

DSM2-DB

Current Status

Monday, January 10, 2005

Changes

The new version of DSM2 has these changes from the text version:

- *Fixed data now reads from a relational database, not from text files.* This allows for better control of data and a better guarantee that different studies using the same Delta design elements (e.g. permanent barriers, or a Through-Delta facility) will use identical parameters. It also allows for an easier implementation of a GUI.
- *Graphical User Interface.* The GUI enables far easier review of changes from an initial study (i.e. base case) to a plan study. It is not intended to run the model or examine time-varying data, but only to allow manipulation of the fixed data in the database: adding new data and editing and deleting existing data.
- *Optional use of HDF5 for the tidefile.* The user can now specify use of HDF5 instead of the binary tidefile to store hydrodynamic information needed by Qual. HDF5 is a standard storage format used in high-performance computing, has a public domain viewer and editor, and results in smaller file sizes.
- *Increased Gate Capabilities.* Gates now are collections of *devices*. The devices contain the physical dimensions and parameters of what we now call gates, so a single gate may contain several independent devices. Furthermore, gates can now be operated by several criteria or *triggers* during a model run. Reservoirs can now have true gates attached to them, as well as the previous simple reservoir connection. The nonlinear numerical solver for both gate and reservoir connections has been improved.
- *Little Language for Operating Rules.* A simple interpretive language has been developed which allows users to specify *actions* to take place on *triggers*. An action can be a change of gate state (open/close), or pumping or inflow change. A trigger is a value of stage, flow or time that reaches a specified value. This allows the model to make decisions during a run in response to environmental values.

Needed Work and Status

Several tasks must be completed before the new version of DSM2 is ready for production use.

- **Micro calibration/validation on historic run.** This would finish implementing the historic run, establish and fine-tune the new gate devices for the historic run, and do a quick re-validation. No operating rules used, all device operations would be from observed data. No improvement sought over previous calibration. This work just started.
- **Finish DSM2/DB/GUI work.**
 - Restructure GUI to handle Operating Rule language
 - Initial conditions: Verify restart file works well.
 - Multiple QUAL/PTM per simulation. There isn't much to do in DSM2. The ability to add and remove models in the GUI must be enhanced to deal with this, and some small modifications required in the database.
 - Some work on GUI Help system. A basic Help should be ready when new DSM2 is released for production.
 - Other operating rule enhancements. Extensions to current rules will be driven by user needs as they are discovered.

- **Finish development of planning runs, one for temporary barriers, another for permanent barriers.** Explore operating rules for planning runs. Need to acquire experience and rules-of-thumb in how the feature can be used.