

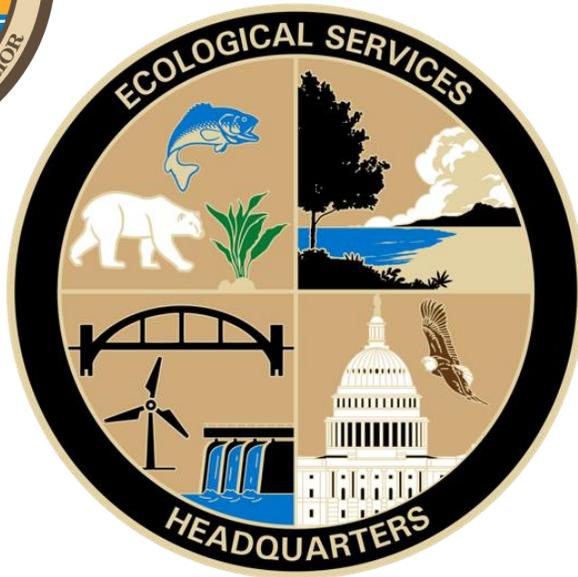


NWI Program Overview and Updates, Fall 2024

Amanda Pachomski, Regional Wetlands Coordinator (Northeast)
USFWS National Wetlands Inventory Program



National Wetlands Inventory (NWI) Program





NWI Staff: Wetland Coordinators

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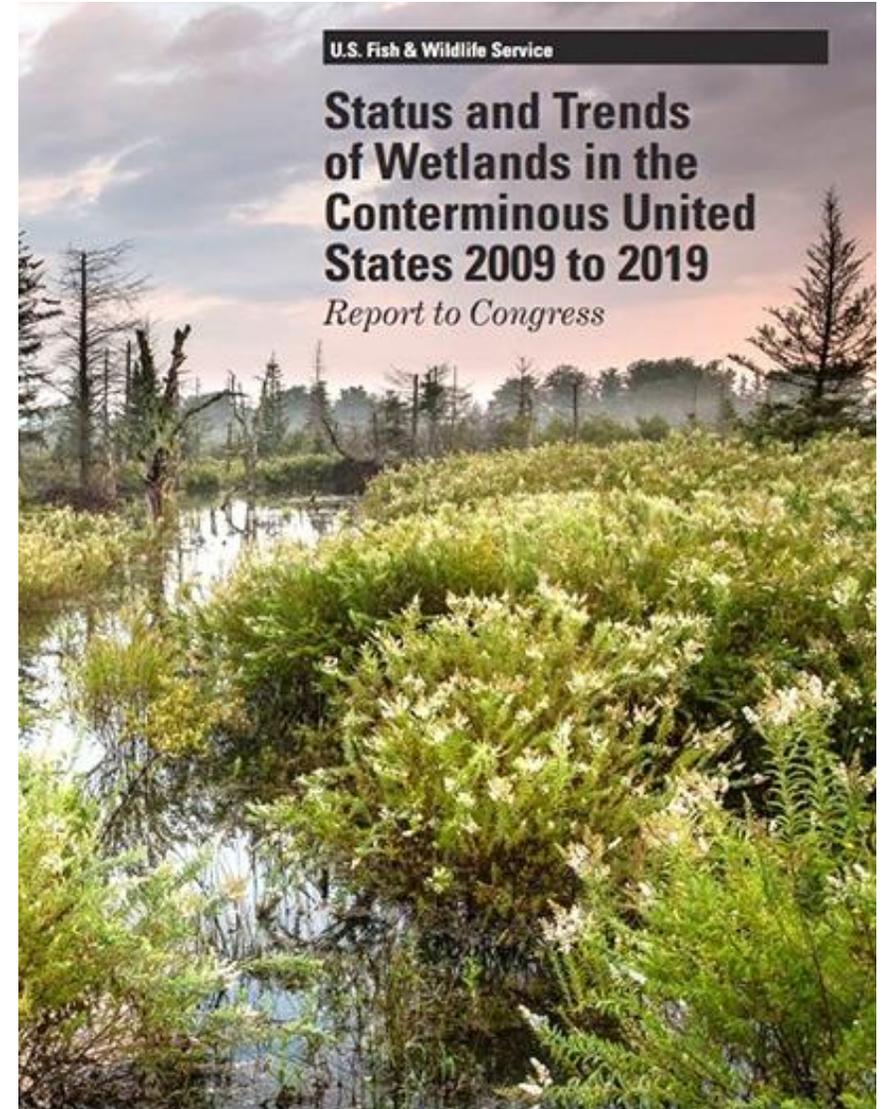
Madison, WI NWI Data Center

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The National Wetlands Inventory Program

- USFWS is the principle U.S. federal agency tasked with providing information to the American public on extent and trends of U.S. wetlands
- Emergency Wetlands Resources Act of 1986
 - Directed U.S. Interior to map the location and type of wetlands across the country
 - And, provide 10 year reports on the status and trends of the Nation's wetlands
- OMB Circular A-16 identifies the Wetlands Layer as a National Spatial Data Infrastructure (NSDI) layer, maintained by USFWS
- The Federal Geographic Data Committee (FGDC) oversees the National Geospatial Data Asset (NGDA)





Scientific Wetland Definition

FWS/OBS-79/31
DECEMBER 1979
Reprinted 1992

Classification of Wetlands and Deepwater Habitats of the United States



U.S. Department of the Interior
Fish and Wildlife Service

- The FGDC Wetlands Classification Standard (WCS) defines “wetlands” according to Cowardin et al. (1979):
 - WETLANDS *are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification wetlands must have one or more of the following three attributes:*
 - (1) *at least periodically, the land supports predominantly hydrophytes;*
 - (2) *the substrate is predominantly undrained hydric soil; and*
 - (3) *the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year.*

Non-Regulatory Definition



2009 – 2019 Wetlands Status and Trends Report



<https://www.fws.gov/project/2019-wetlands-status-and-trends-report>

Key Findings

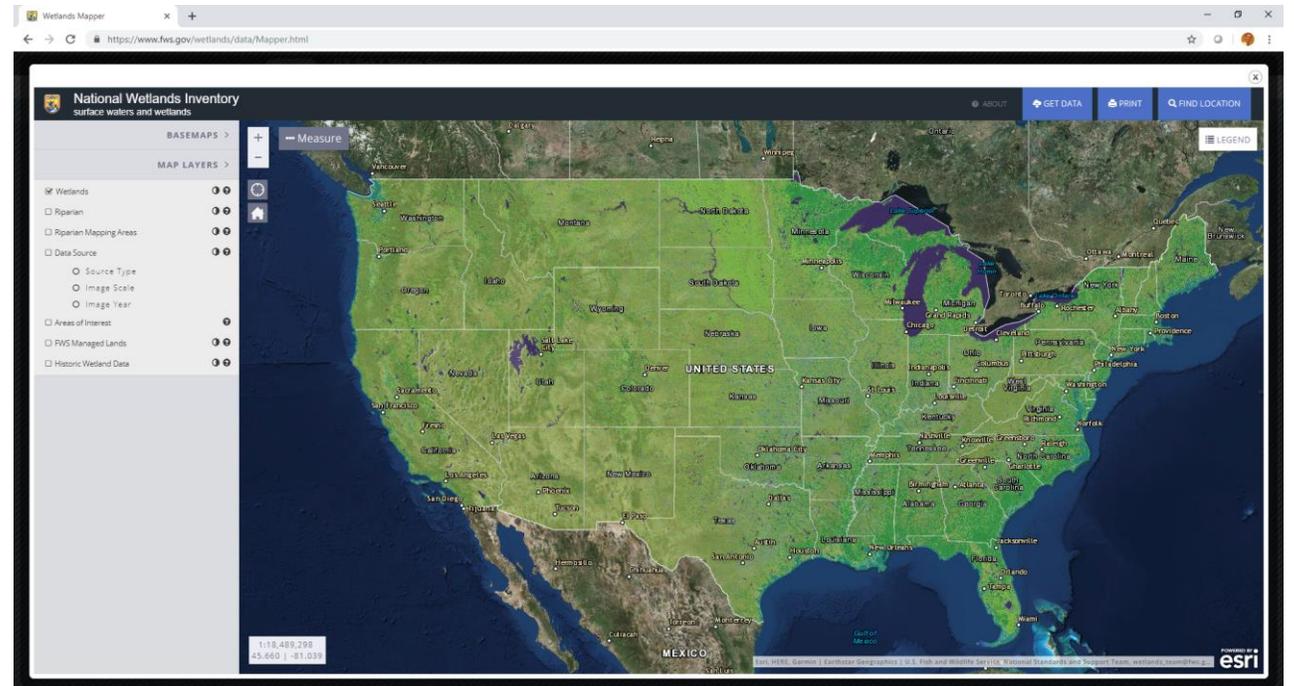
- Net wetland loss increased by more than 50% since the previous study.
- 221K acres of wetlands were lost, primarily to uplands through drainage and fill.
- Wetland loss disproportionately affected vegetated wetlands (-670K acres).
- Salt marsh experienced the largest net percent reduction of any wetland category (2% or -70K acres)
- Freshwater forested wetlands experienced the largest loss by area (-426K acres).
- There was a net gain in non-vegetated wetlands of 488K acres, and a related increase in pond area of over 7%.



NWI Wetlands Dataset

- Publicly available dataset of wetland and deepwater habitats of the U.S.
- New data are published twice per year (May and October)
- 40+ years and \$220+ million
 - 100% of the Lower 48 mapped
 - 63% of Alaska
 - over 36 million polygons

NOT a Jurisdictional Wetland Map



<https://www.fws.gov/wetlands/Data/Mapper>



Funding for Wetland Mapping

Current data production is mostly funded by external cooperators, such as state agencies, Tribes, and other FWS departments:

- Wetland Program Development Grants (EPA)
- Great Lakes Restoration Initiative (USFWS)
- BLM interagency agreement
- U.S. Army Corps of Engineers

NWI's primary challenge is to support a contemporary dataset with a historically flat budget.

