



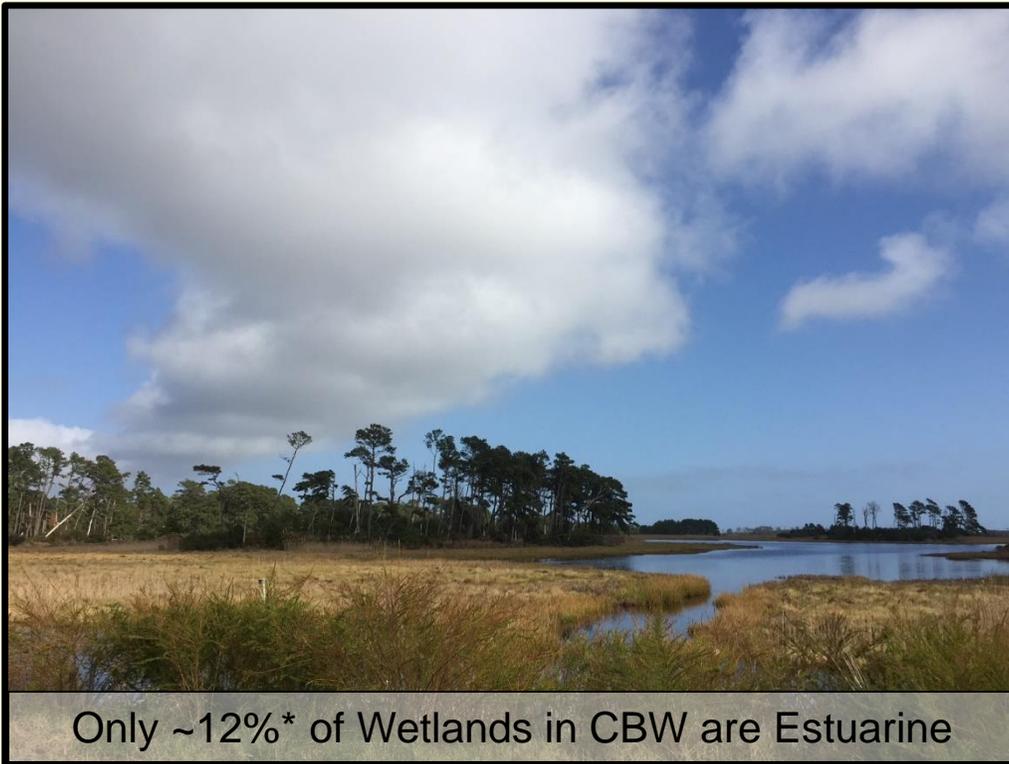
The National Wetlands Inventory: Mapping and Monitoring Wetlands in the Chesapeake Bay Watershed

Megan W. Lang

megan_lang@fws.gov

U.S. Fish and Wildlife Service National
Wetlands Inventory

Wetlands of the Chesapeake Bay Watershed



Only ~12%* of Wetlands in CBW are Estuarine

Wetlands cover ~4% of the Chesapeake Bay Watershed, but they provide disproportionately large benefits to society.



~60%* of Wetlands in CBW are Palustrine Forested

*Tiner et al. 1994



Why are Wetlands Important?

- **Provisioning** – provides direct material and consumable benefits
 - Food and fiber
 - Timber and minerals
 - Fuels
 - Medicinal resources
- **Cultural Services** – provides direct social and spiritual benefits
 - Recreation
 - Spiritual and historic
 - Science and education
- **Regulation** – provides direct benefits to support and maintain control of ecosystems
 - Climate regulation
 - Waste treatment
 - Water regulation
 - Nutrient regulation
- **Supporting** - provides direct benefits to support and maintain control of ecosystems
 - Primary production
 - Nutrient cycling
 - Water cycling

Millenium Ecosystem Assessment (2005)

“Retaining and expanding wetlands is a critical way to reduce pollution, provide habitat and restore the Bay” (Chesapeake Bay Program 2018)

