Lower Susquehanna River Watershed Assessment

WQGIT Update

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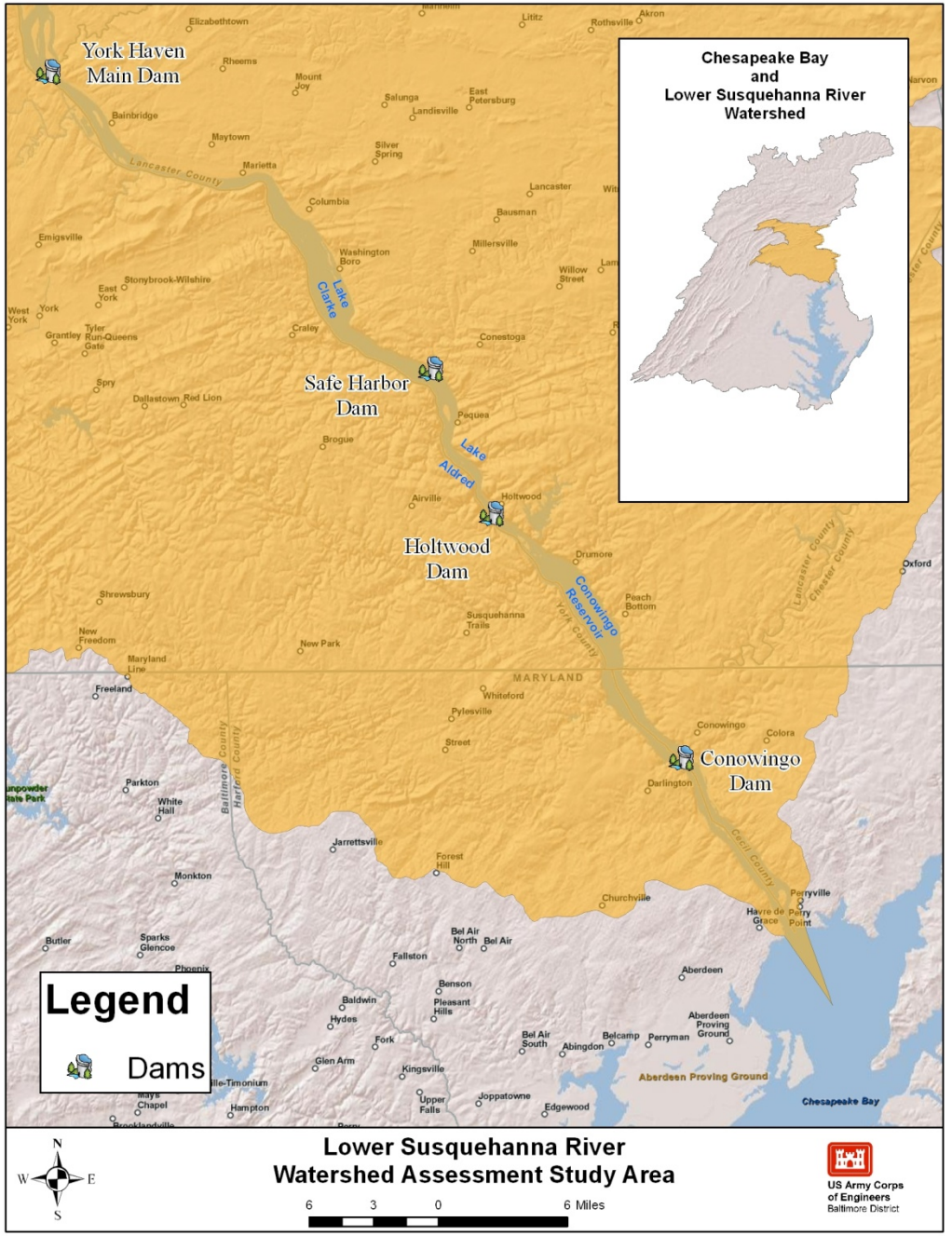


Assessment Initiation

- ✓ Funding from Congress to “restart” study – May ‘09
- ✓ Sediment Task Force Reconvened – Oct. ’09
- ✓ Scoping Kick-off meeting – June ‘10
- ✓ Scoping completed – April ‘11.
- ✓ Executed Project Management Plan/Cost-Sharing Agreement – September ‘11
- ✓ Federal funding of $250K secured – September ‘11
- ✓ Team Kick-off meeting – November ‘11

Assessment Partners

- Each agency will be providing resources and/or conducting specific tasks for the assessment.