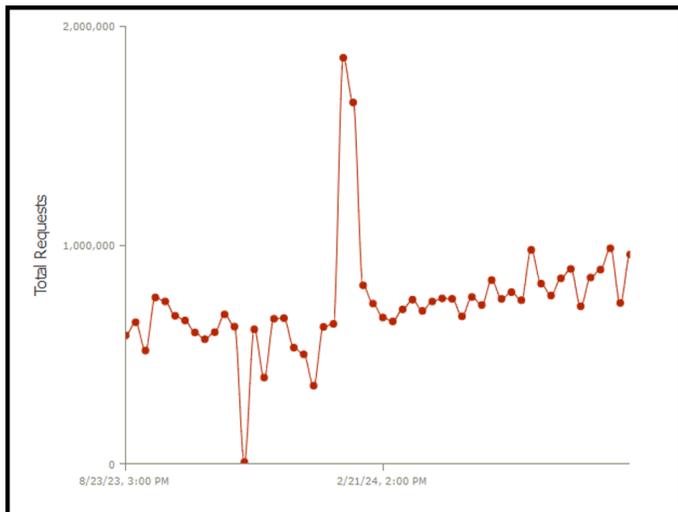
- After accounting for inflation, NWI's current budget is 1/6th of its 1986 budget (the year NWI mapping was mandated).

All federally funded wetland inventory mapping projects must comply with the FGDC [Wetland Mapping Standard](#) and [Classification of Wetlands and Deepwater Habitats of the United States!](#)



Benefits of Publishing with NWI

- Back-end data storage, distribution, and maintenance
- Standardized data production across the nation and territories allows for consistent analyses and planning
- Most visited FWS webpage
- Data are very important for passive avoidance during development





Data Uses and Supporting Applications

- Habitat and Species Assessments
 - Threatened and endangered species status assessments (ex: Eastern Black Rail)
 - Conservation prioritization planning (ex: Ducks Unlimited Wisconsin Duck Plan)
- Infrastructure Projects
 - Roads, pipelines, renewable energy
- Baseline data for NEPA documents
- Wetland Functional Assessments
- Restoration and enhancement planning



The Wetlands Layer and Wetlands Status and Trends data have been used to support the development of Species Status Assessments.



NWI Standard Compliant Data Production

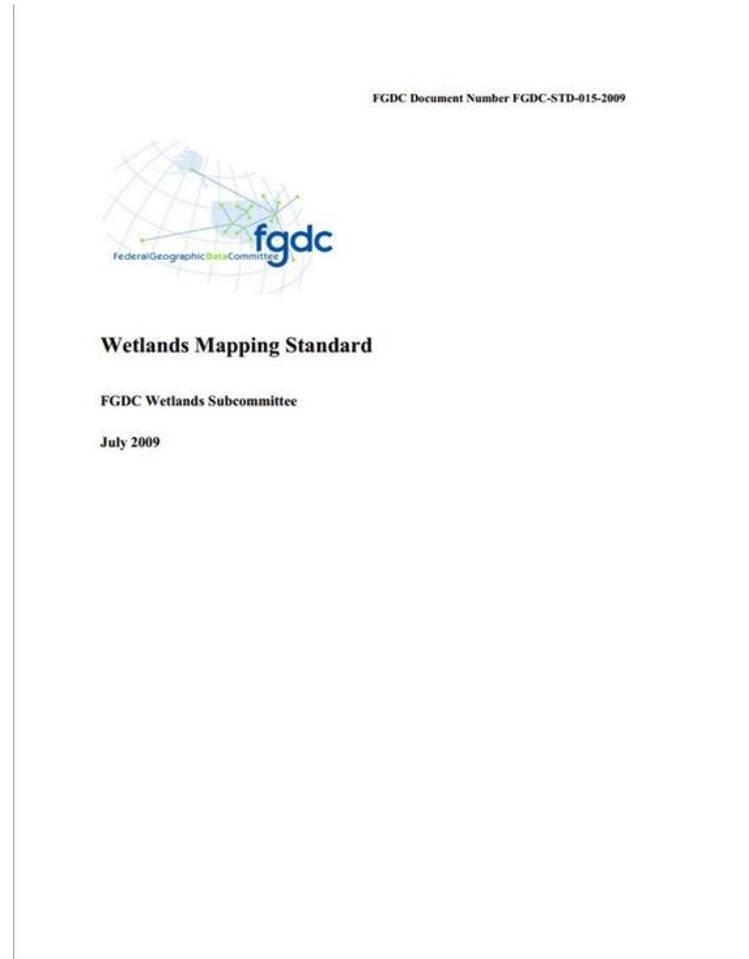
- Photo interpretation of base imagery (snapshot in time)
- Ancillary datasets inform mapping & classification
 - NHD, SSURGO, lidar derivatives
- Primarily produced by external contractors using ArcGIS Pro
- Field verification of a small subset of representative features
- Iterative QA/QC





FGDC Wetland Mapping Standard

- Established in 2009; updated 2015
- Creates minimum requirements for data quality
 - Metadata
 - Projection
 - Spatial resolution of imagery
 - Omission Errors
 - Horizontal Accuracy
 - 5 m wetlands
 - 15 m for deepwater
 - Feature and Attribute Accuracy
 - Target Mapping Unit (next slide)

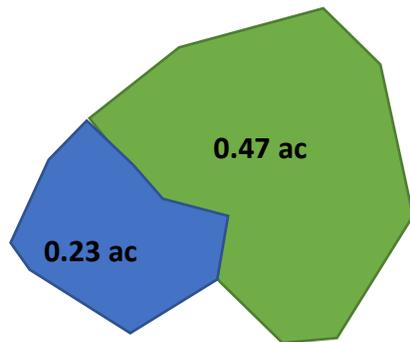




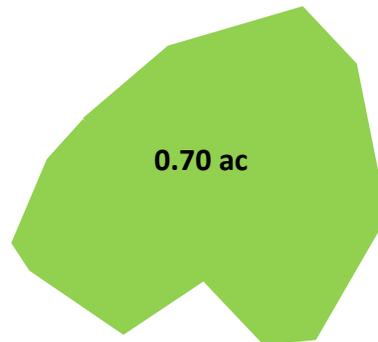
Mapping Considerations

Target Mapping Unit (TMU) for lower 48 states, HI, and Territories:

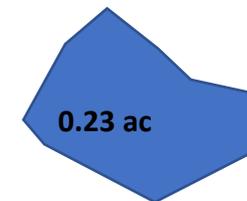
- Features larger than 0.5 acres or 1 acre for estuarine and lacustrine
- Riverine features equal to or wider than 15 feet
- The TMU may be exceeded if greater detail is desired and funding is available. Features smaller than 0.5 ac will be accepted.



This is a feature
(2 adjacent Cowardin
codes greater than TMU)



This is a feature
(1 Cowardin code
greater than TMU)



This is not a feature
(below TMU)



Classification Standard

- Original document:
 - Classification of Wetlands and Deepwater Habitats of the United States
 - Cowardin, et al 1979
- Revised document:
 - Added water regimes: saturated (B) split out into B, E (beyond Northeast) and D
 - Added Q (regularly flooded freshwater tidal)
 - Added the “managed” special modifier
 - Clarified wetland definition

FGDC-STD-004-2013
Second Edition



Classification of Wetlands and Deepwater Habitats of the United States

Adapted from Cowardin, Carter, Golet and LaRoe (1979)

Wetlands Subcommittee
Federal Geographic Data Committee

August 2013

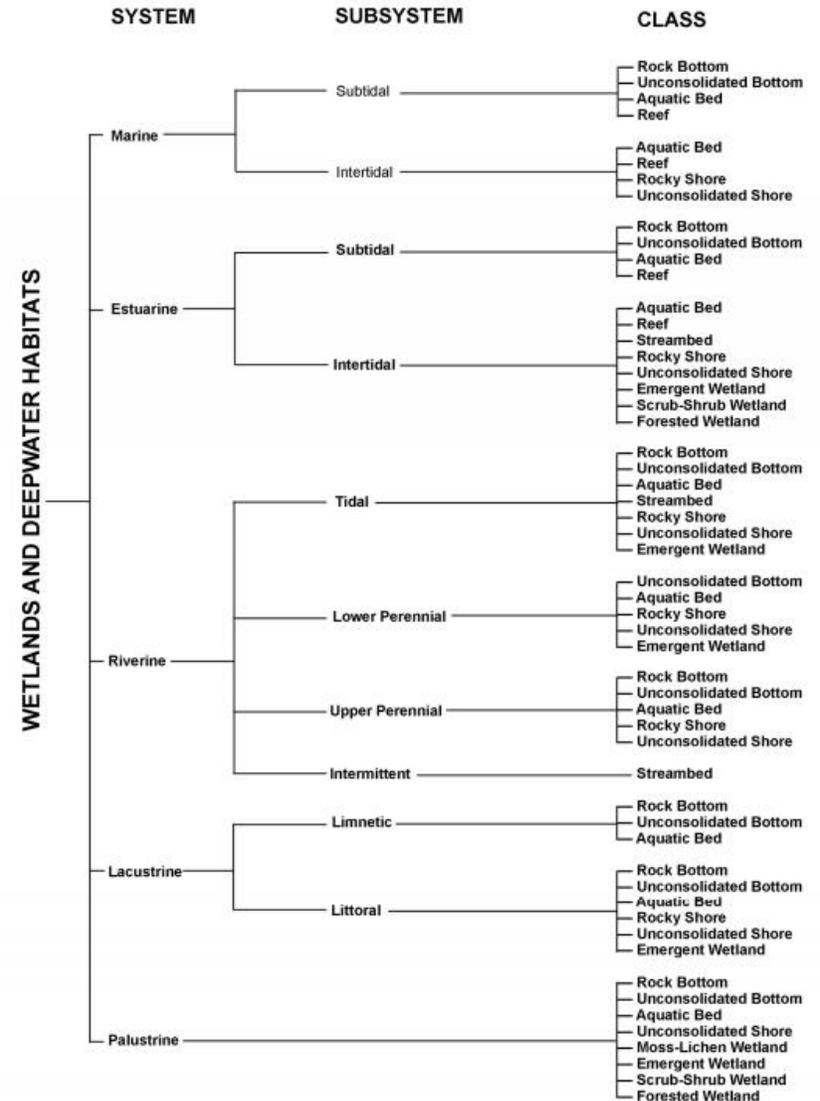


Cowardin Classification

“Cowardin” Classification:

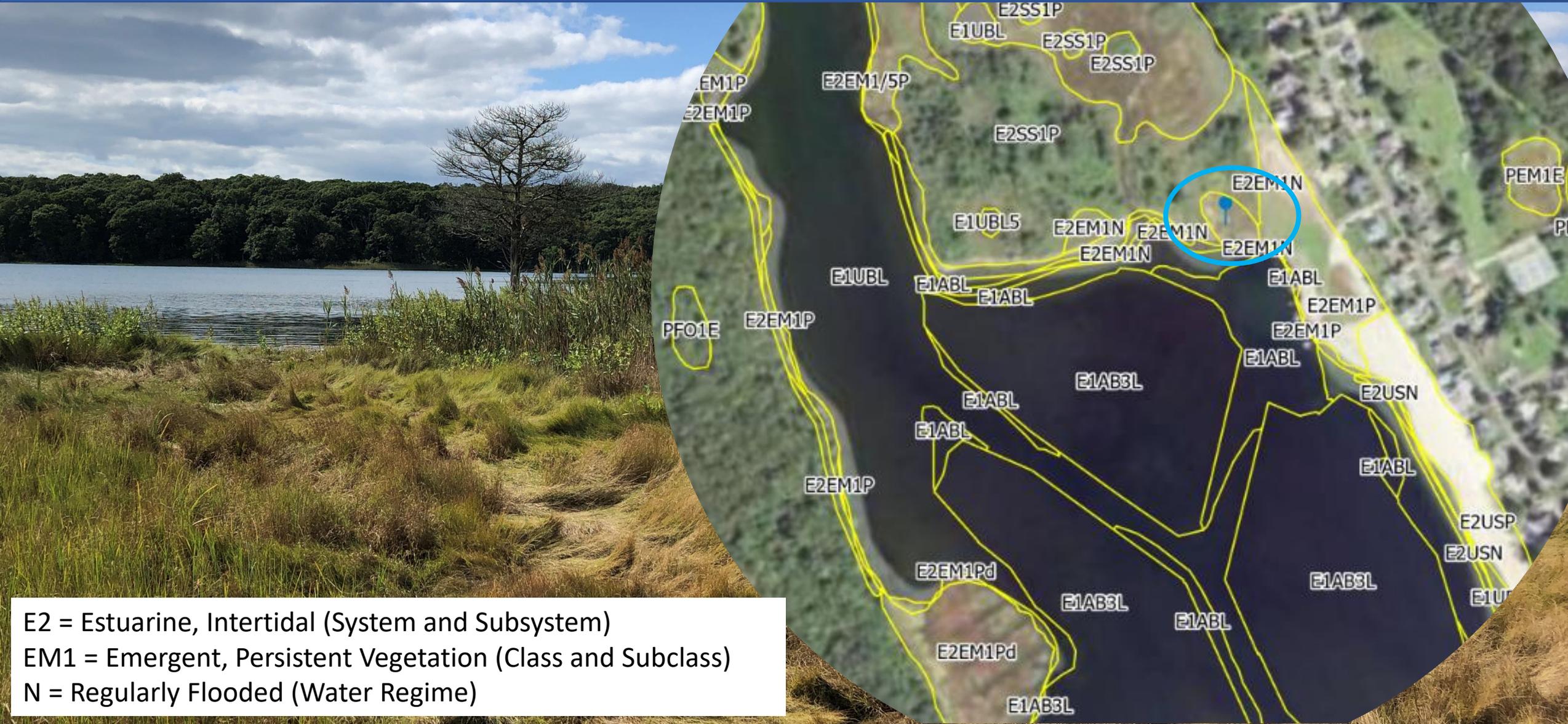
- System
- Subsystem (except Palustrine)
- Class
- Subclass (where applicable)
- Water Regime
- Special Modifiers (where applicable)

The resulting classification is represented by an alpha-numerical code (the “Cowardin code”)





Feature Attribution Example



E2 = Estuarine, Intertidal (System and Subsystem)
EM1 = Emergent, Persistent Vegetation (Class and Subclass)
N = Regularly Flooded (Water Regime)



Metadata

- Map Report contains at a minimum:
 - Project Area
 - Image Year
 - Target Mapping Unit
 - Unique Cowardin Codes

These reports drive users' ability to appropriately utilize the data

Examples available:

<https://www.fws.gov/program/national-wetlands-inventory/contribute-data>

National Wetlands Inventory Map Report for Quinault Indian Nation

Project ID(s): R01Y19P01: Quinault Indian Nation, fiscal year 2019

Project area

The project area (Figure 1) is restricted to the Quinault Indian Nation, bounded by Grays Harbor Co. Jefferson Co. and the Olympic National Park.

Appendix A: USGS 7.5-minute Quadrangles: Queets, Salmon River West, Salmon River East, Matheny Ridge, Tunnel Island, O'Took Prairie, Thimble Mountain, Lake Quinault West, Lake Quinault East, Taholah, Shale Slough, Macafee Hill, Stevens Creek, Moclips, Carlisle.

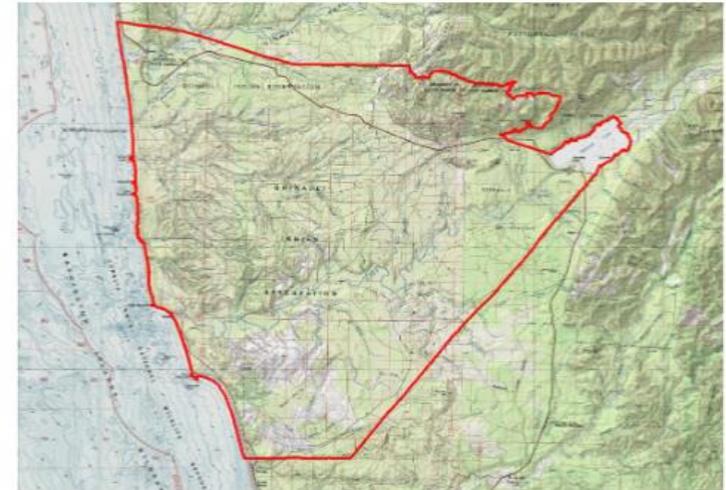


Figure 1. QIN NWI+ 2019 project area (red outline).

Source Imagery:

Citation: For all quads listed above: See Appendix A *Citation Information:*

Originator: USDA-FSA-APFO Aerial Photography Field Office

Publication Date: 2017

Publication place: Salt Lake City, Utah

Title: Digital Orthoimagery Series of Washington

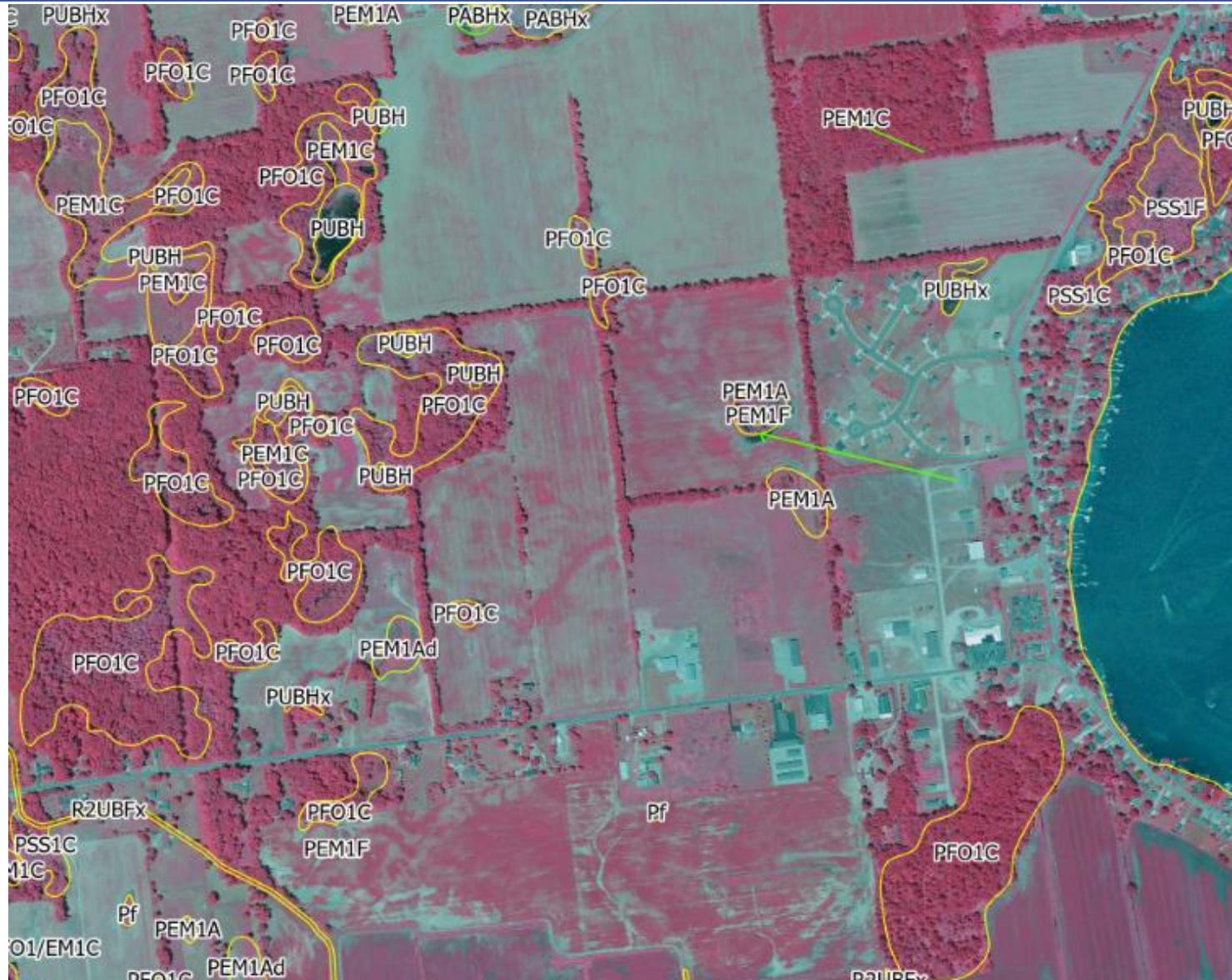
Geospatial Data Presentation Form: raster digital data

