

U.S. Department of Energy
Office of Civilian Radioactive Waste Management

TSPA-SR Model Implementation

Presented to:

**NRC/DOE Technical Exchange on Total System
Performance Assessment (TSPA) for Yucca Mountain
San Antonio, Texas**

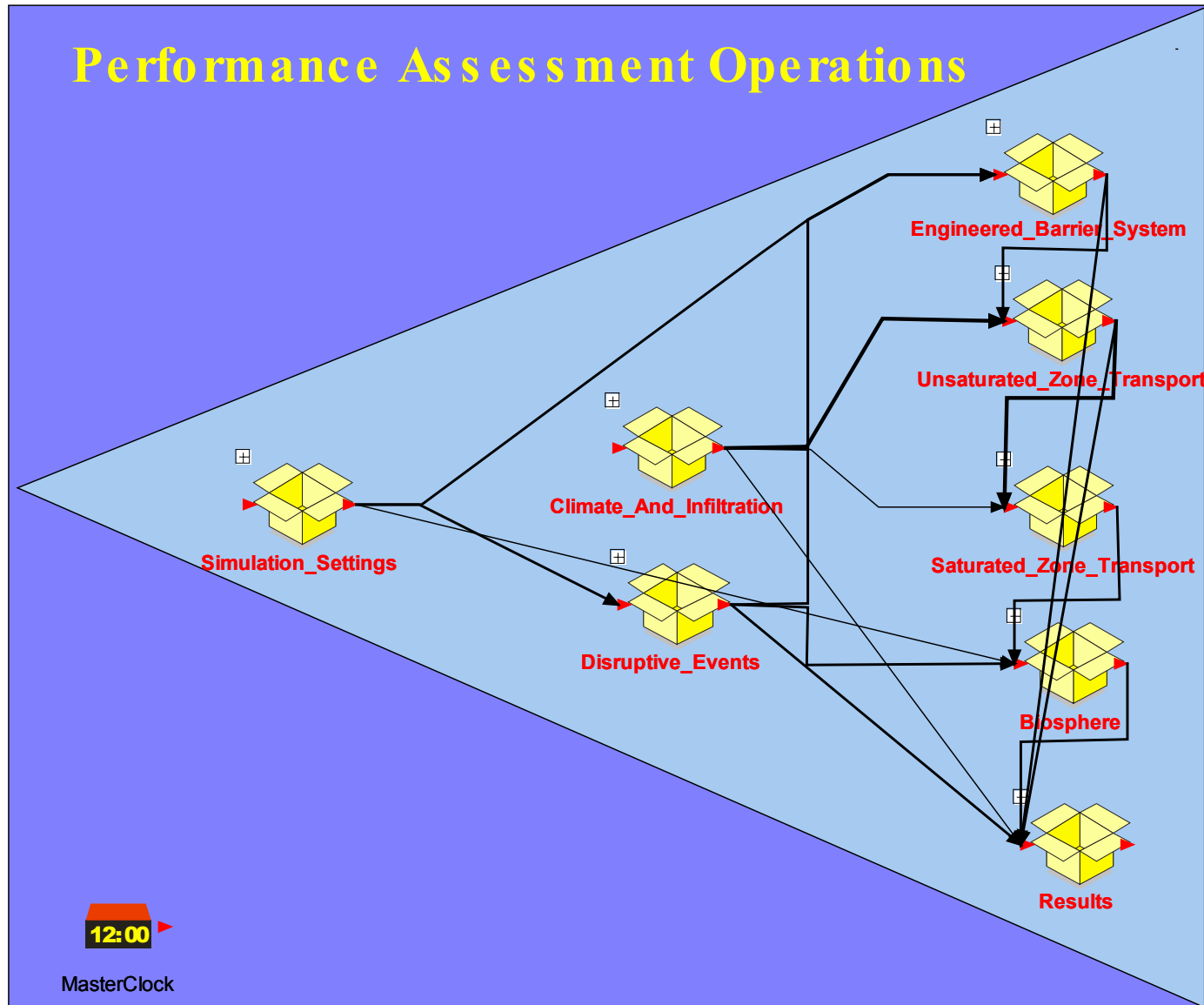
Presented by:

