

Meeting Notes  
DSM2 PWT  
December 9, 1998

The meeting was attended by Rick Oltmann and Pete Smith (USGS), Parviz Nader, Dawn Friend, Kamyar Guivetchi, Brad Tom, Bryan McFadin and Chris Enright (DWR), Henry Wong (USBR).

#### 1) Announcements

The Delta Modeling Section is hosting a session at the Bay Delta Modeling Forum at Asilomar in February. At the request of Francis Chung, DSM2 PWT activities and progress will be the subject of one talk during the session. ESO staff will likely prepare the talk with input from the group prior to the workshop. Chris Enright also announced that ESO staff will put together a poster on DSM2 PWT activities and progress for the IEP workshop, also at Asilomar.

Pete Smith announced that bathymetry data collection was identified as a high priority in the recent CMARP summary report. Funding could be available this year for bathymetry data collection using LIDAR fly-over technology along with a boat mounted "wide swath" technology (I forget the actual name). The technology was used successfully at Lake Tahoe but, as Rick pointed out, is not proven in turbid, shallow water. It was also noted that the Delta Modeling Section and Central District staff have initiated a program to collect more bathymetry data over the next few years.

#### 2) PWT Progress

Chris Enright re-stated the PWT's mission to produce a consensus calibration of DSM2 along with calibration documentation and a white paper on error bounds under alternative modes of planning analysis. Completion of the project has been promised to the IEP coordinators by December 1999. Chris suggested that one year is enough time to do the work, but only if the group proceeds with some diligence and participation by everyone.

There are several outstanding questions that require consensus decision before the calibration begins in earnest like: 1) what will be the final geometry, 2) do we use channels and/or reservoirs, 3) what is the proper delta x, and 4) is the model verified numerically. Ralph Finch (via emails) and Kamyar Guivetchi suggested that we should begin documenting our decisions now while they are being made. Kamyar suggested that we begin to write draft chapters as issues are resolved. Pete Smith suggested that we should begin to develop an annotated outline of the report to guide our work.

Everyone acknowledges that all issues will not likely be resolved for this calibration. Chris suggested that when participants identify issues that they should also identify resources and time to resolve them if they can. Kamyar suggested that the group should begin a list of issues that cannot be addressed

at this point. Ralph Finch has suggested referencing the Delta Modeling Section task list in a recent email to the DSM2 list. Rick Oltmann and Chris Enright will develop an issues list and report topics for the next meeting.

### 3) Goodness-of-fit indices for Hydro calibration

Dawn Friend presented a summary of three indices that could be used as objective measures of goodness-of-fit on each calibration plot (flow and stage for each data comparison location and each calibration period). Dawn presented an example plot of 15-minute field and model stage to illustrate the points. RMS error will be calculated on the full calibration time-window, while phase and amplitude differences will be determined for one tidal day. Rick Oltmann suggested that calculating phase and amplitude difference for the entire calibration time window and then plotting the result can point out input errors and atmospheric anomalies that are not captured by the model. It was decided that this type of plot will be made as time permits and/or to answer specific questions as the calibration proceeds since the raw 15-minute output should also show these errors, albeit less clearly. The issue of calibration output volume may preclude routine usage of such a plots. Chu Ching suggested that least squares criteria provide the best measure of phase error, and that residual flow plots should also be generated. Scatter plots with regression statistics and residual flow plots are planned.

Dawn's goal is to provide on-plot, single number indexes for quick, objective G-O-F assessment and comparison between runs. Pete Smith cautioned that amplitude differences based on comparisons of one time series to another are different than comparing the absolute range of each time-series independently. To avoid problems with datum errors at stage gages, amplitude difference will be calculated as absolute ranges.

### 4) Cross-section simplification progress update

Brad Tom presented the work plan he and Parviz developed to simplify model cross-sections. The goal is to use the CSDP to develop channel x-section conveyance characteristics without regard for computational concerns. Based on the calculated  $A$ ,  $P$ , and  $T$  as  $f(h)$ , the cross-sections would be simplified on run time while maintaining the same conveyance characteristics to within a tolerance. Brad is comparing the accuracy and computation time of Delta Modeling section's current geometry to the geometry so far developed by the PWT.

### 5) Sensitivity analysis on delta x

Parviz Nader updated his discussion of delta x from the last meeting. Parviz distinguished between what he called "discretization error" and geometry error. Parviz showed that there is little difference between flow results using rectangular x-sections with  $dx = 3,200$ ,  $5,000$ , and channel length. However, using irregular cross-sections, the same test produced significant differences under the  $dx=3,200$  case since more cross-sections are actually used by the model- actually changing the geometry. Therefore, geometry governs the choice

of delta x, more than discretization error. Parviz is planning to modify DSM2 hydro to allow for variable delta x between channels so that all x-section information can be used. He said that this capability is important to have in place before calibration.

#### 6) DSM2 Hydro Validation

Parviz Nader reviewed the model validation testing that was conducted for the Bay Delta Modeling Forum. The model has performed correctly on all of the tests that have been applied to it. Parviz said that he felt it would still be useful to compare DSM2 to Lew Delong's 4 Point model for some simple test cases to make sure that the original numerics are intact. Pete Smith said that at this point his opinion about DSM2 model validation is influenced by Parviz' level of confidence in the validation. If Parviz feels ok about it, so will Pete.

#### 7) Testing open water areas as reservoirs or channels.

Ralph Finch provided a write-up of his effort to compare hydrodynamics and salinity response to modeling open water areas as reservoirs or channels. Since both Ralph and Eli were not present, the group felt that no final decisions should be made until Ralph and Eli can represent their work. Some discussion ensued about the relative ability of reservoirs and channel networks to model wave movement and solute transport.

The next meeting was scheduled for Thursday January 14, in the DWR Environmental Services Office Cafeteria Conference Room at 9:00 AM (not 9:30). Currently, topics for the meeting include:

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| - Reservoir/Channel network open water area modeling | Ralph Finch<br>Eli Ateljevich |
| - Outline for DSM2 PWT report                        | Rick Oltmann<br>Chris Enright |
| - Update on cross-section simplification             | Brad Tom<br>Parviz Nader      |
| - Calibration protocols development update           | Dawn Friend<br>Chris Enright  |
| - Toward consensus on closure to outstanding Issues  | All                           |