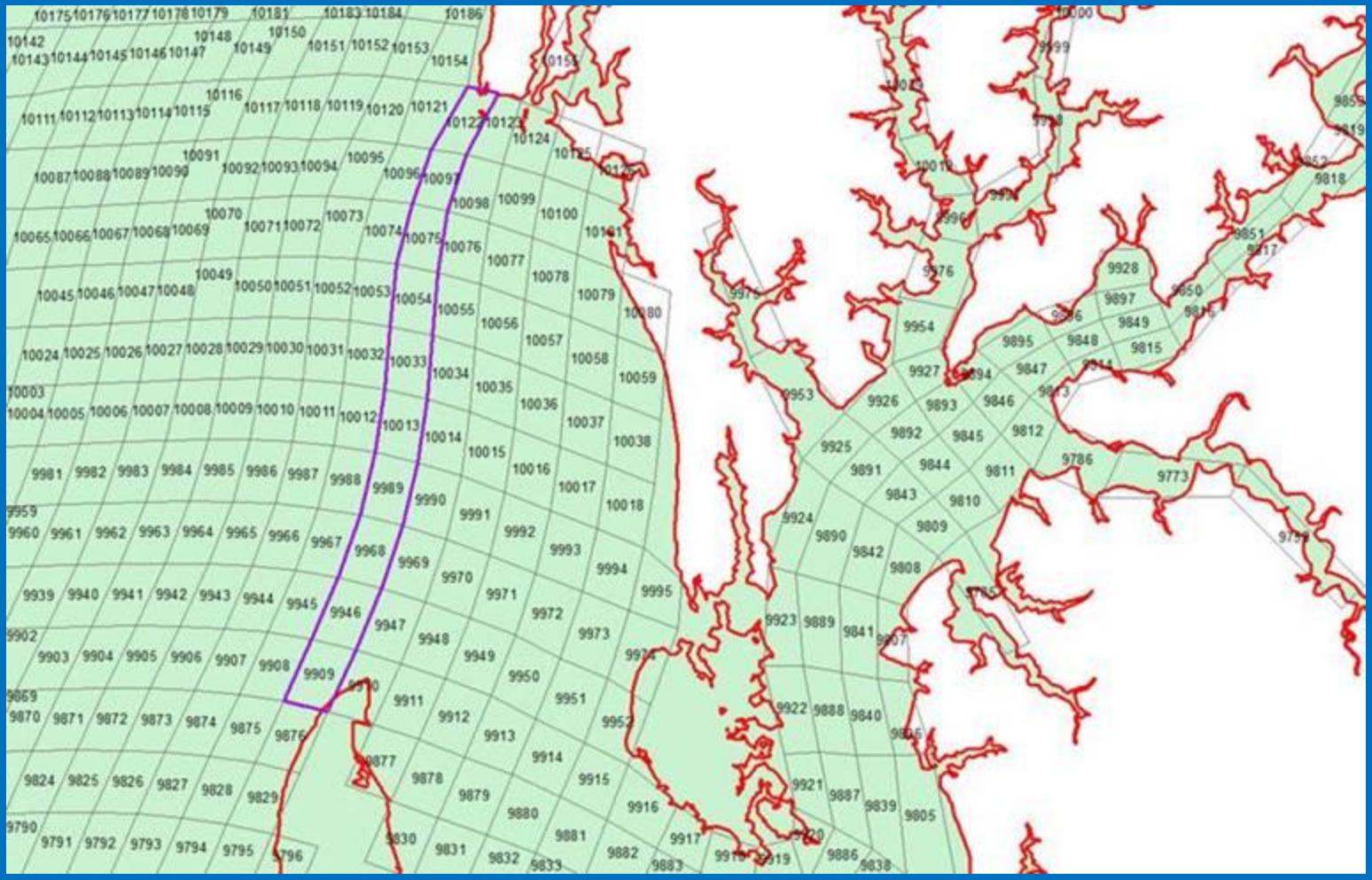
Extension of the WQSTM to 2011

- The CBP is sponsoring a “Multiple Model Assessment of Shallow-Water Systems.”
- The Chester River has been selected as the focus of this effort.
- Boundary conditions at the mouth of the Chester will be supplied by the existing bay-wide hydrodynamic and water quality models.



Status

Hydrodynamics

- Hydrodynamic runs for 2002 – 2011 have been completed by the CBP. These are available to specify hydrodynamic boundary conditions.

Water Quality

- The effort to extend the water quality model to 2011 is spinning up right now. We aim to have an initial 2002 – 2011 run by July 31.

Water Quality

- Development of the WQ simulation through 2011 is a continuous task planned through calendar year 2015, at least.
- There cannot be a single transmission of WQ boundary conditions. Rather, boundary conditions will be transmitted as the WQM develops.
- We aim to quickly provide a set of boundary conditions based on the initial 2002 – 2011 run to be completed July 31.

Processing

- The computational grid and the number of state variables are not changing. The CBP can start on a processor to extract boundary conditions at the desired location immediately, using the existing WQM set-up.
- We anticipate providing all active WQM state variables (23) at hourly-intervals, 2002 – 2011.
- Due to the file size concerns, we will likely make individual one-year runs.

Processing

- The WQM runs will be conducted by the CBP team on EPA computers at Research Triangle. This will facilitate CBP processing of results for the Shallow-Water teams. We will also have redundancy in model operation.
- ERDC will provide model input files and codes to the CBP.
- We will perform routine model comparisons to ensure ERDC and EPA results are consistent.

Atmospheric Loads

- Atmospheric nutrient loads to the water surface will be supplied mass/unit area/day.
- These will be provided as annual values and divided into model state variables (e.g. organic N, ammonium, nitrate) based on guidelines from preceding years.

Shoreline Erosion

- At present, we erode solids only, no associated nutrient content.
- Daily loads are computed for WQM cells based on energy dissipation by waves and inundation.
- It's going to take a while (weeks to months) to spin this effort up and create 2002 – 2011 loads consistent with the previous 1985 – 2001 loads.

Shoreline Erosion

- If loads from shoreline erosion are desired immediately, the best approach is to use long-term averages of the 1985 – 2001 rates.

Other Issues

- There are some other features of the WQM that may affect the Chester River e.g. wetland respiration. We will investigate and transmit relevant information.
- Future WQM developments and refinements will no doubt occur. We will work with the Shallow-Water teams to keep their inputs and boundary conditions up-to-date.