**S. David Sevougian
Performance Assessment Department
CRWMS M&O**

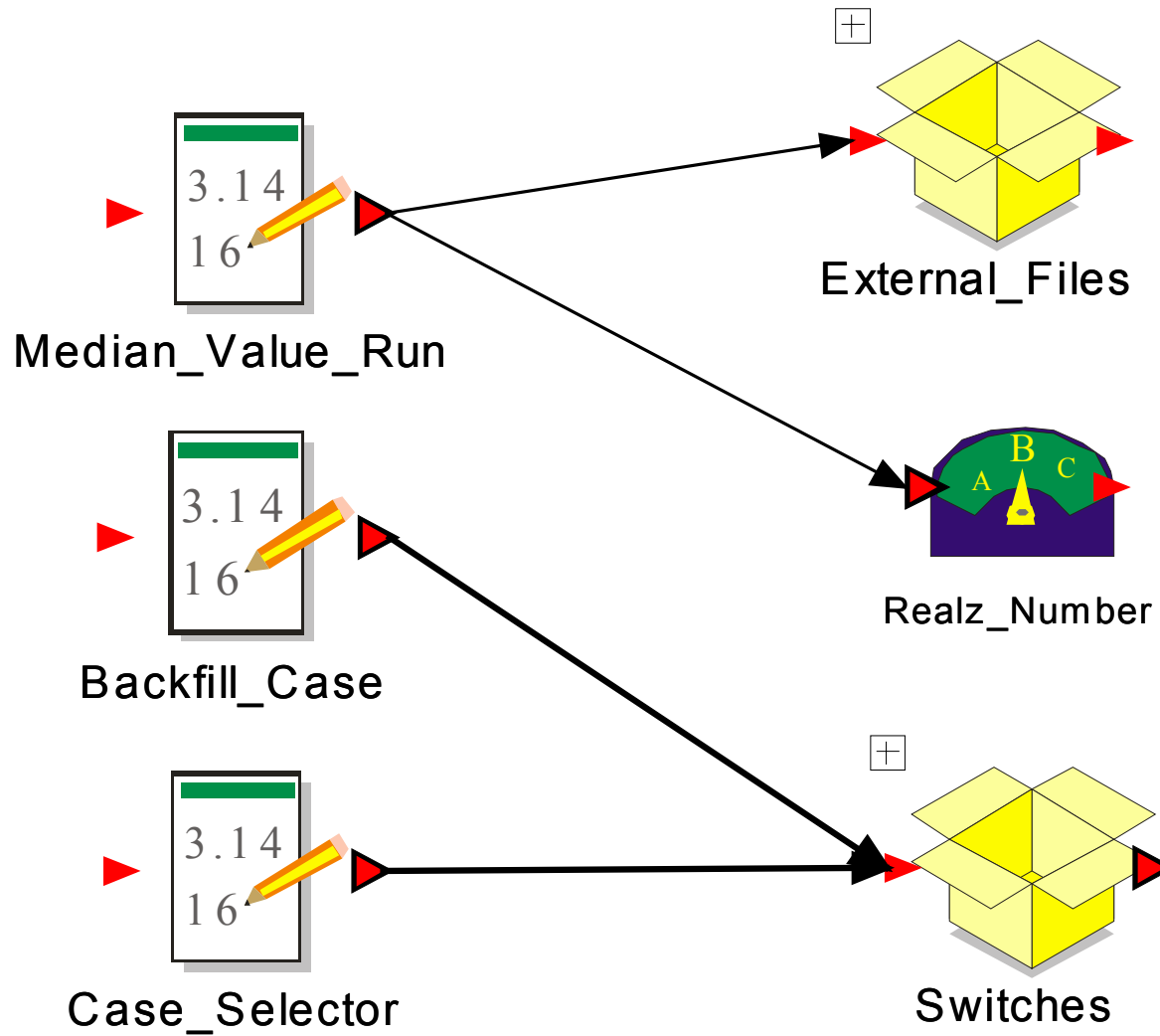
June 7, 2000

YUCCA
MOUNTAIN
PROJECT

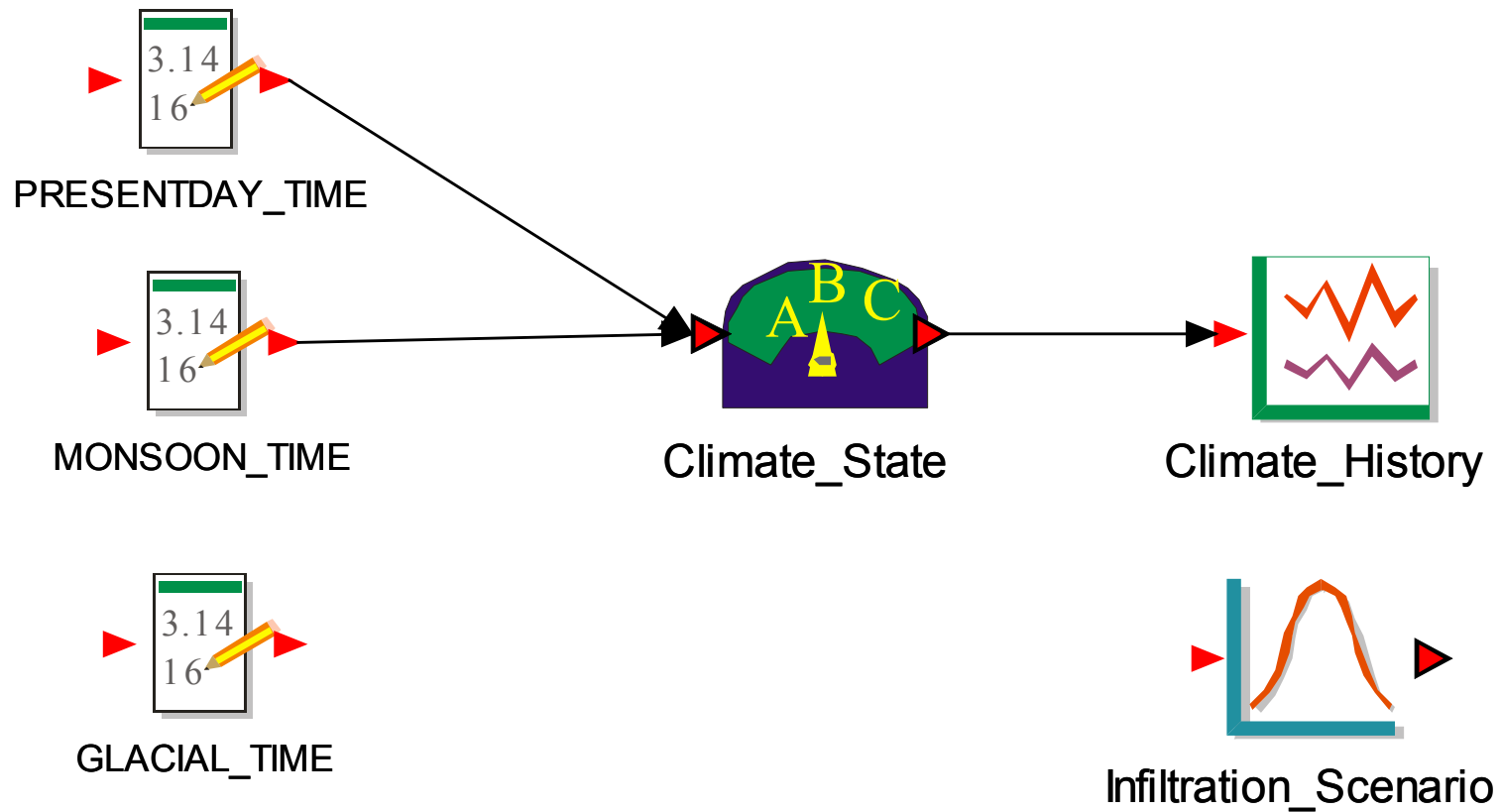
TSPA Model for Site Recommendation



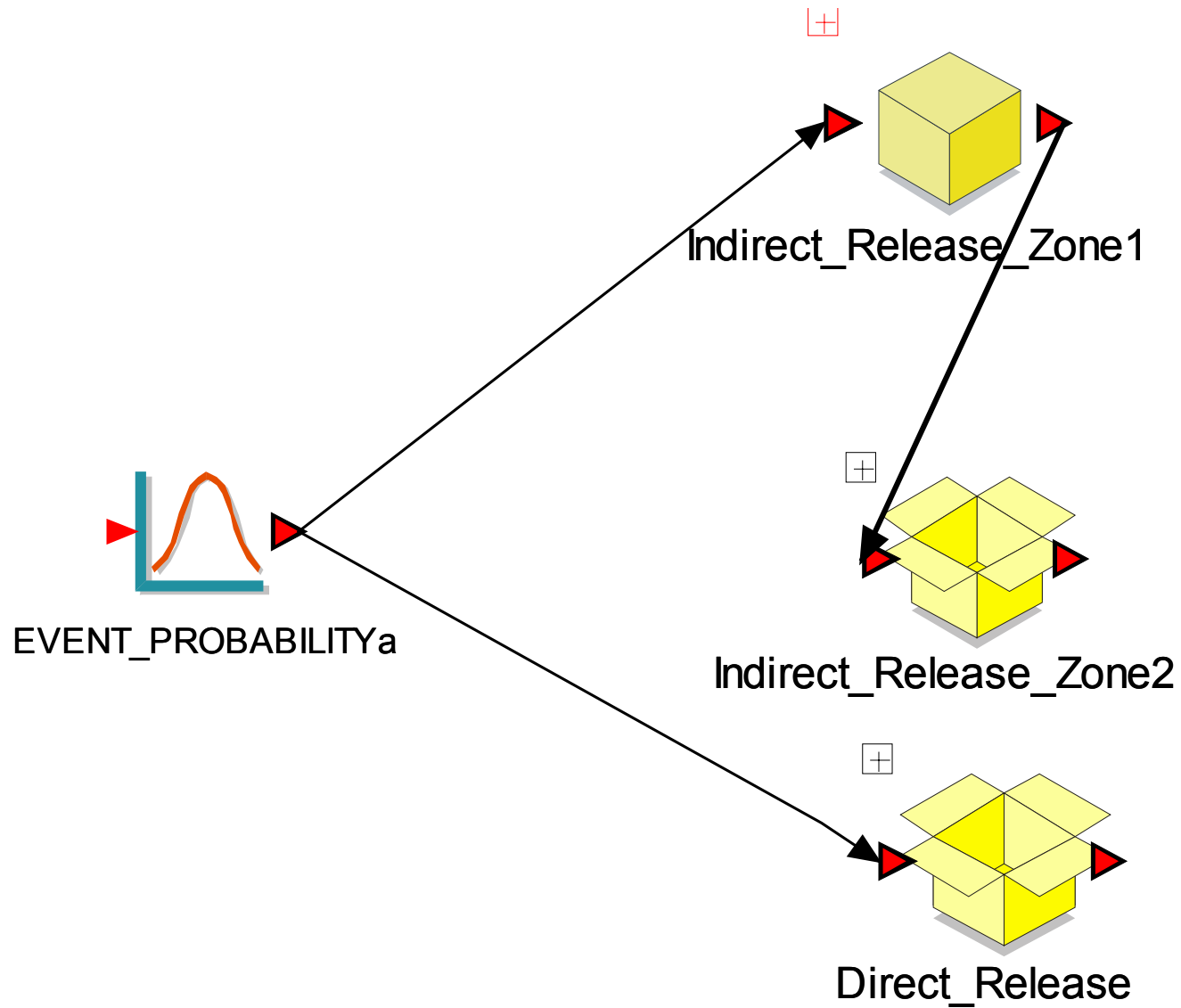
Simulation Settings Submodel



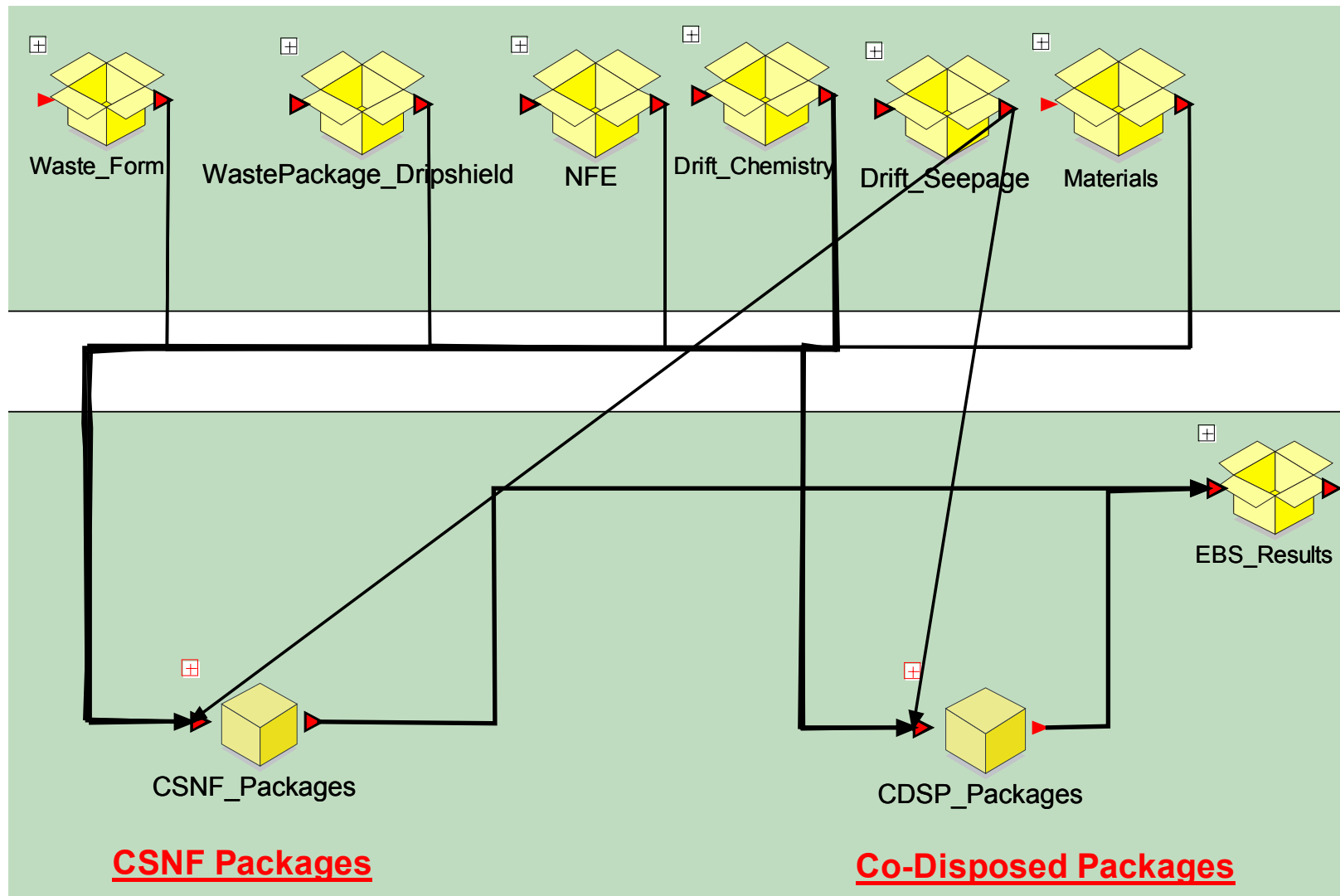
Climate and Infiltration Submodel



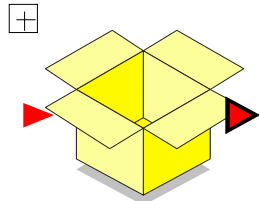
Disruptive Events Submodel



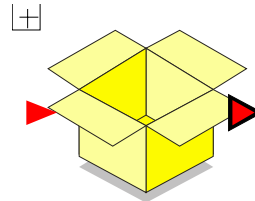
Engineered Barrier System Submodel



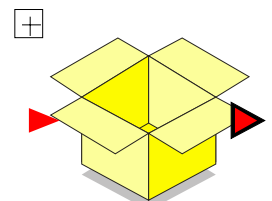
Waste Form Component of the EBS Submodel



