



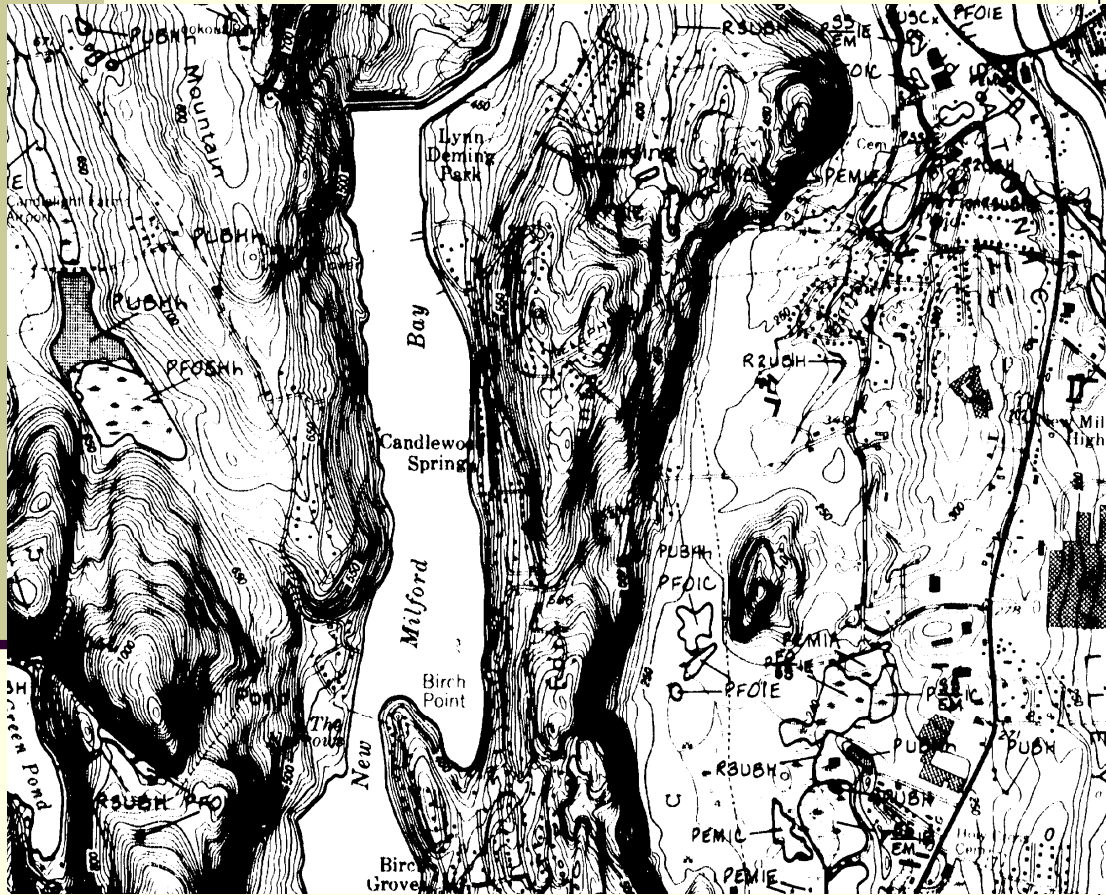
National Wetlands Inventory Update for New England 2009

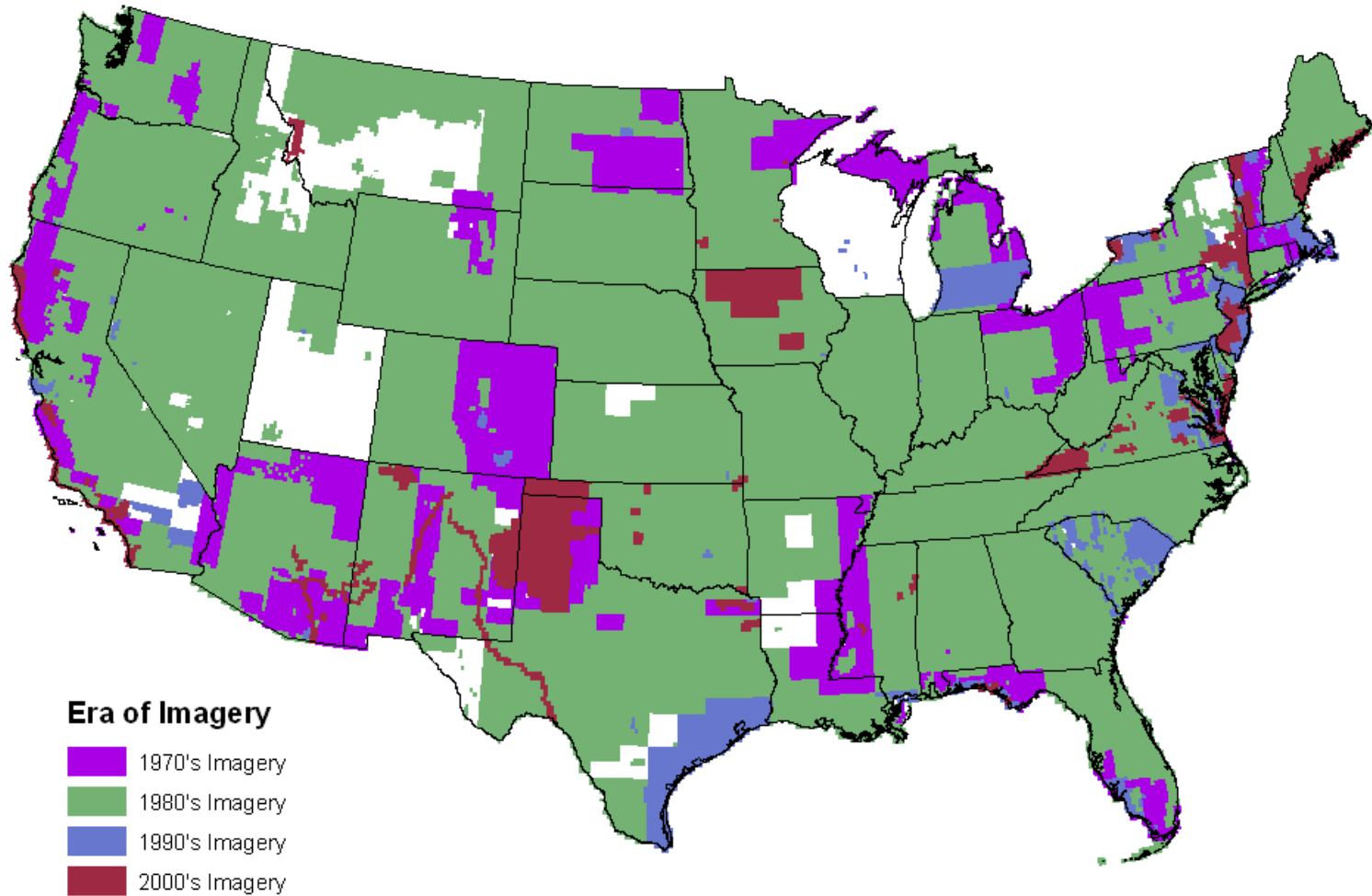


Ralph Tiner
Wetland Ecologist
U.S. Fish & Wildlife Service
National Wetlands Inventory Program

-
- Where we've been
 - Maps
 - Status and trends investigations
 - Where we are going to some degree
 - New mapping approach
 - More specific classification
 - New products
 - Wetland digital data
 - Challenge ahead

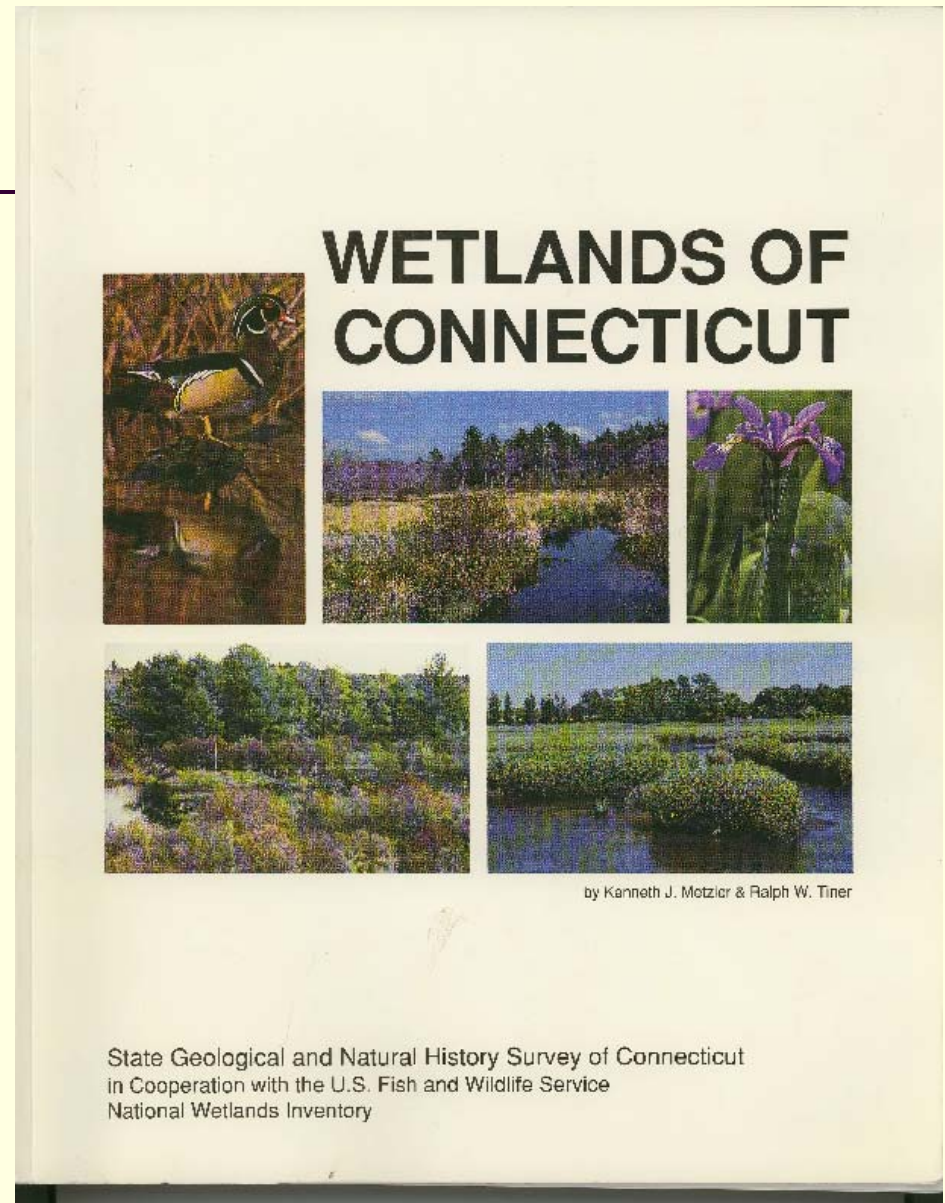
Where We've Been





State Reports

- Rhode Island (1989)
 - EPA support
- Connecticut (1991)
 - CTDEP support
- Summary reports
 - Massachusetts
 - Vermont



