An Update of National Wetlands Inventory Activities in New England

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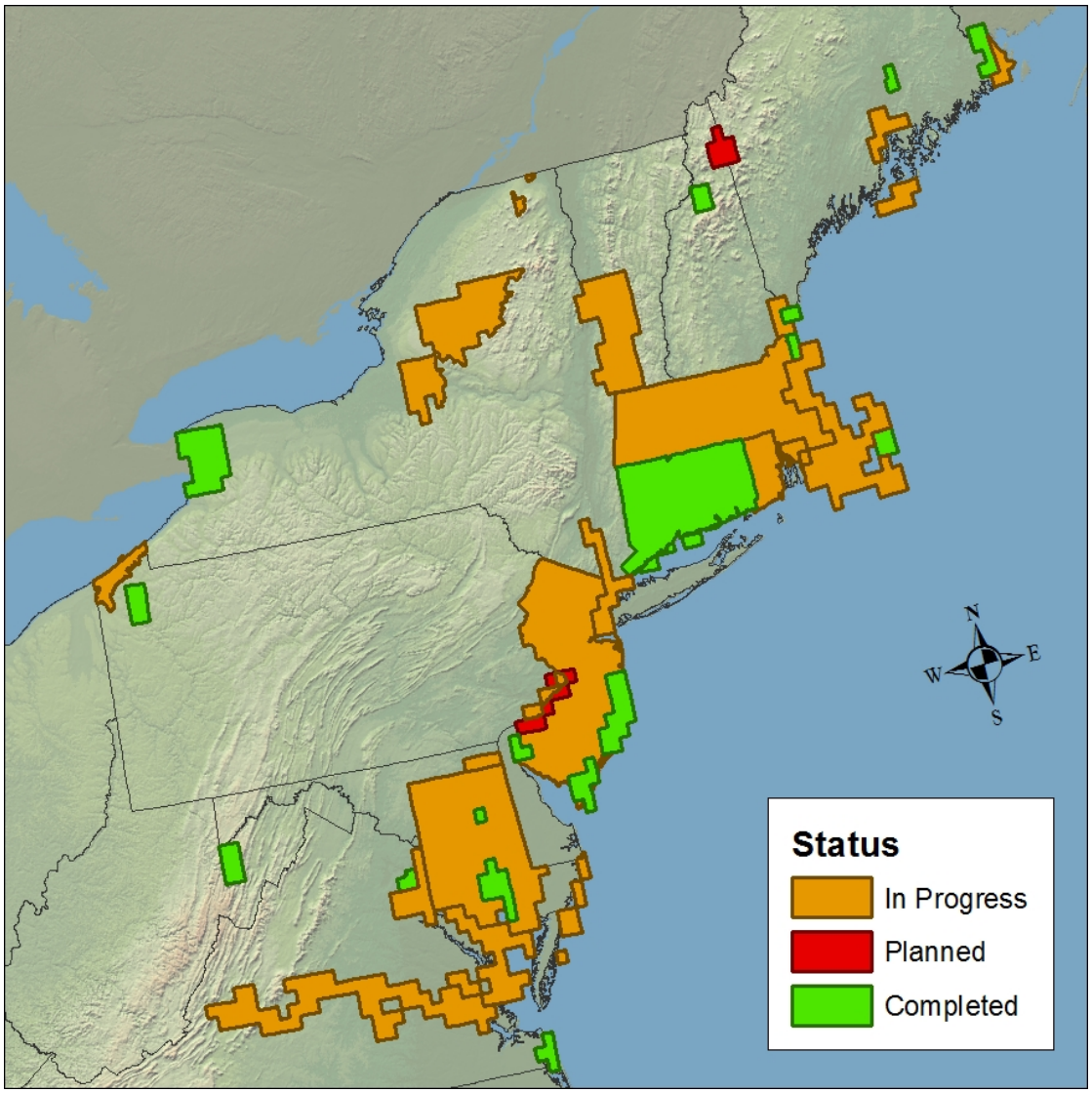
Projects

- Completed
  - Enhanced Wetlands Inventory for Connecticut
  - Updated NWI for selected refuges
  - Rapid Update of Older Coastal Quads (1980s or 1990s)
  - Long Island Sound Eelgrass Survey
- Nearly Completed
  - Enhanced Wetlands Inventory for:
    - Rhode Island
    - Massachusetts
    - Coastal New Hampshire
    - Southwestern Vermont
- Planned
  - Establish plots in Great Bay to monitor changes in coastal vegetation in response to rising sea level

NWI Recent and Ongoing Activities



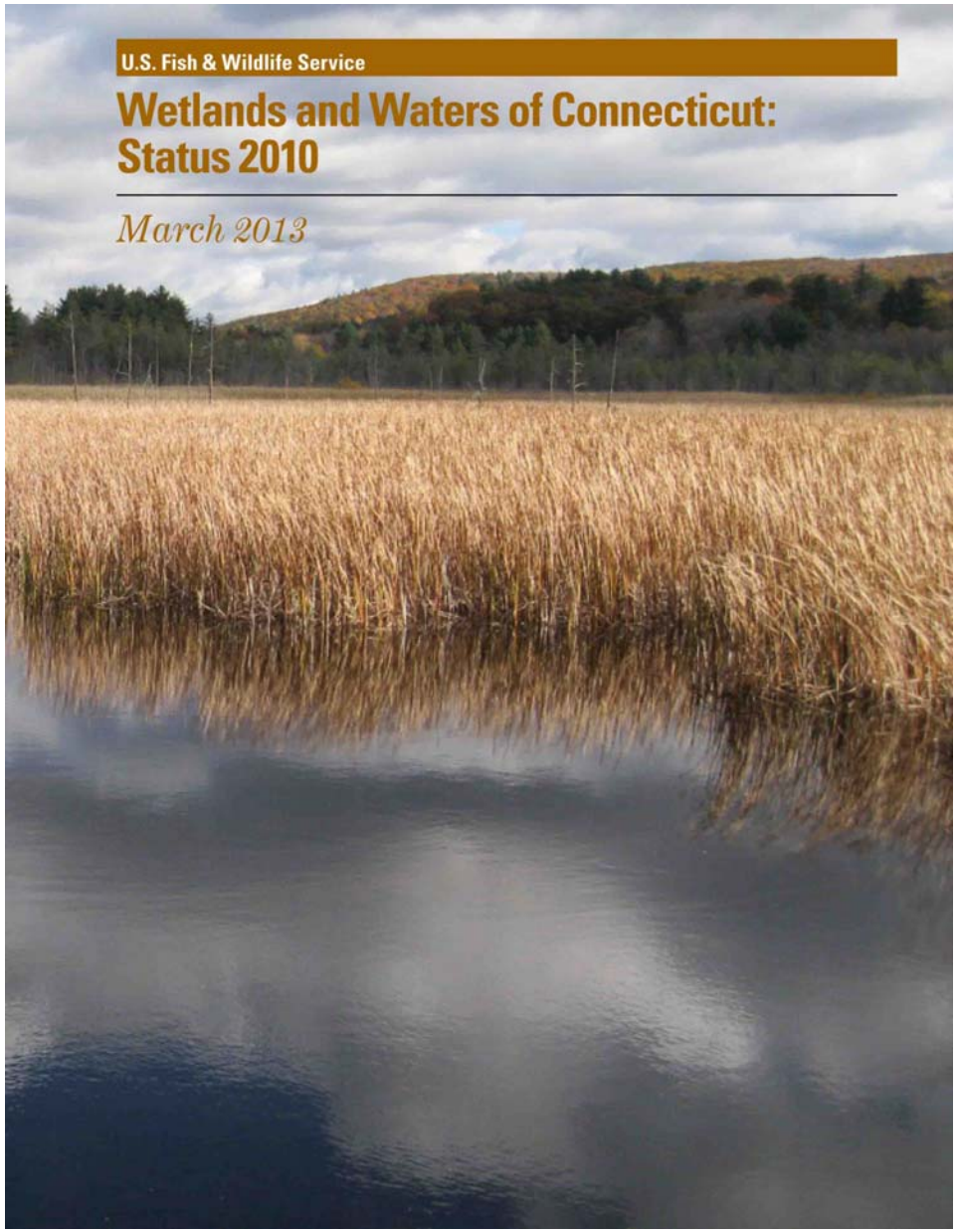
Connecticut

- Updated NWI with 2008 imagery
- Funded by State (CTDEEP)
- Expanded geospatial data for entire state
  - Posted online via NWI+ Web Mapper at: http://aswm.org/wetland-science/wetlands-one-stop-mapping
  - Data available from CTDEEP
- Four reports produced

