UNDERSTANDING THE WETLAND DATA ECOSYSTEM: DIFFERENT APPROACHES AND OUTCOMES





WETLAND DATA ARE FOUNDATIONAL

Wetlands are essential for the health and resilience of communities, ecosystems, and economies.

Wetlands data are the foundation of critical and often daily decisions made by governments, the private-sector, and individuals

- Infrastructure development
- Regulatory decisions
- Energy production
- Conservation and restoration
- Natural disaster mitigation
- Clean drinking water
- Food security
- Recreation





THE WETLAND DATA ECOSYSTEM

Different types of geospatial data include information on wetlands.

- Wetland maps
- Wetland potential maps
- Land cover maps that include wetland classes

These datasets have different characteristics, which are determined by dataset definitions, standards, and production workflows.

- Accuracy
- Categorical and spatial detail
- What is mapped as a wetland
  - An area that is currently a wetland
  - An area that is likely to be a wetland or a historical wetland (e.g., drained wetland)

These datasets form an ecosystem comprised of different but interacting products.

- The datasets are not interchangeable but can be used together to meet a broader array of user requirements.





TODAY'S WEBINAR

Goal: To help tribes, states, federal agencies, and others find or create the wetland geospatial data they need to support decision-making

- How are components of the wetlands data ecosystem similar or different?
- How can they be created efficiently and effectively?
- How can they can they be leveraged to achieve your goals?

A team of wetland mapping experts:

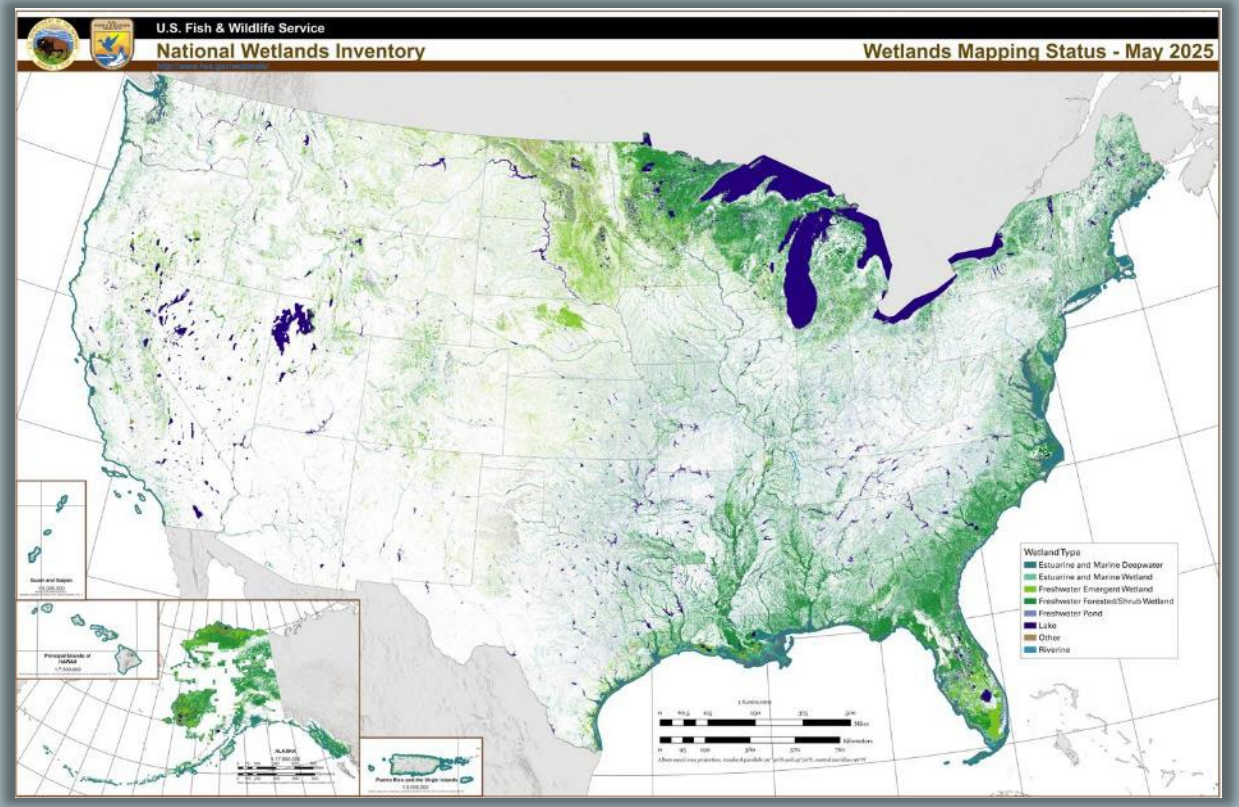
- **Megan Lang**, Chief Scientist National Wetlands Inventory
- **Meghan Halabisky**, Chief Scientist TealWaters
- **Robb Macleod**, Ducks Unlimited National Geospatial Coordinator
- **Andy Robertson**, Executive Director of Geospatial Services St. Mary's University of Minnesota