Other Reports

- Various local wetlands status and trends reports (covering 1970s-80s) published before 1999
 - Central Connecticut
 - Southeastern Massachusetts
 - Casco Bay, ME
 - Cobscook Bay, ME
 - Plum Island to Scituate, MA
 - Neponset Watershed, MA

WHERE WE ARE GOING – Wetland Mapping

- Updated and Improved mapping
- Expanded wetland classification

Improved Wetland Mapping

- Better imagery
 - Larger scale (1:40,000 vs 1:58,000/1:80,000)
 - CIR preferred
 - Digital imagery (e.g., 1-m or 1-ft resolution)
- Collateral data readily available in digital form
 - Soils data
 - Hydro (stream) data
 - State wetland inventory data
- Better base maps (DOQQs)
- GIS technology = operational

Wetland Mapping Procedures

- On-screen photointerpretation
- Adding “**undeveloped** hydric soil map units” (H_wetland type, HPFO__) where there seems to be a good correlation between the units and wetlands on the ground
- Base Map = DOQQ (1:12K)
- PRODUCT will likely show more areas of wetlands and potential wetlands

Change in Wetland Acreage - Example

- Original NWI = 414 acres
- New NWI (photointerpreted only) = 523 acres (+109 acres or 26% increase)
- New NWI + Undev. Hydric Soils = 718 acres (+195 acres; 37% increase over Pled wetlands; 73% increase over original NWI)
- Undeveloped Hydric Soils coded as:
H-NWI type, such as HPFO1B, HPSS1B

New NWI Mapping Technique

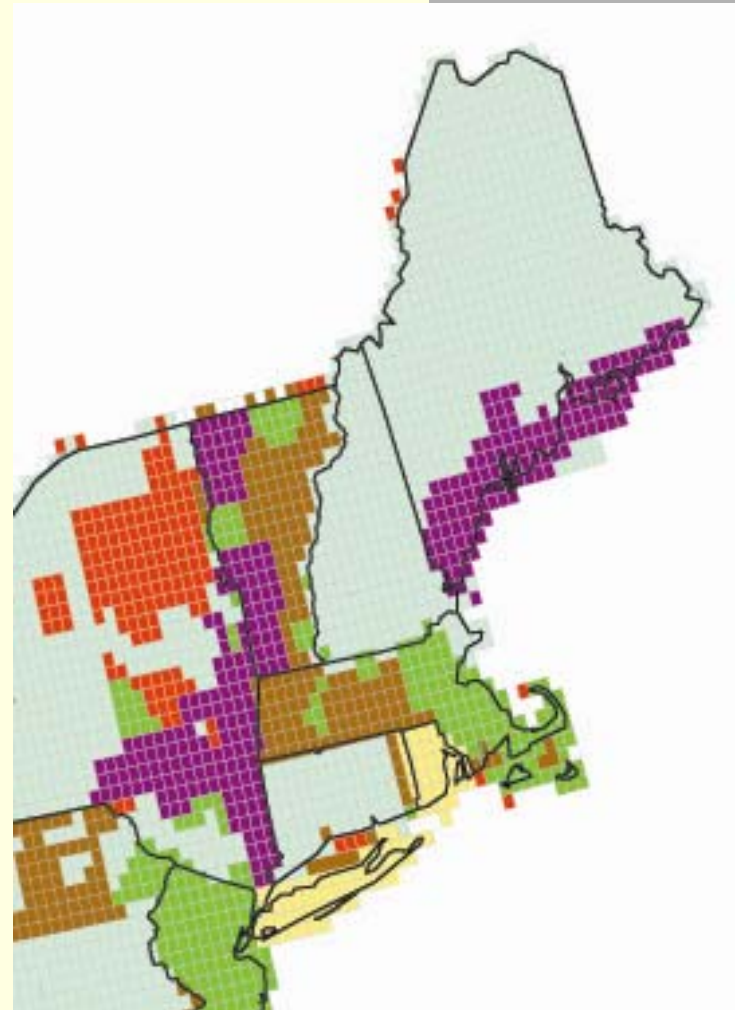
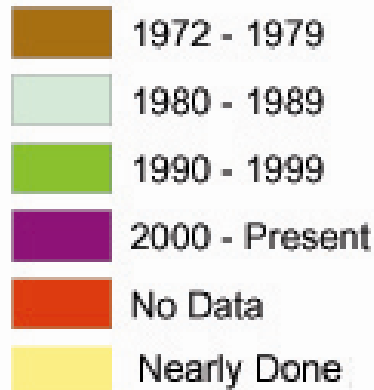
- Should identify
 - More wetland acreage (variable)
 - Smaller wetlands (incl. ponds)
 - Areas with high potential for containing wetlands (undeveloped hydric soil map units)
- Separates photointerpretable wetlands from those we cannot see, but can be interpreted from the soils data
- 1:12K (DOQQ) base map image

Limitations of New NWI Method

- Can readily do where digital soils data are available
- “Hydric soil” wetlands may contain variable amounts of wetland (variable quality of soil surveys)...still best available.
- Don’t view imagery in stereo

Recent Updates – New England

- Coastal Maine
- Western half of Vermont
- Southern Vermont
- Eastern Massachusetts
- Rhode Island



Updates

- More recent imagery 1995+
- More detail
 - More drier-end wetlands
 - Smaller wetlands
 - Better stream information
 - Integration of hydric soils data
- Standard NWI classification
 - Some projects enhanced classification
 - LLWW descriptors

Future Updates: Plan to add LLWW descriptors

Where We Can Go – Landscape-level Wetland Assessment

- Preliminary assessments of wetland functions for large geographic areas
- Other Possibilities:
 - Potential Wetland Restoration Sites
 - Watershed “condition” re: natural habitat
- Summary Reports
 - Basic Inventory Findings
 - Watershed Assessments
 - Wetland Functions

Reports since 1999

- Casco Bay watershed wetland characterization and functional assessment (1999)
- Wetlands of Boston Harbor Islands (2003)
- Coastal wetland trends
 - Parker River Estuary (2002)
 - Narragansett Bay Estuary (2004)
 - Boston Harbor, Cape Cod & the Islands (2006)
 - Selected small estuaries in CT (2006)
- Eelgrass surveys (Eastern LI Sound; 2003, 2006)
- Potential wetland restoration site inventories
 - For MA Wetland Restoration Program (w/UMass)

2007 Reports – NWI Summary Reports



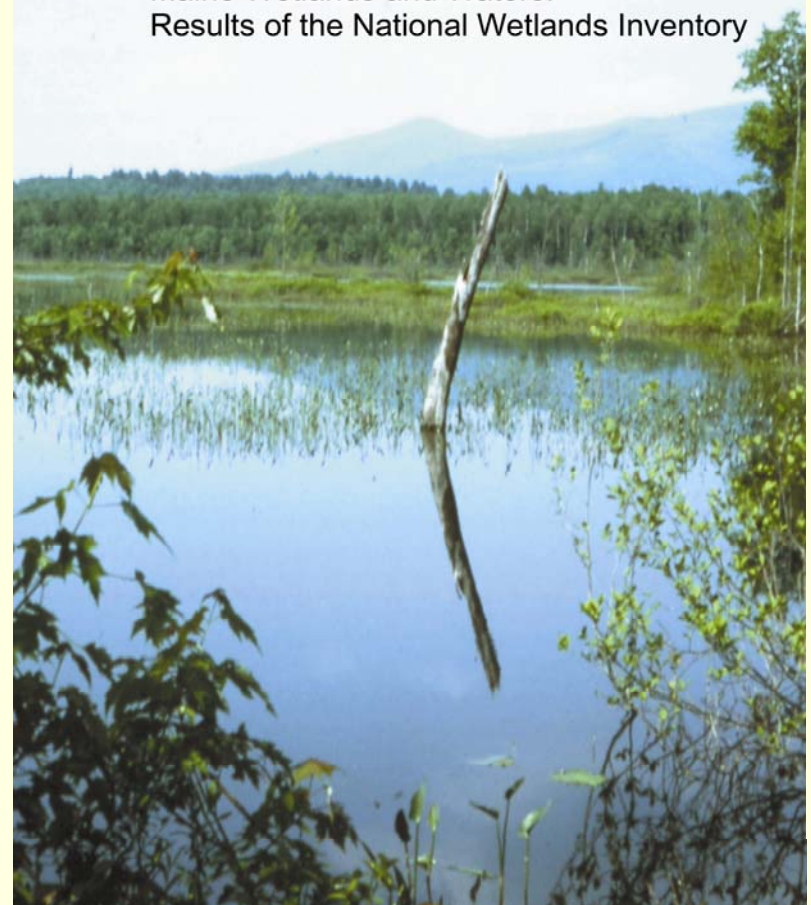
U.S. Fish & Wildlife Service

New Hampshire Wetlands and Waters:
Results of the National Wetlands Inventory



U. S. Fish & Wildlife Service

Maine Wetlands and Waters:
Results of the National Wetlands Inventory



Pending Reports

- **Wetlands of Cape Cod and the Islands, Massachusetts: Current Status and Landscape-level Functional Assessment**
 - Summary of Wetlands
 - NWI Types
 - LLWW Types
 - Predicted Wetland Functions
 - Narrative and Maps
 - Cape Cod/vicinity, Martha's Vineyard, Nantucket, and the Elizabeth Islands