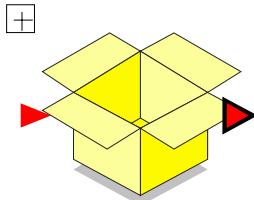
Rn_Inventory



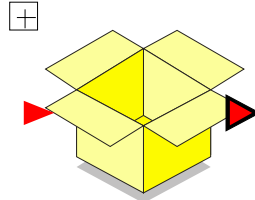
In_Package_Chemistry



Solubilities



DSNF_Dissolution

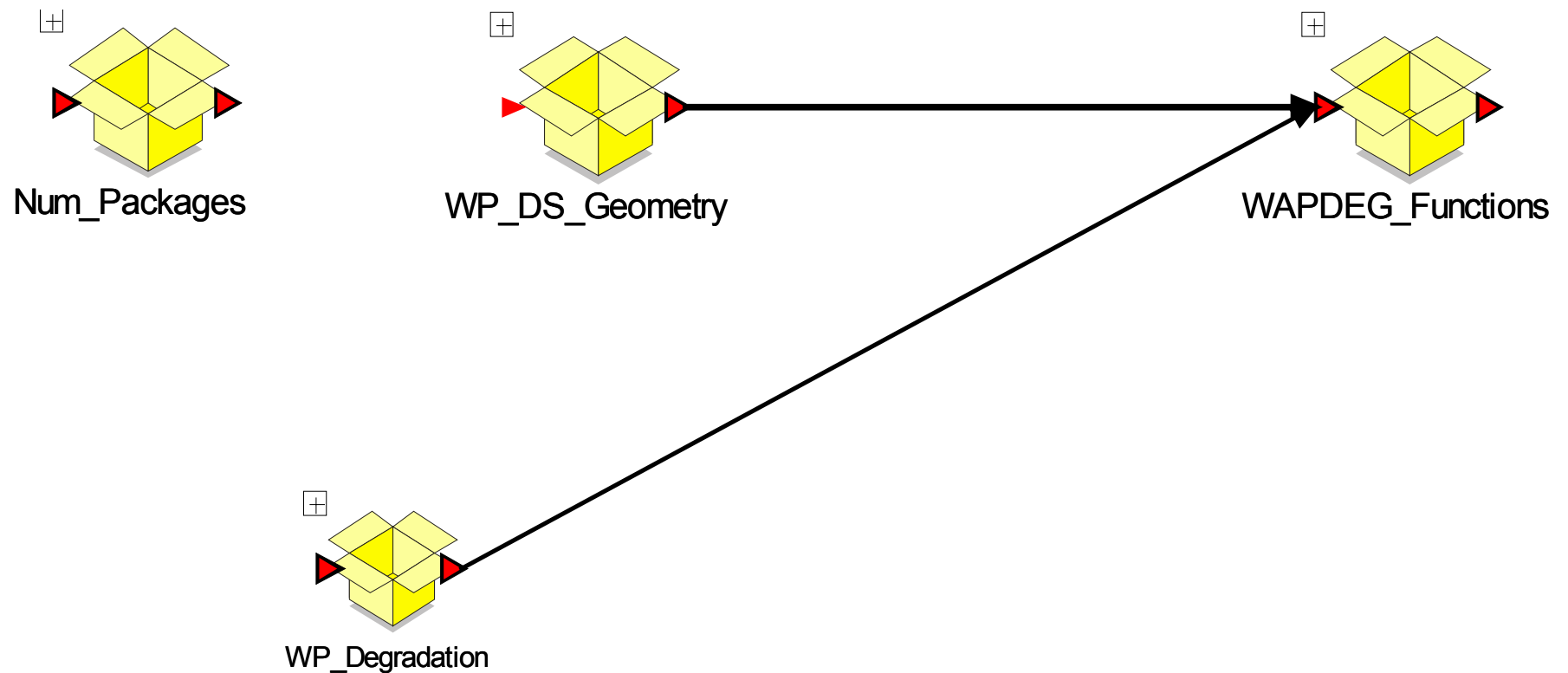


Glass_Dissolution_Parameters

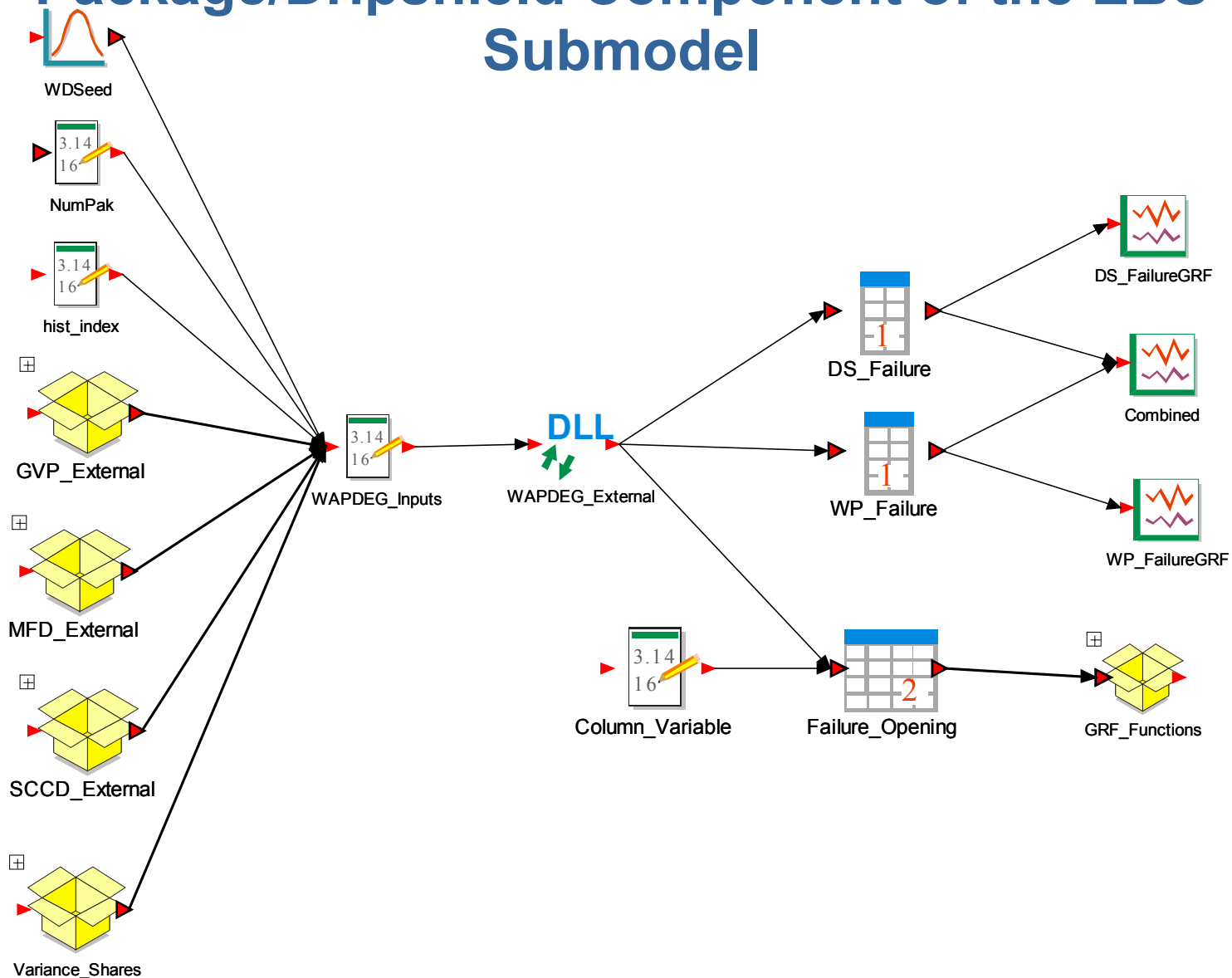


Dissolution_Threshold

Waste Package/Dripshield Component of the EBS Submodel



WAPDEG Calculations in the Waste Package/Dripshield Component of the EBS Submodel



Properties Window of WAPDEG in the Waste Package/Dripshield Component of the EBS Submodel

External Properties : WAPDEG_External

Definition

Element ID:

Description:

Definition

DLL:

Function:

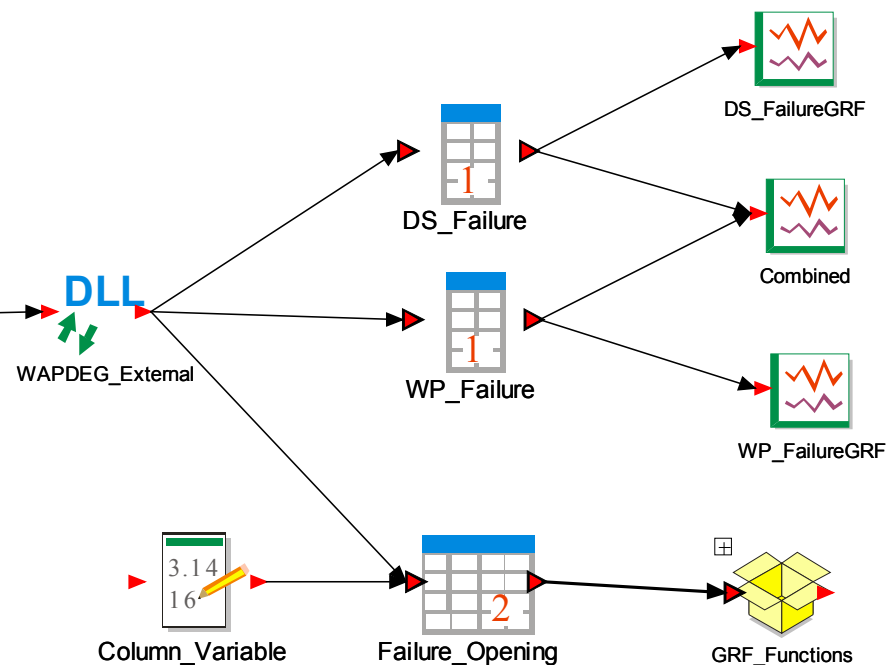
1 Inputs

3 Outputs

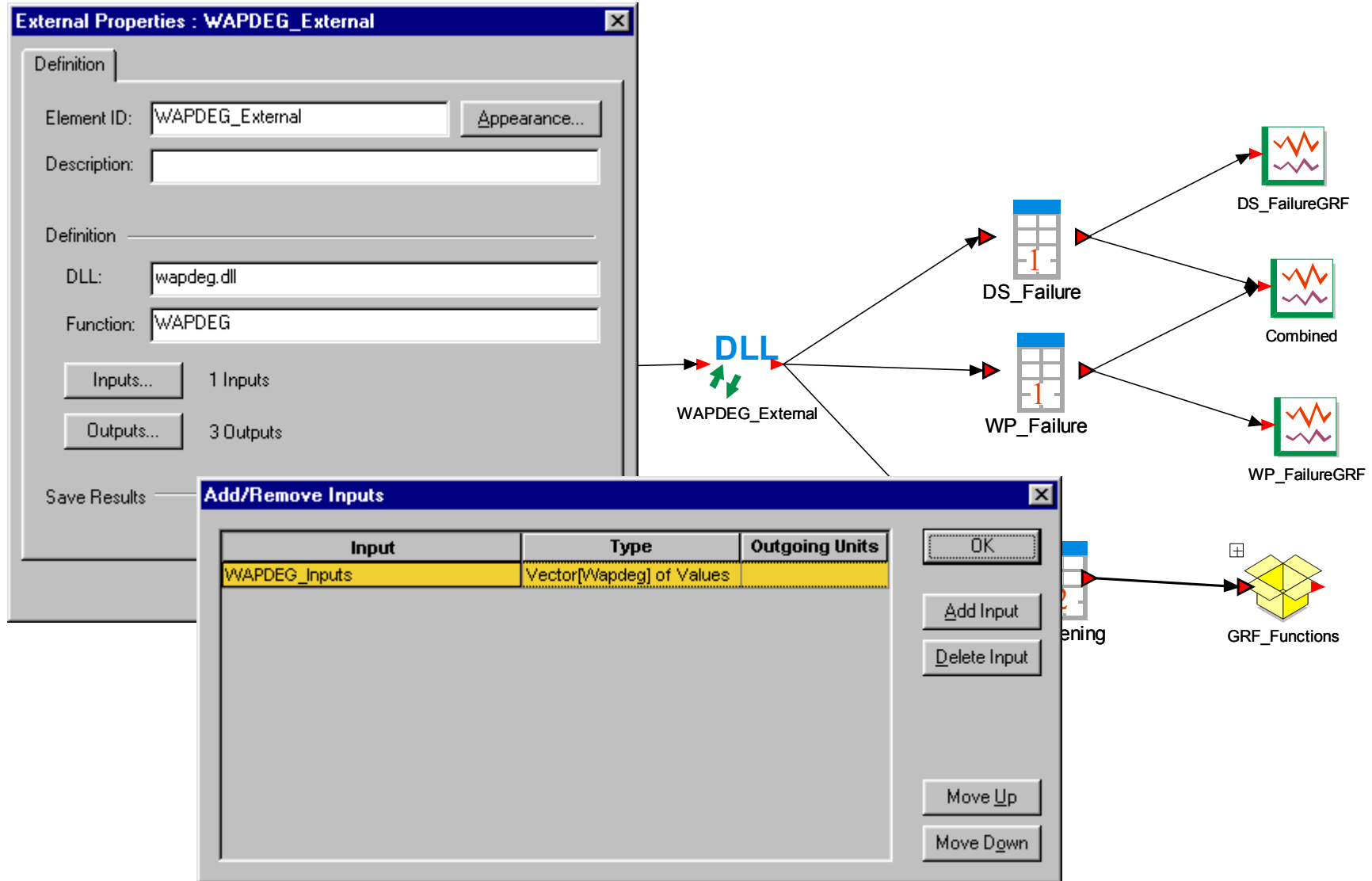
Save Results ☒ Final Values ☐ Time Histories

SCCD_External

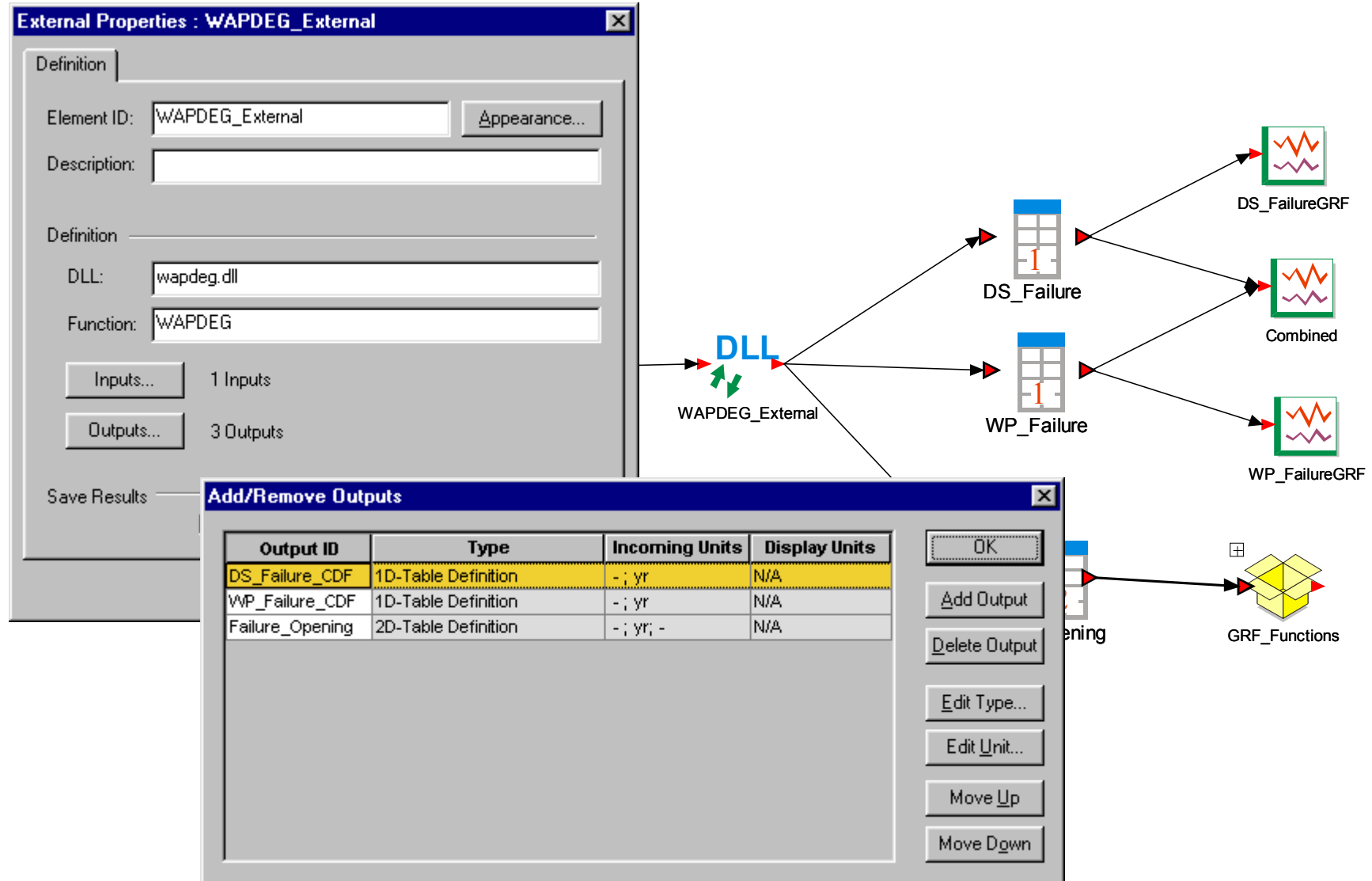
Variance_Shares



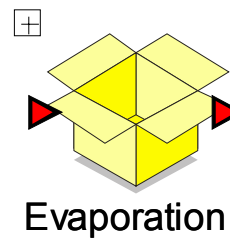
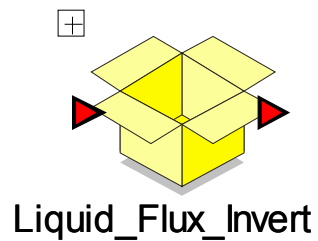
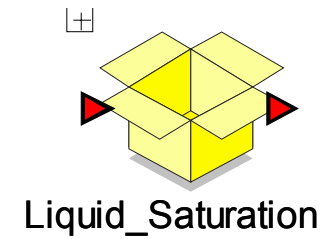
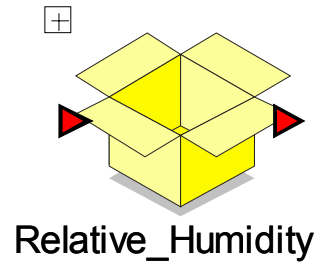
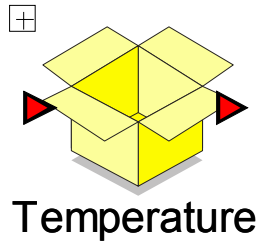
WAPDEG Inputs in the Waste Package/Dripshield Component of the EBS Submodel



