HOMESTAKE
Grants Project

Homestake Mining Company of California

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Washington, DC 20555-0001

RE: Homestake Mining Company of California – Grants Reclamation Project – Preliminary Groundwater Flow and Transport Model Status Report

Dear Mr. Linton:

As per the December 31, 2018 NRC's approval for HMC's request for a due date extension for the Groundwater Corrective Action Plan (CAP) (ADAMS Accession No. ML18355A893), a milestone was set for submission of a preliminary groundwater model results report by March 4th, 2019. You will find the report attached to this cover letter. A hard copy of this groundwater model report has also been submitted to the NRC's Document Control Desk.

Thank you for your time and attention on this matter. If you have any questions, please contact me via e-mail at twohlford@homestakeminingcoca.com or via phone at 505.290.2187.

Respectfully,

Thomas P. Wohlford

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HOMESTAKE MINING COMPANY OF CALIFORNIA

Grants Reclamation Project

PRELIMINARY GROUNDWATER FLOW AND TRANSPORT MODEL STATUS REPORT

March 2019

U.S. Nuclear Regulatory Commission License SUA-1471

State of New Mexico DP-200

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List of Abbreviations

amsl	above mean sea level
ASTM	American Society for Testing and Materials
BC	Brown and Caldwell
CAP	Corrective Action Plan
CEC	cation exchange capacity
CGM	conceptual geochemical model
cm^3	cubic centimeter/centimeters
COCs	constituents of concern
d	day(s)
DEM	digital elevation model
DO	dissolved oxygen
Eh	redox potential
EP	evaporation pond
ft	foot/feet
ft^2	square foot/feet
ft^3	cubic foot/feet
g	gram/grams
gpm	gallon(s) per minute
GIS	geographic information system
GRP	Grants Reclamation Project
HE	Hydro—Engineering, LLC.
HMC	Homestake Mining Company of California
HSCM	hydrogeologic site conceptual model
K_d	distribution coefficient
K_f	Freundlich isotherm partition coefficient
Kg	kilogram/kilograms
L	liter(s)
LGR	local grid refinement
LTP	large tailings pile
m^2	square meter/meters
mg	milligram(s)
NRC	U.S. Nuclear Regulatory Commission
ppm	parts per million
PRISM	Parameter-Elevation Regressions on Independent Slopes Model
R_f	retardation factor
RI	Remedial Investigation
RMM	reformulated mixing odel
RMSE	root mean squared error
RO	reverse osmosis
SAG	San Andres/Glorieta
SCM	surface complexation models
SCMM	surface complexation and mixing model
SI	saturation index
SMC	San Mateo Creek
STP	small tailings pile
TDS	total dissolved solids
U.S. DOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WME	Worthington Miller Environmental, LLC.
XRD	X-Ray Diffraction

Section 1: Introduction

Homestake Mining Company of California (HMC) is currently developing a combined Groundwater Flow and Transport Model that includes San Mateo Creek (SMC) Basin in west-central New Mexico and HMC's Grants Reclamation Project (GRP) at the HMC Mill site (Site), located near Grants New Mexico. This status report details on-going groundwater model development progress with a specific focus on the GRP, including both geochemical modeling and preliminary groundwater flow and transport calibration results. As the model is regularly updated, it will continue to be used to evaluate GRP groundwater restoration activities and as a tool to predict effectiveness of future remediation efforts including fate and transport of site constituents of concern (COCs). This model will also be used to support completion of a revised Groundwater Corrective Action Plan (CAP) for the GRP and, thus, the model includes simulation of the following key hydrogeologic components of the site conceptual model:

- Groundwater flow and hydraulic heads within the alluvial and bedrock (upper, middle and lower Chinle and San Andres) aquifers beneath the GRP.
- Fate and transport of site COCs associated with the GRP.

In March 2018, HMC submitted a Groundwater Flow and Transport Modeling Work Plan (Work Plan) for the GRP to the U.S. Nuclear Regulatory Commission (NRC) (HMC, 2018a). The Work Plan outlined a recommended approach for development of a new groundwater flow and transport model spanning the entire SMC Basin, including the area of the GRP. The Work Plan described development of both a site-specific model and a simplified regional scale model that would be coupled using an advanced MODFLOW modeling technique known as Local Grid Refinement (LGR). After additional consideration, this methodology was deemed unnecessarily complicated because matching grid and layer structures between the regional and site-scale models would be required. An alternative approach was implemented where a single regional-scale model covering the entire SMC Basin has been developed. The alternative modeling approach was described in a modeling progress update Memorandum dated October 2018 (HMC, 2018b).

1.1 Background Information

The HMC Mill site (Site) is located approximately 6 miles north of Milan in the SMC Basin, which encompasses an area of approximately 321 square miles and is shown by the blue outline on Figure 1-1. The SMC Basin includes the Grants Mineral Belt, which produced more uranium than any other district in the world during the period 1951–1980 (HDR, 2016). There are more than 85 legacy mining and mill sites in the SMC Basin and mining and remediation activities have had a significant impact on local and regional groundwater.

Significant remedial activities have occurred at four uranium mill sites in the SMC Basin, which are shown on Figures 1-1 and 1-2. These include the HMC Mill site and Bluewater Mill site in the lower (southern) SMC Basin, which is defined as the portion below the confluence of San Mateo Creek and the Arroyo del Puerto (Figure 1-2). The Rio Algom/Quivira Mill Site (also referred to as the Ambrosia Lake Mill site) and the Phillips Mill Site in the Ambrosia Lake area are located in the upper (northern) SMC Basin about 12 miles north of the HMC Mill site (Figure 1-2). Significant groundwater data have been collected at these sites associated with past and ongoing remedial activities.

HMC Mill site features are shown on Figure 1-3, and include former uranium milling operation areas, tailings piles, collection and evaporation ponds, and support facilities. At the HMC Mill site, uranium milling operations occurred from 1958 until 1990. Closure activities occurring at the site include security, groundwater

remediation operations, and environmental monitoring (HDR, 2016). Ongoing site remedial activities are collectively referred to as the GRP and have been ongoing since 1977.

Past remedial activities at the GRP have been described in detail in both the Work Plan (HMC, 2018a) and the Draft Remedial Investigation (RI) Report (HDR, 2016). The goal of remediation has been to reduce the concentrations of COCs in underlying aquifers to levels meeting designated standards. The current system includes multiple components that are frequently adjusted based on evaluation of monitoring data. The primary components of the current system are summarized as follows:

- **Hydraulic Containment** – Groundwater extraction from and reinjection into the alluvial, Upper Chinle, and Middle Chinle aquifers creates a hydraulic barrier to limit the movement of contaminated groundwater. The hydraulic barrier in the alluvial aquifer is created and maintained downgradient of the Large Tailings Pile (LTP) with dozens of wells used to extract impacted groundwater and to introduce clean water into the alluvium with more than 6,000 linear feet (ft) of infiltration lines (HMC, 2012). Water added to the alluvial formation used to create the hydraulic containment area is derived from the reverse osmosis (RO) plant product water, treated effluent from the zeolite pilot testing systems, and the San Andres Limestone/Glorieta Sandstone (SAG) aquifer.
- **Groundwater Extraction and RO Treatment** – Groundwater is extracted from numerous dewatering wells and tailing pile toe drains upgradient of the hydraulic barrier created by injected water. Extracted groundwater is routed primarily to the RO treatment plant to remove contaminant mass, or to evaporation ponds if RO capacity is unavailable. RO is the primary treatment process by which COCs are removed, along with the zeolite pilot-testing system. Plant influent is composed primarily of groundwater from the alluvial, Upper Chinle, and Middle Chinle aquifers (approximately 90 percent) and West Collection Pond water (approximately 10 percent), which receives groundwater and tailings water suitable for treatment, along with miscellaneous overflows from the RO plant. As described in the 2017 Annual Monitoring Report / Performance Review (HMC and Hydro-Engineering [HE], 2018), in 2017, approximately 364 gallons per minute (gpm) of RO plant influent came from the alluvial aquifer collection wells, 53 gpm from Collection Ponds, 100 gpm from Upper Chinle aquifer extraction wells, and 32.7 gpm from Middle Chinle aquifer extraction wells.
- **Evaporation** - There are three lined evaporation ponds (EP-1, EP-2, and EP-3) in use at the HMC Mill site (Figure 1-3) that are used for site remediation. The evaporation system is used primarily for water disposal and receives brine from the RO plant, regeneration water from the zeolite system, and the tailings sumps. In 2017, average evaporation from the ponds was approximately 225 gpm, while receiving an average of 8.4 gpm from the tailings extraction wells, 108 gpm of brine from the RO plant, 33 gpm from precipitation, 50 gpm from the zeolite pilot testing systems, and 23 gpm from collection ponds (HMC and HE, 2018).

Groundwater extraction, injection, and hydraulic containment are key components for groundwater flow and transport model development for the GRP. In general, source and plume control measures have reduced the concentrations of COCs in tailings and the areal extent of observed contaminant plumes. Figure 1-4 shows the extent of the uranium plume in the Alluvial aquifer for years 1999 and 2017 where total affected areas have decreased by nearly 40% (1,108 acres to 678 acres).

1.2 Groundwater Flow and Transport Modeling Objectives

Groundwater flow and transport modeling for the HMC Mill site and surrounding SMC Basin is being used as a tool to assess recent, current, and potential future changes in groundwater flow and COC transport as a result of the ongoing remedial activities described above. The eventual goal is to develop a single model encompassing the entire SMC Basin that can be used to simulate both current GRP groundwater restoration activities and as a tool to predict system changes in response to basin-wide remediation efforts, including an

understanding of the long-term fate and transport of COCs. The initial focus of model development and calibration, and the subject of this report, has been to reasonably simulate observed flow and COC transport conditions in the vicinity of the GRP. A generalized representation of flow in the surrounding regional aquifers has been developed to set water levels and regional groundwater inflows and outflows to the focused GRP area.

Both model development and this report have been developed based on applicable ATSM International (ASTM) Standards (ASTM, 2006; ASTM, 2008) and in general accordance with NRC guidance (Neuman and Wierenga, 2003). Section 2 of this Preliminary Model Development Report provides a summary of the Hydrogeologic Site Conceptual Model (HSCM), which form the basis of numerical model development. Section 3 describes development of the GRP numerical groundwater model, while model groundwater flow calibration is outlined in Section 4. Section 5 presents results of geochemical modeling and groundwater transport model calibration discussion for uranium and molybdenum. Results of sensitivity analyses are included in Section 6, and Section 7 includes a summary and discussion of future modeling activities.

Section 2: Hydrogeologic Site Conceptual Model

The HSCM was developed for the San Mateo Creek (SMC) Basin and is described in detail in a technical memorandum (BC, 2018). The HSCM forms the framework for development of numerical groundwater flow and contaminant transport model for the San Mateo Creek Basin, which also includes the Grants Reclamation Project. A HSCM is a summary of available knowledge related to groundwater flow and water quality of the principal hydrostratigraphic units at a certain location and scale. Elements of the HSCM form the basis for numerical model development, including the lateral model domain extents, model layer structures, boundary conditions, physical parameterizations, and calibration approaches described in Sections 3 and 4.

Regionally, the SMC Basin is located in the southeastern portion of the Colorado Plateau physiographic province on the south flank of the San Juan Basin. Figure 2-1 shows the general area in northern New Mexico underlain by the San Juan Basin, while Figure 2-2 presents a geologic cross section illustrating the principal stratigraphic units. The region experienced structural deformation during the Laramide Orogeny from near the end of the Late Cretaceous through the Eocene. Uplift associated with this orogeny formed the Zuni Mountains to the southwest of the SMC Basin, which consists of a northwest-trending monoclinal fold dipping northeast into the San Juan Basin. The SMC Basin lies on the eastern flank of the fold, resulting in bedrock and strata that dip to the north-northeast at about 5 to 10 degrees into the San Juan Basin.

Surface geology in the SMC Basin is shown on Figure 2-3. The primary regional aquifer units in the SMC Basin are as follows (from youngest to oldest):

- Quaternary valley fill deposits (alluvium)
- Menefee Formation
- Point Lookout Sandstone
- Crevasse Canyon Formation
- Gallup Sandstone
- Dakota Sandstone
- Morrison Formation
- Bluff Sandstone
- Entrada Sandstone
- SAG aquifer

The Morrison Formation, Entrada Complex, and SAG are considered the major aquifers in the SMC Basin. Figure 2-4 presents a geologic cross section through the central portion of the SMC Basin illustrating the aquifer units.

The SMC Basin is primarily a region of recharge to groundwater, both to shallow and deeper hydrostratigraphic units. Figure 2-5 shows the general regional groundwater flow patterns for aquifer units that receive recharge within the SMC Basin. Groundwater recharge, discharge, and flow characteristics as well as aquifer physical properties for each of the principal aquifers in the SMC Basin are provided as part of the Regional HSCM (BC, 2018). The effects of groundwater extraction in the alluvial, Morrison Formation, and SAG aquifer on regional flow conditions are also presented. The main structural features in the SMC Basin consist of north- to northeast-trending sub-vertical normal faults, which may locally either impede or facilitate groundwater flow, depending on orientation and offset.

Key elements of the HSCM for the SMC Basin are summarized as follows:

- The SMC Basin is located at the southern margin of the San Juan Basin.
- Aquifers of Quaternary, Cretaceous, Jurassic, and Permian age units are present in the SMC Basin.
- Principal regional aquifers that may have significant flow in the SMC Basin include the alluvium, Menefee, Point Lookout, Gallup, Morrison, and SAG aquifers.
- Geologic uplift of the Zuni Mountains on the southwest edge of the SMC Basin has exposed outcrops of the principal aquifers. Aquifer units generally dip to the north-northeast toward the central portion of the San Juan Basin.
- Flow directions in the Cretaceous and Jurassic aquifers are variable but generally toward the east-northeast from outcrops and subcrops in the SMC Basin toward discharge to the Rio Puerco watershed.
- Regional groundwater flow in the Permian SAG aquifer is generally to the east and southeast, with discharge occurring southeast of Grants via upward flow to alluvium of the Rio San Jose.
- Hydraulic conductivities and other aquifer parameters typically vary greatly between units, vertically within many units, and even areally within some units in the basin.
- Historical groundwater pumping has occurred primarily in the alluvial Morrison, and SAG aquifers.
- Extensive pumping from the Morrison Formation in the Ambrosia Lake area between the late 1950s and early 1980s resulted in significant water level declines in the aquifer. Water levels in this area are recovering after the cessation of pumping, but few water-level data are available to evaluate system recovery.
- Groundwater pumped from the Morrison Formation in the Ambrosia Lake area for dewatering of uranium mines was discharged into local drainages including the Arroyo del Puerto. This discharge provided significant recharge to previously unsaturated alluvium, and this water still persists in the alluvial system.
- The SAG aquifer represents the primary regional source of groundwater. Extensive pumping from the aquifer has occurred since the 1940s for irrigation, municipal, and industrial uses.
- Long-term pumping in the SAG aquifer has produced local-scale and regional-scale drawdowns in the aquifer.
- In general, there is little evidence of inter-aquifer flow in the basin, which is due to the presence of low-permeability aquitards between the principal aquifers.

- High-angle normal faulting has locally affected groundwater flow in bedrock aquifers, including near the Bluewater and HMC Mill sites, where local faulting has been shown to restrict groundwater flow.

Key HSCM elements specific to the GRP include:

- The HMC Mill site is located in the southern (lower) portion of the SMC Basin.
- Aquifers of Quaternary, Triassic, and Permian age are present at the site.
- Principal aquifers with groundwater flow at the site include the alluvium; Upper, Middle, and Lower transmissive units of the Chinle Formation; and SAG aquifer.
- Local groundwater flow in the alluvium generally flows parallel to downgradient surface flows in SMC, the Rio Lobo, and the Rio San Jose, but bifurcates around a bedrock high located south of the LTP.
- Groundwater flow in the Chinle Formation aquifer units is generally to the north-northeast, except where influenced by faulting, subcrop locations, or ongoing restoration operations. Groundwater flow in the underlying SAG aquifer is more to the east and southeast.
- Site remedial activities have included groundwater extraction and injection in both the alluvium and Chinle sandstones, affecting local groundwater flow conditions.
- The presence of fault zones has restricted and redirected local groundwater flow in the Chinle aquifers under the GRP.
- Local groundwater flow conditions have been well characterized through data collected from hundreds of monitoring wells on the GRP.

These elements of the HSCM were generally translated into the GRP Model as described in Section 3.

As an initial step toward creating a groundwater flow and transport model, a 3-D geologic model was developed that captures stratigraphy and faulting at both the site scale around the GRP and regionally within the SMC Basin. The geologic model was then used to create appropriate hydrostratigraphic layer structure in a USGS MODFLOW environment. The geologic model was developed using Leapfrog™, a geologic modeling software that provides for enhanced interpretation and visualization of regional stratigraphy and geology. Development of the regional Leapfrog 3-D geologic included the incorporation of an existing site-scale geologic model's interpretations of surface outcrops, stratigraphic layer thicknesses, fault structures, dip directions, and dip angles to produce "layer cake" representation of the primary stratigraphic units in the SMC Basin in the vicinity of the GRP (HMC, 2012). Information from geologic logs collected at the site, along with regional well information (well depths and units penetrated) were added and localized changes were made to stratigraphic thicknesses and depths to expand the model regionally to the scale of the SMC Basin, such that the model reflects available geologic data. 3-D geologic model development ended with the addition of primary regional fault structures and assumed stratigraphic offsets related to these structures. Overall, approximately 1,437 well logs were used to inform the basin-scale 3-D geology model in addition to 14 geologic maps for the region (see References for data sources).

Figures 2-6 through 2-8 provide representative cross sections through the SMC Basin that were generated using the 3-D geologic model. Representations of regional stratigraphy developed from the 3-D geologic model were then translated to MODFLOW format for development of the GRP Model layer structure described in Section 3.3.

Section 3: GRP Numerical Model Development

This section discusses development of GRP Model. The GRP Model consists of a groundwater flow model to simulate system responses to changes in background hydrologic conditions and site remediation pumping/injection activities, and a solute transport model to simulate changes in constituent concentrations in response to ongoing remediation activities. Model code selection is described immediately below.

3.1 Model Code Selection

The GRP Model was developed based on MODFLOW-NWT, a version of the popular U.S. Geological Survey family of MODFLOW groundwater flow modeling codes (Niswonger et al., 2011). MODFLOW-NWT includes the Newton-Raphson solution formulation that enables improved unconfined groundwater flow simulations and incorporates code changes that better simulate drying and rewetting, which may occur within the GRP and SMC Basin if sufficient water table declines and increases are predicted. MODFLOW-NWT is maintained by the U.S. Geological Survey and is publicly available.

3.2 Simulation Period

The current version of the GRP groundwater model simulates a transient calibration period of 2013 through 2017 using stress periods that contain variable time lengths. A steady state solution was developed for 2013 that provides the initial condition for the transient model. A simulation that consisted of a predevelopment steady state condition followed by a transient model covering the period of 1940 through present day was considered but lack of historical SMC Basin data availability (especially historical dewatering records) would prevent this model from reasonably approximating actual Basin conditions.

From 2013 through 2016, each year contains two stress periods that are 6-months in length. At the time of model development, pumping and injection associated with 2017 was projected and therefore an annual stress period was used for this year. The overall simulation period and stress period durations will likely be a focus of future work. For example, if additional historical pumping and injection data for the GRP site (e.g., 2005 through 2012) can be reliably estimated, the simulation period may be lengthened to include additional years of historical operations.

3.3 Model Domain & Layering

The GRP Model domain encompasses the principal regional aquifers present in the basin and the regional SAG aquifer. The full model extent is shown on Figure 3-1, which was designed to include both north to northeast flow in the Cretaceous, Jurassic, and Triassic aquifers and east to southeast flow in the underlying SAG (Permian) aquifer. The regional extent of the model also generally corresponds to the SMC Basin watershed boundary to the north and east. The domain was expanded to the south and west to include areas upgradient of Bluewater, the Grants-Milan area, and mountain front recharge to the SAG, which occurs in the Zuni Mountains.

Active model areas not immediate to the GRP generally contain uniform grid spacing of 500 by 500 ft, which is adequate to simulate representative regional flow conditions. Grid refinement is implemented near the GRP with grid cell sizes decreasing to 62.5 ft by 62.5 ft, where the smaller areas are appropriate for simulation of both constituent transport and fluxes from the numerous Site wells associated with the GRP extraction/injection system (Figure 3-2). The variably spaced grid includes 449 rows and 490 columns, with a total of 1,738,207 active model cells.

Initial efforts to develop the regional model construct included 18 layers, which allowed very detailed representation of hydrostratigraphic units found beneath both the GRP area and at the regional basin scale. Initial model layering was created as summarized in Table 3-1. The 18-layer model construct led to simulations

with very long run times and solution nonconvergence issues using MODFLOW-NWT. To address this problem, certain layers were lumped together where appropriate to reduce the overall complexity of the model. The simplified 10-layer model honors critical hydrostratigraphic units at the GRP area but aggregates regional bedrock formations located north and northeast of the GRP. This 10-layer groundwater flow model is characterized by reduced run times and convergent solutions and this construct is also summarized in Table 3-1 and shown graphically in Figure 3-3.

Since model layers were defined by hydrostratigraphy, where geologic units do not exist at a location due to erosion, the corresponding model layers are assigned nominal thicknesses of 1 foot each and are assigned the hydraulic properties of the uppermost existing geologic unit. For example, at a location where the Middle Chinle aquifer (model layer 6) is sub-cropping beneath alluvium, model layers 2, 3, 4, and 5 are assigned the nominal thickness of 1 foot and the hydraulic properties of the Middle Chinle aquifer. The thickness of model layer 6 is reduced by the total thickness of the overlying nominal thickness layers (i.e., 4 feet) to preserve the overall transmissivity of the Middle Chinle aquifer. This approach allows for appropriate simulation of continuous flow and transport between the Middle Chinle aquifer subcrop and the overlying alluvium (see Section 3.4 for figure representations). Using nominal thicknesses of less than 1 foot for each layer (e.g., 0.1 foot each) were initially tested and led to numerical instabilities and solution nonconvergence issues in MODFLOW-NWT.

Cross sections through the GRP as they are represented in the MODFLOW-NWT model are provided in Figures 3-4 and 3-5. The model grid rotation is 23 degrees to maintain an orientation that generally aligns with principal hydraulic conductivity and observed primary transport directions, so a single row cross section from the model trends slightly from northwest to southeast whereas a column trends from southwest to northeast.

As part of future efforts, Layer 2 of the current construct may be revisited and subdivided such that additional regional hydrostratigraphic details are represented by the groundwater model, if runtimes are manageable and model convergence is maintained.

Table 3-1 - Initially Proposed Layer Structure versus Model Implementation

Hydrostratigraphic Unit	Originally Proposed Model Layers	Current Model Layering Approach	Geologic Period	Hydrogeologic Characteristics
Quaternary Valley Fill Deposits	1	1	Cenozoic	Limited Area of Saturation in the San Mateo Creek Basin (Weston Solutions, 2018)
Point Lookout Sandstone	2	2	Cretaceous	Limited Water Bearing Unit (T varies from 0.4 ft^2/d to 236 ft^2/d) (Stone et al., 1983; Kernodle, 1996)
Crevasse Canyon Formation	3		Cretaceous	Interbedded Coal and Sandstone; Limited Water Bearing Unit. T is approximately 50 ft^2/d (Stone et al., 1983)
Mulatto Tongue	4		Cretaceous	Aquitard (Walvoord et al., 1998)
Gallup Sandstone	5		Cretaceous	Aquifer (Kernodle, 1996)
Mancos Shale	6		Cretaceous	Aquitard (Walvoord et al., 1998)
Dakota Sandstone	7		Cretaceous	Aquifer and Uranium Bearing (Kernodle, 1996)
Morrison Formation	8		Jurassic	Aquifer (primary uranium ore bearing unit) (Kernodle, 1996)
San Rafael (i.e., Entrada)	9		Jurassic	Limited Water Bearing Unit near Outcrops (Kernodle, 1996)

Table 3-1 - Initially Proposed Layer Structure versus Model Implementation				
Hydrostratigraphic Unit	Originally Proposed Model Layers	Current Model Layering Approach	Geologic Period	Hydrogeologic Characteristics
Chinle Shale	10	3	Triassic	Aquitard (HDR, 2016)
Upper Chinle Water Bearing Unit	11	4	Triassic	Water Bearing (HDR, 2016)
Chinle Shale	12	5	Triassic	Aquitard (HDR, 2016)
Middle Chinle Water Bearing Unit	13	6	Triassic	Water Bearing (HDR, 2016)
Chinle Shale	14	7	Triassic	Aquitard (HDR, 2016)
Lower Chinle Water Bearing Unit	15	8	Triassic	Water Bearing (HDR, 2016)
Chinle Shale	16	9	Triassic	Aquitard (HDR, 2016)
San Andres Limestone/	17	10	Permian	Primary Aquifer (Stone et al., 1983)
Glorieta Sandstone (SAG)	18		Permian	

3.4 Flow Model Boundary Conditions

Model boundary conditions provide a mechanism to add flow into the groundwater system (such as recharge, well injection, or upgradient inflow) and to allow for flow out of the system (such as well pumping or as downgradient outflow). Groundwater flow can also be affected by no-flow boundaries and fault structures that restrict flow. Boundary conditions developed for the current model construct are described below and were only minimally adjusted during model testing and calibration.

3.4.1 Groundwater Recharge

Background recharge from seasonal precipitation is applied to the highest active model layer through the MODFLOW Recharge (RCH) package. Specifically, if upper model layers are simulated as dry, MODFLOW passes recharge vertically downward into the model and recharge is then applied to an elevation associated with the simulated water table.

Currently, groundwater recharge is primarily simulated in the model based on spatial precipitation data obtained from the Parameter-Elevation Regressions on Independent Slopes Model (PRISM) (PRISM Group 2004). The PRISM method interpolates a database of climate records onto a spatial grid covering the coterminous United States (Daly et al., 2008). PRISM calculates a climate-elevation regression for each gridded spatial location based on data from nearby climate stations where long-term records are available, and on a digital elevation model (DEM). Factors considered in the regression used for interpolation of precipitation include location, elevation, coastal proximity, topographic facet orientation, vertical atmospheric layer, topographic position, and orographic effectiveness of the terrain. PRISM precipitation data for 2016 were obtained for the PRISM 4-kilometer stable data grid and further spatially interpolated using GIS-based methods. The preliminary model does not vary basin-wide areal recharge transiently to focus on simulating the primary transient hydrologic stresses of the Site remedial systems, but subsequent versions of the model may include transient variation of groundwater recharge.

The GIS-interpolated precipitation dataset was initially scaled to an estimate of groundwater recharge as 5% of total precipitation through most of the SMC Basin based on estimates included in previous studies performed across the southwest. Specifically, this scaling approach is consistent with other numerical modeling efforts for the region where, on average, a range of 2%-6% of precipitation has been used as an estimate of recharge to groundwater (Scanlon et al. 2006). At southern edge of the model domain where the San Andres-Glorieta aquifer materials outcrop on the flanks of the Zuni Mountains was initially scaled to 25% of total precipitation to account for infiltration of snowmelt and runoff from the Zuni Mountains. During the model

calibration process, these percentages of total precipitation simulated as groundwater recharge were adjusted to be 4% for areas in the basin covered by alluvium, 1% for areas in the basin with relatively permeable bedrock at the surface (i.e., sandstone), 0% for areas in the basin with relatively impermeable bedrock at the surface (i.e., mudstones), and 30% for the SAG aquifer outcrops at the southern edge of the model domain. These recharge rates, as currently represented in the model, are provided on Figure 3-6.

Seepage from the LTP represents an important source of both recharge and chemical mass loading to the local groundwater system. A separate seepage model (the reformulated mixing model [RMM]) has been developed to assess long-term changes in both seepage flow rates and constituent mass loading (HDR, 2016, Appendix G). Assessments of past LTP seepage rates, along with predictions of future seepage rates, have been developed based on vadose modeling using the VADOSE/W code. Development, calibration, and application of the VADOSE/W seepage model is described in HDR, 2016, Appendix G. Seepage estimates developed from that model are used in the current version of the GRP model to simulate flow from the LTP into the local groundwater system and are shown in Figure 3-6 as a location of high recharge beneath the LTP. Updated LTP seepage rate estimations associated with future revisions to the RMM may be incorporated into subsequent versions of the GRP model.

3.4.2 Well Pumping and Injection

Ongoing remediation of the GRP Site includes both injection and groundwater extraction to create and maintain a hydraulic barrier to control potential groundwater migration away from the LTP footprint (HDR, 2016). The general groundwater restoration sequence utilizes injection of San Andres aquifer fresh water, treated water from the RO and zeolite remediation systems around the impacted area with simultaneous collection to contain impacted water. The injection of unimpacted water serves the primary purpose of enhancing and expanding a hydraulic barrier to further limit uranium/COC migration and directing impacted groundwater to collection wells. Comprehensive details on the GRP Site remediation system pumping and injection program, including well locations, can be found in HDR (2016) and HMC and HE (2018)

Volumes, rates, and locations of injection and extraction have varied over time to optimize system performance and maintenance of the hydraulic barrier is re-assessed and modified on roughly an annual basis. In addition, groundwater extraction volumes from wells are measured on an aggregate basis for the alluvial aquifer, Upper and Middle Chinle aquifers, and off-site areas, respectively (HMC and HE, 2018). Similarly, injection rates within specific aquifer units and areas of the GRP Site are also measured collectively and not for individual wells. (HMC and HE, 2018).

Therefore, past pumping and injection rates at specific locations were approximated for years 2013 through 2016 and organized into a database by Hydro-Engineering, LLC., (personal communication, Hydro-Engineering, 2017). These rates were then simulated in the GRP Model using the MODFLOW Well (WEL) package. As discussed previously, only projections of 2017 pumping/injection rates were available for most of the time that the model was being developed and calibrated. Estimates of actual system operations for 2017 (rather than projections) recently became available and were subsequently included in the groundwater model; however, the stress period interval remains as a single year for 2017.

At the time of preliminary model development, regional pumping data for the SAG associated with municipal, commercial, irrigation, domestic, and livestock uses were not available. Specifically, there is known pumping in the SAG south and west of the GRP by Tri-State Power, Murray Acres Community Association and Village of Milan and regional pumping from the SAG aquifer has gradually drawn down water levels in the aquifer over time (DOE, 2014). Thus, simulated groundwater withdrawals are currently approximated in the SAG aquifer using a set of 12 wells pumping at an assumed constant rate of 1,000 gpm in order to help match observed and calibrated groundwater elevations. As part of future work, if reliable historical SAG pumping records can be obtained from sources such as the New Mexico State Engineer Office, the estimated pumping rates and locations may be replaced with known volumes.

3.4.3 Surface Water

In general, streams in the SMC Basin are ephemeral and consist of San Mateo Creek, the Arroyo del Puerto, and the Lobo Canyon drainage (Figure 1-1). Surface flows in these creeks and drainages are generally non-existent and only occur for short periods of time in response to extreme snowmelt and/or summer thunderstorm events. In the upper parts of the SMC Basin and Lobo Canyon, on the west side of Mount Taylor, perennial flow occurs at San Mateo Springs, an unnamed tributary of San Mateo Creek, and an unnamed tributary of the Lobo Canyon drainage. Further up-valley from the Routes 605/509 intersection leading to the village of San Mateo, San Mateo Creek may be more perennial. Surface water flows for these streams are not currently simulated but may be added to the model when hydrostratigraphy associated with the upper SMC Basin is incorporated into the groundwater model.

South of the SMC basin and the GRP Site, the Rio San Jose is a larger surface water feature that is currently simulated in the model using the stream package. The stream package provides the model with a defined head reference in Layer 1 that helps to improves overall solution stability and maintains regional alluvial groundwater flow directions toward the southeast in this portion of the domain. The Rio San Jose is the only surface water feature currently represented in the model domain (Figure 3-7).

3.4.4 Horizontal Flow Barrier – San Mateo Fault

The geologic model developed in Leapfrog introduces explicit representation of offsets between principal hydrostratigraphic units at both the regional scale and beneath the GRP, which allows contacts of differing hydraulic properties in the groundwater flow and transport simulations. However, during calibration of the groundwater flow and transport model, it was determined that overall model calibration improved if the San Mateo Fault was represented as a flow barrier. In the model north of the GRP, the HFB bifurcates to represent both the east and west splays of the San Mateo Fault (Figure 3-8 through Figure 3-16). The Leapfrog geologic model used the geometric representations of the San Mateo Fault splays at the site from the previous site-scale geologic model (including the interpreted fault dips) and extended the splays to the north (HMC 2012). To represent the San Mateo Fault as a continuous barrier to flow in the groundwater flow and transport model, the flow barriers were placed vertically along cell faces following the lateral centerline of the fault splays with their interpreted dips inherited from the previous site-scale geologic model. A vertical representation of the fault is necessary to avoid simulating vertical bypass of groundwater flow between model layers where using flow barriers located based on the dips of the faults would be offset laterally. To limit simulated horizontal hydraulic flow across the faults, a conductivity value of 0.1243 feet/day (ft/d) is assigned in all HFB package locations. The flow barrier is applied only in Layers 2 through 9 where layer thicknesses are greater than 1 ft.

3.4.5 General Head Boundaries – Regional Aquifer Systems Inflow and Outflow

General head boundaries (GHBs) are used to simulate regional groundwater flows for major aquifer units in the SMC Basin. General head boundaries for the Mesozoic bedrock above the Chinle Group in model layer 2 were developed using published groundwater-level contour maps for the Entrada Complex (also known as the San Rafael Group) and Morrison Formation (Brod and Stone, 1981; Frenzel and Lyford, 1982; Stone et al. 1983), as presented and discussed in the Work Plan (HMC 2018a). These general head boundaries allow simulated groundwater in model layer 2 (bedrock above the Chinle group) to flow to the northeast in the northern portion of the SMC Basin and to the east in the southeastern portion of the SMC Basin, as depicted on previously published groundwater level maps (Figure 3-8).

Little regional flow information exists for the Chinle Group because it represents a regional aquitard even if the water-bearing units observed in the vicinity of the GRP site are important to local-scale groundwater flow at the site. As such, the GHBs developed for the model layers representing the Chinle Group (Figures 3-9 through 3-15) are based on the overlying and underlying units and primarily provide model solution stability rather than simulation of the uncertain regional groundwater flow in the Chinle Group. The uppermost Chinle

shale (model layer 3; Figure 3-9) general head boundaries were developed using the general head boundaries of the bedrock above the Chinle Group (model layer 2; Figure 3-8). The lowermost Chinle shale (model layer 9; Figure 3-15) general head boundaries were developed using the general head boundaries of the SAG (model layer 10; Figure 3-16). The general head boundaries in model layers 3 and 9 provide a mechanism for the model to simulate observed downward vertical gradients across the Chinle Group regional aquitard. The remaining general head boundaries in the Chinle Group are only placed in the water-bearing units (model layers 4, 6, and 8) on the eastern side of the SMC Basin and are intended to provide model solution stability (Figures 3-10, 3-12, and 3-14).

Similarly, GHBs for the San Andres/Glorieta (SAG) aquifer in model layer 10 were developed using a published groundwater-level contour map for the SAG aquifer (Baldwin and Anderholm, 1992; HMC, 2018a) and boundary condition locations are provided in Figure 3-16.

3.5 Aquifer Physical Properties

Original zonation of model hydraulic parameterization was based on the Leapfrog 3-D geologic model, developed from geologic mapping, and borehole data from both the GRP site and SMC Basin. Initial parameterization values for the different hydrostratigraphic units relied upon published literature values for each material type including Fetter (2001) and Schwartz and Zhang (2003). Input hydraulic parameter values (primarily hydraulic conductivity) were then adjusted within typically observed ranges to better match observed groundwater-level data and interpreted flow directions in accordance with standard manual calibration practices. Table 3-2, provided below, shows the hydraulic conductivity and storage values for each hydrostratigraphic unit in the preliminarily calibrated flow model.

Table 3-2 - Hydraulic Parameterization Summary

Model Layer Number	Hydrostratigraphy	Preliminary GRP Groundwater Model Hydraulic Parameter Values		
		Horizontal Hydraulic Conductivity (ft/d)	Specific Yield (--)	Specific Storage (1/ft)
1	Alluvium	2.0 - 200	0.1	0.0001
2	Bedrock above the Chinle Group	0.04	0.01	0.00001
3	Chinle Shale	0.0006	0.005	0.0000001
4	Upper Chinle Aquifer	0.10 - 10	0.01	0.00001
5	Chinle Shale	0.001	0.005	0.0000001
6	Middle Chinle Aquifer	1.0 - 10	0.01	0.00001
7	Chinle Shale	0.001	0.005	0.0000001
8	Lower Chinle Aquifer	1.0 - 10	0.01	0.00001
9	Chinle Shale	0.0009	0.01	0.00001
10	SAG	20 - 500	0.2	0.0001

Figures 3-10 through 3-19 19 provide the hydraulic conductivity values associated with each respective hydrostratigraphic model layer and pixelated coloration is used to show areas of nominal layer thickness, as described previously. Zonation of parameter values within a given layer were used to improve the match between simulated groundwater elevations, flow directions, and constituent transport with observed data and is a standard calibration technique used in numerical modeling (Anderson et al. 2015). Where hydraulic

conductivity values associated with layer hydrostratigraphy are shown in these figures, the constant specific yield and specific storage shown in Table 3-2 are applied in the model. For example, in Figure 3-10, , all areas of Alluvium in Layer 1 are assigned a specific yield of 0.1 and specific storage of 0.0001 ft^{-1}. Similarly, where Figure 3-11 shows zonation associated with the bedrock above the Chinle Group, this area is assigned specific yield equal to 0.01 and specific storage of 0.00001 ft^{-1}.

Section 4: Flow Model Calibration

Model calibration for the 2013-2017 period focused on four primary areas:

- Reasonable simulation of wetting and drying of alluvium associated with GRP remediation activities
- Simulation of observed groundwater elevations especially for the alluvial aquifer in the vicinity of the GRP
- Simulation of observed groundwater flow directions in the GRP area
- Development of a groundwater flow solution that allowed calibration to observed uranium and molybdenum concentrations

Model parameters, including aquifer physical parameters and application of PRISM recharge (this did not include LTP seepage) were adjusted to obtain agreement with observed conditions. The final calibration represents a balance between the calibration objectives, as certain parameter modifications may have improved the model's ability to simulate one condition (such as improved simulation of groundwater elevations) while degrading the model's match in other areas (such as degraded matches to observed constituent concentrations). The current set of model parameters achieves a good balance between all model calibration objectives but will likely change as additional updates are made to the model.

The existing current version of the GRP model was manually calibrated such that simulated heads generally match observed groundwater elevations. The head target dataset consists of 45 locations in the alluvium (Layer 1; 330 observations), 3 locations in the Upper Chinle aquifer (Layer 4; 37 observations), 3 locations in the Middle Chinle aquifer (Layer 6; 37 observations), 1 Lower Chinle aquifer location (Layer 8; 7 observations), and 10 San Andres/Glorieta locations (Layer 10, 45 observations). Figures 4-1 through 4-5 provide groundwater flow targets used for calibration.

Analysis of how well the model simulates observed conditions is based on statistics related to model residuals (the difference between simulated and observed groundwater levels). Standard calibration statistics include the average residual, absolute average residual, root mean squared error (RMSE, which gives greater weight to larger residuals), and the scaled RMSE (RMSE divided by the total change in measured head, a measure of how well the model simulates groundwater flow gradients). Table 4-1 provides a summary of these statistics for the overall model and for only the alluvial aquifer, since the calibration for the alluvium is especially critical for estimation of remediation timeframes at the GRP.

It is important to note that an industry-defined statistical range that quantifies a well-calibrated model does not exist, since modeling by necessity requires subjectivity and the acceptability of a calibration is directly dependent on the modeling objective (Anderson et al., 2015). In general terms, however, regional models typically strive for percentage error metrics (e.g., scaled RMSE) of less than 10% whereas local scale models attempt for scaled statistics less than 5%. In the case of the GRP model, when all layers are included, the model has regional characteristics and thus a scaled RMSE of 6.22% is acceptable. The low residual mean also indicates that on average, there is little bias to the solution and the absolute residual mean suggests that the groundwater flow solution is typically within 8.76 feet of the observed value.

For the alluvial aquifer, alone, most of the targets are in the vicinity of the GRP so the calibration process aimed for minimizing both the residual mean and the absolute residual mean with scaled statistic values of

less than 5%. In the current model version, the residual mean indicates that simulated alluvial heads are, on average, slightly high (negative values indicate over-estimation) while the absolute residual mean shows that the solution is typically within 5.86 feet of observed alluvial groundwater elevations. Scaled statistics are well below 5% and range from 3.21% to 4.33% for Layer 1.

Table 4-1 – Bulk Simulated Groundwater Elevation Calibration Statistics

Statistic	All Layers	Model Layer 1 (Alluvial Aquifer)
Residual Mean (feet)	-0.47	-1.79
Absolute Residual Mean (feet)	8.76	5.86
Sum of Square Residuals (feet^2)	76,140	20,515
Root Mean Squared RMS Error (feet)	12.92	7.88
Minimum Residual (feet)	-43.67	-22.66
Maximum Residual (feet)	61.54	61.54
Number of Observations	456	330
Range in Observations (feet)	207.62	182.23
Scaled RMS error (%)	6.22	4.21
Scaled Absolute Mean (%)	4.22	3.21
Scaled Residual Standard Deviation (%)	6.23	4.33

Figure 4-1 presents a scatter plot comparing simulated and observed groundwater elevations. For all layers except Layer 4, simulated groundwater elevations relative to target values generally fall near the 1:1 line, indicative of good calibration. However, there is a cluster of observations in the Upper Chinle aquifer associated with two target wells (i.e., 929 and 931) where observed values are higher than what the model currently simulates. Improving model calibration for these two targets may be part of future efforts.

Simulated contours for the alluvial aquifer are provided in Figures 4-2 and 4-3. The simulated contours for both 2015 and 2017 approximate both observed groundwater elevations and key groundwater flow directions reflected in the observed data. This includes:

- Southerly groundwater flow from the upgradient portions of the SMC Basin toward the GRP
- Westerly groundwater flow directions west of the NRC License Boundary
- Southerly groundwater flow south of the Small Tailings Pile
- Divergent groundwater flow around the bedrock high located southwest of the GRP

Hydrographs for all simulated targets are provided in Appendix A and all groundwater elevation target values are provided in table format as Appendix B.

Given the overall objectives of the current version to simulate remediation timeframes for the GRP, the model is considered sufficiently calibrated to observed water levels and the general hydraulic gradients. Groundwater levels are simulated to within approximately 5.86 ft on average in the alluvial aquifer, with simulated levels being slightly higher than those observed. The overall model scaled RMSE is 6.2% whereas the alluvial aquifer scaled RMSE is 4.2%, representing good calibration to the regional hydraulic gradient and observed alluvial groundwater elevations.

Section 5: Transport Model

For contaminant transport assessment at uranium mill tailings sites, regulatory guidance stipulates that geochemical conditions be sufficiently characterized to: (1) estimate the source term, (2) characterize the subsurface geochemical properties, and (3) identify contaminant attenuation mechanisms (USNRC, 2003a). Consequently, HMC initiated a characterization study in 2018 to assess geochemical conditions within the tailings and the alluvial groundwater system. The objectives were to characterize the solid-phase geochemistry of tailings and alluvium, together with geochemical conditions in the tailings solution and alluvial groundwater, to better understand the factors controlling transport of three primary COCs (uranium, molybdenum, selenium). An interim report for this ongoing characterization study was prepared in November 2018 (WME, 2018), and a draft site conceptual geochemical model (CGM) is under development which incorporates historic information and preliminary data from the recently implemented characterization study. The numerical parameters quantifying the extent of uranium and molybdenum attenuation in the current groundwater flow model were established using the CGM in conjunction with site-specific geochemical data as described in this section.

5.1 Tailings Geochemistry

The Homestake uranium mill utilized an alkaline circuit to process sandstone ore (80 to 85% of the mill feed) and limestone ore (15 to 20% of the mill feed) sourced from underground mines in the Ambrosia Lake subdistrict (Skiff and Turner, 1981). Uranium mineralization occurred as coffinite [$U(SiO_4)_{1-x}(OH)_{4x}$], uraninite (UO_2), tyuyamunite [$Ca(UO_2)(VO_4)_2 \cdot (5\text{-}8)H_2O$], and carnotite ($K_2O \cdot 2UO_3 \cdot V_2O_5$) associated with carbonaceous material and sulfide minerals containing molybdenum and selenium. The tailings slurry consisted of a high-pH ($\approx$ 10) sodium-sulfate water, with elevated concentrations of total dissolved solids (TDS), uranium, molybdenum, and indicator constituents (chloride and sulfate) (Table 5-1). Redox conditions are important in controlling the solubility and behavior of COCs in the tailings and were evaluated by assessing dissolved oxygen (DO) content and measured redox potential (Eh). Because field Eh measurements are often unstable unless the system is completely anoxic (devoid of DO) and dominated by iron, sulfur, and manganese (Langmuir, 1997), the characterization study in 2018 included analysis for additional redox couples to assess the redox status of the groundwater, including iron (Fe^{2+}/Fe^{3+}), nitrogen (NH_4/NO_3), and sulfur (H_2S/SO_4). This evaluation indicated that Eh values computed from the NH_4/NO_3 redox couple provides the closest match to field-measured Eh values (Figure 5-1). The low DO concentrations in some tailings wells is consistent with the consumption of DO by organic decay, producing localized reducing conditions. The redox classification scheme developed for groundwaters (Langmuir, 1997) indicates the tailings can be classified as ranging from "oxic" to "suboxic", although the presence of measurable sulfide (H_2S) concentrations suggests the existence of some "anoxic sulfidic" zones.

Tailings speciation calculations were subsequently conducted with the geochemical model PHREEQC (Parkhurst and Appelo, 2013) using Eh calculated from the NH_4/NO_3 couple to define redox conditions (WME, 2018). The results indicate that dissolved uranium and molybdenum occur primarily in their oxidized forms [U(VI), Mo(VI)], while selenium is present as both Se(VI) and Se(IV). Molybdenum is predicted to exist primarily as the molybdate ion (MoO_4^{2-}), uranium as the uranyl tetracarbonate species ($UO_2(CO_3)_3^{4-}$), and selenium as selenite (SeO_3^{-}) with only minor selenate (SeO_4^{-2}). Calculated saturation index (SI) values suggest there are no discrete uranium, molybdenum, or selenium minerals controlling the overall concentrations

Table 5-1 – Chemical Characteristics of Homestake Mill Tailings Solution

Constituent	Tailings Solution[1] (HE, 1983)				Tailings Sump (NMHED, 1980)			Average	
	11-16-78	11-6-79	9-23-81	10-28-82	10-26-77	11-16-78	11-6-79	Solution	Sump
Calcium	<0.01	<0.01	135	35	nr[2]	10.0	60.0	85	35
Magnesium	nr	<0.1	30.0	nr	nr	nr	813	30.0	813
Sodium	10,000	10,000	9,800	9,080	6,141	8,464	9,292	9,720	7,966
Potassium	0.58	nr	nr	450	nr	31.2	35.1	225	33.2
Bicarbonate	3,280	nr	1,850	2,480	nr	nr	2,388	2,537	2,388
Carbonate	nr	nr	6,450	nr	nr	nr	nr	6,450	--------
Sulfate	8,100	8,420	15,700	12,800	5,532	8,346	8,412	11,255	7,430
Chloride	624	1,070	2,340	1,870	793.2	1,014	1,418	1,476	1,075
TDS	nr	nr	43,300	31,400	17,035	20,710	25,400	37,350	21,048
pH	nr	10.1	10.3	9.9	10.12	nr	10.32	10.1	10.22
Nitrate-N	13.8	11.0	8.2	nr	nr	22.42	10.72	11.0	16.6
Ammonia-N	<1.0	nr	nr	nr	11.2	13.9	17.8	<1.0	14.3
Aluminum	nr	nr	<1.0	nr	nr	nr	<0.25	<1.0	<0.25
Arsenic	0.18	nr	0.07	0.08	2.86	7.19	5.02	0.11	5.02
Barium	<1.0	nr	<1.0	<1.0	<0.10	0.051	<0.10	<1.0	0.051
Cadmium	<0.01	nr	<0.01	<0.01	nr	0.0277	0.001	<0.01	0.014
Lead	<0.01	nr	<0.01	0.01	nr	<0.005	0.007	<0.01	0.007
Molybdenum	80.5	74.8	105	94.0	72.0	105.2	104.5	88.6	93.9
Selenium	26.4	14.7	35.5	24.8	51.18	31.16	27.88	25.4 *(0.92)*[β]	36.7
Uranium	54.3	47.3	21.0	24.7	44.0	52.8	4.17	36.8 *(150)*[β]	33.7
Vanadium	16.9	nr	9.23	4.23	nr	13.6	1.18	10.1 *(6.8)*[β]	7.39
Zinc	14.8	nr	6.62	<1.0	nr	<0.10	<0.25	10.7	---------
Gross Alpha (pCi/L)	nr	nr	nr	nr	nr	10,000 ±1,000	3,400±400	29,000	6,700
^{226}Radium (pCi/L)	31.9	23.5	88.4	80.3	58 ±4	90 ±1	56 ±17	56.0 *(52)*[β]	68

Table 5-1 – Chemical Characteristics of Homestake Mill Tailings Solution

Constituent	Tailings Solution[1] (HE, 1983)				Tailings Sump (NMHED, 1980)			Average	
	11-16-78	11-6-79	9-23-81	10-28-82	10-26-77	11-16-78	11-6-79	Solution	Sump
^{210}Lead (pCi/L)	nr	nr	nr	nr	49 ±8	nr	nr	-------	49 ±8
^{230}Thorium (pCi/L)	nr	0.036	0.151	nr	nr	nr	nr	0.094	0.094

[1]All concentrations are total (unfiltered) and expressed as mg/L except where noted. [2]nr = not reported.[3]Average value reported by USEPA, 1975.

of uranium or molybdenum in the tailings. The tailings are undersaturated with respect to the common reduced uranium(IV) minerals of low solubility [uraninite, $UO_2(c)$; amorphous uranium oxide, $UO_2(am)$], and the oxidized uranium(VI) minerals of high solubility (carnotite, tyuyamunite, uranium phosphate). The tailings are also undersaturated with the common molybdenum and selenium minerals, such as calcium molybdate ($CaMoO_4$) and elemental selenium [Se(am)].

The tailings mineralogy is dominated by quartz, feldspar, and clays, with lesser amounts of calcite, pyrite, and iron oxides. Although tailings solutions were calculated to be undersaturated with respect to selenium and uranium minerals, electron microscopy revealed selenium in association with iron on the surface of pyrite and as elemental selenium mineral inclusions. Uranium was associated with calcium and vanadium, consistent with an oxidized mineralogy (tyuyamunite, carnotite), and selective chemical extraction suggests uranium may be associated with carbonates, organic matter, and iron oxides. No solid-phase forms of molybdenum were identified through microscopy; however selective chemical extraction indicates the majority of molybdenum in the tailings is either water soluble or occurs in an unidentified residual (stable) form, with lesser amounts extracted from the exchangeable and organic/sulfide phases (WME, 2018). Static testing using acid-base accounting showed the tailings contain an excess acid neutralizing capacity, and kinetic testing using humidity cells did not indicate any significant release of acidity, iron, sulfate, uranium, selenium, or molybdenum. At present, the tailings solids do not appear to represent a significant residual source term upon prolonged weathering, relative to existing elevated concentrations of uranium and molybdenum in the existing tailings seepage.

5.2 Alluvial Groundwater Geochemistry

Alluvial groundwater in the vicinity of the LTP is a sodium-sulfate type water with elevated pH due to tailings influence, but becomes more calcium-sulfate dominated, consistent with background conditions, with increasing distance from the LTP. The alluvial aquifer is more oxidizing compared to the tailings, with measurable DO up to 6 mg/L, and very low to non-detectable concentrations of ferrous iron (Fe^{2+}), ammonia-nitrogen (NH_3-N), and hydrogen sulfide (H_2S). Poor agreement between the measured Eh and that calculated from the DO content (Figure 5-1) indicates a general lack of redox equilibrium, and the DO content was therefore used to control redox in subsequent calculations. Redox conditions are classified as oxic based on DO concentrations, and the dissolved uranium, molybdenum, and selenium are predicted to occur primarily in their oxidized forms [U(VI), Mo(VI), Se(VI)]. PHREEQC was used to predict speciation: molybdenum in the alluvial groundwater exists primarily as the molybdate ion (MoO_4^{2-}), uranium speciation is dominated by the uranium(VI)-calcium complexes ($CaUO_2(CO_3)_3^{2-}$, $Ca_2UO_2(CO_3)_3$), and selenium is mainly present as selenate (SeO_4^{2-}). The SI values for the reduced uranium(IV) minerals (amorphous and crystalline UO_2) indicate a high degree of undersaturation due to the low calculated proportion of reduced uranium(IV). Undersaturation was also calculated for the common oxidized uranium(VI) minerals (e.g., carnotite or tyuyamunite), elemental selenium, ferroselite ($FeSe_2$), and calcium molybdate. The alluvial aquifer is in equilibrium with calcite, oversaturated with respect to ferrihydrite, and undersaturated with respect to pyrite.

Nine alluvium samples were collected in 2018 mid-way through the saturated zone from locations upgradient and downgradient of the LTP, various numbers of which were analyzed for bulk mineralogical composition and selected chemical properties (WME, 2018). The alluvial aquifer mineralogy is dominated by quartz, feldspar, calcite (Table 5-2) Only minor clay was identified (2 to 15% kaolinite, smectite, illite) and the resulting cation exchange capacity (CEC) values were low (2.9 to 7.7 $cmol_+/kg$) (Table 5-2). Pyrite was below detection in all samples (<1%) using X-Ray Diffraction (XRD) and the sulfide-S content was <0.01% from sulfur fractionation testing. Natural weathering of the alluvium in a predominantly oxidizing environment limits the preservation of iron sulfides, however these have been shown to be present in finer grained silts and clays associated with the alluvial system (HMC, 2018c). Weathering of pyrite and other iron-bearing primary minerals generates iron oxides as stable weathering products under oxidizing conditions.

Table 5-2 – XRD Mineralogy and Chemical Results (Percent by Weight Unless Indicated) for Alluvium Samples (WME, 2018)

Sample ID	WME-8 @110'	WME-8 @121	WME-11	WME-14	WME-15	WME-16	WME-17	Mean
Location	Perched alluvium below LTP	Perched alluvium below LTP	North of LTP	South of LTP	South of LTP	Adjacent to LTP	Adjacent to LTP	
Quartz	72	74	73	40	72	77	77	69
K-Feldspar	10	8	7	5	7	8	8	7.6
Plagioclase	7	7	7	6	5	7	9	6.9
Calcite	4	6	9	21	11	6	4	8.7
Smectite	4	3	1	4	3	1	1	2.4
Illite	1	1	1	6	1	<1	<1	2.0
Kaolinite	2	1	1	5	1	1	1	1.7
Pyrite	<1	<1	<1	<1	<1	<1	<1	<1
Sulfide-Sulfur	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Iron	0.54	1.18	3.57	1.51	1.27	0.86	nm	1.37 [1]
Total Iron [2]	Sands with gravel and/or silt							0.529
	Overall average of sands, silts, clays							1.089
Extractable Iron	0.092	0.051	0.0347	0.0228	0.0420	0.0485	nm	0.050 [1]
CEC (cmol+ kg^{-1})	4.1	4.2	2.9	7.7	4.2	3.1	6.1	4.9 [1]

[1] Mean value includes two additional samples not analyzed for XRD mineralogy.

[2] Mean value from HMC, 2018.

Iron oxides are considered the most important adsorbents for trace elements in nature due to their high capacity for adsorption, coupled with their tendency to be finely dispersed and to occur as mineral coatings (Dzombak and Morel, 1990; Langmuir, 1997). Iron oxides were not apparent because the crystalline forms (e.g., hematite) were below the XRD detection limit (1 to 3%) and/or a significant fraction of the iron oxide is non-crystalline (amorphous iron hydroxide, ferrihydrite). Chemical analysis showed the total iron content of the alluvium samples ranged from 0.54 to 3.57% with an average of 1.37%. This value is consistent with the average of five samples (1.09%) reported by HMC (2018c) containing a mixture of sands, silts, and clays and where hematite was identified with XRD in two of the samples (1%). Selective chemical extraction for the WME (2018) samples indicates that a small proportion of the iron exists as amorphous iron hydroxide with a content averaging 0.05% as iron (Table 5-2, Figure 5-2).

No discrete mineralogical forms of uranium or molybdenum could be identified through direct examination of the alluvium samples. However, selective chemical extraction indicated that a fraction of the total uranium was associated with iron oxides in both tailings-influenced and non-impacted alluvium samples. While chemical extraction methods are not completely selective, they are useful in understanding general associations and for comparison between samples. Alluvium samples influenced by tailings (adjacent, perched, and vadose) contained relatively higher fractions of soluble, exchangeable, and carbonate-bound uranium, in addition to iron oxide bound, compared to the remaining non-impacted samples (Figure 5-3). The samples contain low CEC (Table 5-2) and uranium, sourced from LTP seepage/groundwater, is not expected to be strongly retained by clays under site conditions (Section 5.3). Therefore, the uranium associated with the exchangeable fraction may have been extracted from iron oxide surfaces by the high ionic strength of the exchangeable solution (1 M $MgCl_2$). Molybdenum also adsorbs to iron oxide minerals but was found to exist in a predominantly residual form in all samples (WME, 2018). The paucity of molybdenum associated with iron oxides in the selective extractions also suggests some molybdenum associated with iron oxides may have been extracted in the exchangeable step during chemical extraction.

5.3 Conceptual Geochemical Model

In the current CGM, an active source term is contained within a dissipating mound of tailings water where the rates of seepage will continue to decrease over time (Figure 5-4). The sodium-sulfate tailings seepage contains elevated pH, TDS, and COC concentrations, with redox conditions ranging from oxic to suboxic. Uranium exists primarily as oxidized U(VI) complexed with carbonate ($UO_2(CO_3)_2^{2-}$) while molybdenum is mainly present as the oxidized molybdate (MoO_4^{2-}) ion. Dissolved selenium in the tailings is predicted to occur as both the oxidized [Se(VI)] selenate (SeO_4^{2-}) ion and the reduced [Se(IV)] selenite (SeO_3^{2-}) species. As tailings seepage migrates into the underlying alluvial aquifer, it becomes partially diluted as it mixes with alluvial groundwater from upgradient. As the tailings-influenced groundwater moves downgradient, the concentrations of conservative indicator constituents (chloride, sulfate) are controlled by dilution and dispersion. The dissolved uranium becomes dominated by the uranyl-calcium complexes ($CaUO_2(CO_3)_3^{2-}$, $Ca_2UO_2(CO_3)_3$) and selenate becomes the main form of selenium upon mixing with the more oxidizing calcium-sulfate type alluvial groundwater. Molybdenum continues to migrate as the free molybdate ion.

Potential attenuation mechanisms for the COCs in the alluvial aquifer include mineral precipitation, adsorption by various clay minerals, and adsorption by amorphous iron hydroxide (ferrihydrite). Direct precipitation of COCs is not considered to be an important attenuation mechanism in the alluvial aquifer due to the extent of undersaturation with respect to the oxidized mineral forms (e.g., carnotite, calcium molybdate, metal selenates). However, HMC (2018c) has recognized the presence of reduced microenvironments in the alluvial aquifer which could produce locally-reducing conditions. Selenium is more easily reduced relative to uranium and molybdenum, and thus could also potentially migrate as selenite or precipitate as elemental selenium in these localized zones (Figure 5-4). The relative importance of the two remaining attenuation mechanisms (adsorption to clays or ferrihydrite) focuses on the two COCs (uranium and molybdenum) whose modeled transport results are presented in this report.

The affinity for adsorption of COCs to minerals is controlled by the forms of dissolved uranium and molybdenum in the groundwater, and the surface charge of the mineral, both of which are pH-dependent. Uranium is mainly present as negatively-charged calcium- and carbonate-complexes under Site pH conditions, and would only exist as positively-charged species (UO_2OH^+, UO_2^{2+}) below pH of 6 (Figure 5-5a). Similarly, molybdenum occurs primarily as the negatively-charged MoO_4^{2-} ion (Figure 5-5b). Clay minerals are negatively-charged above pH of 5 (Appelo and Postma, 2013), producing a swarm of positively-charged cations (Na^+, Ca^{2+}) at their surface, where the concentrations of negatively-charged anions are the lowest. A diffuse layer of ions extends from the surface into the solution, with cations at higher and anions at lower concentrations than in the solution (Figure 5-6). Major cations (Na^+, Ca^{2+}) are held rather weakly to the clays by electrostatic force, whereas metal oxyanions bond more strongly with oxygen on mineral surfaces. However, under Site conditions (pH >7), the anionic forms of uranium and molybdenum are essentially excluded from interacting with negatively-charged clays.

Alternatively, iron oxide surfaces will be neutral or positively-charged under most groundwater pH conditions (Appelo and Postma, 2013). Oxyanion adsorption involves both an electrostatic attraction and chemical bonding to the mineral surface, and adsorption of uranium and molybdenum by ferrihydrite is expected under Site conditions. In the CGM, adsorption by ferrihydrite [$Fe(OH)_3$] is therefore considered to be the primary mechanism for partitioning of uranium and molybdenum in the alluvial aquifer (Figure 5-4). The extent of adsorption is not 100%, and will vary depending on the specific constituent and local geochemical conditions, such that a fraction of the uranium and molybdenum remains mobile. Due to its widespread nature, studies have shown ferrihydrite to exert more control on the attenuation of uranium compared to clays. For example, uranium adsorption data compiled by the USEPA (1999) suggests that soils containing higher percentages of iron oxides, mineral coatings, and/or clay minerals will exhibit higher adsorption capacities compared to soils solely dominated by quartz and feldspars (Figure 5-7). Some investigators have also shown that adsorption capacities for soils of mixed mineralogy are not necessarily correlated with clay content, but rather uranium appeared to be associated with mineral surface coatings of variable pH (consistent with ferrihydrite occurrence) (USEPA, 1999). Consequently, the use of surface complexation models (SCMs) utilizing the adsorptive behavior of uranium on ferrihydrite are almost universally used to model fate and transport of uranium in groundwater systems (e.g., Zhu et al., 2002; Curtis et al., 2009; Johnson et al., 2013; USNRC, 2003b; USNRC, 2006).

5.4 Transport Parameter Development

Incorporation of SCMs into geochemical reaction codes (e.g., PHREEQC, MINTEQA2) can be used to predict the adsorption behavior of metals and radionuclides as a function of key geochemical parameters (pH, carbonate concentration). The current state of knowledge regarding surface complexation constants for uranium adsorption onto iron oxides and the mechanistic understanding of the controlling reactions is probably as advanced as those for any other trace metal (USEPA, 2013). Three general models are commonly used to describe the adsorption of dissolved constituents onto mineral surfaces: (1) the distribution coefficient (K_d), (2) the Freundlich adsorption isotherm, and (3) the Langmuir adsorption isotherm (Langmuir, 1997). A geochemical surface complexation and mixing model (SCMM) was developed using site-specific data from which the Freundlich isotherm provided the best fit:

$$x/m = K_f\, C^{(1/n)} \qquad [1]$$

where x/m is the weight of adsorbate per unit weight of adsorbent (mg/g), C is the equilibrium concentration of the adsorbate (mg/L), K_f is an empirical partition coefficient at equilibrium (L/g), and n is an empirical coefficient (INEEL, 2002).

5.4.1 Modeling Software and Database

The geochemical model PHREEQC (Parkhurst and Appelo, 2013) was used to develop the SCMM for describing uranium and molybdenum adsorption characteristics in the alluvial aquifer. PHREEQC is capable of performing a variety of geochemical calculations, such as solution speciation and saturation index calculations, solution mixing, mineral and gas equilibria, ion exchange simulations, and surface complexation reactions. The MINTEQv4.dat database developed by the USEPA (1998) was used because it contains an extensive compilation of thermodynamic data for uranium. A modified MINTEQv4.dat database has been created which contains additional thermodynamic data for the aqueous U(VI) alkaline-earth metal (Ca, Mg) complexes (Table 5-3), which have since been recognized as playing an important role in the environmental chemistry of uranium. For the surface complexation component of the model, a number of uranium and molybdenum species were considered as potential sorbents (Table 5-4). These include the free uranyl (UO_2^{2+}) as provided in the WATQ4F database which accompanies the PHREEQC program. The uranyl surface complexation constants (Dzombak and Morel, 1990) were subsequently revised based on the improved constants published by Mahoney et al. (2009). Additional adsorbing species considered are the various uranium-carbonate and -calcium complexes (including the carbonate ion) for which thermodynamic data have been developed (Table 5-4). The modified MINTEQv4.dat geochemical database is provided in Appendix G.

Table 5-3 – Supplemental Thermodynamic Data for Uranium Species in the Modified Database

Reaction	Log K	Source
$Ca^{+2} + UO_2^{+2} + 3CO_3^{-2} = CaUO_2(CO_3)_3^{-2}$	27.18	Dong and Brooks (2006)
$2Ca^{+2} + UO_2^{+2} + 3CO_3^{-2} = Ca_2UO_2(CO_3)_3$	30.70	
$Mg^{+2} + UO_2^{+2} + 3CO_3^{-2} = MgUO_2(CO_3)_3^{-2}$	25.02	Dong and Brooks (2006)

Table 5-4 – Uranium and Molybdenum Reactions Considered in Surface Complexation Mixing Model

No.	Reaction	Log K	Source
1	$Hfo\_sOH + UO_2^{+2} = Hfo\_sOUO_2^{+} + H^{+}$	3.735	Mahoney et al. (2009)
2	$Hfo\_wOH + UO_2^{+2} = Hfo\_wOUO_2^{+} + H^{+}$	2.534	
3	$Hfo\_wOH + UO_2^{+2} + CO_3^{-2} = Hfo\_wOUO_2CO_3^{-} + H^{+}$	9.034	
4	$Hfo\_wOH + UO_2^{+2} + 2CO_3^{-2} = Hfo\_wOUO_2(CO_3)_2^{-3} + H^{+}$	15.28	
5	$Hfo\_wOH + Ca_2UO_2(CO_3)_3 + 2H^{+} = Hfo\_wOUO_2^{+} + 3HCO_3^{-} + 2Ca^{+2}$	3.01	NRC (2006)
6	$Hfo\_wOH + Ca_2UO2(CO_3)_3 + H^{+} + H_2O = Hfo\_wOUO_2OH + 3HCO_3^{-} + 2Ca^{+2}$	-4.88	
7	$Hfo\_sOH + Ca_2UO_2(CO_3)_3 + 2H^{+} = Hfo\_sOUO_2^{+} + 3HCO_3^{-} + 2Ca^{+2}$	6.25	
8	$Hfo\_sOH + Ca_2UO_2(CO_3)_3 + H^{+} + H_2O = Hfo\_sOUO_2OH + 3HCO_3^{-} + 2Ca^{+2}$	-1.65	
9	$Hfo\_wOH + CO_3^{-2} + H^{+} = Hfo\_wOCO_2^{-} + H_2O$	12.78	Appelo et al. (2002)
10	$Hfo\_wOH + CO_3^{-2} + 2H^{+} = Hfo\_wOCO_2H + H_2O$	20.37	
11	$Hfo\_sOH + MoO_4^{-2} + H^{+} = Hfo\_sMoO_4^{-} + H_2O$	9.50	USEPA (1998)
12	$Hfo\_wOH + MoO_4^{-2} + H^{+} = Hfo\_wMoO_4^{-} + H_2O$	9.50	
13	$Hfo\_sOH + MoO_4^{-2} = Hfo\_sOHMoO_4^{-2}$	2.40	
14	$Hfo\_wOH + MoO_4^{-2} = Hfo\_wOHMoO_4^{-2}$	2.40	

5.4.2 Geochemical Model Description

The SCMM combines surface complexation reactions with geochemical mixing of groundwater to calculate uranium and molybdenum partition coefficient values (K_f) using the Freundlich isotherm. The values for K_f are in turn used to calculate uranium and molybdenum retardation factor values (R_f) to define their degree of attenuation in the groundwater flow model. In the SCMM, upgradient groundwater is mixed with varying proportions of tailings-influenced groundwater (ranging from 0.10% to 98%) in the presence of ferrihydrite, clays, and other major minerals (quartz, feldspar, calcite). This approach allows for the generation of empirical adsorption isotherms to account for the large range in COC and TDS concentrations encountered upon migration and mixing of the contaminant plume with alluvial groundwater. All groundwater solution compositions and aquifer mineral component inputs to the SCMM are based on site-specific measurements conducted in 2018 (WME, 2018).

The two end-member solution compositions used in the SCMM are provided in Table 5-5. The composition of upgradient water represents average 2018 concentrations calculated from upgradient Wells DD, R, and Q (Quarters 1 through 3). The composition of the tailings-influenced water is representative of the alluvial groundwater containing the highest concentrations of uranium and molybdenum measured in the vicinity of the LTP (Well SE6) (HMC and HE, 2018). The mineralogic inputs are based on recent site-specific characterization (WME, 2018) as shown in Table 5-6. The alluvium is dominated by quartz, and therefore a particle density of 2.65 grams/cubic centimeter (g/cm^3) and a porosity of 0.30 were used to calculate a bulk density of 1.86 g/cm^3 (Klein and Hurlbut 1993; WME, 2018). For consistency with the groundwater flow model, an effective porosity of 0.20 was used with the calculated bulk density of 1.86 g/cm^3 to convert mineral concentrations from a mass basis (mg/kg) to moles/L of pore water for input to PHREEQC (Table 5-6). Mineral saturation index values were fixed at their respective average values in groundwater as previously calculated (WME, 2018).

Table 5-5 - Groundwater Compositions (mg/L) Used in the Surface Complexation Mixing Model

Constituent	Upgradient	Tailings Influenced
Alkalinity as $CaCO_3$	192.4	4,295
Calcium	411	33
Magnesium	77.8	66.3
Sodium	314	7,150
Potassium	5.9	8.9
Chloride	66.1	1,200
Sulfate	1704	9,980
pH (s.u.)	7.4	8.47
Dissolved Oxygen	2.4	3.2
Temperature (°C)	16.2	15.5
Uranium	0.063	45
Molybdenum	0.004	71.5
Selenium	0.377	3.7

Table 5-6 Mineralogical Data and PHREEQC Input Used in the Surface Complexation Mixing Model

Constituent	Average Concentration	Model Input Concentration (moles/L)	Saturation Index (SI)
Quartz (α-SiO_2)	69%	10	0.72
K-Feldspar ($KAlSi_3O_8$)	7.6%	2.5	-0.10
Calcite ($CaCO_3$)	8.7%	8.05	0.18
Kaolinite [$Al_2Si_2O_5(OH)_4$]	1.7%	0.61	3.4
Ferrihydrite [$Fe(OH)_3(am)$]	0.05%	0.084	1.4
Exchange Phase (X)	4.9 $cmol_+/kg$	0.46	NA

The properties of the adsorbing surface in the SCMM were defined to be consistent with those of ferrihydrite. The SCMM uses 0.2 moles of weak sites ("hydrous ferric oxide," analogous to ferrihydrite, or Hfo_w) and 0.005 moles of strong sites (Hfo_s) per mole of iron, and a surface area of 5.33 x 10^4 m^2/mole iron (Dzombak and Morel, 1990). The total number of adsorption sites were allowed to vary with mixing by linking the amount of adsorbing surface to the mass of ferrihydrite, which was allowed to precipitate or dissolve as needed to maintain the ferrihydrite saturation index of +1.4 (Table 5-6). The amount of ferrihydrite was assumed to be 0.05% as iron based on selective extraction results (Table 5-2). However, because prior visual estimates of alluvial iron content (up to 3%) were higher than those detected using XRD (HMC, 2018), two additional ferrihydrite contents were evaluated by assuming that the average iron contents reported by HMC (2018) in Table 5-2 represent an amorphous iron phase consistent with ferrihydrite. The additional ferrihydrite contents included the average content for alluvial sands (0.529% or 5,290 ppm as iron) and the overall average for alluvium samples (1.0855% or 1,885 ppm as iron) reported by HMC (2018) (Table 5-2) The PHREEQC input files for uranium and molybdenum simulations in the SCMM are provided in Appendix G.

5.4.3 Geochemical Modeling Results

The SCMM which simulates the mixing of upgradient water with tailings-influenced water (ranging from 0.01 to 98%) in the presence of ferrihydrite was run using a range in ferrihydrite content, and by evaluating the effects of varying species adsorption (Table 5-4) on the calculated K_f value. Adsorption curves showing the adsorbed concentration (mg/kg) versus the equilibrium solution concentration (mg/L) were prepared and the data were also plotted as the linear form of the Freundlich isotherm (Equation 1):

$$\log x/m = 1/n \log C + \log K \qquad [2]$$

The linear form of the Freundlich isotherm (Equation 2) produces a slope of 1/n and an intercept of log K from which the empirical partition coefficient (K_f) can be derived.

The initial model simulation considered the adsorption of uranyl (UO_2^{2+}) using the default surface complexation reactions from PHREEQC (WATEQ4F database), but incorporating the revised constants from Mahoney et al. (2009) (Table 5-4). The model results (Figure 5-8) are consistent with a typical adsorption isotherm, where at a given ferrihydrite content, the maximum degree of adsorption occurs at low uranium concentrations, followed by increasingly less adsorption at higher concentrations (Langmuir, 1997). The amount of adsorbed uranium also increases with increasing iron (ferrihydrite) content for any given equilibrium solution concentration. However, the amount of uranium predicted to be adsorbed (Figure 5-8) in this simulation is orders of magnitude lower compared to the amount measured from tailings-influenced alluvium samples using selective extraction (Figure 5-3). Subsequent additional model simulations were therefore conducted

by considering additional potential adsorption reactions involving the uranium-carbonate and uranium-calcium complexes (Table 5-4).

The additional simulations which included adsorption of the uranium-carbonate species (Reactions 3 and 4, Table 5-4) produced K_f values and resulting R_f values which were too low to account for the observed plume behavior, unless the uranium-calcium and uranium-carbonate surface species were also included (Reactions 5 through 9, Table 5-4). When both uranium-carbonate and uranium-calcium complexes were considered, the extent of uranium adsorption was overpredicted for the higher average sands iron content (5,290 ppm) and the overall average iron content (10,885 ppm). Overprediction was indicated by unreasonably high calculated uranium solid phase concentrations (mg/kg), and calculated uranium equilibrium solution concentrations at the 98% tailings composition which were far below the observed concentration in tailings-impacted groundwater.

Subsequent sensitivity runs therefore focused on using the measured ferrihydrite contents from selective extractions (0.05% or 500 ppm as iron, Table 5-2), where the effects of competitive carbonate adsorption (Reactions No. 9 and 10, Table 5-4) were next evaluated. Uranium adsorption was slightly overpredicted as indicated by equilibrium concentrations which ranged from approximately 20 to 35 mg/L at the highest tailings water mixture (98% tailings-influenced water from Well SE6 which contained 45 mg/L uranium, Table 5.5). To account for the slight overprediction, the initial concentration of uranium in the tailings-influenced water was increased to 100 mg/L (Appendix G), consistent with the average value of 150 mg/L reported by USEPA (1975) for HMC tailings water (Table 5-1). Using a log PCO_2 of -1.2 within the range of values calculated for the groundwater (WME, 2018) produced modeled equilibrium uranium concentrations more consistent with observed concentrations in the tailings-impacted groundwater, the result of reaction of the historic tailings water with unimpacted alluvium. The results on Figure 5-9 show that predicted uranium adsorption was lowest when both adsorbing carbonate species (Reactions 9 and 10, Table 5-4) were included due to competitive adsorption. The highest uranium adsorption was predicted when only the CO_2H surface species was considered (Reaction 10, Table 5-4). This simulation produced a final equilibrium uranium concentration at 98% tailings-influenced water of 48.3 mg/L, which agrees well with observed concentration (45 mg/L) in the tailings-influenced alluvial water (Table 5-5).

The maximum adsorbed uranium concentration (5.26 mg/kg) is higher, but similar in magnitude to the highest value (2.24 mg/kg) from selective extraction of impacted alluvium (sample WME-16, Figure 5-3), assuming that both the exchangeable fraction and Fe/Mn oxide bound fraction represent adsorbed uranium (Section 5.2). The extent of predicted uranium adsorption is also consistent with similar studies of alluvium where uranium is likely associated with ferrihydrite under oxidizing conditions, for example: (1) up to 8 mg/kg total uranium at Rifle, CO (Johnson et al., 2018), (2) 0.12 to 2.87 mg/kg adsorbed uranium from selective ferrihydrite extraction at Naturita, CO (NRC, 2003b), (3) 0.46 to 4.4 mg/kg adsorbed uranium from bicarbonate extraction at Richland, WA (Stoliker et al., 2011).

The resulting Freundlich log K_f values for uranium in these model runs (Figure 5-10) ranged from -4.399 to -3.532, where the highest log K_f of -3.532 corresponds to the adsorption data curve for 500 ppm iron (Figure 5.9). This model considers all adsorbing species in Table 5-4 with the exception of Reaction 9 for the CO_2- species. The log K_f of -3.532 for uranium was found to be the best predictor of uranium plume migration based on groundwater transport calibration (Section 5.6). The SCMM molybdenum adsorption isotherm (Figure 5-11) and corresponding linear Freundlich isotherm plot (Figure 5-12) were developed under the identical set of model inputs and constraints. The maximum amount of molybdenum predicted to be adsorbed (3 mg/kg, Figure 5-11) is consistent with the amount extracted from the exchangeable and iron oxide fractions (2 mg/kg) from a tailings-influenced alluvium sample adjacent to the LTP (WME, 2018).

Successful transport calibration for Mo was also achieved using the log K_f of -3.66 (Section 5.6), providing further support for the SCMM approach.

5.5 Transport Model Parameterization

Using the current calibration of the groundwater flow model, additional constituent models were developed to simulate uranium and molybdenum fate and transport at the GRP and immediate vicinity as described below.

5.5.1 Transport Model Code Selection

The groundwater transport model simulations are conducted using MT3D-USGS (Bedekar et al. 2016). MT3D-USGS was selected as the transport simulation code because it is the most recent release of the MT3D code and includes an update allowing compatibility with the handling of model dry cells in the MODFLOW-NWT Newton-Raphson formulation. Transport simulations were performed using the finite-difference approach for advection. The transport modeling includes simulation of dispersion and geochemical attenuation processes through Freundlich non-linear adsorption isotherms as described previously in Section 5. The non-linear adsorption isotherm requires that model concentration units be based on volumetric units that match the length units of the model grid, so concentrations are converted from mg/L to mg/ft^3 in the model inputs for initial concentrations, recharge concentrations, and injection concentrations. Upon completion of model simulations, output concentrations are then converted back to mg/L from mg/ft^3 using a Python script.

5.5.2 Transport Model Input Parameters

The solution obtained from the preliminary groundwater flow model was used to simulate transport of uranium and molybdenum at the GRP site.

In order to calibrate the transport model to observed conditions, initial concentration source zones were interpolated to the model grid using 2013 interpreted plume map contours, 2013 analytical data from well sampling, and 2014 interpreted plume map contours (HE, 2014 and HE, 2015). This was performed for both uranium and molybdenum in the alluvial aquifer, Upper Chinle aquifer, Middle Chinle aquifer, and Lower Chinle aquifer (uranium only). All shale units and the SAG were assigned concentrations equal to background. Initial uranium plume area concentrations in the alluvial aquifer were only slightly modified from their interpolated vales during calibration. Initial condition molybdenum concentrations were not adjusted from their initial interpolated values.

To initialize the transport model, values of 0.02 mg/L and 0.003 mg/L were assigned for uranium and molybdenum, respectively, in areas unimpacted by the GRP Site. This includes portions of the model including the SAG aquifer (Layer 10), all Chinle Shale representations, and alluvial areas that are unaffected by the GRP Site. Re-injection concentrations associated with GRP site remedial activities were set equal to 0.01 mg/L for uranium and 0.003 mg/L for molybdenum.

Freundlich sorption parameters developed from the geochemical modeling were directly applied for transport modeling for both uranium and molybdenum. The only adjustment from geochemical model output was to convert units to those consistent with MT3D-USGS requirements, which lead to the retardation factor versus concentration relationships provided in Figures 5-13 and 5-14 (presented here in mg/L rather than mg/ft^3).

Other transport parameterization included values for bulk density and porosity. The velocity of the constituents of interest in groundwater are directly related to the effective porosity of the porous medium. A single effective porosity of 0.20 was assigned to the Alluvial aquifer. All other effective porosity values assigned to bedrock units are equal to their respective specific yield values. The bulk density used in the transport model is 2.12 grams/cubic centimeter (g/cm^3), calculated from an effective porosity value of 0.20 and a particle density of 2.65 g/cm^3 because the alluvium is dominated by quartz (Klein and Hurlbut, 1993; WME, 2018).

Dispersivity quantifies the degree to which mechanical dispersion of constituent occurs in advection of groundwater. Dispersity values were assigned to the current model construct from a previous model developed by Hydro-Engineering for the GRP site (HMC, 2012). Sensitivity to dispersity was evaluated during early model calibration and results showed that the model is generally insensitive to dispersivity. As such, lower dispersivity values of 20 feet, 0.1 feet, and 0.1 feet (longitudinal, traverse horizontal, transverse vertical) were retained in this model. The use of the finite difference solution for transport simulations can introduce a degree of artificial numerical dispersion, spreading constituents along groundwater flow paths at a rate similar to that expected to occur due to mechanical dispersion. A widely accepted and broadly used approach to minimizing numerical dispersion is to employ model grid spacing that has a dimensionless Peclet number (grid cell spacing divided by dispersivity) under 4 (Voss, 1984). For the refined portion of the model grid the Peclet number is 3.125 (62.5 feet divided by 20 feet).

5.6 Transport Model Results

Transport model calibration results for uranium and molybdenum were evaluated based upon visual comparison of simulated contours and well chemographs to observed data. Results for uranium transport, followed by molybdenum, are described below. Transport calibration target locations for both uranium and molybdenum are provided in Figures 5-15 through 5-19.

5.6.1 Uranium Transport Calibration Results

Simulated uranium concentrations by the transport model generally reflect both observed plume footprints and plume concentration changes through time as compared to uranium concentration contours and well chemographs derived from analytical data.

Figures 5-20 through 5-27 provide comparisons of observed versus simulated uranium contours for the different aquifer units in years 2015 and 2017. For year 2015, the transport model simulates uranium contours greater than 0.1 mg/L extending westward from the GRP that are consistent with observed values (Figure 5-20). Simulated uranium contours within the LTP and STP footprint and southeast of the STP are also reflective of contours derived from analytical data and included in annual reporting (HE, 2016). On the east side of the bedrock high, the transport model simulates the plume extending south and southwestward through a narrow zone of alluvium saturation, but simulated concentrations of uranium are slightly lower than observed values (Figure 5-20). The model simulates a lobe of elevated uranium concentrations northwest of the LTP, which is a result of deriving the initial condition from analytical data that captures naturally occurring elevated uranium concentrations in the area of the DD and DD2 wells (HMC, 2018c)

Simulated 2015 uranium contours for the Upper Chinle (Figure 5-21), Middle Chinle (Figure 5-22), and Lower Chinle (Figure 5-23) aquifers are consistent with observed contours included in GRP annual reports (HE, 2016).

In year 2017, transport model results approximate uranium concentrations for locations extending west from the LTP, within the general footprints of the LTP and STP, and southeast of the STP (Figure 5-24). In areas adjacent to the bedrock high, the model simulates reduction of uranium concentration that occurs more quickly than has been recently observed. Figure 5-25 provides Upper Chinle aquifer simulated uranium contours for 2017 that are consistent with those derived based on analytical data. Figure 5-26 shows that the model replicates Middle Chinle concentrations consistent with data collected from areas west of the LTP and south of the NRC License boundary. Approximately 0.5 mi northwest of the LTP, the model continues to simulate an area of slightly elevated uranium concentrations that, while present in 2015, is no longer observed in 2017 (Figure 5-26). For the Lower Chinle aquifer, the model simulates uranium concentrations that are generally consistent with analytical data values for this hydrostratigraphic unit (Figure 5-27).

Figures 5-28 through 5-35 provide select timeseries chemographs for well target locations, which are shown on the previous uranium concentration contour maps (chemographs for all target locations are provided in

Appendix C and all transport target data is provided as a table in Appendix D). For alluvial well 0881-AI located in plume area west of the LTP, the model simulates concentrations and trends consistent with analytical data collected from this well (Figure 5-28). At wells M9-AI and D1-AI, transport results do not replicate the variability in observed data but the model captures the gradual decreasing trend in uranium in these areas of the GRP (Figures 5-29 and 5-30). As noted previously, targets within the southern offsite plume (0497-AI and 0864-AI) slightly underestimate observed uranium values but simulated results capture the trend in concentrations over the 5-year simulation period (Figure 5-31 and 5-32).

Select chemographs for target locations in the Upper, Middle, and Lower Chinle aquifers are provided in Figures 5-33 through 5-35, respectively. In the Upper Chinle aquifer, the transport model simulates both uranium concentrations and trends that are consistent with observed data (Figure 5-33). At target location CW44-MC in the Middle Chinle aquifer, the model only slightly overestimates concentrations relative to well analytical data and the simulation captures the gradual decreasing trend in uranium with time (Figure 5-34). In the Lower Chinle aquifer, the model simulates a slight decreasing trend in concentrations at Well CW29-LC, which is consistent with analytical data from this location (Figure 5-35).

All concentrations simulated for the SAG aquifer are equal to model initialization values for the entire simulation period.

Overall, the preliminary transport model simulates distribution and changes in uranium concentrations at the GRP for all four aquifer units (alluvium, Upper Chinle, Middle Chinle, and Lower Chinle) that are consistent with observed conditions.

5.6.2 Molybdenum Transport Calibration Results

Simulated molybdenum transport results are generally reflective of both observed plume footprints and plume concentration changes through time as illustrated by molybdenum concentration contours and well chemographs derived from analytical data and included in GRP annual reporting.

Figures 5-36 and 5-37 provide comparisons of observed versus simulated molybdenum contours for the alluvial and Upper Chinle aquifer in year 2015 whereas Figure 5-33 provides simulated contours for the Middle Chinle aquifer). All other aquifer units are unaffected by molybdenum concentrations that exceed GRP cleanup standards. For year 2015, the transport model simulates molybdenum concentrations of greater than 0.1 mg/L extending slightly westward from the GRP, which is consistent with observed values (Figure 5-36). Simulated alluvium molybdenum contours within the LTP and STP footprint and southeast of the STP are also reflective of contours derived from analytical data that were previously included in annual reporting (HE 2016). Simulated 2015 molybdenum contours for the Upper Chinle (Figure 5-37) are also consistent with observed contours developed for GRP annual reports (HE 2016). Figure 5-38 provides simulated molybdenum contours for the Middle Chinle where model derived concentrations are consistent with analytical data collected from GRP observation wells (see below for Middle Chinle chemographs).

In year 2017, transport model results approximate observed alluvium aquifer molybdenum contours for locations extending west from the LTP, within the general footprints of the LTP and STP, and southeast of the STP (Figure 5-39). Similarly, the transport model generates concentrations resulting in Upper Chinle aquifer molybdenum contours that are consistent with observed data (Figure 5-40). In the Middle Chinle aquifer, simulated 2017 concentrations west of the LTP are similar to those calculated by the model in 2015 (Figure 3-41).

Figures 5-42 through 5-49 provide select timeseries chemographs for well target locations, which are shown on the previous the molybdenum concentration contour maps (chemographs for all target locations are provided in Appendix C and molybdenum target data as Appendix E). For alluvial aquifer wells M9-AI and D1-AI, the model underestimates molybdenum concentrations but simulates a decreasing trend consistent with analytical data collected from these wells. For S4-AI (west of the LTP) the model only slightly overestimates observed concentrations and simulates a gradual decline in concentrations that is similar to the analytical

data timeseries. At C8-AI (northwest edge of the small tailings pile [STP]), simulated results capture concentrations and trends that are consistent with analytical data at this location within the Alluvial aquifer. At wells CE6-UC and CE15-UC, which are both screened in the Upper Chinle aquifer, simulated molybdenum concentrations through time are consistent with observed data. For the Middle Chinle aquifer well CW56-MC, the model simulates concentrations consistent with observed data in early time but the model maintains higher concentrations through 2017 while analytical data show a decreasing trend. At well CW62-MC, also a Middle Chinle well, the model simulates concentrations that are consistent with analytical data although the decline in observed concentrations is slightly more rapid than simulated by the model.

All molybdenum concentrations simulated for the Lower Chinle and SAG aquifers are equal to background values for the entire simulation period.

Overall, the preliminary transport model simulates distribution and changes in molybdenum concentrations at the GRP for all three aquifer units (alluvium, Upper Chinle, and Middle Chinle) that are consistent with observed conditions.

Section 6: Sensitivity Analysis

Additional simulations were performed to assess potential changes in calibration metrics for both groundwater flow model inputs and transport model inputs. Each type of parameter value was adjusted globally rather than by individual hydrostratigraphic unit or parameter zone.

6.1 Groundwater Flow Model Sensitivity

Hydraulic conductivity value sensitivity analyses were performed by executing six groundwater flow model simulations in which the calibrated model values were increased and decreased by 5%, 10%, and 15%. While the magnitudes for these changes may be relatively small for individual hydrostratigraphic units, the impacts of these changes are significant when applied globally across the entire model domain. Table 6-1 presents a summary of groundwater flow model bulk calibration statistics for the six hydraulic conductivity sensitivity simulations versus the calibrated model. The calibration residual mean decreases with decreasing hydraulic conductivity values and increases with increasing hydraulic conductivity values as would be expected. (Residual values are calculated as observed water level minus simulated water level such that negative residuals represent higher simulated water levels.) The calibrated model has the lowest sum of square residuals and RMSE, indicating that the calibrated model provides the best overall fit to the observed groundwater heads. This result indicates that the overall hydraulic conductivity values are reasonable; however, additional adjustments to hydraulic conductivity values for individual hydrostratigraphic units or spatial zones within hydrostratigraphic units may lead to improved model calibration.

Table 6-1 – Hydraulic Conductivity Sensitivity Bulk Simulated Groundwater Elevation Calibration Statistics

Statistic	Decrease 15%	Decrease 10%	Decrease 5%	Calibrated Model	Increase 5%	Increase 10%	Increase 15%
Residual Mean (feet)	-3.79	-2.67	-1.47	-0.47	0.46	1.33	2.12
Absolute Residual Mean (feet)	10.33	9.68	9.12	8.76	8.53	8.39	8.28
Sum of Square Residuals (feet^2)	86,261	80,993	77,457	76,140	76,342	77,846	80,536
Root Mean Squared RMS Error (feet)	13.75	13.33	13.03	12.92	12.94	13.07	13.29
Minimum Residual (feet)	-43.33	-43.49	-43.58	-43.67	-43.73	-43.77	-43.80
Maximum Residual (feet)	54.68	57.09	59.41	61.54	63.63	65.83	69.10
Number of Observations	456	456	456	456	456	456	456

Table 6-1 – Hydraulic Conductivity Sensitivity Bulk Simulated Groundwater Elevation Calibration Statistics							
Statistic	Decrease 15%	Decrease 10%	Decrease 5%	Calibrated Model	Increase 5%	Increase 10%	Increase 15%
Range in Observations (feet)	207.62	207.62	207.62	207.62	207.62	207.62	207.62
Scaled RMS error (%)	6.62	6.42	6.28	6.22	6.23	6.29	6.40
Scaled Absolute Mean (%)	4.98	4.66	4.39	4.22	4.11	4.04	3.99
Scaled Residual Standard Deviation (%)	6.37	6.29	6.24	6.23	6.23	6.26	6.32

Storage parameter value sensitivity analyses were performed by executing six groundwater flow model simulations in which the calibrated model input values were increased and decreased by 5%, 10%, and 15%. These changes were applied to both specific yield and specific storage throughout the model domain. Again, although the magnitudes for these storage parameter changes may be relatively small for individual hydrostratigraphic units, the impacts of these changes are significant when applied globally across the entire model domain. Table 6-2 presents a summary of groundwater flow model bulk calibration statistics for the six storage parameter sensitivity simulations versus the calibrated model. The calibration residual mean increases with decreasing storage values, indicating that lower storage parameters lead to simulation of overall lower groundwater levels. The lower storage parameters result in simulations with very slightly lower sum of square residuals and RMSE statistics. These improvements in statistics from global storage changes are negligible, and adjustments to storage parameter values for individual hydrostratigraphic units or spatial zones within hydrostratigraphic units may provide a better approach to improvements in model calibration.

Table 6-2 – Storage Parameter Sensitivity Bulk Simulated Groundwater Elevation Calibration Statistics							
Statistic	Decrease 15%	Decrease 10%	Decrease 5%	Calibrated Model	Increase 5%	Increase 10%	Increase 15%
Residual Mean (feet)	-0.34	-0.39	-0.43	-0.47	-0.51	-0.54	-0.57
Absolute Residual Mean (feet)	8.74	8.74	8.75	8.76	8.77	8.77	8.78
Sum of Square Residuals (feet^2)	75,903	75,977	76,057	76,140	76,231	76,322	76,414
Root Mean Squared RMS Error (feet)	12.90	12.91	12.91	12.92	12.93	12.94	12.95
Minimum Residual (feet)	-43.67	-43.67	-43.67	-43.67	-43.67	-43.67	-43.67
Maximum Residual (feet)	61.54	61.54	61.54	61.54	61.54	61.54	61.54
Number of Observations	456	456	456	456	456	456	456
Range in Observations (feet)	207.62	207.62	207.62	207.62	207.62	207.62	207.62
Scaled RMS error (%)	0.06	0.06	0.06	6.22	0.06	0.06	0.06
Scaled Absolute Mean (%)	0.04	0.04	0.04	4.22	0.04	0.04	0.04
Scaled Residual Standard Deviation (%)	0.06	0.06	0.06	6.23	0.06	0.06	0.06

6.2 Transport Model Sensitivity

Effective porosity value sensitivity analyses were performed by executing six uranium transport model simulations in which the calibrated model input values were increased and decreased by 5%, 10%, and 15%. These changes were applied to effective porosity throughout the model domain. Figure 6-1 presents a map of simulated uranium concentration contours in the alluvium at the site-specific standard of 0.16 mg/L at the end of 2017 showing the results of the changes to effective porosity. These adjustments had very little effect on overall simulated transport in the alluvium as evidenced by the 0.16 mg/L uranium concentration

contours nearly overlying each other. This result indicates that the transport model is generally not sensitive to input values of effective porosity over the range of values tested.

Transport model sensitivity to Freundlich sorption parameters was assessed by performing two uranium transport model simulations with Freundlich sorption parameters obtained from geochemical model sensitivity simulations. This approach was undertaken to provide a conceptual geochemical basis for the sensitivity of these parameters rather than adjusting these parameters by predetermined percentages. The first set of Freundlich sorption sensitivity parameters were derived from a geochemical model that considers adsorption of the uranyl ion (UO_2^{2+}) only (log Kf = -7.13, 1/n = 0.936). The second set of input Freundlich sorption sensitivity parameters were derived from the geochemical model used for the calibrated transport model except additionally includes CO_2^- as a competing carbonate surface species with all other processes and input parameters the same (log Kf = -4.40, 1/n = 0.917). Figure 6-2 presents a comparison of retardation factors (dimensionless) for the calibrated model Freundlich parameters and the sensitivity Freundlich parameters calculated over the general range of observed aqueous uranium concentrations at the GRP site (Sharma and Reddy 2004). The retardation factor for the calibrated transport model is approximately 5.3 at low aqueous uranium concentrations and decreases to approximately 2.3 at higher aqueous uranium concentrations. The retardation factor for the first Freundlich parameter sensitivity model is approximately 1.0 (i.e., no retardation) throughout the range of aqueous uranium concentrations. The retardation factor for the calibrated transport model is approximately 1.5 at low aqueous uranium concentrations and decreases to approximately 1.3 at higher aqueous uranium concentrations.

Figure 6-3 presents a map of simulated uranium concentration contours in the alluvium at the site-specific standard of 0.16 mg/L at the end of 2017 showing the results of the changes to Freundlich sorption parameters. The first Freundlich sensitivity parameter set (virtually no retardation) was simulated to have a lesser extent of uranium above 0.16 mg/L in the North Offsite and South Offsite areas because the remedial system collection and injection is more effective in extracting and diluting uranium mass when uranium is simulated to be less retarded. The second Freundlich sensitivity parameter set (retardation factors ranging from approximately 1.3 to 1.5) was simulated to transport uranium further downgradient in the North Offsite area. This occurs because the lower retardation factor provides greater mobility of uranium that results in transport further downgradient in the North Offsite area than the calibrated model, which is not extracted and diluted as effectively as in the first Freundlich parameter sensitivity simulation. The second Freundlich sensitivity parameter set allowed greater efficacy of the South Offsite remedial system to reduce concentrations than the calibrated model but less than the first Freundlich sorption sensitivity parameters. These results indicate that the transport model results are sensitive to the Freundlich sorption parameter values.

Section 7: Summary & Future Work

HMC has developed a preliminary transient groundwater flow and transport model that is anticipated to be further refined and used to evaluate the effectiveness of ongoing and future GRP remediation efforts including fate and transport of site CoCs. In addition to the GRP Site, the model domain currently encompasses the entire SMC Basin and future work is also expected to focus on regional scale calibration, which would allow additional evaluation of basin-wide remediation efforts.

The groundwater flow model is currently calibrated to available and observed GRP groundwater conditions between years 2013 and 2017. Geochemical modeling was performed using site-specific data to develop transport parameters describing uranium and molybdenum attenuation for simulation of CoC transport across multiple aquifer units beneath the GRP Site. Transport model calibration was then achieved for the same period as the groundwater flow model. Calibration of the flow and transport model is within generally accepted criteria and the model is therefore considered a viable tool to assess future remediation efforts at the GRP Site.

Future improvements to the model may include, but may not be limited to:

- Subdivision of bedrock units above the Chinle Group into representative hydrogeologic units.
- Movement of the model representation of the San Mateo Fault north of the GRP to the east as depicted in Weston (2017).
- Increase in the overall calibration period to include previous years if pumping and injection can be reliably estimated.
- Improvement of the groundwater flow calibration in the Alluvial aquifer north of the LTP and in the South Offsite Area.
- Advancing our understanding of potential attenuation mechanisms for the underlying Chinle Formation through supplemental geochemical characterization.
- Improvement of the groundwater flow calibration east of the LTP footprint in the Upper Chinle aquifer
- Inclusion of the historical pumping records for the SAG Aquifer if they are obtainable from the New Mexico State Engineer's Office or other data sources.
- Incorporation of any revisions associated with seepage or mass loading from the Reformulated Mixing Model for the LTP.
- Recalibration of the transport model if appropriate if updates to the flow model are achieved.

Future groundwater modeling efforts will include the following tasks:

- Predictive flow and transport simulations to evaluate GRP remedial timeframes for both the existing collection/injection system and alternatives associated with the 2019 Corrective Action Plan (CAP).
- Regional flow and transport calibration including simulation of southward plume migration from the Upper SMC Basin to the Lower SMC Basin for the current model calibration period (i.e., 2013 – 2017).

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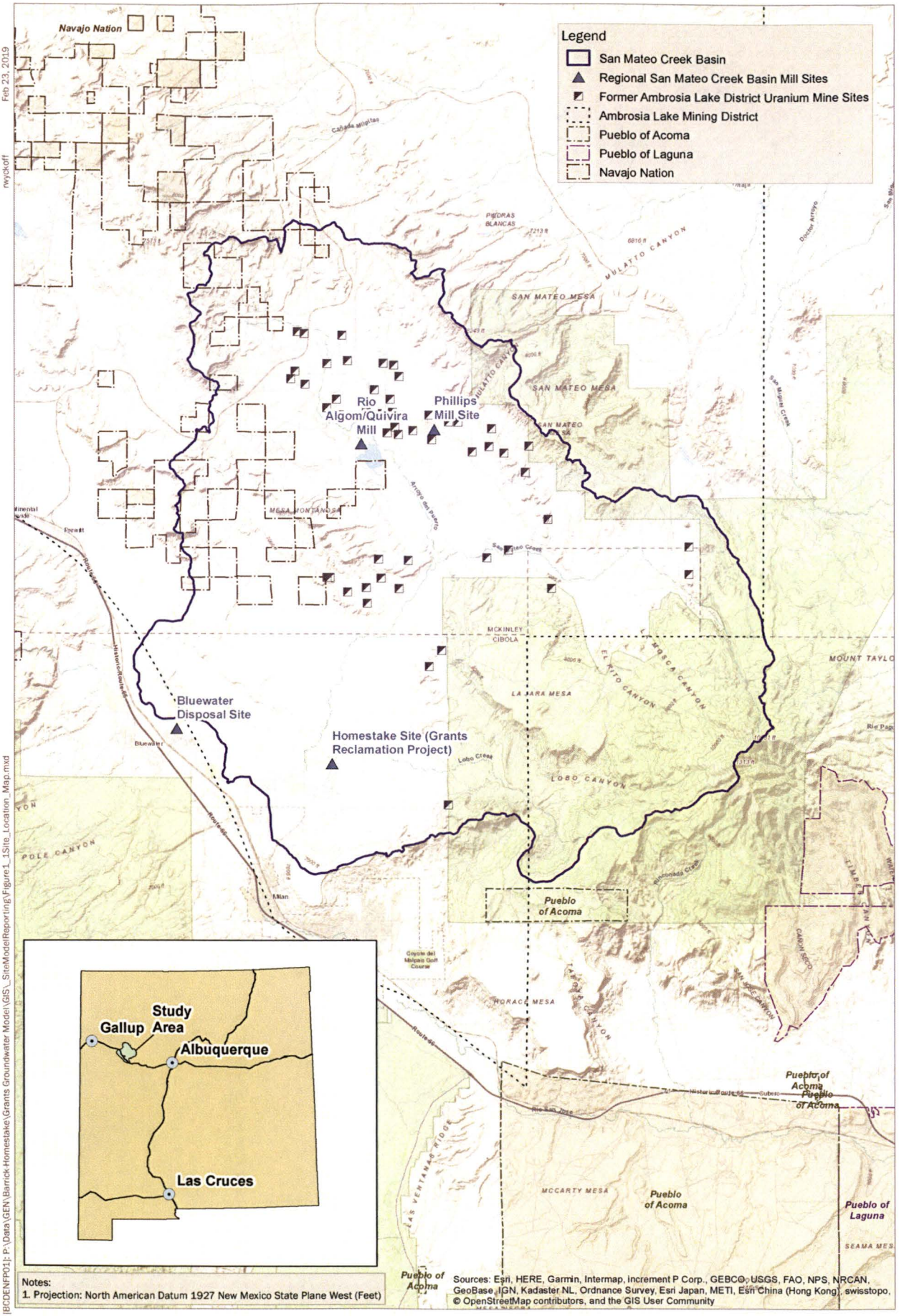
Figures



Notes:
1. Projection: North American Datum 1927 New Mexico State Plane West (Feet)

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

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Groundwater Fate and Transport Modeling
Date: March 2019
Project: 152816

0 2.75 5.5 Miles

N

Figure 1-1

Site Location Map

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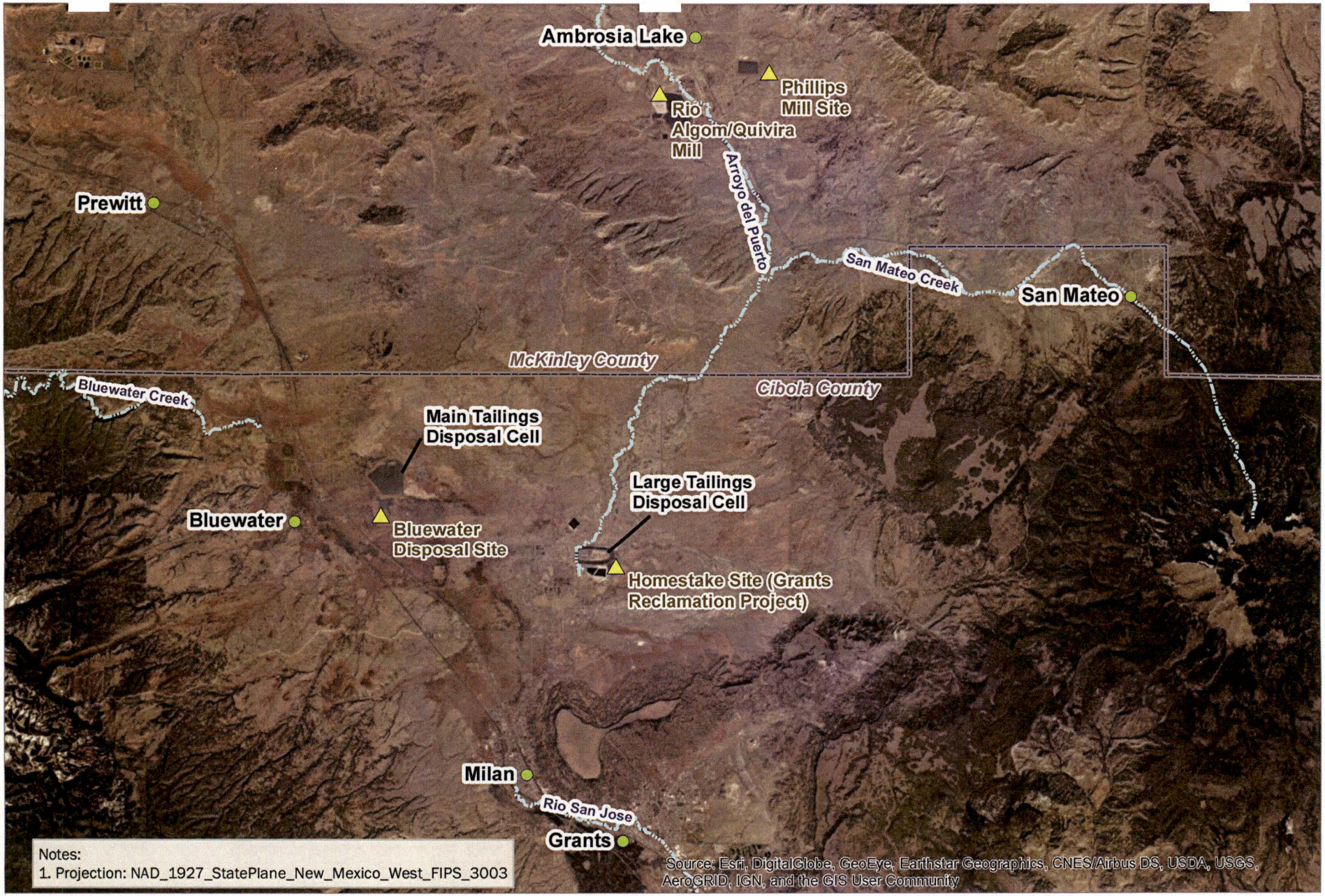

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Project: 152816

0 1.25 2.5 Miles

N

Figure 1-2

Location of Historical Uranium Mill Site Operations

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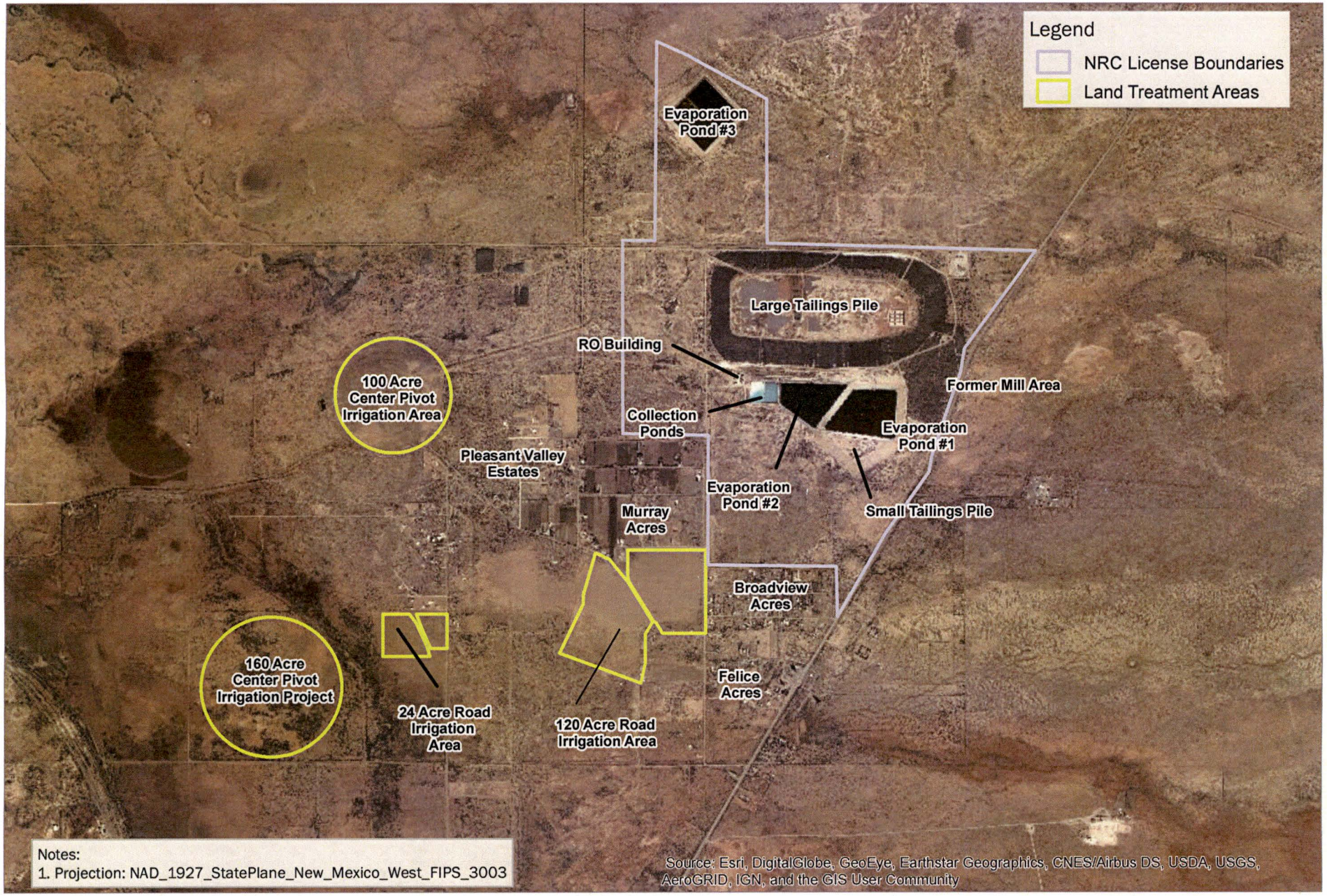
Feb 14, 2019
smiller



Notes:
1. Projection: NAD_1927_StatePlane_New_Mexico_West_FIPS_3003

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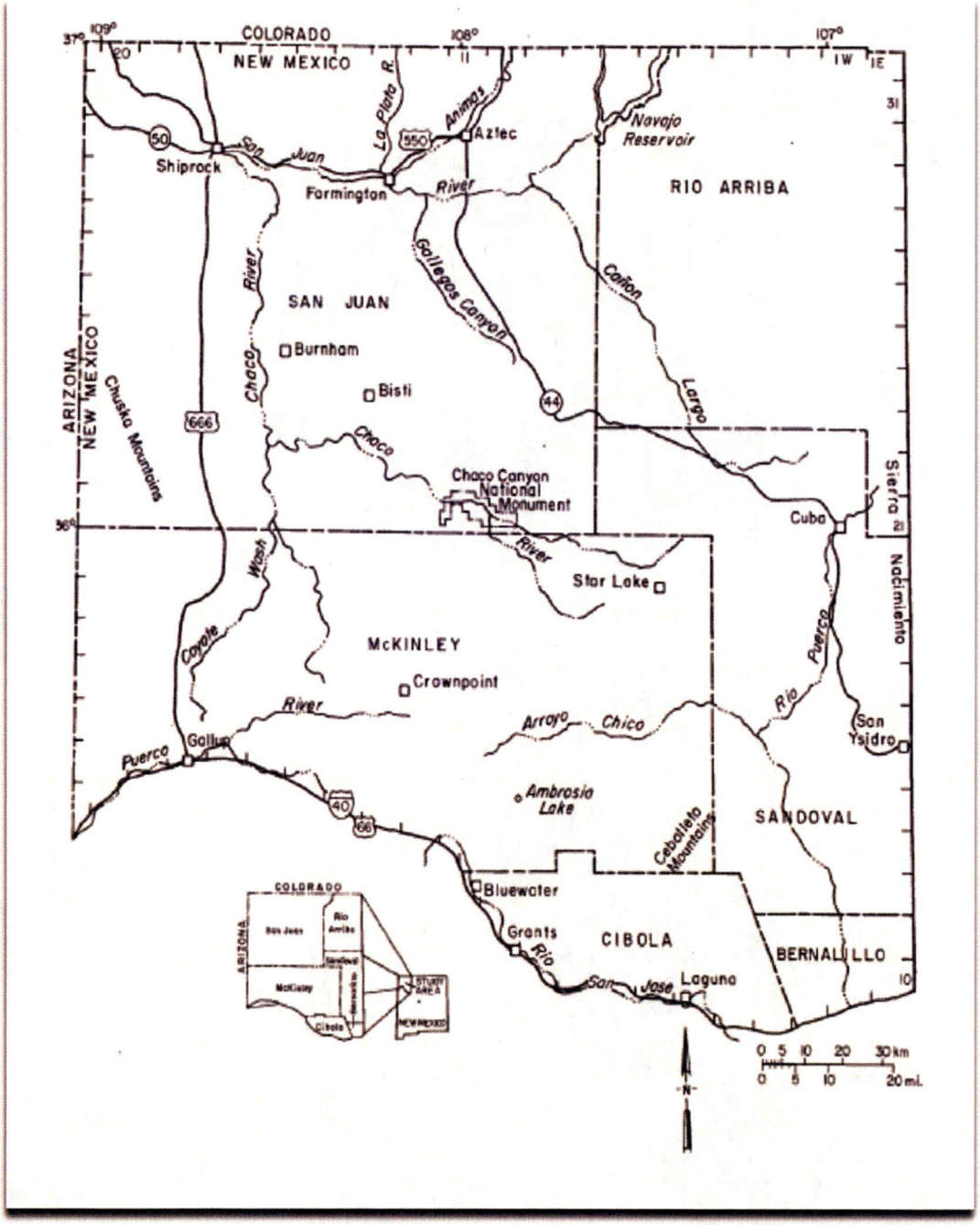
Grants Reclamation Project
Groundwater Fate and Transport Modeling
Date: March 2019
Project: 152816

0 0.25 0.5 Miles

N

Figure 1-3

HMC Mill Site Features



Source: Stone et al., 1983

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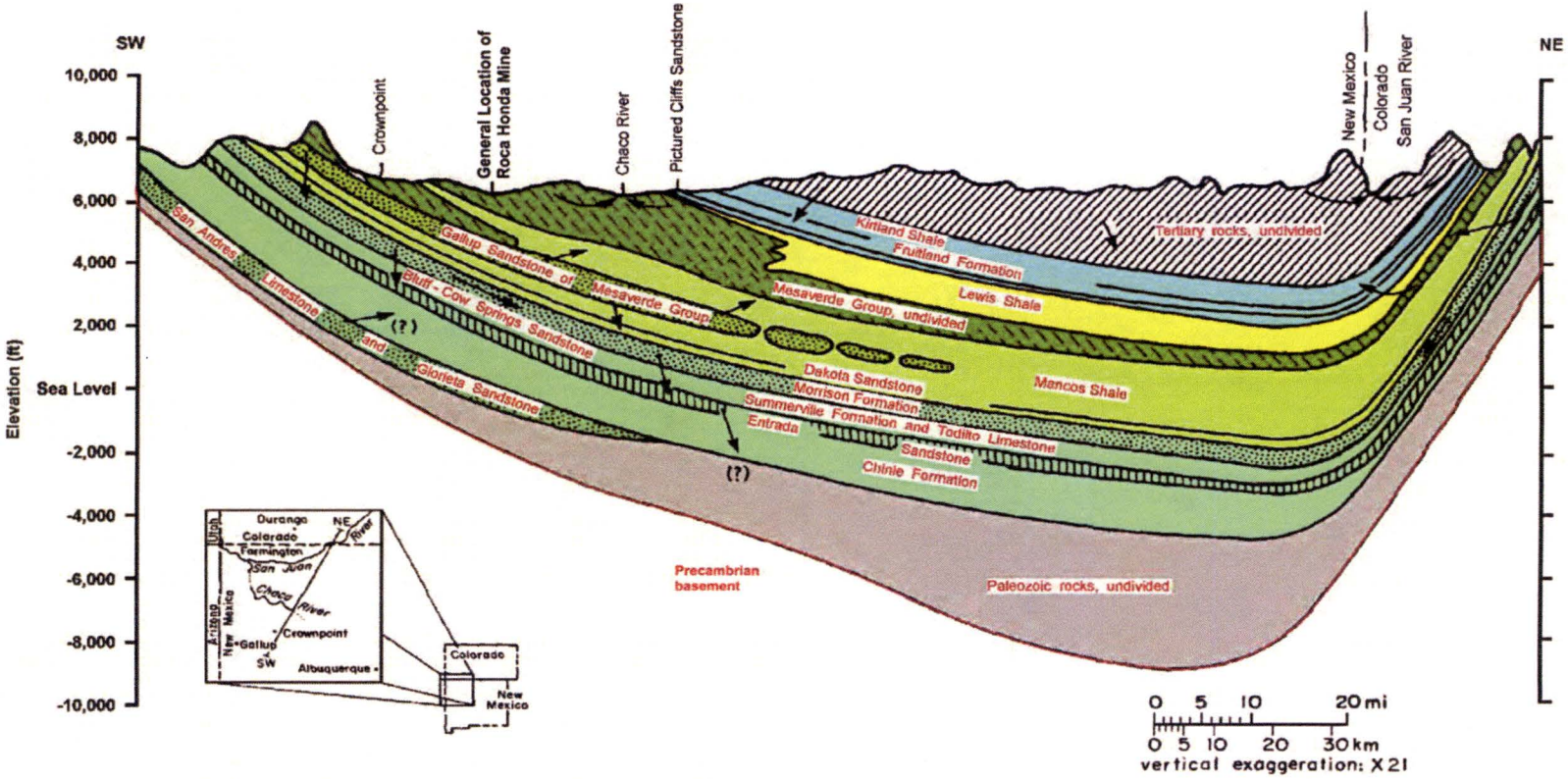
Figure 2-1

Geography of Northwest New Mexico Including the San Juan Basin



Source: INTERA, 2012

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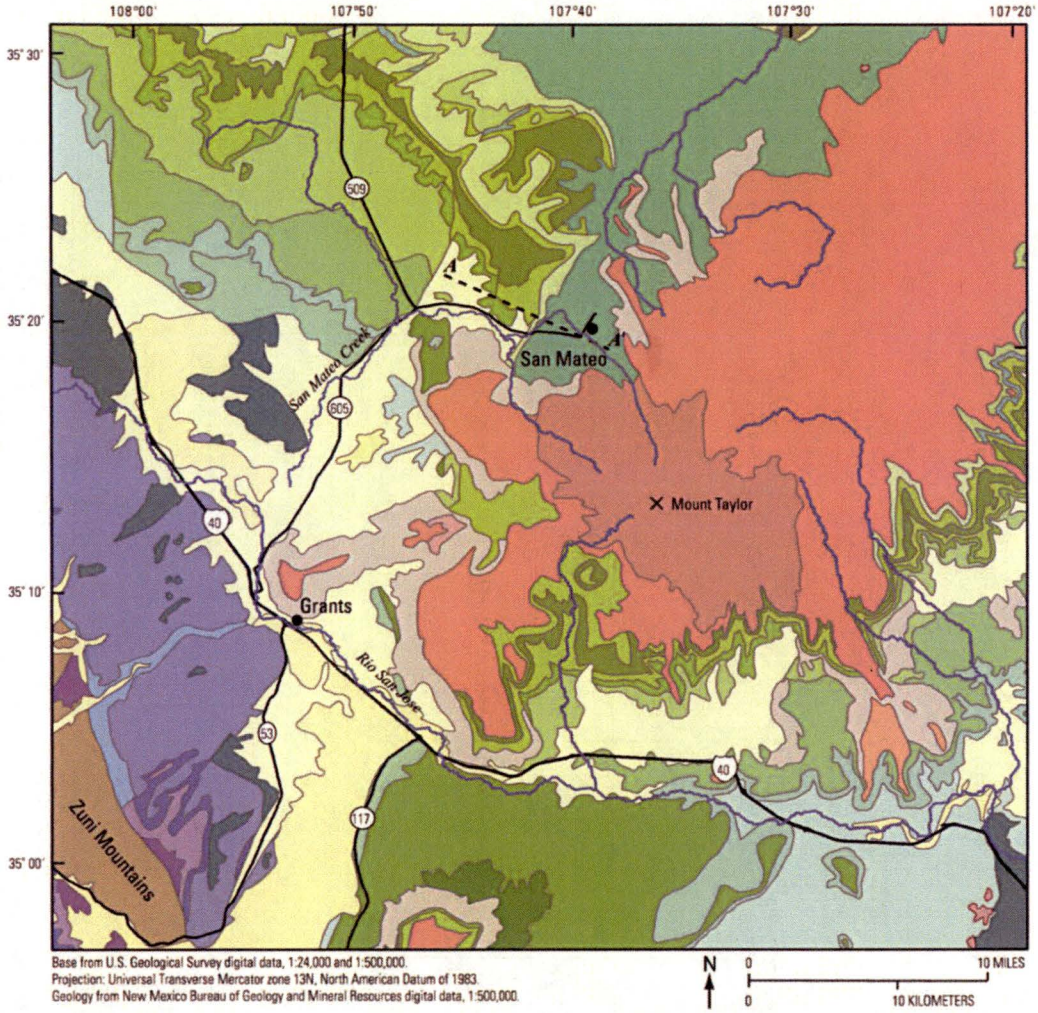
Figure 2-2

Regional Geologic Cross Section Through the San Juan Basin



Source: Langman et al., 2012

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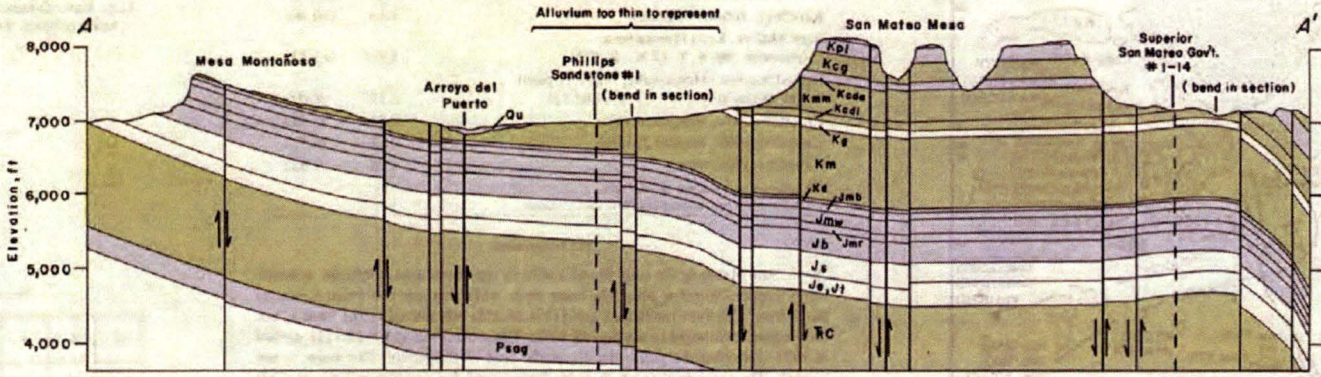
Figure 2-3

Surface Geology of the San Mateo Creek Basin



CROSS SECTION—Unit thicknesses from measured section by Brod (1979, Appendix C, section 1) and logs from wells shown.

Source: Brod and Stone, 1981

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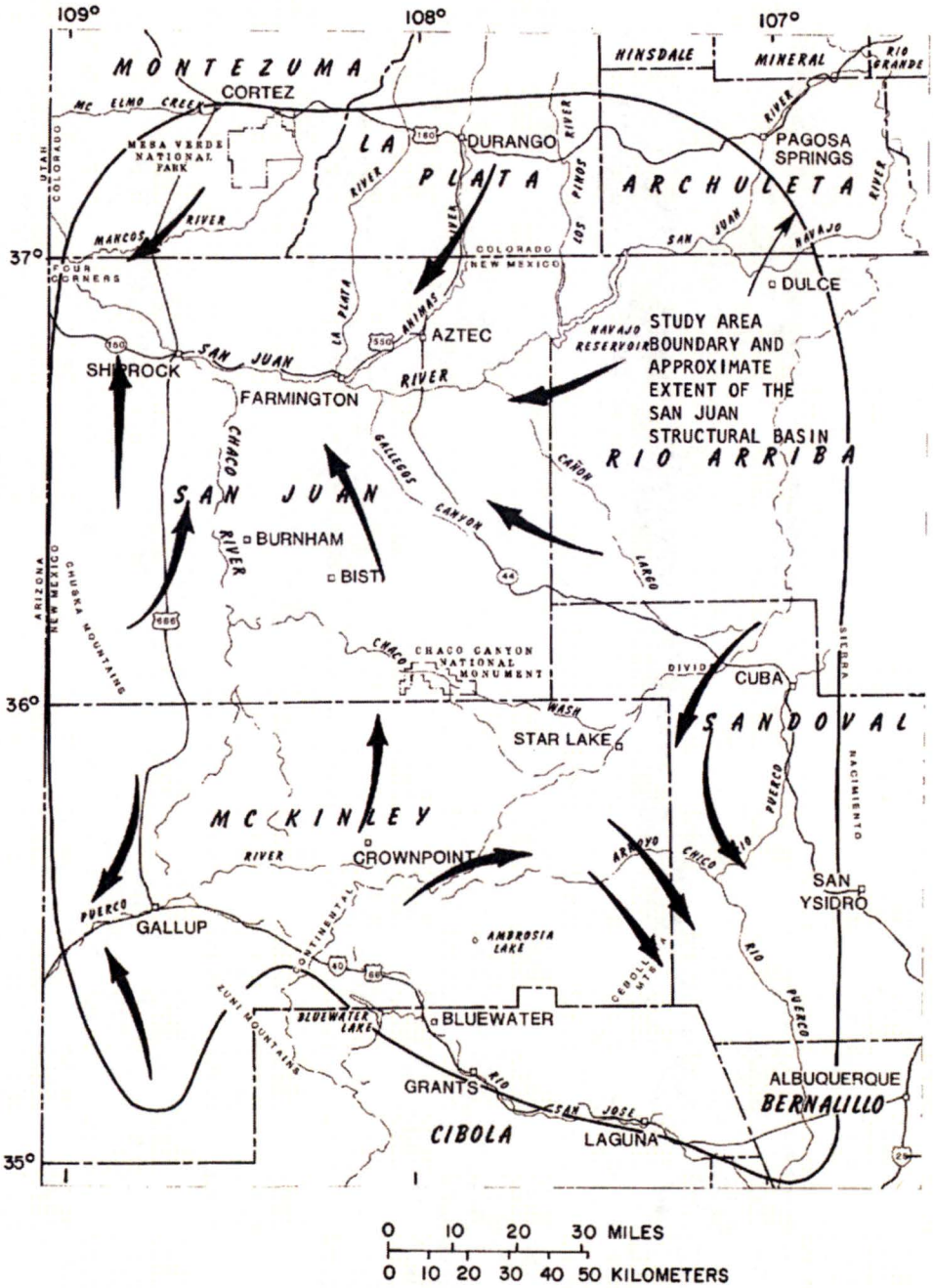
Figure 2-4

Hydrogeologic Cross Section Through the San Mateo Basin



Source: Frenzel and Lyford, 1982

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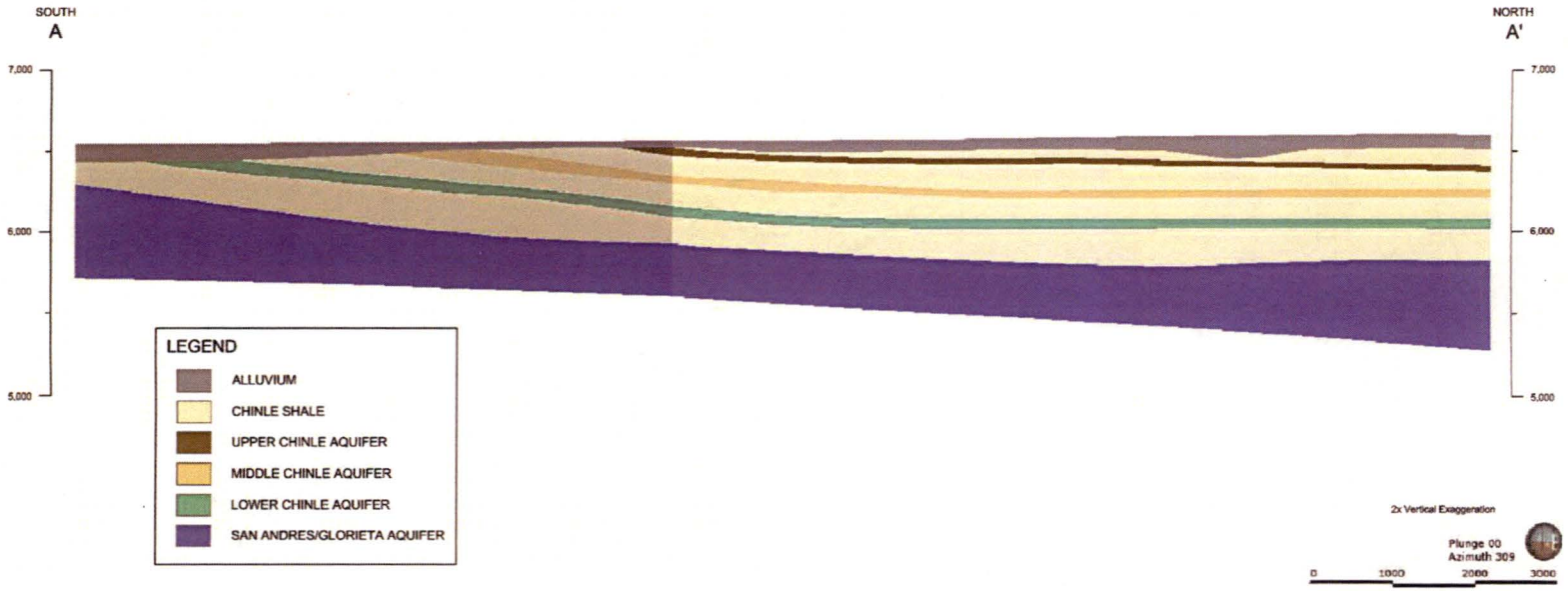
Figure 2-5

Conceptual Groundwater Flow Directions in Cretaceous and Jurassic Aquifers



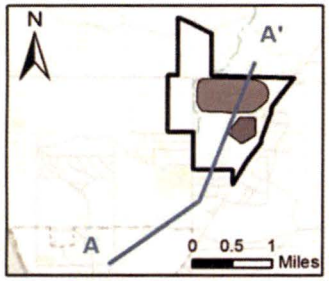


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Figure 2-6

Hydrogeologic Cross Section A-A' Through the GRP Site

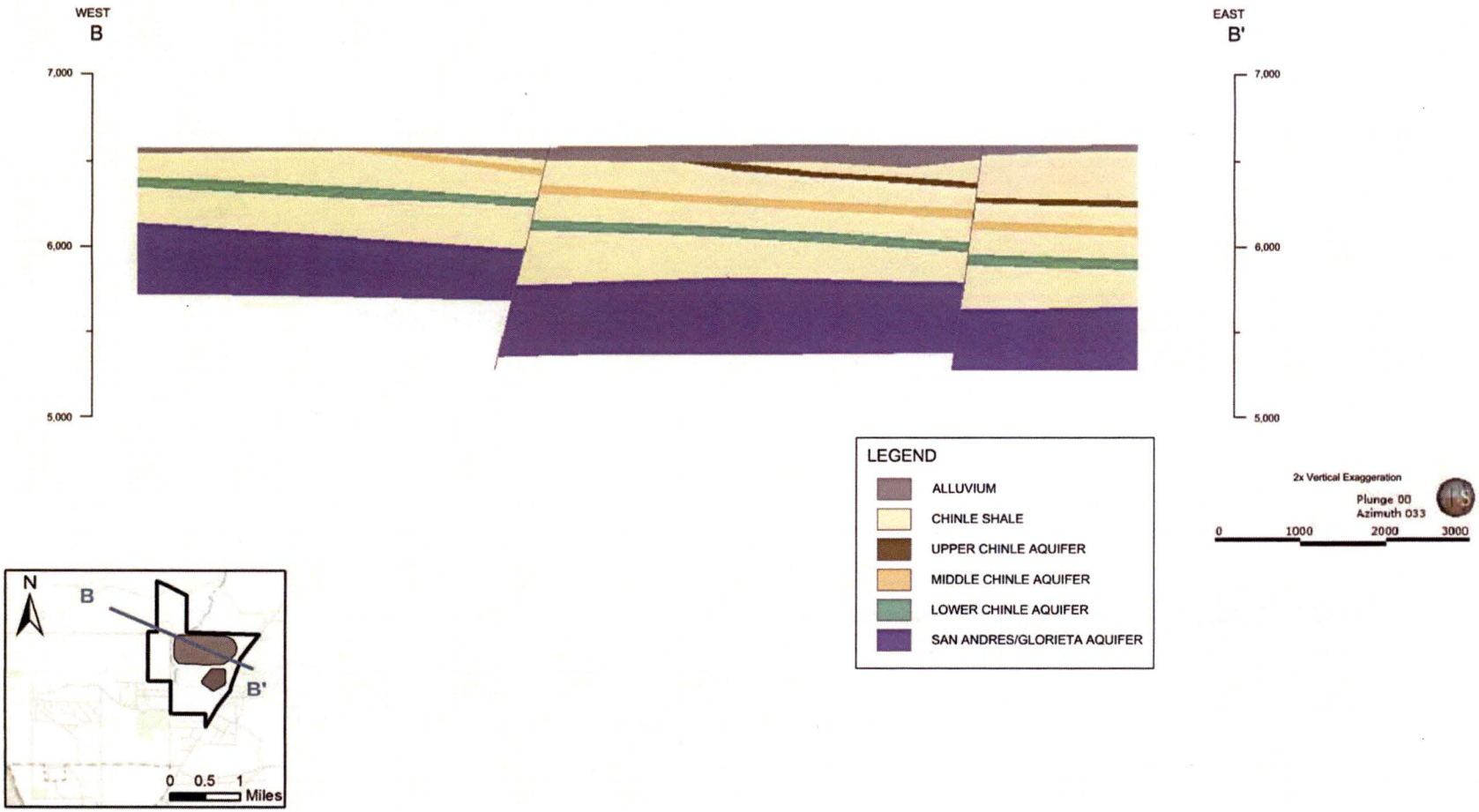

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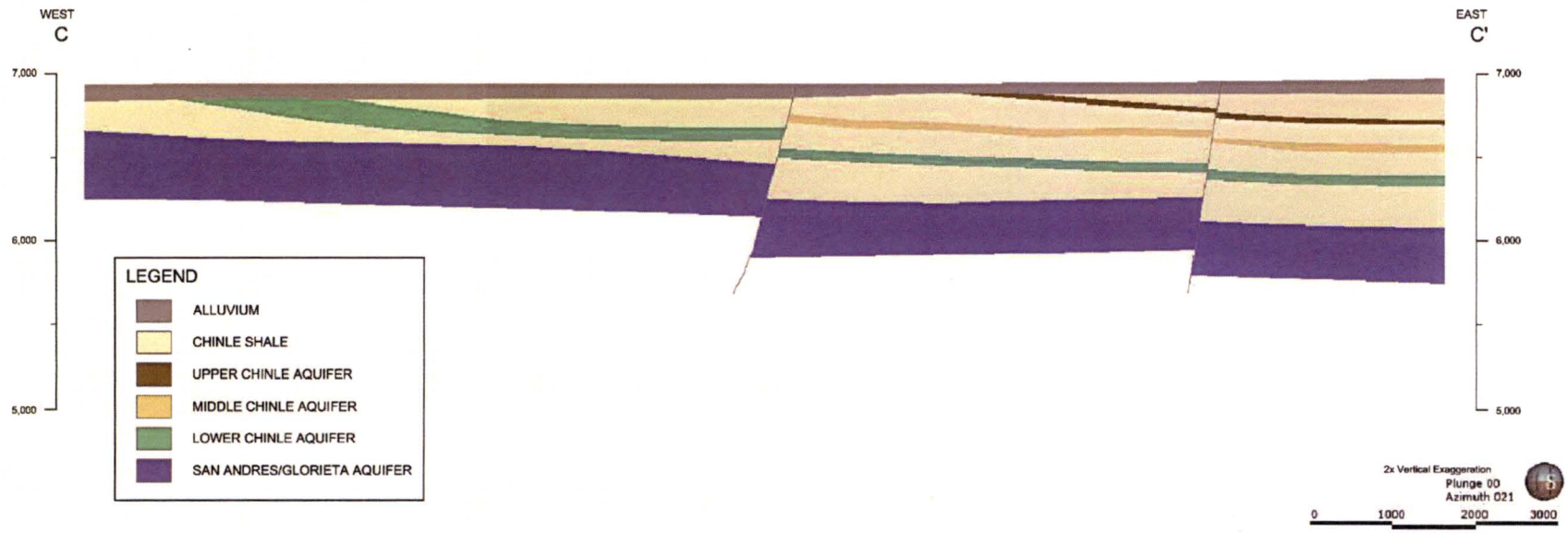
Figure 2-7

Hydrogeologic Cross Section B-B' Through the GRP Site



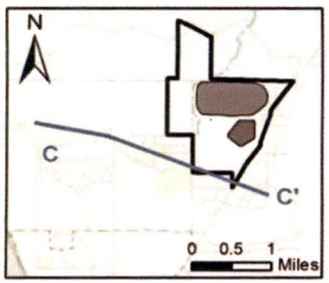


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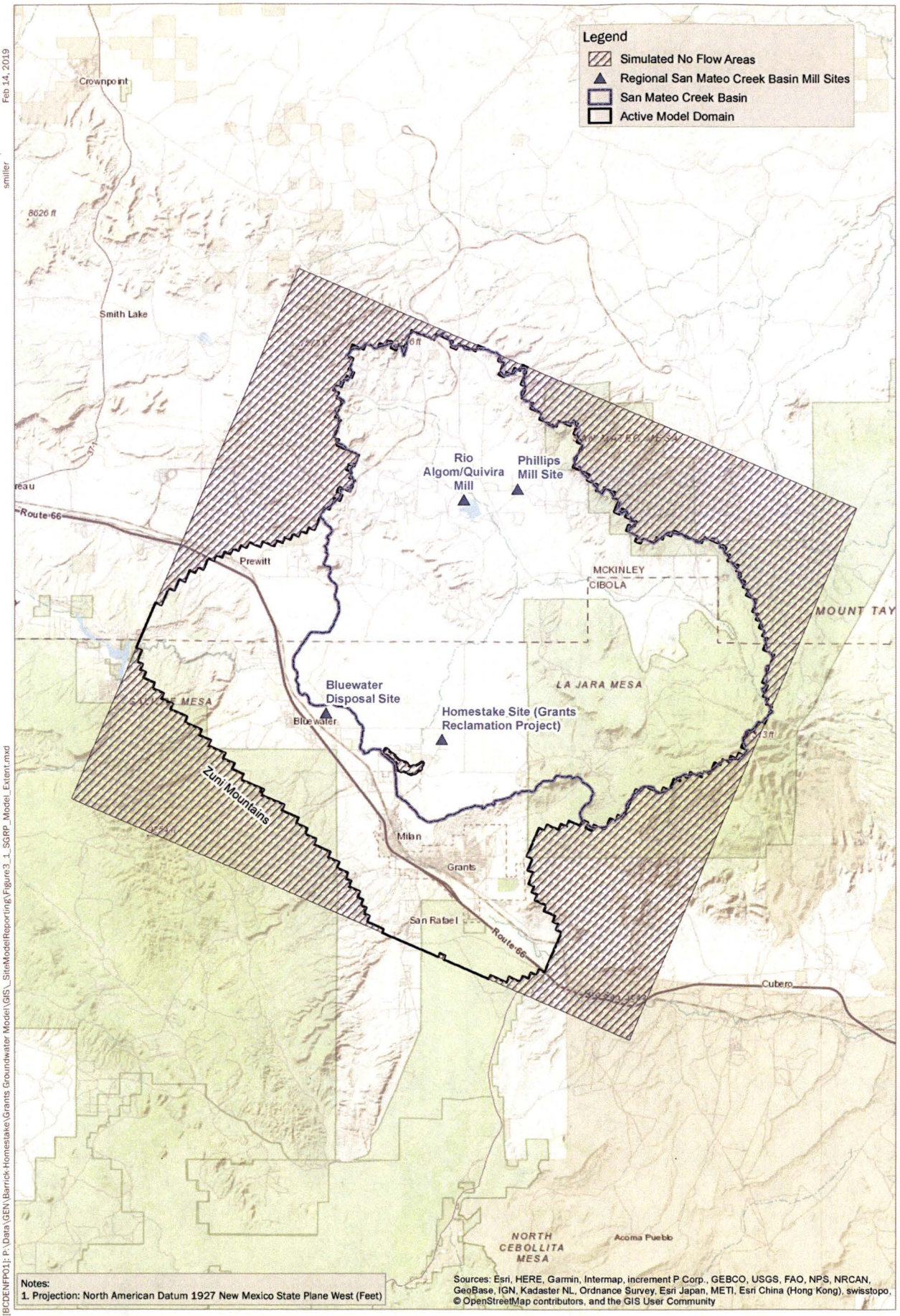
Figure 2-8

Hydrogeologic Cross Section C-C' Through the GRP Site



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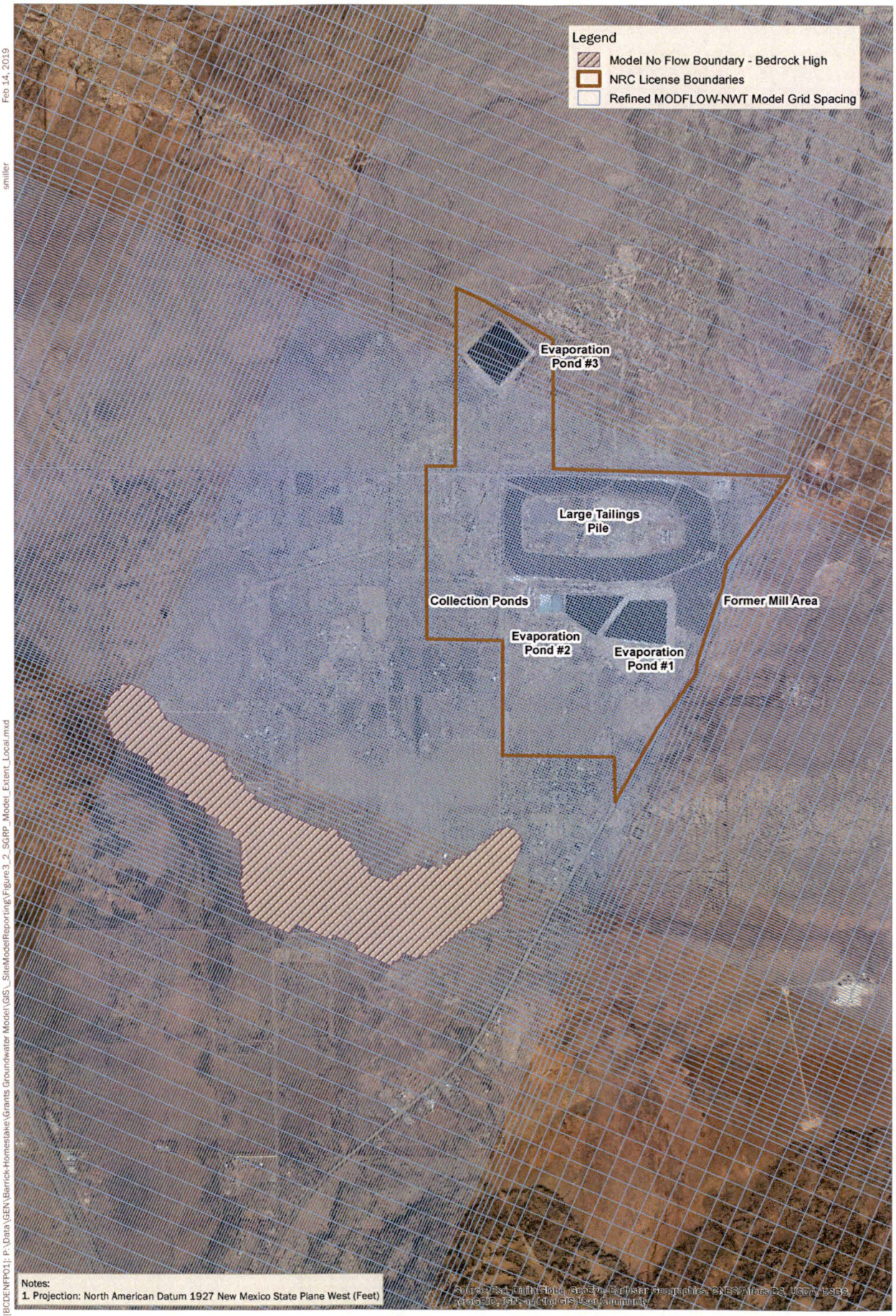
Date: March 2019
Project: 152816

0 3.75 7.5 Miles

N

Figure 3-1

GRP Model Extent - Active Model Domain



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N

0 2,000 4,000 Feet

Figure 3-2

Area of High Grid Resolution within GRP Site Area

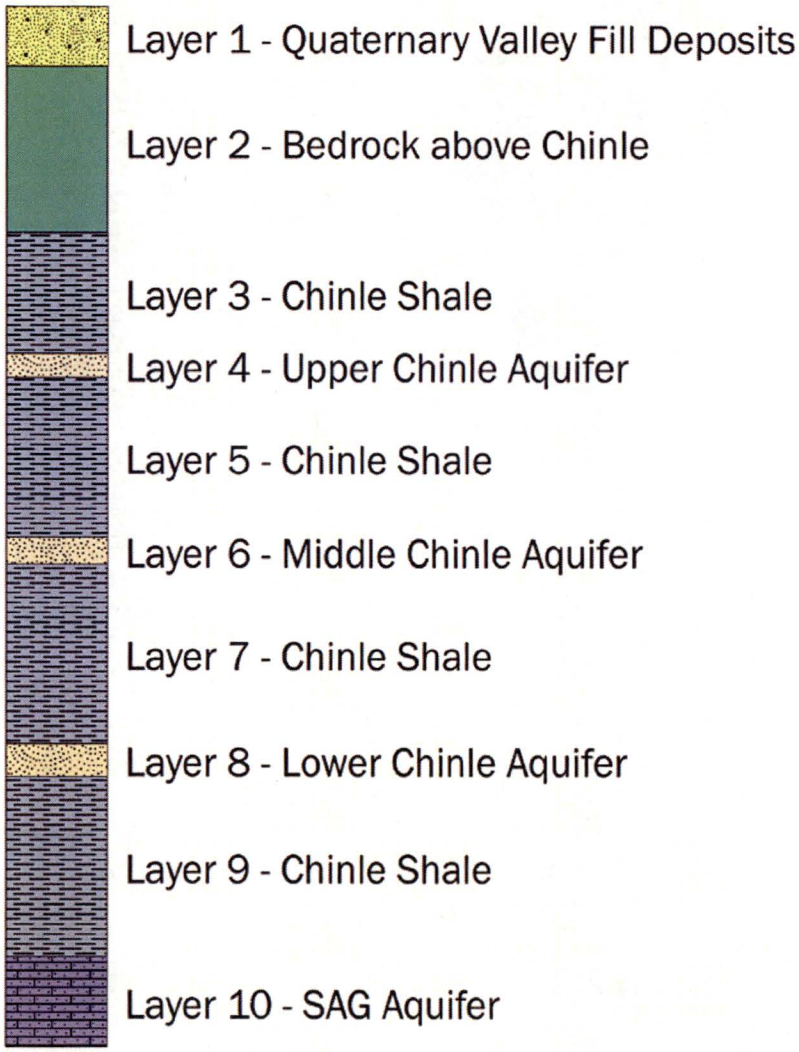

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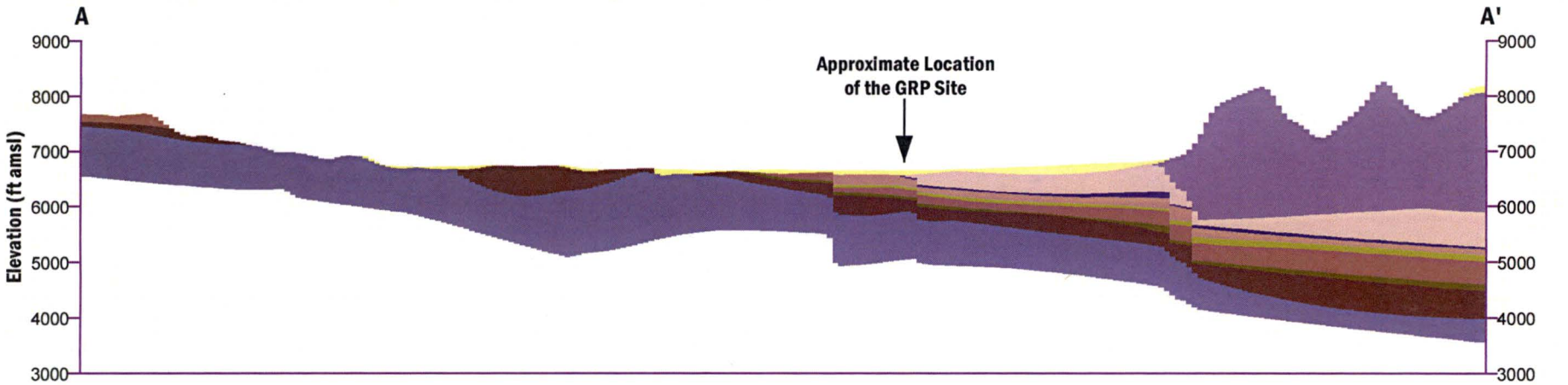
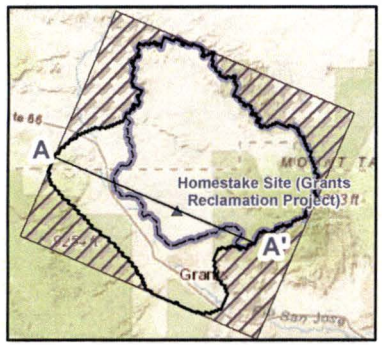
Figure 3-3

GRP Model Layering Stratigraphic Column





Legend

- Layer 1 - Alluvium
- Layer 2 - Bedrock Above Chinle Group
- Layer 3 - Upper Chinle Shale
- Layer 4 - Upper Chinle Aquifer
- Layer 5 - Middle Chinle Shale
- Layer 6 - Middle Chinle Aquifer
- Layer 7 - Middle Chinle Shale
- Layer 8 - Lower Chinle Aquifer
- Layer 9 - Lower Chinle Shale
- Layer 10 - San Andres/Glorieta Aquifer

Vertical Exaggeration = 5x

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Date: March 2019
Project: 152816

0 2.5 5 Miles

N

Figure 3-4

MODFLOW-NWT Hydrogeologic Cross Section A-A' Through the GRP Site

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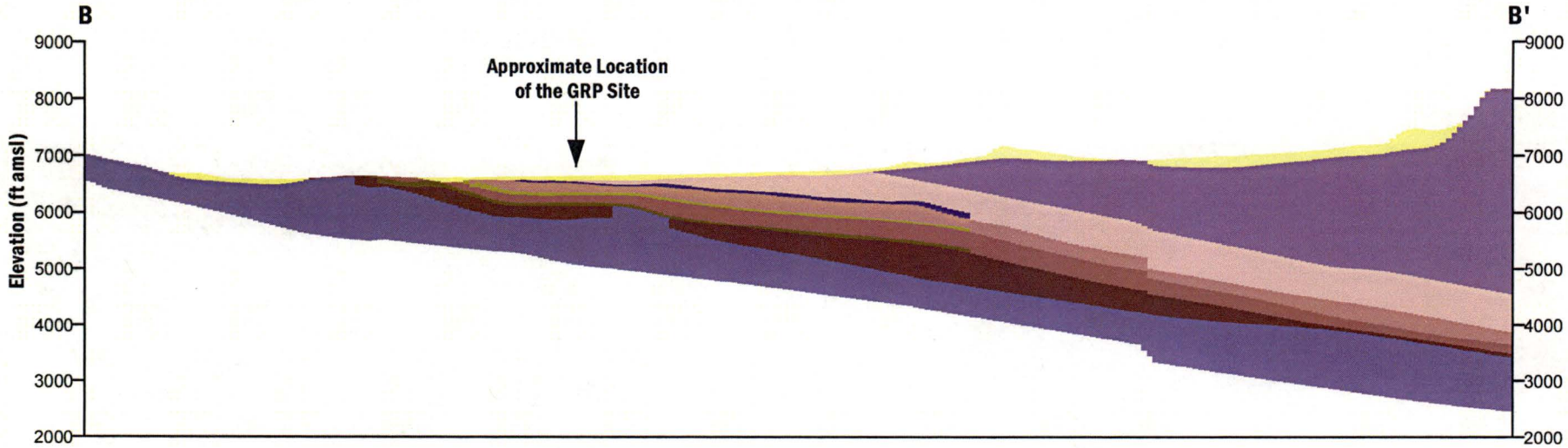

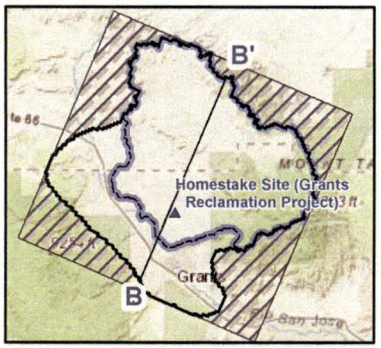

Legend

- Layer 1 - Alluvium
- Layer 2 - Bedrock Above Chinle Group
- Layer 3 - Upper Chinle Shale
- Layer 4 - Upper Chinle Aquifer
- Layer 5 - Middle Chinle Shale
- Layer 6 - Middle Chinle Aquifer
- Layer 7 - Middle Chinle Shale
- Layer 8 - Lower Chinle Aquifer
- Layer 9 - Lower Chinle Shale
- Layer 10 - San Andres/Glorieta Aquifer

Vertical Exaggeration = 5x

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Grants Reclamation Project
Groundwater Fate and Transport Modeling
Date: March 2019
Project: 152816

0 2.5 5 Miles

N

Figure 3-5

MODFLOW-NWT Hydrogeologic Cross Section B-B' Through the GRP Site

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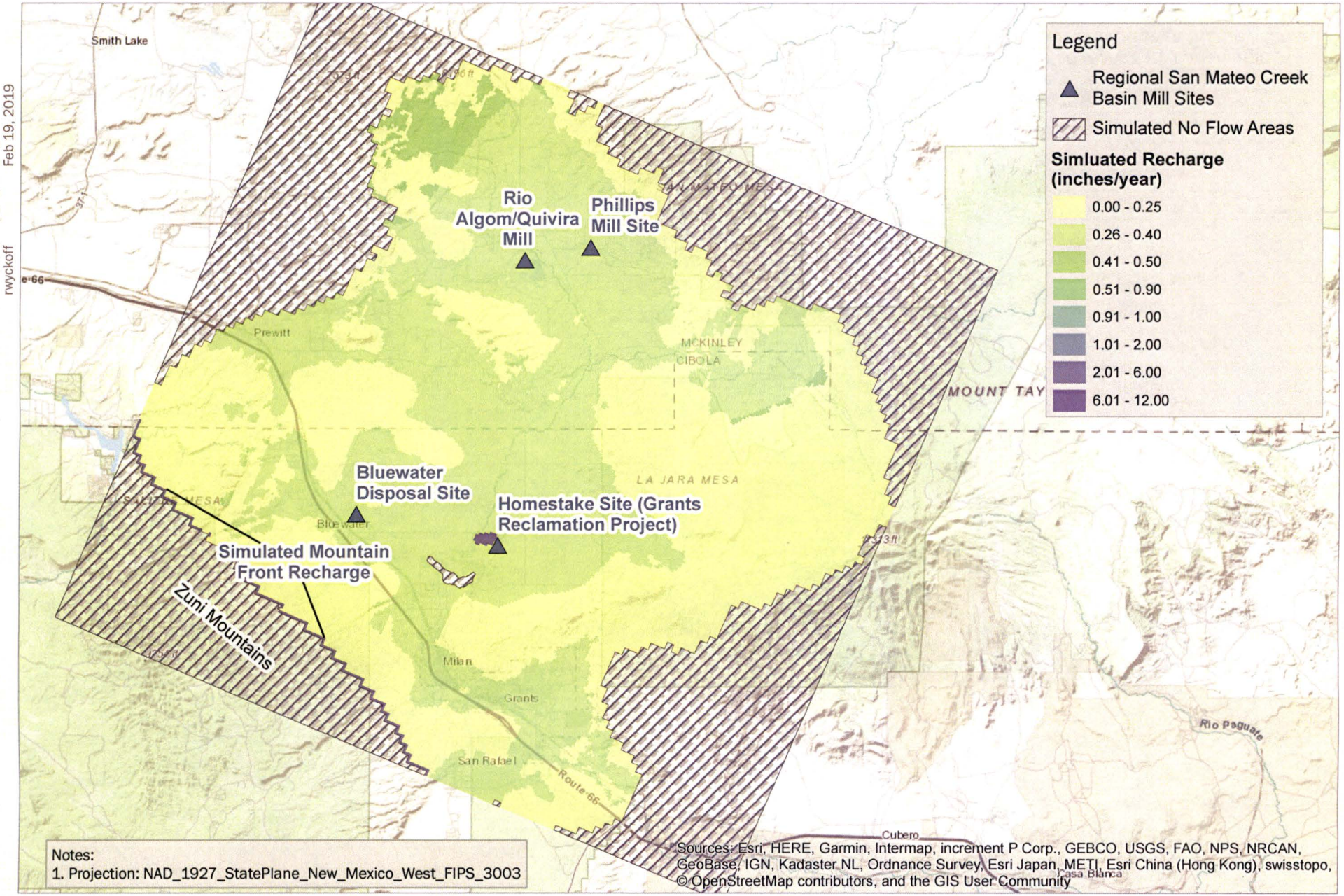

Notes:
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Project: 152816

0 2.5 5 Miles

N

Figure 3-6

Simulated Annual Recharge Rates

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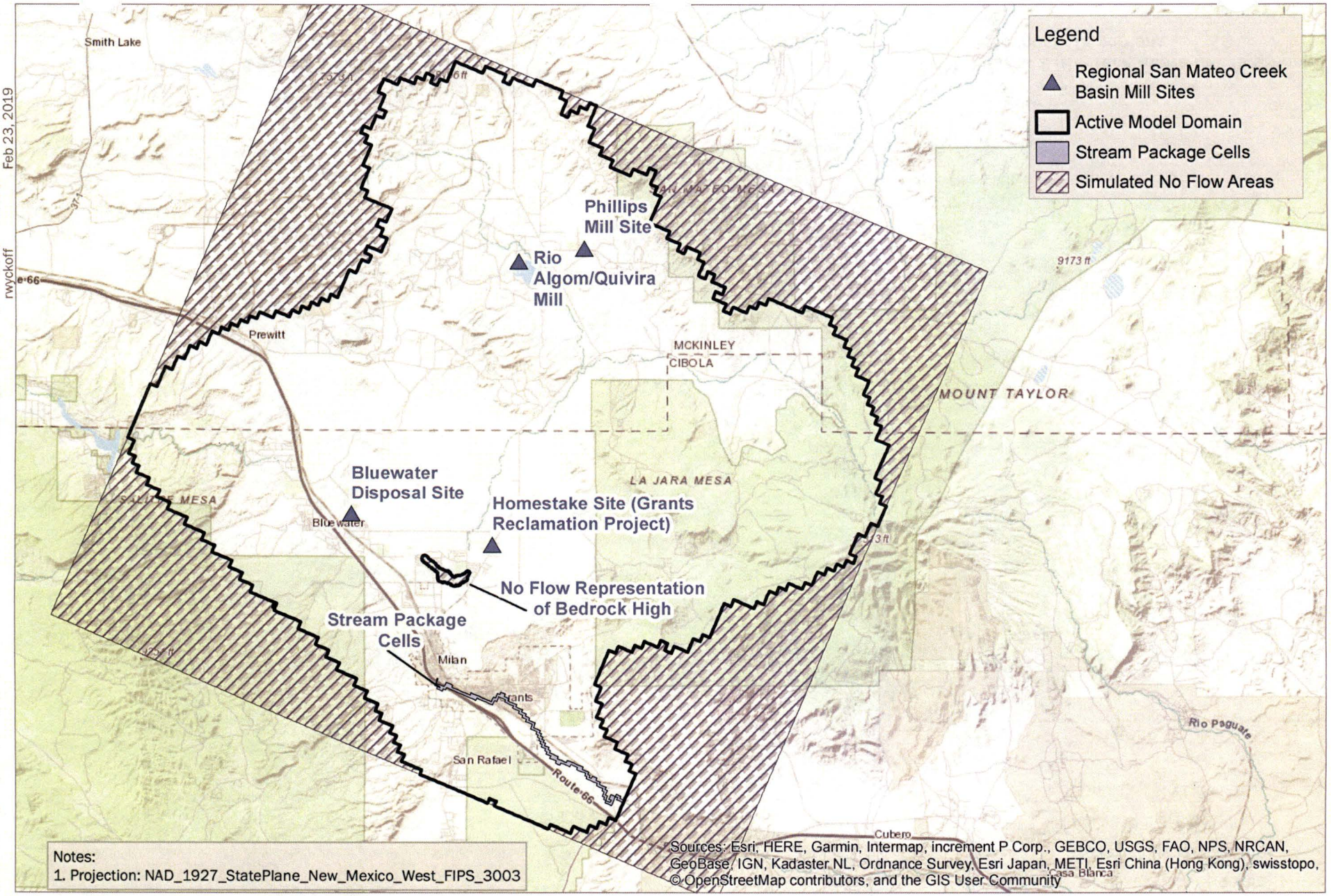

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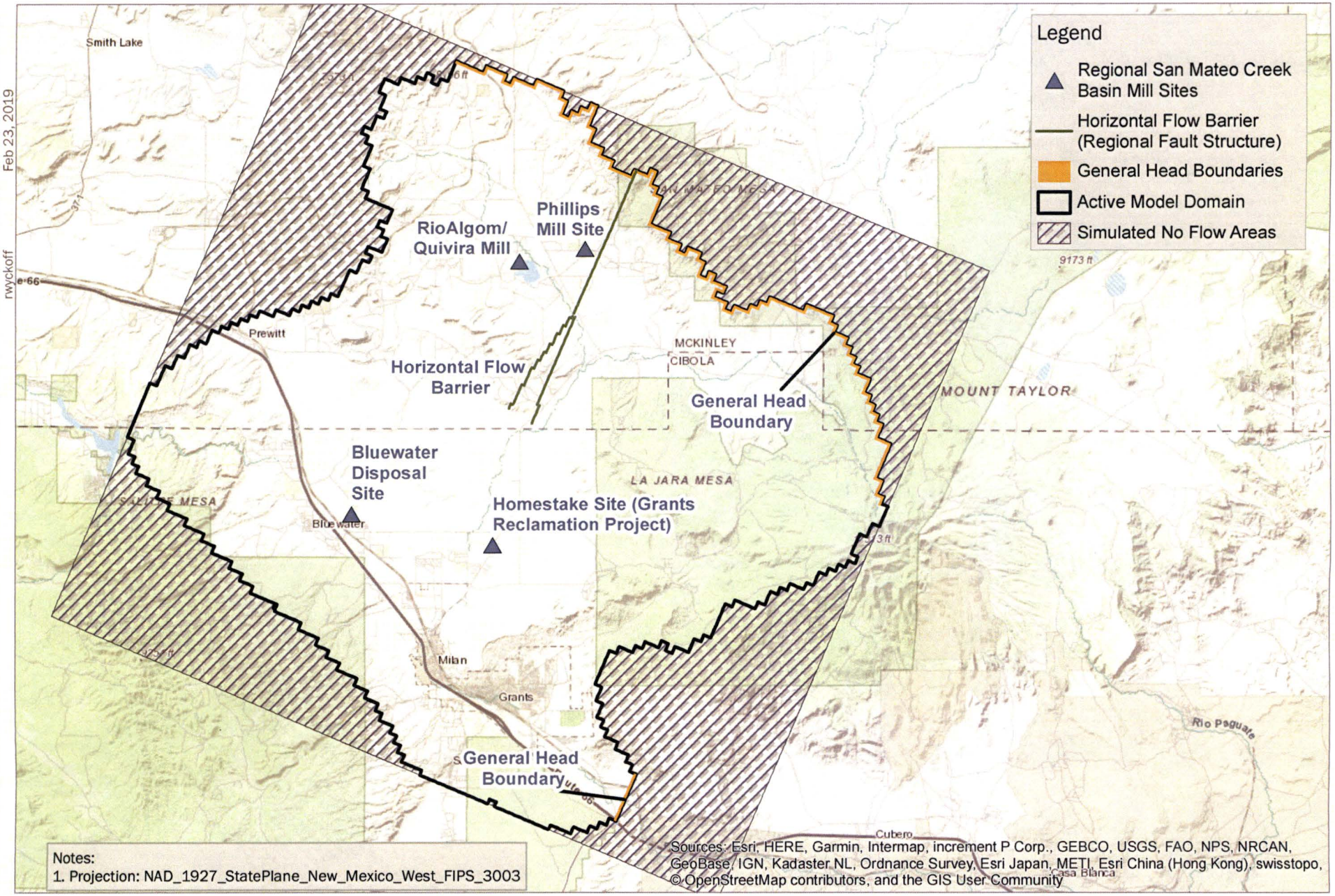
0 2.5 5 Miles

N

Figure 3-7

Layer 1 (Alluvial Aquifer) Boundary Conditions



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0 2.5 5 Miles

N

Figure 3-8

Layer 2 (Bedrock Above Chinle Group) Boundary Conditions

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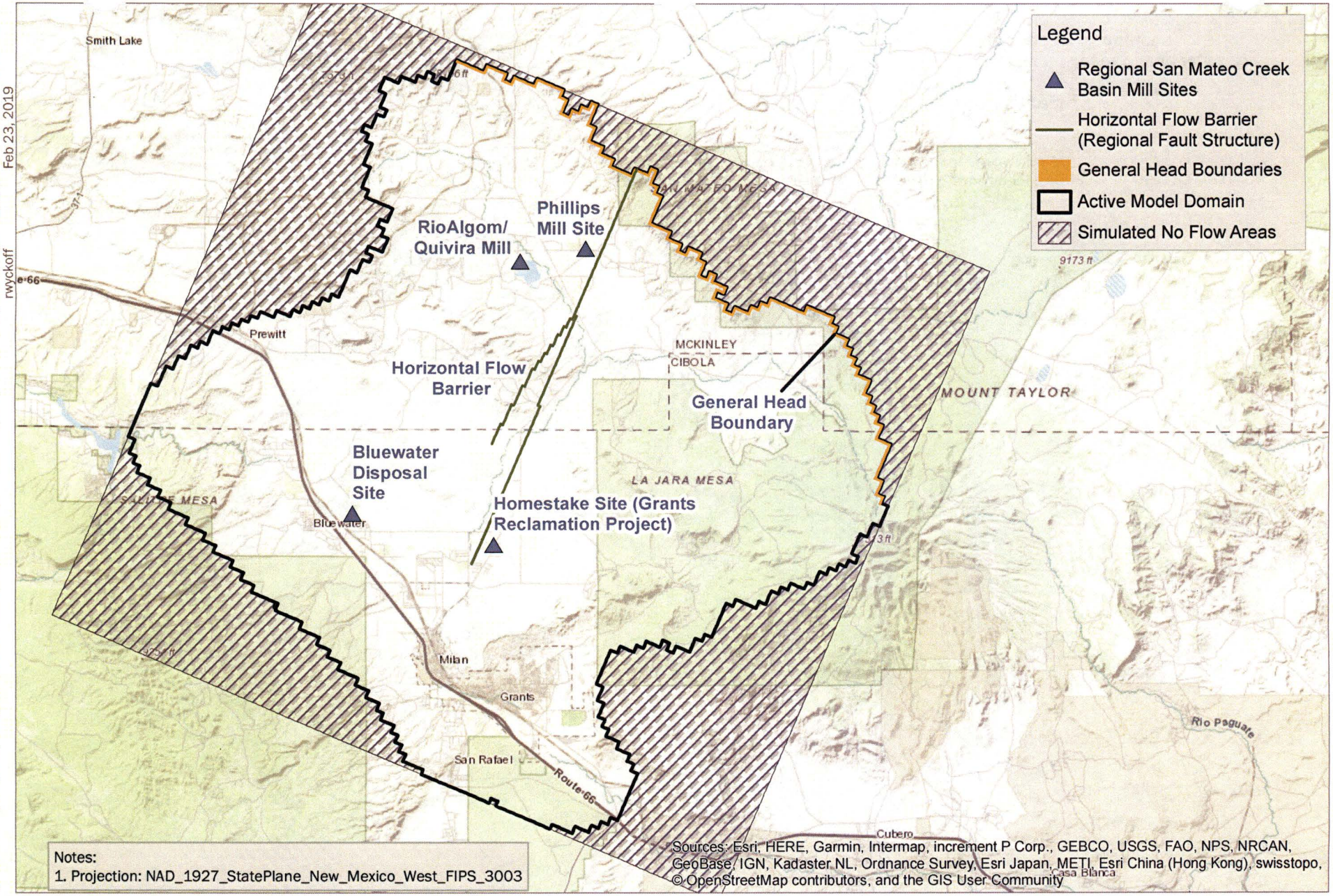

Notes:
1. Projection: NAD_1927_StatePlane_New_Mexico_West_FIPS_3003

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0 2.5 5 Miles

N

Figure 3-9

Layer 3 (Upper Chinle Shale) Boundary Conditions

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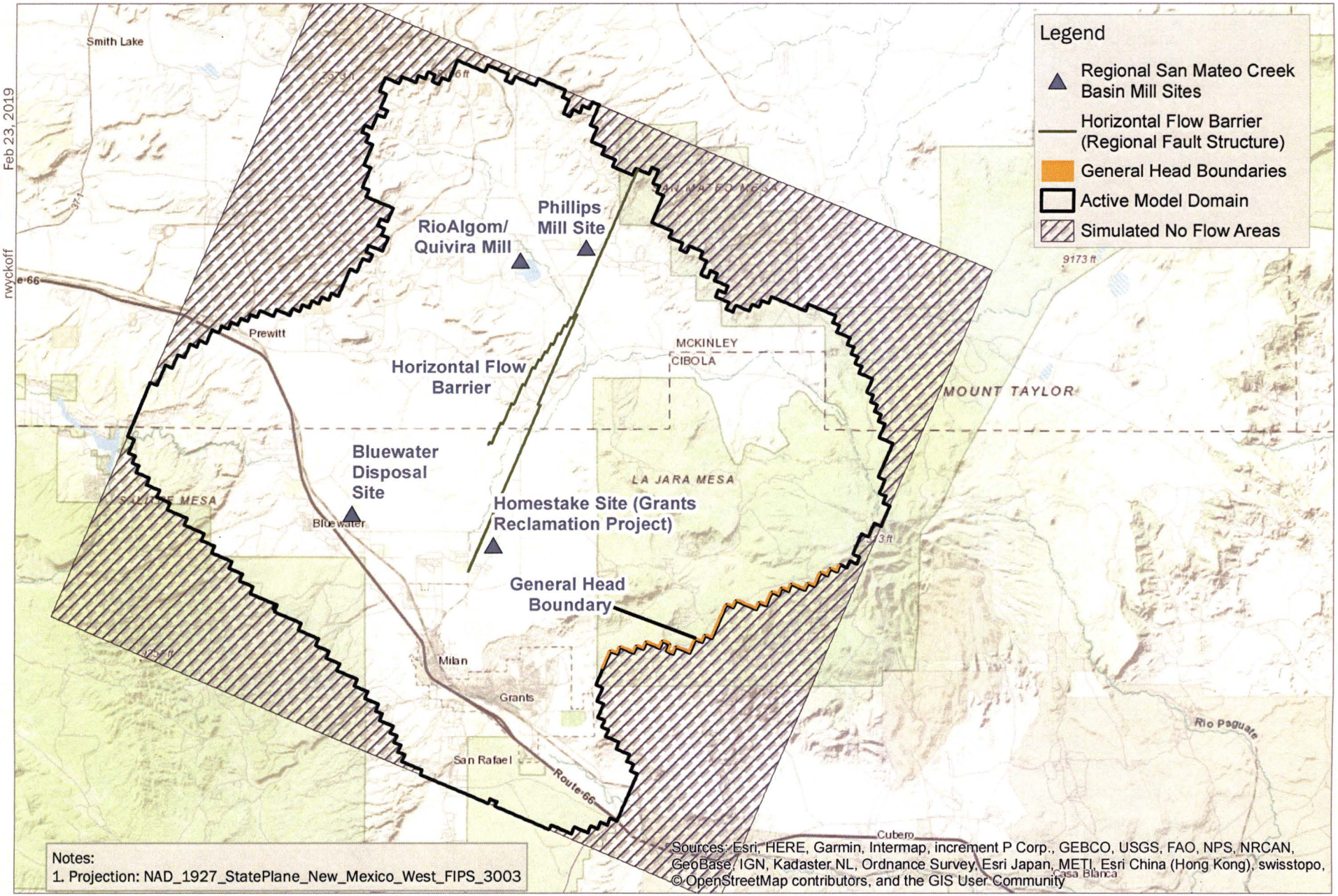

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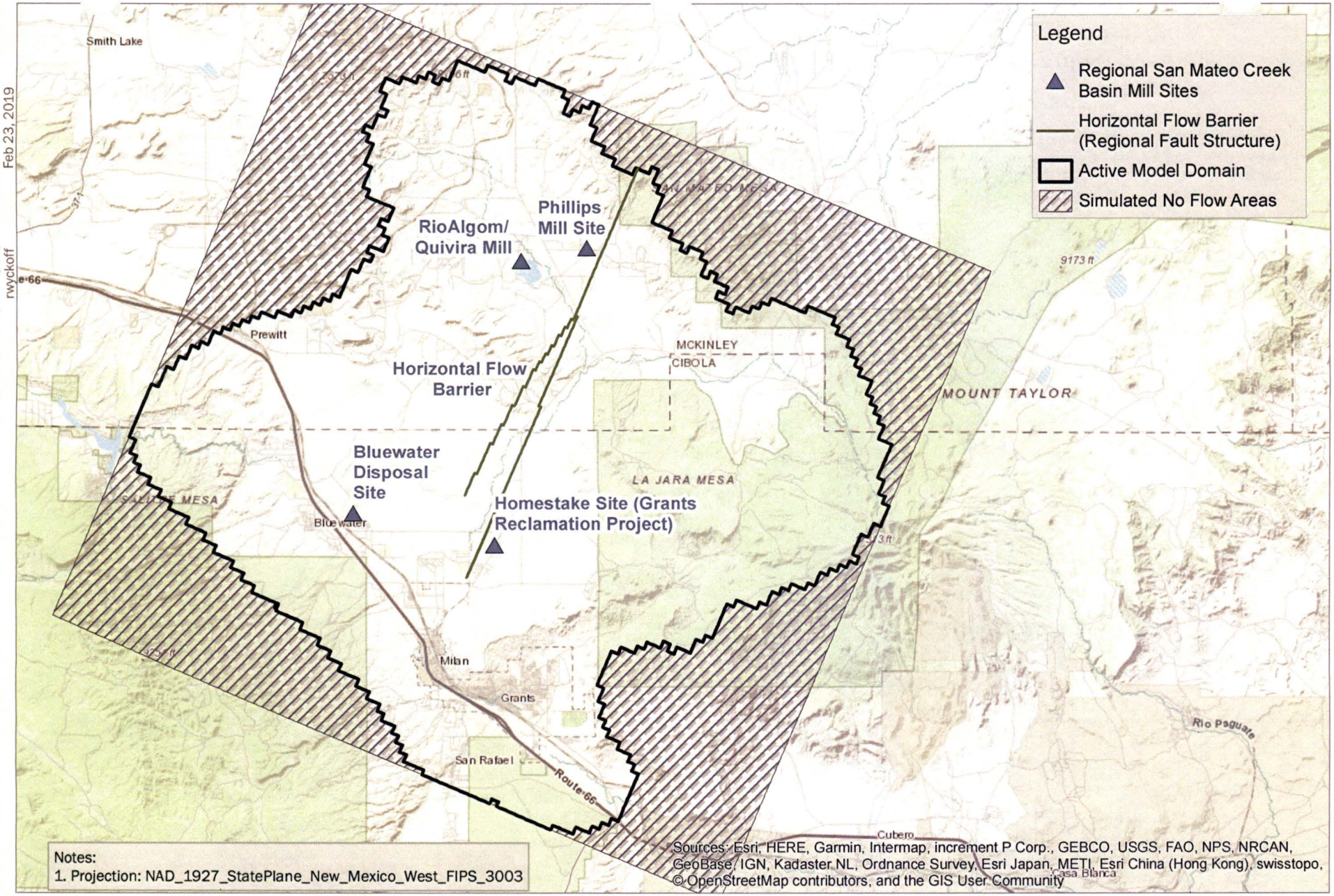
0 2.5 5 Miles

N

Figure 3-10

Layer 4 (Upper Chinle Aquifer) Boundary Conditions



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0 2.5 5 Miles

N

Figure 3-11

Layer 5 (Middle Chinle Shale) Boundary Conditions

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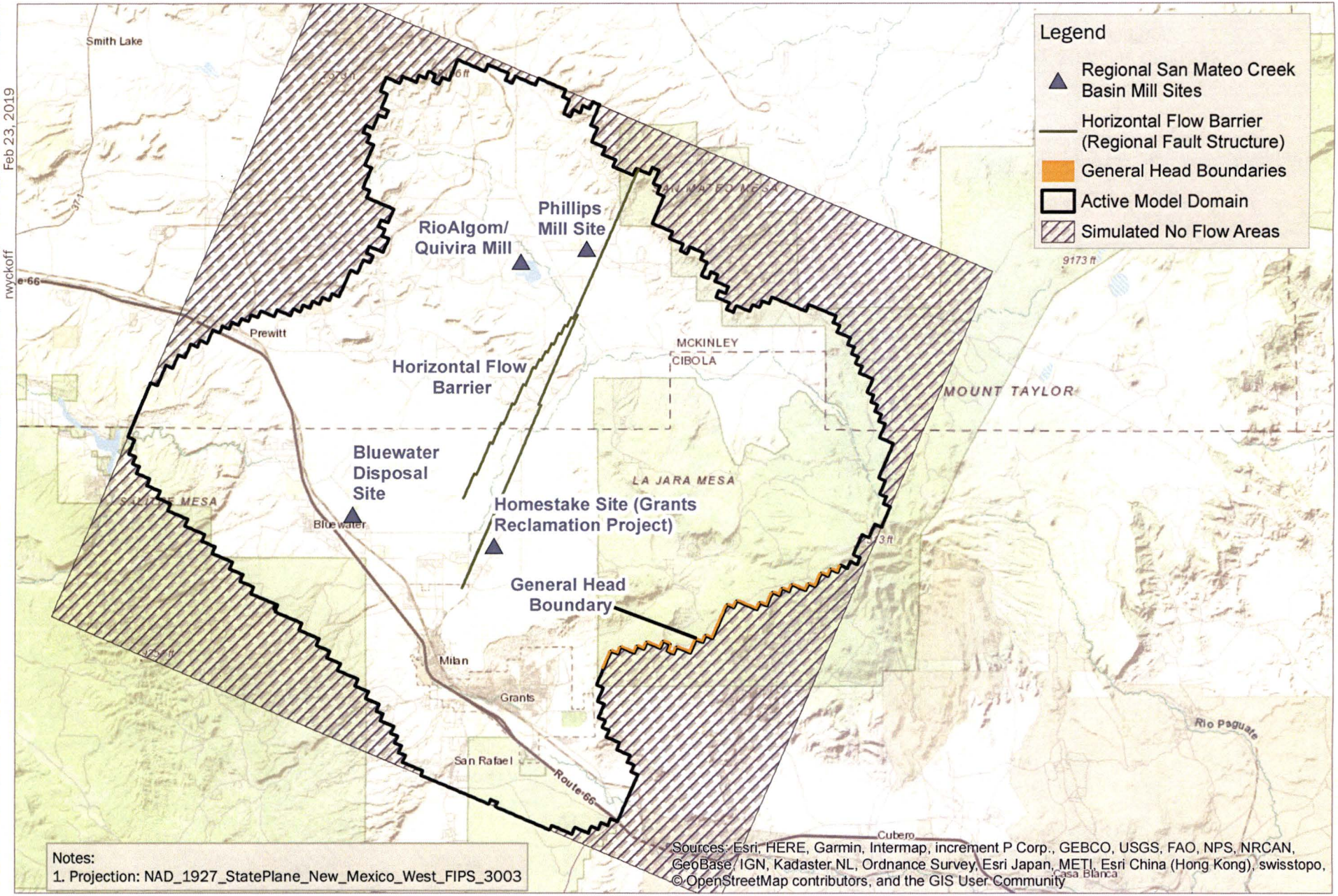

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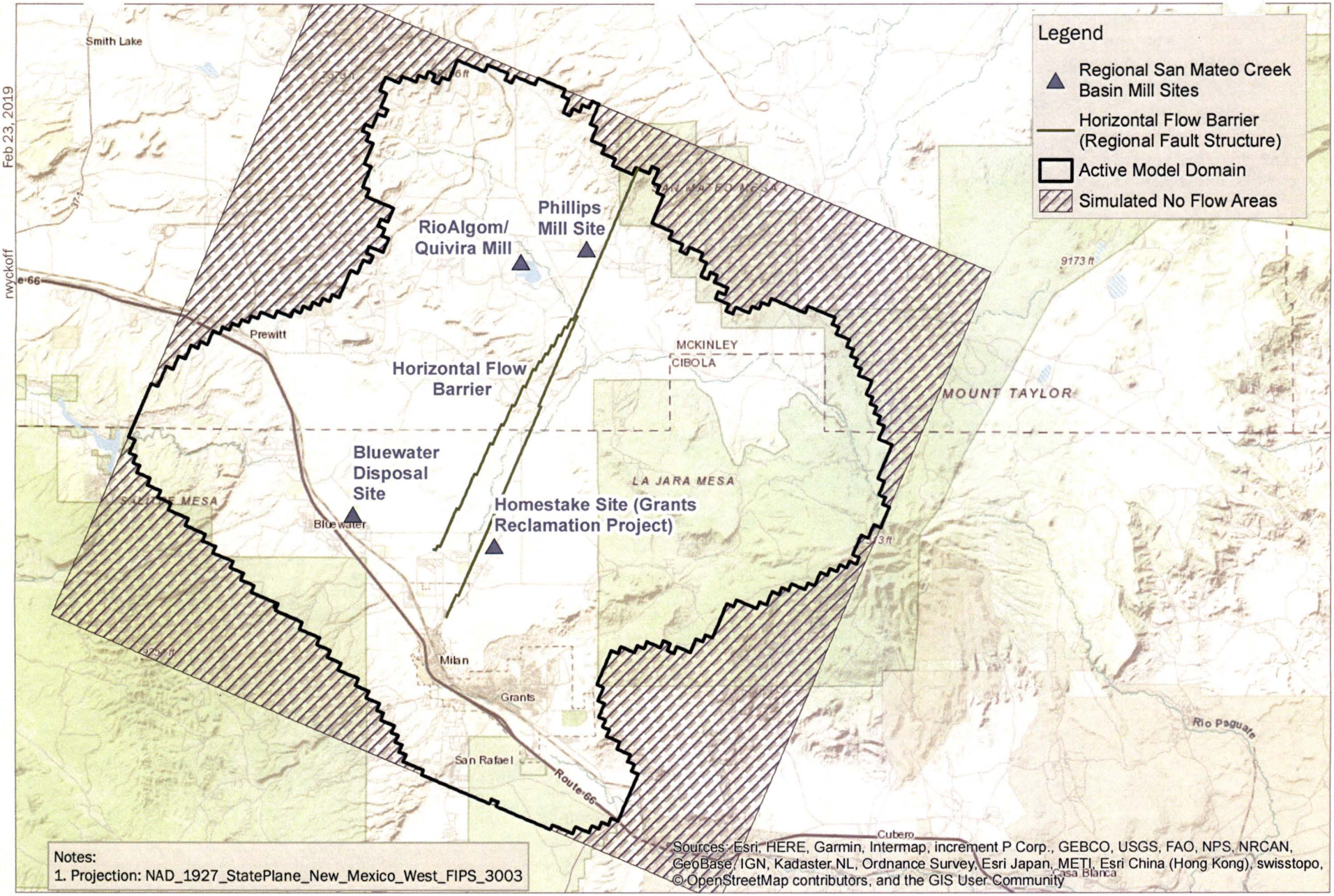
0 2.5 5 Miles

N

Figure 3-12

Layer 6 (Upper Chinle Aquifer) Boundary Conditions



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0 2.5 5 Miles

N

Figure 3-13

Layer 7 (Middle Chinle Shale) Boundary Conditions

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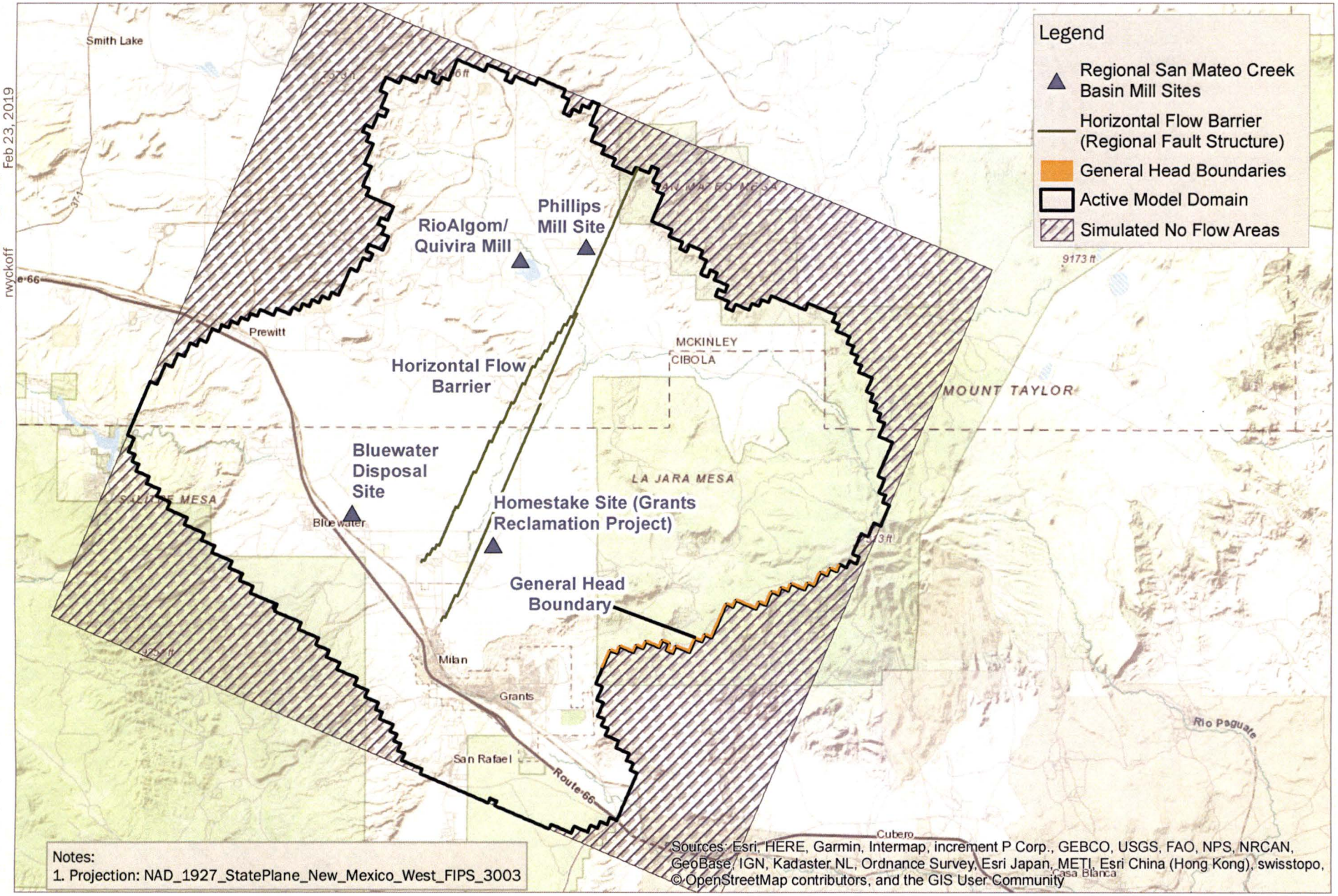

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0 2.5 5 Miles

N

Figure 3-14

Layer 8 (Lower Chinle Aquifer) Boundary Conditions

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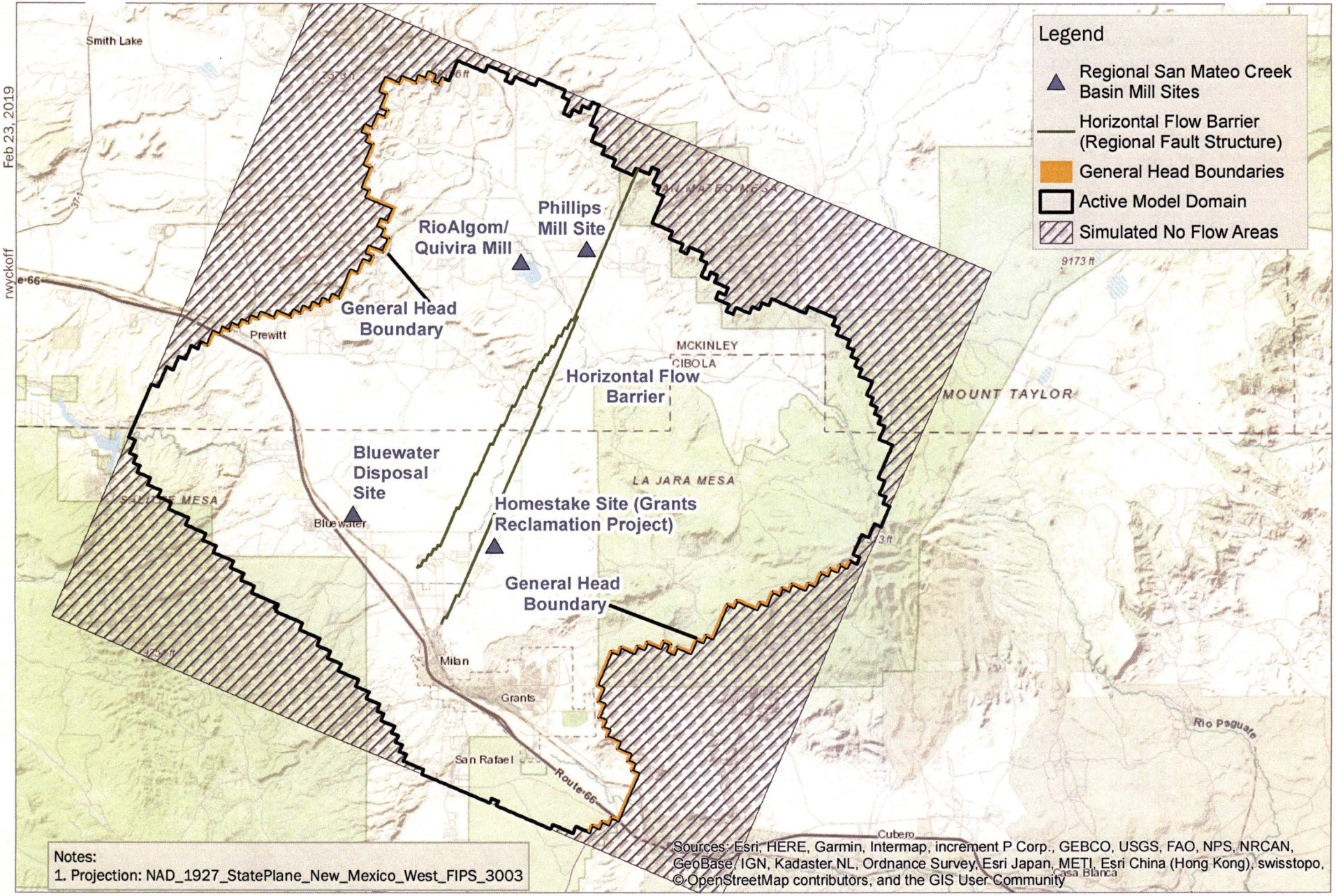

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0 2.5 5 Miles

N

Figure 3-15

Layer 9 (Lower Chinle Shale) Boundary Conditions

[BCDENFP01]: P:\Data\GEN\Barrick-Homestake\Grants Groundwater Model\GIS_SiteModelReporting\Figure3_16_Ly10Boundary_Conditions.mxd
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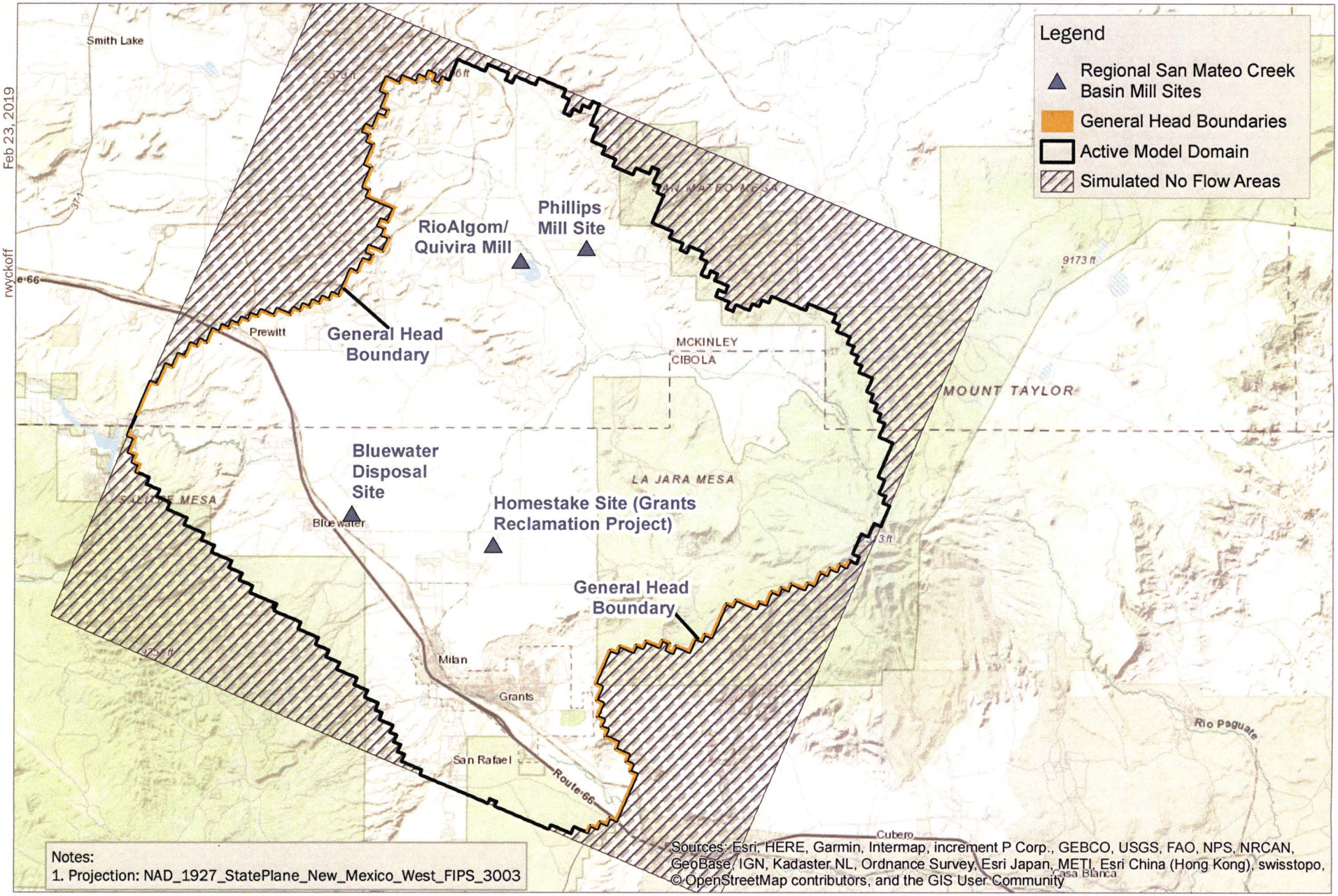

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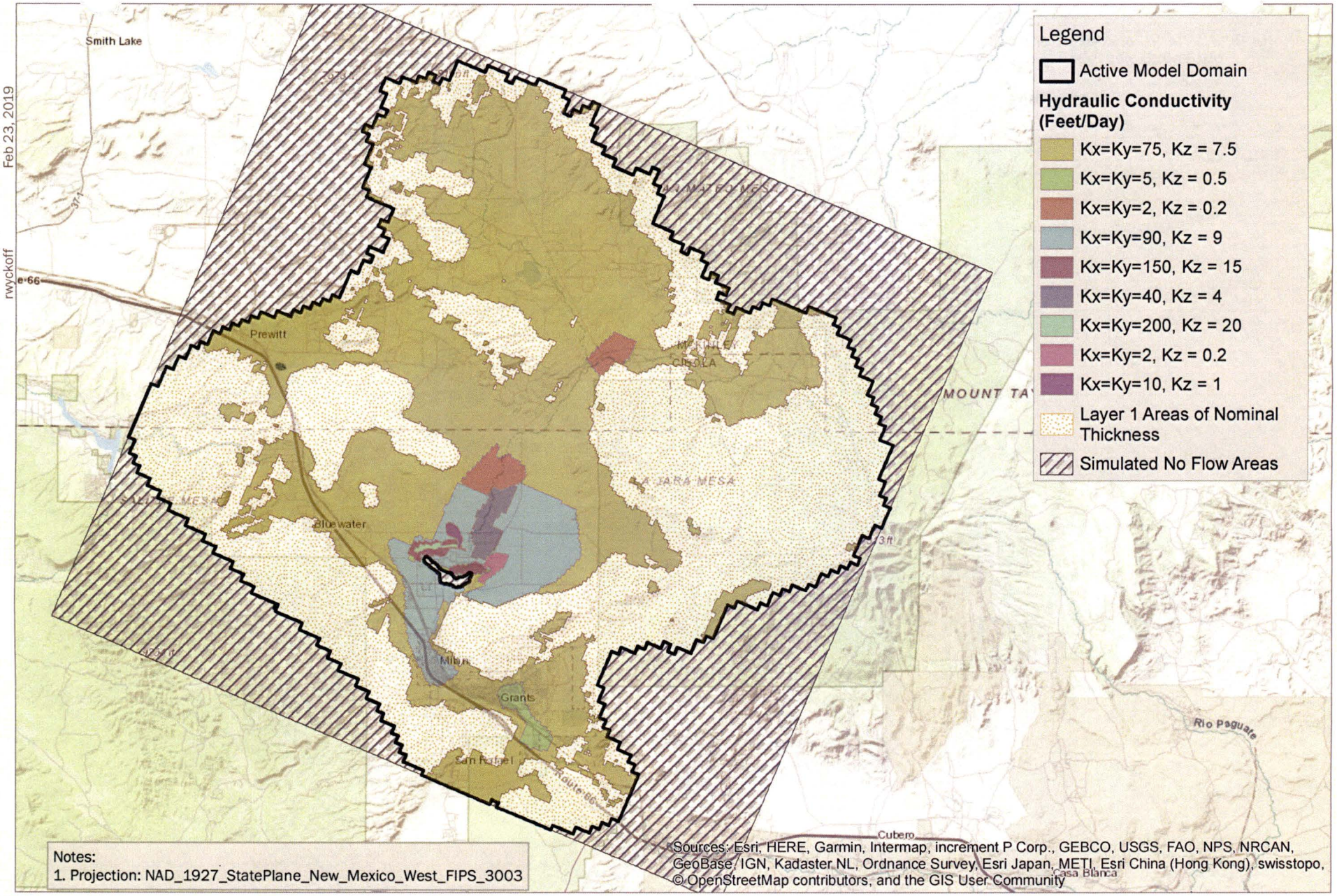
0 2.5 5 Miles

N

Figure 3-16

Layer 10 (San Andres/Glorieta Aquifer) Boundary Conditions



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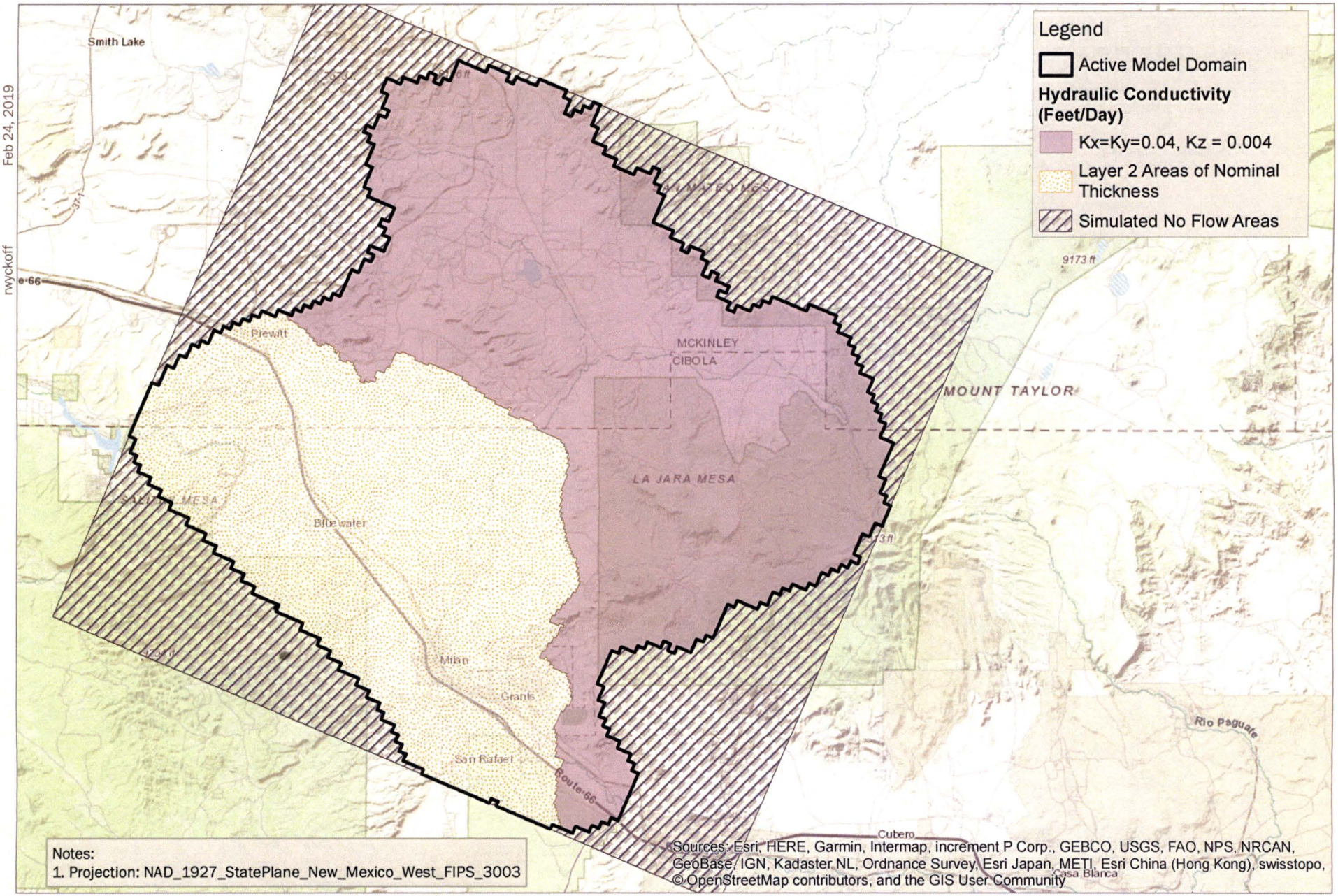
0 2.5 5 Miles

N

Figure 3-17

Layer 1 (Alluvial Aquifer) Hydraulic Conductivity



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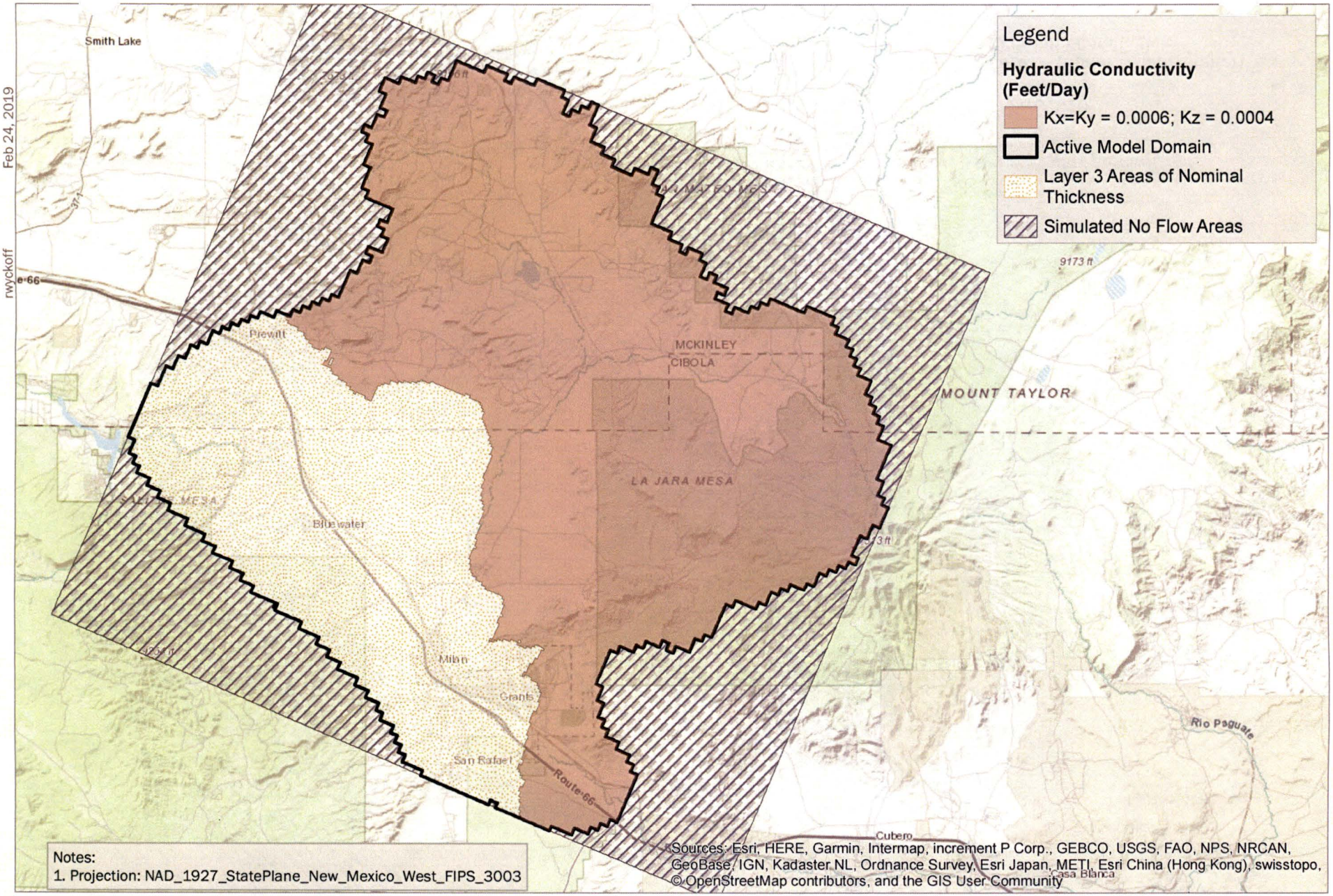
0 2.5 5 Miles

N

Figure 3-18

Layer 2 (Bedrock above the Chinle Group) Hydraulic Conductivity



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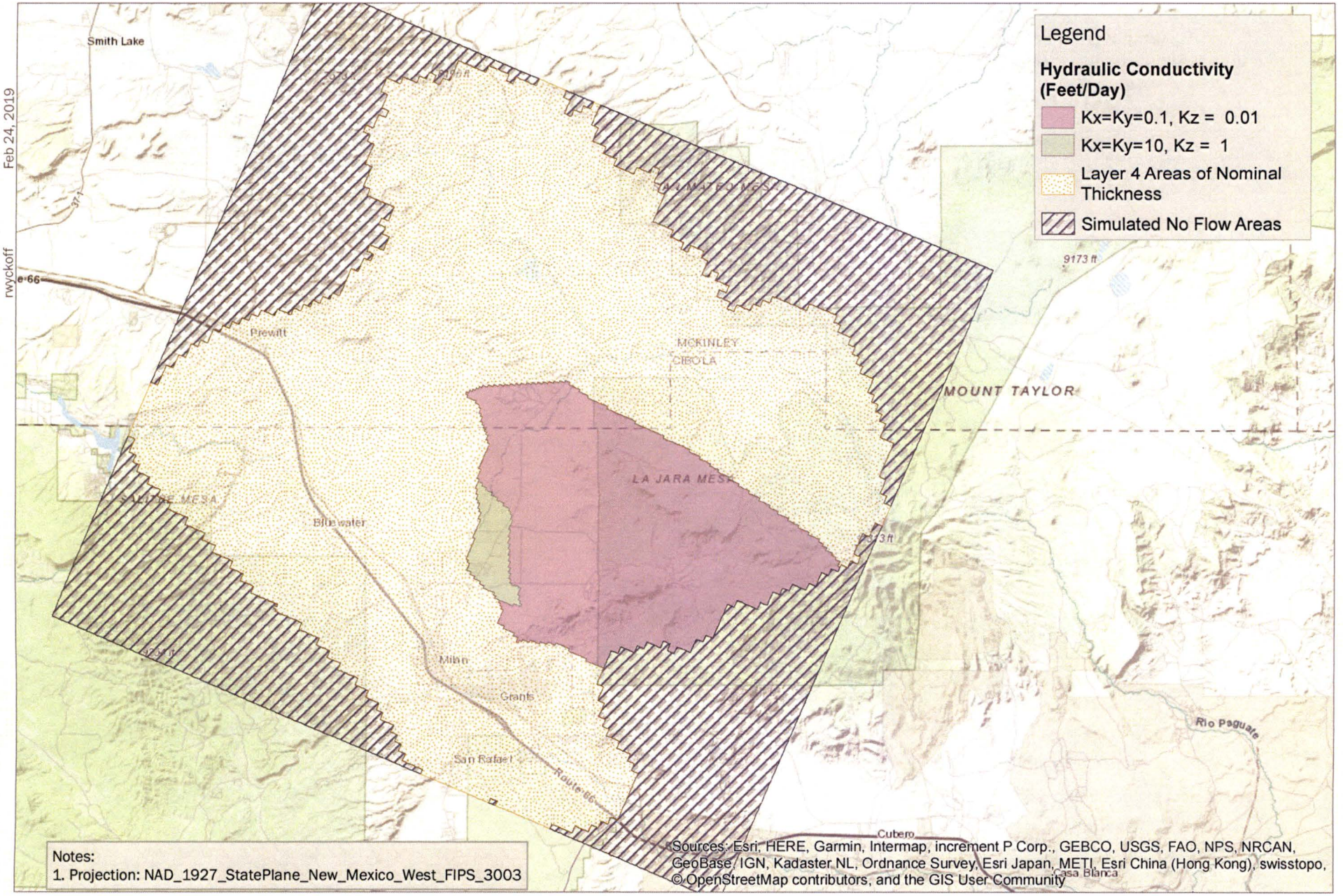
0 2.5 5 Miles

N

Figure 3-19

Layer 3 (Upper Chinle Shale) Hydraulic Conductivity



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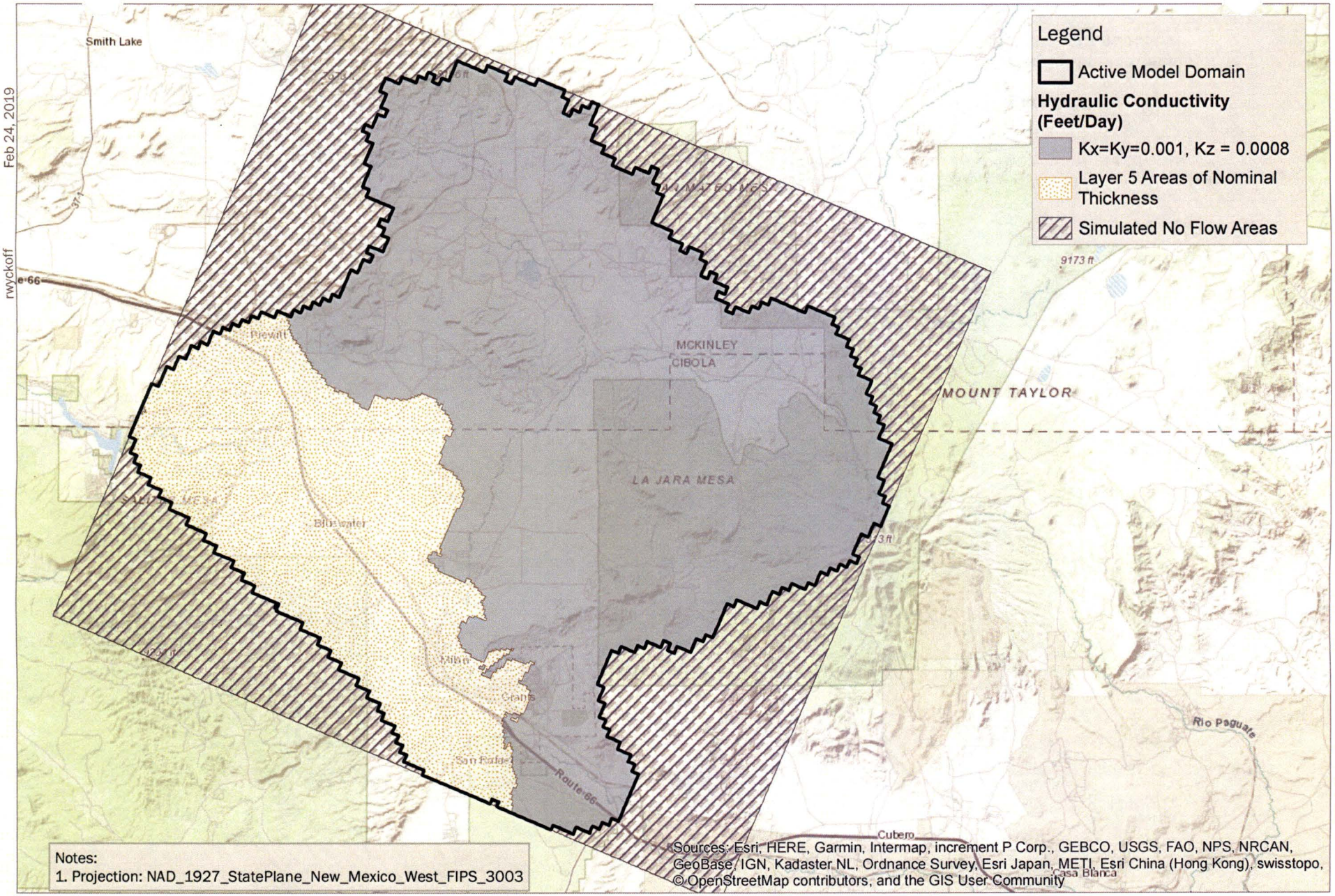
0 2.5 5 Miles

N

Figure 3-20

Layer 4 (Upper Chinle Aquifer) Hydraulic Conductivity



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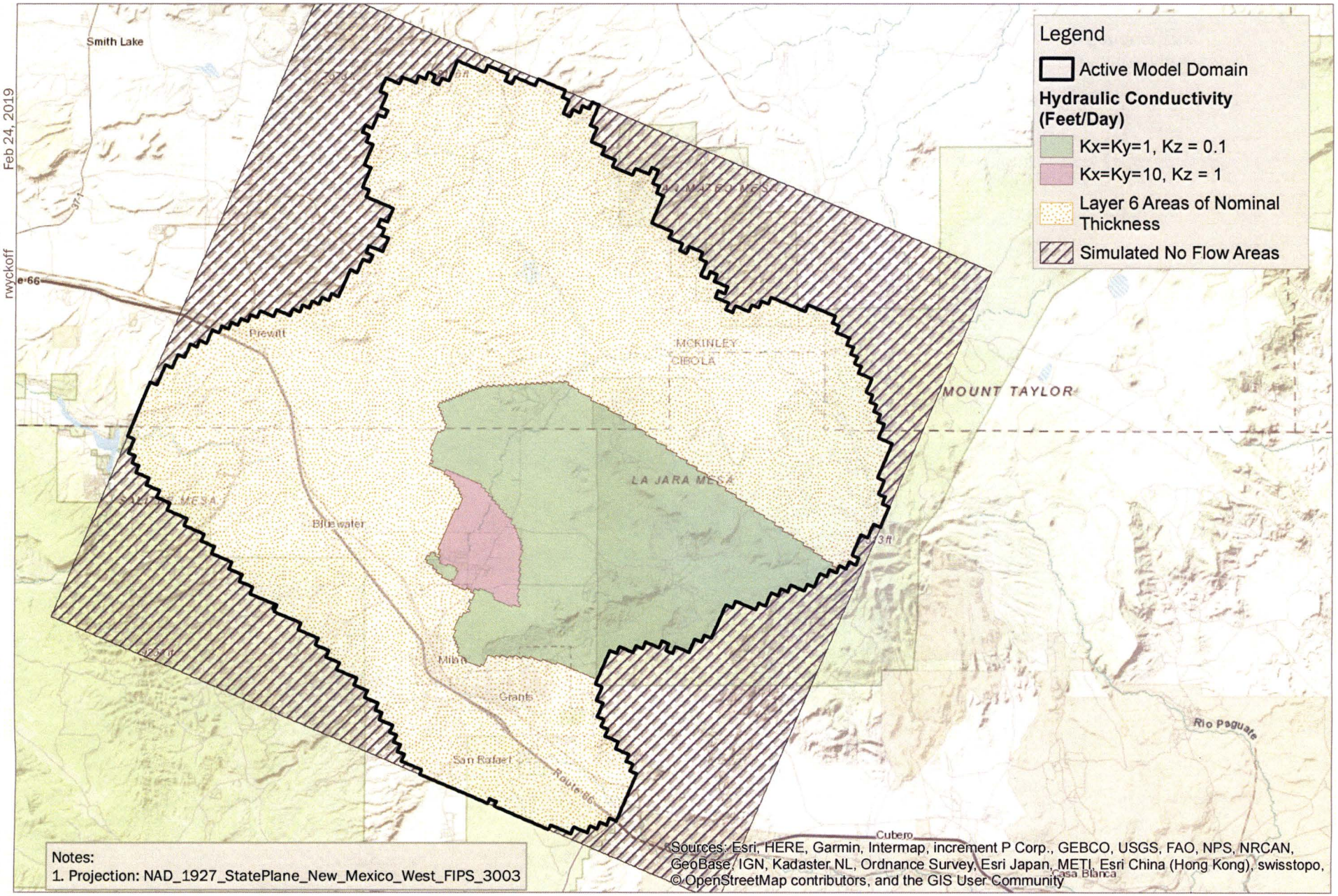
0 2.5 5 Miles

N

Figure 3-21

Layer 5 (Middle Chinle Shale) Hydraulic Conductivity



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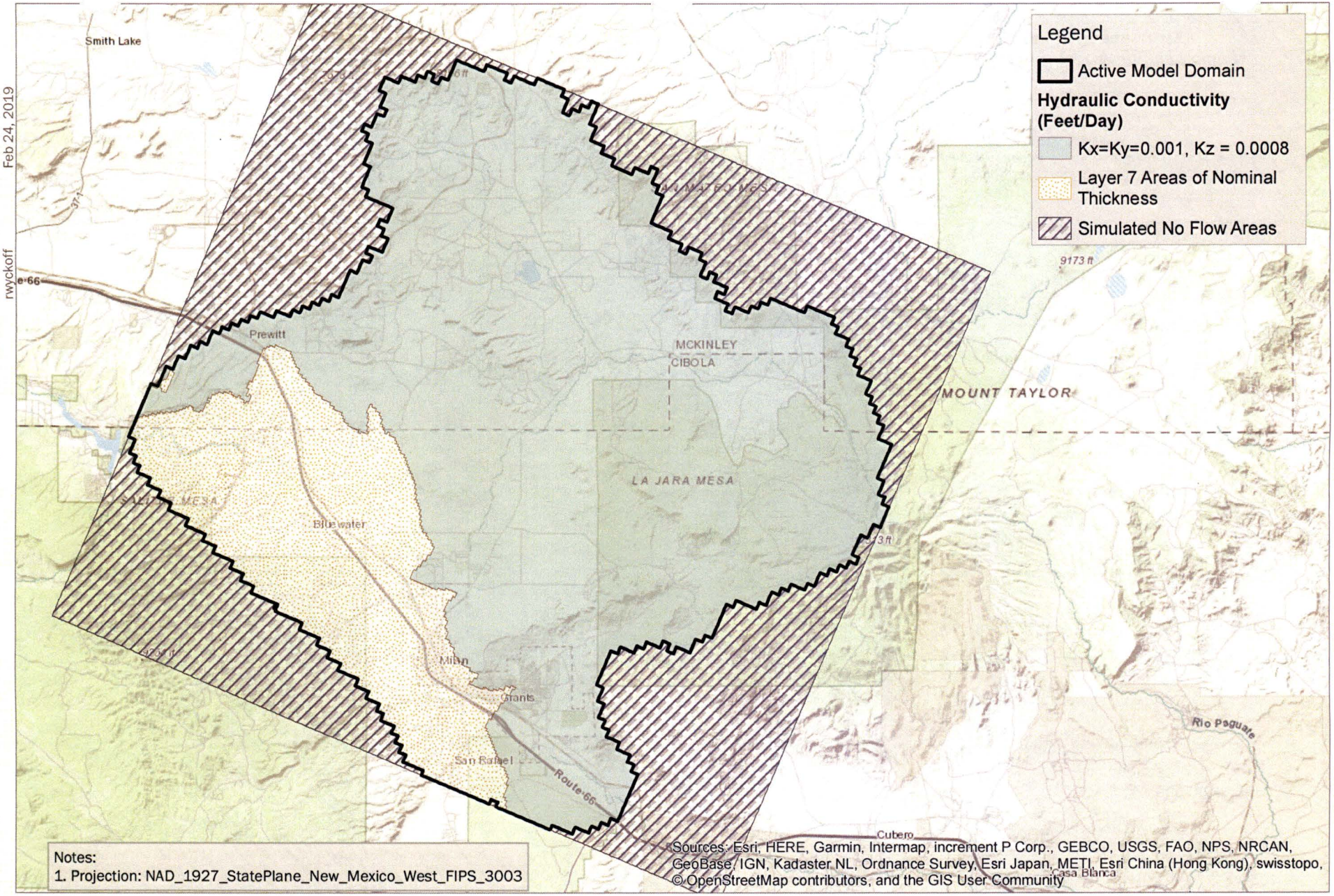
0 2.5 5 Miles

N

Figure 3-22

Layer 6 (Middle Chinle Aquifer) Hydraulic Conductivity



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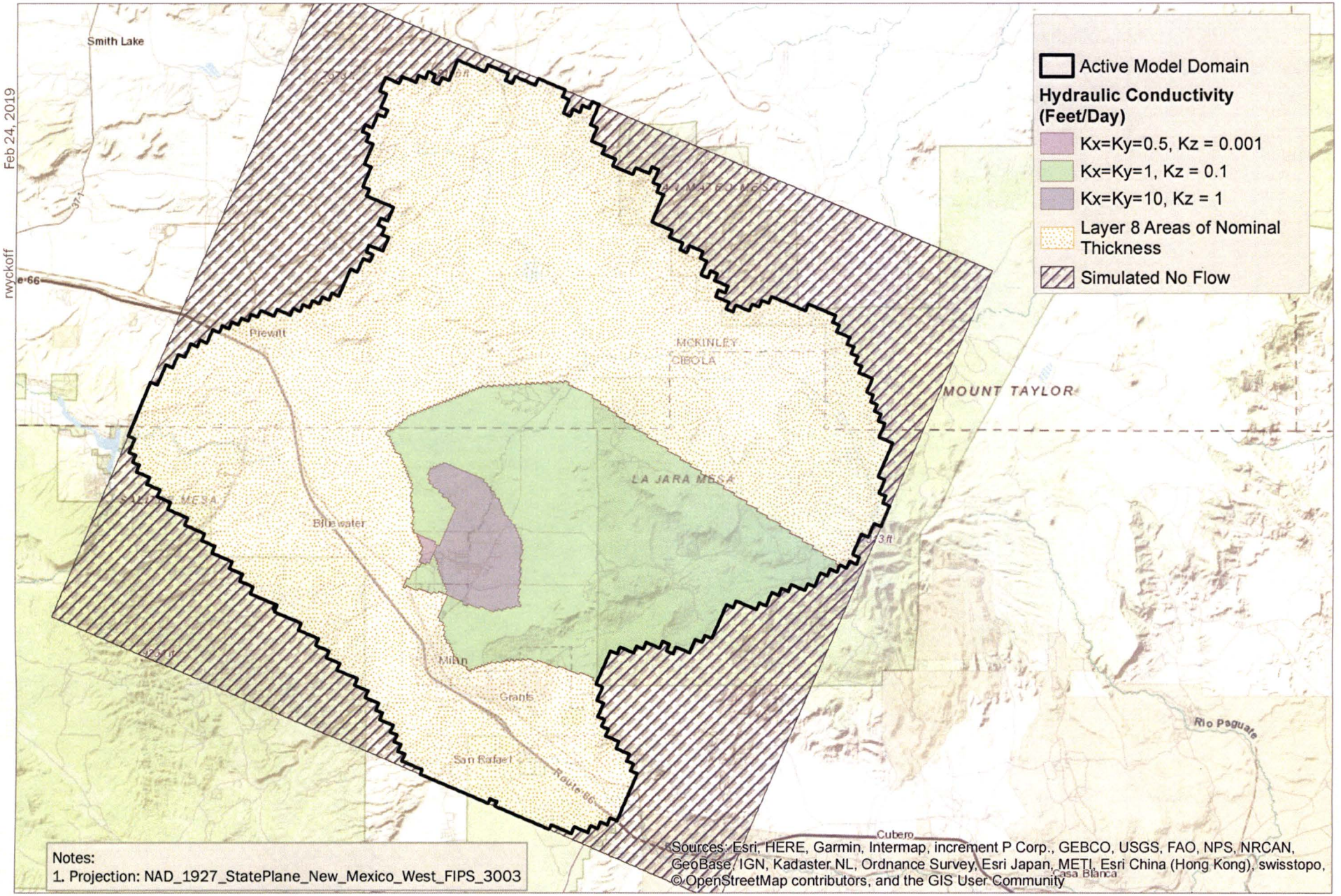
0 2.5 5 Miles

N

Figure 3-23

Layer 7 (Middle Chinle Shale) Hydraulic Conductivity



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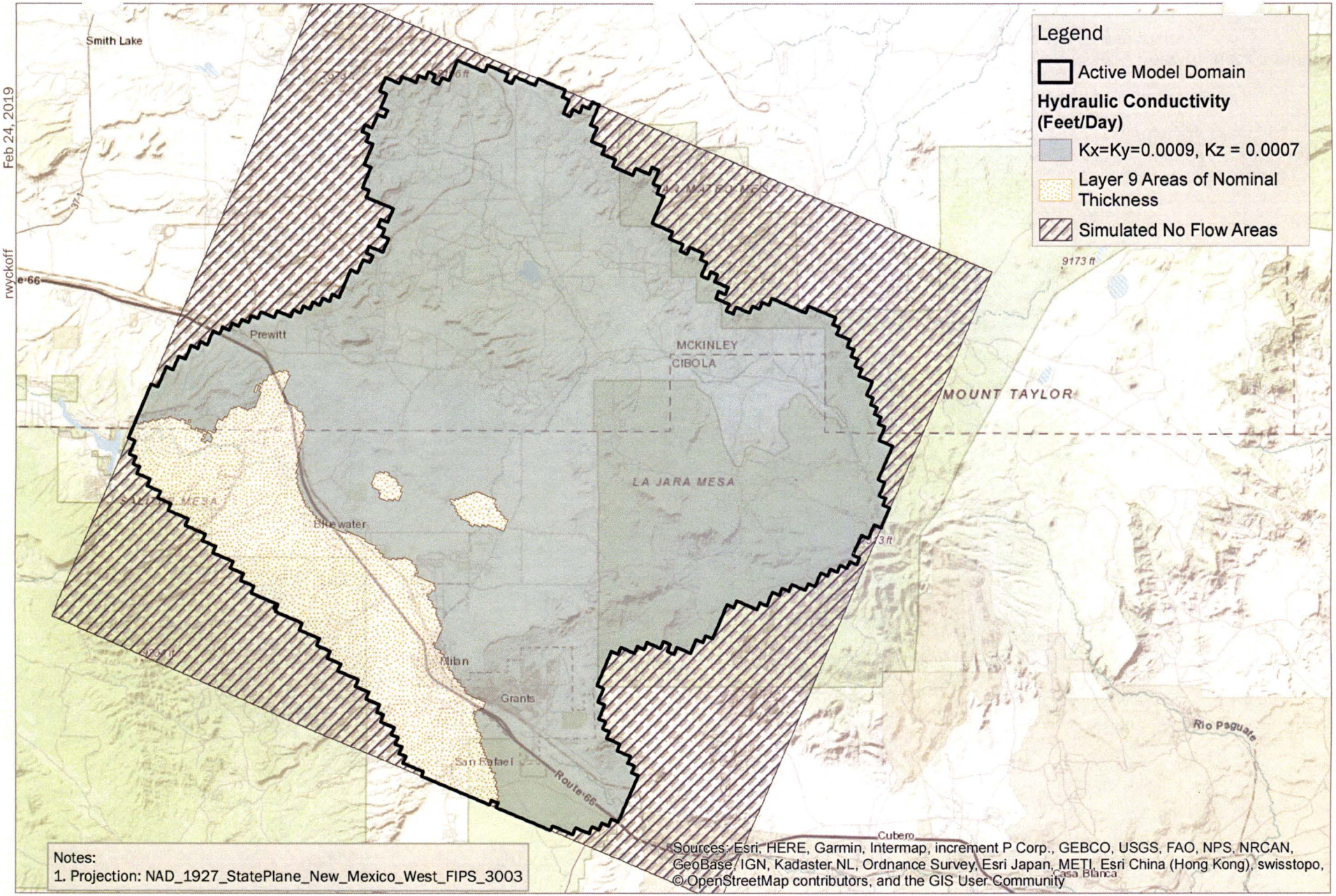
0 2.5 5 Miles

N

Figure 3-24

Layer 8 (Lower Chinle Aquifer) Hydraulic Conductivity



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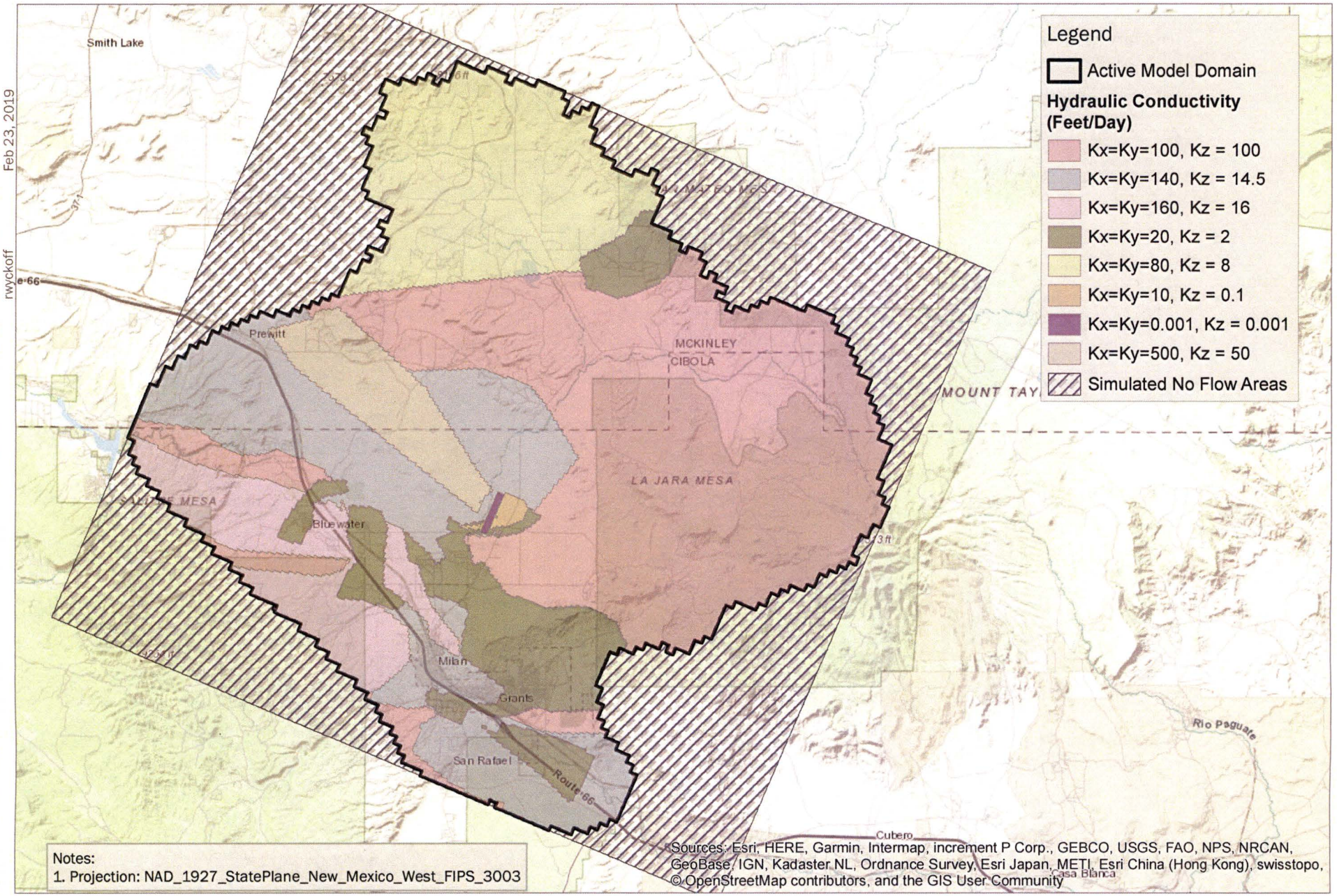
0 2.5 5 Miles

N

Figure 3-25

Layer 9 (Lower Chinle Shale) Hydraulic Conductivity



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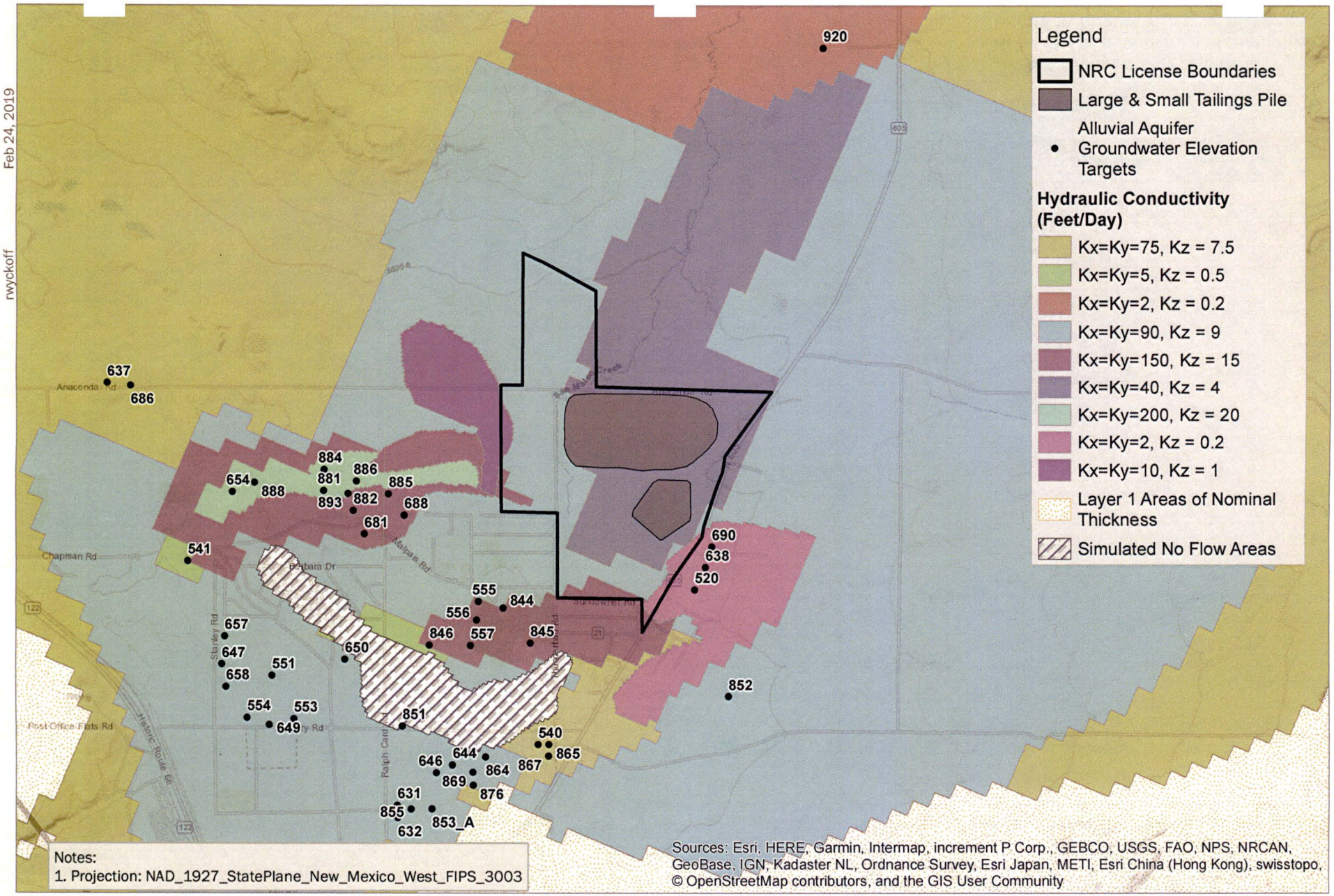
0 2.5 5 Miles

N

Figure 3-26

Layer 10 (San Andres/Glorieta Aquifer) Hydraulic Conductivity



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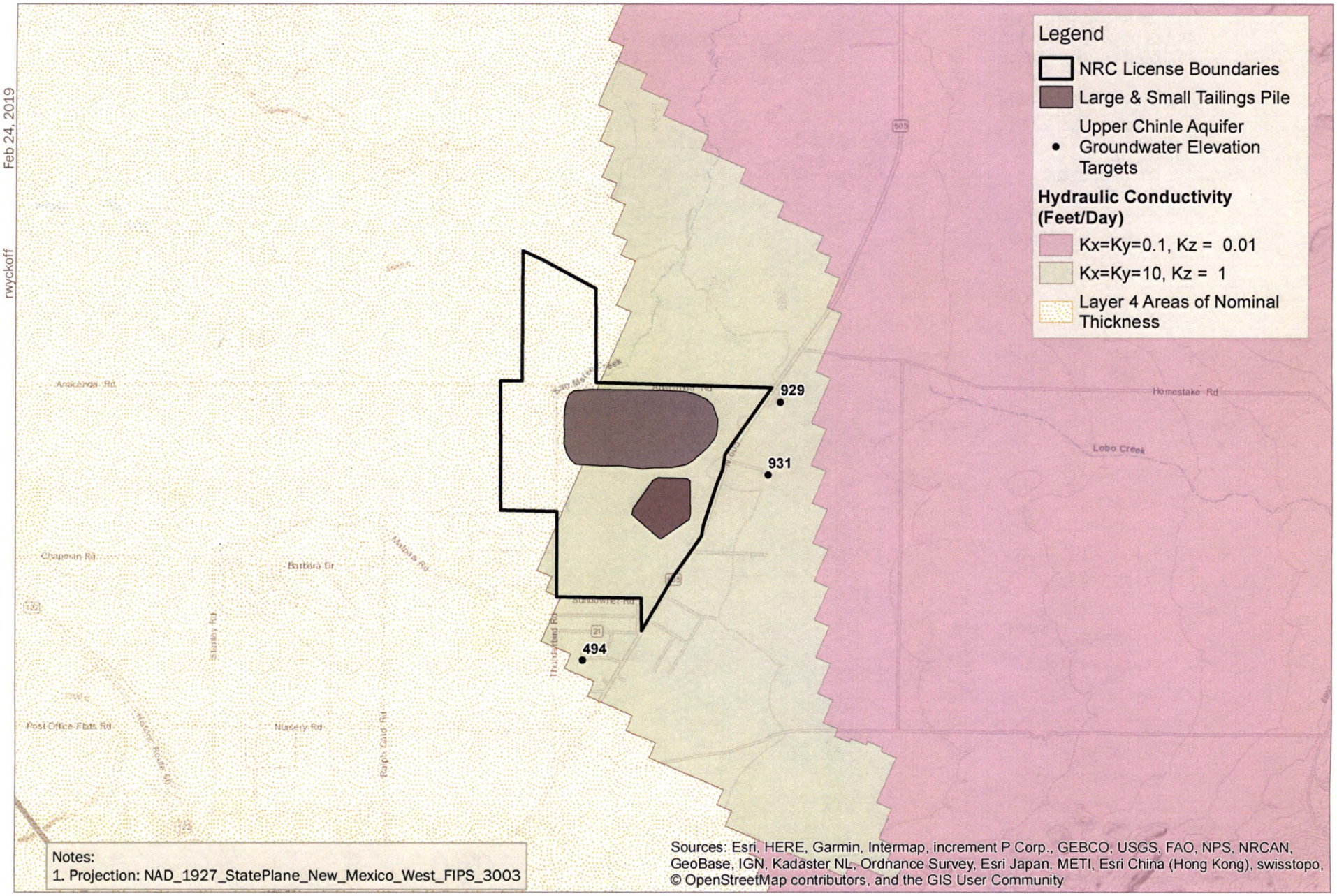
0 2,000 4,000 Feet

N

Figure 4-1

Layer 1 (Alluvial Aquifer) Hydraulic Conductivity and Groundwater Elevation Targets



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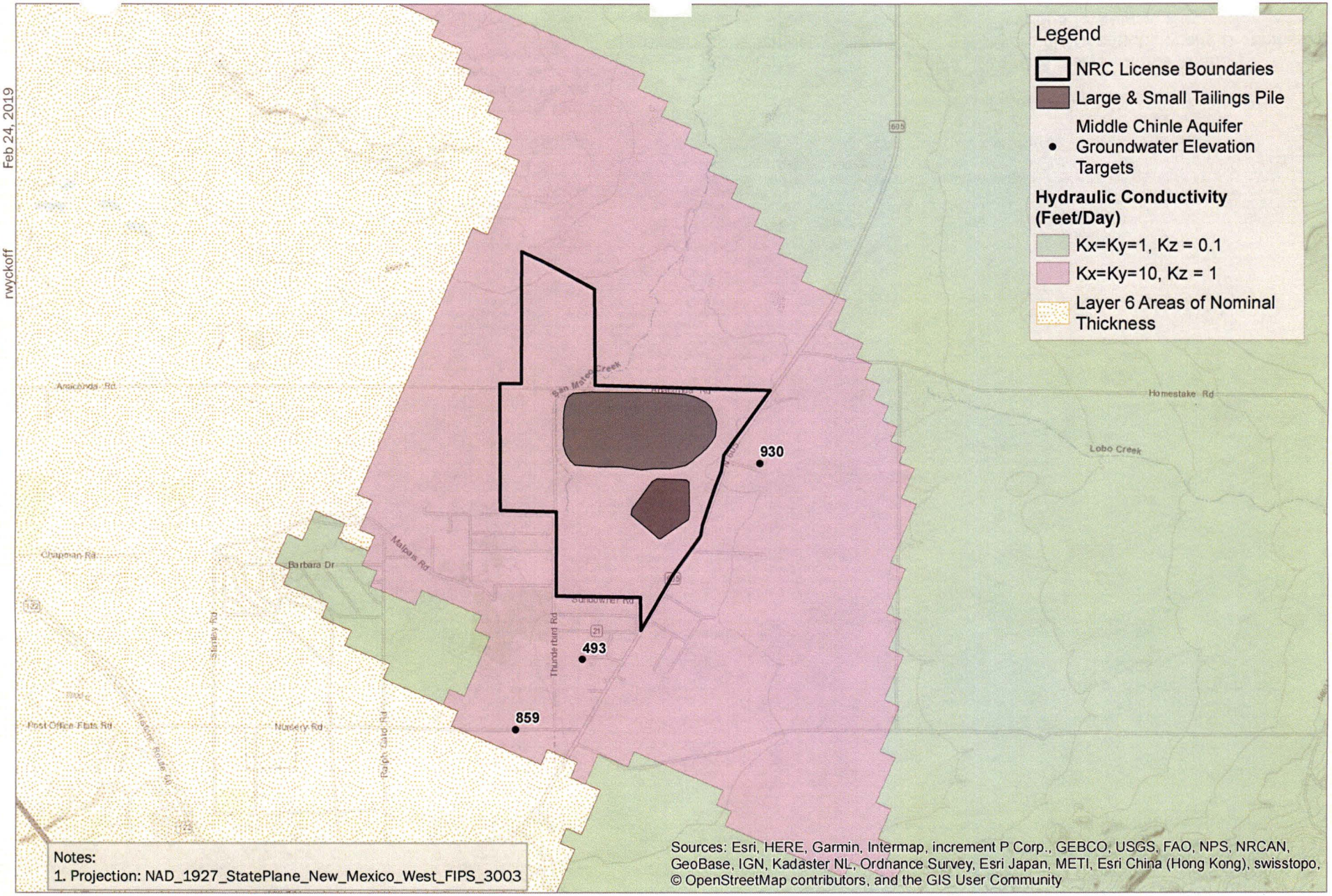
0 2,000 4,000 Feet

N

Figure 4-2

Layer 4 (Upper Chinle Aquifer) Hydraulic Conductivity and Groundwater Elevation Targets



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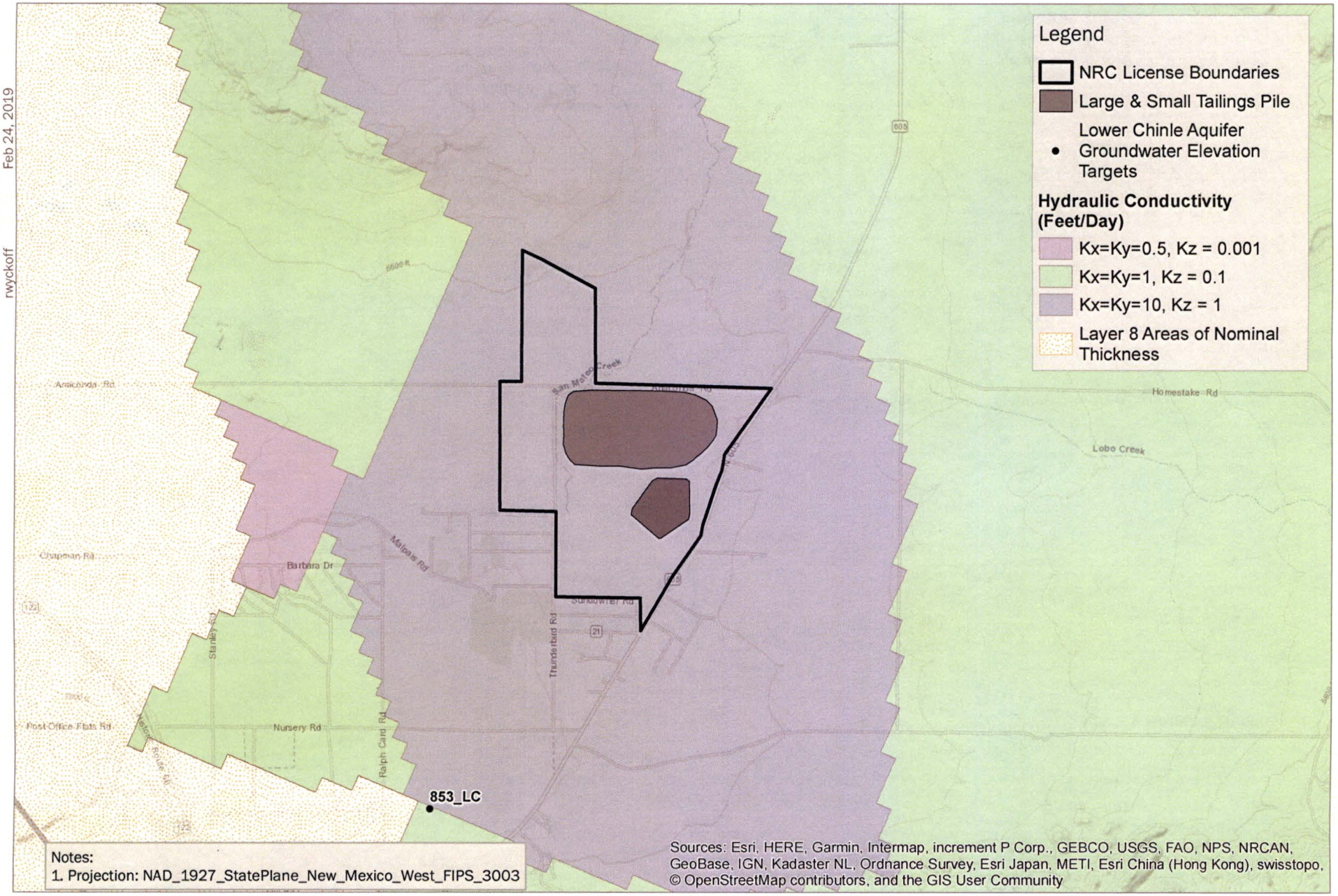
0 2,000 4,000 Feet

N

Figure 4-3

Layer 6 (Middle Chinle Aquifer) Hydraulic Conductivity and Groundwater Elevation Targets



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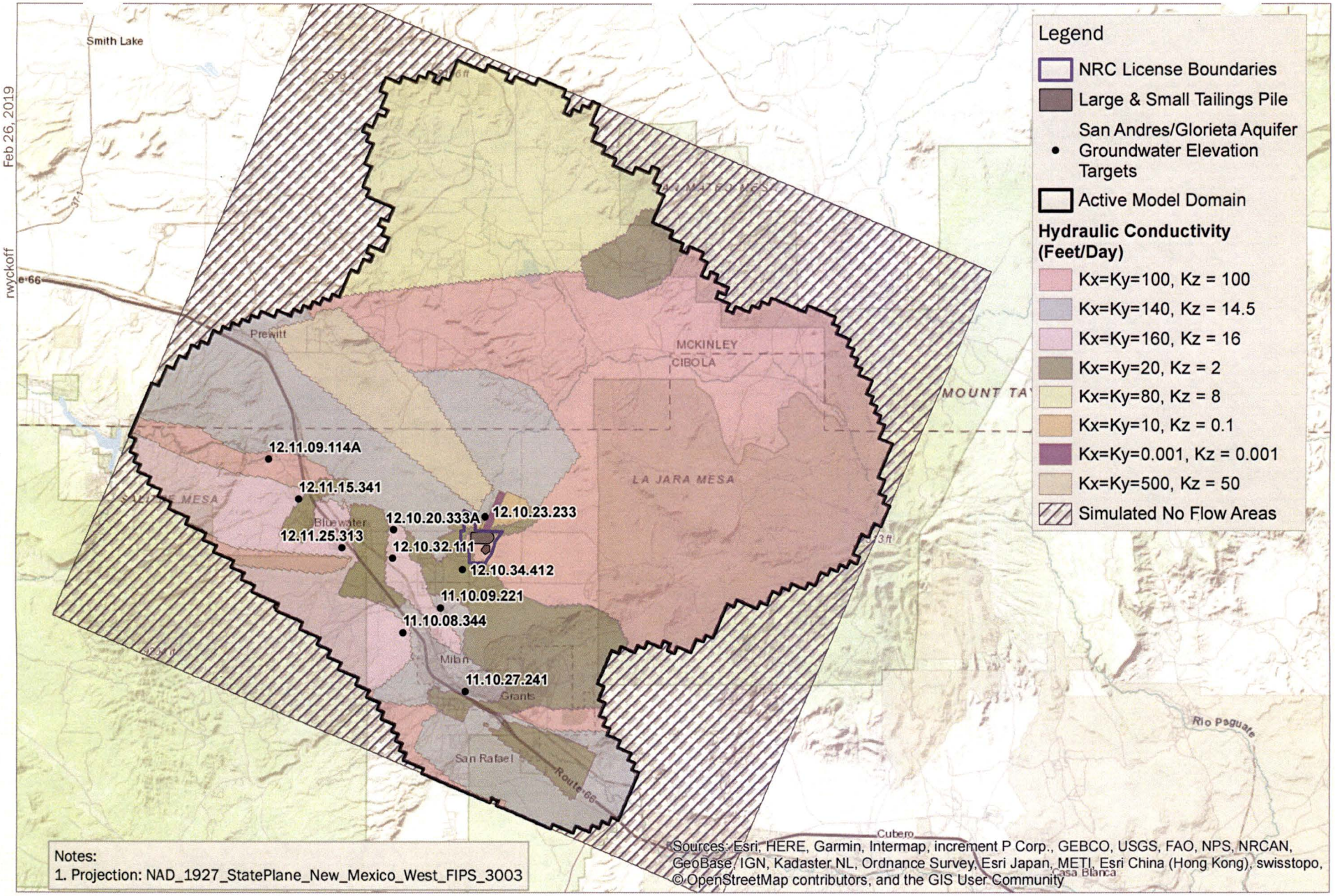
0 2,000 4,000 Feet

N

Figure 4-4

Layer 8 (Lower Chinle Aquifer) Hydraulic Conductivity and Groundwater Elevation Targets



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0 2.5 5 Miles

N

Figure 4-5

Layer 10 (San Andres/Glorieta Aquifer) Hydraulic Conductivity and Groundwater Elevation Targets

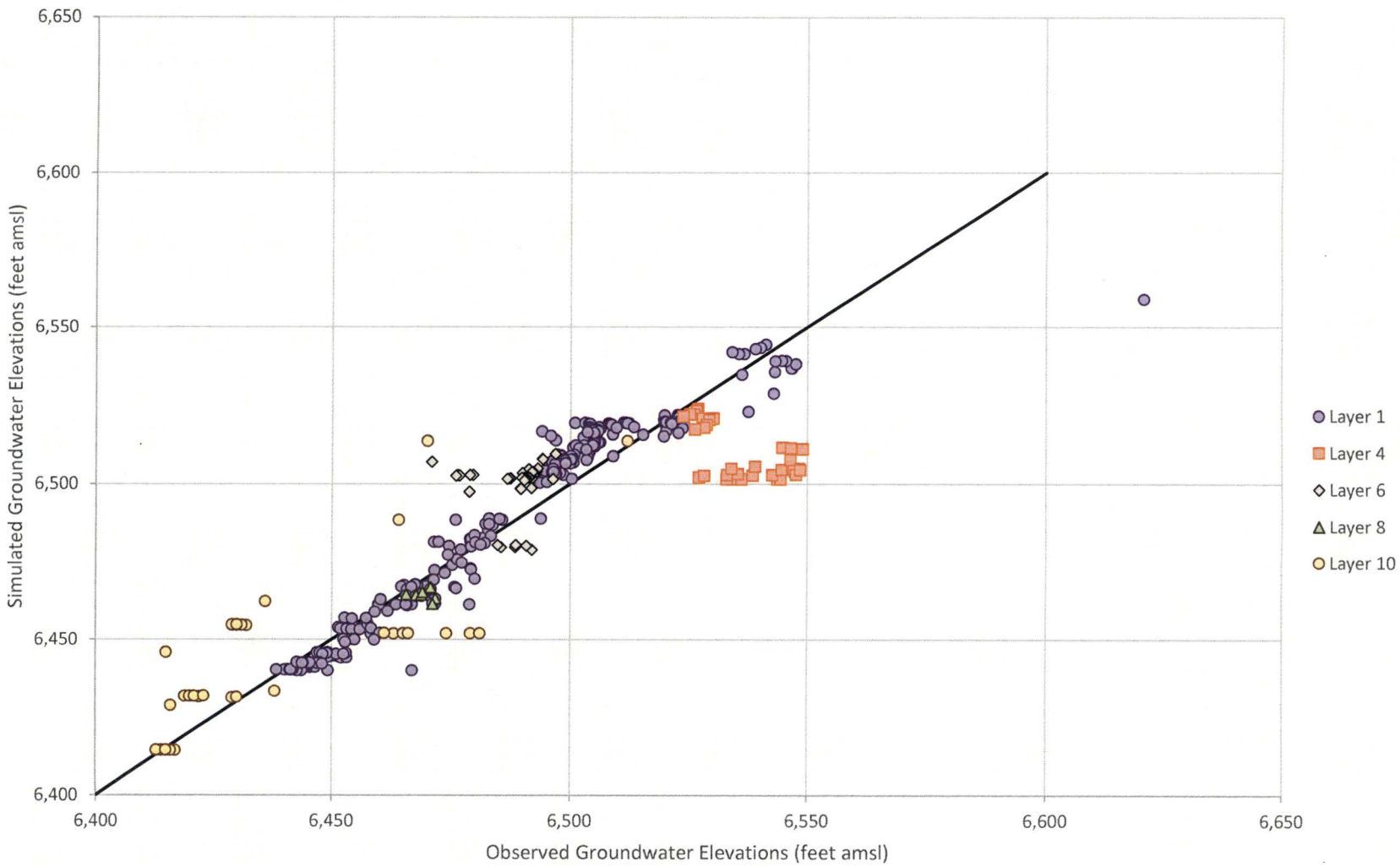

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Figure 4-6

Scatterplot of Simulated versus Observed Groundwater Elevations

[BCDENFP01]: P:\Data\GEN\Barrick-Homestake\Grants Groundwater Model\GIS_SiteModelReporting\Figure4_7_2015SiteContours.mxd
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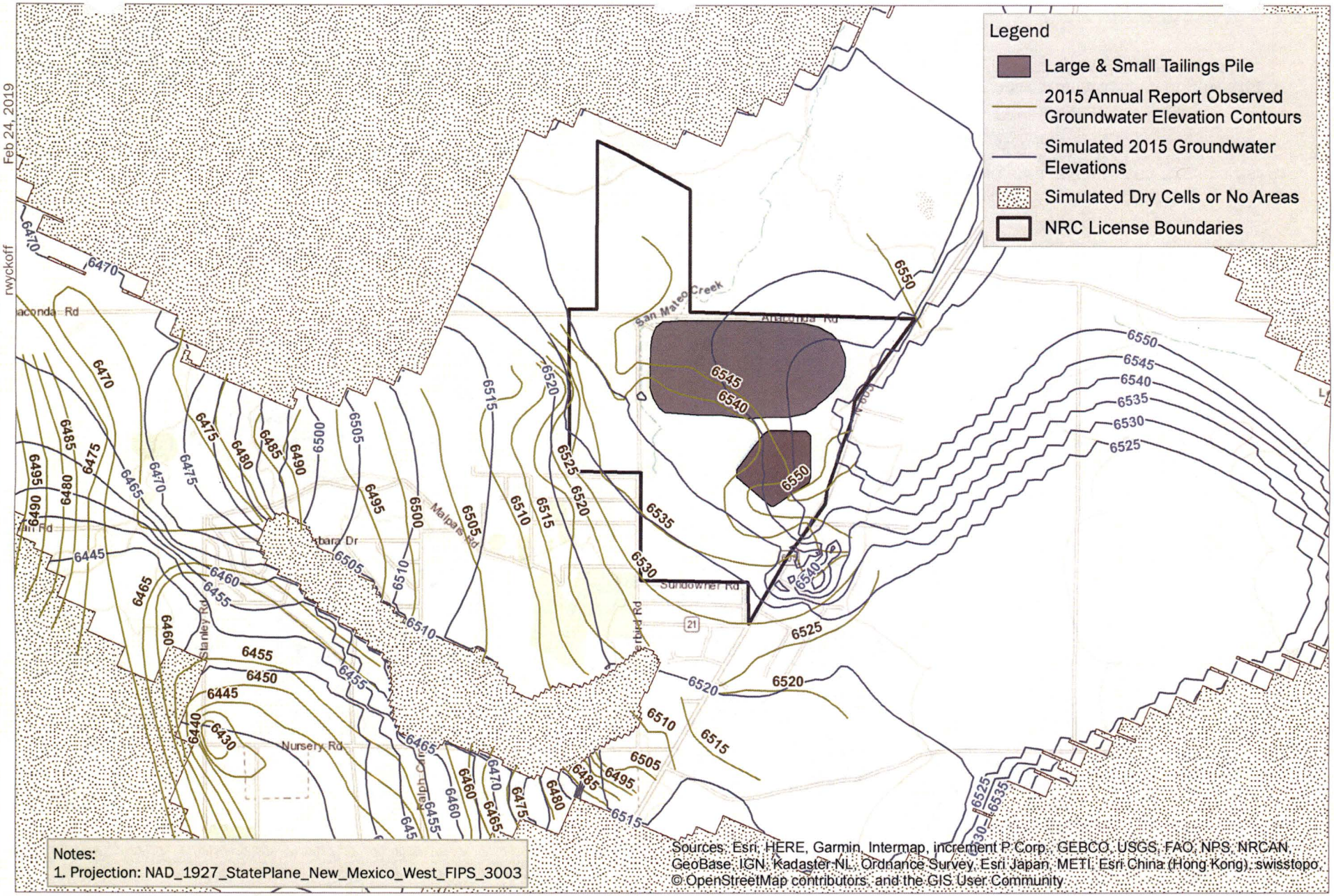

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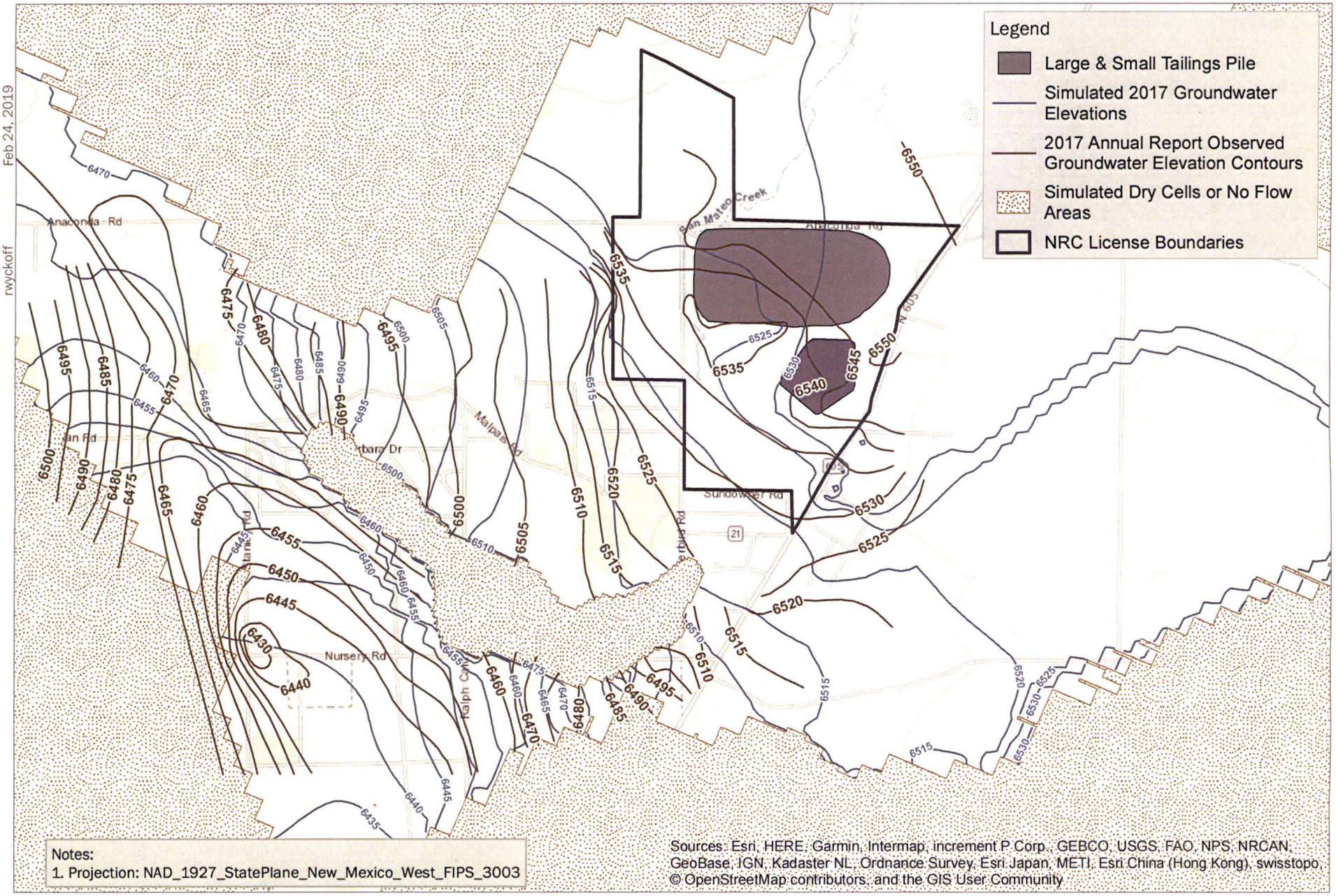
0 0.5 1 Miles

N

Figure 4-7
Alluvial Simulated vs. Observed 2015 Groundwater Elevation Contours



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0 0.5 1 Miles

N

Figure 4-8
Alluvial Simulated vs. Observed 2017 Groundwater Elevation Contours

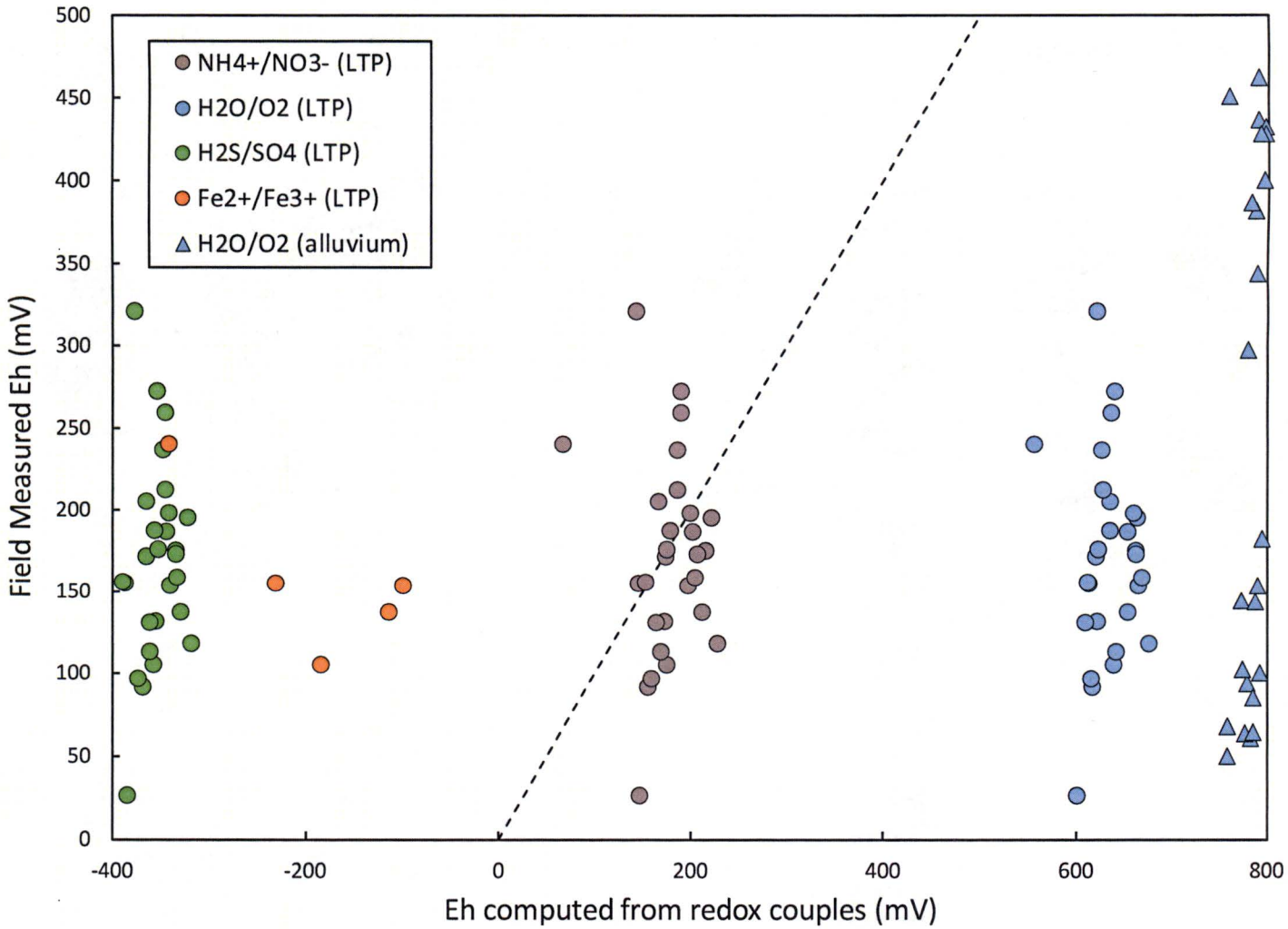

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Figure 5-1

Comparison of Field-Measured Groundwater Eh and Potentials Computed from Individual Redox Couples for Selected LTP and Alluvial Wells

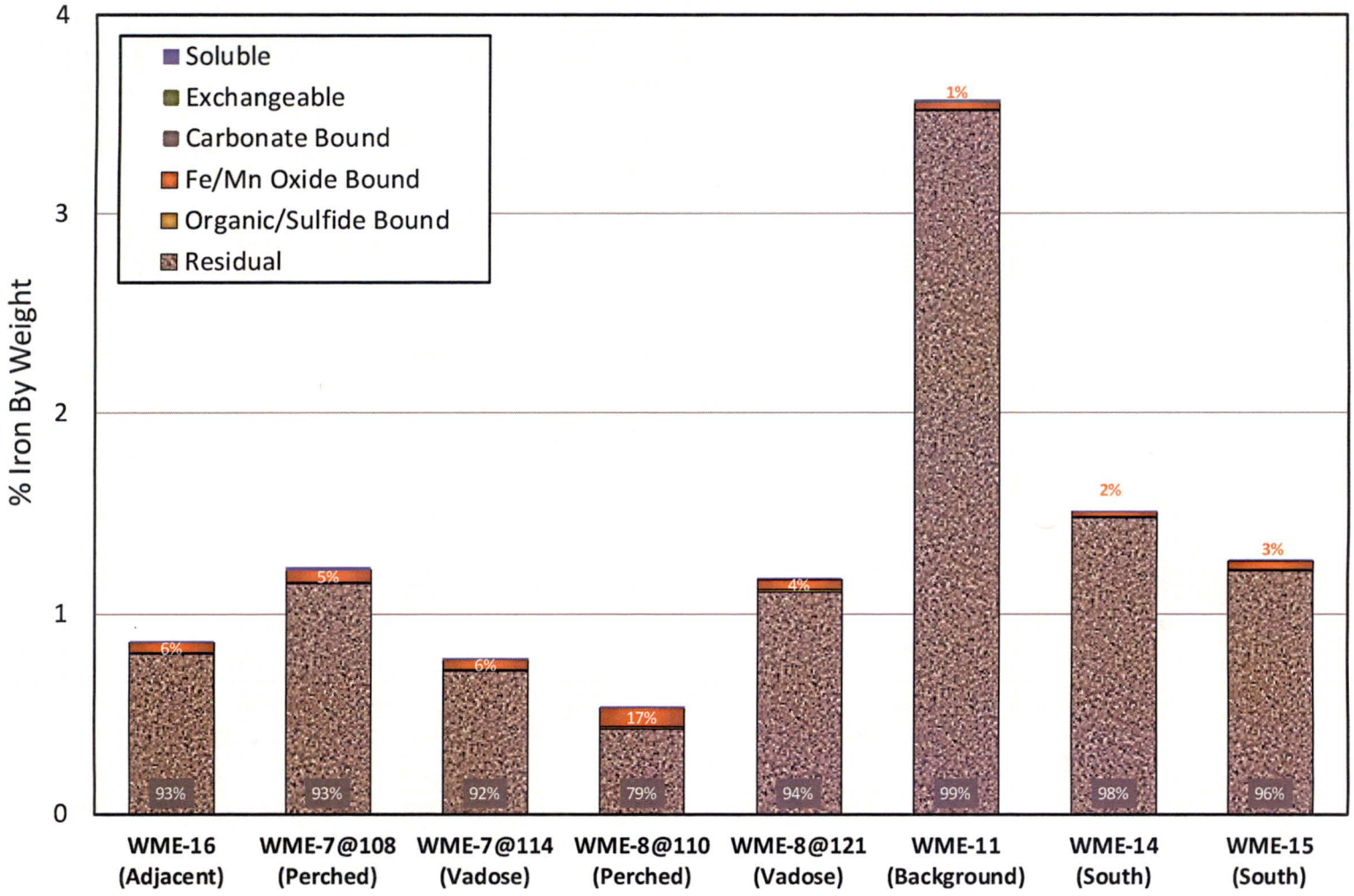

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Figure 5-2

Selective Extraction Iron Results for Alluvium Samples

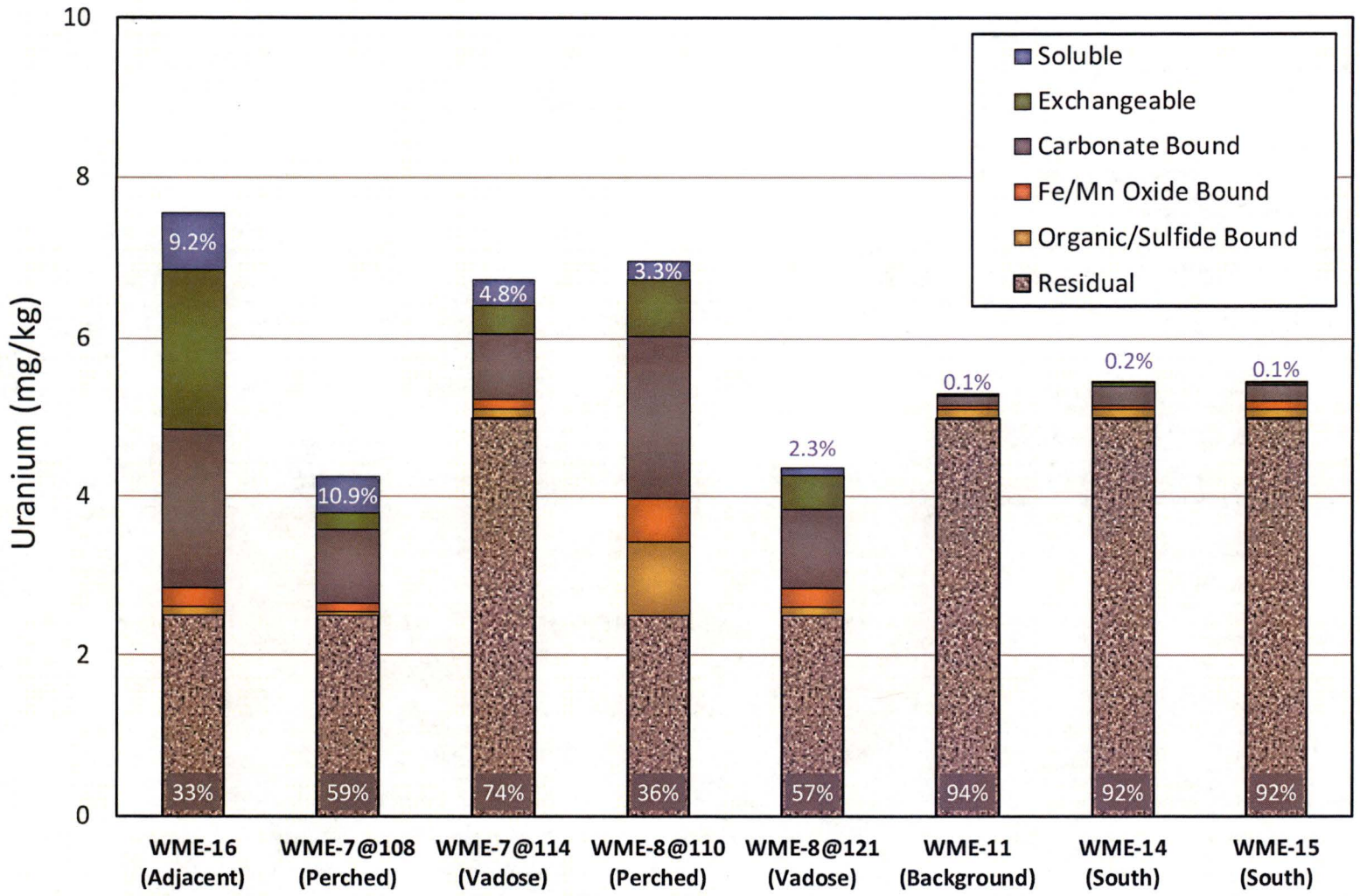

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Figure 5-3

Selective Extraction Uranium Results for Alluvium Samples

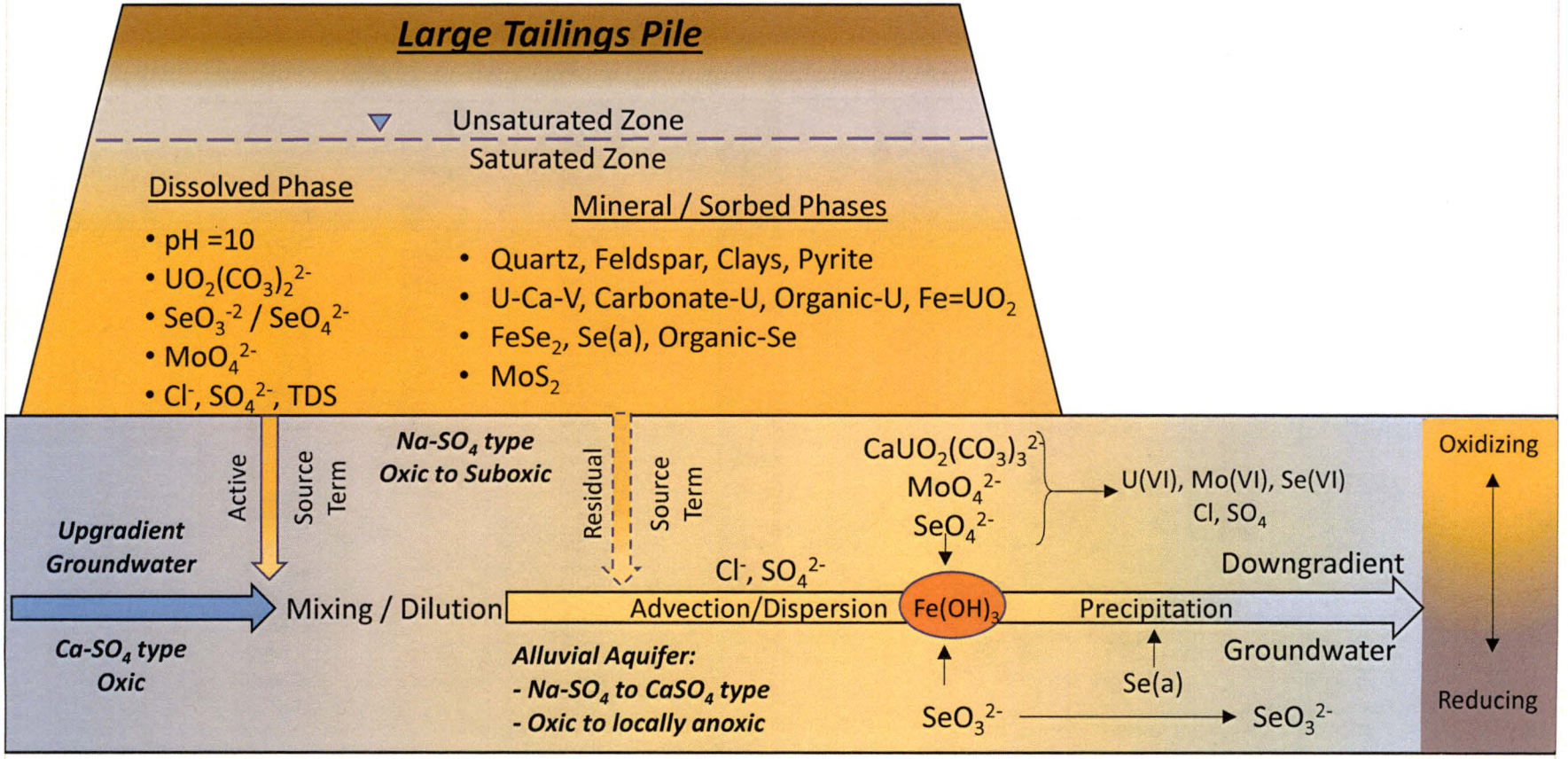

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Figure 5-4

Conceptual Geochemical Model for COC Sources and Transport

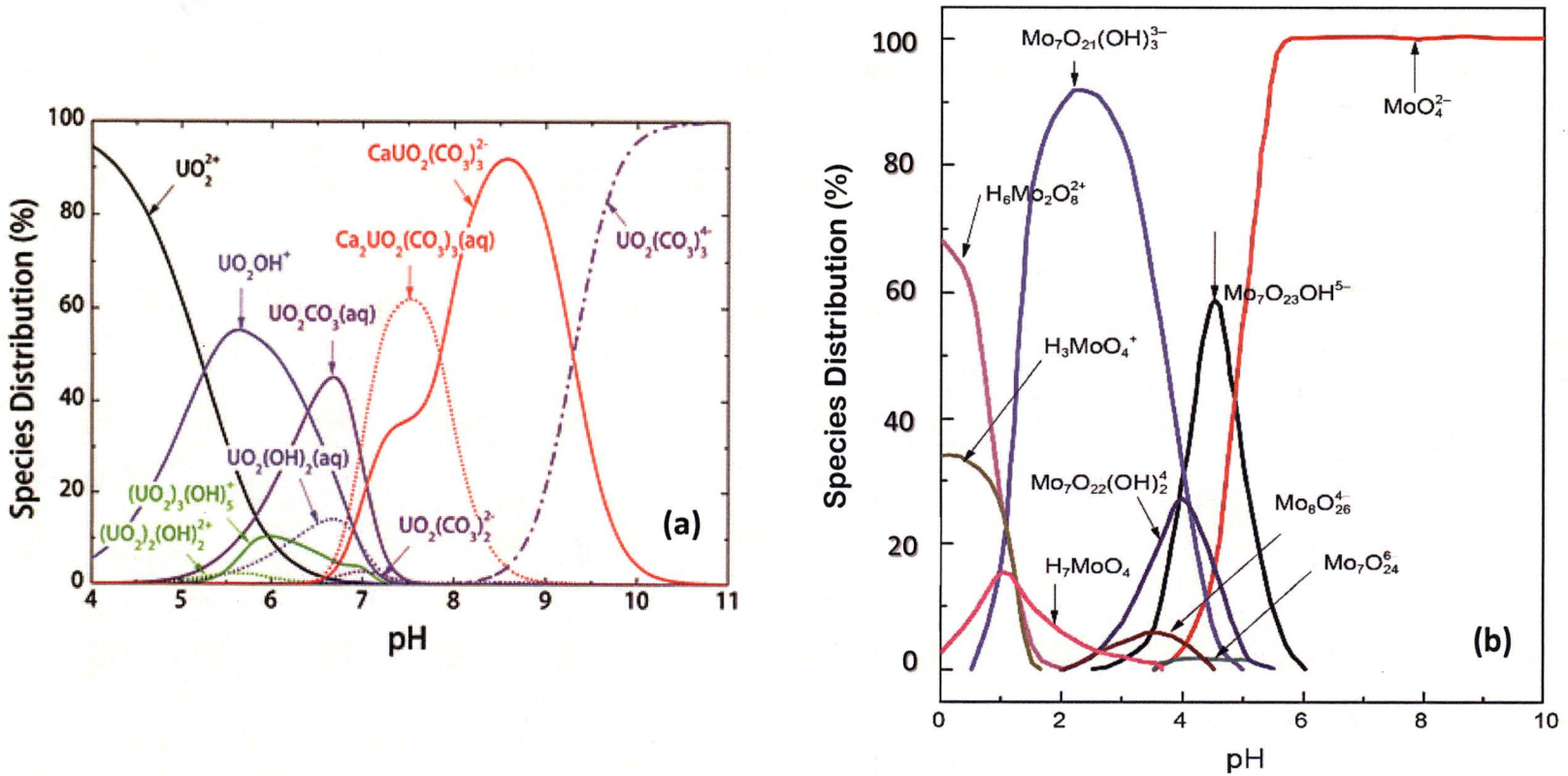

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Figure 5-5

(a) Uranium and (b) molybdenum speciation as a function of pH (Lee and Yun, 2013; Lee et al., 2011)

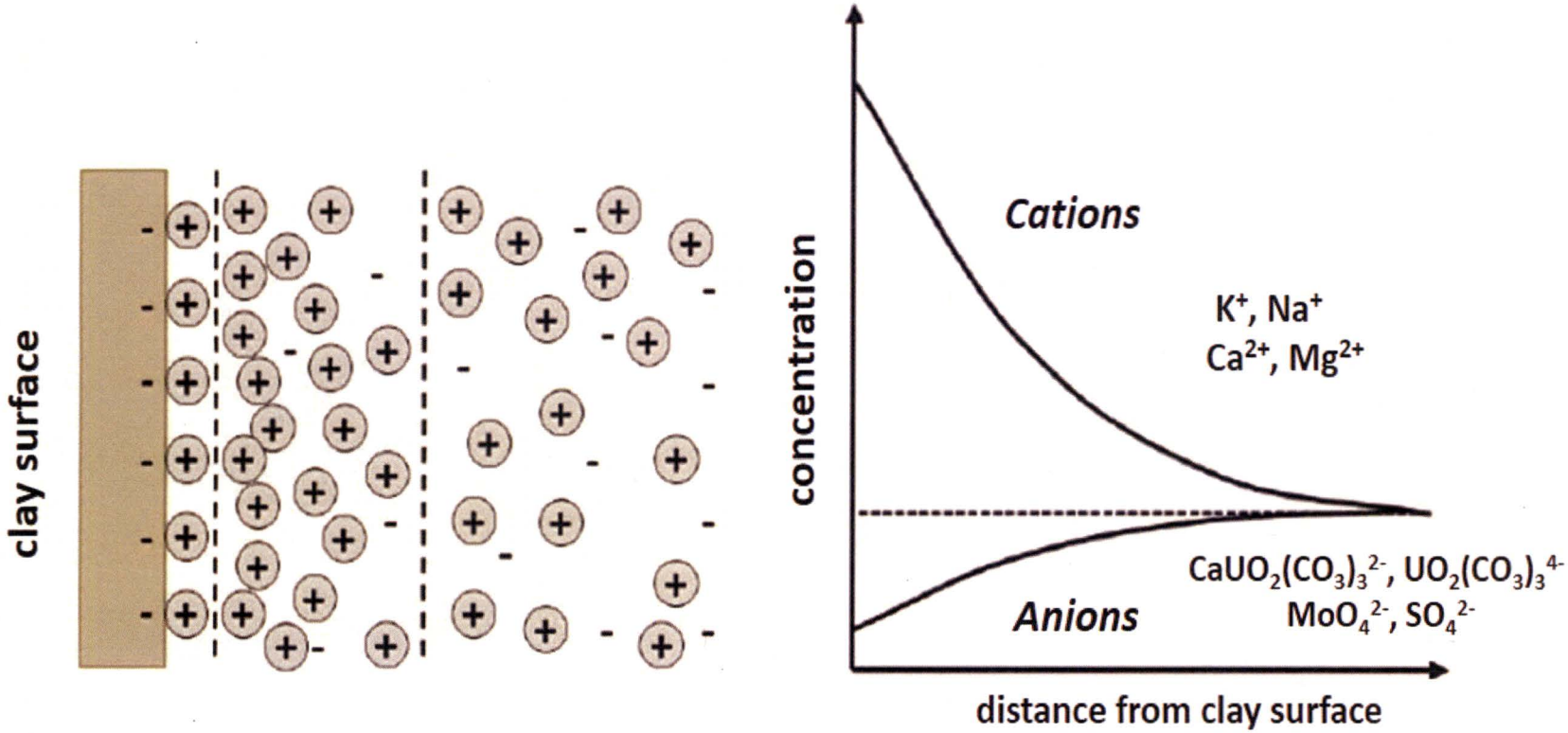

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Figure 5-6

Distribution of Ions Adjacent to a Clay Surface

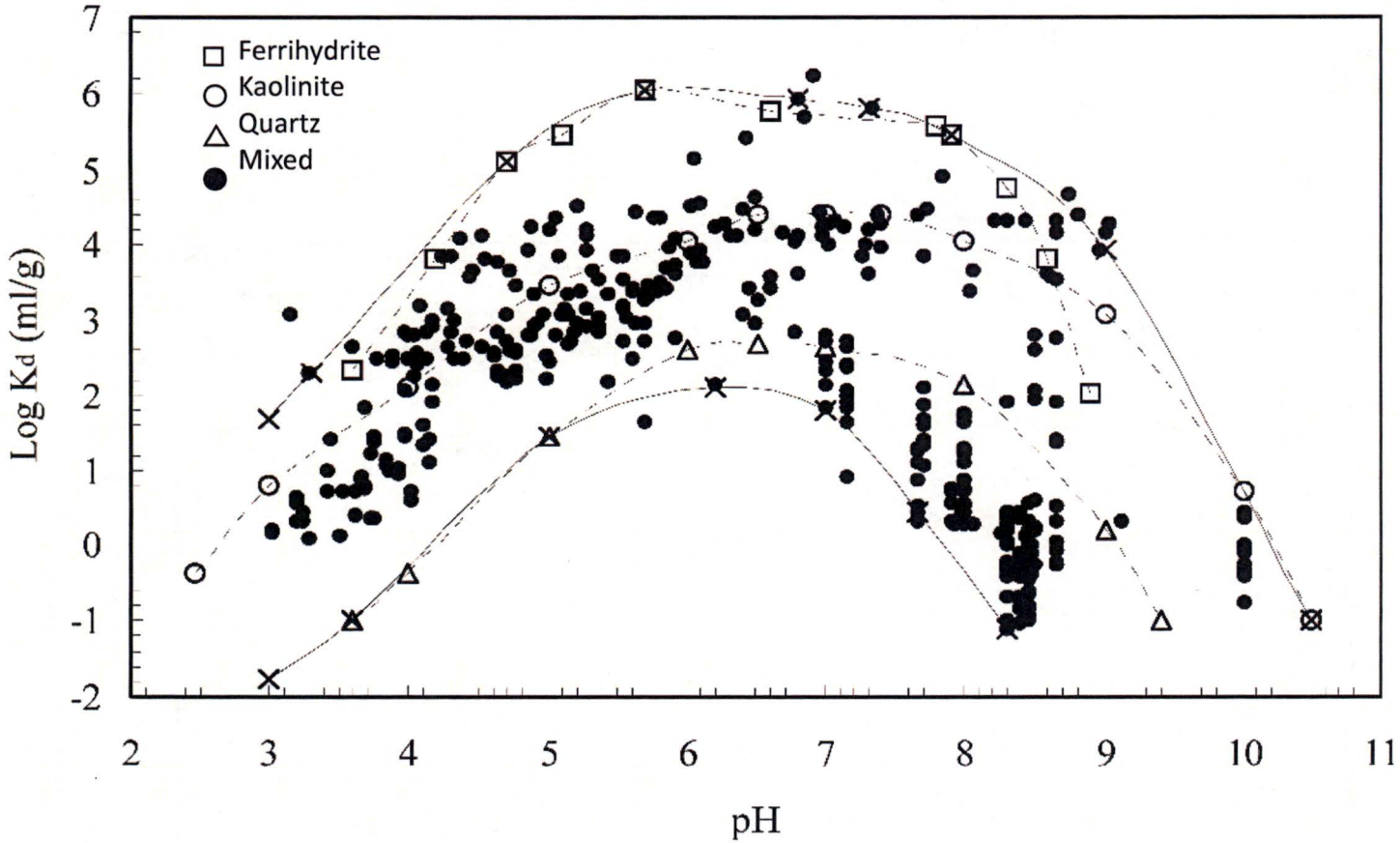

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Figure 5-7

Range of Uranium K_d Values Compiled by the USEPA (1999) for Various Minerals

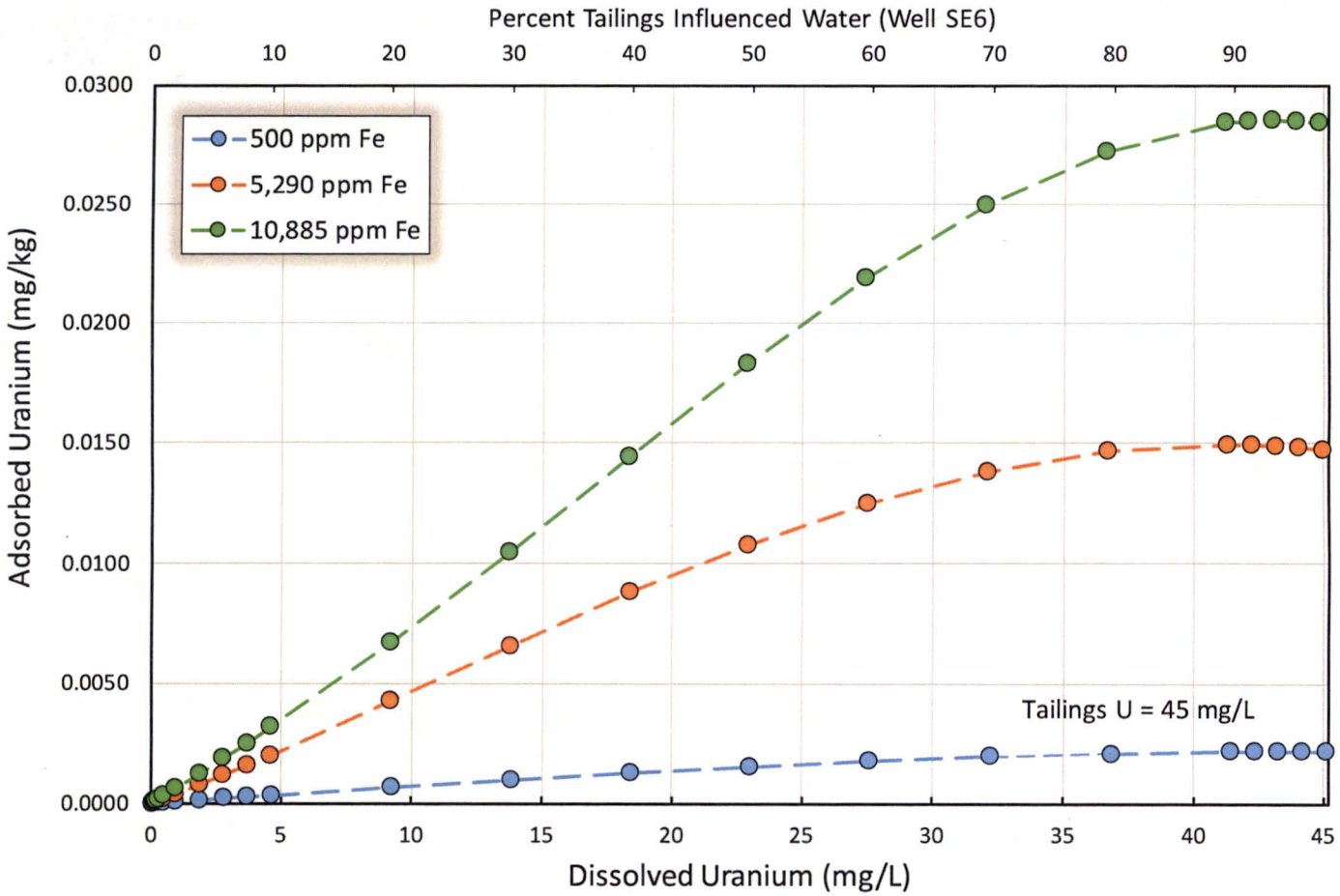

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Figure 5-8

Initial Modeling Results Simulating UO_2^{2+} Adsorption Onto Ferrihydrite for Three Different Iron Concentrations

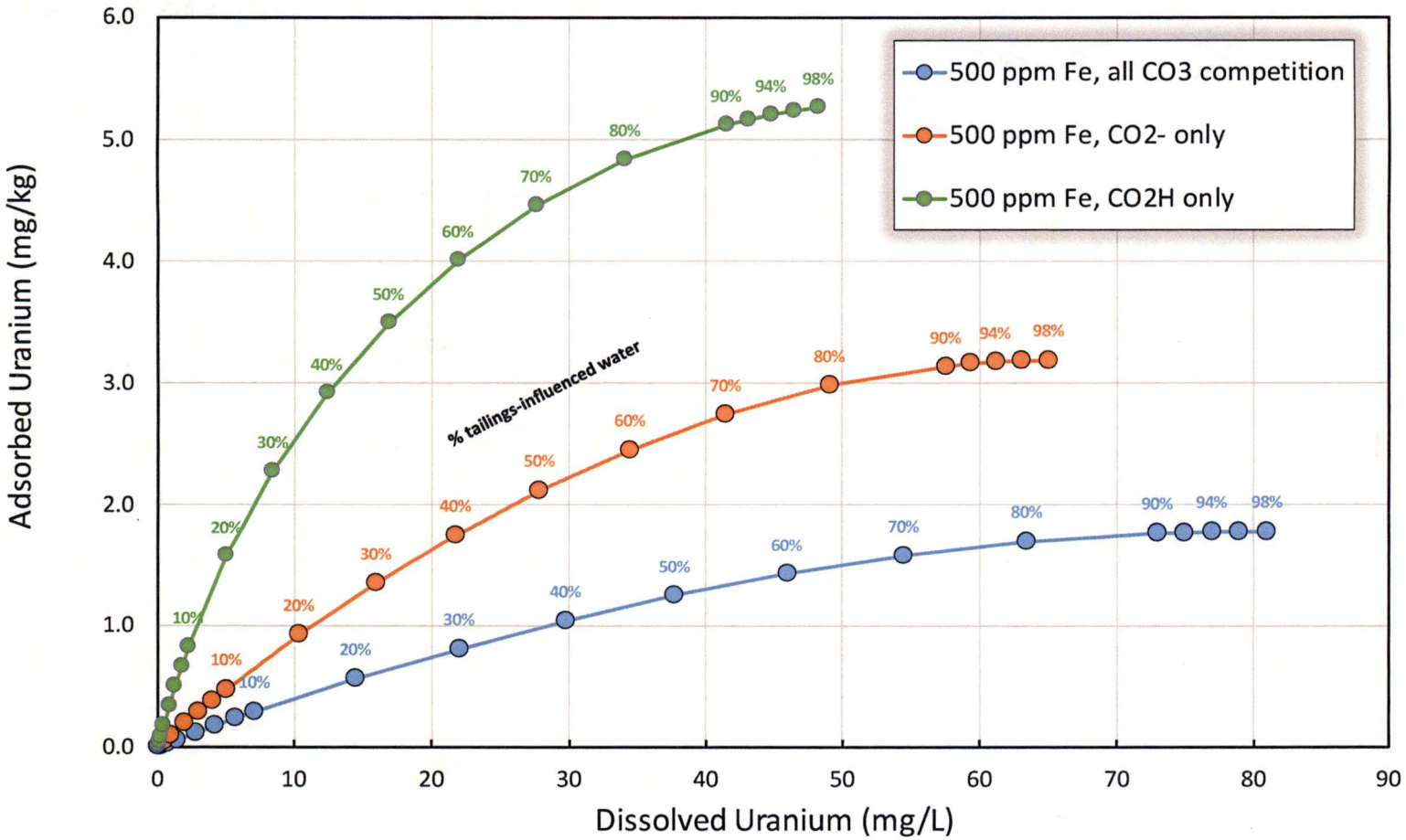

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Figure 5-9

Model Results Showing the Effect of Adsorbed Carbonate Species on Uranium Adsorption With Increasing Percentage of Tailings-Influenced Water

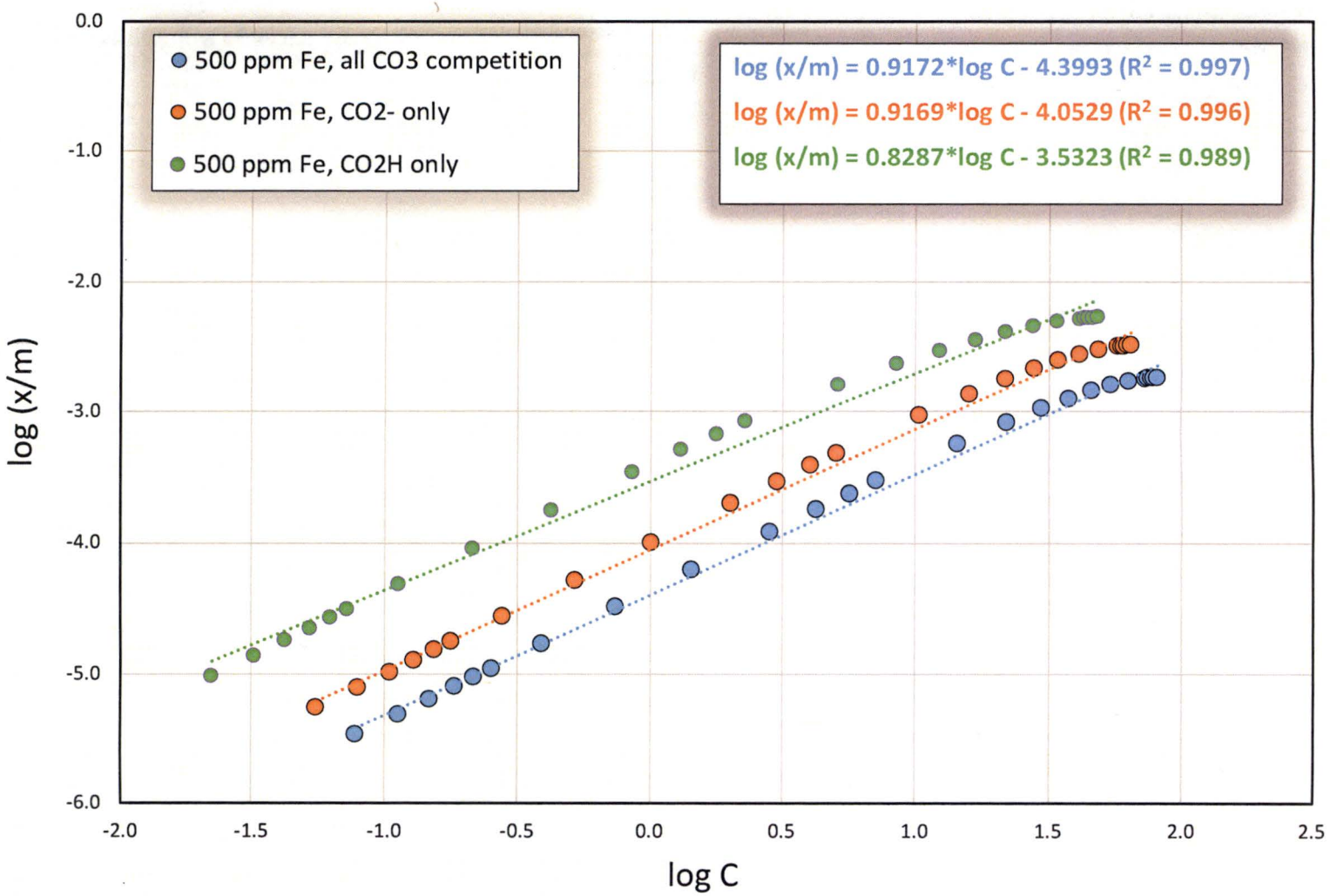

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Figure 5-10

Linear Freundlich Isotherm Plot for Adsorption of Various Carbonate Species

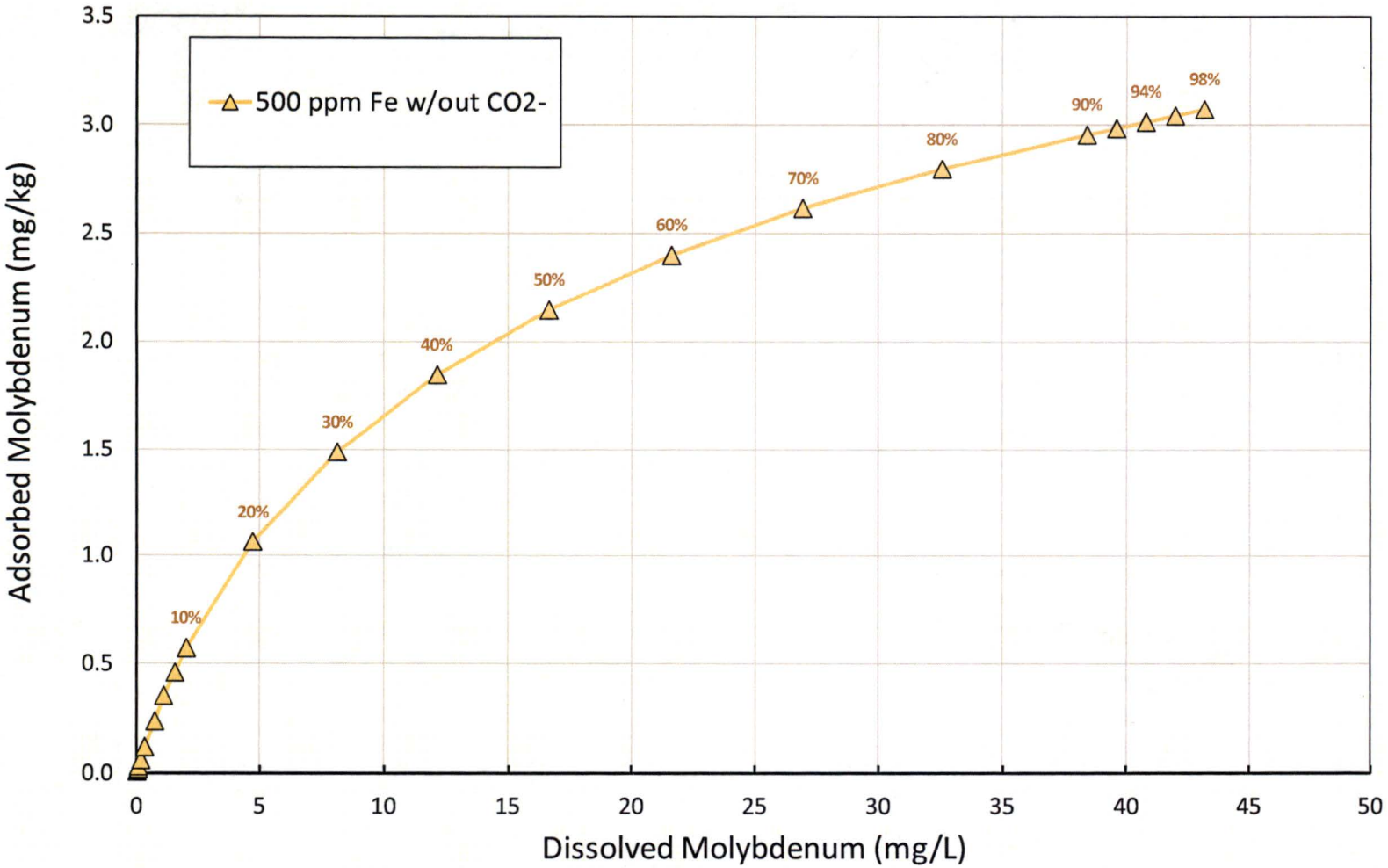

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Figure 5-11

Model Adsorption Curve for Molybdenum

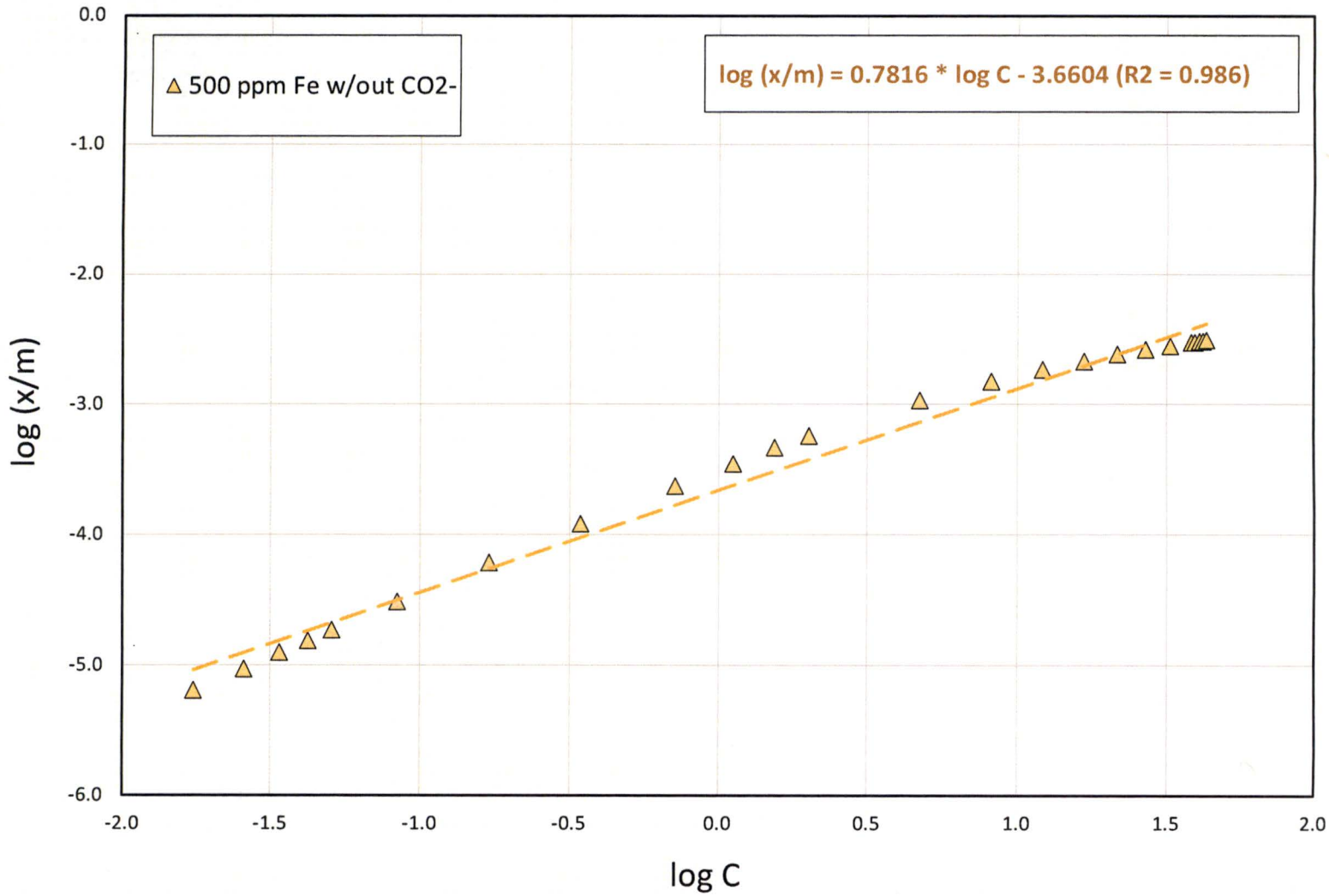

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Figure 5-12

Linear Freundlich Isotherm Plot for Molybdenum

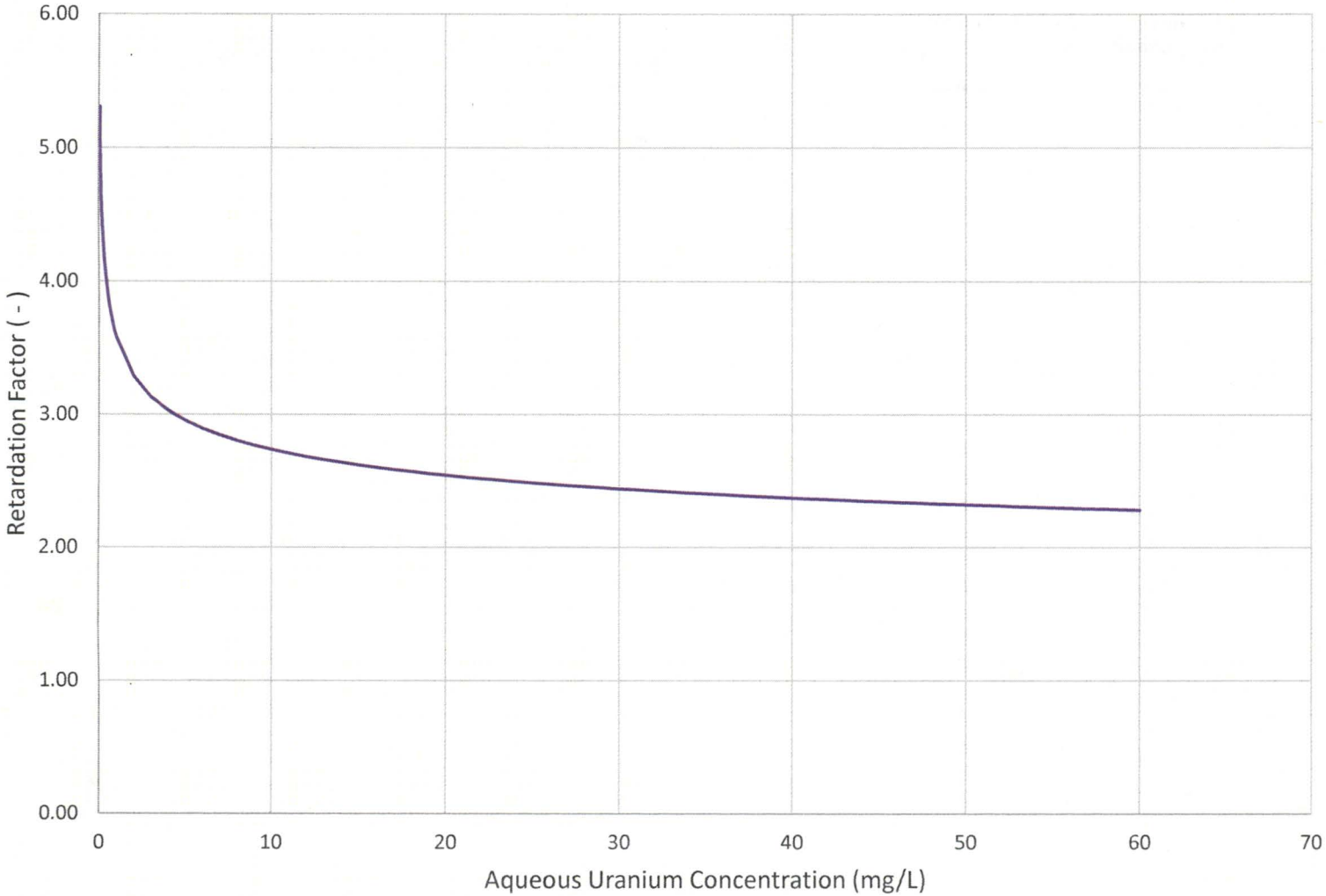

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Figure 5-13

Retardation and Aqueous Uranium Concentration Relationship for Transport Modeling

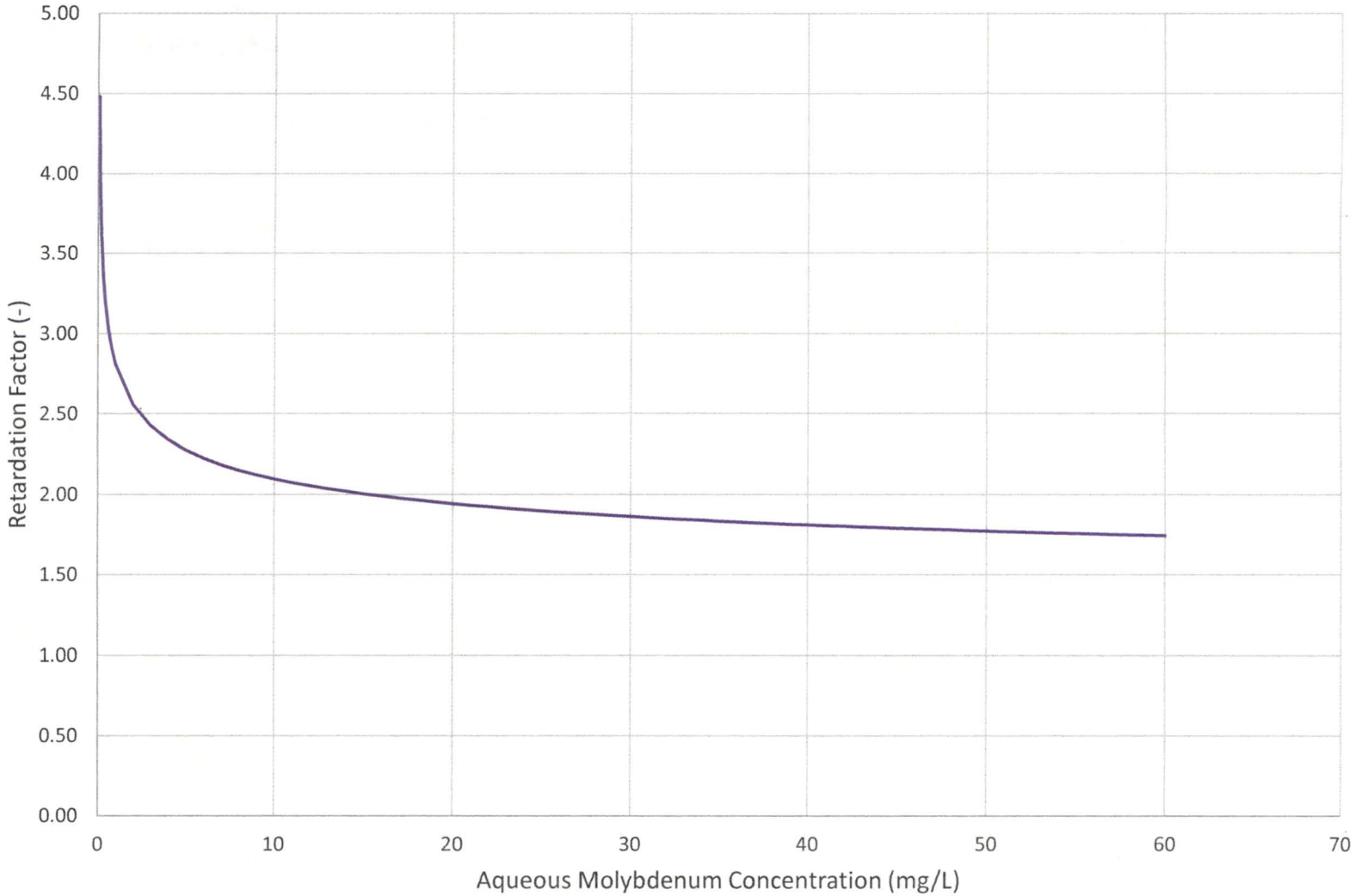

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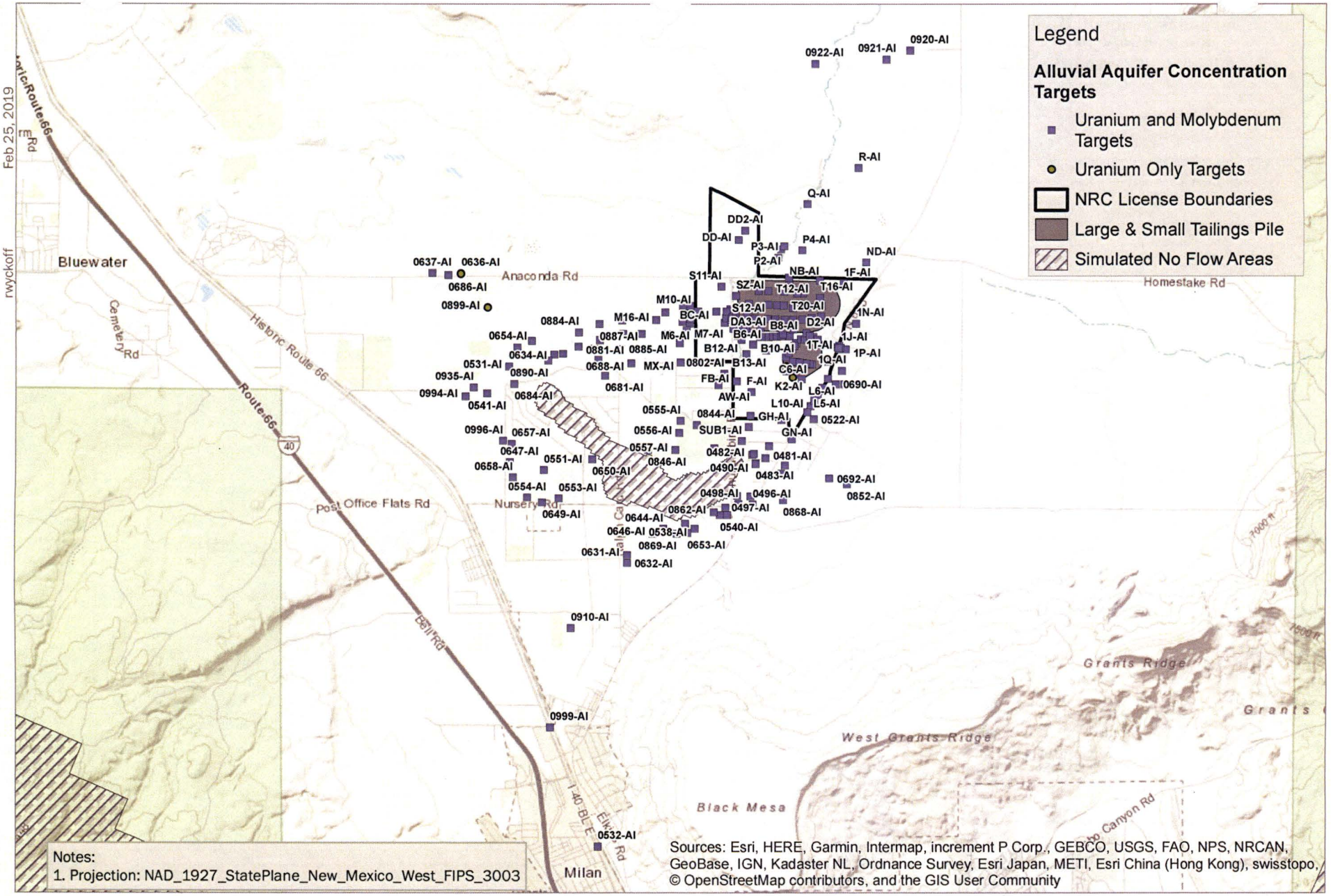
Figure 5-14

Retardation and Aqueous Molybdenum Concentration Relationship for Transport Modeling



Notes:
1. Projection: NAD_1927_StatePlane_New_Mexico_West_FIPS_3003

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

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0 3,000 6,000 Feet

N

Figure 5-15

Layer 1 (Alluvial Aquifer) Uranium and Molybdenum Concentration Targets

[BCDENFP01]: \\BCDENFP01\Projects\Data\GEN\Barrick-Homestake\Grants Groundwater Model\GIS_SiteModelReporting\Figure5_x2_Ly04_HydraulicKandConcTargs.mxd
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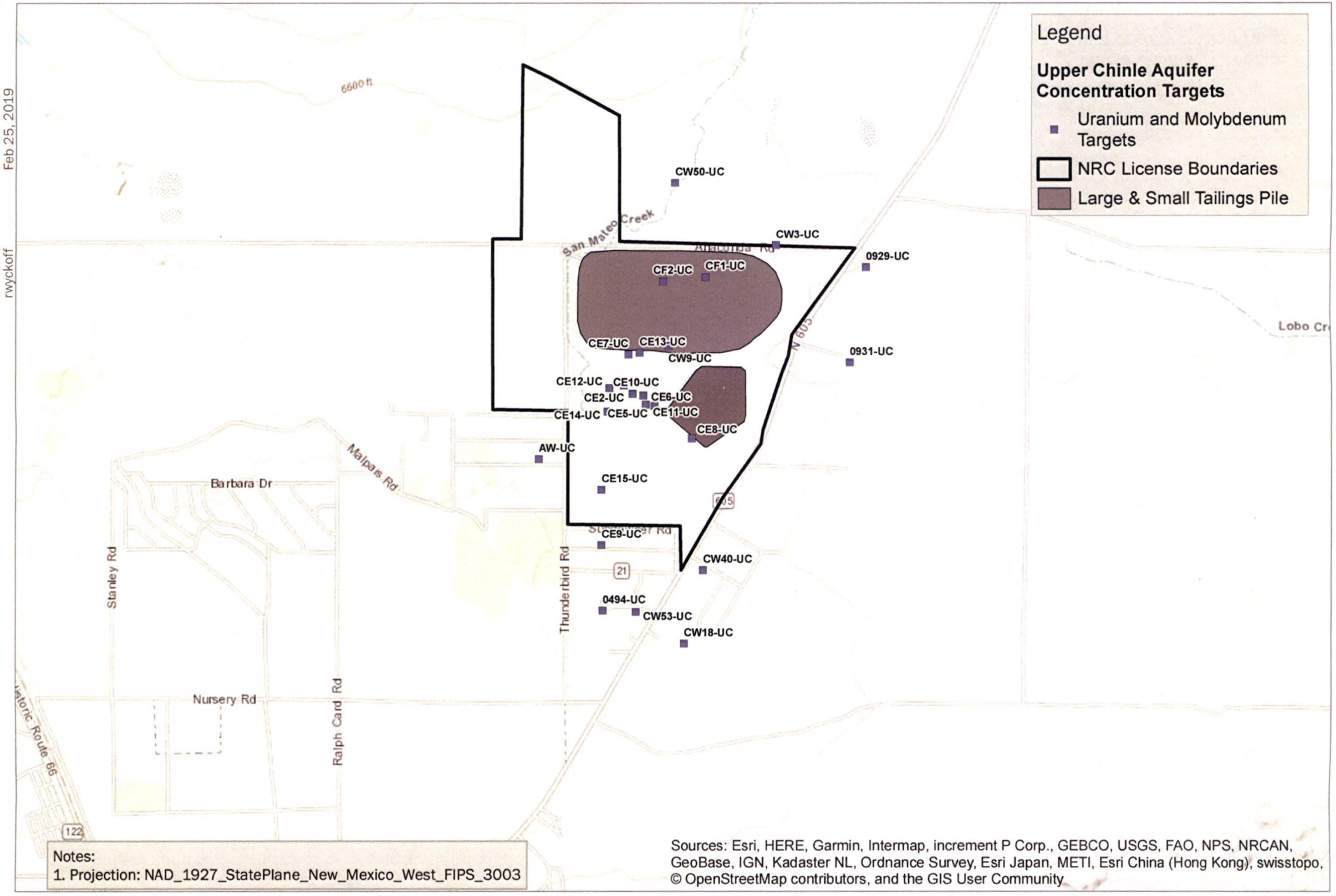

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0 0.25 0.5 Miles

N

Figure 5-16

Layer 4 (Upper Chinle Aquifer) Uranium and Molybdenum Concentration Targets

[BCDENFP01]: \\BCDENFP01\Projects\Data\GEN\Barrick-Homestake\Grants Groundwater Model\GIS_SiteModelReporting\Figure5_x3_Ly06_HydraulicKandConcTargs.mxd
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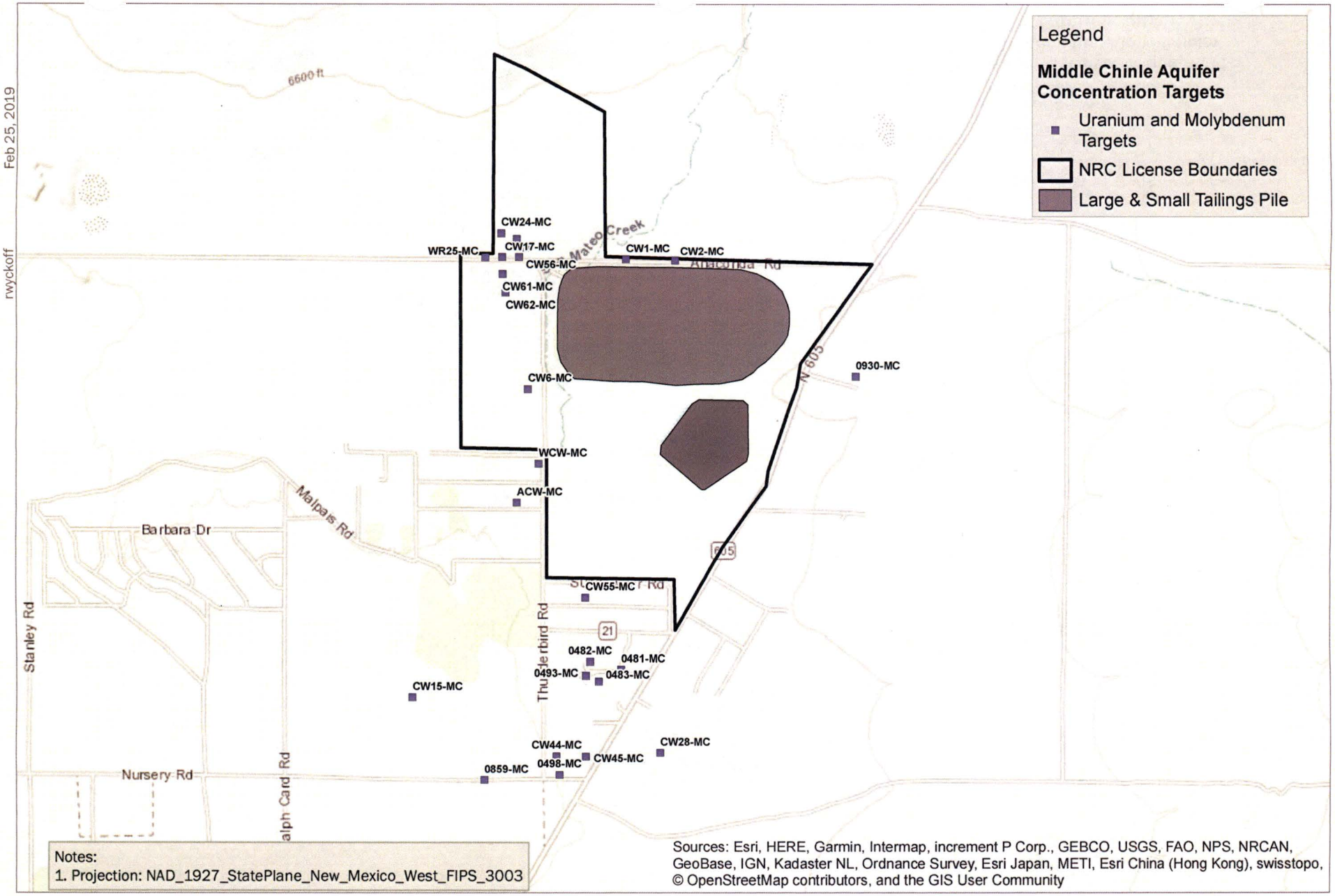

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Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

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0 2,000 4,000 Feet

N

Figure 5-17

Layer 6 (Middle Chinle Aquifer) Uranium and Molybdenum Concentration Targets

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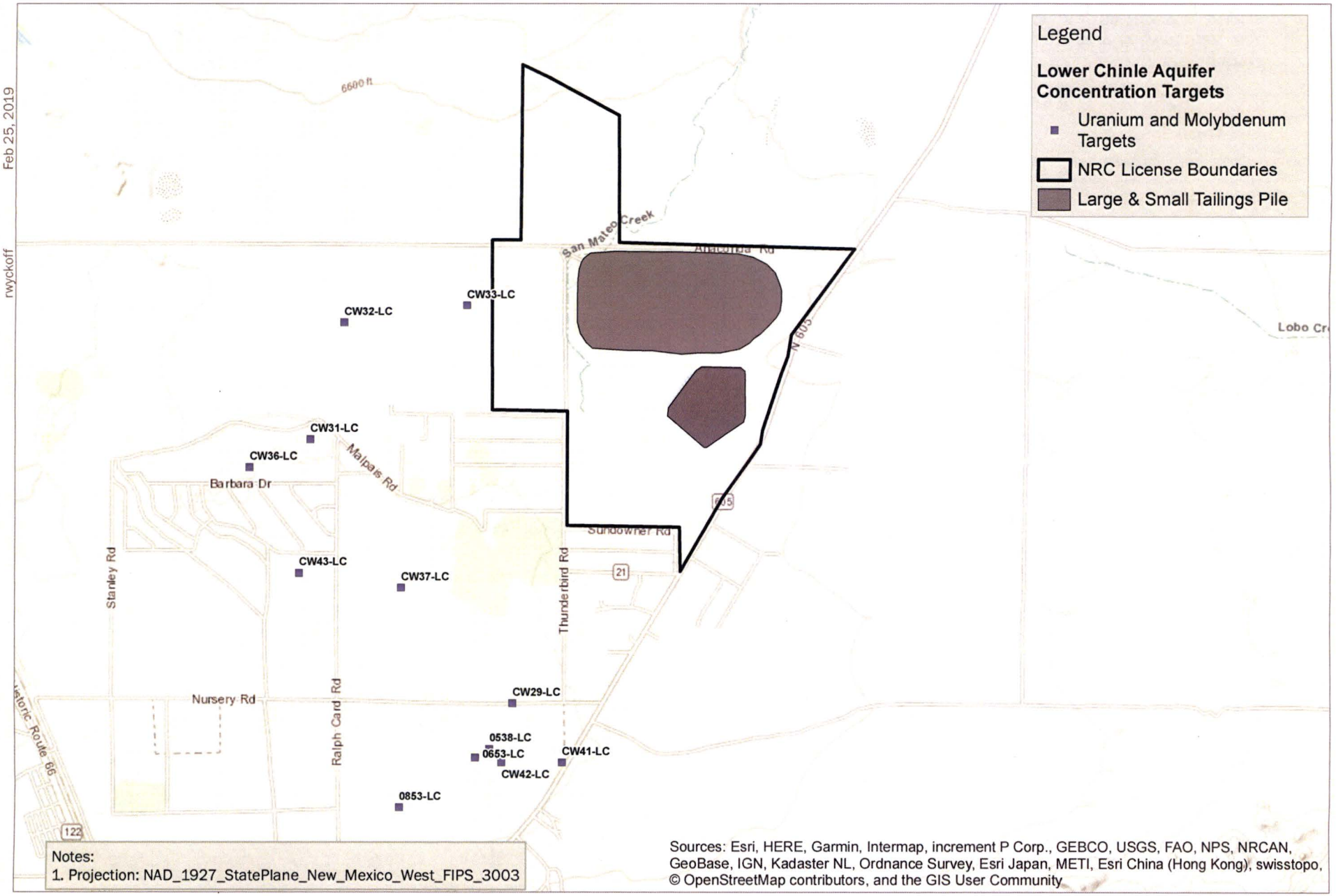

Notes:
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Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

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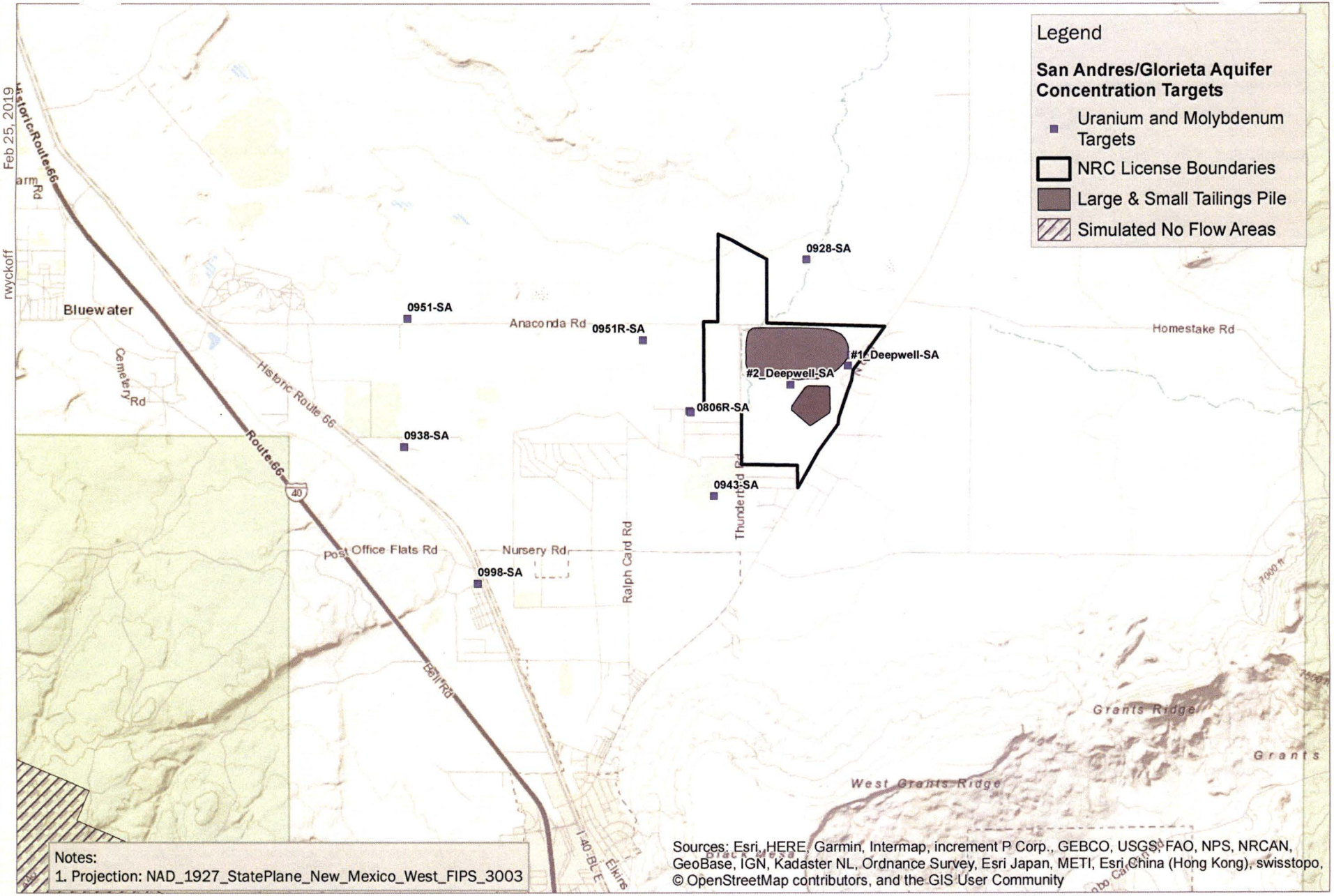
0 2,000 4,000 Feet

N

Figure 5-18

Layer 8 (Lower Chinle Aquifer) Uranium and Molybdenum Concentration Targets



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0 3,000 6,000 Feet

N

Figure 5-19

Layer 10 (San Andres/Glorieta Aquifer) Uranium and Molybdenum Concentration Targets

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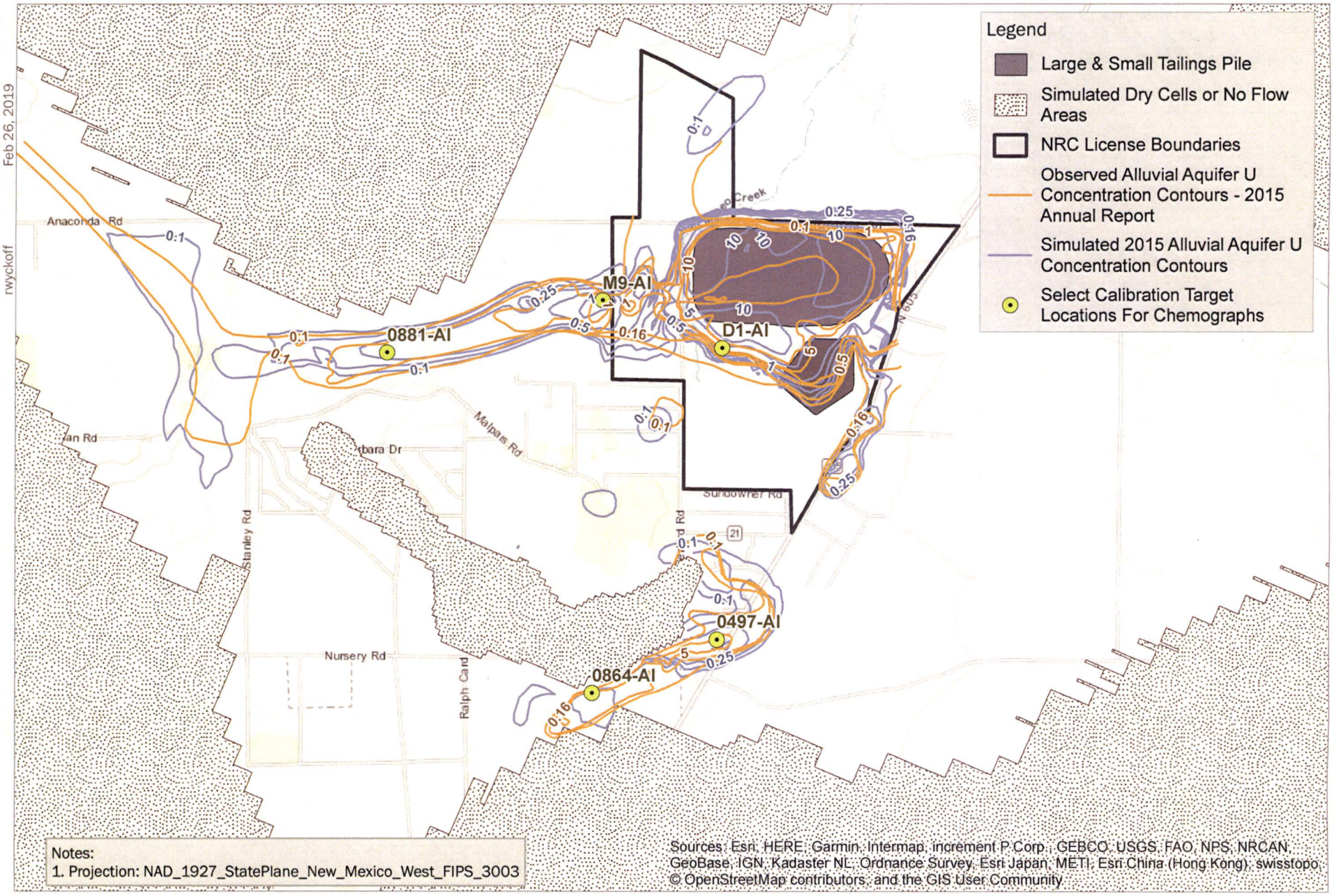

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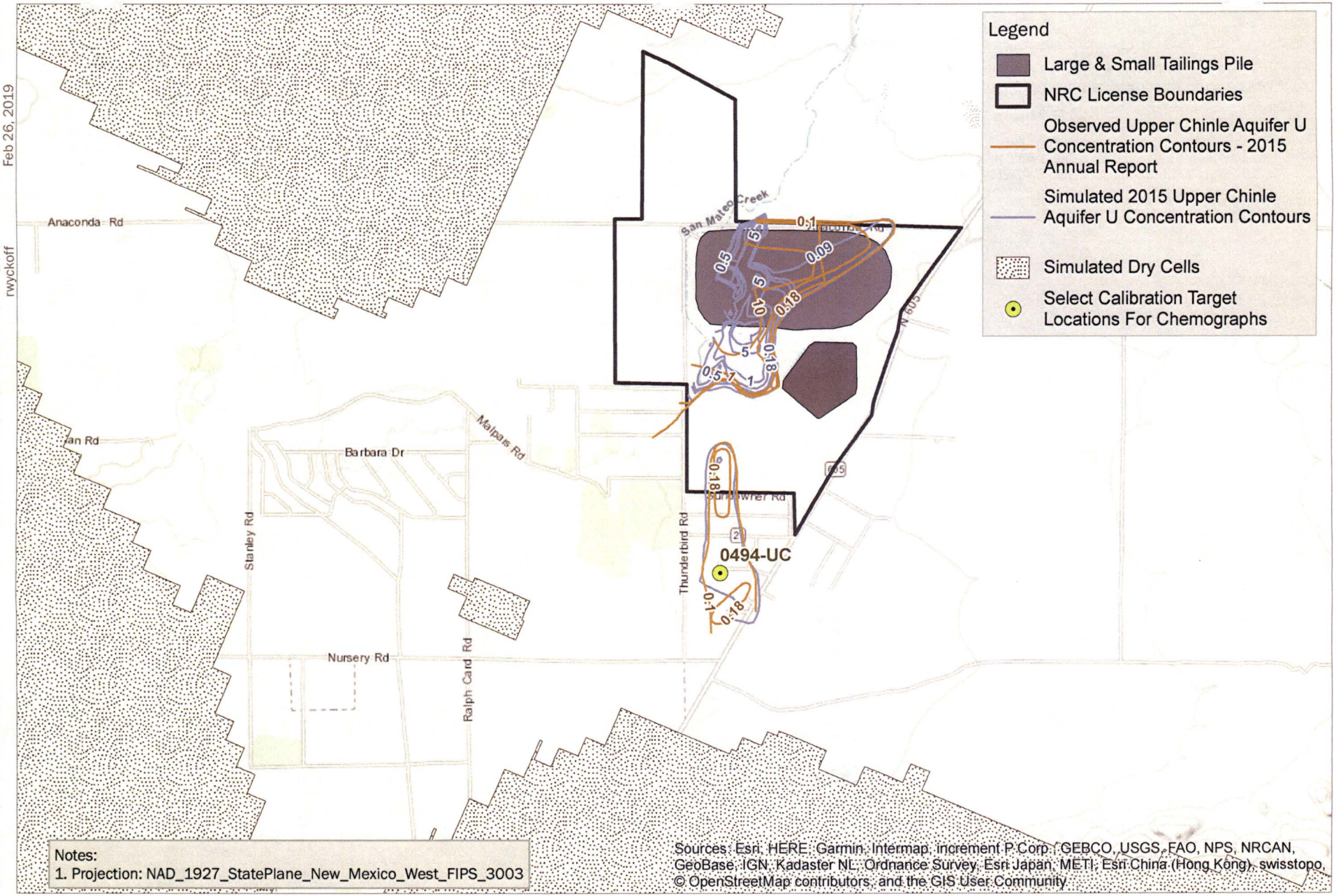
0 0.5 1 Miles

N

Figure 5-20
Alluvial Aquifer Simulated vs. Observed 2015 Uranium Concentration Contours



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0 0.5 1 Miles

N

Figure 5-21
Upper Chinle Aquifer Simulated vs. Observed 2015 Uranium Concentration Contours

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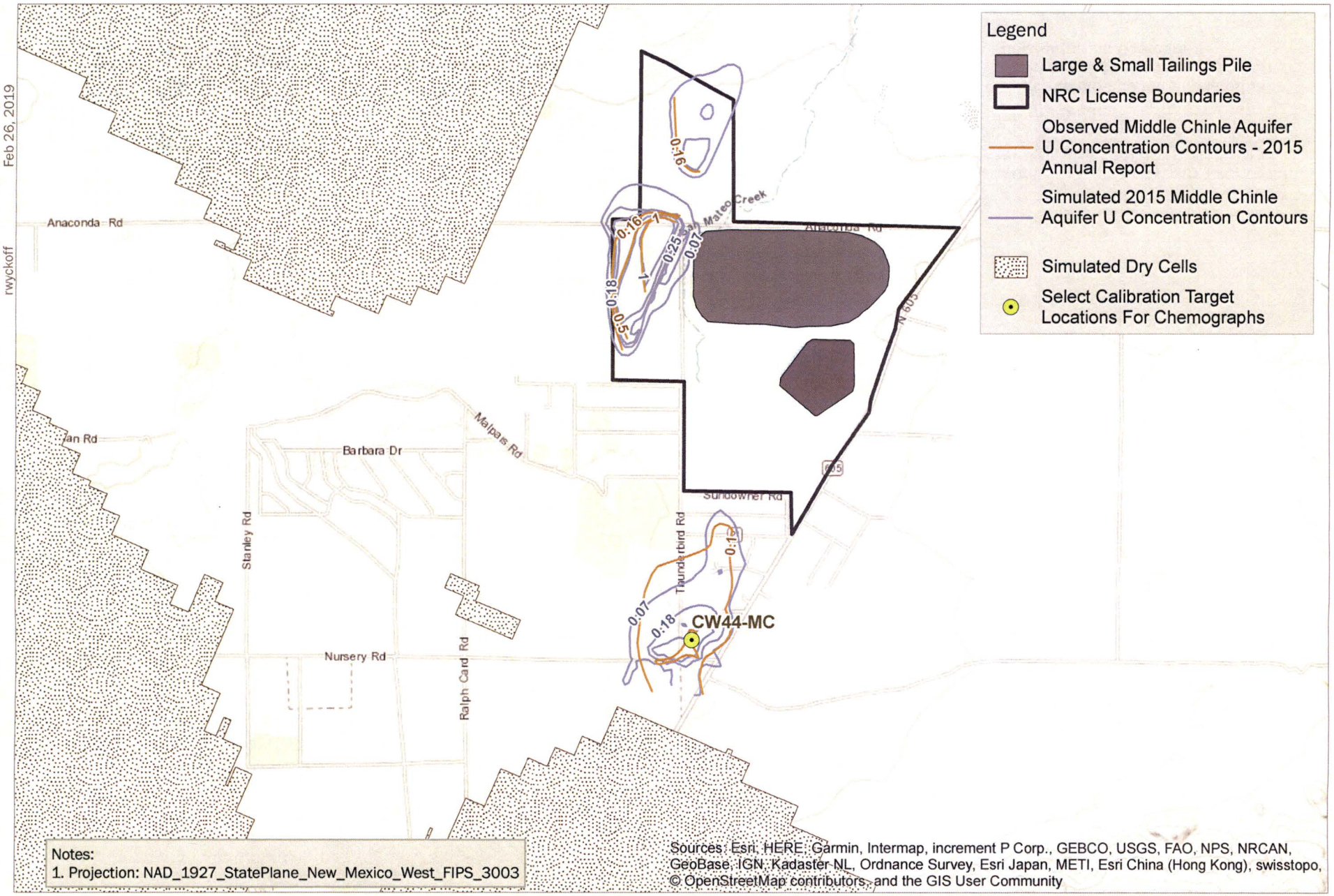

Notes:
1. Projection: NAD_1927_StatePlane_New_Mexico_West_FIPS_3003

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

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0 0.5 1 Miles

N

Figure 5-22
Middle Chinle Aquifer Simulated vs. Observed 2015 Uranium Concentration Contours

[BCDENFP01]: P:\Data\GEN\Barrick-Homestake\Grants Groundwater Model\GIS_SiteModelReporting\Figure5_23_2015SiteLC_UContours.mxd
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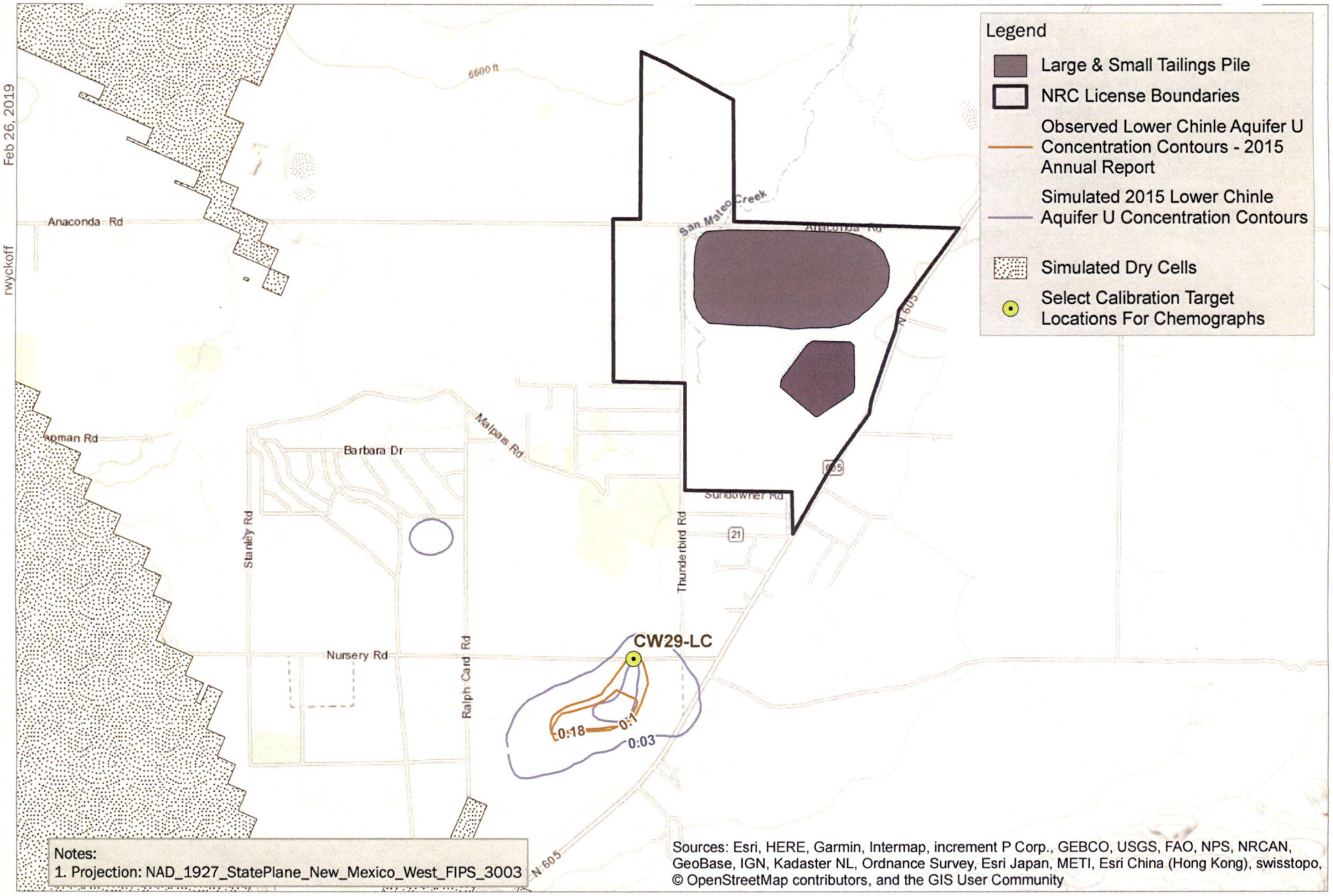

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Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

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0 0.5 1 Miles

N

Figure 5-23
Lower Chinle Aquifer Simulated vs. Observed 2015 Uranium Concentration Contours

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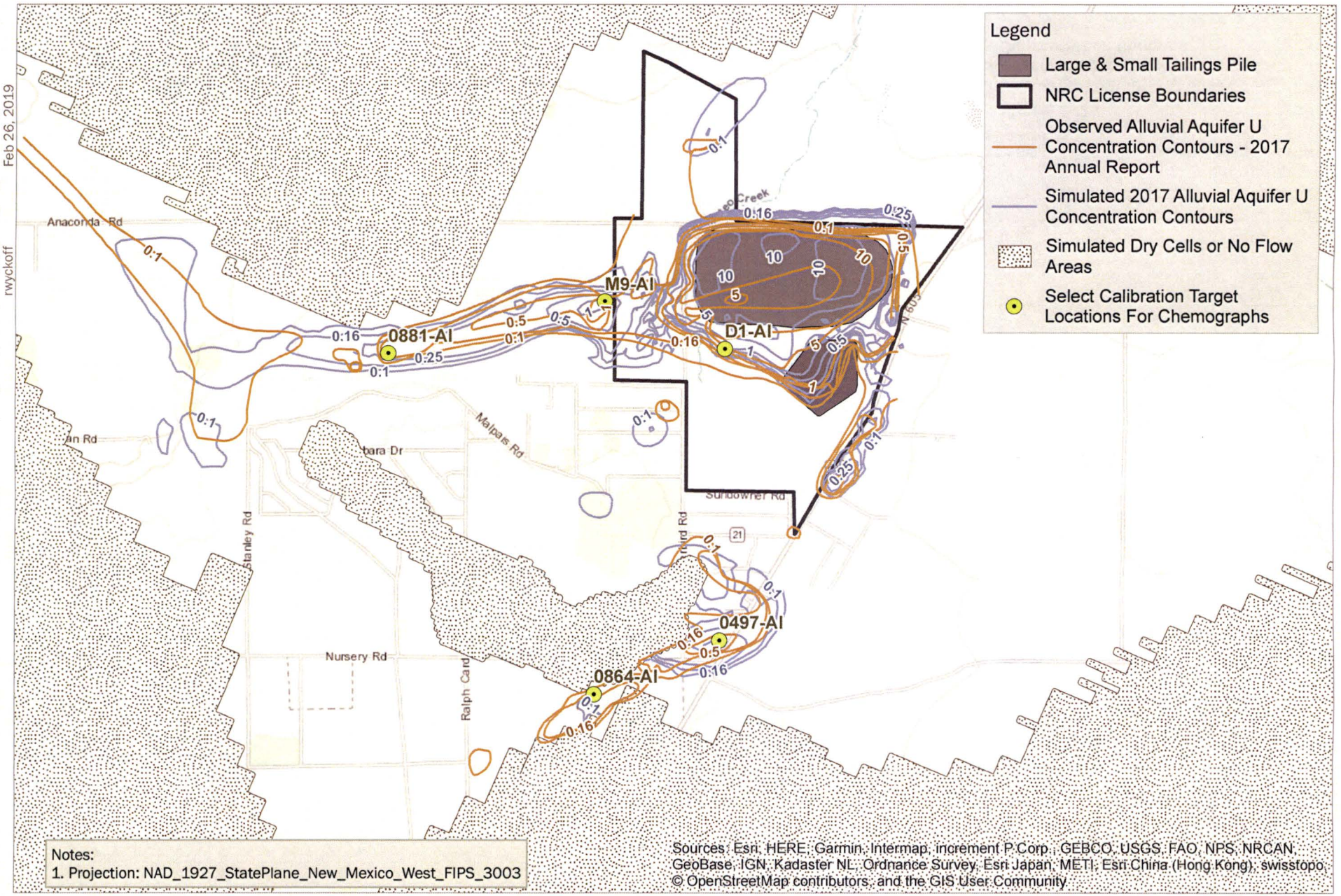

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Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

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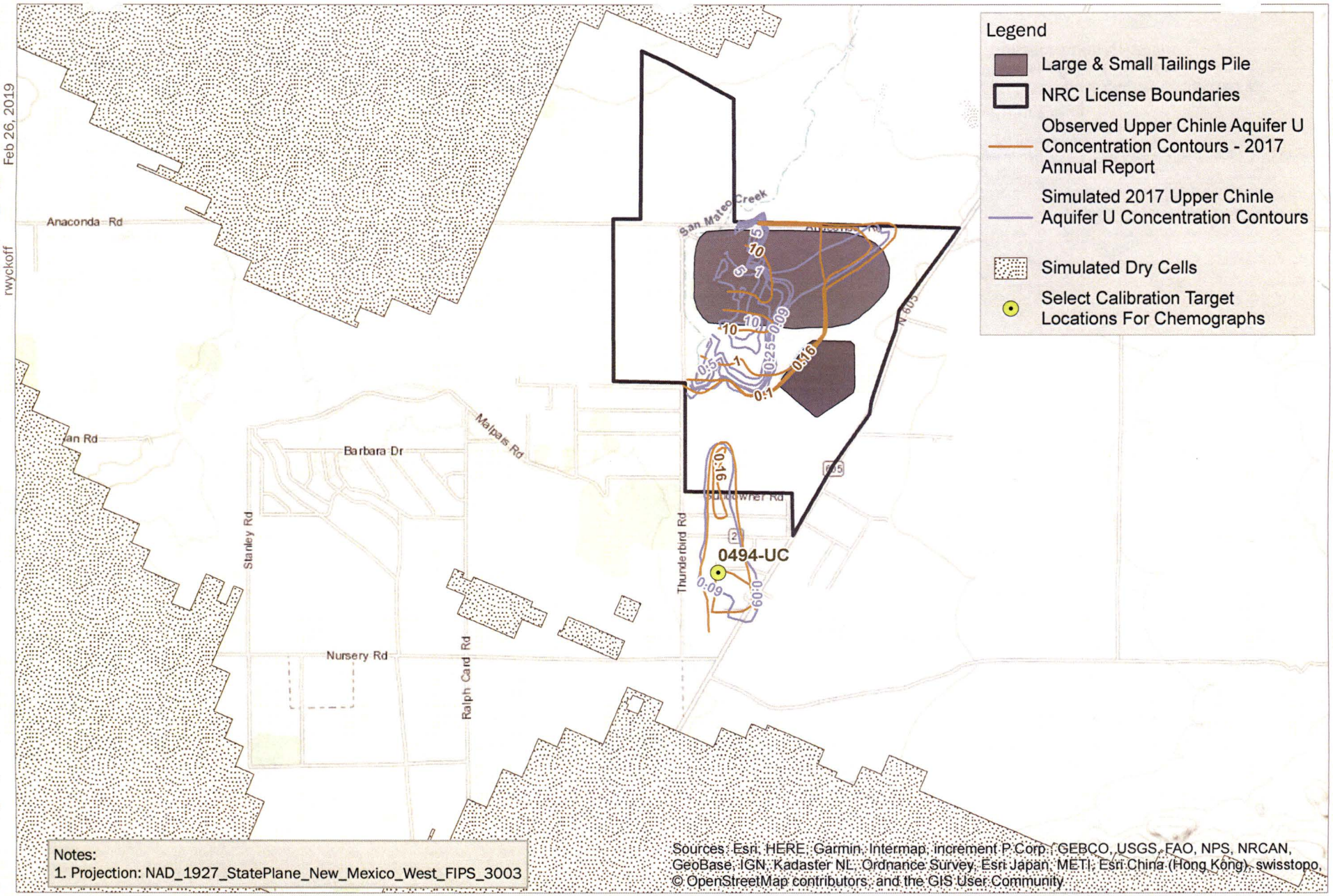
0 0.5 1 Miles

N

Figure 5-24
Alluvial Aquifer Simulated vs. Observed 2017 Uranium Concentration Contours



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0 0.5 1 Miles

N

Figure 5-25
Upper Chinle Aquifer Simulated vs. Observed 2017 Uranium Concentration Contours

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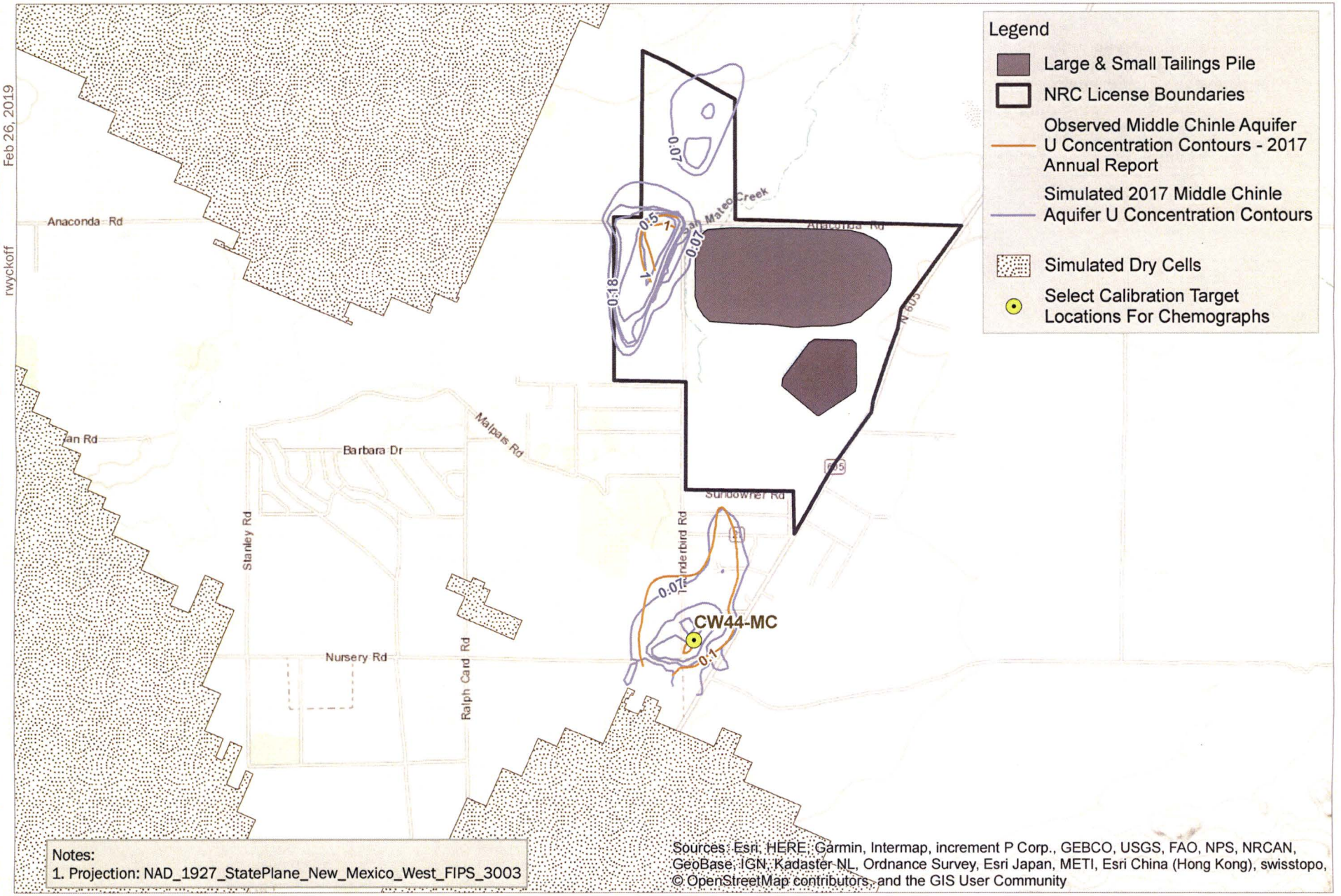

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Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

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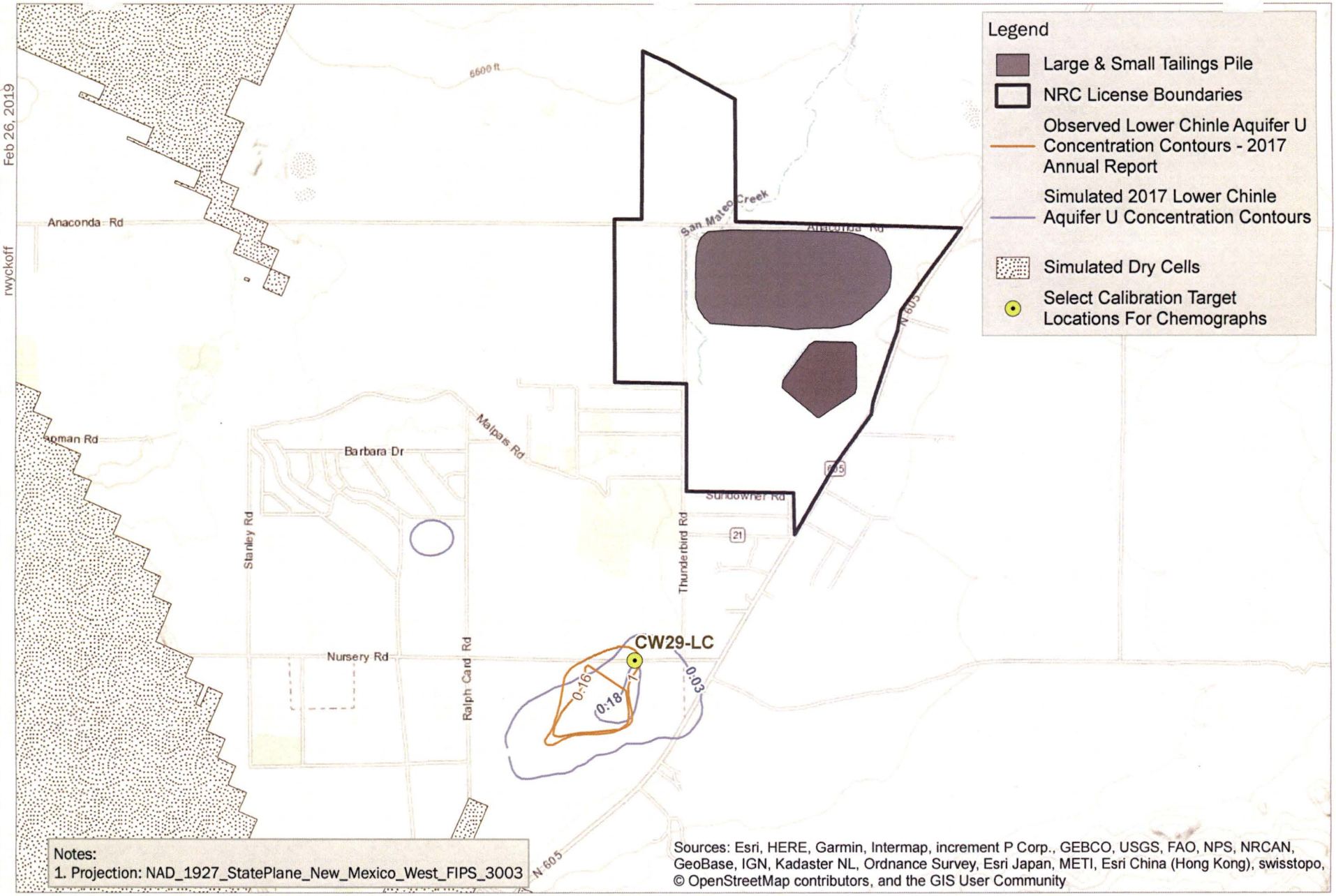
0 0.5 1 Miles

N

Figure 5-26
Middle Chinle Aquifer Simulated vs. Observed 2017 Uranium Concentration Contours



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Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

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0 0.5 1 Miles

N

Figure 5-27
Lower Chinle Aquifer Simulated vs. Observed 2017 Uranium Concentration Contours

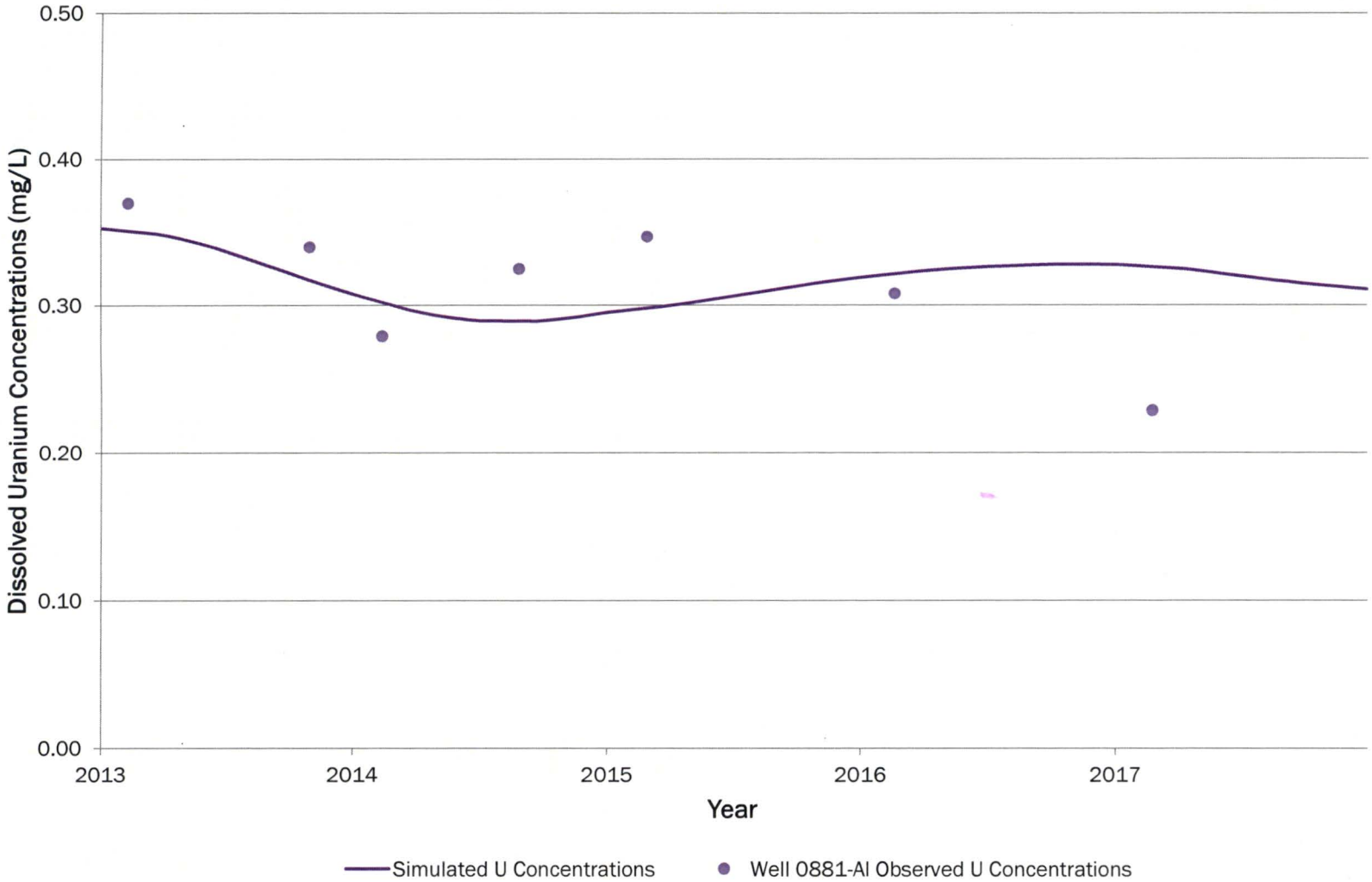

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Figure 5-28

Simulated versus Observed Uranium Concentrations - Well 0881-AI

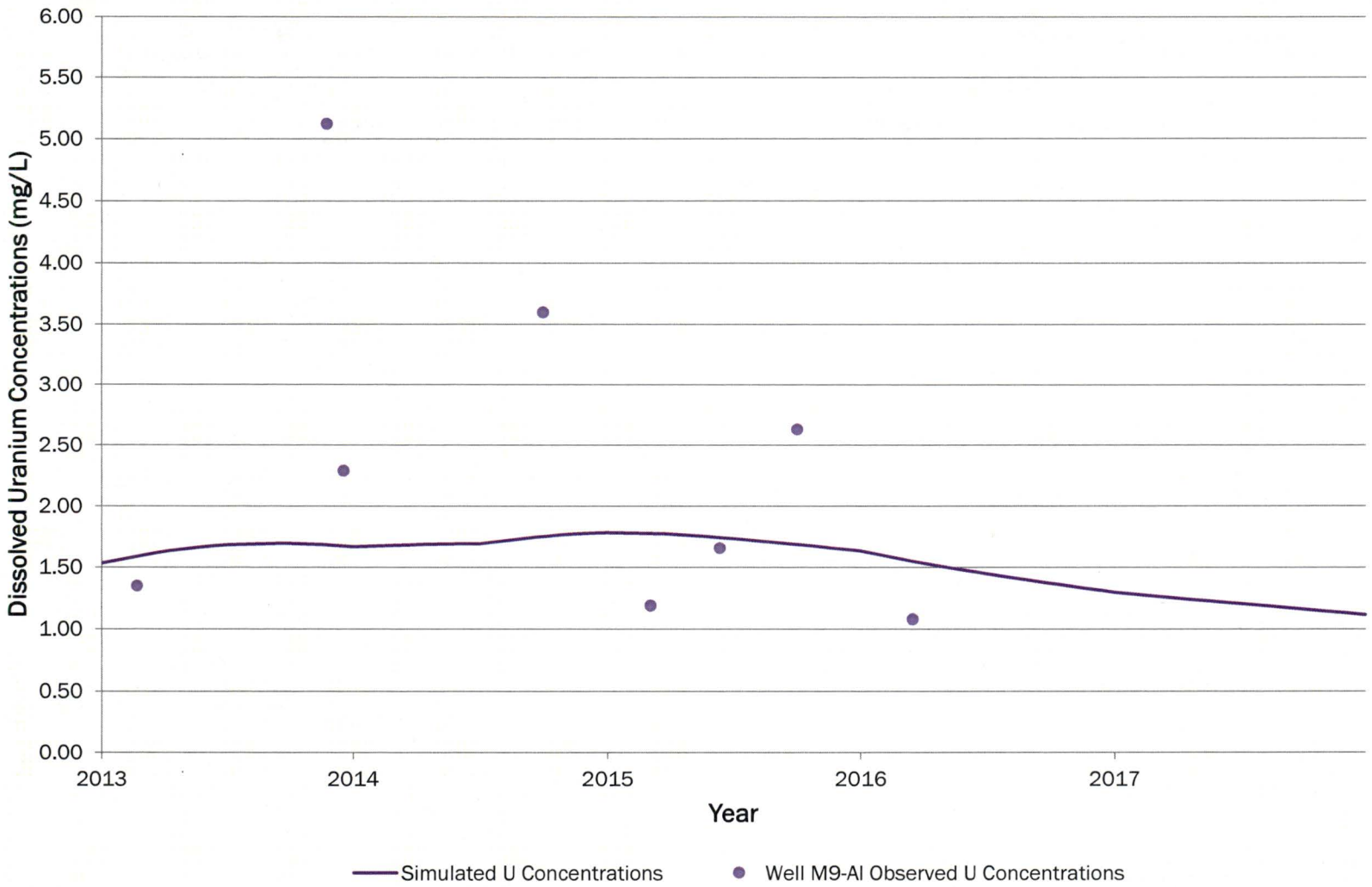

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Figure 5-29

Simulated versus Observed Uranium Concentrations - Well M9-AI

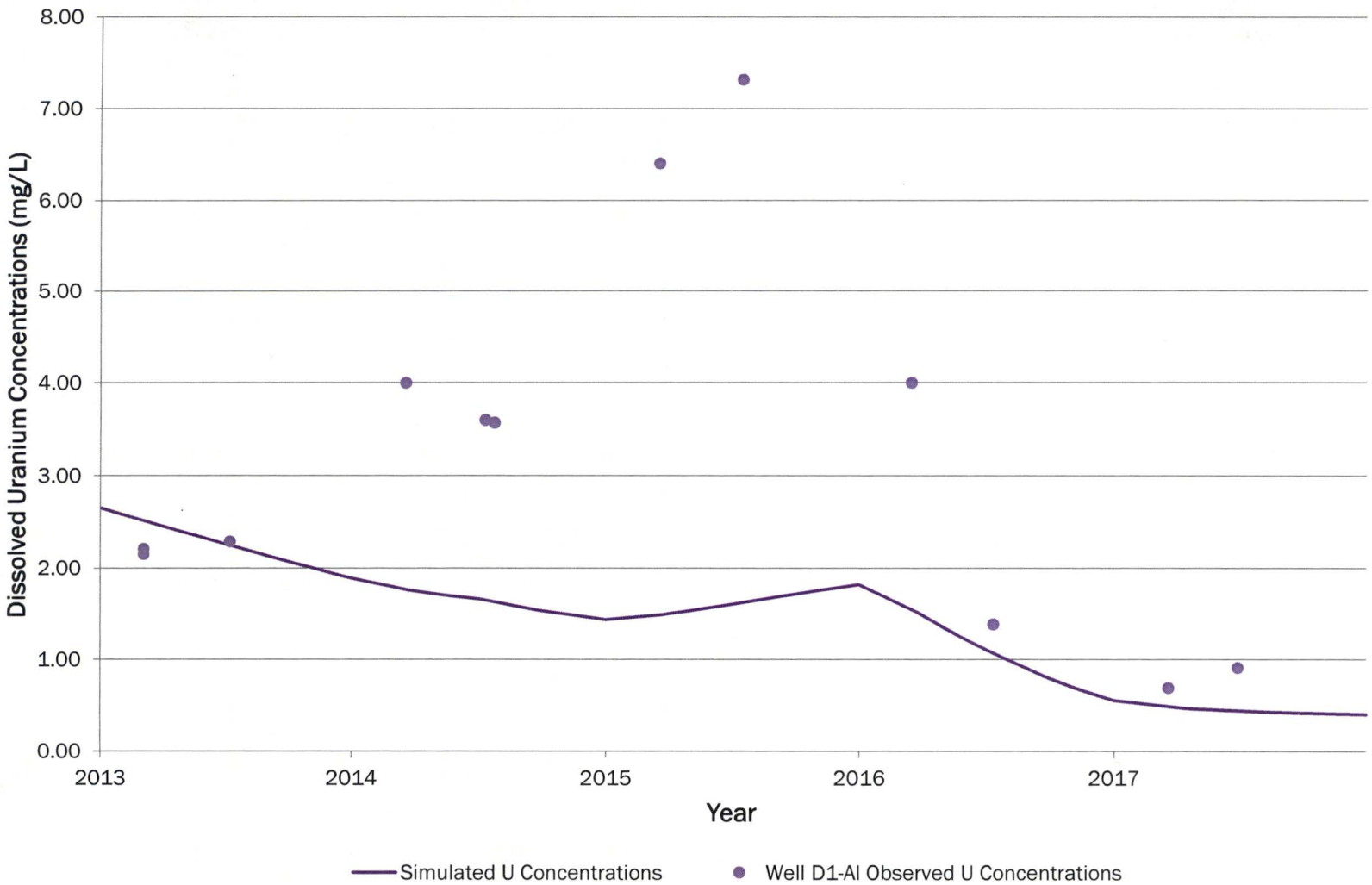

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Figure 5-30

Simulated versus Observed Uranium Concentrations - Well D1-AI

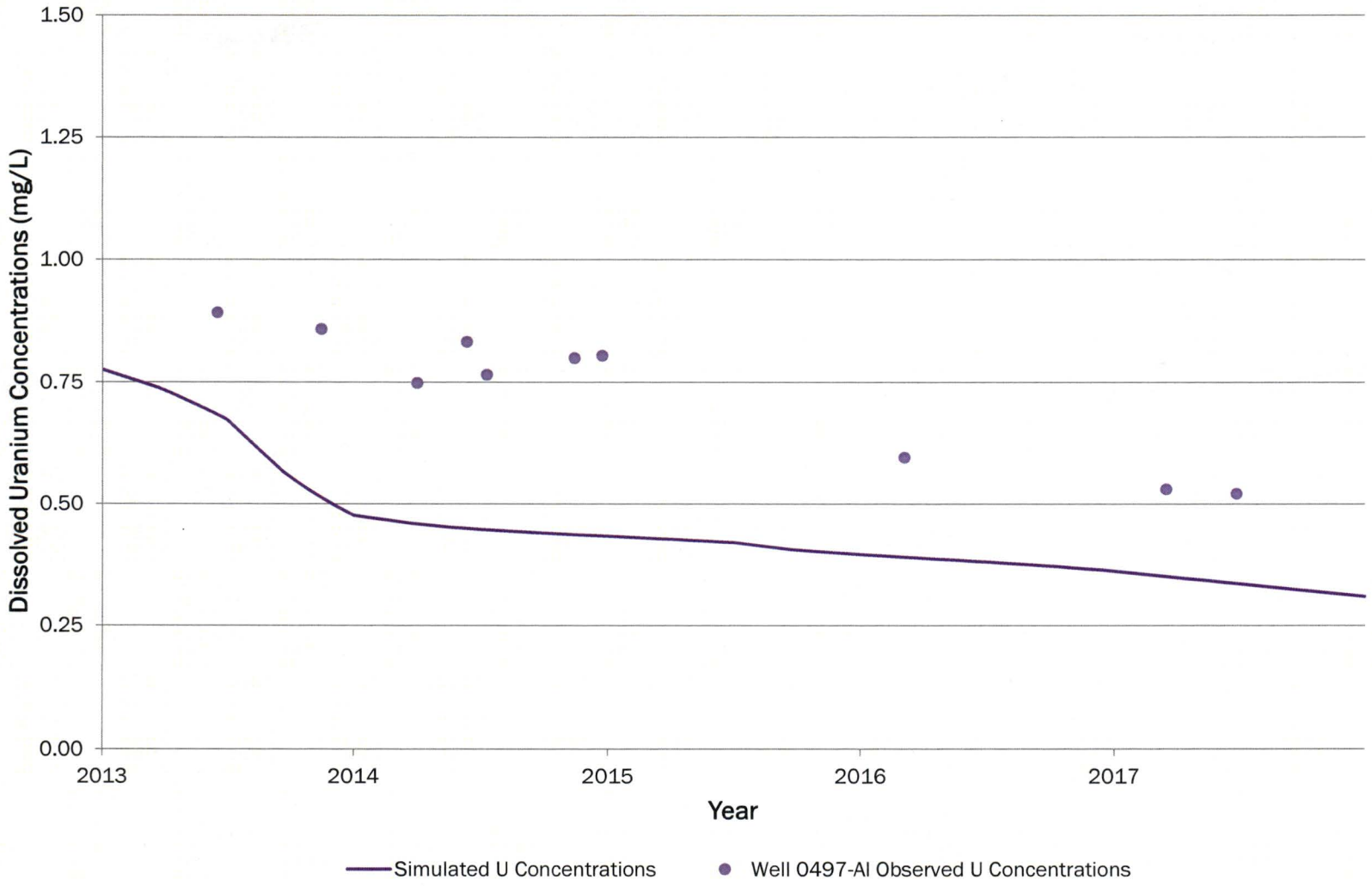

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Figure 5-31

Simulated versus Observed Uranium Concentrations - Well 0497-AI

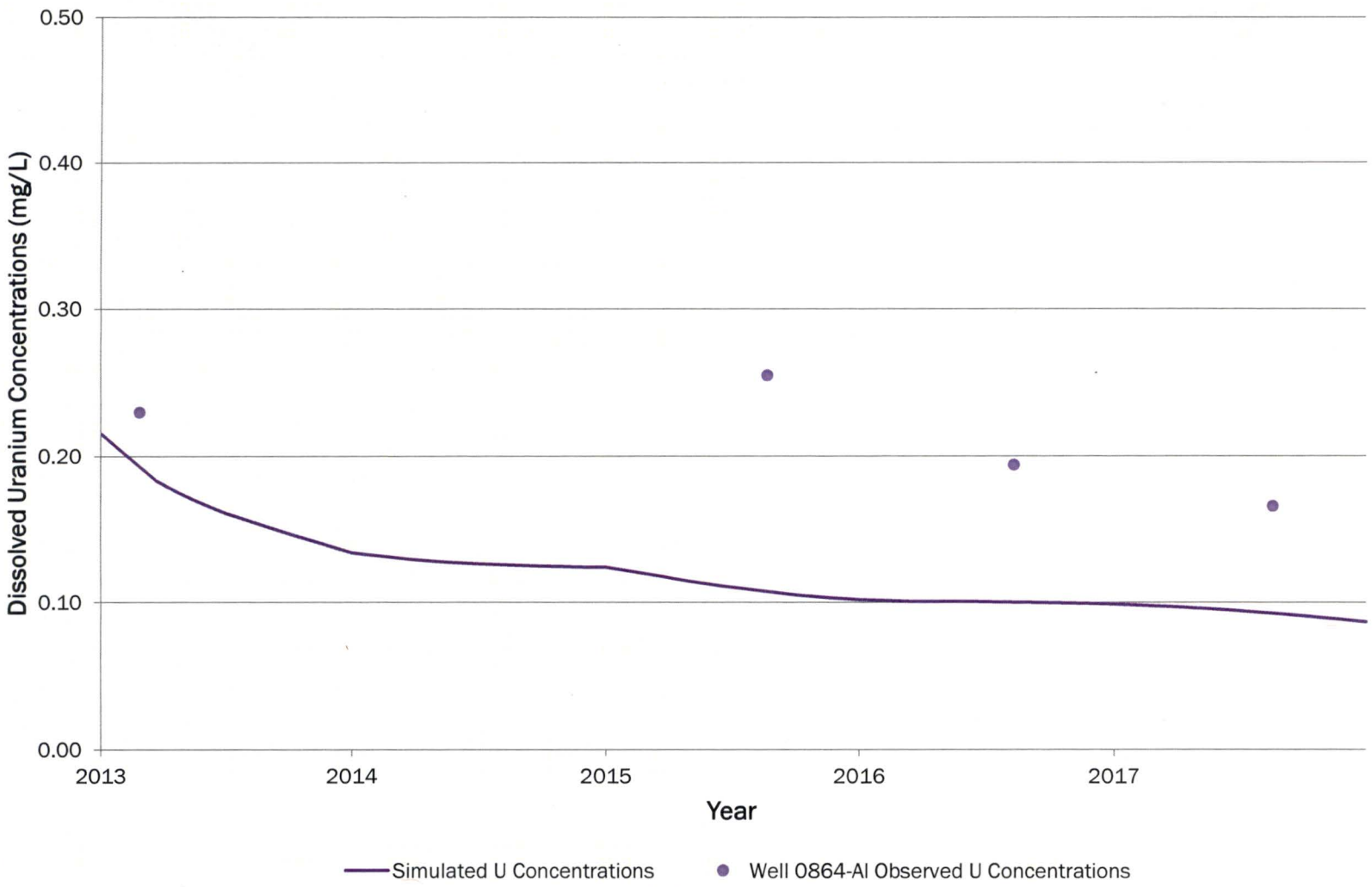

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Figure 5-32

Simulated versus Observed Uranium Concentrations - Well 0864-AI

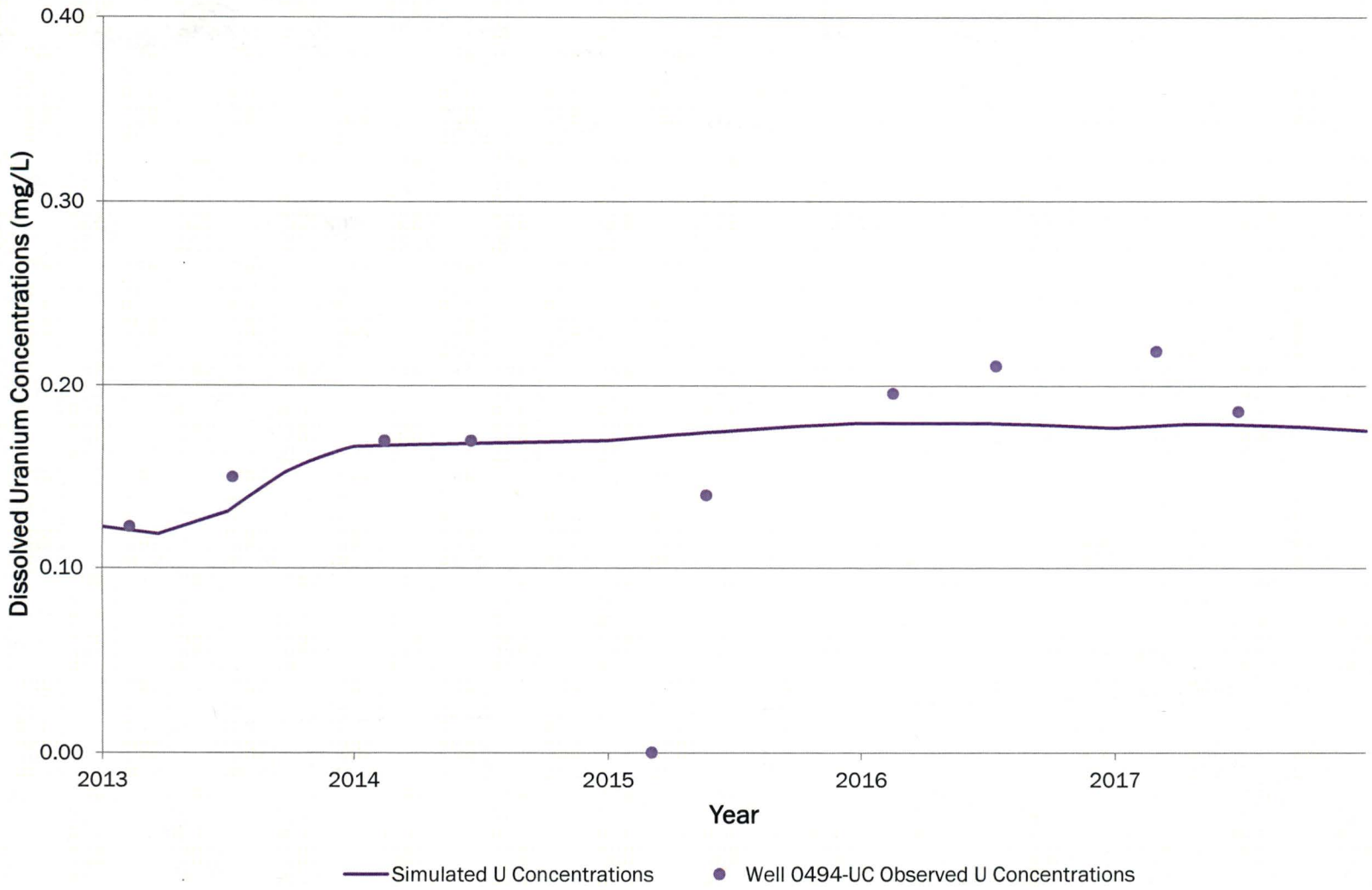

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Figure 5-33

Simulated versus Observed Uranium Concentrations - Well 0494-UC

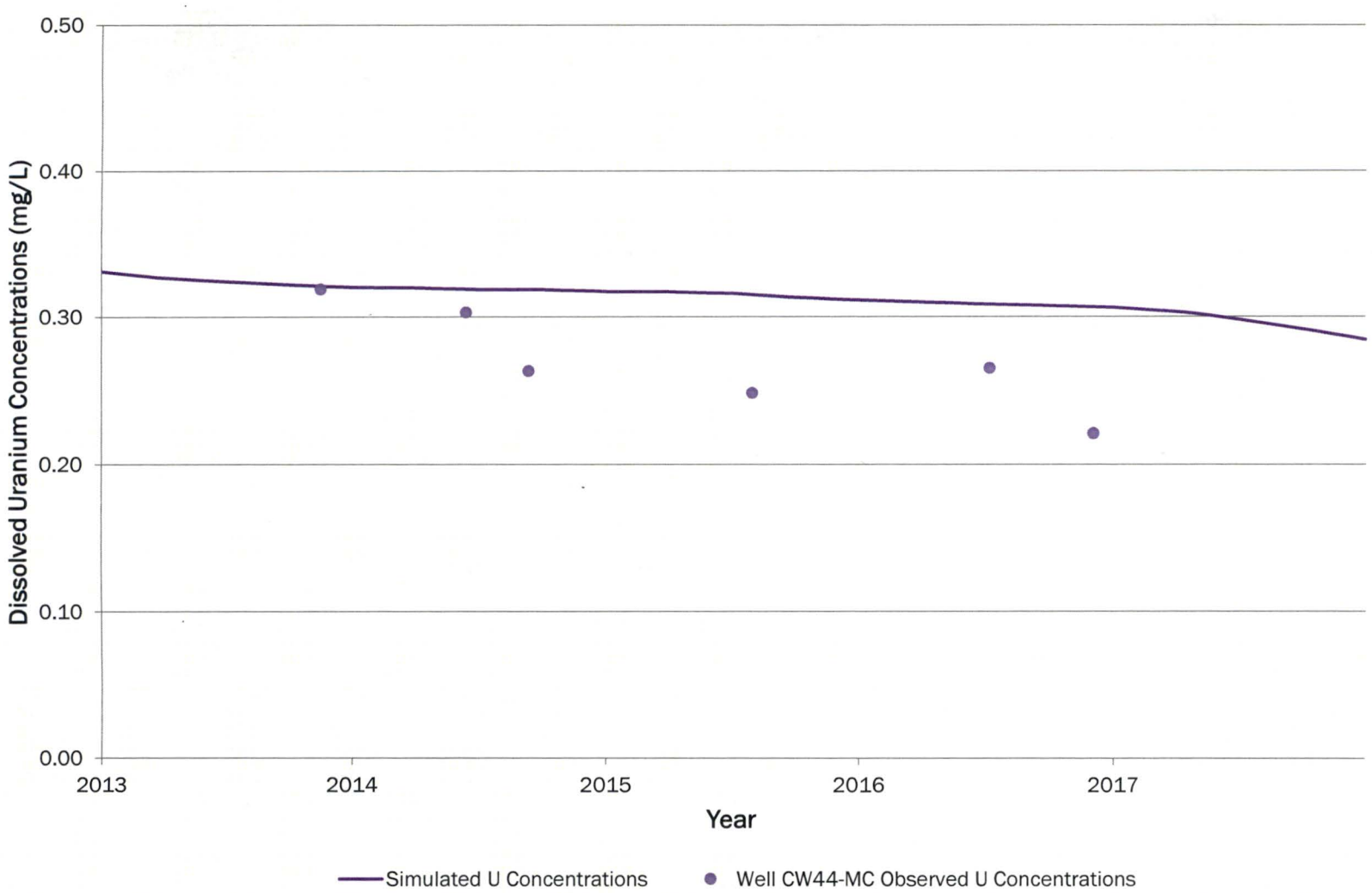

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Figure 5-34

Simulated versus Observed Uranium Concentrations - Well CW44-MC

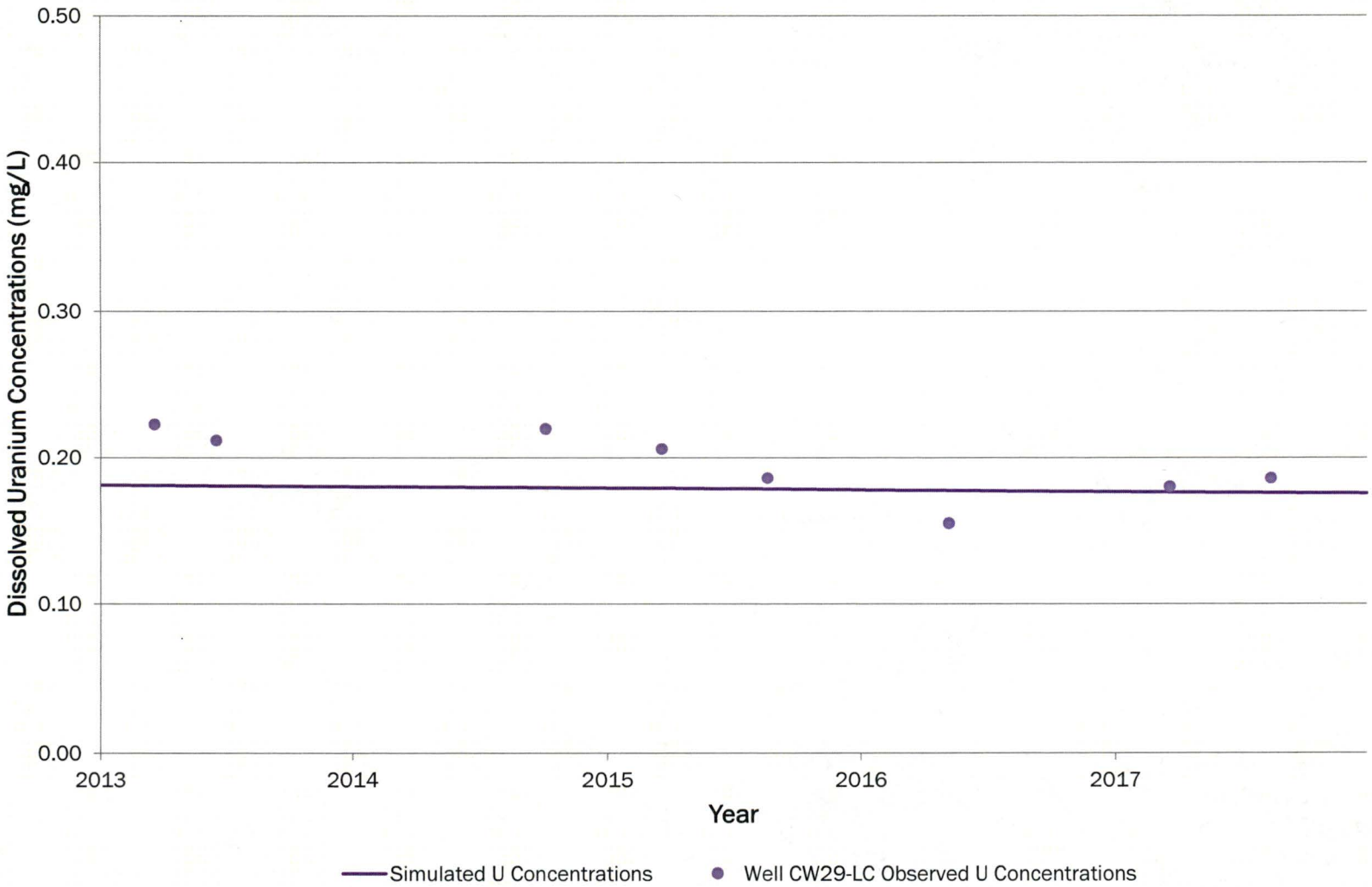

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Figure 5-35

Simulated versus Observed Uranium Concentrations - Well CW29-LC

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rwyckoff
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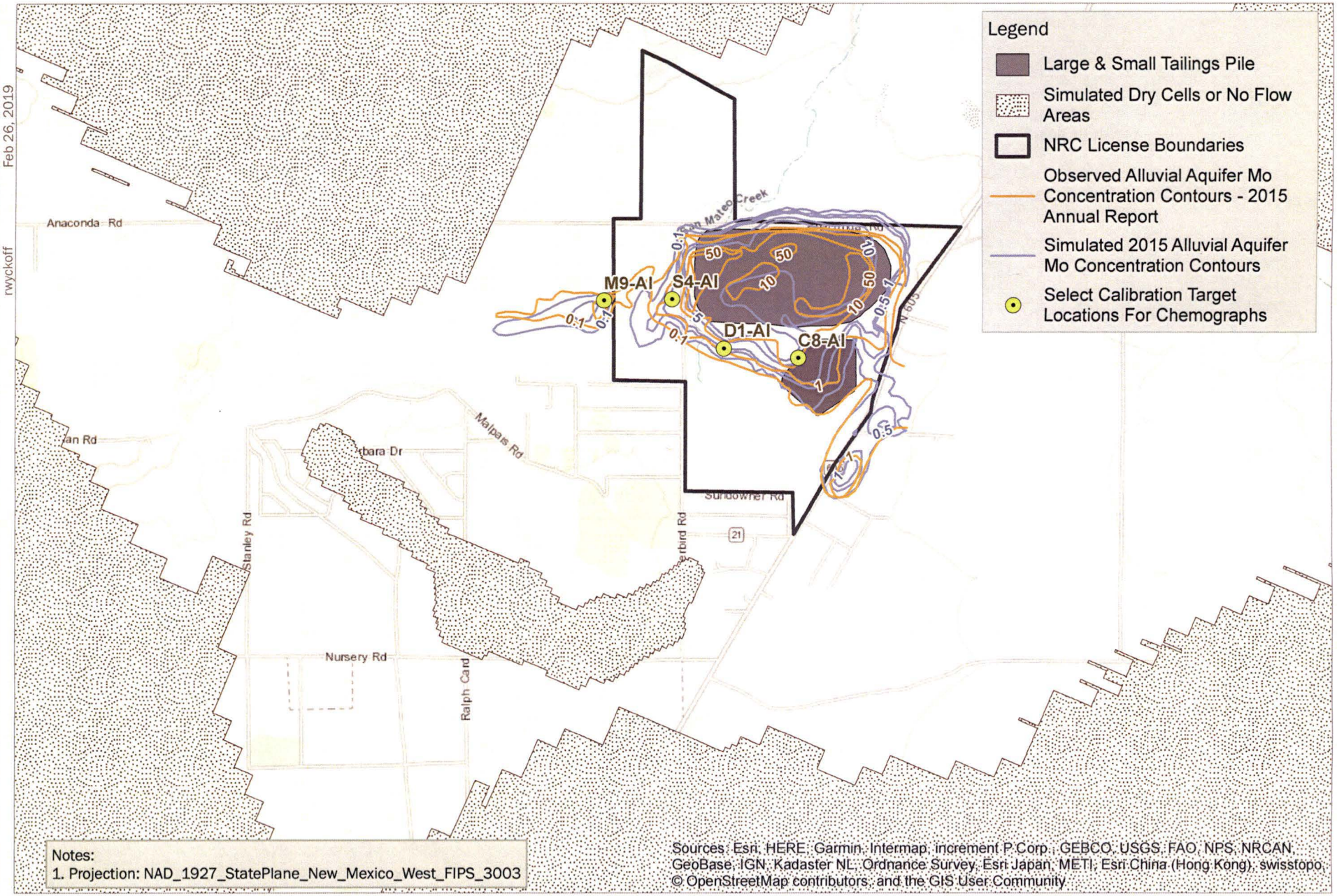

