Mitchell L. Griffin

Water Resources Principal Technologist

Education

Ph.D., Agricultural Engineering, Purdue University, 1988
M.S., Agricultural Engineering, University of Kentucky, 1983
B.S., Civil Engineering, University of Kentucky, 1980

Professional Registrations

Professional Engineer: Florida (1989, No. 40772), Georgia (1999, No. 25672), Louisiana (2004, No. 31484)

Distinguishing Qualifications

- Nationally recognized expert on watershed pollution sources and control. Experience has included both urban (separate and combined sewers) and rural watersheds.
- Strong hydrologic and hydraulic technology background with extensive experience in evaluating water supply sources, flooding, and hydroperiods. Computer modeling expert with experience using a variety of hydraulic, hydrology, and watershed models.
- Successfully negotiates surface water discharge permits, including treated wastewater effluent, stormwater, bioassessments, toxicity identification evaluations, and water quality based limitations.

Relevant Experience

Dr. Griffin is a senior water resources engineer specializing in solving surface water drainage, supply, and quality problems. He assists municipal and industrial clients in making planning decisions and obtaining surface water permits, including National Pollutant Discharge Elimination System (NPDES) federal permits for point source discharges and storm water. He is skilled in computer modeling to solve water resources-related problems and is familiar with a wide range of computer model types including: hydraulics, hydrologic (watershed), mixing zones, water quality impacts, geographic information systems (GIS), systems analysis, and time series analysis. Dr. Griffin has more than 30 years of experience practicing engineering.

Recent Projects

Senior Technical Consultant; Confidential Client – Texas, USA; October 2011 through January 2012. Dr. Griffin led the development of design guidance for surface water drainage facilities on agricultural fields in Southeast TX. The guidance was based on a combination of Texas and national USDA and DOT criteria; and included practical considerations based on his experience in designing facilities for rural areas. Dr. Griffin also provided all quality assurance checks on the computations for the design.

Project Manager; USDA Natural Resource Conservation Service Wetland Restoration Program Design Services; March 2005 through March 2015. The NRCS Wetland Restoration Program (WRP) involves making previously drained agricultural lands and restoring their hydrology to form natural wetlands. These projects involve deconstructing the previous drainage improvements and building new ones that retain water. CH2M HILL is performing

design and permitting services to implement the WRP in Florida. CH2M HILL completed 18 projects during the first five years, restoring about 16,000 acres of USDA Wetland Reserve Program property.

Senior Technical Consultant; Site Certification Application, Florida, and Combined License Application, Federal, for Levy Nuclear Plant Units 1 and 2, Progress Energy. June 2006 through June 2013 (est.). Dr. Griffin has provided senior consulting and expert testimony for the license applications for a green-field nuclear plant located in Levy County, Florida. He is the engineer of record for the NPDES permit application for the disposal of industrial wastewater from the power plant (Section 316(a) of the Clean Water Act). Dr. Griffin has also consulted on the various surface water aspects related to the permitting and planning of the site and associated facilities. These activities have included evaluating water balances, on-site wetland hydroperiod affects, reviewing storm water permitting issues, and providing intake (Section 316(b)) and discharge antidegradation demonstration support. Dr. Griffin has also assisted by developing responses to information requests by the Nuclear Regulatory Commission on watershed flooding in the Withlacoochee River and potential tsunami effects on the coastline.

Senior Technical Consultant/Expert Witness; City of Key West, Florida. Stormwater Services. January 2007 through February 2012. Dr. Griffin has provided professional engineering services for the City of Key West related to its stormwater program and stormwater utility. The stormwater utility has been addressing challenges by certain land holders and Dr. Griffin has provided affidavits on behalf of the City's utility. CH2M HILL has developed new designs for stormwater pump stations and gravity wells (interchange redevelopment) and Dr. Griffin has assisted in reviewing these documents. Some of these projects have received FEMA funding and CH2M HILL has developed Benefit Cost Analysis (BCA) utilizing FEMA's modeling software. These projects were permitted and are under construction (summer 2011).
CH2M HILL is currently conducting a stormwater master plan for the entire island. The previous master plan is more than 5 years old and it did not include some annexed property on North Stock Island. Dr. Griffin led an assessment of the North Stock Island which will be included in the updated master plan for the whole island. Part of the project includes an extensive GPS data collection of the stormwater and sanitary infrastructure, which will be incorporated into a new GIS database for the City.