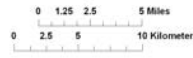
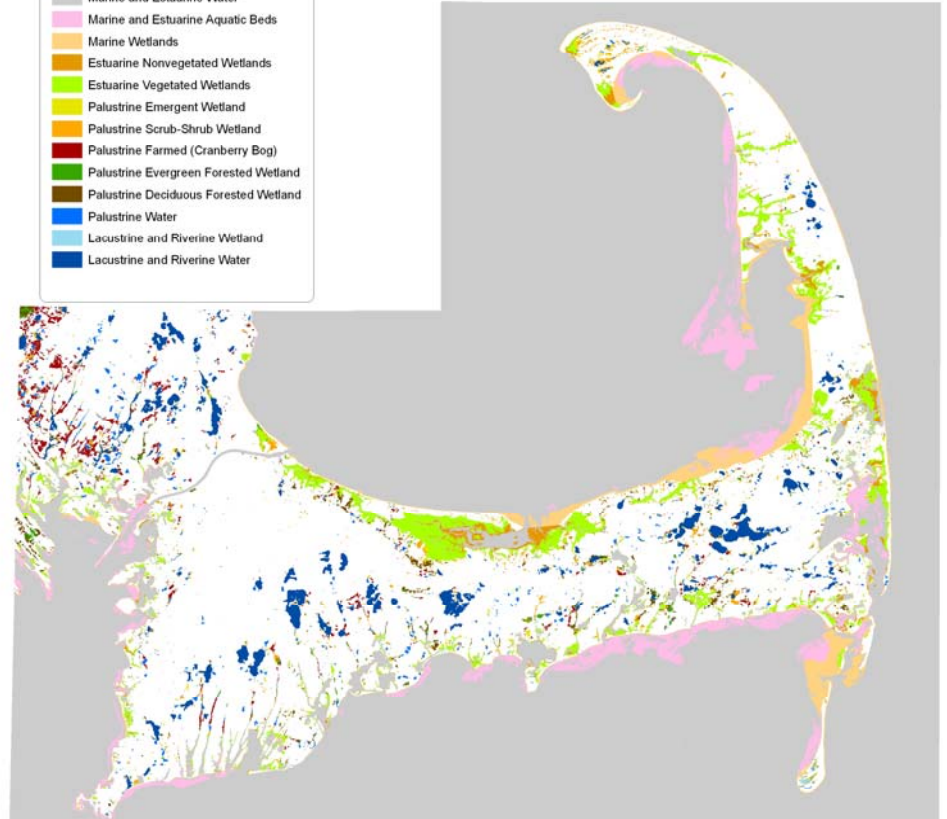
NWI Types

WETLANDS OF CAPE COD, MASSACHUSETTS AND VICINITY CLASSIFIED BY NWI TYPES

LEGEND

NWI Types

- Marine and Estuarine Water
- Marine and Estuarine Aquatic Beds
- Marine Wetlands
- Estuarine Nonvegetated Wetlands
- Estuarine Vegetated Wetlands
- Palustrine Emergent Wetland
- Palustrine Scrub-Shrub Wetland
- Palustrine Farmed (Cranberry Bog)
- Palustrine Evergreen Forested Wetland
- Palustrine Deciduous Forested Wetland
- Palustrine Water
- Lacustrine and Riverine Wetland
- Lacustrine and Riverine Water



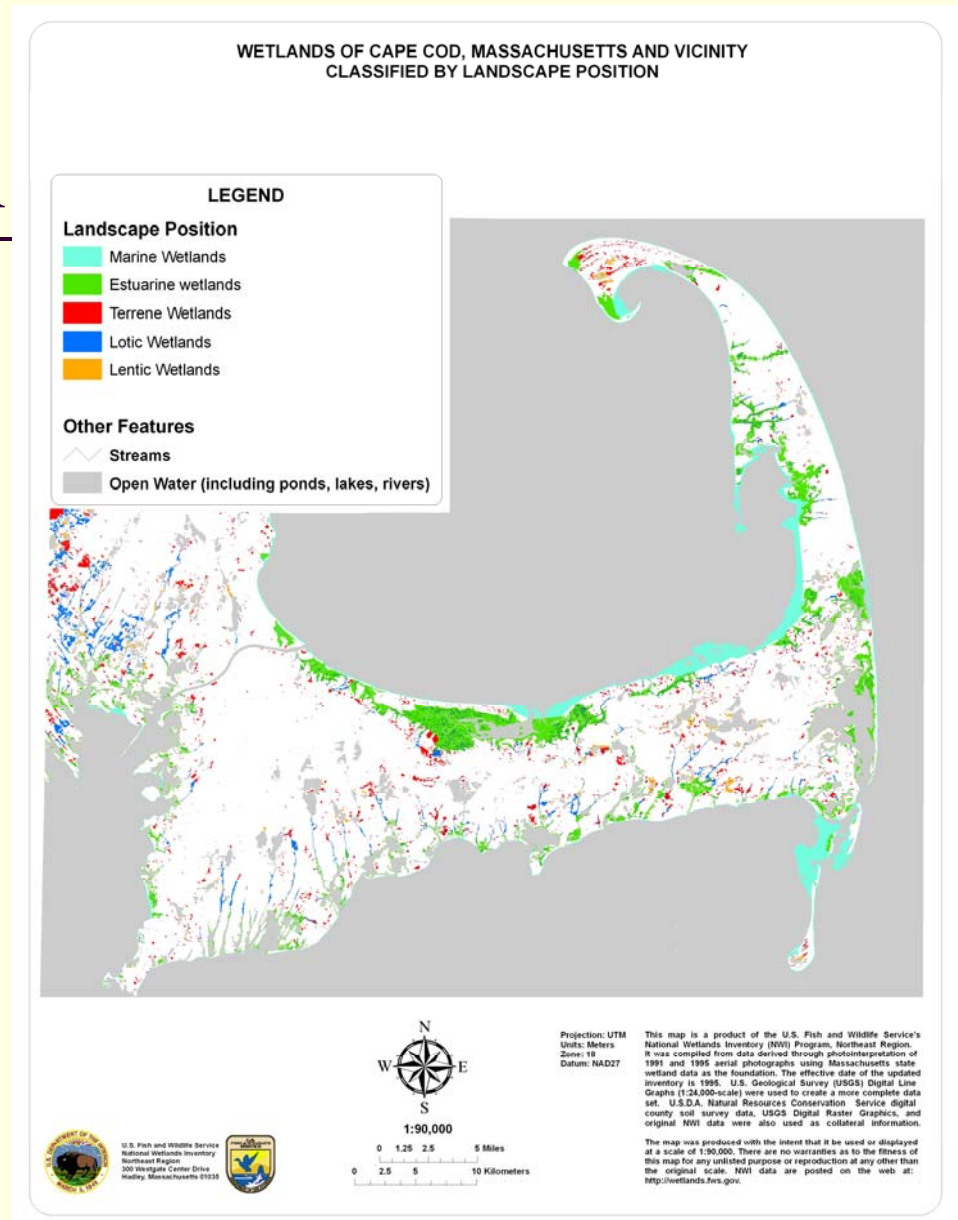
Projection: UTM
 Units: Meters
 Zone: 18
 Datum: NAD27

This map is a product of the U.S. Fish and Wildlife Service's National Wetlands Inventory (NWI) Program, Northeast Region. It was compiled from data derived through photointerpretation of 1991 and 1995 aerial photographs using Massachusetts state wetland data as the foundation. The effective date of the updated inventory is 1995. U.S. Geological Survey (USGS) Digital Line Graphs (1:24,000-scale) were used to create a more complete data set. U.S.D.A. Natural Resources Conservation Service digital county soil survey data, USGS Digital Raster Graphics, and original NWI data were also used as collateral information.

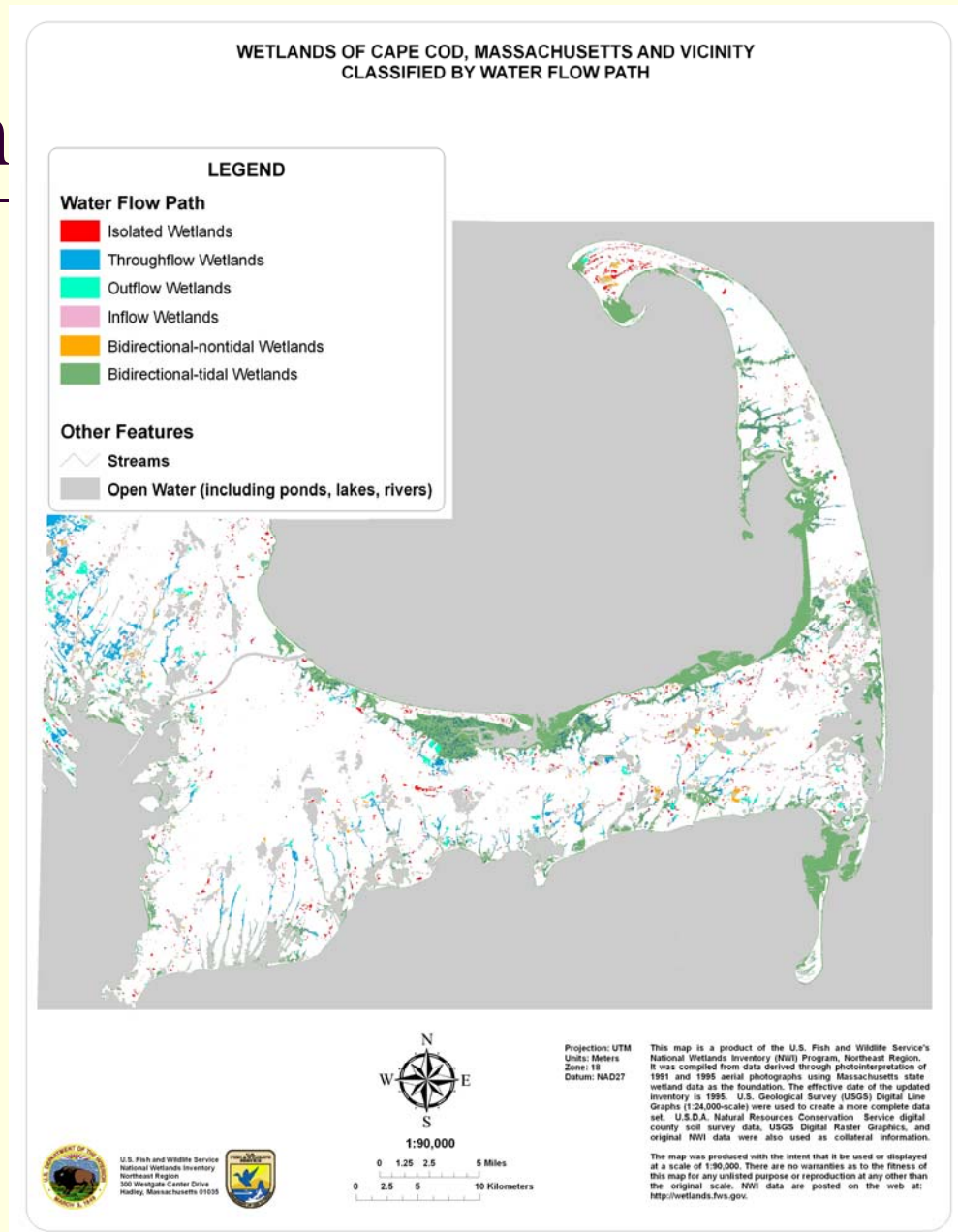
The map was produced with the intent that it be used or displayed at a scale of 1:90,000. There are no warranties as to the fitness of this map for any unlisted purpose or reproduction at any other than the original scale. NWI data are posted on the web at: <http://wetlands.fws.gov>.



