Goals for Wetland Monitoring Strategy

• Integrate Results into Regulatory Program for Permit Review and Mitigation

• Improve Voluntary Wetland Restoration and Protection

• Integrate Results with other Planning and Water Monitoring, and Water/Natural Resources Management

• Meet Requirements of Clean Water Act Use classes, water quality standards, 305(b) 303(d), TMDLs
Existing Monitoring Efforts

- Best Professional Judgment for Small Wetland Impacts
- Formal Functional Assessment for State Highway Projects
- Monitoring of Mitigation Sites
- Pilot Studies of Wetland Condition – Completed, In progress or Near Future
EPA’s Elements of a Wetland Monitoring Strategy for Clean Water Act Requirements

- Objectives
- Monitoring Design
- Core and Supplemental Indicators and Methods (Levels I, II, III)
- Quality Assurance
- Data Management
- Data Analysis/Assessment
- Reporting
- Programmatic Evaluation
- General Support and Infrastructure Planning
Steps in Development of Strategy

- Acquire background information and hold internal discussions among State agencies
  - Assess condition and function
  - Develop draft classification system

- Form Work Group of Stakeholders
  - State/federal/local agencies, private conservation groups, homebuilders
Steps in Development of Strategy cont.

- Review and Refine Identification of Gaps and Needs for Level 1,2,3 – Va. Tech
- Review, discuss and reach consensus on recommendations for:
  - Inventory and Mapping
  - Regulatory Permitting, Mitigation, and Voluntary Restoration
  - Large-scale, Regional or Watershed Assessments
  - Preservation
  - Clean Water Act
Steps in Development of Strategy cont.

• Reach Consensus on Protocols

• Final Report with background information, analysis of data sources considered and decisions on use, literature citations, deliberations, indicators, detailed work plan, study design, data analysis, storage, and dissemination
Other Deliverables

Draft Water Quality Standards
Template for Level III Assessment
Potential Long-Term Reference Sites
Wetland Inventories and Maps


Total: 757,200 acres
Other Maps/Mapping Efforts

Hydric Soils

Vernal Pools

LiDAR
Baseline

Use both NWI and MD-DOQQ for guidance.

Use hydric soil maps with caveats—not all mapped hydric soils are wetlands.

Wetland acreage estimates should be explained and referenced with regard to limitations.

Recommended map layers should be designated and made available on MSGIC website.

Evaluate change in State law for updates to tidal wetland maps.
Baseline cont.

Recommendations – Additional Resources

- Digitize wetland boundaries from 1972 maps, if maps remain in effect
- Expand and evaluate use of LiDAR in wetland in wetland detection
- Incorporate data from regulatory review in updating wetland boundary maps
Wetland Classification
Classification System

Hydrogeomorphic Assessment (HGM) – currently favored by EPA Region III.

Uses hydrology source, landscape position, physiographic region to classify wetlands – e.g. tidal fringe, depression, riverine, flat, slope

National Wetland Inventory

Existing classification on base maps, uses hydrology, salinity, vegetation, duration of inundation. Used in gains and loss tracking.
Key Wildlife Habitats

Concept developed as a required element of State Wildlife Action Plan for all states

Method to focus conservation for about 500 GCN species, as well as the full array of wildlife that also occurs within those habitats

Conserve entire assemblages of species by working to protect and conserve key wildlife habitats

Use of existing, data-driven and standardized ecoregion and vegetative classification systems NWI, USNVC, MD Ecological Community groups, Ecological Systems
Modified Wetland Classification

Renames, Consolidates, Revises HGM classes, Allows for Cross Walk with HGM and Key Wildlife Habitats

Tidal Wetlands (separated into estuarine and freshwater)

Riparian Headwater Wetland – may have multiple hydrology sources, include slope and depressional complexes in or connected to floodplain

Riparian Mainstem Wetland – may have multiple hydrology sources, including overbank flooding, include slope and depressional complexes in or connected to floodplain
Modified Wetland Classification cont.

Isolated Depressional or Seepage Slope Wetland – not hydrologically connected to surface water body.

Seasonal Flat Wetland – slow infiltration of surface water, high groundwater, level topography, may or may not be connected.

Peatland Wetlands – sphagnous mat, organic soils, accumulated peat, year-round soil saturation.
Modified Wetland Classification cont.

Altered, Constructed, or Incidental Wetland – Actively managed or established due to human activity (wetlands in stormwater facility).

May have increased or decreased functional performance.

May not initially be comparable to reference wetland, but may resemble natural reference over time (e.g. mitigation or created/restored wetlands).

Does not include wetlands under management to replace natural process (e.g. fire).
Regulatory Permitting and Mitigation Recommendations Using Existing Resources

1. Prepare rationale and guidance for regulatory assessments.

2. Review status of mitigation projects quarterly and follow up as needed.

3. Update mitigation guidance.

4. Prepare report on tidal wetland mitigation projects.
Regulatory Permitting and Mitigation Recommendations Using Existing Resources cont.