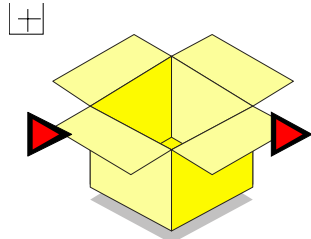
WAPDEG Outputs in the Waste Package/Dripshield Component of the EBS Submodel



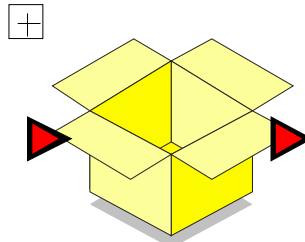
Near Field Environment - Thermohydrology Component of the EBS Submodel



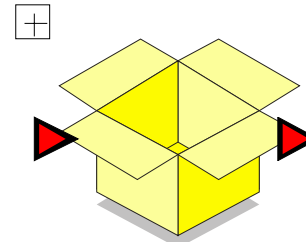
Drift Chemistry Component of the EBS Submodel



Ionic_Strength_Invert

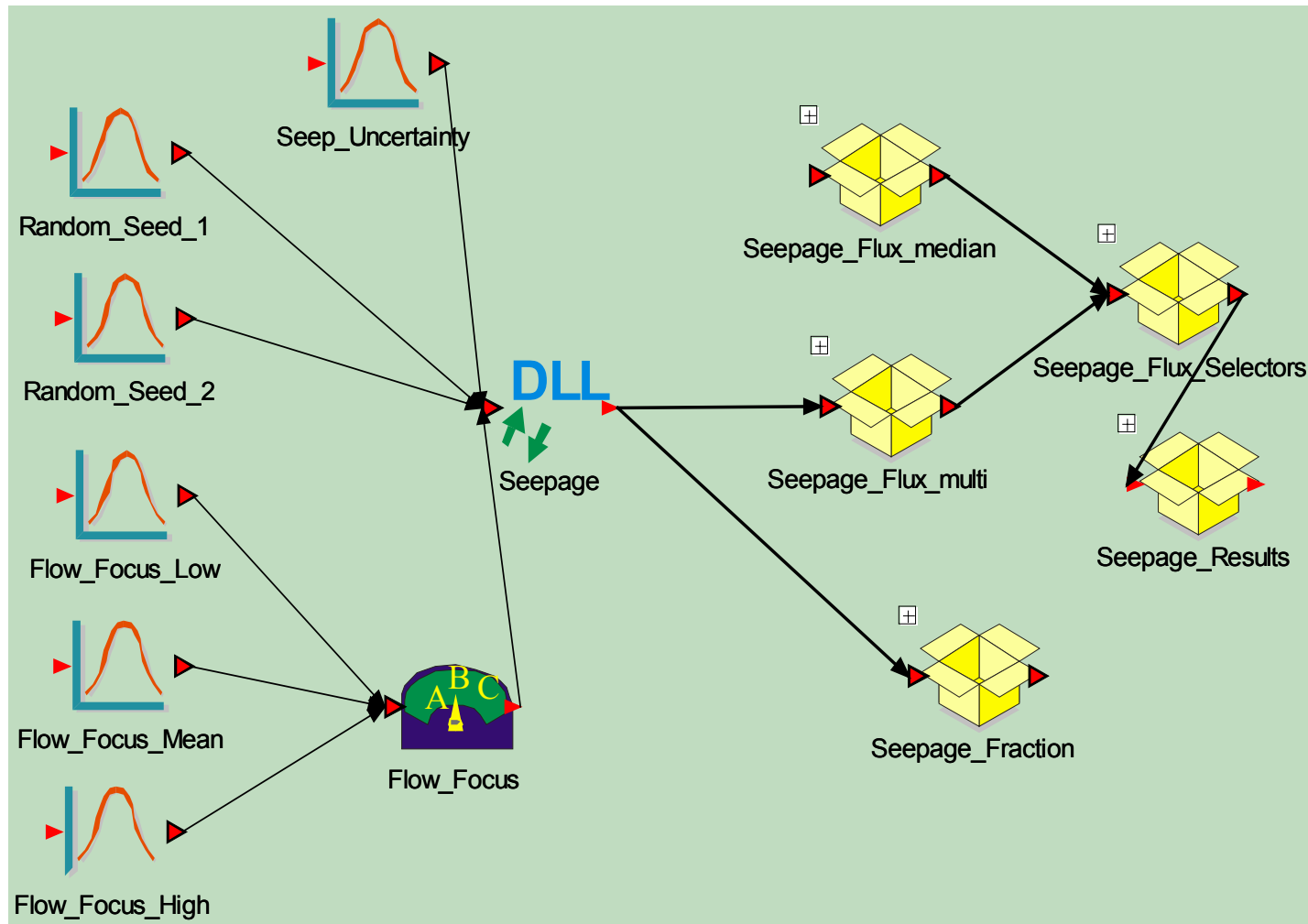


Chloride_Invert

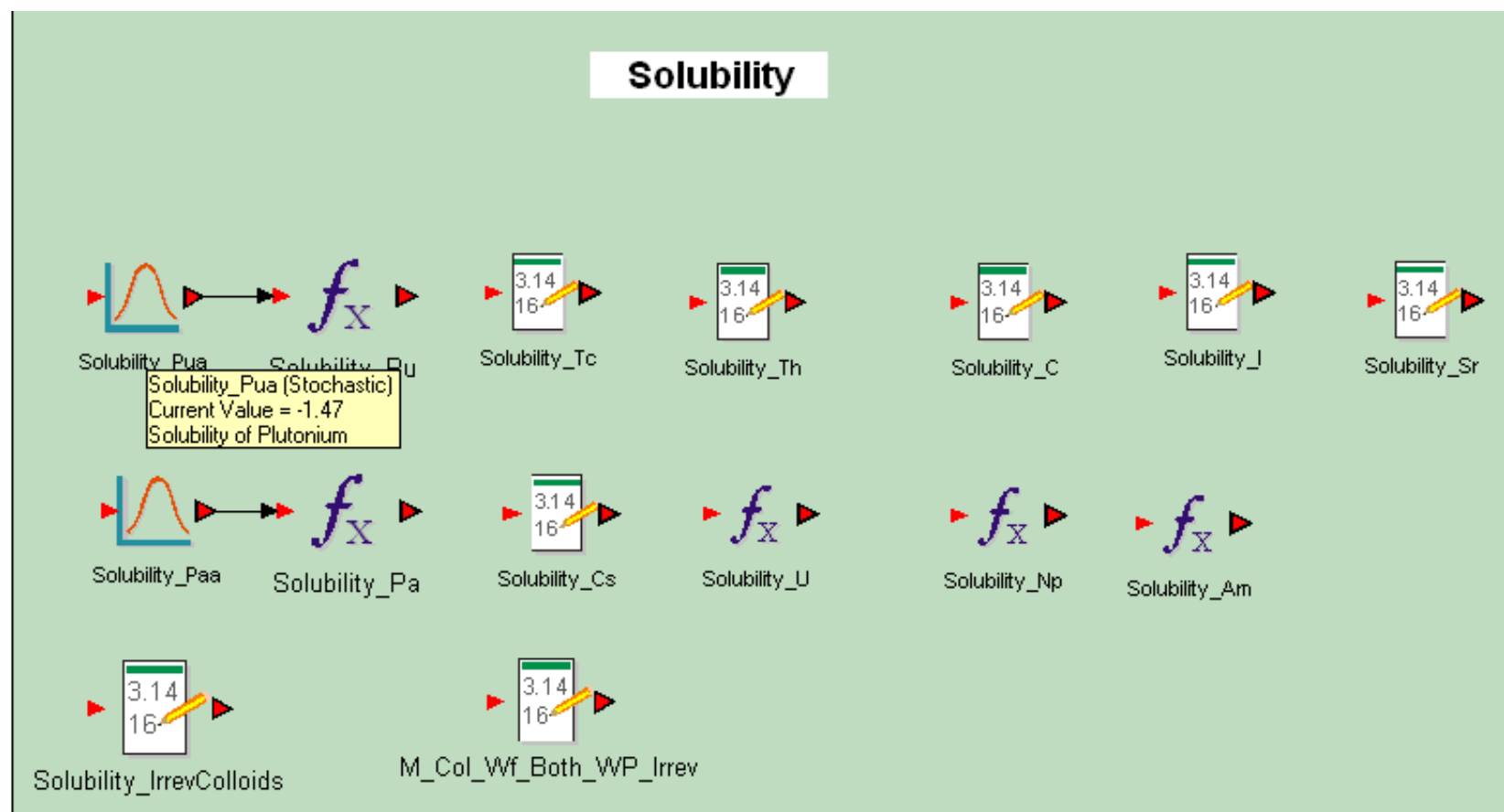


pH

Drift Seepage Component of the EBS Submodel



Example of Current Values of Fixed Parameters, Stochastic Parameters, and Calculations



Example of Stochastic Parameter Definitions

Solubility

The diagram illustrates the stochastic parameter definitions for Solubility. It shows a flow from input parameters (Solubility_Pua, Solubility_Paa) through a function f_X to output parameters (Solubility_Pu, Solubility_Pa, Solubility_Tc, Solubility-Cs, M_Col_Wf_Both_WP_Ir). Each parameter is associated with a specific stochastic distribution (Gaussian or f_X) and a data table (3.14, 1.6). A central dialog box titled "Stochastic Properties : Solubility_Pua" provides the configuration for the Solubility_Pua parameter.

Stochastic Properties : Solubility_Pua

Definition | Database

Element ID: Solubility_Pua Appearance...

Description: Solubility of Plutonium

Display Units:

Distribution

Uniform
Minimum = -4.62, Maximum = 1.68 Edit Distribution...