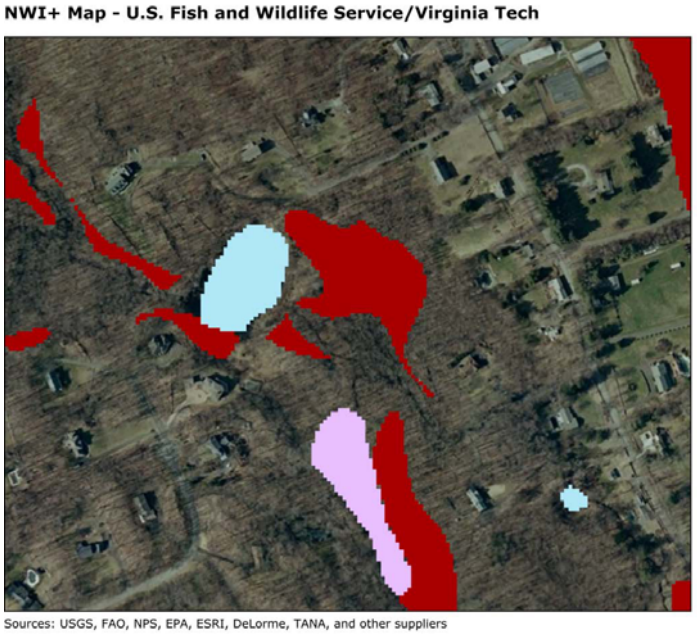
Wetlands and Waters of Connecticut: Status 2010

Summary of wetland and deepwater habitat acreage by state, county, and watershed

- Wetlands classified by Cowardin types
- 220,000 acres of wetland = 6% of state's land-water area
- 447,000 acres of deepwater habitat = 13% of state



Inventory of “P-wet Areas” - areas not mapped as wetland by NWI but mapped as hydric soil by NRCS and in “natural vegetation”: 221,575 acres



Connecticut Wetlands: Characterization and Landscape-level Functional Assessment

Wetland classification enhanced by adding hgm-type descriptors

- Landscape Position
- Landform
- Water Flow Path
- Waterbody Type

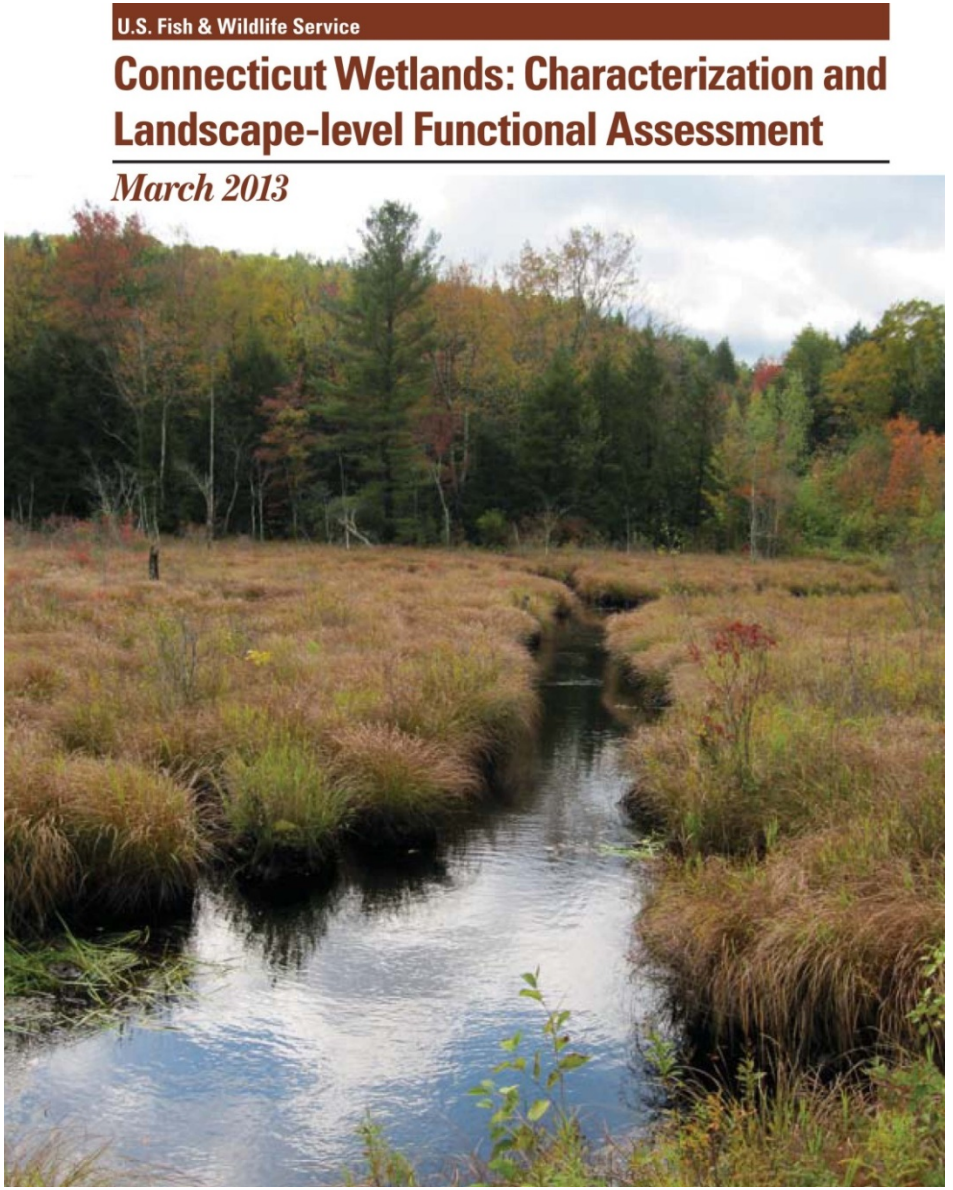
Results for state and watersheds

63% = lotic; 25% = terrene; 8% = estuarine; 4% = lentic

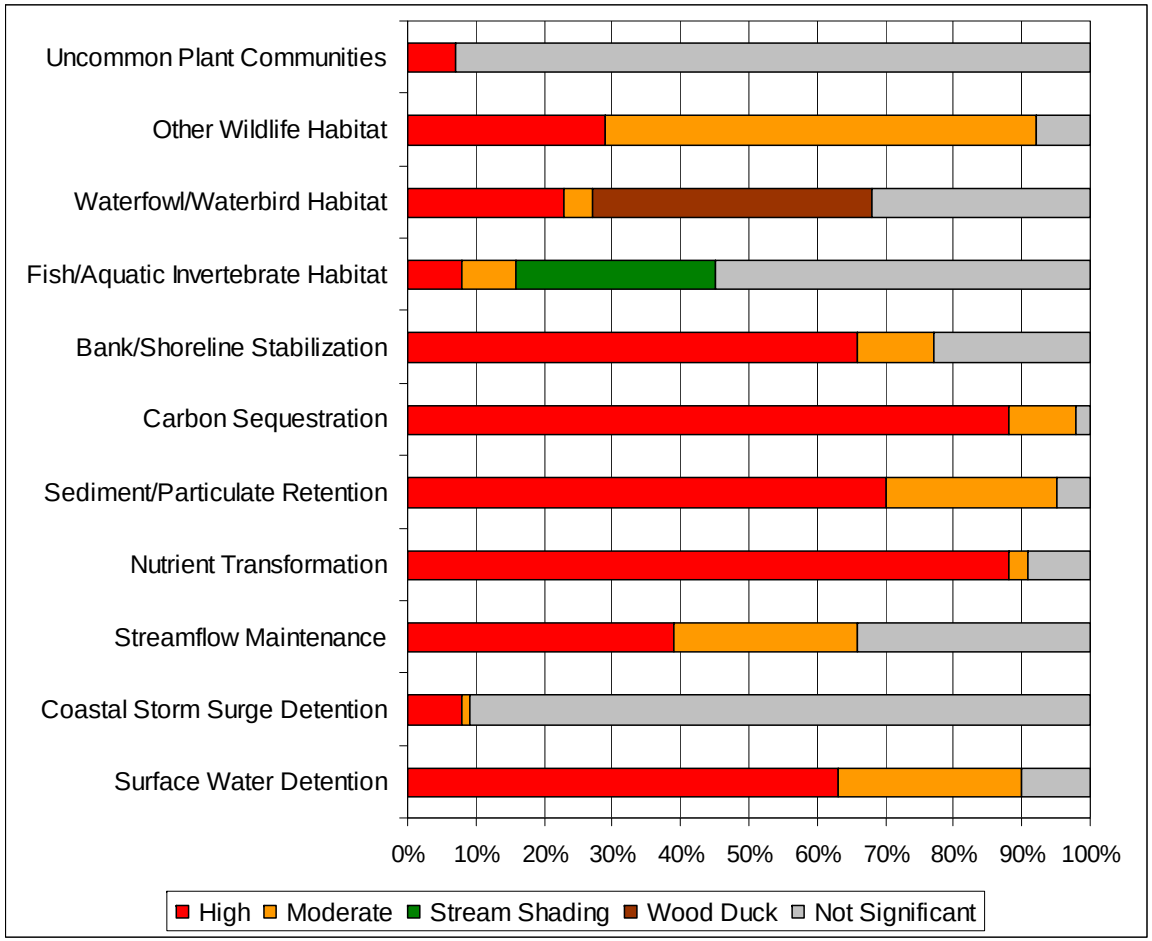
63% = throughflow; 13% = outflow;