Senior Technical Consultant; Coal-Mac Inc., Holden, West Virginia. Selenium Passive Treatment System. August 2010 through March 2011. CH2M HILL designed two passive wetland treatment systems to remove high concentrations of selenium (and other pollutants) from the head of valley toe drains at a coal mine in West Virginia. Dr. Griffin assisted in assessing the hydraulics of the system and how it would perform during storm events.

Senior Technical Consultant; City of Jeffersonville, Indiana. Pre-Design of Jeffersonville Canal. April 2010 through July 2011. The City of Jeffersonville is developing a downtown redevelopment plan that will utilize an open channel to convey stormwater to the Ohio River. Portions of a former combined sewer system will be separated and the stormwater used to create a community park around the canal. Reclaimed wastewater will be utilized to maintain a low-flow and low impact development will be incorporated to treat stormwater prior to discharge. Dr. Griffin conducted the stormwater modeling to support he predesign of the canal. This included modifying an existing XP-SWMM model for the downtown area to incorporate

the new project. Downstream Ohio River elevations will require a stormwater pumping station to be included for periods when the river stages are relatively high.

Senior Technical Consultant; Lower St. Johns River Reuse and Treatment Project, St. Johns River Water Management District. August 2006 through September 2010. The SJRWMD is facilitating meetings and reuse project cost sharing to assist local utilities and communities to comply with nutrient TMDLs and to reduce future consumptive use of groundwater. CH2M HILL is providing technical support in tracking nutrient loadings, costs, and flows. This project support included the development of a regional cost estimate to comply with the TMDL, utilizing District and CH2M HILL planning level cost procedures. An optimization simulation was completed on the average annual nitrogen loadings from municipal wastewater plants and nonpoint sources to determine least cost scenarios for complying with the TMDL, exceeding the TMDL, and to reduce a fixed percentage of discharge into the Lower St. Johns River.

Senior Technical Consultant; Development of a Copper Translator for the C.D. McIntosh Power Plant, Lakeland Electric, City of Lakeland, Florida. April 2007 through January 2010. Dr. Griffin was the engineer of record in a study that applied Florida's rule for finding the biologically active portion of copper levels in Lake Parker. A translator is defined as the ratio of the dissolved fraction to total copper that is then used to establish a total recoverable permit limit. This approach was developed and applied after a mixing zone study did not provide adequate permit limits for the C.D. McIntosh once-through cooling waters. A plan of study was developed and approved by the Florida Department of Environmental Protection, then implemented over a 14-month period.

Senior Technical Consultant; Upper Kissimmee River Water Supply Technical Support, South Florida Water Management District. March 2007 through September 2009. Dr. Griffin assisted the District by evaluating the water supply yield of potential reservoirs located in the Upper Kissimmee River Basin. This lead into a follow-up project to determine the potential costs and optimum pipeline and reservoir network system using Voyage™ that could provide surface water to the region. Additional support was provided through the Kissimmee Basin Management and Operations Study by working with the technical advisory group to help develop future potential operation strategies.

Senior Technical Consultant; Tracking and Investigating Microbial Sources, Gainesville Regional Utilities (GRU), Gainesville, Florida. July 2004 through April 2007. Several of the City of Gainesville's urban streams have proposed TMDL for fecal coliform. As part of a remediation program, GRU retained CH2M HILL and Biological Consulting Services to conduct an intensive bacteria source tracking (BST) project to identify the potential sources. This water quality sampling effort used pioneering technology to ribotype DNA, develop and test human markers such as *bacteriodes*, human enteric and polynoma viruses, and *enterococcus*. These tests identified multiple sources which makes addressing the issue more complex. Additional identification work is being focused on areas identified from this study.

Project Manager; St. Johns River Water Management District Project Management and Technical Support Services for Demineralization and Concentrate Management Studies; October 2005 through September 2008. The SJRWMD District Water Supply Plan addresses a number of water supply management strategies, and one of them is support for emerging potable water treatment technologies. Raw water treatment of brackish and saline waters using

membrane technologies is one of the more promising of these options, but to date management of the resultant concentrate has been identified as one of the primary impediments to gaining necessary regulatory approvals for system installation and operation. CH2M HILL is providing project management support to help the District to evaluate the many factors that are involved in designing and permitting this kind of water supply alternative.