Correlated To:

Correlation Factor: 0

Importance Sampling... Sampling: None

Activation

☒ Implicit Trigger (when parent activates)

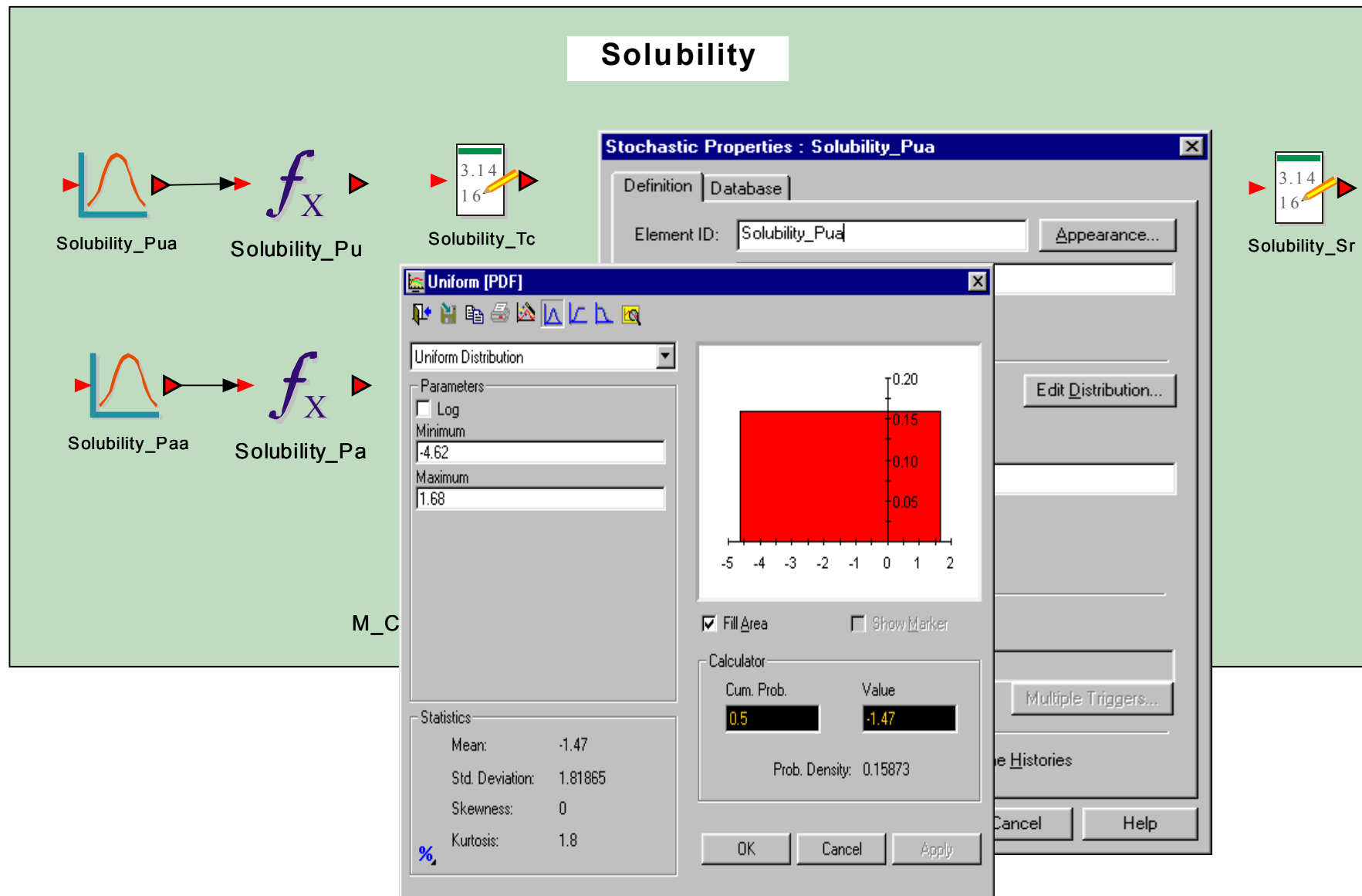
☐ Explicit Trigger Multiple Triggers...

Save Results

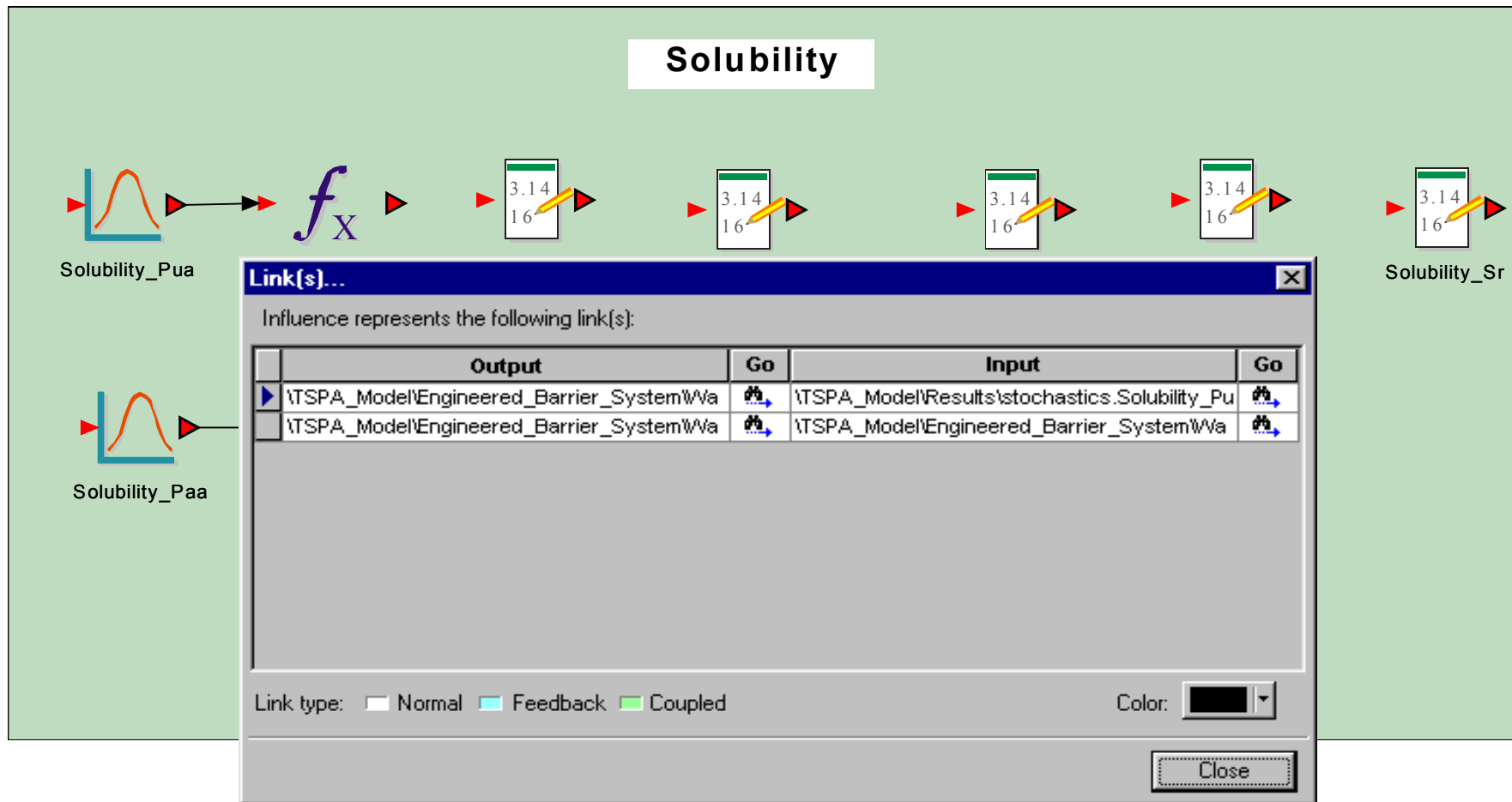
☒ Final Values ☐ Time Histories

OK Cancel Help

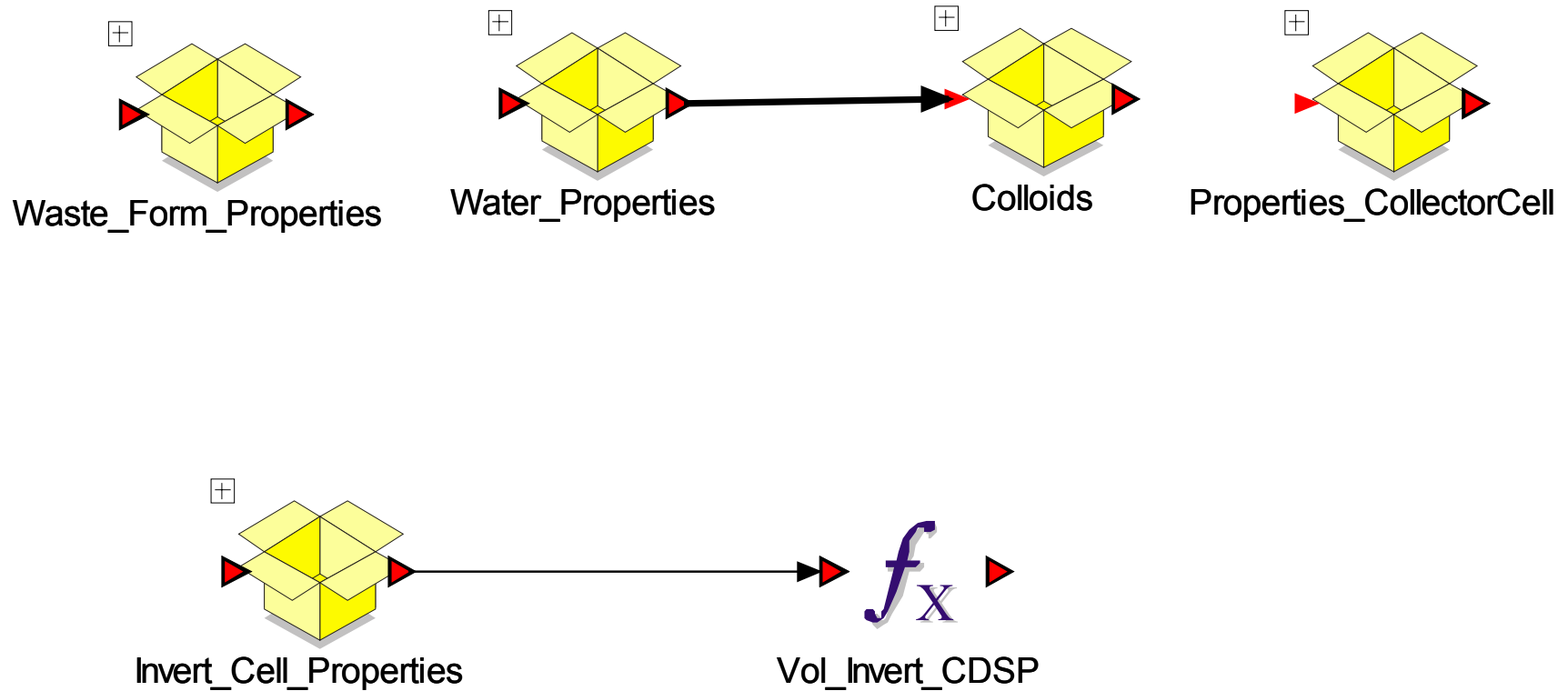
Example of Stochastic Parameter Distribution Definitions



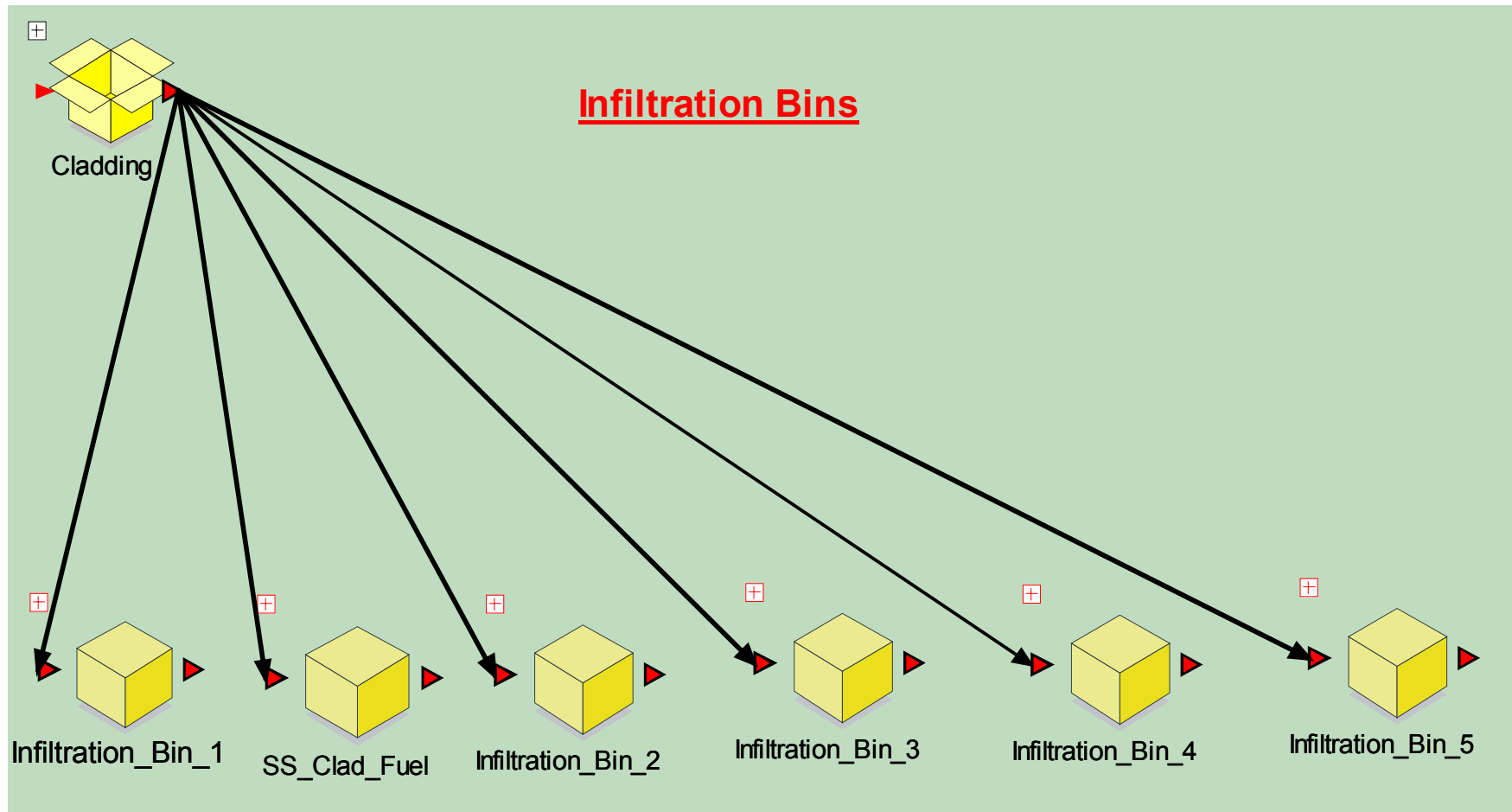
Example of Links Between Model Elements, Components, and Submodels