Other Citation Details: 1-meter and 1-foot, Natural Color and NIR-False Color



NWI Quality Control and Assurance

- Fieldwork
- Wetlands Coordinator conducts iterative Quality Control review of 30% of the project area
- Visual review at 1:12,000
 - Horizontal accuracy
 - Incorrect classification
 - Upland inclusions
 - Sufficiently detailed line work
 - Omitted wetlands
 - Consistently mapped at TMU
- Quality Assurance (10%)





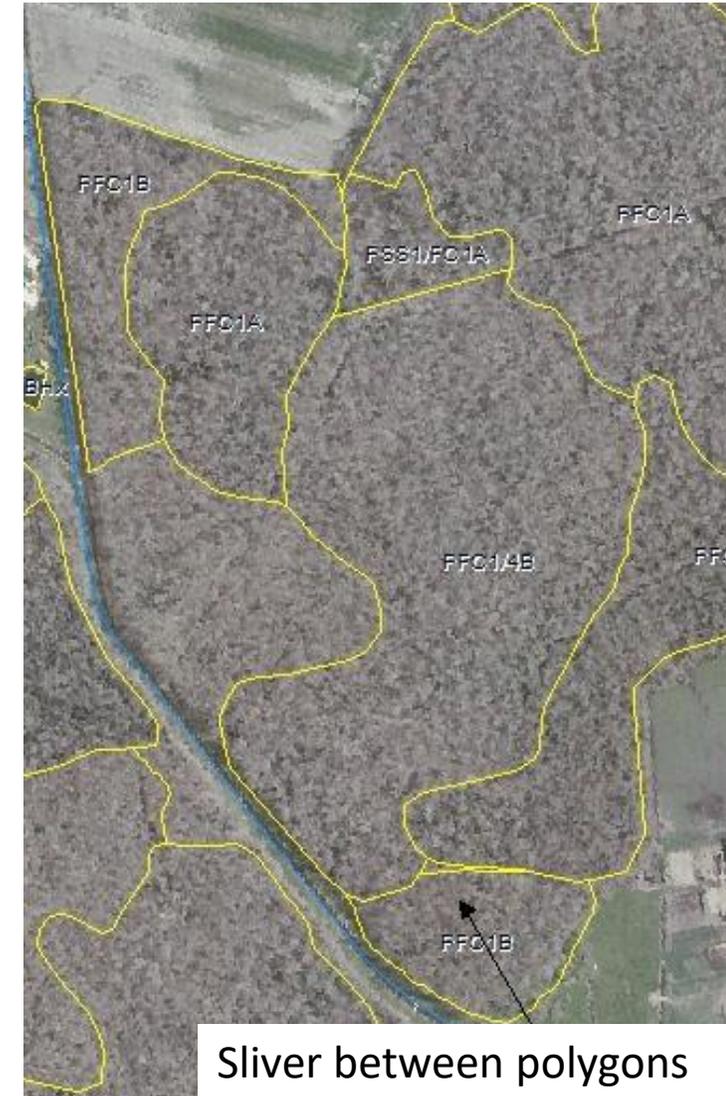
NWI Wetlands Data Verification Toolset

Logic Tests

- Default code/no errors present
- Bad Wetland Codes
- Adjacent Polygons
- Sliver Wetlands
- Sliver Uplands
- Lake/Pond
- Overlapping Polygons
- Gaps between project boundary

Resulting Codes

- NNNNNN
- CNNNNN
- NANNNN
- NNSNNN
- NNNUNN
- NNNNLN/NNNNPN
- NNNNNO
- NNNGNN



Sliver between polygons



Final Submission: Quality Assurance

Final Submission

- Vendors are advised to submit their final 100% mapped dataset at least four weeks prior to a contract or agreement end date to allow for final QC and QA.
- Quality Assurance Deadlines:
 - **March 15th** (May 1st mapper update).
 - **July 15th** (October 1st update).
 - Please submit your data for final QC at least 2 weeks prior.





Guidance Documents



Federal Standard Compliant Wetland Data Project Coordination and Communications Plan

U.S. Fish and Wildlife Service
National Wetlands Inventory

Table of Contents

1	Introduction.....	1
1.1	Overview of the National Wetlands Inventory (NWI)	1
1.2	Purpose of Project Coordination and Communications Plan	1
2	Project Goals and Critical Success Factors.....	1
3	Communications Management	1
4	Quality Management.....	2
5	Compliance Related Planning.....	2
6	Schedule/Time Management.....	2
6.1	Project Initiation and Check Out.....	3
6.2	Project Kick-off Meeting.....	3
6.3	Data Production and Review	4
6.4	Final Submission.....	4

<https://www.fws.gov/media/federal-standard-compliant-wetland-data-project-coordination-and-communications-plan>



Mapping Standard Compliant Wetlands Data-Supplement (version 2)

U.S. Fish and Wildlife Service National Wetlands Inventory
October 3, 2024

Introduction

This updated document rescinds and replaces the September 2021 memorandum titled “Revised Mapping Approach for Narrow Linear Habitats” and the “Mapping Standard Compliant Data-Supplement” guidance. These previous documents led to confusion that impeded workflow for cooperators, and NWI staff, notably:

1. Inconsistency among data producers resulting in drastically different and regionally inconsistent NWI datasets.
2. Increased workload by Regional Wetland Coordinators in providing guidance and clarification to data producers as well as increased time reviewing data.

The update is being provided by the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Program to clarify Federal Geographic Data Committee (FGDC) Wetlands Mapping Standard requirements to aid in polygonal wetland feature interpretation and standards-related expectations. Data producers (e.g., contractor or cooperator) are requested to bring their funders and NWI program staff together to clarify project-specific needs at the beginning of a project. A pre-mapping discussion of the project area and expectations will greatly assist data producers in making consistent, project-wide mapping decisions and ensure a final standard-compliant data product that is completed on time and within budget. If potential mapping issues or questions arise, it is the responsibility of the data producer and/or the project funder to work with NWI staff to determine the best path forward.