Assessment Components

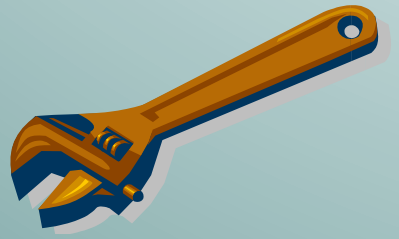
- River Basin Assessment (Sec 729 of WRDA ‘86)
- Cost: $1.4 million
- Legal Cost-sharing sponsor: MDE
- 75 Federal/25 Non-Federal Cost Share
- 3 Years

Assessment Components

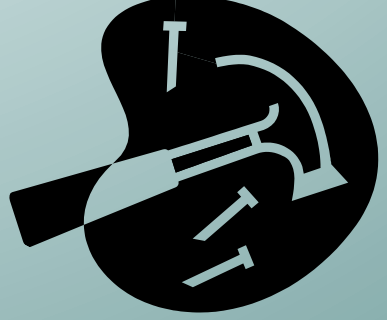
- Identification of sediment management strategies (Dredging? Innovative Re-use? By-passing? Alter Reservoir Operations? Other?).
- Use of models to link incoming sediment and associated nutrient projections to in-reservoir processes at the hydroelectric dams.
- Use of models to forecast impacts of sediment management strategies to living resources in Chesapeake Bay.
- Integration of the MD, PA, NY Watershed Implementation Plans.
- Concept-level designs and costs.
- Will *not* lead directly to construction.

Lower Susquehanna River Watershed Assessment
Goals & Objectives

1. Evaluate strategies to manage sediment and associated nutrient delivery to the Chesapeake Bay.
   - Strategies will incorporate input from Maryland, New York, and Pennsylvania TMDL WIPS.
   - Strategies will incorporate evaluations of sediment storage capacity at the four hydroelectric dams on the Lower Susquehanna River.
   - Strategies will evaluate types of sediment delivered and associated impacts to Chesapeake Bay.
2. Evaluate strategies to manage sediment and associated nutrients available for transport during high flow storm events to reduce impacts to the Chesapeake Bay.
3. Determine the effects to the Chesapeake Bay from the loss of sediment and nutrient storage from behind the hydroelectric dams on the Lower Susquehanna River.