Project Manager; St. Johns River Water Management District Demineralization Concentrate Ocean Outfall Feasibility Study: Phase 2A – Conceptual Ocean Outfall Evaluation; October 2005 through July 2007. To better define the feasibility of ocean outfall disposal of concentrate, SJRWMD initiated investigations to help utilities understand relevant outfall implementation issues. The Phase 2A activities included preparation of planning-level conceptual engineering designs and dilution modeling for a range of outfall discharge scenarios that bracket the concentrate, outfall design, and oceanographic conditions that could likely be encountered in northeast and central Florida. On the basis of the synthesis of the modeling and engineering analysis results, it appears clear that ocean outfalls for demineralization concentrate should be feasible from the technical and regulatory perspectives.

Project Manager/Technical Consultant; George B. Wittmer and Associates Nassau County Agricycle Facility Permitting; February 2005 through July 2011. George B. Wittmer and Associates specializes in reclaiming natural materials for reuse. The Nassau Agricycle Facility creates soil products (potting soil) and amendments by processing yard and pulp mill wastes. CH2M HILL was contracted to support permitting for both the Environmental Resource Permit (stormwater) and the Solid Waste Permit from the Florida Department of Environmental Protection (FDEP). This work included designing a new stormwater system, evaluating subsurface clay conditions, and providing supporting information to FDEP.

Conference Co-Chair; TMDL 2005 and TMDL 2007, Water Environment Federation (WEF). Dr. Griffin has volunteered with WEF for a number of years related to their Nonpoint Sources technical committee. For three years, he served as the conference co-chair on WEF's specialty conference related to policy and technology issues for addressing TMDLs. Dr. Griffin has worked with other volunteers from across the nation to produce this popular biennial conference by reviewing abstracts and papers, organizing panels, and developing a program of speakers from EPA, states, and municipalities.

Project Manager; Miami-Dade County Stormwater Master Plan, Basins C-103 and C-2; November 2001 through March 2007. During Phase I of the Stormwater Master Plan (SMP) program (completed 1996), CH2M HILL used the C-9 East study area to establish the procedures that are used in the overall program. Dr. Griffin assisted in developing the data collection program during Phase I. For Phase II of the SMP, the following activities were completed:

- Watershed modeling to determine both flooding and water quality amounts
- Flood contour mapping
- Assess the flood and water quality level-of-service and prioritize sub-basins
- Development of proposed Control Measures for priority sub-basins
- Evaluation of Control Measures including cost, institutional and regulatory issues for both existing and future land uses
- Phase II Deliverables

CH2M HILL completed the SMP for the C-103, Florida City, and North Canal basins October 2003. These basins include parts of Homestead and the agricultural areas near the Everglades. CH2M HILL completed Phase II of the C-2 Basin master plan March 2007, which contains the highly urbanized Snapper Creek watershed (Kendall area). The total value of these two Phase II studies was $1.3 million dollars.

Lead Project Engineer; Louisiana Department of Natural Resources Mississippi River Water Reintroduction to Bayou Lafourche; December 2003 through December 2005. Federal and State plans to restore marshlands along Louisiana's coast depend on diverting large quantities of freshwater from the Mississippi River to affected areas. This project will use Bayou Lafourche's unique location to convey 1,000 cubic feet per second (cfs), or more, to 85,000 acres of marshes in the Terrebonne and Barataria Basins. CH2M HILL is designing up to five alternatives to the 30 Percent level for the Louisiana Department of Natural Resources. Dr. Griffin led an assessment of the historical water levels over the last 120 years in Bayou Lafourche. He also provided senior leadership for the hydraulic modeling (HEC-RAS) completed during the preliminary screening at the 10 Percent level and additional conveyance design for the 30 Percent level. Dr. Griffin also is providing senior review on the development of a two dimensional hydrodynamic model of the entire project area utilizing TABS (RMA-1, RMA-2, and RMA-11).

Senior Technical Consultant; City of Milton Level II Water Quality-based Effluent Limitation (WQBEL); March 2004 through December 2007. The City of Milton was required by the Florida Department of Environmental Protection (FDEP) to conduct a Level II WQBEL as a condition of their National Pollutant Discharge Elimination System (NPDES) permit. CH2M HILL is conducting this study in the Blackwater River near the City. A Level II WQBEL requires that a plan of study be developed and approved by FDEP, sampling, and receiving water modeling. Dr. Griffin will lead the water quality modeling portion of the project.