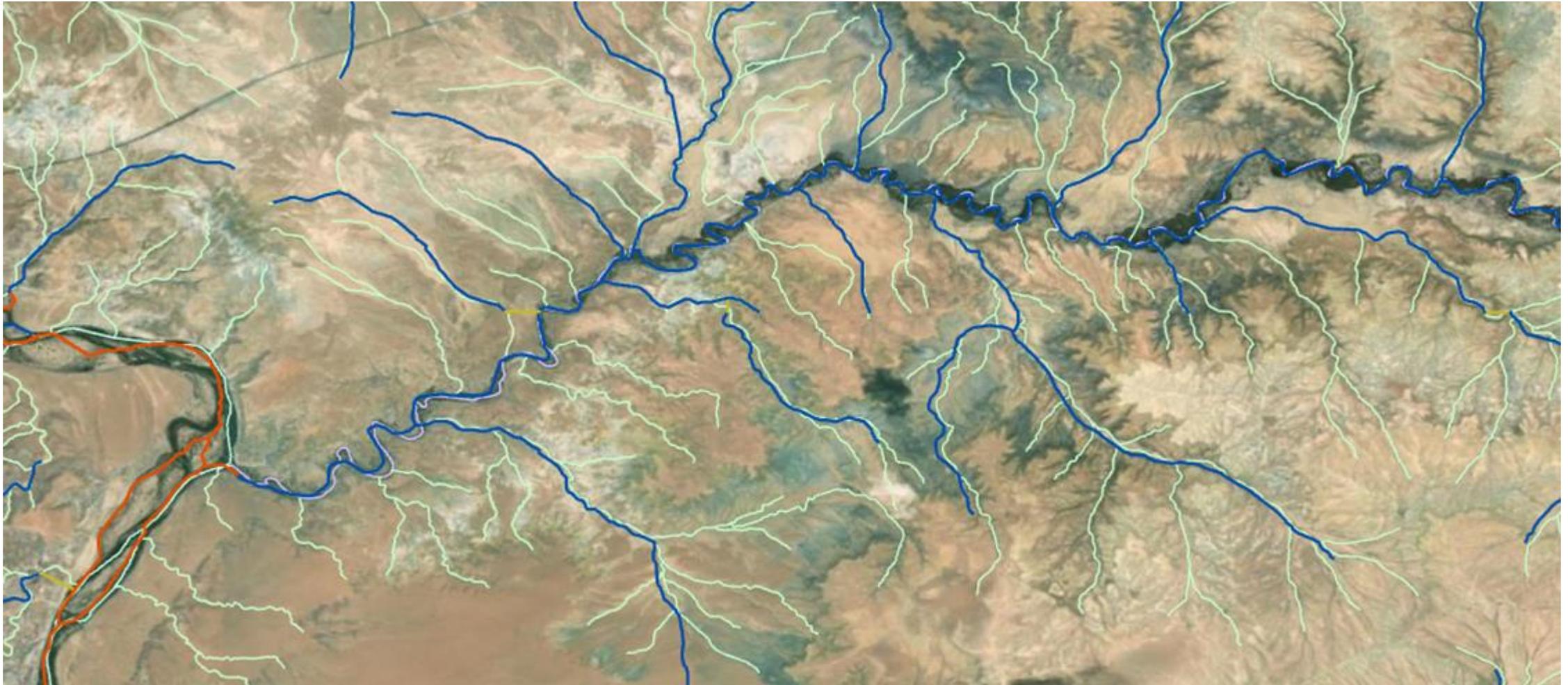
Background

The NWI Program continues to update the National Wetlands Data Layer to enhance its applicability. The Data Layer has advanced considerably from a collection of analog maps to a highly detailed geospatial dataset of wetlands and deepwater habitats within CONUS. In Alaska, a comprehensive wetland map is anticipated in the next decade. In 2009, the Federal Geographic Data Committee, in partnership with the USFWS, adopted the Wetlands Mapping Standard

<https://www.fws.gov/media/mapping-standard-compliant-data-supplement-version-2>

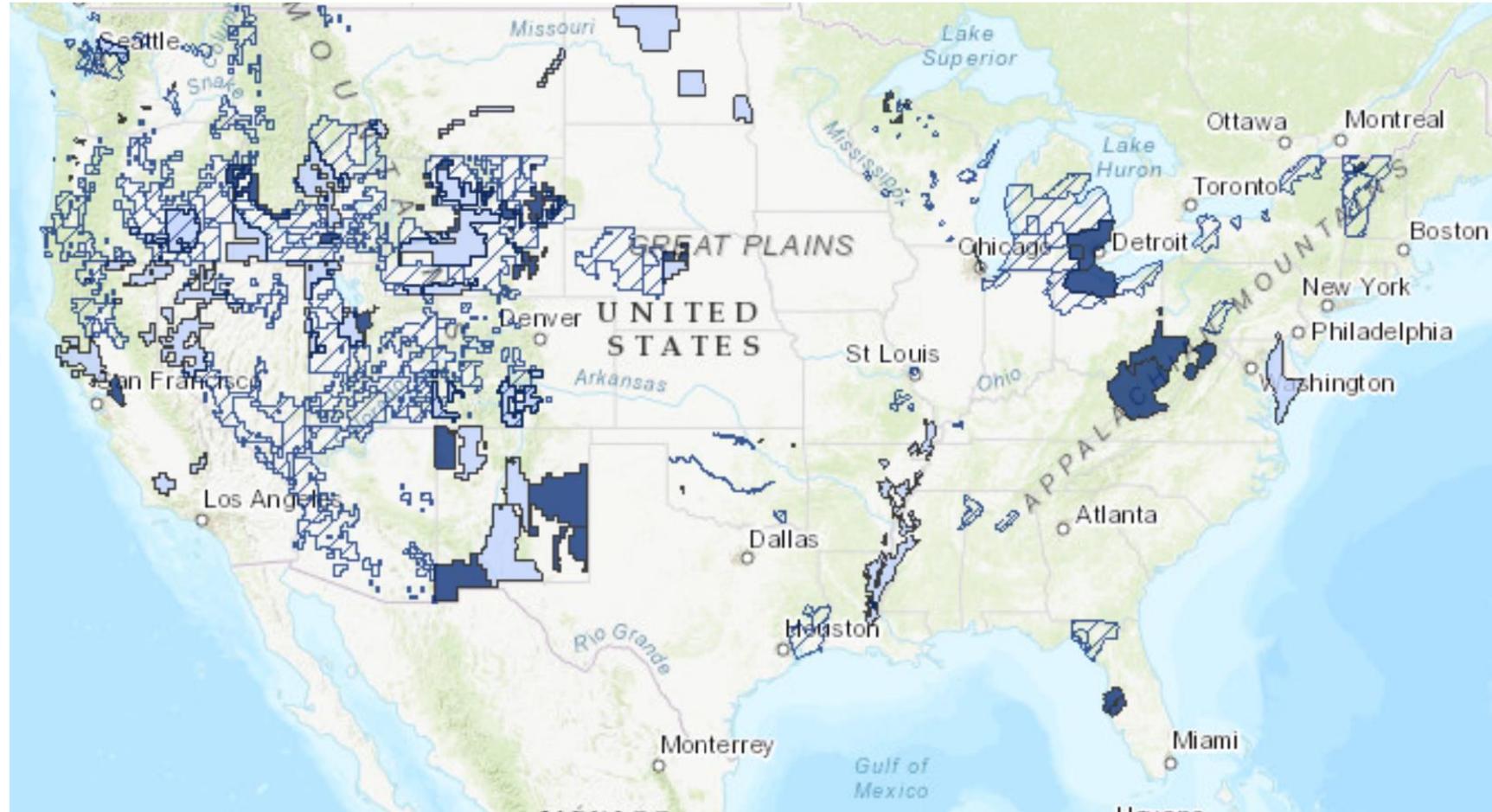
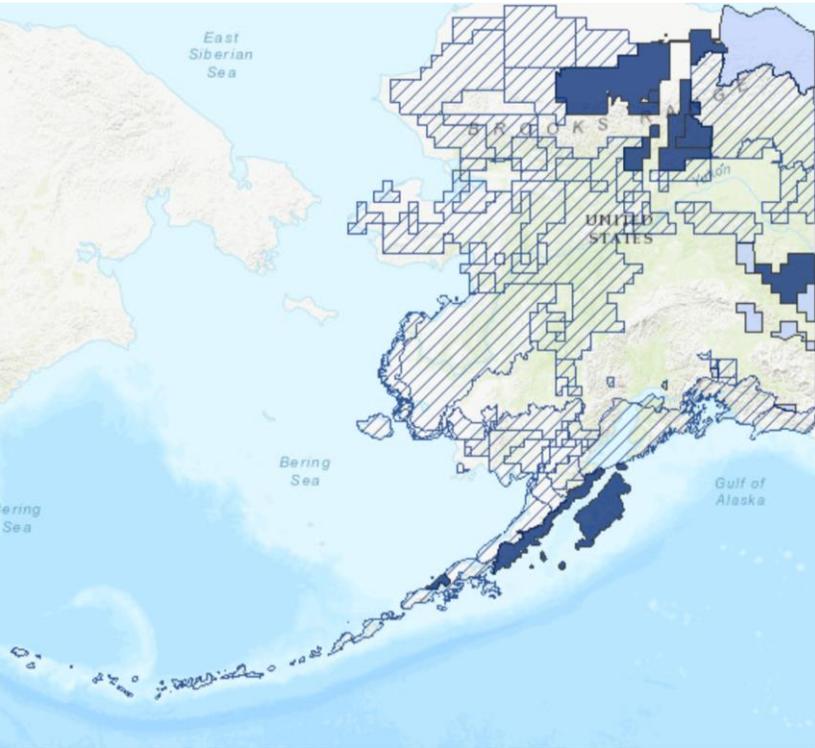


Hydrologic Reference Data Set (HRDS)