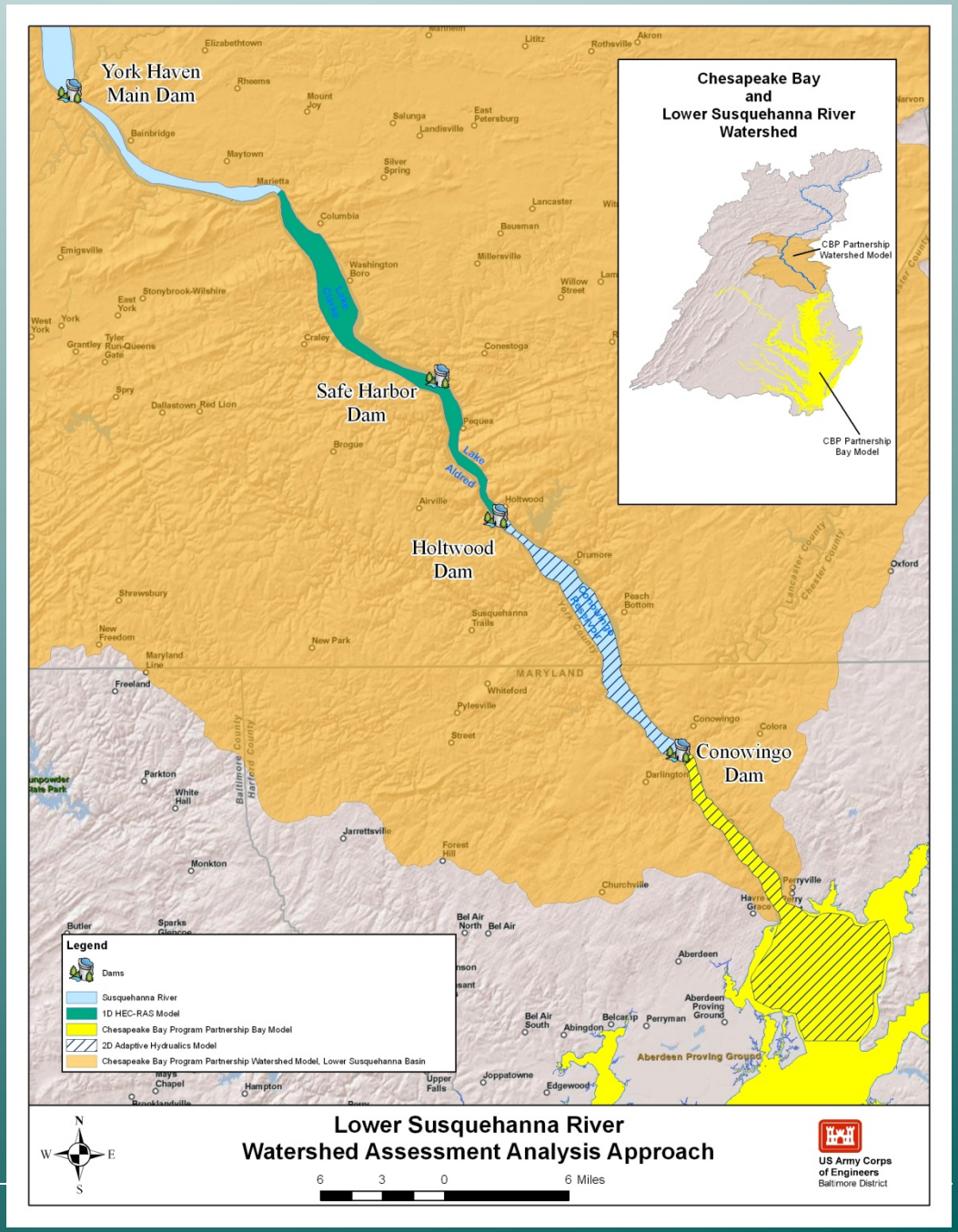


Modeling Tools



1. CBP Partnership-Watershed Model
   - Sediment and nutrient loads from the watershed at key locations into the reservoirs.
2. HEC-RAS 1D Model
   - Hydrologic conditions and sediment transport into Conowingo Reservoir (from upper 2 reservoirs)
3. 2D Adaptive Hydraulics Model (ADH)
   - Erosion/deposition within Conowingo Reservoir
   - Sediment transport out of reservoir
   - Response of reservoir and flats to various scenarios.
4. CBP Partnership - Chesapeake Bay Model
   - Impact of sediments and nutrients on light attenuation; SAV; chlorophyll; DO

Lower Susquehanna River Watershed Assessment Analysis Approach



Prospective Modeling Scenarios

1. **Base Condition** –

   WQ/sediment accumulation rate under existing conditions.

2. **Watershed Management** –

   WQ/sediment accumulation rate after implementation of TMDL's.

3. **What happens when the Reservoir Fills** –

   Impact on WQ/sediment accumulation rate to the Bay (assume TMDL's are being met).

4. **Effect of Scouring during Winter/Spring Runoff** –

   WQ/sediment accumulation rate with scouring of the bottom of a full reservoir (utilize Jan '96 event).

5. **Effect of Scouring from a Tropical Storm** –

   Same as Scenario 4 except event will occur in summer (substitute the Jan '96 event).

6. **Reservoir Bypass** –

   Impacts on WQ/sediment accumulation rates with a system bypassing sediment from behind Conowingo to below the dam.