Lead Water Resource Engineer; Pinellas County Water Management Study for the Bridgeway Acres Solid Waste Management Facility; October 2004 through May 2005. As part of an overall assessment of the water supply, management, and treatment, Dr. Griffin prepared an assessment of the surface water facilities of Pinellas County's Bridgeway Acres landfill site. A main component of the analysis was an assessment of the water supply potential of an on-site pond. A yield study of the reservoir and the supply benefits of deepening it were examined. This assessment was used by the County to prepare a list of capital improvement projects for the site.

Project Manager; Tampa Bay Water Hillsborough River/Tampa Bypass Canal Hydrodynamic and Flow Forecasting Models Evaluation; June 2002 through October 2003. Dr. Griffin managed a watershed modeling project for Tampa Bay Water. The purpose of this project was to predict flows and stages at specific locations in the surface water supply system 7 days into the future so Tampa Bay Water can plan on water withdrawals and general operations of the flow control structures. Upstream flows were predicted using Analytical Neural Network (ANN) stochastic models. A one-dimensional HEC-RAS model was developed for the lower Hillsborough River and Tampa Bypass Canal watersheds. The results of these models were then integrated into a flow prediction tool using an Excel spreadsheet to assist the utility to predict surface water withdrawals. Dr. Griffin also led a long-term supply forecasting modeling effort for Tampa Bay Water to use with their demand forecasts. Monthly surface water supply was forecasted for 25-years into the future using stochastic time series models.

Lead Project Engineer; City of Atlanta CSO Remedial Measures Plan; June 1999 through April 2001. The City of Atlanta's combined sewer service area is about 19 square miles, and is centered about its downtown commercial district. Dr. Griffin was the lead project engineer to develop a long-term control plan for the City to meet a federal consent decree. He led the generation of a combined sewer system evaluation report that analyzed and documented a 15-month field study of water quality of the sanitary, storm water, and combined sewage. There was a strict deadline imposed on the study by the EPA and state regulatory agency to finish this report, which consisted of approximately 3,500 pages (6 Volumes). Dr. Griffin was also the task leader to develop an analysis of long-term control plan (LTCP) to reduce the pollutants and to bring the combined sewer overflows (CSO) into compliance with water quality standards. This project had an extensive public involvement component that required coordination of information and public presentations about the program. The preferred alternative consisted of approximately $1 billion dollars of capital improvements in the combined sewer service area, and included new sewers, storage, and treatment of the CSO.

Watershed Planning Projects

See Tampa Bay Water and Louisiana Department of Natural Resources project descriptions under *Recent Projects*.

Dr. Griffin quantified planning-level estimates of nonpoint sources of pollution into the Great Swamp National Wildlife Refuge (New Jersey). CH2M HILL assisted a local planning committee to address their management and data needs to protect this valuable national resource. During this project, Dr. Griffin presented results to the planning commission and offered recommendations for further research and data collection. The commission used CH2M HILL's report to develop a regulatory strategy for managing the watershed.

Dr. Griffin assisted in formulating a watershed protection plan for Mecklenburg County, North Carolina. He analyzed the hydrologic regime and coordinated the development of a GIS database for Mountain Island Lake, the county's only drinking water source. Using this database, Dr. Griffin formulated a methodology to determine nonpoint source pollution loadings to the reservoir. The County has established a tough non-degradation policy for its reservoir and CH2M HILL assisted in characterizing the existing water quality, evaluating potential future impacts, and in formulating regulations for implementing a watershed protection plan.

In the area of storm water master planning, Dr. Griffin assisted the City of Gainesville, Florida, in formulating watershed flood control alternatives. He assisted the Miami-Dade County Department of Environmental Resources Management (DERM) in developing guidelines for collecting stormwater data for their master planning program. He managed the development of stormwater master plans for two basins in Miami-Dade County. For certain priority watersheds in Franklin County, Florida, Dr. Griffin examined the local flooding problems and potential water quality loadings into Apalachicola Bay and recommended both flood control and water quality improvements. Dr. Griffin assisted the City of Atlantic Beach, Florida, to meet its master planning requirements, refine its storm water utility data base, and obtain its storm water NPDES permit application. Dr. Griffin also led the development of detailed master plans for two watersheds in Leesburg, Florida, and a Phase I plan for the City of North Miami.