Wetlands by Landscape Position

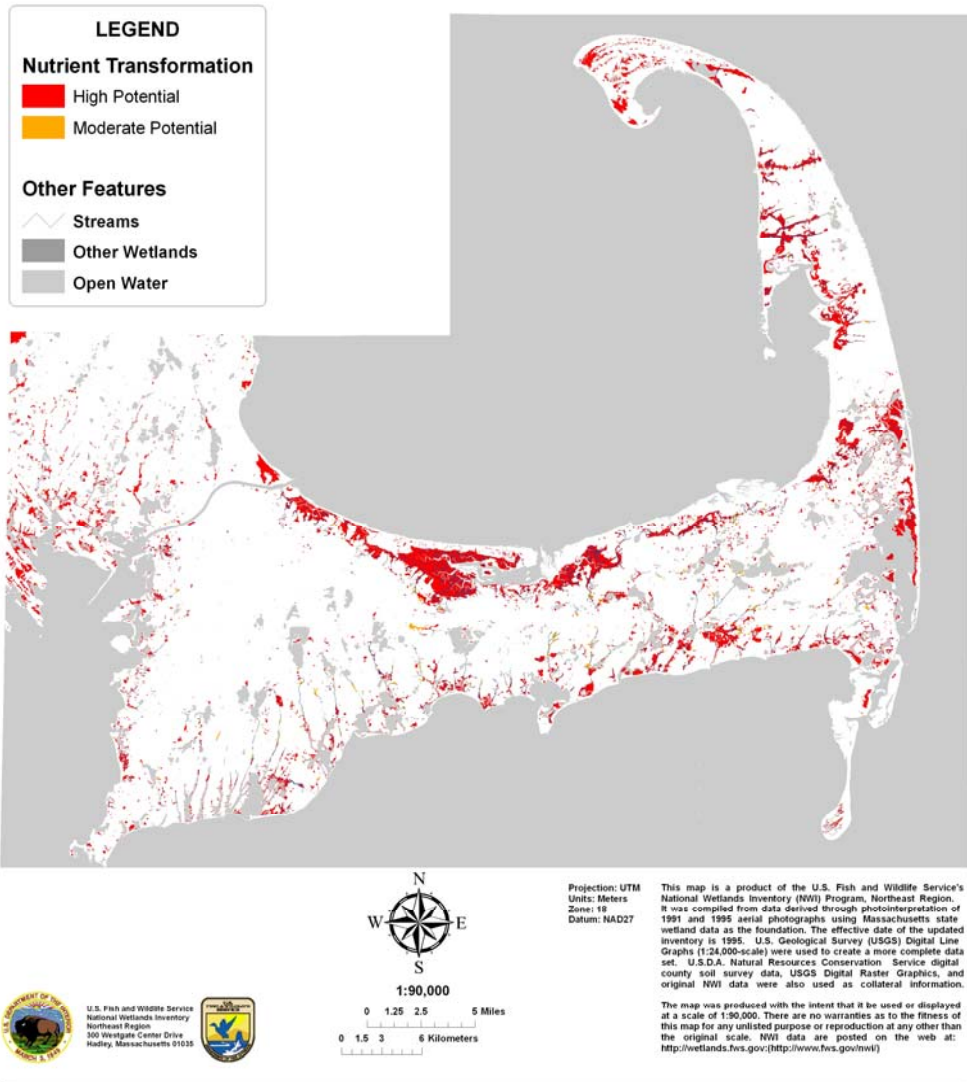


Wetlands by Water Flow Path



Nutrient Retention

POTENTIAL WETLANDS OF SIGNIFICANCE FOR NUTRIENT TRANSFORMATION CAPE COD, MASSACHUSETTS AND VICINITY



Rhode Island – New State Report

- Planned
- Same as for Cape Cod
 - NWI Wetlands, LLWW Wetlands
 - Wetland Functions
 - Narrative and Maps
- Need final QC on LLWW and data analysis
 - Working on funding

NWI Data Availability

- Not making paper maps
- Data available online:
 - <http://www.fws.gov/wetlands/>
 - Online mapping tool – Wetlands Mapper
 - Custom maps
 - Download digital data
 - For GIS applications

Wetland Mapper

3.5 million hits/month



U.S. Fish & Wildlife Service

Division of Habitat and Resource Conservation

Wetlands Geodatabase

Providing Wetland Information to the American People

Wetlands Digital Data

[Wetlands Mapper](#)
[Download Wetlands Data](#)

Wetlands Mapper Information

[Introduction](#)
[Layers and Metadata](#)
[History and Changes](#)
[Map Creation and Mapper](#)
[Display](#)
[Wetlands Codes](#)
[OGC Web Map Service](#)
[Disclaimer](#)
[Supplemental Information](#)
[MGD Info Quality Guidelines](#)
[Attribution and Verification](#)
[Tools](#)

[Click here](#)

[Go to
Wetlands Mapper](#)



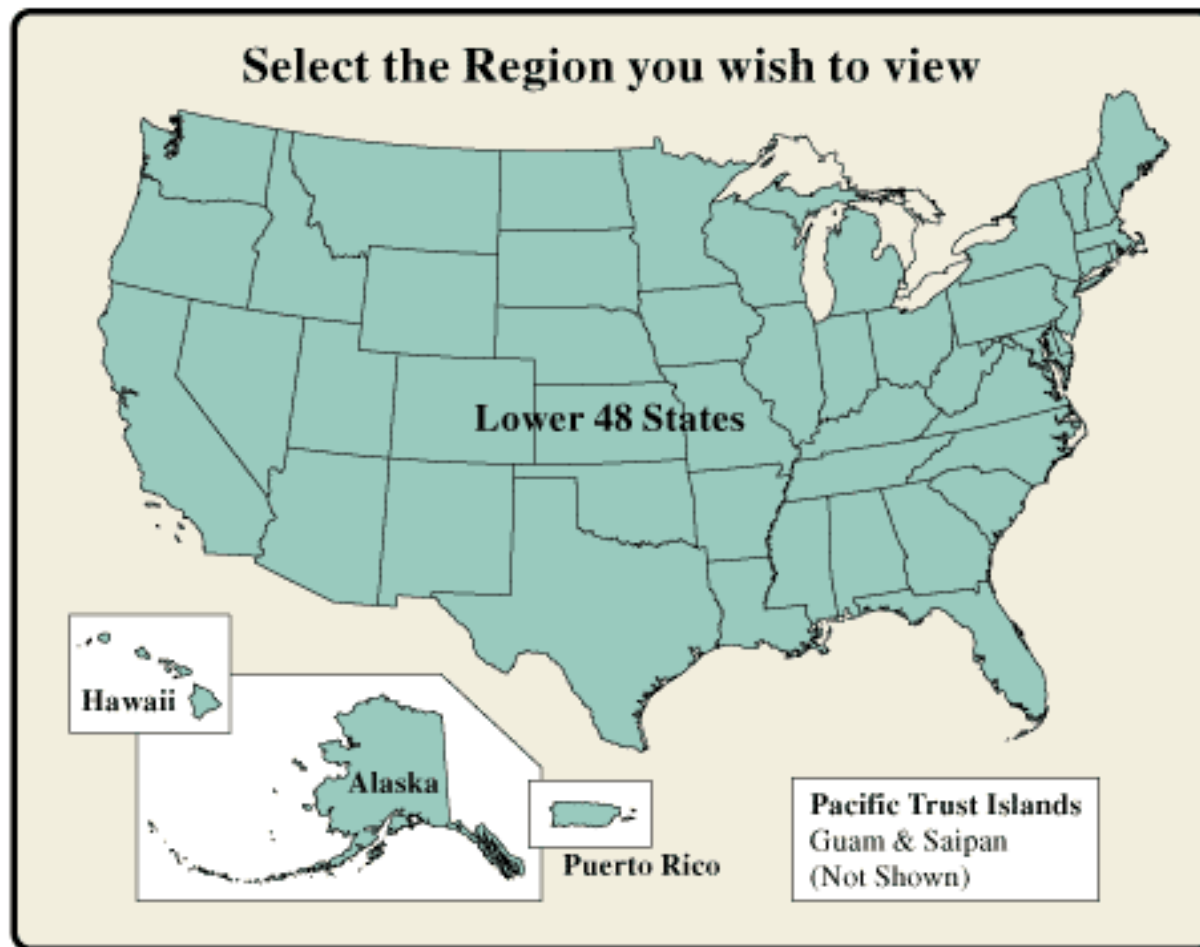
Wetlands Digital Data

Build, search, query, and download custom digital maps and data in the area you choose:

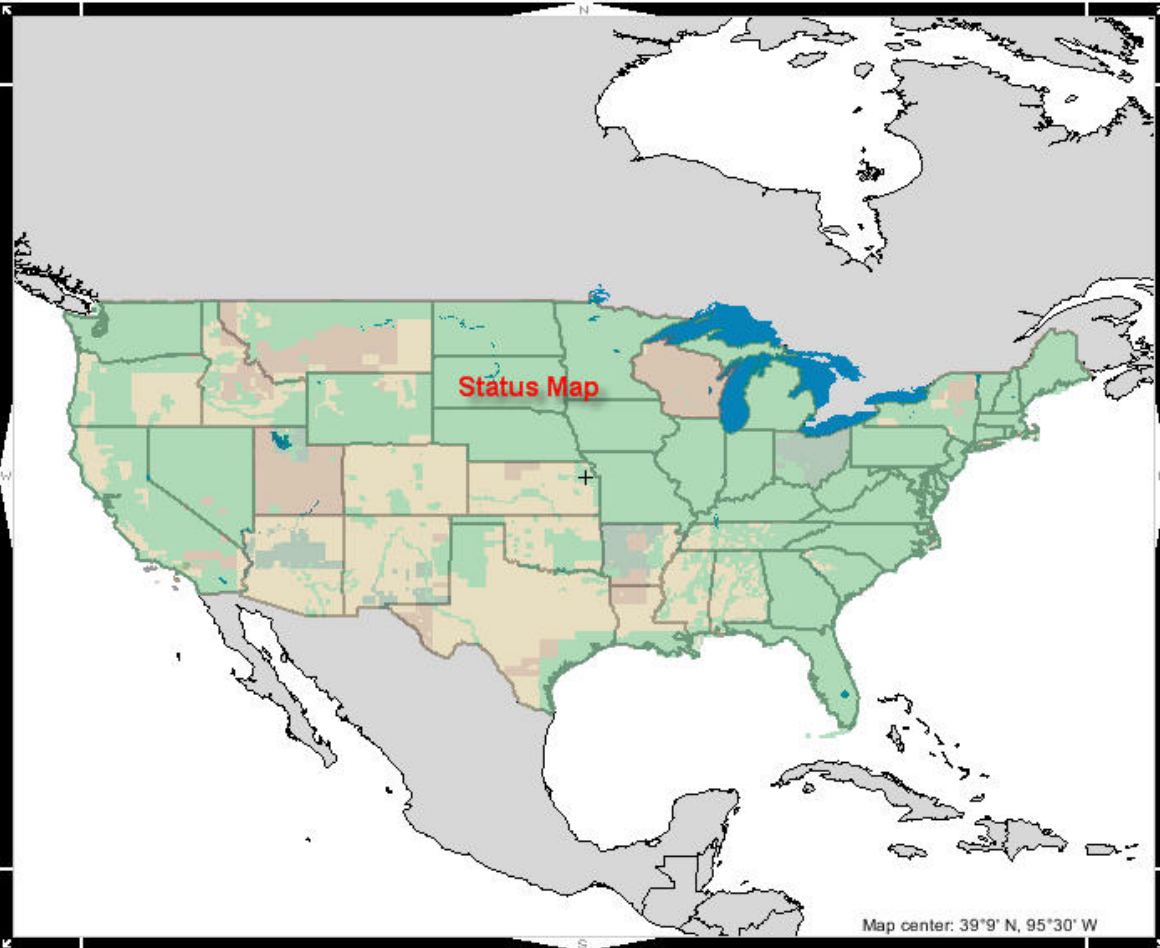
[Go to the Wetlands Mapper](#)

