

**Status Report
Modeling Technical Review Group (MTRG)
Savannah Harbor Expansion Project
January 20, 2000**

A meeting was held on Thursday, January 20, 2000 in Savannah, GA at the office of the US Corps of Engineers, Savannah District. The goals of the meeting were as follows:

- Review status and discuss coordination efforts for the Upper Basin Modeling by EPA
- Review/Finalize the format for tracking "Unresolved Issues"
- Provide recommendations for dealing with tidal amplitude and water level projections
- Review status of Data Report, Model Development, and Modeling Schedule

The following persons provided input and/or participated in the MTRG discussions:

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A summary of the discussion items is presented below.

Lower Harbor Model Development Process and Schedules

- A draft of the Data Report is scheduled for completion by mid February. ATM should post the draft report on the MTRG website. The report should be broken down on the website by chapter rather than posting the entire document. This will hopefully alleviate difficulties in downloading and printing large files.
- There should be a data presentation by ATM at the next meeting on March 1.
- Hydrodynamic modeling should start being discussed at the March 1 meeting.
- The modeling will be coordinated and conducted according to the following 3 phases:
 1. Hydrodynamic Model Development, schedule = spring through early summer of 2000.

- turbulence closure, thermal component, and 1997-1999 data sets of currents, tides, and salinity
 - 2. Water Quality Model Development, scheduled for completion in December 2000, data analyses and testing of model parameters will parallel effort with hydrodynamics.
 - LTBODs, SOD, Reaeration rates, DO data, nutrient data
 - 3. Chloride Model Development, schedule for completion in Fall 2000,
 - chloride, bromide, and salinity data, chloride sub-model
- The MTRG should continue to have monthly meetings throughout the model development.

Discussion on Modeling Tidal Amplitude

- The issue for MTRG consideration, as identified by the SEG, was the potential effects of the project on tidal amplitude and mean water level. At the meeting members of the SEG further explained that their concern also includes other causes of water level rise in the harbor.
- A representative of the Coastal Environmental Organization (CEO) explained that according to sources, there has been an estimated 18 inches of water level rise in the past 100 years in the Savannah Harbor. The 18 inches of rise was further broken down into the following components according to the CEO: 6 inches due to climatic changes (sea level rise), 6 inches due to limestone subsidence, and 6 inches due to prior deepenings.
- The CEO also raised the issue that areas such as Bakers Street and Presidents Street in Savannah have experienced more occurrences of flooding in the last 10 years.
- There was a question concerning the on-going peer review of the modeling work and if there was a need for additional peer review outside the MTRG. Several MTRG members responded that the on-going review of project scoping, status reports and interim deliverables provided the most valuable input into the model development process. They also stated that further peer review after the model is developed would likely take a great deal of time and money. It was explained that it is very important for model reviewers to understand the fundamental goals and purpose for the model to provide an adequate review.
- There was a discussion of how well the model, used previously, predicted water surface elevation in the harbor. An error analysis for the model comparisons showed that the model was within <10% in the harbor below the Houlihan Bridge.
- A demonstration of how percent error is calculated with model comparisons was performed. Two methods were presented, Root Mean Square (RMS) and harmonic analysis.
- It was agreed that the issue of overall water level rise in the harbor is beyond the scope of the on-going model development work. To better address this concern, if warranted, some more information on sea level rise and land subsidence for areas adjacent to Savannah Harbor would be necessary. Paul Conrads will check with some colleagues at the USGS for available information. The project effect on tidal amplitude is being addressed by the modeling effort. It is the only factor, which may increase water levels in the harbor, to be determined by the modeling evaluations. Sea level rise and land subsidence are conditions unaffected by deepening, but may be used in determining offshore boundary conditions for model applications.
- The recommendations from the MTRG to the SEG consisted of the following:
 1. Ask ATM to address the following questions concerning the model now under development:
 - What are the model's limitations when projecting tides in the harbor?
 - Is the model useful in evaluating resonance of a tidal wave in the harbor?
 - How well does the model do with past projections? Report the model error analysis of mean water level.
 2. Examine the historical data from the USGS gauging stations from 1987 to present to determine if there were noticeable changes in tidal amplitude and mean sea level from the following 3 events:
 - A. Tide Gate decommissioned on March 15, 1991.
 - B. New Cut closed on April 1, 1992.
 - C. GPA harbor deepening completed in May of 1994.

3. Ask ATM to examine the topography of the riverbank along the harbor to determine an elevation at which substantial overtopping or flooding would occur. This elevation will be the highest water level that the current model can accurately project.

Upper Basin Modeling

- The EPA and GA EPD are working jointly to develop a water quality model for the upper basin of the Savannah River watershed. It is planned that this model will be used in the regulatory permitting process to determine waste load allocations affecting water quality standards in the river upstream of the harbor. EPA plans to provide model outputs by the end of 2000, which may be used for Harbor model applications.
- NPSM = Non-Point Source Model will be utilized.
- BASINS is the interface to run the watershed models.
- HSPF = Hydrologic Simulation Program Fortran will be utilized.
- SWAP = Source Water Assessment Program will be utilized.
- Components of the watershed model are as follows:
 - A. BASINS GIS
 - B. NPSM Windows Interface
 - C. Meteorological data
 - D. Land use data (30 meter by 30 meter) used for non-point source pollutant loadings
 - E. Core Model – HSPF
 - F. Post Processing
- Output will be flow versus concentration of pollutant as a time series at each location.
- Lake Thurmond and Stephens Creek and major tributaries will be input as flow versus concentration.
- Will use 8 HUC areas defined by state.
- Intend on extending upper basin model at least to I-95 Bridge and possibly down to Houlihan Bridge with some overlap of the Harbor model.

Unresolved Issues List

- A “To Do List” was developed to keep track of work to be done and reported to the MTRG. These items were not originally included in the modeling task statements, but the group has agreed that they are important to model development.
- The format for an “Unresolved Issues List” was agreed upon by the MTRG. These items have been raised in the MTRG for further discussion, but it was agreed to hold them to be addressed at a more appropriate time. This list will be posted on the MTRG website and updated as needed.

Future Meeting

The next MTRG meeting will be held in Atlanta at the EPA office on March 1, 2000 at 9:00 am.