In the area of drainage planning, Dr. Griffin drafted the drainage subelements of the comprehensive plans that CH2M HILL prepared for the cities of Deerfield Beach and Boynton

Beach, Florida. He evaluated the potential effects of proposed drainage facilities on spray irrigation effluent disposal fields owned by a large, Florida-based development company. Also, he provided a technical review of a flood insurance study the U.S. Army Corps of Engineers conducted on Fourche Creek in Little Rock, Arkansas. Dr. Griffin also has prepared Letter of Map Revision applications for the FEMA flood insurance program for the City of Gainesville.

Dr. Griffin has designed stormwater facilities for industrial and water plants sites, and municipal drainage facilities for neighborhoods. In Fort Lauderdale, Florida, Dr. Griffin designed French drains (infiltration systems) for nearly 9,500 linear feet of commercial neighborhoods. In another residential neighborhood, French drains and grit chambers were designed. For the City of Miami Beach, Dr. Griffin performed senior review of preliminary design for new facilities in the South Beach area.

Dr. Griffin was the lead senior reviewer during the design of four stormwater pump stations for the City of Key West. These pump stations were used to pressurize drainage wells used to eliminate stormwater discharges to nearby ocean waters. The pump stations included pretreatment with vortex-type units and ranged in size from 2,500 to 5,000 gallons per minute (gpm).

Under CH2M HILL's contract with the Virgin Islands Port Authority, Dr. Griffin developed sediment control plans for proposed marinas in St. Thomas and St. John. These plans were designed to protect the marinas and off-shore grass beds from the effects of sediment deposition resulting from upland erosion.

To control nutrient runoff from eight dairy farms in the Lake Okeechobee basin in South Florida, Dr. Griffin designed intensive waste management facilities. The project involved coordination with the dairy owners and the South Florida Water Management District to ensure that best management practices could be incorporated into the farmers' operations and still meet Florida's Dairy Rule requirements.

NPDES and Water Quality Related Permitting

See GRU and City of Milton project descriptions under *Recent Projects*.

Dr. Griffin has assisted clients such as Jacksonville, Lakeland Electric, Pace, Key West, Gasparilla Island Water Association, Cooper City, Chevron Terminal, and a Tropicana processing facility in the Tampa Bay area evaluate dilution and water quality effects from their outfalls. These effects must consider the water quality and antidegradation implications to satisfy Florida rules and obtain permits. Several of these projects also involved predicting mixing zones and plume dilution using computer models. Dr. Griffin also modeled the mixing zone for the Arecibo regional wastewater plant in Puerto Rico. The concentrate from membrane treatment also requires similar evaluations. Dr. Griffin has assisted Palm Coast and Gasparilla Island obtain permits for brine discharge too.

Dr. Griffin assisted United Water Florida (UWFL), a private utility company in Jacksonville, Florida, to address a variety of permitting issues. CH2M HILL has been providing environmental permitting assistance for this utility for about 20 years. Projects Dr. Griffin completed or managed for the utility include:

- Yulee Service Area

  - Develop conceptual disposal plan for effluent management. This plan was used to select and locate a new regional wastewater treatment facility (WWTF). The recommended alternative was a wetland disposal system.
  - Conducted wetland sampling and prepared permit documentation for the baseline monitoring requirements of the wetland disposal system.
  - Conducted receiving water sampling and prepared permit documentation to address water quality and antidegradation issues for effluent disposal system.
  - Prepared the application and obtained an NPDES disposal permit for the regional WWTF.
  - Provided environmental and geotechnical services to support UWFL's purchase of the wetland and WWTF site.

- Jacksonville Heights WWTF
  - Conducted receiving water sampling and generated a Level I water quality based effluent limit report for a permit renewal.
  - Conducted a detailed toxicity identification evaluation of the effluent. Continuing professional engineering support is being provided to address an Administrative Order on this facility.
  - Conducted in-stream sampling, benthic monitoring, and bioassay testing of the receiving water.
- Royal Lakes WWTF
  - Developed an antidegradation analysis for a new direct discharge outfall into the St. Johns River to replace wetland discharge.
  - Monitored the St. Johns River for discharge permit compliance.
- San Jose WWTF
  - Assisted permit renewal by studying the mixing characteristics of the outfall.
- Monterey WWTF
  - Performed the antidegradation analysis for the permit renewal documentation.
- Ponte Vedra WWTF
  - Conducted an assessment of the treatment performance of the WWTF, including the existing percolation system used for effluent disposal.
  - Developed a Capacity Analysis Report for permit application.
  - Developed an Operations and Maintenance Report for permit application.