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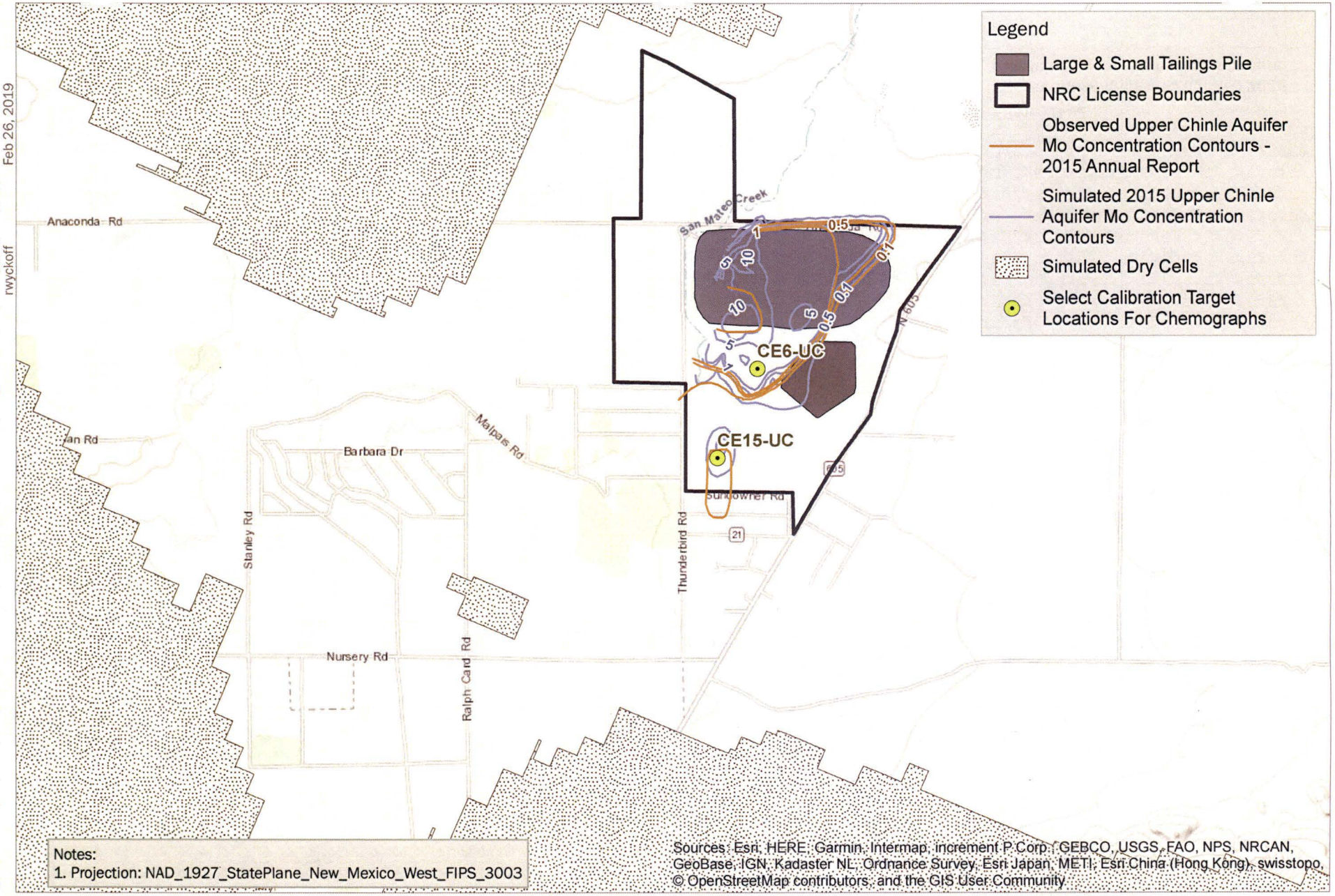
0 0.5 1 Miles

N

Figure 5-36
Alluvial Aquifer Simulated vs. Observed 2015 Molybdenum Concentration Contours

[BCDENFP01]: P:\Data\GEN\Barrick-Homestake\Grants Groundwater Model\GIS_SiteModelReporting\Figure5_37_2015SiteUC_MoContours.mxd
rwyckoff
Feb 26, 2019



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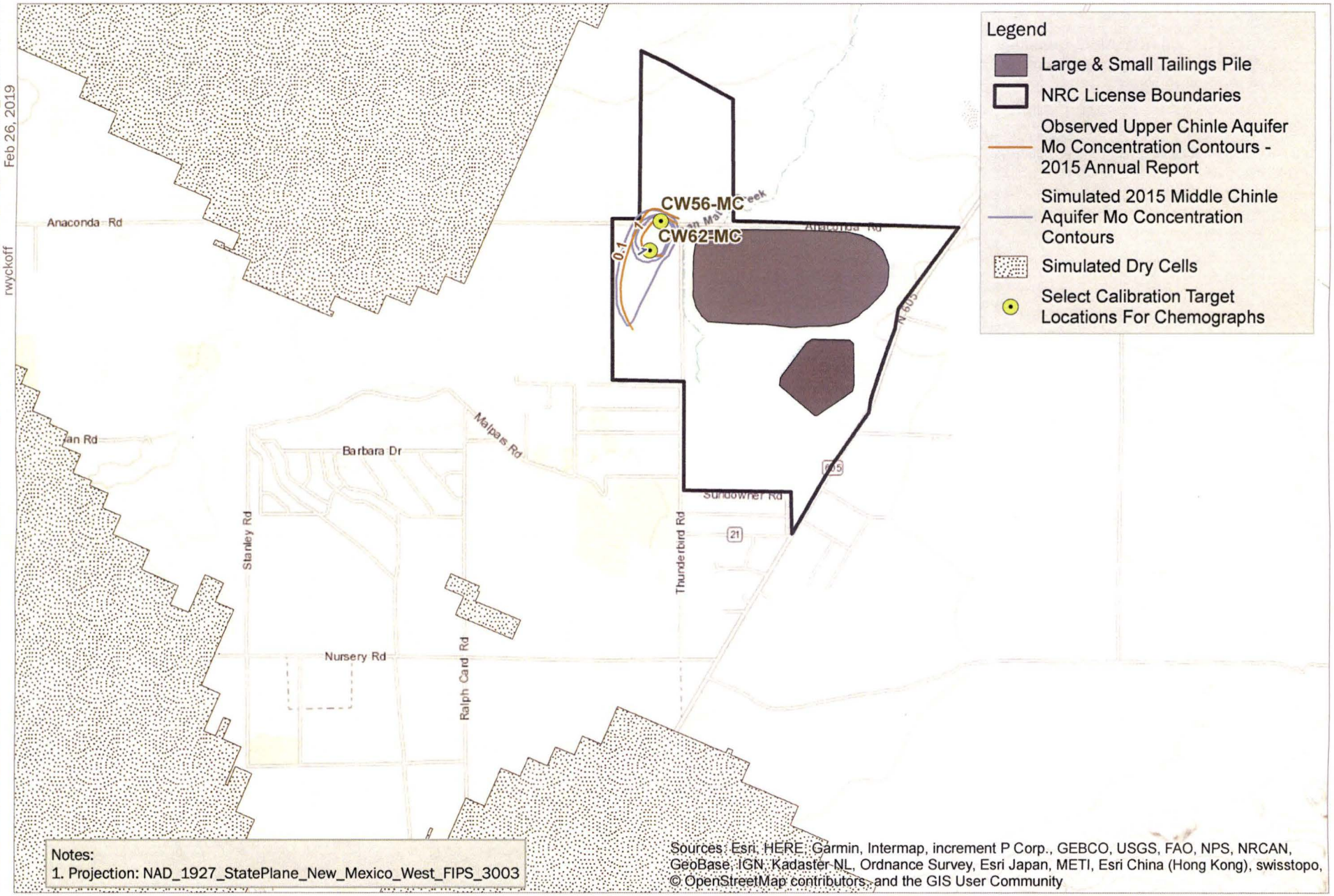
0 0.5 1 Miles

N

Figure 5-37
Upper Chinle Aquifer Simulated vs. Observed 2015 Molybdenum Concentration Contours

[BCDENFP01]: P:\Data\GEN\Barrick-Homestake\Grants Groundwater Model\GIS_SiteModelReporting\Figure5_38_2015SiteMC_MoContours.mxd
rwyckoff
Feb 26, 2019



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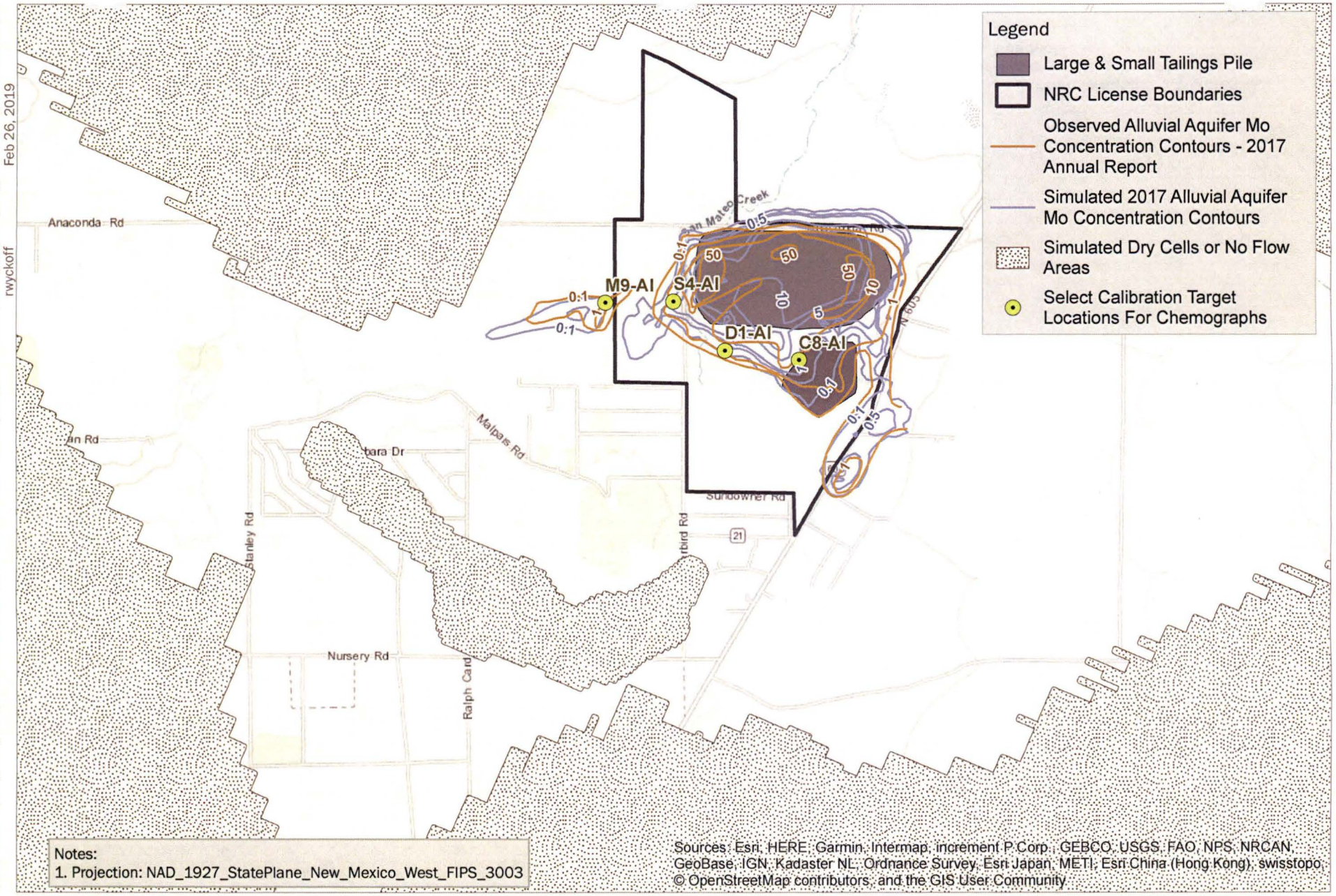
0 0.5 1 Miles

N

Figure 5-38
Middle Chinle Aquifer Simulated 2015 Molybdenum Concentration Contours

[BCDENFP01]: P:\Data\GEN\Barrick-Homestake\Grants Groundwater Model\GIS_SiteModelReporting\Figure5_39_2017SiteAl_MoContours.mxd
rwyckoff
Feb 26, 2019



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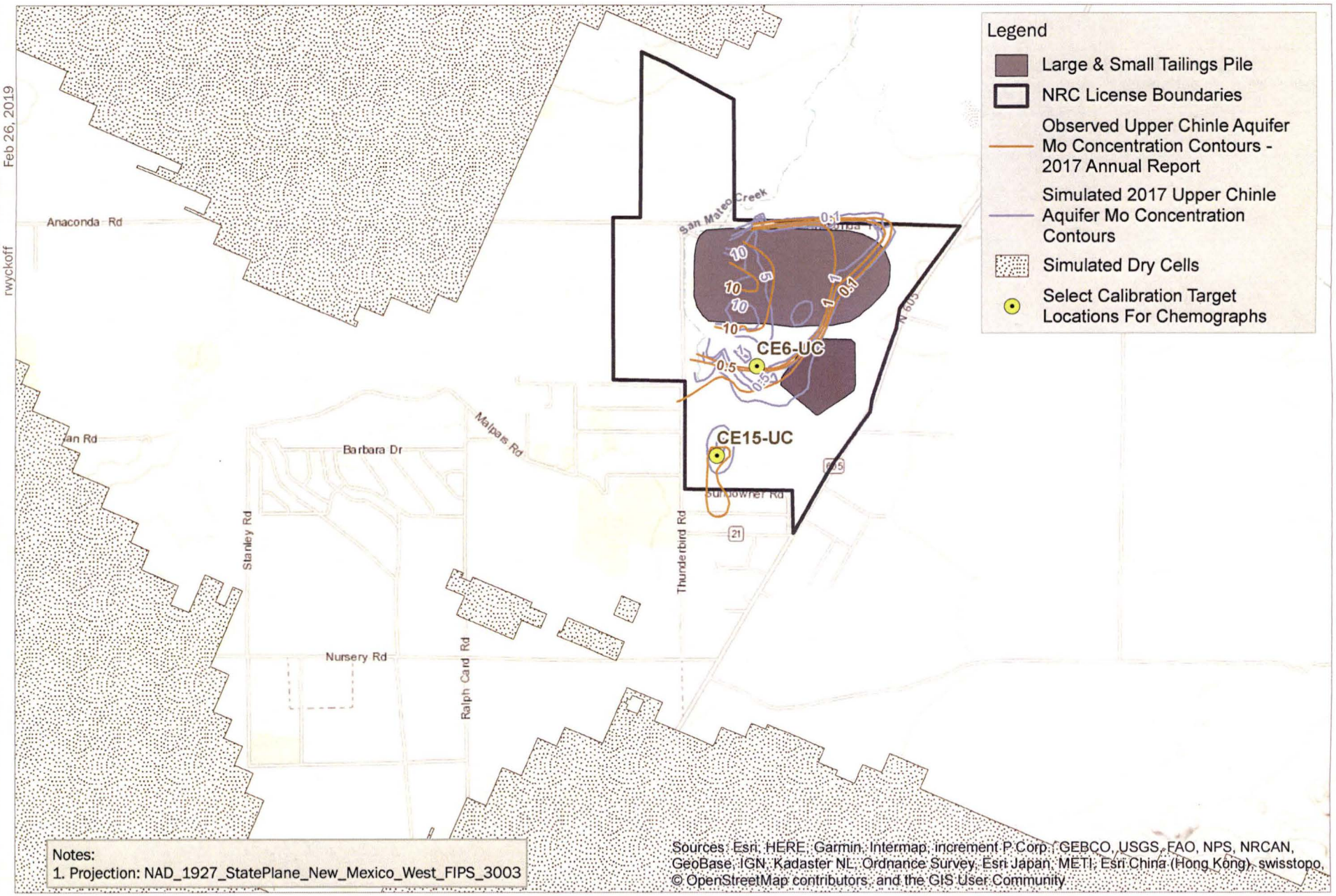
0 0.5 1 Miles

N

Figure 5-39
Alluvial Aquifer Simulated vs. Observed 2017 Molybdenum Concentration Contours

[BCDENFP01]: P:\Data\GEN\Barrick-Homestake\Grants Groundwater Model\GIS_SiteModelReporting\Figure5_40_2017SiteUC_MoContours.mxd
rwyckoff
Feb 26, 2019



Notes:
1. Projection: NAD_1927_StatePlane_New_Mexico_West_FIPS_3003

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

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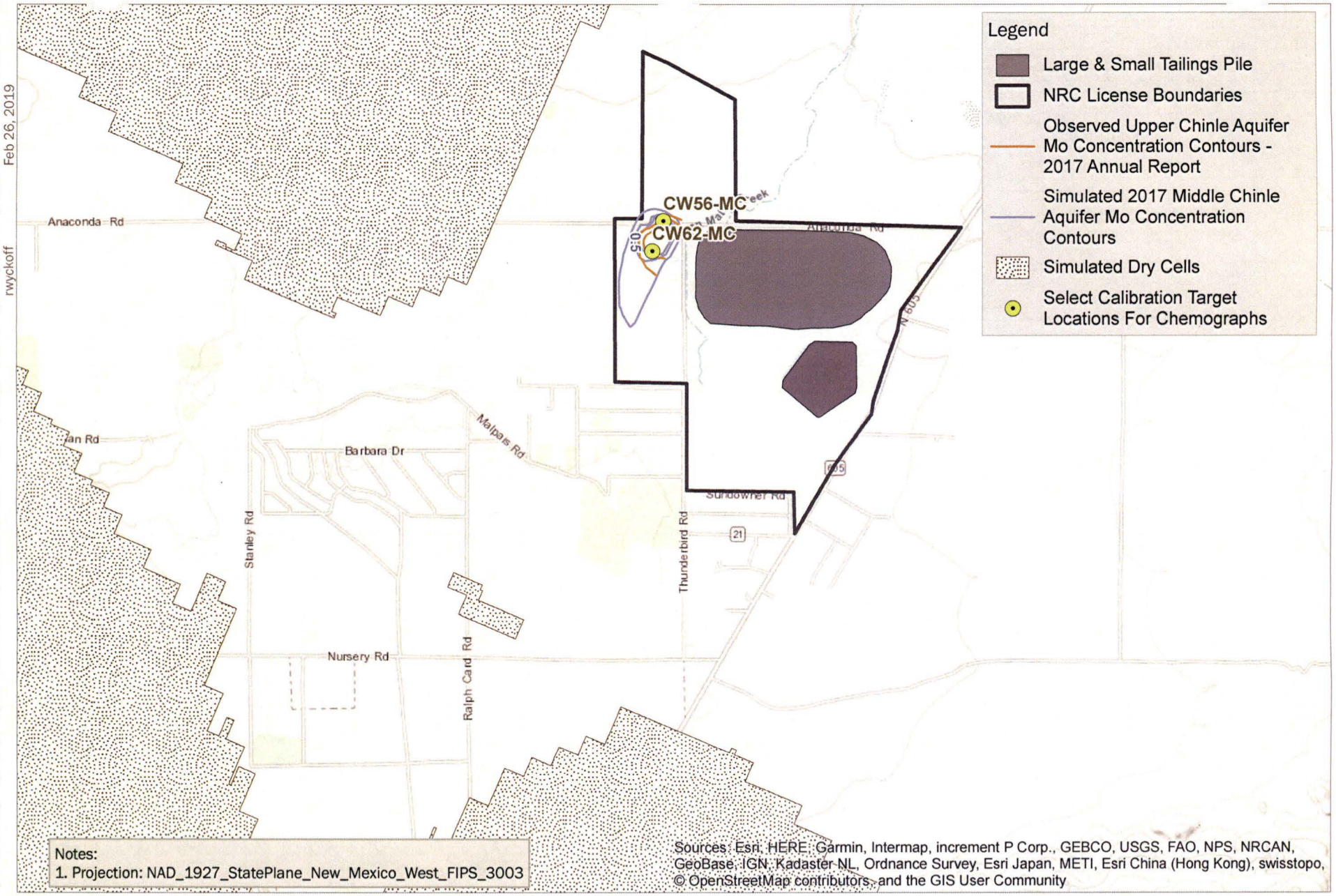
0 0.5 1 Miles

N

Figure 5-40
Upper Chinle Aquifer Simulated vs. Observed 2017 Molybdenum Concentration Contours

[BCDENFP01]: P:\Data\GEN\Barrick-Homestake\Grants Groundwater Model\GIS_SiteModelReporting\Figure5_41_2017SiteMC_MoContours.mxd
rwyckoff
Feb 26, 2019



Notes:
1. Projection: NAD_1927_StatePlane_New_Mexico_West_FIPS_3003

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

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0 0.5 1 Miles

N

Figure 5-41
Middle Chinle Aquifer Simulated 2017 Molybdenum Concentration Contours

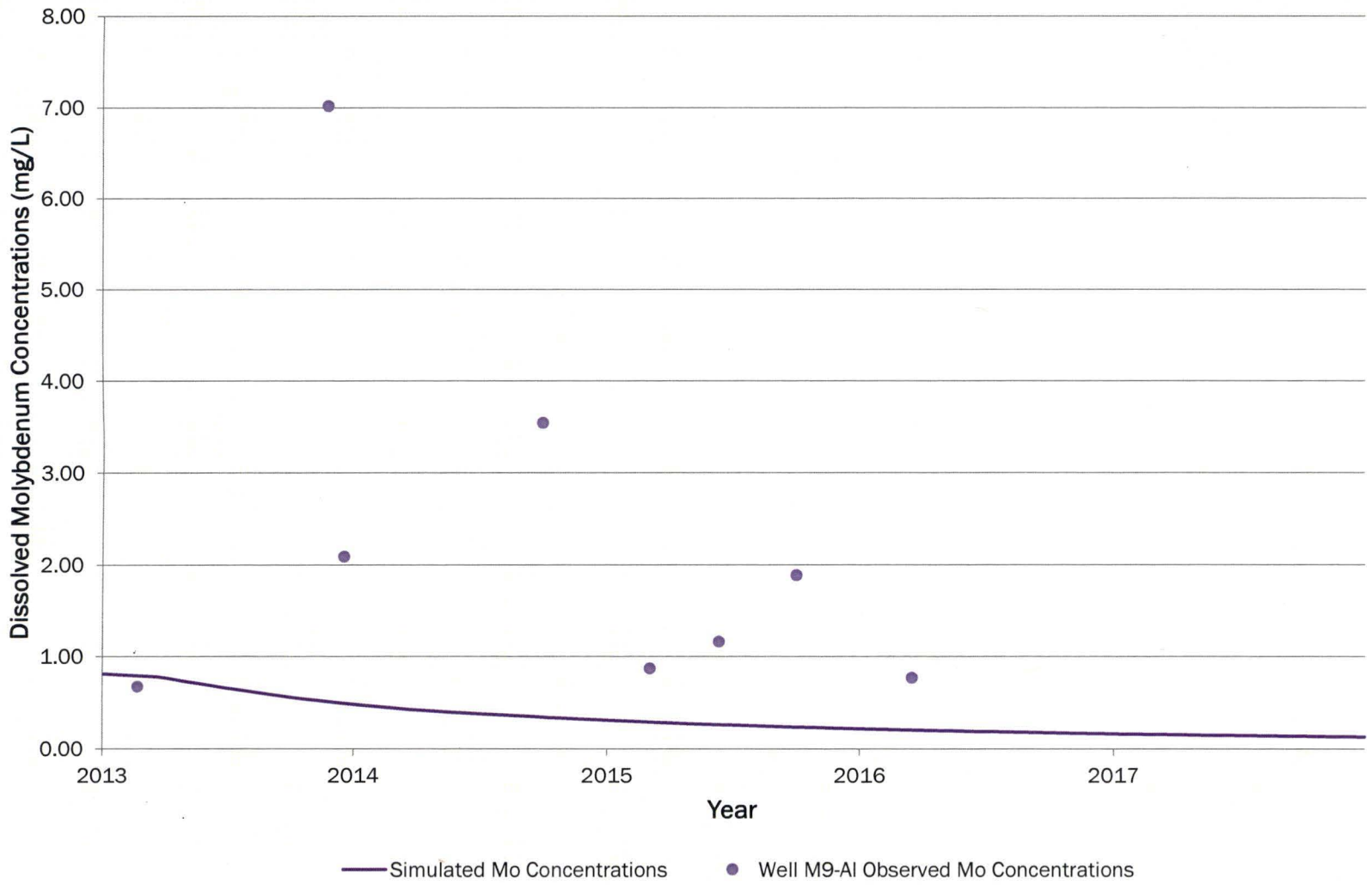

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Figure 5-42

Simulated versus Observed Molybdenum Concentrations - Well M9-AI

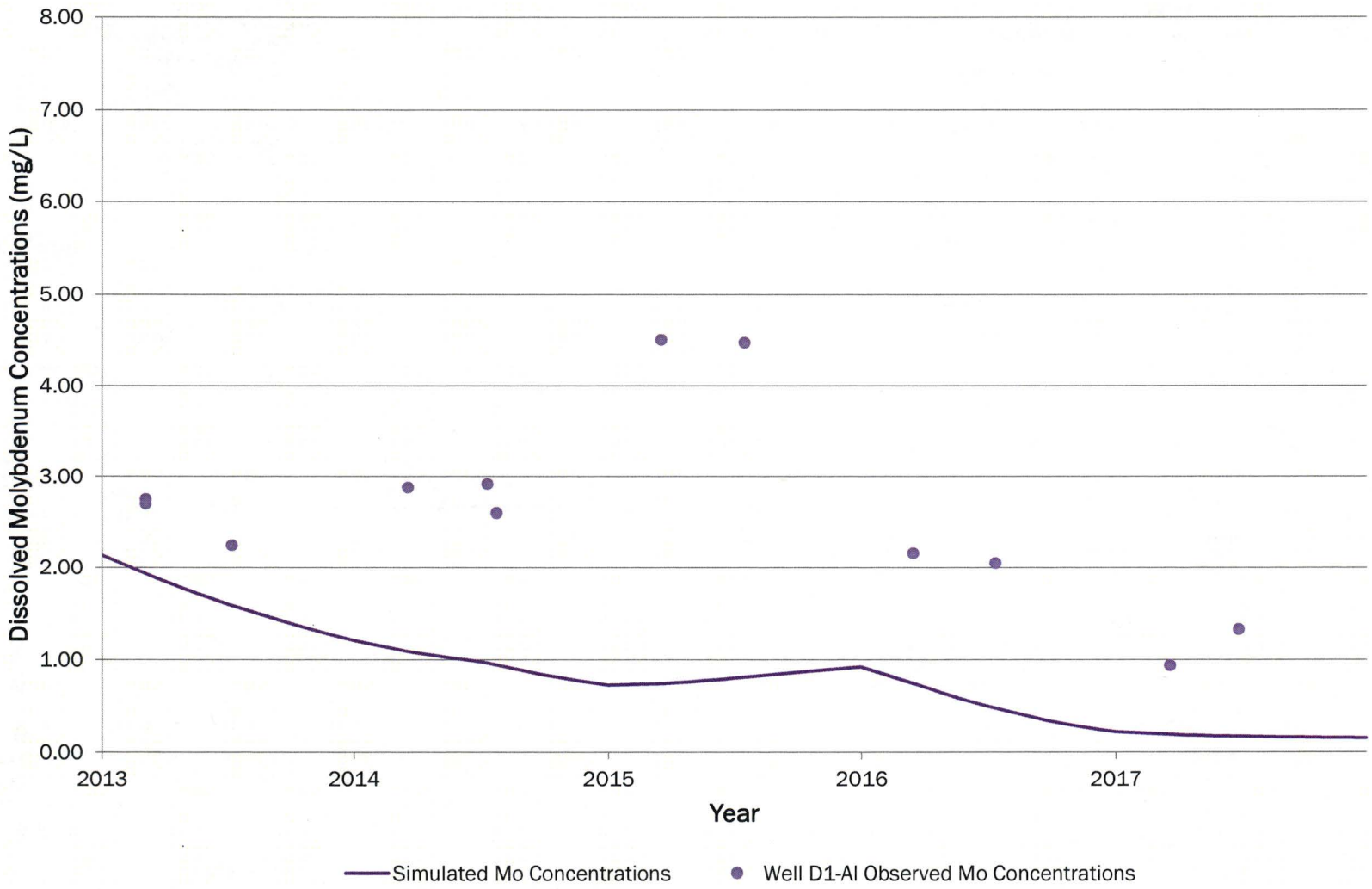

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Figure 5-43

Simulated versus Observed Molybdenum Concentrations - Well D1-AI

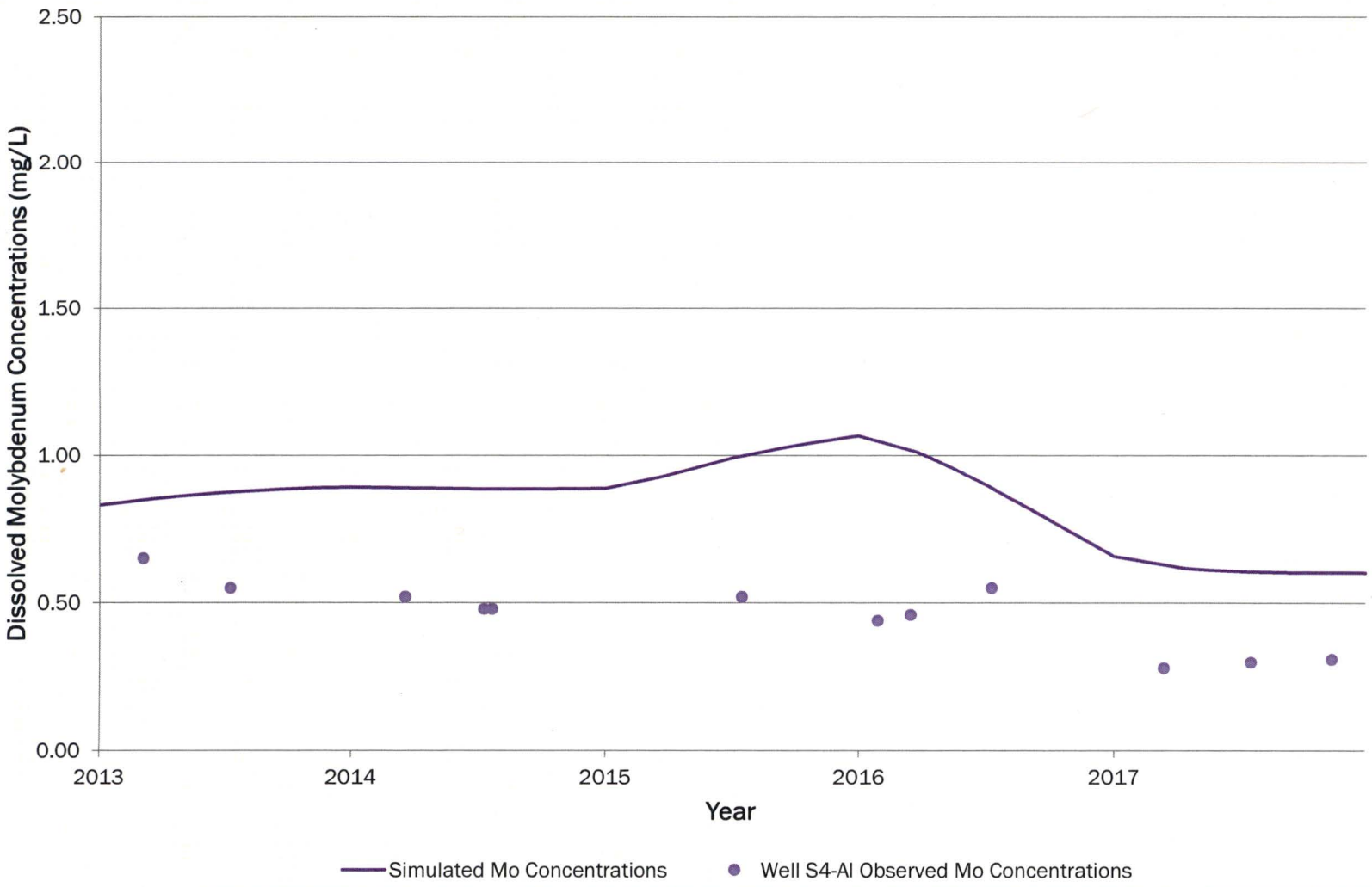

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Figure 5-44

Simulated versus Observed Molybdenum Concentrations - Well S4-AI

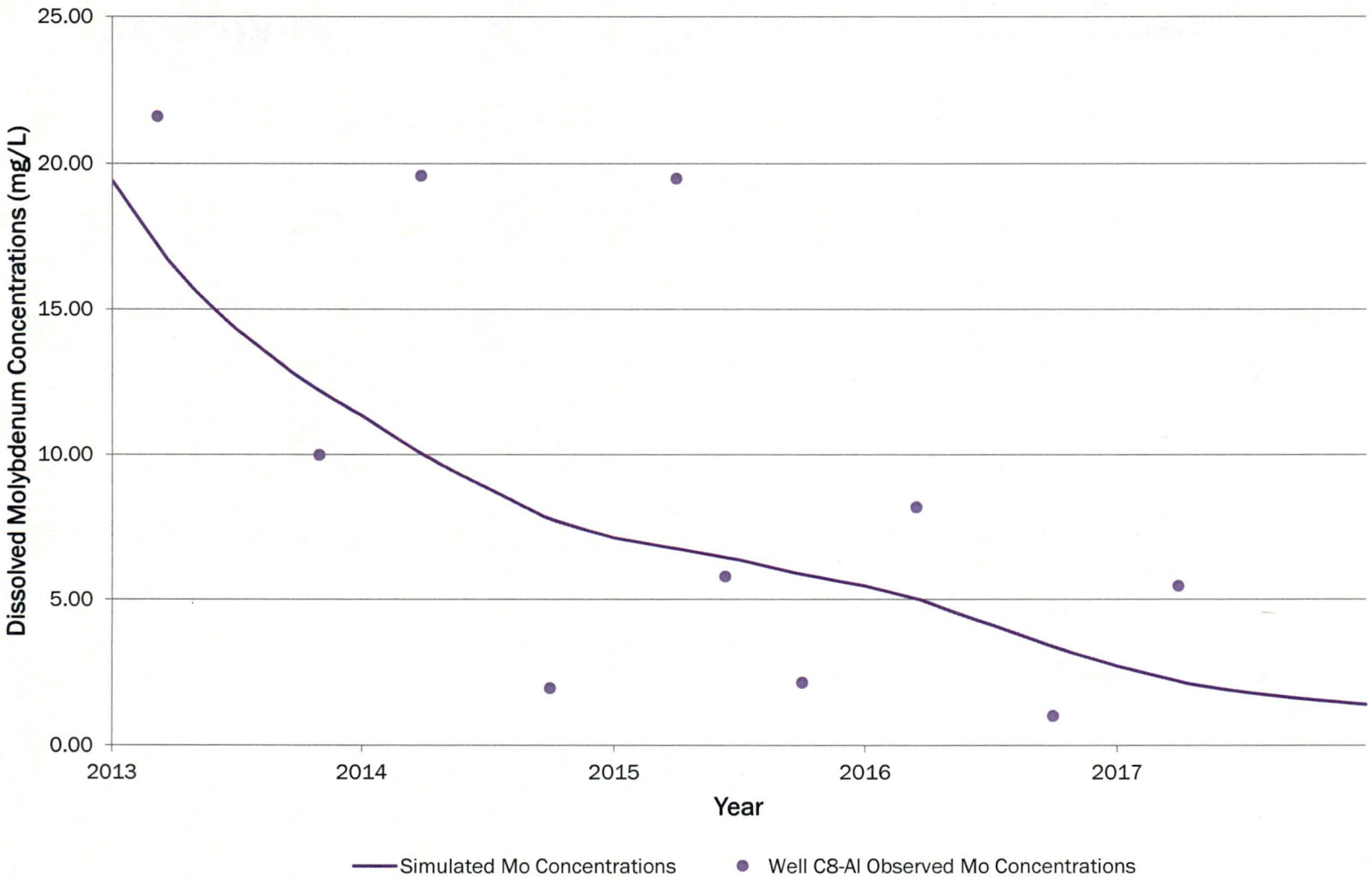

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Figure 5-44

Simulated versus Observed Molybdenum Concentrations - Well C8-AI

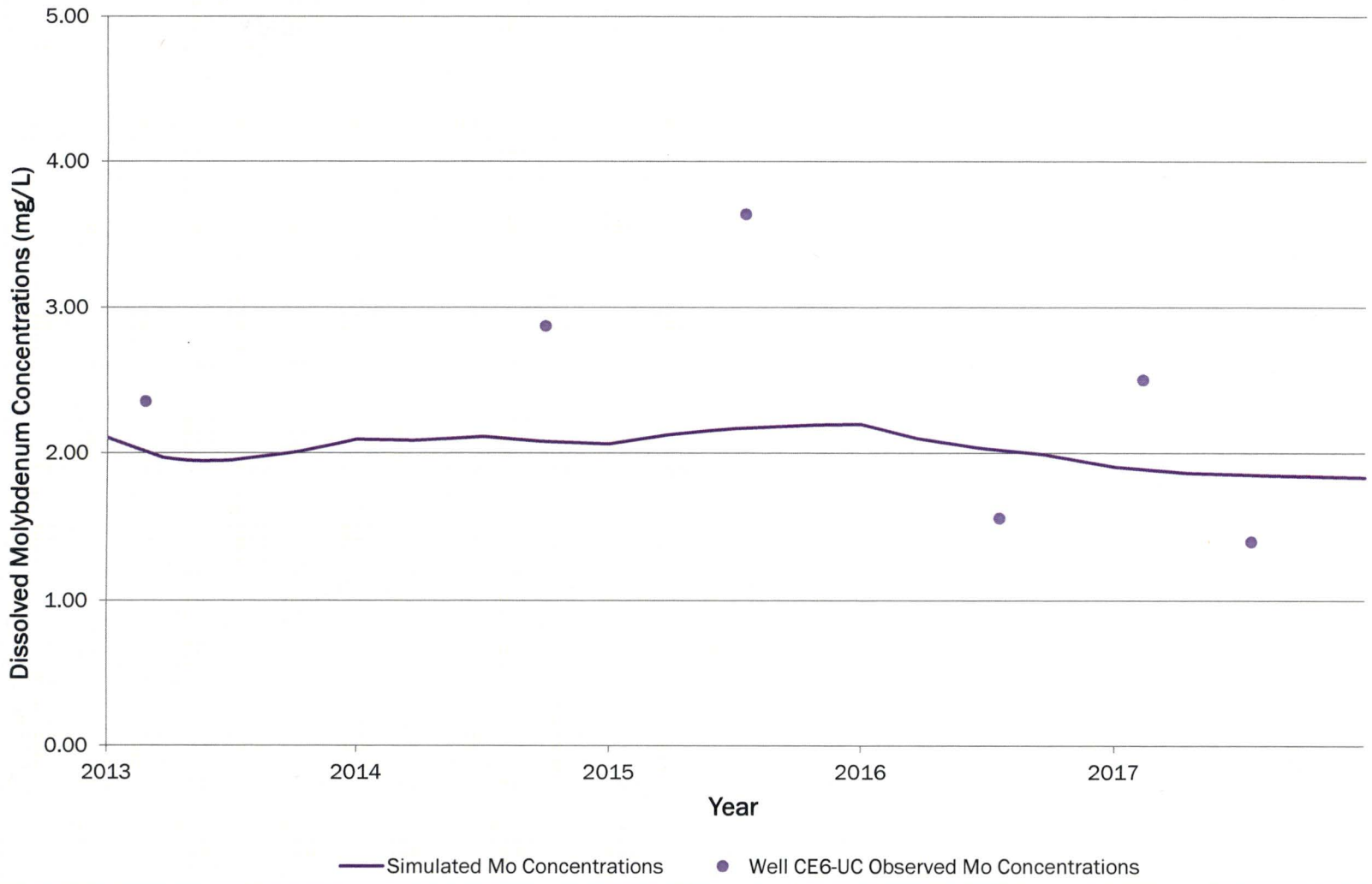

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Figure 5-46

Simulated versus Observed Molybdenum Concentrations - Well CE6-UC

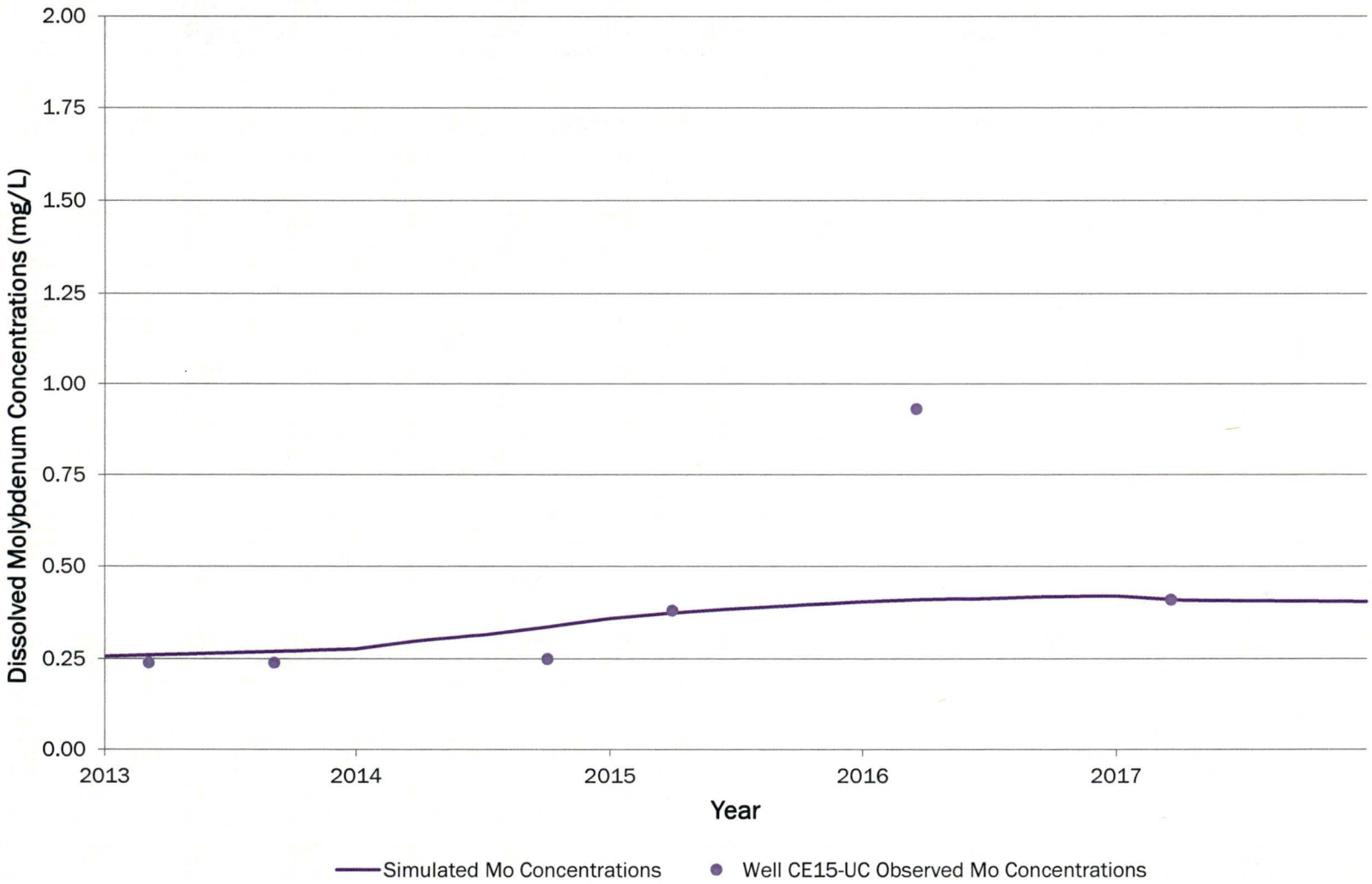

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Figure 5-47

Simulated versus Observed Molybdenum Concentrations - Well CE15-UC

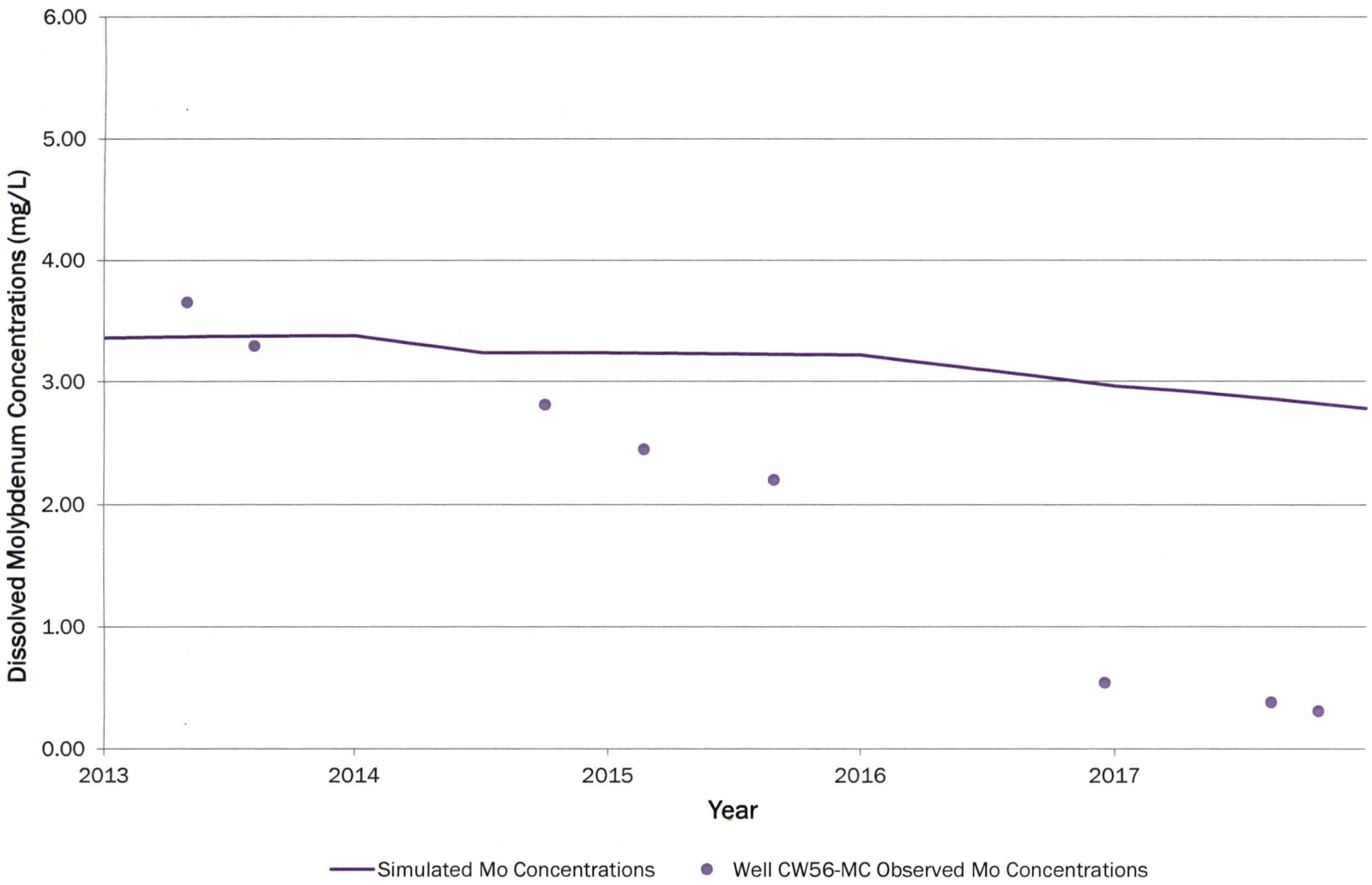

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Figure 5-48

Simulated versus Observed Molybdenum Concentrations - Well CW56-MC

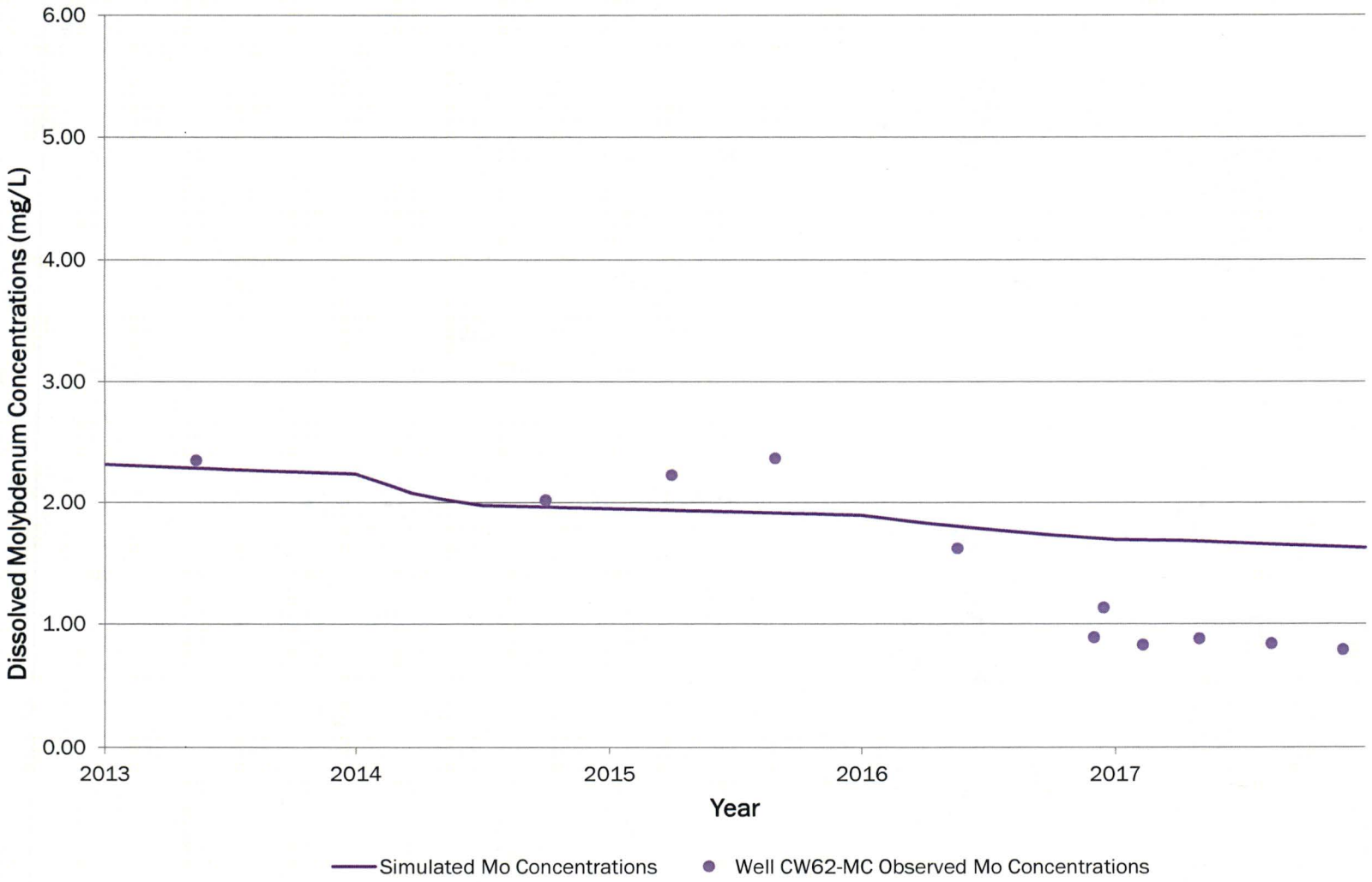

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Figure 5-49

Simulated versus Observed Molybdenum Concentrations - Well CW62-MC

[BCDENFP01]: P:\Data\GEN\Barrick-Homestake\Grants Groundwater Model\GIS_SiteModelReporting\Figure6_1_2017SiteAl_UContours_EffPoro.mxd
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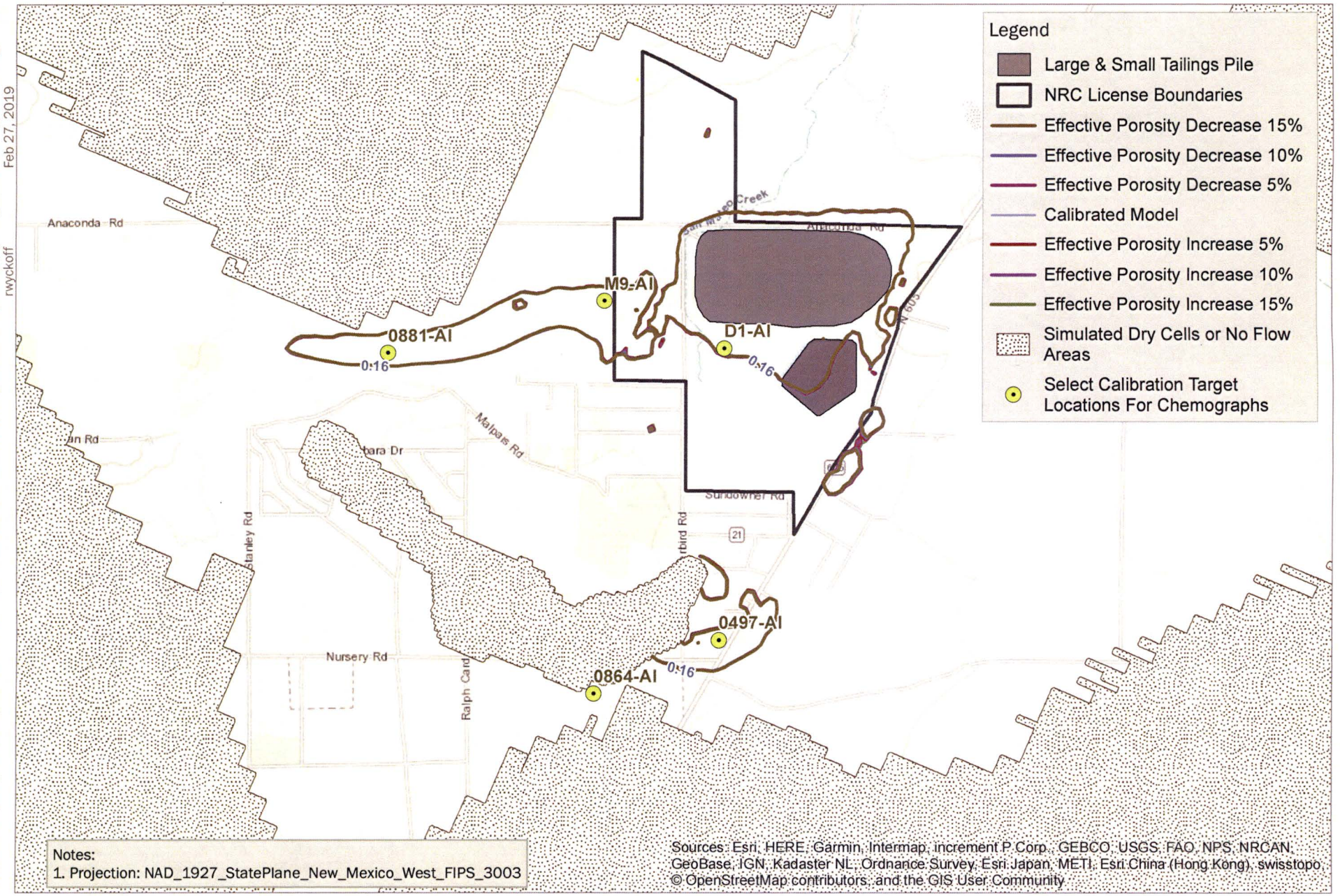

Notes:
1. Projection: NAD_1927_StatePlane_New_Mexico_West_FIPS_3003

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

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0 0.5 1 Miles

N

Figure 6-1
Effective Porosity Sensitivity
2017 Alluvial Aquifer Uranium
0.16 mg/L Concentration Contours

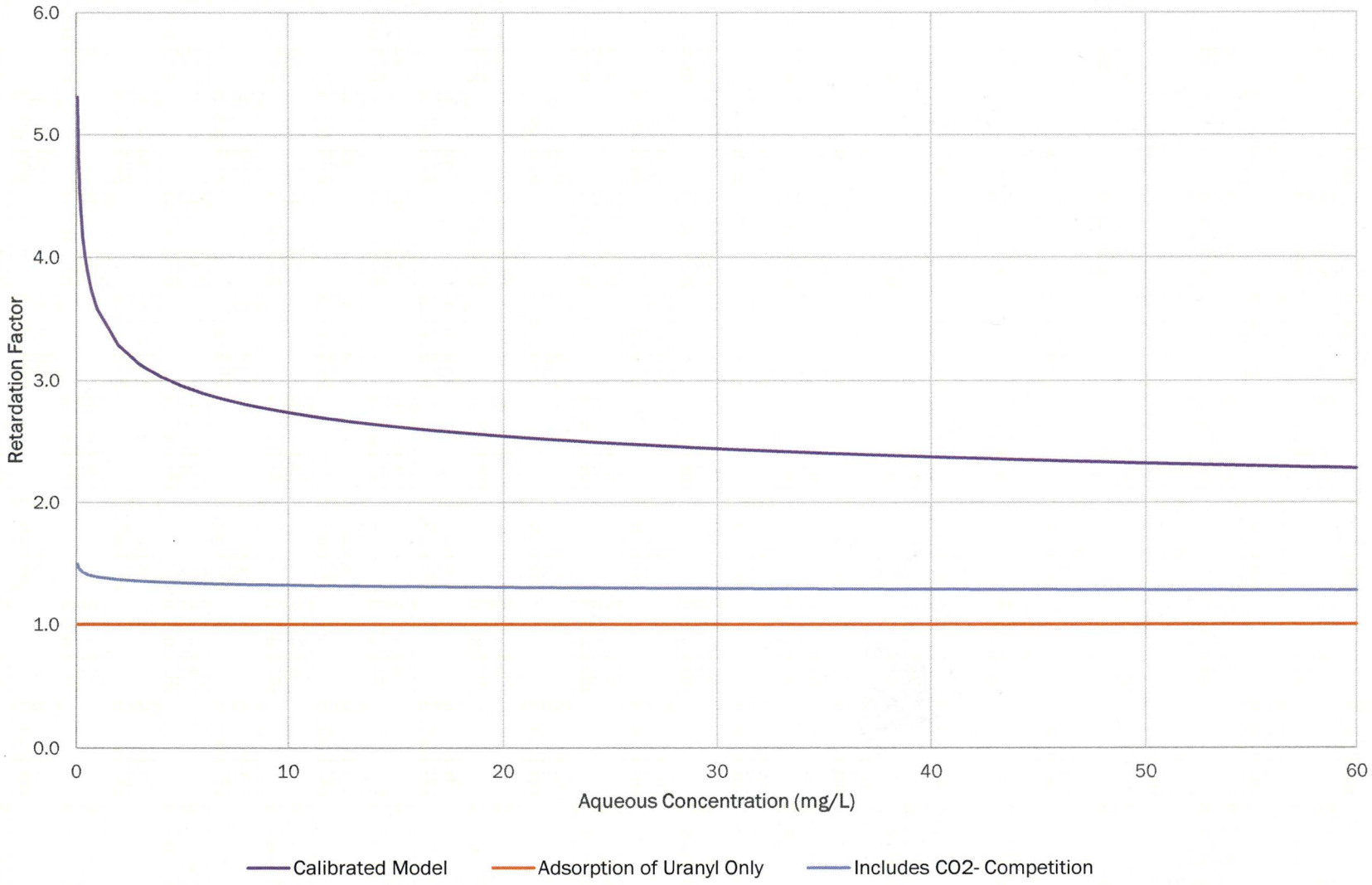

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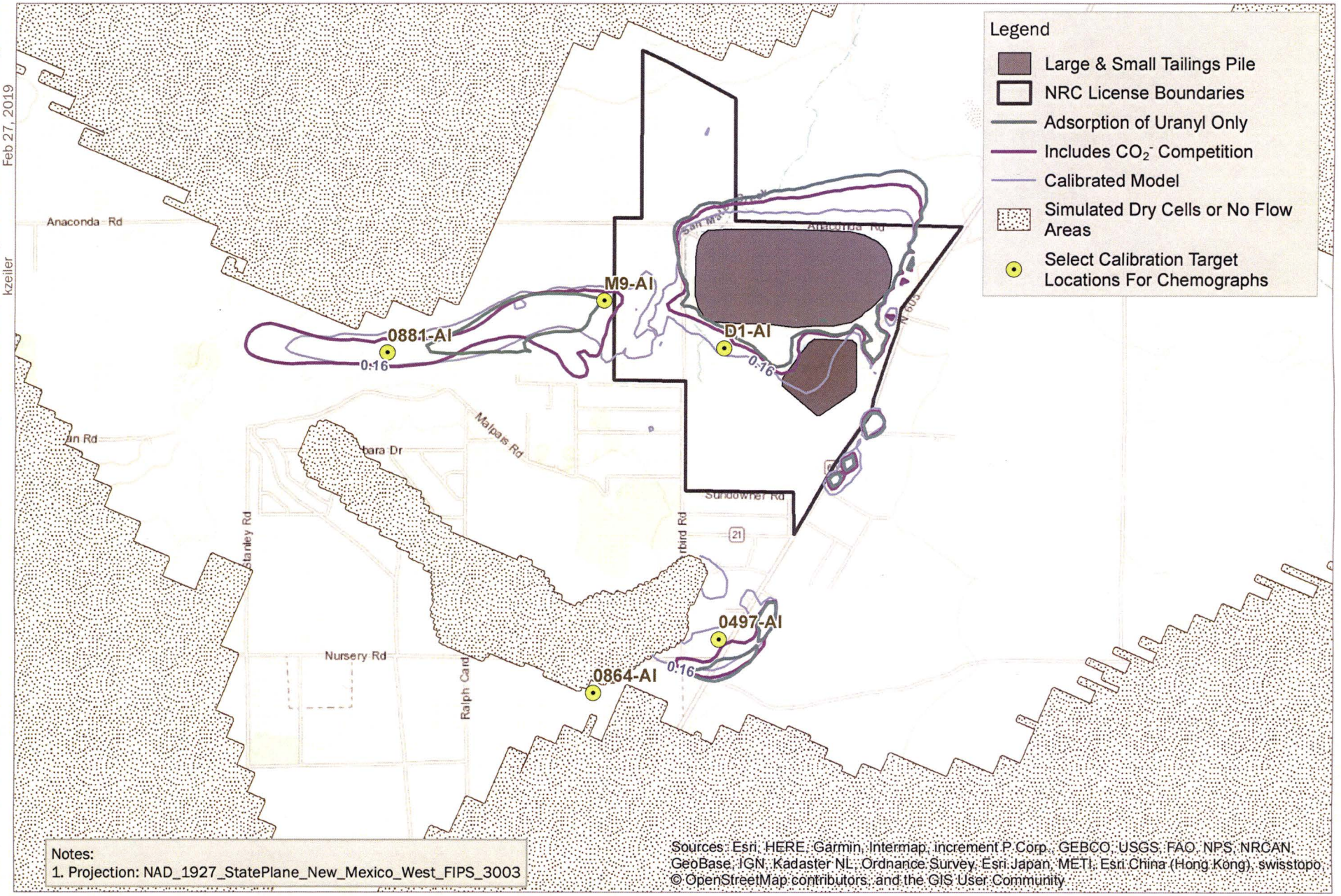
Figure 6-2

Freundlich Sensitivity Parameter Retardation Factor Comparison

[BCDENFP01]: P:\Data\GEN\Barrick-Homestake\Grants Groundwater Model\GIS_SiteModelReporting\Figure6-3_2017SiteAl_UContours_Freundlich.mxd
Feb 27, 2019
kzeiler



Notes:
1. Projection: NAD_1927_StatePlane_New_Mexico_West_FIPS_3003

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

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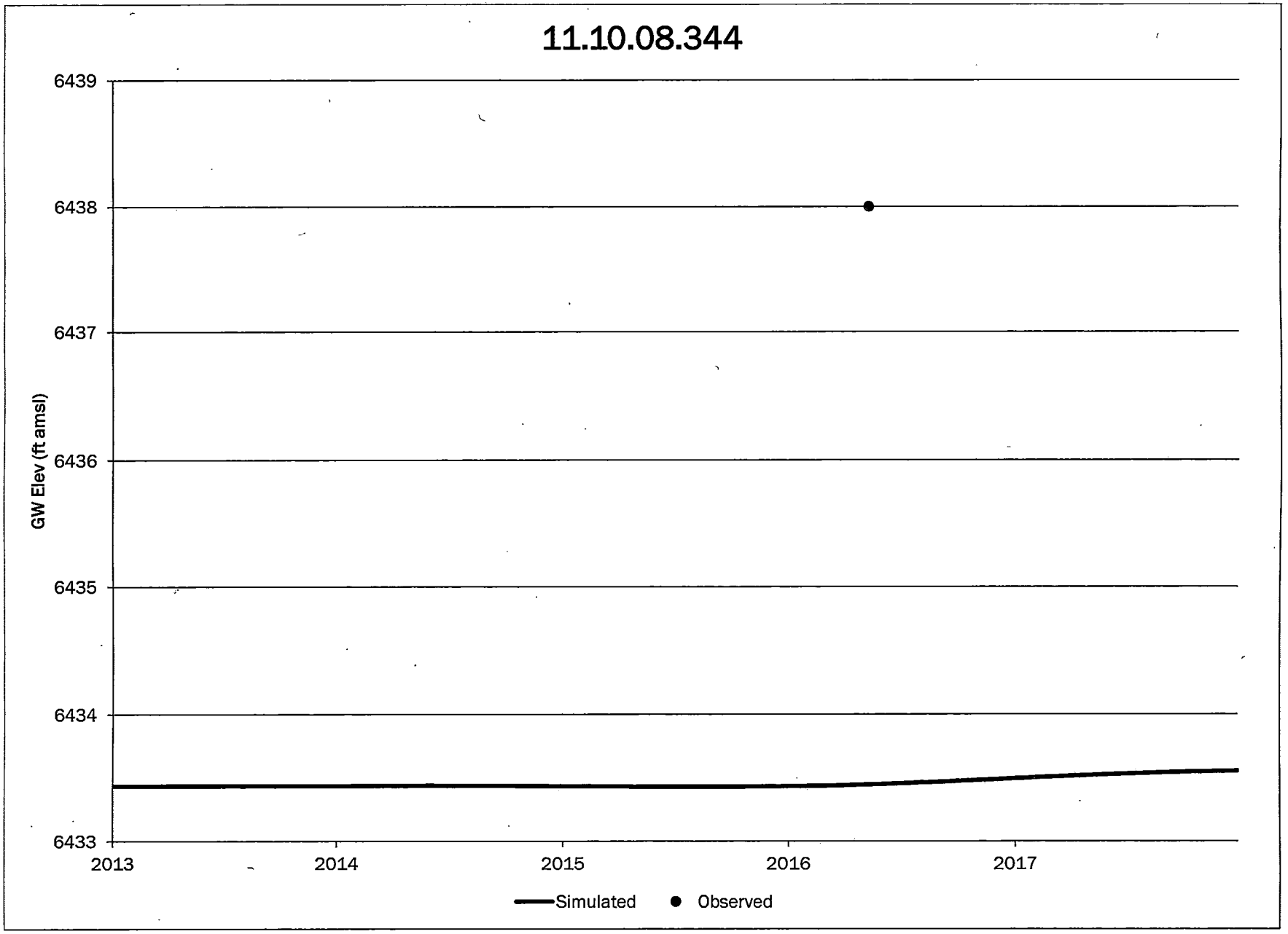
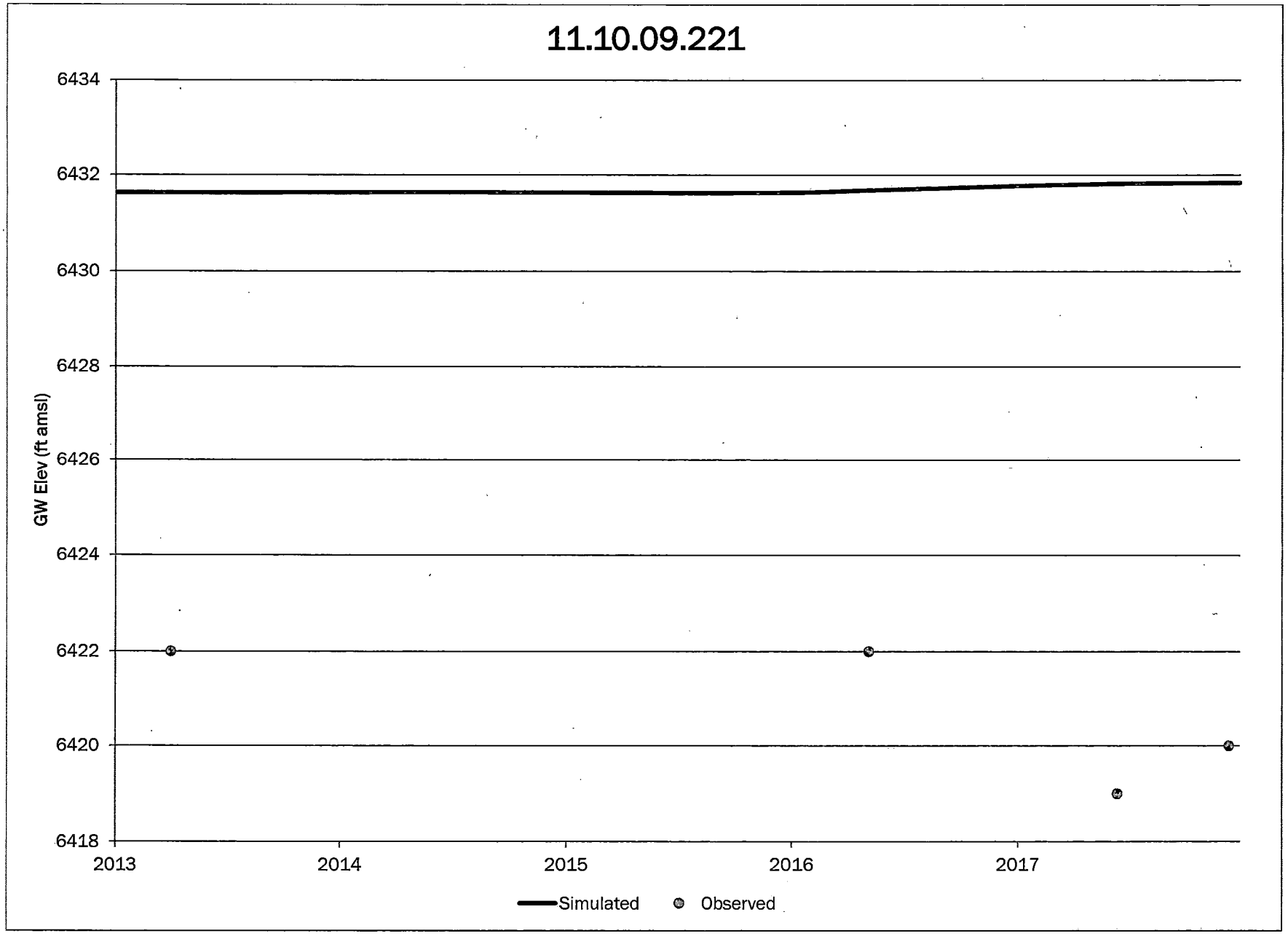
0 0.5 1 Miles

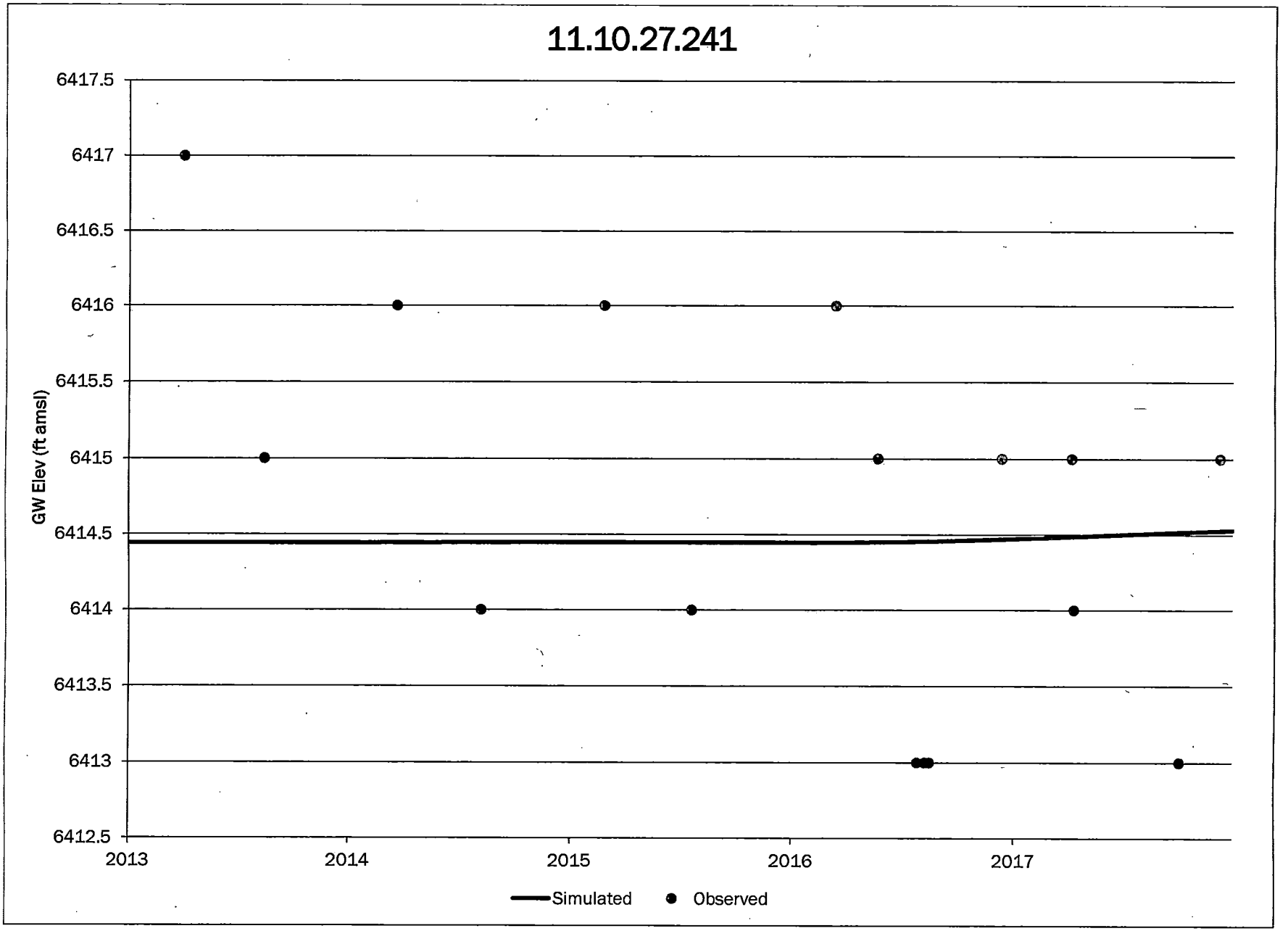
N

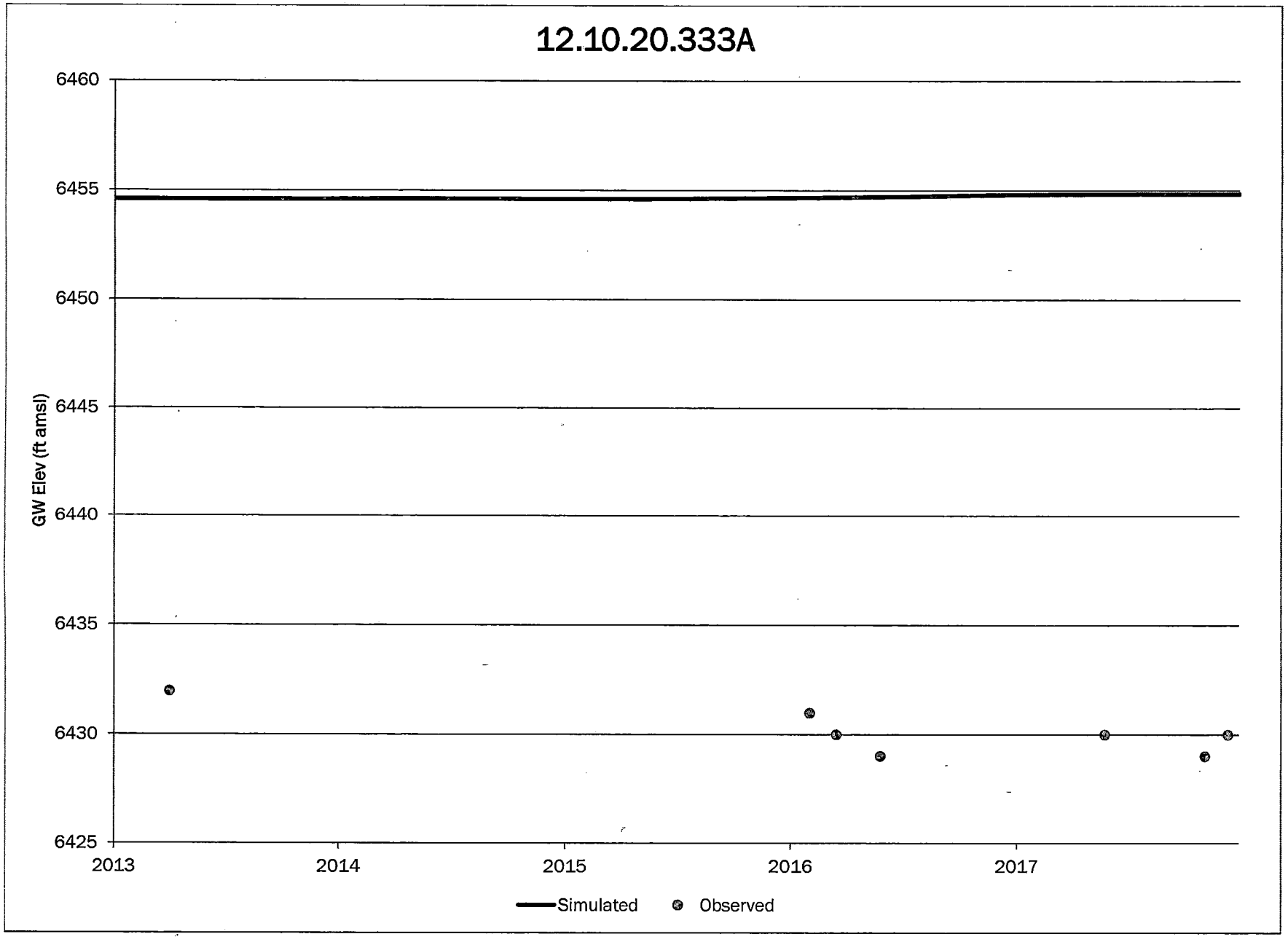
Figure 6-3
Freundlich Parameter Sensitivity
2017 Alluvial Aquifer Uranium
0.16 mg/L Concentration Contours

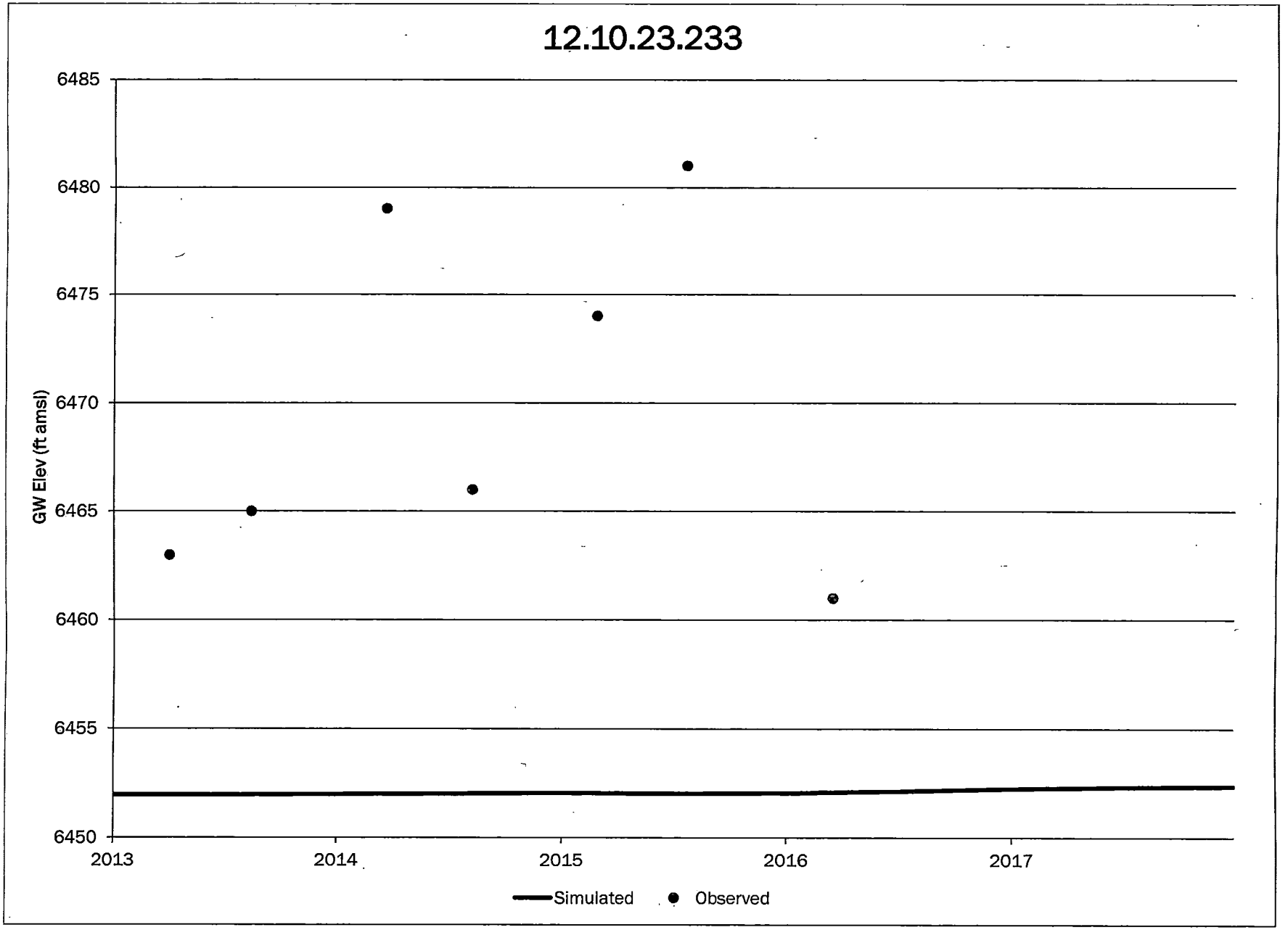
Appendix A: Simulated Groundwater Hydrographs

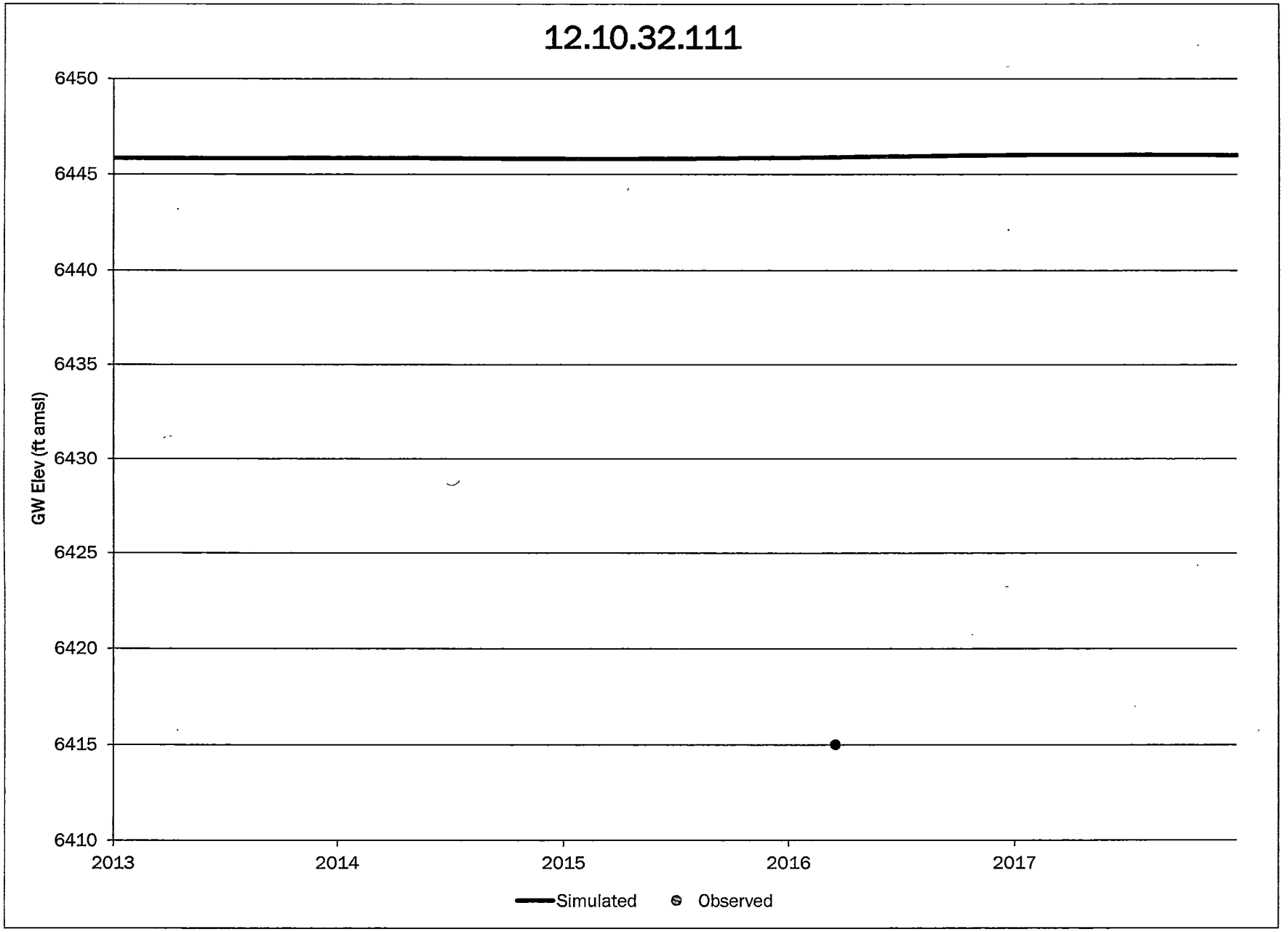

11.10.08.344
6439
6438
6437
6436
6435
6434
6433
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed

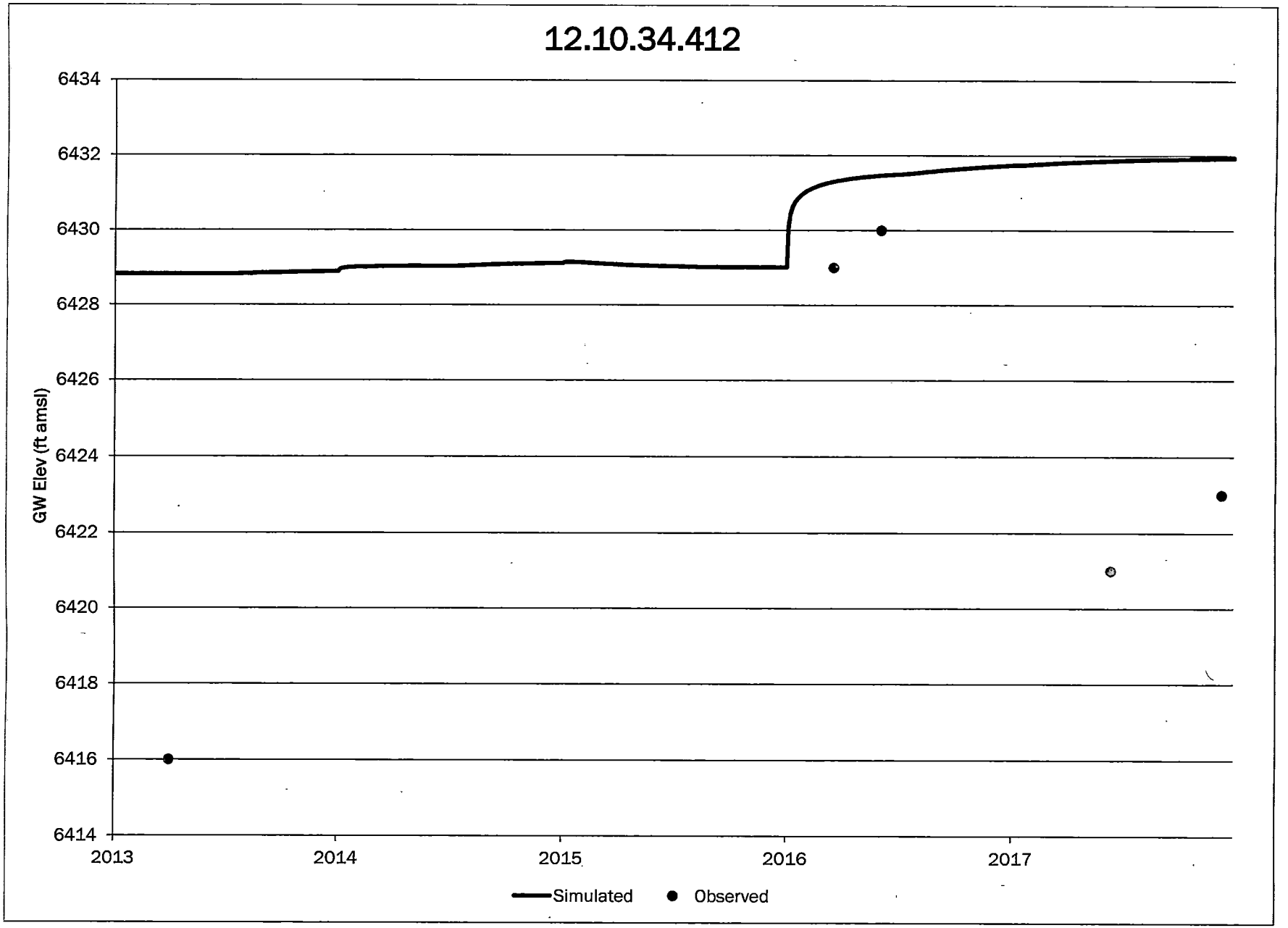

11.10.09.221
6434
6432
6430
6428
6426
6424
6422
6420
6418
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed

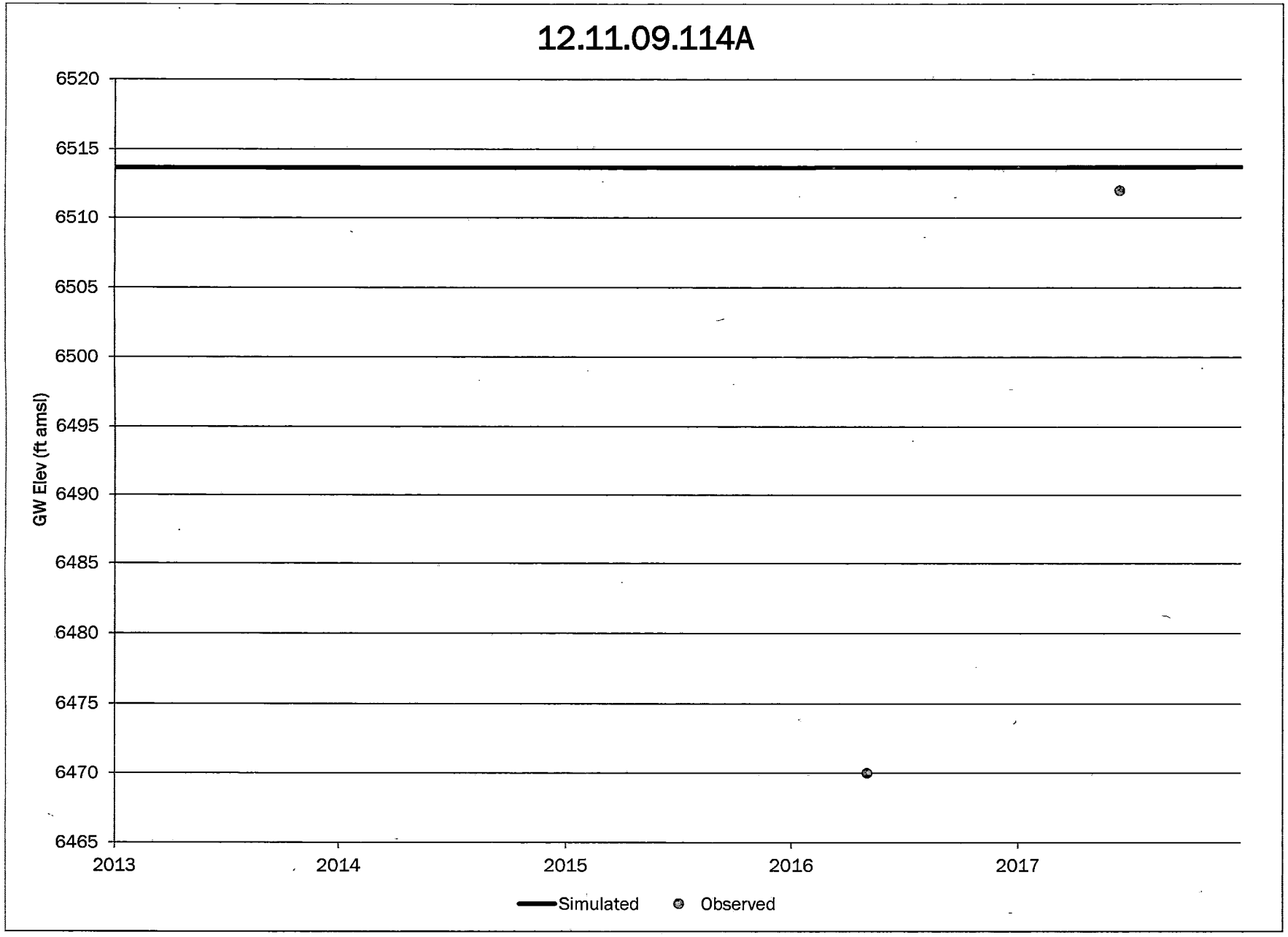

11.10.27.241
6417.5
6417
6416.5
6416
6415.5
6415
6414.5
6414
6413.5
6413
6412.5
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed

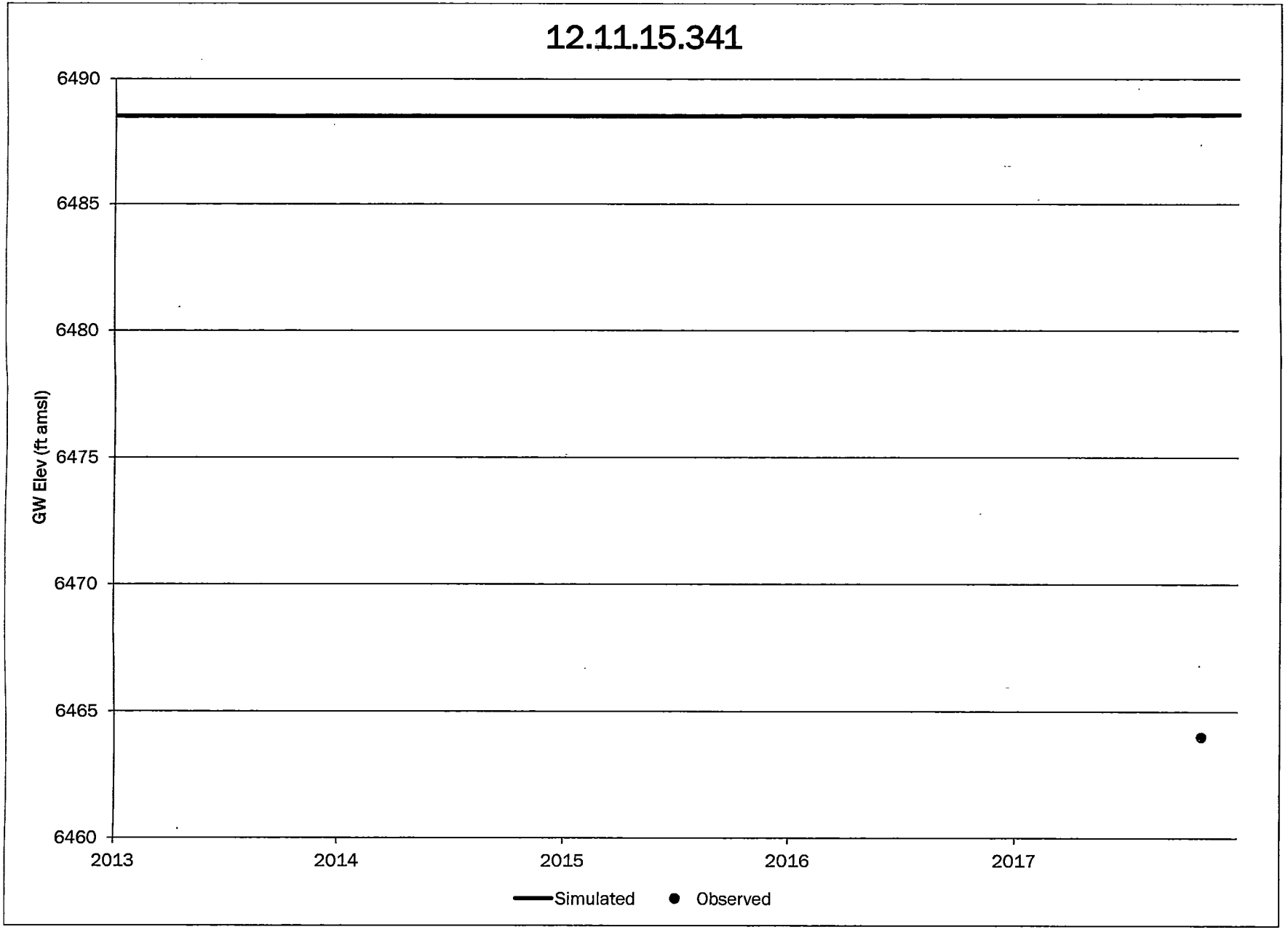

12.10.20.333A
6460
6455
6450
6445
6440
6435
6430
6425
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed

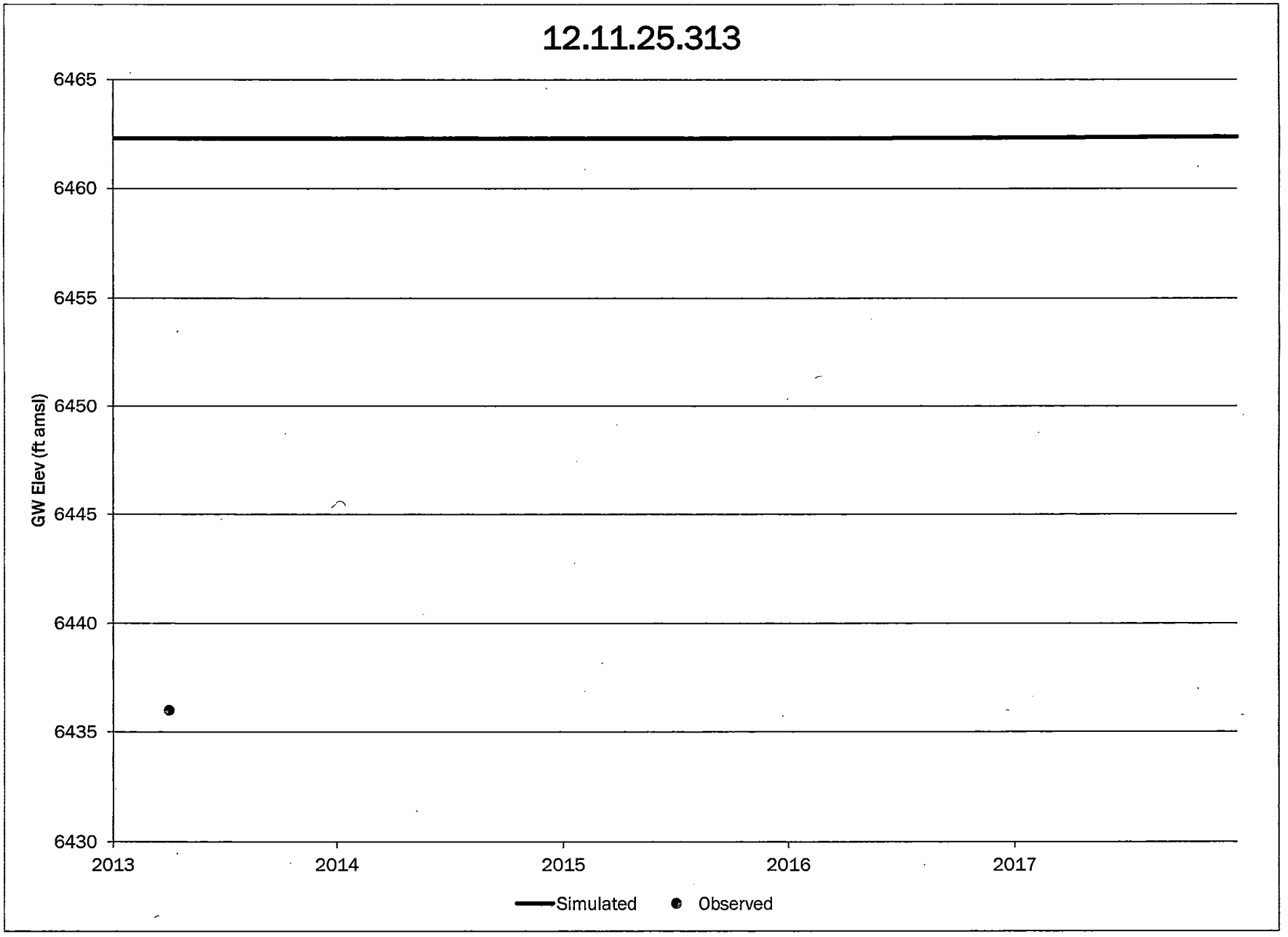

12.10.23.233
6485
6480
6475
6470
6465
6460
6455
6450
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed

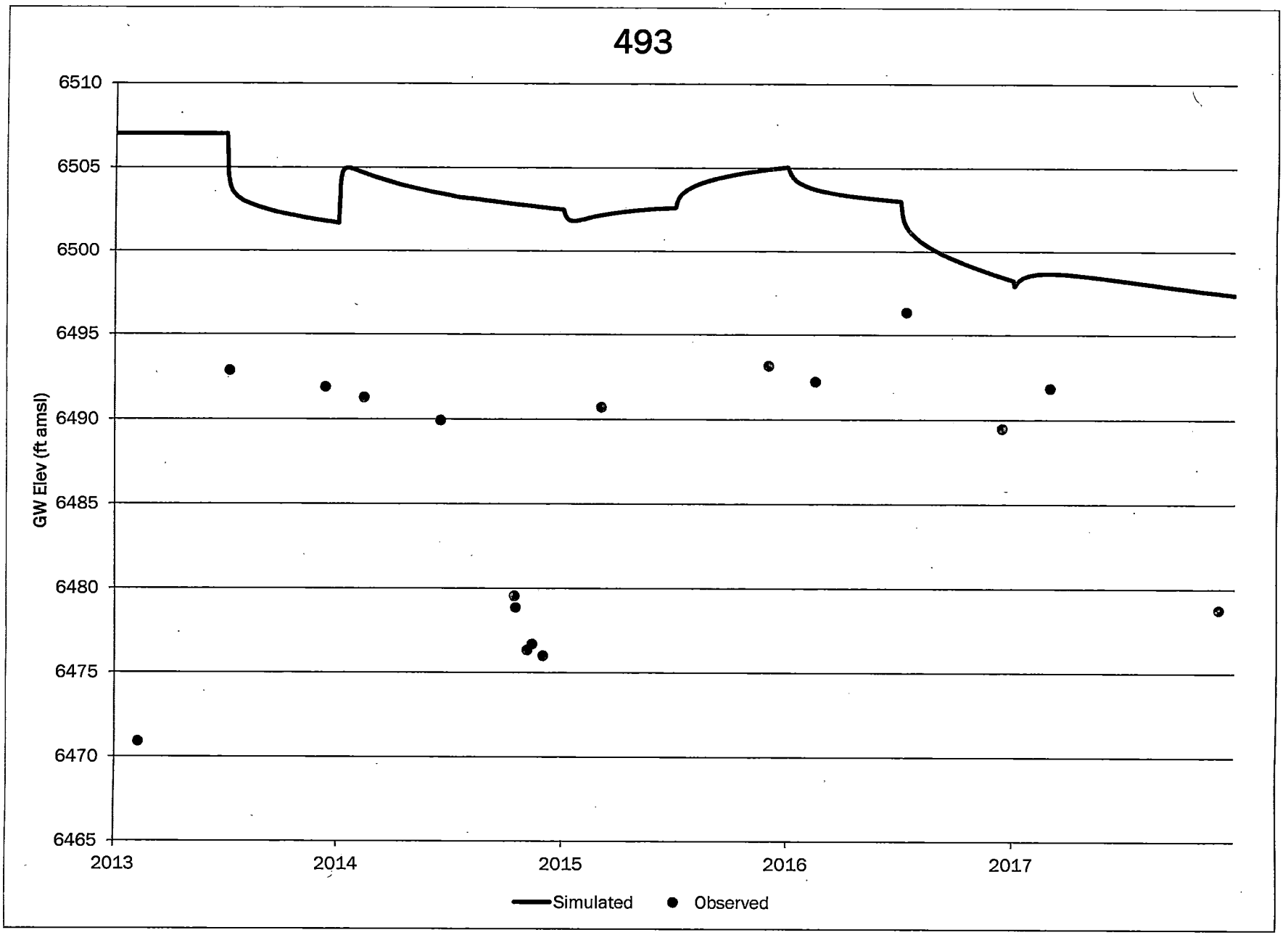

12.10.32.111
6450
6445
6440
6435
6430
6425
6420
6415
6410
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed

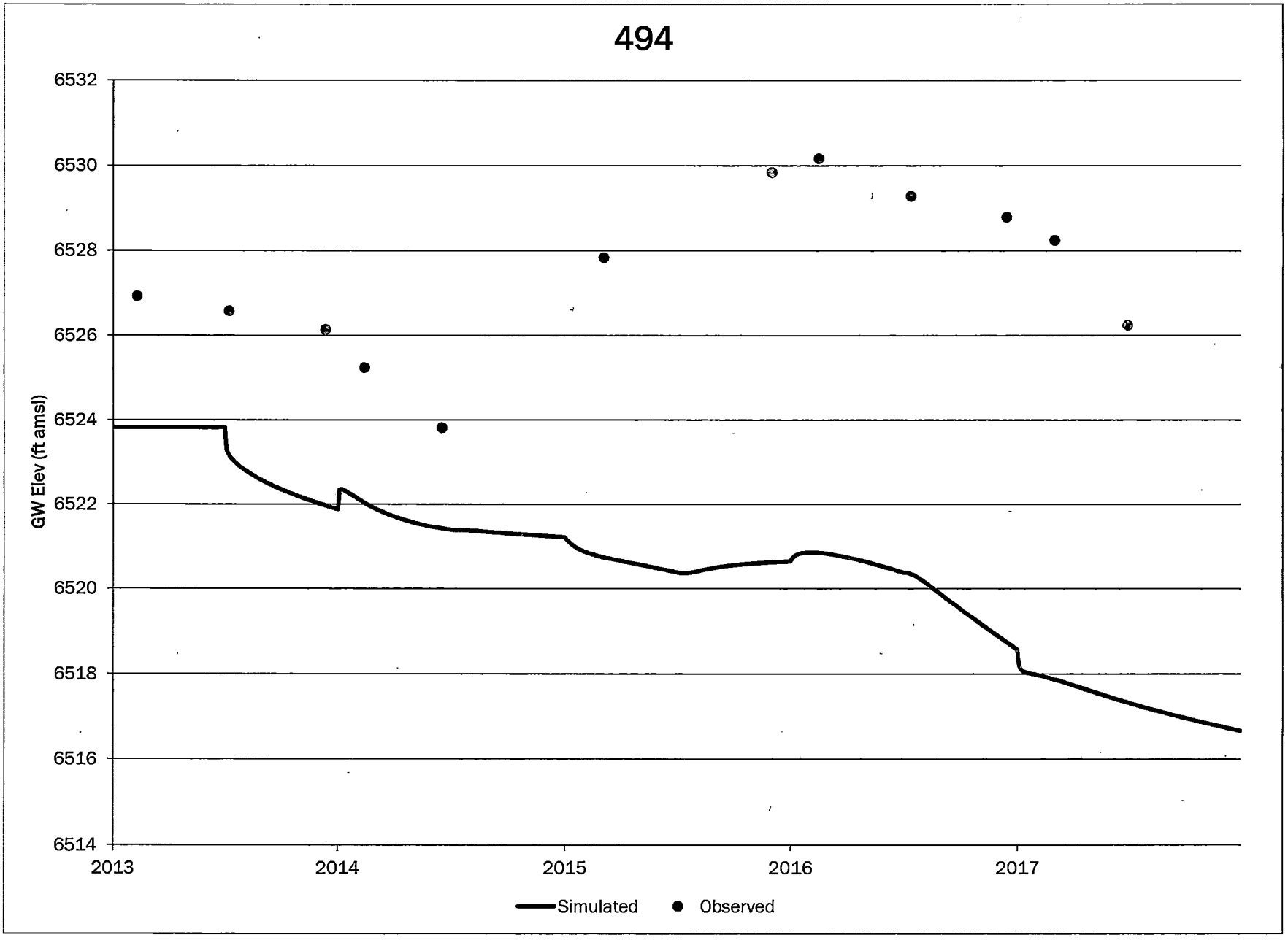

12.10.34.412
6434
6432
6430
6428
6426
6424
6422
6420
6418
6416
6414
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed

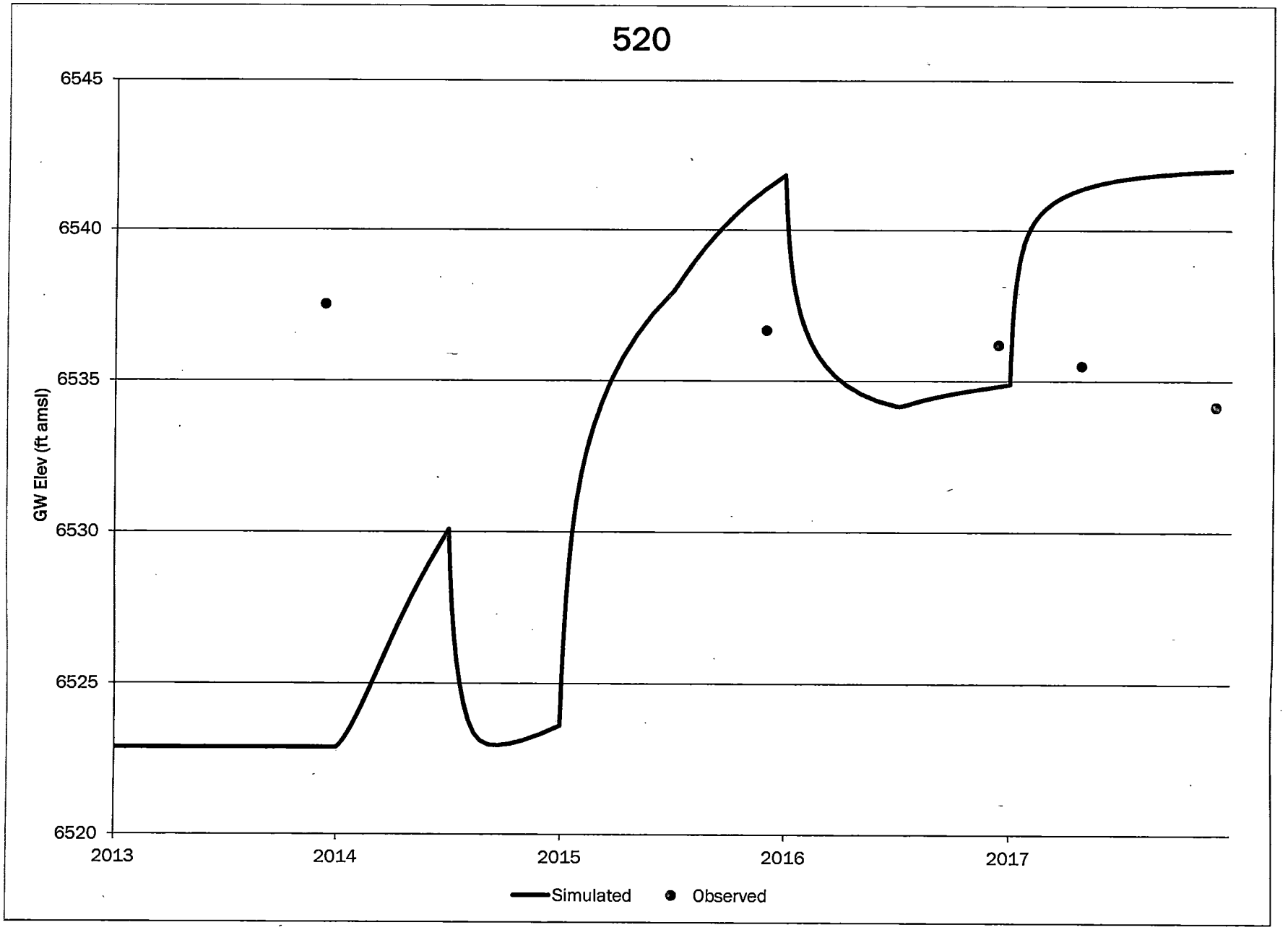

12.11.09.114A
6520
6515
6510
6505
6500
6495
6490
6485
6480
6475
6470
6465
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed

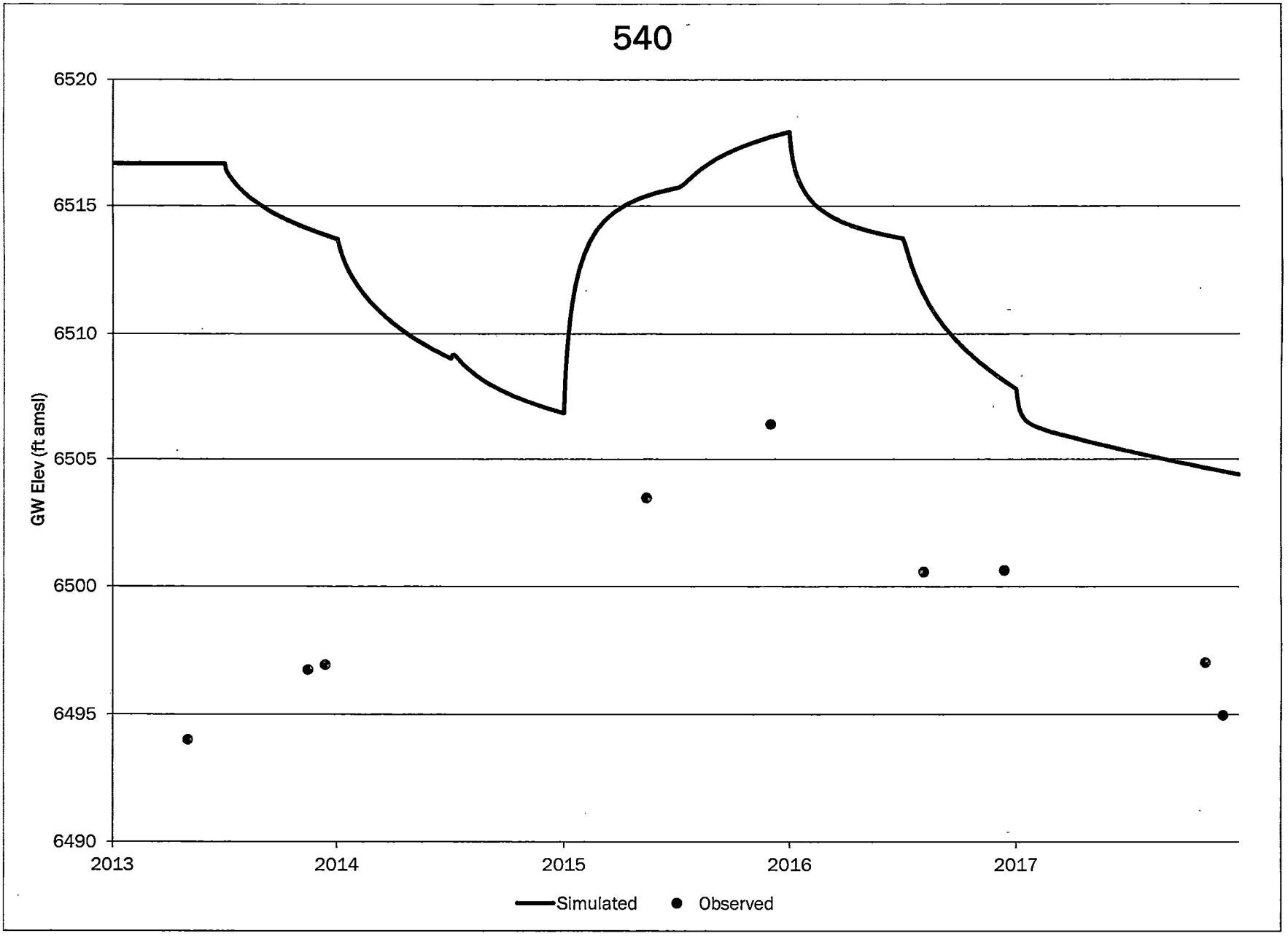

12.11.15.341
6490
6485
6480
6475
6470
6465
6460
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed

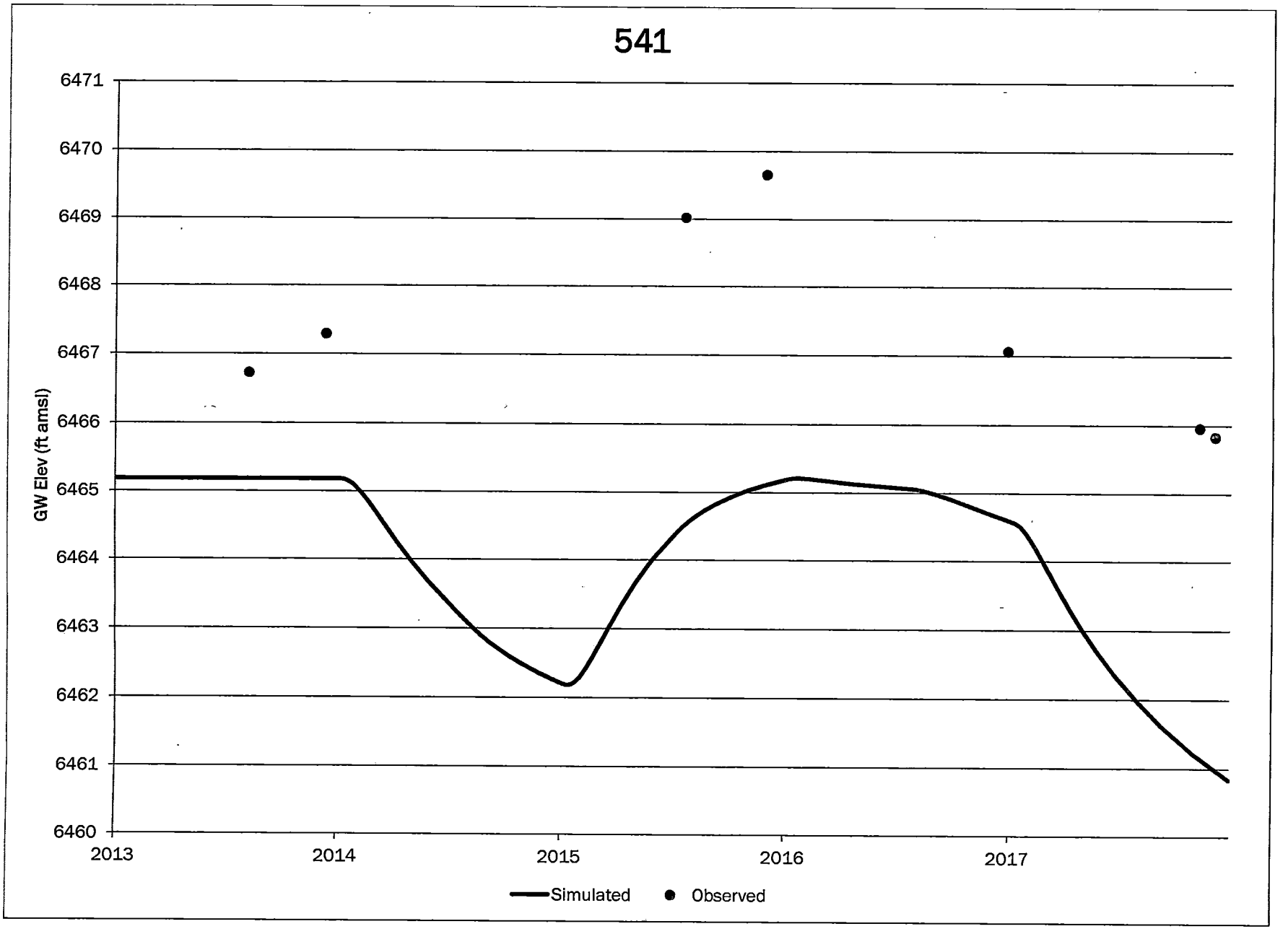

12.11.25.313
6465
6460
6455
6450
6445
6440
6435
6430
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed

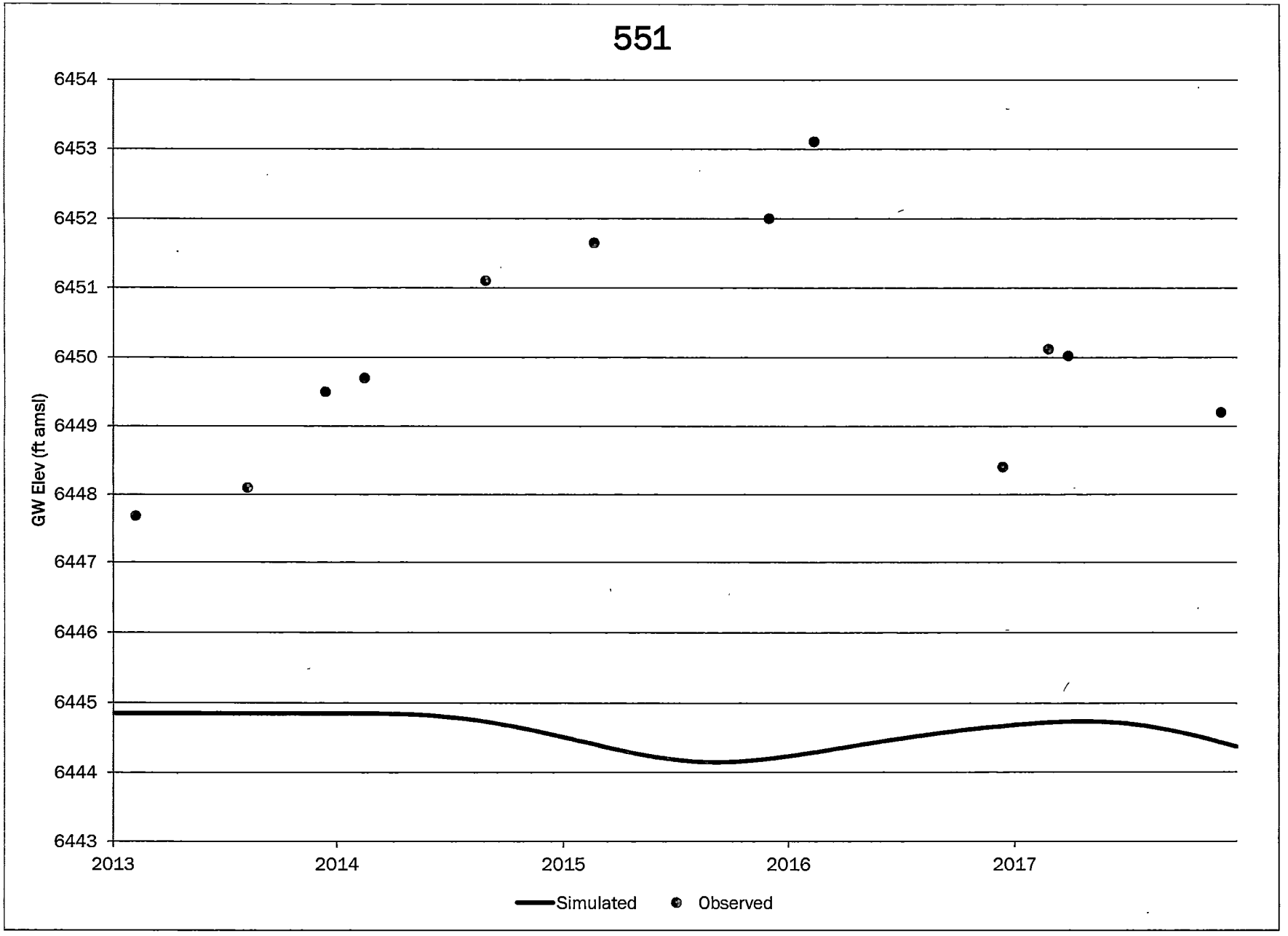

493
6510
6505
6500
6495
6490
6485
6480
6475
6470
6465
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed

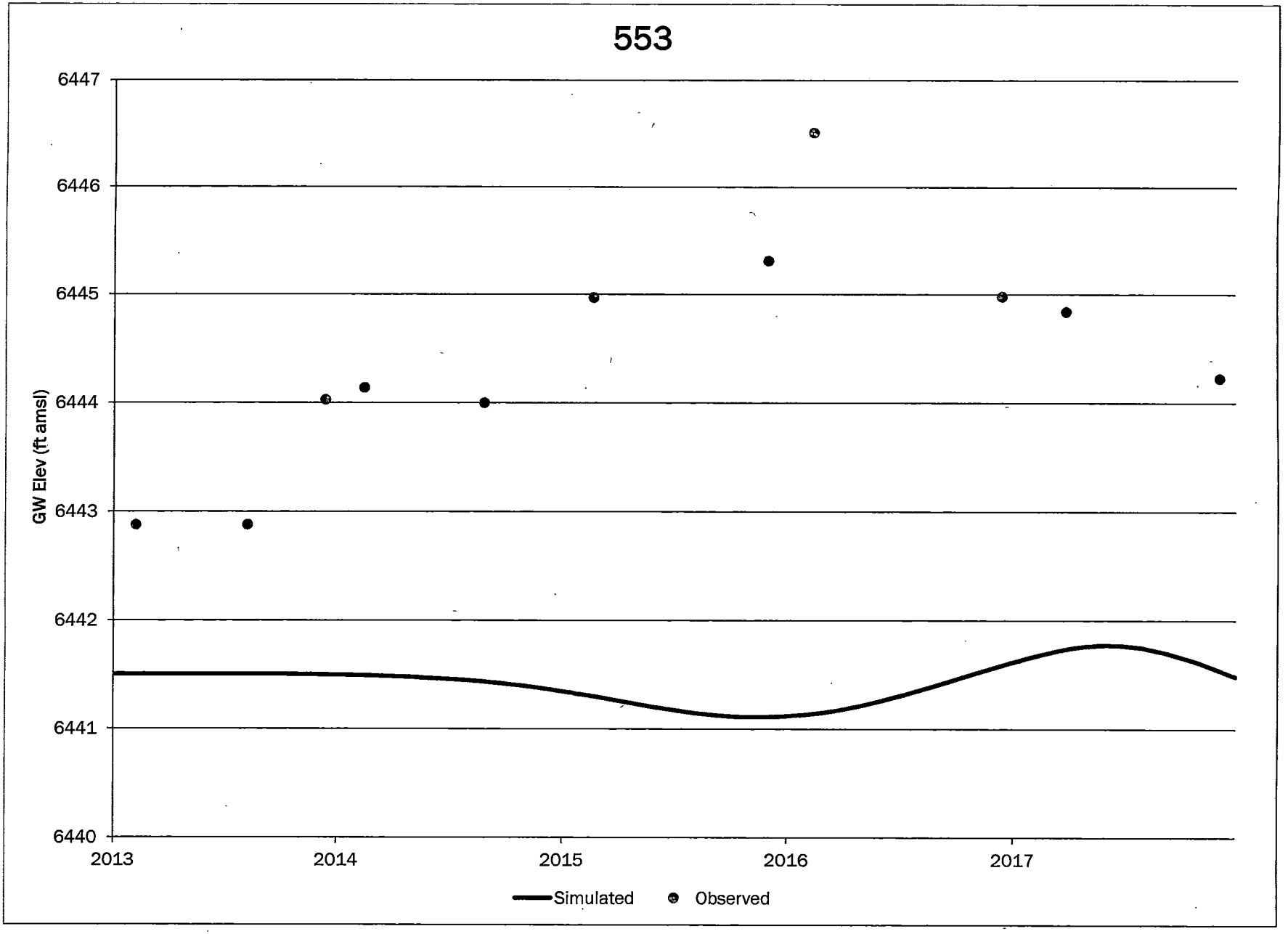

494
6532
6530
6528
6526
6524
6522
6520
6518
6516
6514
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed

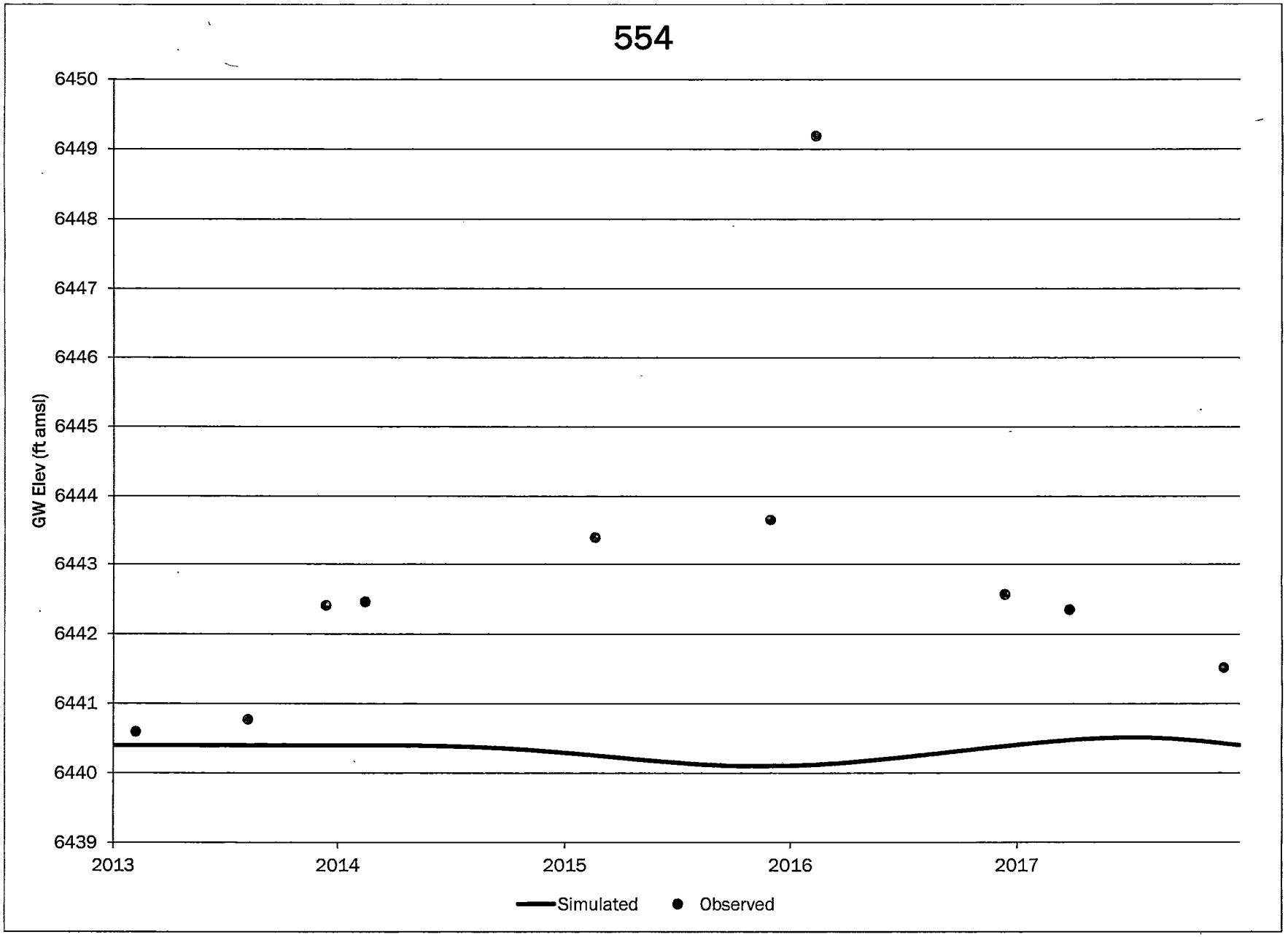

520
6545
6540
6535
6530
6525
6520
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed

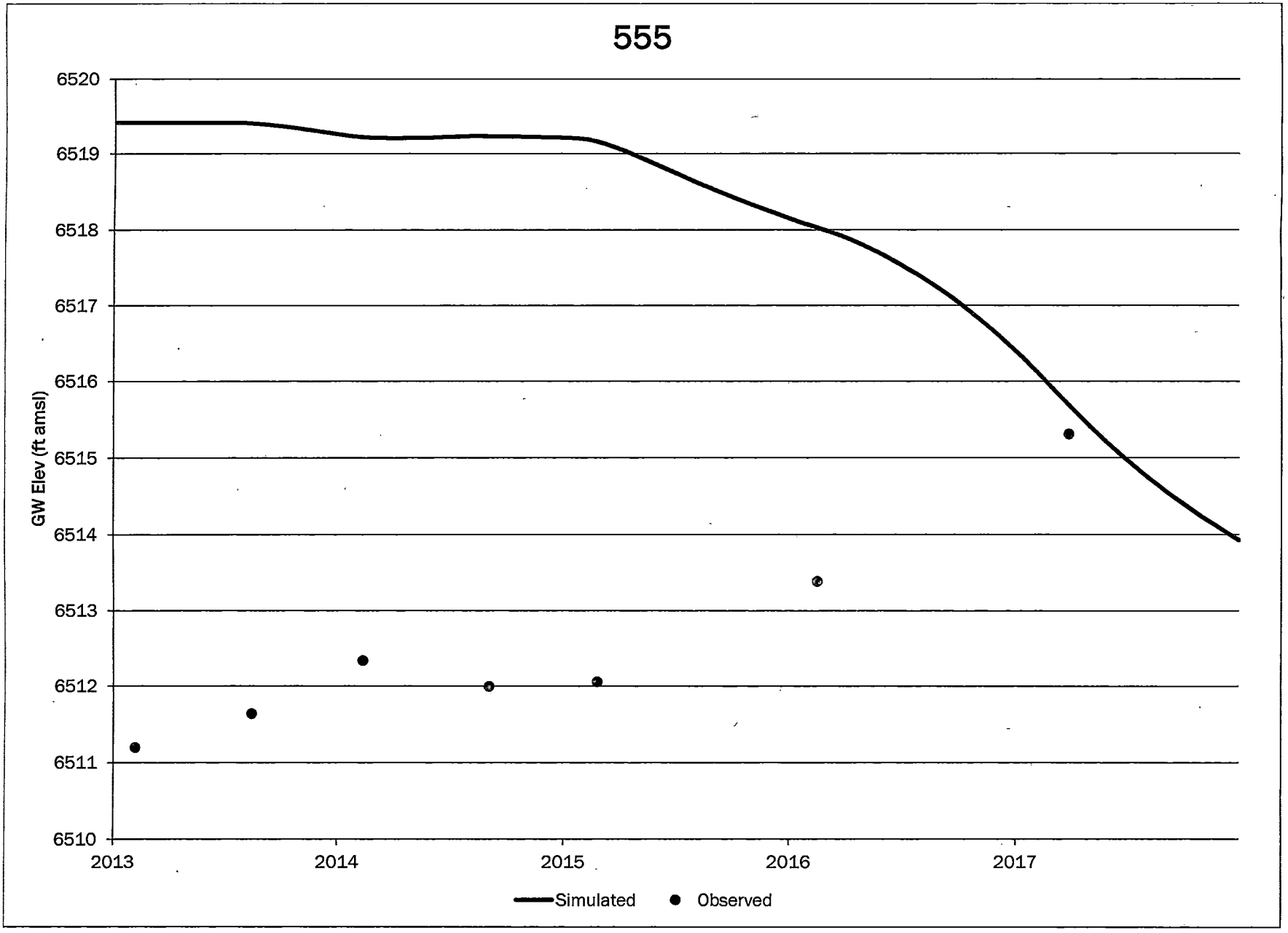

540
6520
6515
6510
6505
6500
6495
6490
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed


541
6471
6470
6469
6468
6467
6466
6465
6464
6463
6462
6461
6460
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed


551
6454
6453
6452
6451
6450
6449
6448
6447
6446
6445
6444
6443
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed


553
6447
6446
6445
6444
6443
6442
6441
6440
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed


554
6450
6449
6448
6447
6446
6445
6444
6443
6442
6441
6440
6439
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed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GW Elev (ft amsl)
2013
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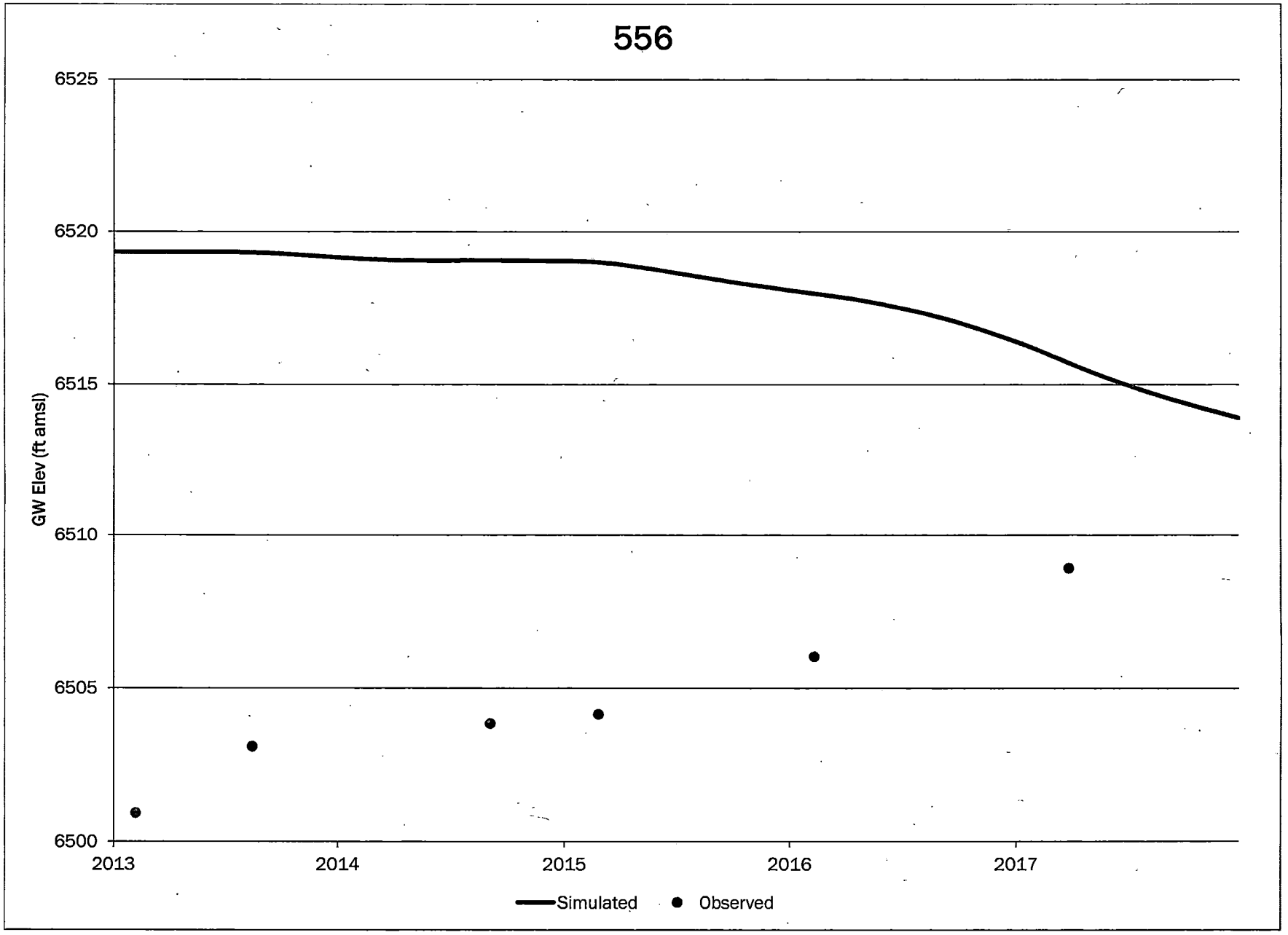
2017
Simulated
Observed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GW Elev (ft amsl)
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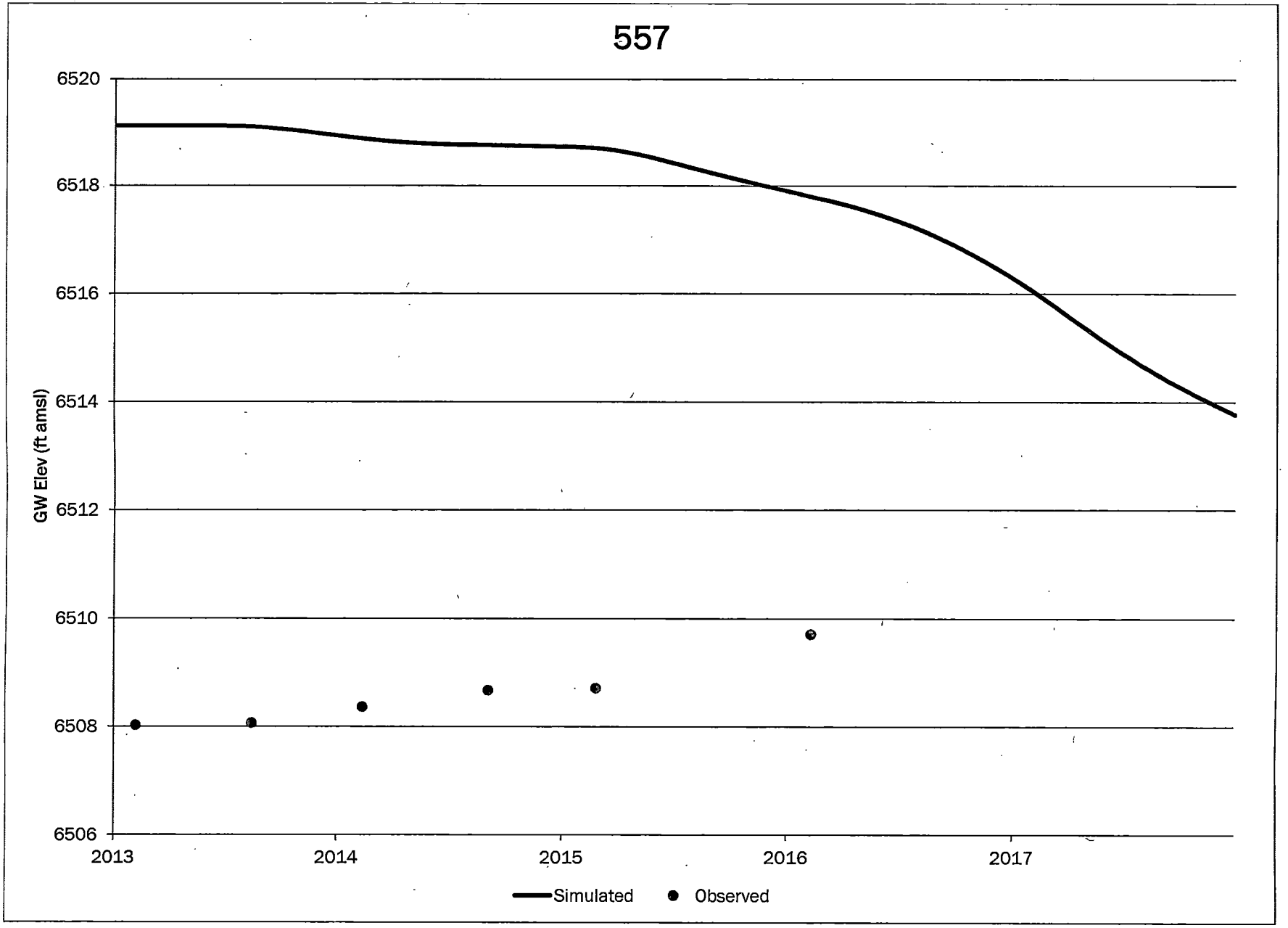
2017
Simulated
Observed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GW Elev (ft amsl)
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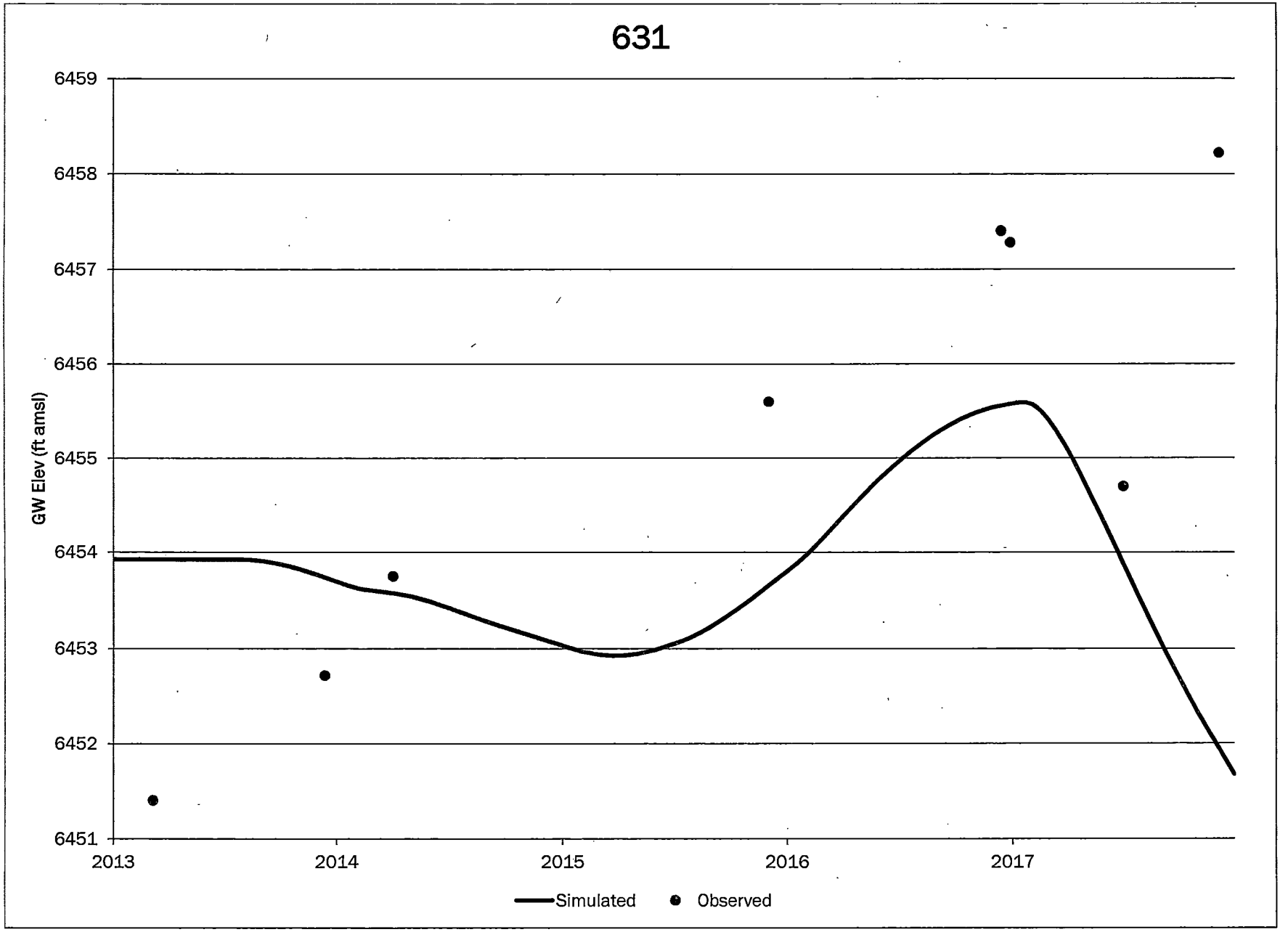
2017
Simulated
Observed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GW Elev (ft amsl)
2013
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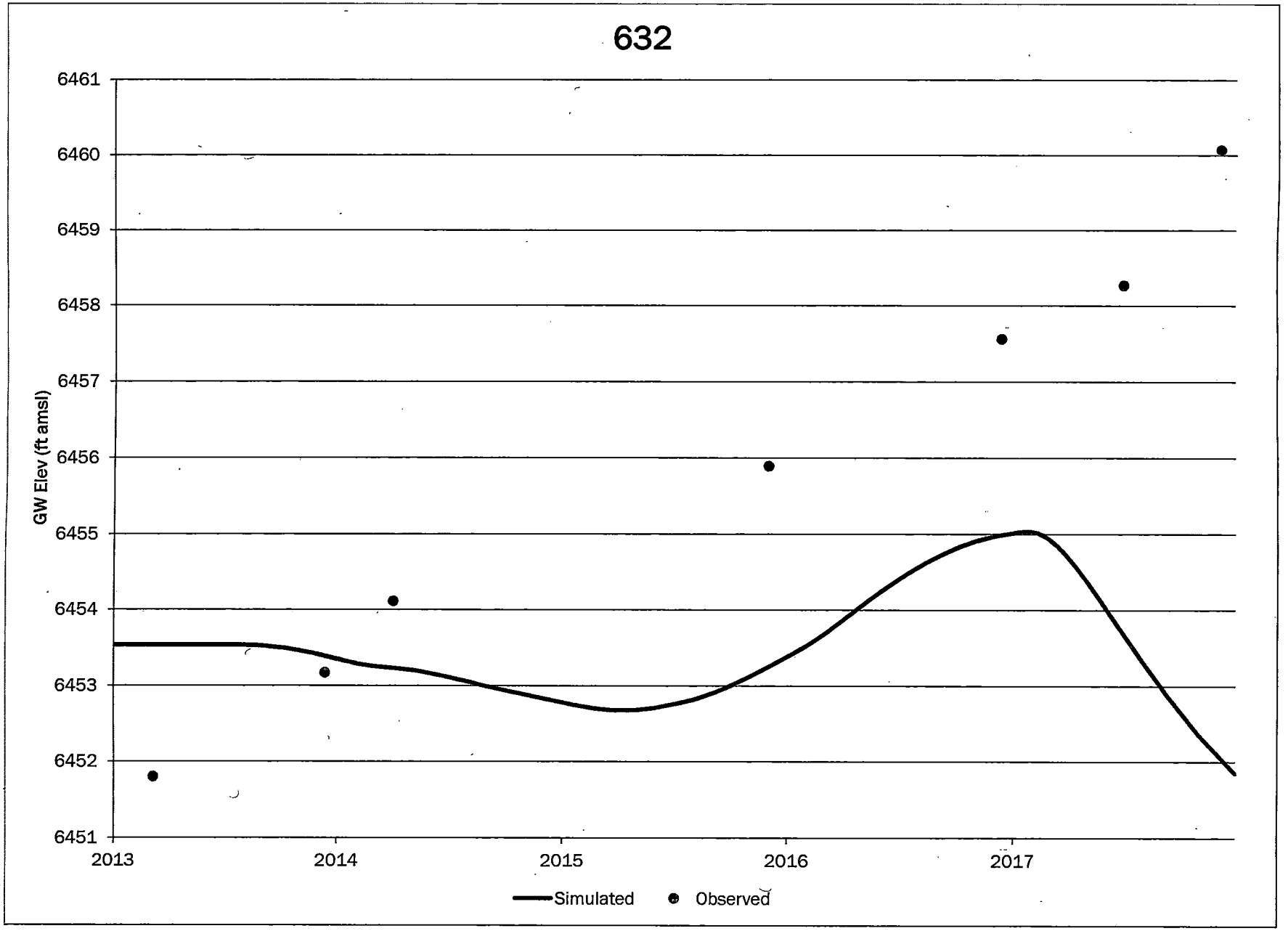
2017
Simulated
Observed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GW Elev (ft amsl)
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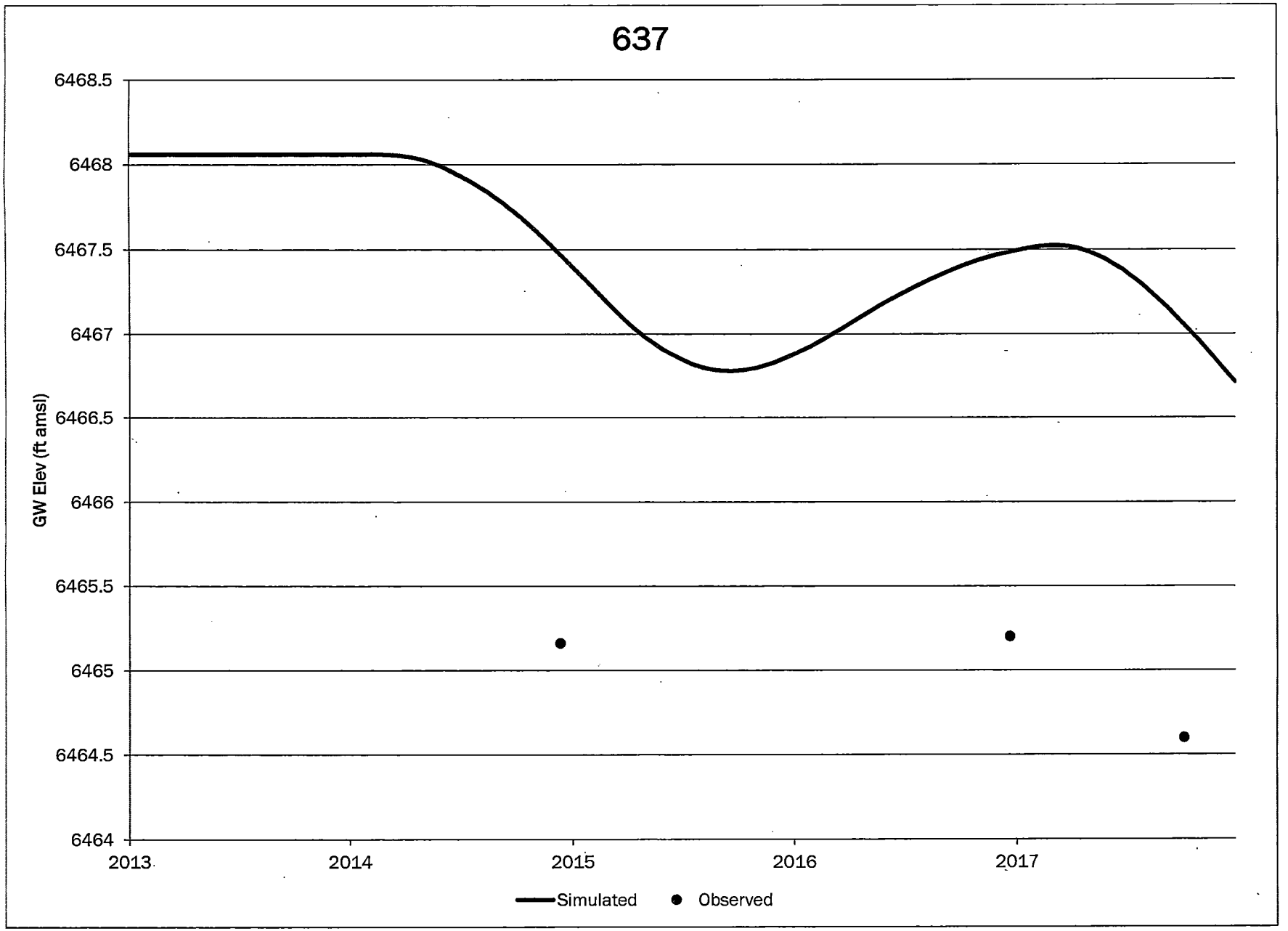
Simulated
Observed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GW Elev (ft amsl)
2013
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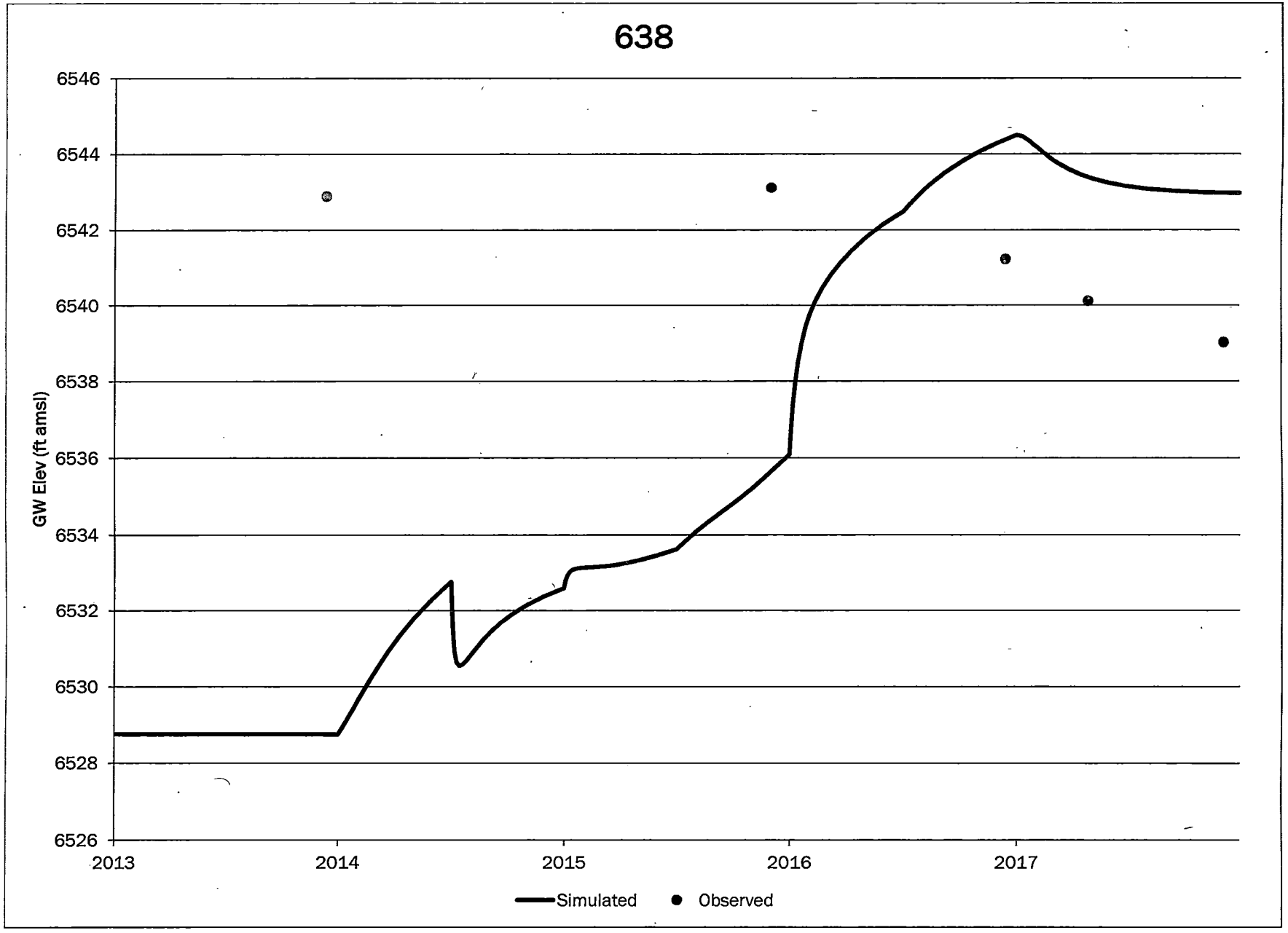
2017
Simulated
Observed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GW Elev (ft amsl)
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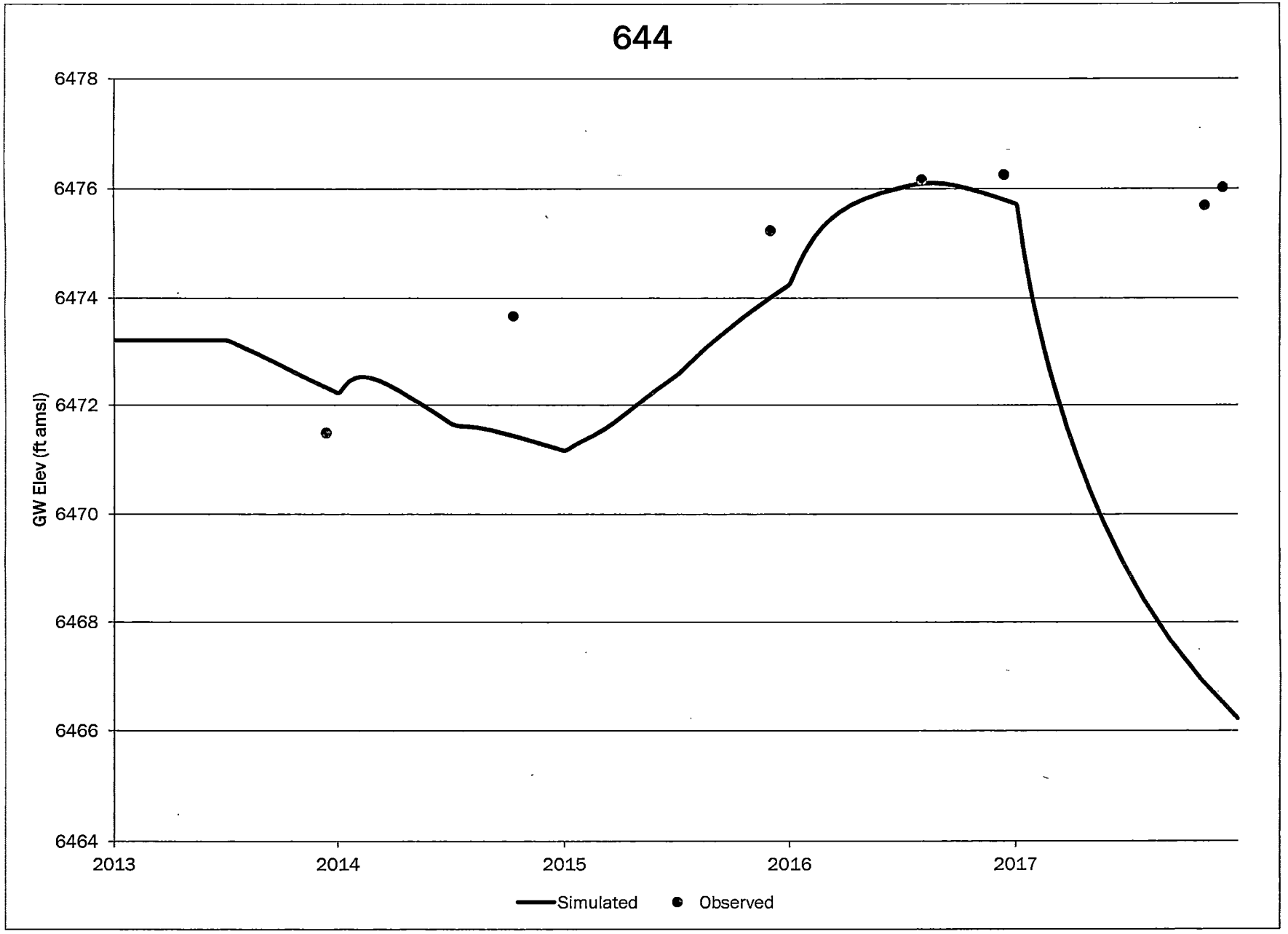
2017
Simulated
Observed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GW Elev (ft amsl)
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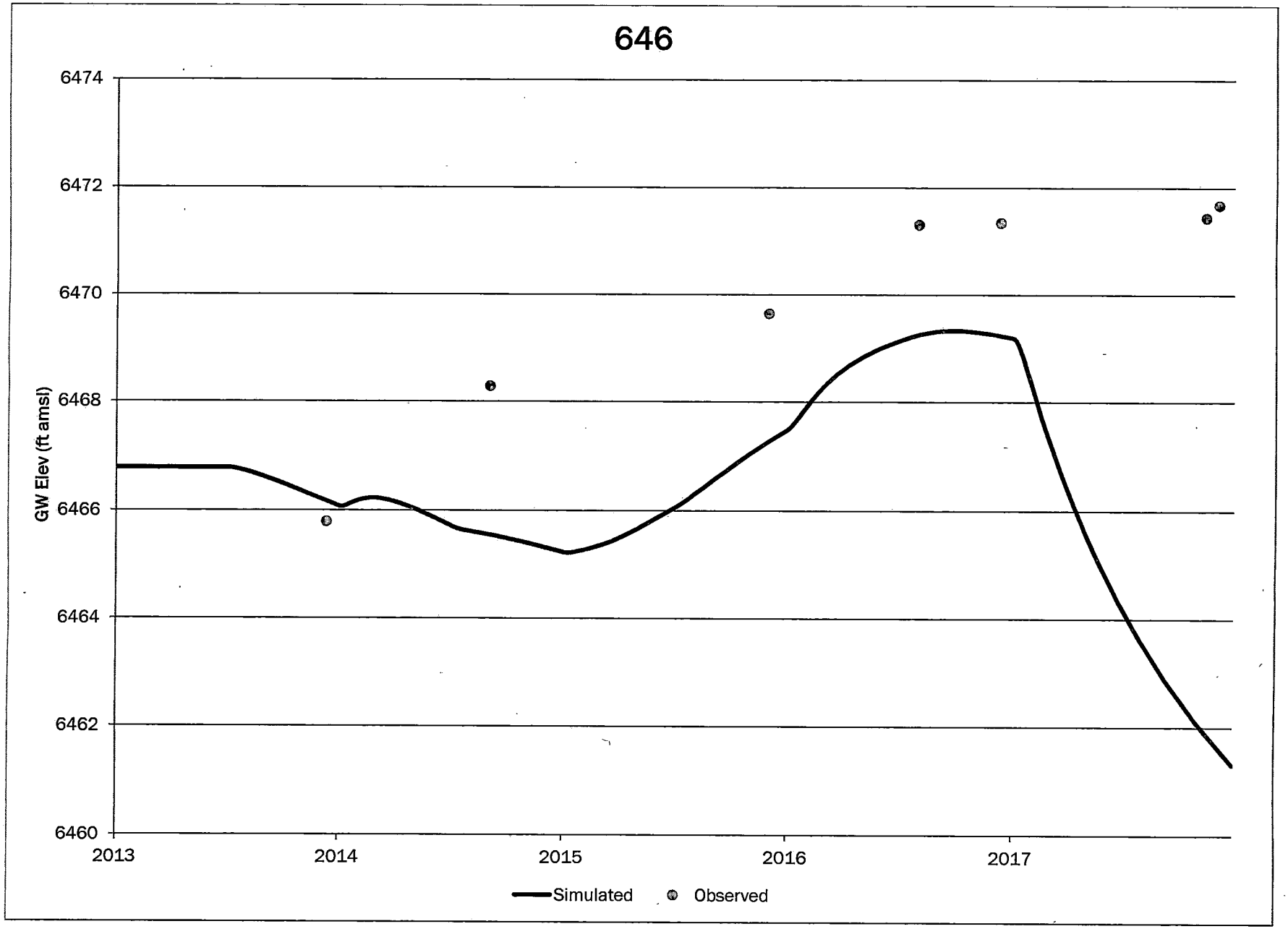
Simulated
Observed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GW Elev (ft amsl)
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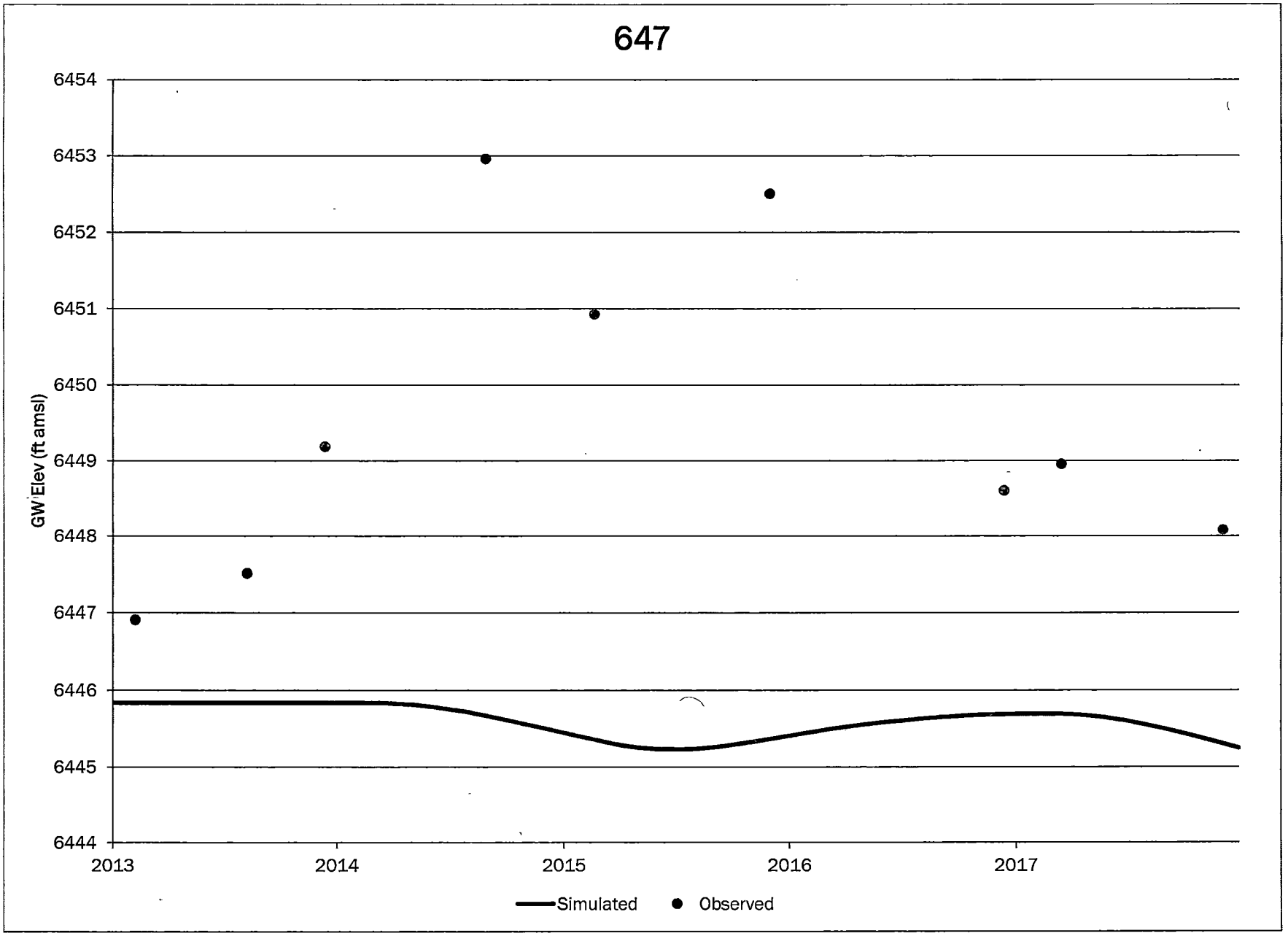
Simulated
Observed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GW Elev (ft amsl)
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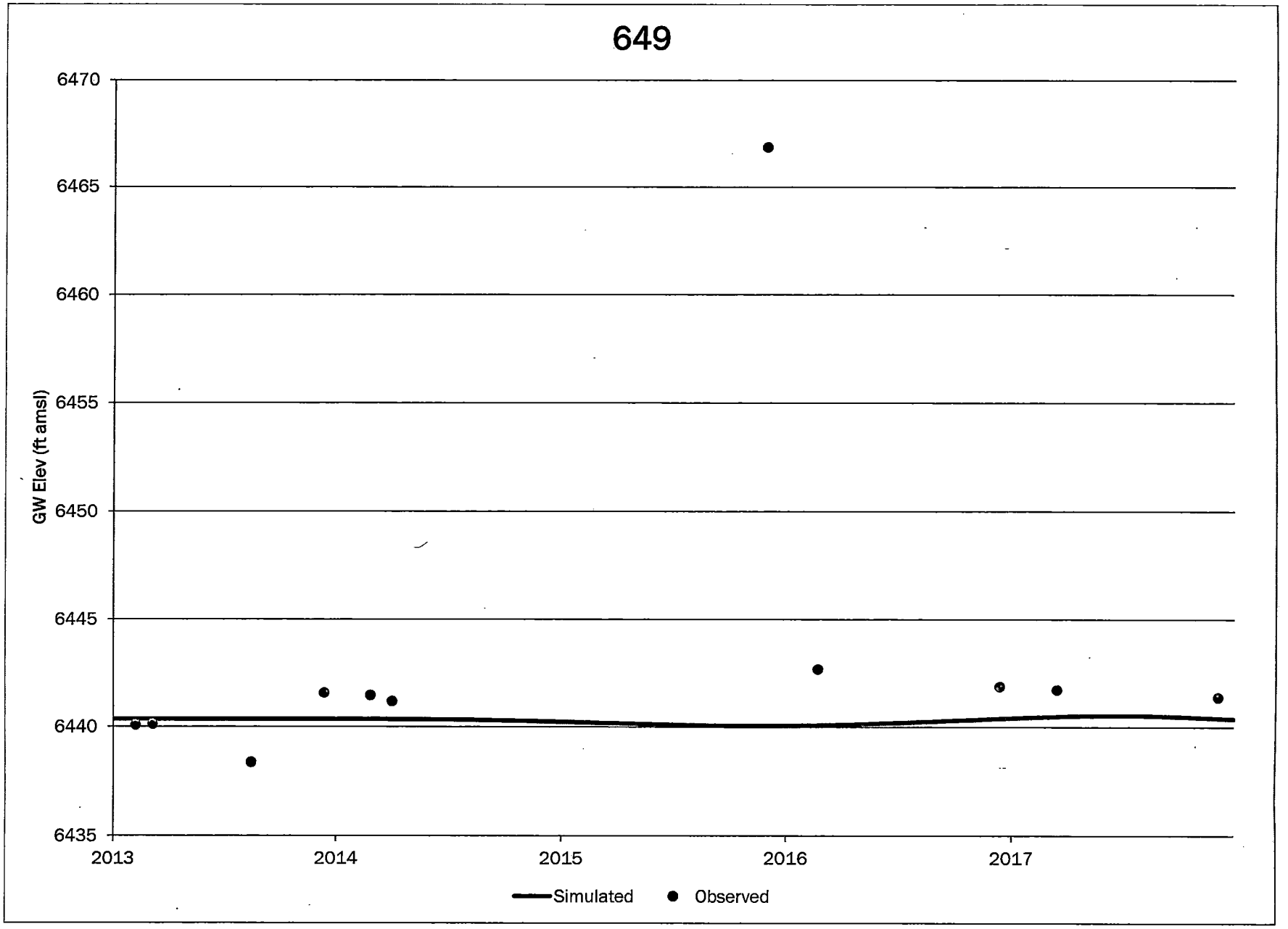
2017
Simulated
Observed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GW Elev (ft amsl)
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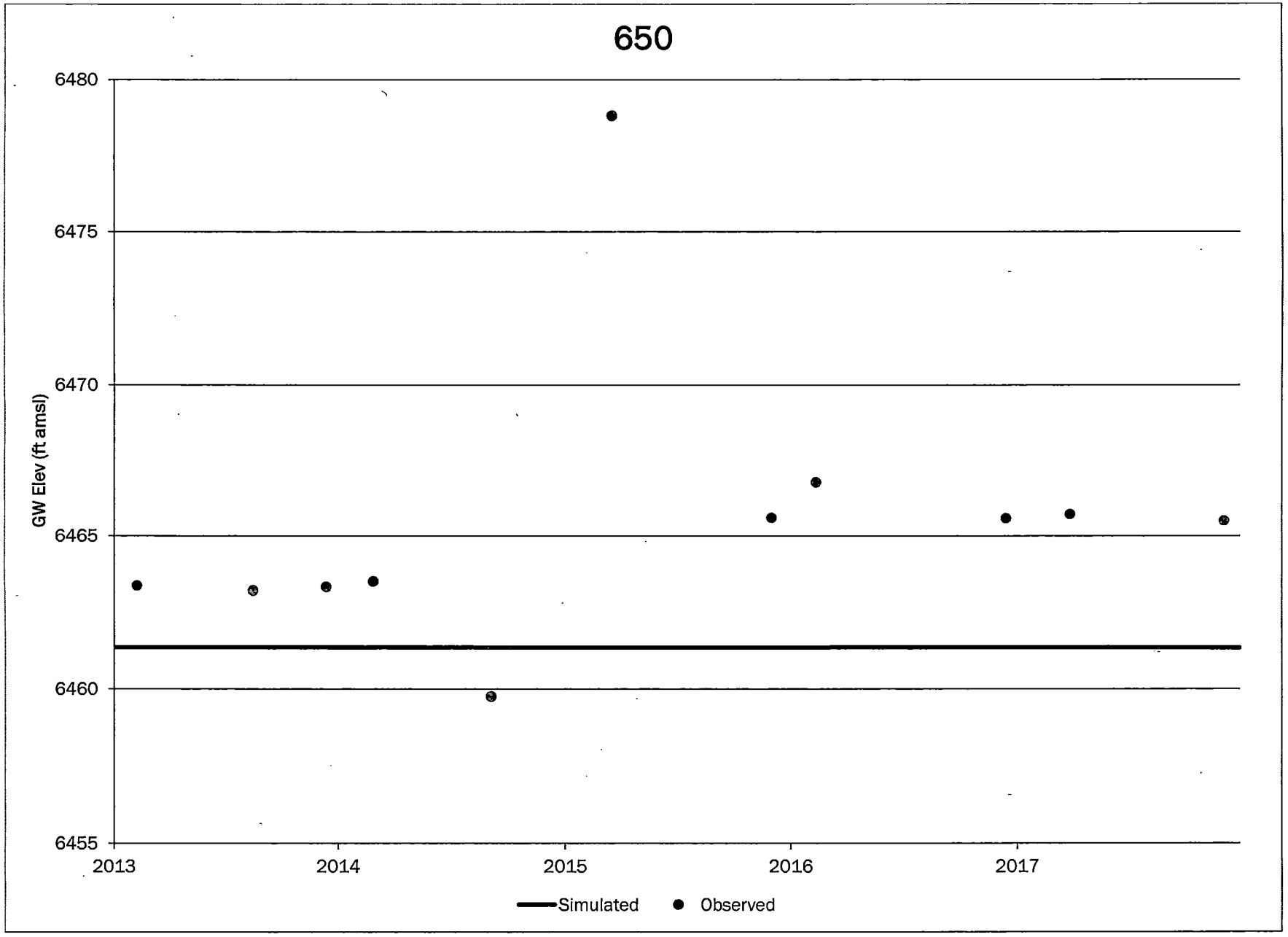
Simulated
Observed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GW Elev (ft amsl)
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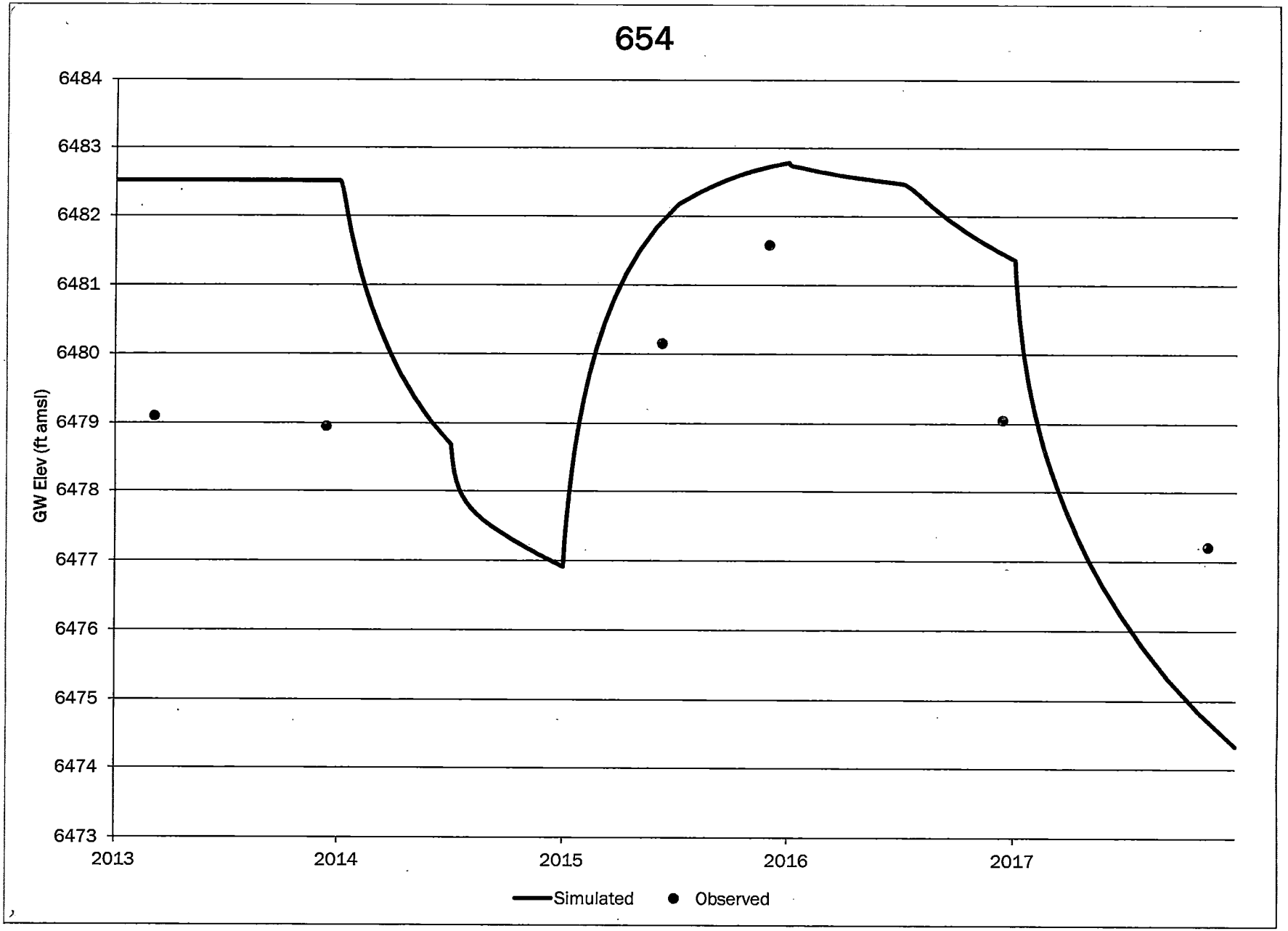
Simulated
Observed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GW Elev (ft amsl)
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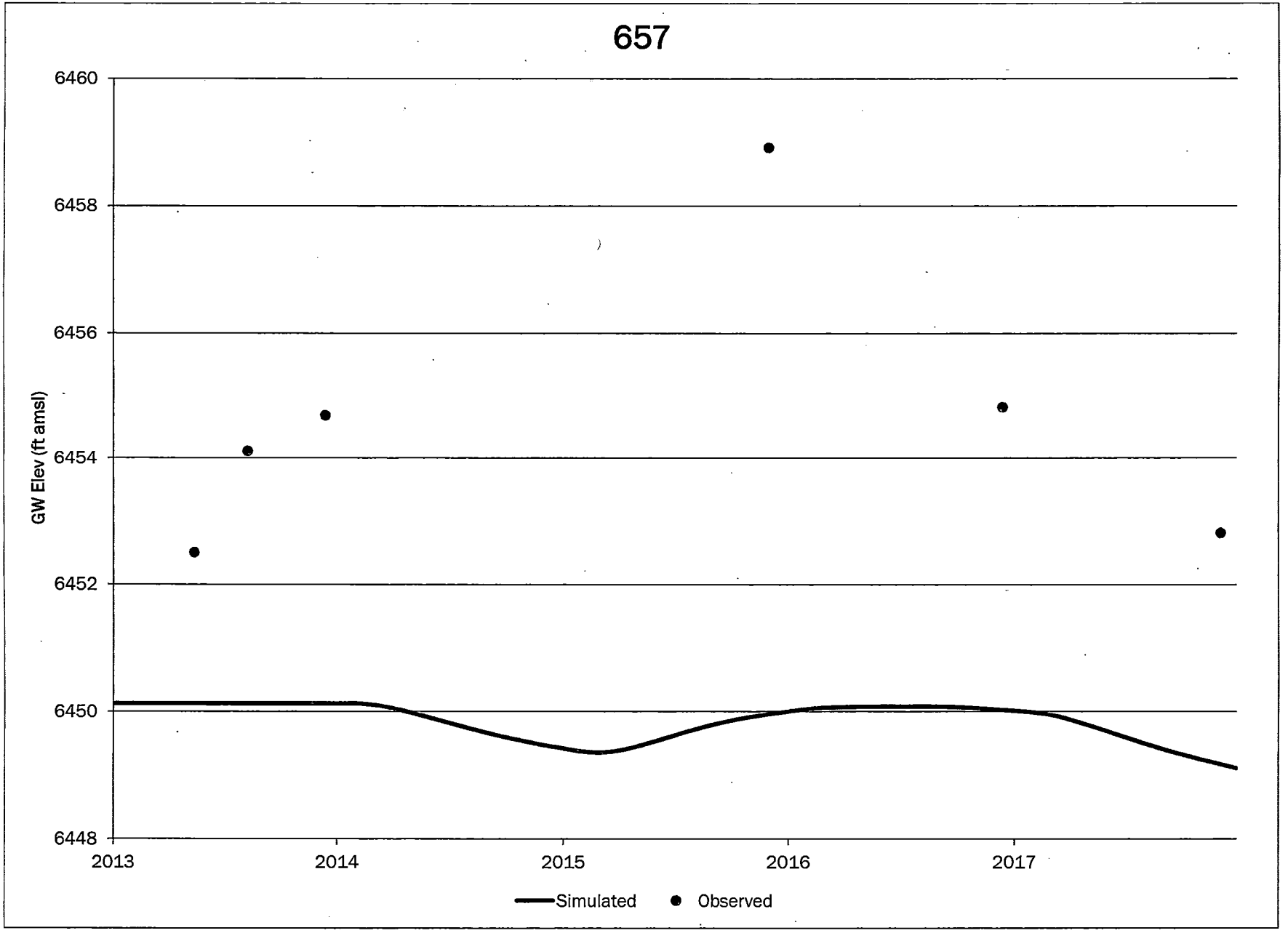
Simulated
Observed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GW Elev (ft amsl)
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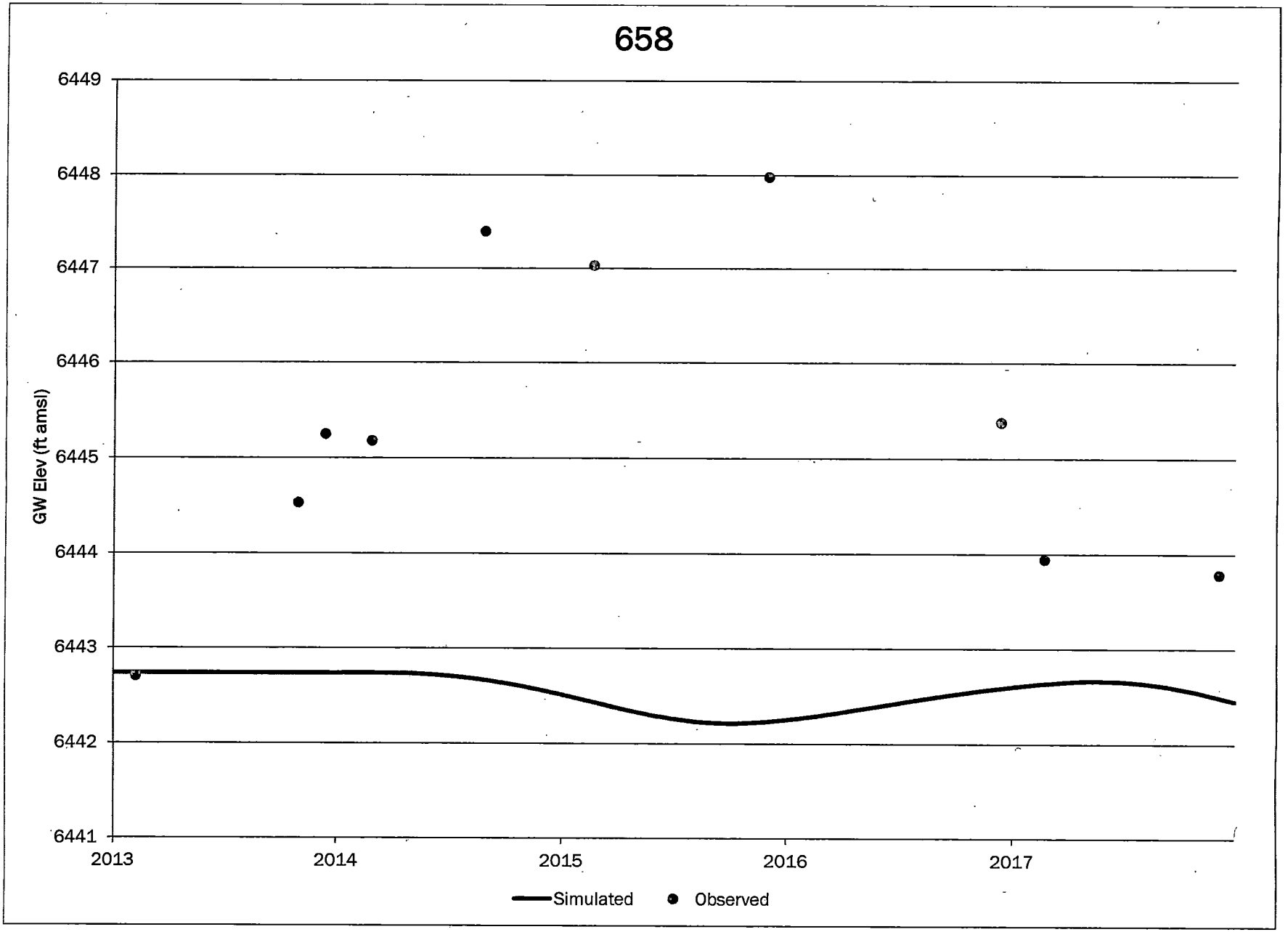
Simulated
Observed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GW Elev (ft amsl)
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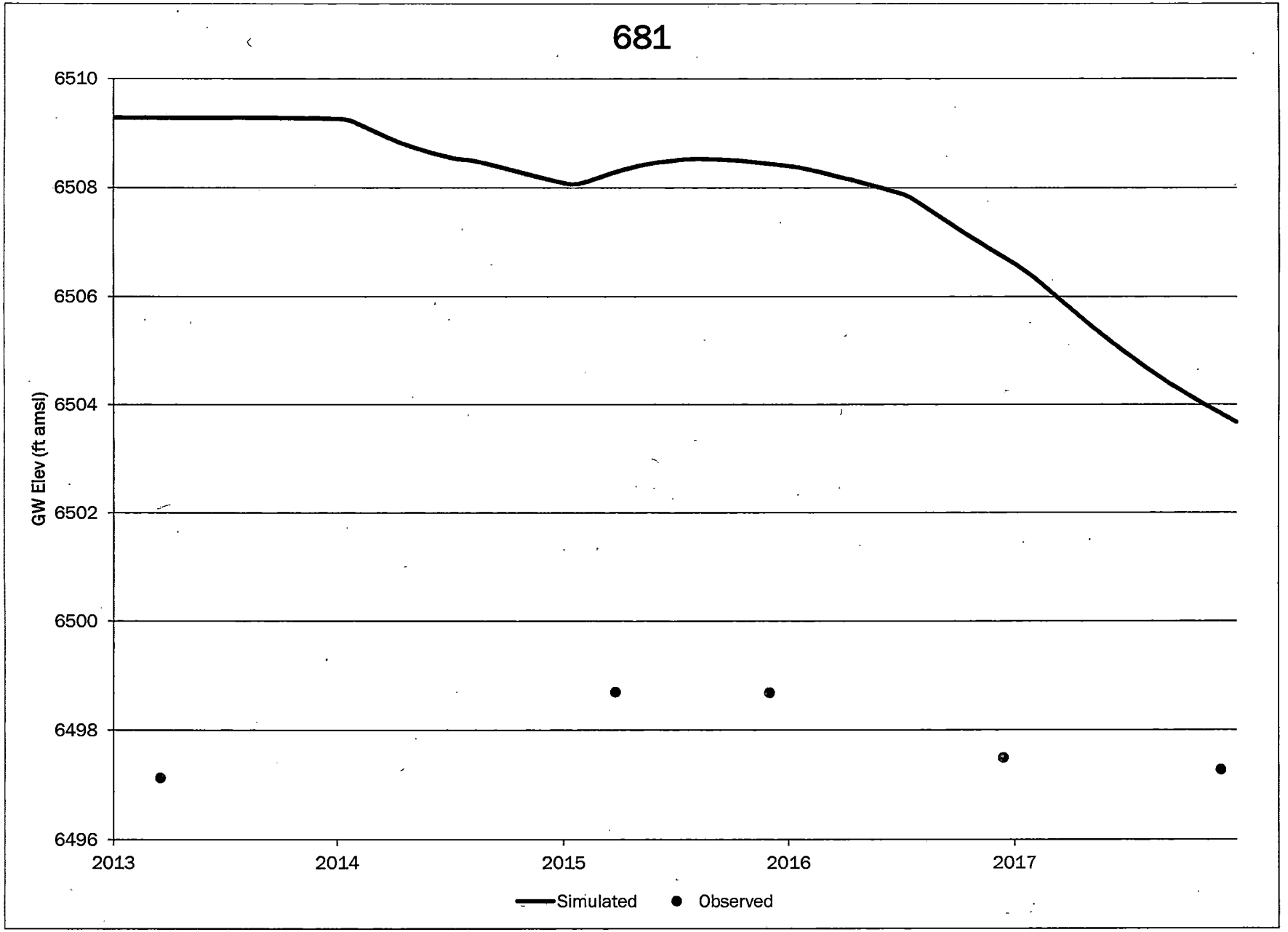
Simulated
Observed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GW Elev (ft amsl)
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Simulated
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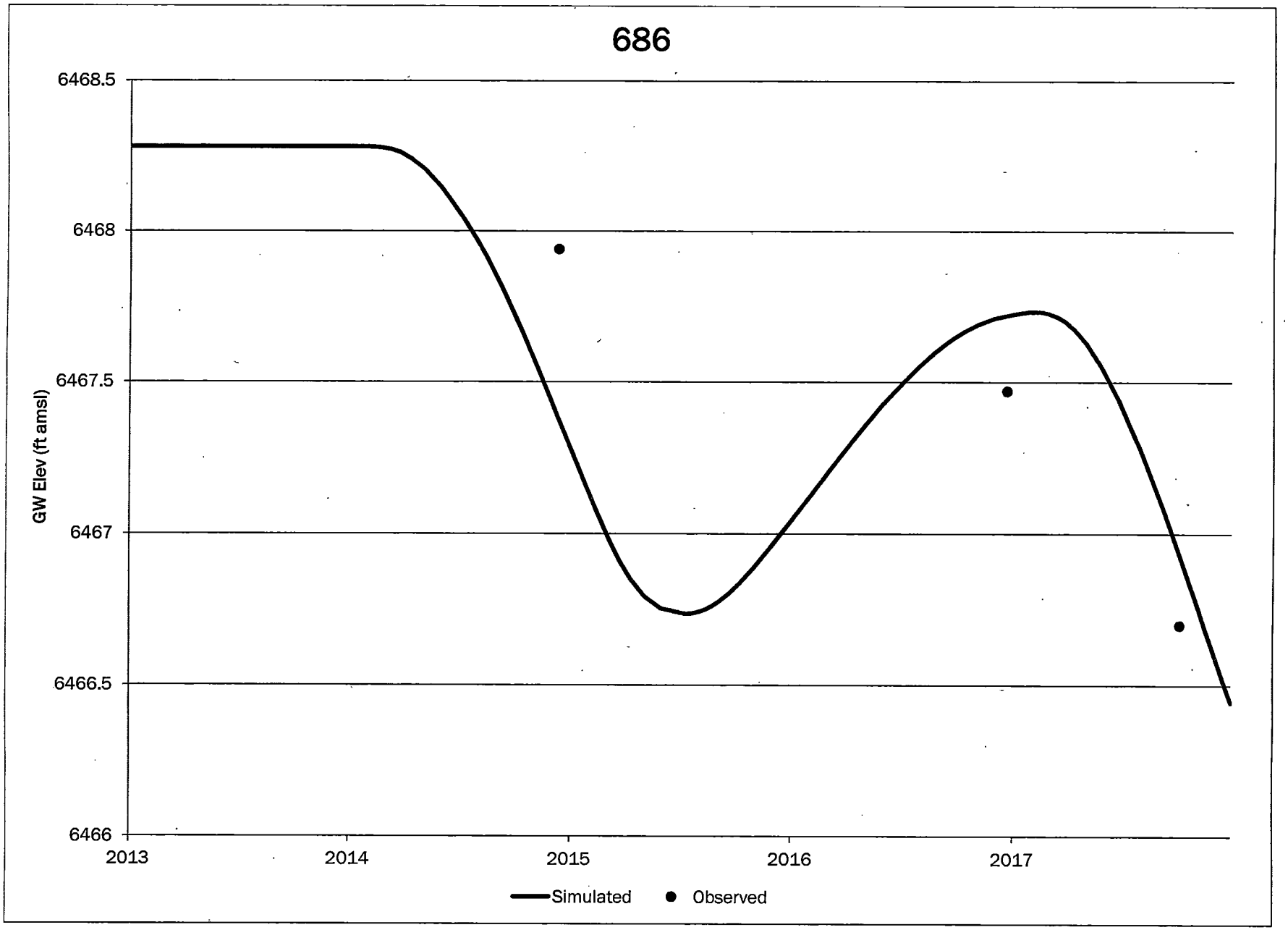
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GW Elev (ft amsl)
2013
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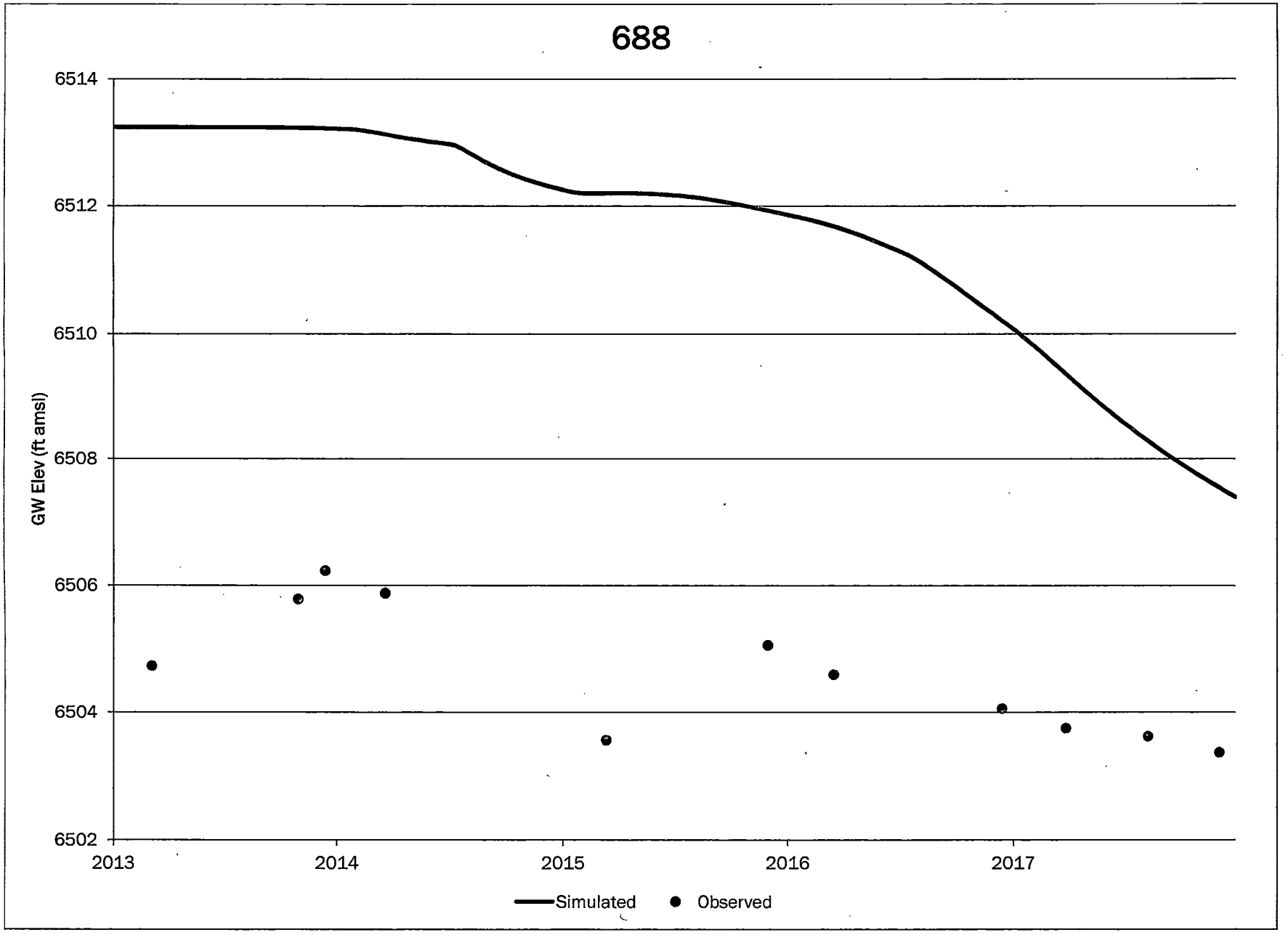
Simulated
Observed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GW Elev (ft amsl)
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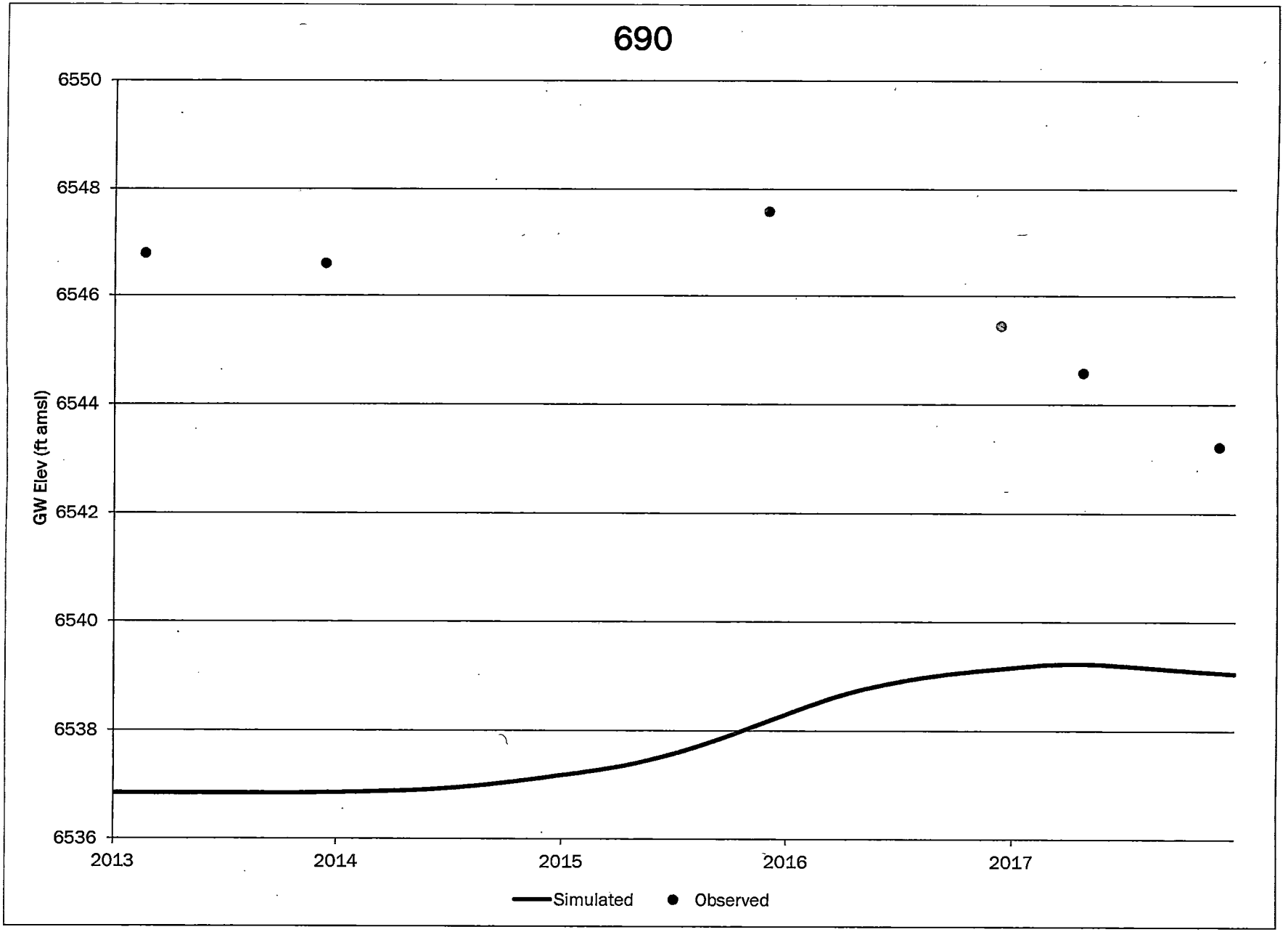
Simulated
Observed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GW Elev (ft amsl)
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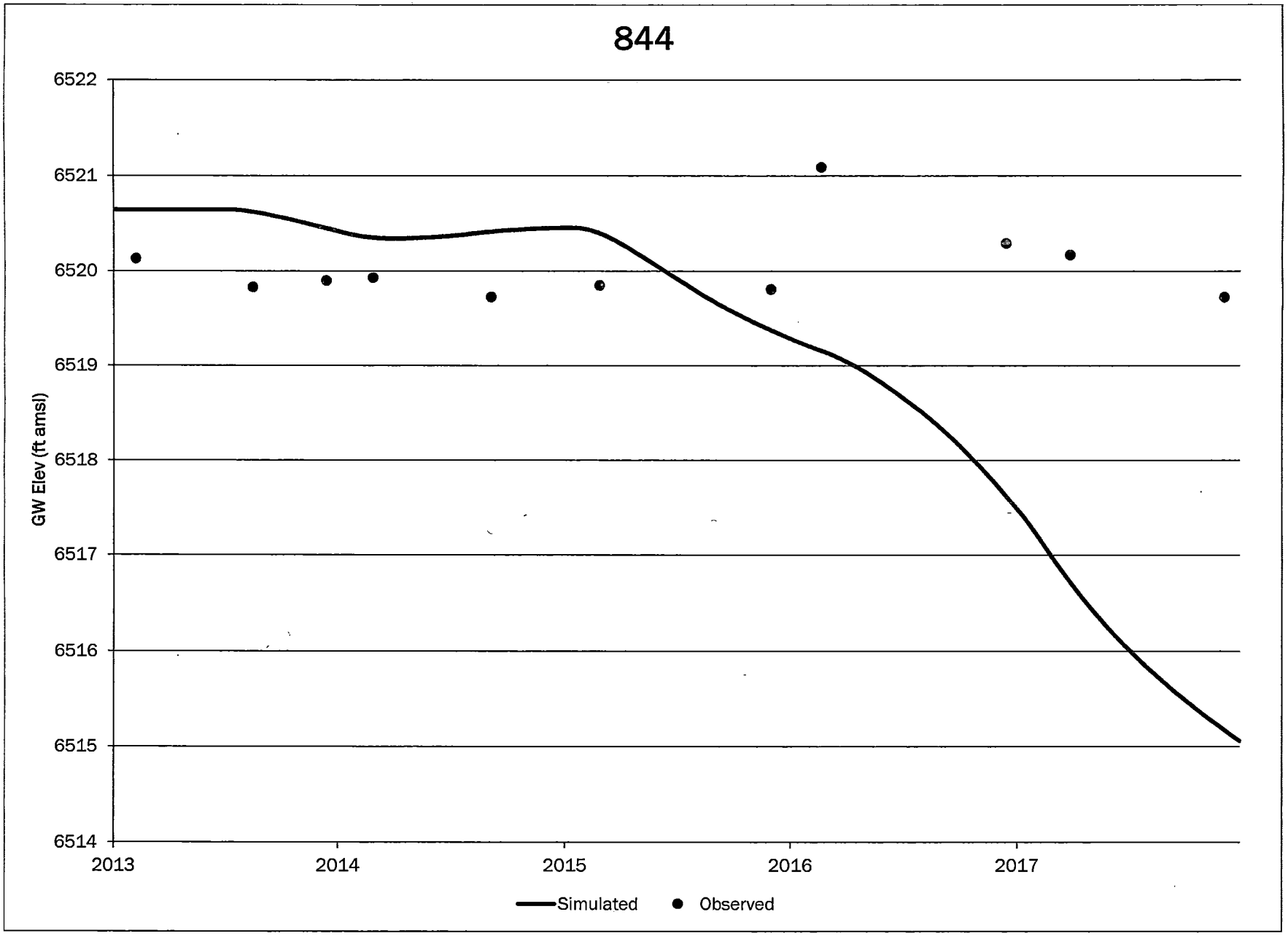
Simulated
Observed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GW Elev (ft amsl)
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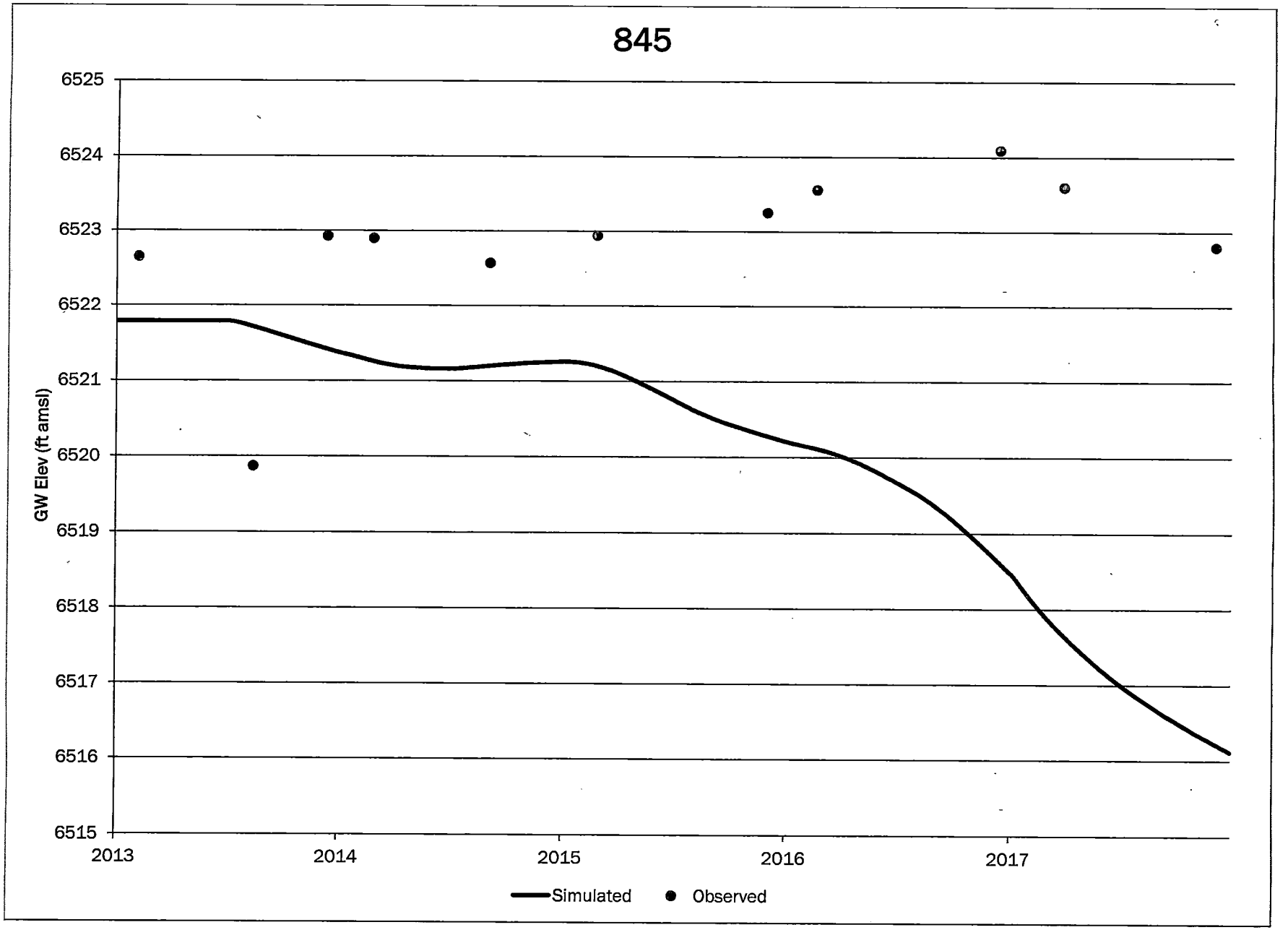
Simulated
Observed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GW Elev (ft amsl)
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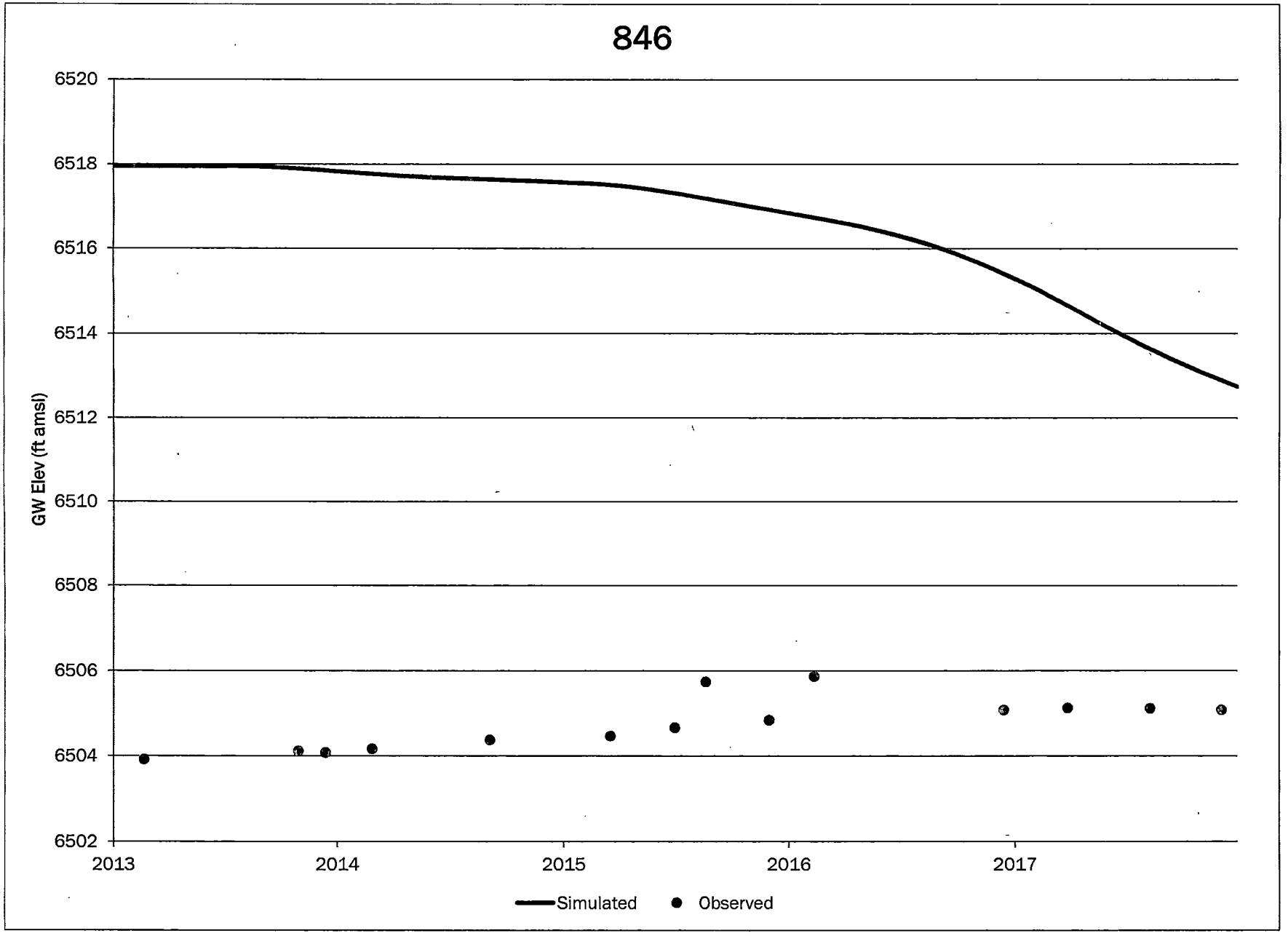
Simulated
Observed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GW Elev (ft amsl)
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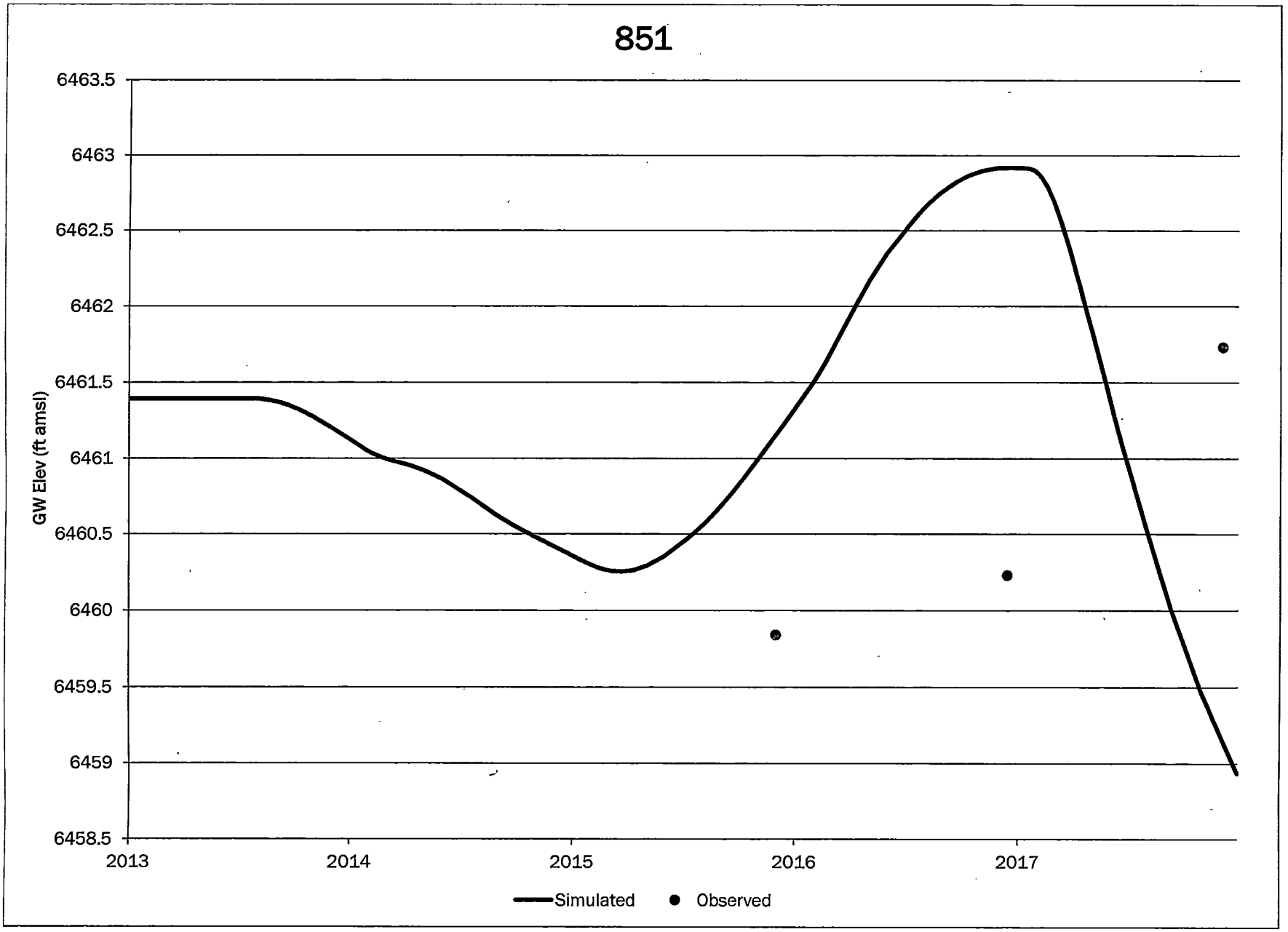
Simulated
Observed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GW Elev (ft amsl)
2013
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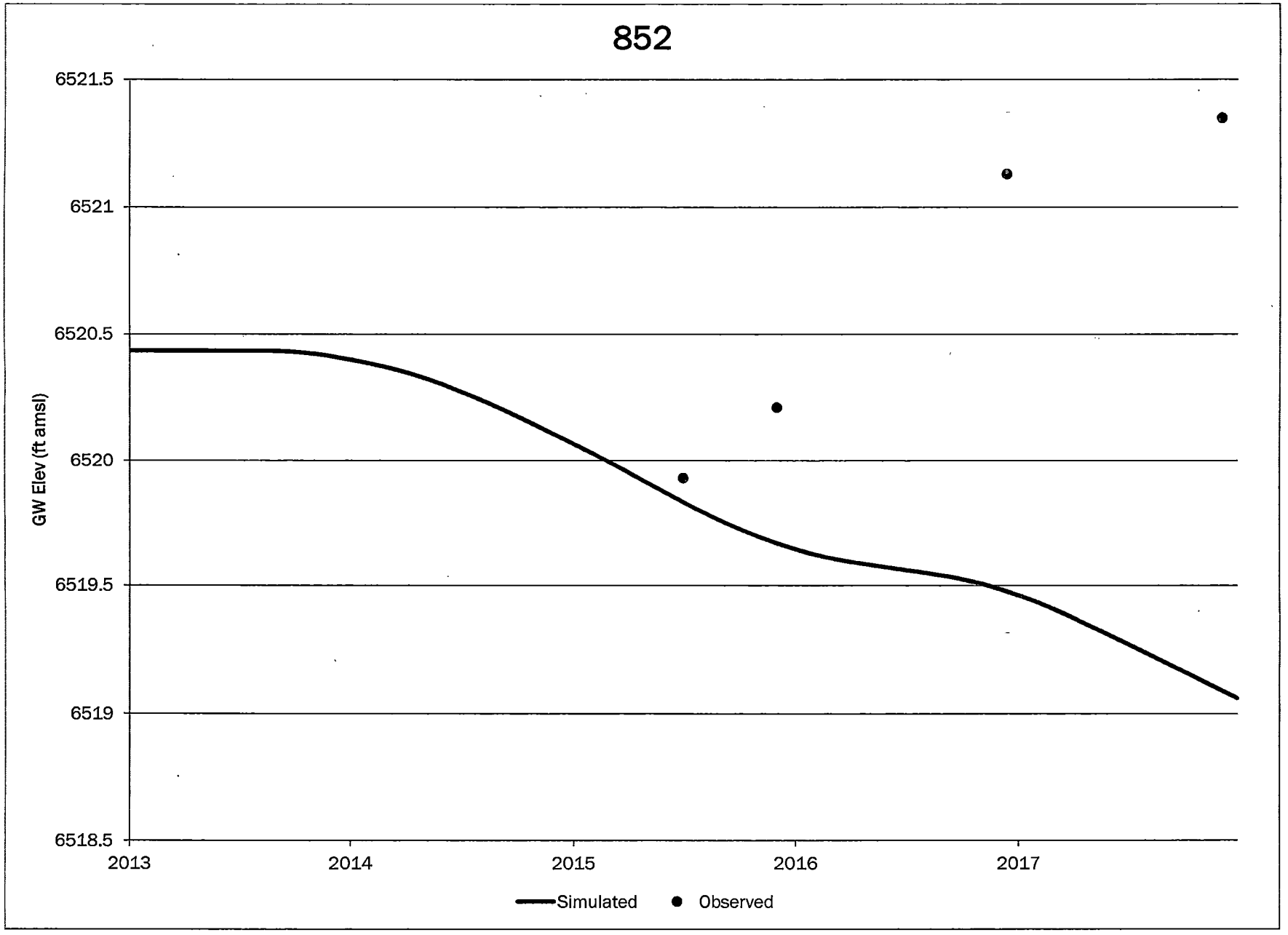
Simulated
Observed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GW Elev (ft amsl)
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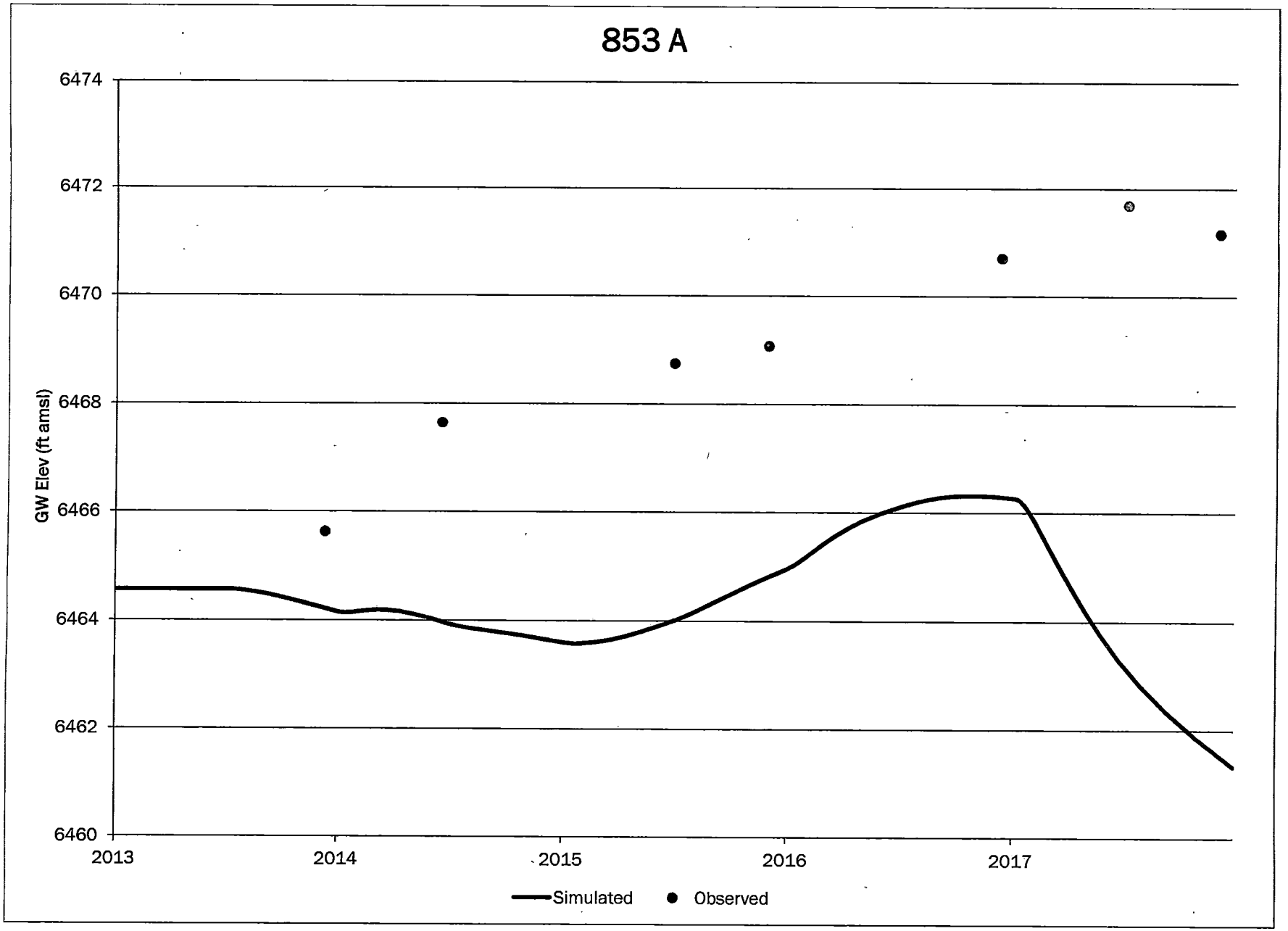
Simulated
Observed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GW Elev (ft amsl)
2013
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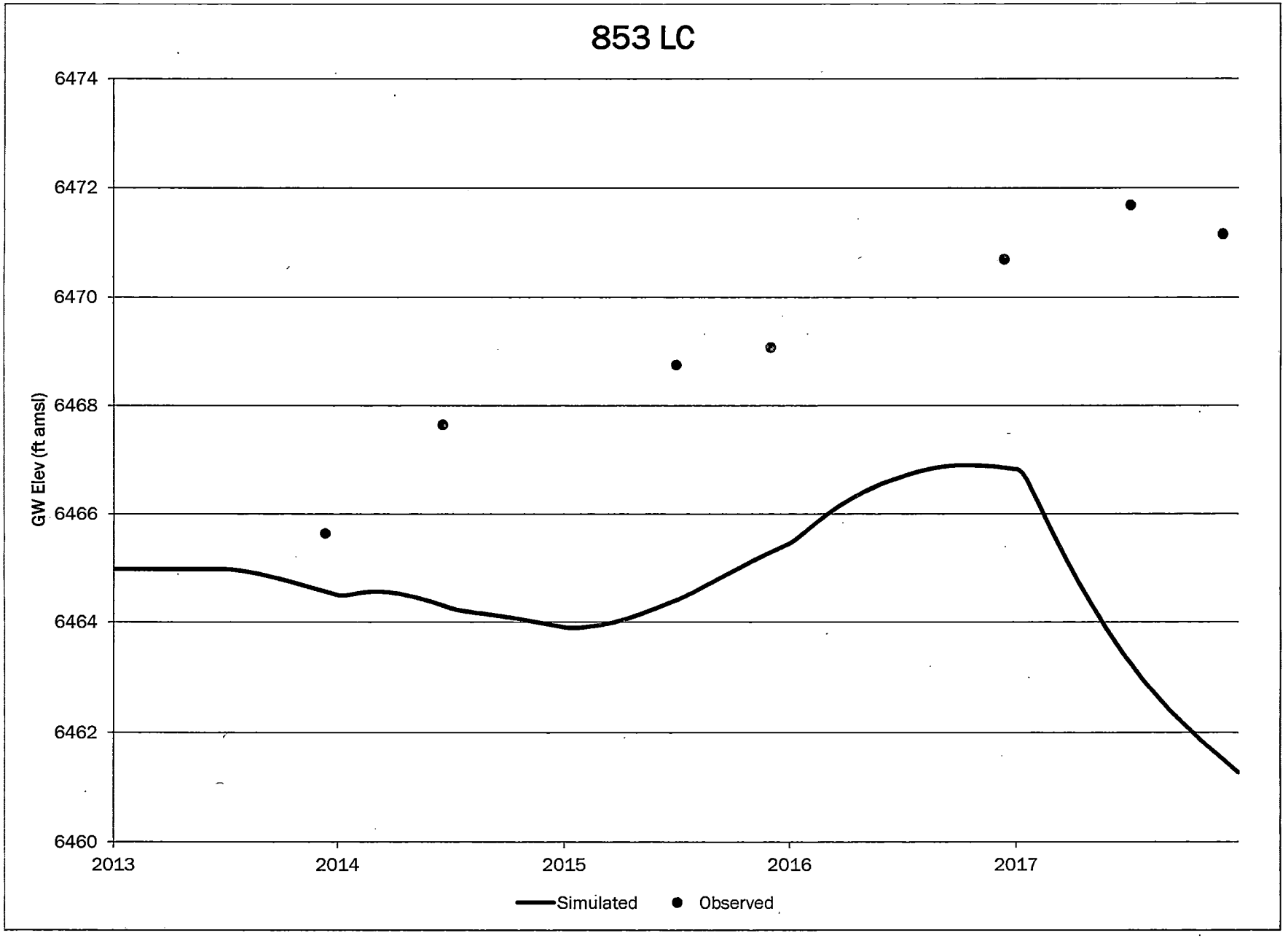
Simulated
Observed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GW Elev (ft amsl)
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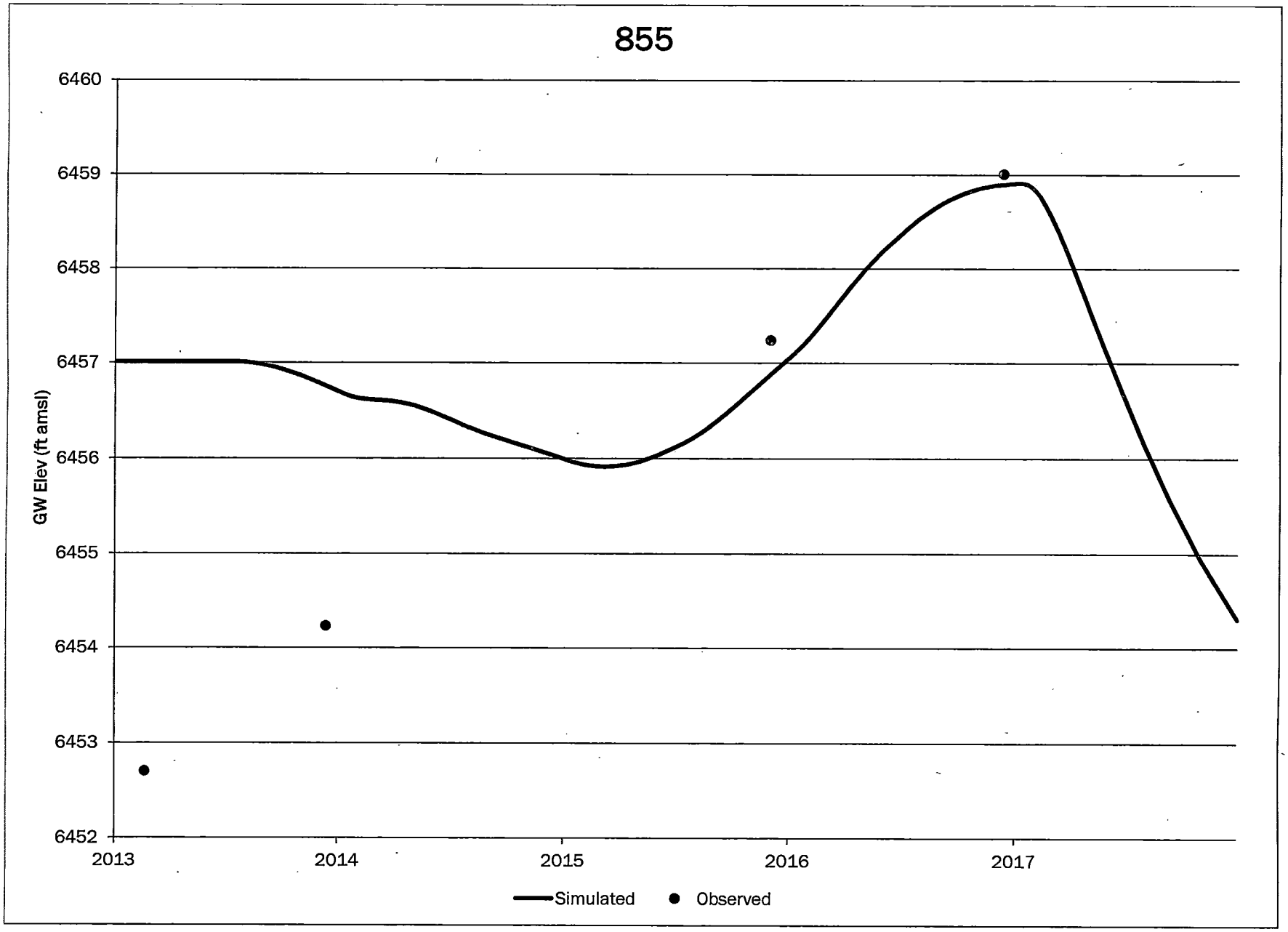
Simulated
Observed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GW Elev (ft amsl)
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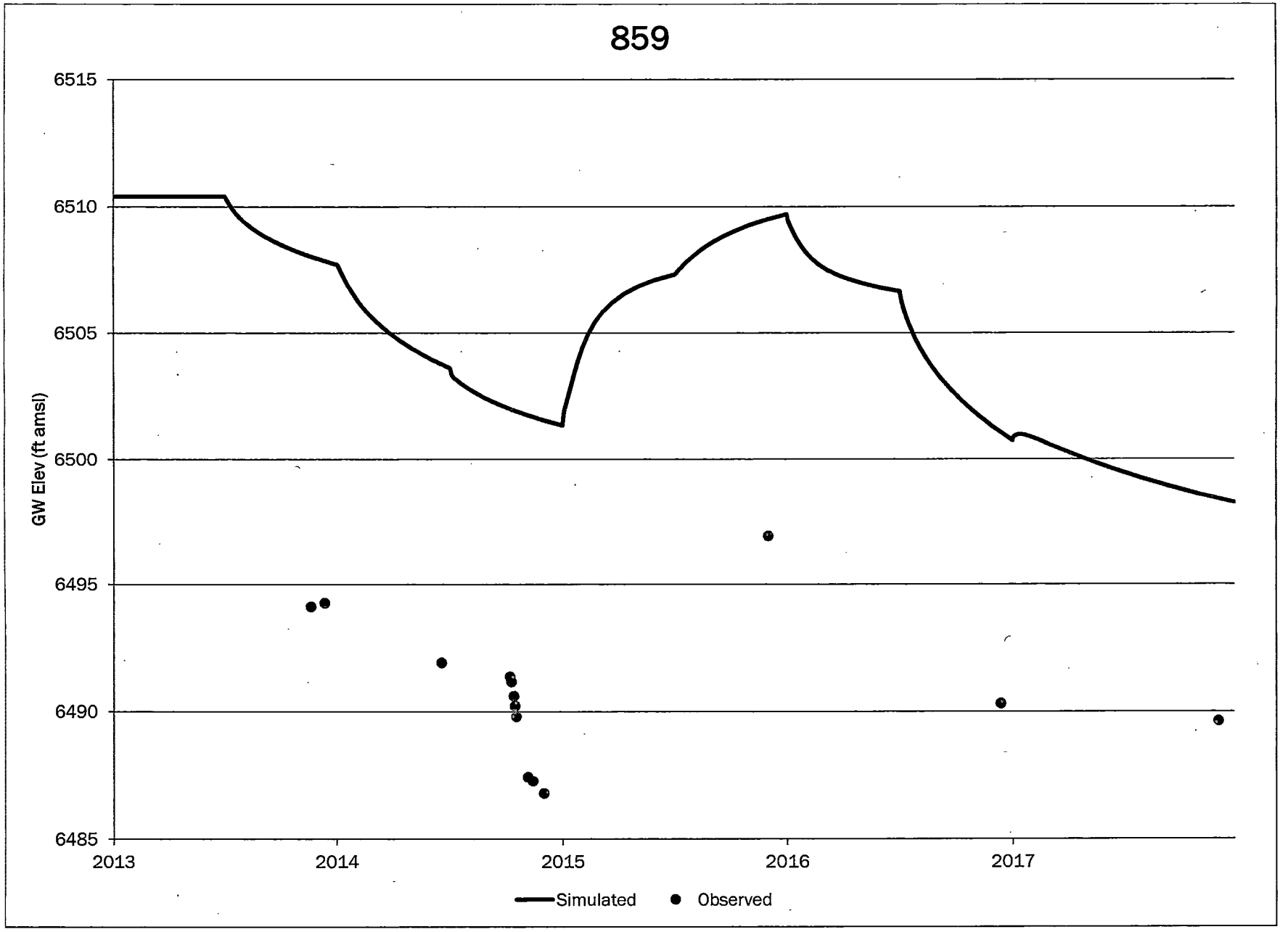
Simulated
Observed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GW Elev (ft amsl)
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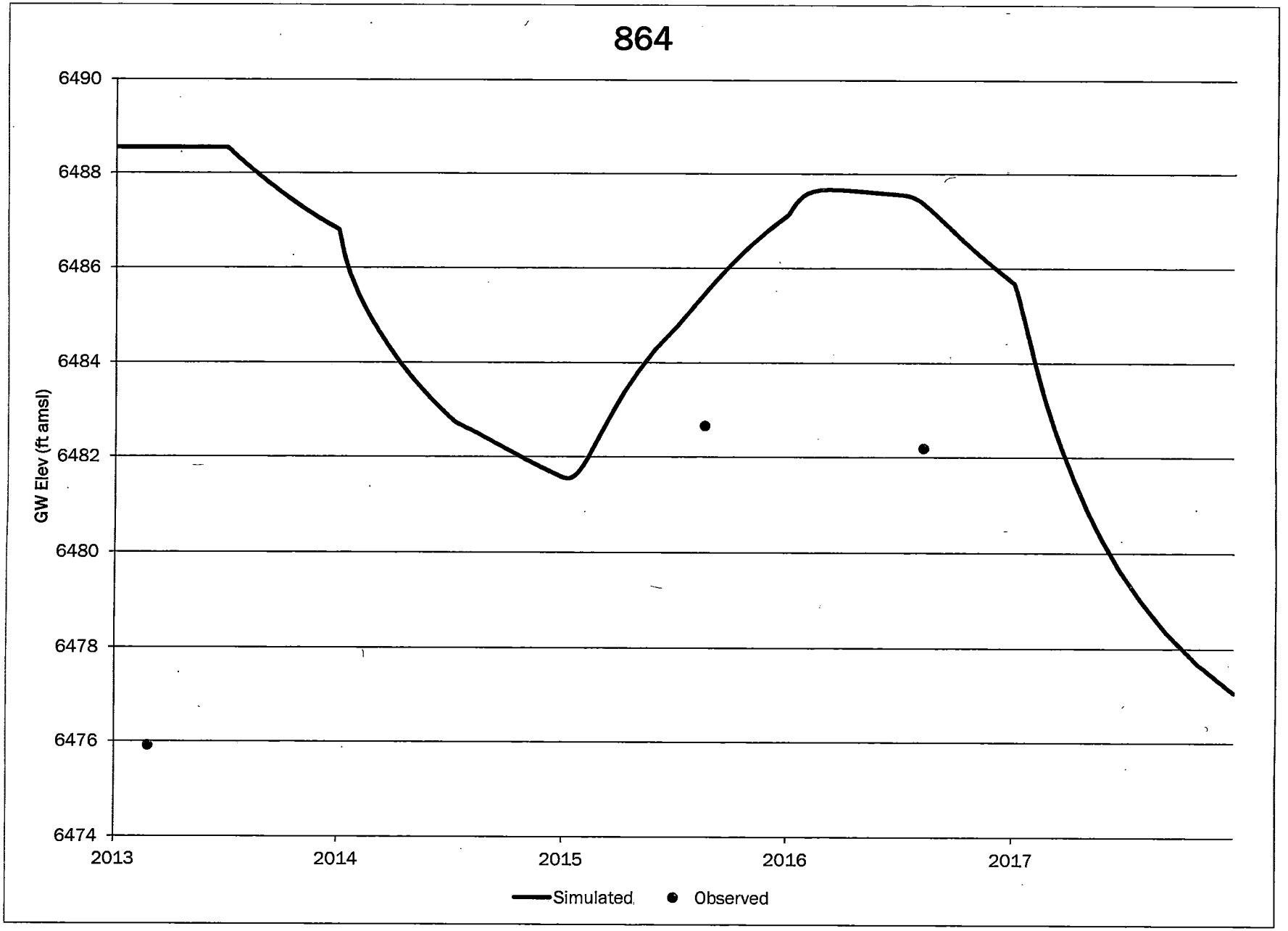
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GW Elev (ft amsl)
2013
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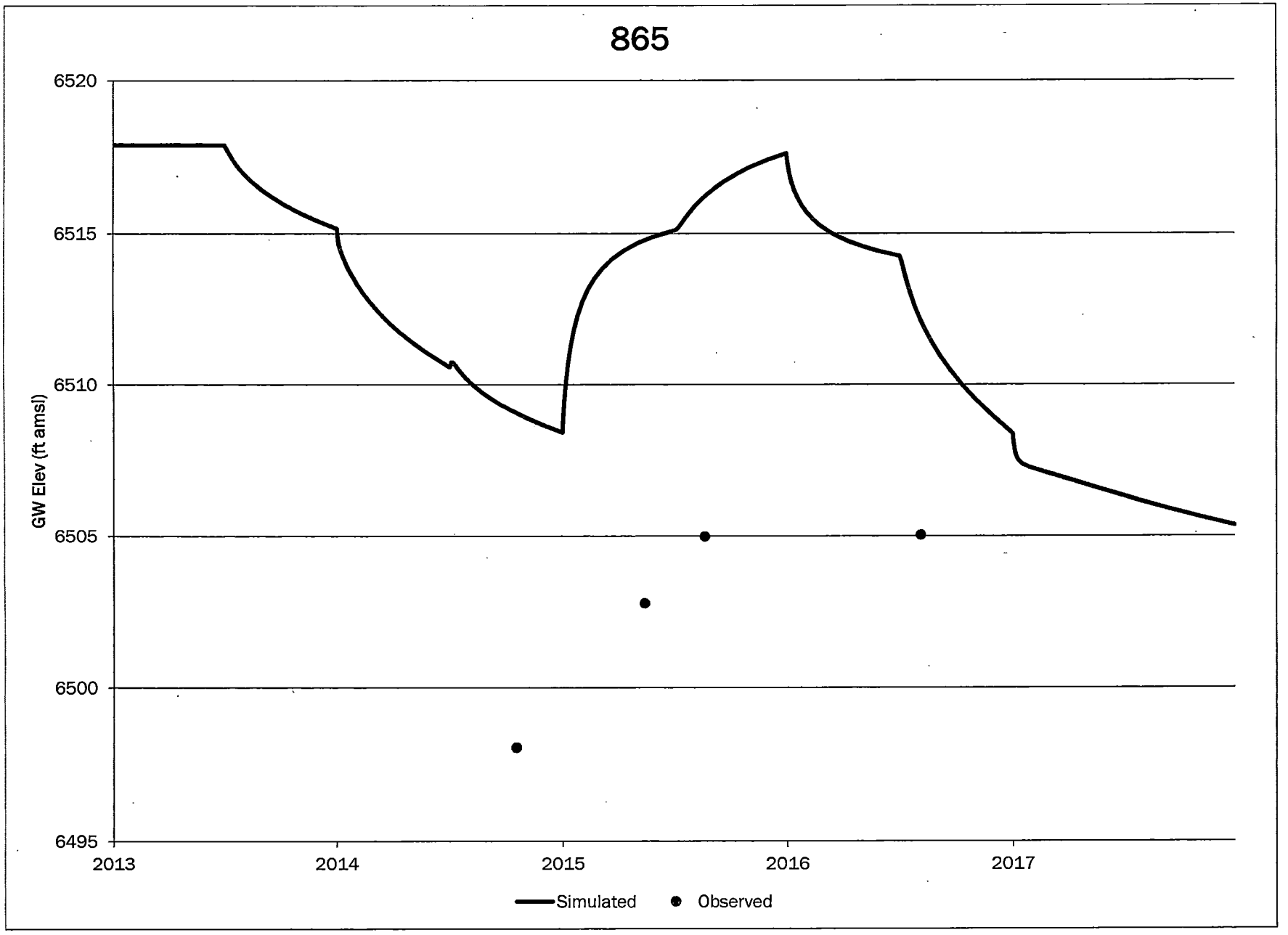
Simulated
Observed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GW Elev (ft amsl)
2013
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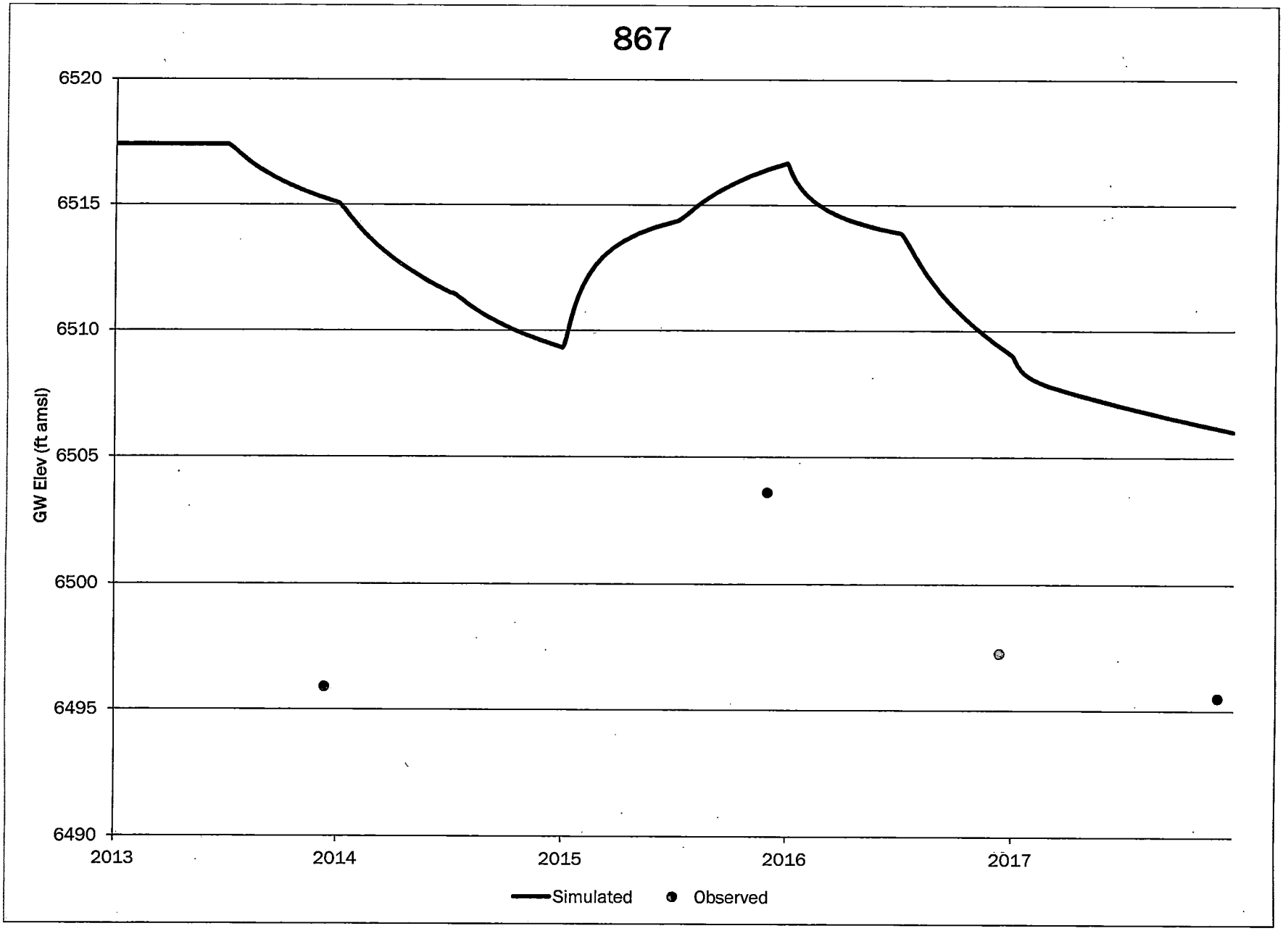
Simulated
Observed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GW Elev (ft amsl)
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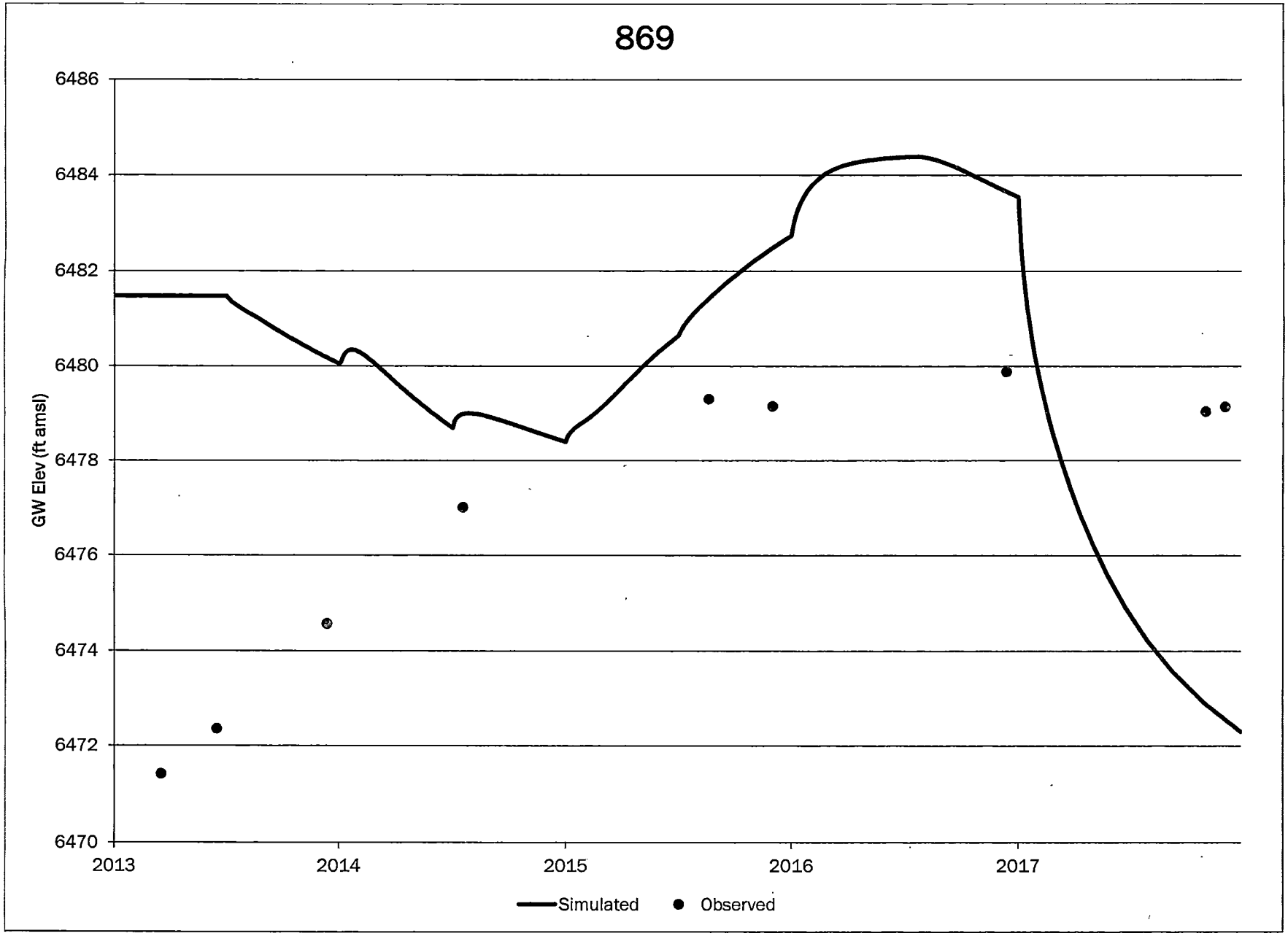
Simulated
Observed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GW Elev (ft amsl)
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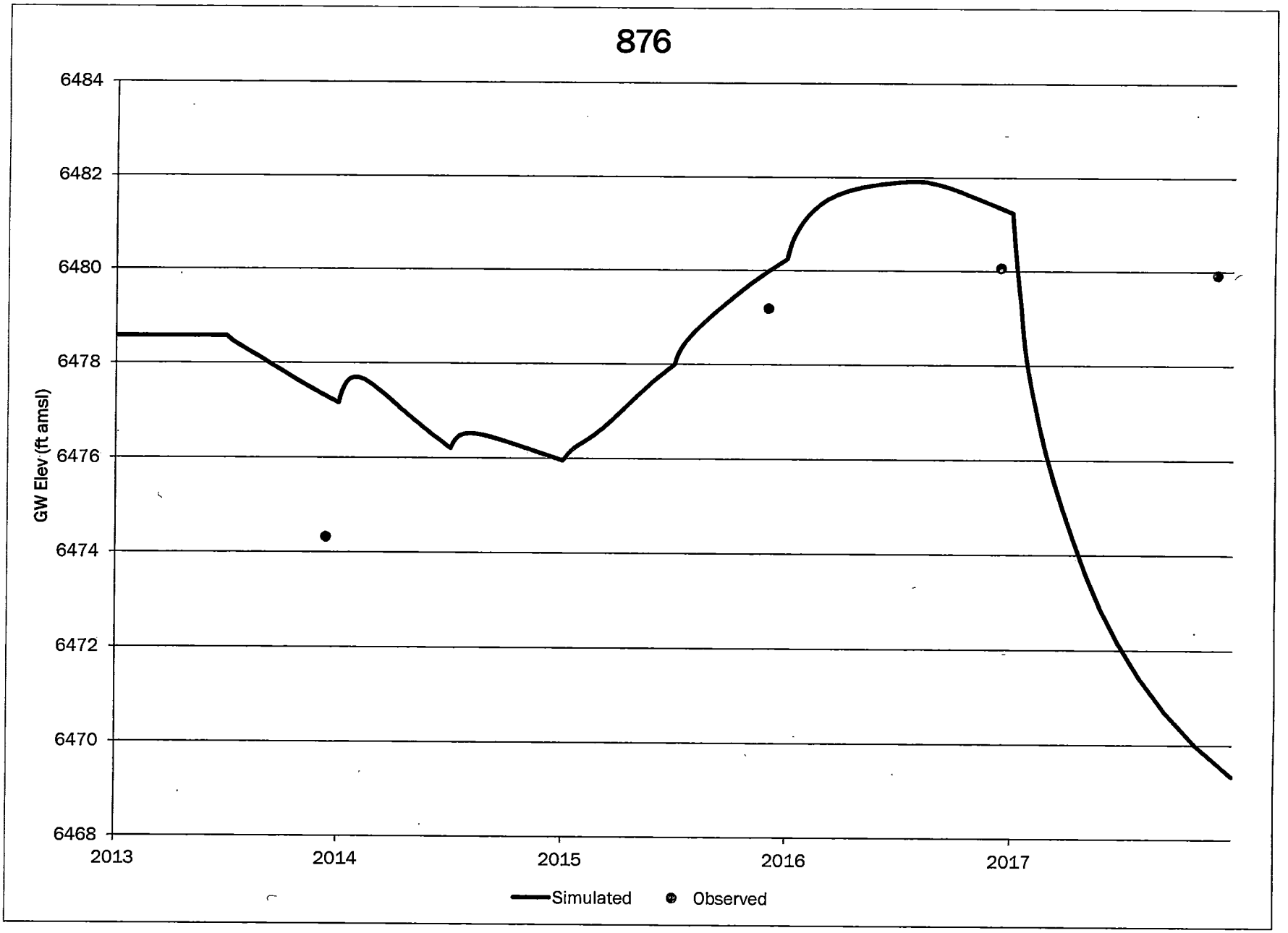
Simulated
Observed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GW Elev (ft amsl)
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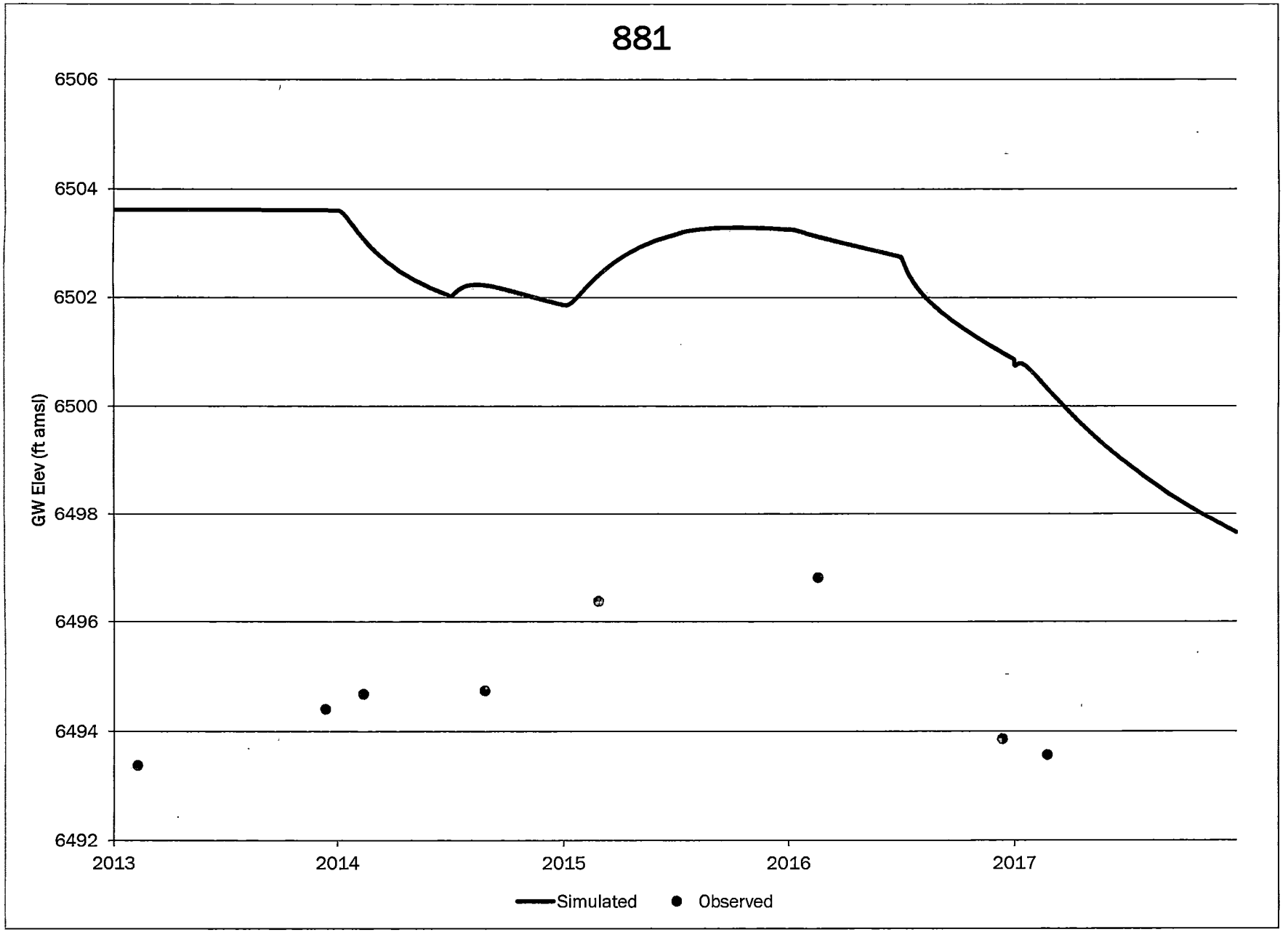
2017
Simulated
Observed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GW Elev (ft amsl)
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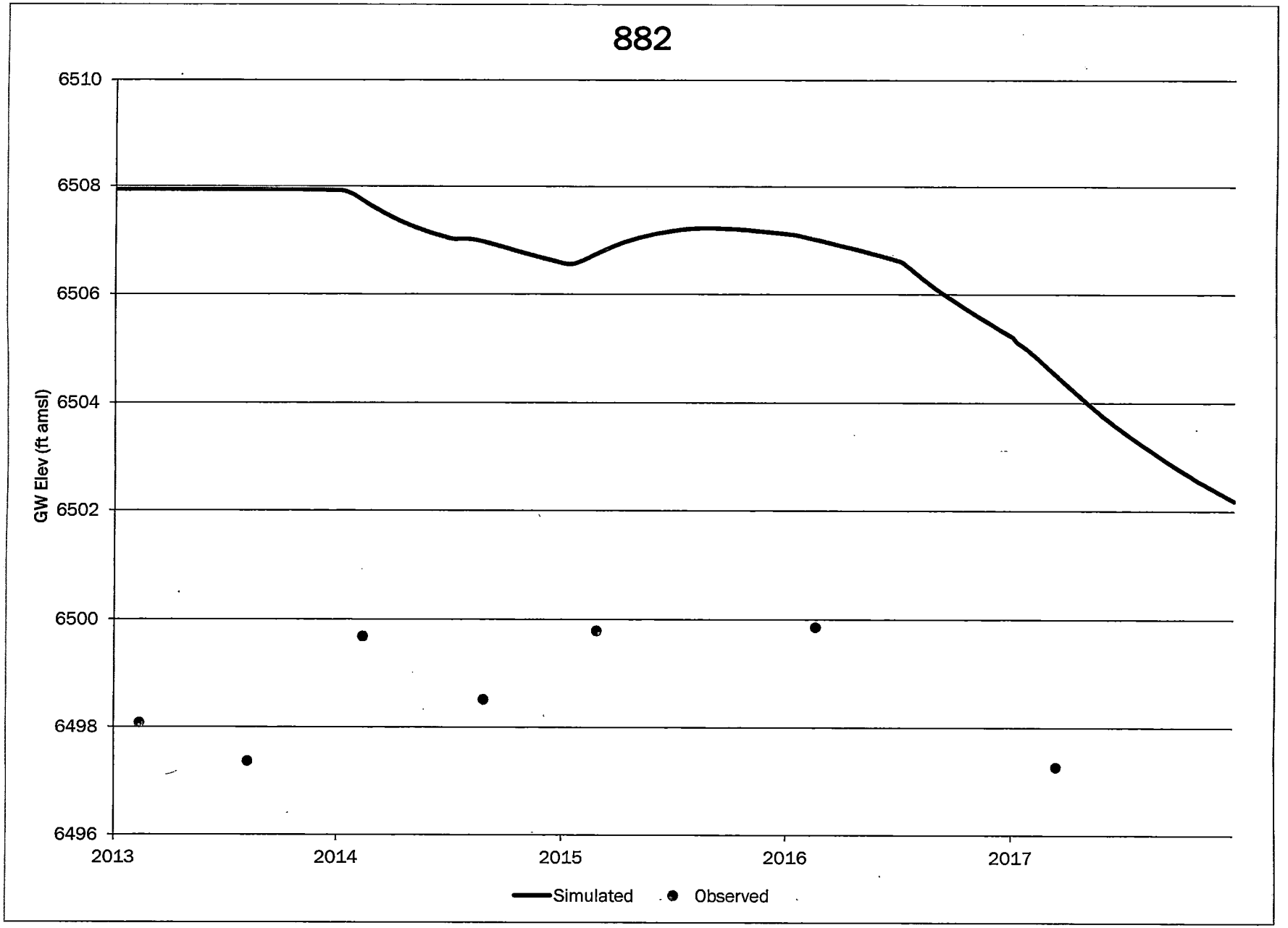
Simulated
Observed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GW Elev (ft amsl)
2013
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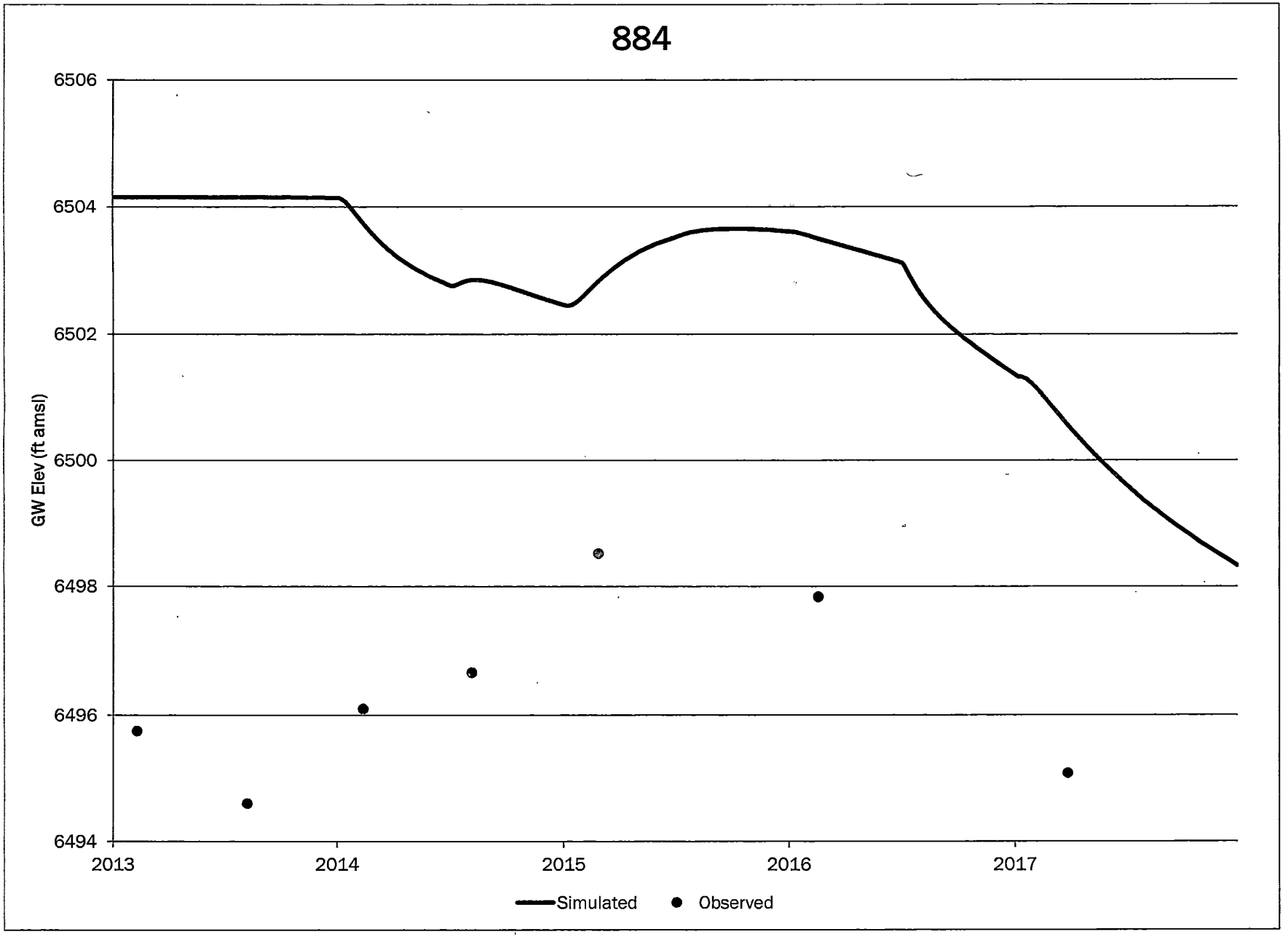
Simulated
Observed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GW Elev (ft amsl)
2013
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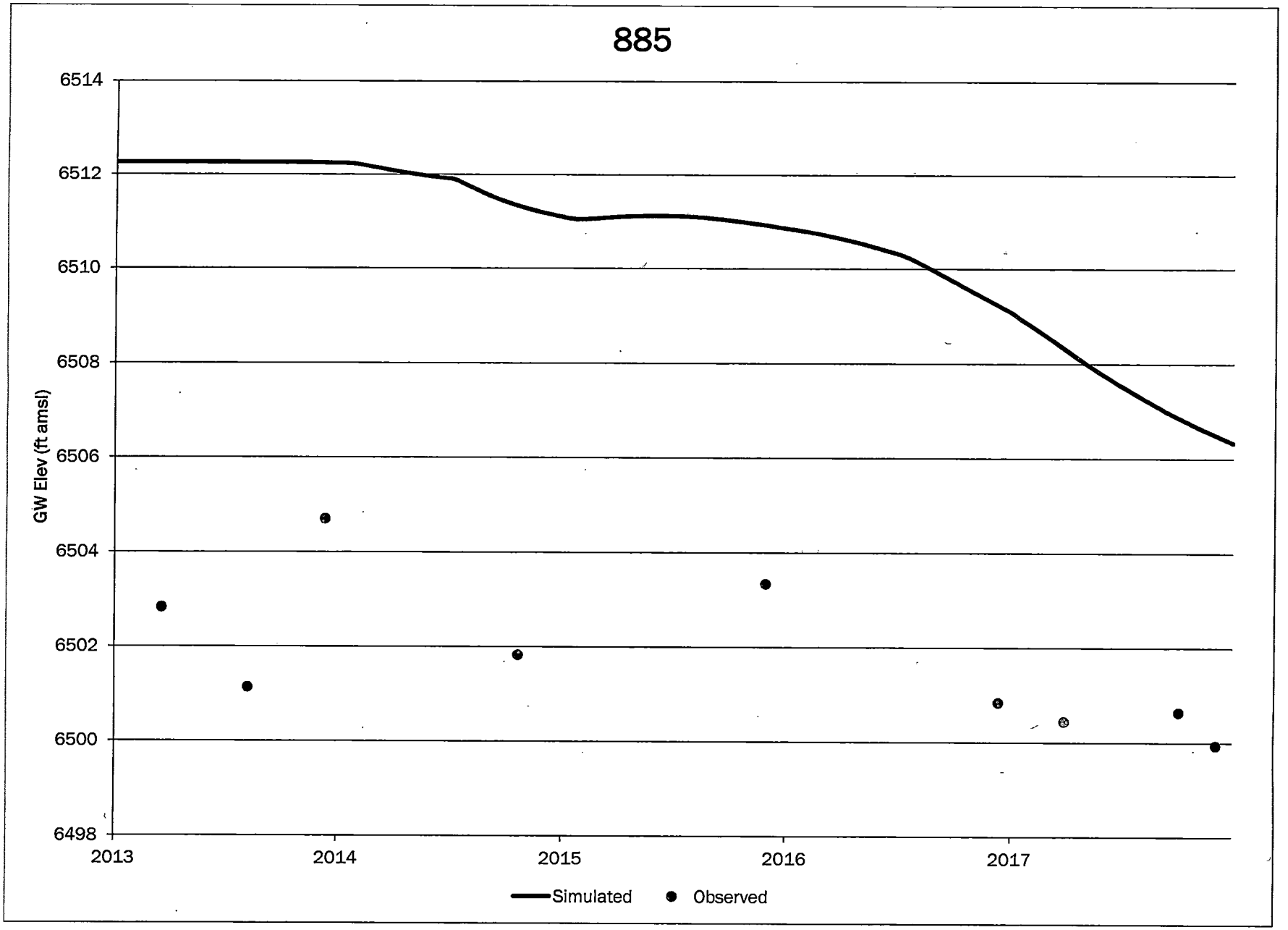
Simulated
Observed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GW Elev (ft amsl)
2013
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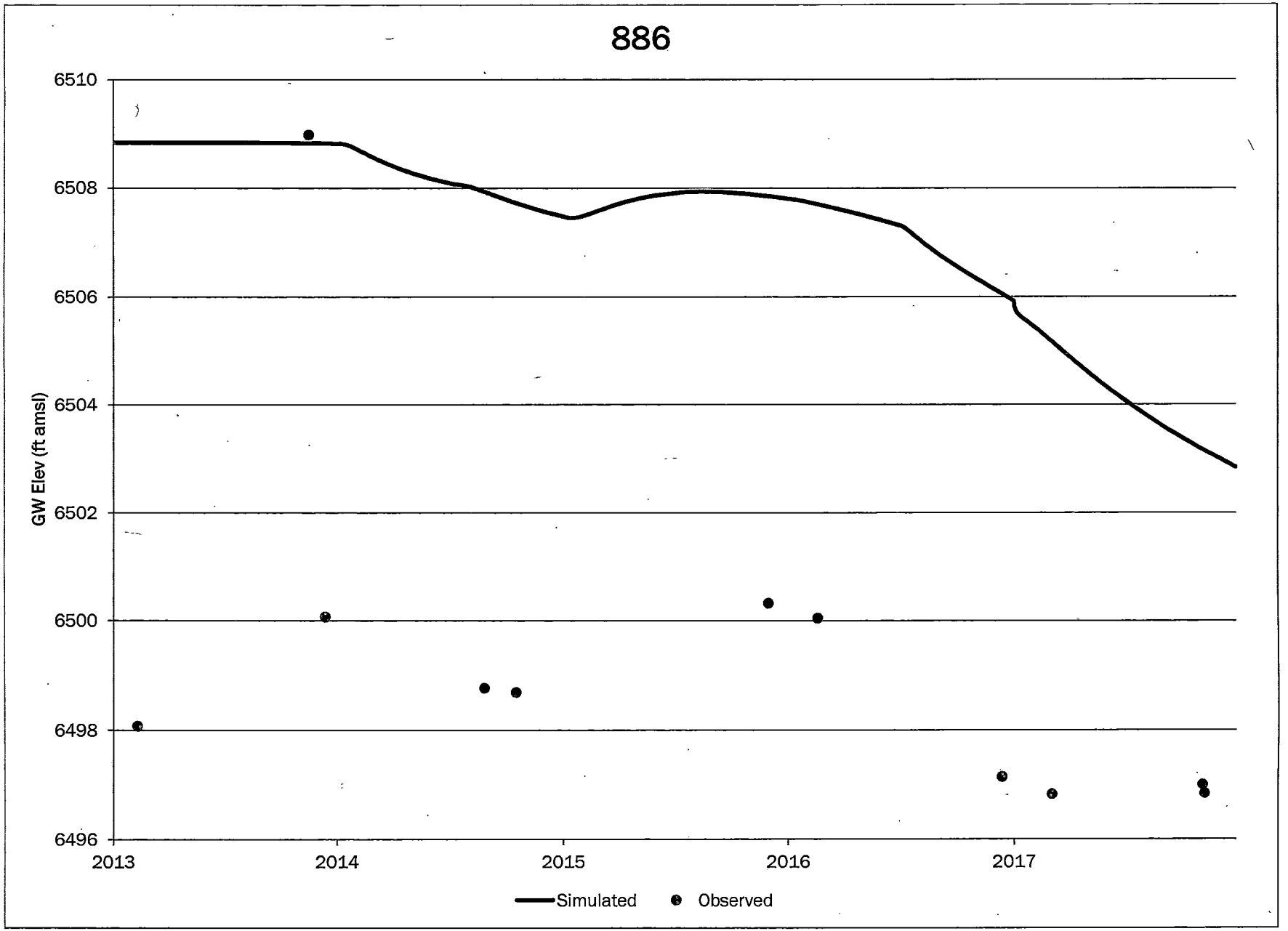
Simulated
Observed


886
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GW Elev (ft amsl)
2013
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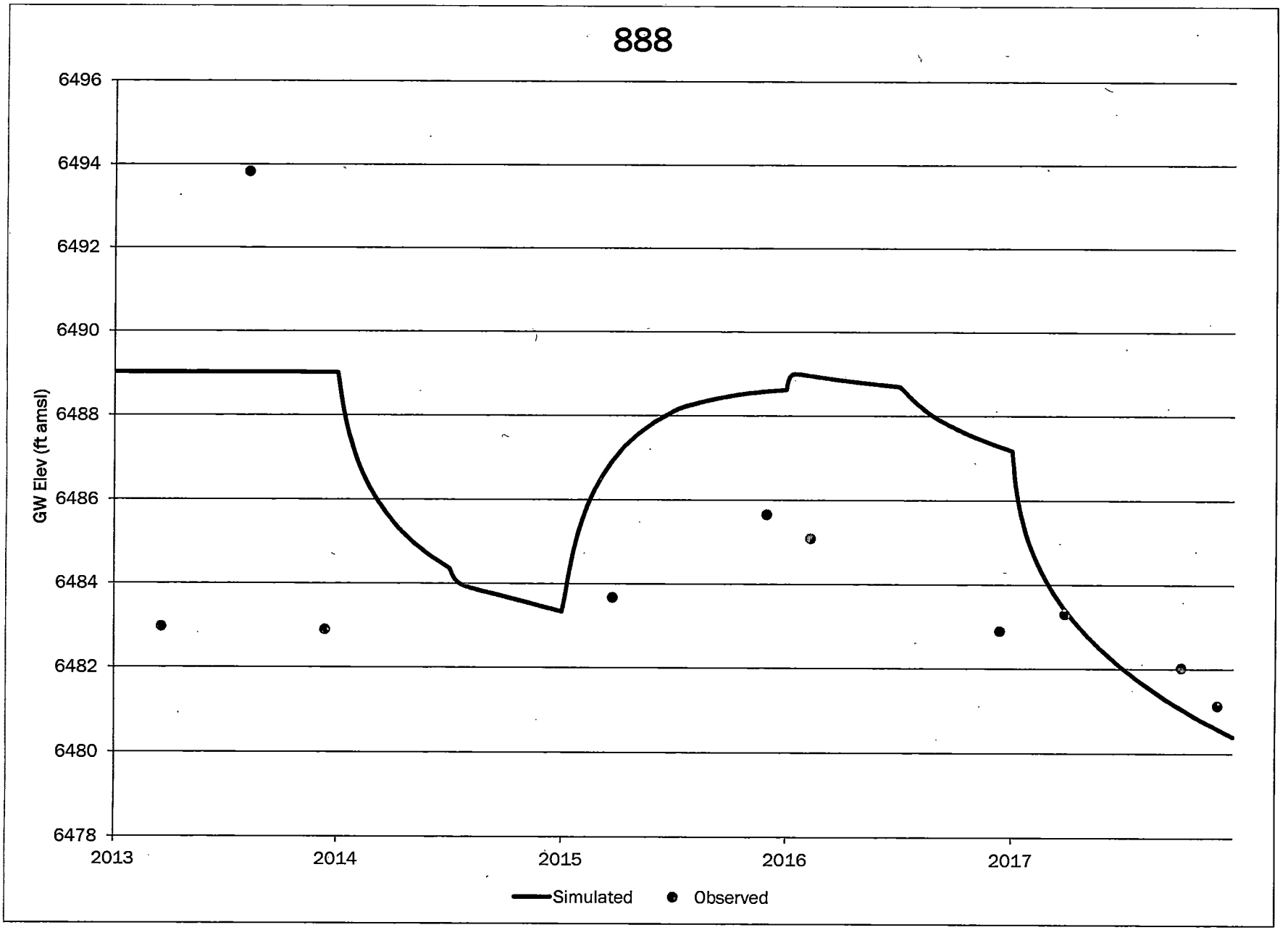
2017
Simulated
Observed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GW Elev (ft amsl)
2013
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2015
2016
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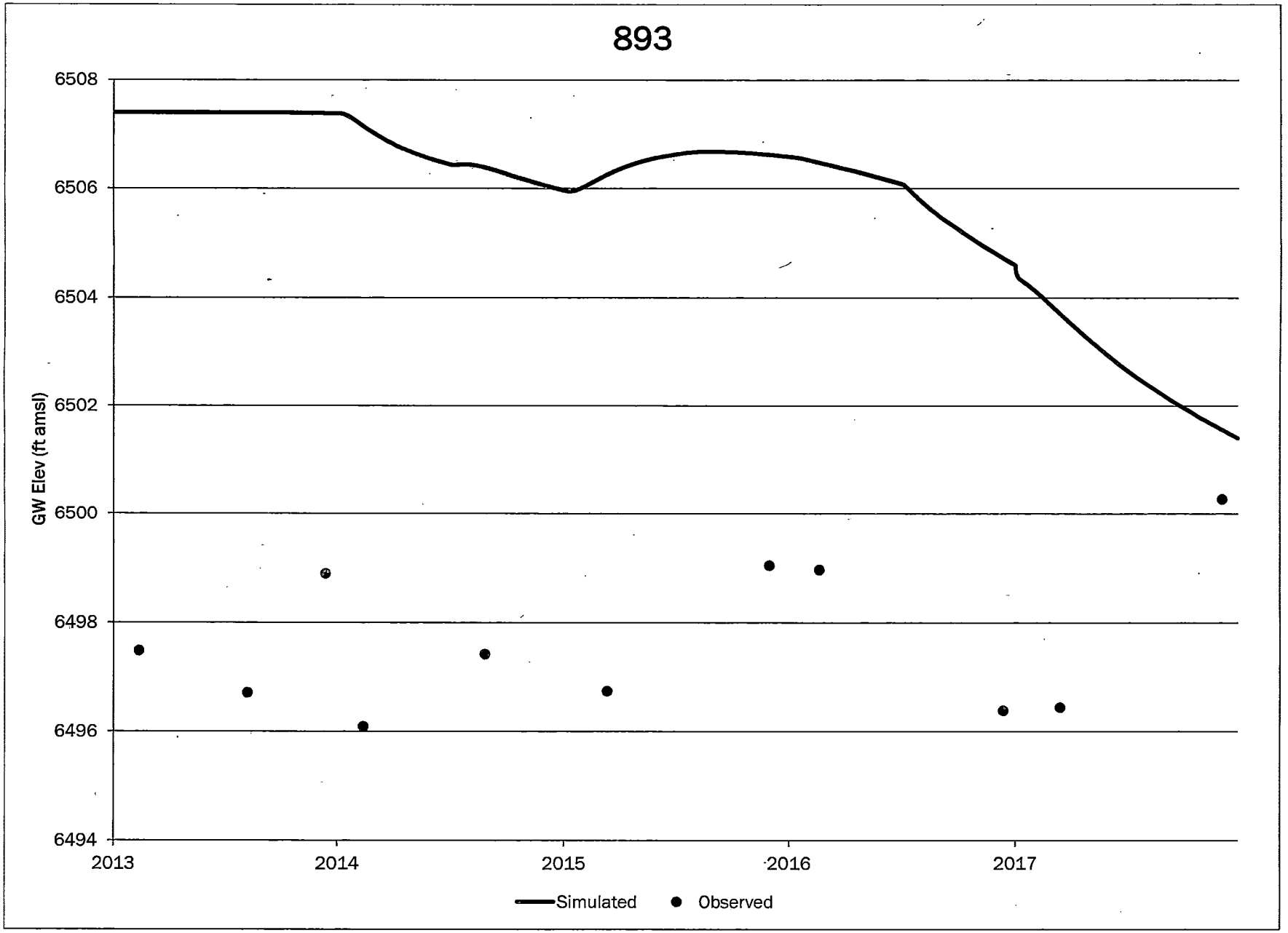
Simulated
Observed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GW Elev (ft amsl)
2013
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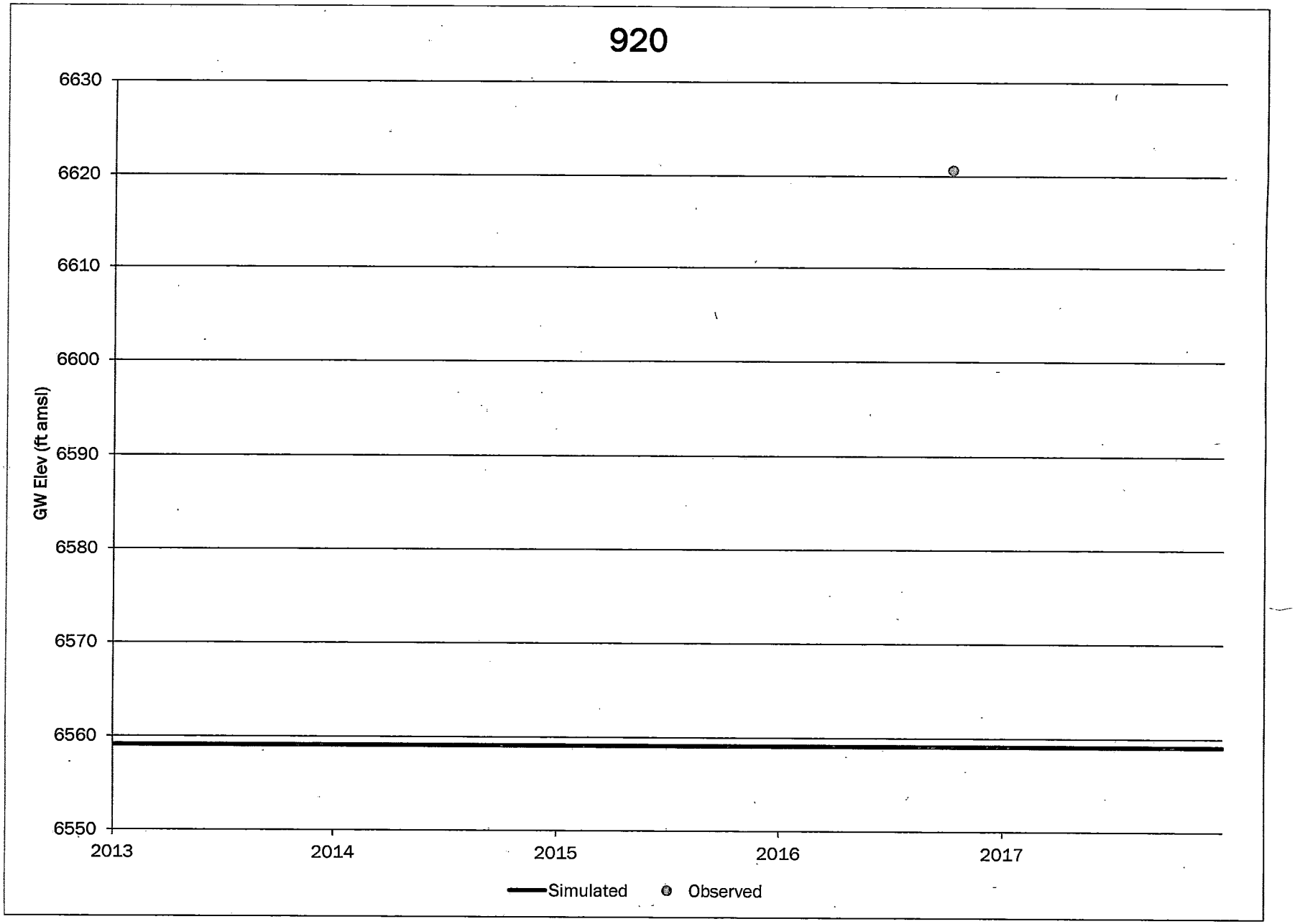
Simulated
Observed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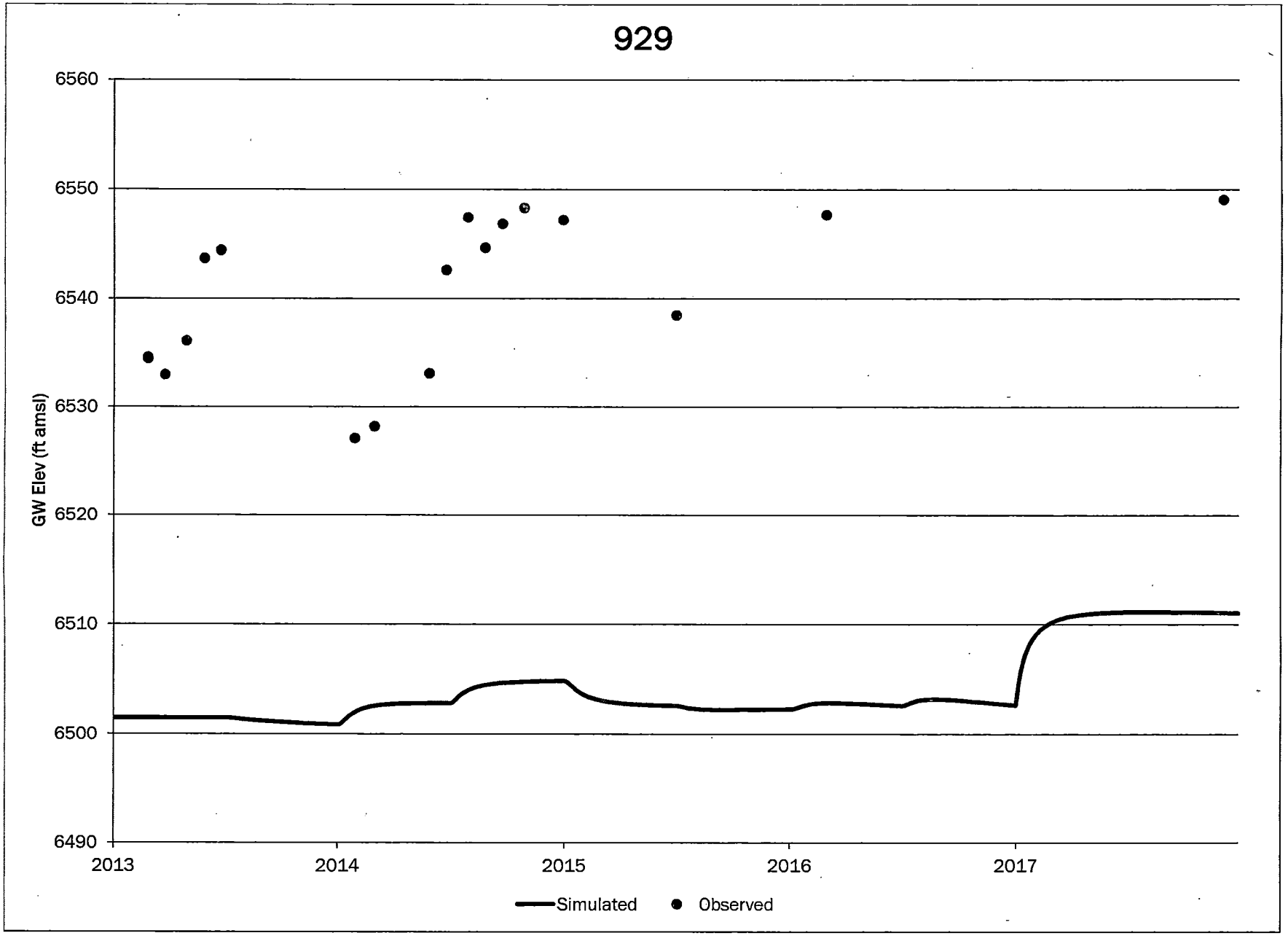
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed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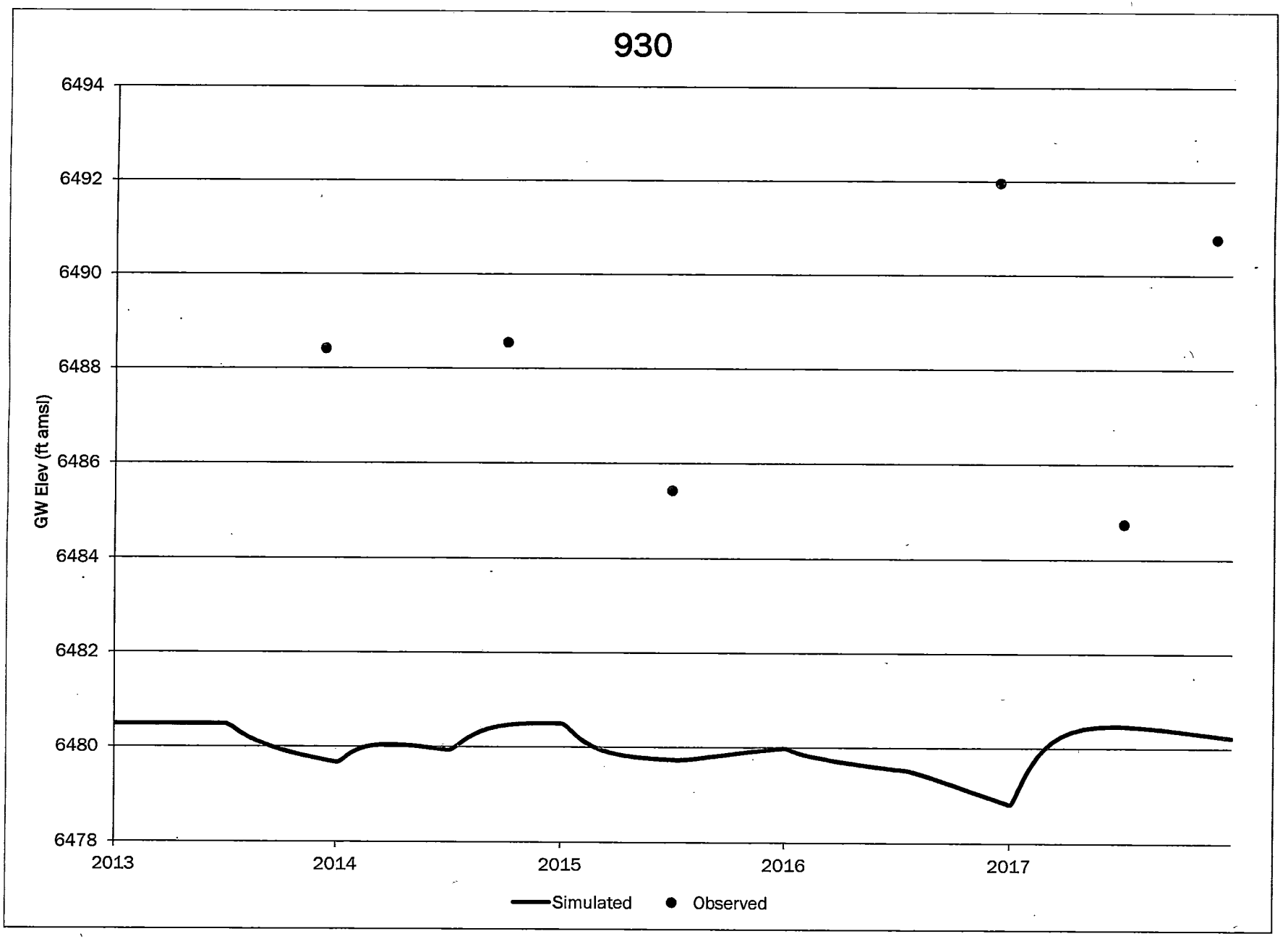
6560
6550
6540
6530
6520
6510
6500
6490
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed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6492
6490
6488
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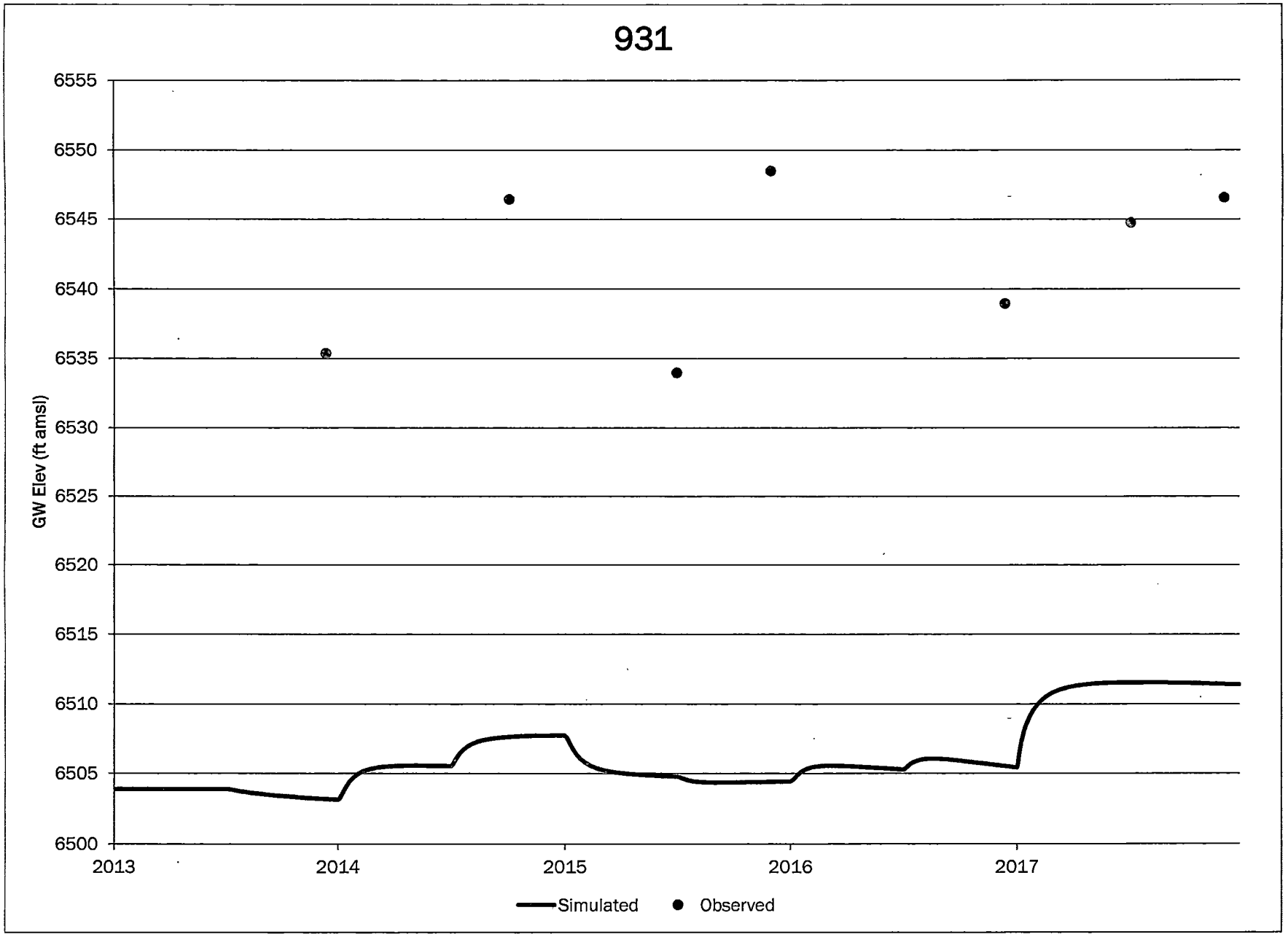
6484
6482
6480
6478
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed


931
6555
6550
6545
6540
6535
6530
6525
6520
6515
6510
6505
6500
GW Elev (ft amsl)
2013
2014
2015
2016
2017
Simulated
Observed

Appendix B: Groundwater Elevation Target Dataset

Table B-1. Groundwater Flow Model Water-Level Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Groundwater-Level Elevation (ft amsl)	Simulated Groundwater-Level Elevation (ft amsl)	Residual (ft)	Weight
520	492,935	1,538,934	1	12/12/2013	345	6537.53	6522.87	14.66	1.0
				12/2/2015	1065	6536.67	6541.40	-4.73	1.0
				12/13/2016	1442	6536.19	6534.83	1.36	1.0
				4/28/2017	1578	6535.50	6541.39	-5.89	1.0
				12/6/2017	1800	6534.15	6541.98	-7.83	1.0
540	488,091	1,534,125	1	5/4/2013	123	6494.00	6516.66	-22.66	1.0
				11/15/2013	318	6496.76	6514.10	-17.34	1.0
				12/13/2013	346	6496.95	6513.85	-16.90	1.0
				5/15/2015	864	6503.48	6515.39	-11.91	1.0
				12/2/2015	1065	6506.41	6517.73	-11.32	1.0
				8/5/2016	1312	6500.57	6511.53	-10.96	1.0
				12/13/2016	1442	6500.63	6508.14	-7.51	1.0
				11/7/2017	1771	6497.04	6504.66	-7.62	1.0
				12/6/2017	1800	6494.97	6504.52	-9.55	1.0
541	477,236	1,539,831	1	8/9/2013	220	6466.72	6465.18	1.54	1.0
				12/13/2013	346	6467.29	6465.18	2.11	1.0
				7/22/2015	932	6469.02	6464.51	4.51	1.0
				12/1/2015	1064	6469.66	6465.11	4.55	1.0
				12/29/2016	1458	6467.06	6464.60	2.46	1.0
				11/10/2017	1774	6465.96	6461.17	4.79	1.0
				12/6/2017	1800	6465.83	6461.00	4.83	1.0
551	479,880	1,536,272	1	2/7/2013	37	6447.69	6444.85	2.84	1.0
				8/9/2013	220	6448.10	6444.85	3.25	1.0
				12/13/2013	346	6449.50	6444.85	4.65	1.0
				2/14/2014	409	6449.70	6444.85	4.85	1.0
				8/28/2014	604	6451.10	6444.73	6.37	1.0
				2/20/2015	780	6451.65	6444.41	7.24	1.0
				12/1/2015	1064	6452.00	6444.20	7.80	1.0
				2/12/2016	1137	6453.11	6444.29	8.82	1.0
				12/13/2016	1442	6448.40	6444.67	3.73	1.0
				2/25/2017	1516	6450.12	6444.72	5.40	1.0
				3/29/2017	1548	6450.02	6444.73	5.29	1.0
				12/6/2017	1800	6449.20	6444.43	4.77	1.0
553	480,563	1,534,923	1	2/7/2013	37	6442.88	6441.50	1.38	1.0

Table B-1. Groundwater Flow Model Water-Level Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Groundwater-Level Elevation (ft amsl)	Simulated Groundwater-Level Elevation (ft amsl)	Residual (ft)	Weight
				8/9/2013	220	6442.88	6441.50	1.38	1.0
				12/13/2013	346	6444.03	6441.50	2.53	1.0
				2/14/2014	409	6444.14	6441.49	2.65	1.0
				8/27/2014	603	6444.00	6441.44	2.56	1.0
				2/20/2015	780	6444.97	6441.30	3.67	1.0
				12/1/2015	1064	6445.31	6441.11	4.20	1.0
				2/12/2016	1137	6446.51	6441.14	5.37	1.0
				12/13/2016	1442	6444.98	6441.59	3.39	1.0
				3/28/2017	1547	6444.84	6441.74	3.10	1.0
				12/6/2017	1800	6444.23	6441.54	2.69	1.0
554	479,107	1,534,967	1	2/7/2013	37	6440.59	6440.40	0.19	1.0
				8/9/2013	220	6440.77	6440.40	0.37	1.0
				12/13/2013	346	6442.41	6440.40	2.01	1.0
				2/14/2014	409	6442.46	6440.40	2.06	1.0
				2/20/2015	780	6443.39	6440.25	3.14	1.0
				12/1/2015	1064	6443.65	6440.10	3.55	1.0
				2/12/2016	1137	6449.19	6440.12	9.07	1.0
				12/13/2016	1442	6442.57	6440.39	2.18	1.0
				3/28/2017	1547	6442.35	6440.47	1.88	1.0
				12/6/2017	1800	6441.52	6440.43	1.09	1.0
555	486,236	1,538,572	1	2/6/2013	36	6511.20	6519.42	-8.22	1.0
				8/16/2013	227	6511.64	6519.40	-7.77	1.0
				2/12/2014	407	6512.34	6519.22	-6.88	1.0
				9/4/2014	611	6512.00	6519.23	-7.23	1.0
				2/26/2015	786	6512.06	6519.15	-7.10	1.0
				2/17/2016	1142	6513.39	6518.03	-4.64	1.0
				3/28/2017	1547	6515.31	6515.69	-0.38	1.0
556	486,184	1,538,006	1	2/6/2013	36	6500.94	6519.34	-18.40	1.0
				8/16/2013	227	6503.12	6519.32	-16.20	1.0
				9/4/2014	611	6503.86	6519.06	-15.20	1.0
				2/26/2015	786	6504.16	6519.00	-14.84	1.0
				2/11/2016	1136	6506.03	6517.98	-11.95	1.0
				3/28/2017	1547	6508.91	6515.71	-6.80	1.0
557	486,000	1,537,204	1	2/6/2013	36	6508.03	6519.12	-11.09	1.0
				8/16/2013	227	6508.07	6519.10	-11.03	1.0

Table B-1. Groundwater Flow Model Water-Level Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Groundwater-Level Elevation (ft amsl)	Simulated Groundwater-Level Elevation (ft amsl)	Residual (ft)	Weight
				2/12/2014	407	6508.37	6518.87	-10.50	1.0
				9/4/2014	611	6508.68	6518.75	-10.07	1.0
				2/26/2015	786	6508.72	6518.69	-9.98	1.0
				2/11/2016	1136	6509.72	6517.79	-8.07	1.0
631	483,756	1,532,234	1	3/7/2013	65	6451.40	6453.92	-2.52	1.0
				12/13/2013	346	6452.72	6453.74	-1.02	1.0
				4/2/2014	456	6453.75	6453.57	0.18	1.0
				12/3/2015	1066	6455.60	6453.65	1.95	1.0
				12/13/2016	1442	6457.40	6455.56	1.84	1.0
				12/28/2016	1457	6457.28	6455.57	1.71	1.0
				7/1/2017	1642	6454.70	6453.89	0.81	1.0
				12/6/2017	1800	6458.22	6451.95	6.27	1.0
632	483,767	1,531,850	1	3/7/2013	65	6451.80	6453.53	-1.73	1.0
				12/13/2013	346	6453.17	6453.39	-0.22	1.0
				4/2/2014	456	6454.11	6453.23	0.88	1.0
				12/3/2015	1066	6455.89	6453.25	2.64	1.0
				12/13/2016	1442	6457.56	6454.98	2.58	1.0
				7/1/2017	1642	6458.27	6453.68	4.59	1.0
				12/6/2017	1800	6460.07	6452.07	8.00	1.0
637	474,710	1,545,409	1	12/12/2014	710	6465.16	6467.47	-2.31	1.0
				12/21/2016	1450	6465.20	6467.49	-2.29	1.0
				10/7/2017	1740	6464.60	6467.06	-2.46	1.0
638	493,265	1,539,628	1	12/12/2013	345	6542.89	6528.75	14.14	1.0
				12/2/2015	1065	6543.12	6535.64	7.48	1.0
				12/13/2016	1442	6541.23	6544.37	-3.14	1.0
				4/28/2017	1578	6540.12	6543.38	-3.26	1.0
				12/6/2017	1800	6539.01	6542.98	-3.97	1.0
644	485,450	1,533,481	1	12/13/2013	346	6471.50	6472.33	-0.83	1.0
				10/11/2014	648	6473.67	6471.44	2.23	1.0
				12/2/2015	1065	6475.23	6474.01	1.22	1.0
				8/2/2016	1309	6476.16	6476.09	0.07	1.0
				12/13/2016	1442	6476.25	6475.79	0.46	1.0
				11/7/2017	1771	6475.69	6466.88	8.81	1.0
				12/6/2017	1800	6476.02	6466.53	9.49	1.0
646	484,952	1,533,246	1	12/13/2013	346	6465.79	6466.17	-0.38	1.0

Table B-1. Groundwater Flow Model Water-Level Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Groundwater-Level Elevation (ft amsl)	Simulated Groundwater-Level Elevation (ft amsl)	Residual (ft)	Weight
				9/4/2014	611	6468.28	6465.56	2.72	1.0
				12/3/2015	1066	6469.64	6467.27	2.37	1.0
				8/2/2016	1309	6471.31	6469.24	2.07	1.0
				12/13/2016	1442	6471.35	6469.22	2.13	1.0
				11/15/2017	1779	6471.44	6461.92	9.52	1.0
				12/6/2017	1800	6471.67	6461.65	10.02	1.0
				2/7/2013	37	6446.91	6445.83	1.08	1.0
				8/9/2013	220	6447.51	6445.83	1.68	1.0
				12/13/2013	346	6449.19	6445.83	3.36	1.0
				8/28/2014	604	6452.96	6445.67	7.29	1.0
647	478,308	1,536,623	1	2/20/2015	780	6450.93	6445.36	5.57	1.0
				12/1/2015	1064	6452.51	6445.36	7.15	1.0
				12/13/2016	1442	6448.61	6445.69	2.92	1.0
				3/16/2017	1535	6448.96	6445.69	3.27	1.0
				12/6/2017	1800	6448.08	6445.30	2.78	1.0
				2/7/2013	37	6440.08	6440.35	-0.27	1.0
				3/7/2013	65	6440.13	6440.35	-0.22	1.0
				8/16/2013	227	6438.39	6440.35	-1.96	1.0
				12/13/2013	346	6441.58	6440.35	1.23	1.0
				2/26/2014	421	6441.46	6440.35	1.11	1.0
649	479,798	1,534,730	1	4/2/2014	456	6441.19	6440.35	0.84	1.0
				12/1/2015	1064	6466.84	6440.06	26.78	1.0
				2/23/2016	1148	6442.69	6440.08	2.61	1.0
				12/13/2016	1442	6441.89	6440.39	1.50	1.0
				3/16/2017	1535	6441.73	6440.49	1.24	1.0
				12/6/2017	1800	6441.39	6440.41	0.98	1.0
				2/7/2013	37	6463.37	6461.35	2.02	1.0
				8/16/2013	227	6463.21	6461.35	1.86	1.0
				12/12/2013	345	6463.33	6461.35	1.98	1.0
				2/26/2014	421	6463.51	6461.35	2.16	1.0
650	482,135	1,536,779	1	9/4/2014	611	6459.76	6461.35	-1.59	1.0
				3/18/2015	806	6478.83	6461.34	17.49	1.0
				12/2/2015	1065	6465.61	6461.35	4.26	1.0
				2/12/2016	1137	6466.80	6461.35	5.45	1.0
				12/14/2016	1443	6465.59	6461.35	4.24	1.0

Table B-1. Groundwater Flow Model Water-Level Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Groundwater-Level Elevation (ft amsl)	Simulated Groundwater-Level Elevation (ft amsl)	Residual (ft)	Weight
				3/28/2017	1547	6465.73	6461.35	4.38	1.0
				12/6/2017	1800	6465.51	6461.34	4.17	1.0
654	478,636	1,541,994	1	3/7/2013	65	6479.10	6482.52	-3.42	1.0
				12/13/2013	346	6478.95	6482.52	-3.57	1.0
				6/10/2015	890	6480.15	6481.93	-1.78	1.0
				12/1/2015	1064	6481.58	6482.73	-1.15	1.0
				12/13/2016	1442	6479.05	6481.45	-2.40	1.0
				11/15/2017	1779	6477.21	6474.72	2.49	1.0
657	478,392	1,537,497	1	5/14/2013	133	6452.50	6450.13	2.37	1.0
				8/9/2013	220	6454.11	6450.13	3.98	1.0
				12/13/2013	346	6454.68	6450.13	4.55	1.0
				12/1/2015	1064	6458.91	6449.96	8.95	1.0
				12/13/2016	1442	6454.81	6450.02	4.79	1.0
				12/6/2017	1800	6452.81	6449.16	3.65	1.0
658	478,436	1,535,922	1	2/7/2013	37	6442.70	6442.73	-0.03	1.0
				10/30/2013	302	6444.53	6442.73	1.80	1.0
				12/13/2013	346	6445.25	6442.73	2.52	1.0
				2/26/2014	421	6445.18	6442.73	2.45	1.0
				8/27/2014	603	6447.40	6442.66	4.74	1.0
				2/20/2015	780	6447.03	6442.44	4.59	1.0
				12/1/2015	1064	6447.98	6442.23	5.75	1.0
				12/13/2016	1442	6445.38	6442.58	2.80	1.0
				2/22/2017	1513	6443.94	6442.63	1.31	1.0
				12/6/2017	1800	6443.78	6442.49	1.29	1.0
681	482,734	1,540,676	1	3/19/2013	77	6497.12	6509.29	-12.17	1.0
				3/27/2015	815	6498.70	6508.29	-9.59	1.0
				12/2/2015	1065	6498.69	6508.44	-9.75	1.0
				12/14/2016	1443	6497.49	6506.73	-9.24	1.0
				12/6/2017	1800	6497.27	6503.84	-6.57	1.0
686	475,438	1,545,319	1	12/12/2014	710	6467.94	6467.38	0.56	1.0
				12/21/2016	1450	6467.47	6467.72	-0.25	1.0
				10/7/2017	1740	6466.70	6466.93	-0.23	1.0
688	483,954	1,541,257	1	3/5/2013	63	6504.74	6513.24	-8.50	1.0
				10/30/2013	302	6505.79	6513.23	-7.44	1.0
				12/13/2013	346	6506.23	6513.22	-6.99	1.0

Table B-1. Groundwater Flow Model Water-Level Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Groundwater-Level Elevation (ft amsl)	Simulated Groundwater-Level Elevation (ft amsl)	Residual (ft)	Weight
				3/20/2014	443	6505.88	6513.13	-7.25	1.0
				3/13/2015	801	6503.56	6512.20	-8.64	1.0
				12/1/2015	1064	6505.07	6511.93	-6.86	1.0
				3/17/2016	1171	6504.60	6511.68	-7.08	1.0
				12/14/2016	1443	6504.06	6510.21	-6.15	1.0
				3/28/2017	1547	6503.75	6509.36	-5.61	1.0
				8/10/2017	1682	6503.62	6508.28	-4.66	1.0
				12/6/2017	1800	6503.37	6507.55	-4.18	1.0
690	493,465	1,540,279	1	2/20/2013	50	6546.79	6536.84	9.95	1.0
				12/12/2013	345	6546.60	6536.85	9.75	1.0
				12/2/2015	1065	6547.58	6538.17	9.41	1.0
				12/13/2016	1442	6545.44	6539.14	6.30	1.0
				4/26/2017	1576	6544.58	6539.23	5.35	1.0
				12/6/2017	1800	6543.23	6539.07	4.16	1.0
844	487,002	1,538,376	1	2/6/2013	36	6520.13	6520.64	-0.51	1.0
				8/16/2013	227	6519.83	6520.62	-0.79	1.0
				12/13/2013	346	6519.90	6520.44	-0.54	1.0
				2/26/2014	421	6519.93	6520.35	-0.42	1.0
				9/4/2014	611	6519.73	6520.41	-0.68	1.0
				2/26/2015	786	6519.85	6520.39	-0.54	1.0
				12/1/2015	1064	6519.81	6519.38	0.43	1.0
				2/20/2016	1145	6521.09	6519.16	1.93	1.0
				12/14/2016	1443	6520.29	6517.63	2.66	1.0
				3/28/2017	1547	6520.17	6516.72	3.45	1.0
				12/6/2017	1800	6519.73	6515.18	4.55	1.0
845	487,833	1,537,280	1	2/6/2013	36	6522.65	6521.78	0.87	1.0
				8/16/2013	227	6519.87	6521.71	-1.84	1.0
				12/13/2013	346	6522.93	6521.42	1.51	1.0
				2/26/2014	421	6522.90	6521.26	1.64	1.0
				9/4/2014	611	6522.57	6521.20	1.37	1.0
				2/26/2015	786	6522.94	6521.20	1.74	1.0
				12/1/2015	1064	6523.25	6520.29	2.96	1.0
				2/20/2016	1145	6523.56	6520.12	3.44	1.0
				12/14/2016	1443	6524.09	6518.62	5.47	1.0
				3/28/2017	1547	6523.60	6517.67	5.93	1.0

Table B-1. Groundwater Flow Model Water-Level Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Groundwater-Level Elevation (ft amsl)	Simulated Groundwater-Level Elevation (ft amsl)	Residual (ft)	Weight
				12/6/2017	1800	6522.80	6516.23	6.57	1.0
846	484,730	1,537,219	1	2/20/2013	50	6503.92	6517.95	-14.03	1.0
				10/30/2013	302	6504.12	6517.89	-13.77	1.0
				12/13/2013	346	6504.08	6517.85	-13.77	1.0
				2/26/2014	421	6504.17	6517.76	-13.59	1.0
				9/4/2014	611	6504.38	6517.63	-13.25	1.0
				3/18/2015	806	6504.47	6517.50	-13.03	1.0
				7/1/2015	911	6504.67	6517.30	-12.63	1.0
				8/20/2015	961	6505.74	6517.18	-11.44	1.0
				12/1/2015	1064	6504.84	6516.91	-12.07	1.0
				2/12/2016	1137	6505.87	6516.72	-10.85	1.0
				12/14/2016	1443	6505.08	6515.41	-10.33	1.0
				3/28/2017	1547	6505.13	6514.66	-9.53	1.0
				8/10/2017	1682	6505.12	6513.64	-8.52	1.0
				12/6/2017	1800	6505.08	6512.90	-7.82	1.0
851	483,909	1,534,692	1	12/2/2015	1065	6459.84	6461.16	-1.32	1.0
				12/14/2016	1443	6460.23	6462.92	-2.69	1.0
				12/6/2017	1800	6461.73	6459.16	2.57	1.0
852	493,989	1,535,610	1	7/1/2015	911	6519.93	6519.83	0.10	1.0
				12/2/2015	1065	6520.21	6519.67	0.54	1.0
				12/13/2016	1442	6521.13	6519.48	1.65	1.0
				12/6/2017	1800	6521.35	6519.09	2.26	1.0
855	484,184	1,532,111	1	2/20/2013	50	6452.70	6457.01	-4.31	1.0
				12/13/2013	346	6454.23	6456.75	-2.52	1.0
				12/3/2015	1066	6457.24	6456.88	0.36	1.0
				12/13/2016	1442	6459.01	6458.90	0.11	1.0
864	486,464	1,533,735	1	2/26/2013	56	6475.91	6488.54	-12.63	1.0
				8/21/2015	962	6482.67	6485.47	-2.80	1.0
				8/10/2016	1317	6482.19	6487.33	-5.14	1.0
865	488,429	1,534,123	1	10/18/2014	655	6498.05	6509.07	-11.02	1.0
				5/15/2015	864	6502.77	6514.78	-12.01	1.0
				8/21/2015	962	6504.98	6516.21	-11.23	1.0
				8/5/2016	1312	6505.03	6512.13	-7.10	1.0
867	488,409	1,533,762	1	12/13/2013	346	6495.90	6515.21	-19.31	1.0
				12/2/2015	1065	6503.60	6516.44	-12.84	1.0

Table B-1. Groundwater Flow Model Water-Level Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Groundwater-Level Elevation (ft amsl)	Simulated Groundwater-Level Elevation (ft amsl)	Residual (ft)	Weight
				12/13/2016	1442	6497.25	6509.35	-12.10	1.0
				12/6/2017	1800	6495.50	6506.15	-10.65	1.0
869	486,073	1,533,251	1	3/19/2013	77	6471.41	6481.47	-10.06	1.0
				6/18/2013	168	6472.36	6481.47	-9.11	1.0
				12/13/2013	346	6474.57	6480.17	-5.60	1.0
				7/19/2014	564	6477.02	6478.99	-1.97	1.0
				8/21/2015	962	6479.31	6481.43	-2.12	1.0
				12/2/2015	1065	6479.16	6482.49	-3.33	1.0
				12/13/2016	1442	6479.89	6483.65	-3.76	1.0
				11/4/2017	1768	6479.05	6472.88	6.17	1.0
				12/6/2017	1800	6479.15	6472.56	6.59	1.0
876	486,088	1,532,853	1	12/13/2013	346	6474.32	6477.29	-2.97	1.0
				12/2/2015	1065	6479.19	6479.98	-0.79	1.0
				12/13/2016	1442	6480.06	6481.34	-1.28	1.0
				12/6/2017	1800	6479.92	6469.62	10.30	1.0
881	481,478	1,542,034	1	2/9/2013	39	6493.38	6503.61	-10.23	1.0
				12/13/2013	346	6494.41	6503.61	-9.20	1.0
				2/12/2014	407	6494.68	6503.07	-8.39	1.0
				8/27/2014	603	6494.74	6502.22	-7.48	1.0
				2/27/2015	787	6496.38	6502.40	-6.02	1.0
				2/19/2016	1144	6496.81	6503.11	-6.30	1.0
				12/13/2016	1442	6493.86	6500.99	-7.13	1.0
				2/24/2017	1515	6493.57	6500.33	-6.76	1.0
882	482,396	1,541,404	1	2/12/2013	42	6498.08	6507.94	-9.86	1.0
				8/9/2013	220	6497.36	6507.94	-10.58	1.0
				2/12/2014	407	6499.69	6507.71	-8.02	1.0
				8/27/2014	603	6498.52	6506.96	-8.44	1.0
				2/27/2015	787	6499.79	6506.76	-6.97	1.0
				2/19/2016	1144	6499.86	6507.00	-7.14	1.0
				3/16/2017	1535	6497.26	6504.48	-7.22	1.0
884	481,498	1,542,677	1	2/9/2013	39	6495.75	6504.15	-8.40	1.0
				8/9/2013	220	6494.60	6504.15	-9.55	1.0
				2/12/2014	407	6496.10	6503.73	-7.63	1.0
				8/6/2014	582	6496.66	6502.85	-6.19	1.0
				2/27/2015	787	6498.51	6502.83	-4.32	1.0

Table B-1. Groundwater Flow Model Water-Level Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Groundwater-Level Elevation (ft amsl)	Simulated Groundwater-Level Elevation (ft amsl)	Residual (ft)	Weight
				2/19/2016	1144	6497.84	6503.50	-5.66	1.0
				3/28/2017	1547	6495.08	6500.57	-5.49	1.0
885	483,474	1,541,919	1	3/20/2013	78	6502.83	6512.26	-9.43	1.0
				8/9/2013	220	6501.14	6512.26	-11.12	1.0
				12/13/2013	346	6504.70	6512.25	-7.55	1.0
				10/23/2014	660	6501.83	6511.32	-9.49	1.0
				12/1/2015	1064	6503.33	6510.92	-7.59	1.0
				12/13/2016	1442	6500.84	6509.21	-8.37	1.0
				3/30/2017	1549	6500.44	6508.30	-7.86	1.0
				10/5/2017	1738	6500.64	6506.86	-6.22	1.0
				12/6/2017	1800	6499.94	6506.49	-6.55	1.0
886	482,487	1,542,327	1	2/9/2013	39	6498.08	6508.83	-10.75	1.0
				11/16/2013	319	6508.98	6508.83	0.15	1.0
				12/13/2013	346	6500.07	6508.82	-8.75	1.0
				8/27/2014	603	6498.78	6507.93	-9.15	1.0
				10/17/2014	654	6498.70	6507.73	-9.03	1.0
				12/1/2015	1064	6500.32	6507.85	-7.53	1.0
				2/19/2016	1144	6500.05	6507.70	-7.65	1.0
				12/13/2016	1442	6497.15	6506.05	-8.90	1.0
				3/4/2017	1523	6496.83	6505.17	-8.34	1.0
				11/7/2017	1771	6497.01	6503.16	-6.15	1.0
				11/10/2017	1774	6496.85	6503.15	-6.30	1.0
888	479,335	1,542,285	1	3/20/2013	78	6482.97	6489.01	-6.04	1.0
				8/9/2013	220	6493.83	6489.01	4.82	1.0
				12/13/2013	346	6482.90	6489.01	-6.11	1.0
				3/25/2015	813	6483.68	6486.95	-3.27	1.0
				12/1/2015	1064	6485.66	6488.58	-2.92	1.0
				2/10/2016	1135	6485.09	6488.94	-3.85	1.0
				12/13/2016	1442	6482.90	6487.27	-4.37	1.0
				3/29/2017	1548	6483.31	6483.42	-0.11	1.0
				10/7/2017	1740	6482.03	6481.06	0.97	1.0
				12/6/2017	1800	6481.13	6480.59	0.54	1.0
893	482,244	1,541,934	1	2/12/2013	42	6497.49	6507.39	-9.90	1.0
				8/9/2013	220	6496.72	6507.39	-10.67	1.0
				12/13/2013	346	6498.89	6507.38	-8.49	1.0

Table B-1. Groundwater Flow Model Water-Level Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Groundwater-Level Elevation (ft amsl)	Simulated Groundwater-Level Elevation (ft amsl)	Residual (ft)	Weight
				2/12/2014	407	6496.09	6507.13	-11.04	1.0
				8/27/2014	603	6497.43	6506.37	-8.94	1.0
				3/13/2015	801	6496.75	6506.25	-9.50	1.0
				12/1/2015	1064	6499.04	6506.61	-7.57	1.0
				2/20/2016	1145	6498.96	6506.46	-7.50	1.0
				12/13/2016	1442	6496.39	6504.72	-8.33	1.0
				3/15/2017	1534	6496.45	6503.70	-7.25	1.0
				12/6/2017	1800	6500.27	6501.56	-1.29	1.0
920	496,900	1,555,800	1	10/7/2016	1375	6620.62	6559.08	61.54	1.0
				12/12/2013	345	6465.63	6464.22	1.41	1.0
				6/19/2014	534	6467.65	6463.98	3.67	1.0
				7/2/2015	912	6468.75	6464.01	4.74	1.0
853_A	484,824	1,532,124	1	12/2/2015	1065	6469.07	6464.81	4.26	1.0
				12/13/2016	1442	6470.70	6466.29	4.41	1.0
				7/7/2017	1648	6471.68	6463.15	8.53	1.0
				12/6/2017	1800	6471.16	6461.55	9.61	1.0
				2/9/2013	39	6526.93	6523.82	3.11	1.0
				7/9/2013	189	6526.58	6523.17	3.41	1.0
				12/12/2013	345	6526.14	6521.98	4.16	1.0
				2/13/2014	408	6525.24	6522.03	3.21	1.0
				6/17/2014	532	6523.82	6521.43	2.39	1.0
494	489,494	1,536,689	4	3/5/2015	793	6527.84	6520.74	7.10	1.0
				12/2/2015	1065	6529.84	6520.62	9.22	1.0
				2/16/2016	1141	6530.17	6520.85	9.32	1.0
				7/13/2016	1289	6529.28	6520.35	8.93	1.0
				12/14/2016	1443	6528.78	6518.75	10.03	1.0
				3/2/2017	1521	6528.24	6517.88	10.36	1.0
				6/29/2017	1640	6526.24	6517.33	8.91	1.0
				2/26/2013	56	6534.60	6501.51	33.09	1.0
				2/26/2013	56	6534.47	6501.51	32.96	1.0
				3/26/2013	84	6532.99	6501.51	31.48	1.0
929	495,585	1,544,684	4	4/30/2013	119	6536.12	6501.51	34.61	1.0
				5/29/2013	148	6543.65	6501.51	42.14	1.0
				6/25/2013	175	6544.39	6501.51	42.88	1.0
				1/28/2014	392	6527.13	6501.98	25.15	1.0

Table B-1. Groundwater Flow Model Water-Level Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Groundwater-Level Elevation (ft amsl)	Simulated Groundwater-Level Elevation (ft amsl)	Residual (ft)	Weight
				3/1/2014	424	6528.22	6502.59	25.63	1.0
				5/28/2014	512	6533.11	6502.84	30.27	1.0
				6/24/2014	539	6542.61	6502.84	39.77	1.0
				7/29/2014	574	6547.37	6503.98	43.39	1.0
				8/26/2014	602	6544.63	6504.48	40.15	1.0
				9/23/2014	630	6546.79	6504.69	42.10	1.0
				10/28/2014	665	6548.27	6504.81	43.46	1.0
				12/30/2014	728	6547.13	6504.88	42.25	1.0
				7/2/2015	912	6538.48	6502.62	35.86	1.0
				3/1/2016	1155	6547.62	6502.87	44.75	1.0
				12/6/2017	1800	6549.06	6511.08	37.98	1.0
				12/12/2013	345	6535.36	6503.18	32.18	1.0
				10/3/2014	640	6546.45	6507.63	38.82	1.0
				7/2/2015	912	6533.98	6504.79	29.19	1.0
931	495,207	1,542,461	4	12/1/2015	1064	6548.51	6504.41	44.10	1.0
				12/13/2016	1442	6538.97	6505.52	33.45	1.0
				7/6/2017	1647	6544.76	6511.55	33.21	1.0
				12/6/2017	1800	6546.59	6511.44	35.15	1.0
				2/9/2013	39	6470.92	6506.99	-36.07	1.0
				7/9/2013	189	6492.86	6503.84	-10.98	1.0
				12/12/2013	345	6491.88	6501.78	-9.90	1.0
				2/13/2014	408	6491.28	6504.64	-13.36	1.0
				6/17/2014	532	6489.95	6503.44	-13.49	1.0
				10/16/2014	653	6479.55	6502.81	-23.26	1.0
				10/18/2014	655	6478.87	6502.80	-23.93	1.0
				11/6/2014	674	6476.33	6502.71	-26.38	1.0
493	489,492	1,536,702	6	11/14/2014	682	6476.69	6502.68	-25.99	1.0
				12/2/2014	700	6475.99	6502.60	-26.61	1.0
				3/5/2015	793	6490.72	6502.16	-11.44	1.0
				12/2/2015	1065	6493.16	6504.91	-11.75	1.0
				2/16/2016	1141	6492.23	6503.71	-11.48	1.0
				7/12/2016	1288	6496.34	6501.46	-5.12	1.0
				12/14/2016	1443	6489.50	6498.45	-8.95	1.0
				3/2/2017	1521	6491.85	6498.67	-6.82	1.0
				12/6/2017	1800	6478.78	6497.51	-18.73	1.0

Table B-1. Groundwater Flow Model Water-Level Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Groundwater-Level Elevation (ft amsl)	Simulated Groundwater-Level Elevation (ft amsl)	Residual (ft)	Weight
859	487,426	1,534,549	6	11/20/2013	323	6494.12	6508.01	-13.89	1.0
				12/12/2013	345	6494.26	6507.84	-13.58	1.0
				6/19/2014	534	6491.91	6503.77	-11.86	1.0
				10/8/2014	645	6491.36	6501.99	-10.63	1.0
				10/10/2014	647	6491.17	6501.97	-10.80	1.0
				10/14/2014	651	6490.60	6501.93	-11.33	1.0
				10/16/2014	653	6490.22	6501.92	-11.70	1.0
				10/18/2014	655	6489.81	6501.90	-12.09	1.0
				11/6/2014	674	6487.43	6501.74	-14.31	1.0
				11/14/2014	682	6487.27	6501.68	-14.41	1.0
				12/2/2014	700	6486.78	6501.54	-14.76	1.0
				12/2/2015	1065	6496.91	6509.49	-12.58	1.0
				12/13/2016	1442	6490.32	6501.07	-10.75	1.0
				12/6/2017	1800	6489.63	6498.42	-8.79	1.0
930	494,997	1,542,848	6	12/12/2013	345	6488.41	6479.72	8.69	1.0
				10/4/2014	641	6488.54	6480.46	8.08	1.0
				7/1/2015	911	6485.43	6479.73	5.70	1.0
				12/13/2016	1442	6491.96	6478.90	13.06	1.0
				7/6/2017	1647	6484.74	6480.46	4.28	1.0
				12/6/2017	1800	6490.76	6480.26	10.50	1.0
853_LC	484,824	1,532,124	8	12/12/2013	345	6465.63	6464.56	1.07	1.0
				6/19/2014	534	6467.65	6464.30	3.35	1.0
				7/2/2015	912	6468.75	6464.40	4.35	1.0
				12/2/2015	1065	6469.07	6465.28	3.79	1.0
				12/13/2016	1442	6470.70	6466.85	3.85	1.0
				7/7/2017	1648	6471.68	6463.26	8.42	1.0
				12/6/2017	1800	6471.16	6461.52	9.64	1.0
11.10.08.344	475,185	1,524,399	10	5/9/2016	1224	6438.00	6433.45	4.55	1.0
11.10.09.221	482,873	1,529,418	10	4/2/2013	91	6422.00	6431.63	-9.63	1.0
				5/6/2016	1221	6422.00	6431.68	-9.68	1.0
				6/13/2017	1624	6419.00	6431.82	-12.82	1.0
				12/14/2017	1808	6420.00	6431.84	-11.84	1.0
11.10.27.241	487,858	1,512,323	10	4/2/2013	91	6417.00	6414.44	2.56	1.0
				8/15/2013	226	6415.00	6414.44	0.56	1.0
				3/21/2014	444	6416.00	6414.44	1.56	1.0

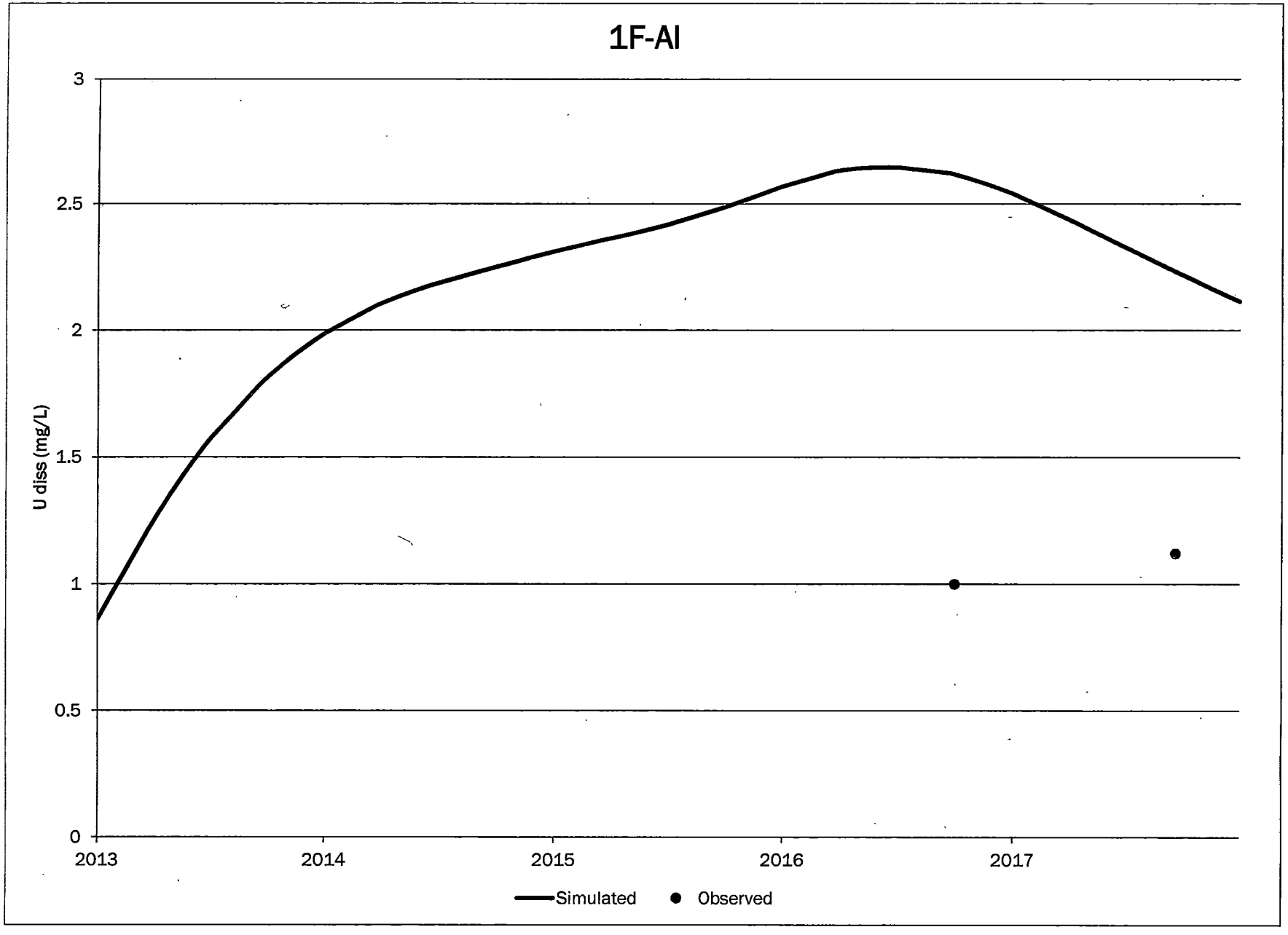
Table B-1. Groundwater Flow Model Water-Level Calibration Data

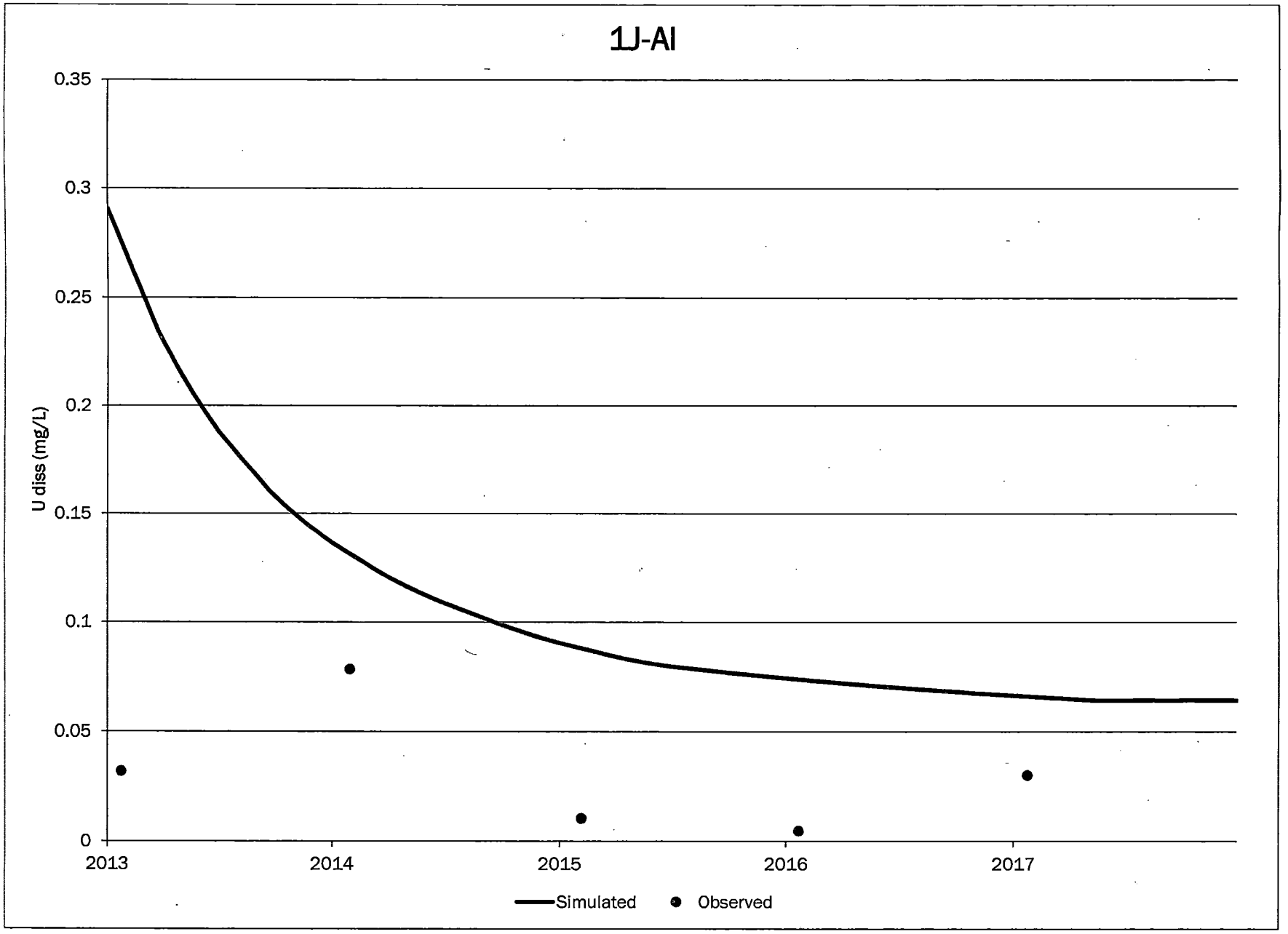
Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Groundwater-Level Elevation (ft amsl)	Simulated Groundwater-Level Elevation (ft amsl)	Resid-ual (ft)	Weight
				8/8/2014	584	6414.00	6414.44	-0.44	1.0
				2/26/2015	786	6416.00	6414.45	1.55	1.0
				7/22/2015	932	6414.00	6414.45	-0.45	1.0
				3/14/2016	1168	6416.00	6414.45	1.55	1.0
				5/23/2016	1238	6415.00	6414.45	0.55	1.0
				7/27/2016	1303	6413.00	6414.45	-1.45	1.0
				8/8/2016	1315	6413.00	6414.45	-1.45	1.0
				8/16/2016	1323	6413.00	6414.46	-1.46	1.0
				12/12/2016	1441	6415.00	6414.47	0.53	1.0
				4/7/2017	1557	6415.00	6414.49	0.51	1.0
				4/11/2017	1561	6414.00	6414.49	-0.49	1.0
				10/5/2017	1738	6413.00	6414.52	-1.52	1.0
				12/11/2017	1805	6415.00	6414.53	0.47	1.0
12.10.20.333A	473,212	1,545,470	10	4/2/2013	91	6432.00	6454.58	-22.58	1.0
				2/2/2016	1127	6431.00	6454.66	-23.66	1.0
				3/16/2016	1170	6430.00	6454.68	-24.68	1.0
				5/26/2016	1241	6429.00	6454.70	-25.70	1.0
				5/25/2017	1605	6430.00	6454.83	-24.83	1.0
				11/6/2017	1770	6429.00	6454.84	-25.84	1.0
				12/14/2017	1808	6430.00	6454.84	-24.84	1.0
12.10.23.233	491,790	1,548,181	10	4/3/2013	92	6463.00	6451.96	11.04	1.0
				8/15/2013	226	6465.00	6451.96	13.04	1.0
				3/21/2014	444	6479.00	6452.00	27.00	1.0
				8/8/2014	584	6466.00	6452.02	13.98	1.0
				2/26/2015	786	6474.00	6452.03	21.97	1.0
				7/22/2015	932	6481.00	6452.02	28.98	1.0
				3/17/2016	1171	6461.00	6452.08	8.92	1.0
12.10.32.111	473,116	1,539,606	10	3/18/2016	1172	6415.00	6445.89	-30.89	1.0
12.10.34.412	487,224	1,537,264	10	4/2/2013	91	6416.00	6428.82	-12.82	0.5
				3/17/2016	1171	6429.00	6431.31	-2.31	1.0
				6/2/2016	1248	6430.00	6431.47	-1.47	1.0
				6/13/2017	1624	6421.00	6431.87	-10.87	1.0
				12/13/2017	1807	6423.00	6431.94	-8.94	1.0
12.11.09.114A	447,774	1,559,953	10	5/3/2016	1218	6470.00	6513.67	-43.67	1.0
				6/15/2017	1626	6512.00	6513.69	-1.69	1.0

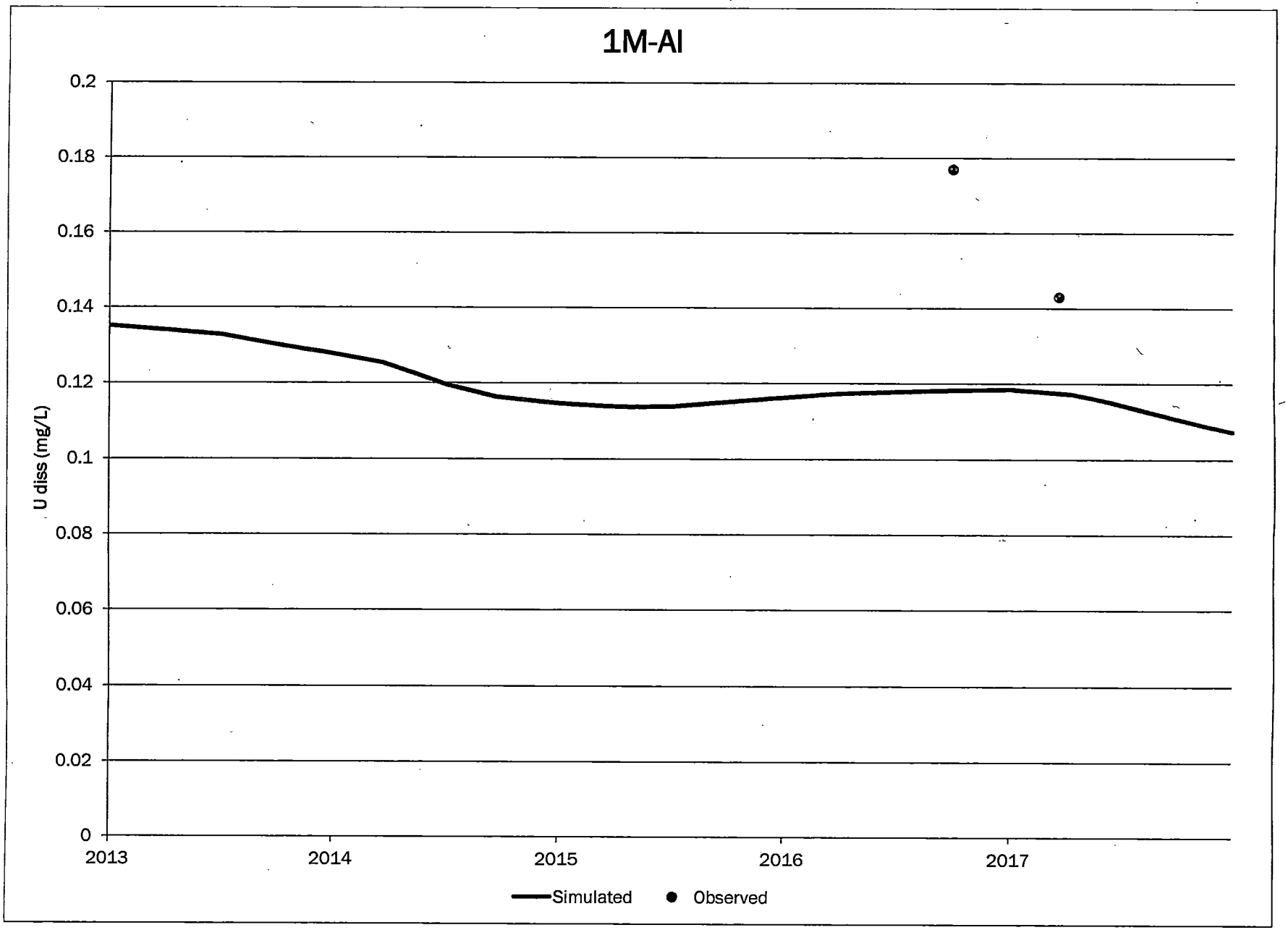
Table B-1. Groundwater Flow Model Water-Level Calibration Data

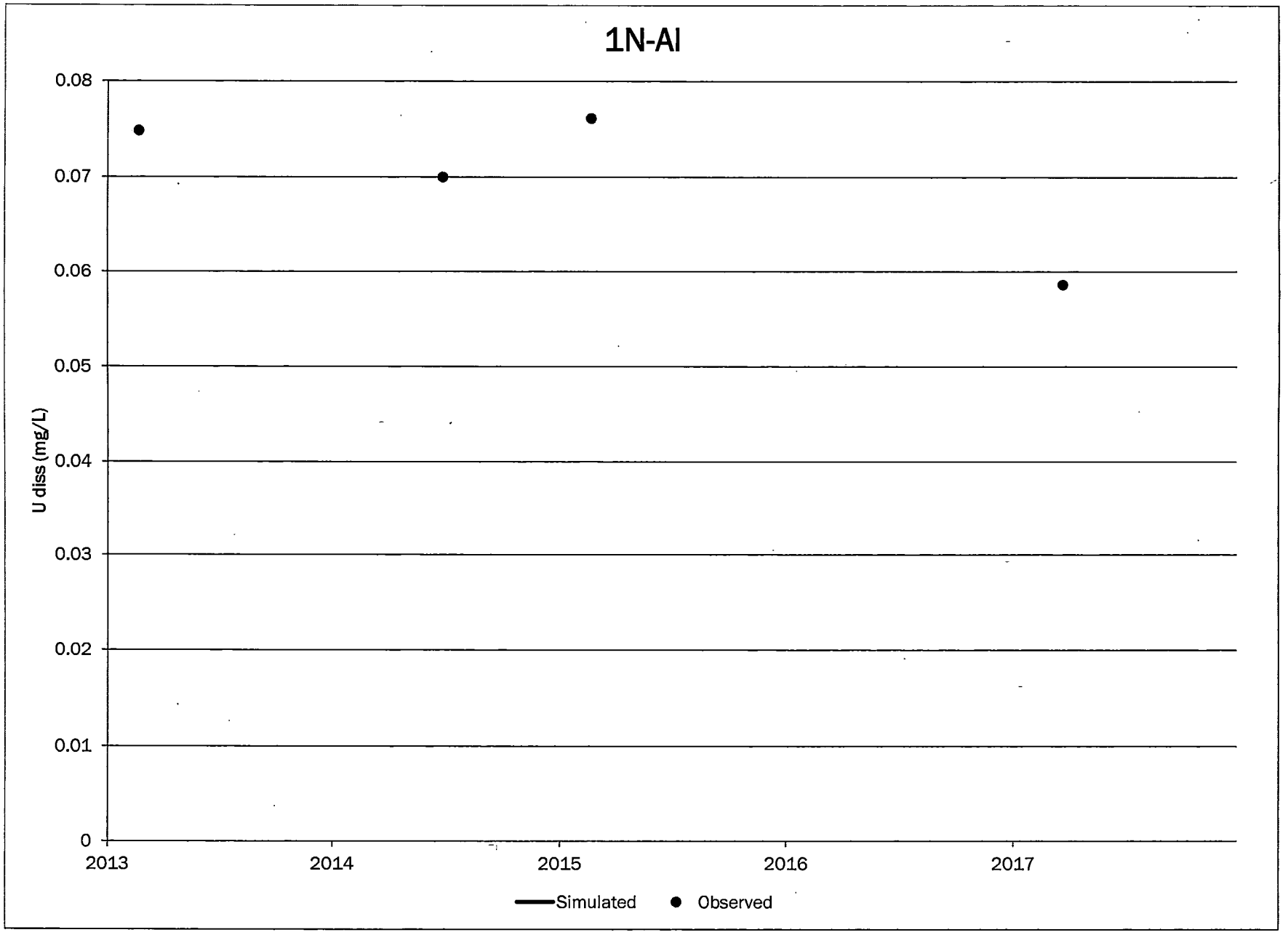
Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Groundwater-Level Elevation (ft amsl)	Simulated Groundwater-Level Elevation (ft amsl)	Residual (ft)	Weight
12.11.15.341	453,979	1,551,754	10	11/3/2017	1767	6464.00	6488.59	-24.59	1.0
12.11.25.313	462,782	1,541,821	10	4/3/2013	92	6436.00	6462.30	-26.30	1.0

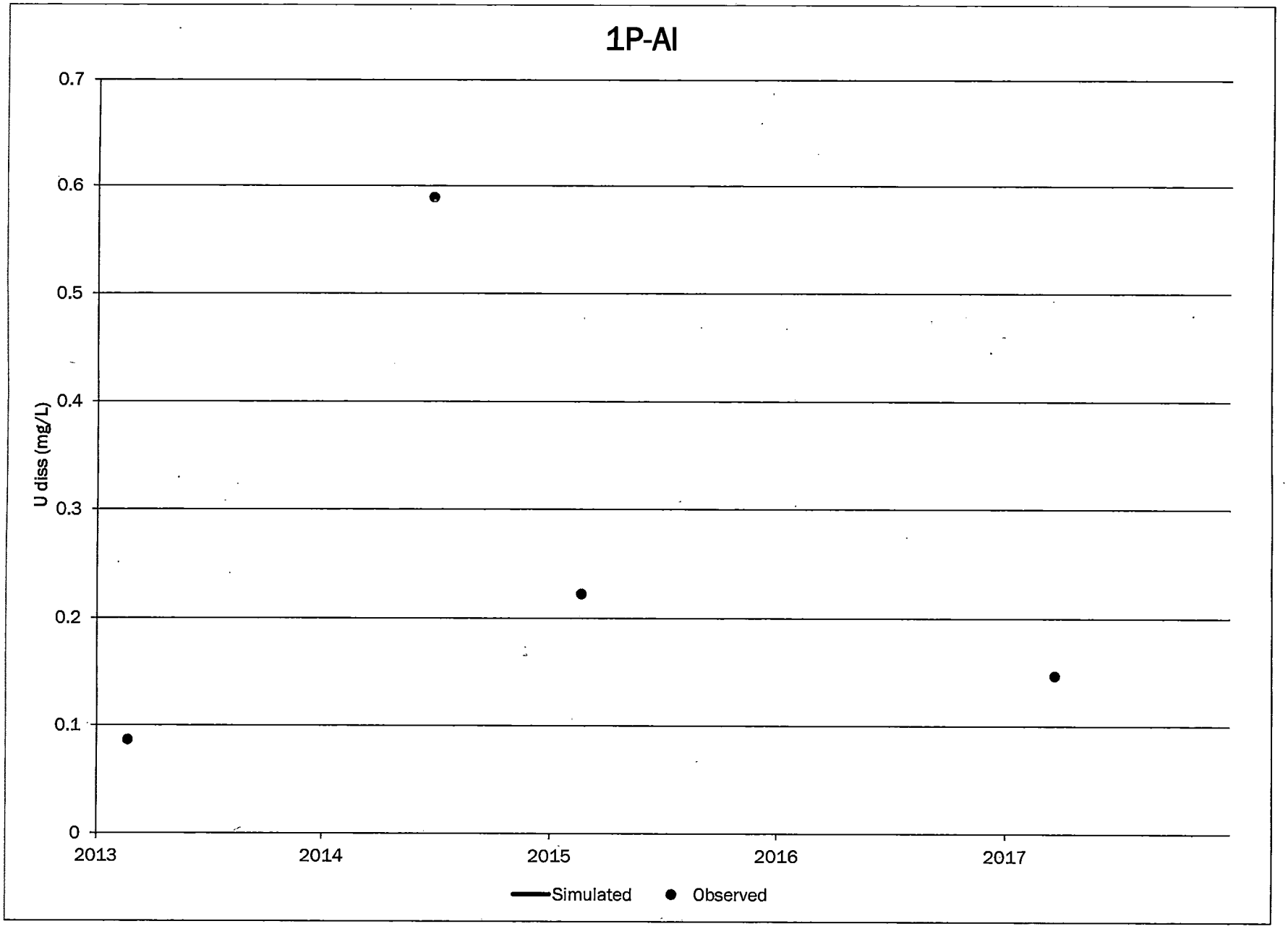
Appendix C: Simulated Constituent Chemographs

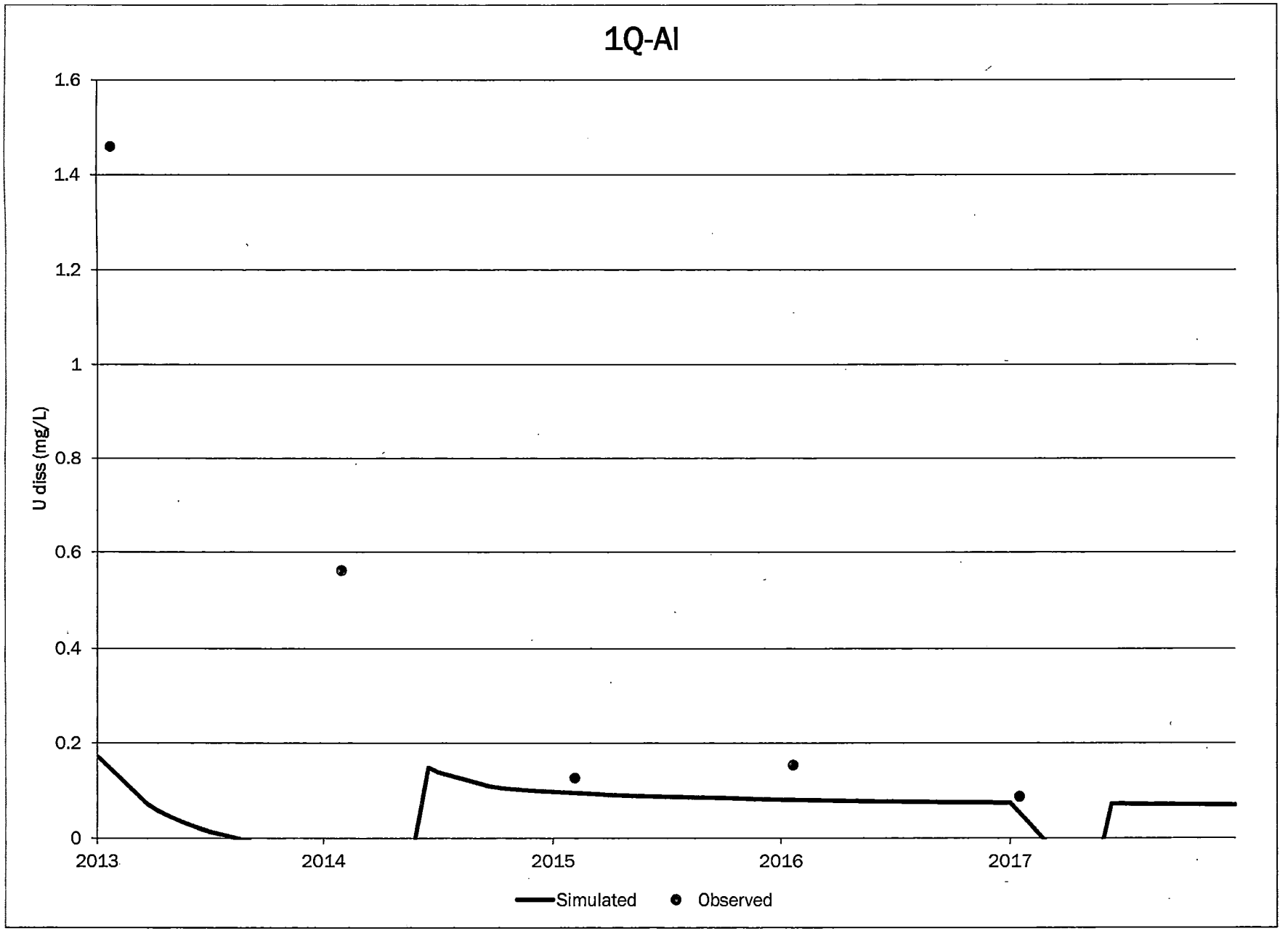

1F-AI
U diss (mg/L)
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

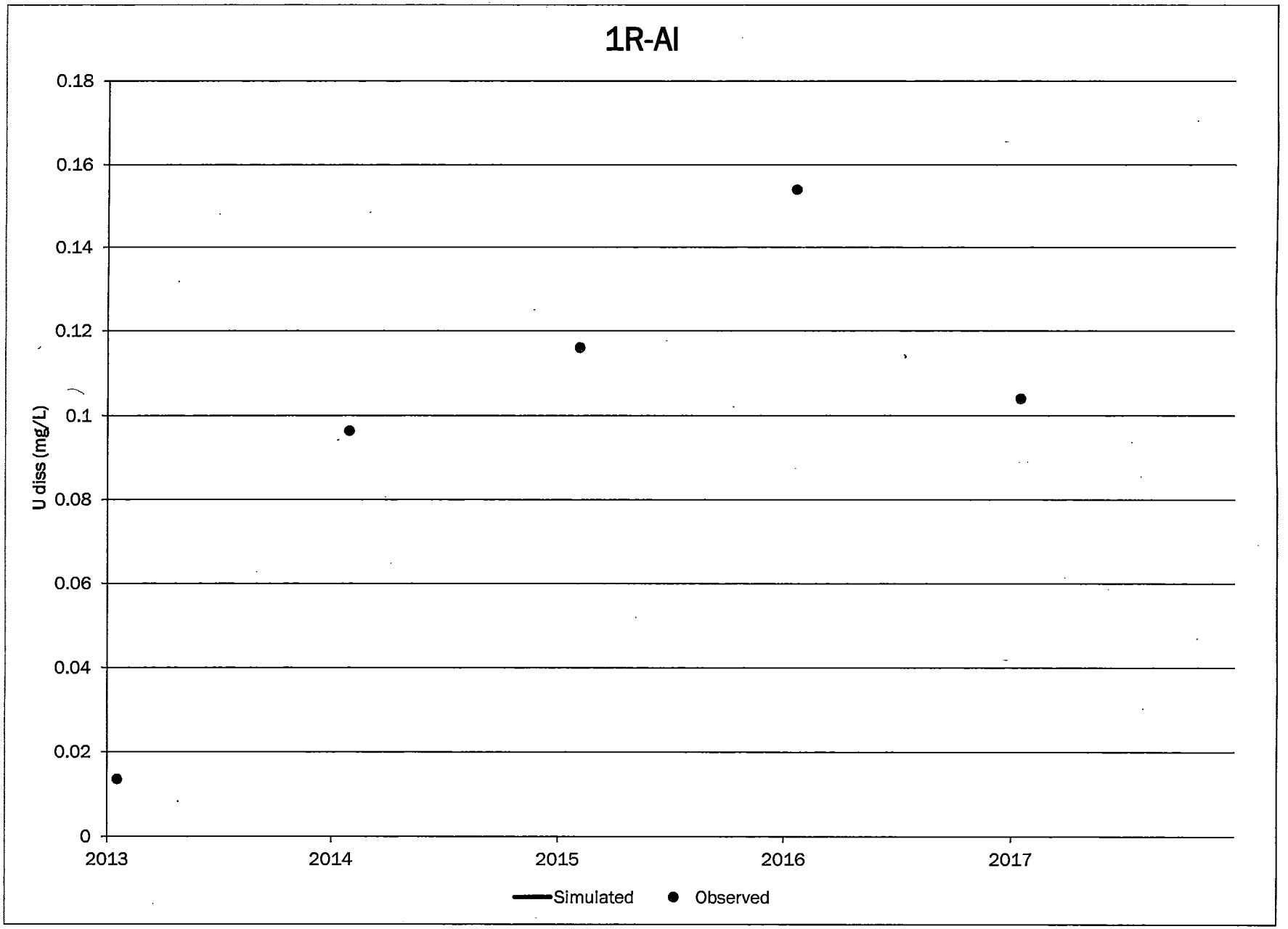

1J-AI
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

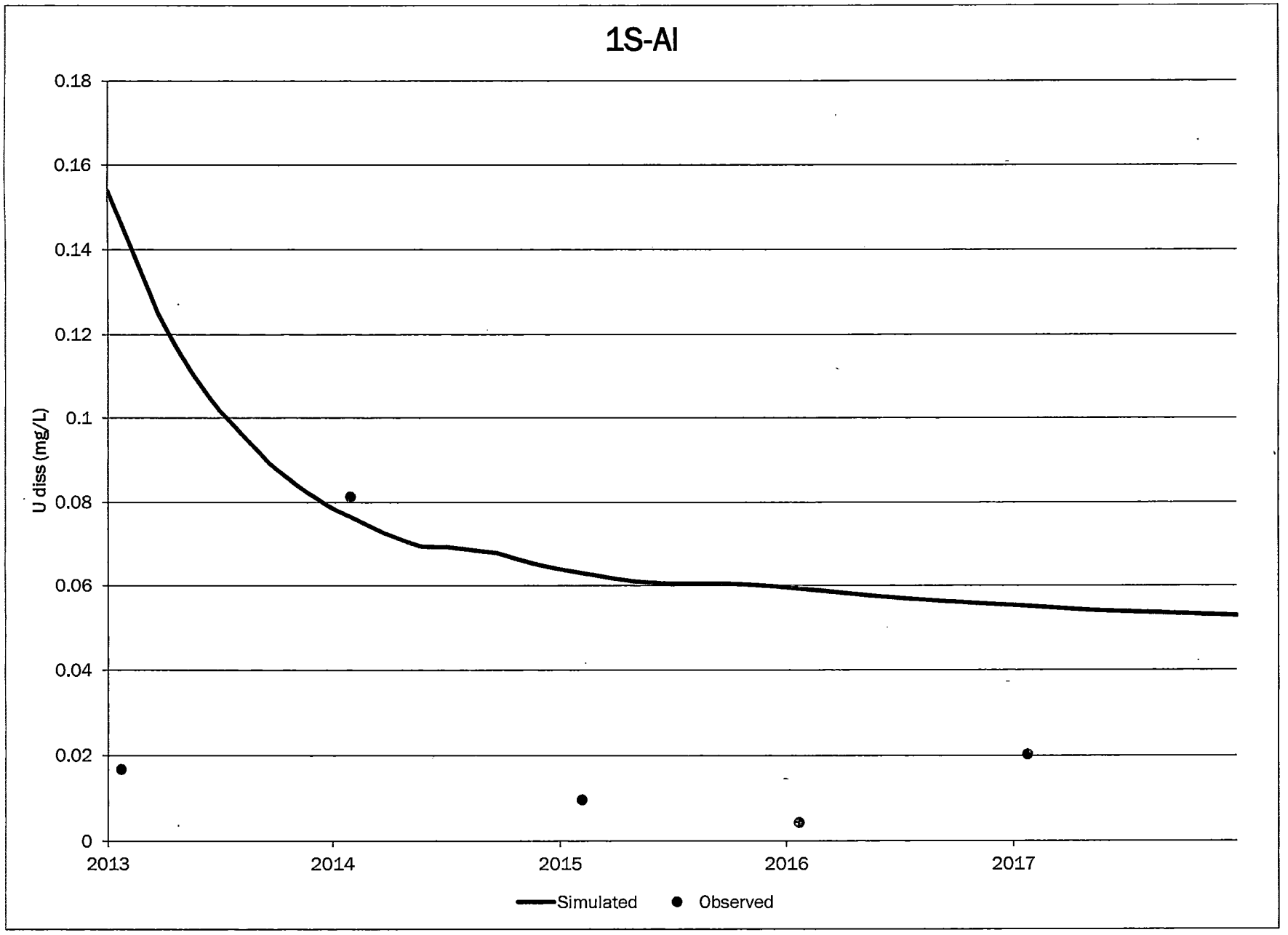

1M-AI
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

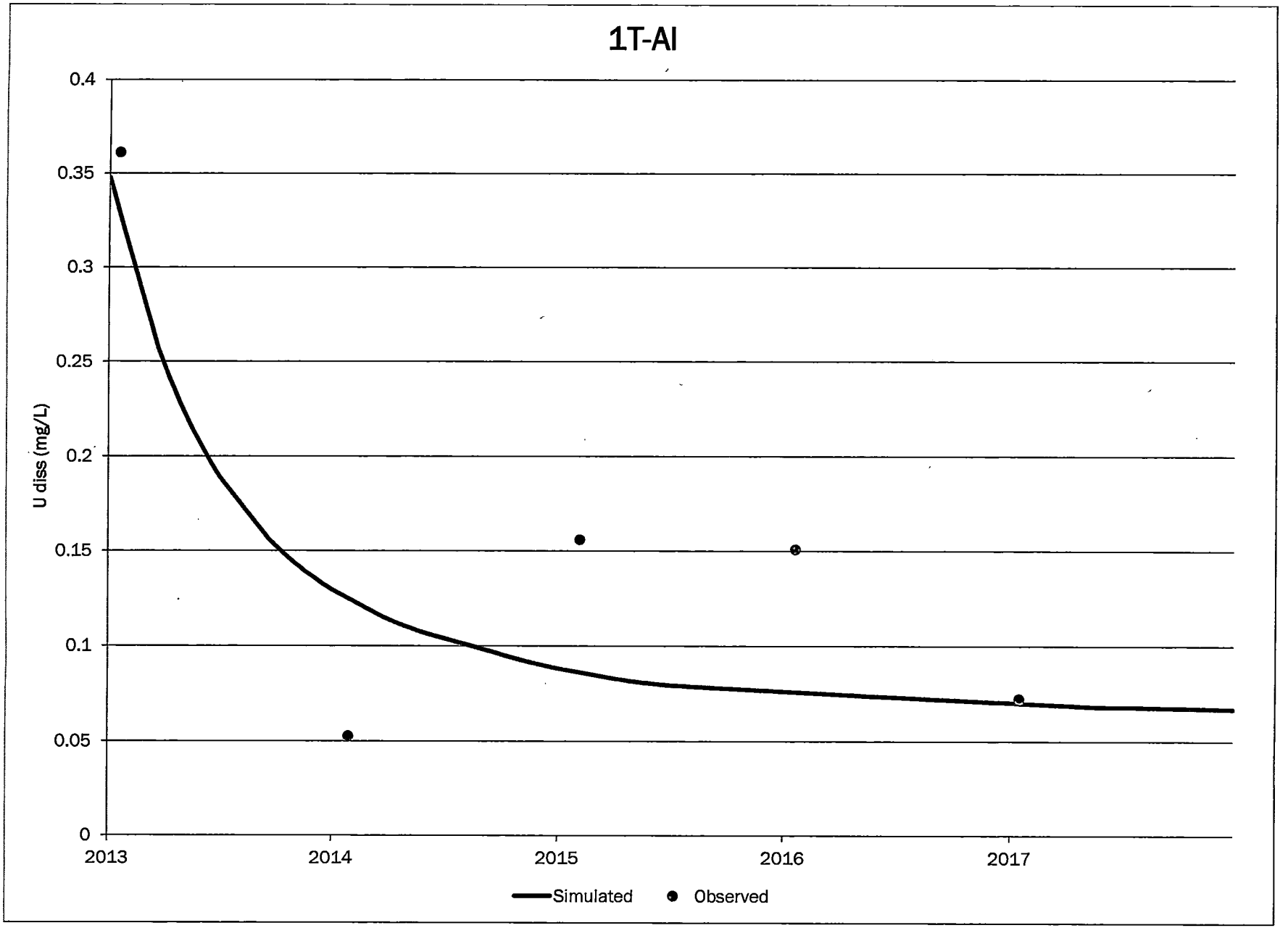

1N-AI
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

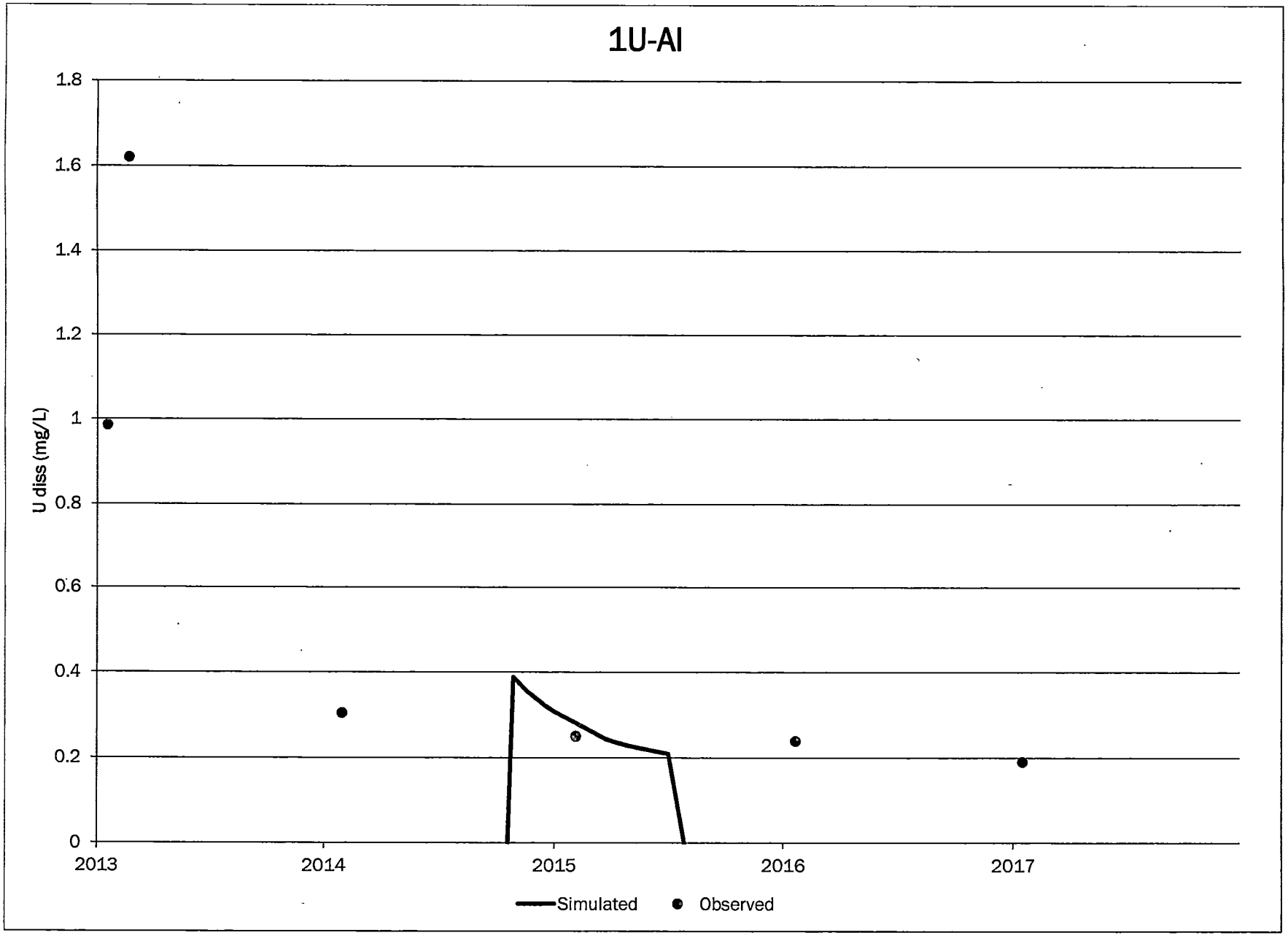

1P-AI
U diss (mg/L)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
2013
2014
2015
2016
2017
Simulated
Observed

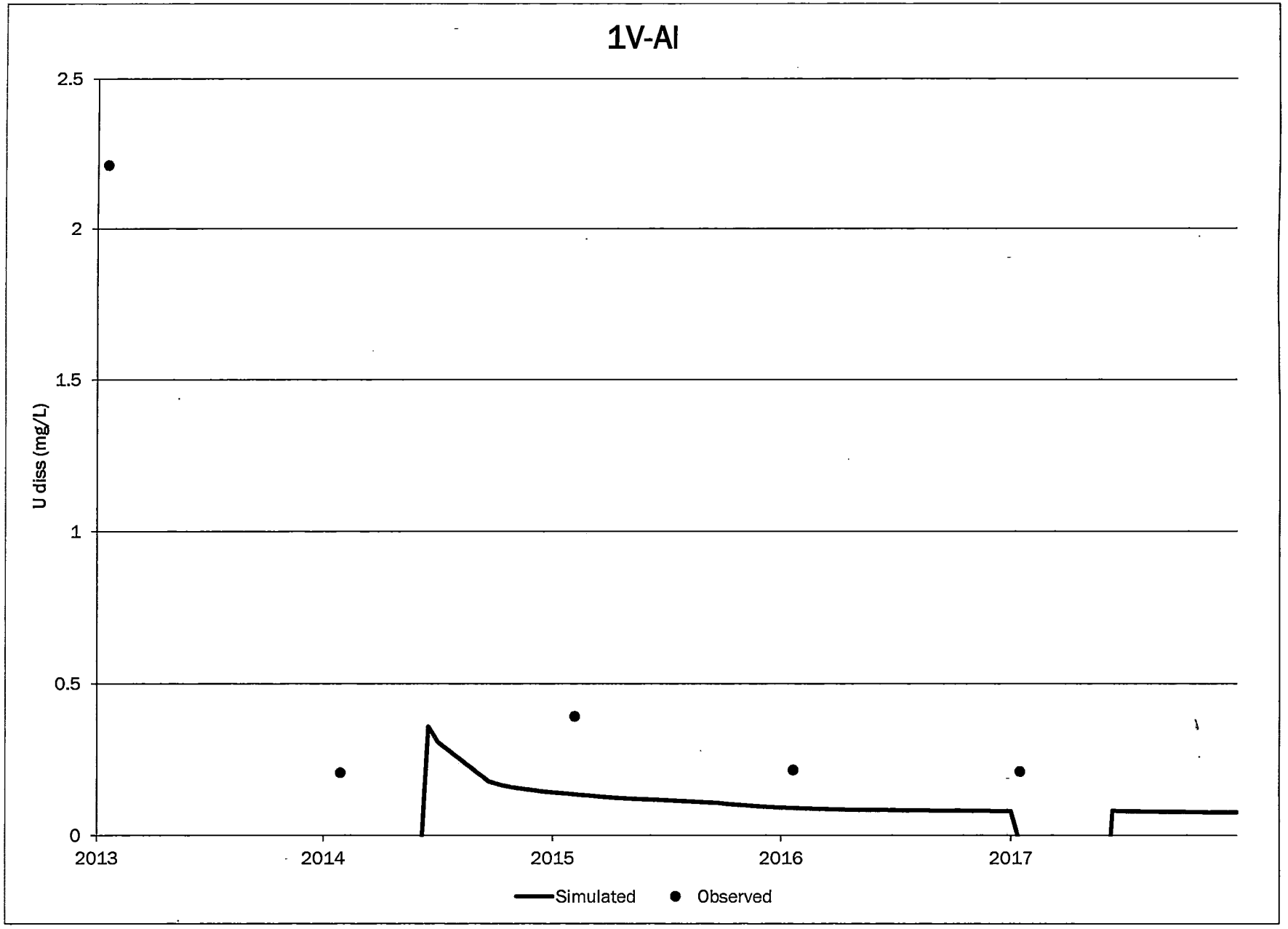

1Q-Al
U diss (mg/L)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2013
2014
2015
2016
2017
Simulated
Observed