12% = isolated; 9% = bidirectional-tidal; 3% = bidirectional-nontidal

Used “NWI+ data” to predict wetland functions at the landscape level



Connecticut Statewide Functional Assessment



Potential Wetland Restoration Sites for Connecticut

Statewide inventory of sites that may be suitable for restoration

Type 1 sites – former wetlands in land use that may be readily restored

Type 2 sites – existing wetlands impaired to some degree

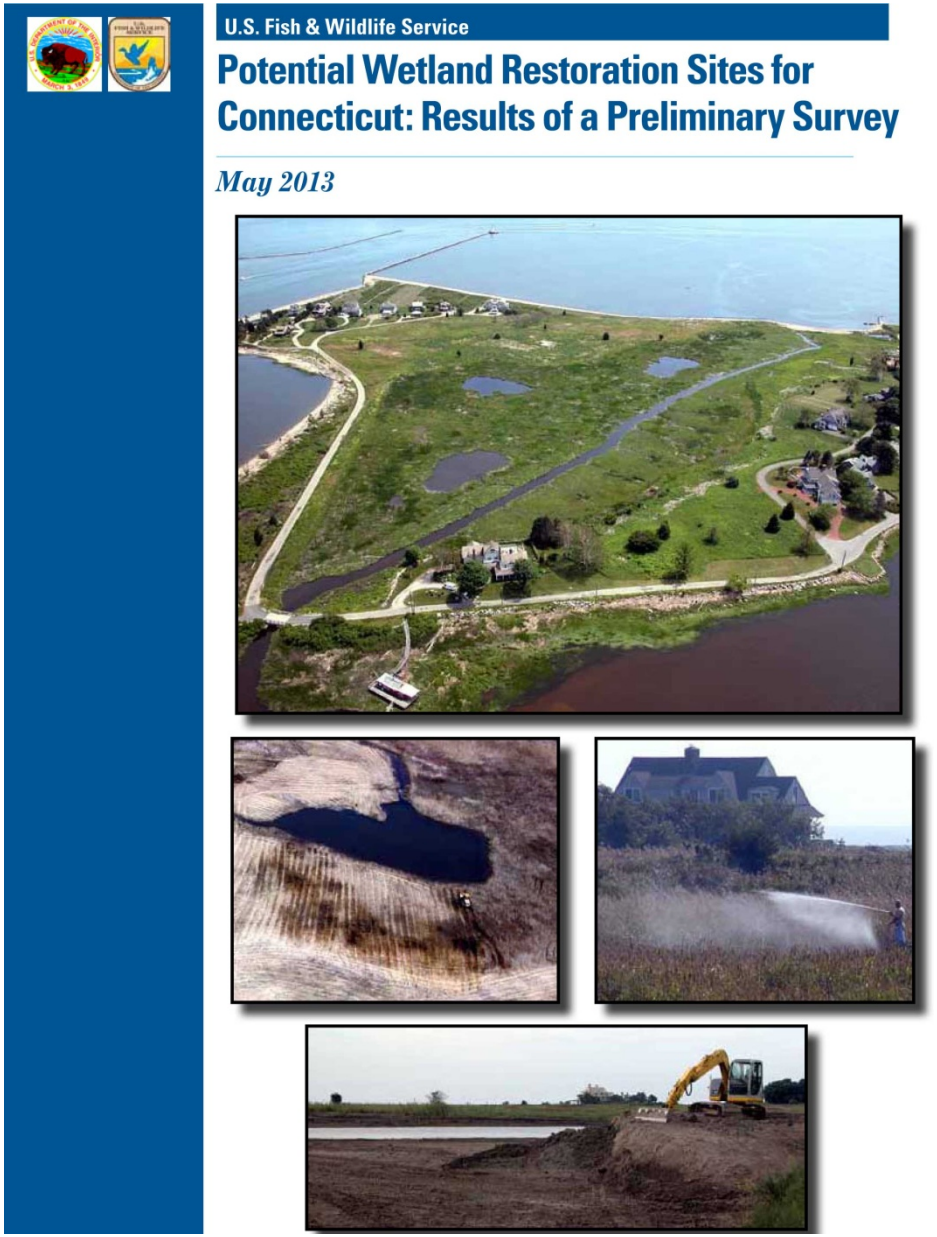
18,784 acres of Type 1 sites

- Mainly drained hydric soils

22, 500 acres of Type 2 sites

- 10% of state's wetlands
- 84% were ditched or impounded

Report included some additional sites – former tidal wetlands that were filled (dumps/dredged spoil areas)



CHANGES IN CONNECTICUT WETLANDS: 1990 to 2010

Net Losses:

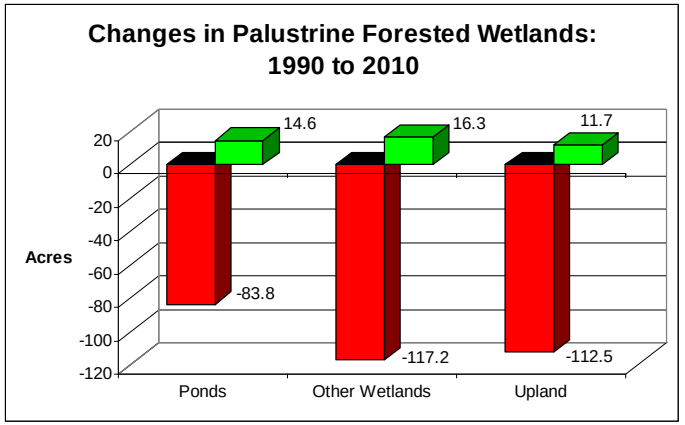
- Estuarine Emergent = 11 acres
- Estuarine Unc. Shore = 25
- Palustrine Forested = 271
- Palustrine Scrub-shrub = 47

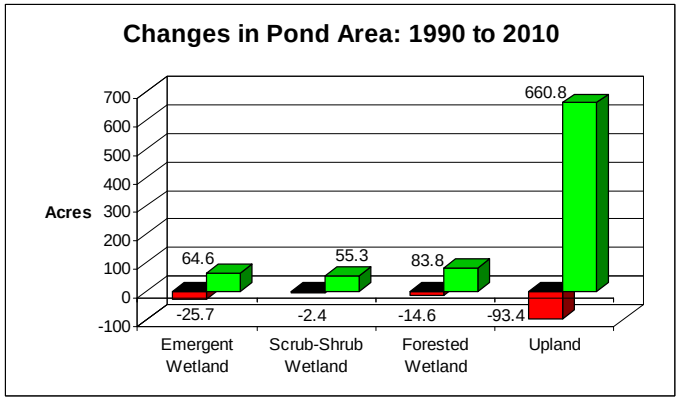
Net Gains:

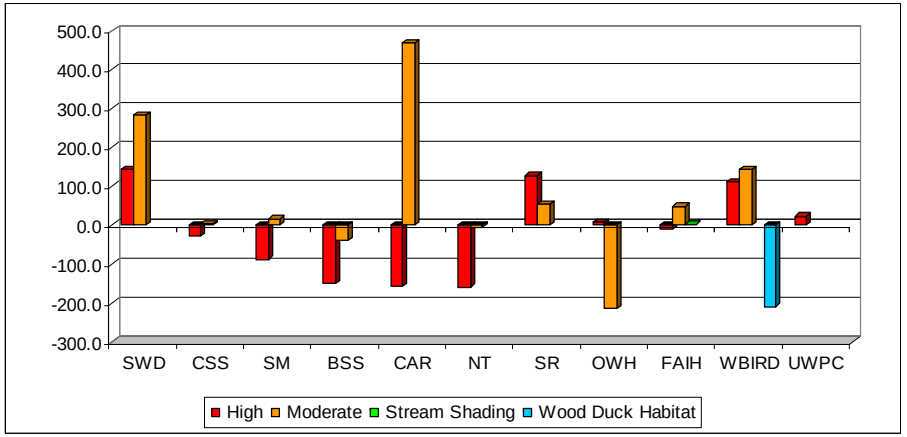
- Estuarine Scrub-shrub = 8 acres
- Palustrine Emergent = 45
- Palustrine Unc. Bottom = 613
- Palustrine Unc. Shore = 7

Note: Palustrine aquatic bed experienced gain of 102 acres, but difference due to temporal changes –seasonal imagery (leaf-on v. leaf-off)