- Ortega Hills WWTF
  - Prepared a permit renewal application.
- Holly Oaks WWTF
  - Conducted a limited toxicity identification evaluation.
- Sunray Utilities
  - Reviewed the condition and permit history of water and wastewater treatment facilities in St. Johns and Nassau Counties in support of UWFL purchase of a utility company.
- Blacks Ford Regional WWTF
  - Develop conceptual disposal plan for effluent management. This plan was used to select and locate a new regional WWTF. The recommended alternative was a wetland disposal system.
  - Conducted wetland sampling and prepared permit documentation for the baseline monitoring requirements of the wetland disposal system.
  - Conducted receiving water sampling and prepared permit documentation to address water quality and antidegradation issues for effluent disposal system.
  - Prepared application for an NPDES disposal permit for the regional WWTF.
  - Provided environmental and geotechnical services to support UWFL's purchase of wetland and WWTF site.
  - Conducting operation monitoring of the wetland after the WWTF was constructed.
- Permit Tracking Software
  - Developed an ACCESS database application that can assist UWF track scheduled permit conditions.

Dr. Griffin has assisted the City of Jacksonville to address antidegradation permitting requirements for wastewater plants. The Arlington East regional facility discharges directly into the St. Johns River. The anti-degradation study evaluated water quality effects, natural systems effects, potential for reuse, and other public interests of the project. As an outgrowth of this project, Dr. Griffin assisted the City respond to regulators requests for information at their other wastewater treatment plants concerning the effect of nutrients on the St. Johns River near the outfalls. He has also prepared mixing zone applications for Arlington East, Buckman, Southwest, and District II water reclamation facilities for selected metals.

Dr. Griffin assisted a pulp mill in North Florida conduct an investigation on possible mercury contamination in the surrounding environment. This investigation examined surface and ground waters, sediments, and bio-accumulation. The plan of study, which was negotiated with the state regulatory agency, stipulated a phased approach that conducted a screening-level

investigation, followed by an intensive remediation study if mercury in alarming levels are found. Ultra-clean laboratory measurements were used as quality assurance controls on some of the samples. Levels found within the sediments were not significantly higher than other background stations.

Dr. Griffin managed a Level II Water Quality-Based Effluent Limitation (WQBEL) study for the New Township of Poinciana, Florida. This wasteload allocation project differed from traditional studies because the water quality within the water body as a result of loadings from both point and nonpoint sources must be determined to establish the point source discharge limitations. This study involved negotiating a detailed plan of study with the state regulatory agency, collecting field water quality data, and computer modeling of dissolved oxygen dynamics in a canal and of nonpoint sources of nutrient loadings and their impact on Lake Hatchineha. Dr. Griffin has also conducted WQBEL analyses for Orange County Utilities Department for discharge of diluted leachate from its landfill stormwater ponds.

Dr. Griffin assisted several clients in obtaining NPDES storm water permits. For the City of Jacksonville, he provided technical quality control guidance and reviewed the preparation the City's municipal permit application. Dr. Griffin had primary responsibility in designing the storm water sampling program and estimating pollutant loadings for the more than 500 outfalls in the City. Other permit applications were prepared for the Department of Transportation, City of Neptune Beach, and City of Atlantic Beach. For Atlantic Beach, Dr. Griffin was the project leader. He also prepared a group application for several wastewater treatment plants in the Jacksonville area.

Dr. Griffin has also assisted clients in operating their stormwater systems after being permitted by EPA's stormwater NPDES permits. Dr. Griffin led the dry weather sampling effort by the City of Miami to collect water quality samples at priority outfalls within the City. Sediment and benthic samples were collected along Wagner Creek for permit compliance. Final reports were developed for the City to use as part of their annual compliance report. Dr. Griffin has assisted industrial clients prepare stormwater pollution prevention plans for their NPDES stormwater permit compliance also.

Combined Sewer Overflow

See City of Atlanta project description under *Recent Projects*.