Calvert Cliffs

Maryland

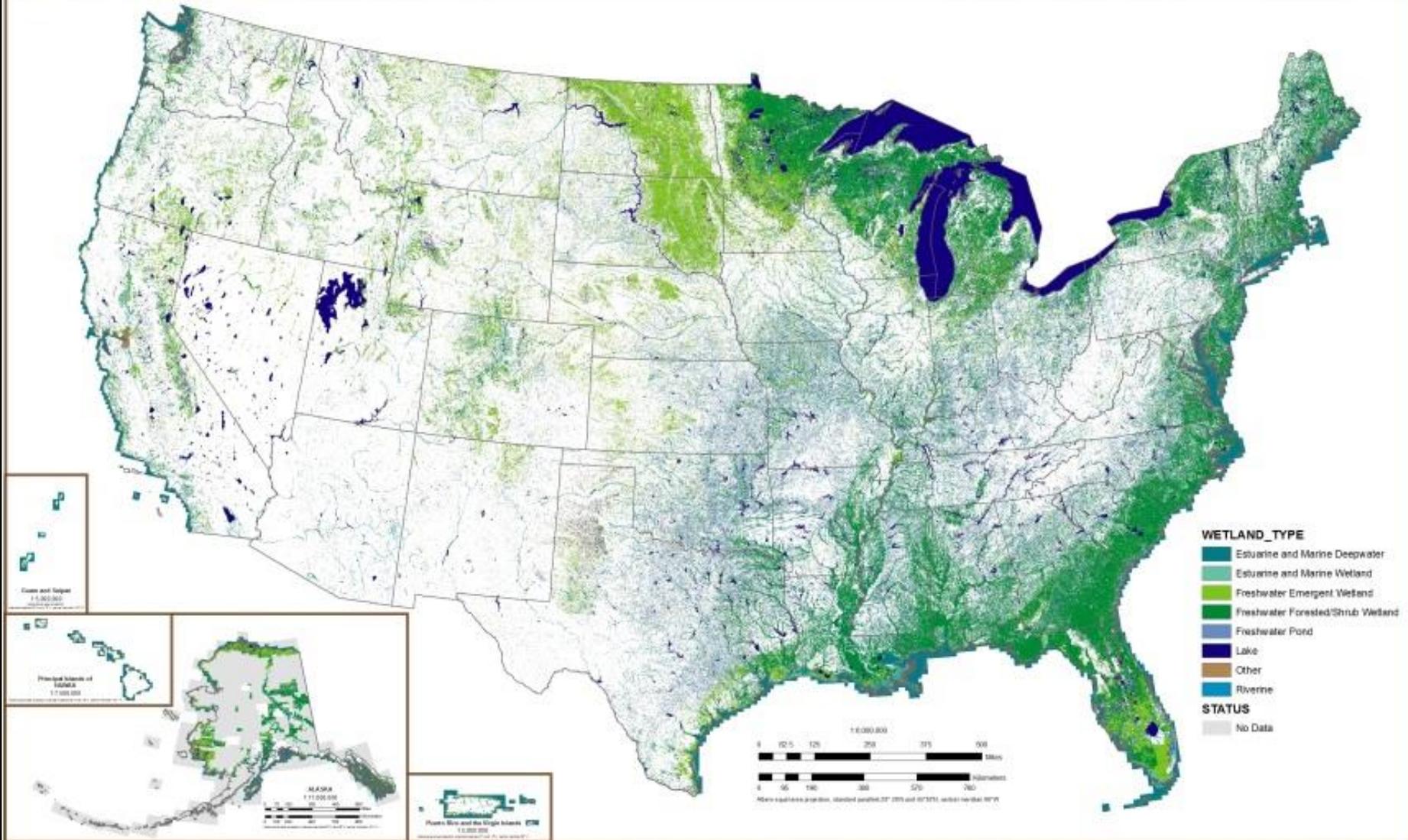


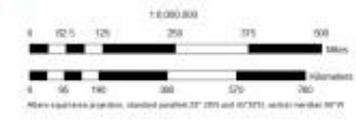
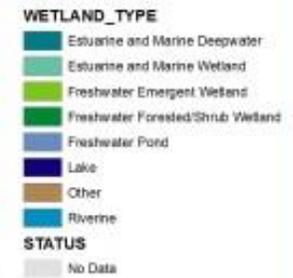
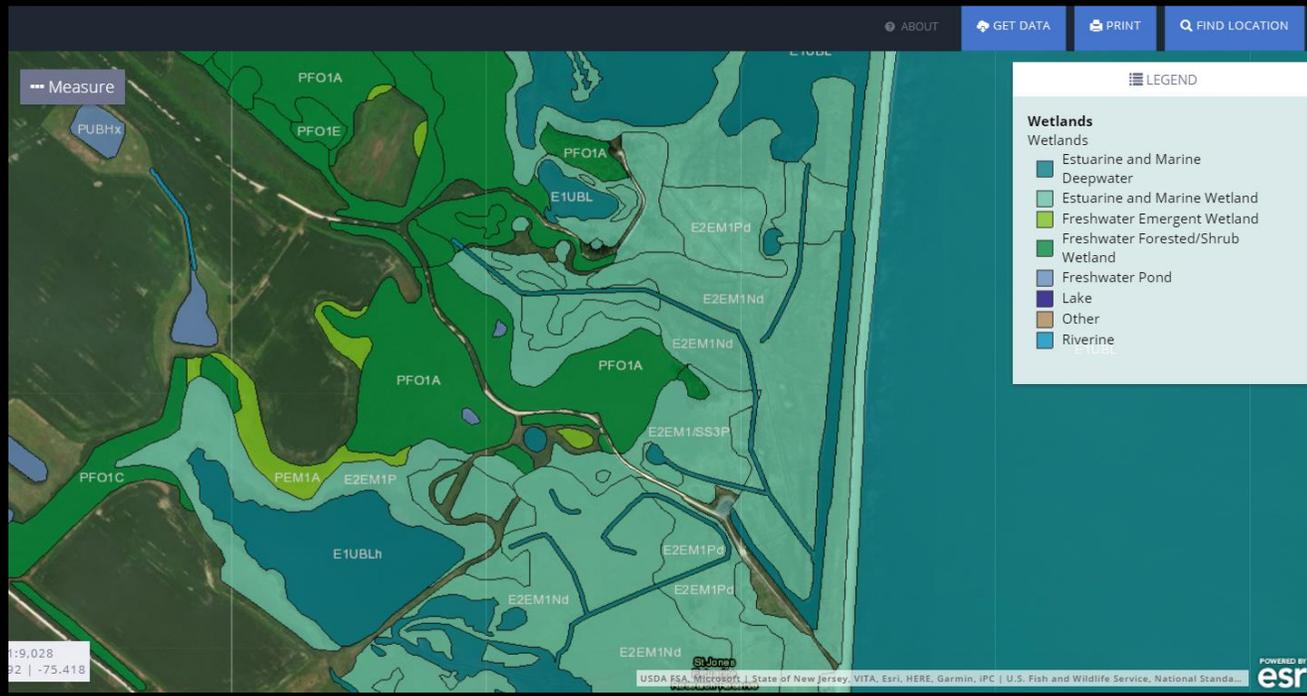
Production and
Transport of
Organic Rich
Water to the
Chesapeake Bay



National Wetlands Inventory

- The U.S. Fish and Wildlife Service National Wetlands Inventory (NWI) program was initiated to guide natural resource decision-making relevant to wetlands.
- The Service is required by the U.S. Congress to:
 1. Map wetlands of the United States
 - **National Wetlands Inventory geospatial dataset**
 - Completed in 2014 for the conterminous U.S.
 - Wetlands Layer of the National Spatial Data infrastructure
 2. Provide decadal reports on wetland status and change
 - Wetlands Status and Trends Reports