[Download Wetlands Digital Data](#)

Select the Region you wish to view



[Lower 48 States](#) | [Alaska](#) | [Hawaii](#) | [Puerto Rico & U.S. Virgin Islands](#) | [Pacific Trust Islands](#)

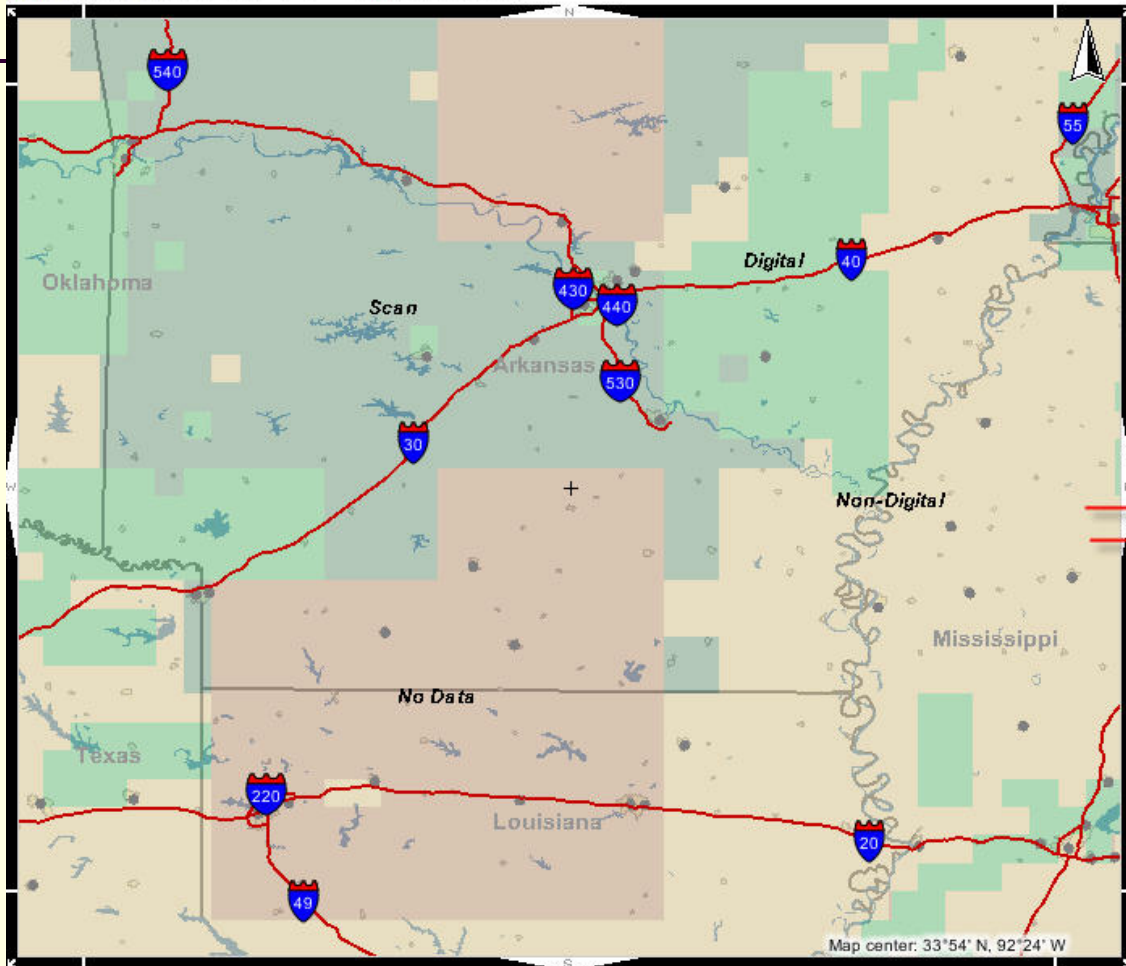


Jump To: Lower 48 States

Map Layers

- Interactive Layers
- Wetlands Data
 - Wetlands Data Availability
 - Scale > 1:100,000**
 - Digital (vector data)
 - Scan (raster data)
 - Non-Digital (hardcopy only)
 - Unmapped Area
 - Scale < 1:100,000**
 - Digital (data will display)
 - Scan (data will display)
 - Non-Digital
 - Unmapped Area
 - Digital Wetland Polygons (Vector)
 - Wetland Scan Data (Raster, 1:24k)
 - Wetland Project Area Metadata
 - Historic Wetlands Map Info
 - AZ/NM 100k Scans (use i for PDF lin)
 - Base Data
 - WMS Display Layers (not printable)
- Automatically Refresh Map
- Show Legends

Notes:
Please refer to the following for descriptions of the functions of the controls in the layer list above.



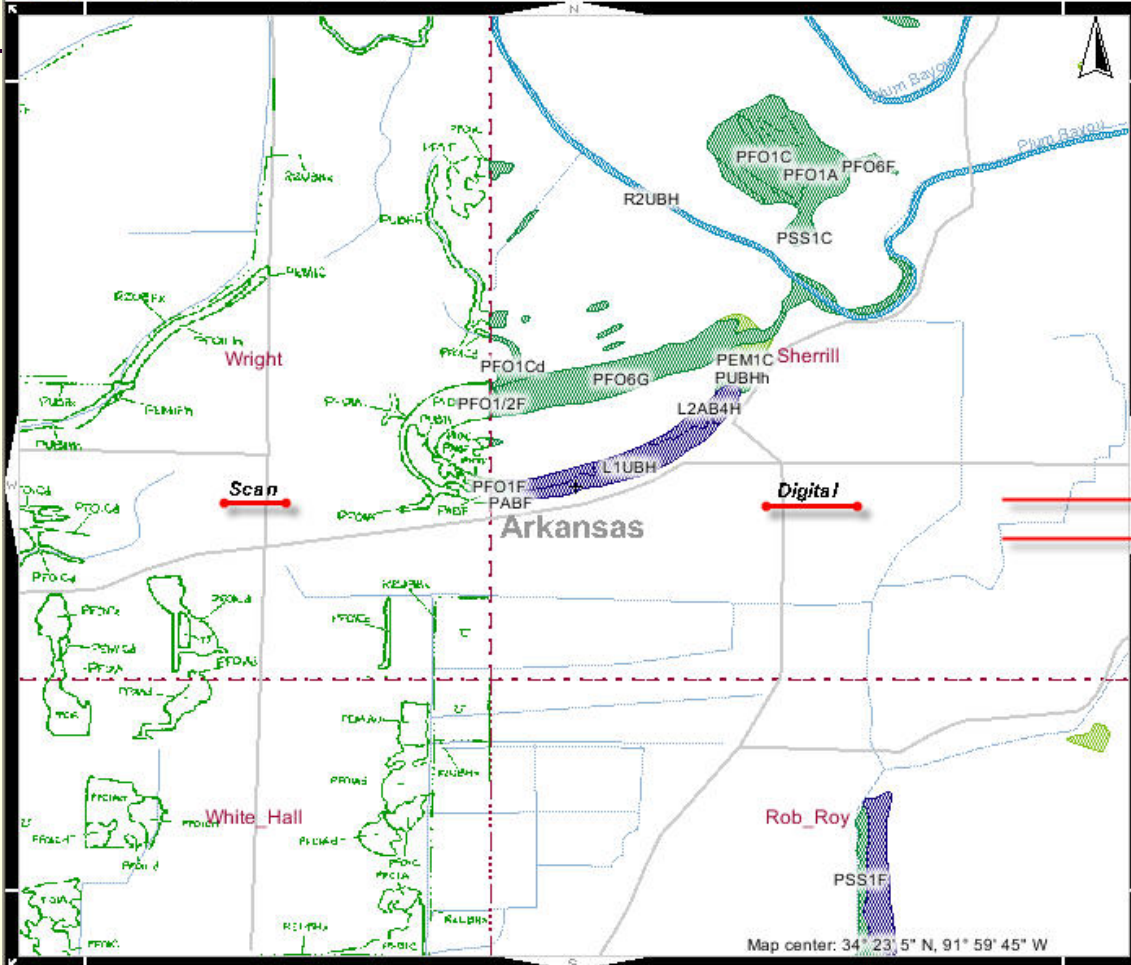
Jump To: Lower 48 States

Map Layers

- Interactive Layers
 - Wetlands Data
 - Wetlands Data Availability
 - Scale > 1:100,000
 - Digital (vector data)
 - Scan (raster data)
 - Non-Digital (hardcopy only)
 - Unmapped Area
 - Scale < 1:100,000
 - Digital (data will display)
 - Scan (data will display)
 - Non-Digital
 - Unmapped Area
 - Digital Wetland Polygons (Vector)
 - Wetland Scan Data (Raster, 1:24k)
 - Wetland Project Area Metadata
 - Historic Wetlands Map Info
 - AZ/NM 100k Scans (use i for PDF lin)
 - Base Data
 - WMS Display Layers (not printable)
- Automatically Refresh Map
 Show Legends

Notes:
 Please refer to the following for descriptions of the functions of the controls in the layer list above.

Click folder to show or hide contents.