During CH2M HILL's development of a facility plan to reduce combined sewer overflows (CSO) into Boston Harbor, Dr. Griffin developed a FORTRAN computer model to simulate the performance of large-scale storage facilities (deep tunnels). This program was used to evaluate all deep tunnel alternatives and included optimizing the size of the secondary treatment facility to economically treat wet-weather flows.

For the City of Bangor, Maine, Dr. Griffin provided senior consulting to develop the computer model used to simulate their combined sewer system. Dr. Griffin wrote a program to determine rainfall-derived inflow and infiltration (RDII) component of combined sewage. This final model combined custom programming and elements of the SWMM computer model to more accurately represent inflow and infiltration into the collection system. The final model was used to evaluate the magnitude CSO discharges and the effectiveness of alternative controls.

Technical Society Related

Dr. Griffin was the principal investigator of the Water Pollution Control Federation Research Foundation, now called Water Environment Research Foundation (WERF), critical assessment of the literature pertaining to nonpoint source pollution impacts. The newly formed research foundation sponsored assessments of literature to determine research needs in specific technical areas. With the advent of water quality-based effluent limitations, the impacts of nonpoint sources of pollution on water bodies will become an increasingly important topic for members of WERF. Dr. Griffin managed this project which developed a state of the art assessment and led a public workshop to develop projects for WERF. These projects were used by WERF to establish its first five-year research agenda.

Dr. Griffin led a two-day seminar sponsored by the American Society of Civil Engineers (ASCE) about municipal NPDES storm water permits. This seminar discussed regulatory requirements, management strategies to develop the permit application, best management practices and their effectiveness, and an overview of industrial permit requirements. The seminar was attended by 40 participants and had guest speakers from EPA and a municipality.

Dr. Griffin compiled a technical comment report on the Upper Raba River Watershed Management Plan in Poland. The Upper Raba River watershed feeds the Dobczyce Reservoir that is a primary source of drinking water for Krakow. Currently, there is serious concern over improperly treated wastewater discharges and eutrophication from nonpoint sources of runoff, which is causing rapid aging of this relatively new reservoir. The Water Environment Federation (WEF) was funded through the U.S. EPA to provide technical assistance to Eastern Europe and WEF consequently relied on its members' expertise to provide comments. Dr. Griffin participated and then synthesized these comments into an organized report.

Experience Prior to CH2M HILL

Dr. Griffin's doctoral studies focused on a computer-aided design procedure to determine precipitation data enabling the simulation of average annual erosion estimates from small landscapes. He was a principal researcher on a USDA-funded project that evaluated interactions among erosion, crop productivity, economics, and spatial variability. Dr. Griffin worked extensively with the ANSWERS and CREAMS models.

Dr. Griffin worked as a project water resource engineering consultant in Texas evaluating water supply primarily. He determined the operating characteristics of over 16 reservoirs in a single watershed comprising more than 2,000 square miles, evaluated critical water supply reserves for several municipalities in western Texas, monitored water supply reserves of Tarrant County, simulated water quality of Lake Ray Hubbard in Dallas, plus other various assignments.

Dr. Griffin has conducted tracer tests to determine flow rates and residence time analyses (using reactor theory models). For his M.S. thesis, he conducted a significant amount of dye testing to determine the hydraulic flow and residence time in model sediment ponds. These results were utilized in the formulation of the University of Kentucky's SEDIMOT computer program that analyses the performance of settling ponds. As part of his permitting support described under CH2M HILL experience, he has conducted tracer studies for water quality evaluations (Poinciana and Ponte Vedra). He also has utilized dye tracers to evaluate sewer systems during the development of storm water permits.

Professional Organizations/Affiliations

Florida Engineering Society

- North Central Chapter President, 2001, Treasurer 2006 to present.
- Mathcounts North Central Chapter Chairman, 1998 to 2007, Co-chair to present.

American Water Resources Association

Water Environment Federation

- Nonpoint source committee past vice-chair then chair (2001 through 2004)
- Co-Chair of TMDL 2005 and TMDL 2007, National Specialty Conference

National Society of Professional Engineers

Publications and Presentations

Griffin, M., S. Gong, J. Fitzgerald (2010). Feasibility Evaluations for St. Johns River Membrane Water Plant Demineralization Concentrate Management. Presented at the 2010 World Environmental and Water Resources Congress, Providence, RI, May 19, 2010.

