Chesapeake Assessment Scenario Tool

CAST

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Interstate Commission on the Potomac River Basin

GOALS FOR CAST

- Provide a mechanism for the states to get input and commitment from multiple federal and local jurisdictions
- Guarantee that calculations are consistent and replicable
- Create transparency
- Integrate data in a uniform format for WIP and Milestones

PROJECT INITIATION

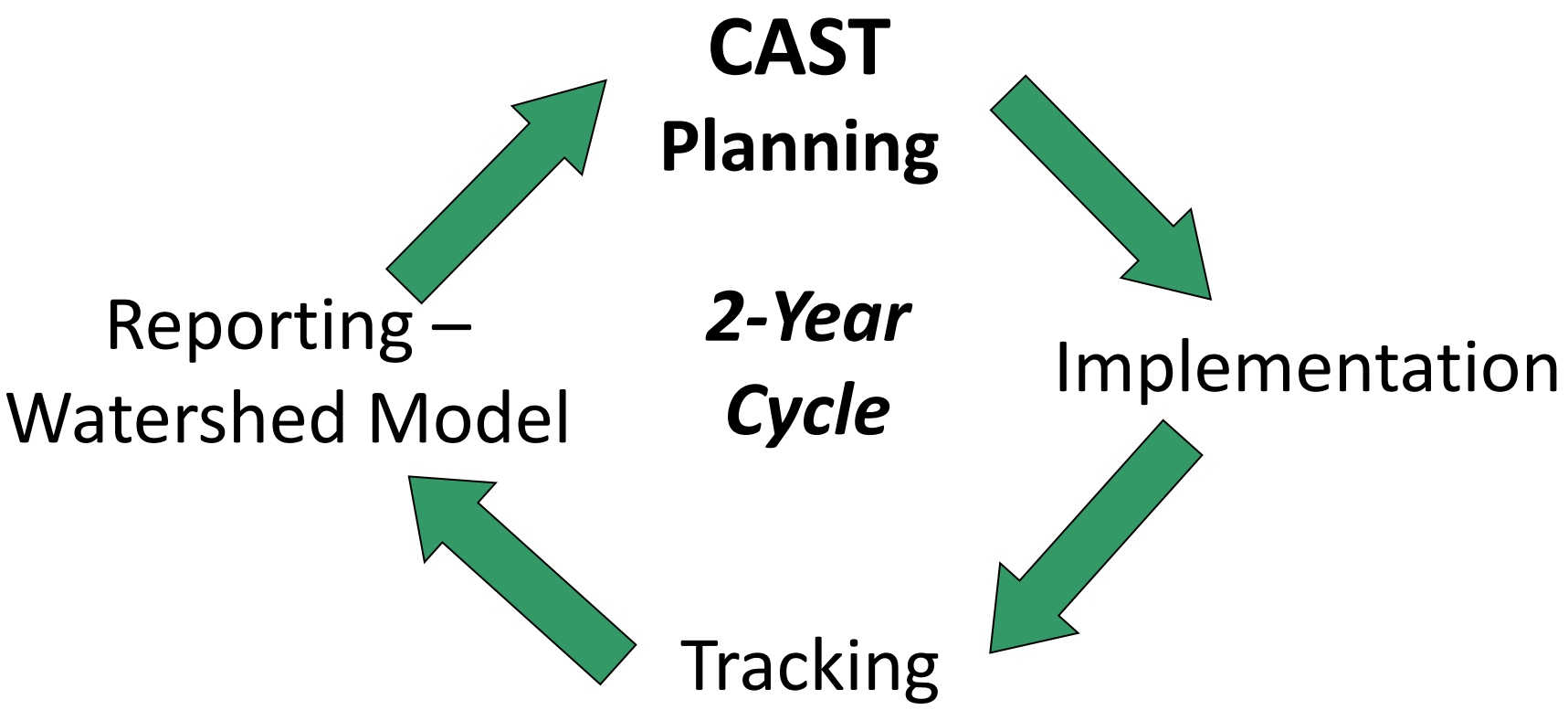
- Maryland Department of the Environment requested that ICPRB develop MAST to facilitate their WIP 2 process
  - CBRAP and MD General Funds

- Virginia Department of Conservation and Recreation asked that ICPRB customize MAST to meet Virginia's needs (VAST).

- Chesapeake Bay Program requested that ICPRB develop CAST to apply MAST to the entire watershed.
  - CBRAP funding to MD was expanded
  - Tetra Tech hired ICPRB to perform training

CAST FEATURES

- Consistent with EPA Phase 5.3.2 and WIP Phase II
- Consistent process for WIP teams
- Approved and interim BMPs
- Consistent input scale



- Facilitate an adaptive process, scenario development is iterative
- Serve as a data management system
- Facilitate stakeholder involvement, show implications of decisions

VALUE FOR JURISDICTIONS

- Builds load reduction strategies (by local area)
  - Identifies the BMPs that give the greatest load reductions
  - Specifies the extent these BMPs are to be implemented
- Meets the allocations
  - Compares among scenarios
- Produces CBP Scenario Builder model inputs
- Assesses WIPs and 2-Year Milestones

GROUP		USERS
VAST		320
MAST		224
CAST:	Virginia	77
	West Virginia	67
	Pennsylvania	65
	Maryland	64
	District of Columbia	49
	New York	48
	Delaware	47