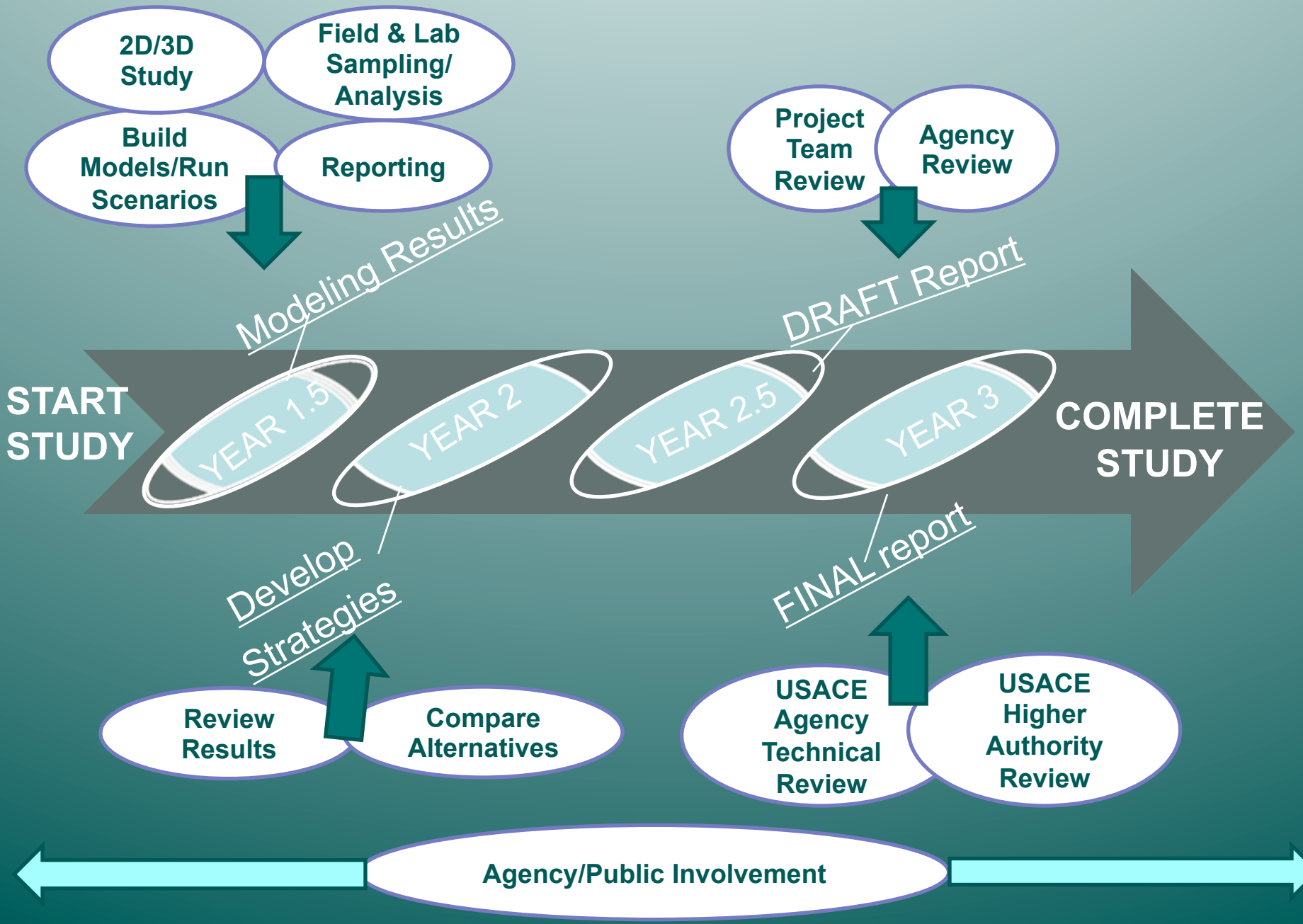
7. **Reservoir Strategic Dredging** –

   WQ/sediment accumulation rate impacts from dredging fines in potentially any reservoir.

8. **Modify Dam Operations** –

   Effects of altering the flow and/or the way the Conowingo is currently operated..

Assessment Timeline



Schedule of Upcoming Activities

2D/3D Study and Model Construction	Ongoing-Mar 2012
Data Assembly for Chesapeake Bay Model	Jan-Feb 2012
Sediment Grab Sample Collection	Feb-Mar 2012
Develop Project Website	Jan-Mar 2012
Chesapeake Bay Model Data Report	Mar 2012
Bathymetric Analysis and Data Collection	Jan-Mar 2012
Complete Initial HEC-RAS Hydraulic Model	Ongoing-Mar 2012
Sediment Characterization (SEDFlume)	Mar-May 2012
Model Proof	April-May 2012
Hydrodynamics Model Runs	April-May 2012

2011 – Chesapeake Bay Impacts from a very atypical year

- 2011 Second wettest year on record
- High spring flows contributed to near record summer "Dead Zones" in the CB deep channel and high oyster mortality in the upper Bay
- Flow at Conowingo Dam after TS Lee were third highest recorded, only behind 1972 Hurricane Agnes and 1996 winter flood
- Hurricane Agnes delivered 5 times the amount of sediment as TS Lee
- TS Lee delivered huge amounts of sediment and nutrients to the Bay. 4 million tons of sediment were scoured from behind Conowingo dam in addition to sediment delivered from the watershed
- Although high flows and sediments negatively impacted SAV, the SAV in the Susquehanna Flats which is the largest contiguous bed in the Chesapeake Bay, remains intact with marginal losses around the edges
- Maryland entered into a 3-year agreement with the US Army Corps of Engineers in September to develop options to extend the sediment storage capacity behind Conowingo Dam on the Susquehanna River
- DNR's monitoring programs will be evaluating any carry over impacts from 2011 on water quality, habitat and living resources in 2012

Questions?