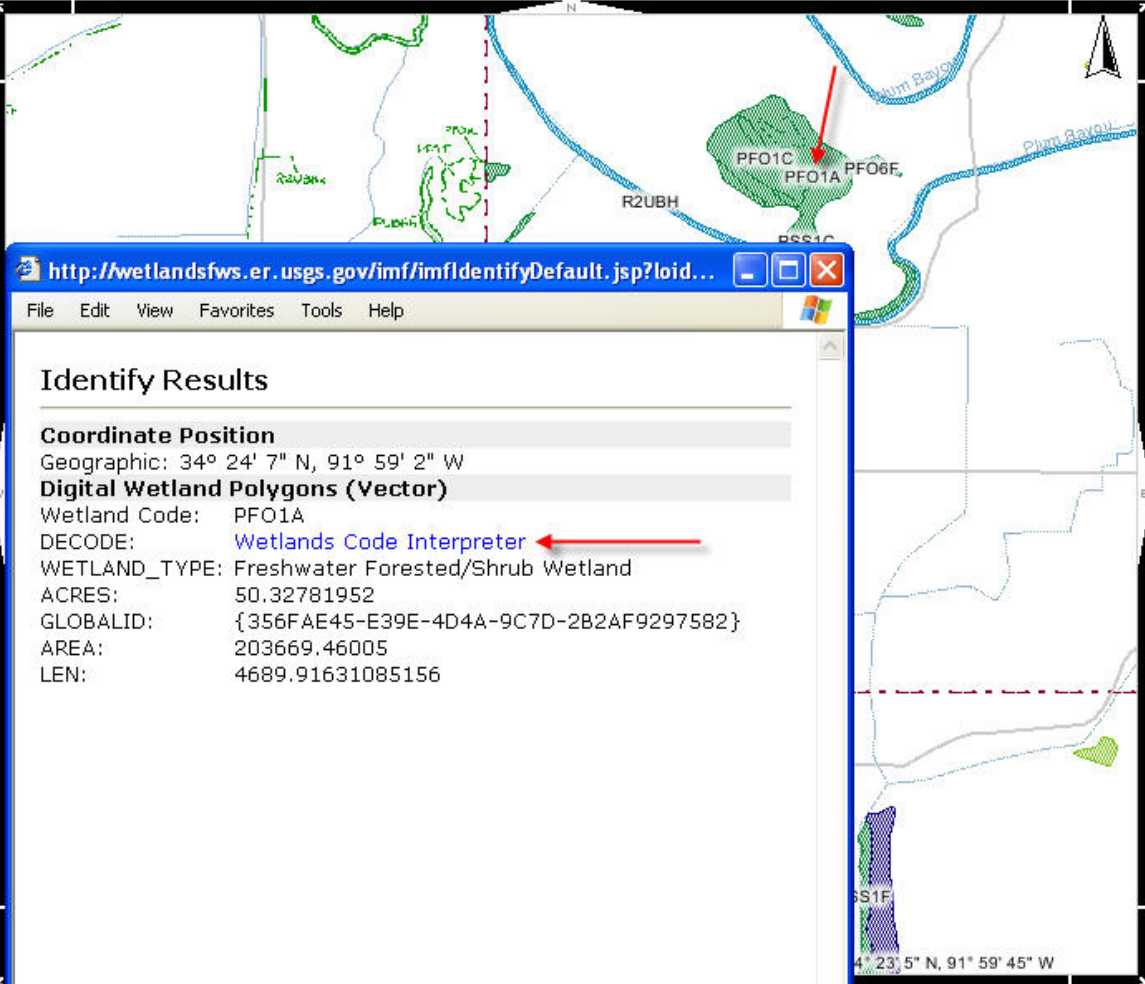
Jump To: Lower 48 States

Map Layers

- Interactive Layers
 - Wetlands Data
 - Wetlands Data Availability
 - Scale > 1:100,000**
 - Digital (vector data)
 - Scan (raster data)
 - Non-Digital (hardcopy only)
 - Unmapped Area
 - Scale < 1:100,000**
 - Digital (data will display)
 - Scan (data will display)
 - Non-Digital
 - Unmapped Area
 - Digital Wetland Polygons (Vector)**
 - Wetland Scan Data (Raster, 1:24k)
 - Wetland Project Area Metadata
 - Historic Wetlands Map Info
 - AZ/NM 100k Scans (use i for PDF lin
 - Base Data
 - WMS Display Layers (not printable)
- Automatically Refresh Map
 Show Legends

Notes:
Please refer to the following for descriptions of the functions of the controls in the layer list above.

Click folder to show or hide contents.



Jump To: Lower 48 States

Map Layers

- Interactive Layers
 - Wetlands Data
 - Wetlands Data Availability
 - Scale > 1:100,000
 - Digital (vector data)
 - Scan (raster data)
 - Non-Digital (hardcopy only)
 - Unmapped Area
 - Scale < 1:100,000
 - Digital (data will display)
 - Scan (data will display)
 - Non-Digital
 - Unmapped Area
 - Digital Wetland Polygons (Vector)
 - Wetland Scan Data (Raster, 1:24k)
 - Wetland Project Area Metadata
 - Historic Wetlands Map Info
 - AZ/NM 100k Scans (use i for PDF lin)
 - Base Data
 - WMS Display Layers (not printable)
- Automatically Refresh Map
- Show Legends

Notes: Please refer to the following for descriptions of the functions of the controls in the layer list above.

Click folder to show or hide contents.

http://wetlandsfws.er.usgs.gov/imf/imfIdentifyDefault.jsp?loid...

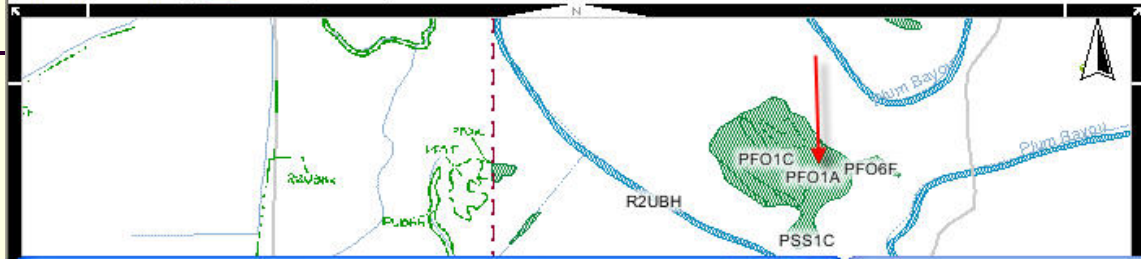
File Edit View Favorites Tools Help

Identify Results

Coordinate Position
 Geographic: 34° 24' 7" N, 91° 59' 2" W

Digital Wetland Polygons (Vector)
 Wetland Code: PFO1A
 DECODE: [Wetlands Code Interpreter](#)
 WETLAND_TYPE: Freshwater Forested/Shrub Wetland
 ACRES: 50.32781952
 GLOBALID: {356FAE45-E39E-4D4A-9C7D-2B2AF9297582}
 AREA: 203669.46005
 LEN: 4689.91631085156

Polygons (Vector)



Jump To:

Map Layers

- Interactive Layers
- Wetlands Data
 - Wetlands Data Availability
 - Scale > 1:100,000

http://wetlandsfws.er.usgs.gov/imf/imfIdentifyDefault.jsp?loid...

Identify Results

Coordinate Position
 Geographic: 34° 24' 3" N, 91° 59' 1" W

Digital Wetland Polygons (Vector)
 Wetland Code: PFO1A
 DECODE: [Wetlands Code Interpreter](#) ←

WETLAND_TYPE: Freshwater Forested/Shrub Wetland
 ACRES: 50.32781952
 GLOBALID: {356FAE45-E39E-4D4A-9C7D-2B2AF9297582} ←
 AREA: 203669.46005
 LEN: 4689.91631085156

Wetlands and Deepwater Habitats Classification - Microsoft Inte...

Wetlands and Deepwater Habitats Classification

National Wetlands Inventory Mapping Code Description

[Wetlands Mapper](#) / [Download Wetlands Data](#) / [NWI Homepage](#)

(case sensitive; ex. E2AB)
 short
 long
 none

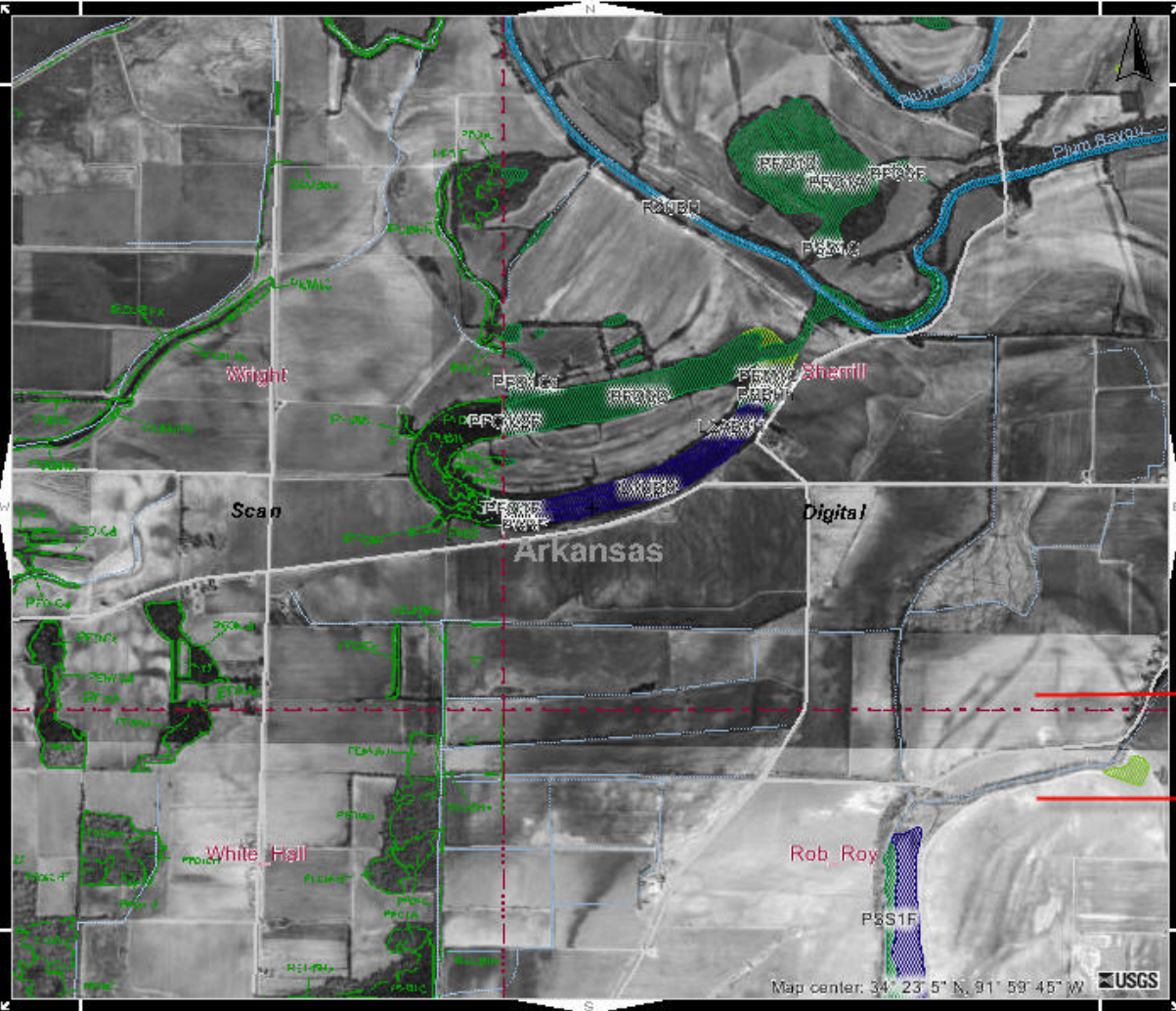
Length of descriptions:

List plant species?
 Yes
 No

[\(NWI Map Codes Legend\)](#) ←

[P] Palustrine, [FO] Forested, [1] Broad-Leaved Deciduous,

[P] Palustrine - The Palustrine System includes all nontida dominated by trees, shrubs, emergents, mos and all such wetlands that occur in tidal salinity due to ocean derived salts is bel Wetlands lacking such vegetation are also

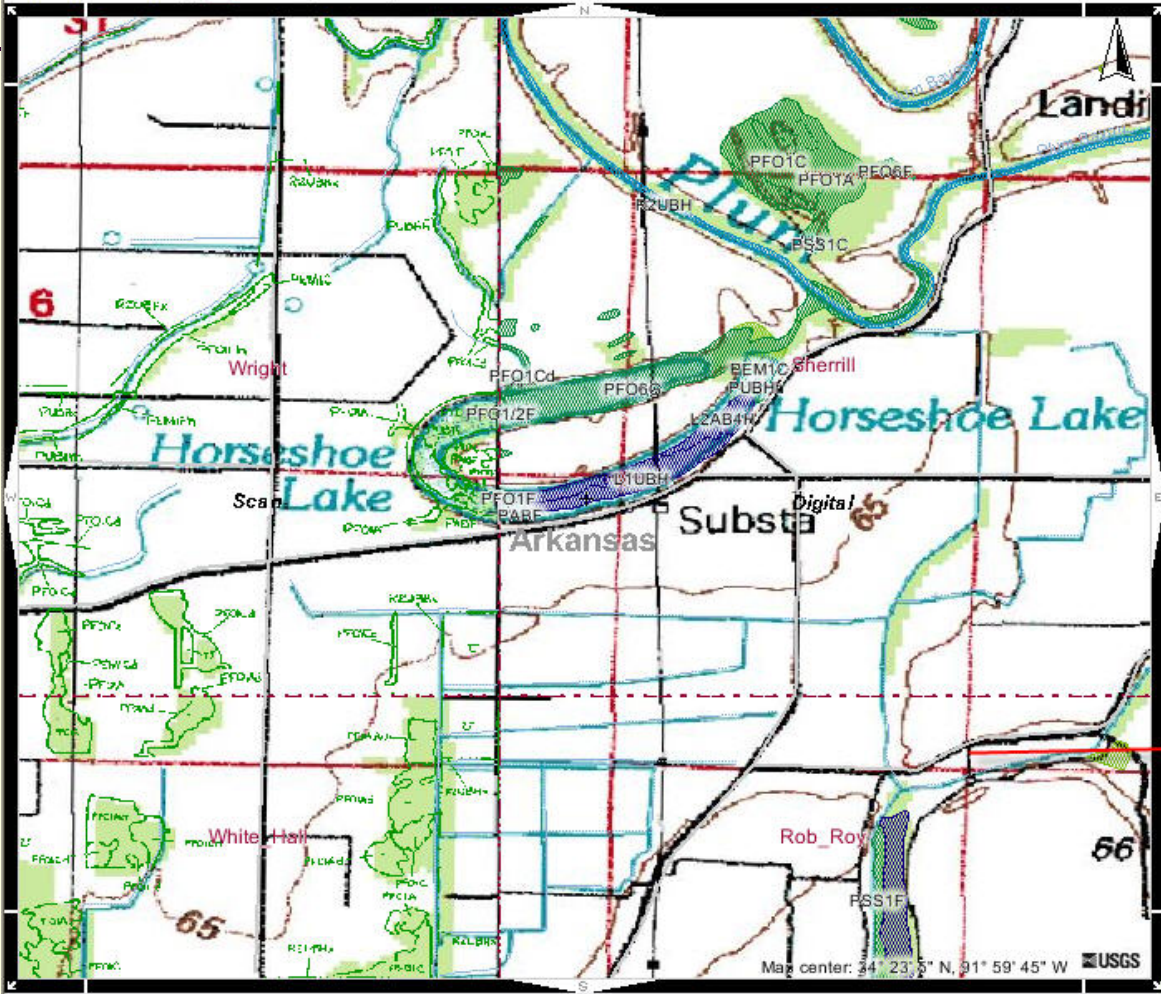


Jump To: Lower 48 States

Map Layers

- Interactive Layers
- Wetlands Data
 - Wetlands Data Availability
 - Scale > 1:100,000**
 - Digital (vector data)
 - Scan (raster data)
 - Non-Digital (hardcopy only)
 - Unmapped Area
 - Scale < 1:100,000**
 - Digital (data will display)
 - Scan (data will display)
 - Non-Digital
 - Unmapped Area
- Digital Wetland Polygons (Vector)**
 - Wetland Scan Data (Raster, 1:24k)
 - Wetland Project Area Metadata
 - Historic Wetlands Map Info
 - AZ/NM 100k Scans (use i for PDF lin)
- Base Data
- WMS Display Layers (not printable)
 - Shaded Relief (USGS)
 - Digital Raster Graphic (TerraServer)
 - Digital Ortho Quad (TerraServer)
 - Land Cover (USGS)
- Automatically Refresh Map
- Show Legends

Notes:



Jump To: Lower 48 States

Map Layers

- Interactive Layers
- Wetlands Data
 - Wetlands Data Availability
 - Scale > 1:100,000
 - Digital (vector data)
 - Scan (raster data)
 - Non-Digital (hardcopy only)
 - Unmapped Area
 - Scale < 1:100,000
 - Digital (data will display)
 - Scan (data will display)
 - Non-Digital
 - Unmapped Area
 - Digital Wetland Polygons (Vector)
 - Wetland Scan Data (Raster, 1:24k)
 - Wetland Project Area Metadata
 - Historic Wetlands Map Info
 - AZ/NM 100k Scans (use i for PDF link)
 - Base Data
 - WMS Display Layers (not printable)
 - Shaded Relief (USGS)
 - Digital Raster Graphic (TerraServer)
 - Digital Ortho Quad (TerraServer)
 - Land Cover (USGS)
- Automatically Refresh Map
- Show Legends

Notes:

Wetlands Metadata

U.S. Fish & Wildlife Service
Wetlands Online Mapper

About Home Layers Legend Key Map Locate Contact Us Print PDF Help Exit

Advanced tools

Jump To: Lower 48 States

Map Layers

- Interactive Layers
- Wetlands Data
 - Wetlands Data Availability
 - Scale > 1:100,000
 - Digital (vector data)
 - Scan (raster data)
 - Non-Digital (hardcopy only)
 - Unmapped Area
 - Scale < 1:100,000
 - Digital (data will display)
 - Scan (data will display)
 - Non-Digital
 - Unmapped Area
 - Digital Wetland Polygons (Vector)
 - Wetland Scan Data (Raster, 1:24k)
 - Wetland Project Area Metadata
 - Historic Wetlands Map Info
 - AZ/NM 100k Scans (use i for PDF link)
- Base Data
- WMS Display Layers (not printable)
 - Shaded Relief (USGS)
 - Digital Raster Graphic (TerraServer)
 - Digital Ortho Quad (TerraServer)
 - Land Cover (USGS)

Automatically Refresh Map
 Show Legends

Notes:
data

Scale: 1:34,

Identify Results

Coordinate Position
Geographic: 34° 24' 2" N, 91° 59' 14" W

Wetland Project Area Metadata

SUPPMAPINFO: None
PROJECT_NAME: Sherrill
STATUS: Digital
IMAGE_DATE: 03/83
DATA_SOURCE: NWIC, NWI-GX
EMULSION: CIR
IMAGE_SCALE: 1:58K
FGDC_METADATA: [More data](#)

AREA: 159309229.357
LEN: 50749.9513610201

Powered by OCORTEX

Historic Wetland Map Info

U.S. Fish & Wildlife Service
Wetlands Online Mapper

About Home Layers Legend Key Map Locate Contact Us Print PDF Help Exit

Advanced tools

Jump To: Lower 48 States

Map Layers

- Interactive Layers
- Wetlands Data
 - Wetlands Data Availability
 - Scale > 1:100,000
 - Digital (vector data)
 - Scan (raster data)
 - Non-Digital (hardcopy only)
 - Unmapped Area
 - Scale < 1:100,000
 - Digital (data will display)
 - Scan (data will display)
 - Non-Digital
 - Unmapped Area
 - Digital Wetland Polygons (Vector)
 - Wetland Scan Data (Raster, 1:24k)
 - Wetland Project Area Metadata
 - Historic Wetlands Map Info
 - AZ/NM 100k Scans (use i for PDF lin)
- Base Data
- WMS Display Layers (not printable)
 - Shaded Relief (USGS)
 - Digital Raster Graphic (TerraServer)
 - Digital Ortho Quad (TerraServer)
 - Land Cover (USGS)

Automatically Refresh Map
 Show Legends

Notes:

Scale: 1:34

Powered by **Quocortex**

Identify Results

Coordinate Position
Geographic: 34° 24' 9" N, 91° 59' 3" W

Historic Wetlands Map Info

PDF_HYPERLINK: [More data](#)

AREA: 25240949364.916
LEN: 739964.54108509

PDF_HYPERLINK: [More data](#)

AREA: 25240949364.916
LEN: 739964.54108509

PDF_HYPERLINK: [More data](#)

AREA: 25240684016.6797
LEN: 739968.357467096

Historic Wetland Map Info

Identify Results

Coordinate Position
Geographic: 30° 35' 34" N, 83° 27' 11" W

Historic Wetlands Map Info

PDF_HYPERLINK:	More data
AREA:	31682799672.9007
LEN:	713465.696541398
PDF_HYPERLINK:	More data
AREA:	26645943710.6996
LEN:	716873.735570726
PDF_HYPERLINK:	More data
AREA:	146372458521.215
LEN:	9648700.47725761

**USER REPORT: VALDOSTA NW, NE (GEORGIA QUADRANGLE)
WAYCROSS NW, NE, SW, SE**

NATIONAL WETLANDS INVENTORY MAPS

INTRODUCTION

The U.S. Fish & Wildlife Service's National Wetlands Inventory is producing maps showing the location and classification of wetlands and deepwater habitats of the United States. The Classification of Wetlands and Deepwater Habitats of the United States by Cowardin et al. is the classification system used to define and classify wetlands. Photo interpretation conventions, hydric soils lists and wetland plant lists are also available to enhance the use and application of the classification system.