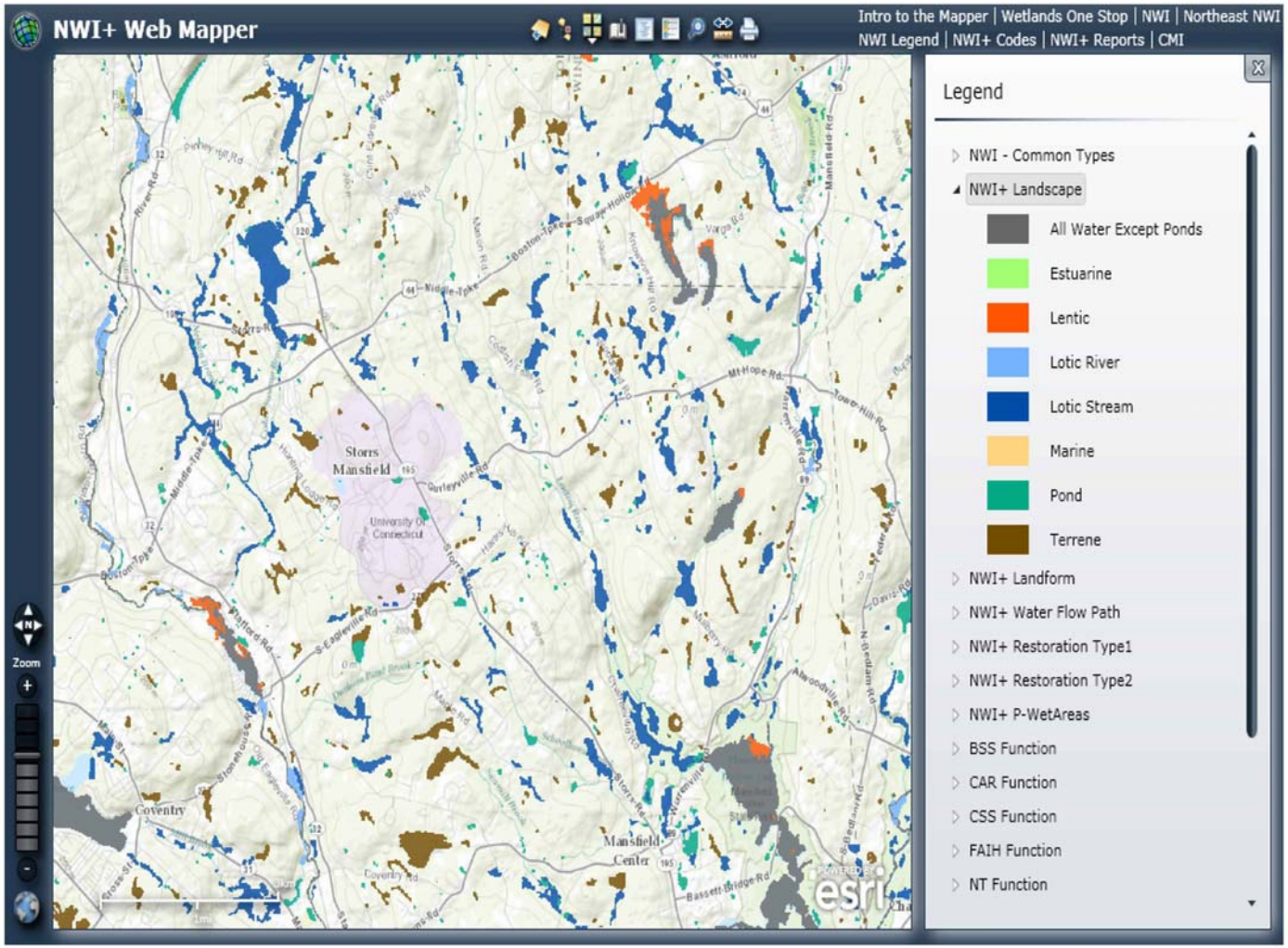
Predicted effect of changes on wetland functions



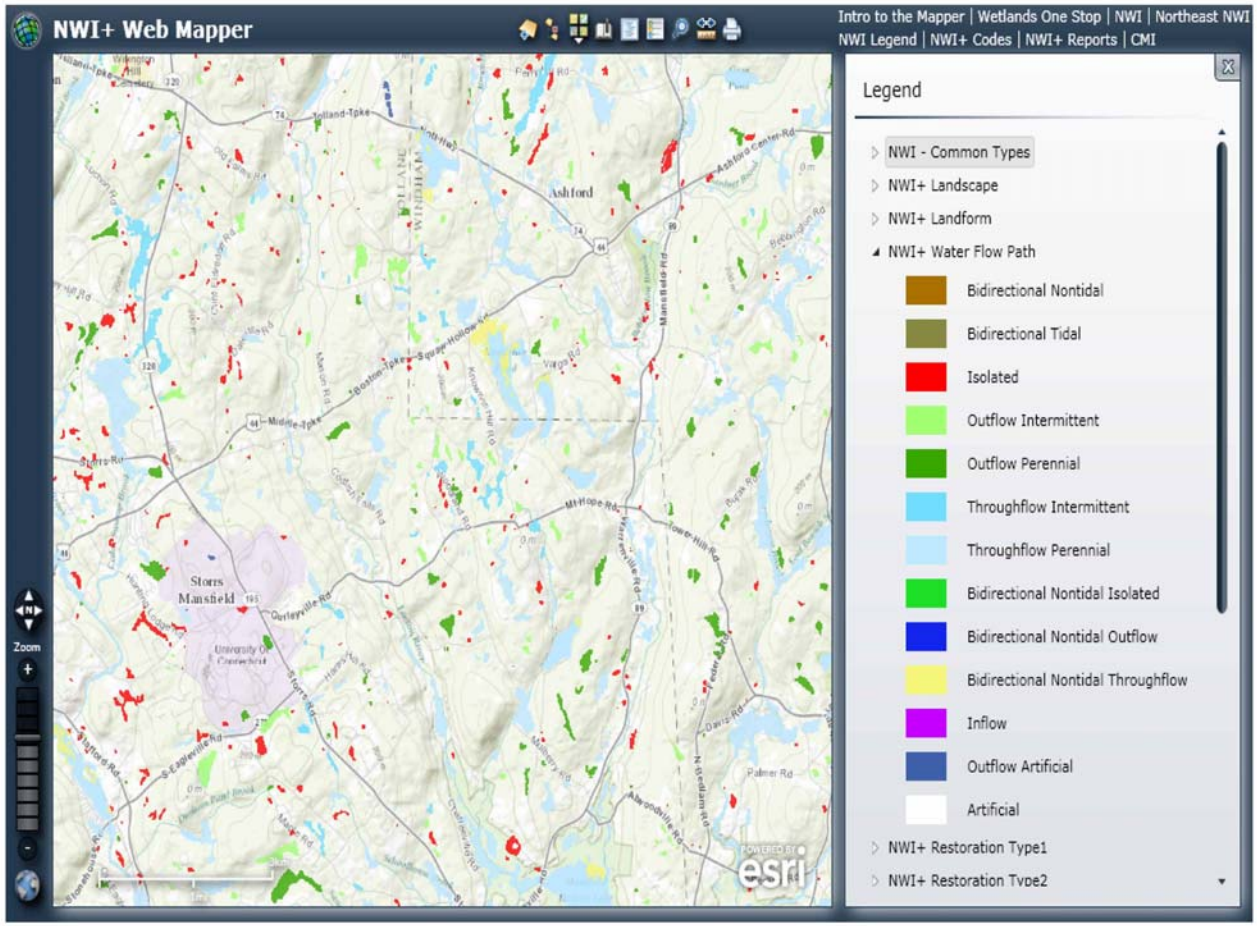




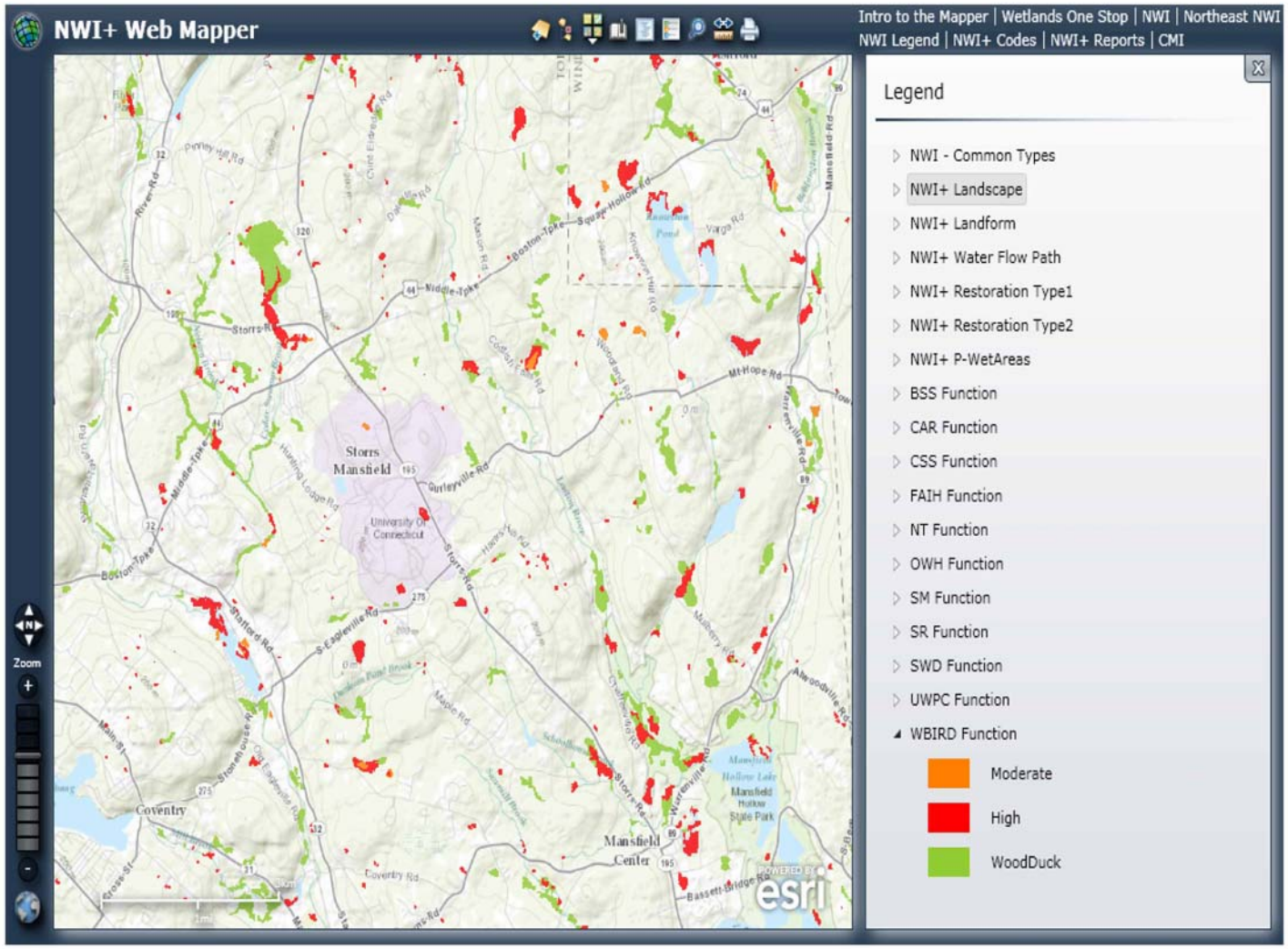
Geospatial Data Posted Online: **NWI+ Web Mapper** – Association of State Wetland Managers