Current & Recent Wetlands Mapper Projects



Mapping Projects

Recent

- 2023
- 2024

Active

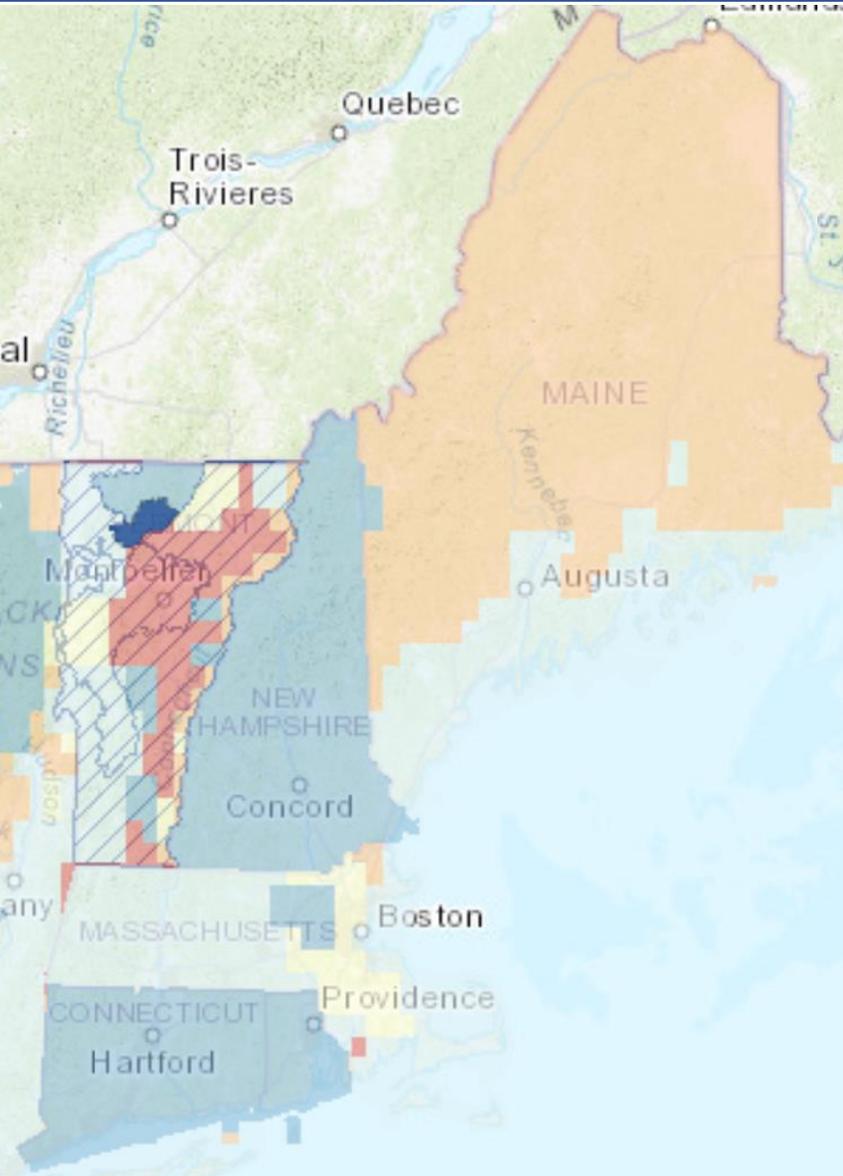


<https://fwsprimary.wim.usgs.gov/wetland-projects-v2/>





NWI Data Status: New England



Mapping Projects

Recent

- 2023
- 2024

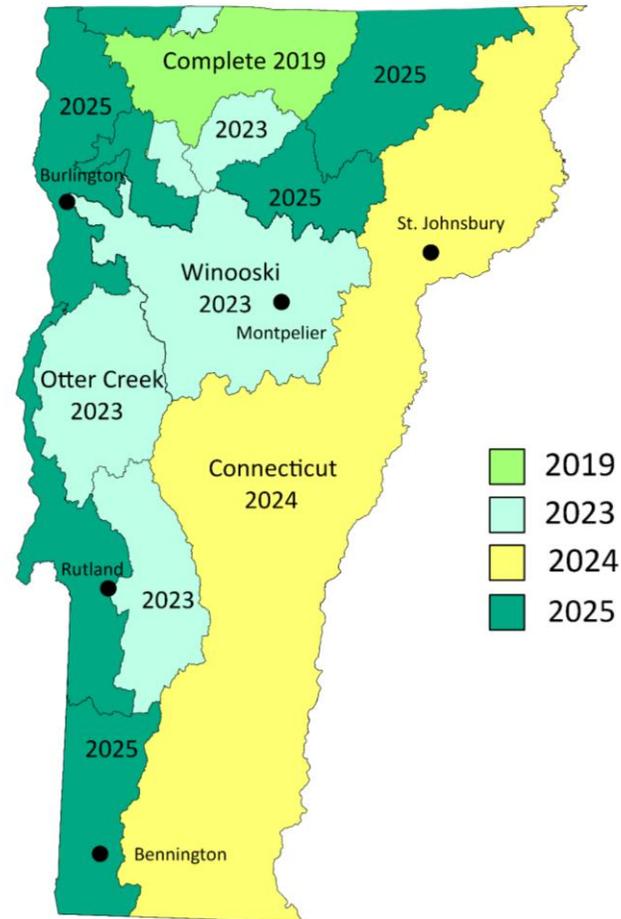
Active



Image Year

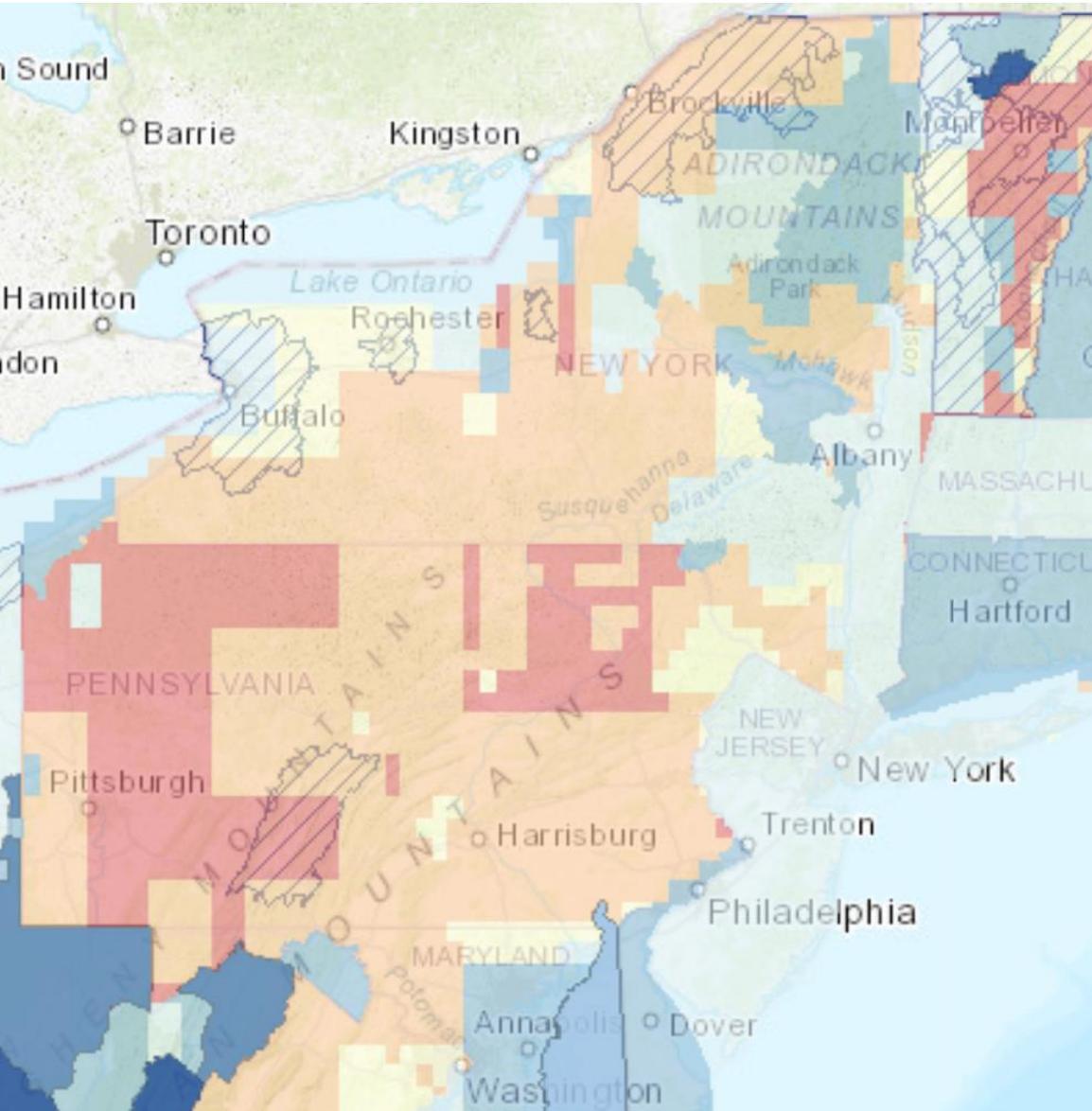
- 2020s
- 2010s
- 2000s
- 1990s
- 1980s
- 1970s
- N/A