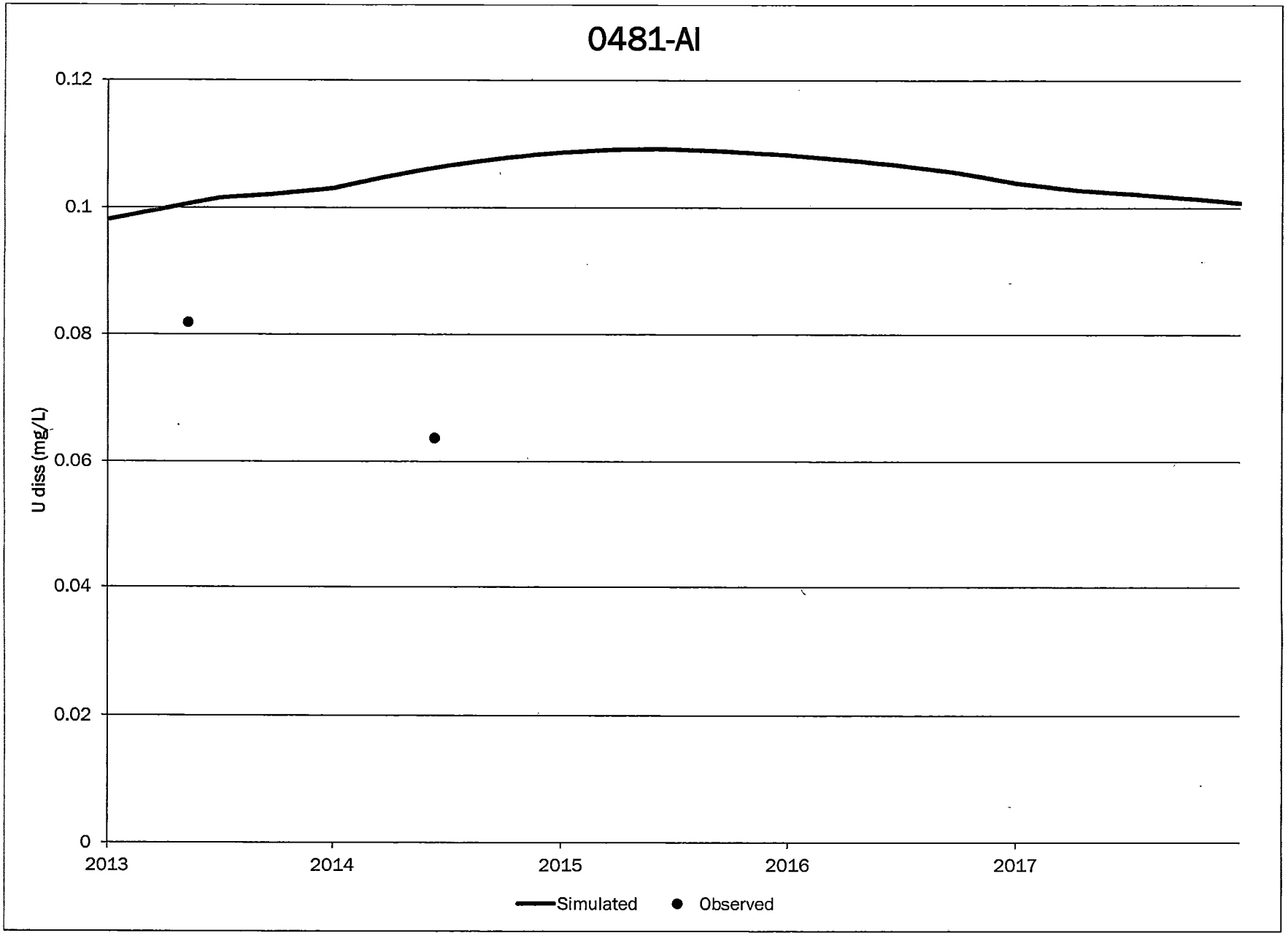

1R-AI
U diss (mg/L)
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
2013
2014
2015
2016
2017
Simulated
Observed

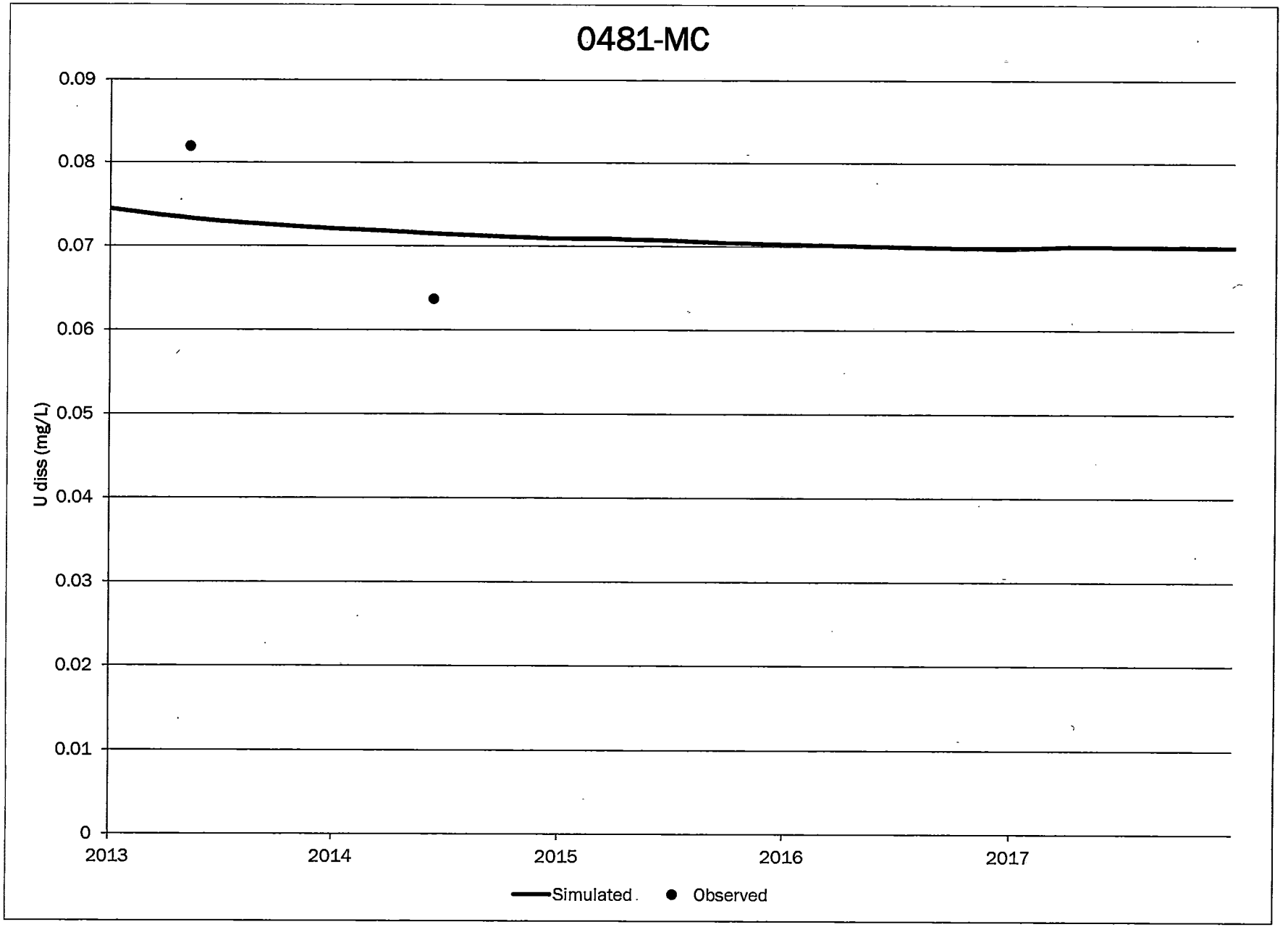

1S-AI
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

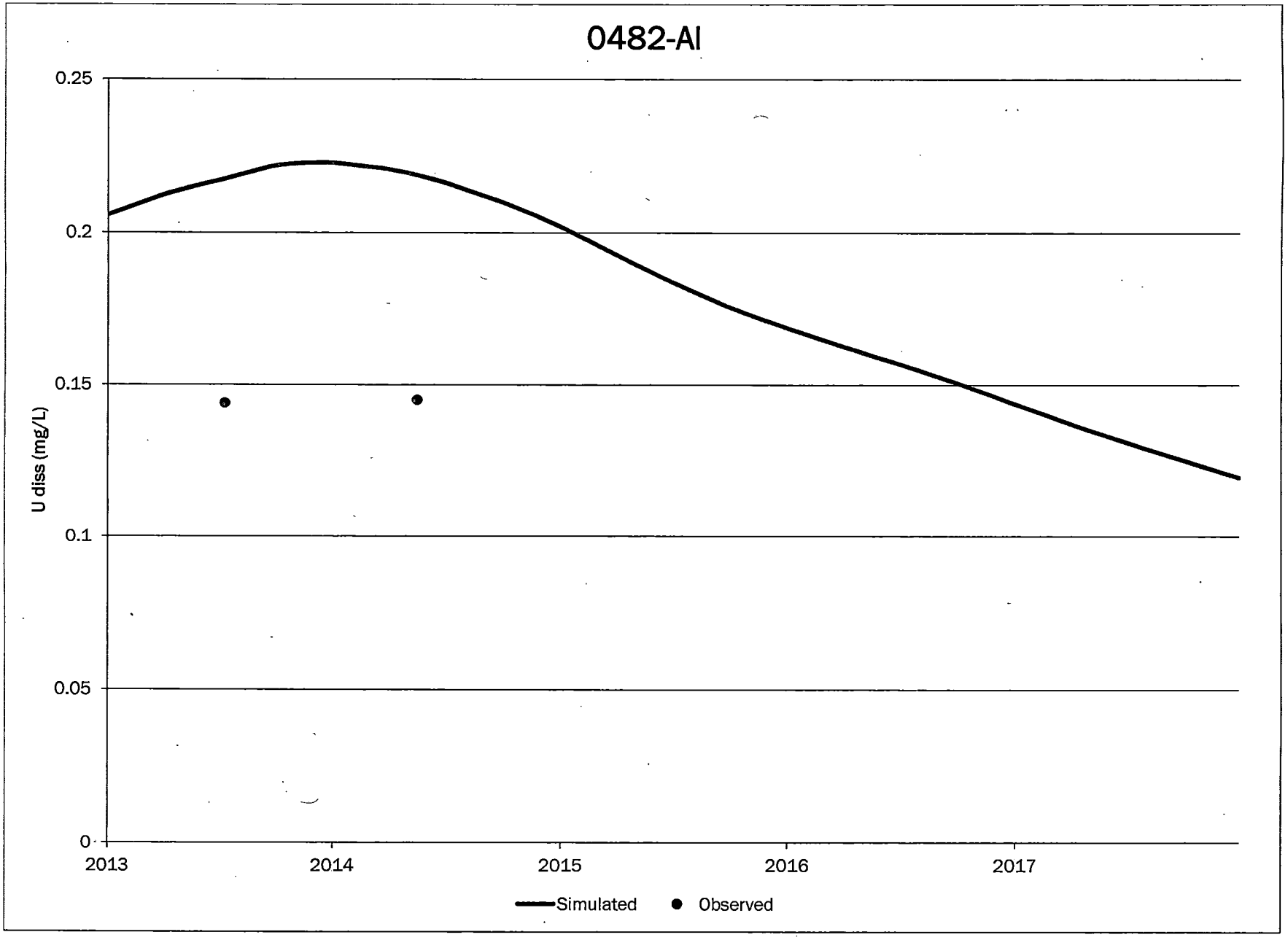

1T-AI
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

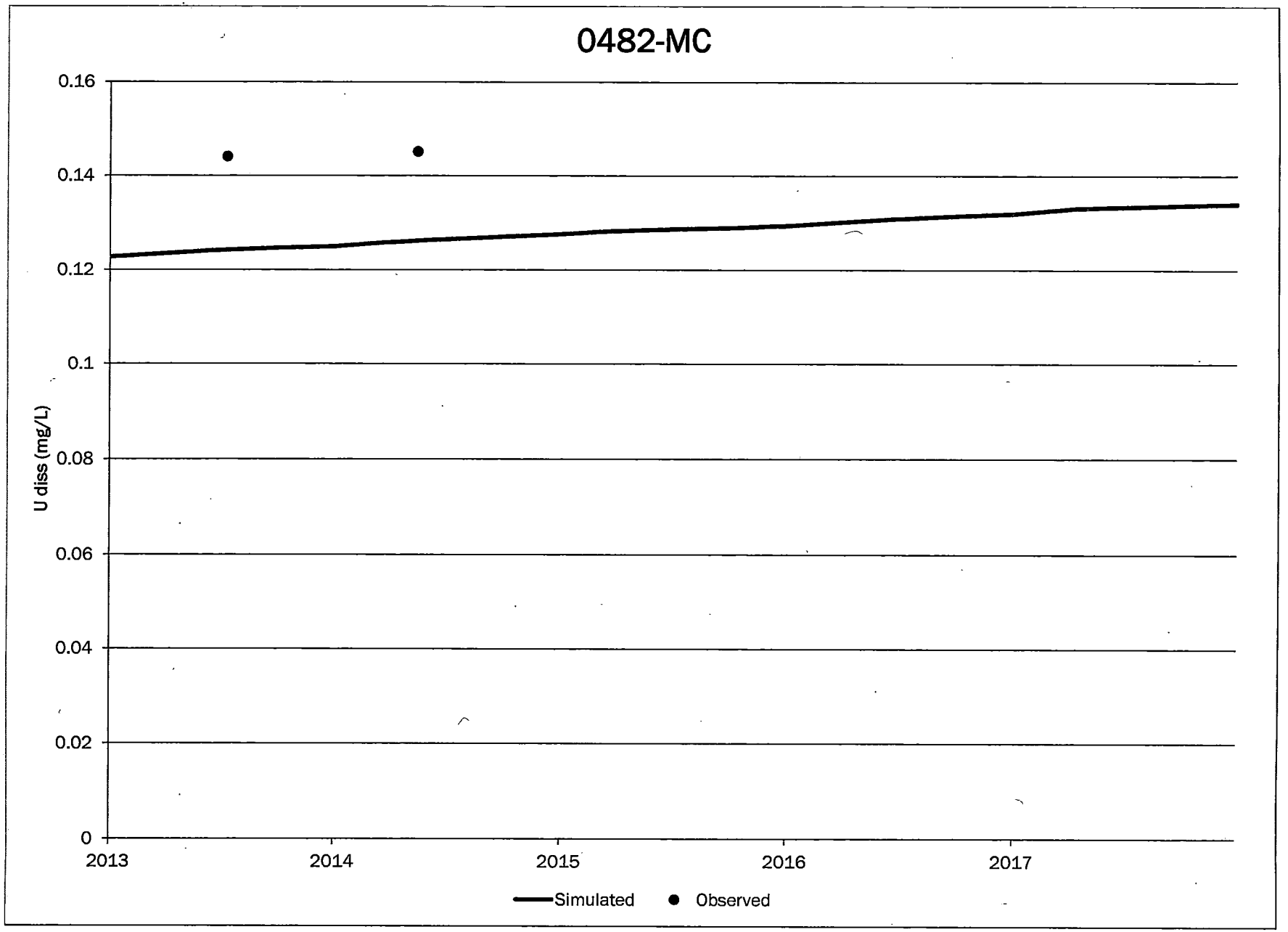

1U-AI
U diss (mg/L)
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2013
2014
2015
2016
2017
Simulated
Observed

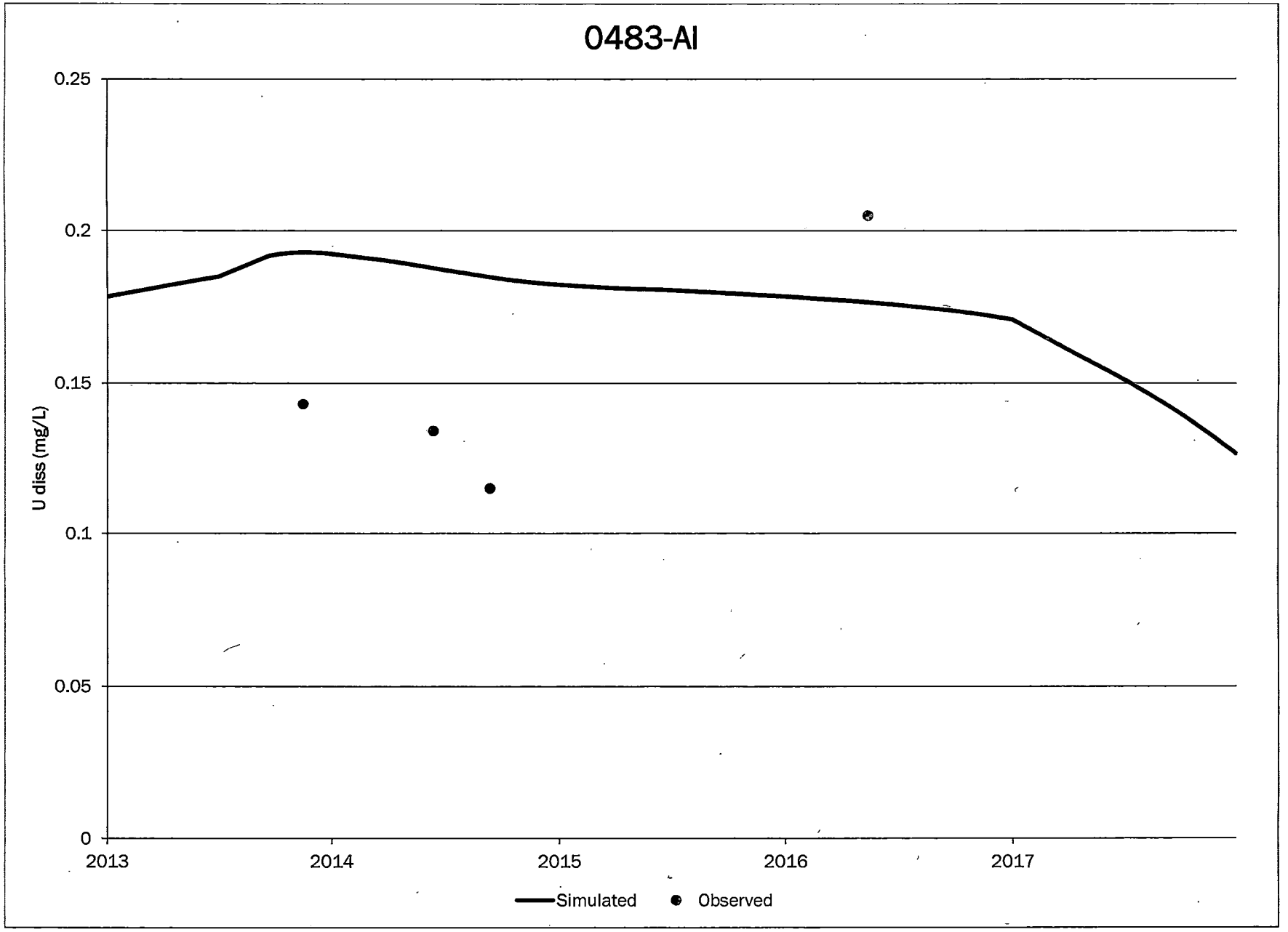

1V-AI
2.5
2
1.5
1
0.5
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

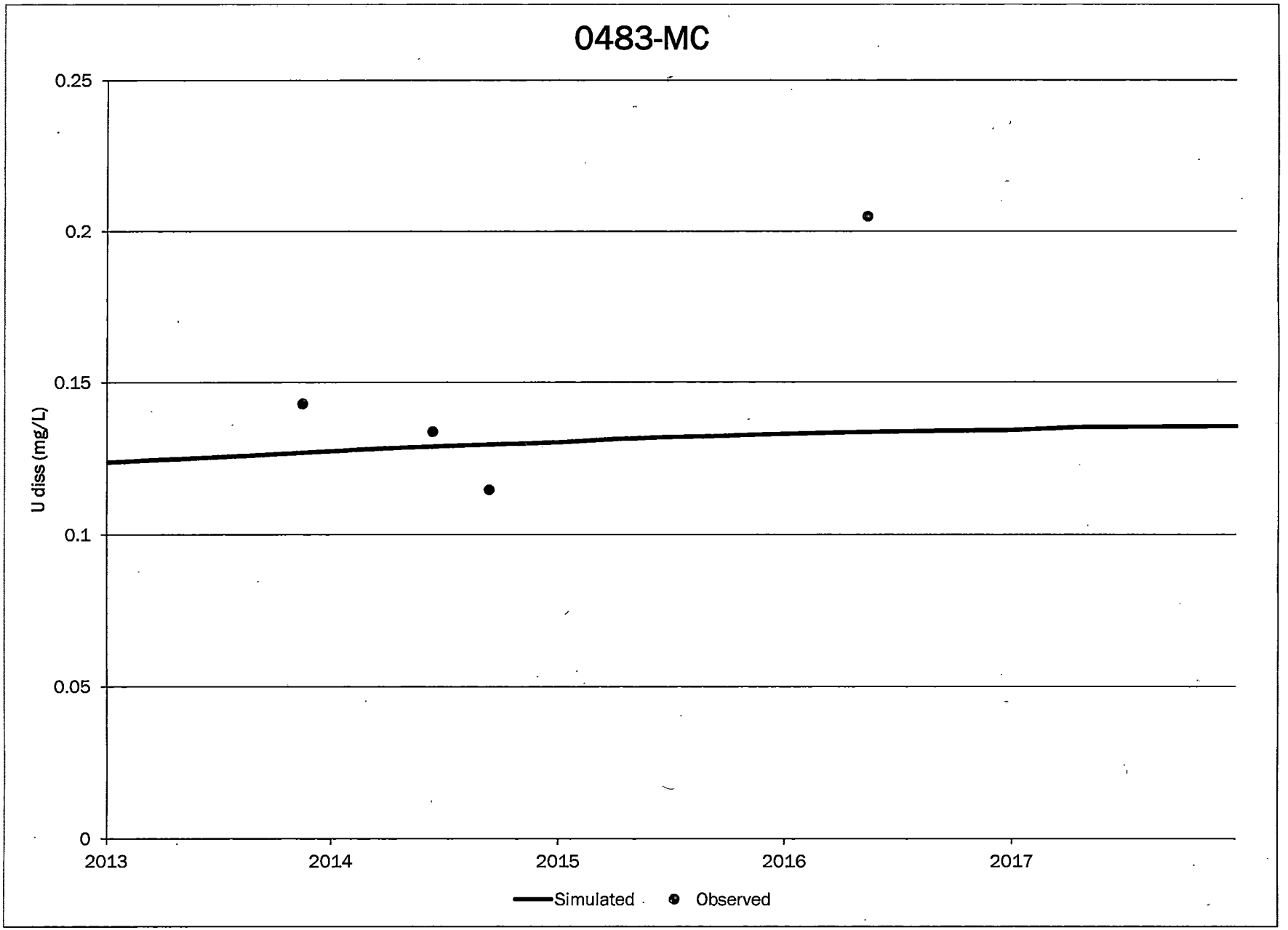

0481-AI
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

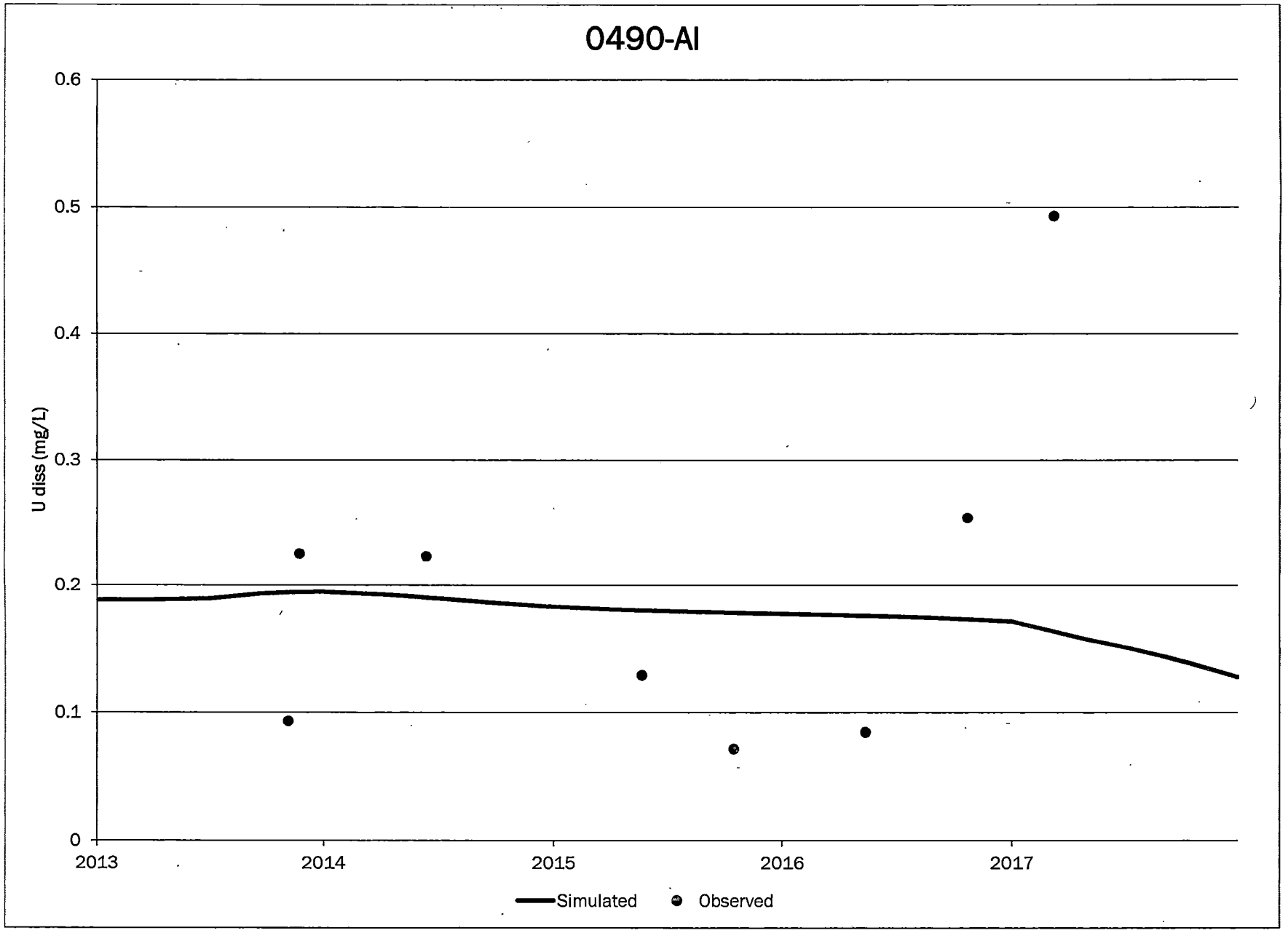

0481-MC
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

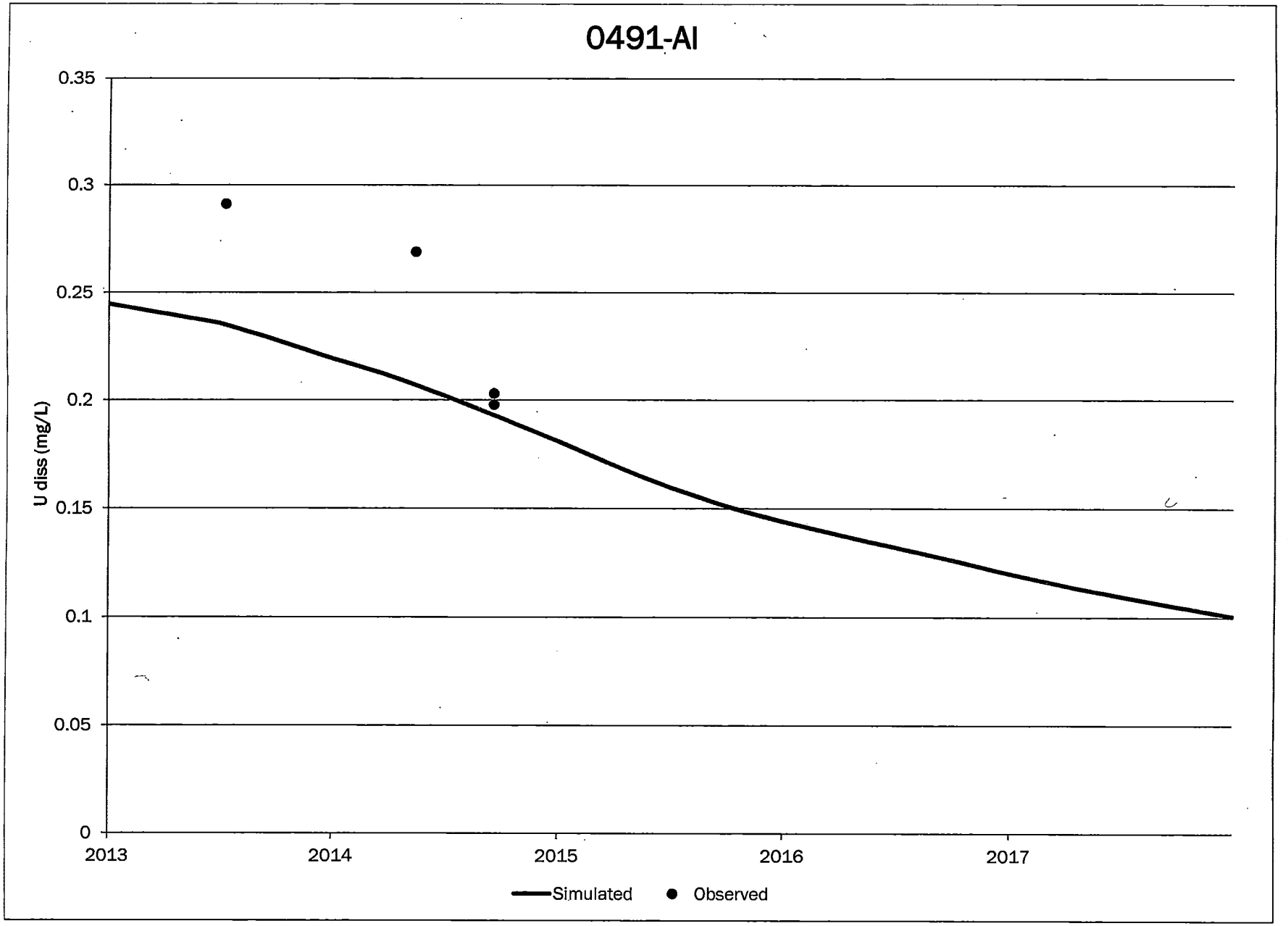

0482-AI
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

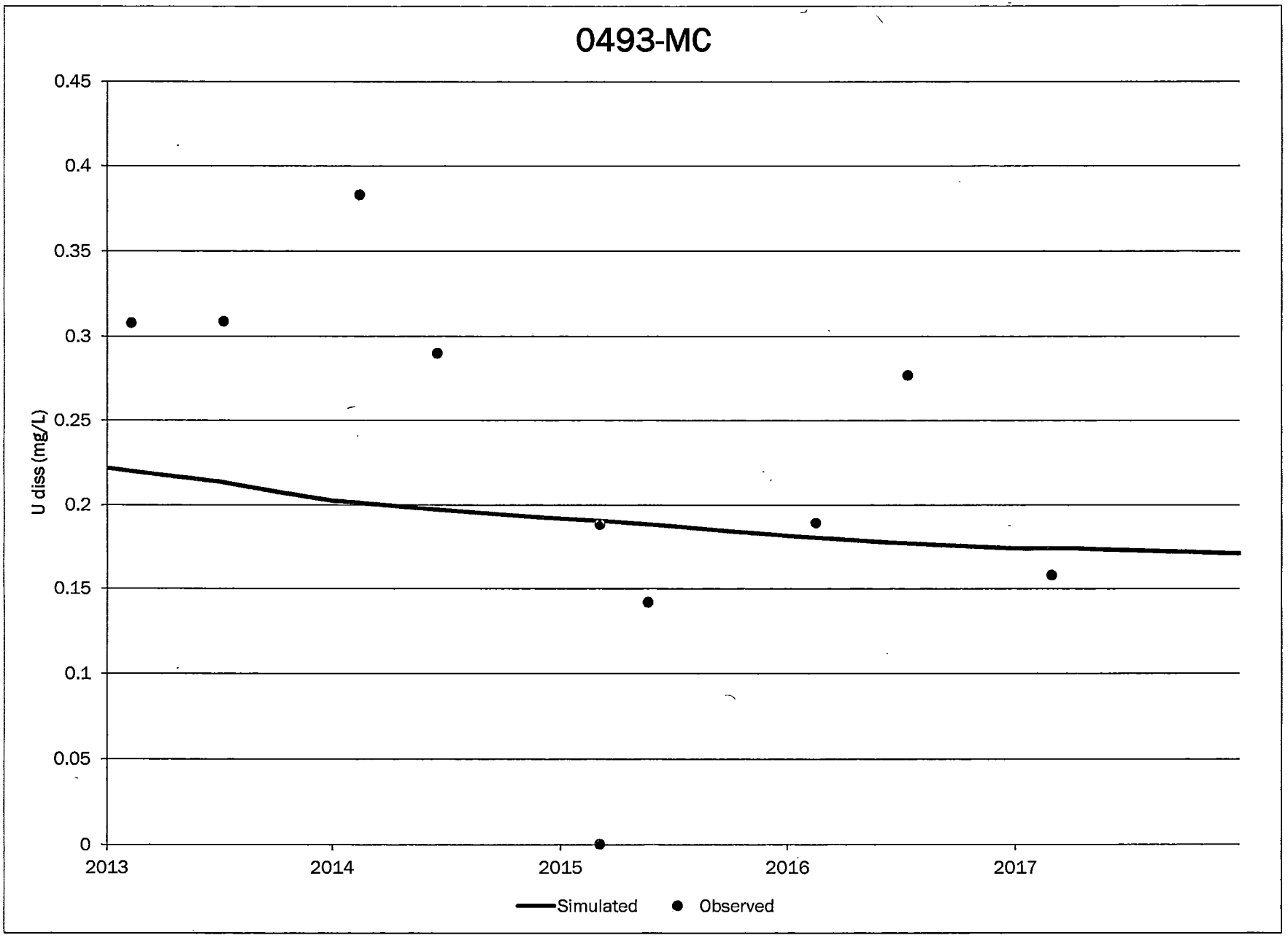

0482-MC
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

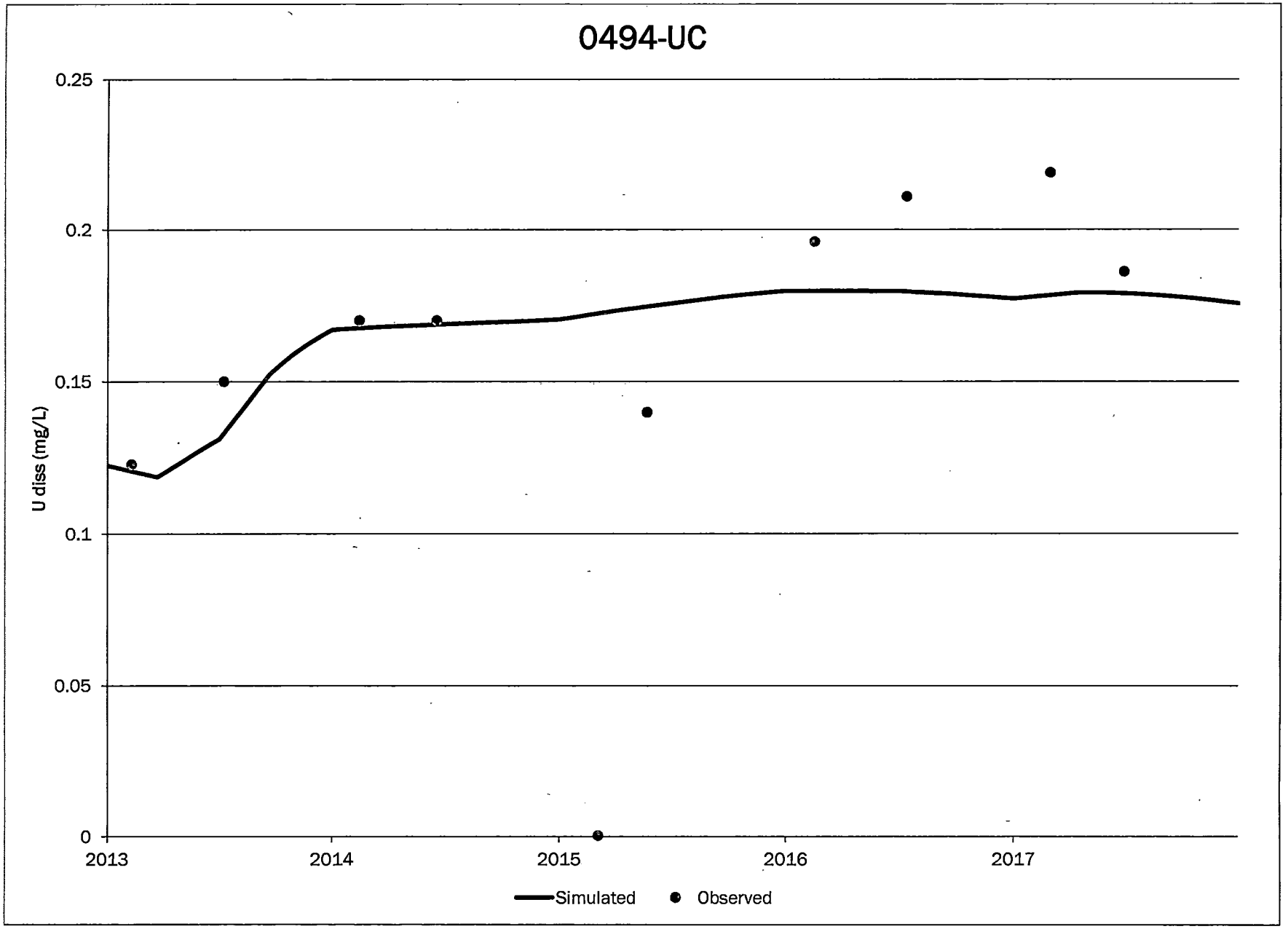

0483-AI
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

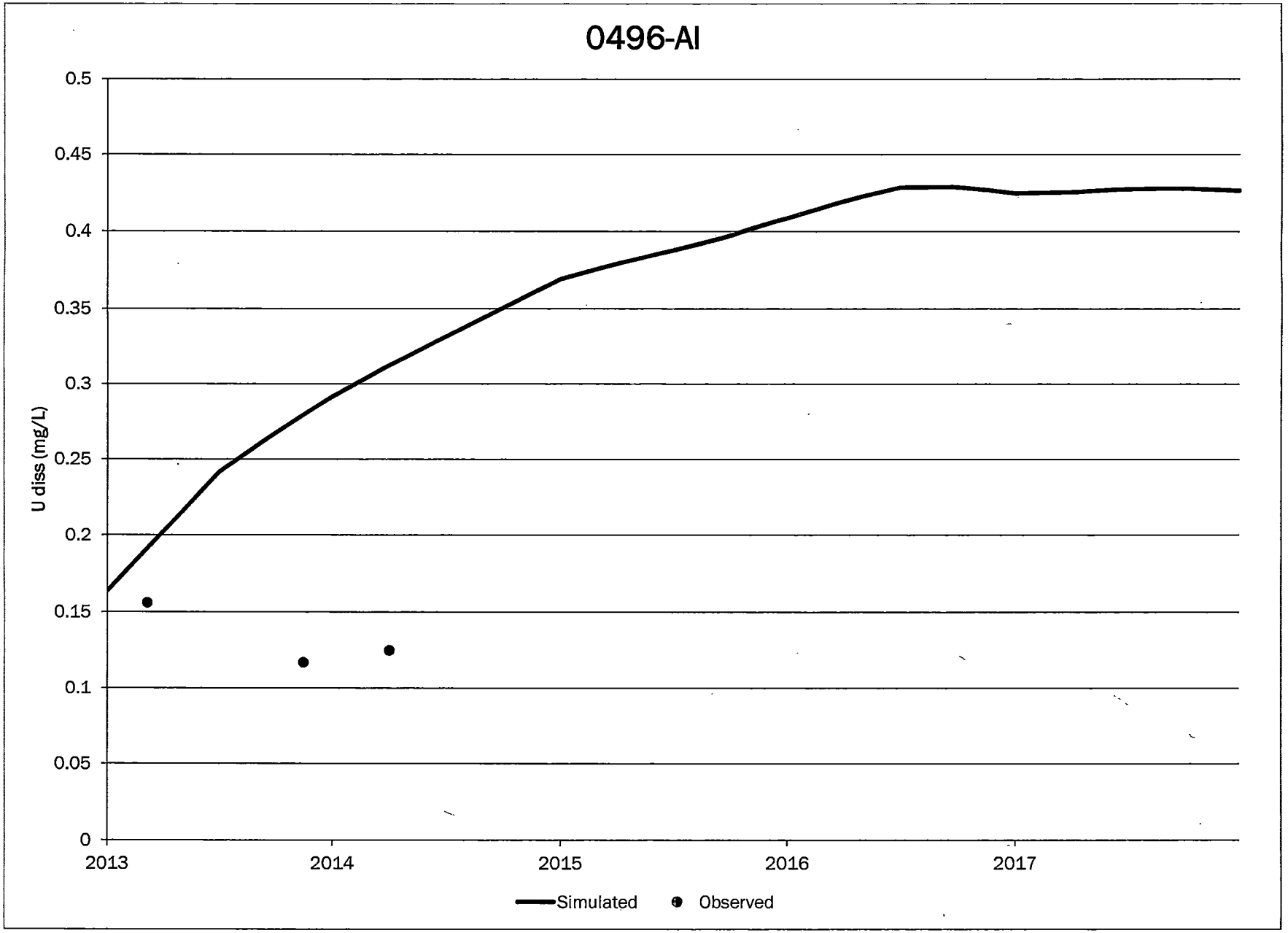

0483-MC
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

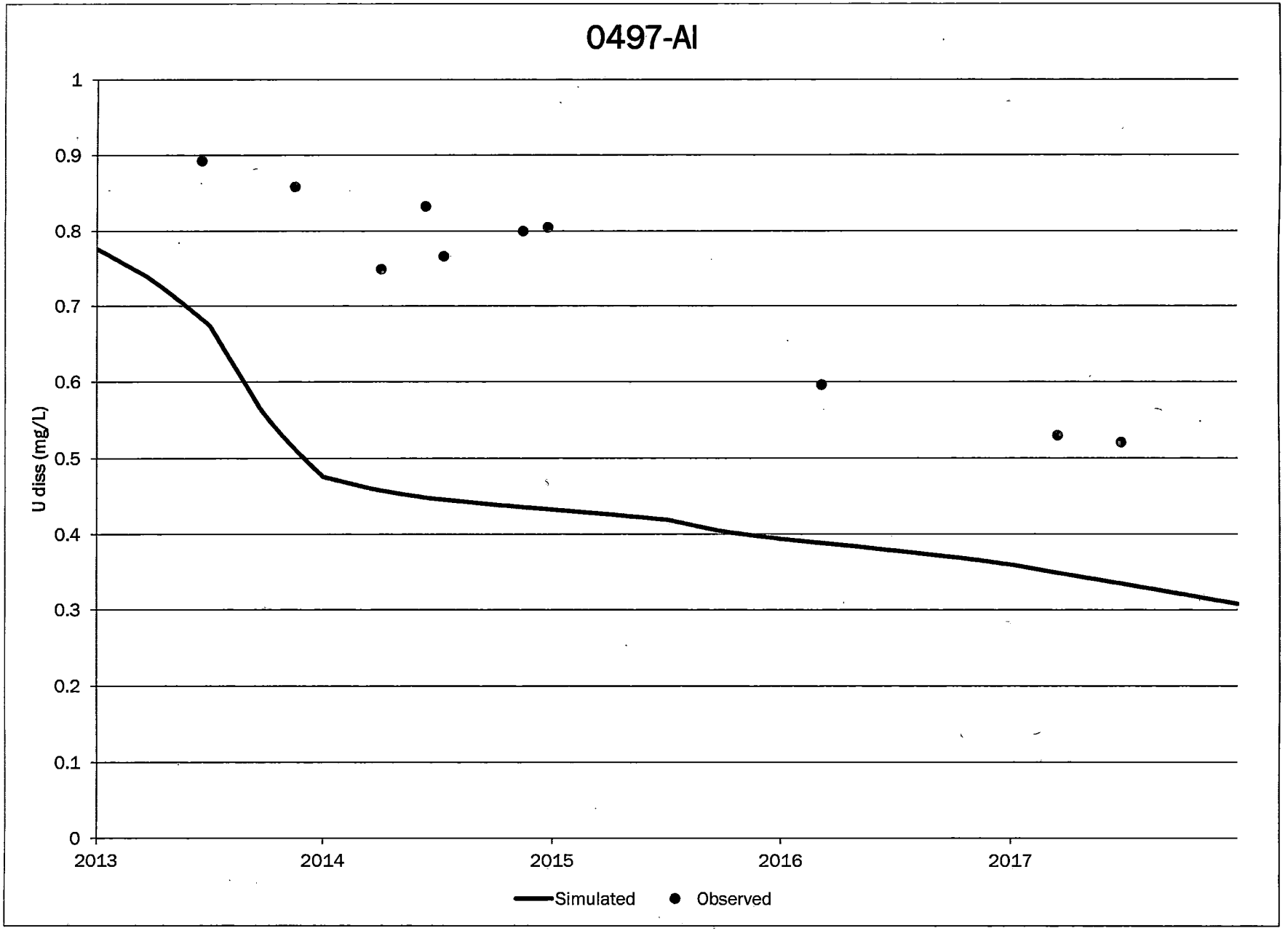

0490-AI
U diss (mg/L)
0.6
0.5
0.4
0.3
0.2
0.1
0
2013
2014
2015
2016
2017
Simulated
Observed

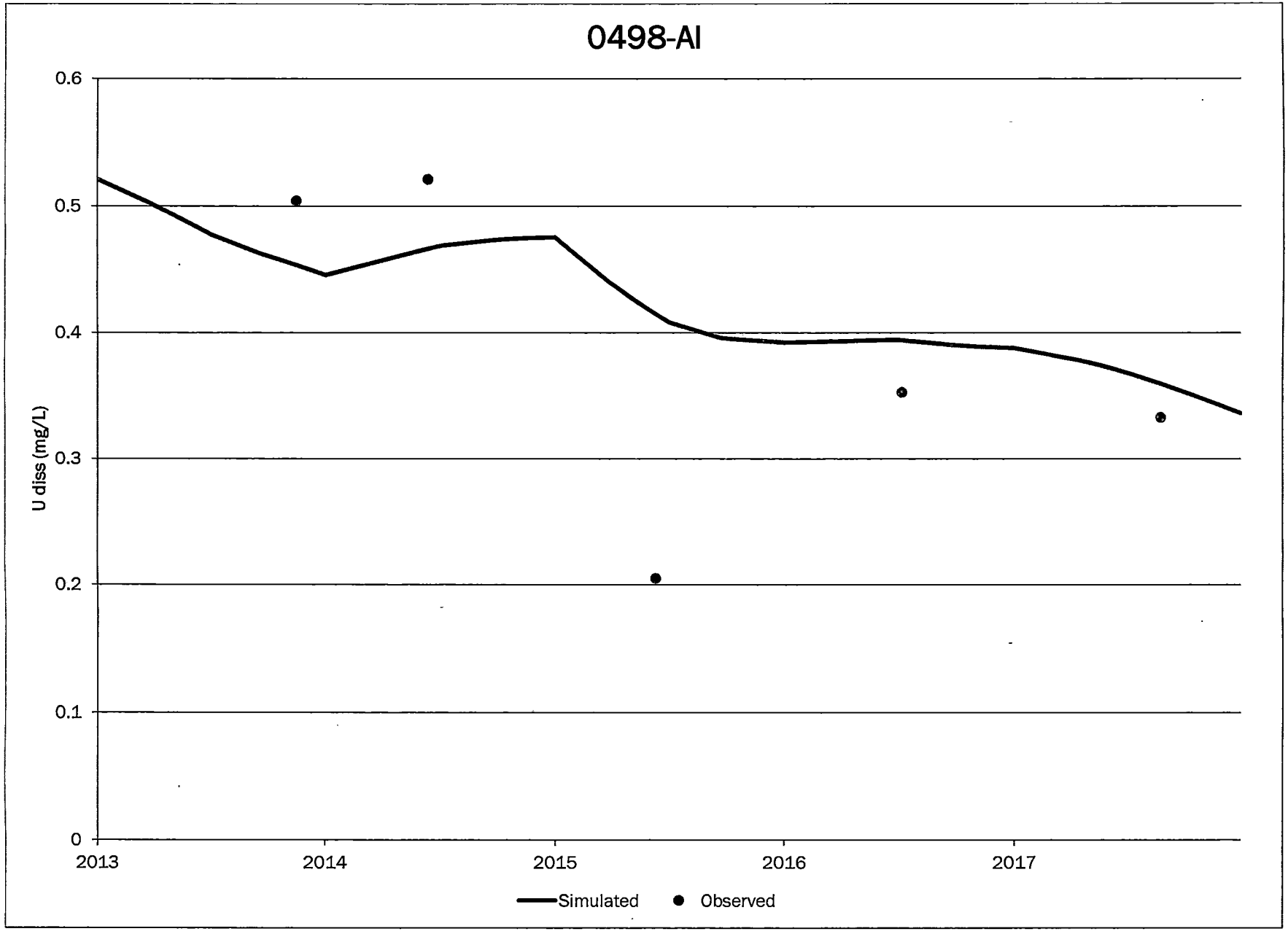

0491-AI
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

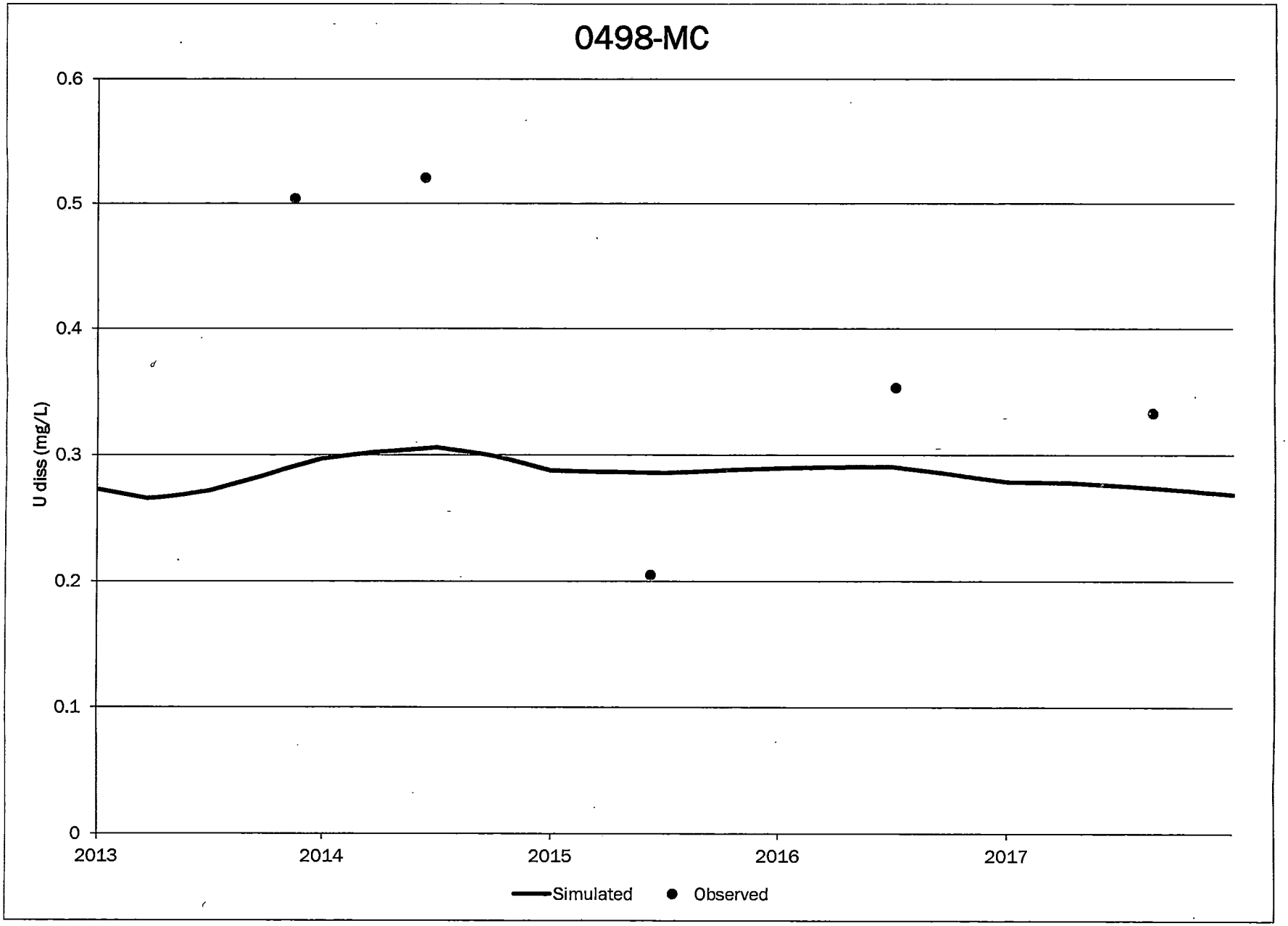

0493-MC
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

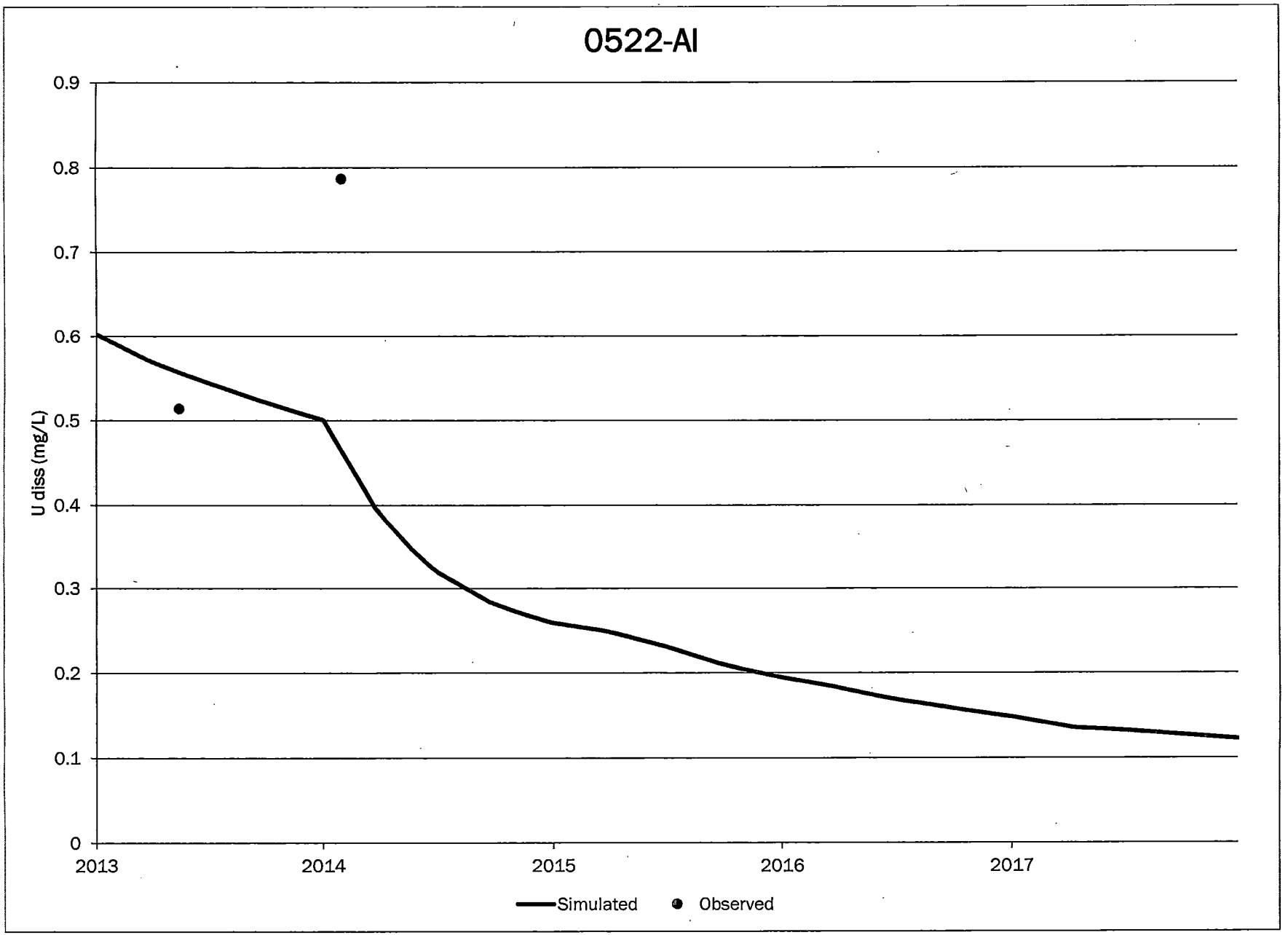

0494-UC
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

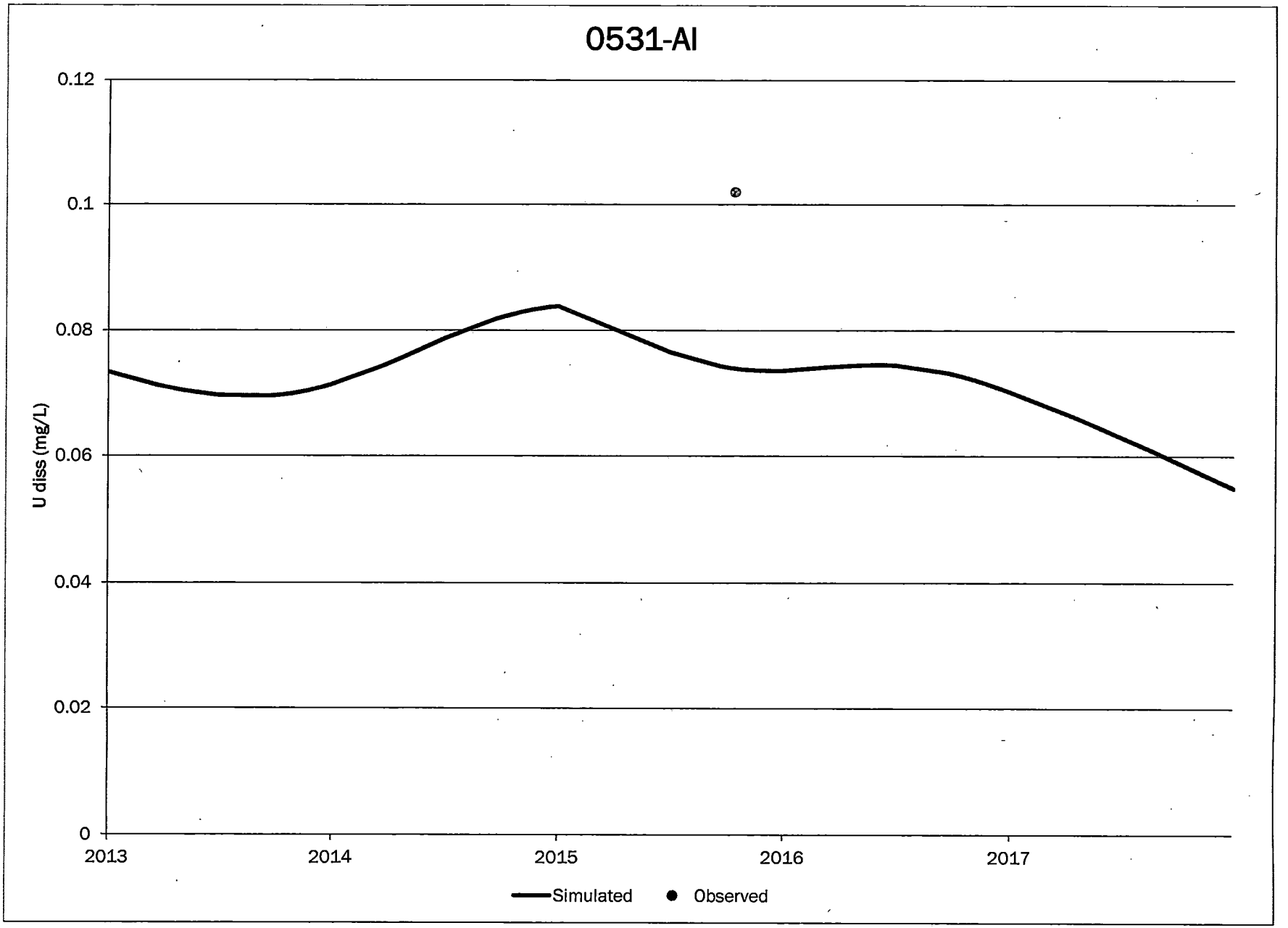

0496-AI
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

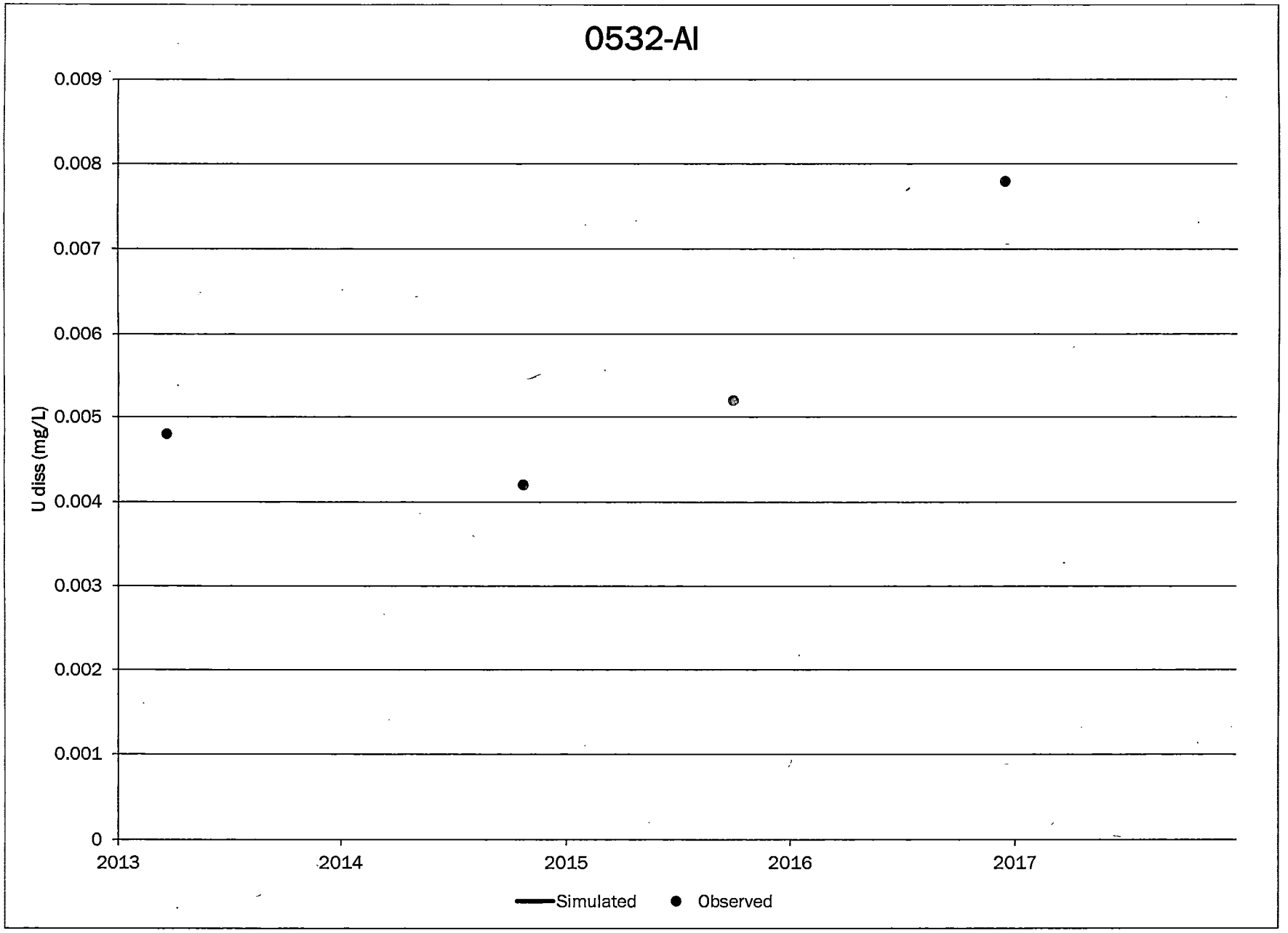

0497-AI
U diss (mg/L)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
2013
2014
2015
2016
2017
Simulated
Observed

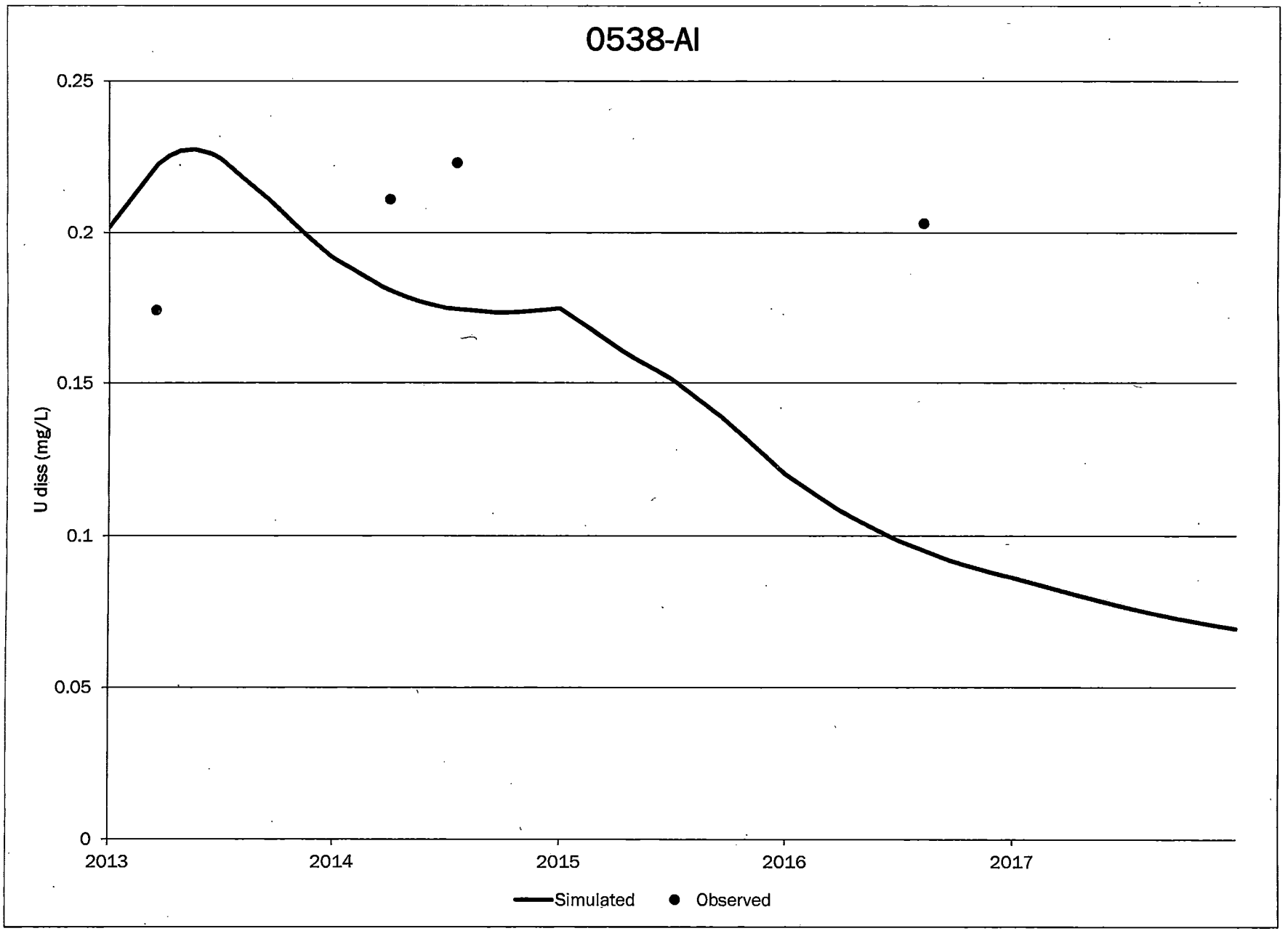

0498-AI
0.6
0.5
0.4
0.3
0.2
0.1
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

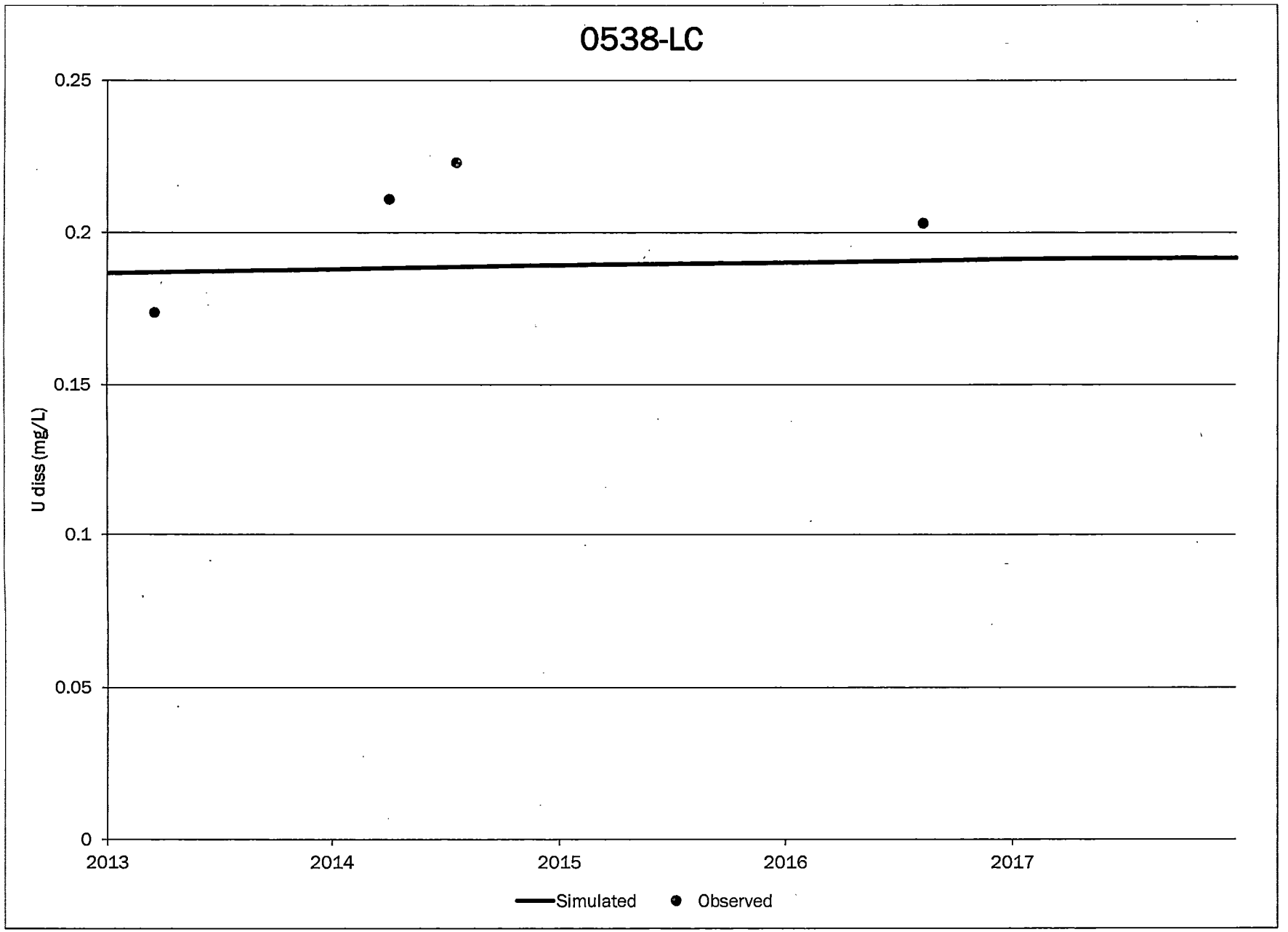

0498-MC
0.6
0.5
0.4
0.3
0.2
0.1
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

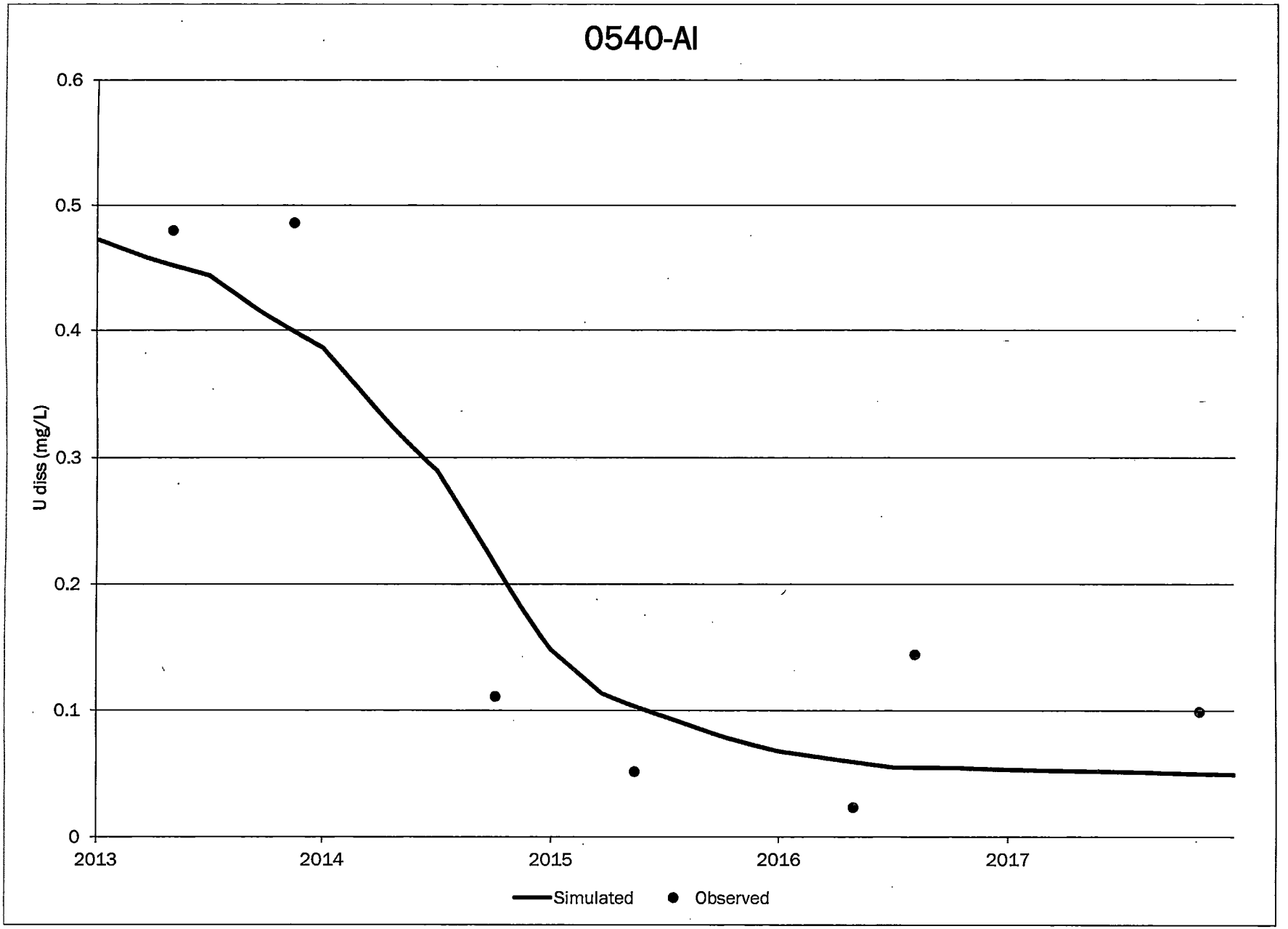

0522-AI
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

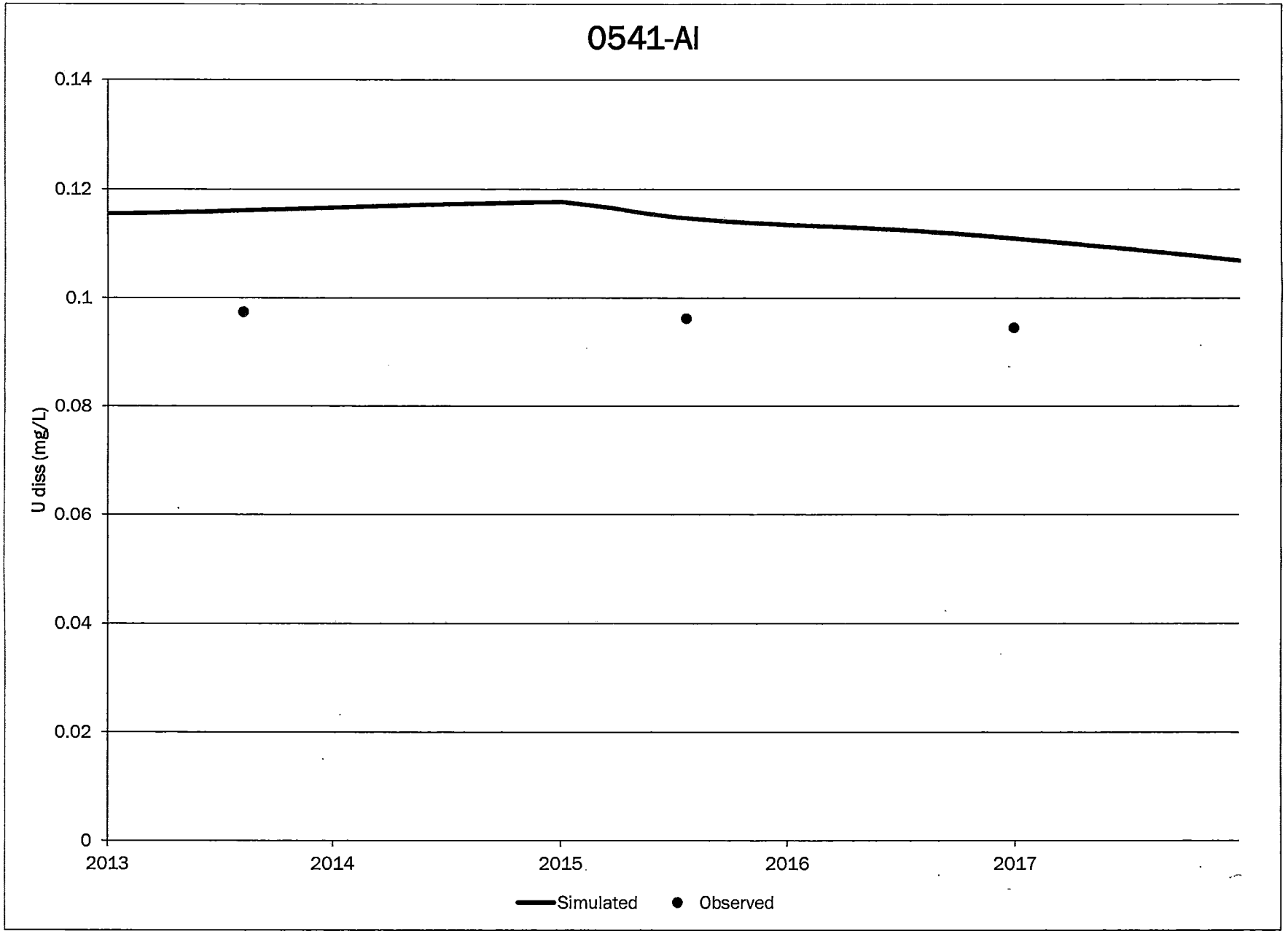

0531-AI
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

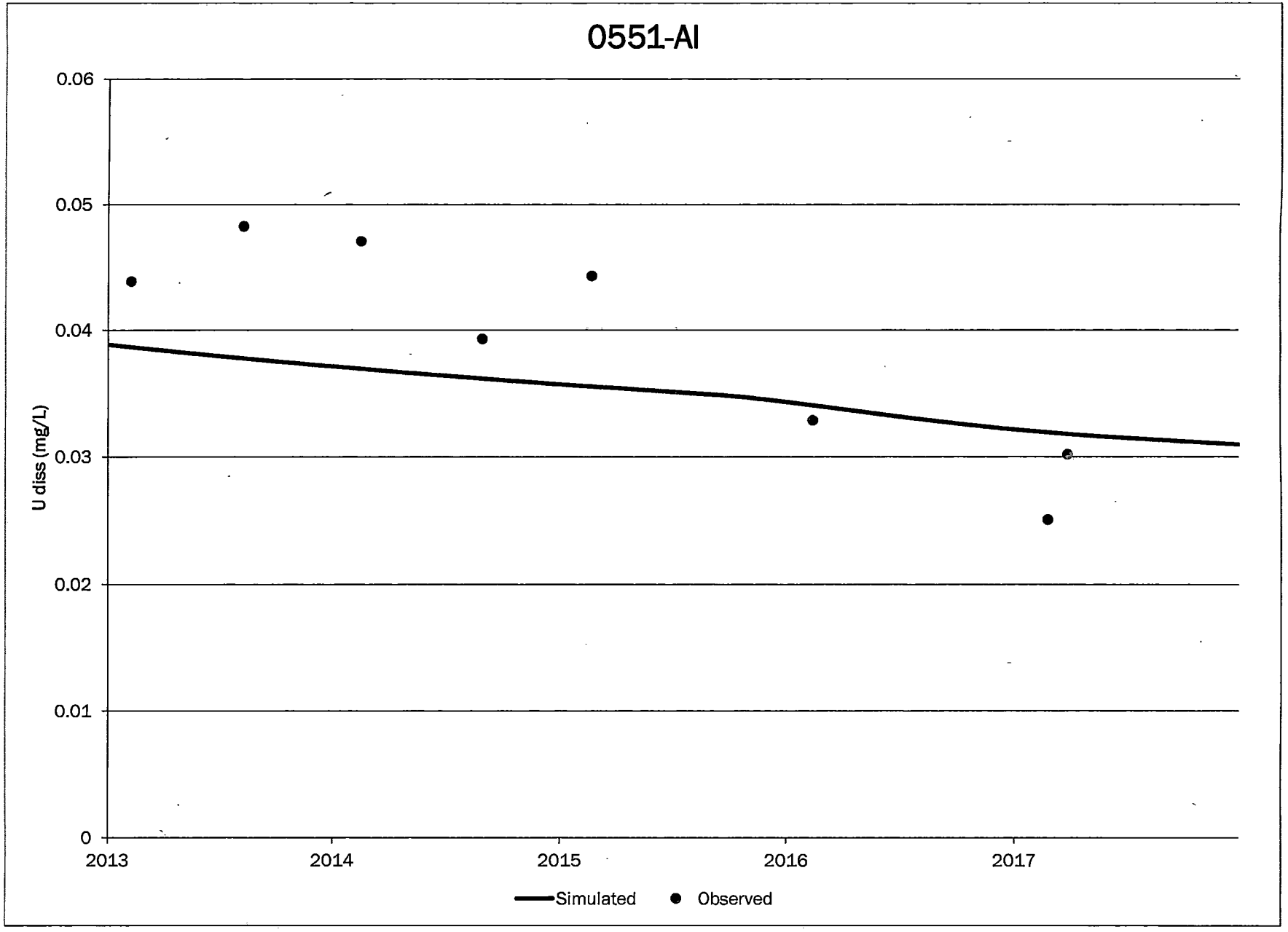

0532-AI
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

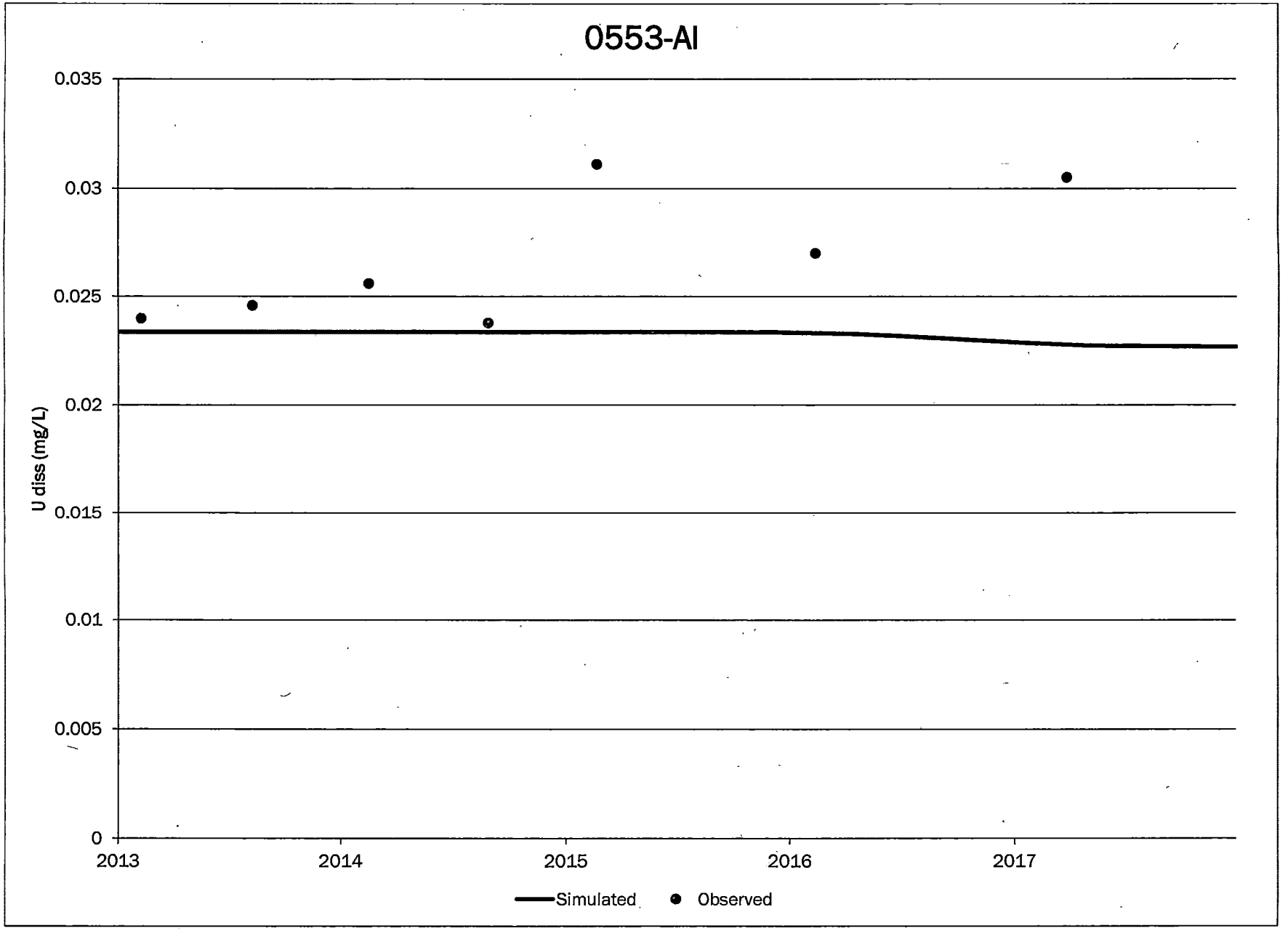

0538-AI
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

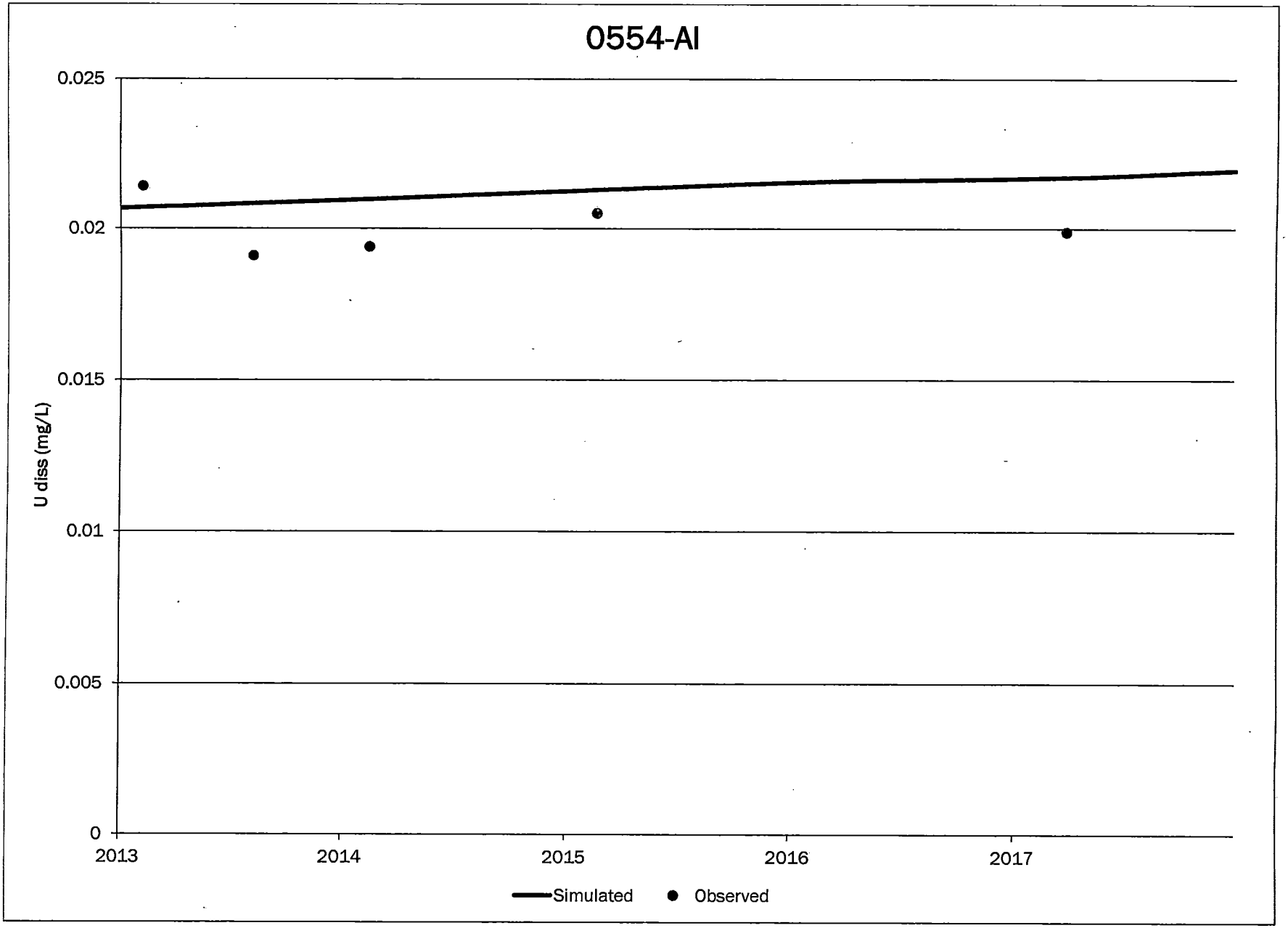

0538-LC
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

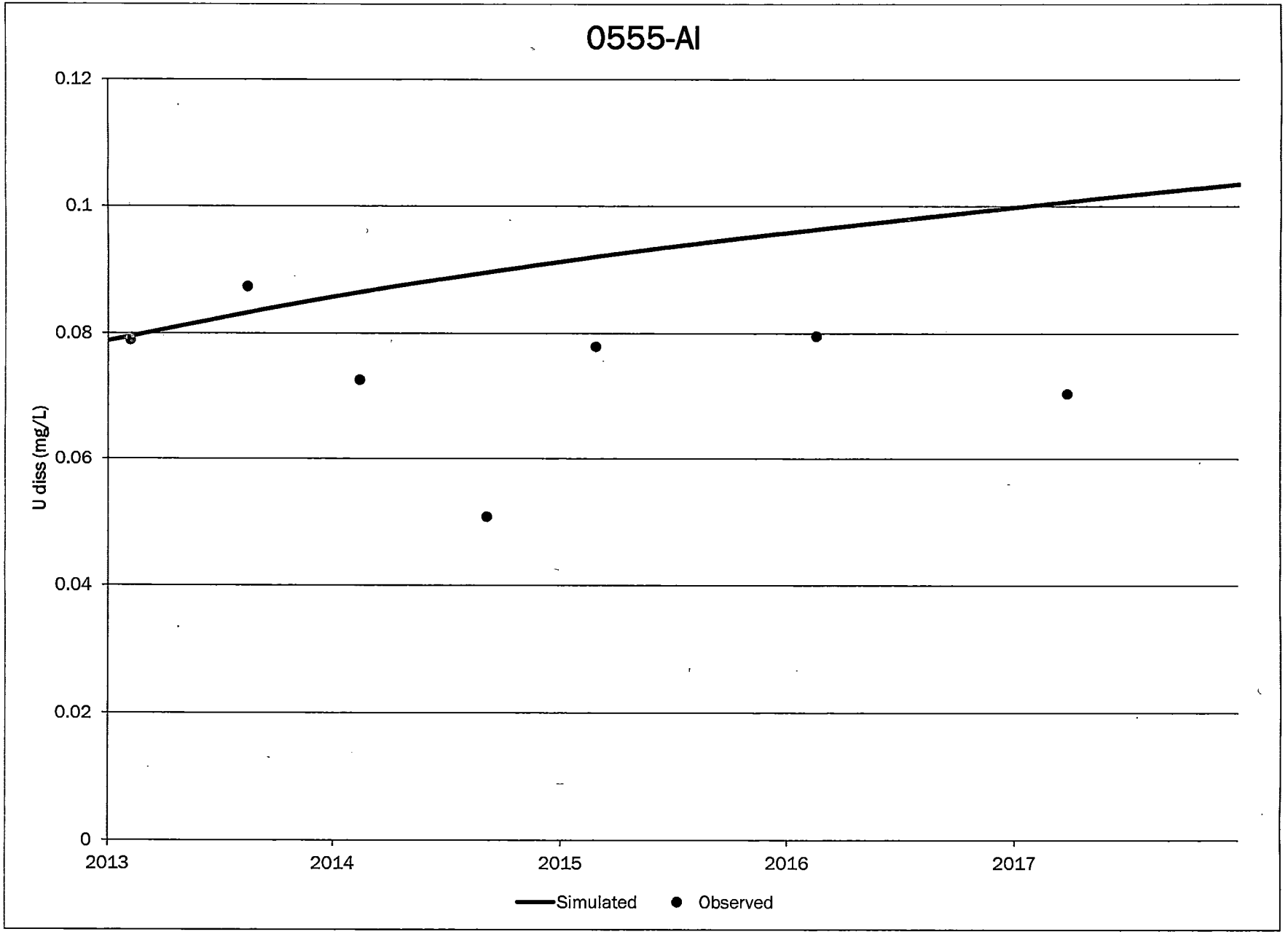

0540-AI
0.6
0.5
0.4
0.3
0.2
0.1
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

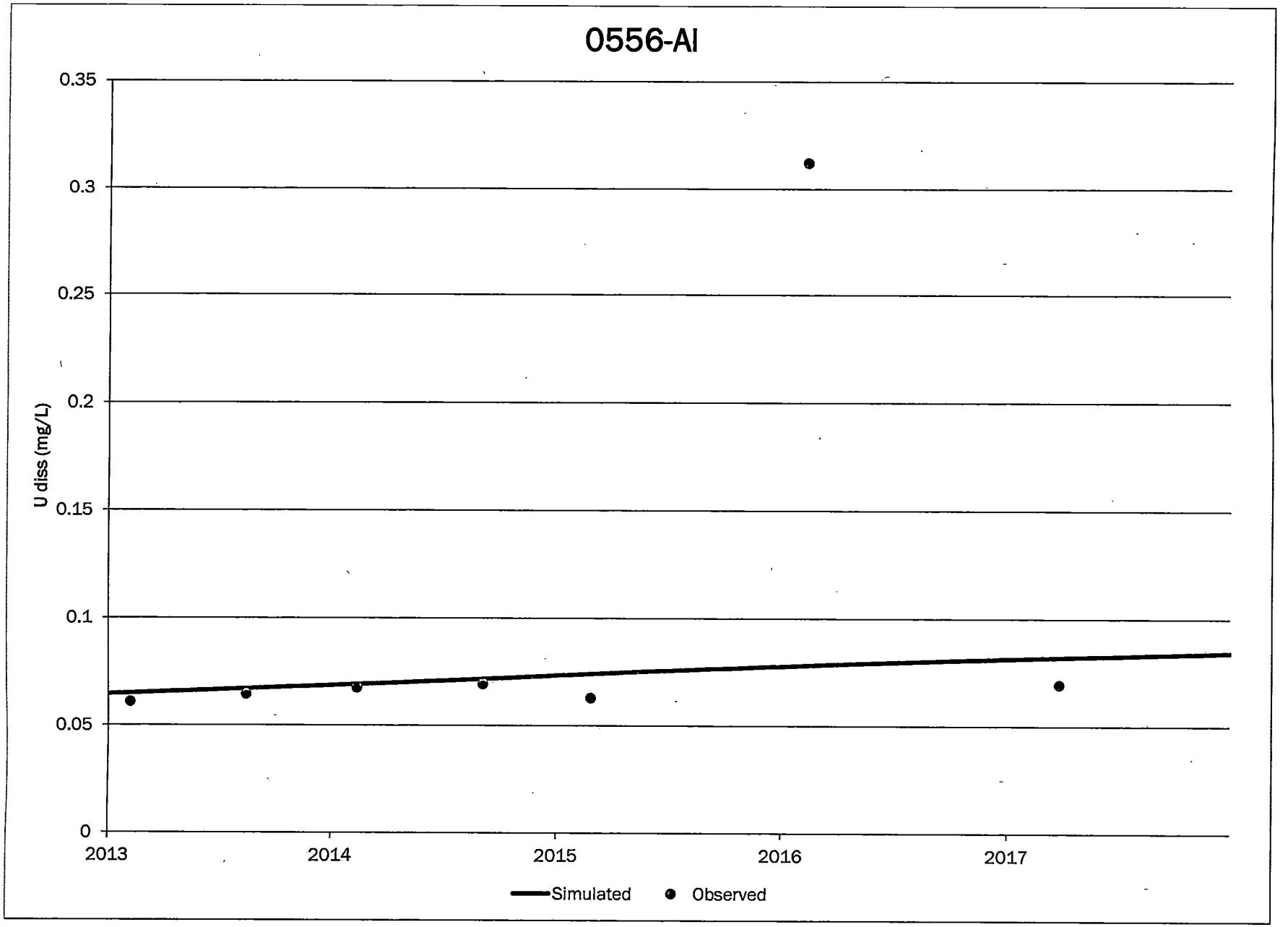

0541-AI
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

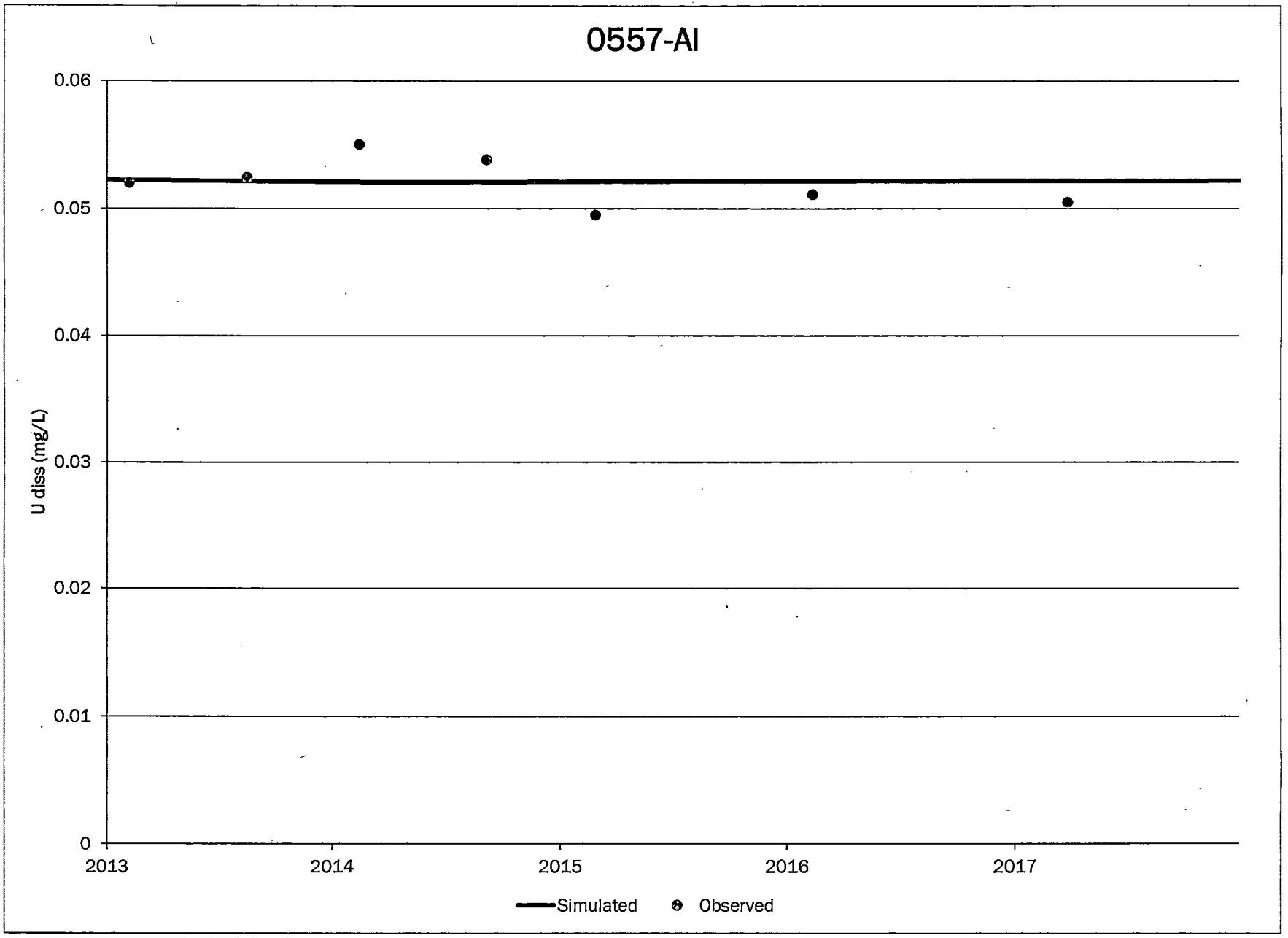

0551-AI
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

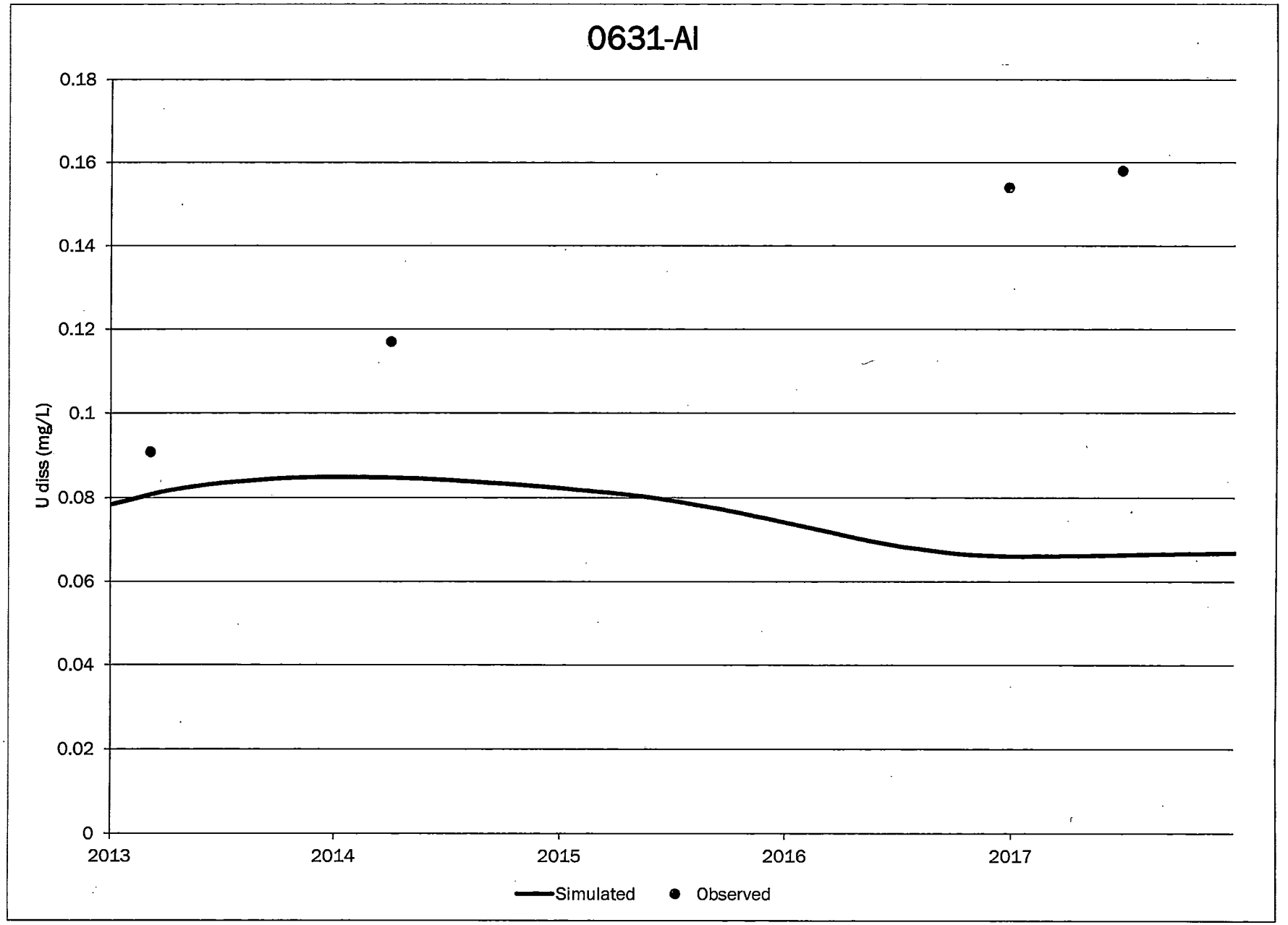

0553-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

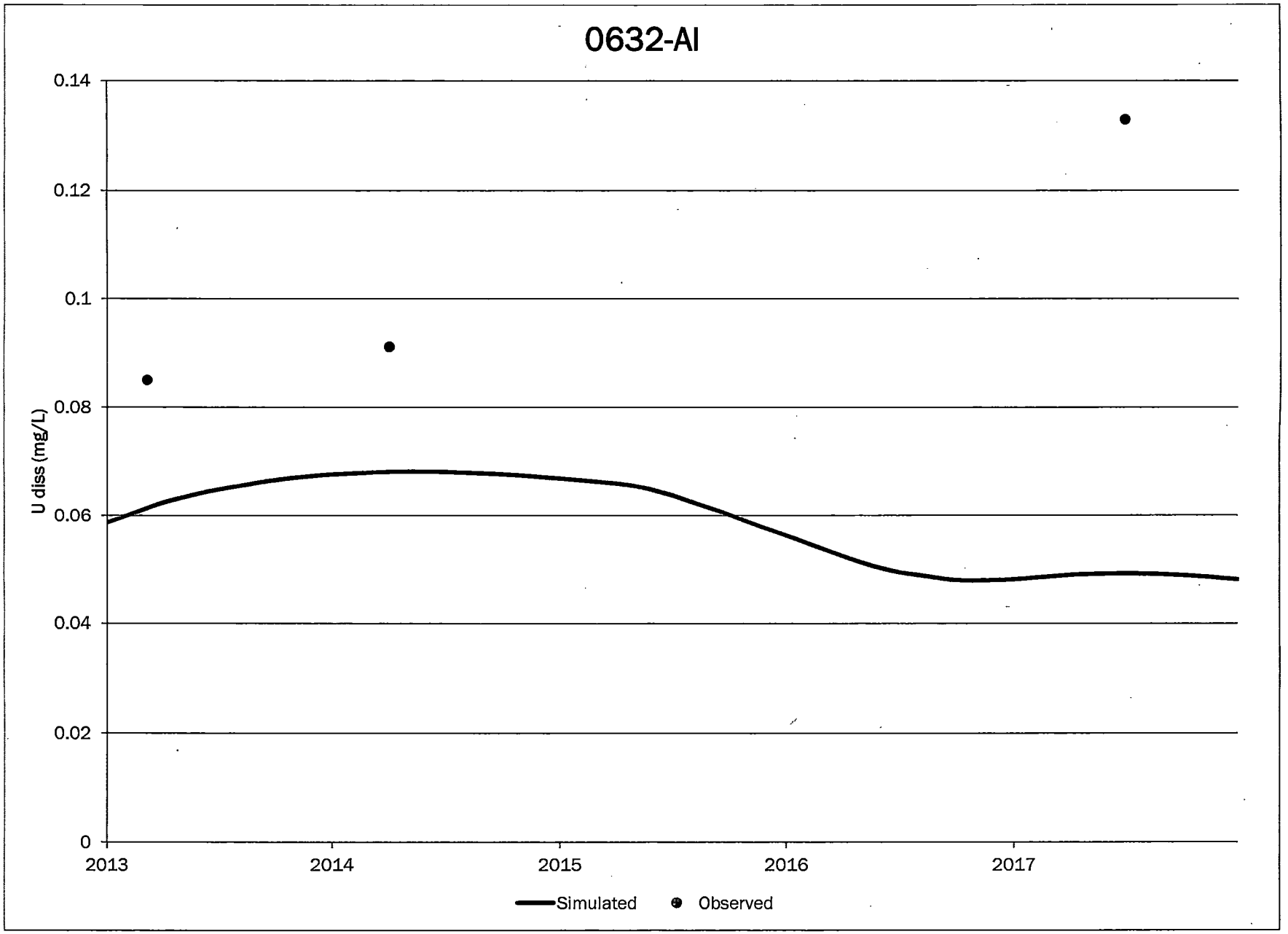

0554-AI
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

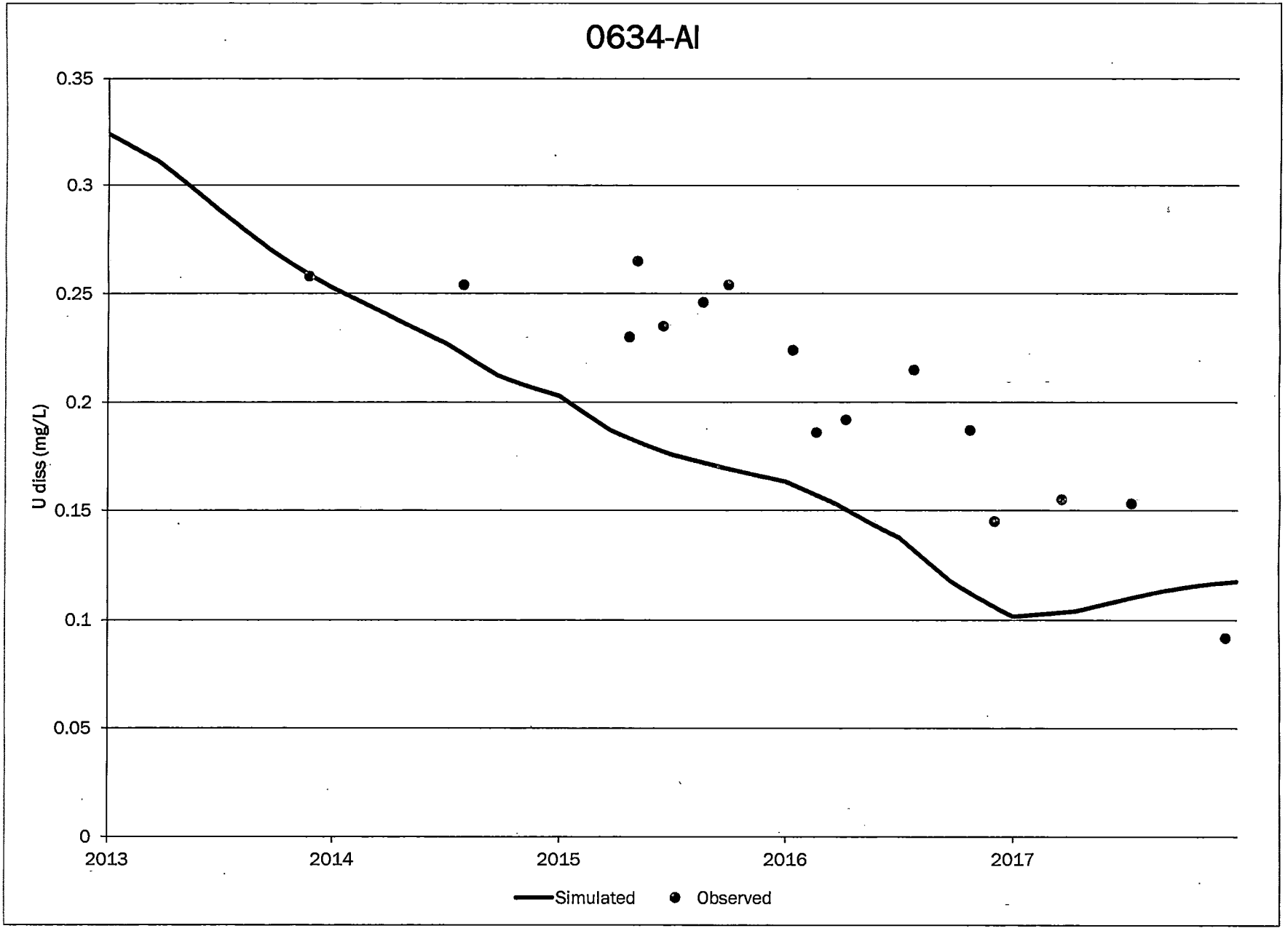

0555-AI
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

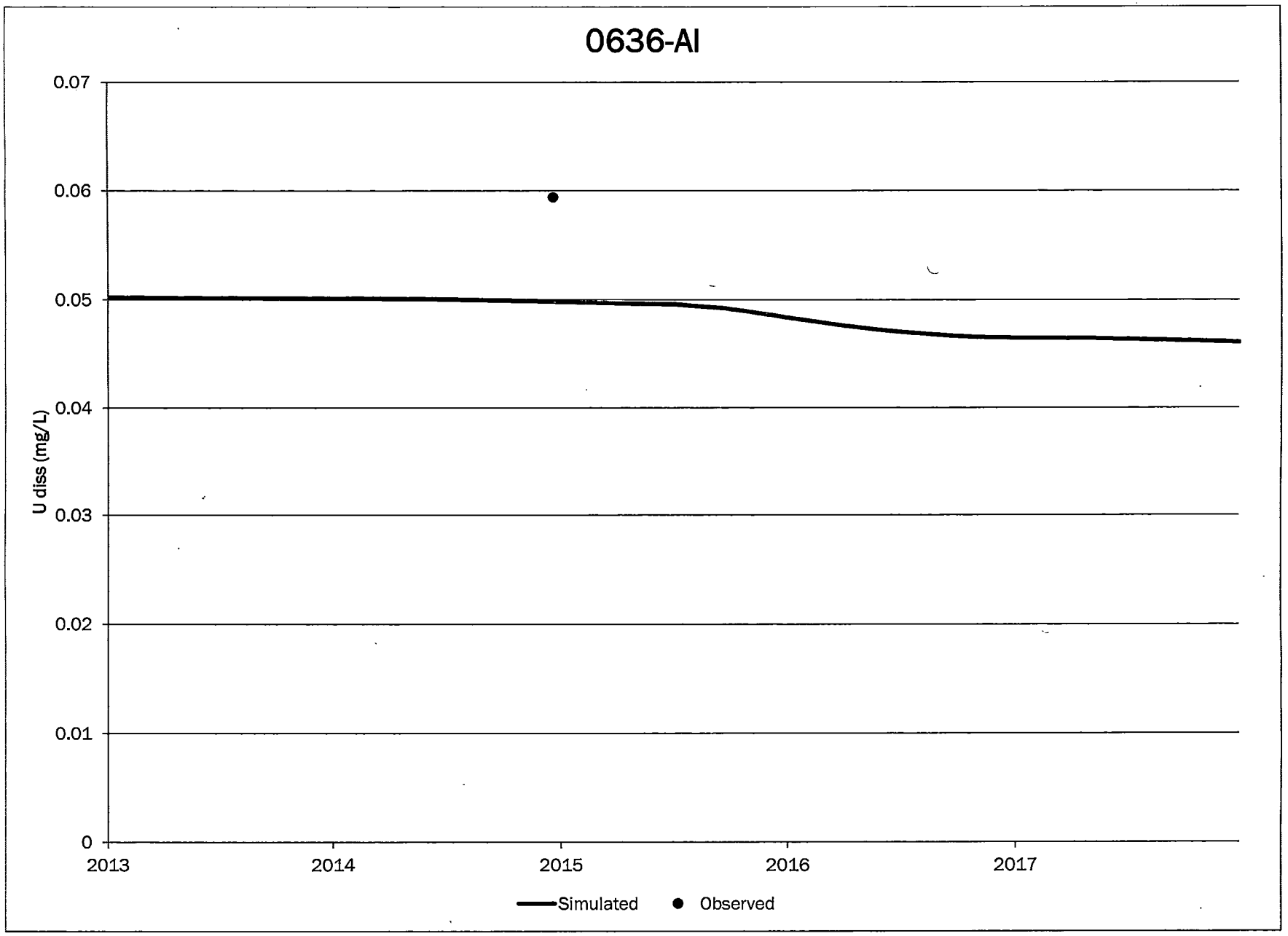

0556-AI
U diss (mg/L)
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
2013
2014
2015
2016
2017
Simulated
Observed


0557-AI
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0631-AI
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0632-AI
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0634-AI
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0636-AI
0.07
0.06
0.05
0.04
0.03
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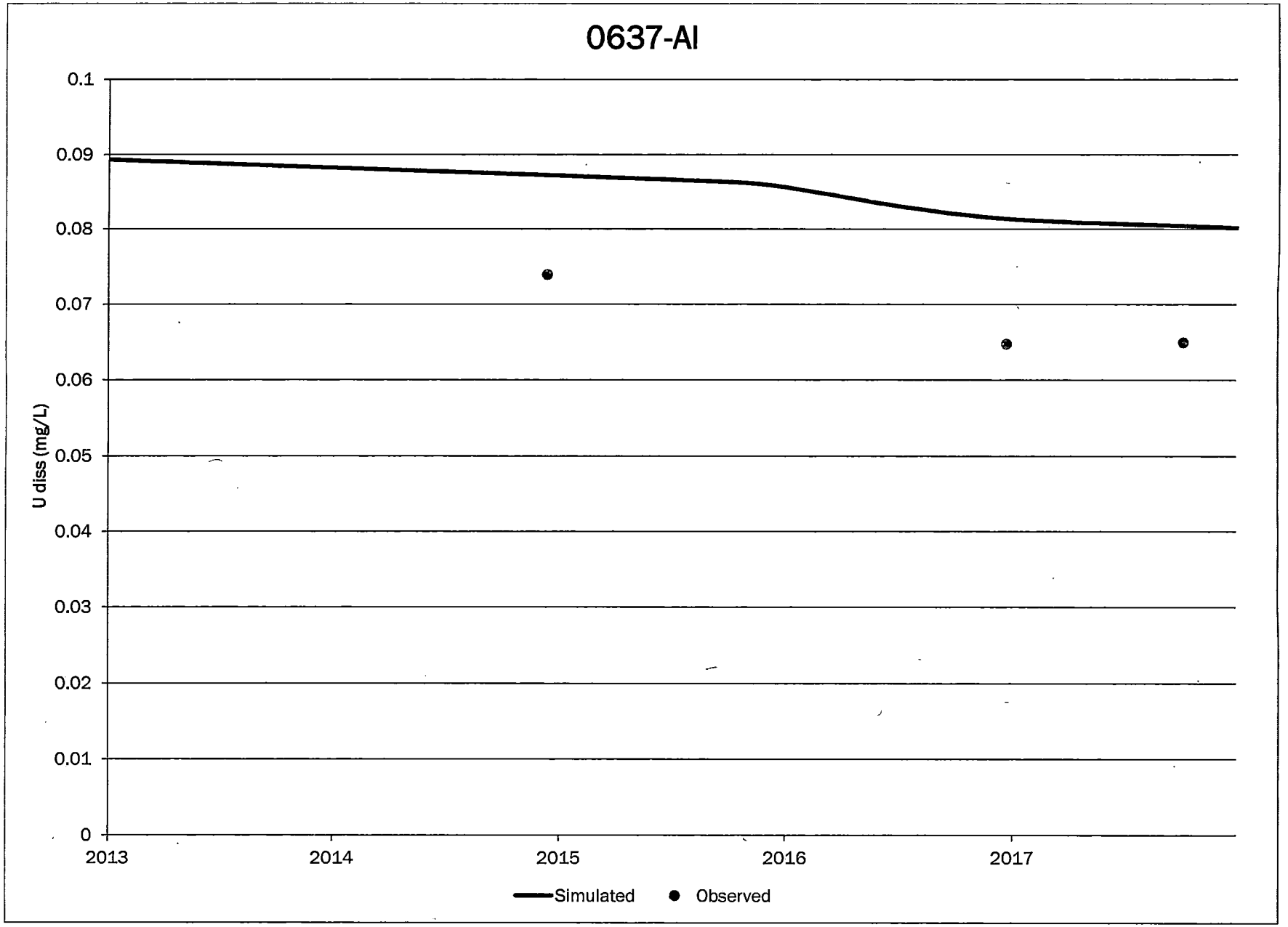
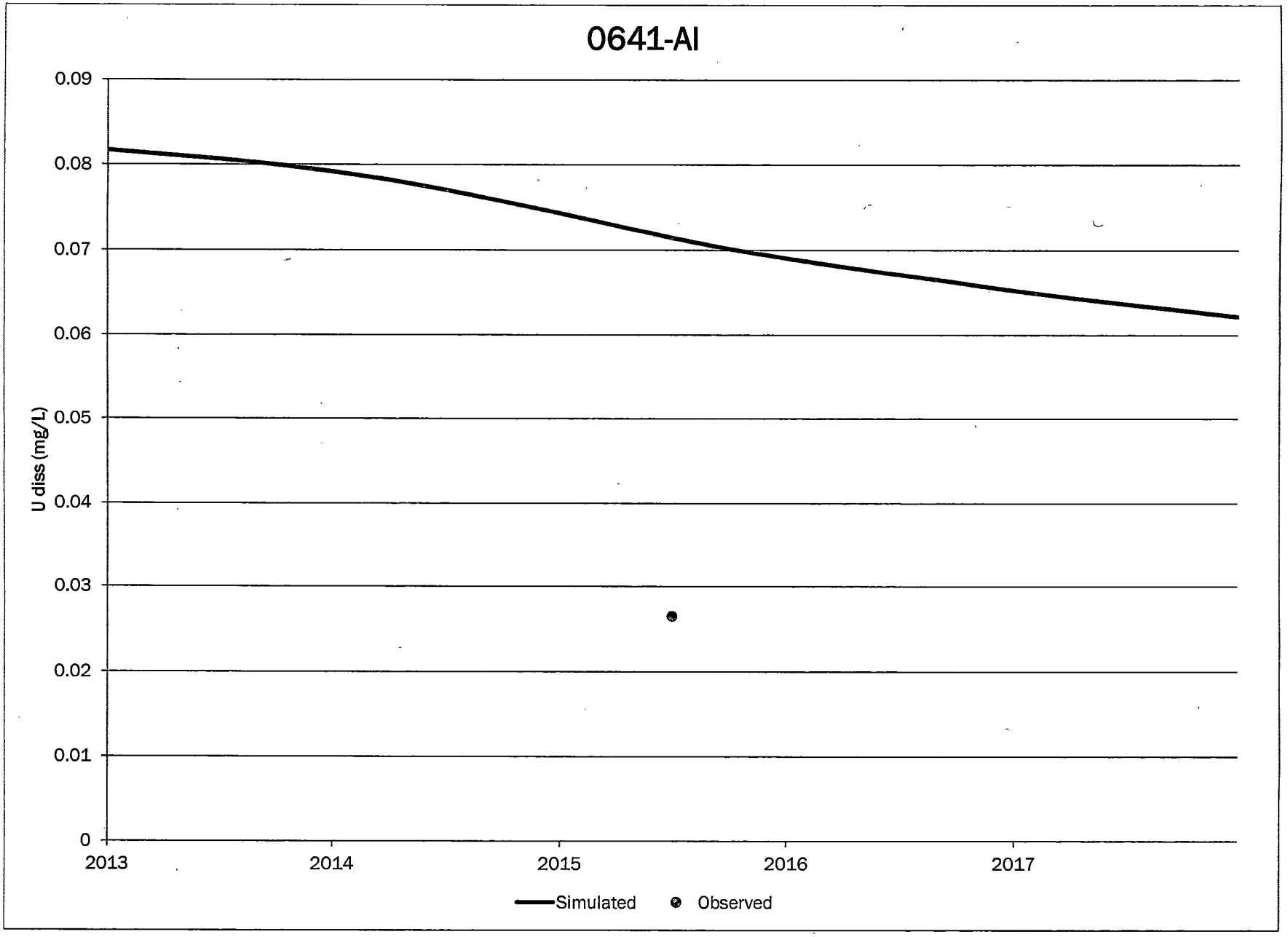
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0637-AI
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0641-AI
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0.08
0.07
0.06
0.05
0.04
0.03
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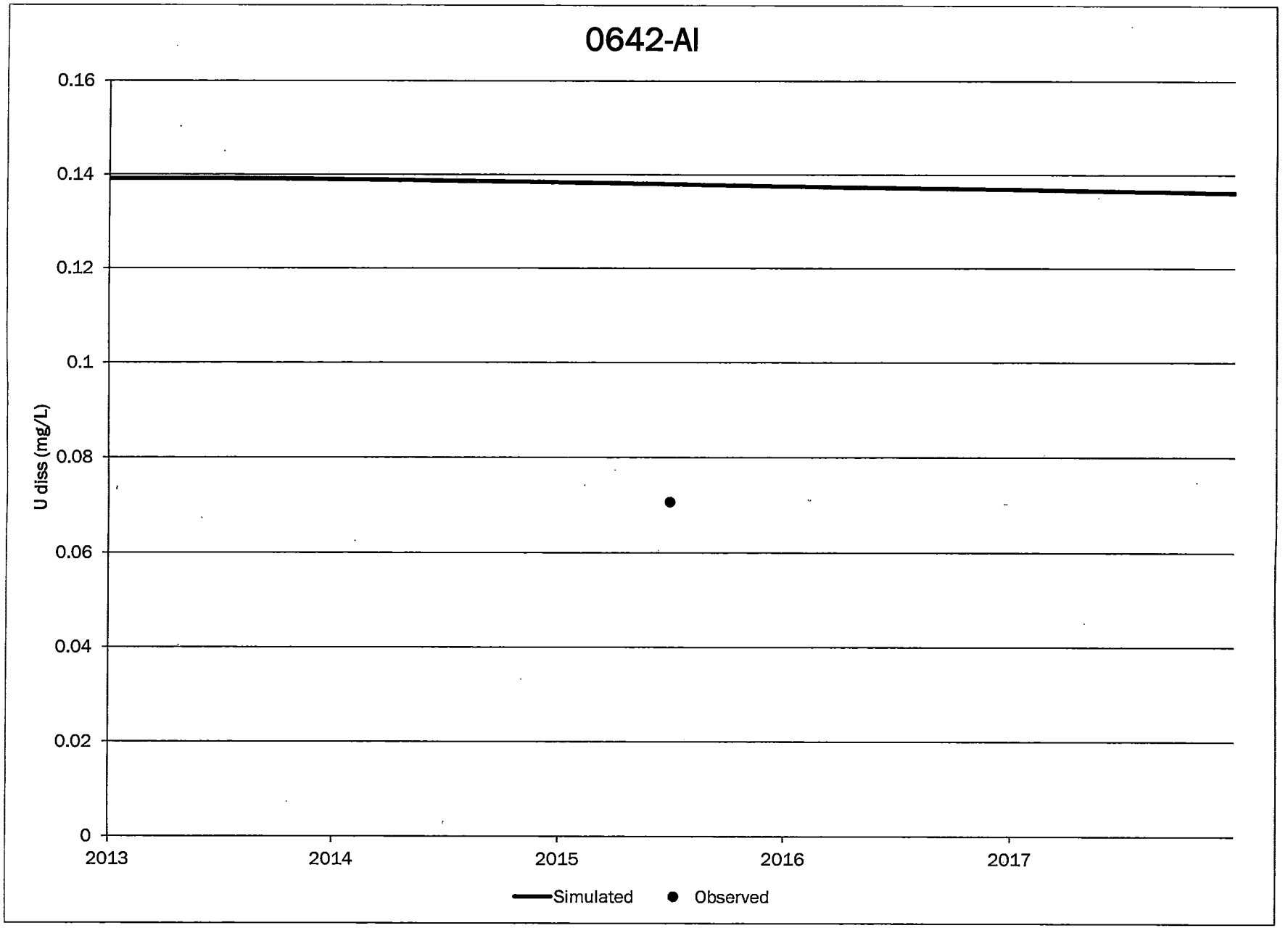
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0642-AI
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0.14
0.12
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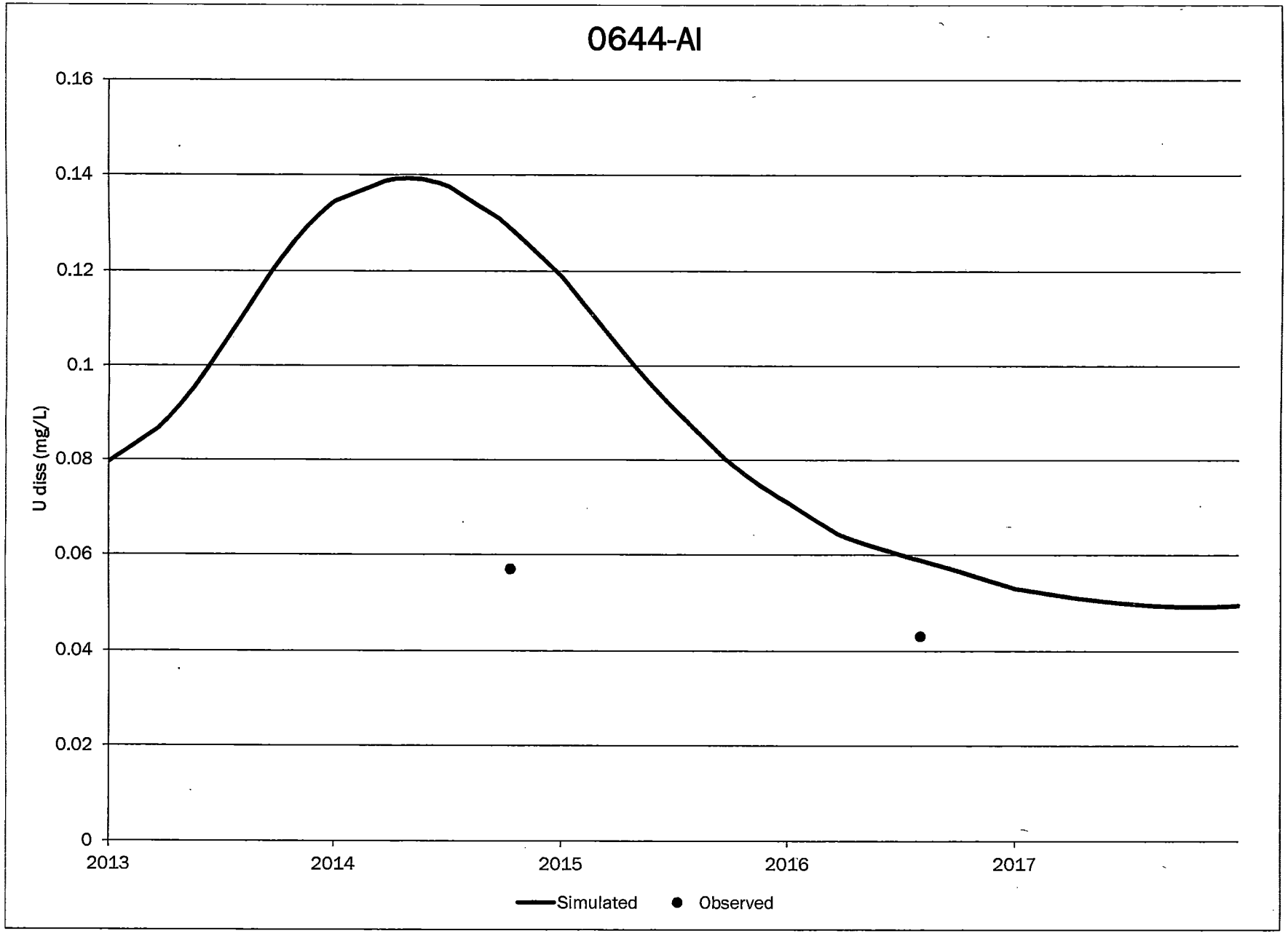
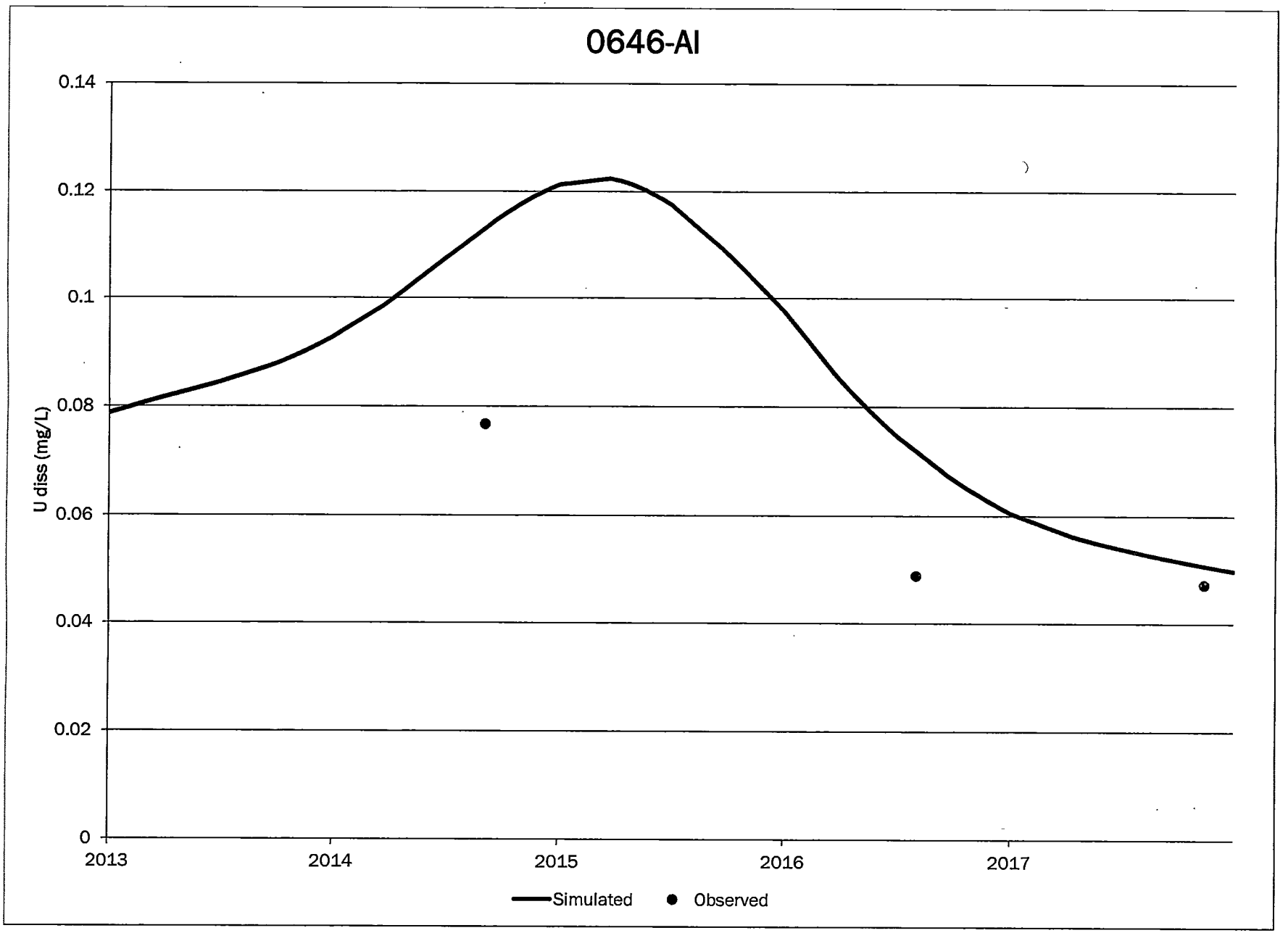
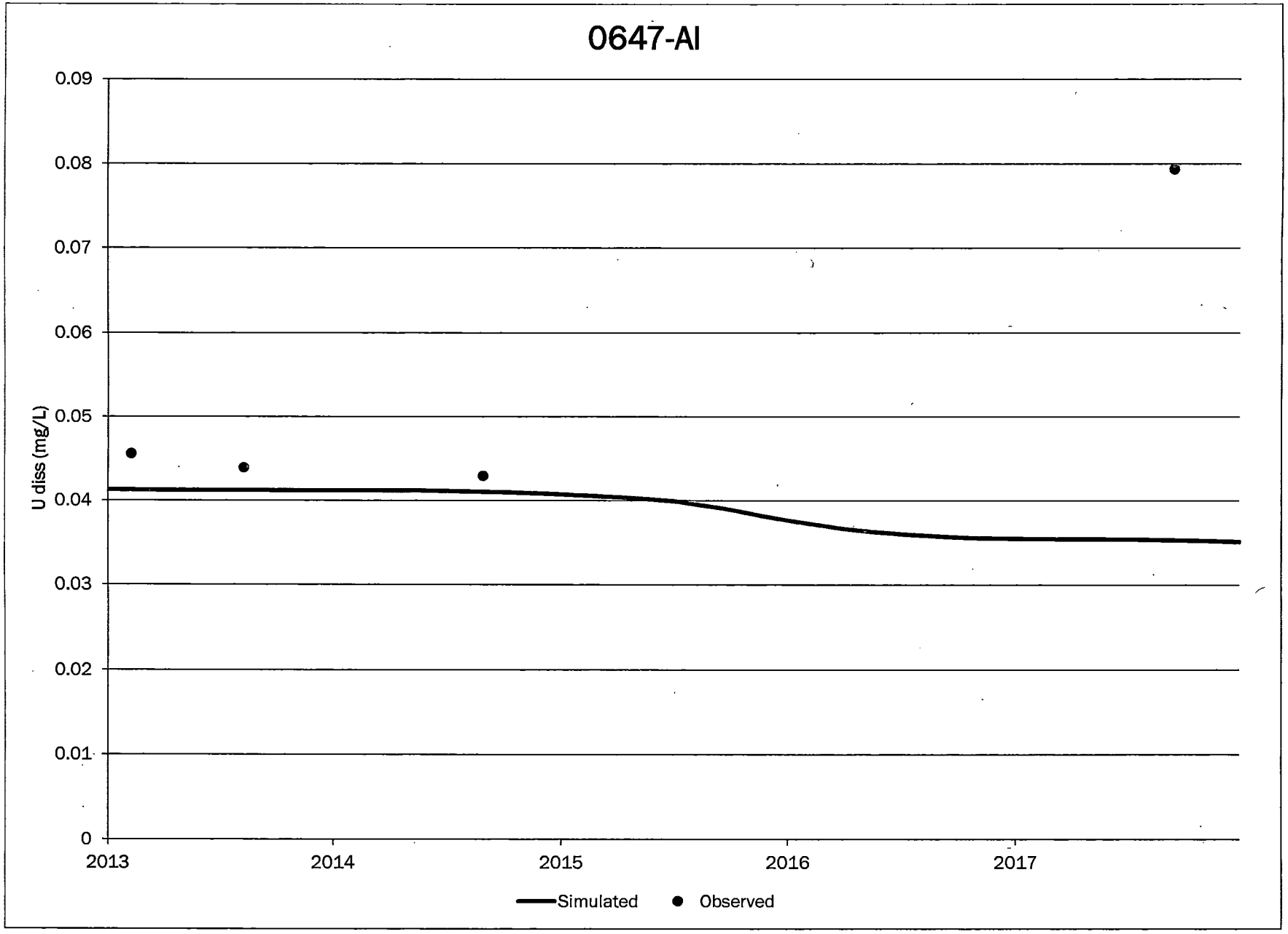
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0644-AI
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0646-AI
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0647-AI
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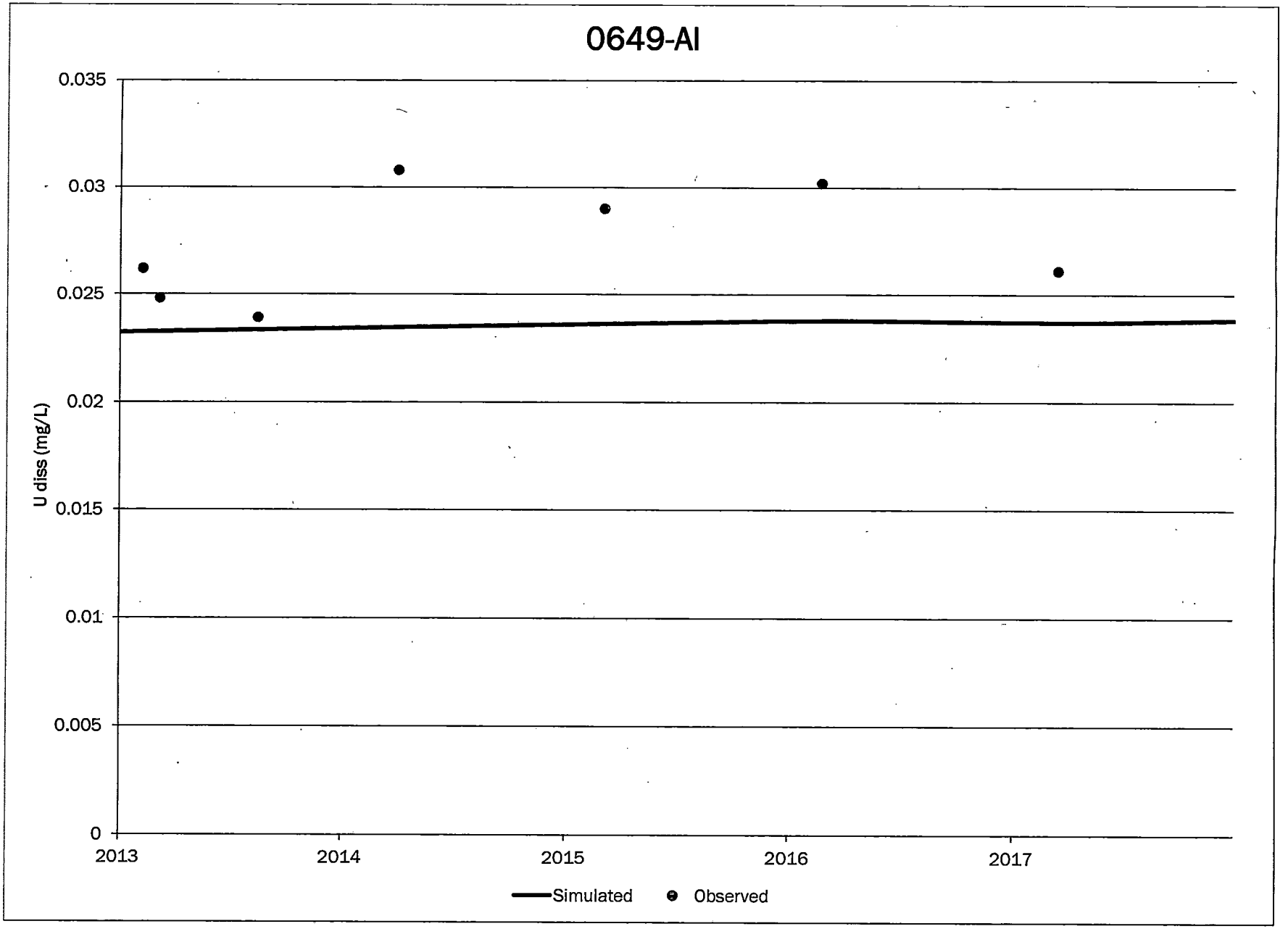
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0649-AI
0.035
0.03
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0.01
0.005
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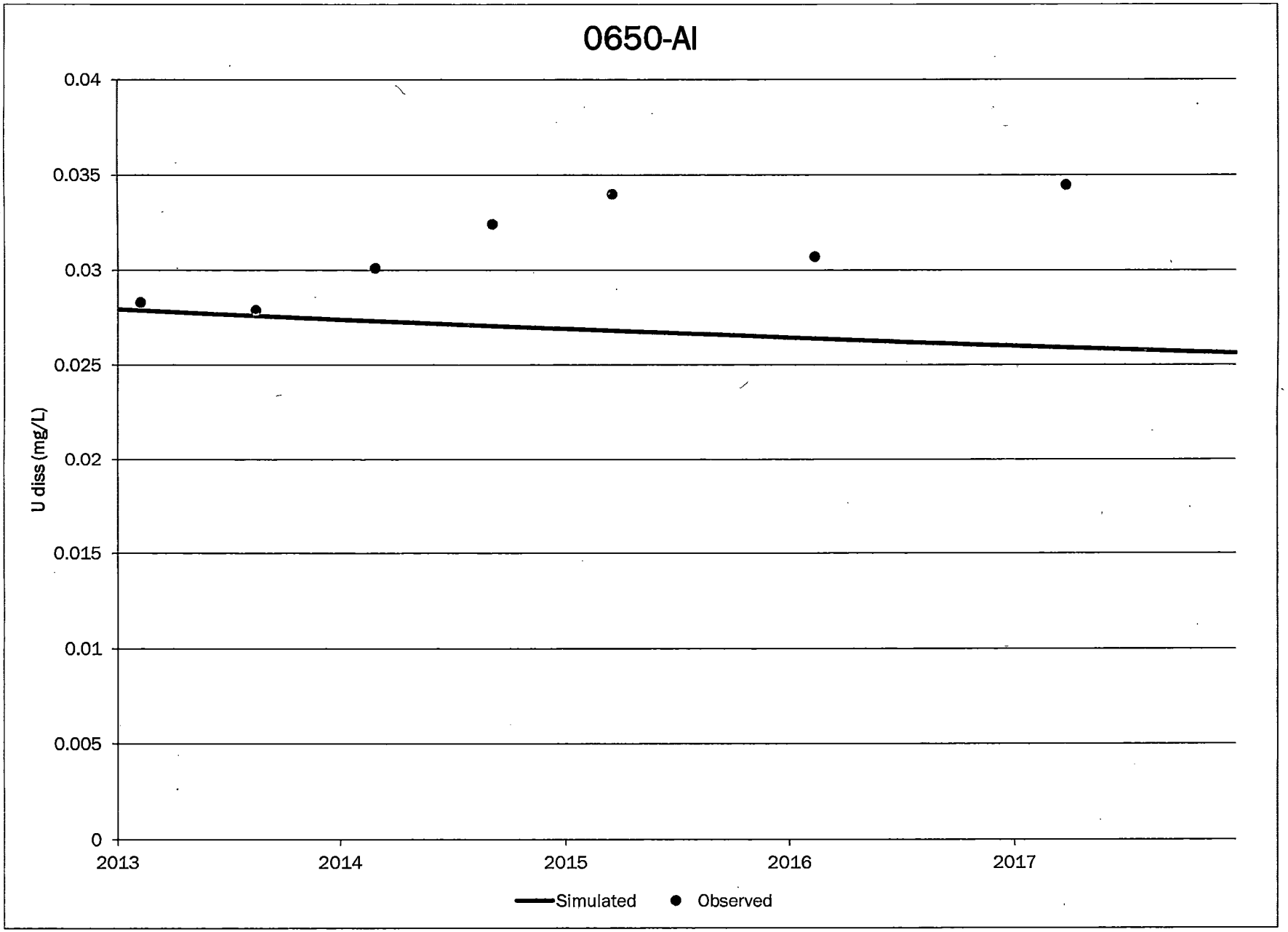
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0650-AI
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0.035
0.03
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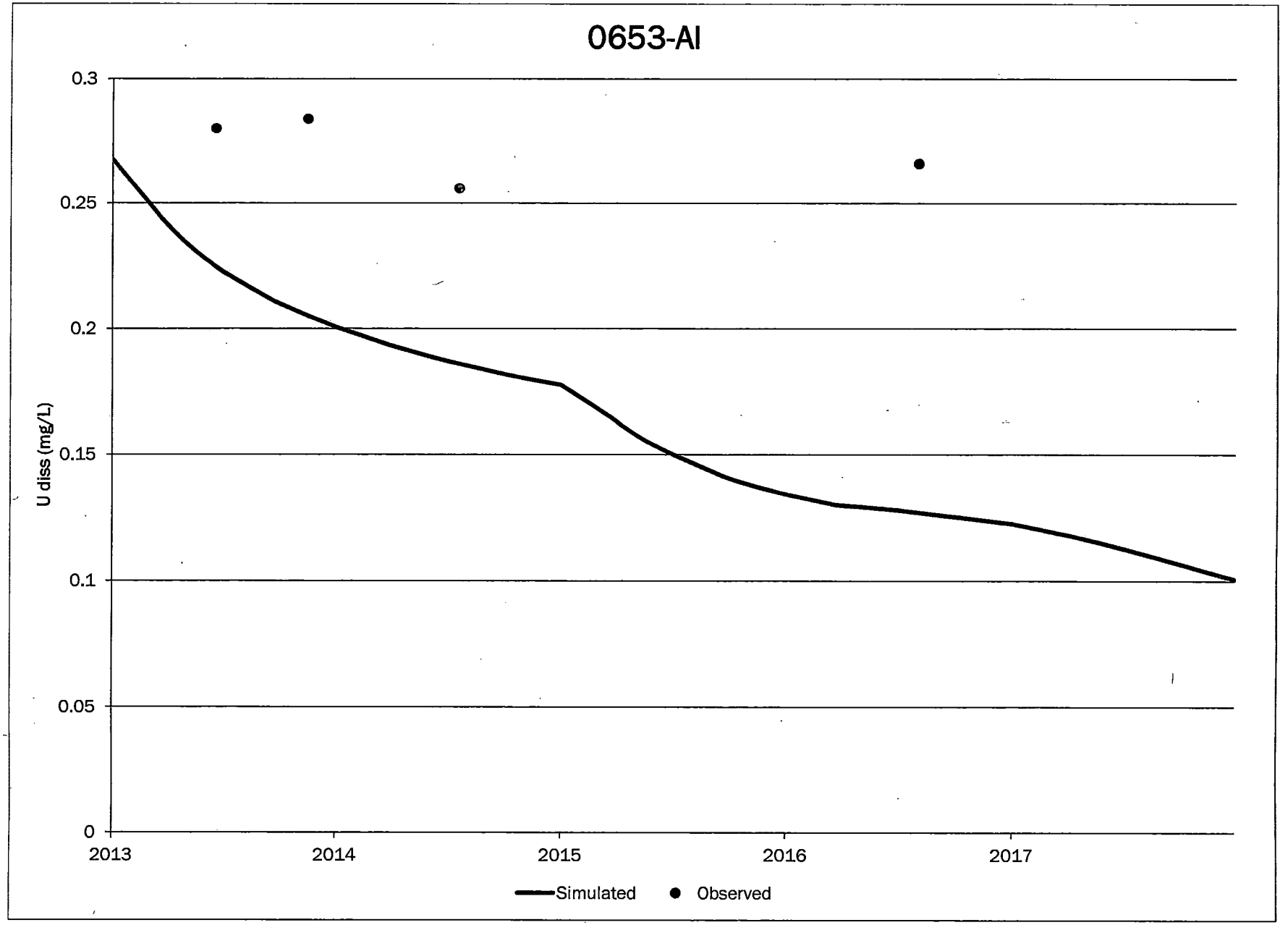
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0653-AI
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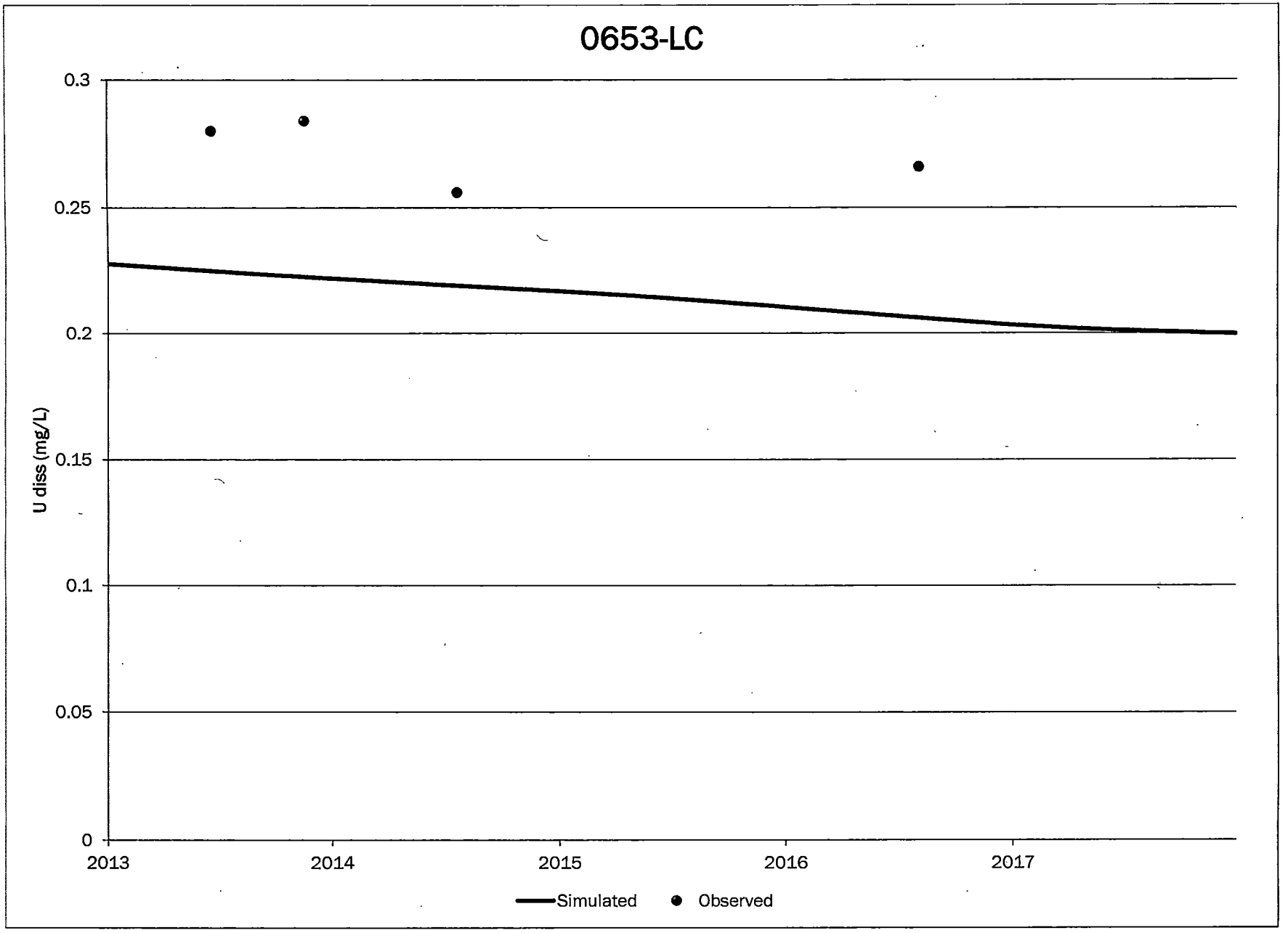
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0653-LC
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0.1
0.05
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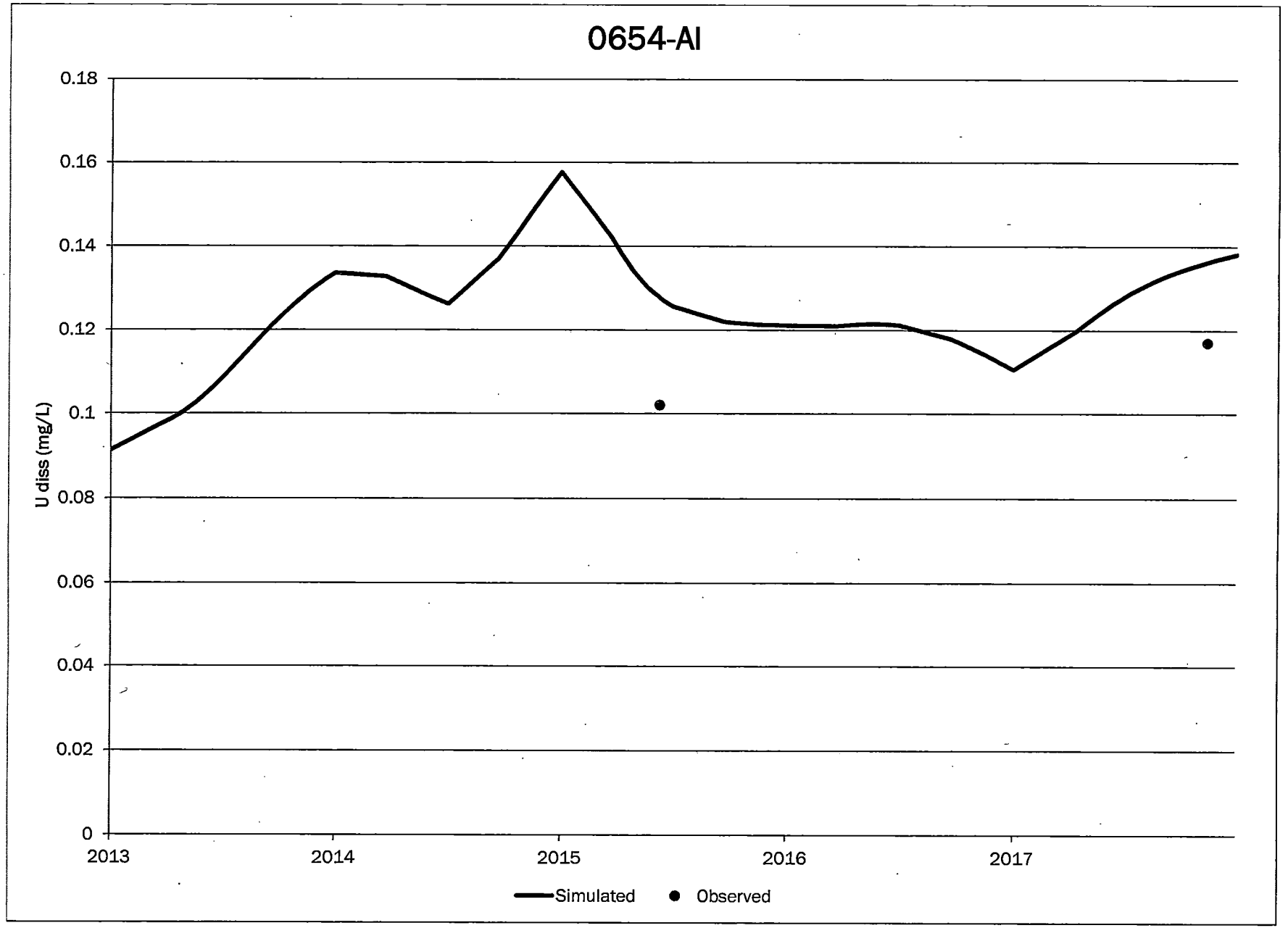
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0654-AI
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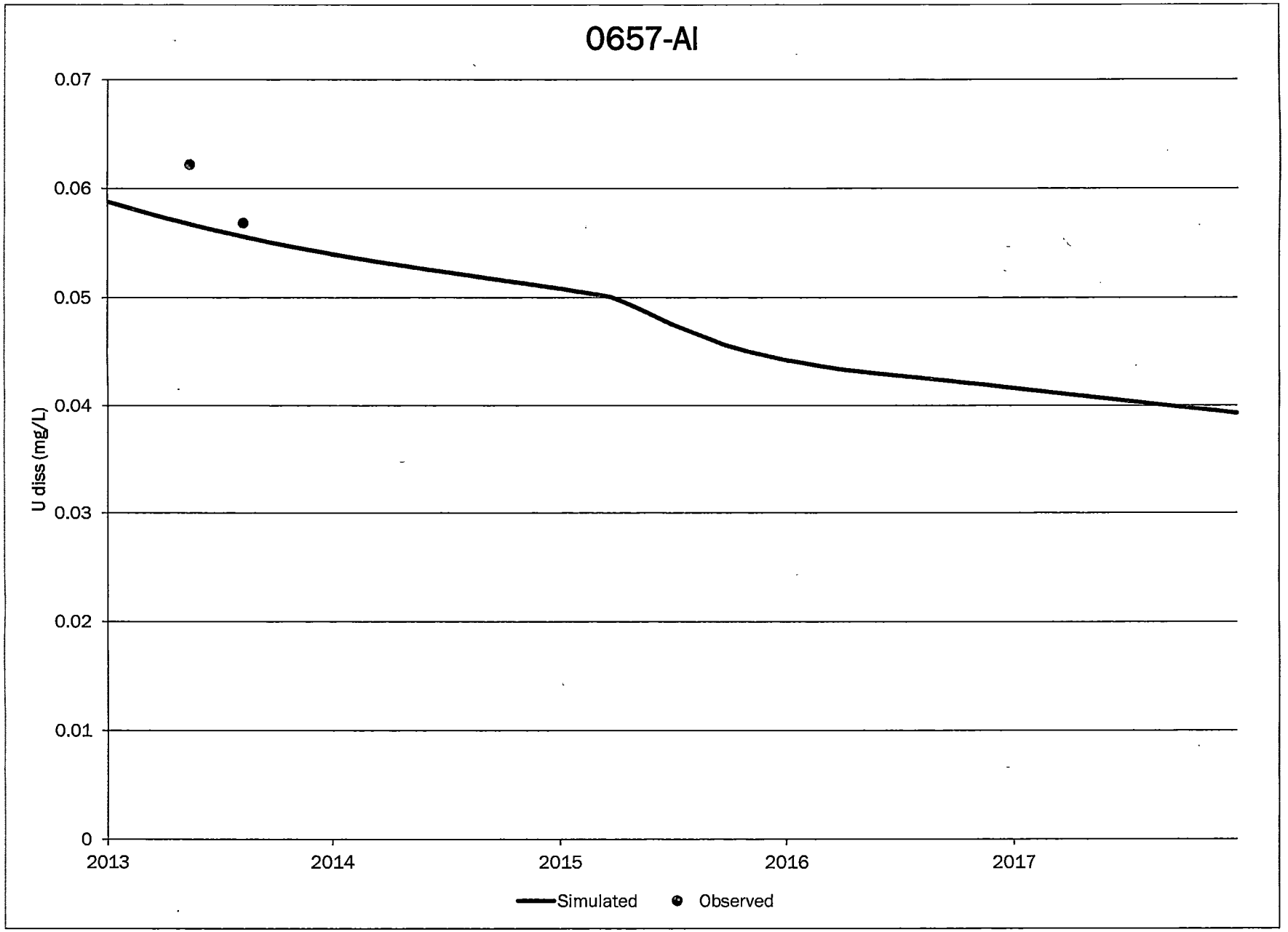
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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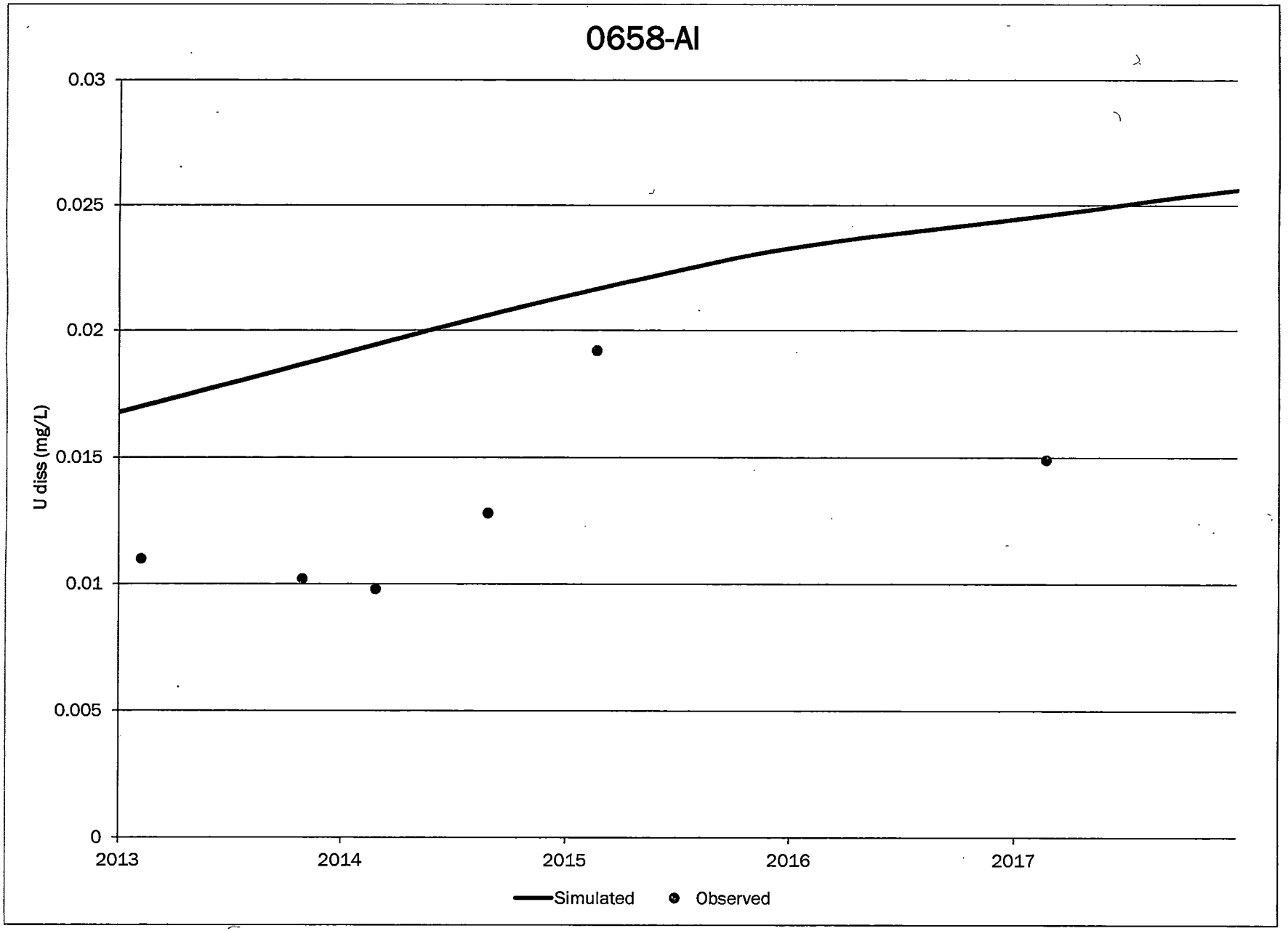
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0658-AI
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0.015
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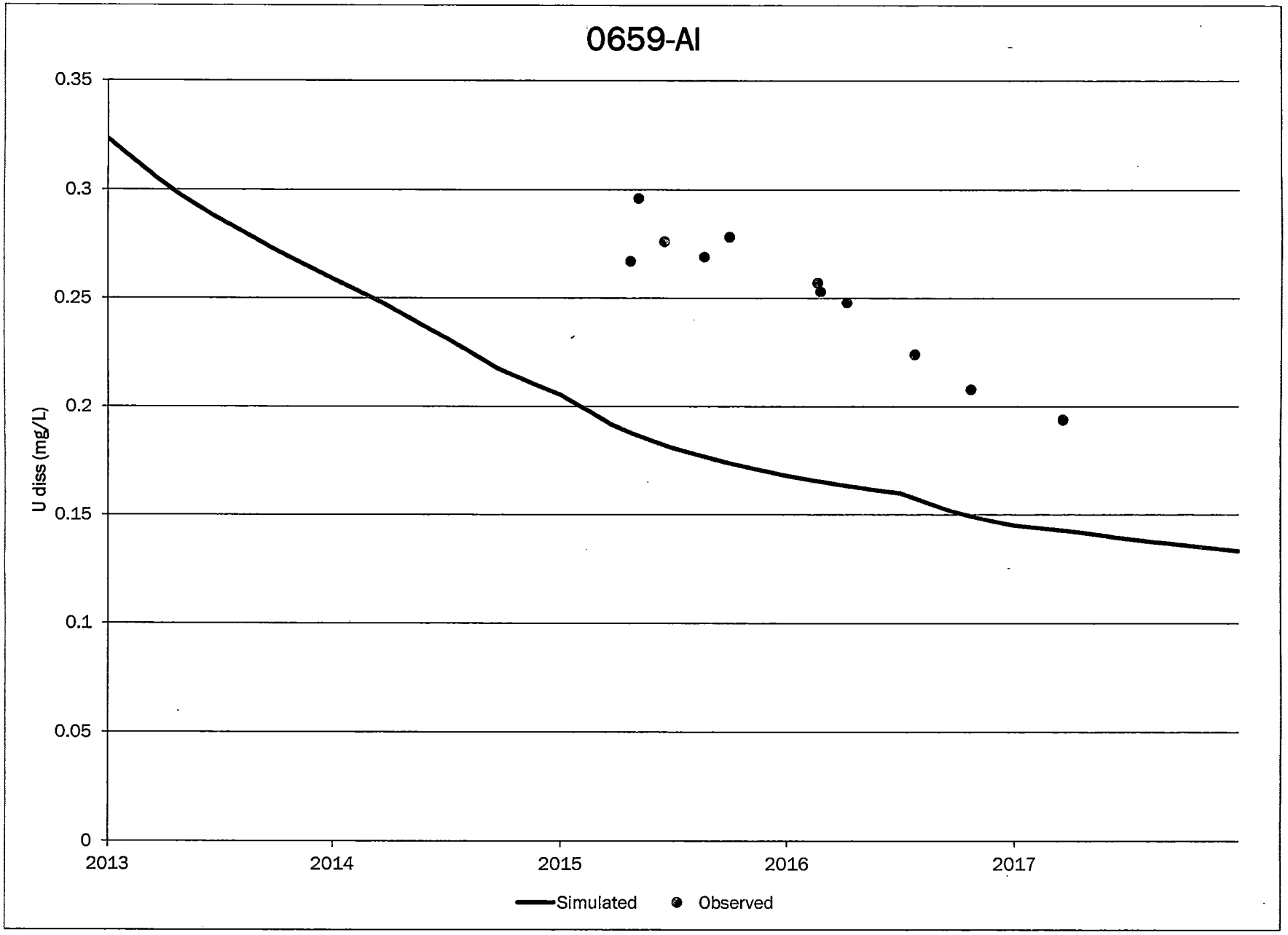
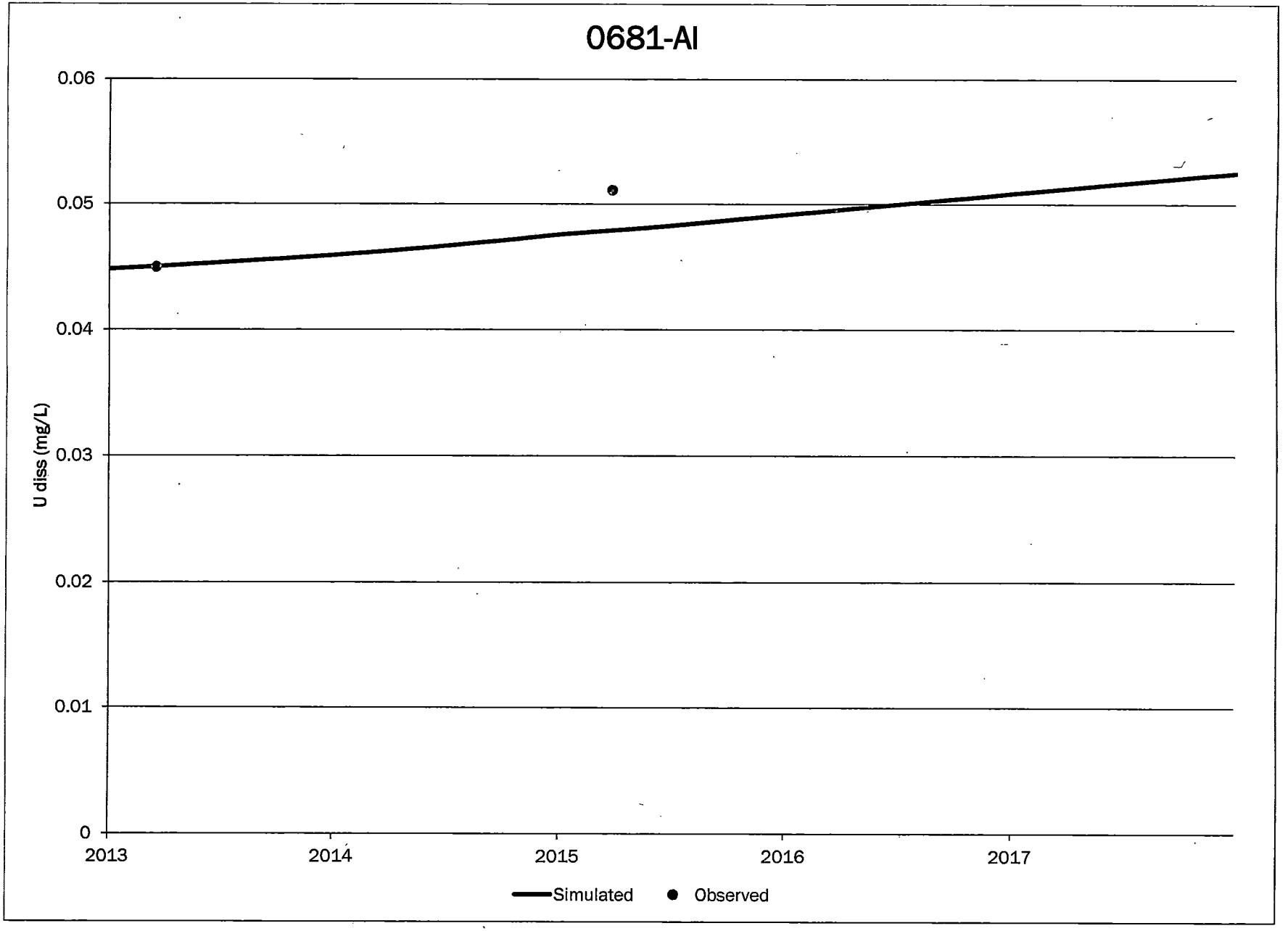
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0659-AI
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0681-AI
0.06
0.05
0.04
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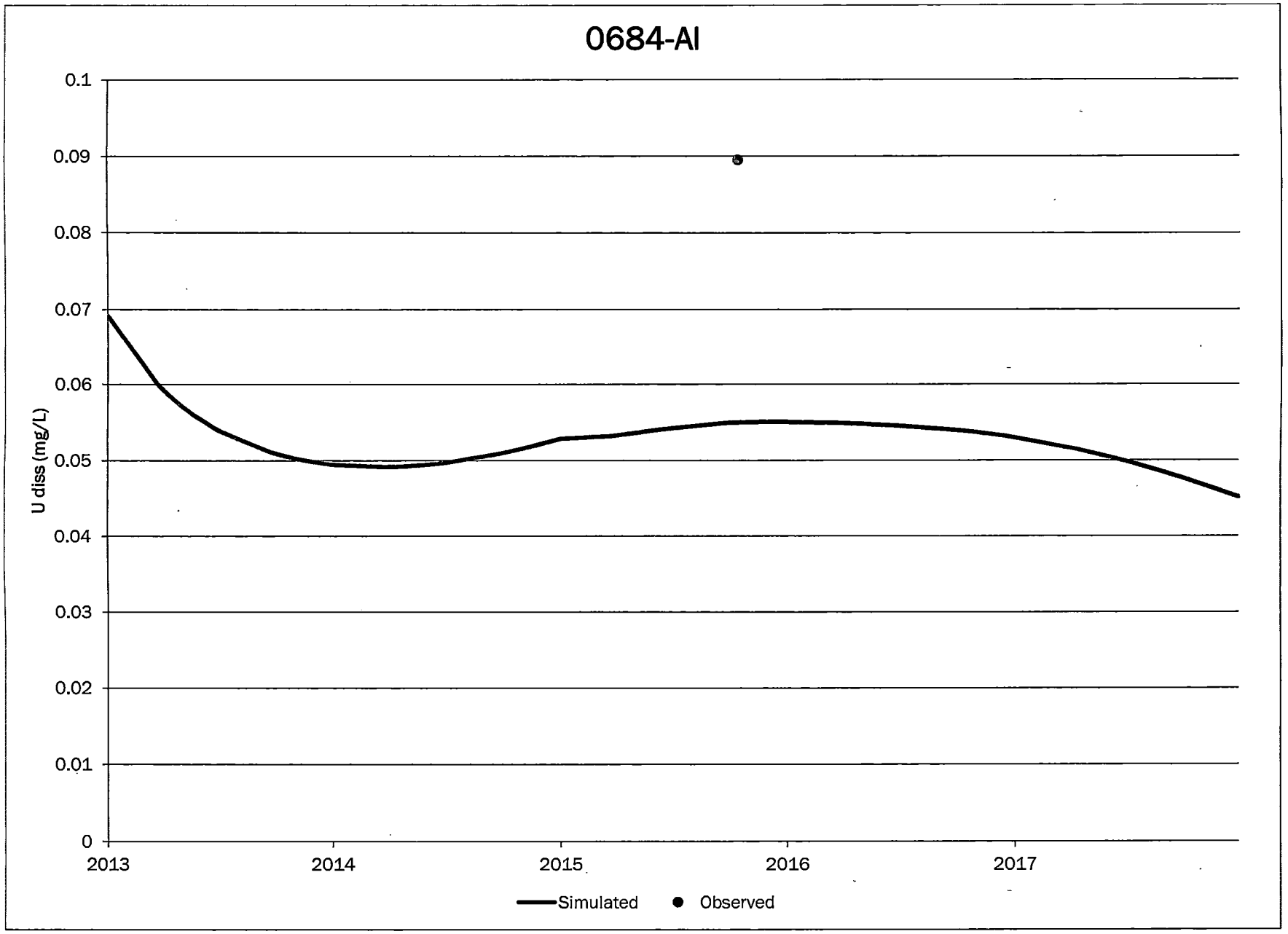
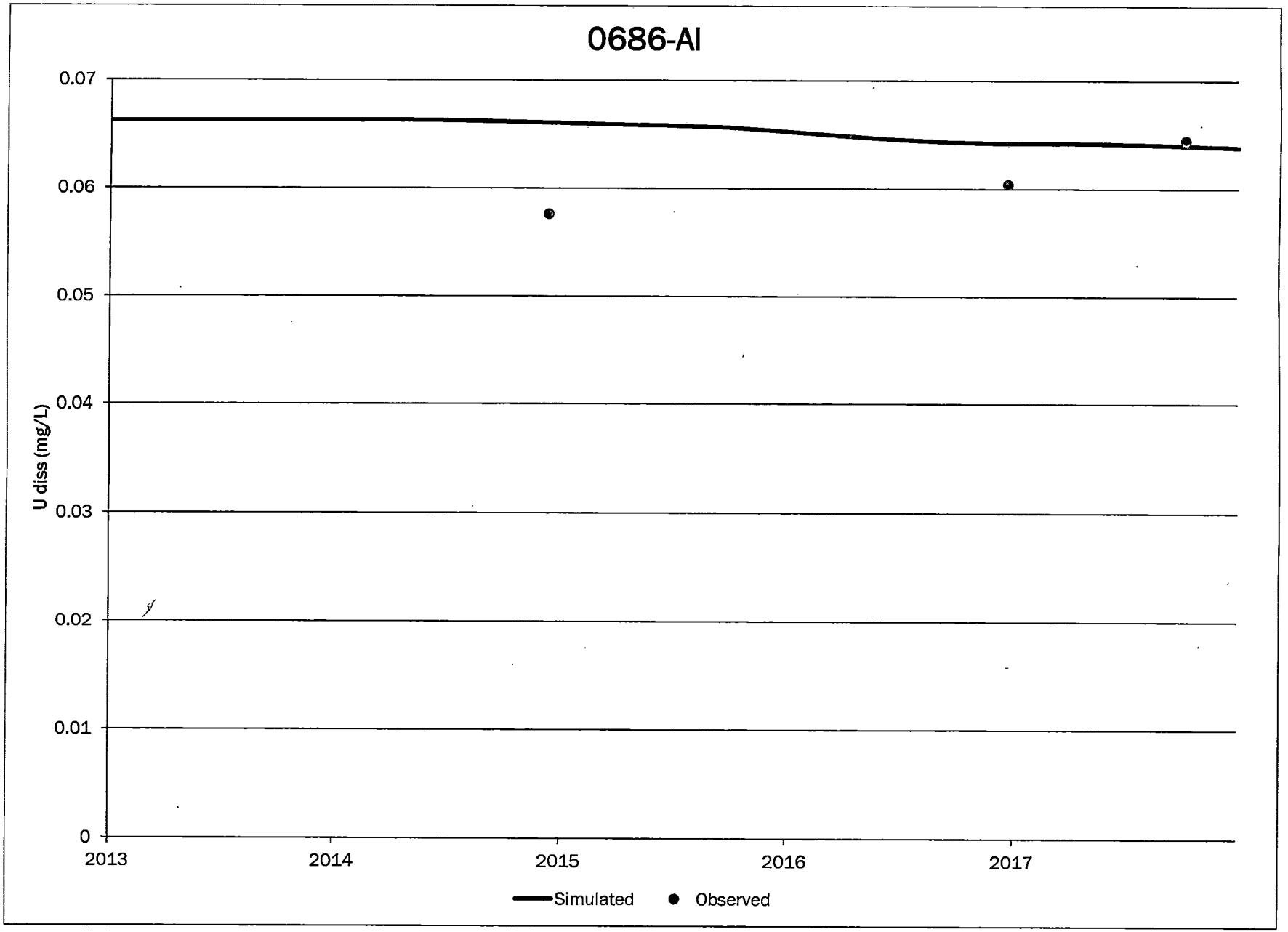
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0684-AI
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0686-AI
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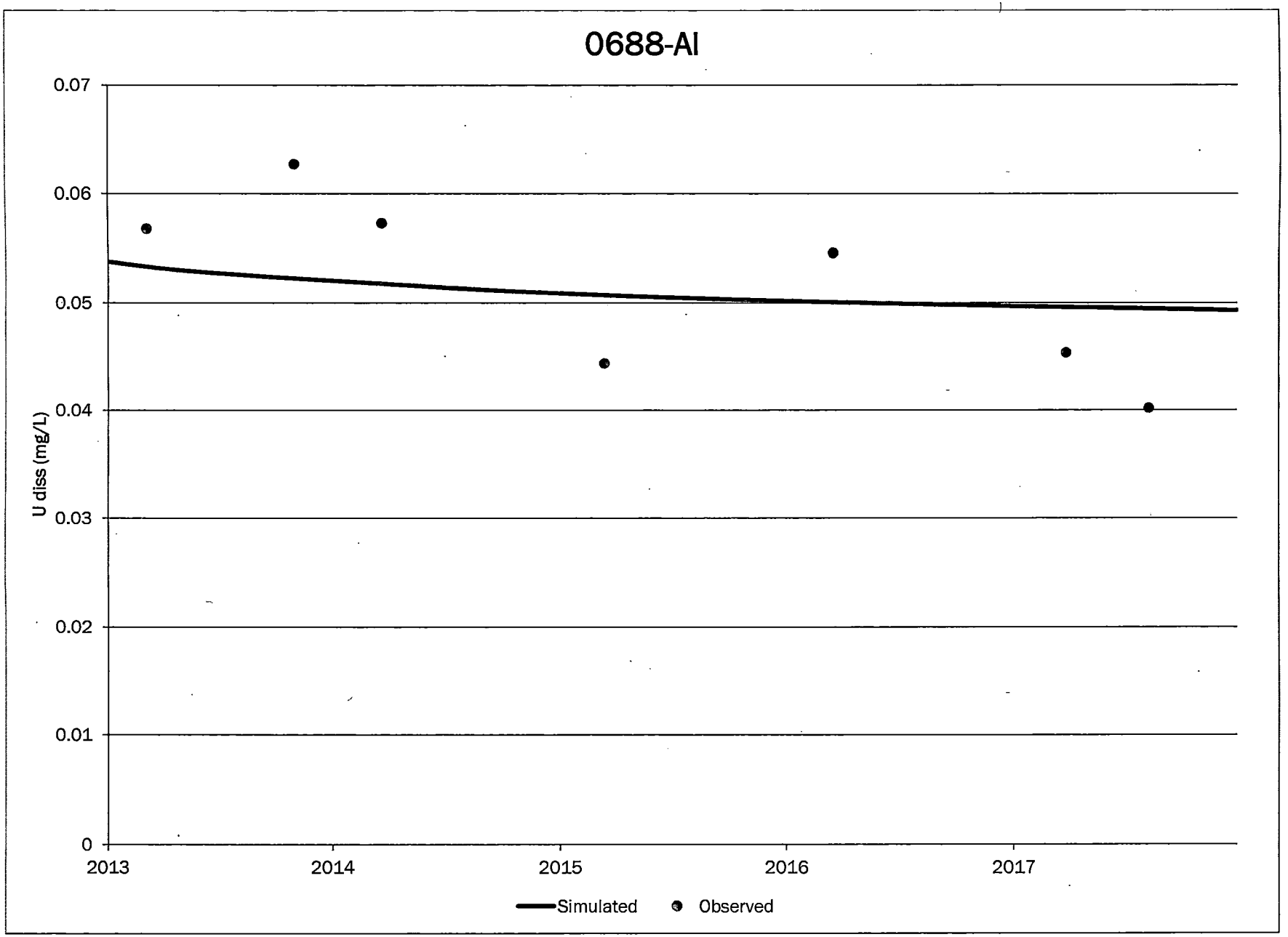
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0688-AI
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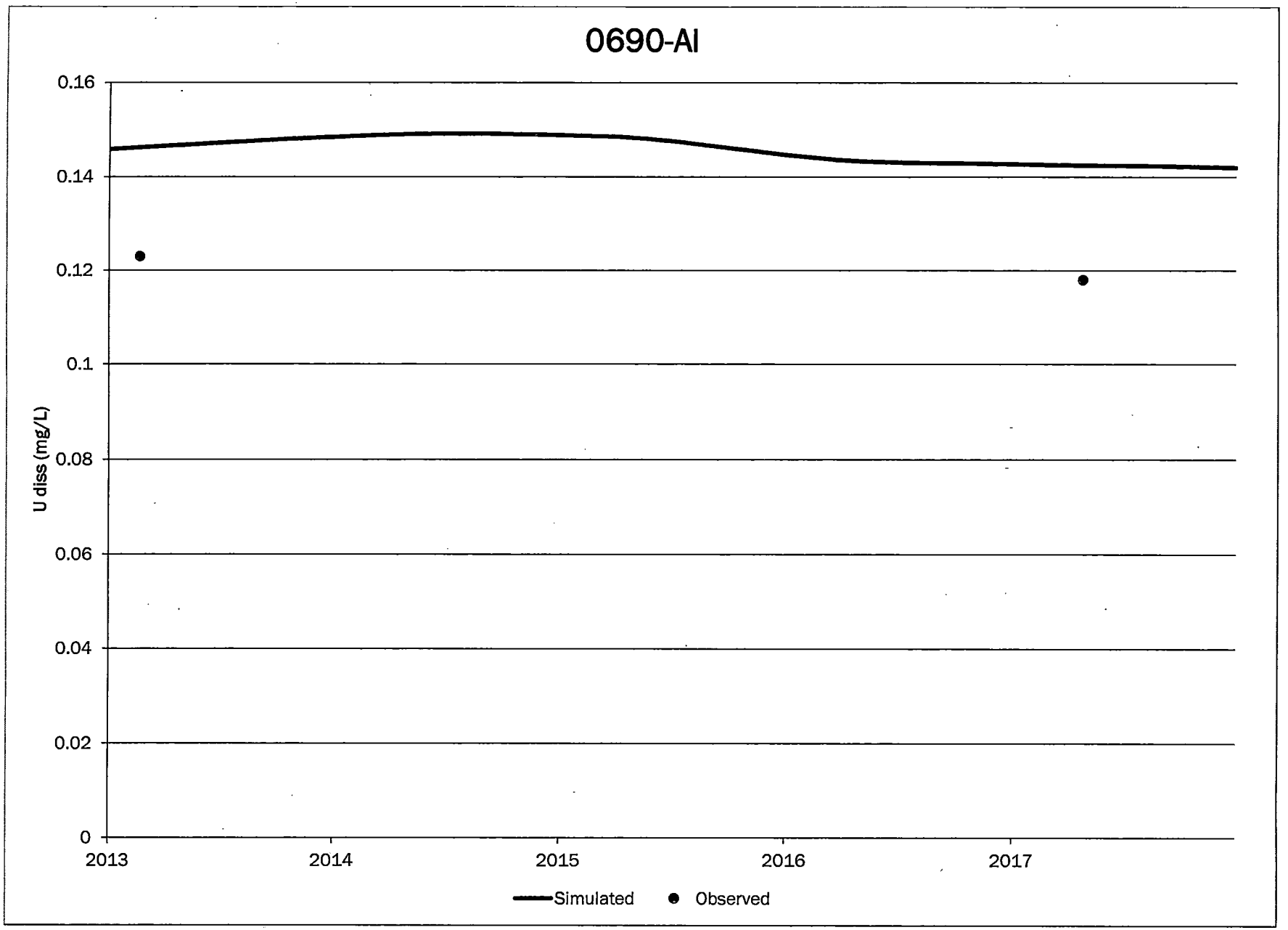
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0690-AI
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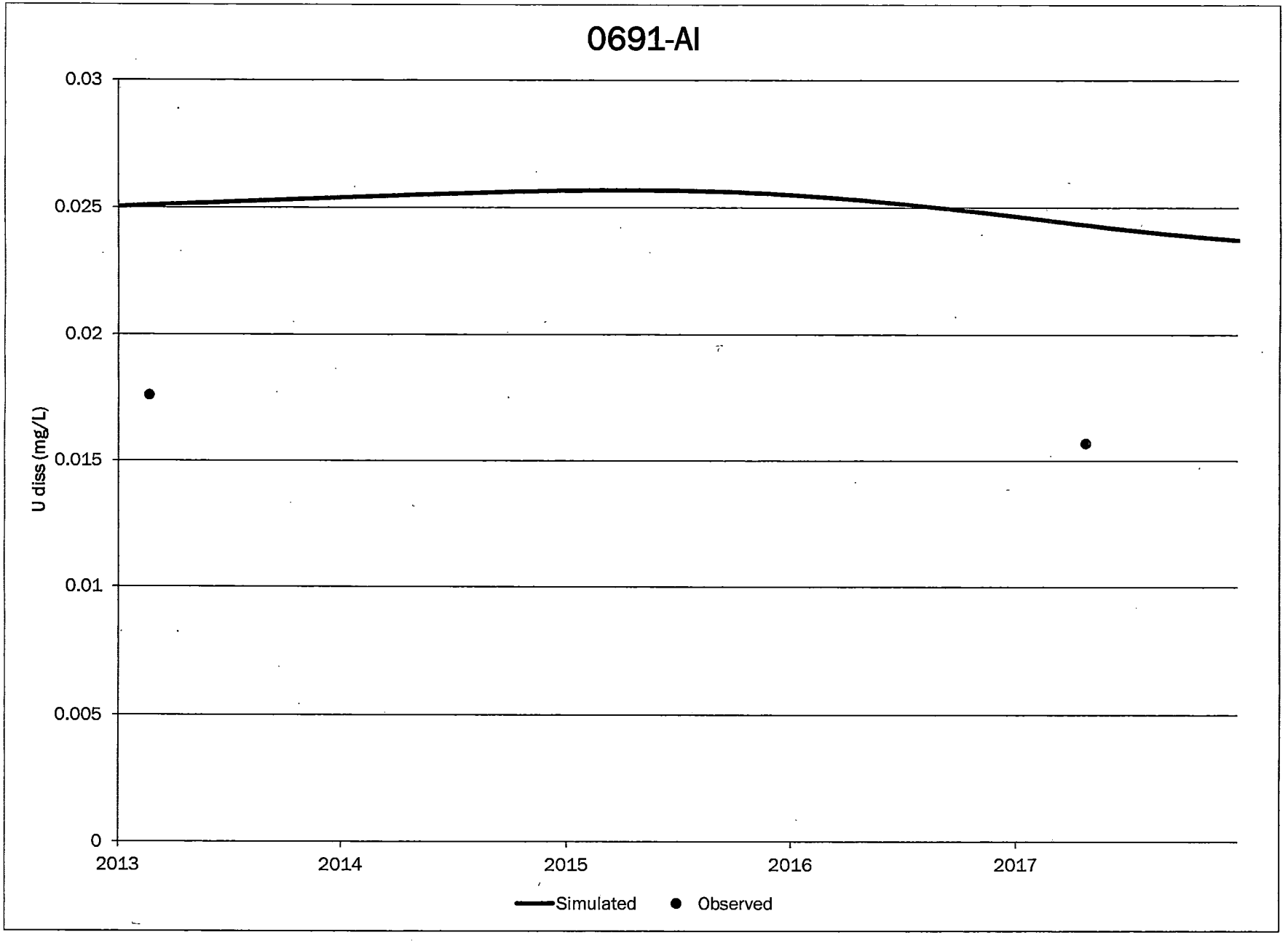
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0691-AI
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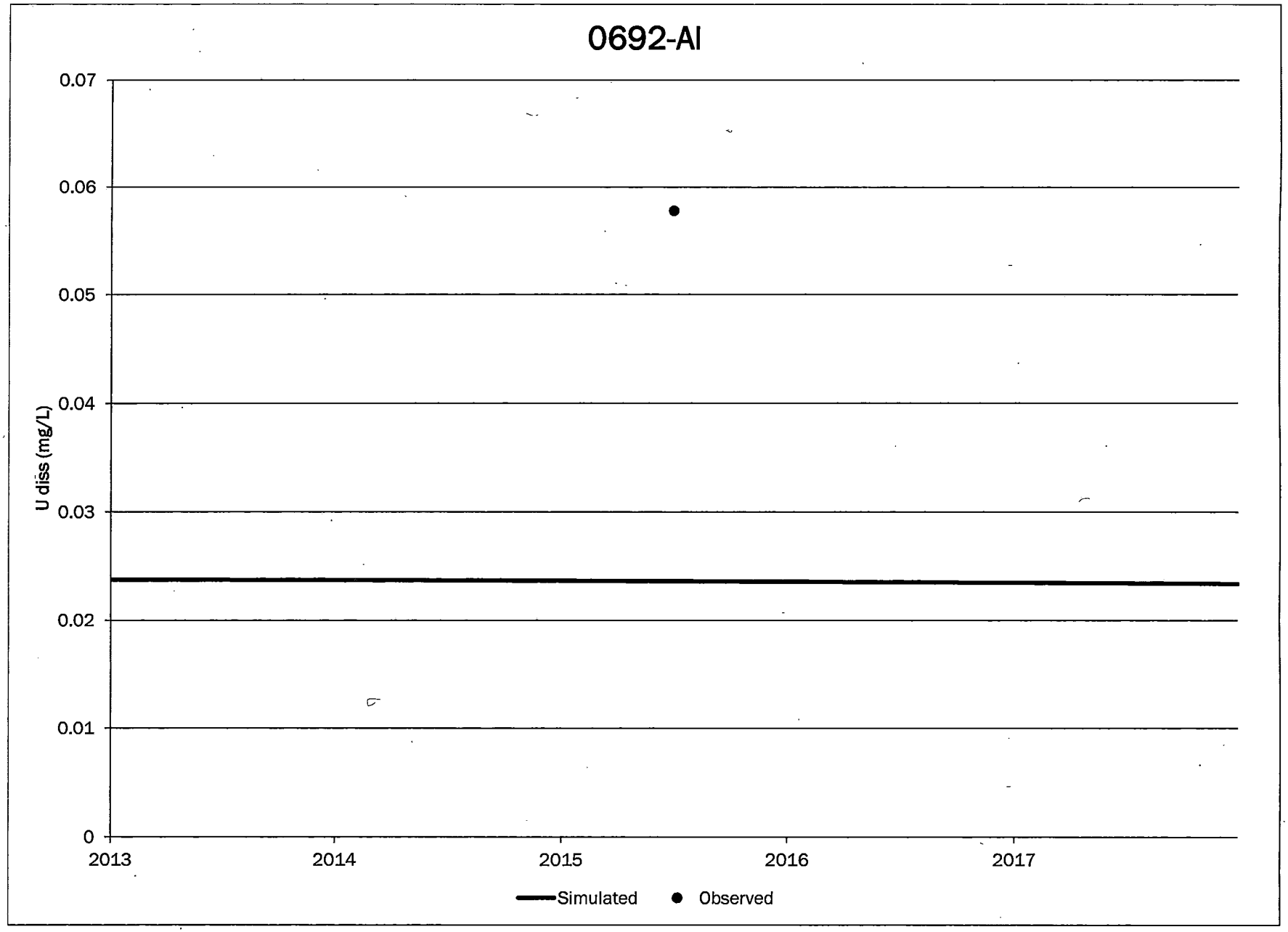
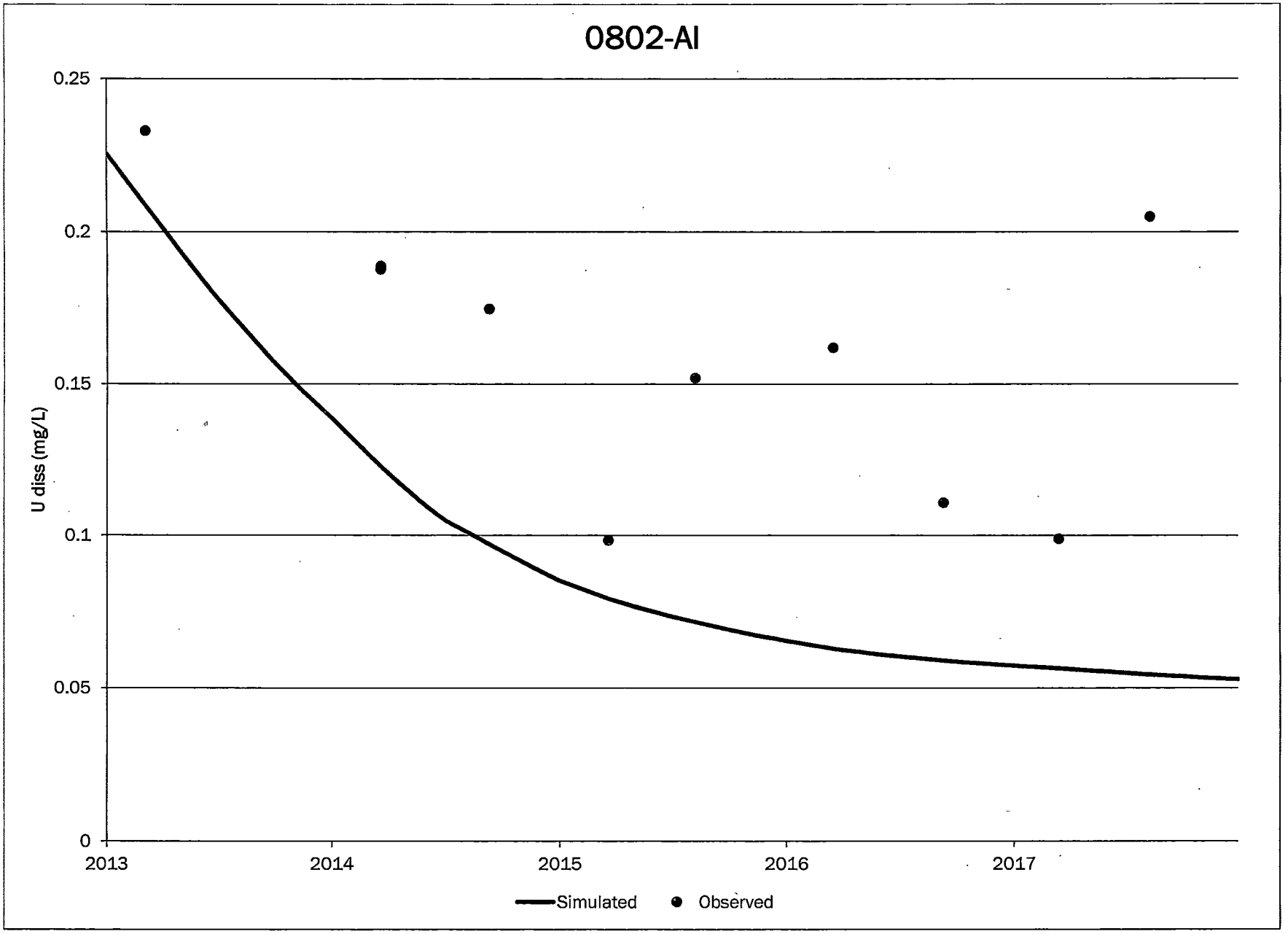
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0692-AI
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0802-AI
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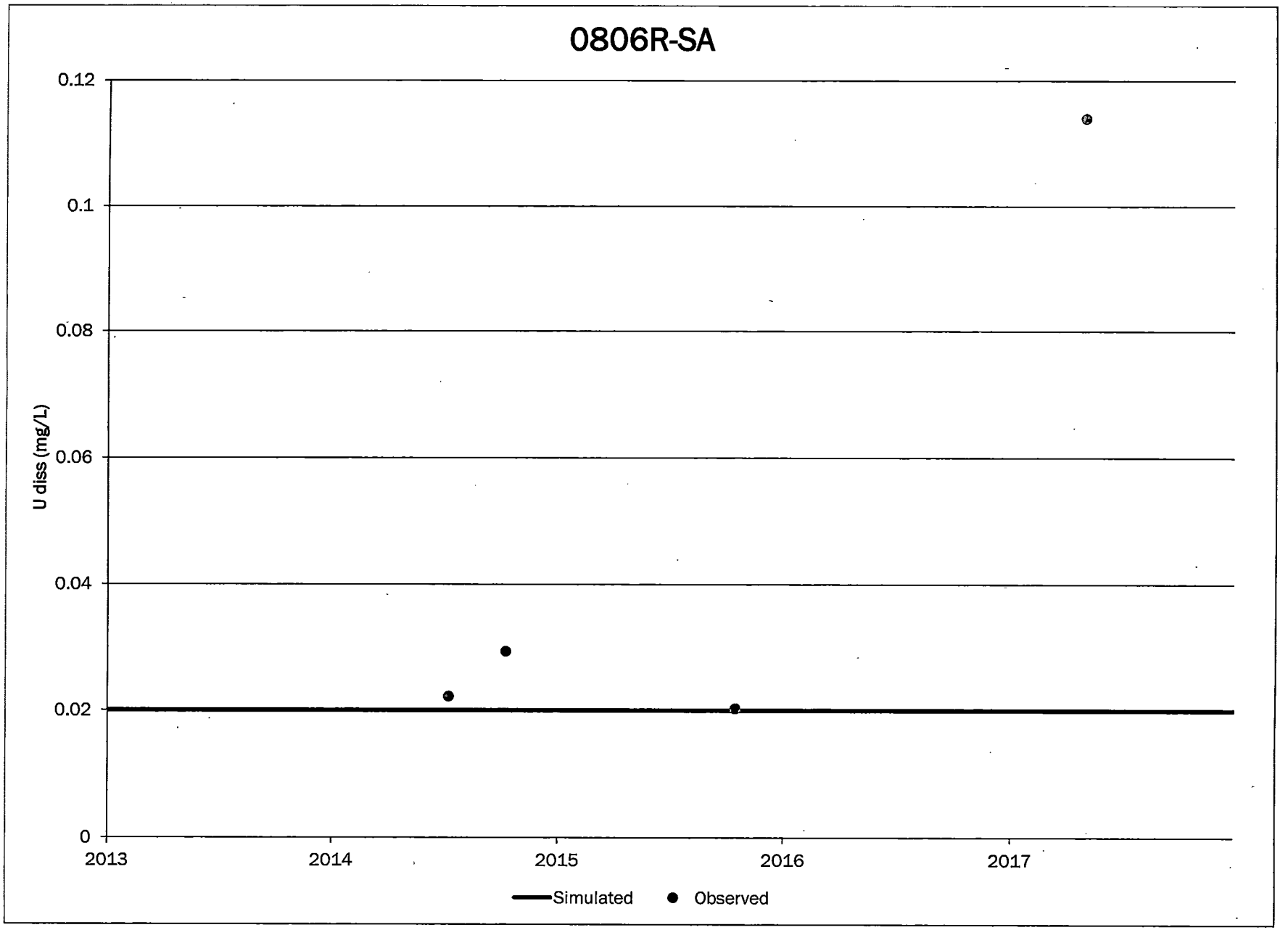
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0806R-SA
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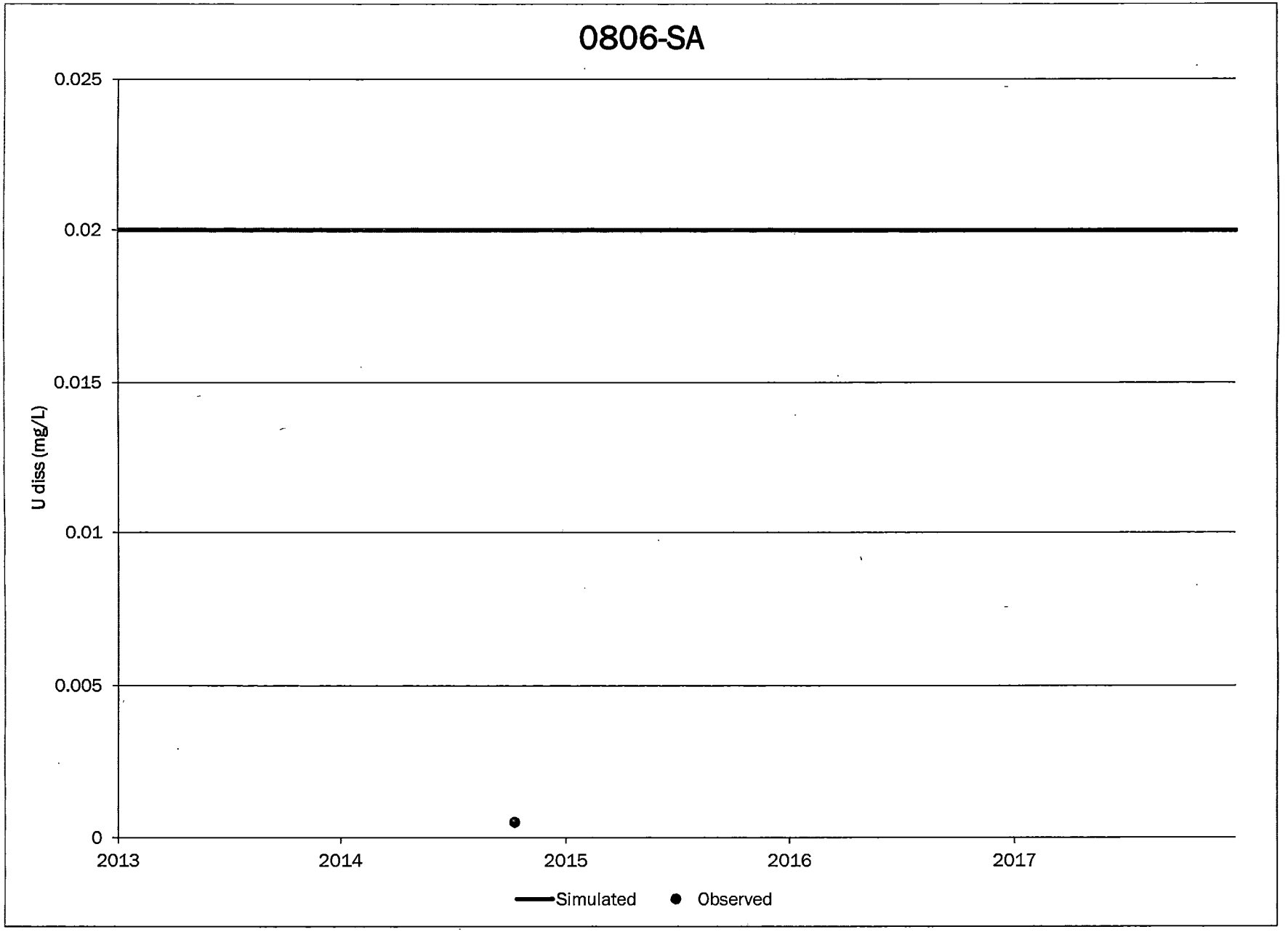
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0806-SA
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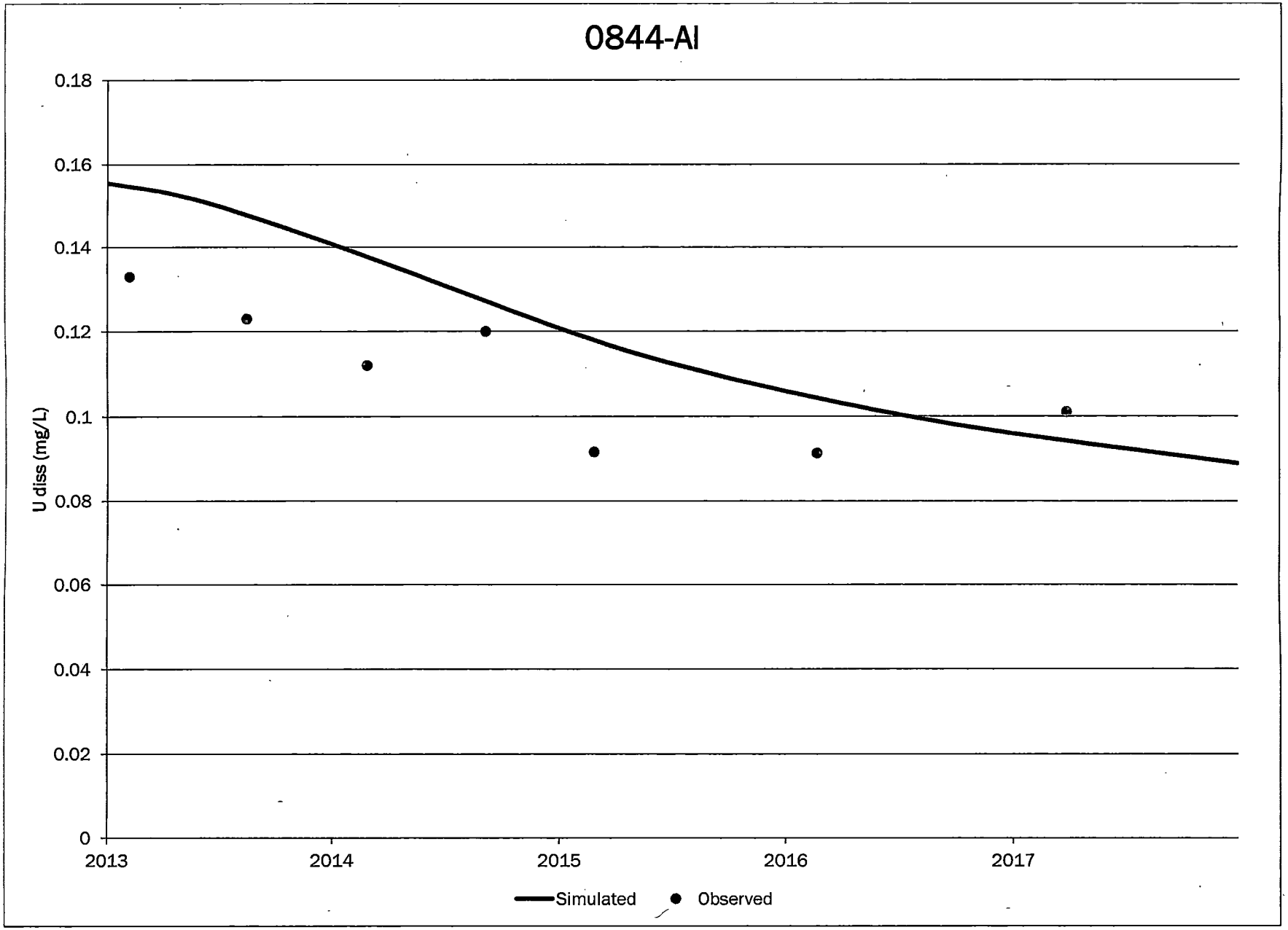
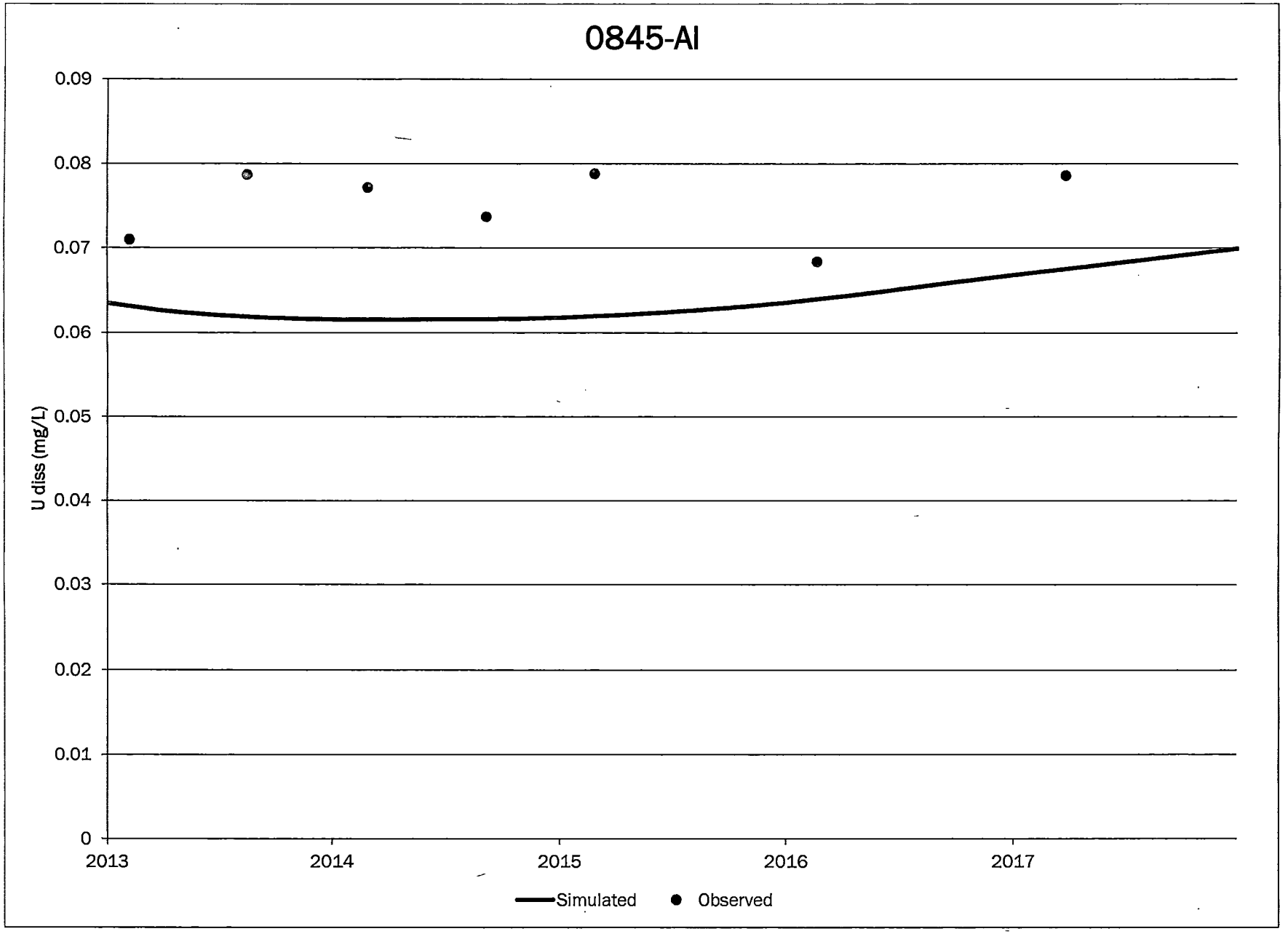
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0844-AI
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0845-AI
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0.08
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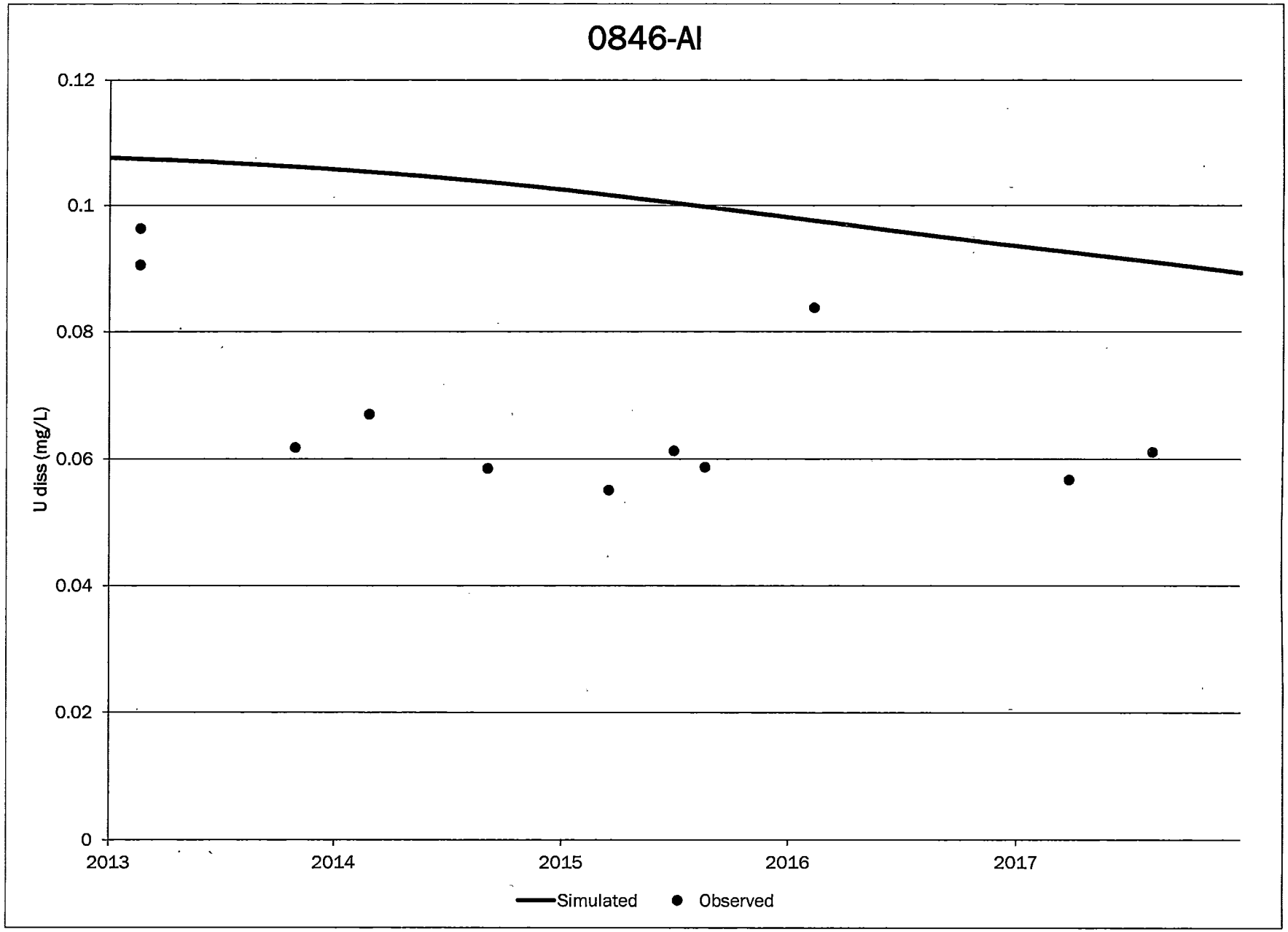
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0846-AI
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0.08
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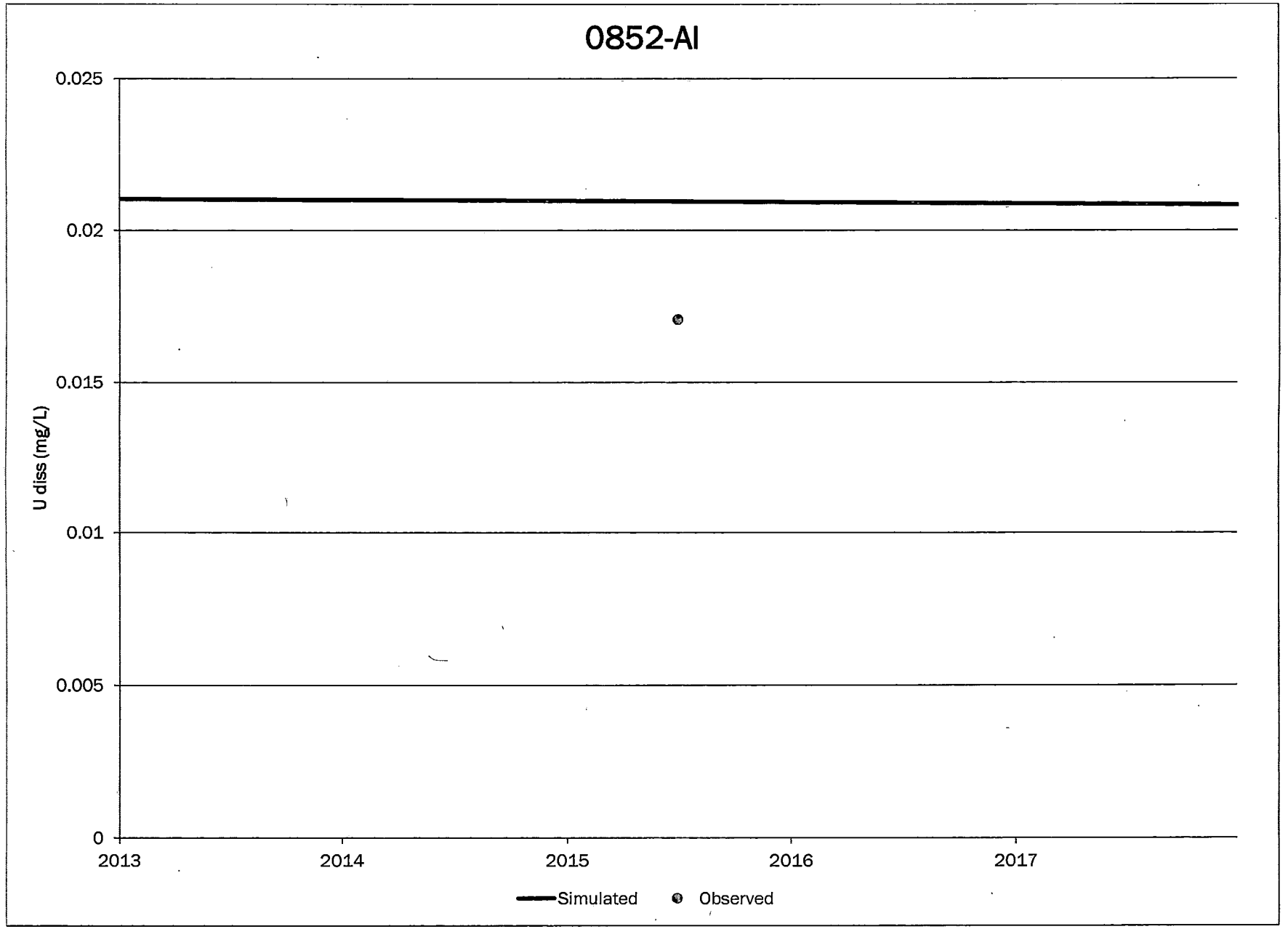
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0852-AI
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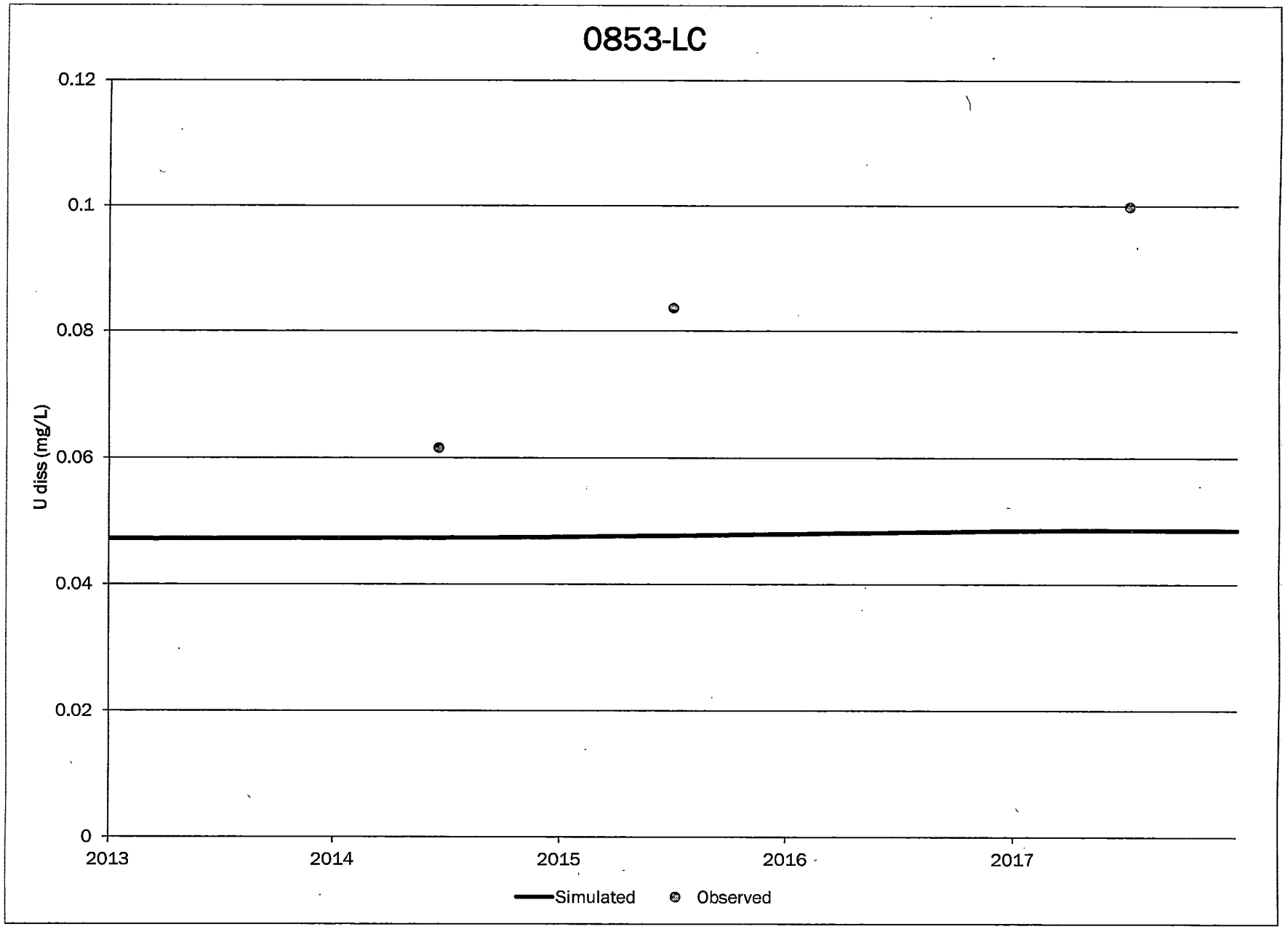
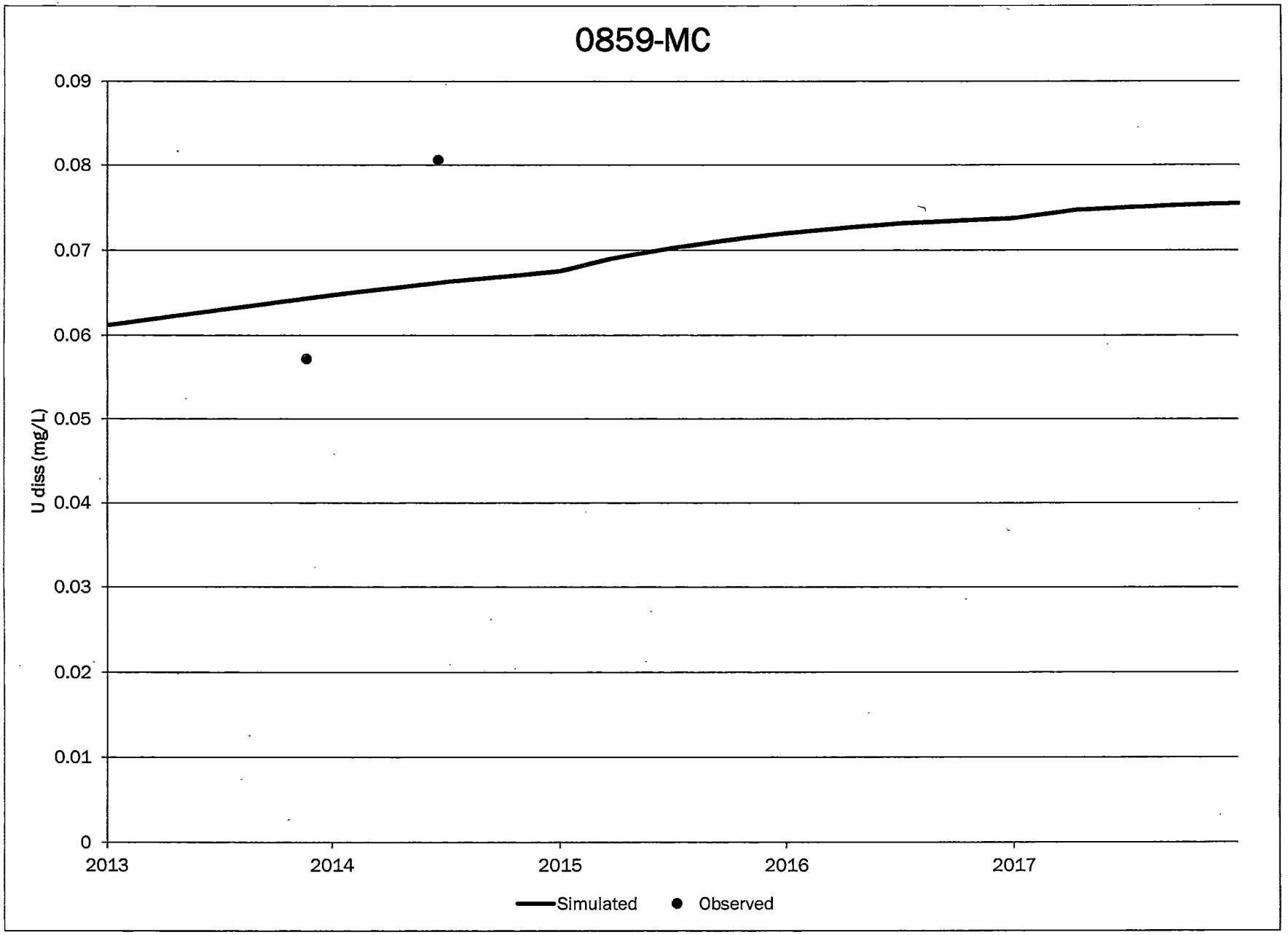
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0853-LC
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0859-MC
0.09
0.08
0.07
0.06
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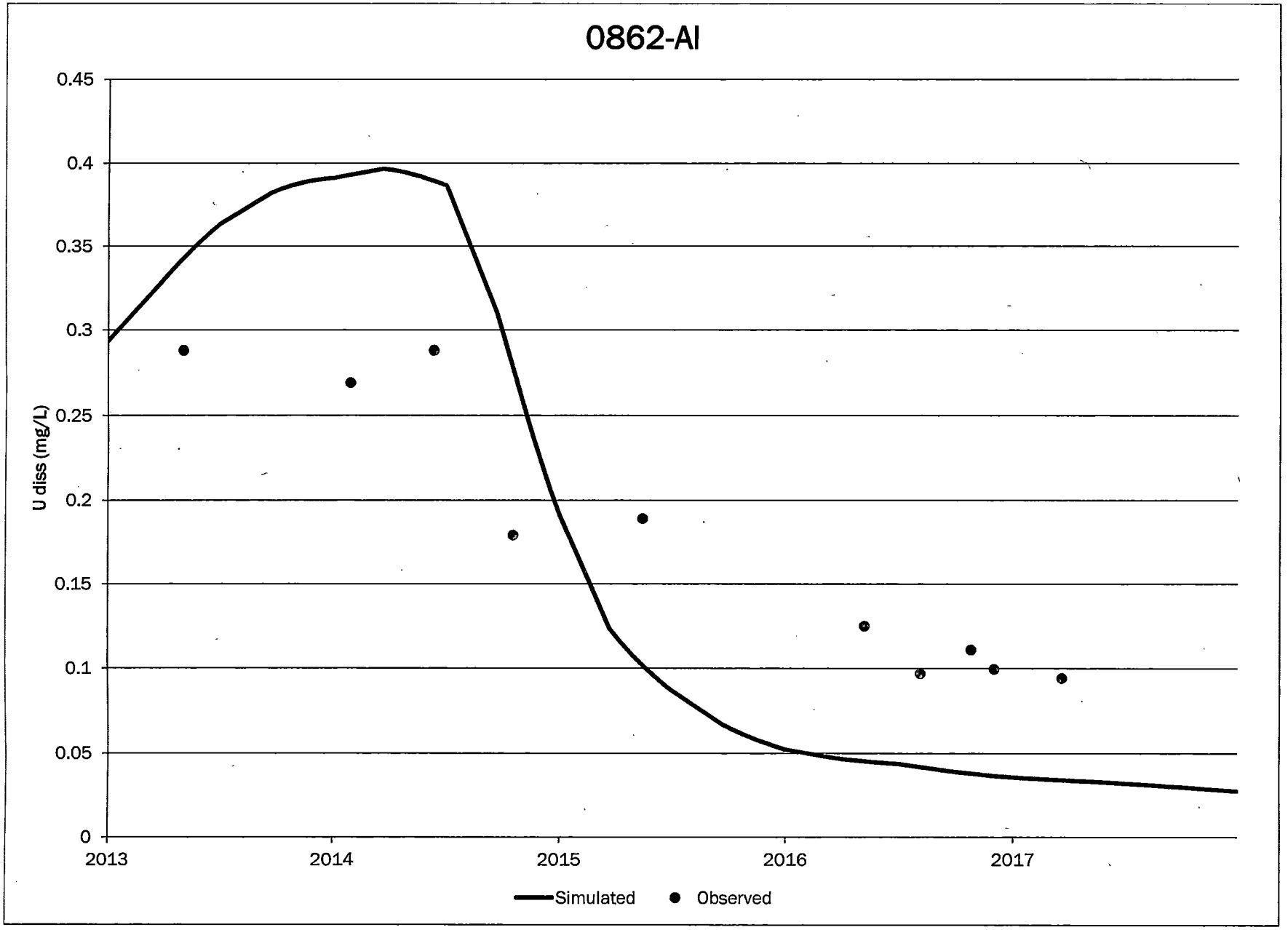
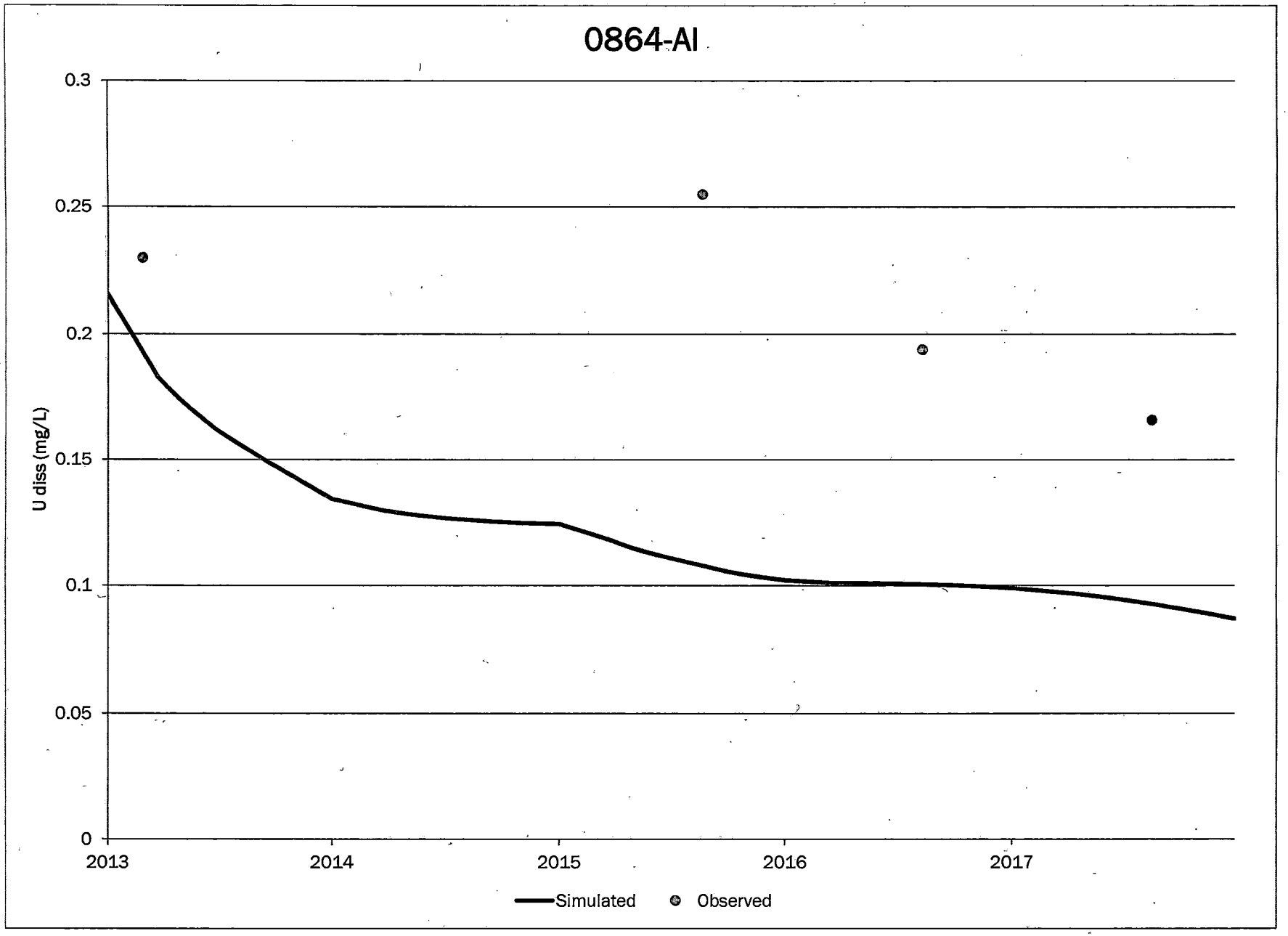
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0862-AI
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0864-AI
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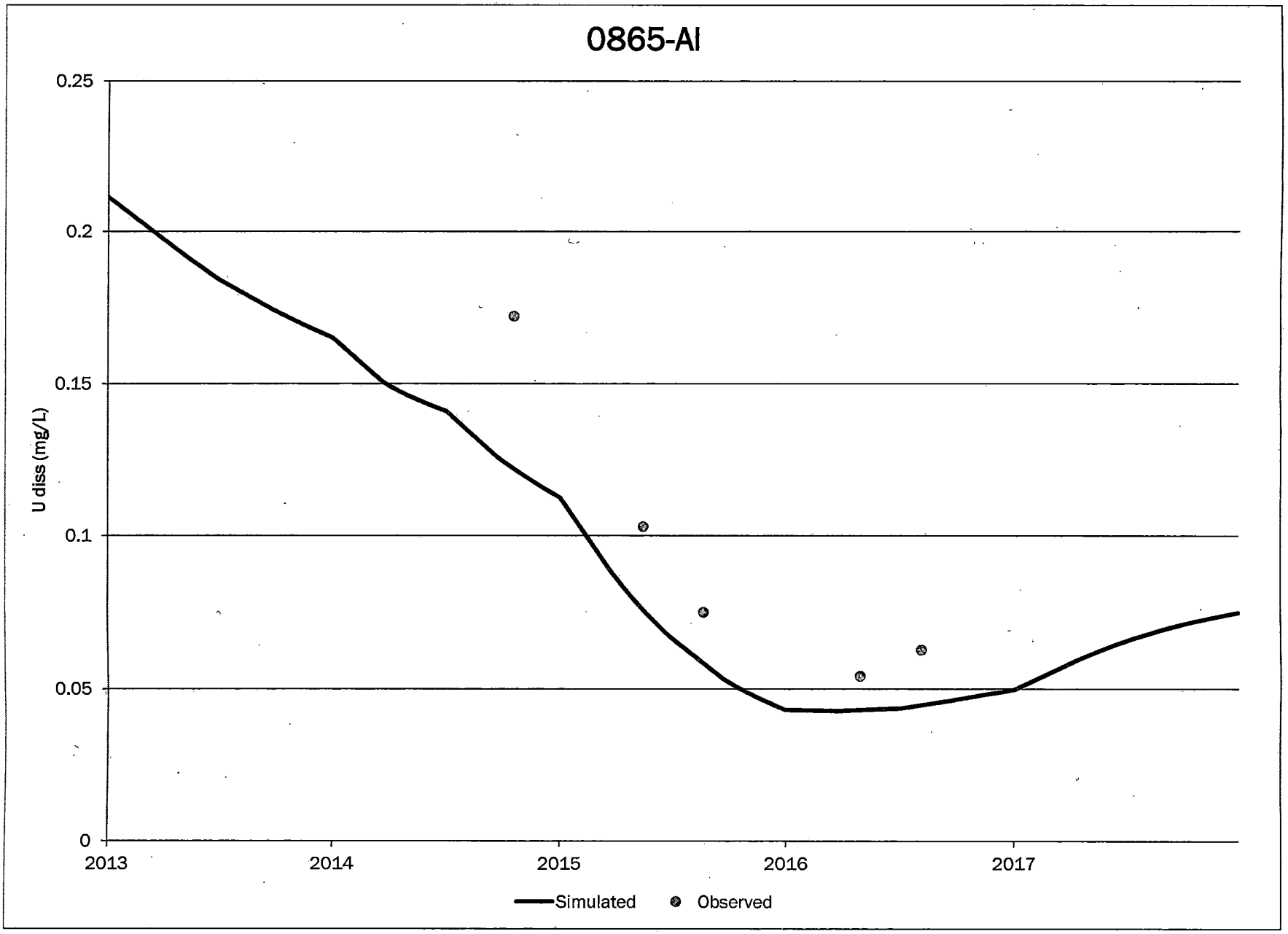
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0865-AI
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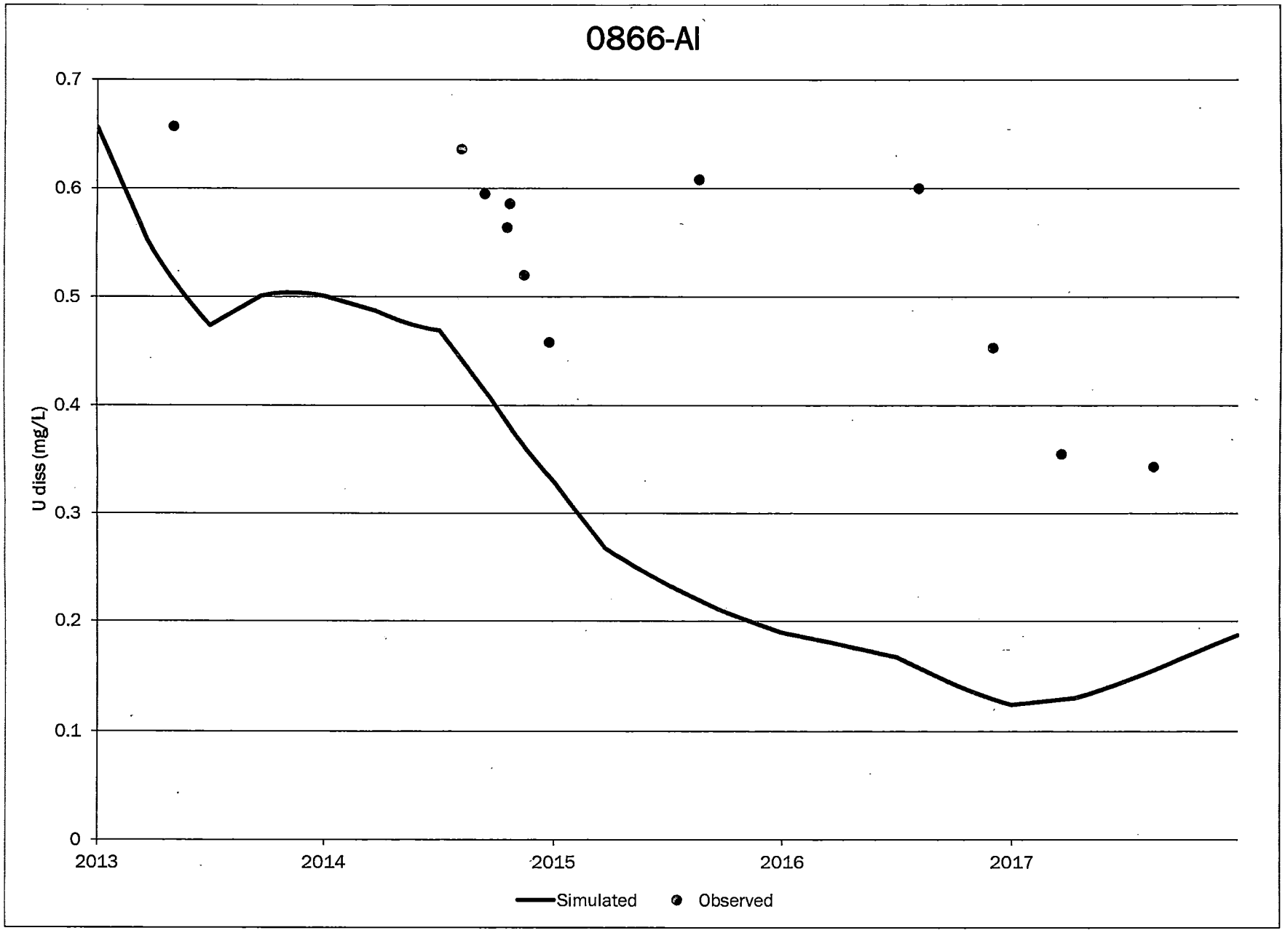
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0866-AI
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0.6
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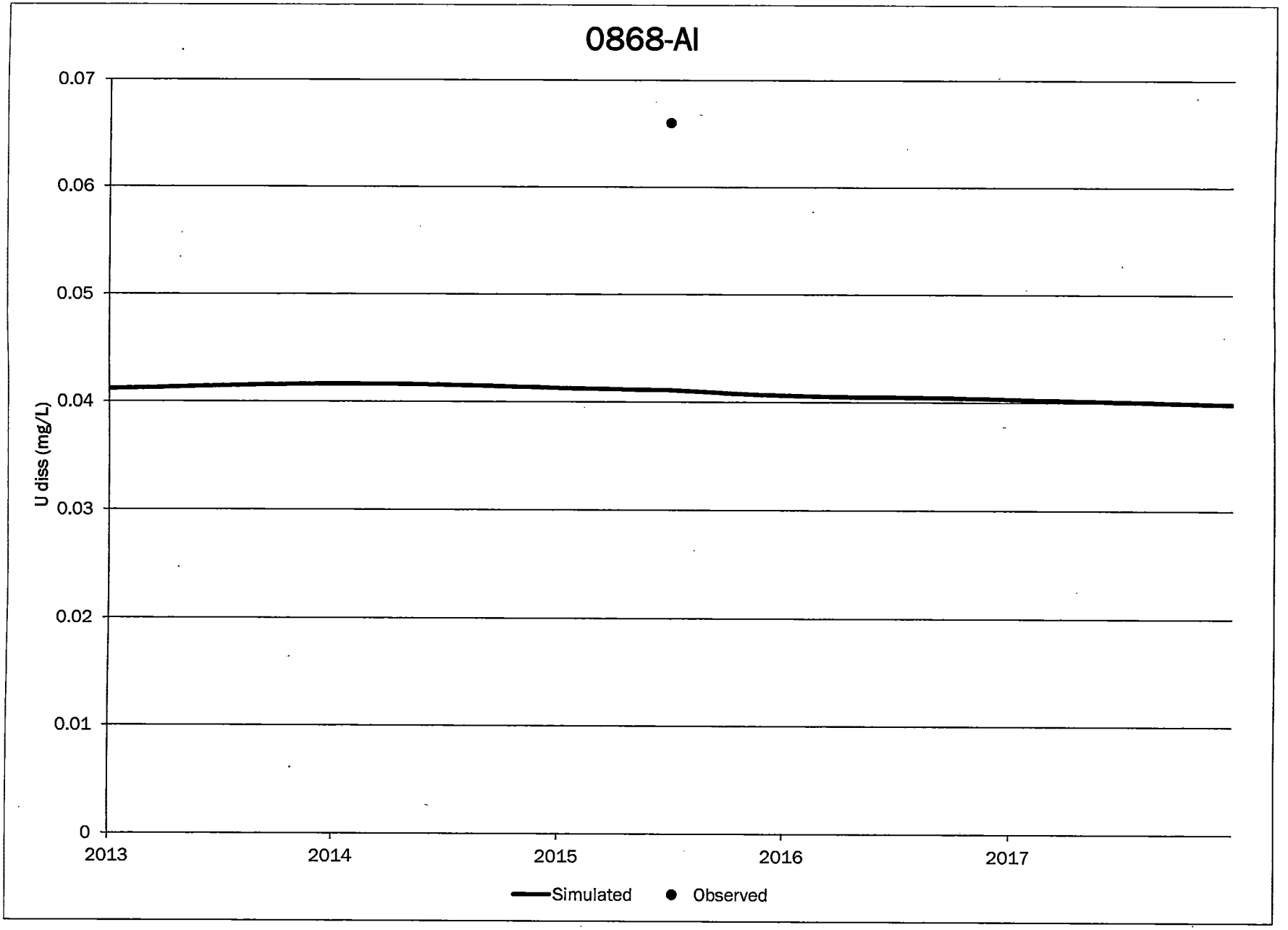
0.3
0.2
0.1
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0868-AI
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0.03
0.02
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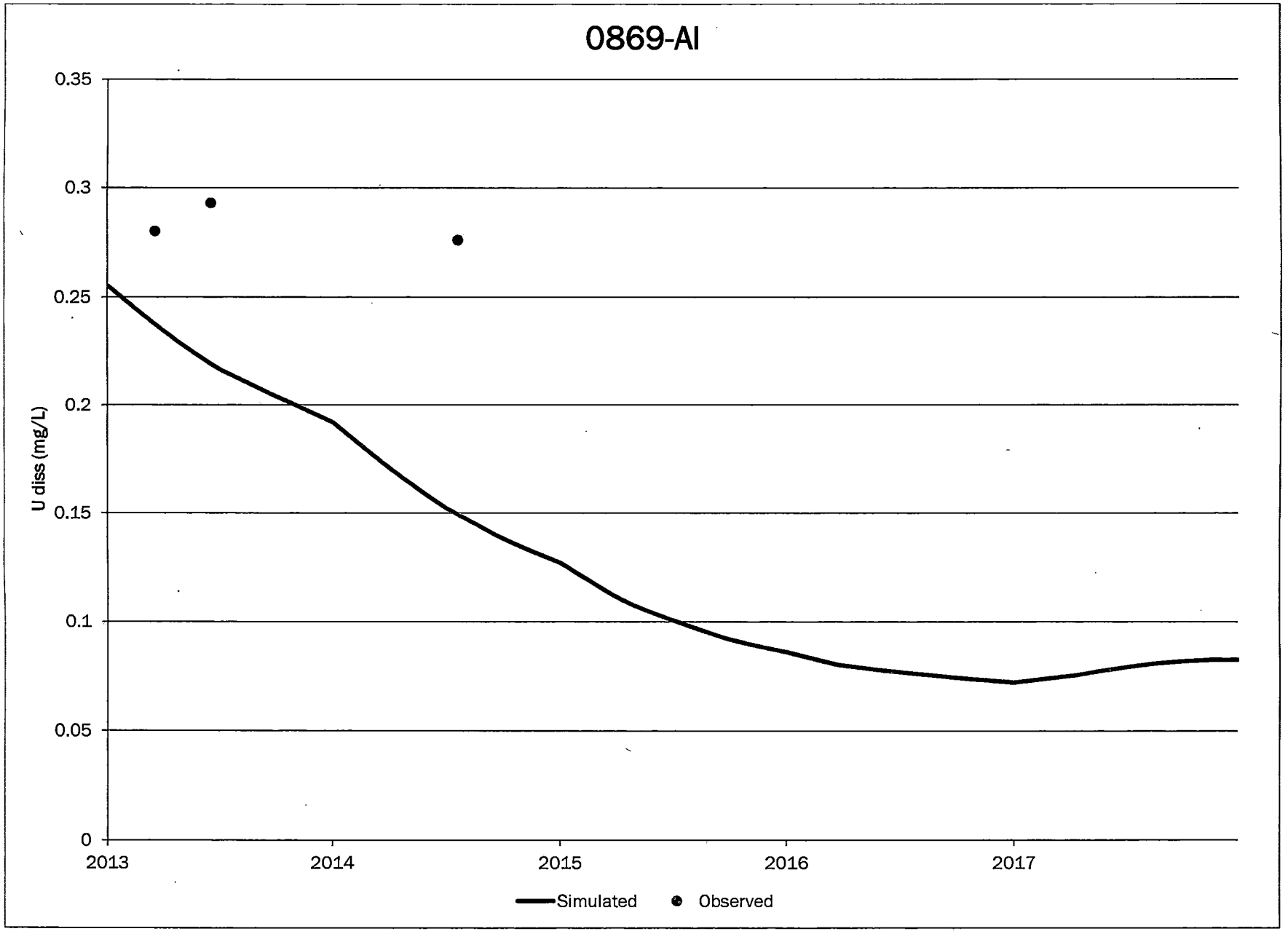
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0869-AI
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0.3
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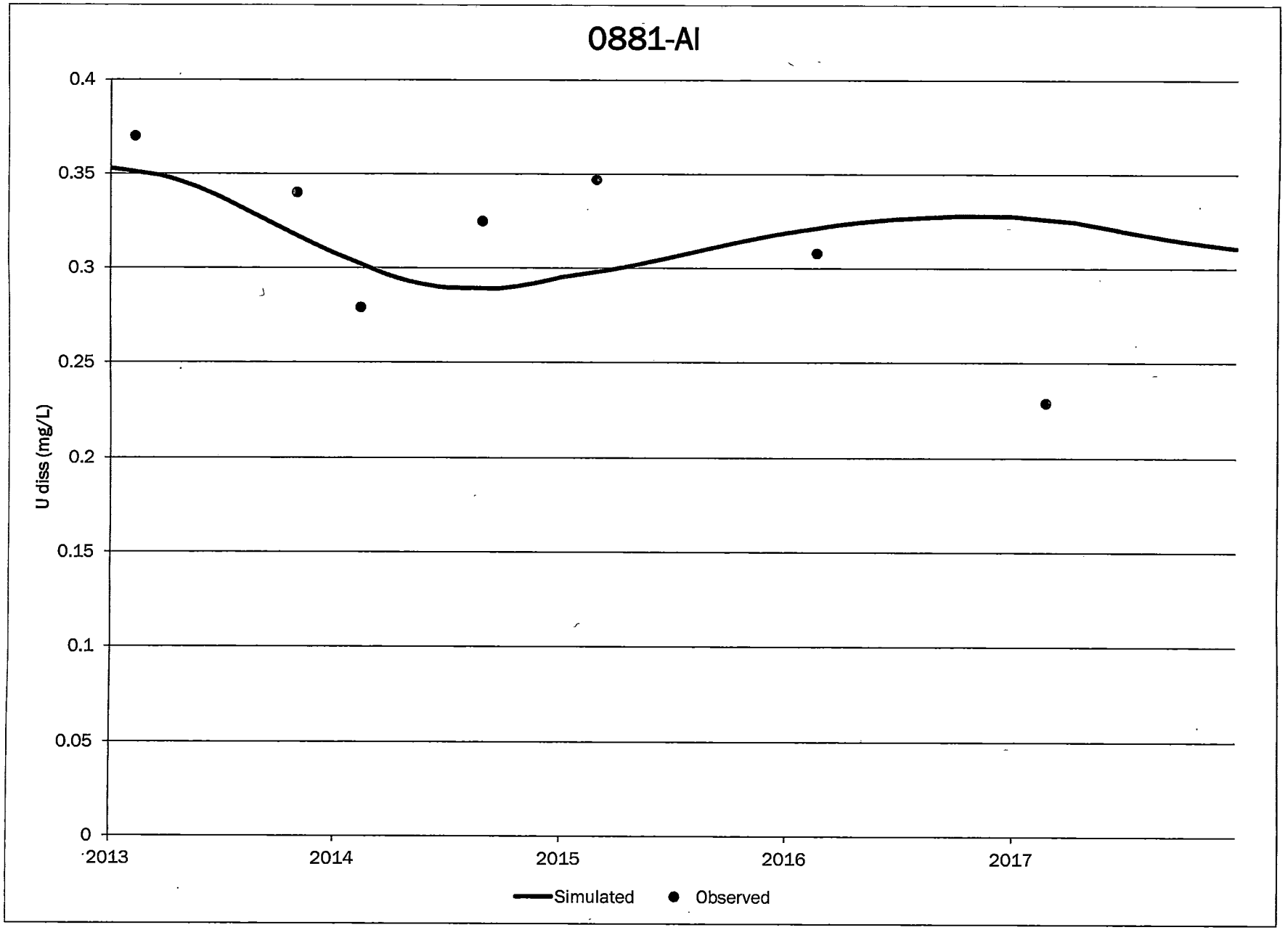
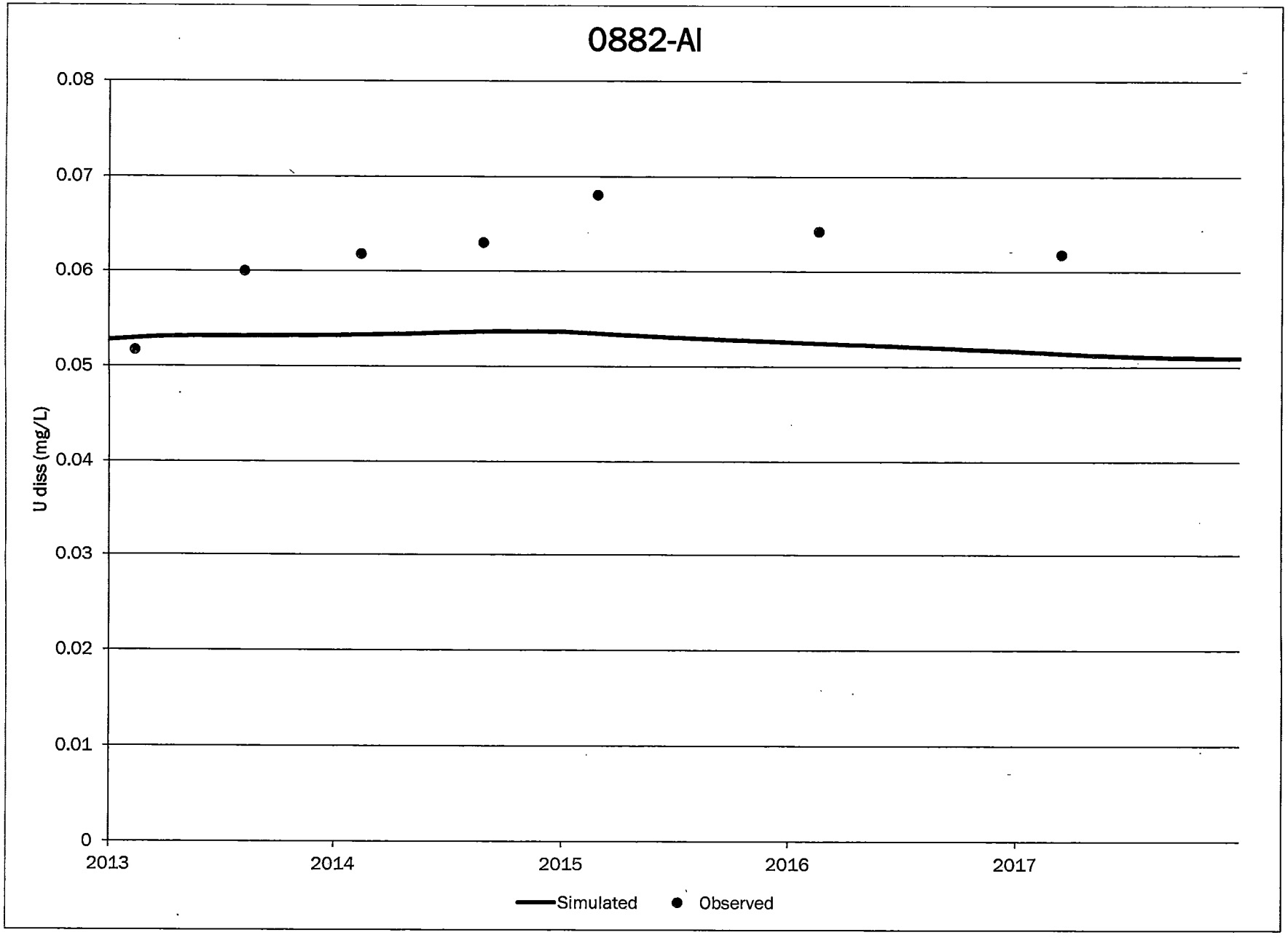
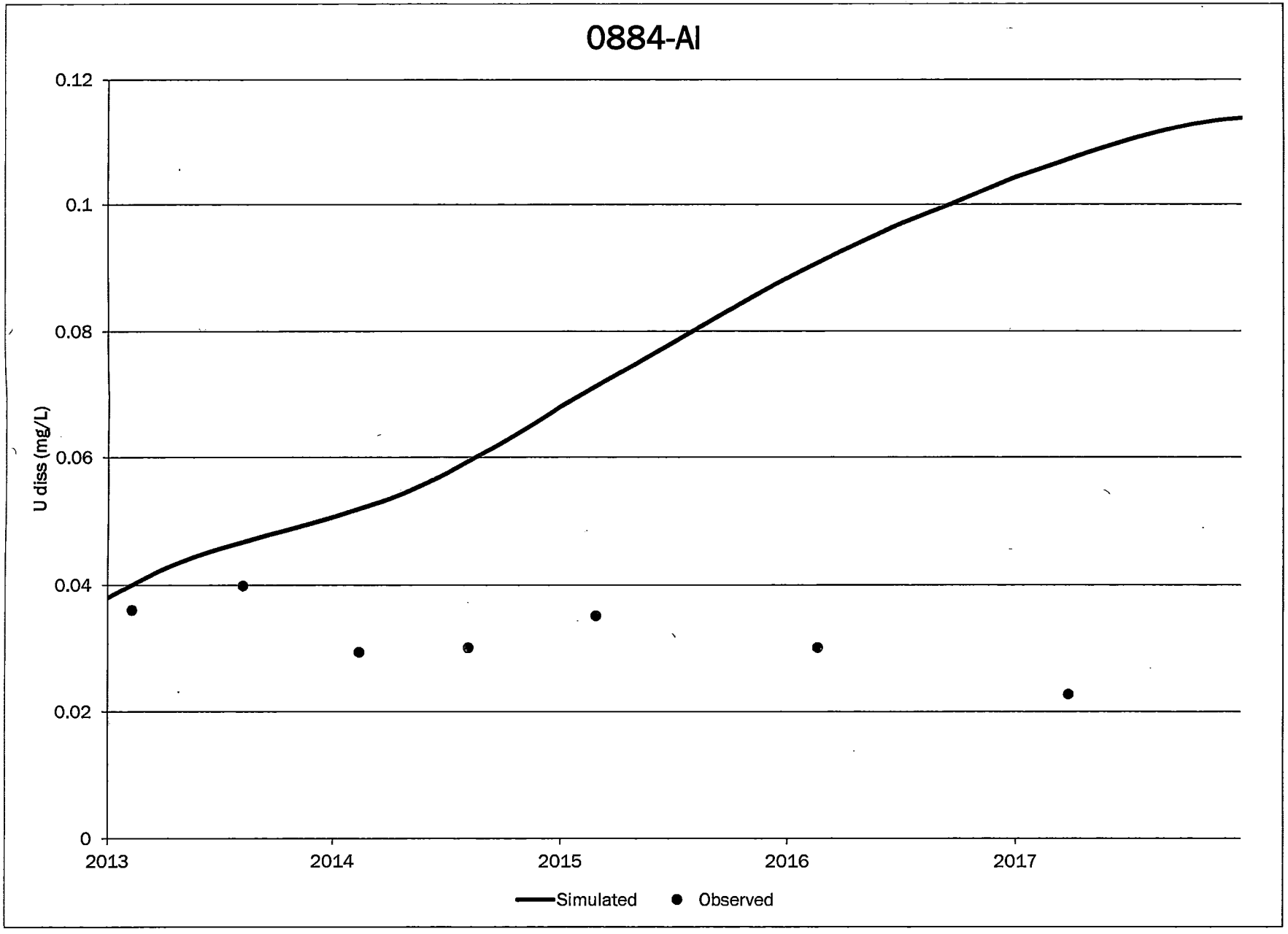
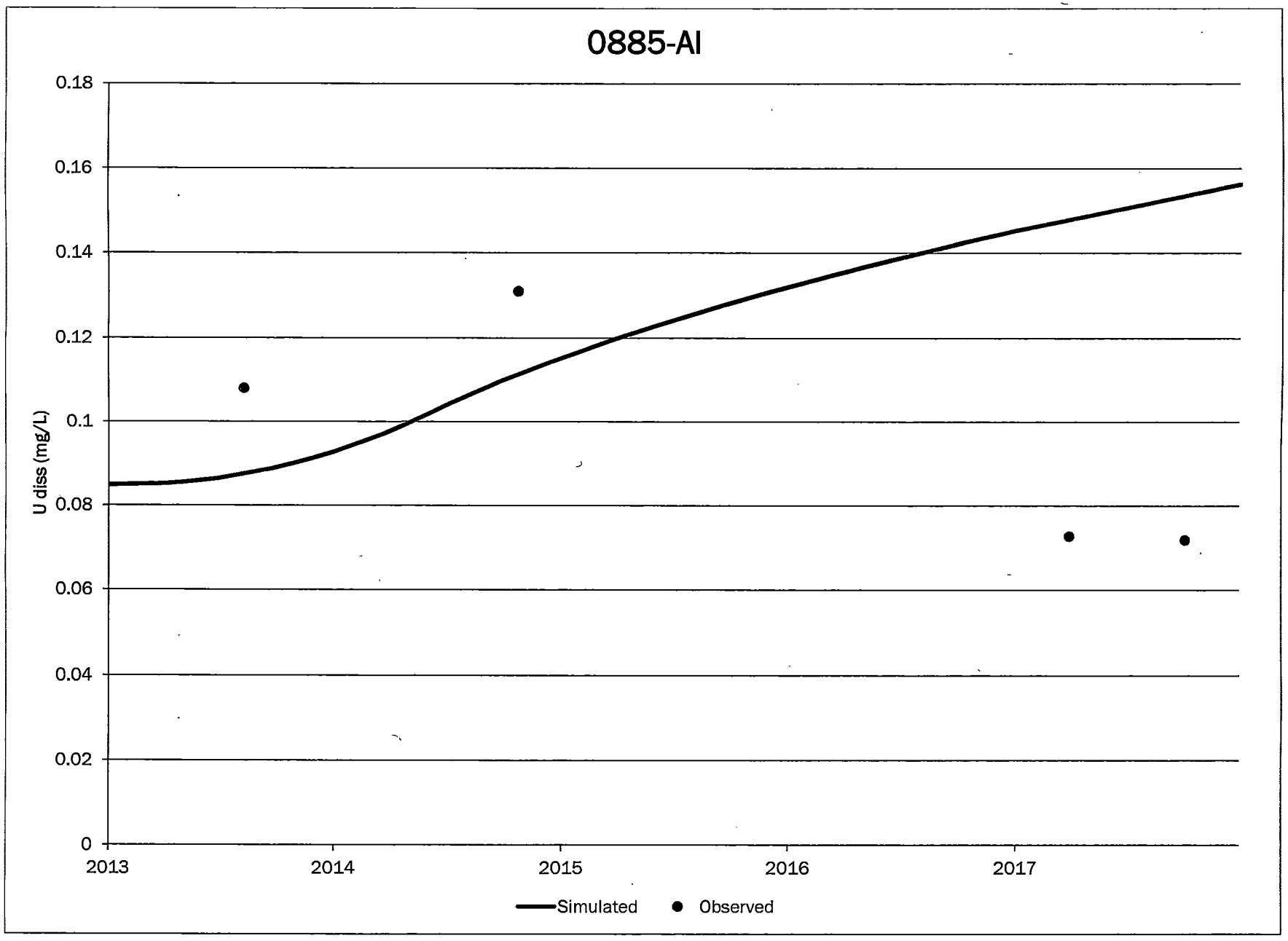
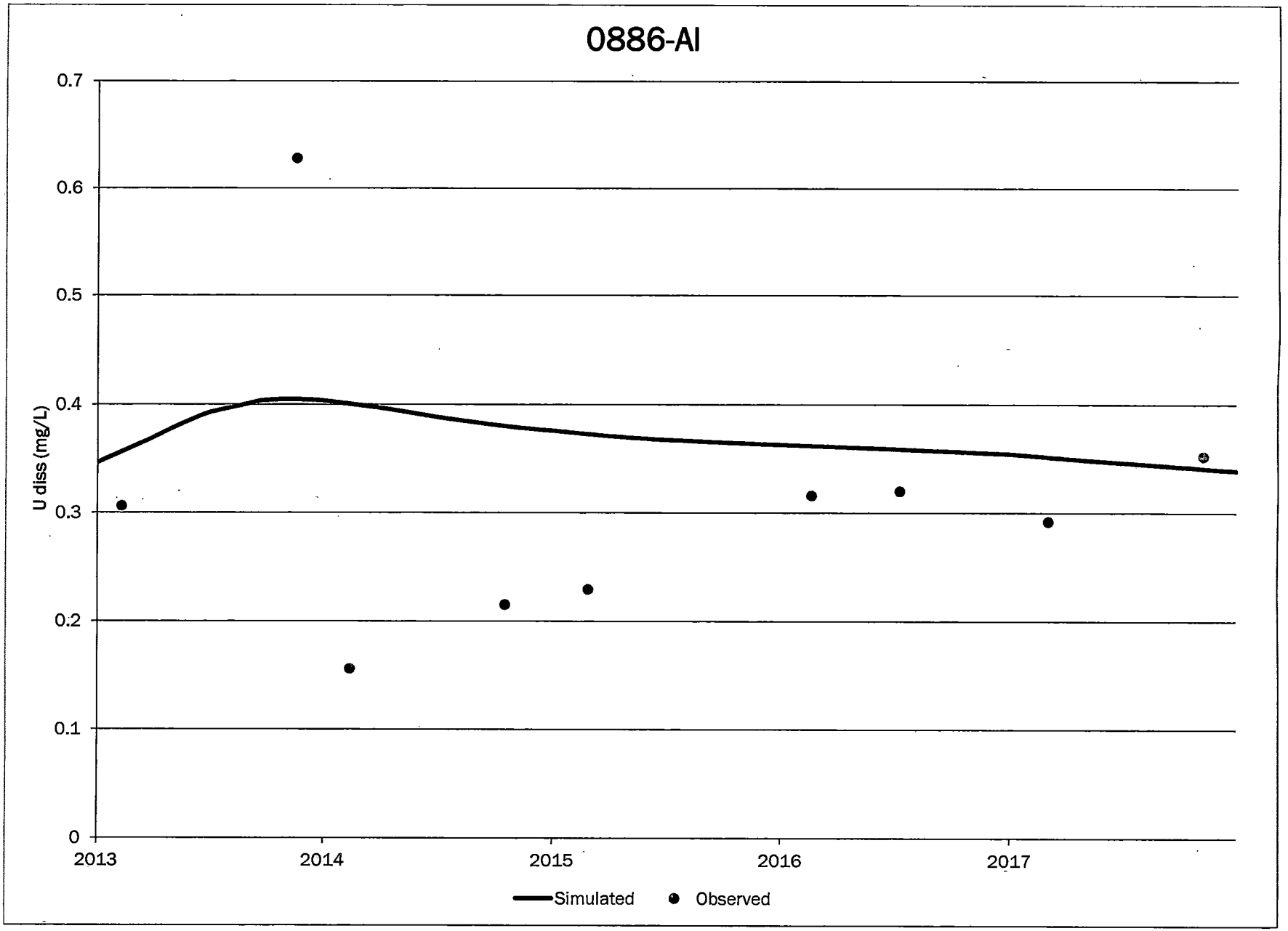
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

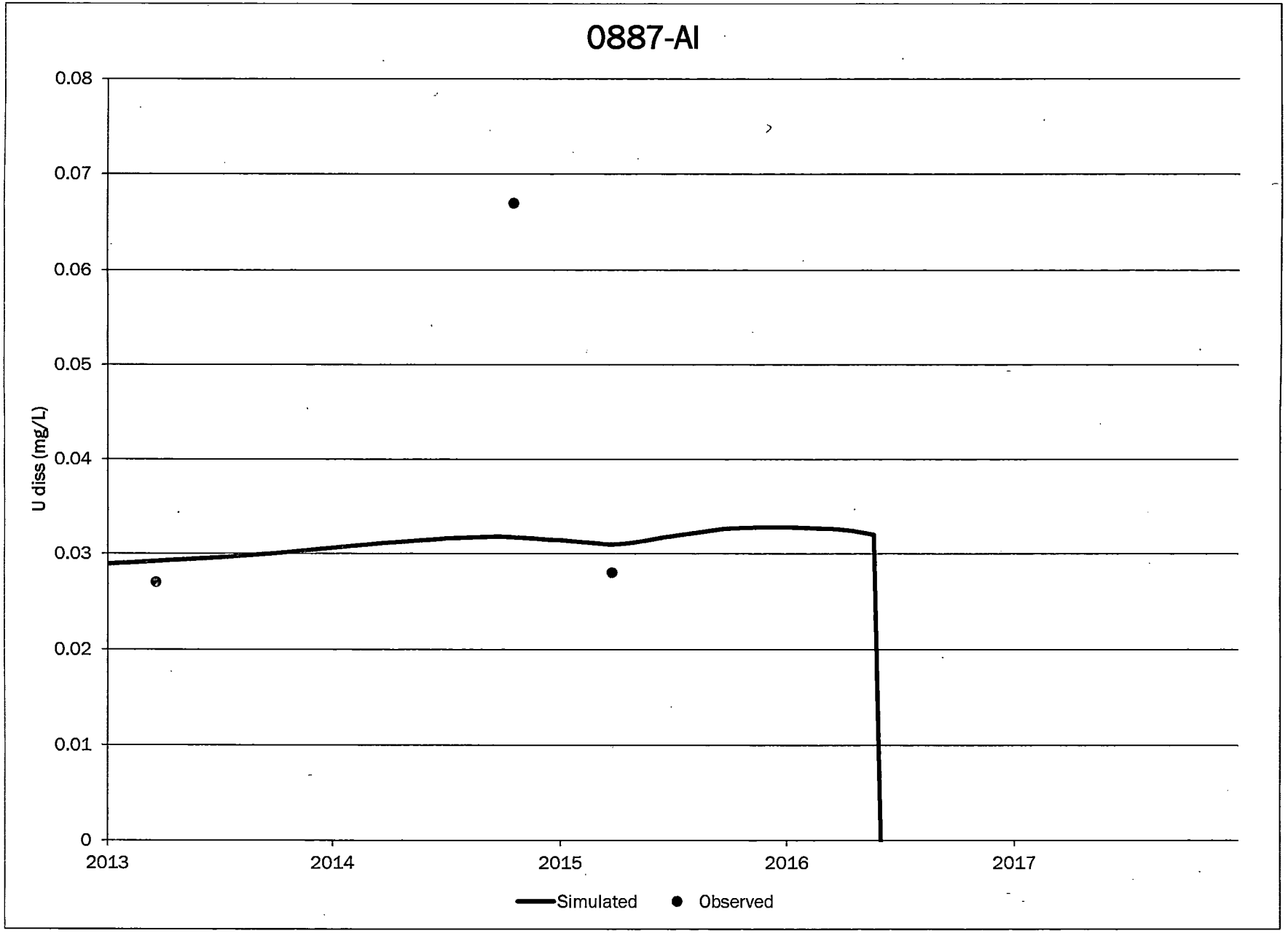

0881-AI
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

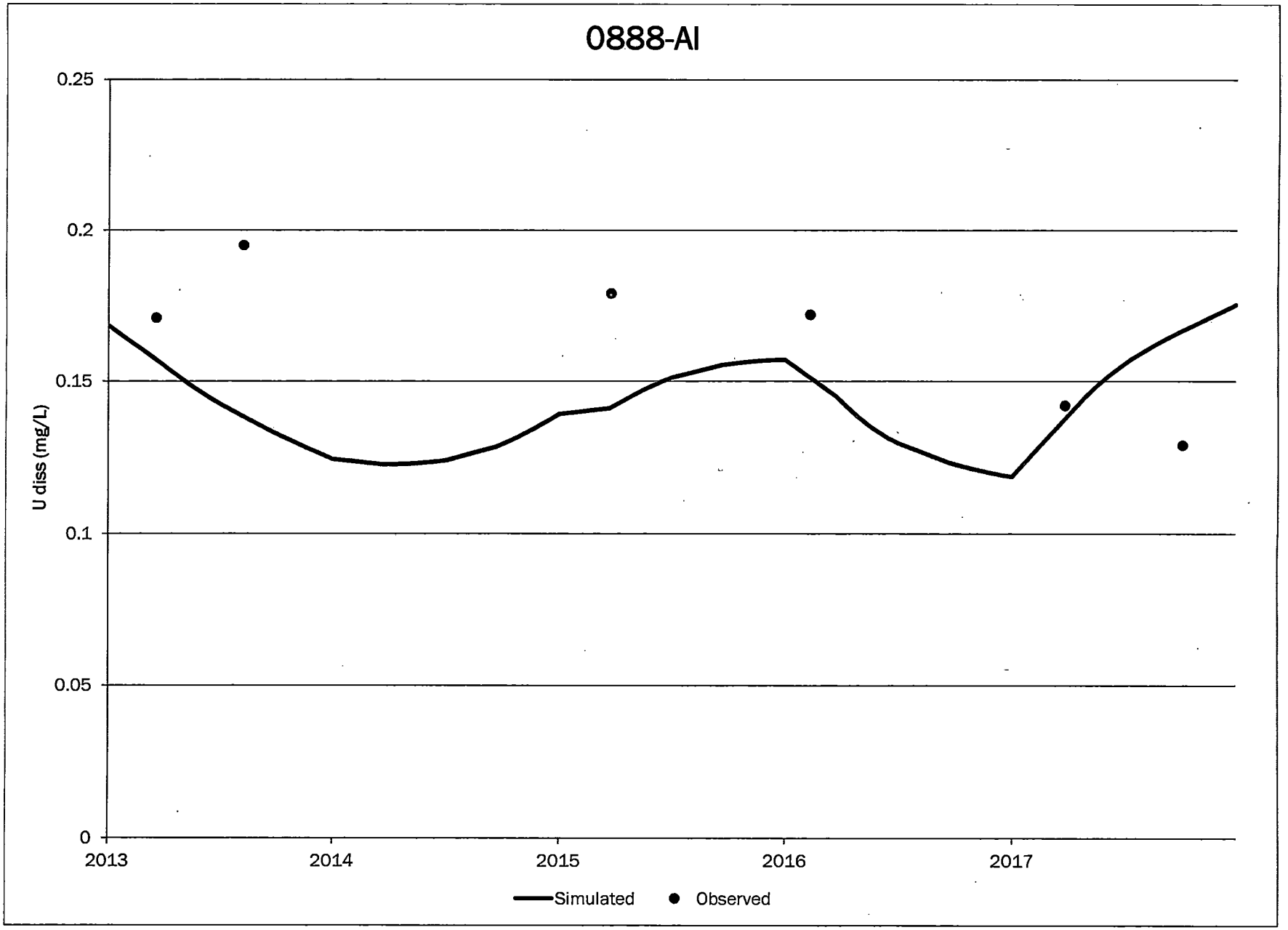

0882-AI
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

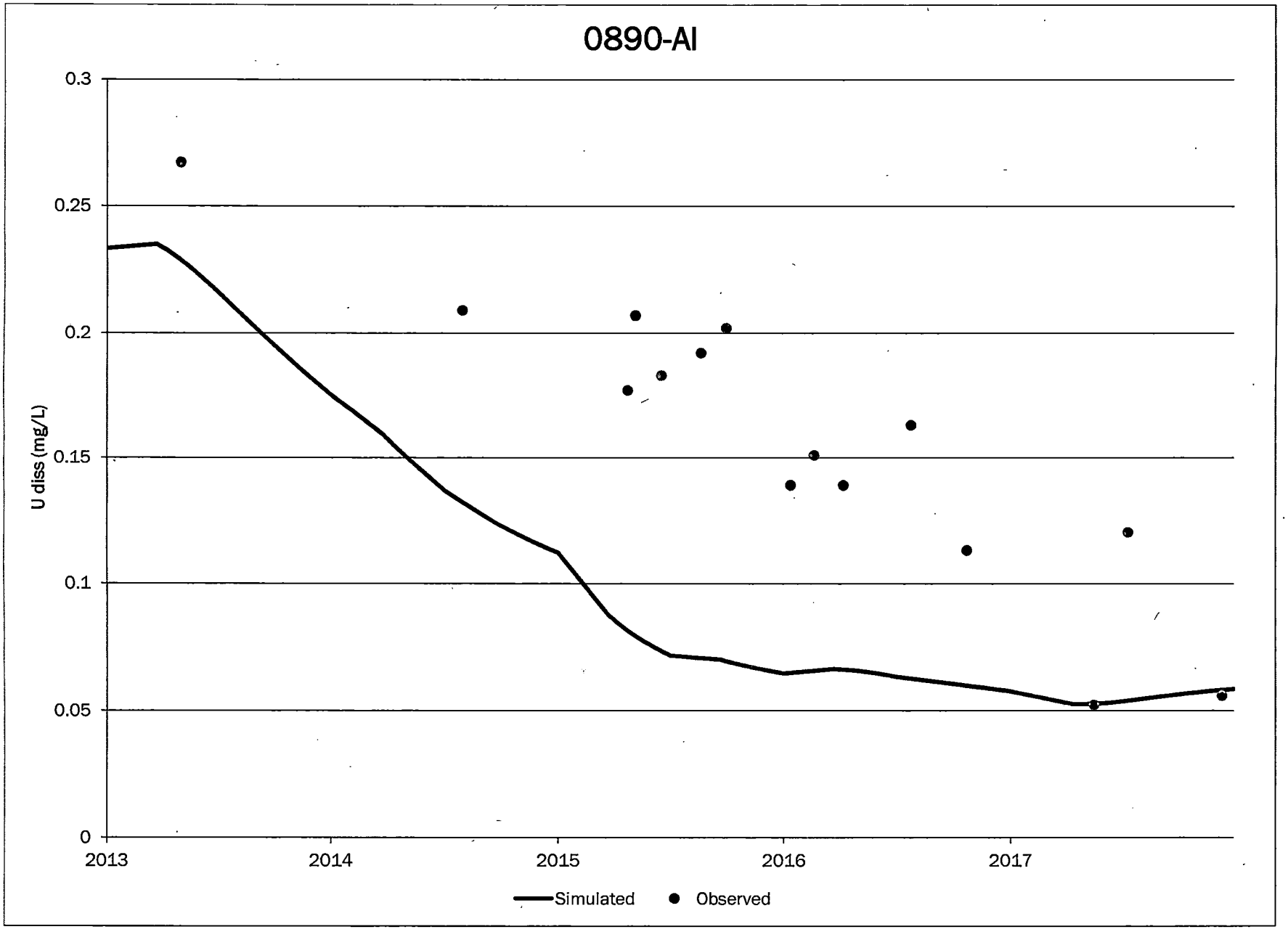

0884-AI
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

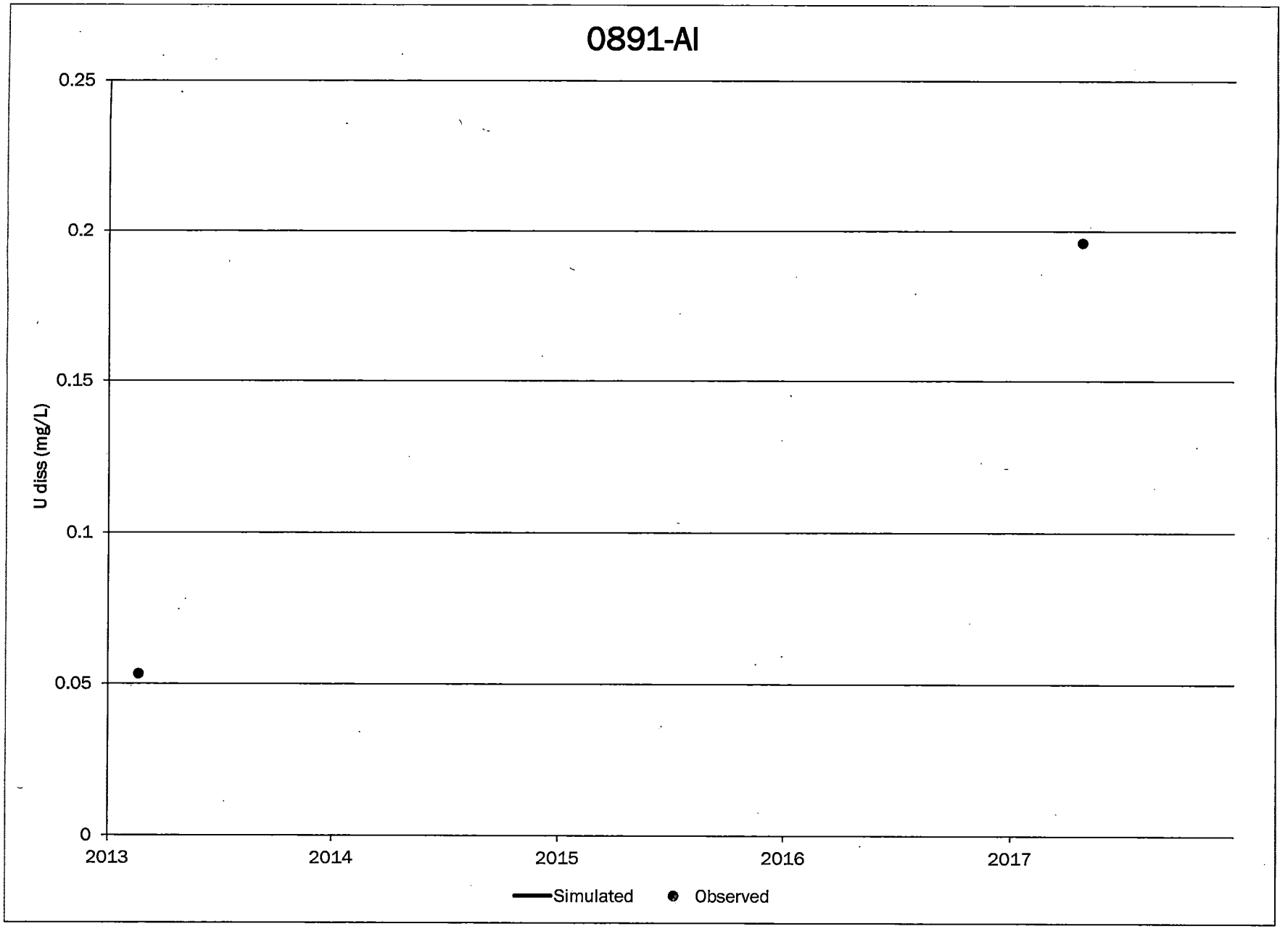

0885-AI
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

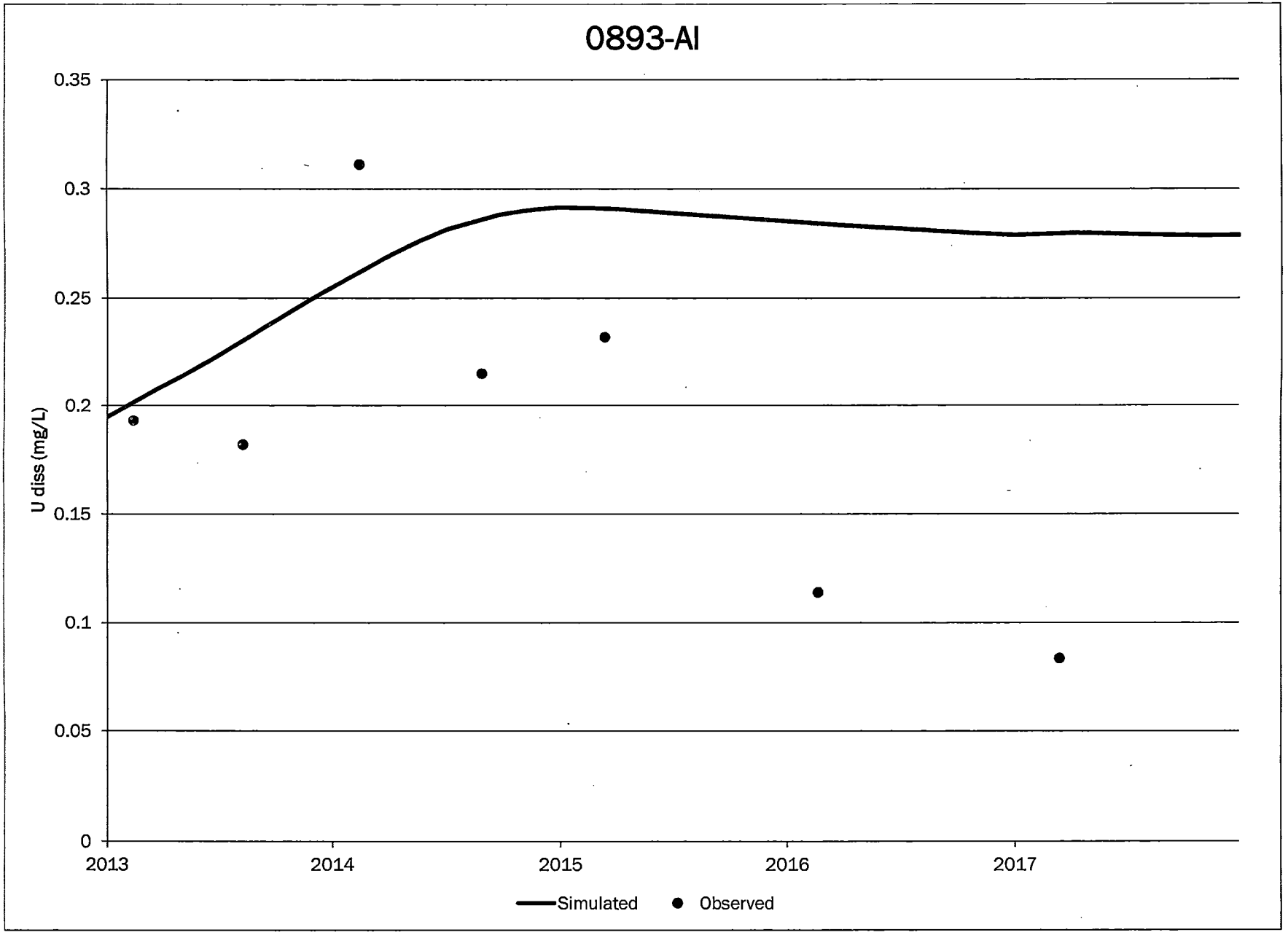

0886-AI
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

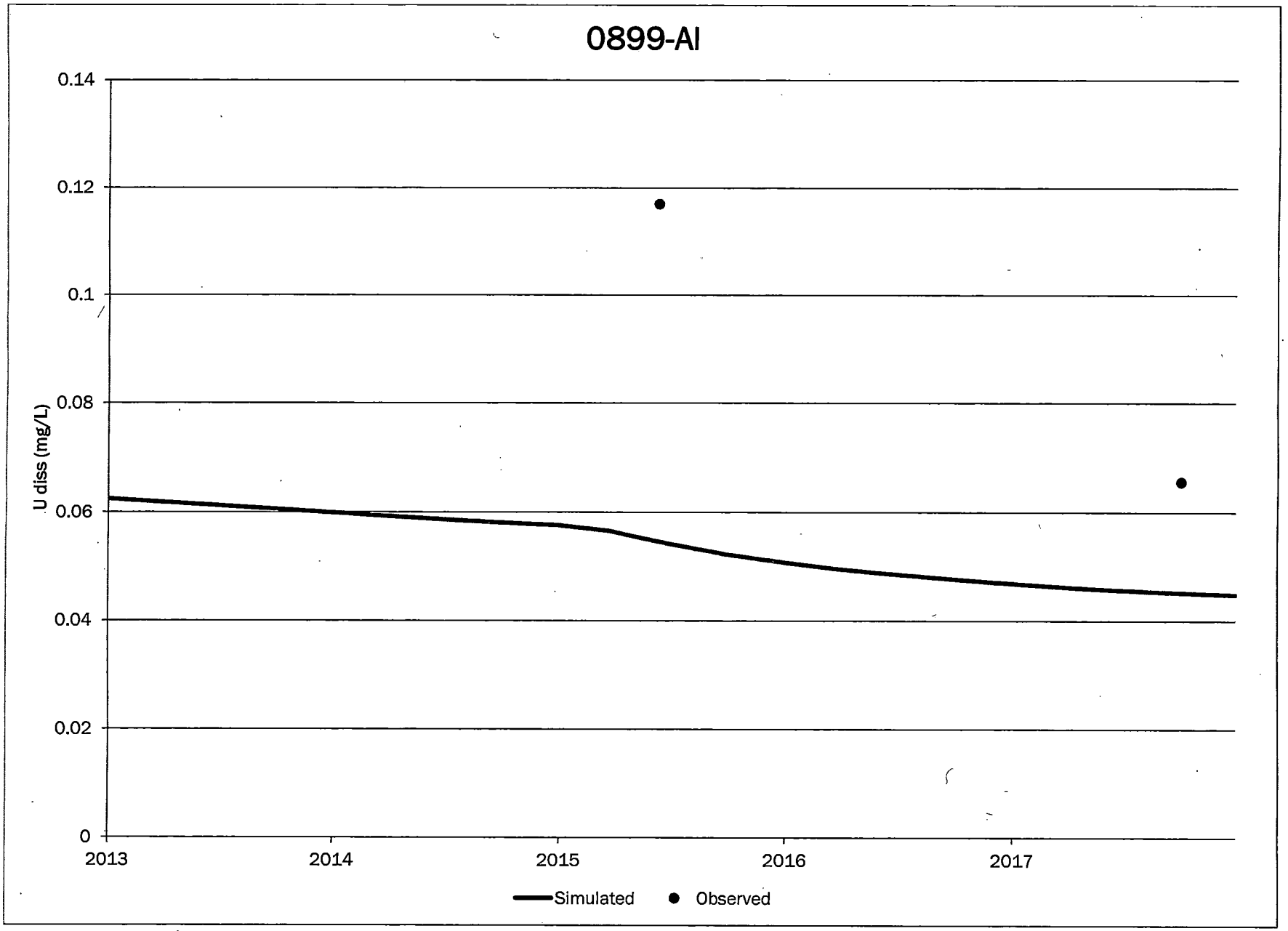

0887-AI
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

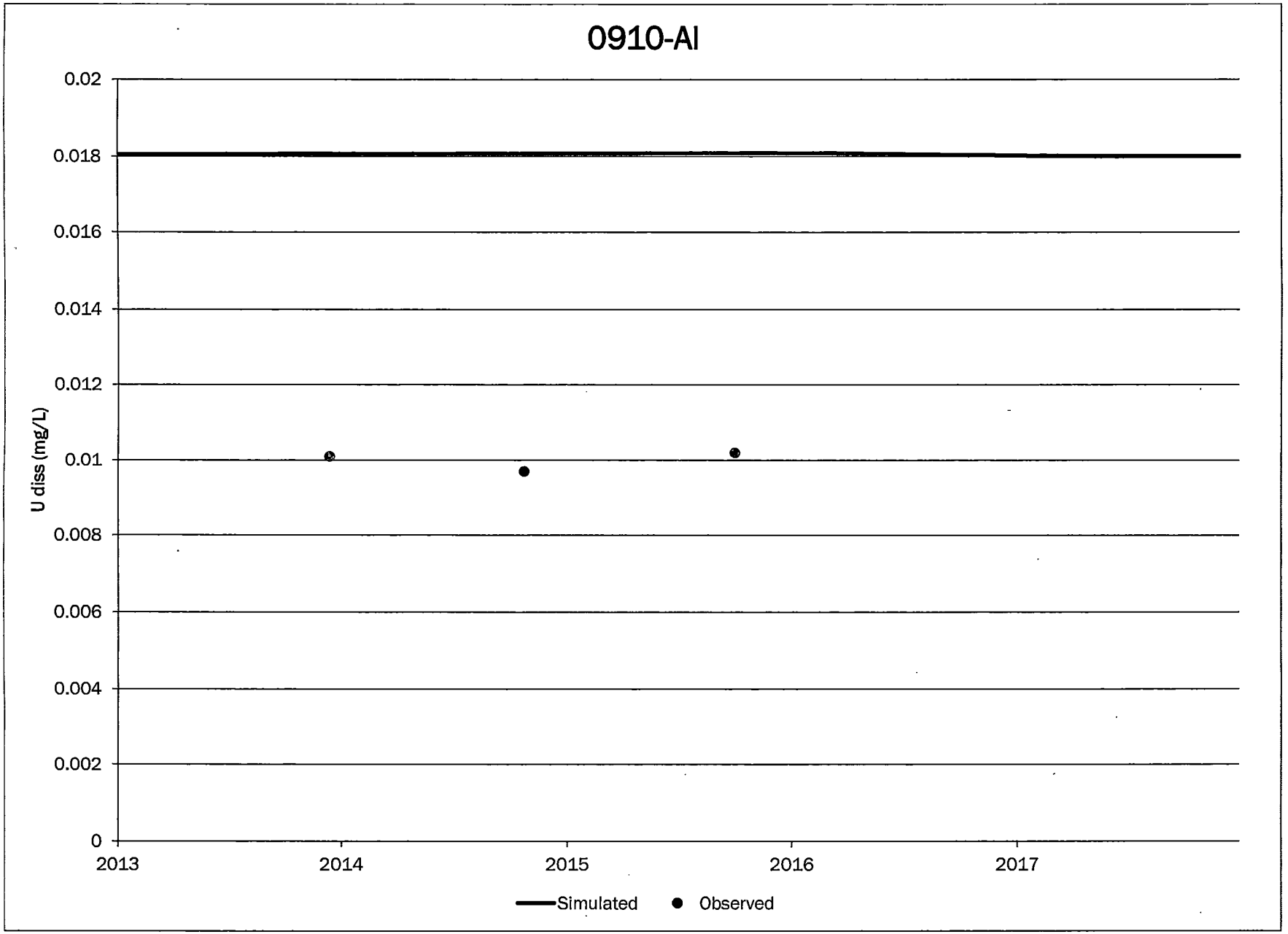

0888-AI
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

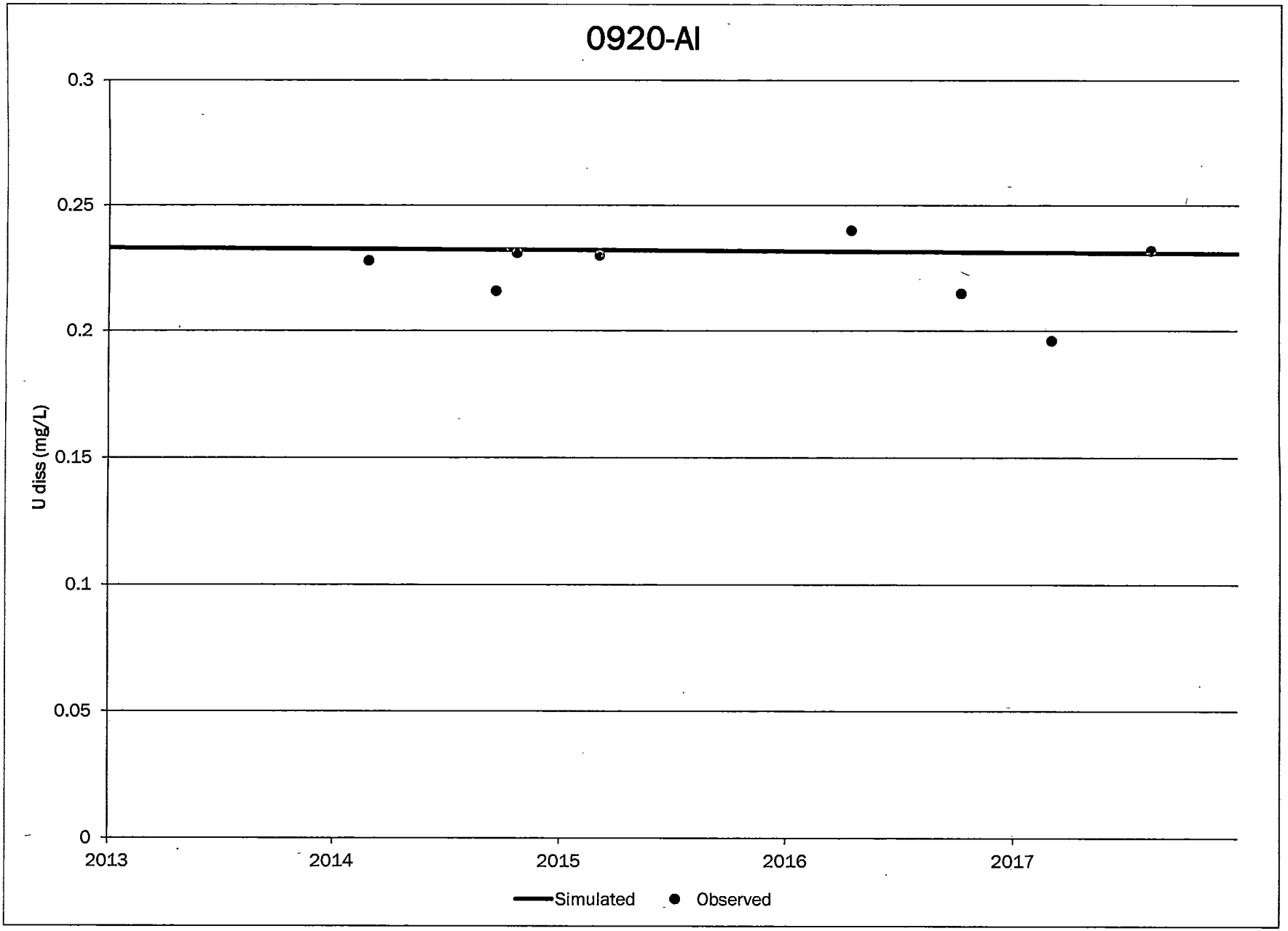

0890-AI
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

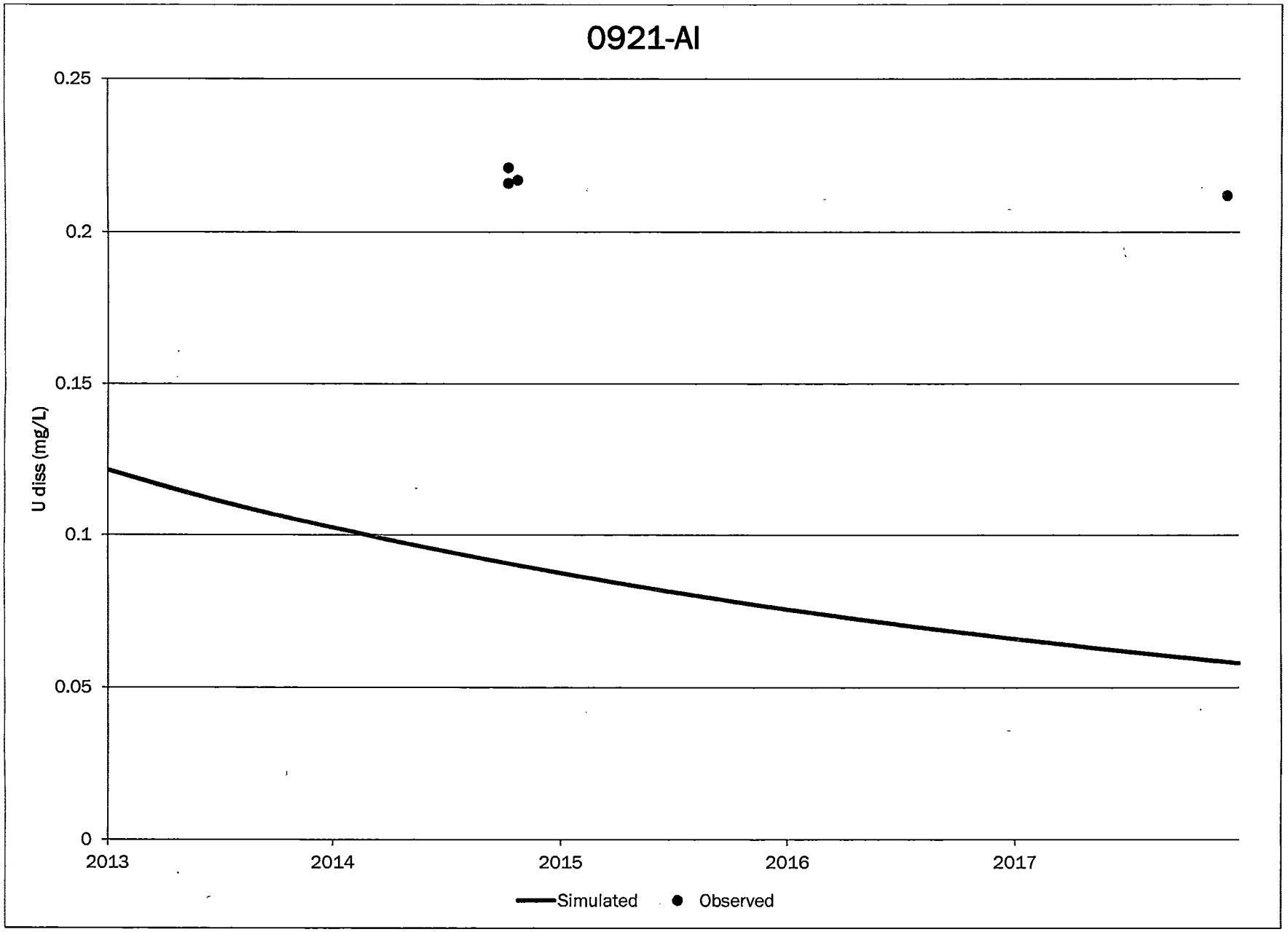

0891-AI
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

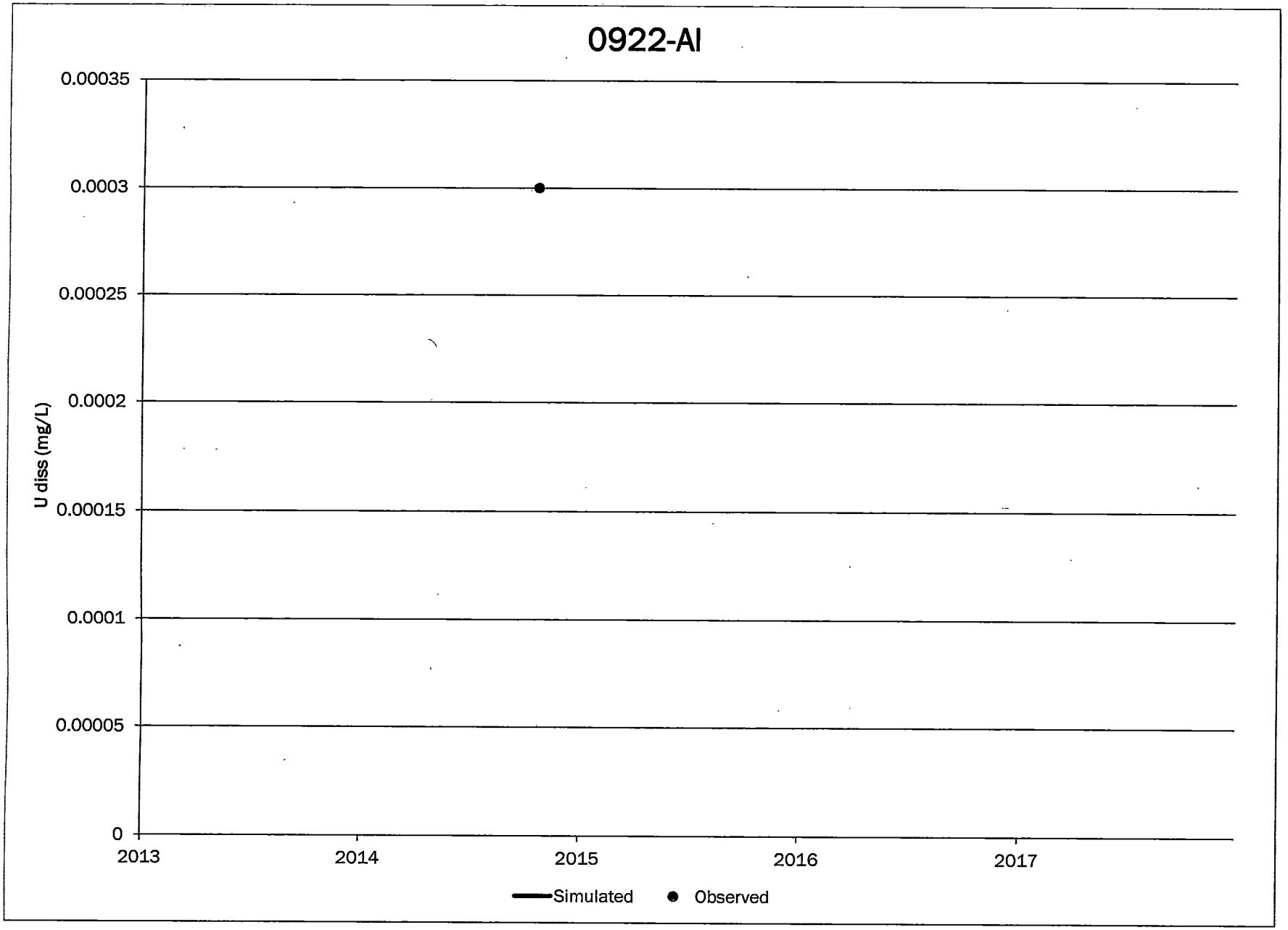

0893-AI
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

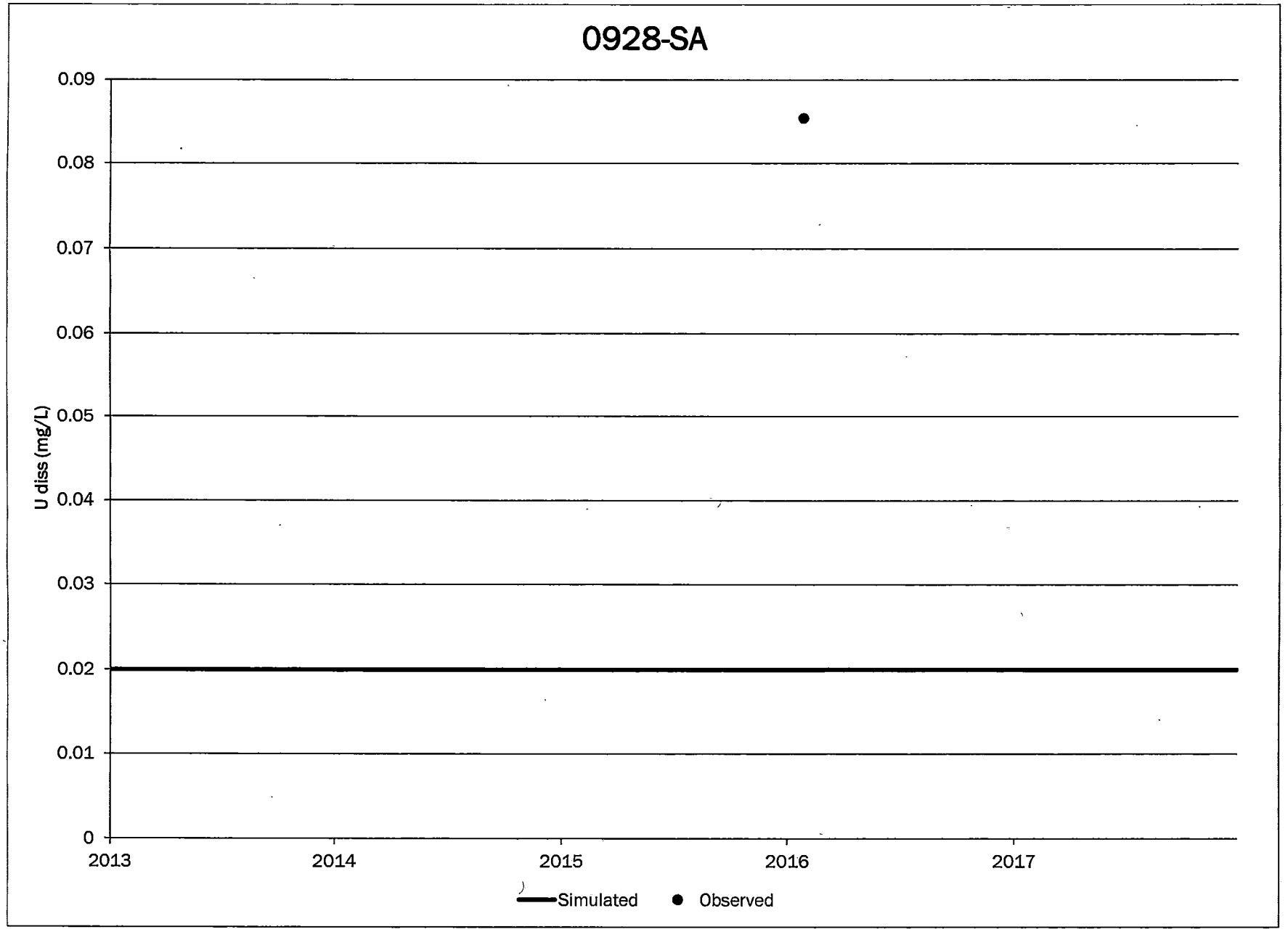

0899-AI
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

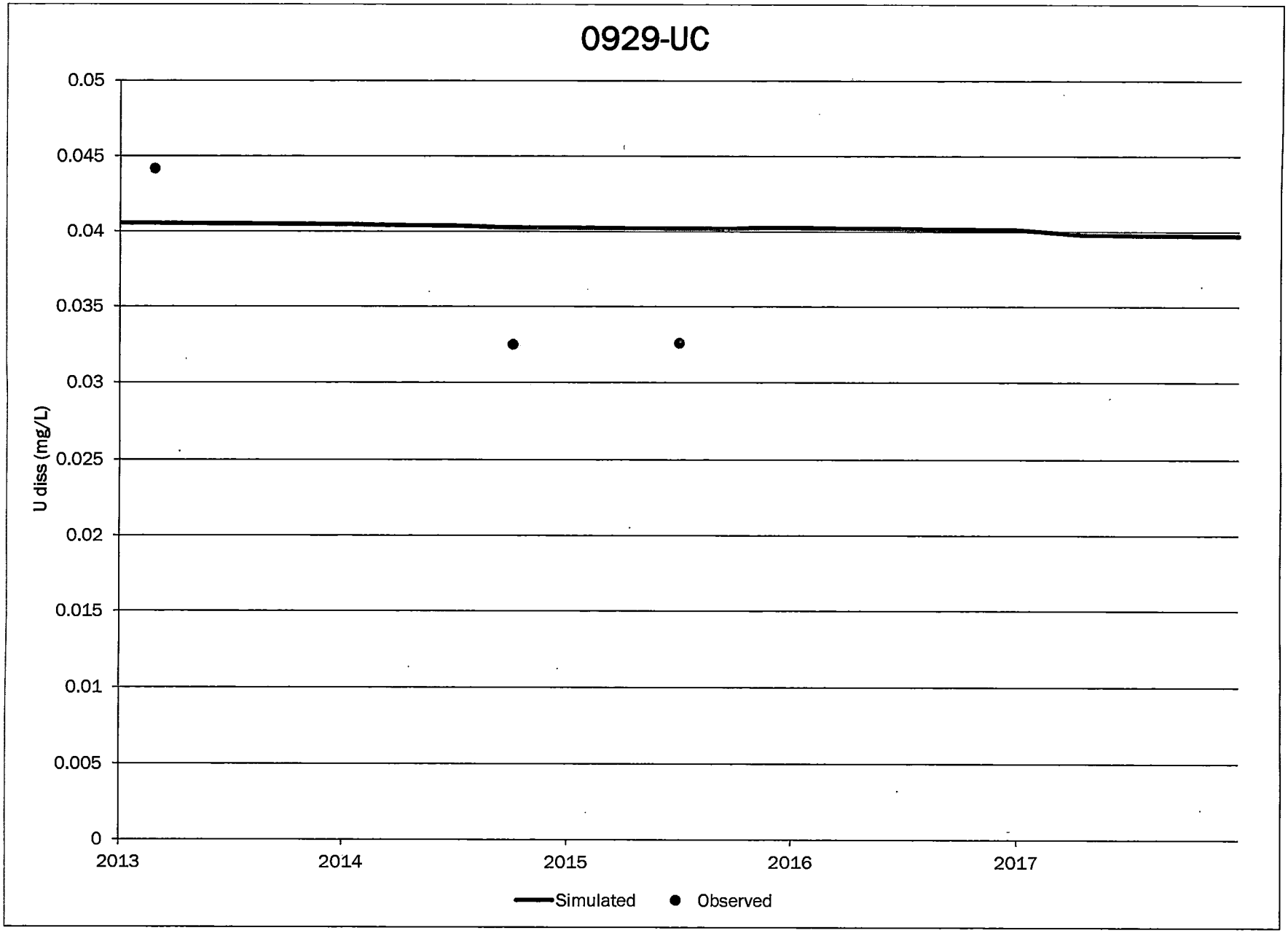

0910-AI
0.02
0.018
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

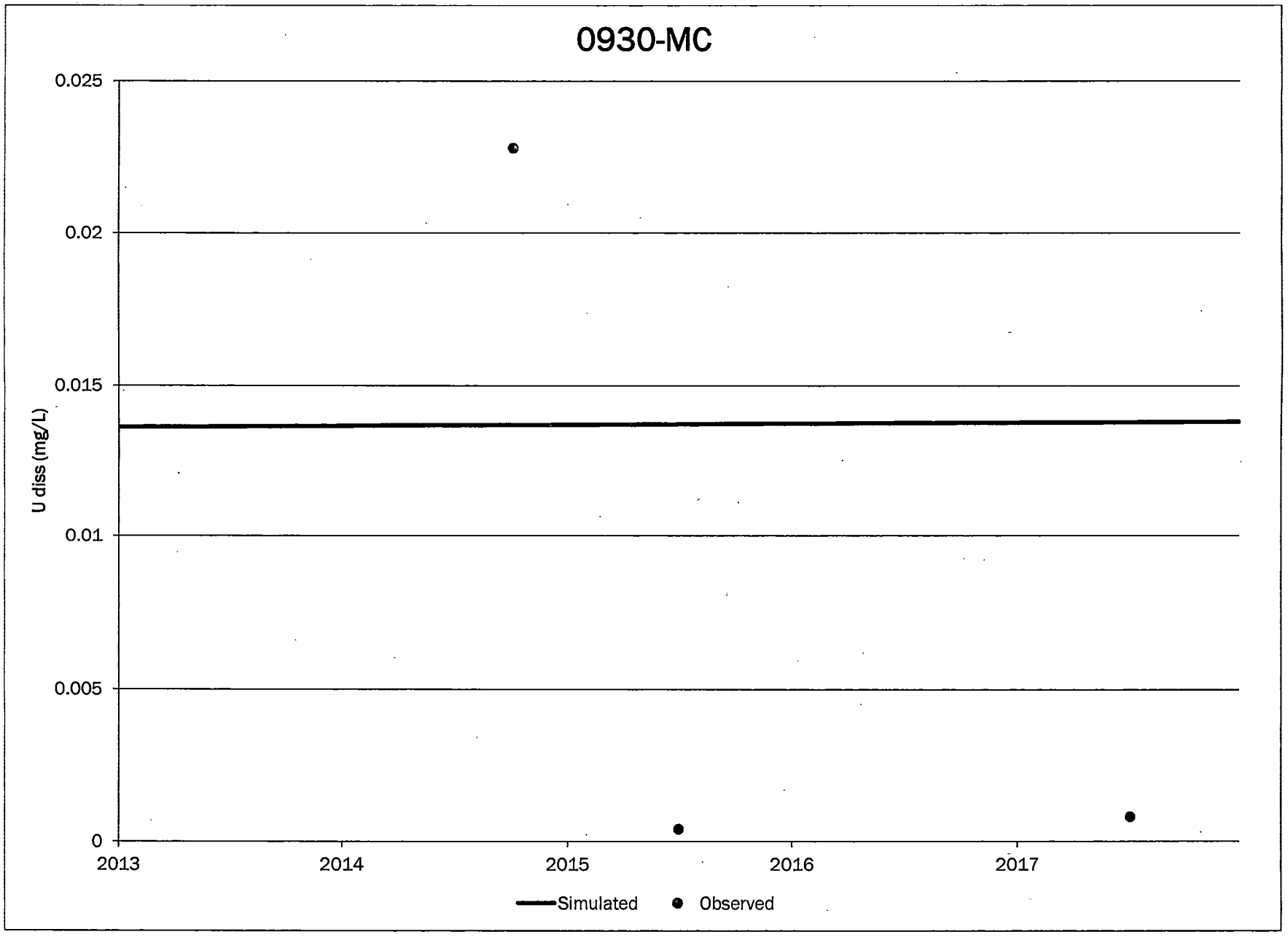

0920-AI
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

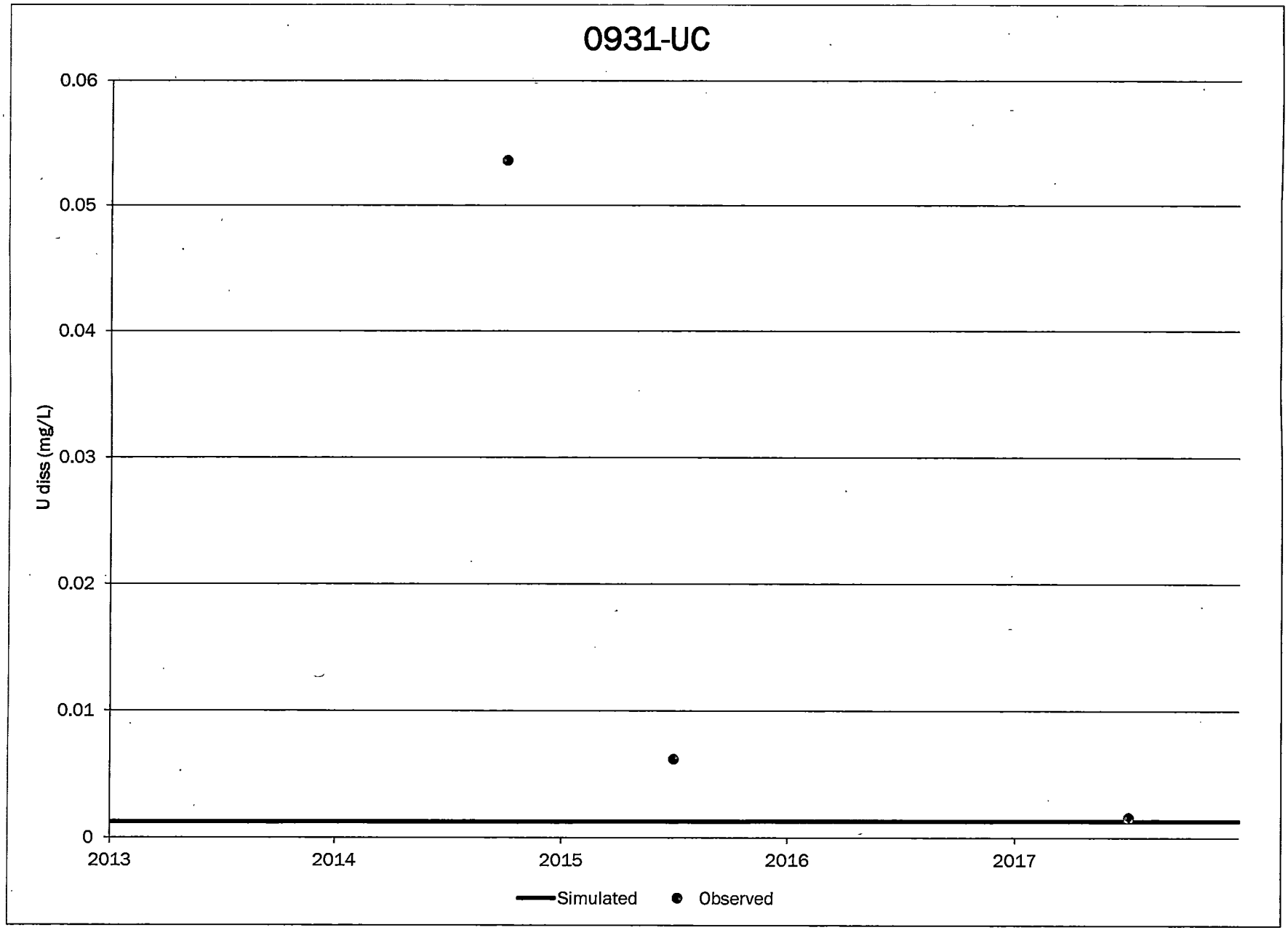

0921-AI
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

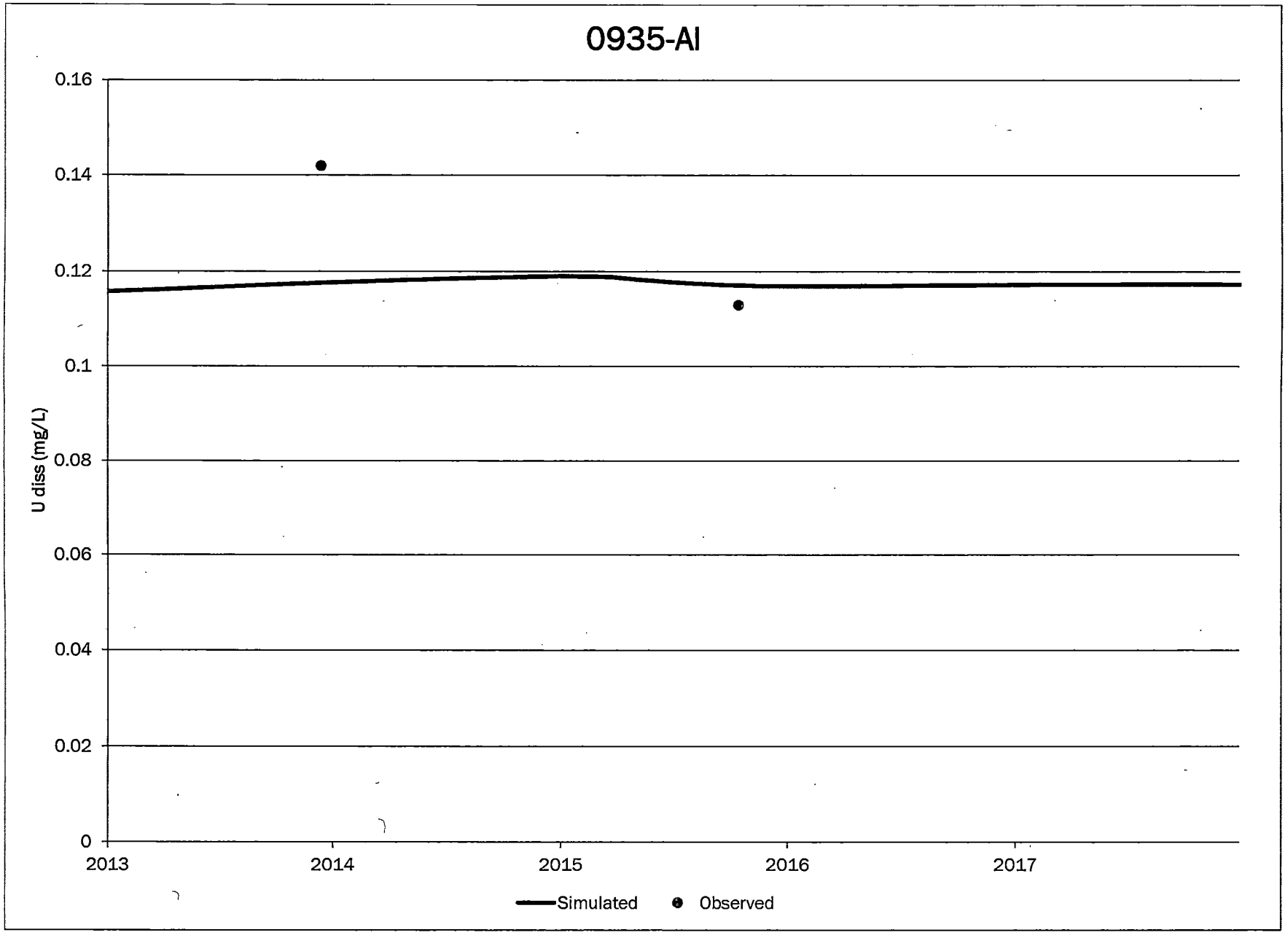

0922-AI
0.00035
0.0003
0.00025
0.0002
0.00015
0.0001
0.00005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

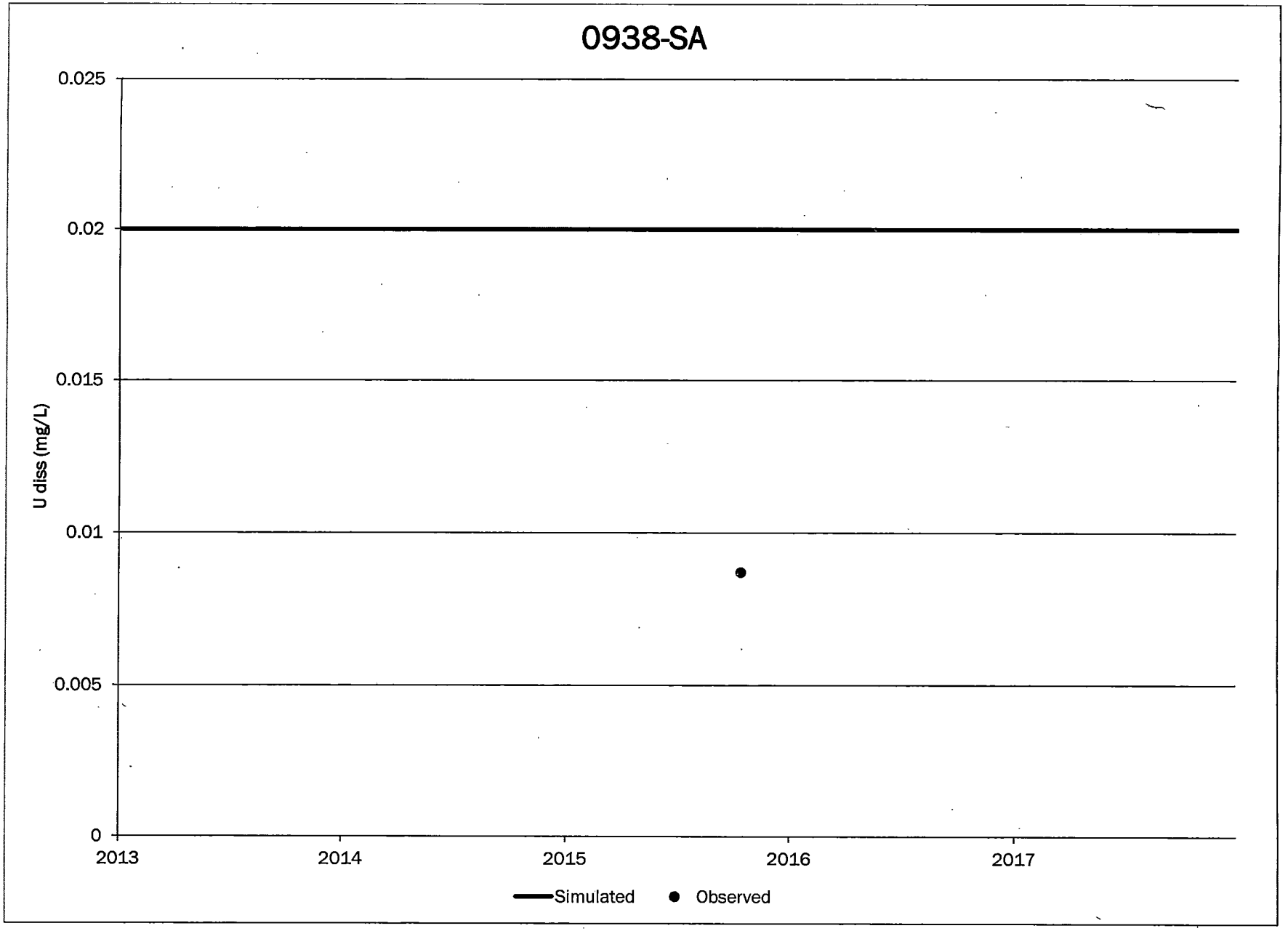

0928-SA
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

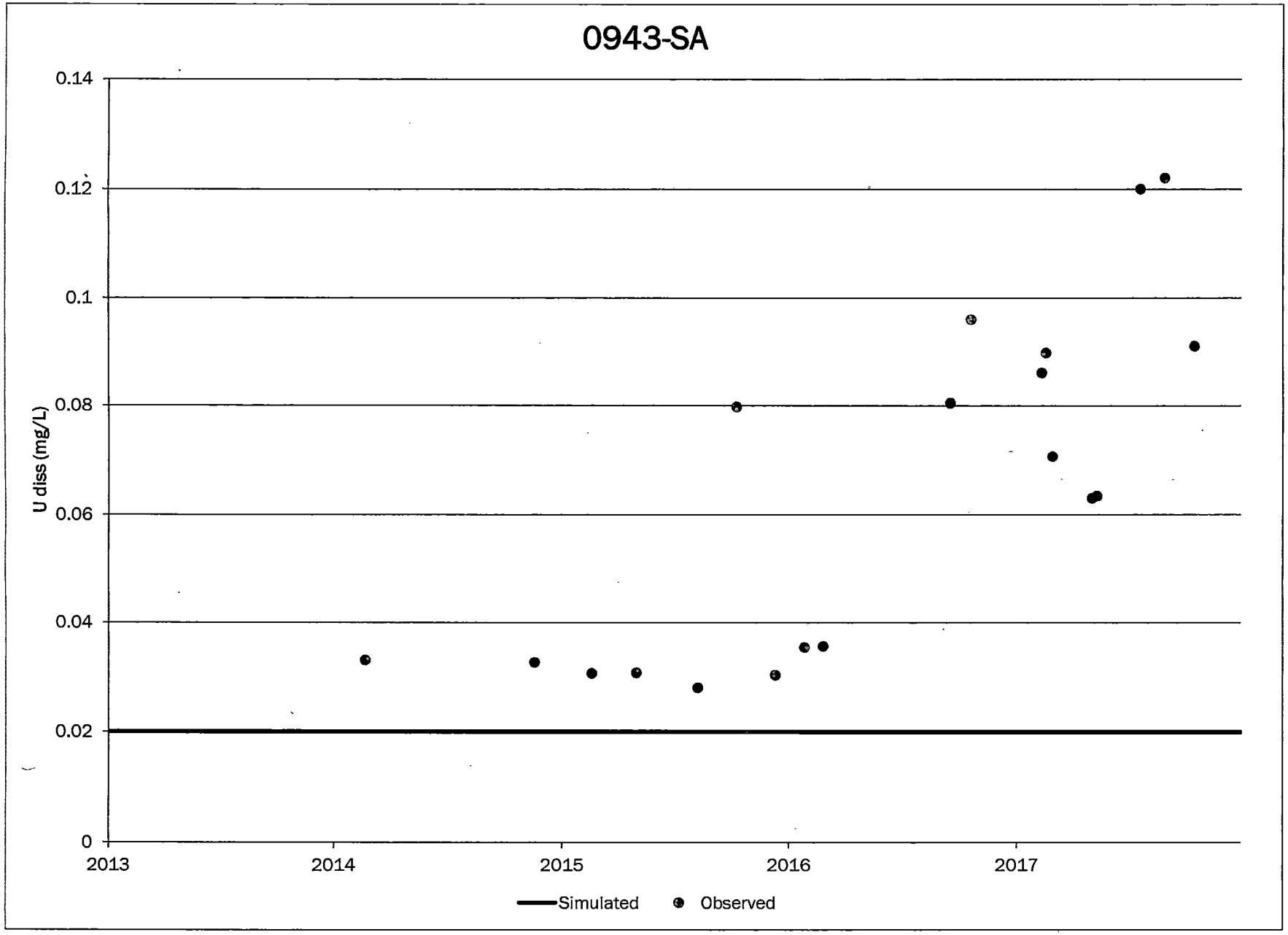

0929-UC
0.05
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

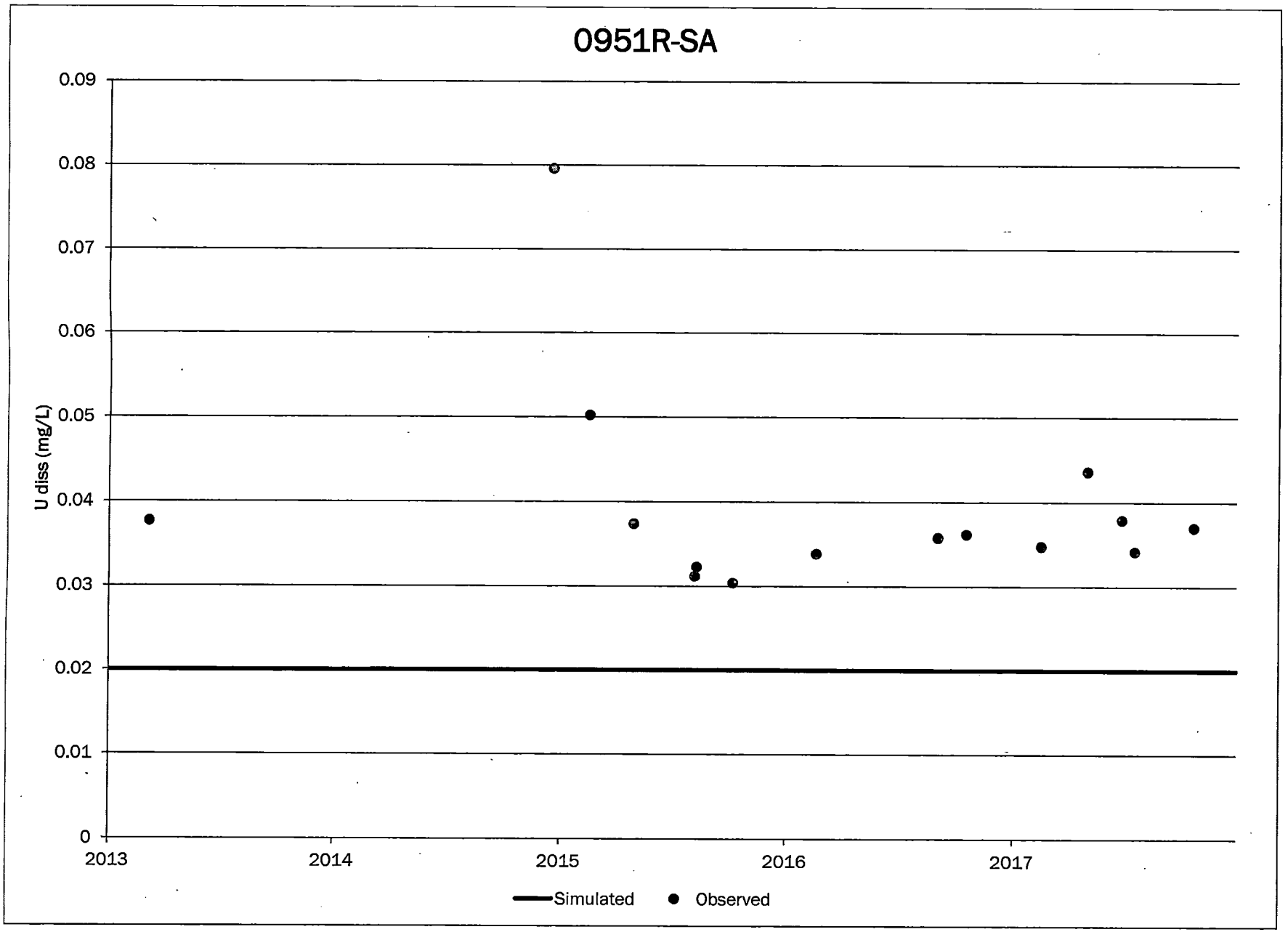

0930-MC
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

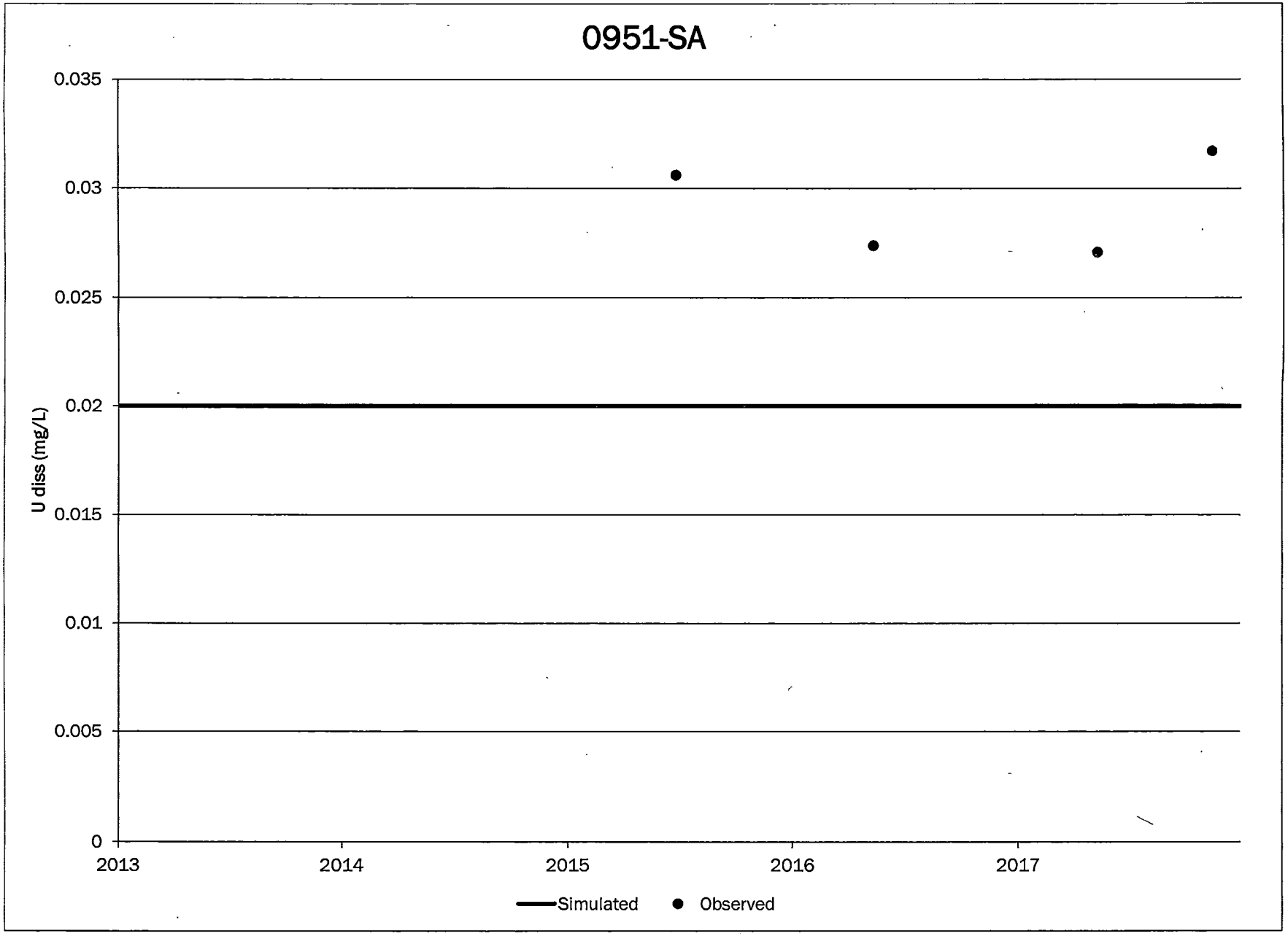

0931-UC
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

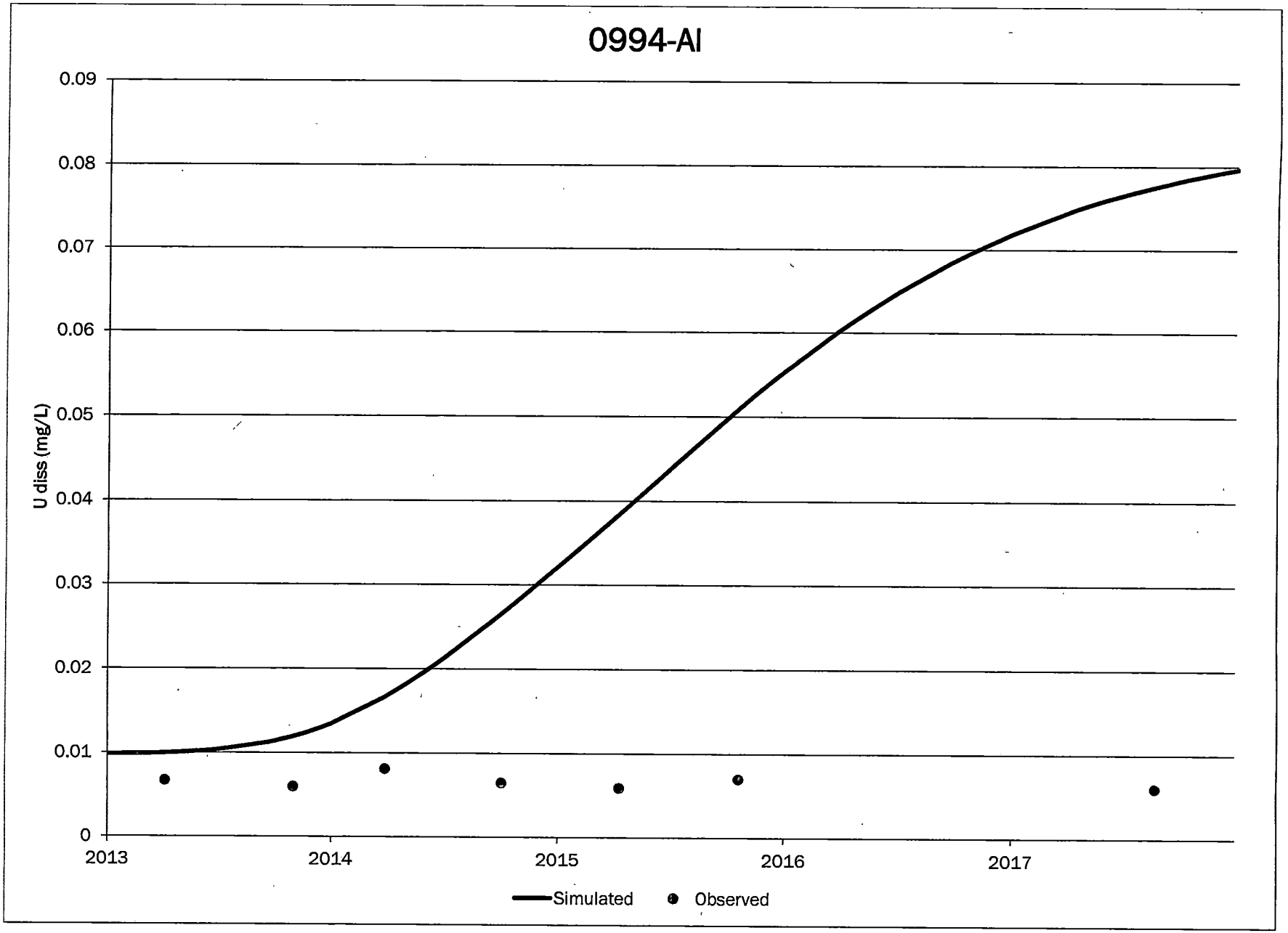

0935-AI
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

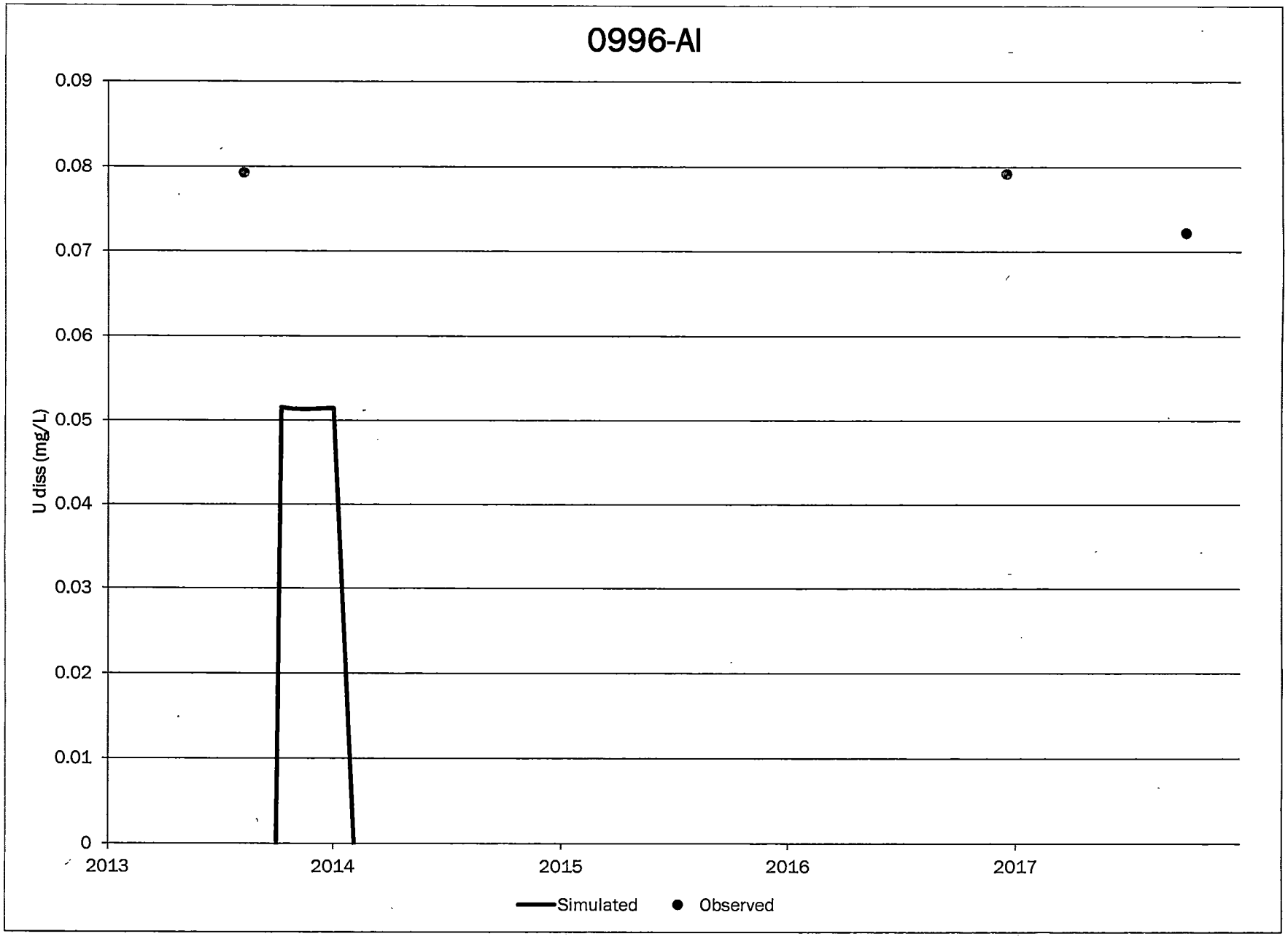

0938-SA
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

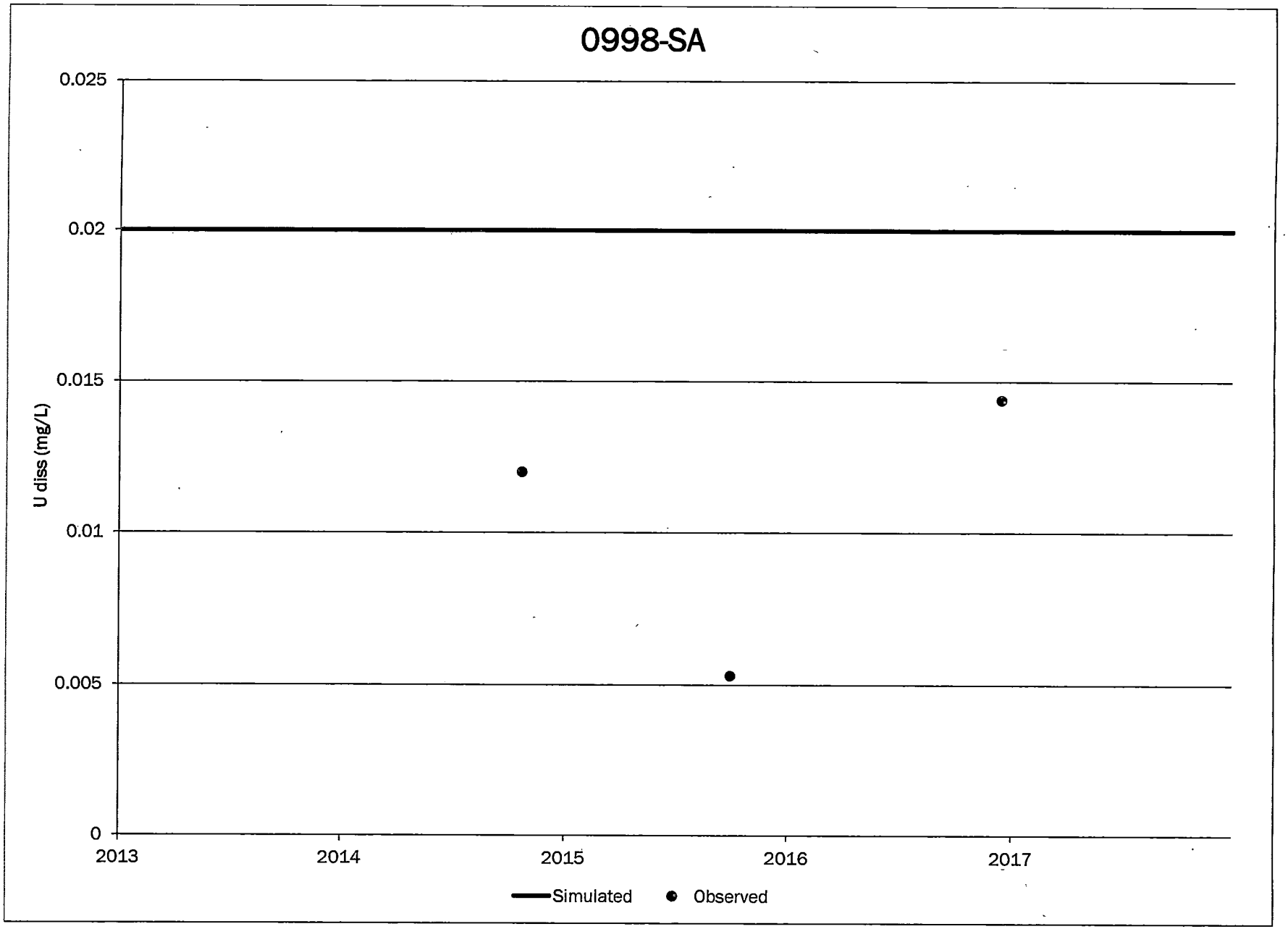

0943-SA
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

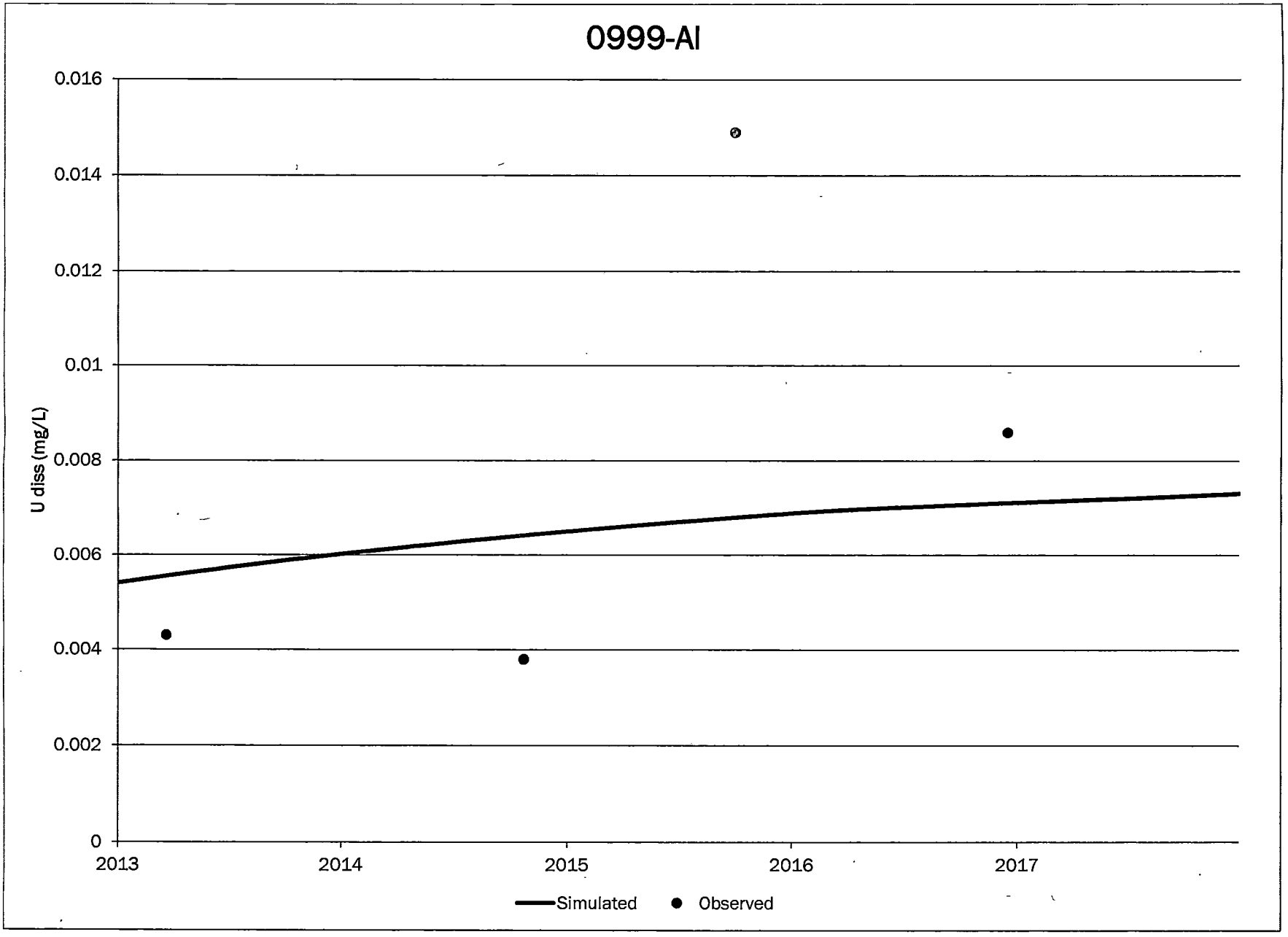

0951R-SA
U diss (mg/L)
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
2013
2014
2015
2016
2017
Simulated
Observed

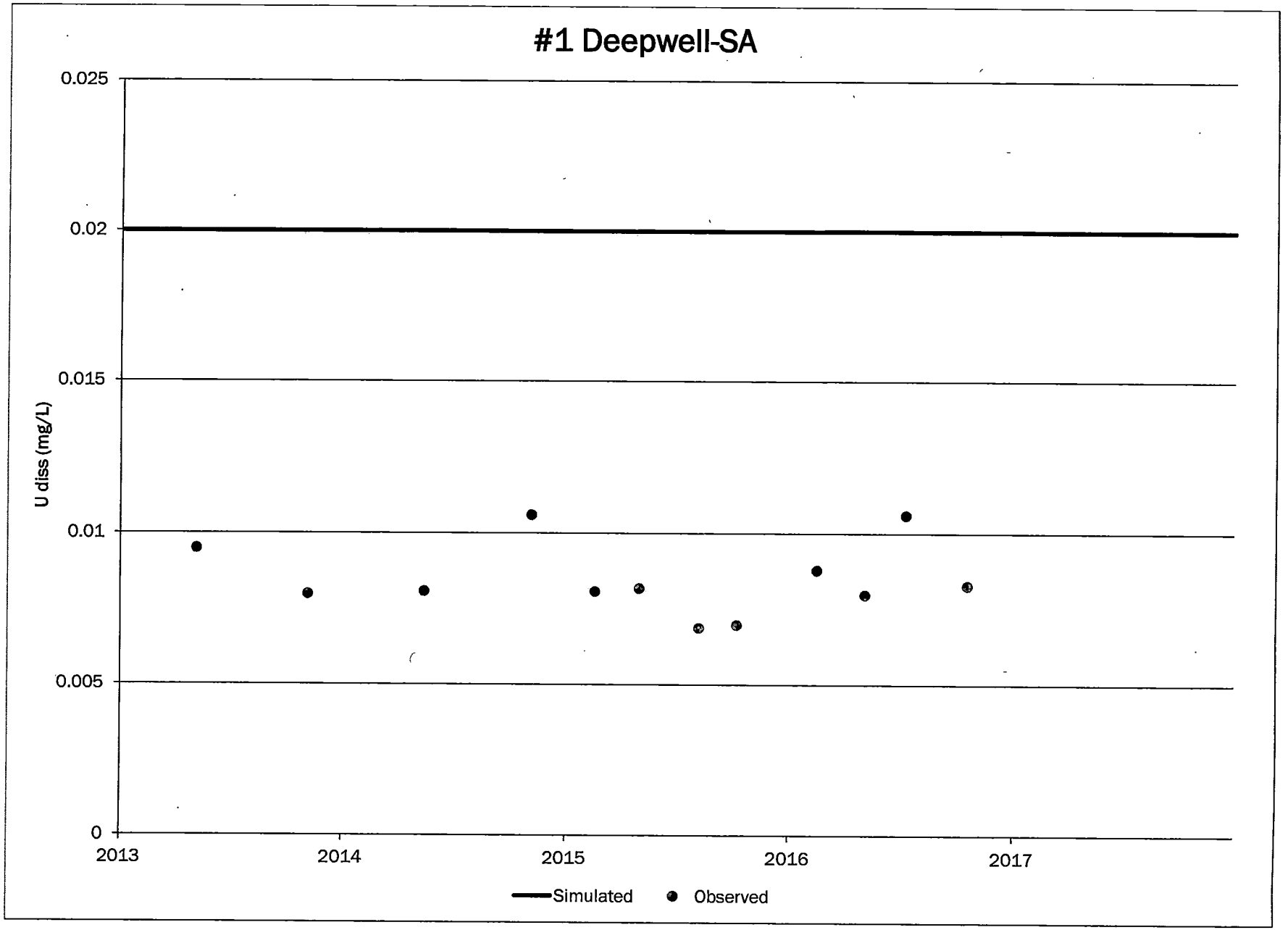

0951-SA
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

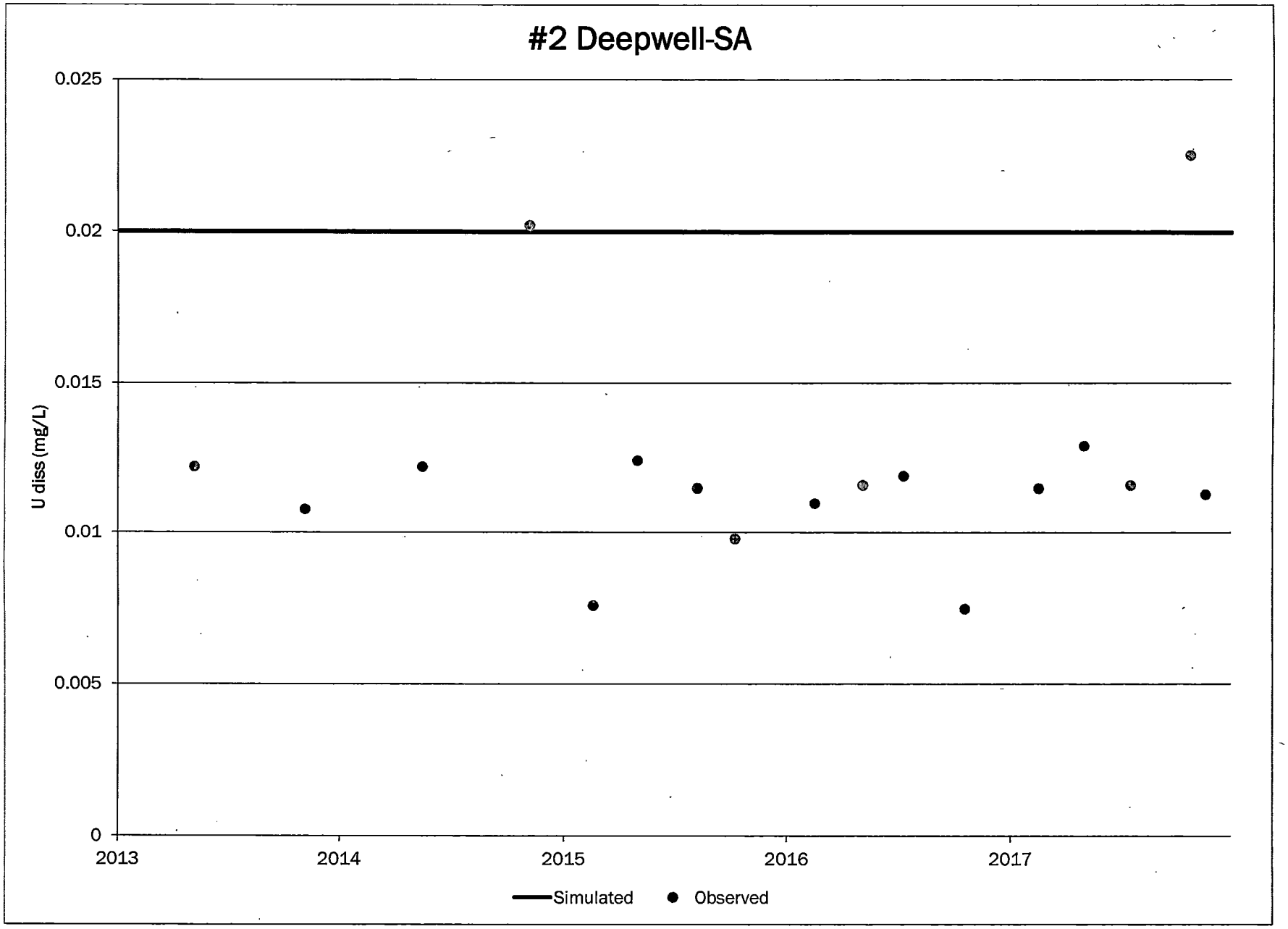

0994-AI
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

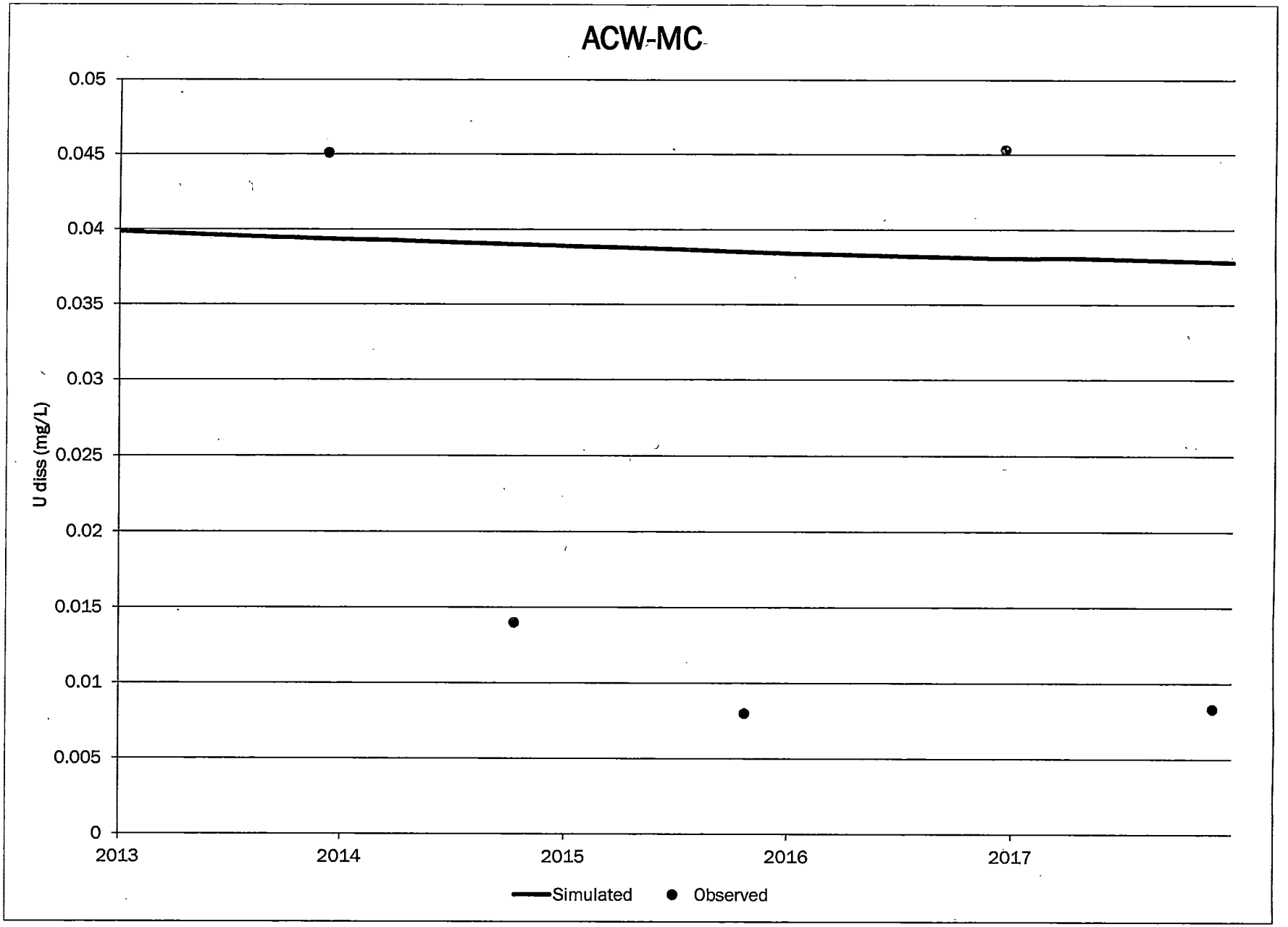

0996-AI
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

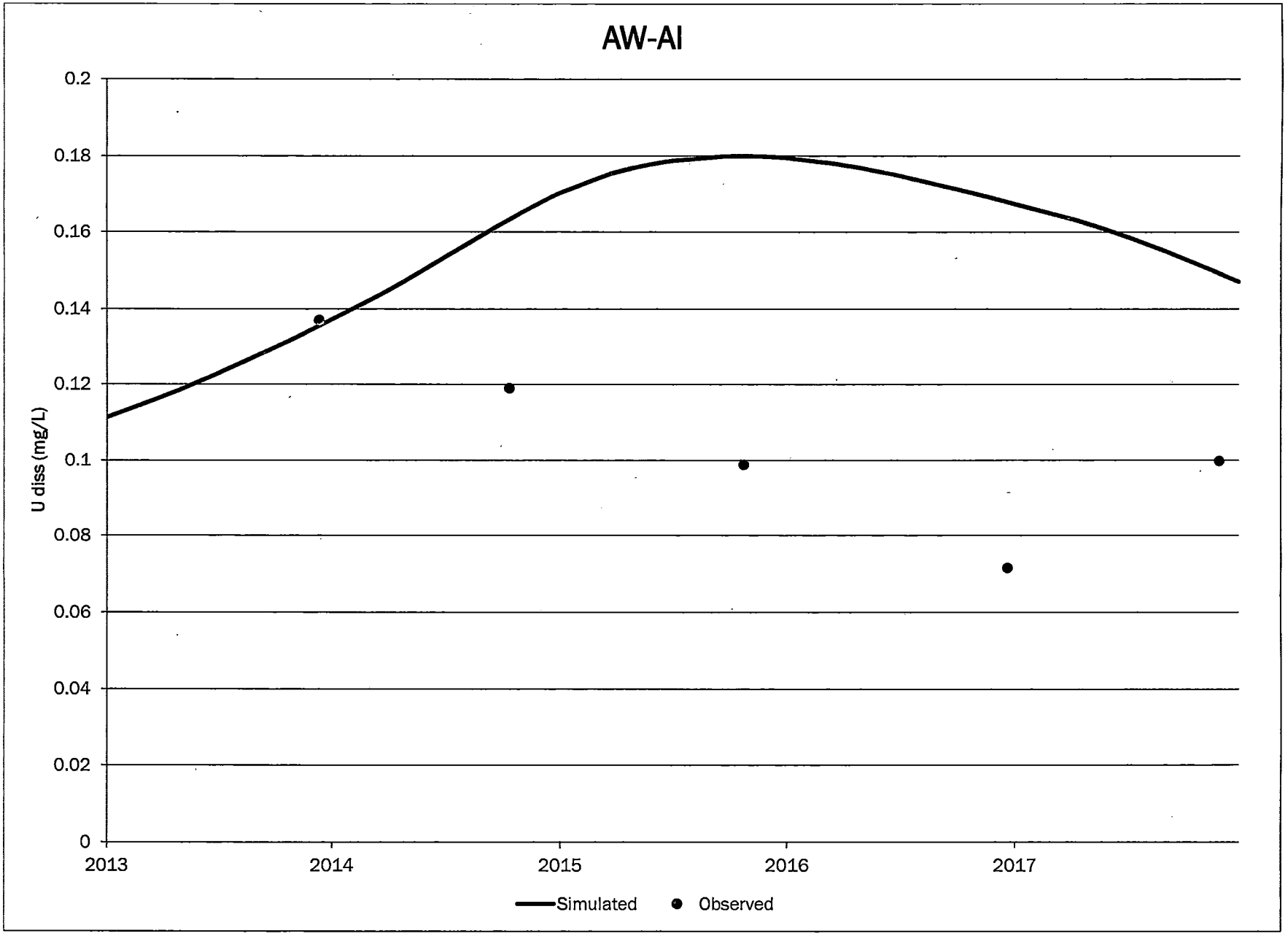

0998-SA
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

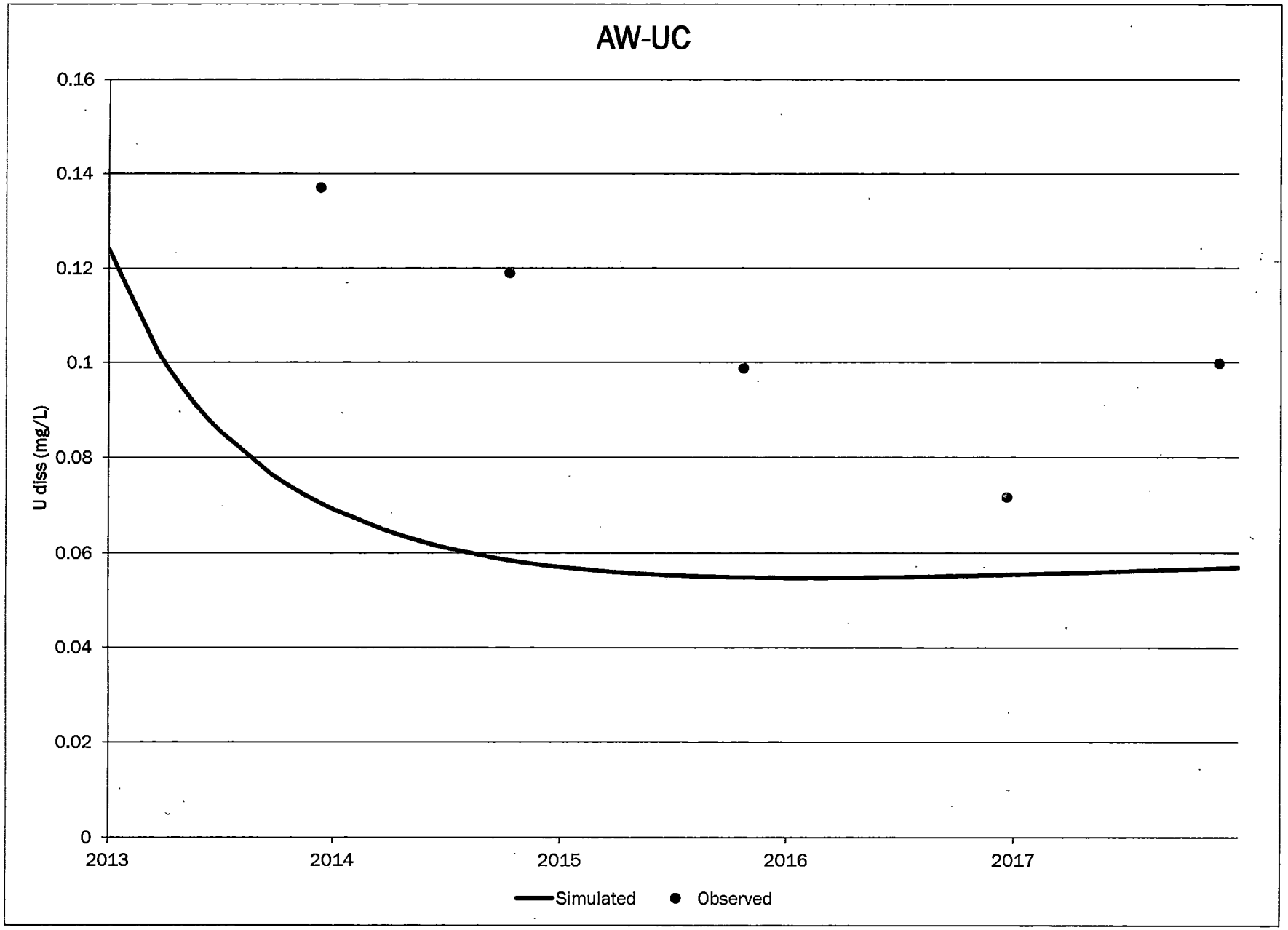

0999-AI
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

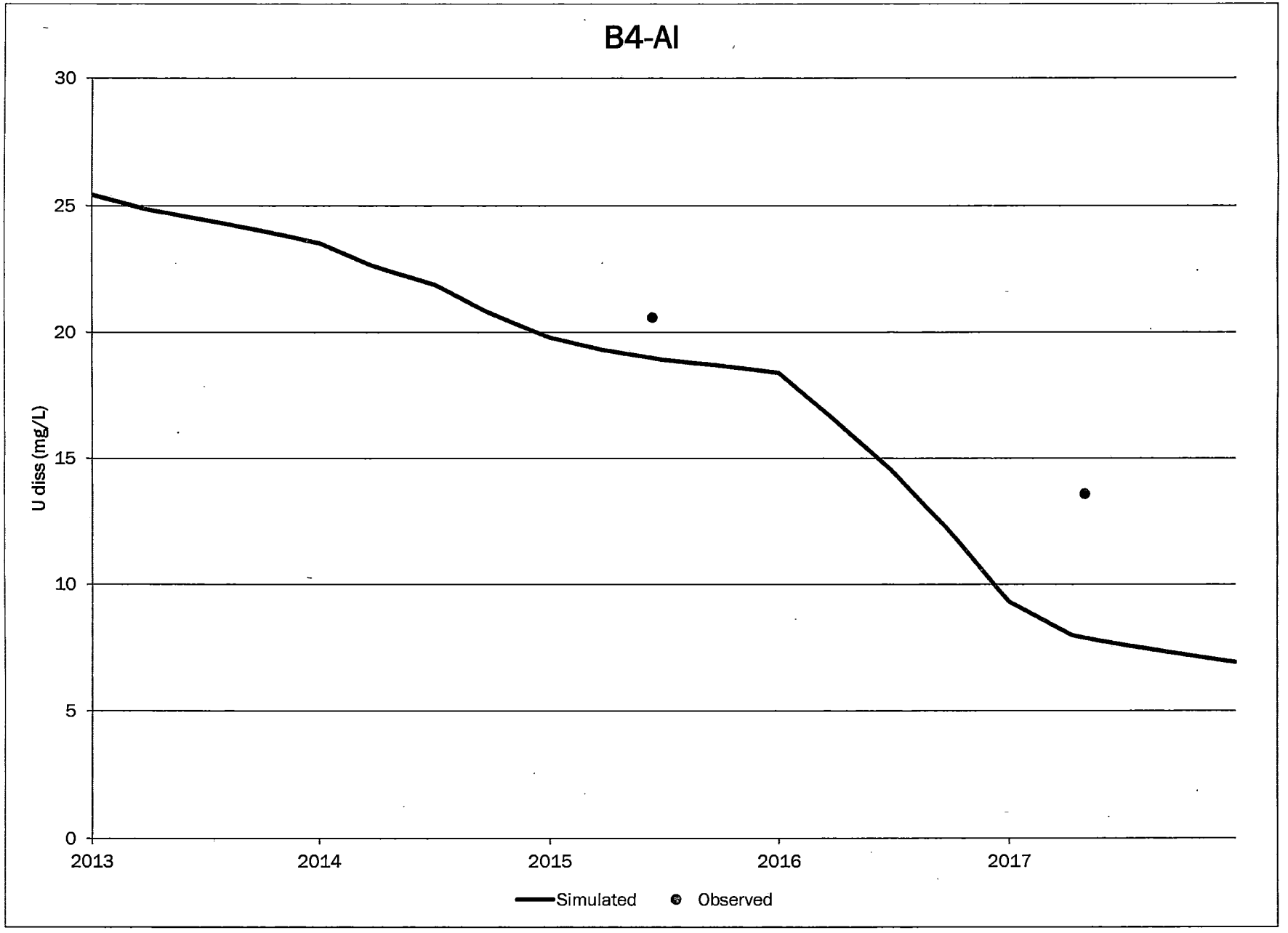

#1 Deepwell-SA
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

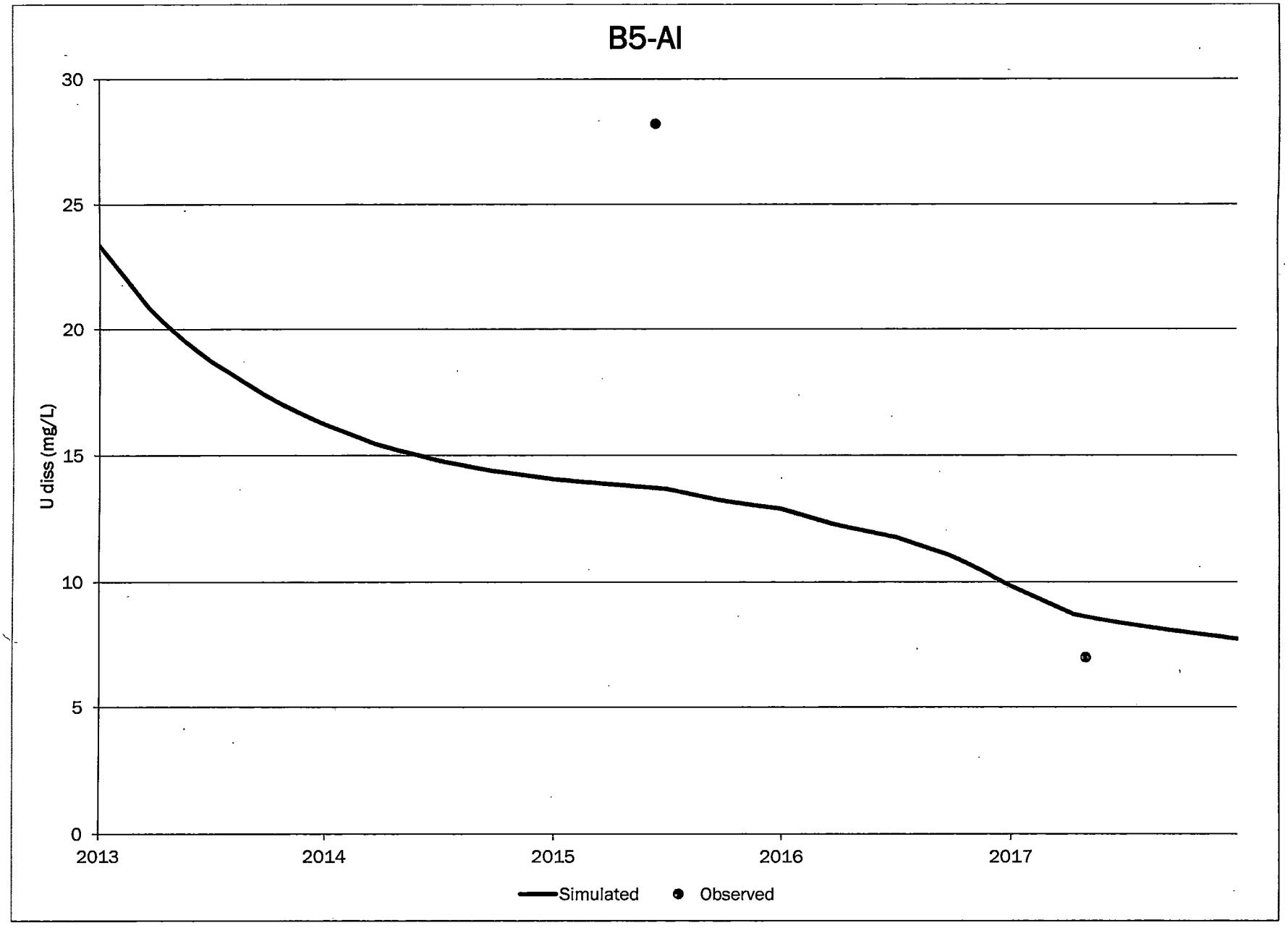

#2 Deepwell-SA
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

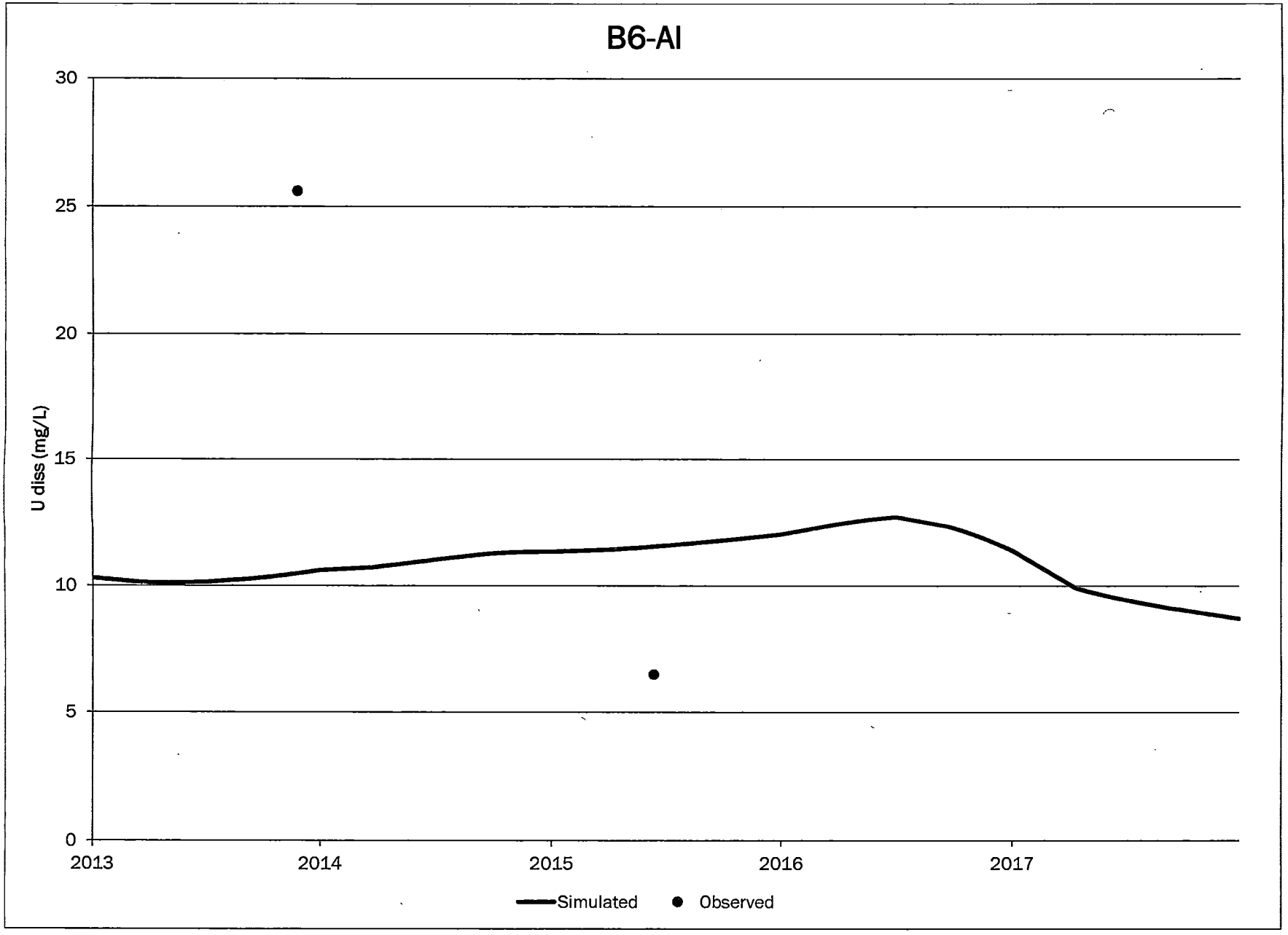

ACW-MC
U diss (mg/L)
0.05
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
2013
2014
2015
2016
2017
Simulated
Observed

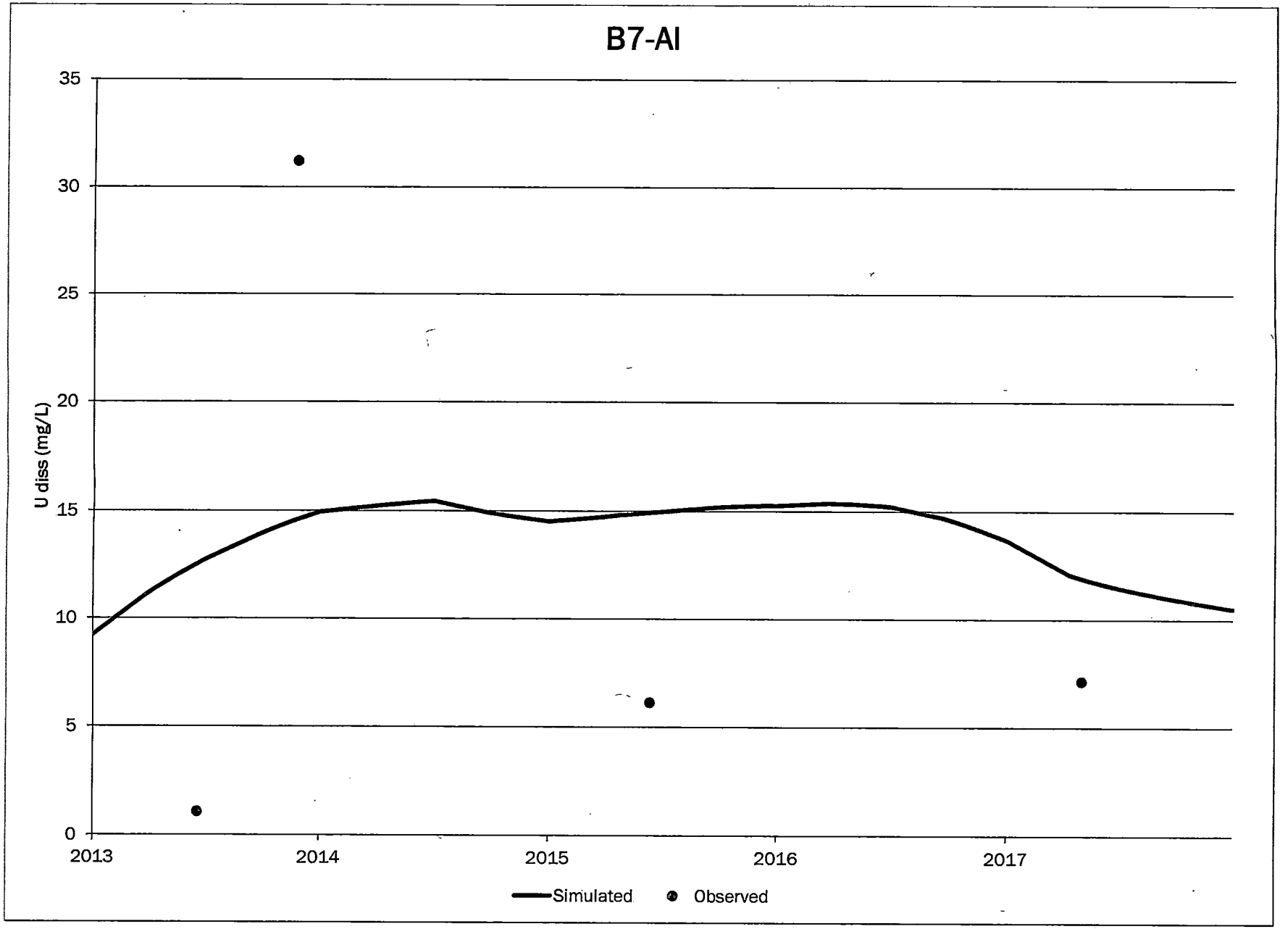

AW-AI
U diss (mg/L)
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
2013
2014
2015
2016
2017
Simulated
Observed