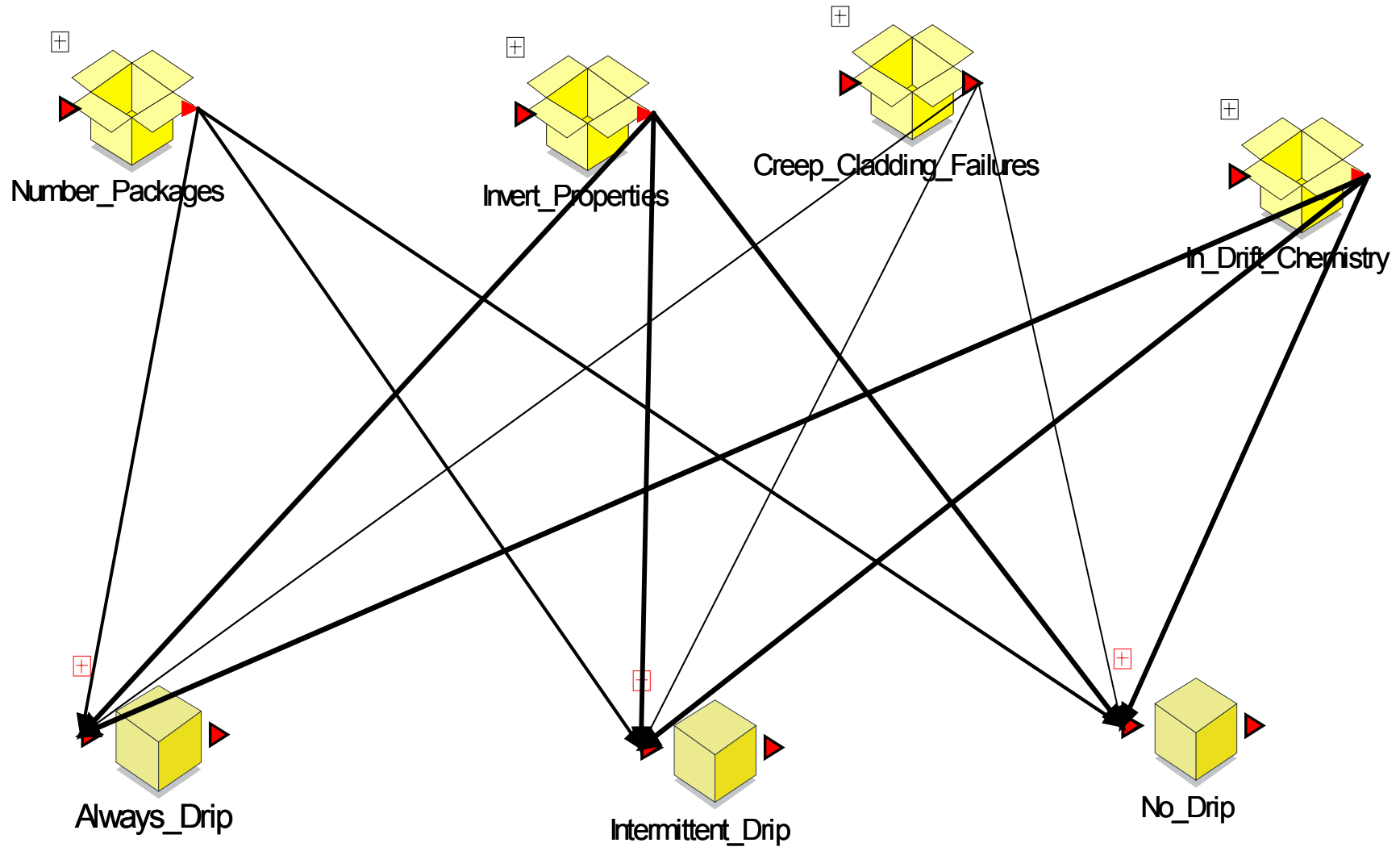
Materials Component of the EBS Submodel



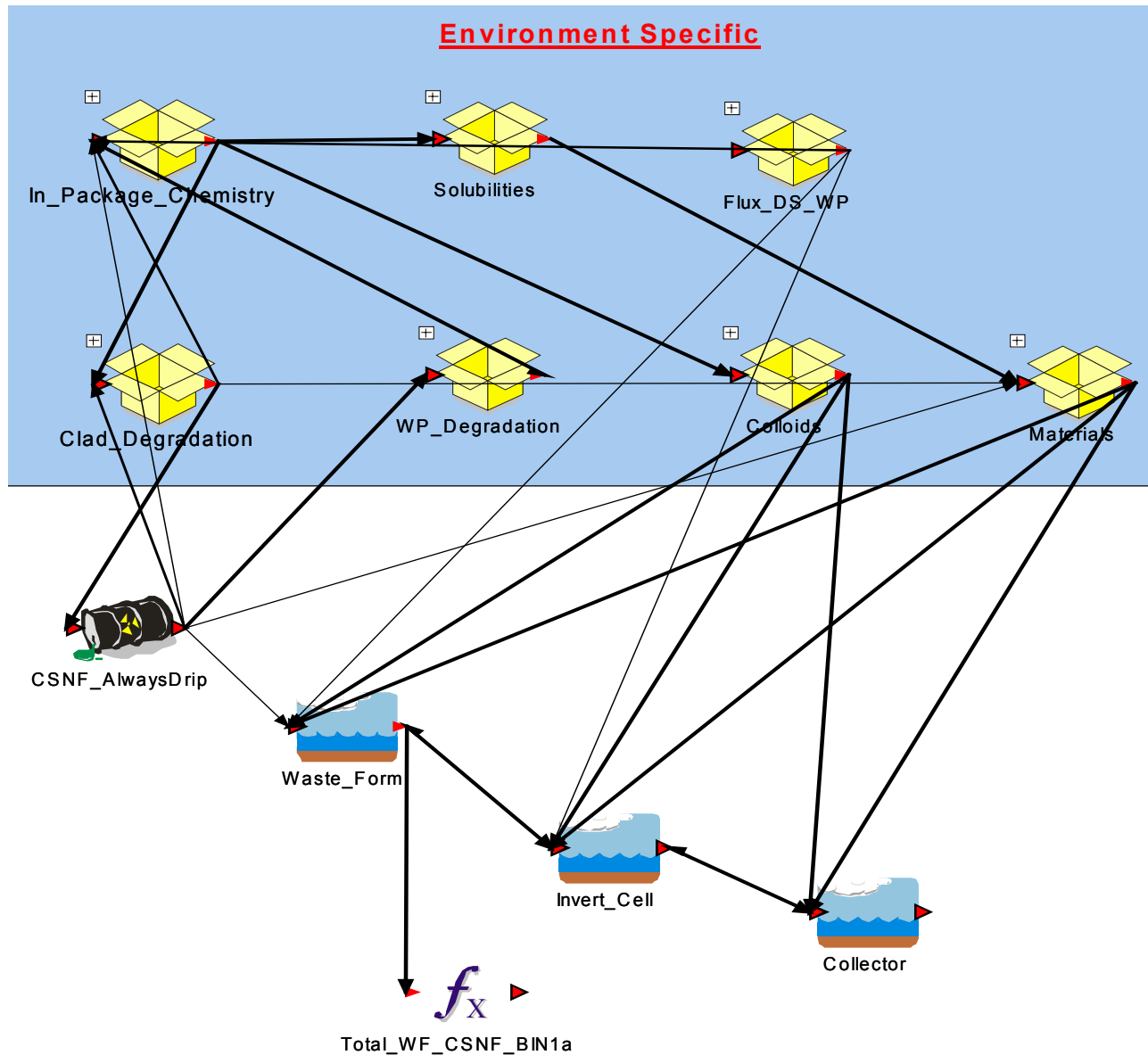
CSNF Packages Component of the EBS Submodel