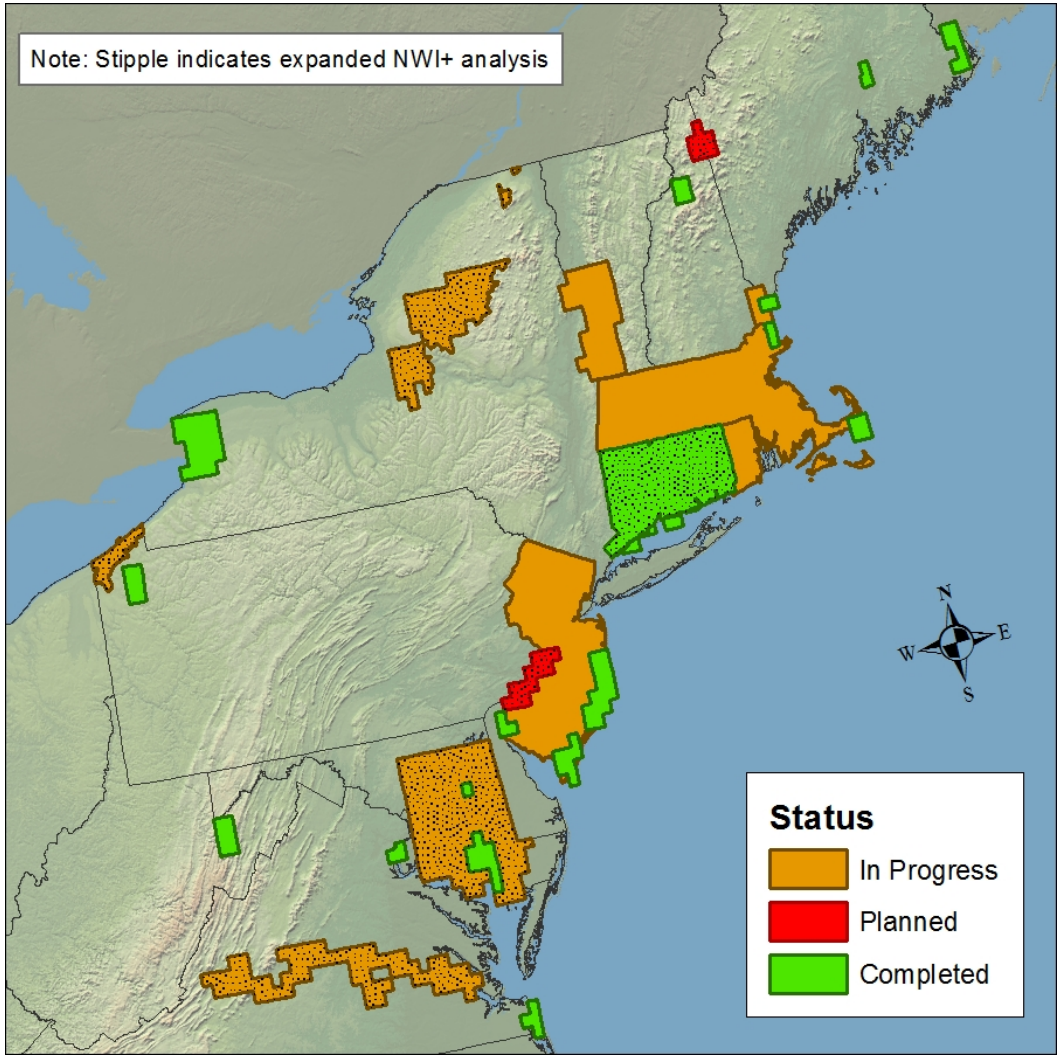
Water Flow Path



Wetland Function



Ongoing or Planned Mapping Projects



Nearly Completed

- Enhanced inventory – NWI+ for:
  - Rhode Island (finalizing report)
  - Massachusetts (preparing stats for report)
  - Coastal New Hampshire (preparing stats)
  - Southwestern Vermont (preparing stats)

  Reports will include acreage summaries by:

  NWI types

  LLWW types

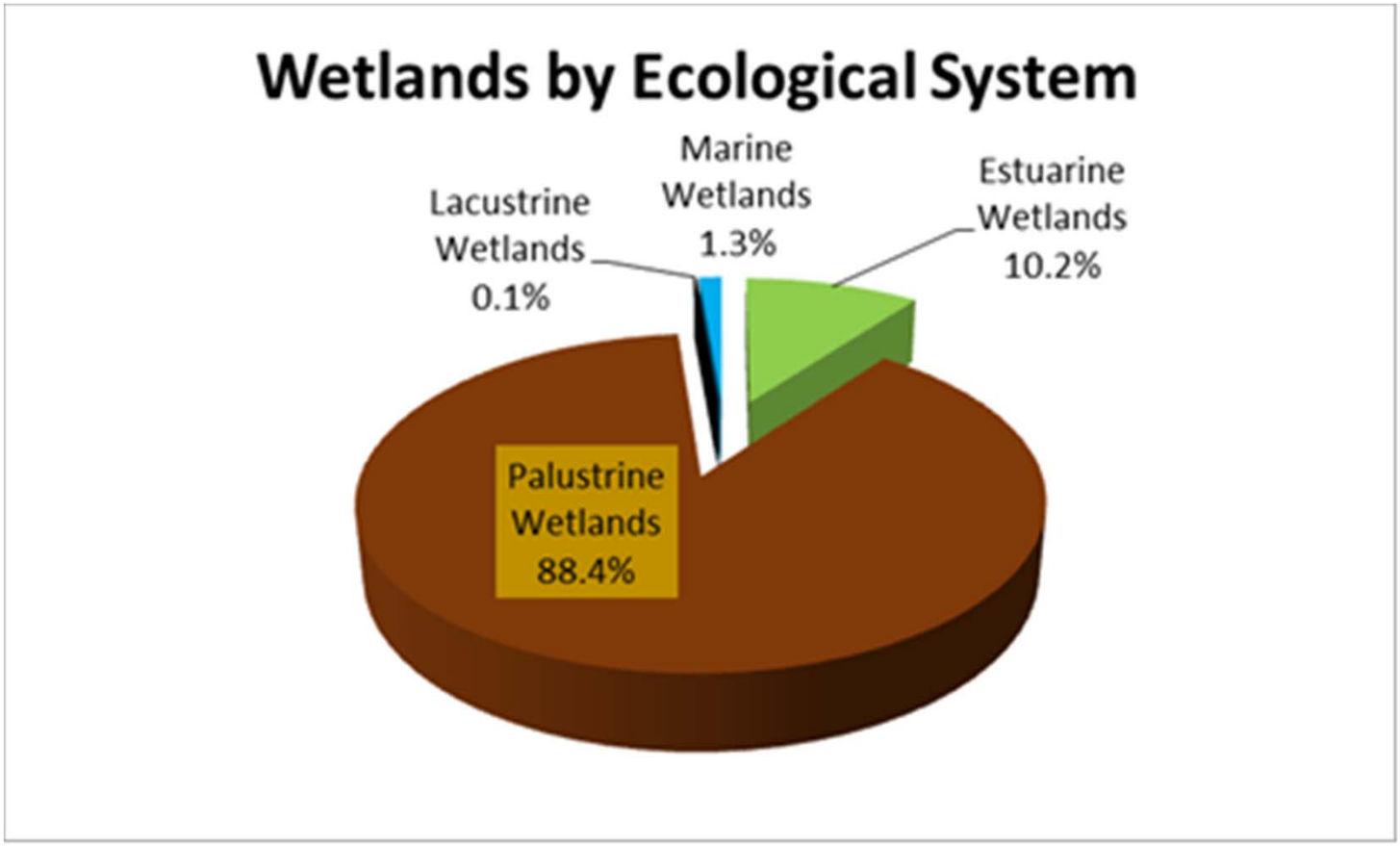
  Landscape-level functional assessment

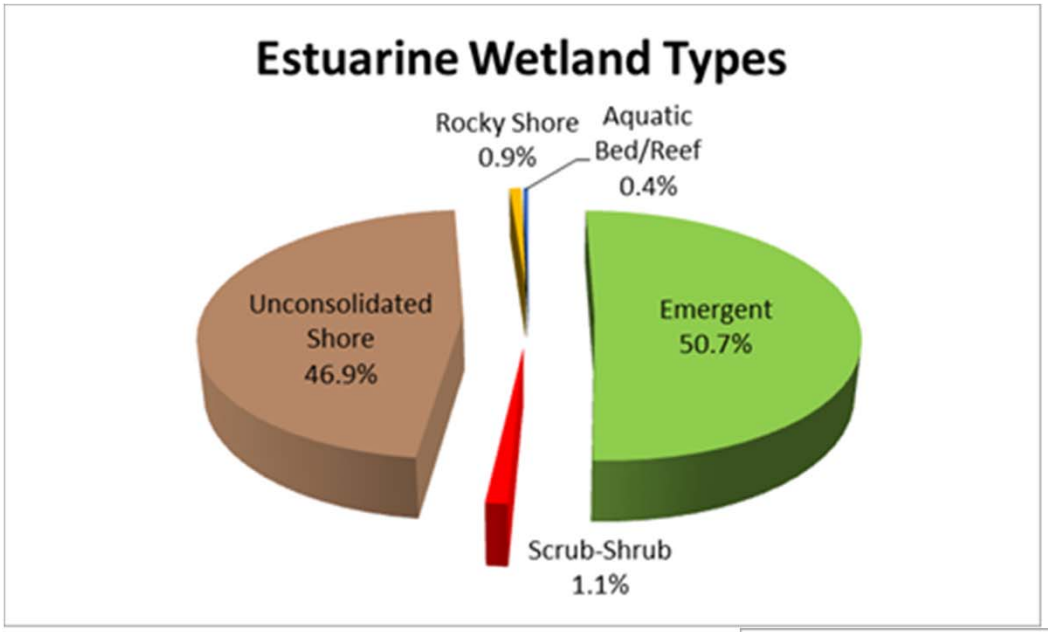
  Reports will be completed by the Fall 2014

Wetlands of Rhode Island

- Updated NWI with 2010 data
- Created NWI+ database
  - NWI Types
  - LLWW Types
  - Predicted wetland functions statewide
- Data will be displayed on the NWI+ Web Mapper