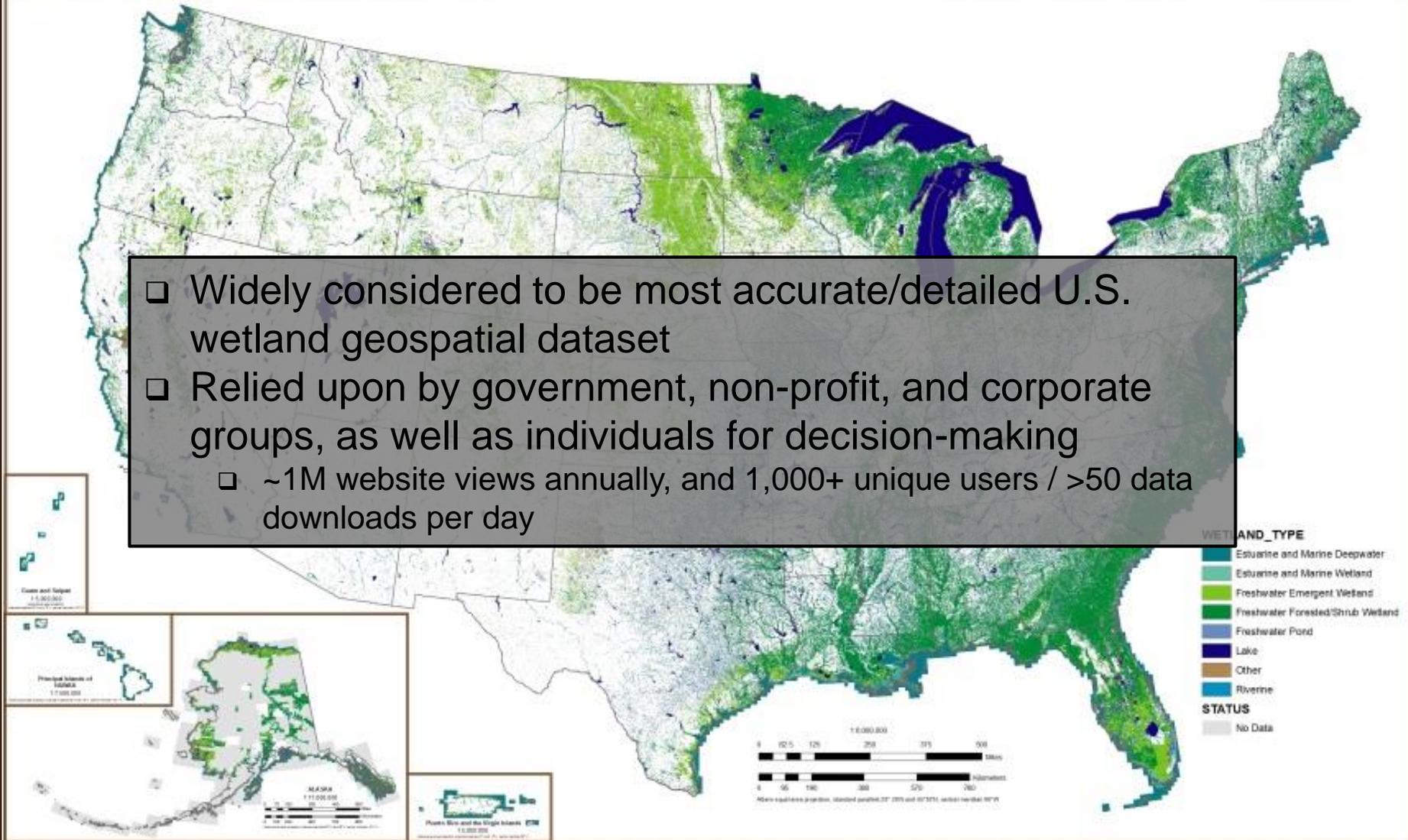


U.S. Fish & Wildlife Service

National Wetlands Inventory

<http://www.fws.gov/wetlands/>

Wetland Mapping Status - October 2014



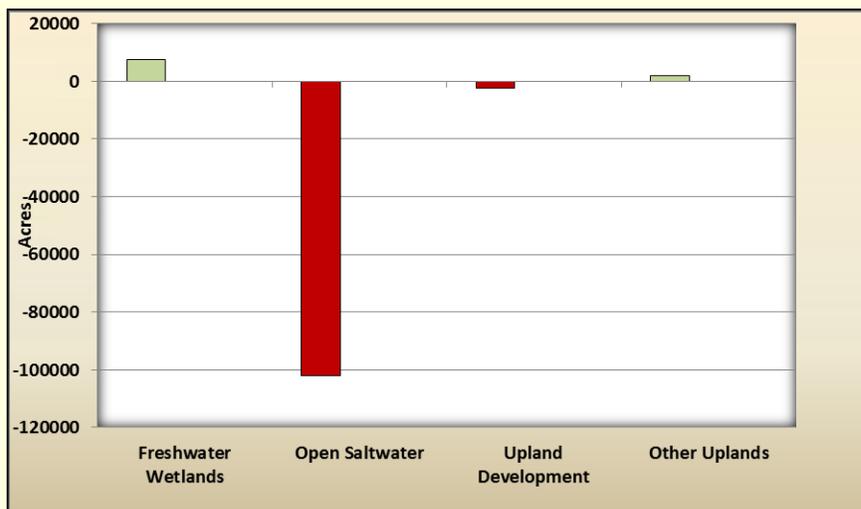
- ❑ Widely considered to be most accurate/detailed U.S. wetland geospatial dataset
- ❑ Relied upon by government, non-profit, and corporate groups, as well as individuals for decision-making
 - ❑ ~1M website views annually, and 1,000+ unique users / >50 data downloads per day



