

**Florida Floodplain Managers Association
2019 Annual Conferences
Abstracts**

Title: NCIMM Development and Testing of EPA SWMM6 based on a Machine Learning Version of SWMM5 and SWMM6

Length: 30 minutes

Subject: General Floodplain Management

Target Audience: Stormwater Modelers

Presenter Name: Robert Dickinson, ME, ASCE, EWRI
Strategy Coordinator, SWMM Development, NCIMM
National Center for Infrastructure Modeling and Management

Biography: I am a water resources engineer (you can contact me by email at robert.dickinson@gmail.com) with 43 years of experience with Stormwater Modeling, Stormwater Expert Systems, Software Development, Hydrologic Simulation and Analysis, Water Quality Modeling, and Stormwater and CSO Modeling Training. Mr. Dickinson's programming experience includes Fortran, Visual Basic, C, C++, and VBA. He was a co-developer of the EPA SWMM version 3 and version 4 computational engines as well as the developer of the XP-SWMM computational engine. He is also one of the developers of the SWMM 5 computational engine. He has extensive experience teaching software workshops in hydrology and hydraulics while at UF, XP-Software and CAiCE. Mr. Dickinson is also experienced in hydrology, hydraulics and interface design. He has had extensive exposure to water quality modeling, water quality data analysis and receiving water modeling.

Co-Presenter: None

Biography:

Abstract: An important component in developing stormwater models is the collection and classification of testing models, scripts and statistics for testing and graphical comparison of unit tests. This paper describes the 5000+ testing models, the Github testing location and how all nodes, links and subcatchments are tested. In addition we develop a Similarity Index for model networks.

There is a well-known Sabermetric tool called Similarity Score which has the intent of discovering who the most similar historical players are to a certain player in baseball and basketball. The scale goes from 0 to 1000 and is used to evaluate current players compared to Hall of Fame players. We attempt to construct a similar scale for SWMM models based on the process flags, length of simulation, number of various elements and output statistical tools based on the renowned missive Rules for Responsible Modeling from CHI. The goal is to classify a new model based on a database of scrubbed existing models for the purpose of classification in Machine Learning. The similarity score will be a "classifier" sometimes also refers to the mathematical function, implemented by a classification algorithm, that maps input data to a category. The categories will be groups such as single event, continuous, hydraulics only, complex hydrology etc. The output will be based on the System output Graphs of various models.