72K Acres = 11% of the State



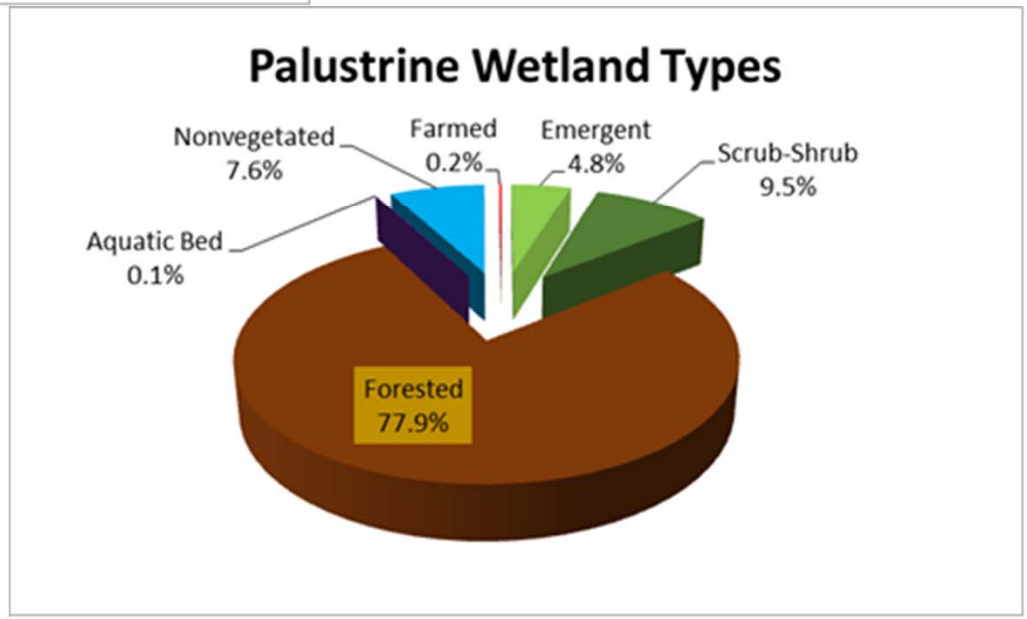


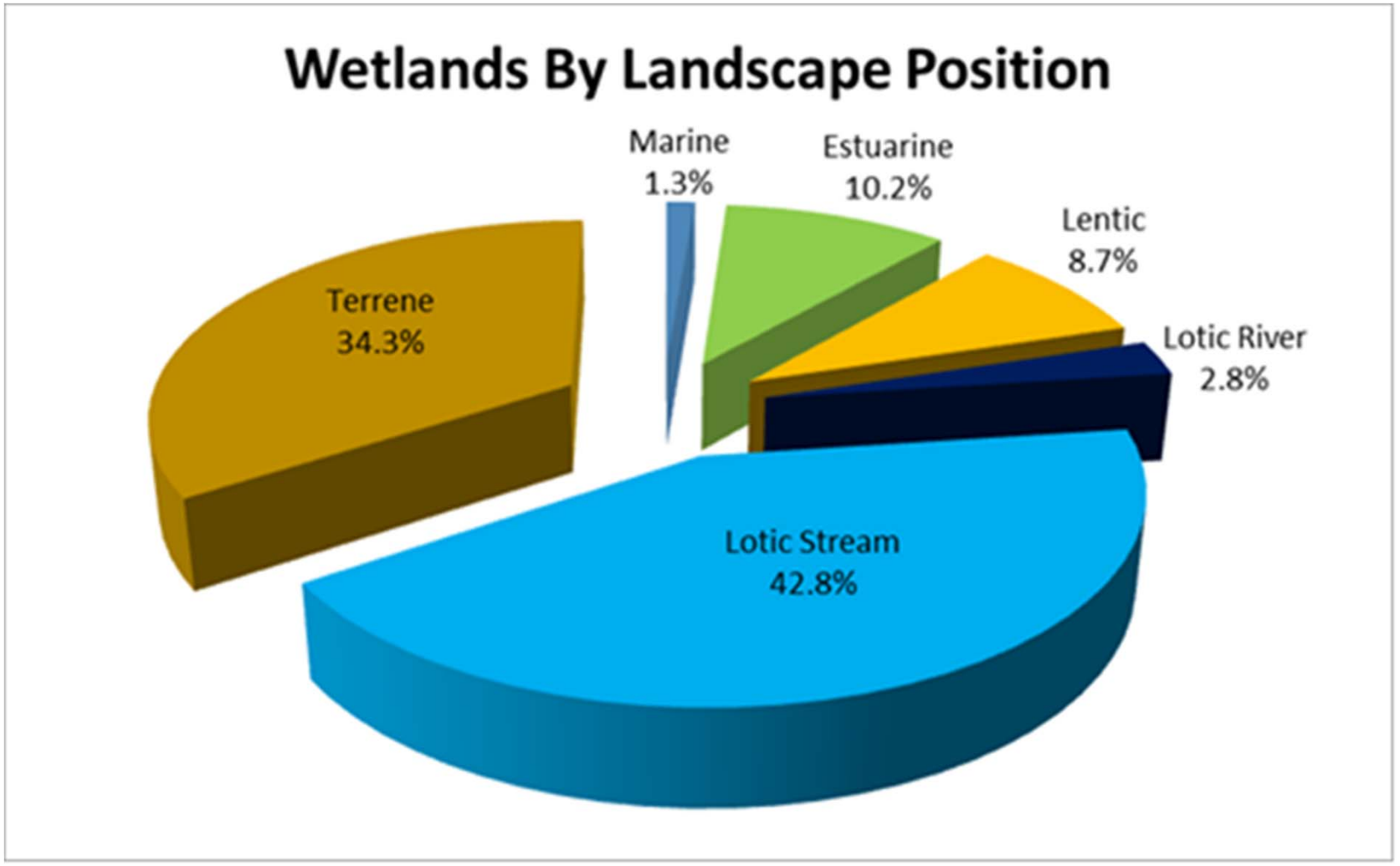
M-wetlands = 933

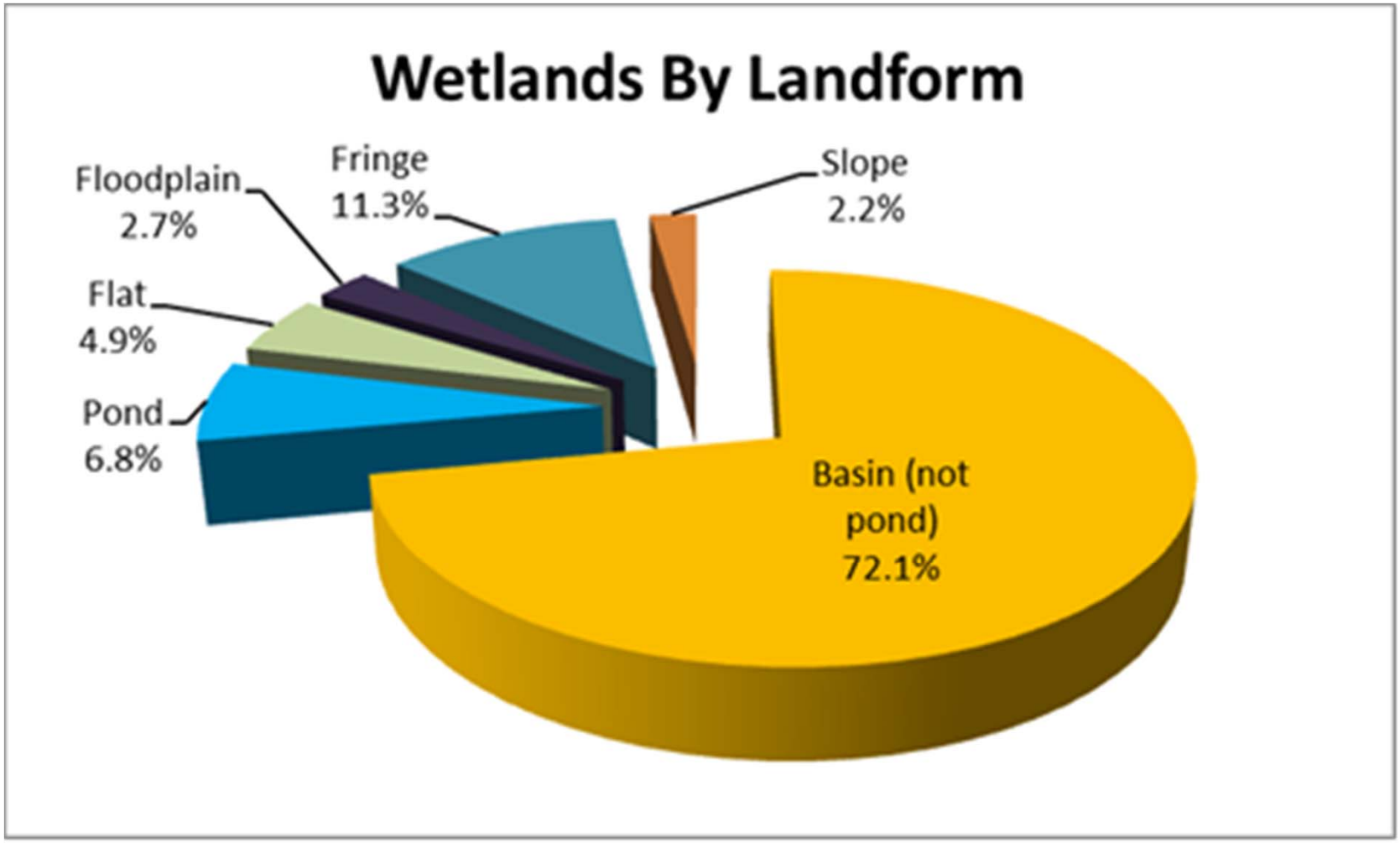
E-wetlands = 7, 3283

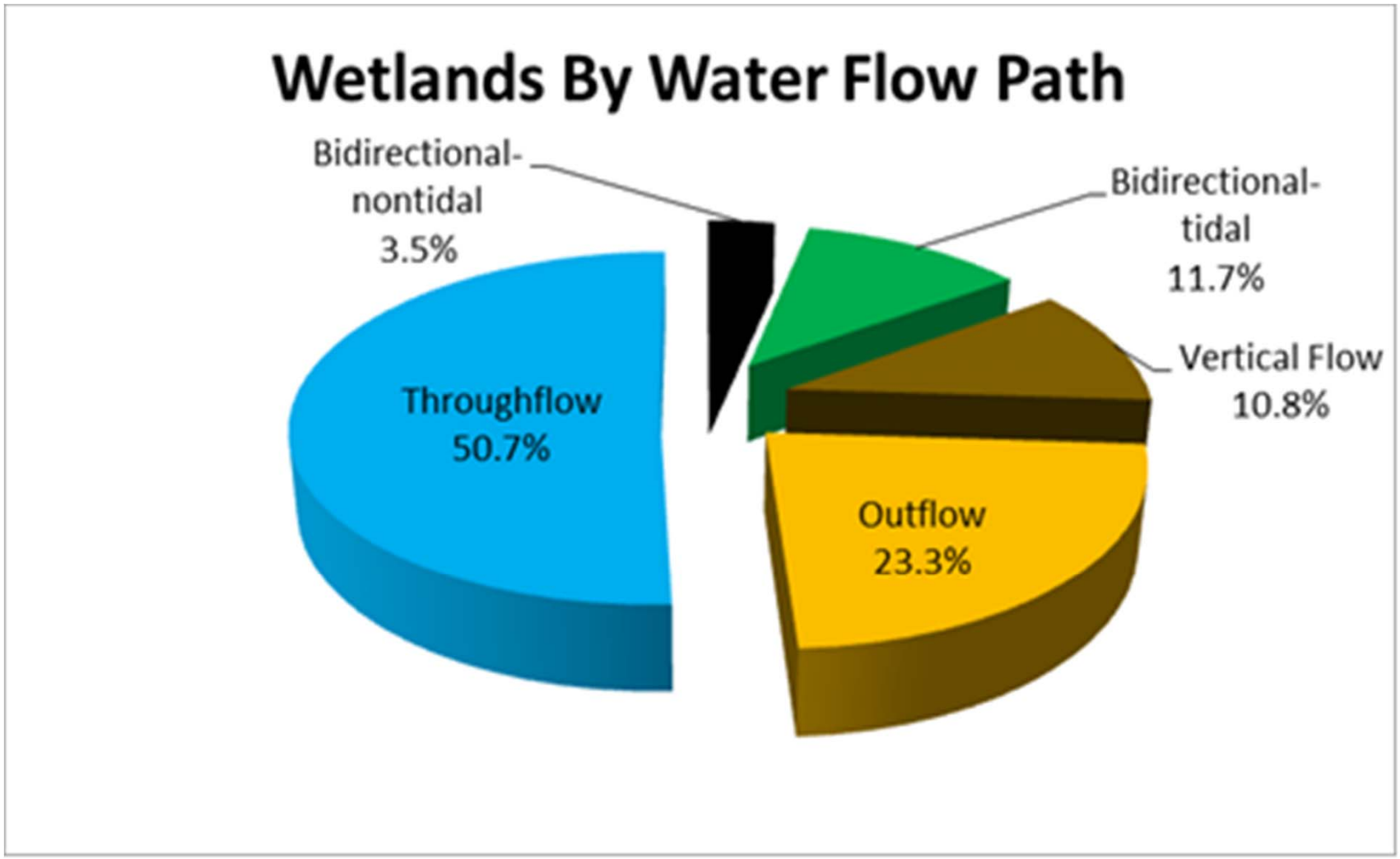
P- wetlands = 63,406

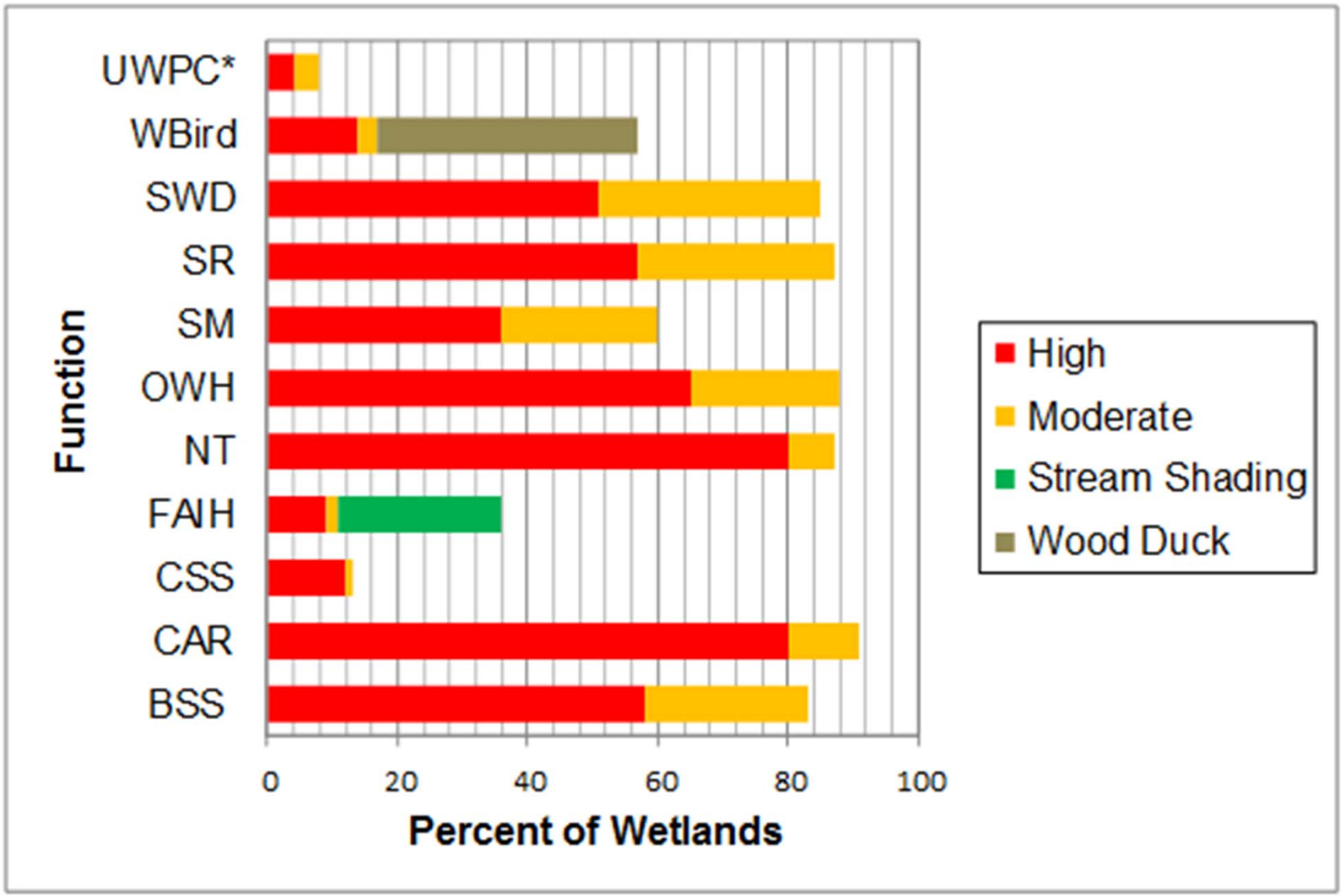
L-wetlands = 88

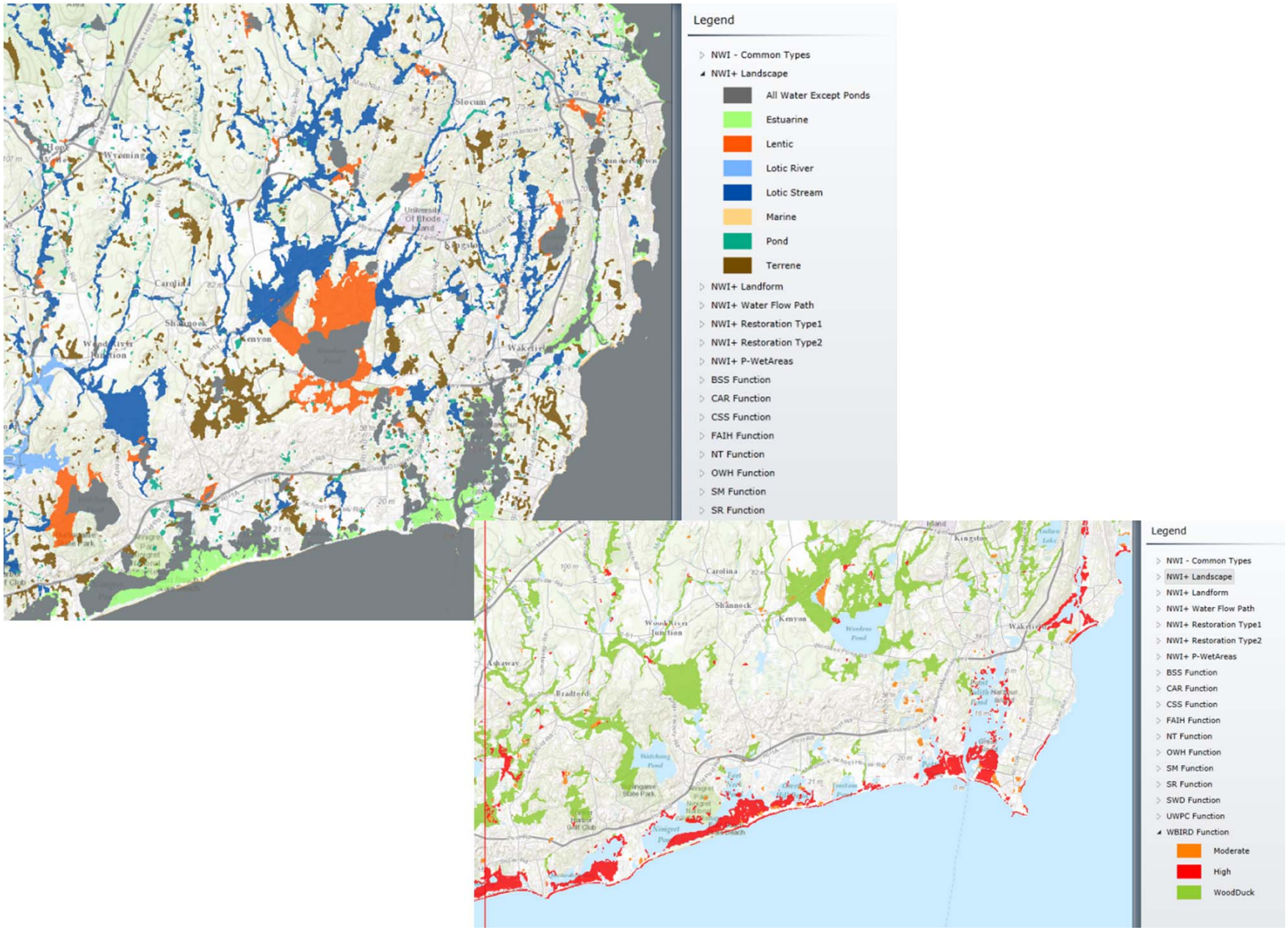



Wetlands By Landscape Position
Marine
1.3%
Estuarine
10.2%
Lentic
8.7%
Lotic River
2.8%
Lotic Stream
42.8%
Terrene
34.3%


Wetlands By Landform
Floodplain
2.7%
Fringe
11.3%
Slope
2.2%
Flat
4.9%
Pond
6.8%
Basin (not
pond)
72.1%


Wetlands By Water Flow Path
Bidirectional-nontidal 3.5%
Bidirectional-tidal 11.7%
Vertical Flow 10.8%
Throughflow 50.7%
Outflow 23.3%


UWPC*
WBird
SWD
SR
SM
OWH
NT
FAIH
CSS
CAR
BSS
Function
0
20
40
60
80
100
Percent of Wetlands
High
Moderate
Stream Shading
Wood Duck


Legend
NWI - Common Types
NWI+ Landscape
All Water Except Ponds
Estuarine
Lentic
Lotic River
Lotic Stream
Marine
Pond
Terrene
NWI+ Landform
NWI+ Water Flow Path
NWI+ Restoration Type1
NWI+ Restoration Type2
NWI+ P-WetAreas
BSS Function
CAR Function
CSS Function
FAIH Function
NT Function
OWH Function
SM Function
SR Function
Legend
NWI - Common Types
NWI+ Landscape
NWI+ Landform
NWI+ Water Flow Path
NWI+ Restoration Type1
NWI+ Restoration Type2
NWI+ P-WetAreas
BSS Function
CAR Function
CSS Function
FAIH Function
NT Function
OWH Function
SM Function
SR Function
SWD Function
UWPC Function
WBIRD Function
Moderate
High
WoodDuck

Special Project: Long-term Monitoring of the Effect of Sea-level Rise on Coastal Vegetation

Monitoring the Effect of Sea-level Rise on Coastal Vegetation

- Given predictions of SLR we expect to see salt marsh migrate inland into lowland forests
- Establish permanent plots for tracking changes from forest to salt marsh
- Similar work done in New Jersey (Forsythe and Cape May NWRs and vicinity)
- First New England area: Great Bay, New Hampshire
- Cooperators: Great Bay NWR; State of NH (Great Bay National Estuarine Research Reserve) and possibly others
- Planned for this summer

General Approach