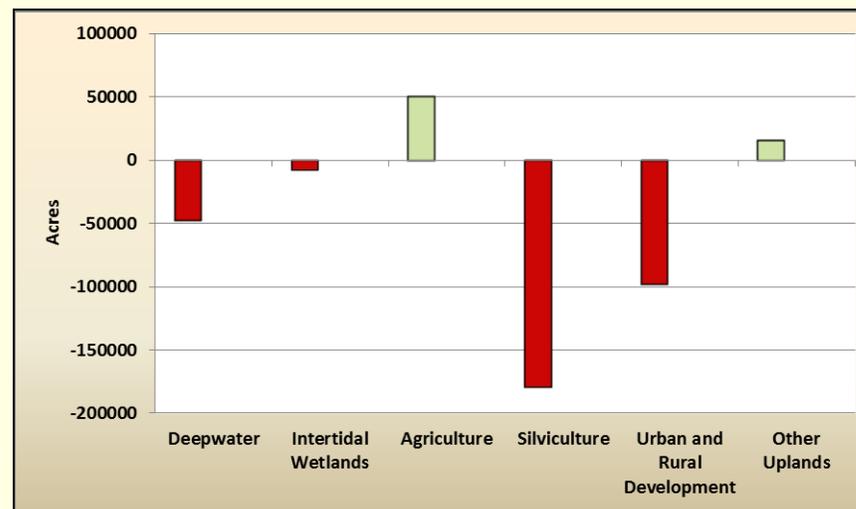
Critical NWI Challenge

- Maintenance of a contemporary dataset that meets users' needs for accuracy, as well as spatial and categorical detail.

Wetland change is especially rapid in coastal watersheds



Change in saltwater wetlands



Change in freshwater wetlands



Opportunities for Collaboration

- Opportunities: The remote sensing community is well positioned to support operational programs, like NWI.
 - Easily ingested time-series products, not imagery, with low or at least well understood levels of uncertainty.
 - Land cover, hydrology (inundation and soil moisture) or plant structure and phenology
 - Reduce uncertainty of wetland codes; implement rapid updates
 - Imagery that serves as base maps for manual interpretation
 - Fine spatial (1–5m); moderate temporal resolution (~monthly)
 - Spectral/radiometric resolution that supports detection of inundation and soil saturation in a wide array of habitats – e.g., below plant canopies, mixed with soil and vegetation.



Summary

- Over half of our Nation's wetlands have already been lost; and substantial net loss continues in coastal watersheds, like the Chesapeake Bay.
 - These losses directly affect water quality.
- Contemporary NWI maps are necessary to guide strategic natural resource decision-making, involving water quality and many other ecosystem services.
- Partnering has been/will be critical to the provision of contemporary NWI maps.
 - NASA imagery and products, as well as state and other federal partnerships likely to play vital role

Loss of wetlands eliminates valuable natural functions, such as water quality improvement, shoreline stabilization, and flood water storage, that are provided free of charge to society. While individual wetlands may seem insignificant to some people, wetlands function as an integrated system, especially in water quality improvement and flood water retention. Loss of a seemingly small, but critical, amount of wetland may destroy the integrity of the entire system and greatly impair its functional capacity. In terms of wetland functions, the system is greater than the sum of its parts. Functional losses of individual wetlands or parts of wetlands throughout the Watershed and its subbasins therefore exacerbate the overall decline in the Bay's water quality and adversely affect its living resources.

Knowledge of wetland status and trends in the Watershed is critically important to developing public policy and strategies for improving the quality of Chesapeake Bay and restoring its living resources.

Tiner, R. et al. (1994) Recent Wetland Status and Trends in the Chesapeake Watershed (1982 to 1989)

**For further information please contact:
Megan_Lang@fws.gov or 703-358-2103**