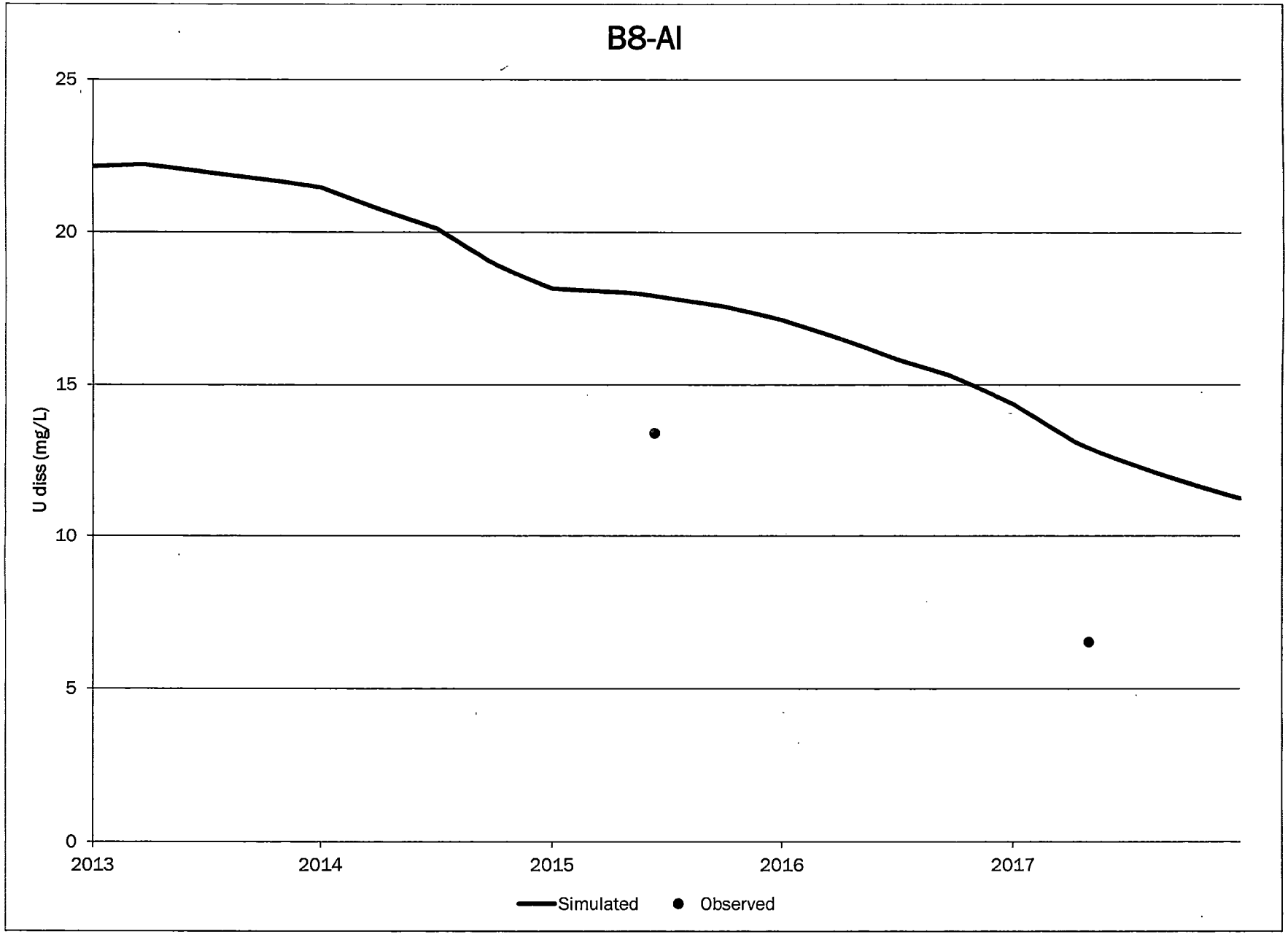

AW-UC
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

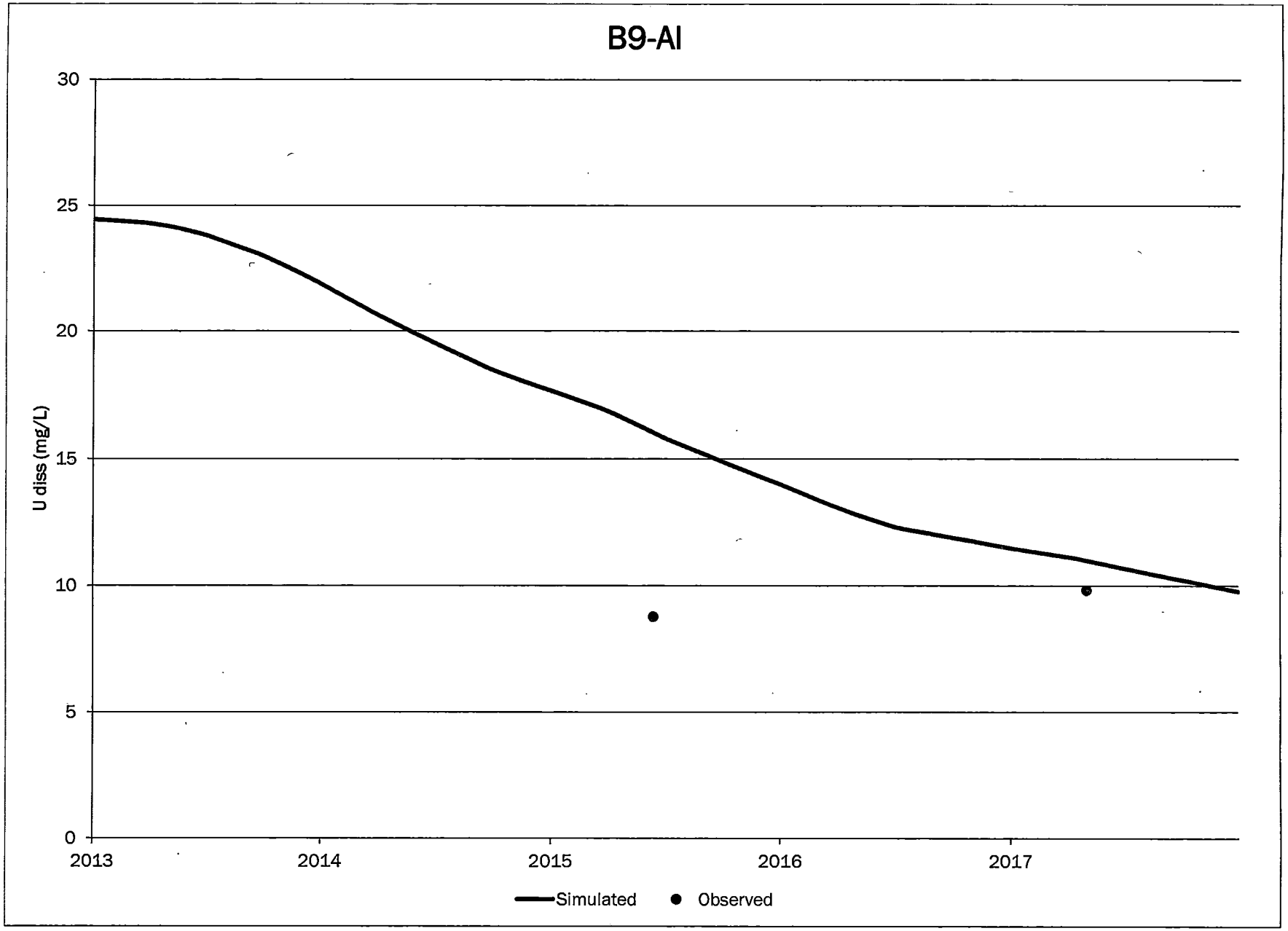

B4-AI
30
25
20
15
10
5
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

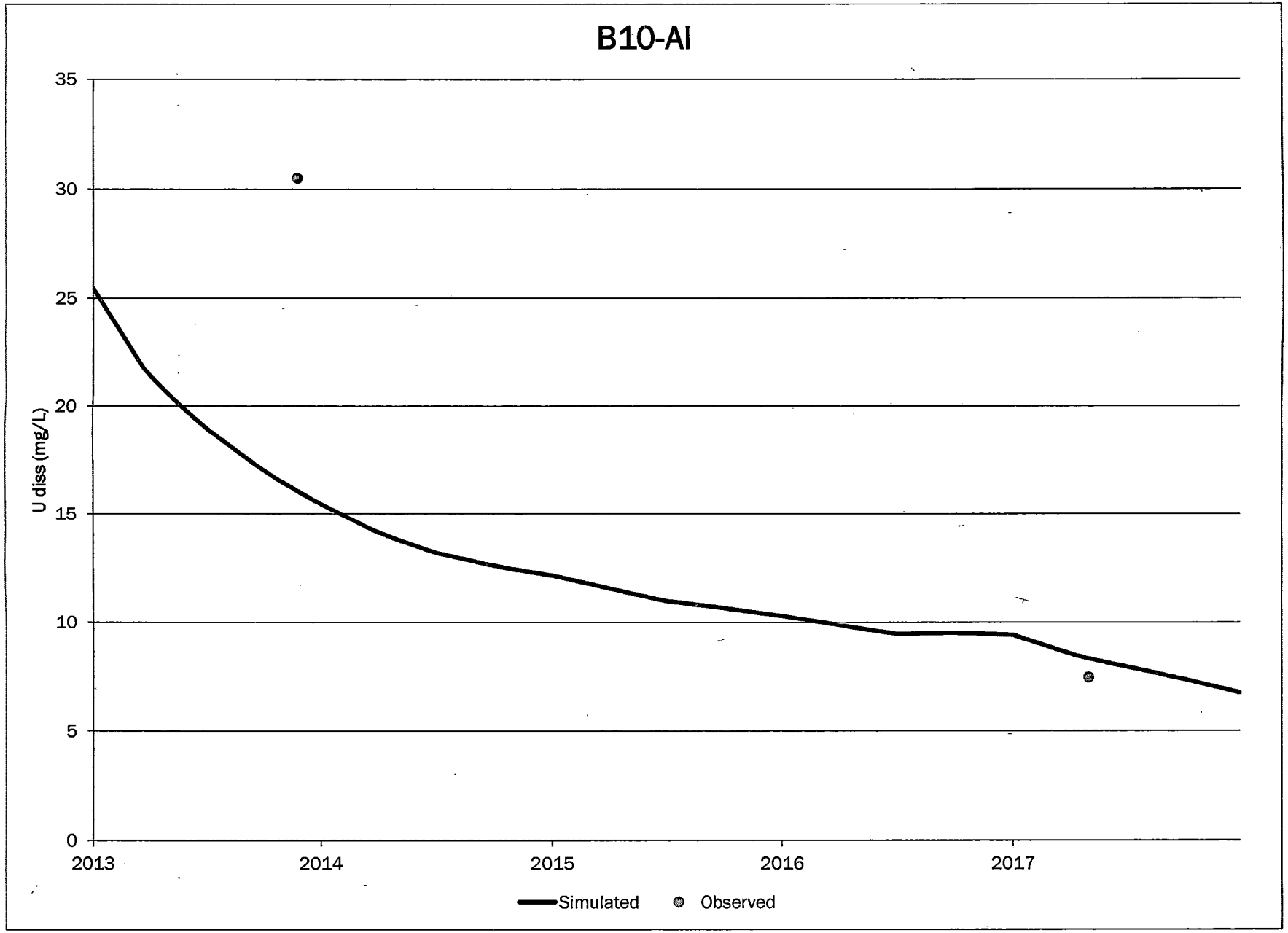

B5-AI
U diss (mg/L)
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

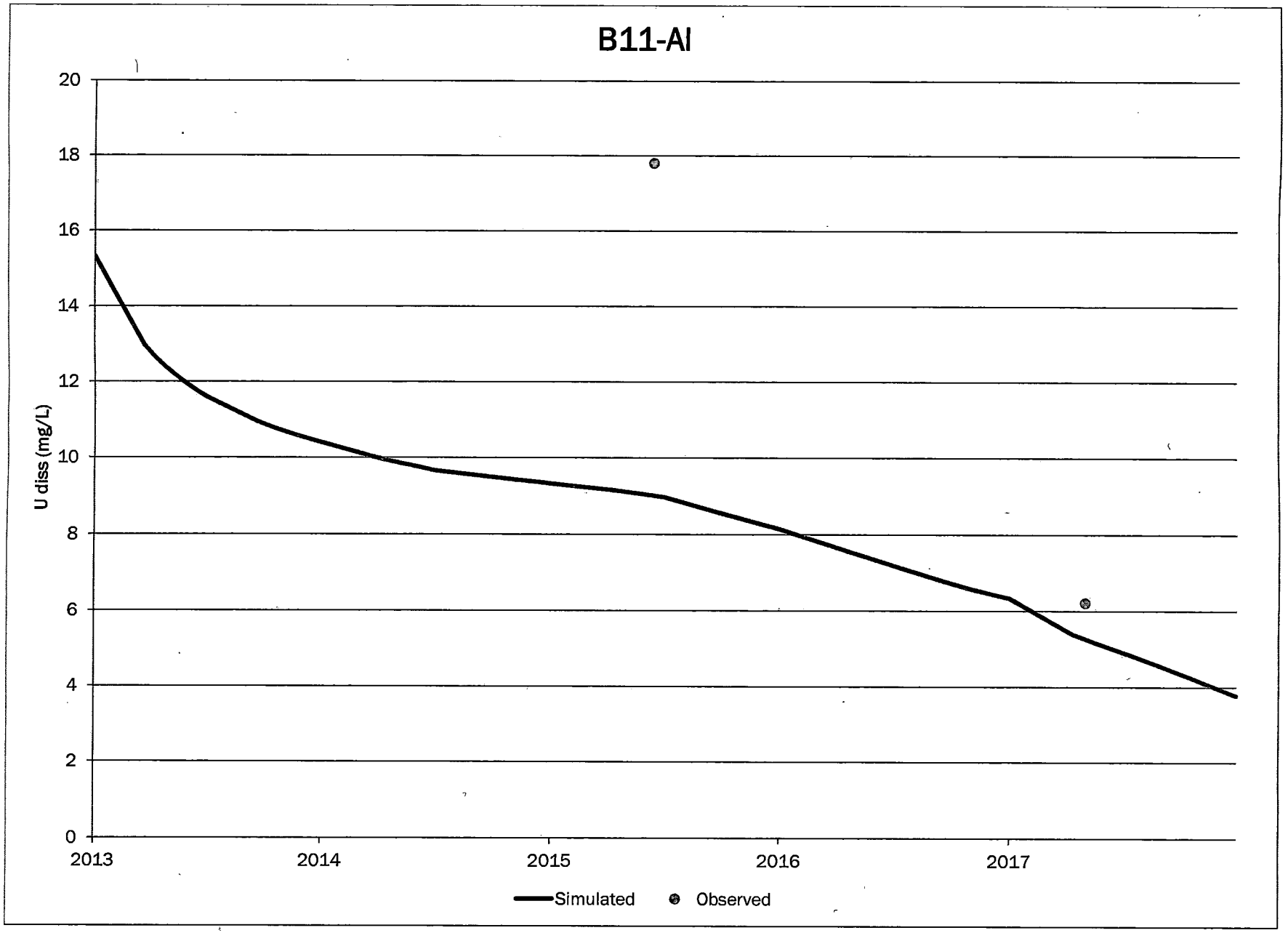

B6-AI
U diss (mg/L)
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

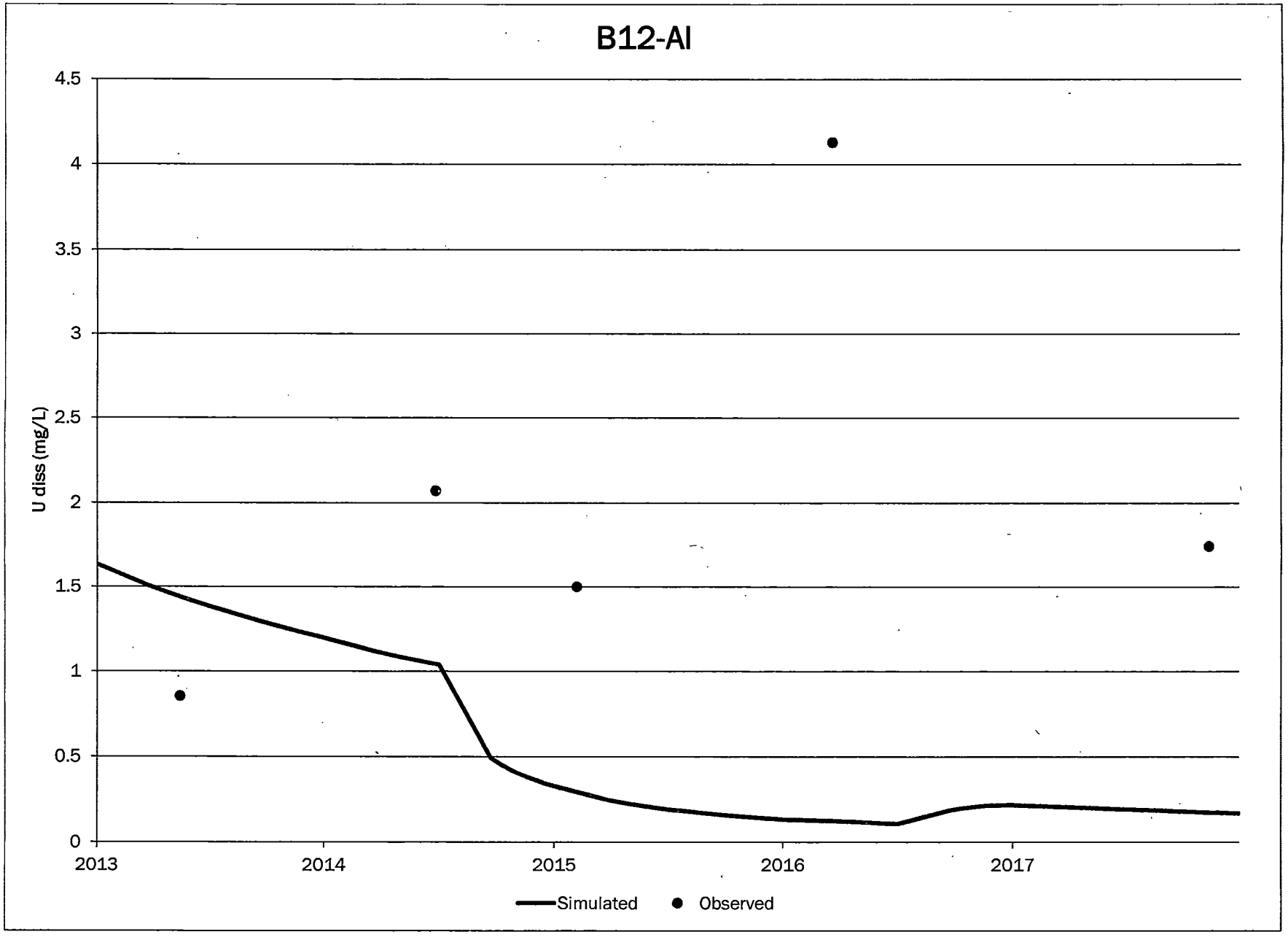

B7-AI
35
30
25
20
15
10
5
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

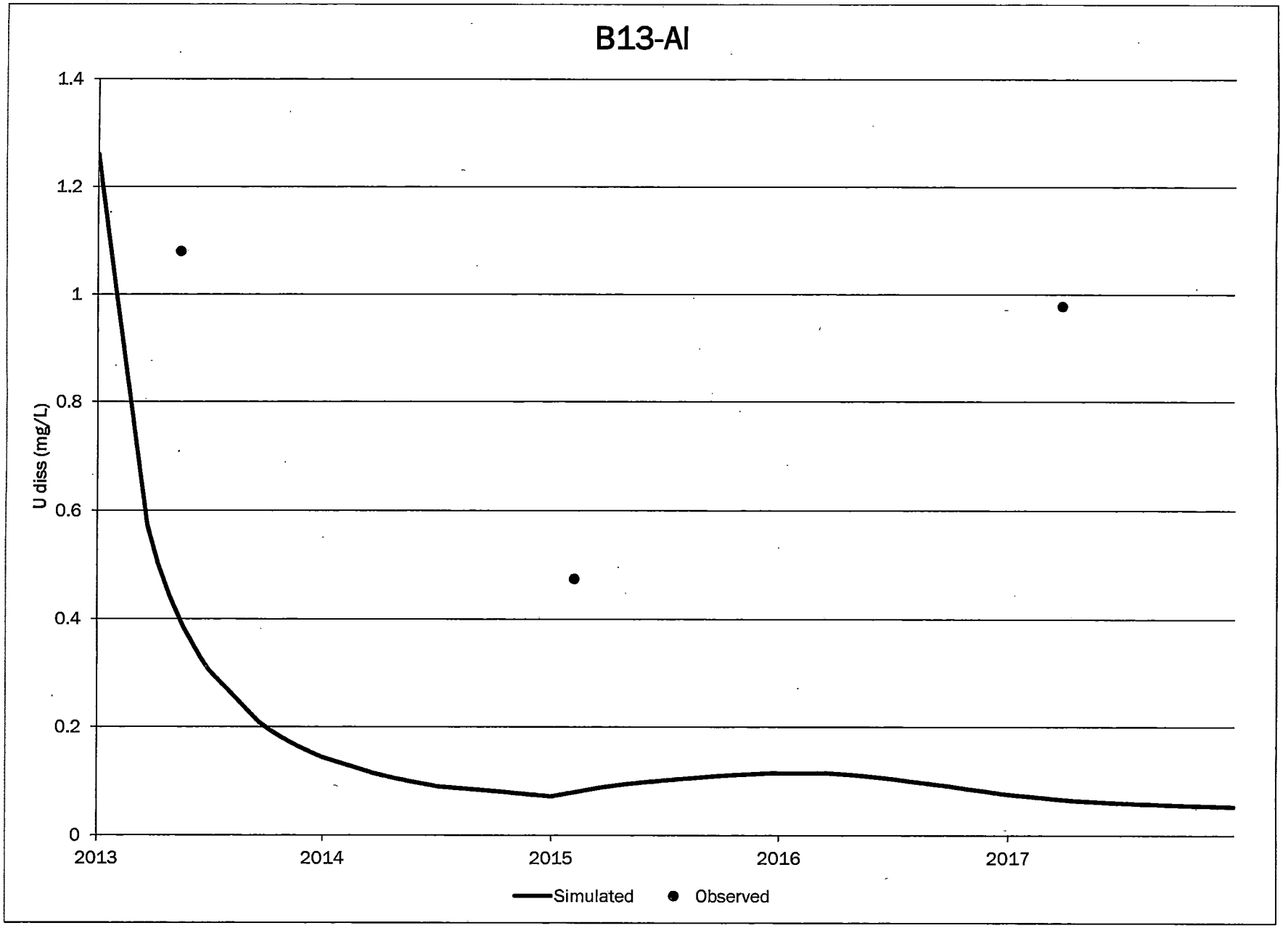

B8-AI
25
20
15
10
5
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

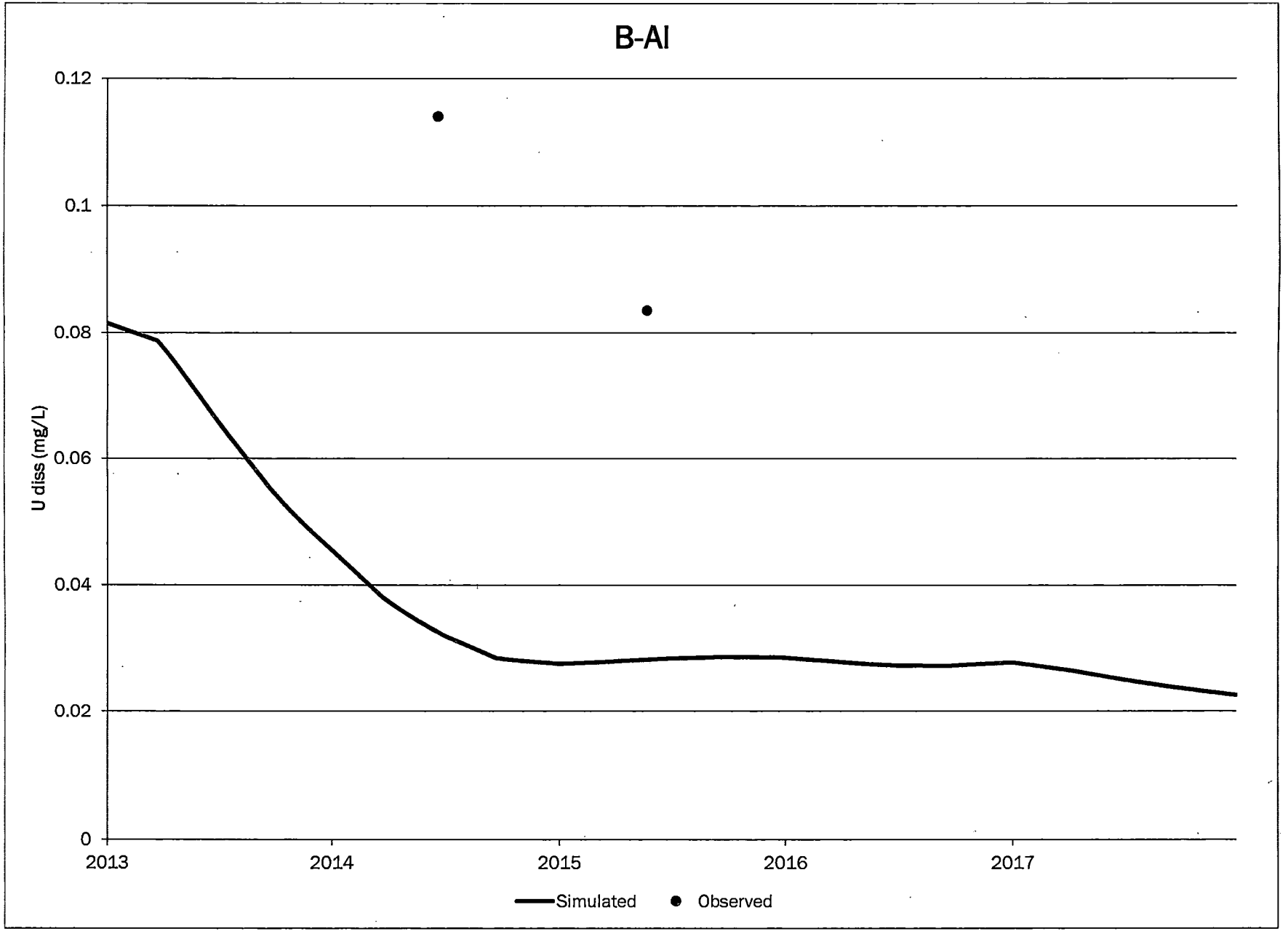

B9-AI
30
25
20
15
10
5
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

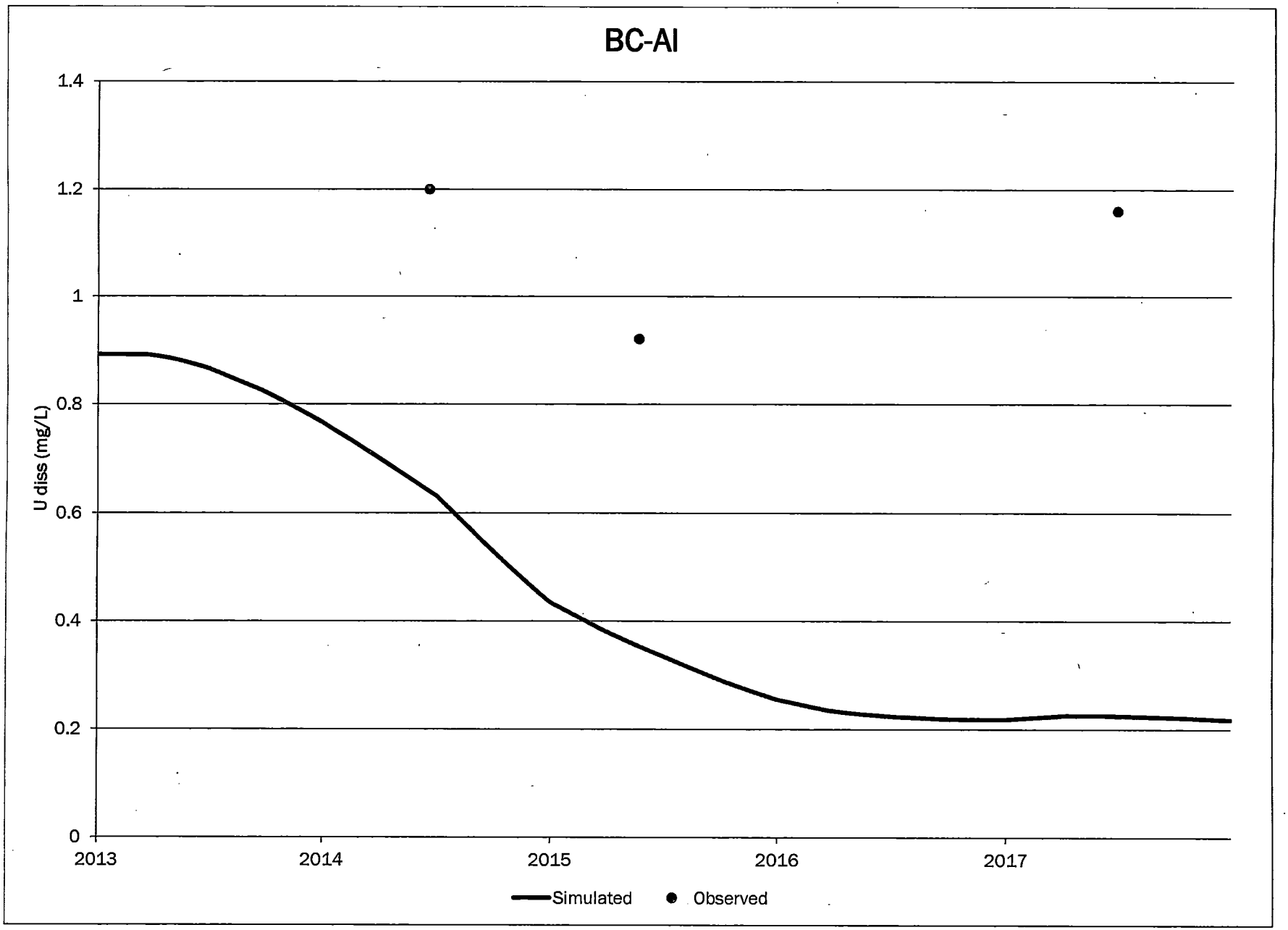

B10-AI
35
30
25
20
15
10
5
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

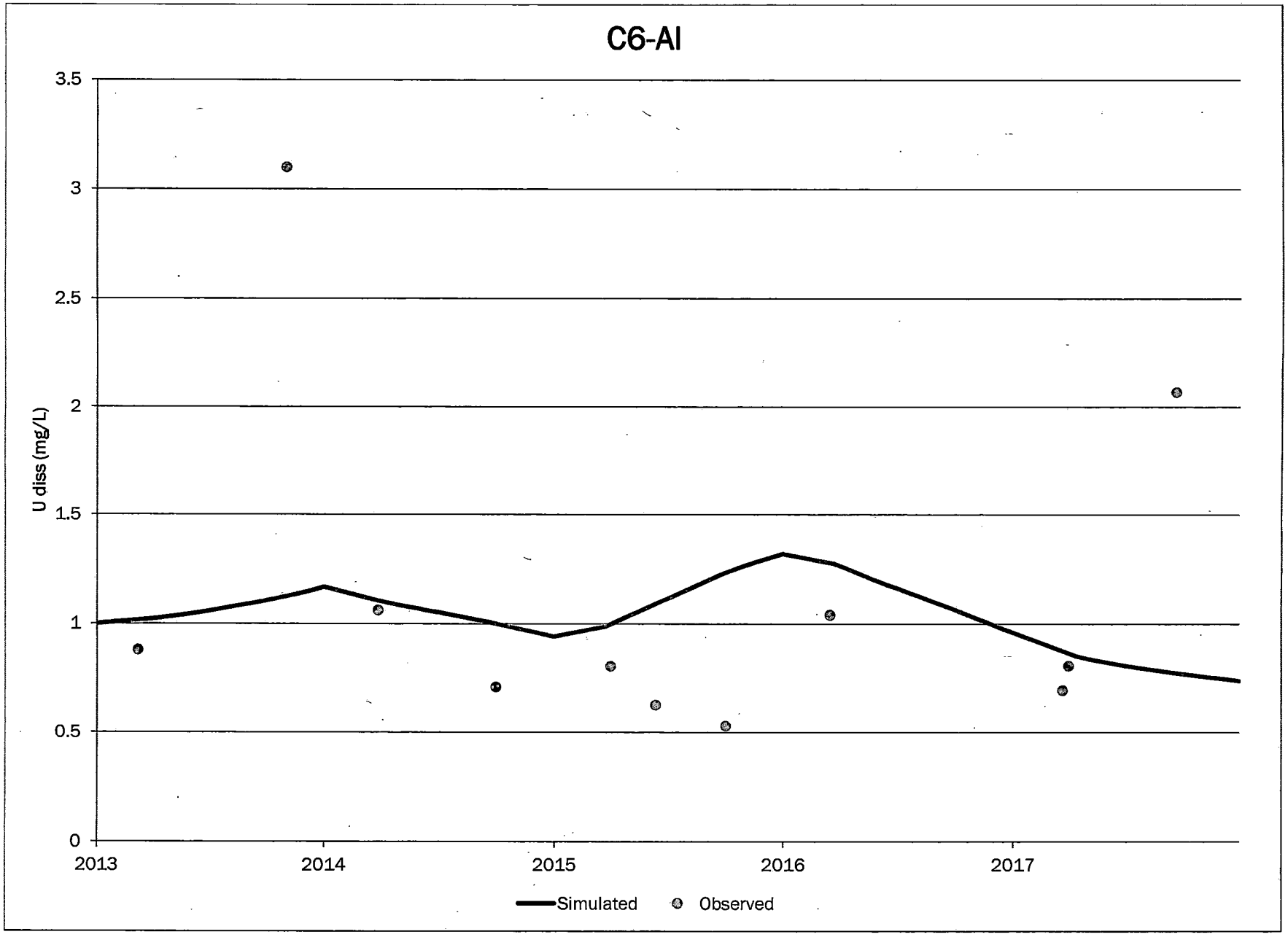

B11-AI
U diss (mg/L)
20
18
16
14
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

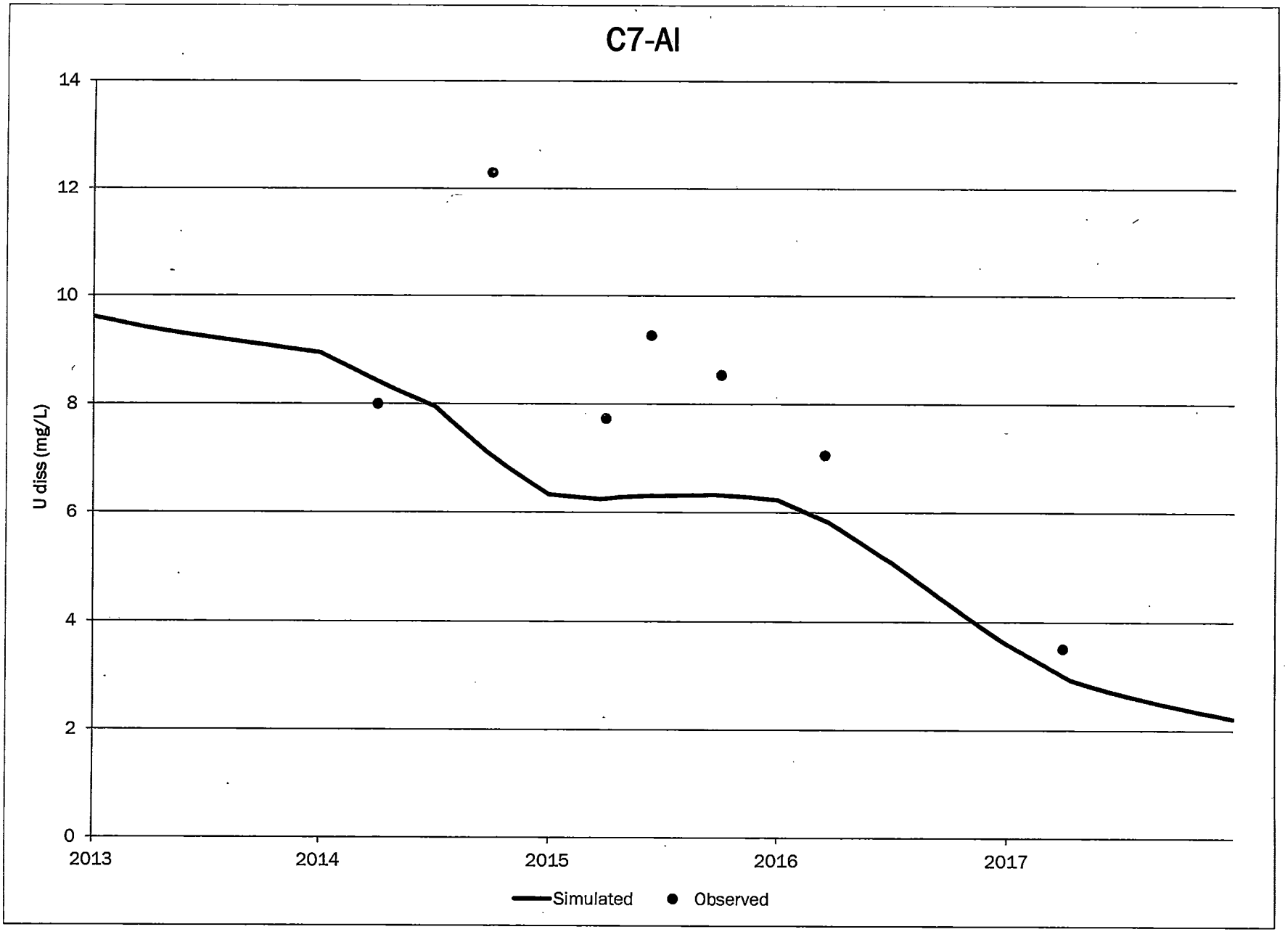

B12-AI
U diss (mg/L)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

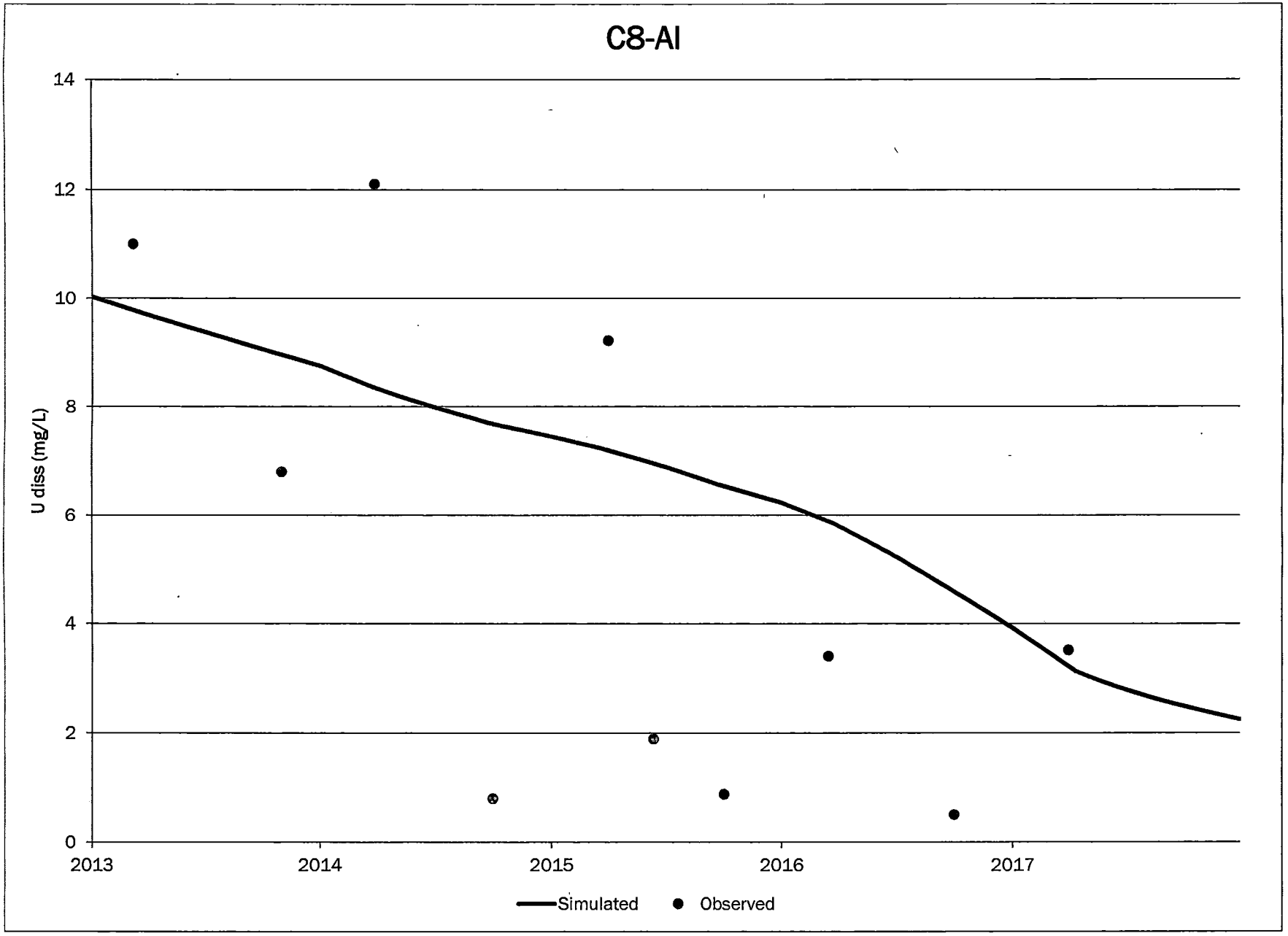

B13-AI
1.4
1.2
1
0.8
0.6
0.4
0.2
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

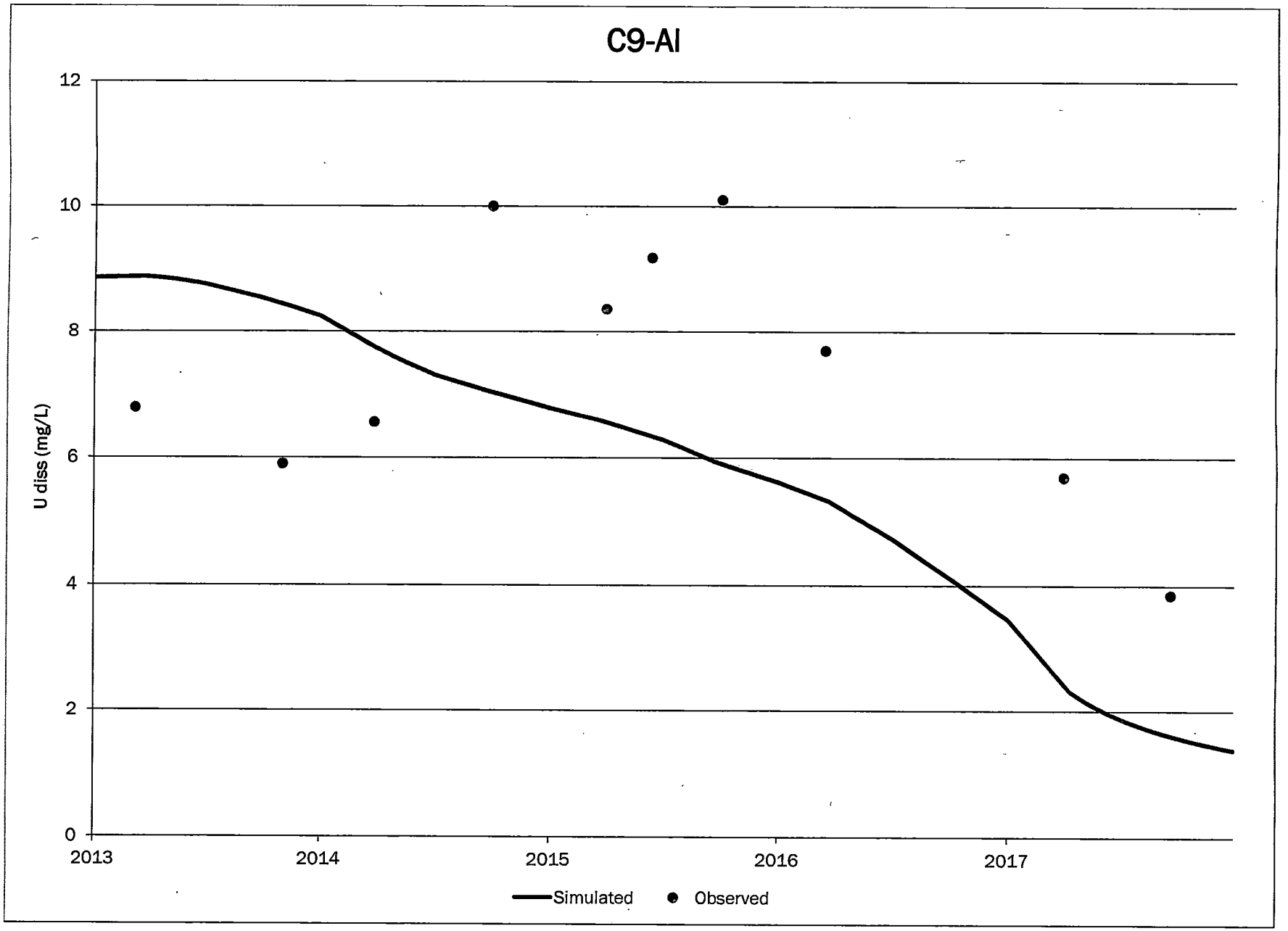

B-AI
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

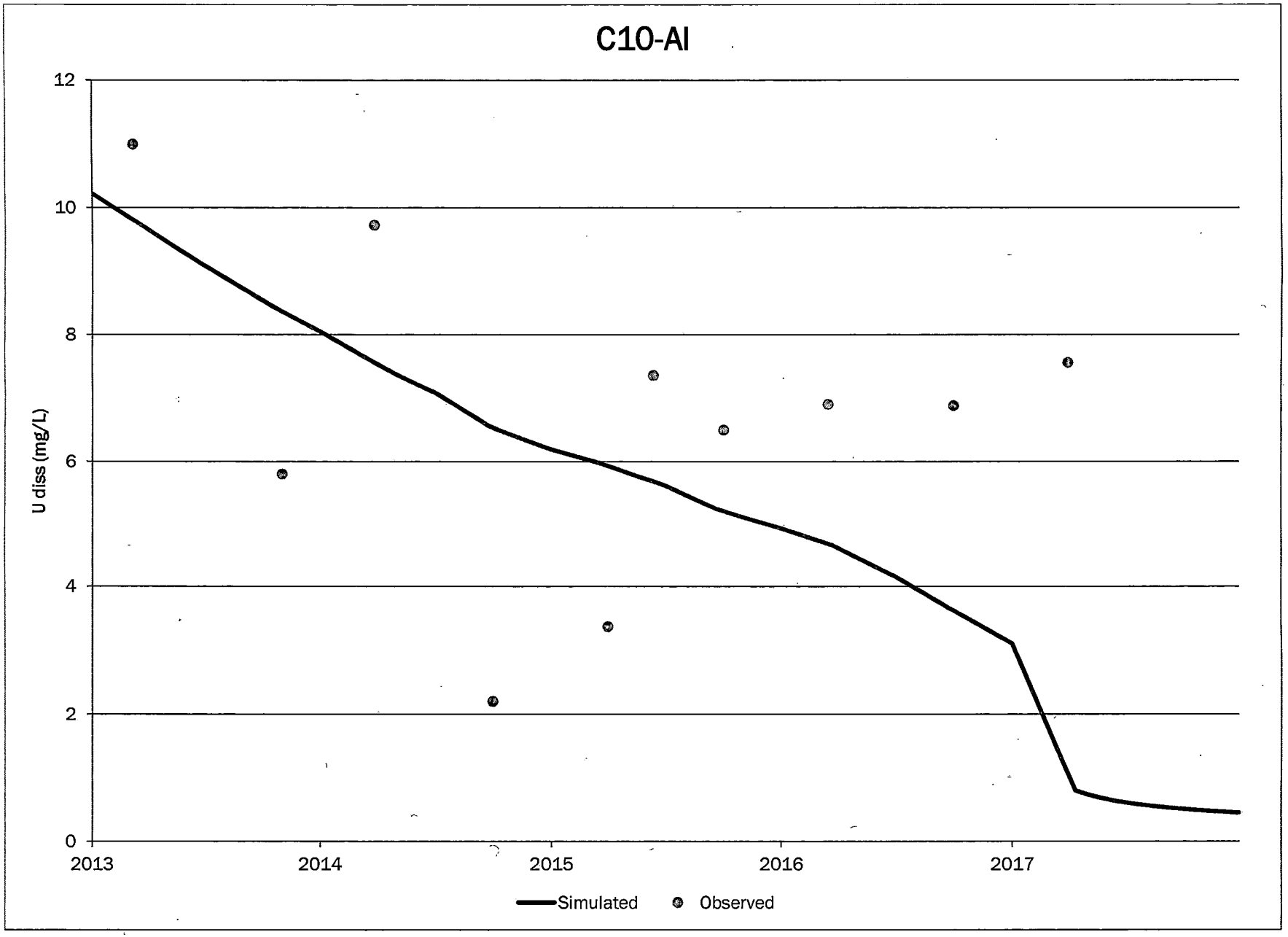

BC-AI
1.4
1.2
1
0.8
0.6
0.4
0.2
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

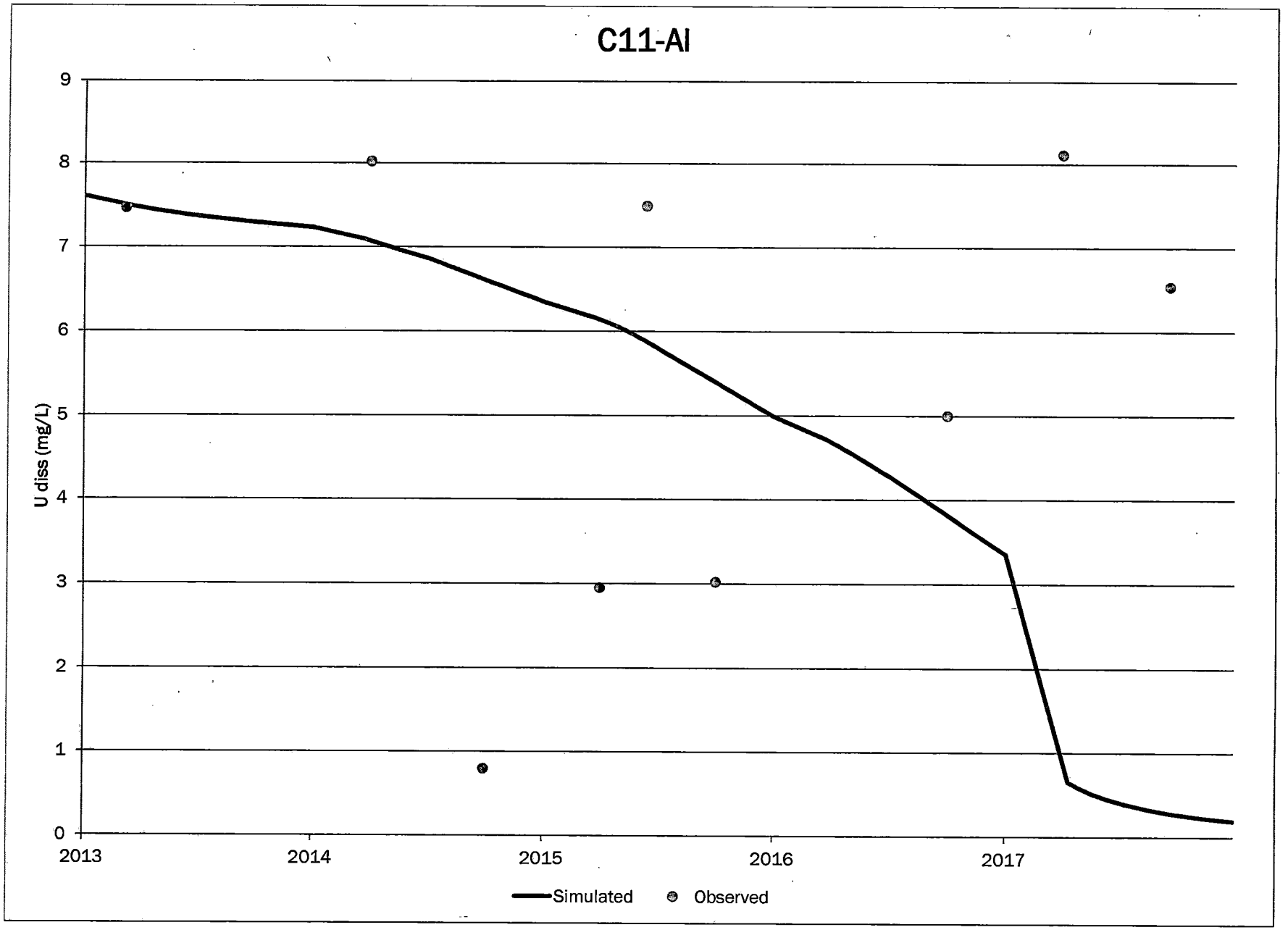

C6-AI
U diss (mg/L)
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

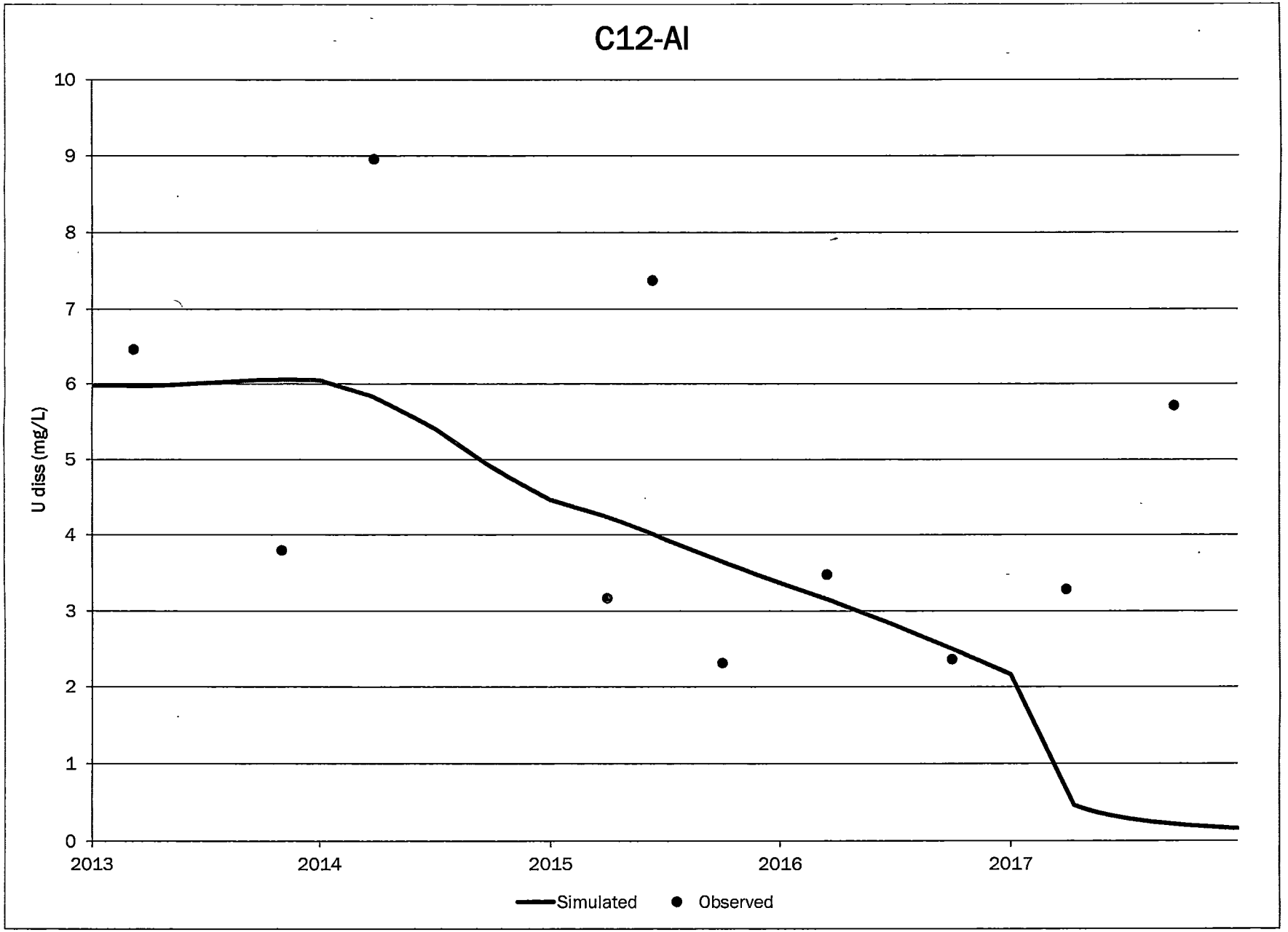

C7-AI
U diss (mg/L)
14
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

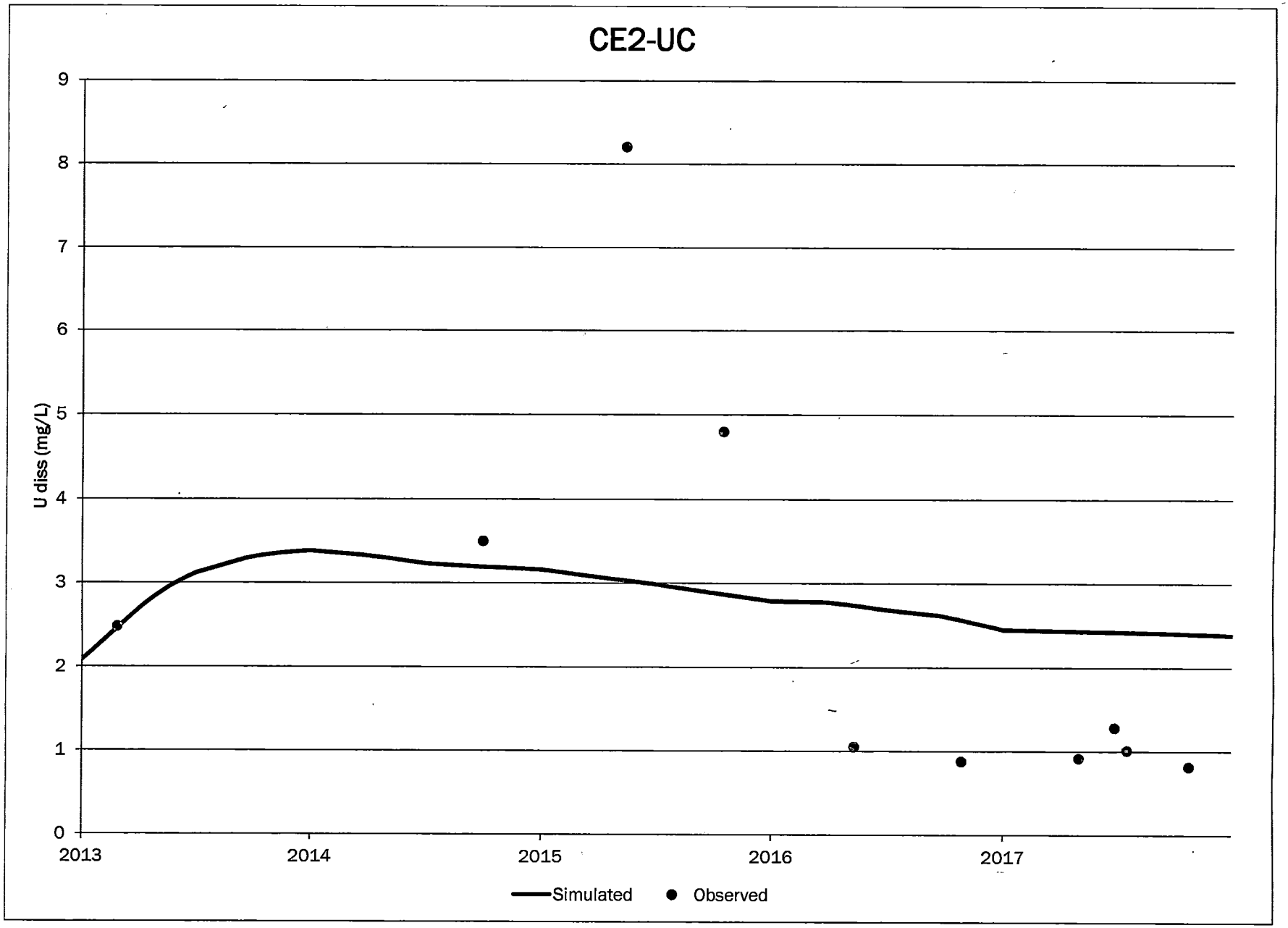

C8-AI
U diss (mg/L)
14
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

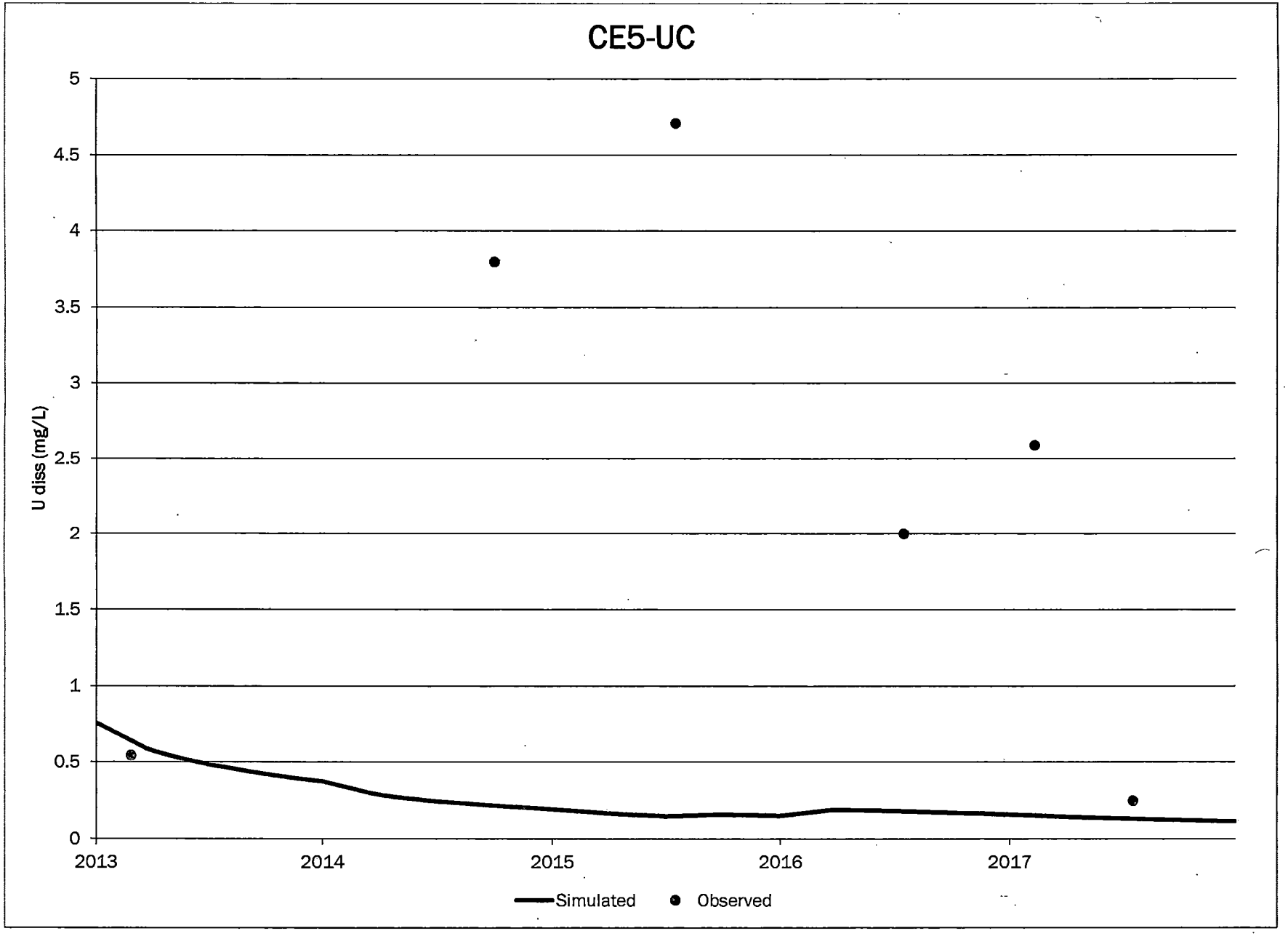

C9-AI
U diss (mg/L)
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

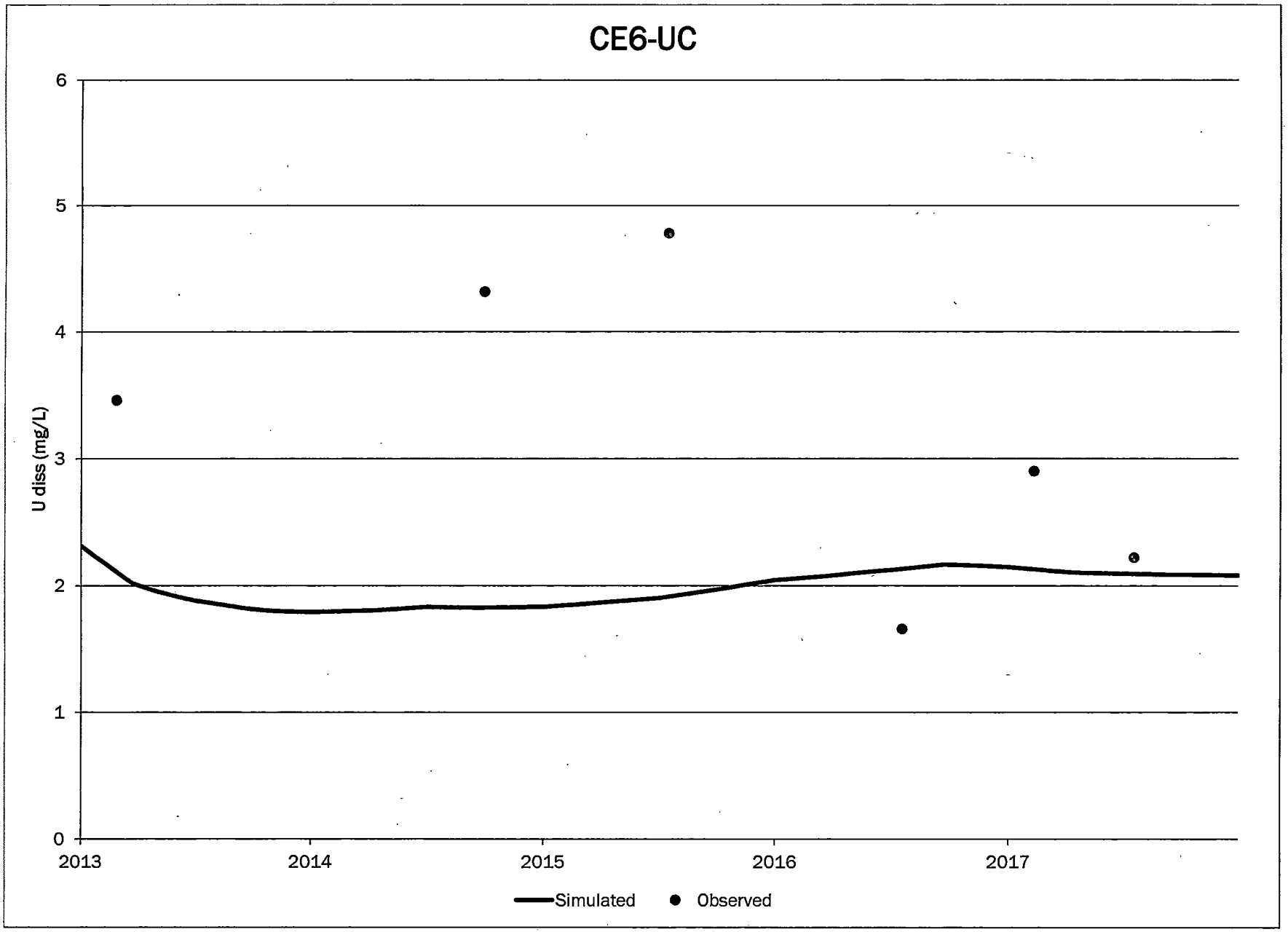

C10-AI
U diss (mg/L)
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

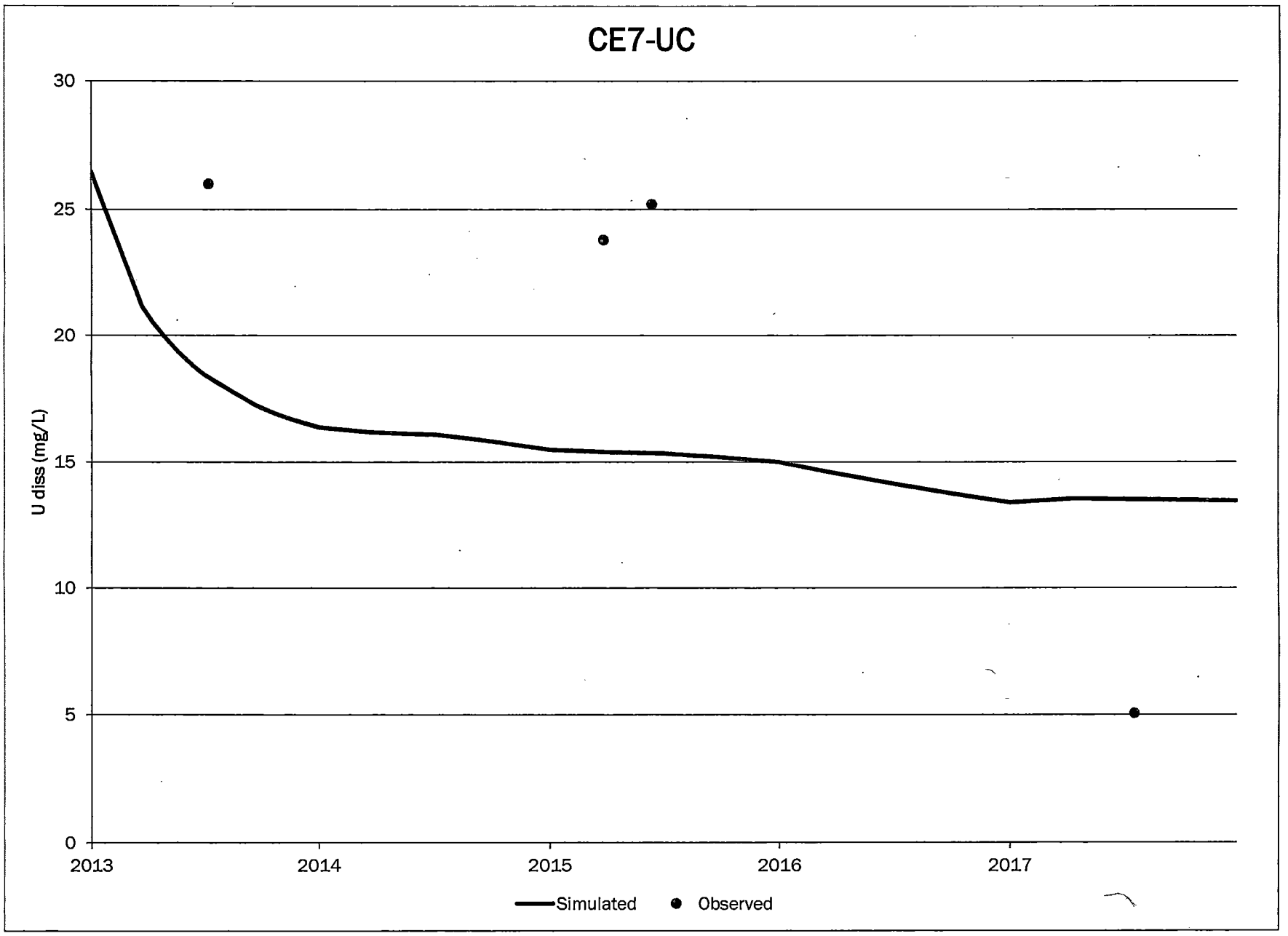

C11-AI
U diss (mg/L)
9
8
7
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

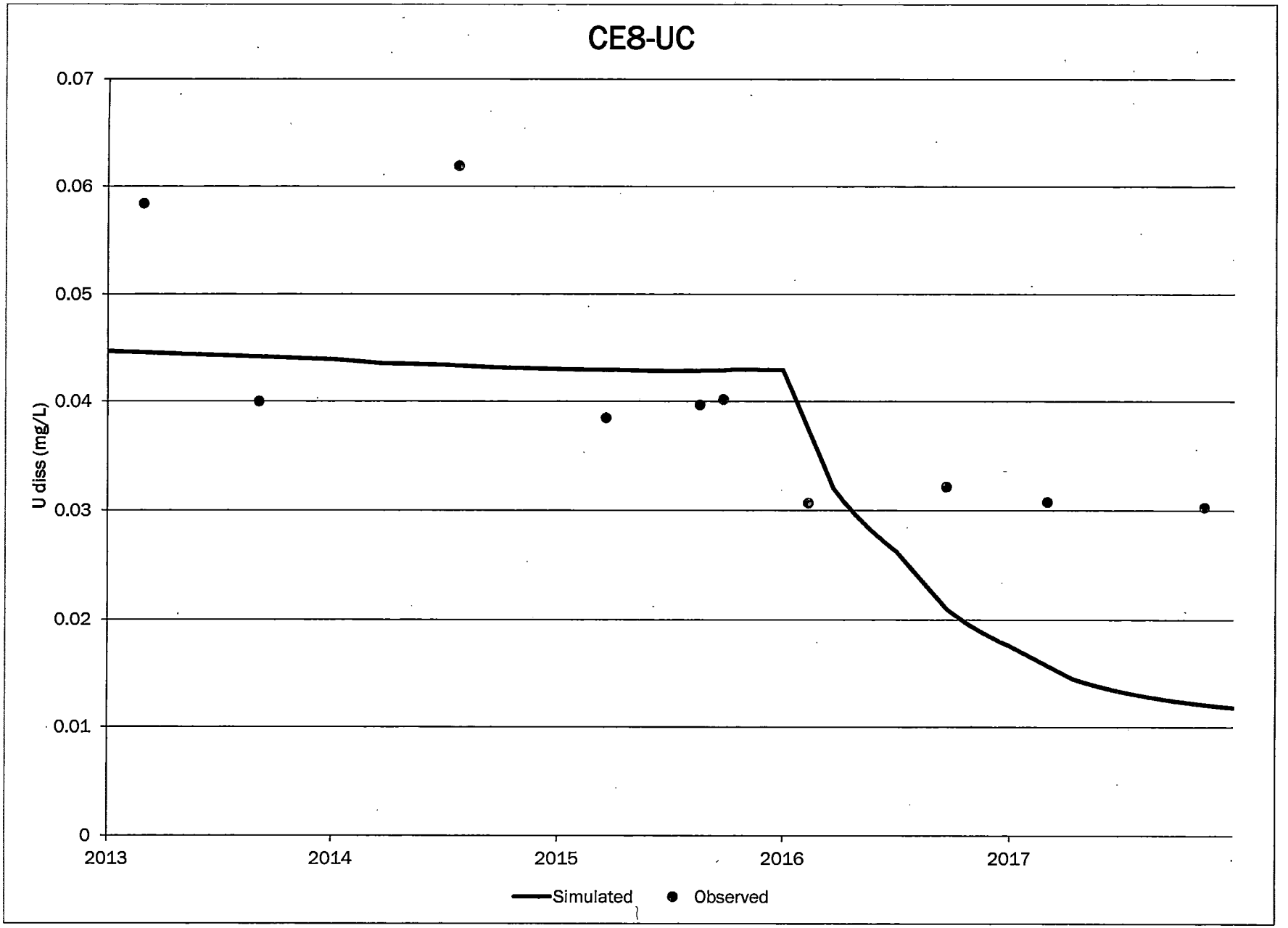

C12-AI
U diss (mg/L)
10
9
8
7
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

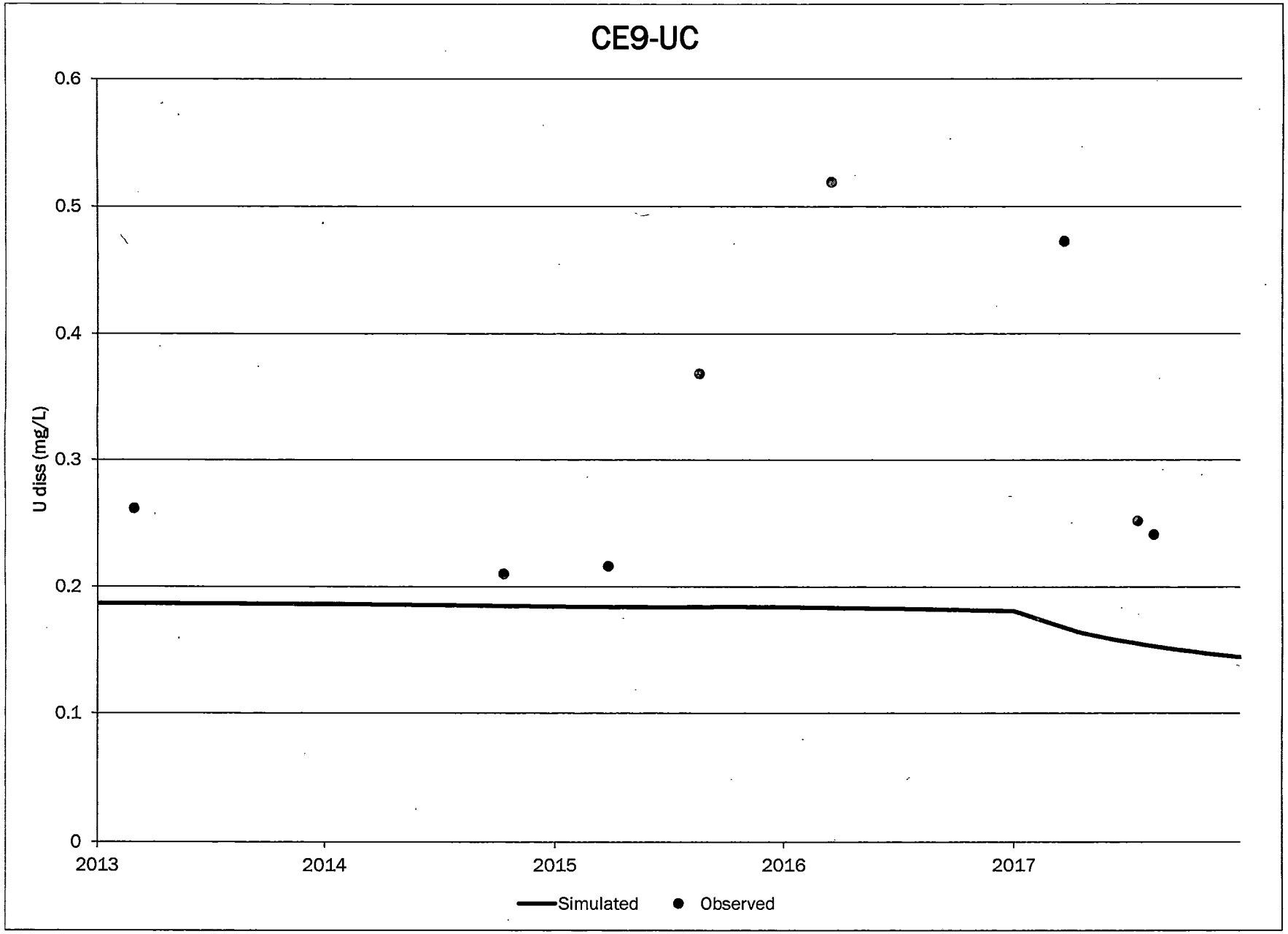

CE2-UC
U diss (mg/L)
0
1
2
3
4
5
6
7
8
9
2013
2014
2015
2016
2017
Simulated
Observed

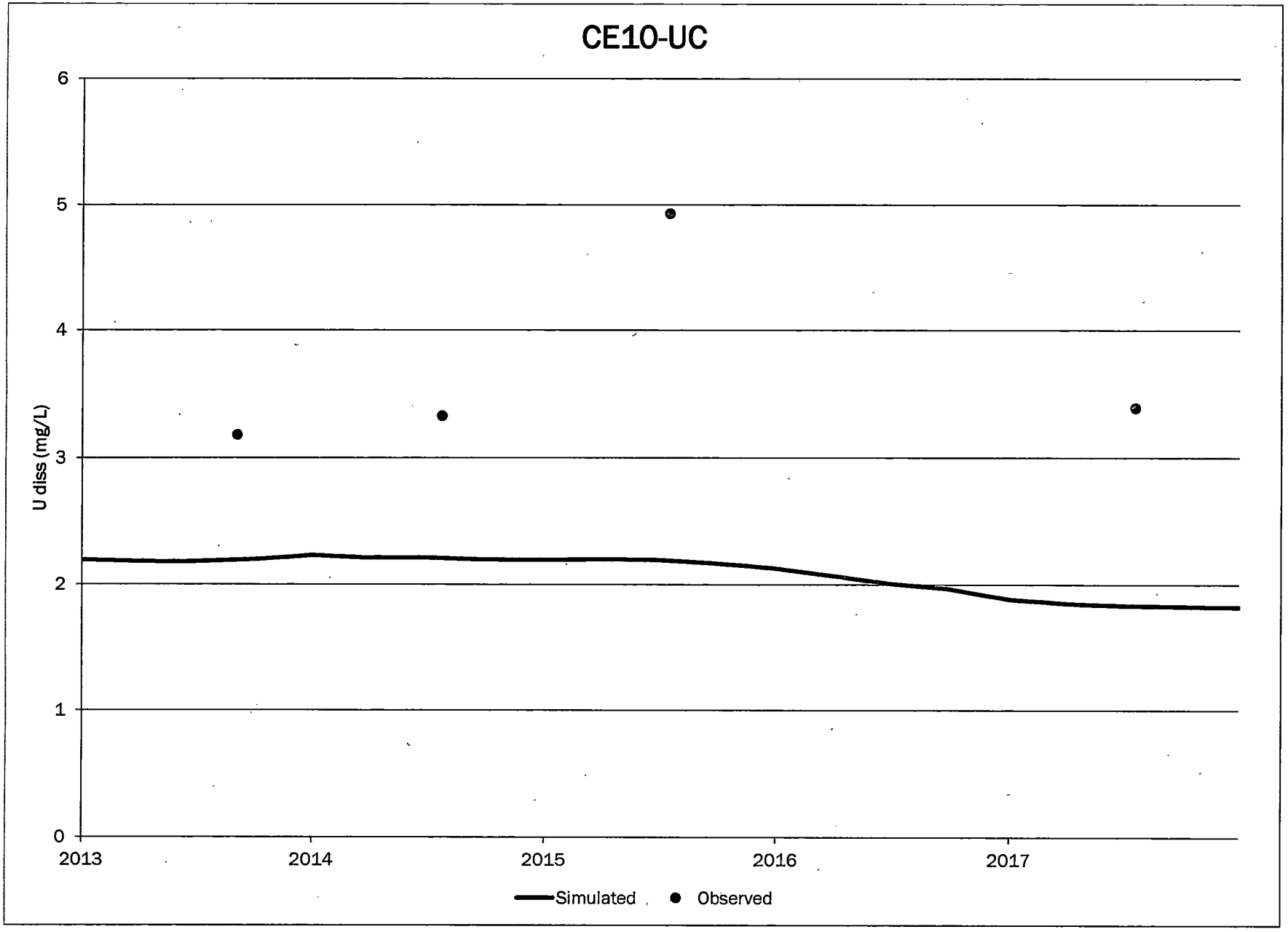

CE5-UC
U diss (mg/L)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

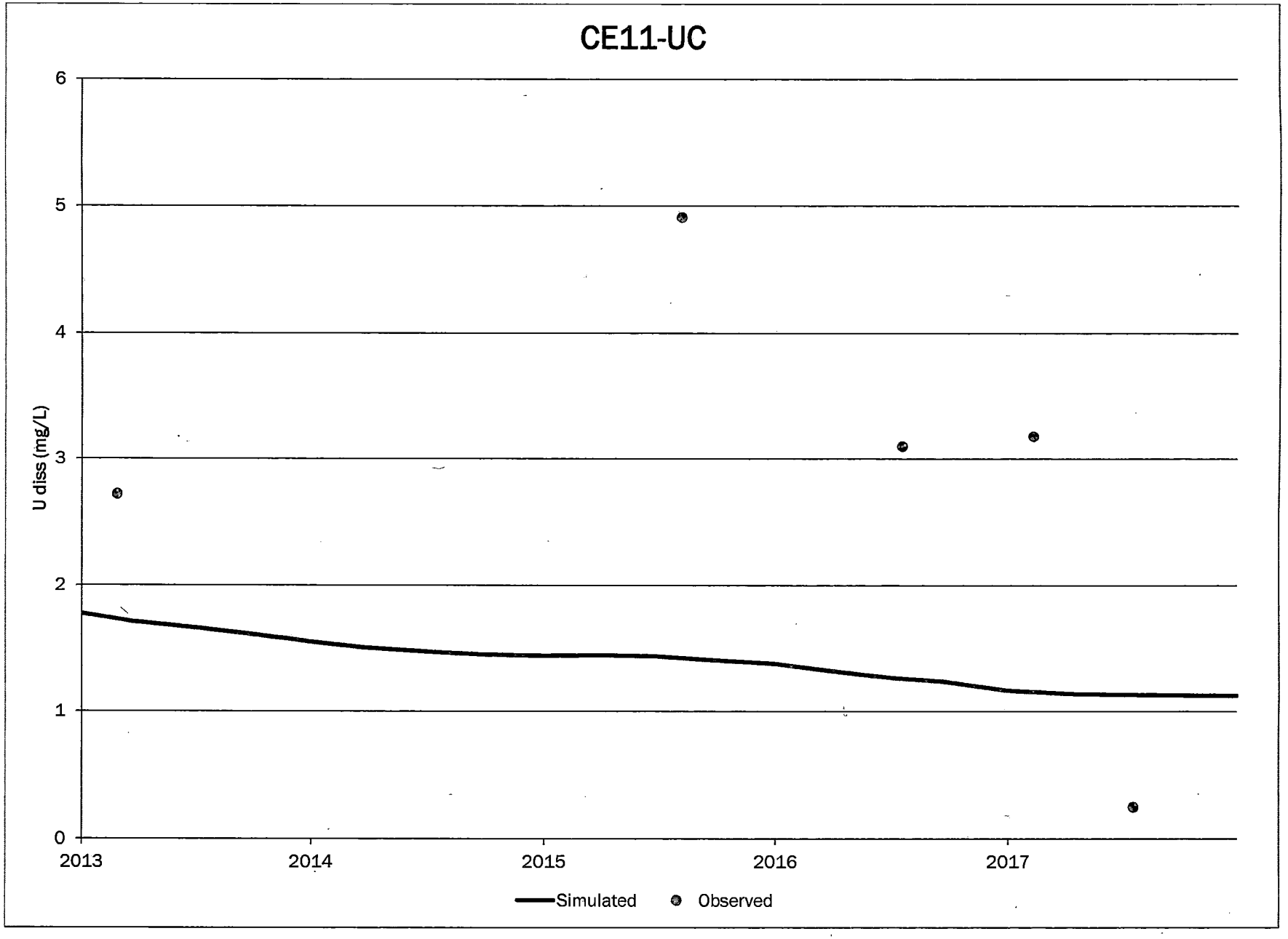

CE6-UC
U diss (mg/L)
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

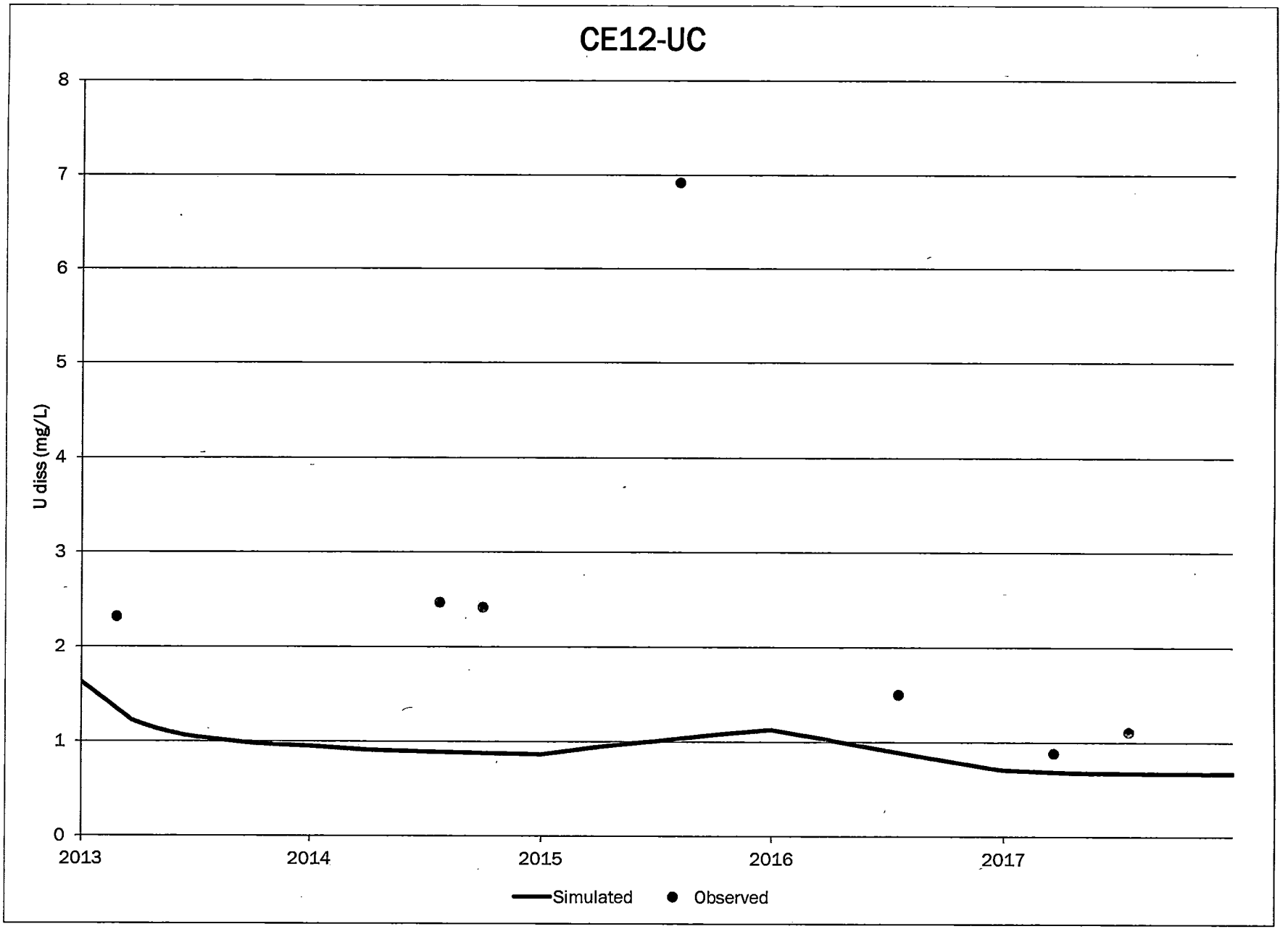

CE7-UC
U diss (mg/L)
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

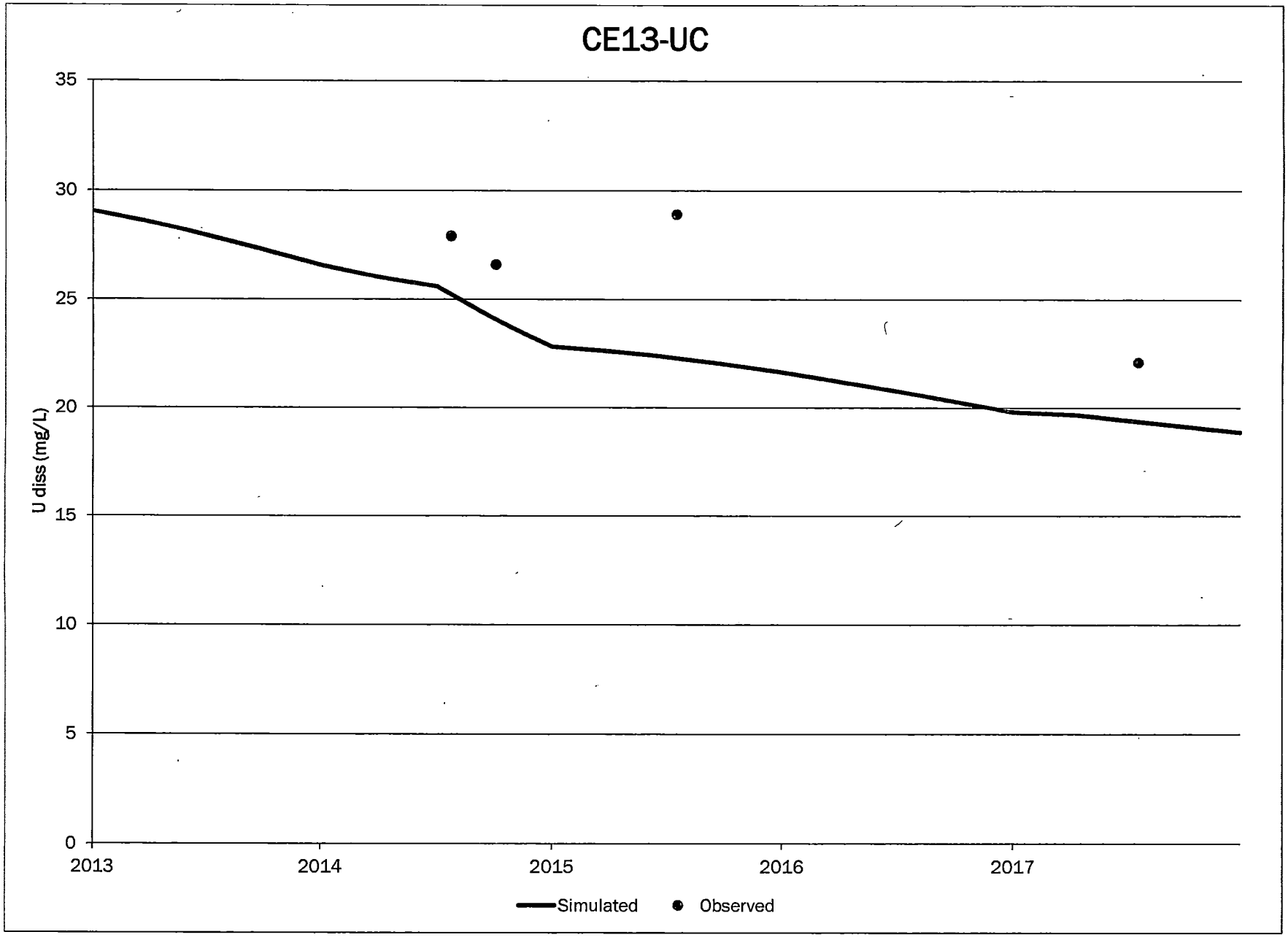

CE8-UC
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

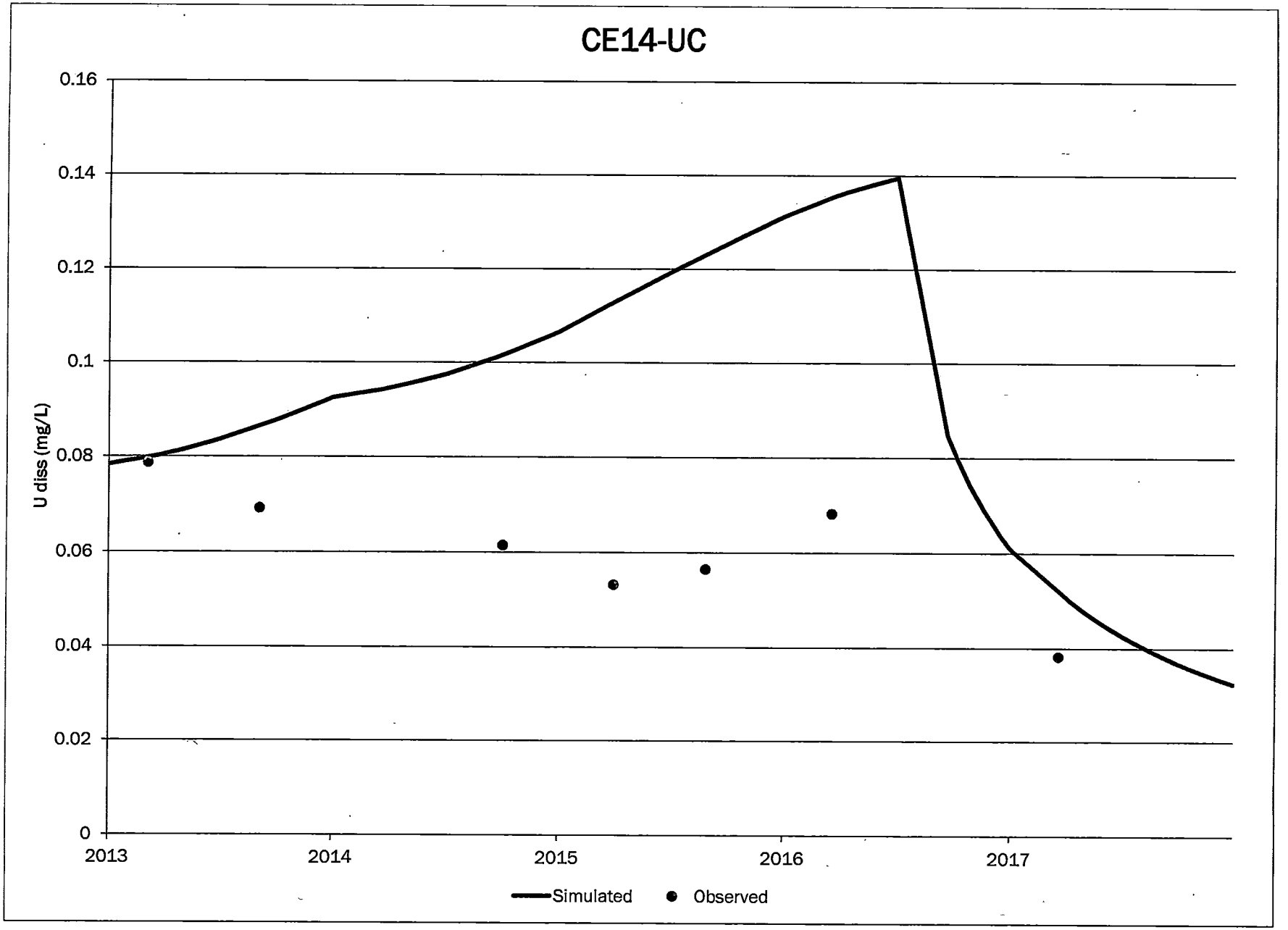

CE9-UC
U diss (mg/L)
0.6
0.5
0.4
0.3
0.2
0.1
0
2013
2014
2015
2016
2017
Simulated
Observed

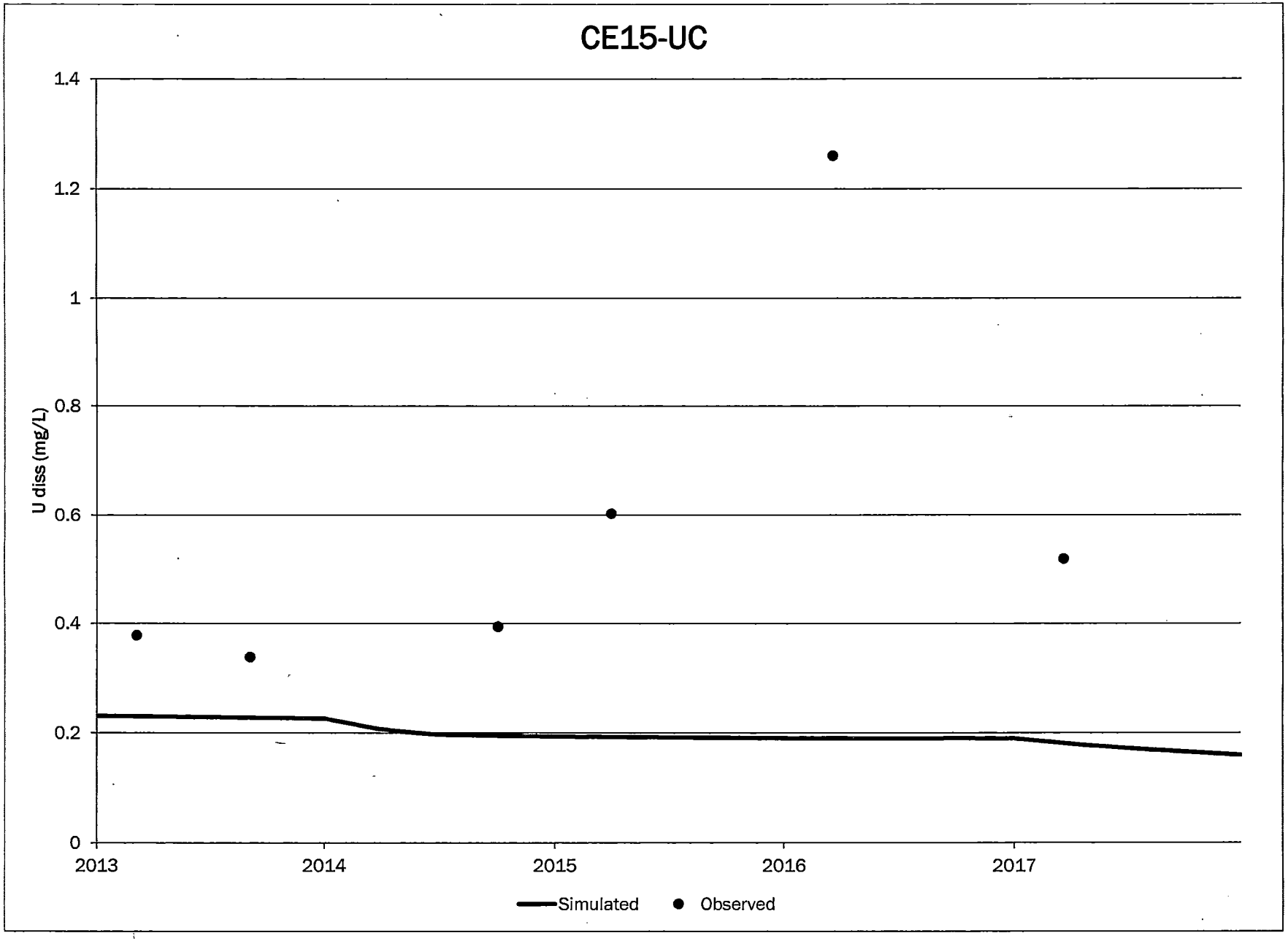

CE10-UC
U diss (mg/L)
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

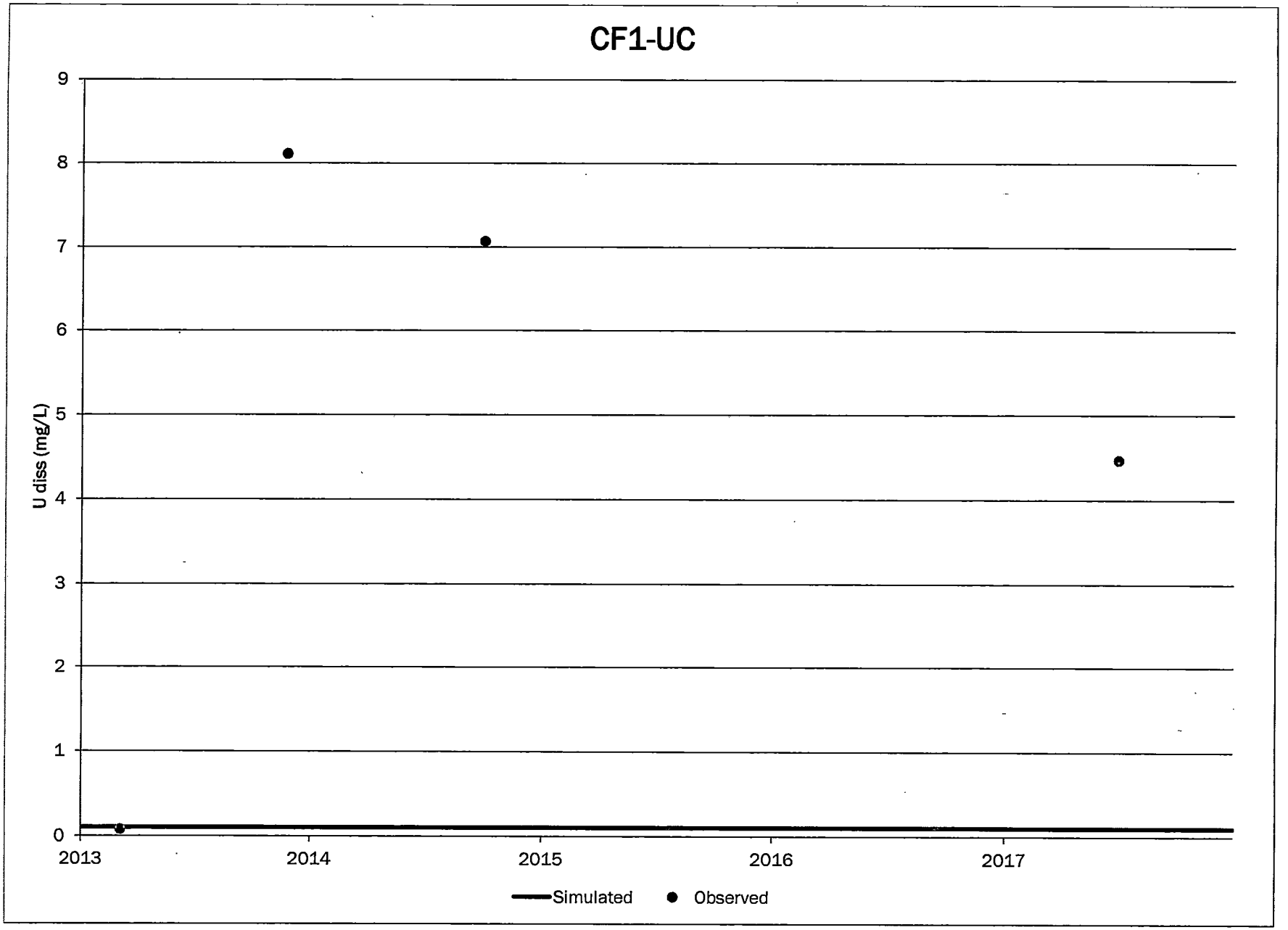

CE11-UC
U diss (mg/L)
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

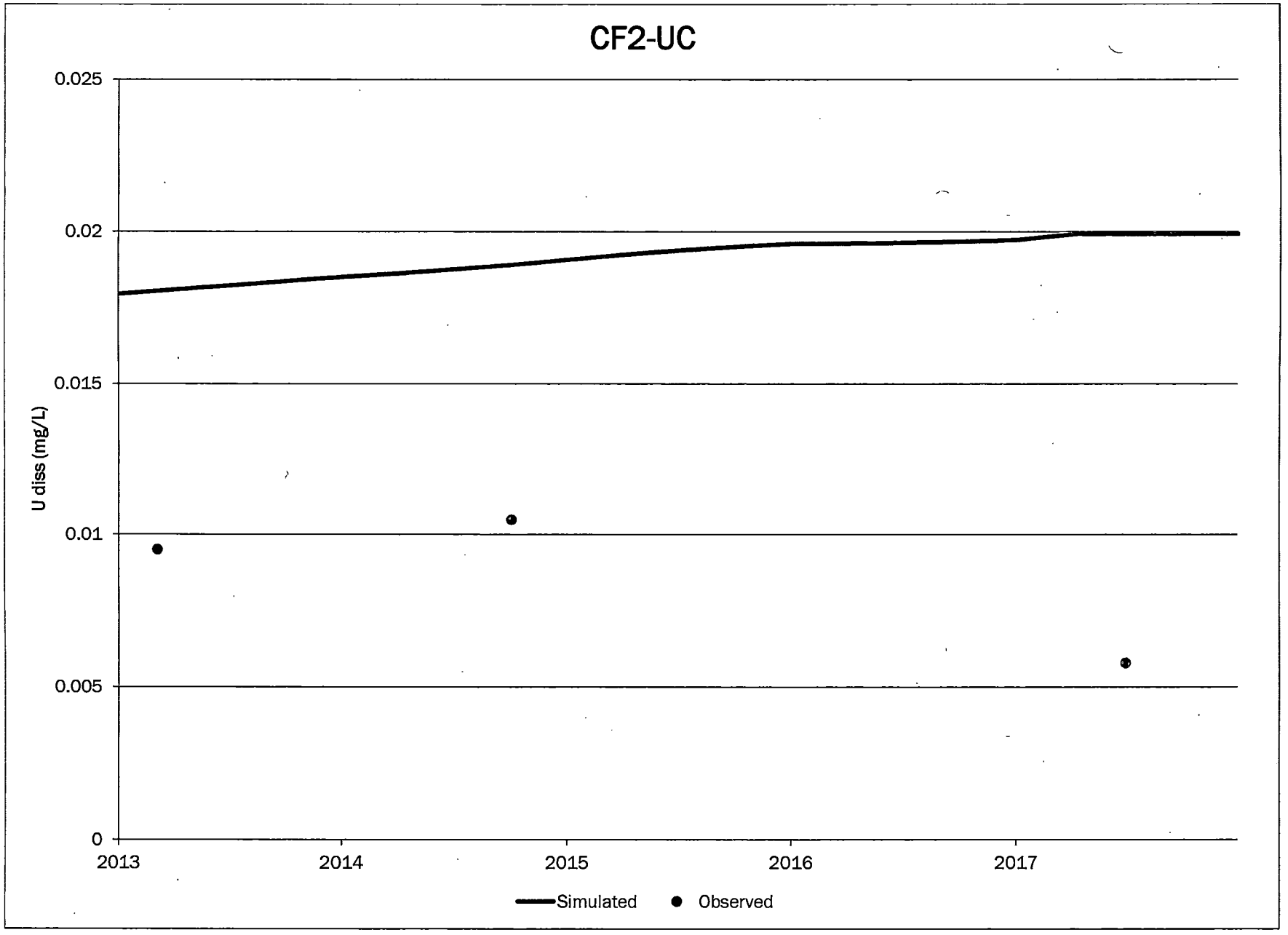

CE12-UC
U diss (mg/L)
8
7
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

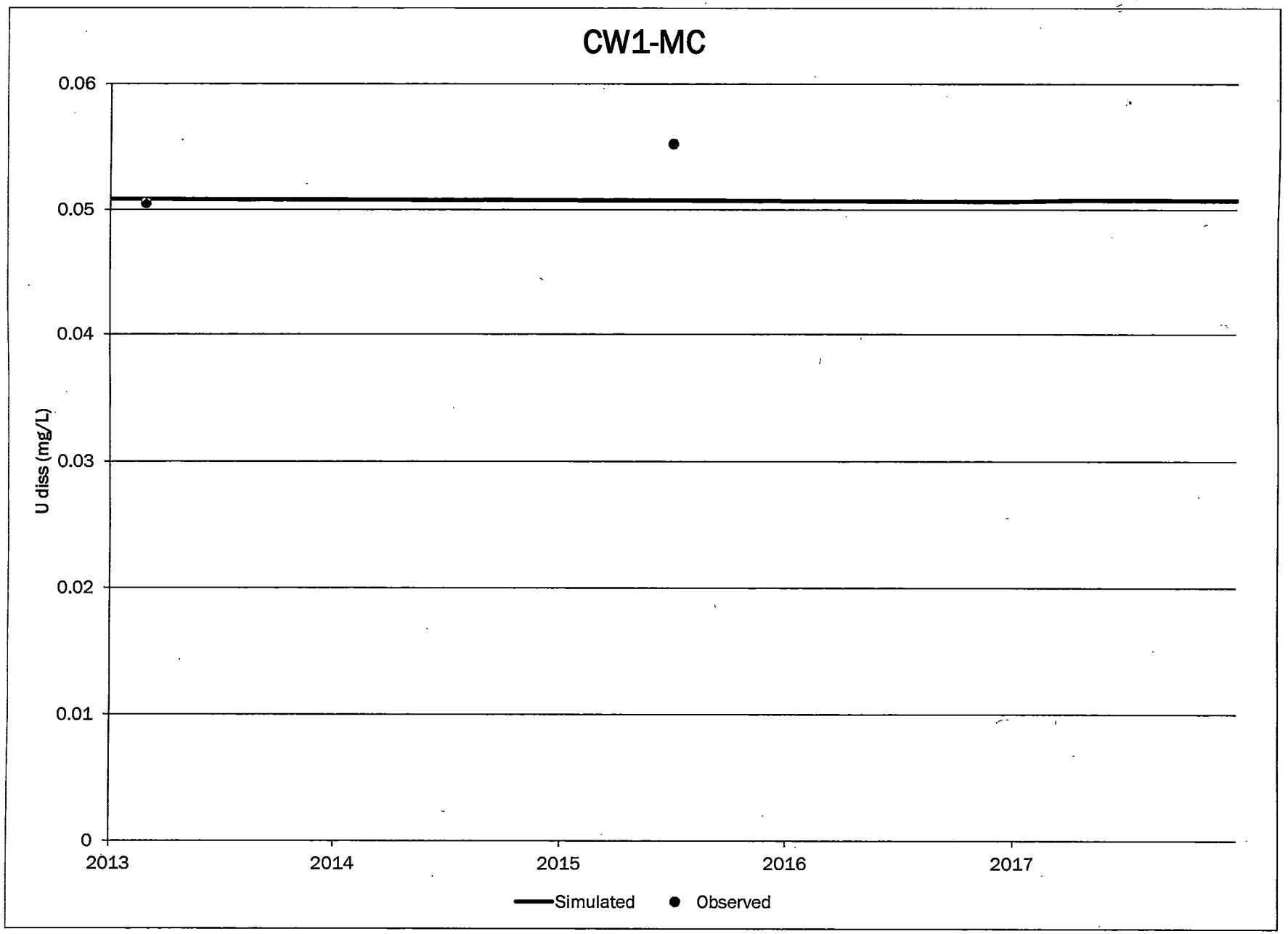

CE13-UC
35
30
25
20
15
10
5
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

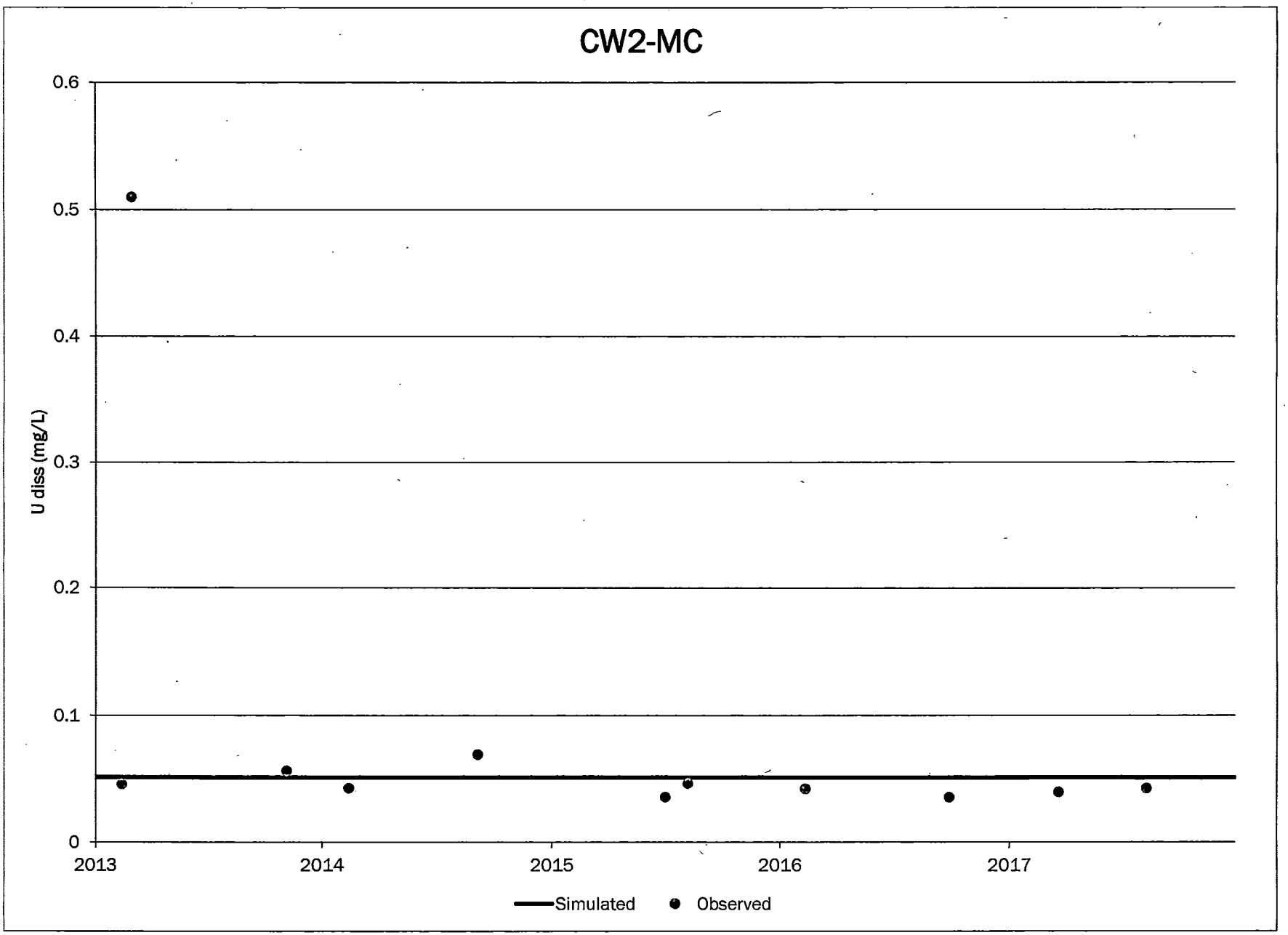

CE14-UC
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

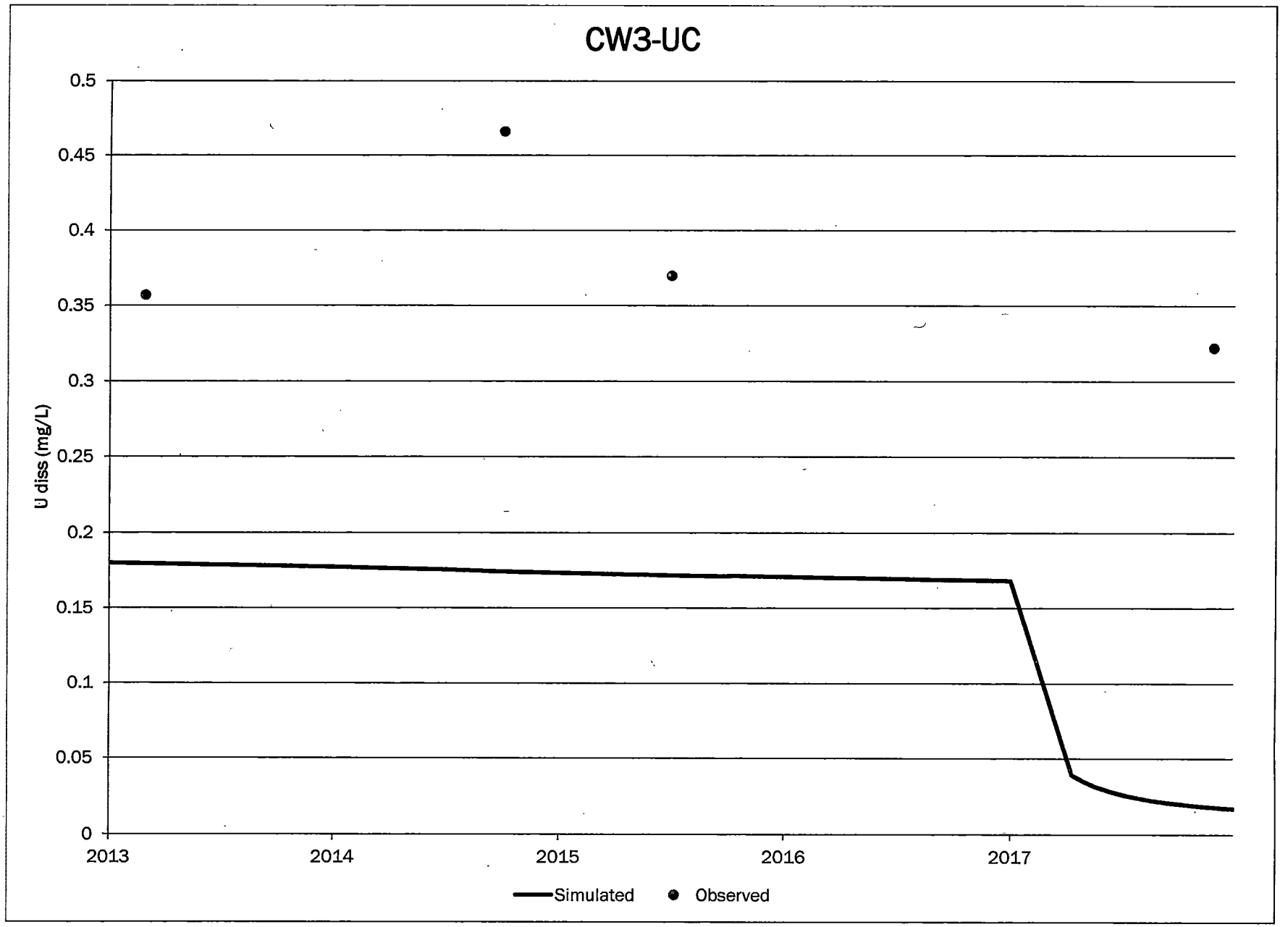

CE15-UC
U diss (mg/L)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2013
2014
2015
2016
2017
Simulated
Observed

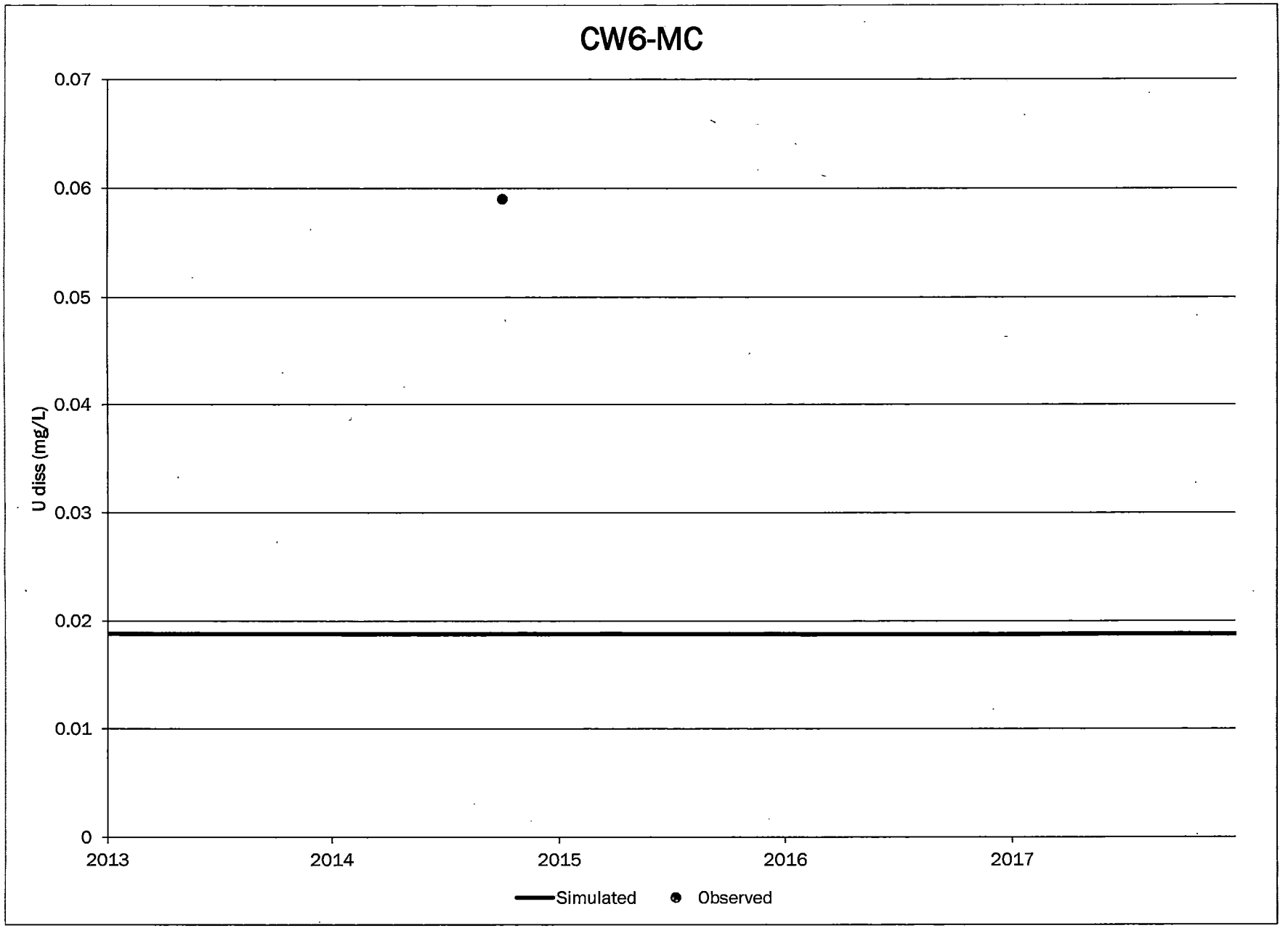

CF1-UC
U diss (mg/L)
9
8
7
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

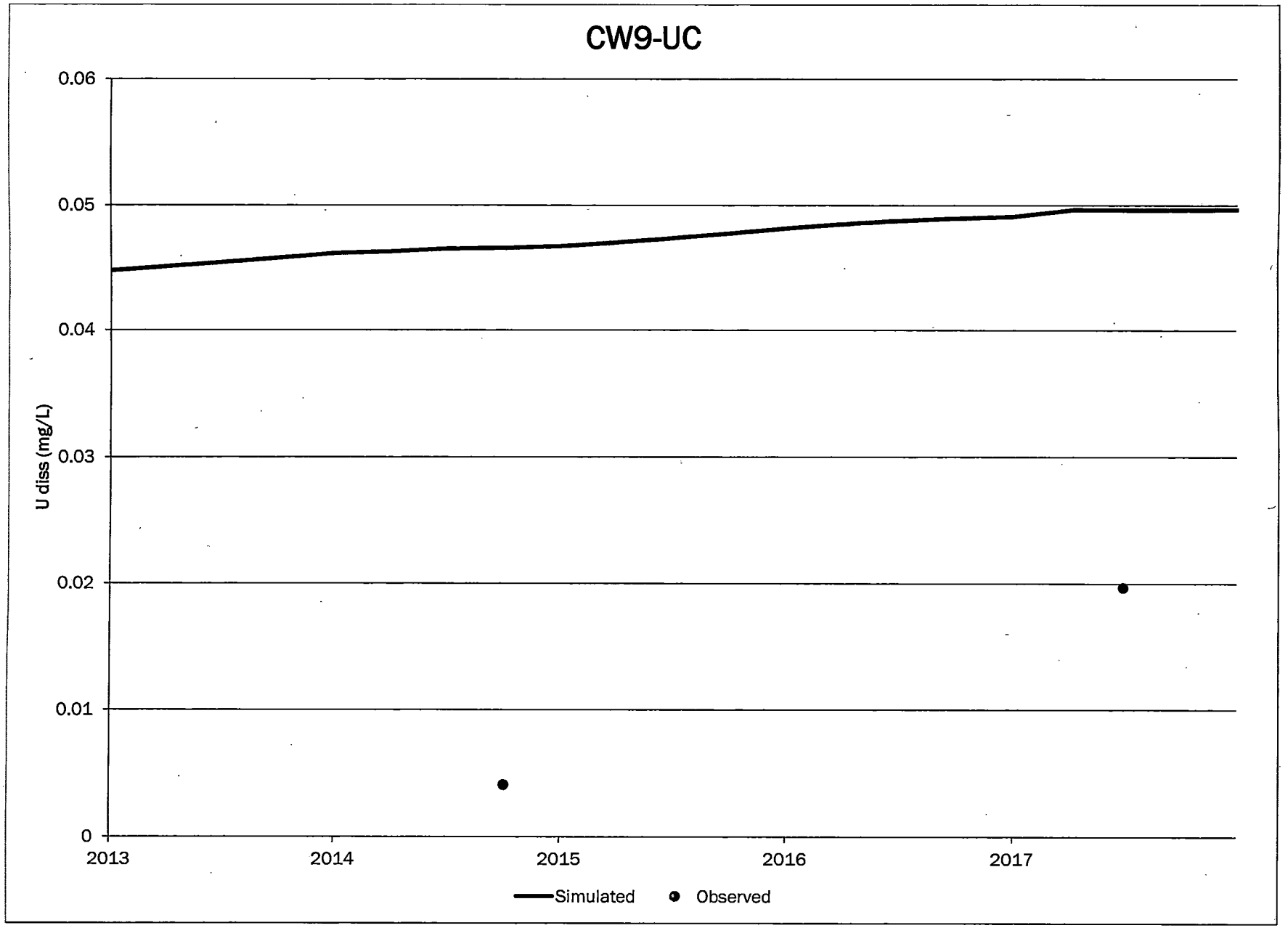

CF2-UC
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

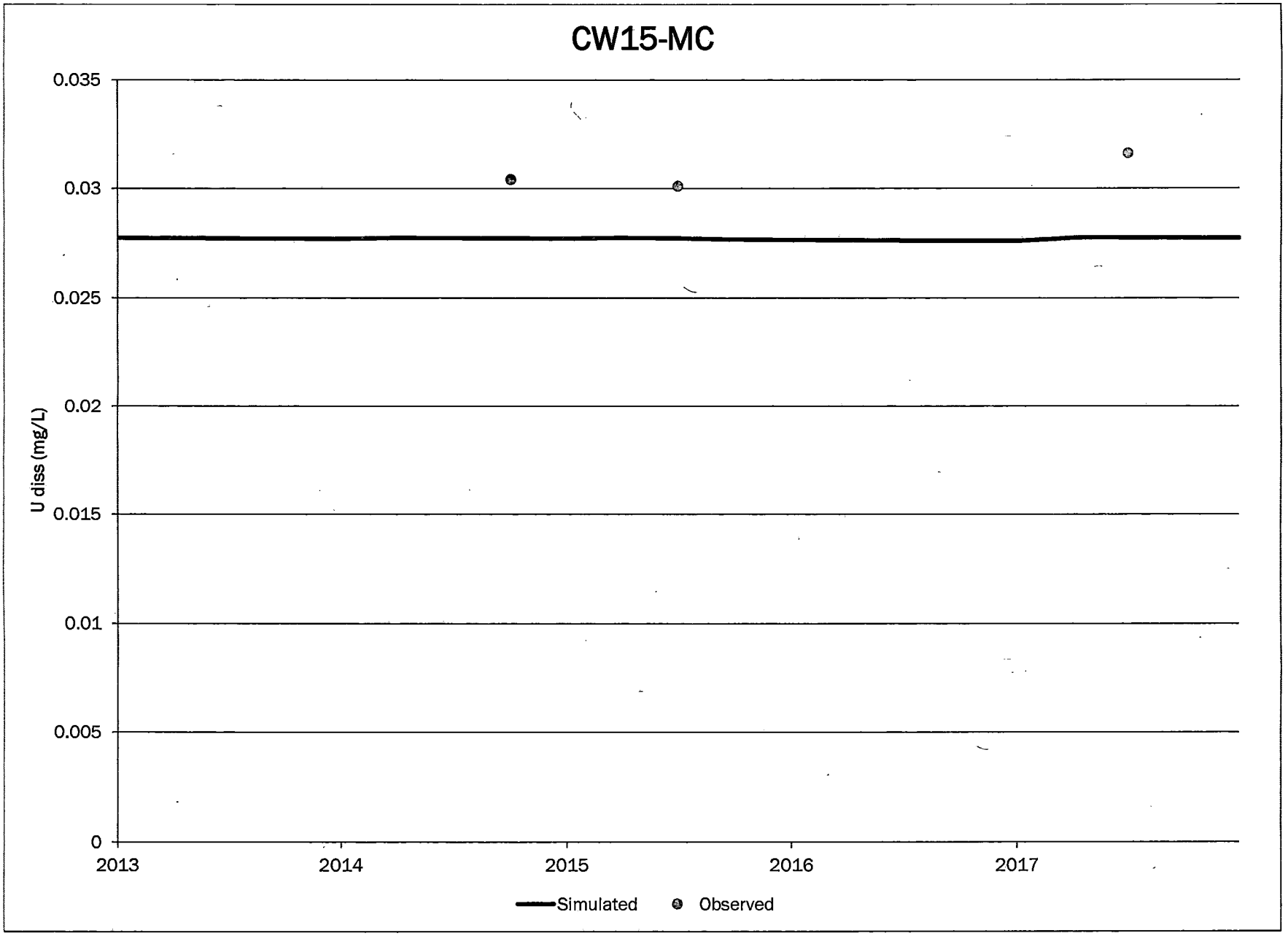

CW1-MC
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

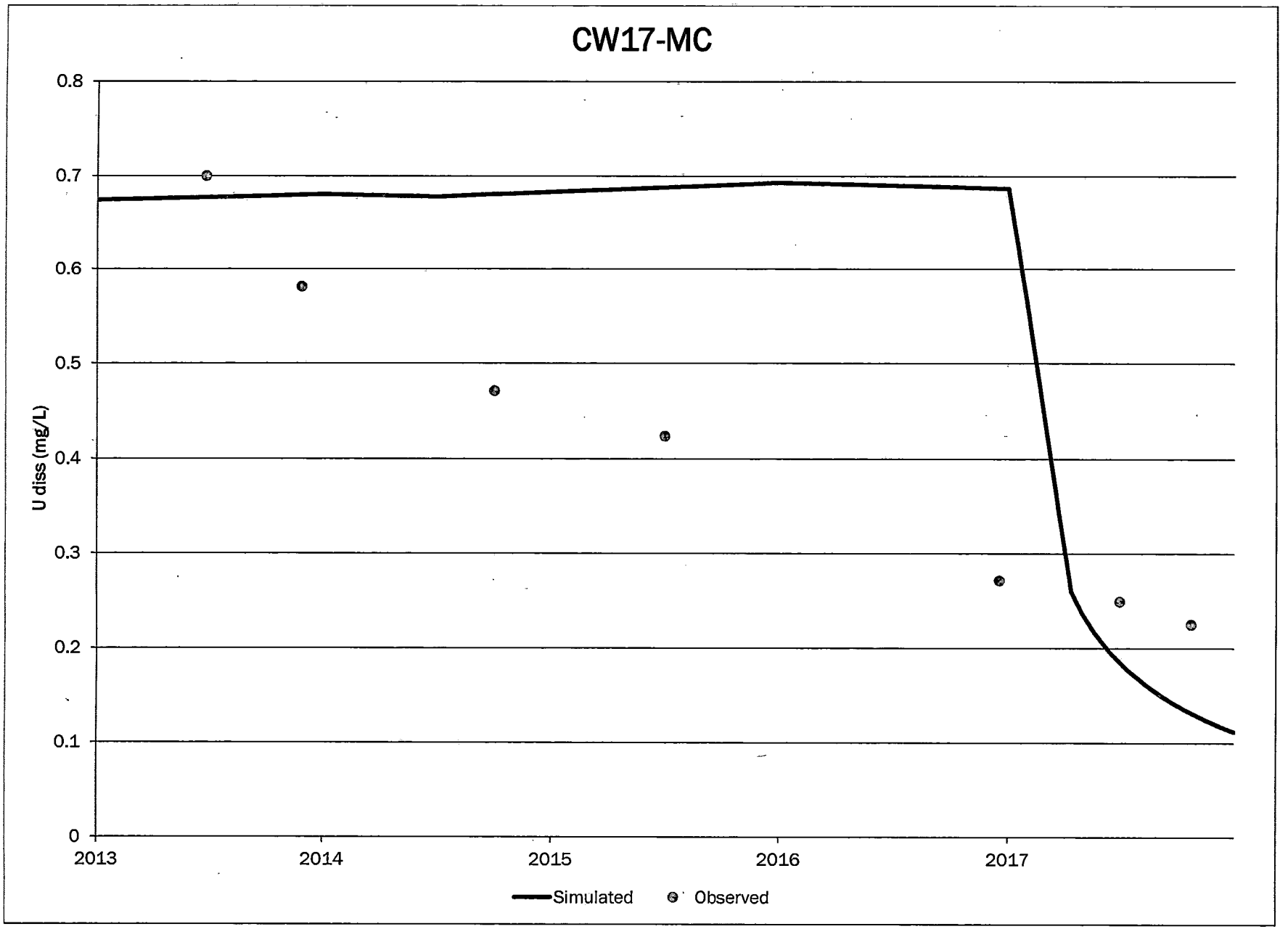

CW2-MC
U diss (mg/L)
0.6
0.5
0.4
0.3
0.2
0.1
0
2013
2014
2015
2016
2017
Simulated
Observed

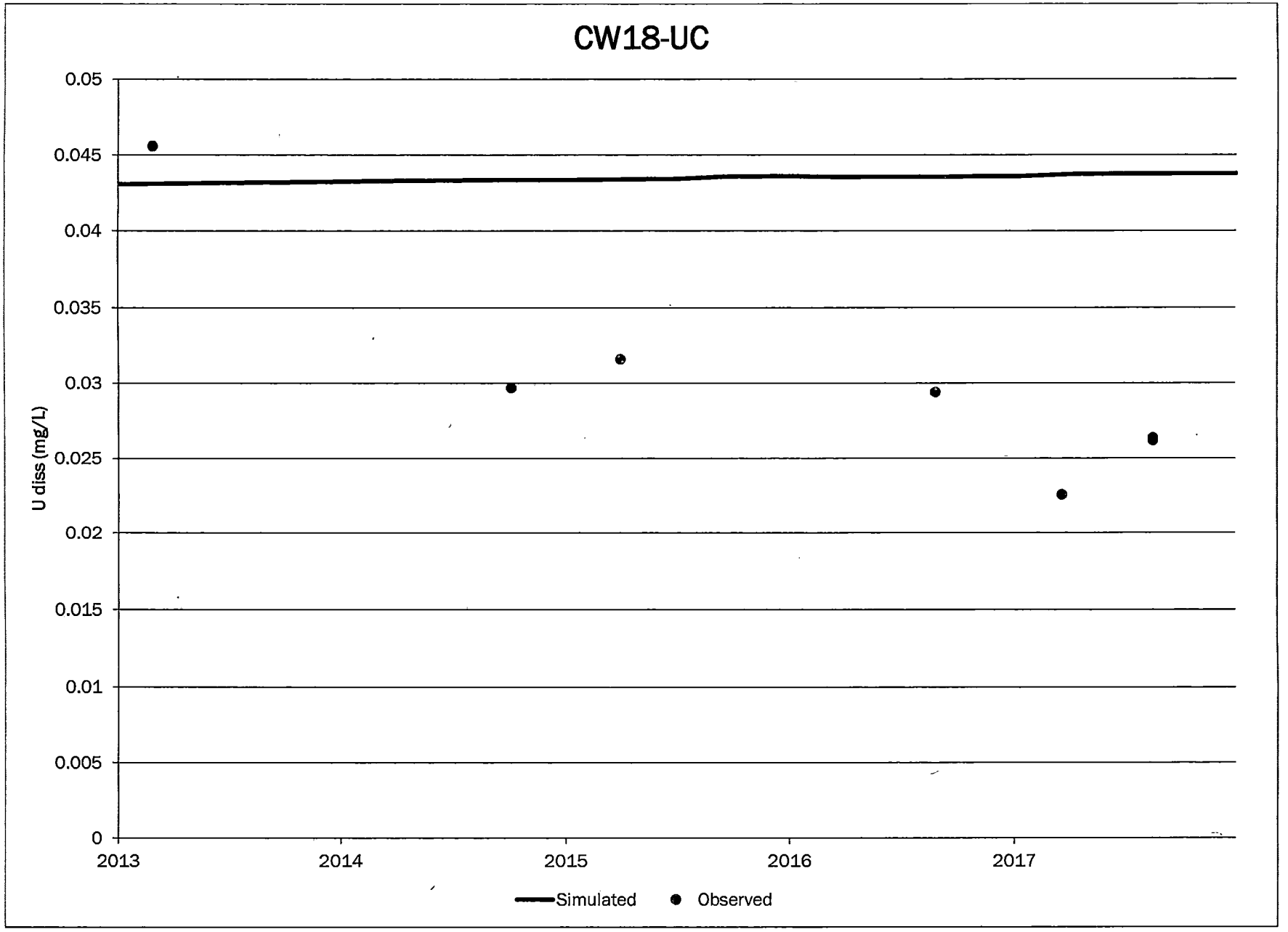

CW3-UC
U diss (mg/L)
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
2013
2014
2015
2016
2017
Simulated
Observed

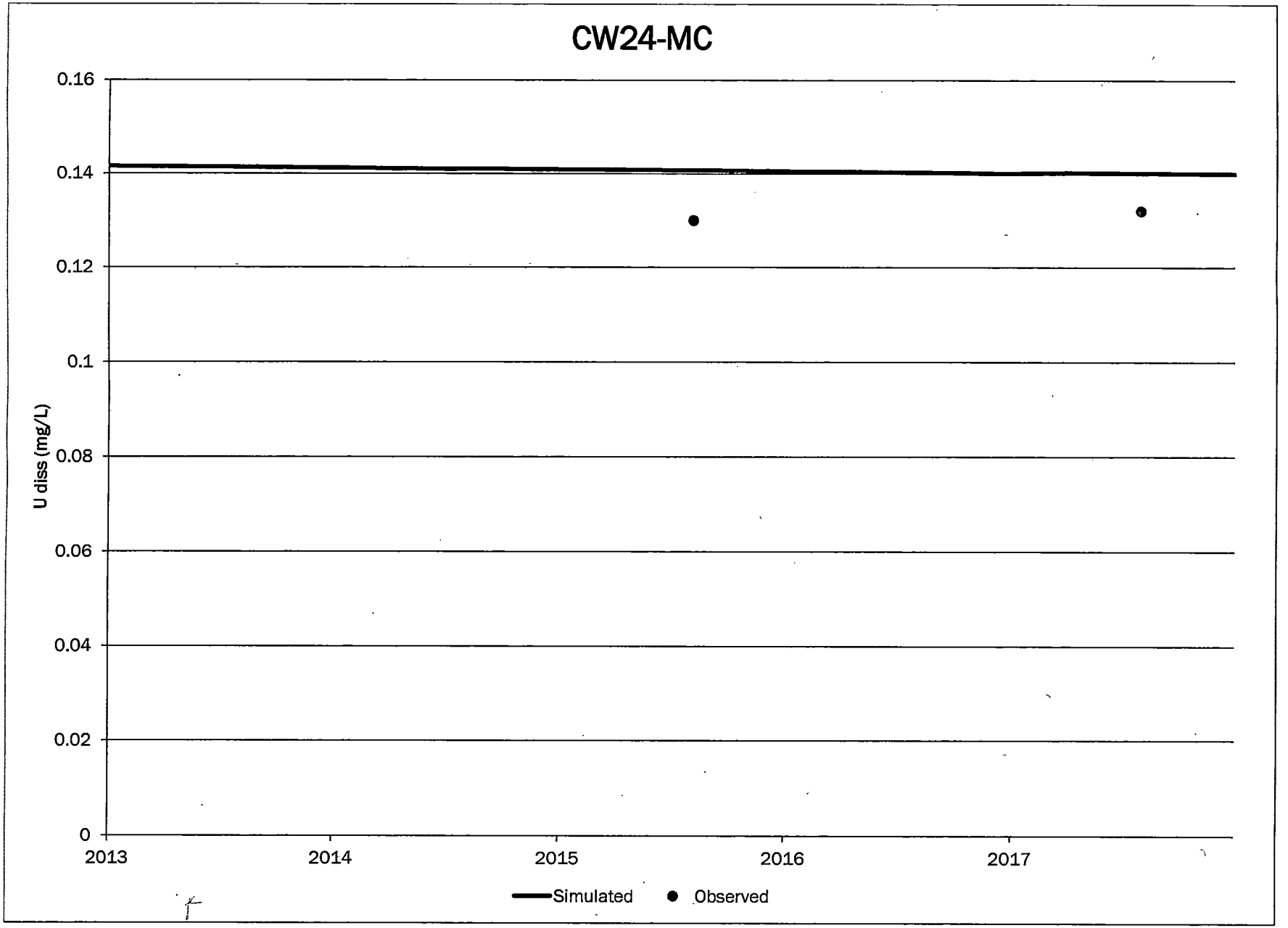

CW6-MC
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

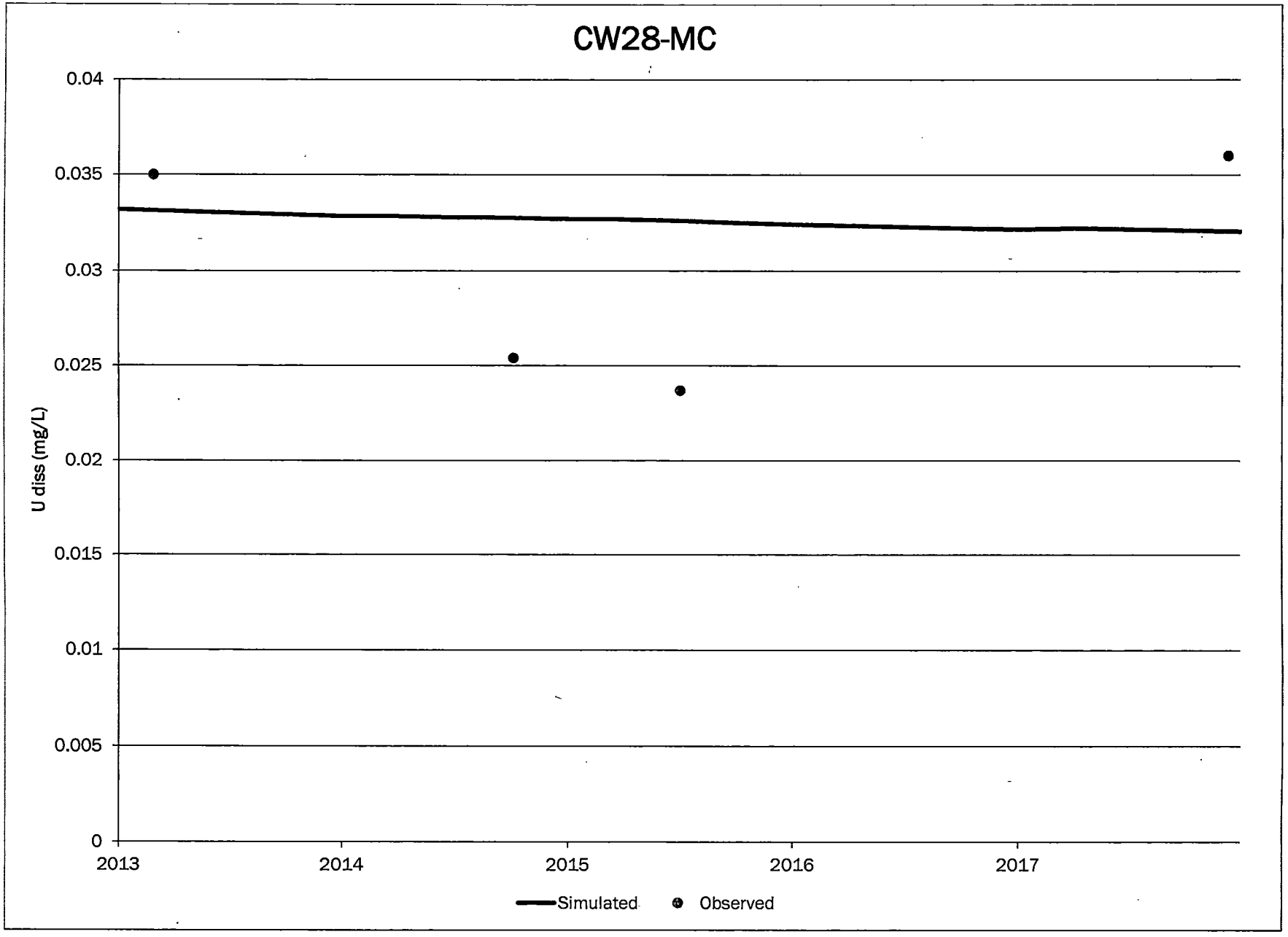

CW9-UC
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

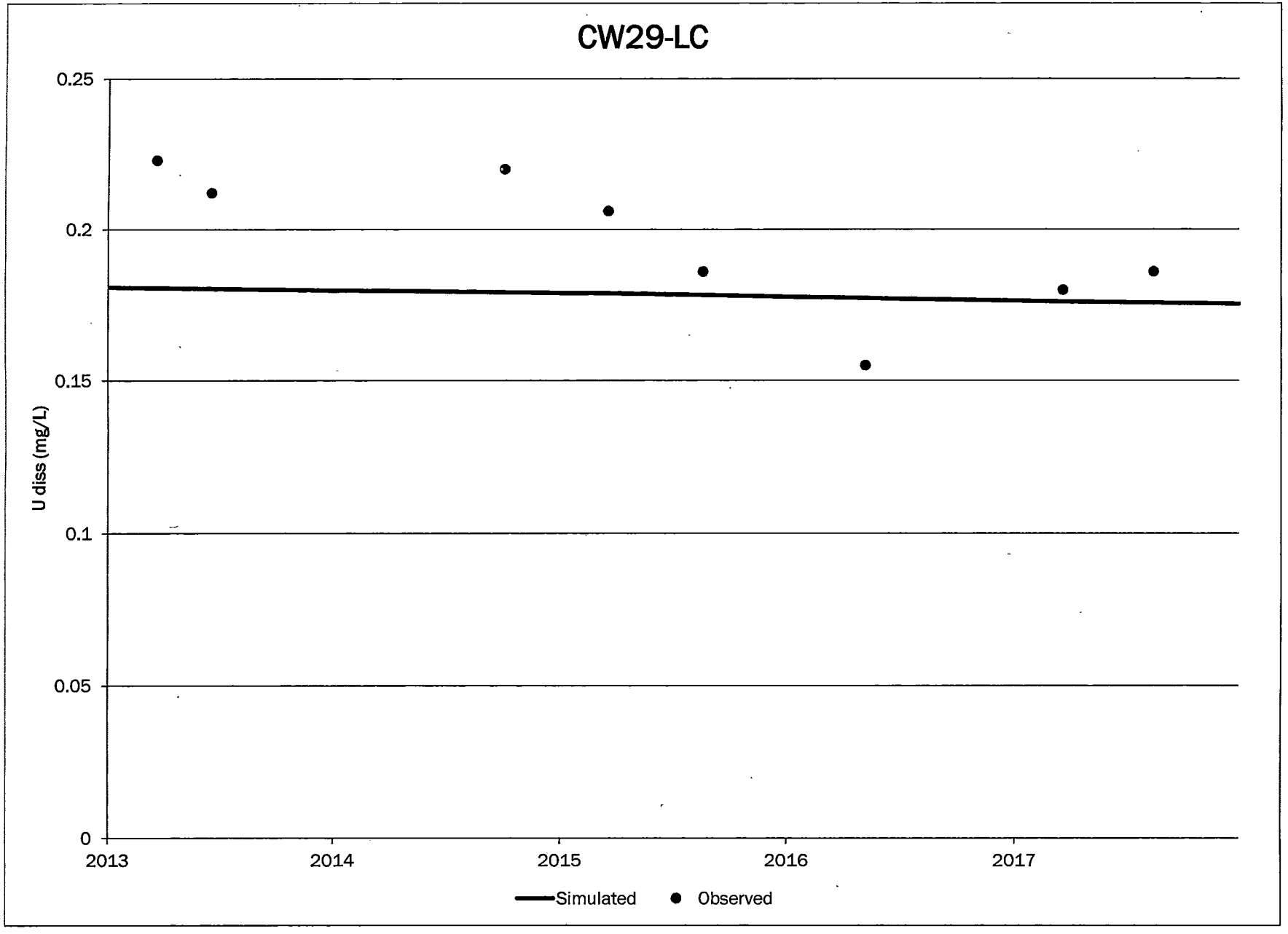

CW15-MC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

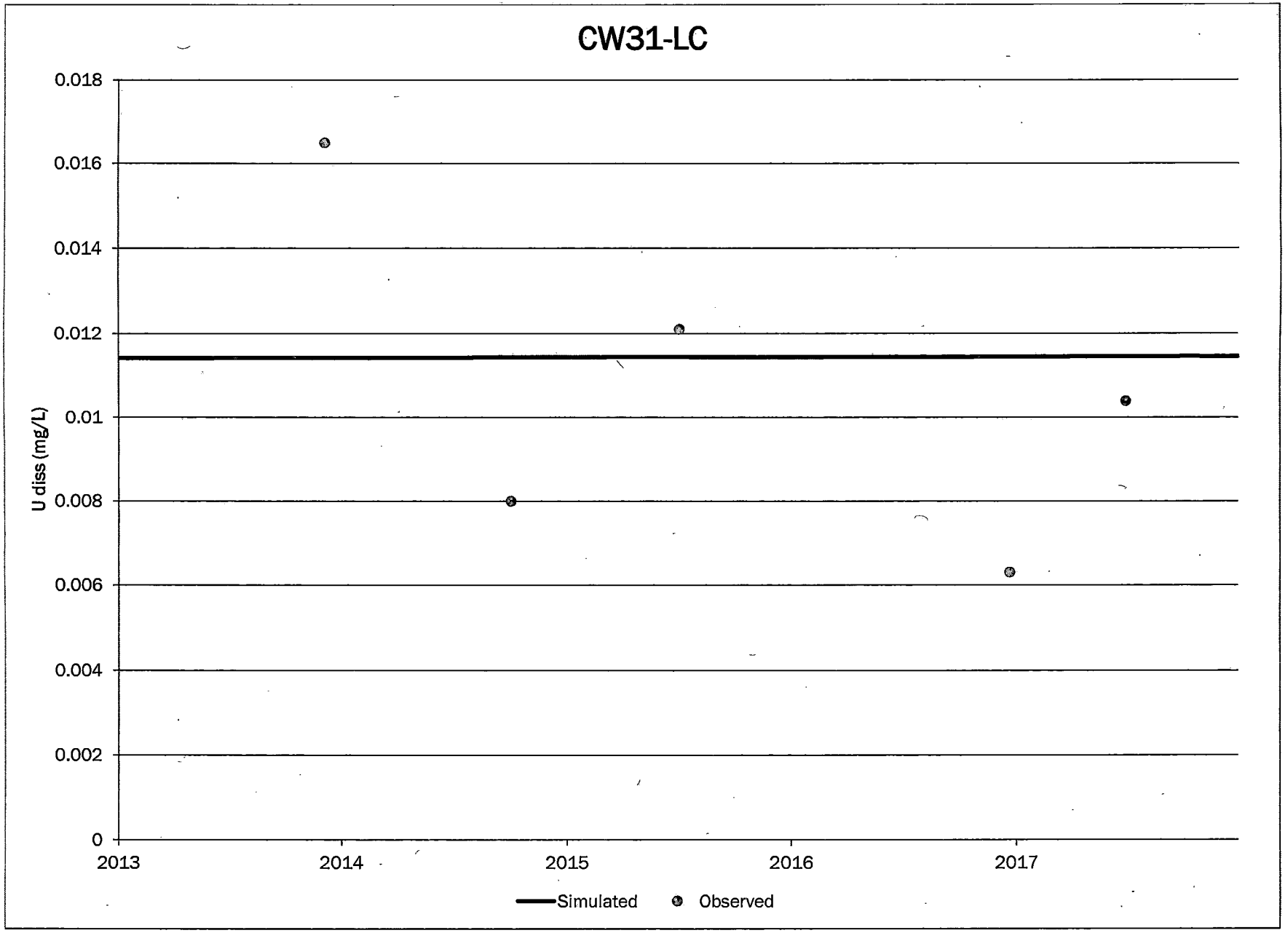

CW17-MC
U diss (mg/L)
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
2013
2014
2015
2016
2017
Simulated
Observed

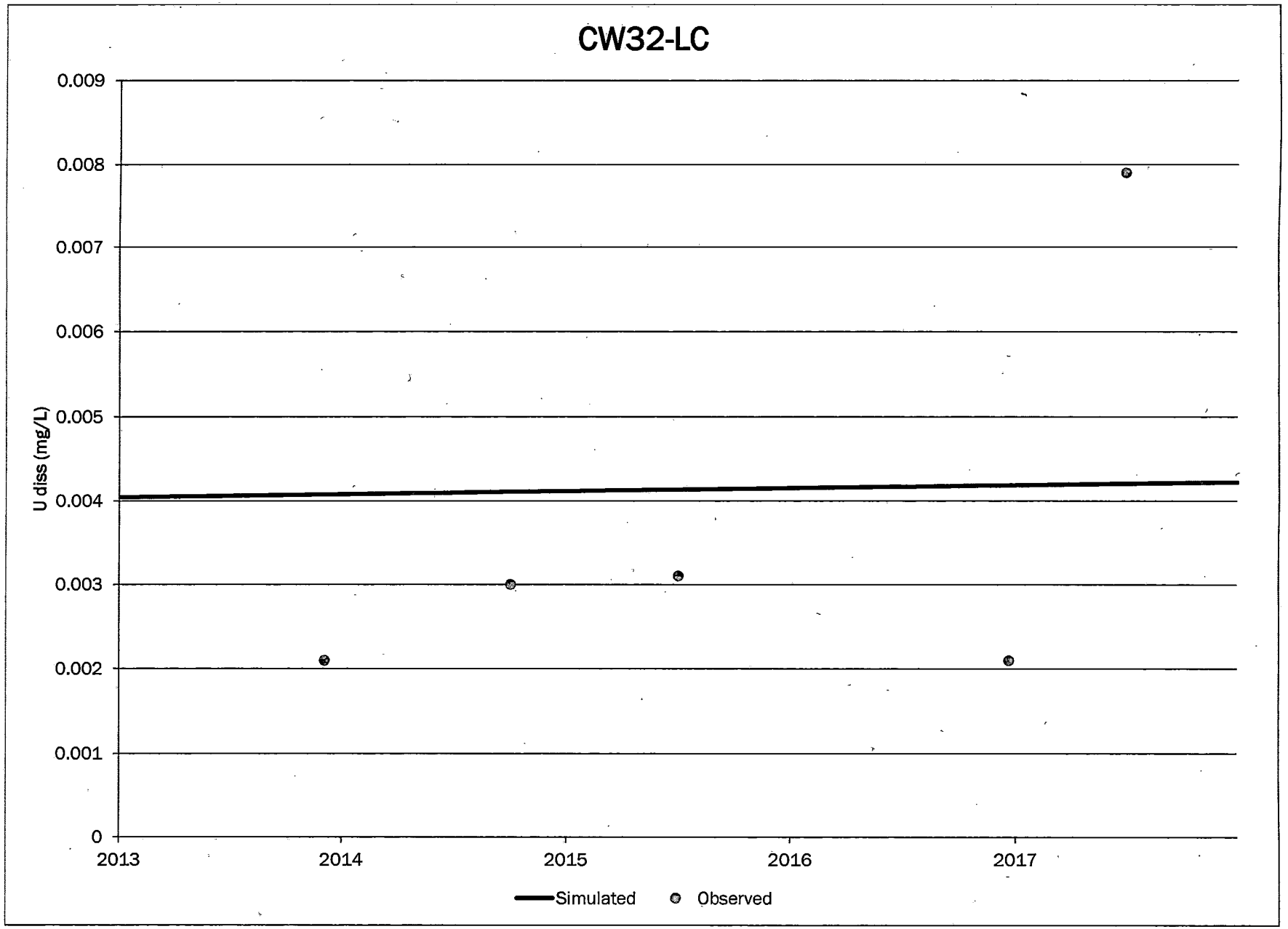

CW18-UC
0.05
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

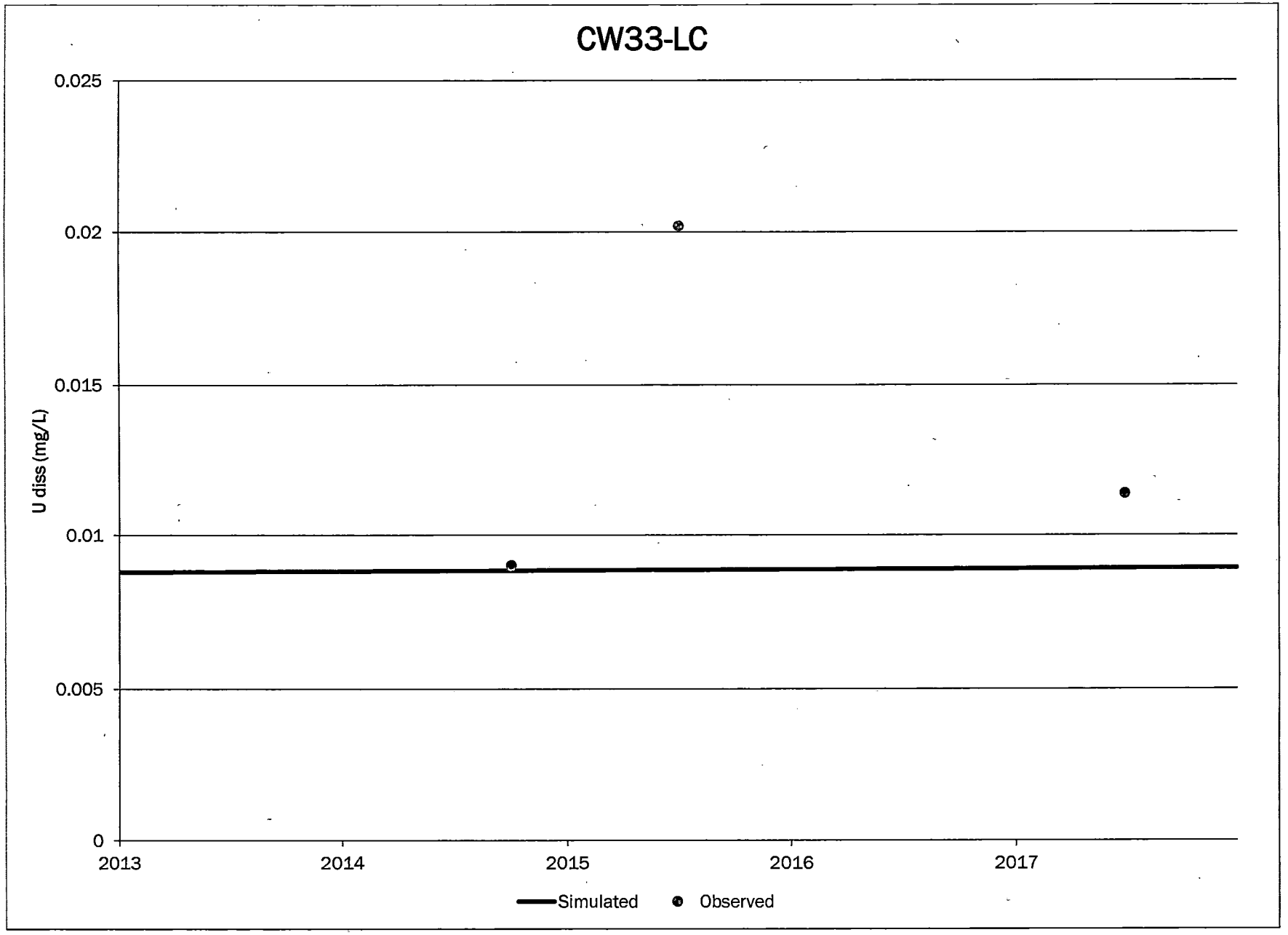

CW24-MC
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

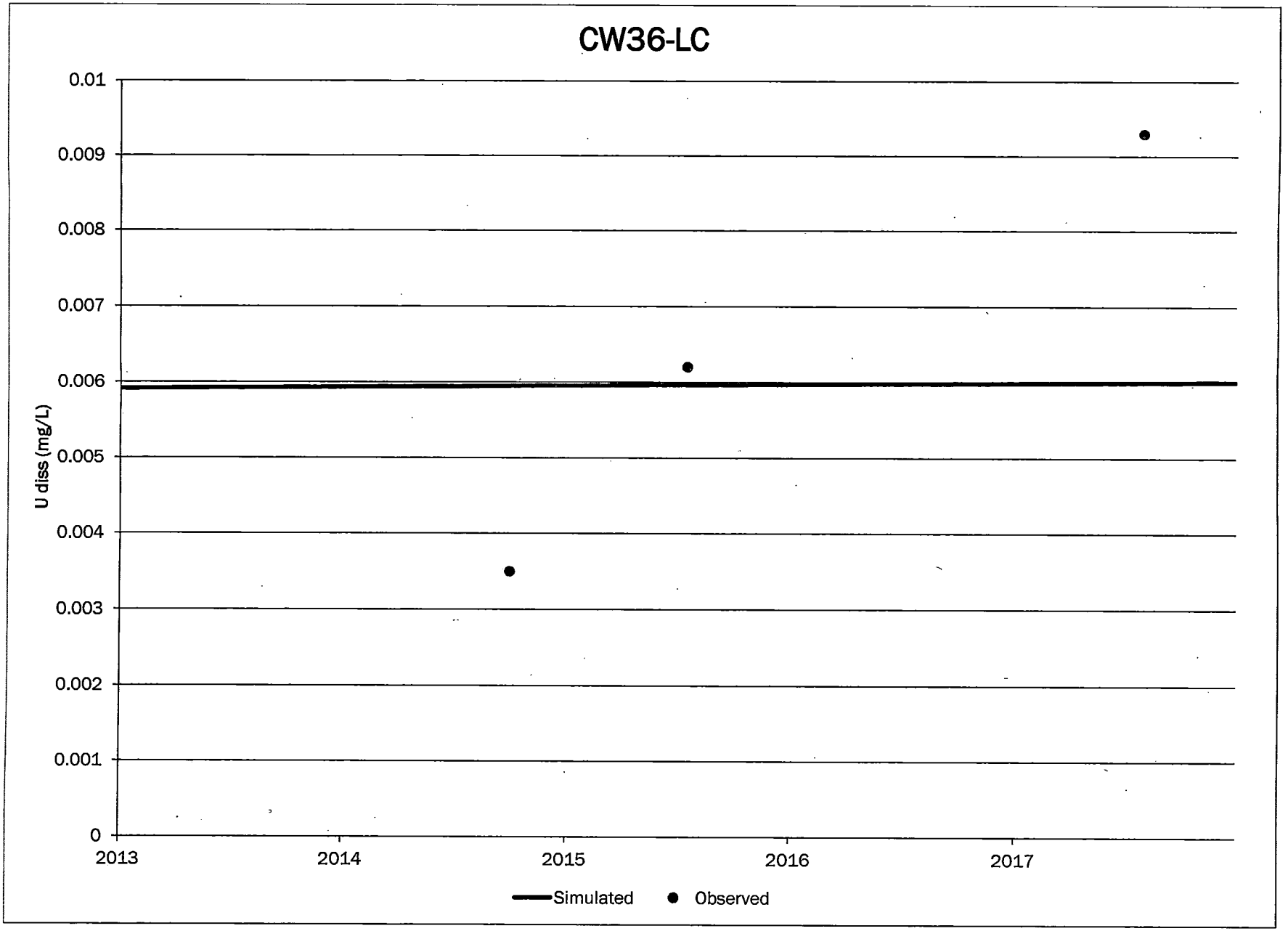

CW28-MC
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

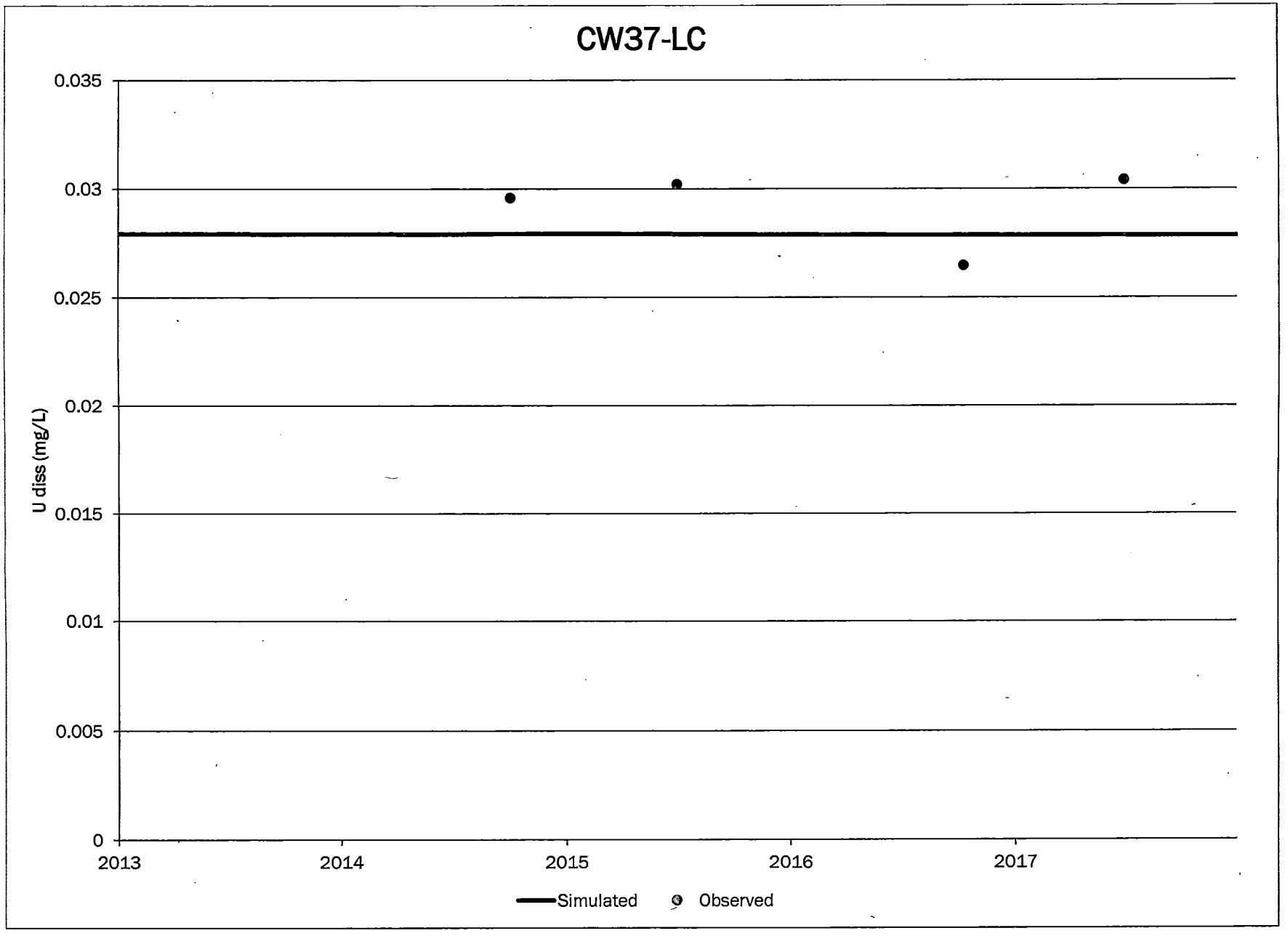

CW29-LC
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

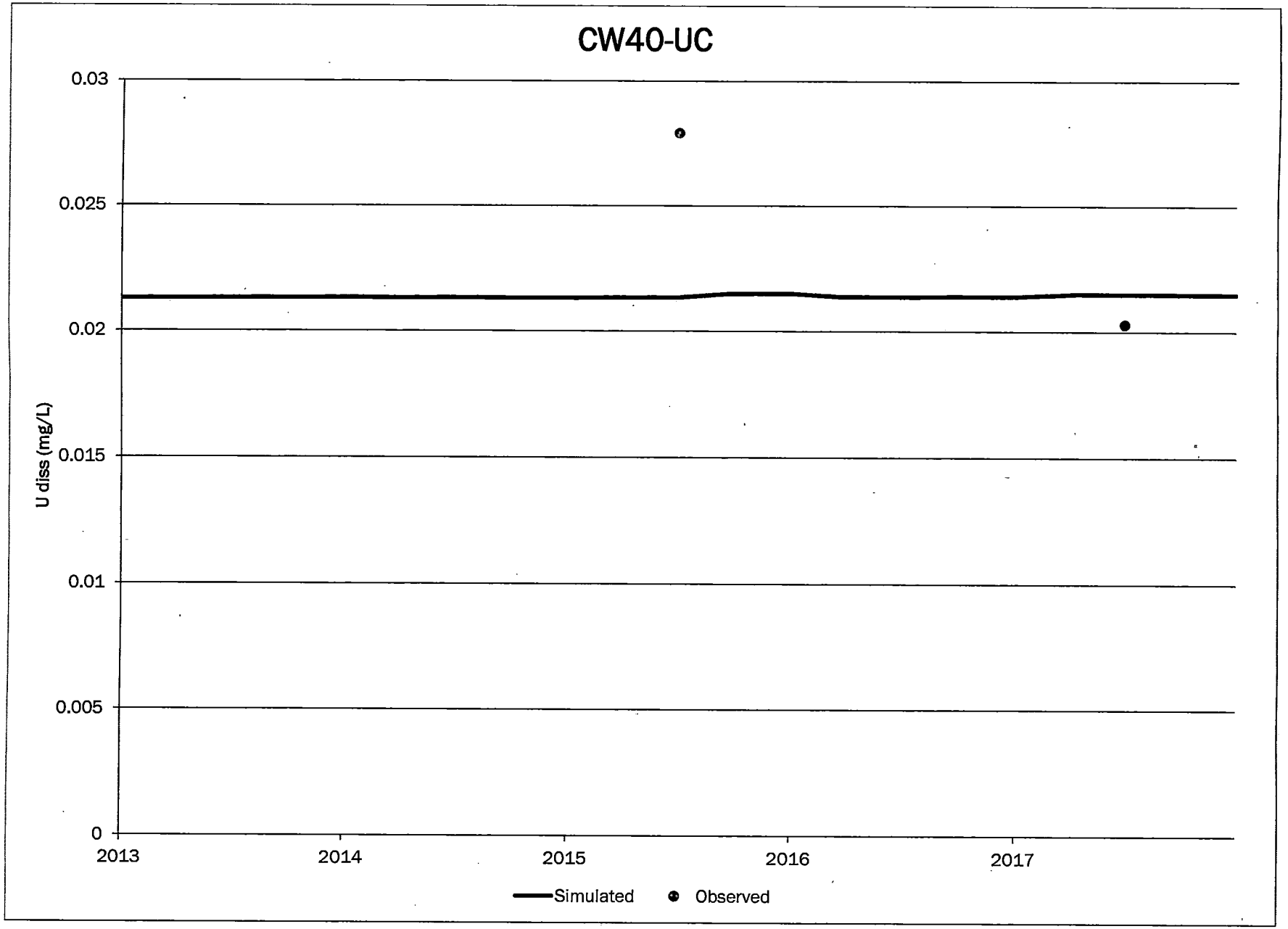

CW31-LC
U diss (mg/L)
0.018
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
2013
2014
2015
2016
2017
Simulated
Observed

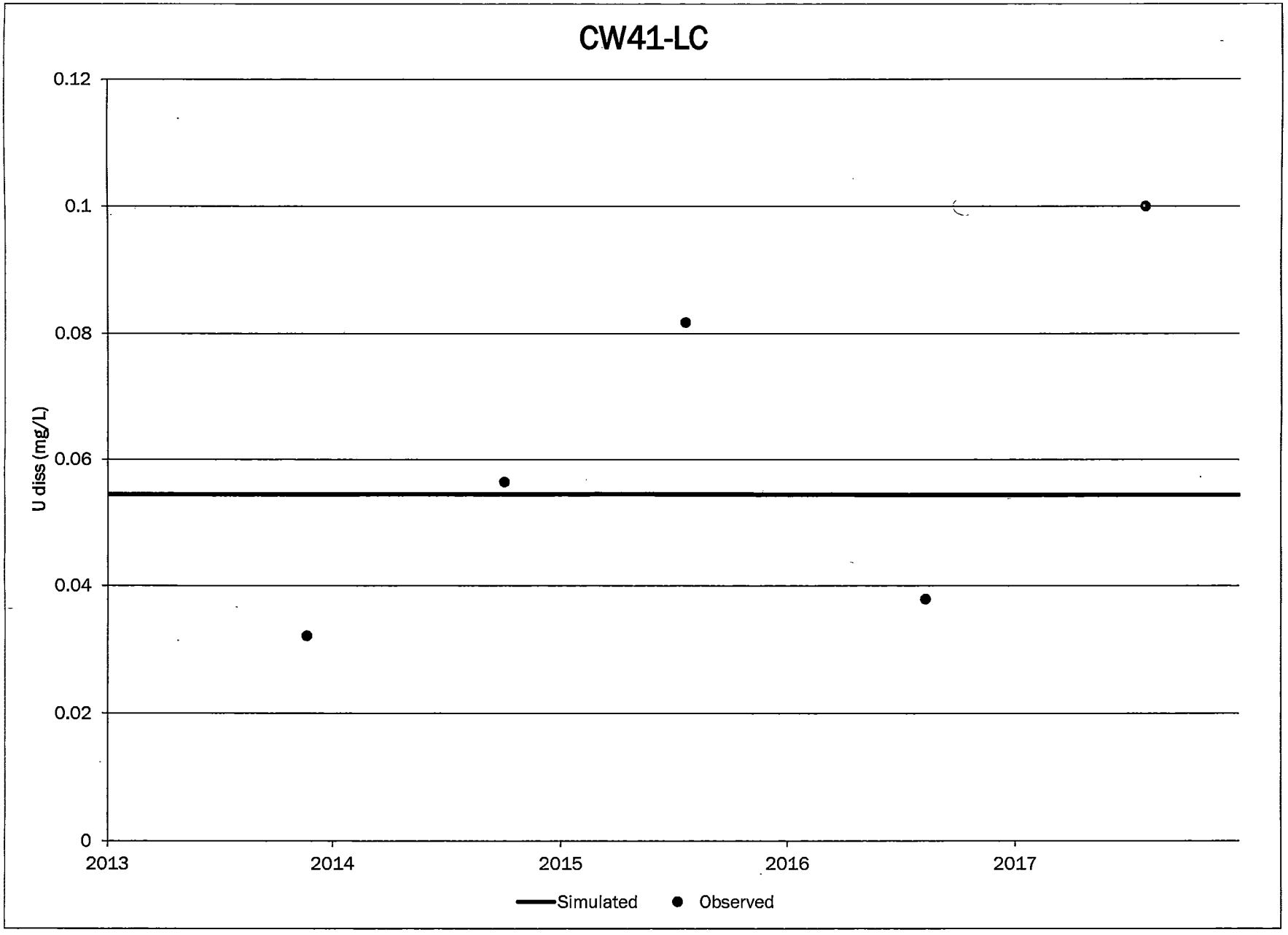

CW32-LC
U diss (mg/L)
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
2013
2014
2015
2016
2017
Simulated
Observed

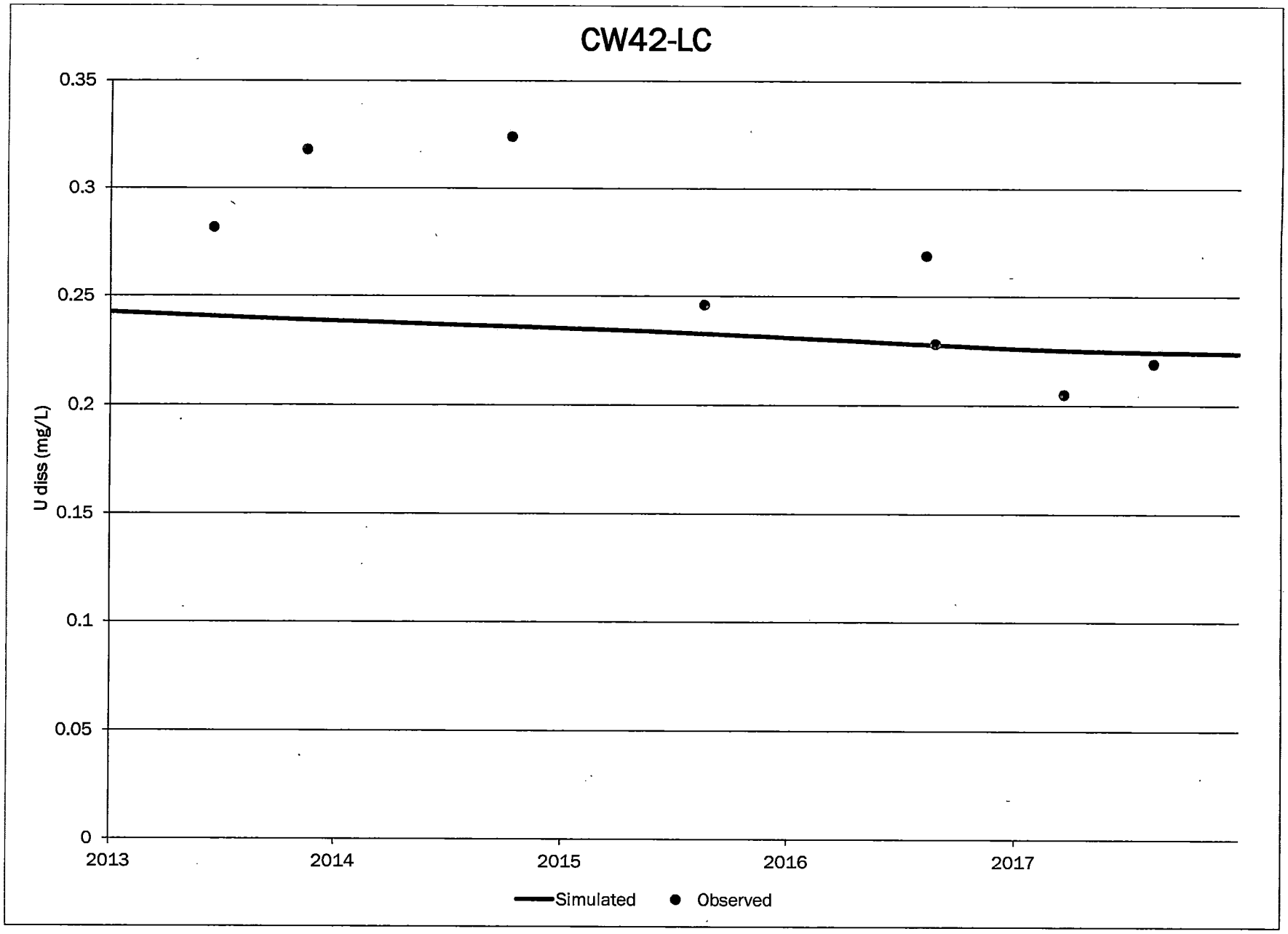

CW33-LC
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

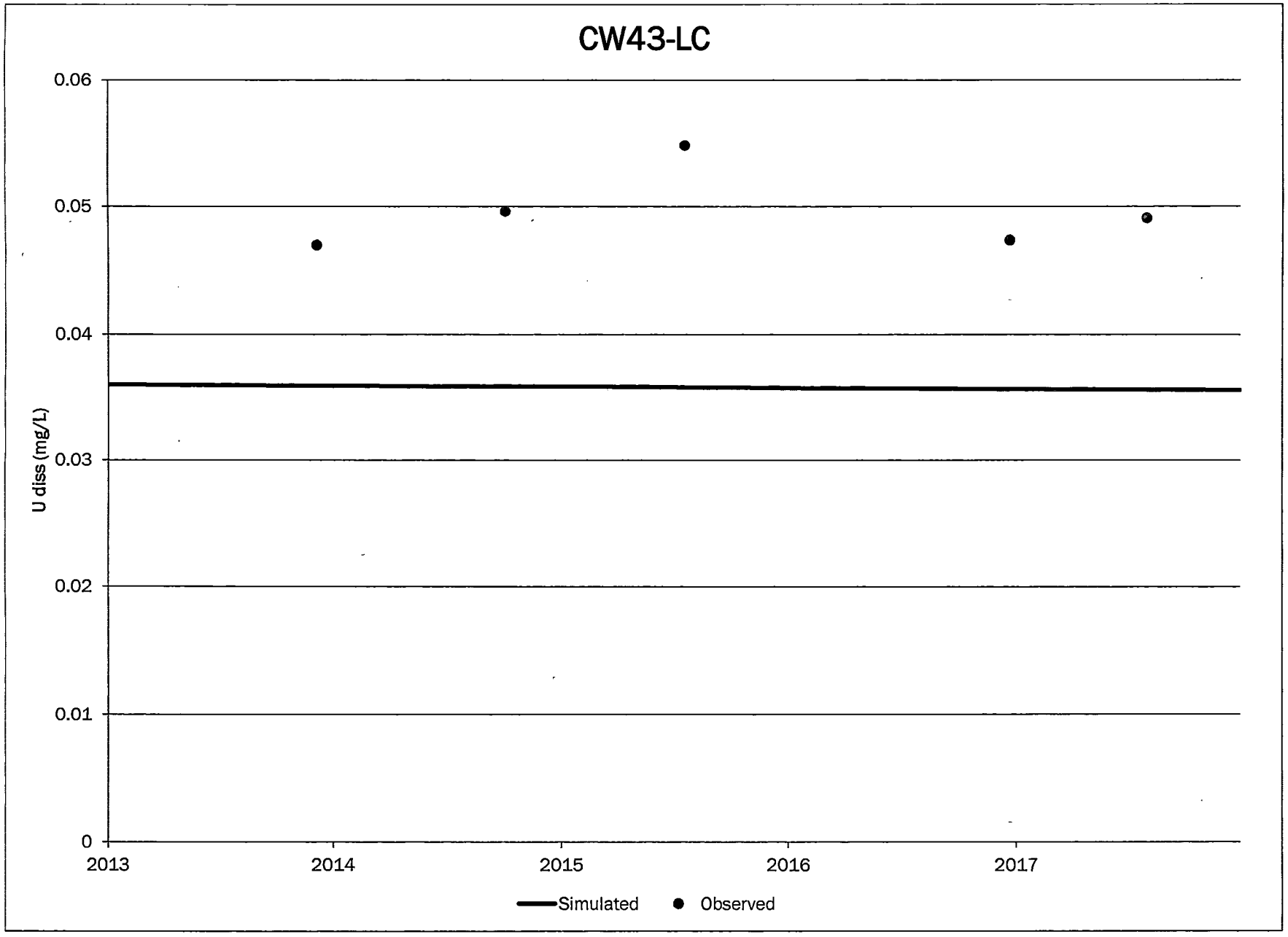

CW36-LC
U diss (mg/L)
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
2013
2014
2015
2016
2017
Simulated
Observed

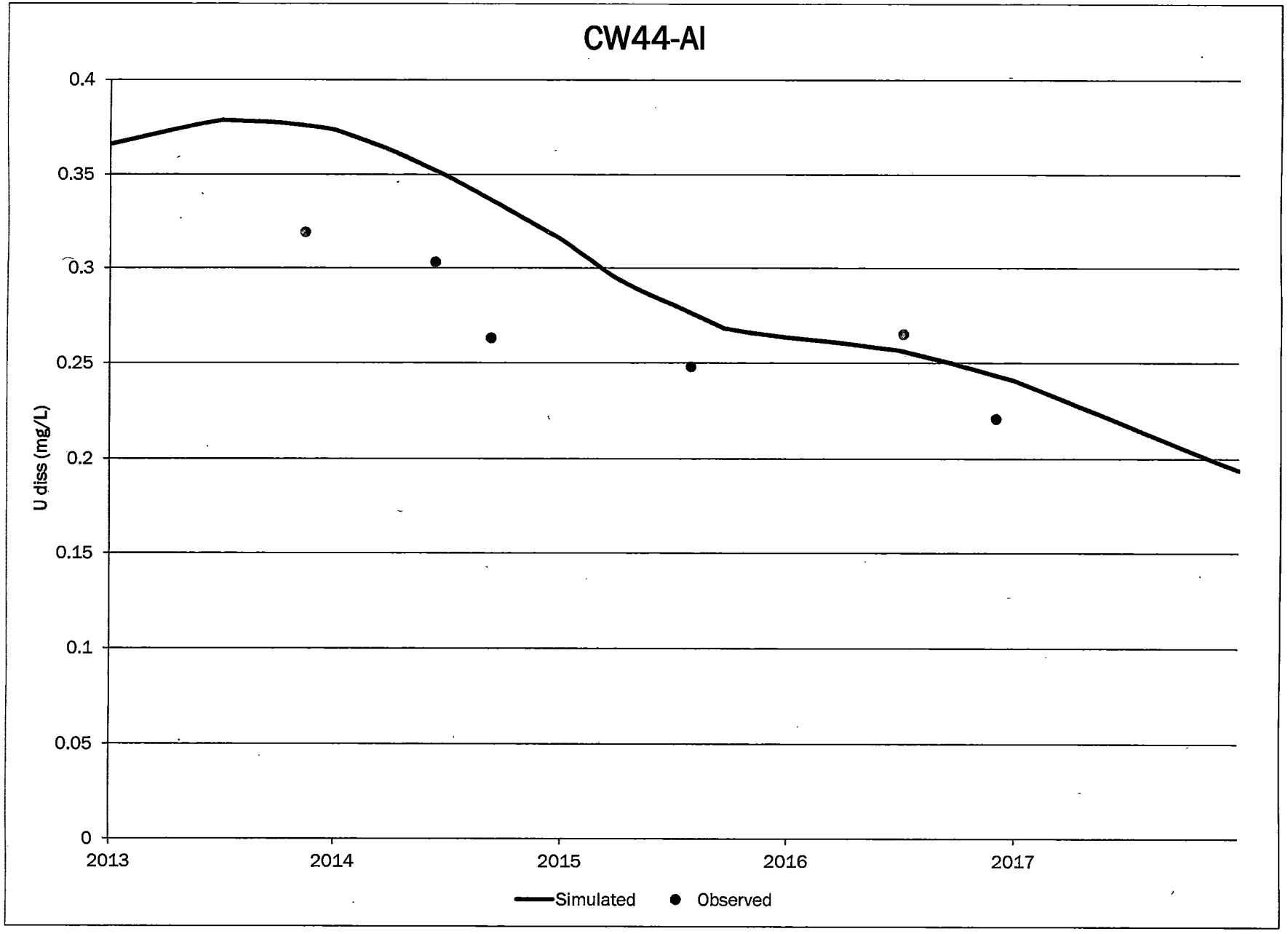

CW37-LC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

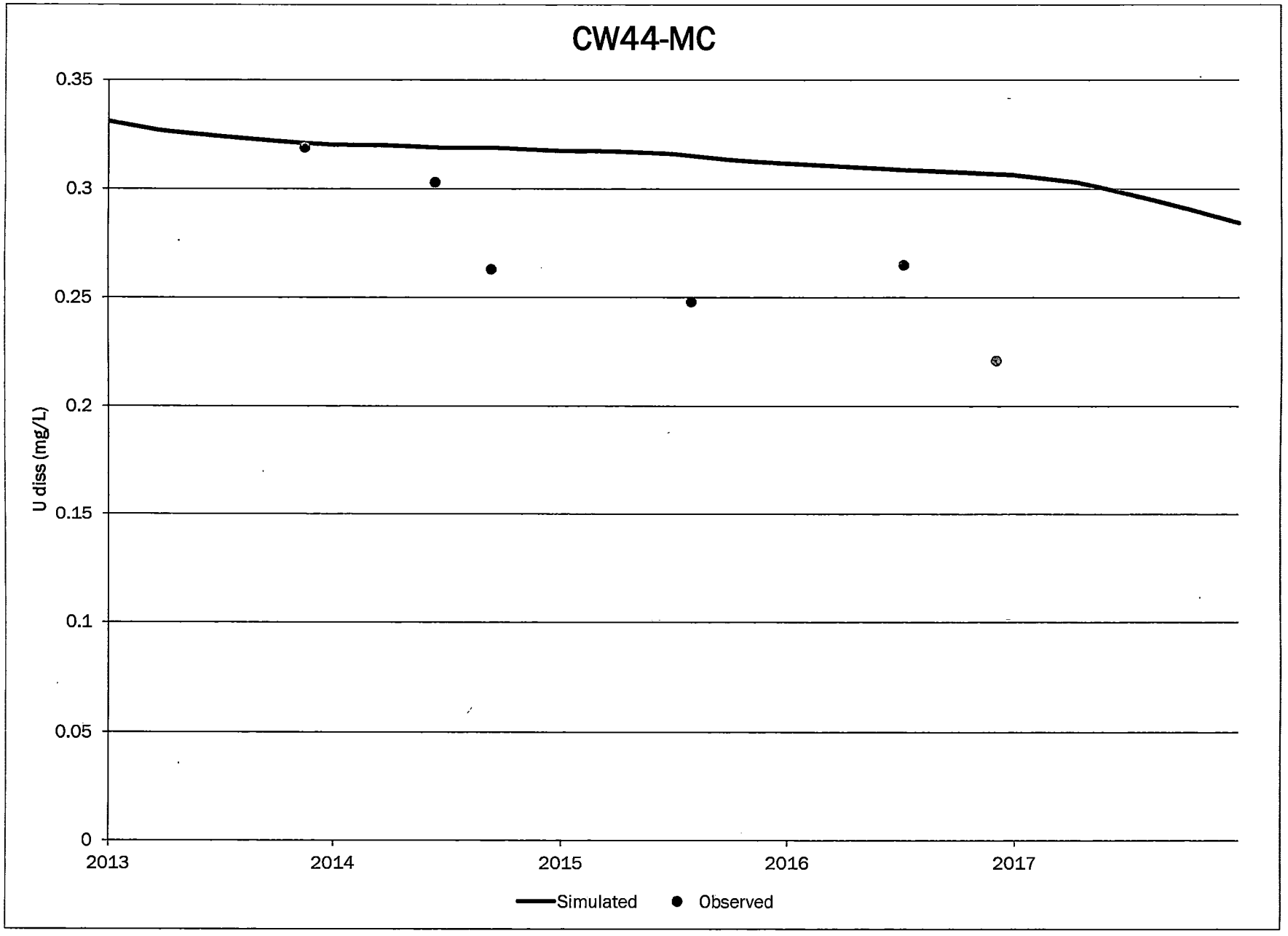

CW40-UC
U diss (mg/L)
0.03
0.025
0.02
0.015
0.01
0.005
0
2013
2014
2015
2016
2017
Simulated
Observed

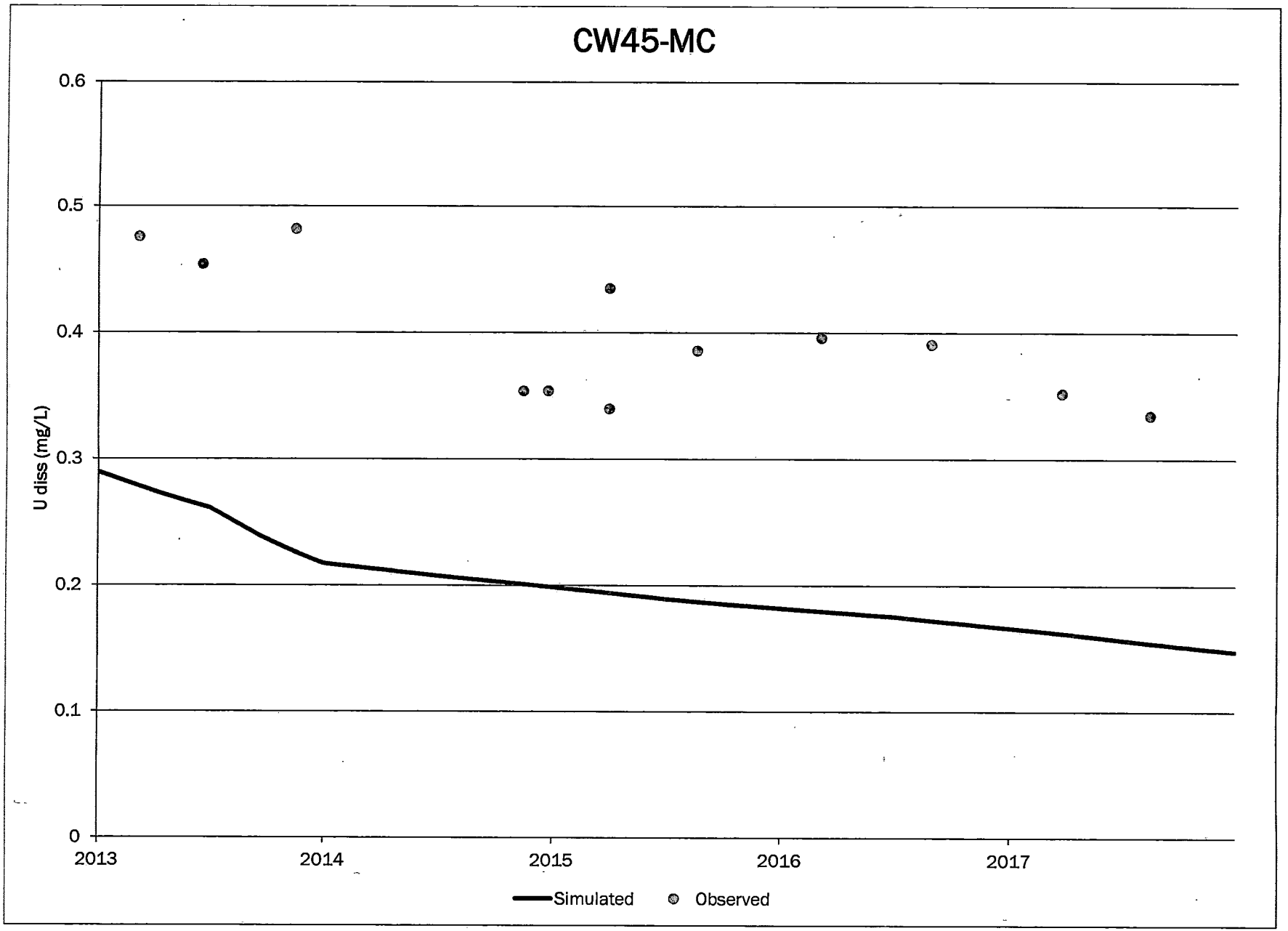

CW41-LC
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

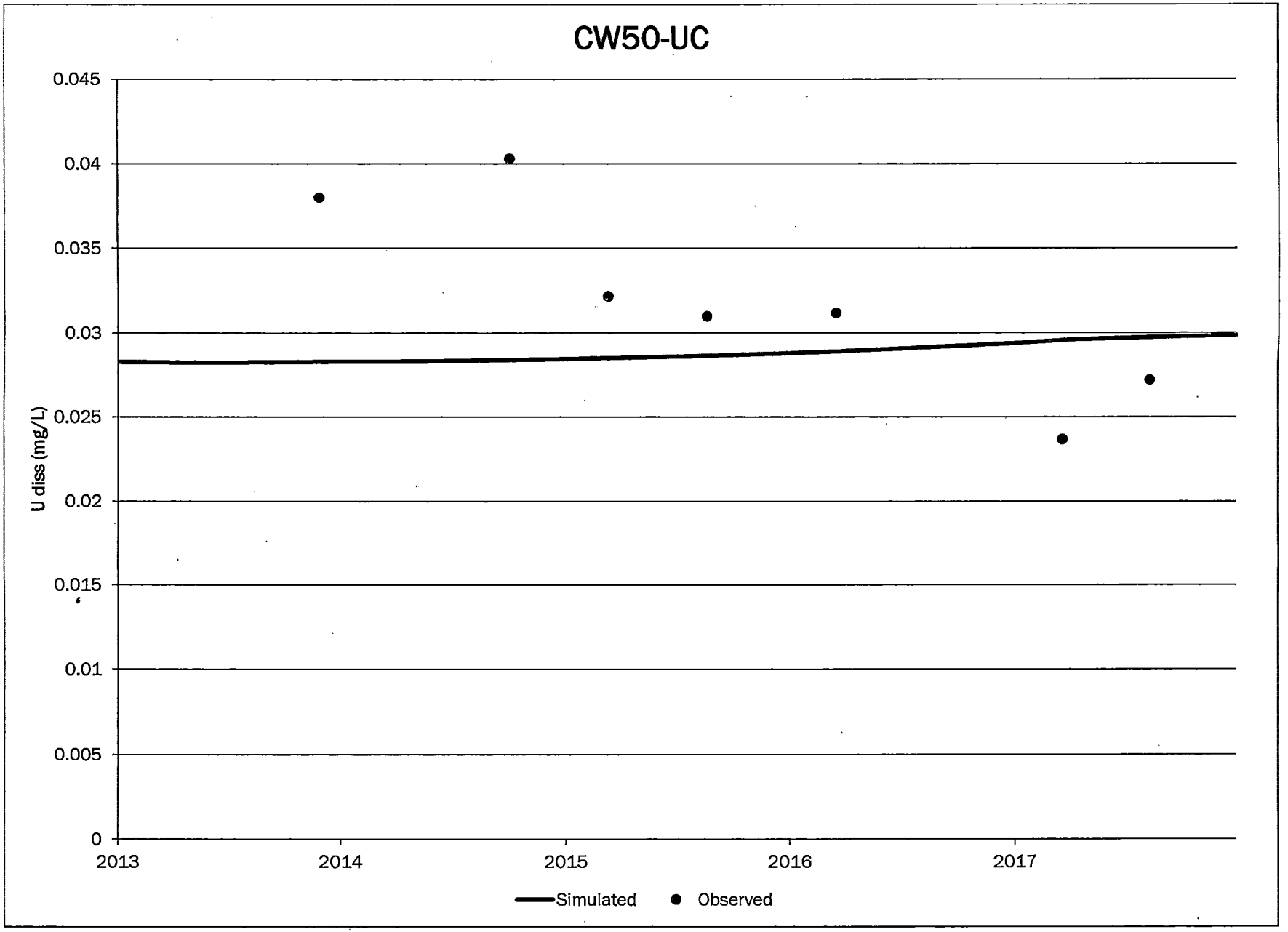

CW42-LC
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

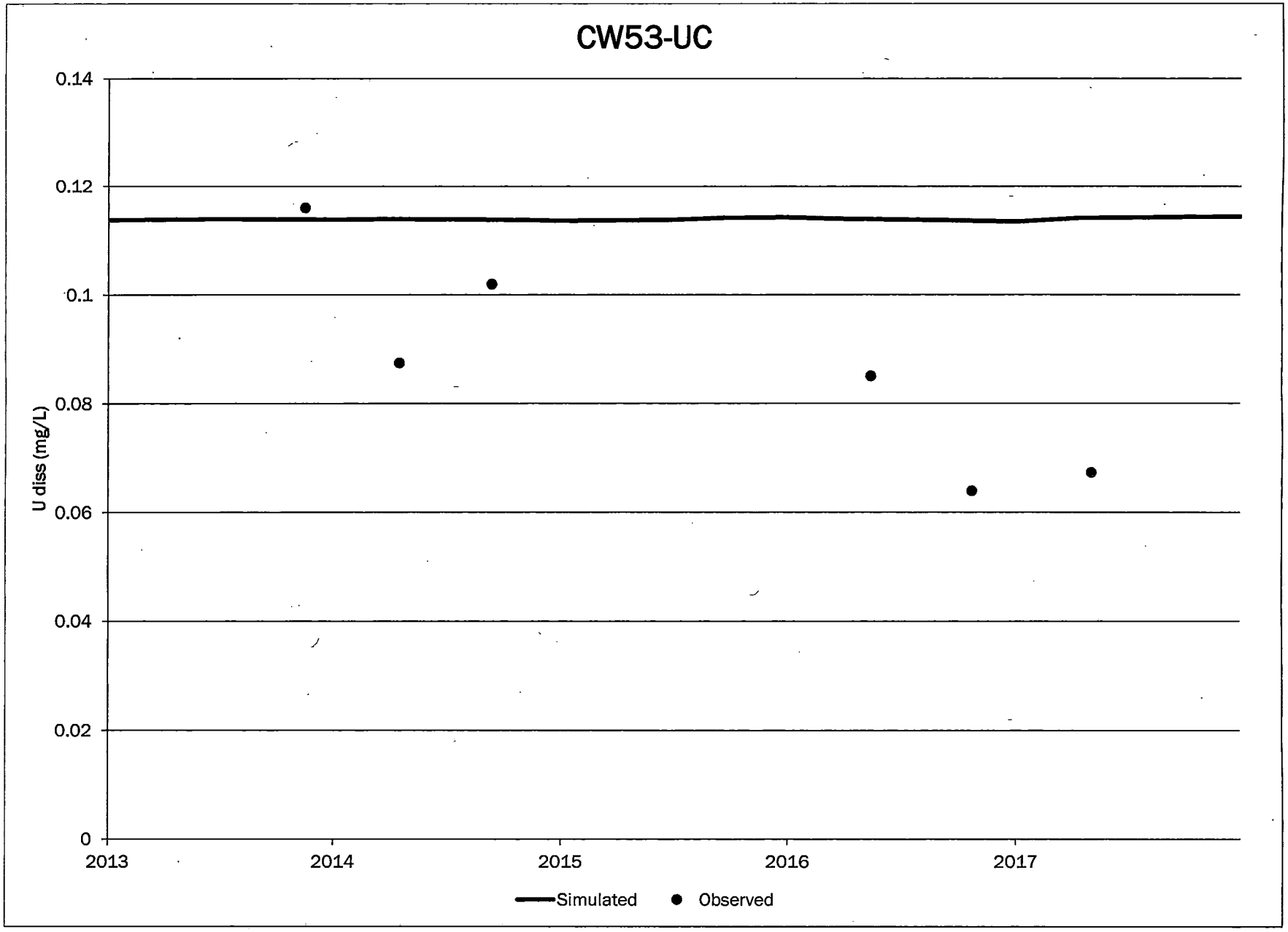

CW43-LC
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

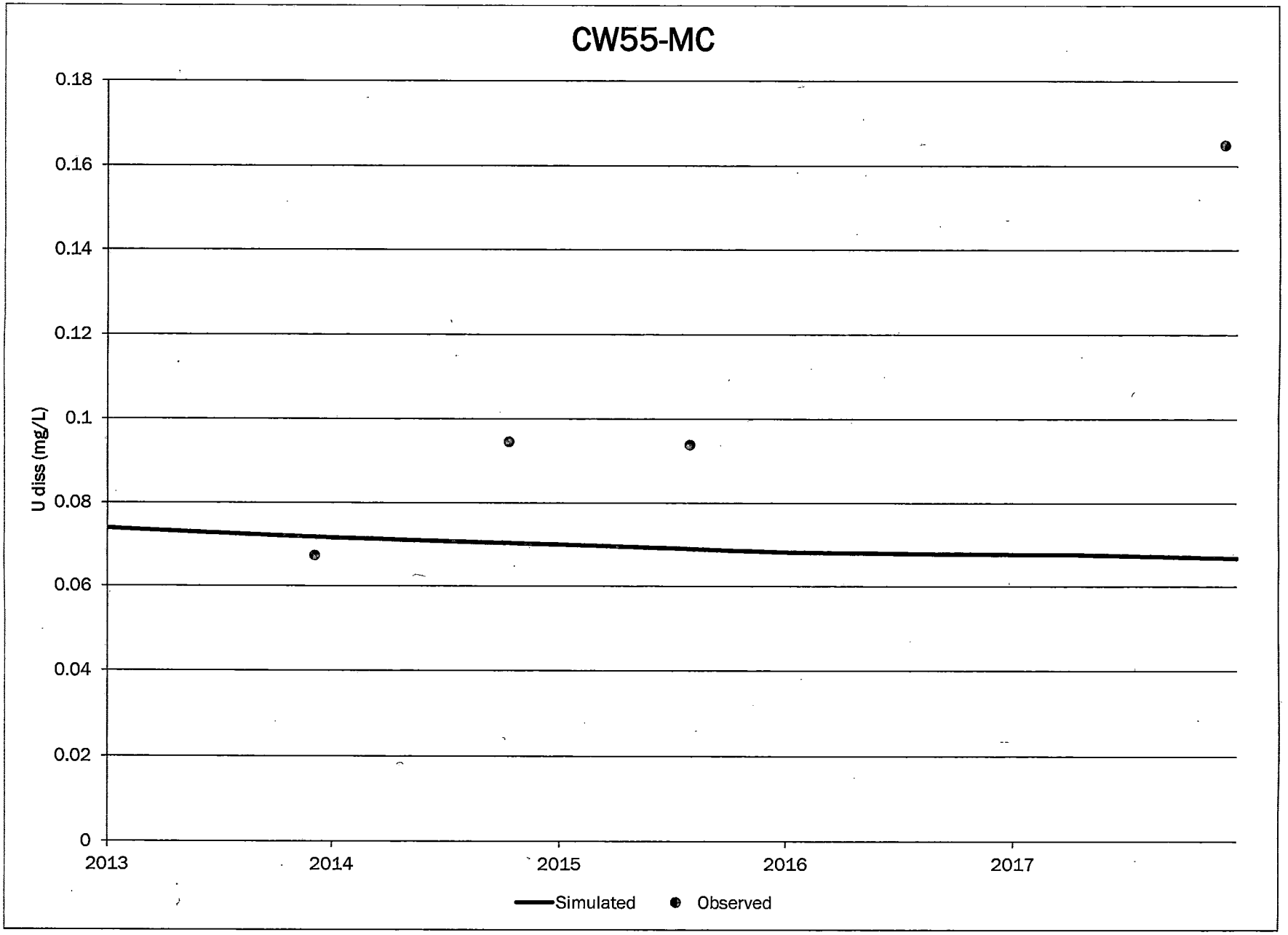

CW44-AI
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

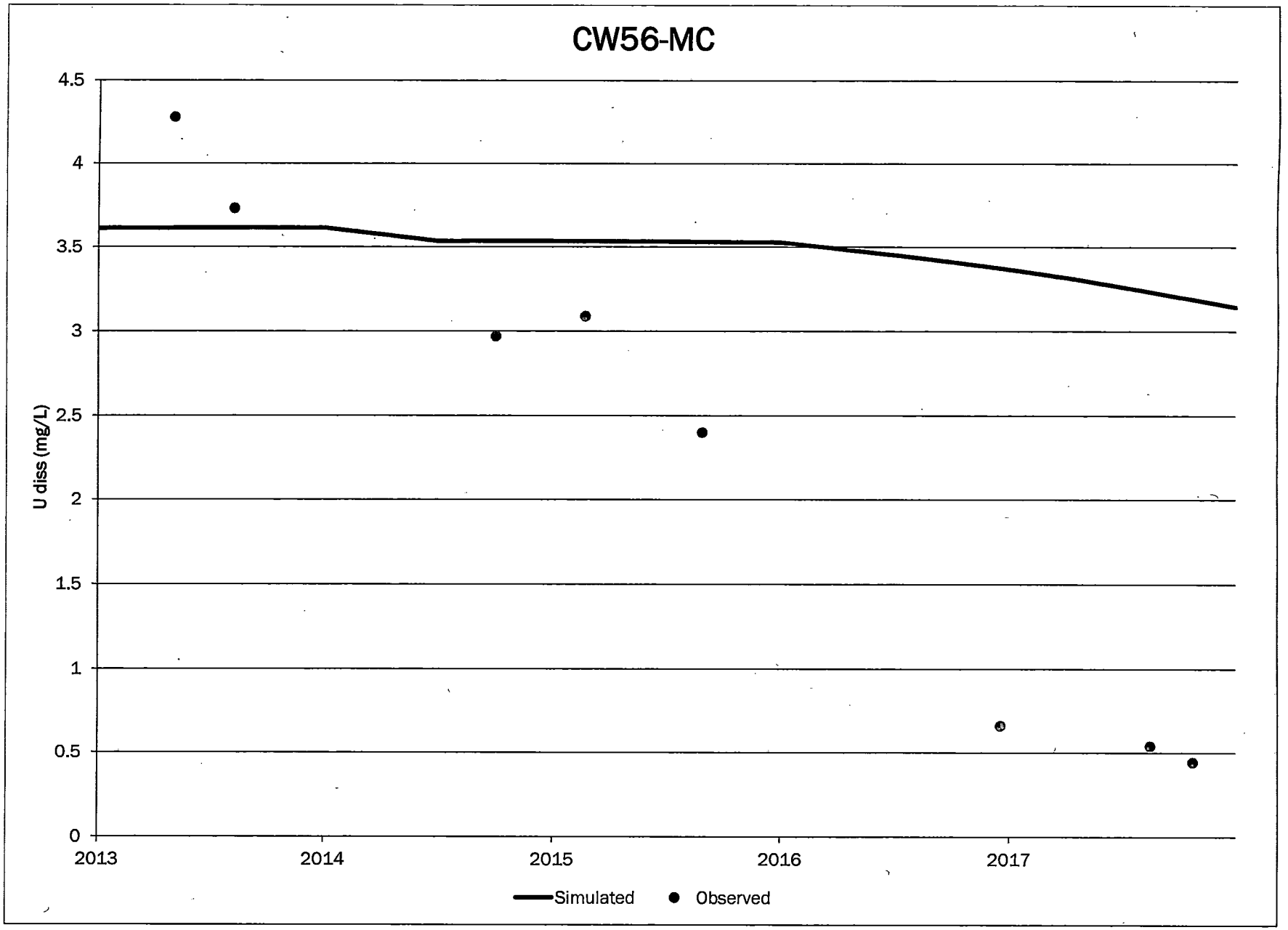

CW44-MC
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

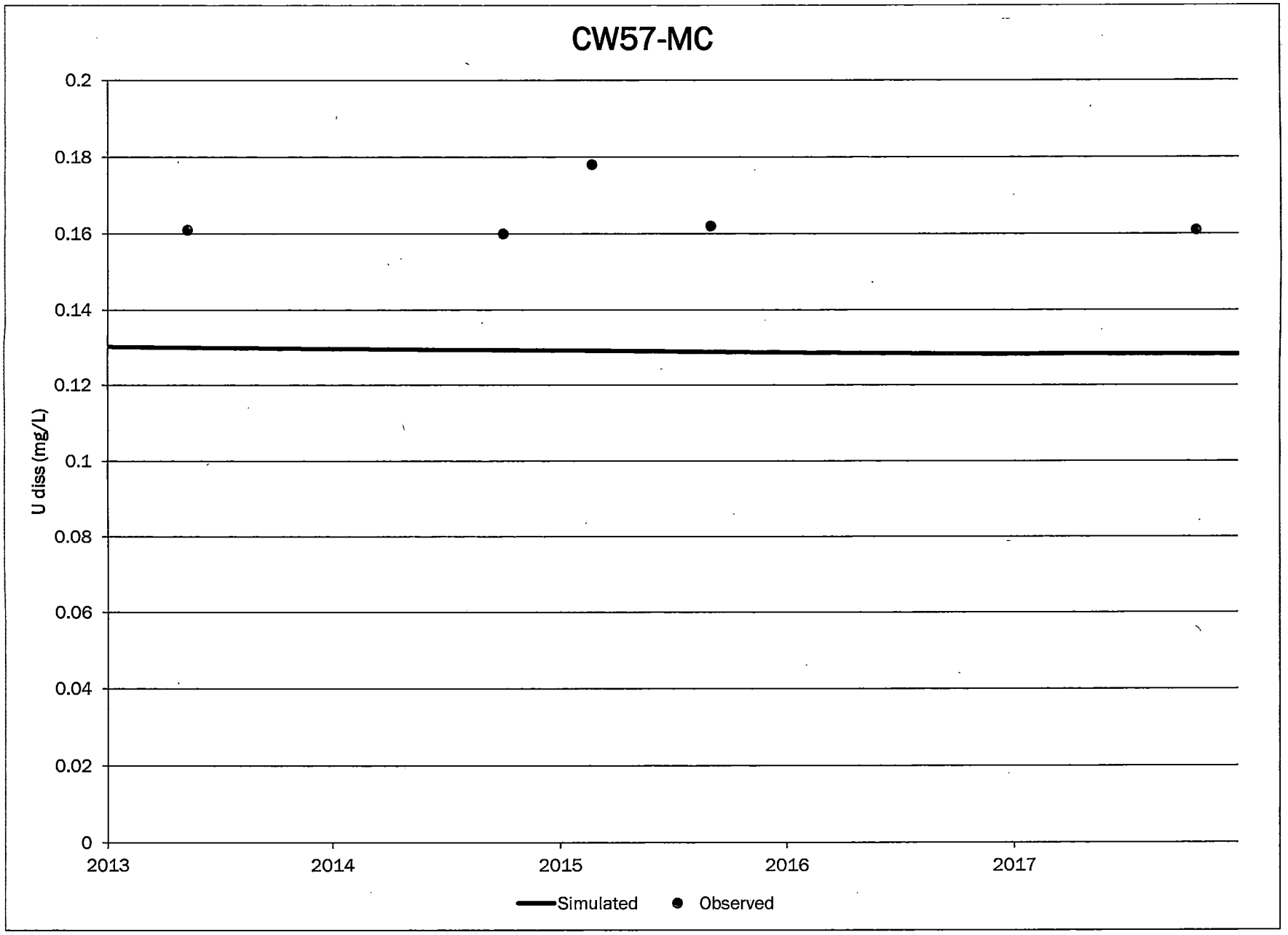

CW45-MC
U diss (mg/L)
0.6
0.5
0.4
0.3
0.2
0.1
0
2013
2014
2015
2016
2017
Simulated
Observed

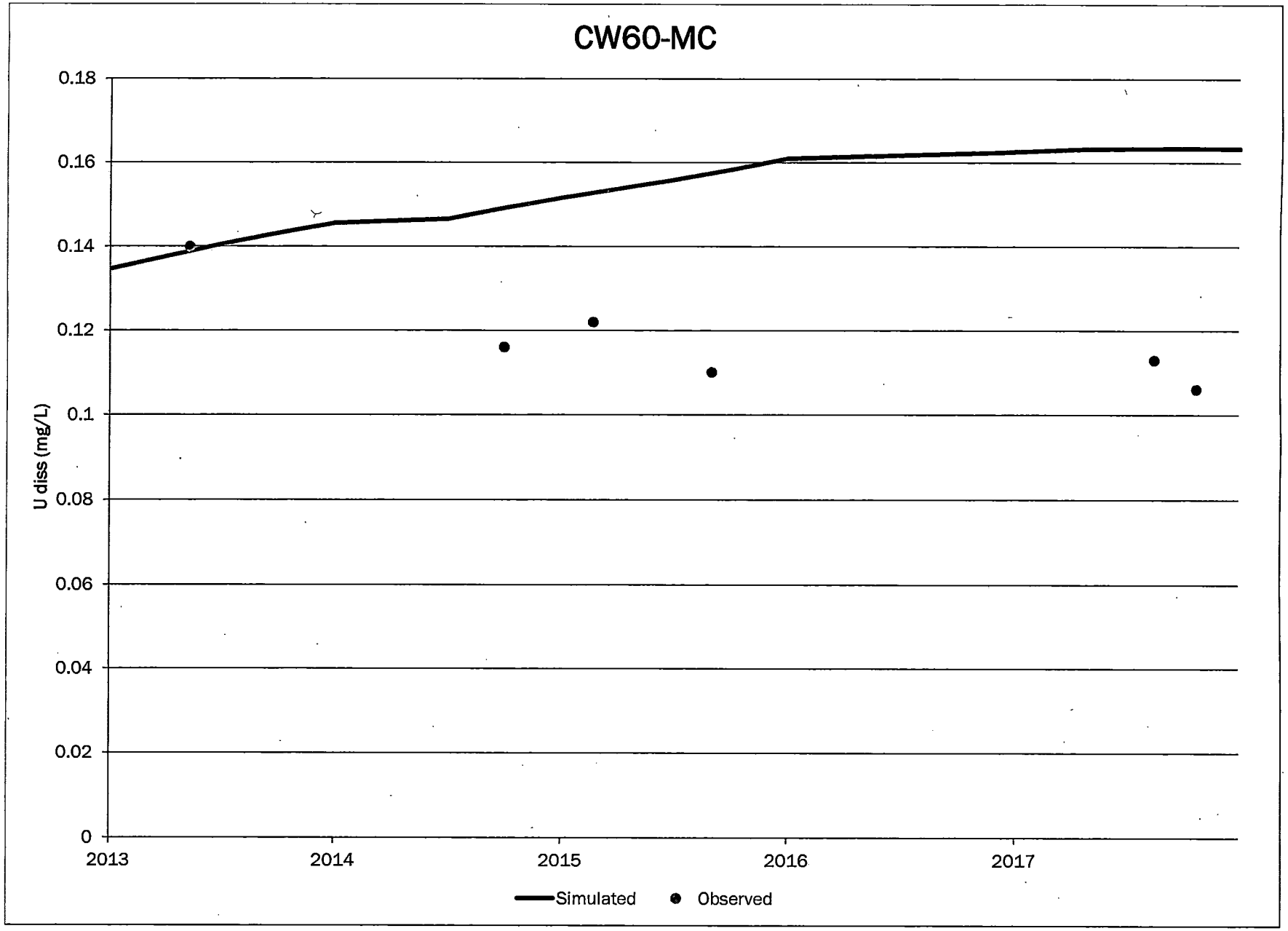

CW50-UC
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

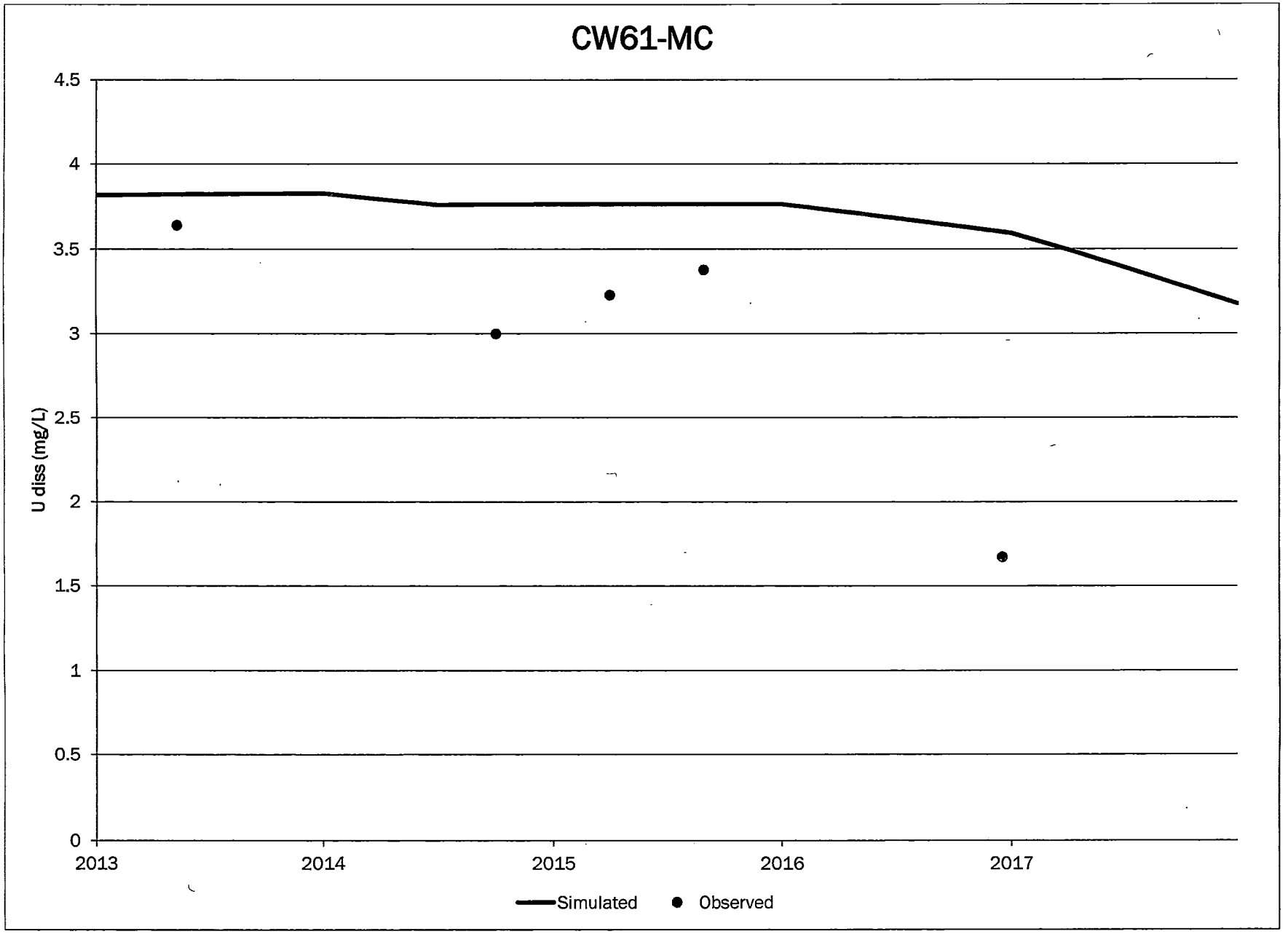

CW53-UC
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

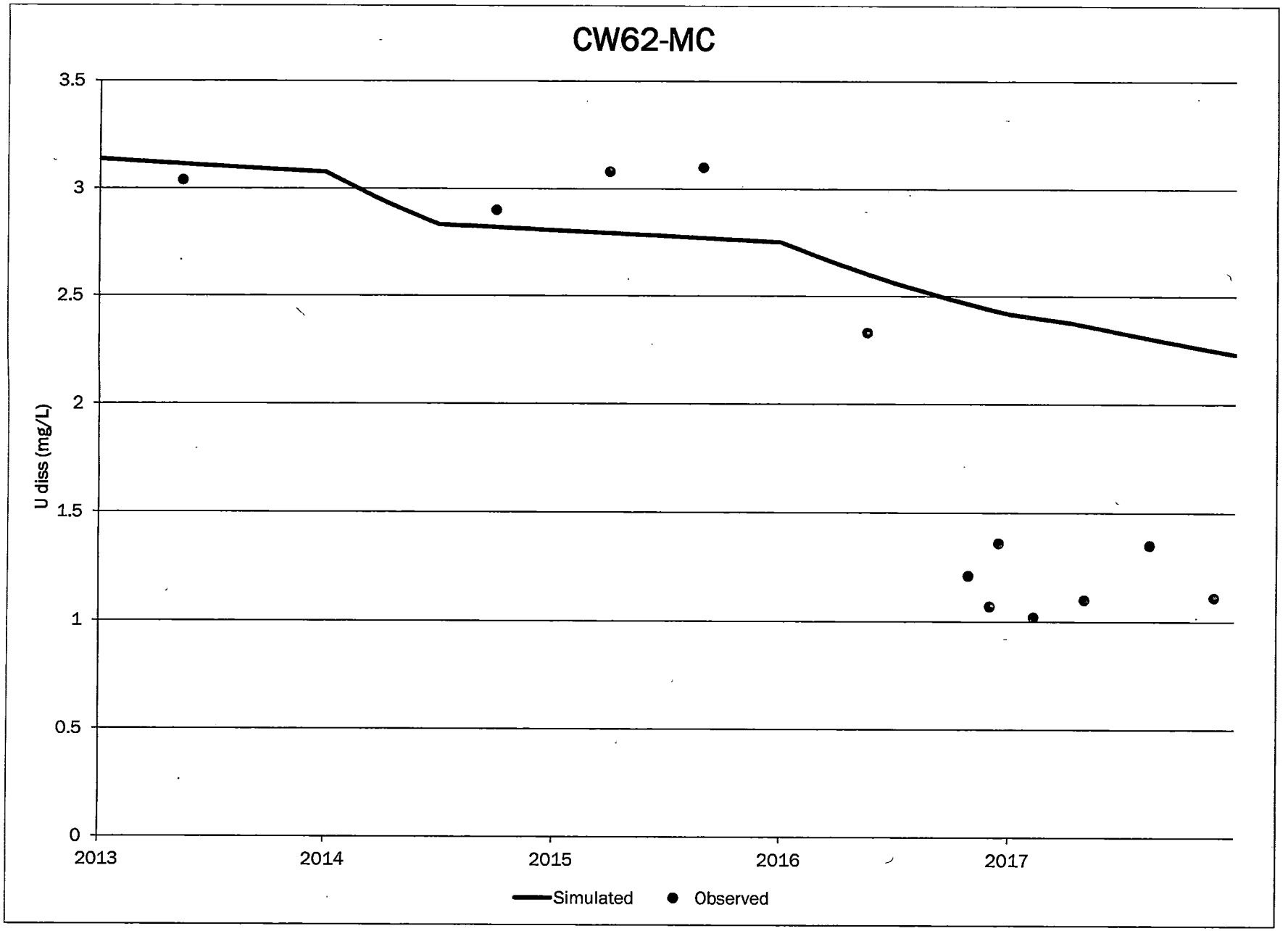

CW55-MC
U diss (mg/L)
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
2013
2014
2015
2016
2017
Simulated
Observed

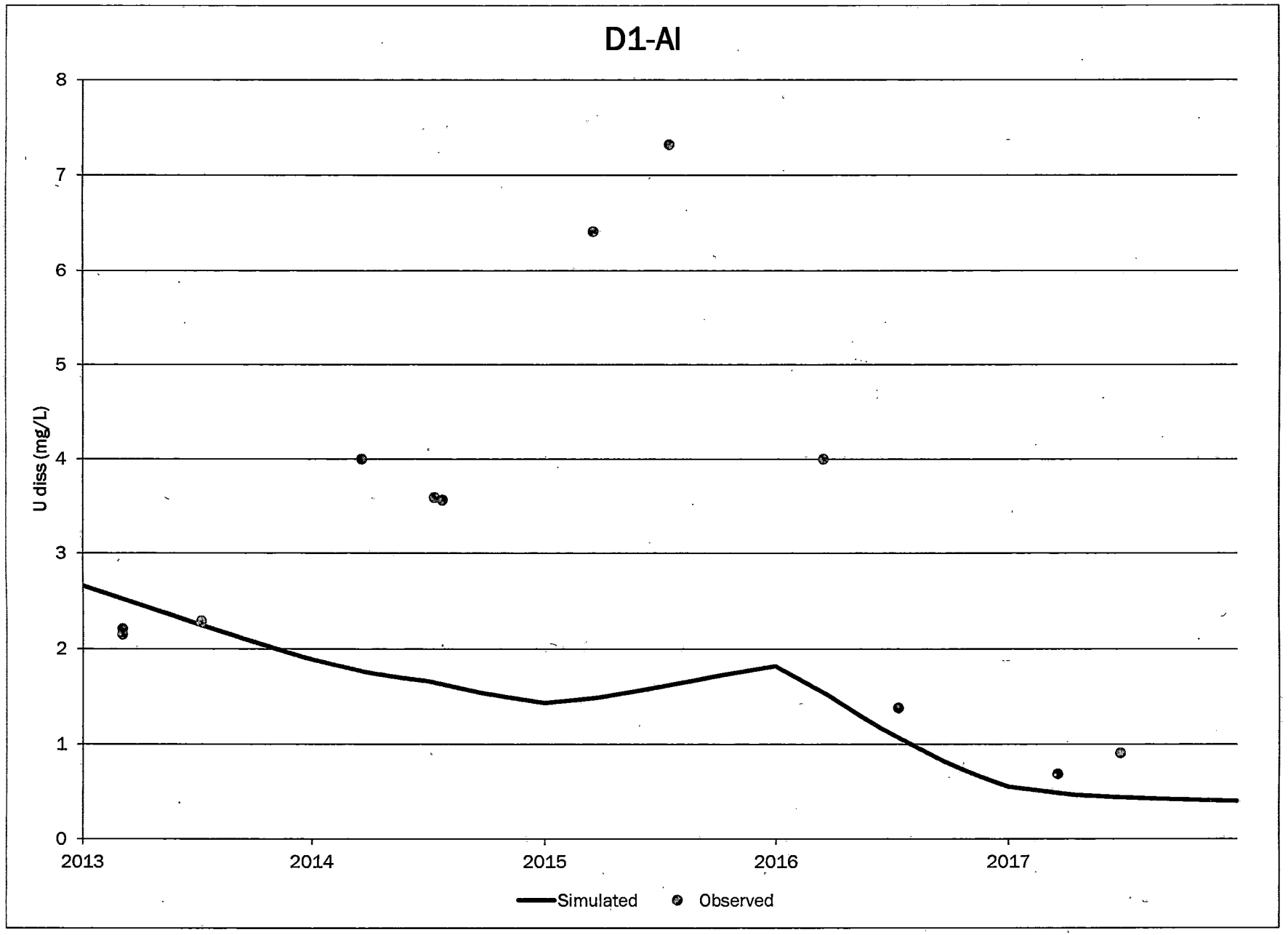

CW56-MC
U diss (mg/L)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

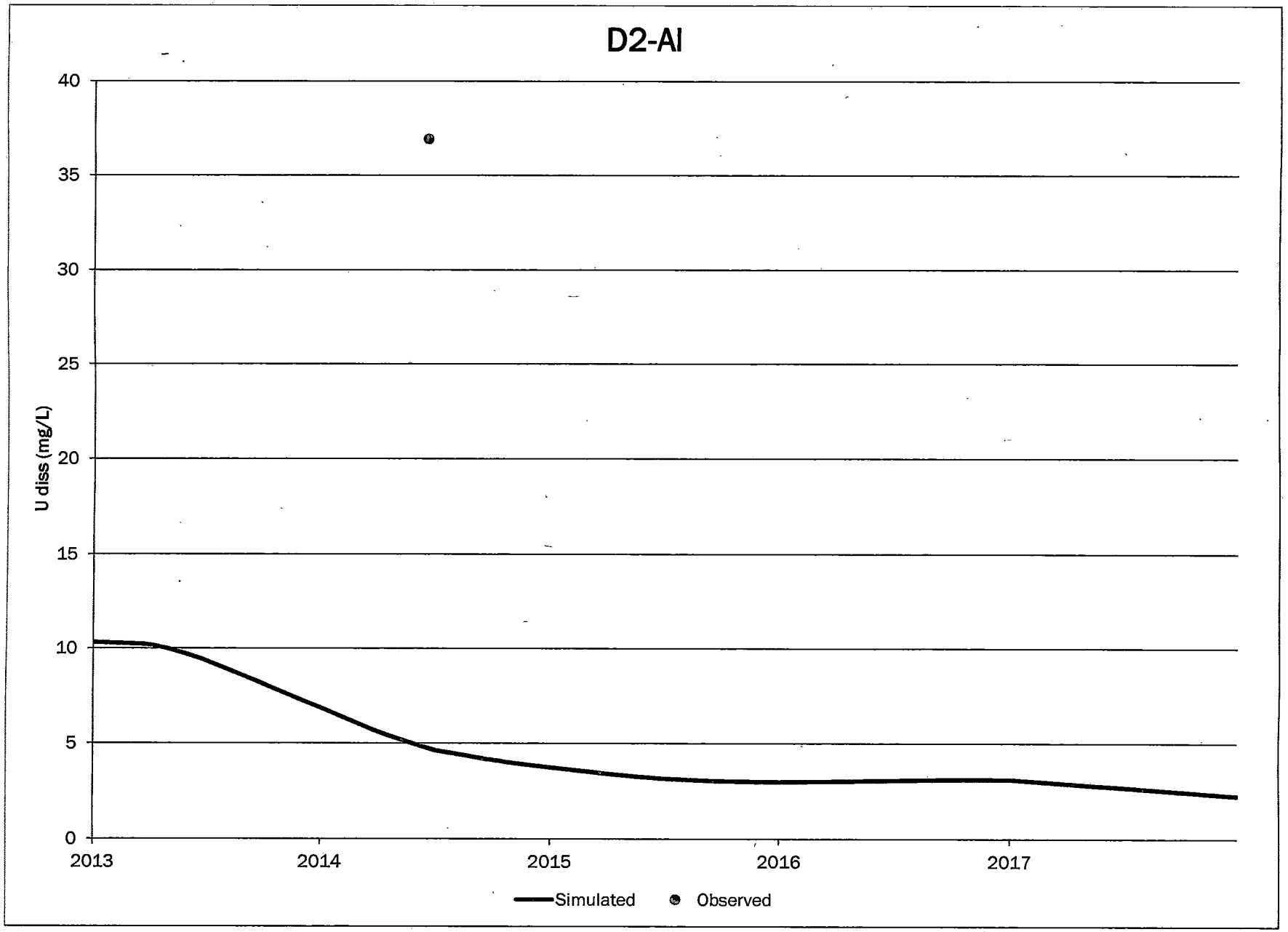

CW57-MC
U diss (mg/L)
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
2013
2014
2015
2016
2017
Simulated
Observed

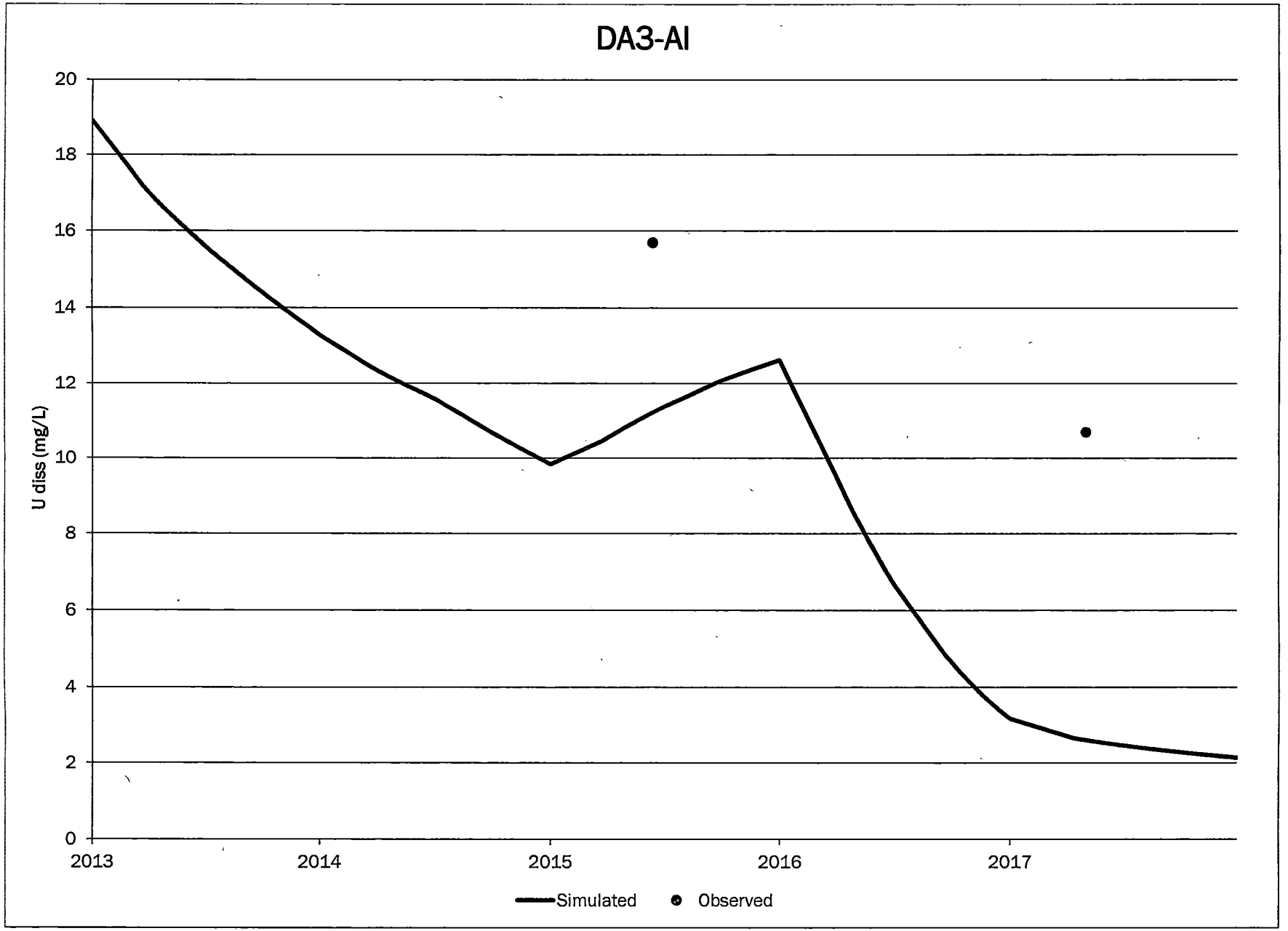

CW60-MC
U diss (mg/L)
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
2013
2014
2015
2016
2017
Simulated
Observed

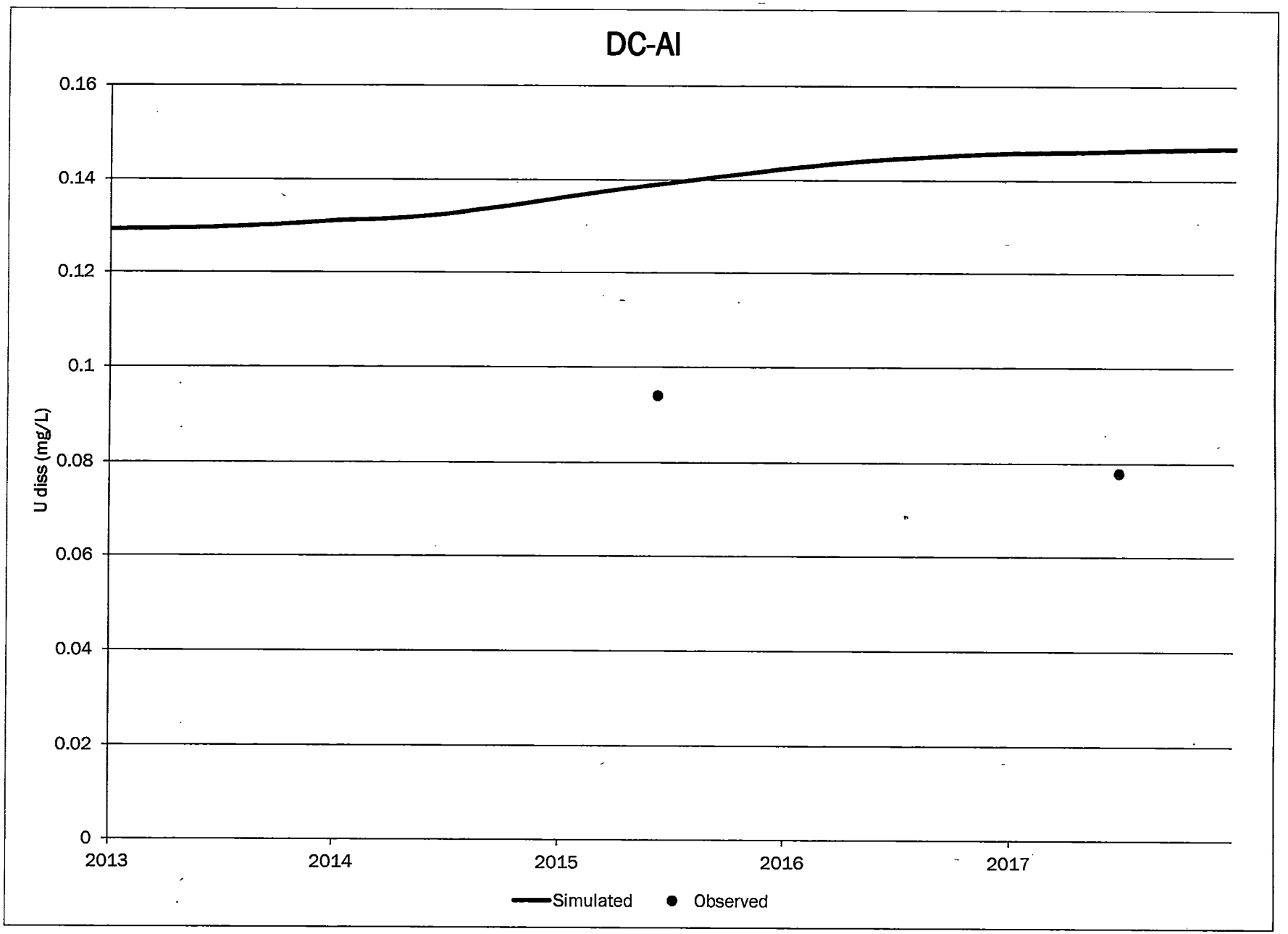

CW61-MC
U diss (mg/L)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

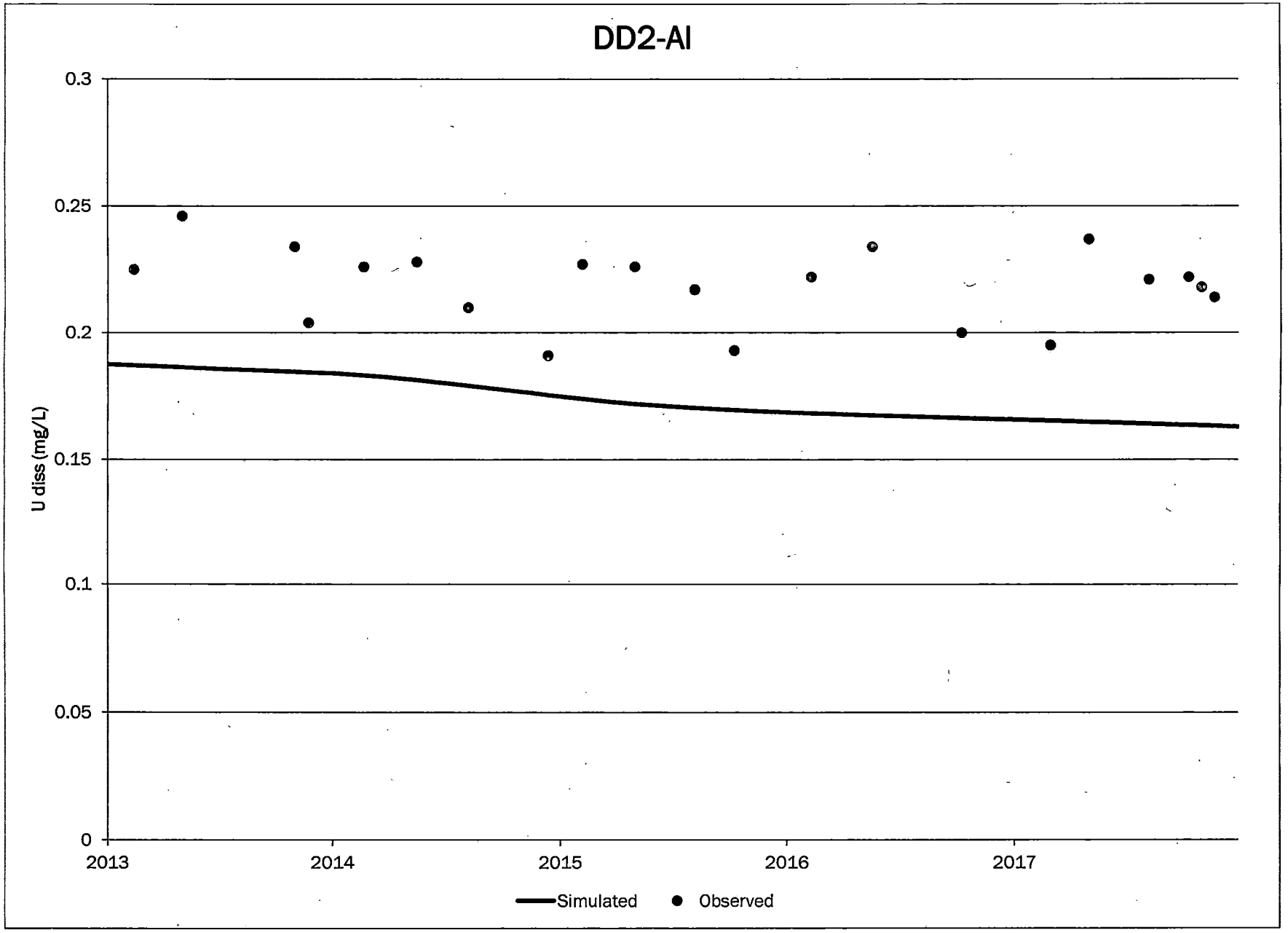

CW62-MC
U diss (mg/L)
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

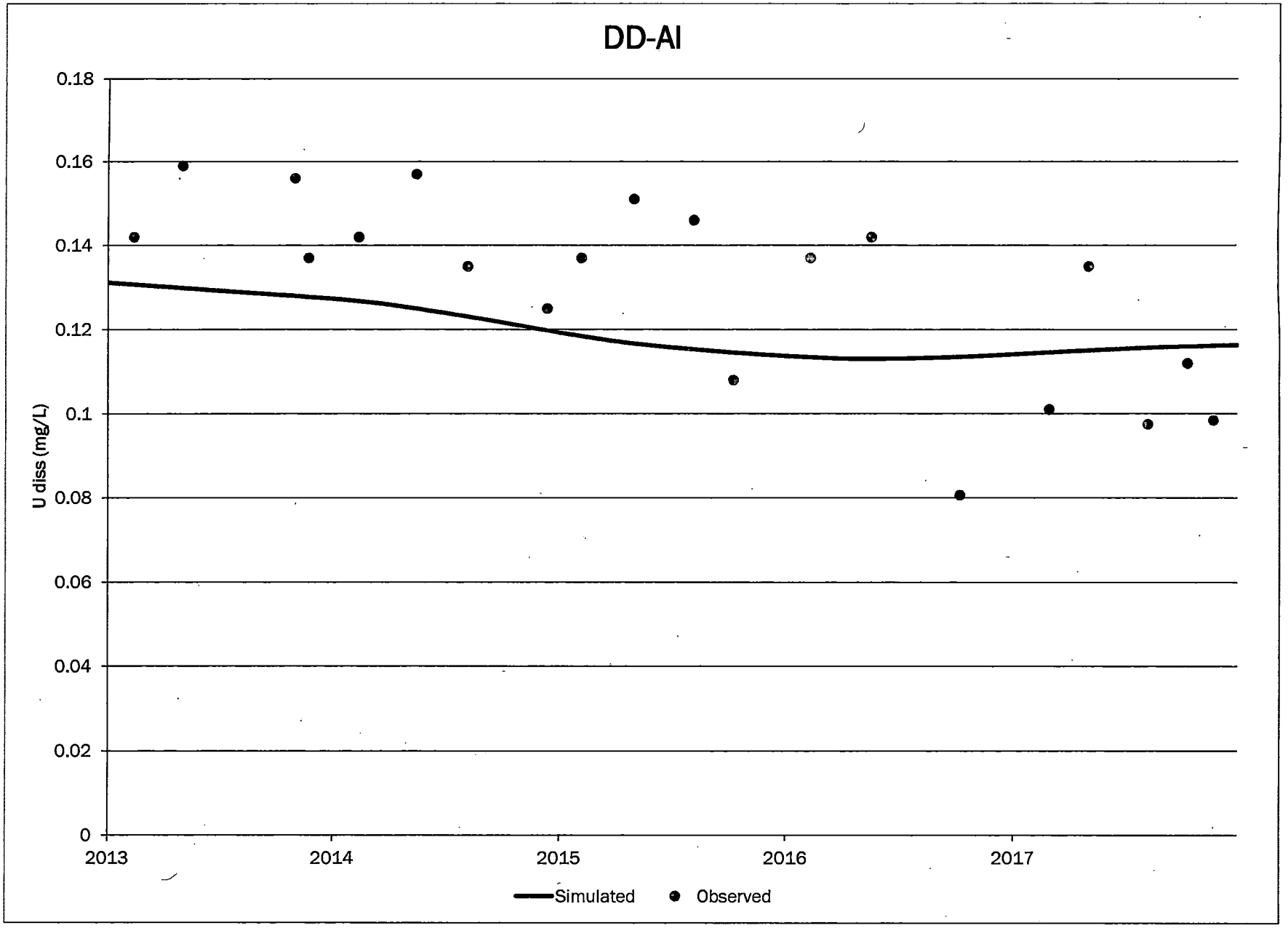

D1-AI
U diss (mg/L)
0
1
2
3
4
5
6
7
8
2013
2014
2015
2016
2017
Simulated
Observed

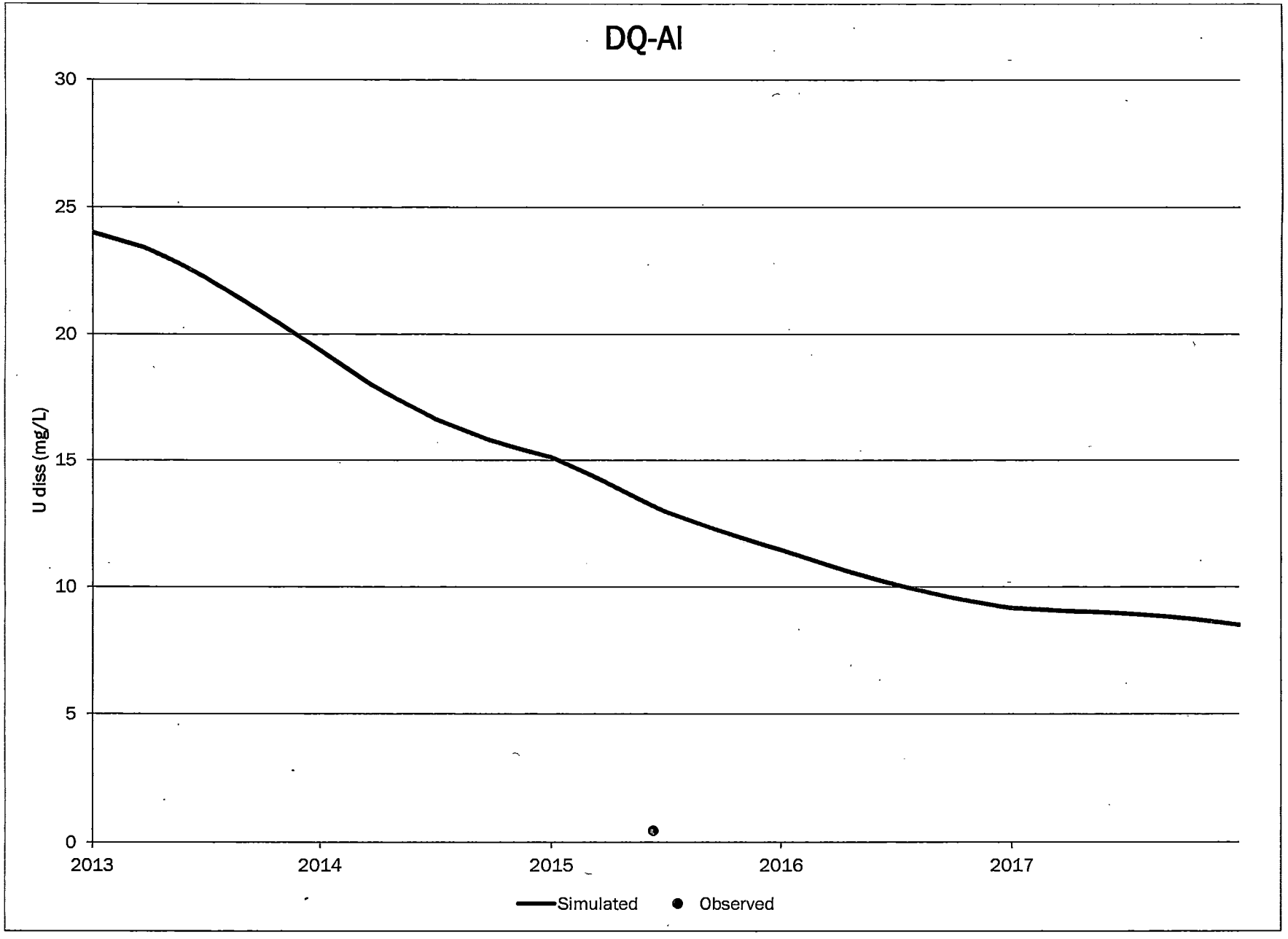

D2-AI
U diss (mg/L)
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

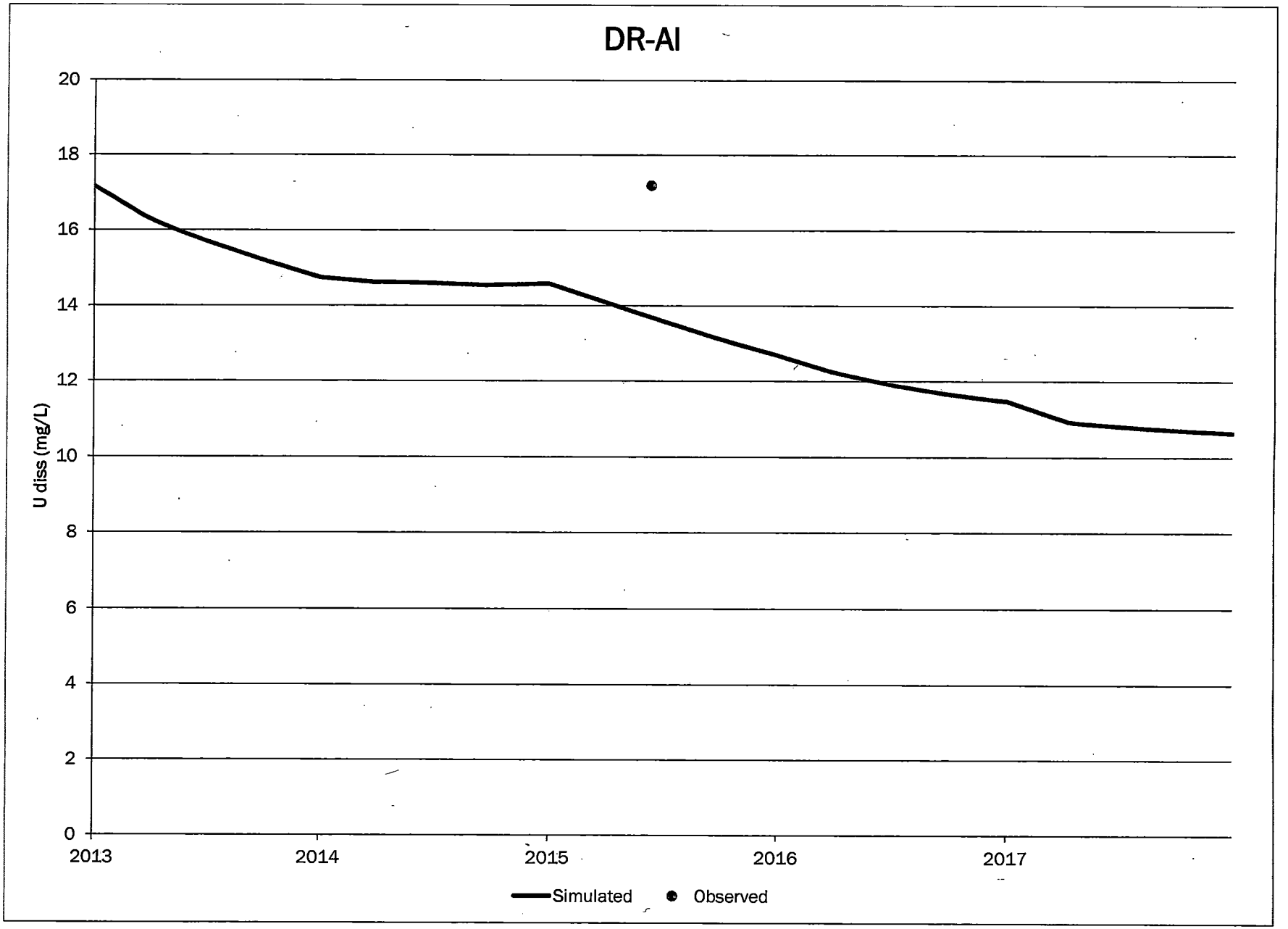

DA3-AI
U diss (mg/L)
20
18
16
14
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

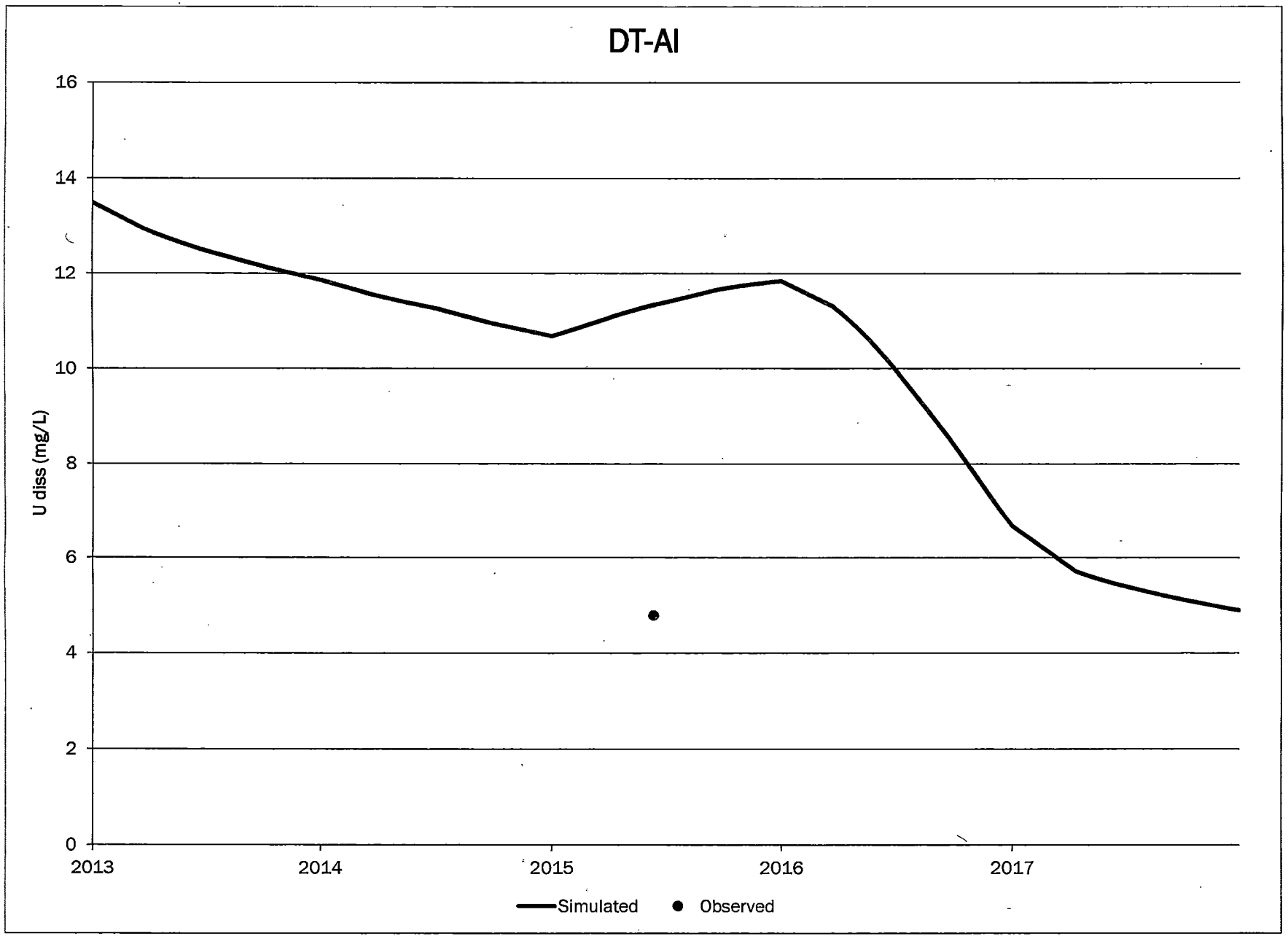

DC-AI
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

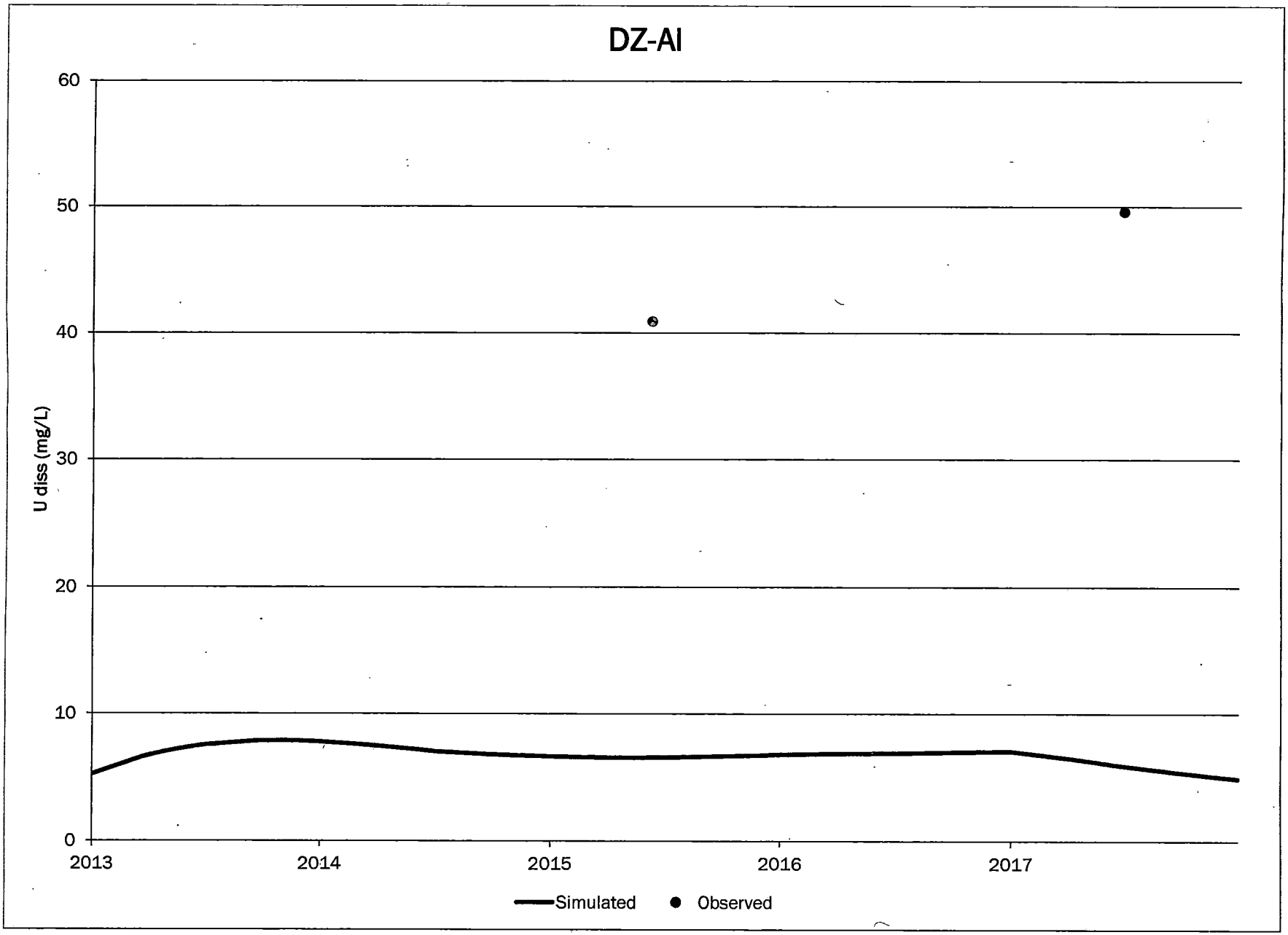

DD2-AI
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

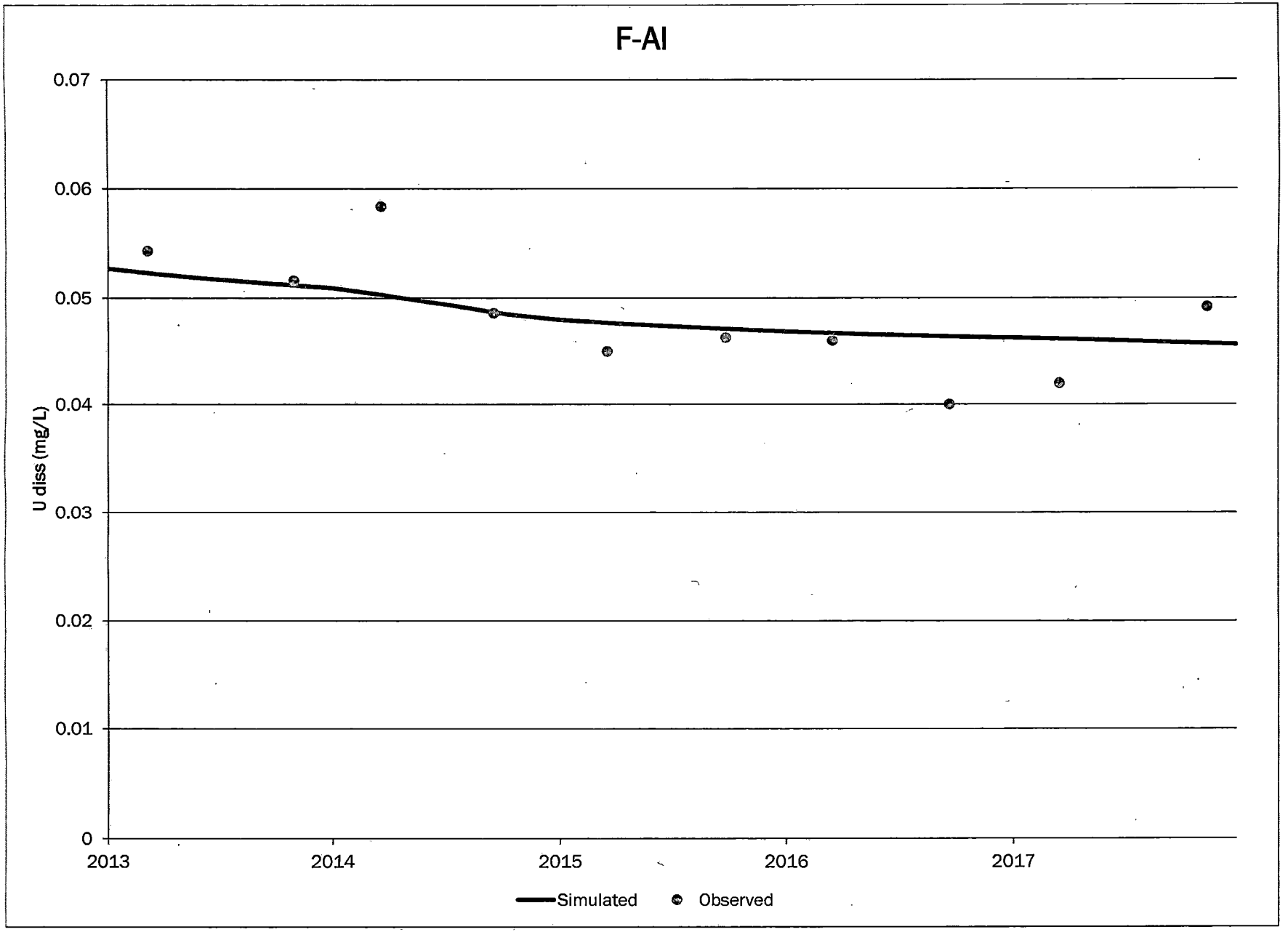

DD-AI
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

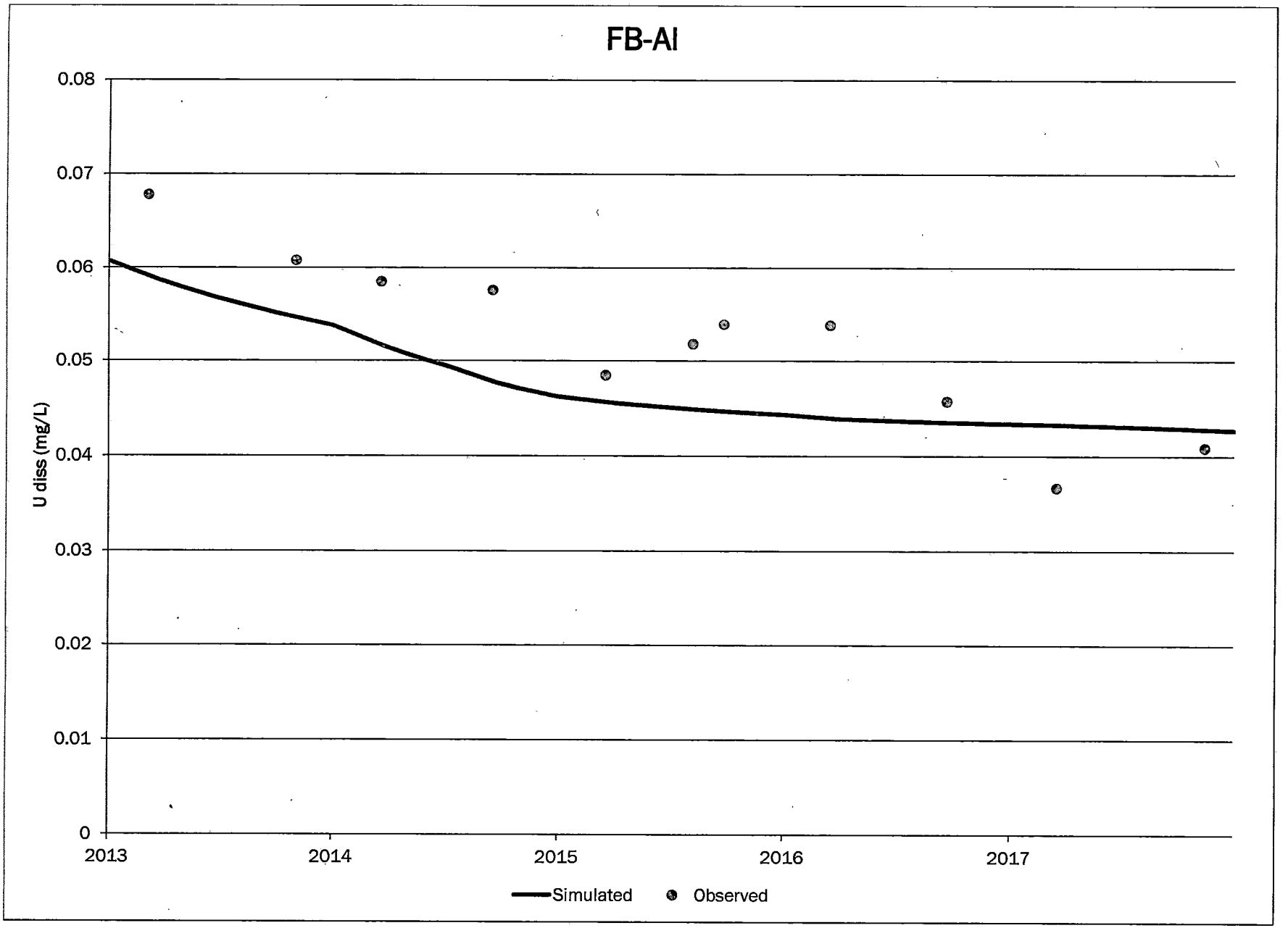

DQ-AI
U diss (mg/L)
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

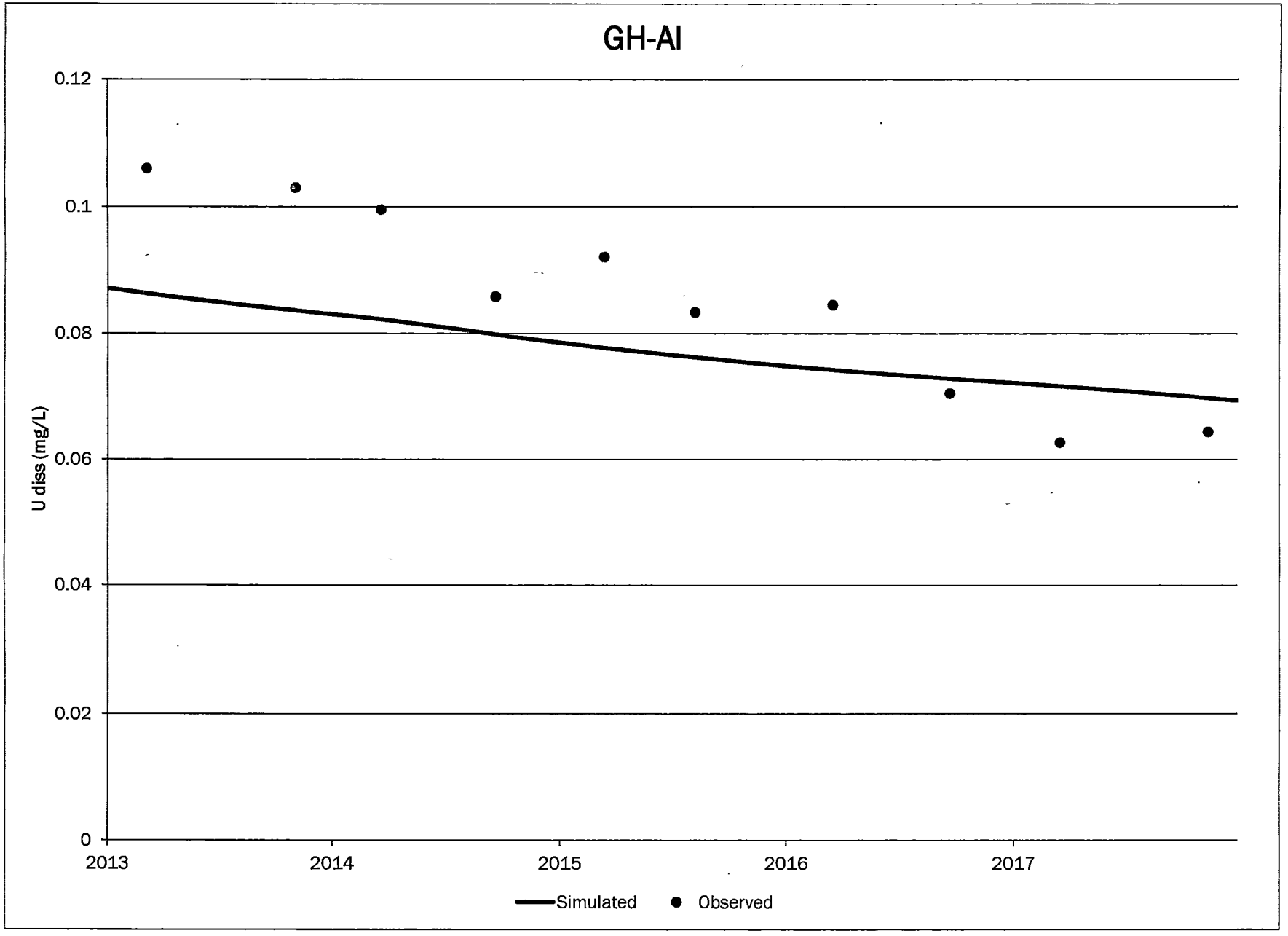

DR-AI
U diss (mg/L)
20
18
16
14
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

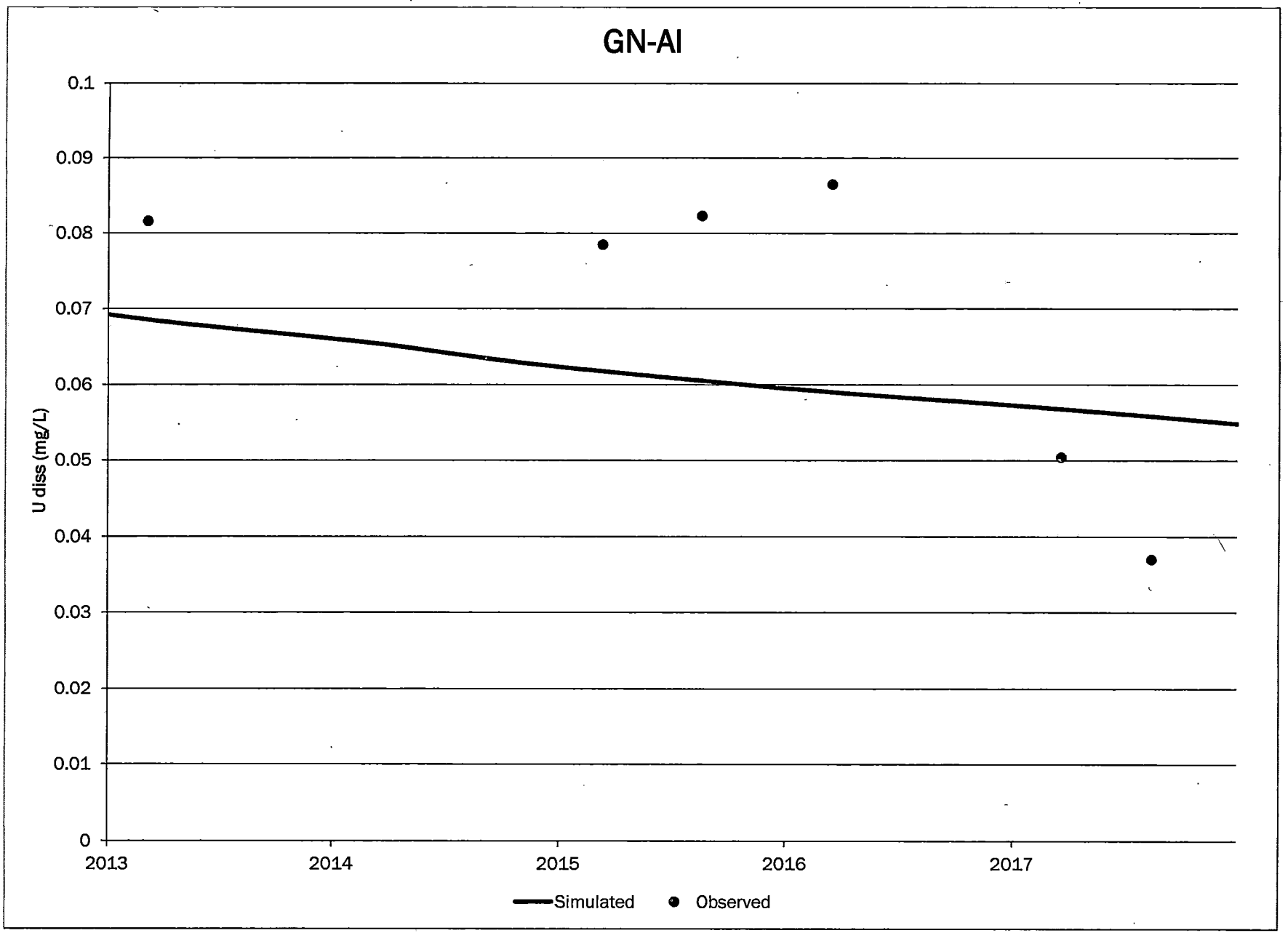

DT-AI
16
14
12
10
8
6
4
2
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

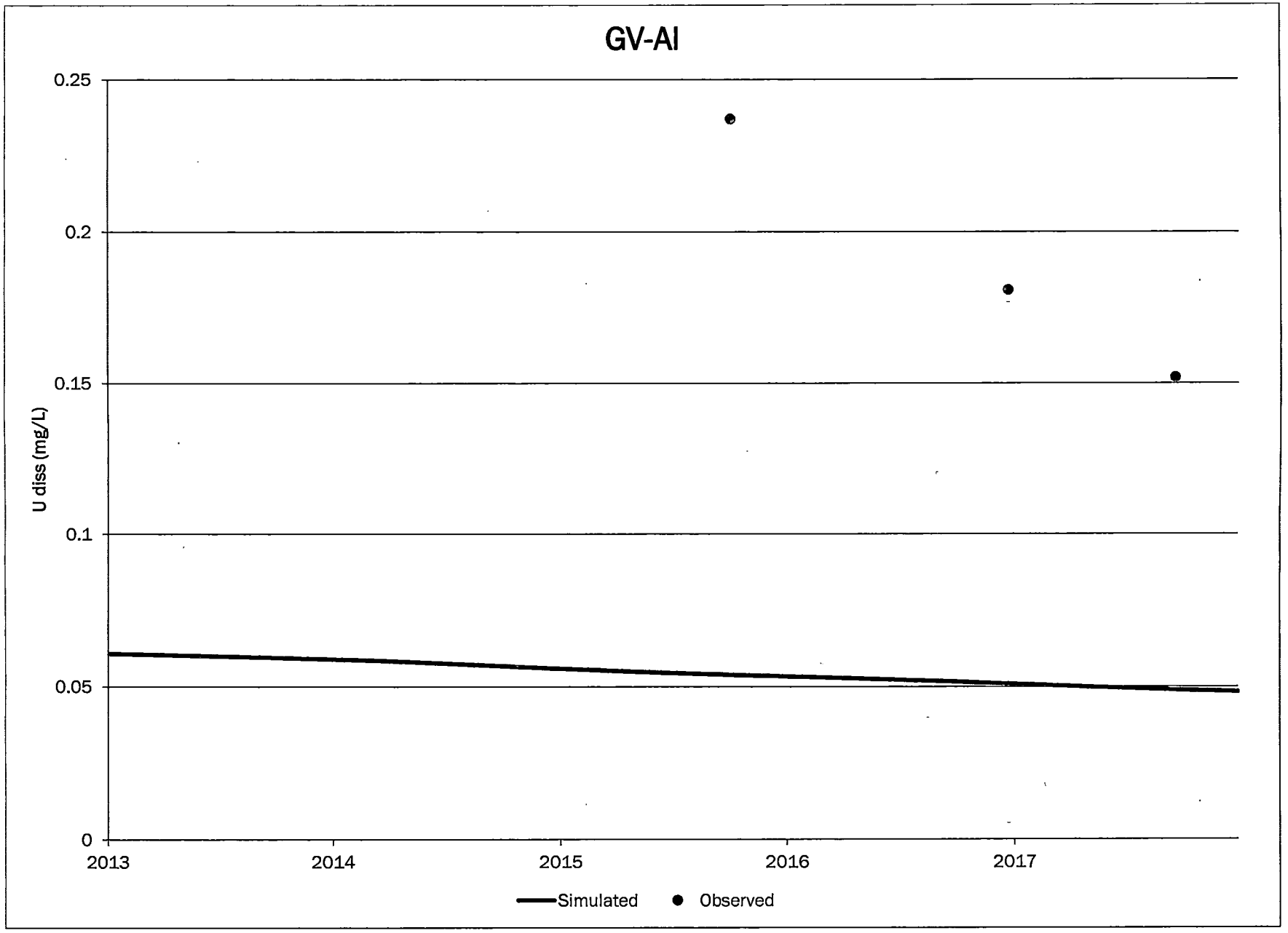

DZ-AI
60
50
40
30
20
10
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

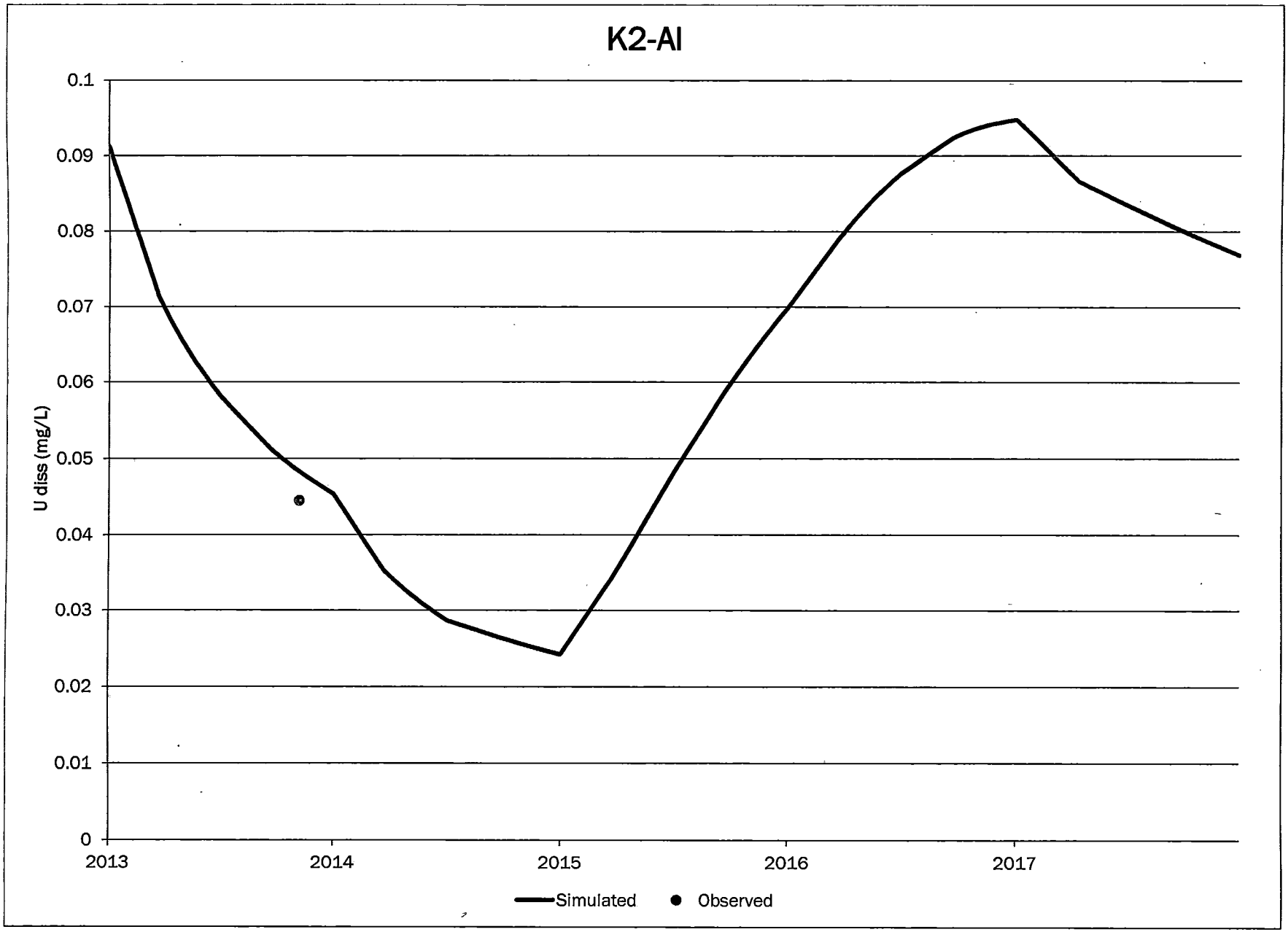

F-Al
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

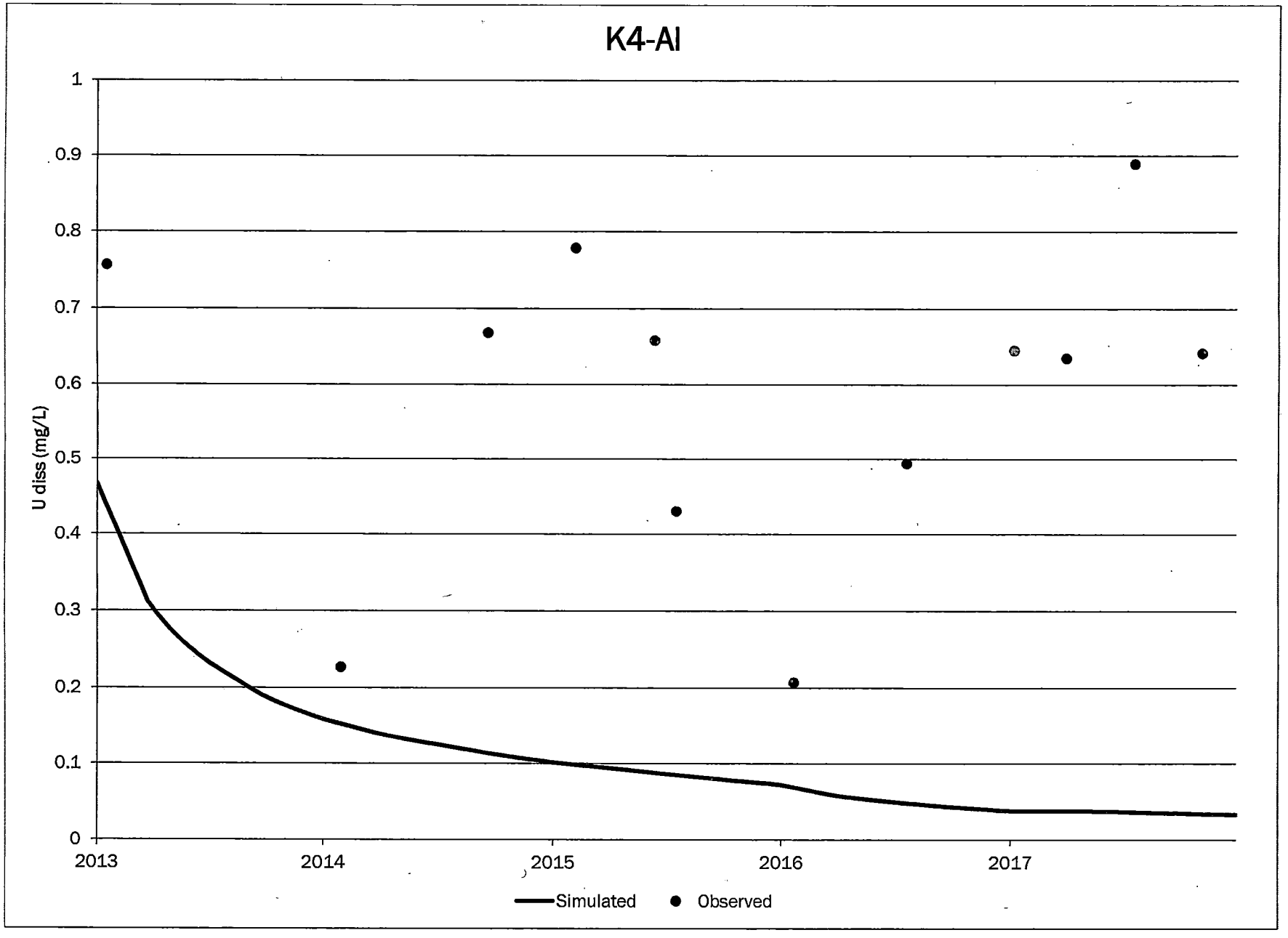

FB-AI
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

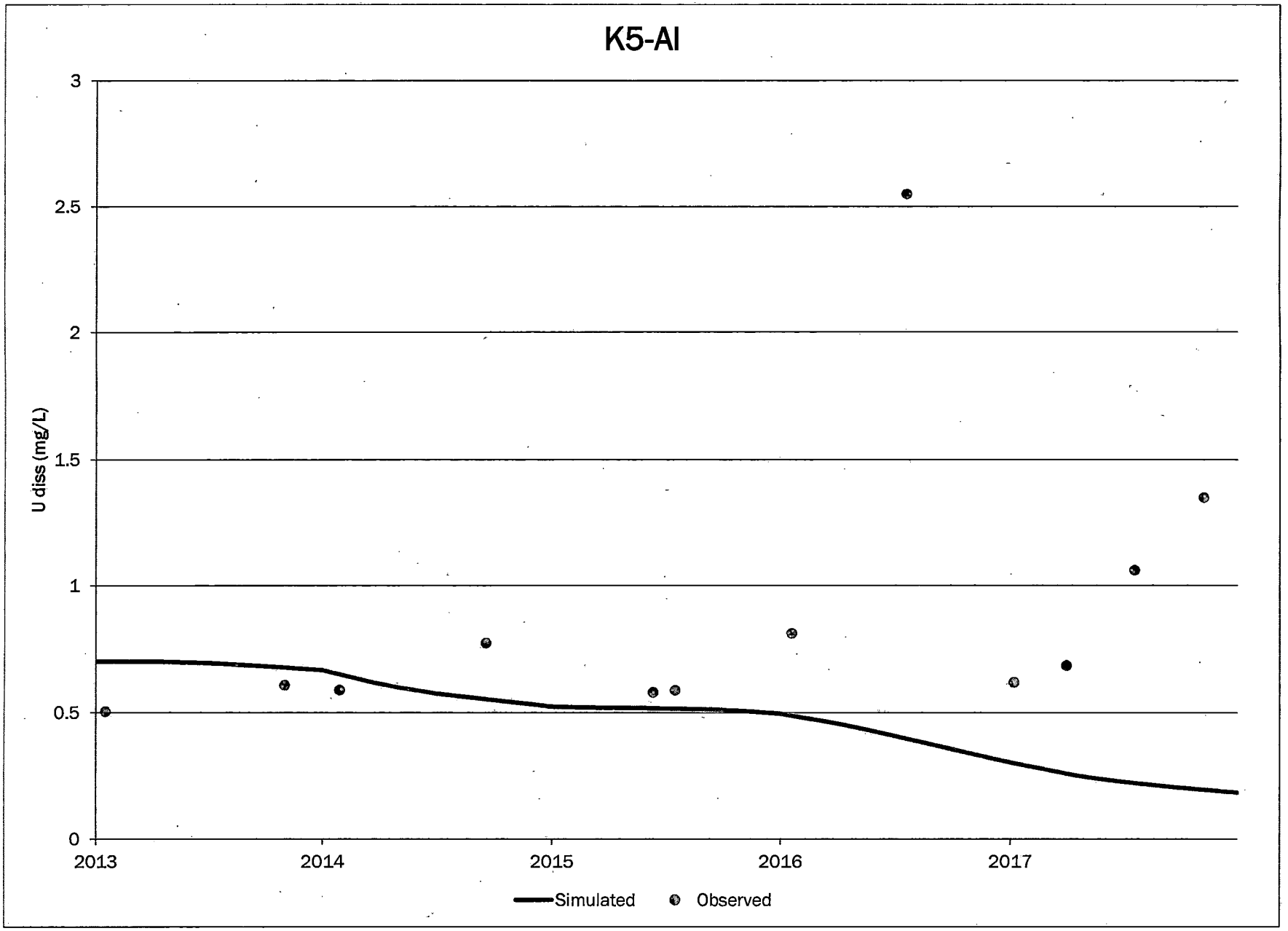

GH-AI
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

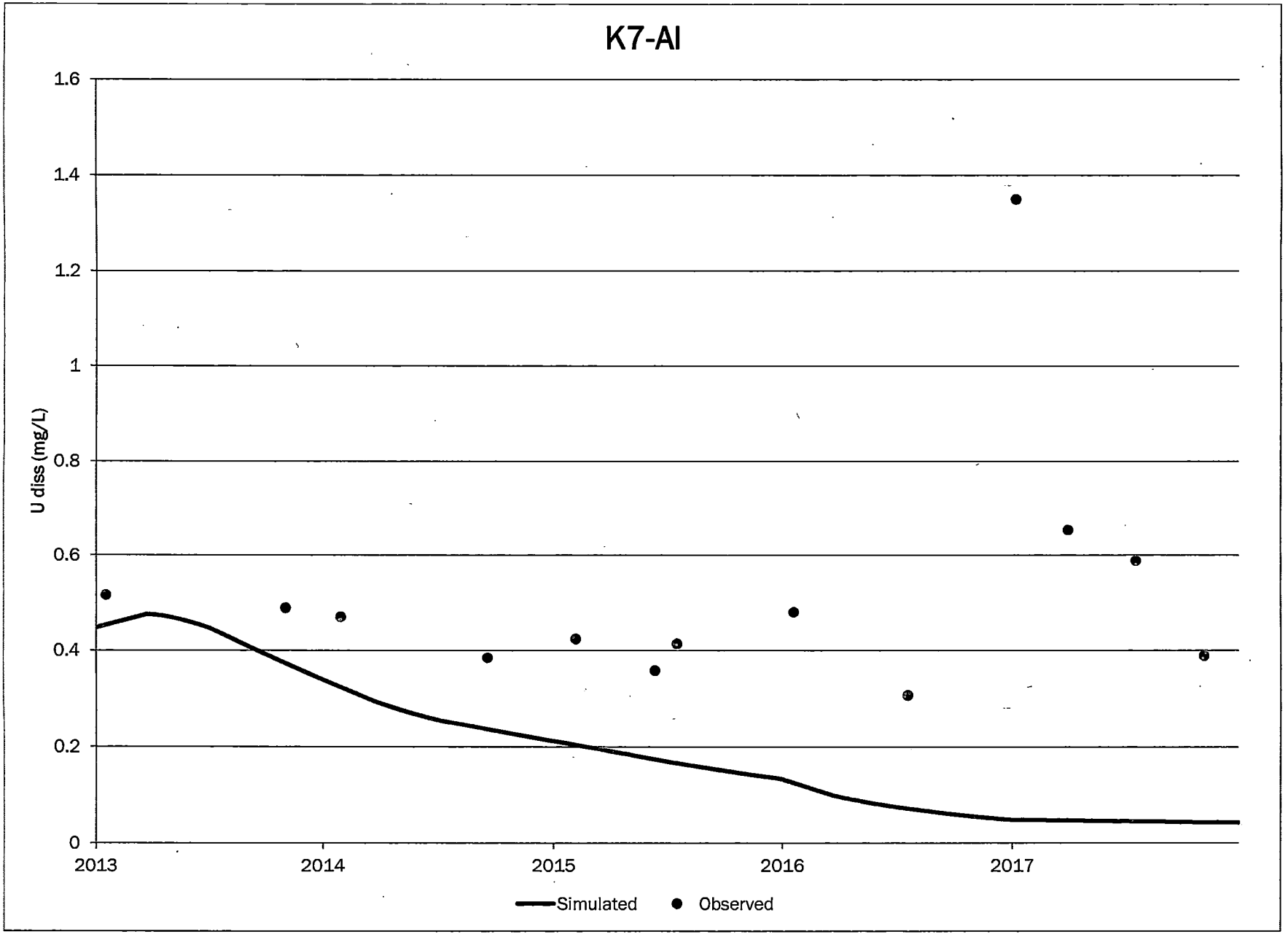

GN-AI
U diss (mg/L)
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
2013
2014
2015
2016
2017
Simulated
Observed

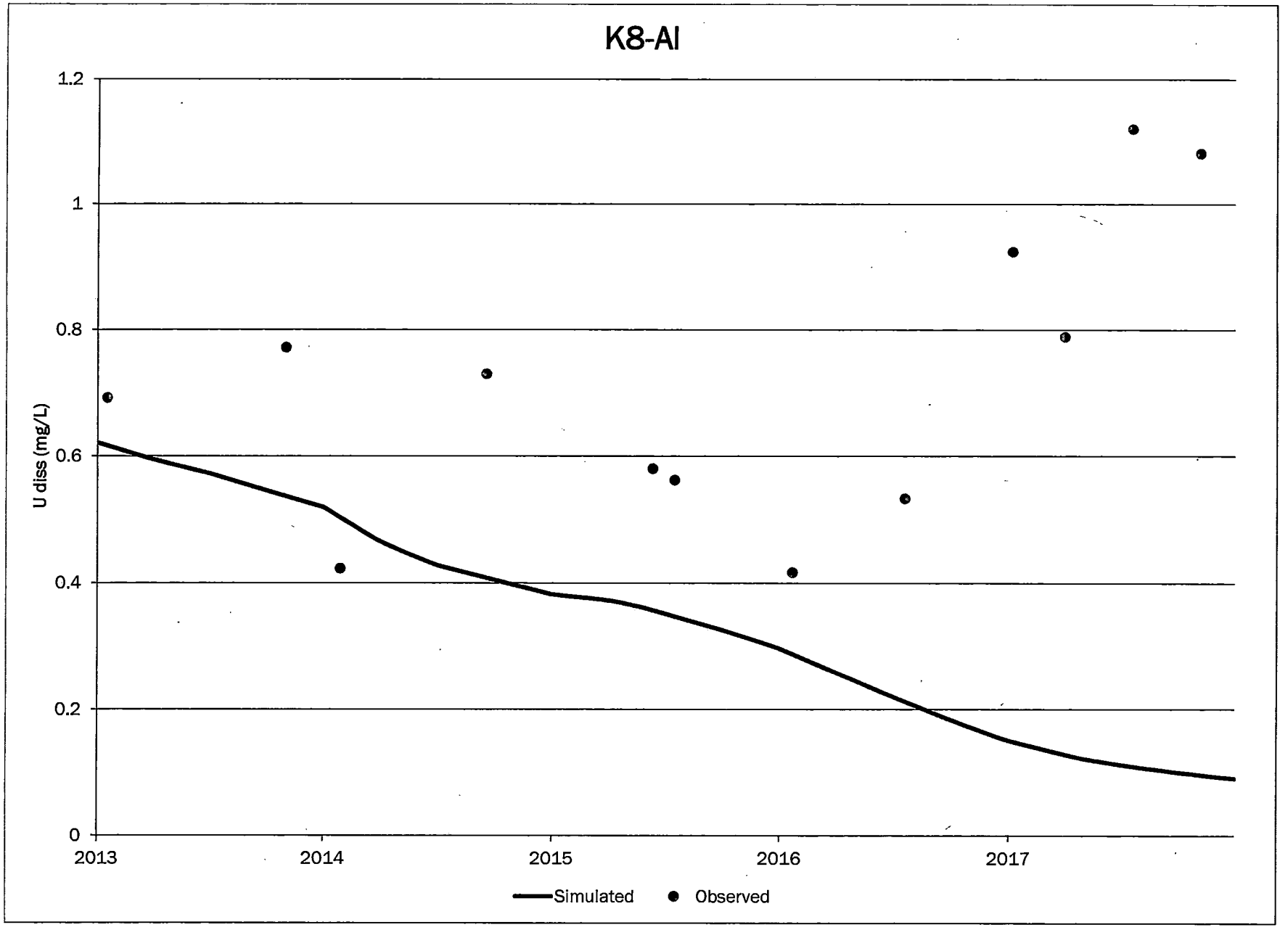

GV-AI
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

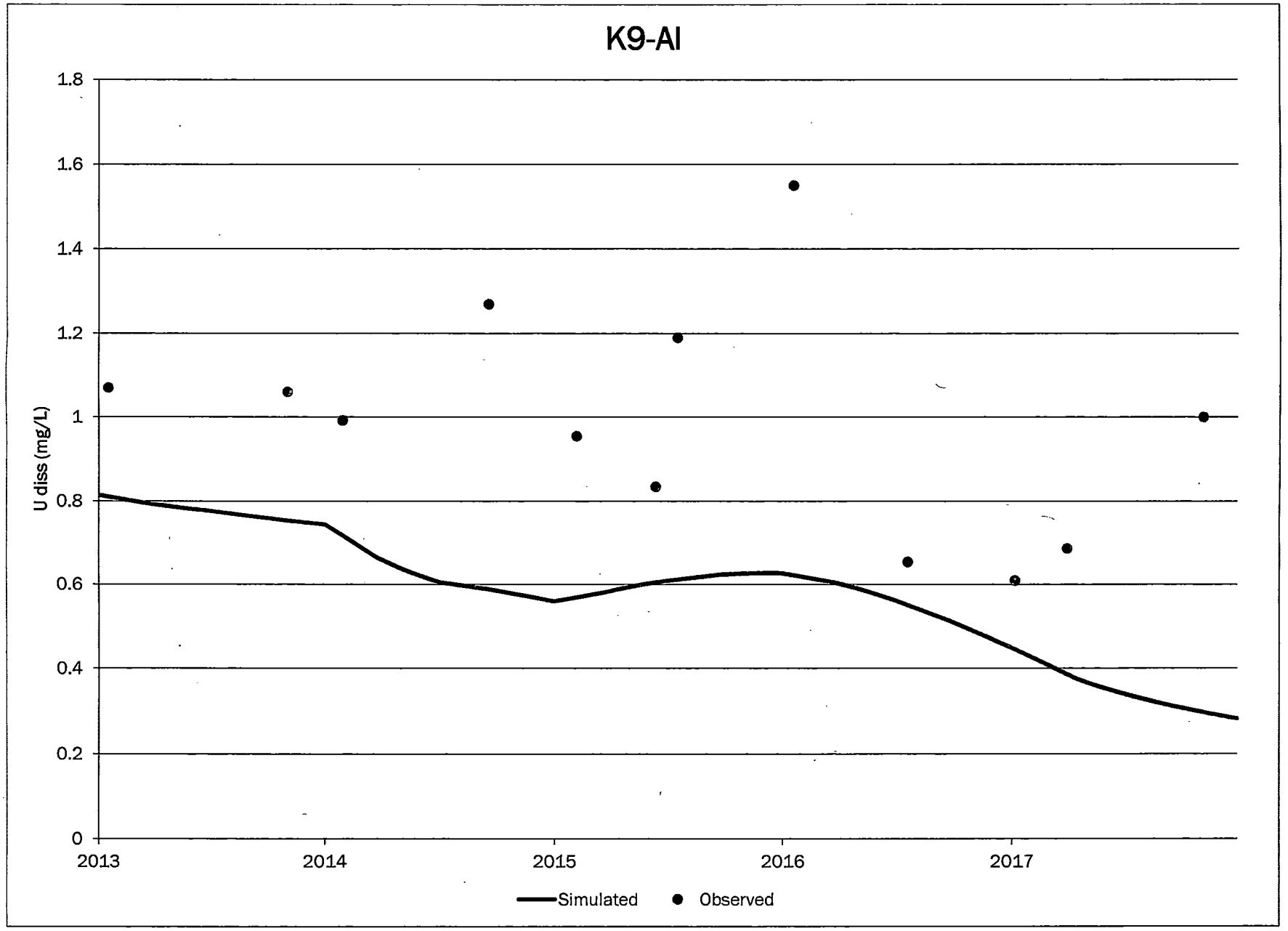

K2-AI
U diss (mg/L)
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
2013
2014
2015
2016
2017
Simulated
Observed

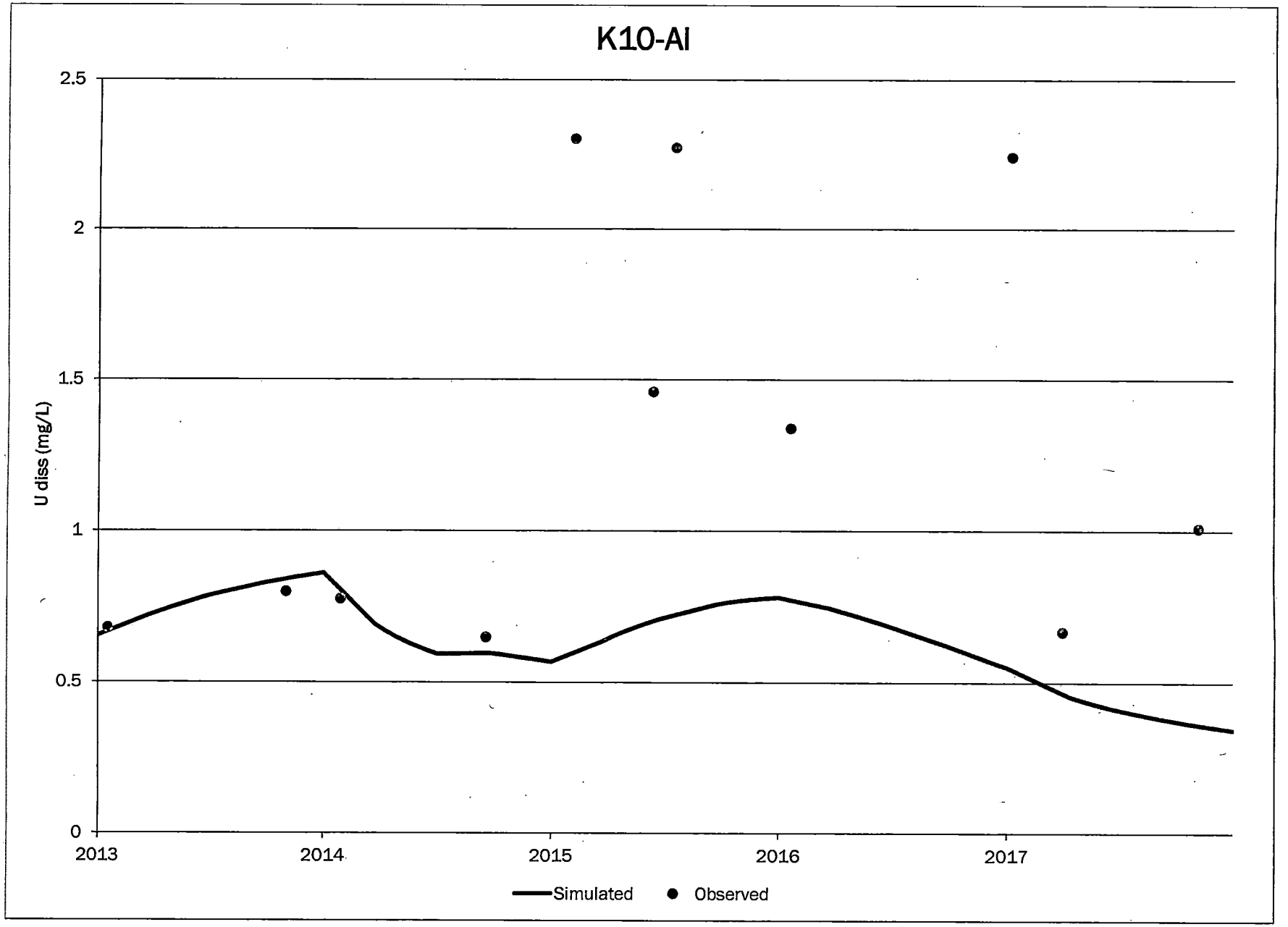

K4-AI
U diss (mg/L)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
2013
2014
2015
2016
2017
Simulated
Observed

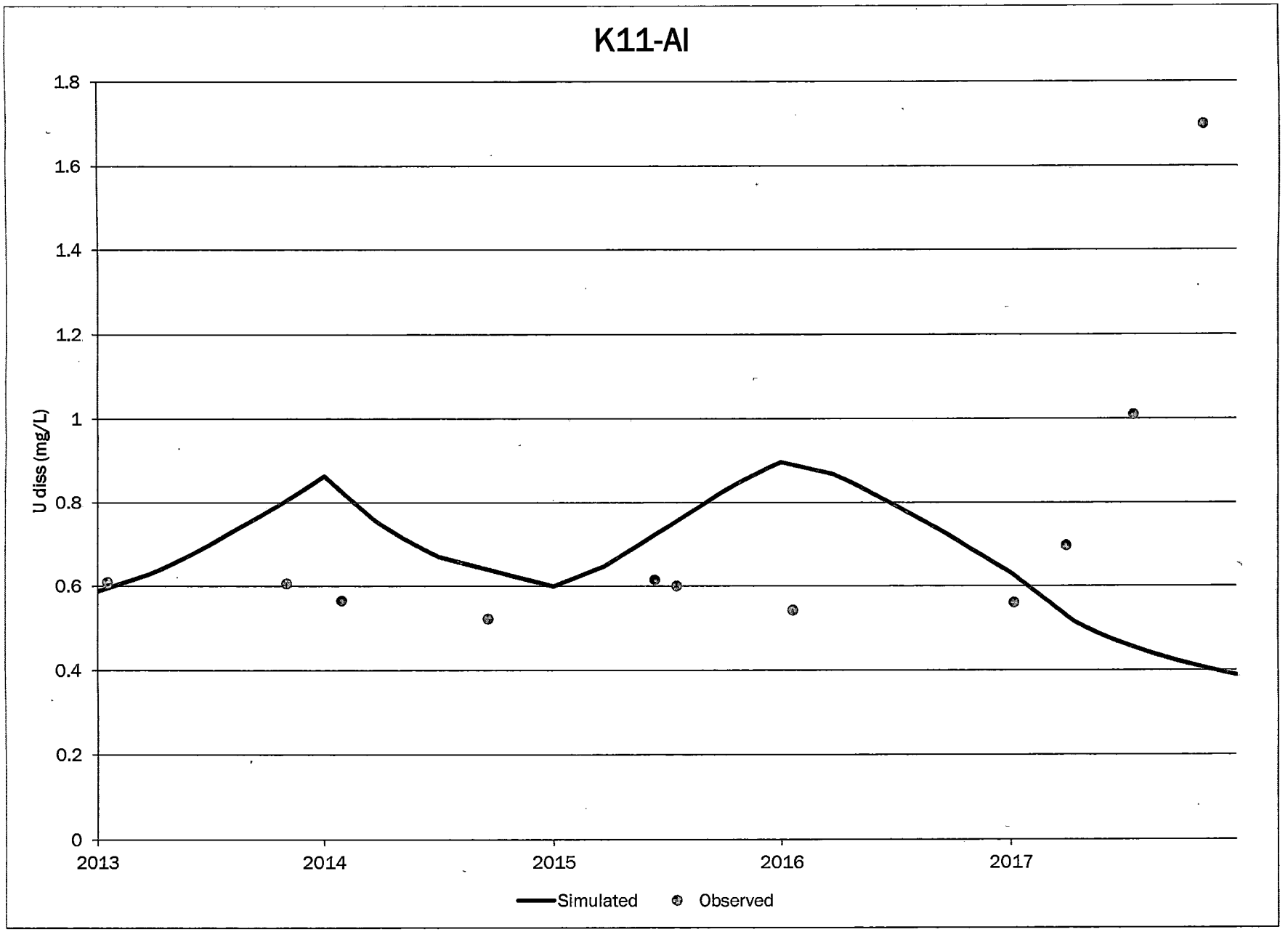

K5-AI
U diss (mg/L)
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

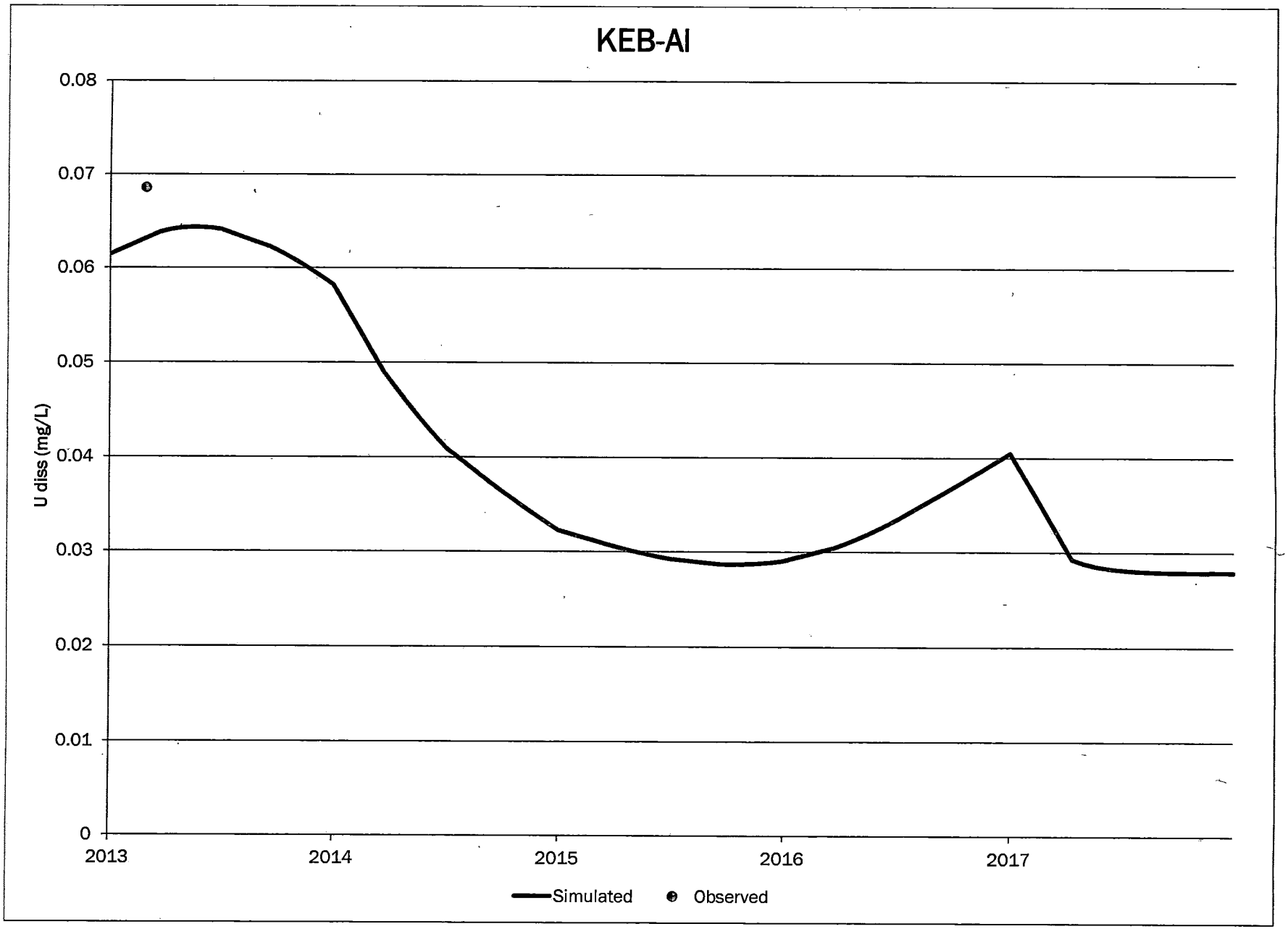

K7-AI
U diss (mg/L)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2013
2014
2015
2016
2017
Simulated
Observed

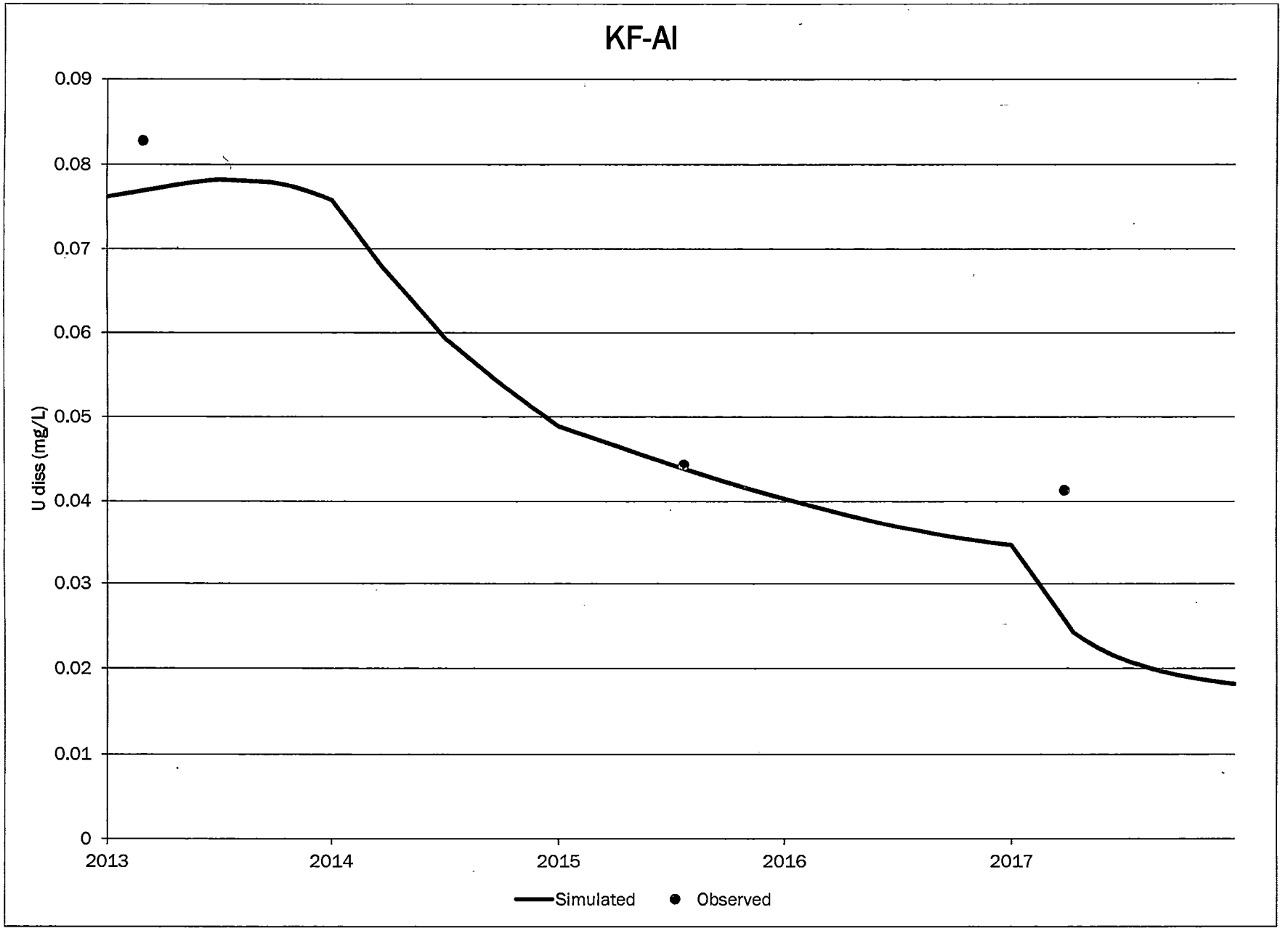

K8-AI
U diss (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
2013
2014
2015
2016
2017
Simulated
Observed

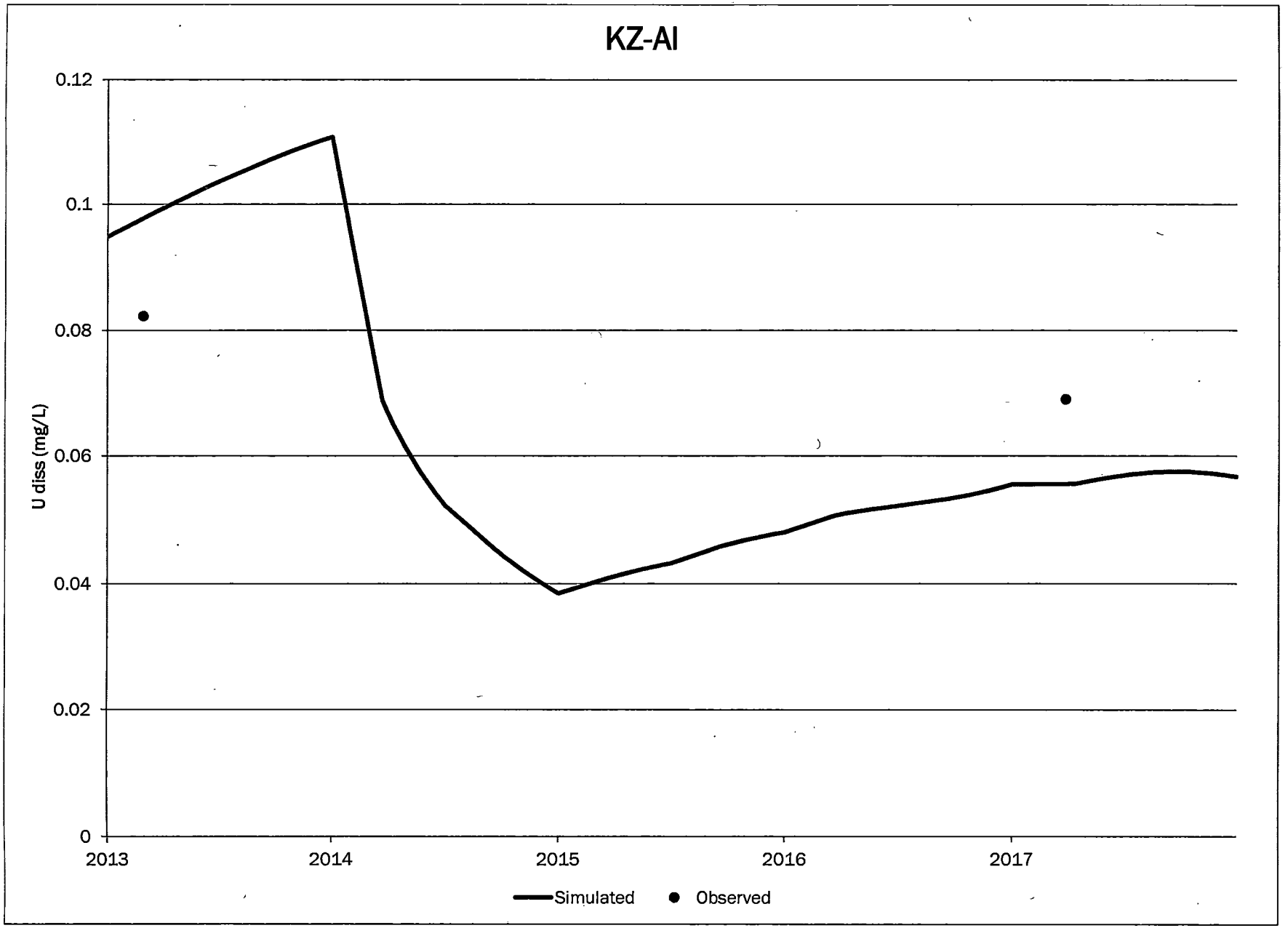

K9-AI
U diss (mg/L)
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2013
2014
2015
2016
2017
Simulated
Observed

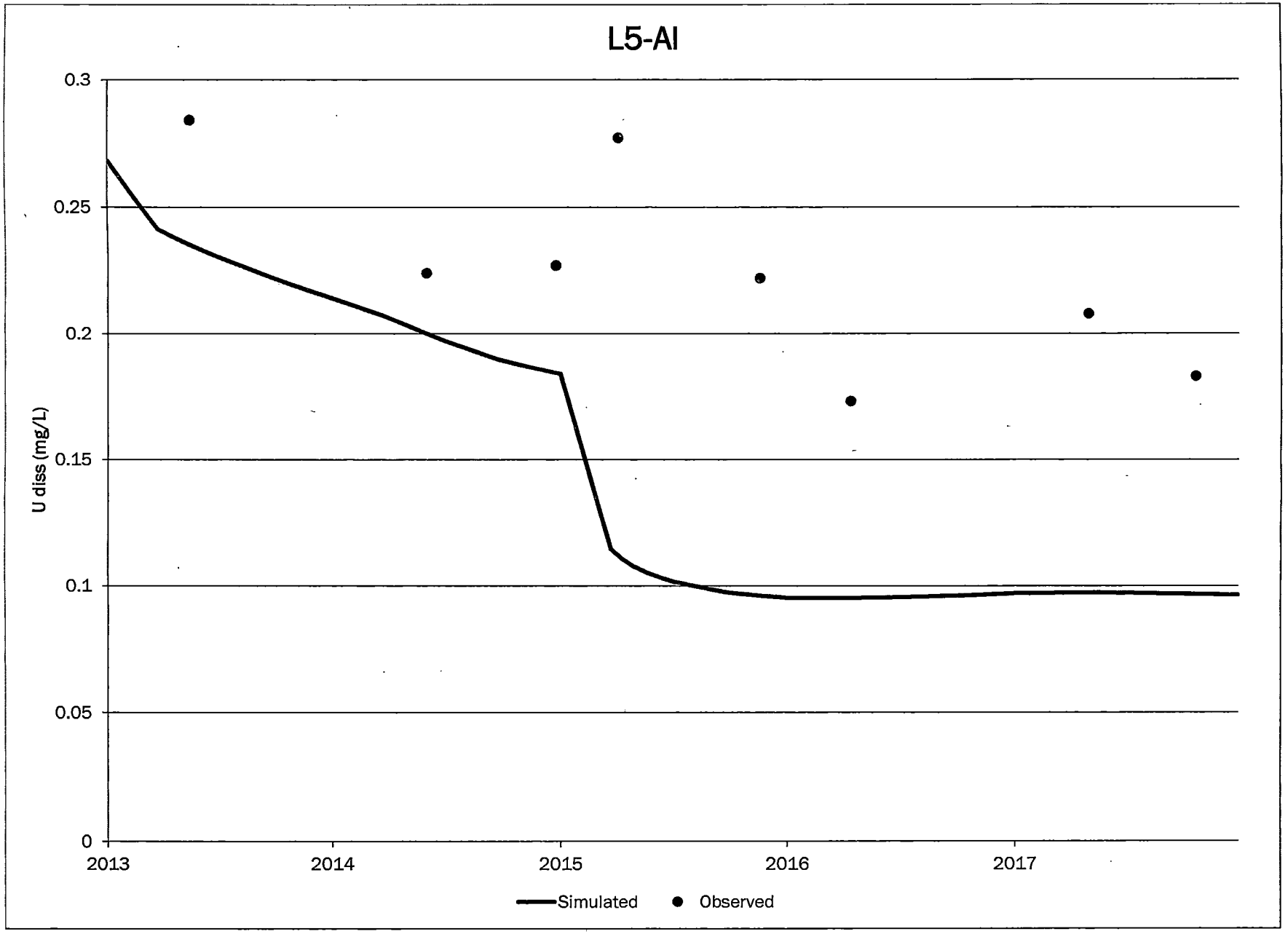

K10-AI
2.5
2
1.5
1
0.5
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

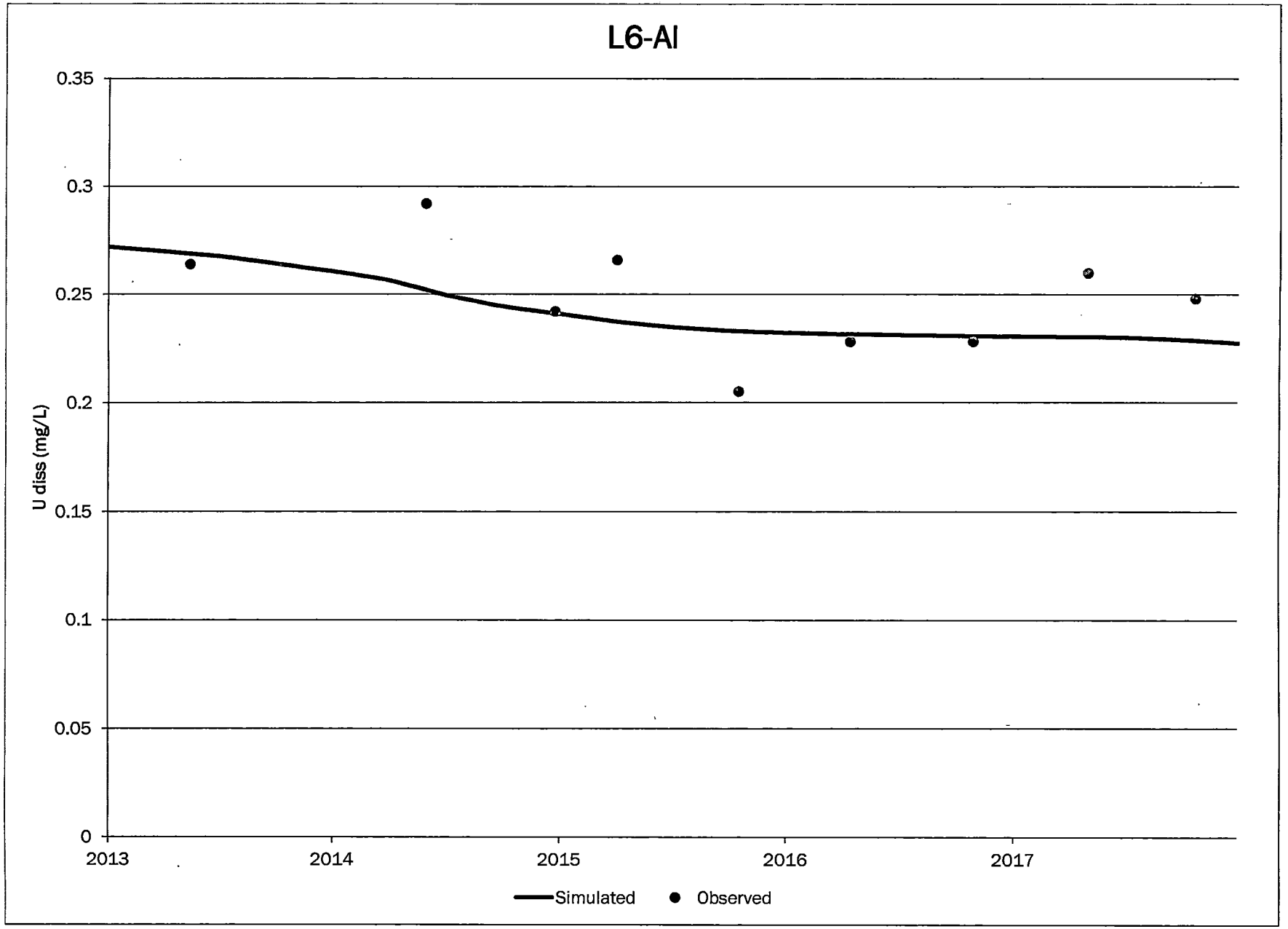

K11-AI
U diss (mg/L)
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2013
2014
2015
2016
2017
Simulated
Observed

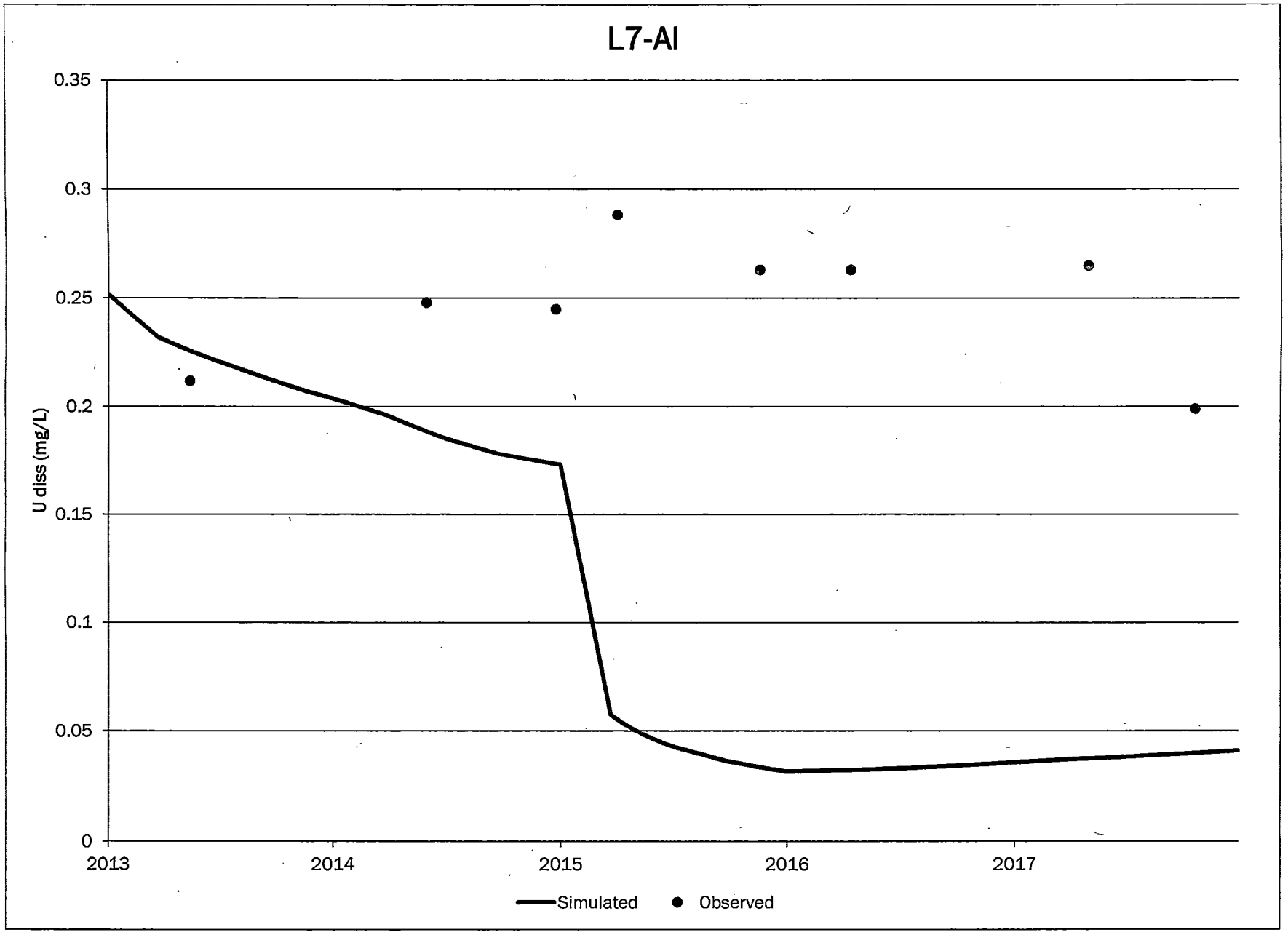

KEB-AI
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

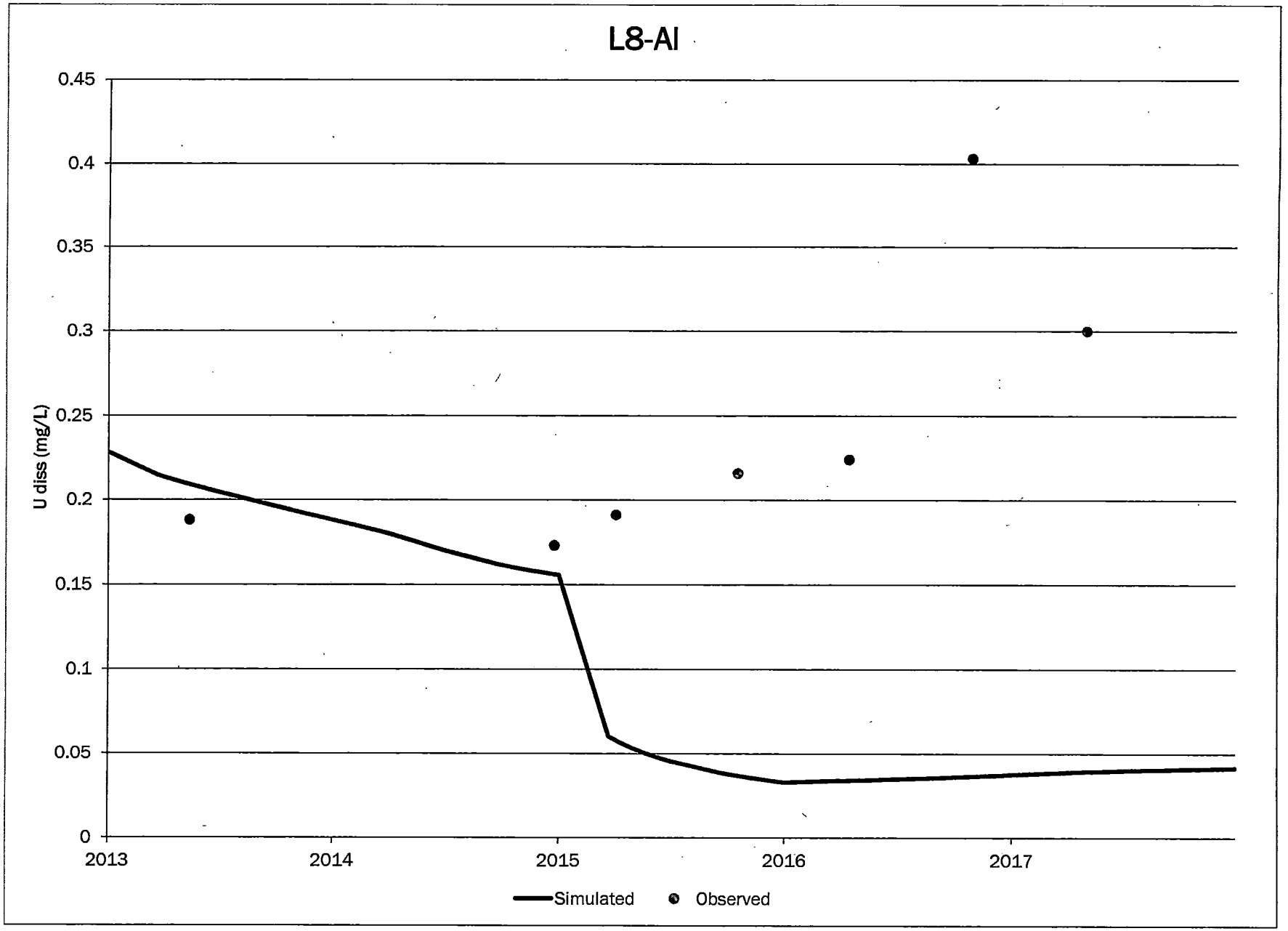

KF-AI
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

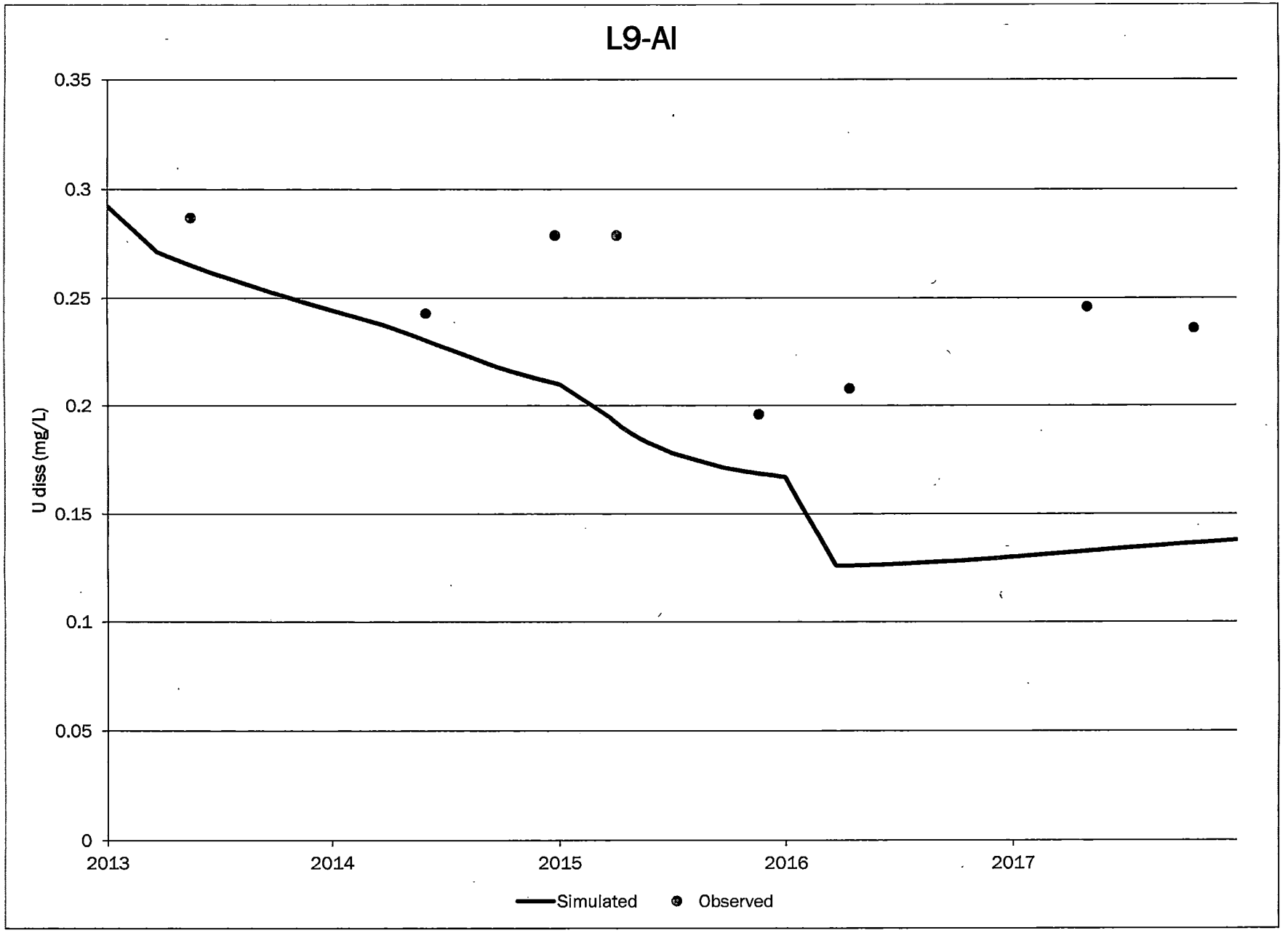

KZ-AI
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

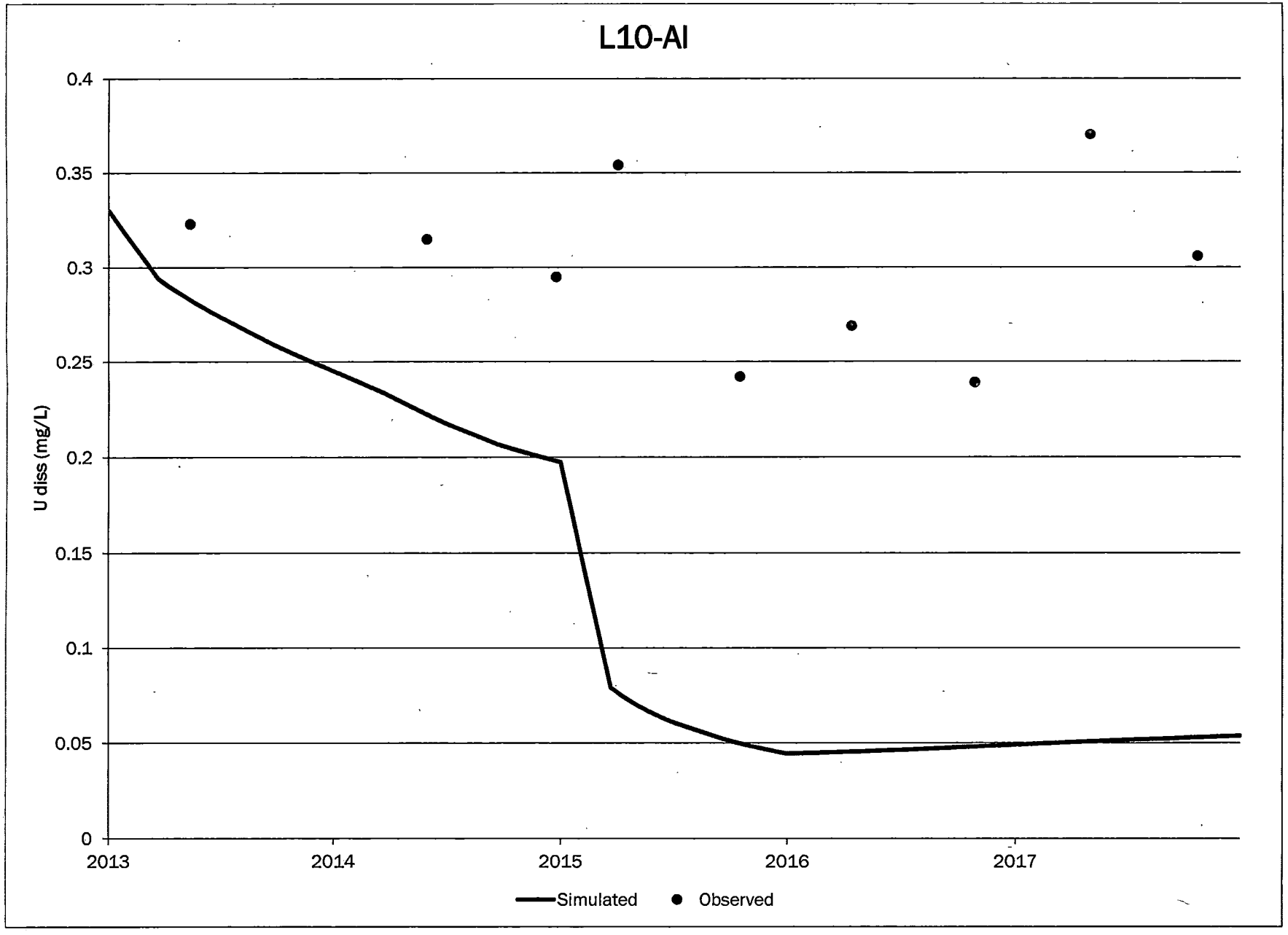

L5-AI
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

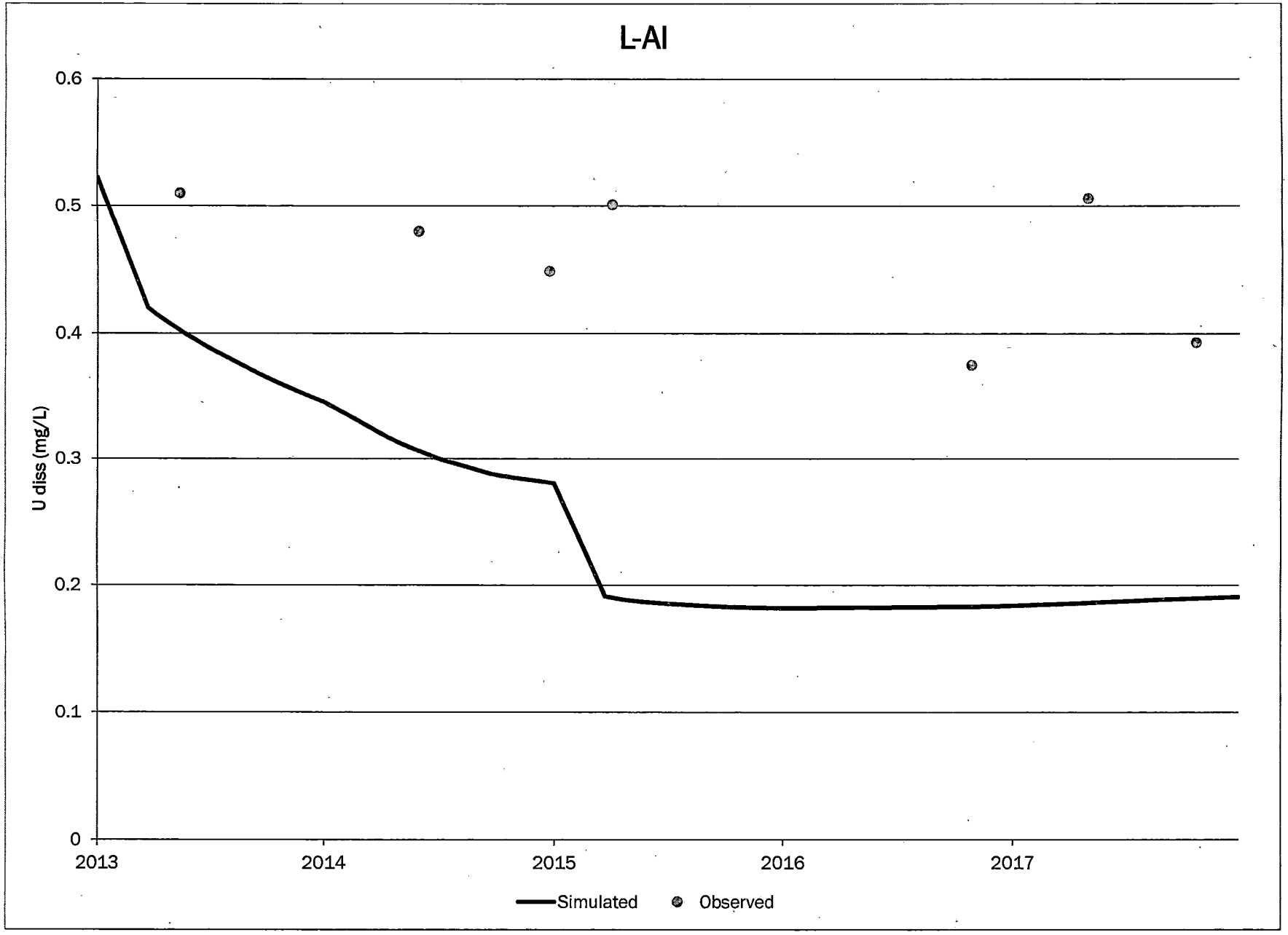

L6-AI
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

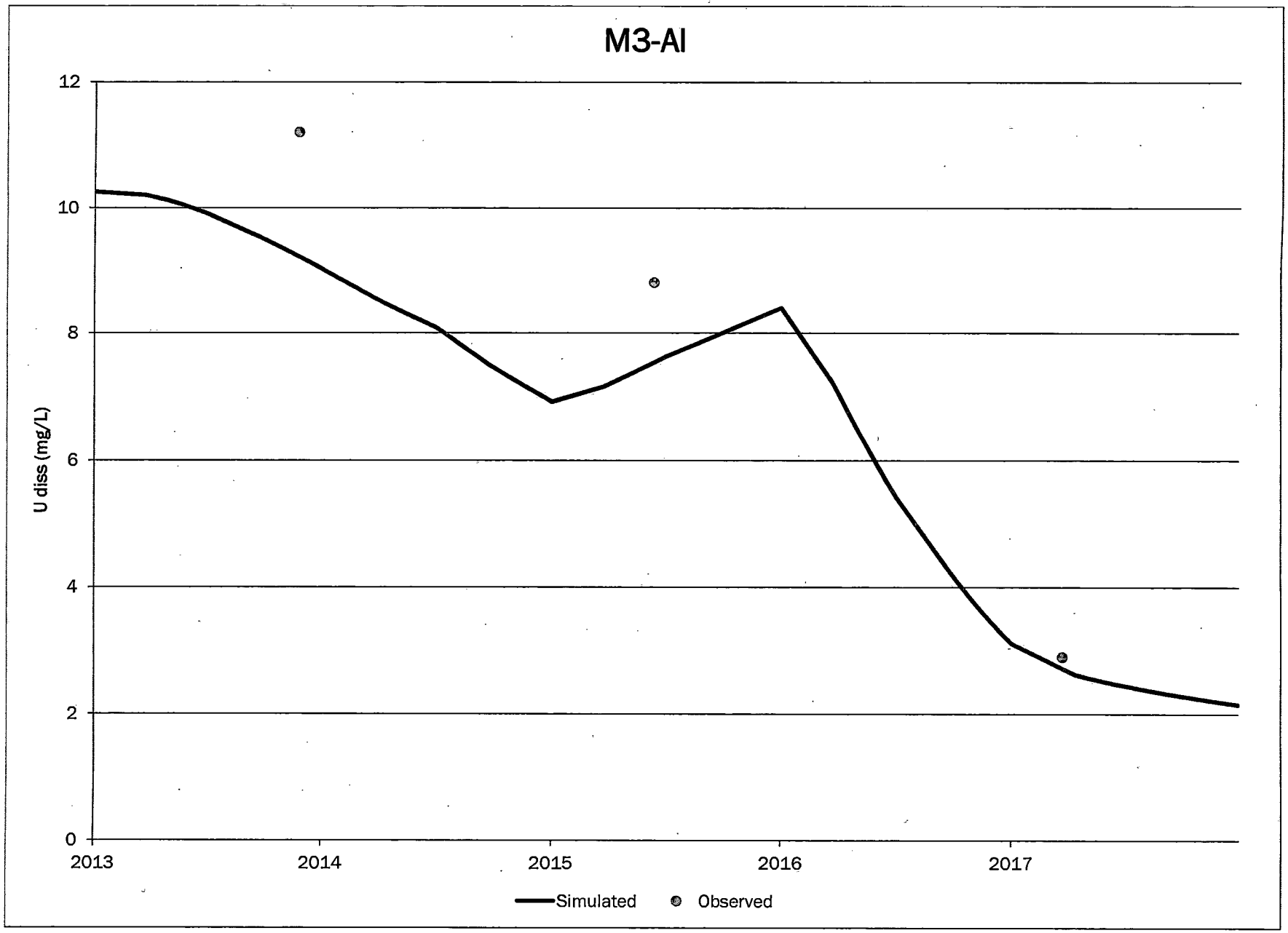

L7-AI
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

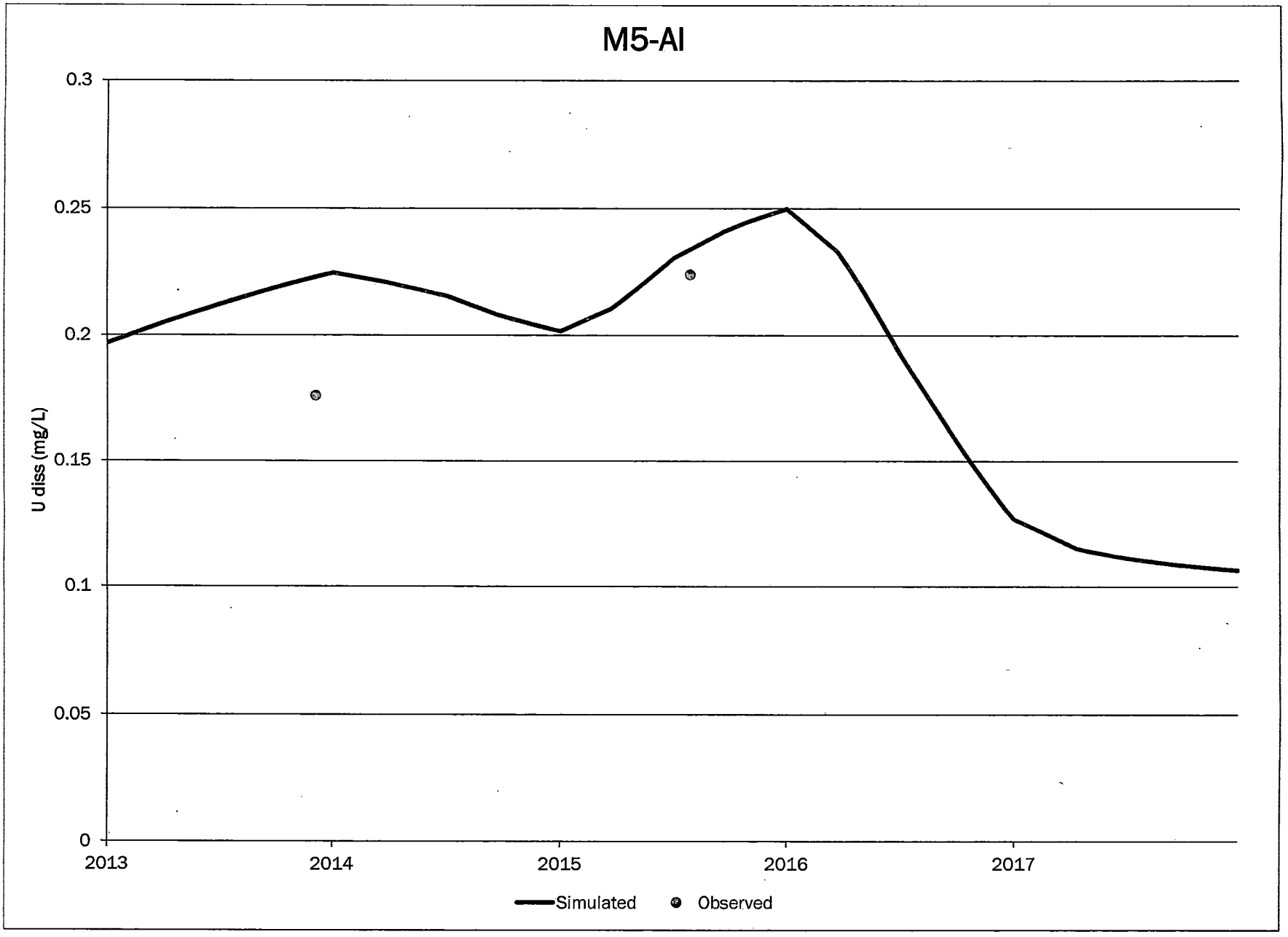

L8-AI
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

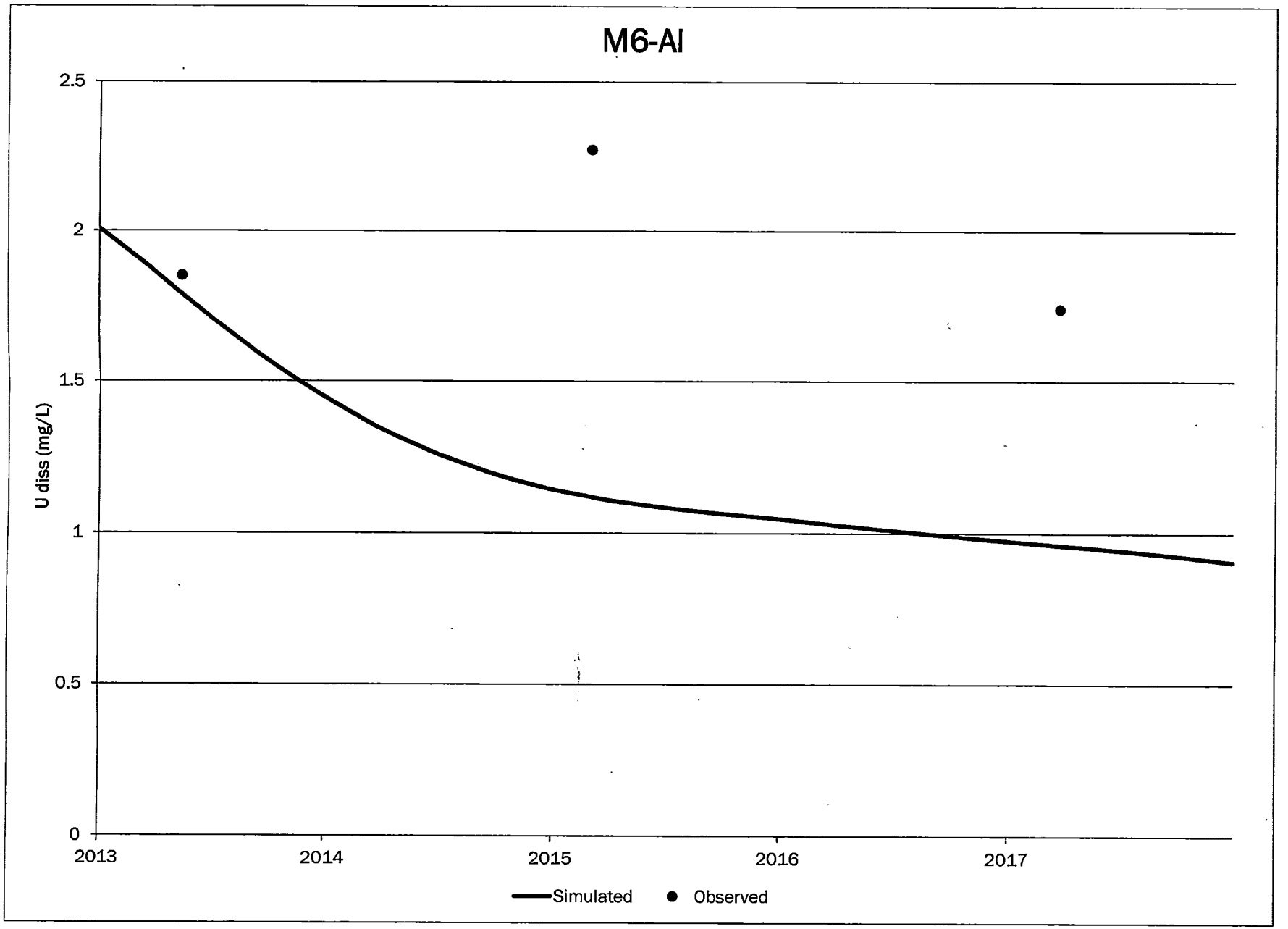

L9-AI
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

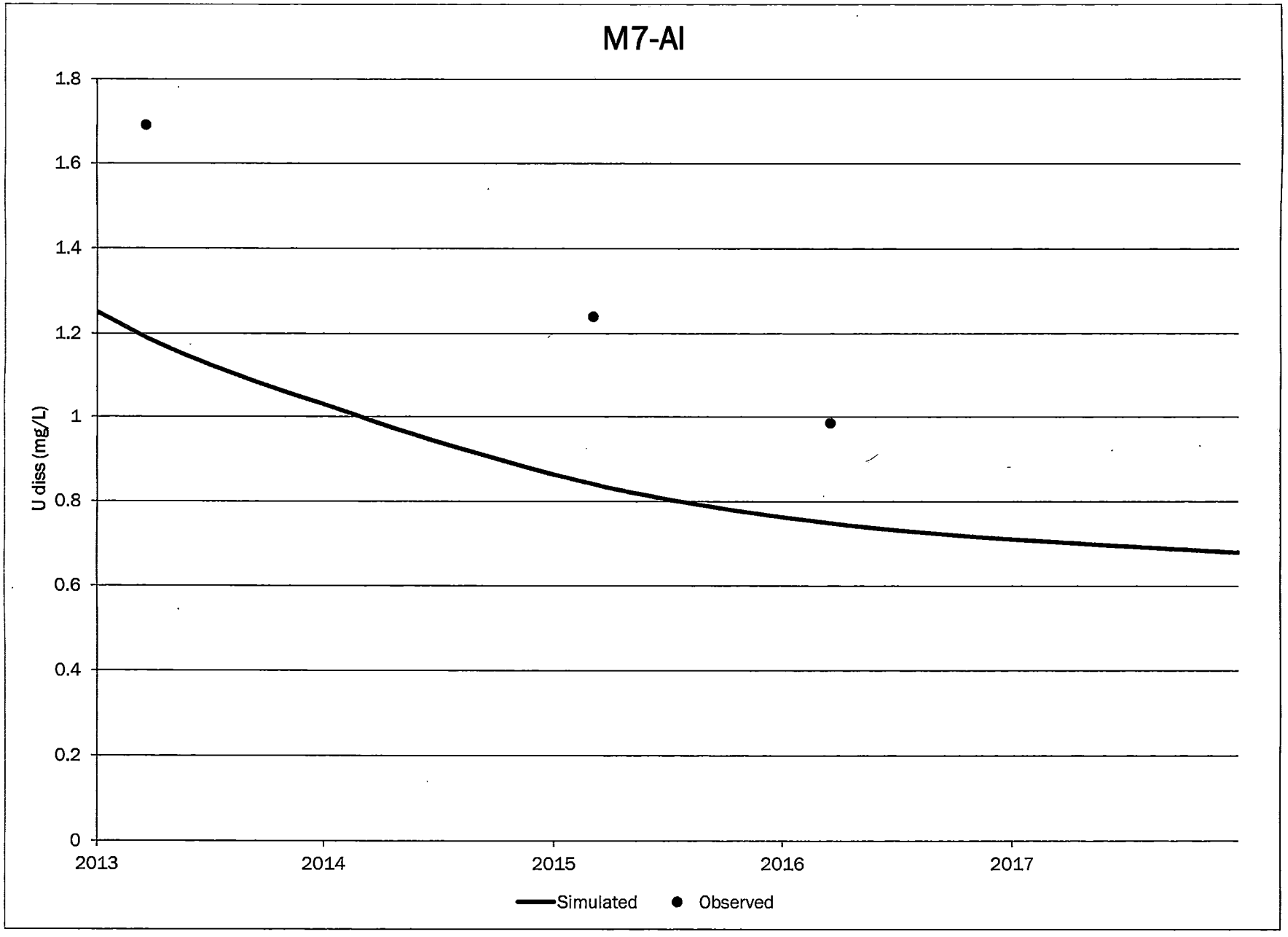

L10-AI
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

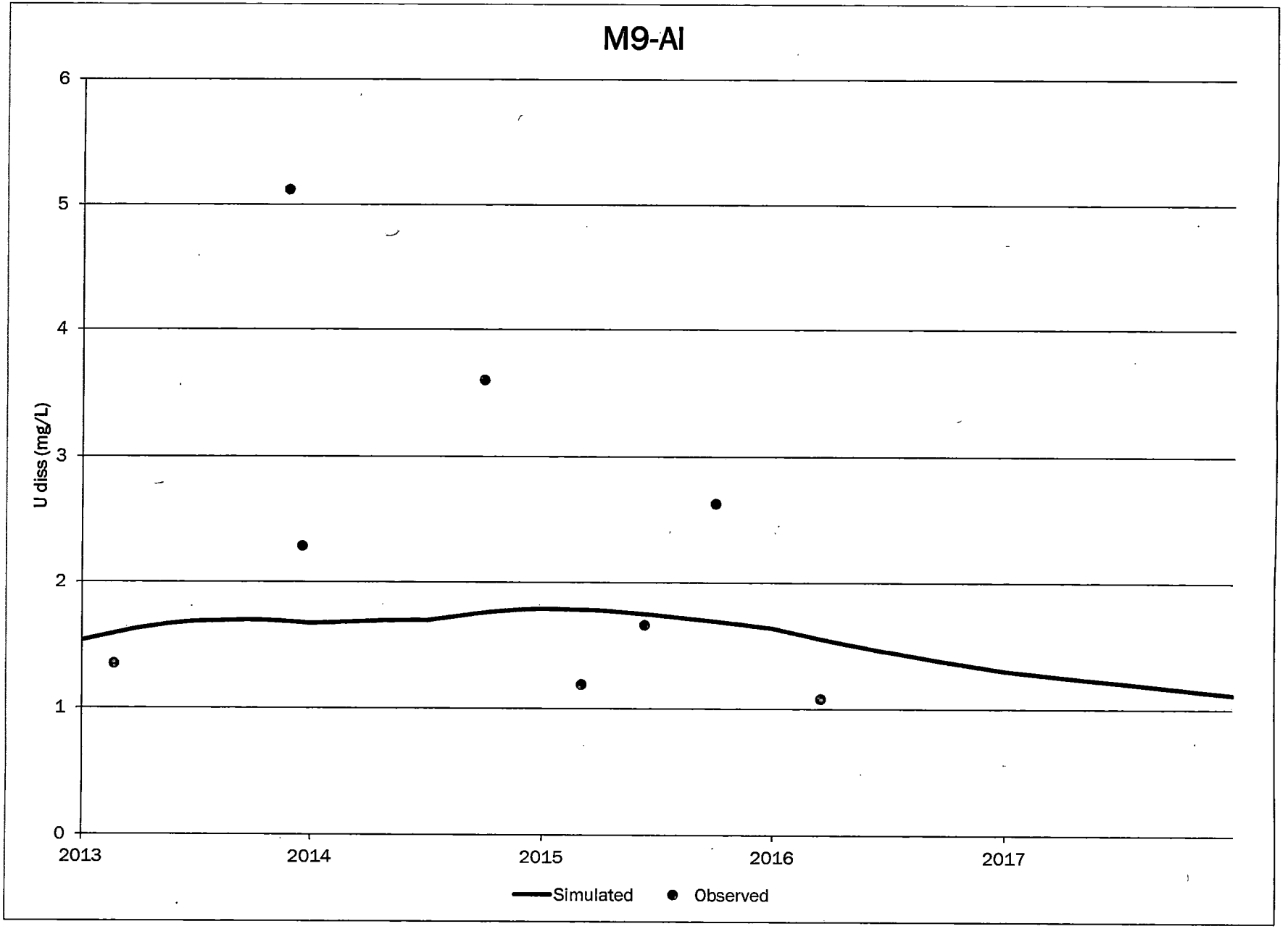

L-AI
0.6
0.5
0.4
0.3
0.2
0.1
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

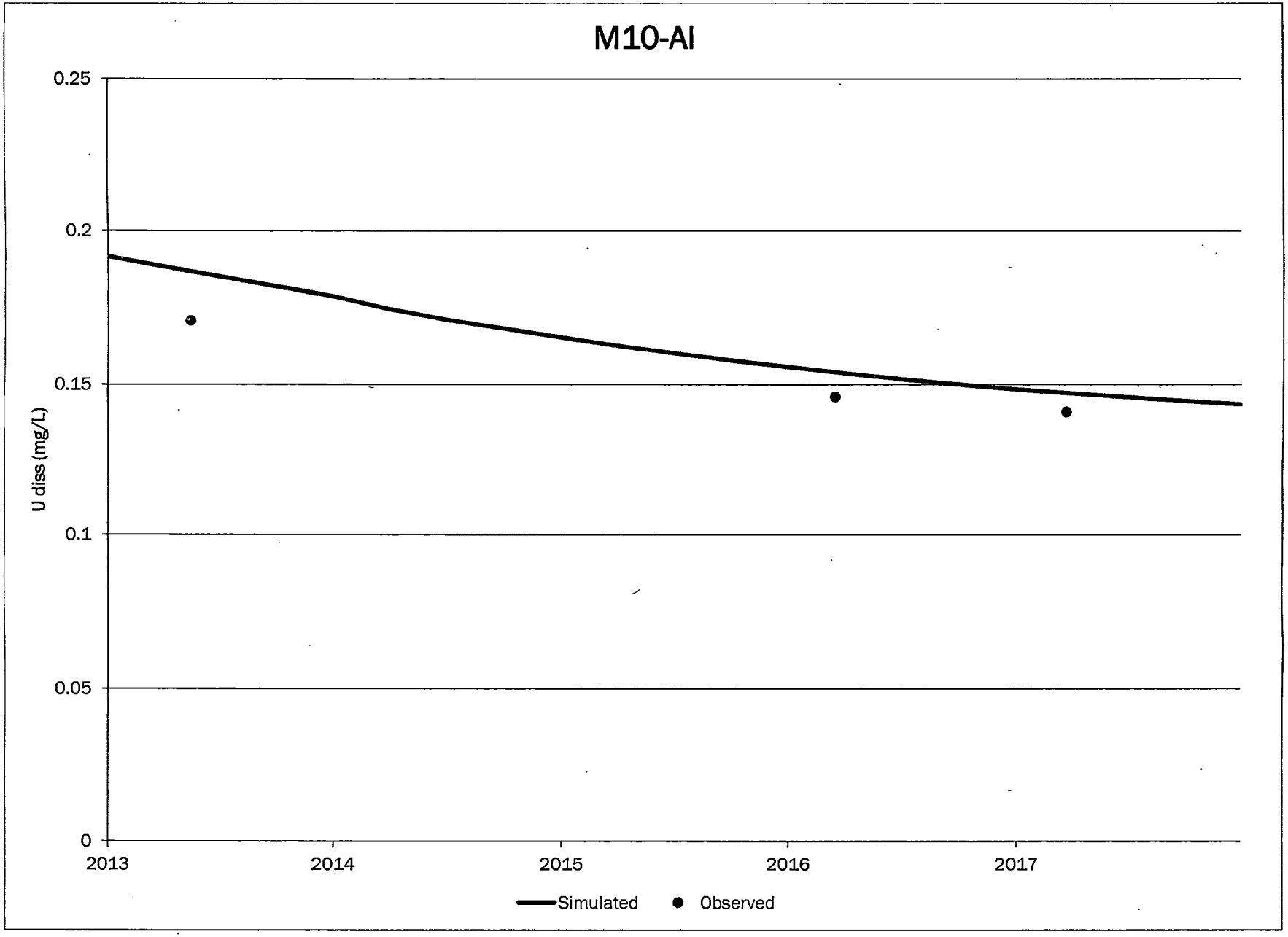

M3-AI
U diss (mg/L)
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

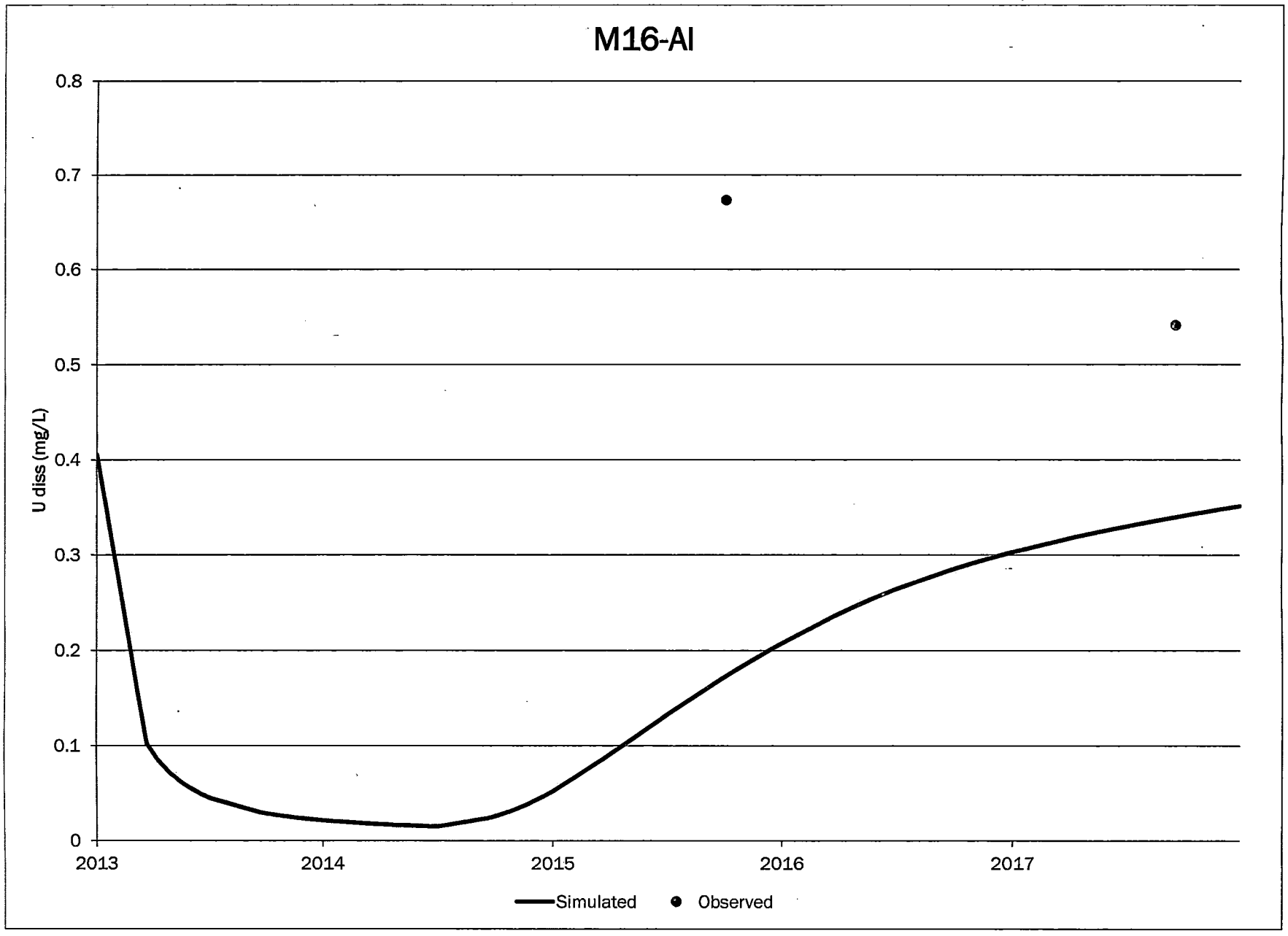

M5-AI
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

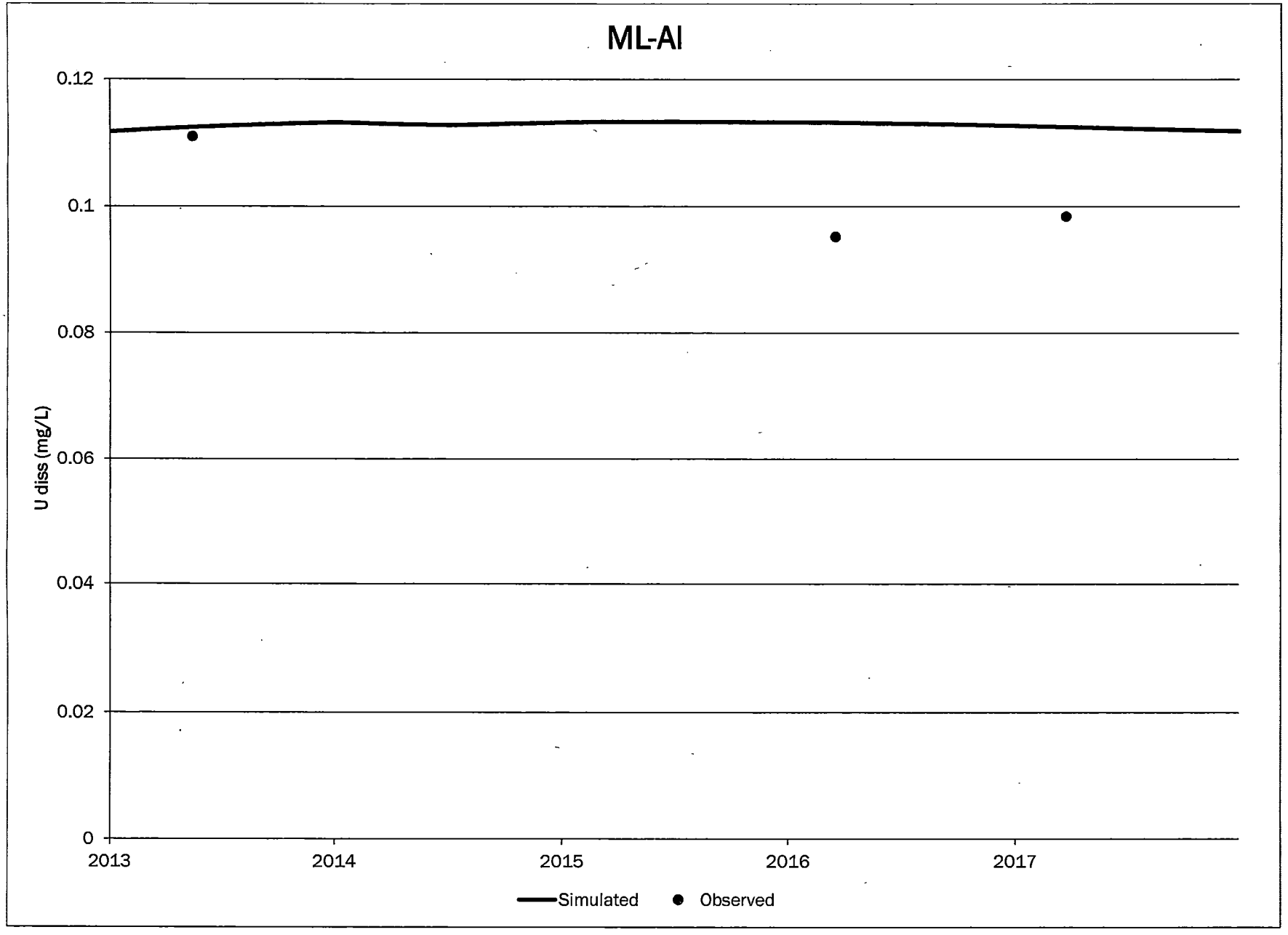

M6-Al
2.5
2
1.5
1
0.5
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

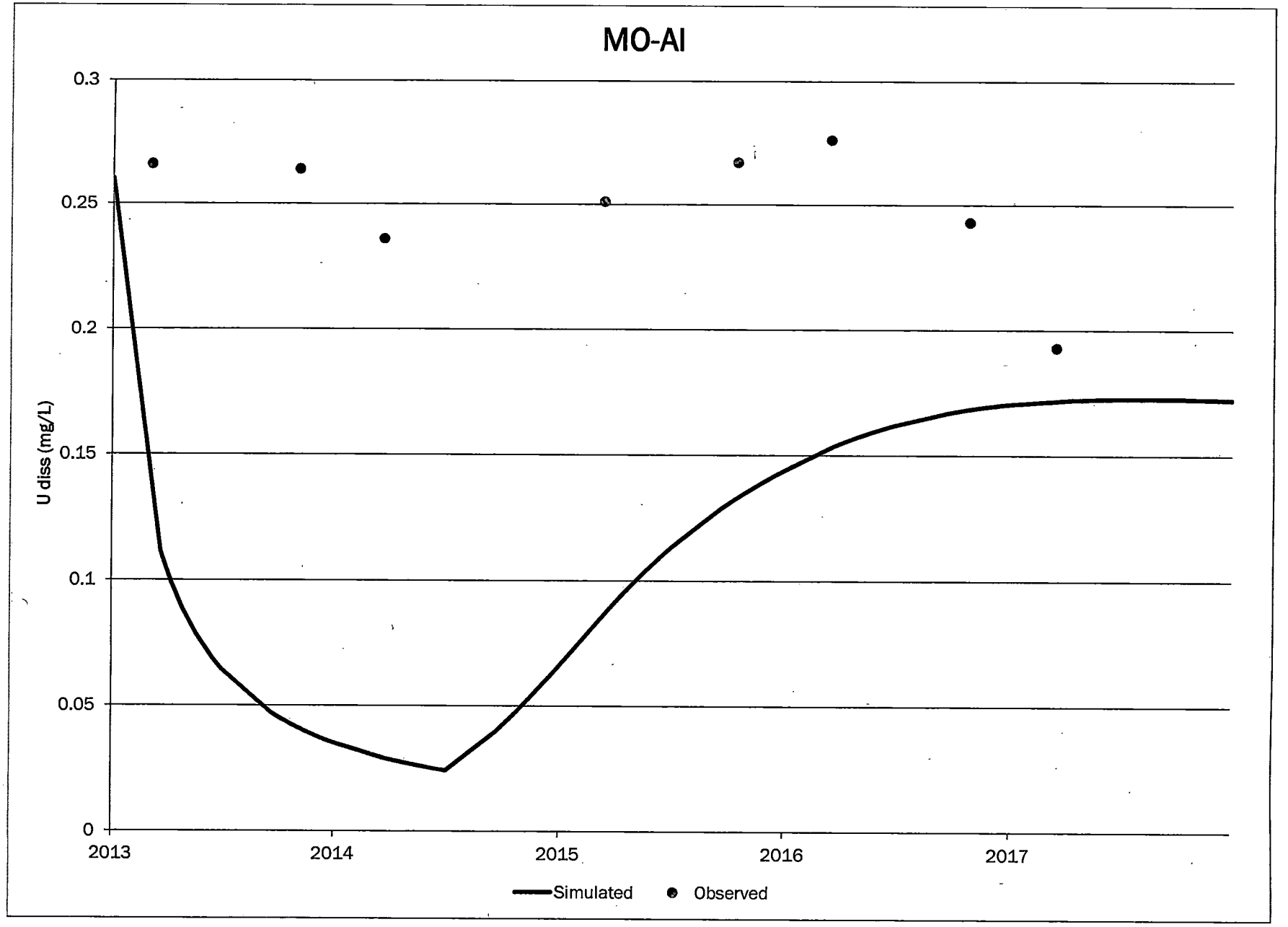

M7-Al
U diss (mg/L)
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2013
2014
2015
2016
2017
Simulated
Observed