- Maine NWI update feasibility assessment
- Vermont statewide update





NWI Data Status: NY, PA, NJ, DE



Mapping Projects

Recent

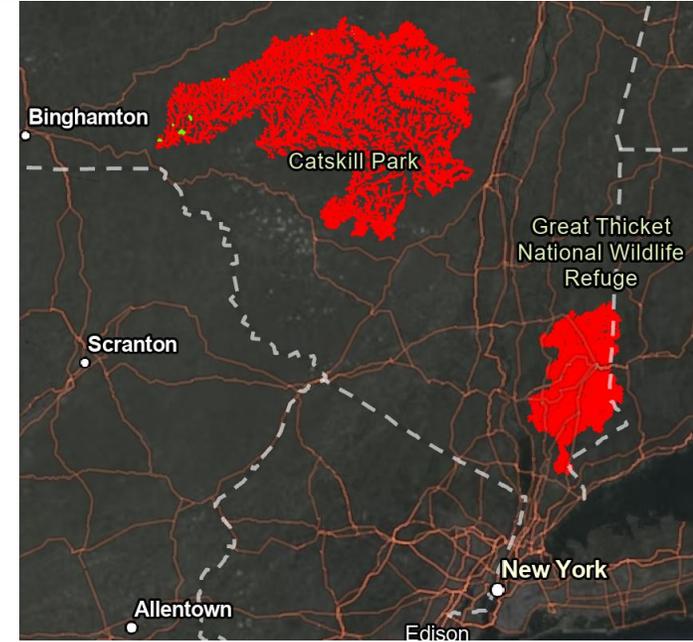
- 2023
- 2024

Active



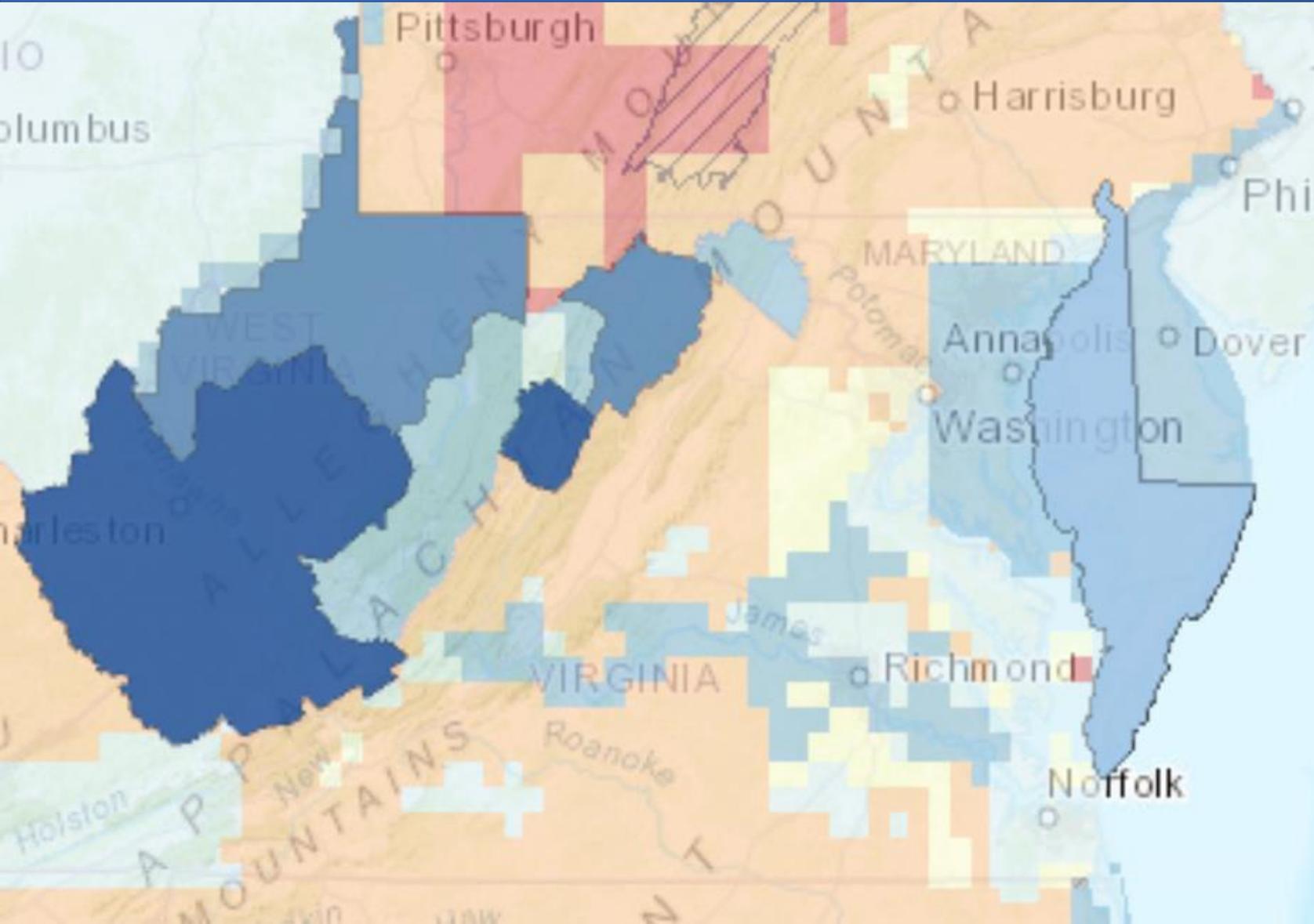
Image Year

- 2020s
- 2010s
- 2000s
- 1990s
- 1980s
- 1970s
- N/A





NWI Data Status: MD, VA, D.C., WV



Mapping Projects

Active



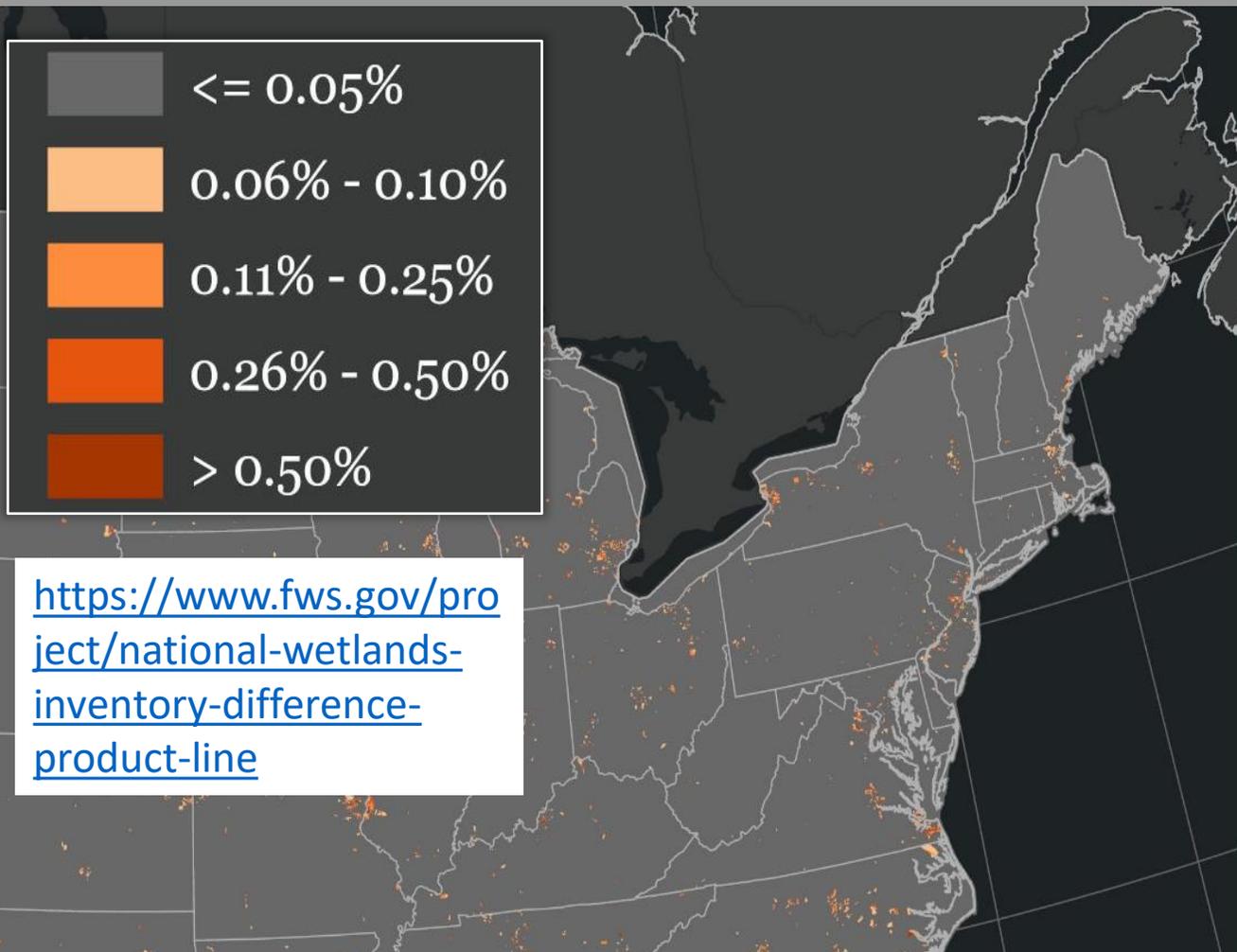
Image Year

- 2020s
- 2010s
- 2000s
- 1990s
- 1980s
- 1970s
- N/A



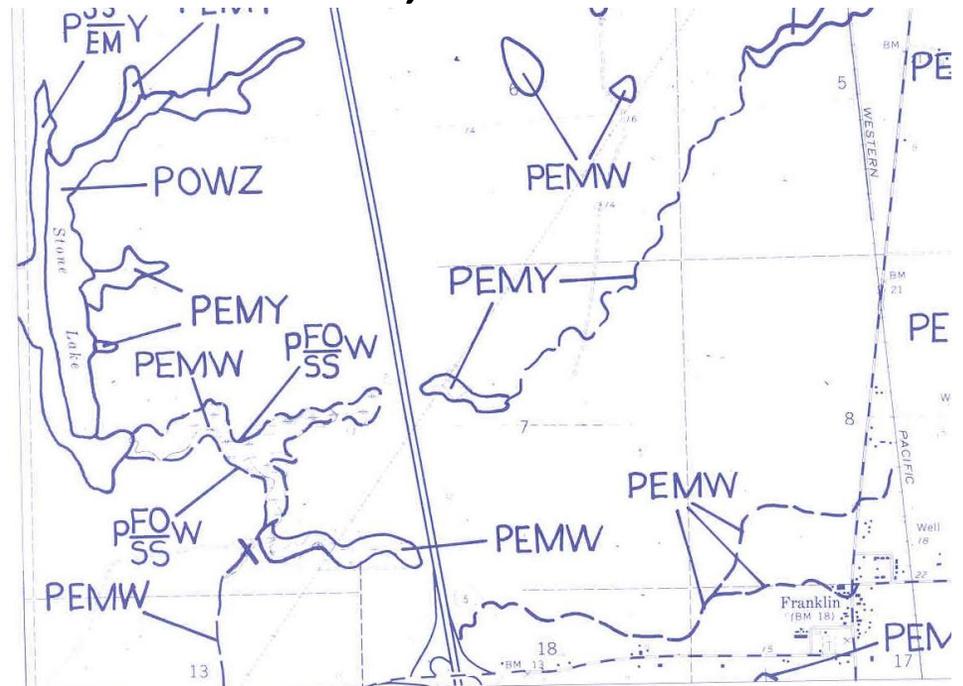
Importance of Maintaining Contemporary Data

- Loss of wetlands to development



<https://www.fws.gov/project/national-wetlands-inventory-difference-product-line>