Especially now – coordination is needed across organizations to create the geospatial data our Nation needs to conserve wetlands and their benefits into the future!

THE NATIONAL WETLANDS INVENTORY: AMERICA'S NATIONAL WETLANDS DATASET

April 9,2026

NWI GEOSPATIAL DATASET

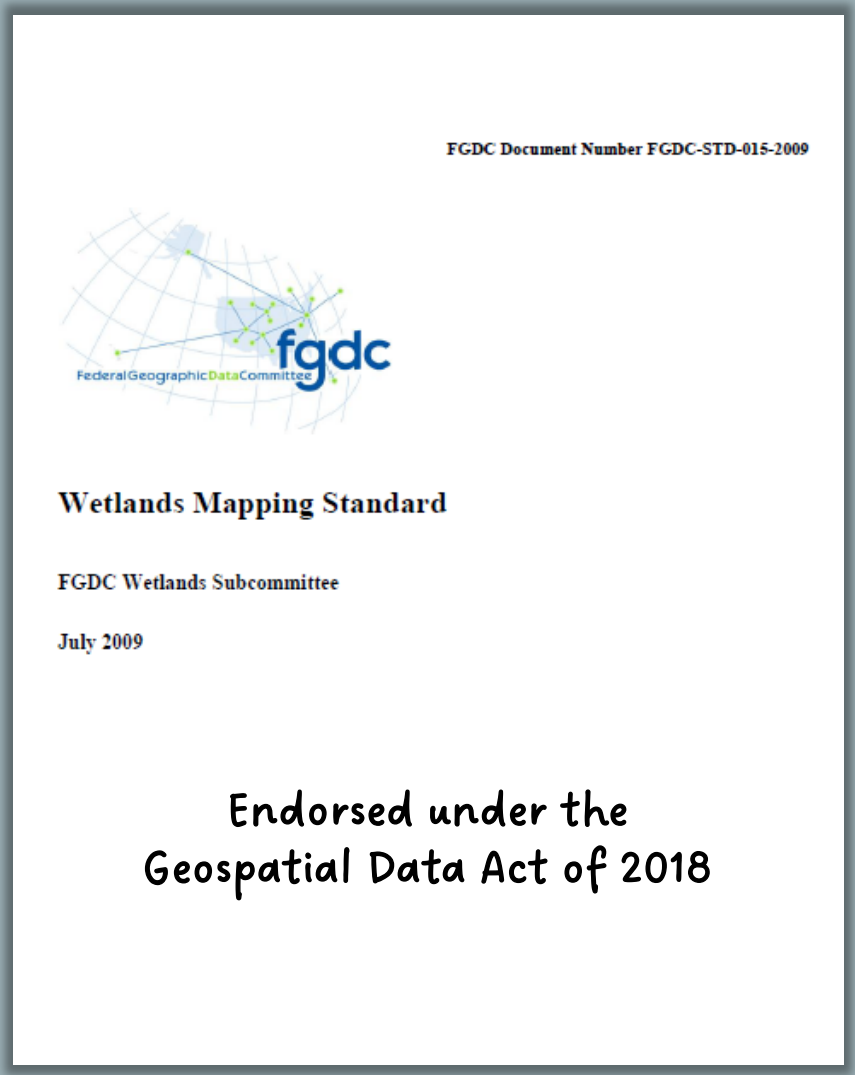


Dataset Facts

America's only wetlands data layer!