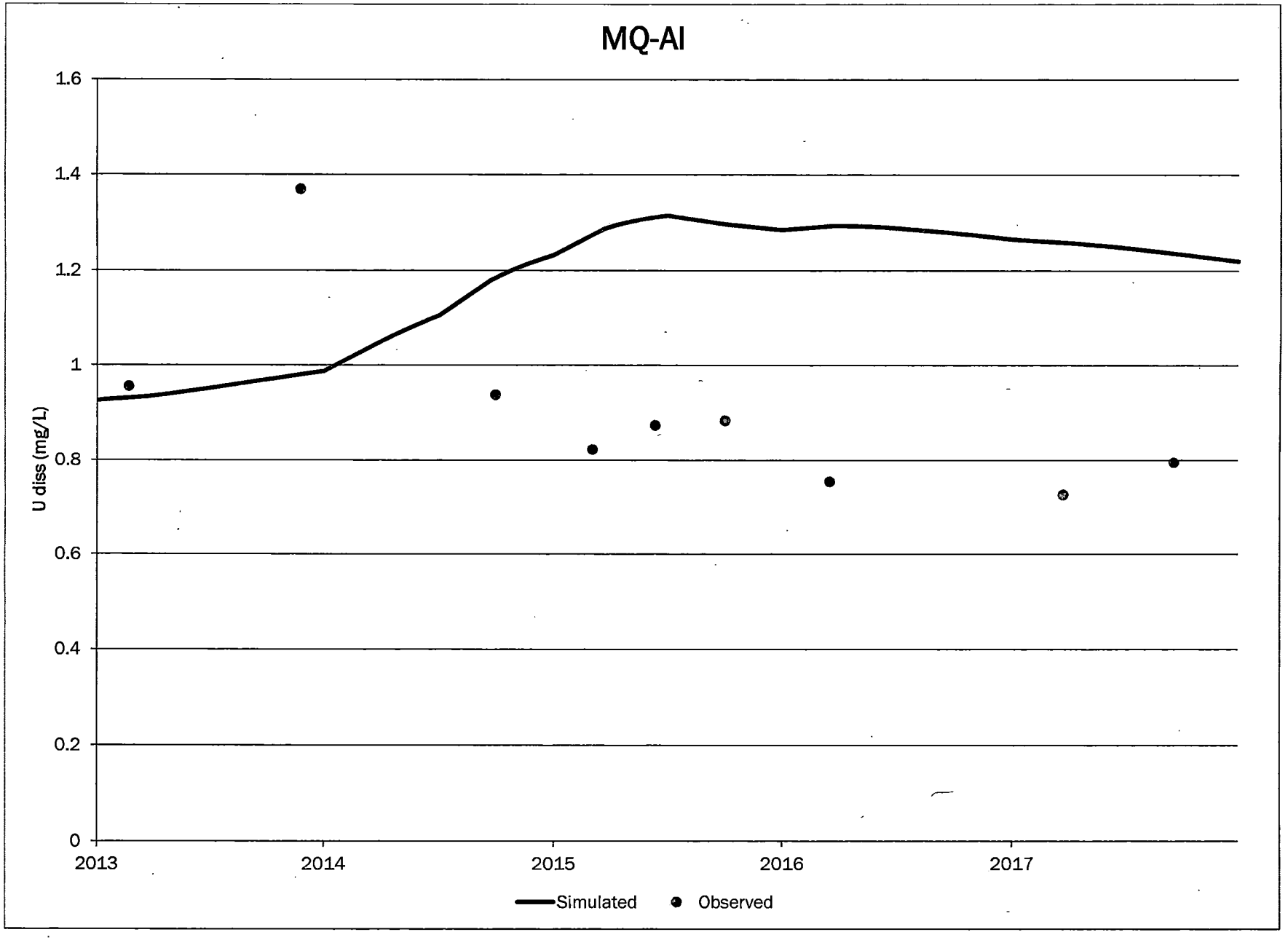

M9-AI
U diss (mg/L)
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

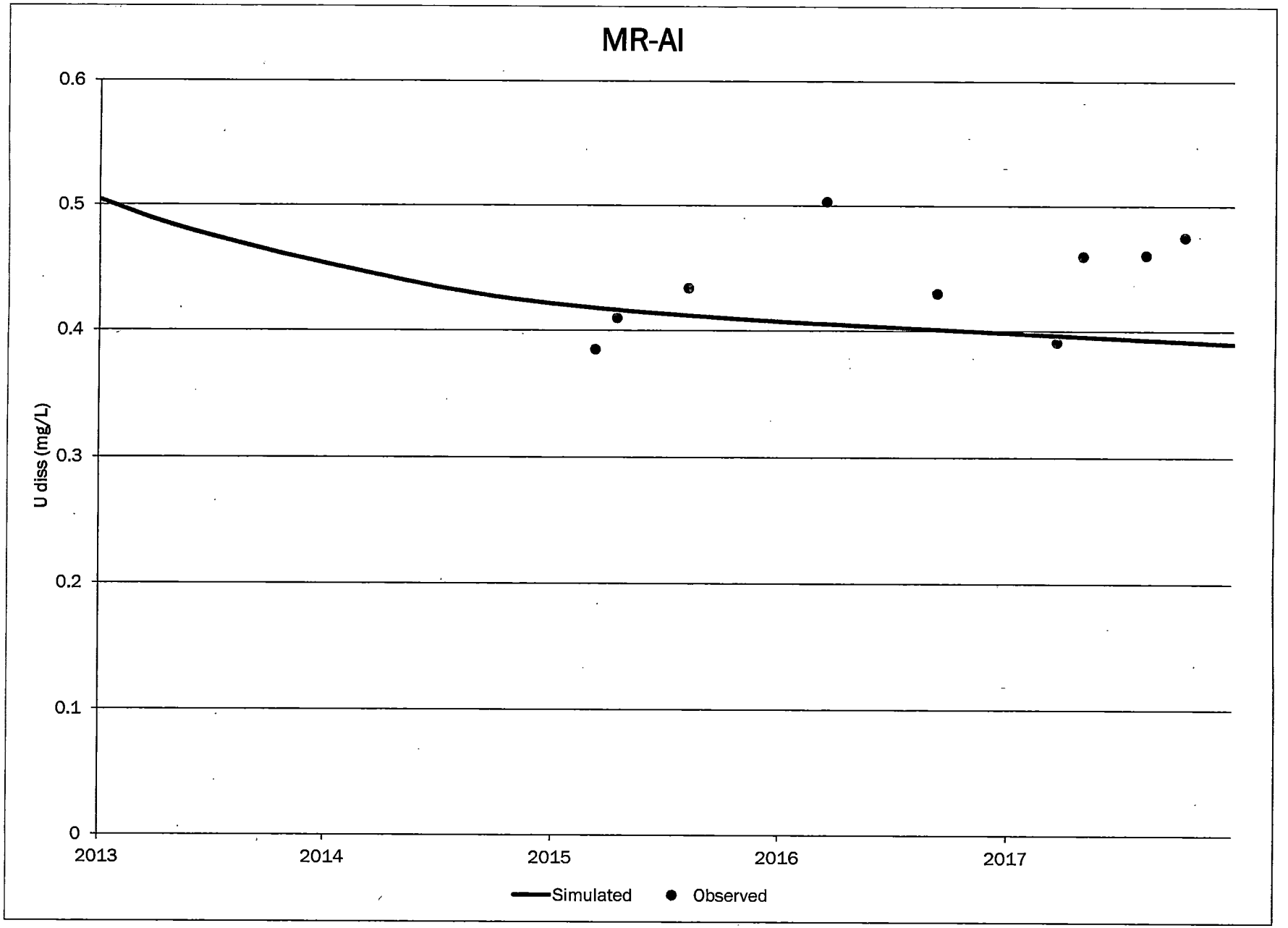

M10-AI
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

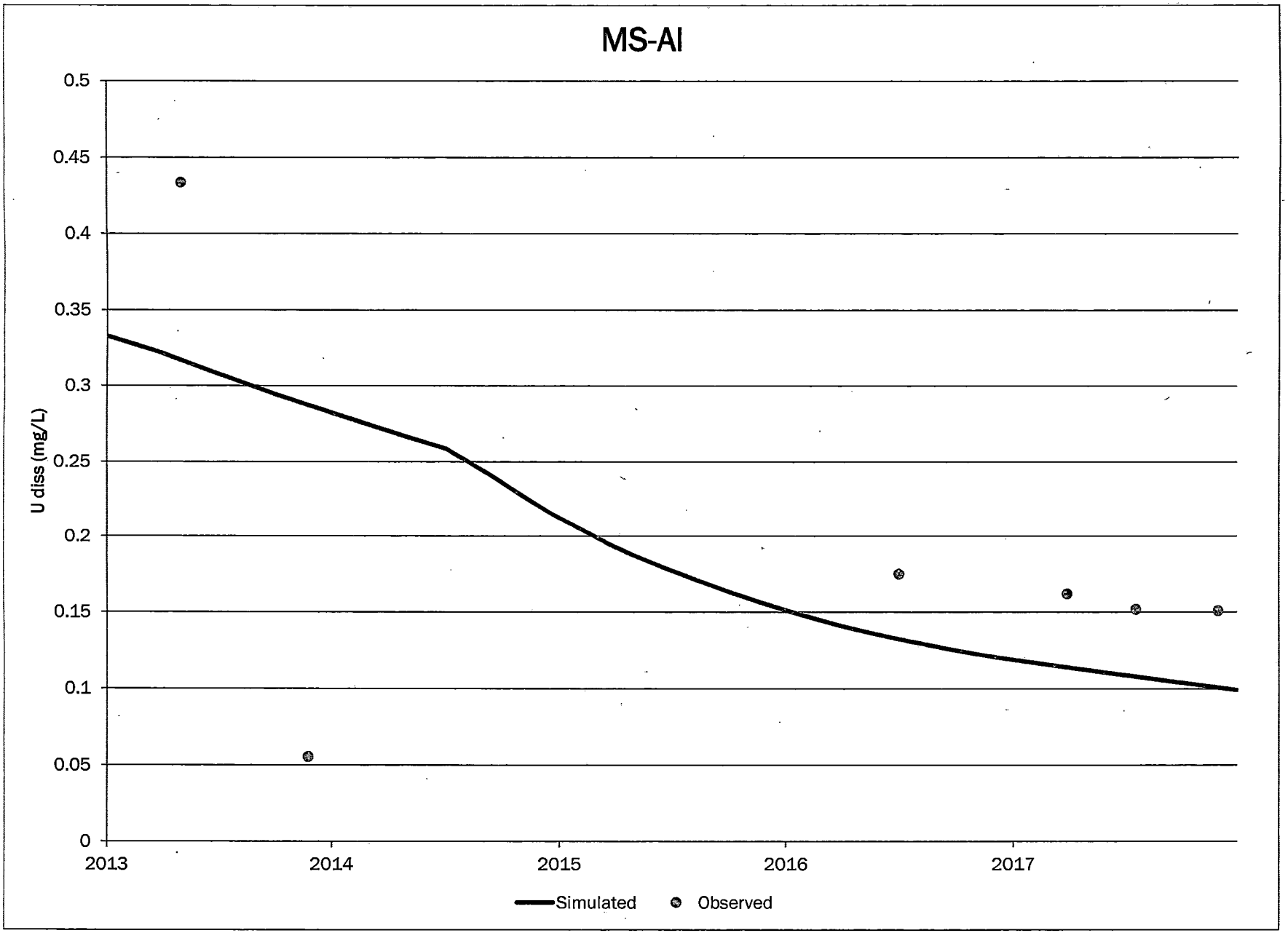

M16-AI
U diss (mg/L)
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
2013
2014
2015
2016
2017
Simulated
Observed

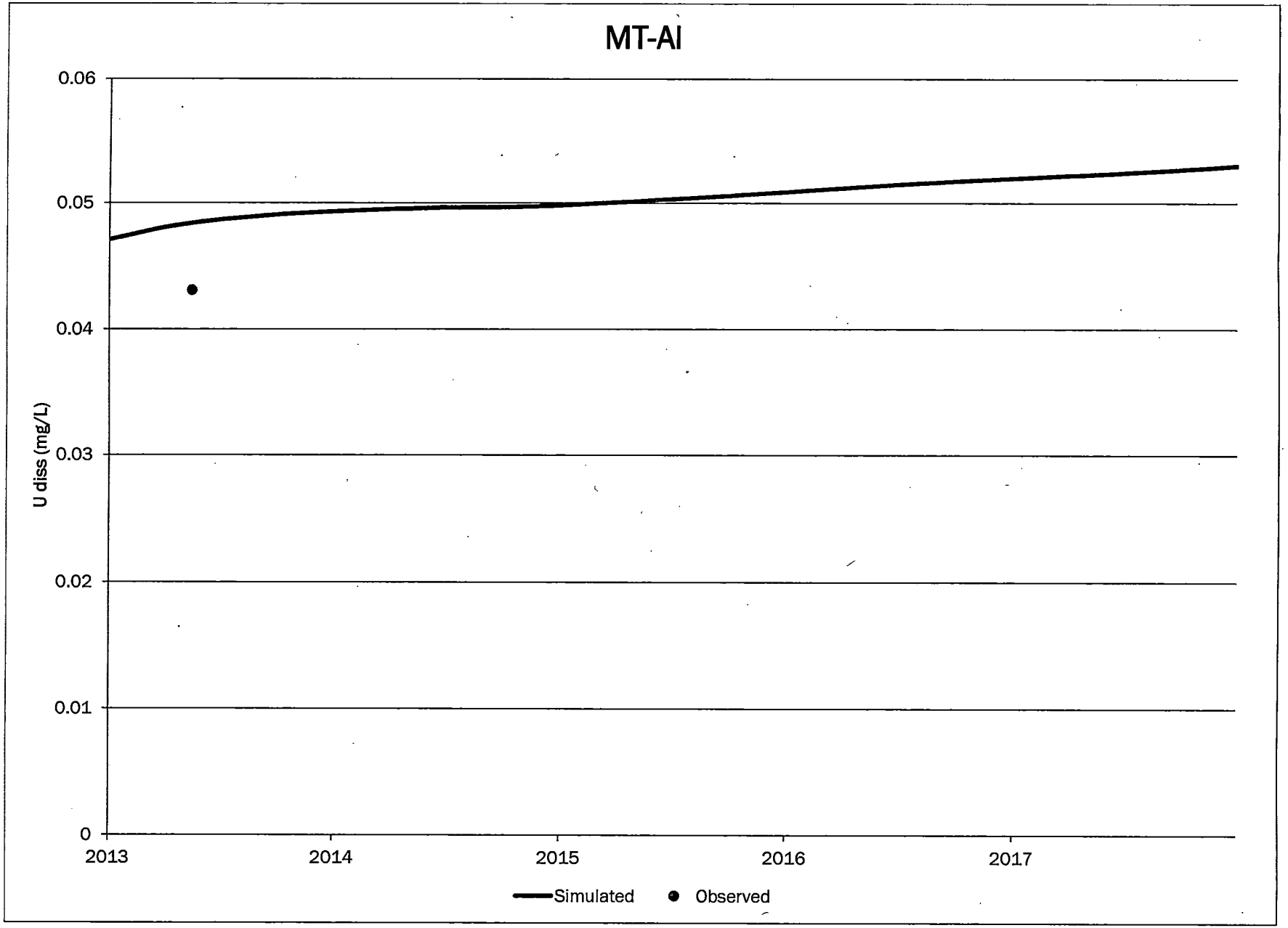

ML-AI
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

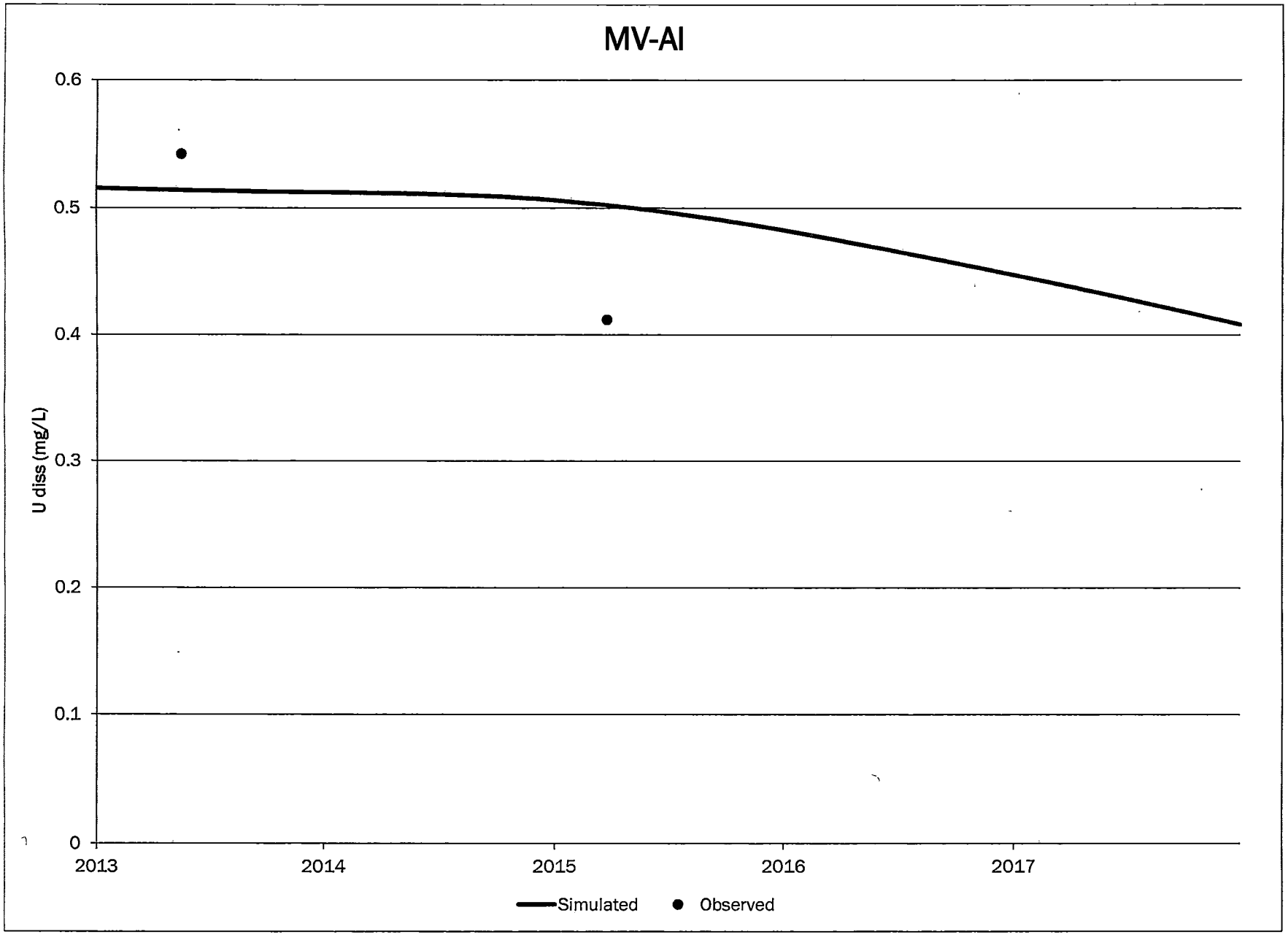

MO-AI
U diss (mg/L)
0.3
0.25
0.2
0.15
0.1
0.05
0
2013
2014
2015
2016
2017
Simulated
Observed

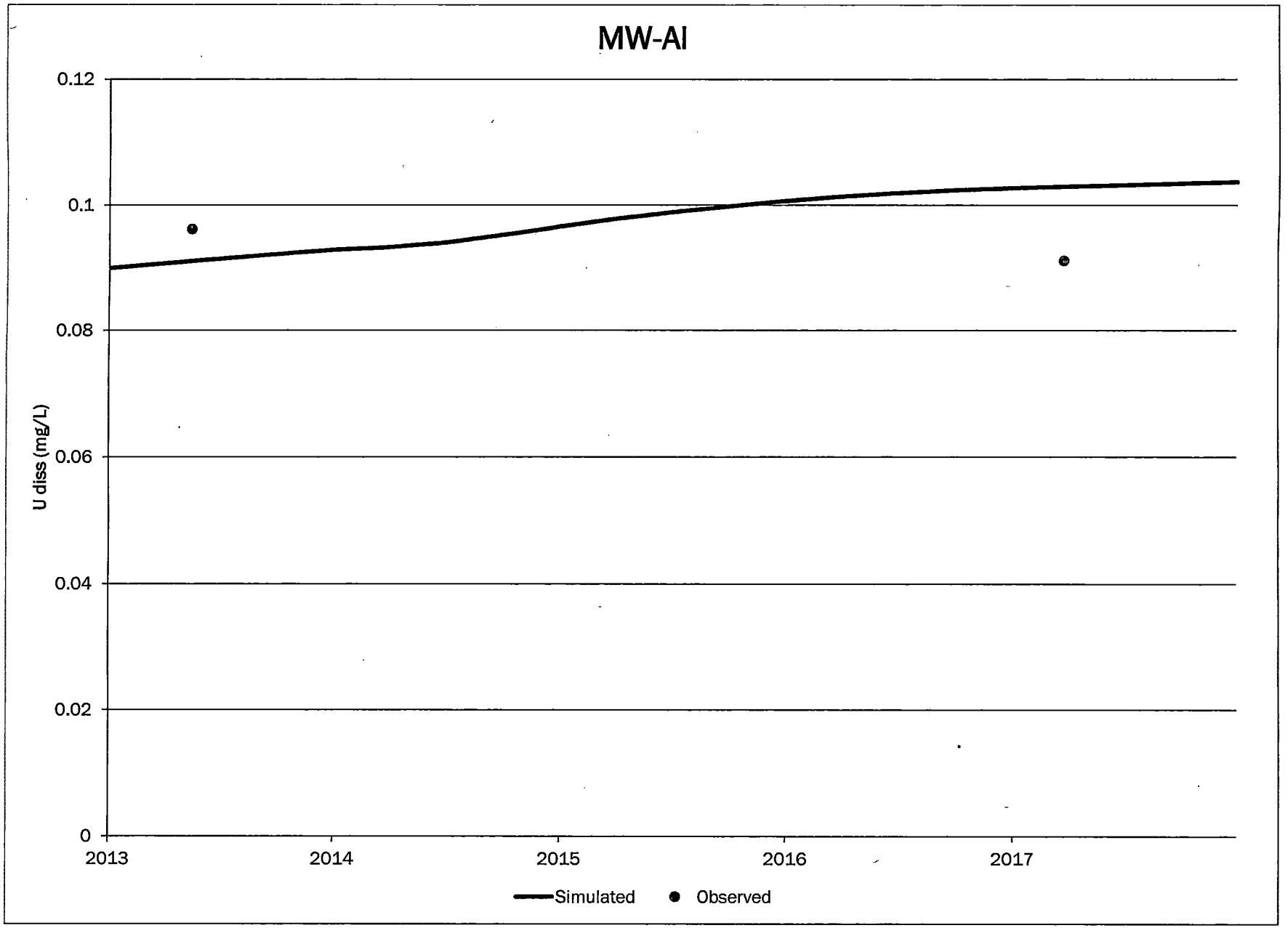

MQ-AI
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

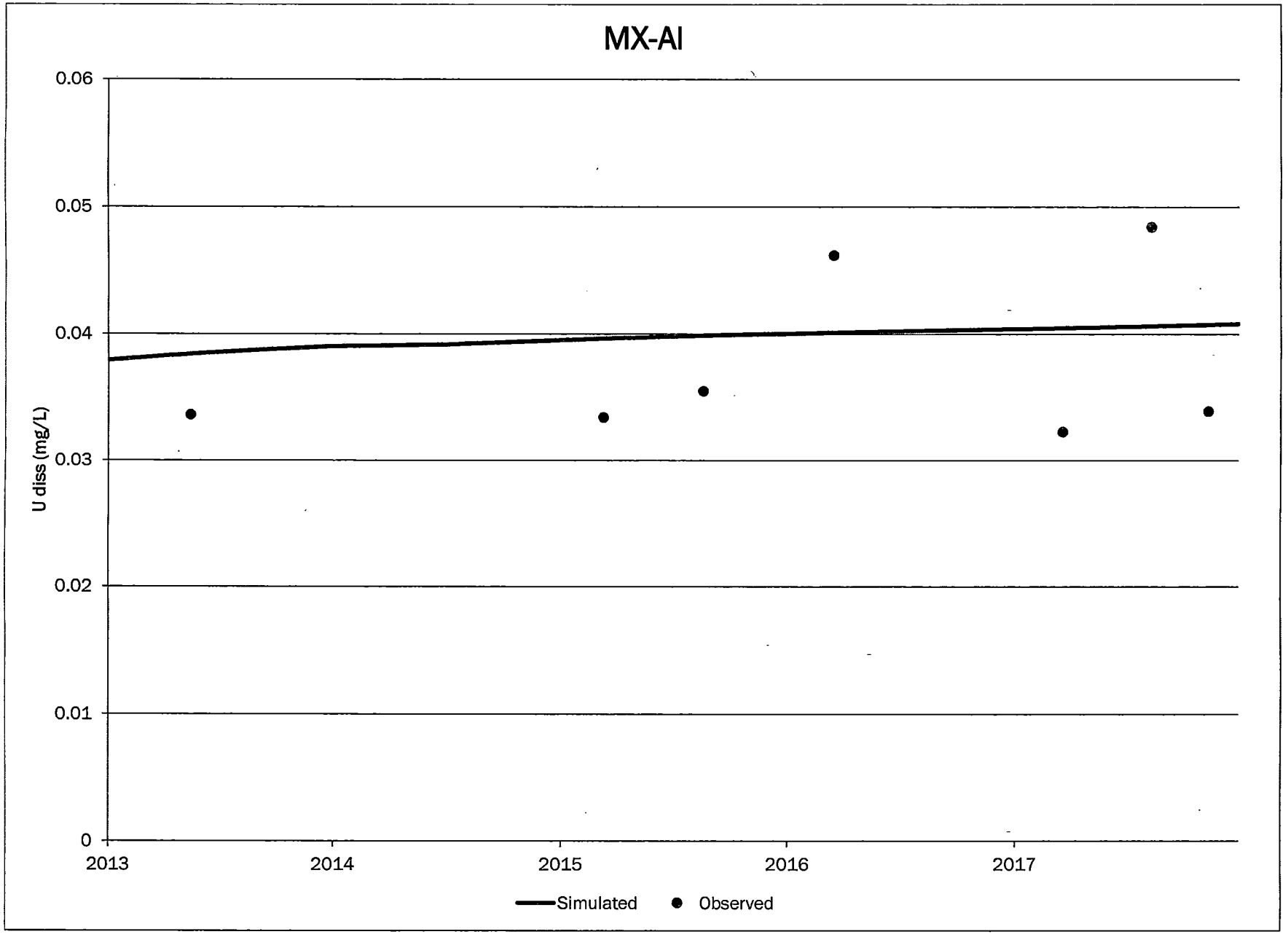

MR-AI
U diss (mg/L)
0.6
0.5
0.4
0.3
0.2
0.1
0
2013
2014
2015
2016
2017
Simulated
Observed

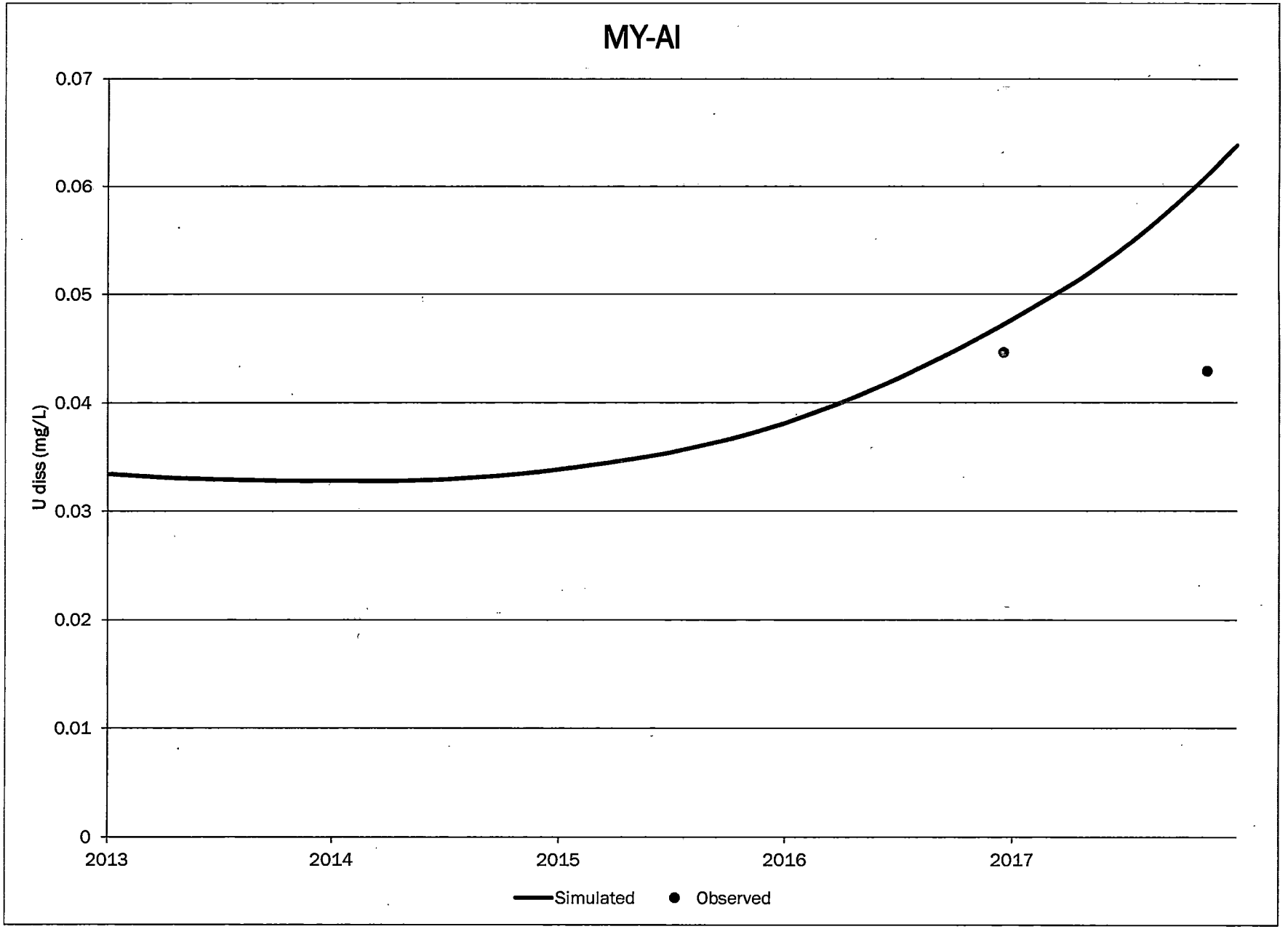

MS-AI
U diss (mg/L)
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
2013
2014
2015
2016
2017
Simulated
Observed

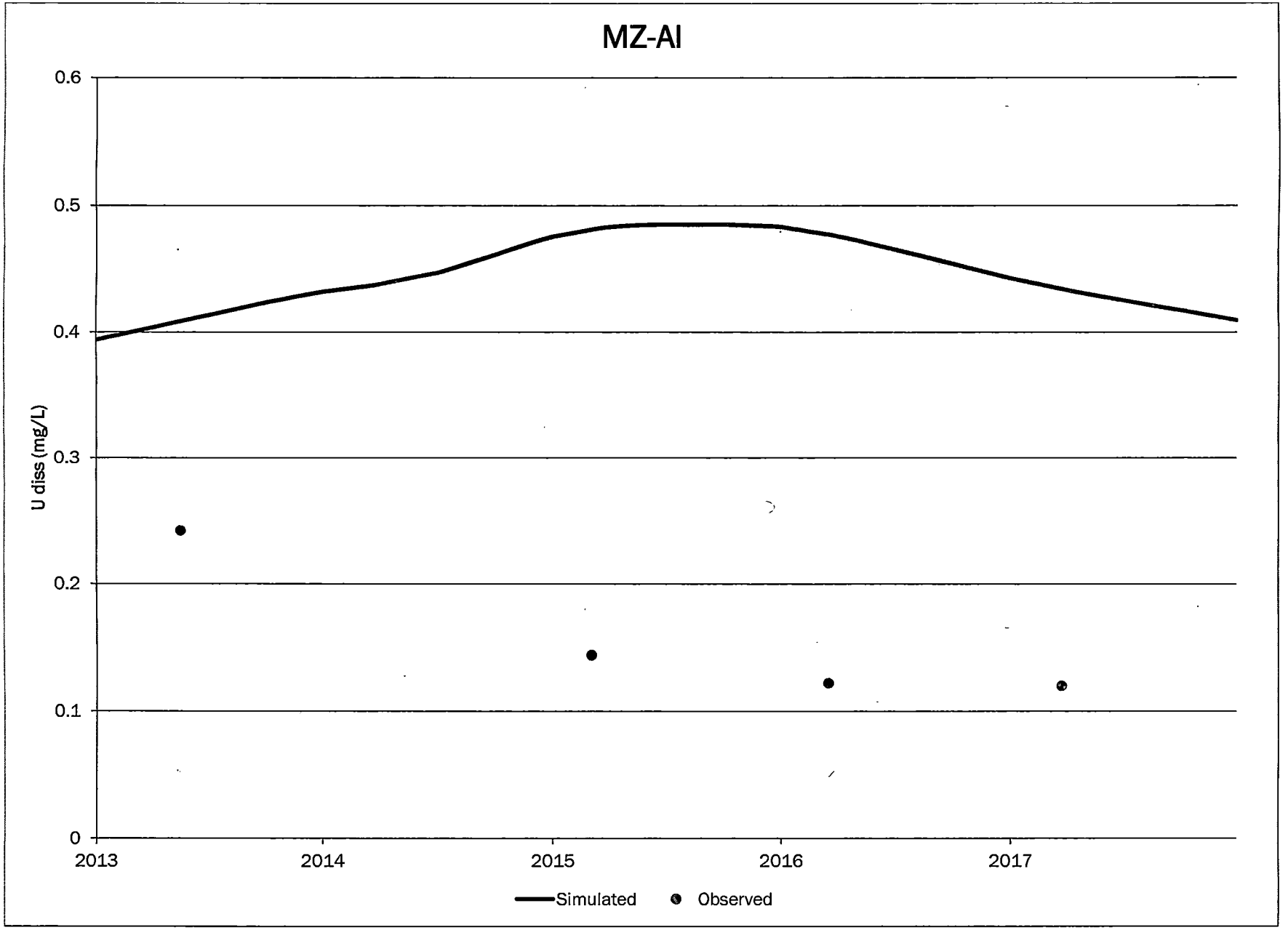

MT-AI
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

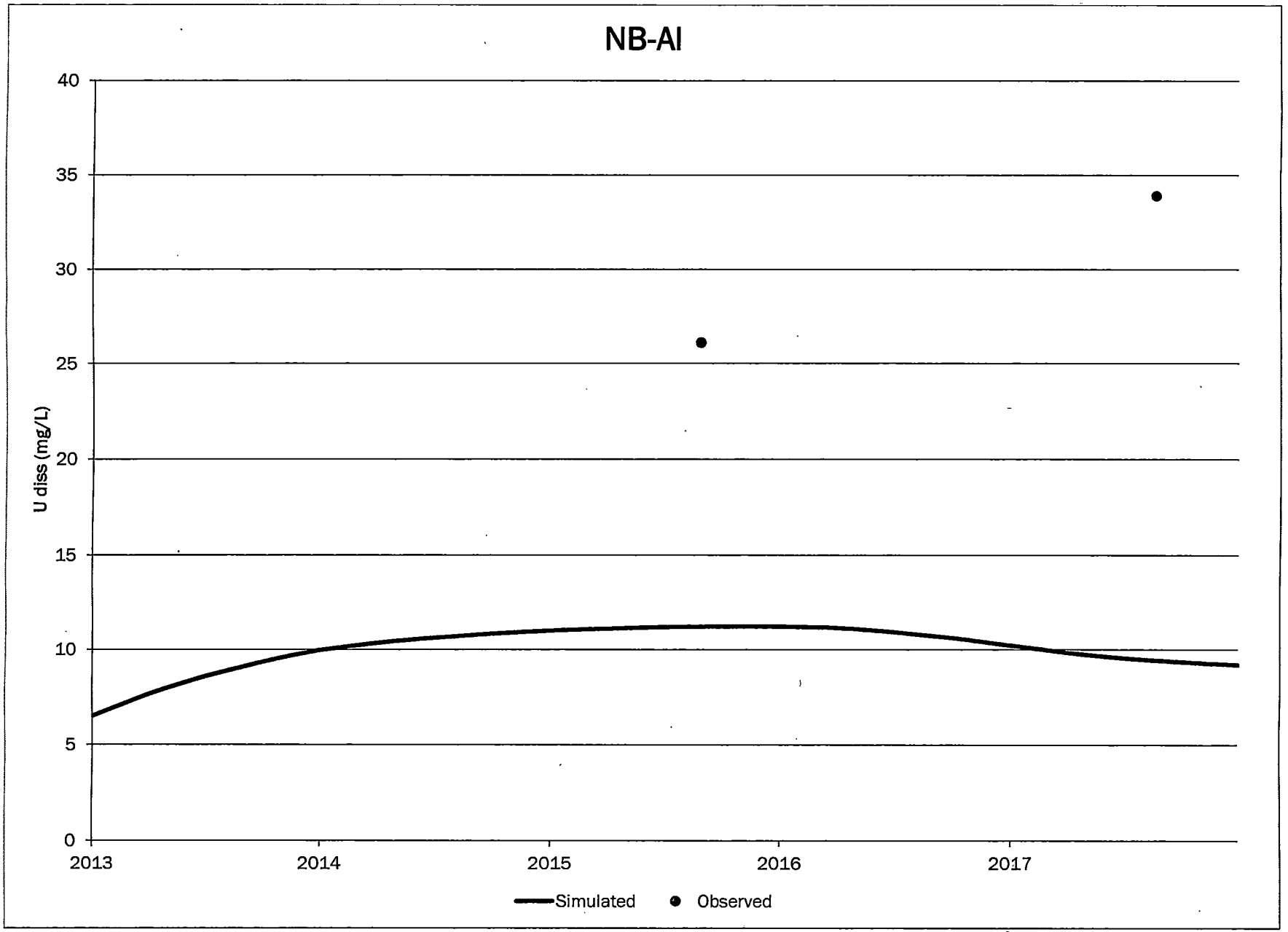

MV-AI
0.6
0.5
0.4
0.3
0.2
0.1
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

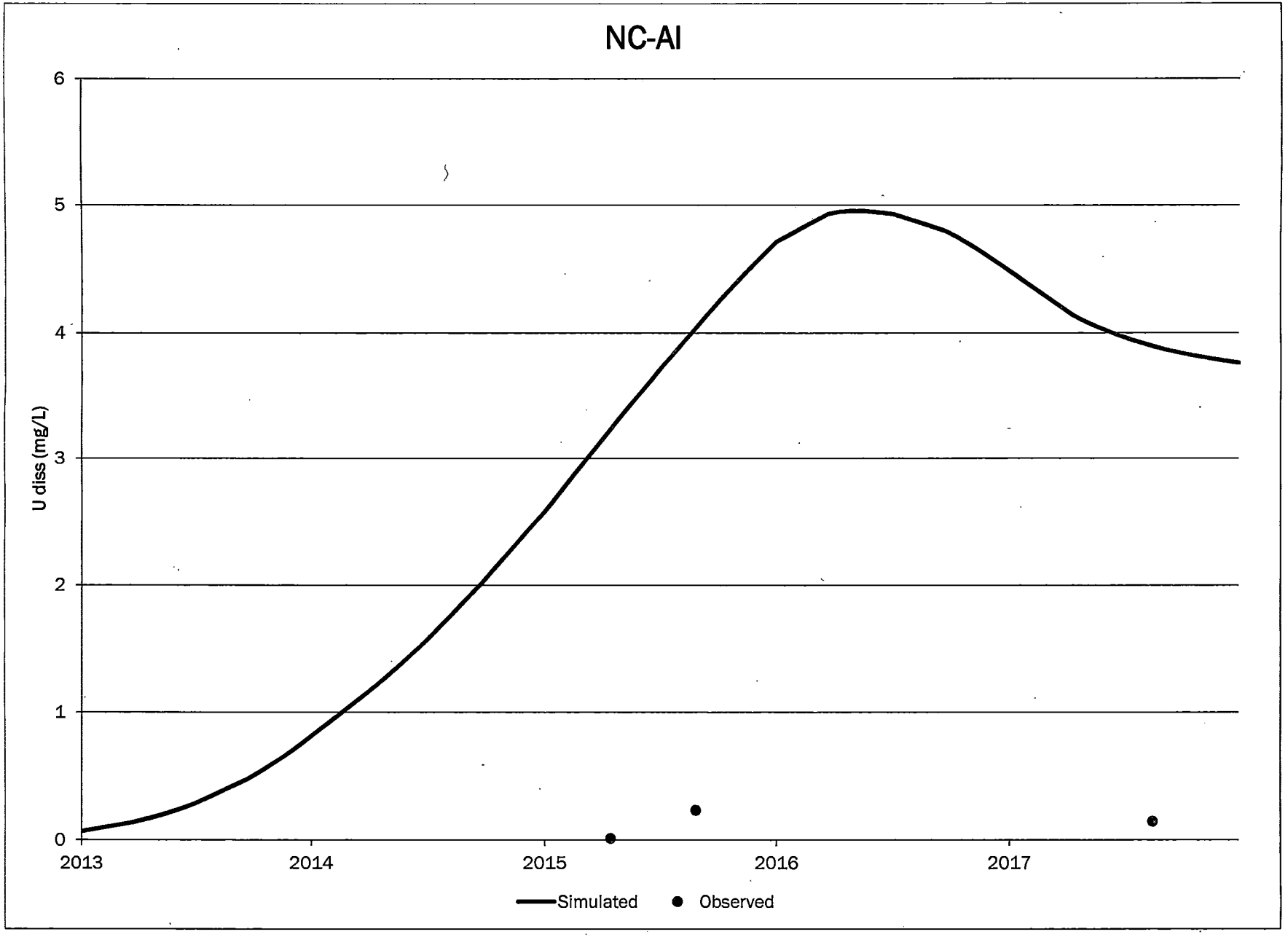

MW-AI
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

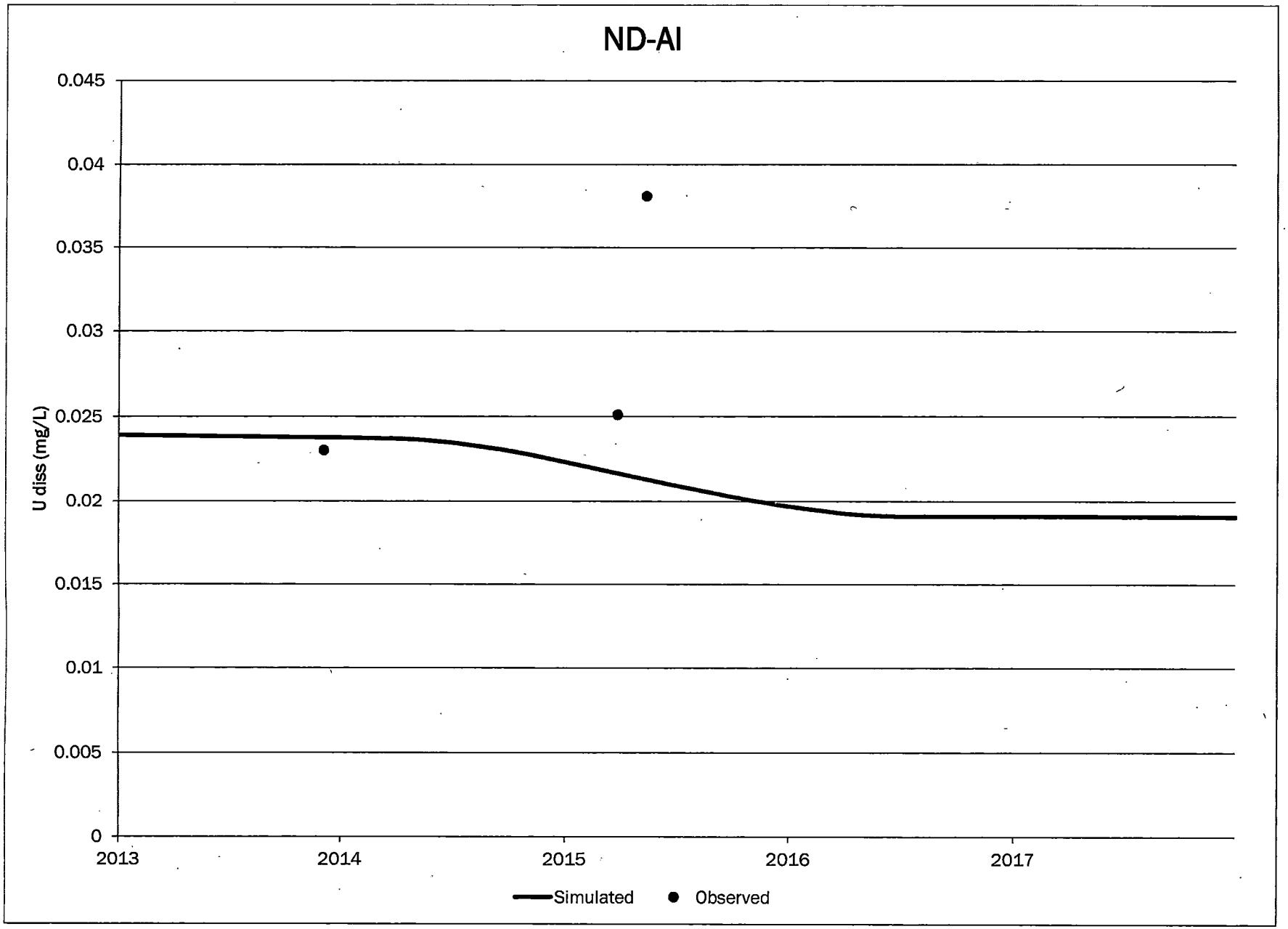

MX-AI
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

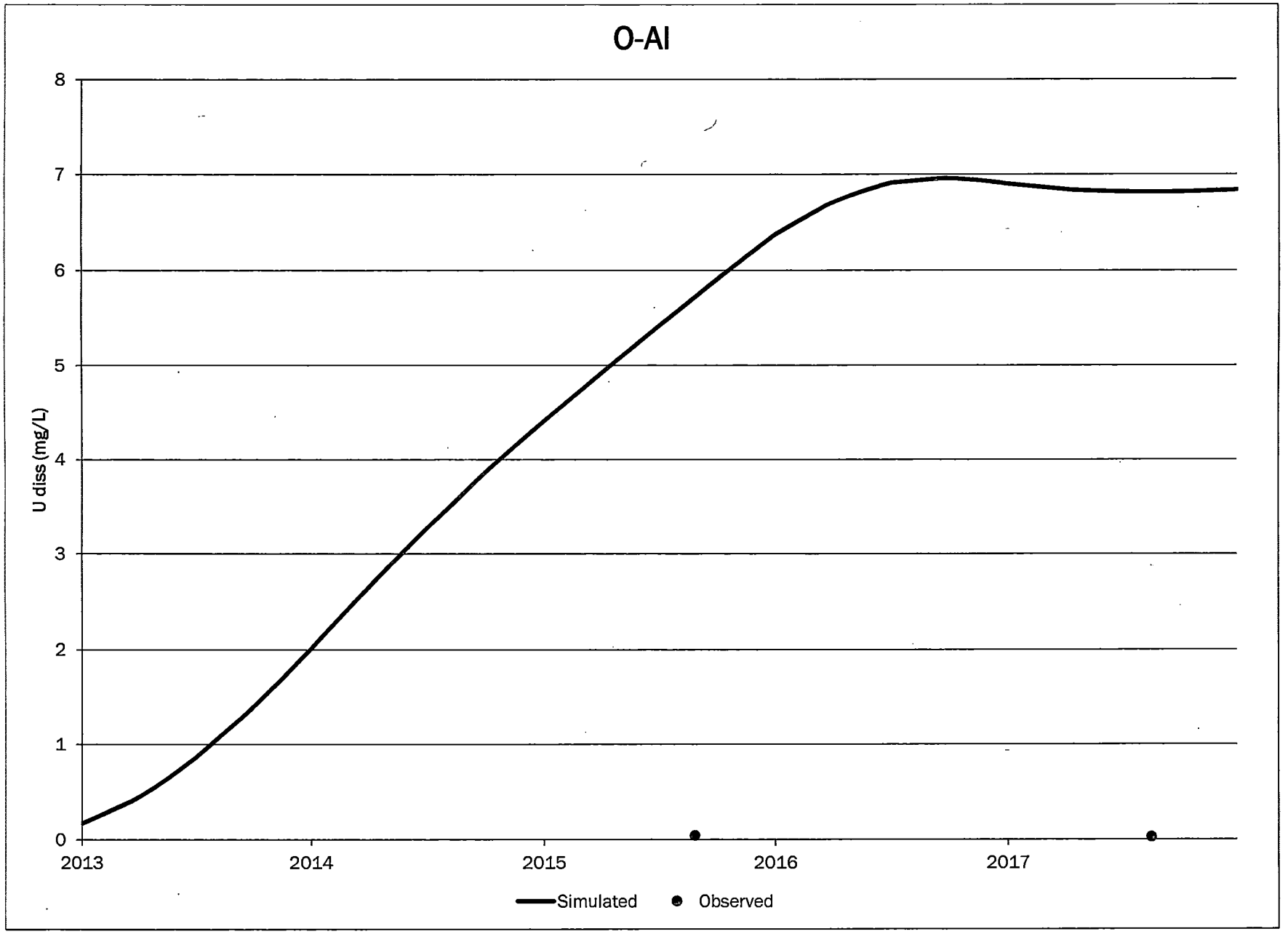

MY-AI
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

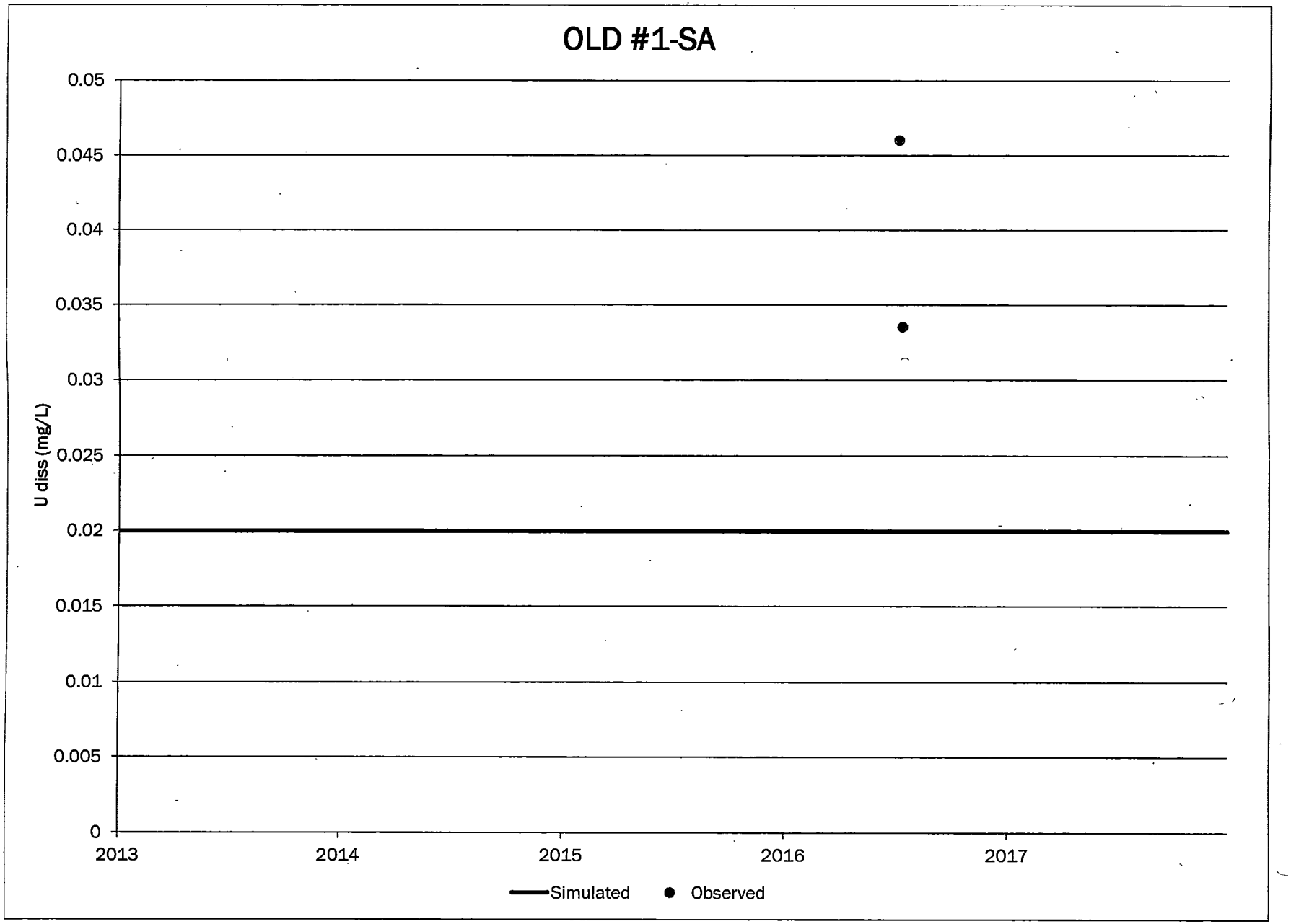

MZ-AI
0.6
0.5
0.4
0.3
0.2
0.1
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

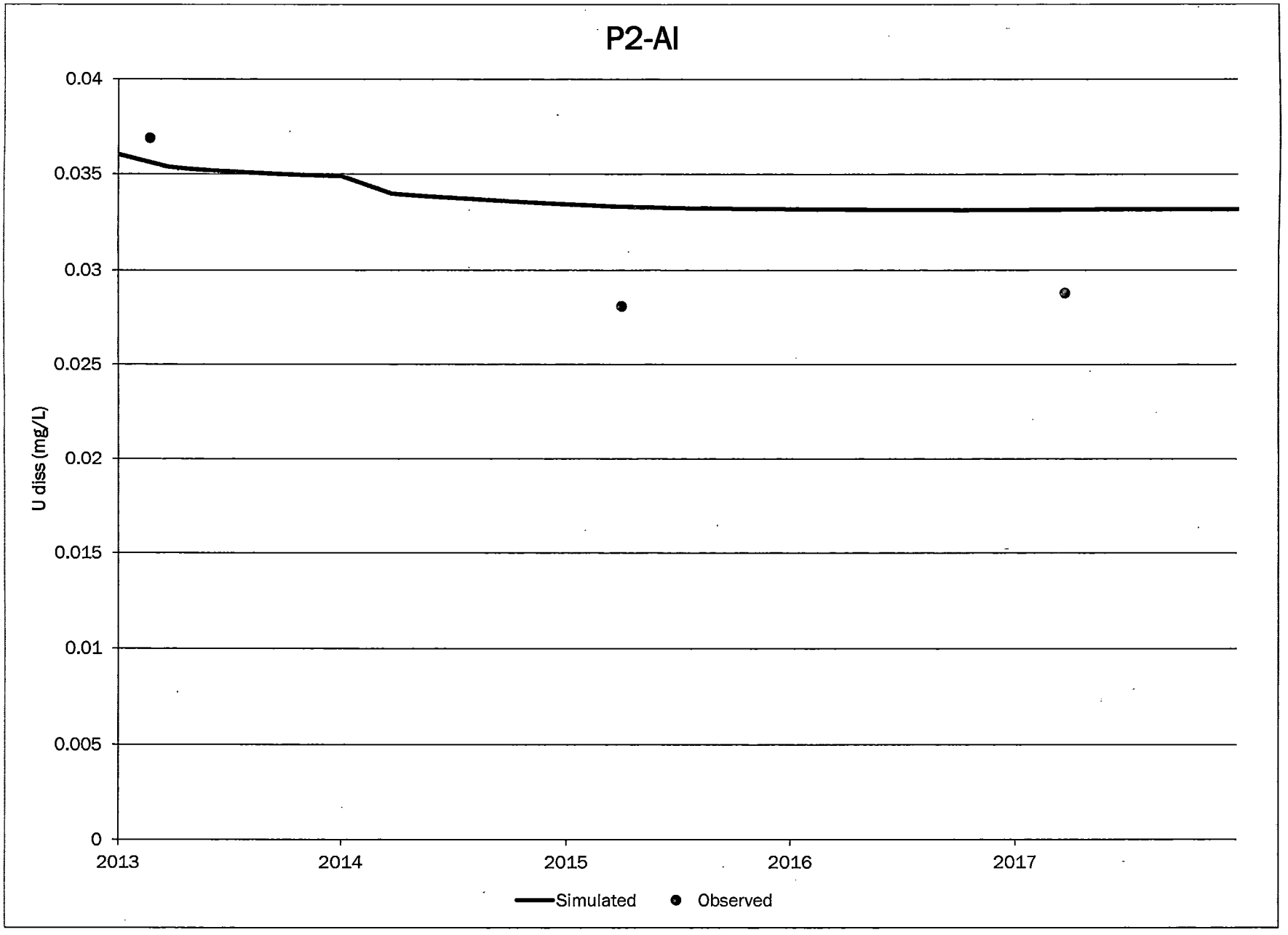

NB-AI
U diss (mg/L)
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

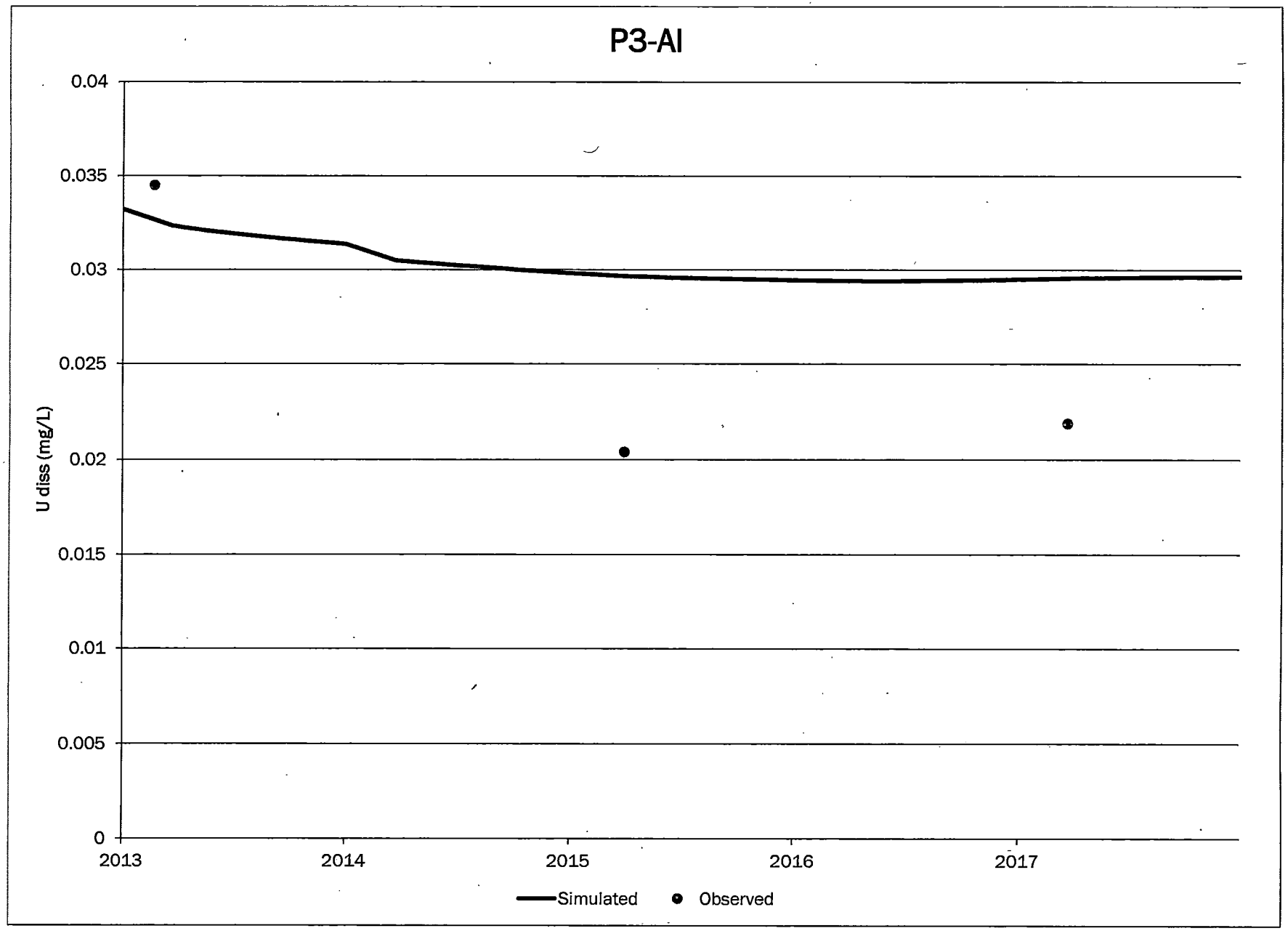

NC-AI
U diss (mg/L)
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

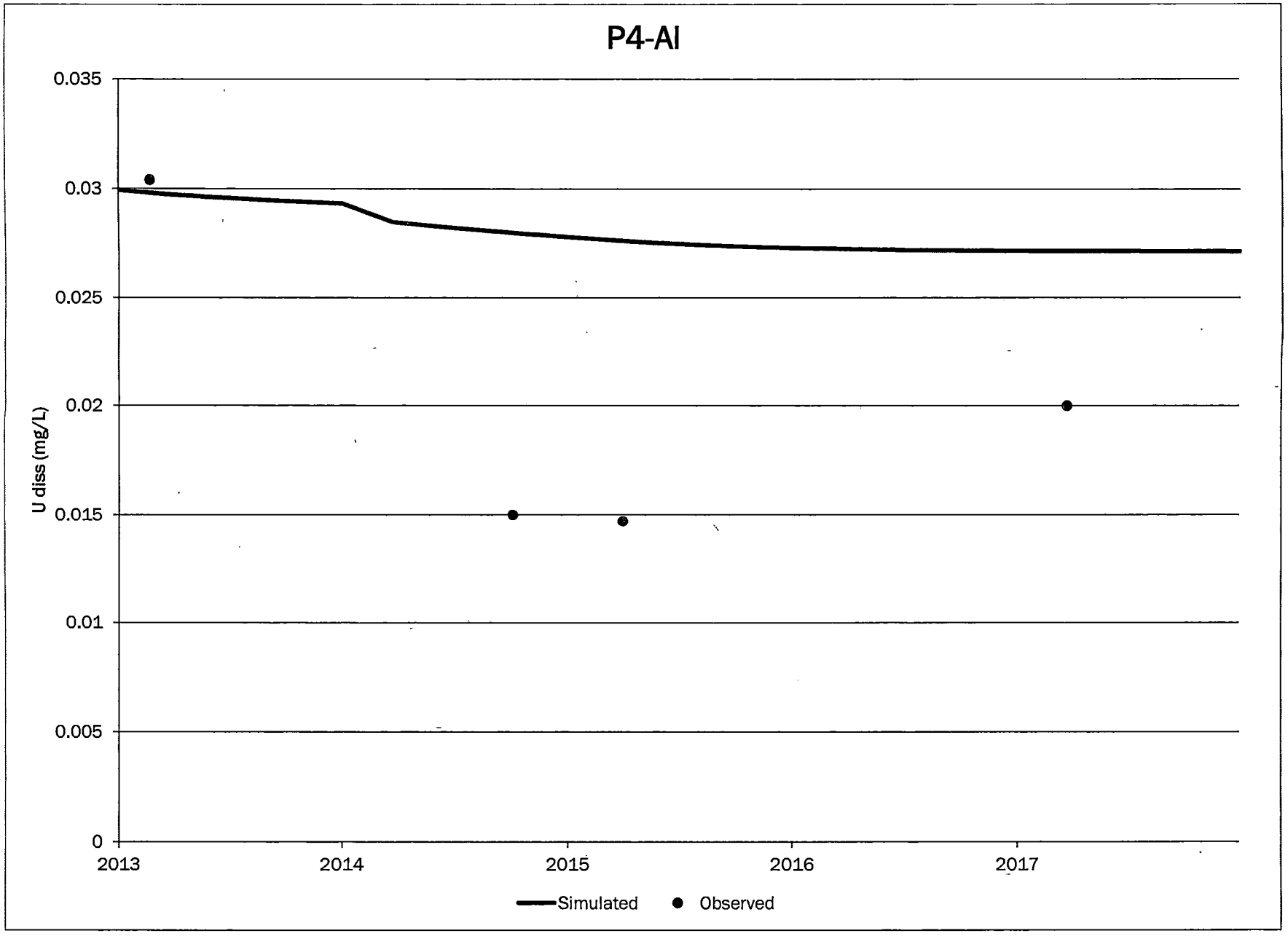

ND-AI
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

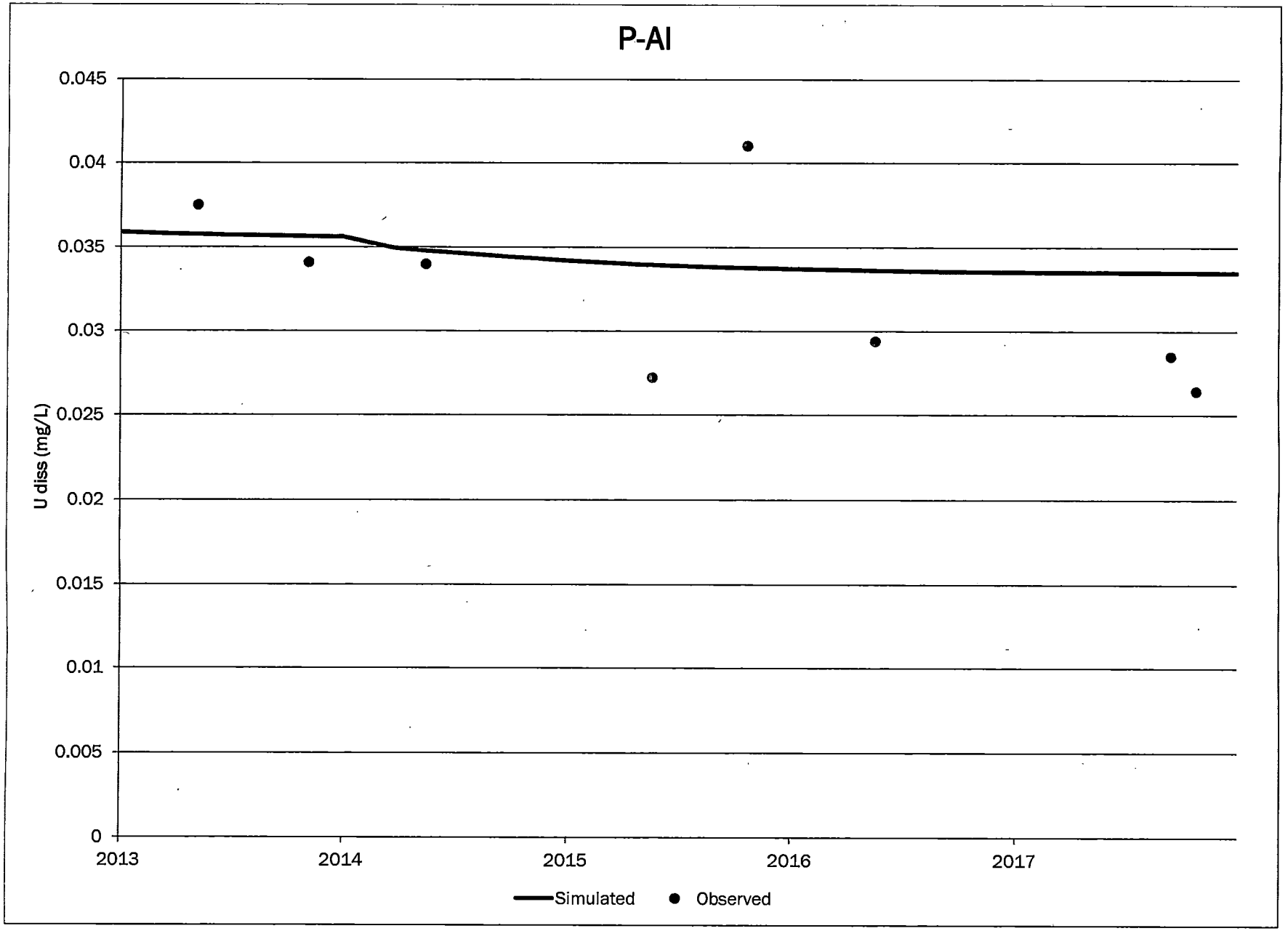

O-Al
U diss (mg/L)
8
7
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

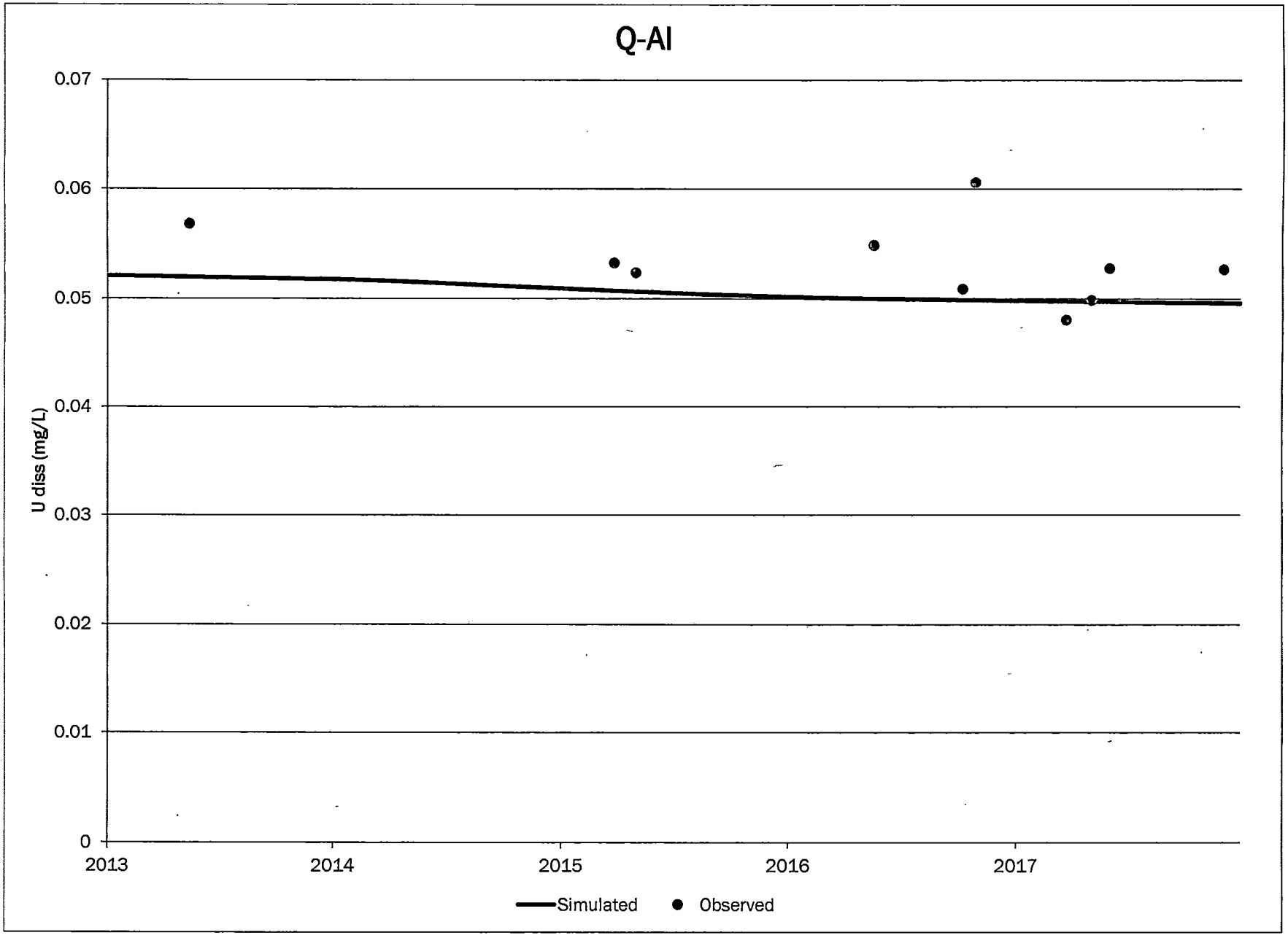

OLD #1-SA
U diss (mg/L)
0.05
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
2013
2014
2015
2016
2017
Simulated
Observed

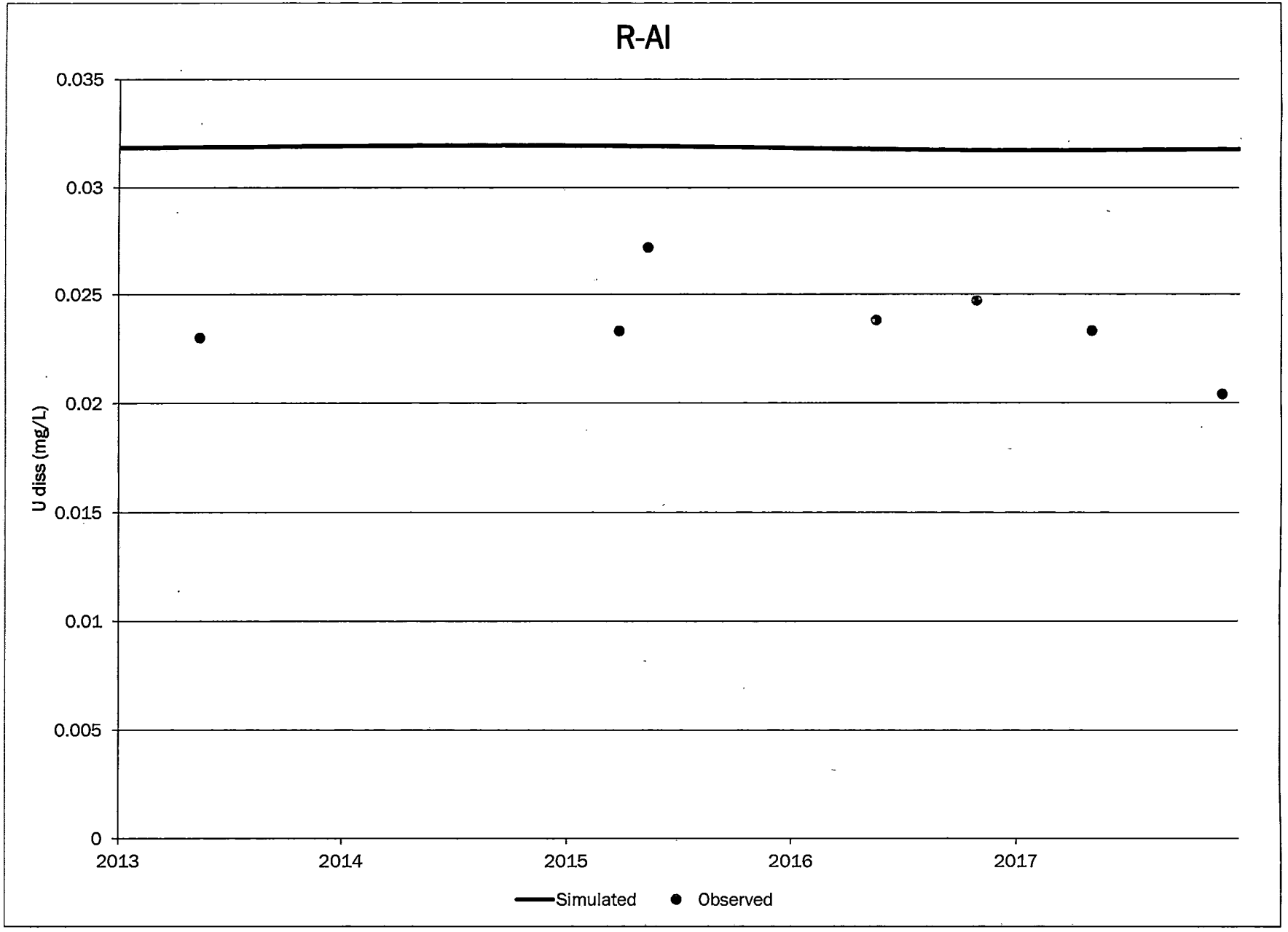

P2-AI
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

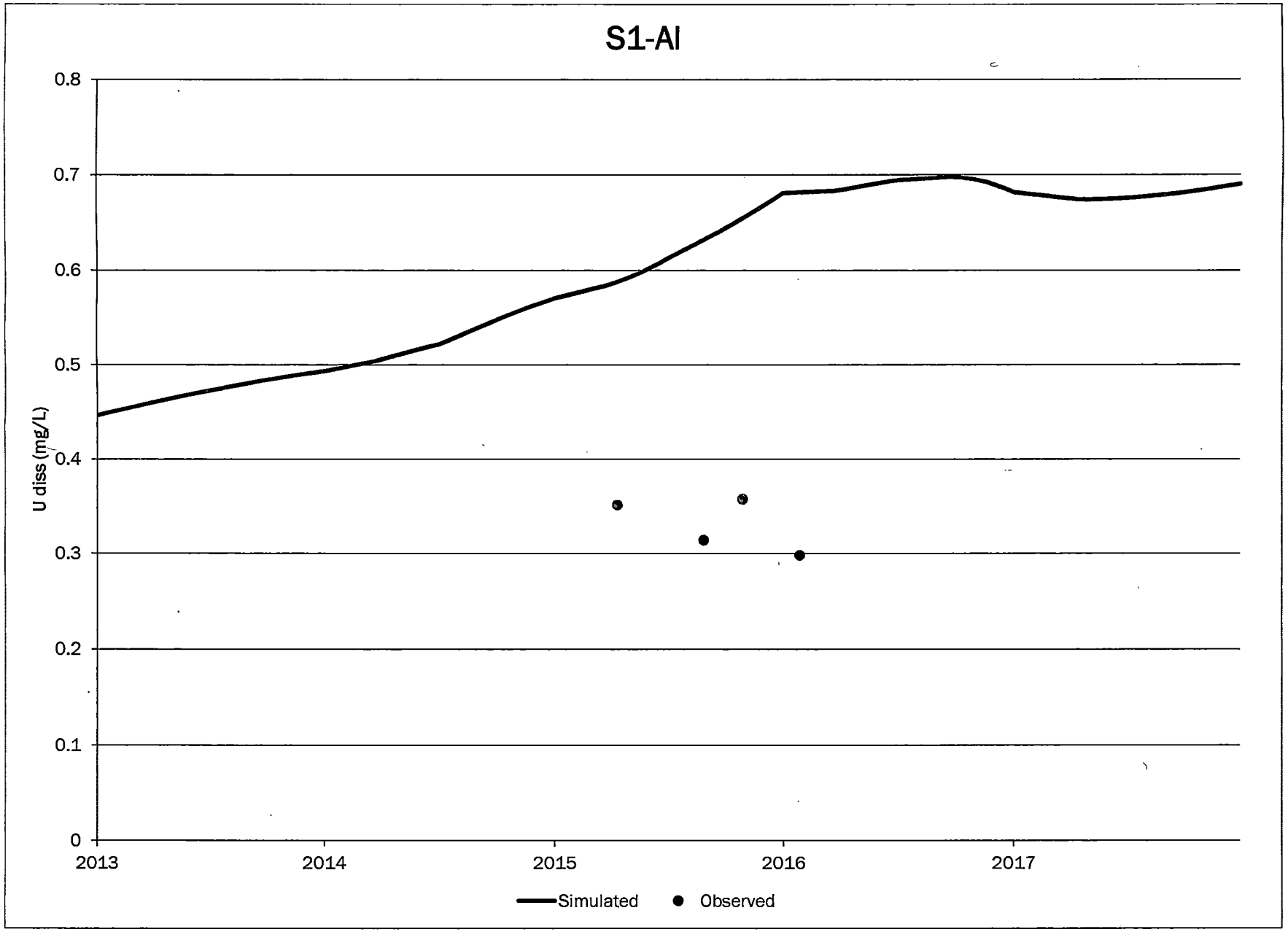

P3-AI
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

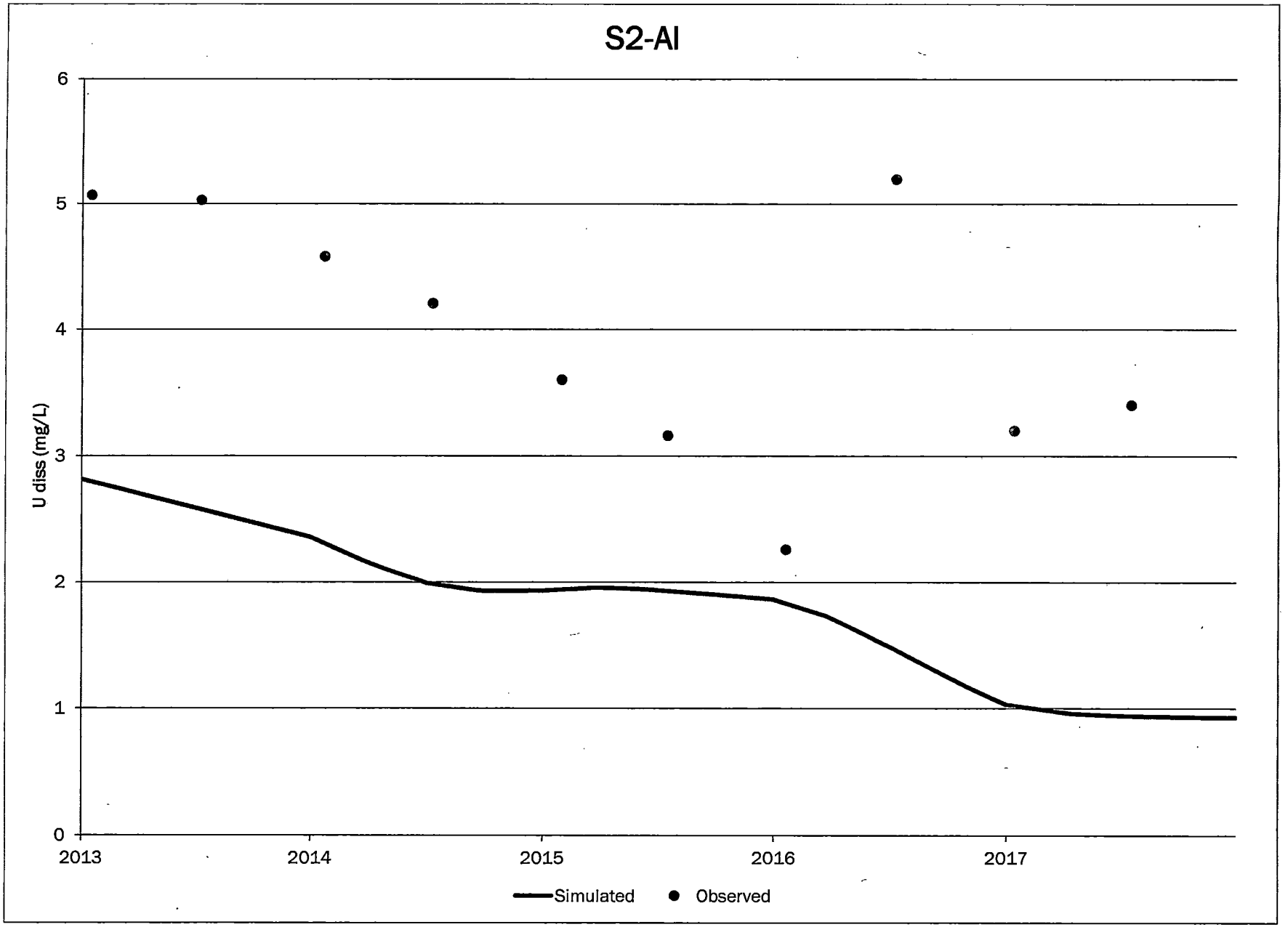

P4-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

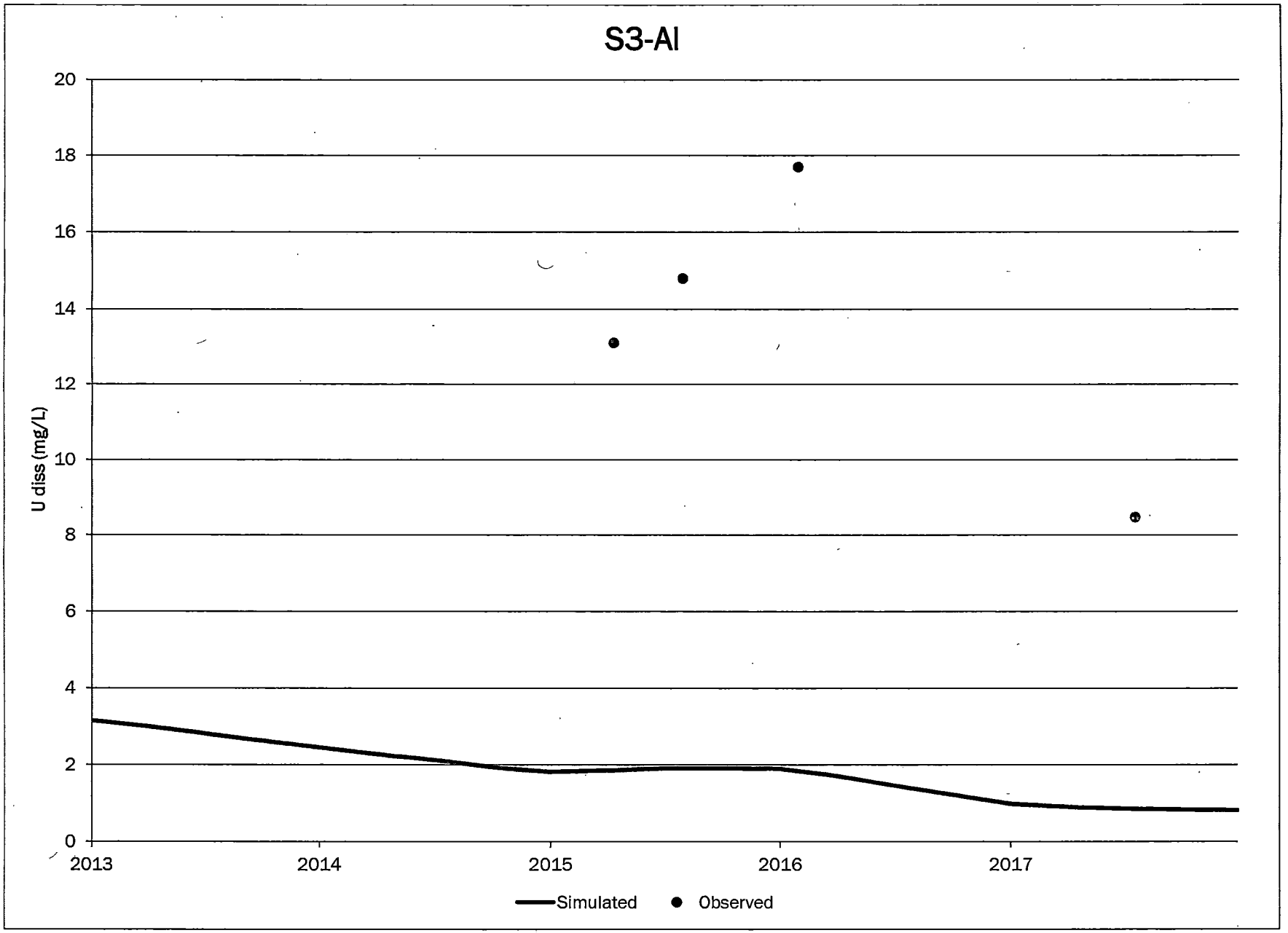

P-AI
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

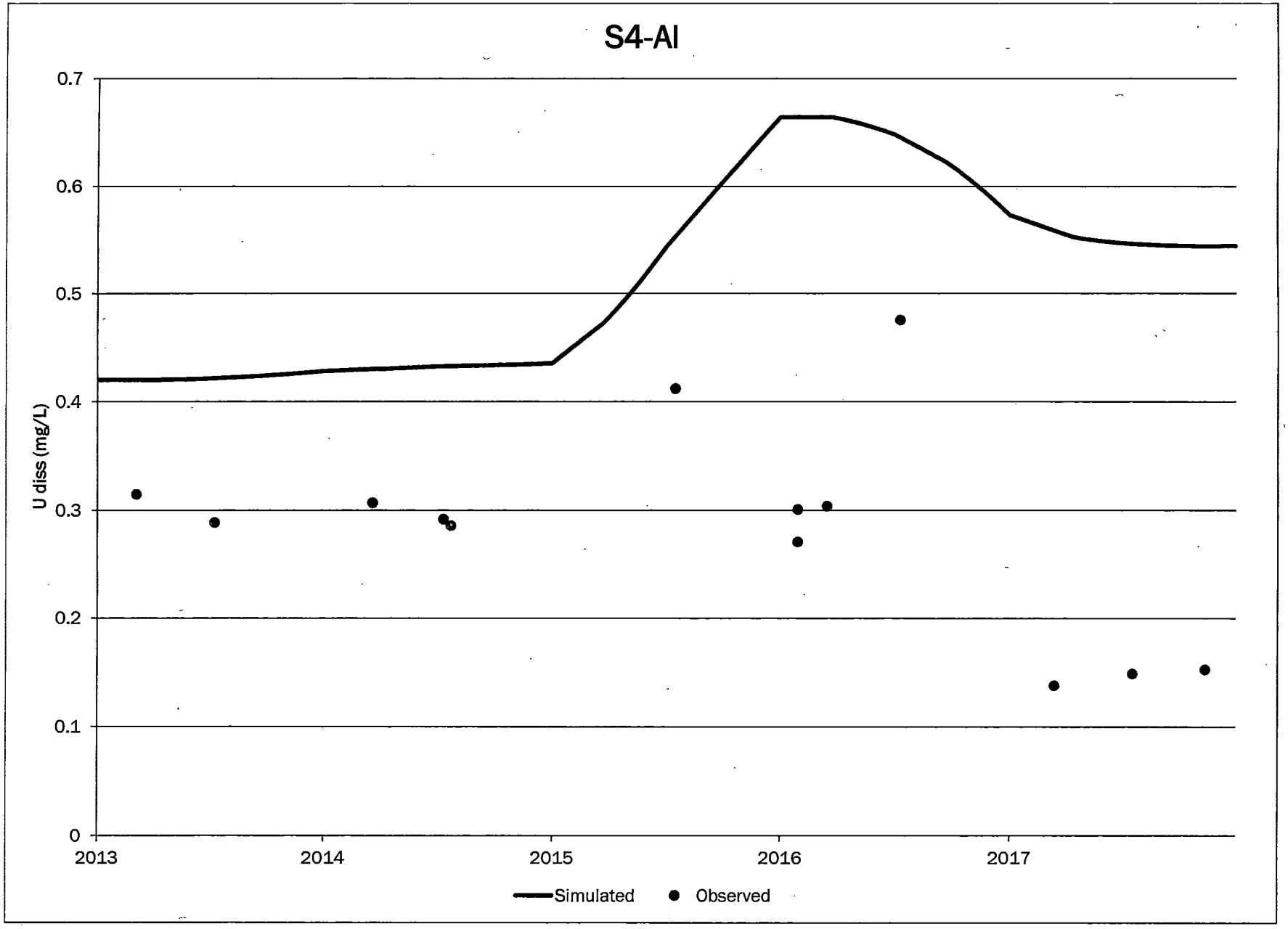

Q-Al
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

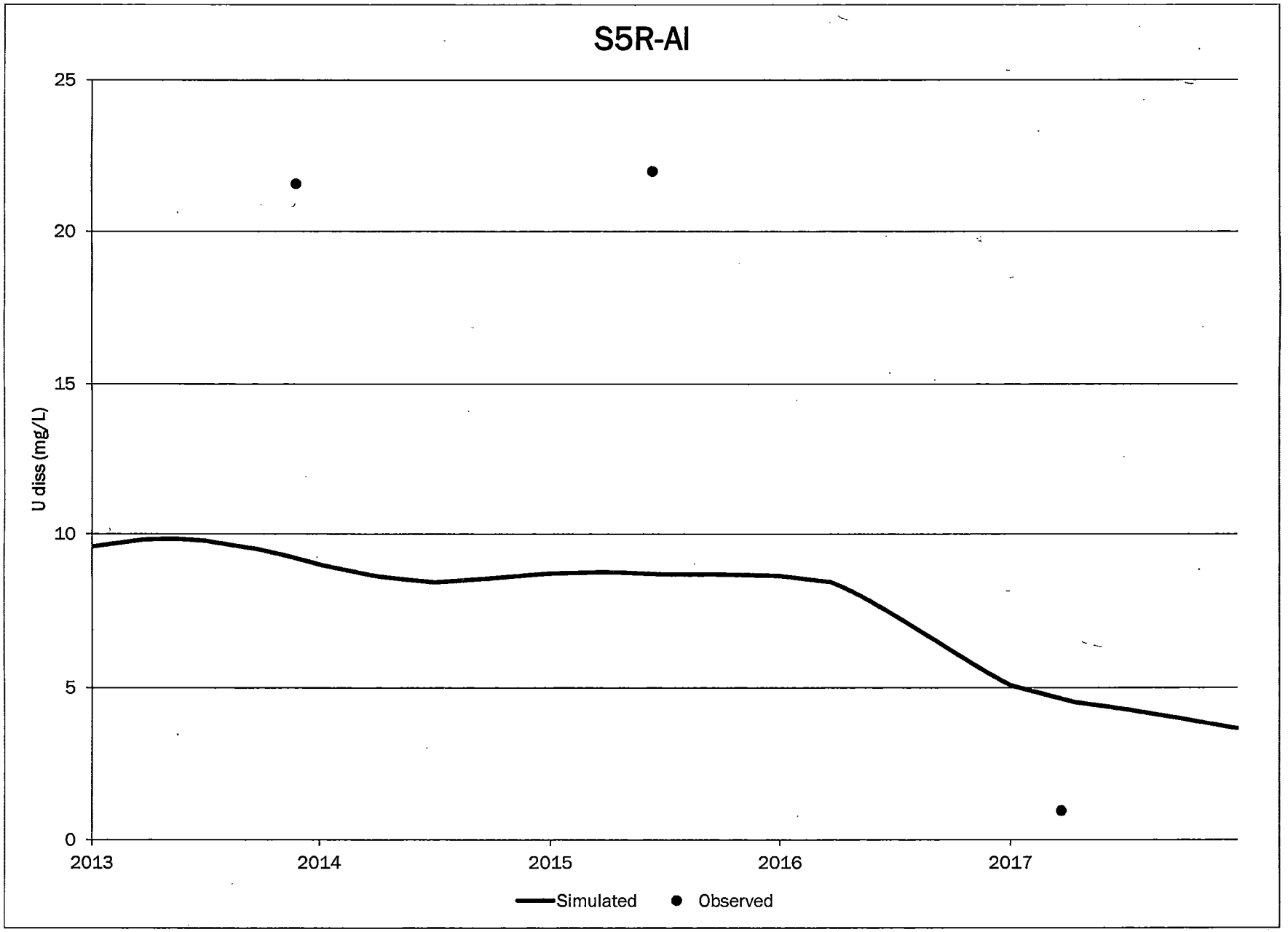

R-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

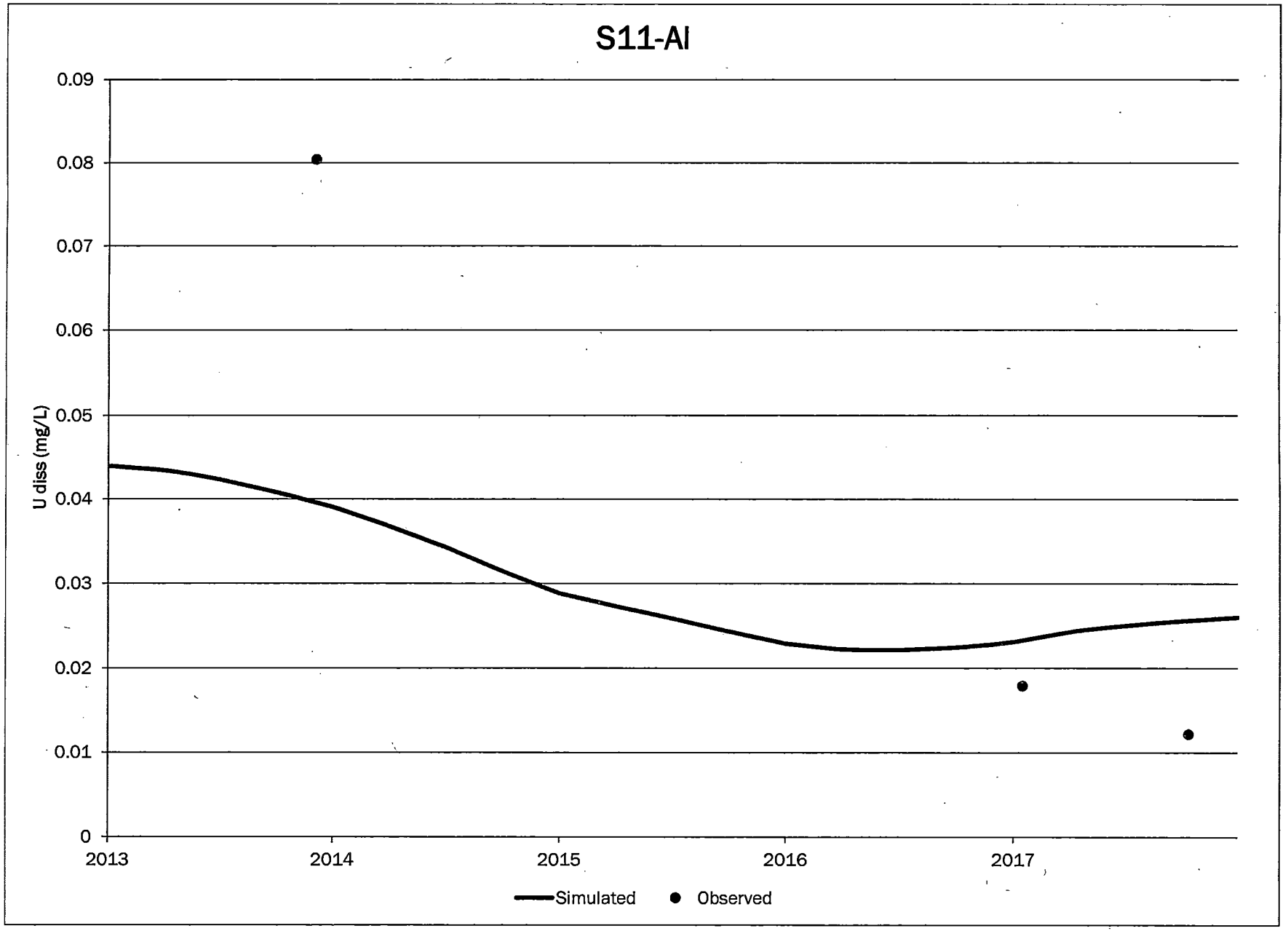

S1-AI
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

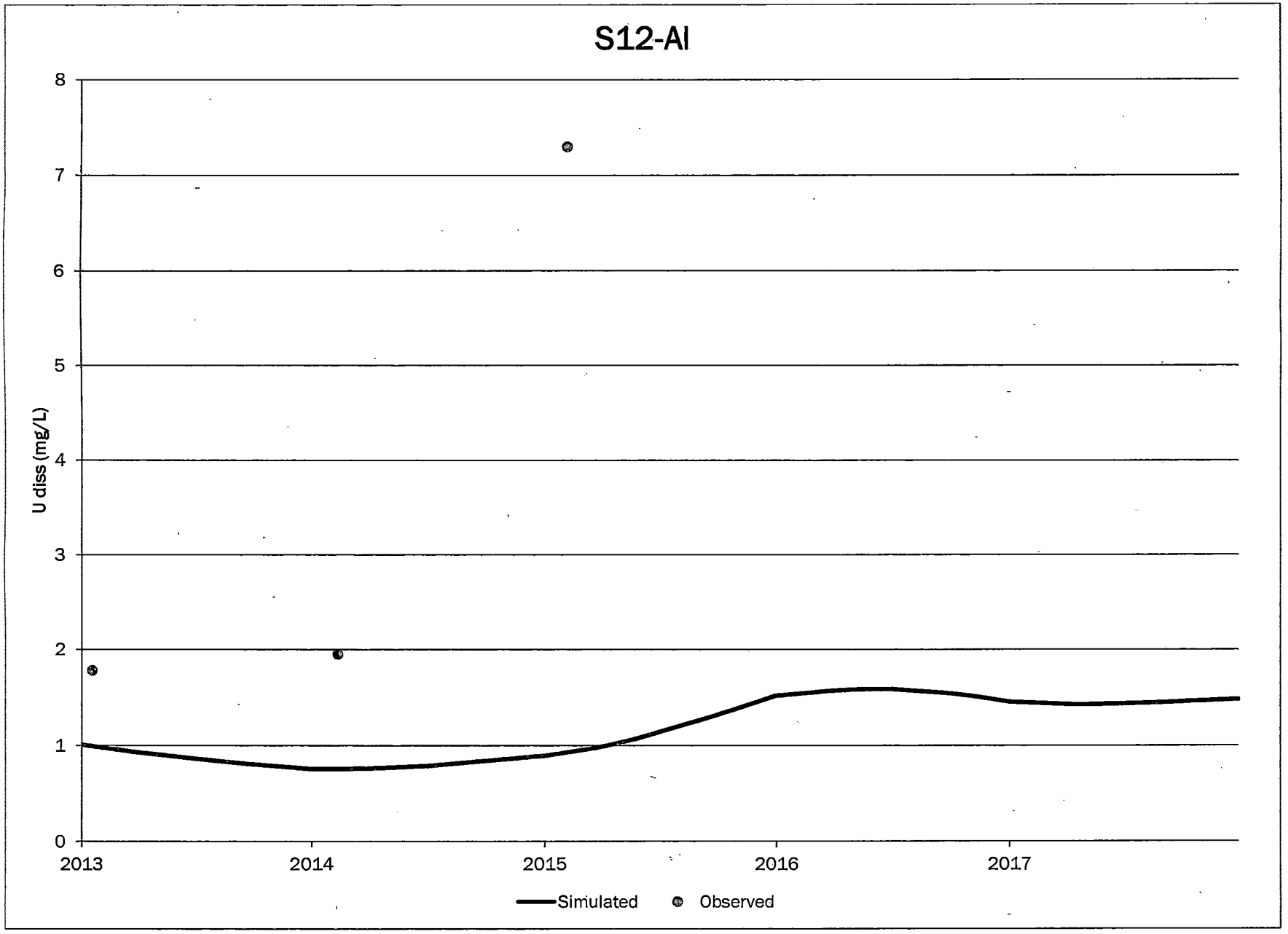

S2-AI
U diss (mg/L)
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

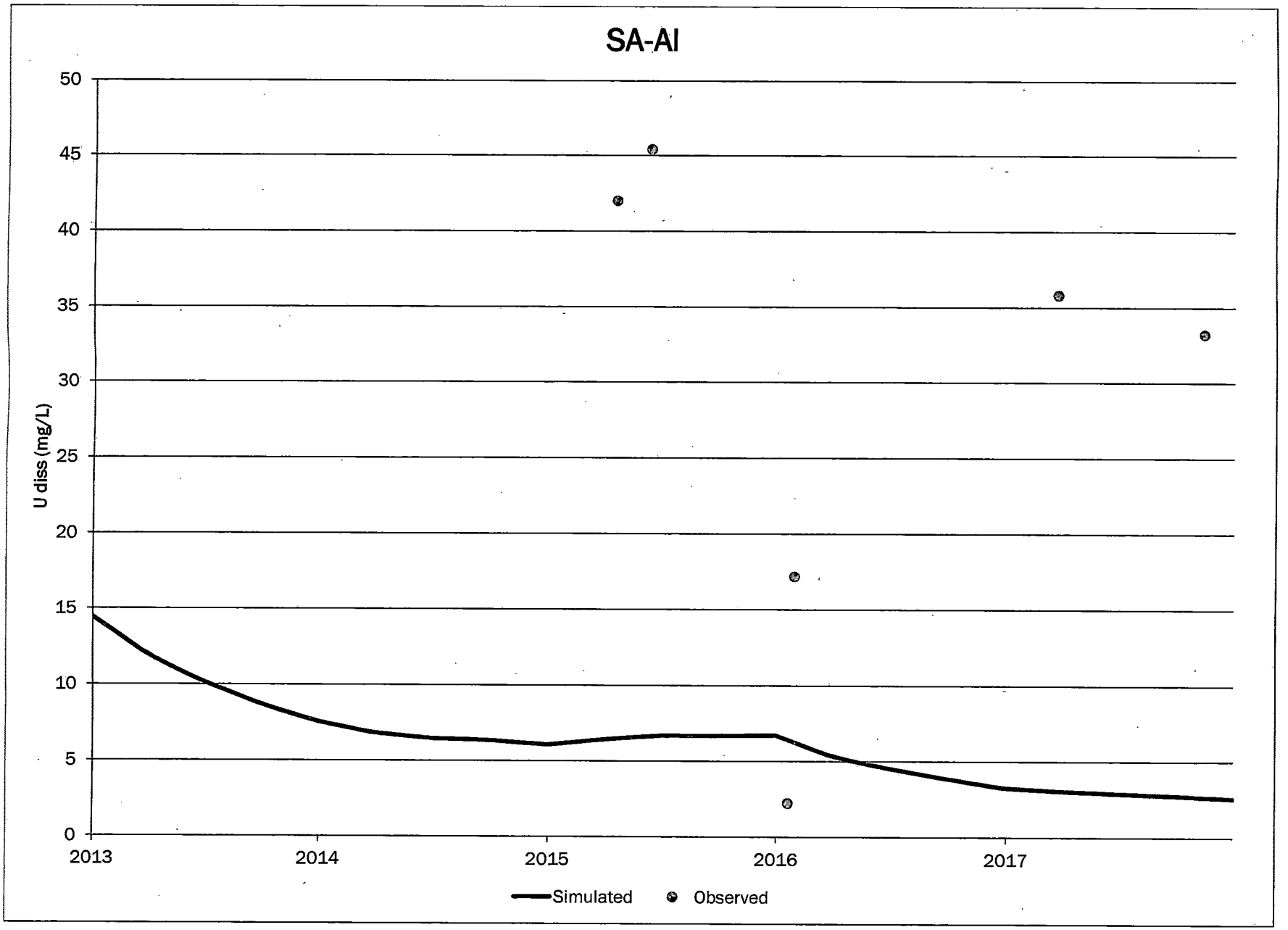

S3-AI
U diss (mg/L)
20
18
16
14
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

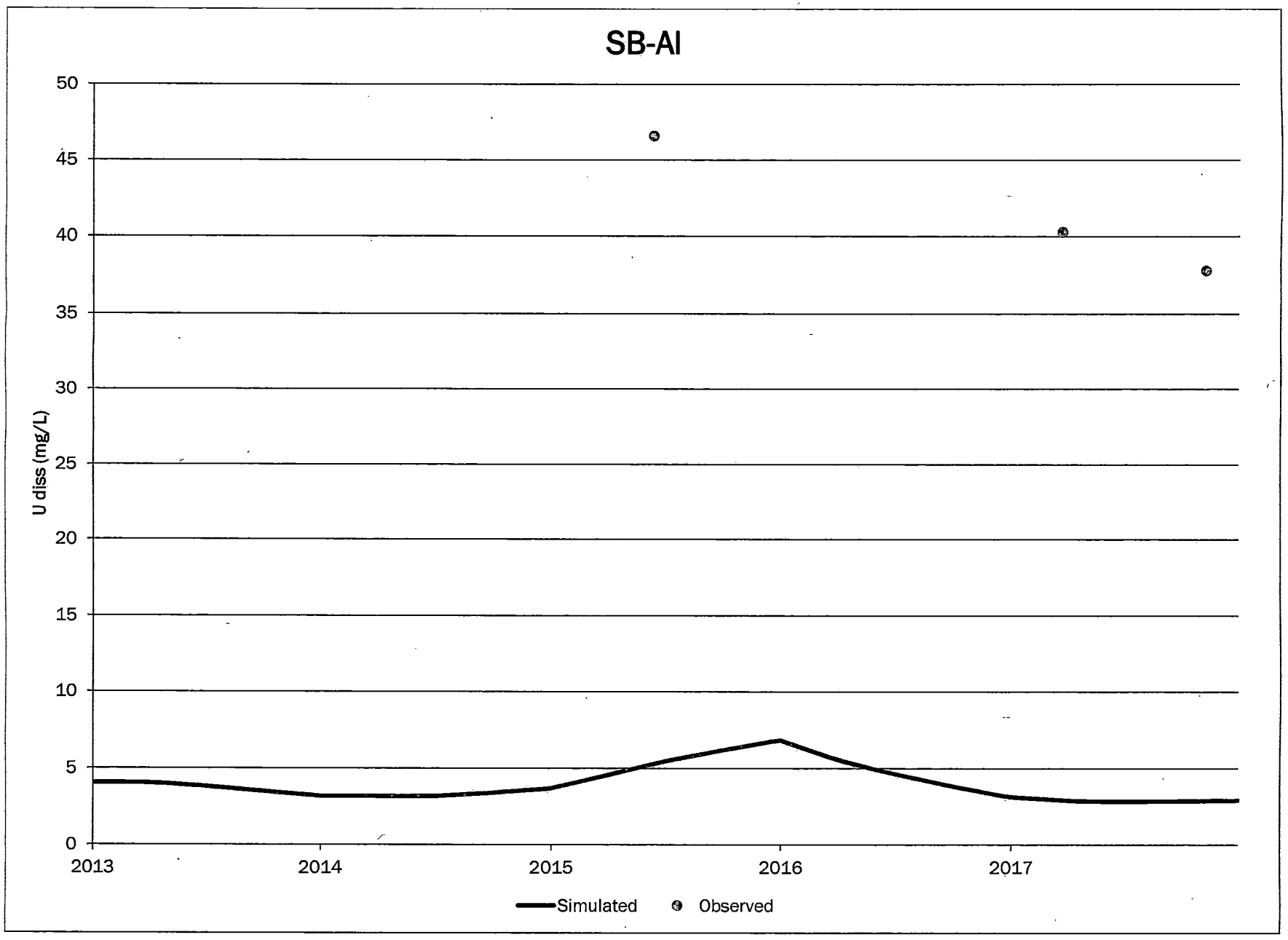

S4-AI
U diss (mg/L)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
2013
2014
2015
2016
2017
Simulated
Observed

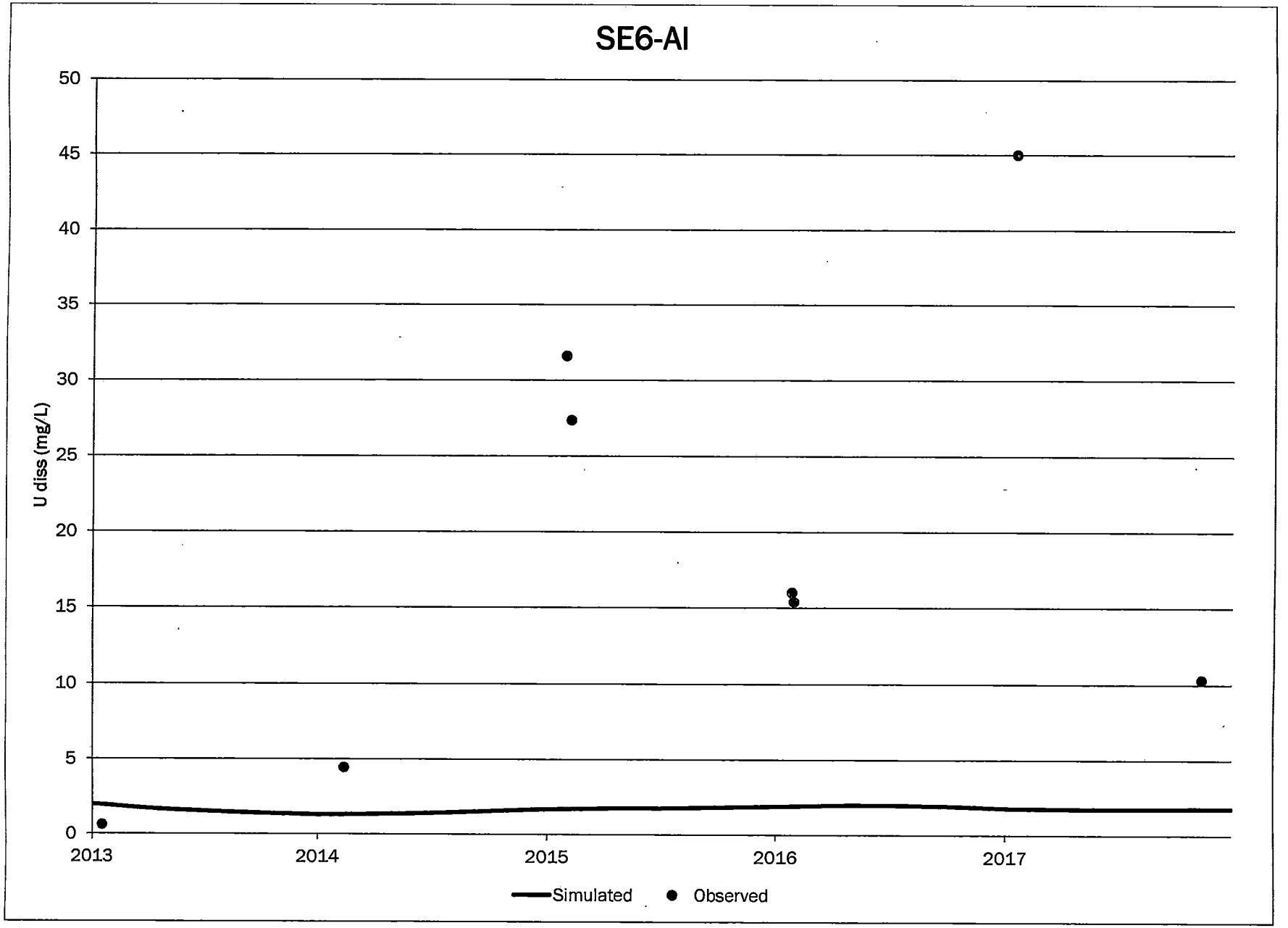

S5R-AI
25
20
15
10
5
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

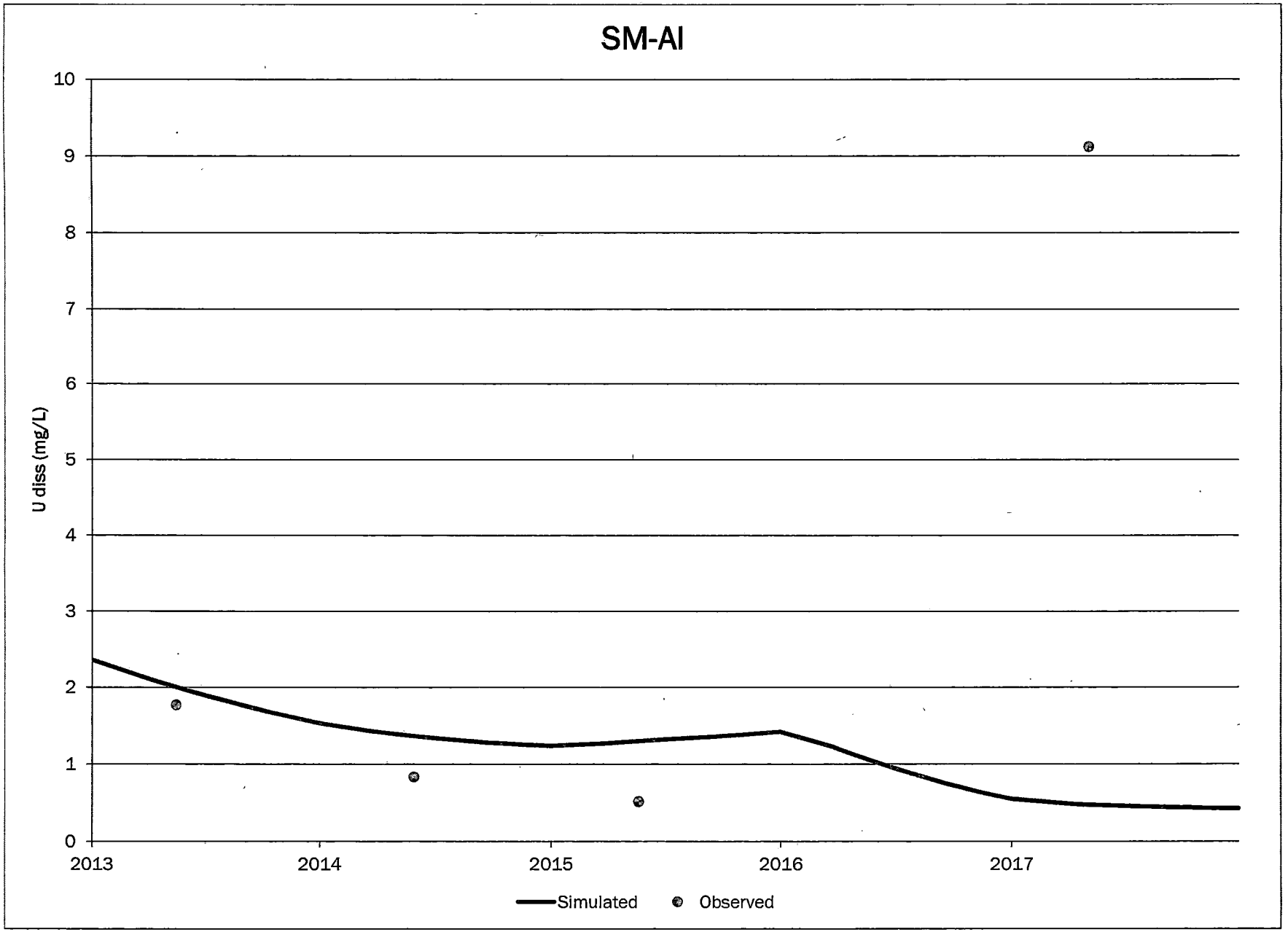

S11-AI
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

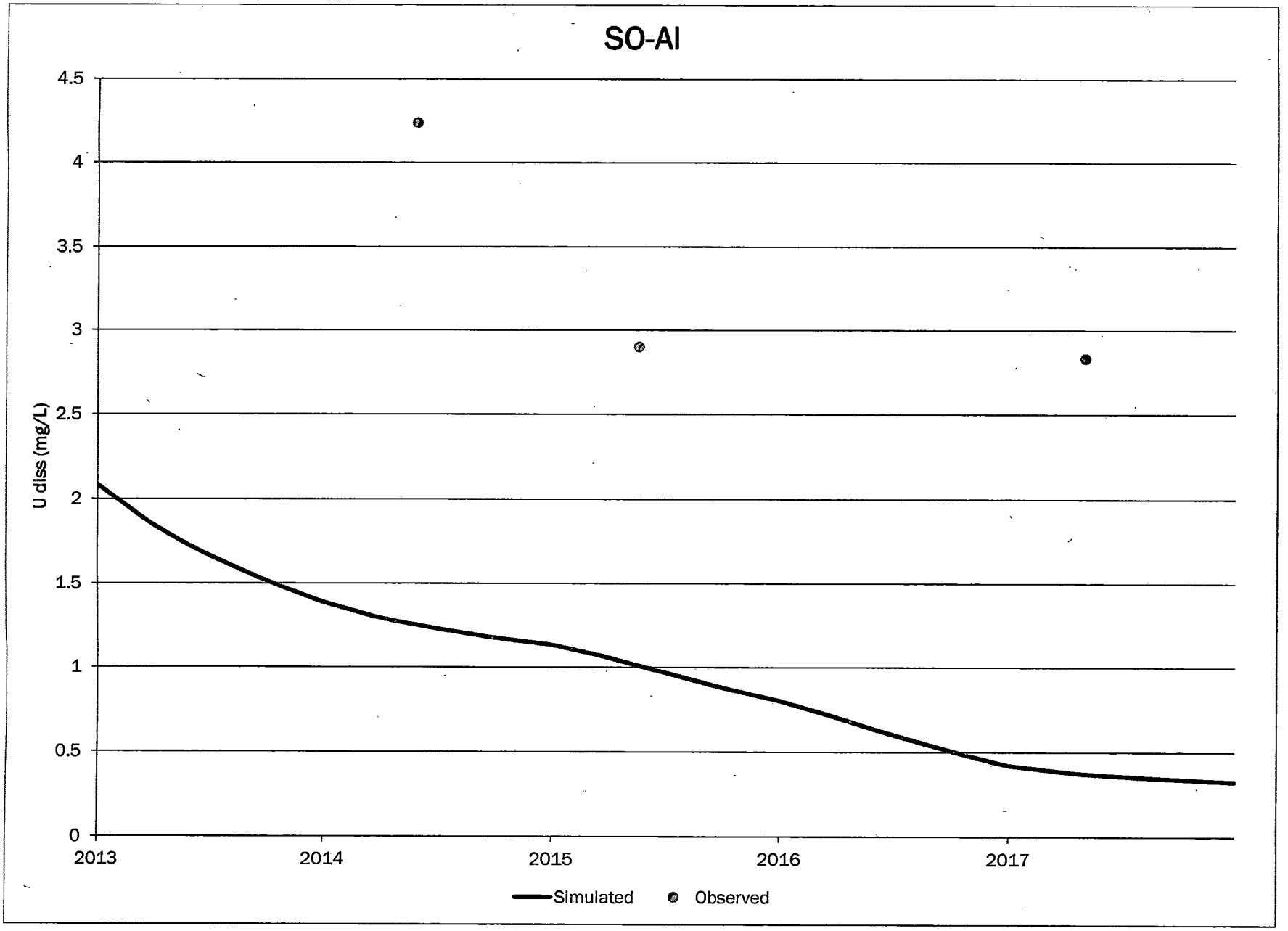

S12-AI
U diss (mg/L)
8
7
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

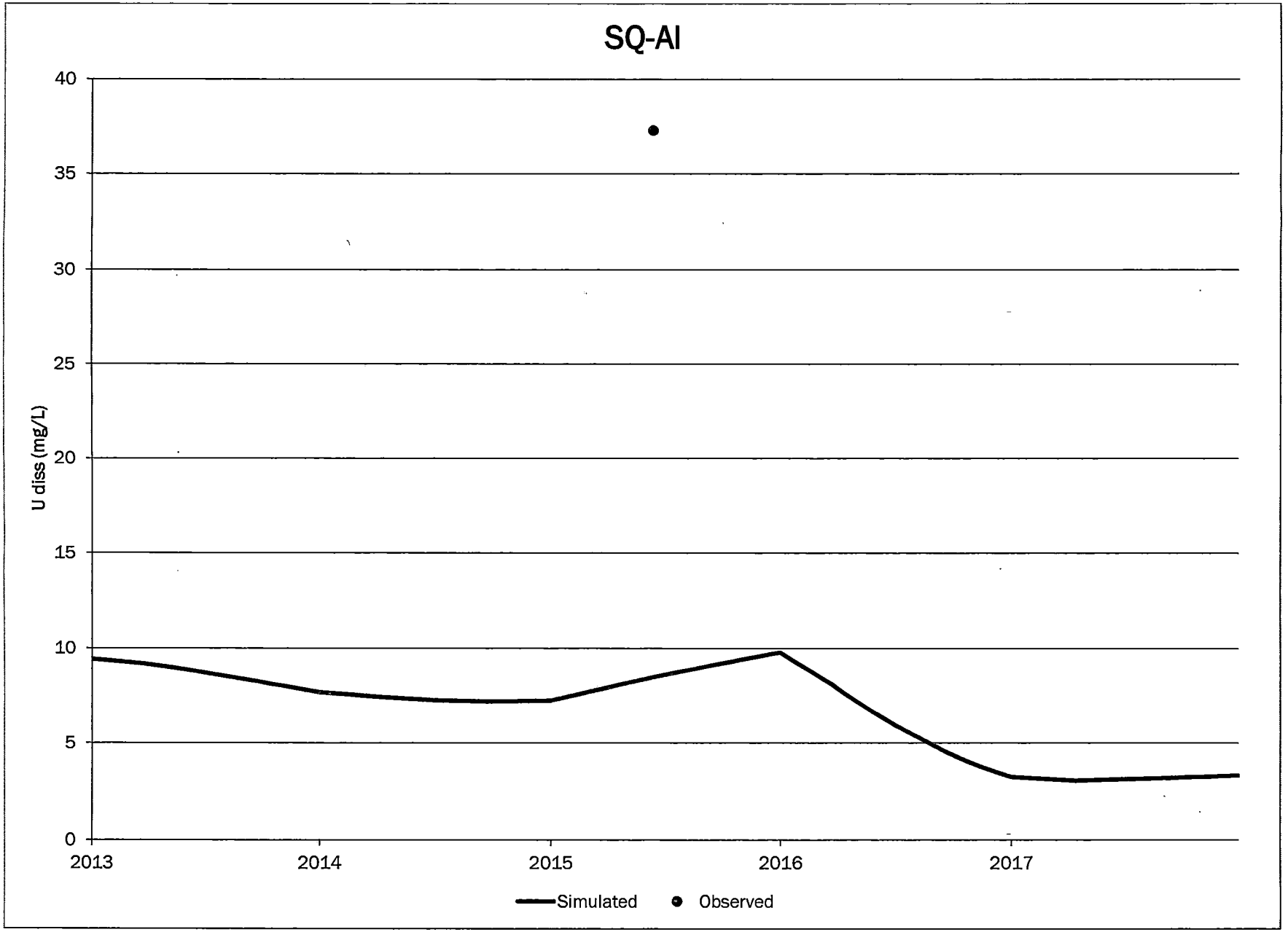

SA-AI
U diss (mg/L)
50
45
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

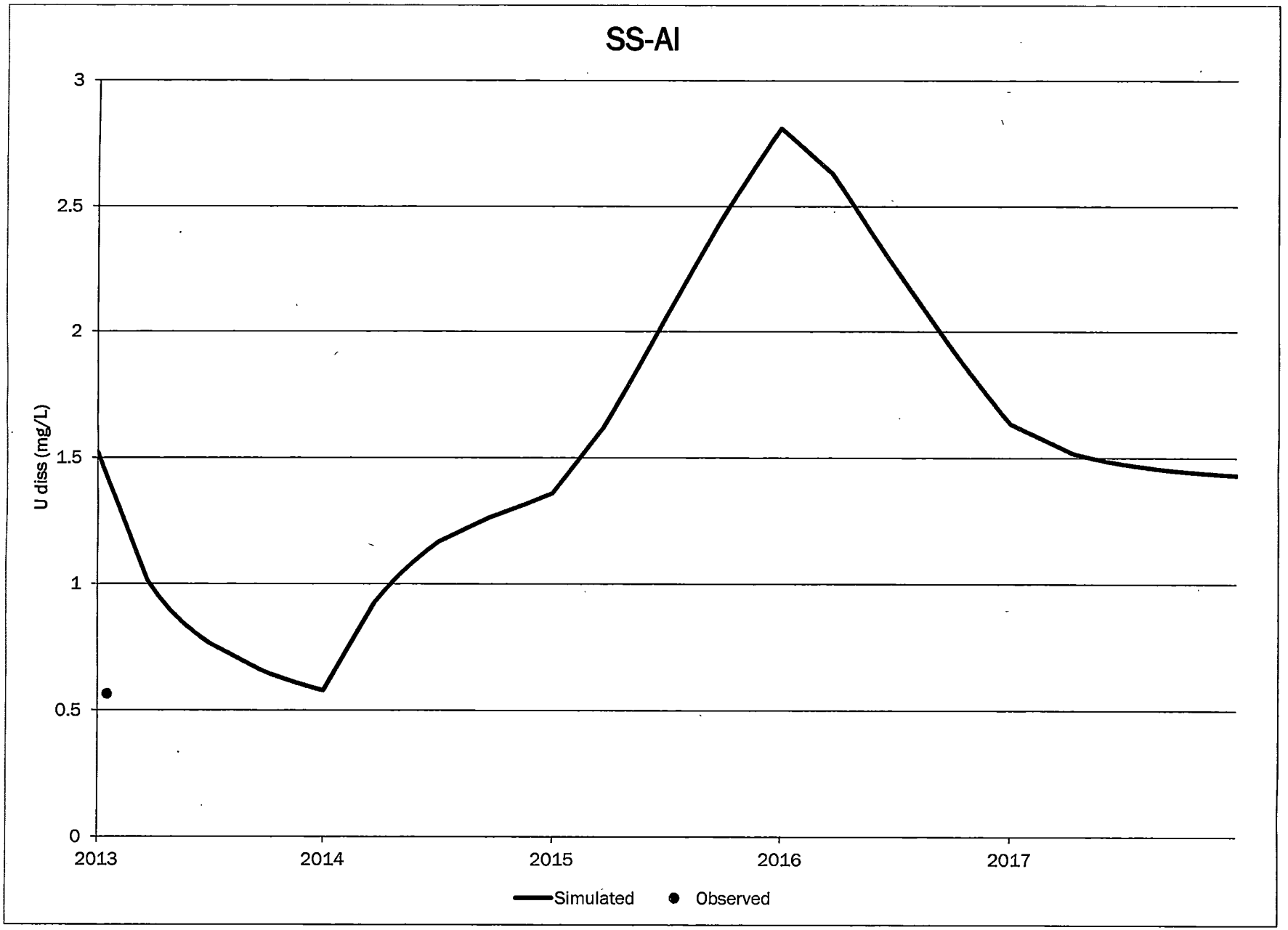

SB-AI
U diss (mg/L)
50
45
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

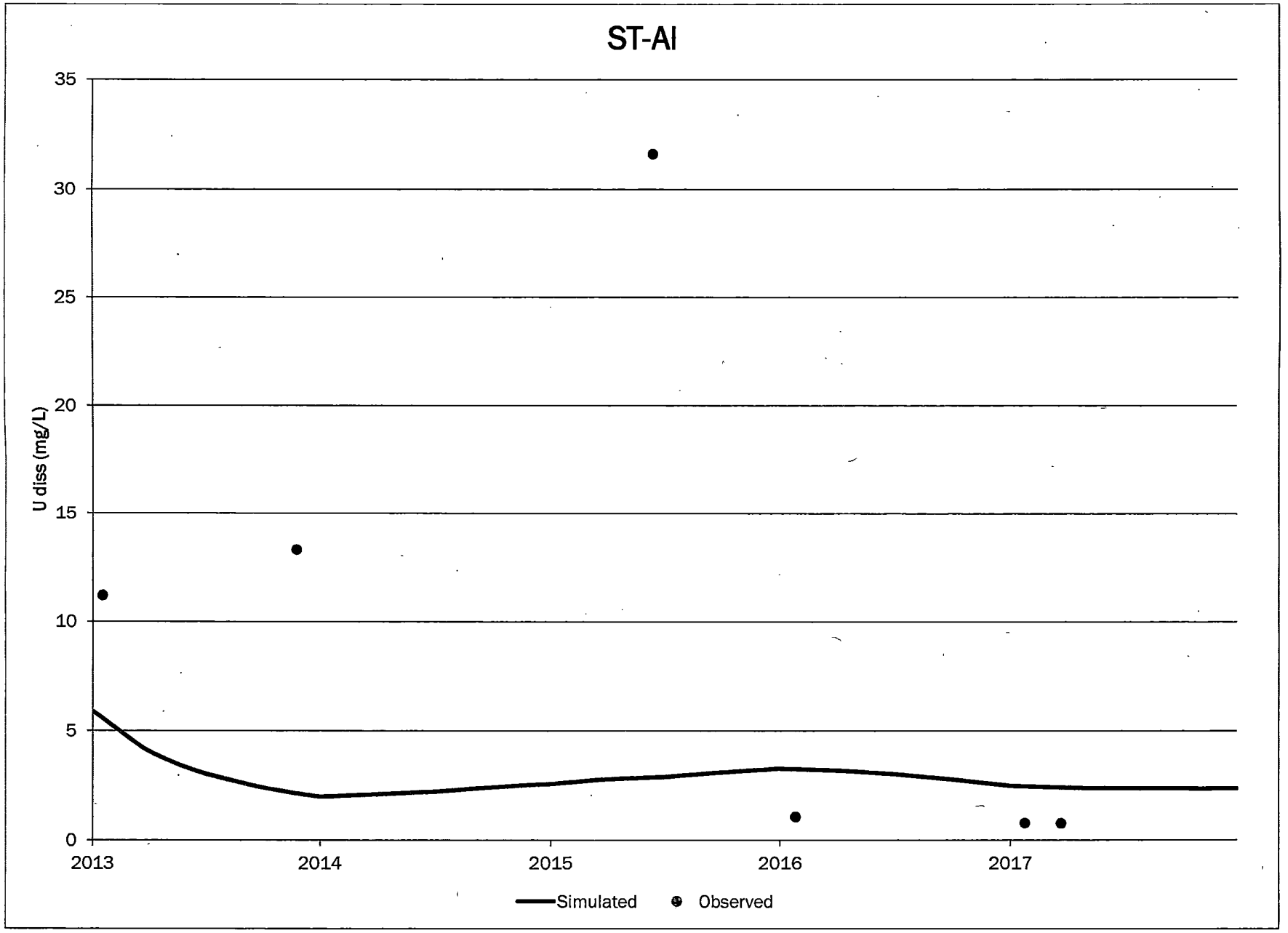

SE6-AI
U diss (mg/L)
50
45
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

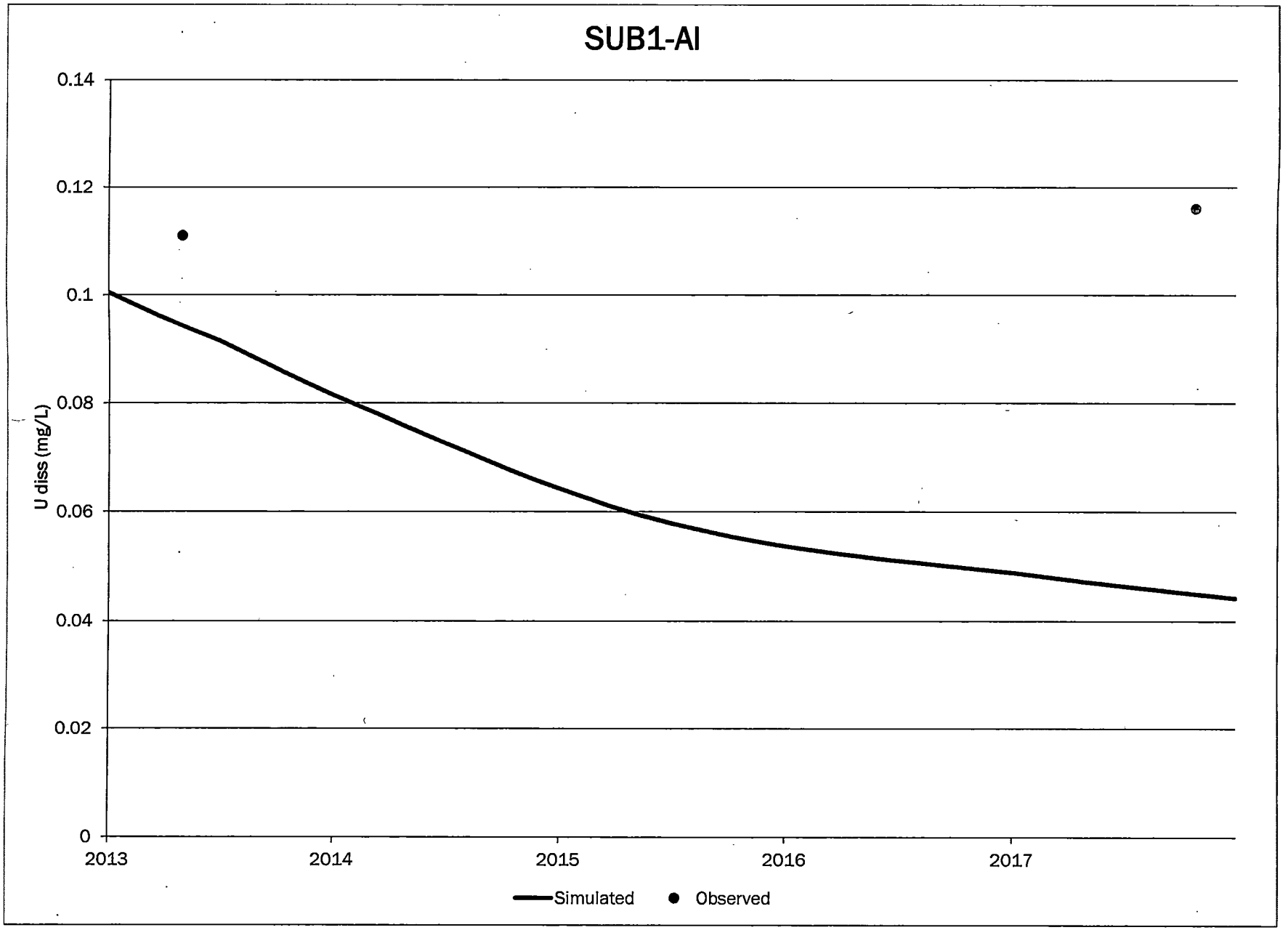

SM-AI
U diss (mg/L)
10
9
8
7
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

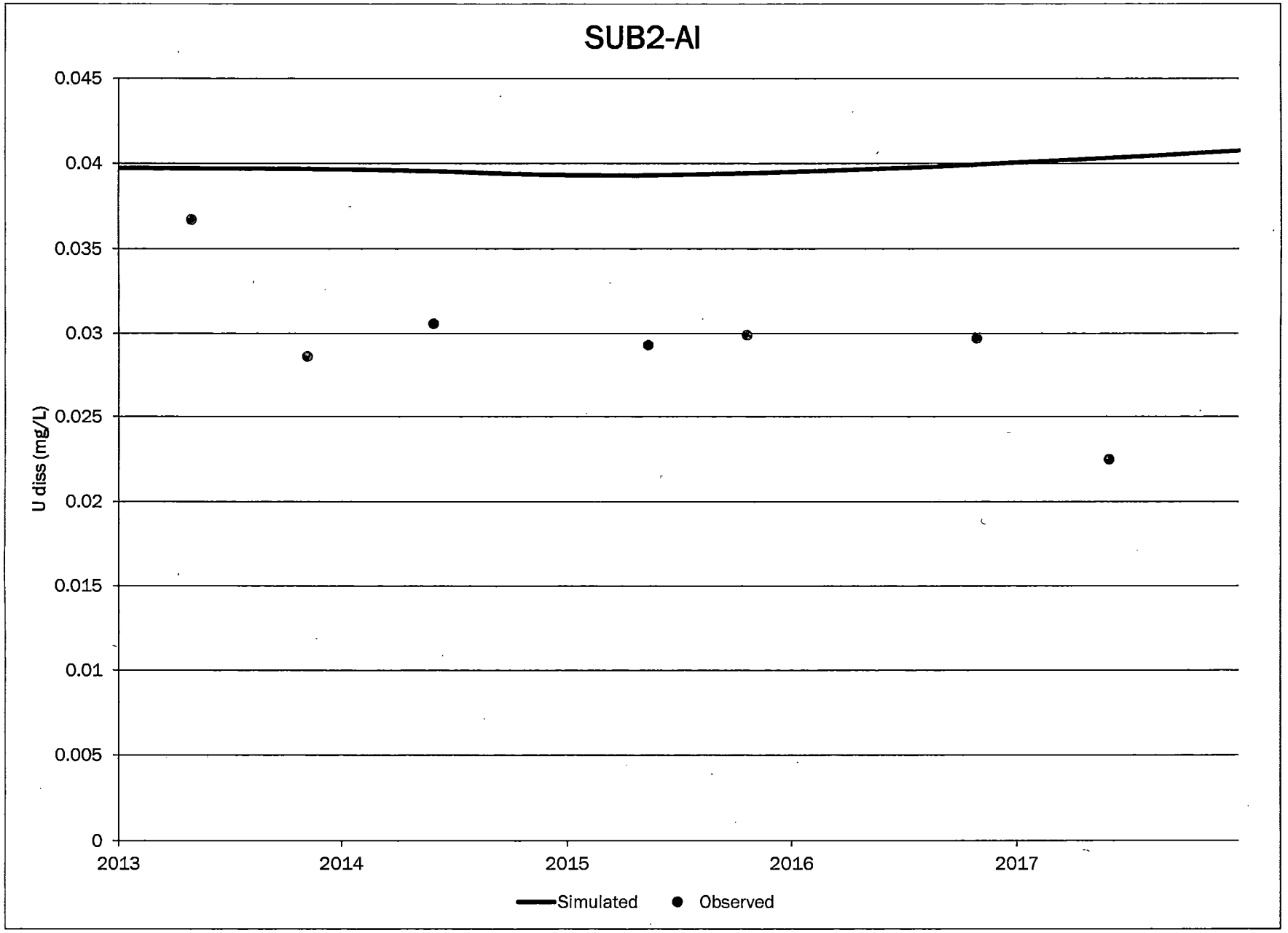

SO-AI
U diss (mg/L)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

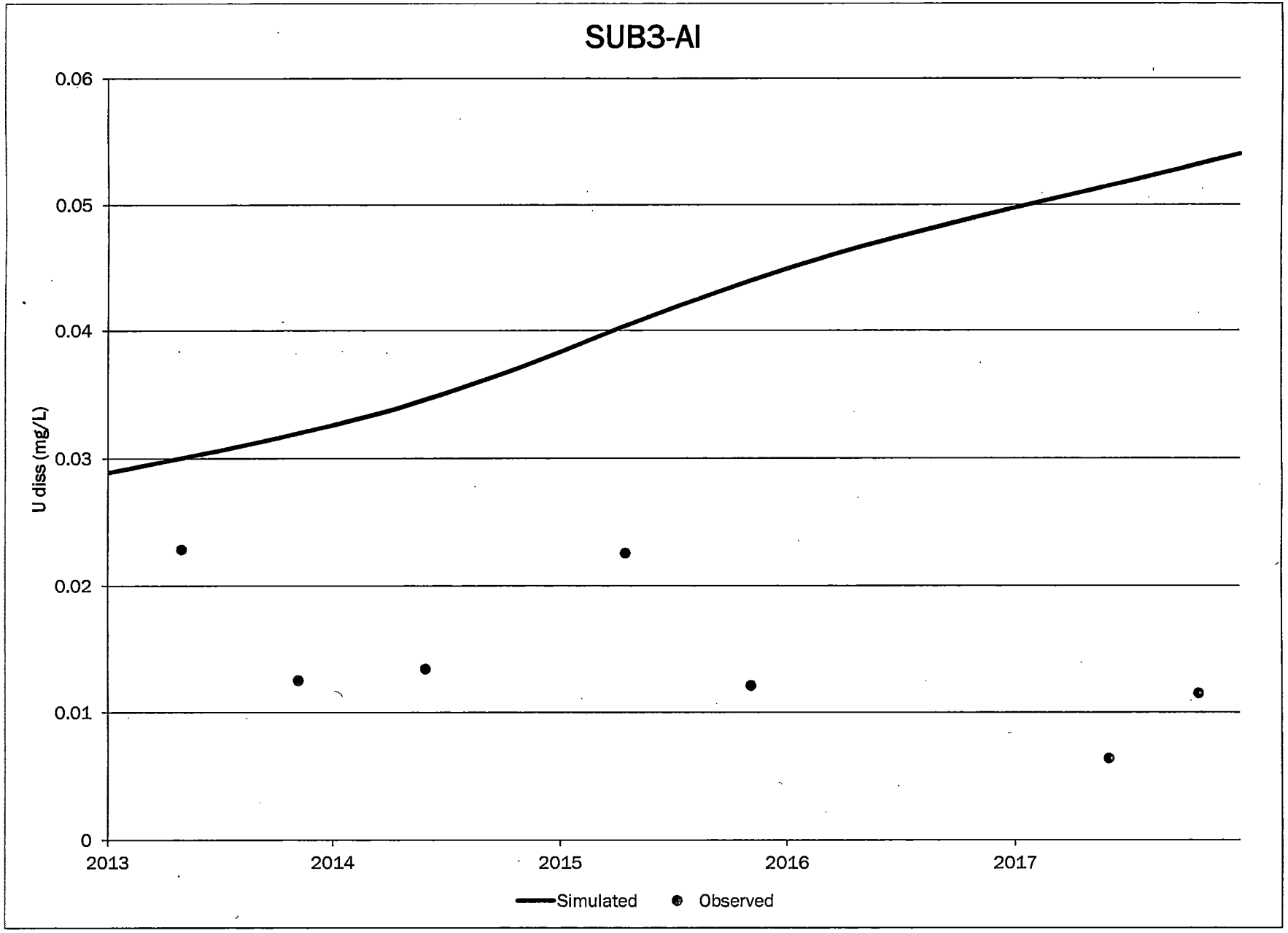

SQ-AI
U diss (mg/L)
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

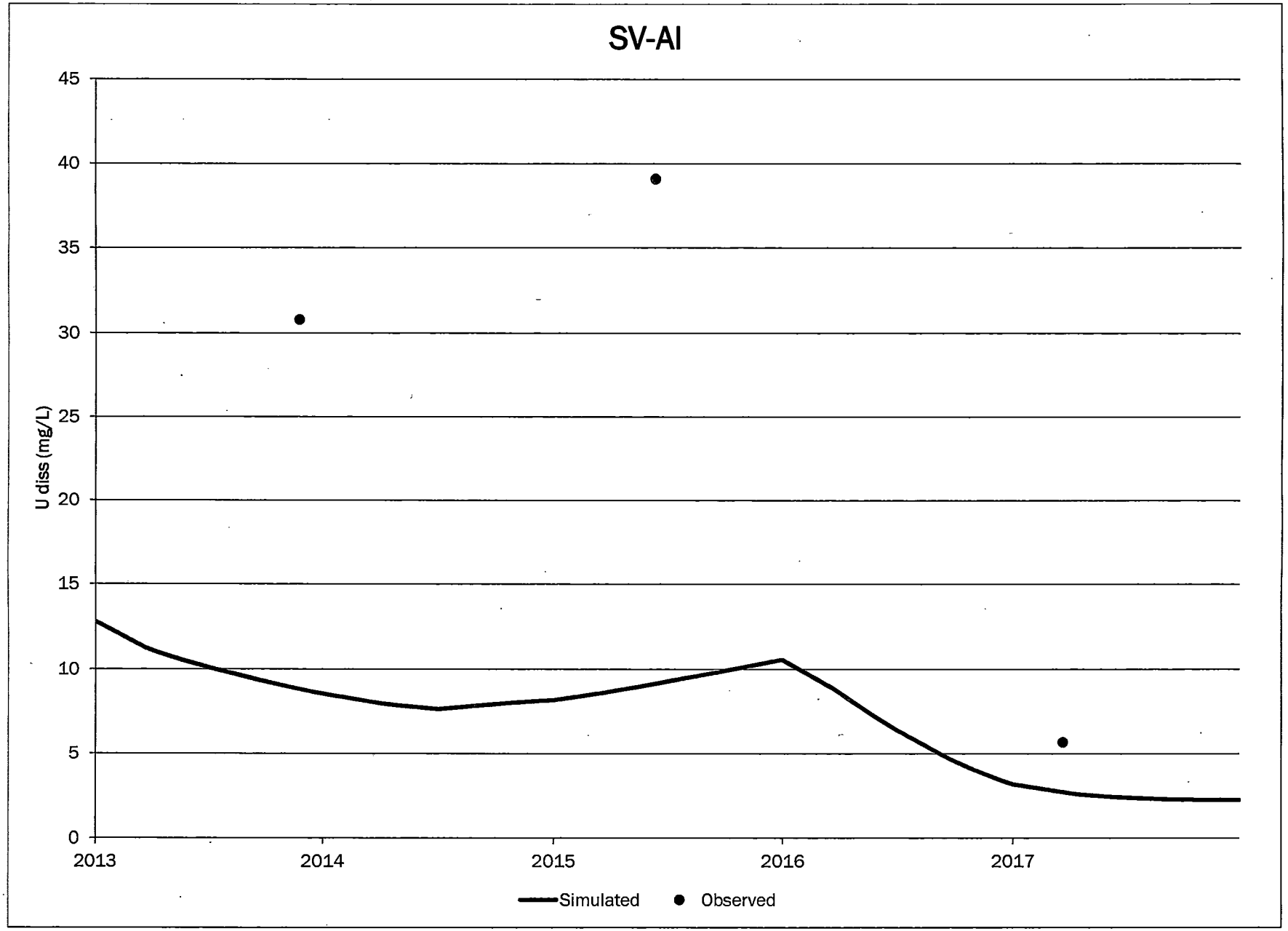

SS-AI
U diss (mg/L)
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

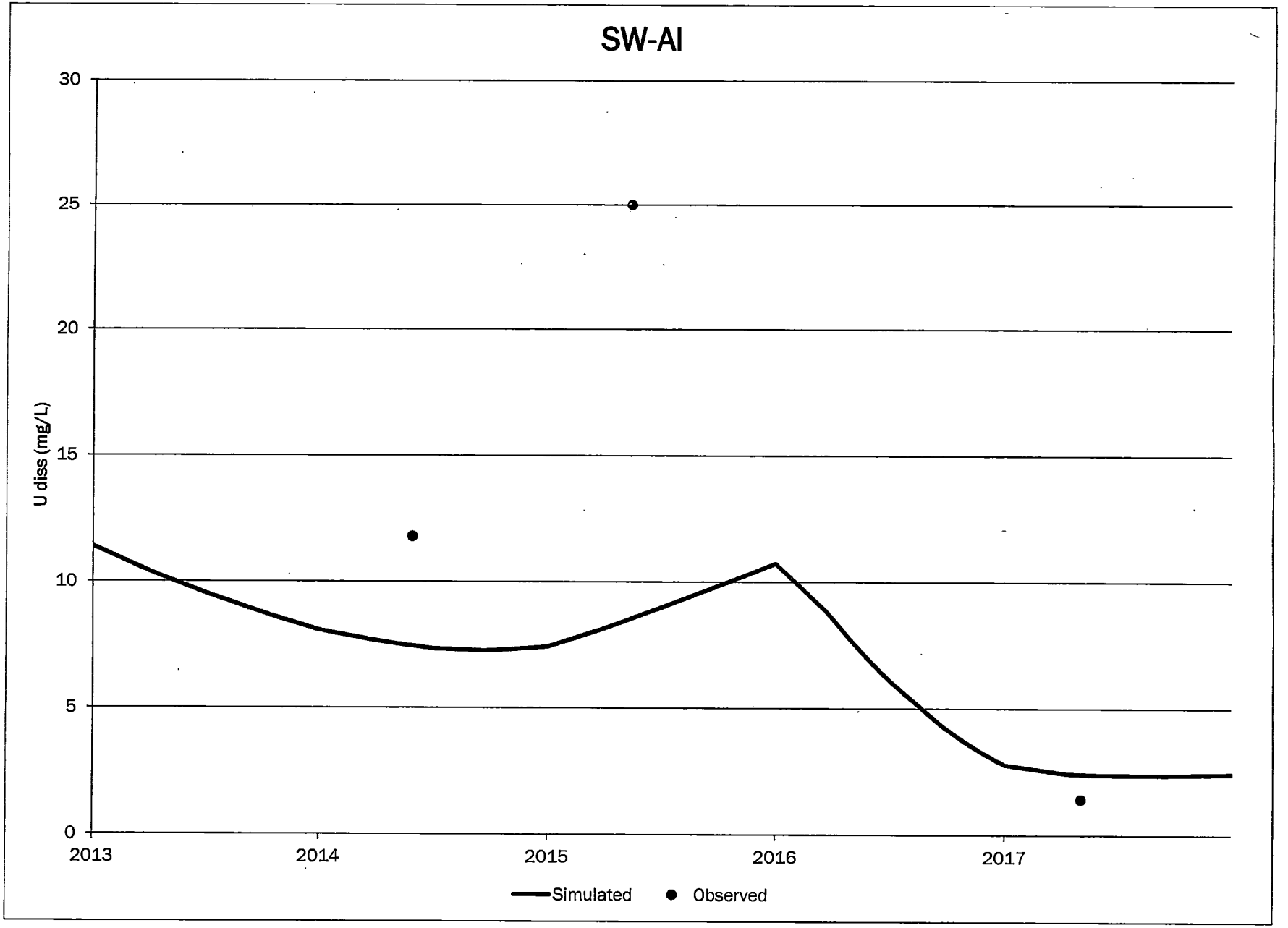

ST-AI
U diss (mg/L)
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

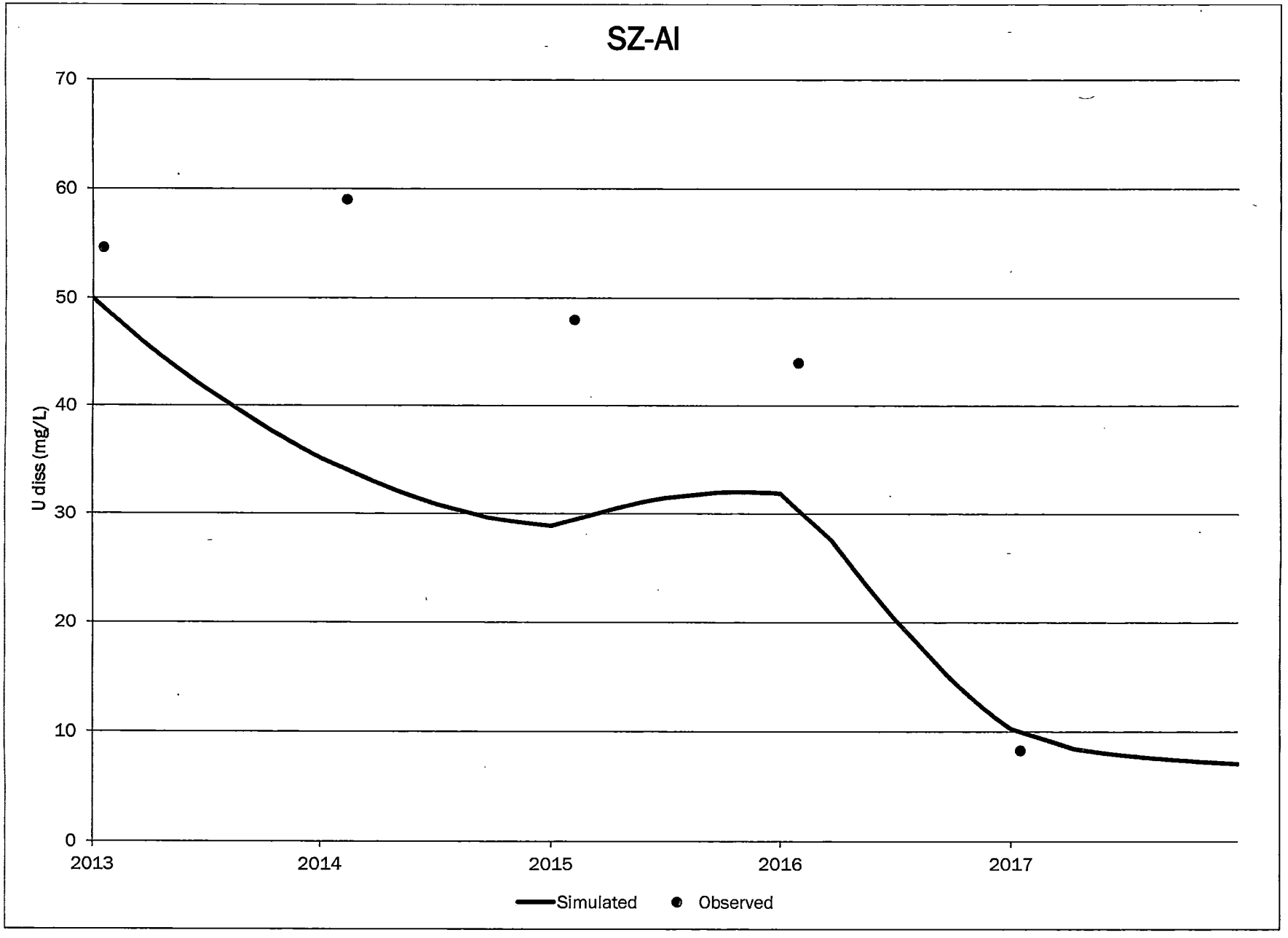

SUB1-AI
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

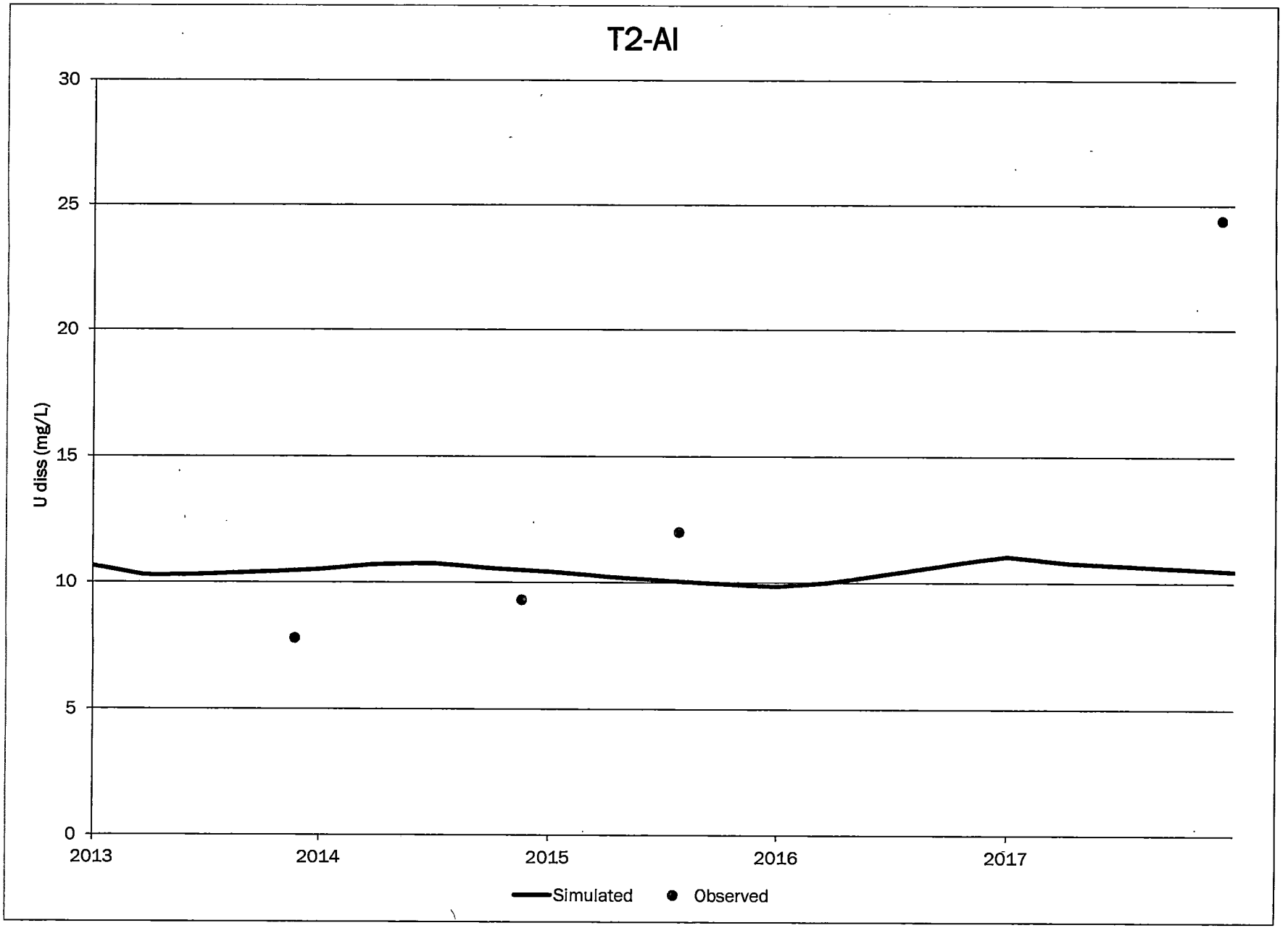

SUB2-AI
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

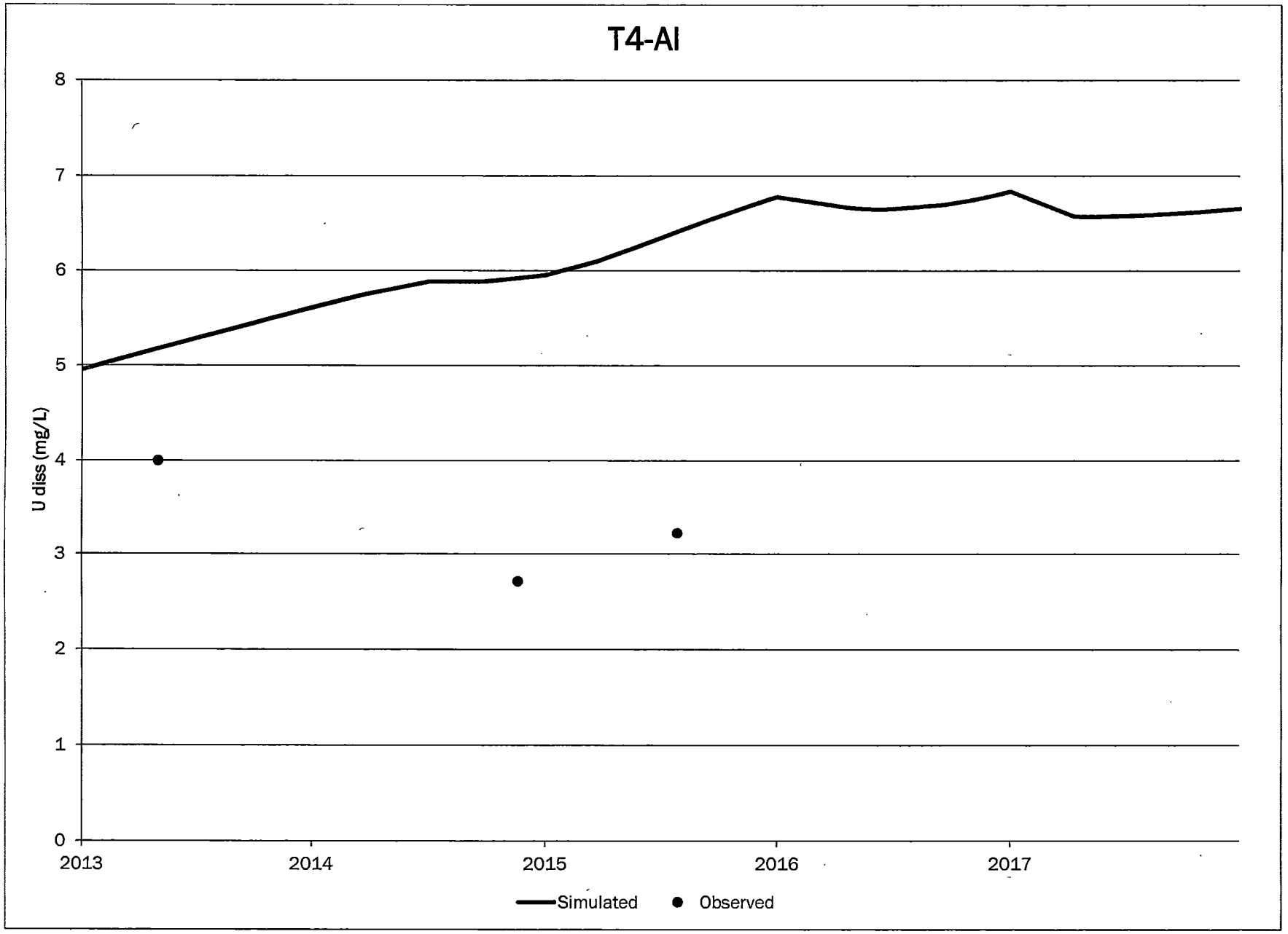

SUB3-AI
0.06
0.05
0.04
0.03
0.02
0.01
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

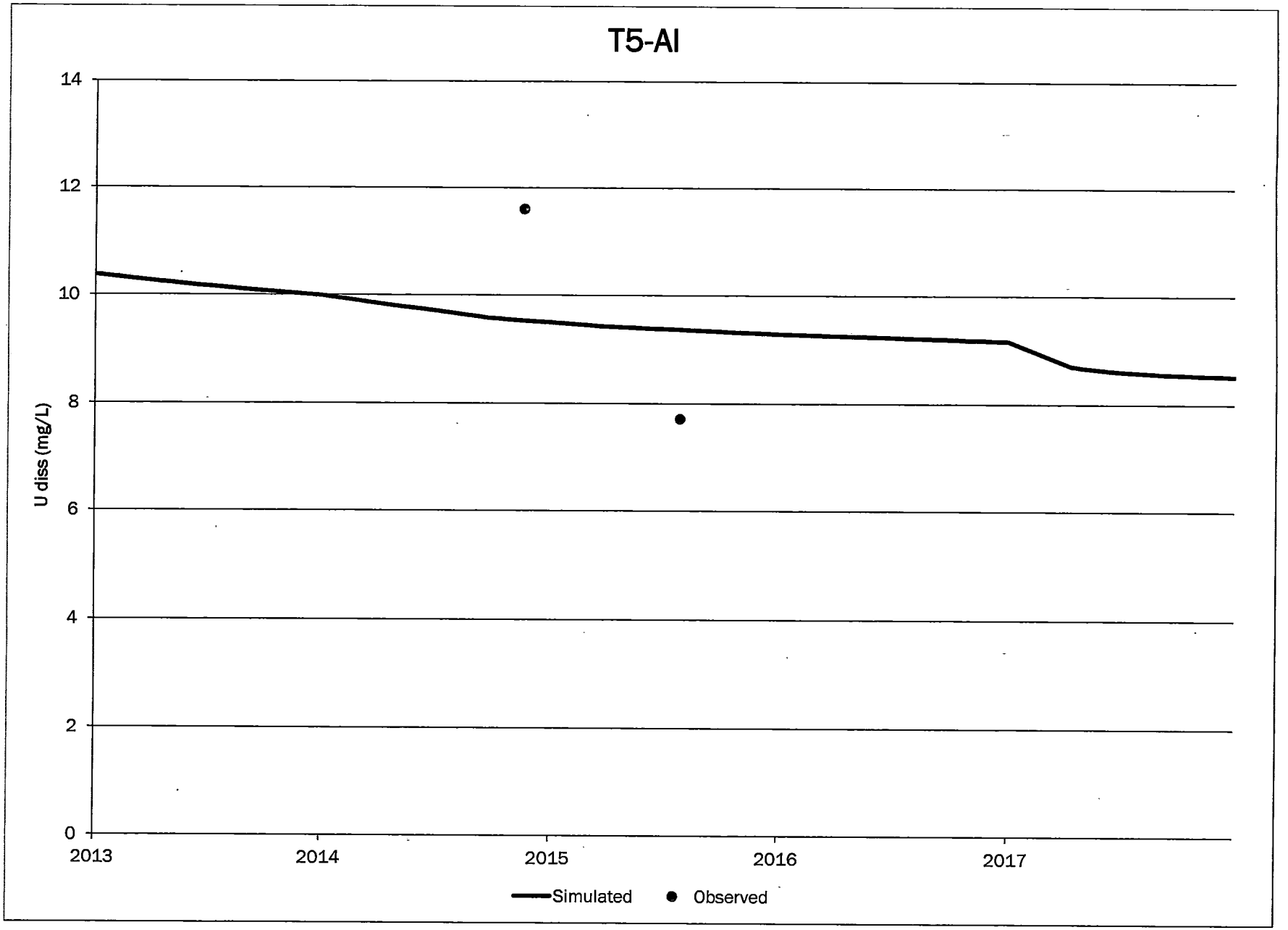

SV-AI
U diss (mg/L)
45
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

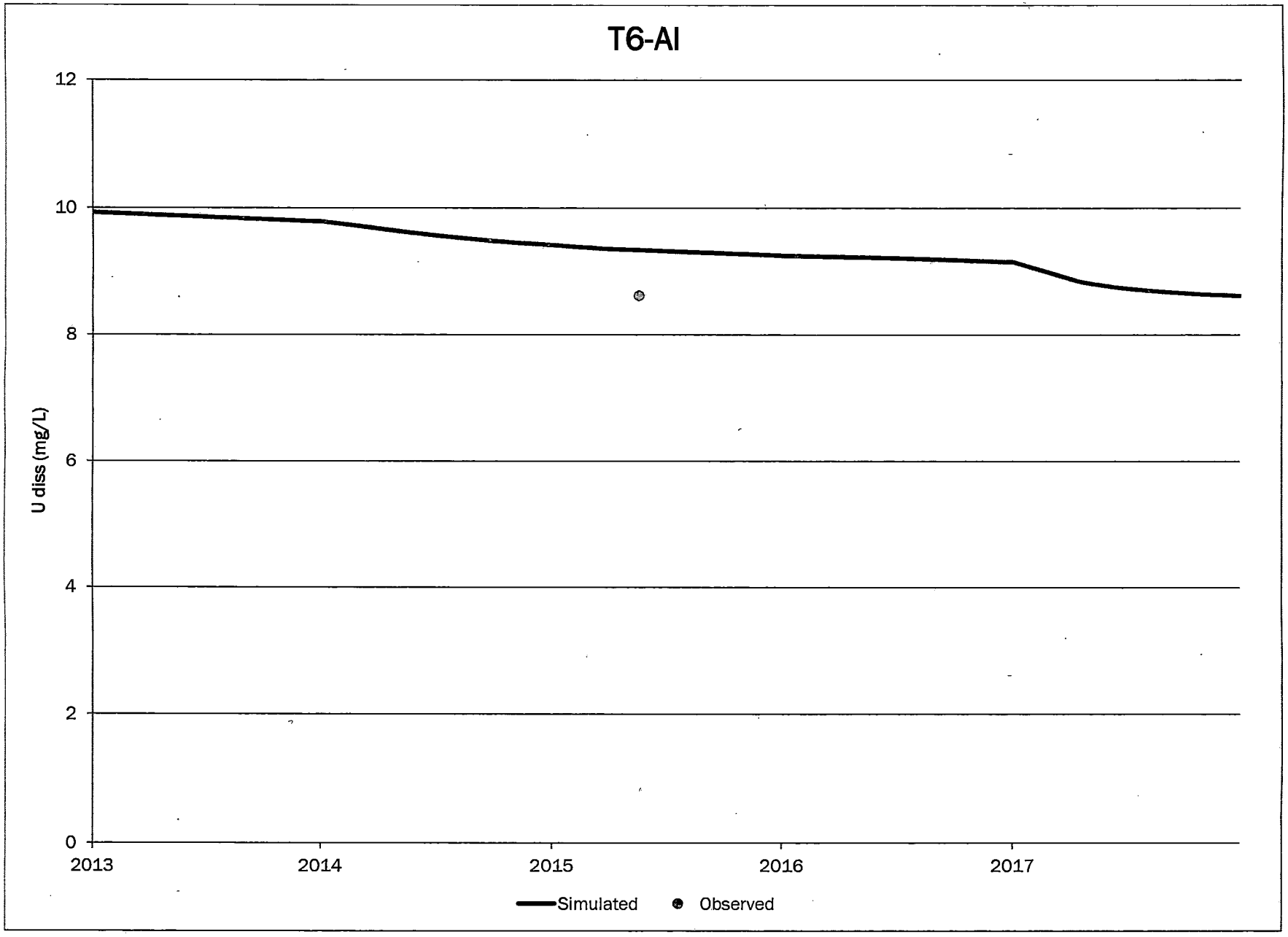

SW-AI
U diss (mg/L)
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

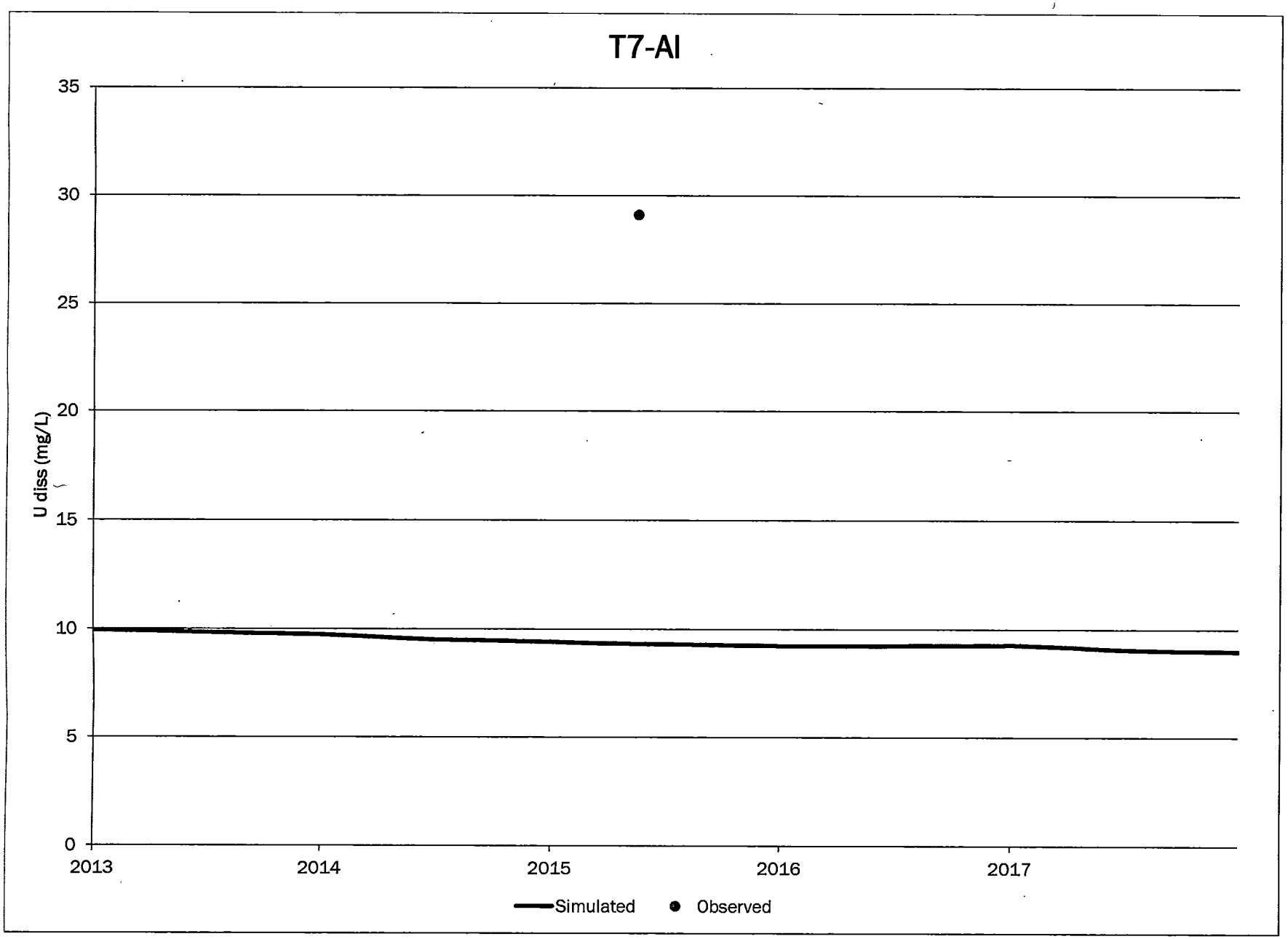

SZ-AI
U diss (mg/L)
70
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
Simulated
Observed

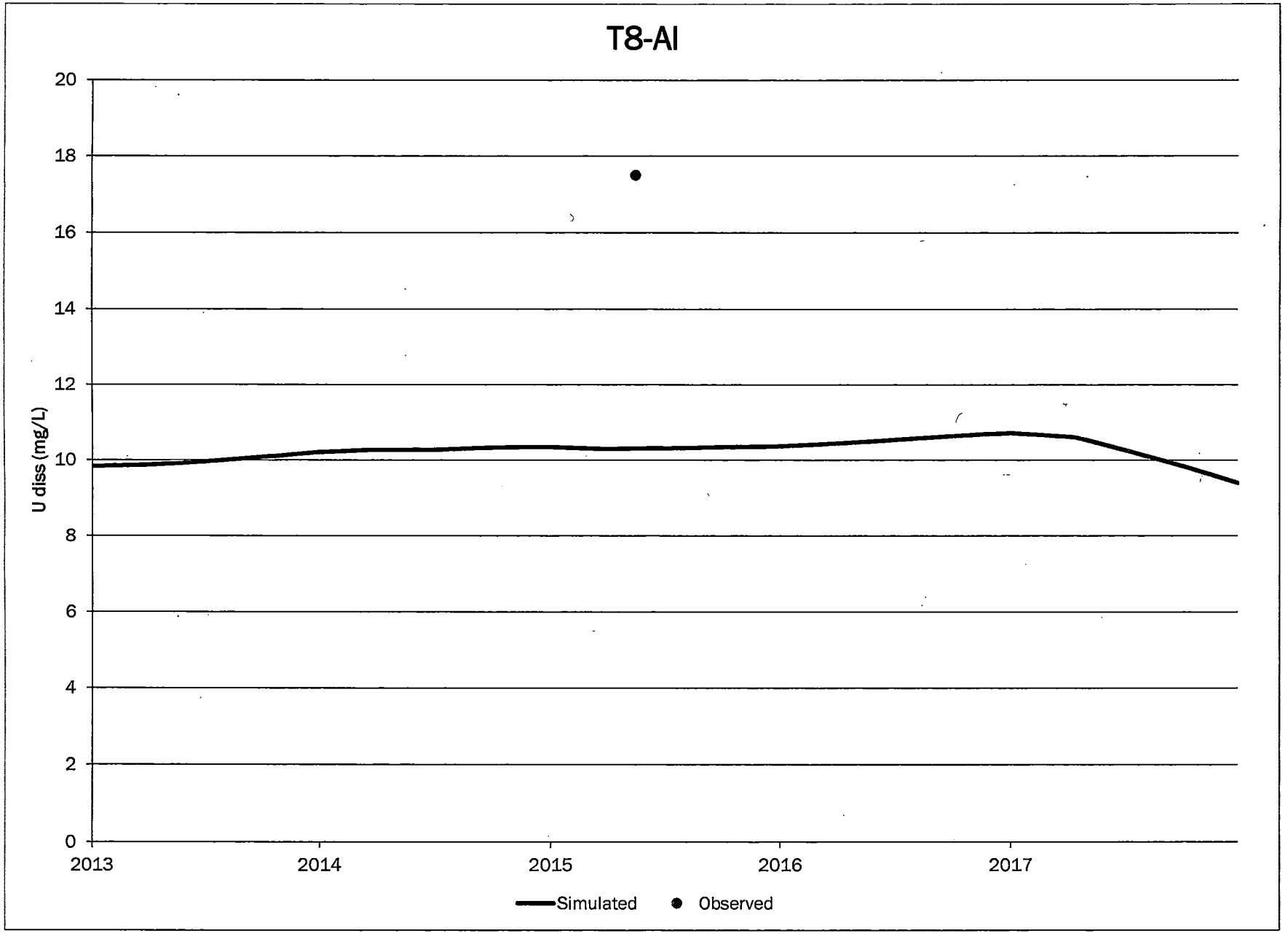

T2-AI
U diss (mg/L)
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

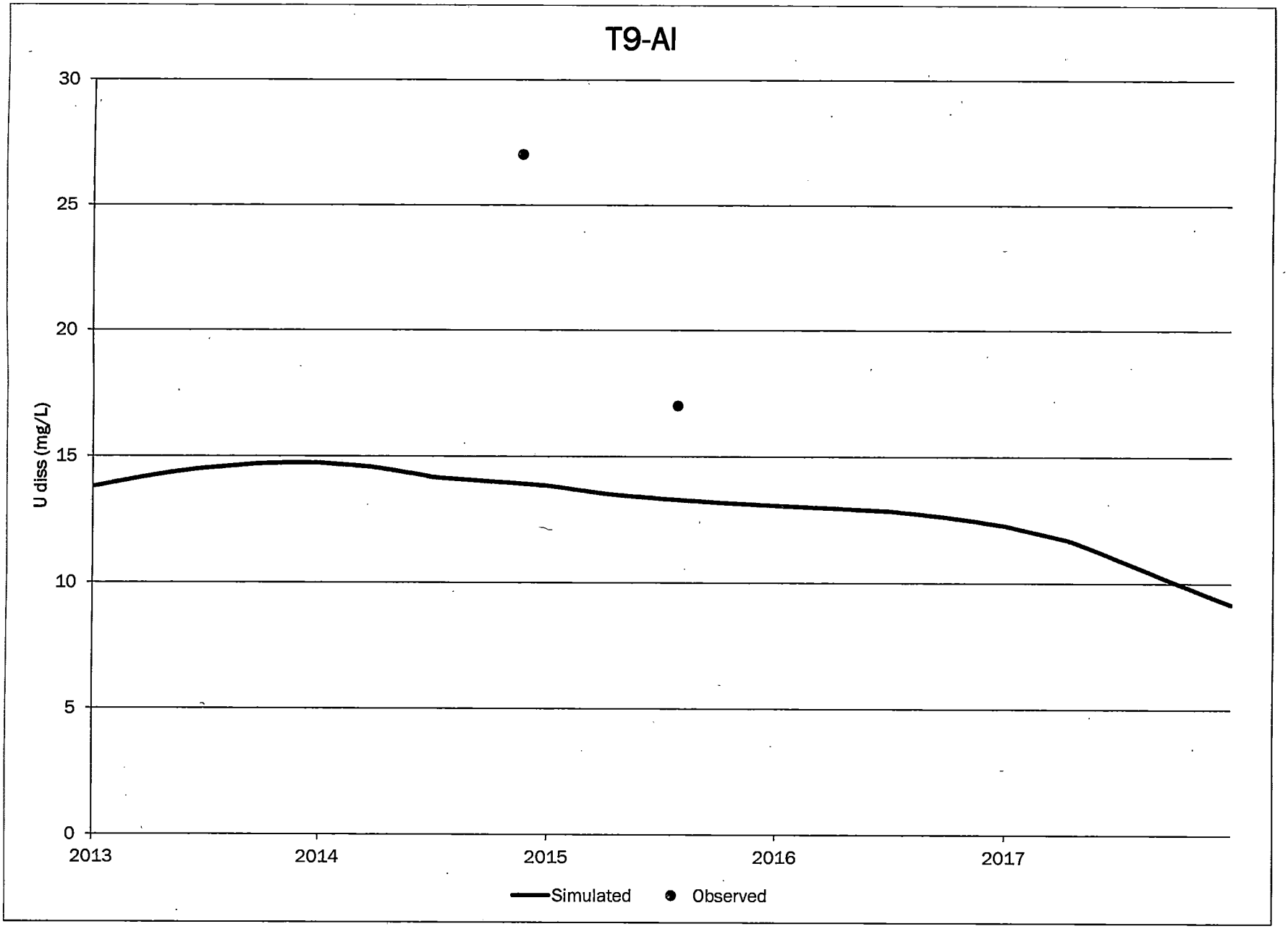

T4-AI
U diss (mg/L)
8
7
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

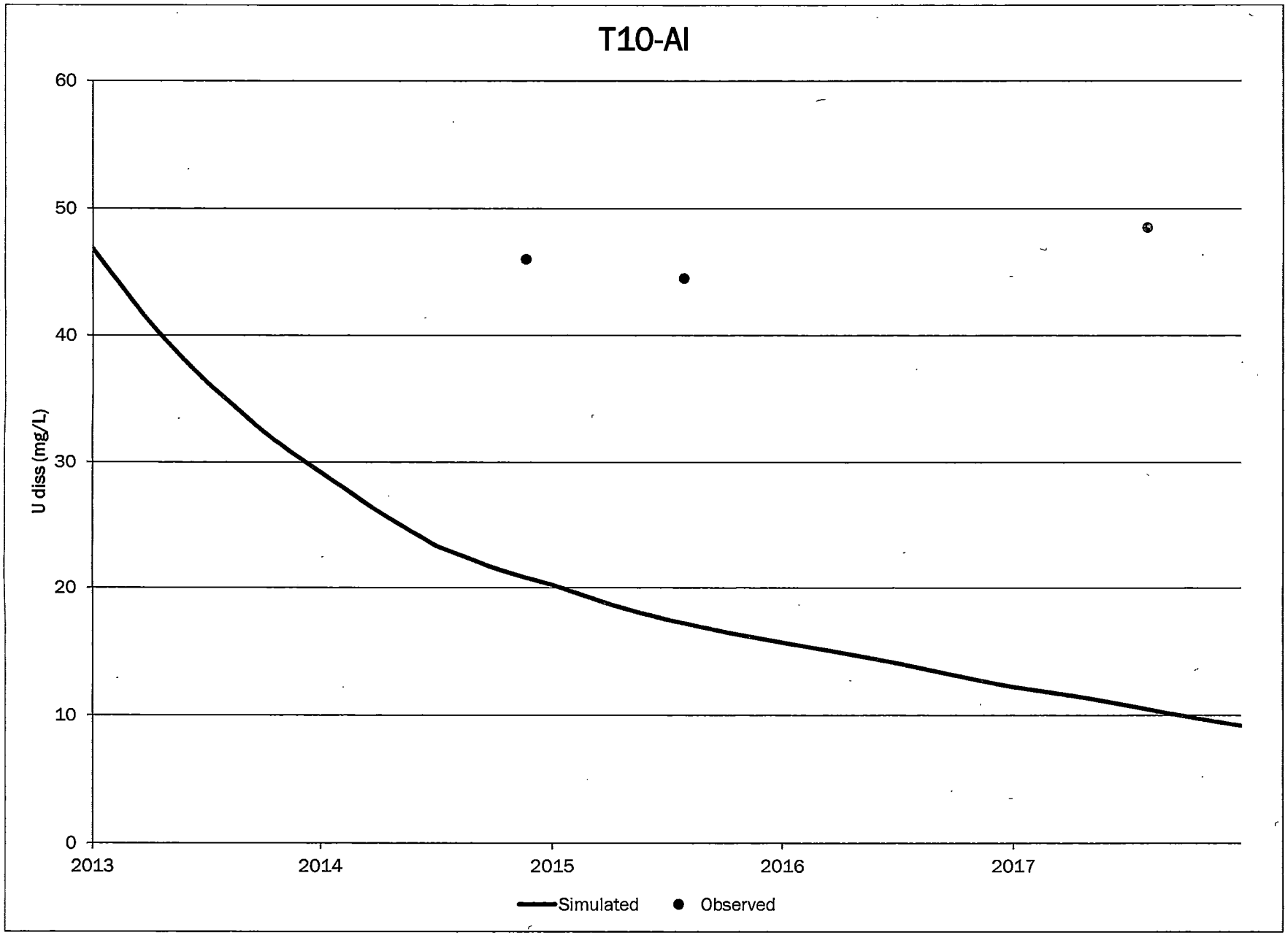

T5-AI
14
12
10
8
6
4
2
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

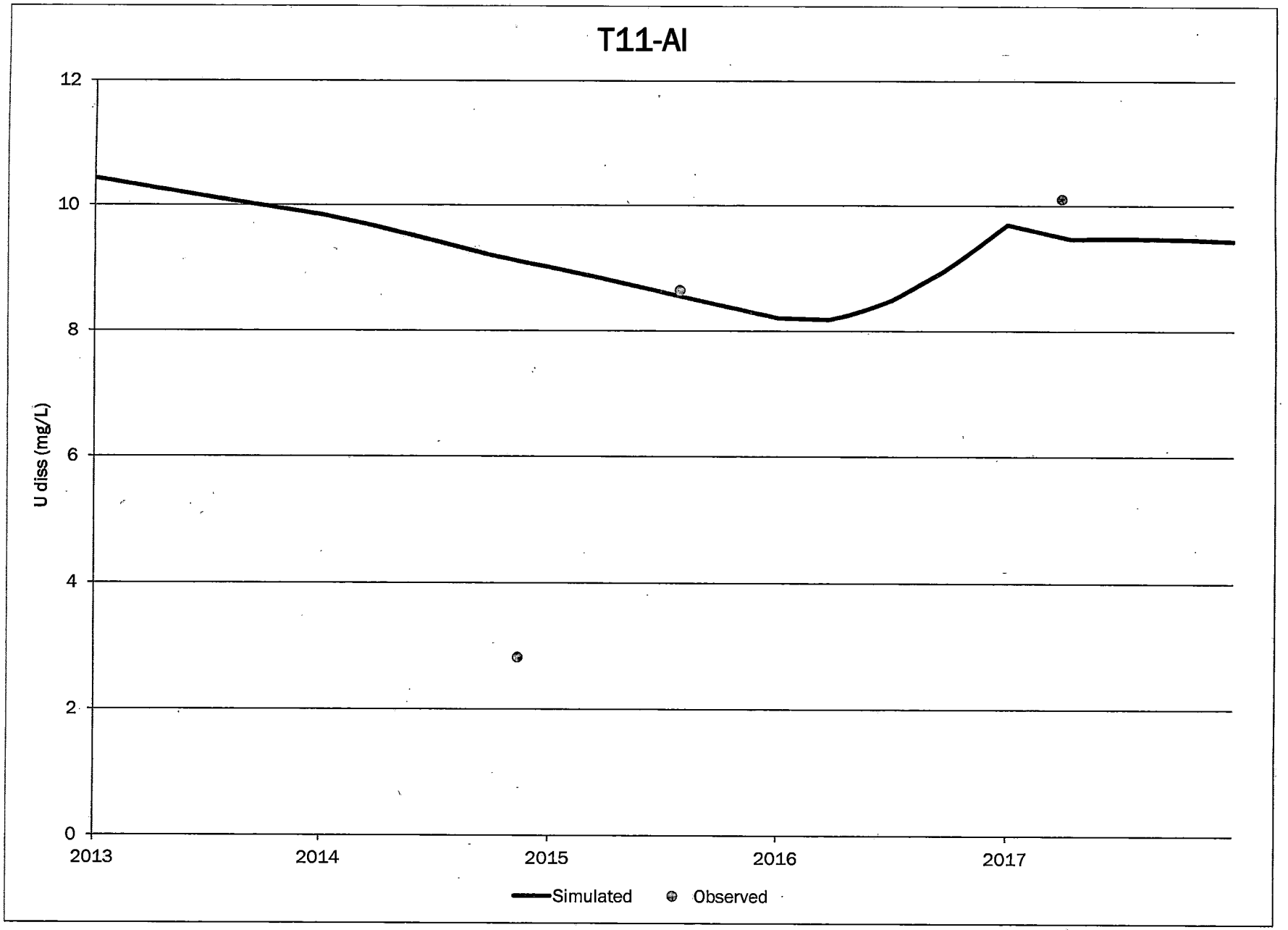

T6-AI
U diss (mg/L)
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

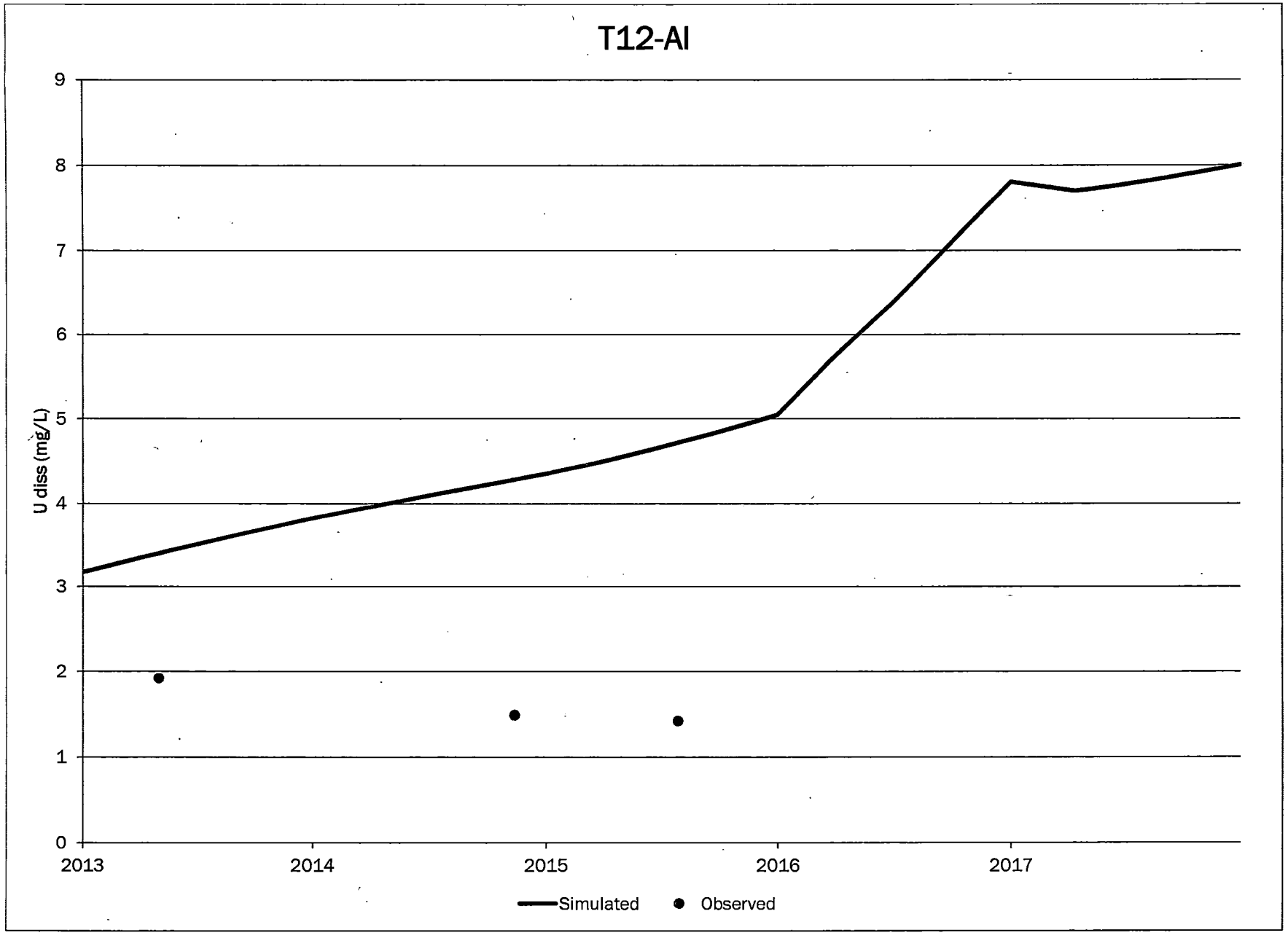

T7-AI
35
30
25
20
15
10
5
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

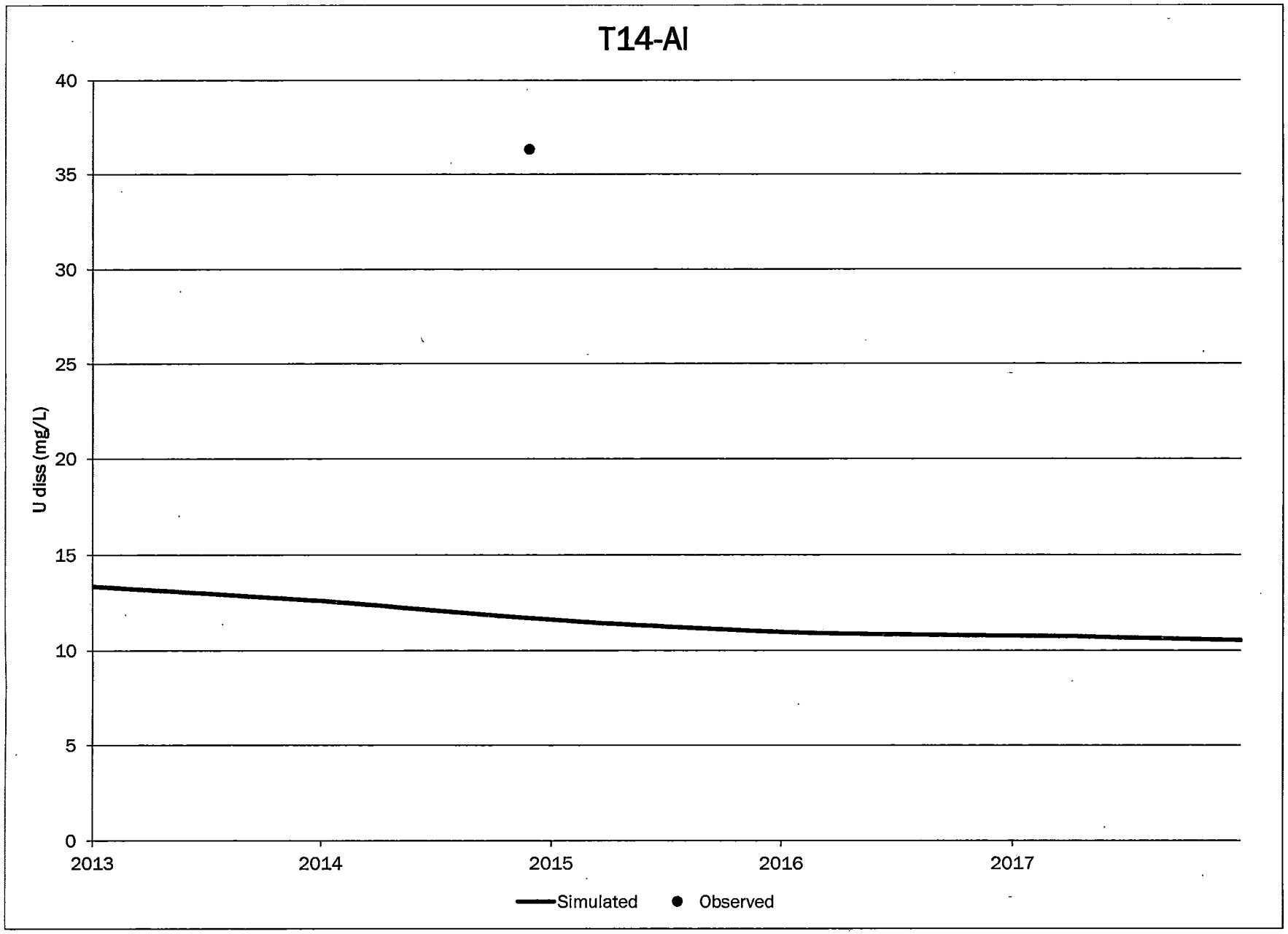

T8-AI
U diss (mg/L)
20
18
16
14
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

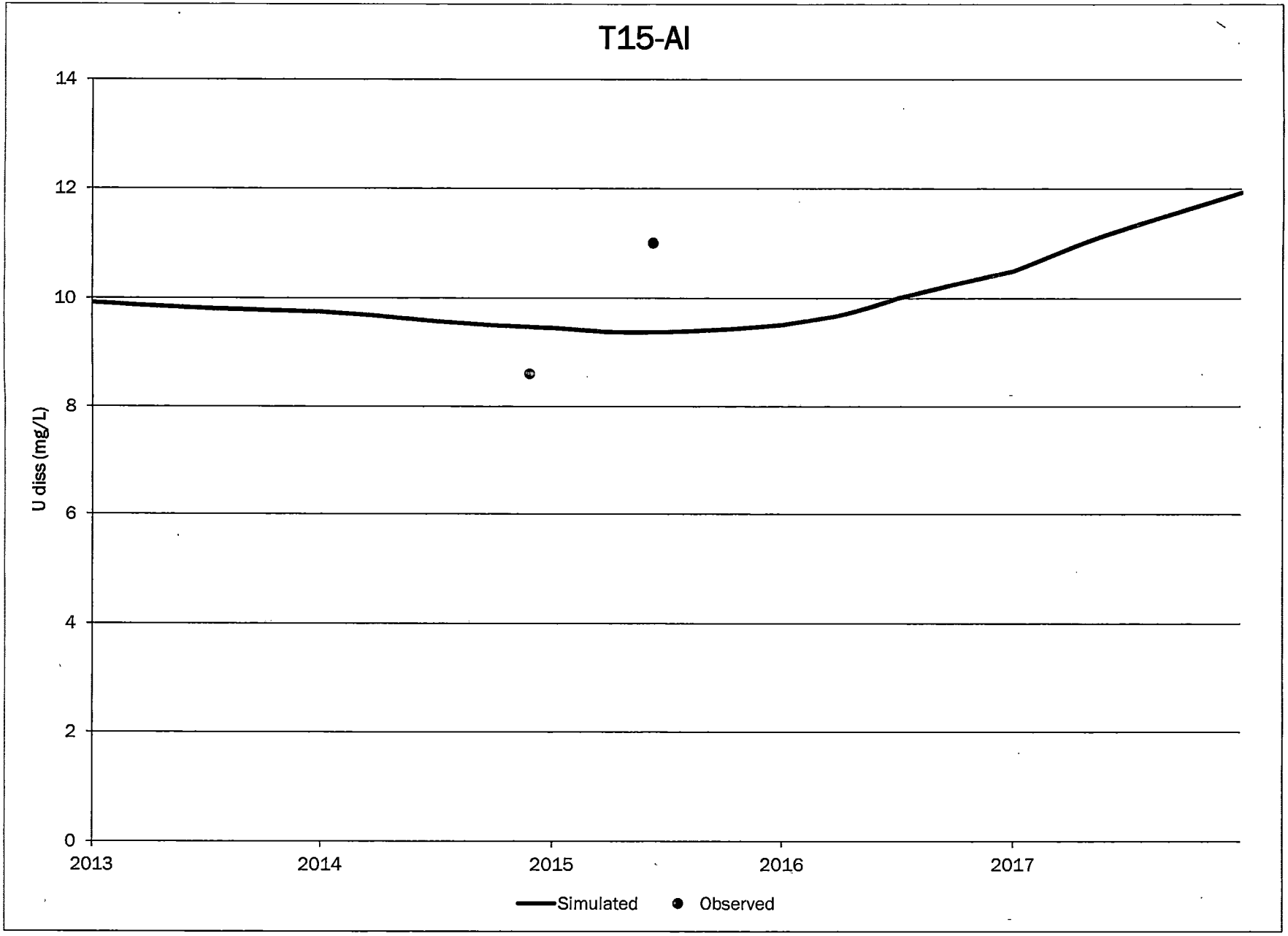

T9-AI
U diss (mg/L)
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

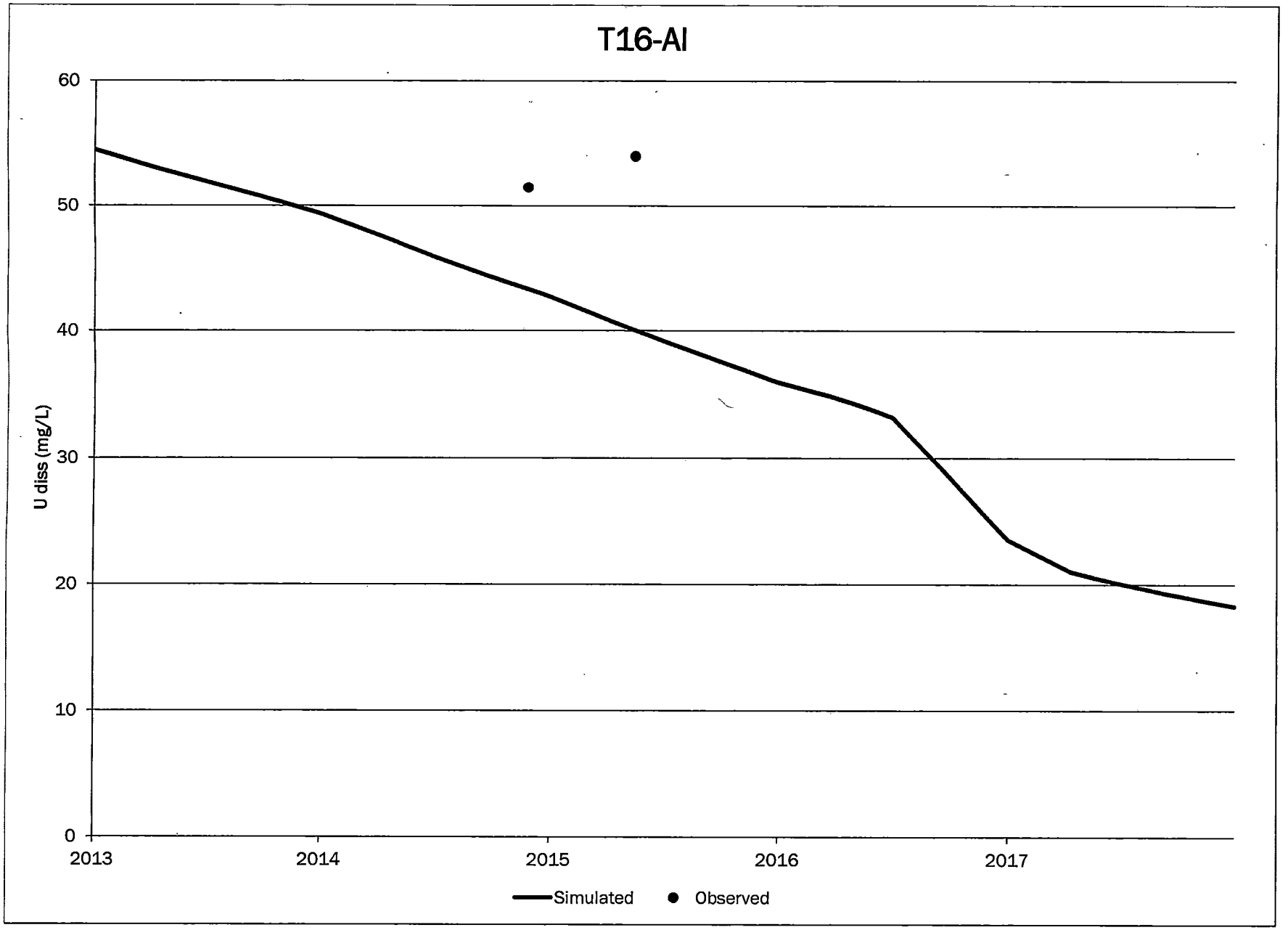

T10-AI
60
50
40
30
20
10
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

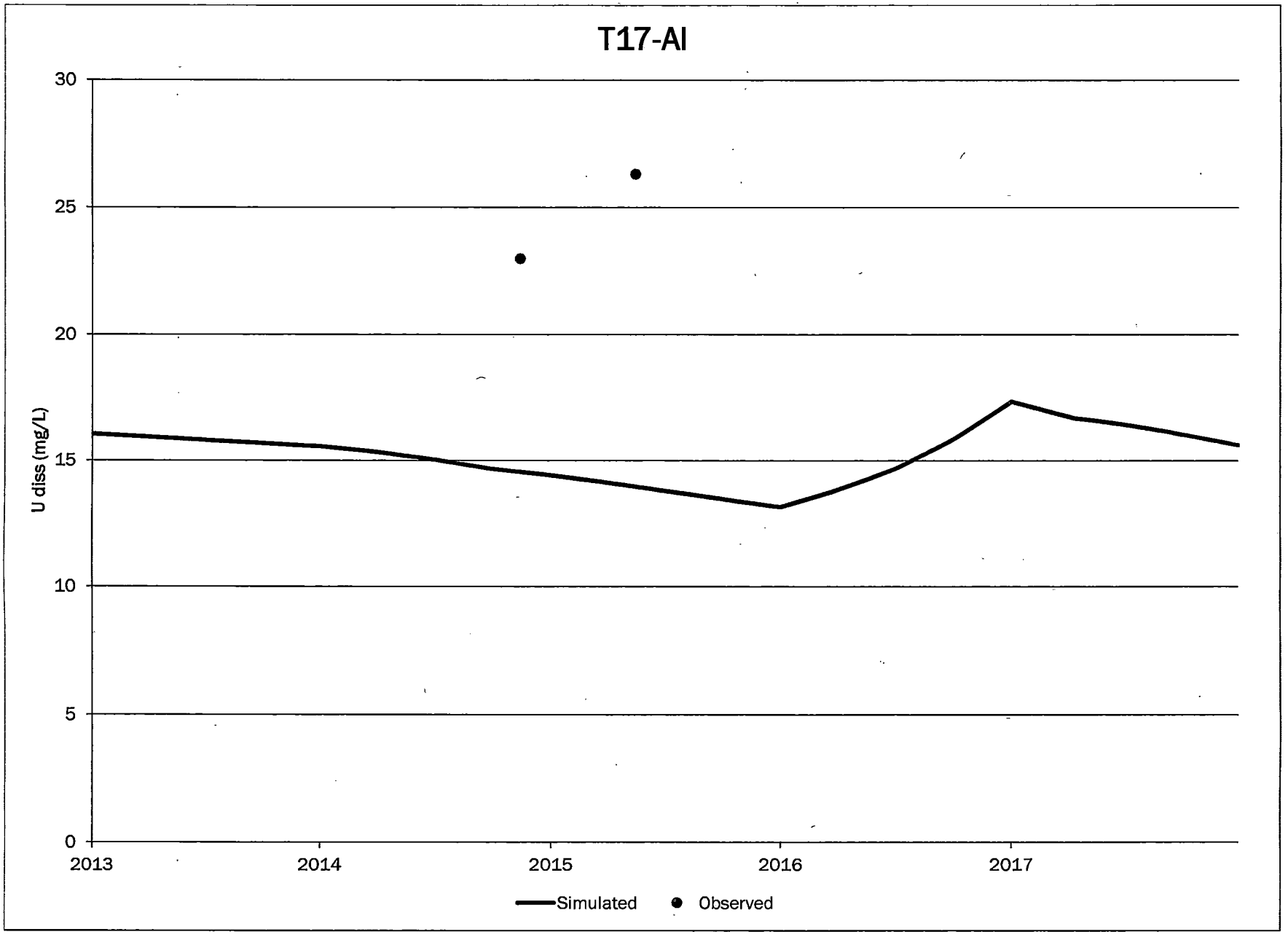

T11-AI
U diss (mg/L)
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

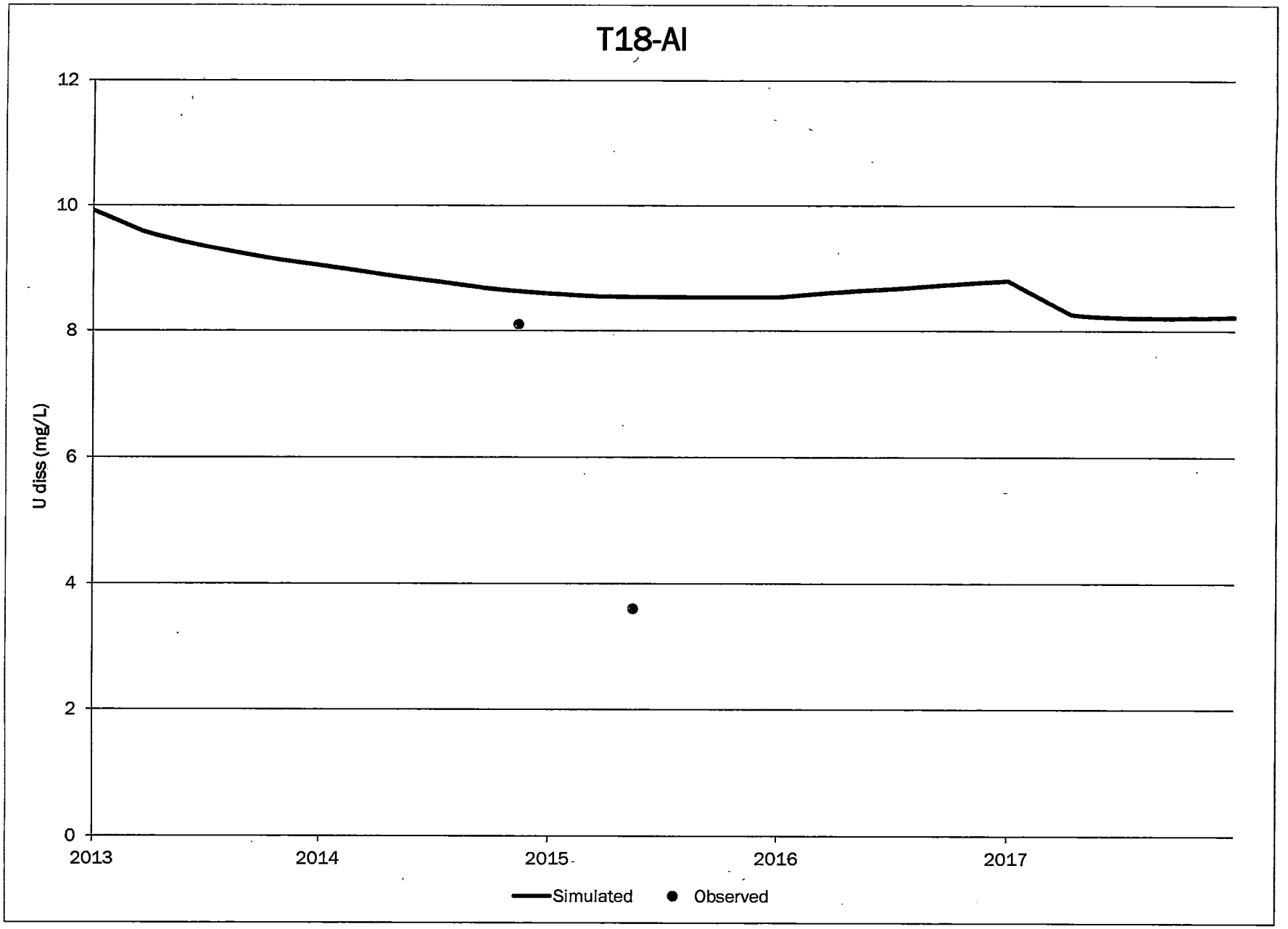

T12-AI
U diss (mg/L)
9
8
7
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

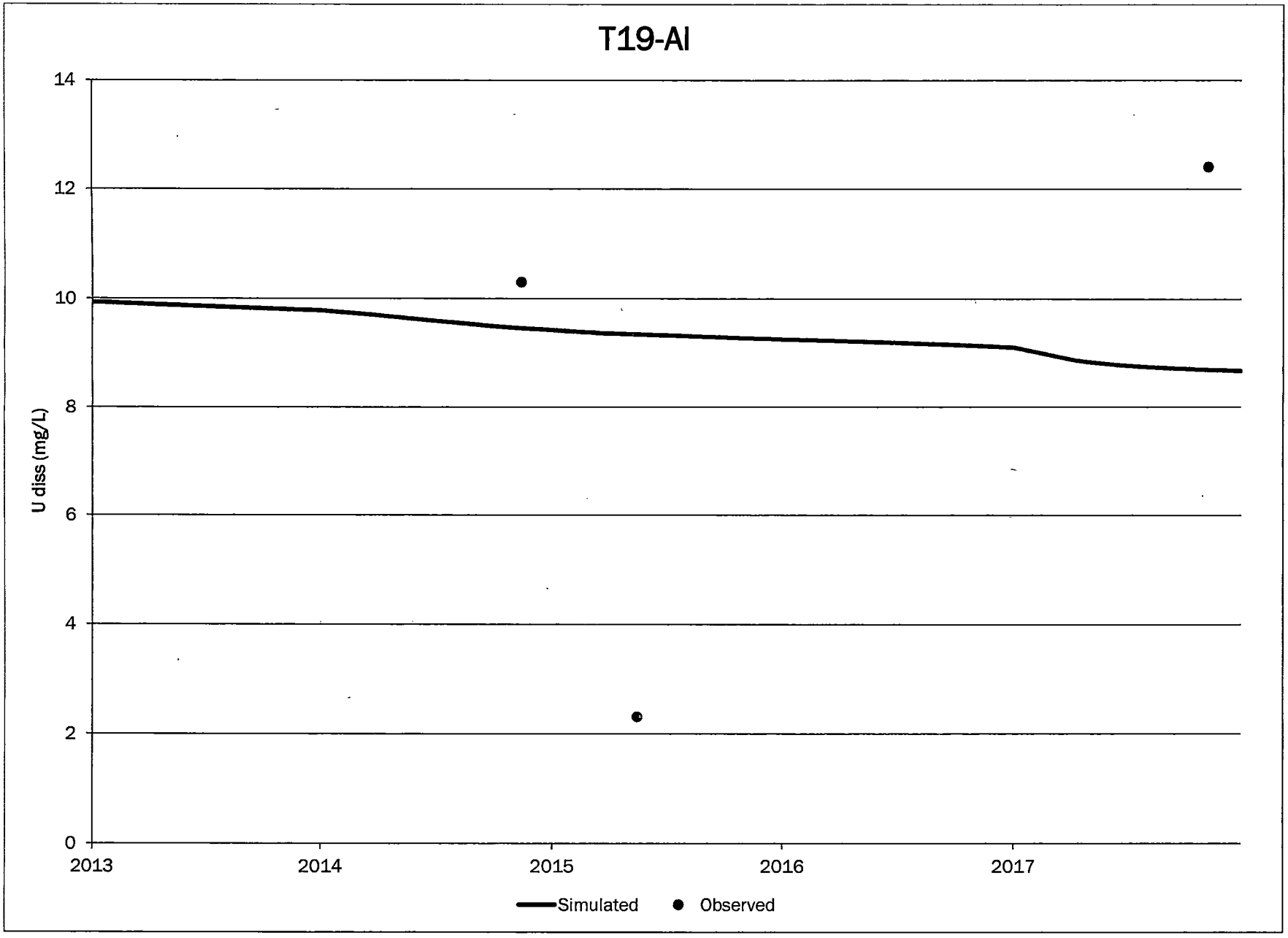

T14-AI
U diss (mg/L)
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

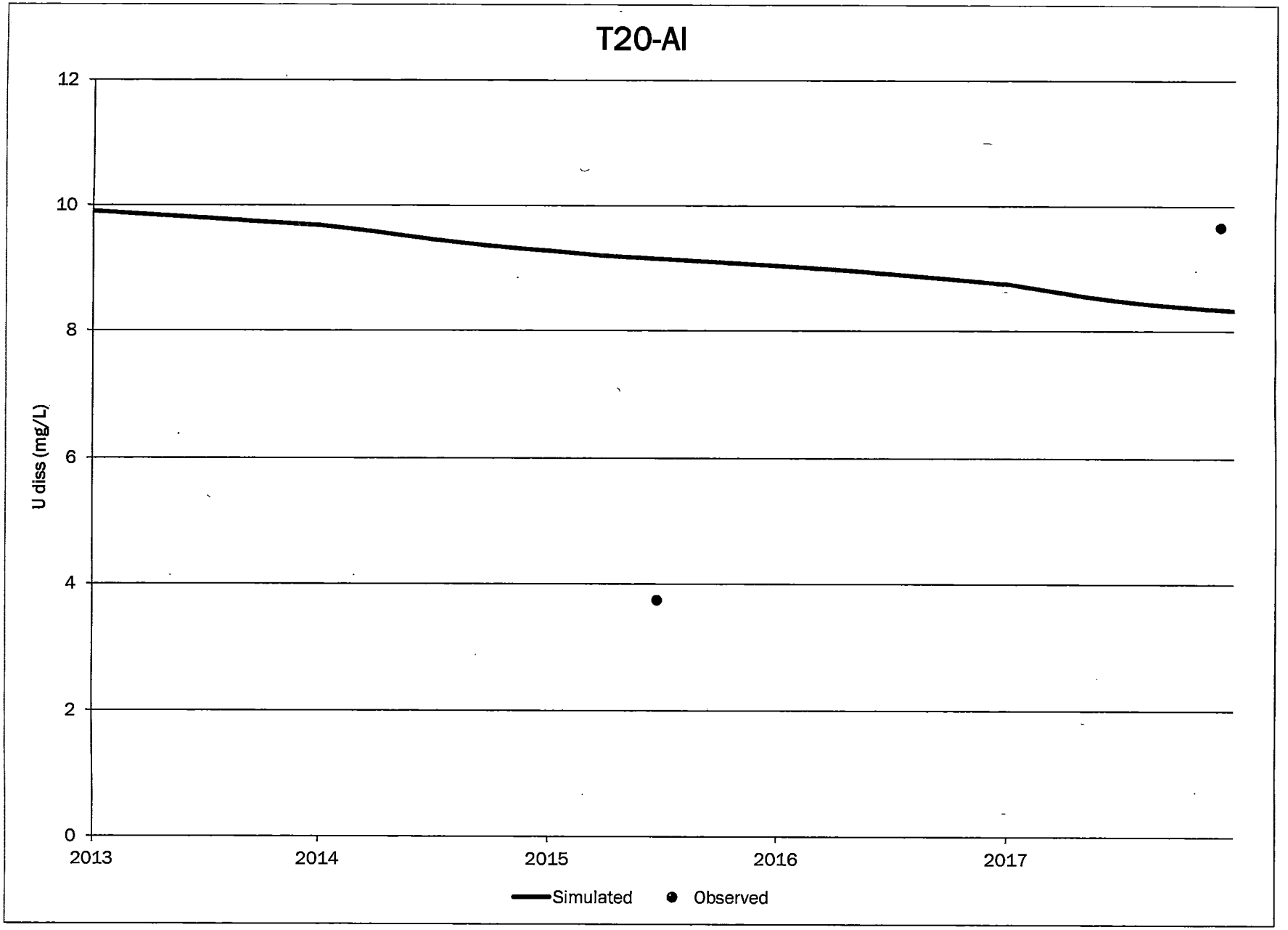

T15-AI
14
12
10
8
6
4
2
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

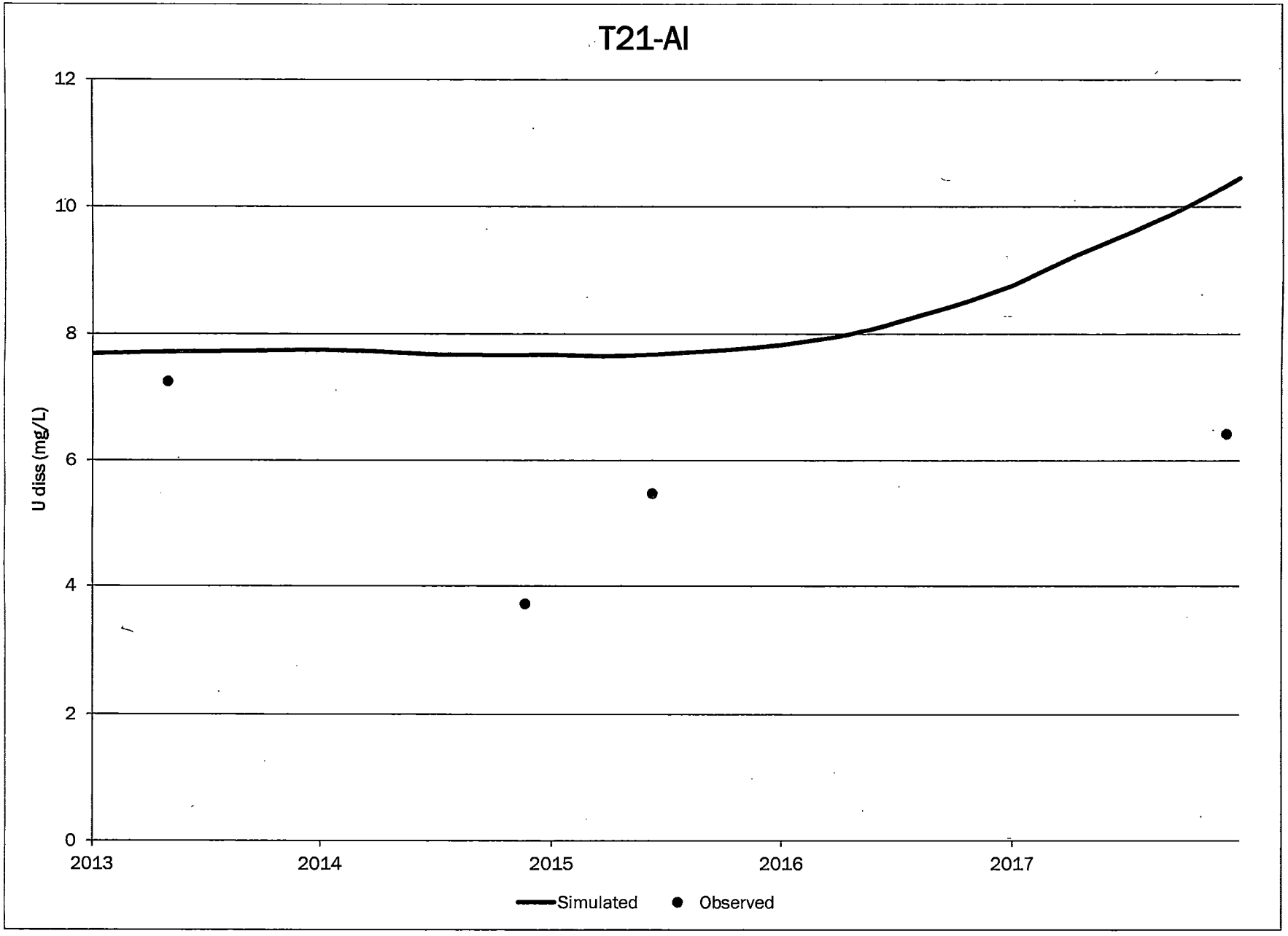

T16-AI
60
50
40
30
20
10
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

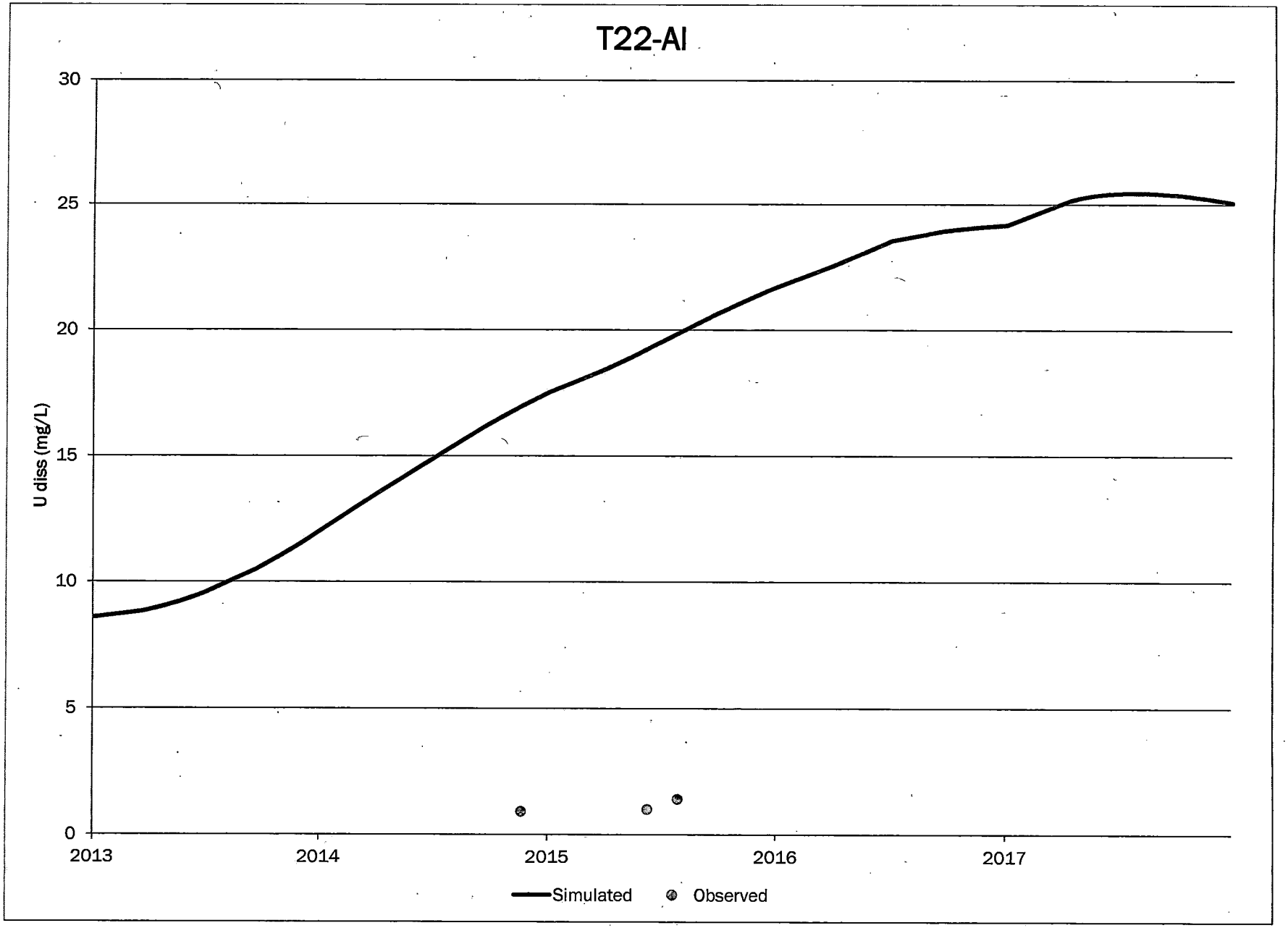

T17-AI
30
25
20
15
10
5
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

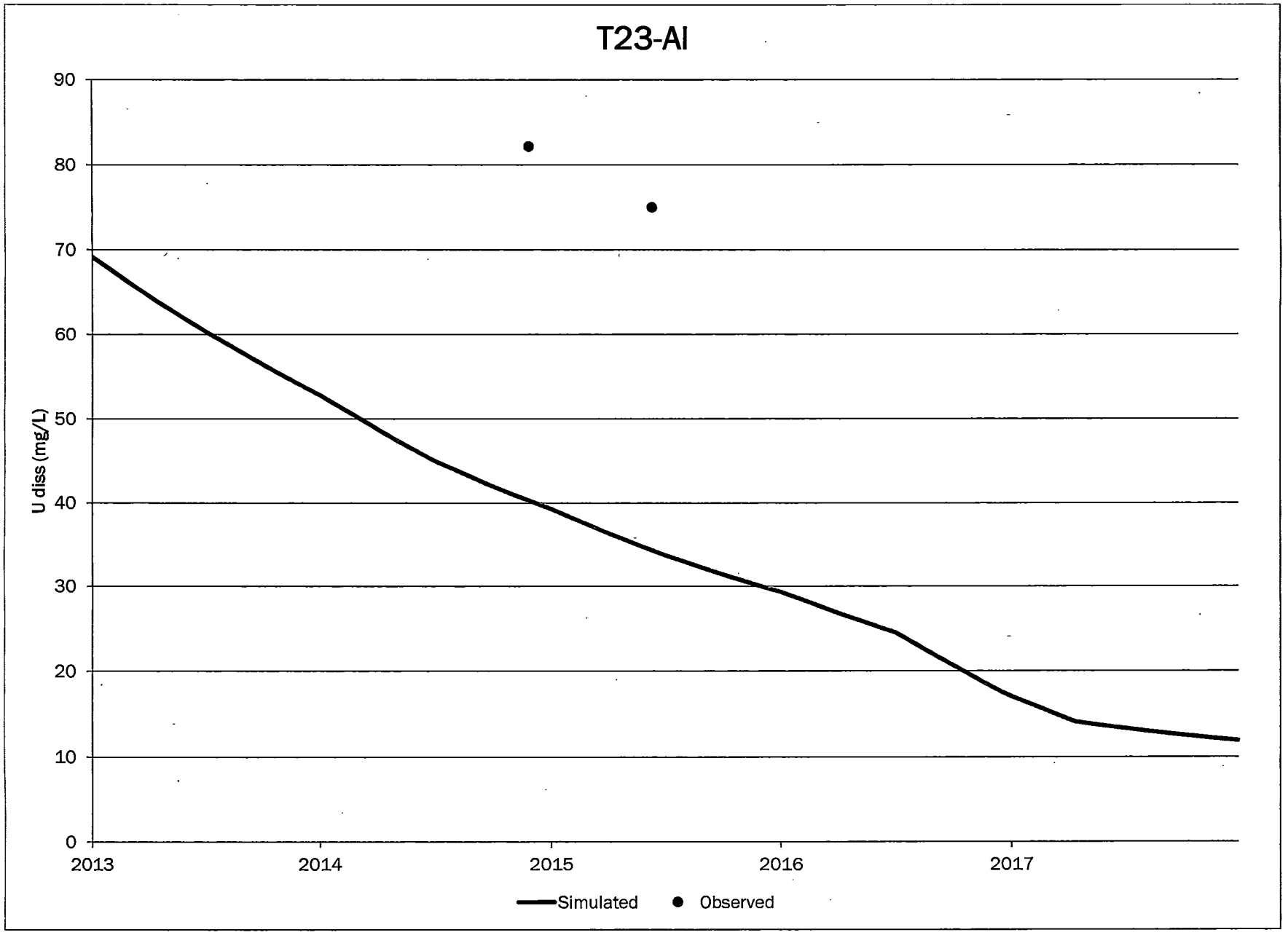

T18-AI
12
10
8
6
4
2
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

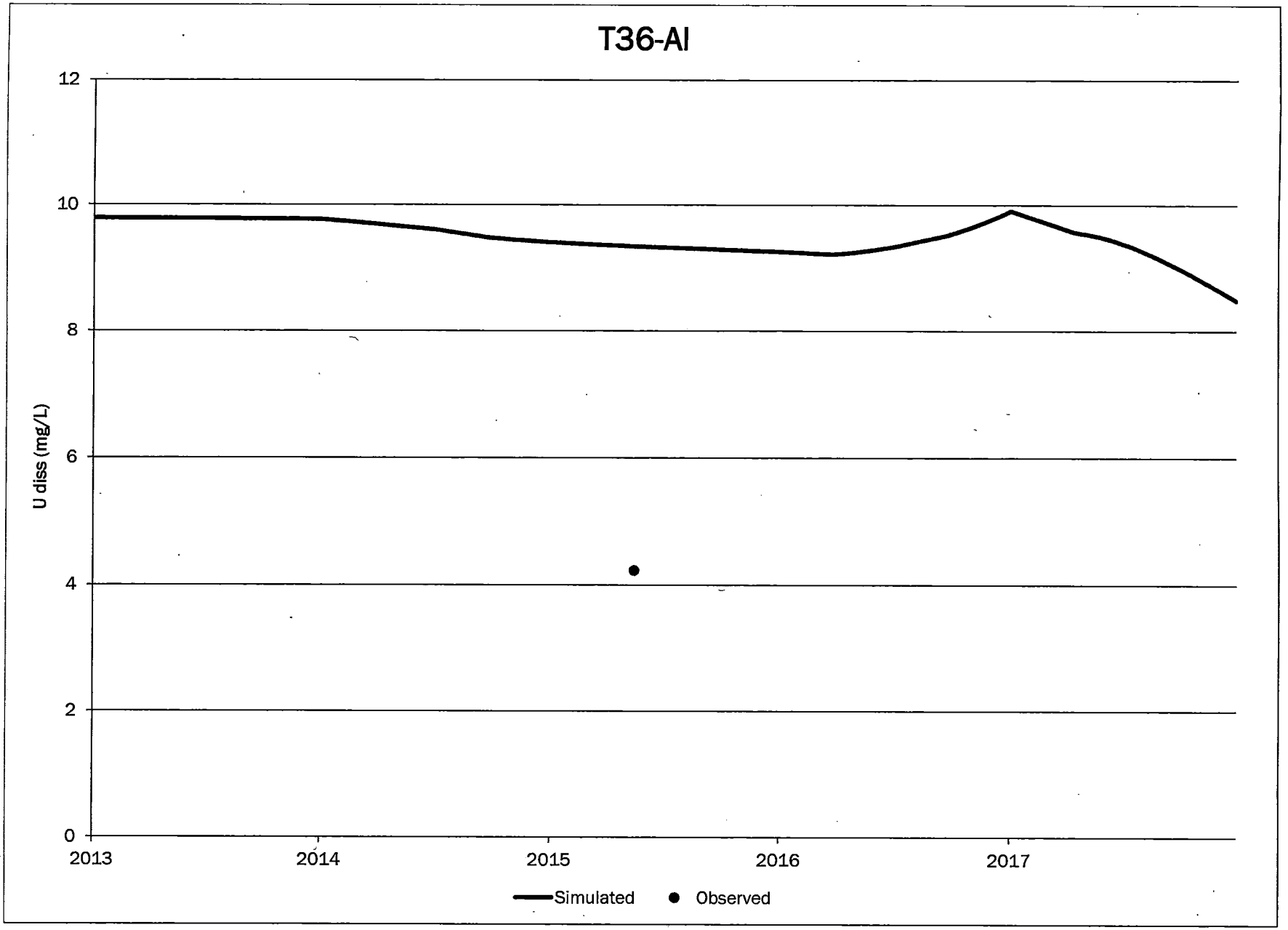

T19-AI
U diss (mg/L)
14
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

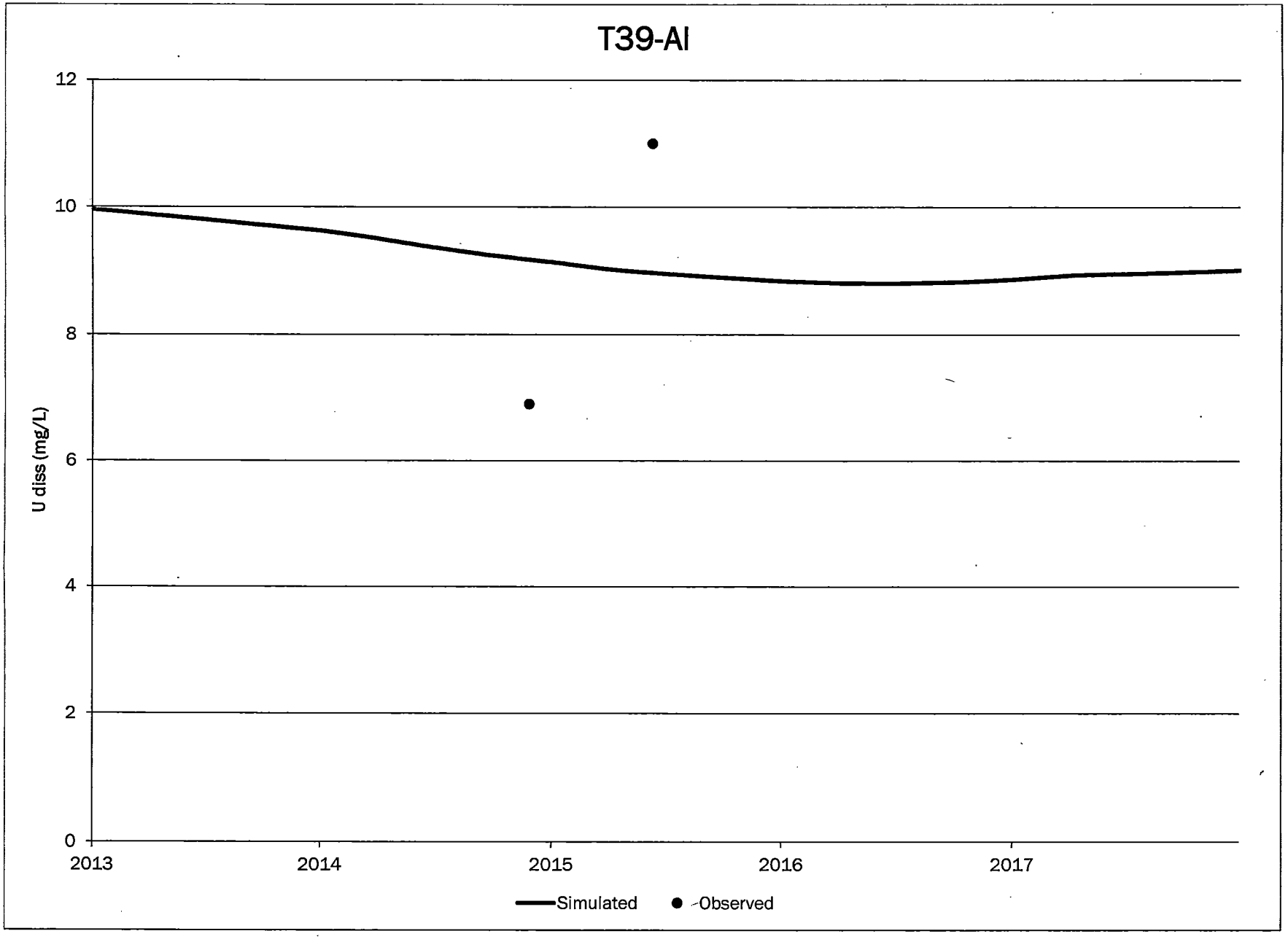

T20-AI
12
10
8
6
4
2
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

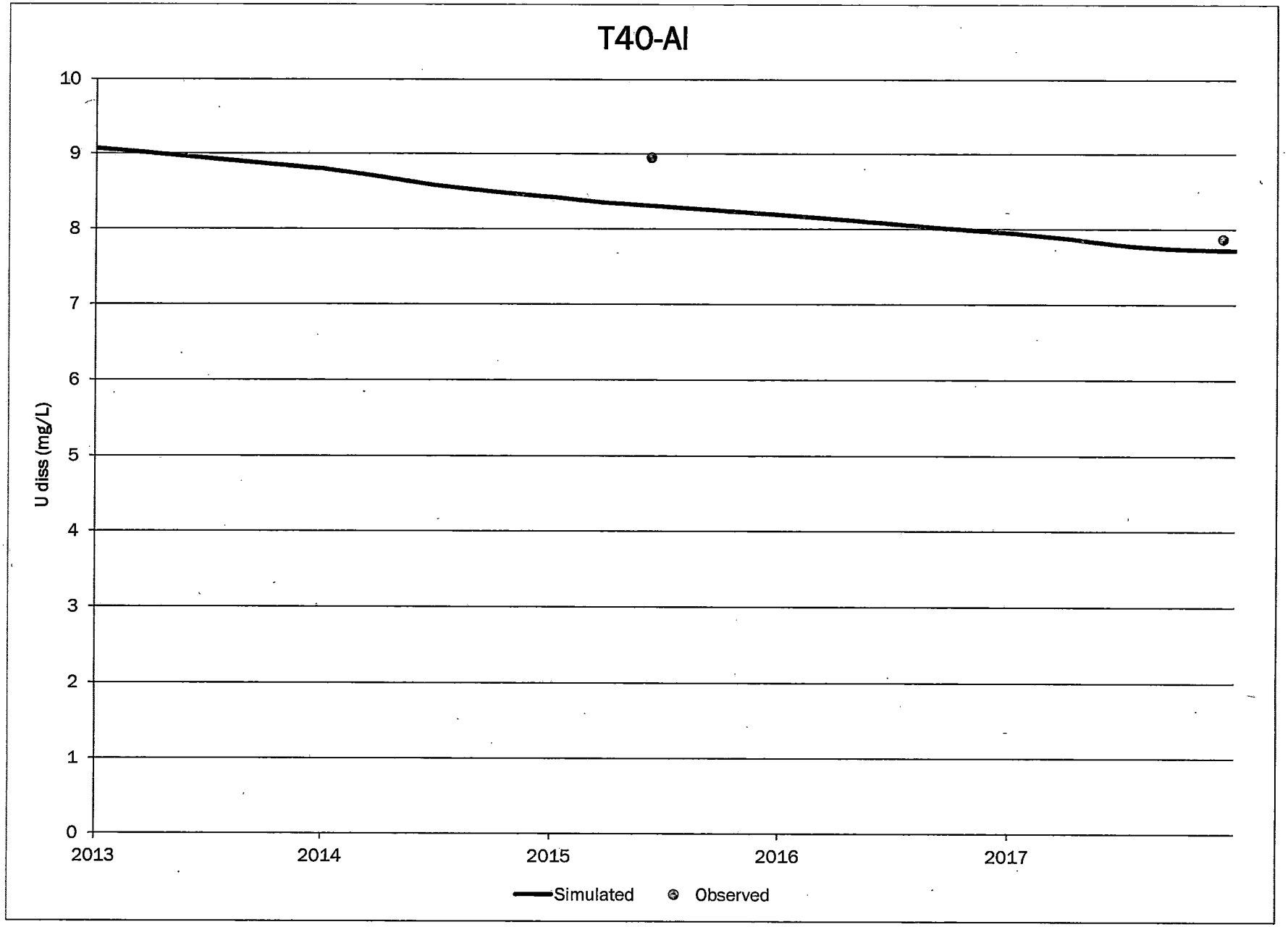

T21-AI
U diss (mg/L)
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

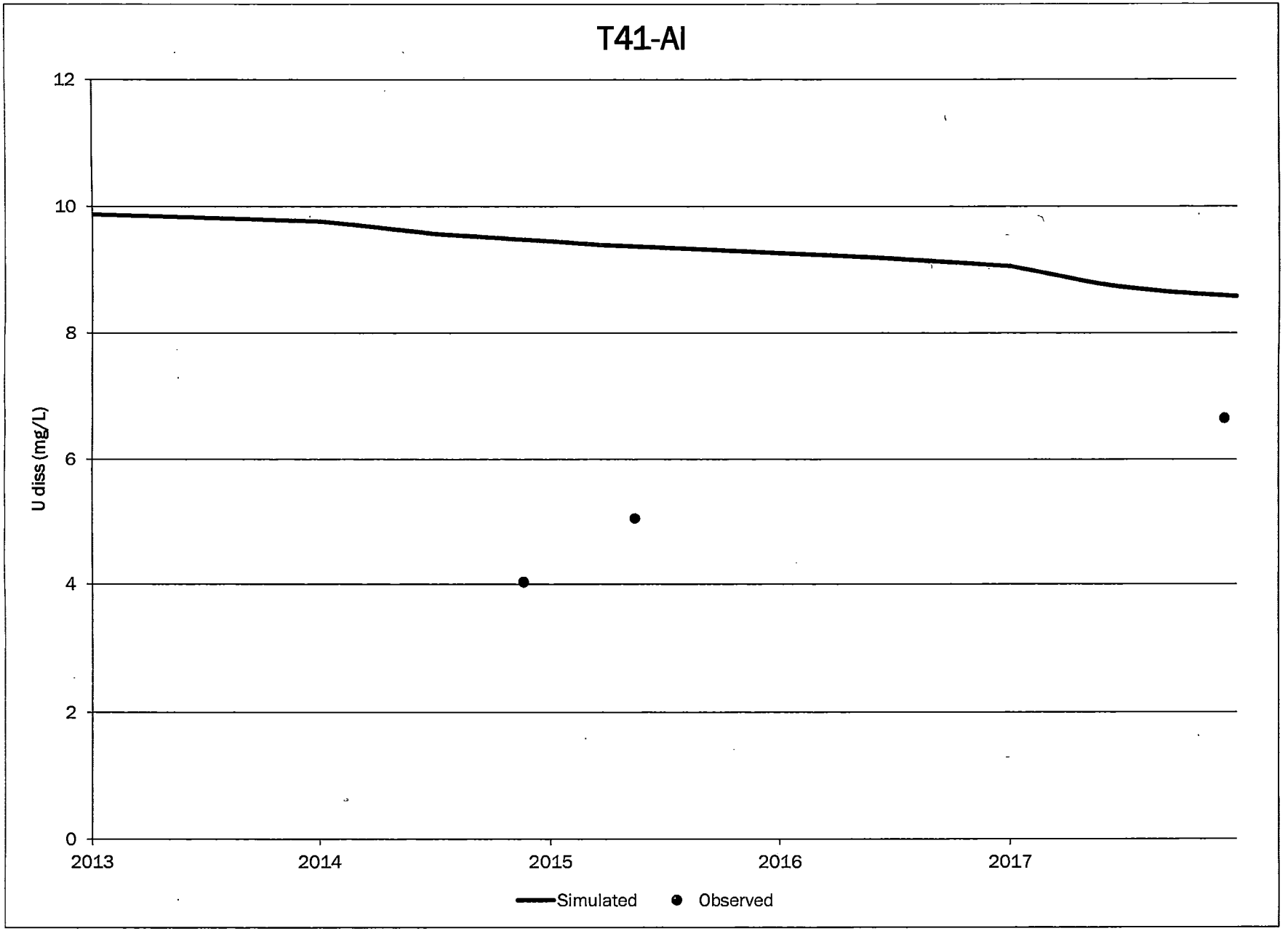

T22-AI
U diss (mg/L)
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

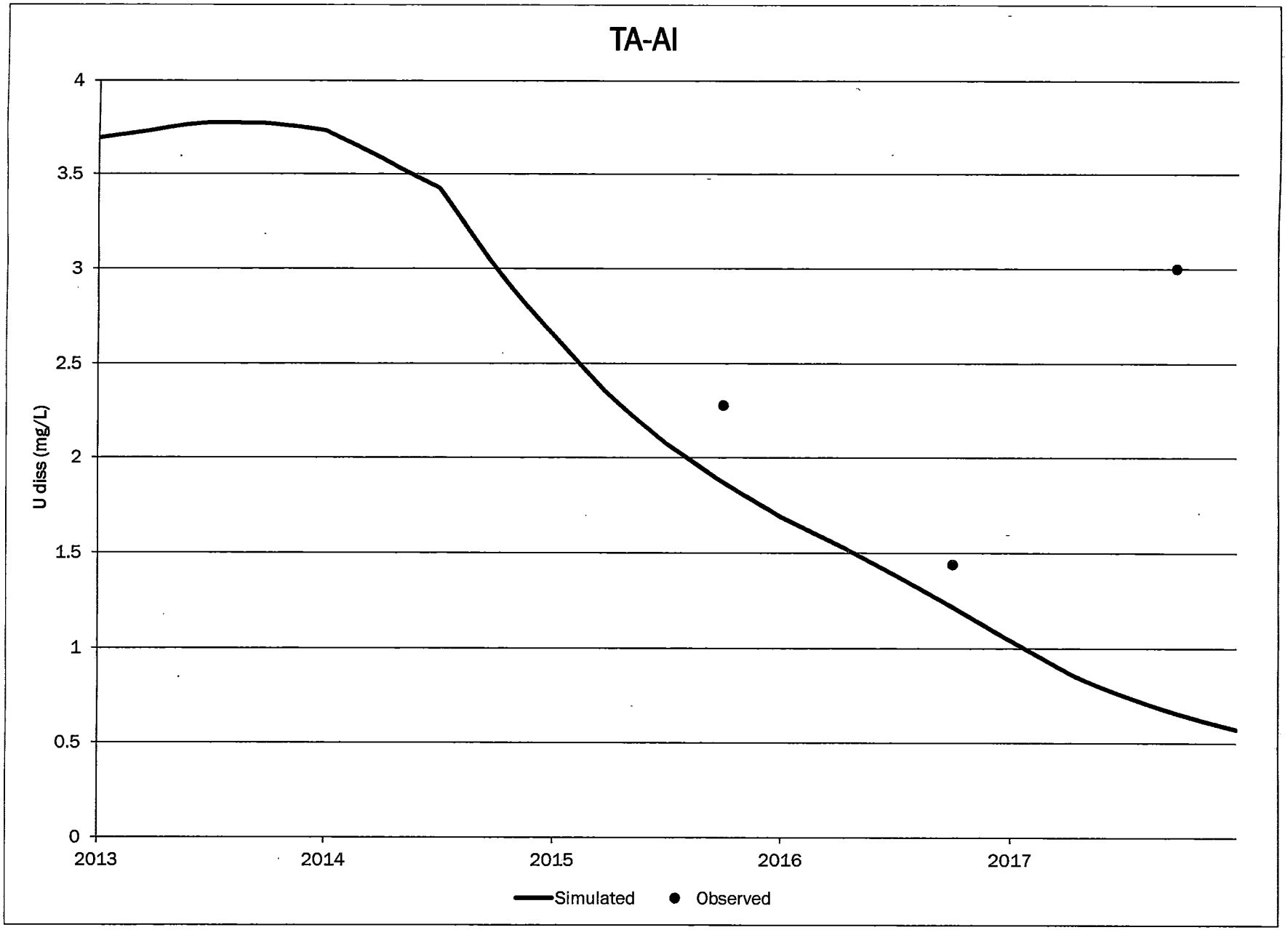

T23-AI
U diss (mg/L)
90
80
70
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
Simulated
Observed

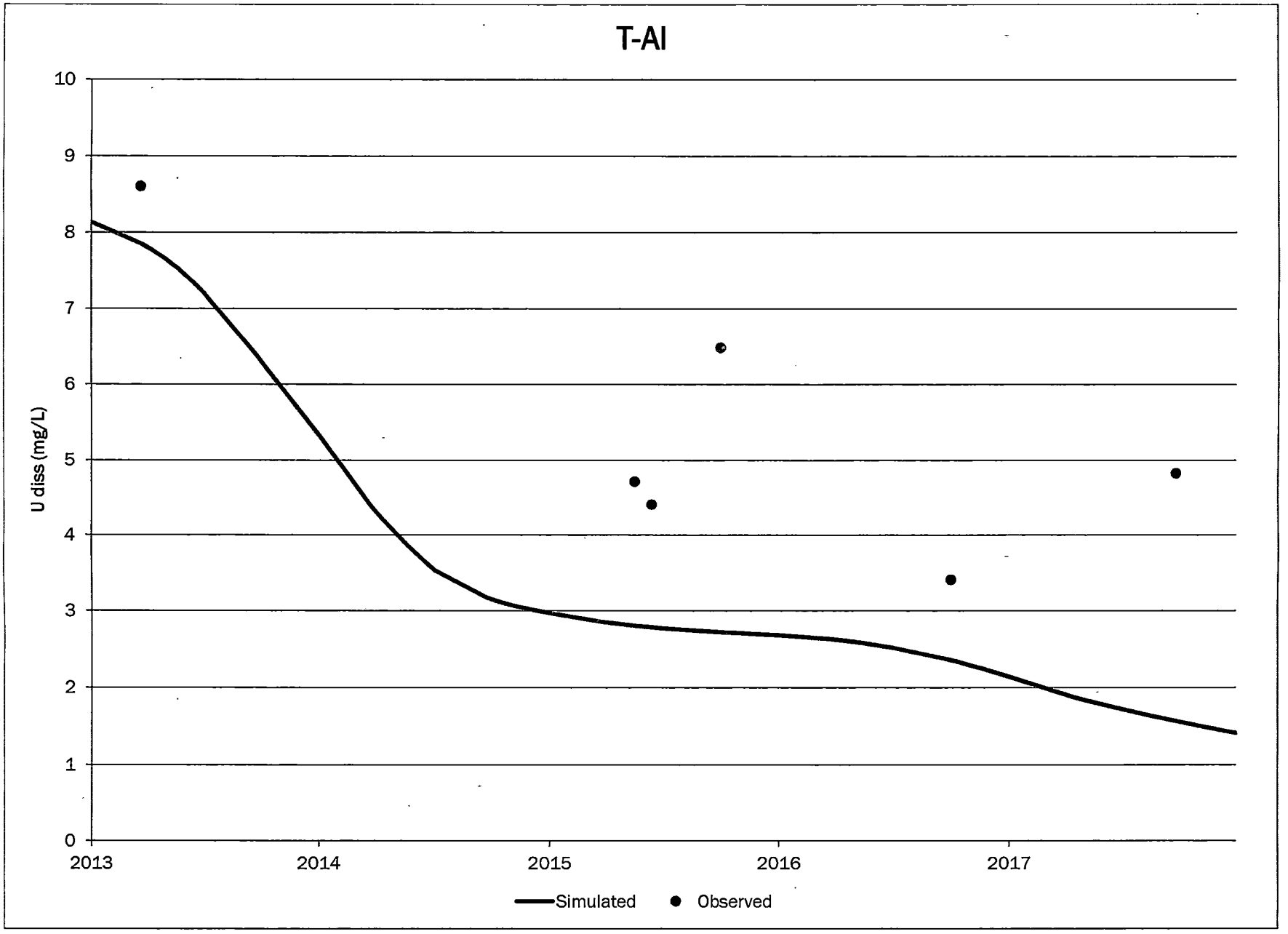

T36-AI
12
10
8
6
4
2
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

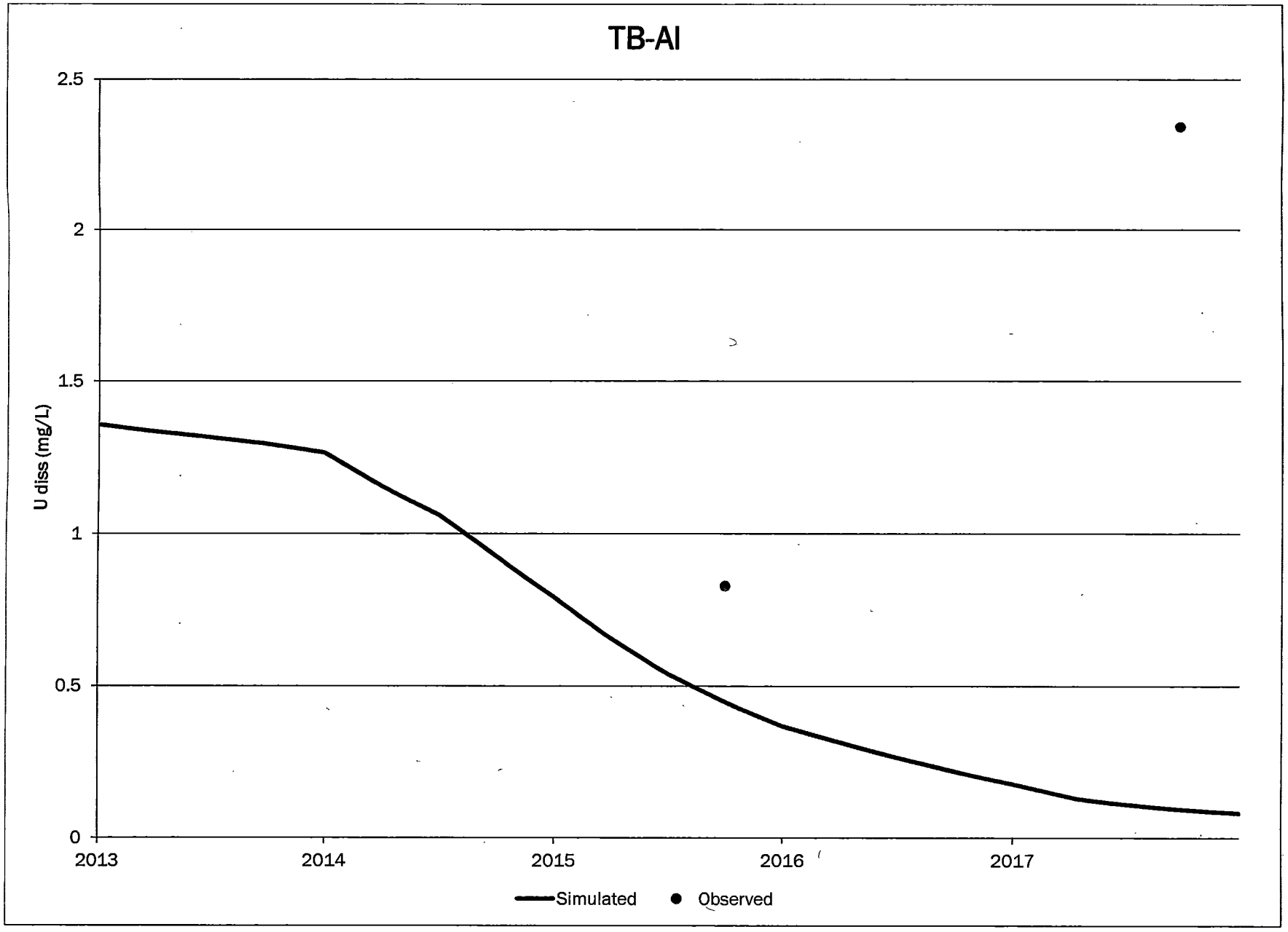

T39-AI
U diss (mg/L)
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

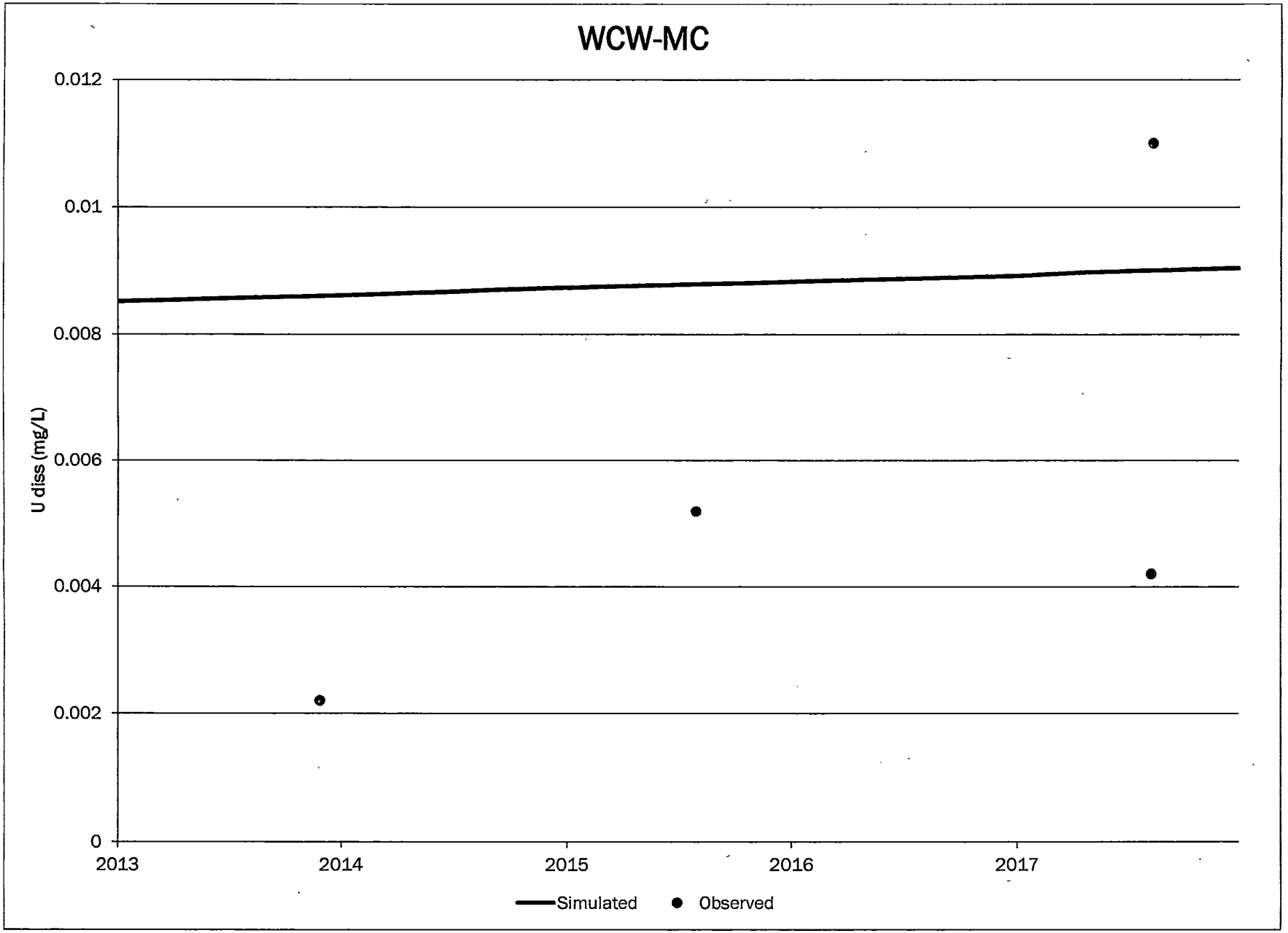

T40-AI
U diss (mg/L)
10
9
8
7
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

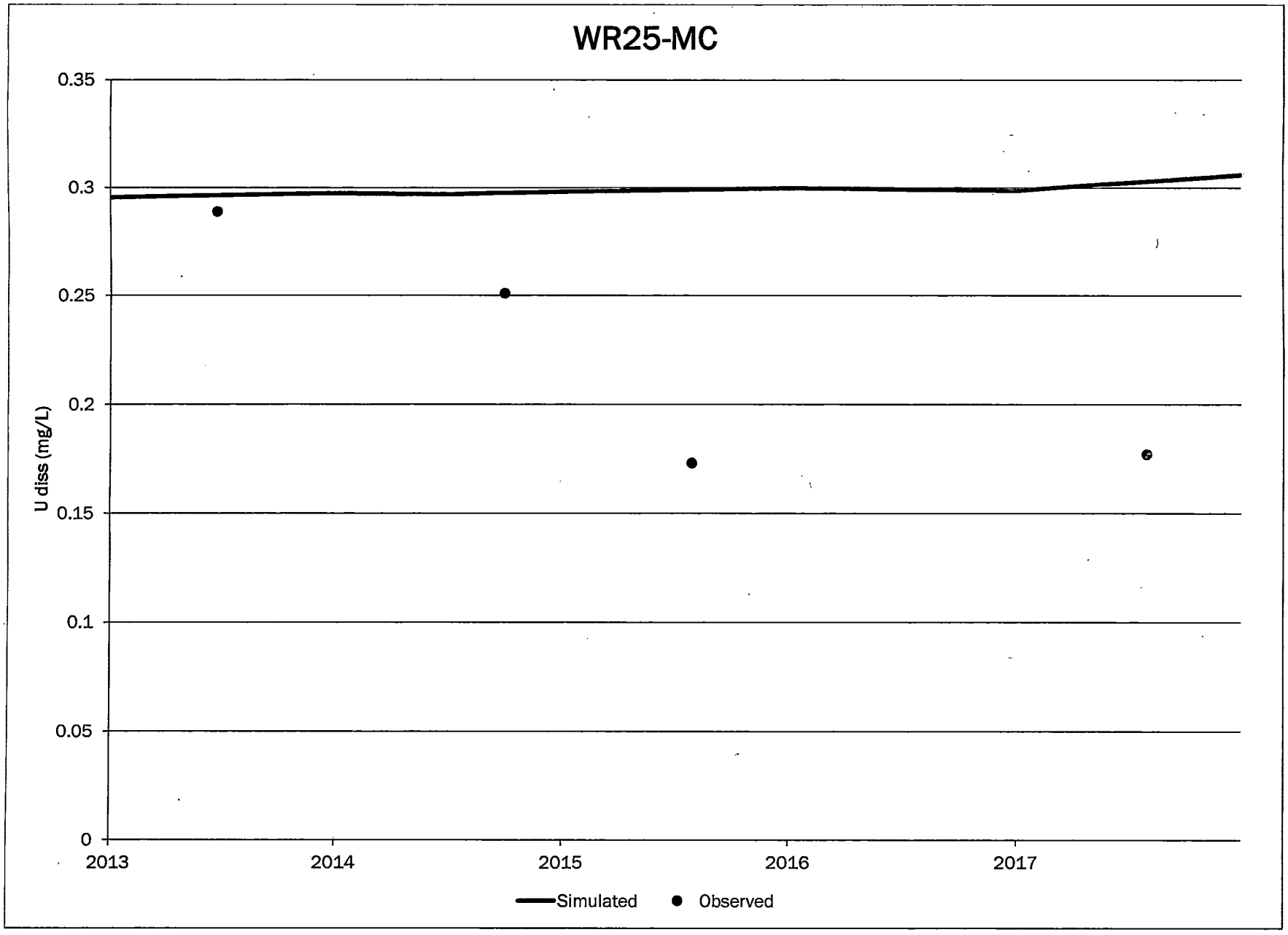

T41-AI
U diss (mg/L)
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

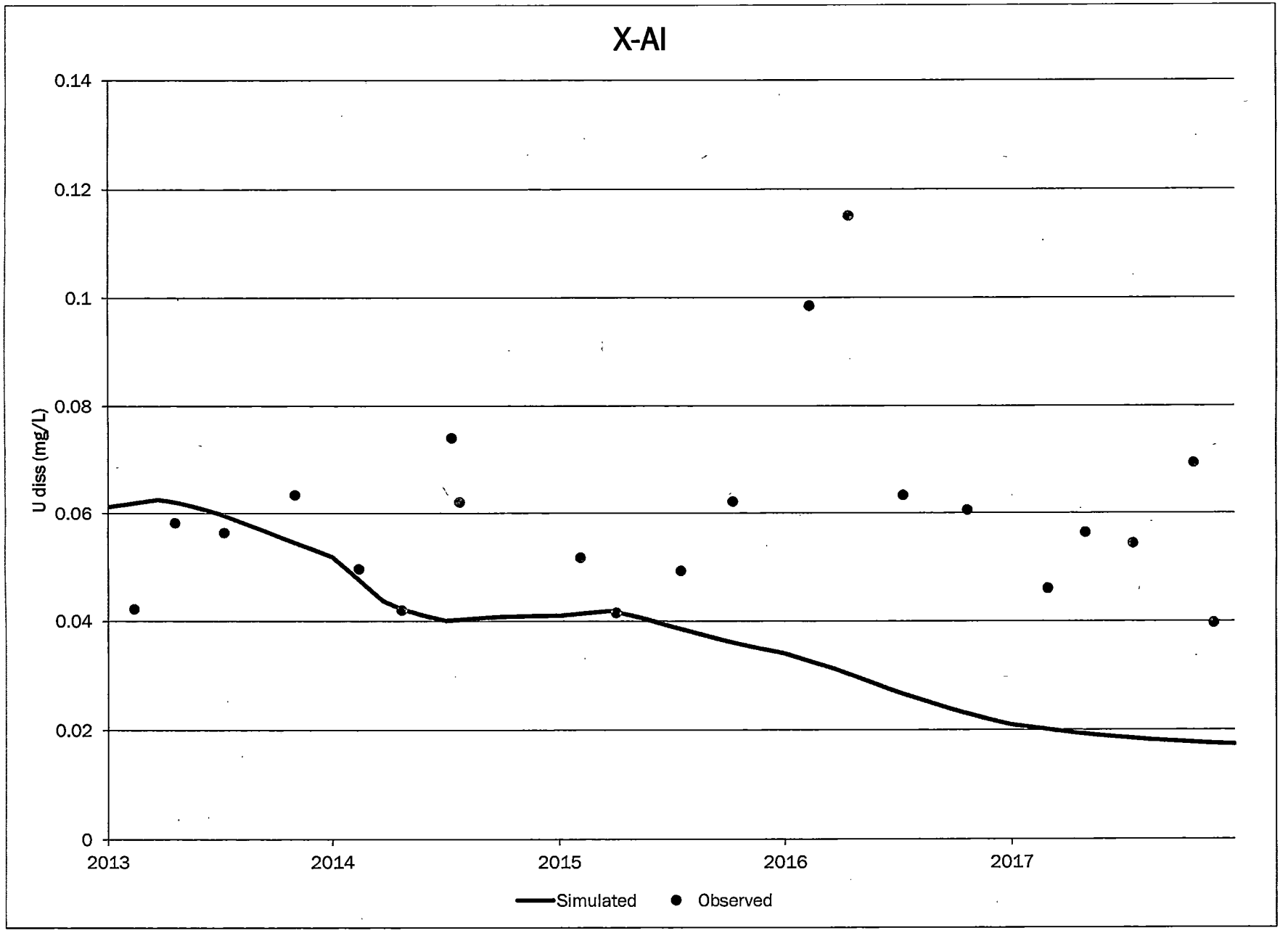

TA-AI
U diss (mg/L)
4
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

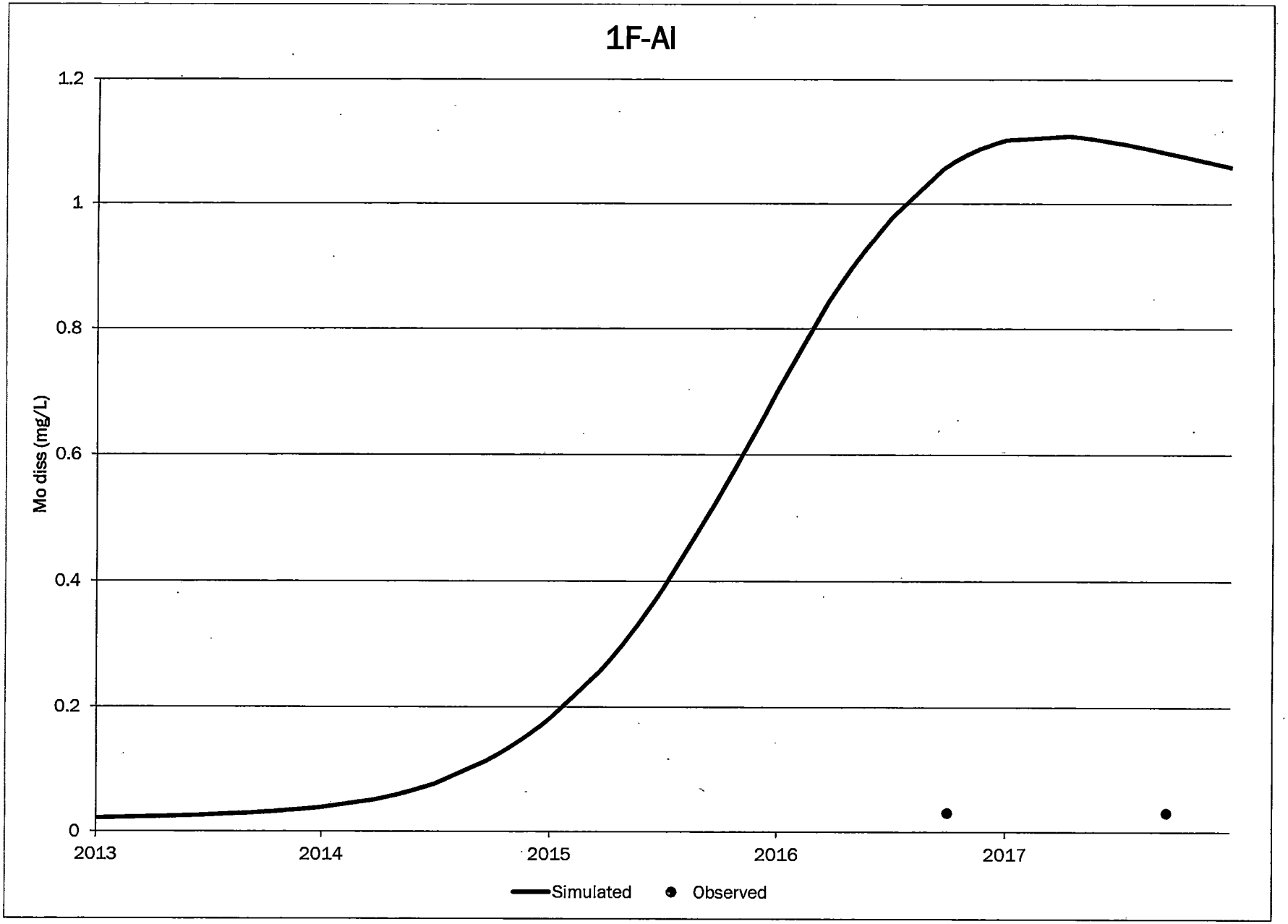

T-Al
U diss (mg/L)
10
9
8
7
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

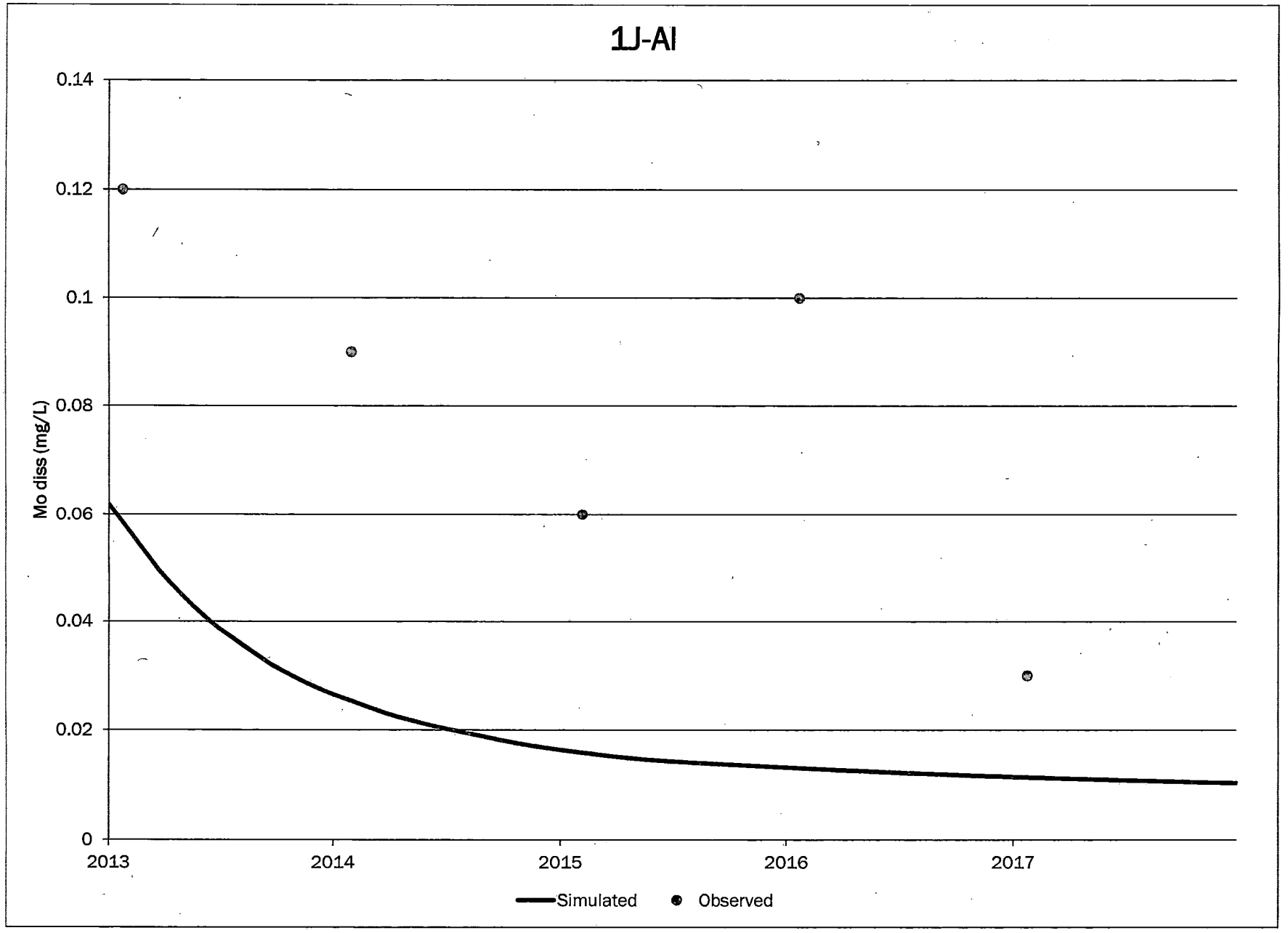

TB-AI
2.5
2
1.5
1
0.5
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

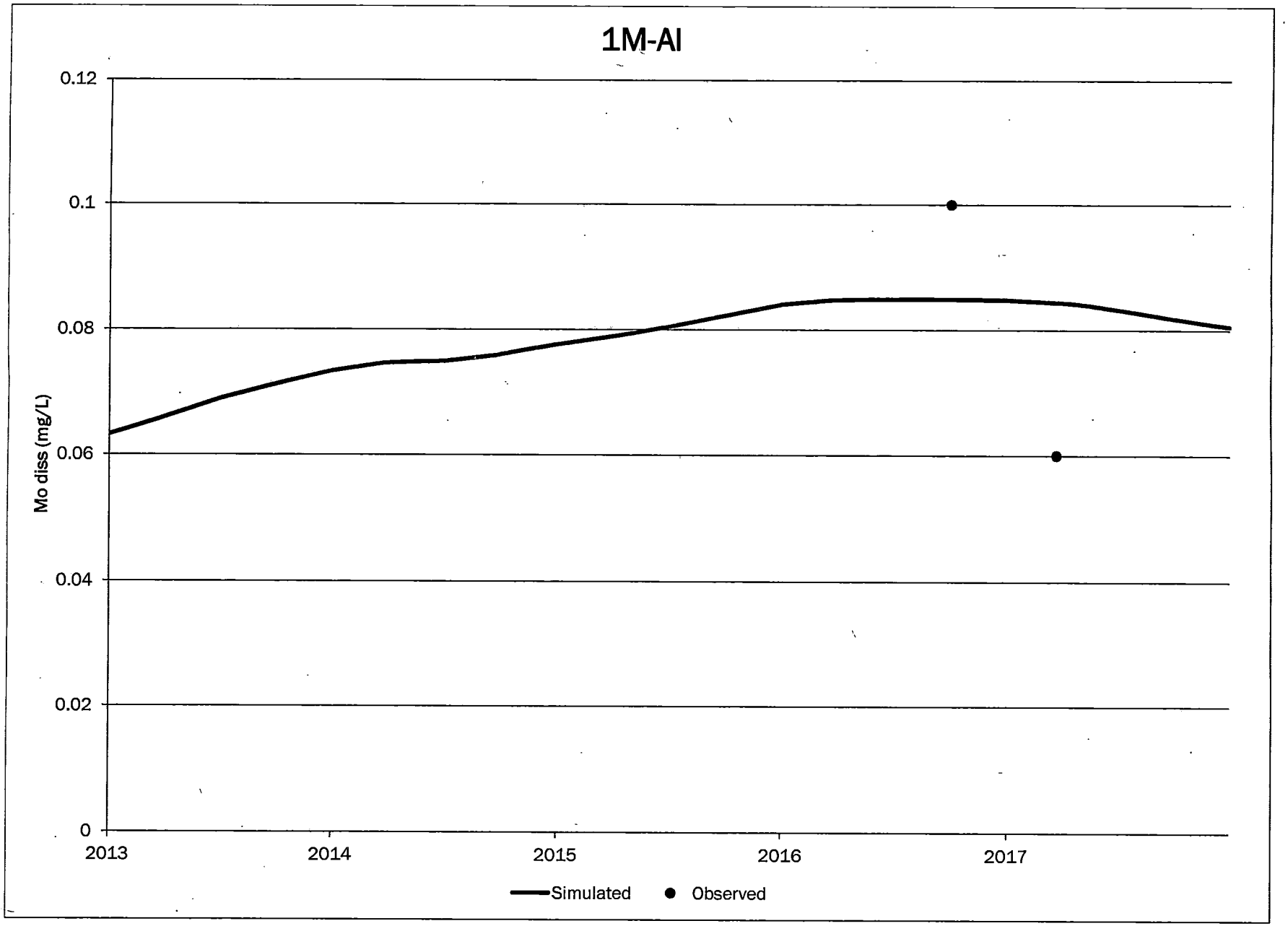

WCW-MC
0.012
0.01
0.008
0.006
0.004
0.002
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

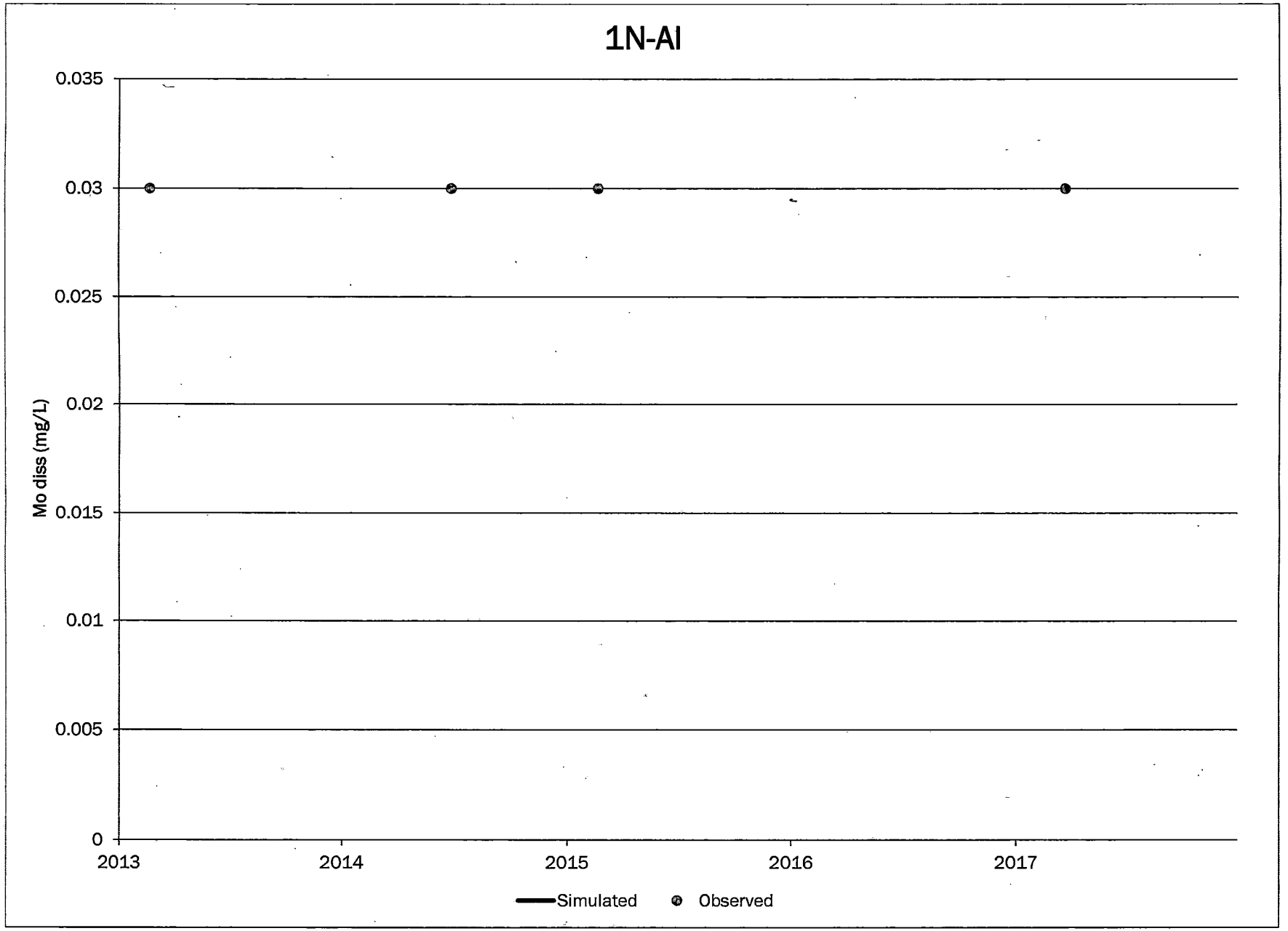

WR25-MC
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

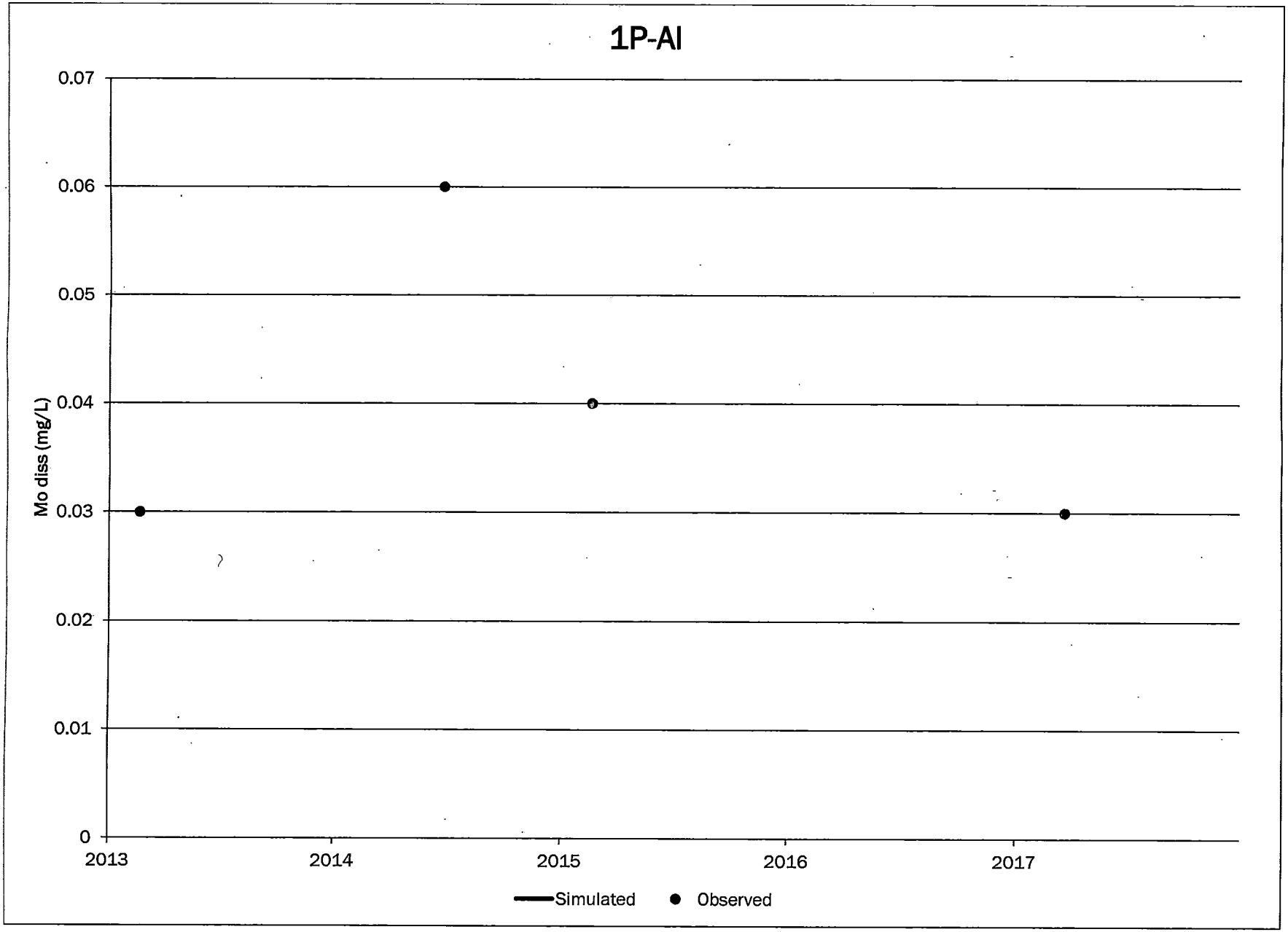

X-AI
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
U diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

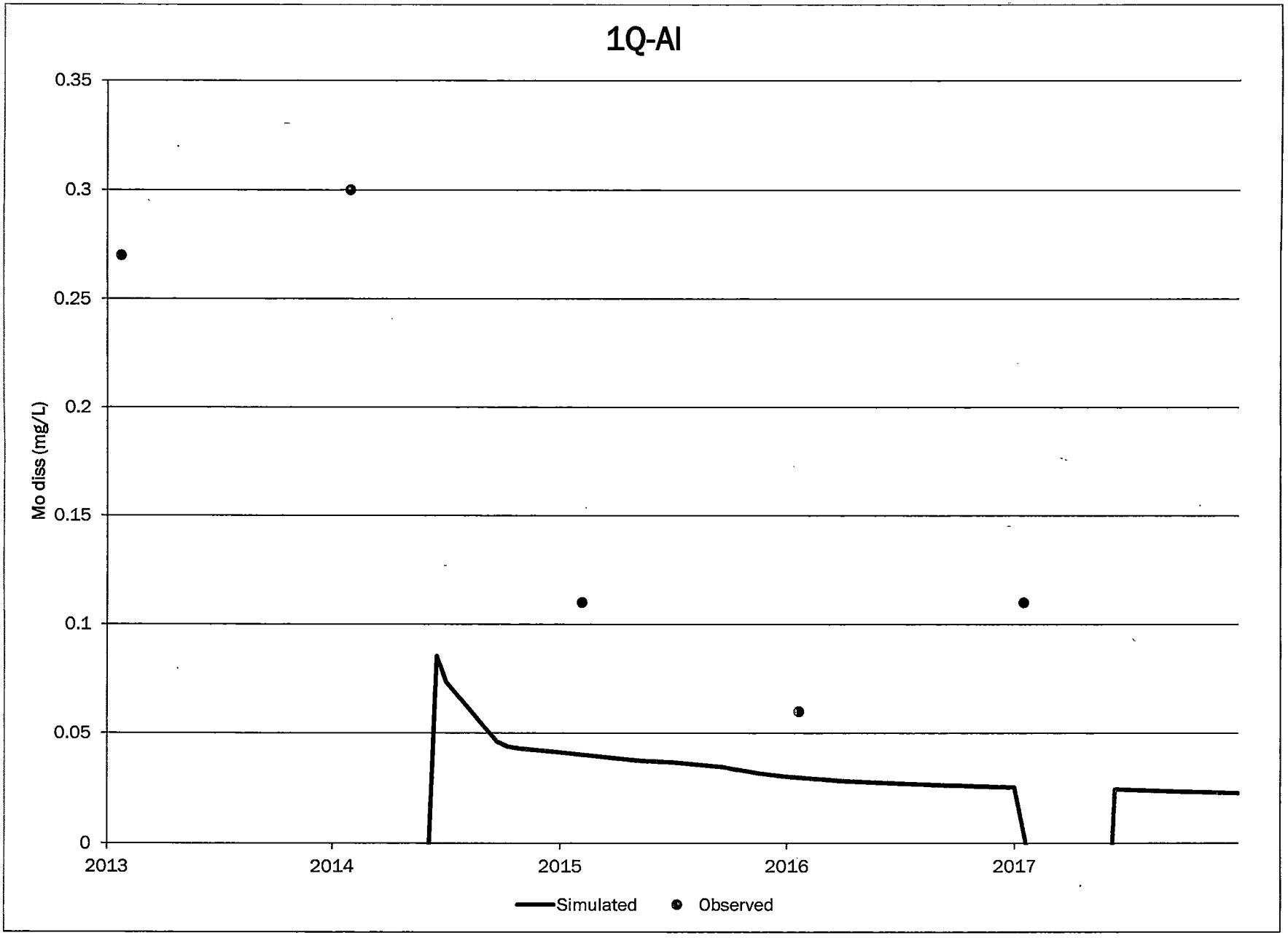

1F-Al
Mo diss (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
2013
2014
2015
2016
2017
Simulated
Observed

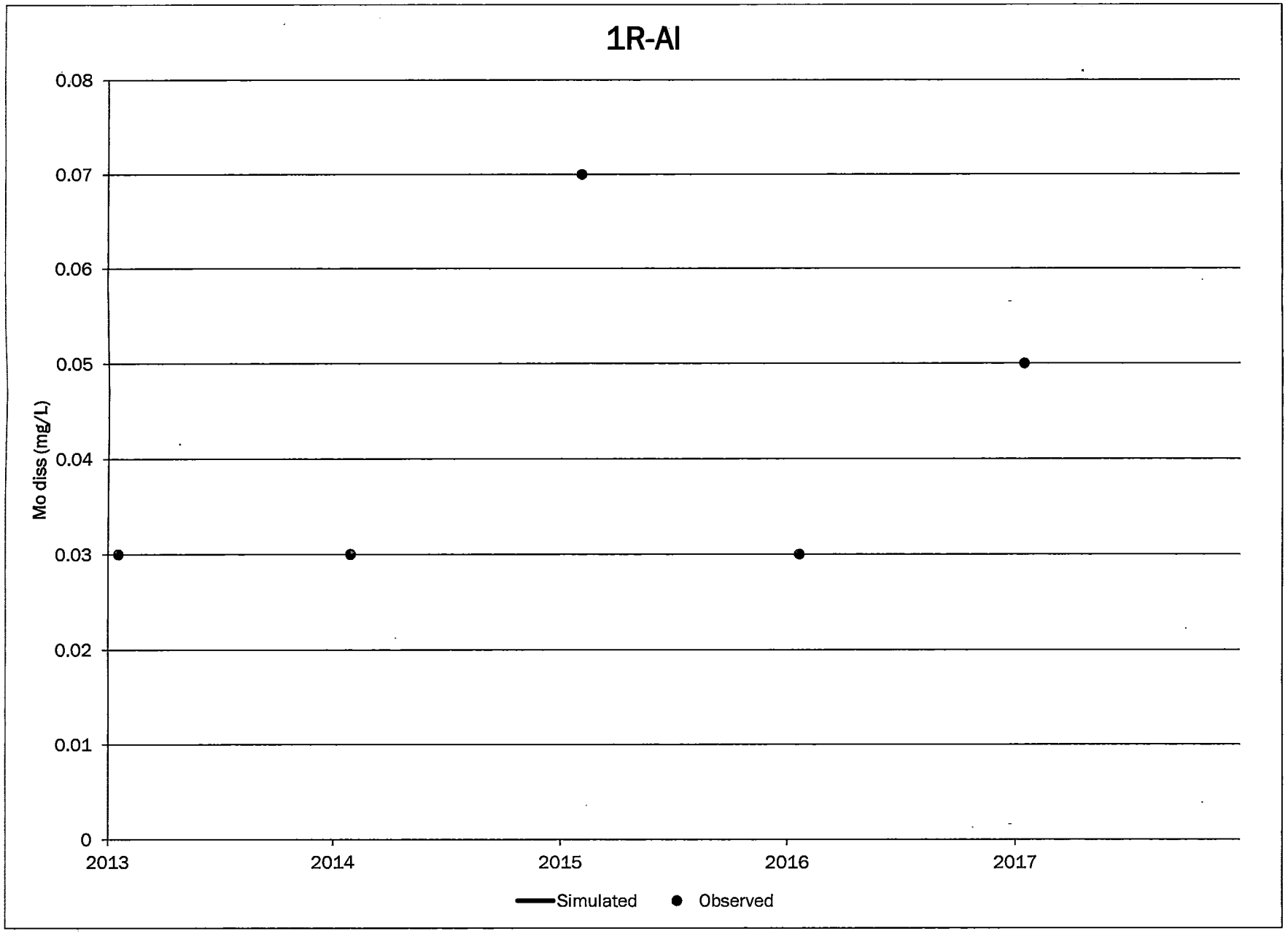

1J-AI
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

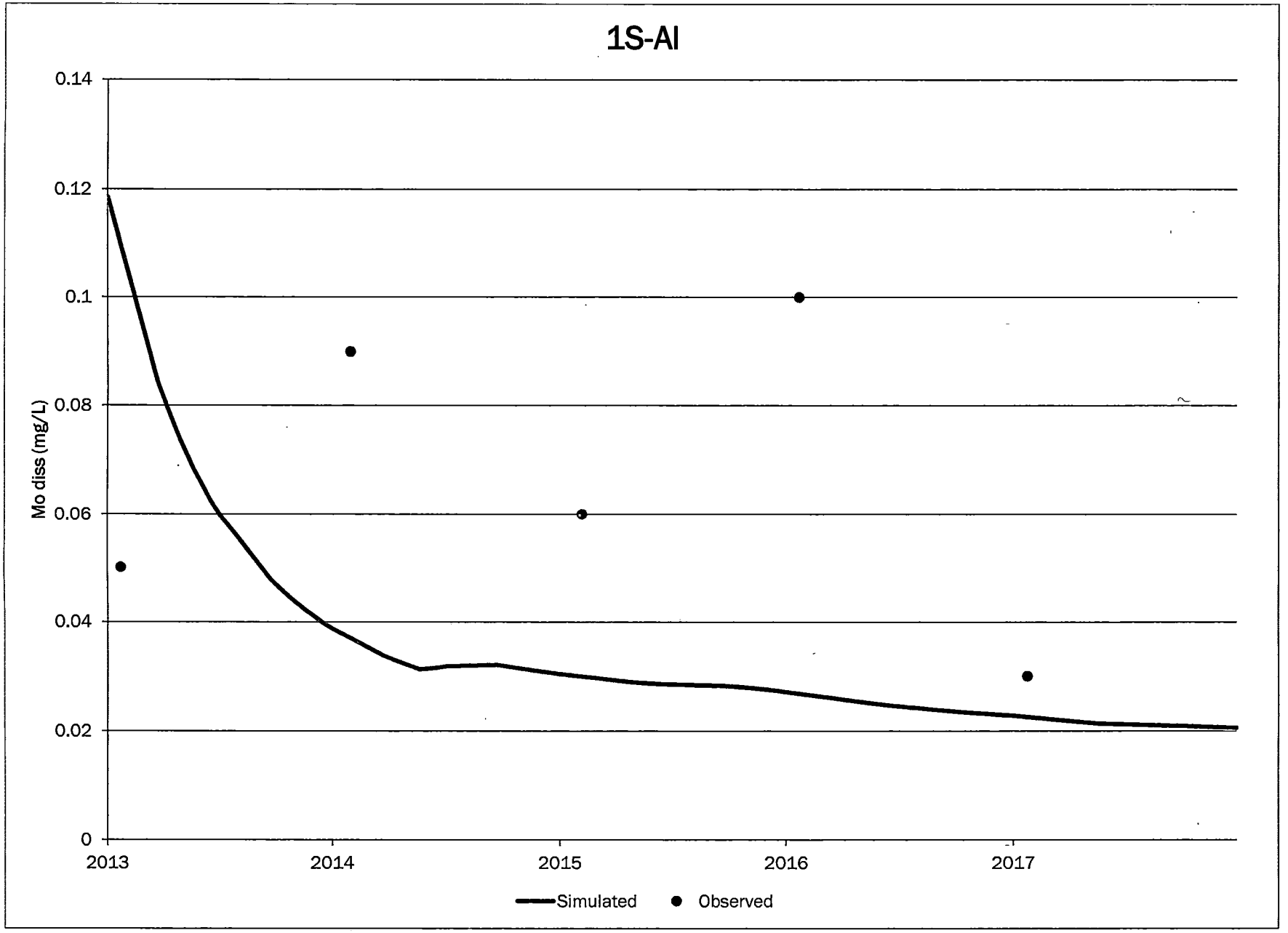

1M-AI
0.12
0.1
0.08
0.06
0.04
0.02
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

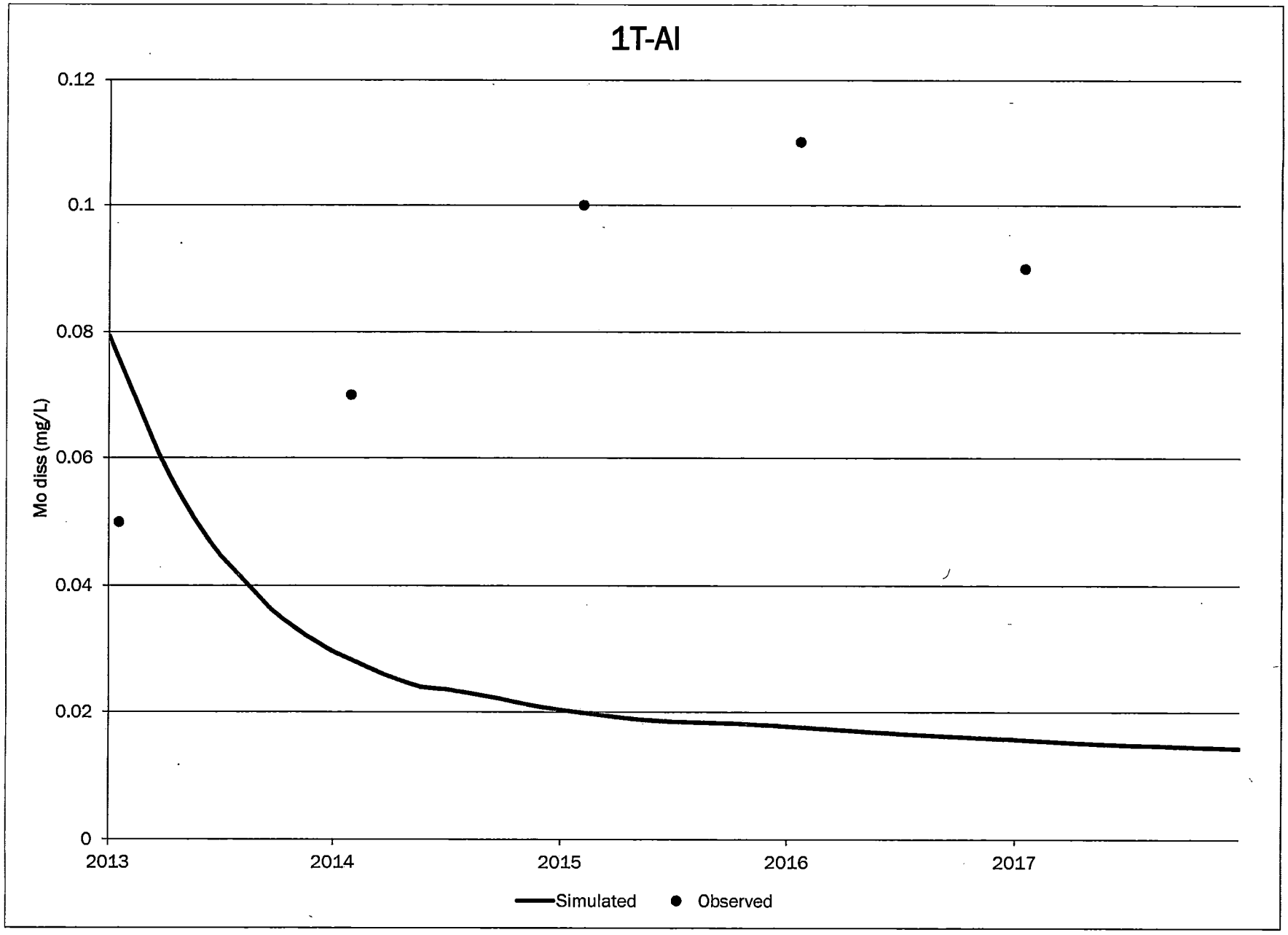

1N-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

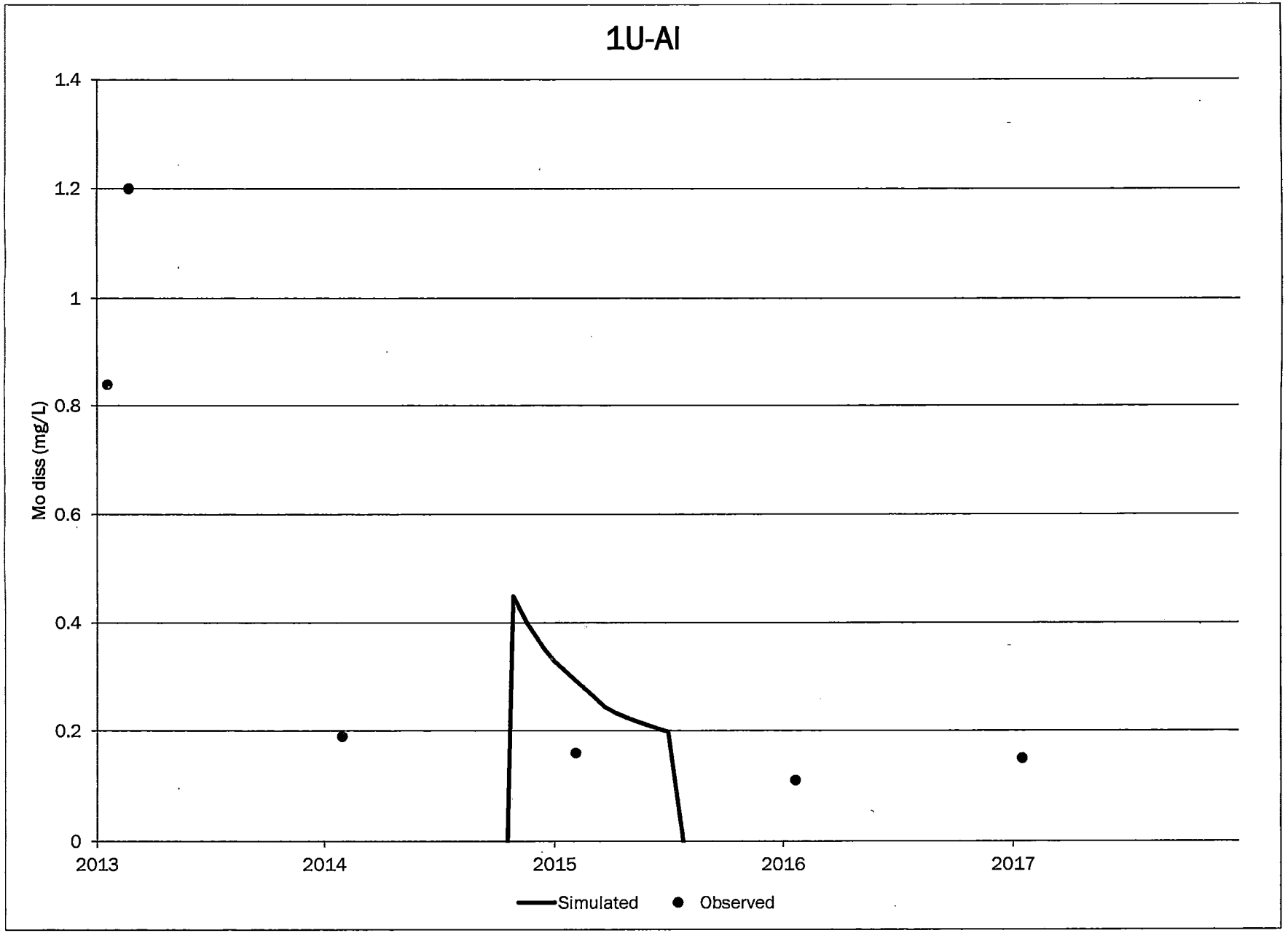

1P-AI
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

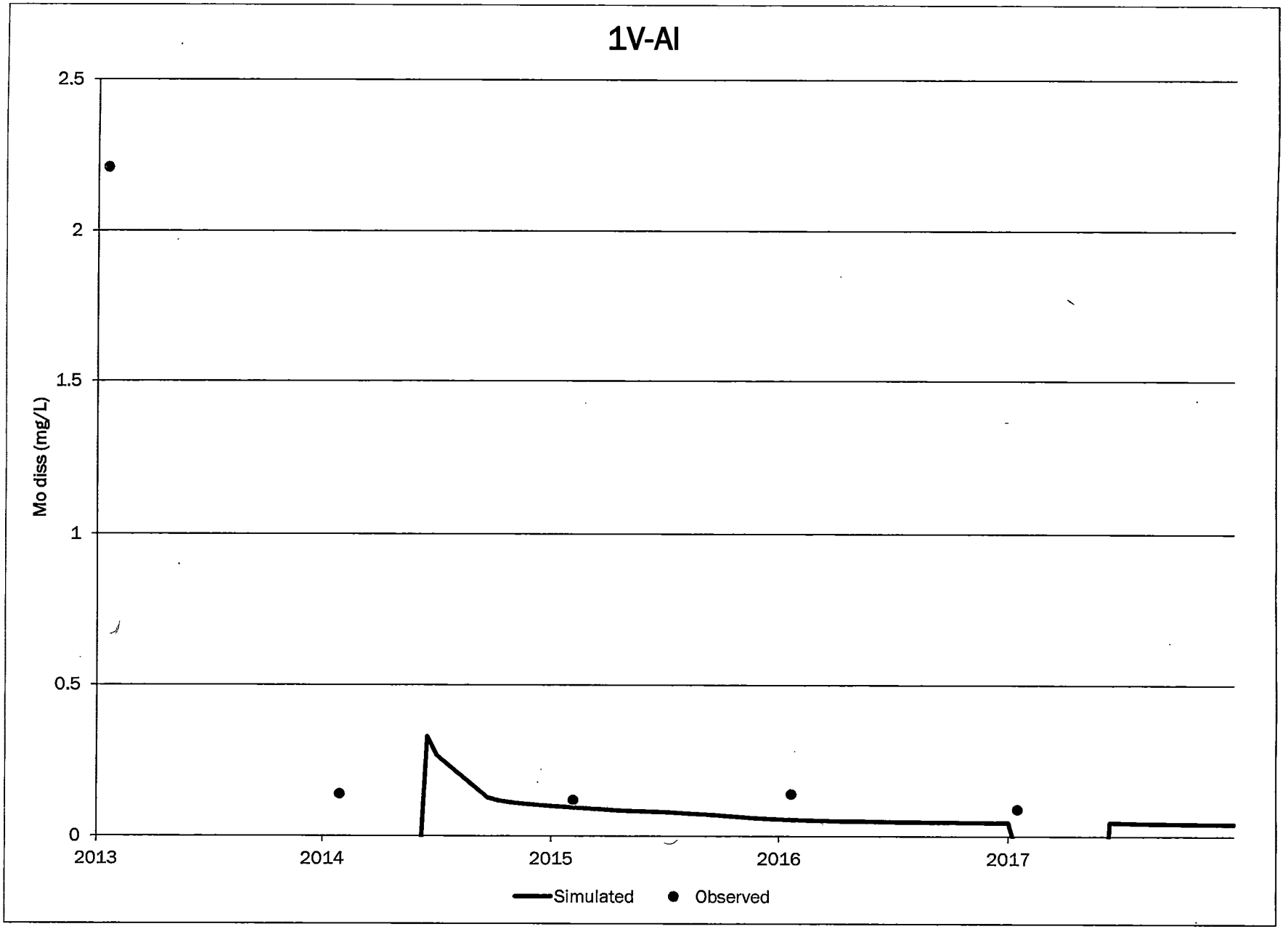

1Q-AI
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

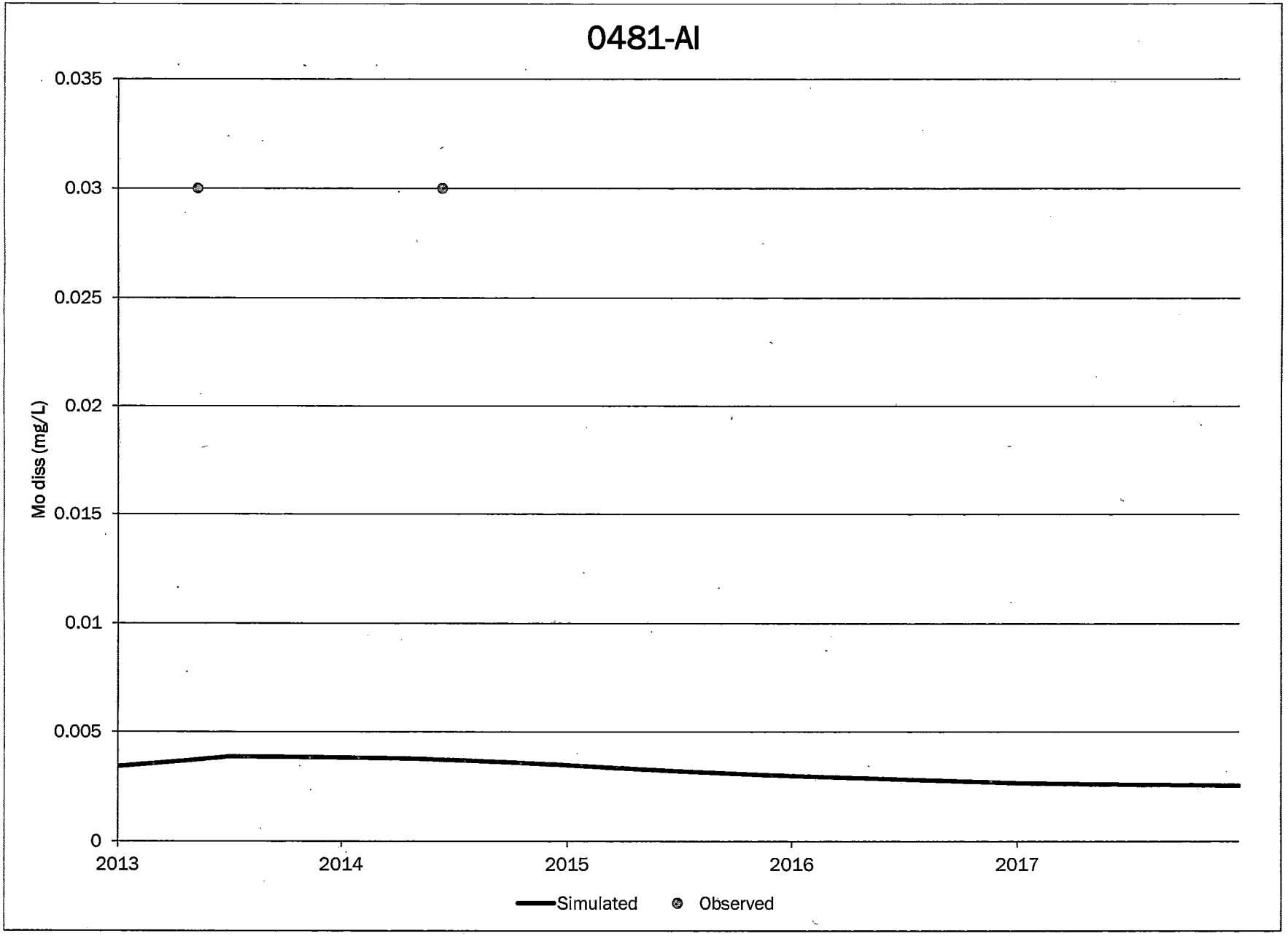

1R-AI
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

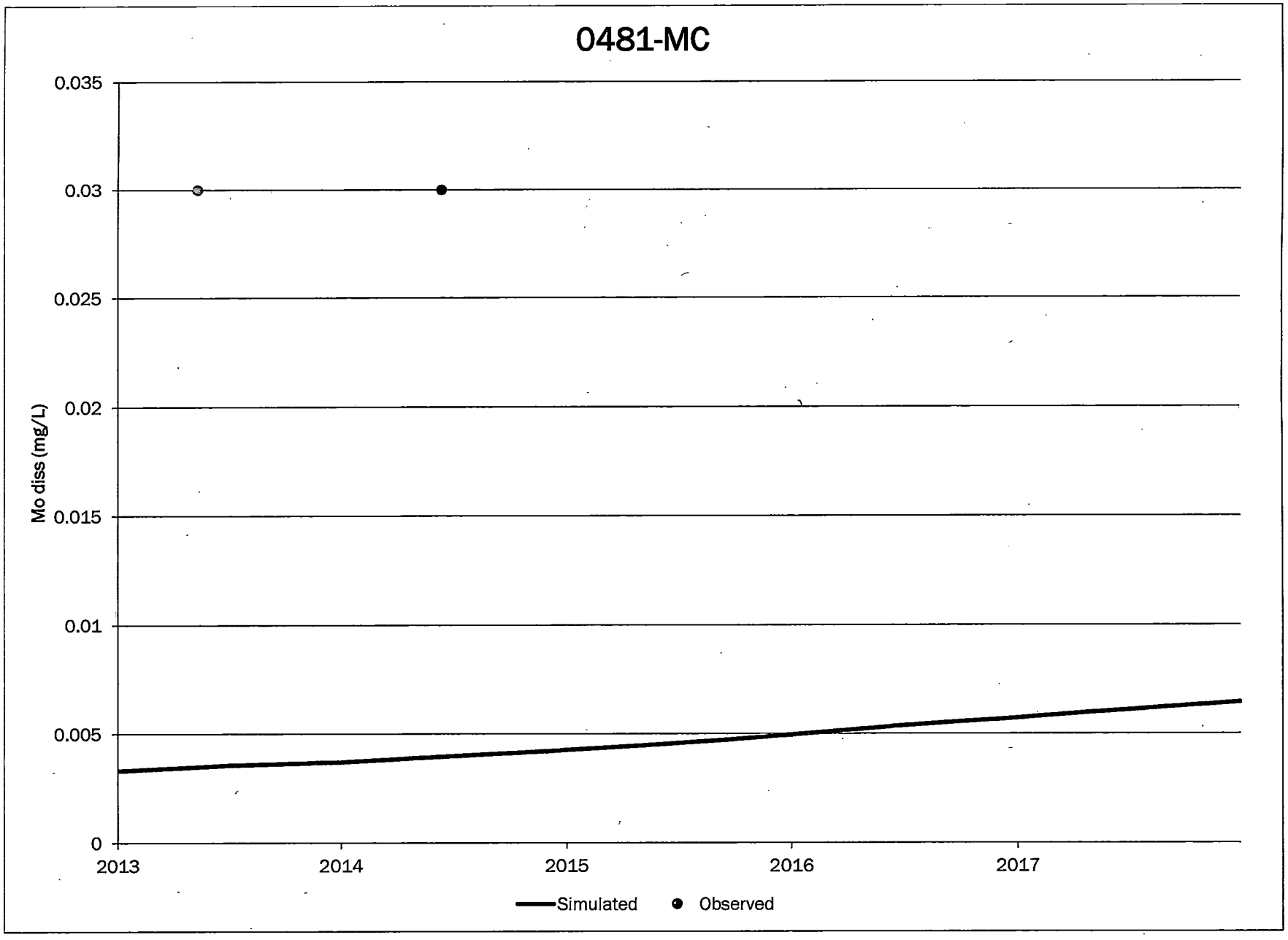

1S-AI
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

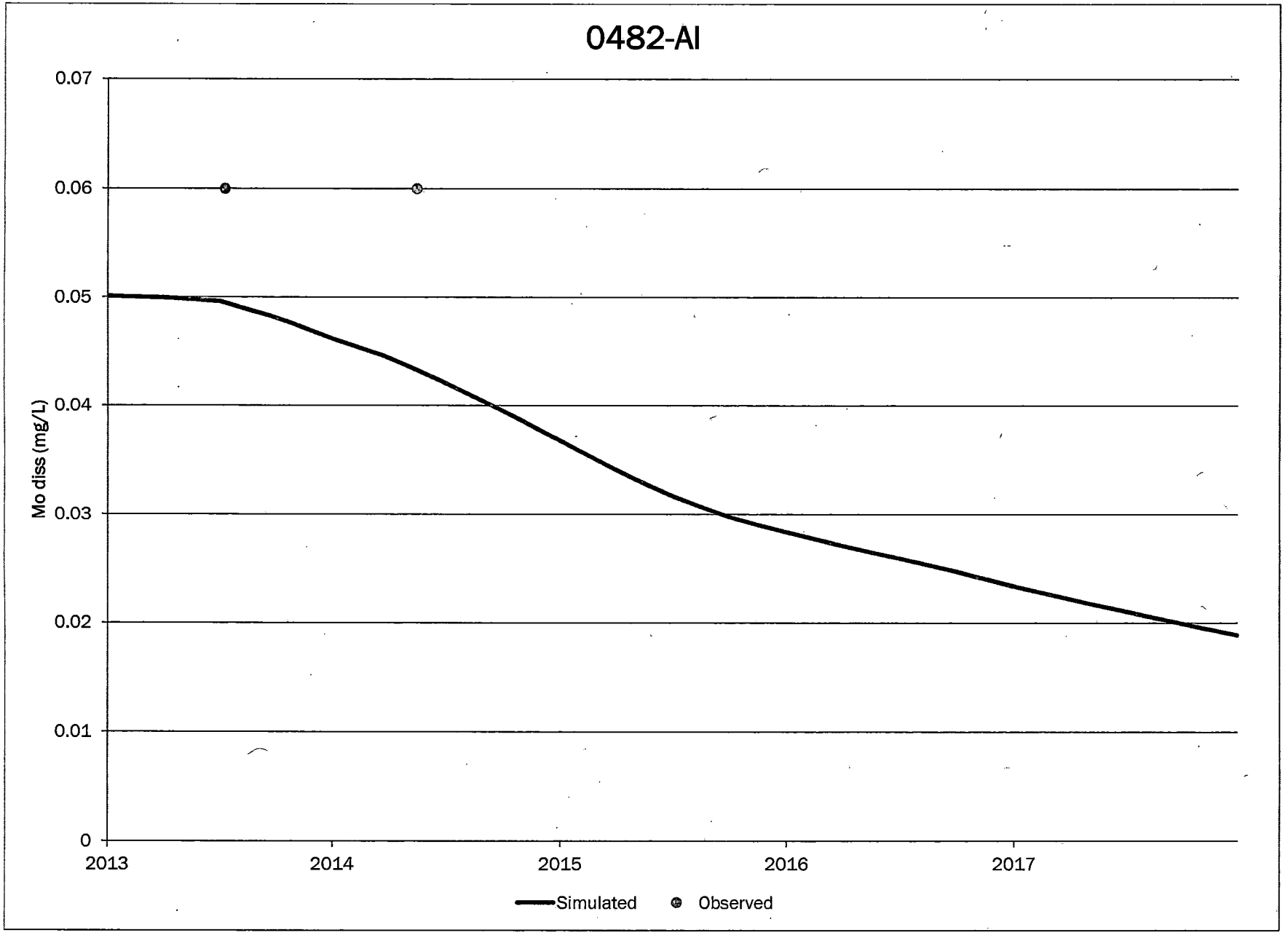

1T-AI
0.12
0.1
0.08
0.06
0.04
0.02
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

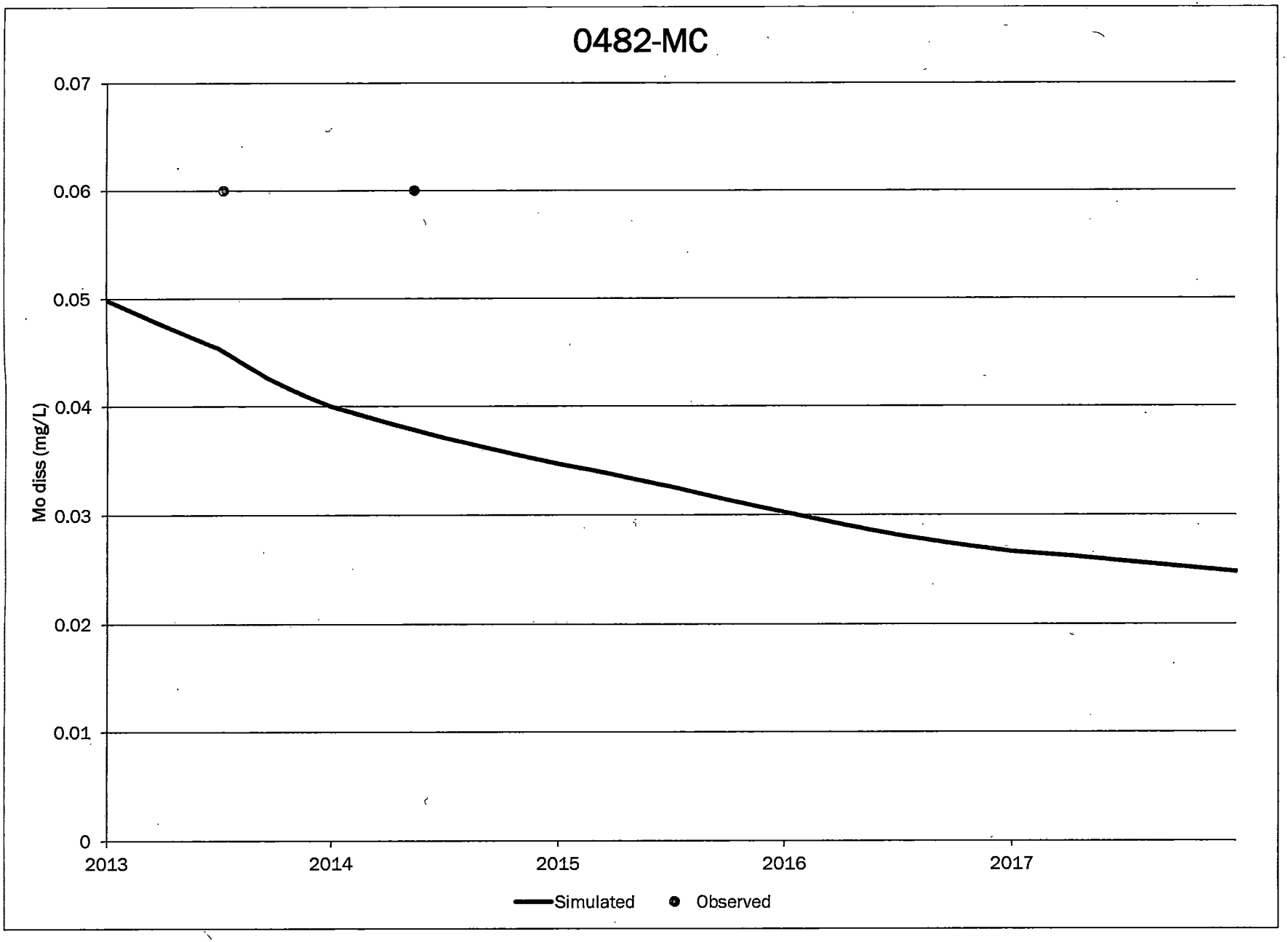

1U-AI
Mo diss (mg/L)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2013
2014
2015
2016
2017
Simulated
Observed

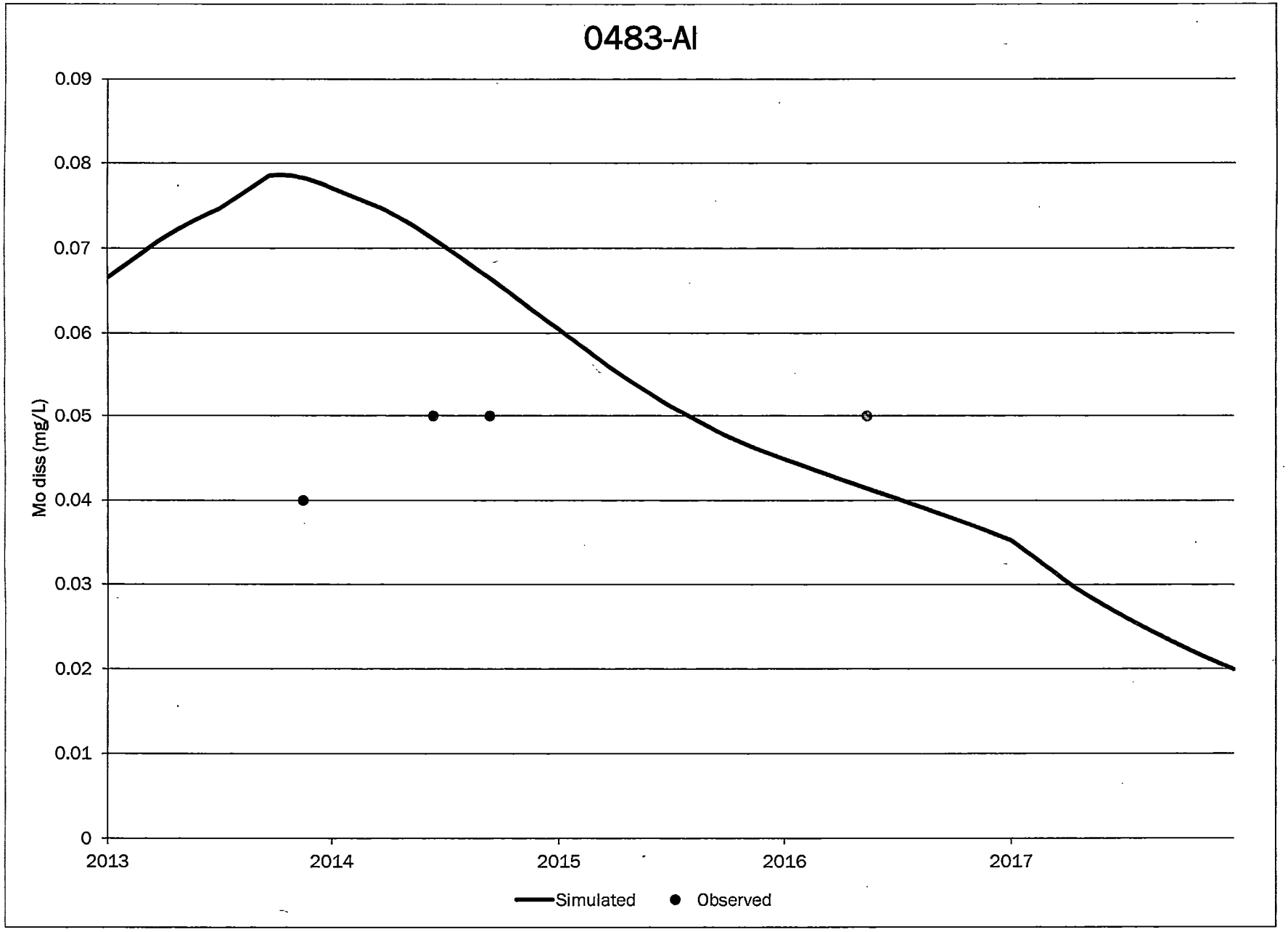

1V-AI
Mo diss (mg/L)
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

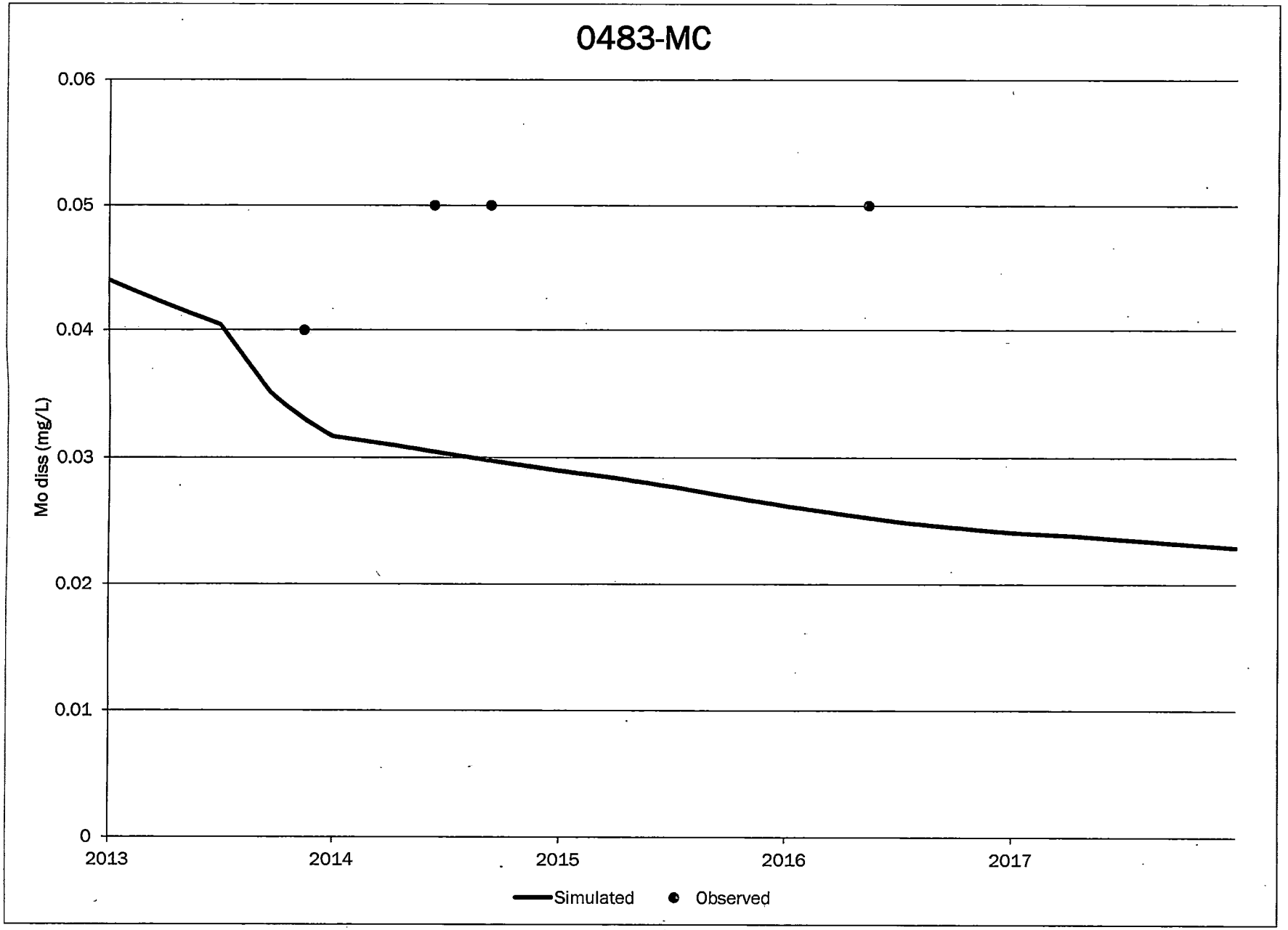

0481-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

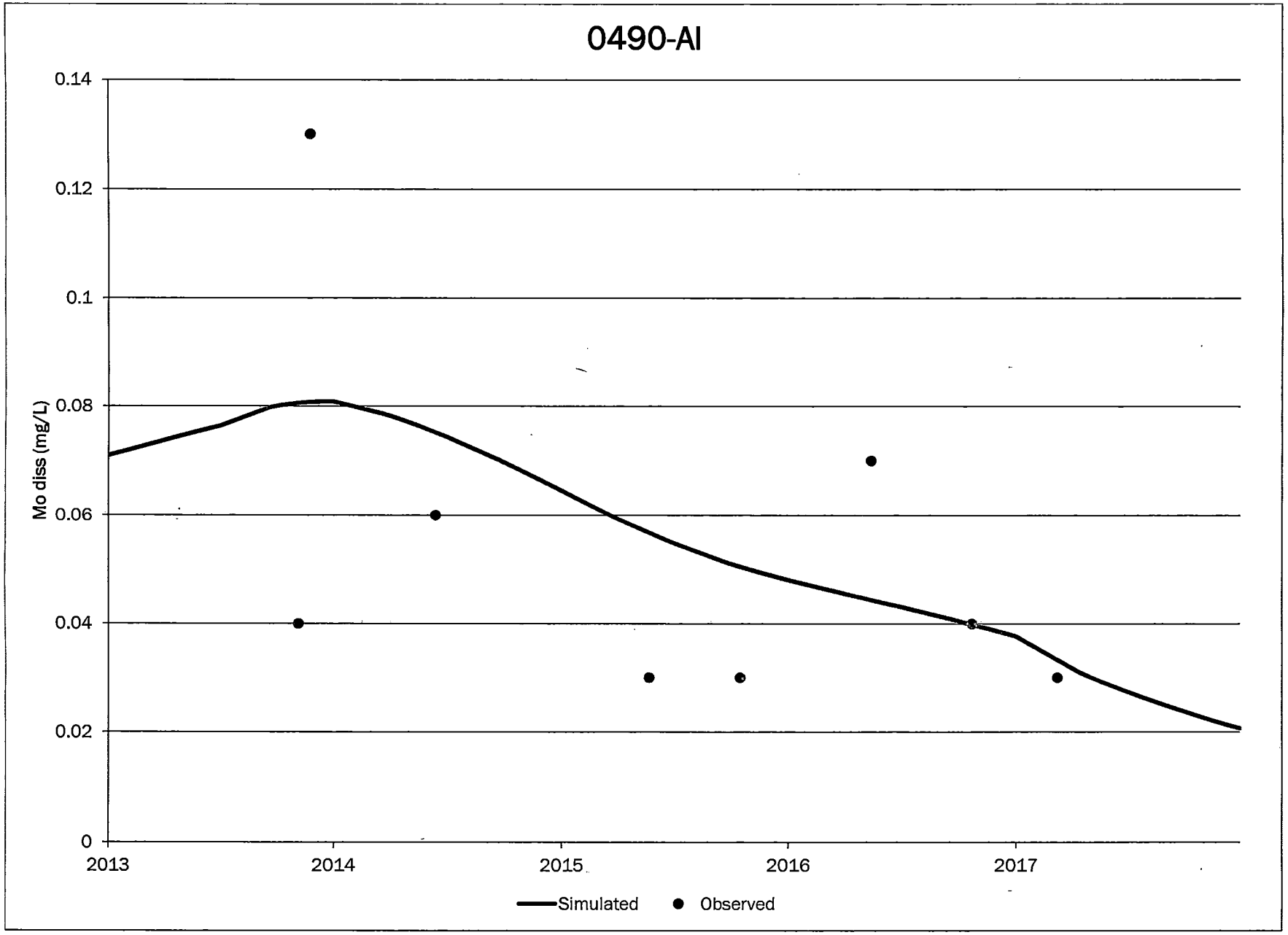

0481-MC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

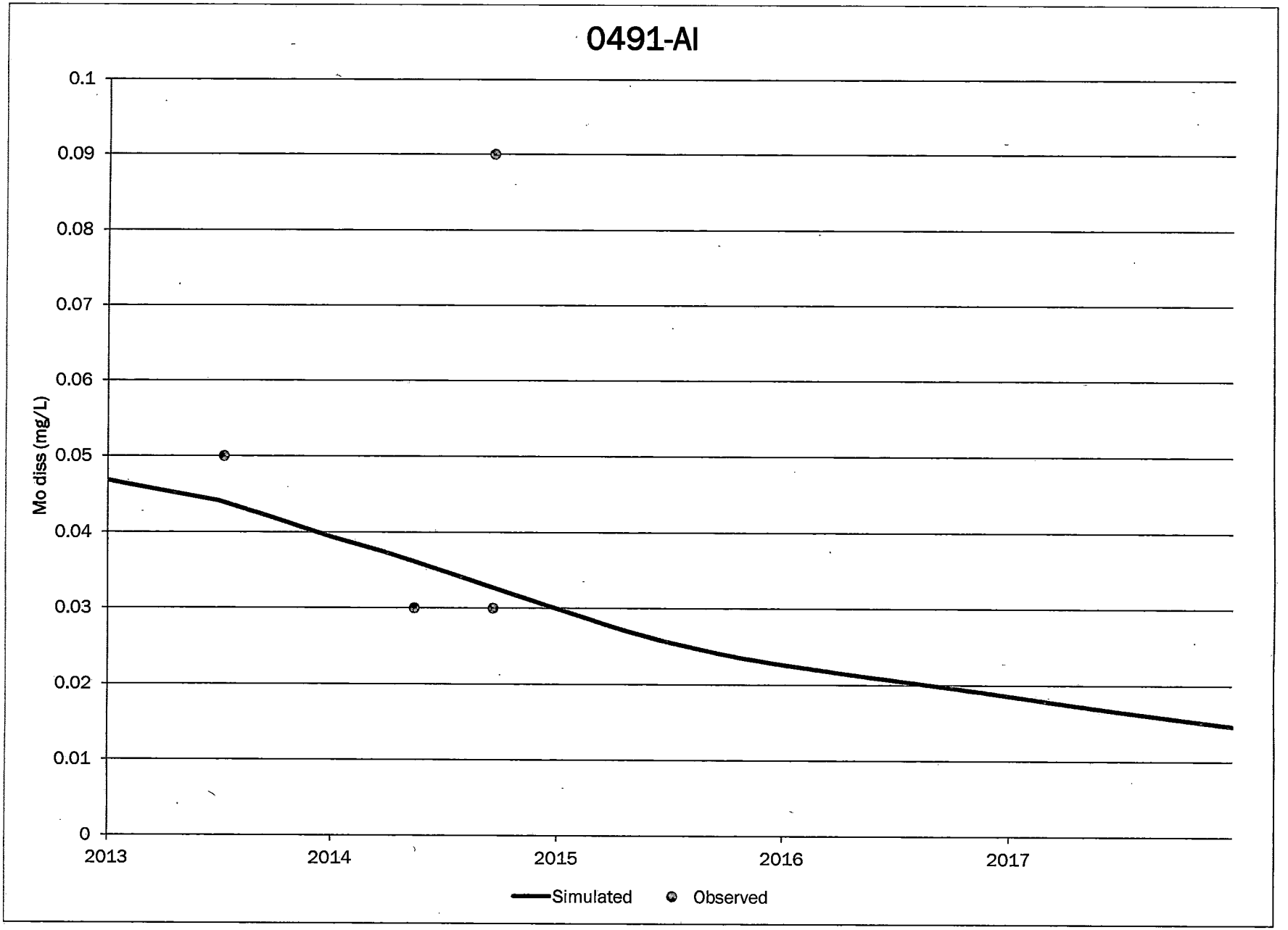

0482-AI
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

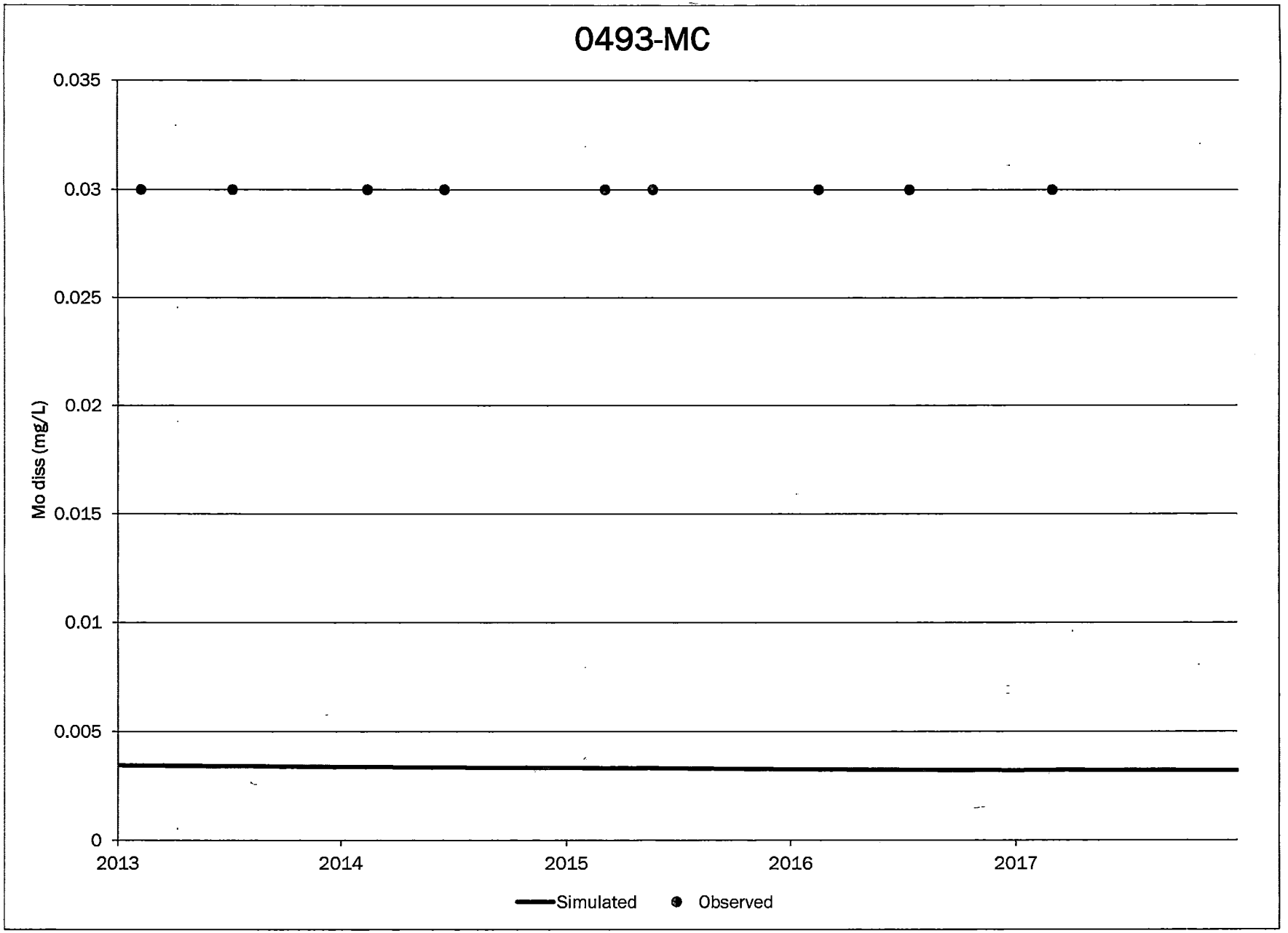

0482-MC
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

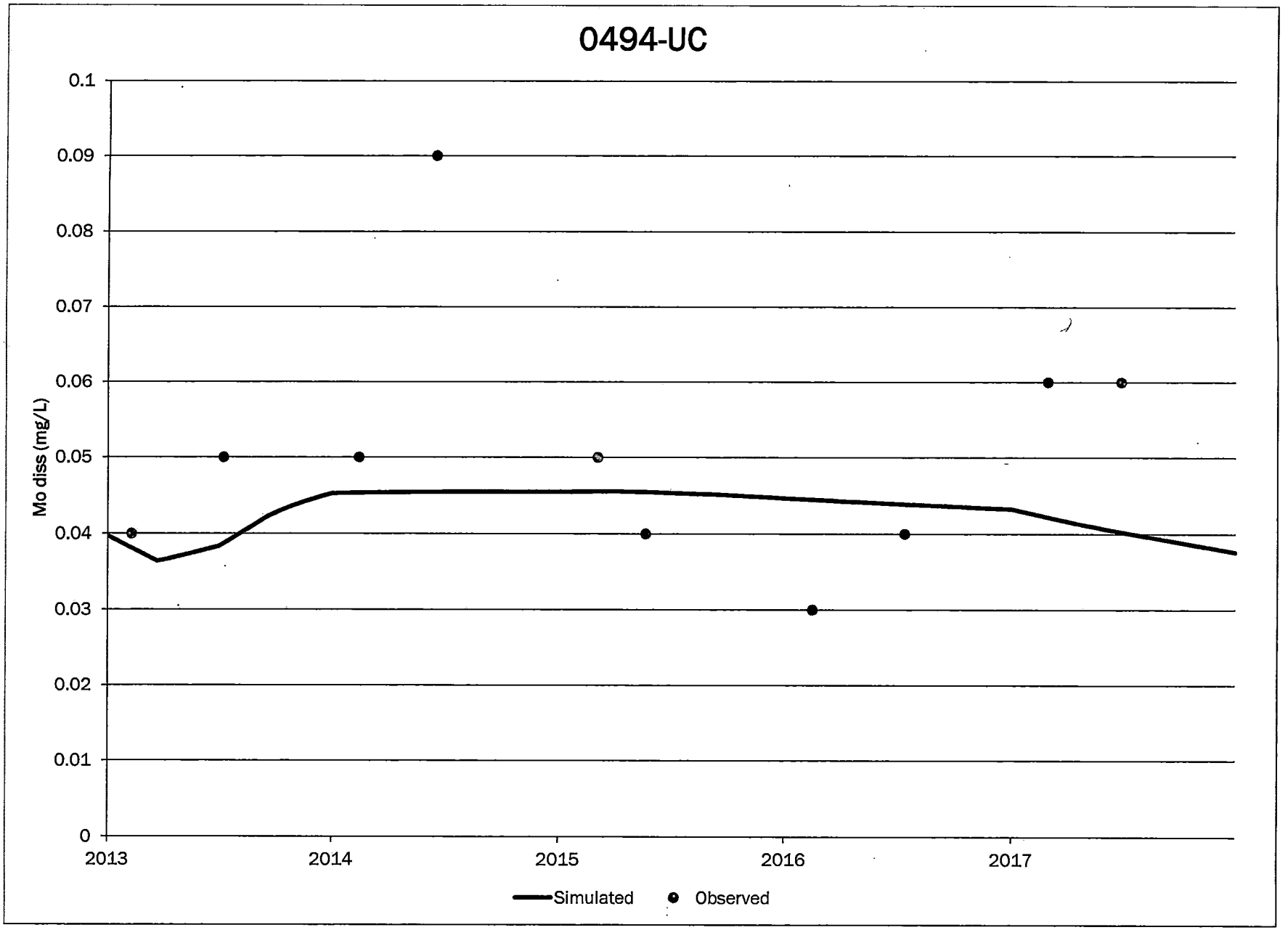

0483-AI
Mo diss (mg/L)
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
2013
2014
2015
2016
2017
Simulated
Observed

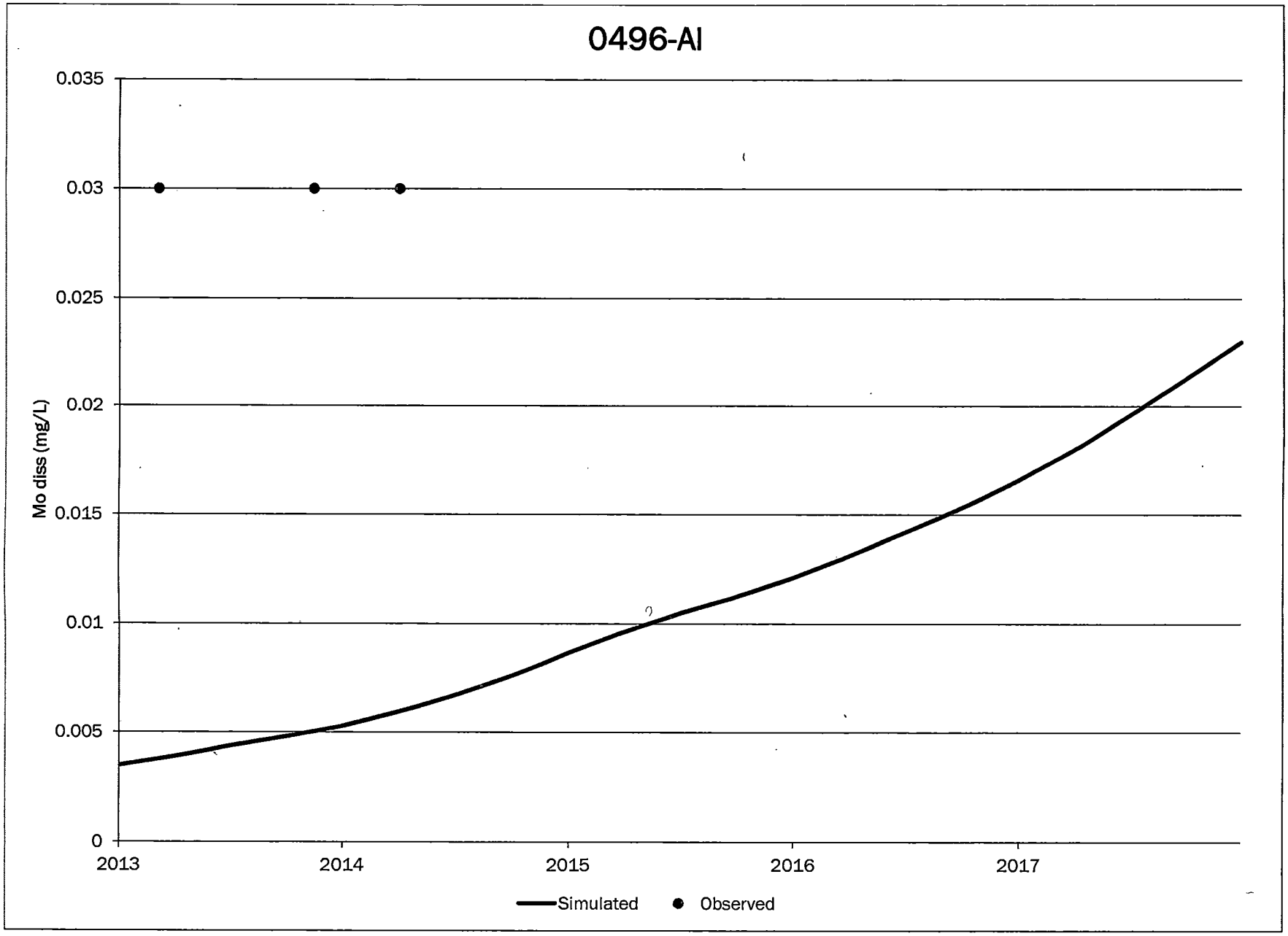

0483-MC
0.06
0.05
0.04
0.03
0.02
0.01
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

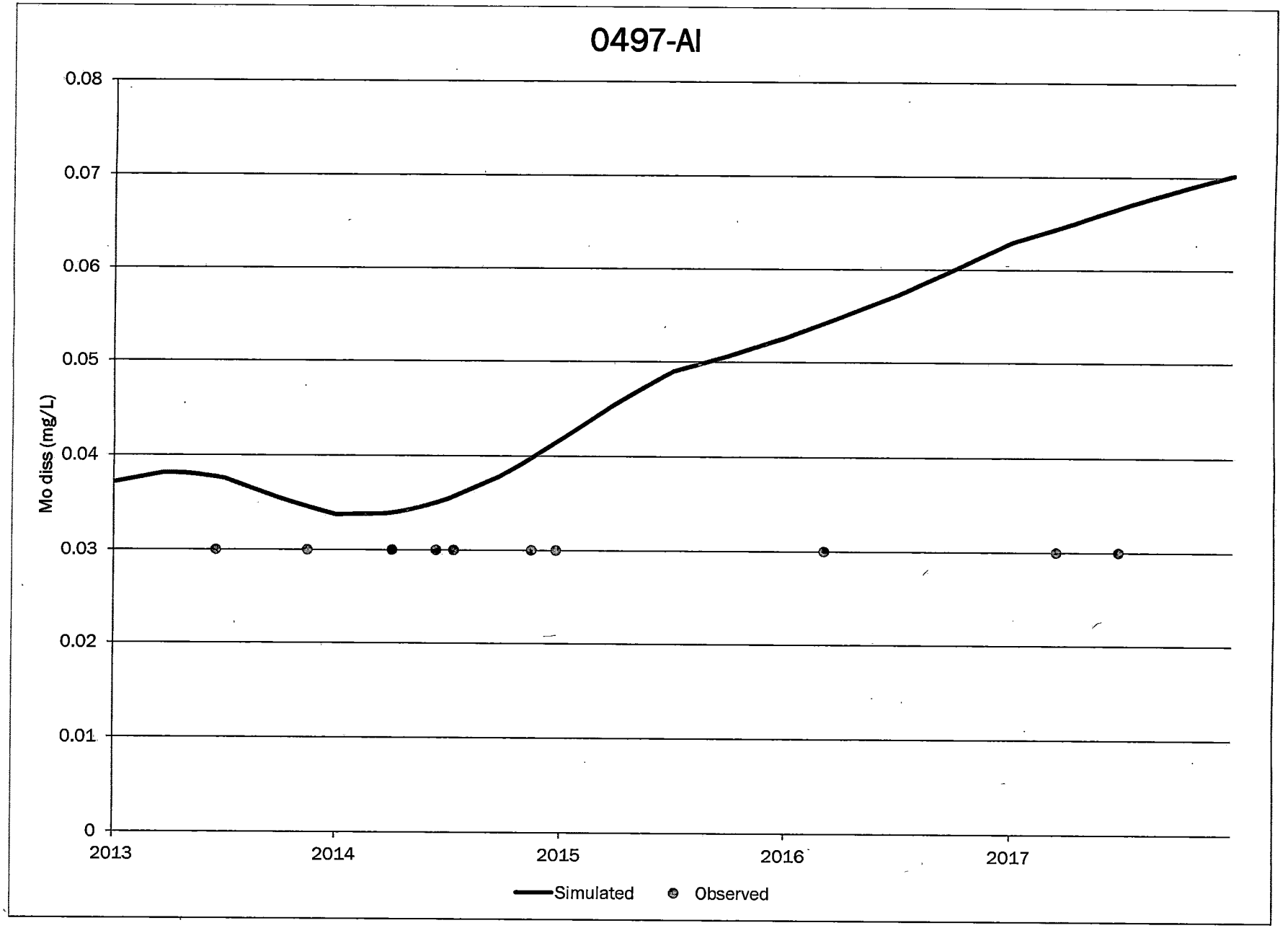

0490-AI
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

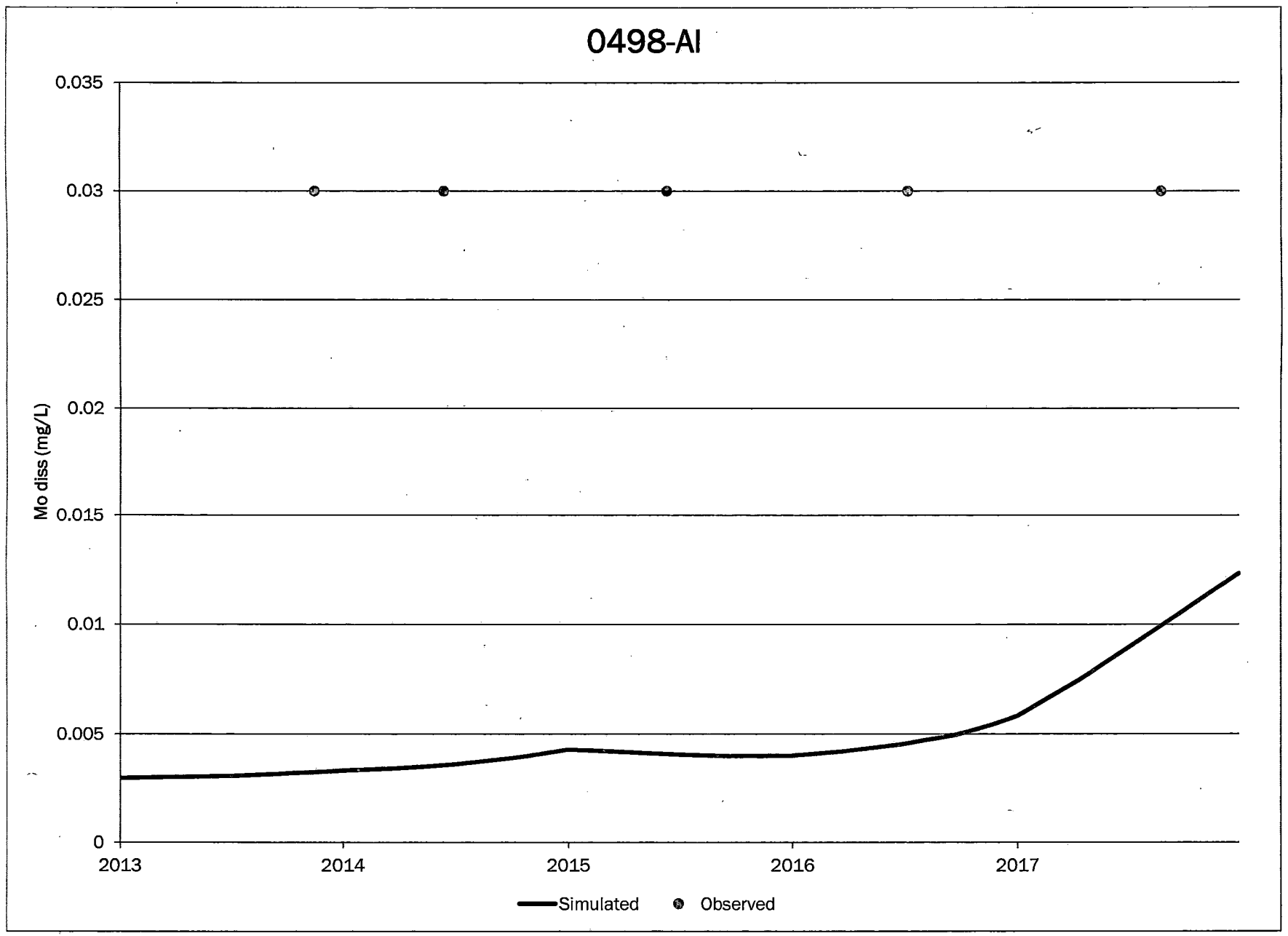

0491-AI
Mo diss (mg/L)
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
2013
2014
2015
2016
2017
Simulated
Observed

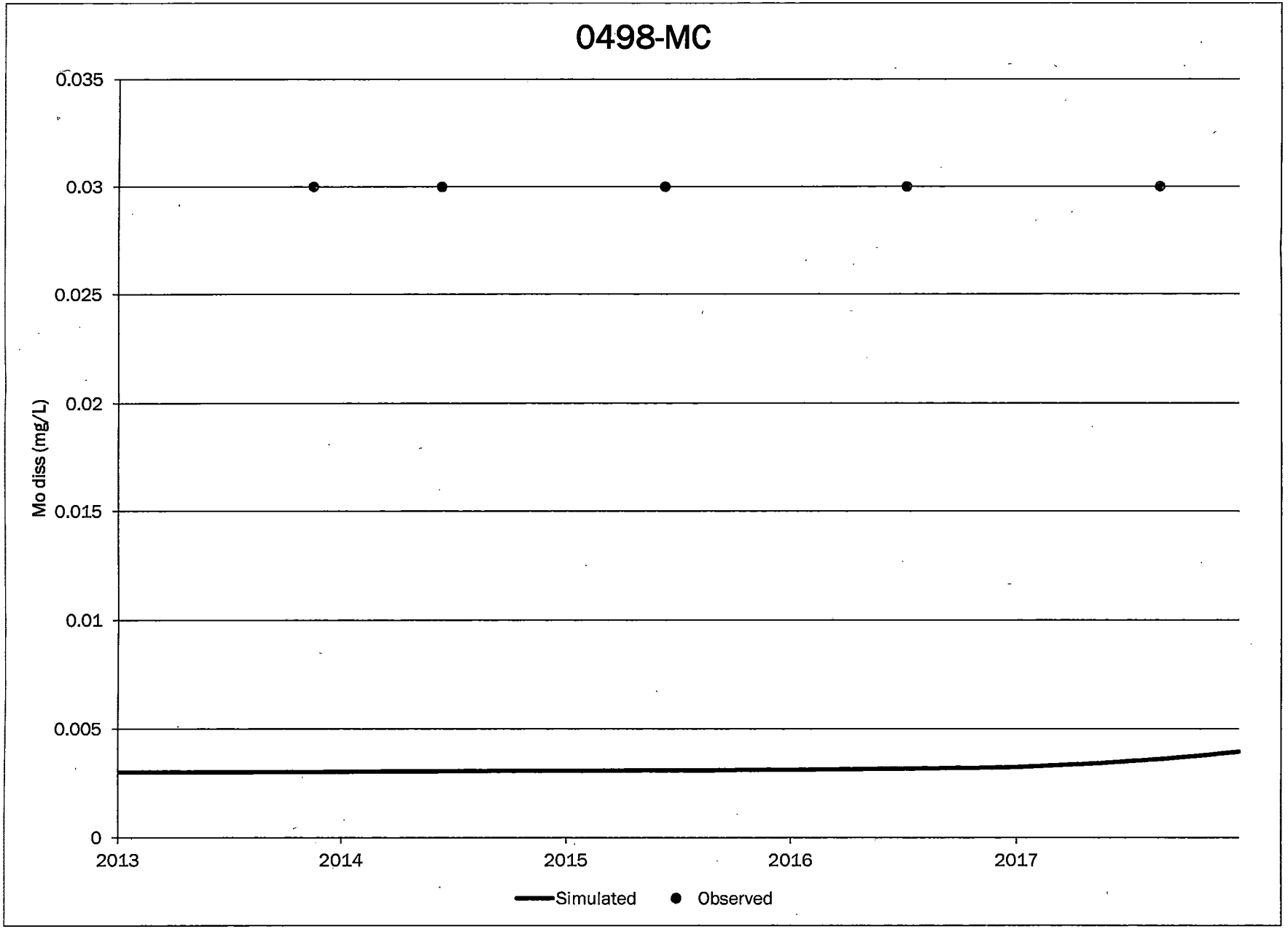

0493-MC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

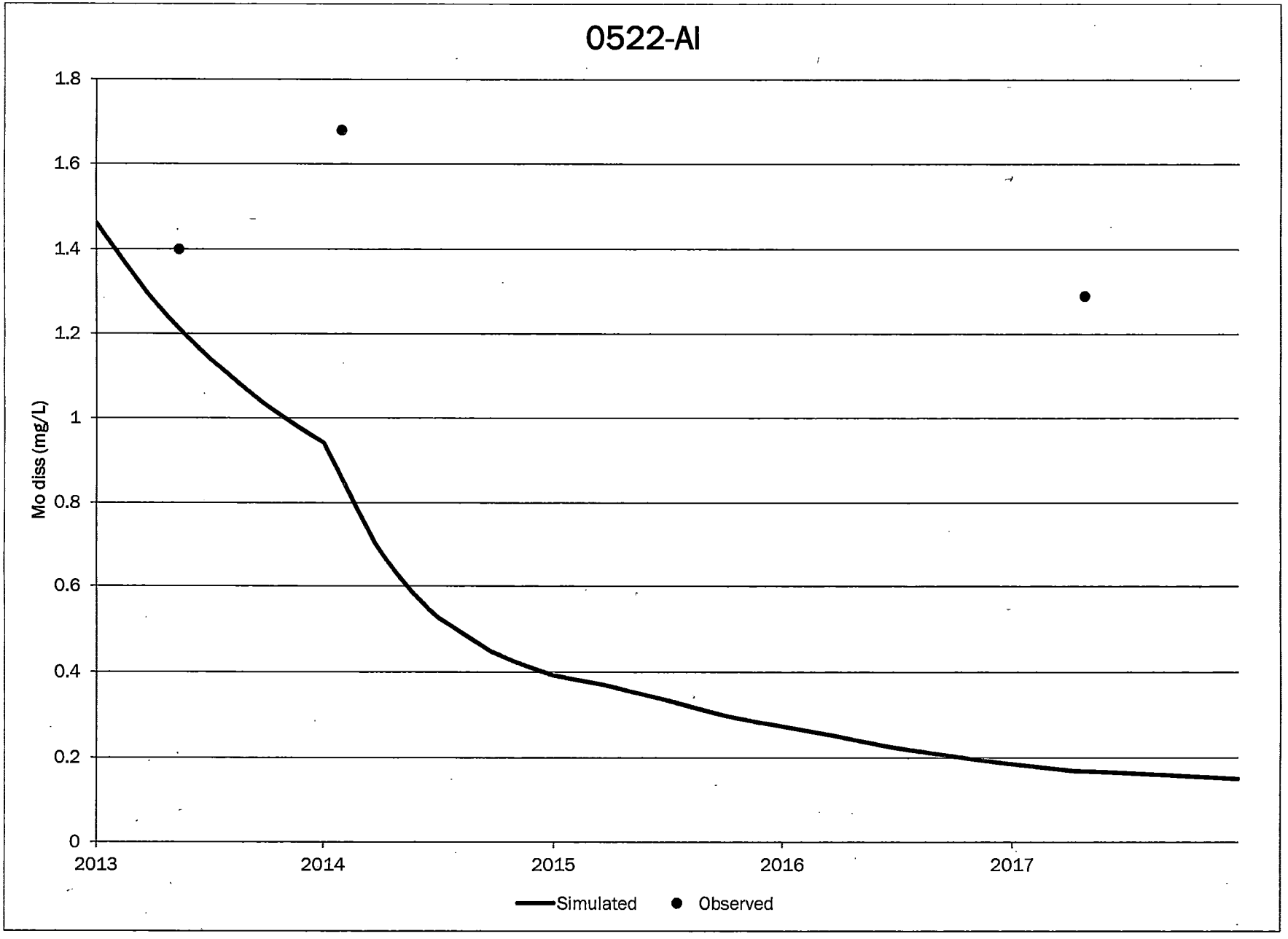

0494-UC
Mo diss (mg/L)
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
2013
2014
2015
2016
2017
Simulated
Observed