PURPOSE

The purpose of the notes to users is threefold: (1) to provide localized information regarding the production of NWI maps, including specific imagery and interpretation discussion; (2) to provide a descriptive crosswalk from wetland codes on the map to common names and representative plant species; and (3) to explain local geography, climate, and wetland communities.

STUDY AREA

Geography:

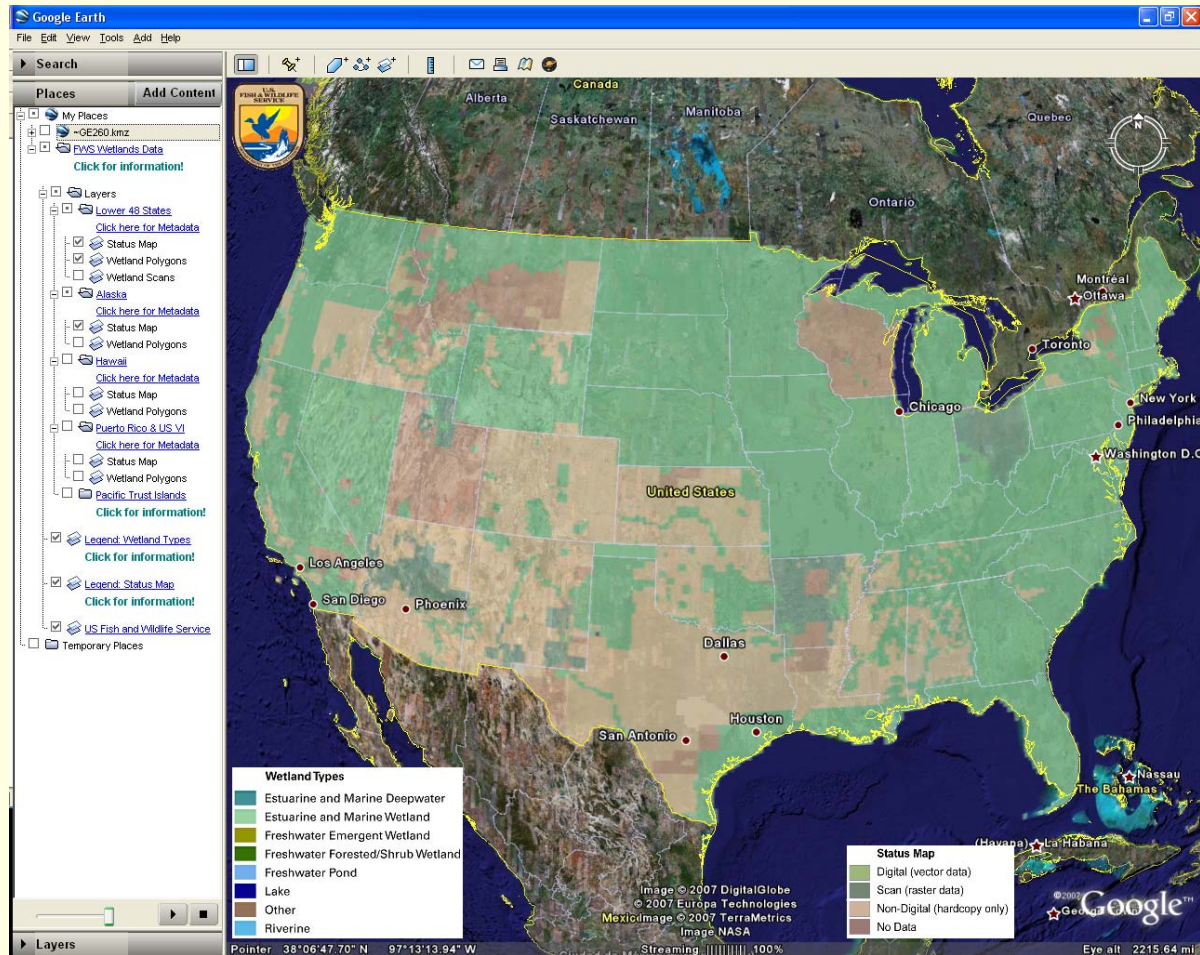
This study area covers a significant portion of inland southern Georgia. It is part of the Southern Coastal Plain

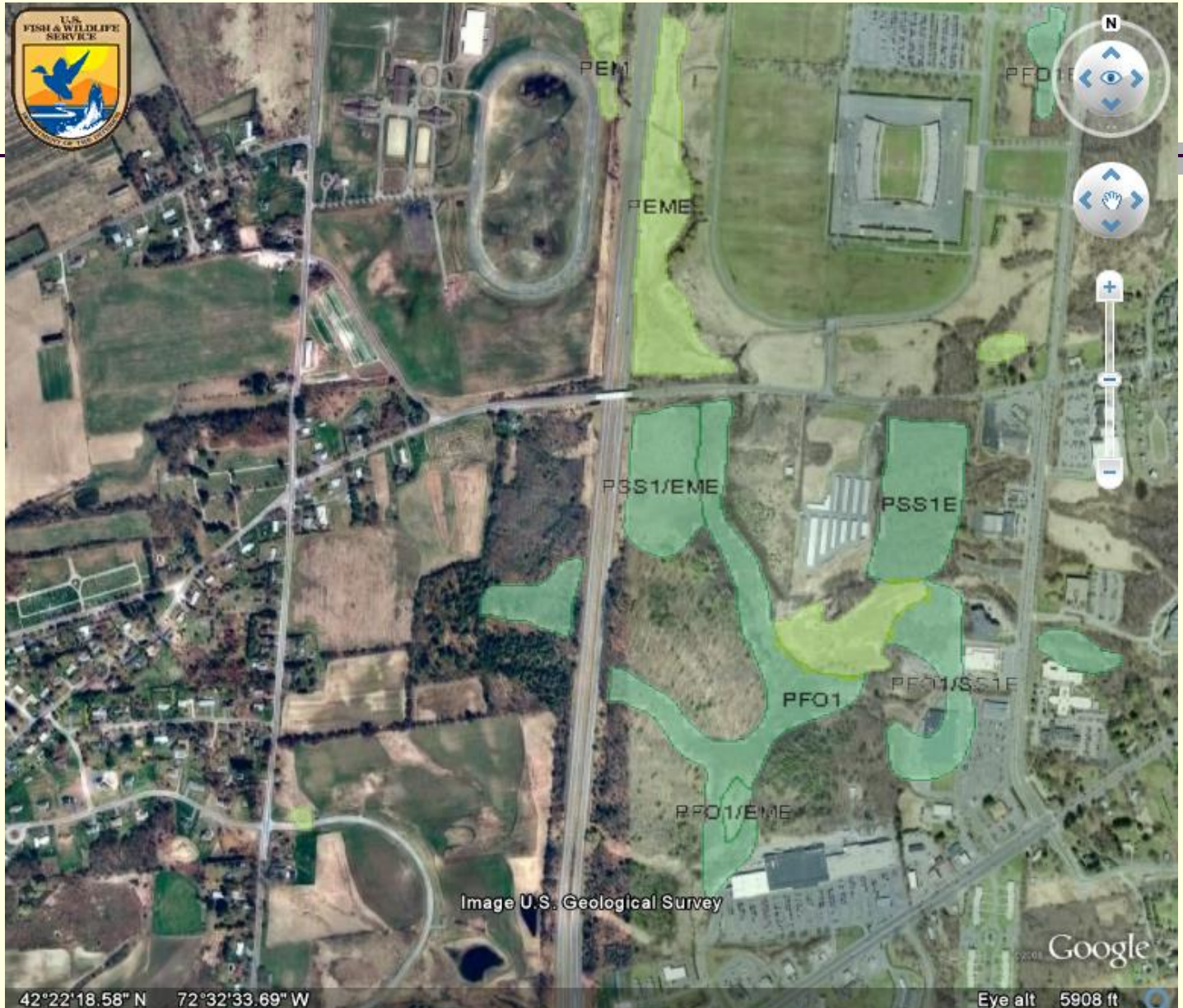
1 of 11

Wetlands on Google Earth

- Go to NWI website
- Click on “View NWI w/Google Earth”
- Click on “WetlandsData.KMZ” and this program will automatically load on Google Earth
- Then type in the area of interest, and away you go....

NWI on Google Earth – Status Map page





42°22'18.58" N 72°32'33.69" W

Image U.S. Geological Survey

Google

Eye alt 5908 ft

NWI on The National Map

USGS
The National Map Viewer

Map Information | Help

Scale

Layers Legend

ADMINISTRATIVE BOUNDARIES

- National Atlas State
- National Atlas State
- National Atlas State

ELEVATION

GEOGRAPHIC NAMES

GEOLOGY

HYDROGRAPHY

Wetland Polygons (USEWS)

- Estuarine and Marine Deep
- Estuarine and Marine Wetlands
- Freshwater Emergent Wetlands
- Freshwater Forested/Shrub
- Freshwater Pond
- Lake
- Other
- Riverine

IMAGERY

TerraServer USA DOC
No legend available.

INTEGRATED SCIENCE

LAND USE/LAND COVER

NATIONAL GRID

NATURAL HAZARDS/WEAT

OTHER

Refresh Map

Partners: MU-SPAM | USGS Mineral Resources Program (MRP) | MSDIS | USGS | U.S. Forest Service | U.S. Fish & Wildlife Service | NOAA | COE | TerraServer USA | SOLDGR | National Geospatial-Intelligence Agency (NGA) | BLM | BTS | CENSUS

U.S. Department of the Interior, U.S. Geological Survey | Contact: National Map Team
URL: <http://nationalmap.usgs.gov/> (R90) | Last modification: 09/14/2005
Privacy Statement | Disclaimer | FOIA | Accessibility

FIRST GOV
First Step to the Government

Future Activity of NWI in New England

- Long Island Sound Eelgrass Mapping
 - Funded by EPA
 - Summer 2009
- Cooperating with Massachusetts on their wetland conservancy mapping
 - Plan to Add to National Database
- Beyond this = ??? Unknown
 - Due to funding issues
 - Program focus on another national wetland trends analysis over next two years

The Challenge

- Need to get NWI focus back on mapping (digital data generation) since data are outdated for many areas