CSNF Packages Component of the EBS Submodel: Infiltration Bin 1

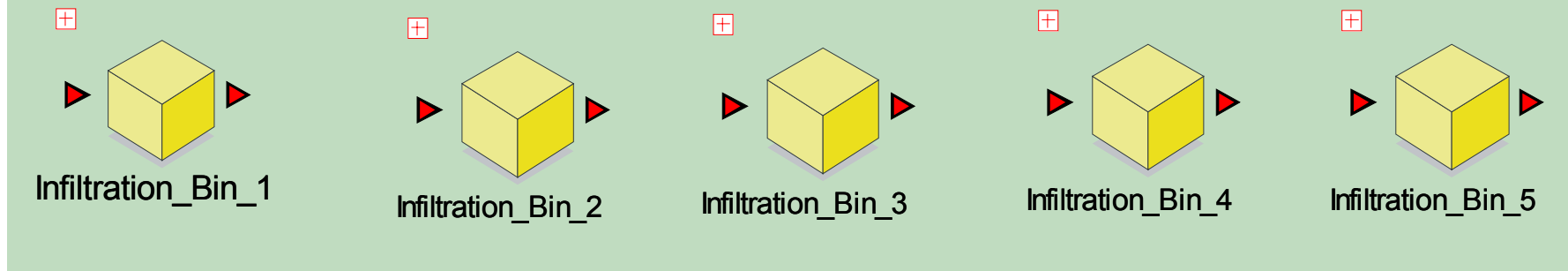


Infiltration Bin 1: Always Drip

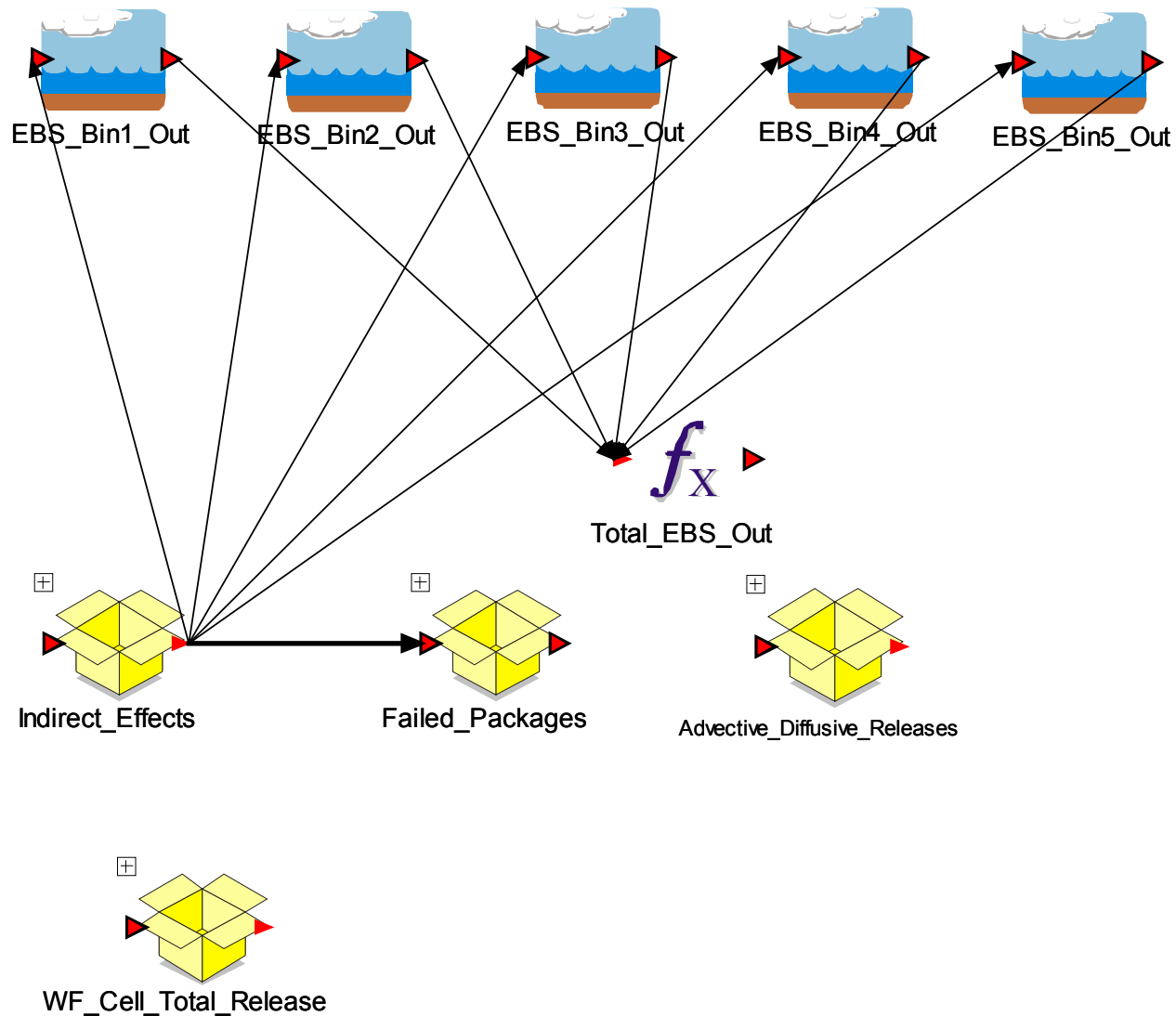


CDSP Packages Component of the EBS Submodel

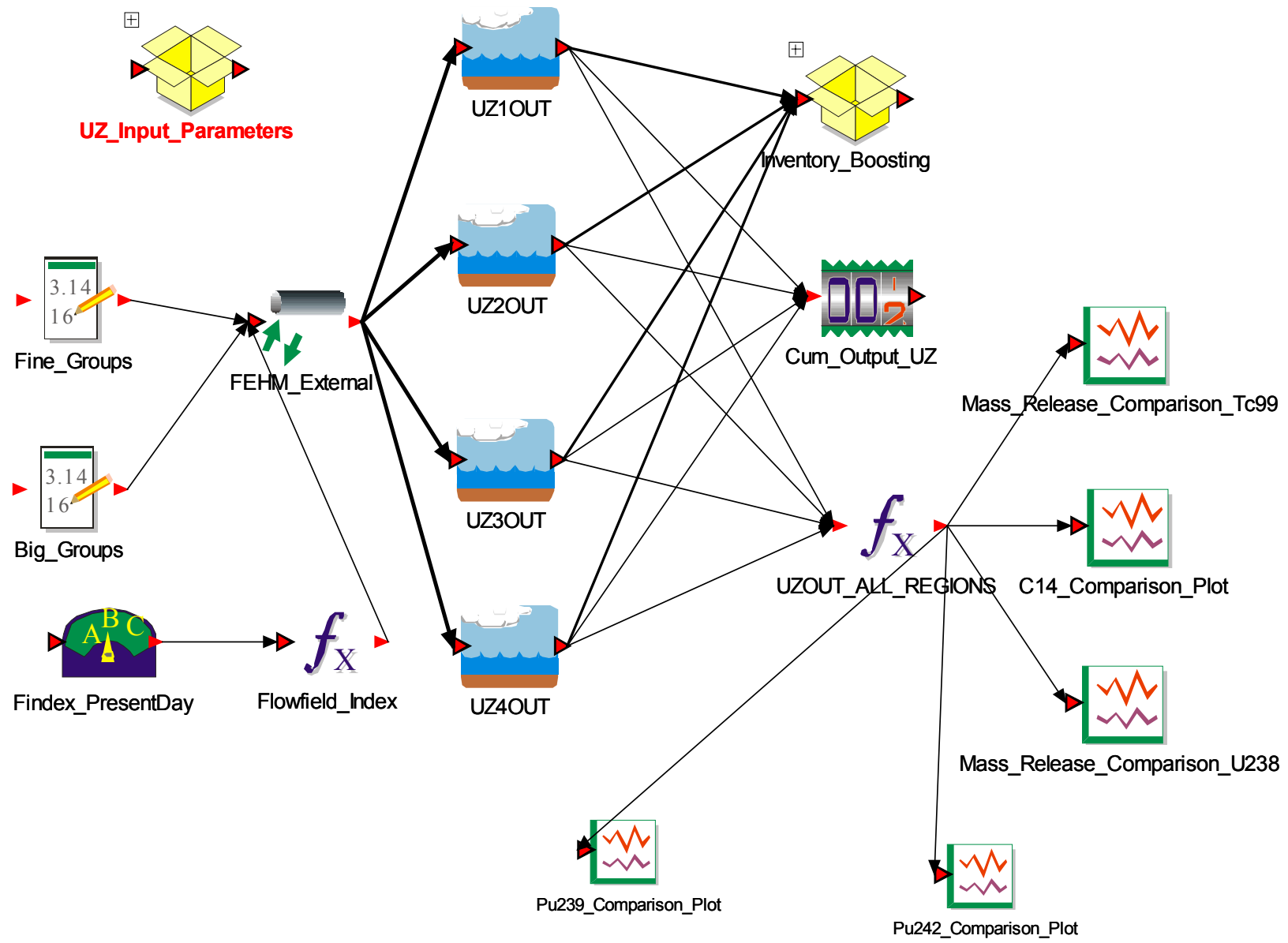
Infiltration Bins



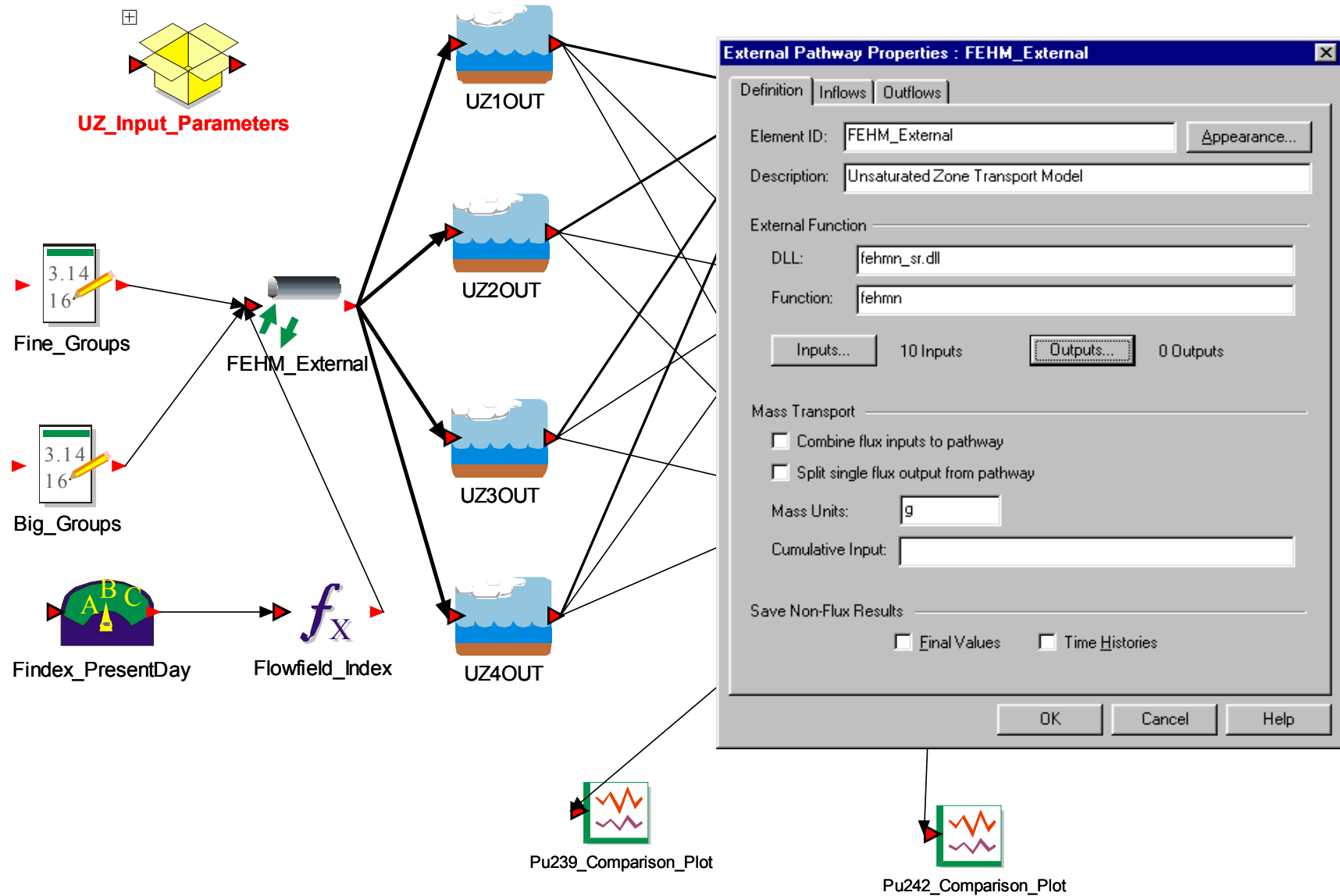
EBS Results Component of the EBS Submodel