5. Explore use of IRIS tubes.

6. Expand and integrate databases to store mitigation information.

7. Coordinate with Enforcement and MDE attorneys to improve compliance for mitigation projects.

8. Subtract acreage of failed projects.
Voluntary Restoration
Recommended Tasks that Require Additional Resources

1. Apply LiDAR and radar to monitor hydrology before and after wetland restoration/creation or creation by U.S. Natural Resources Conservation Service.

2. Expand the model developed in the Choptank and Regional Watershed studies across Maryland.
Voluntary Restoration
Recommended Tasks that Require Additional Resources cont.

3. Develop a method to examine wetland restoration or creation on the overall hydrology of the large-scale landscape.

4. Conduct more monitoring to measure success of the federal/State Phragmites control program.

5. Develop a better understanding of the effects of management burns on the Blackwater National Wildlife Refuge
Voluntary Restoration

Recommendations Using Existing Resources

1. Monitor, by visual observation, evidence that specific habitat features added to a restoration site are used by macrofauna.

2. Evidence may include presence of scat, direct observation of wildlife, etc.
Voluntary Restoration
Recommended Tasks that Require Additional Resources

Advocate use of IRIS tubes to provide a qualitative or quantitative (depending on how they installed and ultimately interpreted) assessment of the soil redox potential.

Monitor wetlands that have had nutria removed: vegetative response and elevation of the marsh surface (is the damage to a particular marsh from nutria herbivory permanent?)
Large-scale Assessments: Recommendations Using Existing Resources

1. Provide training to local governments and other stakeholders in use of wetland-related data layers, with clear explanations of how the layers were derived, what associated assumptions are, and what the data represent.

2. In order to promote restoration and watershed planning, planners should make the link between wetland values and Bay restoration.

3. Link wetland data and management with other local government goals and functions. Local governments should strive for consistency with State requirements and recommendations.
Large-scale Assessments: Recommendations Using Existing Resources cont.

4. MDE shall complete review of the VIMS-GIS layer for wetland stressors and prepare recommendations on its use.

5. Develop area-wide system of reference sites.

6. Do not rely to heavily on models. Collect much observational data.

7. Design monitoring efforts to fit into surface water quality reporting and regulation, considering how wetlands relate to stream function, beneficial uses, and water quality standards, including policies related to Tier II waters and their adjacent wetlands.
1. Design and implement monitoring approaches to determine the effect of increasing the water storage function in drained wetlands on downstream water quality and stream baseflow. LiDAR and other GIS-based hydrology tools should be further explored to determine the effects and help identify restoration opportunities.

2. Combine large scale assessments using LiDAR and SAR with intensive field sampling, to improve identification of restoration sites and determine scope and effect of hydrological alterations. The USDA pilot is the Choptank River should be used as a model.
3. Local government planners should aid in educating the public, wetland monitoring, developing protection practices, and helping to match interested landowners with funding agencies for restoration, preservation, or mitigation. Clear tools should be developed that lay people and local planners can use and understand.
Monitoring and Assessment for Wetland Preservation – Recommendations Using Existing Resources

1. Assess wetlands for occurrence of targeted species (endangered, threatened, or in need of conservation, or species of greatest conservation need) for acquisition of habitat through easement or fee simple purchase.

2. Monitor sites under easement to ensure that terms for wetland protection are followed.
3. Update and make available data layers useful for identifying and targeting priority areas for preservation.

4. MDE will investigate the feasibility of follow up and long term monitoring for preservation of wetlands through the State wetland regulatory program. If feasible, MDE will develop protocols and assessment methods as needed.
Monitoring and Assessment for Wetland Preservation – Recommendations Requiring Additional Resources

1. Assess tidal wetlands with contiguous natural vegetation for targeted elimination of Phragmites.

2. Expand field assessments of tidal wetlands to identify:
   a) wetlands showing evidence that they are not sustaining themselves through vertical accretion to keep pace with sea level rise and erosion;
   b) wetlands that are not keeping pace but that appear healthy;
3. Monitor other wetlands vulnerable to climate change, such as vernal pools.

4. Develop rapid protocols, based on intensive tidal wetland assessment, for determining tidal wetland sustainability. Protocols will include wetlands in front of structural shoreline stabilization practices.

5. DNR will resume field assessments of properties considered for acquisition under Program Open Space.
6. Entities owing land or easements will conduct more intensive monitoring of targeted species to determine success of preservation efforts.
Monitoring for Clean Water Act Requirements

Requires Water Quality Standards for Wetlands

- Designated Uses
- Criteria
- Antidegradation Policy

Monitoring Design

Assessment Method

Integrated Reporting 305(b), 303(d) – how to present results
Monitoring for Condition and Functions – Designated Uses

Some functions support and protect traditional waters and wetlands (habitat, hydrologic cycling)

Some functions protect traditional waters but not wetland condition (water quality)

Wetlands may be as much “Land” as “Water”

Should be based on ecological factors

Link to hydrology
Clean Water Act Requirements cont.

Will be limited to narrative criteria – insufficient data for numerical standard

TMDL considerations

Specify uses for particular classes of wetlands

Integrate data from previous studies

Identify long-term study and reference sites
Last Meeting February 22, 2010

Final Strategy by September 30, 2010