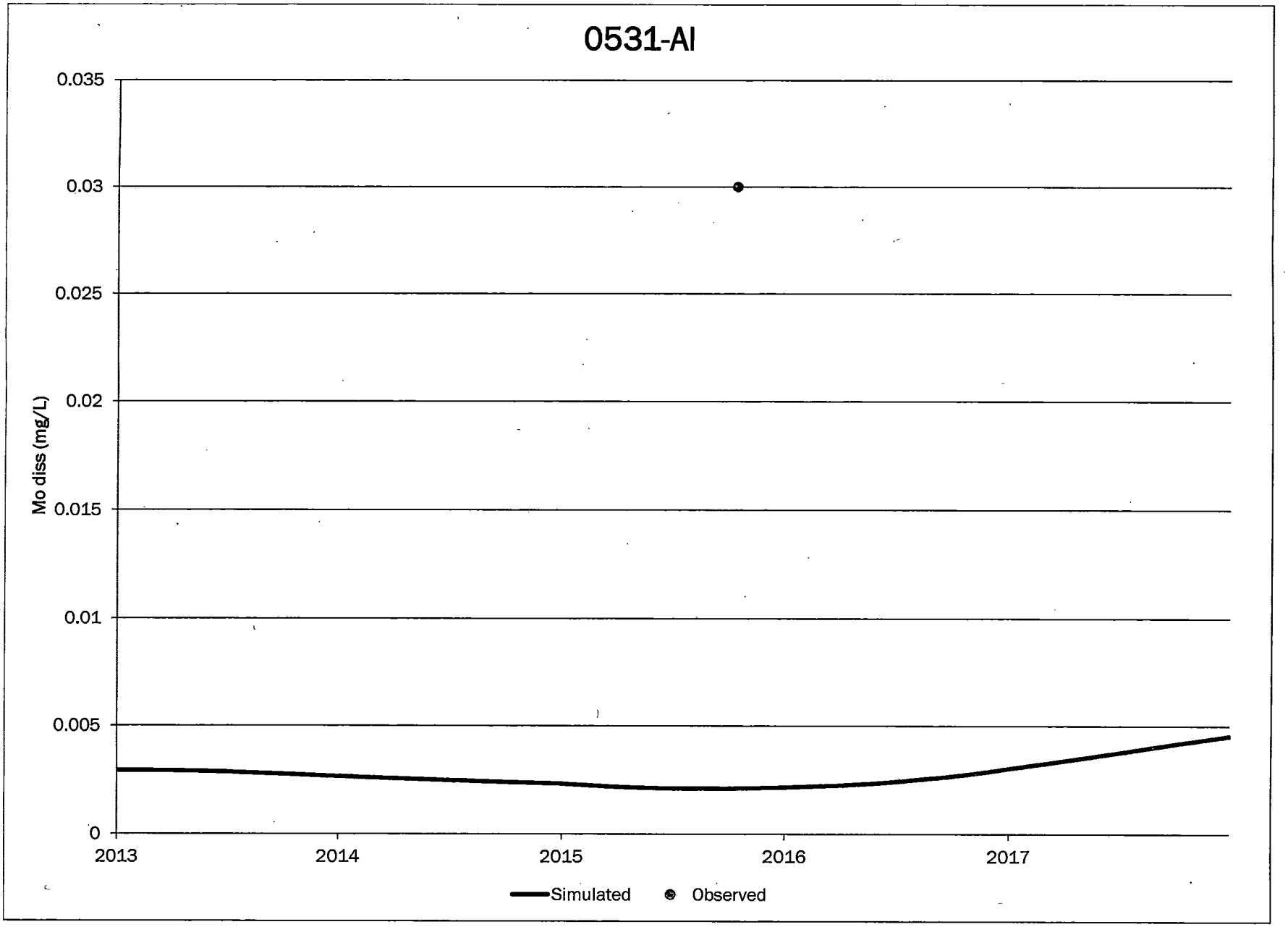

0496-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

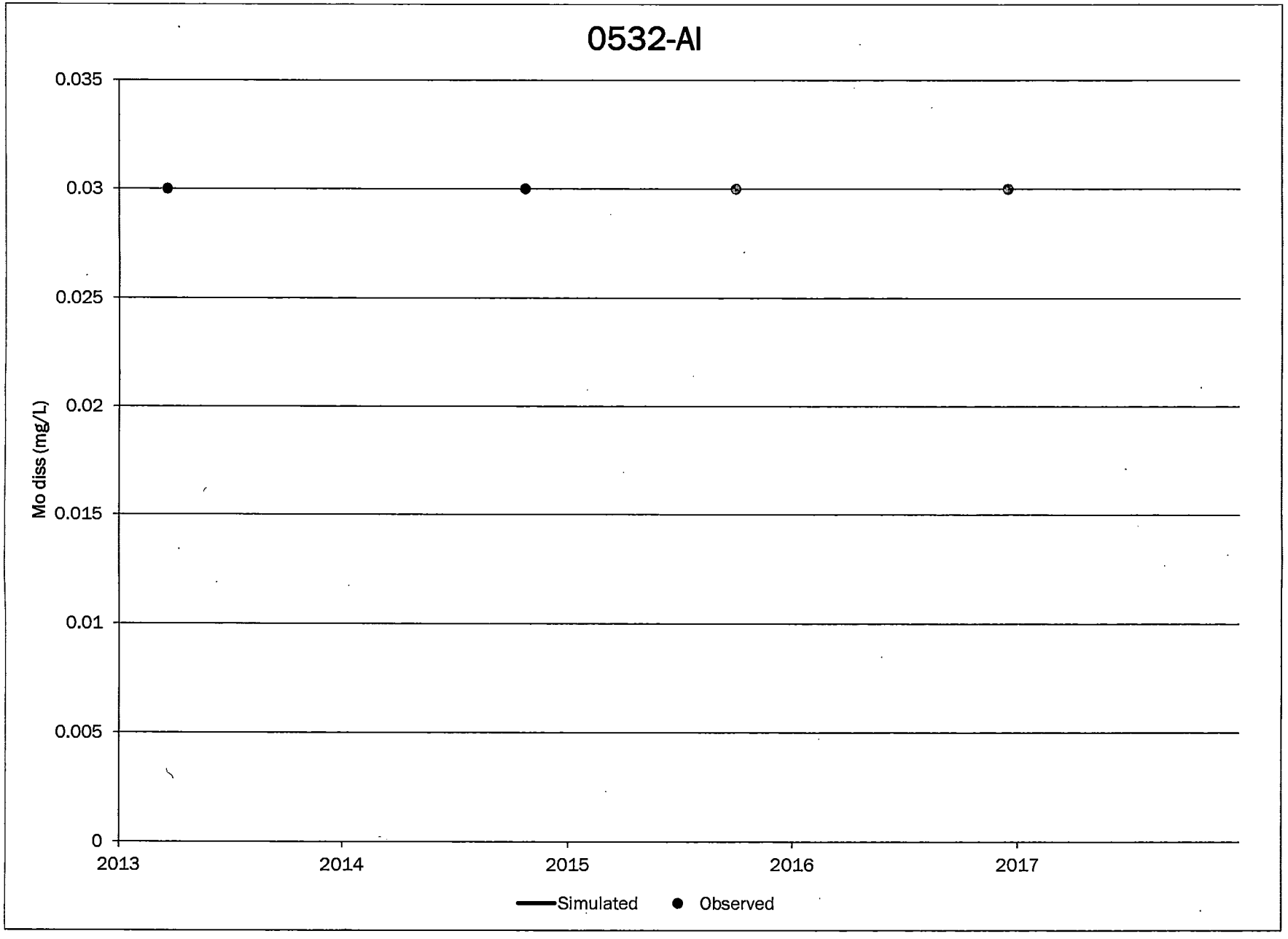

0497-AI
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

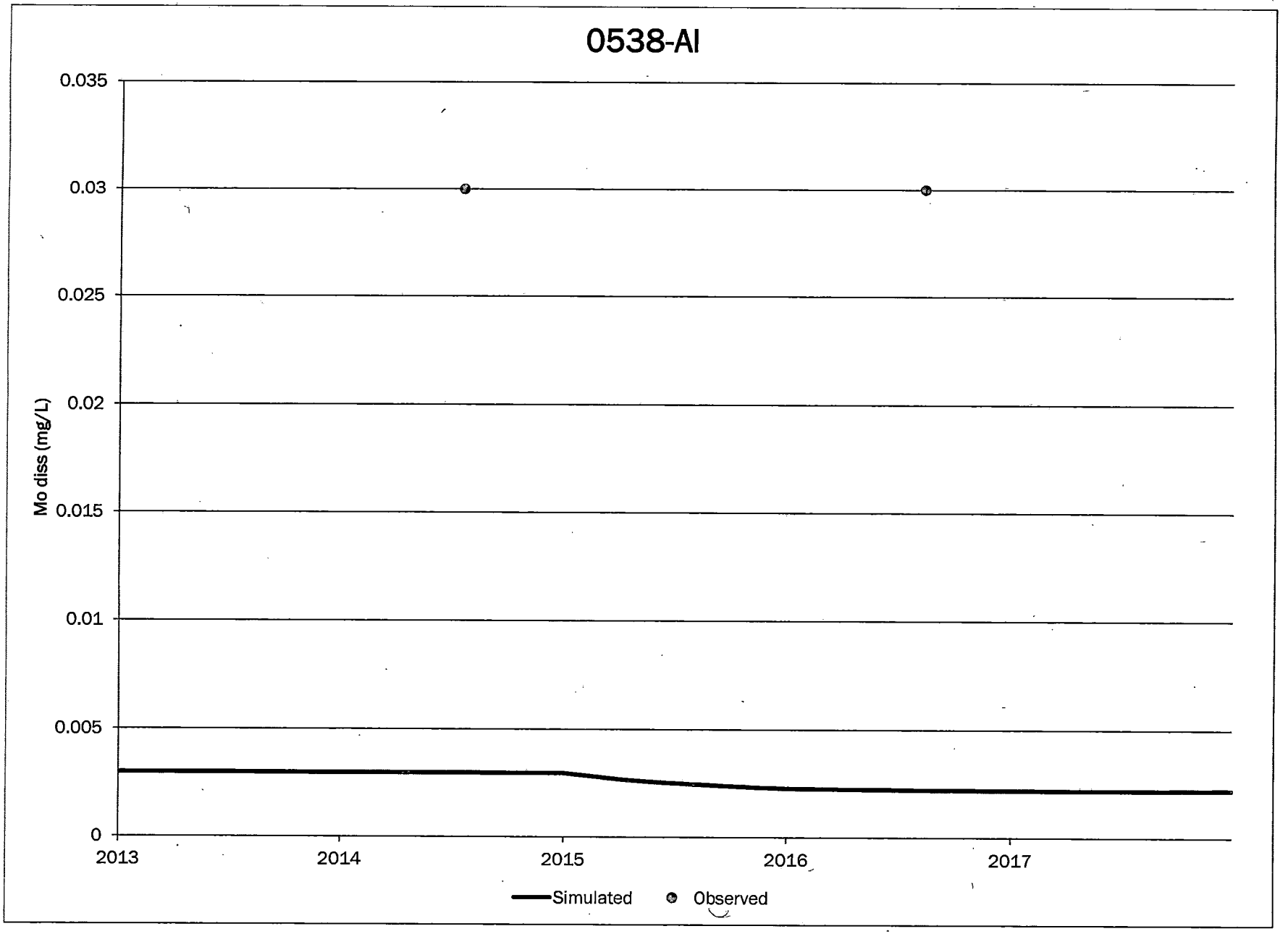

0498-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

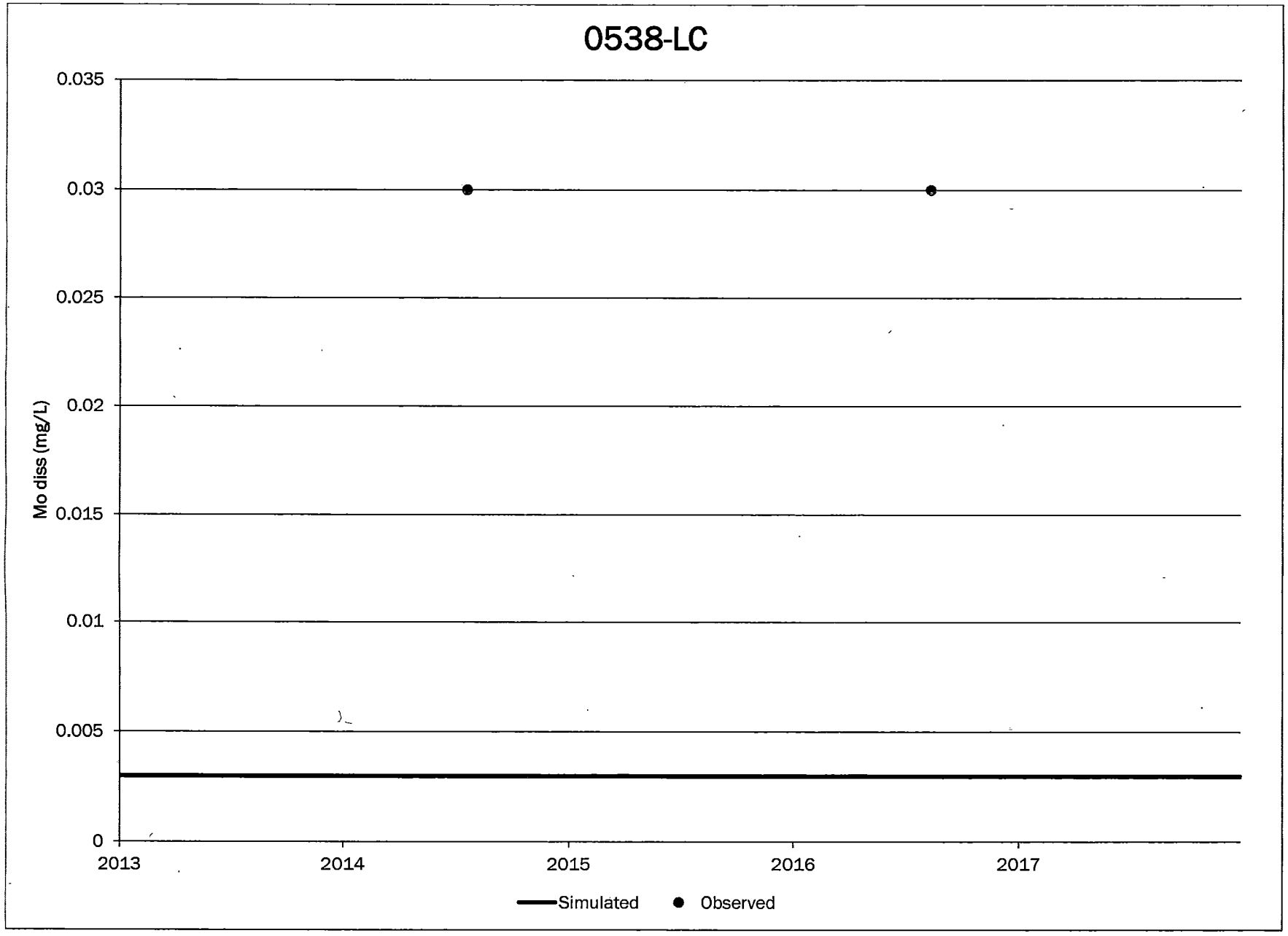

0498-MC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

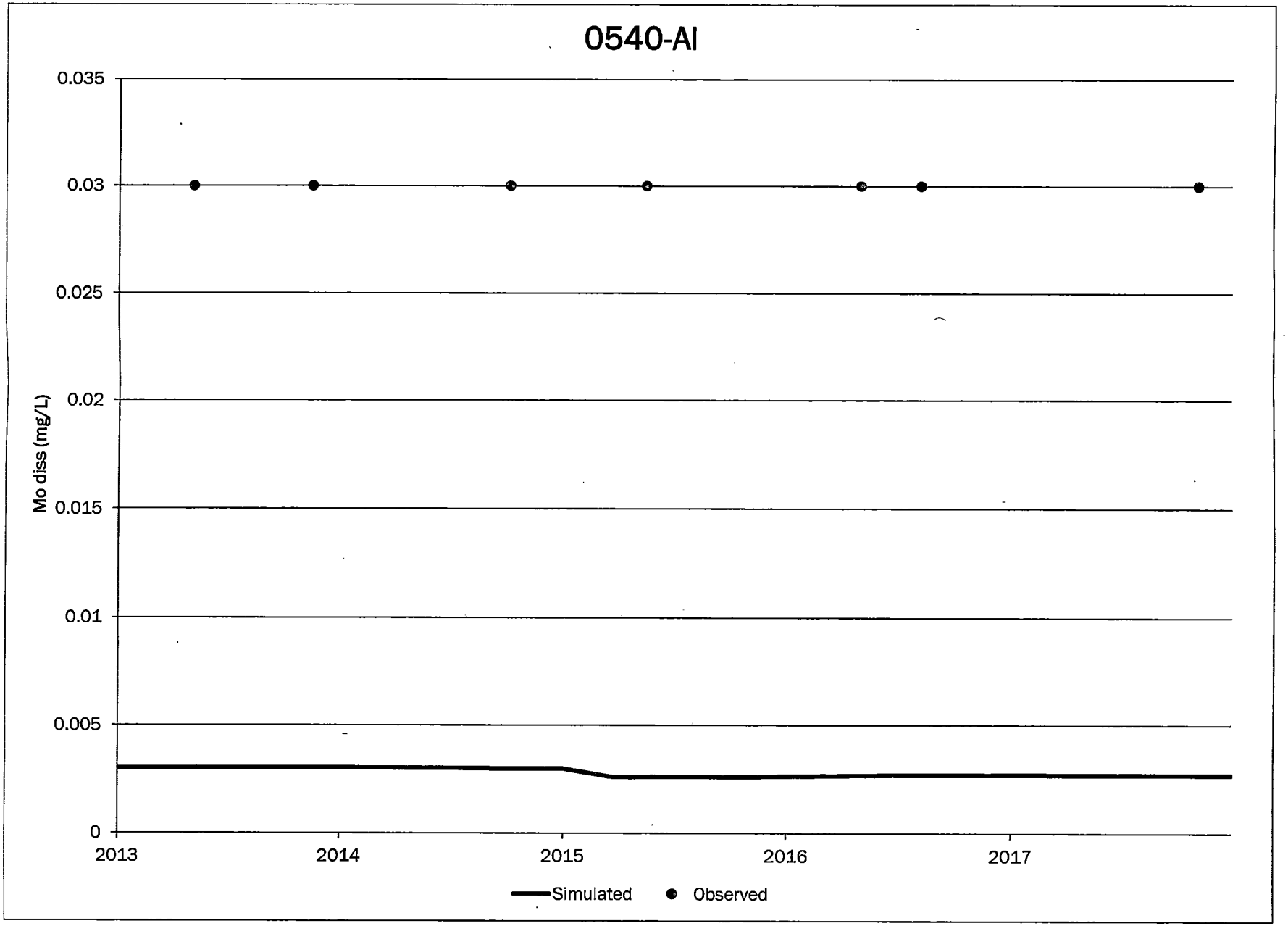

0522-AI
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

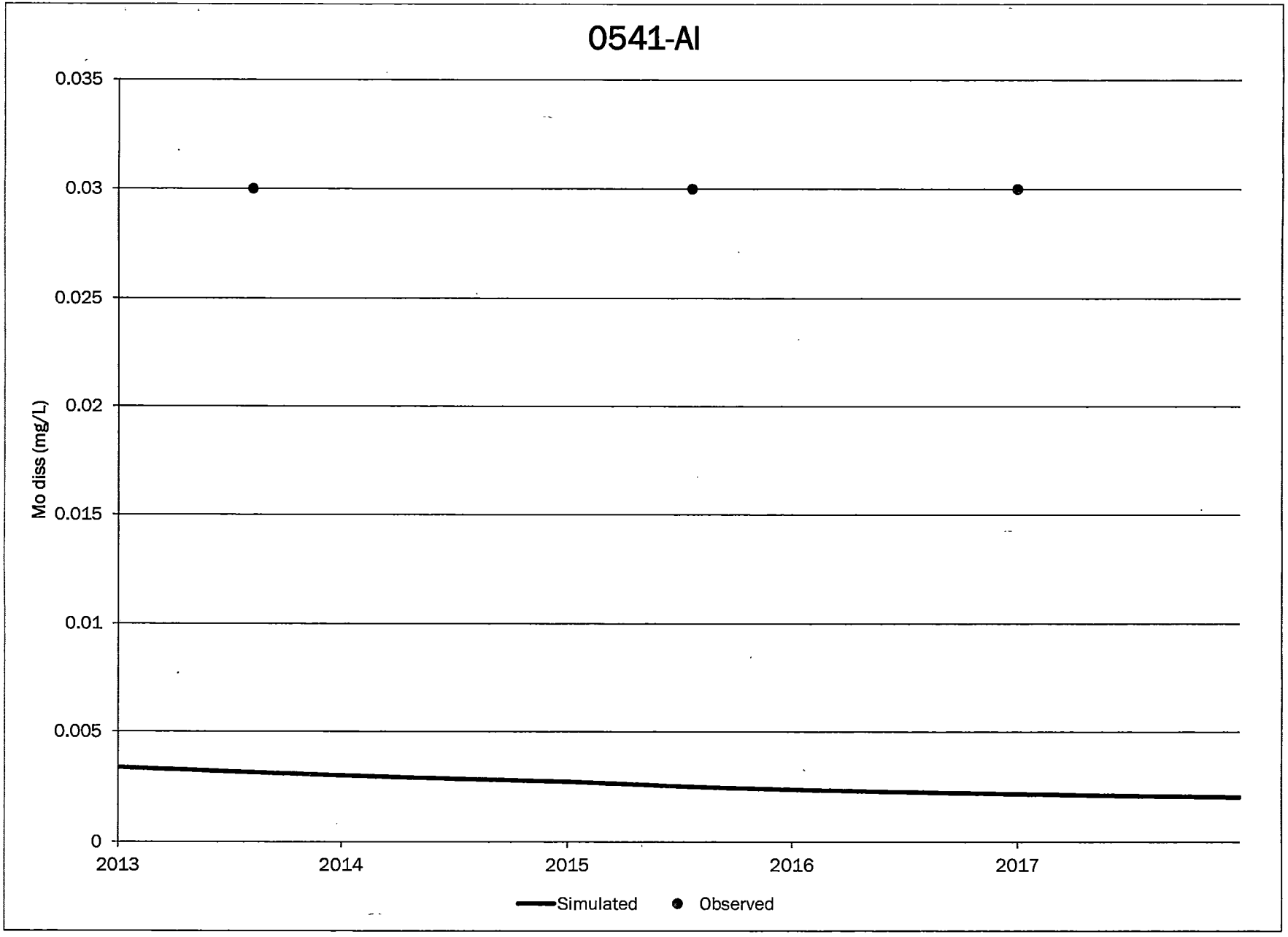

0531-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

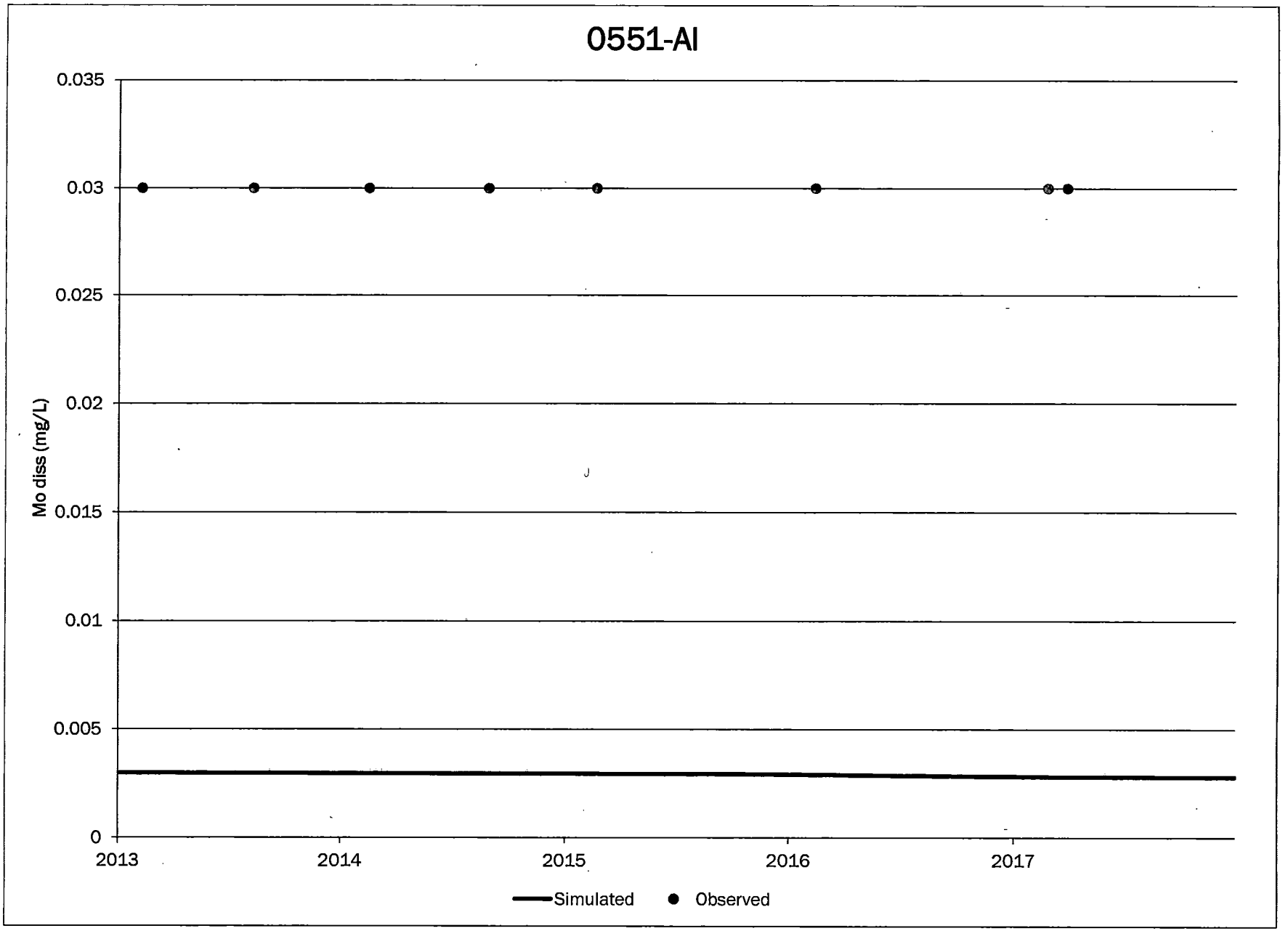

0532-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

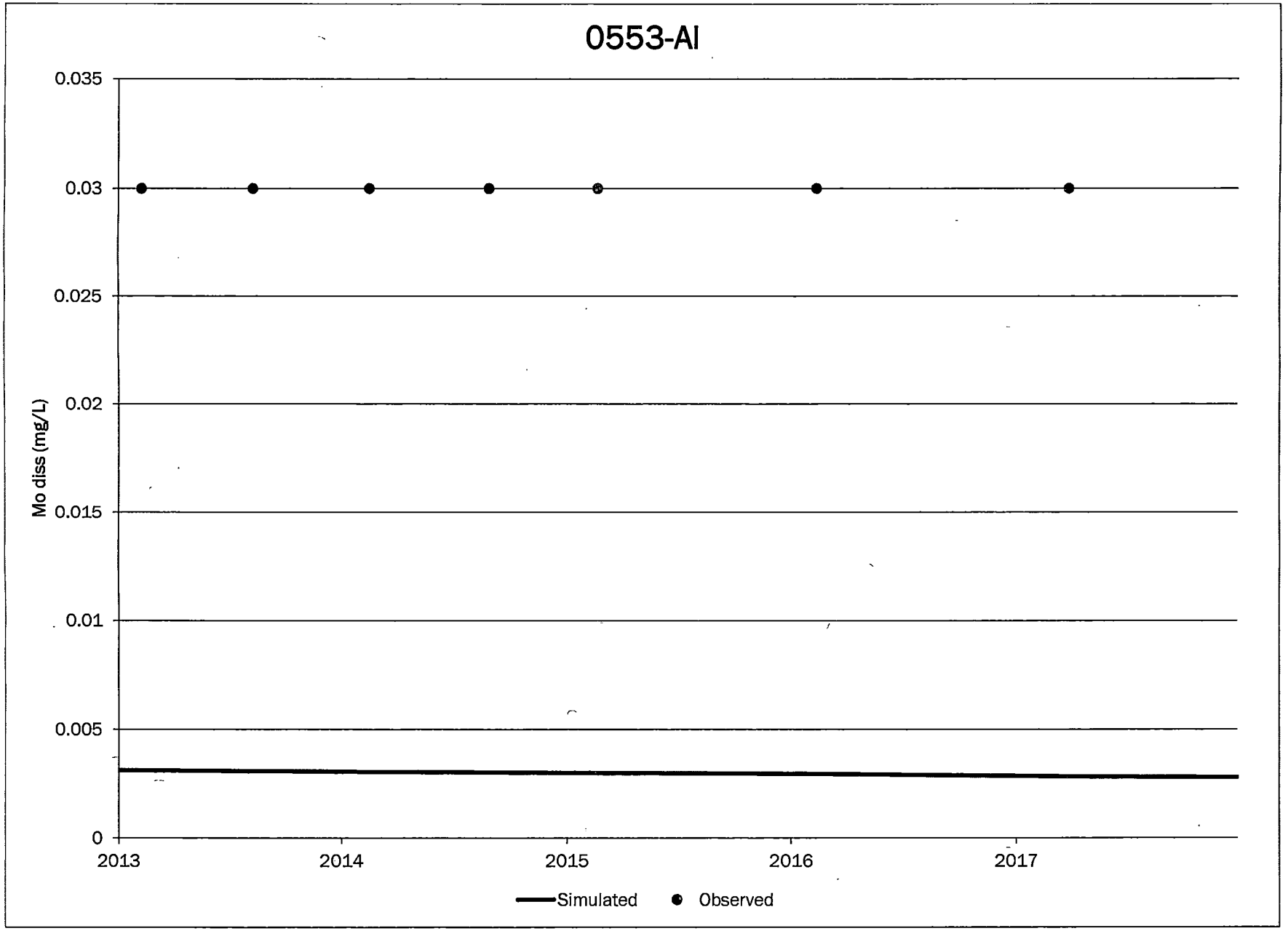

0538-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

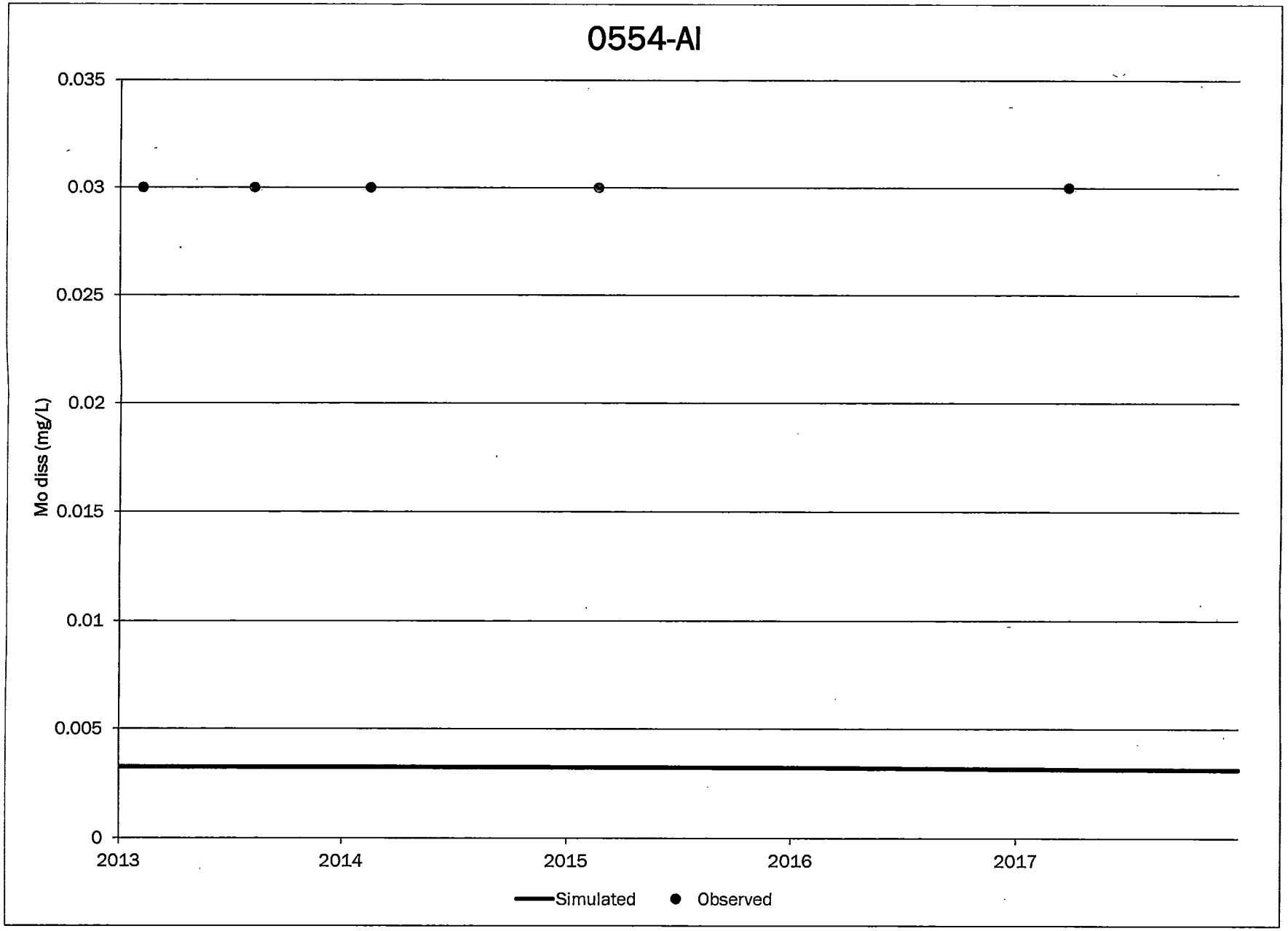

0538-LC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0540-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0541-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0551-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0553-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0554-AI
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0.03
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0.01
0.005
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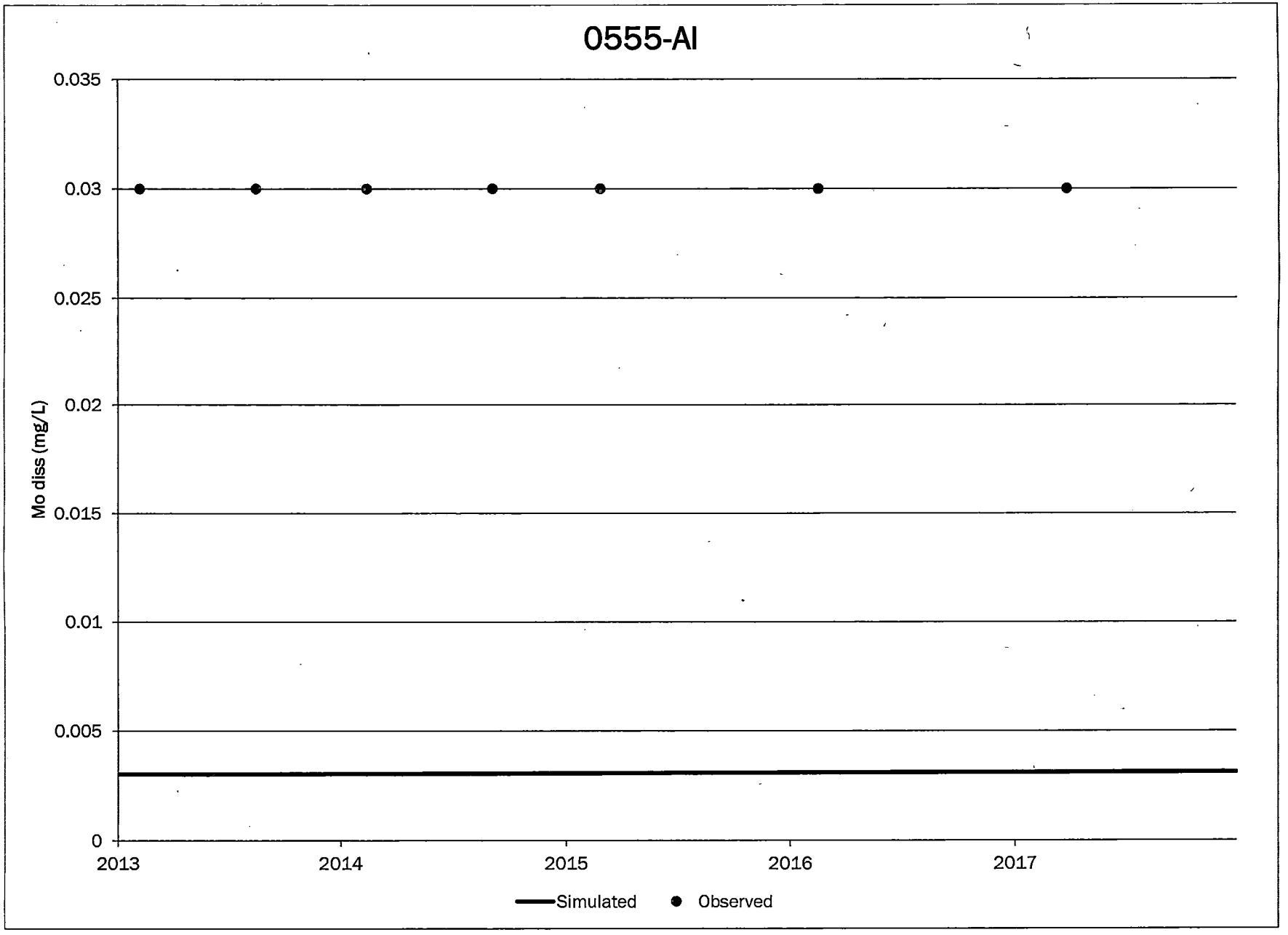
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0555-AI
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0.005
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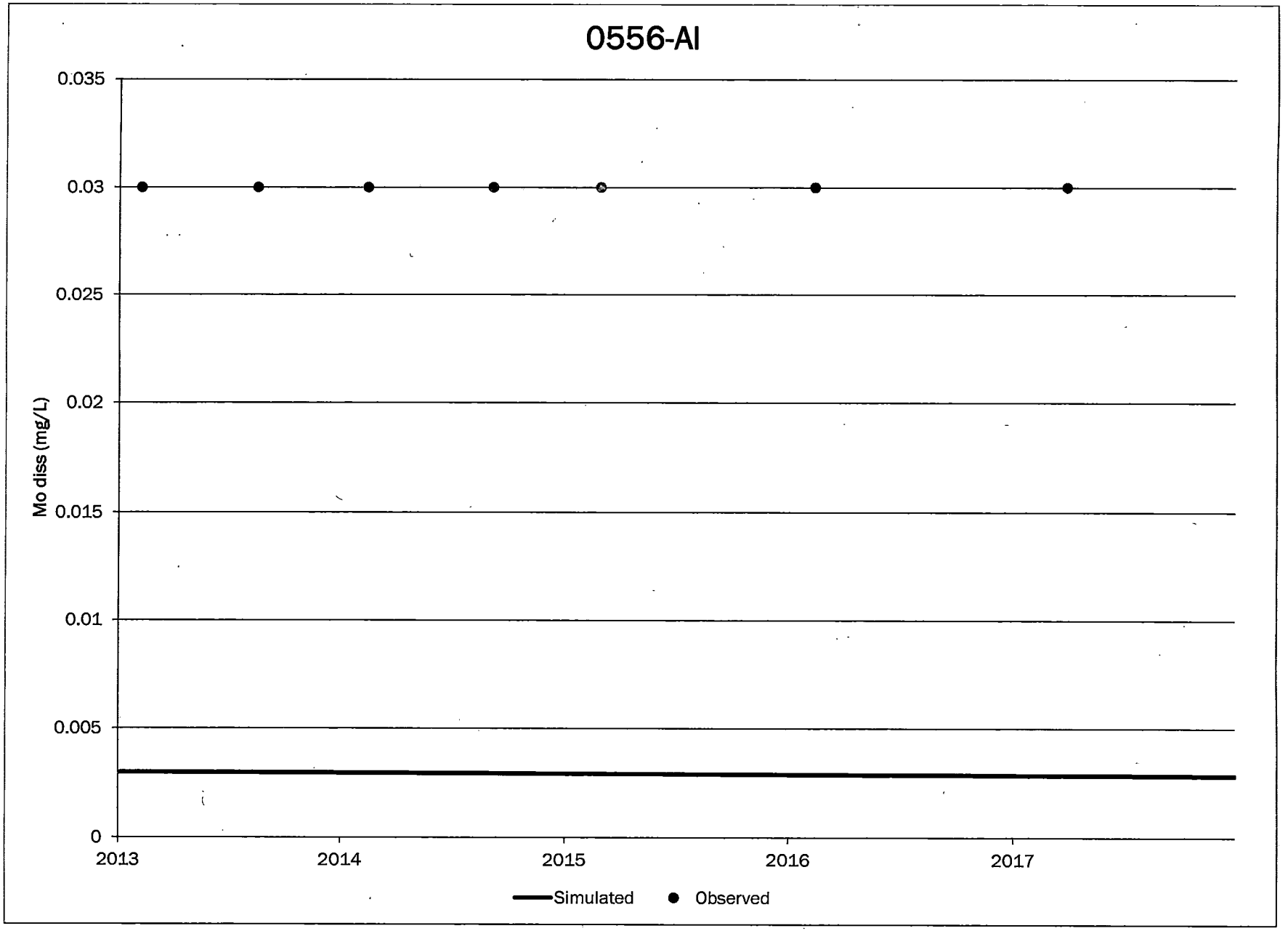
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0556-AI
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0.01
0.005
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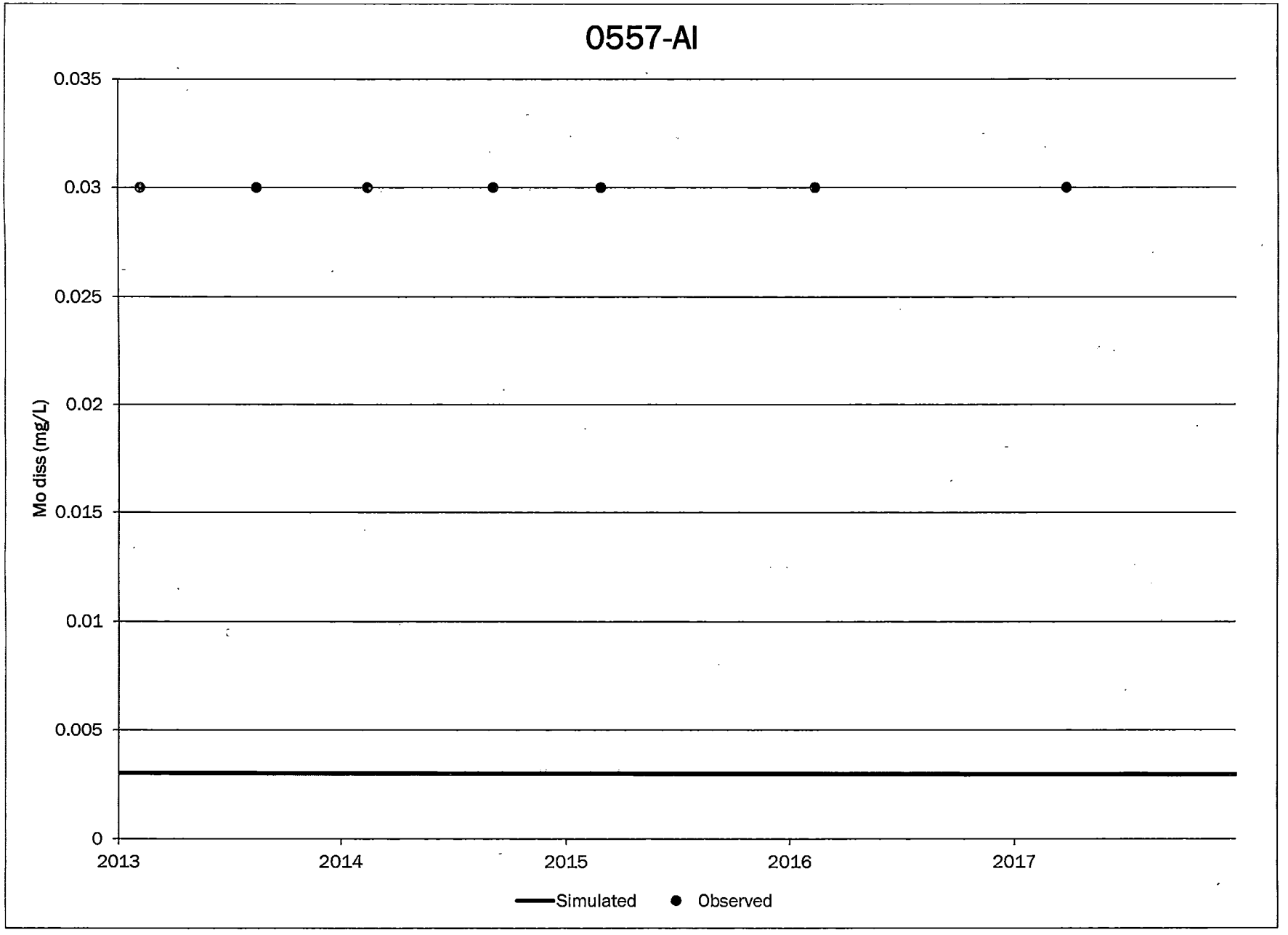
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0557-AI
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0.005
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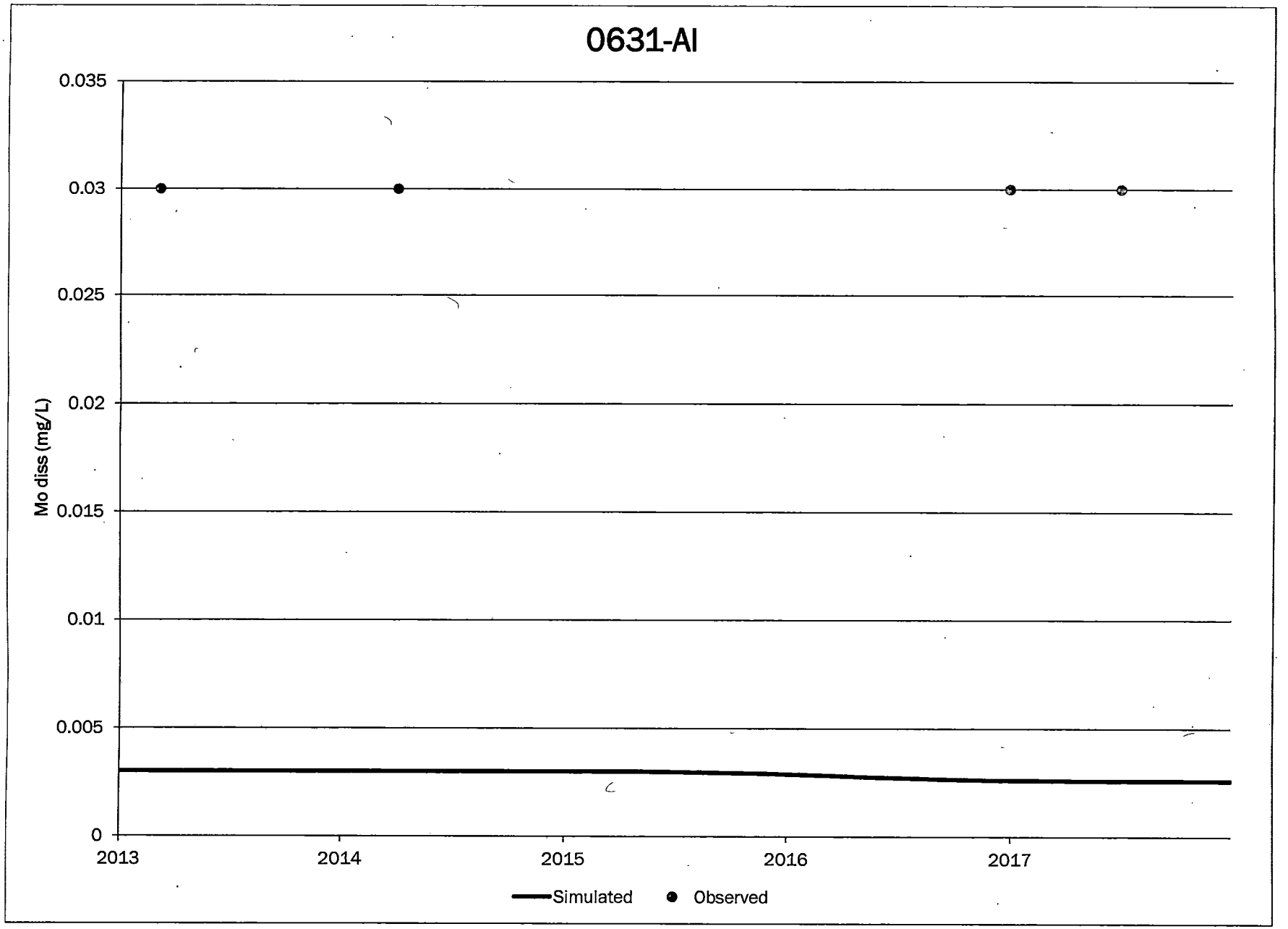
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0631-AI
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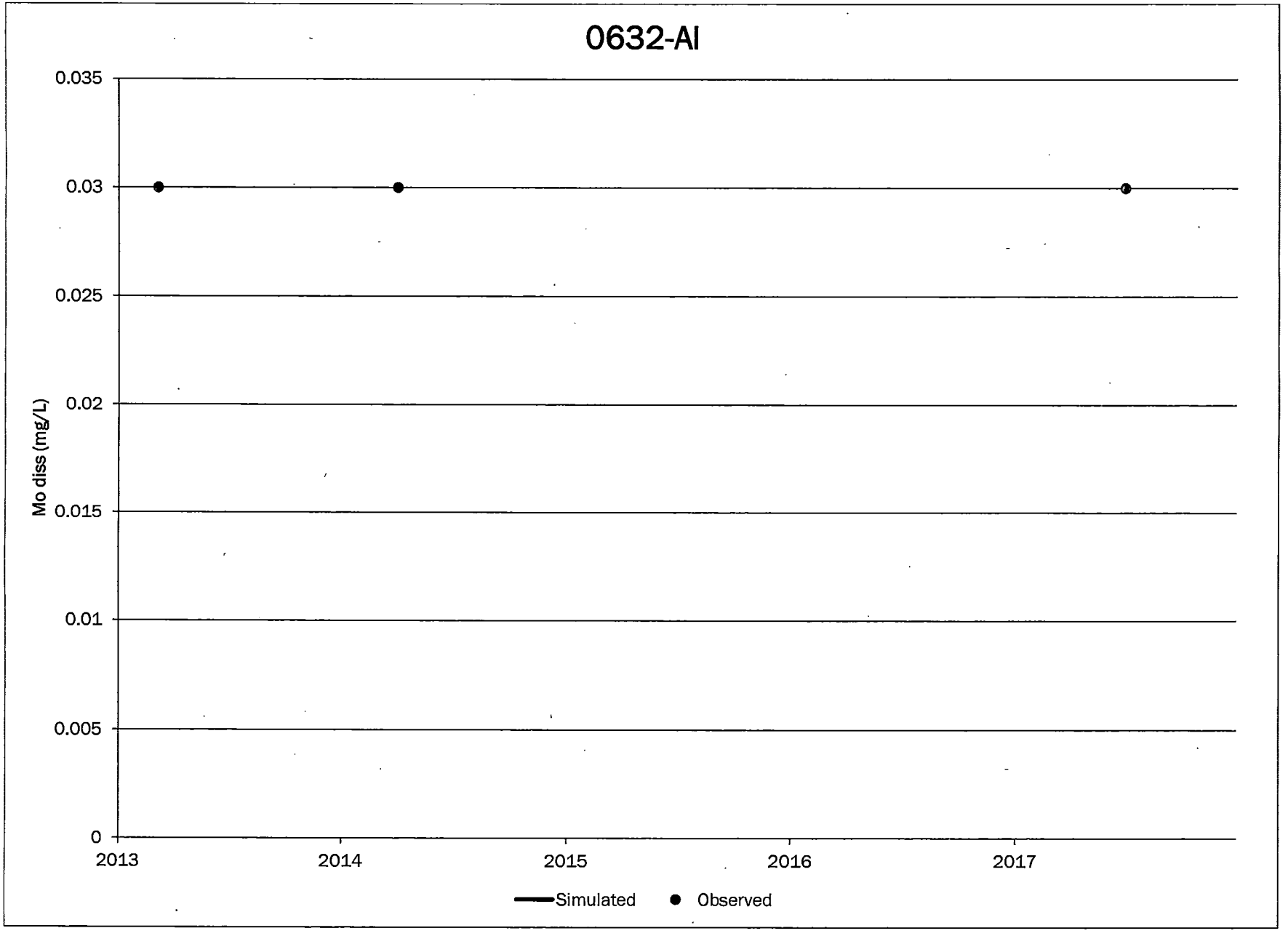
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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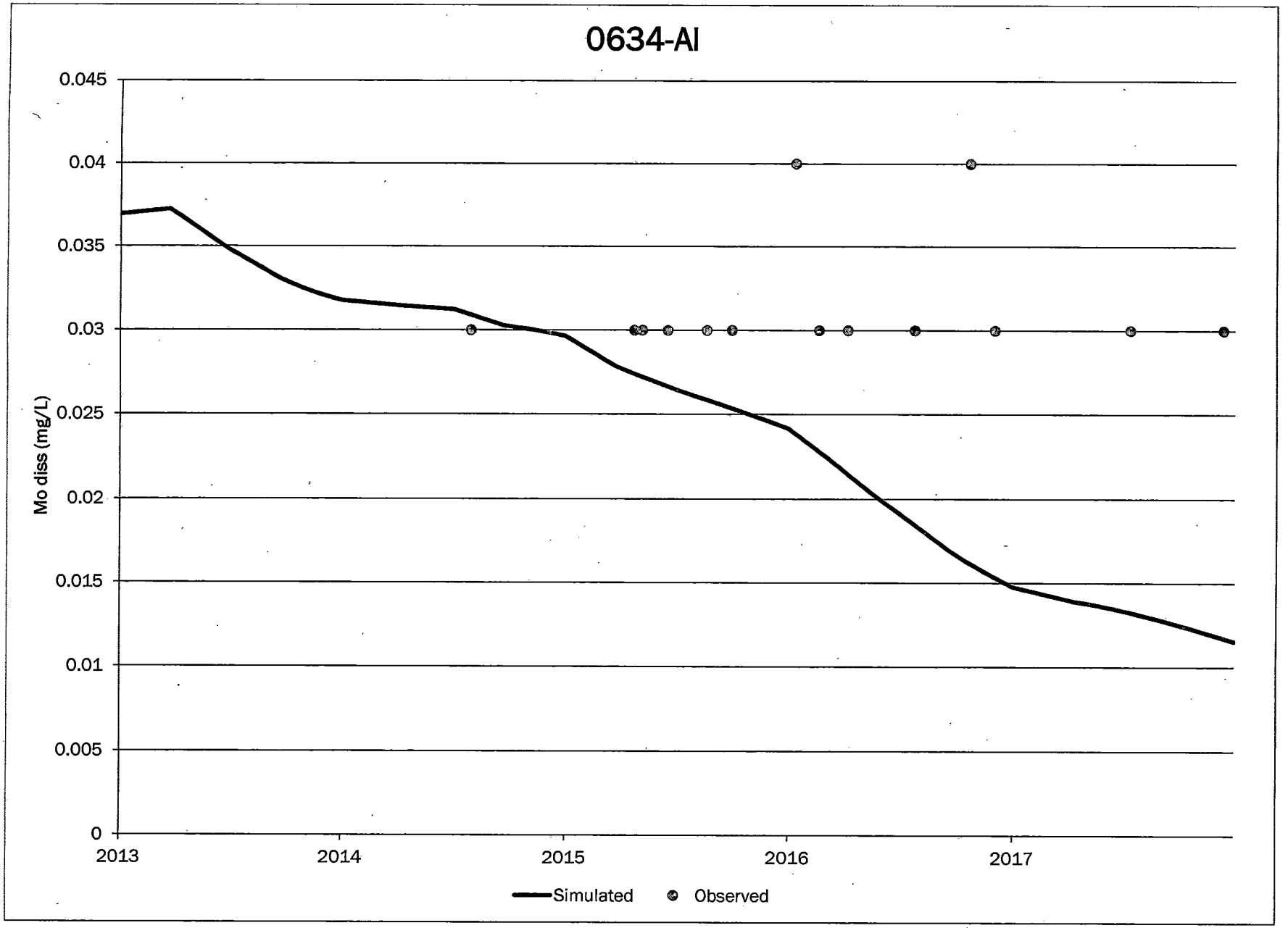
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0634-AI
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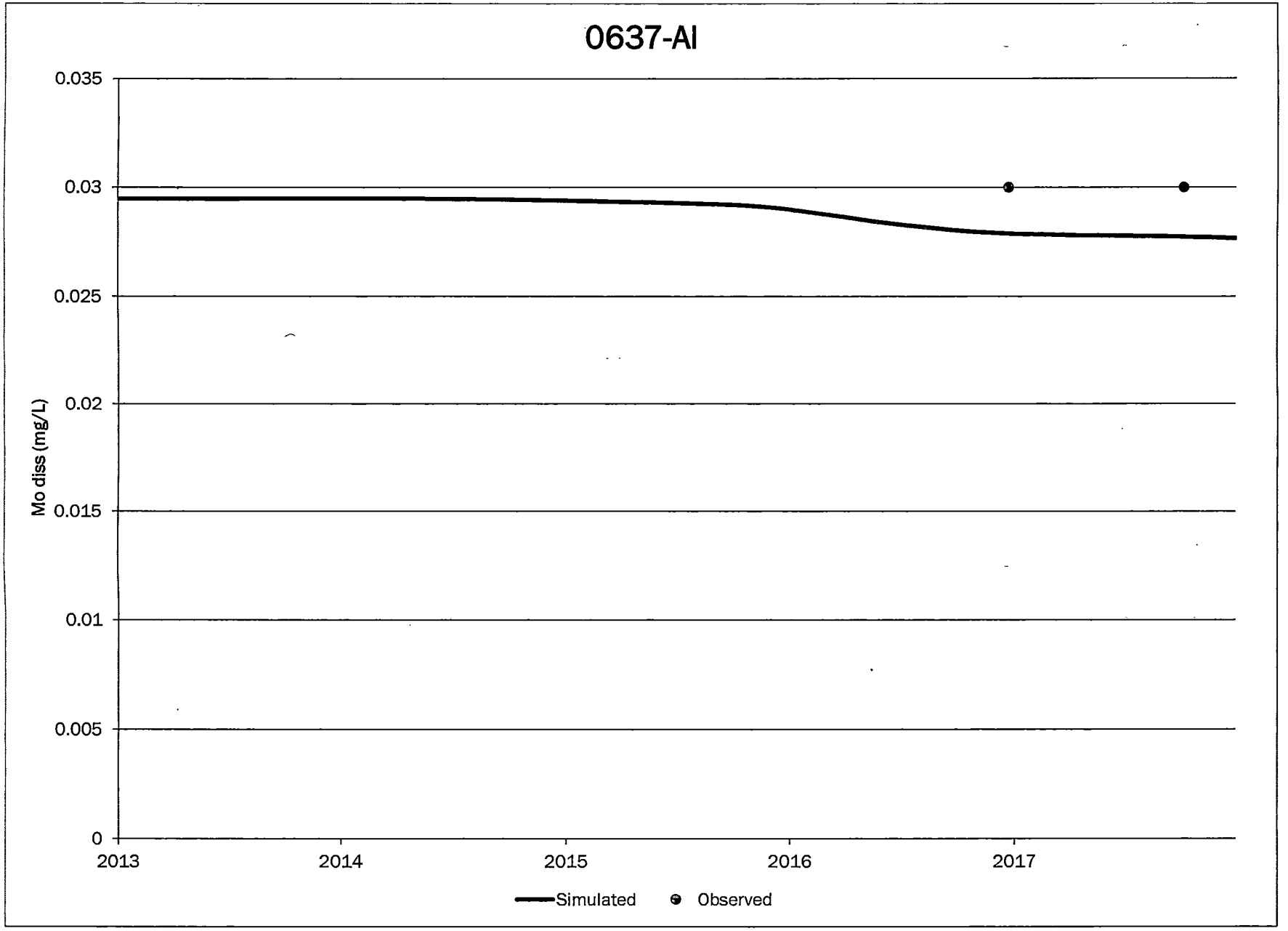
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0637-AI
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Mo diss (mg/L)
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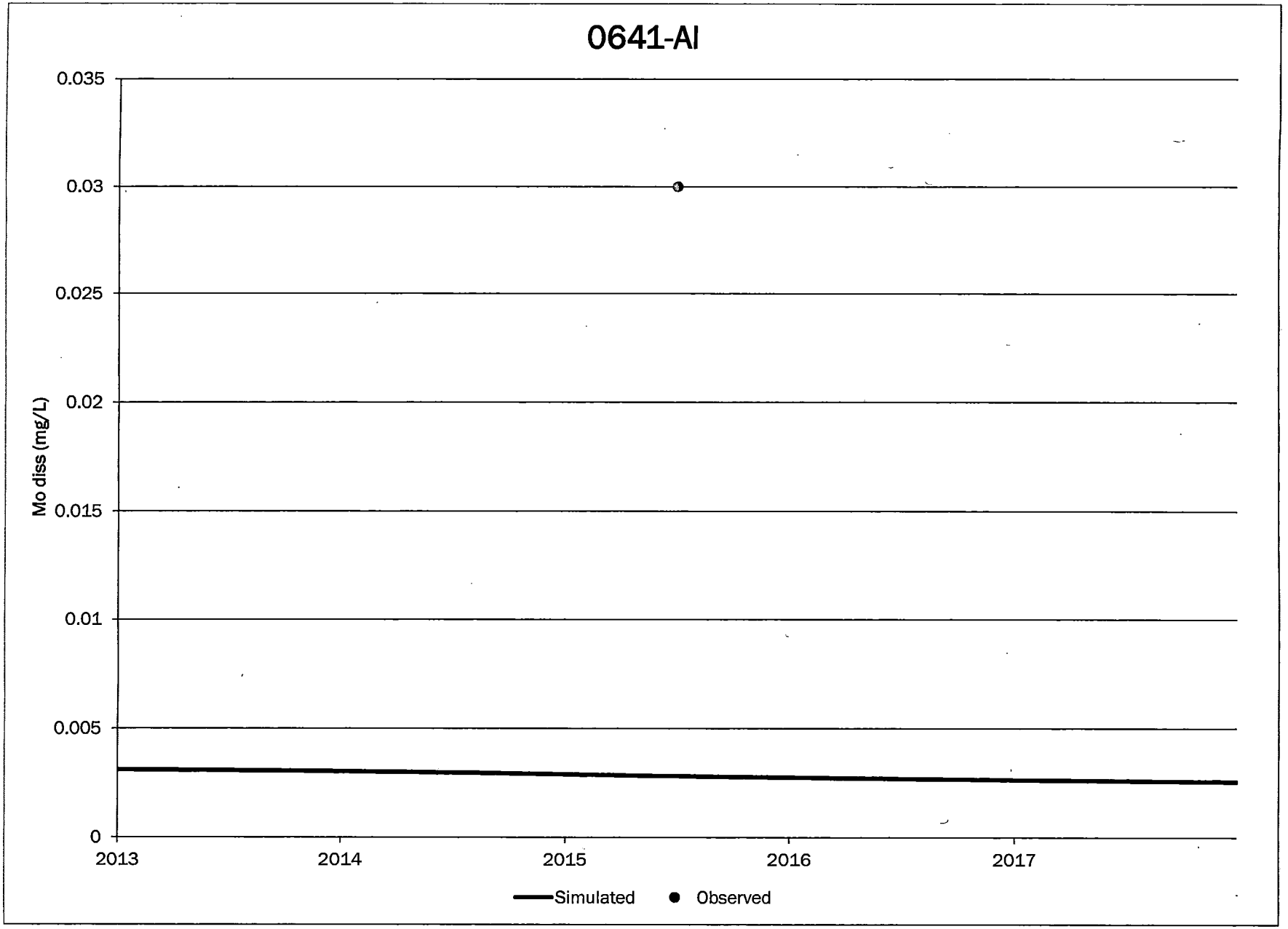
2015
2016
2017
Simulated
Observed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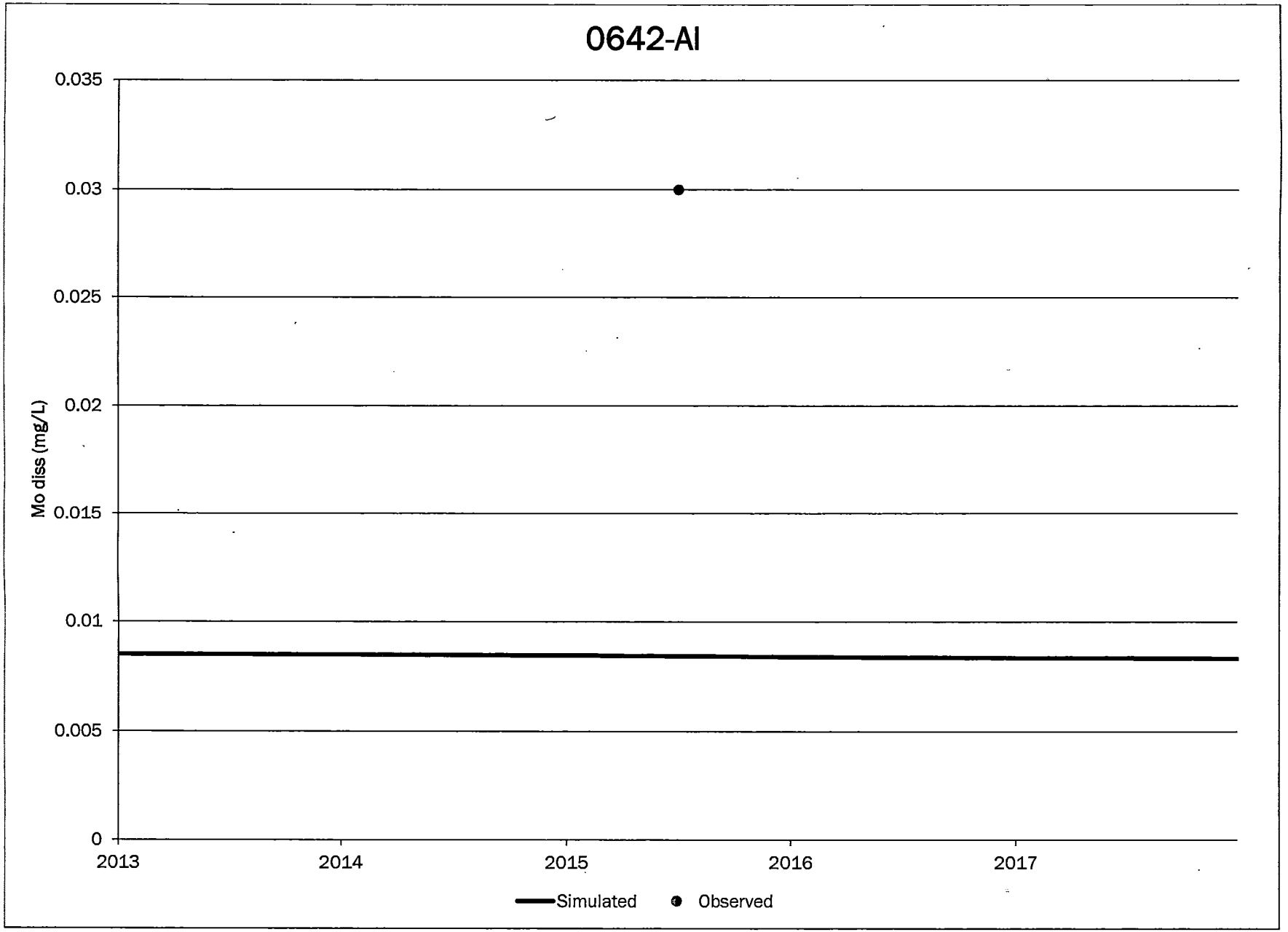
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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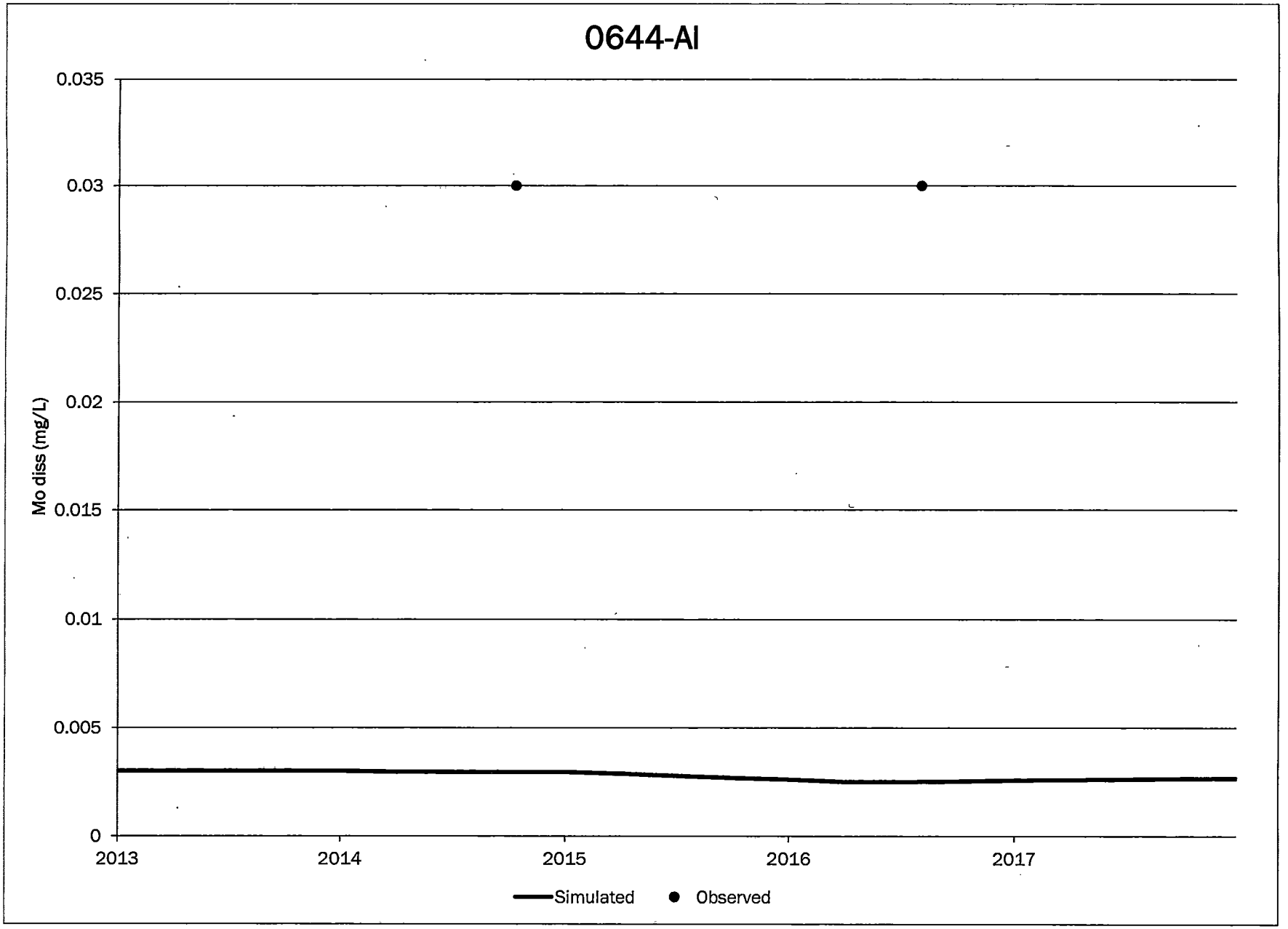
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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0.005
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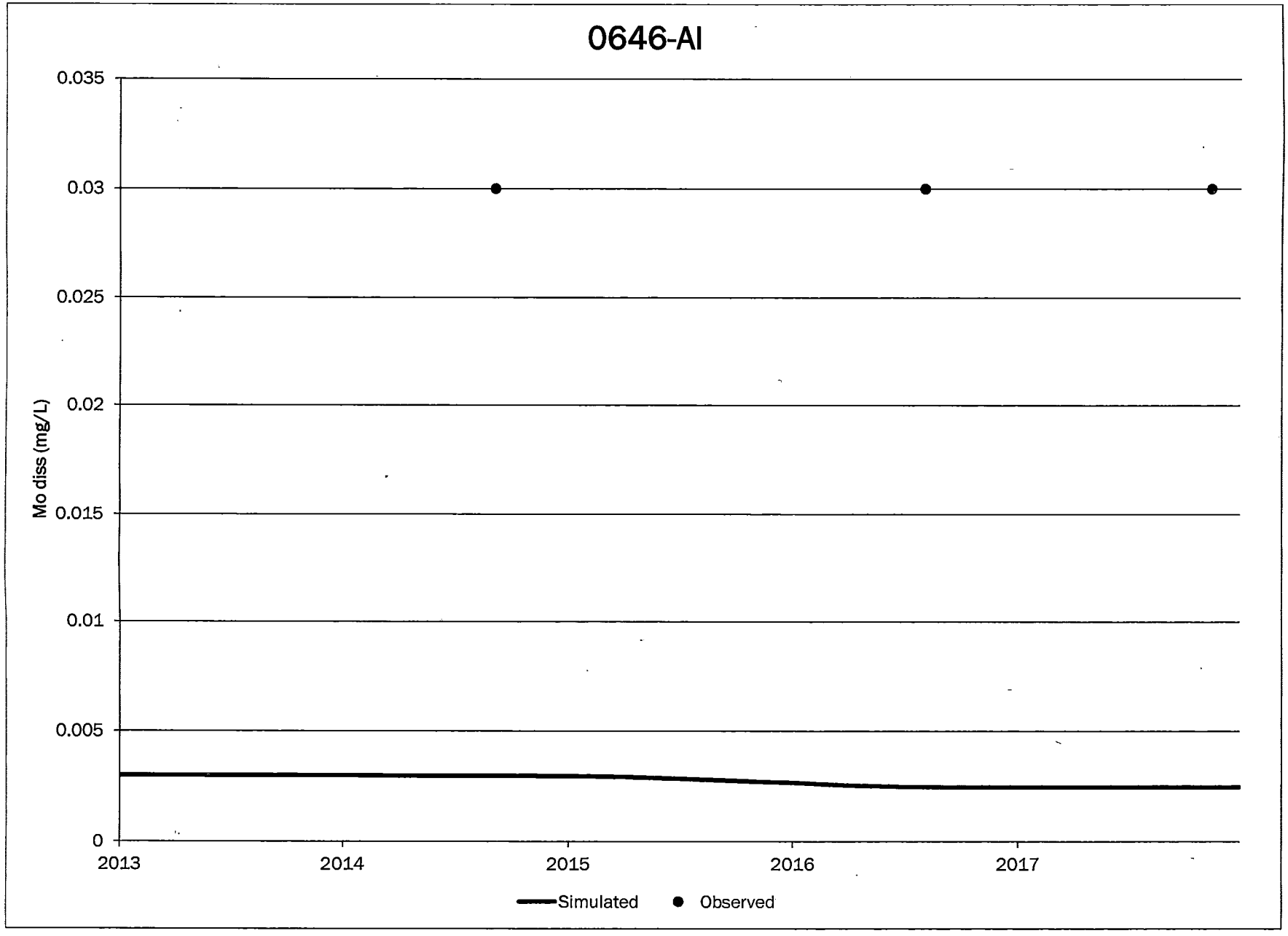
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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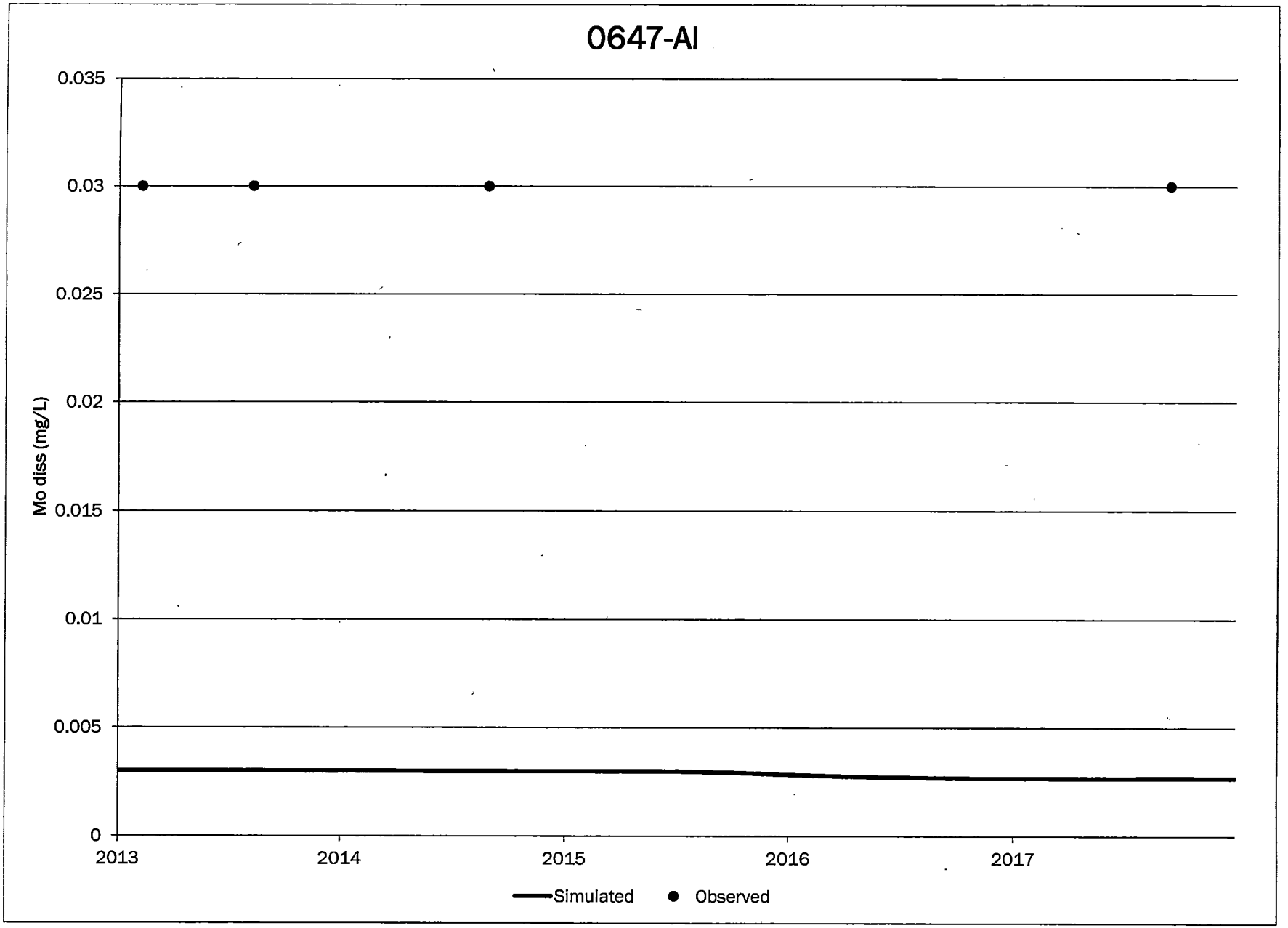
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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0.01
0.005
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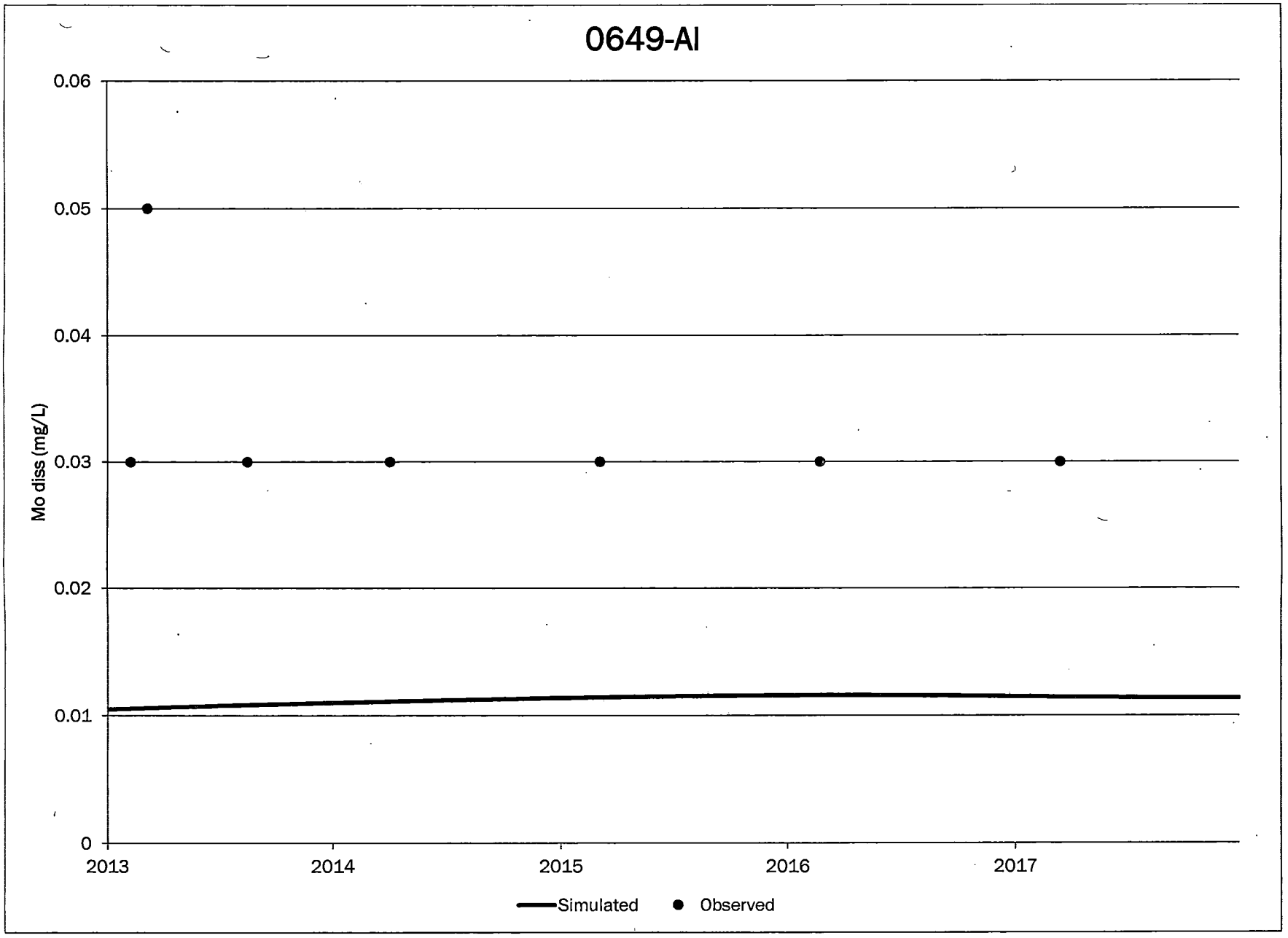
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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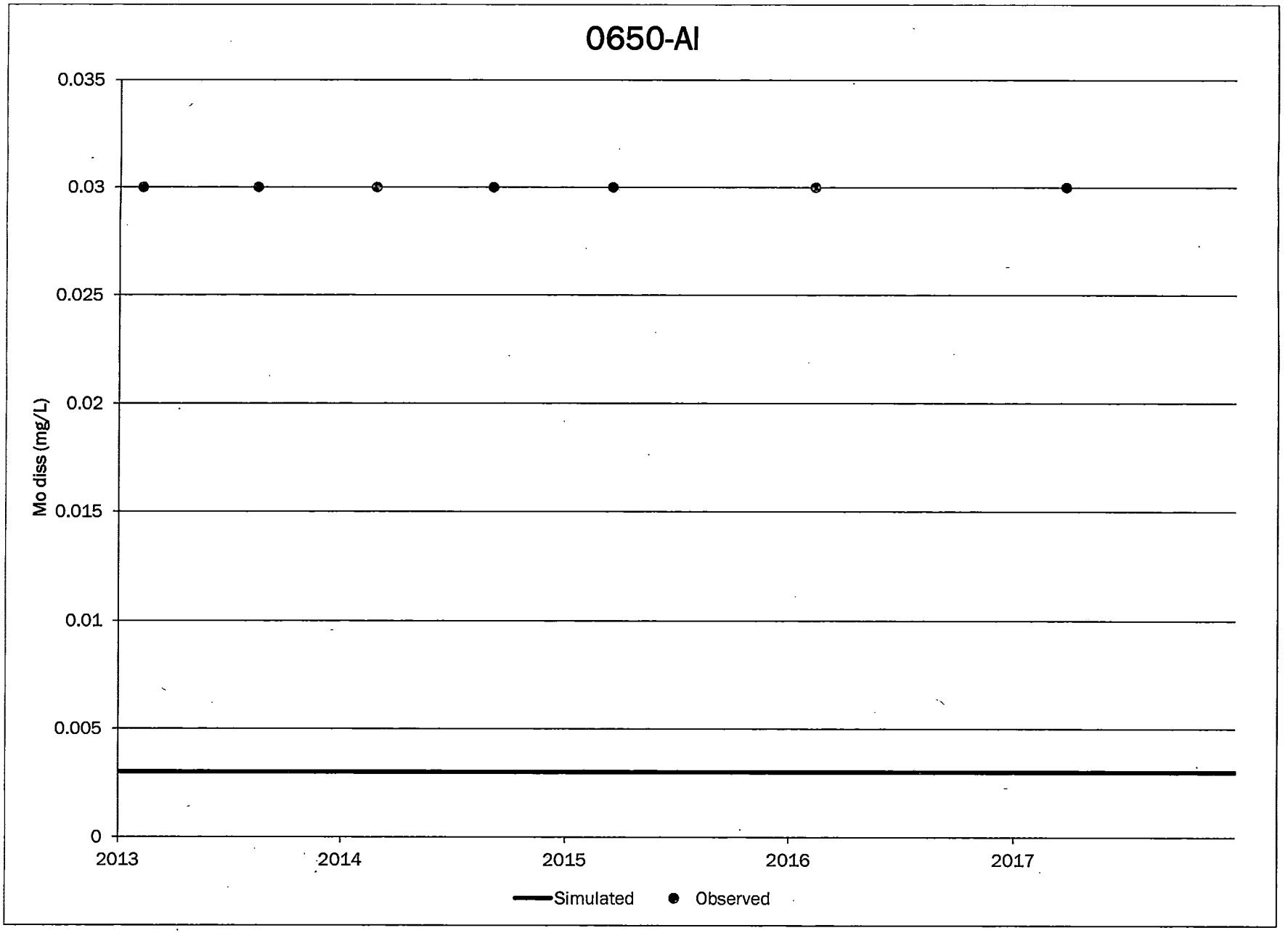
0.01
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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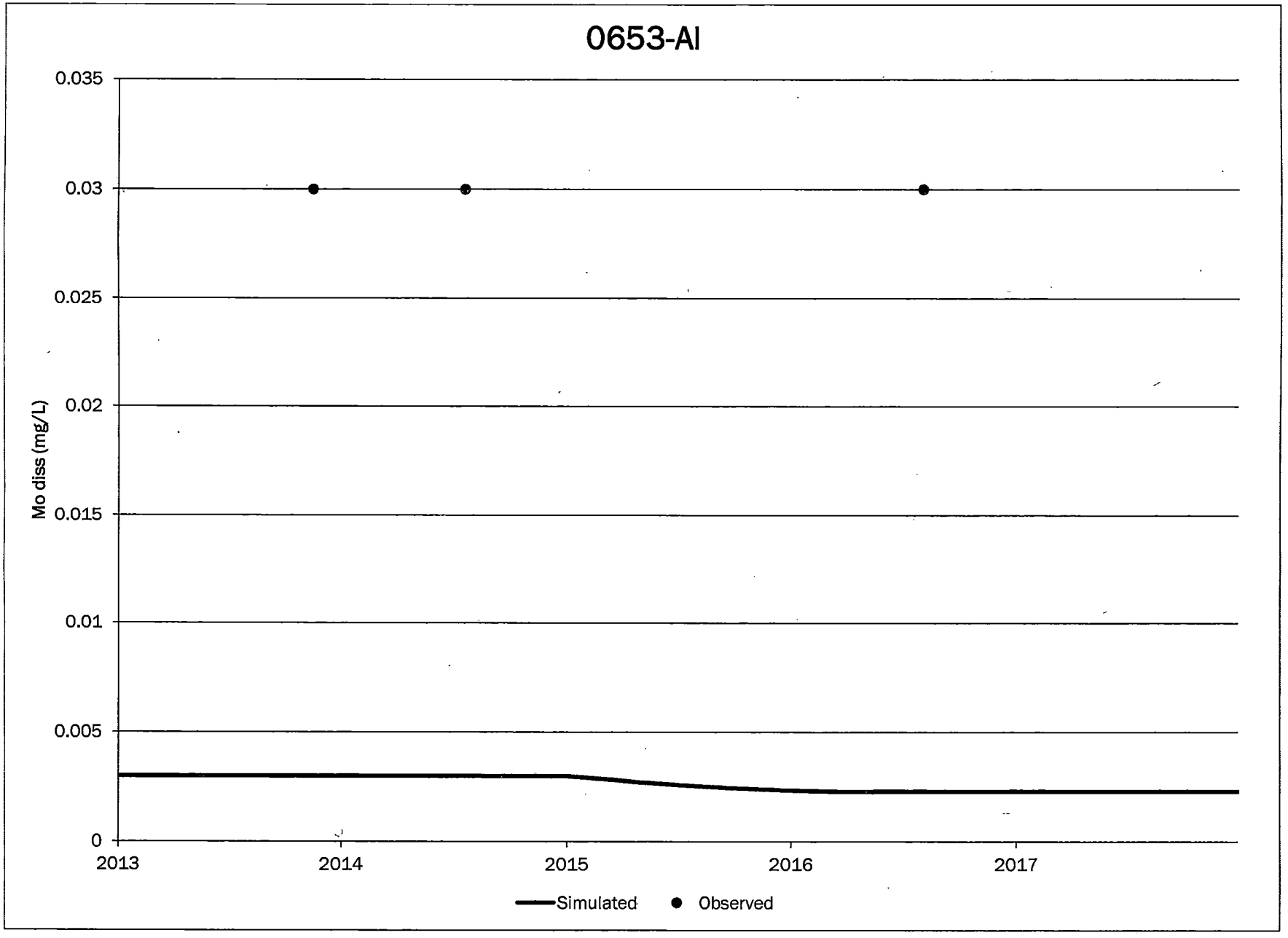
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0653-AI
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0.005
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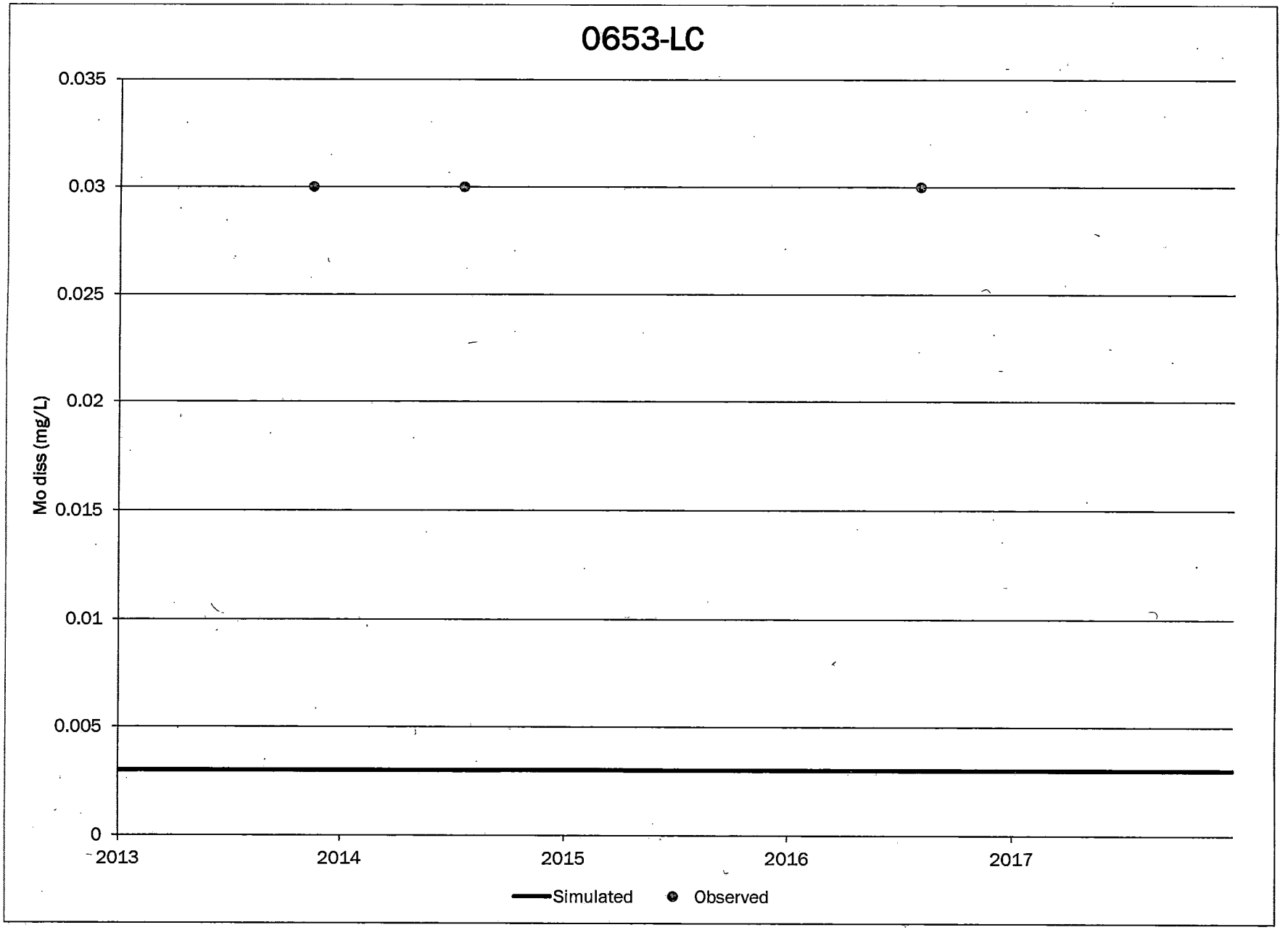
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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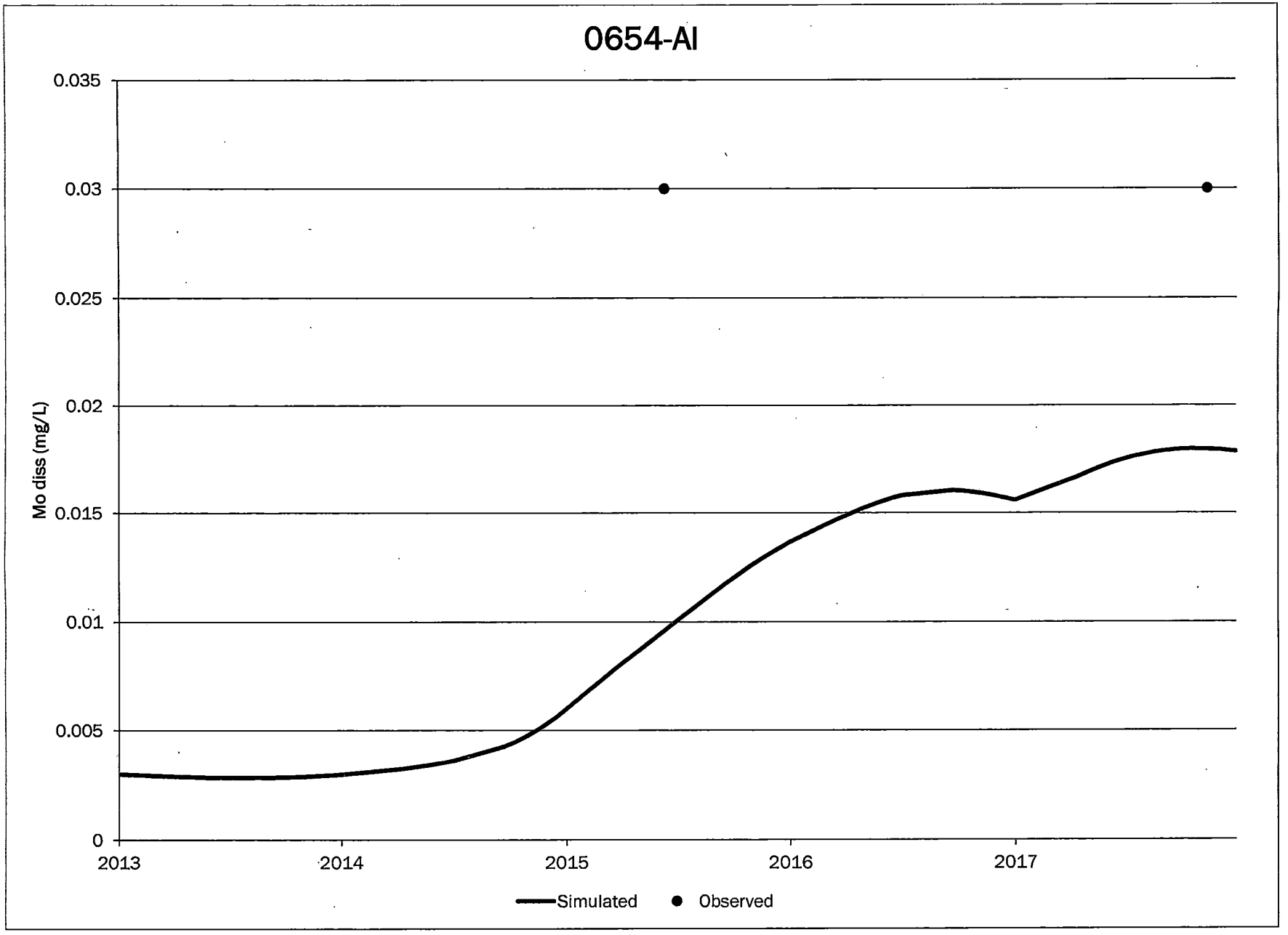
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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0.03
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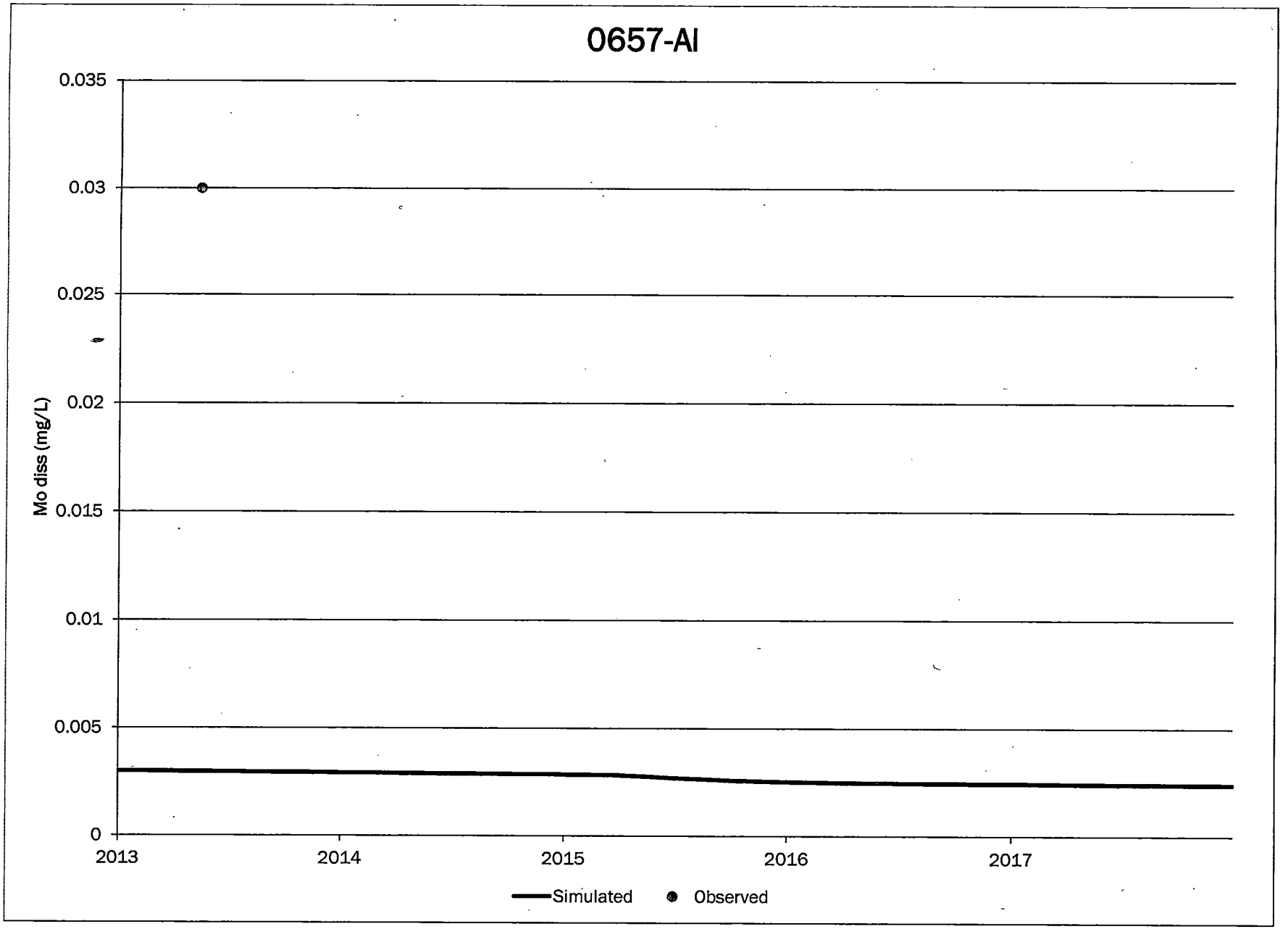
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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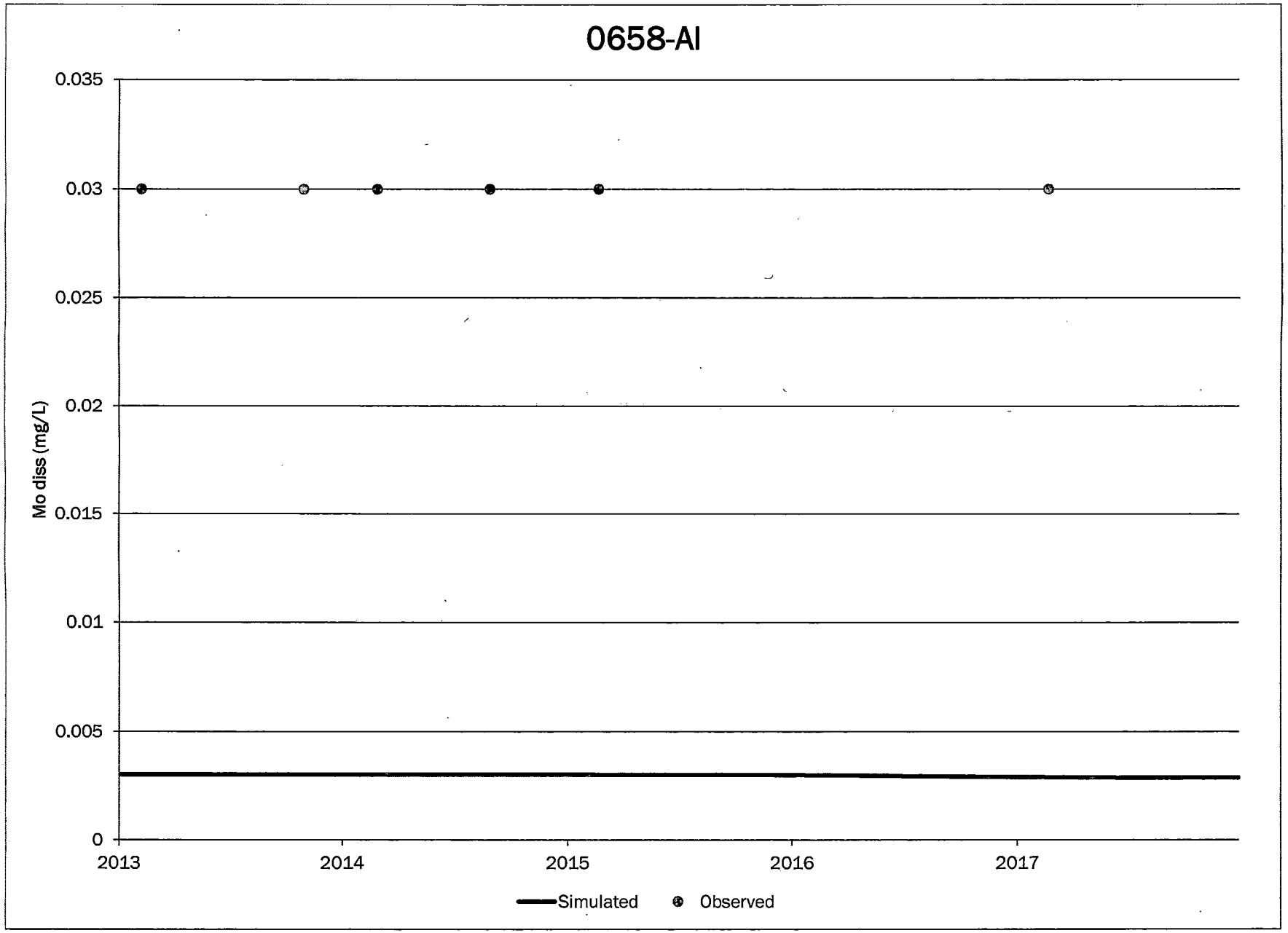
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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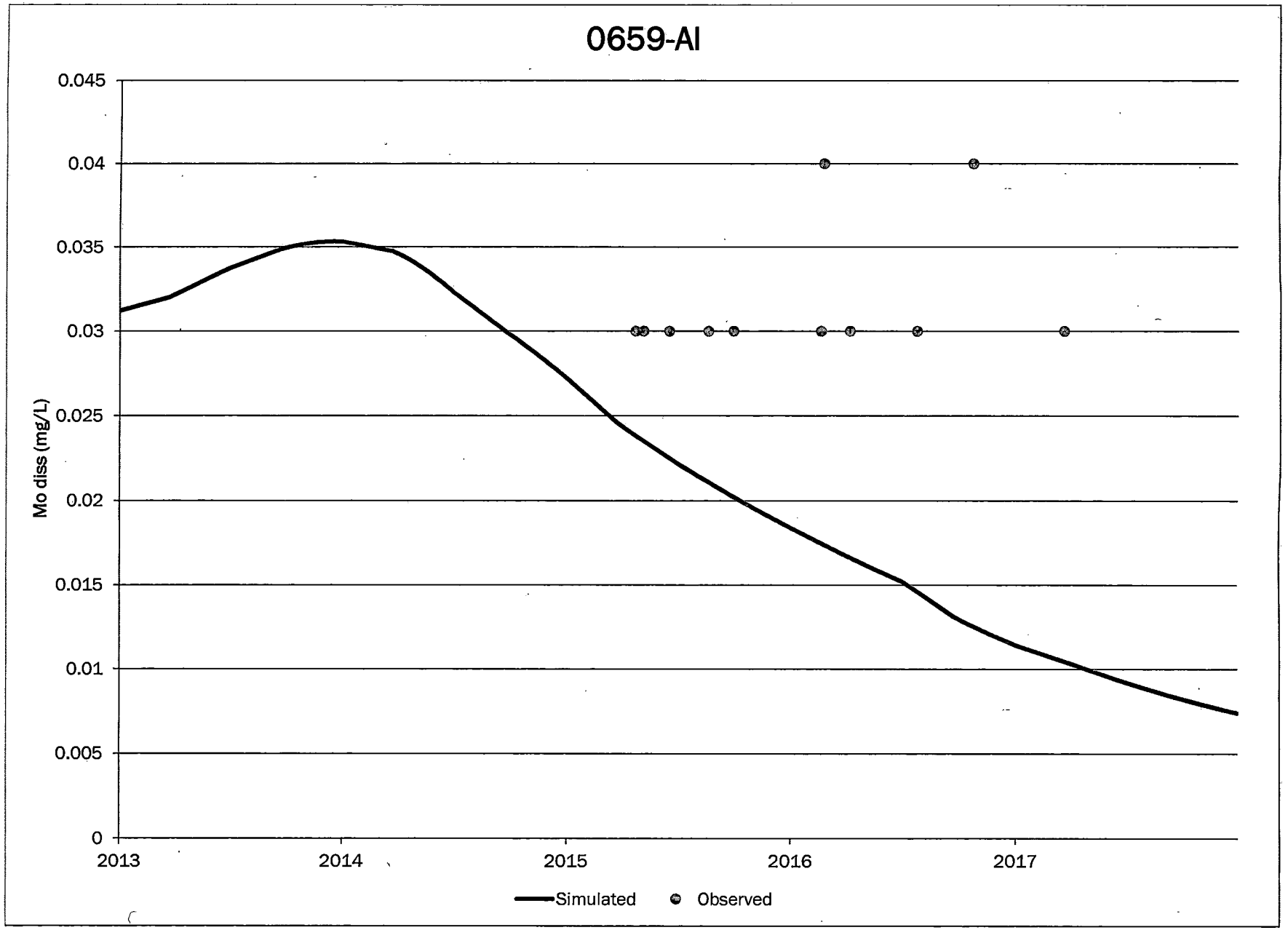
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0659-AI
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0.035
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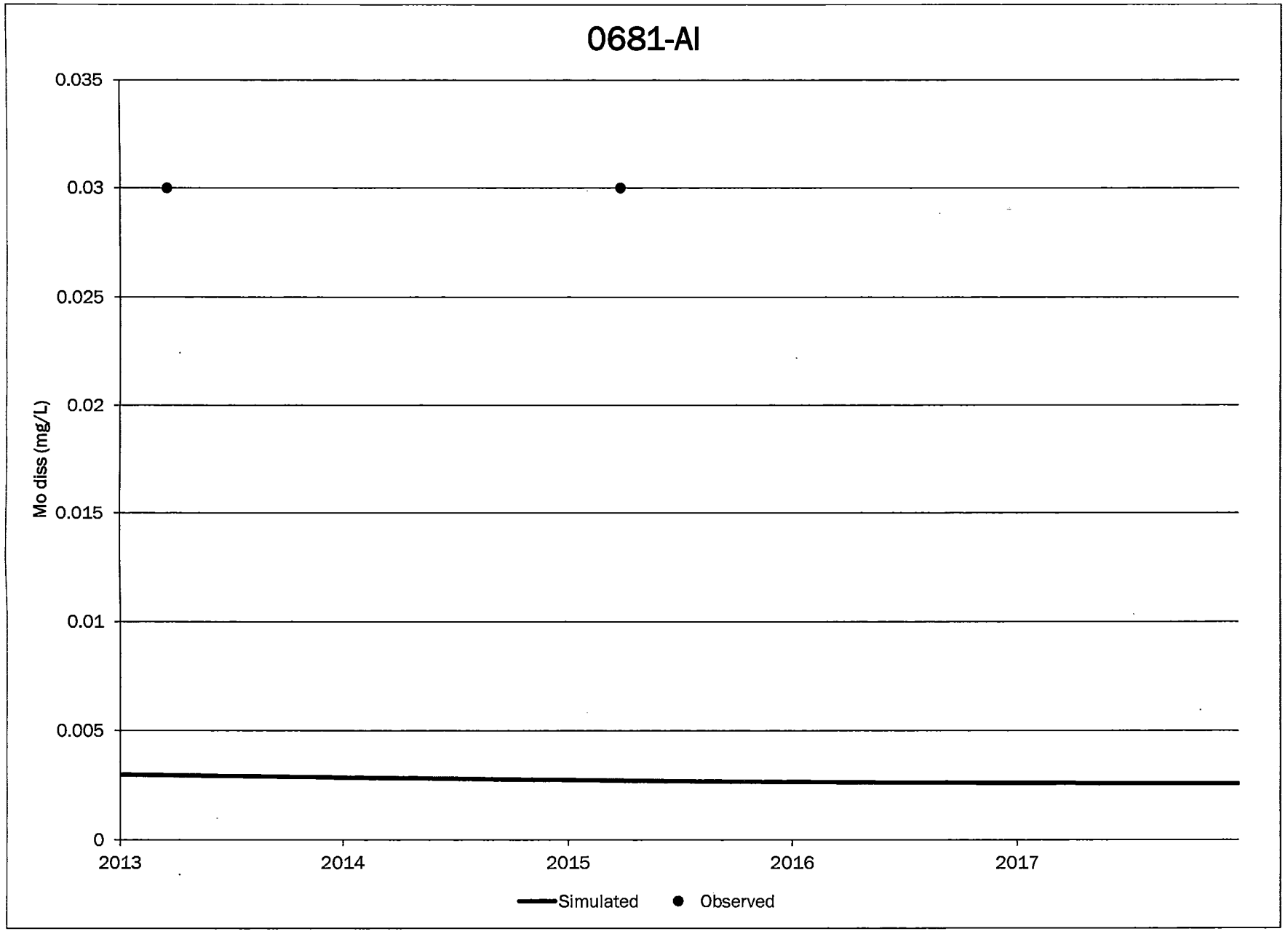
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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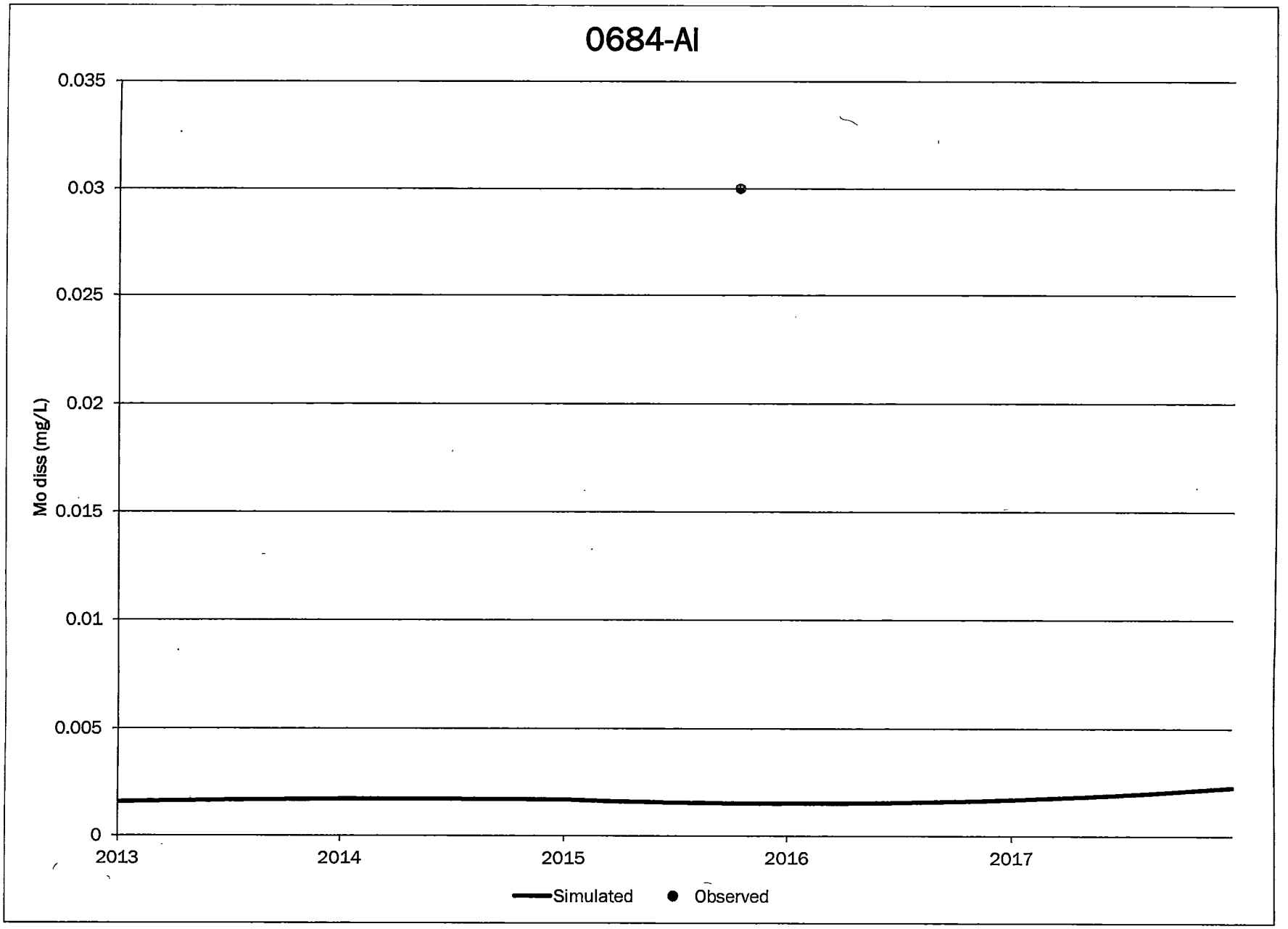
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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0.03
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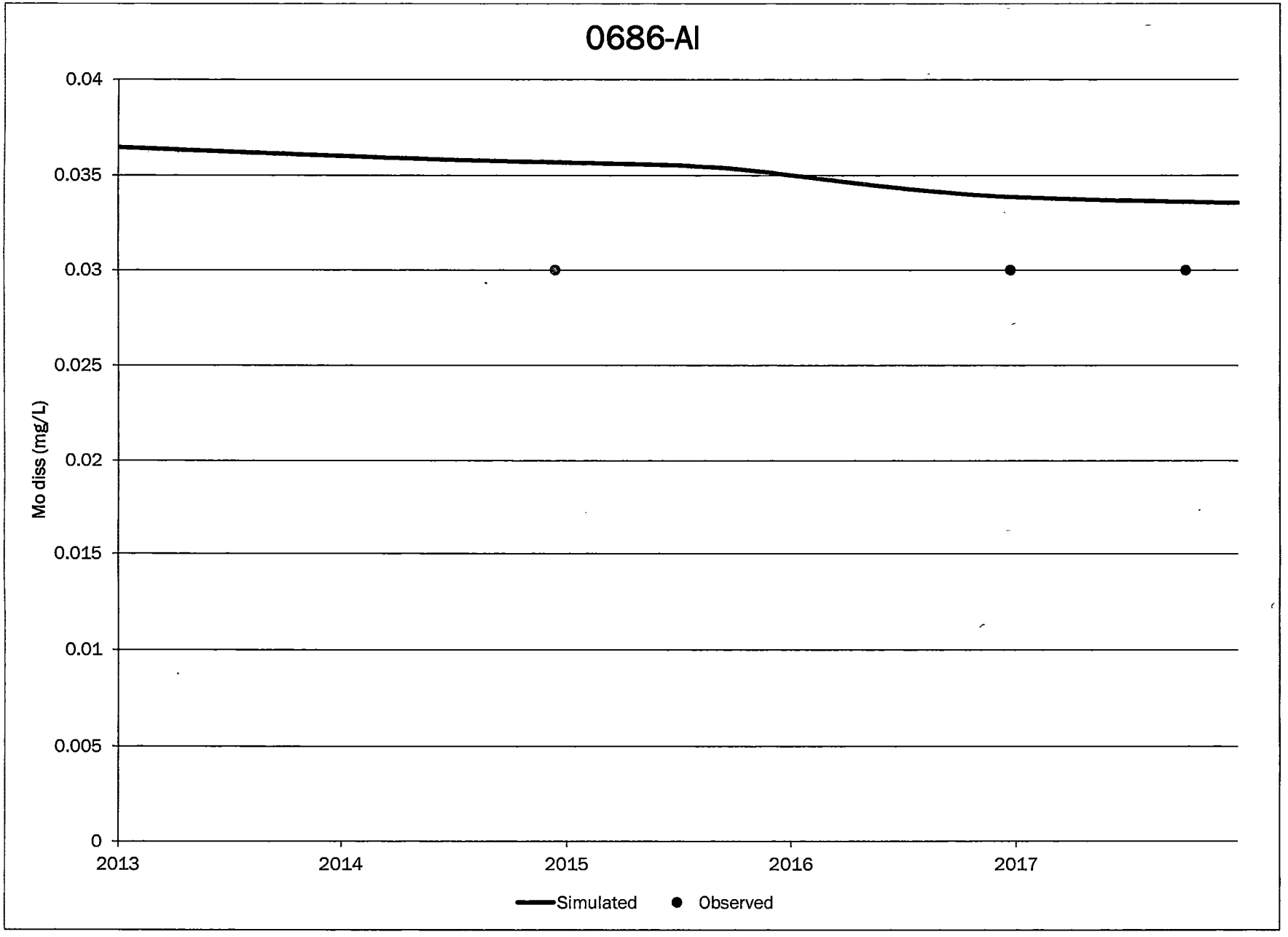
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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0.01
0.005
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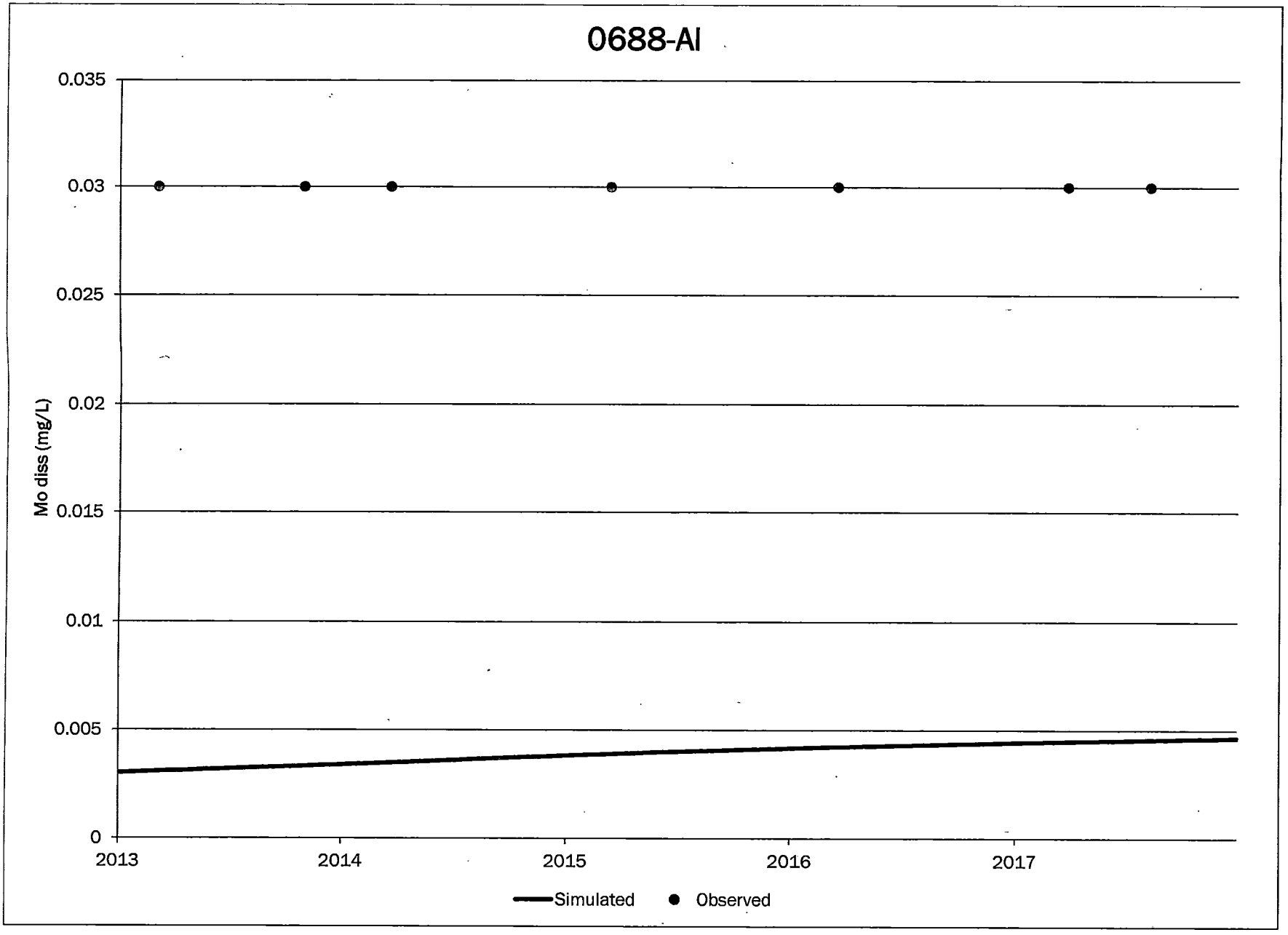
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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Mo diss (mg/L)
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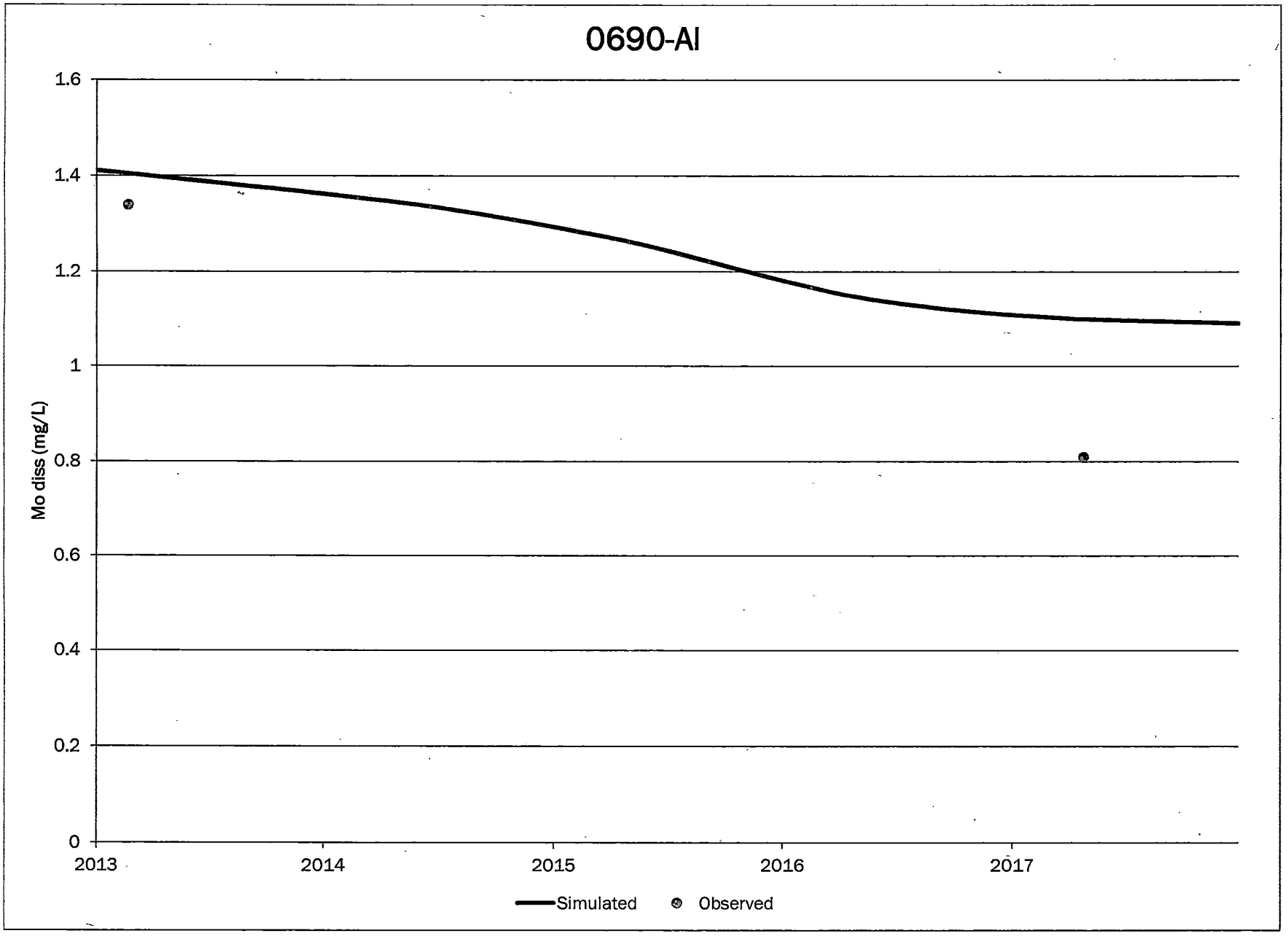
2015
2016
2017
Simulated
Observed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Mo diss (mg/L)
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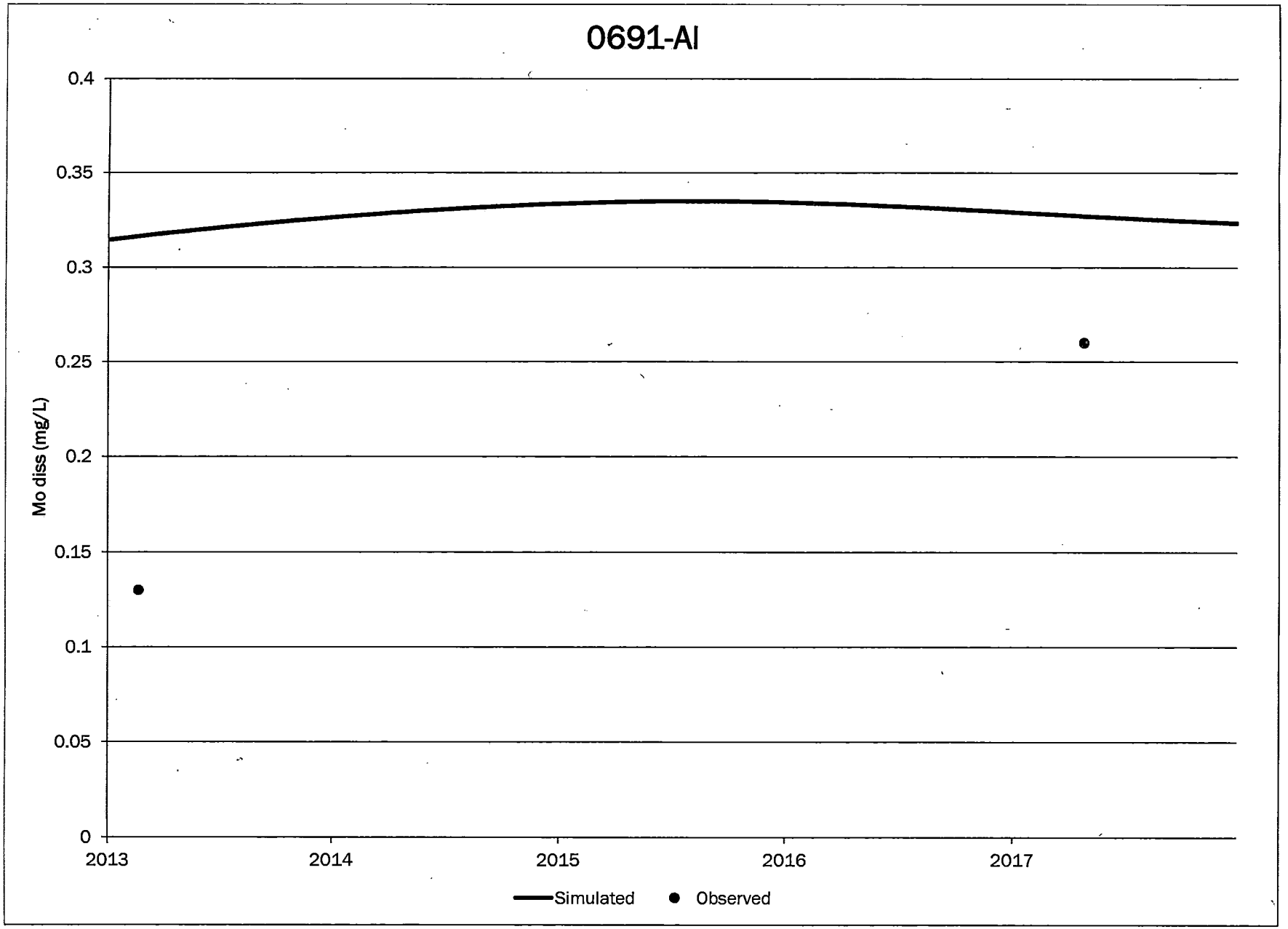
2014
2015
2016
2017
Simulated
Observed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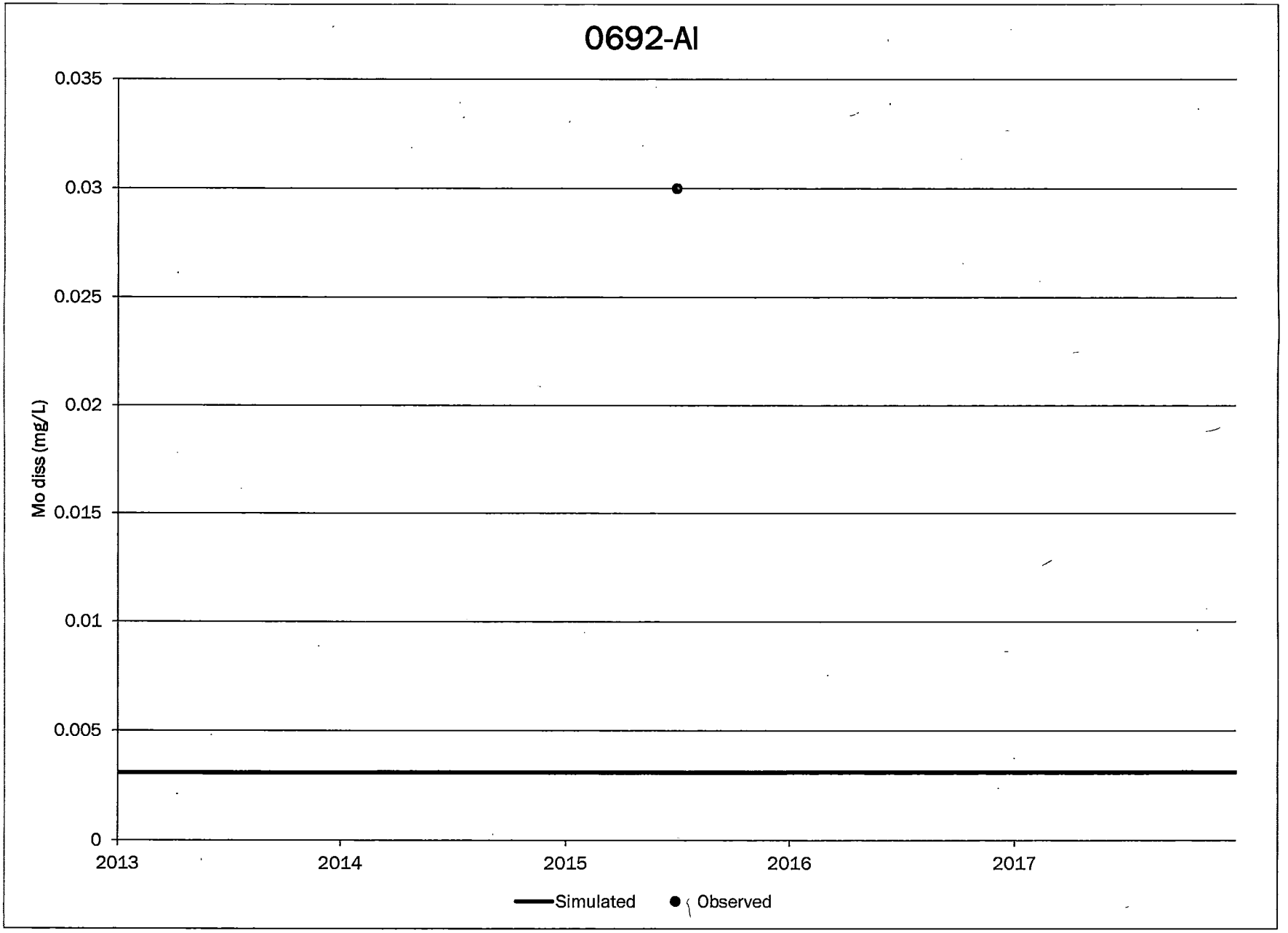
0.1
0.05
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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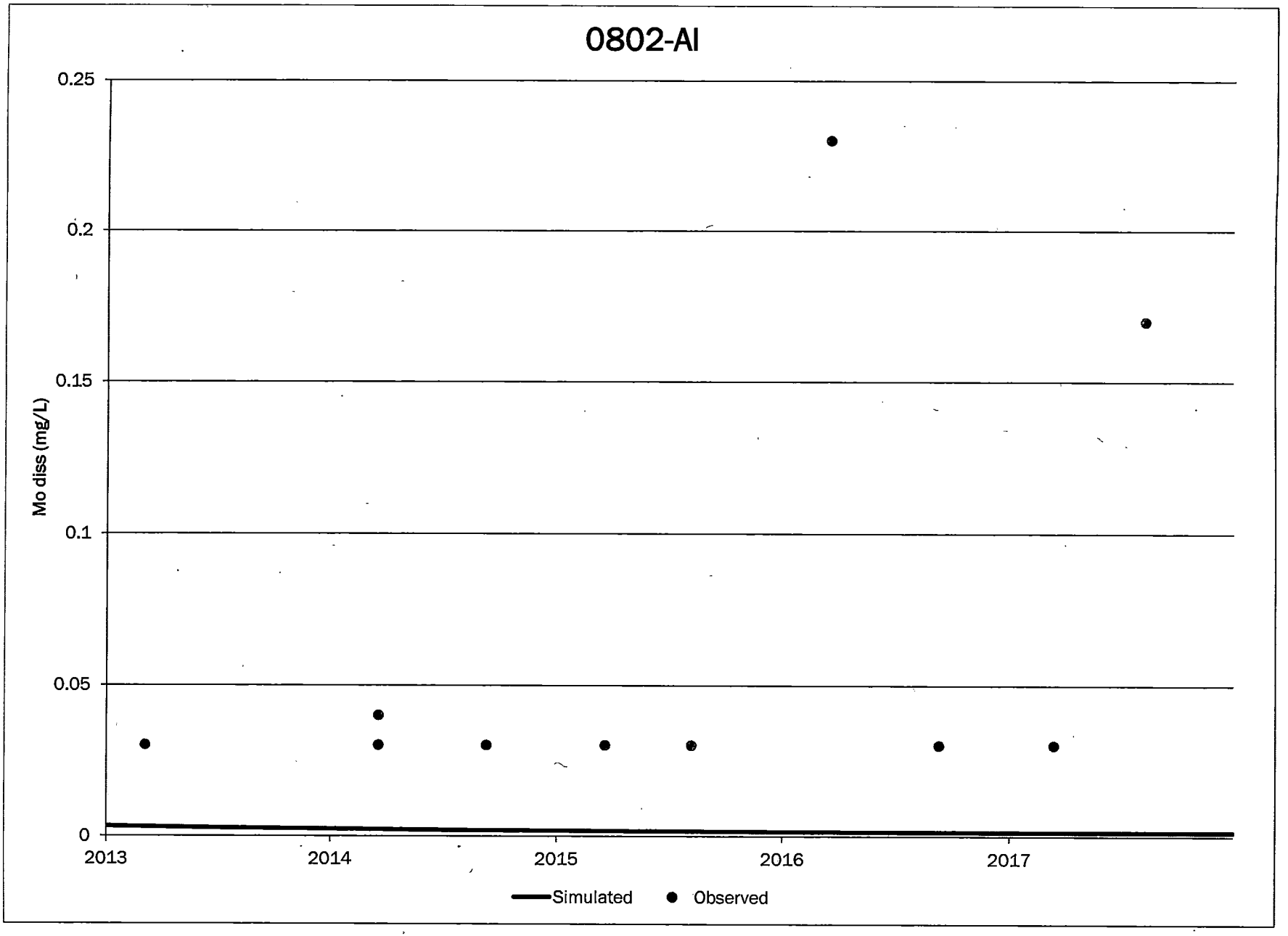
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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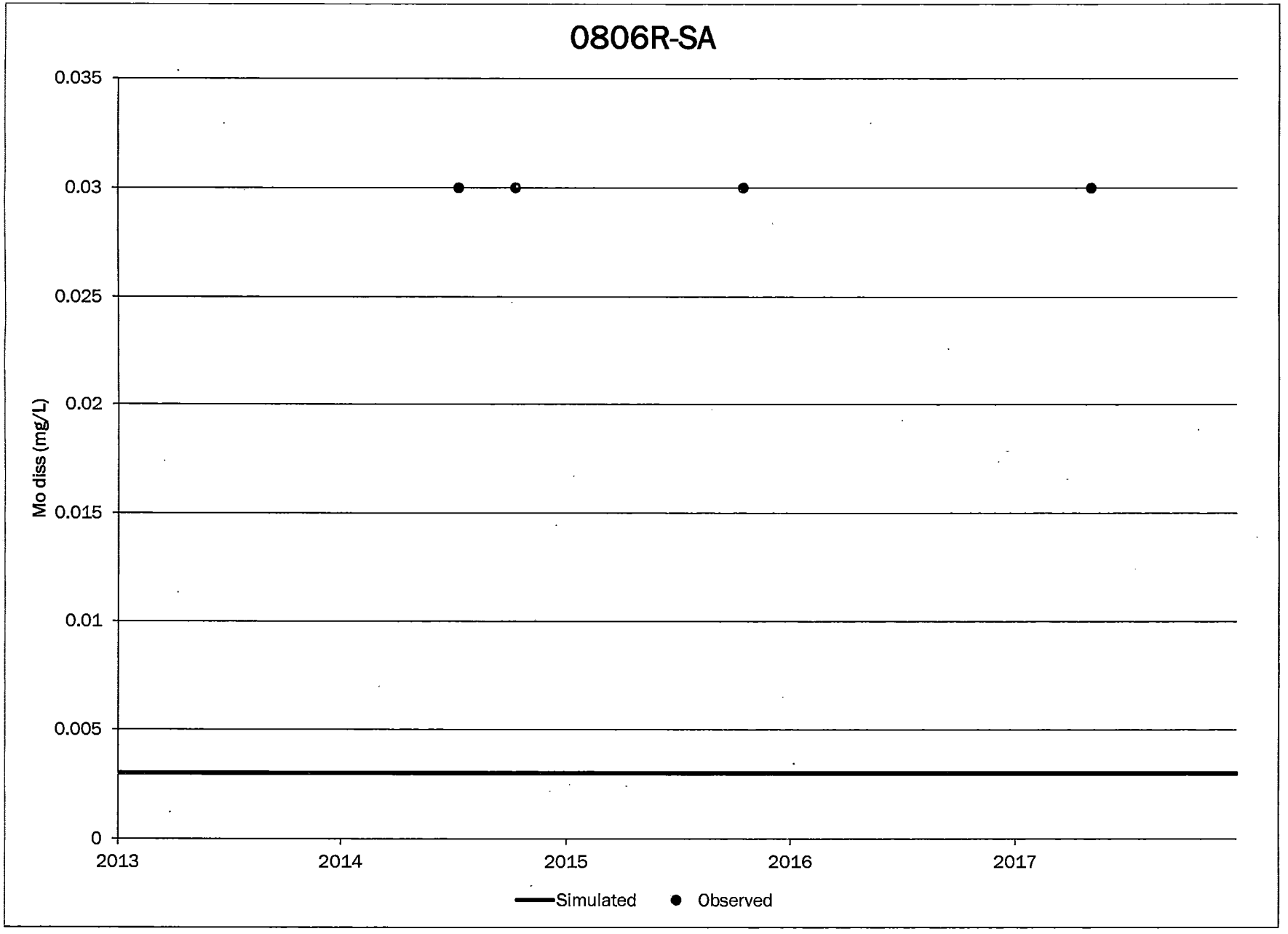
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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0.005
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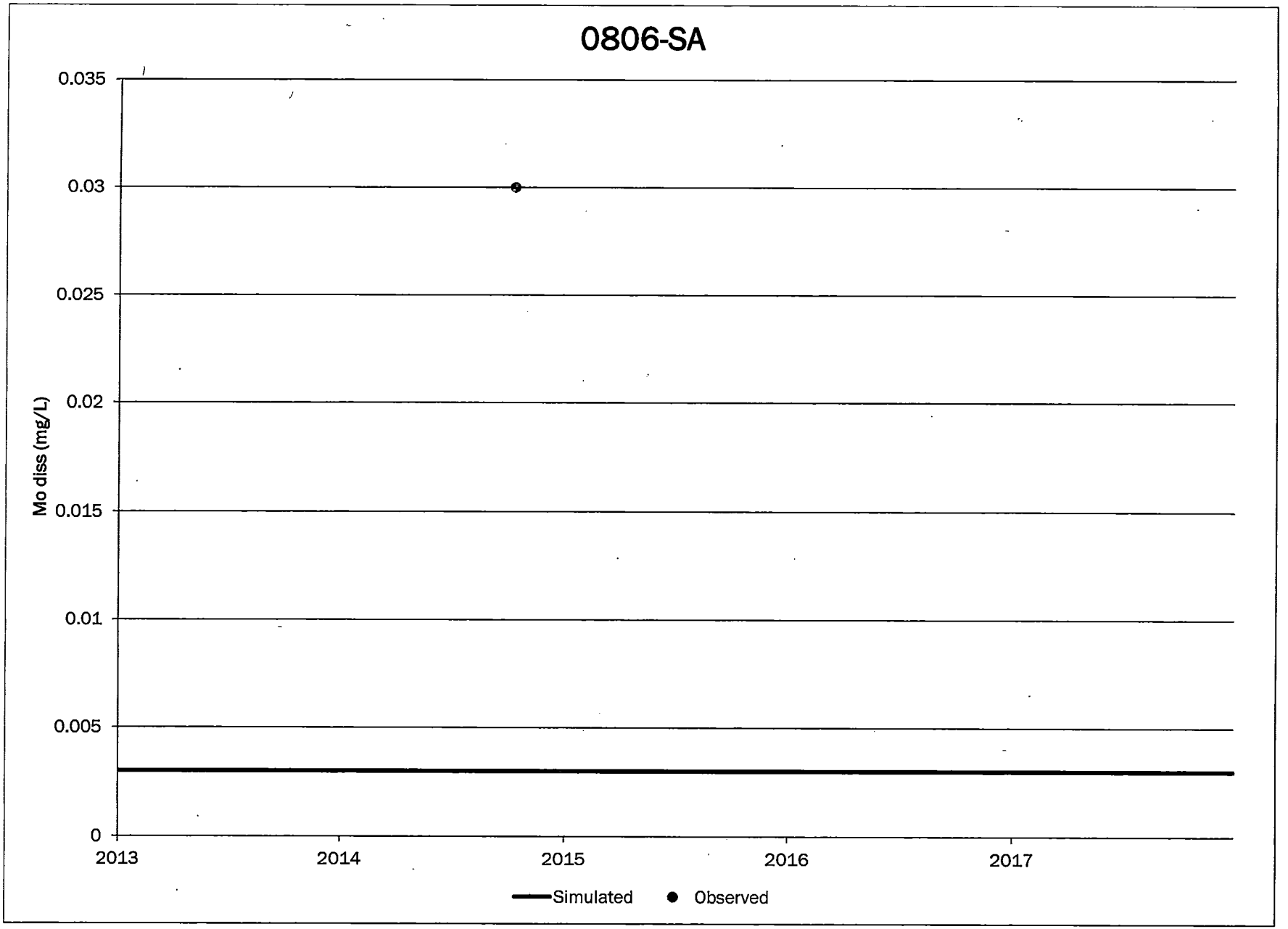
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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0.03
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0.01
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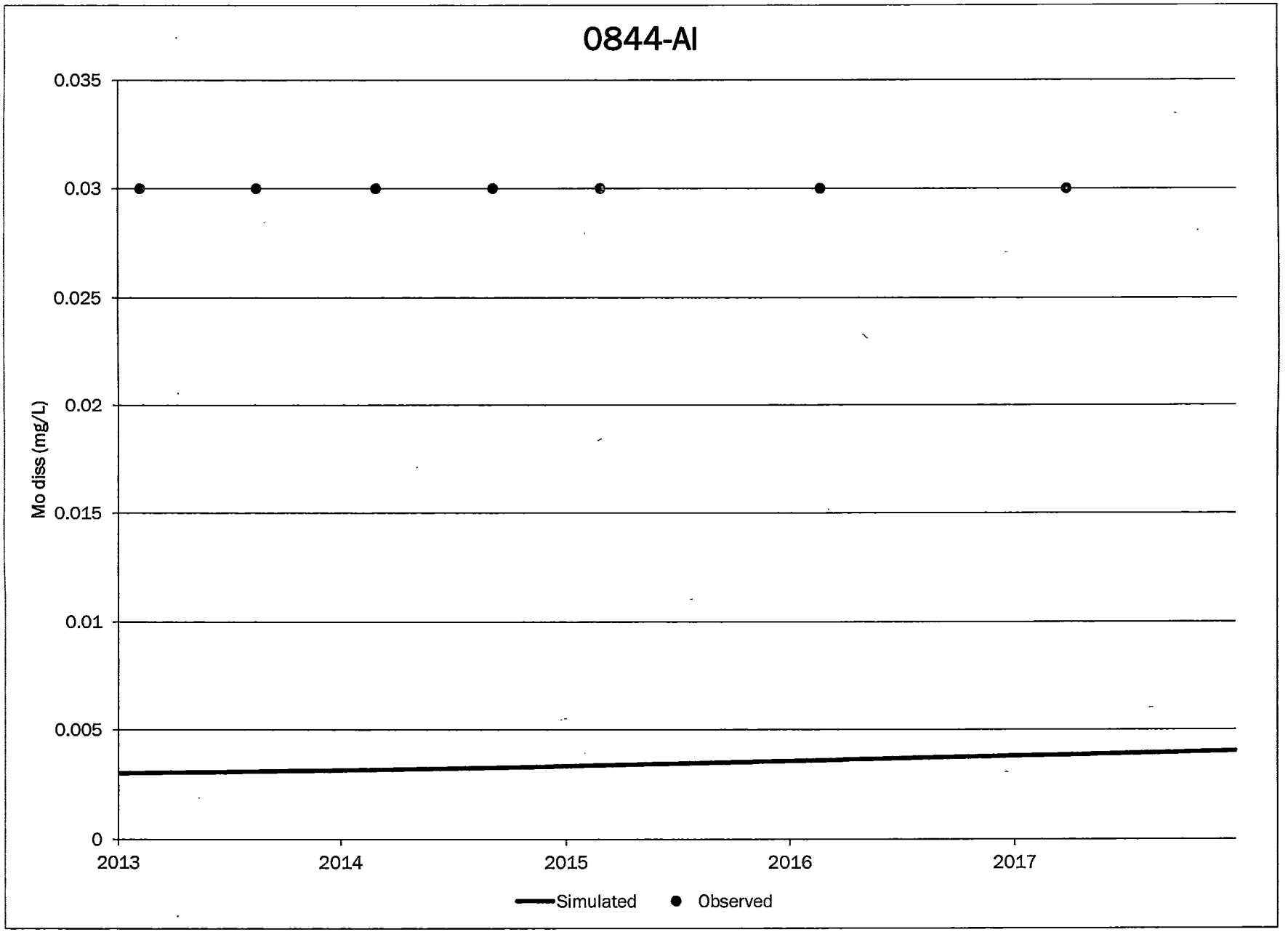
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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Mo diss (mg/L)
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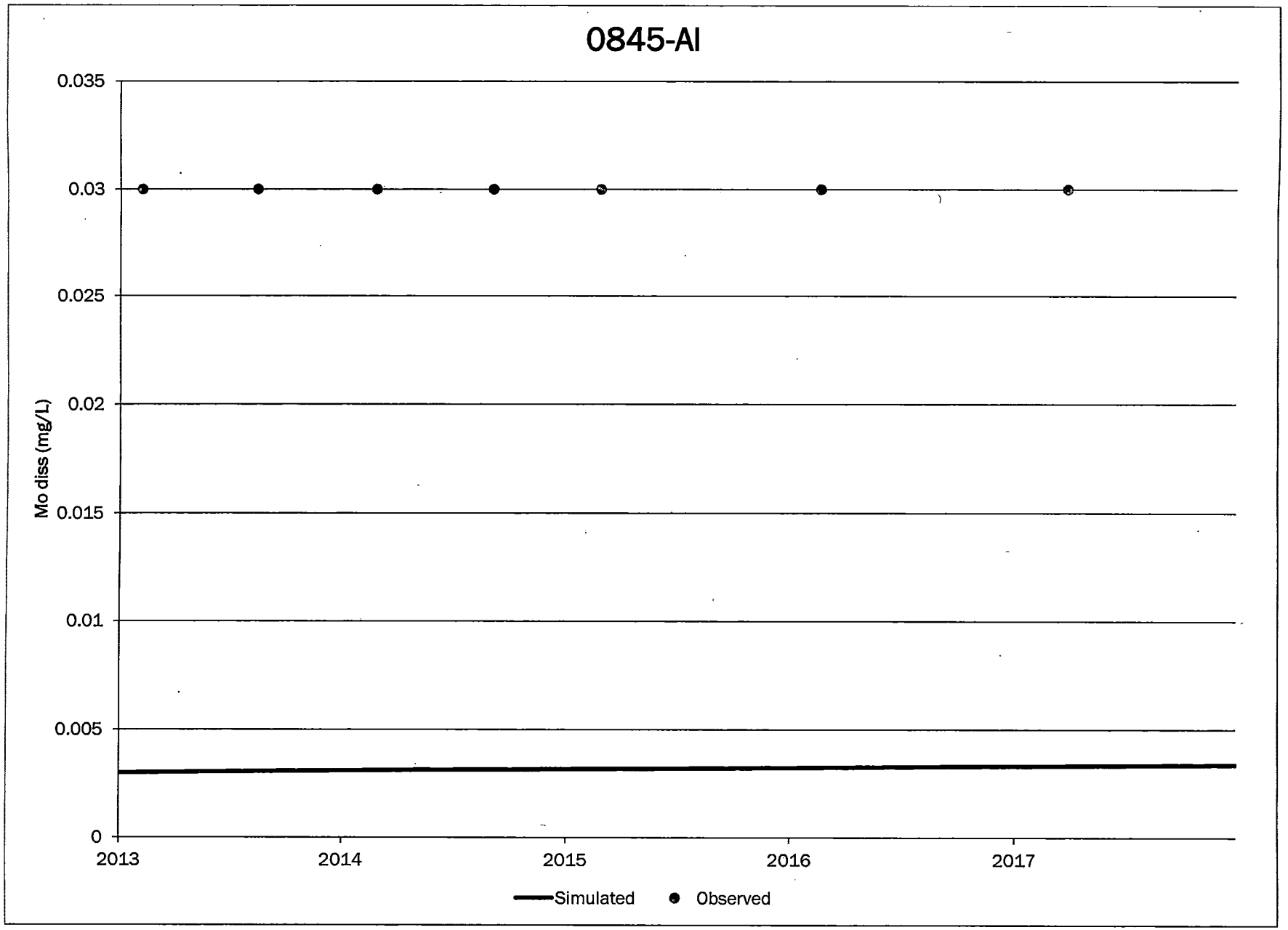
2014
2015
2016
2017
Simulated
Observed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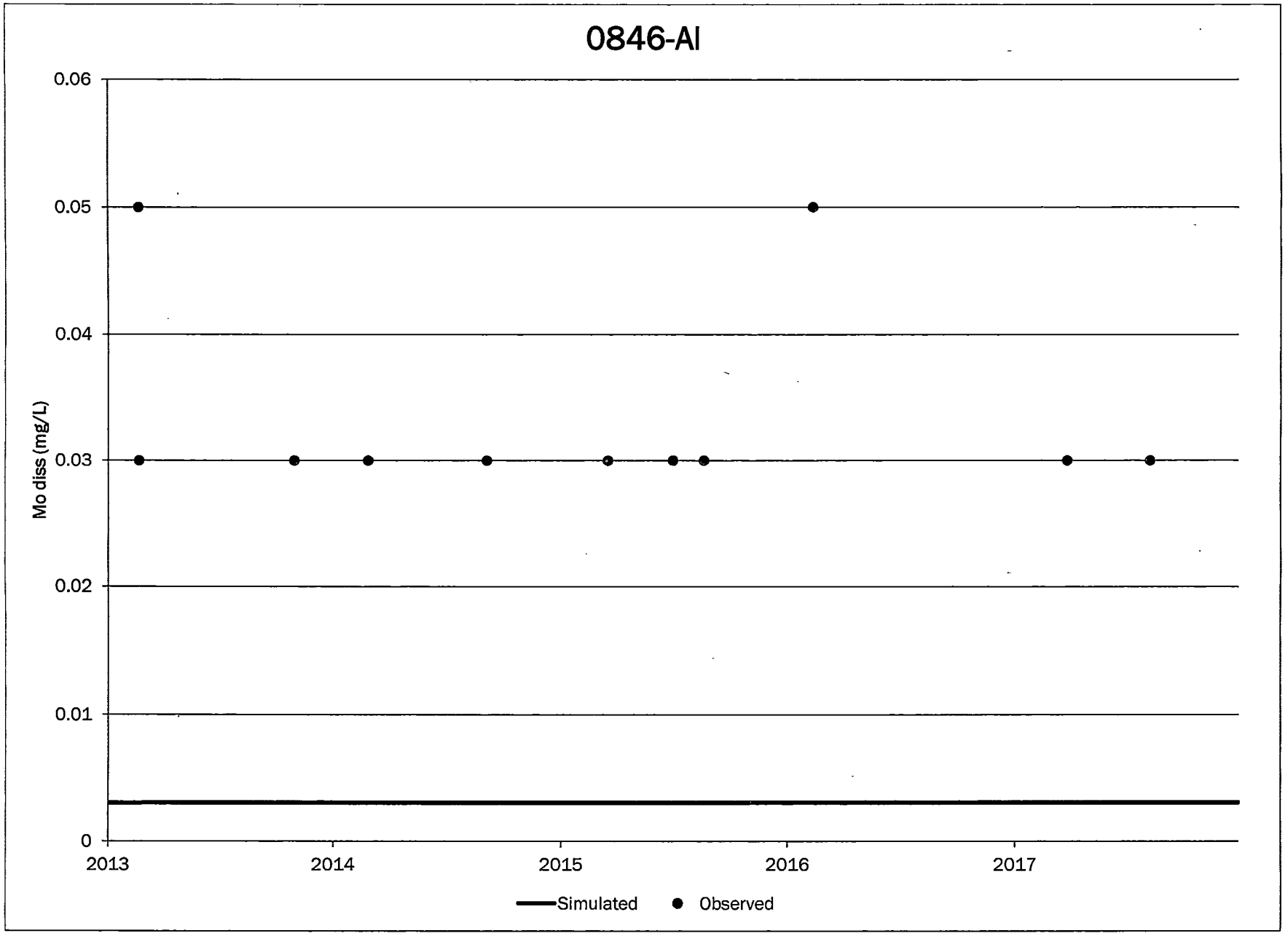
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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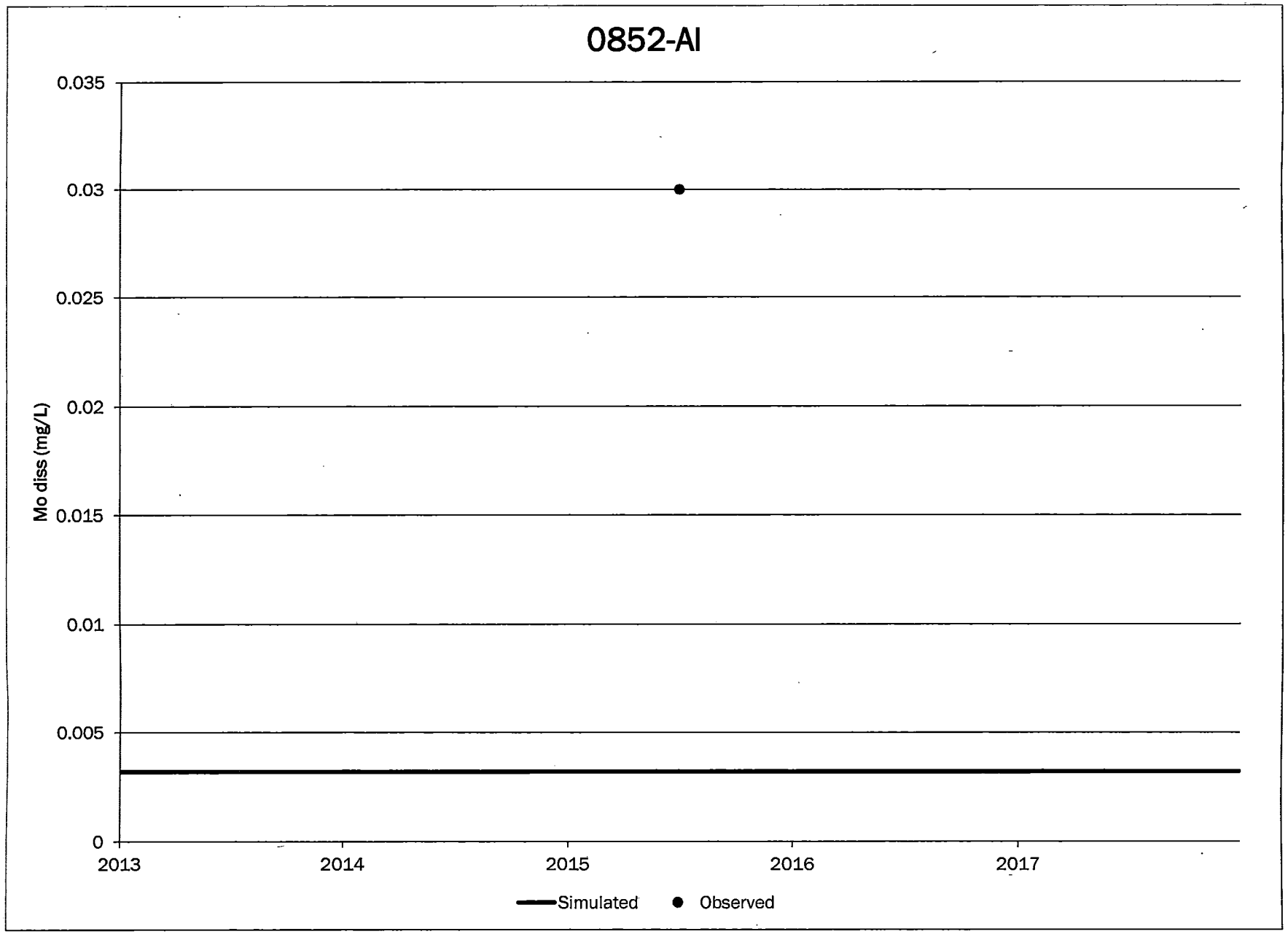
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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0.03
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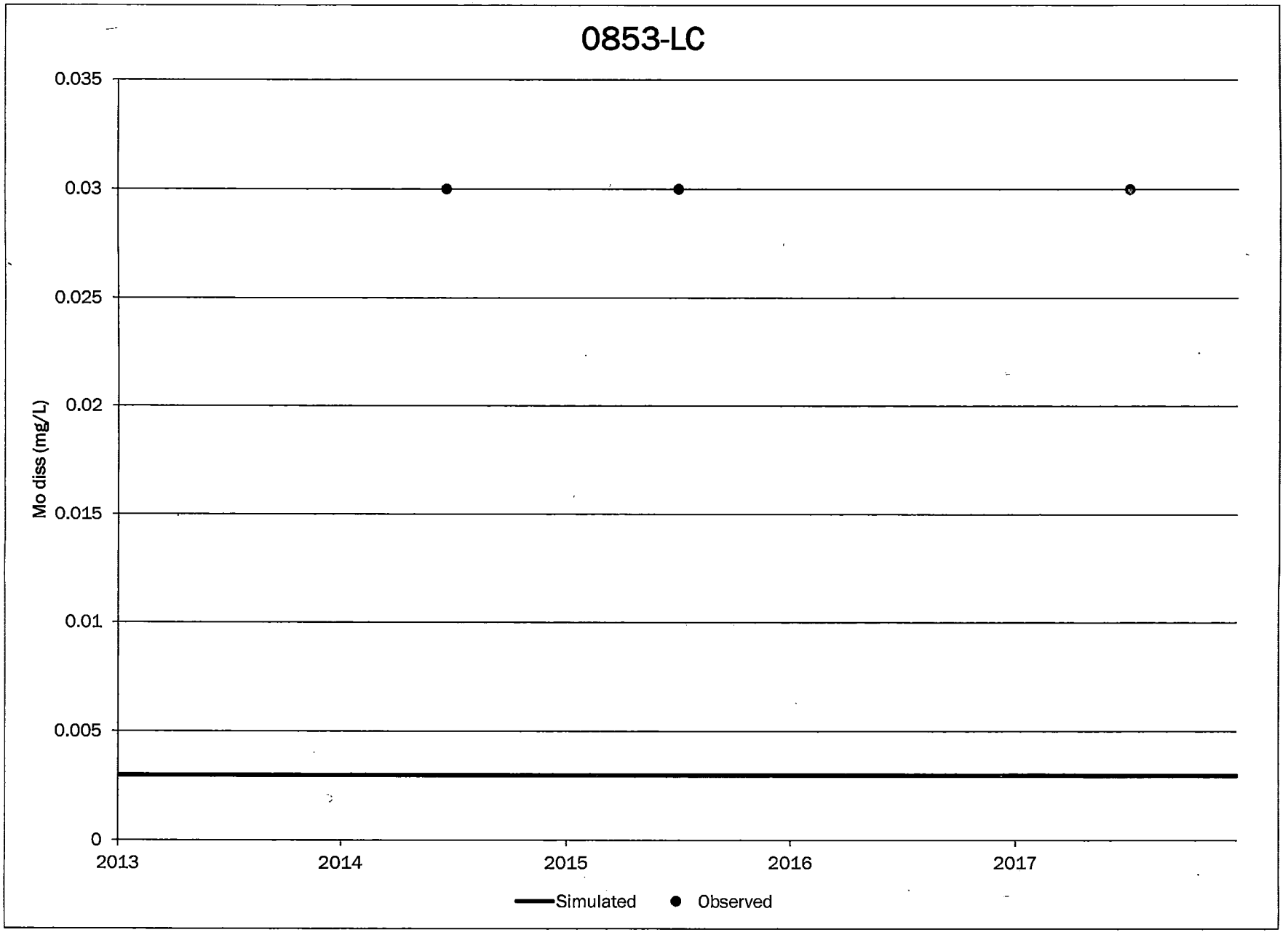
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


0853-LC
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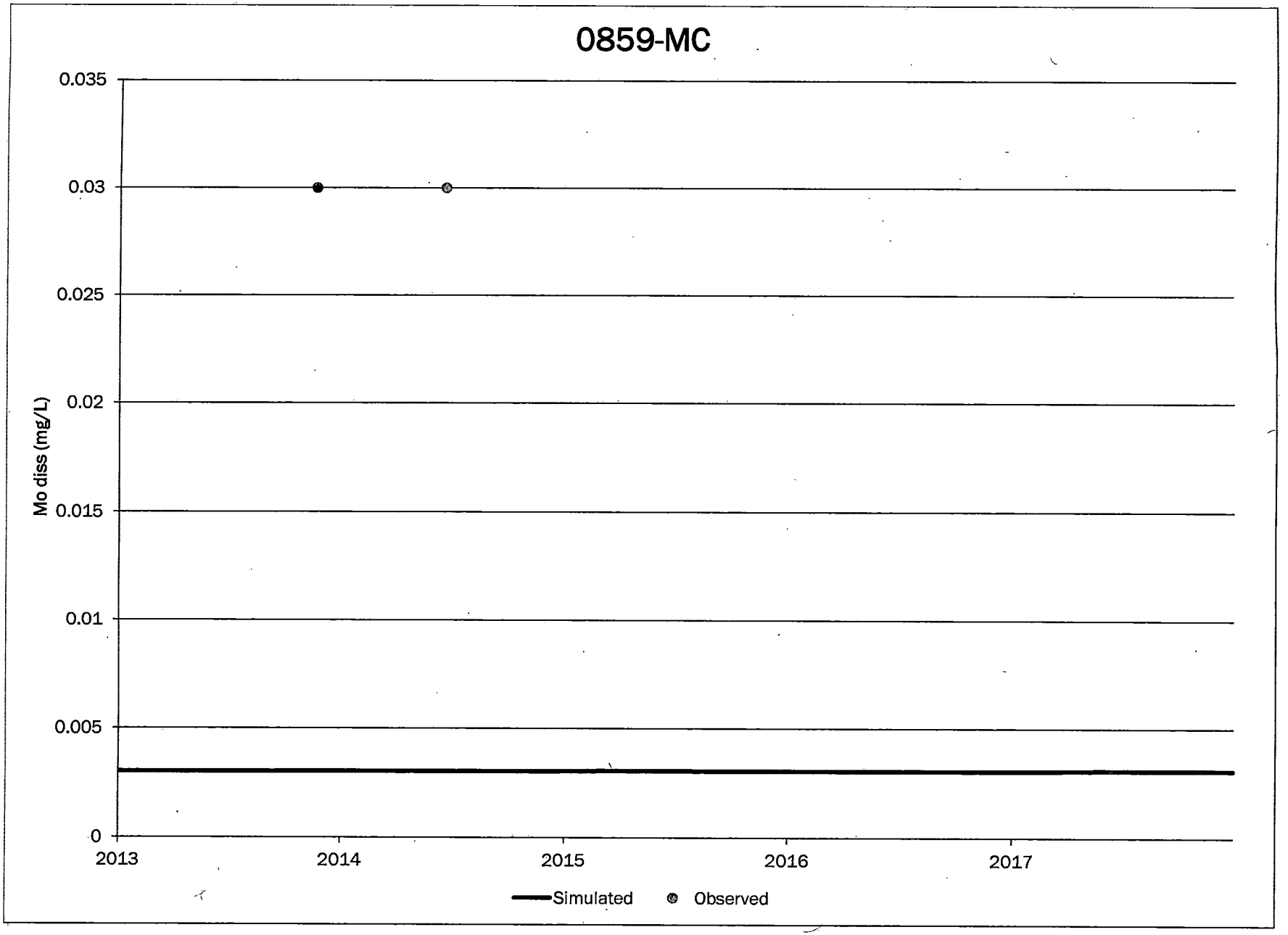
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed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Mo diss (mg/L)
2013
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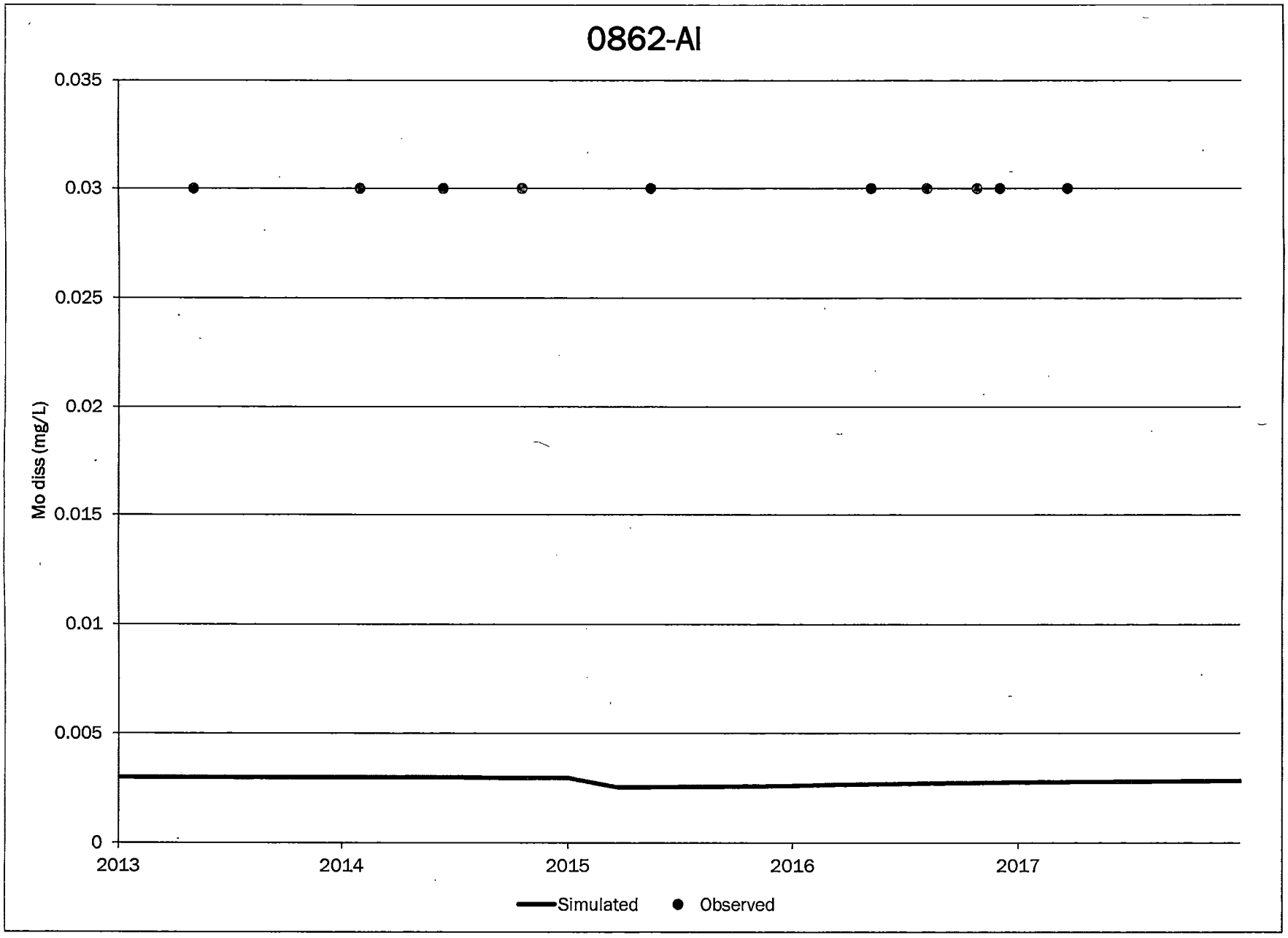
2015
2016
2017
Simulated
Observed


0862-AI
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Mo diss (mg/L)
2013
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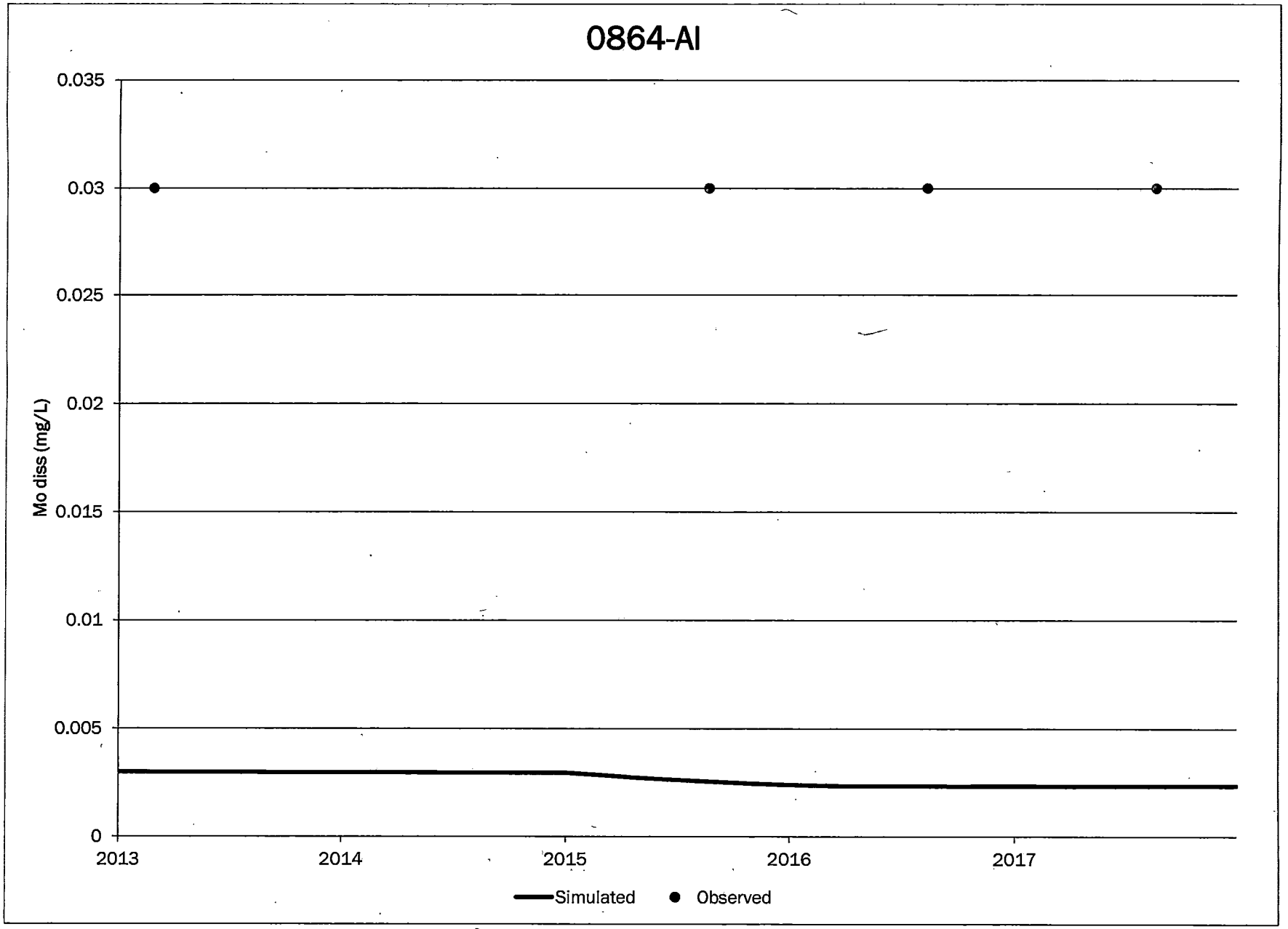
2015
2016
2017
Simulated
Observed


0864-AI
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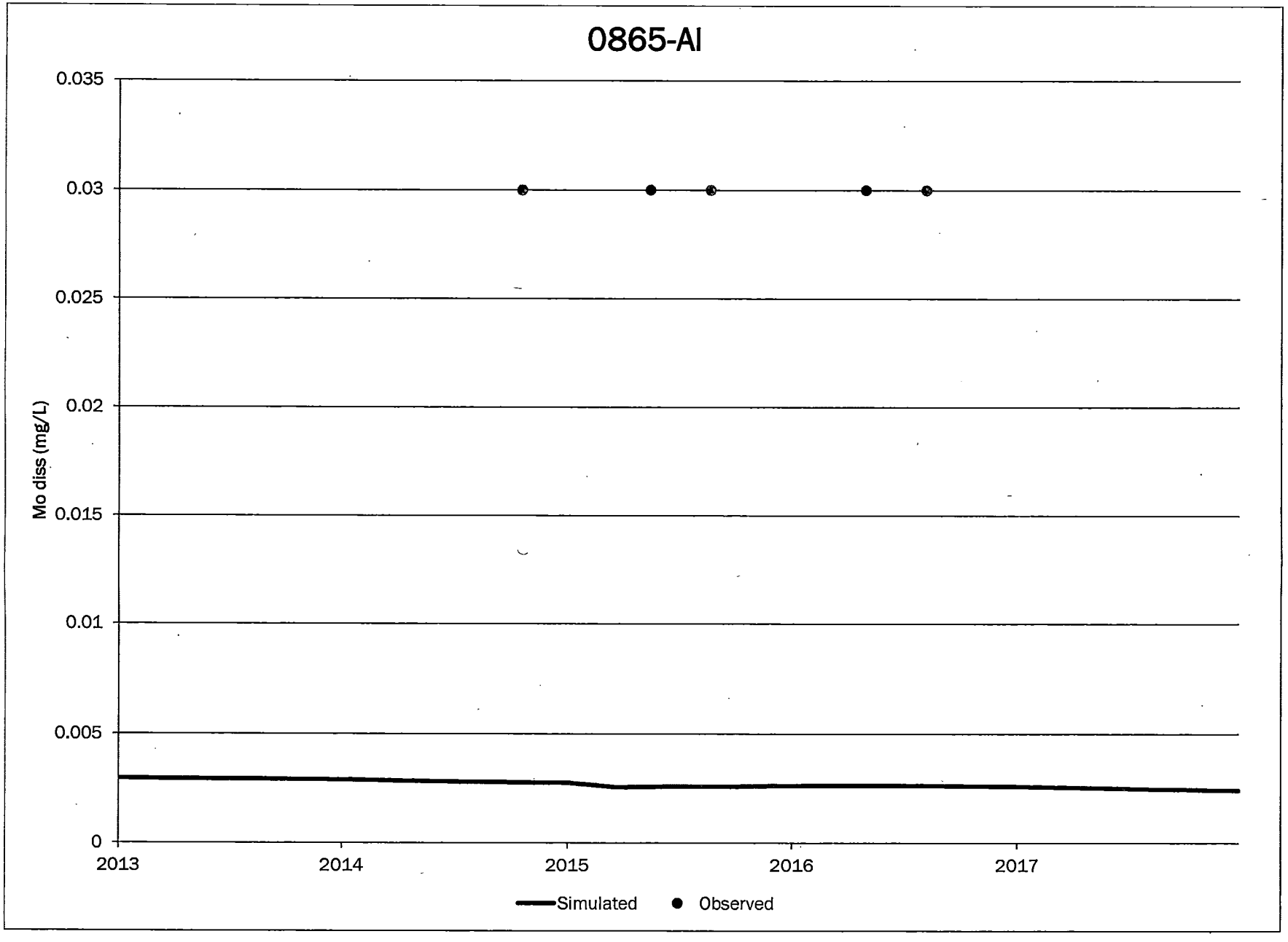
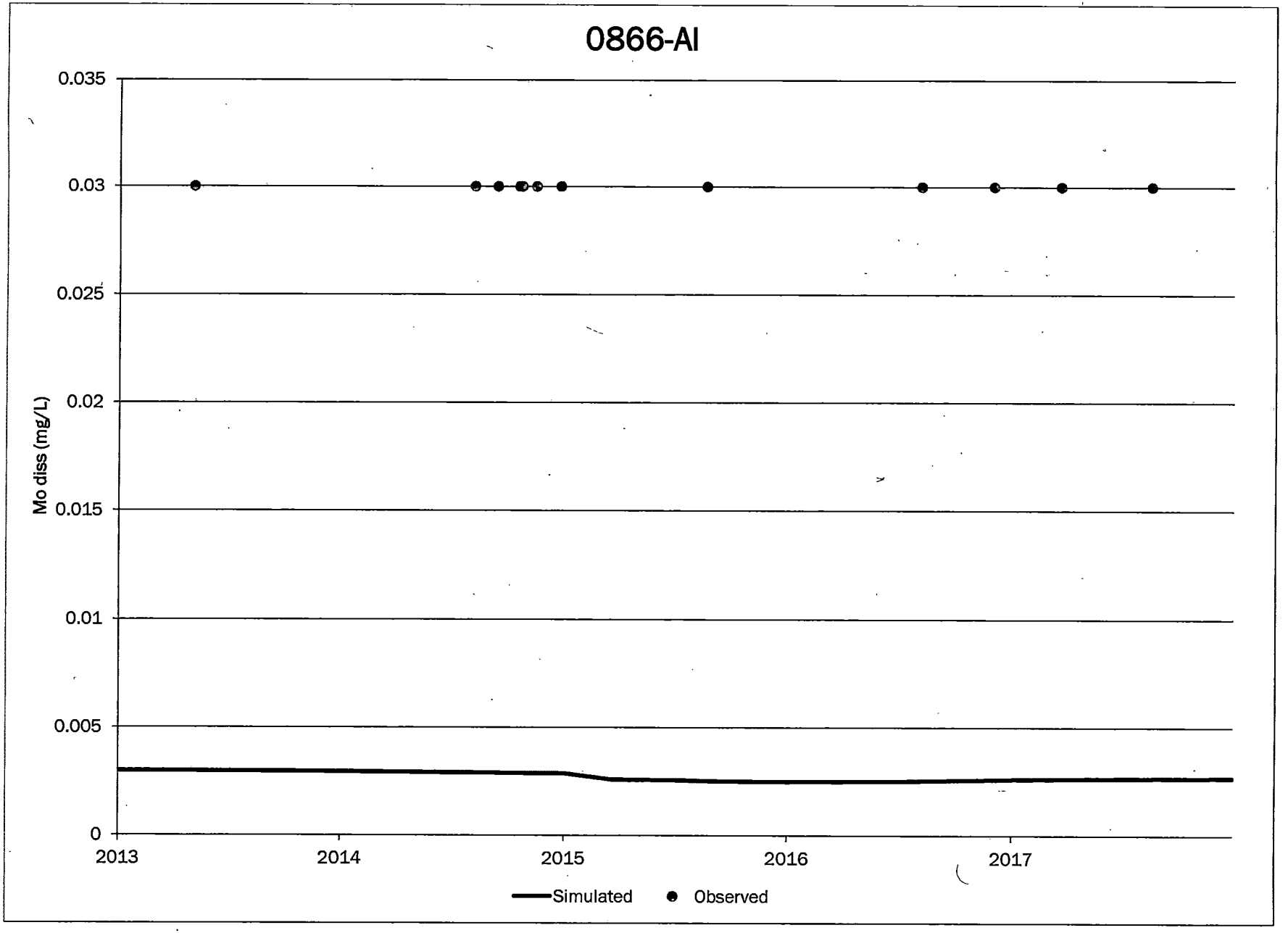
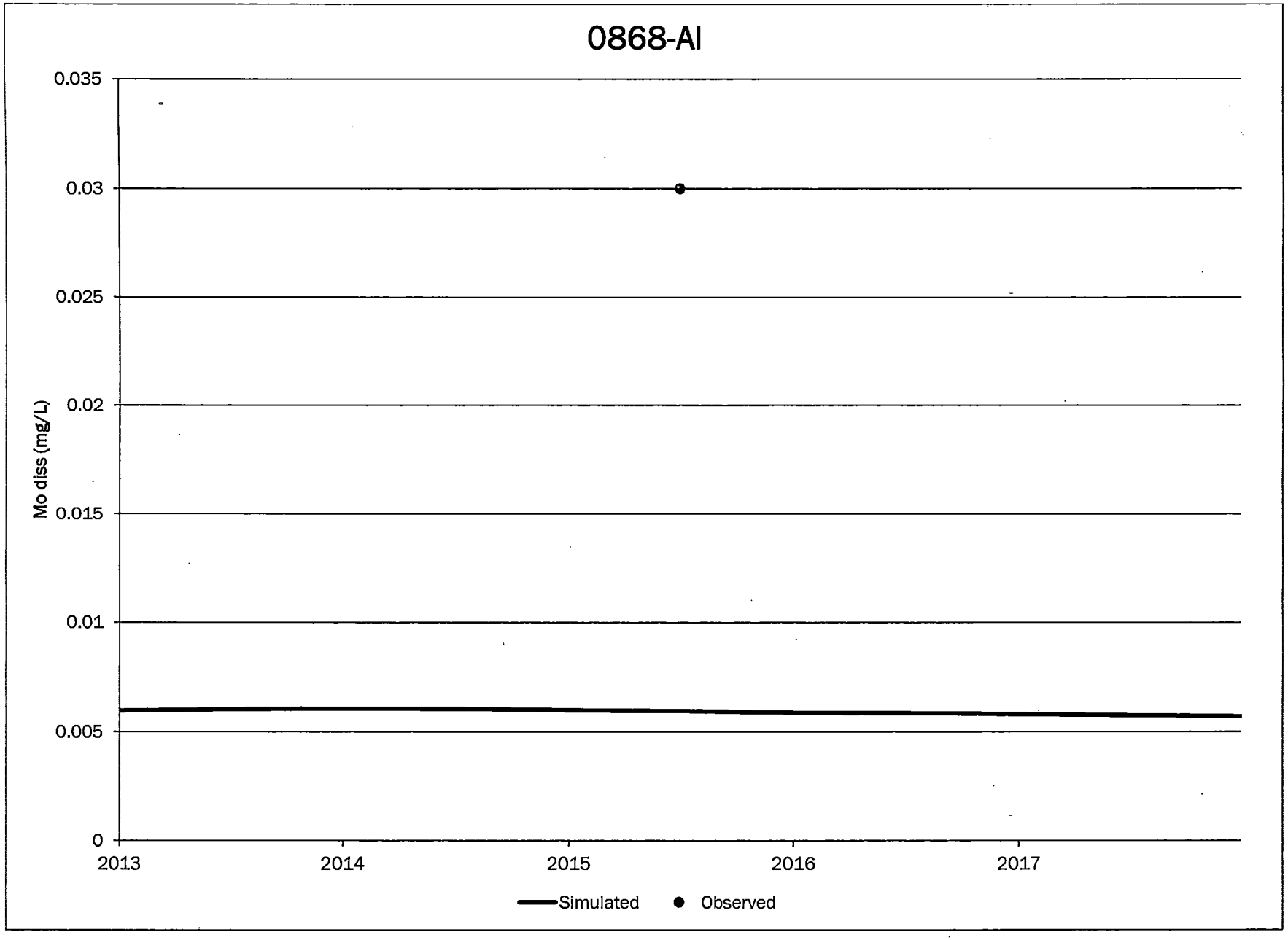
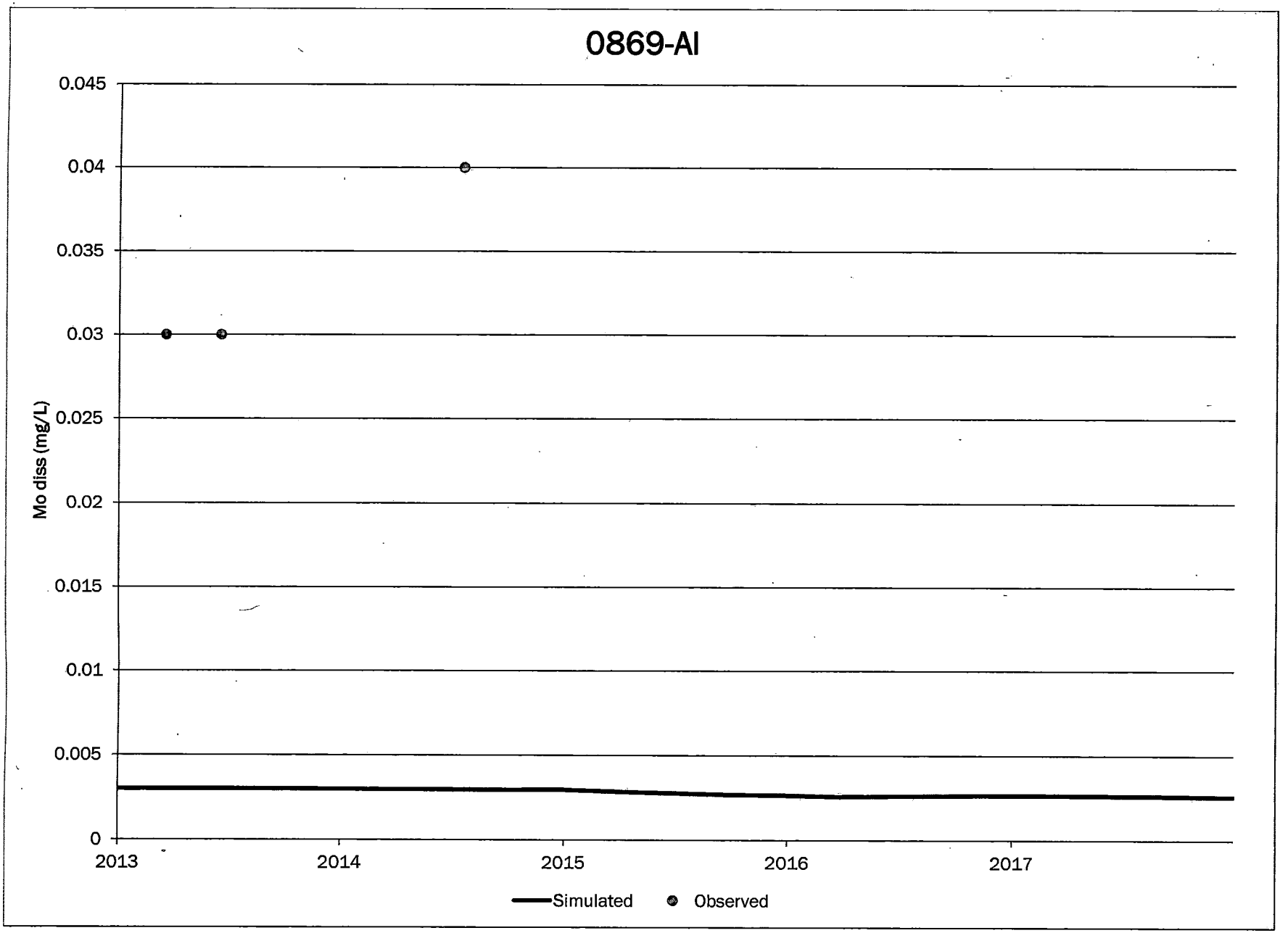
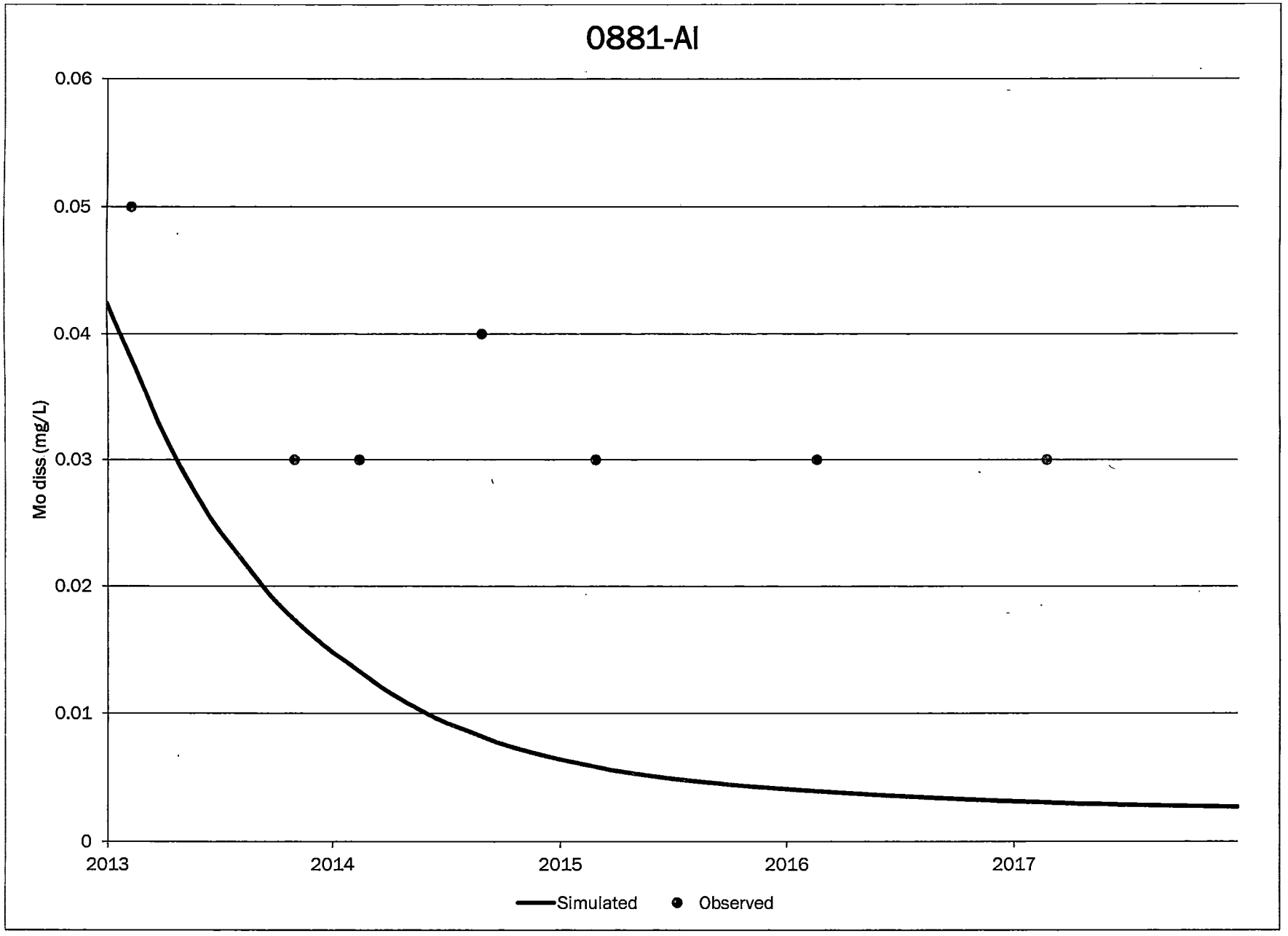
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

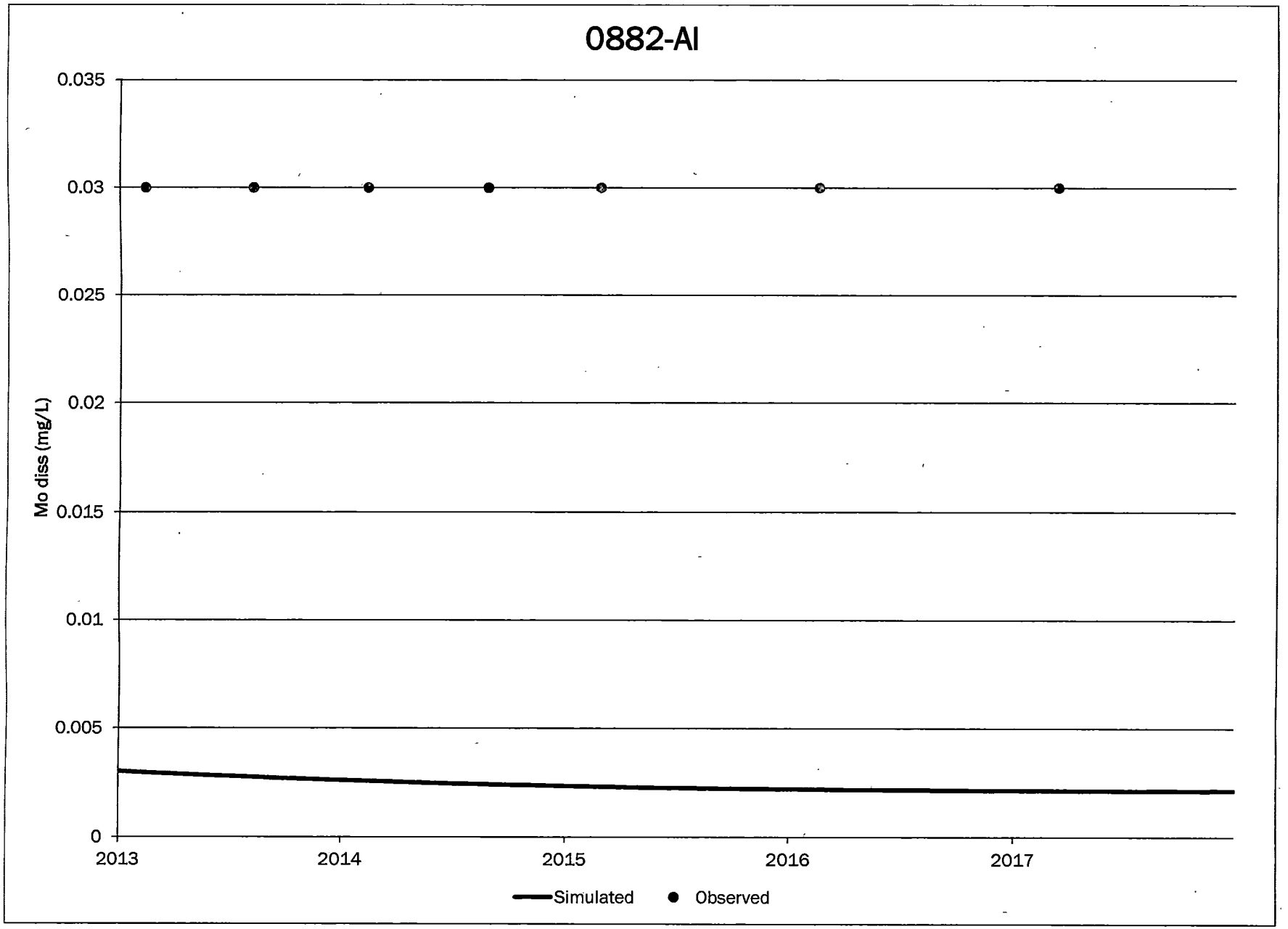

0865-Al
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

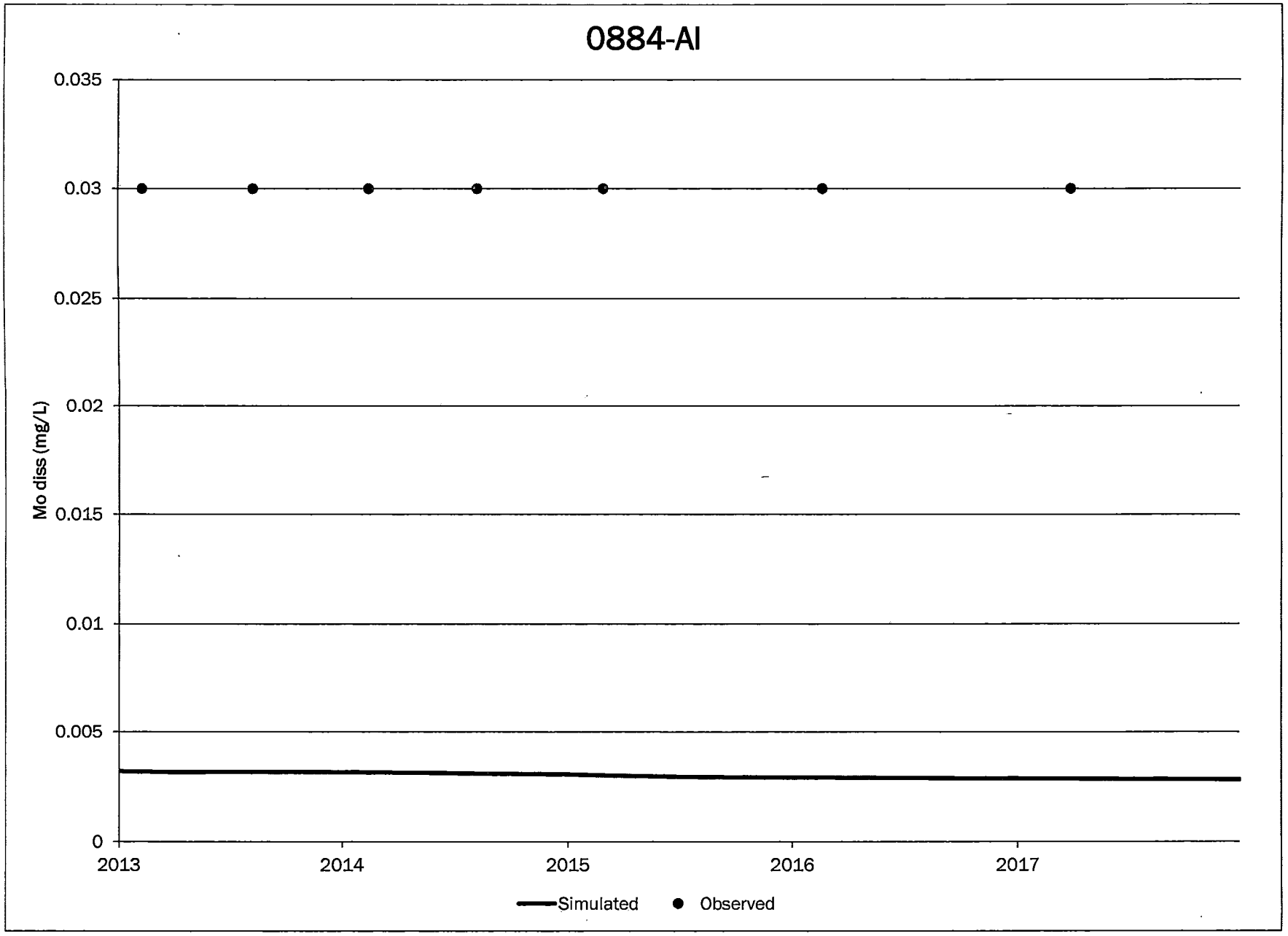

0866-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

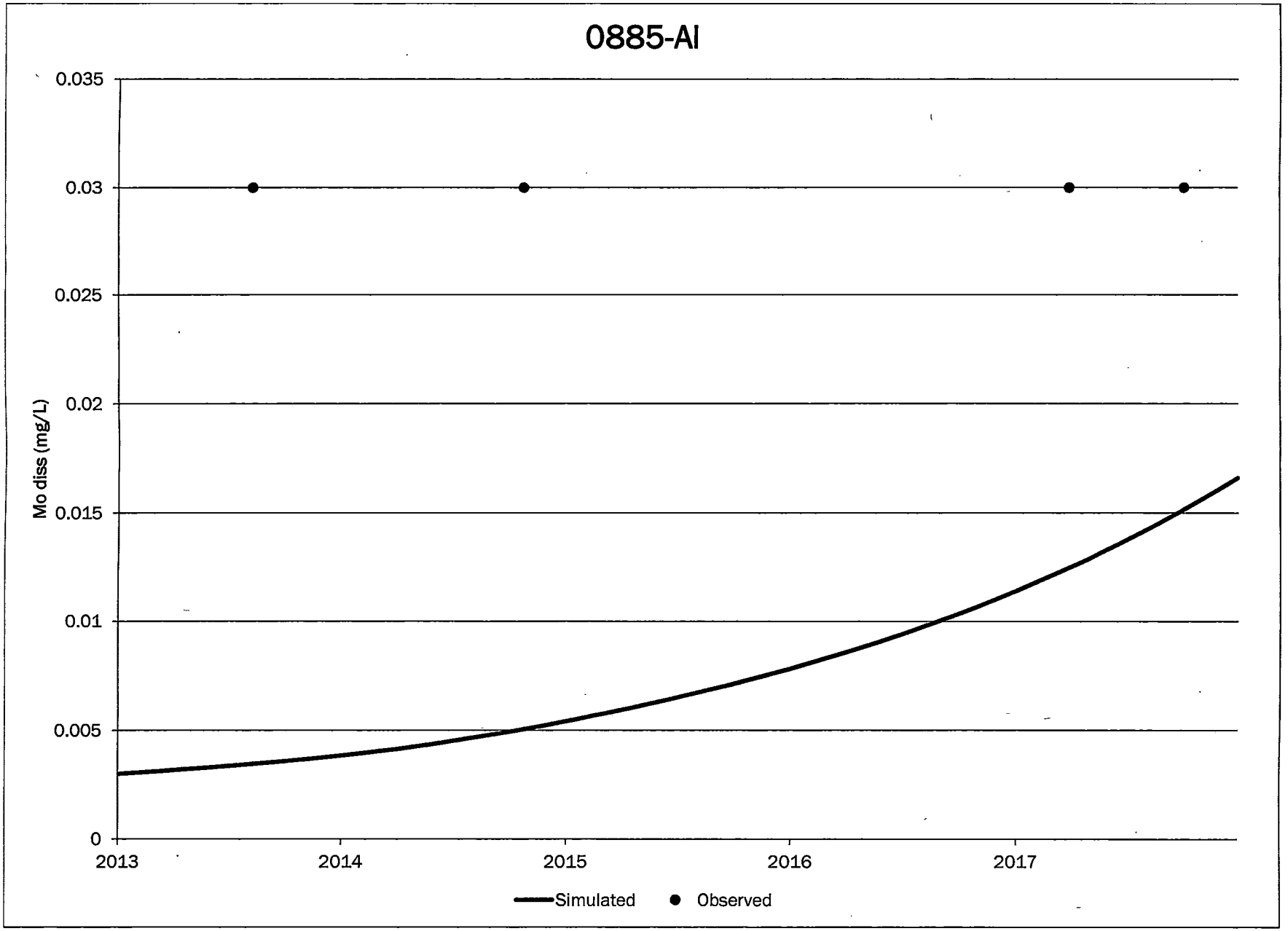

0868-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

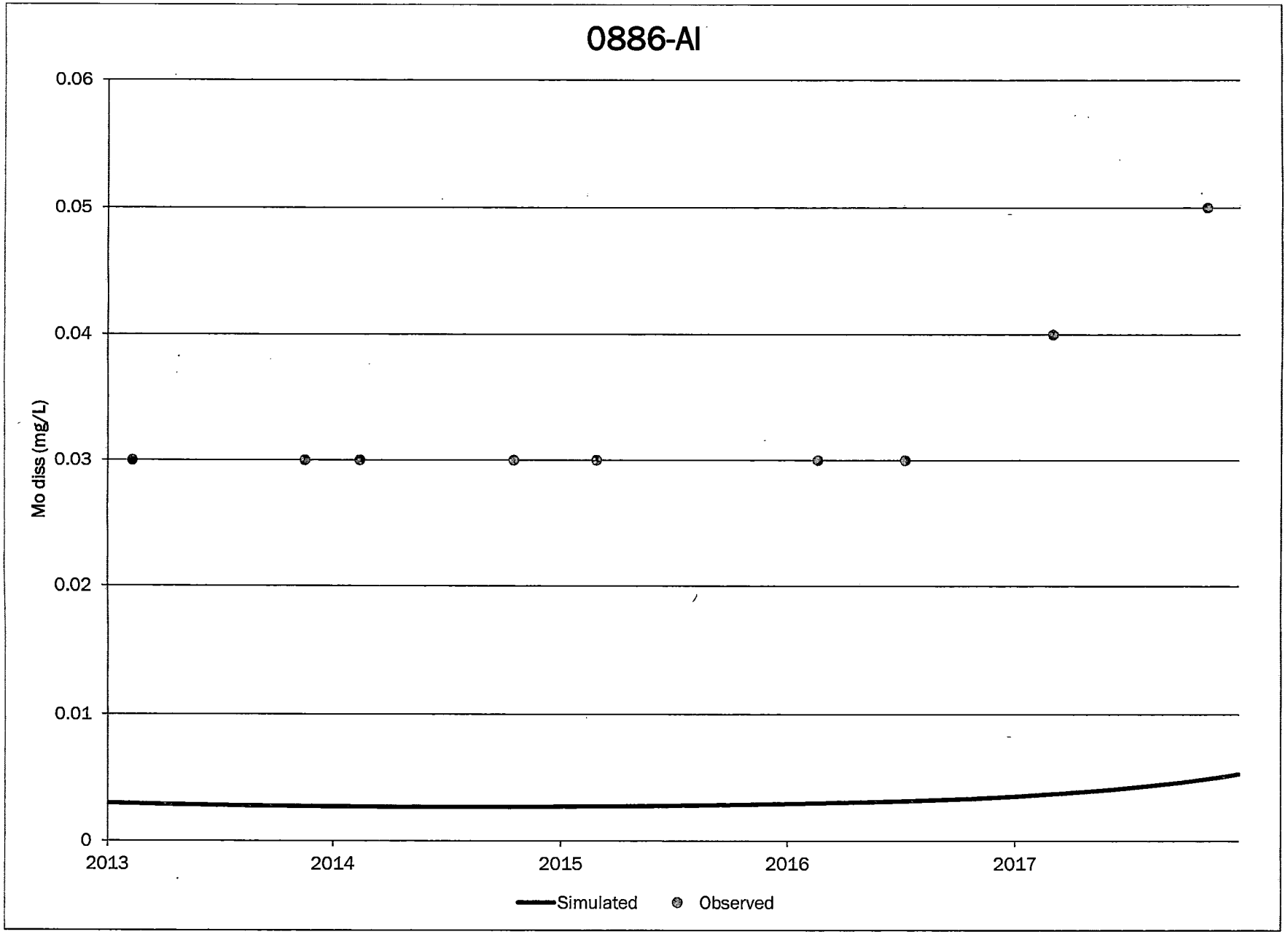

0869-AI
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

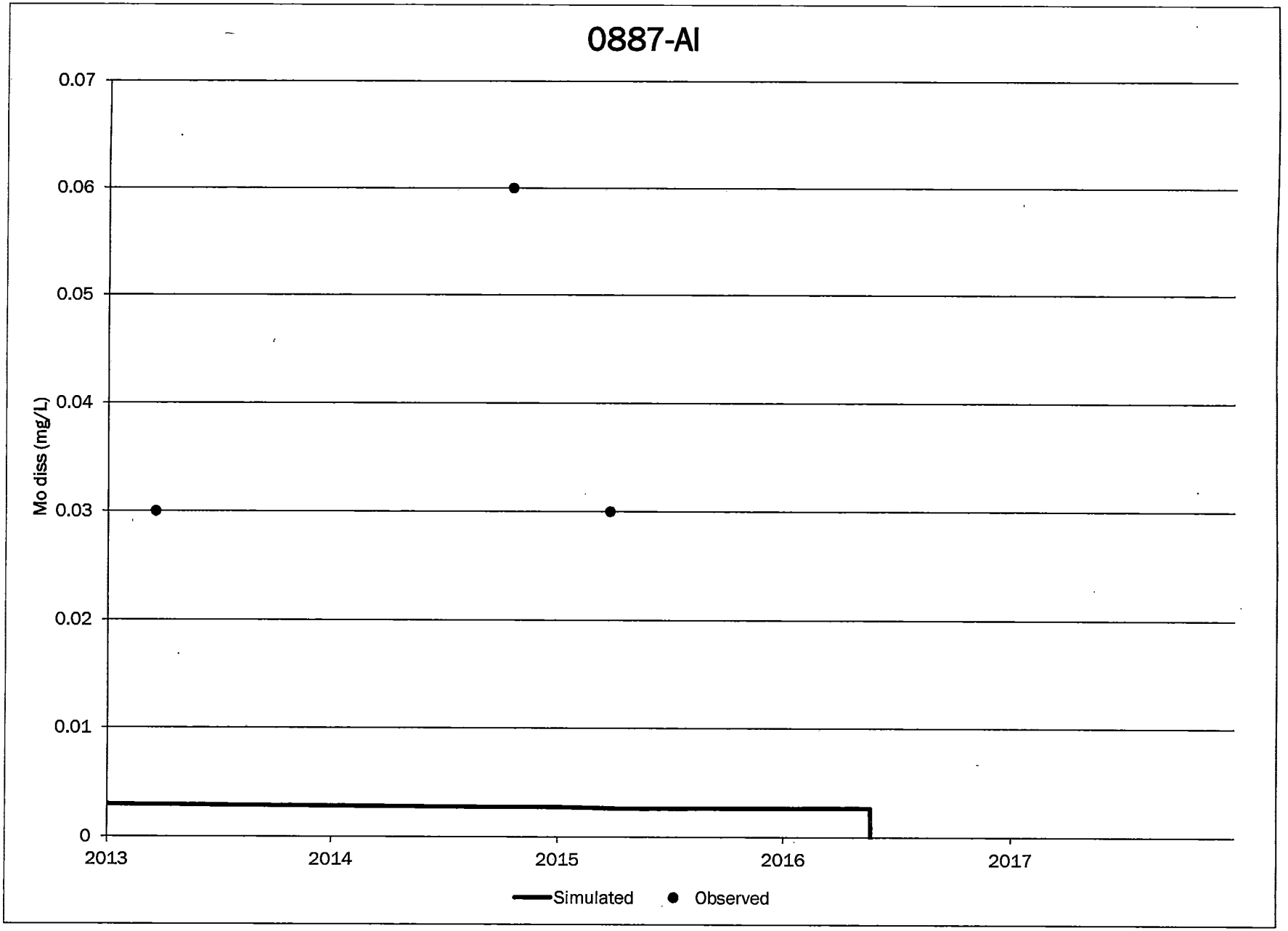

0881-AI
0.06
0.05
0.04
0.03
0.02
0.01
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

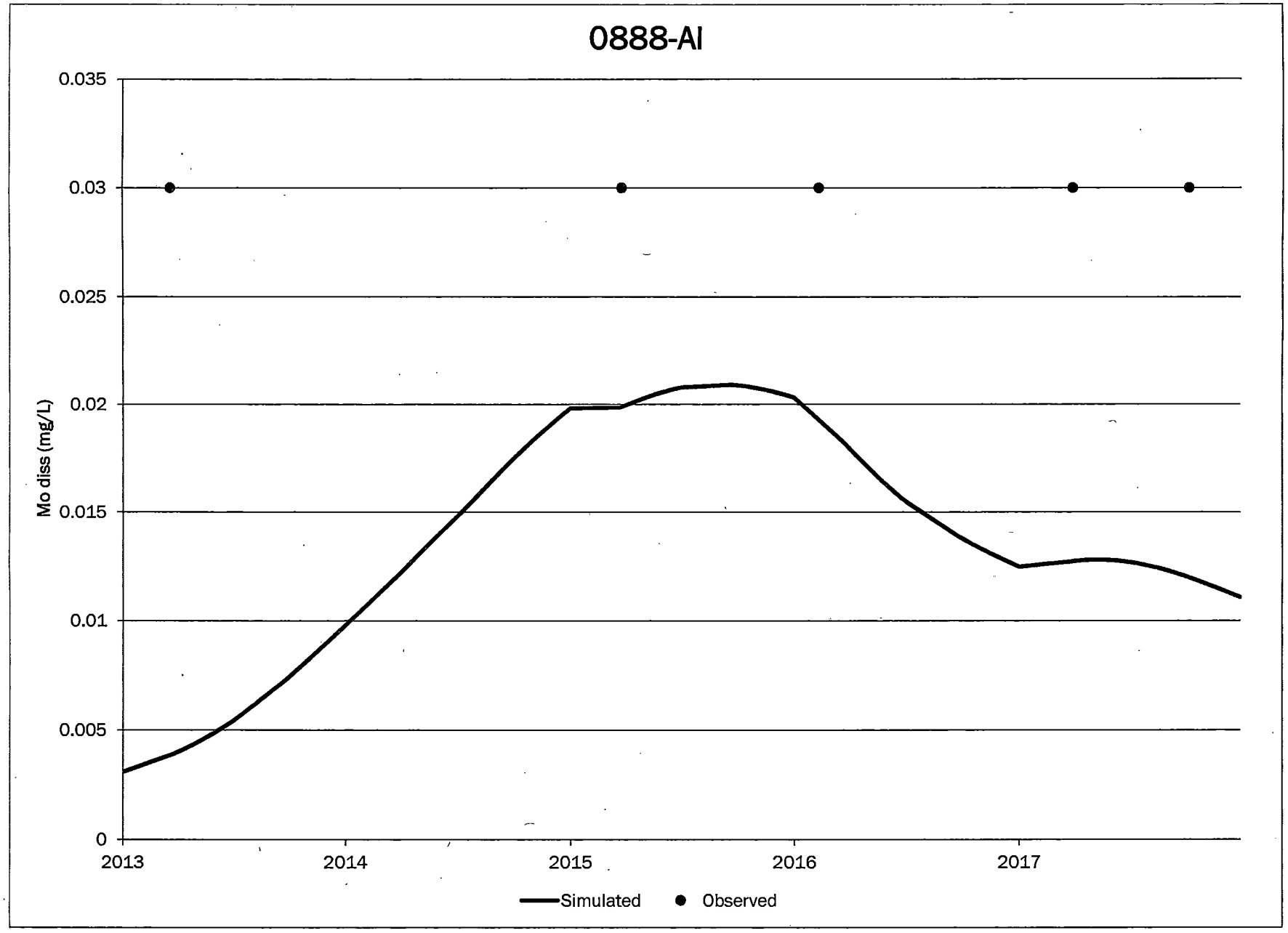

0882-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

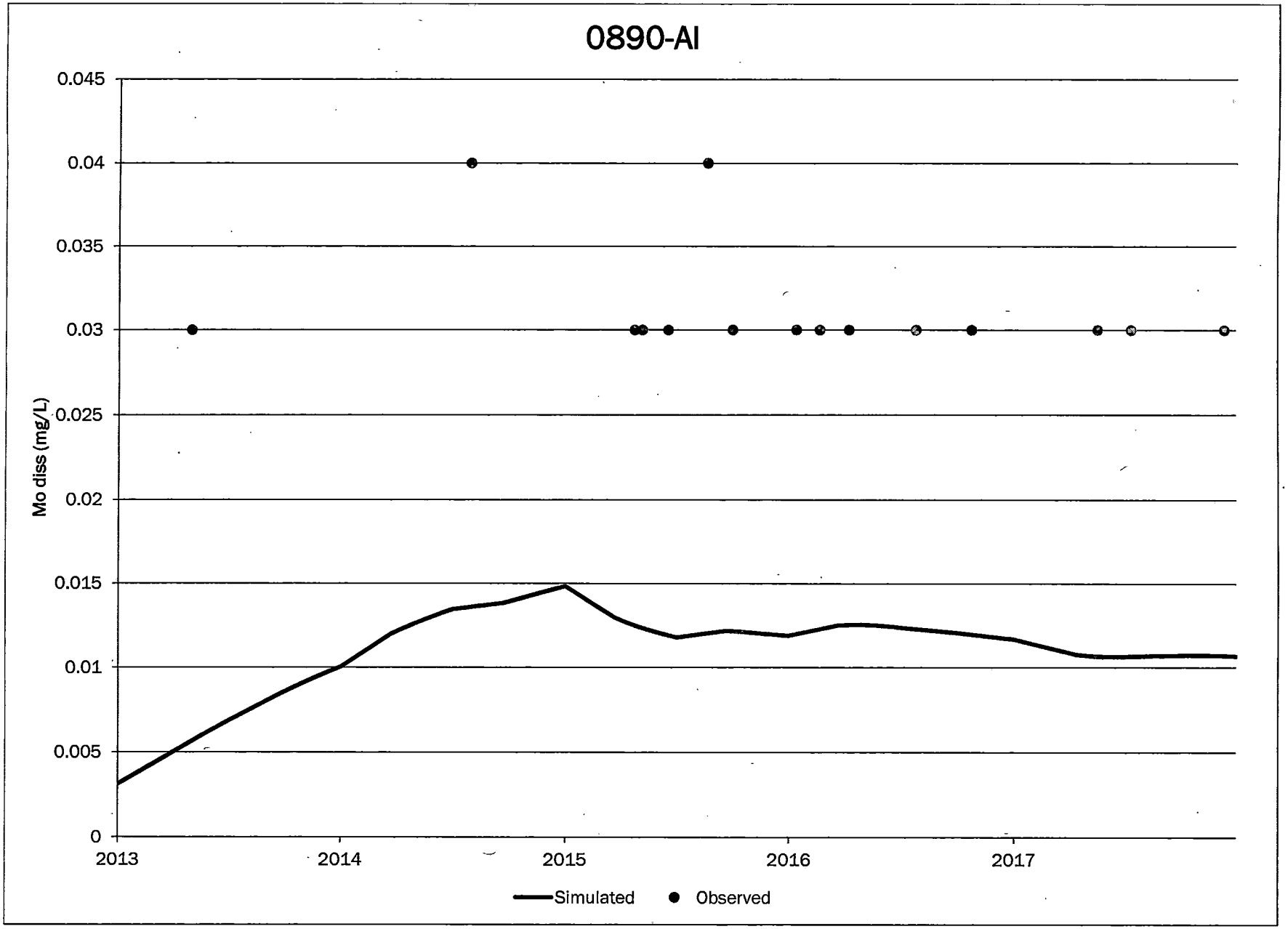

0884-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

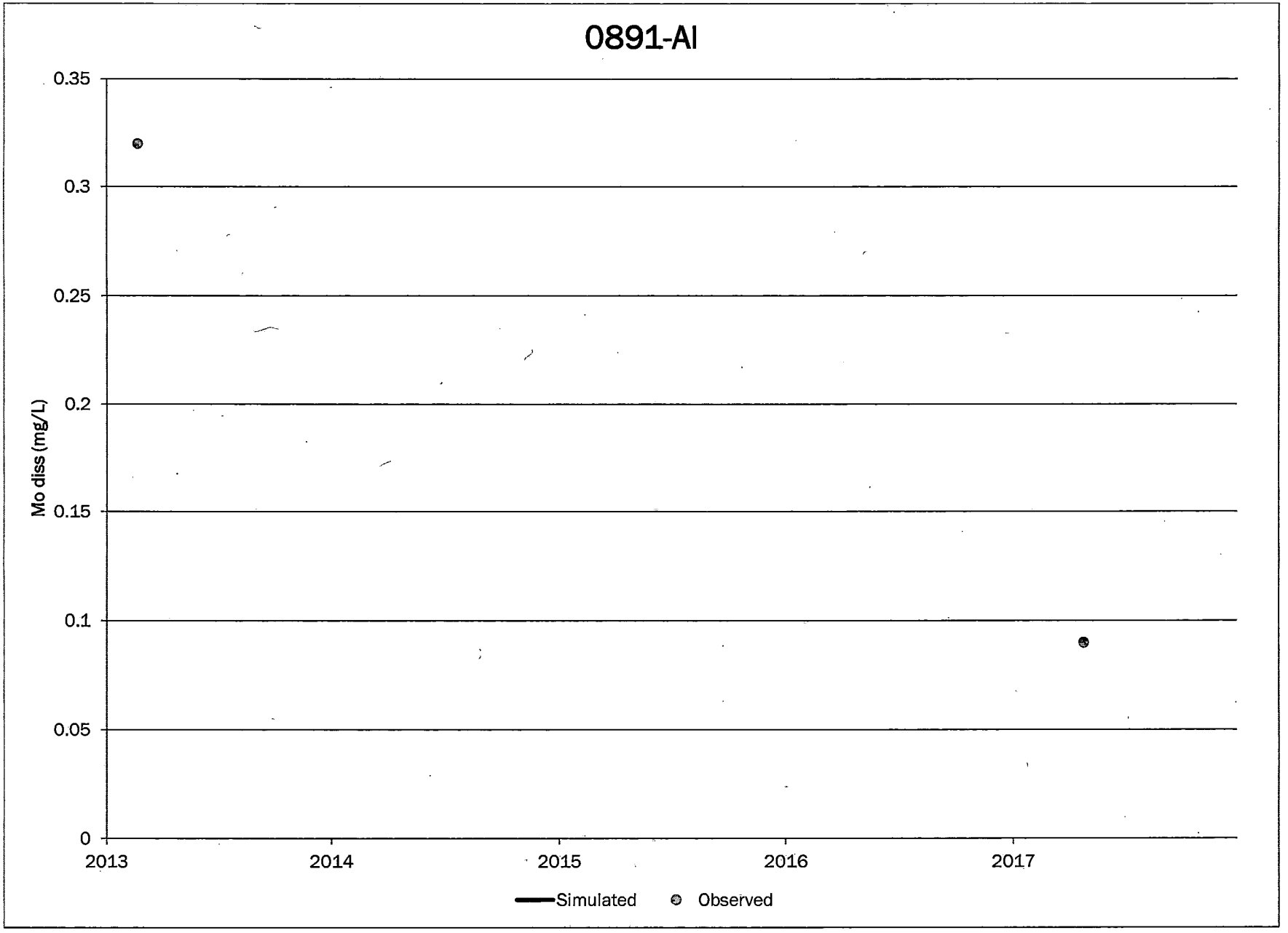

0885-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

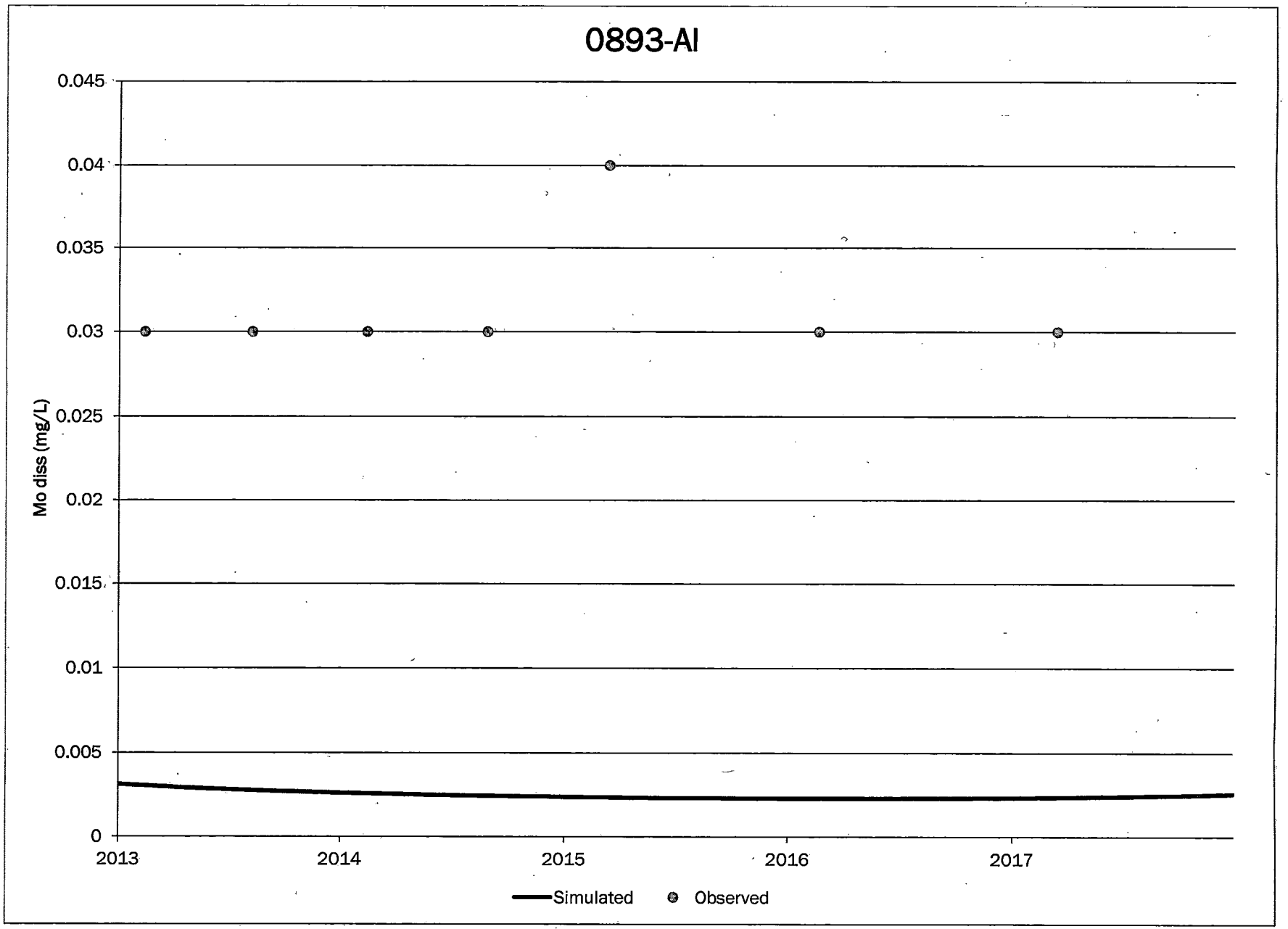

0886-AI
0.06
0.05
0.04
0.03
0.02
0.01
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

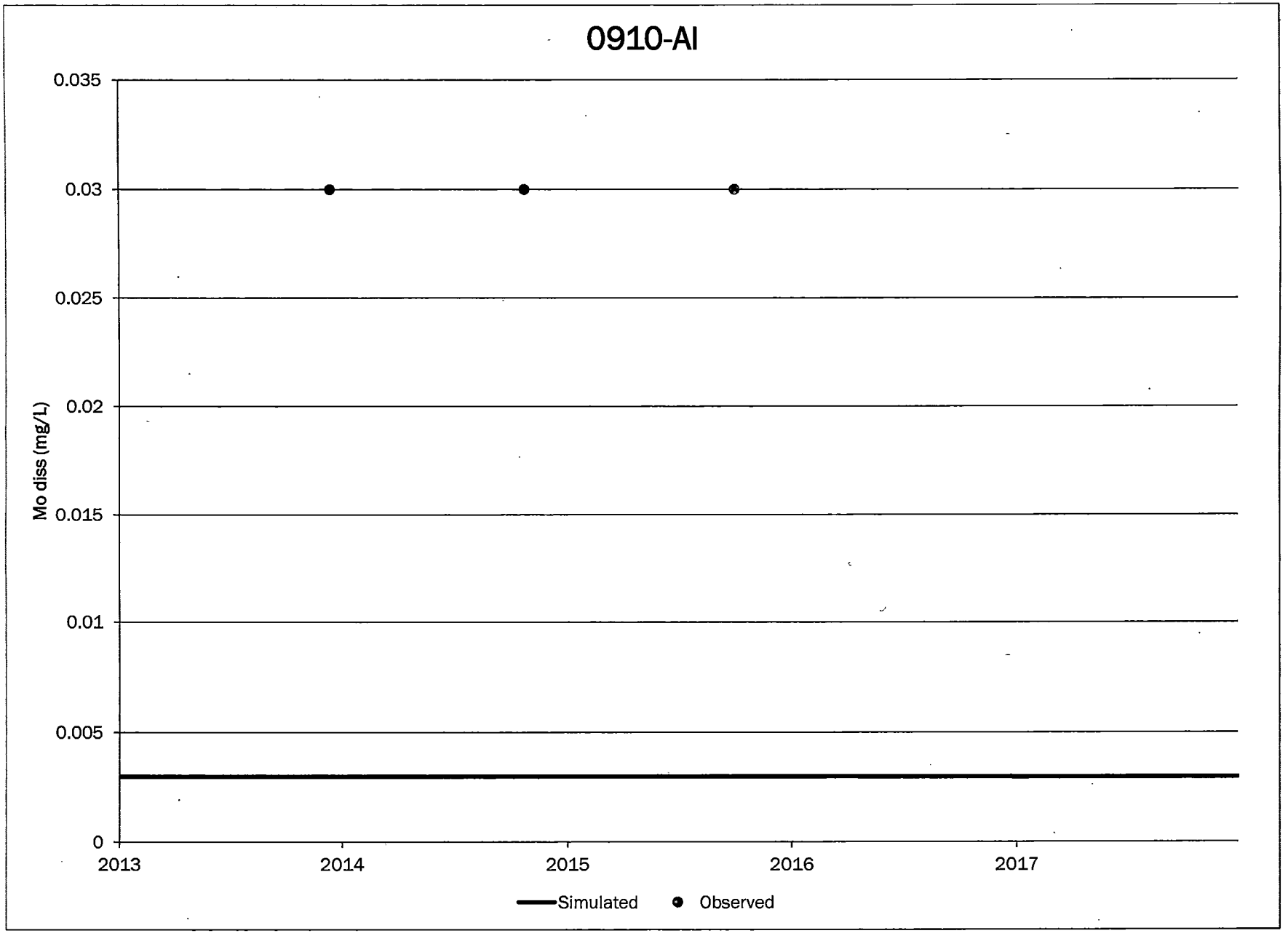

0887-AI
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

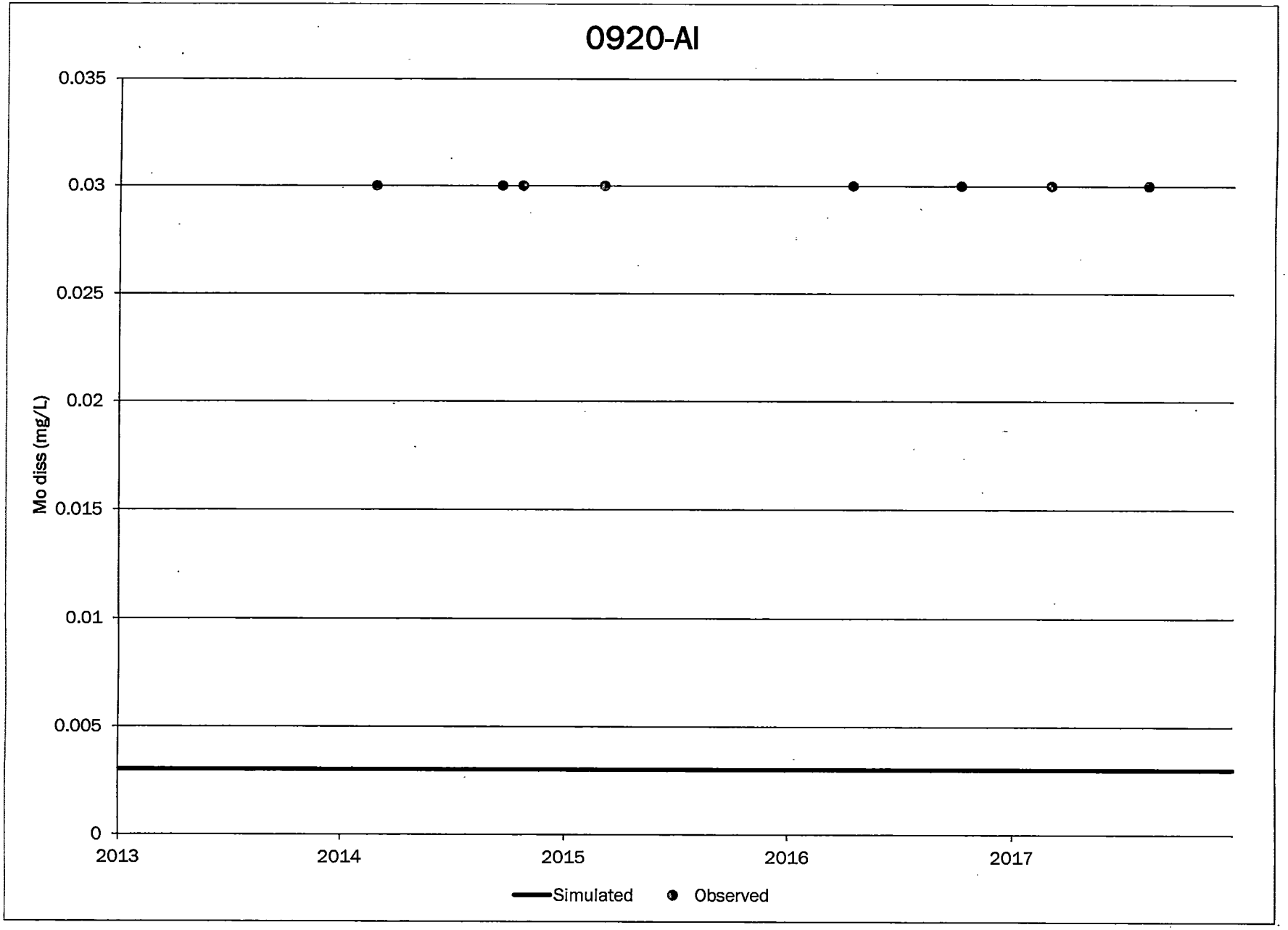

0888-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

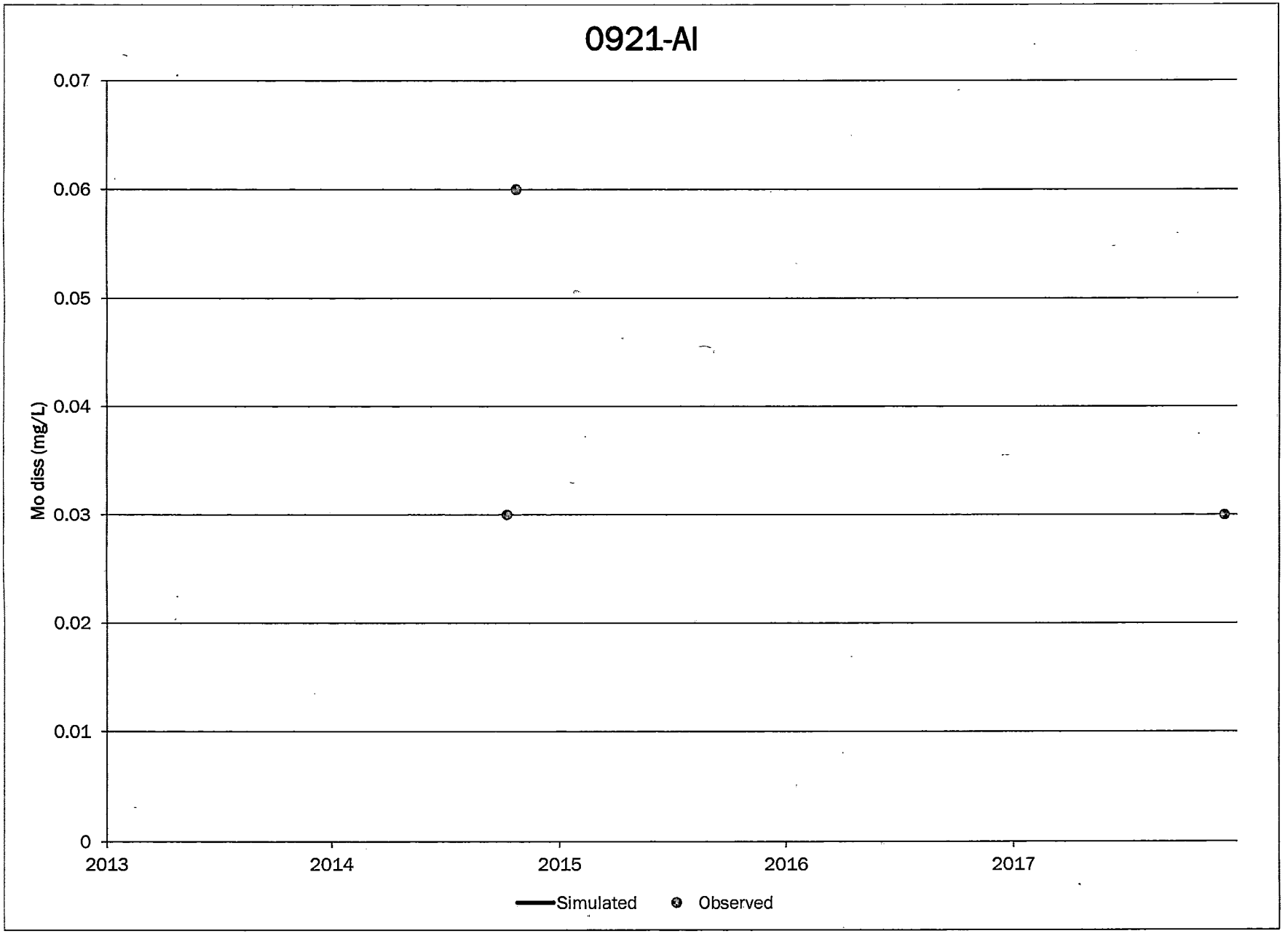

0890-AI
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

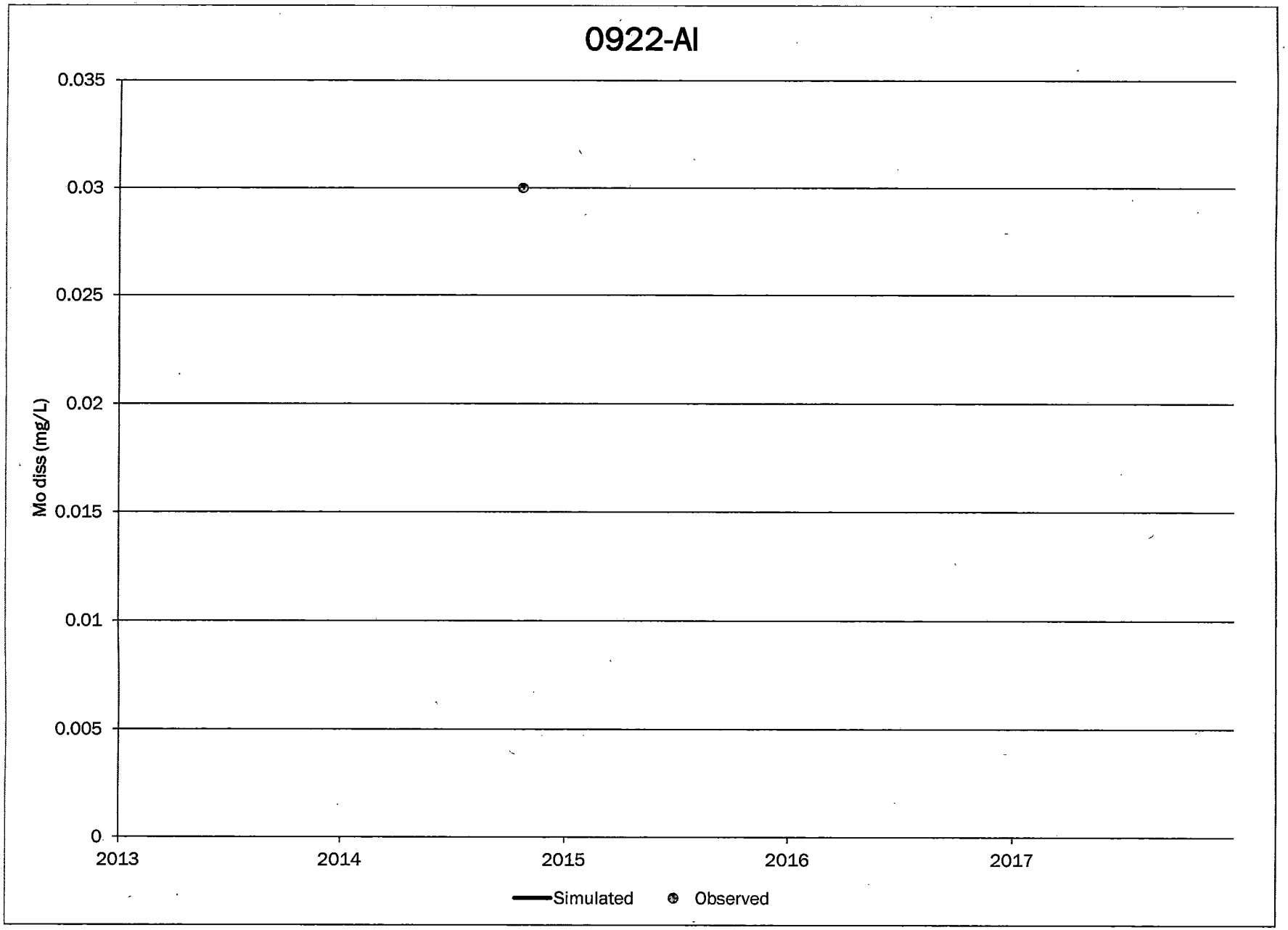

0891-AI
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

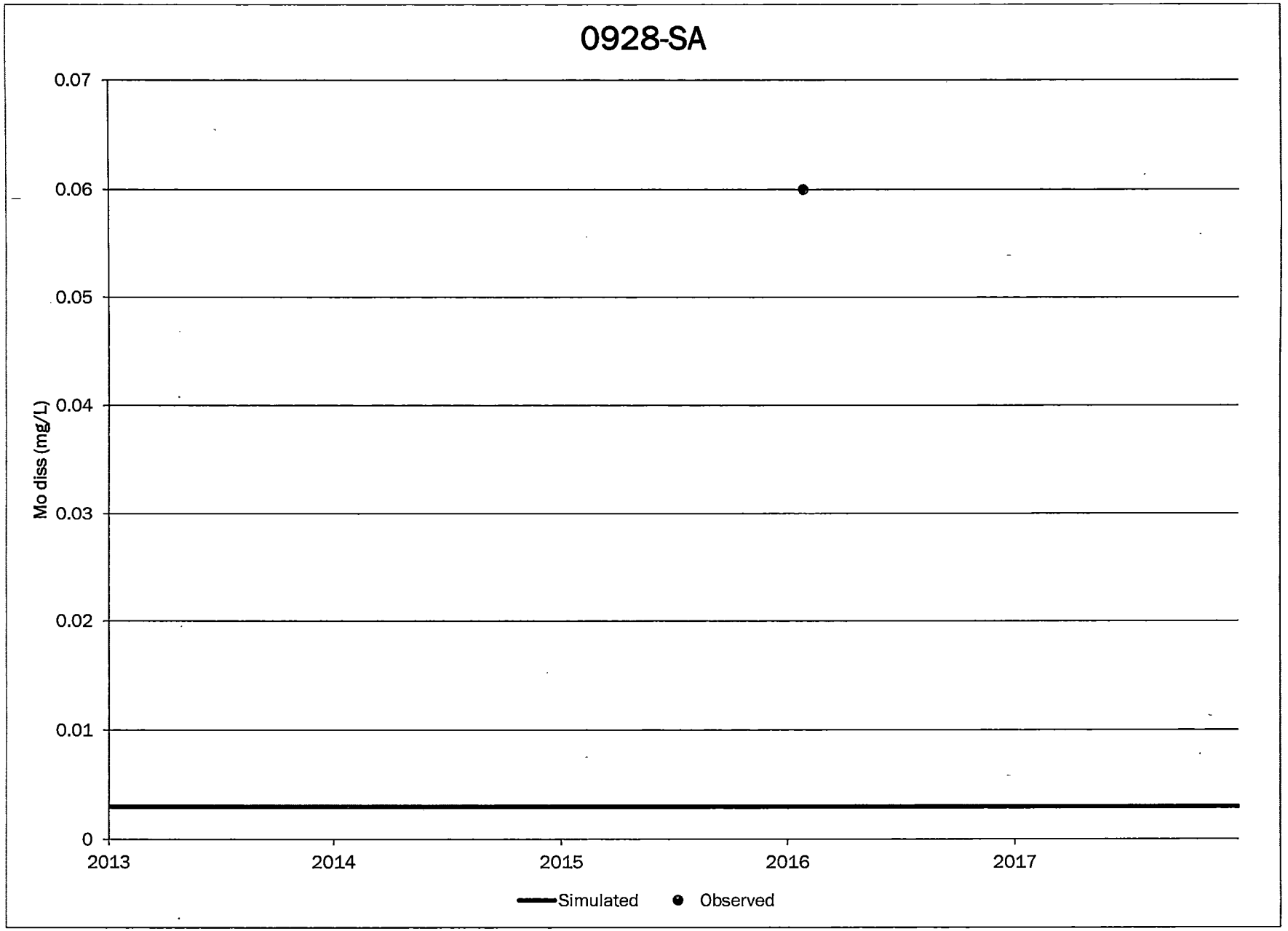

0893-AI
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

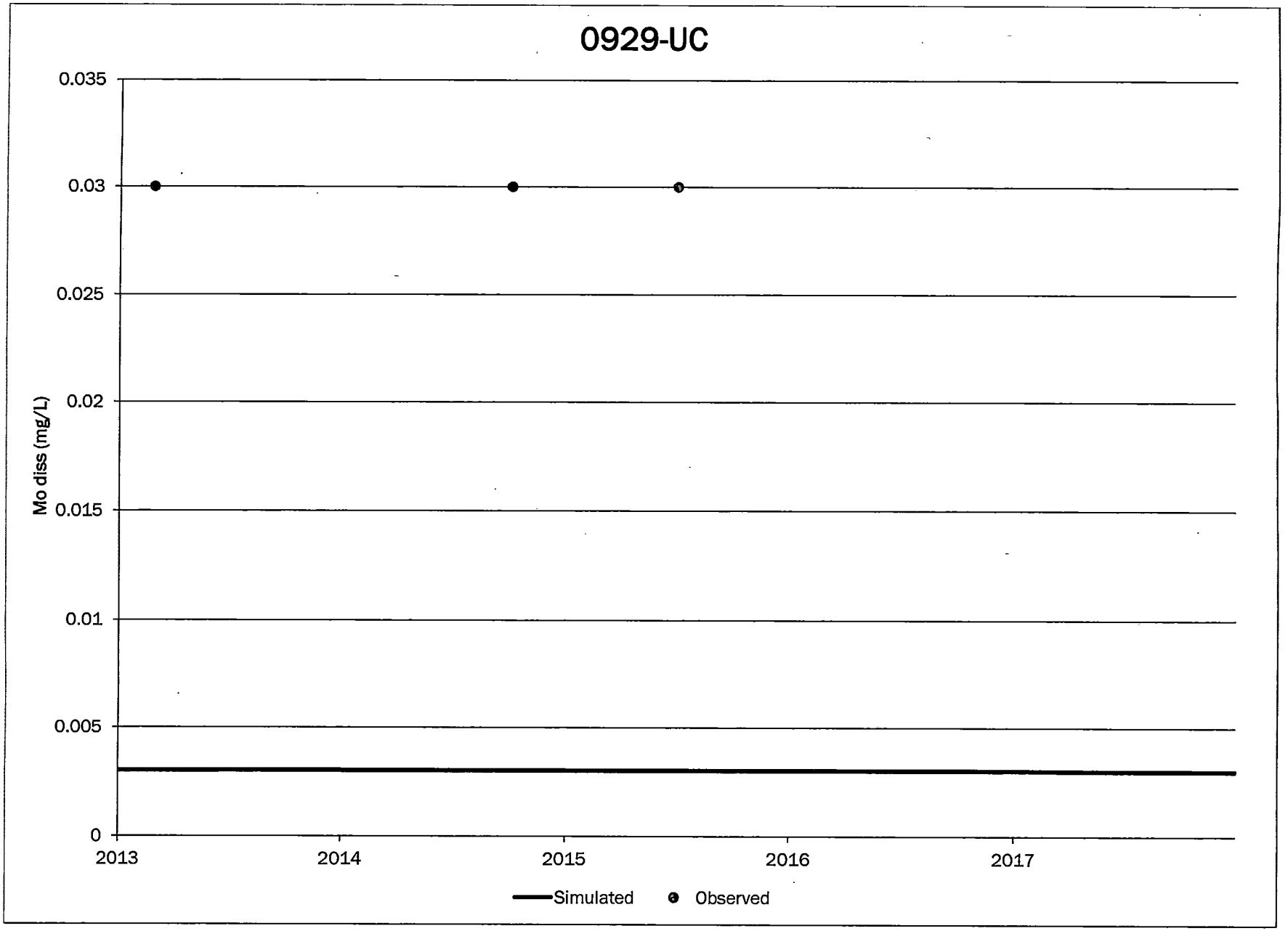

0910-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

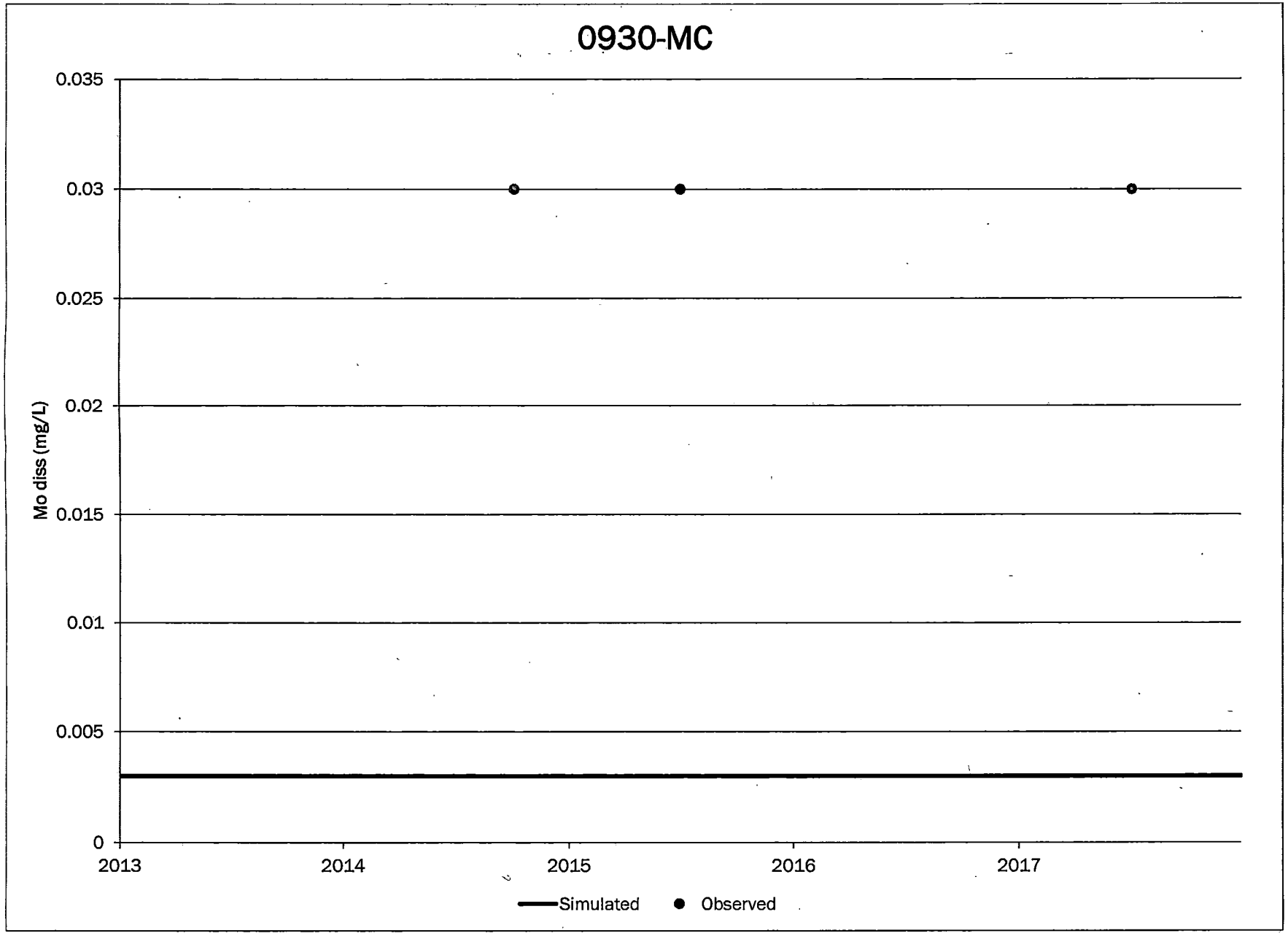

0920-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

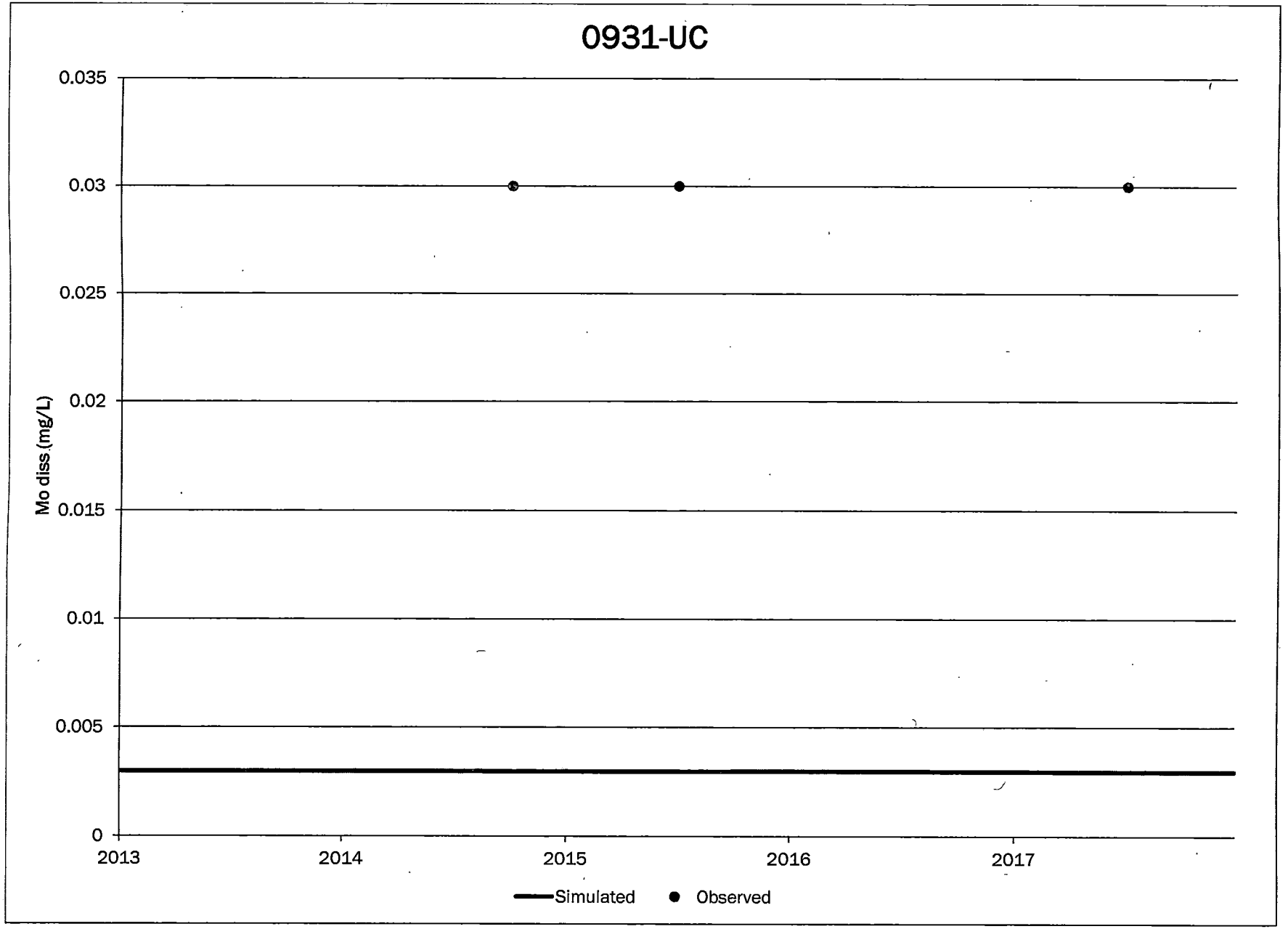

0921-AI
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

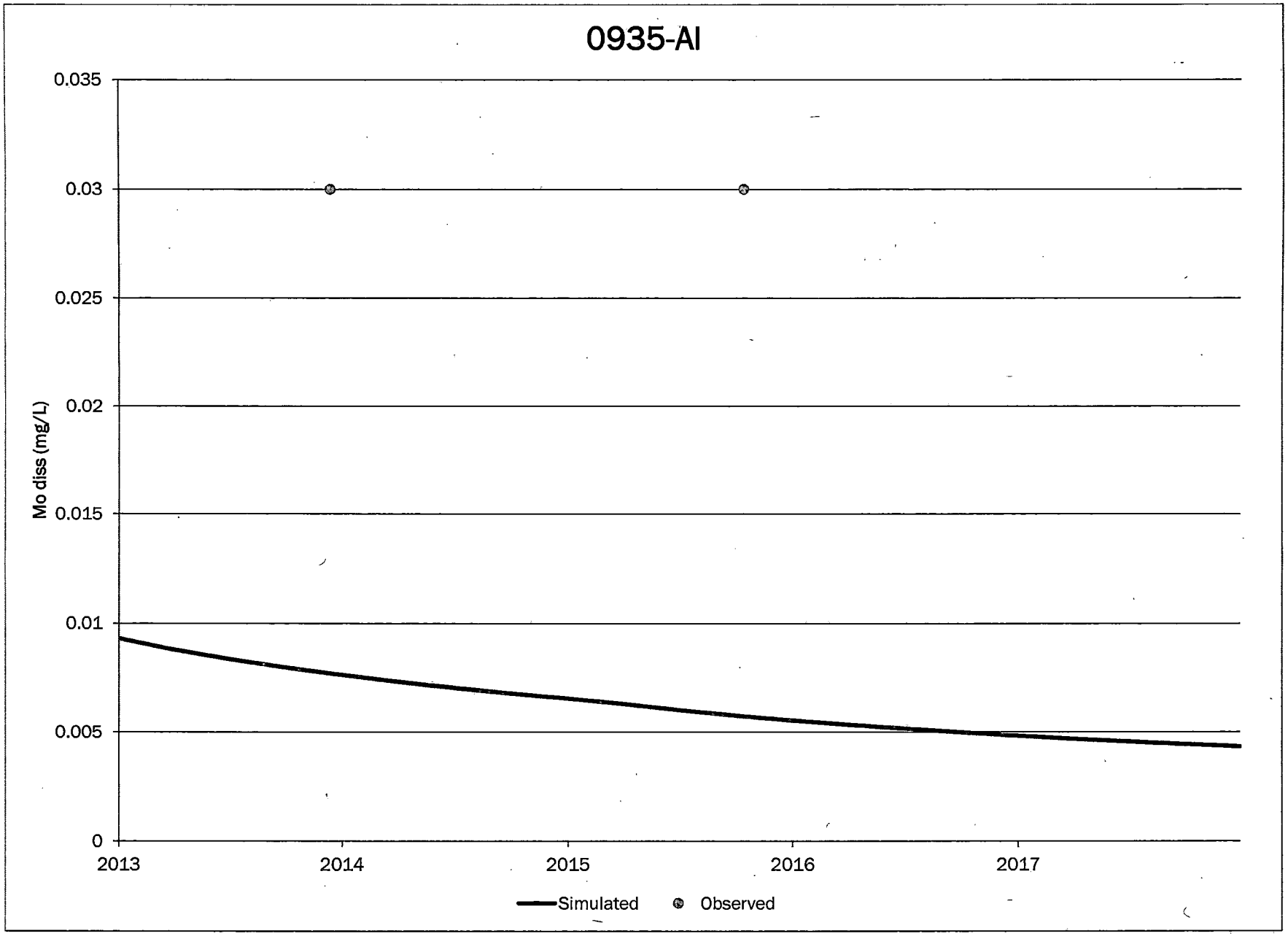

0922-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

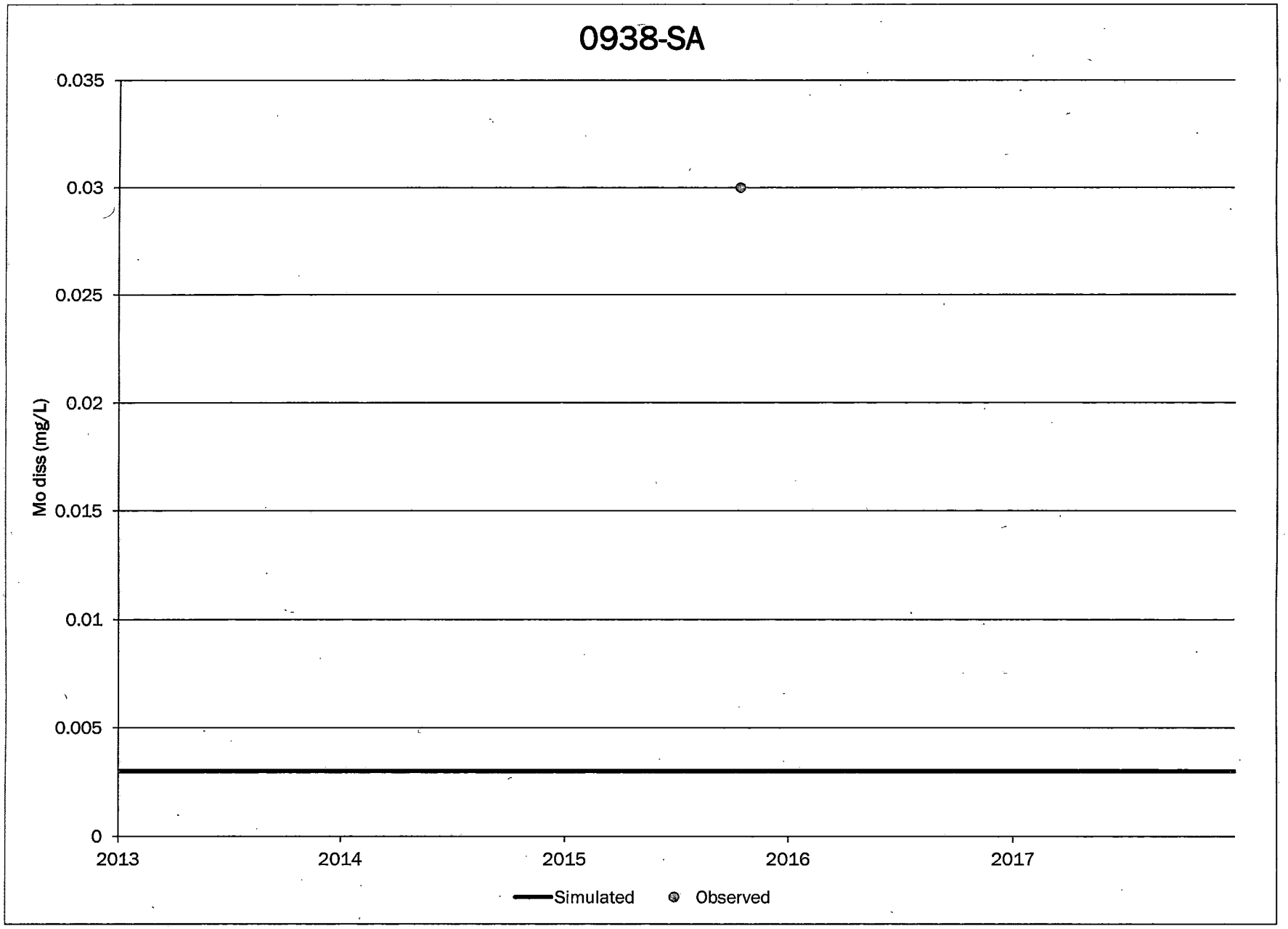

0928-SA
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

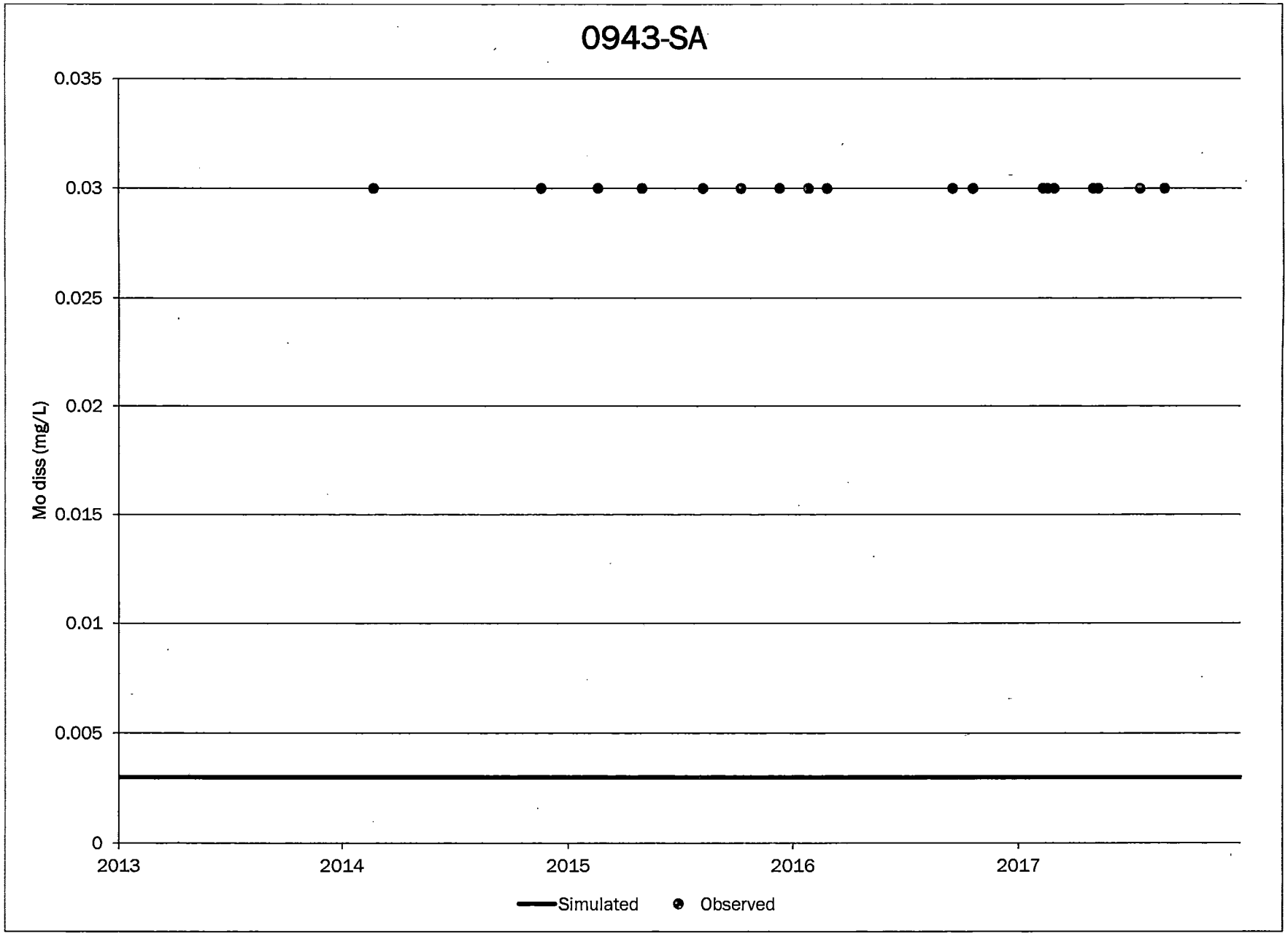

0929-UC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

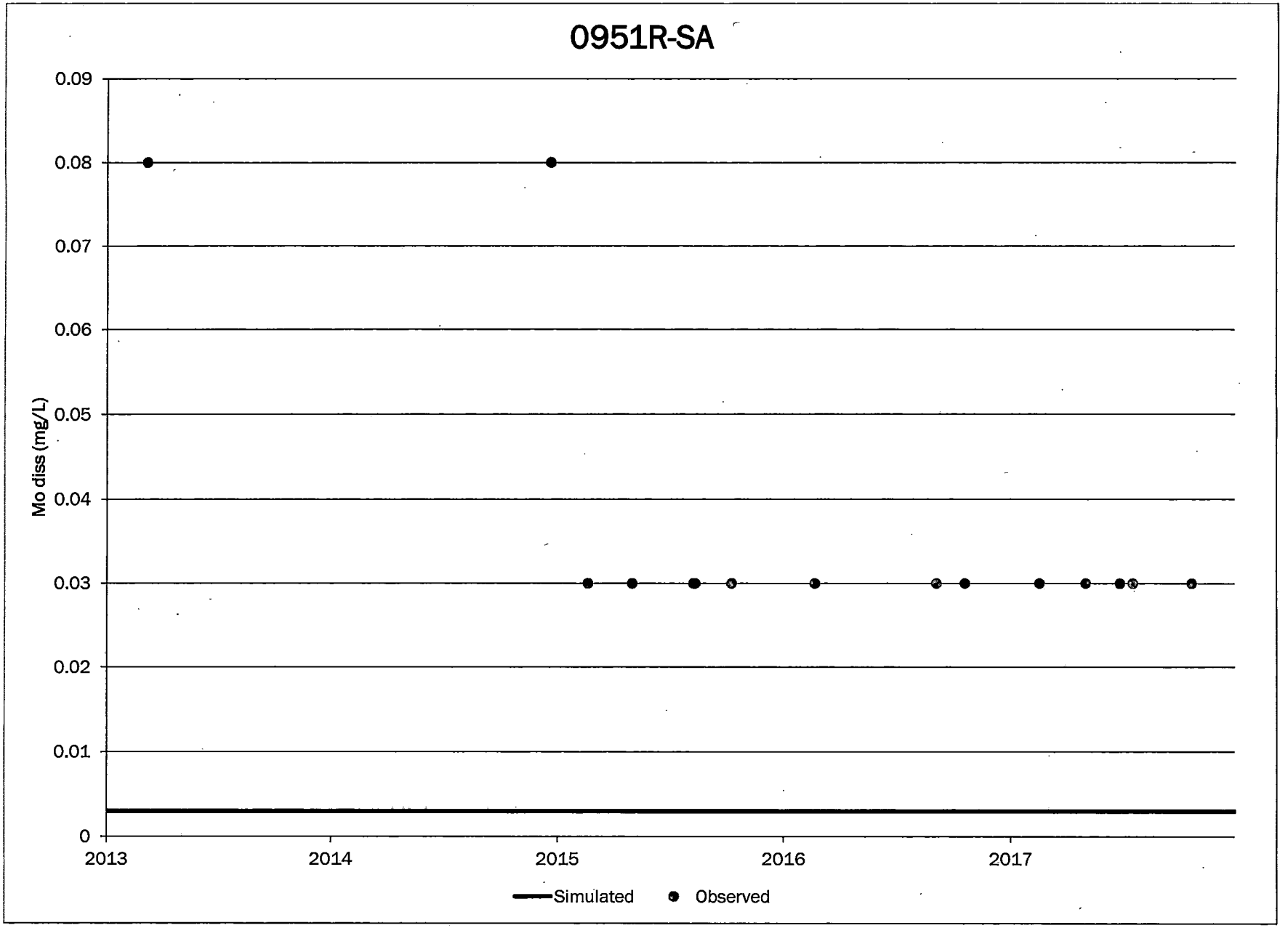

0930-MC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

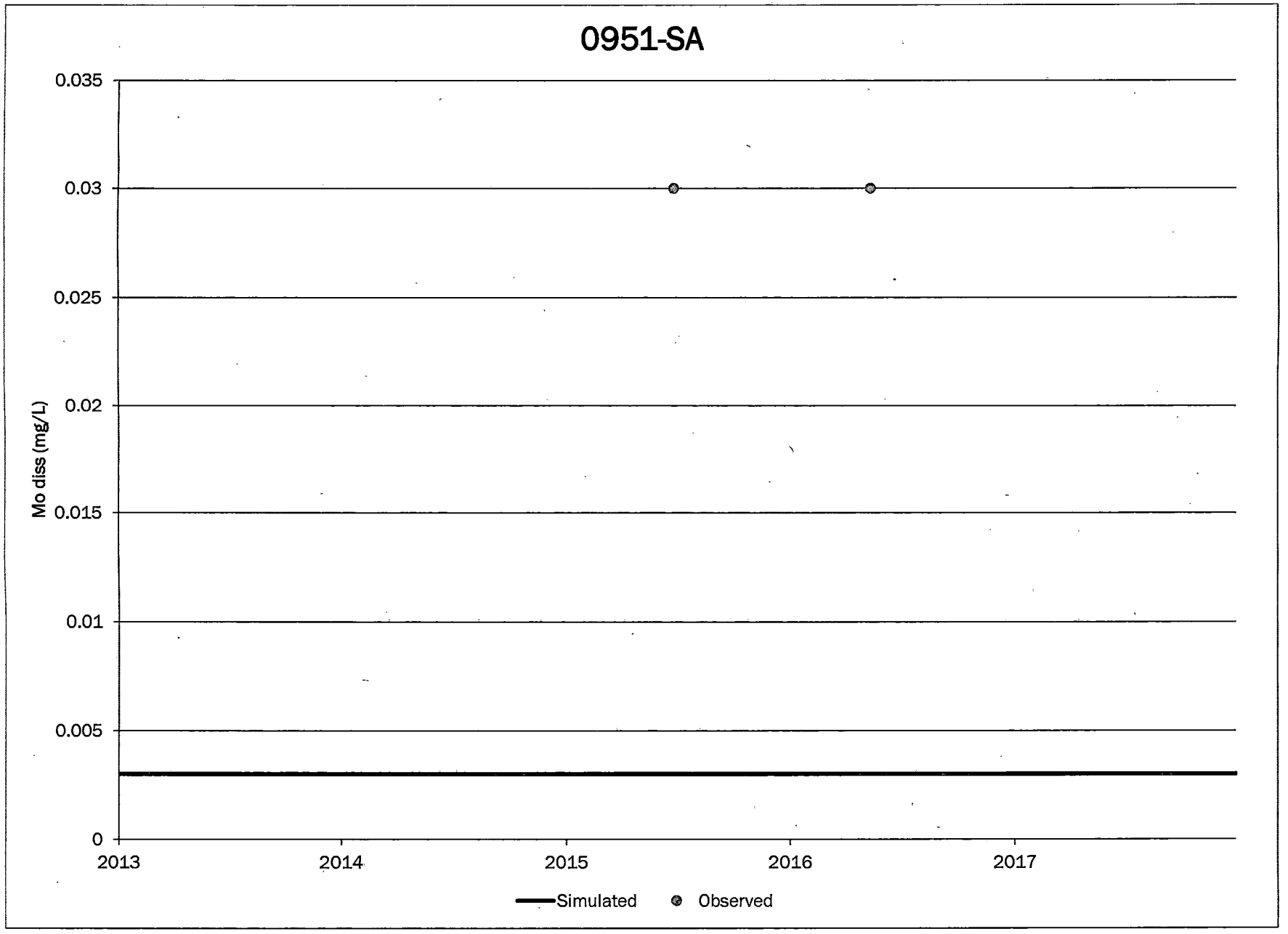

0931-UC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

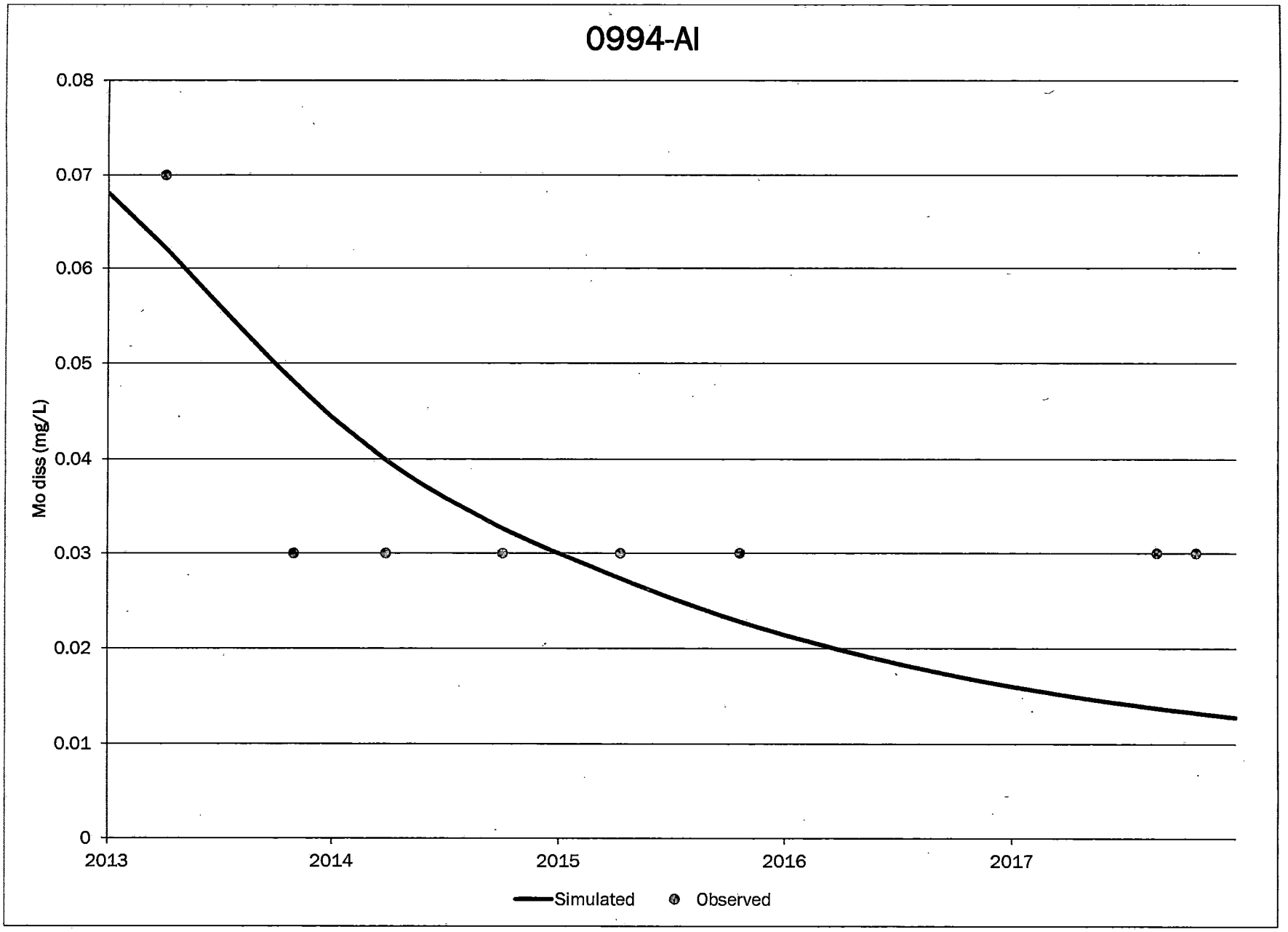

0935-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

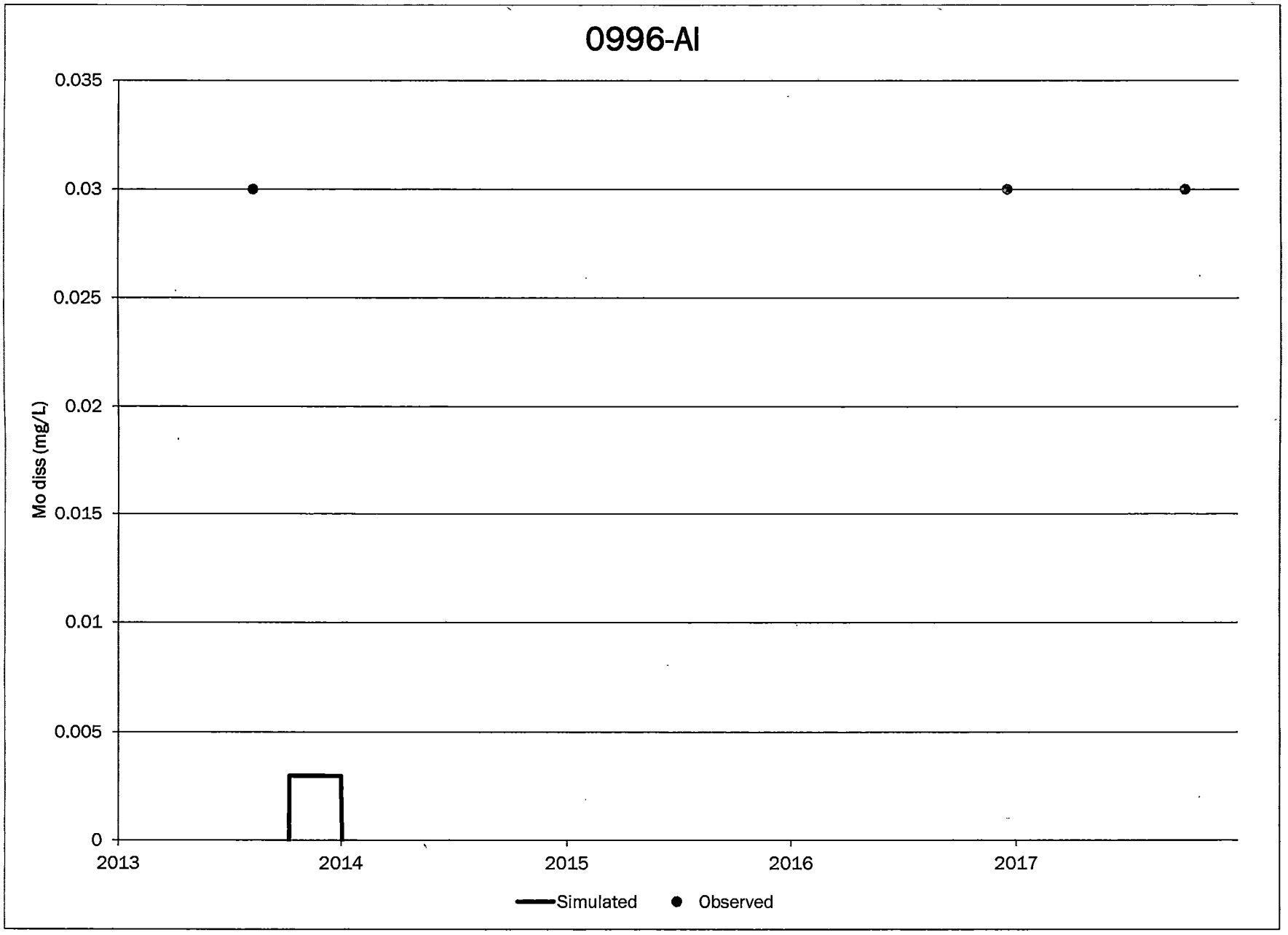

0938-SA
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

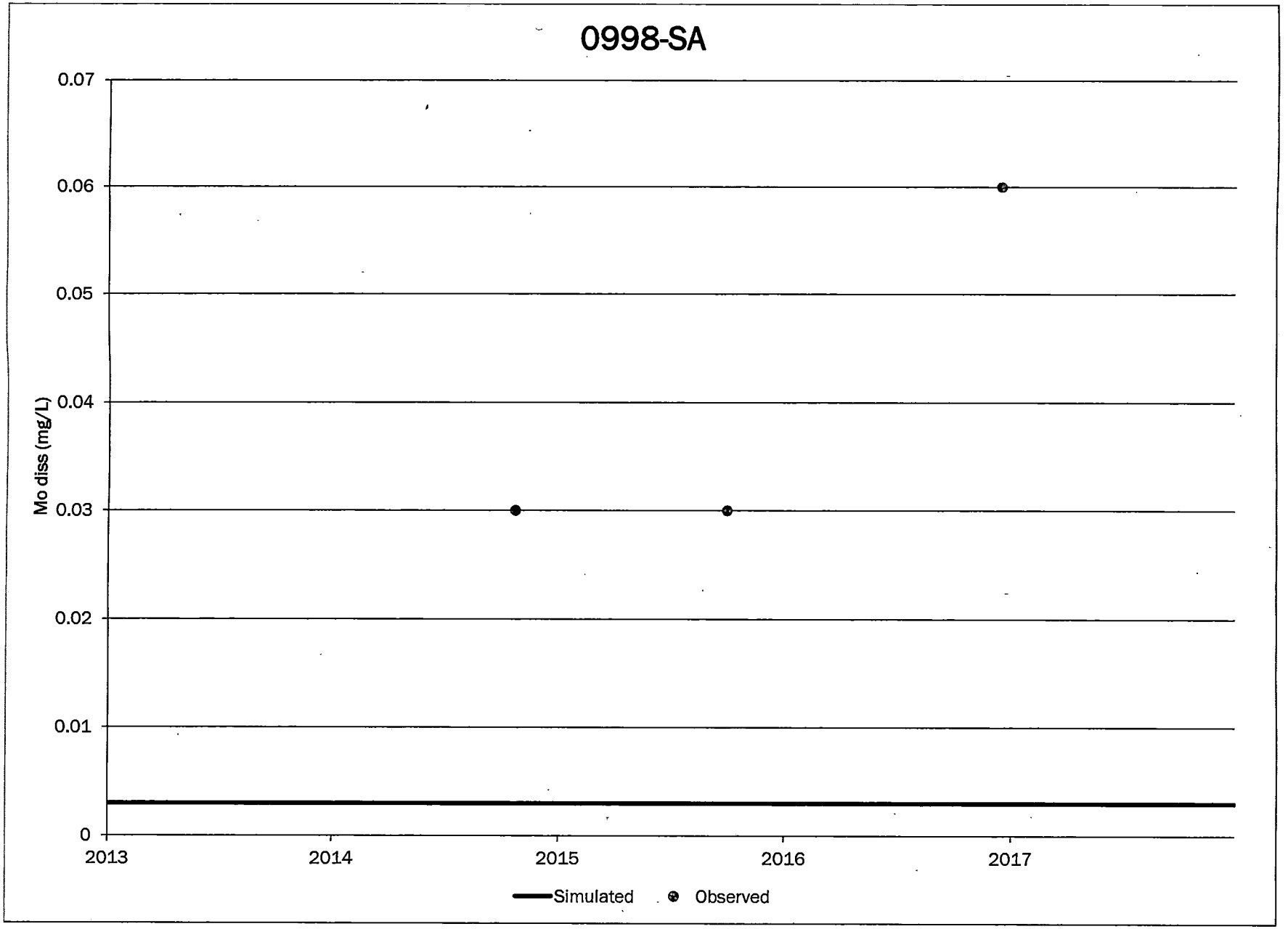

0943-SA
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

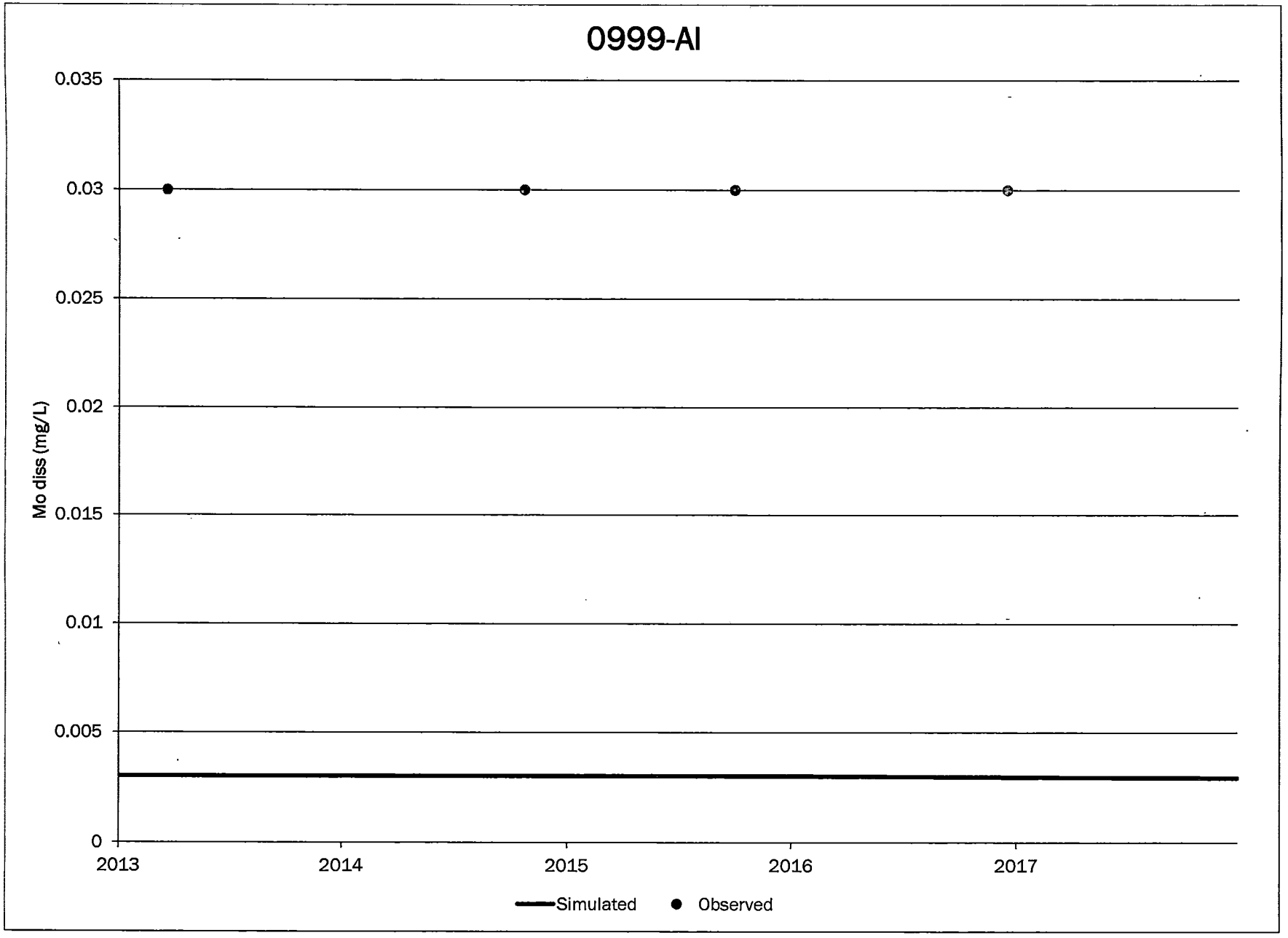

0951R-SA
Mo diss (mg/L)
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
2013
2014
2015
2016
2017
Simulated
Observed

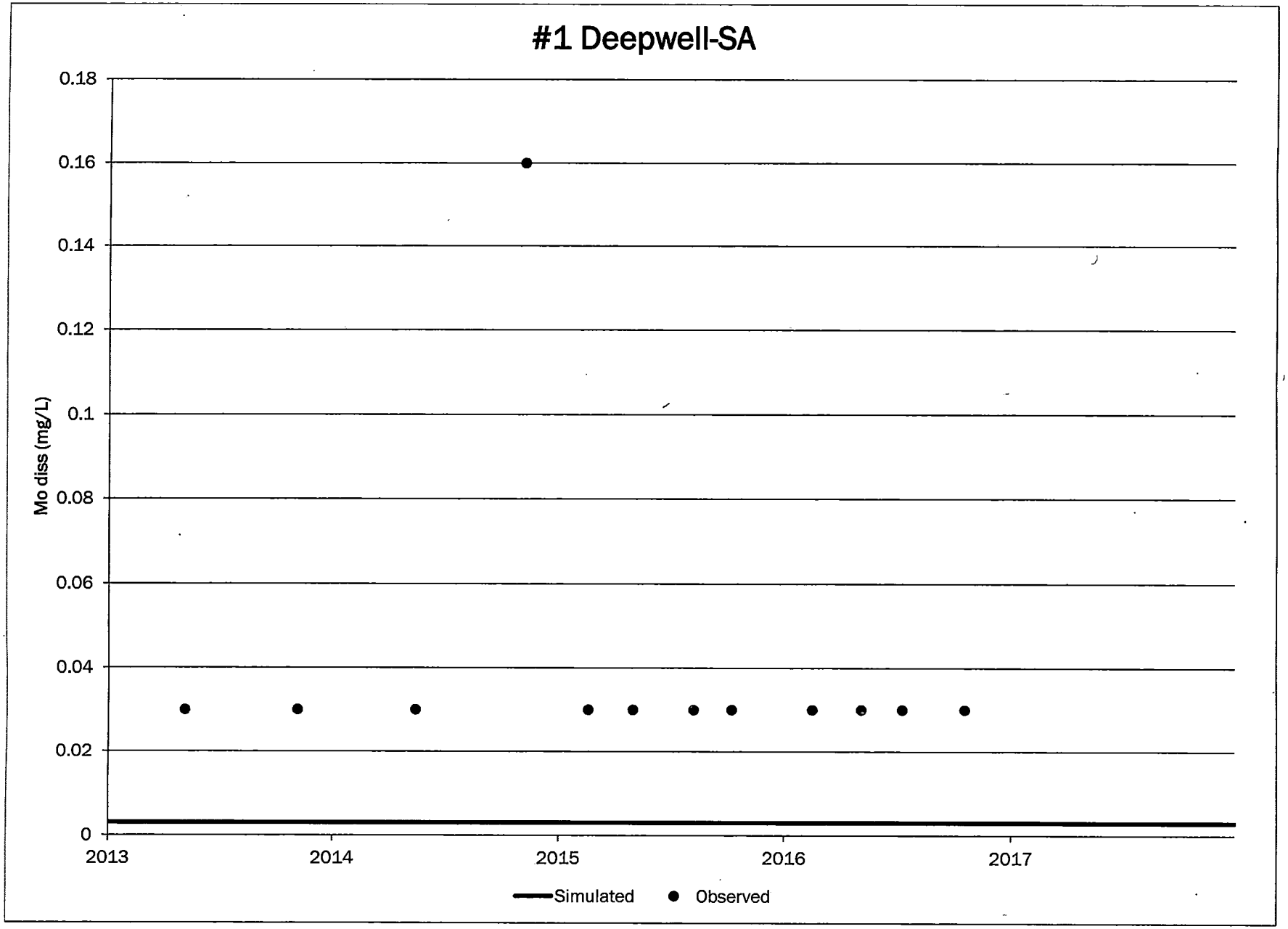

0951-SA
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

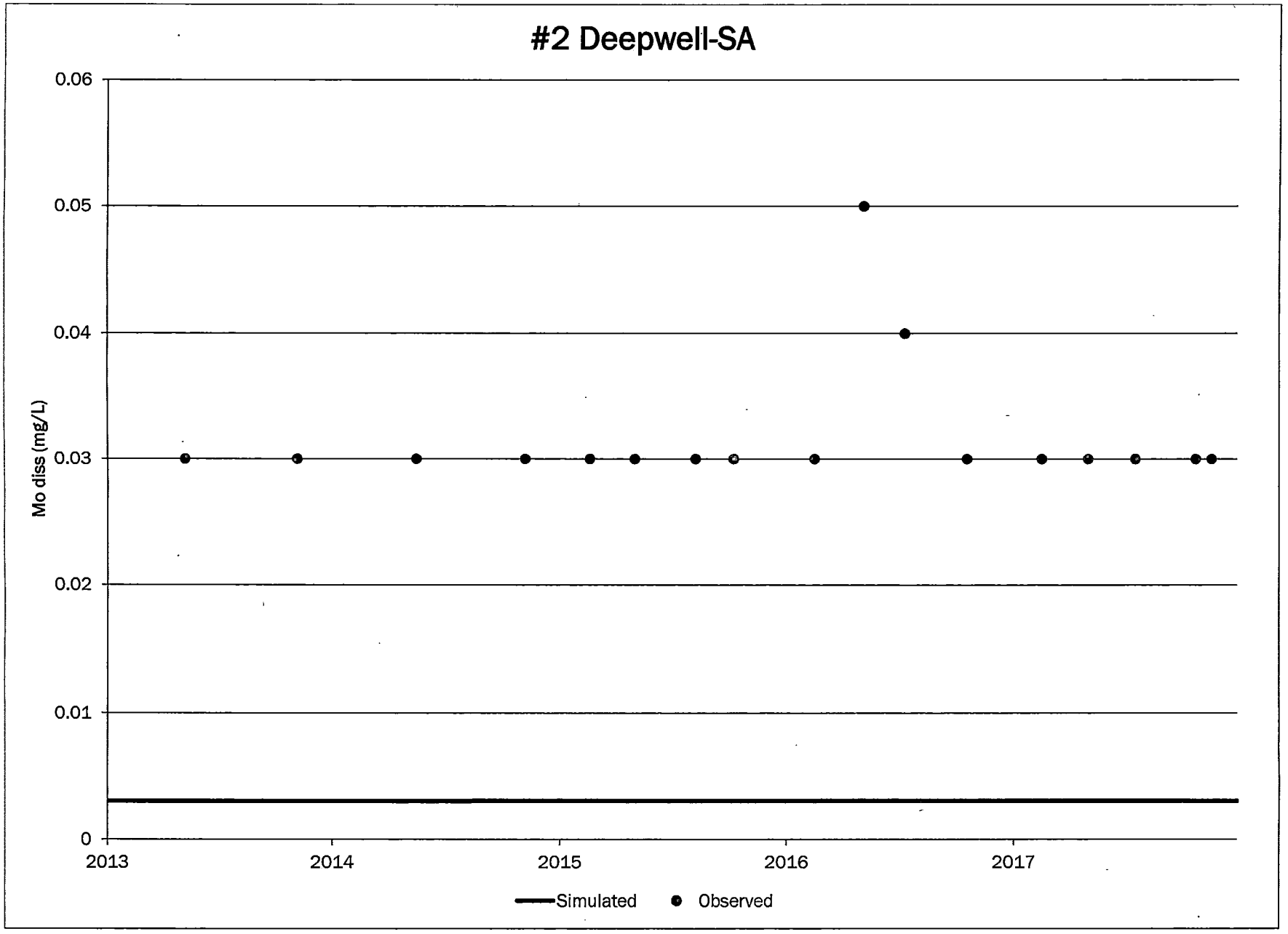

0994-AI
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

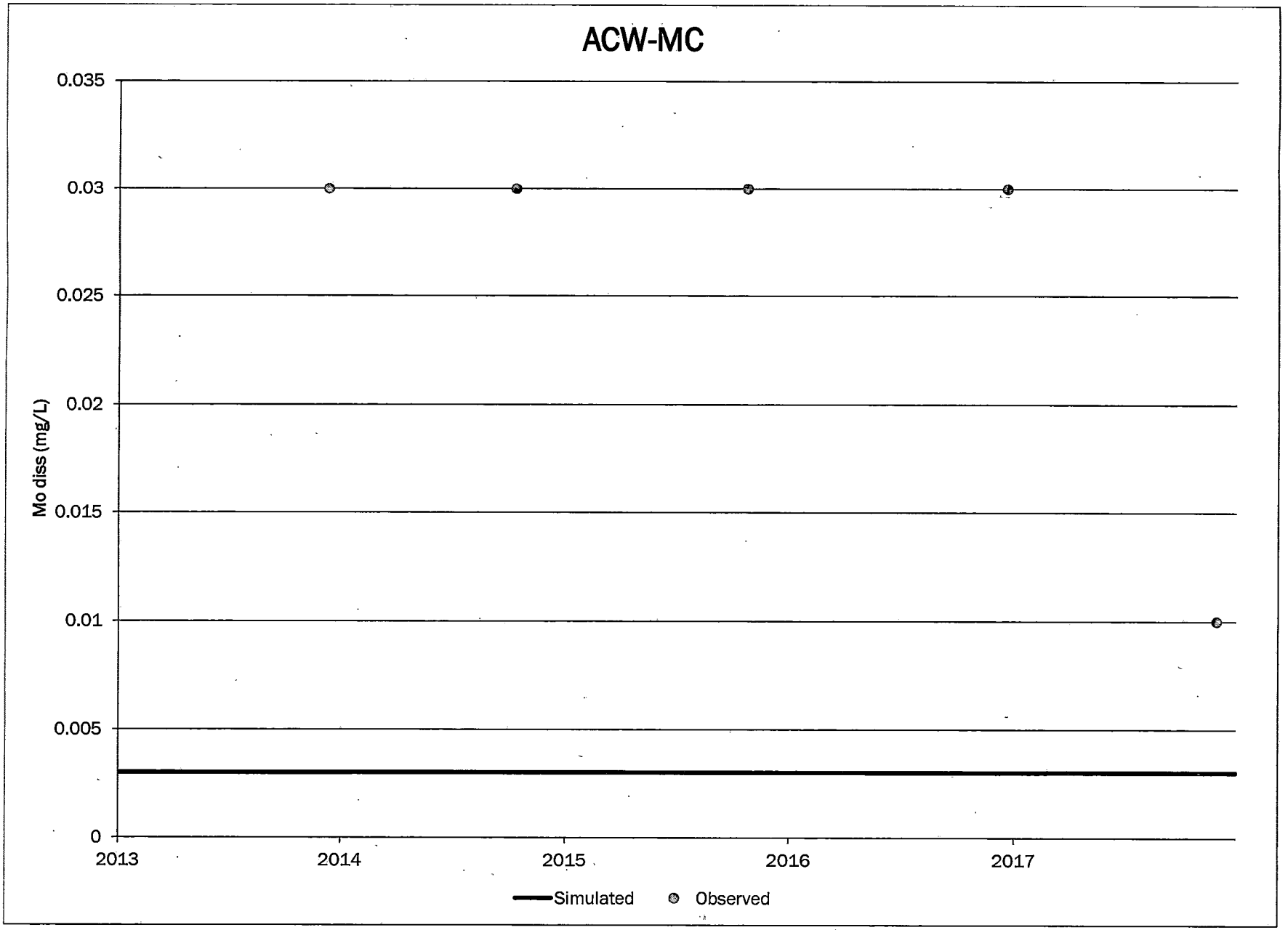

0996-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

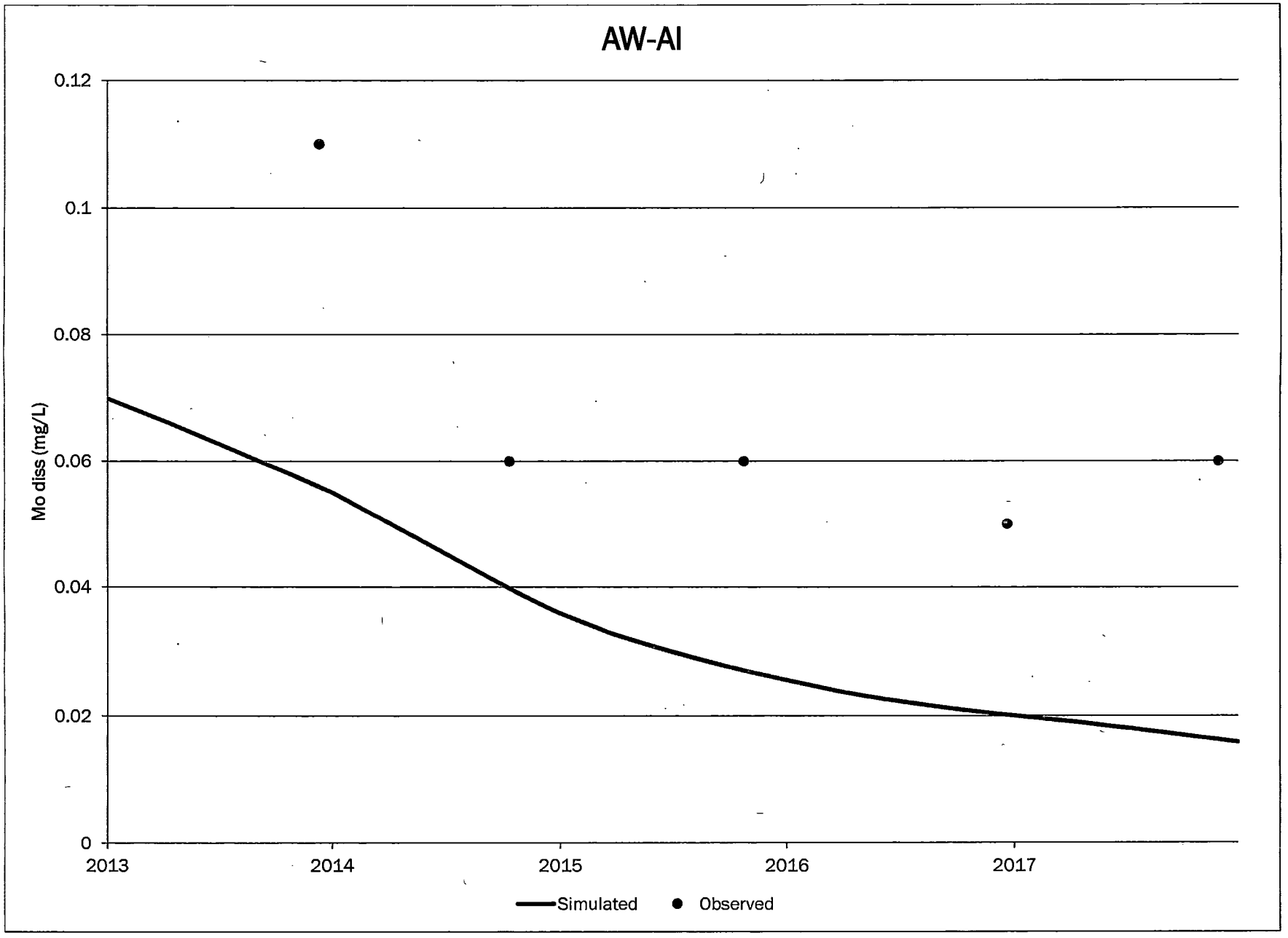

0998-SA
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

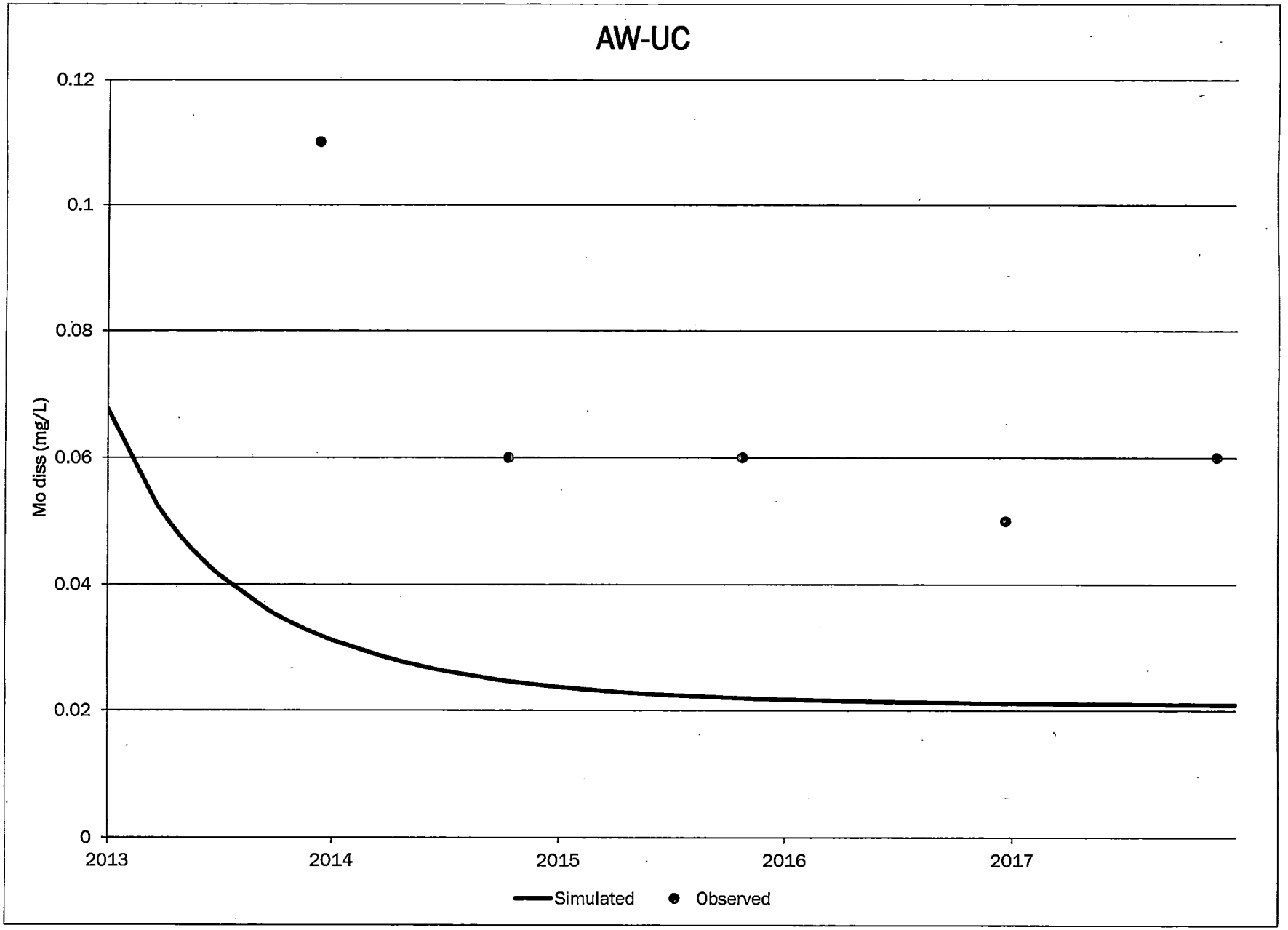

0999-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

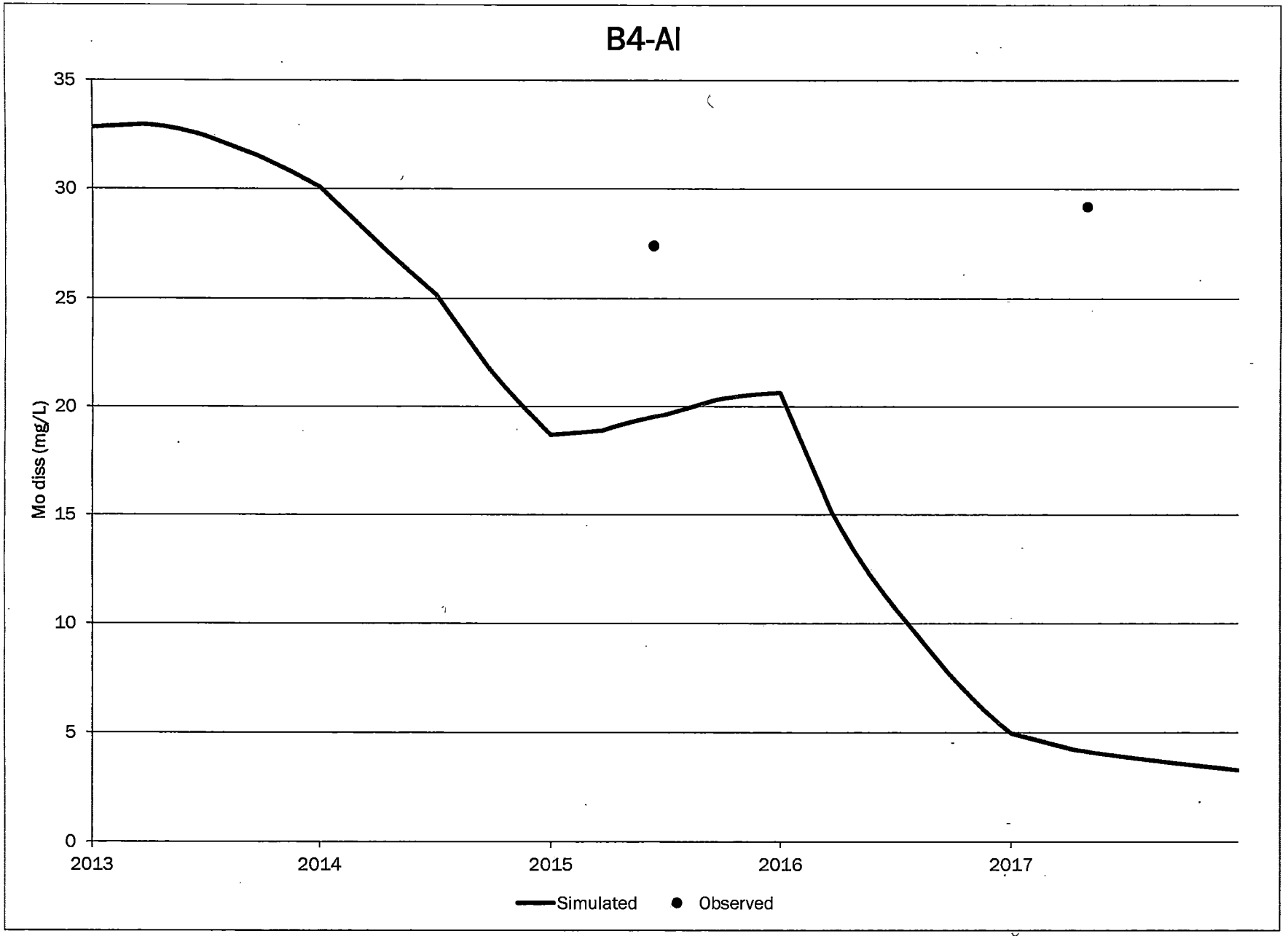

#1 Deepwell-SA
Mo diss (mg/L)
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
2013
2014
2015
2016
2017
Simulated
Observed

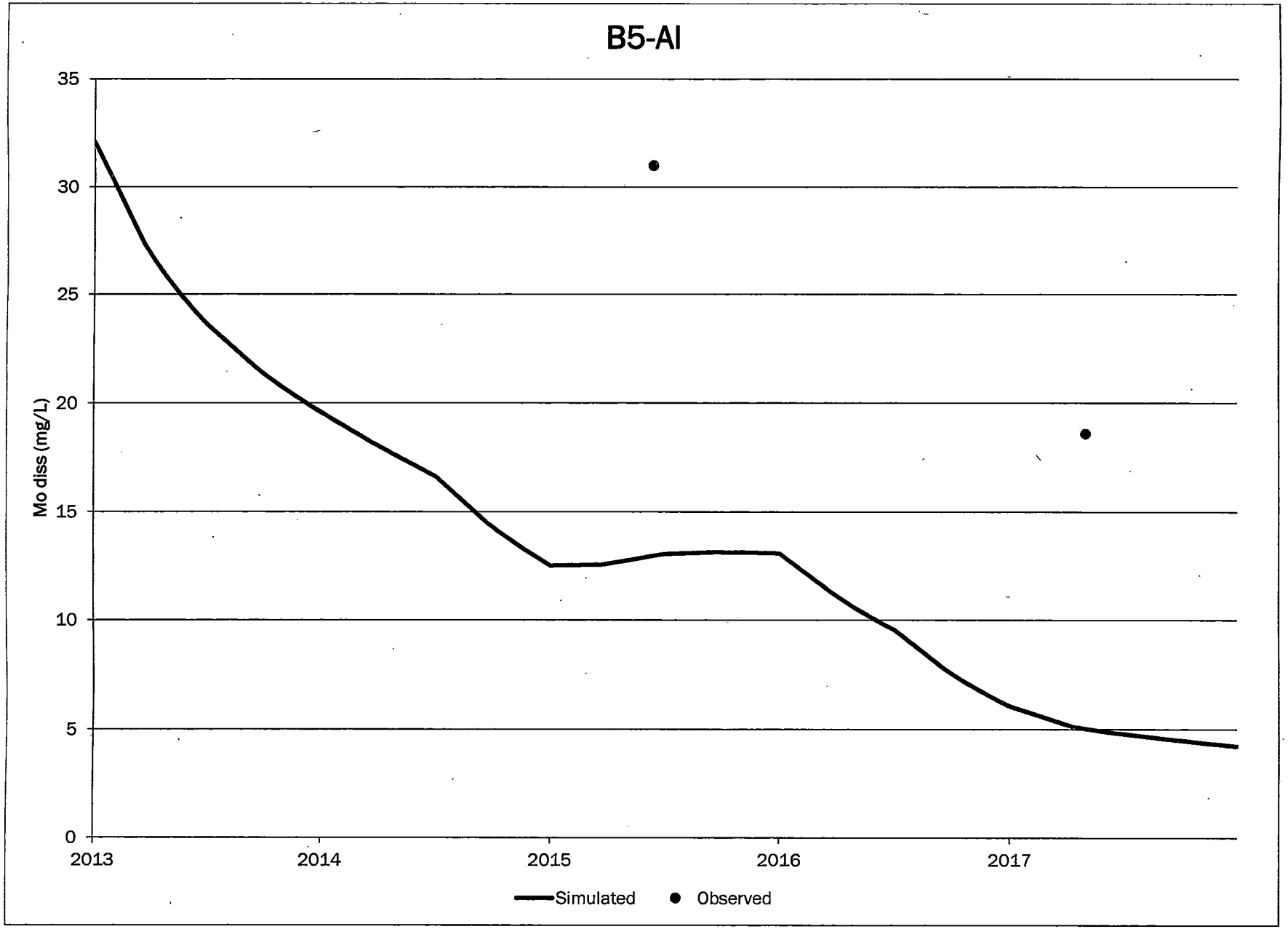

#2 Deepwell-SA
Mo diss (mg/L)
0.06
0.05
0.04
0.03
0.02
0.01
0
2013
2014
2015
2016
2017
Simulated
Observed

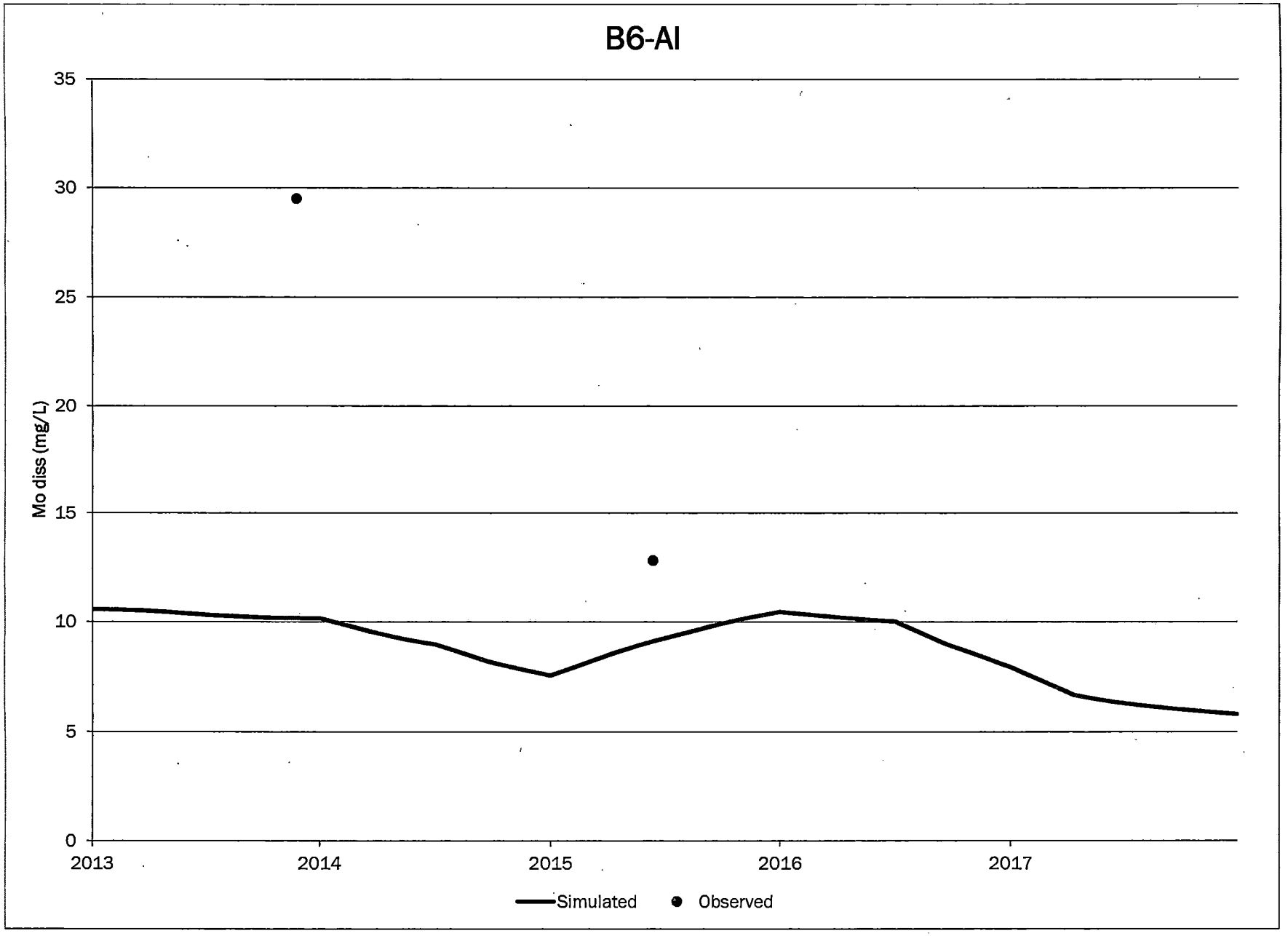

ACW-MC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

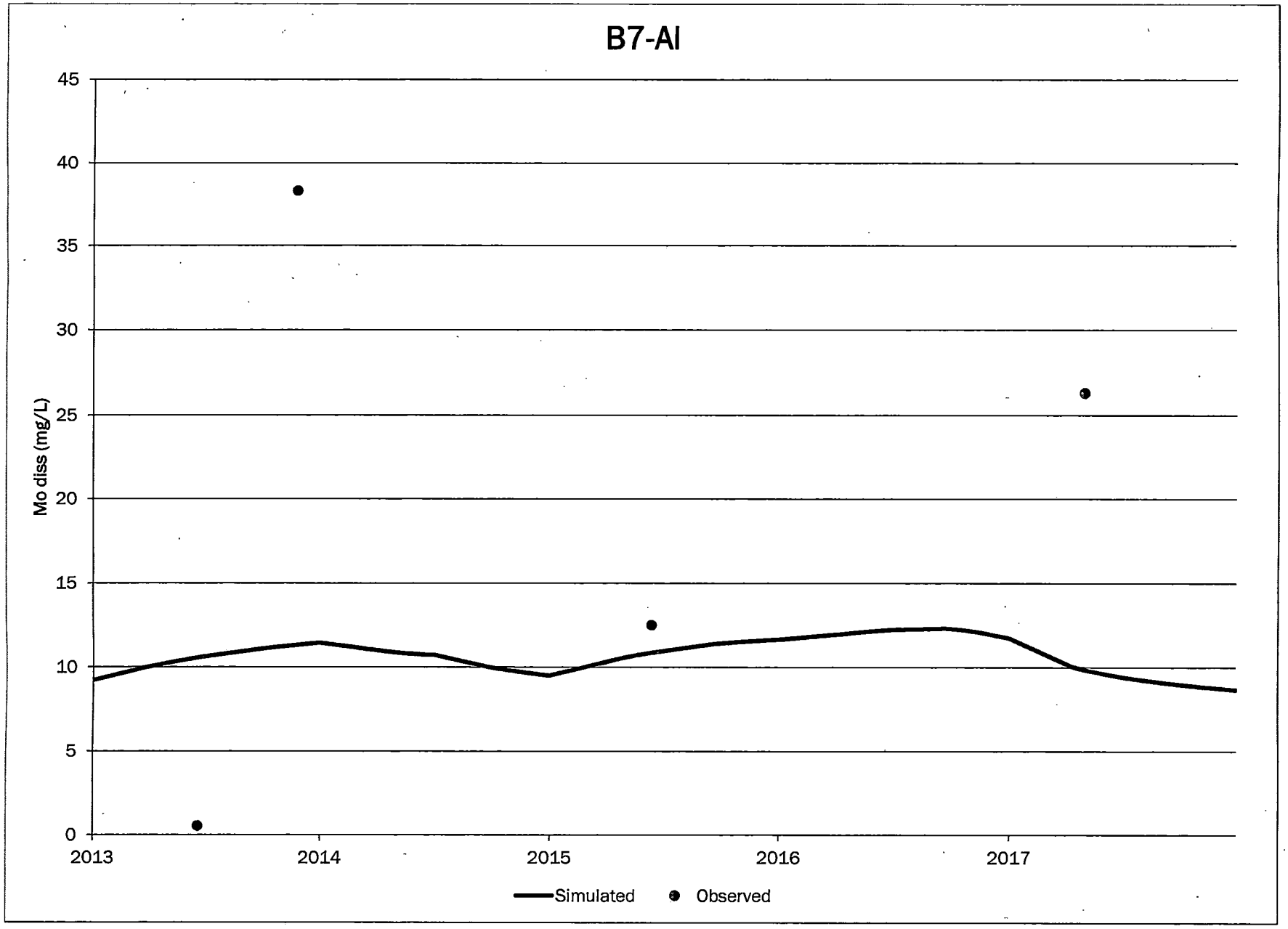

AW-AI
0.12
0.1
0.08
0.06
0.04
0.02
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

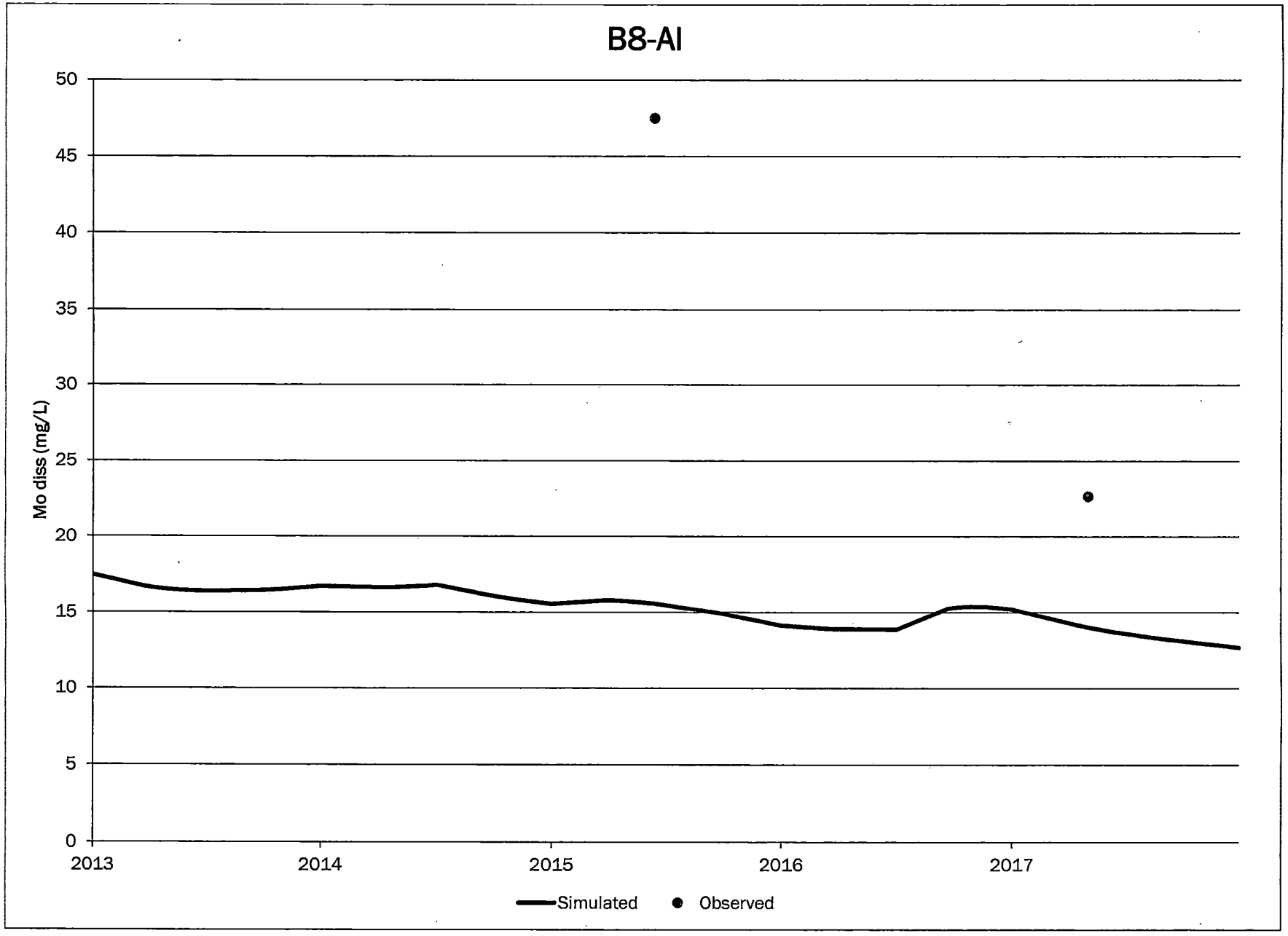

AW-UC
0.12
0.1
0.08
0.06
0.04
0.02
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

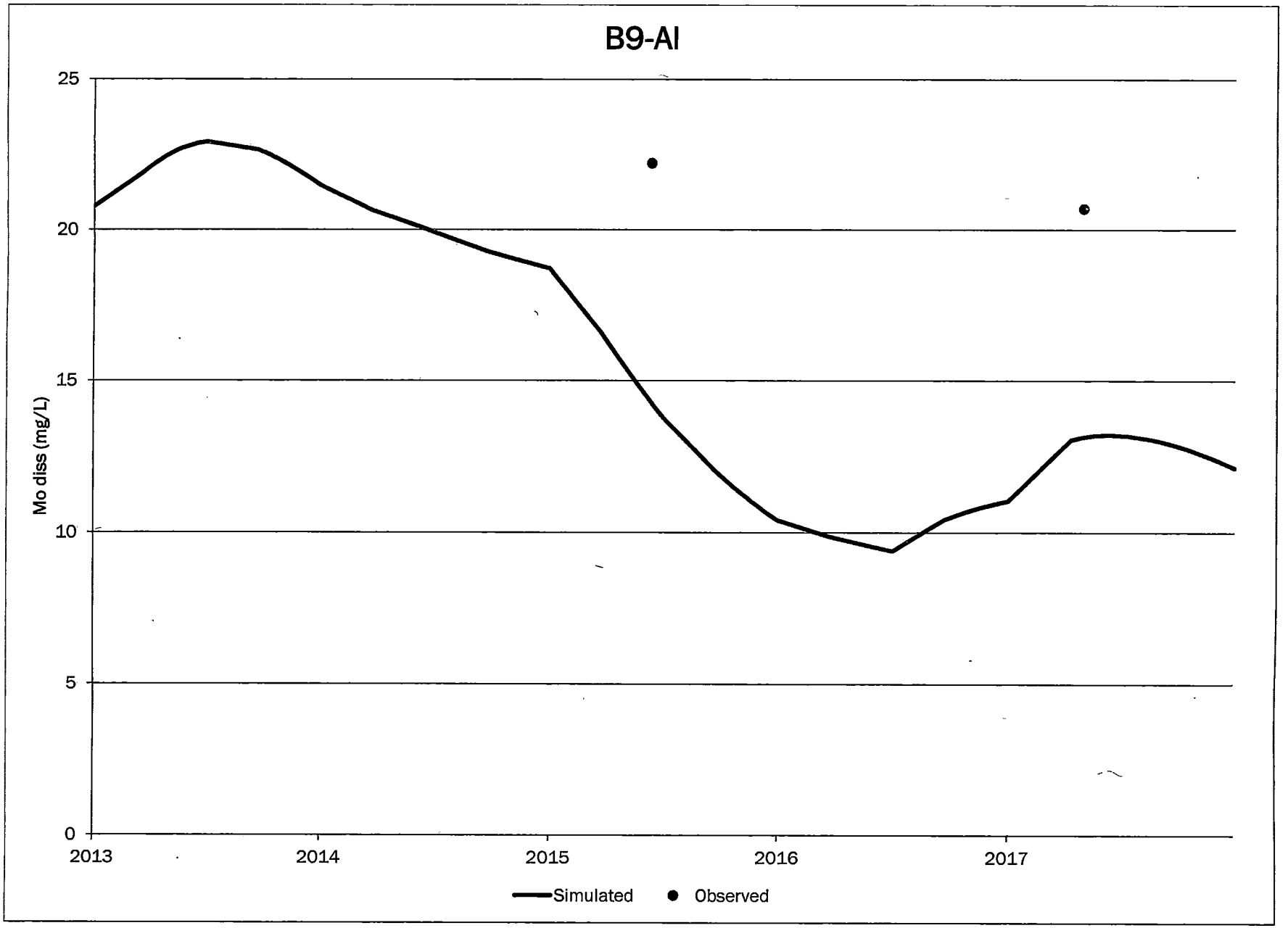

B4-AI
Mo diss (mg/L)
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

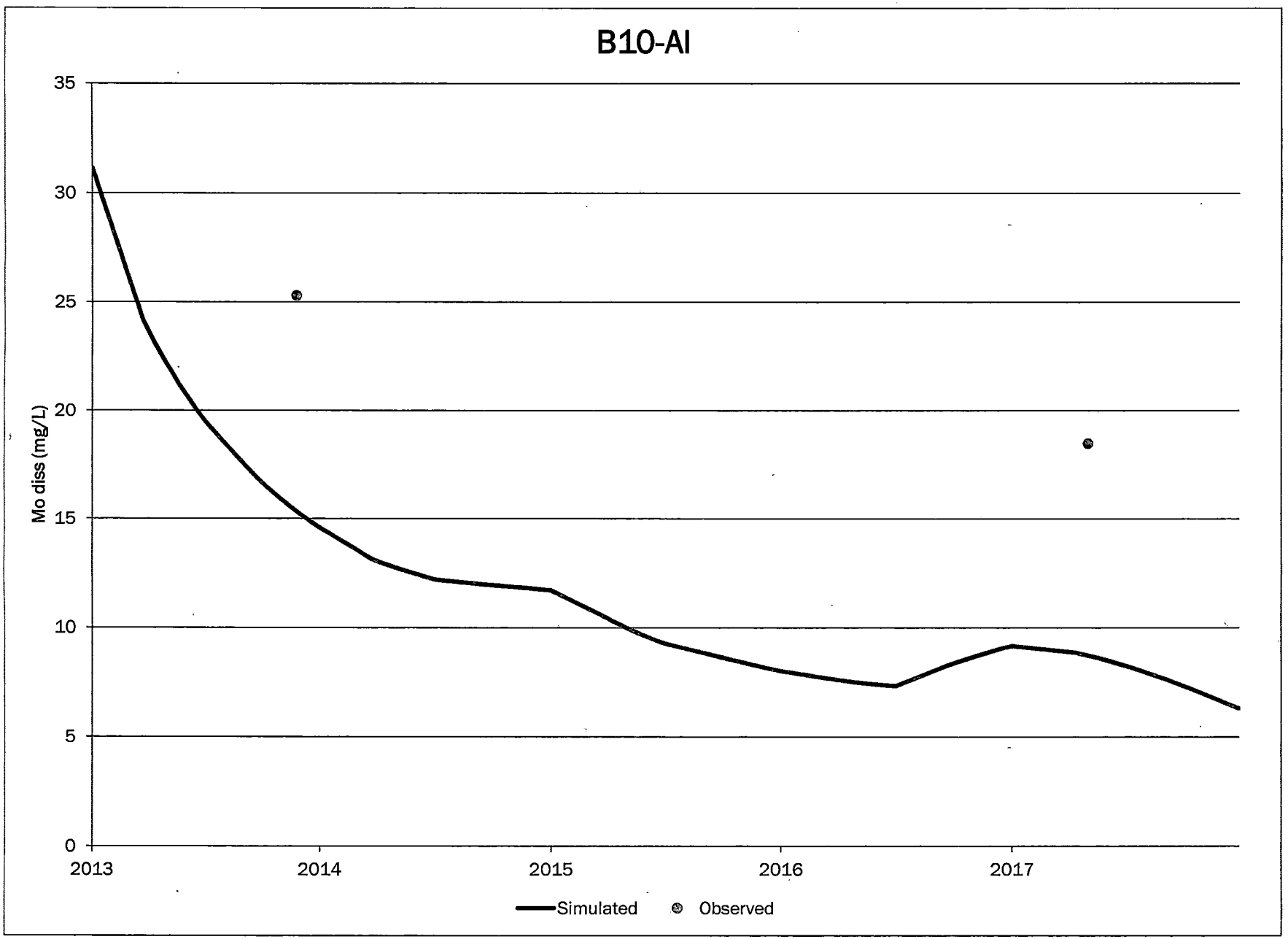

B5-AI
Mo diss (mg/L)
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

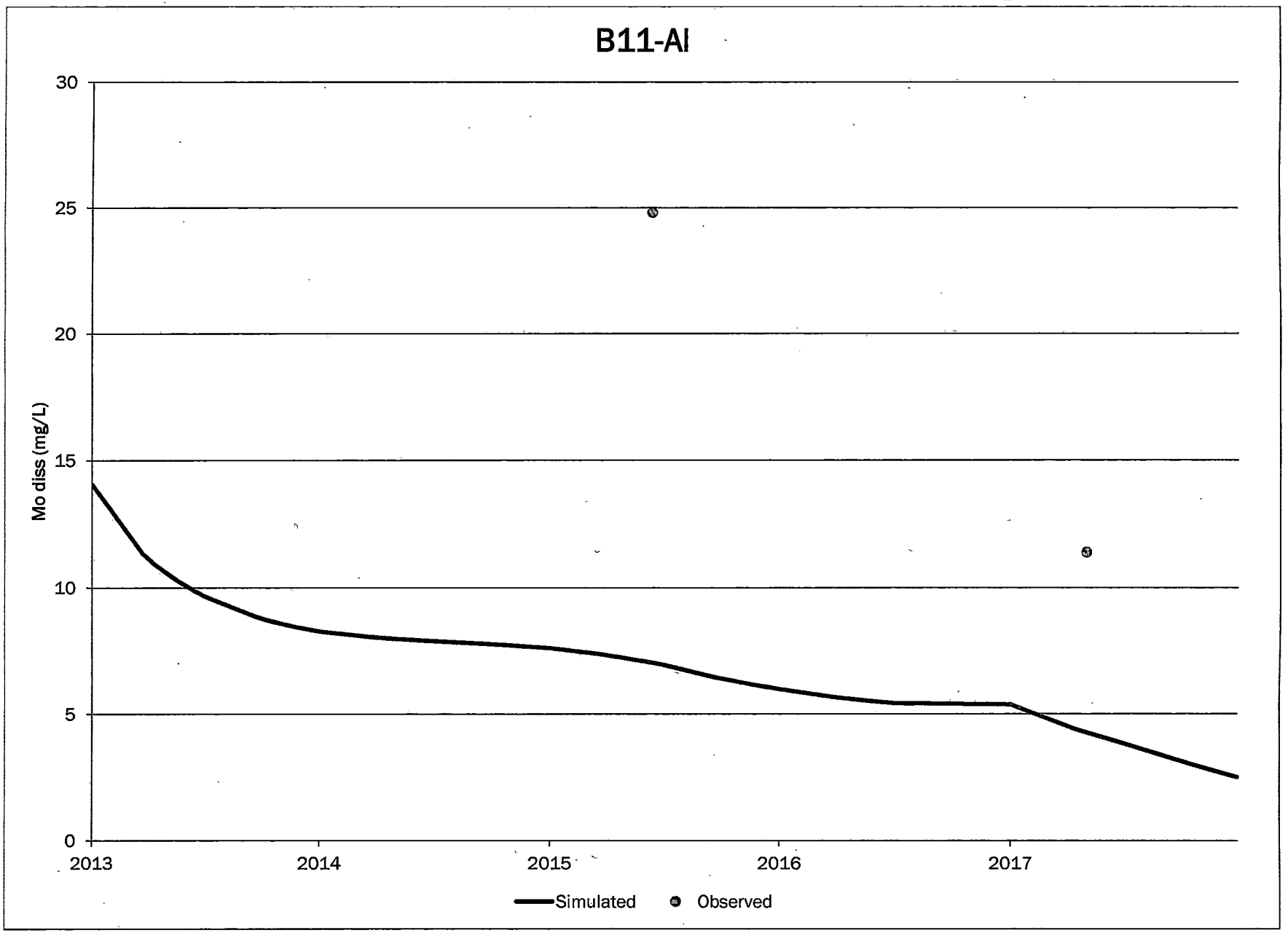

B6-AI
Mo diss (mg/L)
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

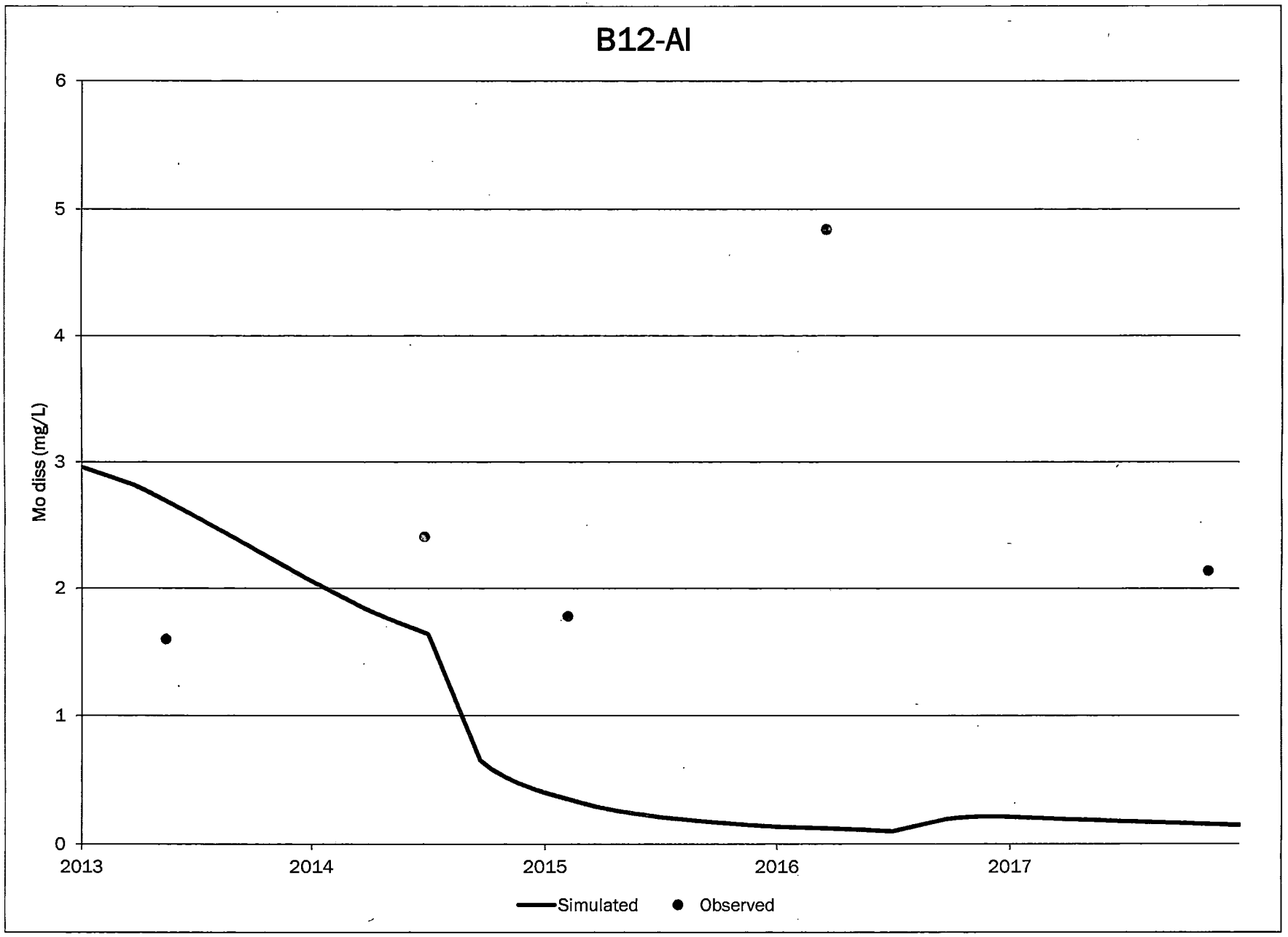

B7-AI
Mo diss (mg/L)
45
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

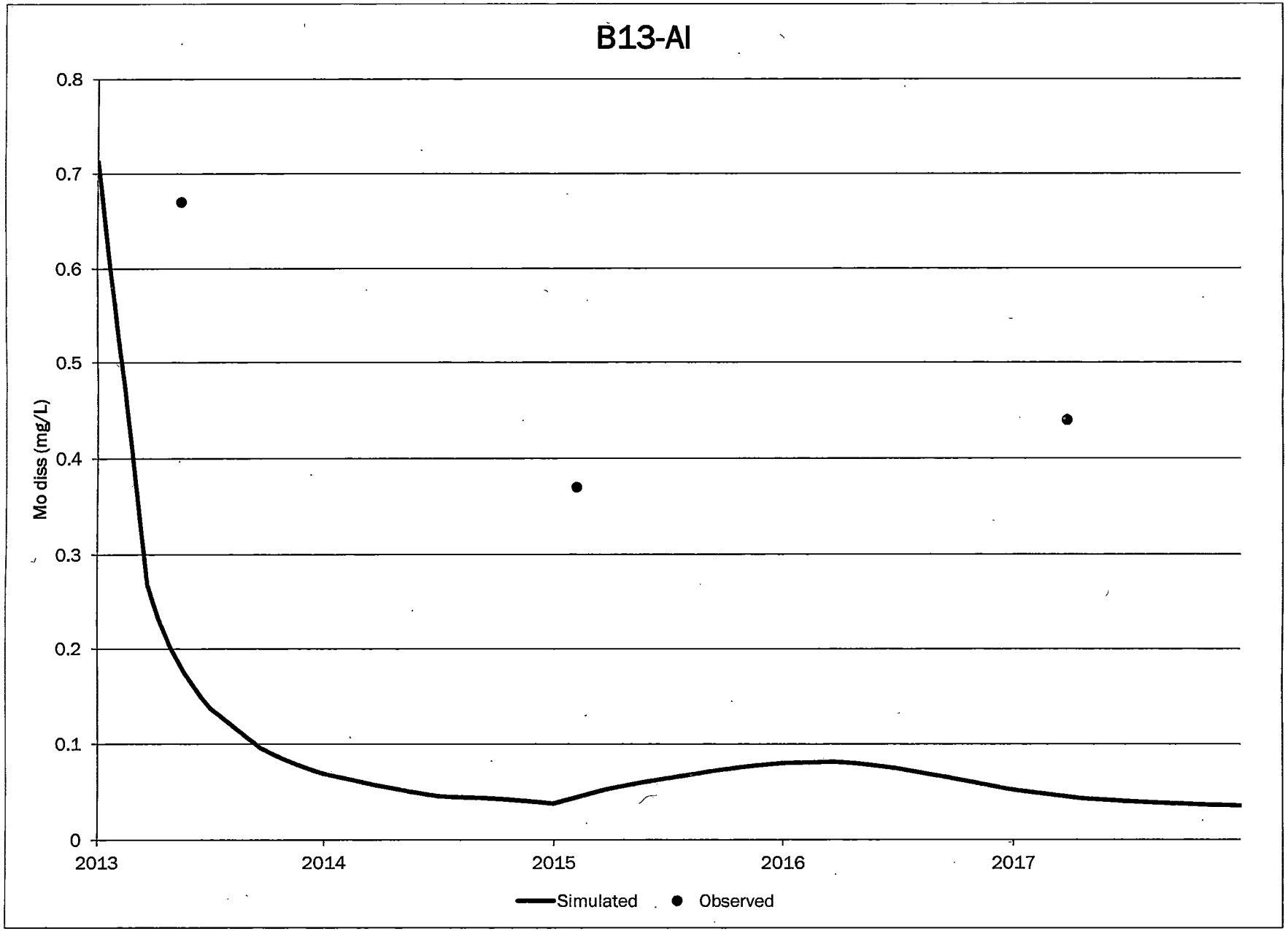

B8-AI
Mo diss (mg/L)
50
45
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

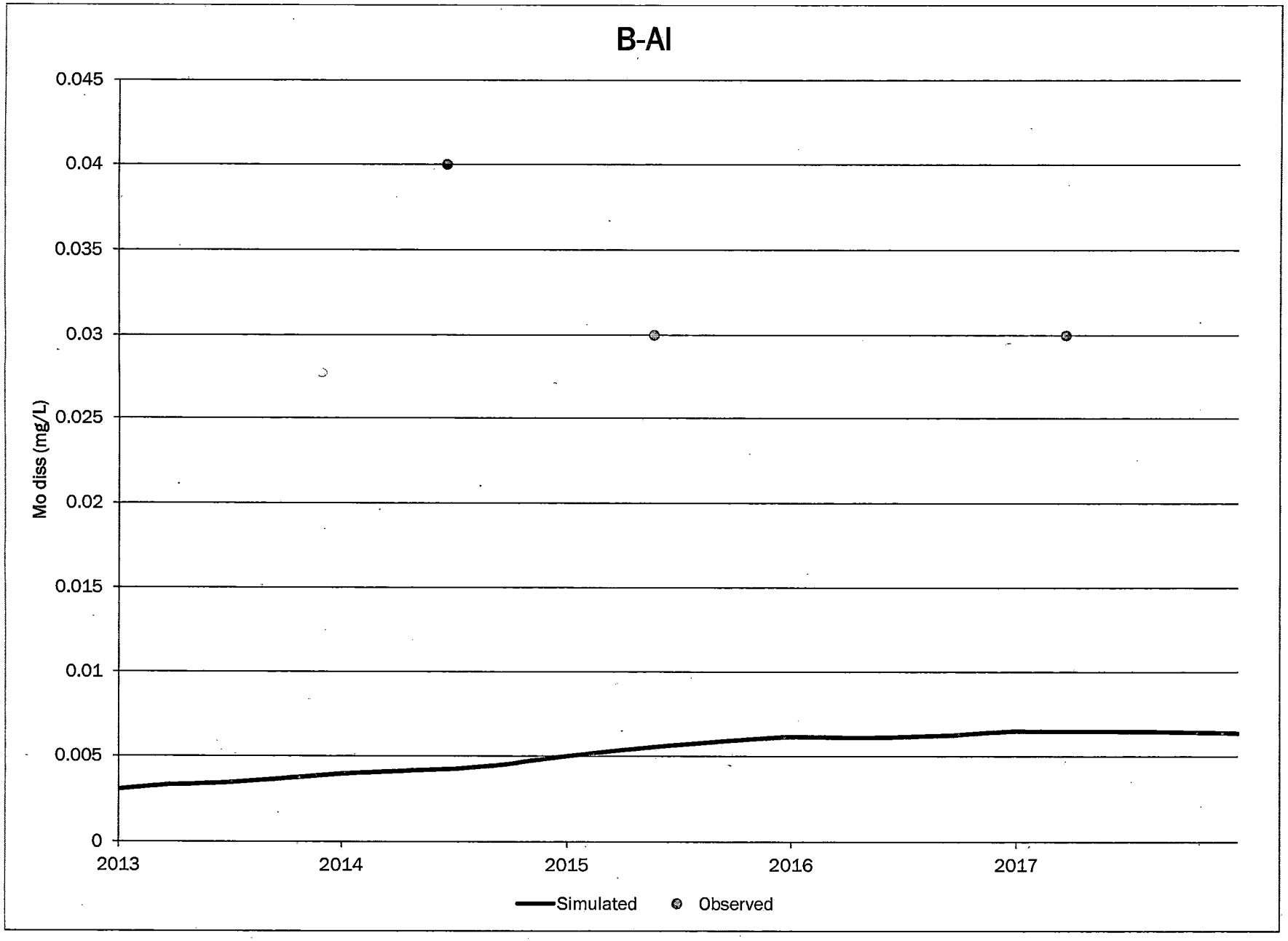

B9-AI
25
20
15
10
5
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

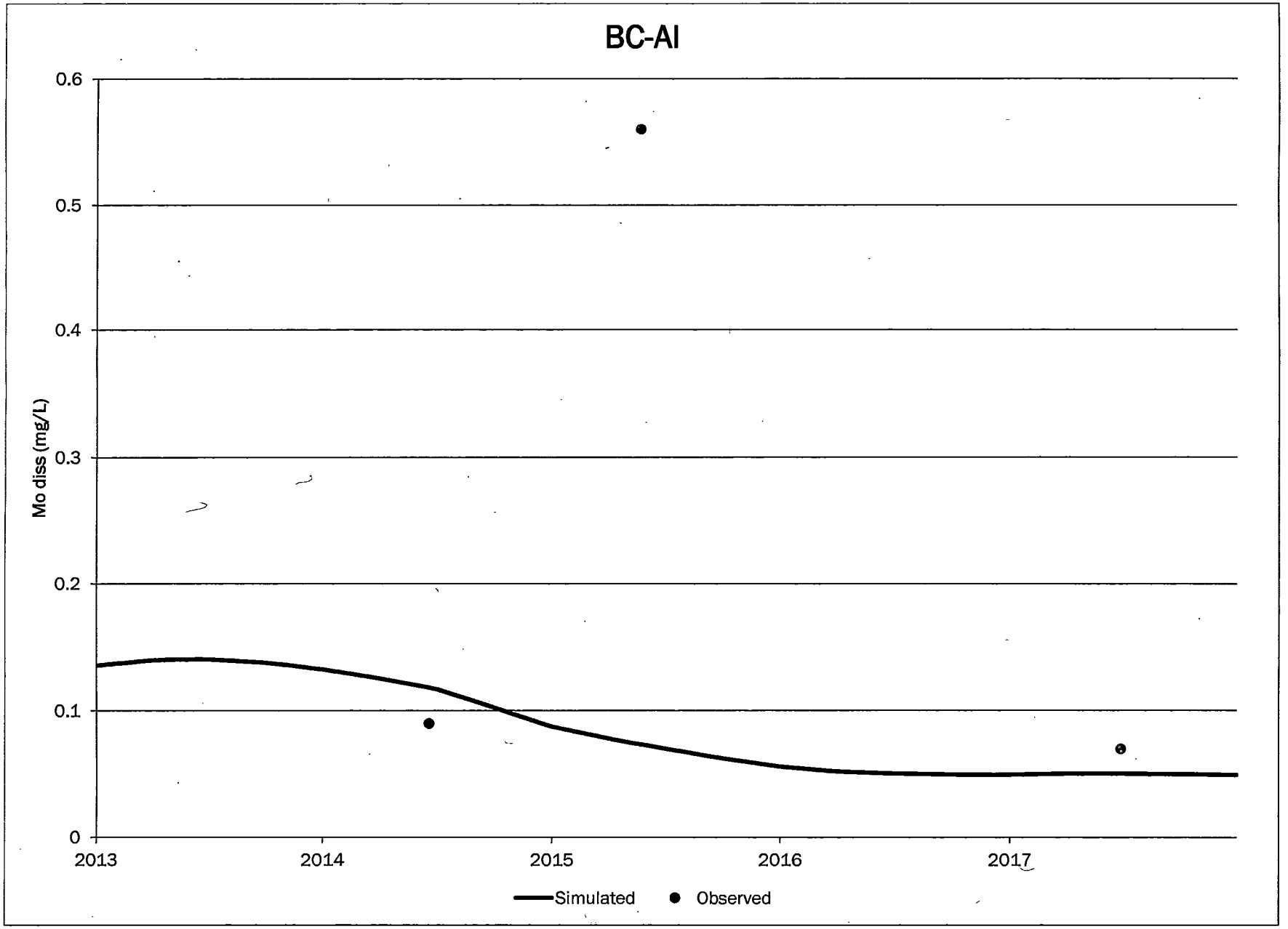

B10-AI
Mo diss (mg/L)
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

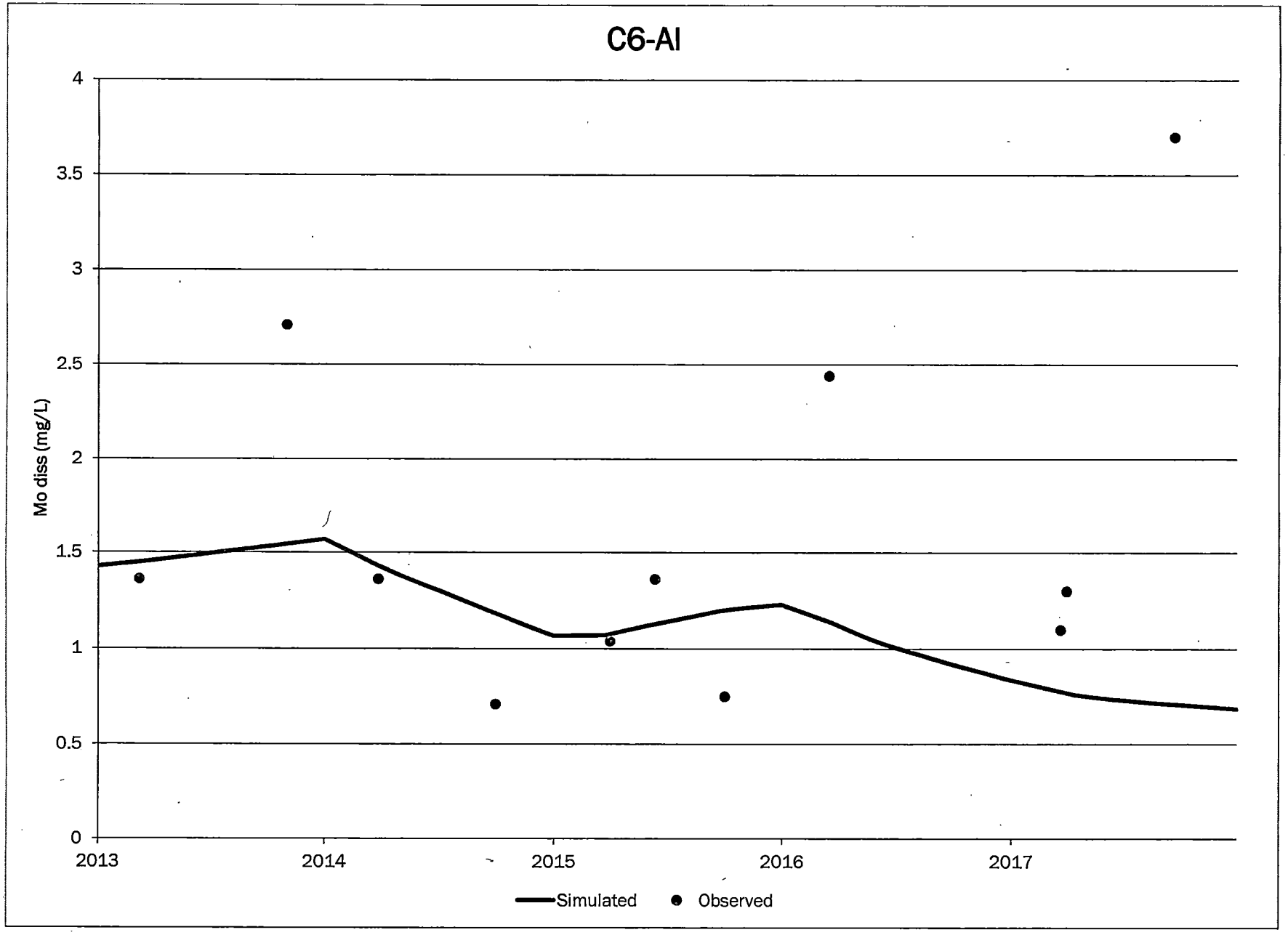

B11-AI
Mo diss (mg/L)
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

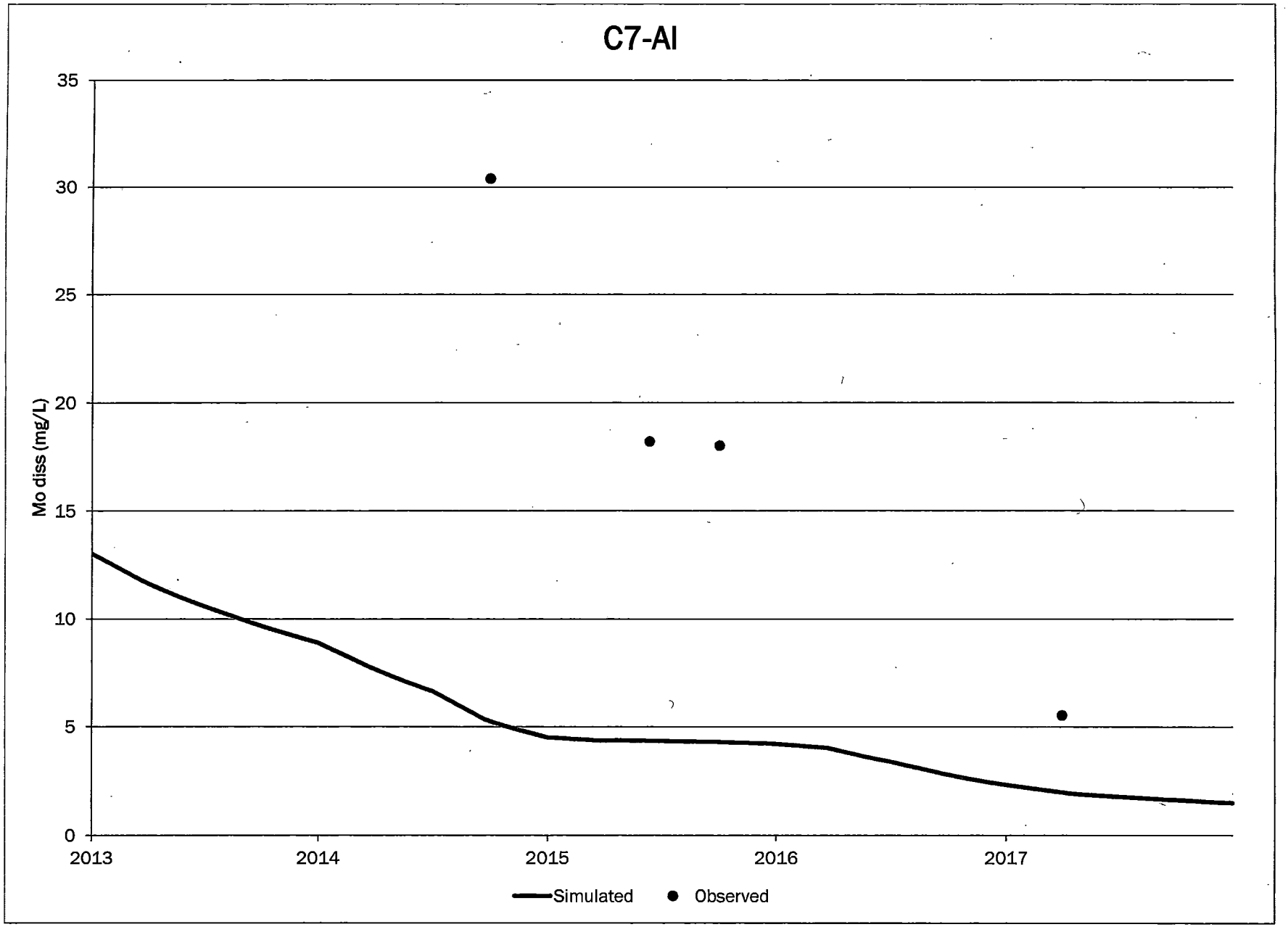

B12-AI
Mo diss (mg/L)
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

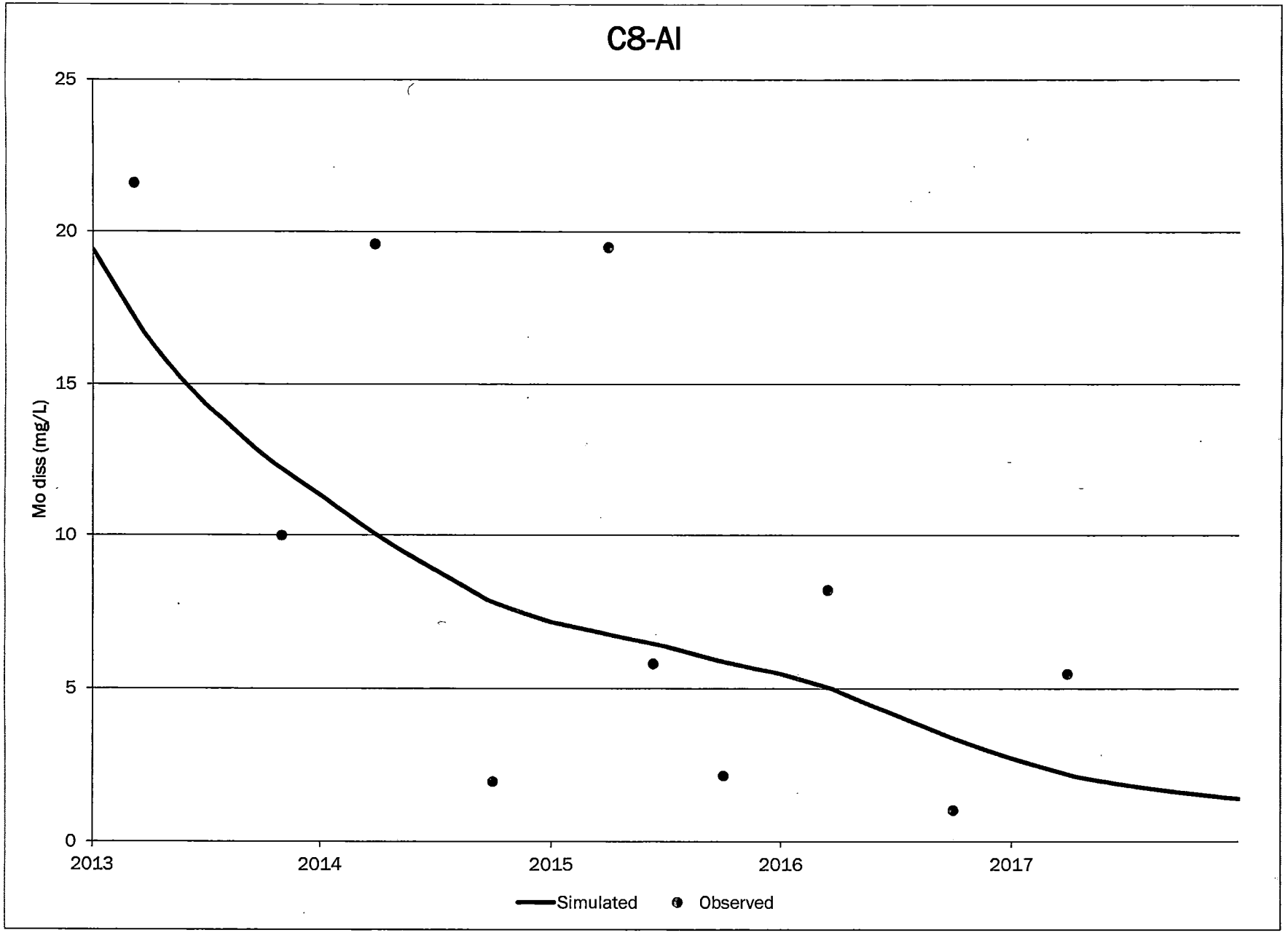

B13-AI
Mo diss (mg/L)
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
2013
2014
2015
2016
2017
Simulated
Observed

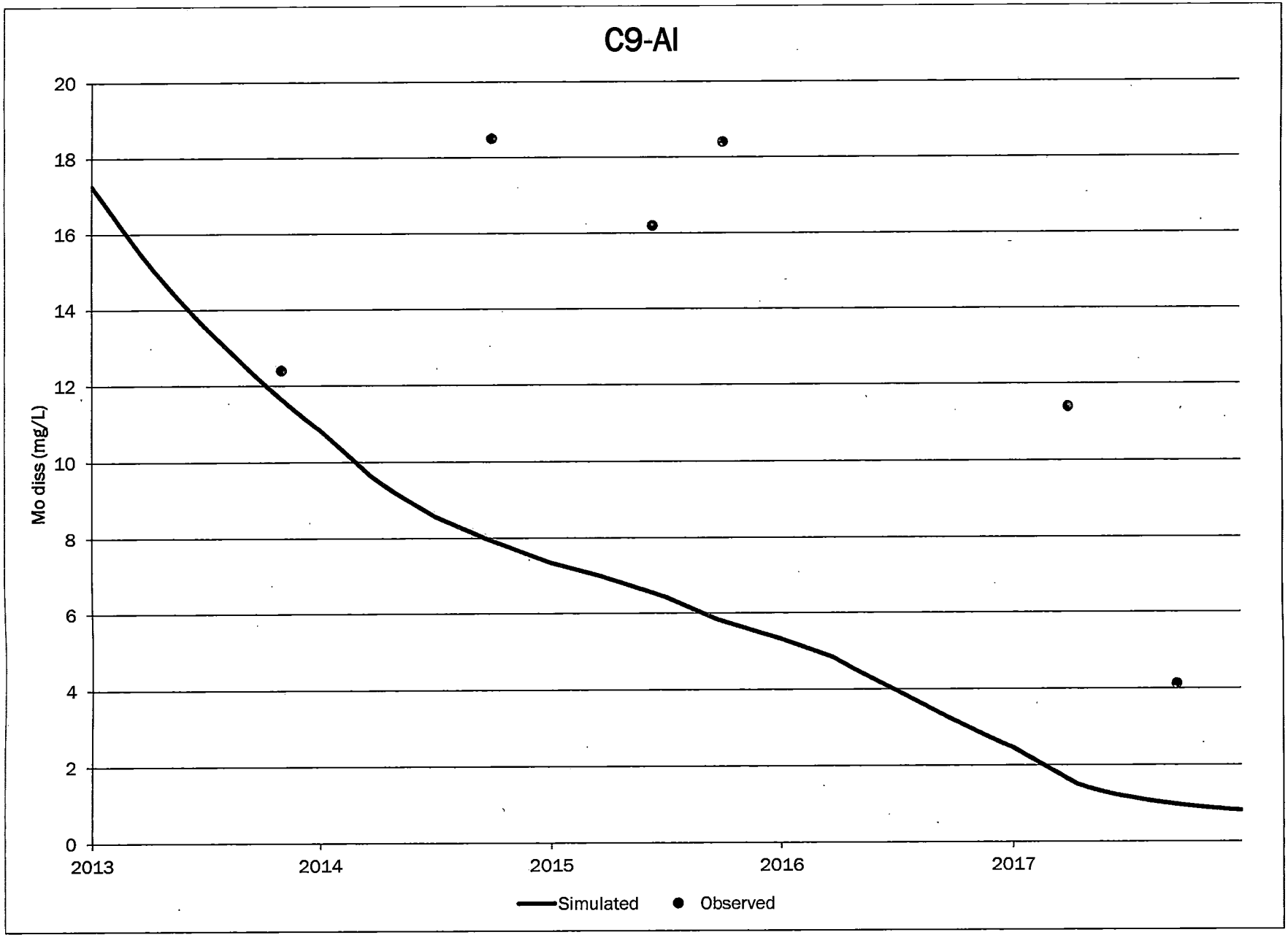

B-AI
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

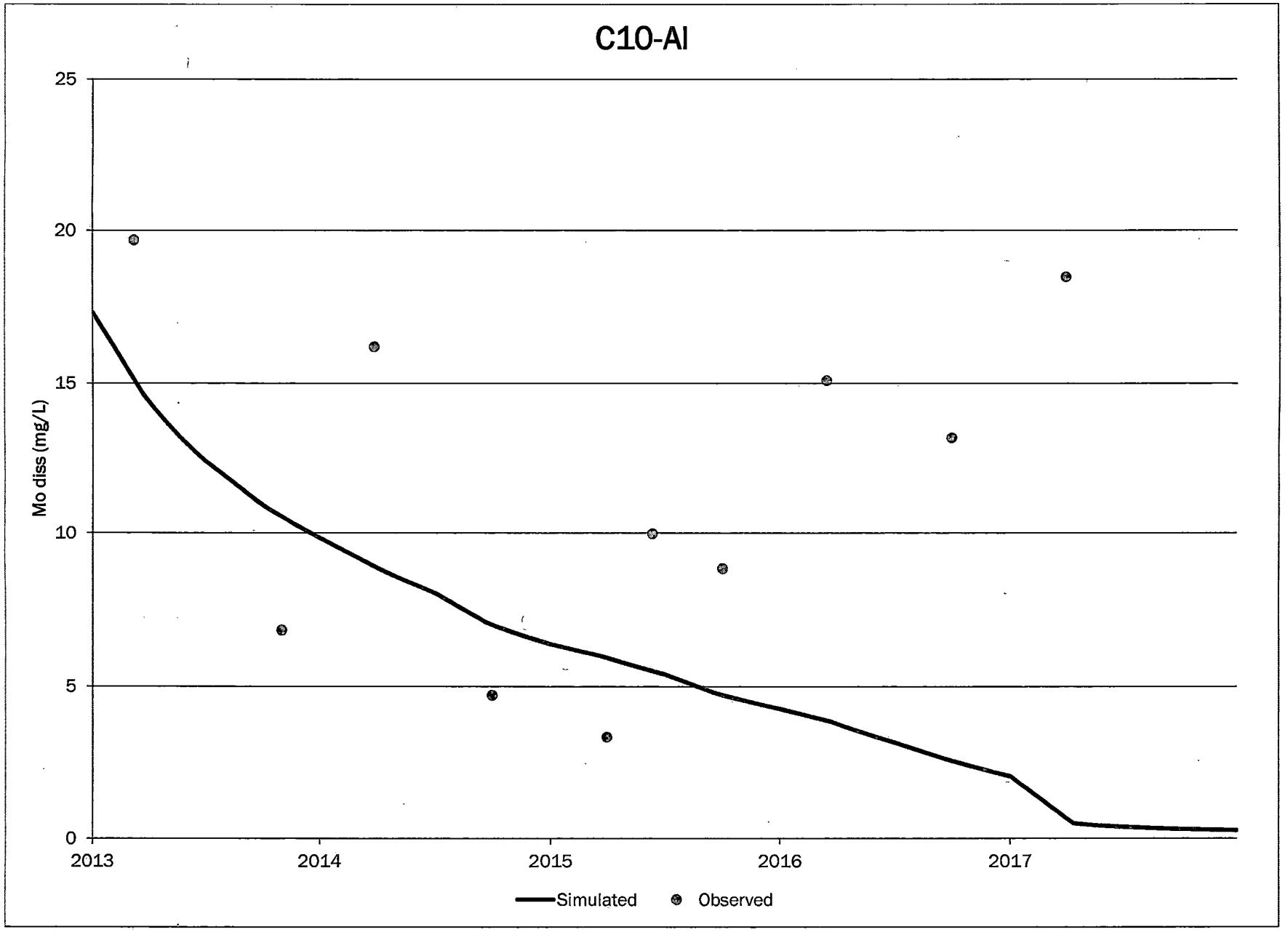

BC-AI
Mo diss (mg/L)
0.6
0.5
0.4
0.3
0.2
0.1
0
2013
2014
2015
2016
2017
Simulated
Observed

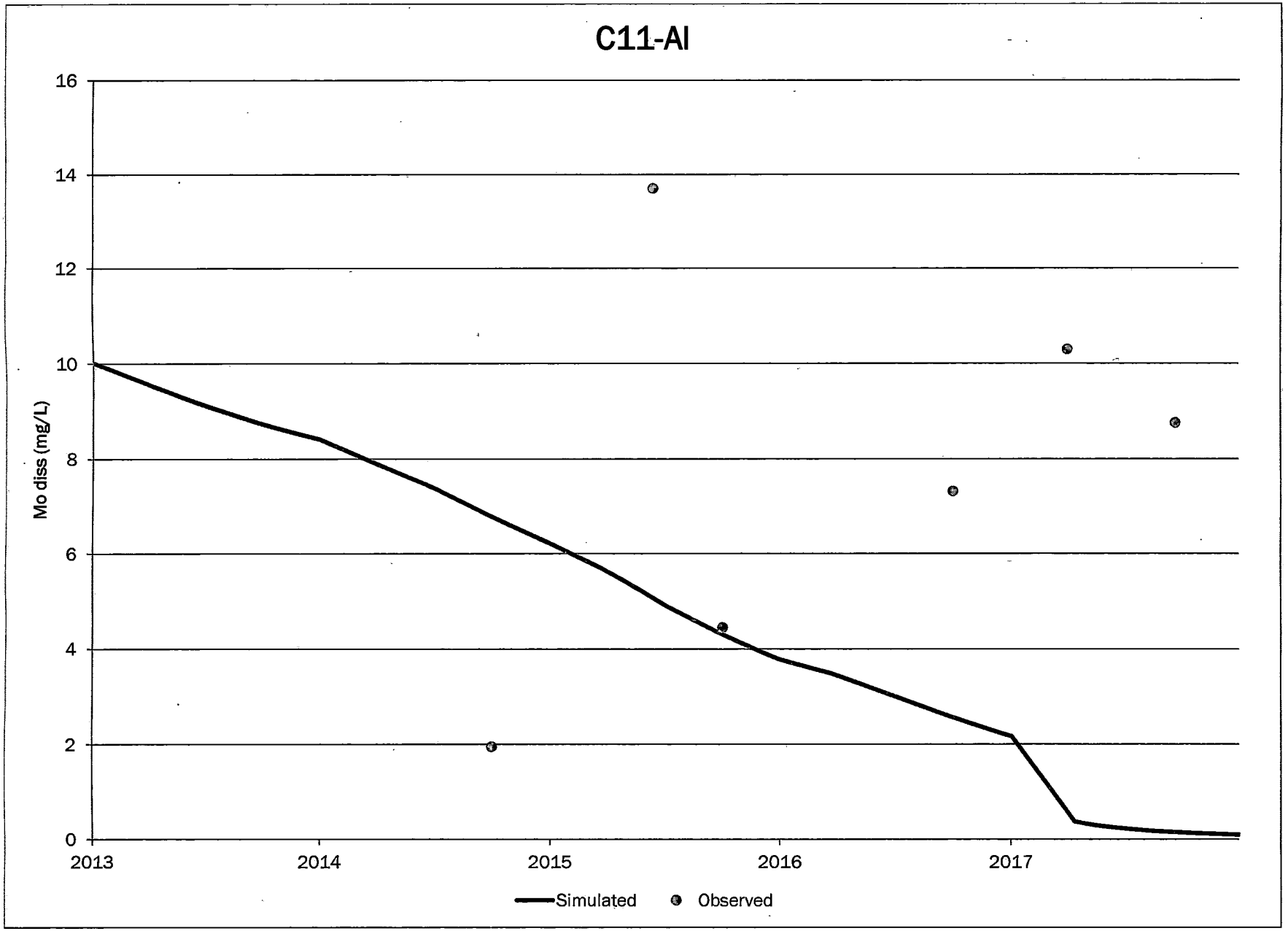

C6-AI
Mo diss (mg/L)
4
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

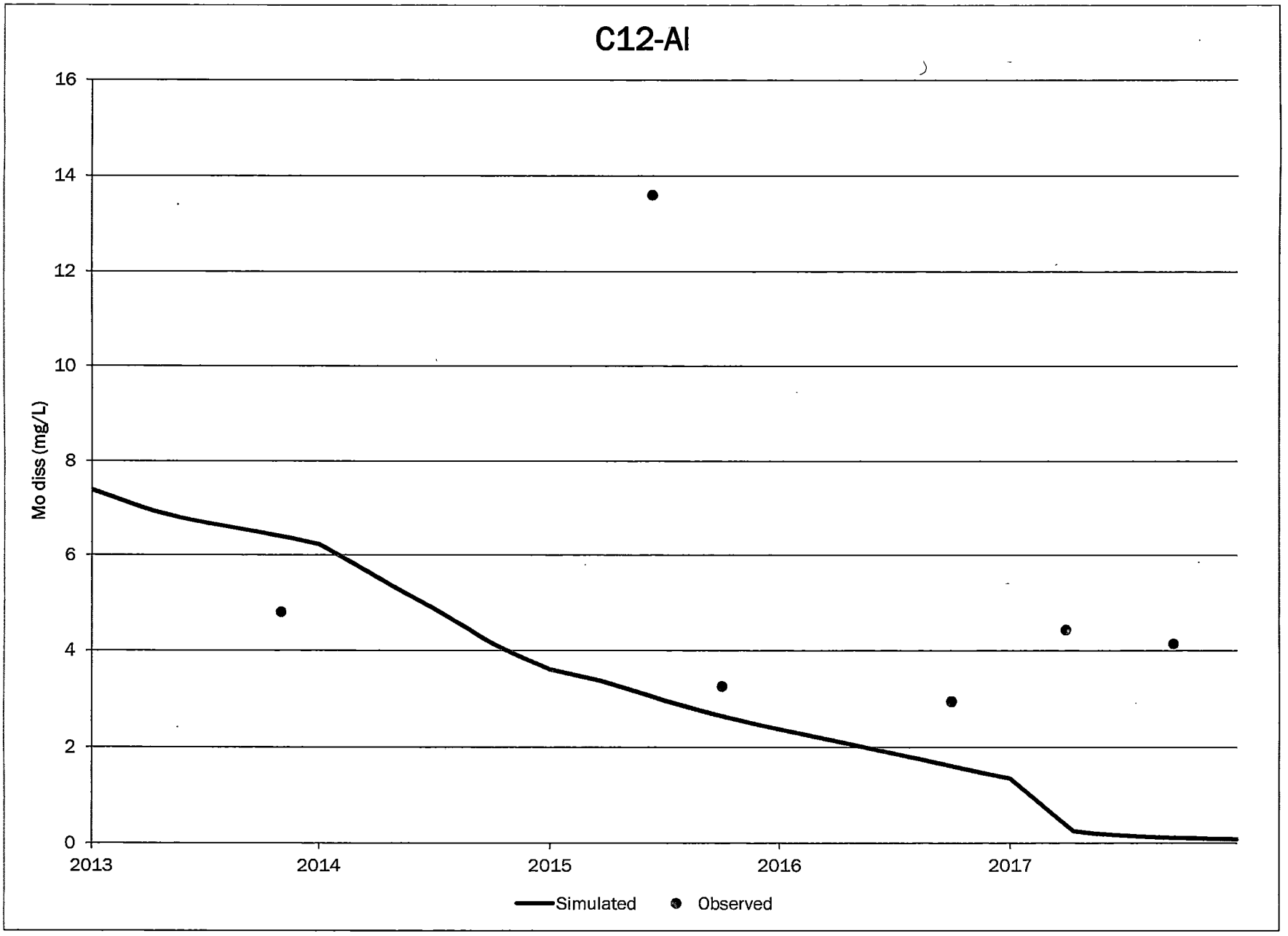

C7-AI
Mo diss (mg/L)
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

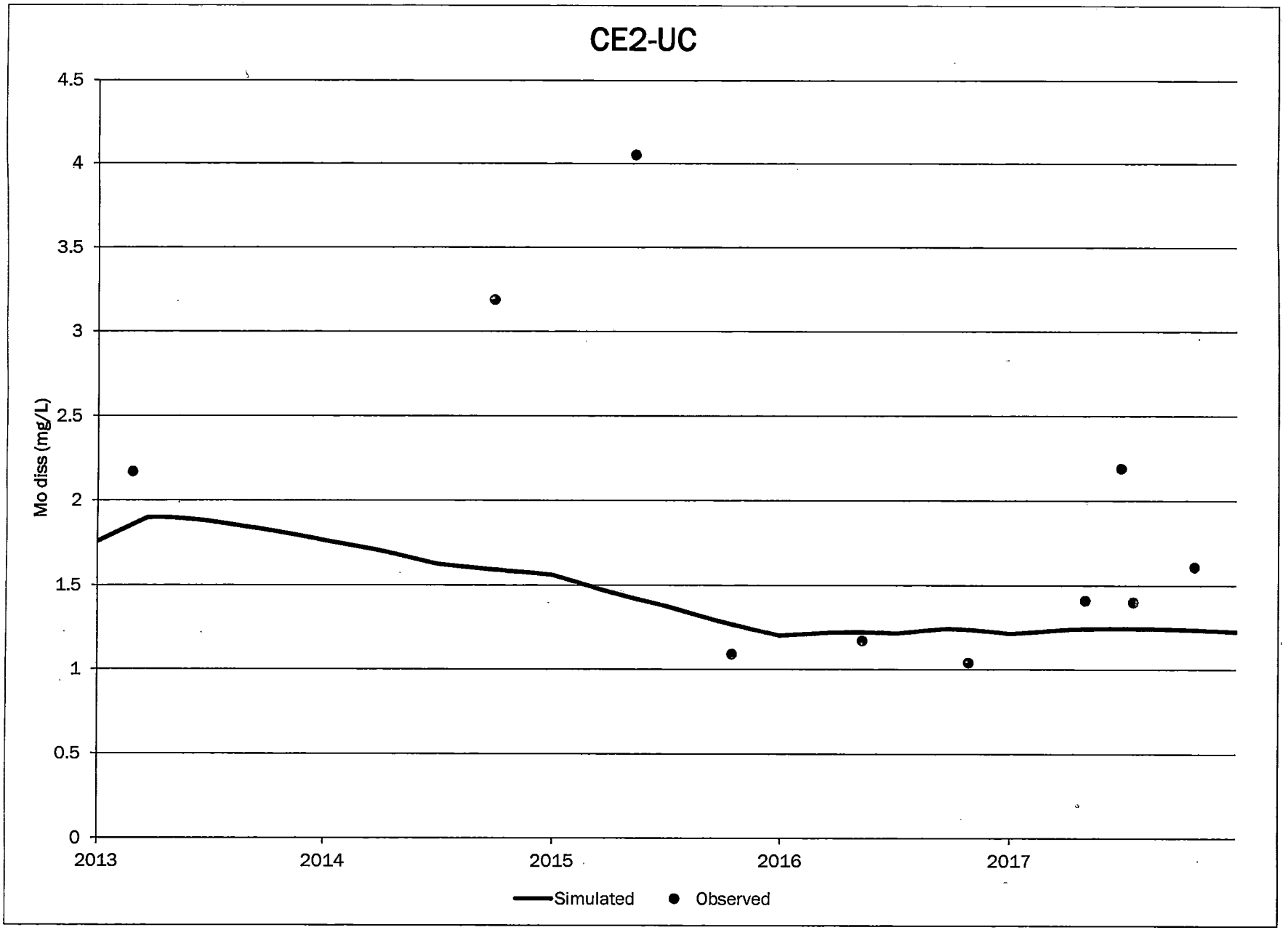

C8-AI
Mo diss (mg/L)
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

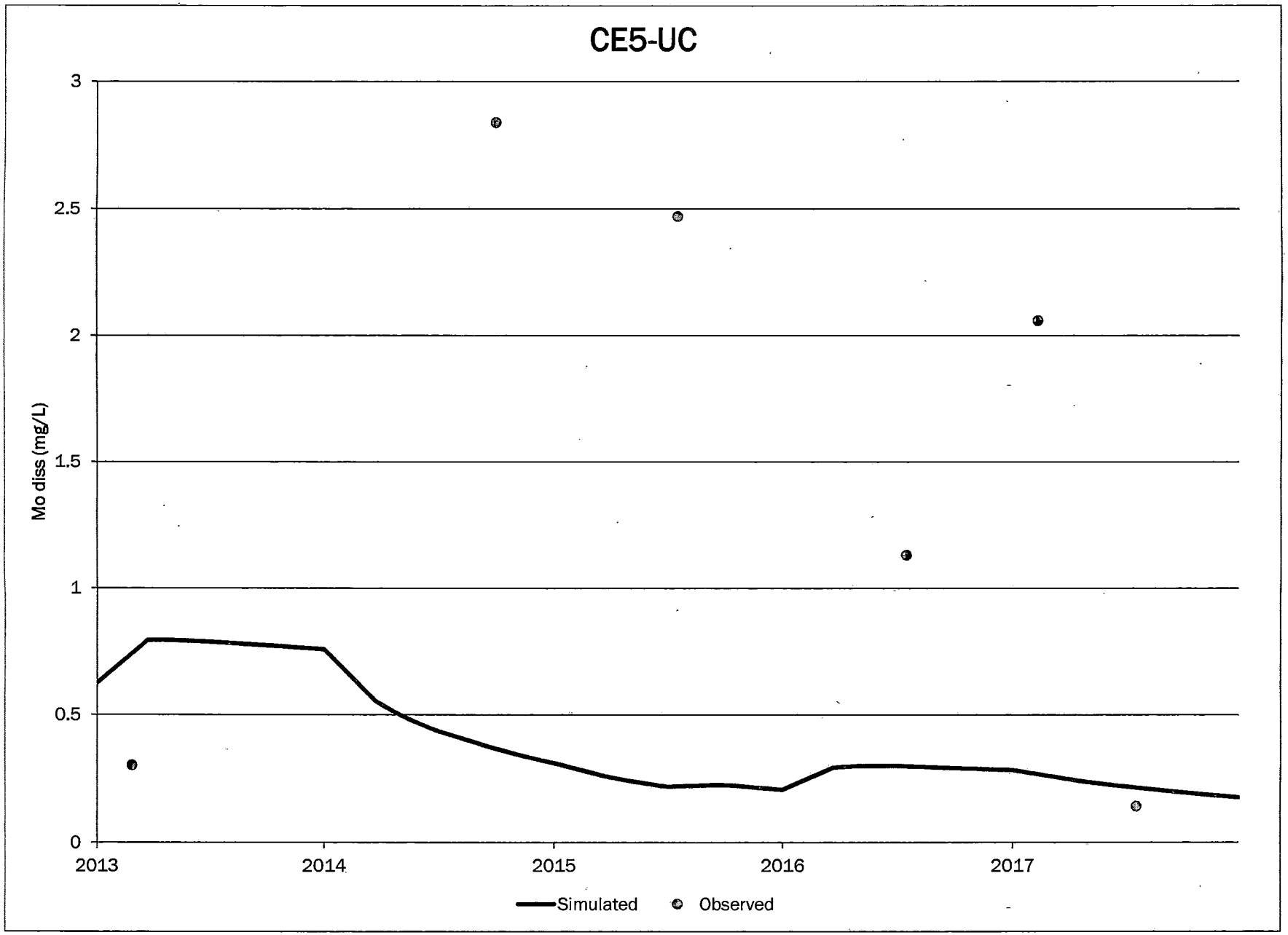

C9-AI
Mo diss (mg/L)
20
18
16
14
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

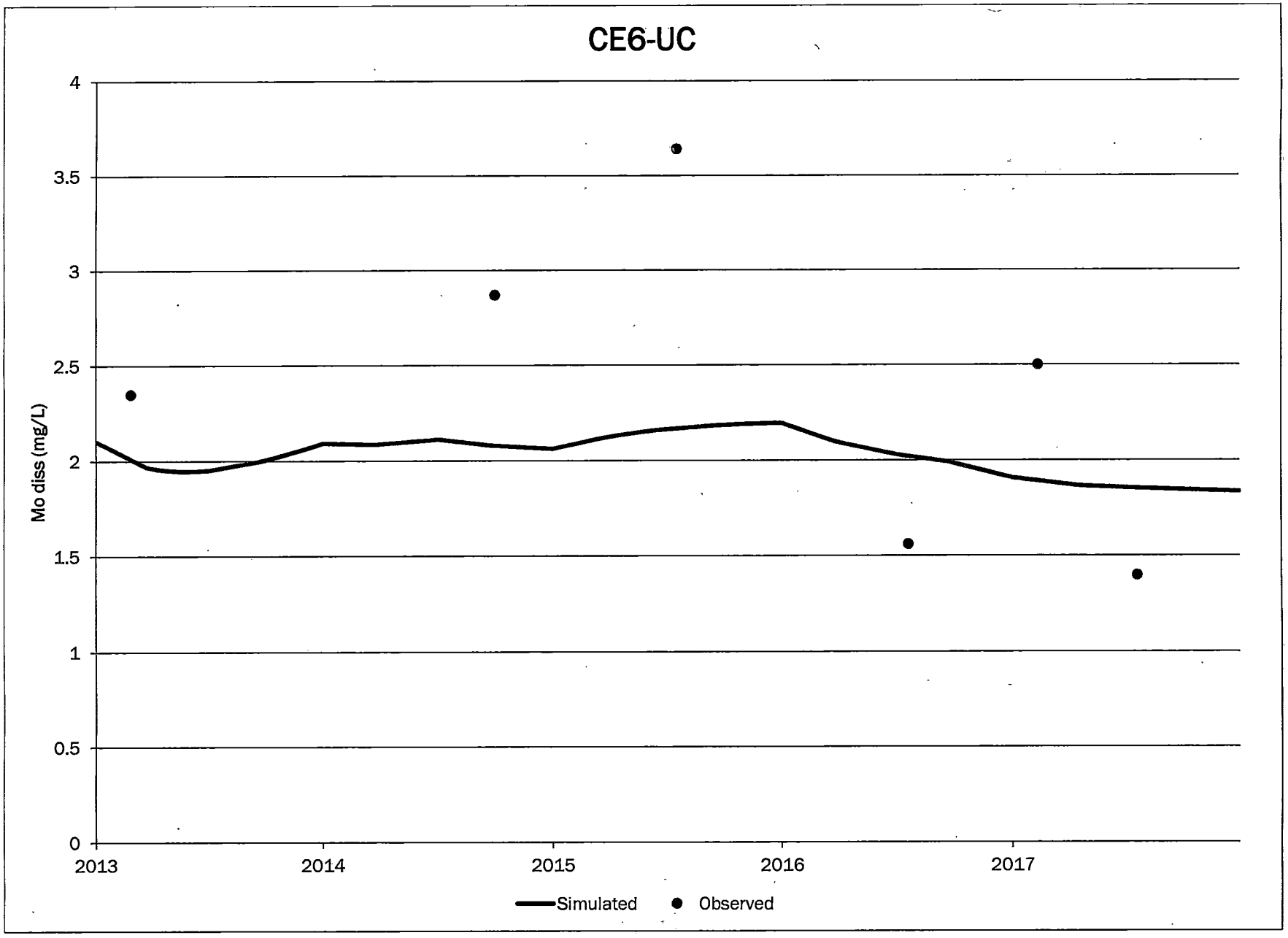

C10-AI
Mo diss (mg/L)
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

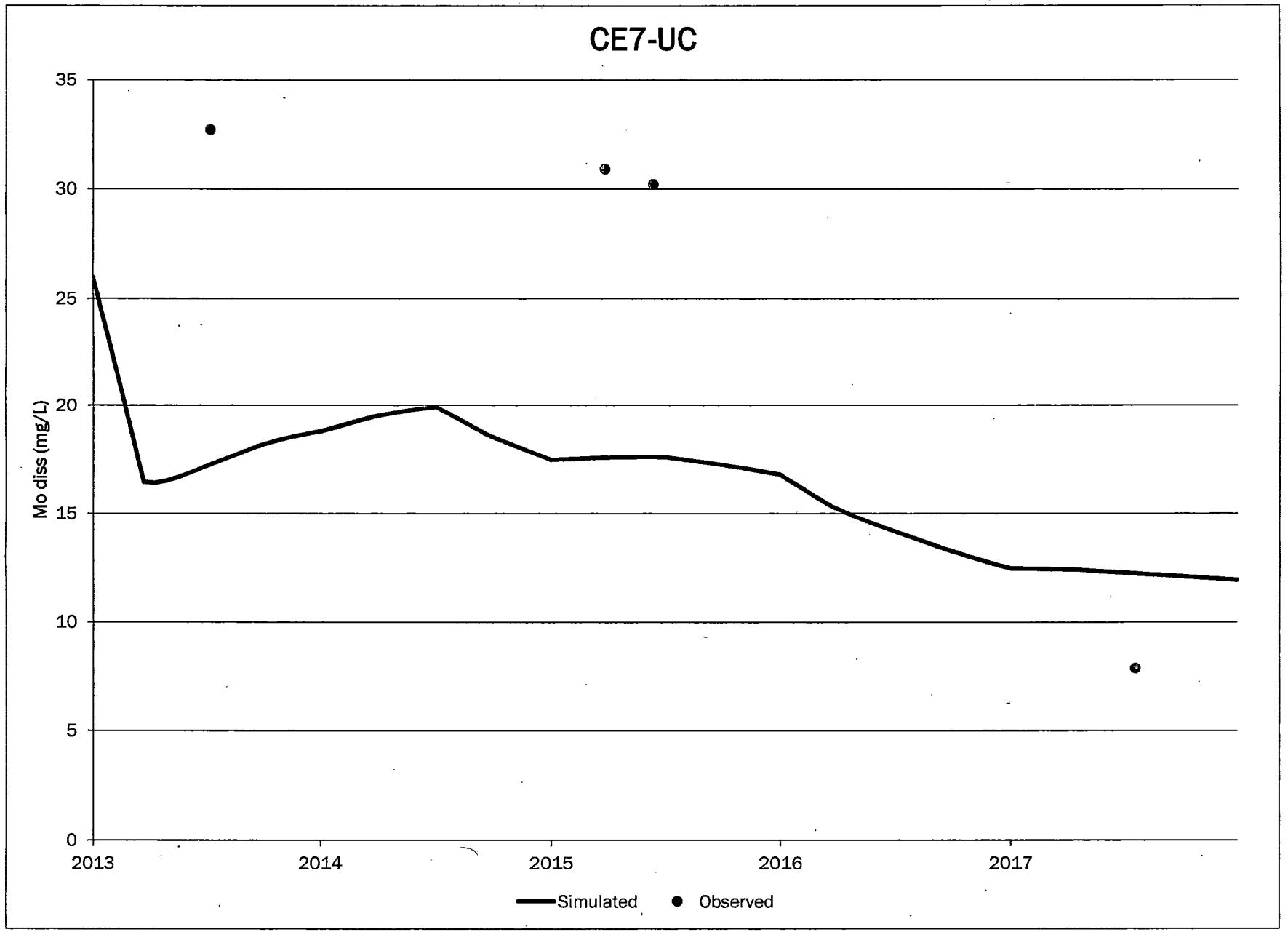

C11-AI
Mo diss (mg/L)
16
14
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

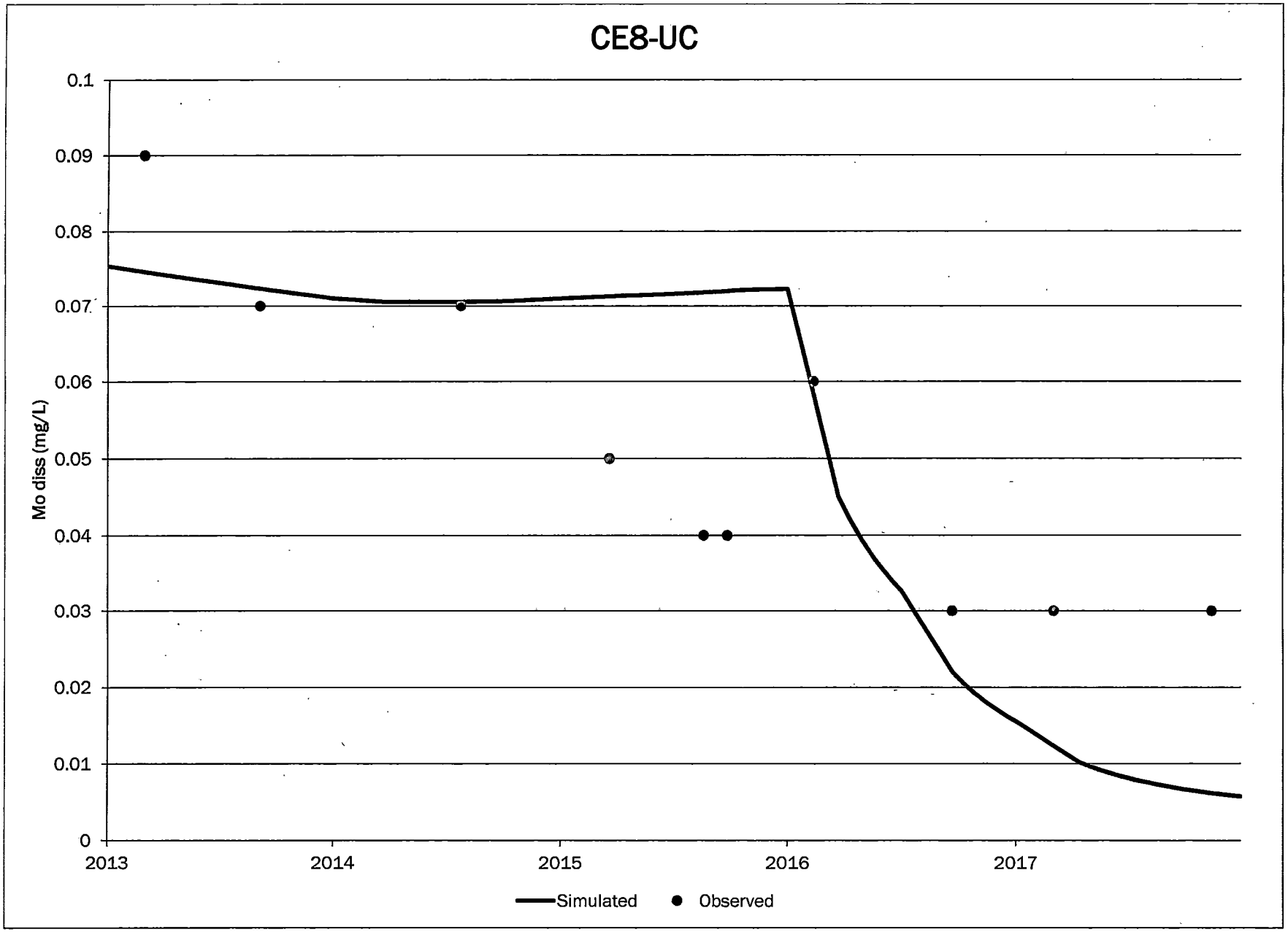

C12-AI
Mo diss (mg/L)
16
14
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

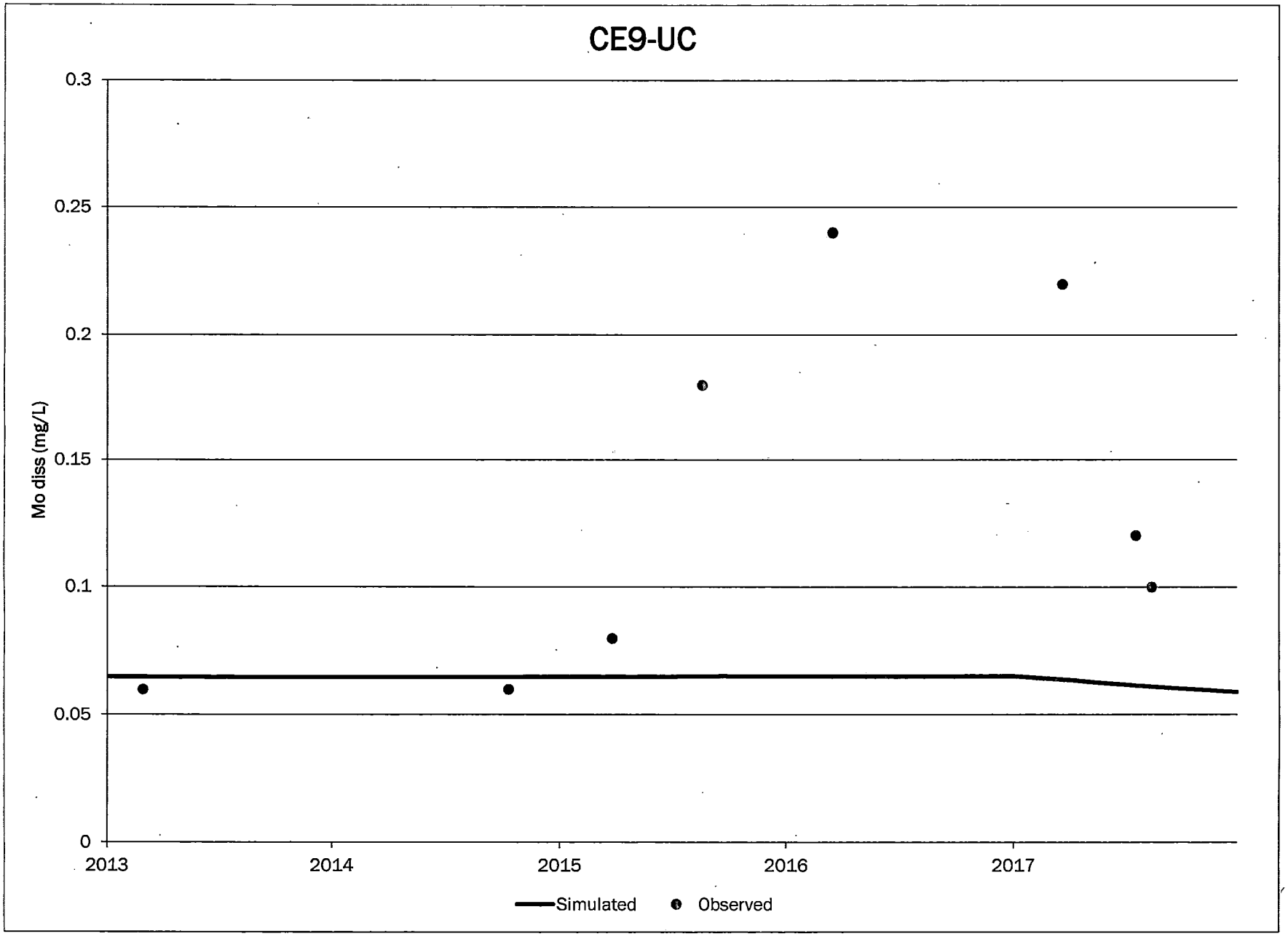

CE2-UC
Mo diss (mg/L)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

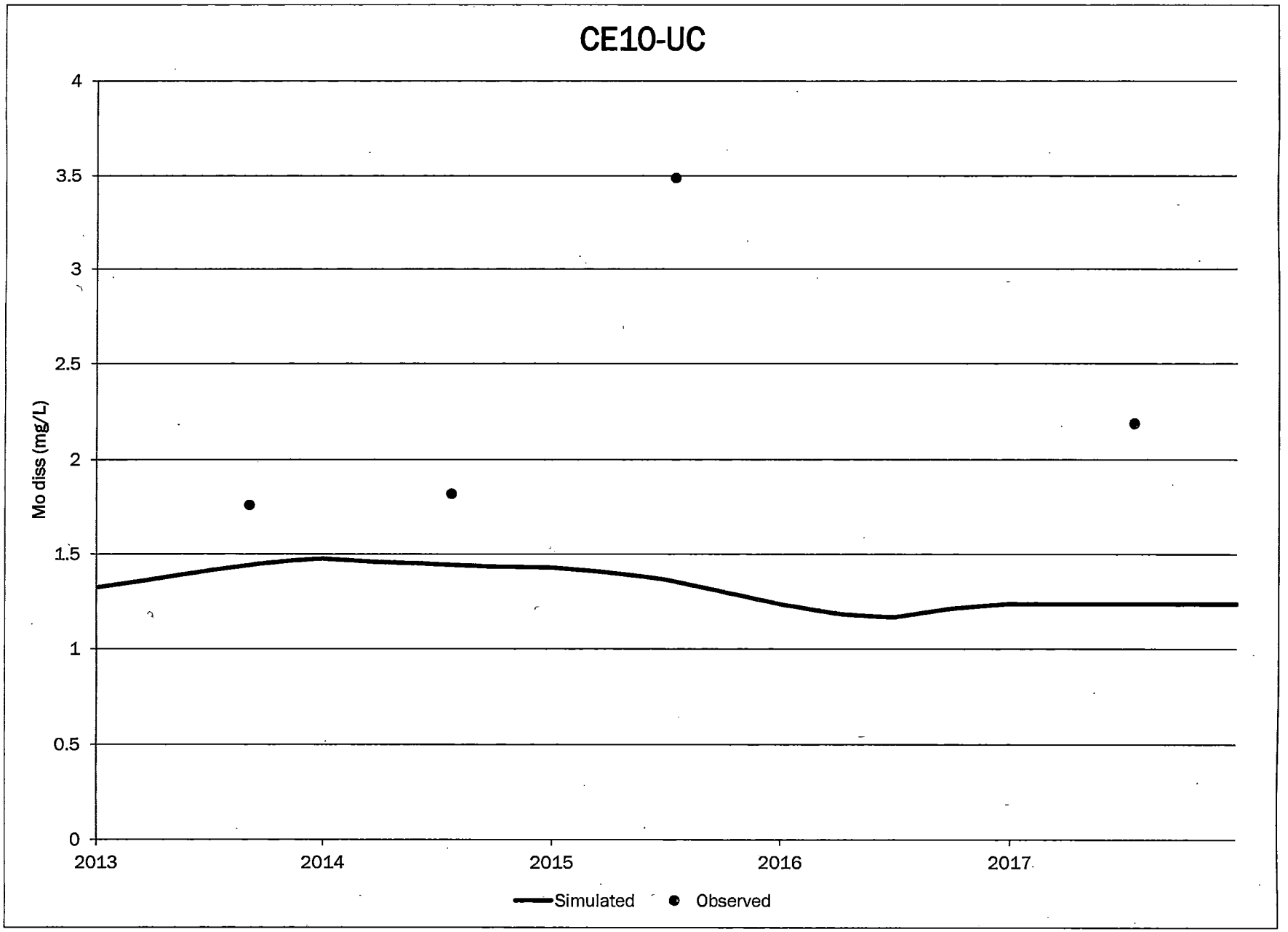

CE5-UC
Mo diss (mg/L)
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

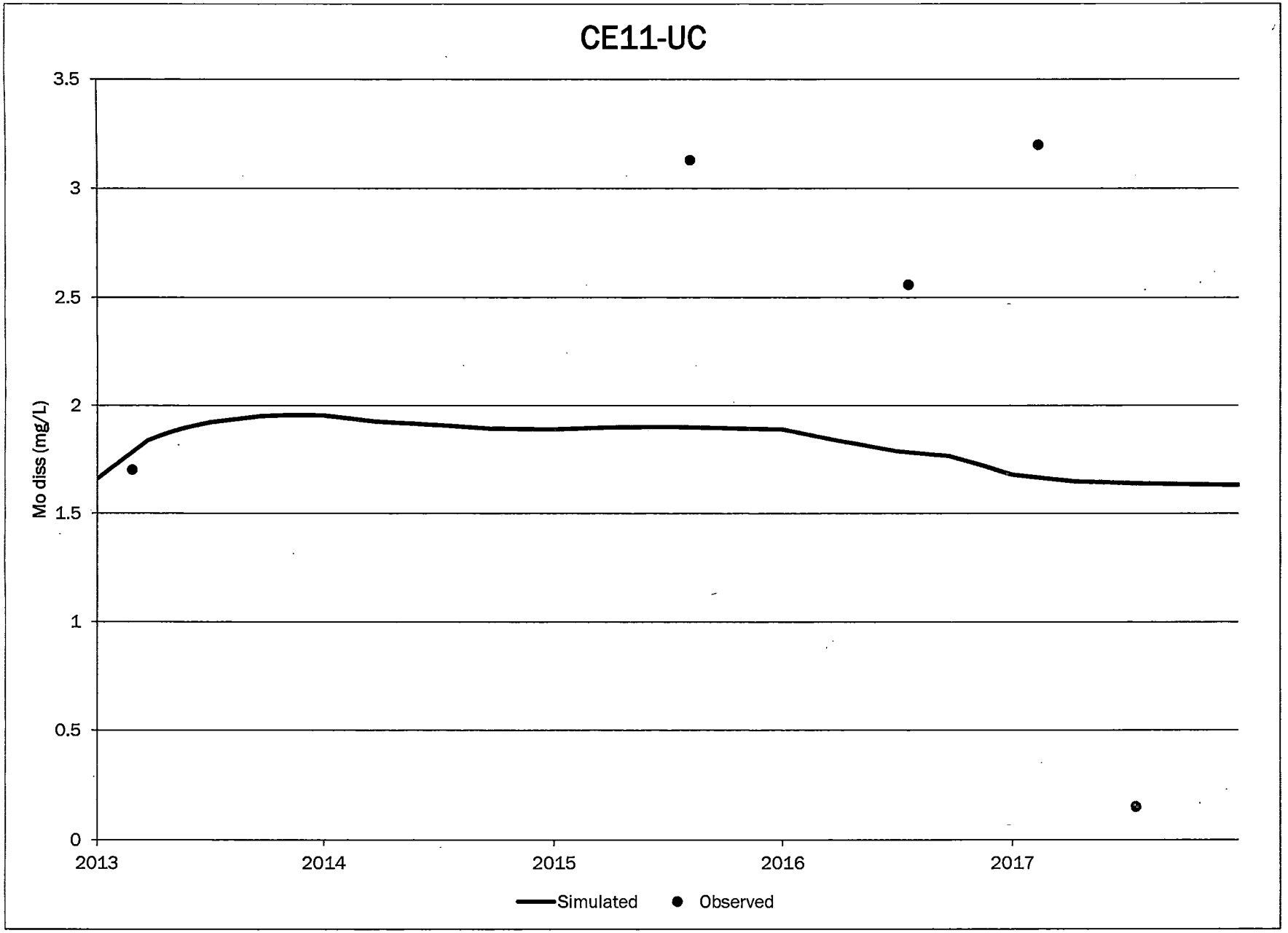

CE6-UC
Mo diss (mg/L)
4
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

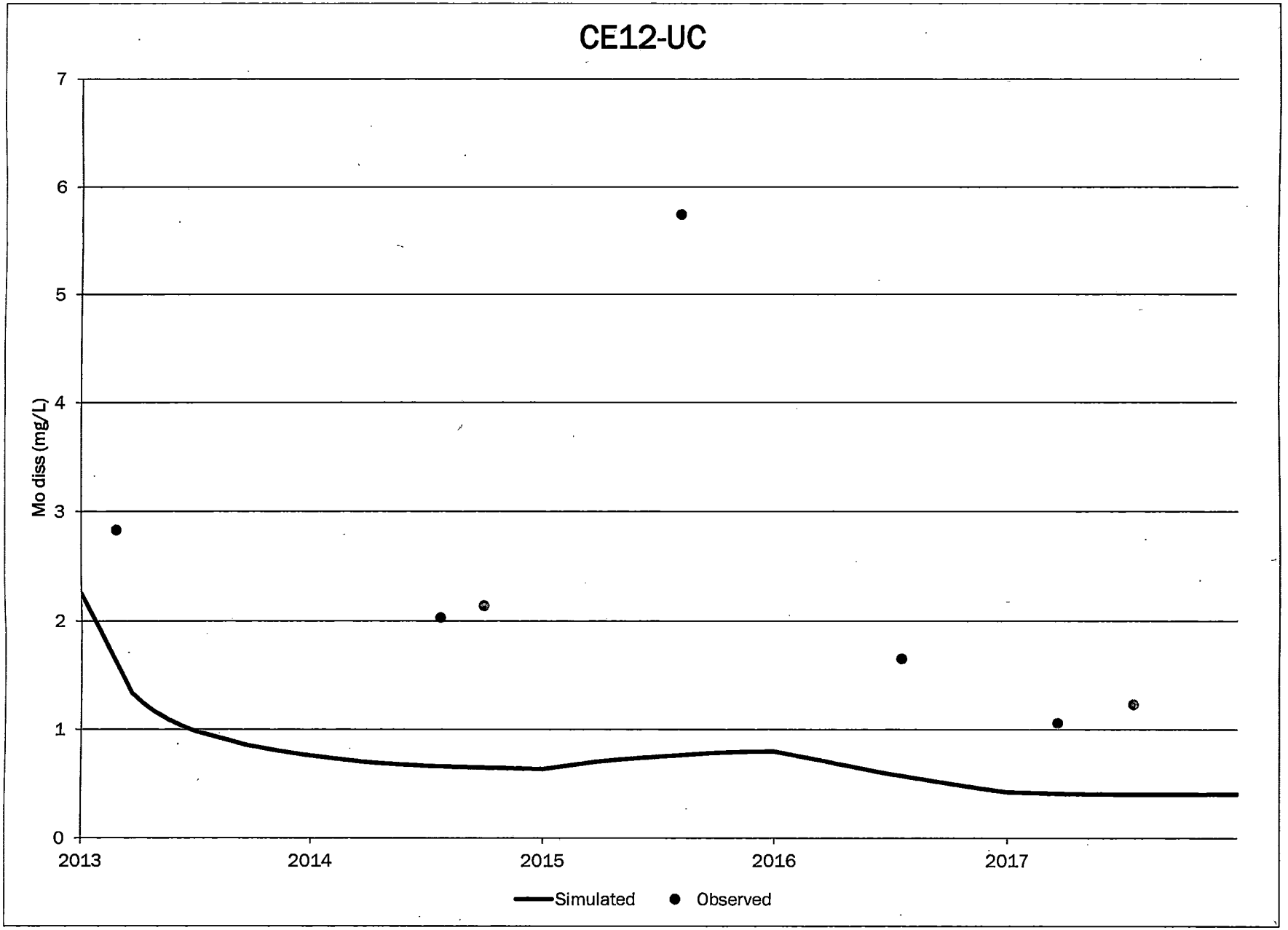

CE7-UC
Mo diss (mg/L)
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

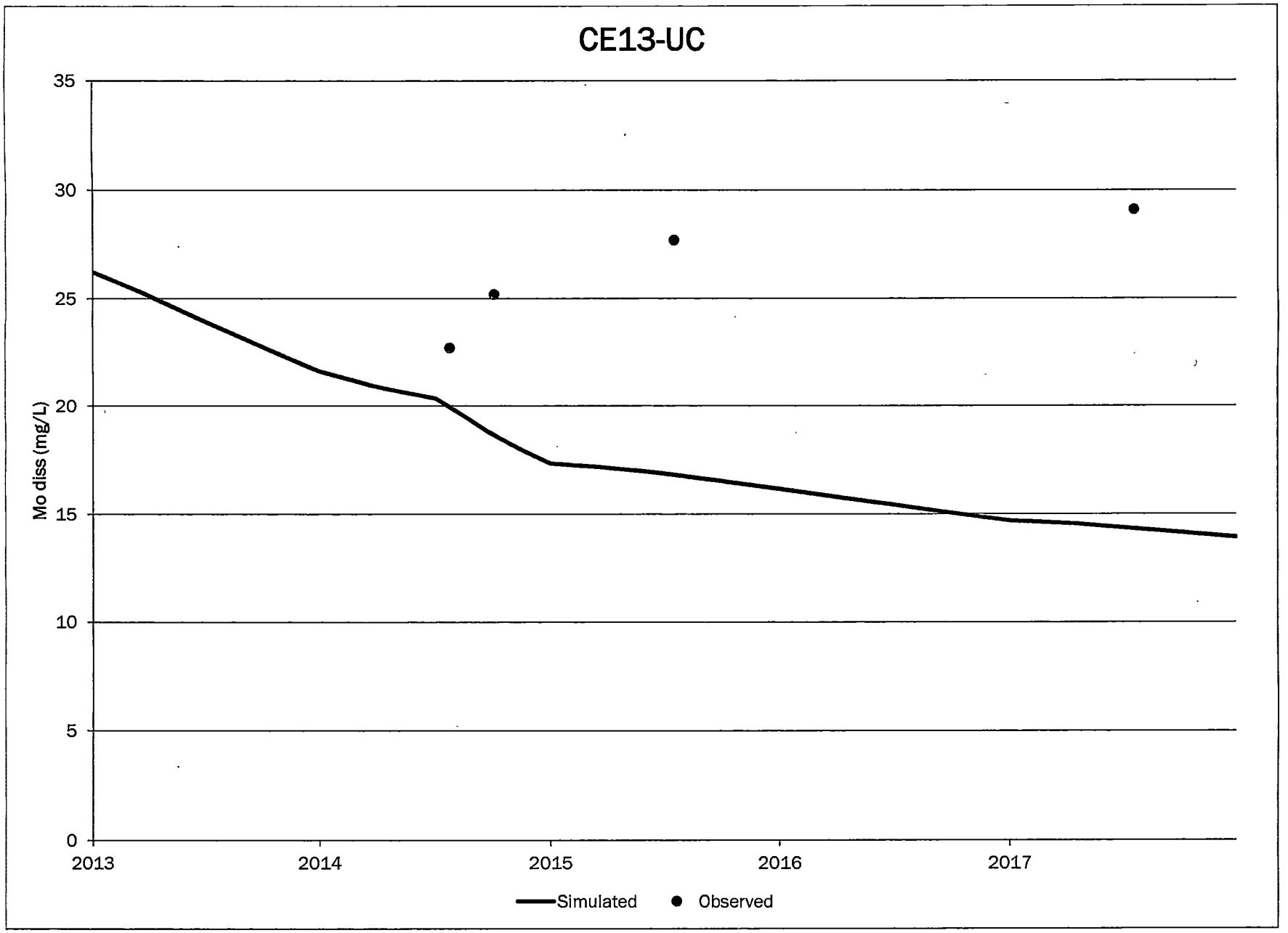

CE8-UC
Mo diss (mg/L)
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
2013
2014
2015
2016
2017
Simulated
Observed