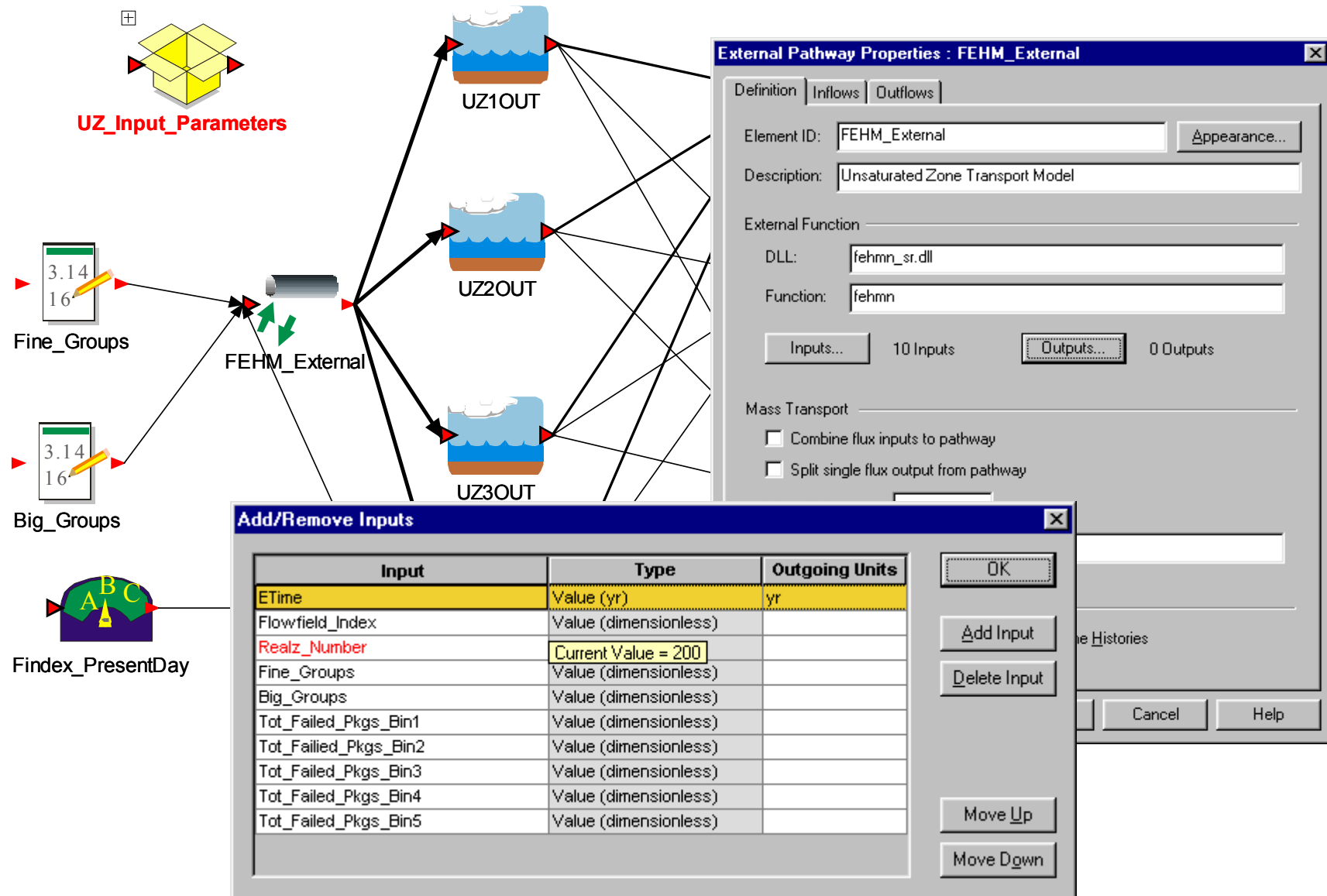
Unsaturated Zone Transport Submodel



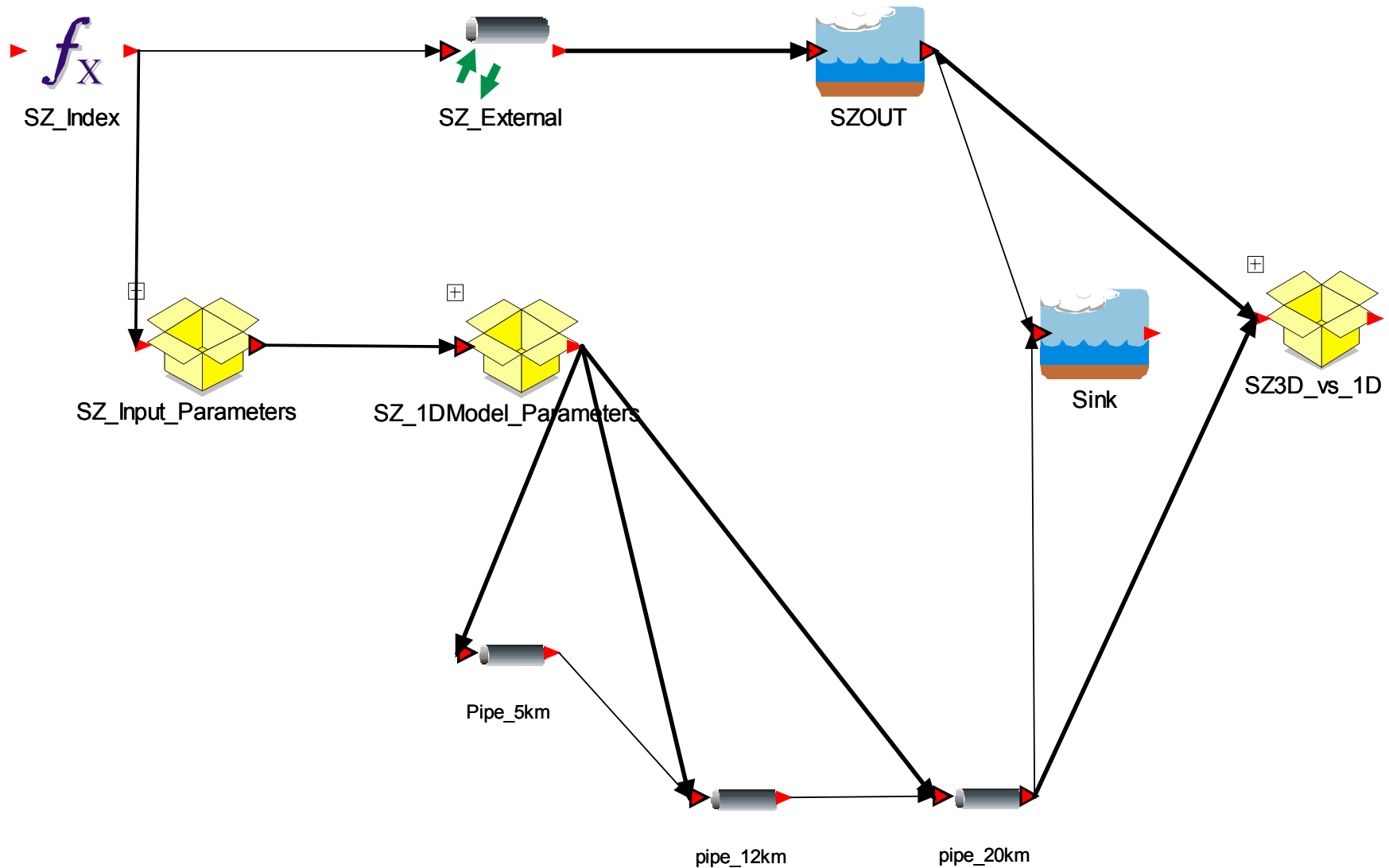
FEHM Properties Window In Unsaturated Zone Transport Submodel



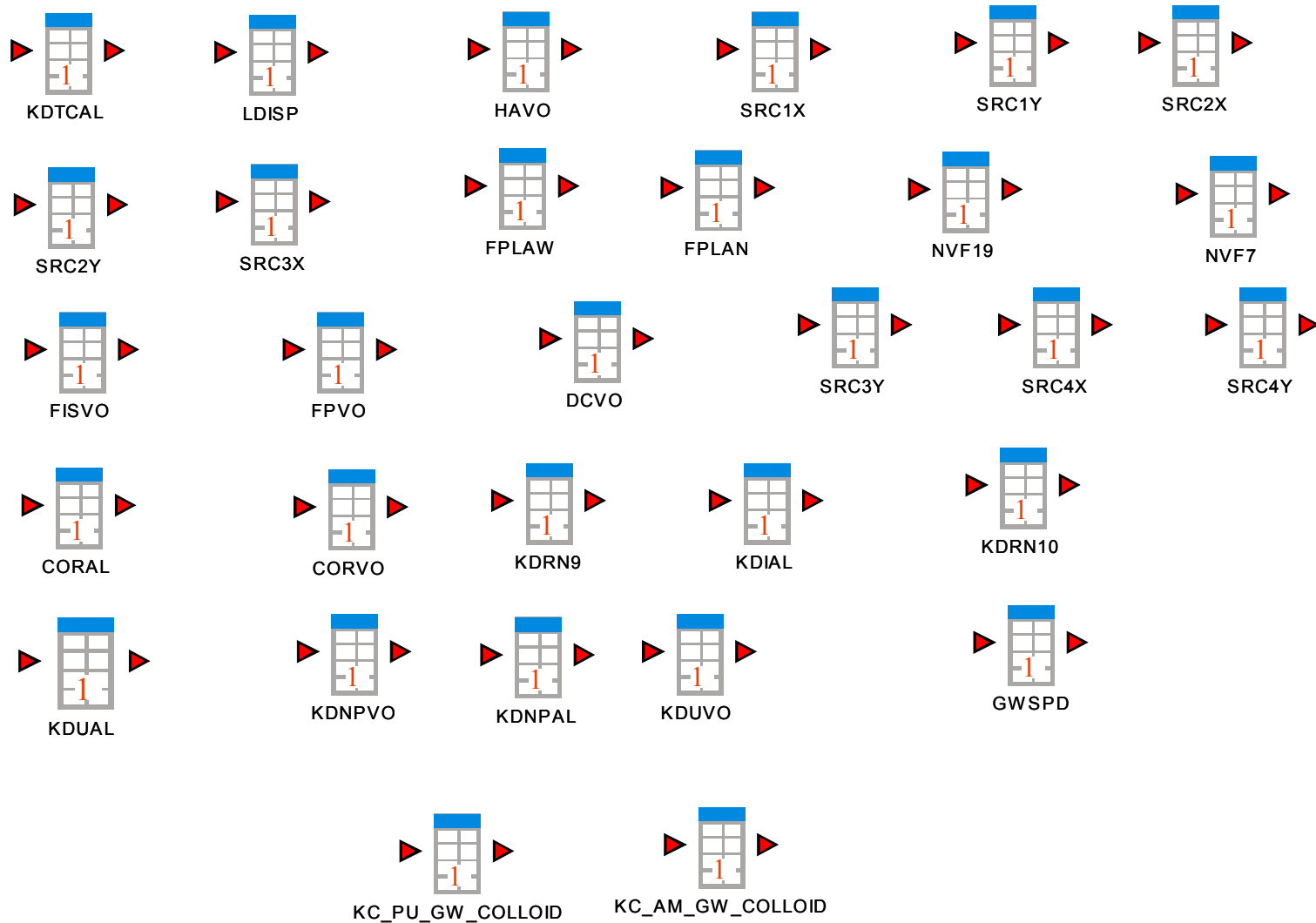
FEHM Inputs in Unsaturated Zone Transport Submodel



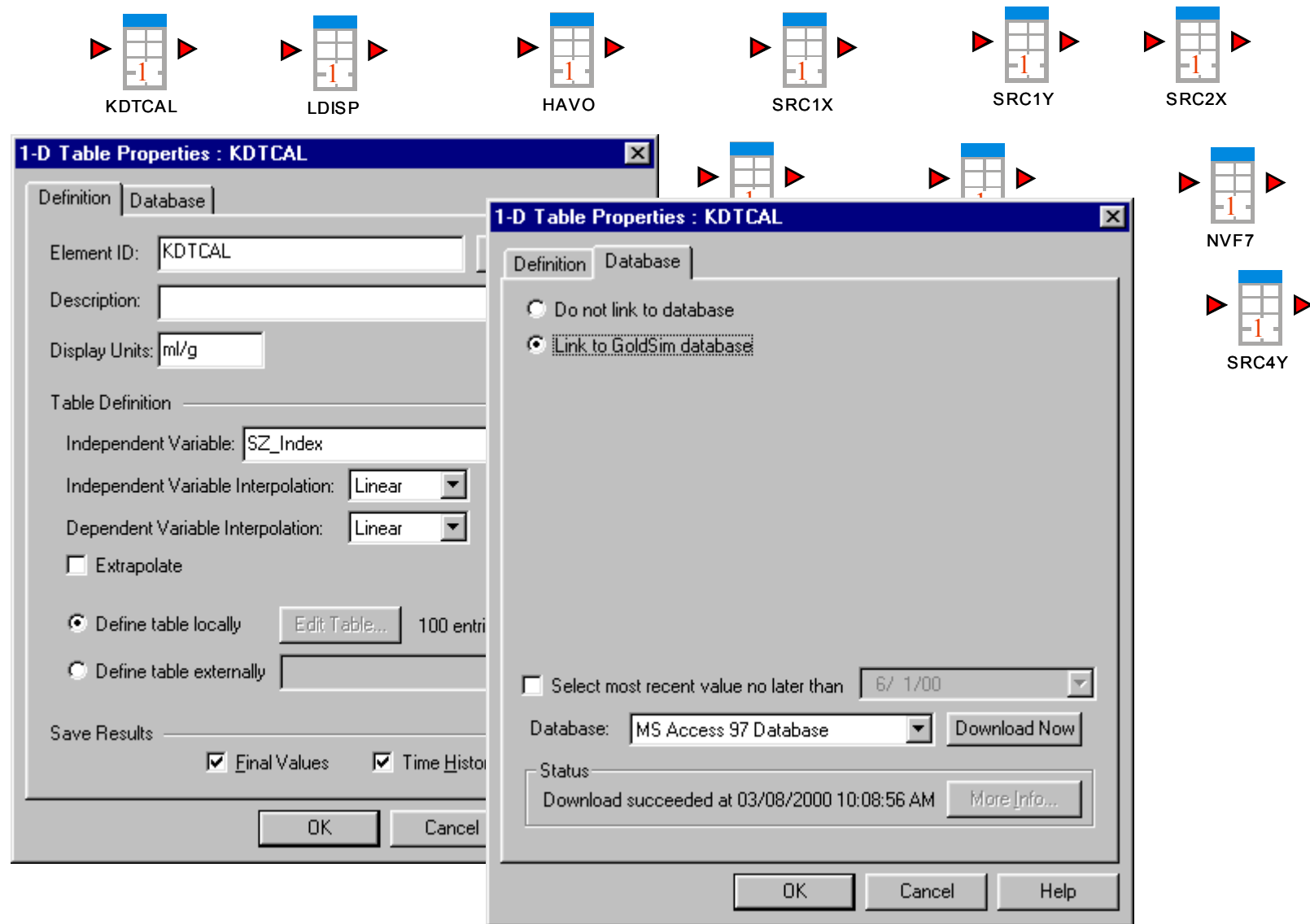
Saturated Zone Transport Submodel



SZ Input Parameter Lookup Tables In Saturated Zone Transport Submodel



Input Parameter Link to TSPA Database In Saturated Zone Transport Submodel



Biosphere Submodel