Date	State	Workshop Location
6/15/2011	WV	Freshwater Institute, Shepardstown, WV
7/11/2011	MD	MDE, Baltimore, MD
7/14/2011	MD	MDE, Baltimore, MD
7/19/2011	MD	Webinar -DNR, Annapolis, MD
7/21/2011	MD	MDE, Baltimore, MD
7/26/2011	MD	MDE, Baltimore, MD
7/28/2011	MD	MDE, Baltimore, MD
8/2/2011	MD	MDE, Baltimore, MD
8/8/2011	PA	Conference Call Demo of MAST
8/16/2011	MD	Webinar Federal Facilities-DNR, Annapolis, MD
8/24/2011	MD	MDE, Baltimore, MD
9/1/2011	WV	Martinsburg, WV
9/27/2011	CBP	Webinar in Annapolis to entire CB Watershed
9/27/2011	CBP Management Board	Annapolis, MD
10/3/2011	VA	Richmond, VA
10/4/2011	PA	Harrisburg PA,
10/11/2011	VA	Fairfax County Government Center,
10/19/2011	DE	Dover, DE
10/20/2011	VA	Weyers Cave, VA
10/24/2011	VA	Virginia Institute of Marine Science, Gloucester Point, VA
10/25/2011	DC	District Department of the Environment, Washington, DC
10/26/2011	WV	Martinsburg, WV
10/28/2011	NY	Owego, NY
11/16/2011	CBP	Federal Facilities Conf. Call (at request of Greg Allen)

WWW.CASTTOOL.ORG

WWW.MASTONLINE.ORG

WWW.VASTTOOL.ORG

METHODOLOGY FOR BMP CALCULATIONS

- CAST calculates all BMPs identically to CBP's Scenario Builder except for Animal BMPs
- Animal BMPs affect the amount of manure
- CAST calculates manure lbs based on user-selected BMP implementation level, same as Scenario Builder
- Distribution of manure lbs based on regressions
- Three classifications of manure
  - direct deposit manure (pasture land uses only)
  - storage loss manure (AFO/CFO)
  - stored manure (crop and pasture land)

ANIMAL BMPs

BMPs that increase stored manure, which is then applied to crops and pasture

- Alum
- Lagoon Covers
- AWMS
- Mortality Composting

BMPs that decrease total manure

- Dairy Precision Feeding
- Poultry Phytase
- Swine Phytase

- **Based on user's selection of % Implementation of these BMPs and the interaction effects with nutrient management, CAST calculates the amount of manure**
- **The regression equations translate the manure into a loading rate by FIPS, LU, and TN or TP.**

MAINTAINING CONSISTENCY WITH THE CHESAPEAKE BAY PROGRAM

- Change on Nov. 30, 2011 to Scenario Builder:
  - Street Sweeping may now only be entered in terms of Mechanical Monthly as acres on an annual basis or in terms of pounds of sediment removed. Note that mechanical monthly has a nitrogen, phosphorus, and sediment benefit whereas street sweeping-pounds only has a sediment benefit.
- Changes on Dec. 7, 2011 to Scenario Builder:
  - Poultry injection and dairy manure infection are no longer allowed on nursery.
  - Crop irrigation management is no longer available for alfalfa, nutrient management alfalfa, hay without nutrients, hay with nutrients, nutrient management hay, and pasture.

VALIDATION USING 2009 PROGRESS

	+/- 10% of Watershed Model Output by land use and FIPS
Acres per LU	99.82%
TN EOS	95.68%
TP EOS	97.94%
TSS EOS	99.93%

Most of the error is on agricultural land uses. Urban land uses match within +/- 1%.

State Specific Practices

- MD—Heavy Use Area Concrete Pads – Poultry
- VA—Conservation No Till implemented in two ways

CHANGES TO SCENARIO BUILDER AND THE WATERSHED MODEL

- **Using multiple models strengthens all models**. Comparisons between MAST/CAST/VAST and Scenario Builder/Watershed Model led to changes to Scenario Builder and/or the Watershed Model including:
  - Processing of agricultural forest buffers, agricultural grass buffers, agricultural wetland restoration and urban forest buffers in Scenario Builder when these BMPs are submitted as a percent. There were also problems with the processing of these upland efficiencies of these BMPs, regardless of how they are submitted (acres or percent). Fixed by CBP last week.
  - Comparisons of CAST with Scenario Builder also showed that the BMP StreetSweepFt is not given credit in Scenario Builder.
  - Working with Maryland and the Chesapeake Bay Program, we updated MD urban data in both MAST and the Watershed Model.
  - There was an error in the Watershed Model that involved pulling data from a previously run scenario where BMPs were not specified. This led to the incorrect base loads that were initially used in MAST/CAST/VAST.
  - The Watershed Model was changed so that groups of overlapping BMPs were better defined, preventing issues related to over-crediting certain BMPs. (This fix needs still to be implemented in Scenario Builder, but is controlled for in the WSM).

Future Refinements

- Users input acres or percent implementation
- BMP costs
- Data Quality
  - P on AFO/CFO
  - Garret County Sediment delivery factor
  - Improved estimation of animal BMPs
  - Additional testing
- Speed—upgrade tool to accommodate increased usage, larger scenarios
- Show results as percent implementation, not just loads
- Continued technical support and updating documentation

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