

Recommendations for Further Research

This document synthesizes sediment research needs through February 2007. Research needs identified after February 2007 will be included in the 2008 list of research needs. The following list of research needs is not in any particular order or priority. Findings from these research projects should help address the numerous sediment information gaps discussed during the STAC 2007 Sedimentsheds Workshop (proceedings found at <http://www.chesapeakebay.net/pubs/STACReportFINAL.pdf>) and also identified in “A Summary Report of Sediment Processes in the Chesapeake Bay and Watershed” found at <http://pa.water.usgs.gov/reports/wrir03-4123.pdf>.

2007 STAC Sedimentshed Workshop Research Recommendations

- What controls the dynamics and abundance of the background suspended sediment load most responsible for surface water turbidity in shallow water SAV grow zones?
- What are the specific sources of suspended sediment affecting nearshore SAV habitat in upper, middle and lower areas of the Bay?
- How do different shoreline stabilization techniques affect local SAV habitat quality?
- When and where are other causes of SAV habitat degradation more important than suspended sediment associated turbidity?
- Quantify the sediment trapping ability of the ETM for both fine grained and coarse sediment, especially during the SAV growing season.
- Determine if tidal tributaries are a source or sink of fine grained sediment to the Bay.

Technical Questions Is current knowledge adequate to answer the following questions? No, all answers are either inadequate or partially adequate, based on October 2005 information.

Sediment/Water Clarity/SAV:

- Is there a relation between sediment load and trend at the fall line and water clarity in the tributaries below the Fall Line?
- How does climate and seasonal variability affect the sediment and clarity trends in the watershed and the Bay?
- How has the sediment deposition and composition in shallow water habitats changed over time and what is the relation to land cover changes, natural variability in climate and stream flow, and changes in morphology of Bay?
- What are the relations among the changes in sedimentation rates, sediment characteristics, water clarity and SAV and other biota in shallow habitats?

Sources:

- What are the sources of sediment in the watershed that reach the estuary?

- What are the sources of sediment in the shallow water tidal tributaries?
- What is the relative fraction of inorganic vs. organic suspended solids within specific tidal tributary habitats and what are the sources of both?
- What are the primary sources of sediment affecting water clarity in the shallow habitats of the Bay?

Fate/Transport:

- What percentage of sediment that is mobilized in the watershed is delivered to the estuary?
- What is the residence time of sediment in the watershed?
- What sediment transport time scales must be modeled for useful applications?
- What are factors affecting sediment mobility in the watershed?
- What are the different size fractions of sediment being transported through the watershed and what is the relation to episodic storm events?
- What are the trends (changes) of the different sediment size fractions over time?
- What nutrients and chemicals are associated with sediment movement and size fractions?
- What are the primary sediment deposition areas in the watershed and how do they affect stream and riparian zone habitat?

Modeling:

- What will be the effect on the northern Bay if the Conowingo Reservoir reaches its sediment-storage capacity?
- How can the WSM model runs be used to develop potential sediment management scenarios?
- What improvements can be made to the WSM to further enhance sediment transport?
- What is the spatial distribution of the suspended-sediments, and the factors affecting the distribution, in shallow water habitats?

Sediment Workgroup Research Priorities (Original from summer 2004 by Sean Smith and Mike Lang land, edited May 2007)

The table below summarizes research needs in categories that could be used to develop multi-year sediment workplans and sediment management priorities to help with strategic planning efforts in the Bay Program.

Suggested categories are as follows --

<u>Category</u>	<u>Activities</u>
Measurement Technologies	<ul style="list-style-type: none"> • Evaluations of existing and new approaches to sediment data collection • Development of new sediment sampling equipment
Data Analysis	<ul style="list-style-type: none"> • Assessments of existing sediment data • Analysis of statistical relations using existing sediment discharge databases • Evaluations of error, bias, and/or trends in existing sediment data
Watershed Processes	<ul style="list-style-type: none"> • Assessments of relations between landscape conditions, erosion, and sediment discharge • Evaluations of historic and contemporary watershed sediment flux • Investigations of relations between sediment and biota in nontidal streams
Tidal Processes	<ul style="list-style-type: none"> • Assessments of sediment trends in the tidal Chesapeake Bay and tributaries • Evaluations of sediment resuspension • Investigations of relations between sediment and biota in tidal areas
Modeling	<ul style="list-style-type: none"> • Development of sediment flux parameters for use in the sediment modules of the watershed and estuary physical models • Evaluations of new hydraulic models for use in sediment evaluations (i.e., WEPP, USLE, HEC6, SAM)
BMPs	<ul style="list-style-type: none"> • Evaluations of sediment BMP performance • Development of sediment BMP databases