- Most spatially and categorically detailed information on U.S. wetlands
- Identified by OMB as the **Wetlands Layer** of **National Spatial Data Infrastructure**
- A **National Geospatial Data Asset**
- Over 165 data contributors
- ~100 - 150M+ acres updated annually
- Codes for all 37M+ features are searchable through a SQL database.
- Dataset production is guided by Federal Geographic Data Committee (FGDC) standards.

WETLANDS MAPPING STANDARD



Endorsed under the Geospatial Data Act of 2018

Federal Geographic Data Committee Wetlands Mapping Standard

Developed by the **FGDC Wetlands Subcommittee**

- Created by ten federal departments and agencies, as well as tribes, states, non-profits, and companies

Balances logistical/technical realities with need for **consistent, high-quality data**

- Meets a broad array of user requirements
- Enables dataset use across jurisdictional boundaries, e.g., states
- Supports interoperability with other national datasets, e.g., 3DHP

Federally funded wetland maps required to meet standard

- Makes a national wetland map possible!

NWI supports partners in achieving standard compliance.

- Guidance documents, training, iterative quality control/assurance, automated tools, and more!

For additional information please see: FGDC-STD-015-2009.

WETLANDS MAPPING STANDARDS

Minimum data inputs and thresholds of spatial and categorical resolution and accuracy

- Source imagery: Orthorectified ≤ 1m color infrared imagery (aerial or satellite)*
- Spatial resolution: Targeted mapping unit of ≤ 0.5 ac (0.2 ha)*
- Horizontal accuracy: Within 5 m for Palustrine and Riverine; 15 m for Estuarine, Lacustrine, and deepwater*
- Producer's accuracy: 98% feature accuracy (wetland identification) and 85% attribute accuracy (classification)
- Categorical detail: Cowardin classification system (some exceptions to full implementation apply)

Used to produce over 1.5B ac of wetlands data

	Lower 48 States, Hawaii, & Territories *	Estuarine & Lacustrine Deepwater **	Alaska (Including Deepwaters)
TMU	0.5 acres (0.2 ha)	1.0 acres (0.4 ha)	5.0 acres (2.0 ha)
Horizontal RMSE Accuracy	5m	15m	25m

www.fws.gov/program/national-wetlands-inventory/data-standards

* All areas outside Alaska

NWI's robust classification system supports many applications.

Applications of NWI include:

- Prioritization and strategic implementation of conservation actions – e.g., restoration
- Disaster response planning and implementation
- Water quality and supply, as well as food security
- Habitat assessment and species population modeling to meet conservation goals and policy mandates
- Management of subsistence resources and recreation opportunities – e.g., hunting and fishing
- Strategic planning for enhanced natural disaster resilience – e.g., storm surge, flooding, drought, and fire
- Cost-effective infrastructure development
- Creation of other wetland geospatial products, e.g., training data for production models