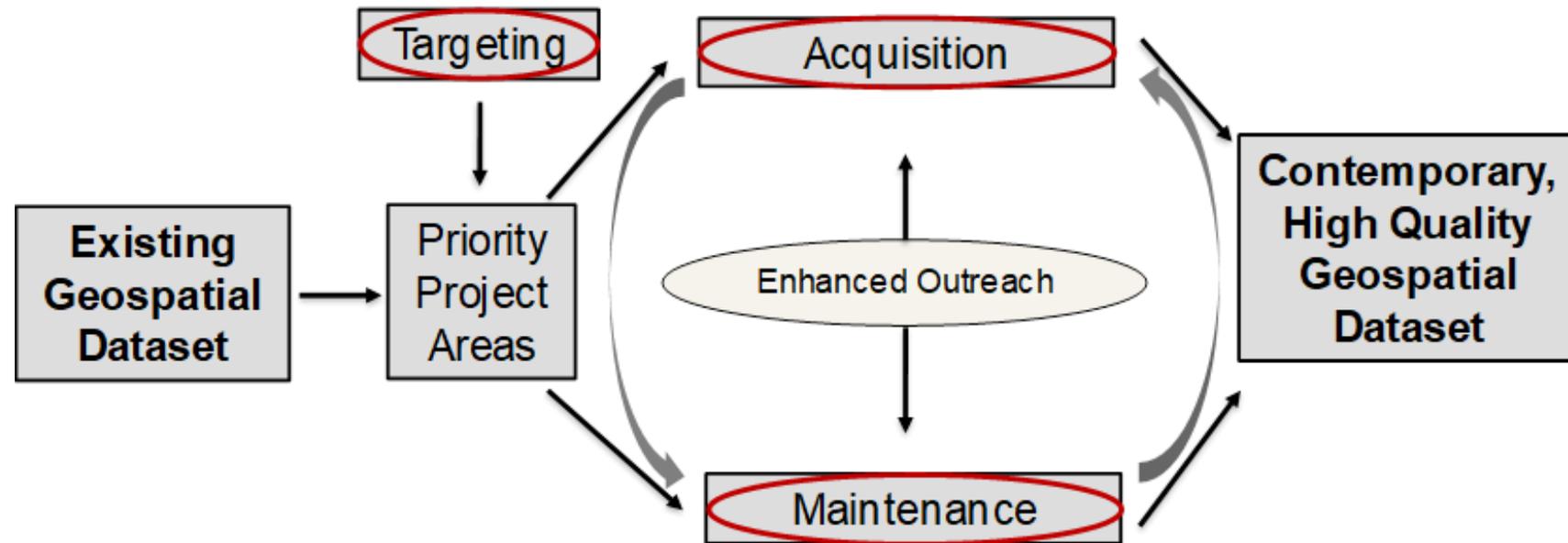
- Pre-2000s, wetlands were drawn using stereoscopes
- Coarse scale base imagery
- 1970s: 1:80,000 B&W
- 1980s: 1:58,000 CIR





Leveraging New Mapping Technologies

- Most data producers use semi-automated work flows
- Machine learning tools for object recognition and image classification
- Hot-spot analysis, change detection



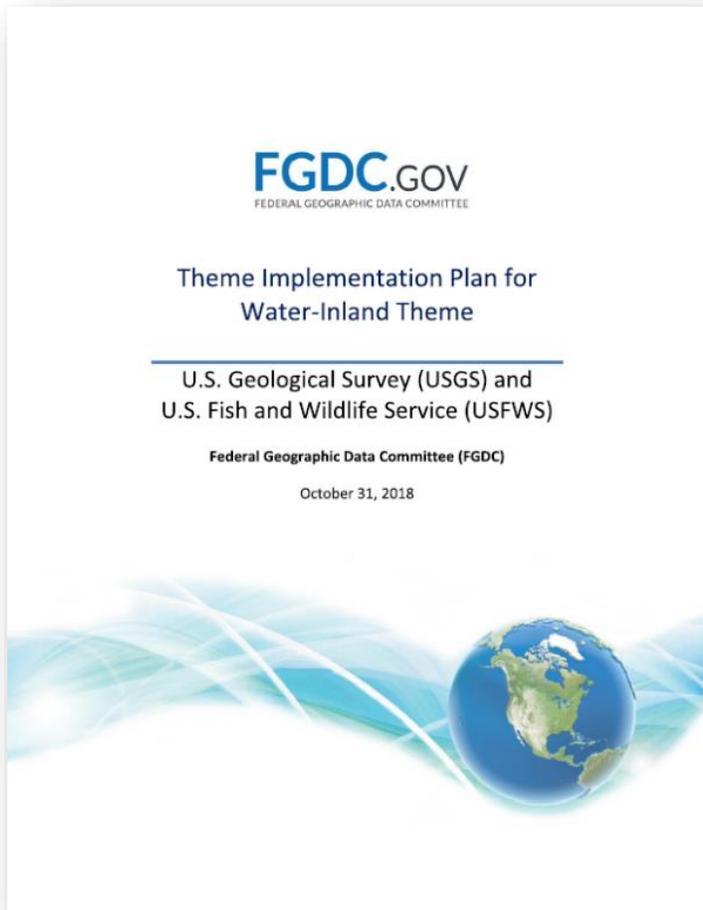


Partnership with USGS

Today's challenges require high-quality, interoperable water data that can be applied rapidly to meet decision-maker needs

FWS and USGS are working to modernize and align all aspects of NWI and NHD data management - from planning and outreach to data standards and distribution

- Goal: Modernize NWI and initiate 3D Hydrography Program as next generation NHD in tandem to improve effectiveness and gain cost/time efficiencies
- Initiated long-term program coordination in 2020
- Implementing pilot projects to develop new specifications and workflows

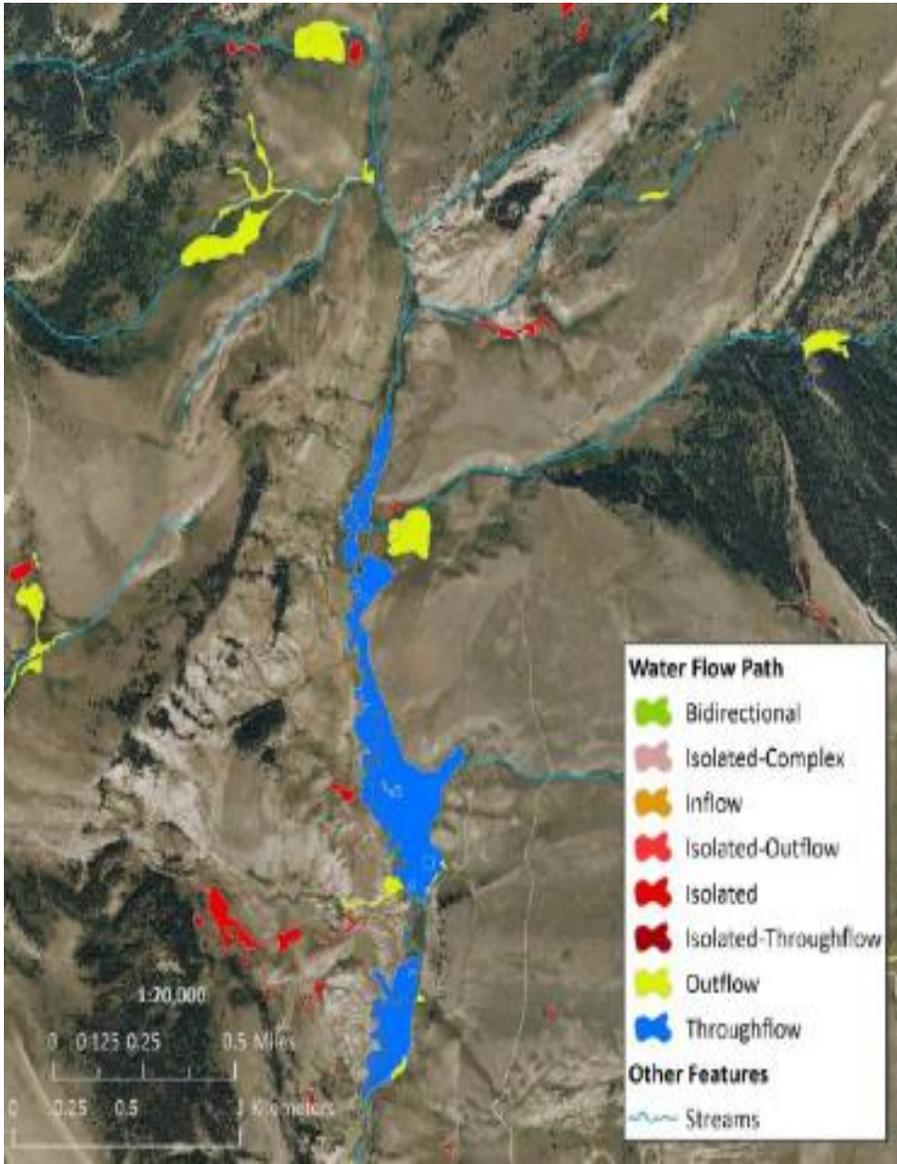




Landscape, Landform, Waterbody, Water Flow Path Data for Functional Assessments

NWI+ LLWW assesses 11 potential functions:

- Carbon sequestration
- Bank and shoreline stabilization
- Coastal storm surge detention
- Fish and aquatic invertebrate habitat
- Waterfowl and waterbird habitat
- Other wildlife habitat
- Unique, uncommon, regionally significant or highly diverse plant communities
- Nutrient cycling & transformation
- Streamflow maintenance
- Sediment and other particulate retention
- Surface water detention





Discussion

- Questions for me?
- Opportunities to collaborate?
- Interest in New Mapping Technologies?
- Key wetland and water management contacts?
- 2025 is NWI's 50th anniversary



NWI Staff Contacts

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Emilia Bartnick, *Regional Wetlands Coordinator* emilia_bartnick@fws.gov

Madison Data Center: *Data QA, Integration, Analysis and Dissemination*

Jane Harner, *Database Administrator* jane_harner@fws.gov

Additional Resources:

Wetlands Mapper:

<https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/>

Information on how to contribute data to NWI:

<https://www.fws.gov/program/national-wetlands-inventory/contribute-data>

Wetland Mapping Library:

<https://www.fws.gov/library/collections/national-wetlands-inventory-mapping>





Thank you for your time!