- Identify areas of lowland forest contiguous to salt marshes where salt marsh migration is likely to occur
  - on public lands
  - proximity to sites with salt marsh accretion studies
  - sites with signs of tree stress and dieback
- Select three or more areas to study
- Record existing vegetation and soils in a series of permanent plots in different communities (along a “transect”) from salt marsh through forested wetland to upland forest
- Record location of plots

- Summarize results
- Make arrangements for future analyses
  - Visit every year if possible (make casual observations and record any pertinent features) so that sites continue to be marked
  - If significant changes are noted, record vegetation in the plot
  - Every 5- to 10-years, re-evaluate vegetation for the entire plot
- Minimal effort – approximately two days in the field
- Publish results in *Wetland Science and Practice* (quarterly journal for applied science and management; the Society of Wetland Scientists)

Vegetation Analysis

Vegetation Analysis

- 30-foot radius circular plot in forests
- 15-foot radius circular plot in shrub thickets
- 5-foot radius circular plot in herb community
- Evaluate strata
  - Trees – dbh, cover, density; estimate % dieback in canopy
  - Shrubs – cover
  - Herbs – cover (multiple small quads - option)
  - Vines – occurrence noted (no cover; can count stems if desirable)

Soil Evaluation

- Dig a soil pit to 50 cm
- Record depth and thickness of all horizons and describe soil color and texture (by feel) of each layer
- Option – collect soil sample from the soil pit for laboratory analysis of texture, bulk density, and % organic matter

Other Options

- Monitor accretion
  - Apply layer of colored feldspar clay to soil near center of plot
  - Use other techniques (e.g., sedimentation disks)
- Measure interstitial salinity
  - Extract soil-water sample; use refractometer to determine salinity at high tide during summer

Looking for Interest in Other Sites

- If interested in conducting similar studies elsewhere, please contact me at:
- ralph_tiner@fws.gov or rtiner@eco.umass.edu

Questions?