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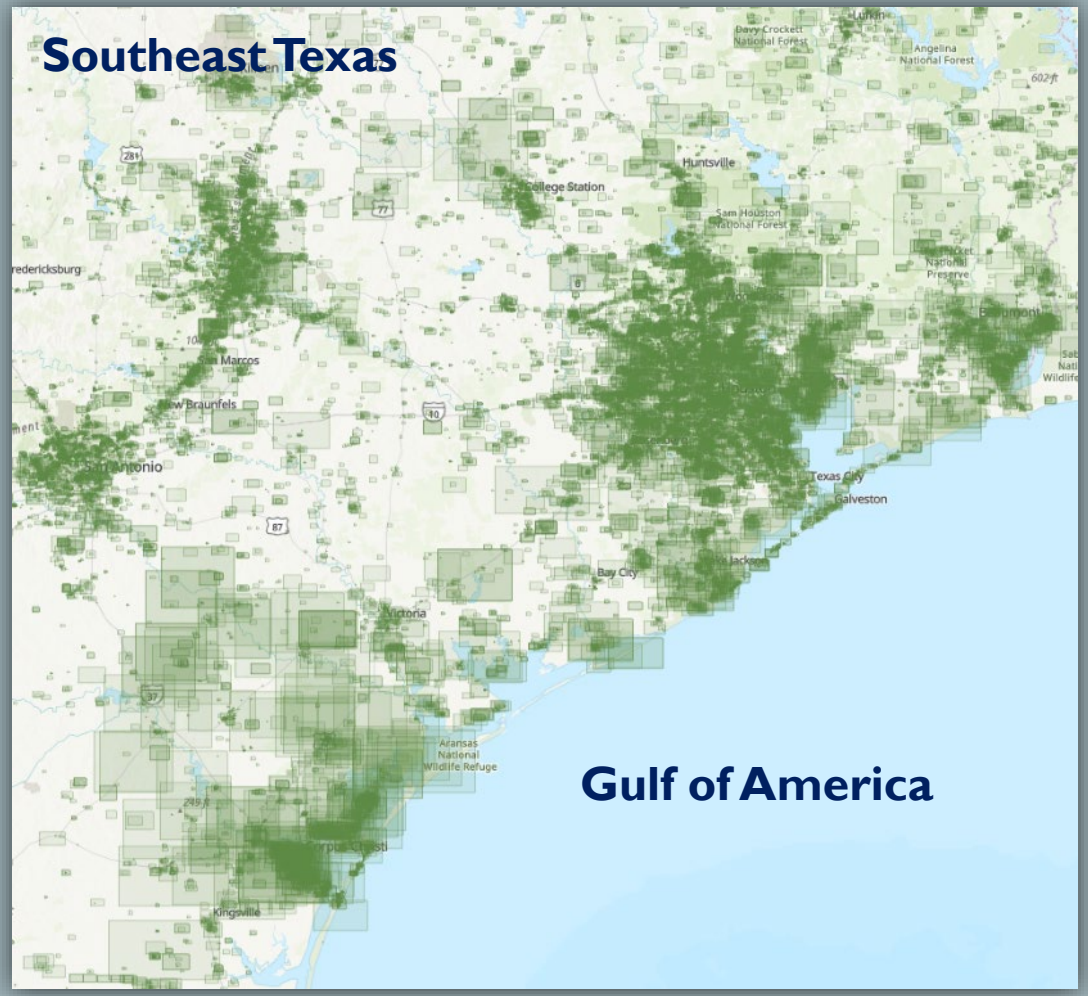


From October 2015 to September 2022, over 2.3M maps were printed from the NWI Wetlands Mapper.

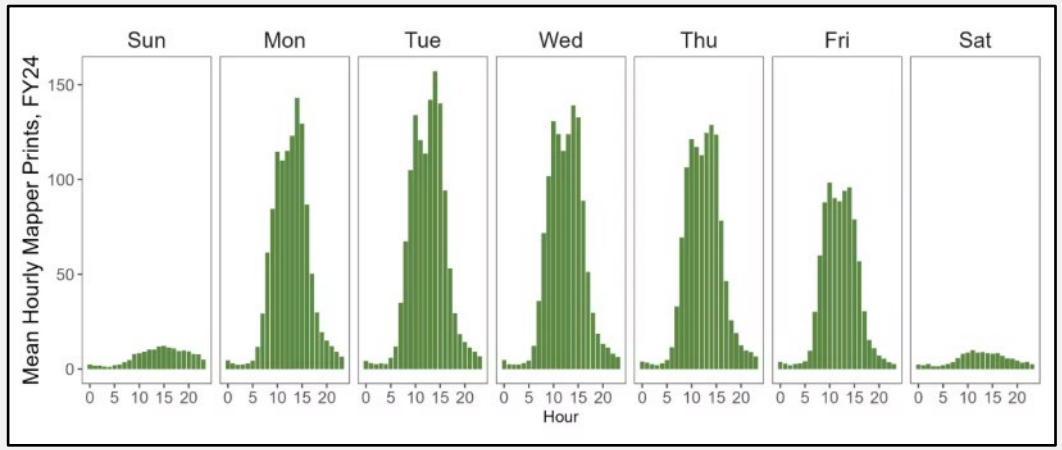
Frequently Relied Upon

One of the **most frequently visited** FWS webpages

In 2025, Wetlands Mapper was viewed **over a million times,** received **over 46 million** requests for information, and supported nearly **300,000 downloads.**

