Mapping and Monitoring of Wetland Dynamics for Improved Resilience and Delivery of Ecosystem Services in the Mid-Atlantic Region

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Introduction

Study objectives
1. Develop improved wetland mapping and change detection using remote-sensing data from multiple, complementary sensors at various temporal and spatial scales;
2. Study the socioeconomic and physical drivers of wetland change affecting wetland extent and function at regional scales;
3. Assess the impacts of multiple environmental stressors, particularly the anthropogenic ones;
4. Quantify vulnerability of wetlands and wetland ecosystem services under multiple climate and land use change scenarios.

Study Area
The Chesapeake Bay Watershed (the most productive estuary in US with a coverage of 165,758 km²) with focus on the Atlantic Coastal Plain Physiographic Region.

Monitoring Key Drivers
- Accurate, dynamic wetland maps can improve society’s resilience to increasing urbanization, population growth, and climate change through
- early detection and improved understanding of climate change effects
- enhanced management of wetlands to target desired ecosystem services
- Wetland hydroperiod is the most important abiotic factor controlling wetland extent and function.

The Overall Design of the Proposed Study

Preliminary Results
Monitoring the Connection between Weather and Hydroperiod with Landsat Based Wetness Trends through Time (1)

Outcomes
- Use of remotely-sensed data to produce dynamic maps of wetland extent and assessment of vulnerability impact and adaptation (VIA) to identify key stressors and functional drivers supports the adaptive management of wetlands

Trends in Landsat Wetness index Indicating Wetland Gains and Loss (2)

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