Griffin, M., A. Tyagi, E. Thomas, K. McLane, and L. Traynham (2009). Integrating Water Quality And Water Supply Objectives in Regional Applications: A Case Study of the Lower St. Johns River Basin, Presented at the Florida Water Resource Conference, West Palm Beach, FL, February 20, 2009.

Tyagi, A., Patwardhan, A., and Griffin, M. (2008). Water Supply Planning Solutions Using Total Water Management Approach, Presented at the Texas Water 2008, San Antonio, TX, March 26, 2008.

Thomas, E., McLane, B. K., Tyagi, A. Traynham, L. and Griffin, M. (2008). Solving Issues of Water Supply and Quality through Optimal Urban Reuse Applications: A Case Study of the Lower St. Johns River. Presented at the 23rd Annual WateReuse Symposium, Dallas, TX, September 7-10, 2008.

Thomas, E., McLane, B. K., Bolam, D., Russell, B., Patwardhan, A., Tyagi, A., Griffin, M. (2008). Regional Management Approaches to Water Crisis: Solving TMDL and Water Supply Issues Concurrently, Presented at WEFTEC 2008, Chicago.

Mitchell L. Griffin, Marc Ischen, Steven W. Gong, and John M. Fitzgerald. 2007. NE Florida Ocean Outfall Feasibility Evaluation for Demineralization Concentrate. Presented at 22nd Annual WateReuse Symposium, Tampa, Florida, September 11, 2007.

Mitchell L. Griffin, Saurabh Srivastava, and James S. Bays. 2007. Modeling Wetland/Wet Pond BMPs for Urban Stormwater. Invited presentation at *Urban Runoff Modeling: Intelligent Modeling to Improve Stormwater Management*. Sponsored by U.S. Environmental Protection Agency, American Society of Civil Engineers, and National Science Foundation. Humboldt State University, Arcata, CA. July 22-27, 2007

Mitchell Griffin, Brett Goodman, Rick Hutton, William Dunn, Troy Scott, Martha Klein. Tracking And Investigating Microbial Sources in Gainesville's Urban Creeks.

Proceedings of the Water Environment Federation Specialty Conference, TMDL 2007. Bellvue, WA. June 2007.

Janice Lantrip, Mitchell Griffin, and Alaa Aly. 2005. Results of Near-Term Forecasting of Surface Water Supplies. Presented at the ASCE World Water and Environmental Resources Congress 2005. Anchorage, AK. May 2005.

Mitchell Griffin, Aditya Tyagi, and Alison Adams. 2004. Multifaceted Time Series Forecasts of a Complex Surface Water Supply. Presented at AWWA Source Water Specialty Conference. Austin, TX. January 2004.

Janice Lantrip, Mitchell Griffin, and Alaa Aly. 2004. Near-term Forecasting of Surface Water Supplies for a Regional Water Utility. Presented at AWWA Source Water Specialty Conference. Austin, TX. January 2004.

Michael Mynhier, Tyler Richards, Mitchell Griffin, and Ron Wycoff. 2001. "A Separate Peace, Atlanta, GA Considers Three Options for Remediating Its Combined Sewers." *Water Environment & Technology.* Alexandria, Virginia: Water Environment Federation. Vol(13):10, October 2001.

Michael Mynhier, Tyler Richards, Mitchell Griffin, and Ron Wycoff. 2001. City of Atlanta CSO Remedial Measures Program. *Proceedings of Technical Session: Wet Weather Issues II.* Atlanta, Georgia. Water Environment Federation. October 2001.

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Supplemental Information

Years Experience Prior to CH2M HILL: 8 years
CH2M HILL Hire Date: August 1988

Employment History

1988 to present	CH2M HILL, Water Resource Engineer. Senior engineer dealing with a variety of surface water issues for the firm's clients. See the relevant project experience section.
1984 to 1988	Purdue University, Graduate Research Instructor. Conducted research related to soil and water conservation modeling in rural areas. The USDA Soil Erosion Research Laboratory sponsored this work.
1983 to 1984	Freese and Nichols, Inc., Water Resource Engineer. Staff consulting engineer dealing primarily with water supply and other water resources projects.

1980 to 1983 University of Kentucky, Agricultural Engineer. Conducted research related to predicting sediment pond performance for the removal of solids from stormwater runoff.