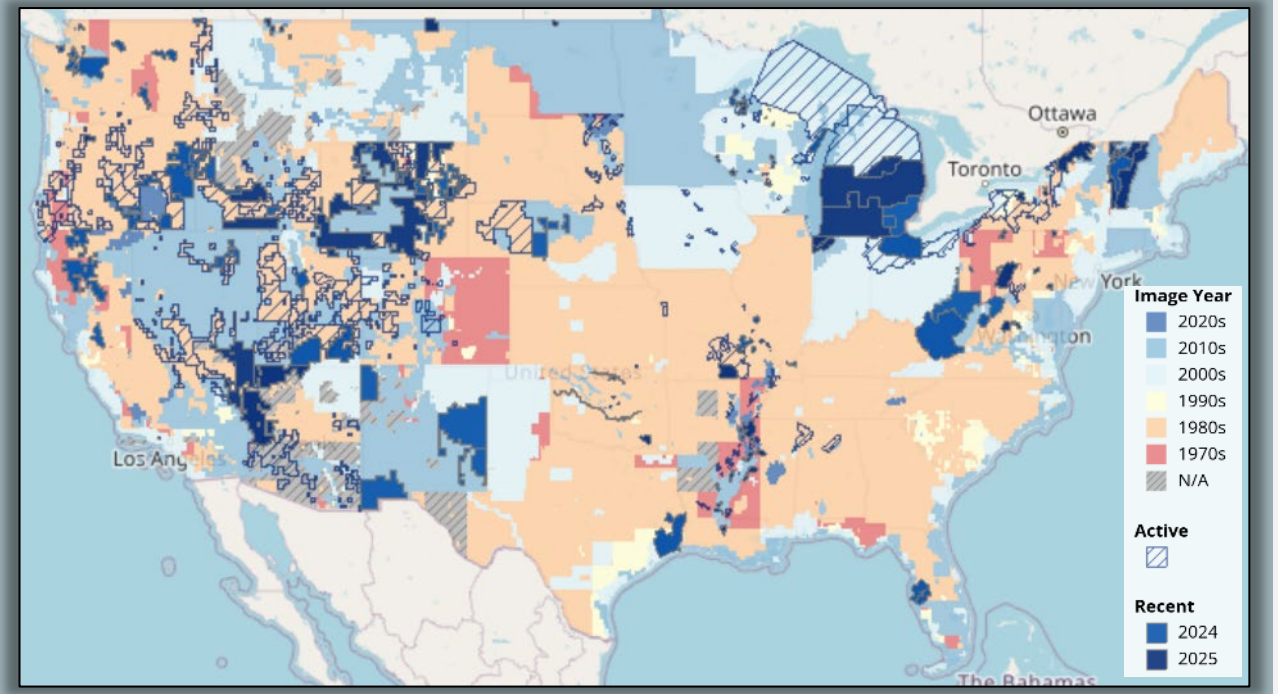
Each year, NWI's web map services receive **several tens of millions** of requests for information.