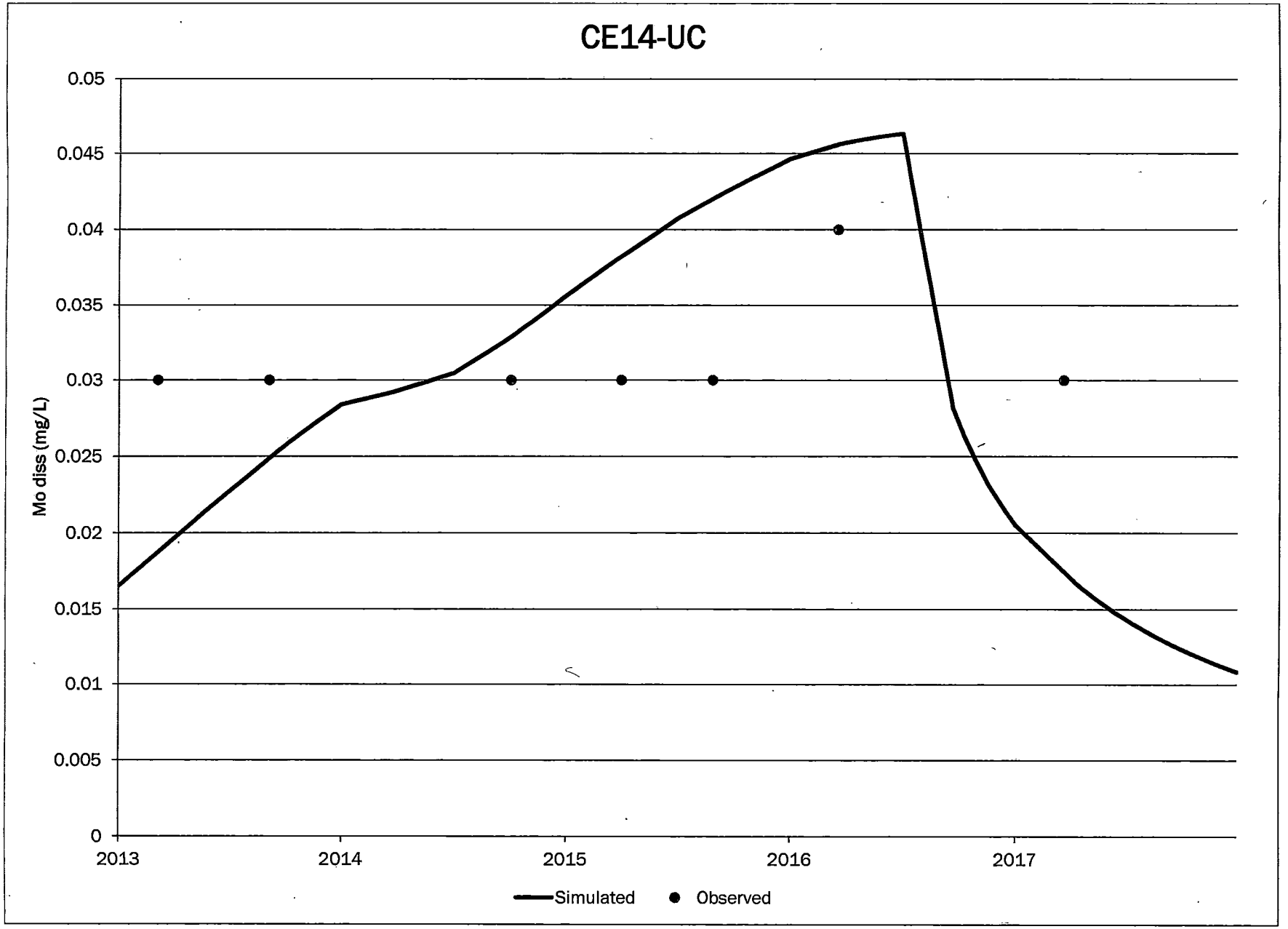

CE9-UC
Mo diss (mg/L)
0.3
0.25
0.2
0.15
0.1
0.05
0
2013
2014
2015
2016
2017
Simulated
Observed

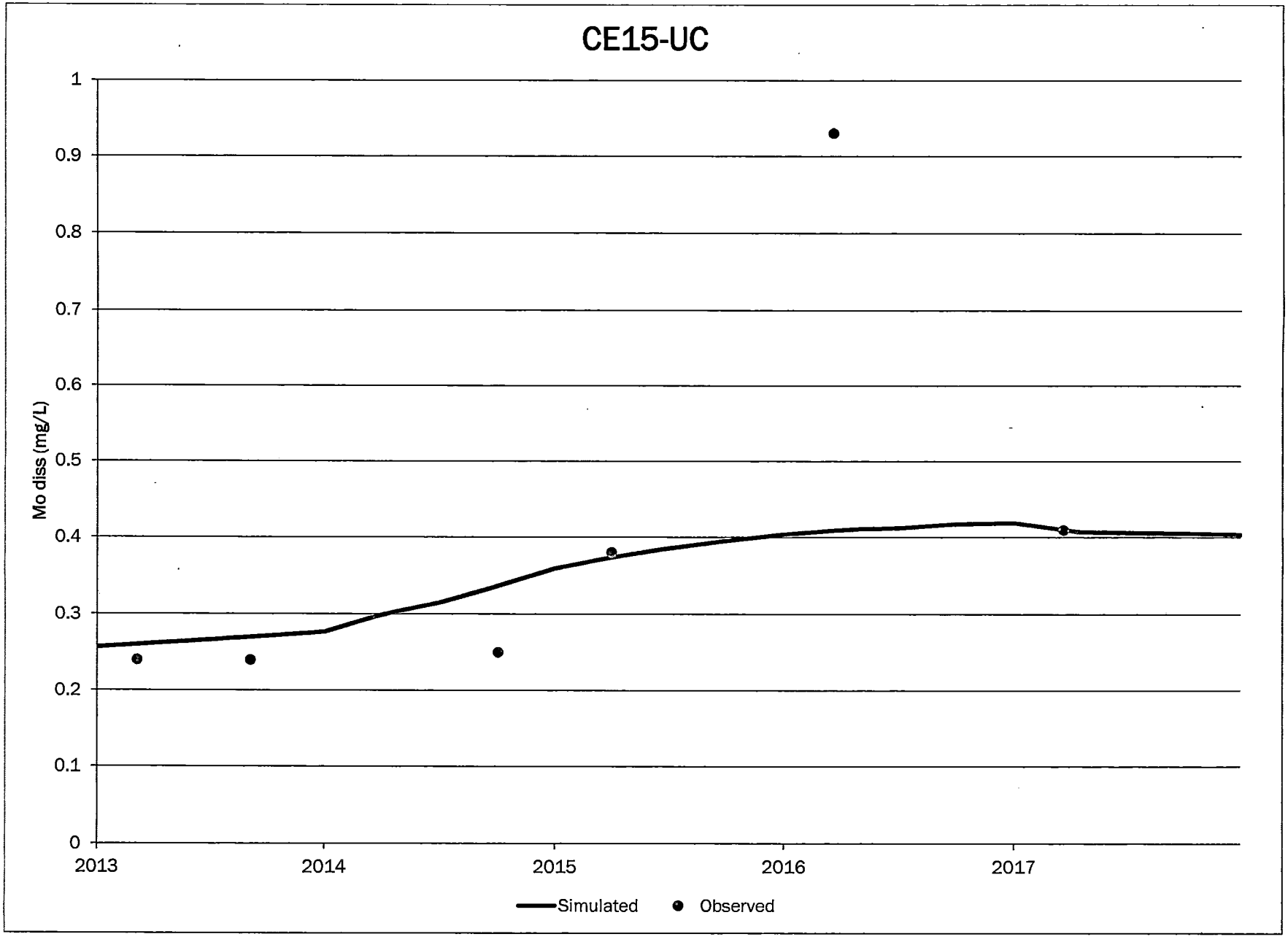

CE10-UC
Mo diss (mg/L)
4
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

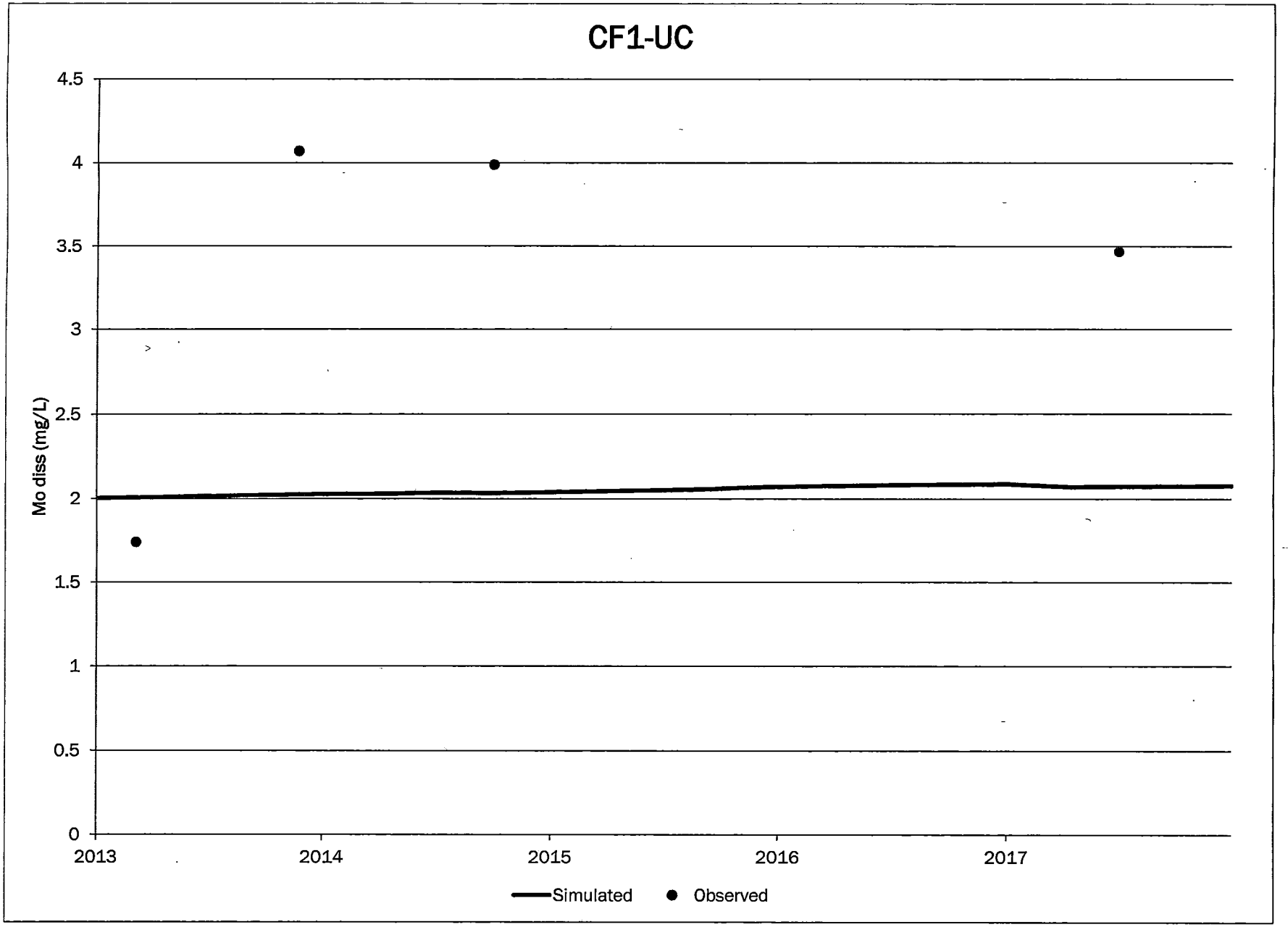

CE11-UC
Mo diss (mg/L)
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

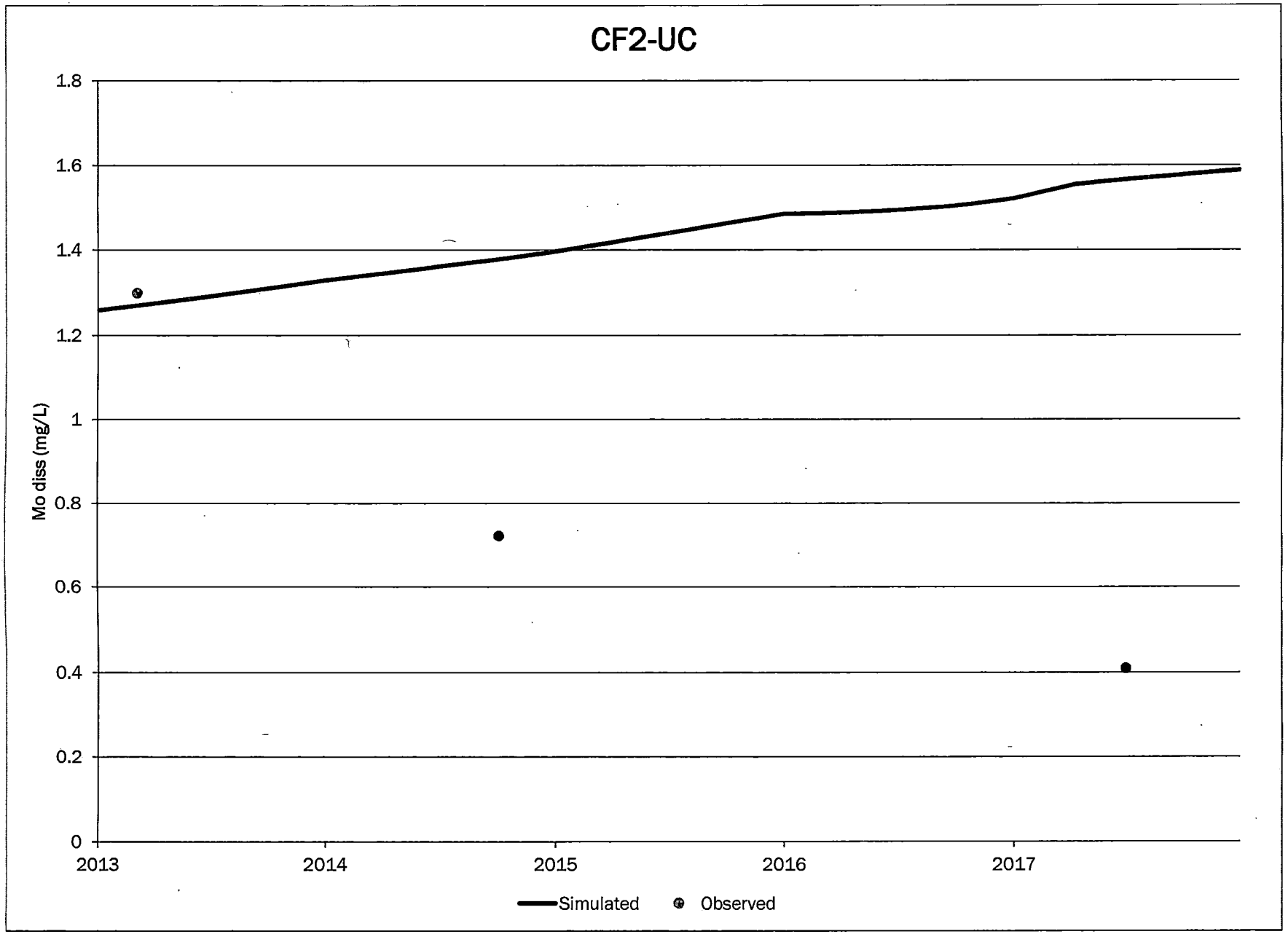

CE12-UC
Mo diss (mg/L)
0
1
2
3
4
5
6
7
2013
2014
2015
2016
2017
Simulated
Observed

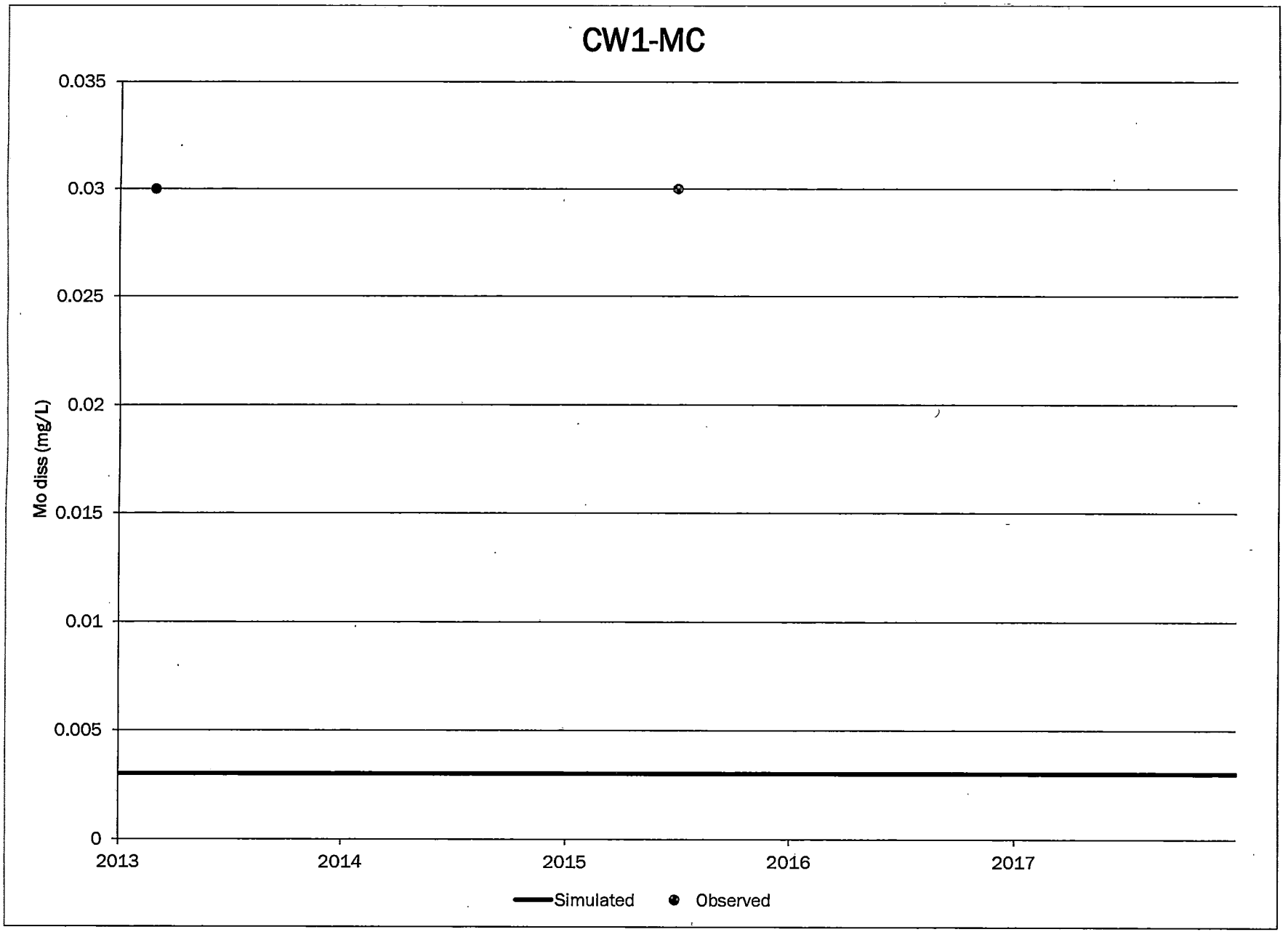

CE13-UC
Mo diss (mg/L)
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

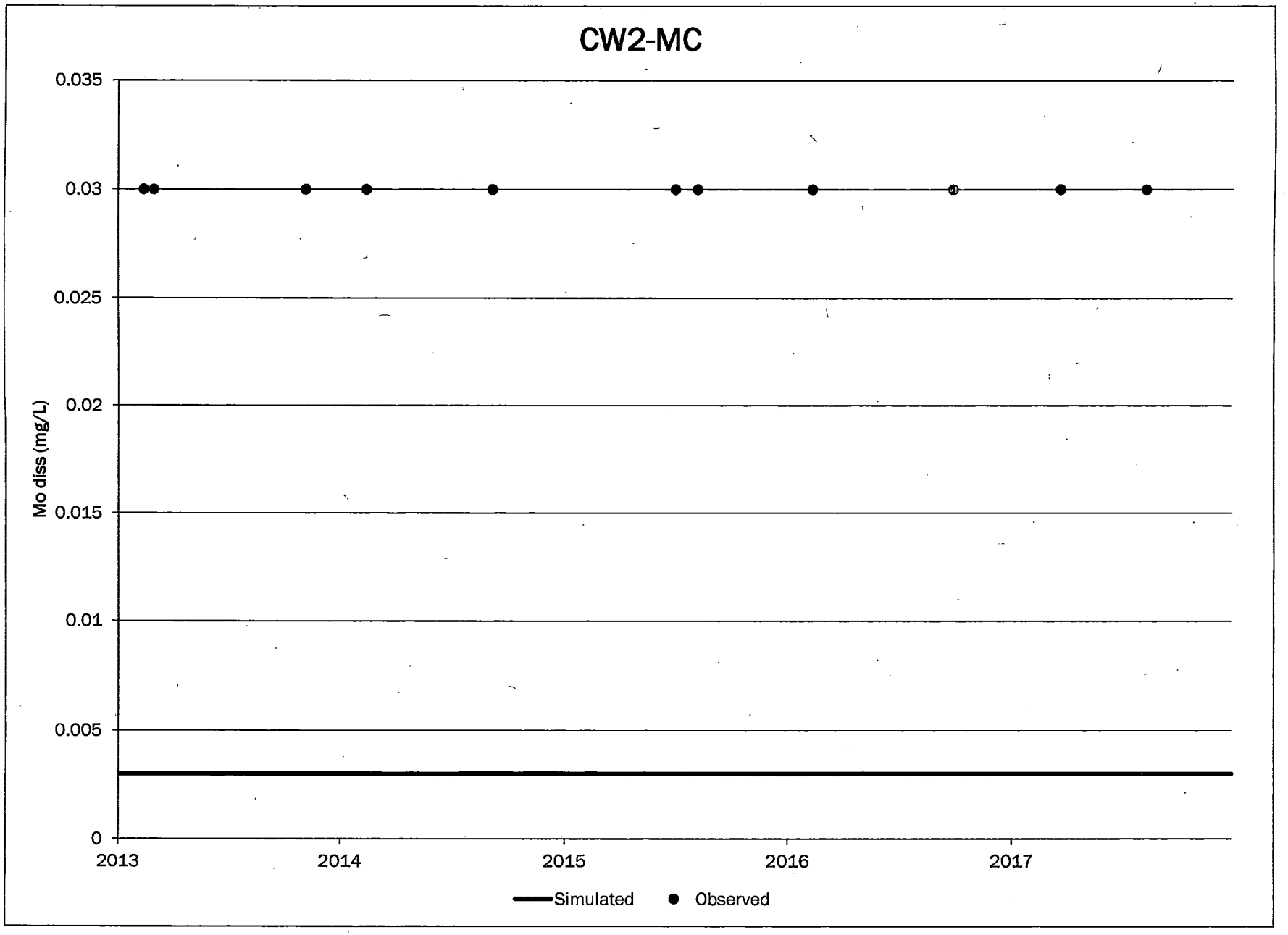

CE14-UC
Mo diss (mg/L)
0.05
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
2013
2014
2015
2016
2017
Simulated
Observed

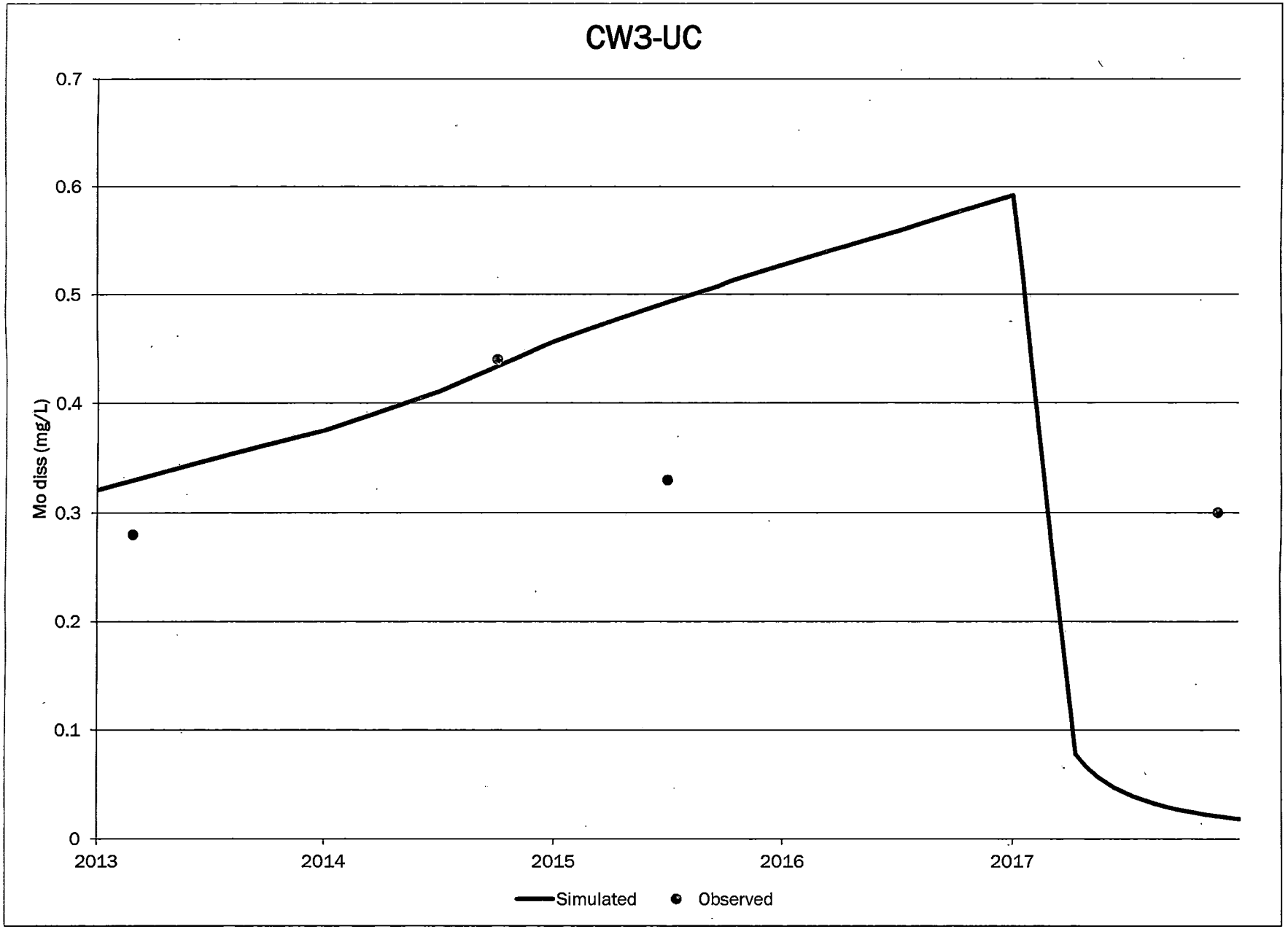

CE15-UC
Mo diss (mg/L)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
2013
2014
2015
2016
2017
Simulated
Observed

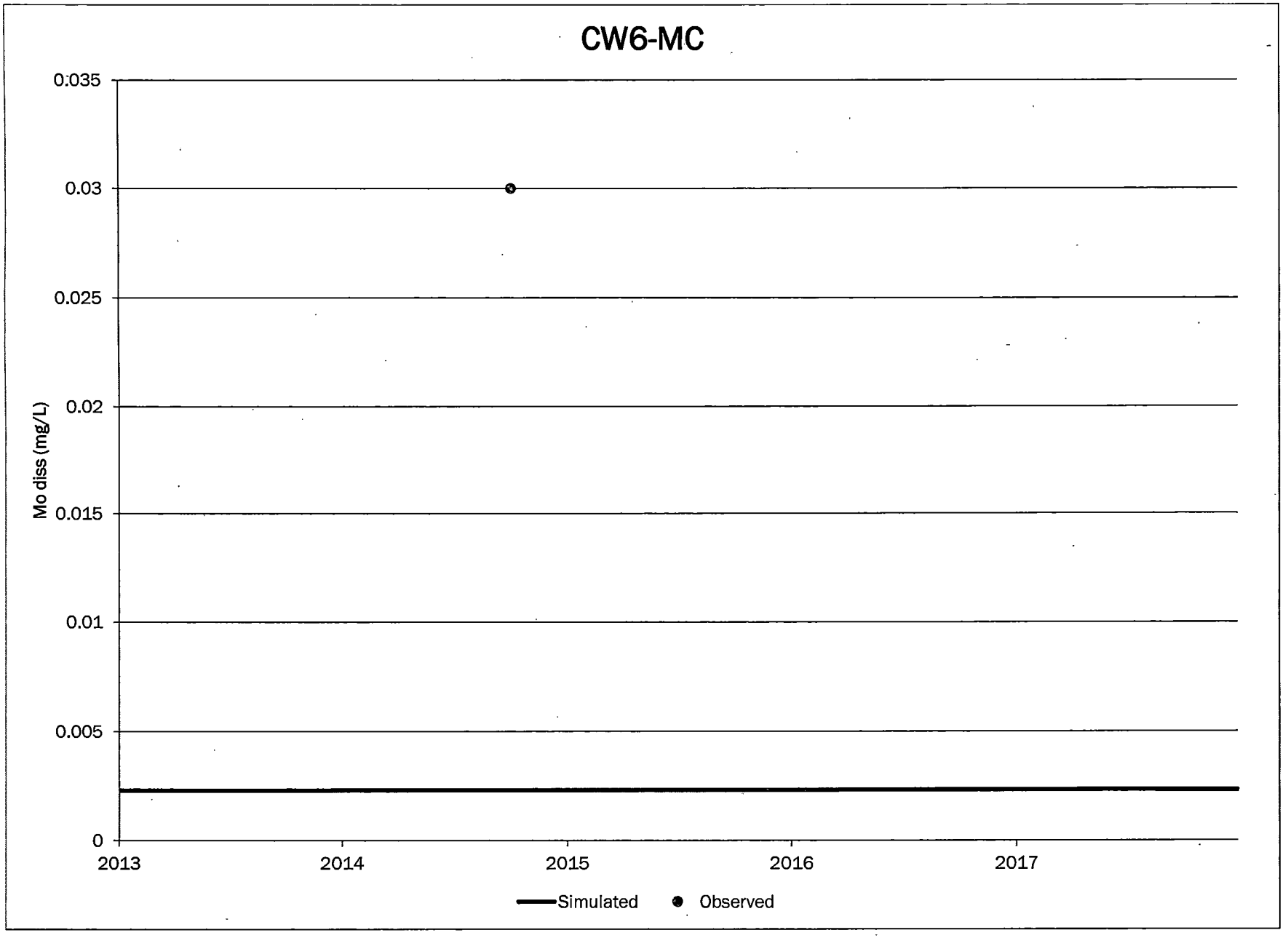

CF1-UC
Mo diss (mg/L)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

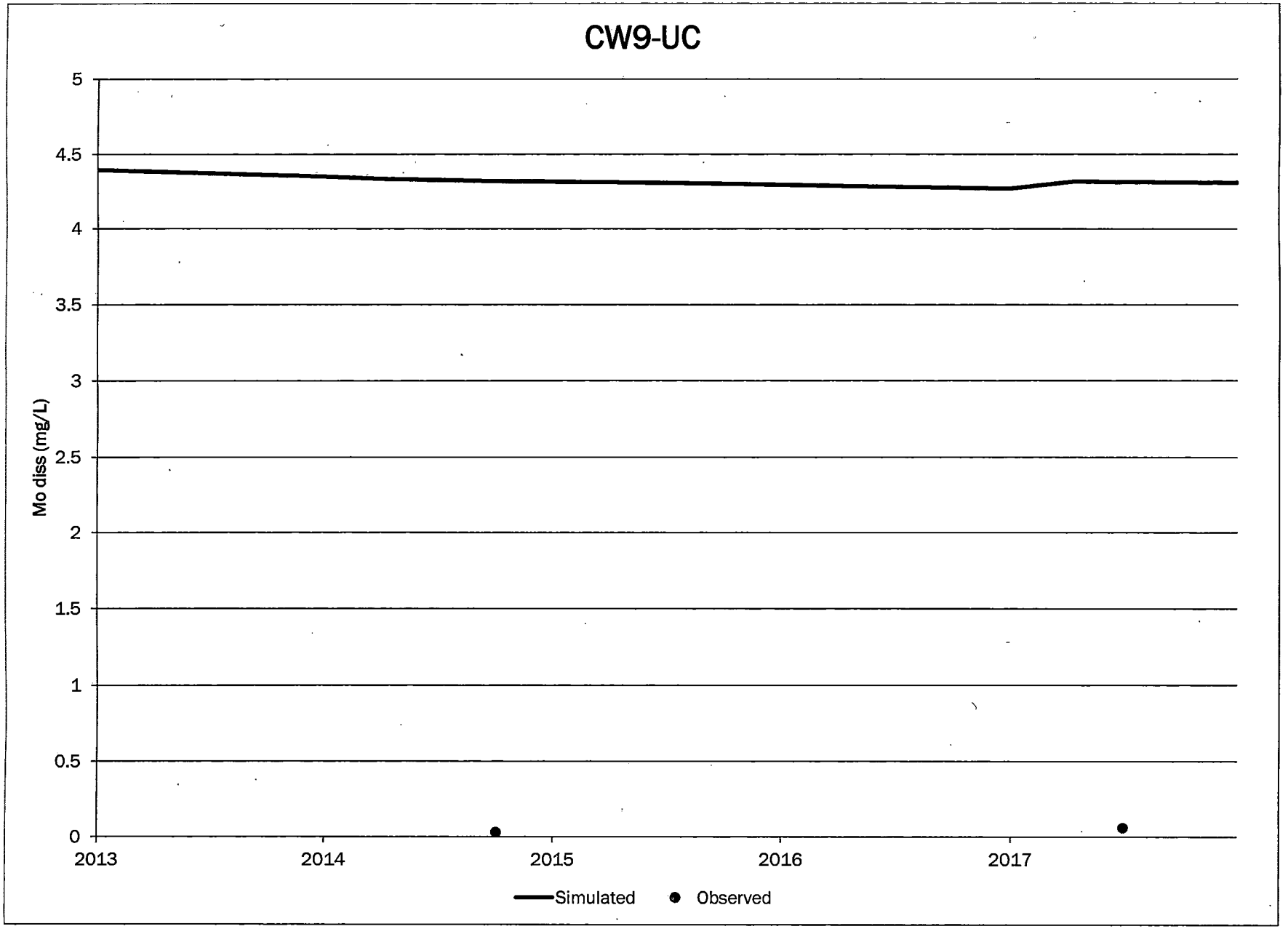

CF2-UC
Mo diss (mg/L)
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2013
2014
2015
2016
2017
Simulated
Observed

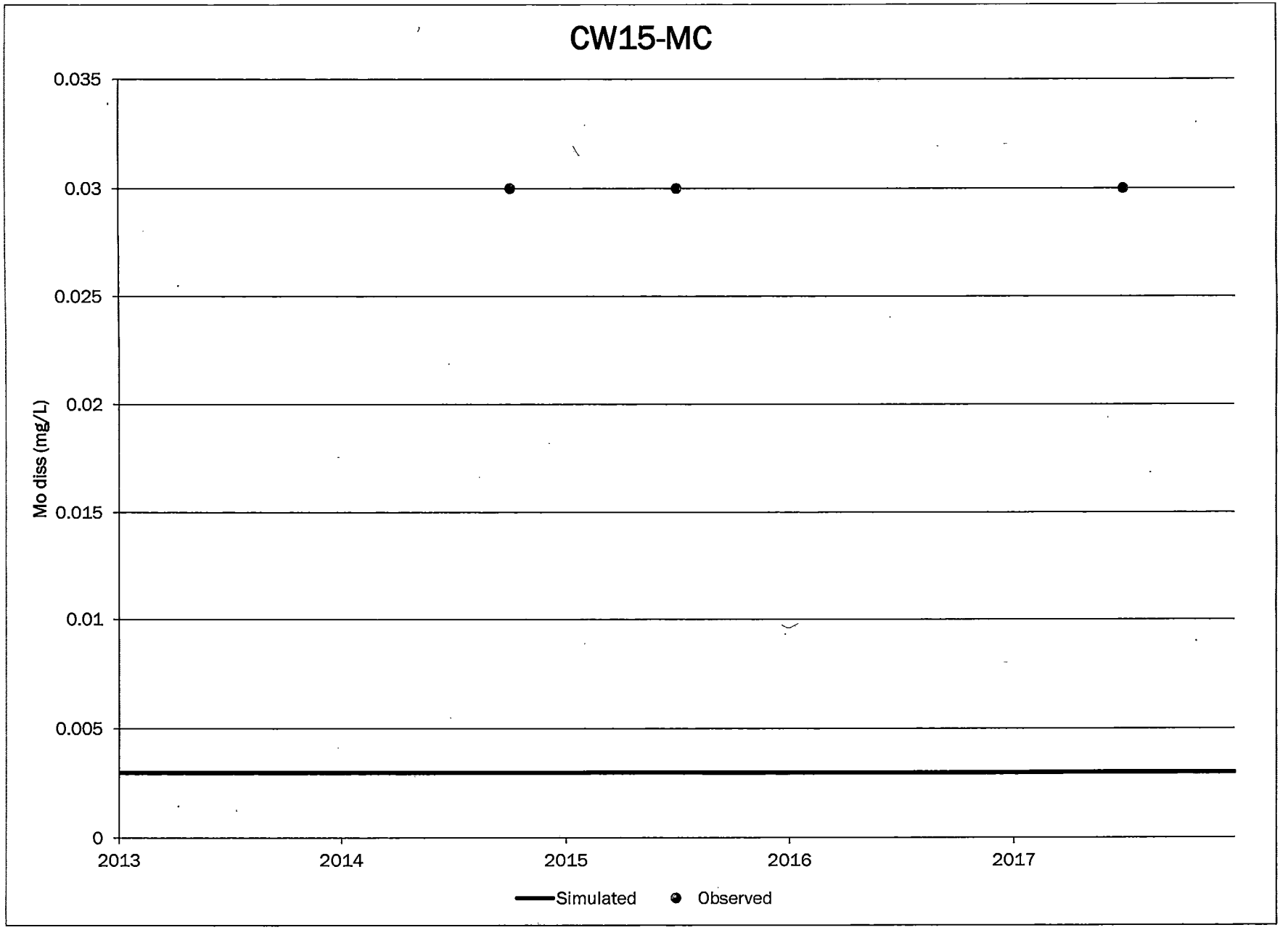

CW1-MC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

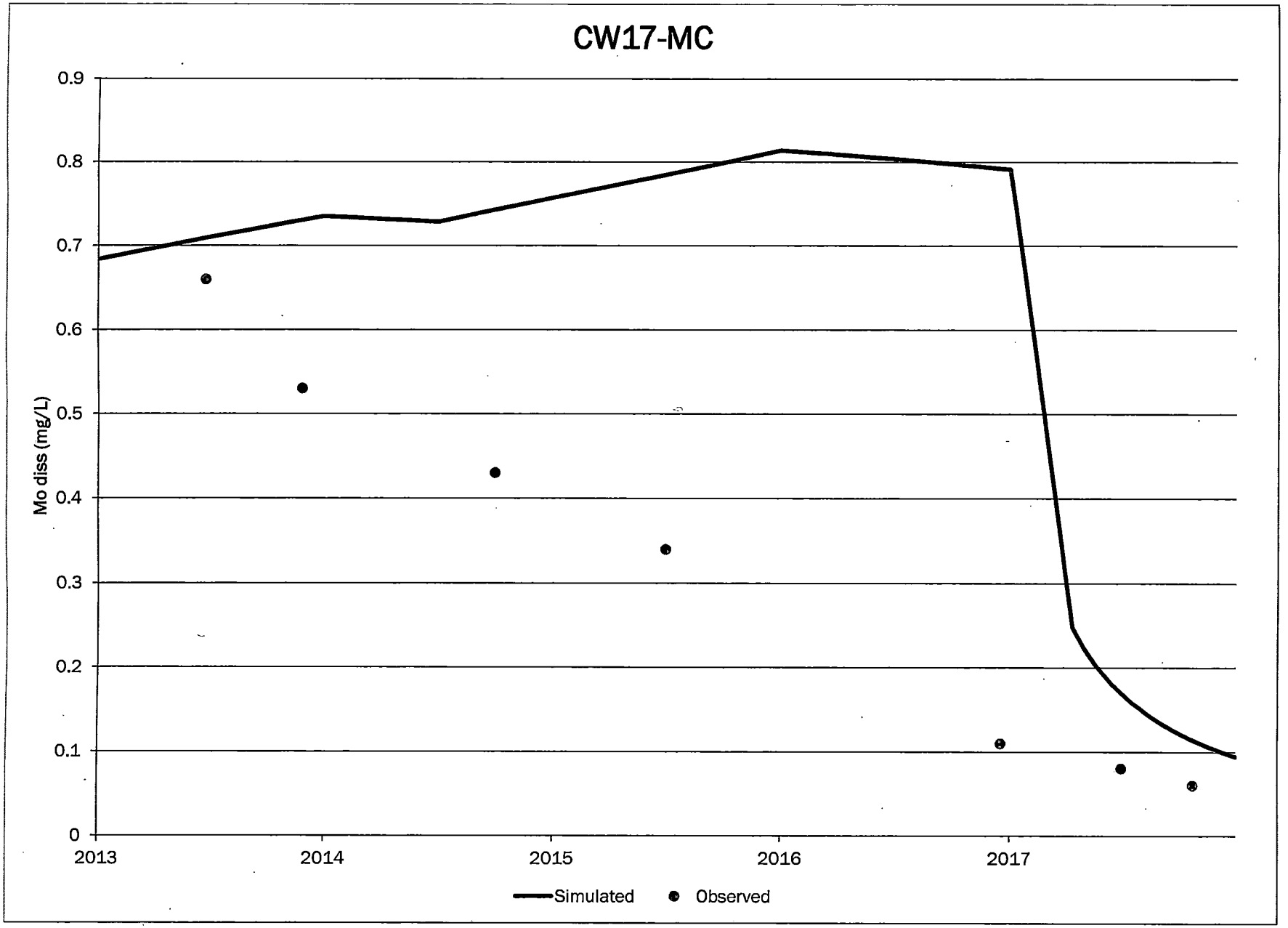

CW2-MC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

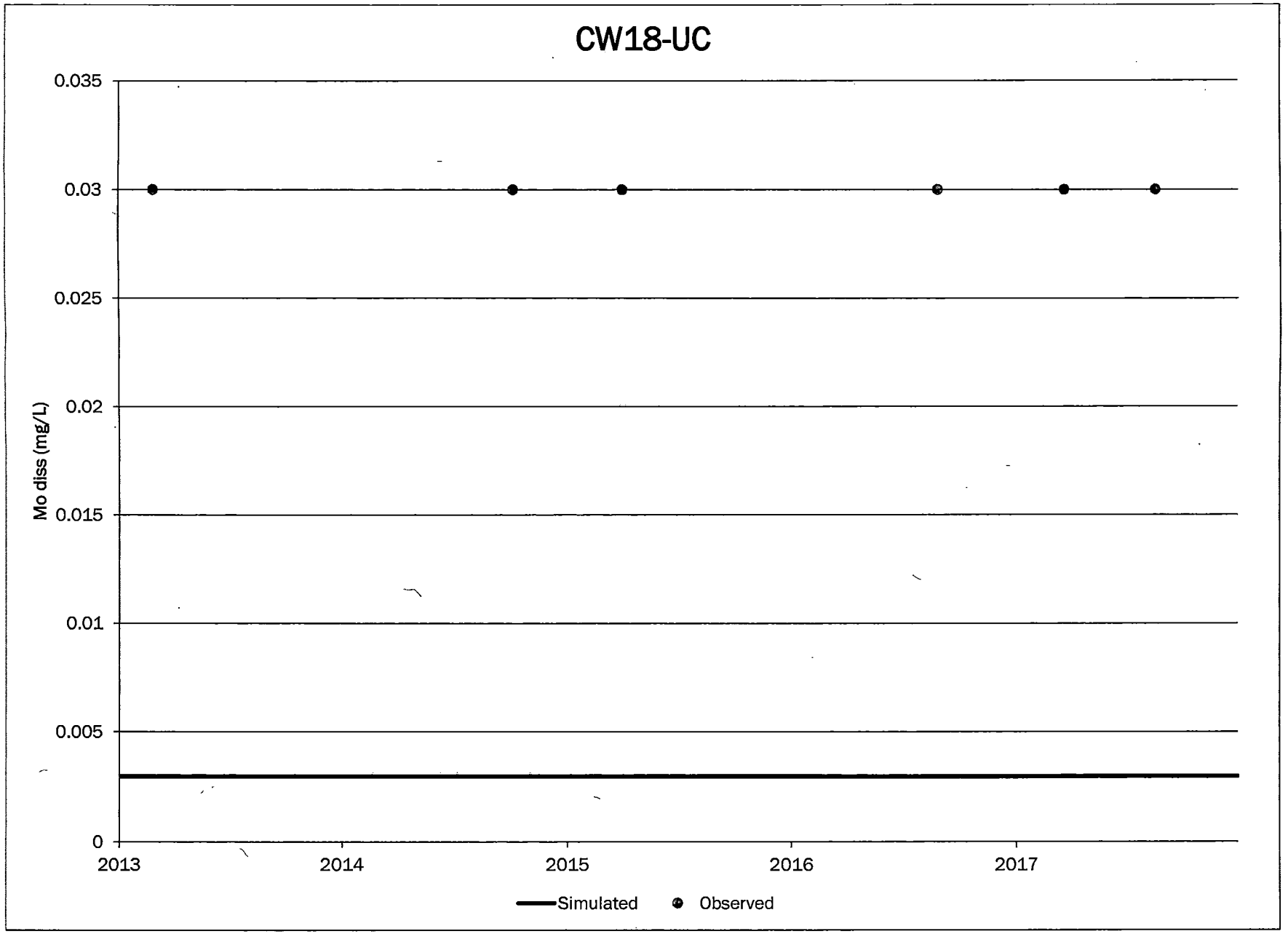

CW3-UC
Mo diss (mg/L)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
2013
2014
2015
2016
2017
Simulated
Observed

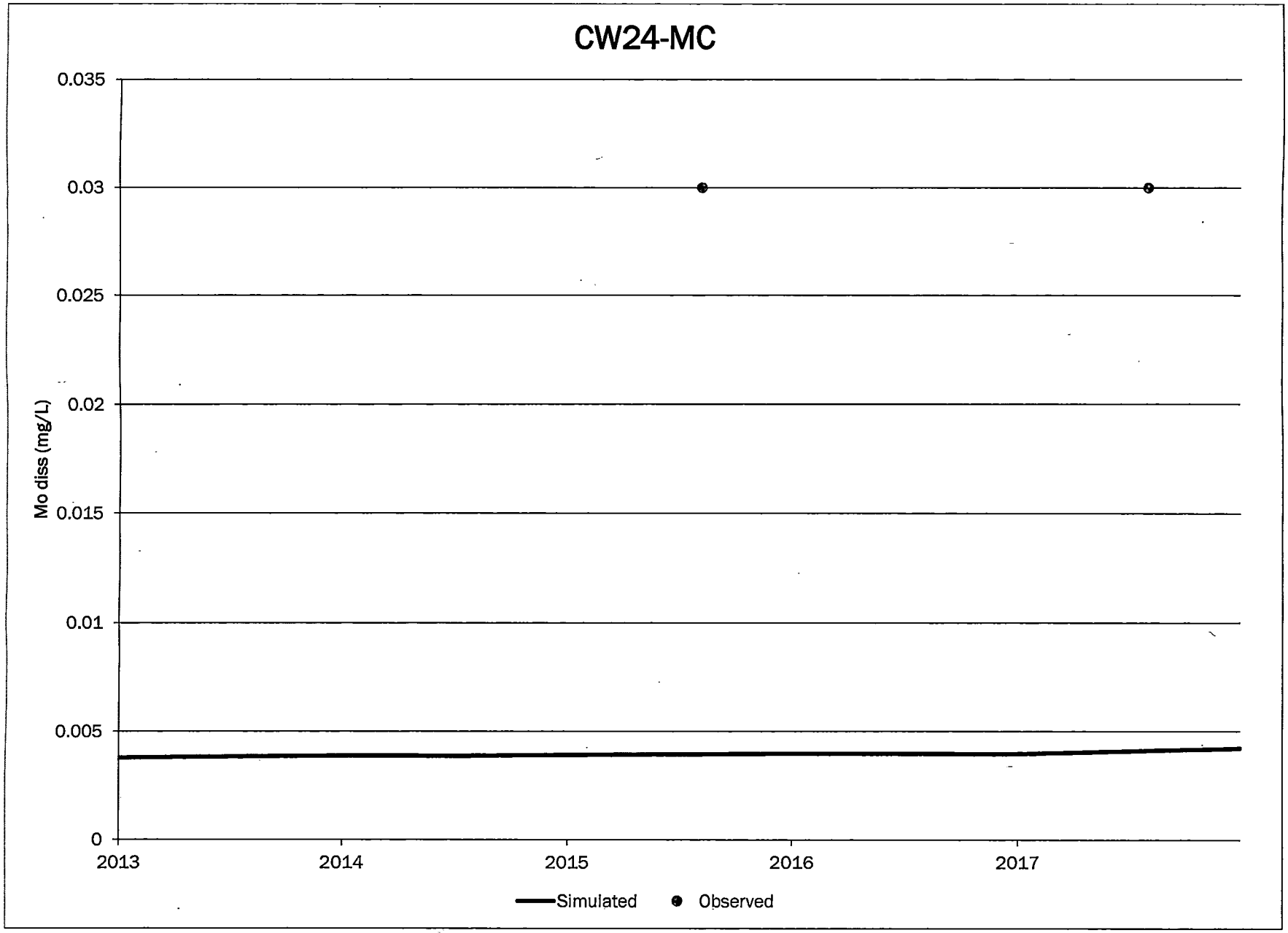

CW6-MC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

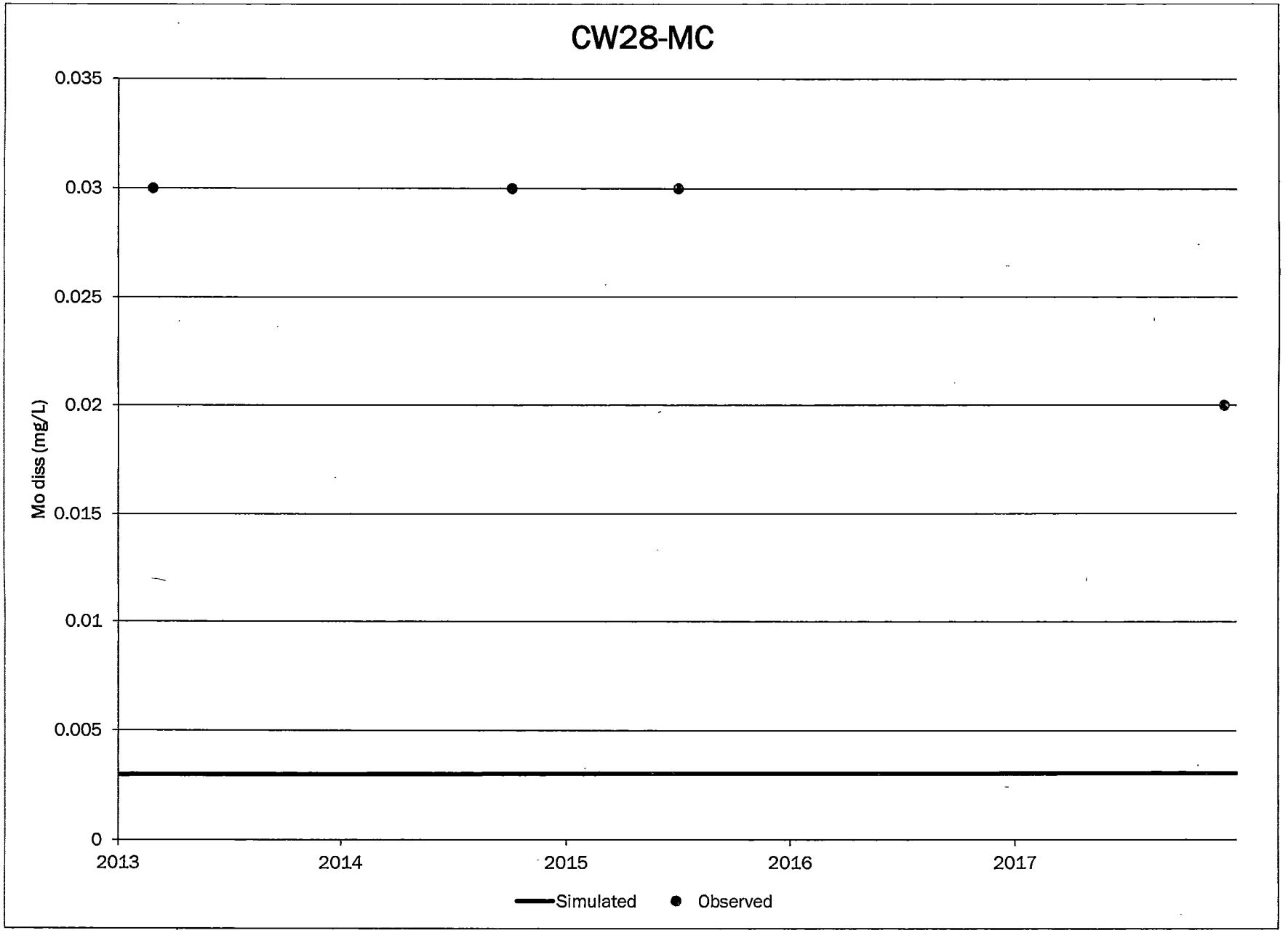

CW9-UC
Mo diss (mg/L)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

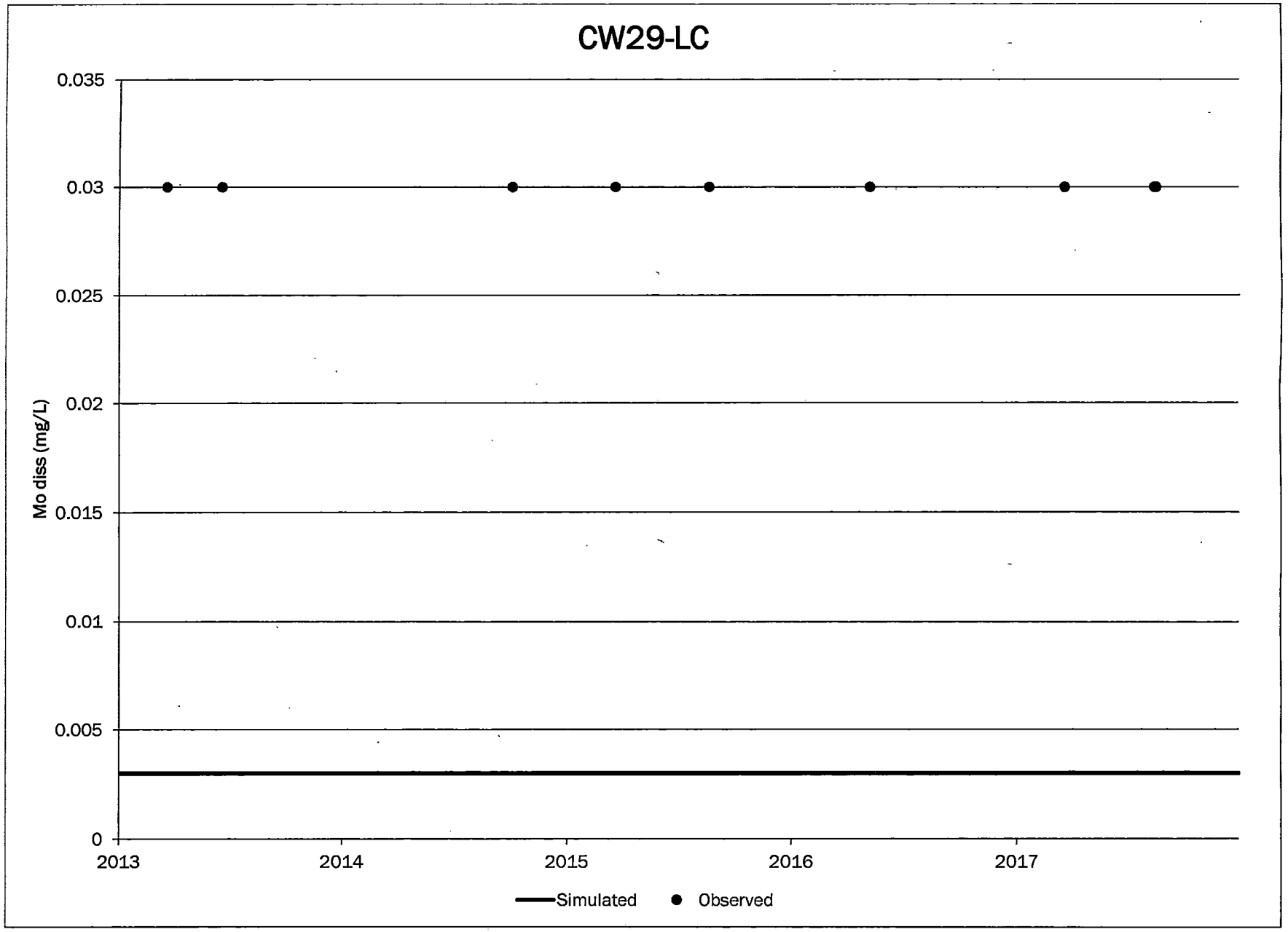

CW15-MC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

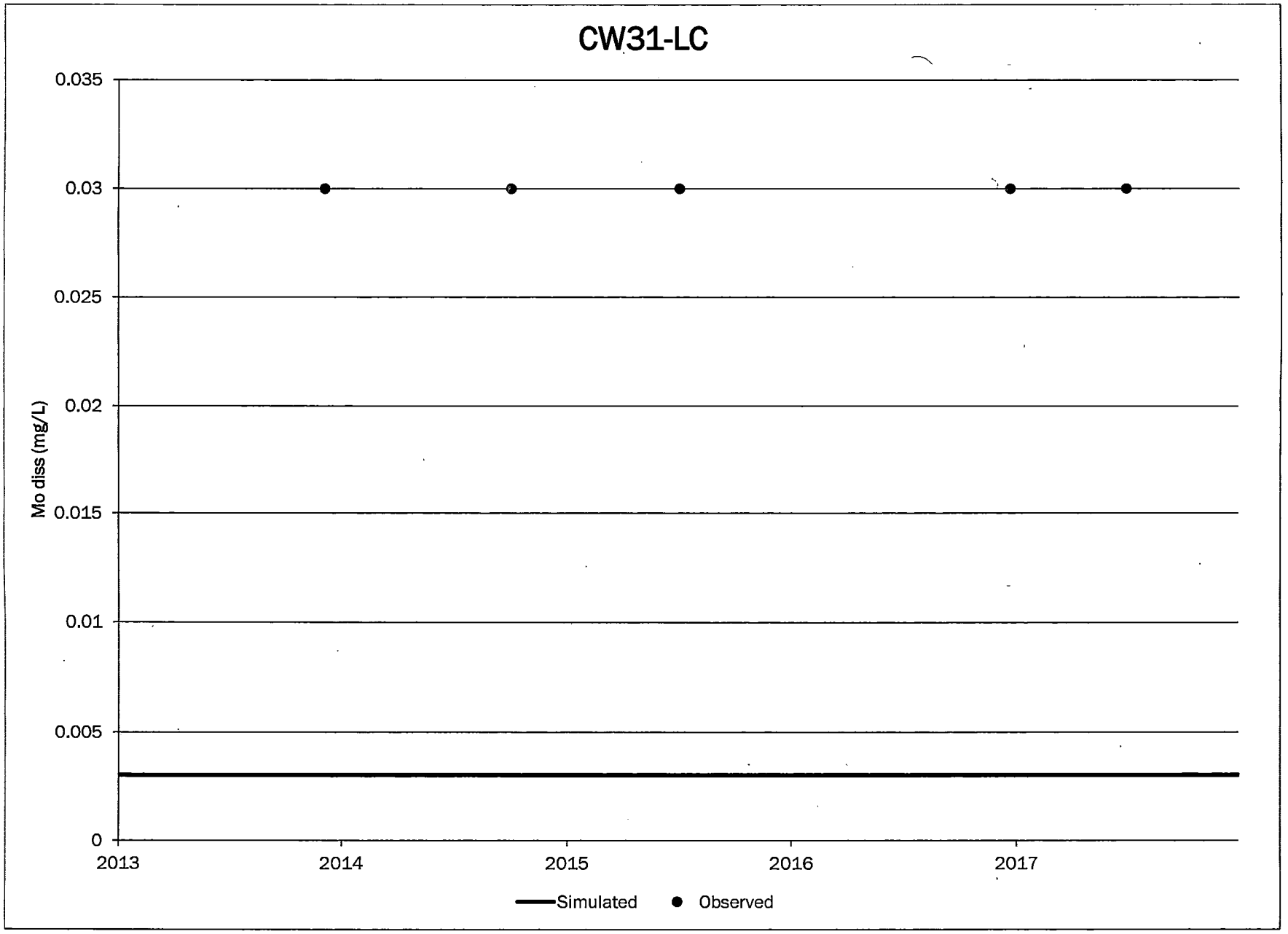

CW17-MC
Mo diss (mg/L)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
2013
2014
2015
2016
2017
Simulated
Observed

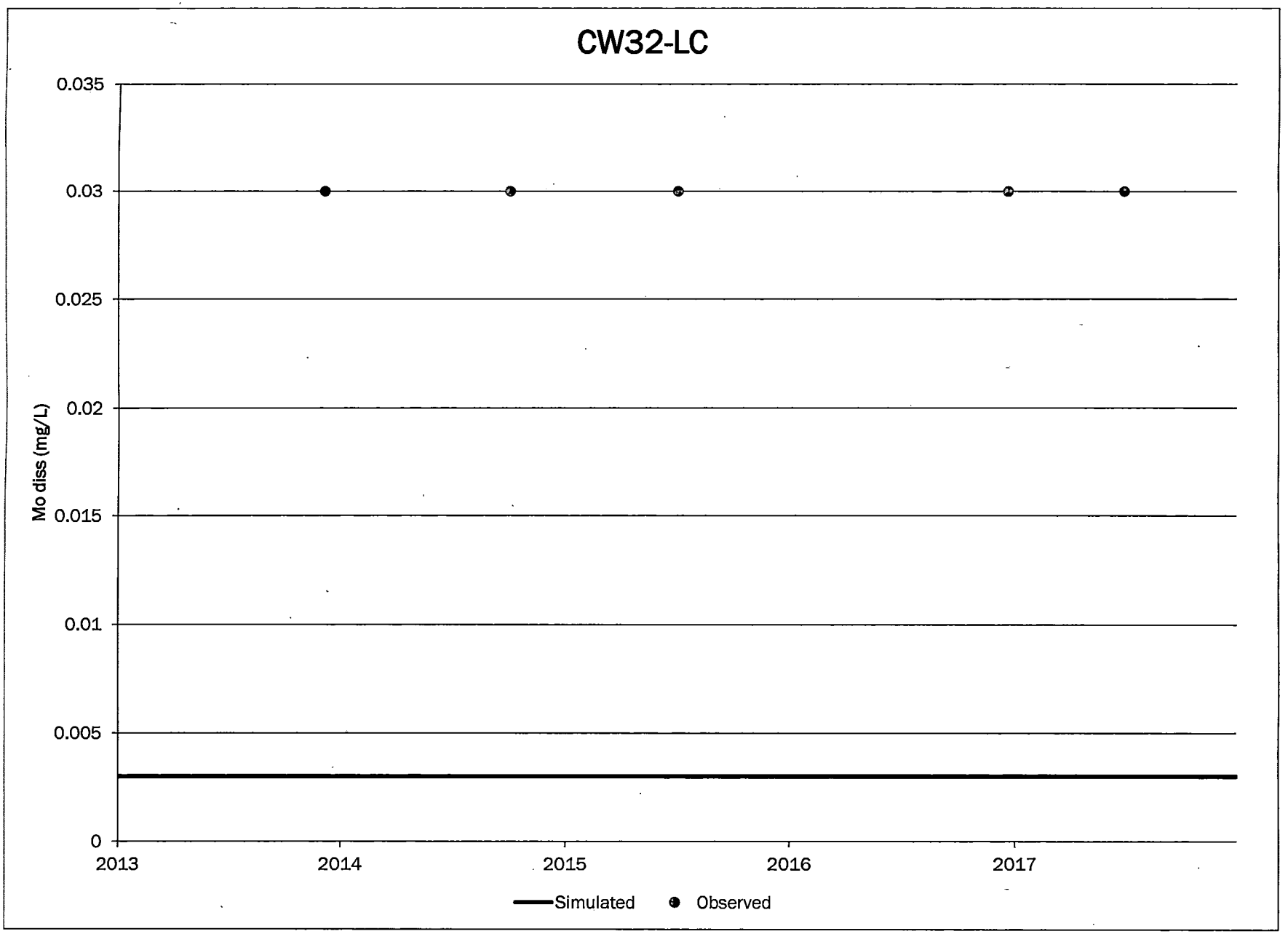

CW18-UC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

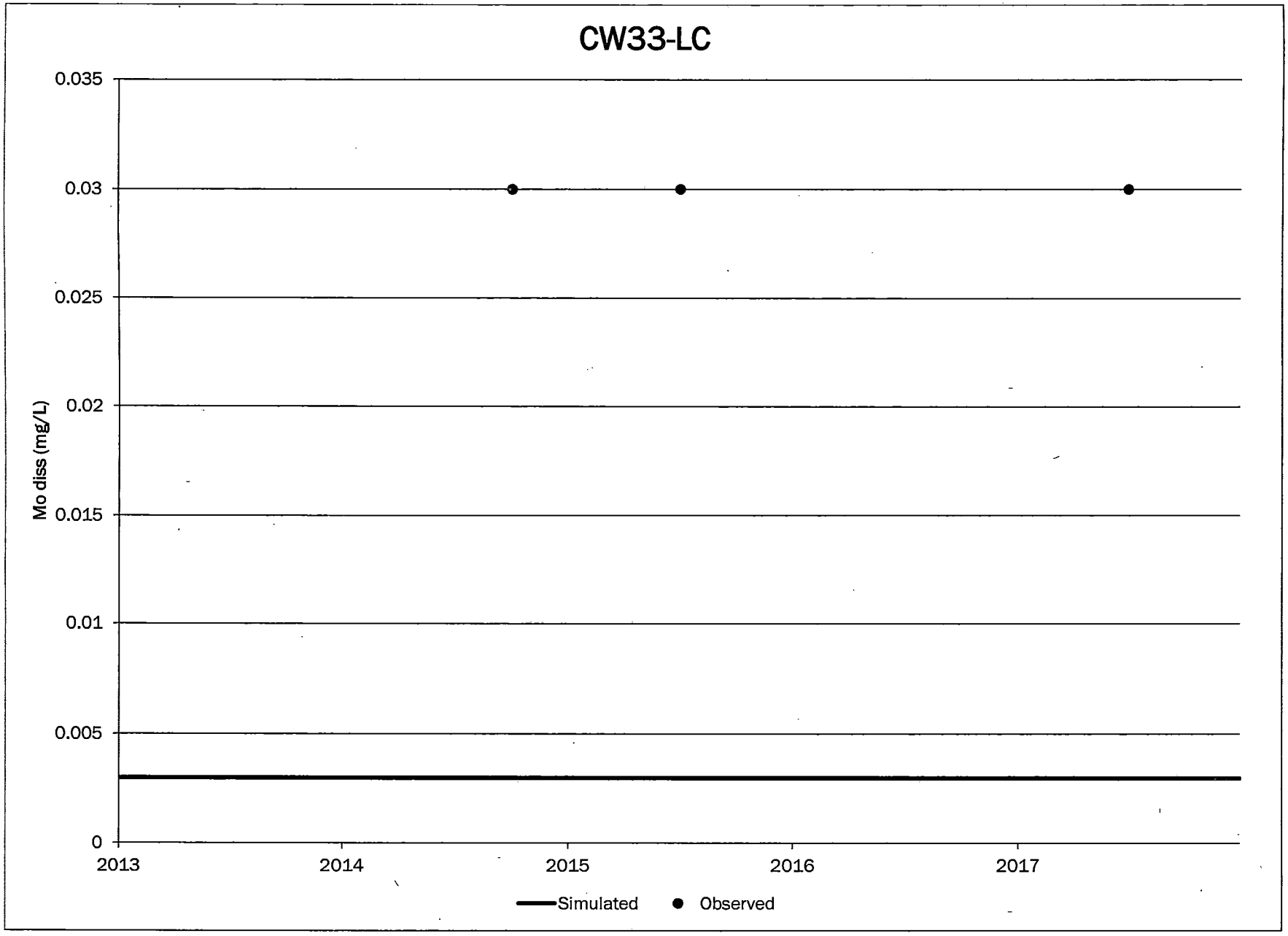

CW24-MC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

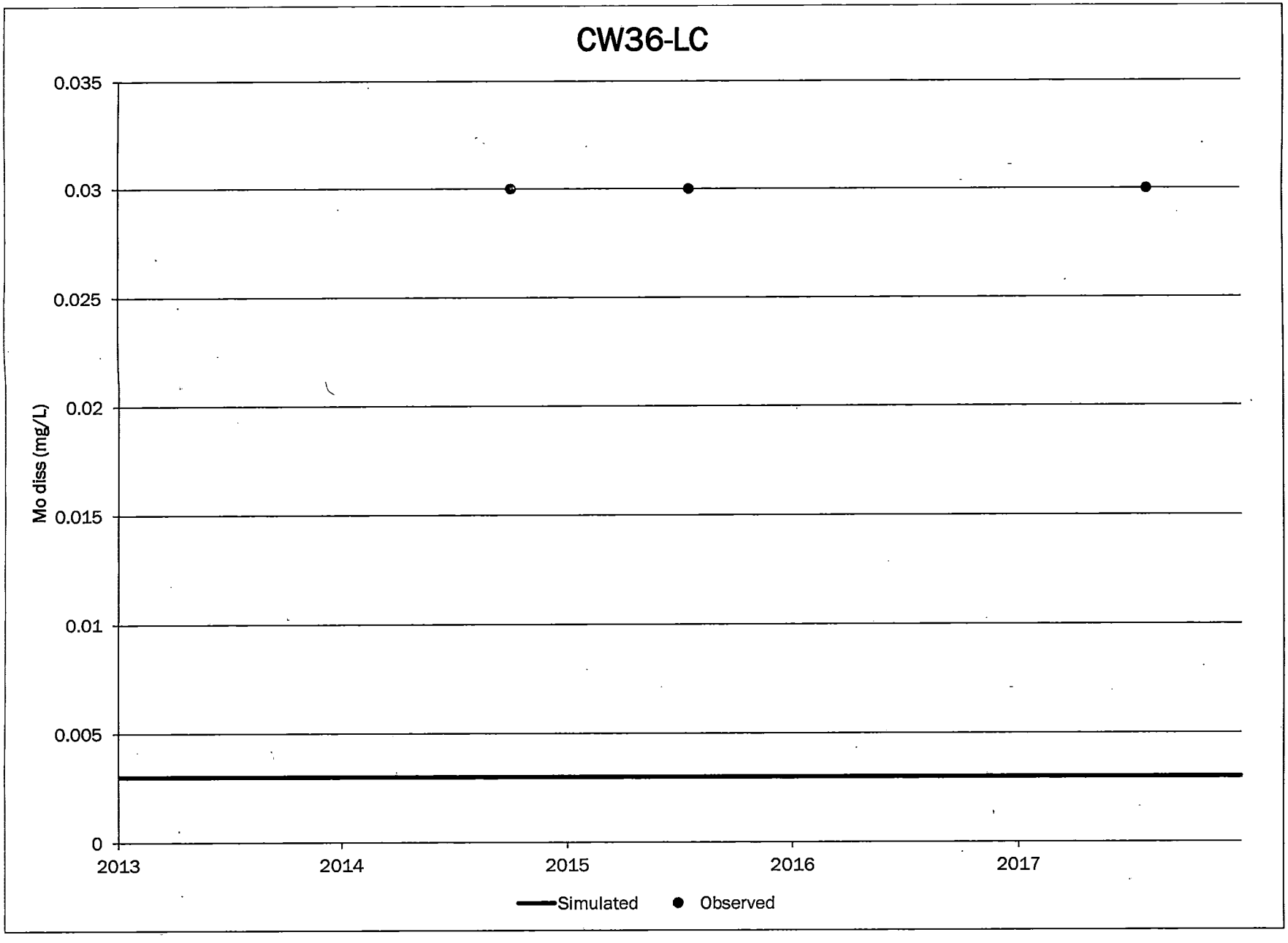

CW28-MC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

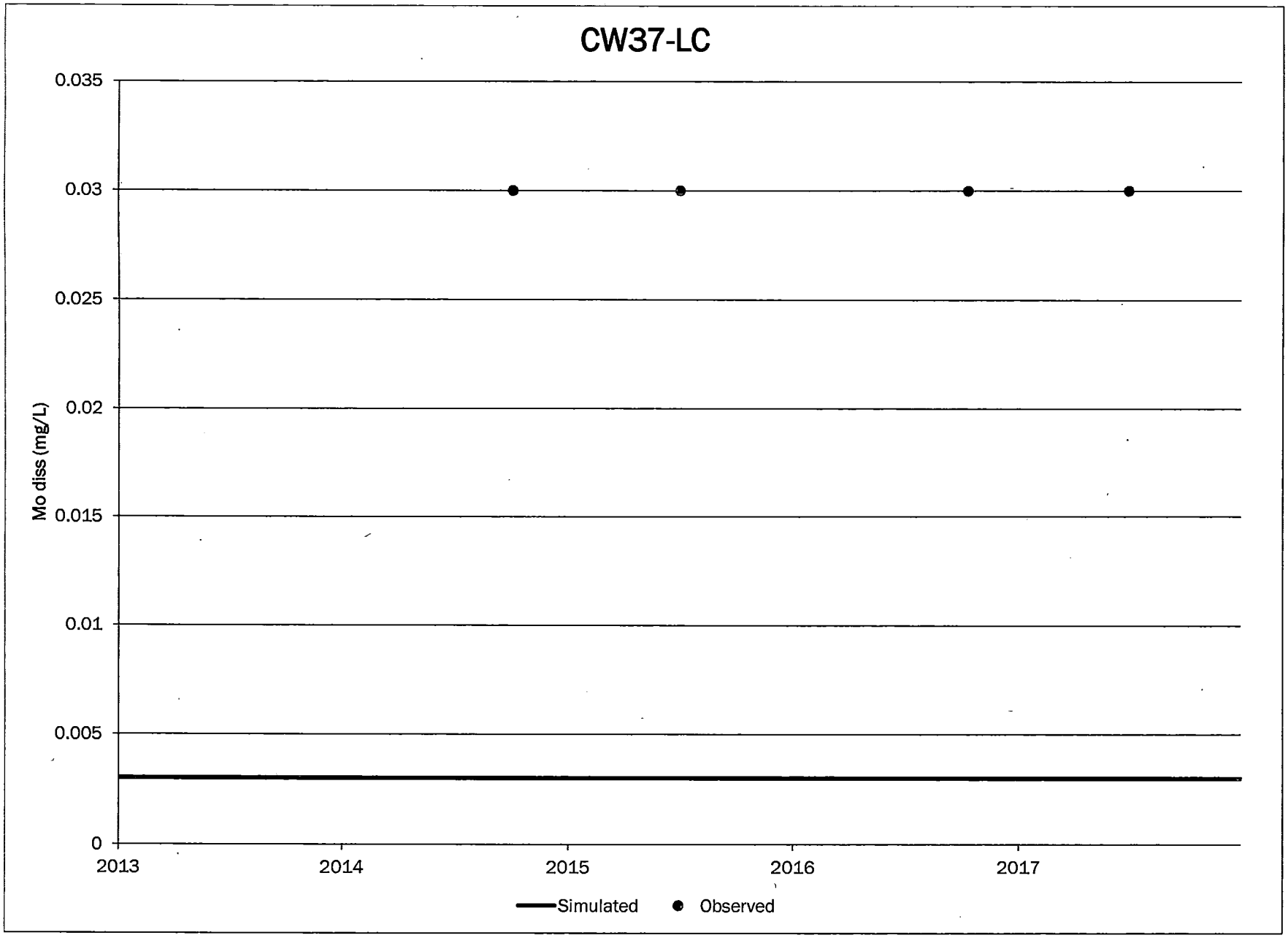

CW29-LC
Mo diss (mg/L)
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
2013
2014
2015
2016
2017
Simulated
Observed

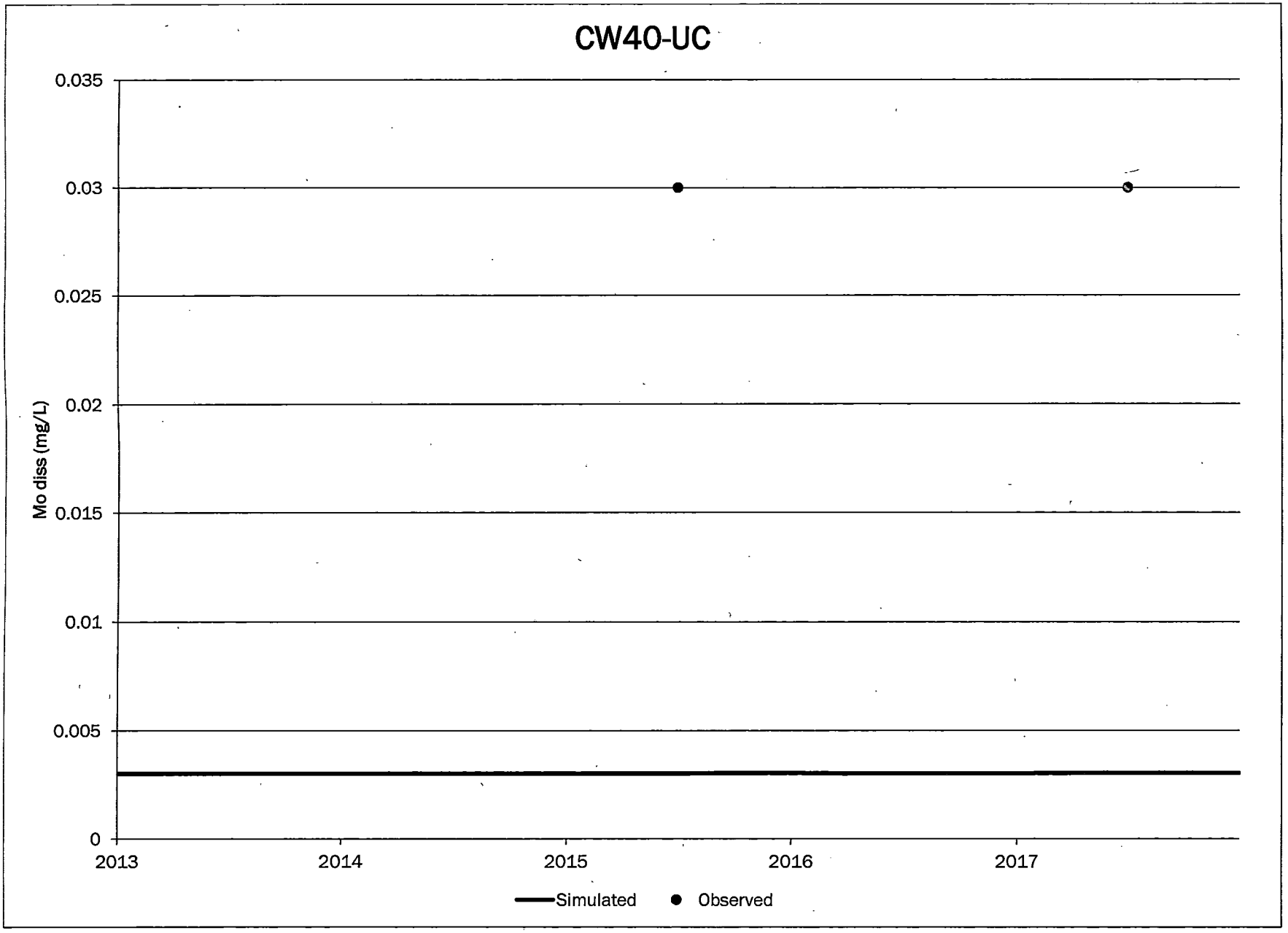

CW31-LC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

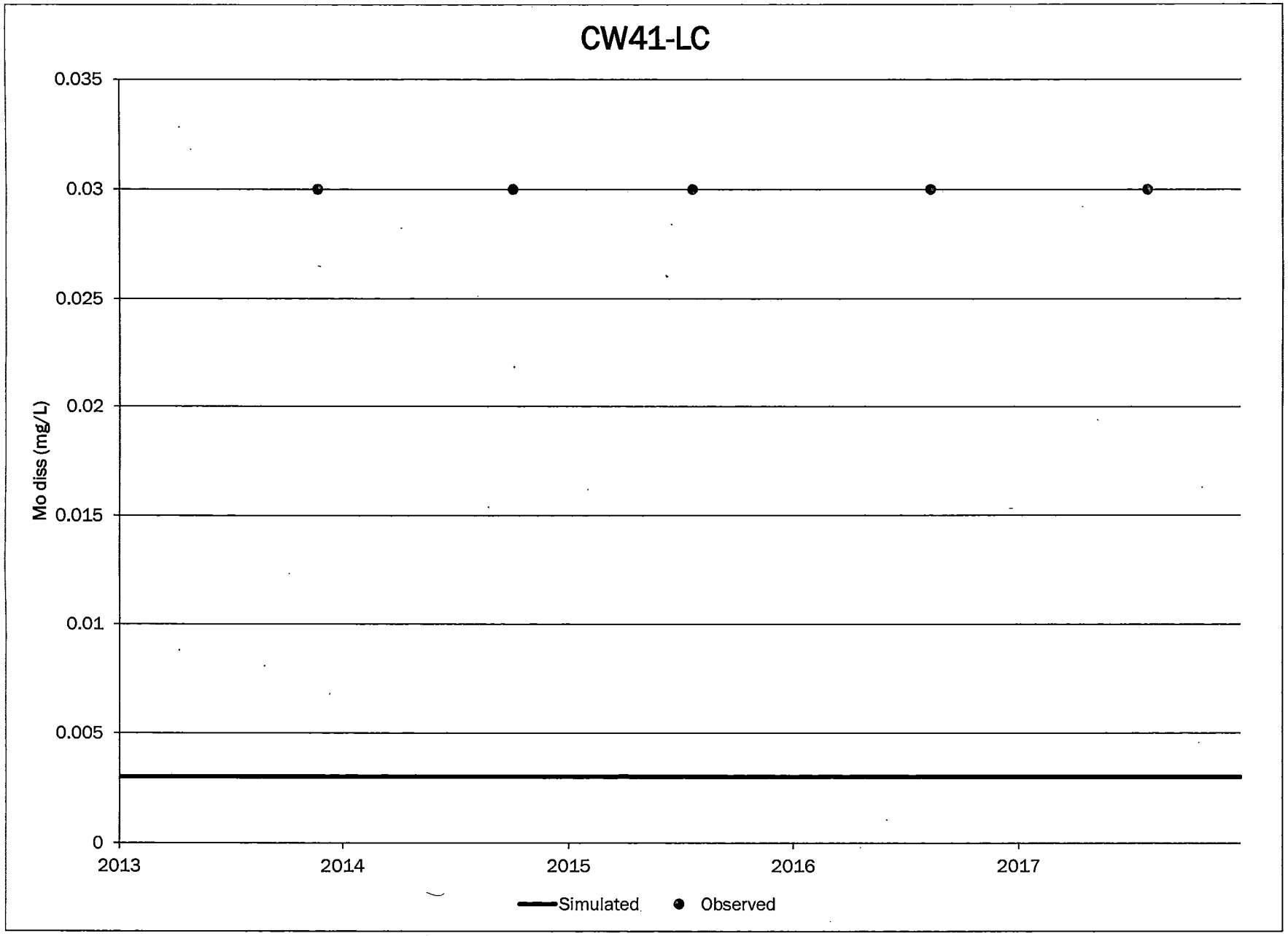

CW32-LC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

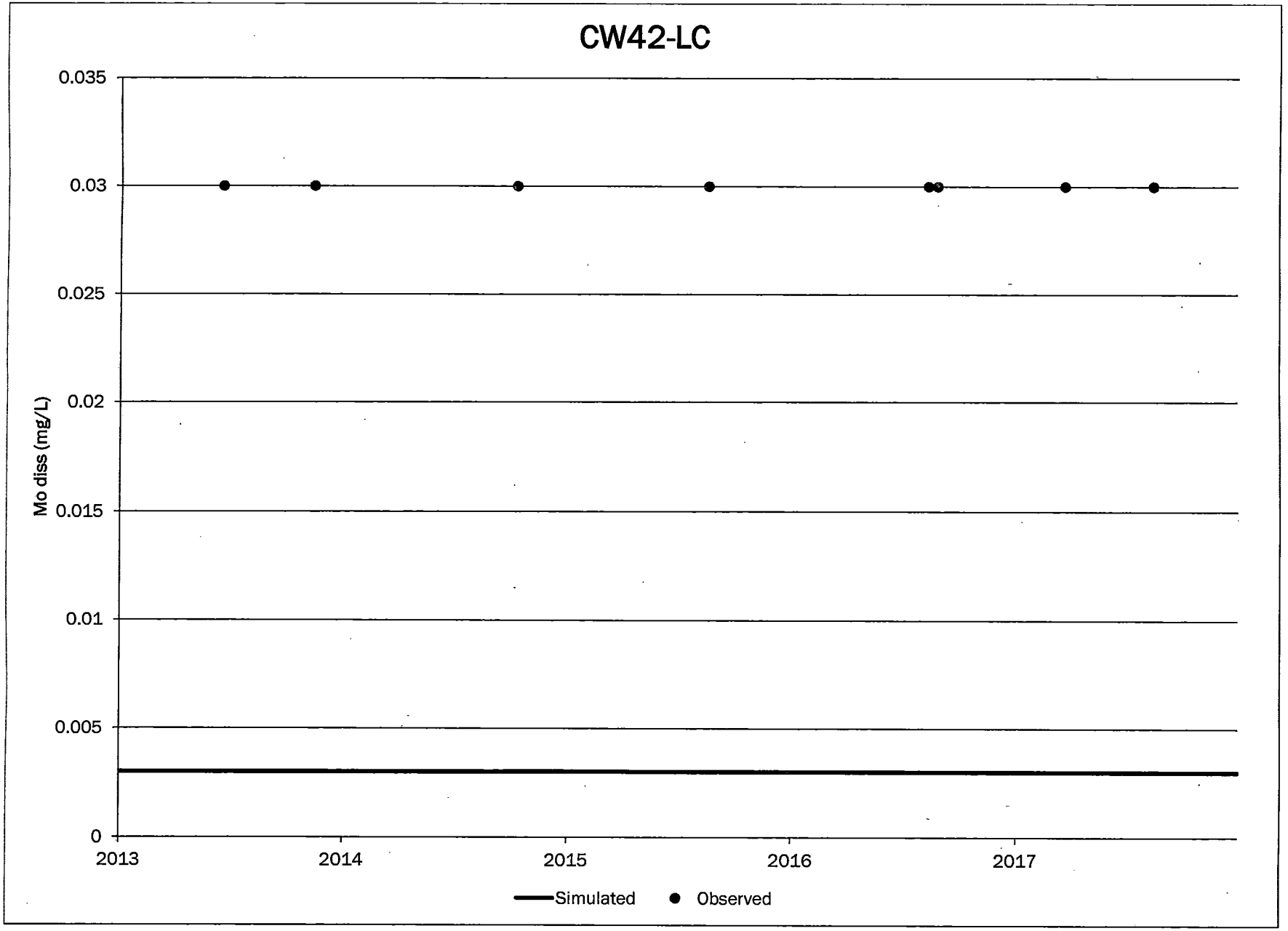

CW33-LC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

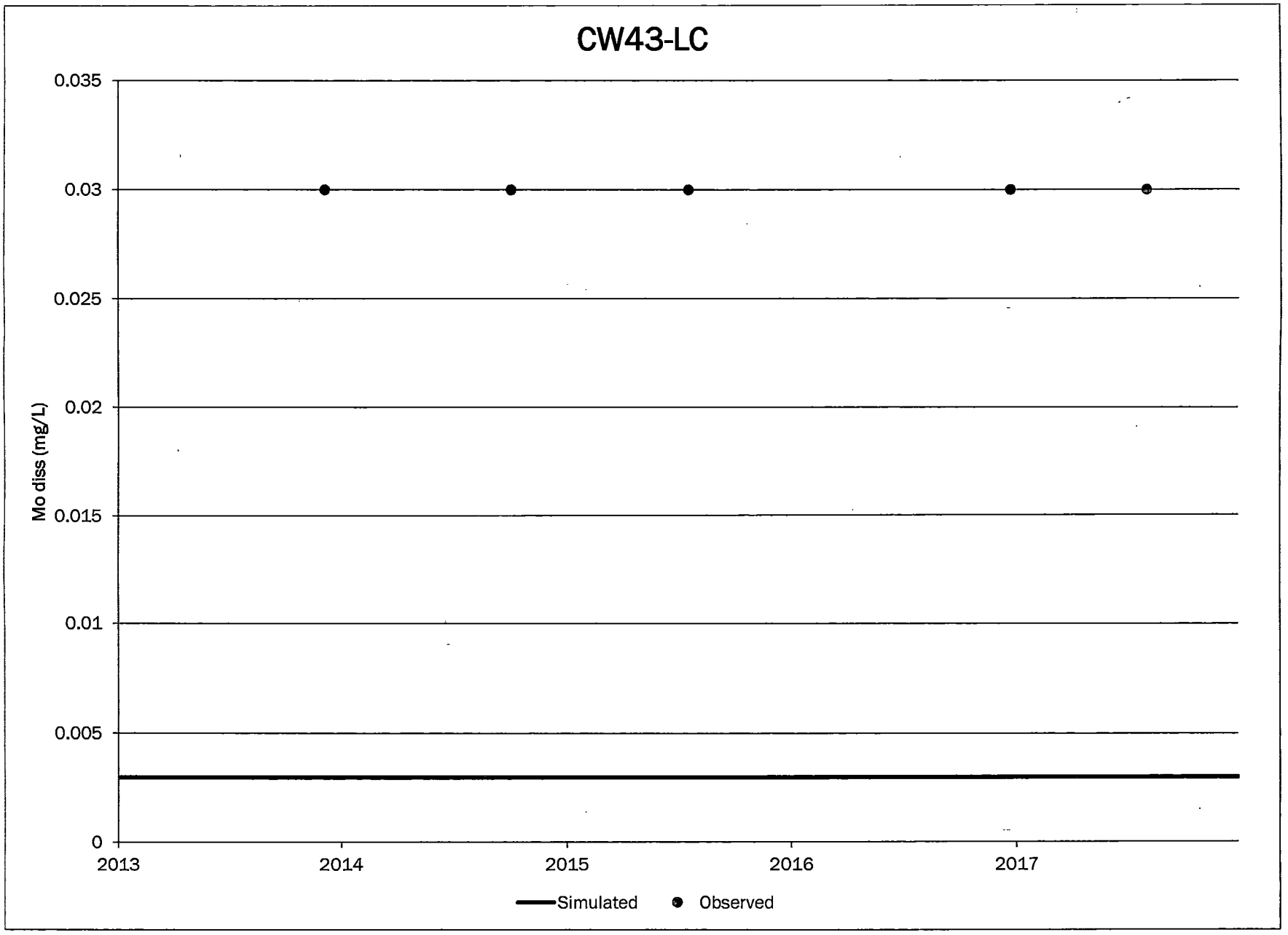

CW36-LC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

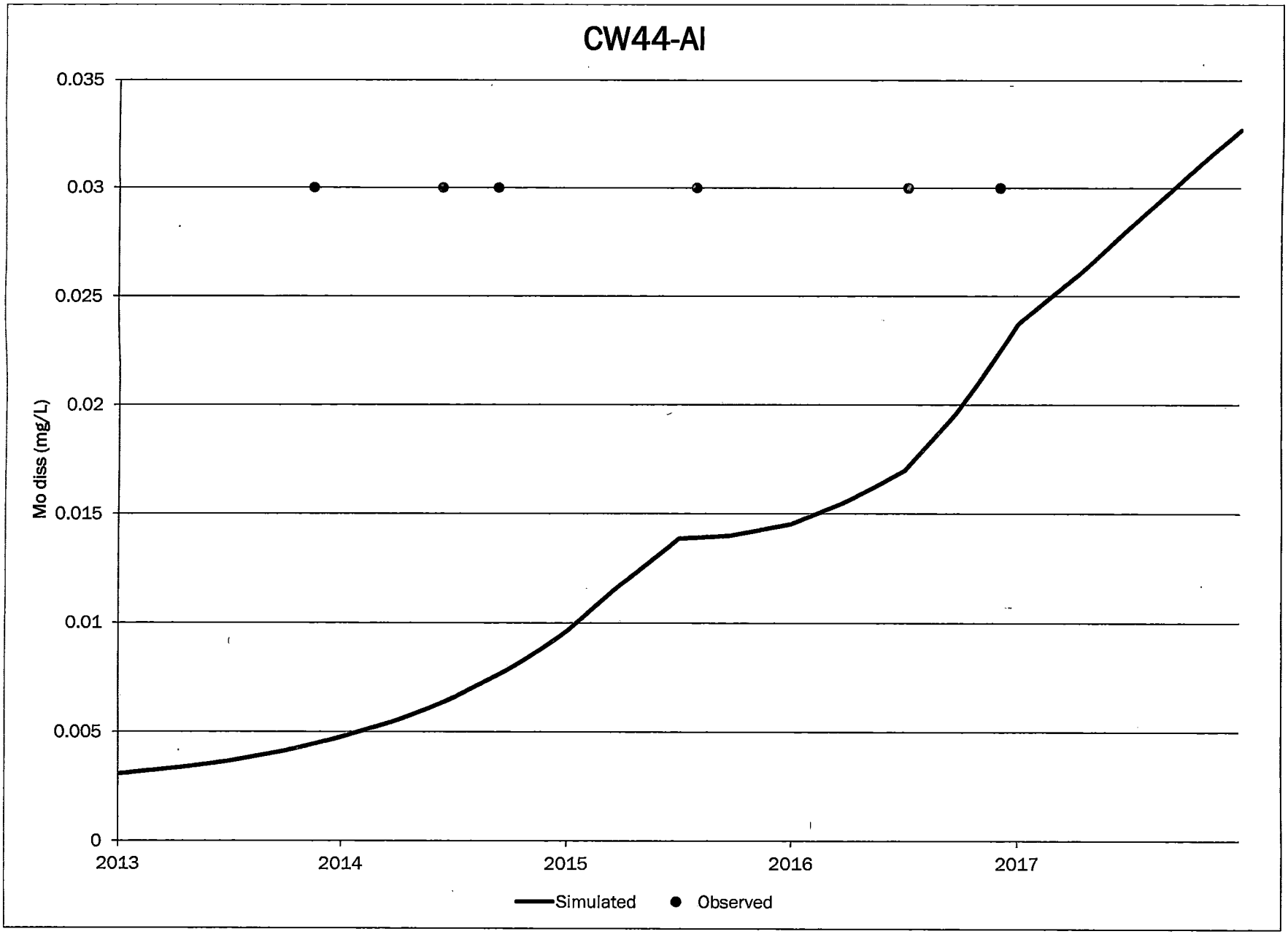

CW37-LC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

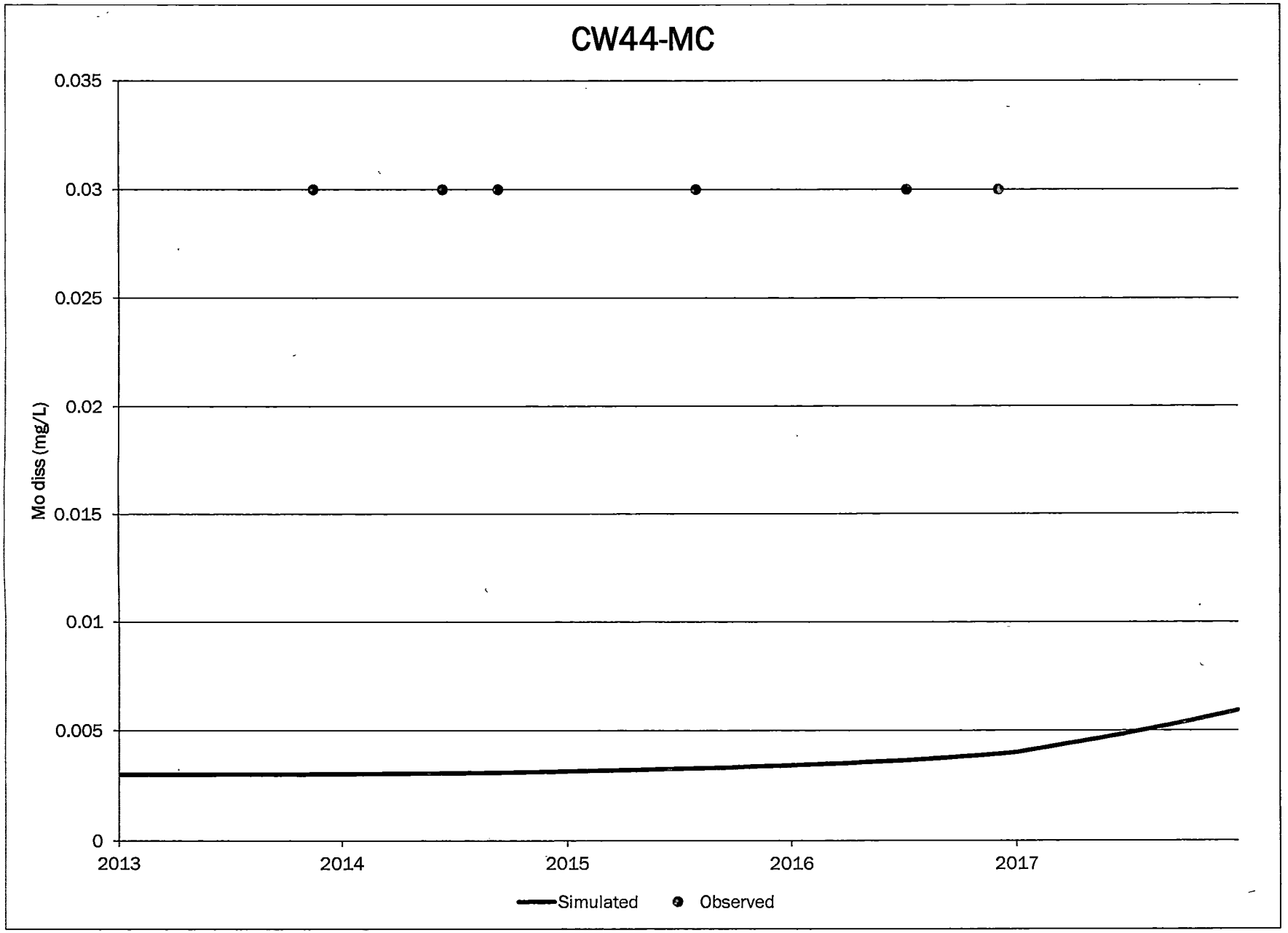

CW40-UC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

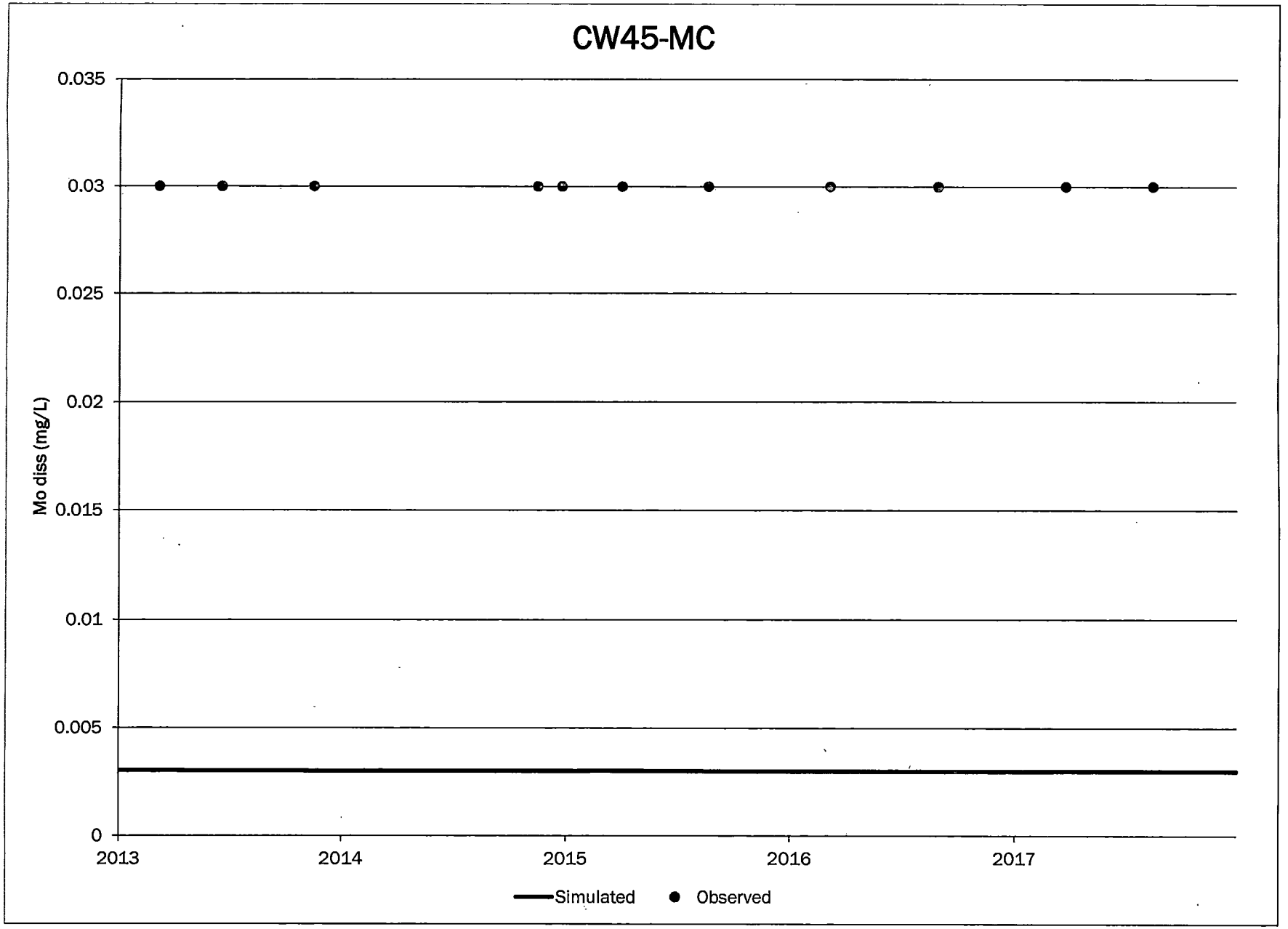

CW41-LC
Mo diss (mg/L)
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
2013
2014
2015
2016
2017
Simulated
Observed

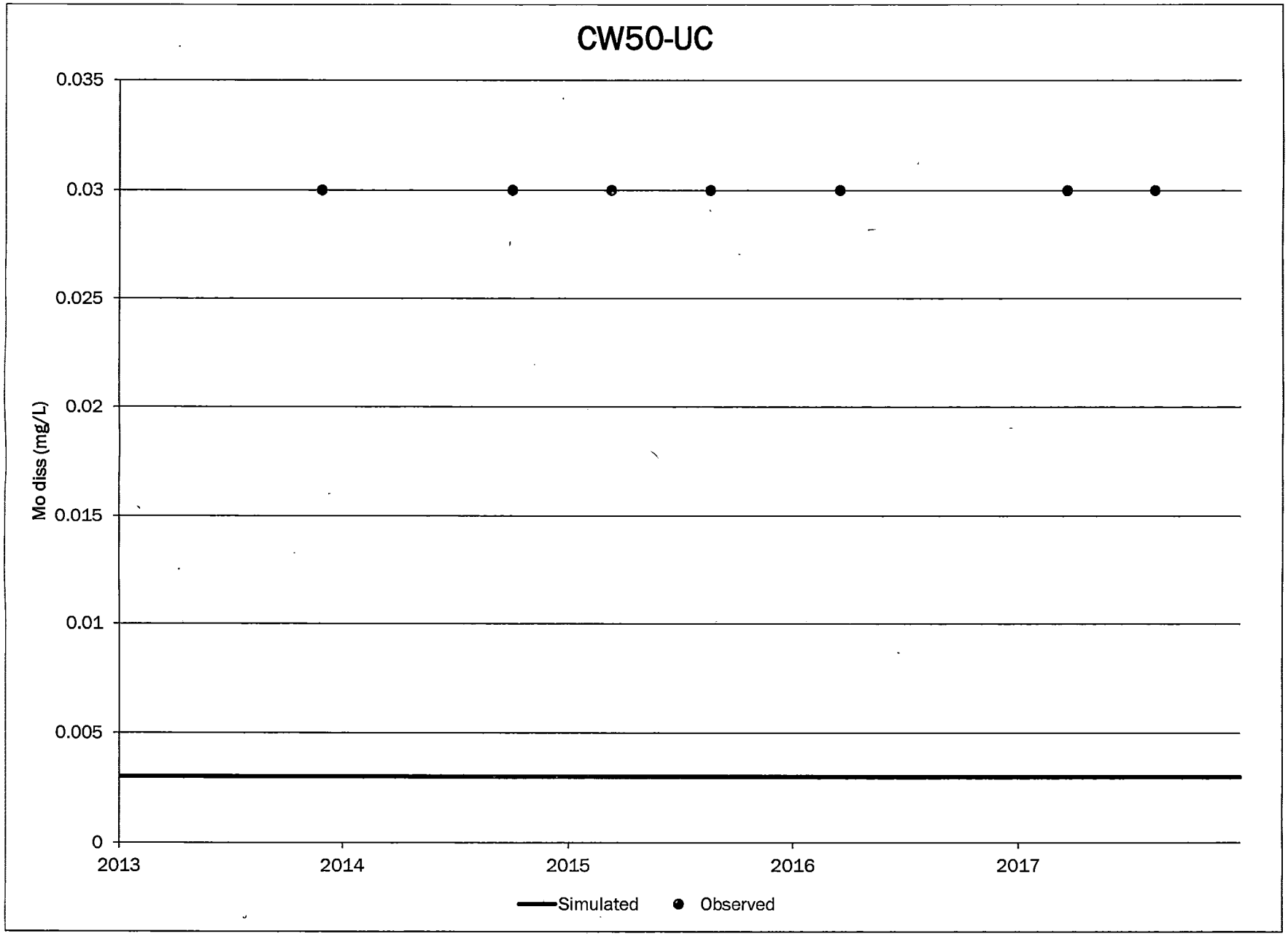

CW42-LC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

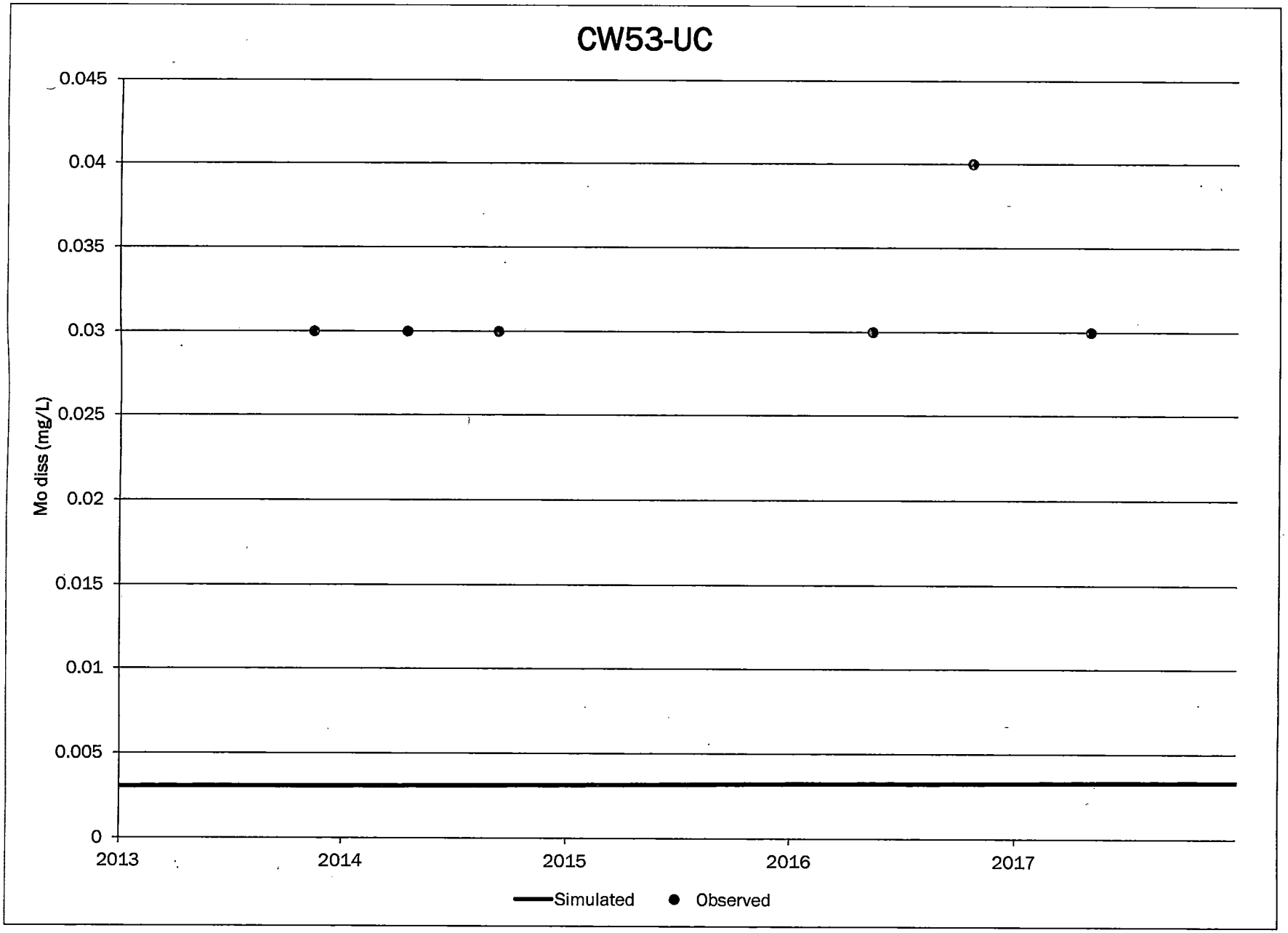

CW43-LC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

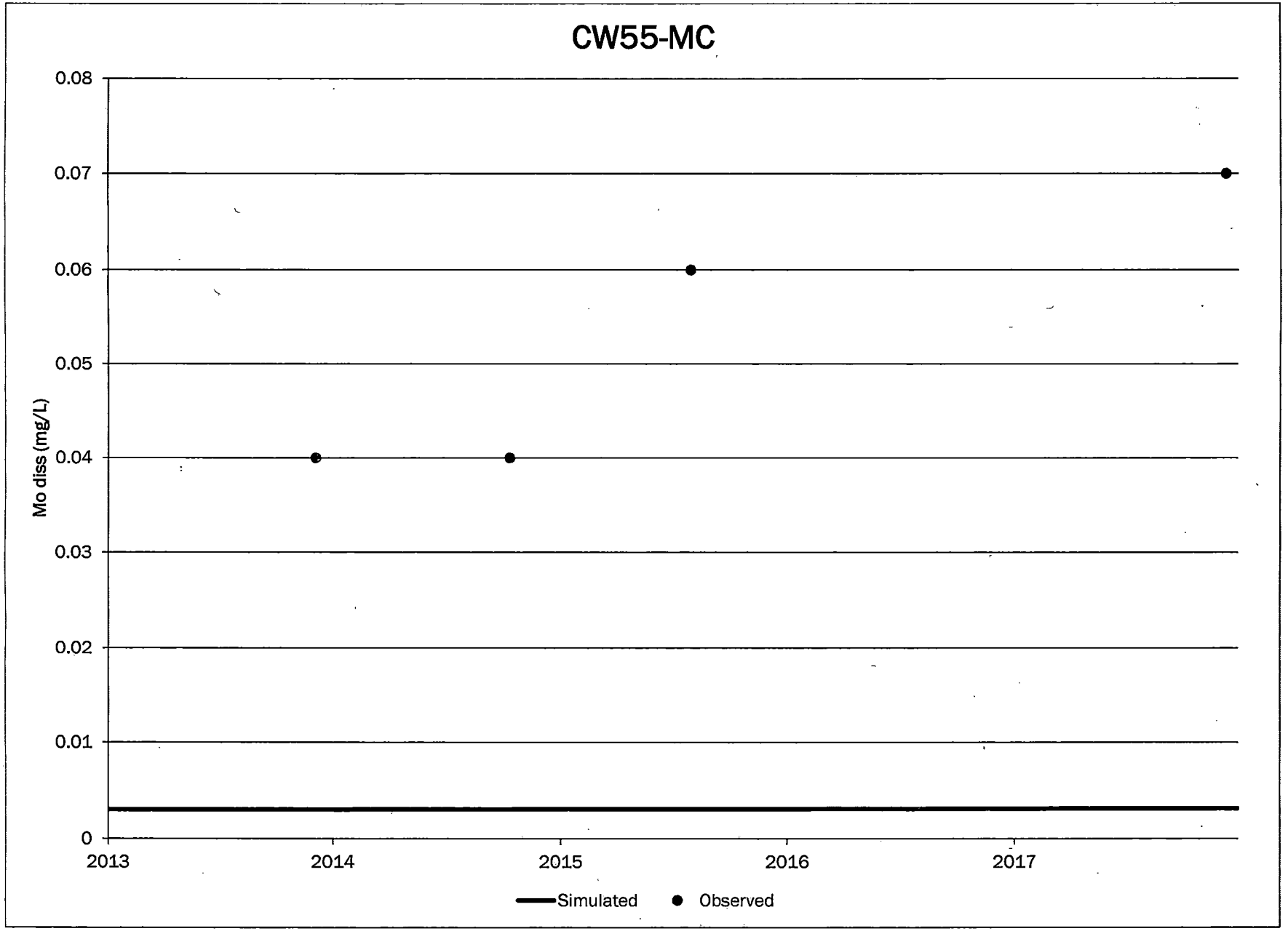

CW44-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

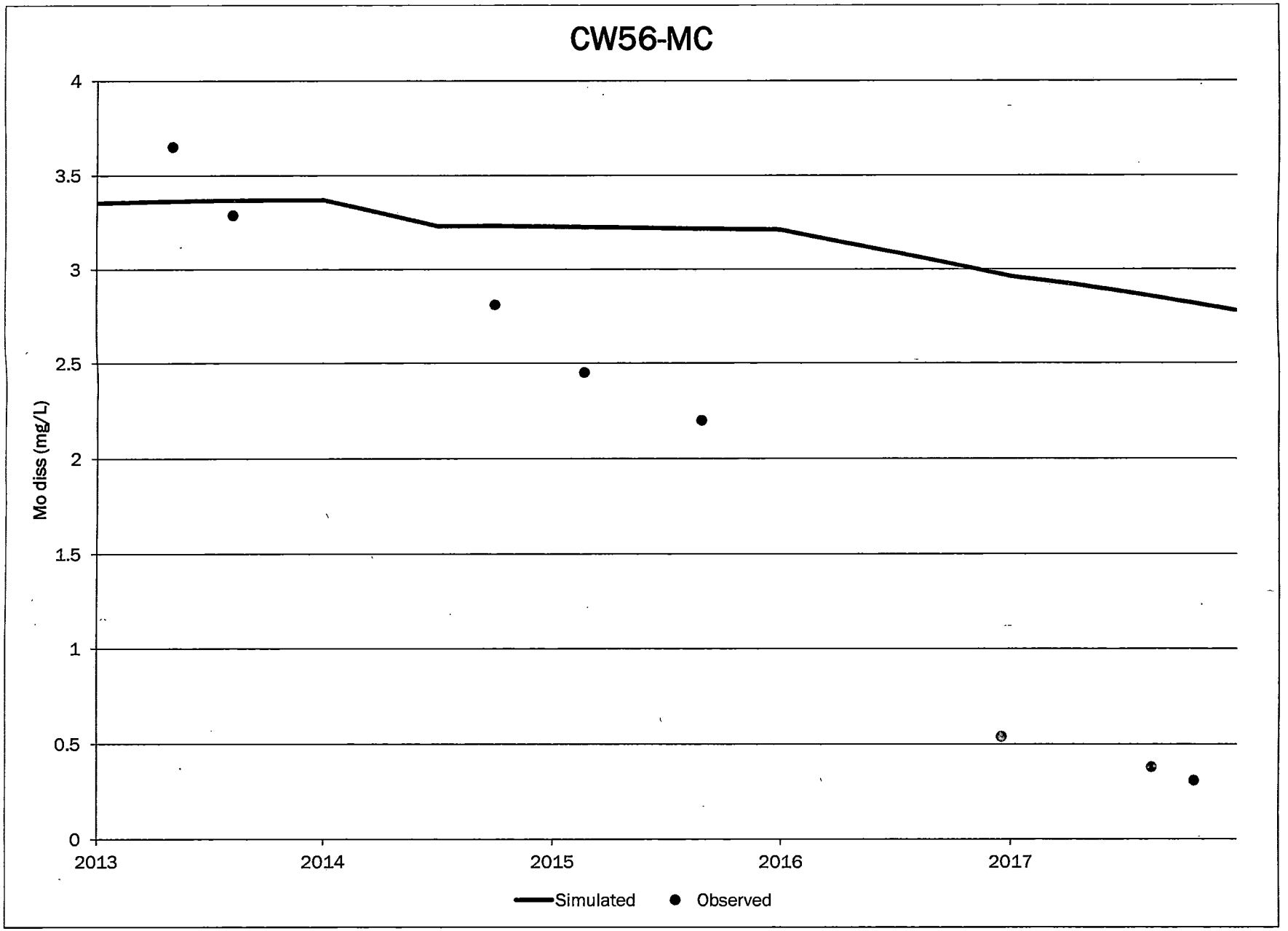

CW44-MC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

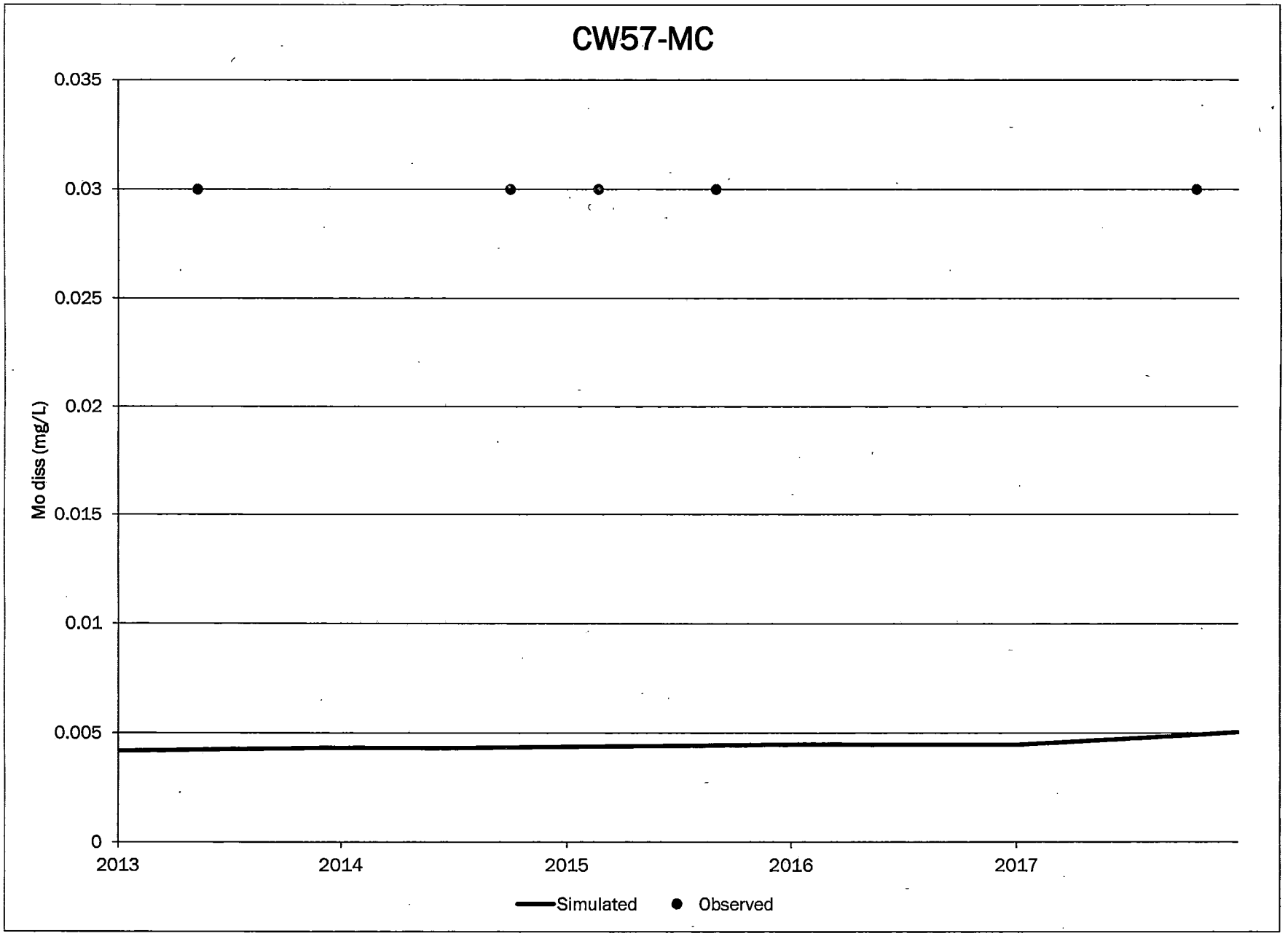

CW45-MC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

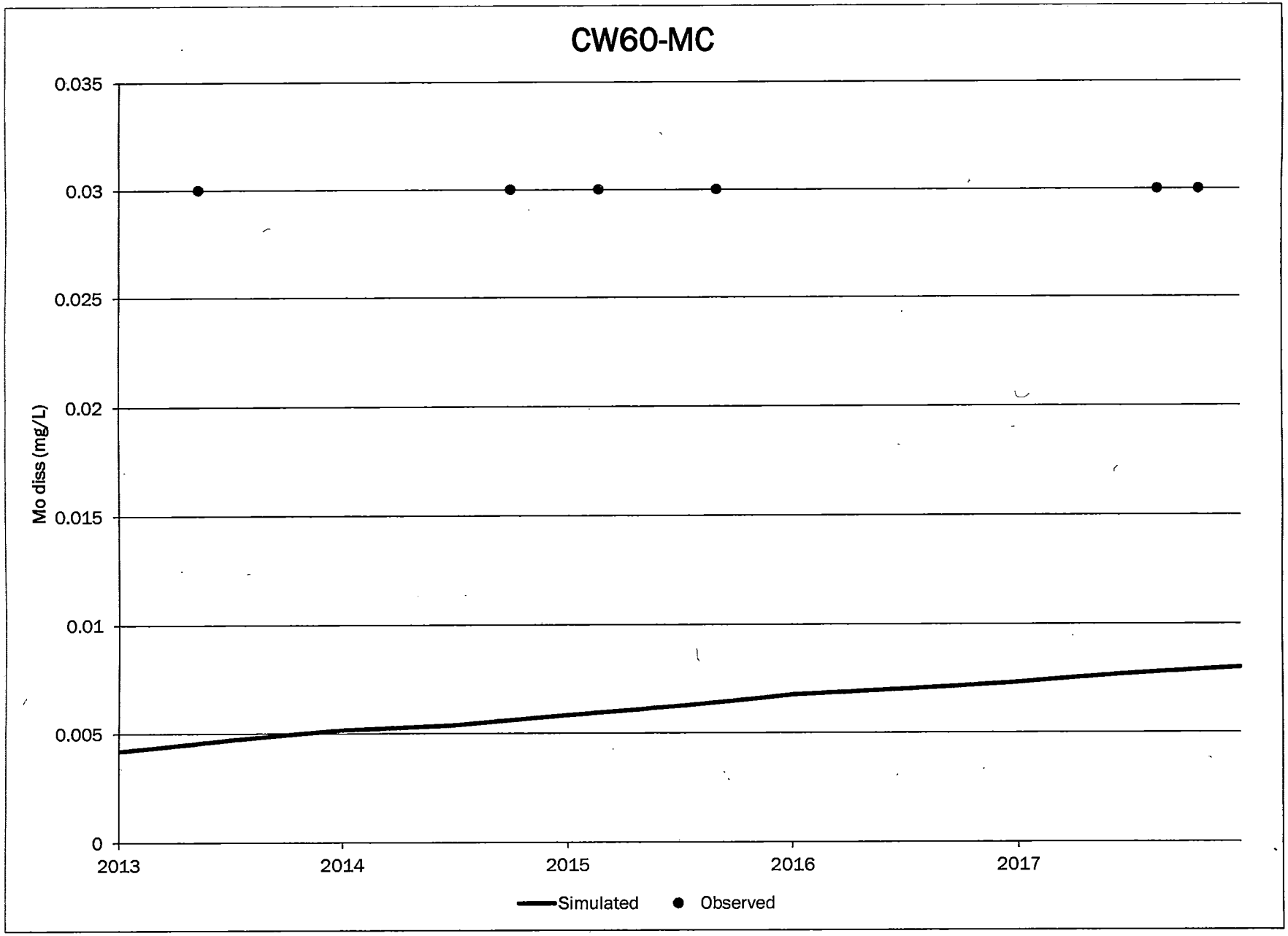

CW50-UC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

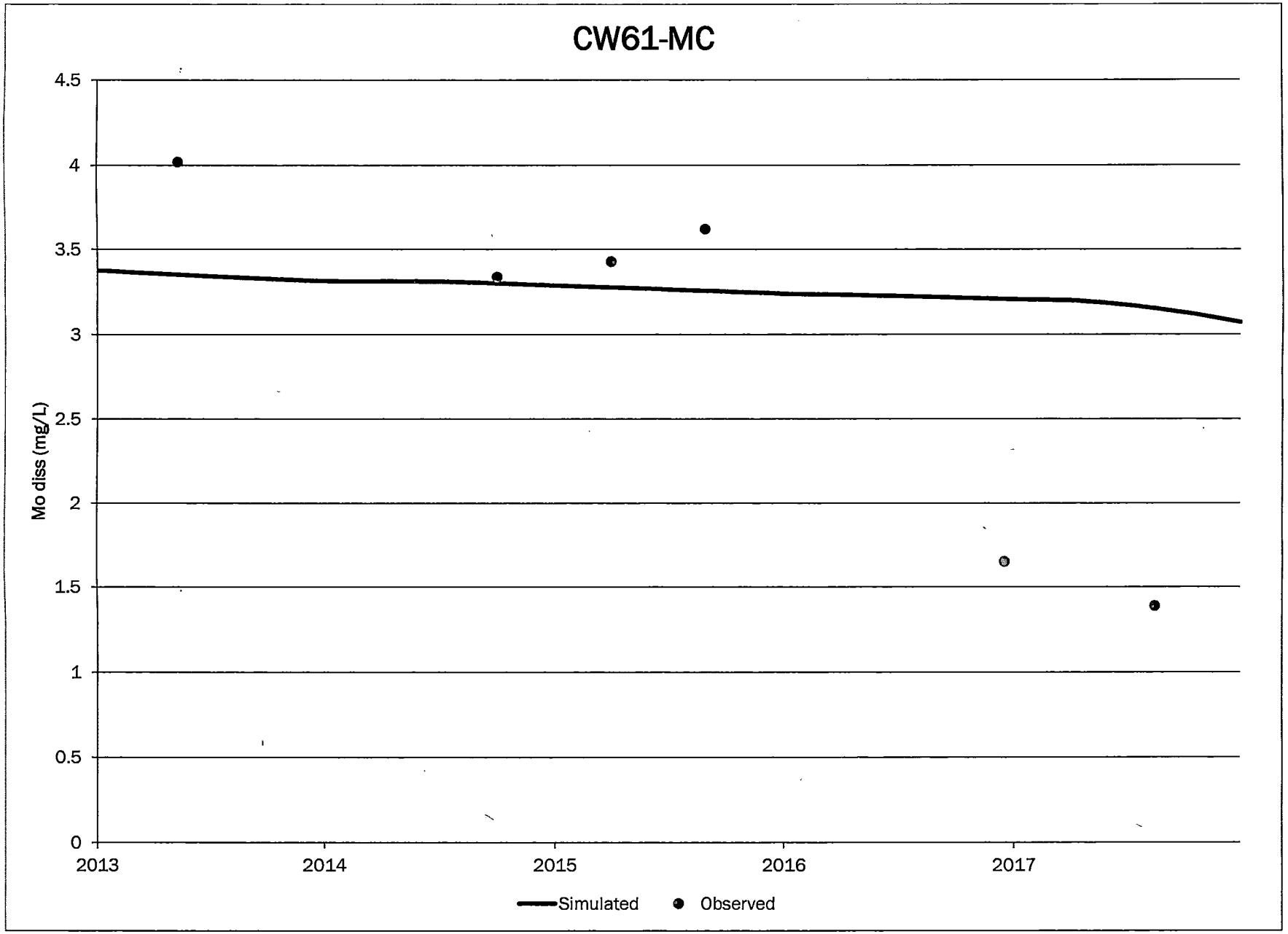

CW53-UC
Mo diss (mg/L)
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
2013
2014
2015
2016
2017
Simulated
Observed

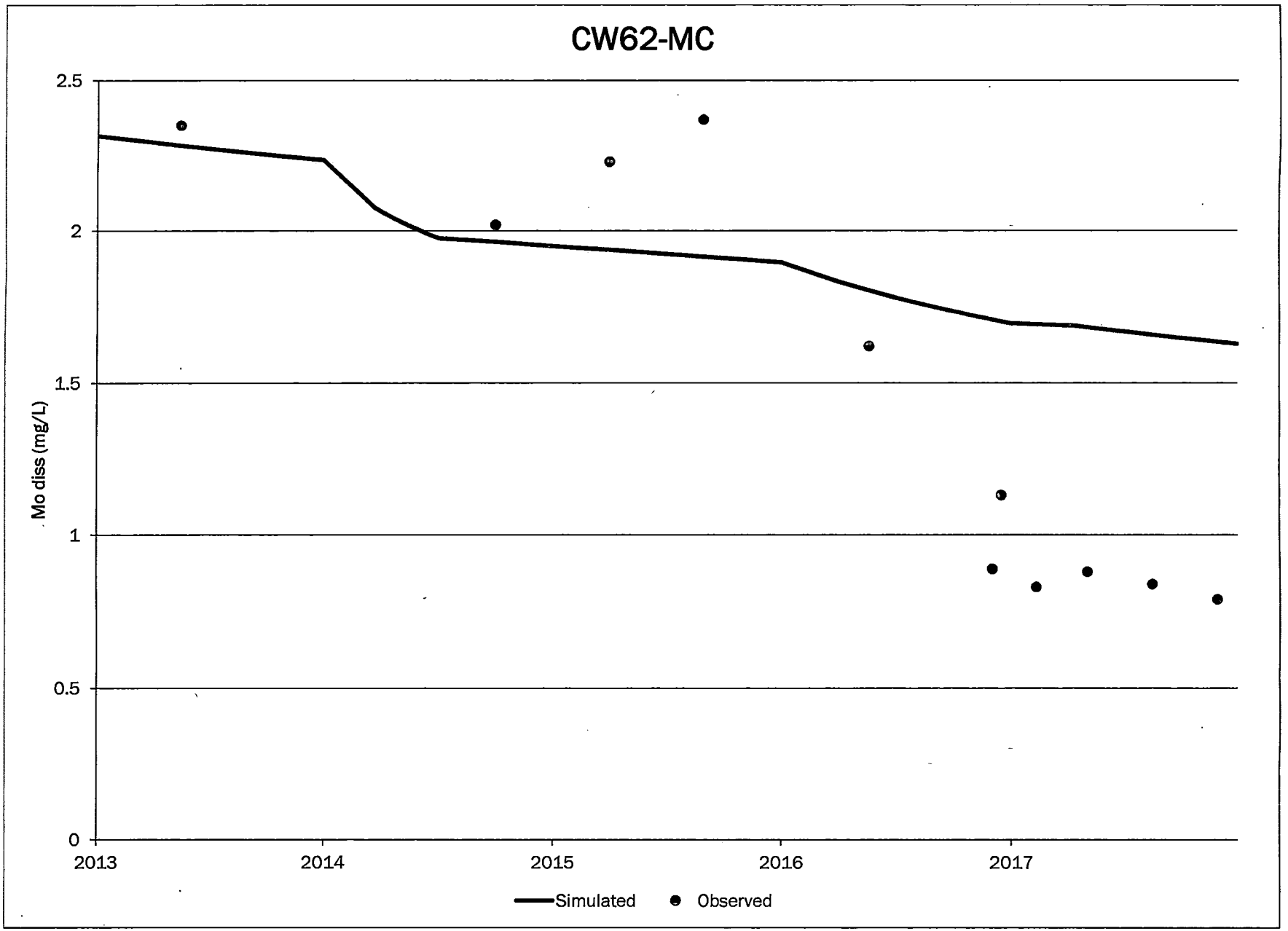

CW55-MC
Mo diss (mg/L)
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
2013
2014
2015
2016
2017
Simulated
Observed

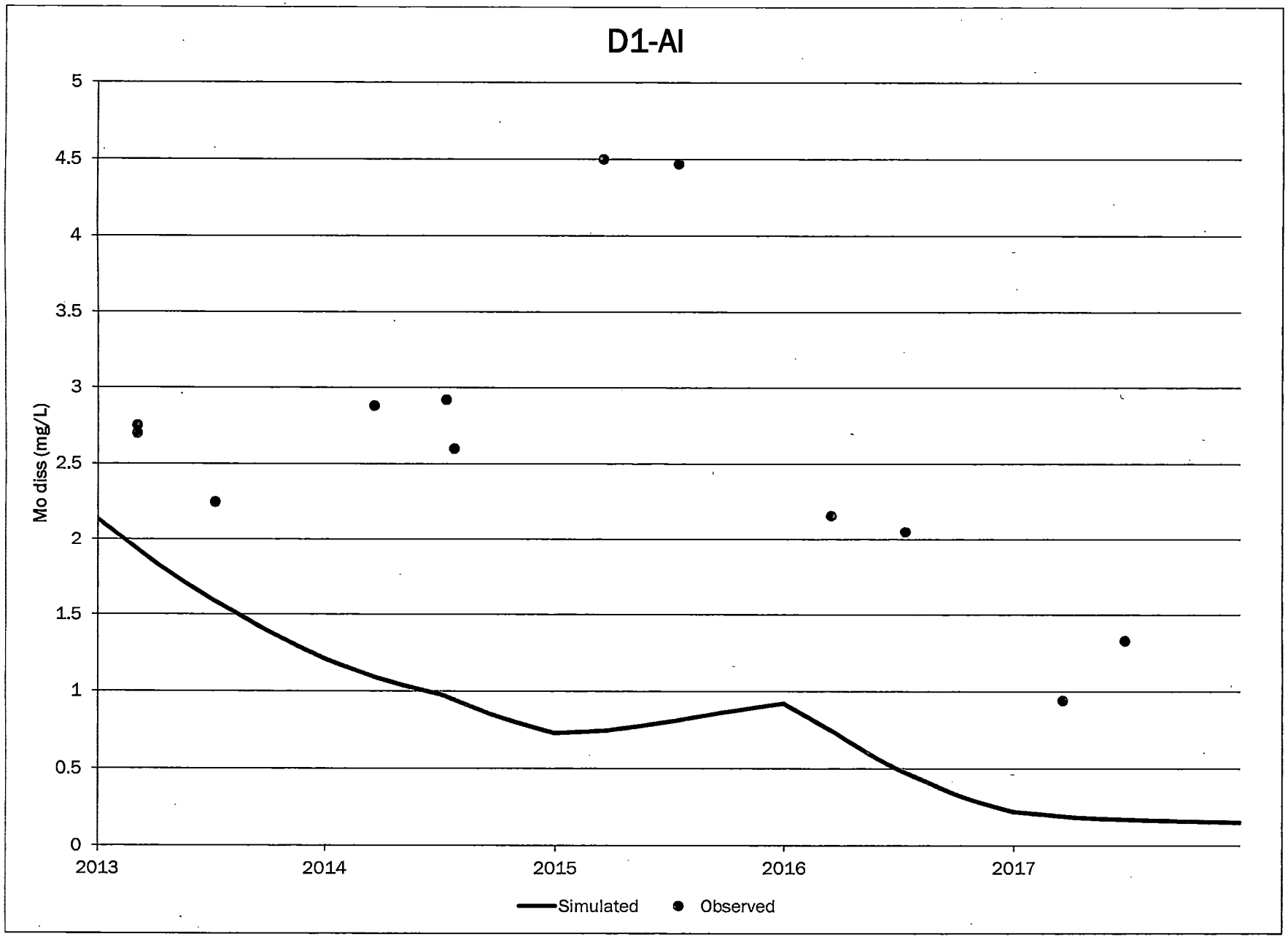

CW56-MC
Mo diss (mg/L)
4
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

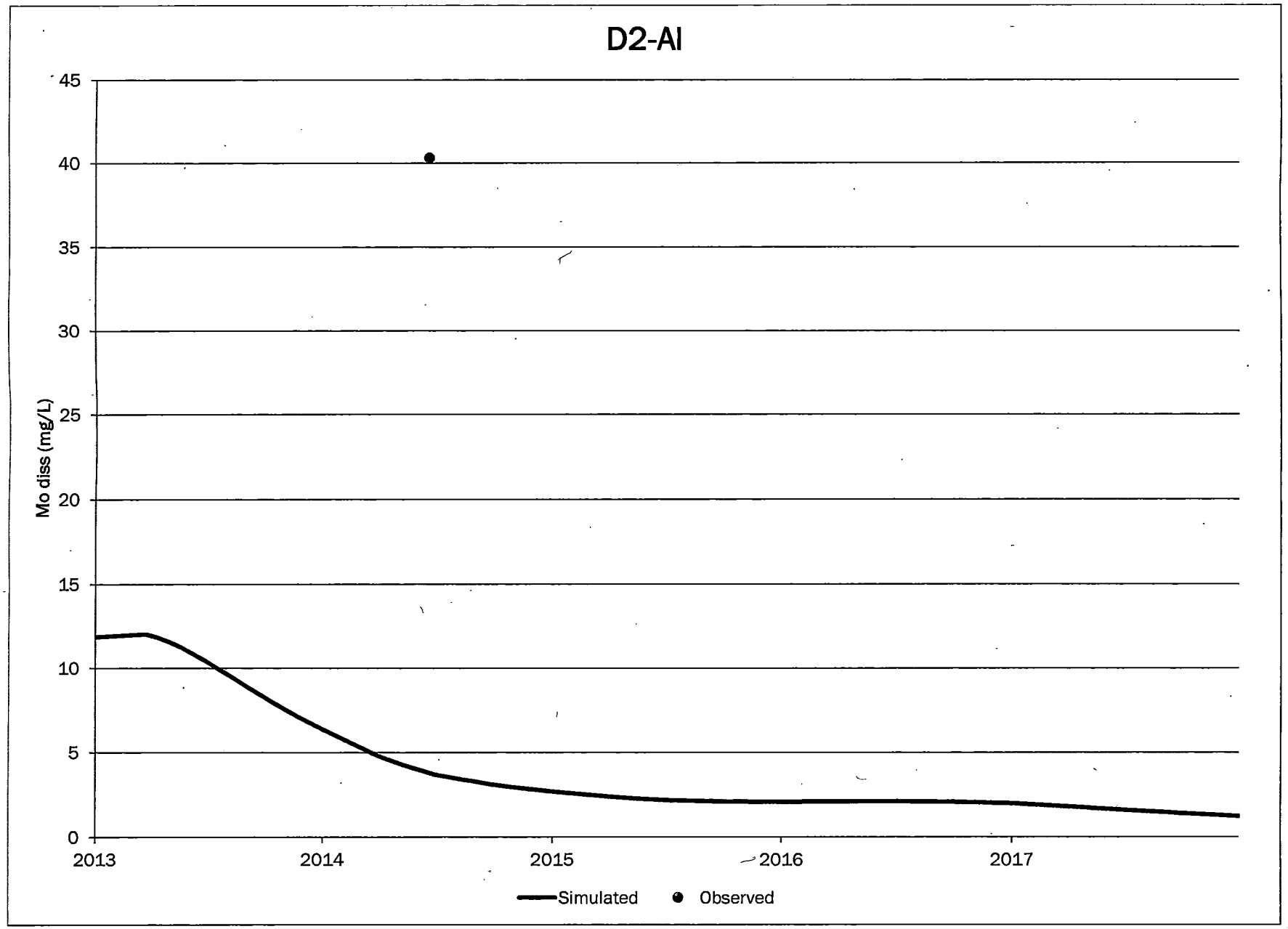

CW57-MC
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

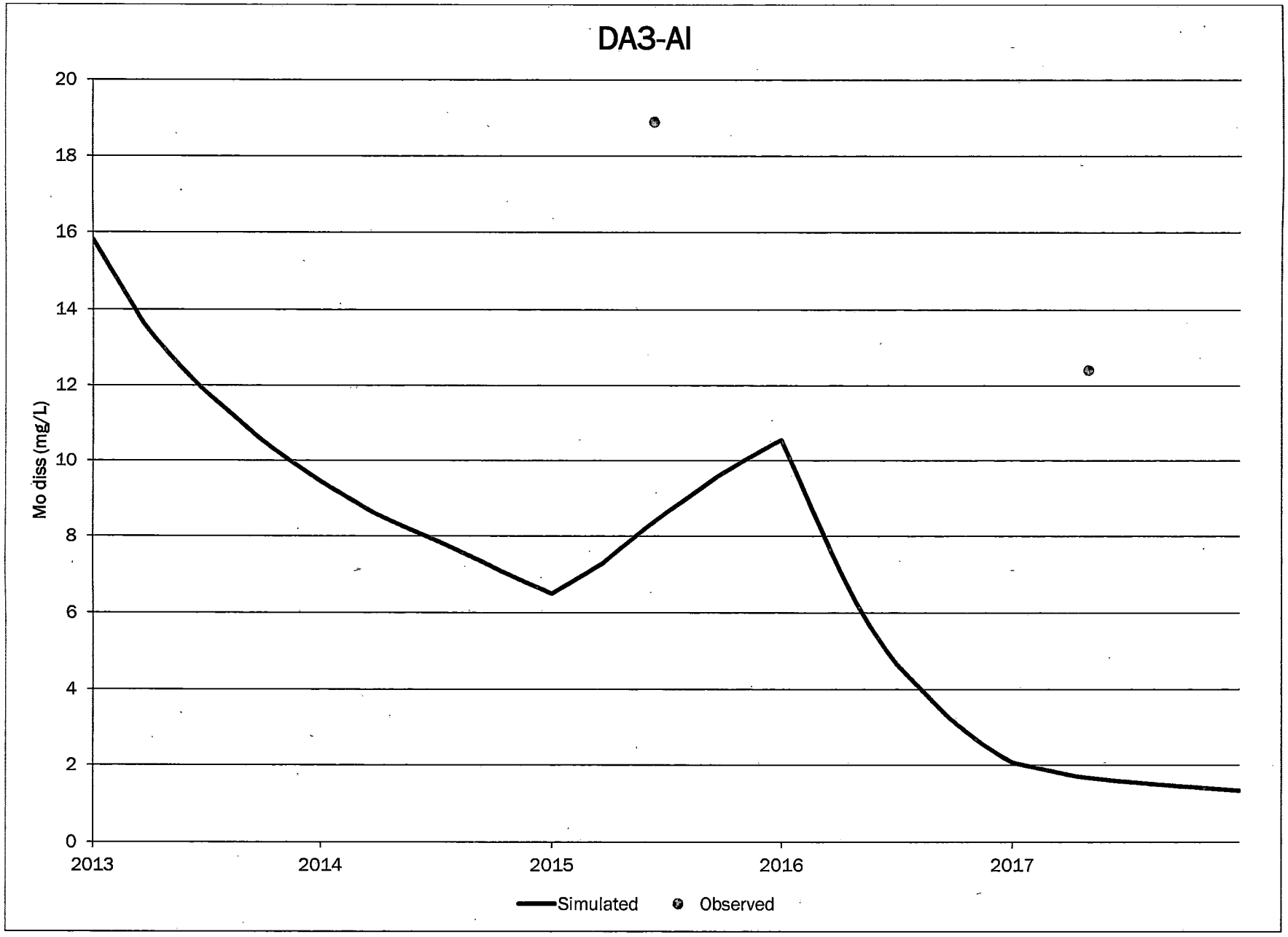

CW60-MC
Mo diss (mg/L)
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
2013
2014
2015
2016
2017
Simulated
Observed

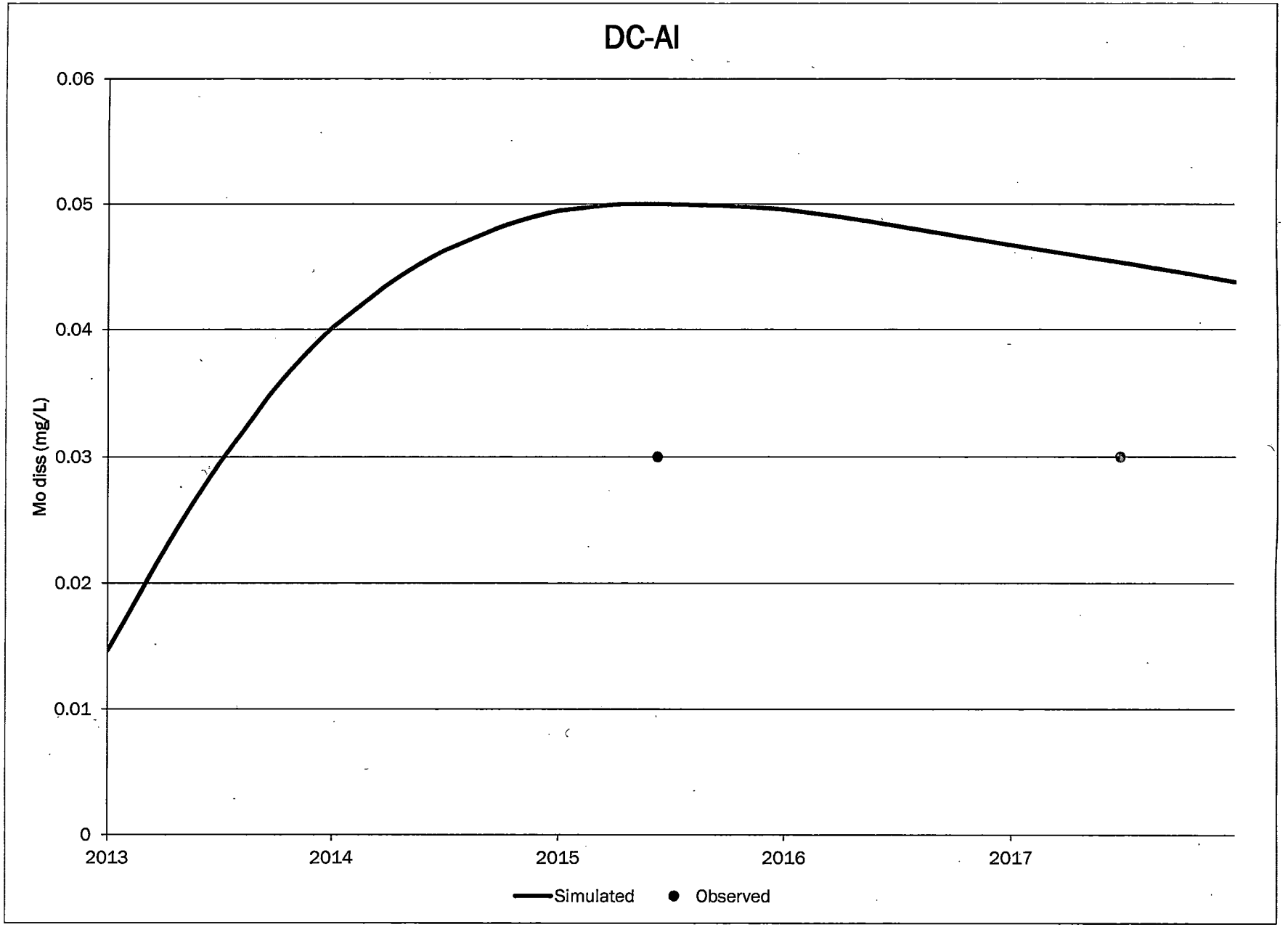

CW61-MC
Mo diss (mg/L)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

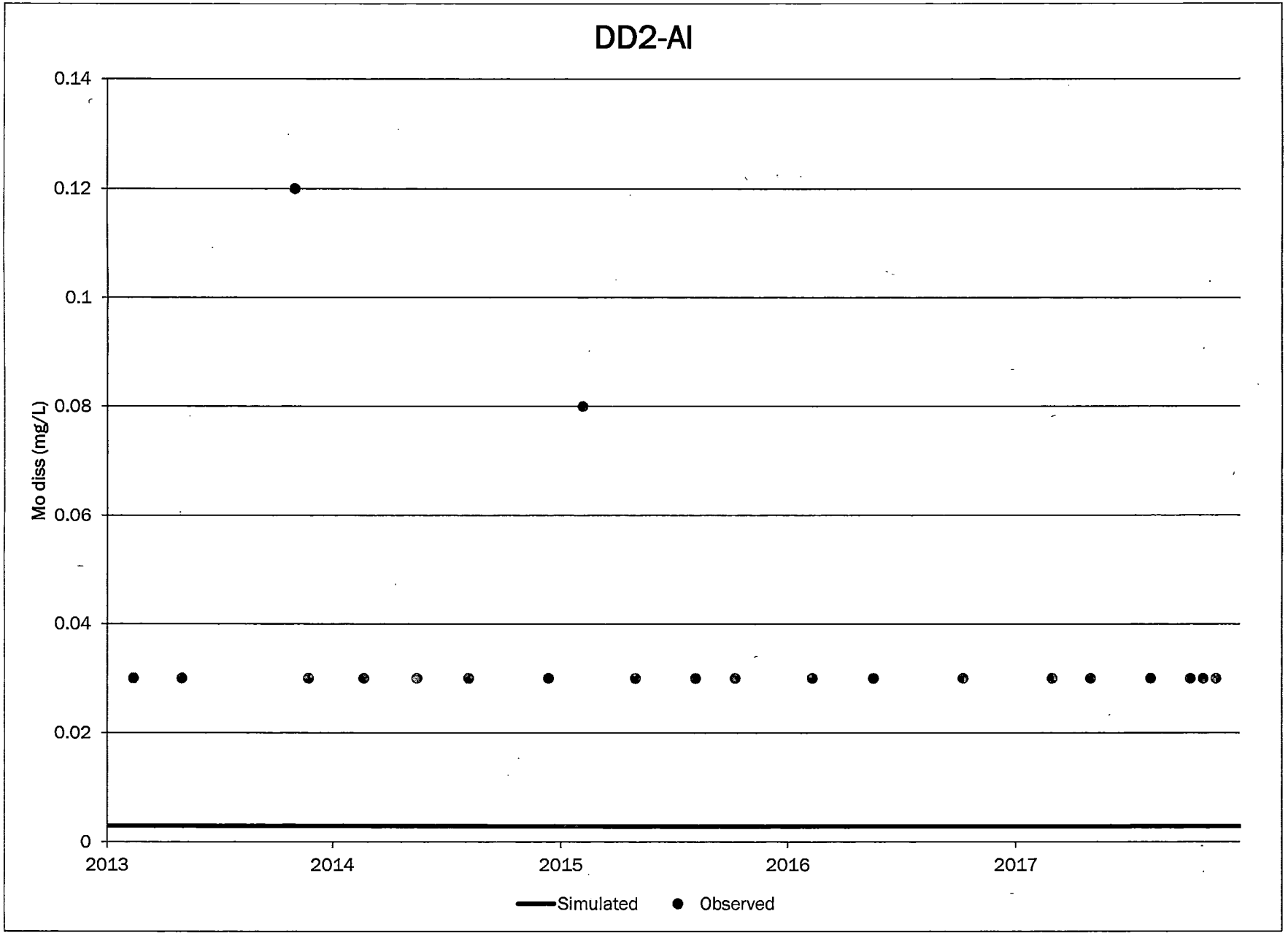

CW62-MC
Mo diss (mg/L)
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

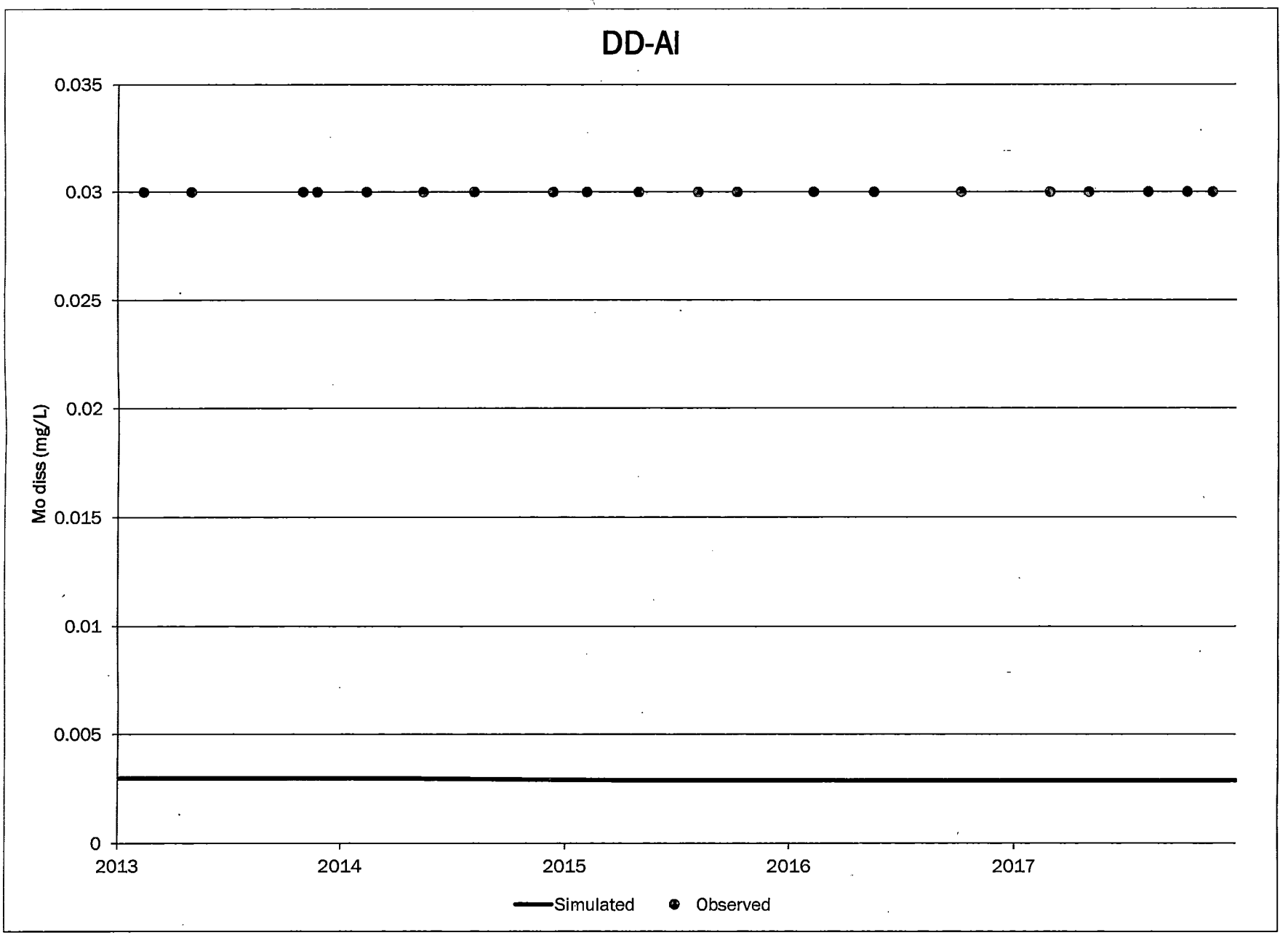

D1-AI
Mo diss (mg/L)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

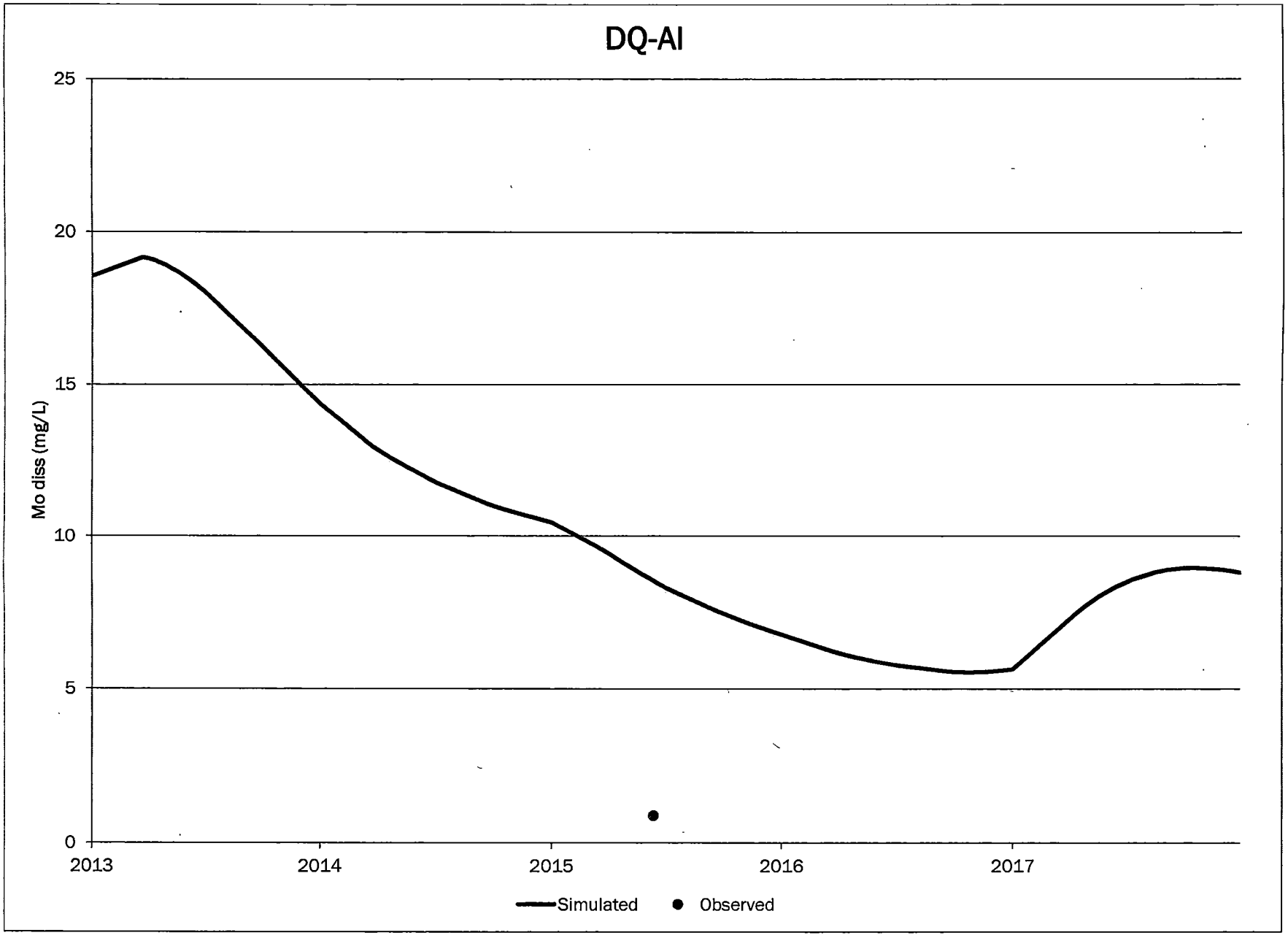

D2-AI
Mo diss (mg/L)
45
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

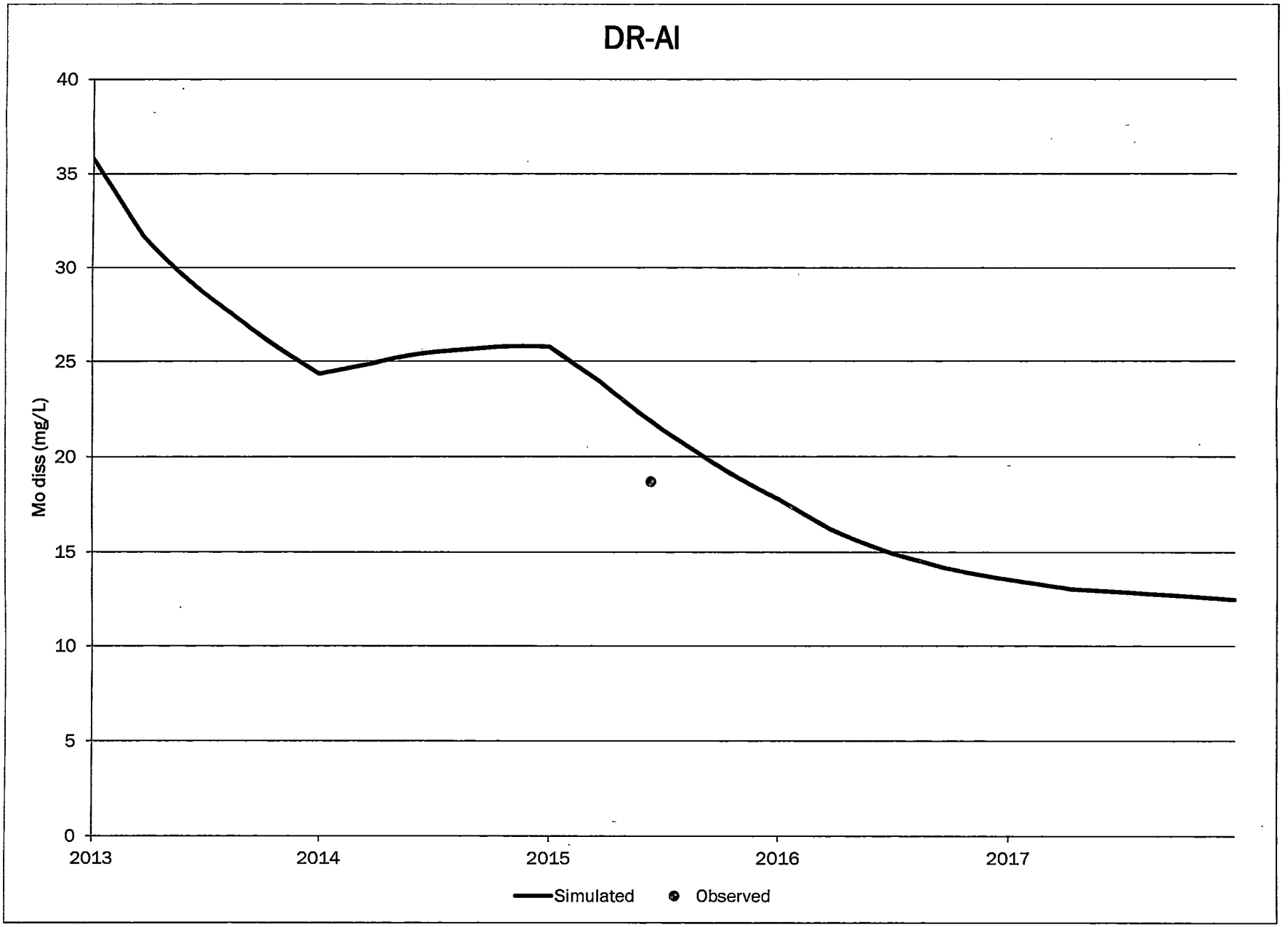

DA3-AI
Mo diss (mg/L)
20
18
16
14
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

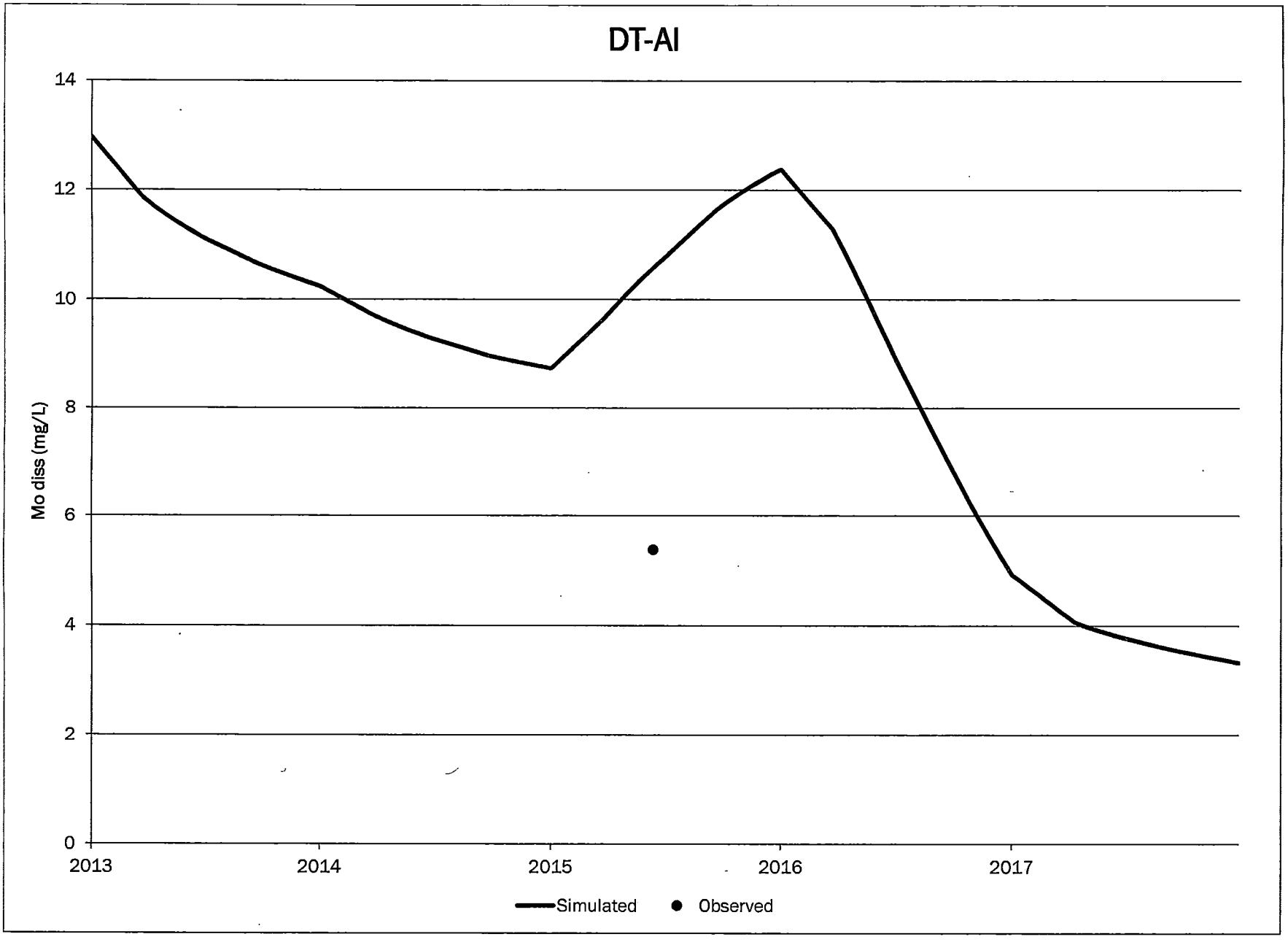

DC-AI
0.06
0.05
0.04
0.03
0.02
0.01
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

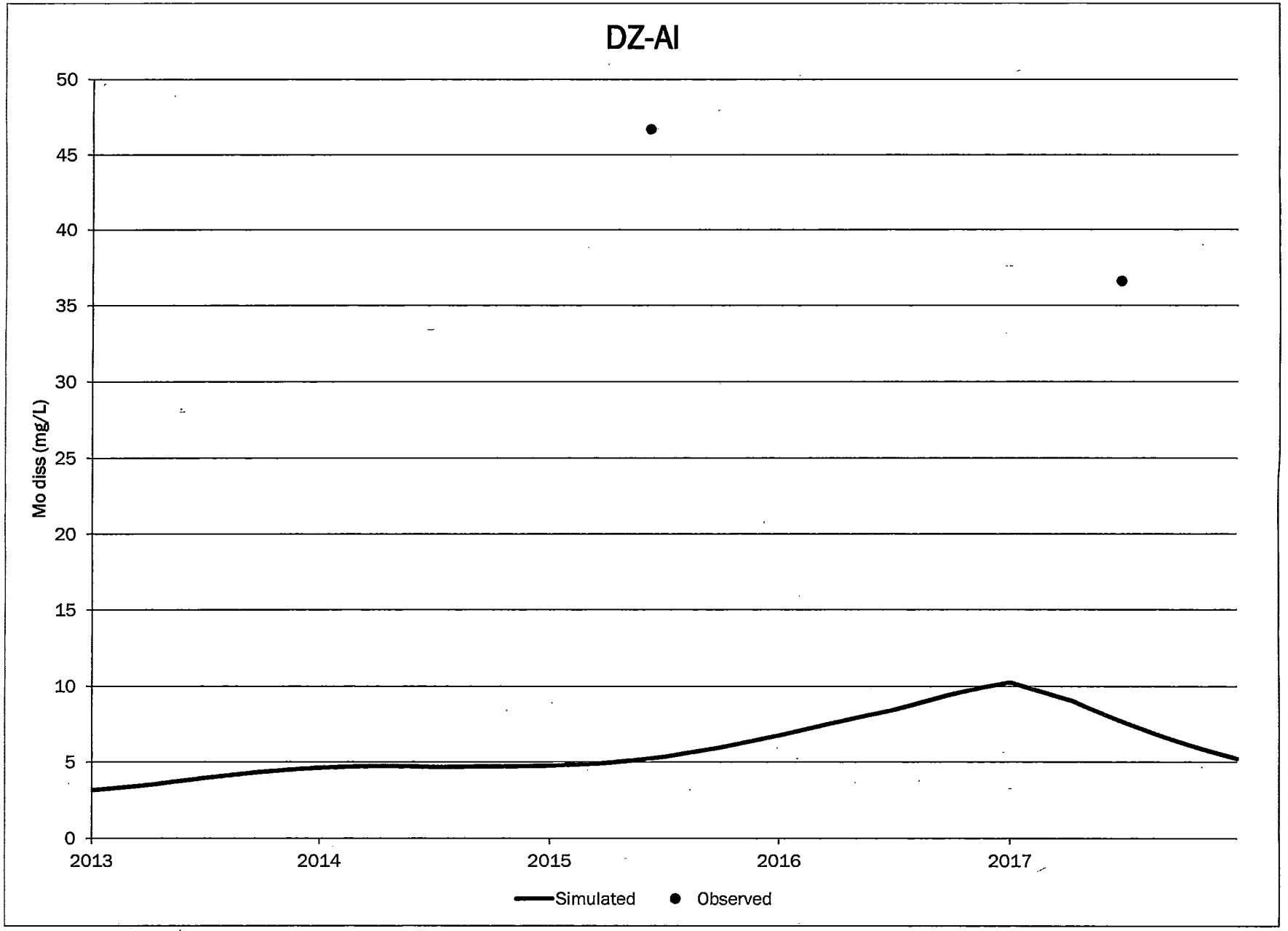

DD2-AI
Mo diss (mg/L)
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
2013
2014
2015
2016
2017
Simulated
Observed

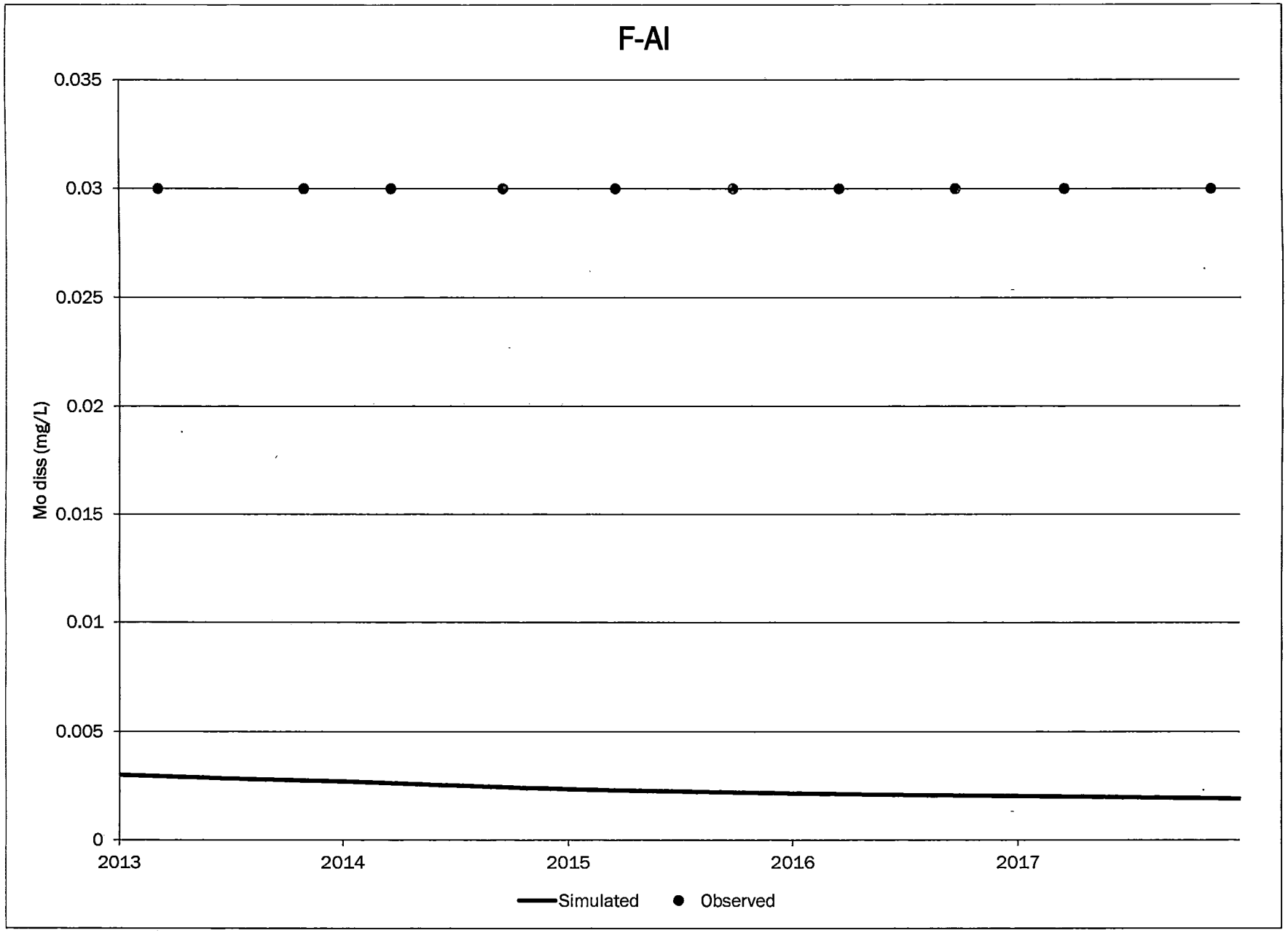

DD-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

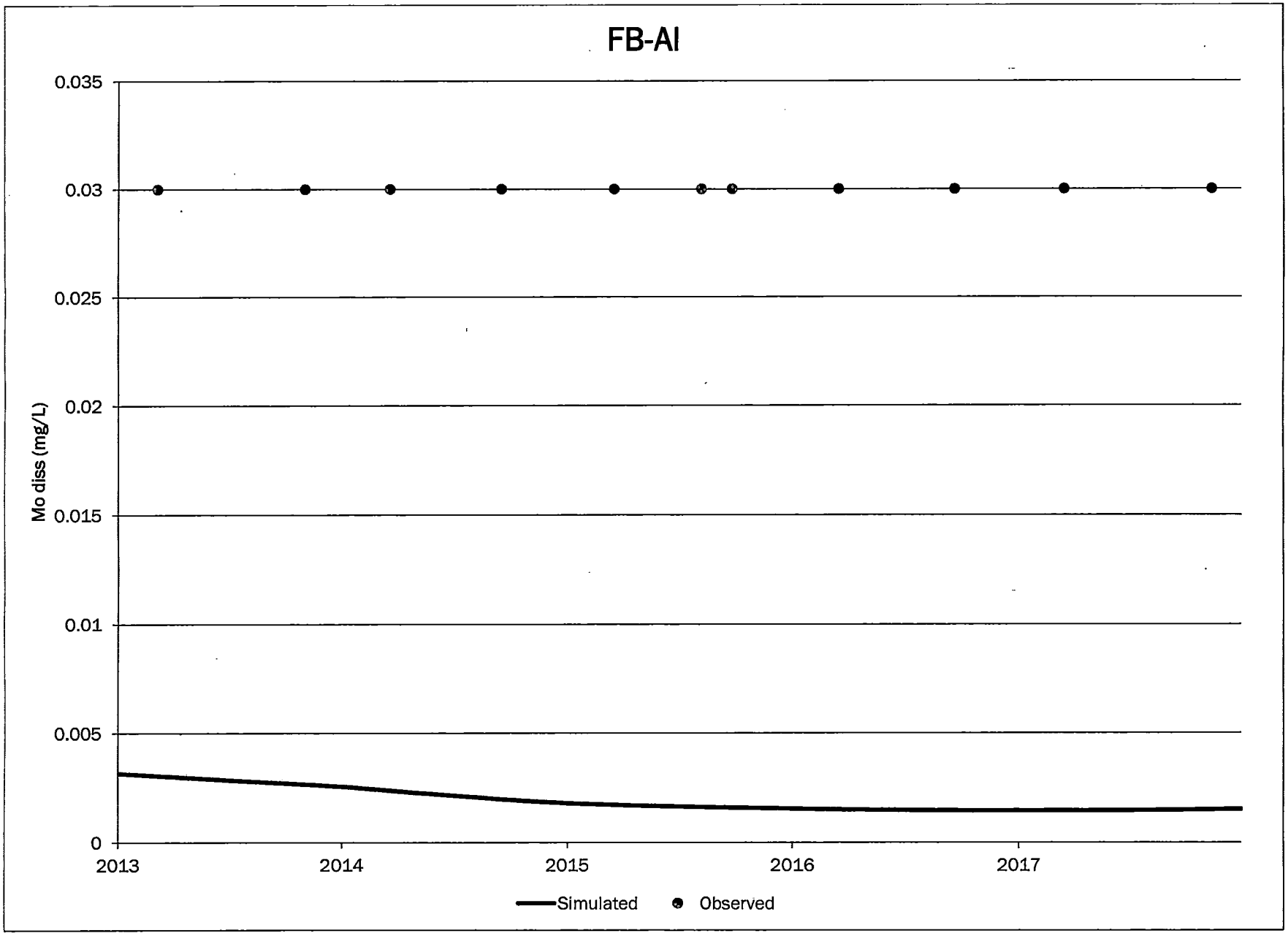

DQ-AI
Mo diss (mg/L)
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

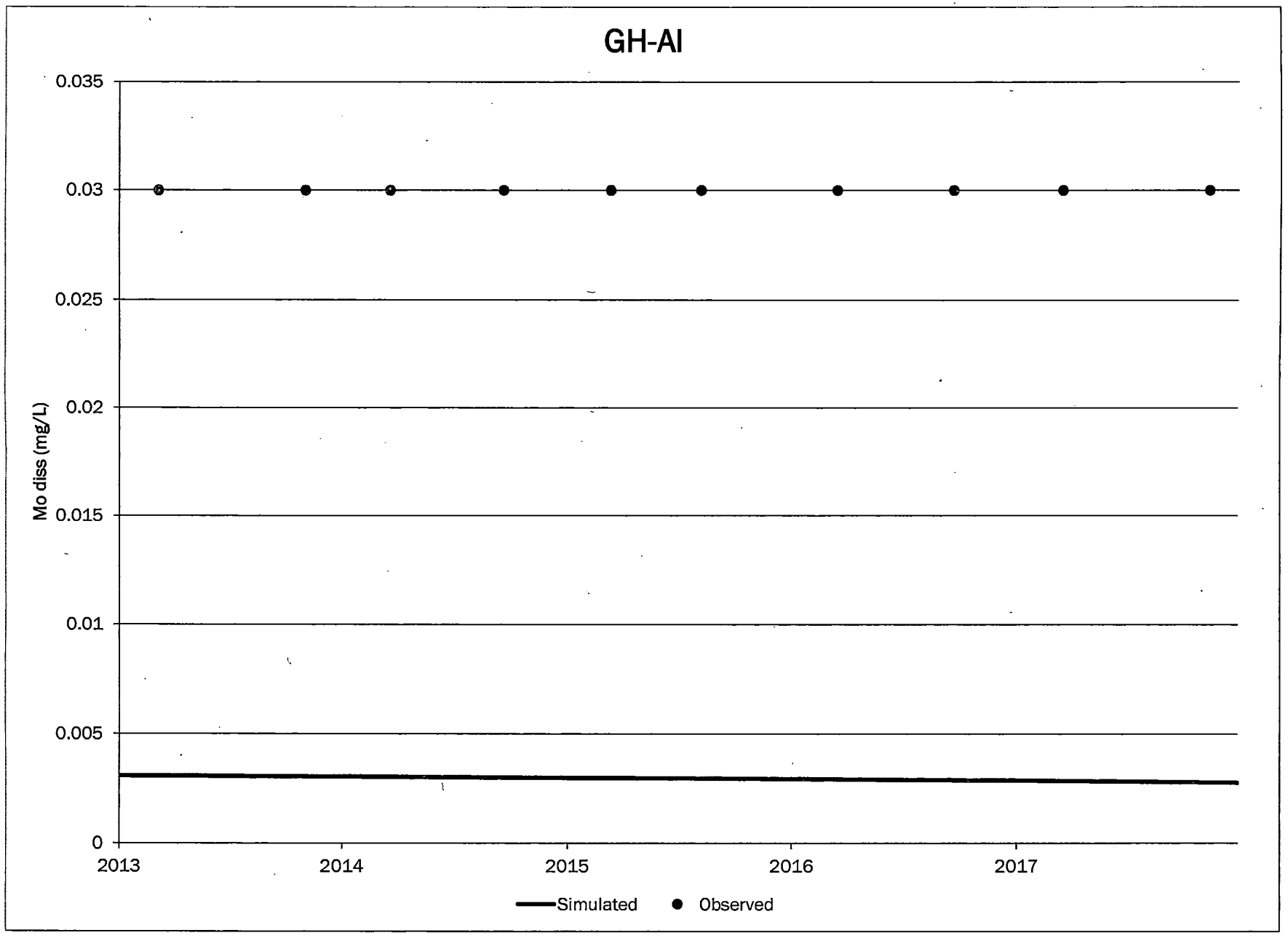

DR-AI
Mo diss (mg/L)
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

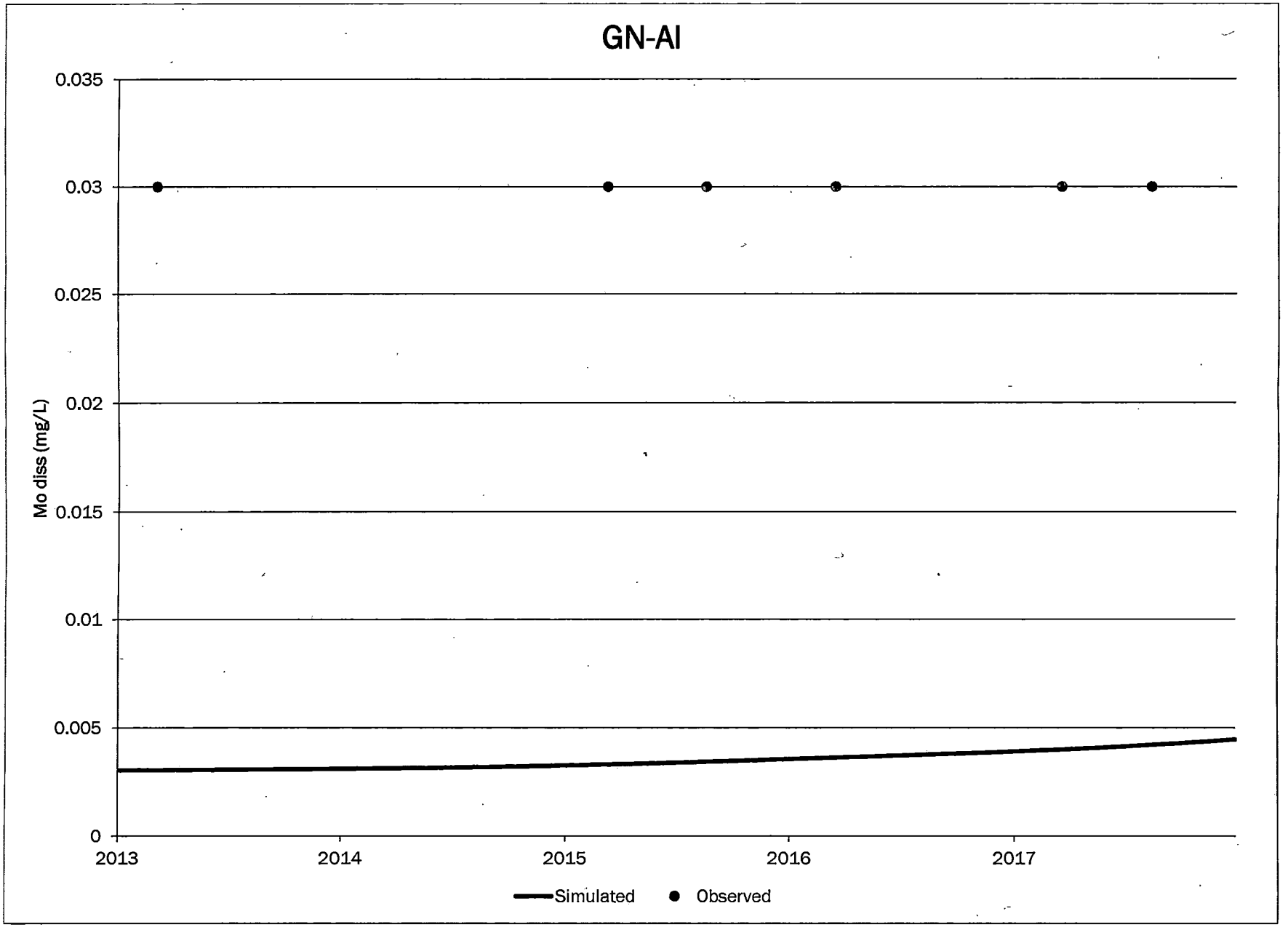

DT-AI
Mo diss (mg/L)
14
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

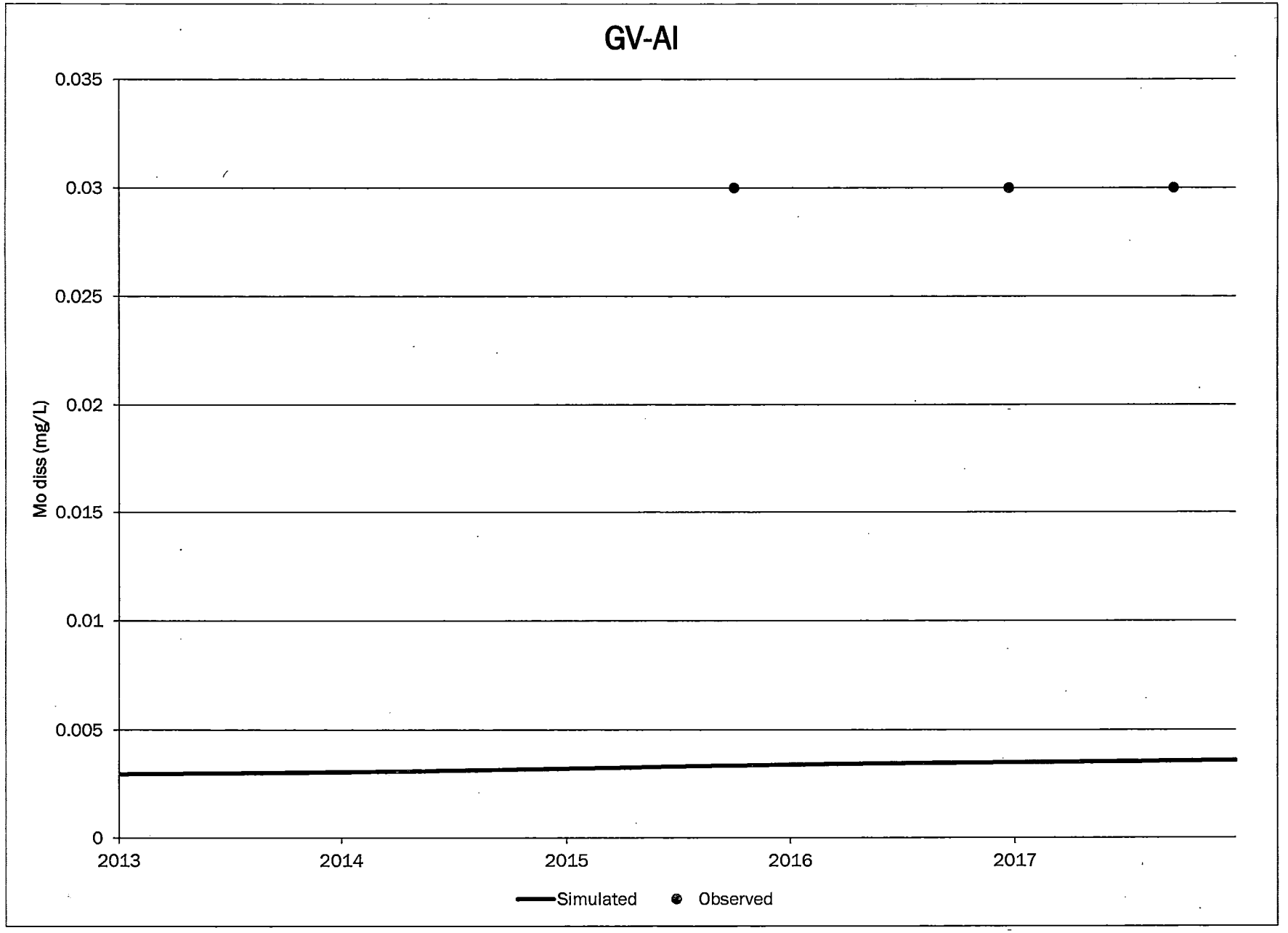

DZ-AI
Mo diss (mg/L)
50
45
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

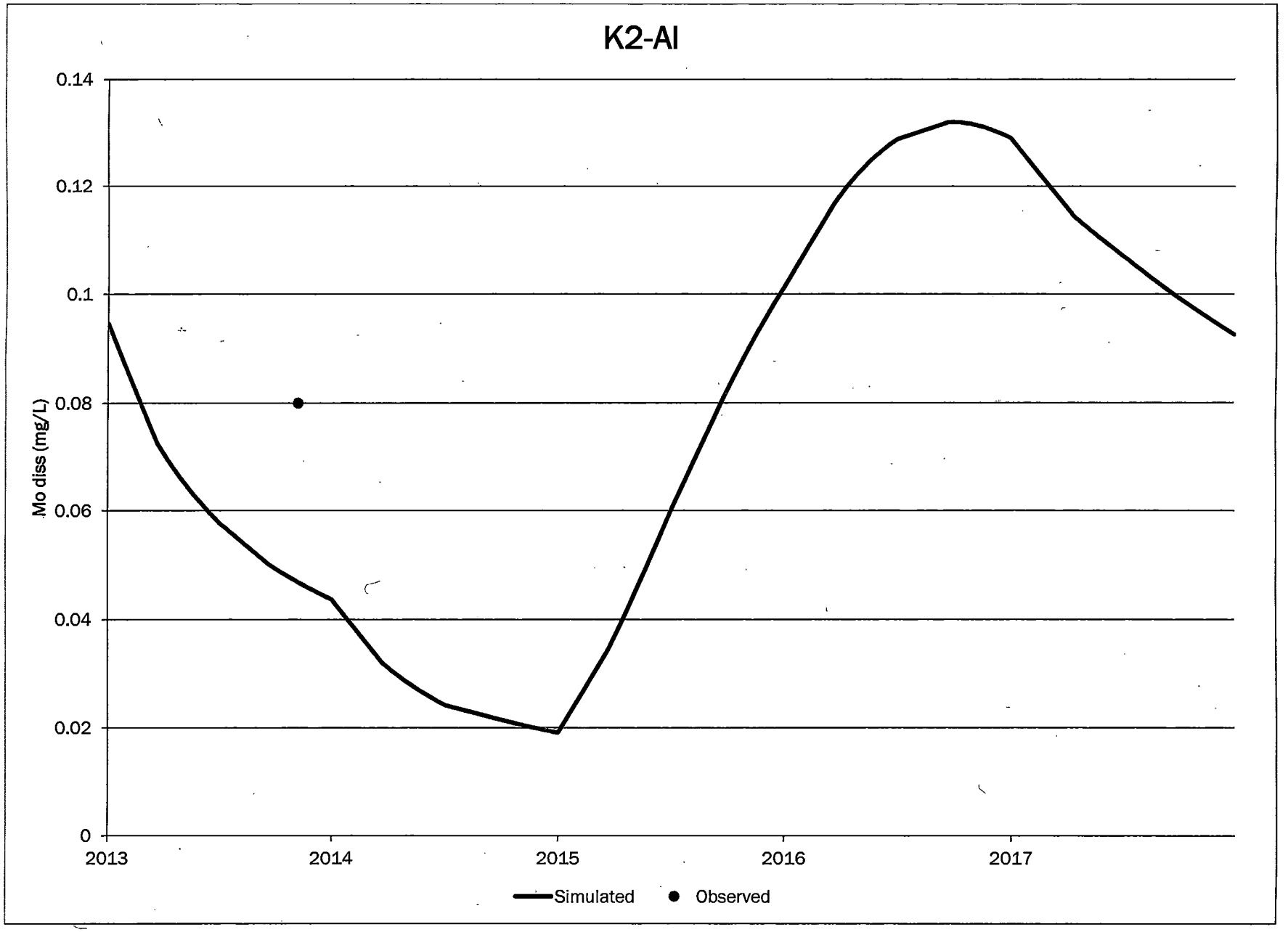

F-Al
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

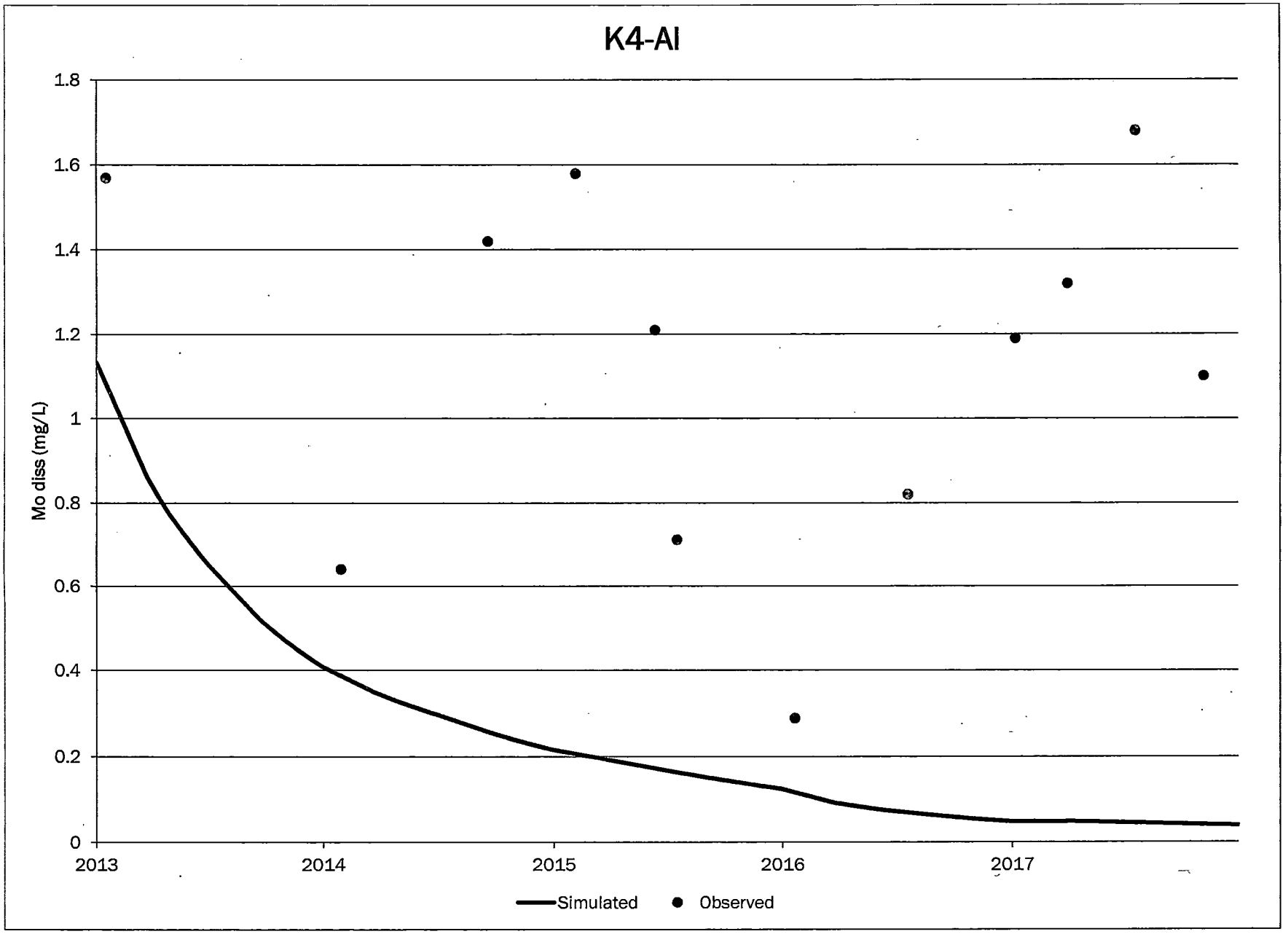

FB-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

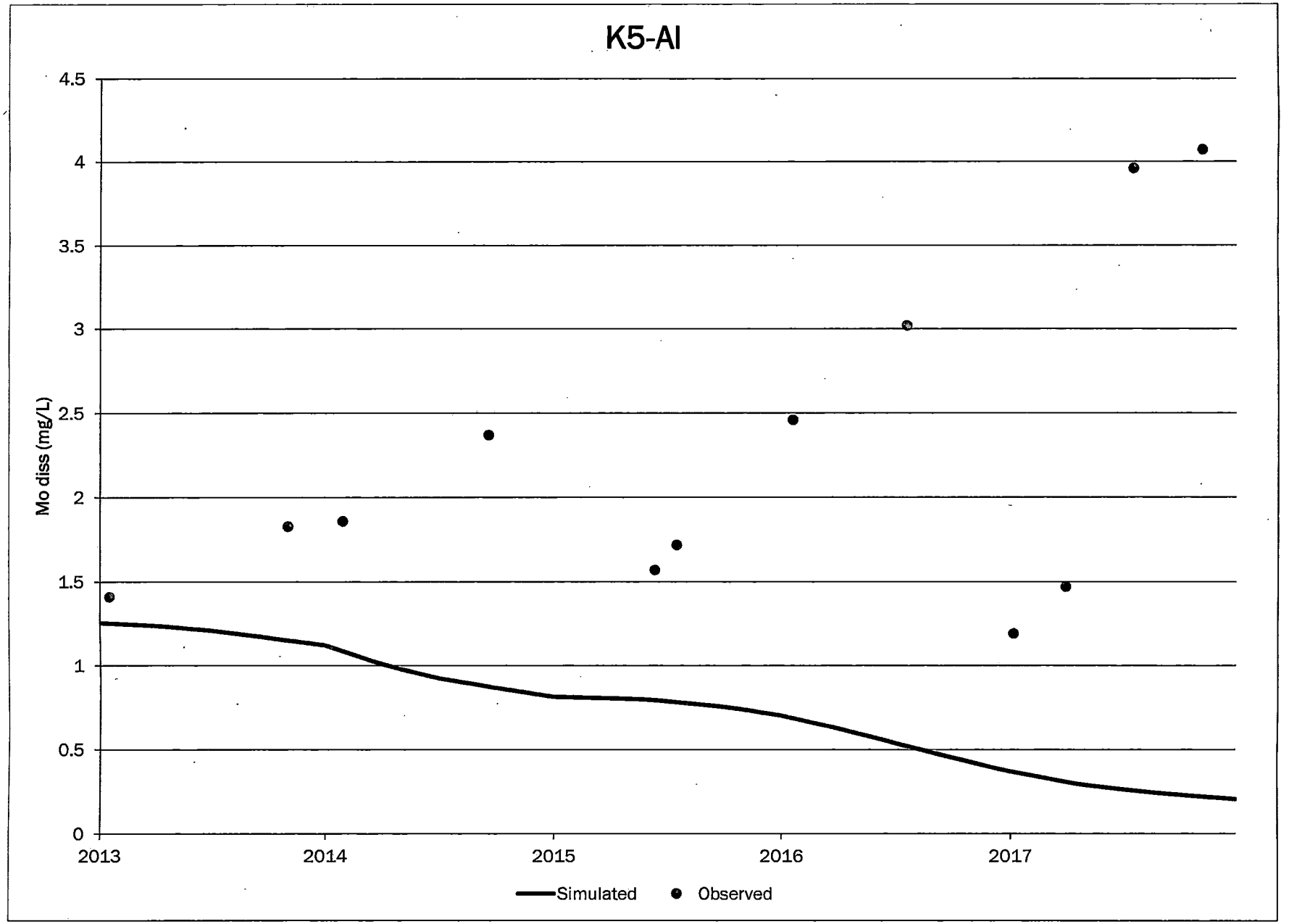

GH-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

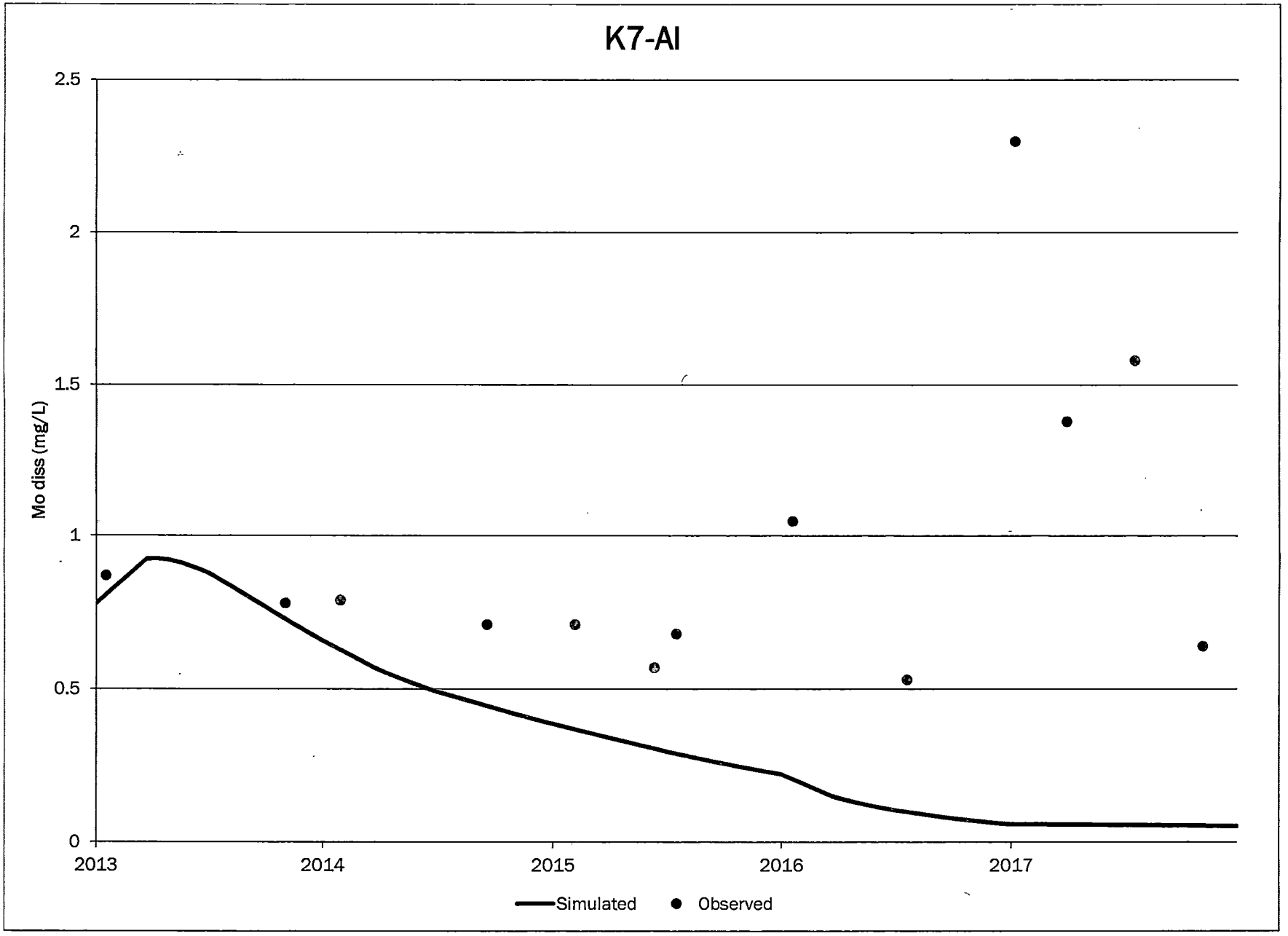

GN-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

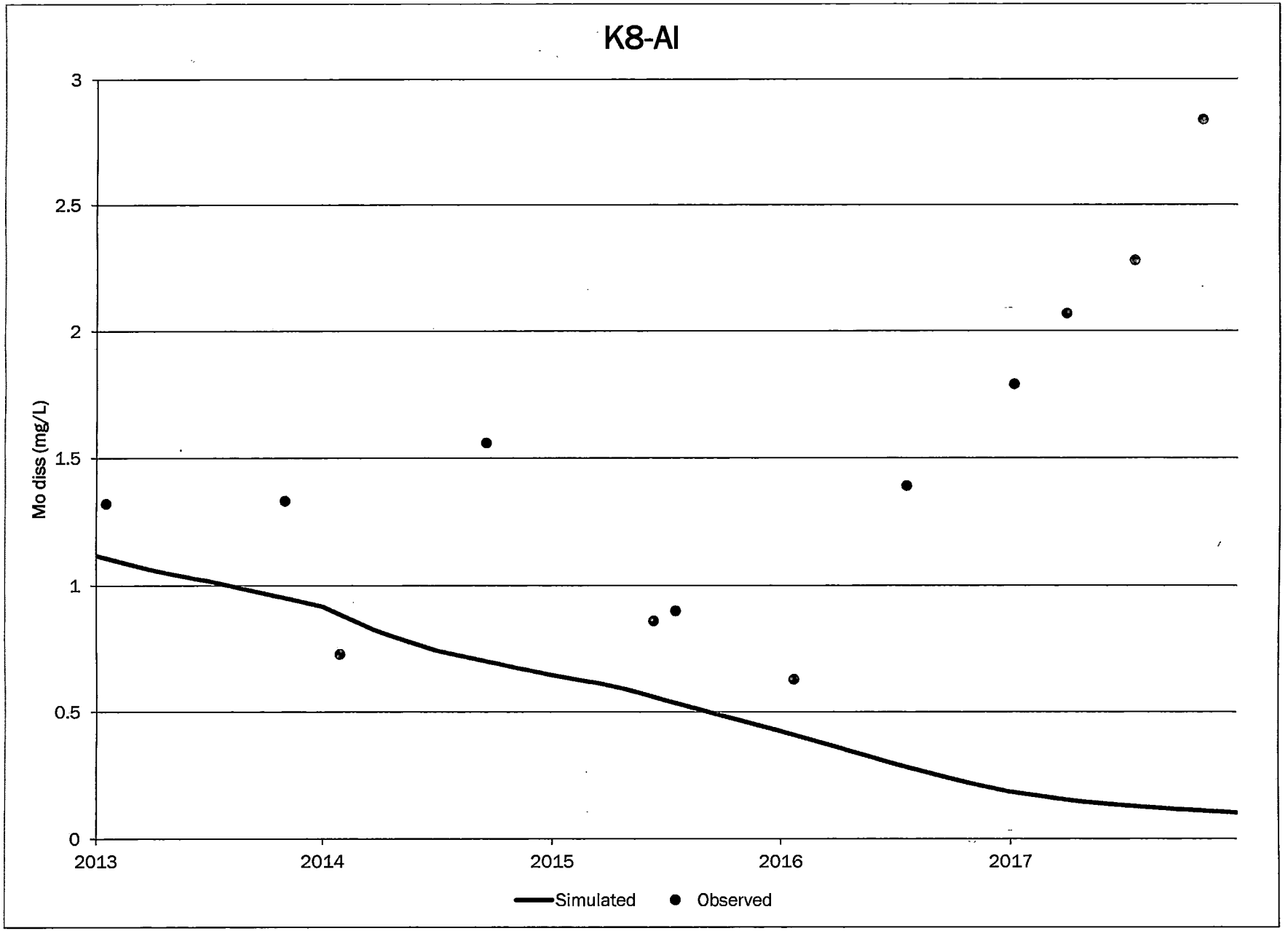

GV-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

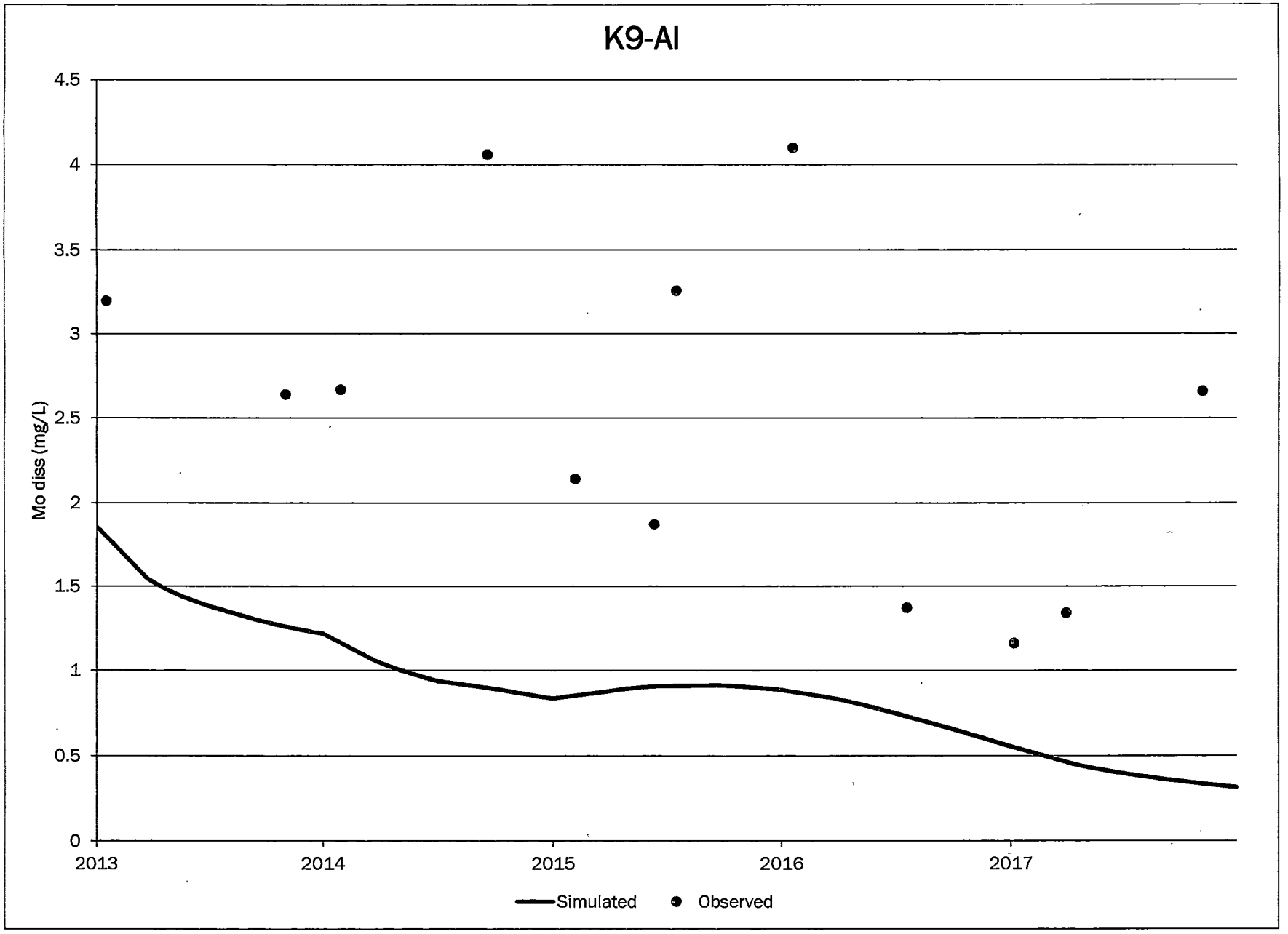

K2-AI
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

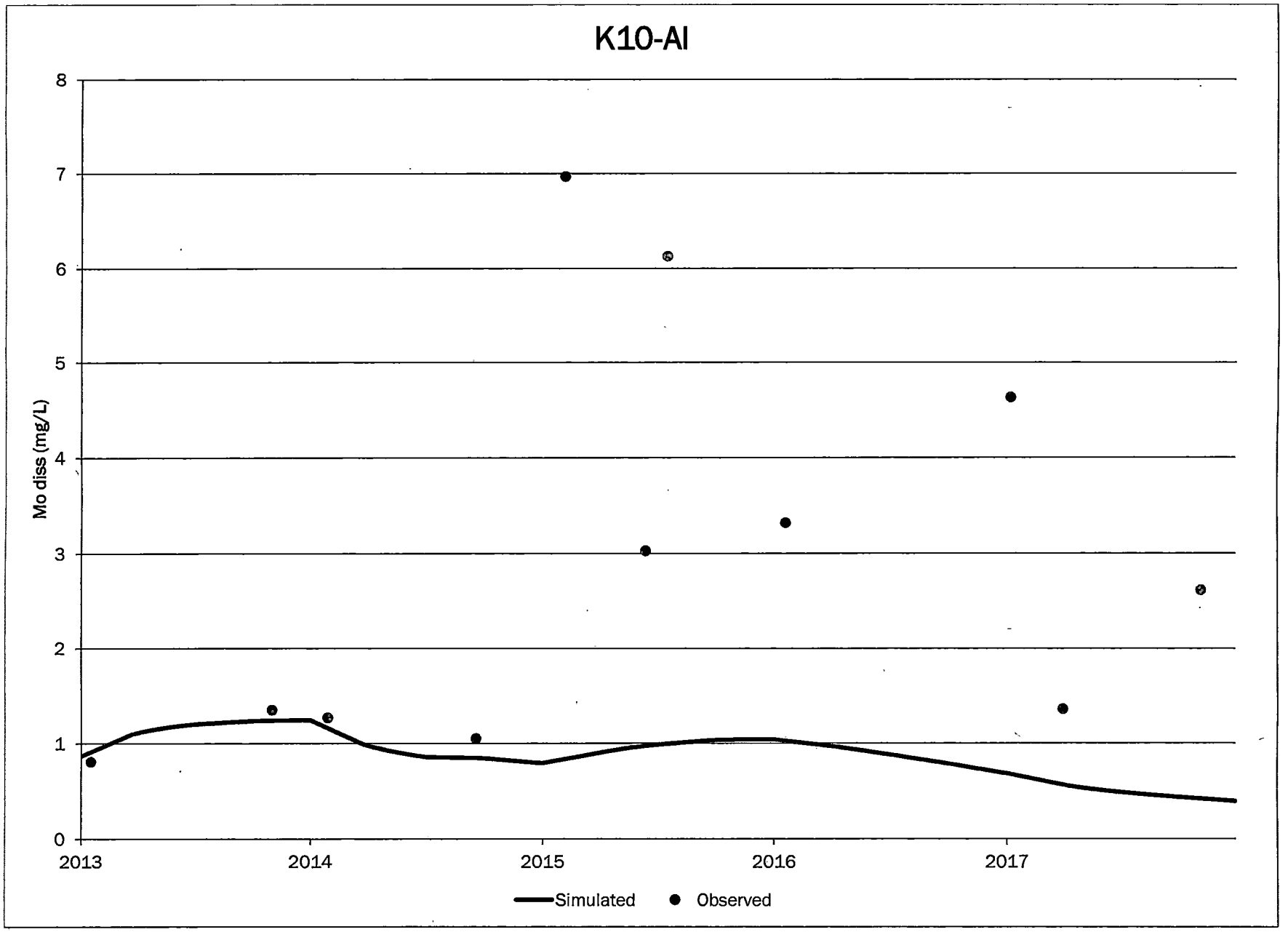

K4-AI
Mo diss (mg/L)
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2013
2014
2015
2016
2017
Simulated
Observed

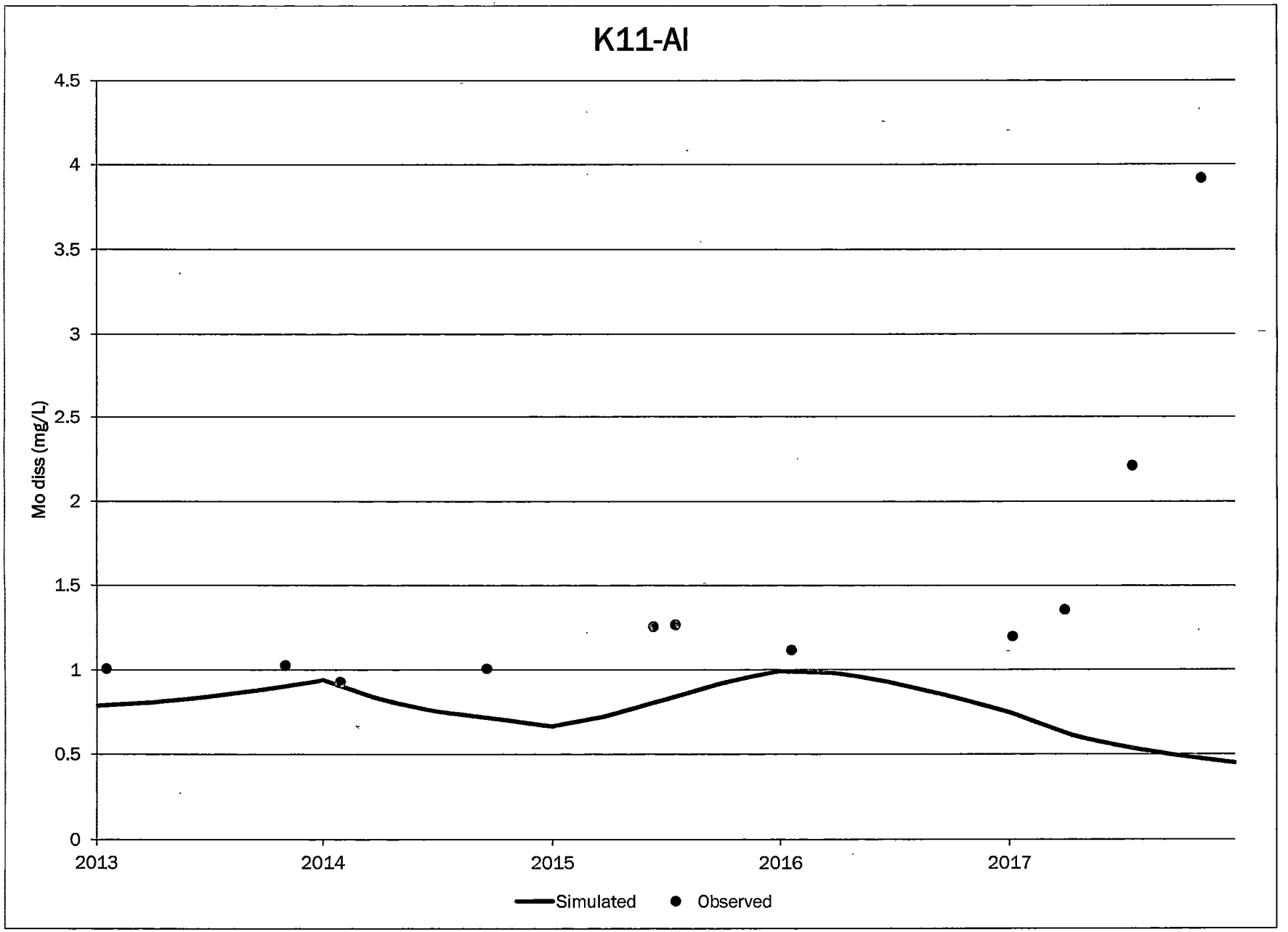

K5-AI
Mo diss (mg/L)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

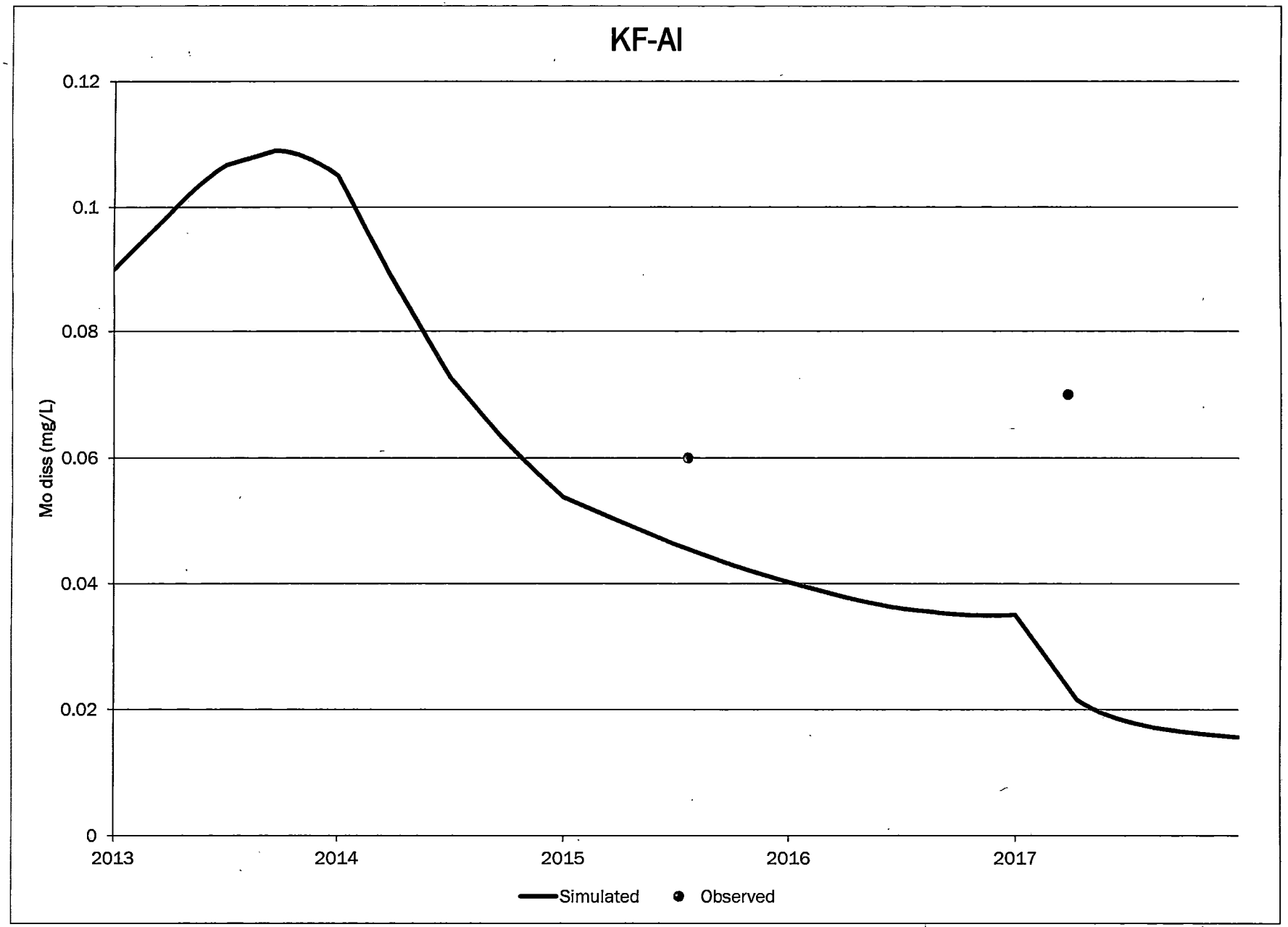

K7-AI
Mo diss (mg/L)
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

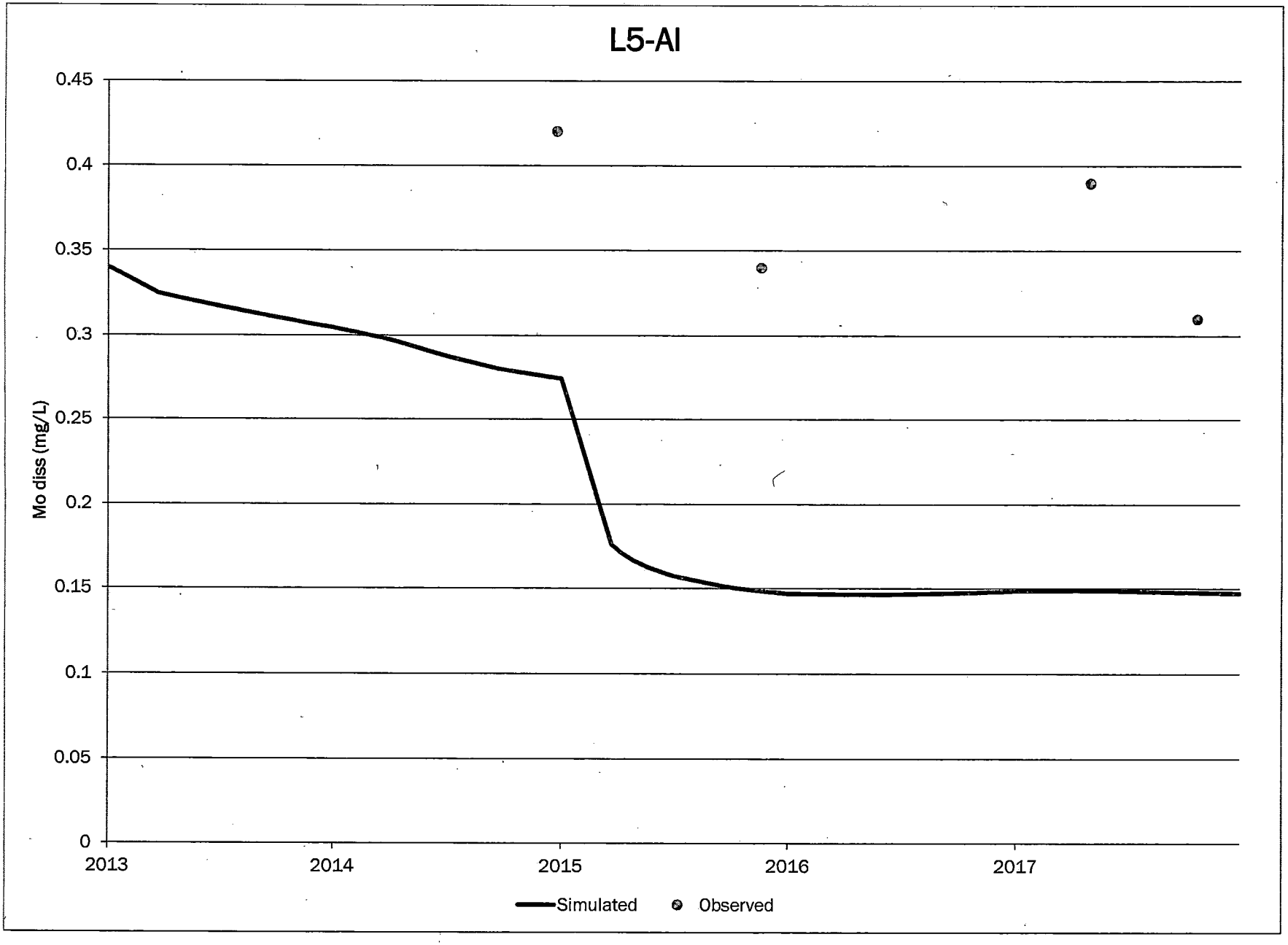

K8-AI
Mo diss (mg/L)
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

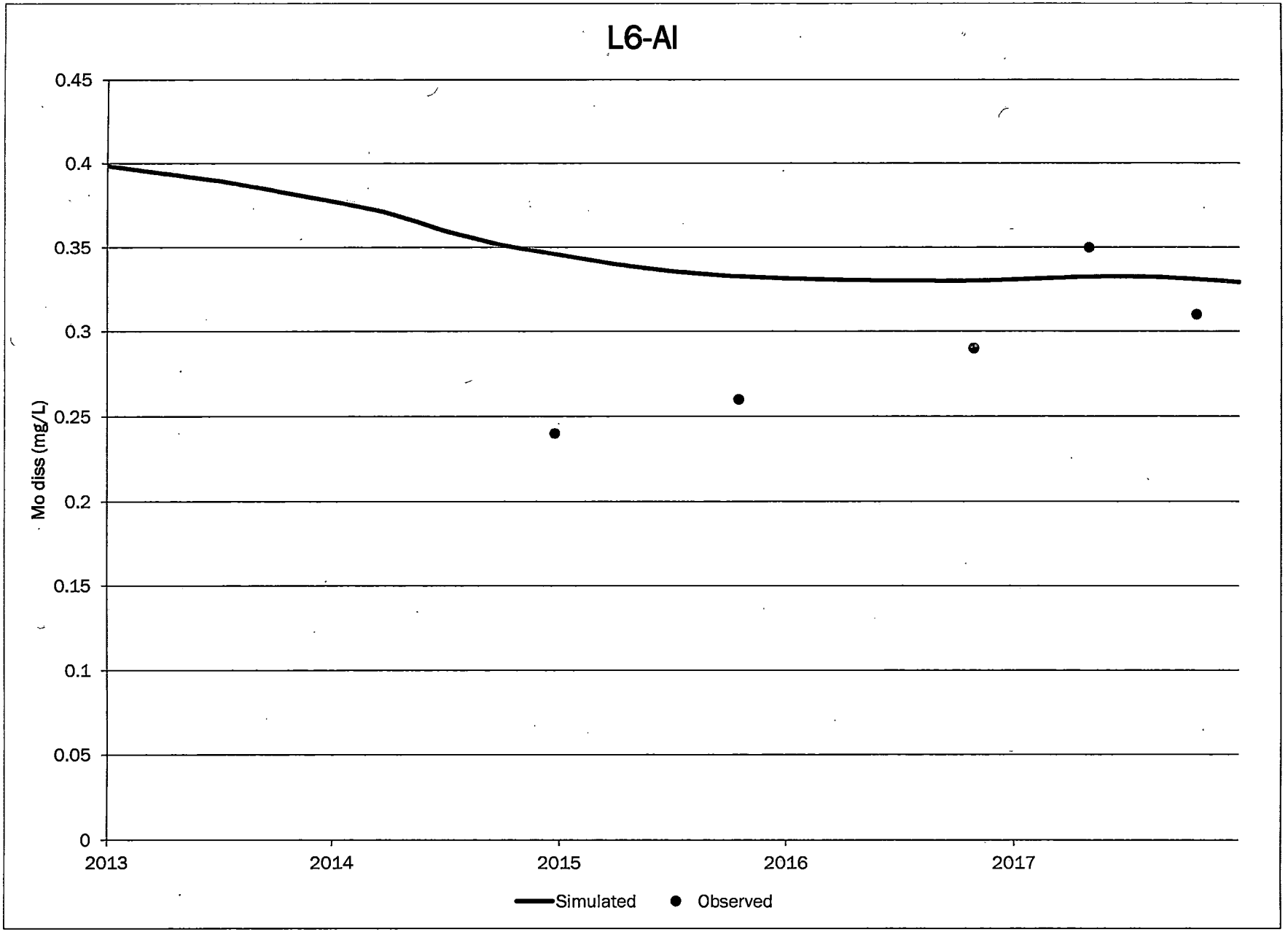

K9-AI
Mo diss (mg/L)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

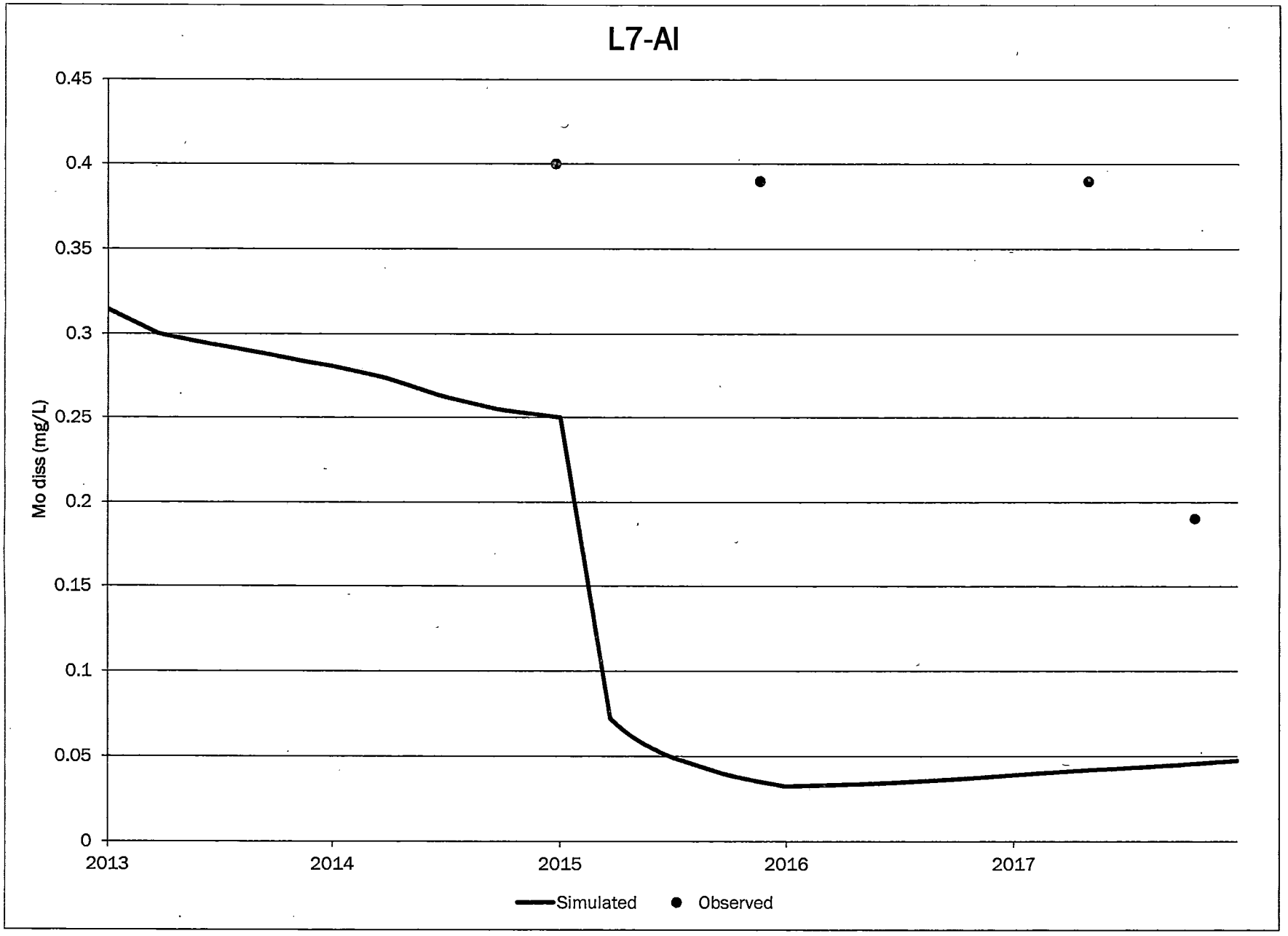

K10-AI
Mo diss (mg/L)
0
1
2
3
4
5
6
7
8
2013
2014
2015
2016
2017
Simulated
Observed

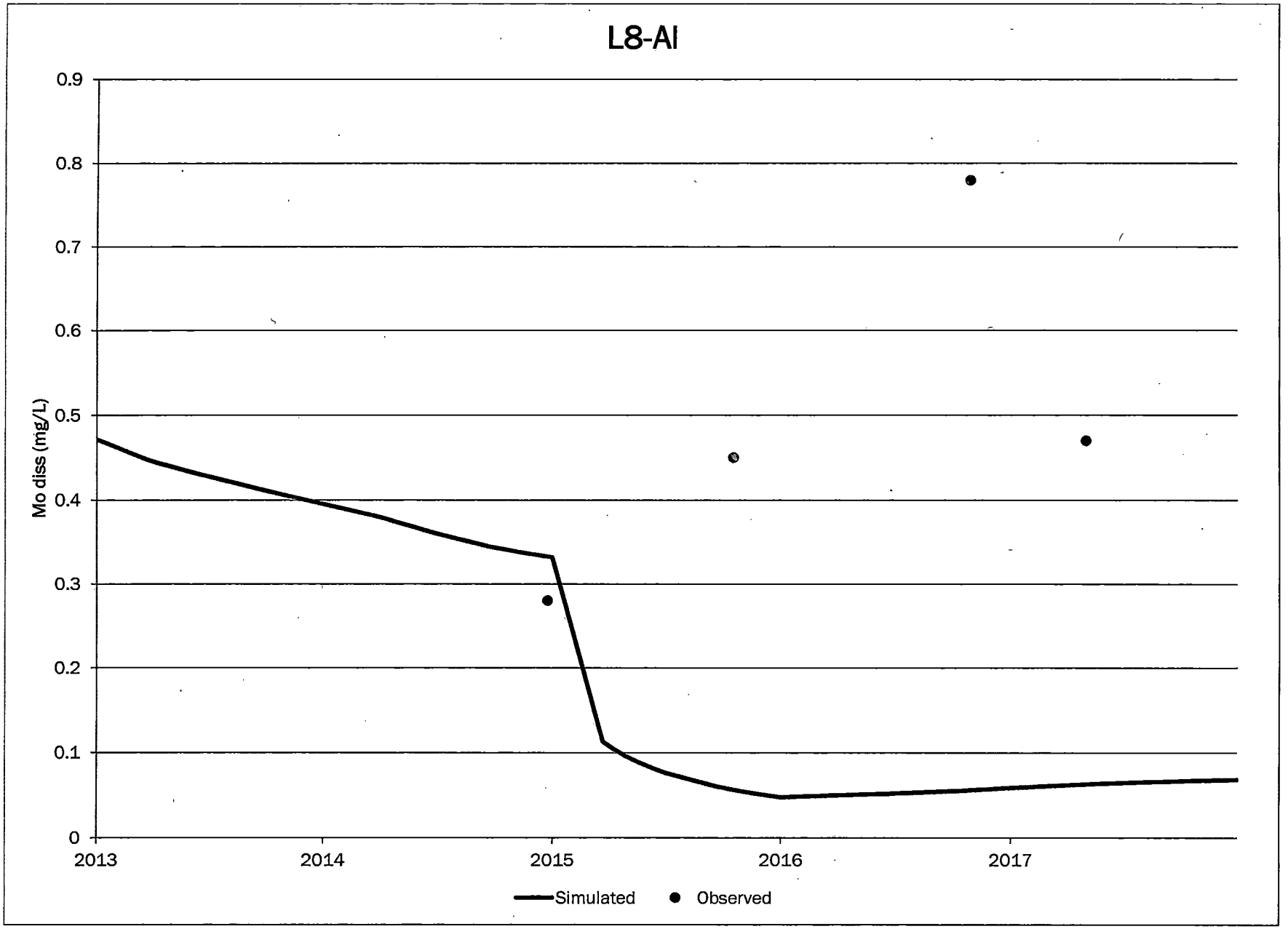

K11-AI
Mo diss (mg/L)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

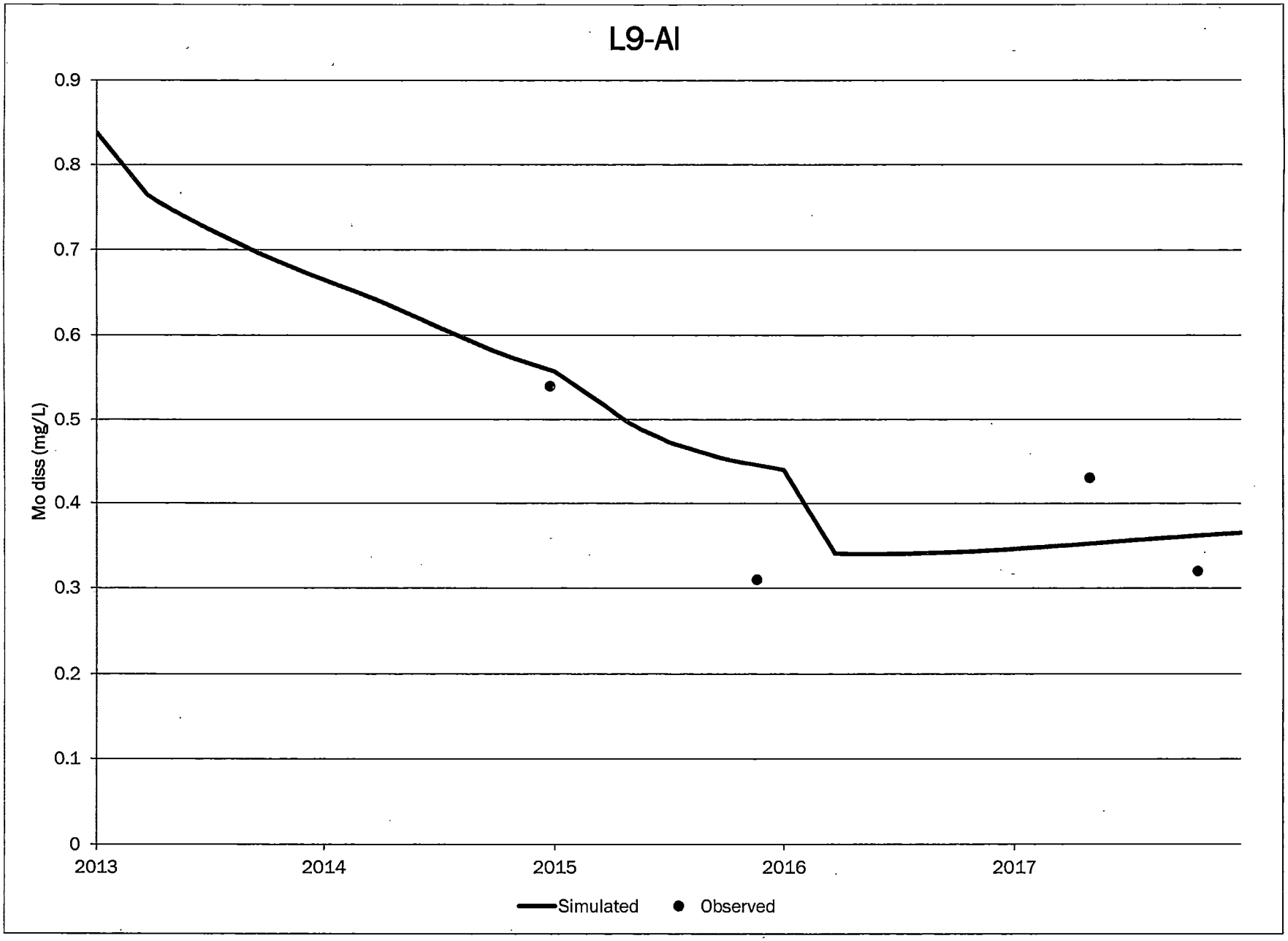

KF-AI
0.12
0.1
0.08
0.06
0.04
0.02
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

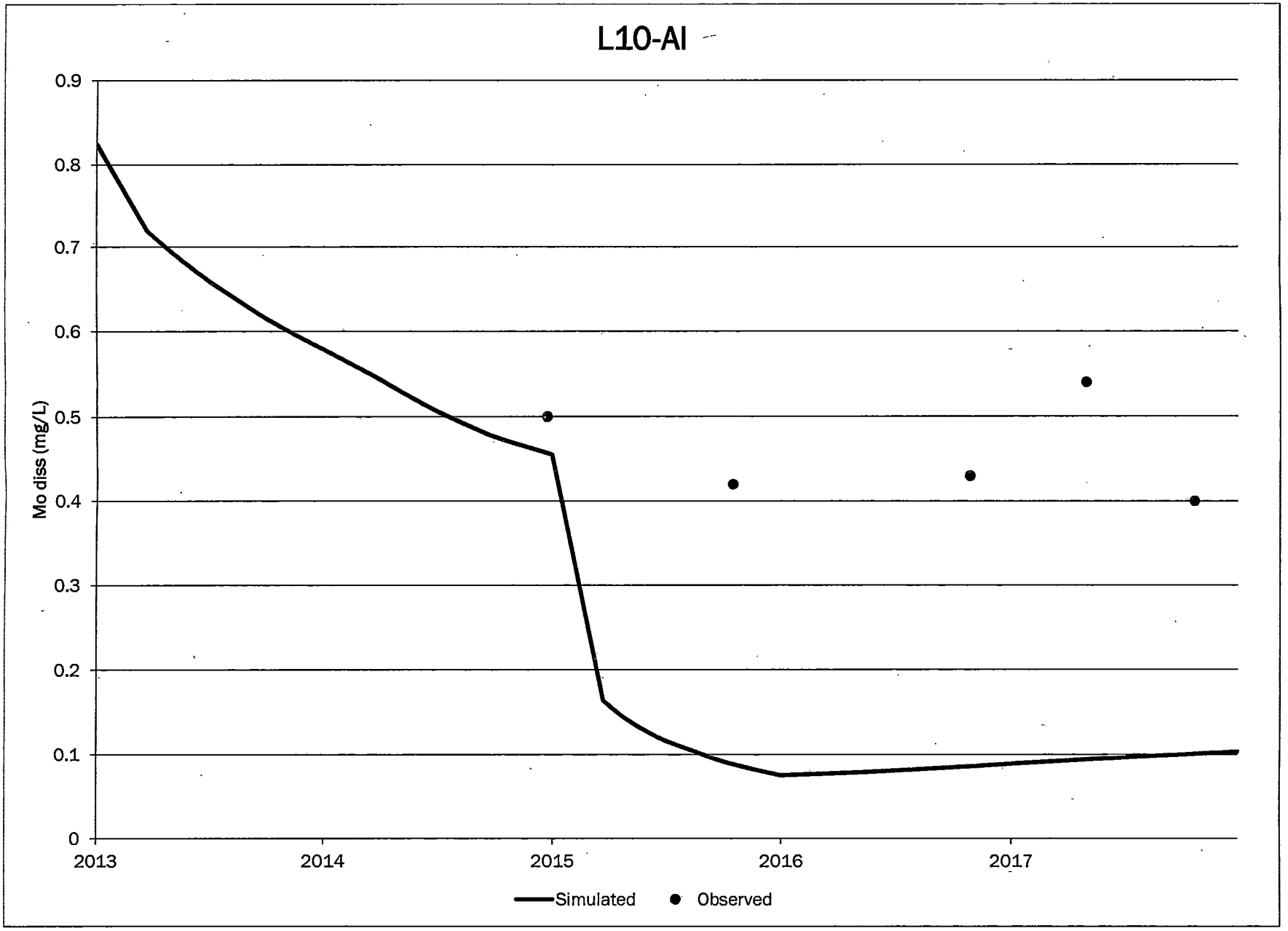

L5-AI
Mo diss (mg/L)
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
2013
2014
2015
2016
2017
Simulated
Observed

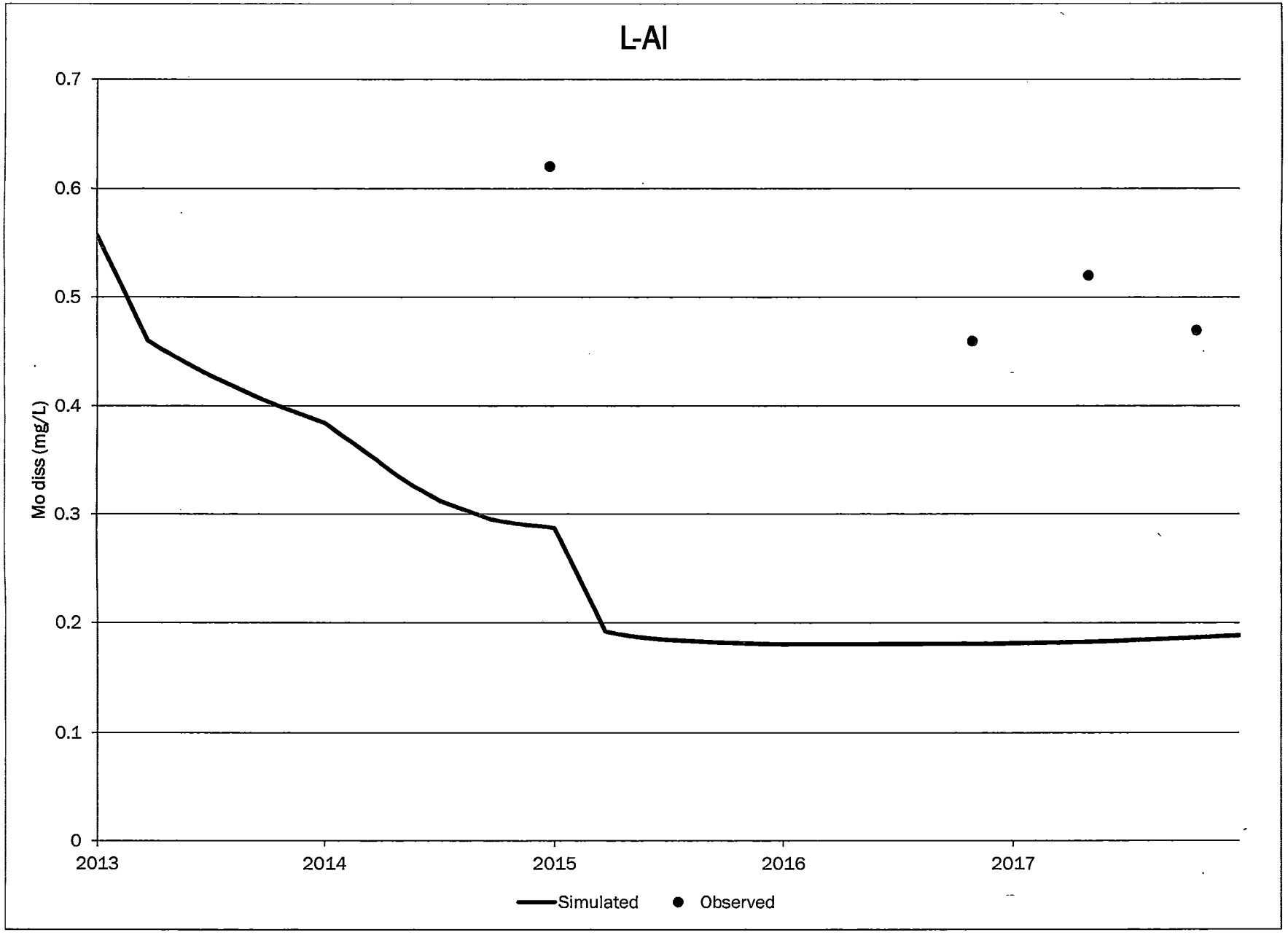

L6-AI
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

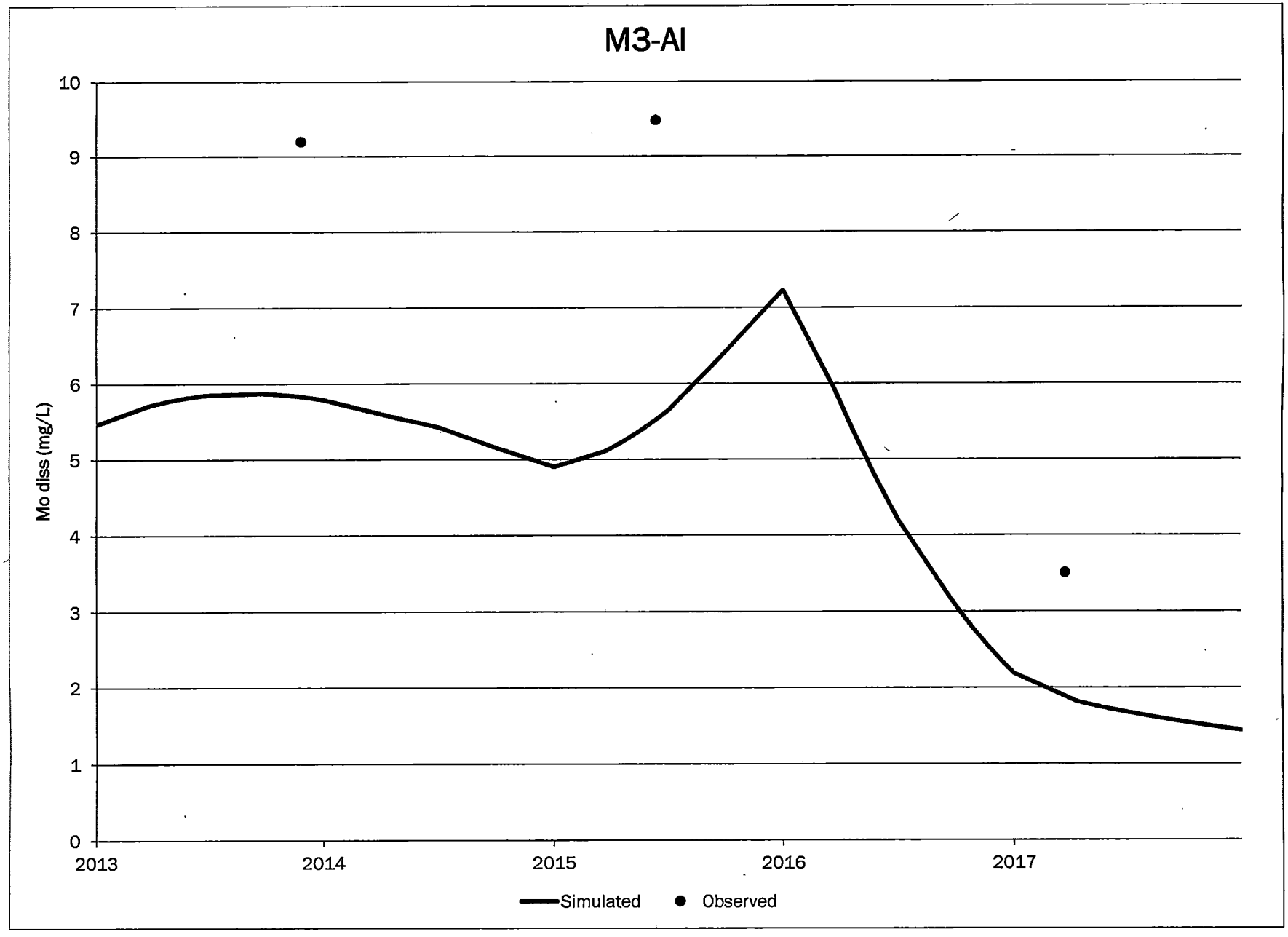

L7-AI
Mo diss (mg/L)
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
2013
2014
2015
2016
2017
Simulated
Observed

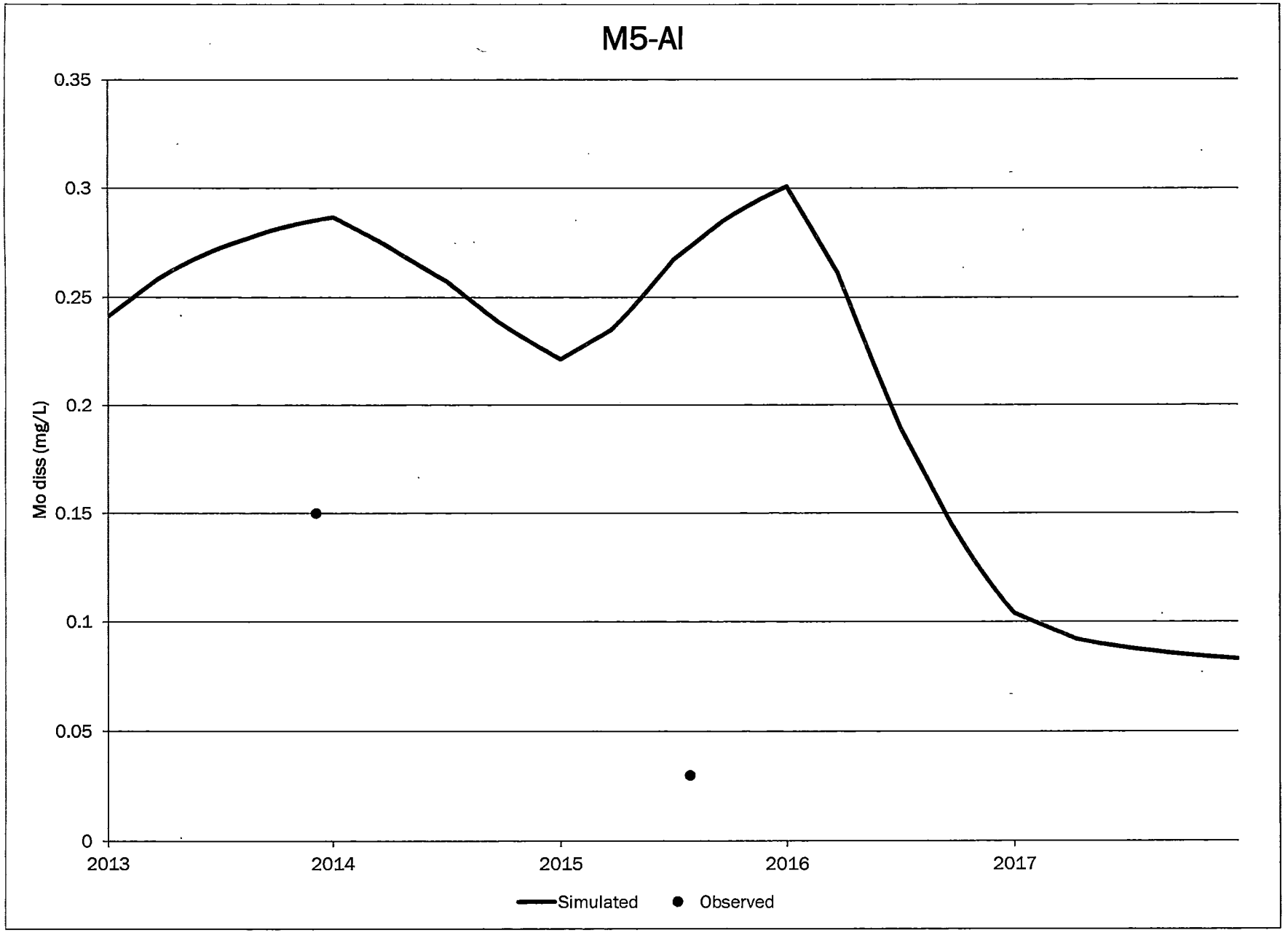

L8-AI
Mo diss (mg/L)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
2013
2014
2015
2016
2017
Simulated
Observed

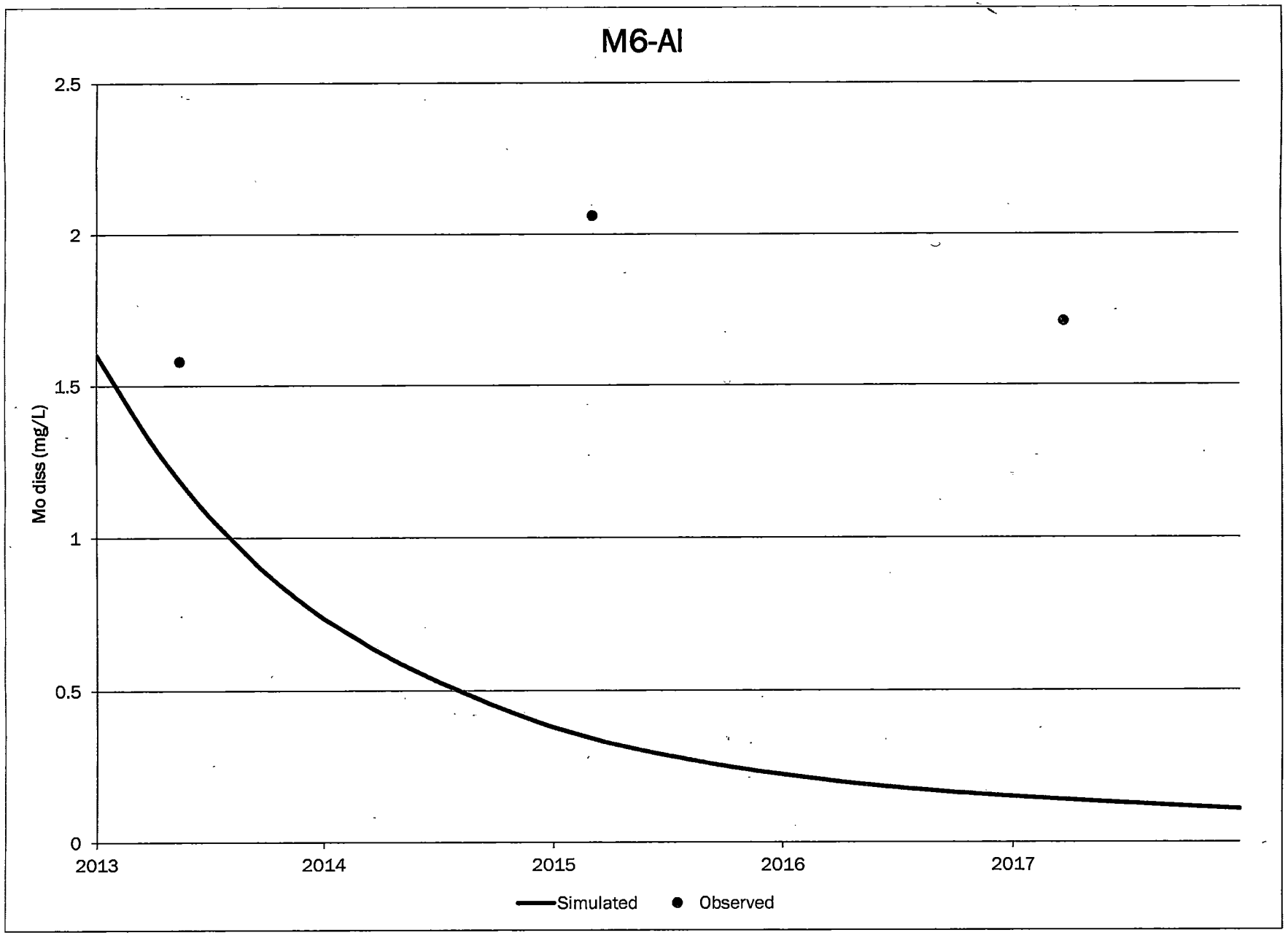

L9-AI
Mo diss (mg/L)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
2013
2014
2015
2016
2017
Simulated
Observed

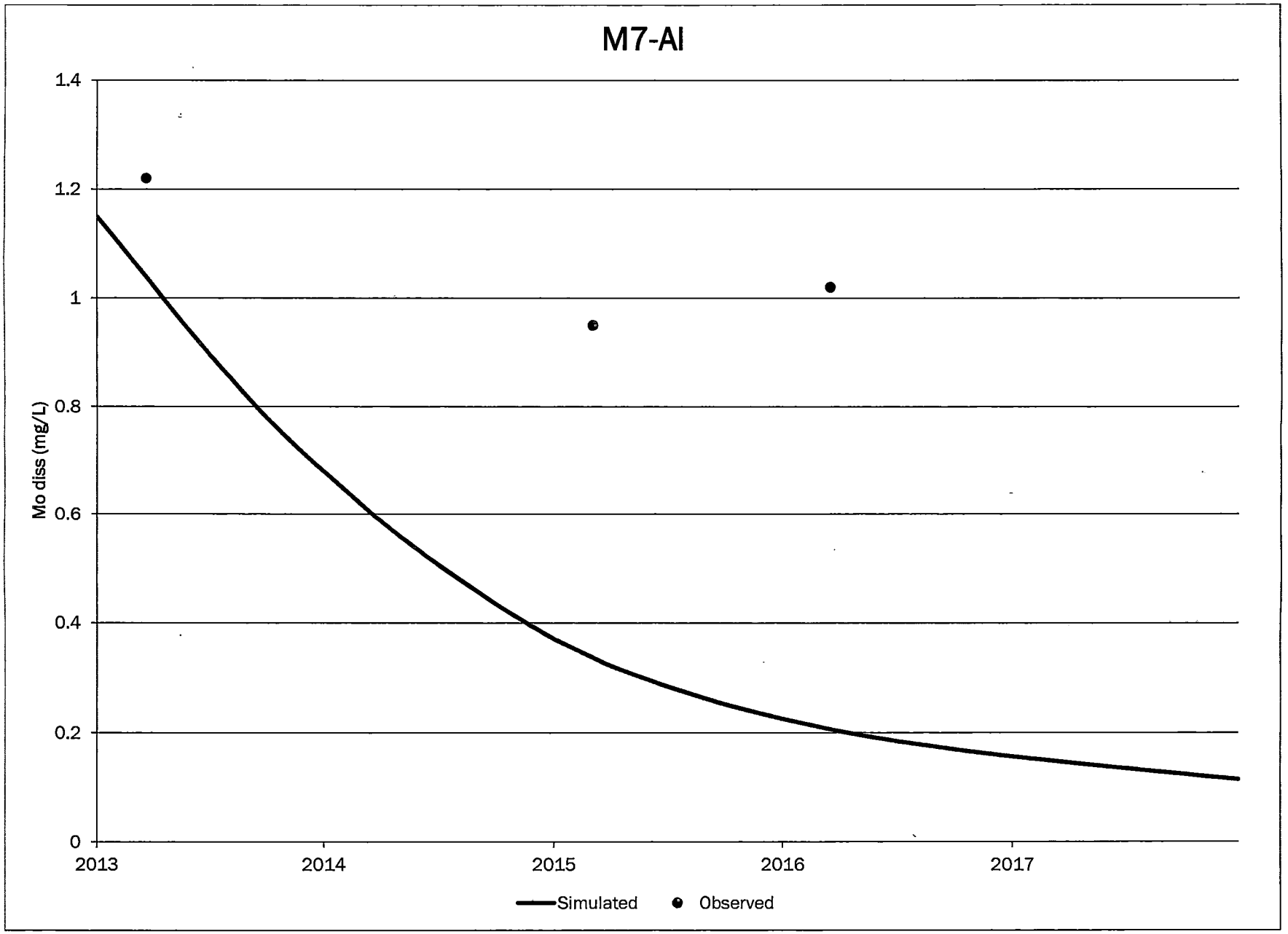

L10-AI
Mo diss (mg/L)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
2013
2014
2015
2016
2017
Simulated
Observed

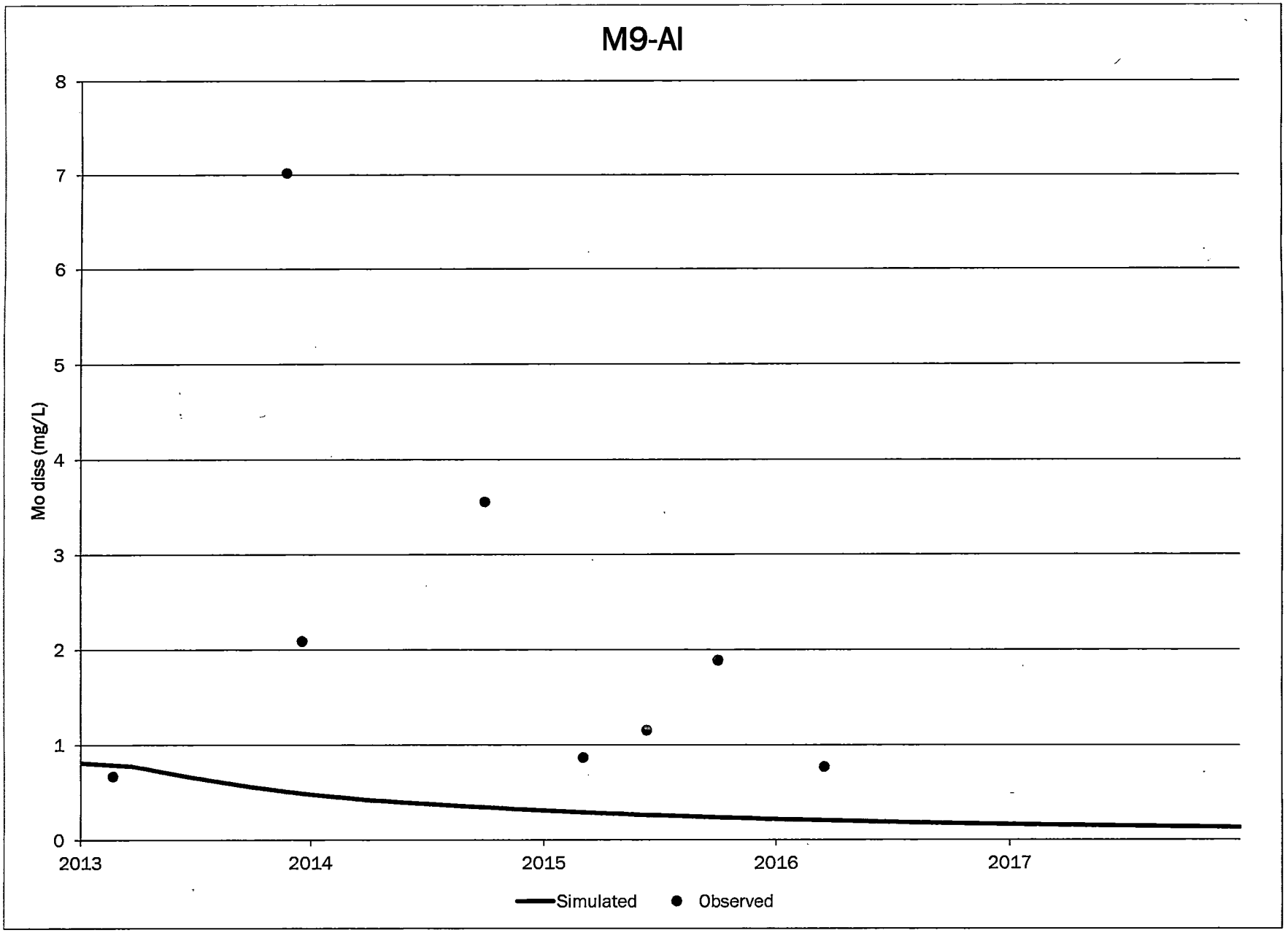

L-Al
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

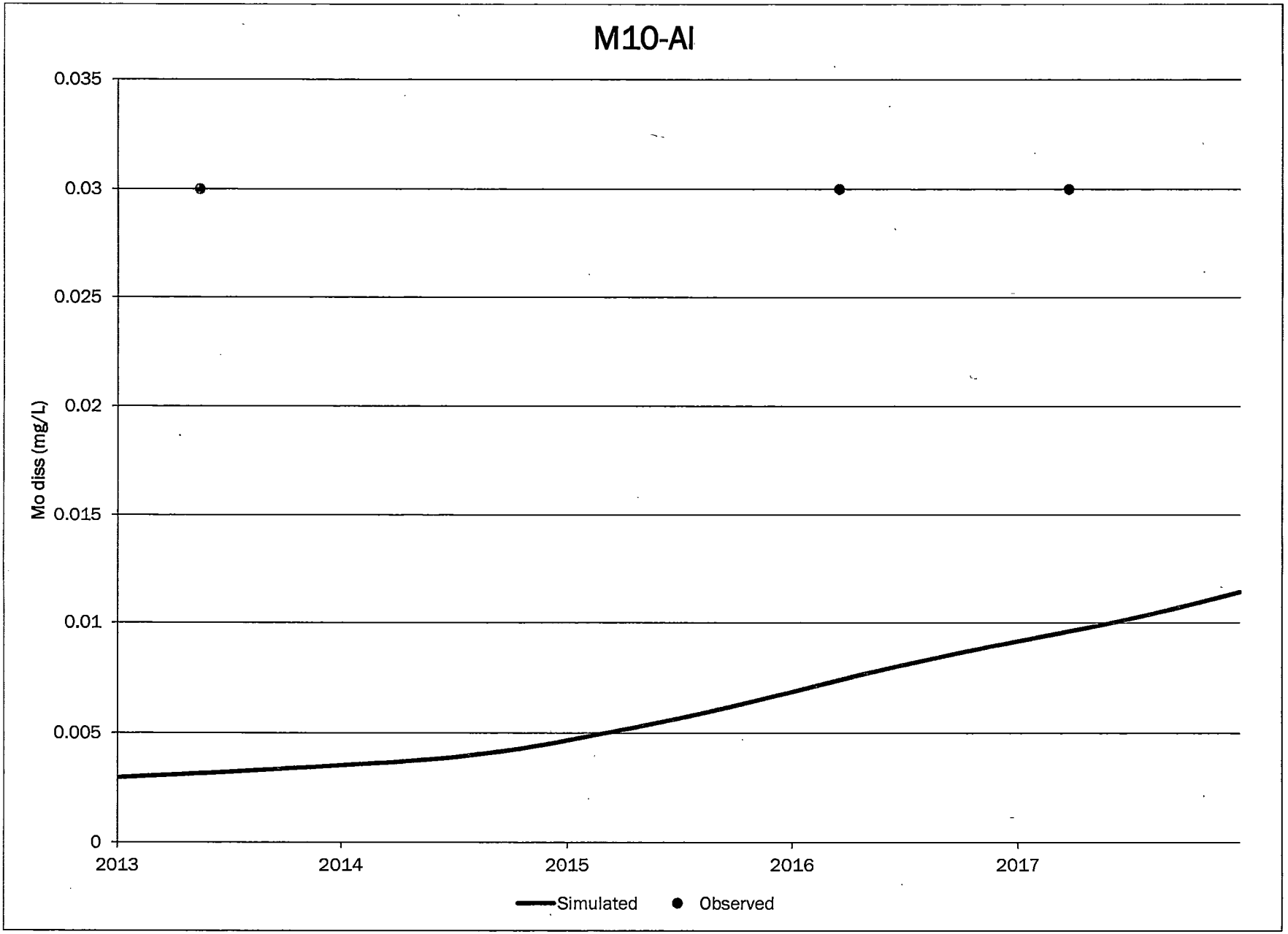

M3-AI
Mo diss (mg/L)
10
9
8
7
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

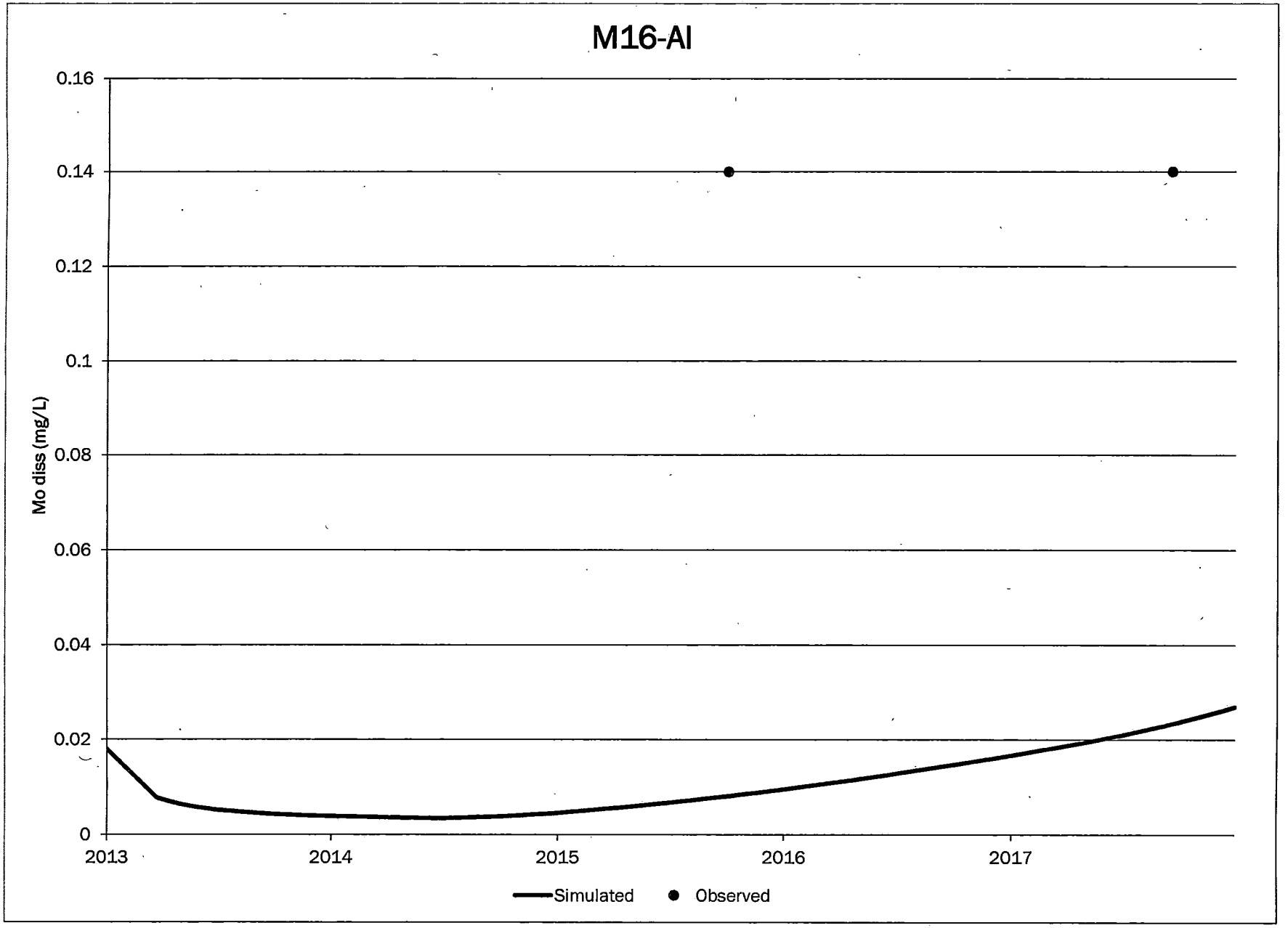

M5-Al
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

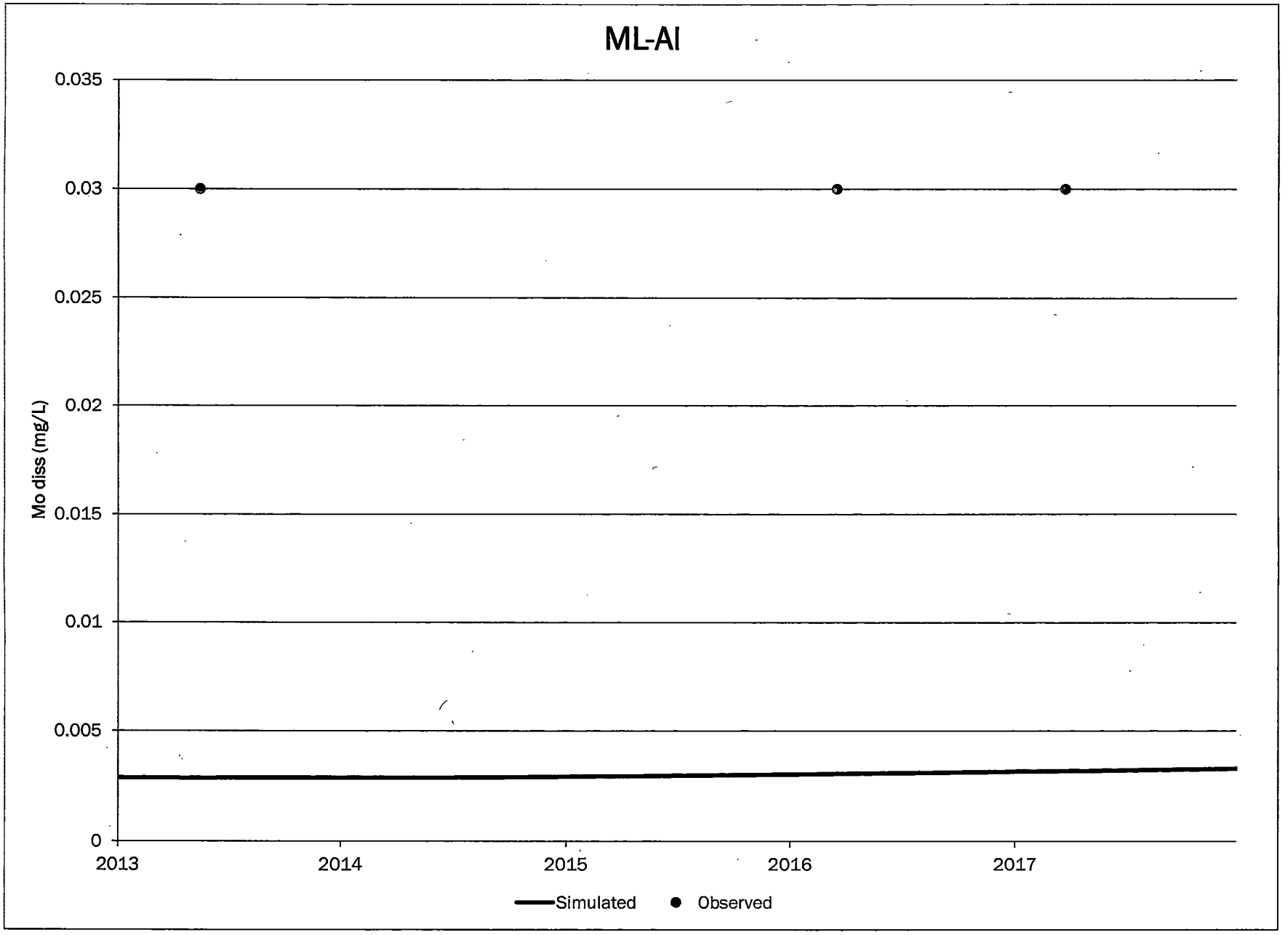

M6-Al
Mo diss (mg/L)
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

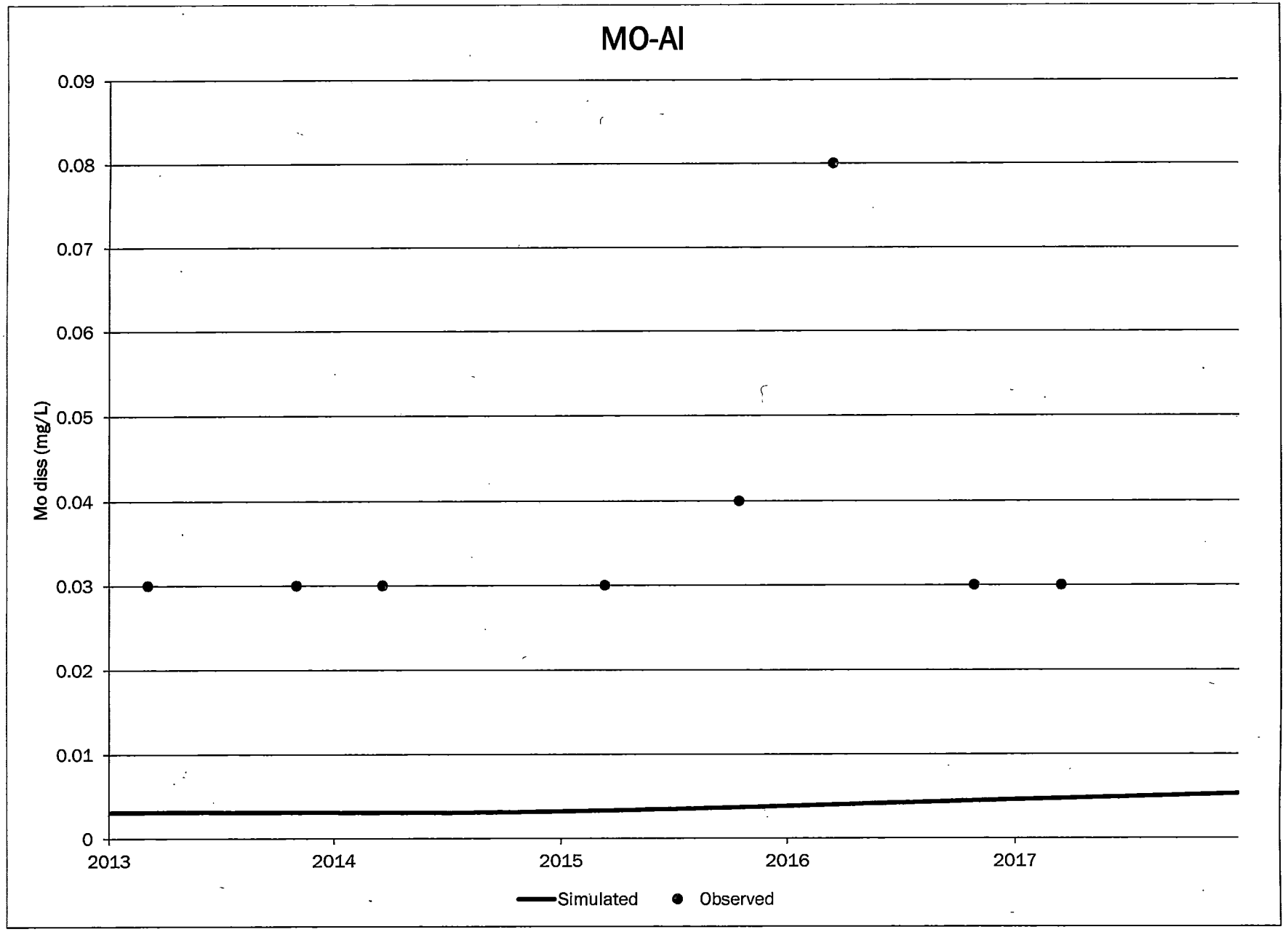

M7-Al
Mo diss (mg/L)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2013
2014
2015
2016
2017
Simulated
Observed

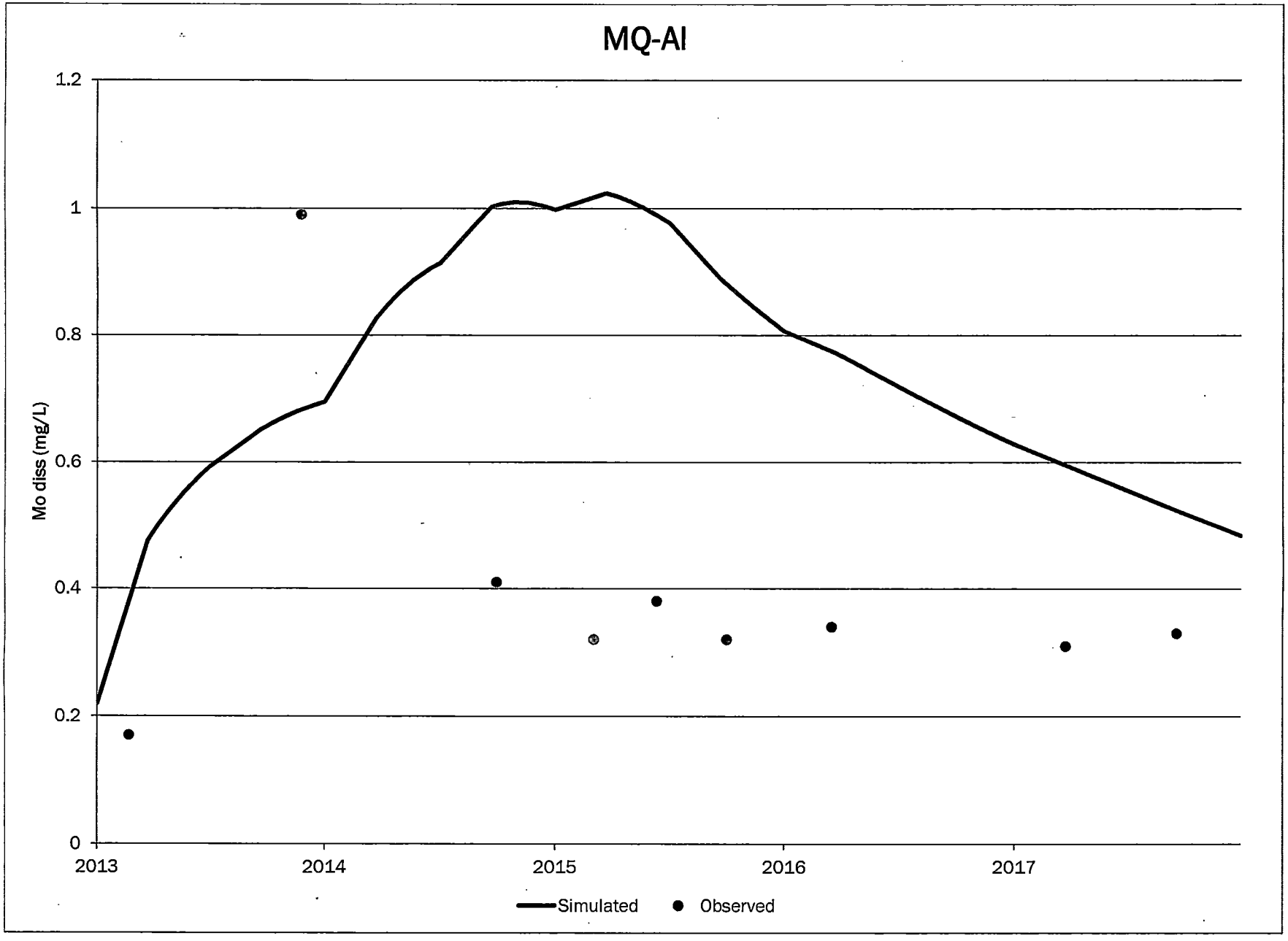

M9-AI
Mo diss (mg/L)
8
7
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

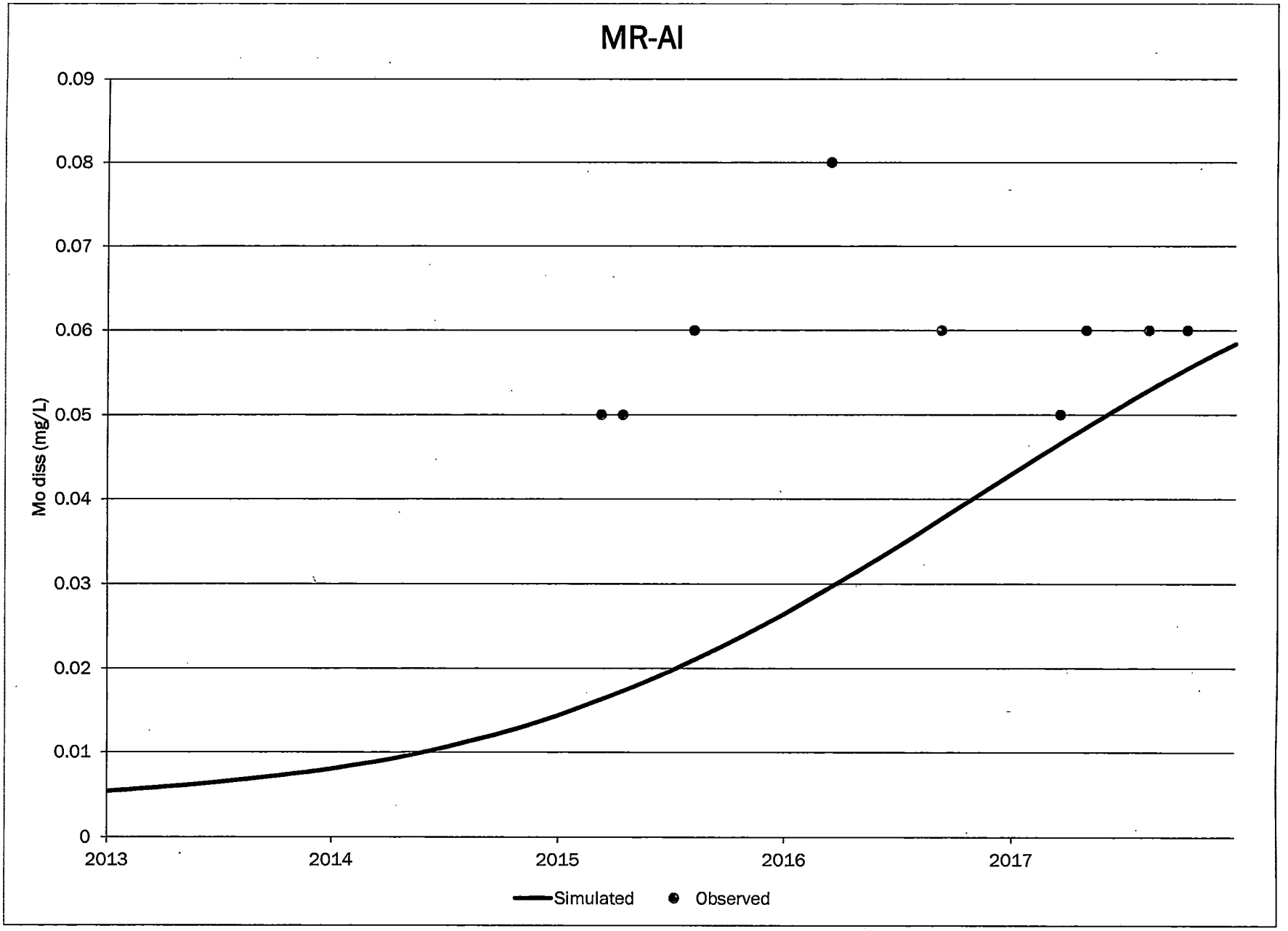

M10-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

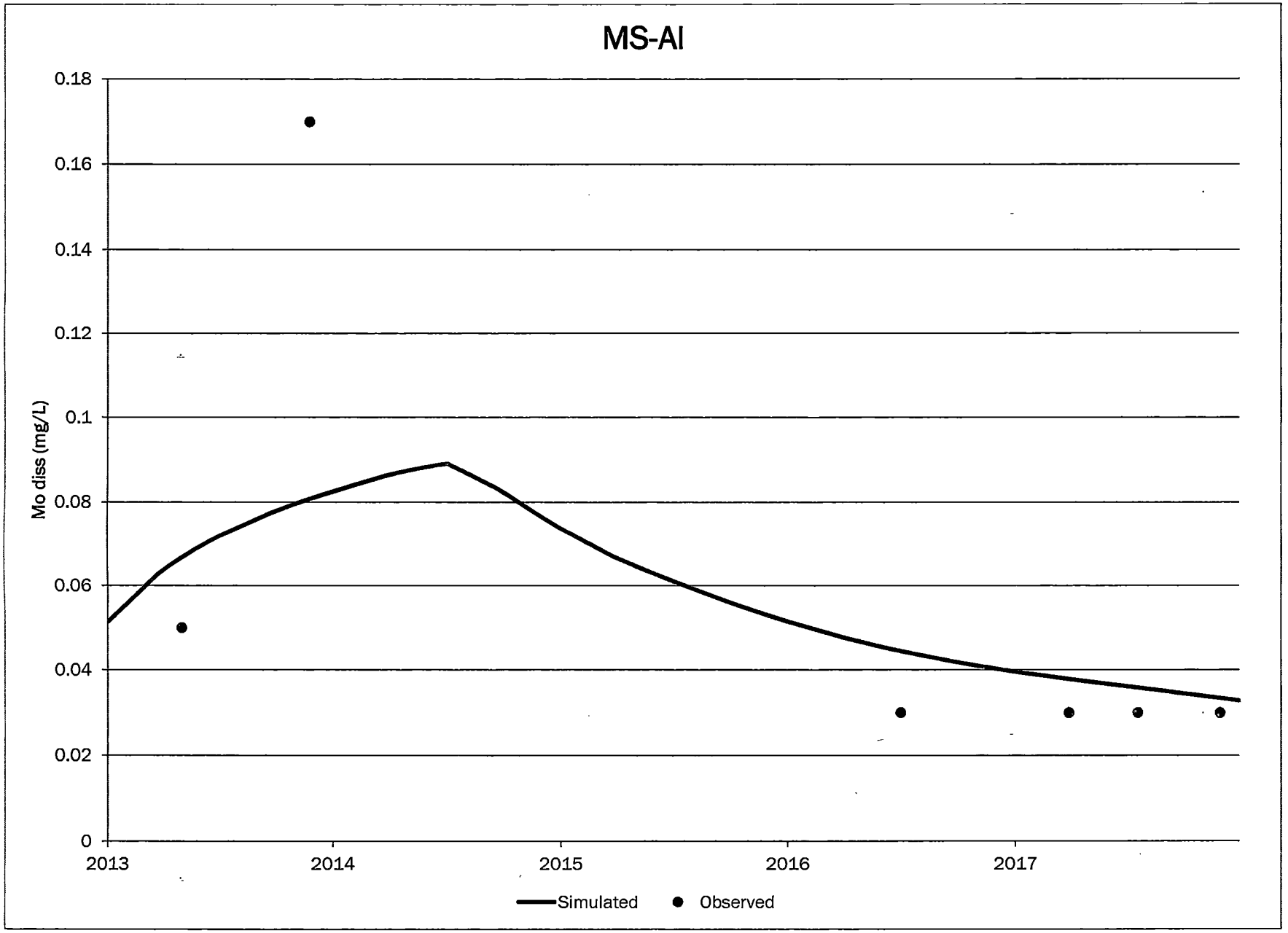

M16-AI
Mo diss (mg/L)
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
2013
2014
2015
2016
2017
Simulated
Observed

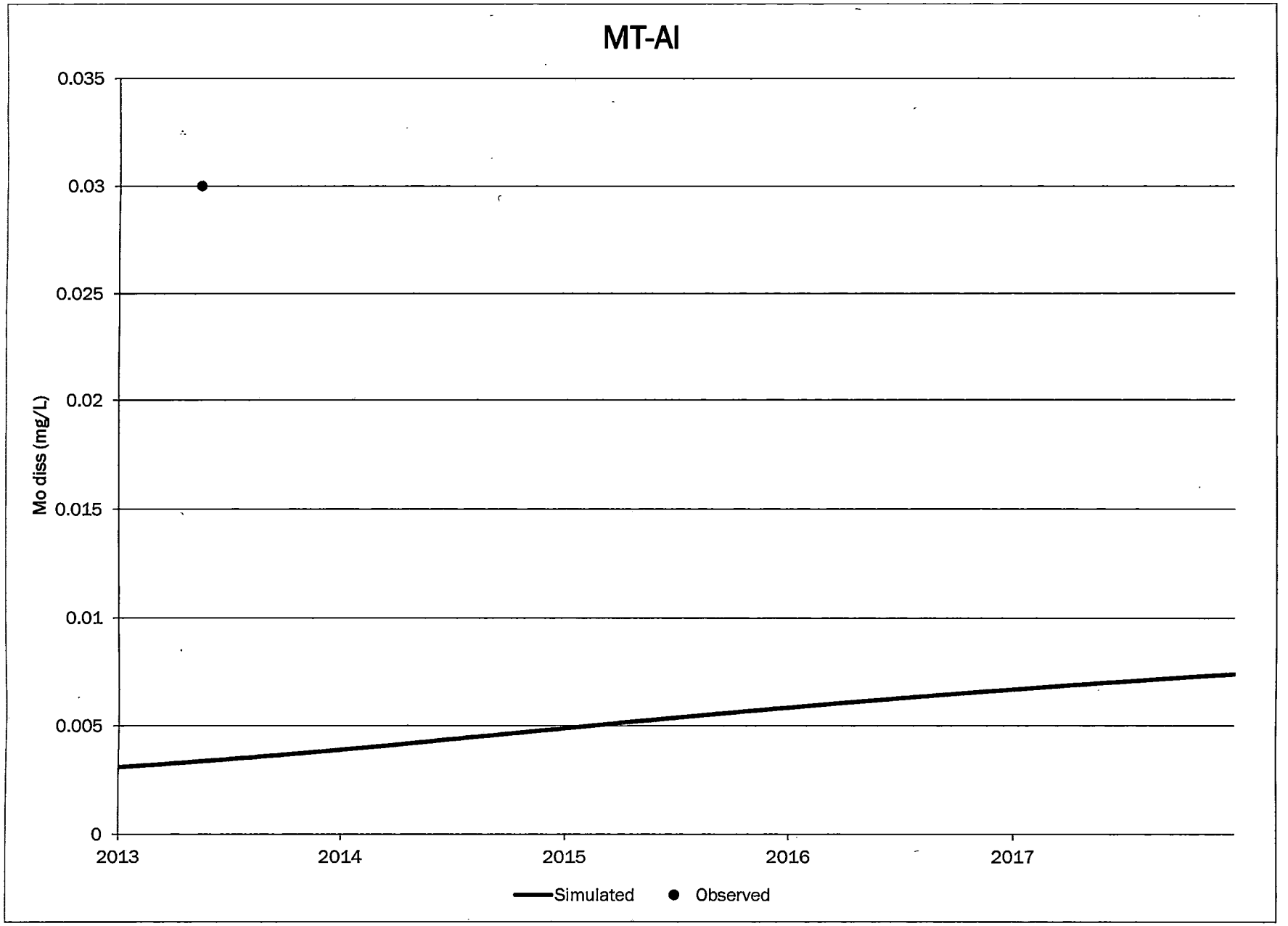

ML-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

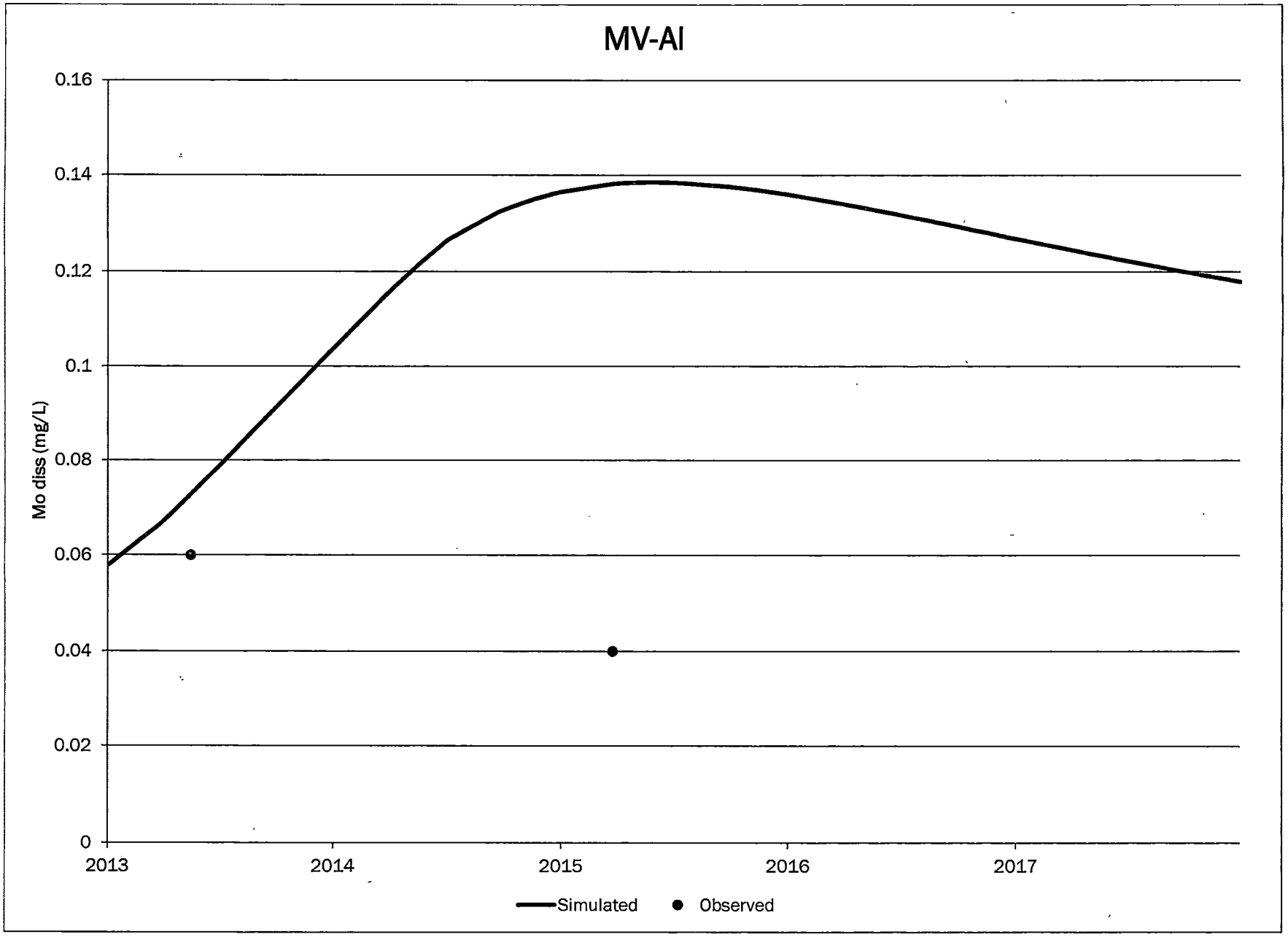

MO-AI
Mo diss (mg/L)
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
2013
2014
2015
2016
2017
Simulated
Observed

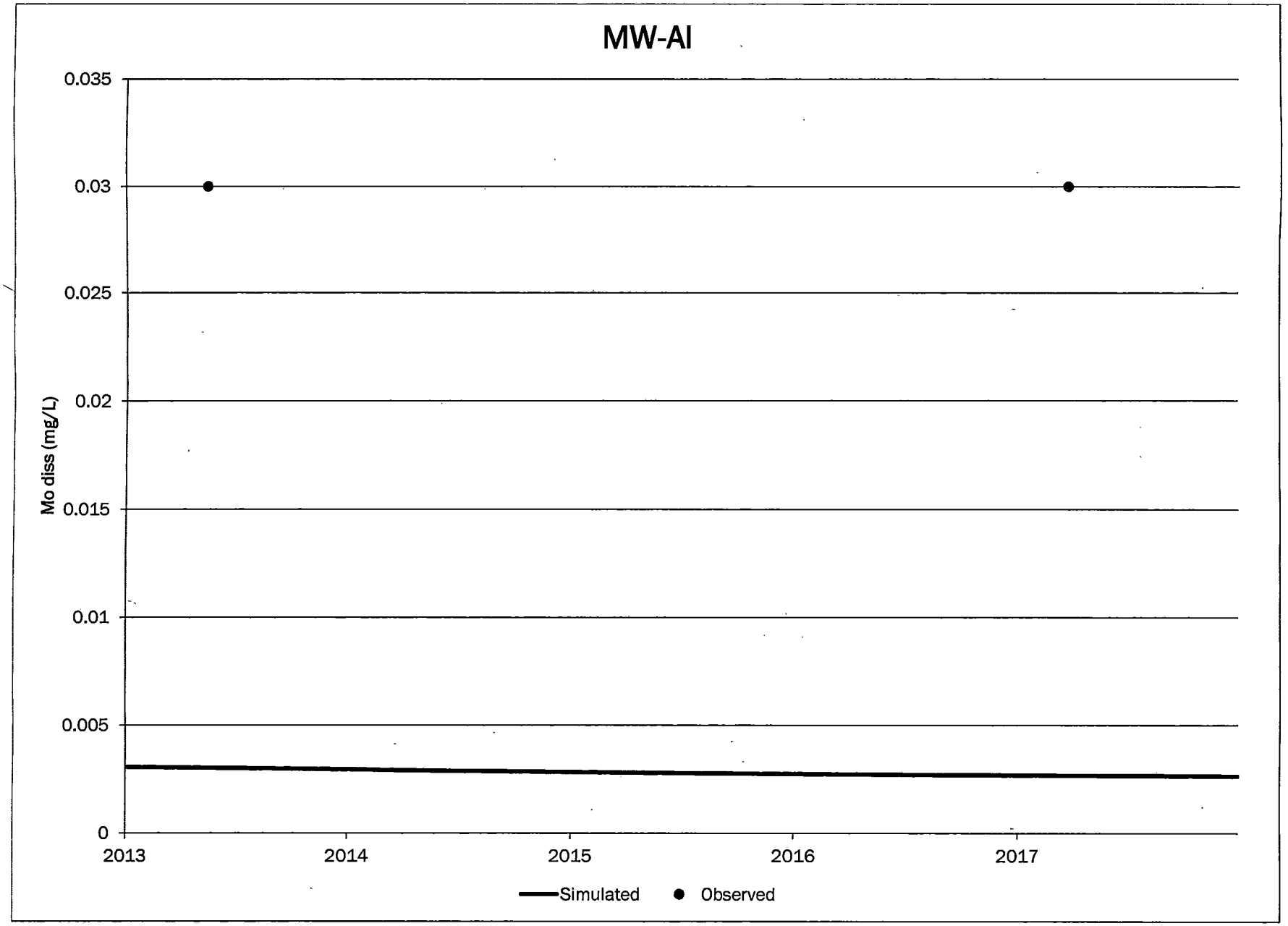

MQ-AI
Mo diss (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
2013
2014
2015
2016
2017
Simulated
Observed

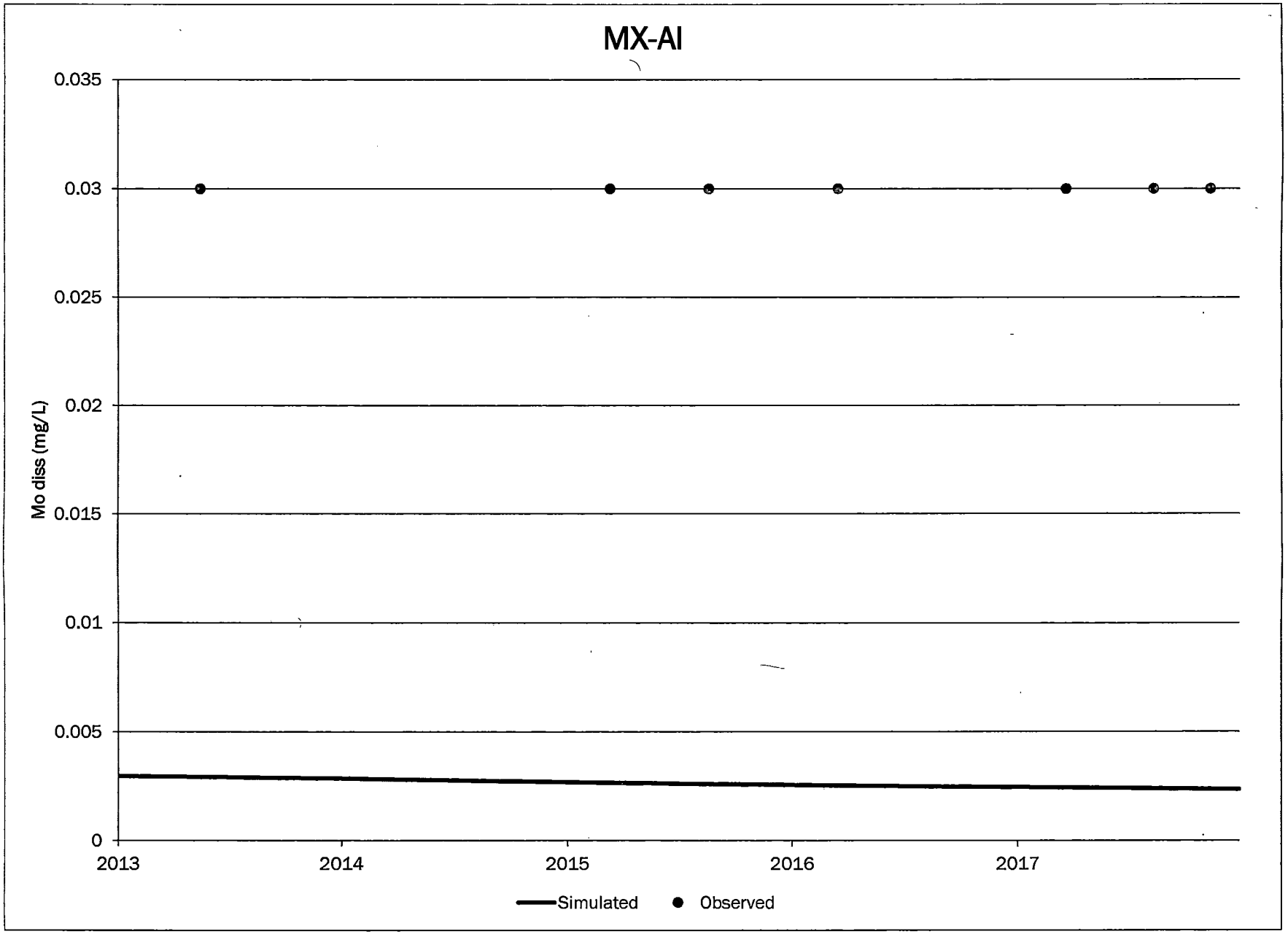

MR-AI
Mo diss (mg/L)
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
2013
2014
2015
2016
2017
Simulated
Observed

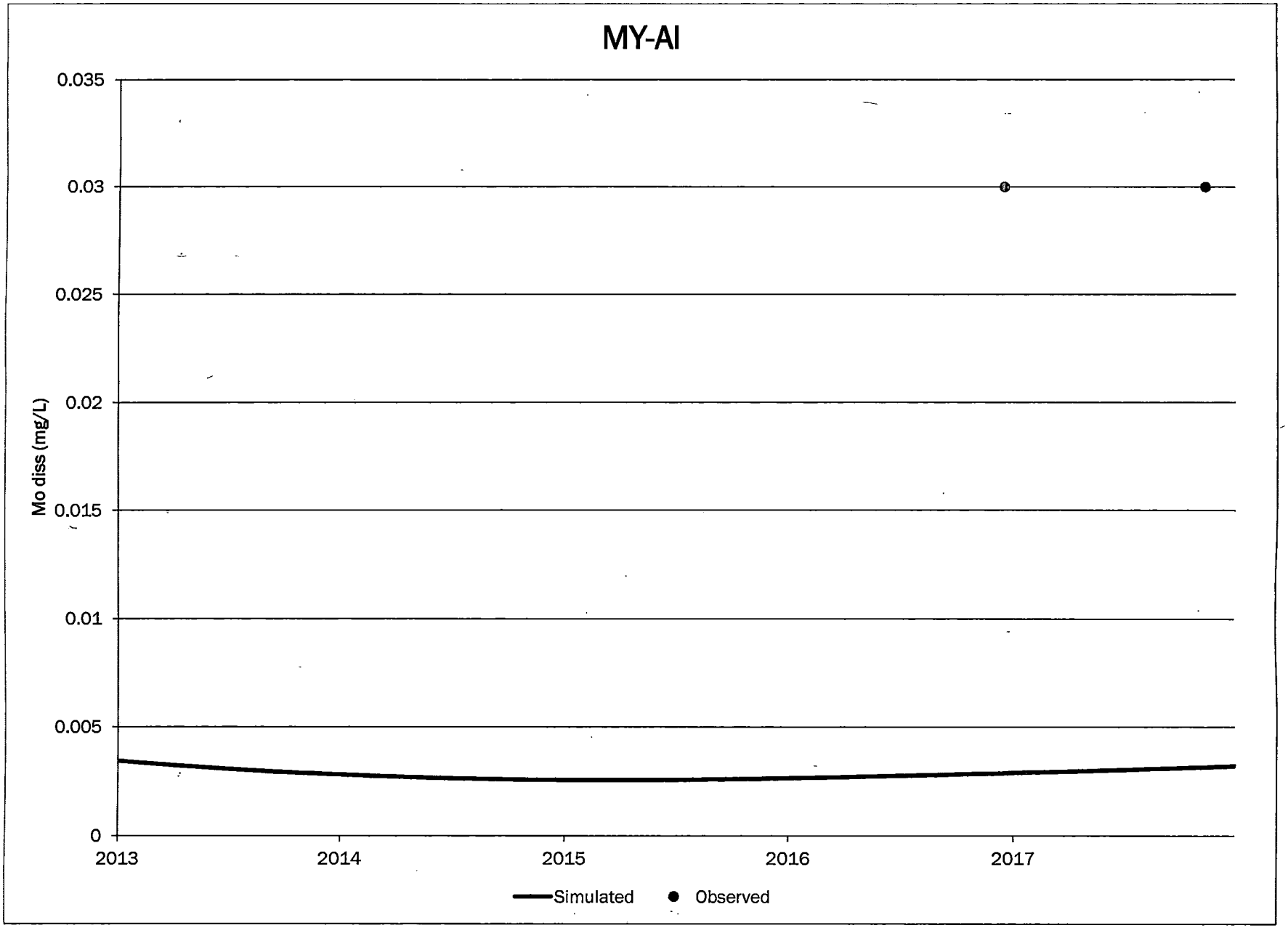

MS-AI
Mo diss (mg/L)
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
2013
2014
2015
2016
2017
Simulated
Observed

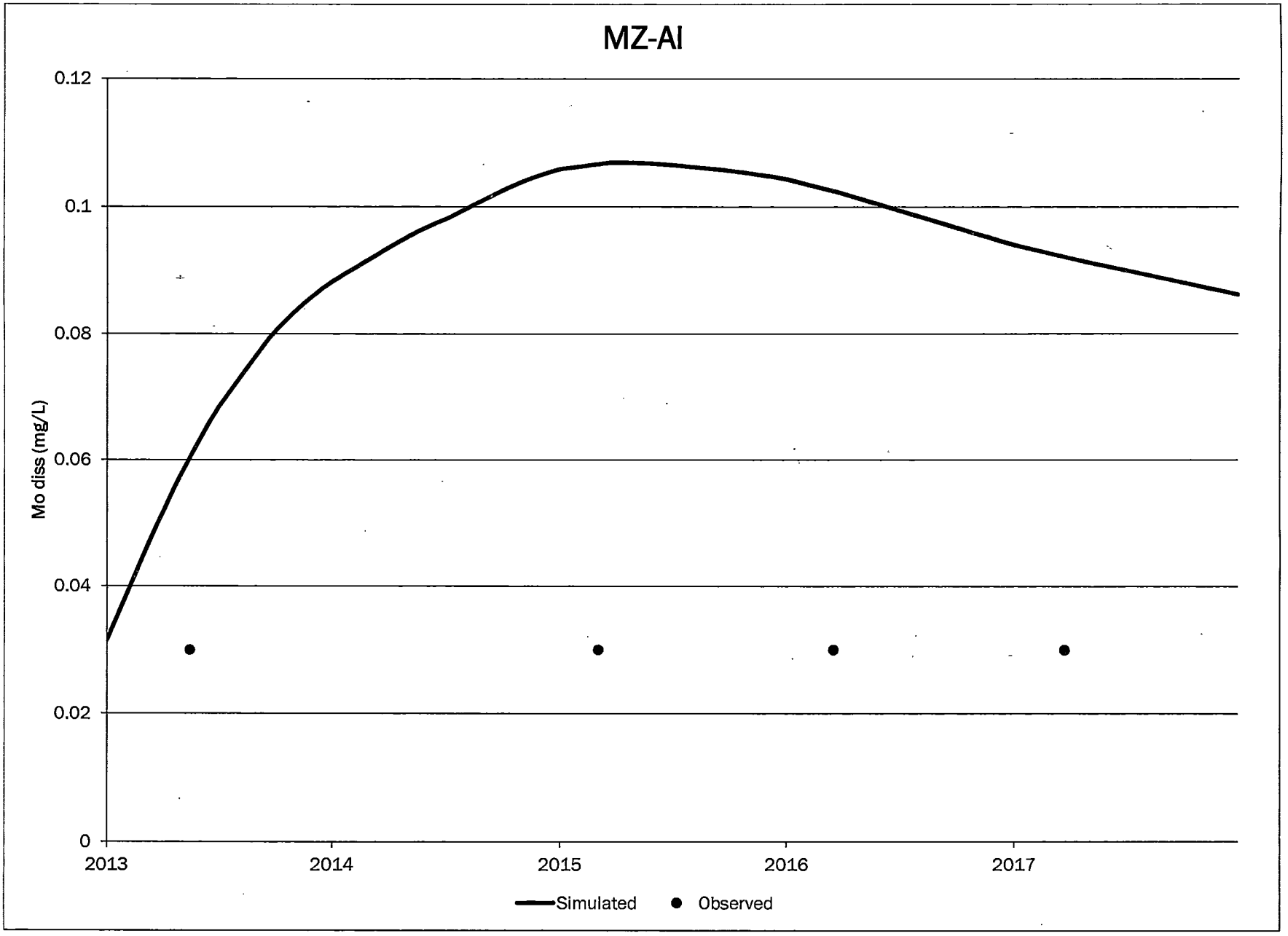

MT-AI
Mo diss (mg/L)
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
2013
2014
2015
2016
2017
Simulated
Observed

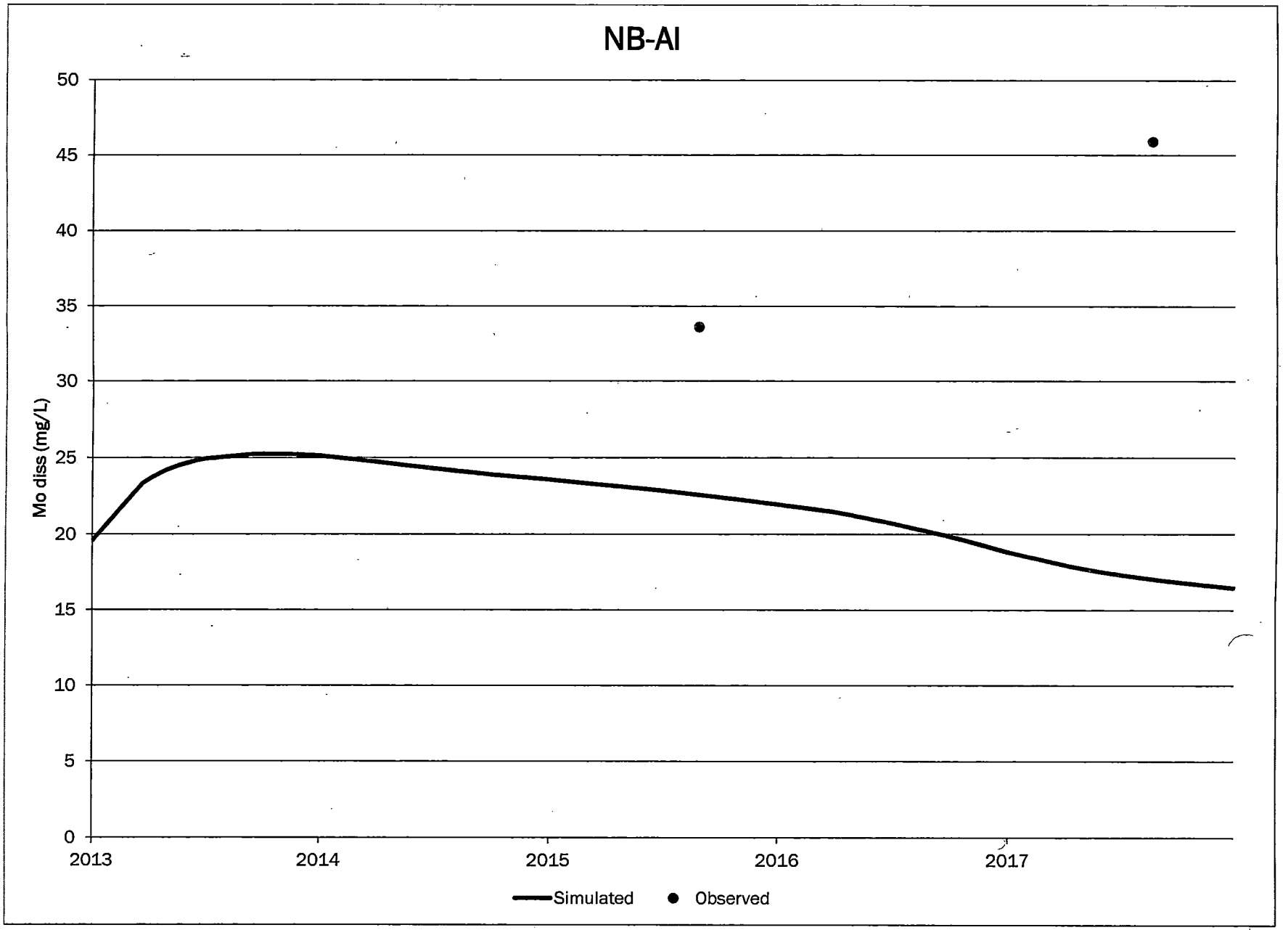

MV-AI
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

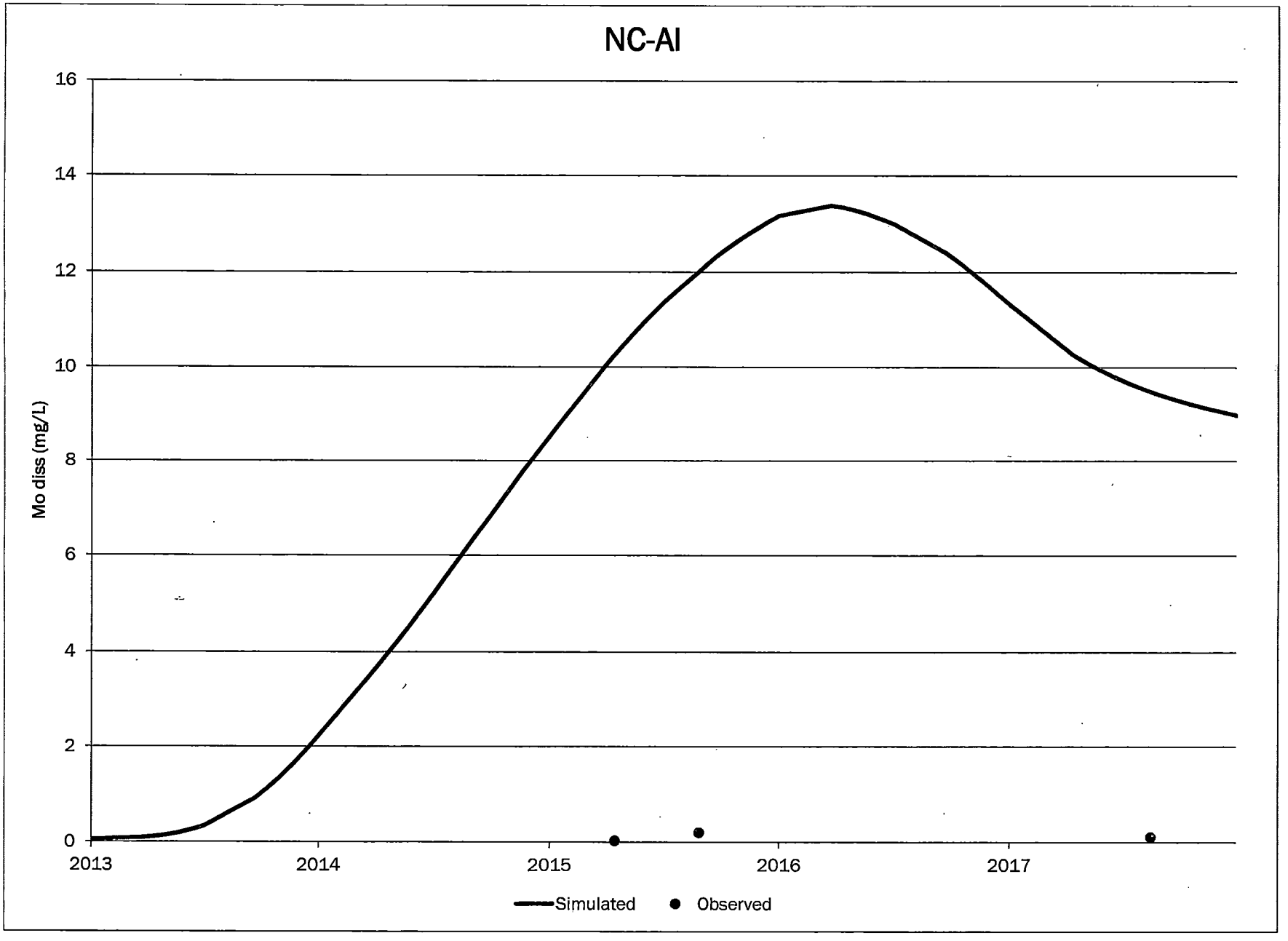

MW-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

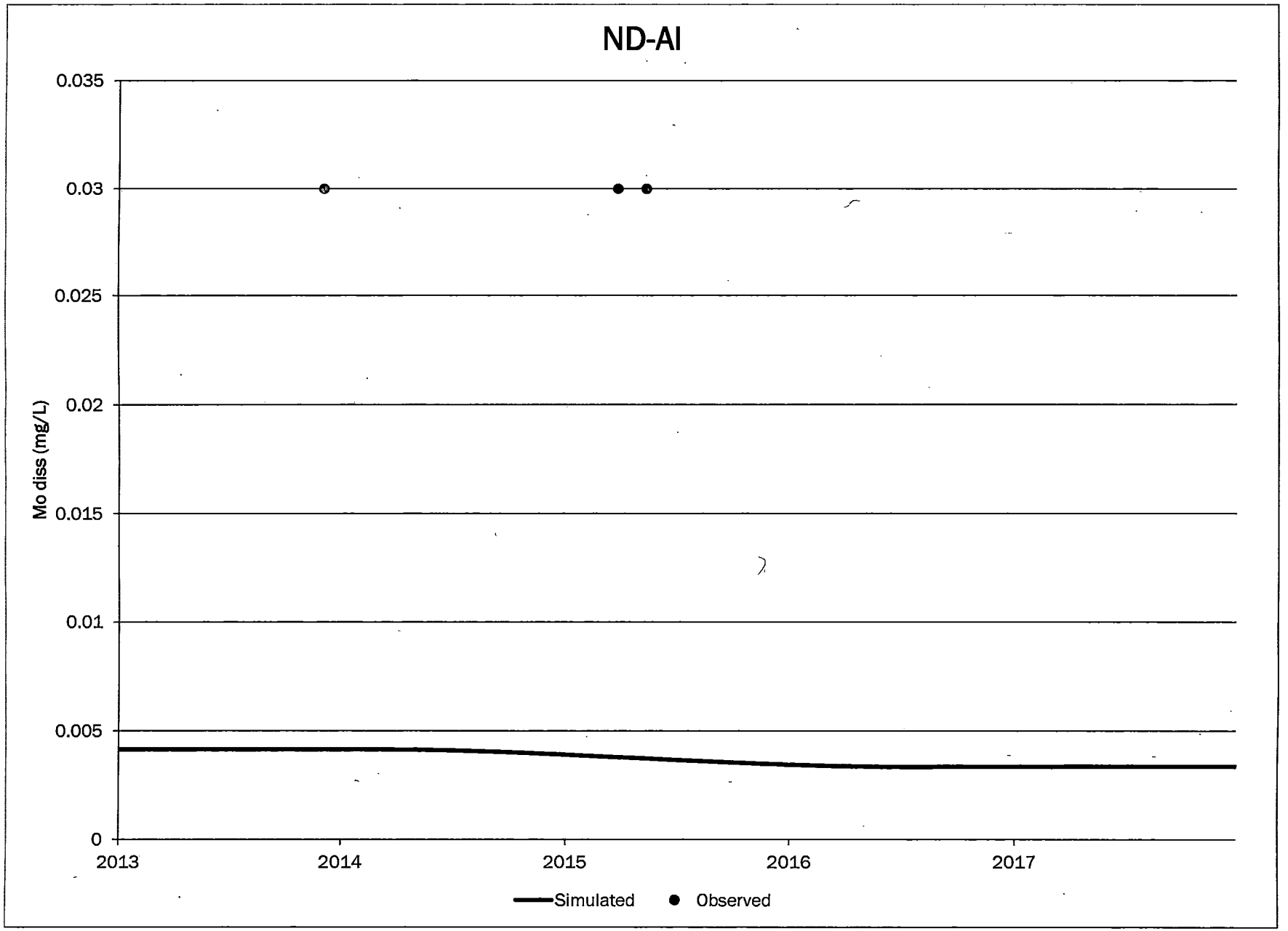

MX-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

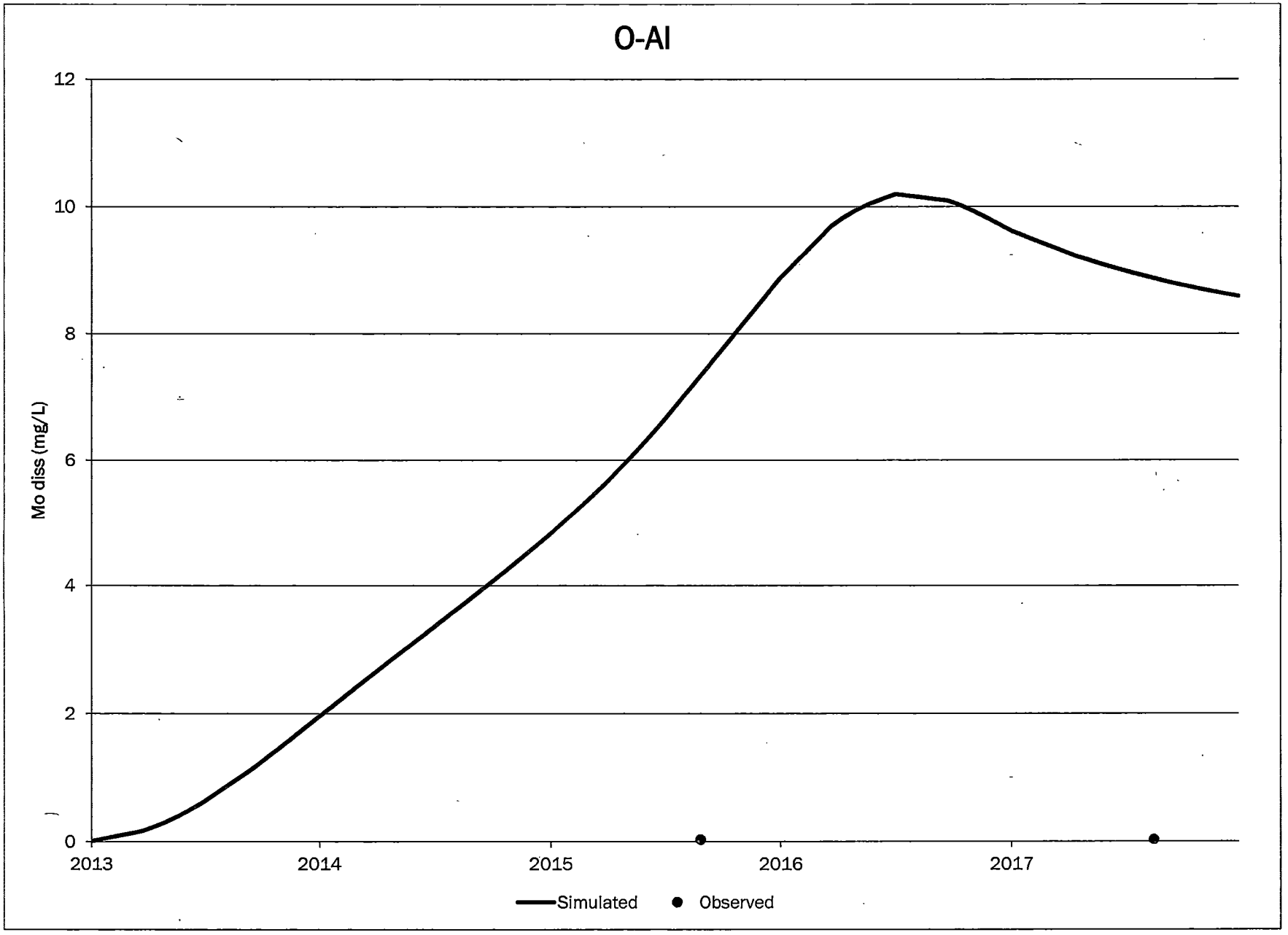

MY-AI
Mo diss (mg/L)
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
2013
2014
2015
2016
2017
Simulated
Observed

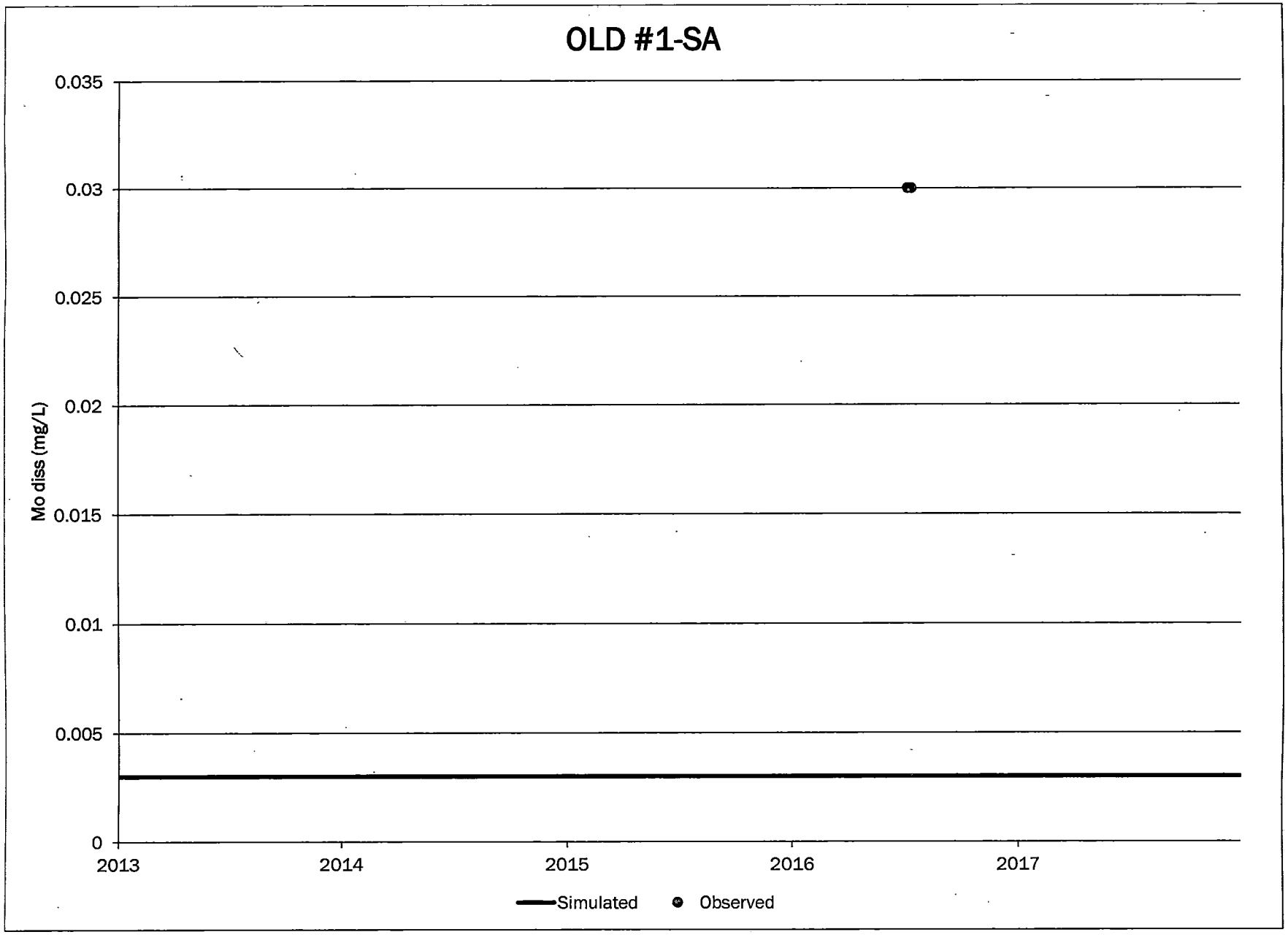

MZ-AI
0.12
0.1
0.08
0.06
0.04
0.02
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

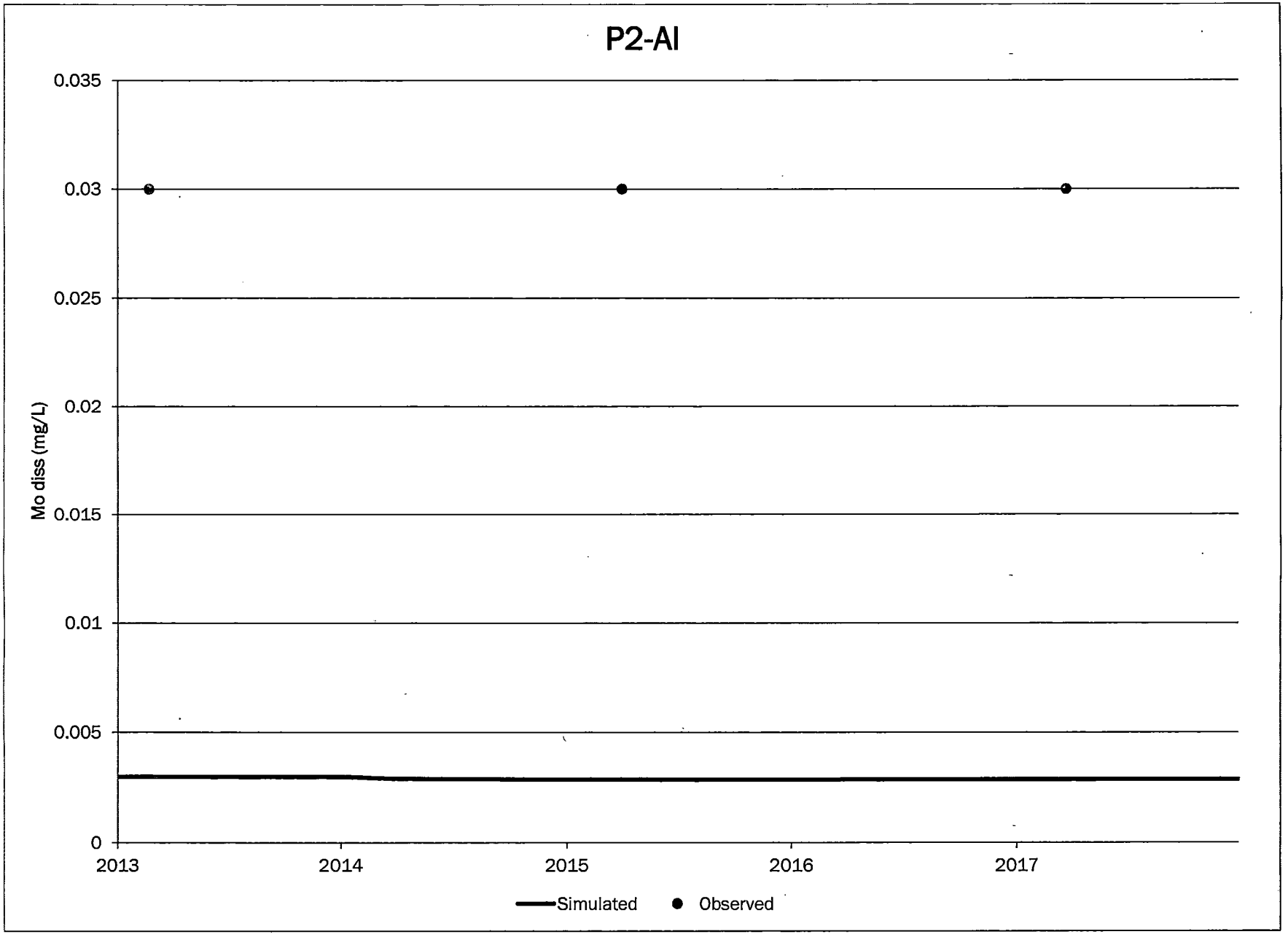

NB-AI
Mo diss (mg/L)
50
45
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

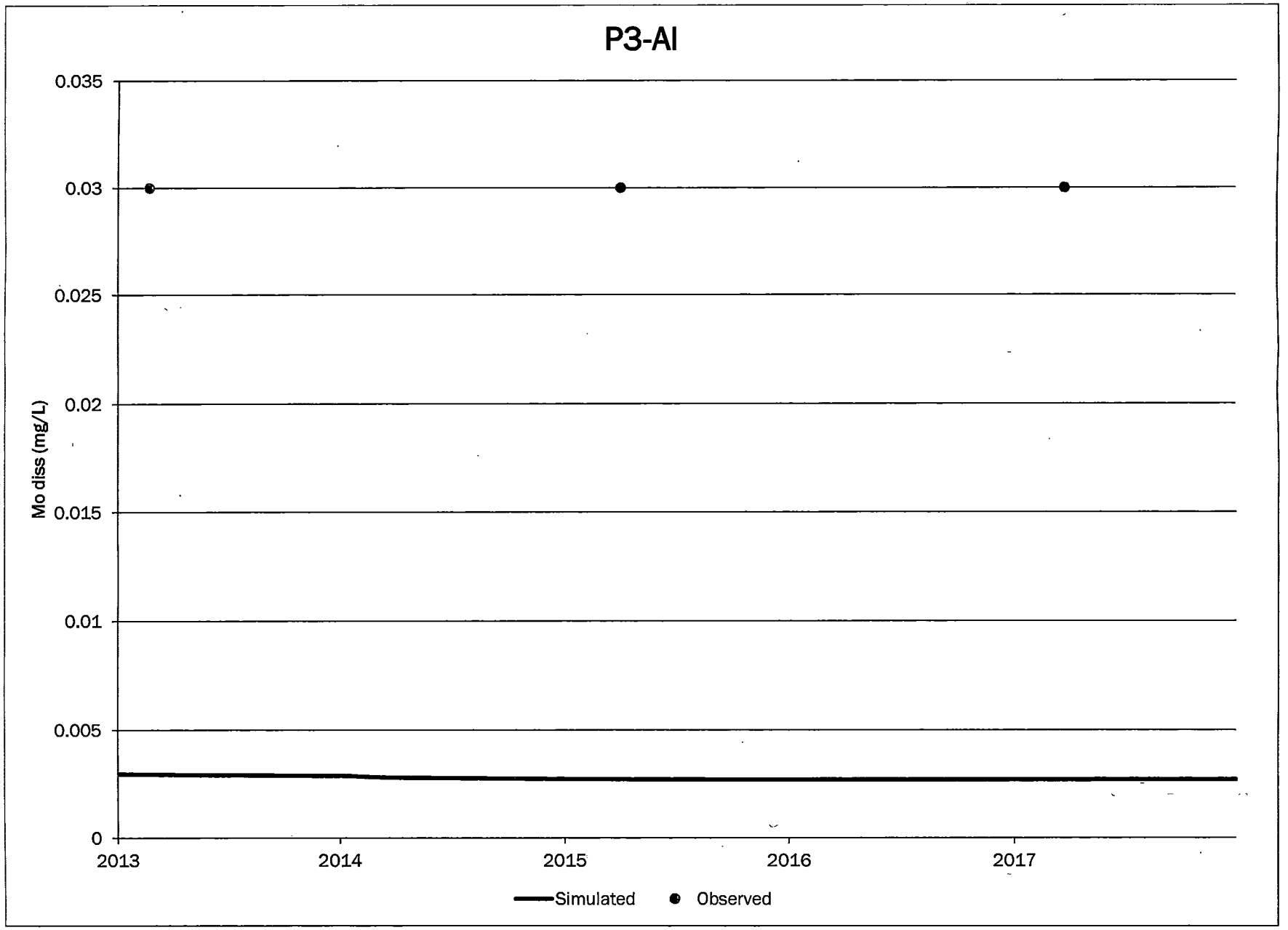

NC-AI
Mo diss (mg/L)
16
14
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

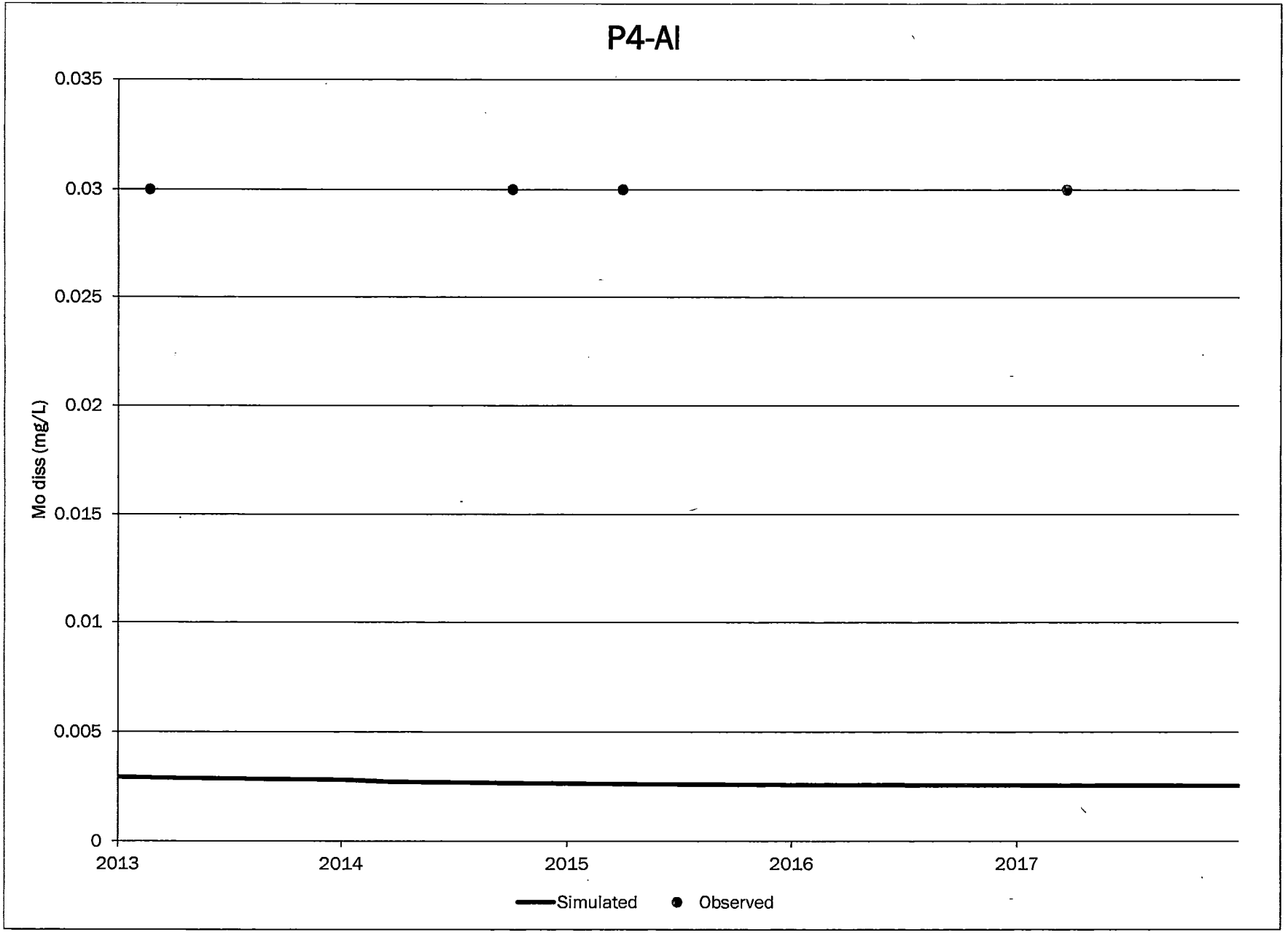

ND-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

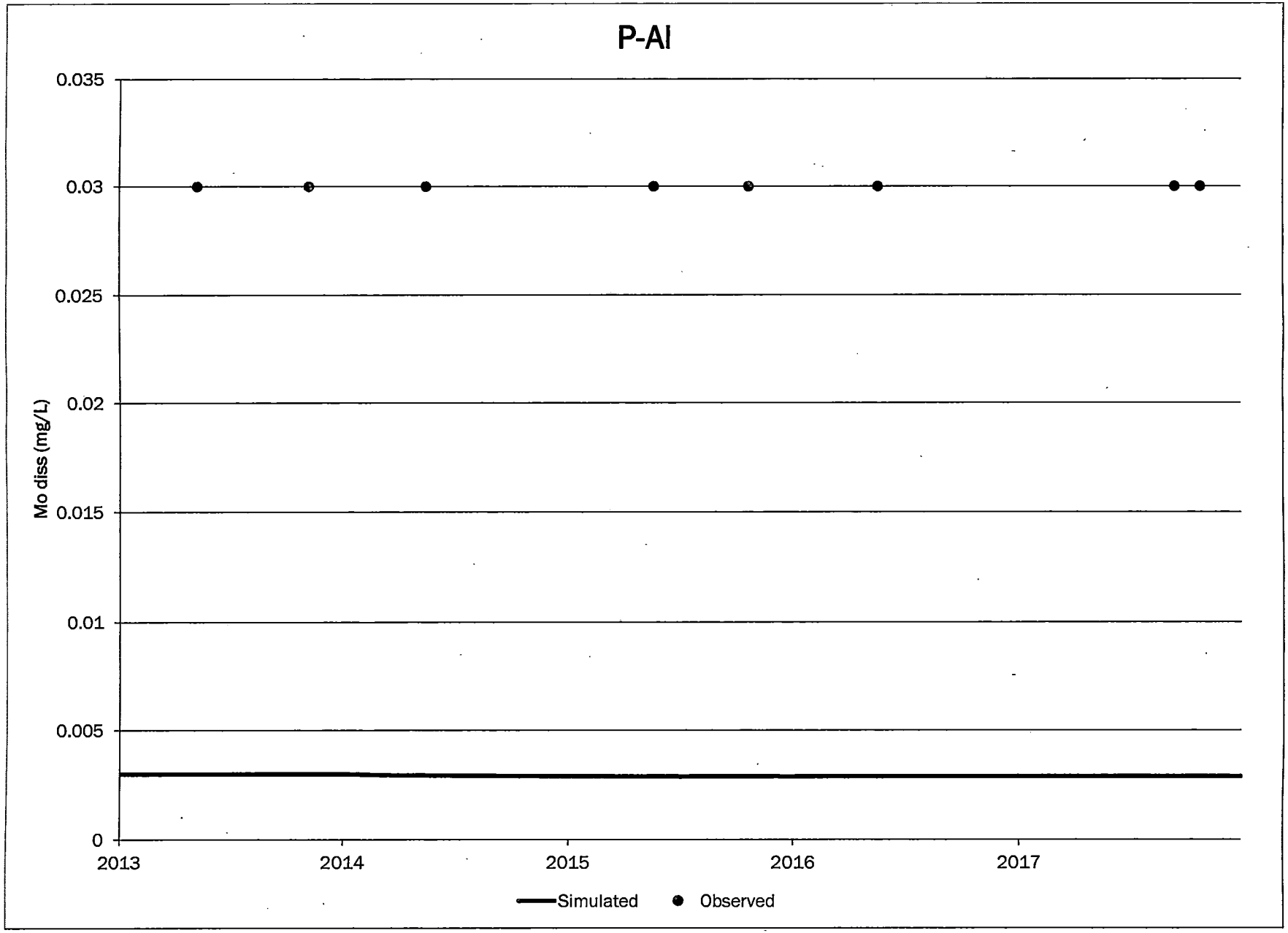

O-AI
Mo diss (mg/L)
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

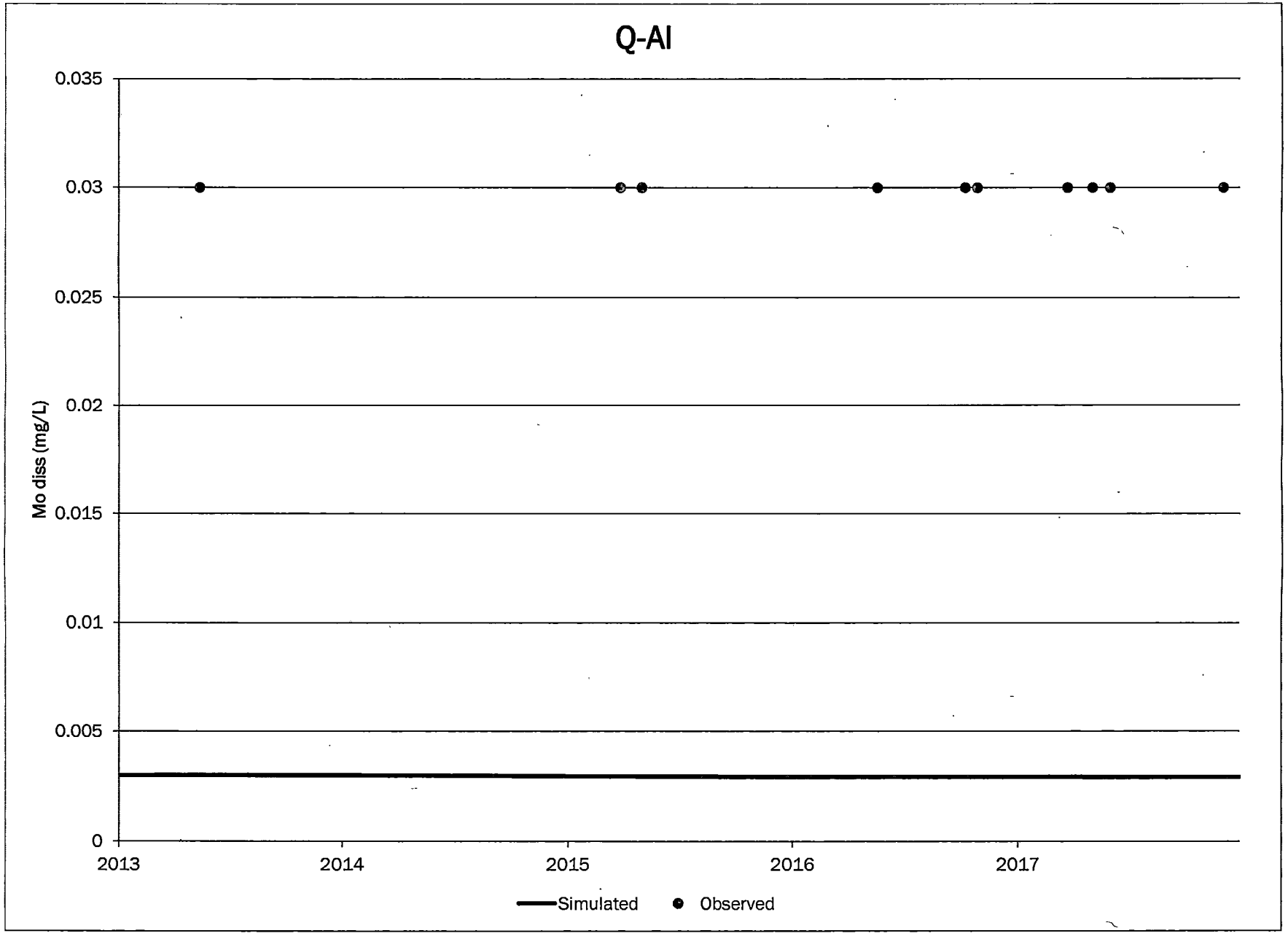

OLD #1-SA
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

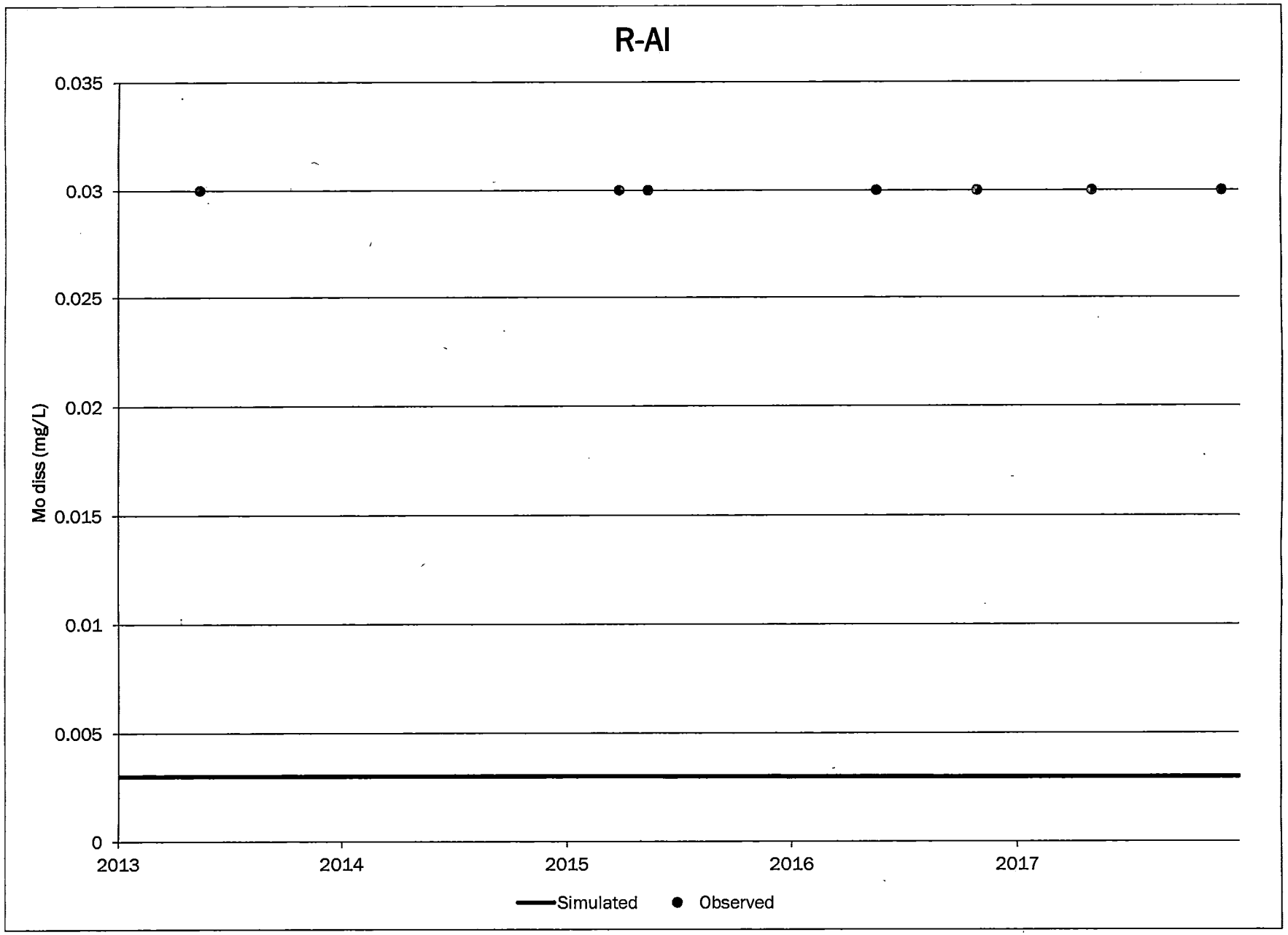

P2-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

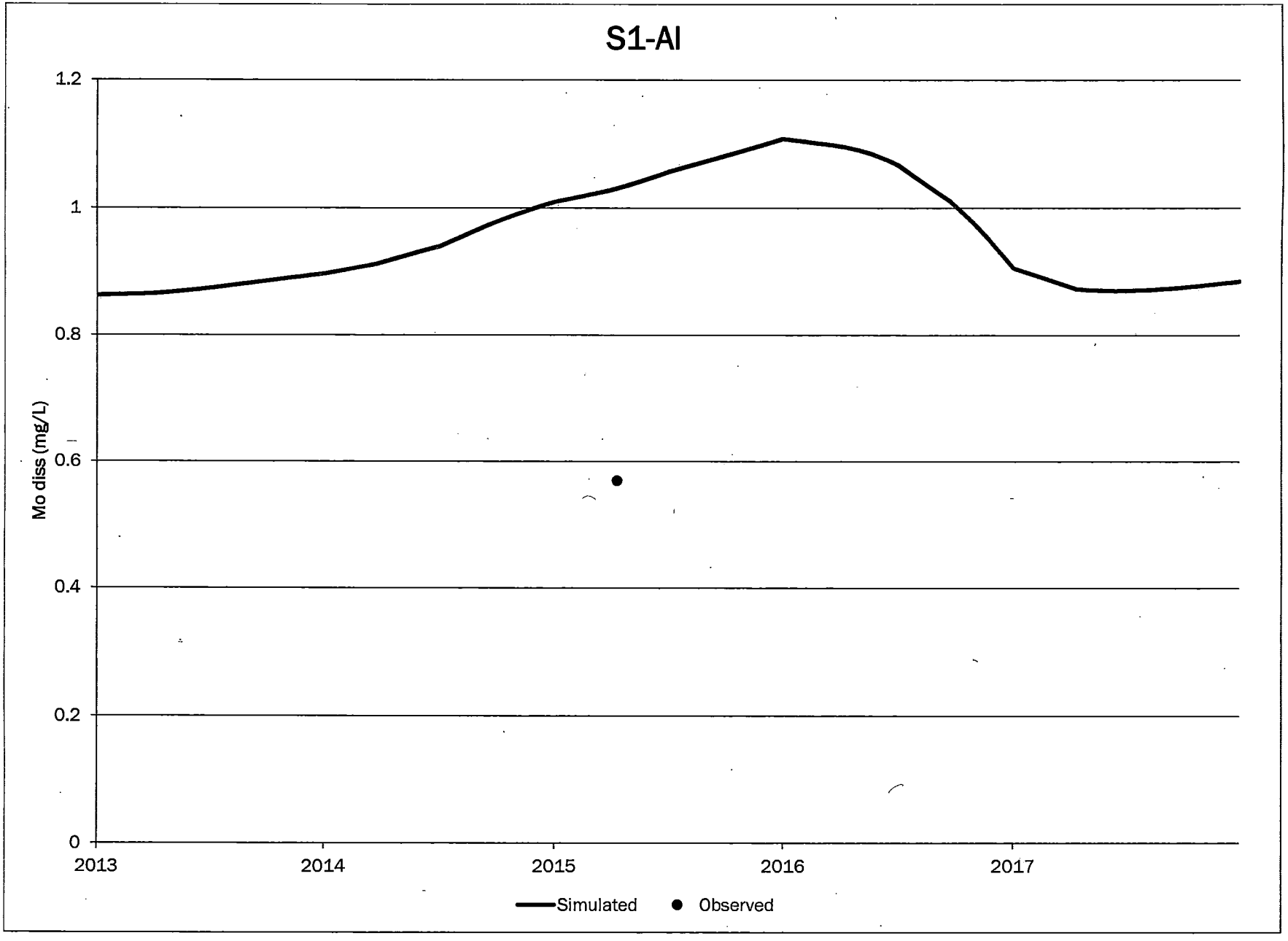

P3-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

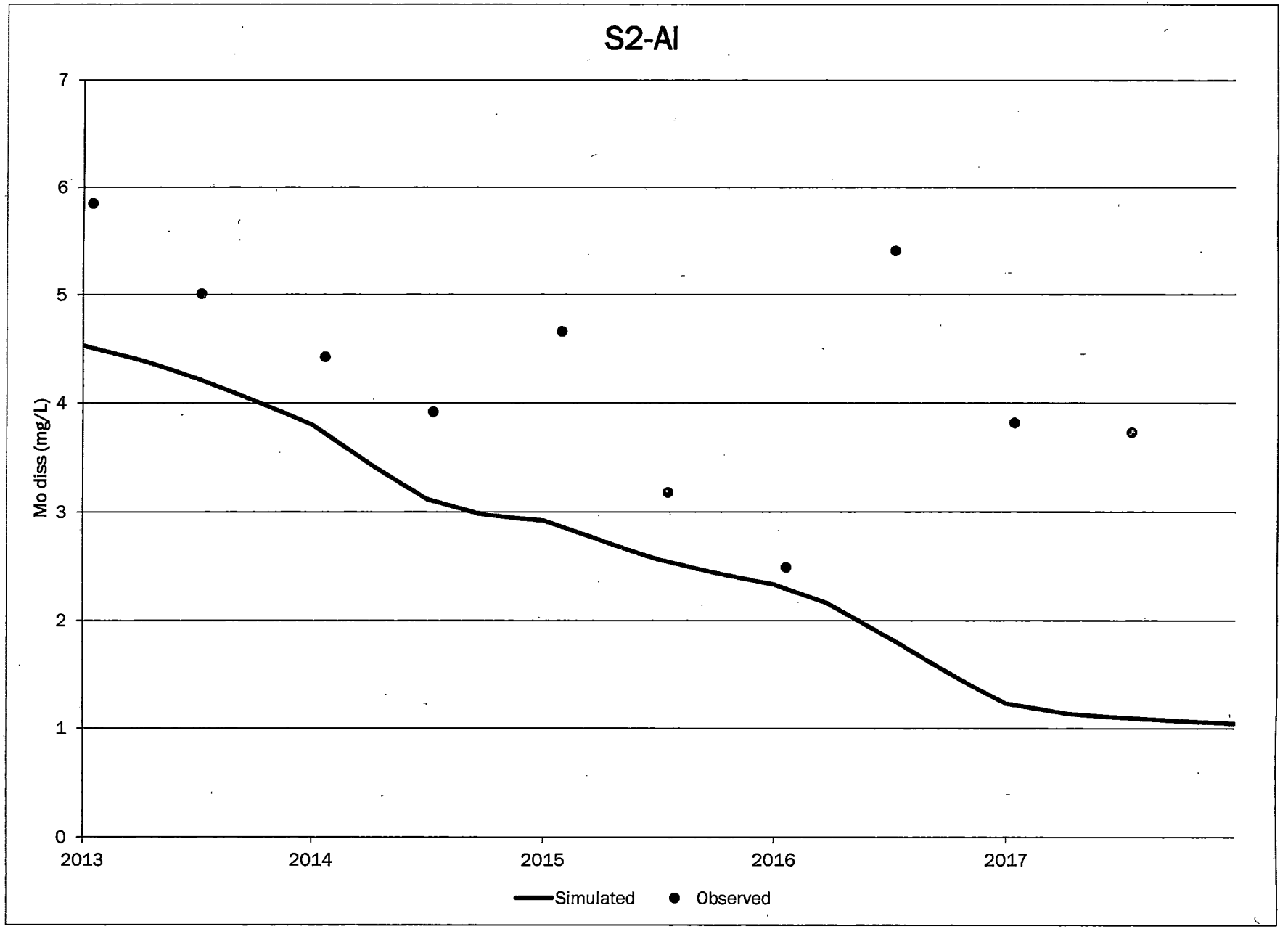

P4-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

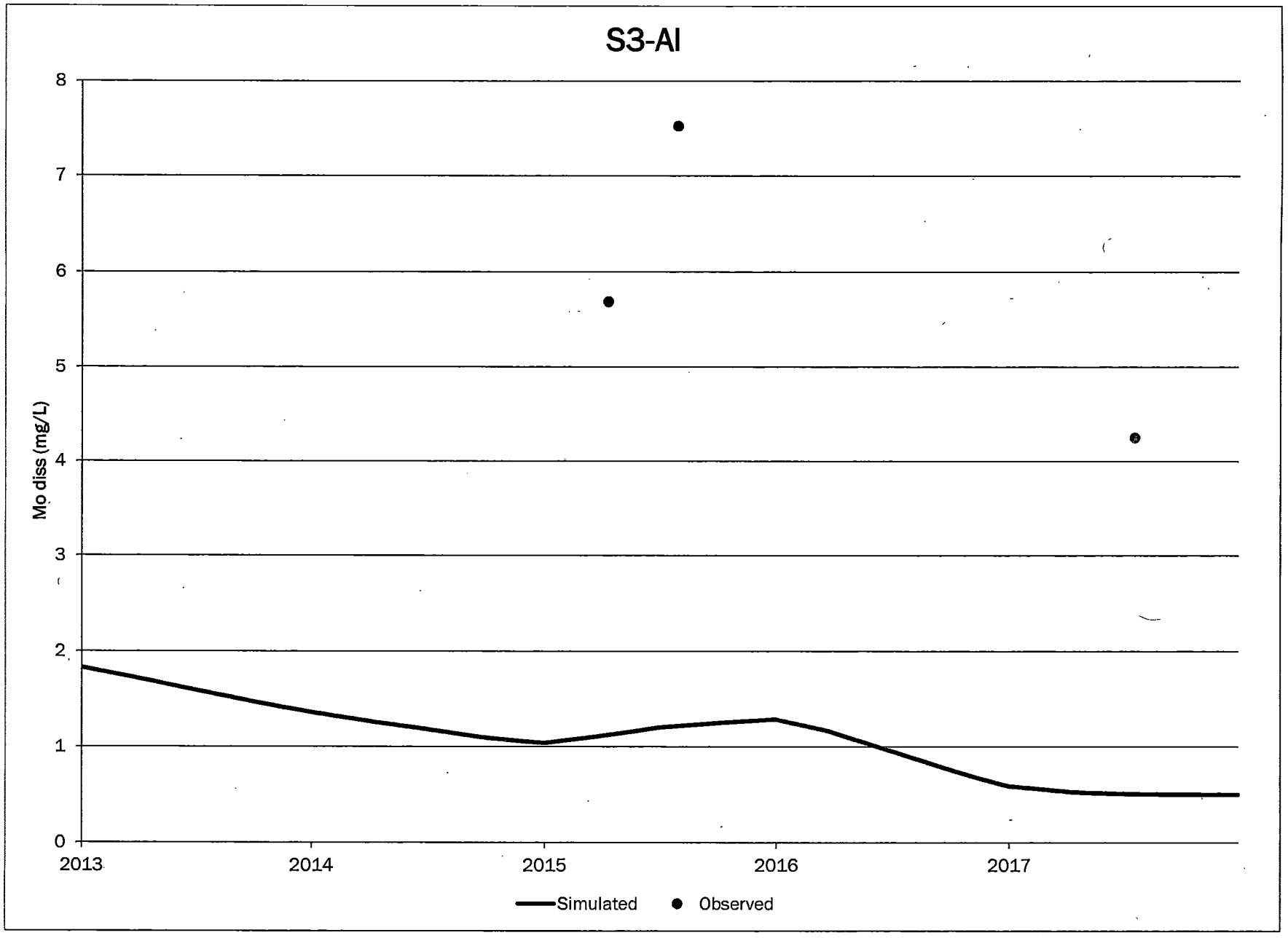

P-Al
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

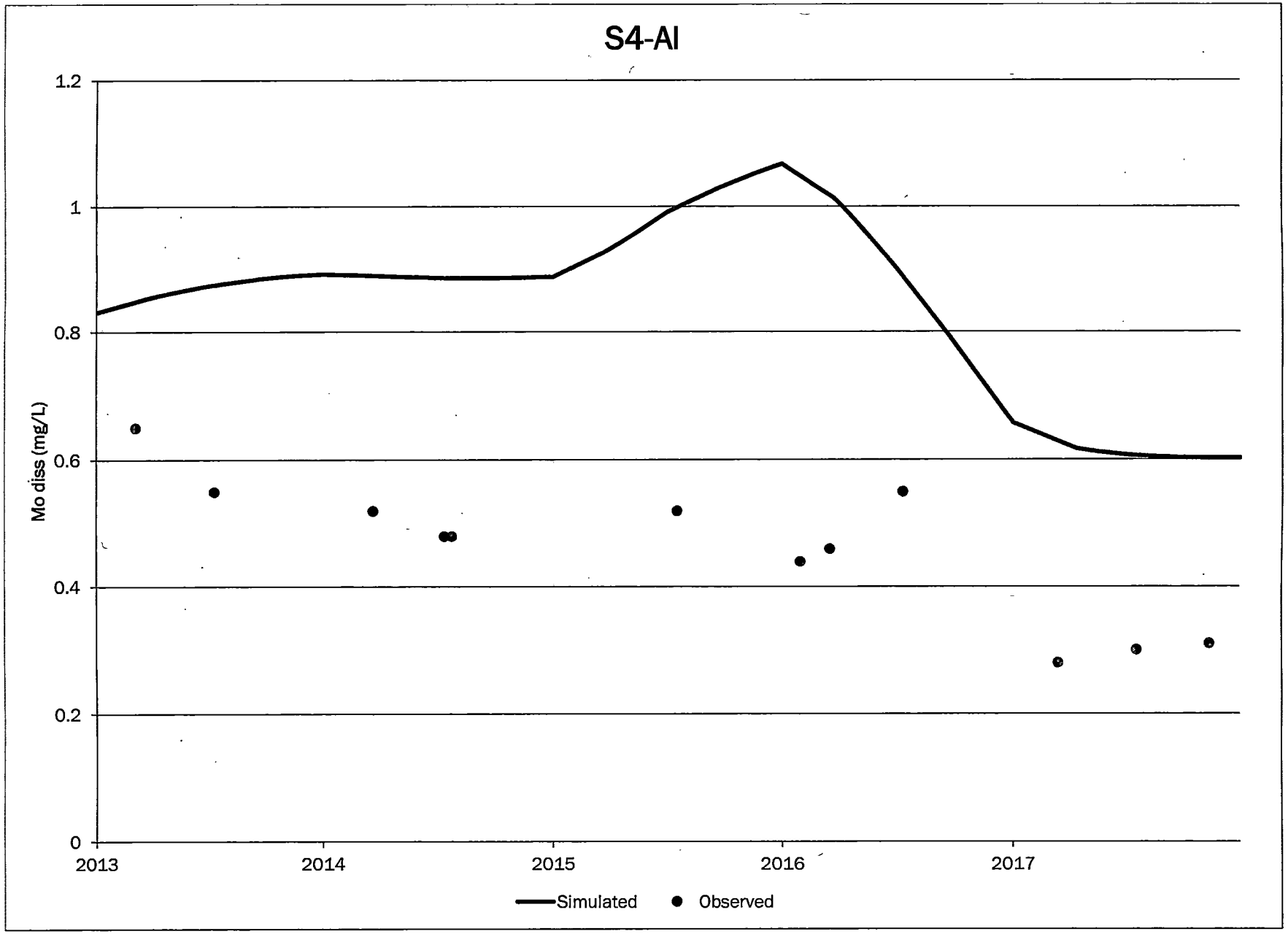

Q-Al
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

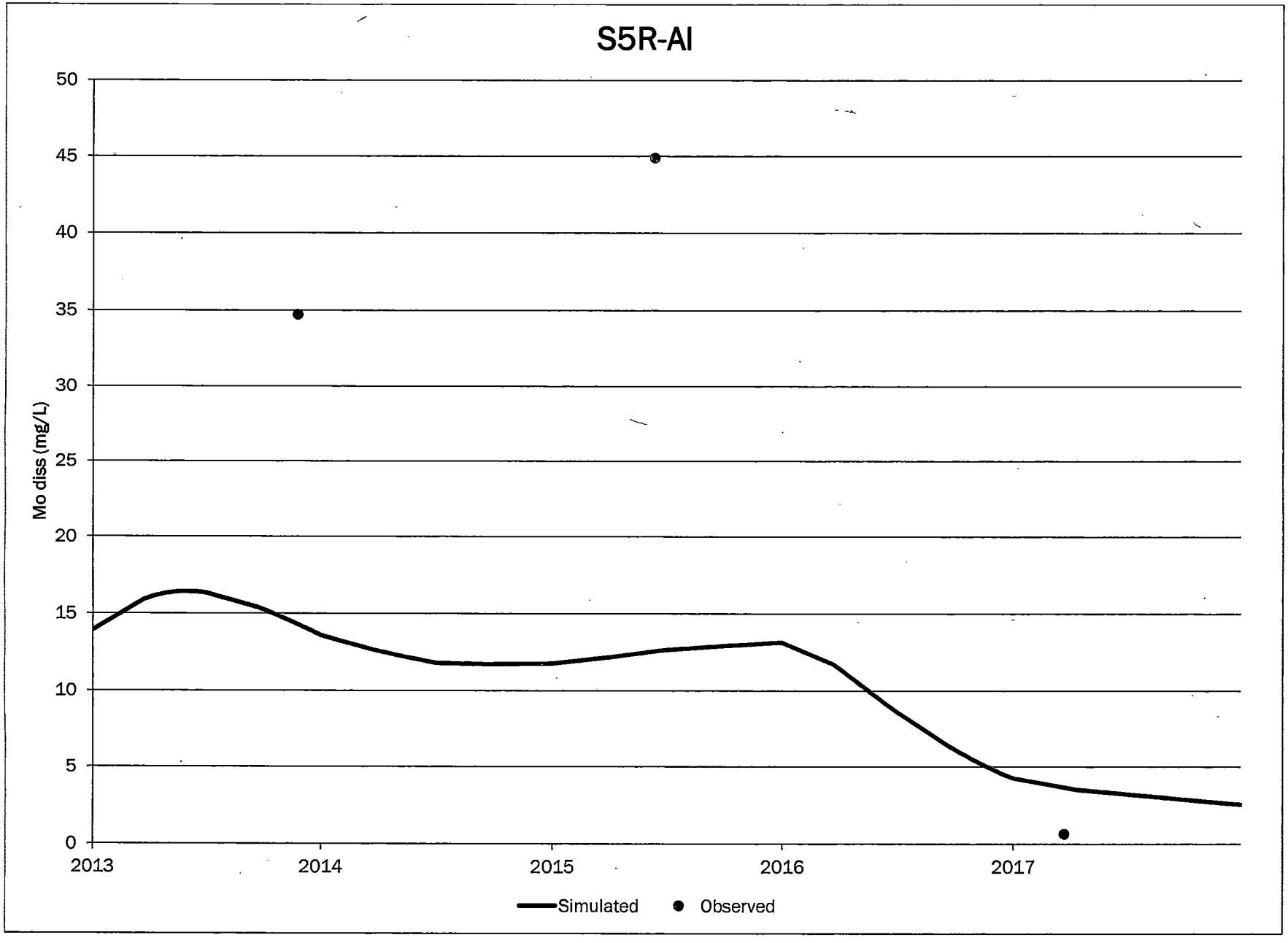

R-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

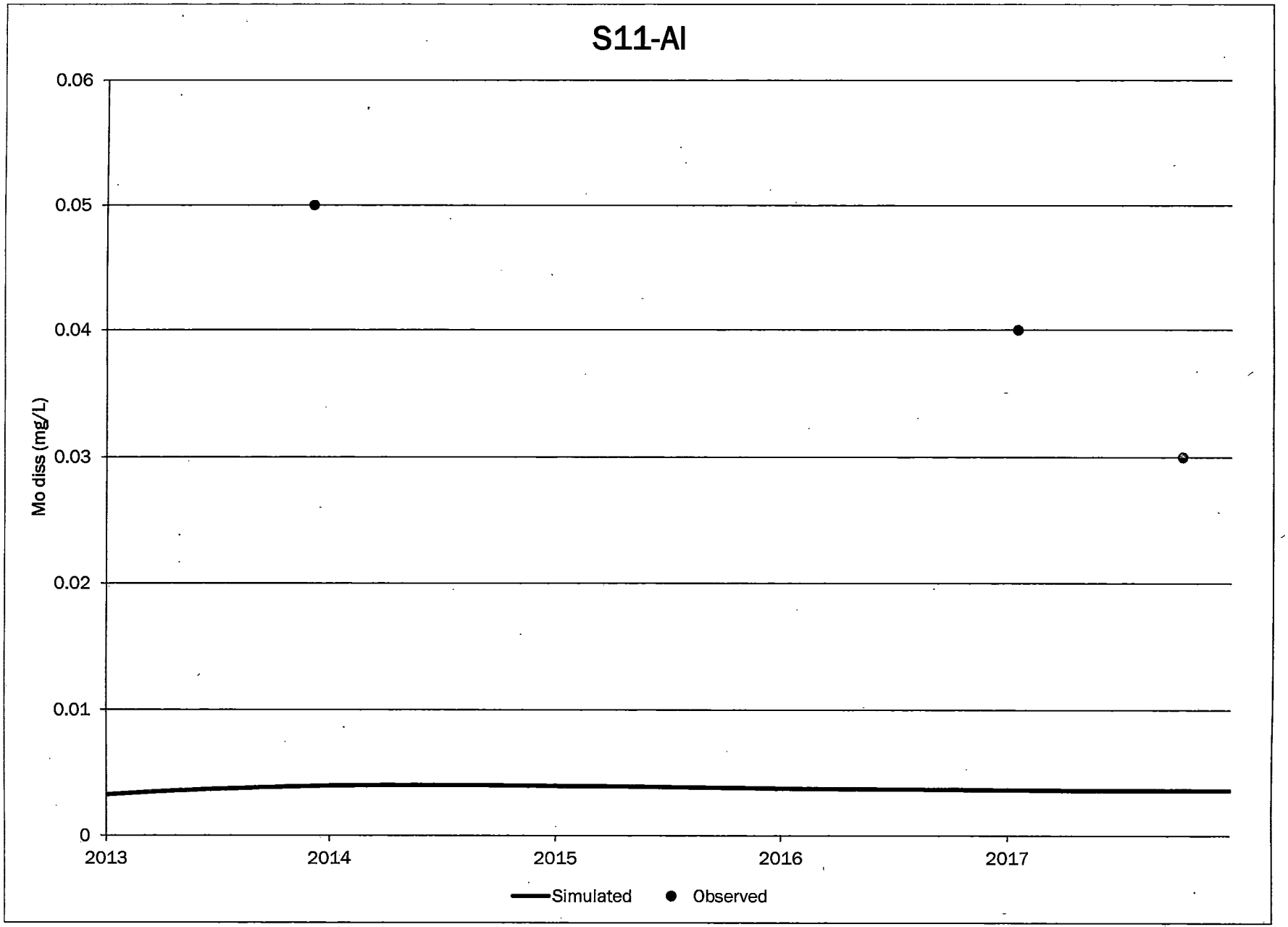

S1-AI
1.2
1
0.8
0.6
0.4
0.2
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

