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Flood & Coastal Storm Damage Reduction R&D Program

Model Independent Calibration and Uncertainty Analysis Toolbox (MICUT), Beta Version One

Description

The Model Independent Calibration and Uncertainty Analysis Toolbox (MICUT) is for the computer-based calibration of hydrologic and environmental models. MICUT is a toolbox of methods in development to support model independent calibration and predictive uncertainty analysis. MICUT can communicate with hydrologic and environmental models through interface with their own input and output files. Since it was designed to be compatible with a popular model independent protocol, it can easily be used by a large existing user group. MICUT includes, among others, an accelerated derivative-based local search algorithm, a stochastic global optimization algorithm for intelligently sifting through local minima to find a global minimum, and most recently includes a state-of-the-art evolution strategy for global parameter identification of difficult problems with noise or other features that make derivatives estimation difficult.

Benefits

MICUT can be applied to a large class of hydrologic and environmental model calibration problems.

Status

Planned software related R&D endpoints are the inclusion of sequential data assimilation and predictive uncertainty analysis capabilities into MICUT, and further modification to allow for the use of multiple processors. Integration of MICUT capabilities with MORPHOS is also planned, as well as possible inclusion into one or more of the XMS systems.

Available Documentation

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