- Peak use: Over two million daily data requests



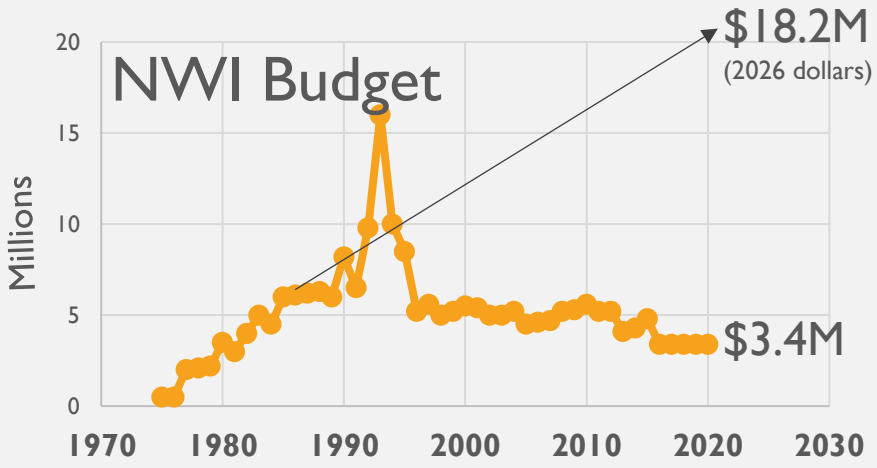
Most maps are printed during the workweek, indicating NWI data support decision-making across the American workforce.

STATUS OF THE WETLANDS LAYER



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

- After accounting for inflation, NWI's budget is ~1/5th of its 1986 budget (year NWI mapping was mandated).
- We are working towards meeting this challenge by leveraging partnerships and advanced technologies.



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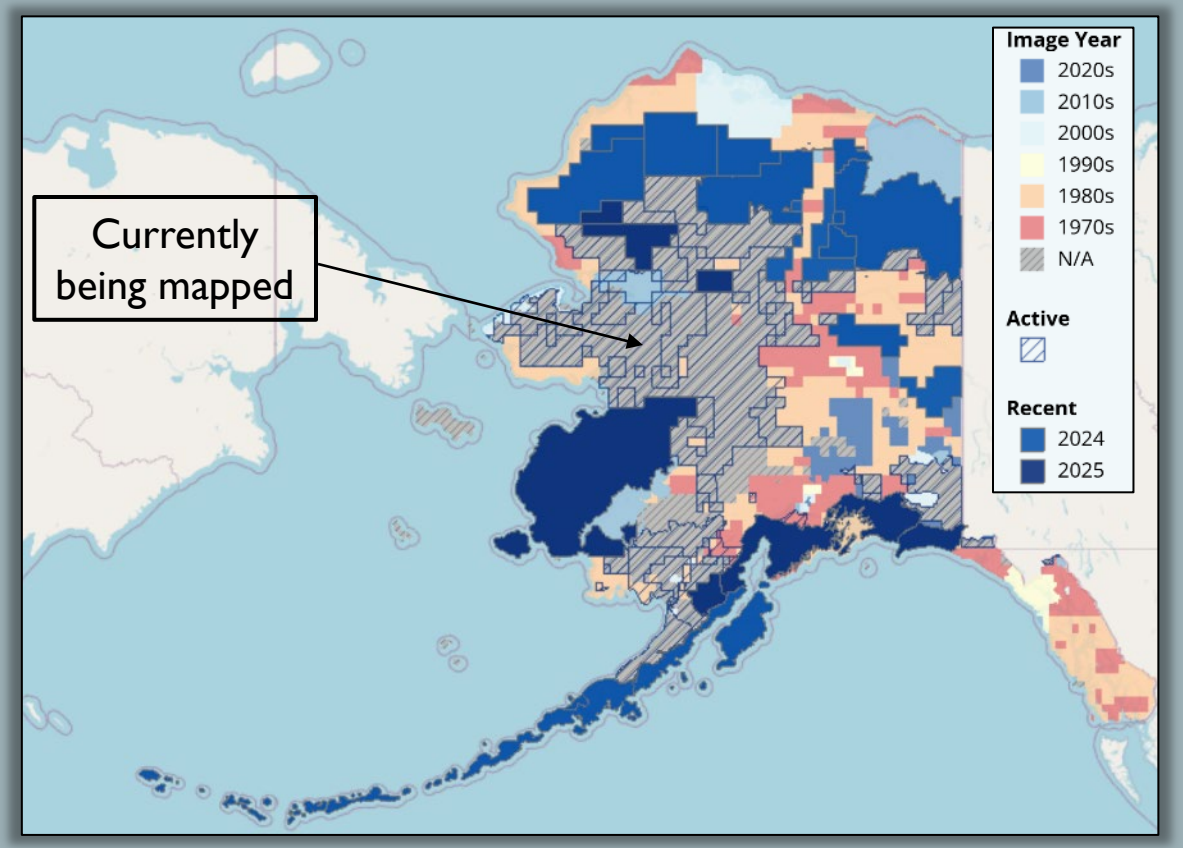