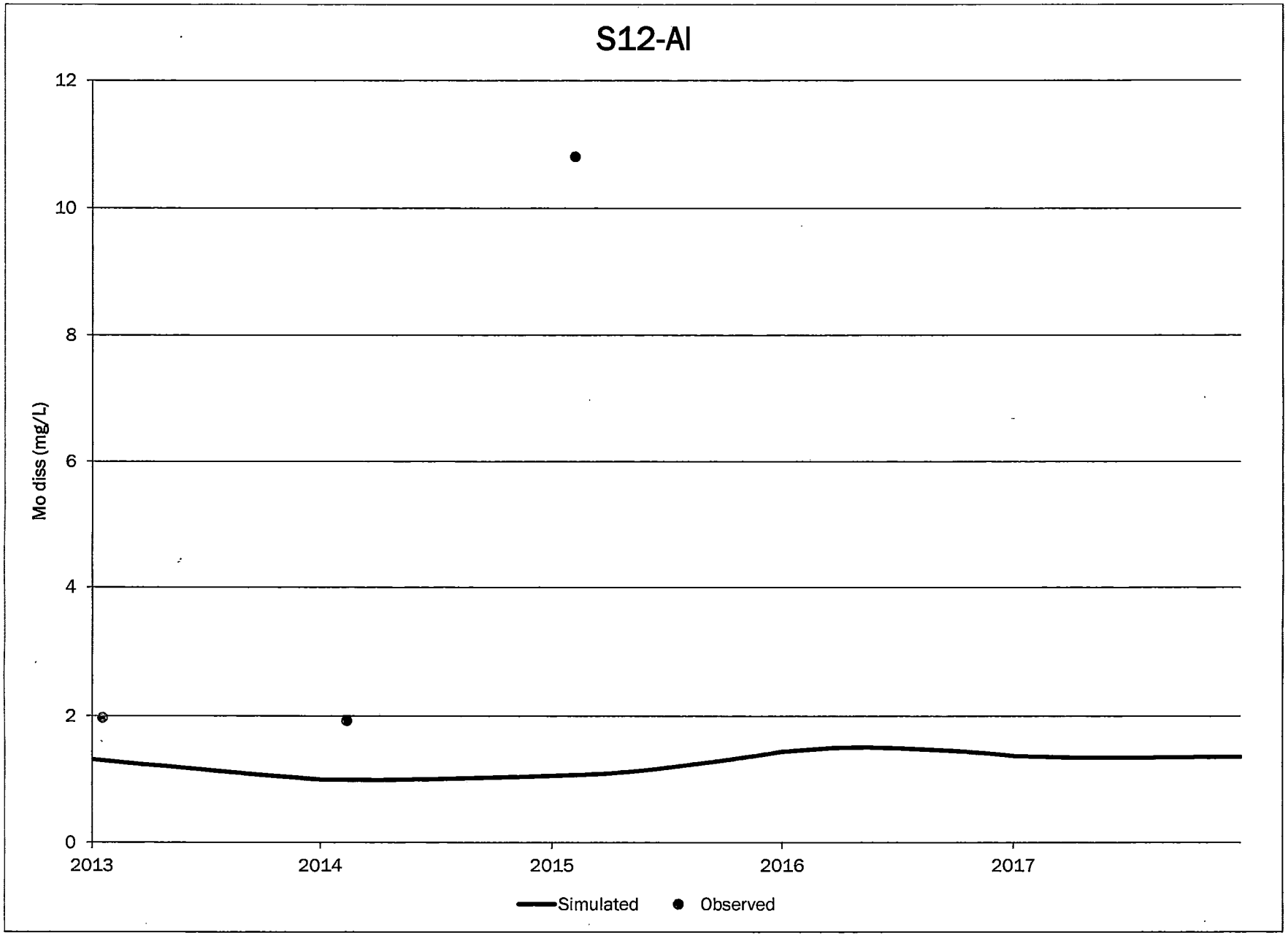

S2-AI
Mo diss (mg/L)
0
1
2
3
4
5
6
7
2013
2014
2015
2016
2017
Simulated
Observed

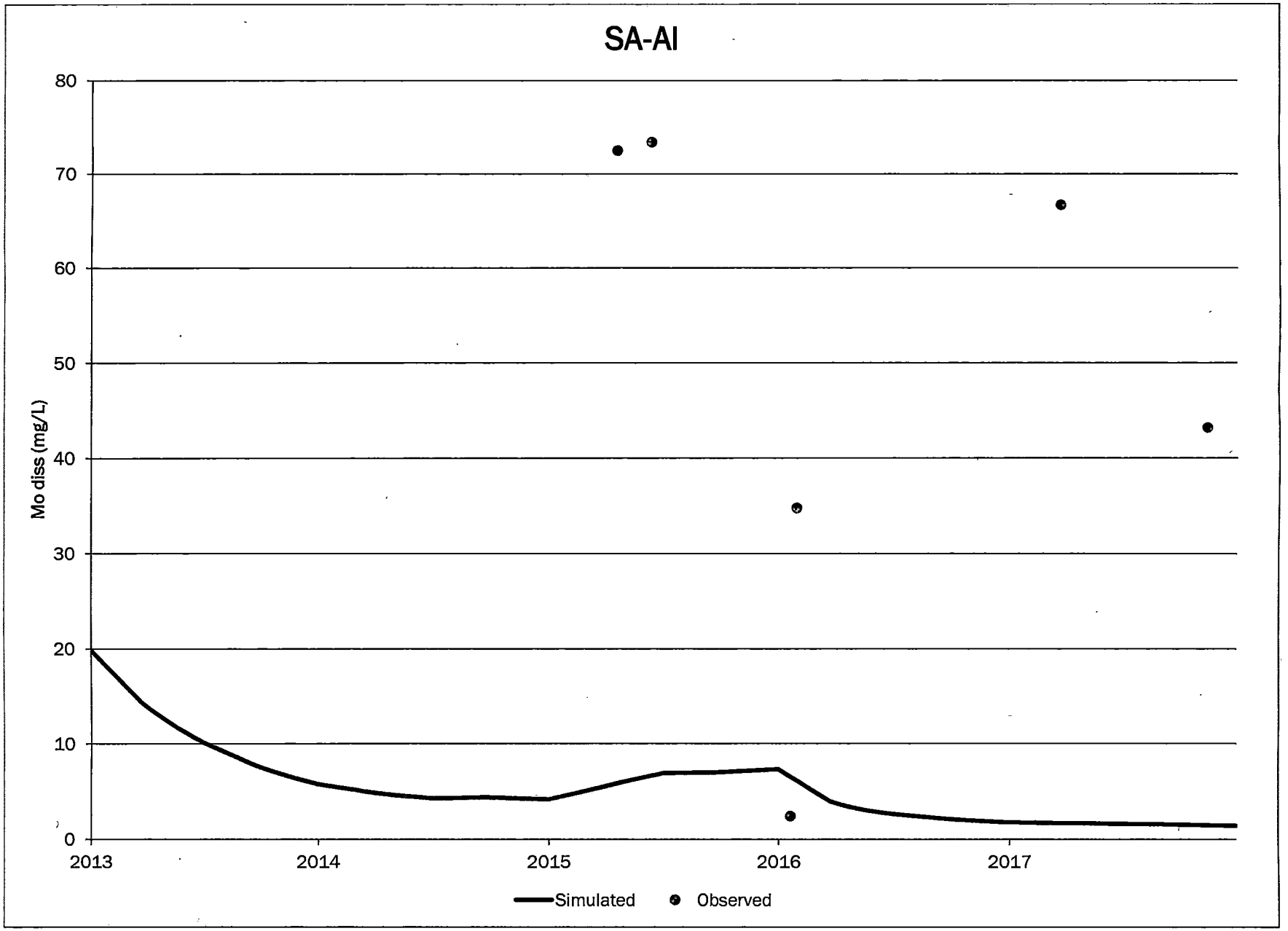

S3-AI
Mo diss (mg/L)
8
7
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

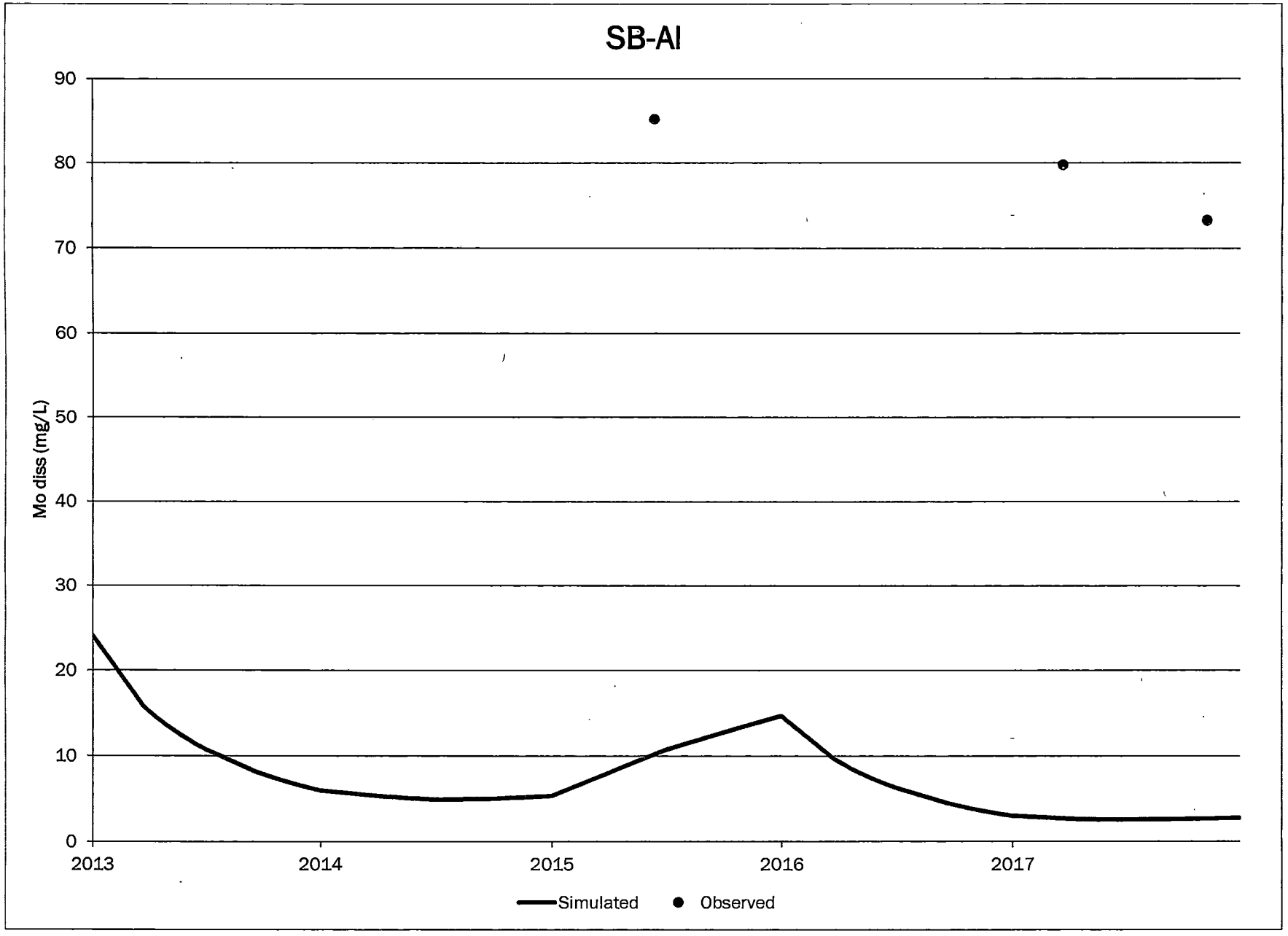

S4-AI
1.2
1
0.8
0.6
0.4
0.2
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

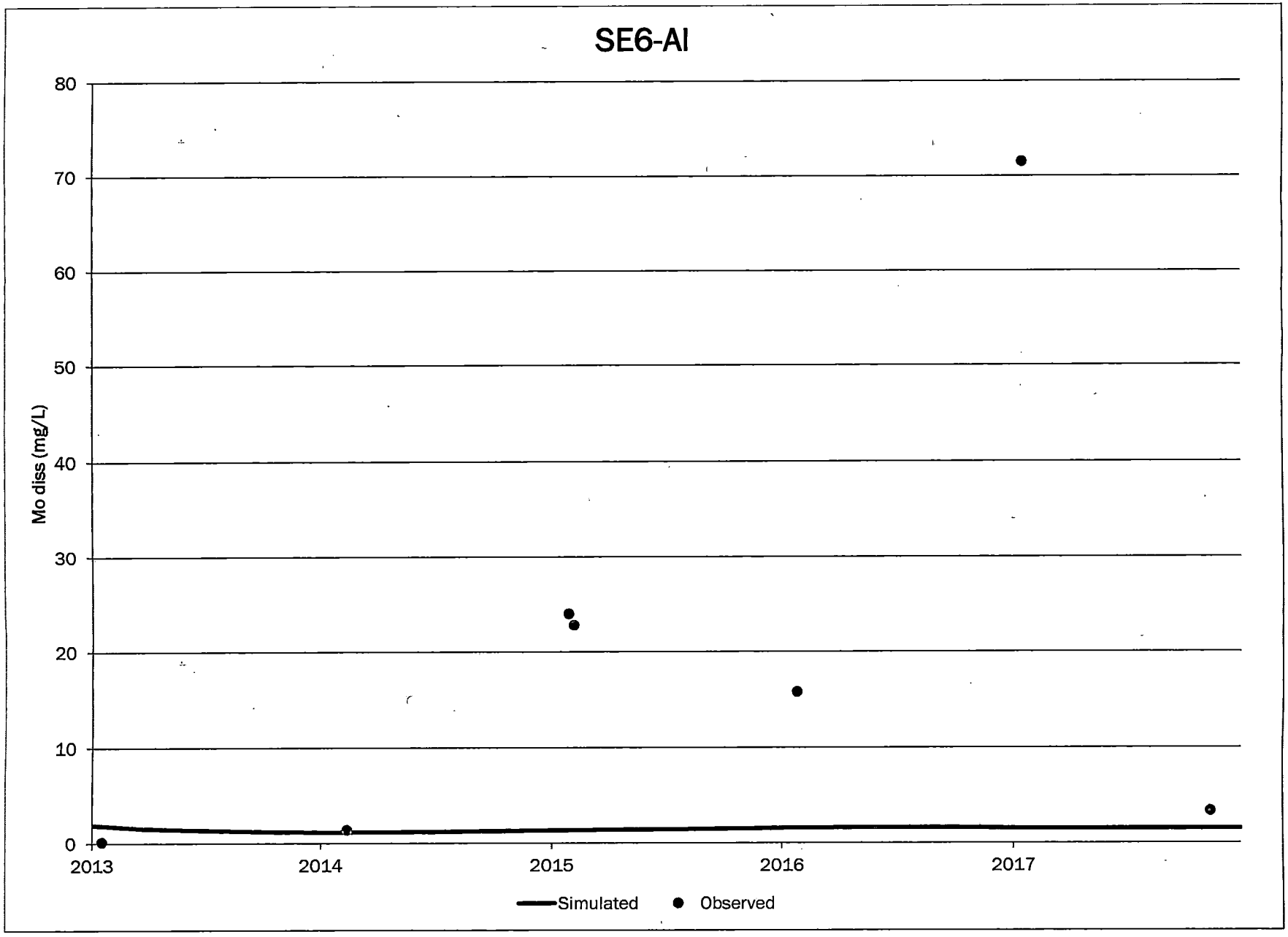

S5R-AI
Mo diss (mg/L)
50
45
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

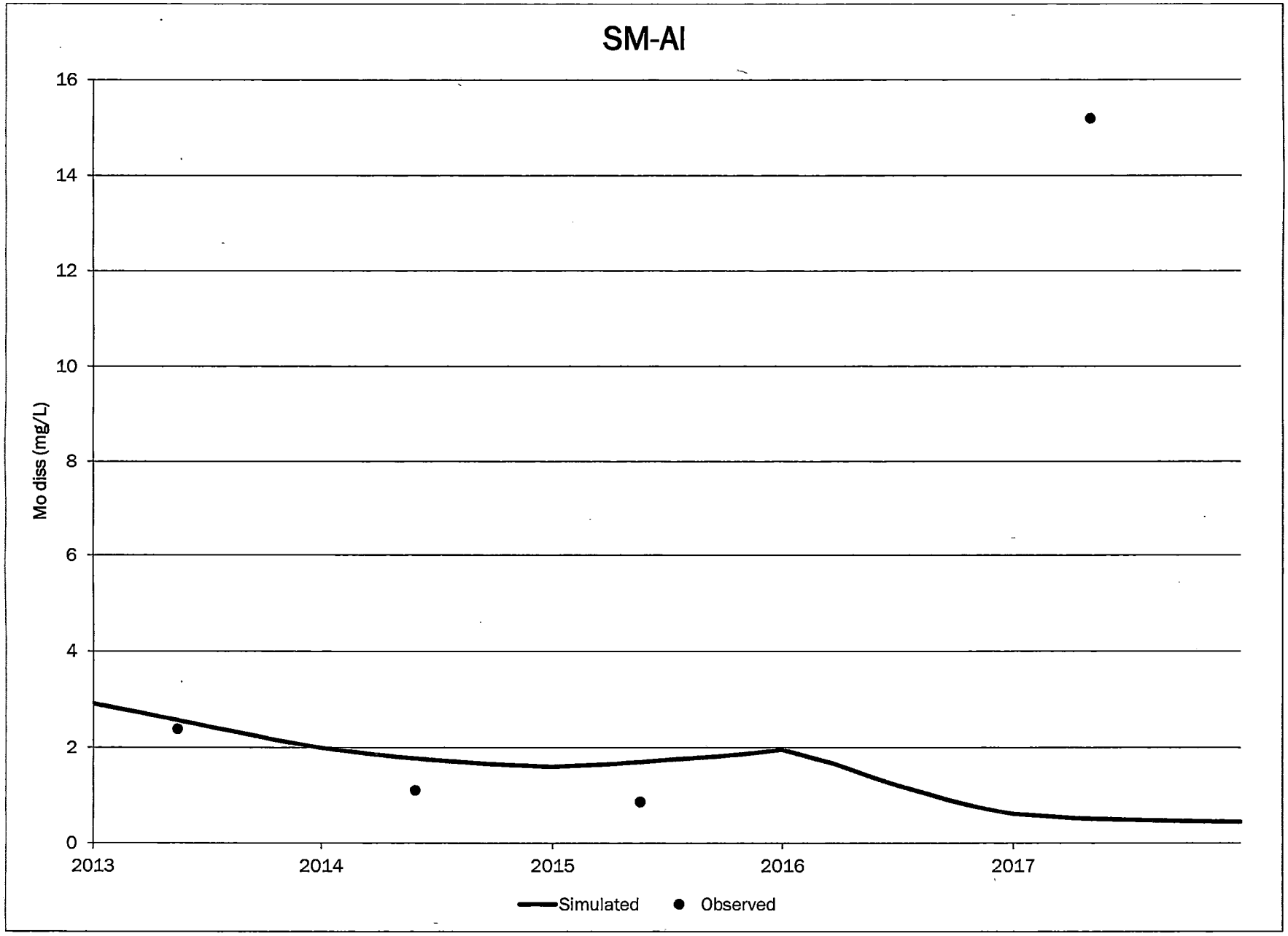

S11-AI
0.06
0.05
0.04
0.03
0.02
0.01
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

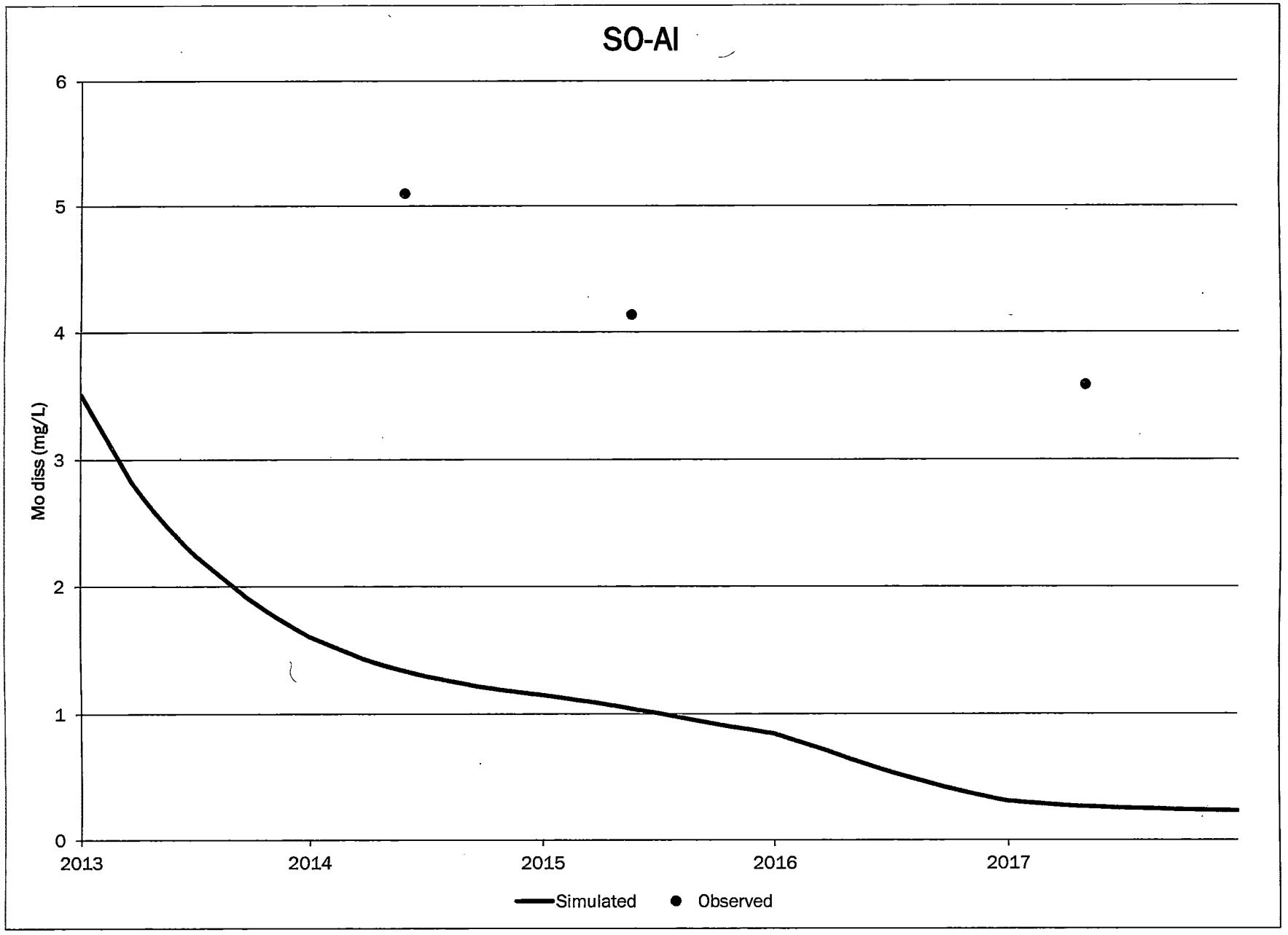

S12-AI
Mo diss (mg/L)
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

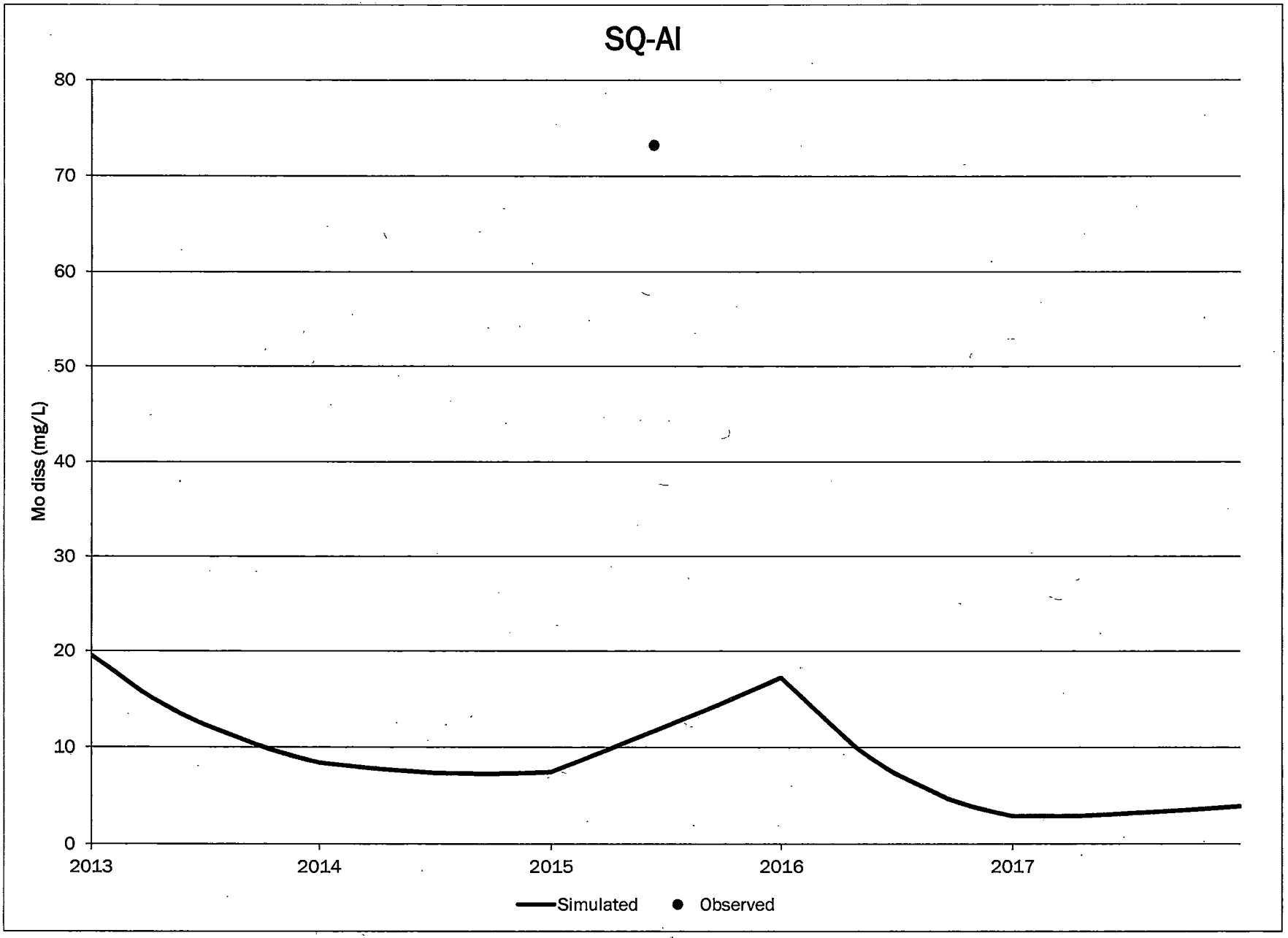

SA-AI
Mo diss (mg/L)
80
70
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
Simulated
Observed

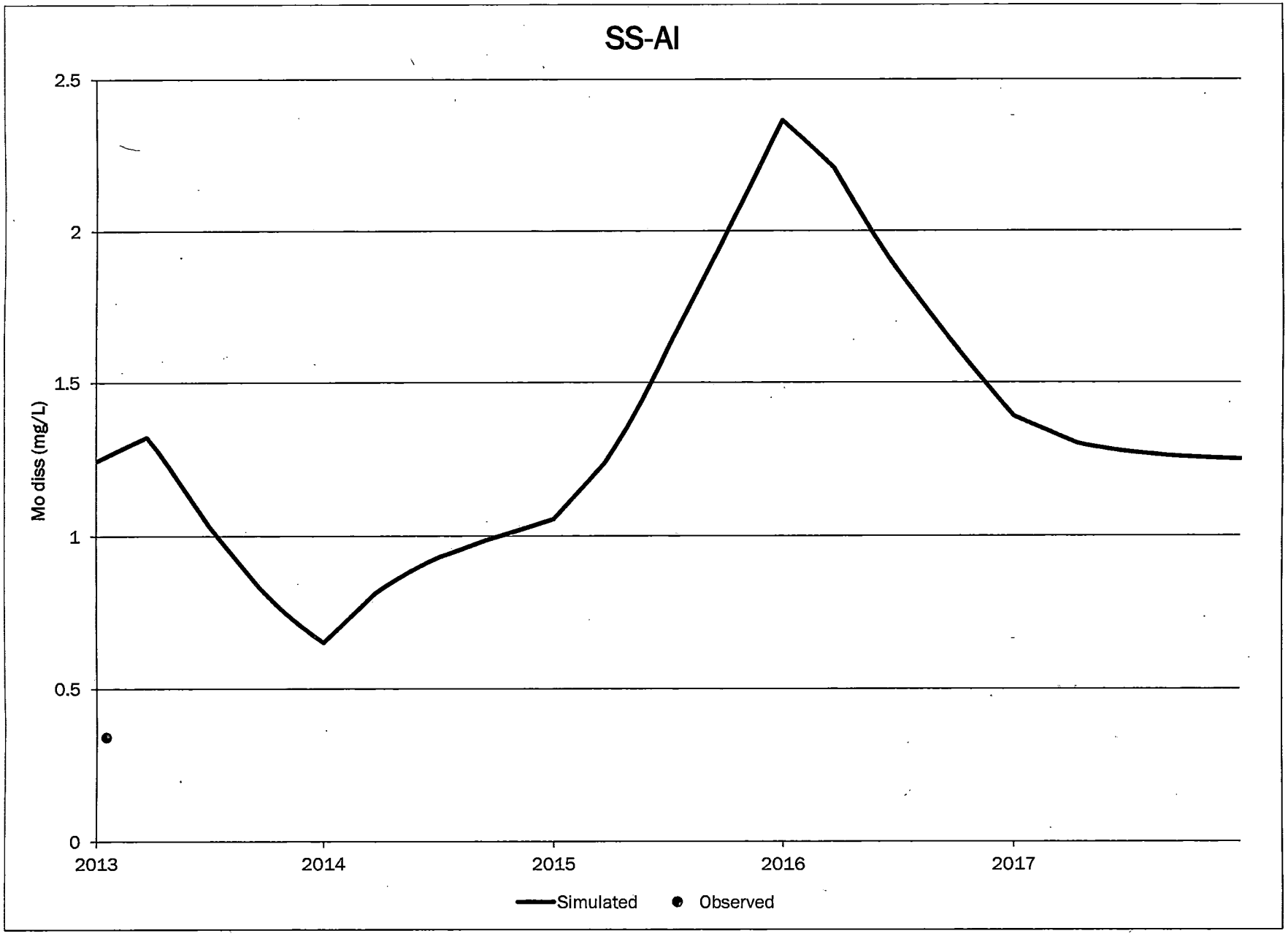

SB-AI
Mo diss (mg/L)
90
80
70
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
Simulated
Observed

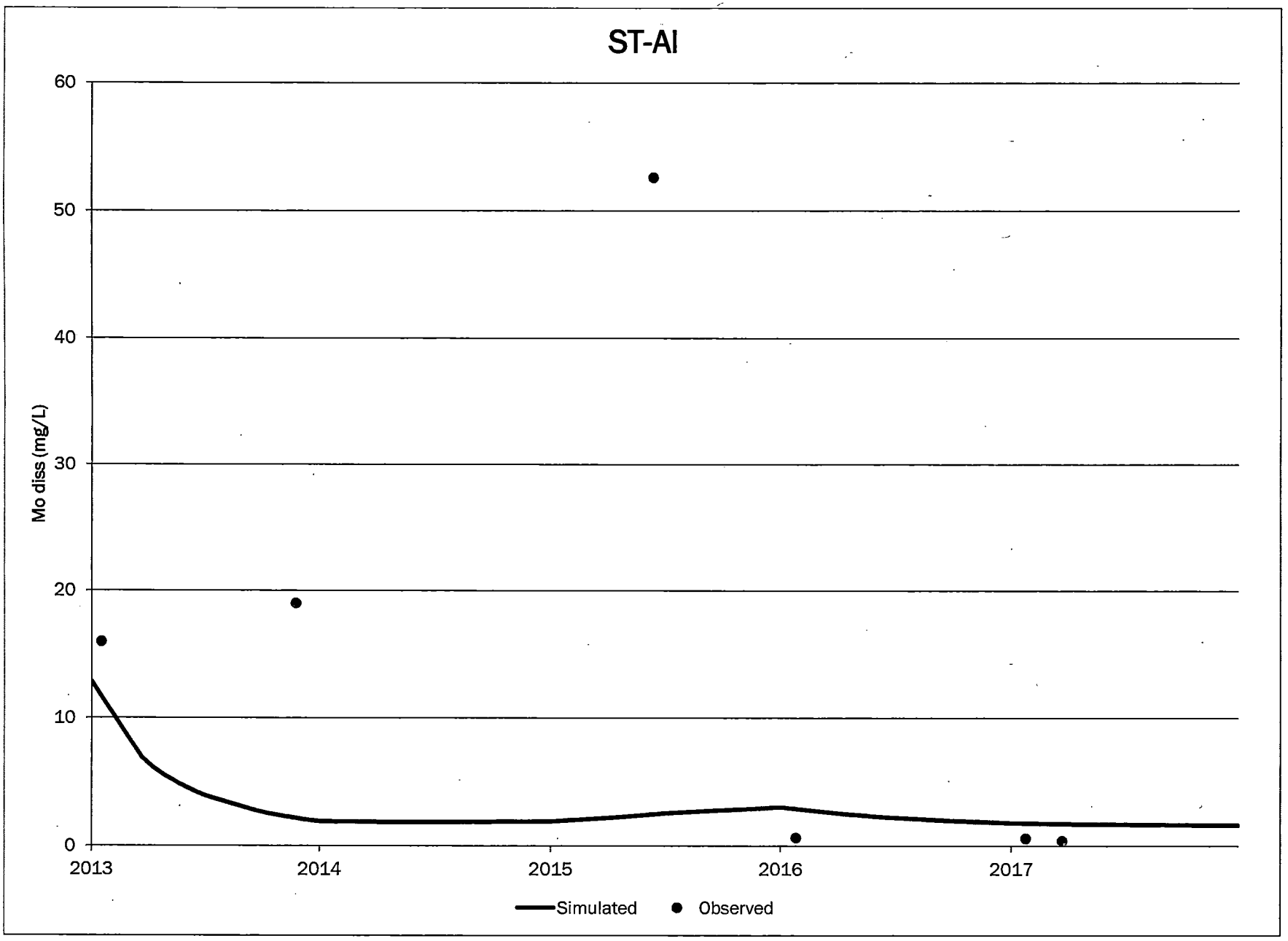

SE6-AI
Mo diss (mg/L)
80
70
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
Simulated
Observed

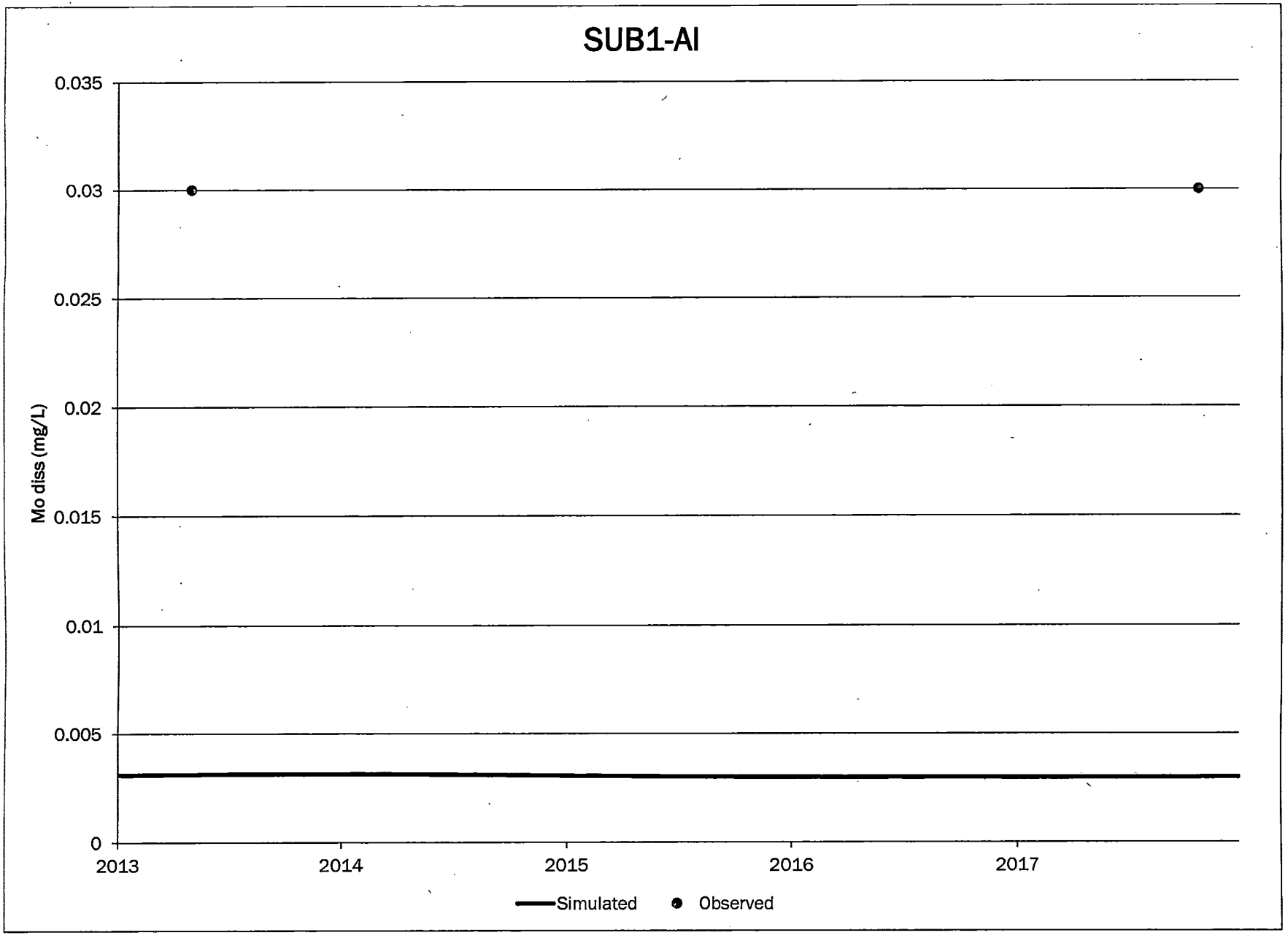

SM-AI
Mo diss (mg/L)
16
14
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

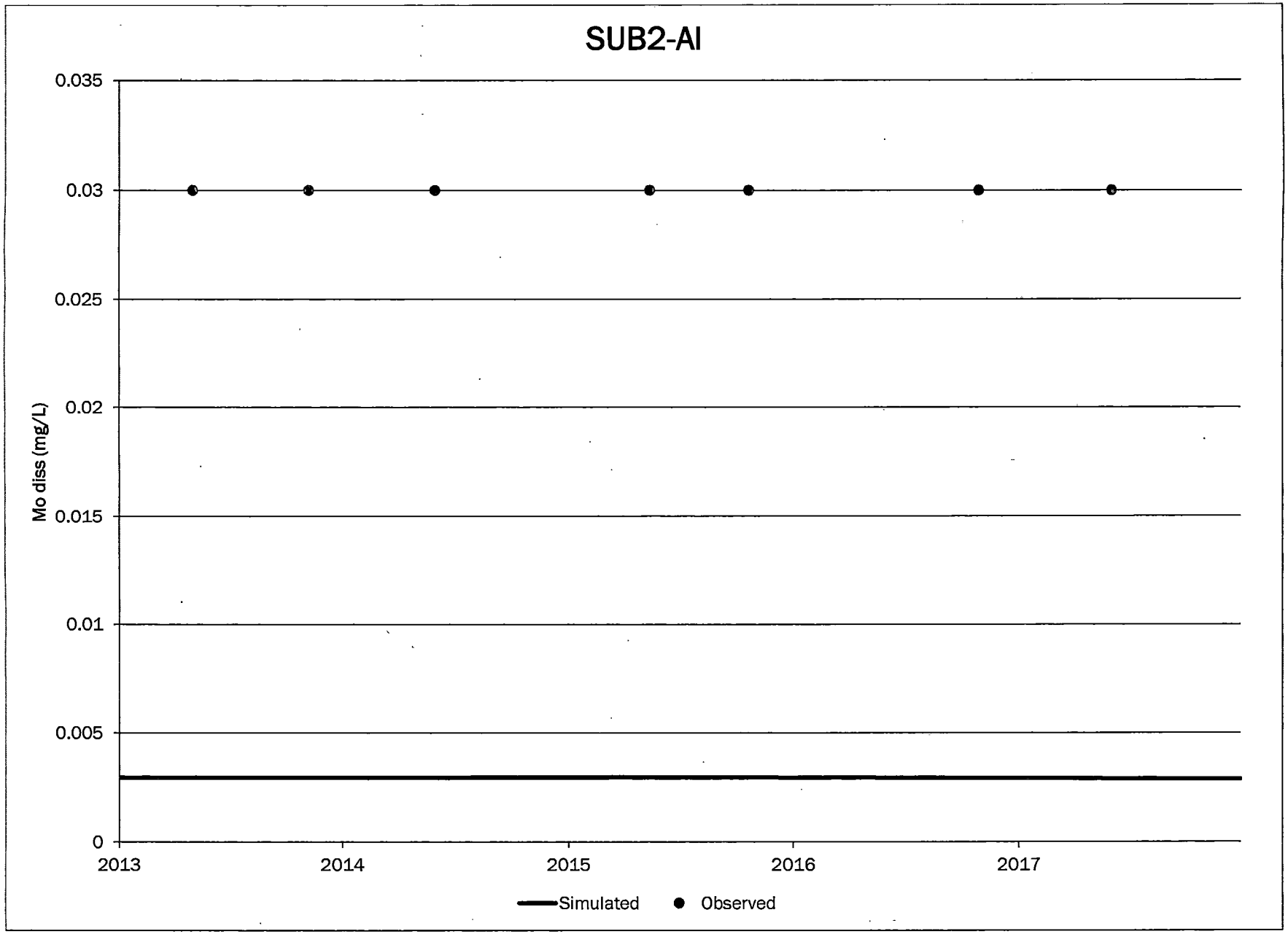

SO-AI
Mo diss (mg/L)
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed

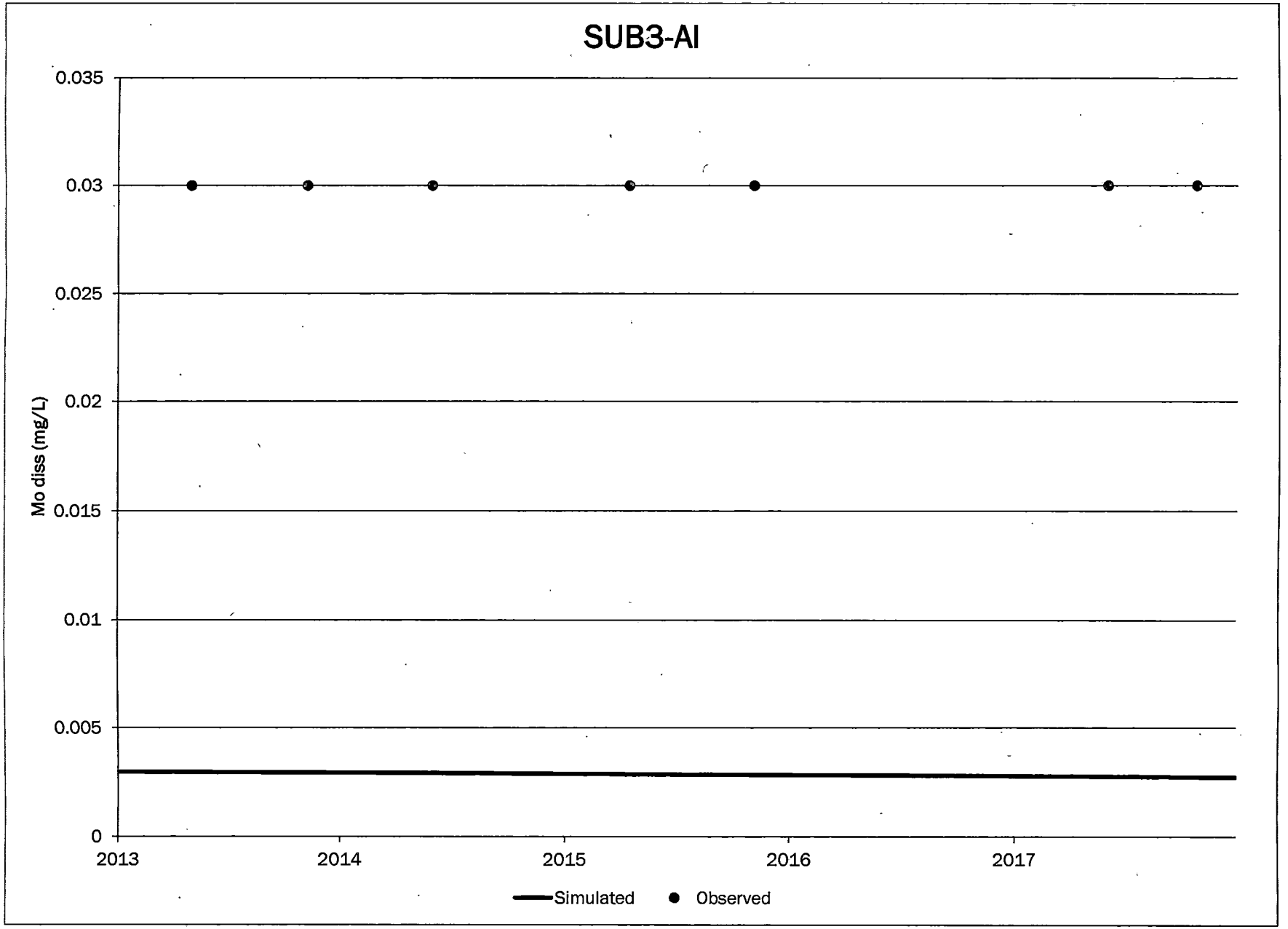

SQ-AI
Mo diss (mg/L)
80
70
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
Simulated
Observed

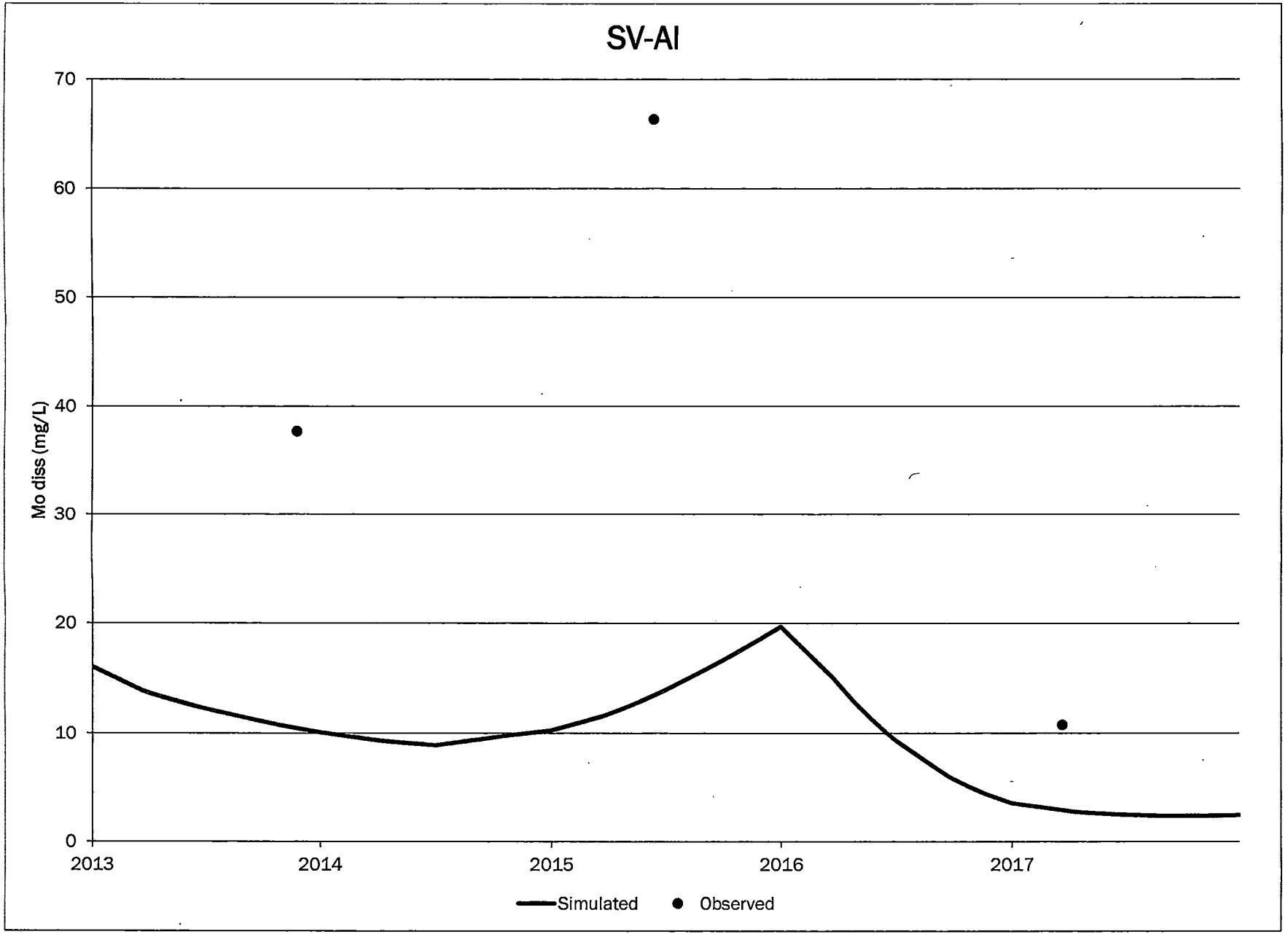

SS-AI
Mo diss (mg/L)
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed

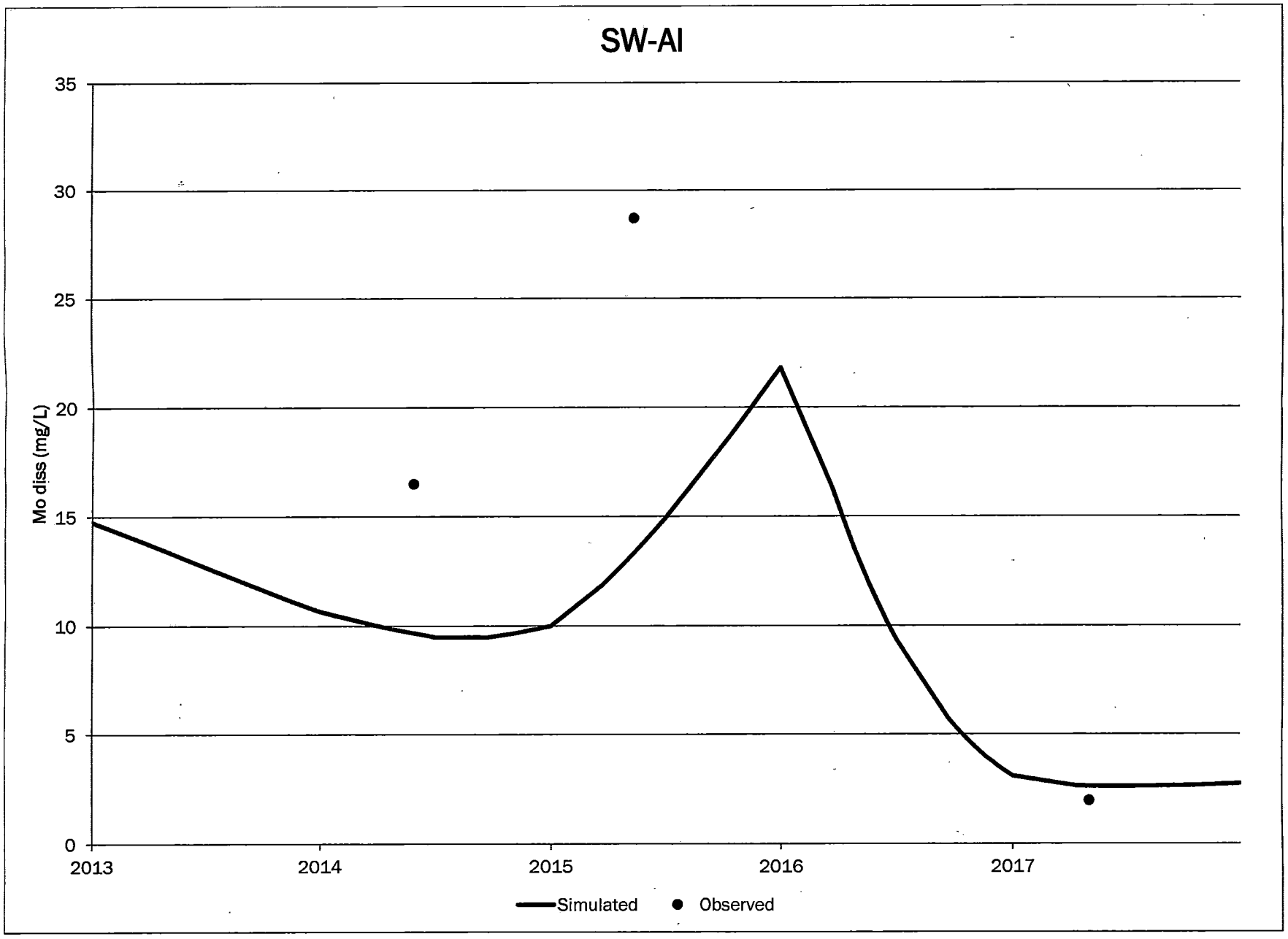

ST-AI
Mo diss (mg/L)
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
Simulated
Observed

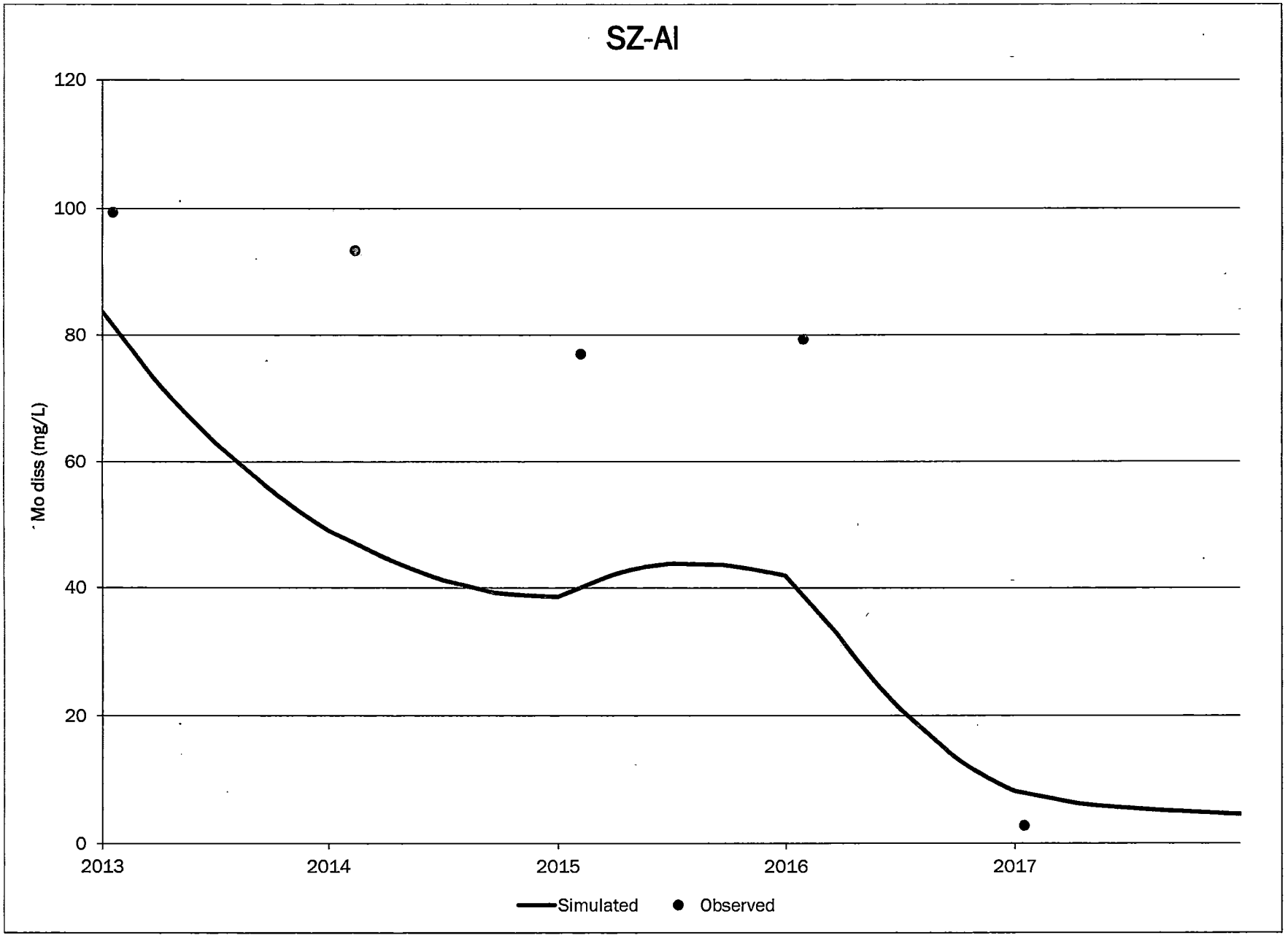

SUB1-AI
Mo diss (mg/L)
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
2013
2014
2015
2016
2017
Simulated
Observed

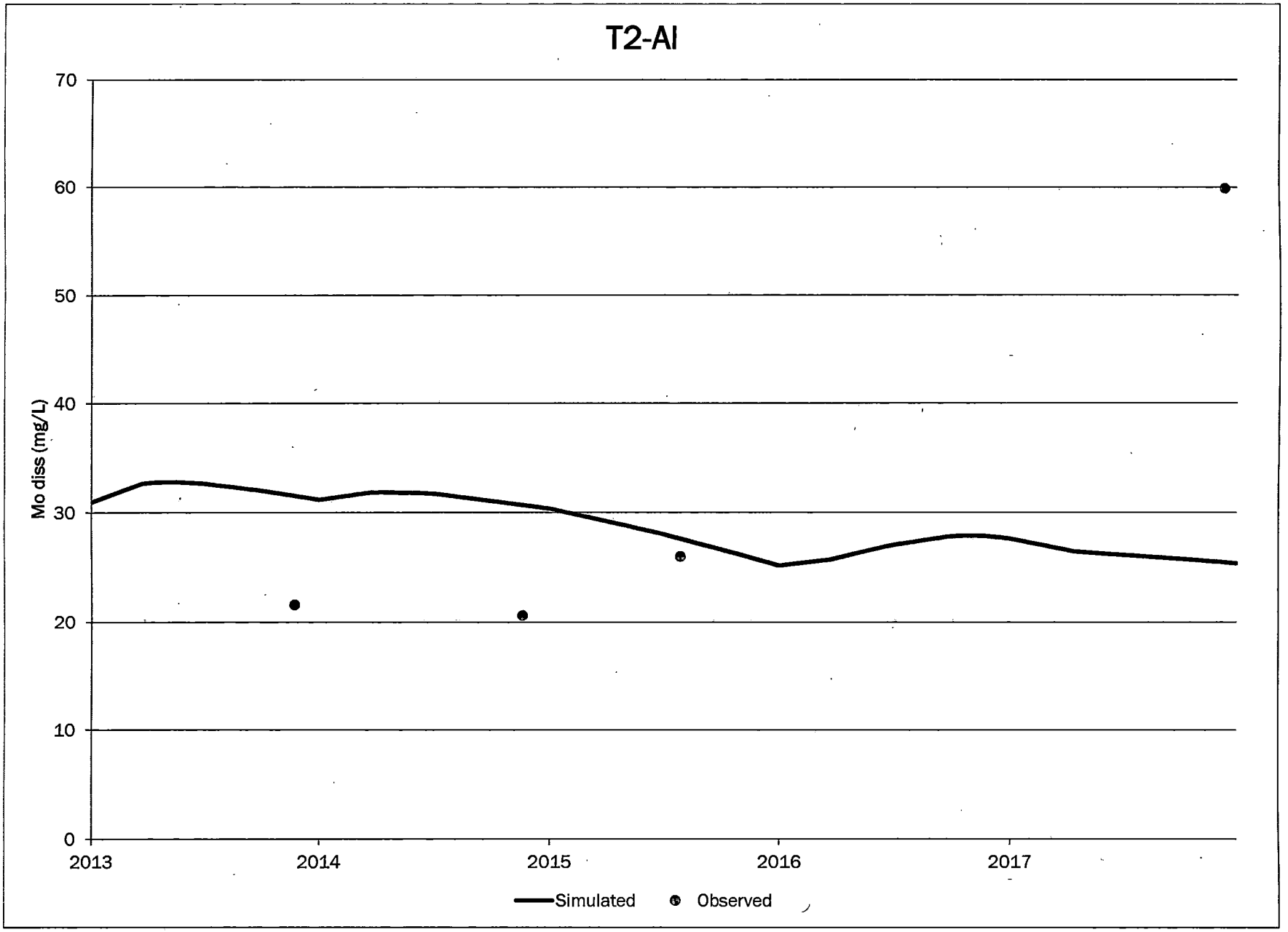

SUB2-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

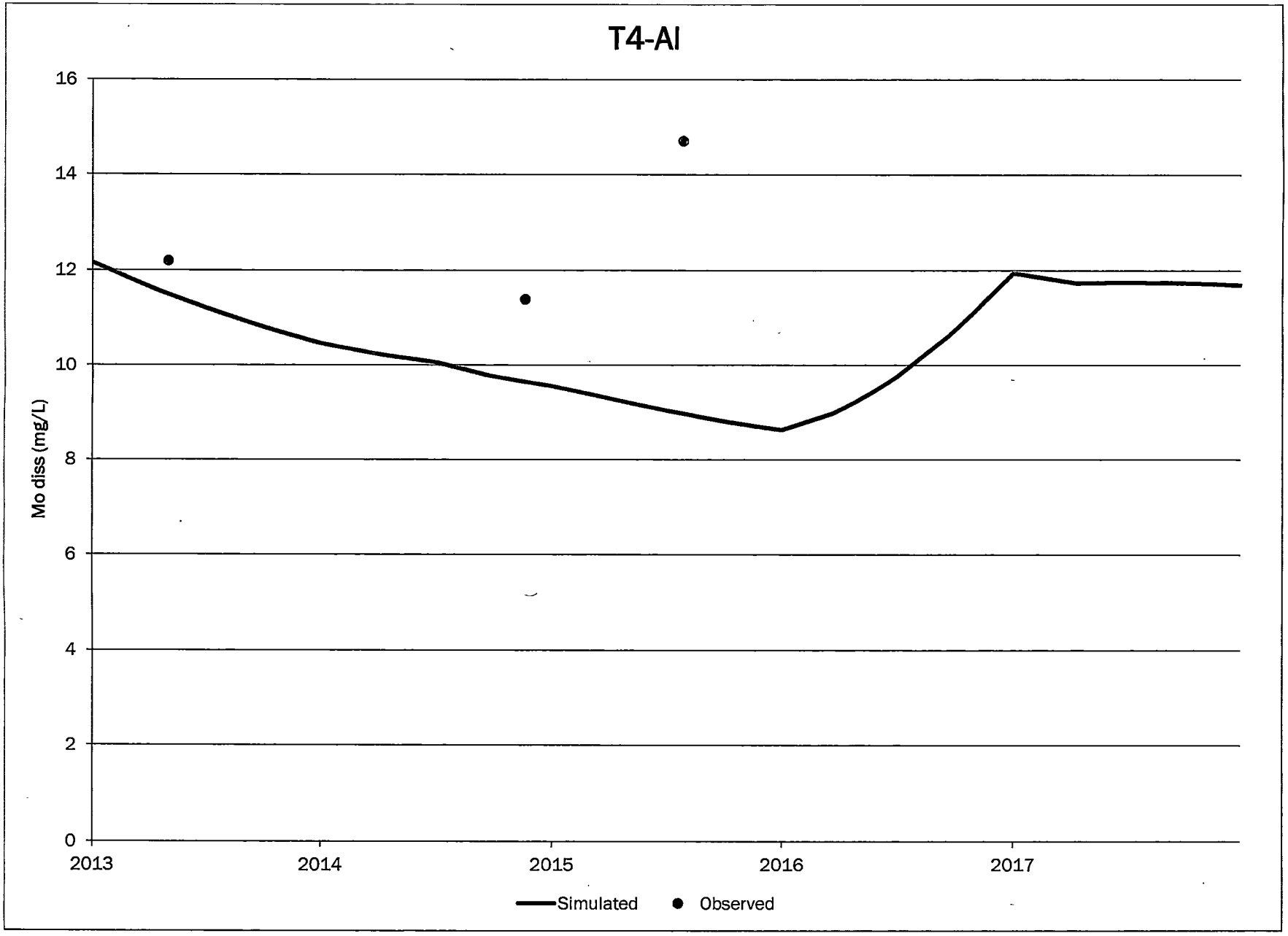

SUB3-AI
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

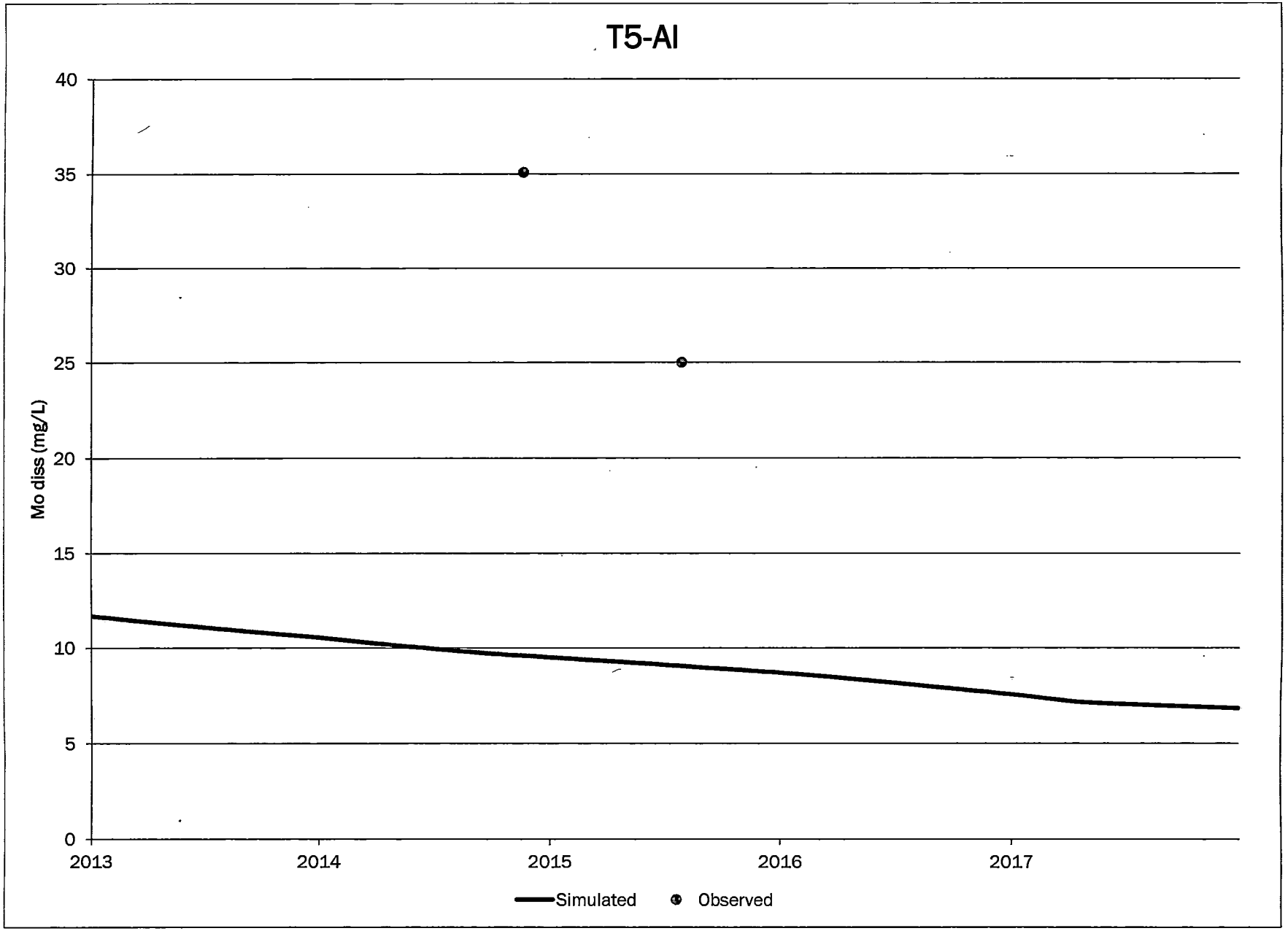

SV-AI
Mo diss (mg/L)
70
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
Simulated
Observed

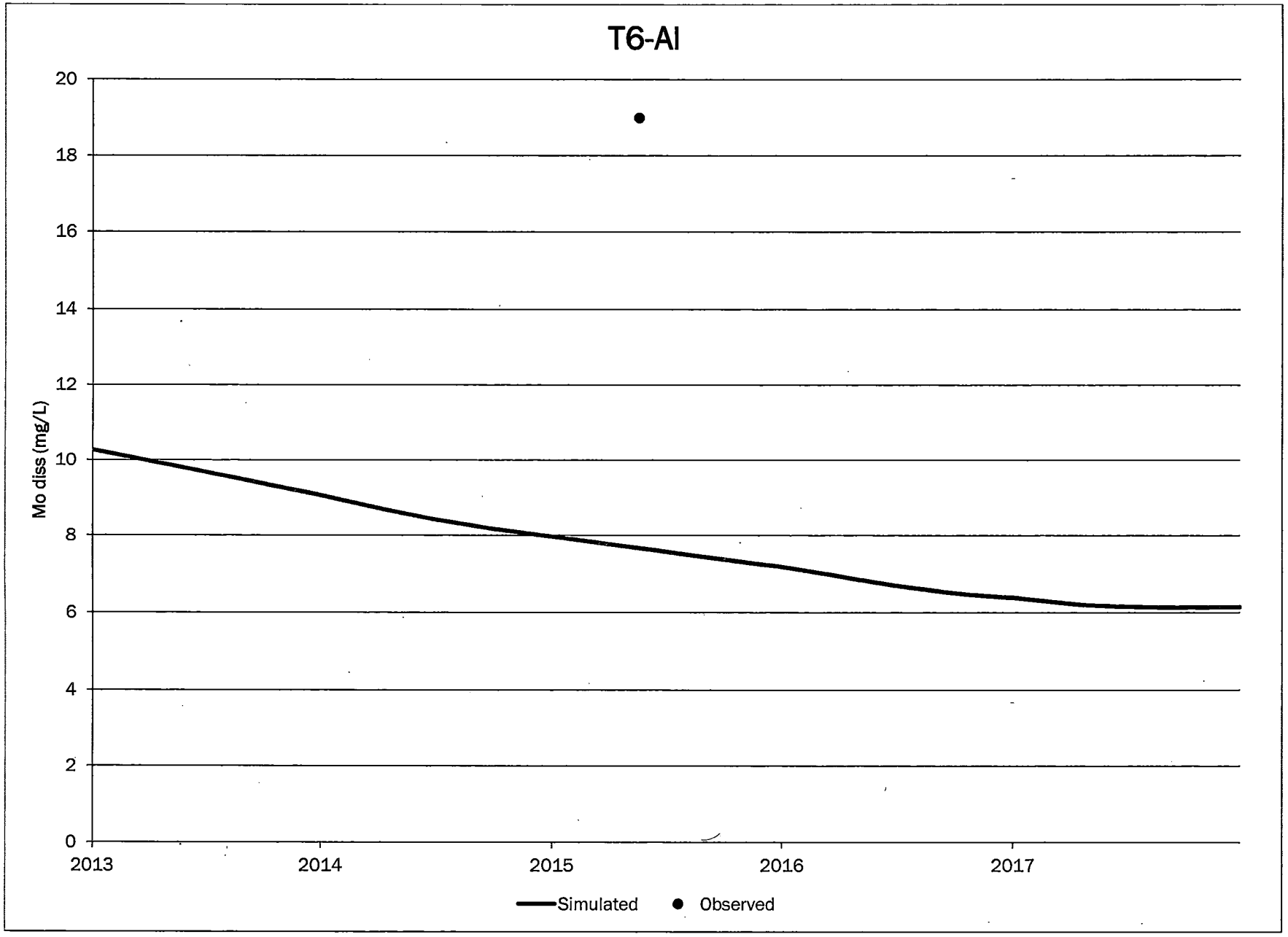

SW-AI
Mo diss (mg/L)
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

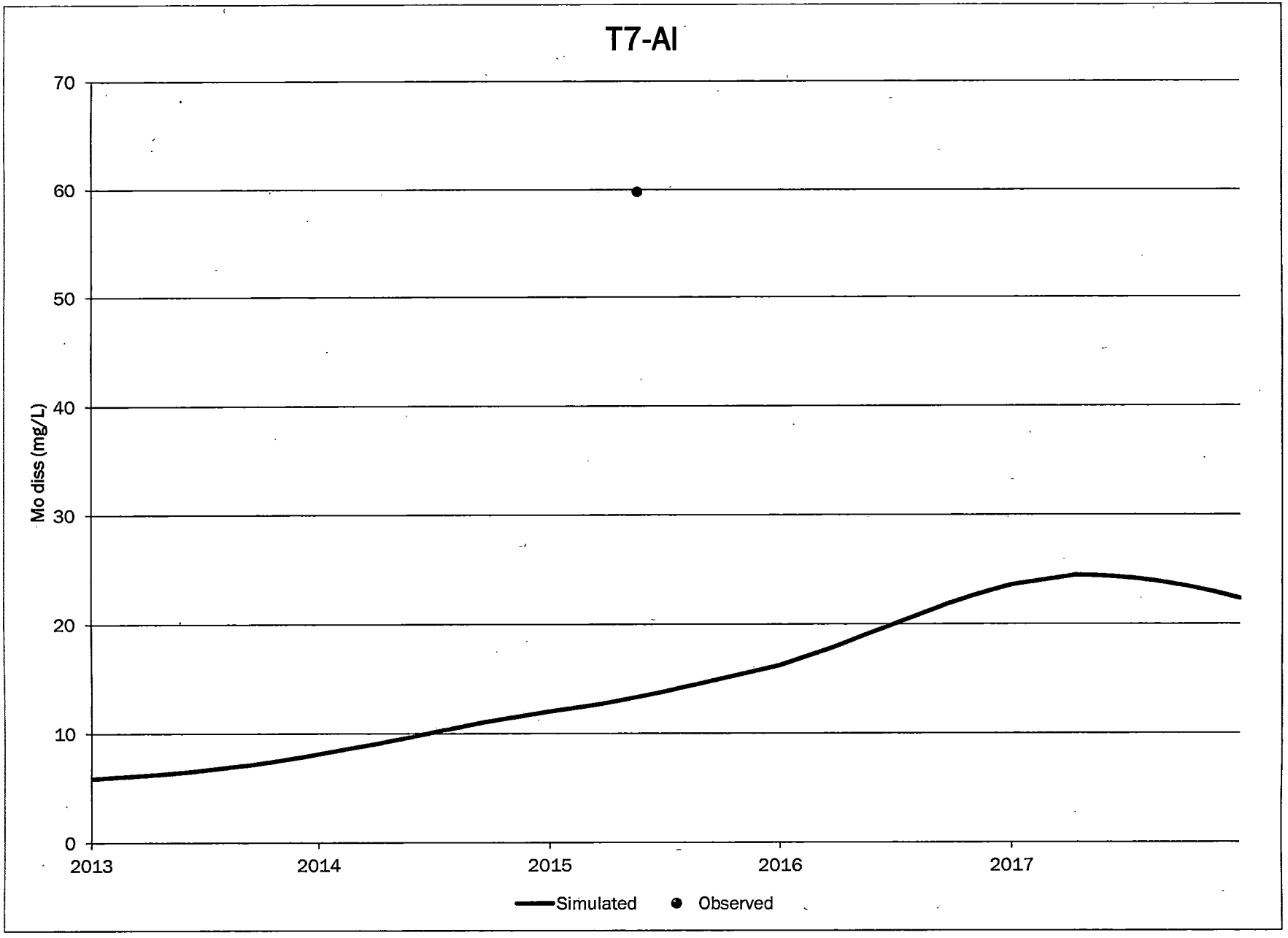

SZ-AI
120
100
80
60
40
20
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

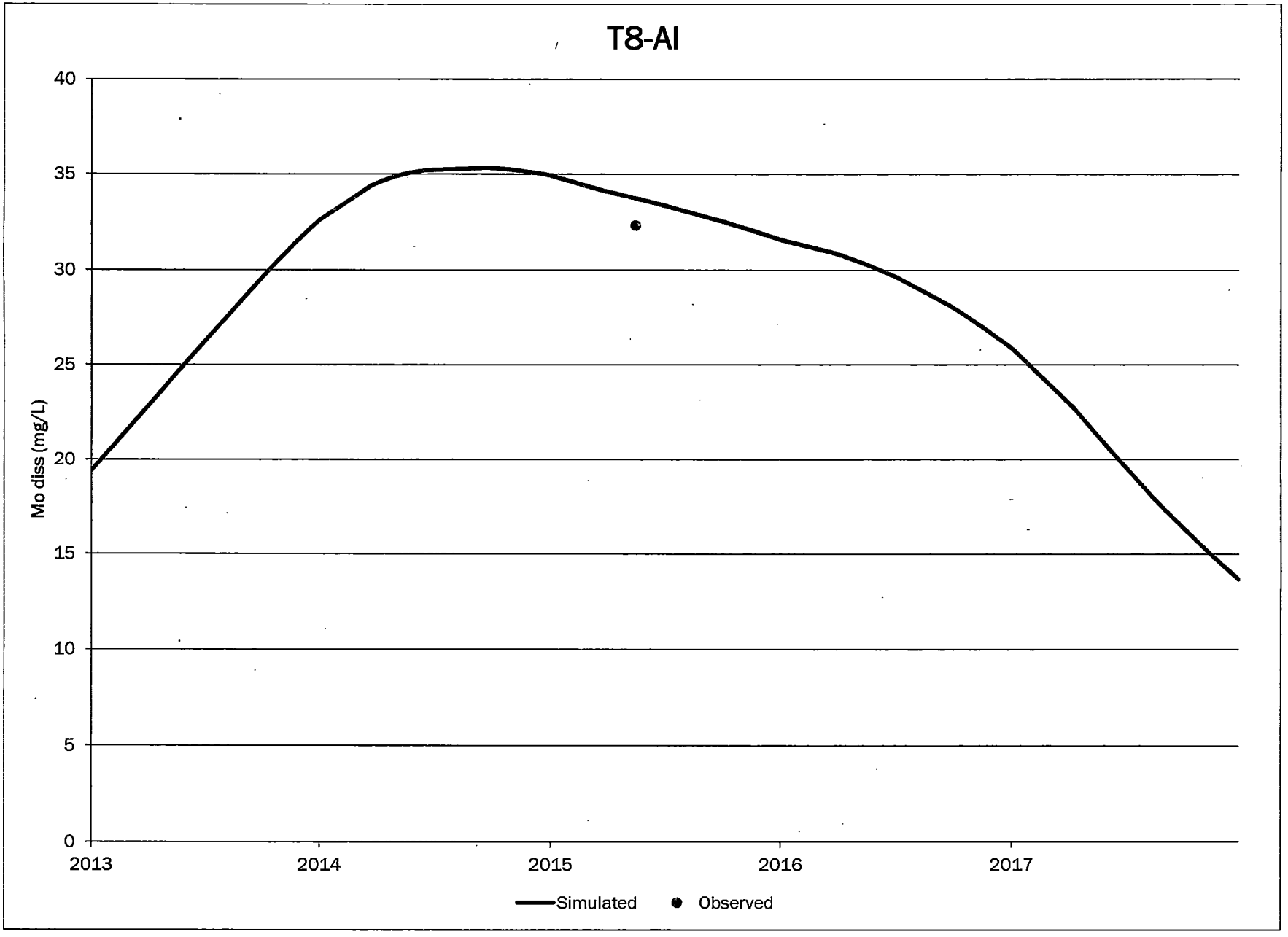

T2-AI
Mo diss (mg/L)
70
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
Simulated
Observed

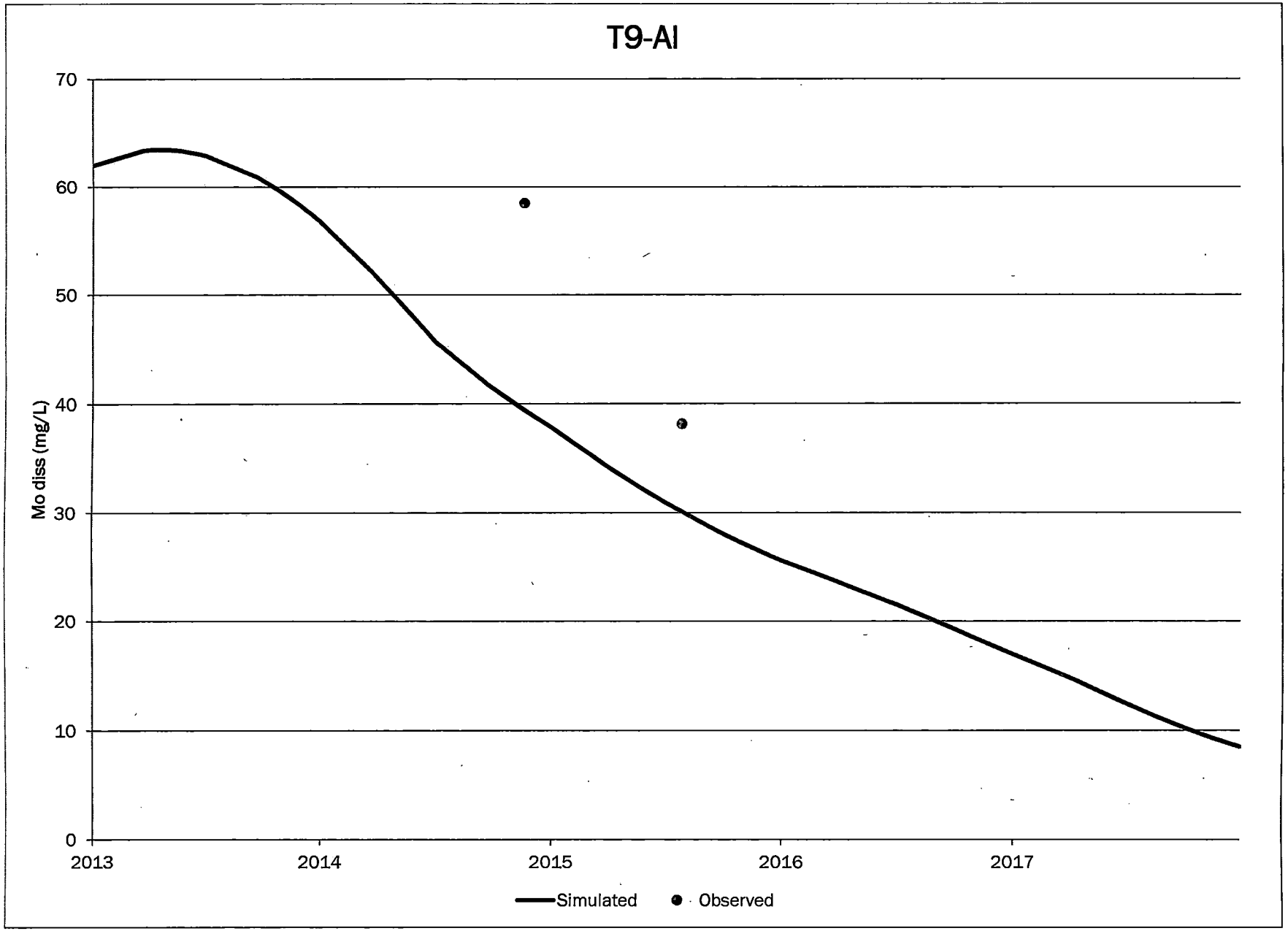

T4-AI
Mo diss (mg/L)
16
14
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

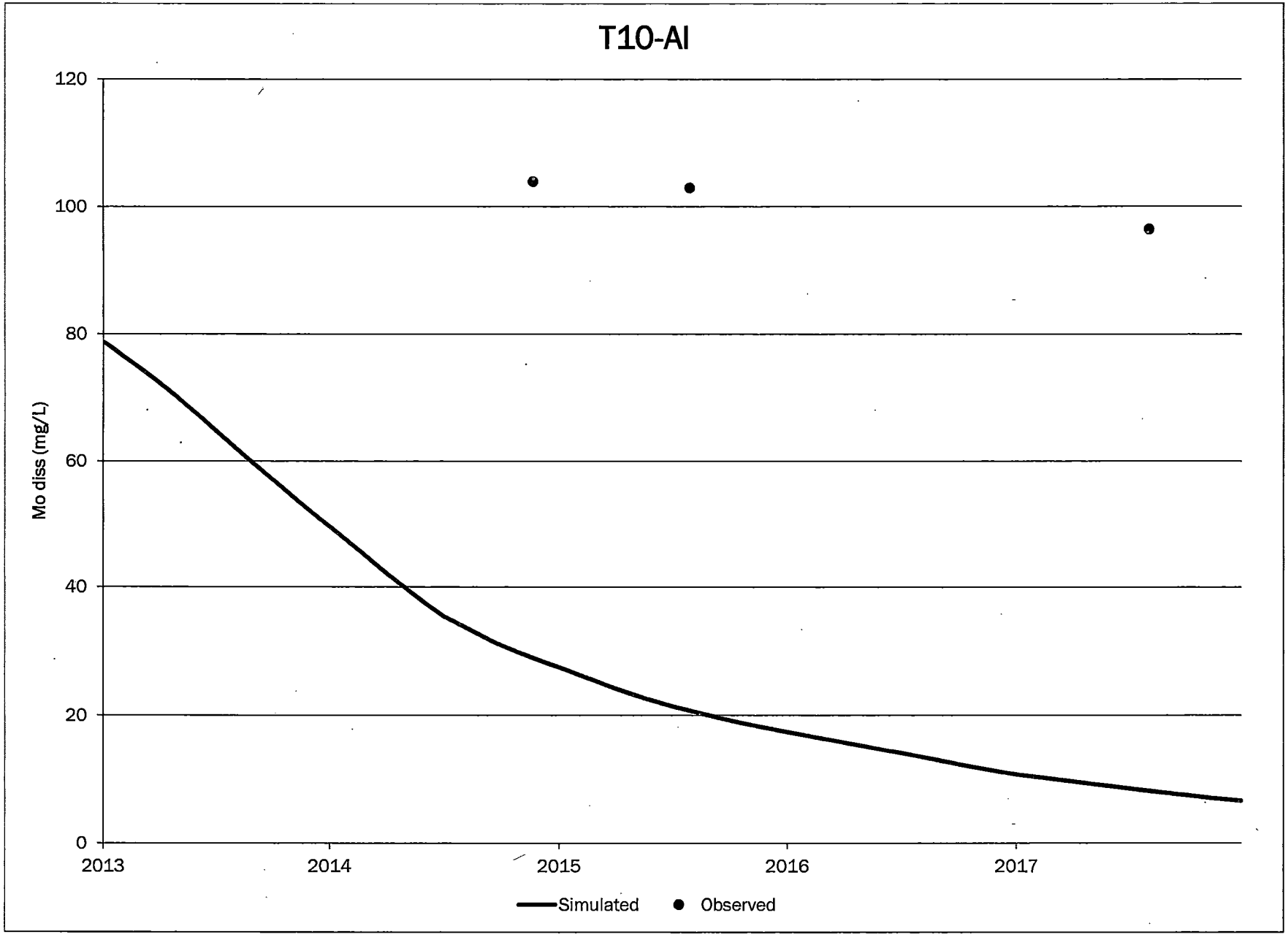

T5-AI
Mo diss (mg/L)
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

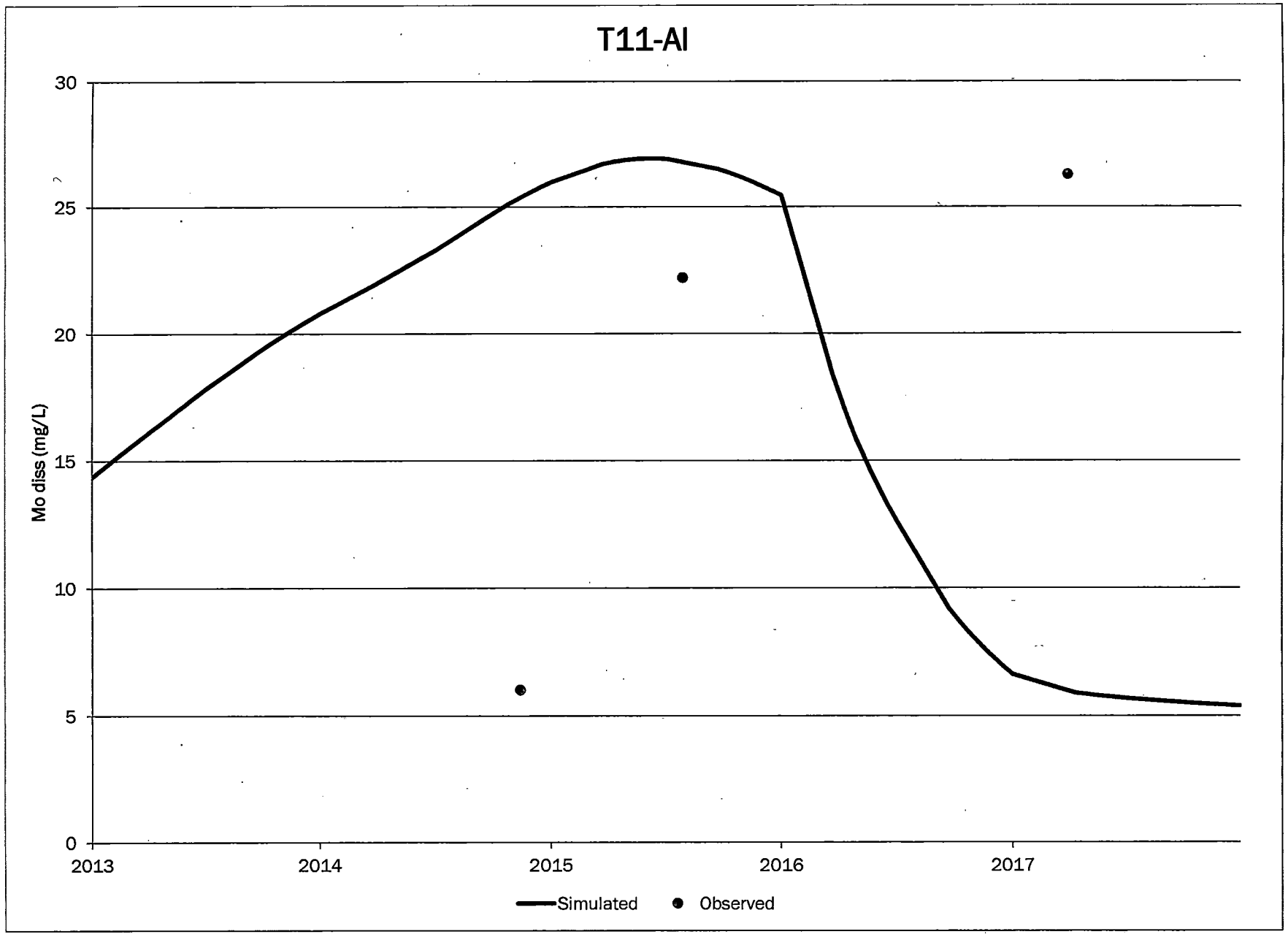

T6-AI
Mo diss (mg/L)
20
18
16
14
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

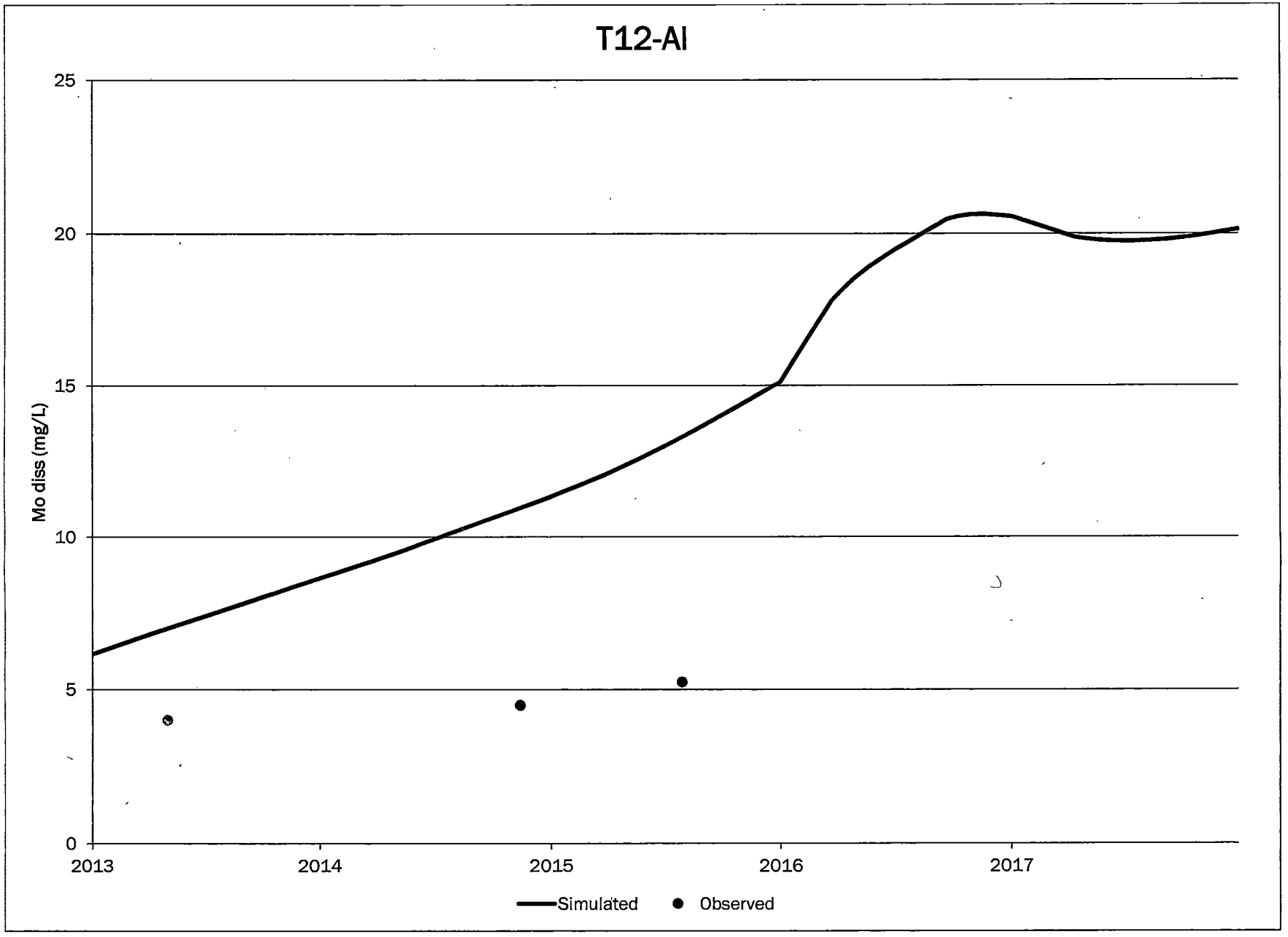

T7-AI
Mo diss (mg/L)
70
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
Simulated
Observed

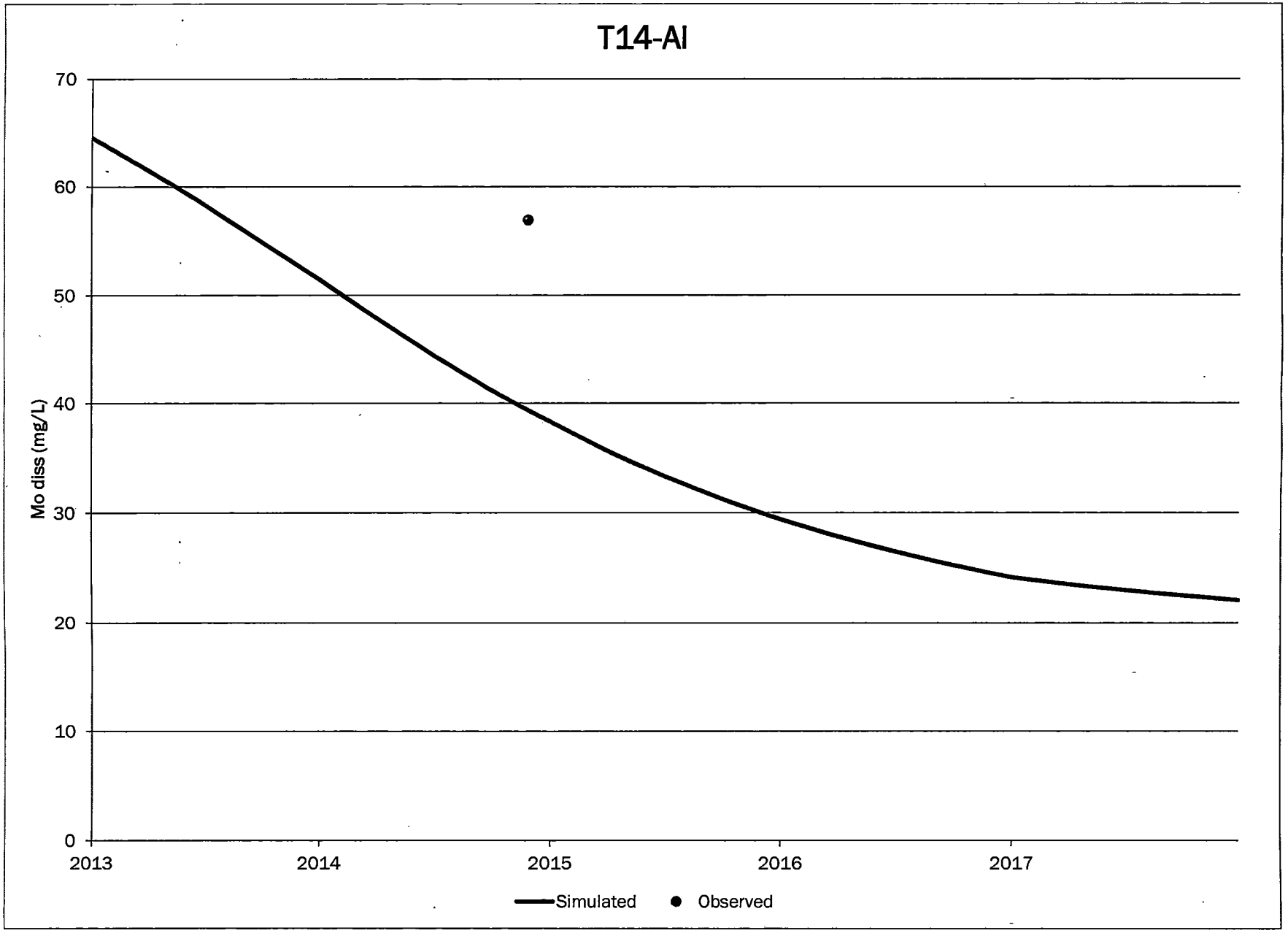

T8-AI
Mo diss (mg/L)
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

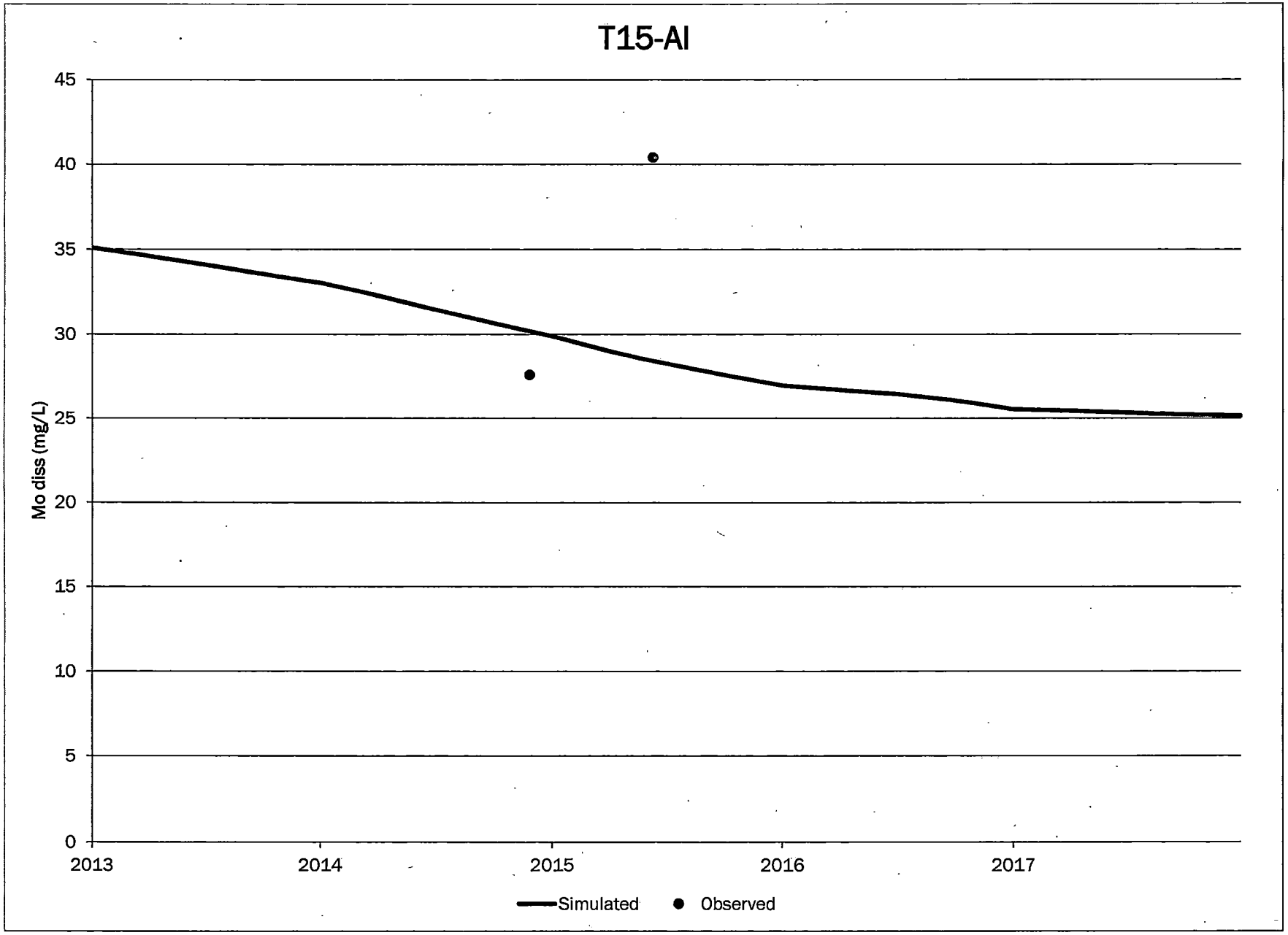

T9-AI
Mo diss (mg/L)
70
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
Simulated
Observed

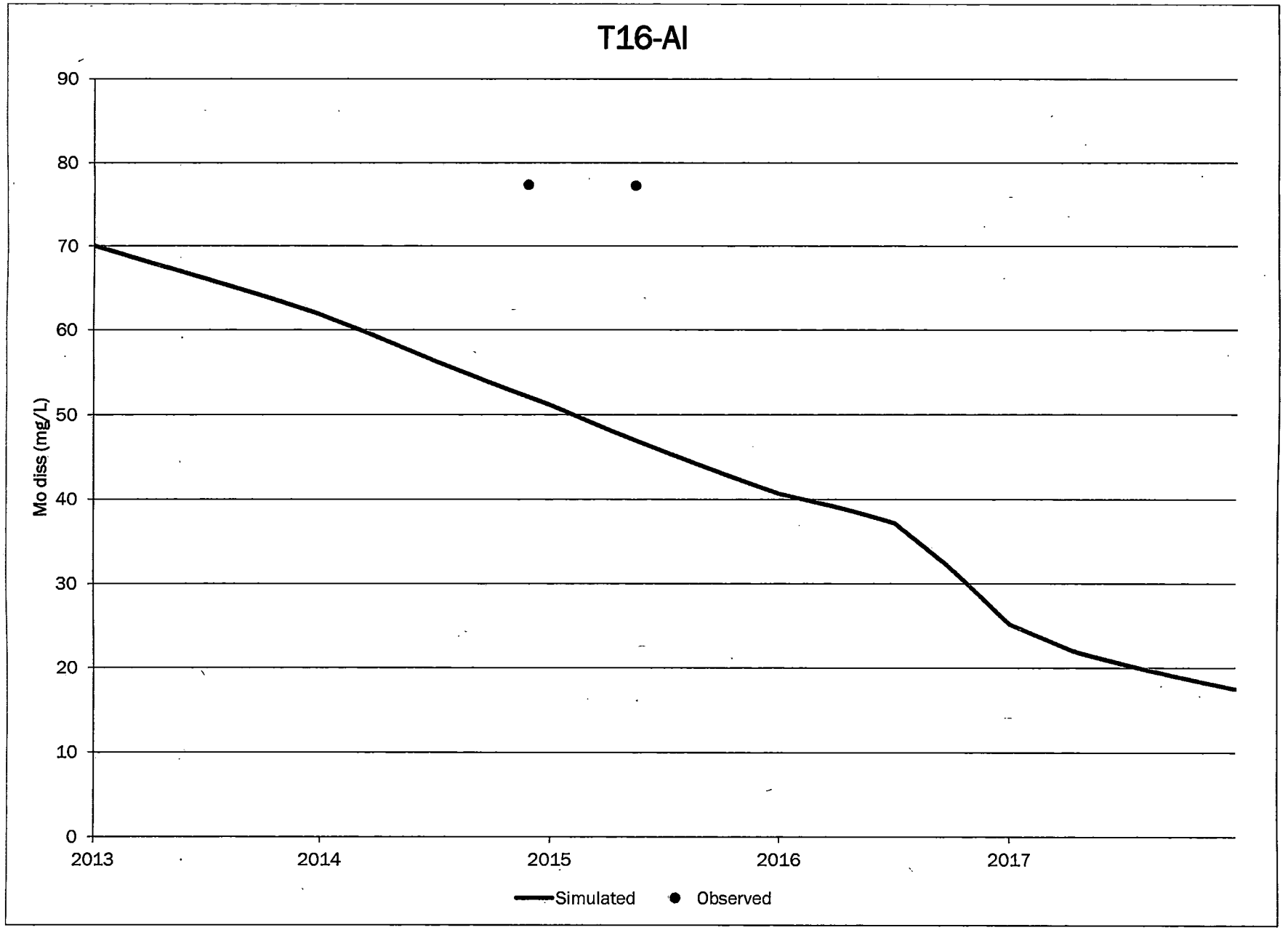

T10-AI
120
100
80
60
40
20
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

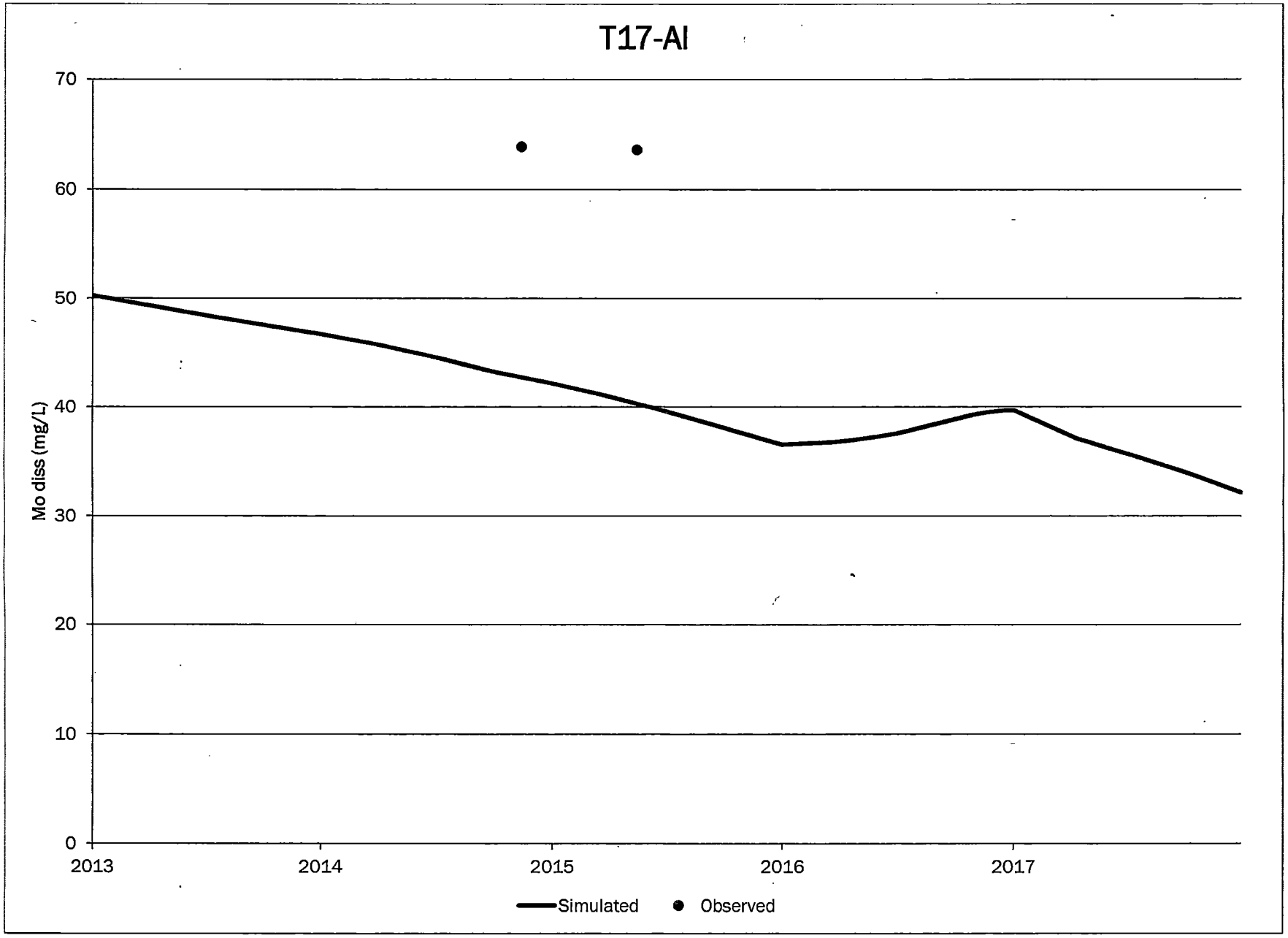

T11-AI
Mo diss (mg/L)
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

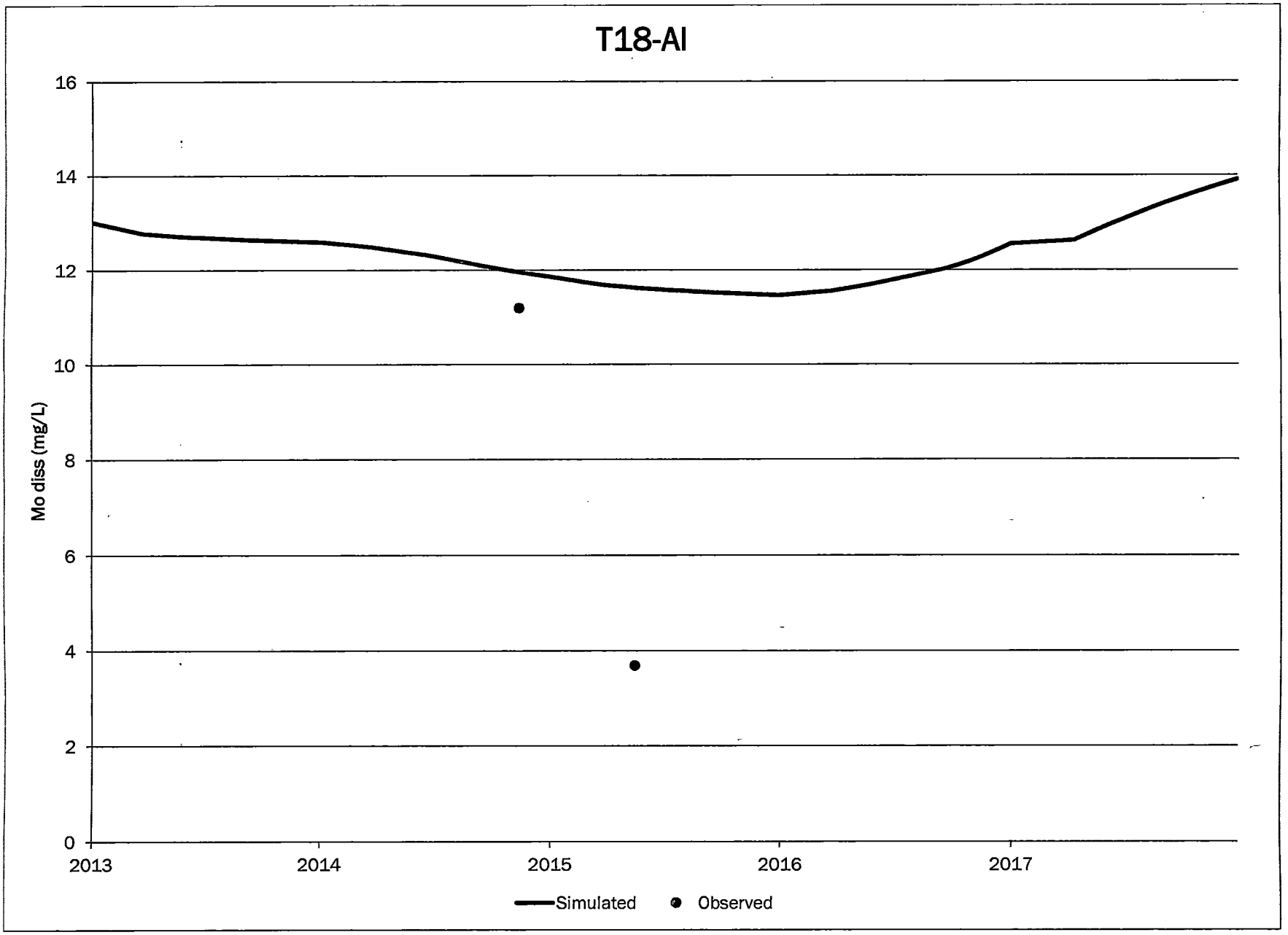

T12-AI
Mo diss (mg/L)
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

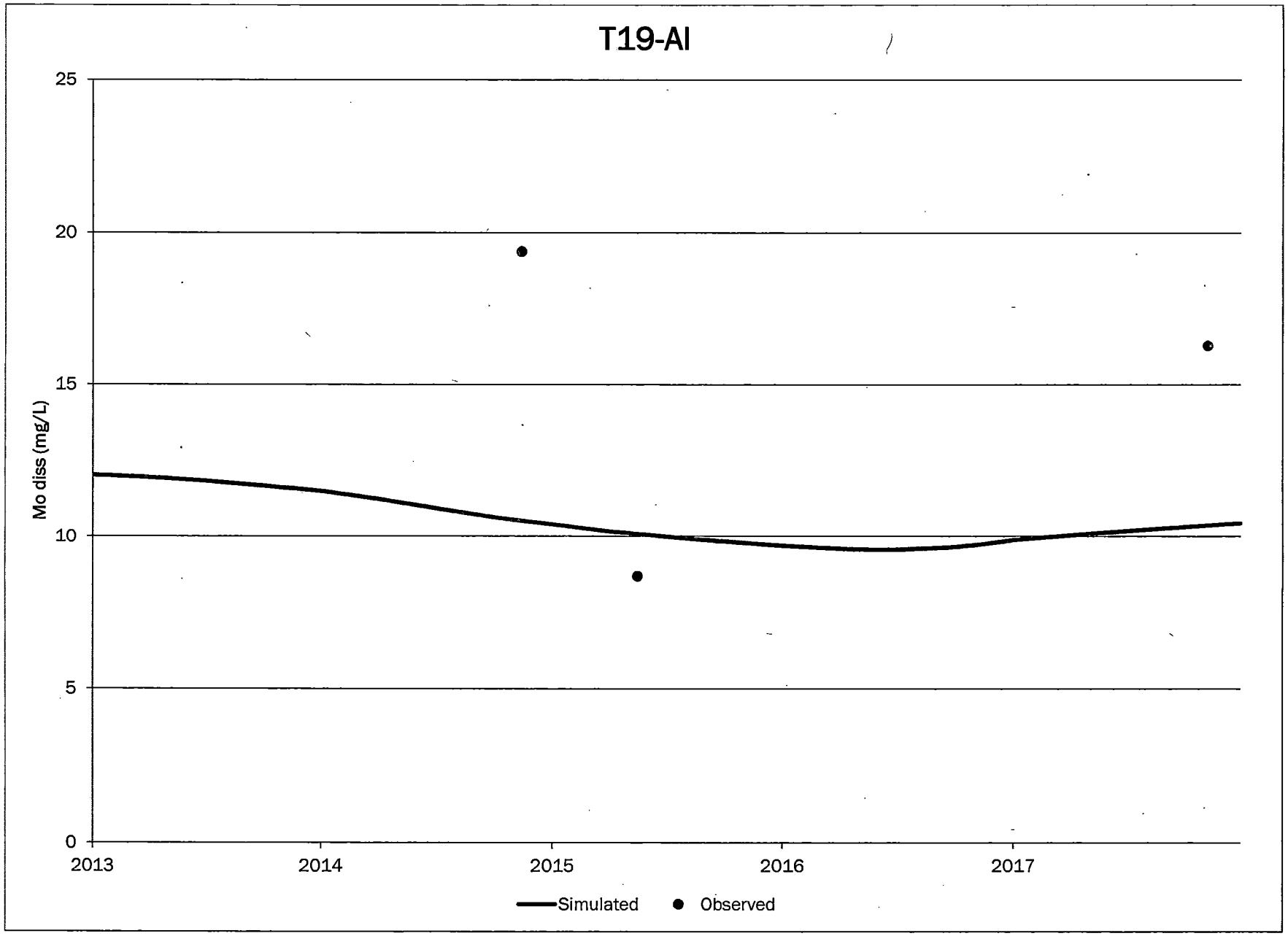

T14-AI
Mo diss (mg/L)
70
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
Simulated
Observed

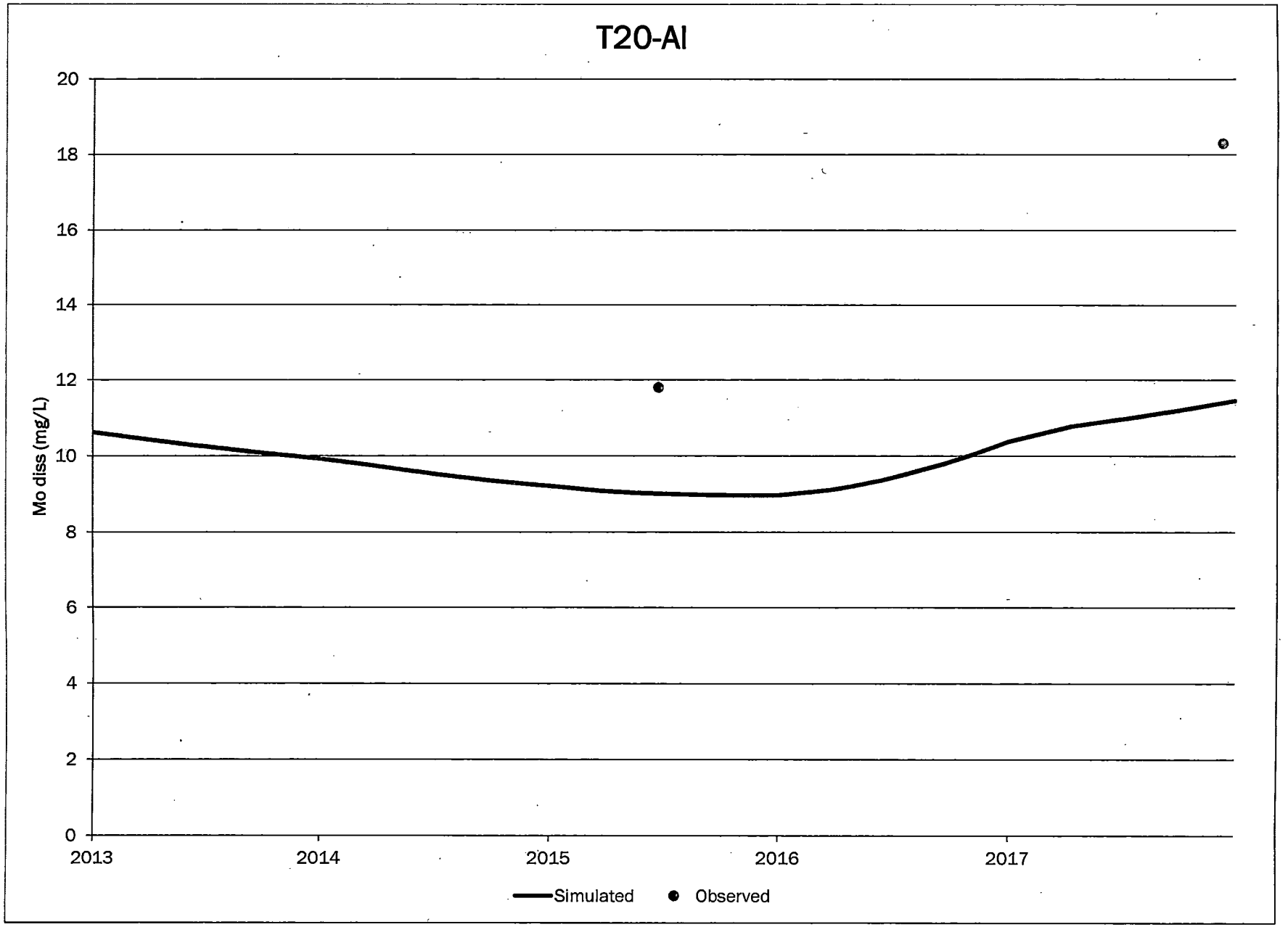

T15-AI
Mo diss (mg/L)
45
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

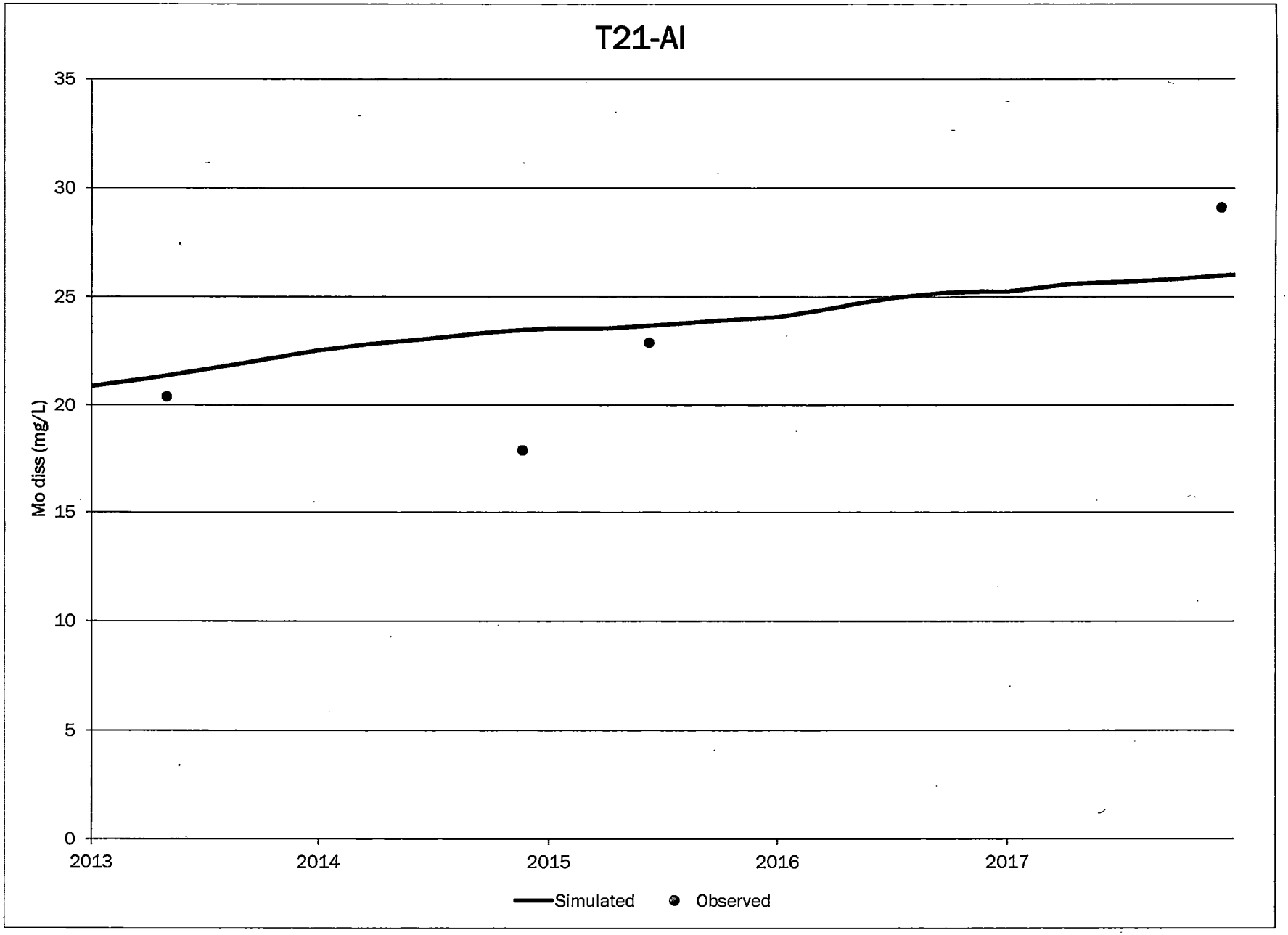

T16-AI
Mo diss (mg/L)
90
80
70
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
Simulated
Observed

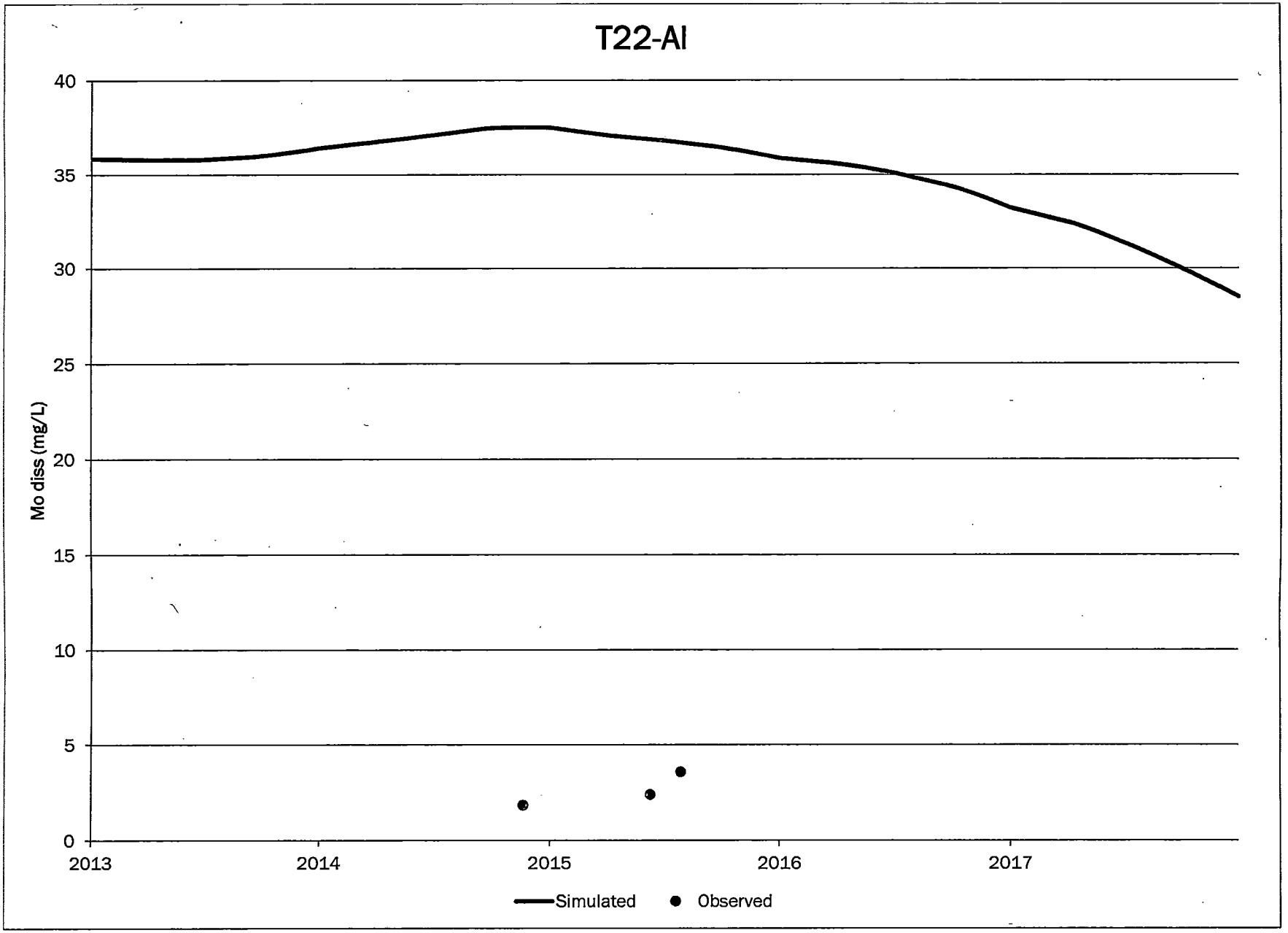

T17-AI
70
60
50
40
30
20
10
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

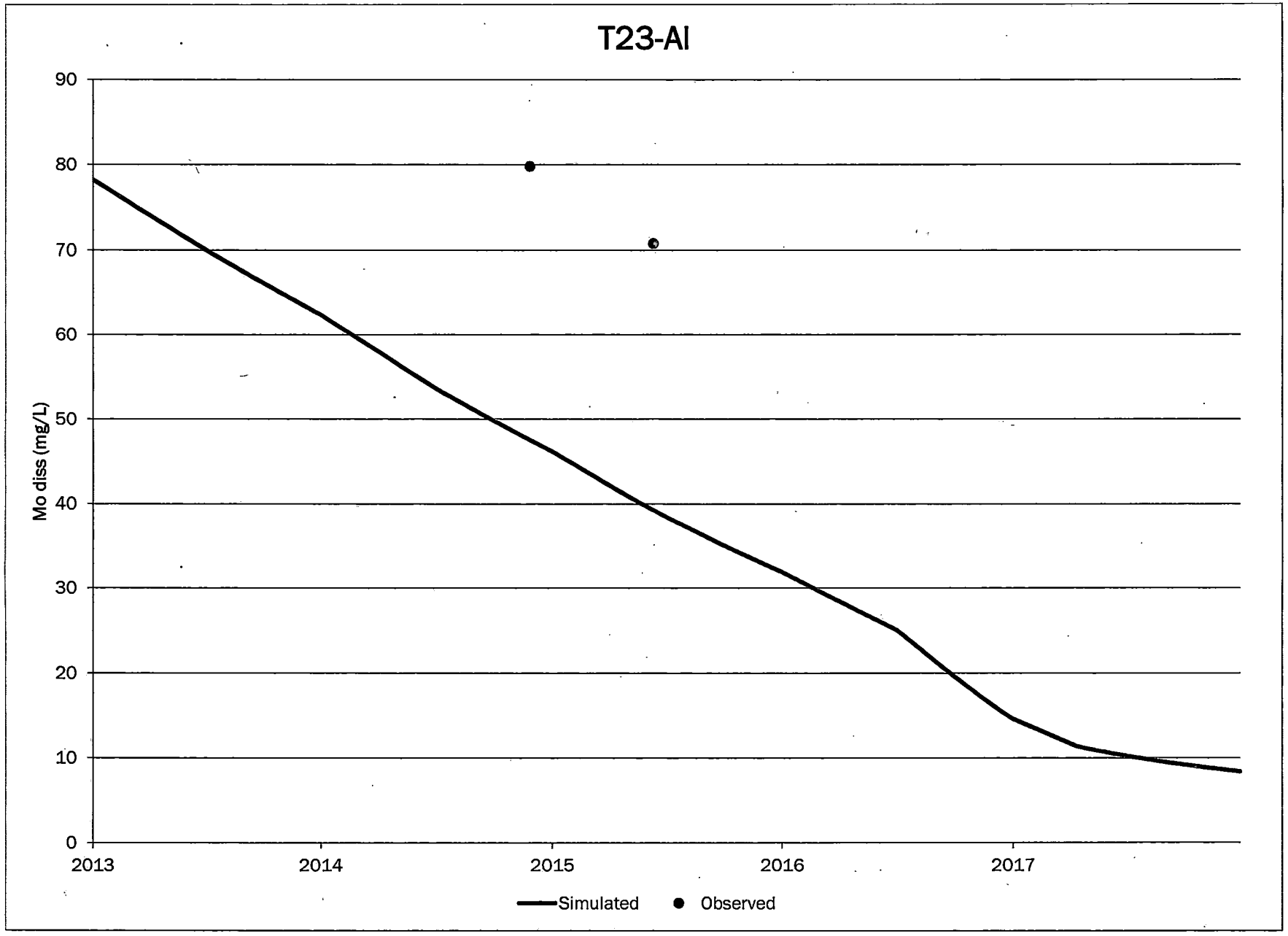

T18-AI
Mo diss (mg/L)
16
14
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

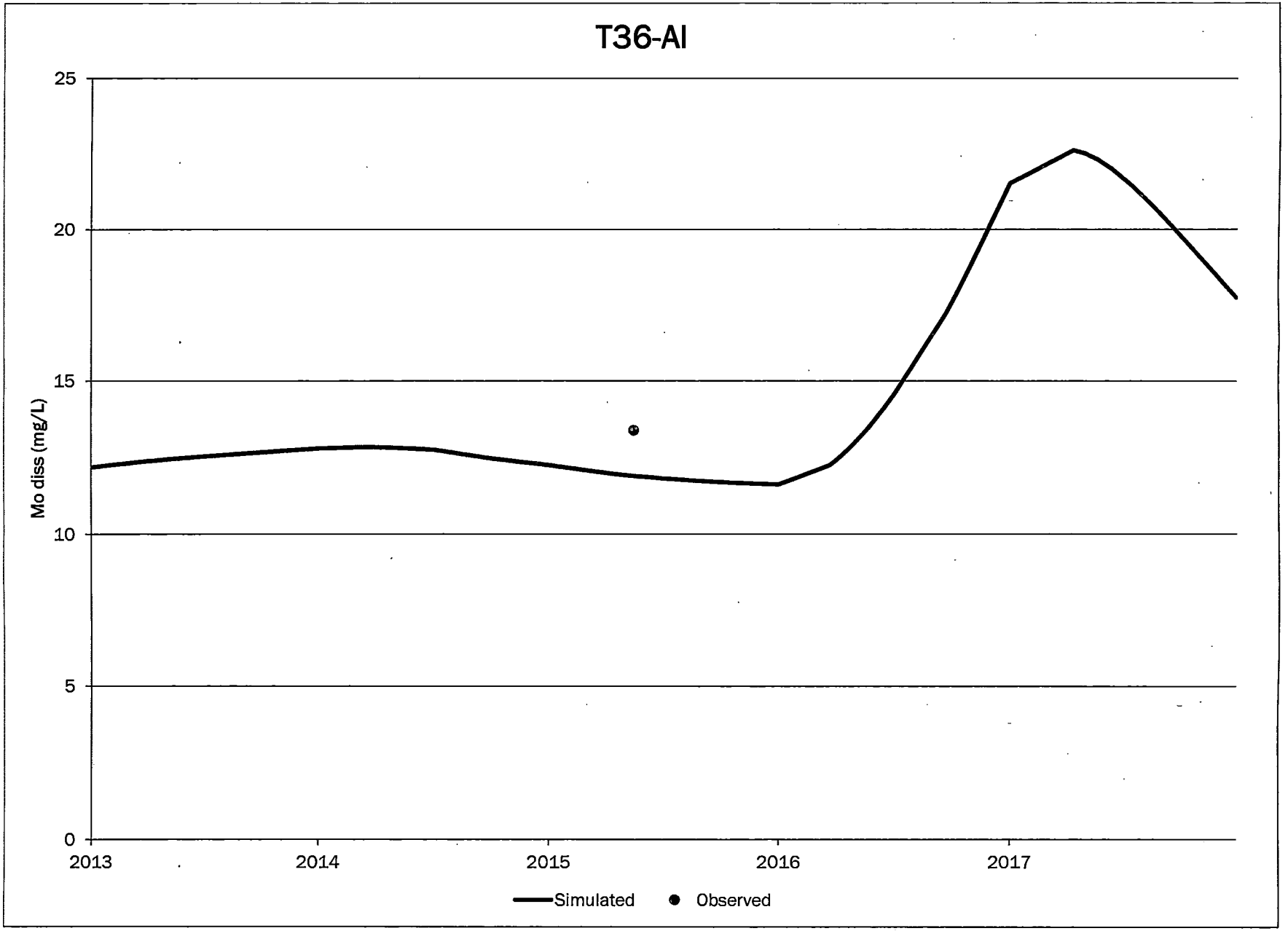

T19-AI
Mo diss (mg/L)
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

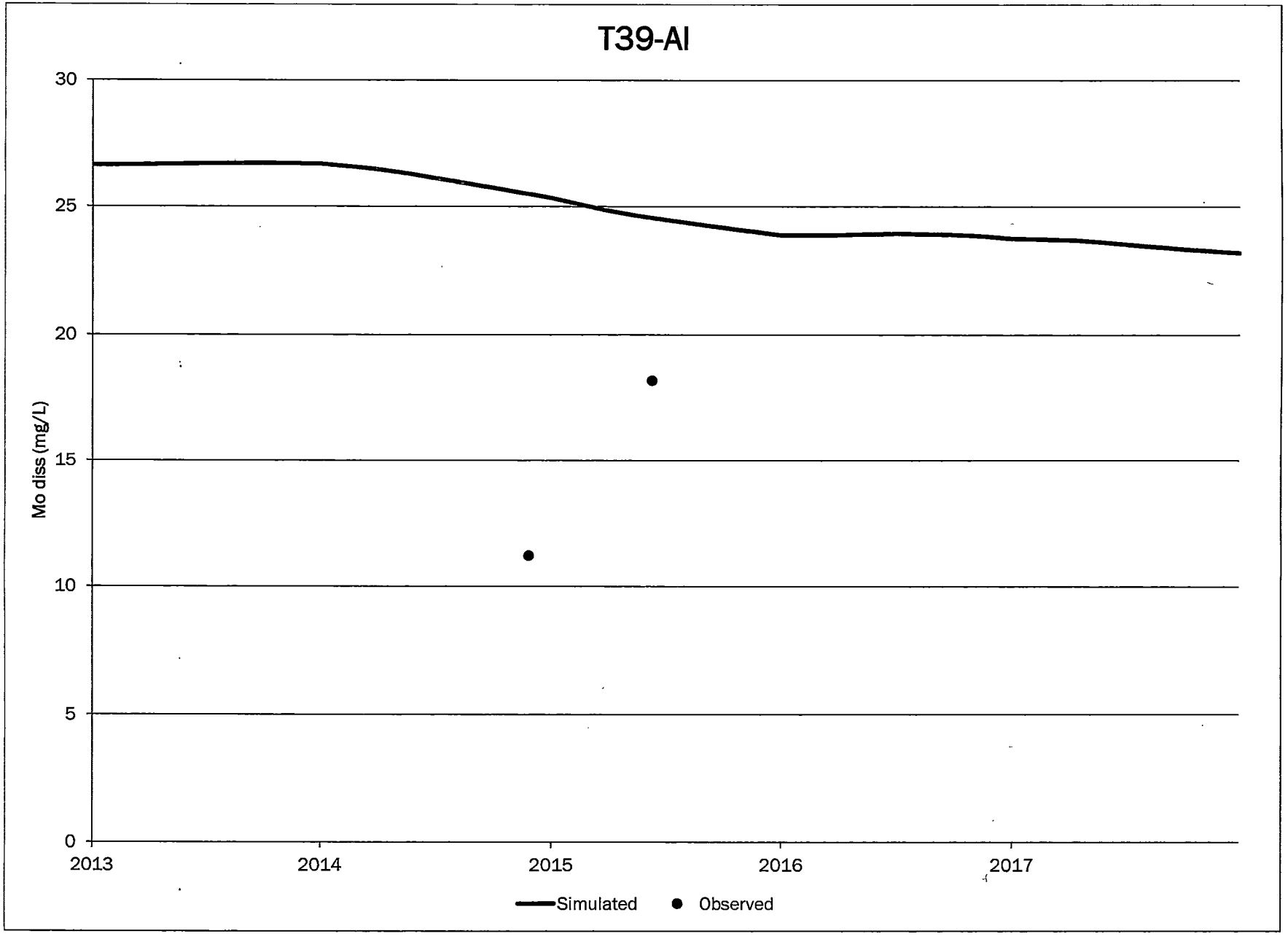

T20-AI
Mo diss (mg/L)
20
18
16
14
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

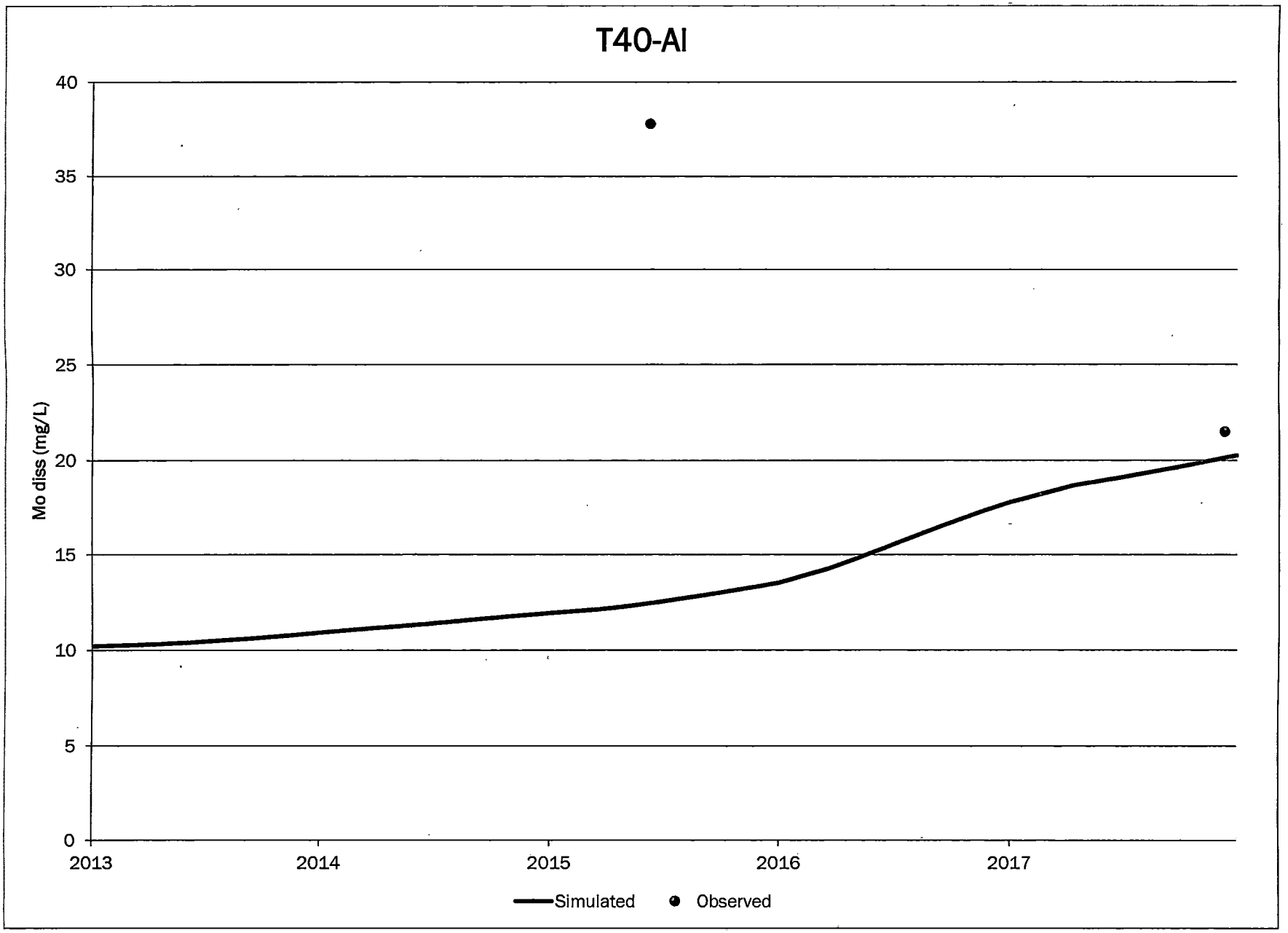

T21-AI
35
30
25
20
15
10
5
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

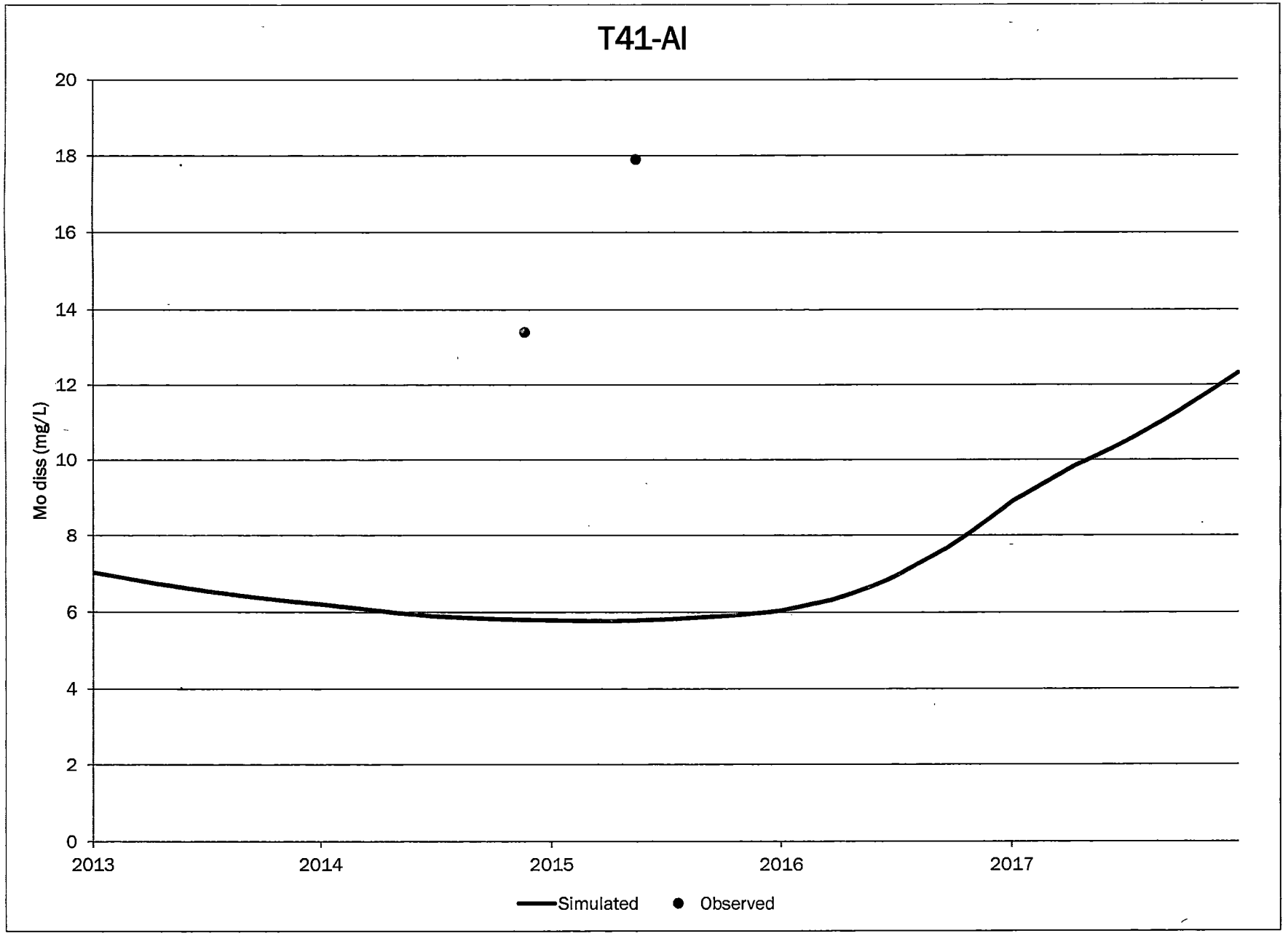

T22-AI
Mo diss (mg/L)
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

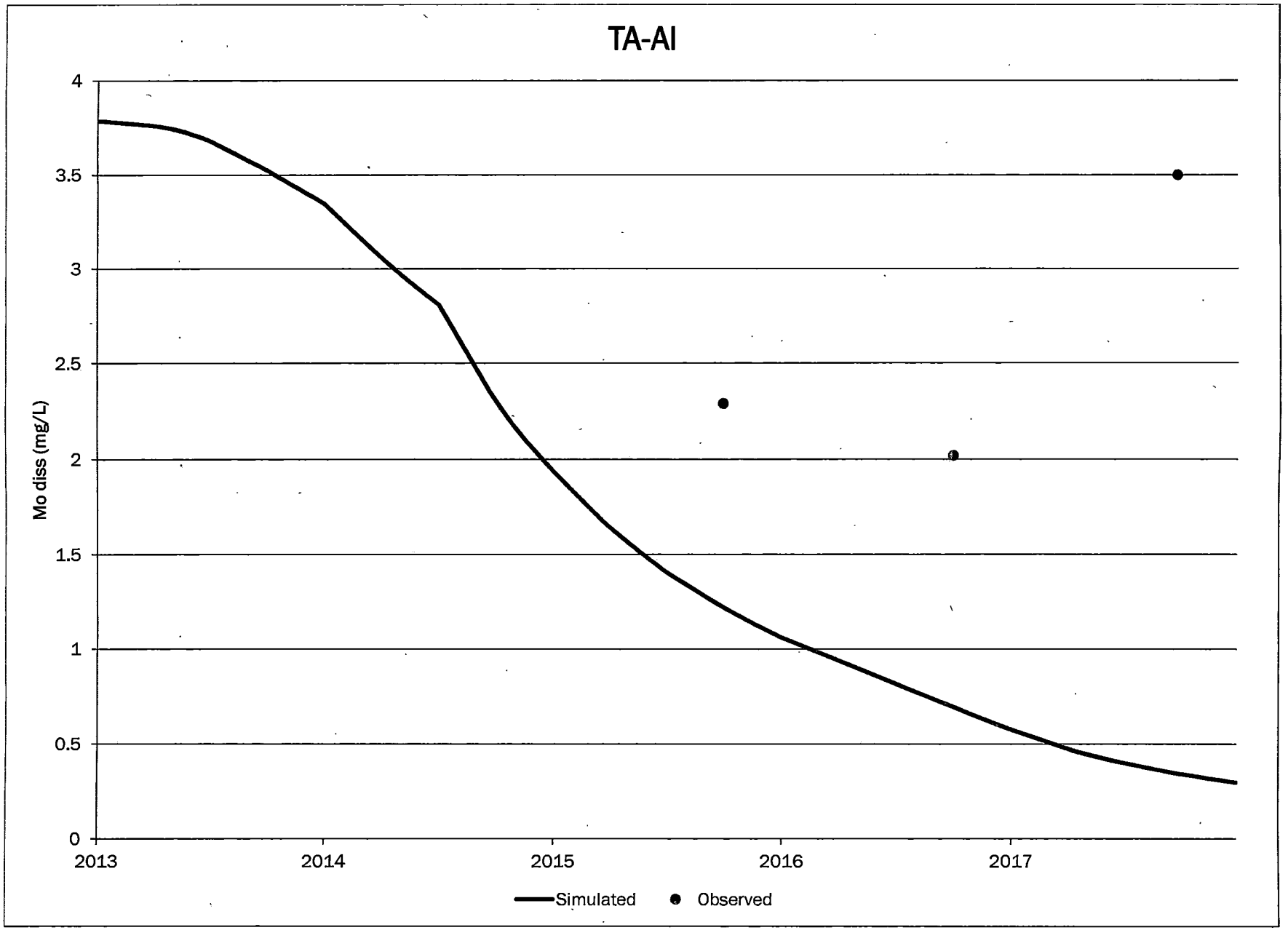

T23-AI
Mo diss (mg/L)
90
80
70
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
Simulated
Observed

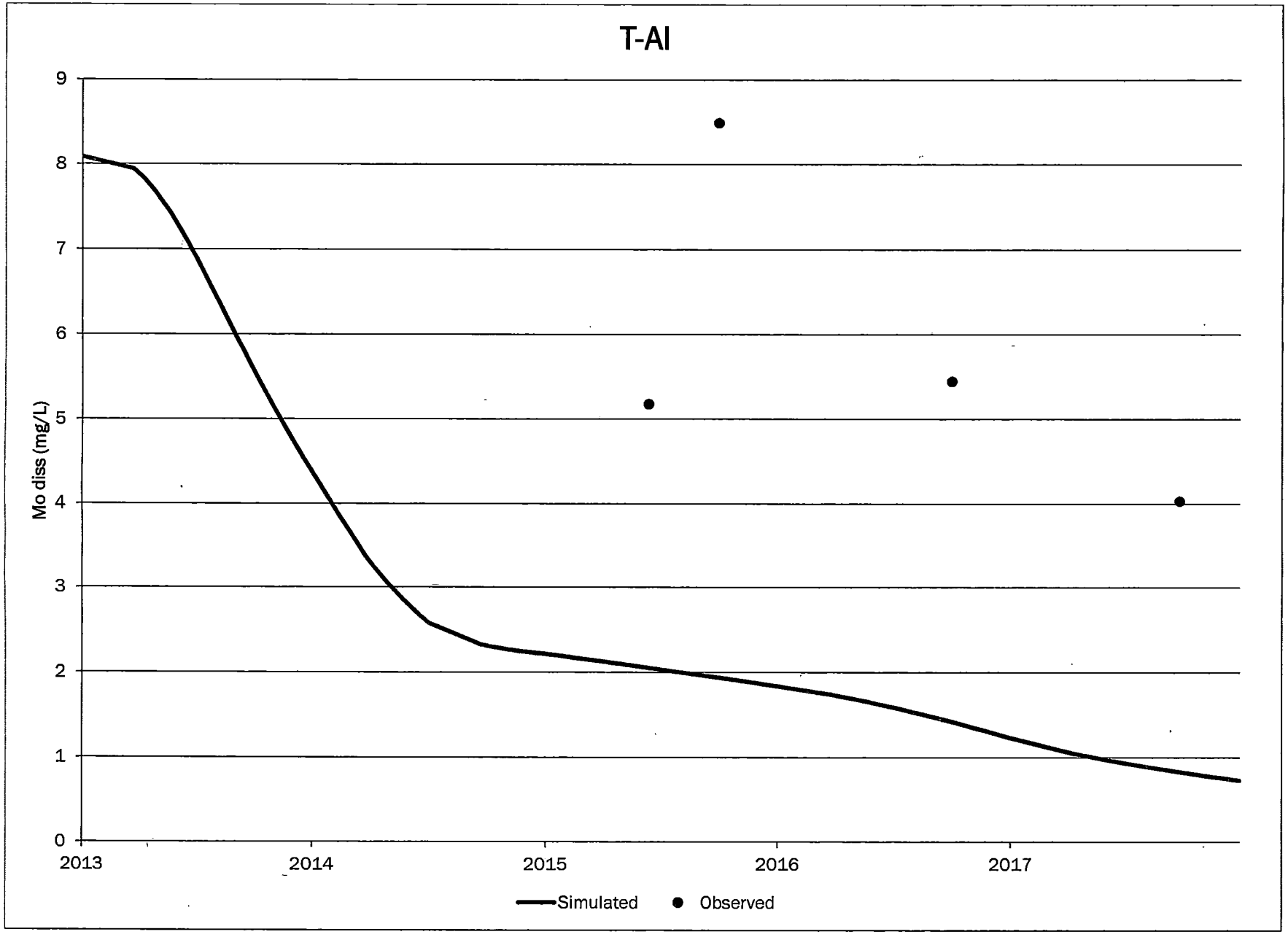

T36-AI
Mo diss (mg/L)
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

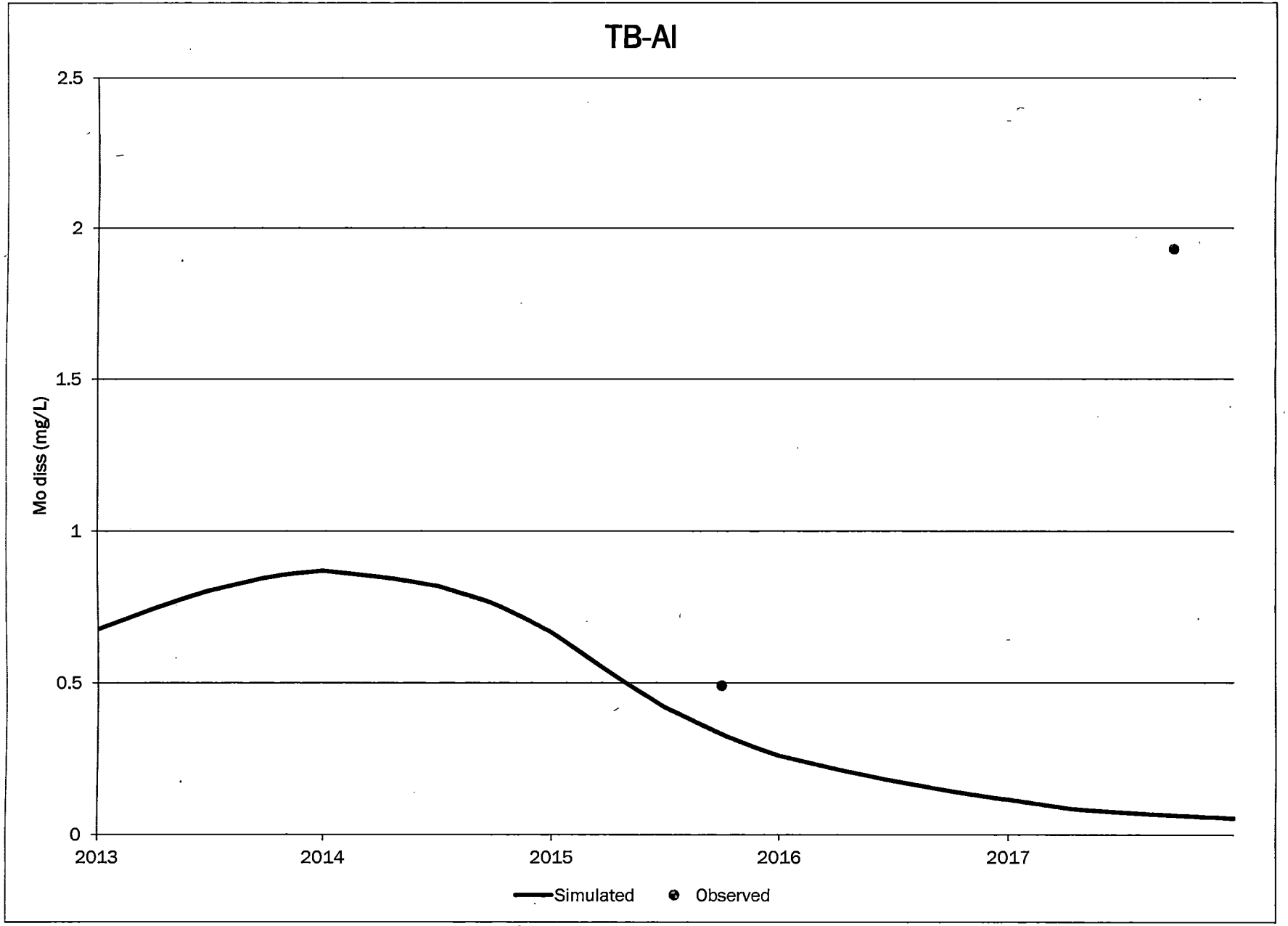

T39-AI
Mo diss (mg/L)
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

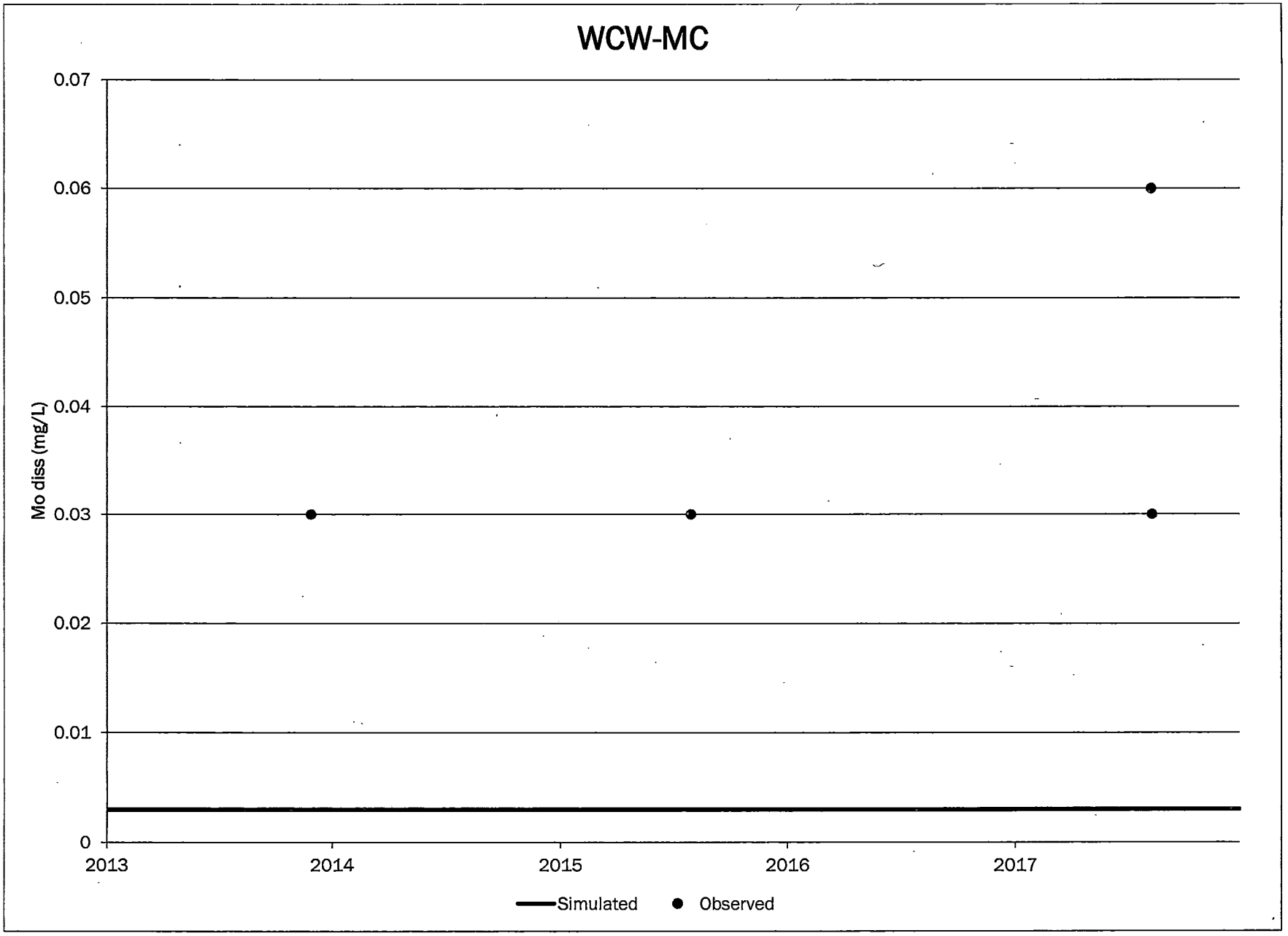

T40-AI
Mo diss (mg/L)
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Simulated
Observed

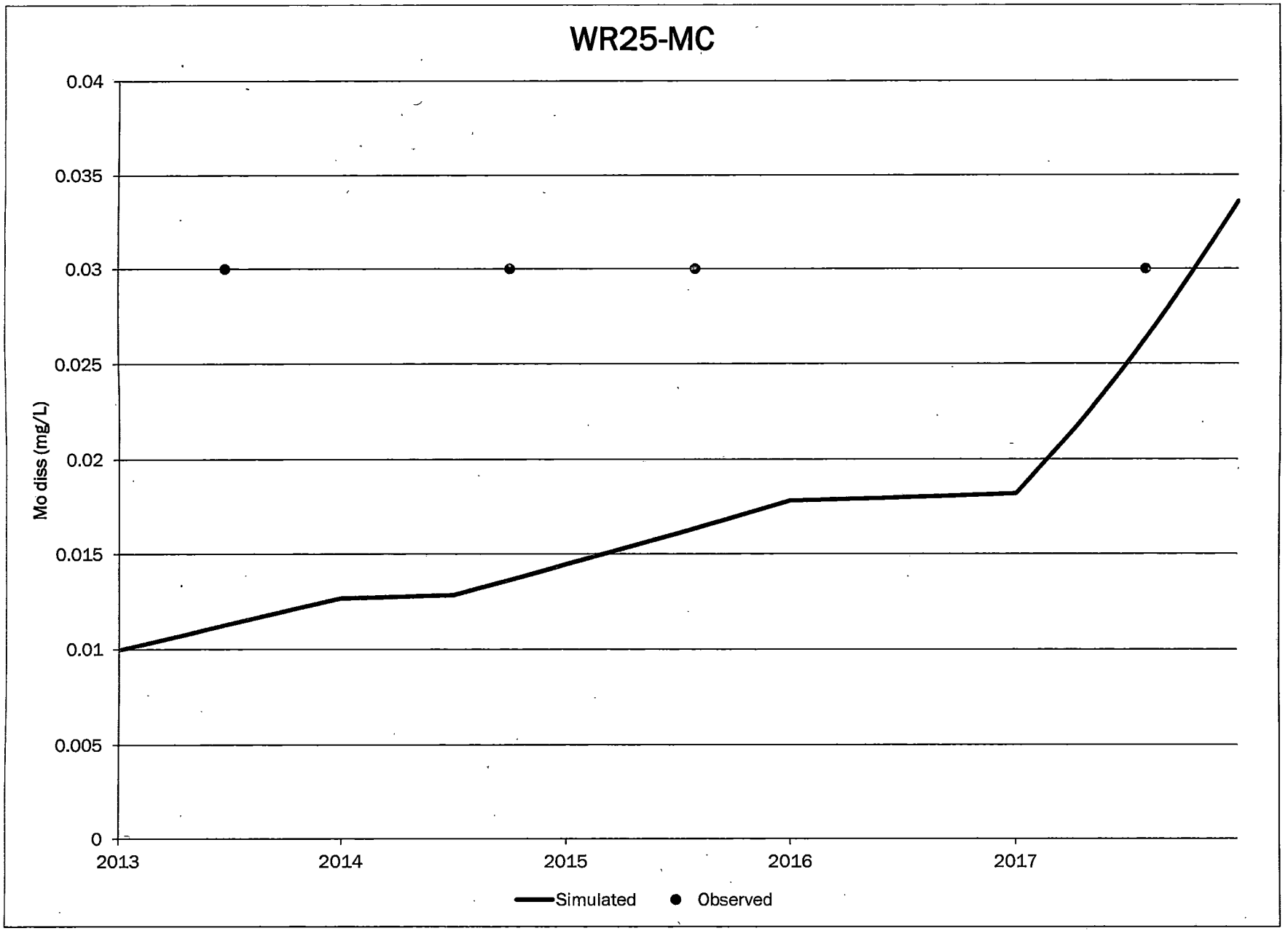

T41-AI
Mo diss (mg/L)
20
18
16
14
12
10
8
6
4
2
0
2013
2014
2015
2016
2017
Simulated
Observed

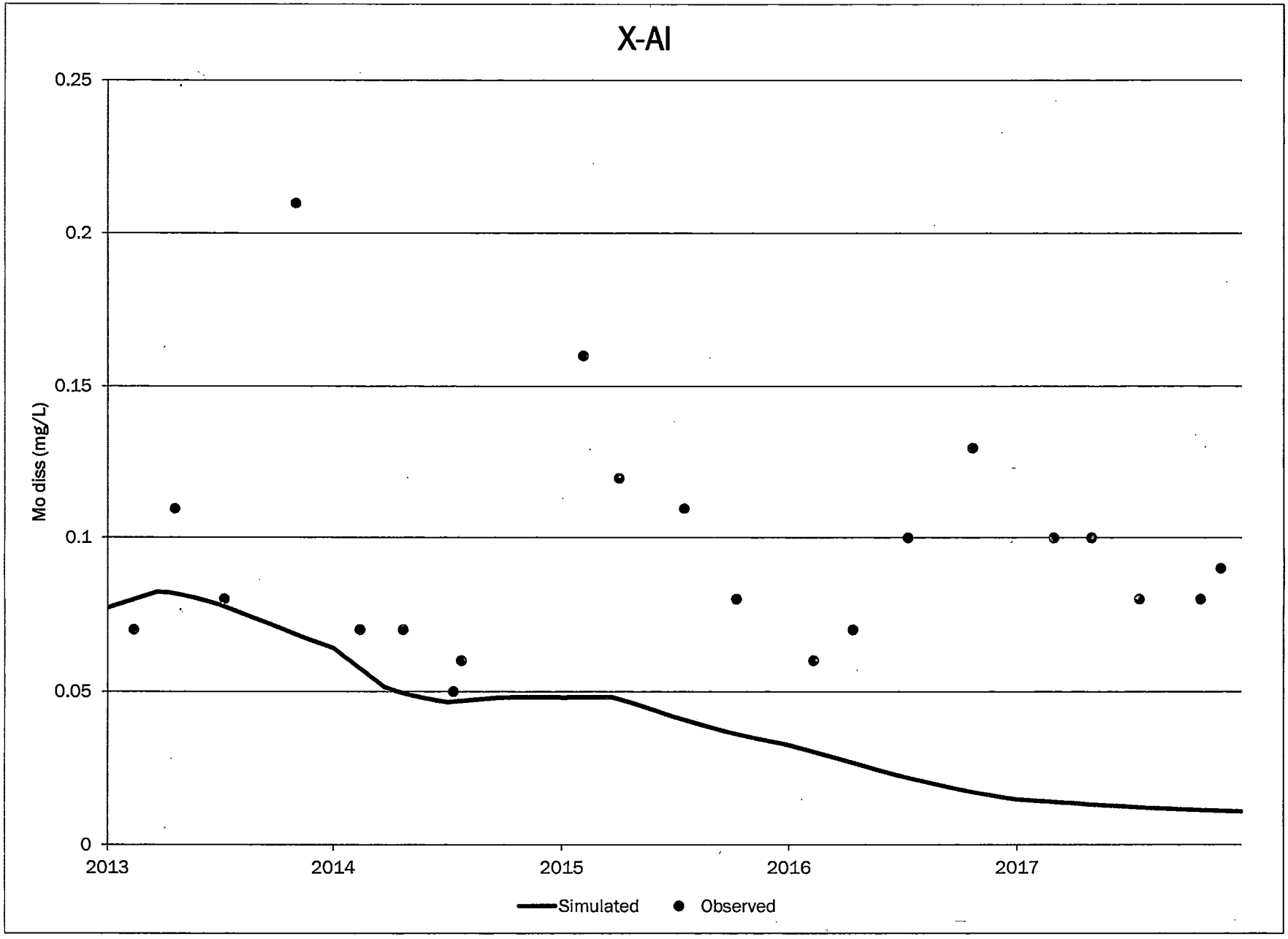

TA-AI
Mo diss (mg/L)
4
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed


T-Al
Mo diss (mg/L)
9
8
7
6
5
4
3
2
1
0
2013
2014
2015
2016
2017
Simulated
Observed


TB-AI
Mo diss (mg/L)
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
Simulated
Observed


WCW-MC
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed


WR25-MC
Mo diss (mg/L)
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
2013
2014
2015
2016
2017
Simulated
Observed


X-AI
0.25
0.2
0.15
0.1
0.05
0
Mo diss (mg/L)
2013
2014
2015
2016
2017
Simulated
Observed

Appendix D: Uranium Transport Calibration Target Dataset

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentra-tion (mg/L)	Simulated Uranium Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
0481-AI	490,210	1,536,820	1	5/11/2013	130.6	0.08	0.10	-0.02	1.0
				6/12/2014	527.4	0.06	0.11	-0.04	1.0
0482-AI	489,579	1,536,981	1	7/10/2013	190.5	0.14	0.22	-0.07	1.0
				5/15/2014	499.4	0.15	0.22	-0.07	1.0
0483-AI	489,753	1,536,586	1	11/15/2013	318.7	0.14	0.19	-0.05	1.0
				6/12/2014	527.5	0.13	0.19	-0.05	1.0
				9/11/2014	618.7	0.12	0.18	-0.07	1.0
				5/13/2016	1228.6	0.21	0.18	0.03	1.0
0490-AI	489,752	1,536,553	1	11/5/2013	308.5	0.09	0.19	-0.10	1.0
				11/23/2013	326.4	0.23	0.19	0.03	1.0
				6/12/2014	527.5	0.22	0.19	0.03	1.0
				5/22/2015	871.4	0.13	0.18	-0.05	1.0
				10/16/2015	1018.6	0.07	0.18	-0.11	1.0
				5/13/2016	1228.6	0.08	0.18	-0.09	1.0
				10/22/2016	1390.6	0.25	0.17	0.08	1.0
				3/9/2017	1528.0	0.49	0.16	0.33	1.0
0491-AI	489,658	1,537,031	1	7/10/2013	190.5	0.29	0.23	0.06	1.0
				5/15/2014	499.4	0.27	0.21	0.06	1.0
				9/19/2014	626.4	0.20	0.19	0.01	1.0
				9/19/2014	626.4	0.20	0.19	0.00	1.0
0496-AI	489,603	1,534,650	1	3/7/2013	65.4	0.16	0.19	-0.04	1.0
				11/15/2013	318.6	0.12	0.28	-0.16	1.0
				4/2/2014	456.3	0.13	0.31	-0.19	1.0
0497-AI	489,503	1,535,039	1	6/18/2013	168.5	0.89	0.68	0.21	1.0
				11/15/2013	318.6	0.86	0.51	0.35	1.0
				4/2/2014	456.3	0.75	0.46	0.29	1.0
				6/12/2014	527.5	0.83	0.45	0.38	1.0
				7/11/2014	556.4	0.77	0.45	0.32	1.0
				11/14/2014	682.6	0.80	0.44	0.36	1.0
				12/24/2014	722.4	0.81	0.43	0.37	1.0
				3/5/2016	1159.5	0.60	0.39	0.21	1.0
				3/17/2017	1536.0	0.53	0.35	0.18	1.0
				6/27/2017	1638.0	0.52	0.33	0.19	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
0498-AI	488,953	1,534,661	1	11/15/2013	318.6	0.50	0.45	0.05	1.0
				6/12/2014	527.5	0.52	0.47	0.05	1.0
				6/10/2015	890.6	0.21	0.41	-0.21	1.0
				7/6/2016	1282.5	0.35	0.39	-0.04	1.0
				8/24/2017	1696.0	0.33	0.36	-0.03	1.0
0522-AI	492,437	1,538,640	1	5/14/2013	133.6	0.51	0.56	-0.04	1.0
				1/29/2014	393.5	0.79	0.46	0.32	1.0
0531-AI	478,262	1,541,086	1	10/14/2015	1016.5	0.10	0.07	0.03	1.0
0532-AI	482,400	1,518,700	1	3/21/2013	79.6	0.00	-1.00	1.00	1.0
				10/23/2014	660.4	0.00	-1.00	1.00	1.0
				10/1/2015	1003.4	0.01	-1.00	1.01	1.0
				12/15/2016	1444.6	0.01	-1.00	1.01	1.0
0538-AI	486,899	1,533,486	1	3/19/2013	77.4	0.17	0.22	-0.05	1.0
				4/2/2014	456.5	0.21	0.18	0.03	1.0
				7/19/2014	564.4	0.22	0.17	0.05	1.0
				8/10/2016	1317.6	0.20	0.10	0.11	1.0
0540-AI	488,091	1,534,125	1	5/4/2013	123.4	0.48	0.45	0.03	1.0
				11/15/2013	318.5	0.49	0.40	0.09	1.0
				10/4/2014	641.5	0.11	0.21	-0.10	1.0
				5/15/2015	864.4	0.05	0.10	-0.05	1.0
				4/29/2016	1214.5	0.02	0.06	-0.04	1.0
				8/5/2016	1312.4	0.14	0.05	0.09	1.0
				11/6/2017	1770.0	0.10	0.05	0.05	1.0
0541-AI	477,236	1,539,831	1	8/9/2013	220.6	0.10	0.12	-0.02	1.0
				7/22/2015	932.6	0.10	0.11	-0.02	1.0
				12/29/2016	1458.6	0.09	0.11	-0.02	1.0
0551-AI	479,880	1,536,272	1	2/7/2013	37.4	0.04	0.04	0.01	1.0
				8/9/2013	220.7	0.05	0.04	0.01	1.0
				2/14/2014	409.6	0.05	0.04	0.01	1.0
				8/28/2014	604.4	0.04	0.04	0.00	1.0
				2/20/2015	780.6	0.04	0.04	0.01	1.0
				2/12/2016	1137.5	0.03	0.03	0.00	1.0
				2/24/2017	1515.0	0.03	0.03	-0.01	1.0
				3/28/2017	1547.0	0.03	0.03	0.00	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
0553-AI	480,563	1,534,923	1	2/7/2013	37.4	0.02	0.02	0.00	1.0
				8/9/2013	220.7	0.02	0.02	0.00	1.0
				2/14/2014	409.6	0.03	0.02	0.00	1.0
				8/27/2014	603.6	0.02	0.02	0.00	1.0
				2/20/2015	780.6	0.03	0.02	0.01	1.0
				2/12/2016	1137.5	0.03	0.02	0.00	1.0
				3/27/2017	1546.0	0.03	0.02	0.01	1.0
0554-AI	479,107	1,534,967	1	2/7/2013	37.4	0.02	0.02	0.00	1.0
				8/9/2013	220.6	0.02	0.02	0.00	1.0
				2/14/2014	409.6	0.02	0.02	0.00	1.0
				2/20/2015	780.5	0.02	0.02	0.00	1.0
				3/27/2017	1546.0	0.02	0.02	0.00	1.0
0555-AI	486,236	1,538,572	1	2/6/2013	36.4	0.08	0.08	0.00	1.0
				8/16/2013	227.5	0.09	0.08	0.00	1.0
				2/12/2014	407.6	0.07	0.09	-0.01	1.0
				9/4/2014	611.4	0.05	0.09	-0.04	1.0
				2/26/2015	786.6	0.08	0.09	-0.01	1.0
				2/17/2016	1142.6	0.08	0.10	-0.02	1.0
				3/27/2017	1546.0	0.07	0.10	-0.03	1.0
0556-AI	486,184	1,538,006	1	2/6/2013	36.4	0.06	0.06	0.00	1.0
				8/16/2013	227.5	0.06	0.07	0.00	1.0
				2/12/2014	407.6	0.07	0.07	0.00	1.0
				9/4/2014	611.4	0.07	0.07	0.00	1.0
				2/26/2015	786.6	0.06	0.07	-0.01	1.0
				2/11/2016	1136.6	0.31	0.08	0.23	1.0
				3/27/2017	1546.0	0.07	0.08	-0.01	1.0
0557-AI	486,000	1,537,204	1	2/6/2013	36.5	0.05	0.05	0.00	1.0
				8/16/2013	227.6	0.05	0.05	0.00	1.0
				2/12/2014	407.6	0.06	0.05	0.00	1.0
				9/4/2014	611.4	0.05	0.05	0.00	1.0
				2/26/2015	786.6	0.05	0.05	0.00	1.0
				2/11/2016	1136.6	0.05	0.05	0.00	1.0
				3/27/2017	1546.0	0.05	0.05	0.00	1.0
0631-AI	483,756	1,532,234	1	3/7/2013	65.5	0.09	0.08	0.01	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				4/2/2014	456.4	0.12	0.08	0.03	1.0
				12/28/2016	1457.4	0.15	0.07	0.09	1.0
				6/30/2017	1641.0	0.16	0.07	0.09	1.0
0632-AI	483,767	1,531,850	1	3/7/2013	65.5	0.09	0.06	0.02	1.0
				4/2/2014	456.4	0.09	0.07	0.02	1.0
				6/30/2017	1641.0	0.13	0.05	0.08	1.0
0634-AI	480,362	1,541,652	1	11/24/2013	327.5	0.26	0.26	0.00	1.0
				7/30/2014	575.4	0.25	0.22	0.03	1.0
				4/23/2015	842.4	0.23	0.18	0.05	1.0
				5/6/2015	855.5	0.27	0.18	0.08	1.0
				6/17/2015	897.4	0.24	0.18	0.06	1.0
				8/20/2015	961.5	0.25	0.17	0.07	1.0
				9/30/2015	1002.5	0.25	0.17	0.08	1.0
				1/12/2016	1106.4	0.22	0.16	0.06	1.0
				2/19/2016	1144.6	0.19	0.16	0.03	1.0
				4/6/2016	1191.6	0.19	0.15	0.04	1.0
				7/24/2016	1300.5	0.22	0.13	0.08	1.0
				10/22/2016	1390.6	0.19	0.11	0.07	1.0
				12/1/2016	1430.5	0.15	0.11	0.04	1.0
				3/20/2017	1539.0	0.16	0.10	0.05	1.0
				7/11/2017	1652.0	0.15	0.11	0.04	1.0
				12/13/2017	1807.0	0.09	0.12	-0.03	1.0
0636-AI	476,038	1,545,374	1	12/19/2014	717.6	0.06	0.05	0.01	1.0
0637-AI	474,710	1,545,409	1	12/12/2014	710.6	0.07	0.09	-0.01	1.0
				12/21/2016	1450.6	0.06	0.08	-0.02	1.0
				10/6/2017	1739.0	0.06	0.08	-0.02	1.0
0641-AI	491,110	1,536,494	1	7/1/2015	911.7	0.03	0.07	-0.04	1.0
0642-AI	490,932	1,536,104	1	7/1/2015	911.7	0.07	0.14	-0.07	1.0
0644-AI	485,450	1,533,481	1	10/11/2014	648.6	0.06	0.13	-0.07	1.0
				8/2/2016	1309.6	0.04	0.06	-0.02	1.0
0646-AI	484,952	1,533,246	1	9/4/2014	611.4	0.08	0.11	-0.04	1.0
				8/2/2016	1309.5	0.05	0.07	-0.02	1.0
				11/14/2017	1778.0	0.05	0.05	0.00	1.0
0647-AI	478,308	1,536,623	1	2/7/2013	37.5	0.05	0.04	0.00	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentra-tion (mg/L)	Simulated Uranium Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
				8/9/2013	220.6	0.04	0.04	0.00	1.0
				8/28/2014	604.4	0.04	0.04	0.00	1.0
				9/14/2017	1717.0	0.08	0.04	0.04	1.0
0649-AI	479,798	1,534,730	1	2/7/2013	37.4	0.03	0.02	0.00	1.0
				3/7/2013	65.5	0.02	0.02	0.00	1.0
				8/16/2013	227.6	0.02	0.02	0.00	1.0
				4/2/2014	456.6	0.03	0.02	0.01	1.0
				3/5/2015	793.5	0.03	0.02	0.01	1.0
				2/23/2016	1148.5	0.03	0.02	0.01	1.0
				3/15/2017	1534.0	0.03	0.02	0.00	1.0
0650-AI	482,135	1,536,779	1	2/7/2013	37.5	0.03	0.03	0.00	1.0
				8/16/2013	227.6	0.03	0.03	0.00	1.0
				2/26/2014	421.5	0.03	0.03	0.00	1.0
				9/4/2014	611.6	0.03	0.03	0.01	1.0
				3/18/2015	806.4	0.03	0.03	0.01	1.0
				2/12/2016	1137.6	0.03	0.03	0.00	1.0
				3/27/2017	1546.0	0.03	0.03	0.01	1.0
0653-AI	486,570	1,533,283	1	6/18/2013	168.5	0.28	0.22	0.06	1.0
				11/15/2013	318.6	0.28	0.21	0.08	1.0
				7/19/2014	564.5	0.26	0.19	0.07	1.0
				8/2/2016	1309.6	0.27	0.13	0.14	1.0
0654-AI	478,636	1,541,994	1	6/10/2015	890.6	0.10	0.13	-0.03	1.0
				11/14/2017	1778.0	0.12	0.14	-0.02	1.0
0657-AI	478,392	1,537,497	1	5/14/2013	133.6	0.06	0.06	0.01	1.0
				8/9/2013	220.6	0.06	0.06	0.00	1.0
0658-AI	478,436	1,535,922	1	2/7/2013	37.5	0.01	0.02	-0.01	1.0
				10/30/2013	302.4	0.01	0.02	-0.01	1.0
				2/26/2014	421.4	0.01	0.02	-0.01	1.0
				8/27/2014	603.6	0.01	0.02	-0.01	1.0
				2/20/2015	780.5	0.02	0.02	0.00	1.0
				2/21/2017	1512.0	0.01	0.02	-0.01	1.0
0659-AI	480,772	1,541,689	1	4/23/2015	842.4	0.27	0.19	0.08	1.0
				5/6/2015	855.5	0.30	0.19	0.11	1.0
				6/17/2015	897.4	0.28	0.18	0.09	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				8/20/2015	961.6	0.27	0.18	0.09	1.0
				9/30/2015	1002.4	0.28	0.17	0.10	1.0
				2/19/2016	1144.5	0.26	0.17	0.09	1.0
				2/24/2016	1149.3	0.25	0.17	0.09	1.0
				4/6/2016	1191.6	0.25	0.16	0.08	1.0
				7/24/2016	1300.5	0.22	0.16	0.07	1.0
				10/22/2016	1390.6	0.21	0.15	0.06	1.0
				3/20/2017	1539.0	0.19	0.14	0.05	1.0
0681-AI	482,734	1,540,676	1	3/19/2013	77.5	0.05	0.05	0.00	1.0
				3/27/2015	815.6	0.05	0.05	0.00	1.0
0684-AI	478,499	1,540,273	1	10/14/2015	1016.5	0.09	0.06	0.03	1.0
0686-AI	475,438	1,545,319	1	12/12/2014	710.6	0.06	0.07	-0.01	1.0
				12/21/2016	1450.6	0.06	0.06	0.00	1.0
				10/6/2017	1739.0	0.06	0.06	0.00	1.0
0688-AI	483,954	1,541,257	1	3/5/2013	63.5	0.06	0.05	0.00	1.0
				10/30/2013	302.6	0.06	0.05	0.01	1.0
				3/20/2014	443.6	0.06	0.05	0.01	1.0
				3/13/2015	801.6	0.04	0.05	-0.01	1.0
				3/17/2016	1171.4	0.05	0.05	0.00	1.0
				3/27/2017	1546.0	0.05	0.05	0.00	1.0
				8/9/2017	1681.0	0.04	0.05	-0.01	1.0
0690-AI	493,465	1,540,279	1	2/20/2013	50.6	0.12	0.15	-0.02	1.0
				4/25/2017	1575.0	0.12	0.14	-0.02	1.0
0691-AI	493,860	1,540,276	1	2/20/2013	50.5	0.02	0.03	-0.01	1.0
				4/25/2017	1575.0	0.02	0.02	-0.01	1.0
0692-AI	493,175	1,535,892	1	7/1/2015	911.4	0.06	0.02	0.03	1.0
0802-AI	488,277	1,540,765	1	3/5/2013	63.4	0.23	0.21	0.02	1.0
				3/19/2014	442.3	0.19	0.12	0.07	1.0
				3/19/2014	442.3	0.19	0.12	0.07	1.0
				9/9/2014	616.7	0.18	0.10	0.08	1.0
				3/20/2015	808.5	0.10	0.08	0.02	1.0
				8/7/2015	948.5	0.15	0.07	0.08	1.0
				3/16/2016	1170.4	0.16	0.06	0.10	1.0
				9/9/2016	1347.6	0.11	0.06	0.05	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				3/14/2017	1533.0	0.10	0.06	0.04	1.0
				8/9/2017	1681.0	0.21	0.05	0.15	1.0
0844-AI	487,002	1,538,376	1	2/6/2013	36.4	0.13	0.15	-0.02	1.0
				8/16/2013	227.4	0.12	0.15	-0.02	1.0
				2/26/2014	421.4	0.11	0.14	-0.03	1.0
				9/4/2014	611.4	0.12	0.13	-0.01	1.0
				2/26/2015	786.5	0.09	0.12	-0.03	1.0
				2/20/2016	1145.5	0.09	0.10	-0.01	1.0
				3/27/2017	1546.0	0.10	0.09	0.01	1.0
0845-AI	487,833	1,537,280	1	2/6/2013	36.4	0.07	0.06	0.01	1.0
				8/16/2013	227.6	0.08	0.06	0.02	1.0
				2/26/2014	421.4	0.08	0.06	0.02	1.0
				9/4/2014	611.4	0.07	0.06	0.01	1.0
				2/26/2015	786.5	0.08	0.06	0.02	1.0
				2/20/2016	1145.5	0.07	0.06	0.00	1.0
				3/27/2017	1546.0	0.08	0.07	0.01	1.0
0846-AI	484,730	1,537,219	1	2/20/2013	50.4	0.10	0.11	-0.01	1.0
				2/20/2013	50.4	0.09	0.11	-0.02	1.0
				10/30/2013	302.6	0.06	0.11	-0.04	1.0
				2/26/2014	421.4	0.07	0.11	-0.04	1.0
				9/4/2014	611.5	0.06	0.10	-0.05	1.0
				3/18/2015	806.4	0.06	0.10	-0.05	1.0
				7/1/2015	911.4	0.06	0.10	-0.04	1.0
				8/20/2015	961.6	0.06	0.10	-0.04	1.0
				2/12/2016	1137.4	0.08	0.10	-0.01	1.0
				3/27/2017	1546.0	0.06	0.09	-0.04	1.0
				8/9/2017	1681.0	0.06	0.09	-0.03	1.0
0852-AI	493,989	1,535,610	1	7/1/2015	911.4	0.02	0.02	0.00	1.0
0862-AI	487,800	1,534,265	1	5/4/2013	123.5	0.29	0.34	-0.06	1.0
				1/29/2014	393.6	0.27	0.39	-0.12	1.0
				6/12/2014	527.5	0.29	0.39	-0.10	1.0
				10/18/2014	655.4	0.18	0.28	-0.10	1.0
				5/15/2015	864.5	0.19	0.10	0.09	1.0
				5/7/2016	1222.5	0.13	0.05	0.08	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				8/5/2016	1312.3	0.10	0.04	0.06	1.0
				10/25/2016	1393.5	0.11	0.04	0.07	1.0
				12/1/2016	1430.6	0.10	0.04	0.06	1.0
				3/21/2017	1540.0	0.09	0.03	0.06	1.0
0864-AI	486,464	1,533,735	1	2/26/2013	56.6	0.23	0.19	0.04	1.0
				8/21/2015	962.4	0.26	0.11	0.15	1.0
				8/10/2016	1317.4	0.19	0.10	0.09	1.0
				8/18/2017	1690.0	0.17	0.09	0.07	1.0
0865-AI	488,429	1,534,123	1	10/18/2014	655.4	0.17	0.12	0.05	1.0
				5/15/2015	864.4	0.10	0.08	0.03	1.0
				8/21/2015	962.5	0.07	0.06	0.02	1.0
				4/29/2016	1214.5	0.05	0.04	0.01	1.0
				8/5/2016	1312.4	0.06	0.04	0.02	1.0
0866-AI	488,340	1,534,494	1	5/4/2013	123.4	0.66	0.52	0.14	1.0
				8/6/2014	582.7	0.64	0.44	0.19	1.0
				9/12/2014	619.7	0.60	0.41	0.18	1.0
				10/18/2014	655.4	0.56	0.38	0.18	1.0
				10/22/2014	659.6	0.59	0.38	0.21	1.0
				11/14/2014	682.6	0.52	0.36	0.16	1.0
				12/24/2014	722.5	0.46	0.33	0.12	1.0
				8/21/2015	962.4	0.61	0.22	0.39	1.0
				8/5/2016	1312.5	0.60	0.16	0.44	1.0
				12/1/2016	1430.6	0.45	0.13	0.32	1.0
				3/21/2017	1540.0	0.36	0.13	0.23	1.0
				8/17/2017	1689.0	0.34	0.16	0.19	1.0
0868-AI	491,033	1,534,848	1	7/1/2015	911.4	0.07	0.04	0.02	1.0
0869-AI	486,073	1,533,251	1	3/19/2013	77.4	0.28	0.24	0.04	1.0
				6/18/2013	168.6	0.29	0.22	0.07	1.0
				7/19/2014	564.5	0.28	0.15	0.13	1.0
0881-AI	481,478	1,542,034	1	2/9/2013	39.5	0.37	0.35	0.02	1.0
				10/31/2013	303.4	0.34	0.32	0.02	1.0
				2/12/2014	407.4	0.28	0.30	-0.02	1.0
				8/27/2014	603.4	0.33	0.29	0.04	1.0
				2/27/2015	787.5	0.35	0.30	0.05	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				2/19/2016	1144.4	0.31	0.32	-0.01	1.0
				2/23/2017	1514.0	0.23	0.33	-0.10	1.0
0882-AI	482,396	1,541,404	1	2/12/2013	42.6	0.05	0.05	0.00	1.0
				8/9/2013	220.4	0.06	0.05	0.01	1.0
				2/12/2014	407.4	0.06	0.05	0.01	1.0
				8/27/2014	603.5	0.06	0.05	0.01	1.0
				2/27/2015	787.5	0.07	0.05	0.01	1.0
				2/19/2016	1144.5	0.06	0.05	0.01	1.0
				3/15/2017	1534.0	0.06	0.05	0.01	1.0
0884-AI	481,498	1,542,677	1	2/9/2013	39.5	0.04	0.04	0.00	1.0
				8/9/2013	220.4	0.04	0.05	-0.01	1.0
				2/12/2014	407.4	0.03	0.05	-0.02	1.0
				8/6/2014	582.6	0.03	0.06	-0.03	1.0
				2/27/2015	787.4	0.04	0.07	-0.04	1.0
				2/19/2016	1144.4	0.03	0.09	-0.06	1.0
				3/27/2017	1546.0	0.02	0.11	-0.08	1.0
0885-AI	483,474	1,541,919	1	8/9/2013	220.5	0.11	0.09	0.02	1.0
				10/23/2014	660.6	0.13	0.11	0.02	1.0
				3/29/2017	1548.0	0.07	0.15	-0.08	1.0
				10/4/2017	1737.0	0.07	0.15	-0.08	1.0
0886-AI	482,487	1,542,327	1	2/9/2013	39.5	0.31	0.36	-0.05	1.0
				11/16/2013	319.5	0.63	0.40	0.22	1.0
				2/12/2014	407.4	0.16	0.40	-0.24	1.0
				10/17/2014	654.4	0.22	0.38	-0.17	1.0
				2/27/2015	787.5	0.23	0.37	-0.14	1.0
				2/19/2016	1144.4	0.32	0.36	-0.05	1.0
				7/8/2016	1284.6	0.32	0.36	-0.04	1.0
				3/3/2017	1522.0	0.29	0.35	-0.06	1.0
				11/9/2017	1773.0	0.35	0.34	0.01	1.0
0887-AI	482,469	1,543,063	1	3/20/2013	78.5	0.03	0.03	0.00	1.0
				10/17/2014	654.4	0.07	0.03	0.04	1.0
				3/25/2015	813.6	0.03	0.03	0.00	1.0
0888-AI	479,335	1,542,285	1	3/20/2013	78.4	0.17	0.16	0.01	1.0
				8/9/2013	220.5	0.20	0.14	0.06	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				3/25/2015	813.6	0.18	0.14	0.04	1.0
				2/10/2016	1135.5	0.17	0.15	0.02	1.0
				3/28/2017	1547.0	0.14	0.14	0.00	1.0
				10/6/2017	1739.0	0.13	0.17	-0.04	1.0
0890-AI	480,088	1,541,365	1	5/1/2013	120.7	0.27	0.23	0.04	1.0
				7/30/2014	575.6	0.21	0.13	0.08	1.0
				4/23/2015	842.4	0.18	0.08	0.10	1.0
				5/6/2015	855.4	0.21	0.08	0.13	1.0
				6/17/2015	897.4	0.18	0.07	0.11	1.0
				8/20/2015	961.5	0.19	0.07	0.12	1.0
				9/30/2015	1002.5	0.20	0.07	0.13	1.0
				1/12/2016	1106.4	0.14	0.06	0.07	1.0
				2/19/2016	1144.5	0.15	0.07	0.09	1.0
				4/6/2016	1191.6	0.14	0.07	0.07	1.0
				7/24/2016	1300.5	0.16	0.06	0.10	1.0
				10/22/2016	1390.6	0.11	0.06	0.05	1.0
				5/17/2017	1597.0	0.05	0.05	0.00	1.0
				7/11/2017	1652.0	0.12	0.05	0.07	1.0
				12/13/2017	1807.0	0.06	0.06	0.00	1.0
0891-AI	493,751	1,540,904	1	2/20/2013	50.6	0.05	-0.40	0.46	1.0
				4/25/2017	1575.0	0.20	-0.40	0.60	1.0
0893-AI	482,244	1,541,934	1	2/12/2013	42.6	0.19	0.20	-0.01	1.0
				8/9/2013	220.4	0.18	0.23	-0.05	1.0
				2/12/2014	407.4	0.31	0.26	0.05	1.0
				8/27/2014	603.6	0.22	0.29	-0.07	1.0
				3/13/2015	801.6	0.23	0.29	-0.06	1.0
				2/20/2016	1145.4	0.11	0.28	-0.17	1.0
				3/14/2017	1533.0	0.08	0.28	-0.20	1.0
0899-AI	477,288	1,543,801	1	6/10/2015	890.6	0.12	0.05	0.06	1.0
				10/3/2017	1736.0	0.07	0.05	0.02	1.0
0910-AI	481,150	1,528,800	1	12/12/2013	345.6	0.01	0.02	-0.01	1.0
				10/23/2014	660.4	0.01	0.02	-0.01	1.0
				10/1/2015	1003.5	0.01	0.02	-0.01	1.0
0920-AI	496,900	1,555,800	1	2/26/2014	421.6	0.23	0.23	0.00	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentra-tion (mg/L)	Simulated Uranium Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
				9/19/2014	626.6	0.22	0.23	-0.02	1.0
				10/23/2014	660.5	0.23	0.23	0.00	1.0
				3/5/2015	793.5	0.23	0.23	0.00	1.0
				4/14/2016	1199.4	0.24	0.23	0.01	1.0
				10/7/2016	1375.4	0.22	0.23	-0.02	1.0
				3/3/2017	1522.0	0.20	0.23	-0.04	1.0
				8/10/2017	1682.0	0.23	0.23	0.00	1.0
0921-AI	495,800	1,555,400	1	10/8/2014	645.7	0.22	0.09	0.13	1.0
				10/8/2014	645.7	0.22	0.09	0.13	1.0
				10/23/2014	660.6	0.22	0.09	0.13	1.0
				12/11/2017	1805.0	0.21	0.06	0.15	1.0
0922-AI	492,500	1,555,200	1	10/23/2014	660.5	0.00	-1.00	1.00	1.0
0935-AI	476,629	1,540,115	1	12/12/2013	345.6	0.14	0.12	0.02	1.0
				10/14/2015	1016.6	0.11	0.12	0.00	1.0
0994-AI	476,240	1,539,700	1	4/5/2013	94.4	0.01	0.01	0.00	1.0
				10/31/2013	303.4	0.01	0.01	-0.01	1.0
				3/28/2014	451.4	0.01	0.02	-0.01	1.0
				10/2/2014	639.4	0.01	0.03	-0.02	1.0
				4/10/2015	829.4	0.01	0.04	-0.03	1.0
				10/20/2015	1022.4	0.01	0.05	-0.04	1.0
				8/24/2017	1696.0	0.01	0.08	-0.07	1.0
0996-AI	477,989	1,537,621	1	8/9/2013	220.6	0.08	-0.07	0.15	1.0
				12/16/2016	1445.6	0.08	-0.08	0.16	1.0
				10/4/2017	1737.0	0.07	-0.37	0.44	1.0
0999-AI	480,187	1,524,230	1	3/21/2013	79.6	0.00	0.01	0.00	1.0
				10/23/2014	660.4	0.00	0.01	0.00	1.0
				10/1/2015	1003.4	0.01	0.01	0.01	1.0
				12/16/2016	1445.4	0.01	0.01	0.00	1.0
1F-AI	493,831	1,544,952	1	9/30/2016	1368.4	1.00	2.62	-1.62	1.0
				9/19/2017	1722.0	1.12	2.23	-1.11	1.0
1J-AI	493,695	1,541,986	1	1/23/2013	22.4	0.03	0.28	-0.24	1.0
				1/29/2014	393.5	0.08	0.13	-0.05	1.0
				2/5/2015	765.6	0.01	0.09	-0.08	1.0
				1/22/2016	1116.6	0.00	0.07	-0.07	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				1/24/2017	1484.0	0.03	0.07	-0.04	1.0
1M-AI	493,133	1,541,327	1	9/30/2016	1368.5	0.18	0.12	0.06	1.0
				3/22/2017	1541.0	0.14	0.12	0.03	1.0
1N-AI	494,396	1,543,100	1	2/20/2013	50.6	0.07	-1.00	1.07	1.0
				6/26/2014	541.5	0.07	-1.00	1.07	1.0
				2/20/2015	780.6	0.08	-1.00	1.08	1.0
				3/22/2017	1541.0	0.06	-1.00	1.06	1.0
1P-AI	493,924	1,541,902	1	2/20/2013	50.6	0.09	-0.21	0.30	1.0
				6/26/2014	541.6	0.59	-0.24	0.83	1.0
				2/20/2015	780.7	0.22	-0.25	0.48	1.0
				3/22/2017	1541.0	0.15	-0.27	0.41	1.0
1Q-AI	493,619	1,541,993	1	1/23/2013	22.4	1.46	0.14	1.32	1.0
				1/29/2014	393.5	0.56	-0.03	0.59	1.0
				2/5/2015	765.6	0.13	0.09	0.03	1.0
				1/21/2016	1115.4	0.15	0.08	0.07	1.0
				1/16/2017	1476.0	0.09	0.05	0.03	1.0
1R-AI	493,623	1,542,071	1	1/17/2013	16.6	0.01	-0.71	0.73	1.0
				1/29/2014	393.5	0.10	-0.77	0.86	1.0
				2/4/2015	764.6	0.12	-0.77	0.89	1.0
				1/21/2016	1115.5	0.15	-0.77	0.93	1.0
				1/16/2017	1476.0	0.10	-0.77	0.88	1.0
1S-AI	493,614	1,541,920	1	1/22/2013	21.5	0.02	0.15	-0.13	1.0
				1/29/2014	393.5	0.08	0.08	0.00	1.0
				2/5/2015	765.6	0.01	0.06	-0.05	1.0
				1/22/2016	1116.6	0.00	0.06	-0.05	1.0
				1/24/2017	1484.0	0.02	0.06	-0.03	1.0
1T-AI	493,656	1,541,990	1	1/17/2013	16.5	0.36	0.33	0.03	1.0
				1/28/2014	392.5	0.05	0.12	-0.07	1.0
				2/5/2015	765.6	0.16	0.09	0.07	1.0
				1/21/2016	1115.4	0.15	0.08	0.08	1.0
				1/16/2017	1476.0	0.07	0.07	0.00	1.0
1U-AI	493,542	1,542,001	1	1/17/2013	16.5	0.99	-0.84	1.82	1.0
				2/21/2013	51.4	1.62	-0.85	2.47	1.0
				1/29/2014	393.4	0.30	-0.87	1.17	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				2/4/2015	764.6	0.25	0.28	-0.03	1.0
				1/21/2016	1115.5	0.24	-0.47	0.71	1.0
				1/16/2017	1476.0	0.19	-0.53	0.72	1.0
1V-AI	493,579	1,541,982	1	1/17/2013	16.5	2.21	-0.59	2.80	1.0
				1/28/2014	392.6	0.21	-0.65	0.86	1.0
				2/5/2015	765.6	0.39	0.13	0.26	1.0
				1/21/2016	1115.4	0.22	0.09	0.13	1.0
				1/16/2017	1476.0	0.21	-0.03	0.24	1.0
AW-AI	488,015	1,540,235	1	12/10/2013	343.6	0.14	0.14	0.00	1.0
				10/11/2014	648.5	0.12	0.16	-0.04	1.0
				10/24/2015	1026.6	0.10	0.18	-0.08	1.0
				12/20/2016	1449.4	0.07	0.17	-0.10	1.0
				11/30/2017	1794.0	0.10	0.15	-0.05	1.0
B10-AI	491,133	1,542,517	1	11/24/2013	327.4	30.5	16.1	14.4	1.0
				5/2/2017	1582.0	7.47	8.33	-0.86	1.0
B11-AI	491,329	1,542,517	1	6/13/2015	893.4	17.8	9.01	8.79	1.0
				5/2/2017	1582.0	6.22	5.27	0.95	1.0
B12-AI	488,915	1,542,524	1	5/15/2013	134.4	0.85	1.44	-0.59	1.0
				6/26/2014	541.6	2.07	1.04	1.03	1.0
				2/6/2015	766.6	1.50	0.29	1.21	1.0
				3/19/2016	1173.5	4.13	0.12	4.01	1.0
				11/13/2017	1777.0	1.74	0.17	1.57	1.0
B13-AI	490,223	1,541,841	1	5/15/2013	134.4	1.08	0.40	0.68	1.0
				2/6/2015	766.6	0.48	0.08	0.40	1.0
				3/28/2017	1547.0	0.98	0.07	0.91	1.0
B4-AI	489,942	1,542,471	1	6/13/2015	893.4	20.6	19.0	1.63	1.0
				5/2/2017	1582.0	13.6	7.87	5.73	1.0
B5-AI	490,141	1,542,474	1	6/13/2015	893.4	28.2	13.7	14.5	1.0
				5/1/2017	1581.0	6.97	8.60	-1.63	1.0
B6-AI	490,341	1,542,478	1	11/24/2013	327.4	25.6	10.5	15.1	1.0
				6/13/2015	893.4	6.49	11.5	-5.04	1.0
B7-AI	490,540	1,542,488	1	6/19/2013	169.6	1.08	12.5	-11.5	1.0
				11/24/2013	327.5	31.2	14.6	16.6	1.0
				6/13/2015	893.4	6.13	14.9	-8.81	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				5/2/2017	1582.0	7.14	11.9	-4.77	1.0
B8-AI	490,734	1,542,488	1	6/13/2015	893.4	13.4	17.9	-4.54	1.0
				5/2/2017	1582.0	6.54	12.9	-6.36	1.0
B9-AI	490,935	1,542,514	1	6/13/2015	893.4	8.78	16.0	-7.23	1.0
				5/1/2017	1581.0	9.82	11.0	-1.17	1.0
B-AI	489,311	1,541,684	1	6/19/2014	534.4	0.11	0.03	0.08	1.0
				5/22/2015	871.5	0.08	0.03	0.06	1.0
BC-AI	487,910	1,543,655	1	6/19/2014	534.4	1.20	0.64	0.56	1.0
				5/22/2015	871.5	0.92	0.35	0.57	1.0
				6/27/2017	1638.0	1.16	0.23	0.93	1.0
C10-AI	491,629	1,542,182	1	3/8/2013	66.4	11.0	9.80	1.20	1.0
				11/1/2013	304.4	5.80	8.37	-2.57	1.0
				3/27/2014	450.6	9.72	7.56	2.16	1.0
				9/30/2014	637.6	2.20	6.54	-4.34	1.0
				4/1/2015	820.4	3.37	5.93	-2.56	1.0
				6/12/2015	892.4	7.36	5.68	1.68	1.0
				10/2/2015	1004.5	6.50	5.21	1.29	1.0
				3/16/2016	1170.4	6.90	4.67	2.23	1.0
				9/30/2016	1368.6	6.88	3.62	3.26	1.0
				3/31/2017	1550.0	7.56	1.07	6.49	1.0
C11-AI	491,844	1,542,376	1	3/8/2013	66.4	7.46	7.50	-0.04	1.0
				4/2/2014	456.5	8.02	7.07	0.95	1.0
				9/30/2014	637.5	0.80	6.61	-5.81	1.0
				4/1/2015	820.5	2.95	6.13	-3.18	1.0
				6/12/2015	892.4	7.49	5.88	1.61	1.0
				10/2/2015	1004.5	3.02	5.39	-2.37	1.0
				9/30/2016	1368.6	5.00	3.82	1.18	1.0
				3/31/2017	1550.0	8.11	0.97	7.14	1.0
				9/20/2017	1723.0	6.54	0.29	6.25	1.0
C12-AI	492,029	1,542,375	1	3/8/2013	66.4	6.46	5.97	0.49	1.0
				11/1/2013	304.5	3.80	6.06	-2.26	1.0
				3/27/2014	450.5	8.96	5.82	3.14	1.0
				4/1/2015	820.4	3.17	4.24	-1.07	1.0
				6/12/2015	892.4	7.37	4.01	3.36	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				10/2/2015	1004.5	2.31	3.65	-1.34	1.0
				3/16/2016	1170.4	3.48	3.16	0.32	1.0
				9/30/2016	1368.6	2.36	2.50	-0.14	1.0
				3/31/2017	1550.0	3.29	0.66	2.63	1.0
				9/20/2017	1723.0	5.71	0.21	5.50	1.0
C6-AI	491,142	1,541,533	1	3/8/2013	66.4	0.88	1.02	-0.14	1.0
				11/1/2013	304.4	3.10	1.12	1.98	1.0
				3/27/2014	450.6	1.06	1.10	-0.04	1.0
				9/30/2014	637.5	0.71	1.00	-0.29	1.0
				4/1/2015	820.4	0.81	1.00	-0.19	1.0
				6/12/2015	892.4	0.63	1.09	-0.46	1.0
				10/2/2015	1004.5	0.53	1.23	-0.70	1.0
				3/16/2016	1170.4	1.04	1.28	-0.24	1.0
				3/21/2017	1540.0	0.70	0.88	-0.18	1.0
				3/31/2017	1550.0	0.81	0.87	-0.06	1.0
				9/20/2017	1723.0	2.07	0.78	1.29	1.0
C7-AI	491,280	1,541,734	1	4/2/2014	456.6	8.00	8.41	-0.41	1.0
				9/30/2014	637.5	12.3	7.06	5.24	1.0
				4/1/2015	820.4	7.74	6.26	1.48	1.0
				6/12/2015	892.4	9.26	6.31	2.95	1.0
				10/2/2015	1004.5	8.53	6.32	2.21	1.0
				3/16/2016	1170.4	7.06	5.85	1.21	1.0
				3/31/2017	1550.0	3.50	3.01	0.49	1.0
C8-AI	491,415	1,541,906	1	3/8/2013	66.4	11.0	9.78	1.22	1.0
				10/31/2013	303.5	6.80	8.96	-2.16	1.0
				3/27/2014	450.6	12.1	8.35	3.75	1.0
				9/30/2014	637.5	0.80	7.68	-6.88	1.0
				4/1/2015	820.4	9.22	7.20	2.02	1.0
				6/12/2015	892.4	1.89	6.96	-5.07	1.0
				10/2/2015	1004.5	0.88	6.54	-5.66	1.0
				3/16/2016	1170.4	3.40	5.88	-2.48	1.0
				9/30/2016	1368.6	0.50	4.58	-4.08	1.0
				3/31/2017	1550.0	3.51	3.22	0.29	1.0
C9-AI	491,545	1,542,075	1	3/8/2013	66.4	6.79	8.87	-2.08	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				11/1/2013	304.4	5.90	8.43	-2.53	1.0
				3/27/2014	450.6	6.56	7.75	-1.19	1.0
				9/30/2014	637.6	10.00	7.03	2.97	1.0
				4/1/2015	820.4	8.36	6.56	1.80	1.0
				6/12/2015	892.4	9.18	6.34	2.84	1.0
				10/2/2015	1004.5	10.1	5.91	4.19	1.0
				3/16/2016	1170.4	7.70	5.34	2.36	1.0
				3/31/2017	1550.0	5.70	2.45	3.25	1.0
				9/20/2017	1723.0	3.85	1.61	2.24	1.0
CW44-AI	488,891	1,535,048	1	11/15/2013	318.6	0.32	0.38	-0.06	1.0
				6/12/2014	527.5	0.30	0.35	-0.05	1.0
				9/10/2014	617.7	0.26	0.34	-0.07	1.0
				7/30/2015	940.4	0.25	0.28	-0.03	1.0
				7/6/2016	1282.6	0.27	0.26	0.01	1.0
				12/2/2016	1431.6	0.22	0.24	-0.02	1.0
D1-AI	489,615	1,542,140	1	3/5/2013	63.5	2.15	2.52	-0.37	1.0
				3/5/2013	63.5	2.21	2.52	-0.31	1.0
				7/9/2013	189.5	2.29	2.25	0.04	1.0
				3/19/2014	442.6	4.00	1.76	2.24	1.0
				7/11/2014	556.5	3.60	1.65	1.95	1.0
				7/24/2014	569.4	3.57	1.63	1.94	1.0
				3/18/2015	806.5	6.41	1.48	4.93	1.0
				7/16/2015	926.6	7.32	1.62	5.70	1.0
				3/16/2016	1170.4	4.00	1.54	2.46	1.0
				7/12/2016	1288.4	1.38	1.07	0.31	1.0
				3/20/2017	1539.0	0.69	0.49	0.20	1.0
				6/28/2017	1639.0	0.91	0.44	0.47	1.0
D2-AI	492,107	1,542,641	1	6/19/2014	534.4	36.9	4.77	32.1	1.0
DA3-AI	489,390	1,542,664	1	6/12/2015	892.6	15.7	11.2	4.47	1.0
				5/2/2017	1582.0	10.7	2.60	8.10	1.0
DC-AI	487,060	1,543,646	1	6/10/2015	890.5	0.09	0.14	-0.05	1.0
				6/27/2017	1638.0	0.08	0.15	-0.07	1.0
DD2-AI	489,251	1,547,439	1	2/12/2013	42.4	0.23	0.19	0.04	1.0
				5/2/2013	121.6	0.25	0.19	0.06	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				10/31/2013	303.6	0.23	0.18	0.05	1.0
				11/23/2013	326.4	0.20	0.18	0.02	1.0
				2/19/2014	414.6	0.23	0.18	0.04	1.0
				5/15/2014	499.6	0.23	0.18	0.05	1.0
				8/6/2014	582.4	0.21	0.18	0.03	1.0
				12/12/2014	710.4	0.19	0.18	0.02	1.0
				2/5/2015	765.6	0.23	0.17	0.05	1.0
				5/1/2015	850.6	0.23	0.17	0.05	1.0
				8/6/2015	947.4	0.22	0.17	0.05	1.0
				10/9/2015	1011.5	0.19	0.17	0.02	1.0
				2/10/2016	1135.4	0.22	0.17	0.05	1.0
				5/18/2016	1233.4	0.23	0.17	0.07	1.0
				10/8/2016	1376.5	0.20	0.17	0.03	1.0
				3/1/2017	1520.0	0.20	0.17	0.03	1.0
				5/2/2017	1582.0	0.24	0.16	0.07	1.0
				8/8/2017	1680.0	0.22	0.16	0.06	1.0
				10/12/2017	1745.0	0.22	0.16	0.06	1.0
				11/2/2017	1766.0	0.22	0.16	0.05	1.0
				11/23/2017	1787.0	0.21	0.16	0.05	1.0
DD-AI	488,943	1,546,989	1	2/12/2013	42.5	0.14	0.13	0.01	1.0
				5/2/2013	121.5	0.16	0.13	0.03	1.0
				10/31/2013	303.6	0.16	0.13	0.03	1.0
				11/23/2013	326.4	0.14	0.13	0.01	1.0
				2/12/2014	407.3	0.14	0.13	0.02	1.0
				5/15/2014	499.6	0.16	0.13	0.03	1.0
				8/6/2014	582.4	0.14	0.12	0.01	1.0
				12/12/2014	710.5	0.13	0.12	0.01	1.0
				2/5/2015	765.6	0.14	0.12	0.02	1.0
				5/1/2015	850.5	0.15	0.12	0.03	1.0
				8/6/2015	947.5	0.15	0.12	0.03	1.0
				10/9/2015	1011.5	0.11	0.11	-0.01	1.0
				2/10/2016	1135.4	0.14	0.11	0.02	1.0
				5/18/2016	1233.4	0.14	0.11	0.03	1.0
				10/7/2016	1375.7	0.08	0.11	-0.03	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				3/1/2017	1520.0	0.10	0.11	-0.01	1.0
				5/3/2017	1583.0	0.14	0.12	0.02	1.0
				8/8/2017	1680.0	0.10	0.12	-0.02	1.0
				10/12/2017	1745.0	0.11	0.12	0.00	1.0
				11/23/2017	1787.0	0.10	0.12	-0.02	1.0
DQ-AI	491,005	1,542,591	1	6/12/2015	892.6	0.45	13.2	-12.8	1.0
DR-AI	489,966	1,542,884	1	6/12/2015	892.6	17.2	13.7	3.51	1.0
DT-AI	489,293	1,542,871	1	6/12/2015	892.6	4.78	11.3	-6.56	1.0
DZ-AI	491,501	1,542,834	1	6/10/2015	890.4	40.9	6.55	34.4	1.0
				6/27/2017	1638.0	49.6	5.92	43.7	1.0
F-AI	489,554	1,539,908	1	3/6/2013	64.5	0.05	0.05	0.00	1.0
				10/30/2013	302.5	0.05	0.05	0.00	1.0
				3/19/2014	442.6	0.06	0.05	0.01	1.0
				9/16/2014	623.6	0.05	0.05	0.00	1.0
				3/18/2015	806.6	0.05	0.05	0.00	1.0
				9/26/2015	998.5	0.05	0.05	0.00	1.0
				9/26/2015	998.5	0.05	0.05	0.00	1.0
				3/16/2016	1170.6	0.05	0.05	0.00	1.0
				9/20/2016	1358.6	0.04	0.05	-0.01	1.0
				3/17/2017	1536.0	0.04	0.05	0.00	1.0
				11/14/2017	1778.0	0.05	0.05	0.00	1.0
FB-AI	488,857	1,540,417	1	3/6/2013	64.4	0.07	0.06	0.01	1.0
				11/2/2013	305.4	0.06	0.05	0.01	1.0
				3/20/2014	443.6	0.06	0.05	0.01	1.0
				9/16/2014	623.6	0.06	0.05	0.01	1.0
				3/18/2015	806.6	0.05	0.05	0.00	1.0
				8/7/2015	948.5	0.05	0.04	0.01	1.0
				9/26/2015	998.4	0.05	0.04	0.01	1.0
				3/16/2016	1170.6	0.05	0.04	0.01	1.0
				9/20/2016	1358.6	0.05	0.04	0.00	1.0
				3/17/2017	1536.0	0.04	0.04	-0.01	1.0
				11/14/2017	1778.0	0.04	0.04	0.00	1.0
GH-AI	489,509	1,538,807	1	3/6/2013	64.4	0.11	0.09	0.02	1.0
				11/2/2013	305.5	0.10	0.08	0.02	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				3/19/2014	442.6	0.10	0.08	0.02	1.0
				9/19/2014	626.6	0.09	0.08	0.01	1.0
				3/13/2015	801.5	0.09	0.08	0.01	1.0
				8/7/2015	948.6	0.08	0.08	0.01	1.0
				3/16/2016	1170.5	0.08	0.07	0.01	1.0
				9/20/2016	1358.6	0.07	0.07	0.00	1.0
				3/17/2017	1536.0	0.06	0.07	-0.01	1.0
				11/14/2017	1778.0	0.06	0.07	-0.01	1.0
GN-AI	490,944	1,538,602	1	3/6/2013	64.6	0.08	0.07	0.01	1.0
				3/11/2015	799.6	0.08	0.06	0.02	1.0
				8/19/2015	960.5	0.08	0.06	0.02	1.0
				3/16/2016	1170.6	0.09	0.06	0.03	1.0
				3/20/2017	1539.0	0.05	0.06	-0.01	1.0
				8/14/2017	1686.0	0.04	0.06	-0.02	1.0
GV-AI	491,428	1,537,701	1	10/2/2015	1004.6	0.24	0.05	0.18	1.0
				12/22/2016	1451.4	0.18	0.05	0.13	1.0
				9/20/2017	1723.0	0.15	0.05	0.10	1.0
K10-AI	491,638	1,541,305	1	1/16/2013	15.4	0.68	0.67	0.01	1.0
				11/1/2013	304.6	0.80	0.84	-0.04	1.0
				1/28/2014	392.5	0.77	0.80	-0.03	1.0
				9/18/2014	625.4	0.65	0.60	0.05	1.0
				2/5/2015	765.5	2.30	0.60	1.70	1.0
				6/12/2015	892.4	1.46	0.70	0.76	1.0
				7/17/2015	927.4	2.27	0.72	1.55	1.0
				1/19/2016	1113.5	1.34	0.77	0.57	1.0
				1/6/2017	1466.0	2.24	0.54	1.70	1.0
				3/31/2017	1550.0	0.67	0.47	0.20	1.0
				11/7/2017	1771.0	1.01	0.36	0.65	1.0
K11-AI	491,490	1,541,325	1	1/16/2013	15.5	0.61	0.60	0.01	1.0
				11/1/2013	304.6	0.61	0.80	-0.20	1.0
				1/28/2014	392.6	0.57	0.83	-0.26	1.0
				9/18/2014	625.5	0.52	0.64	-0.12	1.0
				6/12/2015	892.4	0.61	0.72	-0.11	1.0
				7/17/2015	927.4	0.60	0.75	-0.15	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentra-tion (mg/L)	Simulated Uranium Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
				1/19/2016	1113.5	0.54	0.89	-0.35	1.0
				1/6/2017	1466.0	0.56	0.63	-0.07	1.0
				3/31/2017	1550.0	0.70	0.53	0.17	1.0
				7/18/2017	1659.0	1.01	0.45	0.56	1.0
				11/7/2017	1771.0	1.70	0.41	1.29	1.0
K2-AI	491,587	1,540,736	1	11/7/2013	310.4	0.04	0.05	0.00	1.0
K4-AI	492,371	1,541,211	1	1/16/2013	15.4	0.76	0.44	0.32	1.0
				1/28/2014	392.5	0.23	0.15	0.07	1.0
				9/18/2014	625.6	0.67	0.11	0.55	1.0
				2/5/2015	765.5	0.78	0.10	0.68	1.0
				6/12/2015	892.4	0.66	0.09	0.57	1.0
				7/17/2015	927.4	0.43	0.09	0.35	1.0
				1/21/2016	1115.6	0.21	0.07	0.14	1.0
				7/19/2016	1295.5	0.49	0.05	0.45	1.0
				1/6/2017	1466.0	0.65	0.04	0.61	1.0
				3/31/2017	1550.0	0.64	0.04	0.60	1.0
				7/18/2017	1659.0	0.89	0.04	0.85	1.0
				11/6/2017	1770.0	0.64	0.03	0.61	1.0
K5-AI	491,935	1,541,269	1	1/16/2013	15.4	0.50	0.70	-0.20	1.0
				11/1/2013	304.6	0.61	0.68	-0.07	1.0
				1/28/2014	392.5	0.59	0.65	-0.06	1.0
				9/18/2014	625.4	0.77	0.55	0.22	1.0
				6/12/2015	892.4	0.58	0.52	0.06	1.0
				7/17/2015	927.4	0.59	0.52	0.07	1.0
				1/19/2016	1113.5	0.81	0.49	0.32	1.0
				7/19/2016	1295.6	2.55	0.40	2.15	1.0
				1/6/2017	1466.0	0.62	0.30	0.32	1.0
				3/31/2017	1550.0	0.69	0.26	0.42	1.0
				7/18/2017	1659.0	1.06	0.22	0.84	1.0
				11/7/2017	1771.0	1.35	0.20	1.15	1.0
K7-AI	492,237	1,541,232	1	1/16/2013	15.4	0.52	0.45	0.06	1.0
				11/1/2013	304.6	0.49	0.37	0.12	1.0
				1/28/2014	392.5	0.47	0.32	0.15	1.0
				9/18/2014	625.4	0.39	0.24	0.15	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				2/5/2015	765.5	0.42	0.20	0.22	1.0
				6/12/2015	892.4	0.36	0.17	0.18	1.0
				7/17/2015	927.4	0.41	0.17	0.25	1.0
				1/19/2016	1113.4	0.48	0.13	0.35	1.0
				7/19/2016	1295.5	0.31	0.07	0.23	1.0
				1/6/2017	1466.0	1.35	0.05	1.30	1.0
				3/31/2017	1550.0	0.65	0.05	0.61	1.0
				7/18/2017	1659.0	0.59	0.05	0.54	1.0
				11/6/2017	1770.0	0.39	0.04	0.35	1.0
K8-AI	492,081	1,541,250	1	1/16/2013	15.4	0.69	0.62	0.08	1.0
				11/1/2013	304.6	0.77	0.54	0.24	1.0
				1/28/2014	392.5	0.42	0.50	-0.08	1.0
				9/18/2014	625.4	0.73	0.41	0.32	1.0
				6/12/2015	892.4	0.58	0.36	0.22	1.0
				7/17/2015	927.4	0.56	0.35	0.21	1.0
				1/22/2016	1116.6	0.42	0.29	0.13	1.0
				7/19/2016	1295.5	0.53	0.21	0.32	1.0
				1/6/2017	1466.0	0.92	0.15	0.77	1.0
				3/31/2017	1550.0	0.79	0.13	0.66	1.0
				7/18/2017	1659.0	1.12	0.11	1.01	1.0
				11/6/2017	1770.0	1.08	0.10	0.98	1.0
K9-AI	491,787	1,541,287	1	1/16/2013	15.4	1.07	0.81	0.26	1.0
				11/1/2013	304.6	1.06	0.75	0.31	1.0
				1/28/2014	392.5	0.99	0.72	0.28	1.0
				9/18/2014	625.4	1.27	0.59	0.68	1.0
				2/5/2015	765.5	0.96	0.57	0.39	1.0
				6/12/2015	892.4	0.83	0.60	0.23	1.0
				7/17/2015	927.4	1.19	0.61	0.58	1.0
				1/19/2016	1113.5	1.55	0.62	0.93	1.0
				7/19/2016	1295.6	0.65	0.55	0.10	1.0
				1/6/2017	1466.0	0.61	0.45	0.16	1.0
				3/31/2017	1550.0	0.69	0.39	0.30	1.0
				11/7/2017	1771.0	1.00	0.30	0.70	1.0
KEB-AI	491,487	1,540,570	1	2/28/2013	58.4	0.07	0.06	0.01	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
KF-AI	491,169	1,540,870	1	2/28/2013	58.5	0.08	0.08	0.01	1.0
				7/22/2015	932.5	0.04	0.04	0.00	1.0
				3/28/2017	1547.0	0.04	0.03	0.02	1.0
KZ-AI	491,183	1,541,100	1	2/28/2013	58.5	0.08	0.10	-0.02	1.0
				3/28/2017	1547.0	0.07	0.06	0.01	1.0
L10-AI	492,310	1,539,250	1	5/14/2013	133.4	0.32	0.28	0.04	1.0
				5/30/2014	514.4	0.32	0.22	0.09	1.0
				12/24/2014	722.4	0.30	0.20	0.10	1.0
				4/3/2015	822.4	0.35	0.08	0.28	1.0
				10/17/2015	1019.4	0.24	0.05	0.19	1.0
				4/13/2016	1198.4	0.27	0.05	0.22	1.0
				10/27/2016	1395.6	0.24	0.05	0.19	1.0
				5/1/2017	1581.0	0.37	0.05	0.32	1.0
				10/23/2017	1756.0	0.31	0.05	0.25	1.0
L5-AI	492,730	1,539,946	1	5/14/2013	133.4	0.28	0.24	0.05	1.0
				5/30/2014	514.5	0.22	0.20	0.02	1.0
				12/24/2014	722.4	0.23	0.18	0.04	1.0
				4/3/2015	822.4	0.28	0.11	0.16	1.0
				11/19/2015	1052.4	0.22	0.10	0.13	1.0
				4/13/2016	1198.5	0.17	0.10	0.08	1.0
				5/1/2017	1581.0	0.21	0.10	0.11	1.0
				10/23/2017	1756.0	0.18	0.10	0.09	1.0
L6-AI	493,110	1,540,526	1	5/14/2013	133.4	0.26	0.27	0.00	1.0
				5/30/2014	514.6	0.29	0.25	0.04	1.0
				12/24/2014	722.5	0.24	0.24	0.00	1.0
				4/3/2015	822.5	0.27	0.24	0.03	1.0
				10/17/2015	1019.4	0.21	0.23	-0.03	1.0
				4/13/2016	1198.5	0.23	0.23	0.00	1.0
				10/27/2016	1395.6	0.23	0.23	0.00	1.0
				5/1/2017	1581.0	0.26	0.23	0.03	1.0
				10/23/2017	1756.0	0.25	0.23	0.02	1.0
L7-AI	492,842	1,540,113	1	5/14/2013	133.4	0.21	0.23	-0.01	1.0
				5/30/2014	514.5	0.25	0.19	0.06	1.0
				12/24/2014	722.4	0.25	0.17	0.07	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				4/3/2015	822.4	0.29	0.06	0.23	1.0
				11/19/2015	1052.4	0.26	0.03	0.23	1.0
				4/13/2016	1198.5	0.26	0.03	0.23	1.0
				5/1/2017	1581.0	0.27	0.04	0.23	1.0
				10/23/2017	1756.0	0.20	0.04	0.16	1.0
L8-AI	492,621	1,539,773	1	5/14/2013	133.4	0.19	0.21	-0.02	1.0
				12/24/2014	722.4	0.17	0.16	0.02	1.0
				4/3/2015	822.4	0.19	0.06	0.13	1.0
				10/17/2015	1019.4	0.22	0.04	0.18	1.0
				4/13/2016	1198.5	0.22	0.03	0.19	1.0
				10/27/2016	1395.6	0.40	0.04	0.37	1.0
				5/1/2017	1581.0	0.30	0.04	0.26	1.0
L9-AI	492,463	1,539,509	1	5/16/2013	135.6	0.29	0.27	0.02	1.0
				5/30/2014	514.5	0.24	0.23	0.01	1.0
				12/24/2014	722.4	0.28	0.21	0.07	1.0
				4/3/2015	822.4	0.28	0.19	0.09	1.0
				11/19/2015	1052.4	0.20	0.17	0.03	1.0
				4/13/2016	1198.4	0.21	0.13	0.08	1.0
				5/1/2017	1581.0	0.25	0.13	0.11	1.0
				10/23/2017	1756.0	0.24	0.14	0.10	1.0
L-AI	492,150	1,538,970	1	5/14/2013	133.3	0.51	0.40	0.11	1.0
				5/30/2014	514.4	0.48	0.31	0.17	1.0
				12/24/2014	722.4	0.45	0.28	0.17	1.0
				4/3/2015	822.4	0.50	0.19	0.31	1.0
				10/27/2016	1395.6	0.38	0.18	0.19	1.0
				5/1/2017	1581.0	0.51	0.19	0.32	1.0
				10/23/2017	1756.0	0.39	0.19	0.20	1.0
M10-AI	486,723	1,543,677	1	5/15/2013	134.6	0.17	0.19	-0.02	1.0
				3/17/2016	1171.6	0.15	0.15	-0.01	1.0
				3/24/2017	1543.0	0.14	0.15	-0.01	1.0
M16-AI	485,112	1,543,252	1	10/2/2015	1004.6	0.67	0.17	0.50	1.0
				9/19/2017	1722.0	0.54	0.34	0.20	1.0
M3-AI	489,151	1,542,805	1	11/24/2013	327.5	11.2	9.22	1.98	1.0
				6/12/2015	892.6	8.80	7.53	1.27	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				3/23/2017	1542.0	2.90	2.72	0.18	1.0
M5-AI	489,080	1,542,360	1	12/4/2013	337.4	0.18	0.22	-0.05	1.0
				7/29/2015	939.5	0.22	0.23	-0.01	1.0
M6-AI	486,674	1,543,097	1	5/15/2013	134.5	1.85	1.79	0.06	1.0
				3/4/2015	792.4	2.27	1.12	1.15	1.0
				3/24/2017	1543.0	1.74	0.96	0.78	1.0
M7-AI	486,523	1,542,790	1	3/21/2013	79.4	1.69	1.19	0.50	1.0
				3/4/2015	792.5	1.24	0.84	0.40	1.0
				3/17/2016	1171.6	0.99	0.75	0.24	1.0
M9-AI	486,699	1,543,310	1	2/21/2013	51.6	1.35	1.59	-0.24	1.0
				11/24/2013	327.4	5.12	1.68	3.44	1.0
				12/18/2013	351.5	2.29	1.68	0.61	1.0
				9/30/2014	637.6	3.60	1.76	1.84	1.0
				3/4/2015	792.5	1.19	1.78	-0.59	1.0
				6/12/2015	892.6	1.66	1.75	-0.09	1.0
				10/2/2015	1004.6	2.63	1.69	0.94	1.0
				3/17/2016	1171.5	1.08	1.55	-0.47	1.0
ML-AI	486,691	1,543,902	1	5/15/2013	134.6	0.11	0.11	0.00	1.0
				3/17/2016	1171.6	0.10	0.11	-0.02	1.0
				3/24/2017	1543.0	0.10	0.11	-0.01	1.0
MO-AI	485,518	1,543,620	1	3/5/2013	63.5	0.27	0.14	0.12	1.0
				11/2/2013	305.4	0.26	0.04	0.22	1.0
				3/20/2014	443.4	0.24	0.03	0.21	1.0
				3/13/2015	801.4	0.25	0.09	0.17	1.0
				10/16/2015	1018.6	0.27	0.13	0.13	1.0
				3/16/2016	1170.4	0.28	0.15	0.12	1.0
				10/27/2016	1395.4	0.24	0.17	0.07	1.0
				3/17/2017	1536.0	0.19	0.17	0.02	1.0
MQ-AI	486,326	1,543,173	1	2/21/2013	51.5	0.96	0.93	0.03	1.0
				11/24/2013	327.4	1.37	0.98	0.39	1.0
				9/30/2014	637.6	0.94	1.18	-0.25	1.0
				3/4/2015	792.5	0.82	1.27	-0.45	1.0
				6/12/2015	892.6	0.87	1.31	-0.44	1.0
				10/2/2015	1004.6	0.88	1.30	-0.41	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				3/17/2016	1171.5	0.75	1.29	-0.54	1.0
				3/24/2017	1543.0	0.73	1.26	-0.53	1.0
				9/19/2017	1722.0	0.80	1.24	-0.44	1.0
MR-AI	483,574	1,542,609	1	3/11/2015	799.5	0.39	0.42	-0.03	1.0
				4/15/2015	834.4	0.41	0.42	-0.01	1.0
				8/8/2015	949.6	0.43	0.41	0.02	1.0
				3/16/2016	1170.4	0.50	0.41	0.10	1.0
				9/9/2016	1347.6	0.43	0.40	0.03	1.0
				3/20/2017	1539.0	0.39	0.40	-0.01	1.0
				5/1/2017	1581.0	0.46	0.40	0.06	1.0
				8/11/2017	1683.0	0.46	0.39	0.07	1.0
				10/13/2017	1746.0	0.48	0.39	0.08	1.0
MS-AI	485,570	1,542,607	1	5/1/2013	120.7	0.43	0.32	0.12	1.0
				11/24/2013	327.5	0.06	0.29	-0.23	1.0
				7/1/2016	1277.6	0.18	0.13	0.04	1.0
				3/29/2017	1548.0	0.16	0.11	0.05	1.0
				7/19/2017	1660.0	0.15	0.11	0.04	1.0
				12/1/2017	1795.0	0.15	0.10	0.05	1.0
MT-AI	483,531	1,543,221	1	5/16/2013	135.6	0.04	0.05	-0.01	1.0
MV-AI	484,418	1,542,618	1	5/16/2013	135.4	0.54	0.51	0.03	1.0
				3/25/2015	813.5	0.41	0.50	-0.09	1.0
MW-AI	486,346	1,543,802	1	5/16/2013	135.4	0.10	0.09	0.01	1.0
				3/24/2017	1543.0	0.09	0.10	-0.01	1.0
MX-AI	486,244	1,541,287	1	5/15/2013	134.6	0.03	0.04	0.00	1.0
				3/11/2015	799.5	0.03	0.04	-0.01	1.0
				8/19/2015	960.4	0.04	0.04	0.00	1.0
				3/16/2016	1170.4	0.05	0.04	0.01	1.0
				3/20/2017	1539.0	0.03	0.04	-0.01	1.0
				8/11/2017	1683.0	0.05	0.04	0.01	1.0
				11/13/2017	1777.0	0.03	0.04	-0.01	1.0
MY-AI	486,213	1,542,200	1	12/17/2016	1446.4	0.04	0.05	0.00	1.0
				11/13/2017	1777.0	0.04	0.06	-0.02	1.0
MZ-AI	486,757	1,543,485	1	5/16/2013	135.4	0.24	0.41	-0.17	1.0
				3/4/2015	792.4	0.14	0.48	-0.34	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentra-tion (mg/L)	Simulated Uranium Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
				3/17/2016	1171.6	0.12	0.48	-0.36	1.0
				3/24/2017	1543.0	0.12	0.43	-0.31	1.0
NB-AI	491,296	1,545,000	1	8/28/2015	969.6	26.1	11.2	14.9	1.0
				8/21/2017	1693.0	33.9	9.43	24.5	1.0
NC-AI	491,282	1,545,220	1	4/15/2015	834.5	0.01	3.23	-3.22	1.0
				8/27/2015	968.6	0.23	4.04	-3.81	1.0
				8/16/2017	1688.0	0.14	3.90	-3.75	1.0
ND-AI	494,872	1,545,927	1	12/4/2013	337.4	0.02	0.02	0.00	1.0
				3/27/2015	815.6	0.03	0.02	0.00	1.0
				5/13/2015	862.4	0.04	0.02	0.02	1.0
O-AI	492,725	1,545,060	1	8/27/2015	968.6	0.04	5.72	-5.68	1.0
				8/17/2017	1689.0	0.03	6.82	-6.79	1.0
P2-AI	490,912	1,546,555	1	2/21/2013	51.6	0.04	0.04	0.00	1.0
				4/1/2015	820.4	0.03	0.03	-0.01	1.0
				3/23/2017	1542.0	0.03	0.03	0.00	1.0
P3-AI	490,785	1,546,159	1	2/21/2013	51.6	0.03	0.03	0.00	1.0
				4/1/2015	820.4	0.02	0.03	-0.01	1.0
				3/23/2017	1542.0	0.02	0.03	-0.01	1.0
P4-AI	491,899	1,546,504	1	2/21/2013	51.6	0.03	0.03	0.00	1.0
				10/4/2014	641.3	0.02	0.03	-0.01	1.0
				4/1/2015	820.4	0.01	0.03	-0.01	1.0
				3/23/2017	1542.0	0.02	0.03	-0.01	1.0
P-AI	491,058	1,546,691	1	5/8/2013	127.5	0.04	0.04	0.00	1.0
				11/6/2013	309.4	0.03	0.04	0.00	1.0
				5/15/2014	499.6	0.03	0.03	0.00	1.0
				5/20/2015	869.4	0.03	0.03	-0.01	1.0
				10/21/2015	1023.5	0.04	0.03	0.01	1.0
				5/17/2016	1232.4	0.03	0.03	0.00	1.0
				9/14/2017	1717.0	0.03	0.03	-0.01	1.0
				10/26/2017	1759.0	0.03	0.03	-0.01	1.0
Q-AI	492,153	1,548,693	1	5/14/2013	133.6	0.06	0.05	0.00	1.0
				3/27/2015	815.7	0.05	0.05	0.00	1.0
				5/1/2015	850.6	0.05	0.05	0.00	1.0
				5/18/2016	1233.5	0.05	0.05	0.00	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				10/7/2016	1375.4	0.05	0.05	0.00	1.0
				10/27/2016	1395.5	0.06	0.05	0.01	1.0
				3/23/2017	1542.0	0.05	0.05	0.00	1.0
				5/3/2017	1583.0	0.05	0.05	0.00	1.0
				6/1/2017	1612.0	0.05	0.05	0.00	1.0
				12/5/2017	1799.0	0.05	0.05	0.00	1.0
R-AI	494,514	1,550,372	1	5/14/2013	133.6	0.02	0.03	-0.01	1.0
				3/27/2015	815.6	0.02	0.03	-0.01	1.0
				5/13/2015	862.4	0.03	0.03	0.00	1.0
				5/18/2016	1233.4	0.02	0.03	-0.01	1.0
				10/27/2016	1395.4	0.02	0.03	-0.01	1.0
				5/3/2017	1583.0	0.02	0.03	-0.01	1.0
				12/4/2017	1798.0	0.02	0.03	-0.01	1.0
S11-AI	488,150	1,544,793	1	12/4/2013	337.4	0.08	0.04	0.04	1.0
				1/16/2017	1476.0	0.02	0.02	-0.01	1.0
				10/13/2017	1746.0	0.01	0.03	-0.01	1.0
S12-AI	488,628	1,543,297	1	1/17/2013	16.4	1.78	0.99	0.79	1.0
				2/11/2014	406.4	1.95	0.76	1.19	1.0
				2/6/2015	766.4	7.30	0.93	6.37	1.0
S1-AI	488,401	1,543,288	1	4/11/2015	830.4	0.35	0.59	-0.24	1.0
				8/27/2015	968.4	0.31	0.63	-0.32	1.0
				10/28/2015	1030.5	0.36	0.65	-0.30	1.0
				1/27/2016	1121.5	0.30	0.68	-0.38	1.0
S2-AI	488,299	1,543,127	1	1/15/2013	14.6	5.07	2.80	2.27	1.0
				7/10/2013	190.4	5.03	2.58	2.45	1.0
				1/22/2014	386.4	4.58	2.31	2.27	1.0
				7/11/2014	556.6	4.21	1.99	2.22	1.0
				1/30/2015	759.5	3.60	1.94	1.66	1.0
				7/17/2015	927.4	3.16	1.93	1.23	1.0
				1/20/2016	1114.4	2.26	1.83	0.43	1.0
				7/10/2016	1286.4	5.20	1.46	3.74	1.0
				1/13/2017	1473.0	3.20	1.02	2.18	1.0
				7/18/2017	1659.0	3.40	0.94	2.46	1.0
S3-AI	488,714	1,542,857	1	4/11/2015	830.5	13.1	1.86	11.2	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				7/30/2015	940.5	14.8	1.91	12.9	1.0
				1/29/2016	1123.5	17.7	1.85	15.9	1.0
				7/19/2017	1660.0	8.48	0.85	7.63	1.0
S4-AI	488,359	1,543,344	1	3/5/2013	63.6	0.32	0.42	-0.10	1.0
				7/10/2013	190.4	0.29	0.42	-0.13	1.0
				3/20/2014	443.5	0.31	0.43	-0.12	1.0
				7/11/2014	556.6	0.29	0.43	-0.14	1.0
				7/23/2014	568.4	0.29	0.43	-0.15	1.0
				7/17/2015	927.5	0.41	0.55	-0.14	1.0
				1/29/2016	1123.6	0.30	0.66	-0.36	1.0
				1/29/2016	1123.6	0.27	0.66	-0.39	1.0
				3/16/2016	1170.4	0.30	0.66	-0.36	1.0
				7/10/2016	1286.4	0.48	0.65	-0.17	1.0
				3/14/2017	1533.0	0.14	0.56	-0.42	1.0
				7/18/2017	1659.0	0.15	0.55	-0.40	1.0
				11/13/2017	1777.0	0.15	0.54	-0.39	1.0
S5R-AI	488,938	1,543,150	1	11/24/2013	327.4	21.6	9.21	12.4	1.0
				6/12/2015	892.6	22.0	8.70	13.3	1.0
				3/23/2017	1542.0	0.95	4.64	-3.68	1.0
SA-AI	488,811	1,543,122	1	4/18/2015	837.7	42.0	6.49	35.5	1.0
				6/12/2015	892.6	45.4	6.65	38.8	1.0
				1/20/2016	1114.4	2.23	6.42	-4.19	1.0
				1/29/2016	1123.6	17.2	6.28	10.9	1.0
				3/22/2017	1541.0	35.8	3.07	32.7	1.0
				11/13/2017	1777.0	33.2	2.68	30.5	1.0
SB-AI	488,811	1,543,371	1	6/12/2015	892.6	46.6	5.28	41.3	1.0
				3/22/2017	1541.0	40.3	2.93	37.4	1.0
				11/9/2017	1773.0	37.8	2.89	34.9	1.0
SE6-AI	488,615	1,543,244	1	1/16/2013	15.7	0.61	1.93	-1.32	1.0
				2/11/2014	406.4	4.44	1.31	3.13	1.0
				1/29/2015	758.5	31.6	1.70	29.9	1.0
				2/6/2015	766.4	27.4	1.71	25.7	1.0
				1/26/2016	1120.5	16.0	1.92	14.1	1.0
				1/29/2016	1123.6	15.4	1.93	13.5	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentra-tion (mg/L)	Simulated Uranium Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
				1/17/2017	1477.0	45.0	1.78	43.2	1.0
				11/13/2017	1777.0	10.3	1.79	8.51	1.0
SM-AI	488,566	1,543,748	1	5/16/2013	135.6	1.77	2.00	-0.23	1.0
				5/29/2014	513.6	0.83	1.36	-0.53	1.0
				5/20/2015	869.4	0.51	1.30	-0.79	1.0
				5/3/2017	1583.0	9.12	0.47	8.65	1.0
SO-AI	488,381	1,543,652	1	5/29/2014	513.6	4.24	1.25	2.99	1.0
				5/20/2015	869.4	2.90	1.01	1.89	1.0
				5/3/2017	1583.0	2.83	0.37	2.46	1.0
SQ-AI	488,814	1,543,507	1	6/12/2015	892.6	37.3	8.47	28.8	1.0
SS-AI	488,666	1,543,374	1	1/16/2013	15.6	0.56	1.42	-0.86	1.0
ST-AI	488,688	1,543,215	1	1/16/2013	15.6	11.2	5.58	5.62	1.0
				11/24/2013	327.4	13.3	2.11	11.2	1.0
				6/12/2015	892.6	31.6	2.86	28.7	1.0
				1/26/2016	1120.6	1.05	3.24	-2.19	1.0
				1/24/2017	1484.0	0.77	2.45	-1.68	1.0
				3/23/2017	1542.0	0.75	2.39	-1.64	1.0
SUB1-AI	489,100	1,537,620	1	5/1/2013	120.6	0.11	0.09	0.02	1.0
				10/26/2017	1759.0	0.12	0.04	0.07	1.0
SUB2-AI	490,370	1,537,392	1	5/1/2013	120.4	0.04	0.04	0.00	1.0
				11/6/2013	309.4	0.03	0.04	-0.01	1.0
				5/29/2014	513.5	0.03	0.04	-0.01	1.0
				5/13/2015	862.4	0.03	0.04	-0.01	1.0
				10/21/2015	1023.5	0.03	0.04	-0.01	1.0
				10/27/2016	1395.6	0.03	0.04	-0.01	1.0
				6/1/2017	1612.0	0.02	0.04	-0.02	1.0
SUB3-AI	489,420	1,538,280	1	5/1/2013	120.4	0.02	0.03	-0.01	1.0
				11/6/2013	309.6	0.01	0.03	-0.02	1.0
				5/29/2014	513.5	0.01	0.03	-0.02	1.0
				4/15/2015	834.4	0.02	0.04	-0.02	1.0
				11/4/2015	1037.6	0.01	0.04	-0.03	1.0
				6/2/2017	1613.0	0.01	0.05	-0.05	1.0
				10/26/2017	1759.0	0.01	0.05	-0.04	1.0
SV-AI	488,813	1,543,676	1	11/24/2013	327.4	30.8	8.85	22.0	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				6/12/2015	892.6	39.1	9.16	29.9	1.0
				3/22/2017	1541.0	5.69	2.72	2.97	1.0
SW-AI	488,812	1,543,783	1	5/29/2014	513.6	11.8	7.46	4.34	1.0
				5/13/2015	862.6	25.0	8.53	16.5	1.0
				5/3/2017	1583.0	1.41	2.40	-0.99	1.0
SZ-AI	488,833	1,544,367	1	1/17/2013	16.6	54.6	49.1	5.46	1.0
				2/11/2014	406.4	59.0	34.1	24.9	1.0
				2/6/2015	766.5	48.0	29.4	18.6	1.0
				1/29/2016	1123.5	44.0	30.3	13.7	1.0
				1/16/2017	1476.0	8.30	9.97	-1.67	1.0
T10-AI	492,791	1,543,434	1	11/20/2014	688.5	46.0	20.8	25.2	1.0
				7/29/2015	939.5	44.5	17.2	27.3	1.0
				8/3/2017	1675.0	48.5	10.5	38.0	1.0
T11-AI	489,887	1,544,585	1	11/13/2014	681.4	2.83	9.11	-6.28	1.0
				7/28/2015	938.6	8.65	8.56	0.09	1.0
				3/29/2017	1548.0	10.1	9.50	0.60	1.0
T12-AI	490,317	1,544,583	1	5/2/2013	121.4	1.92	3.40	-1.48	1.0
				11/13/2014	681.4	1.49	4.28	-2.79	1.0
				7/28/2015	938.6	1.42	4.72	-3.30	1.0
T14-AI	491,071	1,544,565	1	11/26/2014	694.6	36.3	11.7	24.6	1.0
T15-AI	491,953	1,544,480	1	11/26/2014	694.6	8.61	9.47	-0.86	1.0
				6/10/2015	890.5	11.0	9.38	1.62	1.0
T16-AI	492,718	1,544,276	1	11/26/2014	694.5	51.5	43.3	8.19	1.0
				5/16/2015	865.6	54.0	40.0	14.0	1.0
T17-AI	489,430	1,544,008	1	11/13/2014	681.4	23.0	14.5	8.46	1.0
				5/15/2015	864.6	26.3	14.0	12.3	1.0
T18-AI	490,333	1,543,977	1	11/13/2014	681.4	8.10	8.63	-0.53	1.0
				5/16/2015	865.5	3.60	8.54	-4.94	1.0
T19-AI	490,722	1,543,958	1	11/13/2014	681.5	10.3	9.46	0.84	1.0
				5/16/2015	865.5	2.31	9.35	-7.04	1.0
				11/9/2017	1773.0	12.4	8.70	3.70	1.0
T20-AI	491,048	1,543,935	1	6/24/2015	904.4	3.74	9.14	-5.40	1.0
				12/11/2017	1805.0	9.66	8.34	1.32	1.0
T21-AI	491,882	1,543,951	1	5/2/2013	121.4	7.25	7.72	-0.47	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				11/20/2014	688.5	3.72	7.67	-3.95	1.0
				6/10/2015	890.4	5.47	7.68	-2.21	1.0
				12/11/2017	1805.0	6.43	10.3	-3.91	1.0
T22-AI	492,311	1,543,876	1	11/20/2014	688.5	0.91	17.0	-16.1	1.0
				6/10/2015	890.5	1.00	19.3	-18.3	1.0
				7/29/2015	939.4	1.40	19.9	-18.5	1.0
T23-AI	492,805	1,543,901	1	11/26/2014	694.5	82.2	40.3	41.9	1.0
				6/10/2015	890.6	75.0	34.3	40.7	1.0
T2-AI	489,303	1,543,538	1	11/23/2013	326.5	7.78	10.5	-2.69	1.0
				11/19/2014	687.3	9.30	10.5	-1.19	1.0
				7/28/2015	938.5	12.0	10.0	1.96	1.0
				12/12/2017	1806.0	24.4	10.5	13.9	1.0
T36-AI	489,688	1,543,735	1	5/15/2015	864.5	4.23	9.34	-5.11	1.0
T39-AI	491,669	1,544,498	1	11/26/2014	694.6	6.90	9.17	-2.27	1.0
				6/10/2015	890.4	11.0	8.97	2.03	1.0
T40-AI	491,466	1,543,819	1	6/10/2015	890.6	8.95	8.31	0.64	1.0
				12/12/2017	1806.0	7.87	7.72	0.15	1.0
T41-AI	491,079	1,543,278	1	11/19/2014	687.4	4.03	9.47	-5.44	1.0
				5/15/2015	864.6	5.05	9.36	-4.31	1.0
				12/12/2017	1806.0	6.65	8.59	-1.94	1.0
T4-AI	489,699	1,543,340	1	5/2/2013	121.5	4.00	5.18	-1.18	1.0
				11/19/2014	687.6	2.71	5.92	-3.21	1.0
				7/28/2015	938.6	3.22	6.40	-3.18	1.0
T5-AI	490,289	1,543,307	1	11/19/2014	687.6	11.6	9.52	2.08	1.0
				7/28/2015	938.6	7.72	9.36	-1.64	1.0
T6-AI	490,655	1,543,282	1	5/19/2015	868.6	8.62	9.34	-0.72	1.0
T7-AI	491,484	1,543,272	1	5/19/2015	868.6	29.1	9.31	19.8	1.0
T8-AI	491,914	1,543,296	1	5/15/2015	864.6	17.5	10.3	7.19	1.0
T9-AI	492,337	1,543,347	1	11/20/2014	688.5	27.0	13.9	13.1	1.0
				7/28/2015	938.6	17.0	13.3	3.70	1.0
TA-AI	492,426	1,542,471	1	9/30/2015	1002.6	2.28	1.87	0.41	1.0
				9/30/2016	1368.5	1.44	1.22	0.22	1.0
				9/26/2017	1729.0	3.00	0.66	2.34	1.0
T-AI	492,260	1,542,536	1	3/21/2013	79.4	8.61	7.86	0.75	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				5/16/2015	865.4	4.72	2.81	1.91	1.0
				6/12/2015	892.5	4.42	2.78	1.64	1.0
				9/30/2015	1002.6	6.48	2.72	3.76	1.0
				9/30/2016	1368.5	3.41	2.35	1.06	1.0
				9/26/2017	1729.0	4.83	1.56	3.27	1.0
TB-AI	492,616	1,542,351	1	10/1/2015	1003.6	0.83	0.45	0.38	1.0
				9/26/2017	1729.0	2.34	0.09	2.25	1.0
X-AI	491,892	1,540,512	1	2/12/2013	42.6	0.04	0.06	-0.02	1.0
				4/20/2013	109.6	0.06	0.06	0.00	1.0
				7/9/2013	189.6	0.06	0.06	0.00	1.0
				11/1/2013	304.6	0.06	0.05	0.01	1.0
				2/12/2014	407.5	0.05	0.05	0.00	1.0
				4/22/2014	476.5	0.04	0.04	0.00	1.0
				7/11/2014	556.6	0.07	0.04	0.03	1.0
				7/24/2014	569.4	0.06	0.04	0.02	1.0
				2/4/2015	764.6	0.05	0.04	0.01	1.0
				4/3/2015	822.5	0.04	0.04	0.00	1.0
				7/17/2015	927.4	0.05	0.04	0.01	1.0
				10/9/2015	1011.5	0.06	0.04	0.03	1.0
				2/10/2016	1135.4	0.10	0.03	0.07	1.0
				4/13/2016	1198.4	0.12	0.03	0.08	1.0
				7/10/2016	1286.5	0.06	0.03	0.04	1.0
				10/21/2016	1389.6	0.06	0.02	0.04	1.0
				3/1/2017	1520.0	0.05	0.02	0.03	1.0
				5/1/2017	1581.0	0.06	0.02	0.04	1.0
				7/18/2017	1659.0	0.05	0.02	0.04	1.0
				10/26/2017	1759.0	0.07	0.02	0.05	1.0
				11/28/2017	1792.0	0.04	0.02	0.02	1.0
0494-UC	489,494	1,536,689	4	2/9/2013	39.4	0.12	0.12	0.00	1.0
				7/9/2013	189.4	0.15	0.13	0.02	1.0
				2/13/2014	408.4	0.17	0.17	0.00	1.0
				6/17/2014	532.5	0.17	0.17	0.00	1.0
				3/5/2015	793.5	0.00	0.17	-0.17	1.0
				5/22/2015	871.5	0.14	0.17	-0.03	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				2/16/2016	1141.6	0.20	0.18	0.02	1.0
				7/13/2016	1289.6	0.21	0.18	0.03	1.0
				3/1/2017	1520.0	0.22	0.18	0.04	1.0
				6/28/2017	1639.0	0.19	0.18	0.01	1.0
0929-UC	495,585	1,544,684	4	2/26/2013	56.6	0.04	0.04	0.00	1.0
				10/4/2014	641.4	0.03	0.04	-0.01	1.0
				7/2/2015	912.5	0.03	0.04	-0.01	1.0
0931-UC	495,207	1,542,461	4	10/3/2014	640.6	0.05	0.00	0.05	1.0
				7/2/2015	912.4	0.01	0.00	0.00	1.0
				7/5/2017	1646.0	0.00	0.00	0.00	1.0
AW-UC	488,015	1,540,235	4	12/10/2013	343.6	0.14	0.07	0.07	1.0
				10/11/2014	648.5	0.12	0.06	0.06	1.0
				10/24/2015	1026.6	0.10	0.05	0.04	1.0
				12/20/2016	1449.4	0.07	0.06	0.02	1.0
				11/30/2017	1794.0	0.10	0.06	0.04	1.0
CE10-UC	490,177	1,541,737	4	9/5/2013	247.5	3.18	2.19	0.99	1.0
				7/24/2014	569.5	3.33	2.21	1.12	1.0
				7/17/2015	927.5	4.93	2.19	2.74	1.0
				7/19/2017	1660.0	3.39	1.83	1.56	1.0
CE11-UC	490,494	1,541,486	4	2/26/2013	56.5	2.72	1.73	0.99	1.0
				8/6/2015	947.4	4.91	1.43	3.48	1.0
				7/19/2016	1295.3	3.10	1.26	1.84	1.0
				2/10/2017	1501.0	3.18	1.16	2.02	1.0
				7/19/2017	1660.0	0.25	1.13	-0.88	1.0
CE12-UC	489,642	1,541,867	4	2/26/2013	56.4	2.32	1.35	0.97	1.0
				7/24/2014	569.6	2.47	0.89	1.58	1.0
				9/30/2014	637.5	2.42	0.88	1.54	1.0
				8/6/2015	947.4	6.92	1.03	5.89	1.0
				7/19/2016	1295.3	1.50	0.89	0.61	1.0
				3/21/2017	1540.0	0.88	0.68	0.20	1.0
				7/19/2017	1660.0	1.11	0.67	0.44	1.0
CE13-UC	490,338	1,542,693	4	7/24/2014	569.6	27.9	25.2	2.67	1.0
				10/3/2014	640.4	26.6	24.1	2.52	1.0
				7/17/2015	927.6	28.9	22.3	6.61	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				7/20/2017	1661.0	22.1	19.4	2.72	1.0
CE14-UC	489,600	1,541,326	4	3/6/2013	64.6	0.08	0.08	0.00	1.0
				9/5/2013	247.6	0.07	0.09	-0.02	1.0
				10/3/2014	640.4	0.06	0.10	-0.04	1.0
				4/1/2015	820.6	0.05	0.11	-0.06	1.0
				8/28/2015	969.6	0.06	0.12	-0.07	1.0
				3/19/2016	1173.6	0.07	0.14	-0.07	1.0
				3/21/2017	1540.0	0.04	0.05	-0.01	1.0
CE15-UC	489,460	1,539,507	4	3/6/2013	64.5	0.38	0.23	0.15	1.0
				9/5/2013	247.4	0.34	0.23	0.11	1.0
				10/3/2014	640.4	0.39	0.20	0.20	1.0
				4/1/2015	820.6	0.60	0.19	0.41	1.0
				3/19/2016	1173.6	1.26	0.19	1.07	1.0
				3/21/2017	1540.0	0.52	0.18	0.34	1.0
CE2-UC	489,979	1,541,923	4	2/26/2013	56.4	2.48	2.46	0.02	1.0
				9/30/2014	637.5	3.50	3.19	0.31	1.0
				5/13/2015	862.4	8.20	3.03	5.17	1.0
				10/16/2015	1018.6	4.80	2.87	1.93	1.0
				5/11/2016	1226.6	1.05	2.74	-1.69	1.0
				10/27/2016	1395.4	0.88	2.57	-1.69	1.0
				5/2/2017	1582.0	0.92	2.44	-1.52	1.0
				6/28/2017	1639.0	1.28	2.43	-1.15	1.0
				7/18/2017	1659.0	1.01	2.42	-1.41	1.0
				10/25/2017	1758.0	0.82	2.41	-1.59	1.0
CE5-UC	490,695	1,541,453	4	2/26/2013	56.5	0.54	0.64	-0.10	1.0
				9/30/2014	637.5	3.80	0.22	3.58	1.0
				7/17/2015	927.5	4.71	0.15	4.56	1.0
				7/16/2016	1292.6	2.00	0.18	1.82	1.0
				2/10/2017	1501.0	2.59	0.15	2.44	1.0
				7/19/2017	1660.0	0.25	0.13	0.12	1.0
CE6-UC	490,433	1,541,698	4	2/26/2013	56.4	3.46	2.11	1.35	1.0
				9/30/2014	637.5	4.32	1.83	2.49	1.0
				7/17/2015	927.6	4.78	1.91	2.87	1.0
				7/19/2016	1295.3	1.66	2.13	-0.47	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				2/10/2017	1501.0	2.90	2.13	0.77	1.0
				7/19/2017	1660.0	2.22	2.09	0.13	1.0
CE7-UC	490,079	1,542,652	4	7/9/2013	189.4	26.0	18.3	7.66	1.0
				3/27/2015	815.4	23.8	15.4	8.39	1.0
				6/12/2015	892.5	25.2	15.4	9.84	1.0
				7/20/2017	1661.0	5.06	13.5	-8.48	1.0
CE8-UC	491,556	1,540,704	4	2/28/2013	58.5	0.06	0.04	0.01	1.0
				9/5/2013	247.4	0.04	0.04	0.00	1.0
				7/24/2014	569.5	0.06	0.04	0.02	1.0
				3/20/2015	808.4	0.04	0.04	0.00	1.0
				8/19/2015	960.5	0.04	0.04	0.00	1.0
				9/26/2015	998.4	0.04	0.04	0.00	1.0
				2/11/2016	1136.5	0.03	0.04	-0.01	1.0
				9/20/2016	1358.5	0.03	0.02	0.01	1.0
				3/2/2017	1521.0	0.03	0.02	0.02	1.0
				11/14/2017	1778.0	0.03	0.01	0.02	1.0
CE9-UC	489,458	1,538,203	4	2/28/2013	58.6	0.26	0.19	0.08	1.0
				10/11/2014	648.5	0.21	0.18	0.03	1.0
				3/27/2015	815.4	0.22	0.18	0.03	1.0
				8/19/2015	960.6	0.37	0.18	0.18	1.0
				3/16/2016	1170.5	0.52	0.18	0.34	1.0
				3/21/2017	1540.0	0.47	0.17	0.31	1.0
				7/19/2017	1660.0	0.25	0.15	0.10	1.0
				8/14/2017	1686.0	0.24	0.15	0.09	1.0
CF1-UC	491,868	1,544,456	4	3/5/2013	63.6	0.08	0.10	-0.02	1.0
				11/22/2013	325.6	8.11	0.10	8.01	1.0
				10/1/2014	638.6	7.07	0.10	6.97	1.0
				6/30/2017	1641.0	4.47	0.10	4.37	1.0
CF2-UC	490,888	1,544,358	4	3/5/2013	63.6	0.01	0.02	-0.01	1.0
				10/3/2014	640.3	0.01	0.02	-0.01	1.0
				6/30/2017	1641.0	0.01	0.02	-0.01	1.0
CW18-UC	491,378	1,535,924	4	2/26/2013	56.6	0.05	0.04	0.00	1.0
				10/4/2014	641.4	0.03	0.04	-0.01	1.0
				3/31/2015	819.5	0.03	0.04	-0.01	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				8/25/2016	1332.6	0.03	0.04	-0.01	1.0
				3/20/2017	1539.0	0.02	0.04	-0.02	1.0
				8/17/2017	1689.0	0.03	0.04	-0.02	1.0
				8/17/2017	1689.0	0.03	0.04	-0.02	1.0
CW3-UC	493,496	1,545,200	4	2/28/2013	58.6	0.36	0.18	0.18	1.0
				10/3/2014	640.7	0.47	0.17	0.29	1.0
				7/2/2015	912.4	0.37	0.17	0.20	1.0
				11/28/2017	1792.0	0.32	0.02	0.30	1.0
CW40-UC	491,819	1,537,624	4	7/1/2015	911.6	0.03	0.02	0.01	1.0
				6/30/2017	1641.0	0.02	0.02	0.00	1.0
CW50-UC	491,159	1,546,687	4	11/27/2013	330.6	0.04	0.03	0.01	1.0
				10/1/2014	638.6	0.04	0.03	0.01	1.0
				3/11/2015	799.4	0.03	0.03	0.00	1.0
				8/19/2015	960.6	0.03	0.03	0.00	1.0
				3/17/2016	1171.5	0.03	0.03	0.00	1.0
				3/20/2017	1539.0	0.02	0.03	-0.01	1.0
				8/11/2017	1683.0	0.03	0.03	0.00	1.0
CW53-UC	490,262	1,536,668	4	11/15/2013	318.6	0.12	0.11	0.00	1.0
				4/16/2014	470.7	0.09	0.11	-0.03	1.0
				9/11/2014	618.7	0.10	0.11	-0.01	1.0
				5/13/2016	1228.5	0.09	0.11	-0.03	1.0
				10/22/2016	1390.6	0.06	0.11	-0.05	1.0
				5/3/2017	1583.0	0.07	0.11	-0.05	1.0
CW9-UC	491,015	1,542,840	4	10/3/2014	640.3	0.00	0.05	-0.04	1.0
				6/30/2017	1641.0	0.02	0.05	-0.03	1.0
0481-MC	490,210	1,536,820	6	5/11/2013	130.6	0.08	0.07	0.01	1.0
				6/12/2014	527.4	0.06	0.07	-0.01	1.0
0482-MC	489,579	1,536,981	6	7/10/2013	190.5	0.14	0.12	0.02	1.0
				5/15/2014	499.4	0.15	0.13	0.02	1.0
0483-MC	489,753	1,536,586	6	11/15/2013	318.7	0.14	0.13	0.02	1.0
				6/12/2014	527.5	0.13	0.13	0.00	1.0
				9/11/2014	618.7	0.12	0.13	-0.01	1.0
				5/13/2016	1228.6	0.21	0.13	0.07	1.0
0493-MC	489,492	1,536,702	6	2/9/2013	39.4	0.31	0.22	0.09	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentra-tion (mg/L)	Simulated Uranium Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
				7/9/2013	189.4	0.31	0.21	0.10	1.0
				2/13/2014	408.4	0.38	0.20	0.18	1.0
				2/13/2014	408.4	0.38	0.20	0.18	1.0
				6/17/2014	532.5	0.29	0.20	0.09	1.0
				3/5/2015	793.5	0.00	0.19	-0.19	1.0
				3/5/2015	793.5	0.19	0.19	0.00	1.0
				5/22/2015	871.4	0.14	0.19	-0.05	1.0
				2/16/2016	1141.6	0.19	0.18	0.01	1.0
				7/12/2016	1288.4	0.28	0.18	0.10	1.0
				3/1/2017	1520.0	0.16	0.17	-0.02	1.0
0498-MC	488,953	1,534,661	6	11/15/2013	318.6	0.50	0.29	0.21	1.0
				6/12/2014	527.5	0.52	0.31	0.22	1.0
				6/10/2015	890.6	0.21	0.29	-0.08	1.0
				7/6/2016	1282.5	0.35	0.29	0.06	1.0
				8/24/2017	1696.0	0.33	0.27	0.06	1.0
0859-MC	487,426	1,534,549	6	11/20/2013	323.4	0.06	0.06	-0.01	1.0
				6/19/2014	534.5	0.08	0.07	0.01	1.0
0930-MC	494,997	1,542,848	6	10/4/2014	641.4	0.02	0.01	0.01	1.0
				7/1/2015	911.6	0.00	0.01	-0.01	1.0
				7/5/2017	1646.0	0.00	0.01	-0.01	1.0
ACW-MC	488,070	1,540,235	6	12/10/2013	343.6	0.05	0.04	0.01	1.0
				10/11/2014	648.4	0.01	0.04	-0.02	1.0
				10/24/2015	1026.6	0.01	0.04	-0.03	1.0
				12/20/2016	1449.4	0.05	0.04	0.01	1.0
				11/30/2017	1794.0	0.01	0.04	-0.03	1.0
CW15-MC	485,961	1,536,259	6	10/2/2014	639.6	0.03	0.03	0.00	1.0
				7/1/2015	911.5	0.03	0.03	0.00	1.0
				6/30/2017	1641.0	0.03	0.03	0.00	1.0
CW17-MC	487,771	1,545,279	6	6/25/2013	175.5	0.70	0.68	0.02	1.0
				11/27/2013	330.6	0.58	0.68	-0.10	1.0
				10/1/2014	638.5	0.47	0.68	-0.21	1.0
				7/2/2015	912.6	0.42	0.69	-0.26	1.0
				12/17/2016	1446.6	0.27	0.69	-0.42	1.0
				6/29/2017	1640.0	0.25	0.19	0.06	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				10/23/2017	1756.0	0.23	0.13	0.09	1.0
CW1-MC	490,295	1,545,235	6	2/28/2013	58.6	0.05	0.05	0.00	1.0
				7/2/2015	912.5	0.06	0.05	0.00	1.0
CW24-MC	487,760	1,545,773	6	8/7/2015	948.5	0.13	0.14	-0.01	1.0
				7/31/2017	1672.0	0.13	0.14	-0.01	1.0
CW28-MC	491,008	1,535,112	6	2/26/2013	56.6	0.04	0.03	0.00	1.0
				10/4/2014	641.4	0.03	0.03	-0.01	1.0
				7/2/2015	912.6	0.02	0.03	-0.01	1.0
				12/12/2017	1806.0	0.04	0.03	0.00	1.0
CW2-MC	491,302	1,545,212	6	2/12/2013	42.4	0.05	0.05	-0.01	1.0
				2/28/2013	58.6	0.51	0.05	0.46	1.0
				11/5/2013	308.6	0.06	0.05	0.01	1.0
				2/12/2014	407.5	0.04	0.05	-0.01	1.0
				9/5/2014	612.7	0.07	0.05	0.02	1.0
				7/2/2015	912.4	0.04	0.05	-0.02	1.0
				8/7/2015	948.6	0.05	0.05	0.00	1.0
				2/11/2016	1136.5	0.04	0.05	-0.01	1.0
				9/27/2016	1365.4	0.04	0.05	-0.02	1.0
				3/21/2017	1540.0	0.04	0.05	-0.01	1.0
				8/10/2017	1682.0	0.04	0.05	-0.01	1.0
CW44-MC	488,891	1,535,048	6	11/15/2013	318.6	0.32	0.32	0.00	1.0
				6/12/2014	527.5	0.30	0.32	-0.02	1.0
				9/10/2014	617.7	0.26	0.32	-0.06	1.0
				7/30/2015	940.4	0.25	0.32	-0.07	1.0
				7/6/2016	1282.6	0.27	0.31	-0.04	1.0
				12/2/2016	1431.6	0.22	0.31	-0.09	1.0
CW45-MC	489,494	1,535,036	6	3/7/2013	65.4	0.48	0.28	0.20	1.0
				6/18/2013	168.4	0.45	0.26	0.19	1.0
				11/15/2013	318.6	0.48	0.23	0.26	1.0
				11/14/2014	682.6	0.35	0.20	0.15	1.0
				12/24/2014	722.4	0.35	0.20	0.16	1.0
				4/1/2015	820.5	0.44	0.19	0.24	1.0
				4/1/2015	820.5	0.34	0.19	0.15	1.0
				8/20/2015	961.4	0.39	0.19	0.20	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentra-tion (mg/L)	Simulated Uranium Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
				3/5/2016	1159.5	0.40	0.18	0.22	1.0
				8/27/2016	1334.5	0.39	0.17	0.22	1.0
				3/24/2017	1543.0	0.35	0.16	0.19	1.0
				8/15/2017	1687.0	0.34	0.15	0.18	1.0
CW55-MC	489,471	1,538,283	6	12/4/2013	337.1	0.07	0.07	0.00	1.0
				10/11/2014	648.5	0.09	0.07	0.02	1.0
				7/30/2015	940.5	0.09	0.07	0.03	1.0
				12/12/2017	1806.0	0.17	0.07	0.10	1.0
CW56-MC	488,115	1,545,279	6	5/2/2013	121.5	4.28	3.61	0.67	1.0
				8/8/2013	219.5	3.73	3.61	0.12	1.0
				10/1/2014	638.6	2.97	3.54	-0.57	1.0
				2/21/2015	781.6	3.09	3.53	-0.44	1.0
				8/28/2015	969.5	2.40	3.53	-1.13	1.0
				12/17/2016	1446.6	0.66	3.37	-2.71	1.0
				8/16/2017	1688.0	0.54	3.23	-2.70	1.0
				10/24/2017	1757.0	0.44	3.19	-2.75	1.0
CW57-MC	488,070	1,545,654	6	5/11/2013	130.4	0.16	0.13	0.03	1.0
				10/1/2014	638.5	0.16	0.13	0.03	1.0
				2/21/2015	781.5	0.18	0.13	0.05	1.0
				9/1/2015	973.4	0.16	0.13	0.03	1.0
				10/24/2017	1757.0	0.16	0.13	0.03	1.0
CW60-MC	488,262	1,545,470	6	5/11/2013	130.4	0.14	0.14	0.00	1.0
				10/1/2014	638.5	0.12	0.15	-0.03	1.0
				2/21/2015	781.5	0.12	0.15	-0.03	1.0
				9/1/2015	973.4	0.11	0.16	-0.05	1.0
				8/16/2017	1688.0	0.11	0.16	-0.05	1.0
				10/24/2017	1757.0	0.11	0.16	-0.06	1.0
CW61-MC	487,779	1,544,927	6	5/11/2013	130.5	3.64	3.82	-0.18	1.0
				10/1/2014	638.4	3.00	3.76	-0.76	1.0
				4/1/2015	820.5	3.23	3.76	-0.53	1.0
				8/29/2015	970.6	3.38	3.76	-0.38	1.0
				12/17/2016	1446.5	1.67	3.60	-1.93	1.0
CW62-MC	487,847	1,544,555	6	5/15/2013	134.4	3.04	3.11	-0.07	1.0
				10/1/2014	638.4	2.90	2.82	0.08	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				4/1/2015	820.5	3.08	2.79	0.29	1.0
				8/29/2015	970.6	3.10	2.77	0.33	1.0
				5/19/2016	1234.5	2.33	2.60	-0.27	1.0
				10/28/2016	1396.4	1.21	2.46	-1.25	1.0
				12/1/2016	1430.6	1.07	2.44	-1.37	1.0
				12/15/2016	1444.5	1.36	2.43	-1.07	1.0
				2/10/2017	1501.0	1.02	2.40	-1.38	1.0
				5/3/2017	1583.0	1.10	2.36	-1.26	1.0
				8/16/2017	1688.0	1.35	2.30	-0.95	1.0
				11/29/2017	1793.0	1.11	2.25	-1.14	1.0
CW6-MC	488,301	1,542,588	6	10/1/2014	638.4	0.06	0.02	0.04	1.0
WCW-MC	488,520	1,541,045	6	11/27/2013	330.6	0.00	0.01	-0.01	1.0
				7/30/2015	940.6	0.01	0.01	0.00	1.0
				8/9/2017	1681.0	0.00	0.01	0.00	1.0
				8/11/2017	1683.0	0.01	0.01	0.00	1.0
WR25-MC	487,430	1,545,267	6	6/25/2013	175.6	0.29	0.30	-0.01	1.0
				10/1/2014	638.5	0.25	0.30	-0.05	1.0
				7/30/2015	940.4	0.17	0.30	-0.13	1.0
				7/31/2017	1672.0	0.18	0.30	-0.13	1.0
0538-LC	486,899	1,533,486	8	3/19/2013	77.4	0.17	0.19	-0.01	1.0
				4/2/2014	456.5	0.21	0.19	0.02	1.0
				7/19/2014	564.4	0.22	0.19	0.03	1.0
				8/10/2016	1317.6	0.20	0.19	0.01	1.0
0653-LC	486,570	1,533,283	8	6/18/2013	168.5	0.28	0.23	0.05	1.0
				11/15/2013	318.6	0.28	0.22	0.06	1.0
				7/19/2014	564.5	0.26	0.22	0.04	1.0
				8/2/2016	1309.6	0.27	0.21	0.06	1.0
0853-LC	484,824	1,532,124	8	6/19/2014	534.6	0.06	0.05	0.01	1.0
				7/2/2015	912.4	0.08	0.05	0.04	1.0
				7/6/2017	1647.0	0.10	0.05	0.05	1.0
CW29-LC	487,435	1,534,551	8	3/20/2013	78.6	0.22	0.18	0.04	1.0
				6/18/2013	168.5	0.21	0.18	0.03	1.0
				10/4/2014	641.5	0.22	0.18	0.04	1.0
				3/20/2015	808.6	0.21	0.18	0.03	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentra-tion (mg/L)	Simulated Uranium Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
				8/20/2015	961.4	0.19	0.18	0.01	1.0
				5/7/2016	1222.4	0.16	0.18	-0.02	1.0
				3/20/2017	1539.0	0.18	0.18	0.00	1.0
				8/14/2017	1686.0	0.19	0.18	0.01	1.0
CW31-LC	482,738	1,540,689	8	12/4/2013	337.5	0.02	0.01	0.01	1.0
				10/2/2014	639.5	0.01	0.01	0.00	1.0
				7/3/2015	913.4	0.01	0.01	0.00	1.0
				12/21/2016	1450.4	0.01	0.01	-0.01	1.0
				6/29/2017	1640.0	0.01	0.01	0.00	1.0
CW32-LC	483,523	1,543,413	8	12/4/2013	337.5	0.00	0.00	0.00	1.0
				10/2/2014	639.4	0.00	0.00	0.00	1.0
				7/3/2015	913.3	0.00	0.00	0.00	1.0
				12/21/2016	1450.4	0.00	0.00	0.00	1.0
				6/29/2017	1640.0	0.01	0.00	0.00	1.0
CW33-LC	486,347	1,543,814	8	10/2/2014	639.3	0.01	0.01	0.00	1.0
				7/2/2015	912.6	0.02	0.01	0.01	1.0
				6/29/2017	1640.0	0.01	0.01	0.00	1.0
CW36-LC	481,329	1,540,053	8	10/2/2014	639.4	0.00	0.01	0.00	1.0
				7/18/2015	928.4	0.01	0.01	0.00	1.0
				7/31/2017	1672.0	0.01	0.01	0.00	1.0
CW37-LC	484,853	1,537,240	8	10/2/2014	639.6	0.03	0.03	0.00	1.0
				7/1/2015	911.5	0.03	0.03	0.00	1.0
				10/9/2016	1377.6	0.03	0.03	0.00	1.0
				6/29/2017	1640.0	0.03	0.03	0.00	1.0
CW41-LC	488,583	1,533,174	8	11/20/2013	323.4	0.03	0.05	-0.02	1.0
				10/2/2014	639.6	0.06	0.05	0.00	1.0
				7/21/2015	931.4	0.08	0.05	0.03	1.0
				8/10/2016	1317.6	0.04	0.05	-0.02	1.0
				7/31/2017	1672.0	0.10	0.05	0.05	1.0
CW42-LC	487,177	1,533,169	8	6/18/2013	168.6	0.28	0.24	0.04	1.0
				11/15/2013	318.6	0.32	0.24	0.08	1.0
				10/11/2014	648.6	0.32	0.24	0.09	1.0
				8/19/2015	960.6	0.25	0.23	0.01	1.0
				8/10/2016	1317.7	0.27	0.23	0.04	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentra-tion (mg/L)	Simulated Uranium Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
				8/25/2016	1332.6	0.23	0.23	0.00	1.0
				3/21/2017	1540.0	0.21	0.23	-0.02	1.0
				8/14/2017	1686.0	0.22	0.22	-0.01	1.0
CW43-LC	482,493	1,537,587	8	12/4/2013	337.5	0.05	0.04	0.01	1.0
				10/2/2014	639.5	0.05	0.04	0.01	1.0
				7/18/2015	928.6	0.05	0.04	0.02	1.0
				12/21/2016	1450.5	0.05	0.04	0.01	1.0
				8/1/2017	1673.0	0.05	0.04	0.01	1.0
#1_Deepwell-SA	493,633	1,543,307	10	5/7/2013	126.4	0.01	0.02	-0.01	1.0
				11/6/2013	309.6	0.01	0.02	-0.01	1.0
				5/15/2014	499.6	0.01	0.02	-0.01	1.0
				11/6/2014	674.4	0.01	0.02	-0.01	1.0
				2/18/2015	778.6	0.01	0.02	-0.01	1.0
				5/2/2015	851.4	0.01	0.02	-0.01	1.0
				8/8/2015	949.6	0.01	0.02	-0.01	1.0
				10/9/2015	1011.4	0.01	0.02	-0.01	1.0
				2/16/2016	1141.6	0.01	0.02	-0.01	1.0
				5/5/2016	1220.3	0.01	0.02	-0.01	1.0
				7/10/2016	1286.4	0.01	0.02	-0.01	1.0
				10/18/2016	1386.4	0.01	0.02	-0.01	1.0
#2_Deepwell-SA	490,972	1,542,424	10	5/7/2013	126.5	0.01	0.02	-0.01	1.0
				11/5/2013	308.6	0.01	0.02	-0.01	1.0
				5/15/2014	499.6	0.01	0.02	-0.01	1.0
				11/6/2014	674.4	0.02	0.02	0.00	1.0
				2/18/2015	778.6	0.01	0.02	-0.01	1.0
				5/2/2015	851.4	0.01	0.02	-0.01	1.0
				8/8/2015	949.6	0.01	0.02	-0.01	1.0
				10/9/2015	1011.4	0.01	0.02	-0.01	1.0
				2/16/2016	1141.6	0.01	0.02	-0.01	1.0
				5/5/2016	1220.3	0.01	0.02	-0.01	1.0
				7/10/2016	1286.4	0.01	0.02	-0.01	1.0
				10/18/2016	1386.4	0.01	0.02	-0.01	1.0
				2/16/2017	1507.0	0.01	0.02	-0.01	1.0
				5/2/2017	1582.0	0.01	0.02	-0.01	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				7/18/2017	1659.0	0.01	0.02	-0.01	1.0
				10/25/2017	1758.0	0.02	0.02	0.00	1.0
				11/20/2017	1784.0	0.01	0.02	-0.01	1.0
0806R-SA	486,263	1,541,177	10	7/9/2014	554.4	0.02	0.02	0.00	1.0
				10/9/2014	646.6	0.03	0.02	0.01	1.0
				10/16/2015	1018.5	0.02	0.02	0.00	1.0
				5/4/2017	1584.0	0.11	0.02	0.09	1.0
0806-SA	486,320	1,541,120	10	10/10/2014	647.5	0.00	0.02	-0.02	1.0
0928-SA	491,700	1,548,250	10	1/27/2016	1121.4	0.09	0.02	0.07	1.0
0938-SA	473,040	1,539,500	10	10/14/2015	1016.6	0.01	0.02	-0.01	1.0
0943-SA	487,407	1,537,222	10	2/20/2014	415.4	0.03	0.02	0.01	1.0
				11/18/2014	686.4	0.03	0.02	0.01	1.0
				2/18/2015	778.6	0.03	0.02	0.01	1.0
				5/1/2015	850.4	0.03	0.02	0.01	1.0
				8/8/2015	949.6	0.03	0.02	0.01	1.0
				10/9/2015	1011.6	0.08	0.02	0.06	1.0
				12/11/2015	1074.5	0.03	0.02	0.01	1.0
				1/27/2016	1121.4	0.04	0.02	0.02	1.0
				2/26/2016	1151.4	0.04	0.02	0.02	1.0
				9/16/2016	1354.4	0.08	0.02	0.06	1.0
				10/19/2016	1387.4	0.10	0.02	0.08	1.0
				2/10/2017	1501.0	0.09	0.02	0.07	1.0
				2/17/2017	1508.0	0.09	0.02	0.07	1.0
				2/28/2017	1519.0	0.07	0.02	0.05	1.0
				5/3/2017	1583.0	0.06	0.02	0.04	1.0
				5/11/2017	1591.0	0.06	0.02	0.04	1.0
				7/19/2017	1660.0	0.12	0.02	0.10	1.0
				8/28/2017	1700.0	0.12	0.02	0.10	1.0
				10/17/2017	1750.0	0.09	0.02	0.07	1.0
0951R-SA	484,100	1,544,500	10	3/7/2013	65.6	0.04	0.02	0.02	1.0
				12/19/2014	717.6	0.08	0.02	0.06	1.0
				2/18/2015	778.6	0.05	0.02	0.03	1.0
				5/1/2015	850.4	0.04	0.02	0.02	1.0
				8/8/2015	949.6	0.03	0.02	0.01	1.0

Table D-1. Groundwater Transport Model Uranium Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Uranium Concentration (mg/L)	Simulated Uranium Concentration (mg/L)	Residual (mg/L)	Weight
				8/11/2015	952.5	0.03	0.02	0.01	1.0
				10/9/2015	1011.4	0.03	0.02	0.01	1.0
				2/20/2016	1145.5	0.03	0.02	0.01	1.0
				9/2/2016	1340.6	0.04	0.02	0.02	1.0
				10/18/2016	1386.6	0.04	0.02	0.02	1.0
				2/16/2017	1507.0	0.03	0.02	0.01	1.0
				5/2/2017	1582.0	0.04	0.02	0.02	1.0
				6/27/2017	1638.0	0.04	0.02	0.02	1.0
				7/18/2017	1659.0	0.03	0.02	0.01	1.0
				10/23/2017	1756.0	0.04	0.02	0.02	1.0
0951-SA	473,200	1,545,500	10	6/25/2015	905.4	0.03	0.02	0.01	1.0
				5/11/2016	1226.4	0.03	0.02	0.01	1.0
				5/10/2017	1590.0	0.03	0.02	0.01	1.0
				11/15/2017	1779.0	0.03	0.02	0.01	1.0
0998-SA	476,450	1,533,080	10	10/23/2014	660.4	0.01	0.02	-0.01	1.0
				10/1/2015	1003.4	0.01	0.02	-0.01	1.0
				12/15/2016	1444.6	0.01	0.02	-0.01	1.0
OLD_#1-SA	493,775	1,543,798	10	7/6/2016	1282.4	0.05	0.02	0.03	1.0
				7/12/2016	1288.6	0.03	0.02	0.01	1.0

Appendix E: Molybdenum Transport Calibration Target Dataset

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
0481-AI	490,210	1,536,820	1	12/24/2014	131	<0.03	0.00	0.03	1.0
				3/5/2016	527	<0.03	0.00	0.03	1.0
0482-AI	489,579	1,536,981	1	11/15/2013	191	0.06	0.05	0.01	1.0
				6/12/2014	499	0.06	0.04	0.02	1.0
0483-AI	489,753	1,536,586	1	8/24/2017	319	0.04	0.08	-0.04	1.0
				5/14/2013	528	0.05	0.07	-0.02	1.0
				1/29/2014	619	0.05	0.07	-0.02	1.0
				4/27/2017	1229	0.05	0.04	0.01	1.0
0490-AI	489,752	1,536,553	1	12/15/2016	309	0.04	0.08	-0.04	1.0
				7/19/2014	326	0.13	0.08	0.05	1.0
				8/10/2016	528	0.06	0.08	-0.02	1.0
				5/4/2013	871	<0.03	0.06	-0.03	1.0
				11/15/2013	1019	<0.03	0.05	-0.02	1.0
				10/4/2014	1229	0.07	0.04	0.03	1.0
				5/15/2015	1391	0.04	0.04	0.00	1.0
				4/29/2016	1528	<0.03	0.03	0.00	1.0
0491-AI	489,658	1,537,031	1	8/5/2016	191	0.05	0.04	0.01	1.0
				11/6/2017	499	<0.03	0.04	-0.01	1.0
				8/9/2013	626	0.09	0.03	0.06	1.0
				7/22/2015	626	<0.03	0.03	0.00	1.0
0496-AI	489,603	1,534,650	1	2/6/2013	65	<0.03	0.00	0.03	1.0
				8/16/2013	319	<0.03	0.01	0.02	1.0
				2/12/2014	456	<0.03	0.01	0.02	1.0
0497-AI	489,503	1,535,039	1	9/4/2014	168	<0.03	0.04	-0.01	1.0
				2/26/2015	319	<0.03	0.03	0.00	1.0
				2/17/2016	456	<0.03	0.03	0.00	1.0
				3/27/2017	528	<0.03	0.04	-0.01	1.0
				2/6/2013	556	<0.03	0.04	-0.01	1.0
				8/16/2013	683	<0.03	0.04	-0.01	1.0
				2/12/2014	722	<0.03	0.04	-0.01	1.0
				9/4/2014	1159	<0.03	0.05	-0.02	1.0
				2/26/2015	1536	<0.03	0.06	-0.03	1.0
				2/11/2016	1638	<0.03	0.07	-0.04	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentra-tion (mg/L)	Simulated Molybdenum Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
0498-AI	488,953	1,534,661	1	3/27/2017	319	<0.03	0.00	0.03	1.0
				2/6/2013	528	<0.03	0.00	0.03	1.0
				8/16/2013	891	<0.03	0.00	0.03	1.0
				2/12/2014	1283	<0.03	0.00	0.03	1.0
				9/4/2014	1696	<0.03	0.01	0.02	1.0
0522-AI	492,437	1,538,640	1	12/28/2016	134	1.40	1.21	0.19	1.0
				6/30/2017	394	1.68	0.86	0.82	1.0
				3/7/2013	1577	1.29	0.17	1.12	1.0
0531-AI	478,262	1,541,086	1	4/2/2014	1017	<0.03	0.00	0.03	1.0
0532-AI	482,400	1,518,700	1	6/30/2017	80	<0.03	0.00	1.03	1.0
				7/30/2014	660	<0.03	0.00	1.03	1.0
				4/23/2015	1003	<0.03	0.00	1.03	1.0
				5/6/2015	1445	<0.03	0.00	1.03	1.0
0538-AI	486,899	1,533,486	1	6/17/2015	564	<0.03	0.00	0.03	1.0
				8/20/2015	1318	<0.03	0.00	0.03	1.0
0540-AI	488,091	1,534,125	1	2/19/2016	123	<0.03	0.00	0.03	1.0
				4/6/2016	318	<0.03	0.00	0.03	1.0
				7/24/2016	641	<0.03	0.00	0.03	1.0
				10/22/2016	864	<0.03	0.00	0.03	1.0
				12/1/2016	1215	<0.03	0.00	0.03	1.0
				7/11/2017	1312	<0.03	0.00	0.03	1.0
				12/13/2017	1770	<0.03	0.00	0.03	1.0
0541-AI	477,236	1,539,831	1	12/21/2016	221	<0.03	0.00	0.03	1.0
				10/6/2017	933	<0.03	0.00	0.03	1.0
				7/1/2015	1459	<0.03	0.00	0.03	1.0
0551-AI	479,880	1,536,272	1	7/1/2015	37	<0.03	0.00	0.03	1.0
				10/11/2014	221	<0.03	0.00	0.03	1.0
				8/2/2016	410	<0.03	0.00	0.03	1.0
				9/4/2014	604	<0.03	0.00	0.03	1.0
				8/2/2016	781	<0.03	0.00	0.03	1.0
				11/14/2017	1137	<0.03	0.00	0.03	1.0
				2/7/2013	1515	<0.03	0.00	0.03	1.0
				8/9/2013	1547	<0.03	0.00	0.03	1.0
0553-AI	480,563	1,534,923	1	8/28/2014	37	<0.03	0.00	0.03	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				9/14/2017	221	<0.03	0.00	0.03	1.0
				2/7/2013	410	<0.03	0.00	0.03	1.0
				3/7/2013	604	<0.03	0.00	0.03	1.0
				8/16/2013	781	<0.03	0.00	0.03	1.0
				4/2/2014	1137	<0.03	0.00	0.03	1.0
				3/5/2015	1546	<0.03	0.00	0.03	1.0
0554-AI	479,107	1,534,967	1	2/23/2016	37	<0.03	0.00	0.03	1.0
				3/15/2017	221	<0.03	0.00	0.03	1.0
				2/7/2013	410	<0.03	0.00	0.03	1.0
				8/16/2013	781	<0.03	0.00	0.03	1.0
				2/26/2014	1546	<0.03	0.00	0.03	1.0
0555-AI	486,236	1,538,572	1	9/4/2014	36	<0.03	0.00	0.03	1.0
				3/18/2015	227	<0.03	0.00	0.03	1.0
				2/12/2016	408	<0.03	0.00	0.03	1.0
				3/27/2017	611	<0.03	0.00	0.03	1.0
				11/15/2013	787	<0.03	0.00	0.03	1.0
				7/19/2014	1143	<0.03	0.00	0.03	1.0
				8/2/2016	1546	<0.03	0.00	0.03	1.0
0556-AI	486,184	1,538,006	1	6/10/2015	36	<0.03	0.00	0.03	1.0
				11/14/2017	227	<0.03	0.00	0.03	1.0
				5/14/2013	408	<0.03	0.00	0.03	1.0
				2/7/2013	611	<0.03	0.00	0.03	1.0
				10/30/2013	787	<0.03	0.00	0.03	1.0
				2/26/2014	1137	<0.03	0.00	0.03	1.0
				8/27/2014	1546	<0.03	0.00	0.03	1.0
0557-AI	486,000	1,537,204	1	2/20/2015	36	<0.03	0.00	0.03	1.0
				2/21/2017	228	<0.03	0.00	0.03	1.0
				4/23/2015	408	<0.03	0.00	0.03	1.0
				5/6/2015	611	<0.03	0.00	0.03	1.0
				6/17/2015	787	<0.03	0.00	0.03	1.0
				8/20/2015	1137	<0.03	0.00	0.03	1.0
				9/30/2015	1546	<0.03	0.00	0.03	1.0
0631-AI	483,756	1,532,234	1	2/19/2016	65	<0.03	0.00	0.03	1.0
				2/24/2016	456	<0.03	0.00	0.03	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentra-tion (mg/L)	Simulated Molybdenum Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
				4/6/2016	1457	<0.03	0.00	0.03	1.0
				7/24/2016	1641	<0.03	0.00	0.03	1.0
0632-AI	483,767	1,531,850	1	10/22/2016	65	<0.03	0.00	0.04	1.0
				3/20/2017	456	<0.03	0.00	0.04	1.0
				3/19/2013	1641	<0.03	0.00	0.04	1.0
0634-AI	480,362	1,541,652	1	3/27/2015	575	<0.03	0.03	0.00	1.0
				10/14/2015	842	<0.03	0.03	0.00	1.0
				12/12/2014	855	<0.03	0.03	0.00	1.0
				12/21/2016	897	<0.03	0.03	0.00	1.0
				10/6/2017	961	<0.03	0.03	0.00	1.0
				3/5/2013	1002	<0.03	0.03	0.00	1.0
				10/30/2013	1106	0.04	0.02	0.02	1.0
				3/20/2014	1145	<0.03	0.02	0.01	1.0
				3/13/2015	1192	<0.03	0.02	0.01	1.0
				3/17/2016	1300	<0.03	0.02	0.01	1.0
				3/27/2017	1391	0.04	0.02	0.02	1.0
				8/9/2017	1431	<0.03	0.02	0.01	1.0
				2/20/2013	1652	<0.03	0.01	0.02	1.0
				4/25/2017	1807	<0.03	0.01	0.02	1.0
0637-AI	474,710	1,545,409	1	2/20/2013	1451	<0.03	0.03	0.00	1.0
				4/25/2017	1739	<0.03	0.03	0.00	1.0
0641-AI	491,110	1,536,494	1	7/1/2015	912	<0.03	0.00	0.03	1.0
0642-AI	490,932	1,536,104	1	3/5/2013	912	<0.03	0.01	0.02	1.0
0644-AI	485,450	1,533,481	1	3/19/2014	649	<0.03	0.00	0.03	1.0
				3/19/2014	1310	<0.03	0.00	0.03	1.0
0646-AI	484,952	1,533,246	1	9/9/2014	611	<0.03	0.00	0.03	1.0
				3/20/2015	1310	<0.03	0.00	0.03	1.0
				8/7/2015	1778	<0.03	0.00	0.03	1.0
0647-AI	478,308	1,536,623	1	3/16/2016	37	<0.03	0.00	0.03	1.0
				9/9/2016	221	<0.03	0.00	0.03	1.0
				3/14/2017	604	<0.03	0.00	0.03	1.0
				8/9/2017	1717	<0.03	0.00	0.03	1.0
0649-AI	479,798	1,534,730	1	2/6/2013	37	<0.03	0.01	0.02	1.0
				8/16/2013	66	0.05	0.01	0.04	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				2/26/2014	228	<0.03	0.01	0.02	1.0
				9/4/2014	457	<0.03	0.01	0.02	1.0
				2/26/2015	793	<0.03	0.01	0.02	1.0
				2/20/2016	1148	<0.03	0.01	0.02	1.0
				3/27/2017	1534	<0.03	0.01	0.02	1.0
0650-AI	482,135	1,536,779	1	2/6/2013	38	<0.03	0.00	0.03	1.0
				8/16/2013	228	<0.03	0.00	0.03	1.0
				2/26/2014	422	<0.03	0.00	0.03	1.0
				9/4/2014	612	<0.03	0.00	0.03	1.0
				2/26/2015	806	<0.03	0.00	0.03	1.0
				2/20/2016	1138	<0.03	0.00	0.03	1.0
				3/27/2017	1546	<0.03	0.00	0.03	1.0
0653-AI	486,570	1,533,283	1	2/20/2013	319	<0.03	0.00	0.03	1.0
				2/20/2013	564	<0.03	0.00	0.03	1.0
				10/30/2013	1310	<0.03	0.00	0.03	1.0
0654-AI	478,636	1,541,994	1	7/1/2015	891	<0.03	0.01	0.02	1.0
				8/20/2015	1778	<0.03	0.02	0.01	1.0
0657-AI	478,392	1,537,497	1	2/12/2016	134	<0.03	0.00	0.03	1.0
0658-AI	478,436	1,535,922	1	3/27/2017	37	<0.03	0.00	0.03	1.0
				8/9/2017	302	<0.03	0.00	0.03	1.0
				7/1/2015	421	<0.03	0.00	0.03	1.0
				5/4/2013	604	<0.03	0.00	0.03	1.0
				1/29/2014	781	<0.03	0.00	0.03	1.0
				6/12/2014	1512	<0.03	0.00	0.03	1.0
0659-AI	480,772	1,541,689	1	10/18/2014	842	<0.03	0.02	0.01	1.0
				5/15/2015	856	<0.03	0.02	0.01	1.0
				5/7/2016	897	<0.03	0.02	0.01	1.0
				8/5/2016	962	<0.03	0.02	0.01	1.0
				10/25/2016	1002	<0.03	0.02	0.01	1.0
				12/1/2016	1145	<0.03	0.02	0.01	1.0
				3/21/2017	1149	0.04	0.02	0.02	1.0
				2/26/2013	1192	<0.03	0.02	0.01	1.0
				8/21/2015	1300	<0.03	0.01	0.02	1.0
				8/10/2016	1391	0.04	0.01	0.03	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				8/18/2017	1539	<0.03	0.01	0.02	1.0
0681-AI	482,734	1,540,676	1	10/18/2014	77	<0.03	0.00	0.03	1.0
				5/15/2015	816	<0.03	0.00	0.03	1.0
0684-AI	478,499	1,540,273	1	8/21/2015	1017	<0.03	0.00	0.03	1.0
0686-AI	475,438	1,545,319	1	4/29/2016	711	<0.03	0.04	-0.01	1.0
				8/5/2016	1451	<0.03	0.03	0.00	1.0
				5/4/2013	1739	<0.03	0.03	0.00	1.0
0688-AI	483,954	1,541,257	1	8/6/2014	63	<0.03	0.00	0.03	1.0
				9/12/2014	303	<0.03	0.00	0.03	1.0
				10/18/2014	444	<0.03	0.00	0.03	1.0
				10/22/2014	802	<0.03	0.00	0.03	1.0
				11/14/2014	1171	<0.03	0.00	0.03	1.0
				12/24/2014	1546	<0.03	0.00	0.03	1.0
				8/21/2015	1681	<0.03	0.00	0.03	1.0
0690-AI	493,465	1,540,279	1	8/5/2016	51	1.34	1.40	-0.06	1.0
				12/1/2016	1575	0.81	1.10	-0.29	1.0
0691-AI	493,860	1,540,276	1	3/21/2017	51	0.13	0.32	-0.19	1.0
				8/17/2017	1575	0.26	0.33	-0.07	1.0
0692-AI	493,175	1,535,892	1	7/1/2015	911	<0.03	0.00	0.03	1.0
0802-AI	488,277	1,540,765	1	3/19/2013	63	<0.03	0.00	0.03	1.0
				6/18/2013	442	<0.03	0.00	0.03	1.0
				7/19/2014	442	0.04	0.00	0.04	1.0
				2/9/2013	617	<0.03	0.00	0.03	1.0
				10/31/2013	808	<0.03	0.00	0.03	1.0
				2/12/2014	948	<0.03	0.00	0.03	1.0
				8/27/2014	1170	0.23	0.00	0.23	1.0
				2/27/2015	1348	<0.03	0.00	0.03	1.0
				2/19/2016	1533	<0.03	0.00	0.03	1.0
				2/23/2017	1681	0.17	0.00	0.17	1.0
0844-AI	487,002	1,538,376	1	2/19/2016	36	<0.03	0.00	0.03	1.0
				3/15/2017	227	<0.03	0.00	0.03	1.0
				2/9/2013	421	<0.03	0.00	0.03	1.0
				8/9/2013	611	<0.03	0.00	0.03	1.0
				2/12/2014	786	<0.03	0.00	0.03	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				8/6/2014	1145	<0.03	0.00	0.03	1.0
				2/27/2015	1546	<0.03	0.00	0.03	1.0
0845-AI	487,833	1,537,280	1	2/19/2016	36	<0.03	0.00	0.03	1.0
				3/27/2017	228	<0.03	0.00	0.03	1.0
				8/9/2013	421	<0.03	0.00	0.03	1.0
				10/23/2014	611	<0.03	0.00	0.03	1.0
				3/29/2017	786	<0.03	0.00	0.03	1.0
				10/4/2017	1146	<0.03	0.00	0.03	1.0
				2/9/2013	1546	<0.03	0.00	0.03	1.0
0846-AI	484,730	1,537,219	1	11/16/2013	50	0.05	0.00	0.05	1.0
				2/12/2014	50	<0.03	0.00	0.03	1.0
				10/17/2014	303	<0.03	0.00	0.03	1.0
				2/27/2015	421	<0.03	0.00	0.03	1.0
				2/19/2016	611	<0.03	0.00	0.03	1.0
				7/8/2016	806	<0.03	0.00	0.03	1.0
				3/3/2017	911	<0.03	0.00	0.03	1.0
				11/9/2017	962	<0.03	0.00	0.03	1.0
				3/20/2013	1137	0.05	0.00	0.05	1.0
				10/17/2014	1546	<0.03	0.00	0.03	1.0
				3/25/2015	1681	<0.03	0.00	0.03	1.0
0852-AI	493,989	1,535,610	1	3/20/2013	911	<0.03	0.00	0.03	1.0
0862-AI	487,800	1,534,265	1	7/30/2014	124	<0.03	0.00	0.03	1.0
				4/23/2015	394	<0.03	0.00	0.03	1.0
				5/6/2015	528	<0.03	0.00	0.03	1.0
				6/17/2015	655	<0.03	0.00	0.03	1.0
				8/20/2015	865	<0.03	0.00	0.03	1.0
				9/30/2015	1222	<0.03	0.00	0.03	1.0
				1/12/2016	1312	<0.03	0.00	0.03	1.0
				2/19/2016	1393	<0.03	0.00	0.03	1.0
				4/6/2016	1431	<0.03	0.00	0.03	1.0
				7/24/2016	1540	<0.03	0.00	0.03	1.0
0864-AI	486,464	1,533,735	1	10/22/2016	57	<0.03	0.00	0.03	1.0
				5/17/2017	962	<0.03	0.00	0.03	1.0
				7/11/2017	1317	<0.03	0.00	0.03	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				12/13/2017	1690	<0.03	0.00	0.03	1.0
0865-AI	488,429	1,534,123	1	2/20/2013	655	<0.03	0.00	0.03	1.0
				4/25/2017	864	<0.03	0.00	0.03	1.0
				2/12/2013	962	<0.03	0.00	0.03	1.0
				8/9/2013	1215	<0.03	0.00	0.03	1.0
				2/12/2014	1312	<0.03	0.00	0.03	1.0
0866-AI	488,340	1,534,494	1	8/27/2014	123	<0.03	0.00	0.03	1.0
				3/13/2015	583	<0.03	0.00	0.03	1.0
				2/20/2016	620	<0.03	0.00	0.03	1.0
				3/14/2017	655	<0.03	0.00	0.03	1.0
				12/12/2013	660	<0.03	0.00	0.03	1.0
				10/23/2014	683	<0.03	0.00	0.03	1.0
				10/1/2015	722	<0.03	0.00	0.03	1.0
				2/26/2014	962	<0.03	0.00	0.03	1.0
				9/19/2014	1312	<0.03	0.00	0.03	1.0
				10/23/2014	1431	<0.03	0.00	0.03	1.0
				3/5/2015	1540	<0.03	0.00	0.03	1.0
				4/14/2016	1689	<0.03	0.00	0.03	1.0
0868-AI	491,033	1,534,848	1	10/7/2016	911	<0.03	0.01	0.02	1.0
0869-AI	486,073	1,533,251	1	3/3/2017	77	<0.03	0.00	0.03	1.0
				8/10/2017	169	<0.03	0.00	0.03	1.0
				10/8/2014	564	0.04	0.00	0.04	1.0
0881-AI	481,478	1,542,034	1	10/8/2014	39	0.05	0.04	0.01	1.0
				10/23/2014	303	<0.03	0.02	0.01	1.0
				12/11/2017	407	<0.03	0.01	0.02	1.0
				10/23/2014	603	0.04	0.01	0.03	1.0
				12/12/2013	787	<0.03	0.01	0.02	1.0
				10/14/2015	1144	<0.03	0.00	0.03	1.0
				4/5/2013	1514	<0.03	0.00	0.03	1.0
0882-AI	482,396	1,541,404	1	10/31/2013	43	<0.03	0.00	0.03	1.0
				3/28/2014	220	<0.03	0.00	0.03	1.0
				10/2/2014	407	<0.03	0.00	0.03	1.0
				4/10/2015	603	<0.03	0.00	0.03	1.0
				10/20/2015	787	<0.03	0.00	0.03	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				8/24/2017	1144	<0.03	0.00	0.03	1.0
				10/27/2017	1534	<0.03	0.00	0.03	1.0
0884-AI	481,498	1,542,677	1	8/9/2013	39	<0.03	0.00	0.03	1.0
				12/16/2016	220	<0.03	0.00	0.03	1.0
				10/4/2017	407	<0.03	0.00	0.03	1.0
				3/21/2013	583	<0.03	0.00	0.03	1.0
				10/23/2014	787	<0.03	0.00	0.03	1.0
				10/1/2015	1144	<0.03	0.00	0.03	1.0
				12/16/2016	1546	<0.03	0.00	0.03	1.0
0885-AI	483,474	1,541,919	1	9/30/2016	220	<0.03	0.00	0.03	1.0
				9/19/2017	661	<0.03	0.01	0.02	1.0
				1/23/2013	1548	<0.03	0.01	0.02	1.0
				1/29/2014	1737	<0.03	0.02	0.01	1.0
0886-AI	482,487	1,542,327	1	2/5/2015	39	<0.03	0.00	0.03	1.0
				1/22/2016	319	<0.03	0.00	0.03	1.0
				1/24/2017	407	<0.03	0.00	0.03	1.0
				9/30/2016	654	<0.03	0.00	0.03	1.0
				3/22/2017	787	<0.03	0.00	0.03	1.0
				2/20/2013	1144	<0.03	0.00	0.03	1.0
				6/26/2014	1285	<0.03	0.00	0.03	1.0
				2/20/2015	1522	0.04	0.00	0.04	1.0
				3/22/2017	1773	0.05	0.00	0.05	1.0
0887-AI	482,469	1,543,063	1	2/20/2013	78	<0.03	0.00	0.03	1.0
				6/26/2014	654	0.06	0.00	0.06	1.0
				2/20/2015	814	<0.03	0.00	0.03	1.0
0888-AI	479,335	1,542,285	1	3/22/2017	78	<0.03	0.00	0.03	1.0
				1/23/2013	814	<0.03	0.02	0.01	1.0
				1/29/2014	1135	<0.03	0.02	0.01	1.0
				2/5/2015	1547	<0.03	0.01	0.02	1.0
				1/21/2016	1739	<0.03	0.01	0.02	1.0
0890-AI	480,088	1,541,365	1	1/16/2017	121	<0.03	0.01	0.02	1.0
				1/17/2013	576	0.04	0.01	0.03	1.0
				1/29/2014	842	<0.03	0.01	0.02	1.0
				2/4/2015	855	<0.03	0.01	0.02	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				1/21/2016	897	<0.03	0.01	0.02	1.0
				1/16/2017	961	0.04	0.01	0.03	1.0
				1/22/2013	1002	<0.03	0.01	0.02	1.0
				1/29/2014	1106	<0.03	0.01	0.02	1.0
				2/5/2015	1145	<0.03	0.01	0.02	1.0
				1/22/2016	1192	<0.03	0.01	0.02	1.0
				1/24/2017	1300	<0.03	0.01	0.02	1.0
				1/17/2013	1391	<0.03	0.01	0.02	1.0
				1/28/2014	1597	<0.03	0.01	0.02	1.0
				2/5/2015	1652	<0.03	0.01	0.02	1.0
				1/21/2016	1807	<0.03	0.01	0.02	1.0
0891-AI	493,751	1,540,904	1	1/16/2017	51	0.32	0.00	0.56	1.0
				1/17/2013	1575	0.09	0.00	0.35	1.0
0893-AI	482,244	1,541,934	1	2/21/2013	43	<0.03	0.00	0.03	1.0
				1/29/2014	220	<0.03	0.00	0.03	1.0
				2/4/2015	407	<0.03	0.00	0.03	1.0
				1/21/2016	604	<0.03	0.00	0.03	1.0
				1/16/2017	802	0.04	0.00	0.04	1.0
				1/17/2013	1145	<0.03	0.00	0.03	1.0
				1/28/2014	1533	<0.03	0.00	0.03	1.0
0910-AI	481,150	1,528,800	1	2/5/2015	346	<0.03	0.00	0.03	1.0
				1/21/2016	660	<0.03	0.00	0.03	1.0
				1/16/2017	1003	<0.03	0.00	0.03	1.0
0920-AI	496,900	1,555,800	1	12/10/2013	422	<0.03	0.00	0.03	1.0
				10/11/2014	627	<0.03	0.00	0.03	1.0
				10/24/2015	660	<0.03	0.00	0.03	1.0
				12/20/2016	794	<0.03	0.00	0.03	1.0
				11/30/2017	1199	<0.03	0.00	0.03	1.0
				11/24/2013	1375	<0.03	0.00	0.03	1.0
				5/2/2017	1522	<0.03	0.00	0.03	1.0
				6/13/2015	1682	<0.03	0.00	0.03	1.0
0921-AI	495,800	1,555,400	1	5/2/2017	646	<0.03	0.00	0.11	1.0
				5/15/2013	646	<0.03	0.00	0.11	1.0
				6/26/2014	661	0.06	0.00	0.14	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				2/6/2015	1805	<0.03	0.00	0.11	1.0
0922-AI	492,500	1,555,200	1	3/19/2016	661	<0.03	0.00	1.03	1.0
0935-AI	476,629	1,540,115	1	6/19/2013	346	<0.03	0.01	0.02	1.0
				11/24/2013	1017	<0.03	0.01	0.02	1.0
0994-AI	476,240	1,539,700	1	3/27/2014	94	0.07	0.06	0.01	1.0
				9/30/2014	303	<0.03	0.05	-0.02	1.0
				4/1/2015	451	<0.03	0.04	-0.01	1.0
				6/12/2015	639	<0.03	0.03	0.00	1.0
				10/2/2015	829	<0.03	0.03	0.00	1.0
				3/16/2016	1022	<0.03	0.02	0.01	1.0
				3/21/2017	1696	<0.03	0.01	0.02	1.0
				3/31/2017	1760	<0.03	0.01	0.02	1.0
0996-AI	477,989	1,537,621	1	9/20/2017	221	<0.03	0.00	0.15	1.0
				9/30/2014	1446	<0.03	0.00	0.15	1.0
				6/12/2015	1737	<0.03	0.00	0.43	1.0
0999-AI	480,187	1,524,230	1	10/31/2013	80	<0.03	0.00	0.03	1.0
				3/27/2014	660	<0.03	0.00	0.03	1.0
				9/30/2014	1003	<0.03	0.00	0.03	1.0
				4/1/2015	1445	<0.03	0.00	0.03	1.0
1F-AI	493,831	1,544,952	1	6/12/2015	1368	<0.03	1.06	-1.03	1.0
				10/2/2015	1722	<0.03	1.08	-1.05	1.0
1J-AI	493,695	1,541,986	1	3/16/2016	22	0.12	0.06	0.06	1.0
				9/30/2016	394	0.09	0.03	0.06	1.0
				3/31/2017	766	0.06	0.02	0.04	1.0
				11/1/2013	1117	0.10	0.01	0.09	1.0
				9/30/2014	1484	<0.03	0.01	0.02	1.0
1M-AI	493,133	1,541,327	1	6/12/2015	1368	0.10	0.08	0.02	1.0
				10/2/2015	1541	0.06	0.08	-0.02	1.0
1N-AI	494,396	1,543,100	1	3/31/2017	51	<0.03	0.00	1.03	1.0
				9/20/2017	542	<0.03	0.00	1.03	1.0
				11/15/2013	781	<0.03	0.00	1.03	1.0
				6/12/2014	1541	<0.03	0.00	1.03	1.0
1P-AI	493,924	1,541,902	1	9/10/2014	51	<0.03	0.00	0.32	1.0
				7/30/2015	542	0.06	0.00	0.35	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				7/6/2016	781	0.04	0.00	0.33	1.0
				12/2/2016	1541	<0.03	0.00	0.32	1.0
1Q-AI	493,619	1,541,993	1	3/5/2013	22	0.27	0.00	0.29	1.0
				3/5/2013	393	0.30	0.00	0.40	1.0
				7/9/2013	766	0.11	0.04	0.07	1.0
				3/19/2014	1115	0.06	0.03	0.03	1.0
				7/11/2014	1476	0.11	0.00	0.11	1.0
1R-AI	493,623	1,542,071	1	7/24/2014	17	<0.03	0.00	0.77	1.0
				3/18/2015	393	<0.03	0.00	0.81	1.0
				7/16/2015	765	0.07	0.00	0.85	1.0
				3/16/2016	1115	<0.03	0.00	0.81	1.0
				7/12/2016	1476	0.05	0.00	0.83	1.0
1S-AI	493,614	1,541,920	1	3/20/2017	21	0.05	0.11	-0.06	1.0
				6/28/2017	394	0.09	0.04	0.05	1.0
				6/19/2014	766	0.06	0.03	0.03	1.0
				6/12/2015	1117	0.10	0.03	0.07	1.0
				5/2/2017	1484	<0.03	0.02	0.01	1.0
1T-AI	493,656	1,541,990	1	6/10/2015	16	0.05	0.08	-0.03	1.0
				6/27/2017	392	0.07	0.03	0.04	1.0
				2/12/2013	766	0.10	0.02	0.08	1.0
				5/2/2013	1115	0.11	0.02	0.09	1.0
				10/31/2013	1476	0.09	0.02	0.07	1.0
1U-AI	493,542	1,542,001	1	11/23/2013	17	0.84	0.00	1.69	1.0
				2/19/2014	51	1.20	0.00	2.06	1.0
				5/15/2014	393	0.19	0.00	1.06	1.0
				8/6/2014	765	0.16	0.29	-0.13	1.0
				12/12/2014	1115	0.11	0.00	0.59	1.0
				2/5/2015	1476	0.15	0.00	0.70	1.0
1V-AI	493,579	1,541,982	1	5/1/2015	16	2.21	0.00	2.83	1.0
				8/6/2015	393	0.14	0.00	0.81	1.0
				10/9/2015	766	0.12	0.09	0.03	1.0
				2/10/2016	1115	0.14	0.05	0.09	1.0
				5/18/2016	1476	0.09	0.00	0.15	1.0
AW-AI	488,015	1,540,235	1	11/2/2017	344	0.11	0.06	0.05	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				11/23/2017	648	0.06	0.04	0.02	1.0
				2/12/2013	1027	0.06	0.03	0.03	1.0
				5/2/2013	1449	0.05	0.02	0.03	1.0
				10/31/2013	1794	0.06	0.02	0.04	1.0
B10-AI	491,133	1,542,517	1	2/5/2015	327	25.3	15.3	9.96	1.0
				5/1/2015	1582	18.5	8.72	9.78	1.0
B11-AI	491,329	1,542,517	1	8/6/2015	893	24.8	7.04	17.8	1.0
				10/9/2015	1582	11.4	4.26	7.14	1.0
B12-AI	488,915	1,542,524	1	2/10/2016	134	1.60	2.70	-1.10	1.0
				5/18/2016	542	2.41	1.65	0.76	1.0
				10/7/2016	767	1.78	0.35	1.43	1.0
				3/1/2017	1174	4.84	0.12	4.72	1.0
				5/3/2017	1777	2.14	0.15	1.99	1.0
B13-AI	490,223	1,541,841	1	8/8/2017	134	0.67	0.18	0.49	1.0
				10/12/2017	767	0.37	0.04	0.33	1.0
				11/23/2017	1547	0.44	0.04	0.40	1.0
B4-AI	489,942	1,542,471	1	6/12/2015	893	27.4	19.5	7.87	1.0
				6/12/2015	1582	29.2	4.14	25.1	1.0
B5-AI	490,141	1,542,474	1	6/12/2015	893	31.0	13.0	18.0	1.0
				6/10/2015	1581	18.6	5.04	13.6	1.0
B6-AI	490,341	1,542,478	1	6/27/2017	327	29.5	10.2	19.3	1.0
				3/6/2013	893	12.8	9.11	3.69	1.0
B7-AI	490,540	1,542,488	1	10/30/2013	170	0.53	10.6	-10.0	1.0
				3/19/2014	327	38.3	11.3	27.0	1.0
				9/16/2014	893	12.5	10.9	1.64	1.0
				3/18/2015	1582	26.3	9.86	16.4	1.0
B8-AI	490,734	1,542,488	1	9/26/2015	893	47.5	15.6	31.9	1.0
				9/26/2015	1582	22.7	14.0	8.67	1.0
B9-AI	490,935	1,542,514	1	3/16/2016	893	22.2	14.3	7.93	1.0
				9/20/2016	1581	20.7	13.1	7.56	1.0
B-AI	489,311	1,541,684	1	3/17/2017	534	0.04	0.00	0.04	1.0
				11/14/2017	872	<0.03	0.01	0.02	1.0
				3/6/2013	1541	<0.03	0.01	0.02	1.0
BC-AI	487,910	1,543,655	1	11/2/2013	534	0.09	0.12	-0.03	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentra-tion (mg/L)	Simulated Molybdenum Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
				3/20/2014	871	0.56	0.07	0.49	1.0
				9/16/2014	1638	0.07	0.05	0.02	1.0
C10-AI	491,629	1,542,182	1	3/18/2015	66	19.7	15.1	4.56	1.0
				8/7/2015	304	6.82	10.5	-3.73	1.0
				9/26/2015	451	16.2	8.91	7.29	1.0
				3/16/2016	638	4.71	7.00	-2.29	1.0
				9/20/2016	820	3.34	5.93	-2.59	1.0
				3/17/2017	892	9.98	5.51	4.47	1.0
				11/14/2017	1004	8.83	4.72	4.11	1.0
				3/6/2013	1170	15.1	3.88	11.2	1.0
				11/2/2013	1369	13.2	2.55	10.6	1.0
				3/19/2014	1550	18.5	0.67	17.8	1.0
C11-AI	491,844	1,542,376	1	9/19/2014	637	1.95	6.78	-4.83	1.0
				3/13/2015	892	13.7	5.08	8.62	1.0
				8/7/2015	1004	4.45	4.31	0.14	1.0
				3/16/2016	1369	7.32	2.57	4.75	1.0
				9/20/2016	1550	10.3	0.58	9.72	1.0
				3/17/2017	1723	8.77	0.15	8.62	1.0
C12-AI	492,029	1,542,375	1	11/14/2017	305	4.80	6.40	-1.60	1.0
				3/6/2013	892	13.6	3.05	10.5	1.0
				3/11/2015	1004	3.26	2.65	0.61	1.0
				8/19/2015	1369	2.95	1.61	1.34	1.0
				3/16/2016	1550	4.43	0.38	4.05	1.0
				3/20/2017	1723	4.14	0.11	4.03	1.0
C6-AI	491,142	1,541,533	1	8/14/2017	66	1.36	1.45	-0.09	1.0
				10/2/2015	304	2.71	1.54	1.17	1.0
				12/22/2016	451	1.36	1.43	-0.07	1.0
				9/20/2017	638	0.71	1.18	-0.47	1.0
				1/16/2013	820	1.04	1.08	-0.04	1.0
				11/1/2013	892	1.36	1.13	0.23	1.0
				1/28/2014	1005	0.75	1.20	-0.45	1.0
				9/18/2014	1170	2.44	1.14	1.30	1.0
				2/5/2015	1540	1.10	0.78	0.32	1.0
				6/12/2015	1550	1.30	0.77	0.53	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				7/17/2015	1723	3.70	0.71	2.99	1.0
C7-AI	491,280	1,541,734	1	1/19/2016	638	30.4	5.26	25.1	1.0
				1/6/2017	892	18.2	4.35	13.8	1.0
				3/31/2017	1005	18.0	4.29	13.7	1.0
				11/7/2017	1550	5.53	1.97	3.56	1.0
C8-AI	491,415	1,541,906	1	1/16/2013	66	21.6	17.2	4.37	1.0
				11/1/2013	303	9.99	12.2	-2.21	1.0
				1/28/2014	451	19.6	10.1	9.55	1.0
				9/18/2014	638	1.96	7.81	-5.85	1.0
				6/12/2015	820	19.5	6.77	12.7	1.0
				7/17/2015	892	5.80	6.46	-0.66	1.0
				1/19/2016	1005	2.15	5.87	-3.72	1.0
				1/6/2017	1170	8.21	5.03	3.18	1.0
				3/31/2017	1369	1.02	3.39	-2.37	1.0
				7/18/2017	1550	5.47	2.20	3.27	1.0
C9-AI	491,545	1,542,075	1	11/7/2017	304	12.4	11.7	0.74	1.0
				11/7/2013	638	18.5	7.93	10.6	1.0
				1/16/2013	892	16.2	6.53	9.67	1.0
				1/28/2014	1005	18.4	5.79	12.6	1.0
				9/18/2014	1550	11.4	1.62	9.78	1.0
				2/5/2015	1723	4.13	0.98	3.15	1.0
CW44-AI	488,891	1,535,048	1	3/27/2015	319	<0.03	0.00	0.03	1.0
				5/13/2015	528	<0.03	0.01	0.02	1.0
				8/27/2015	618	<0.03	0.01	0.02	1.0
				8/17/2017	940	<0.03	0.01	0.02	1.0
				2/21/2013	1283	<0.03	0.02	0.01	1.0
				4/1/2015	1432	<0.03	0.02	0.01	1.0
D1-AI	489,615	1,542,140	1	6/12/2015	64	2.70	1.93	0.77	1.0
				3/22/2017	64	2.75	1.93	0.82	1.0
				11/9/2017	189	2.25	1.59	0.66	1.0
				1/16/2013	443	2.88	1.09	1.79	1.0
				2/11/2014	556	2.92	0.97	1.95	1.0
				1/29/2015	569	2.60	0.94	1.66	1.0
				2/6/2015	806	4.50	0.74	3.76	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentra-tion (mg/L)	Simulated Molybdenum Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
				1/26/2016	927	4.47	0.81	3.66	1.0
				1/17/2017	1170	2.16	0.75	1.41	1.0
				11/13/2017	1288	2.05	0.48	1.57	1.0
				5/16/2013	1539	0.94	0.19	0.75	1.0
				5/29/2014	1639	1.33	0.17	1.16	1.0
D2-AI	492,107	1,542,641	1	5/20/2015	534	40.3	3.78	36.5	1.0
DA3-AI	489,390	1,542,664	1	5/3/2017	893	18.9	8.39	10.5	1.0
				5/29/2014	1582	12.4	1.67	10.7	1.0
DC-AI	487,060	1,543,646	1	5/20/2015	891	<0.03	0.05	-0.02	1.0
				5/3/2017	1638	<0.03	0.05	-0.02	1.0
DD2-AI	489,251	1,547,439	1	6/12/2015	42	<0.03	0.00	0.03	1.0
				1/16/2013	122	<0.03	0.00	0.03	1.0
				1/16/2013	304	0.12	0.00	0.12	1.0
				11/24/2013	326	<0.03	0.00	0.03	1.0
				6/12/2015	415	<0.03	0.00	0.03	1.0
				1/26/2016	500	<0.03	0.00	0.03	1.0
				1/24/2017	582	<0.03	0.00	0.03	1.0
				3/23/2017	710	<0.03	0.00	0.03	1.0
				5/1/2013	766	0.08	0.00	0.08	1.0
				10/26/2017	851	<0.03	0.00	0.03	1.0
				5/1/2013	947	<0.03	0.00	0.03	1.0
				11/6/2013	1011	<0.03	0.00	0.03	1.0
				5/29/2014	1135	<0.03	0.00	0.03	1.0
				5/13/2015	1233	<0.03	0.00	0.03	1.0
				10/21/2015	1377	<0.03	0.00	0.03	1.0
				10/27/2016	1520	<0.03	0.00	0.03	1.0
				6/1/2017	1582	<0.03	0.00	0.03	1.0
				5/1/2013	1680	<0.03	0.00	0.03	1.0
				11/6/2013	1745	<0.03	0.00	0.03	1.0
				5/29/2014	1766	<0.03	0.00	0.03	1.0
				4/15/2015	1787	<0.03	0.00	0.03	1.0
DD-AI	488,943	1,546,989	1	11/4/2015	42	<0.03	0.00	0.03	1.0
				6/2/2017	122	<0.03	0.00	0.03	1.0
				10/26/2017	304	<0.03	0.00	0.03	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				11/24/2013	326	<0.03	0.00	0.03	1.0
				6/12/2015	407	<0.03	0.00	0.03	1.0
				3/22/2017	500	<0.03	0.00	0.03	1.0
				5/29/2014	582	<0.03	0.00	0.03	1.0
				5/13/2015	710	<0.03	0.00	0.03	1.0
				5/3/2017	766	<0.03	0.00	0.03	1.0
				1/17/2013	851	<0.03	0.00	0.03	1.0
				2/11/2014	947	<0.03	0.00	0.03	1.0
				2/6/2015	1011	<0.03	0.00	0.03	1.0
				1/29/2016	1135	<0.03	0.00	0.03	1.0
				1/16/2017	1233	<0.03	0.00	0.03	1.0
				11/20/2014	1376	<0.03	0.00	0.03	1.0
				7/29/2015	1520	<0.03	0.00	0.03	1.0
				8/3/2017	1583	<0.03	0.00	0.03	1.0
				11/13/2014	1680	<0.03	0.00	0.03	1.0
				7/28/2015	1745	<0.03	0.00	0.03	1.0
				3/29/2017	1787	<0.03	0.00	0.03	1.0
DQ-AI	491,005	1,542,591	1	5/2/2013	893	0.88	8.54	-7.66	1.0
DR-AI	489,966	1,542,884	1	11/13/2014	893	18.7	21.9	-3.16	1.0
DT-AI	489,293	1,542,871	1	7/28/2015	893	5.37	10.6	-5.21	1.0
DZ-AI	491,501	1,542,834	1	11/26/2014	890	46.7	5.24	41.5	1.0
				11/26/2014	1638	36.6	7.71	28.9	1.0
F-AI	489,554	1,539,908	1	6/10/2015	64	<0.03	0.00	0.03	1.0
				11/26/2014	303	<0.03	0.00	0.03	1.0
				5/16/2015	443	<0.03	0.00	0.03	1.0
				11/13/2014	624	<0.03	0.00	0.03	1.0
				5/15/2015	807	<0.03	0.00	0.03	1.0
				11/13/2014	998	<0.03	0.00	0.03	1.0
				5/16/2015	998	<0.03	0.00	0.03	1.0
				11/13/2014	1171	<0.03	0.00	0.03	1.0
				5/16/2015	1359	<0.03	0.00	0.03	1.0
				11/9/2017	1536	<0.03	0.00	0.03	1.0
				6/24/2015	1778	<0.03	0.00	0.03	1.0
FB-AI	488,857	1,540,417	1	12/11/2017	64	<0.03	0.00	0.03	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				5/2/2013	305	<0.03	0.00	0.03	1.0
				11/20/2014	444	<0.03	0.00	0.03	1.0
				6/10/2015	624	<0.03	0.00	0.03	1.0
				12/11/2017	807	<0.03	0.00	0.03	1.0
				11/20/2014	949	<0.03	0.00	0.03	1.0
				6/10/2015	998	<0.03	0.00	0.03	1.0
				7/29/2015	1171	<0.03	0.00	0.03	1.0
				11/26/2014	1359	<0.03	0.00	0.03	1.0
				6/10/2015	1536	<0.03	0.00	0.03	1.0
				11/23/2013	1778	<0.03	0.00	0.03	1.0
GH-AI	489,509	1,538,807	1	11/19/2014	64	<0.03	0.00	0.03	1.0
				7/28/2015	305	<0.03	0.00	0.03	1.0
				12/12/2017	443	<0.03	0.00	0.03	1.0
				5/15/2015	627	<0.03	0.00	0.03	1.0
				11/26/2014	801	<0.03	0.00	0.03	1.0
				6/10/2015	949	<0.03	0.00	0.03	1.0
				6/10/2015	1170	<0.03	0.00	0.03	1.0
				12/12/2017	1359	<0.03	0.00	0.03	1.0
				11/19/2014	1536	<0.03	0.00	0.03	1.0
				5/15/2015	1778	<0.03	0.00	0.03	1.0
GN-AI	490,944	1,538,602	1	5/2/2013	65	<0.03	0.00	0.03	1.0
				11/19/2014	800	<0.03	0.00	0.03	1.0
				7/28/2015	961	<0.03	0.00	0.03	1.0
				11/19/2014	1171	<0.03	0.00	0.03	1.0
				7/28/2015	1539	<0.03	0.00	0.03	1.0
				5/19/2015	1686	<0.03	0.00	0.03	1.0
GV-AI	491,428	1,537,701	1	5/19/2015	1005	<0.03	0.00	0.03	1.0
				5/15/2015	1451	<0.03	0.00	0.03	1.0
				11/20/2014	1723	<0.03	0.00	0.03	1.0
K10-AI	491,638	1,541,305	1	7/28/2015	15	0.81	0.91	-0.10	1.0
				9/30/2015	305	1.35	1.24	0.11	1.0
				9/30/2016	393	1.27	1.16	0.11	1.0
				9/26/2017	625	1.05	0.85	0.20	1.0
				6/12/2015	766	6.97	0.84	6.13	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				9/30/2015	892	3.03	0.97	2.06	1.0
				9/30/2016	927	6.13	0.99	5.14	1.0
				9/26/2017	1113	3.32	1.02	2.30	1.0
				10/1/2015	1466	4.63	0.68	3.95	1.0
				9/26/2017	1550	1.36	0.56	0.80	1.0
				2/12/2013	1771	2.62	0.42	2.20	1.0
K11-AI	491,490	1,541,325	1	4/20/2013	15	1.01	0.79	0.22	1.0
				7/9/2013	305	1.03	0.90	0.13	1.0
				11/1/2013	393	0.93	0.91	0.02	1.0
				2/12/2014	625	1.01	0.72	0.29	1.0
				4/22/2014	892	1.26	0.81	0.45	1.0
				7/11/2014	927	1.27	0.84	0.43	1.0
				7/24/2014	1113	1.12	0.99	0.13	1.0
				2/4/2015	1466	1.20	0.74	0.46	1.0
				4/3/2015	1550	1.36	0.63	0.73	1.0
				7/17/2015	1659	2.21	0.54	1.67	1.0
				10/9/2015	1771	3.92	0.47	3.45	1.0
K2-AI	491,587	1,540,736	1	2/10/2016	310	0.08	0.05	0.03	1.0
K4-AI	492,371	1,541,211	1	4/13/2016	15	1.57	1.08	0.49	1.0
				7/10/2016	393	0.64	0.39	0.25	1.0
				10/21/2016	626	1.42	0.26	1.16	1.0
				3/1/2017	766	1.58	0.21	1.37	1.0
				5/1/2017	892	1.21	0.17	1.04	1.0
				7/18/2017	927	0.71	0.16	0.55	1.0
				10/26/2017	1116	0.29	0.12	0.17	1.0
				11/28/2017	1296	0.82	0.07	0.75	1.0
				2/9/2013	1466	1.19	0.05	1.14	1.0
				7/9/2013	1550	1.32	0.05	1.27	1.0
				2/13/2014	1659	1.68	0.05	1.63	1.0
				6/17/2014	1770	1.10	0.04	1.06	1.0
K5-AI	491,935	1,541,269	1	3/5/2015	15	1.41	1.25	0.16	1.0
				5/22/2015	305	1.83	1.15	0.68	1.0
				2/16/2016	393	1.86	1.09	0.77	1.0
				7/13/2016	625	2.37	0.88	1.49	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentra-tion (mg/L)	Simulated Molybdenum Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
				3/1/2017	892	1.57	0.79	0.78	1.0
				6/28/2017	927	1.72	0.78	0.94	1.0
				2/26/2013	1113	2.46	0.69	1.77	1.0
				10/4/2014	1296	3.02	0.52	2.50	1.0
				7/2/2015	1466	1.19	0.36	0.83	1.0
				10/3/2014	1550	1.47	0.31	1.16	1.0
				7/2/2015	1659	3.96	0.26	3.70	1.0
				7/5/2017	1771	4.07	0.22	3.85	1.0
				12/10/2013	15	0.87	0.81	0.06	1.0
				10/11/2014	305	0.78	0.73	0.05	1.0
				10/24/2015	393	0.79	0.63	0.16	1.0
				12/20/2016	625	0.71	0.44	0.27	1.0
				11/30/2017	766	0.71	0.37	0.34	1.0
				9/5/2013	892	0.57	0.30	0.27	1.0
K7-AI	492,237	1,541,232	1	7/24/2014	927	0.68	0.29	0.39	1.0
				7/17/2015	1113	1.05	0.20	0.85	1.0
				7/19/2017	1296	0.53	0.10	0.43	1.0
				2/26/2013	1466	2.30	0.06	2.24	1.0
				8/6/2015	1550	1.38	0.06	1.32	1.0
				7/19/2016	1659	1.58	0.05	1.53	1.0
				2/10/2017	1770	0.64	0.05	0.59	1.0
				7/19/2017	15	1.32	1.11	0.21	1.0
				2/26/2013	305	1.33	0.95	0.38	1.0
				7/24/2014	393	0.73	0.89	-0.16	1.0
				9/30/2014	625	1.56	0.70	0.86	1.0
				8/6/2015	892	0.86	0.56	0.30	1.0
				7/19/2016	927	0.90	0.54	0.36	1.0
K8-AI	492,081	1,541,250	1	3/21/2017	1117	0.63	0.41	0.22	1.0
				7/19/2017	1296	1.39	0.28	1.11	1.0
				7/24/2014	1466	1.79	0.18	1.61	1.0
				10/3/2014	1550	2.07	0.15	1.92	1.0
				7/17/2015	1659	2.28	0.13	2.15	1.0
				7/20/2017	1770	2.84	0.11	2.73	1.0
K9-AI	491,787	1,541,287	1	3/6/2013	15	3.20	1.80	1.40	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentra-tion (mg/L)	Simulated Molybdenum Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
				9/5/2013	305	2.64	1.26	1.38	1.0
				10/3/2014	393	2.67	1.16	1.51	1.0
				4/1/2015	625	4.06	0.90	3.16	1.0
				8/28/2015	766	2.14	0.85	1.29	1.0
				3/19/2016	892	1.87	0.91	0.96	1.0
				3/21/2017	927	3.26	0.91	2.35	1.0
				3/6/2013	1113	4.10	0.88	3.22	1.0
				9/5/2013	1296	1.37	0.73	0.64	1.0
				10/3/2014	1466	1.16	0.55	0.61	1.0
				4/1/2015	1550	1.34	0.46	0.88	1.0
				3/19/2016	1771	2.66	0.34	2.32	1.0
KF-AI	491,169	1,540,870	1	3/21/2017	932	0.06	0.05	0.01	1.0
				2/26/2013	1547	0.07	0.02	0.05	1.0
L10-AI	492,310	1,539,250	1	9/30/2014	722	0.50	0.46	0.04	1.0
				5/13/2015	1019	0.42	0.09	0.33	1.0
				10/16/2015	1396	0.43	0.09	0.34	1.0
				5/11/2016	1581	0.54	0.09	0.45	1.0
				10/27/2016	1756	0.40	0.10	0.30	1.0
L5-AI	492,730	1,539,946	1	5/2/2017	722	0.42	0.27	0.15	1.0
				6/28/2017	1052	0.34	0.15	0.19	1.0
				7/18/2017	1581	0.39	0.15	0.24	1.0
				10/25/2017	1756	0.31	0.15	0.16	1.0
L6-AI	493,110	1,540,526	1	2/26/2013	722	0.24	0.35	-0.11	1.0
				9/30/2014	1019	0.26	0.33	-0.07	1.0
				7/17/2015	1396	0.29	0.33	-0.04	1.0
				7/16/2016	1581	0.35	0.33	0.02	1.0
				2/10/2017	1756	0.31	0.33	-0.02	1.0
L7-AI	492,842	1,540,113	1	7/19/2017	722	0.40	0.25	0.15	1.0
				2/26/2013	1052	0.39	0.04	0.35	1.0
				9/30/2014	1581	0.39	0.04	0.35	1.0
				7/17/2015	1756	0.19	0.05	0.14	1.0
L8-AI	492,621	1,539,773	1	7/19/2016	722	0.28	0.33	-0.05	1.0
				2/10/2017	1019	0.45	0.06	0.39	1.0
				7/19/2017	1396	0.78	0.06	0.72	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				7/9/2013	1581	0.47	0.06	0.41	1.0
L9-AI	492,463	1,539,509	1	3/27/2015	722	0.54	0.56	-0.02	1.0
				6/12/2015	1052	0.31	0.45	-0.14	1.0
				7/20/2017	1581	0.43	0.35	0.08	1.0
				2/28/2013	1756	0.32	0.36	-0.04	1.0
L-AI	492,150	1,538,970	1	9/5/2013	722	0.62	0.29	0.33	1.0
				7/24/2014	1396	0.46	0.18	0.28	1.0
				3/20/2015	1581	0.52	0.18	0.34	1.0
				8/19/2015	1756	0.47	0.19	0.28	1.0
M10-AI	486,723	1,543,677	1	9/26/2015	135	<0.03	0.00	0.03	1.0
				2/11/2016	1172	<0.03	0.01	0.02	1.0
				9/20/2016	1543	<0.03	0.01	0.02	1.0
M16-AI	485,112	1,543,252	1	3/2/2017	1005	0.14	0.01	0.13	1.0
				11/14/2017	1722	0.14	0.02	0.12	1.0
M3-AI	489,151	1,542,805	1	2/28/2013	327	9.20	5.83	3.37	1.0
				10/11/2014	893	9.49	5.53	3.96	1.0
				3/27/2015	1542	3.51	1.88	1.63	1.0
M5-AI	489,080	1,542,360	1	8/19/2015	337	0.15	0.29	-0.14	1.0
				3/16/2016	940	<0.03	0.27	-0.24	1.0
M6-AI	486,674	1,543,097	1	3/21/2017	134	1.58	1.19	0.39	1.0
				7/19/2017	792	2.06	0.34	1.72	1.0
				8/14/2017	1543	1.71	0.14	1.57	1.0
M7-AI	486,523	1,542,790	1	3/5/2013	79	1.22	1.04	0.18	1.0
				11/22/2013	792	0.95	0.34	0.61	1.0
				10/1/2014	1172	1.02	0.21	0.81	1.0
M9-AI	486,699	1,543,310	1	6/30/2017	52	0.67	0.79	-0.12	1.0
				3/5/2013	327	7.02	0.51	6.51	1.0
				10/3/2014	352	2.09	0.49	1.60	1.0
				6/30/2017	638	3.55	0.34	3.21	1.0
				2/26/2013	793	0.87	0.29	0.58	1.0
				10/4/2014	893	1.16	0.26	0.90	1.0
				3/31/2015	1005	1.89	0.24	1.65	1.0
				8/25/2016	1172	0.77	0.20	0.57	1.0
ML-AI	486,691	1,543,902	1	3/20/2017	135	<0.03	0.00	0.03	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				8/17/2017	1172	<0.03	0.00	0.03	1.0
				2/28/2013	1543	<0.03	0.00	0.03	1.0
MO-AI	485,518	1,543,620	1	10/3/2014	63	<0.03	0.00	0.03	1.0
				7/2/2015	305	<0.03	0.00	0.03	1.0
				11/28/2017	443	<0.03	0.00	0.03	1.0
				7/1/2015	801	<0.03	0.00	0.03	1.0
				6/30/2017	1019	0.04	0.00	0.04	1.0
				11/27/2013	1170	0.08	0.00	0.08	1.0
				10/1/2014	1395	<0.03	0.00	0.03	1.0
				3/11/2015	1536	<0.03	0.00	0.03	1.0
MQ-AI	486,326	1,543,173	1	8/19/2015	52	0.17	0.38	-0.21	1.0
				3/17/2016	327	0.99	0.68	0.31	1.0
				3/20/2017	638	0.41	1.00	-0.59	1.0
				8/11/2017	792	0.32	1.02	-0.70	1.0
				11/15/2013	893	0.38	0.99	-0.61	1.0
				4/16/2014	1005	0.32	0.88	-0.56	1.0
				9/11/2014	1172	0.34	0.77	-0.43	1.0
				5/13/2016	1543	0.31	0.60	-0.29	1.0
				10/22/2016	1722	0.33	0.52	-0.19	1.0
MR-AI	483,574	1,542,609	1	5/3/2017	799	0.05	0.02	0.03	1.0
				10/3/2014	834	0.05	0.02	0.03	1.0
				6/30/2017	950	0.06	0.02	0.04	1.0
				5/11/2013	1170	0.08	0.03	0.05	1.0
				6/12/2014	1348	0.06	0.04	0.02	1.0
				7/10/2013	1539	0.05	0.05	0.00	1.0
				5/15/2014	1581	0.06	0.05	0.01	1.0
				11/15/2013	1683	0.06	0.05	0.01	1.0
				6/12/2014	1746	0.06	0.06	0.00	1.0
MS-AI	485,570	1,542,607	1	9/11/2014	121	0.05	0.07	-0.02	1.0
				5/13/2016	327	0.17	0.08	0.09	1.0
				2/9/2013	1278	<0.03	0.04	-0.01	1.0
				7/9/2013	1548	<0.03	0.04	-0.01	1.0
				2/13/2014	1660	<0.03	0.04	-0.01	1.0
				2/13/2014	1795	<0.03	0.03	0.00	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentra-tion (mg/L)	Simulated Molybdenum Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
MT-AI	483,531	1,543,221	1	6/17/2014	136	<0.03	0.00	0.03	1.0
MV-AI	484,418	1,542,618	1	3/5/2015	135	0.06	0.07	-0.01	1.0
				3/5/2015	813	0.04	0.14	-0.10	1.0
MW-AI	486,346	1,543,802	1	5/22/2015	135	<0.03	0.00	0.03	1.0
				2/16/2016	1543	<0.03	0.00	0.03	1.0
MX-AI	486,244	1,541,287	1	7/12/2016	135	<0.03	0.00	0.03	1.0
				3/1/2017	799	<0.03	0.00	0.03	1.0
				11/15/2013	960	<0.03	0.00	0.03	1.0
				6/12/2014	1170	<0.03	0.00	0.03	1.0
				6/10/2015	1539	<0.03	0.00	0.03	1.0
				7/6/2016	1683	<0.03	0.00	0.03	1.0
				8/24/2017	1777	<0.03	0.00	0.03	1.0
MY-AI	486,213	1,542,200	1	11/20/2013	1446	<0.03	0.00	0.03	1.0
				6/19/2014	1777	<0.03	0.00	0.03	1.0
MZ-AI	486,757	1,543,485	1	10/4/2014	135	<0.03	0.06	-0.03	1.0
				7/1/2015	792	<0.03	0.11	-0.08	1.0
				7/5/2017	1172	<0.03	0.10	-0.07	1.0
				12/10/2013	1543	<0.03	0.09	-0.06	1.0
NB-AI	491,296	1,545,000	1	10/11/2014	970	33.6	22.6	11.0	1.0
				10/24/2015	1693	45.9	17.1	28.8	1.0
NC-AI	491,282	1,545,220	1	12/20/2016	834	<0.03	10.3	-10.3	1.0
				11/30/2017	969	0.20	12.0	-11.8	1.0
				10/2/2014	1688	0.11	9.48	-9.37	1.0
ND-AI	494,872	1,545,927	1	7/1/2015	337	<0.03	0.00	0.03	1.0
				6/30/2017	816	<0.03	0.00	0.03	1.0
				6/25/2013	862	<0.03	0.00	0.03	1.0
O-AI	492,725	1,545,060	1	11/27/2013	969	<0.03	7.34	-7.31	1.0
				10/1/2014	1689	<0.03	8.88	-8.85	1.0
P2-AI	490,912	1,546,555	1	6/29/2017	52	<0.03	0.00	0.03	1.0
				10/23/2017	820	<0.03	0.00	0.03	1.0
				2/28/2013	1542	<0.03	0.00	0.03	1.0
P3-AI	490,785	1,546,159	1	7/2/2015	52	<0.03	0.00	0.03	1.0
				8/7/2015	820	<0.03	0.00	0.03	1.0
				7/31/2017	1542	<0.03	0.00	0.03	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
P4-AI	491,899	1,546,504	1	2/26/2013	52	<0.03	0.00	0.03	1.0
				10/4/2014	641	<0.03	0.00	0.03	1.0
				7/2/2015	820	<0.03	0.00	0.03	1.0
				12/12/2017	1542	<0.03	0.00	0.03	1.0
P-AI	491,058	1,546,691	1	2/12/2013	127	<0.03	0.00	0.03	1.0
				2/28/2013	309	<0.03	0.00	0.03	1.0
				11/5/2013	500	<0.03	0.00	0.03	1.0
				2/12/2014	869	<0.03	0.00	0.03	1.0
				9/5/2014	1023	<0.03	0.00	0.03	1.0
				7/2/2015	1232	<0.03	0.00	0.03	1.0
				8/7/2015	1717	<0.03	0.00	0.03	1.0
				2/11/2016	1759	<0.03	0.00	0.03	1.0
Q-AI	492,153	1,548,693	1	9/27/2016	134	<0.03	0.00	0.03	1.0
				3/21/2017	816	<0.03	0.00	0.03	1.0
				8/10/2017	851	<0.03	0.00	0.03	1.0
				11/15/2013	1234	<0.03	0.00	0.03	1.0
				6/12/2014	1375	<0.03	0.00	0.03	1.0
				9/10/2014	1395	<0.03	0.00	0.03	1.0
				7/30/2015	1542	<0.03	0.00	0.03	1.0
				7/6/2016	1583	<0.03	0.00	0.03	1.0
				12/2/2016	1612	<0.03	0.00	0.03	1.0
				3/7/2013	1799	<0.03	0.00	0.03	1.0
R-AI	494,514	1,550,372	1	6/18/2013	134	<0.03	0.00	0.03	1.0
				11/15/2013	816	<0.03	0.00	0.03	1.0
				11/14/2014	862	<0.03	0.00	0.03	1.0
				12/24/2014	1233	<0.03	0.00	0.03	1.0
				4/1/2015	1395	<0.03	0.00	0.03	1.0
				4/1/2015	1583	<0.03	0.00	0.03	1.0
				8/20/2015	1798	<0.03	0.00	0.03	1.0
S11-AI	488,150	1,544,793	1	3/5/2016	337	0.05	0.00	0.05	1.0
				8/27/2016	1476	0.04	0.00	0.04	1.0
				3/24/2017	1746	<0.03	0.00	0.03	1.0
S12-AI	488,628	1,543,297	1	8/15/2017	16	1.97	1.30	0.67	1.0
				12/4/2013	406	1.93	1.00	0.93	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentra-tion (mg/L)	Simulated Molybdenum Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
				10/11/2014	766	10.8	1.07	9.73	1.0
S1-AI	488,401	1,543,288	1	7/30/2015	830	0.57	1.03	-0.46	1.0
S2-AI	488,299	1,543,127	1	12/12/2017	15	5.85	4.51	1.34	1.0
				5/2/2013	190	5.01	4.21	0.80	1.0
				8/8/2013	386	4.43	3.72	0.71	1.0
				10/1/2014	557	3.92	3.10	0.82	1.0
				2/21/2015	760	4.66	2.86	1.80	1.0
				8/28/2015	927	3.18	2.54	0.64	1.0
				12/17/2016	1114	2.49	2.29	0.20	1.0
				8/16/2017	1286	5.41	1.80	3.61	1.0
				10/24/2017	1473	3.82	1.22	2.60	1.0
				5/11/2013	1659	3.73	1.10	2.63	1.0
S3-AI	488,714	1,542,857	1	10/1/2014	831	5.69	1.12	4.57	1.0
				2/21/2015	940	7.52	1.22	6.30	1.0
				9/1/2015	1660	4.25	0.51	3.74	1.0
S4-AI	488,359	1,543,344	1	10/24/2017	64	0.65	0.85	-0.20	1.0
				5/11/2013	190	0.55	0.87	-0.32	1.0
				10/1/2014	443	0.52	0.89	-0.37	1.0
				2/21/2015	557	0.48	0.89	-0.41	1.0
				9/1/2015	568	0.48	0.89	-0.41	1.0
				8/16/2017	927	0.52	1.00	-0.48	1.0
				10/24/2017	1124	0.44	1.05	-0.61	1.0
				5/11/2013	1170	0.46	1.02	-0.56	1.0
				10/1/2014	1286	0.55	0.89	-0.34	1.0
				4/1/2015	1533	0.28	0.63	-0.35	1.0
				8/29/2015	1659	0.30	0.61	-0.31	1.0
				12/17/2016	1777	0.31	0.60	-0.29	1.0
S5R-AI	488,938	1,543,150	1	8/16/2017	327	34.7	14.3	20.4	1.0
				5/15/2013	893	44.9	12.6	32.3	1.0
				10/1/2014	1542	0.63	3.65	-3.02	1.0
SA-AI	488,811	1,543,122	1	4/1/2015	838	72.5	5.86	66.6	1.0
				8/29/2015	893	73.4	6.68	66.7	1.0
				5/19/2016	1114	2.46	6.55	-4.09	1.0
				12/1/2016	1124	34.8	6.17	28.6	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				12/15/2016	1541	66.7	1.72	65.0	1.0
				2/10/2017	1777	43.2	1.50	41.7	1.0
SB-AI	488,811	1,543,371	1	5/3/2017	893	85.2	10.2	75.0	1.0
				8/16/2017	1541	79.8	2.72	77.1	1.0
				11/29/2017	1773	73.3	2.70	70.6	1.0
SE6-AI	488,615	1,543,244	1	10/1/2014	16	0.13	1.86	-1.73	1.0
				11/27/2013	406	1.42	1.16	0.26	1.0
				7/30/2015	758	24.0	1.36	22.6	1.0
				8/9/2017	766	22.8	1.36	21.4	1.0
				8/11/2017	1121	15.8	1.58	14.2	1.0
				6/25/2013	1477	71.5	1.54	70.0	1.0
				10/1/2014	1777	3.36	1.50	1.86	1.0
SM-AI	488,566	1,543,748	1	7/30/2015	136	2.39	2.57	-0.18	1.0
				7/31/2017	514	1.10	1.77	-0.67	1.0
				7/19/2014	869	0.86	1.70	-0.84	1.0
				8/10/2016	1583	15.2	0.50	14.7	1.0
SO-AI	488,381	1,543,652	1	11/15/2013	514	5.10	1.34	3.76	1.0
				7/19/2014	869	4.14	1.04	3.10	1.0
				8/2/2016	1583	3.59	0.26	3.33	1.0
SQ-AI	488,814	1,543,507	1	6/19/2014	893	73.2	11.7	61.5	1.0
SS-AI	488,666	1,543,374	1	7/2/2015	16	0.34	1.26	-0.92	1.0
ST-AI	488,688	1,543,215	1	7/6/2017	16	16.0	11.7	4.28	1.0
				3/20/2013	327	19.0	2.14	16.9	1.0
				6/18/2013	893	52.6	2.44	50.2	1.0
				10/4/2014	1121	0.63	2.87	-2.24	1.0
				3/20/2015	1484	0.58	1.77	-1.19	1.0
				8/20/2015	1542	0.38	1.73	-1.35	1.0
SUB1-AI	489,100	1,537,620	1	5/7/2016	121	<0.03	0.00	0.03	1.0
				3/20/2017	1759	<0.03	0.00	0.03	1.0
SUB2-AI	490,370	1,537,392	1	8/14/2017	120	<0.03	0.00	0.03	1.0
				8/17/2017	309	<0.03	0.00	0.03	1.0
				12/4/2013	514	<0.03	0.00	0.03	1.0
				10/2/2014	862	<0.03	0.00	0.03	1.0
				7/3/2015	1024	<0.03	0.00	0.03	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentra-tion (mg/L)	Simulated Molybdenum Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
				12/21/2016	1396	<0.03	0.00	0.03	1.0
				6/29/2017	1612	<0.03	0.00	0.03	1.0
SUB3-AI	489,420	1,538,280	1	12/4/2013	120	<0.03	0.00	0.03	1.0
				10/2/2014	310	<0.03	0.00	0.03	1.0
				7/3/2015	514	<0.03	0.00	0.03	1.0
				12/21/2016	834	<0.03	0.00	0.03	1.0
				6/29/2017	1038	<0.03	0.00	0.03	1.0
				10/2/2014	1613	<0.03	0.00	0.03	1.0
				7/2/2015	1759	<0.03	0.00	0.03	1.0
SV-AI	488,813	1,543,676	1	6/29/2017	327	37.7	10.5	27.2	1.0
				10/2/2014	893	66.3	13.5	52.8	1.0
				7/18/2015	1541	10.8	2.89	7.91	1.0
SW-AI	488,812	1,543,783	1	7/31/2017	514	16.5	9.66	6.84	1.0
				10/2/2014	863	28.7	13.3	15.4	1.0
				7/1/2015	1583	1.98	2.62	-0.64	1.0
SZ-AI	488,833	1,544,367	1	10/9/2016	17	99.4	81.5	17.9	1.0
				6/29/2017	406	93.4	47.0	46.4	1.0
				11/20/2013	766	77.0	40.0	37.0	1.0
				10/2/2014	1124	79.3	38.8	40.5	1.0
				7/21/2015	1476	2.80	7.91	-5.11	1.0
T10-AI	492,791	1,543,434	1	8/10/2016	688	104	29.0	75.0	1.0
				7/31/2017	939	103	20.8	82.2	1.0
				6/18/2013	1675	96.4	8.20	88.2	1.0
T11-AI	489,887	1,544,585	1	11/15/2013	681	6.02	25.4	-19.4	1.0
				10/11/2014	939	22.2	26.8	-4.59	1.0
				8/19/2015	1548	26.3	6.00	20.3	1.0
T12-AI	490,317	1,544,583	1	8/10/2016	121	4.01	6.98	-2.97	1.0
				8/25/2016	681	4.49	11.0	-6.51	1.0
				3/21/2017	939	5.24	13.3	-8.08	1.0
T14-AI	491,071	1,544,565	1	8/14/2017	695	56.9	39.4	17.5	1.0
T15-AI	491,953	1,544,480	1	12/4/2013	695	27.6	30.2	-2.60	1.0
				10/2/2014	890	40.4	28.4	12.0	1.0
T16-AI	492,718	1,544,276	1	7/18/2015	694	77.4	52.1	25.3	1.0
				12/21/2016	866	77.3	46.9	30.4	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
T17-AI	489,430	1,544,008	1	8/1/2017	681	63.9	42.8	21.1	1.0
				5/7/2013	865	63.6	40.3	23.3	1.0
T18-AI	490,333	1,543,977	1	11/6/2013	681	11.2	12.0	-0.76	1.0
				5/15/2014	866	3.69	11.6	-7.93	1.0
T19-AI	490,722	1,543,958	1	11/6/2014	681	19.4	10.5	8.88	1.0
				2/18/2015	866	8.69	10.1	-1.38	1.0
				5/2/2015	1773	16.3	10.4	5.94	1.0
T20-AI	491,048	1,543,935	1	8/8/2015	904	11.8	9.01	2.79	1.0
				10/9/2015	1805	18.3	11.4	6.90	1.0
T21-AI	491,882	1,543,951	1	2/16/2016	121	20.4	21.4	-0.97	1.0
				5/5/2016	689	17.9	23.5	-5.58	1.0
				7/10/2016	890	22.9	23.7	-0.78	1.0
				10/18/2016	1805	29.1	26.0	3.13	1.0
T22-AI	492,311	1,543,876	1	5/7/2013	689	1.85	37.5	-35.7	1.0
				11/5/2013	891	2.40	36.8	-34.4	1.0
				5/15/2014	939	3.58	36.7	-33.1	1.0
T23-AI	492,805	1,543,901	1	11/6/2014	695	79.8	47.6	32.2	1.0
				2/18/2015	891	70.8	39.3	31.5	1.0
T2-AI	489,303	1,543,538	1	5/2/2015	326	21.6	31.5	-9.95	1.0
				8/8/2015	687	20.6	30.7	-10.1	1.0
				10/9/2015	939	26.0	27.6	-1.61	1.0
				2/16/2016	1806	59.9	25.5	34.5	1.0
T36-AI	489,688	1,543,735	1	5/5/2016	864	13.4	11.9	1.48	1.0
T39-AI	491,669	1,544,498	1	7/10/2016	695	11.2	25.5	-14.3	1.0
				10/18/2016	890	18.2	24.6	-6.35	1.0
T40-AI	491,466	1,543,819	1	2/16/2017	891	37.8	12.5	25.3	1.0
				5/2/2017	1806	21.5	20.1	1.36	1.0
T41-AI	491,079	1,543,278	1	7/18/2017	687	13.4	5.81	7.59	1.0
				10/25/2017	865	17.9	5.80	12.1	1.0
T4-AI	489,699	1,543,340	1	11/20/2017	121	12.2	11.5	0.69	1.0
				7/9/2014	688	11.4	9.65	1.75	1.0
				10/9/2014	939	14.7	8.96	5.74	1.0
T5-AI	490,289	1,543,307	1	10/16/2015	688	35.1	9.60	25.5	1.0
				5/4/2017	939	25.0	9.07	15.9	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentra-tion (mg/L)	Simulated Molybdenum Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
T6-AI	490,655	1,543,282	1	10/10/2014	869	19.0	7.67	11.3	1.0
T7-AI	491,484	1,543,272	1	1/27/2016	869	59.8	13.3	46.5	1.0
T8-AI	491,914	1,543,296	1	10/14/2015	865	32.3	33.7	-1.44	1.0
T9-AI	492,337	1,543,347	1	2/20/2014	689	58.5	39.4	19.1	1.0
				11/18/2014	939	38.2	30.1	8.09	1.0
TA-AI	492,426	1,542,471	1	2/18/2015	1003	2.29	1.22	1.07	1.0
				5/1/2015	1369	2.02	0.70	1.32	1.0
				8/8/2015	1729	3.50	0.35	3.15	1.0
T-AI	492,260	1,542,536	1	10/9/2015	893	5.18	2.05	3.13	1.0
				12/11/2015	1003	8.49	1.94	6.55	1.0
				1/27/2016	1369	5.45	1.42	4.03	1.0
				2/26/2016	1729	4.03	0.83	3.20	1.0
TB-AI	492,616	1,542,351	1	9/16/2016	1004	0.49	0.33	0.16	1.0
				10/19/2016	1729	1.93	0.06	1.87	1.0
X-AI	491,892	1,540,512	1	12/19/2014	43	0.07	0.08	-0.01	1.0
				2/18/2015	110	0.11	0.08	0.03	1.0
				5/1/2015	190	0.08	0.08	0.00	1.0
				8/8/2015	305	0.21	0.07	0.14	1.0
				8/11/2015	407	0.07	0.06	0.01	1.0
				10/9/2015	477	0.07	0.05	0.02	1.0
				2/20/2016	557	0.05	0.05	0.00	1.0
				9/2/2016	569	0.06	0.05	0.01	1.0
				10/18/2016	765	0.16	0.05	0.11	1.0
				2/16/2017	822	0.12	0.05	0.07	1.0
				5/2/2017	927	0.11	0.04	0.07	1.0
				6/27/2017	1012	0.08	0.04	0.04	1.0
				7/18/2017	1135	0.06	0.03	0.03	1.0
				10/23/2017	1198	0.07	0.03	0.04	1.0
				6/25/2015	1286	0.10	0.02	0.08	1.0
				5/11/2016	1390	0.13	0.02	0.11	1.0
				10/23/2014	1520	0.10	0.01	0.09	1.0
				10/1/2015	1581	0.10	0.01	0.09	1.0
				12/15/2016	1659	0.08	0.01	0.07	1.0
				7/6/2016	1759	0.08	0.01	0.07	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				7/12/2016	1792	0.09	0.01	0.08	1.0
0494-UC	489,494	1,536,689	4	2/14/2014	39	0.04	0.04	0.00	1.0
				8/27/2014	189	0.05	0.04	0.01	1.0
				2/20/2015	408	0.05	0.05	0.00	1.0
				2/12/2016	532	0.09	0.05	0.04	1.0
				3/27/2017	793	0.05	0.05	0.00	1.0
				2/7/2013	871	0.04	0.05	-0.01	1.0
				8/9/2013	1142	<0.03	0.04	-0.01	1.0
				2/14/2014	1290	0.04	0.04	0.00	1.0
				2/20/2015	1520	0.06	0.04	0.02	1.0
				3/27/2017	1639	0.06	0.04	0.02	1.0
0929-UC	495,585	1,544,684	4	5/15/2013	57	<0.03	0.00	0.03	1.0
				2/6/2015	641	<0.03	0.00	0.03	1.0
				3/28/2017	912	<0.03	0.00	0.03	1.0
0931-UC	495,207	1,542,461	4	5/1/2017	641	<0.03	0.00	0.03	1.0
				11/24/2013	912	<0.03	0.00	0.03	1.0
				6/13/2015	1646	<0.03	0.00	0.03	1.0
AW-UC	488,015	1,540,235	4	11/23/2013	344	0.11	0.03	0.08	1.0
				2/12/2014	648	0.06	0.02	0.04	1.0
				5/15/2014	1027	0.06	0.02	0.04	1.0
				8/6/2014	1449	0.05	0.02	0.03	1.0
				12/12/2014	1794	0.06	0.02	0.04	1.0
CE10-UC	490,177	1,541,737	4	6/12/2015	247	1.76	1.44	0.32	1.0
				7/17/2015	569	1.82	1.44	0.38	1.0
				1/21/2016	927	3.49	1.36	2.13	1.0
				7/19/2016	1660	2.19	1.24	0.95	1.0
CE11-UC	490,494	1,541,486	4	1/6/2017	56	1.70	1.78	-0.08	1.0
				3/31/2017	947	3.13	1.90	1.23	1.0
				7/18/2017	1295	2.56	1.78	0.78	1.0
				11/6/2017	1501	3.20	1.67	1.53	1.0
				1/16/2013	1660	0.15	1.64	-1.49	1.0
CE12-UC	489,642	1,541,867	4	11/1/2013	56	2.83	1.62	1.21	1.0
				1/28/2014	570	2.03	0.66	1.37	1.0
				9/18/2014	638	2.14	0.65	1.49	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				6/12/2015	947	5.74	0.76	4.98	1.0
				7/17/2015	1295	1.65	0.57	1.08	1.0
				1/19/2016	1540	1.06	0.41	0.65	1.0
				7/19/2016	1660	1.23	0.40	0.83	1.0
CE13-UC	490,338	1,542,693	4	1/6/2017	570	22.7	20.0	2.75	1.0
				3/31/2017	640	25.2	18.7	6.54	1.0
				7/18/2017	928	27.7	16.8	10.9	1.0
				11/7/2017	1661	29.1	14.3	14.8	1.0
CE14-UC	489,600	1,541,326	4	1/16/2013	65	<0.03	0.02	0.01	1.0
				11/1/2013	248	<0.03	0.02	0.01	1.0
				1/28/2014	640	<0.03	0.03	0.00	1.0
				9/18/2014	821	<0.03	0.04	-0.01	1.0
				2/5/2015	970	<0.03	0.04	-0.01	1.0
				6/12/2015	1174	0.04	0.05	-0.01	1.0
				7/17/2015	1540	<0.03	0.02	0.01	1.0
CE15-UC	489,460	1,539,507	4	1/19/2016	65	0.24	0.26	-0.02	1.0
				7/19/2016	247	0.24	0.27	-0.03	1.0
				1/6/2017	640	0.25	0.34	-0.09	1.0
				3/31/2017	821	0.38	0.37	0.01	1.0
				7/18/2017	1174	0.93	0.41	0.52	1.0
				11/6/2017	1540	0.41	0.41	0.00	1.0
CE2-UC	489,979	1,541,923	4	1/16/2013	56	2.17	1.86	0.31	1.0
				11/1/2013	638	3.19	1.59	1.60	1.0
				1/28/2014	862	4.05	1.42	2.63	1.0
				9/18/2014	1019	1.09	1.27	-0.18	1.0
				6/12/2015	1227	1.17	1.22	-0.05	1.0
				7/17/2015	1395	1.04	1.24	-0.20	1.0
				1/22/2016	1582	1.41	1.24	0.17	1.0
				7/19/2016	1639	2.19	1.24	0.95	1.0
				1/6/2017	1659	1.40	1.24	0.16	1.0
				3/31/2017	1758	1.61	1.24	0.37	1.0
CE5-UC	490,695	1,541,453	4	7/18/2017	56	0.30	0.74	-0.44	1.0
				11/6/2017	638	2.84	0.37	2.47	1.0
				1/16/2013	928	2.47	0.22	2.25	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				11/1/2013	1293	1.13	0.30	0.83	1.0
				1/28/2014	1501	2.06	0.27	1.79	1.0
				9/18/2014	1660	0.14	0.21	-0.07	1.0
CE6-UC	490,433	1,541,698	4	2/5/2015	56	2.35	2.01	0.34	1.0
				6/12/2015	638	2.87	2.08	0.79	1.0
				7/17/2015	928	3.64	2.17	1.47	1.0
				1/19/2016	1295	1.56	2.02	-0.46	1.0
				7/19/2016	1501	2.50	1.89	0.61	1.0
				1/6/2017	1660	1.40	1.85	-0.45	1.0
CE7-UC	490,079	1,542,652	4	3/31/2017	189	32.7	17.3	15.4	1.0
				11/7/2017	815	30.9	17.6	13.3	1.0
				7/22/2015	893	30.2	17.6	12.6	1.0
				3/28/2017	1661	7.87	12.2	-4.35	1.0
CE8-UC	491,556	1,540,704	4	12/24/2014	59	0.09	0.07	0.02	1.0
				10/17/2015	247	0.07	0.07	0.00	1.0
				10/27/2016	570	0.07	0.07	0.00	1.0
				5/1/2017	808	0.05	0.07	-0.02	1.0
				10/23/2017	960	0.04	0.07	-0.03	1.0
				12/24/2014	998	0.04	0.07	-0.03	1.0
				11/19/2015	1137	0.06	0.06	0.00	1.0
				5/1/2017	1358	<0.03	0.02	0.01	1.0
				10/23/2017	1521	<0.03	0.01	0.02	1.0
				12/24/2014	1778	<0.03	0.01	0.02	1.0
CE9-UC	489,458	1,538,203	4	10/17/2015	59	0.06	0.06	0.00	1.0
				10/27/2016	648	0.06	0.06	0.00	1.0
				5/1/2017	815	0.08	0.06	0.02	1.0
				10/23/2017	961	0.18	0.07	0.11	1.0
				12/24/2014	1170	0.24	0.07	0.17	1.0
				11/19/2015	1540	0.22	0.06	0.16	1.0
				5/1/2017	1660	0.12	0.06	0.06	1.0
				10/23/2017	1686	0.10	0.06	0.04	1.0
CF1-UC	491,868	1,544,456	4	12/24/2014	64	1.74	2.01	-0.27	1.0
				10/17/2015	326	4.07	2.02	2.05	1.0
				10/27/2016	639	3.99	2.03	1.96	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentra-tion (mg/L)	Simulated Molybdenum Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
				5/1/2017	1641	3.47	2.07	1.40	1.0
CF2-UC	490,888	1,544,358	4	12/24/2014	64	1.30	1.27	0.03	1.0
				11/19/2015	640	0.72	1.38	-0.66	1.0
				5/1/2017	1641	0.41	1.57	-1.16	1.0
CW18-UC	491,378	1,535,924	4	11/24/2013	57	<0.03	0.00	0.03	1.0
				6/12/2015	641	<0.03	0.00	0.03	1.0
				3/23/2017	820	<0.03	0.00	0.03	1.0
				12/4/2013	1333	<0.03	0.00	0.03	1.0
				7/29/2015	1539	<0.03	0.00	0.03	1.0
				5/15/2013	1689	<0.03	0.00	0.03	1.0
CW3-UC	493,496	1,545,200	4	5/16/2013	59	0.28	0.33	-0.05	1.0
				5/16/2013	641	0.44	0.43	0.01	1.0
				3/25/2015	912	0.33	0.49	-0.16	1.0
				5/16/2013	1792	0.30	0.02	0.28	1.0
CW40-UC	491,819	1,537,624	4	3/24/2017	912	<0.03	0.00	0.03	1.0
				5/15/2013	1641	<0.03	0.00	0.03	1.0
CW50-UC	491,159	1,546,687	4	5/1/2015	331	<0.03	0.00	0.03	1.0
				5/18/2016	639	<0.03	0.00	0.03	1.0
				10/7/2016	799	<0.03	0.00	0.03	1.0
				10/27/2016	961	<0.03	0.00	0.03	1.0
				3/23/2017	1171	<0.03	0.00	0.03	1.0
				5/3/2017	1539	<0.03	0.00	0.03	1.0
				6/1/2017	1683	<0.03	0.00	0.03	1.0
CW53-UC	490,262	1,536,668	4	12/5/2017	319	<0.03	0.00	0.03	1.0
				5/14/2013	471	<0.03	0.00	0.03	1.0
				3/27/2015	619	<0.03	0.00	0.03	1.0
				5/13/2015	1228	<0.03	0.00	0.03	1.0
				5/18/2016	1391	0.04	0.00	0.04	1.0
				10/27/2016	1583	<0.03	0.00	0.03	1.0
CW9-UC	491,015	1,542,840	4	3/22/2017	640	<0.03	4.32	-4.29	1.0
				11/13/2017	1641	0.06	4.32	-4.26	1.0
0481-MC	490,210	1,536,820	6	3/17/2017	131	<0.03	0.00	0.03	1.0
				6/27/2017	527	<0.03	0.00	0.03	1.0
0482-MC	489,579	1,536,981	6	6/10/2015	191	0.06	0.05	0.01	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				7/6/2016	499	0.06	0.04	0.02	1.0
0483-MC	489,753	1,536,586	6	10/14/2015	319	0.04	0.03	0.01	1.0
				3/21/2013	528	0.05	0.03	0.02	1.0
				10/23/2014	619	0.05	0.03	0.02	1.0
				10/1/2015	1229	0.05	0.03	0.02	1.0
0493-MC	489,492	1,536,702	6	12/29/2016	39	<0.03	0.00	0.03	1.0
				2/7/2013	189	<0.03	0.00	0.03	1.0
				8/9/2013	408	<0.03	0.00	0.03	1.0
				2/14/2014	408	<0.03	0.00	0.03	1.0
				8/28/2014	532	<0.03	0.00	0.03	1.0
				2/20/2015	793	<0.03	0.00	0.03	1.0
				2/12/2016	793	<0.03	0.00	0.03	1.0
				2/24/2017	871	<0.03	0.00	0.03	1.0
				3/28/2017	1142	<0.03	0.00	0.03	1.0
				2/7/2013	1288	<0.03	0.00	0.03	1.0
				8/9/2013	1520	<0.03	0.00	0.03	1.0
0498-MC	488,953	1,534,661	6	2/26/2015	319	<0.03	0.00	0.03	1.0
				2/11/2016	528	<0.03	0.00	0.03	1.0
				3/27/2017	891	<0.03	0.00	0.03	1.0
				3/7/2013	1283	<0.03	0.00	0.03	1.0
				4/2/2014	1696	<0.03	0.00	0.03	1.0
0859-MC	487,426	1,534,549	6	10/6/2017	323	<0.03	0.00	0.03	1.0
				5/1/2013	535	<0.03	0.00	0.03	1.0
0930-MC	494,997	1,542,848	6	6/13/2015	641	<0.03	0.00	0.03	1.0
				5/2/2017	912	<0.03	0.00	0.03	1.0
				6/13/2015	1646	<0.03	0.00	0.03	1.0
ACW-MC	488,070	1,540,235	6	10/8/2016	344	<0.03	0.00	0.03	1.0
				3/1/2017	648	<0.03	0.00	0.03	1.0
				5/2/2017	1027	<0.03	0.00	0.03	1.0
				8/8/2017	1449	<0.03	0.00	0.03	1.0
				10/12/2017	1794	0.01	0.00	0.01	1.0
CW15-MC	485,961	1,536,259	6	10/23/2017	640	<0.03	0.00	0.03	1.0
				12/24/2014	911	<0.03	0.00	0.03	1.0
				10/27/2016	1641	<0.03	0.00	0.03	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
CW17-MC	487,771	1,545,279	6	5/1/2017	175	0.66	0.71	-0.05	1.0
				10/23/2017	331	0.53	0.73	-0.20	1.0
				5/15/2013	639	0.43	0.74	-0.31	1.0
				3/17/2016	913	0.34	0.78	-0.44	1.0
				3/24/2017	1447	0.11	0.79	-0.68	1.0
				10/2/2015	1640	0.08	0.17	-0.09	1.0
				9/19/2017	1756	0.06	0.11	-0.05	1.0
CW1-MC	490,295	1,545,235	6	3/4/2015	59	<0.03	0.00	0.03	1.0
				3/24/2017	912	<0.03	0.00	0.03	1.0
CW24-MC	487,760	1,545,773	6	3/21/2013	948	<0.03	0.00	0.03	1.0
				3/4/2015	1672	<0.03	0.00	0.03	1.0
CW28-MC	491,008	1,535,112	6	3/17/2016	57	<0.03	0.00	0.03	1.0
				2/21/2013	641	<0.03	0.00	0.03	1.0
				11/24/2013	913	<0.03	0.00	0.03	1.0
				12/18/2013	1806	0.02	0.00	0.02	1.0
CW2-MC	491,302	1,545,212	6	11/2/2013	42	<0.03	0.00	0.03	1.0
				3/20/2014	59	<0.03	0.00	0.03	1.0
				3/13/2015	309	<0.03	0.00	0.03	1.0
				10/16/2015	408	<0.03	0.00	0.03	1.0
				3/16/2016	613	<0.03	0.00	0.03	1.0
				10/27/2016	912	<0.03	0.00	0.03	1.0
				3/17/2017	949	<0.03	0.00	0.03	1.0
				2/21/2013	1137	<0.03	0.00	0.03	1.0
				11/24/2013	1365	<0.03	0.00	0.03	1.0
				9/30/2014	1540	<0.03	0.00	0.03	1.0
				3/4/2015	1682	<0.03	0.00	0.03	1.0
CW44-MC	488,891	1,535,048	6	3/23/2017	319	<0.03	0.00	0.03	1.0
				2/21/2013	528	<0.03	0.00	0.03	1.0
				4/1/2015	618	<0.03	0.00	0.03	1.0
				3/23/2017	940	<0.03	0.00	0.03	1.0
				2/21/2013	1283	<0.03	0.00	0.03	1.0
				10/4/2014	1432	<0.03	0.00	0.03	1.0
CW45-MC	489,494	1,535,036	6	4/1/2015	65	<0.03	0.00	0.03	1.0
				3/23/2017	168	<0.03	0.00	0.03	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				5/8/2013	319	<0.03	0.00	0.03	1.0
				11/6/2013	683	<0.03	0.00	0.03	1.0
				5/15/2014	722	<0.03	0.00	0.03	1.0
				5/20/2015	820	<0.03	0.00	0.03	1.0
				10/21/2015	820	<0.03	0.00	0.03	1.0
				5/17/2016	961	<0.03	0.00	0.03	1.0
				9/14/2017	1159	<0.03	0.00	0.03	1.0
				10/26/2017	1335	<0.03	0.00	0.03	1.0
				5/14/2013	1543	<0.03	0.00	0.03	1.0
				3/27/2015	1687	<0.03	0.00	0.03	1.0
CW55-MC	489,471	1,538,283	6	5/3/2017	337	0.04	0.00	0.04	1.0
				12/4/2017	649	0.04	0.00	0.04	1.0
				12/4/2013	941	0.06	0.00	0.06	1.0
				1/16/2017	1806	0.07	0.00	0.07	1.0
CW56-MC	488,115	1,545,279	6	10/13/2017	121	3.65	3.36	0.29	1.0
				1/17/2013	219	3.29	3.37	-0.08	1.0
				2/11/2014	639	2.81	3.23	-0.42	1.0
				2/6/2015	782	2.45	3.23	-0.78	1.0
				4/11/2015	970	2.20	3.22	-1.02	1.0
				1/15/2013	1447	0.54	2.97	-2.43	1.0
				7/10/2013	1688	0.38	2.85	-2.47	1.0
				1/22/2014	1757	0.31	2.82	-2.51	1.0
CW57-MC	488,070	1,545,654	6	7/11/2014	130	<0.03	0.00	0.03	1.0
				1/30/2015	638	<0.03	0.00	0.03	1.0
				7/17/2015	781	<0.03	0.00	0.03	1.0
				1/20/2016	973	<0.03	0.00	0.03	1.0
				7/10/2016	1757	<0.03	0.00	0.03	1.0
CW60-MC	488,262	1,545,470	6	1/13/2017	130	<0.03	0.00	0.03	1.0
				7/18/2017	638	<0.03	0.01	0.02	1.0
				4/11/2015	781	<0.03	0.01	0.02	1.0
				7/30/2015	973	<0.03	0.01	0.02	1.0
				7/19/2017	1688	<0.03	0.01	0.02	1.0
				3/5/2013	1757	<0.03	0.01	0.02	1.0
CW61-MC	487,779	1,544,927	6	7/10/2013	130	4.02	3.35	0.67	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				3/20/2014	638	3.34	3.30	0.04	1.0
				7/11/2014	820	3.43	3.28	0.15	1.0
				7/23/2014	971	3.62	3.26	0.36	1.0
				7/17/2015	1446	1.65	3.21	-1.56	1.0
				1/29/2016	1688	1.39	3.16	-1.77	1.0
CW62-MC	487,847	1,544,555	6	3/16/2016	134	2.35	2.28	0.07	1.0
				7/10/2016	638	2.02	1.96	0.06	1.0
				3/14/2017	820	2.23	1.94	0.29	1.0
				7/18/2017	971	2.37	1.92	0.45	1.0
				11/13/2017	1234	1.62	1.80	-0.18	1.0
				11/24/2013	1431	0.89	1.71	-0.82	1.0
				6/12/2015	1444	1.13	1.70	-0.57	1.0
				3/23/2017	1501	0.83	1.69	-0.86	1.0
				4/18/2015	1583	0.88	1.68	-0.80	1.0
				6/12/2015	1688	0.84	1.66	-0.82	1.0
				1/20/2016	1793	0.79	1.63	-0.84	1.0
CW6-MC	488,301	1,542,588	6	1/29/2016	638	<0.03	0.00	0.03	1.0
WCW-MC	488,520	1,541,045	6	2/10/2017	331	<0.03	0.00	0.03	1.0
				2/17/2017	941	<0.03	0.00	0.03	1.0
				2/28/2017	1681	0.06	0.00	0.06	1.0
				5/3/2017	1683	<0.03	0.00	0.03	1.0
WR25-MC	487,430	1,545,267	6	5/11/2017	176	<0.03	0.01	0.02	1.0
				7/19/2017	639	<0.03	0.01	0.02	1.0
				8/28/2017	940	<0.03	0.02	0.01	1.0
				3/7/2013	1672	<0.03	0.03	0.00	1.0
0538-LC	486,899	1,533,486	8	9/30/2015	564	<0.03	0.00	0.03	1.0
				1/12/2016	1318	<0.03	0.00	0.03	1.0
0653-LC	486,570	1,533,283	8	2/26/2014	319	<0.03	0.00	0.03	1.0
				9/4/2014	564	<0.03	0.00	0.03	1.0
				3/18/2015	1310	<0.03	0.00	0.03	1.0
0853-LC	484,824	1,532,124	8	3/25/2015	535	<0.03	0.00	0.03	1.0
				2/10/2016	912	<0.03	0.00	0.03	1.0
				3/28/2017	1647	<0.03	0.00	0.03	1.0
CW29-LC	487,435	1,534,551	8	9/30/2014	79	<0.03	0.00	0.03	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				3/4/2015	169	<0.03	0.00	0.03	1.0
				6/12/2015	641	<0.03	0.00	0.03	1.0
				10/2/2015	809	<0.03	0.00	0.03	1.0
				3/17/2016	961	<0.03	0.00	0.03	1.0
				5/15/2013	1222	<0.03	0.00	0.03	1.0
				3/17/2016	1539	<0.03	0.00	0.03	1.0
				3/24/2017	1686	<0.03	0.00	0.03	1.0
				3/5/2013	1689	<0.03	0.00	0.03	1.0
CW31-LC	482,738	1,540,689	8	6/12/2015	338	<0.03	0.00	0.03	1.0
				10/2/2015	639	<0.03	0.00	0.03	1.0
				3/17/2016	913	<0.03	0.00	0.03	1.0
				3/24/2017	1450	<0.03	0.00	0.03	1.0
				9/19/2017	1640	<0.03	0.00	0.03	1.0
CW32-LC	483,523	1,543,413	8	3/11/2015	337	<0.03	0.00	0.03	1.0
				4/15/2015	639	<0.03	0.00	0.03	1.0
				8/8/2015	913	<0.03	0.00	0.03	1.0
				3/16/2016	1450	<0.03	0.00	0.03	1.0
				9/9/2016	1640	<0.03	0.00	0.03	1.0
CW33-LC	486,347	1,543,814	8	3/20/2017	639	<0.03	0.00	0.03	1.0
				5/1/2017	913	<0.03	0.00	0.03	1.0
				8/11/2017	1640	<0.03	0.00	0.03	1.0
CW36-LC	481,329	1,540,053	8	10/13/2017	639	<0.03	0.00	0.03	1.0
				5/1/2013	928	<0.03	0.00	0.03	1.0
				11/24/2013	1672	<0.03	0.00	0.03	1.0
CW37-LC	484,853	1,537,240	8	7/1/2016	640	<0.03	0.00	0.03	1.0
				3/29/2017	911	<0.03	0.00	0.03	1.0
				7/19/2017	1378	<0.03	0.00	0.03	1.0
				12/1/2017	1640	<0.03	0.00	0.03	1.0
CW41-LC	488,583	1,533,174	8	3/11/2015	323	<0.03	0.00	0.03	1.0
				8/19/2015	640	<0.03	0.00	0.03	1.0
				3/16/2016	931	<0.03	0.00	0.03	1.0
				3/20/2017	1318	<0.03	0.00	0.03	1.0
				8/11/2017	1672	<0.03	0.00	0.03	1.0
CW42-LC	487,177	1,533,169	8	11/13/2017	169	<0.03	0.00	0.03	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentra-tion (mg/L)	Simulated Molybdenum Concentra-tion (mg/L)	Resid-ual (mg/L)	Weight
				12/17/2016	319	<0.03	0.00	0.03	1.0
				11/13/2017	649	<0.03	0.00	0.03	1.0
				5/16/2013	961	<0.03	0.00	0.03	1.0
				3/4/2015	1318	<0.03	0.00	0.03	1.0
				3/17/2016	1333	<0.03	0.00	0.03	1.0
				3/24/2017	1540	<0.03	0.00	0.03	1.0
				8/28/2015	1686	<0.03	0.00	0.03	1.0
CW43-LC	482,493	1,537,587	8	8/21/2017	337	<0.03	0.00	0.03	1.0
				4/15/2015	640	<0.03	0.00	0.03	1.0
				8/27/2015	929	<0.03	0.00	0.03	1.0
				8/16/2017	1451	<0.03	0.00	0.03	1.0
				12/4/2013	1673	<0.03	0.00	0.03	1.0
#1_Deepwell-SA	493,633	1,543,307	10	5/11/2013	126	<0.03	0.00	0.03	1.0
				6/12/2014	310	<0.03	0.00	0.03	1.0
				7/10/2013	500	<0.03	0.00	0.03	1.0
				5/15/2014	674	0.16	0.00	0.16	1.0
				11/15/2013	779	<0.03	0.00	0.03	1.0
				6/12/2014	851	<0.03	0.00	0.03	1.0
				9/11/2014	950	<0.03	0.00	0.03	1.0
				5/13/2016	1011	<0.03	0.00	0.03	1.0
				11/5/2013	1142	<0.03	0.00	0.03	1.0
				11/23/2013	1220	<0.03	0.00	0.03	1.0
				6/12/2014	1286	<0.03	0.00	0.03	1.0
				5/22/2015	1386	<0.03	0.00	0.03	1.0
#2_Deepwell-SA	490,972	1,542,424	10	10/16/2015	126	<0.03	0.00	0.03	1.0
				5/13/2016	309	<0.03	0.00	0.03	1.0
				10/22/2016	500	<0.03	0.00	0.03	1.0
				3/9/2017	674	<0.03	0.00	0.03	1.0
				7/10/2013	779	<0.03	0.00	0.03	1.0
				5/15/2014	851	<0.03	0.00	0.03	1.0
				9/19/2014	950	<0.03	0.00	0.03	1.0
				9/19/2014	1011	<0.03	0.00	0.03	1.0
				3/7/2013	1142	<0.03	0.00	0.03	1.0
				11/15/2013	1220	0.05	0.00	0.05	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				4/2/2014	1286	0.04	0.00	0.04	1.0
				6/18/2013	1386	<0.03	0.00	0.03	1.0
				11/15/2013	1507	<0.03	0.00	0.03	1.0
				4/2/2014	1582	<0.03	0.00	0.03	1.0
				6/12/2014	1659	<0.03	0.00	0.03	1.0
				7/11/2014	1758	<0.03	0.00	0.03	1.0
				11/14/2014	1784	<0.03	0.00	0.03	1.0
0806R-SA	486,263	1,541,177	10	2/12/2013	554	<0.03	0.00	0.03	1.0
				8/9/2013	647	<0.03	0.00	0.03	1.0
				2/12/2014	1018	<0.03	0.00	0.03	1.0
				8/27/2014	1584	<0.03	0.00	0.03	1.0
0806-SA	486,320	1,541,120	10	2/27/2015	647	<0.03	0.00	0.03	1.0
0928-SA	491,700	1,548,250	10	11/13/2017	1121	0.06	0.00	0.06	1.0
0938-SA	473,040	1,539,500	10	6/13/2015	1017	<0.03	0.00	0.03	1.0
0943-SA	487,407	1,537,222	10	5/2/2017	415	<0.03	0.00	0.03	1.0
				6/13/2015	686	<0.03	0.00	0.03	1.0
				5/2/2017	779	<0.03	0.00	0.03	1.0
				6/13/2015	850	<0.03	0.00	0.03	1.0
				5/1/2017	950	<0.03	0.00	0.03	1.0
				6/19/2014	1012	<0.03	0.00	0.03	1.0
				5/22/2015	1075	<0.03	0.00	0.03	1.0
				3/22/2017	1121	<0.03	0.00	0.03	1.0
				6/19/2014	1151	<0.03	0.00	0.03	1.0
				5/22/2015	1354	<0.03	0.00	0.03	1.0
				6/27/2017	1387	<0.03	0.00	0.03	1.0
				3/8/2013	1501	<0.03	0.00	0.03	1.0
				11/1/2013	1508	<0.03	0.00	0.03	1.0
				3/27/2014	1519	<0.03	0.00	0.03	1.0
				9/30/2014	1583	<0.03	0.00	0.03	1.0
				4/1/2015	1591	<0.03	0.00	0.03	1.0
				6/12/2015	1660	<0.03	0.00	0.03	1.0
				10/2/2015	1700	<0.03	0.00	0.03	1.0
0951R-SA	484,100	1,544,500	10	3/16/2016	66	0.08	0.00	0.08	1.0
				9/30/2016	718	0.08	0.00	0.08	1.0

Table E-1. Groundwater Transport Model Molybdenum Calibration Data

Well ID	Easting	Northing	Model Layer	Date	Model Time (days)	Measured Molybdenum Concentration (mg/L)	Simulated Molybdenum Concentration (mg/L)	Residual (mg/L)	Weight
				3/31/2017	779	<0.03	0.00	0.03	1.0
				9/30/2014	850	<0.03	0.00	0.03	1.0
				6/12/2015	950	<0.03	0.00	0.03	1.0
				10/2/2015	953	<0.03	0.00	0.03	1.0
				9/30/2016	1011	<0.03	0.00	0.03	1.0
				3/31/2017	1146	<0.03	0.00	0.03	1.0
				9/20/2017	1341	<0.03	0.00	0.03	1.0
				11/1/2013	1387	<0.03	0.00	0.03	1.0
				6/12/2015	1507	<0.03	0.00	0.03	1.0
				10/2/2015	1582	<0.03	0.00	0.03	1.0
				9/30/2016	1638	<0.03	0.00	0.03	1.0
				3/31/2017	1659	<0.03	0.00	0.03	1.0
				9/20/2017	1756	<0.03	0.00	0.03	1.0
0951-SA	473,200	1,545,500	10	3/8/2013	905	<0.03	0.00	0.03	1.0
				11/1/2013	1226	<0.03	0.00	0.03	1.0
0998-SA	476,450	1,533,080	10	10/2/2015	660	<0.03	0.00	0.03	1.0
				3/31/2017	1003	<0.03	0.00	0.03	1.0
				3/8/2013	1445	0.06	0.00	0.06	1.0
OLD_#1-SA	493,775	1,543,798	10	7/2/2015	1282	<0.03	0.00	0.03	1.0
				12/17/2016	1289	<0.03	0.00	0.03	1.0

Appendix F: Approximated Remedial System Collection and Injection Rates (Electronic)

Appendix G: Numerical Modeling Files (Electronic)