Alaska is 86% mapped and we expect completion by 2029!

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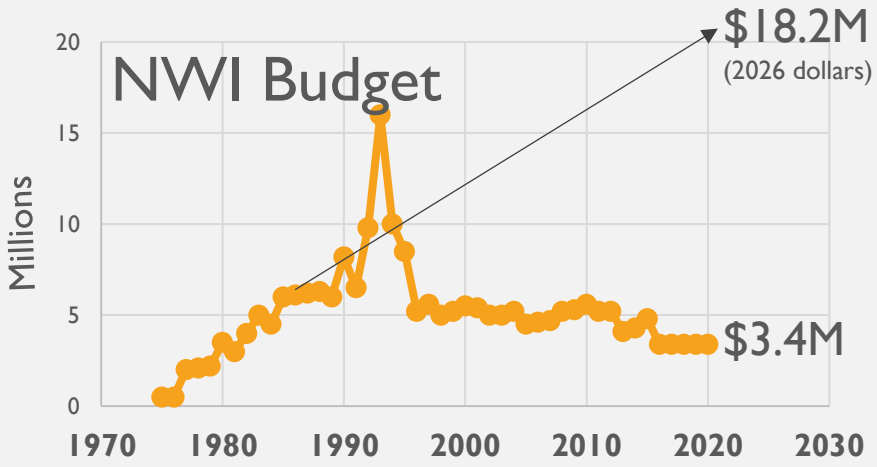
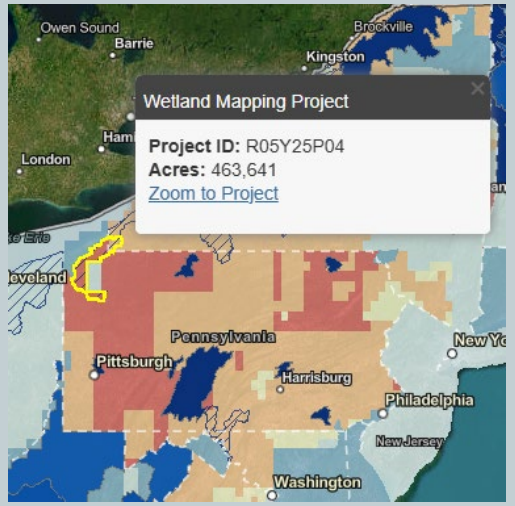


DATA COMPARISON: OLD DATA (1977)

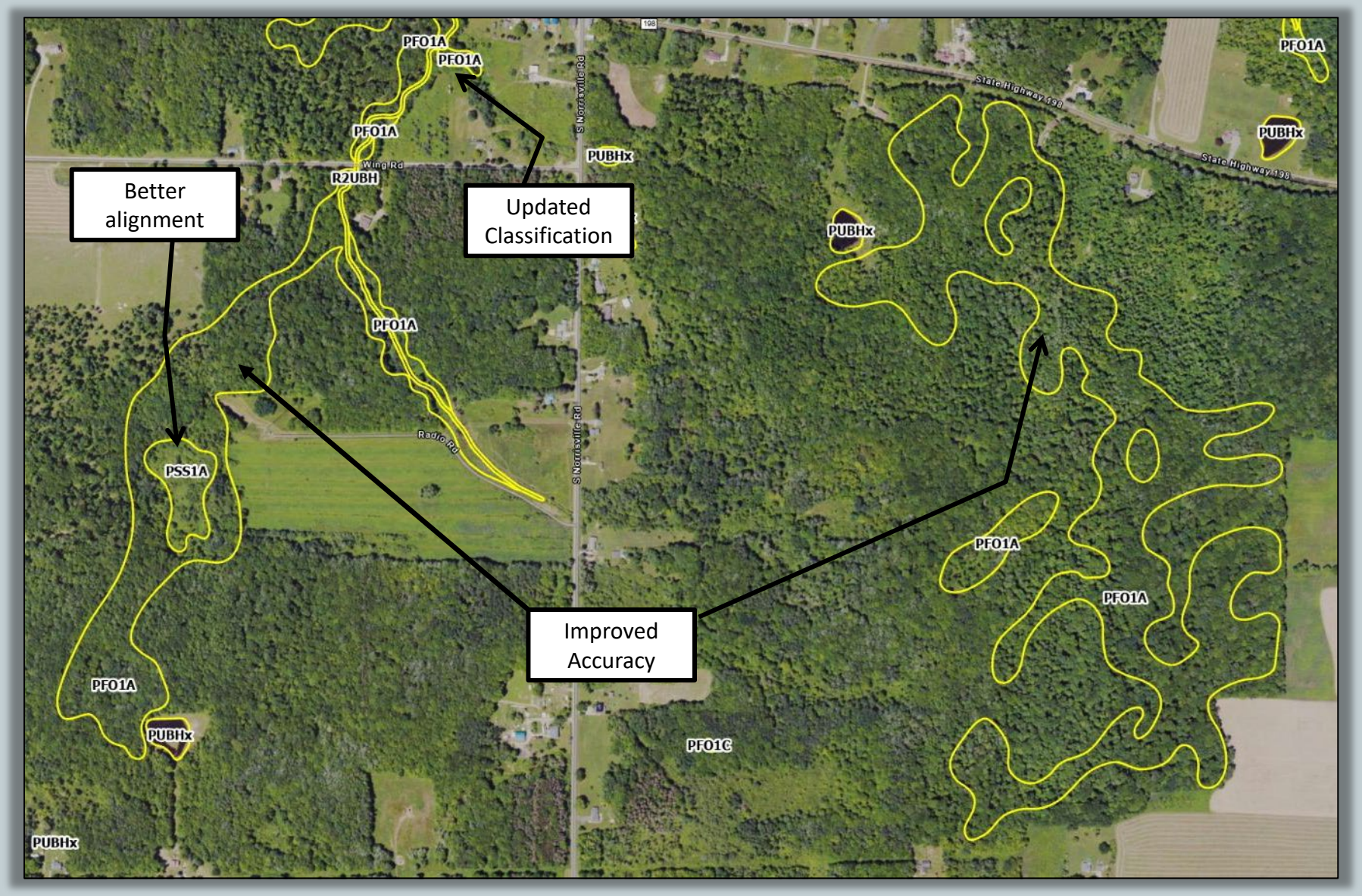
Modern data:

- Reflect current land cover
- Improved classification
- Greater spatial detail
- Much more accurate
- Standardized, allowing for national and regional work



Soon to be reflected on the Wetlands Mapper!

DATA COMPARISON: NEW DATA (2022)



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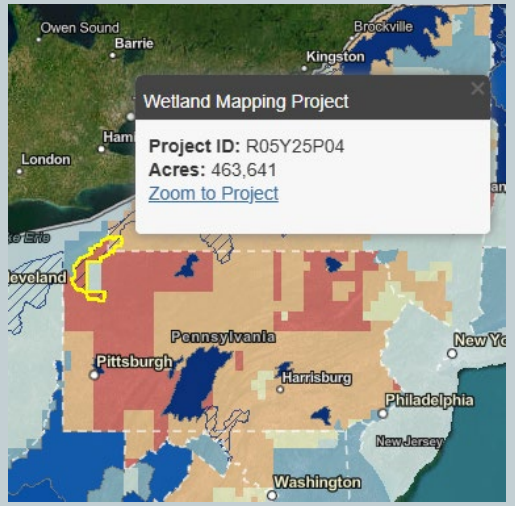

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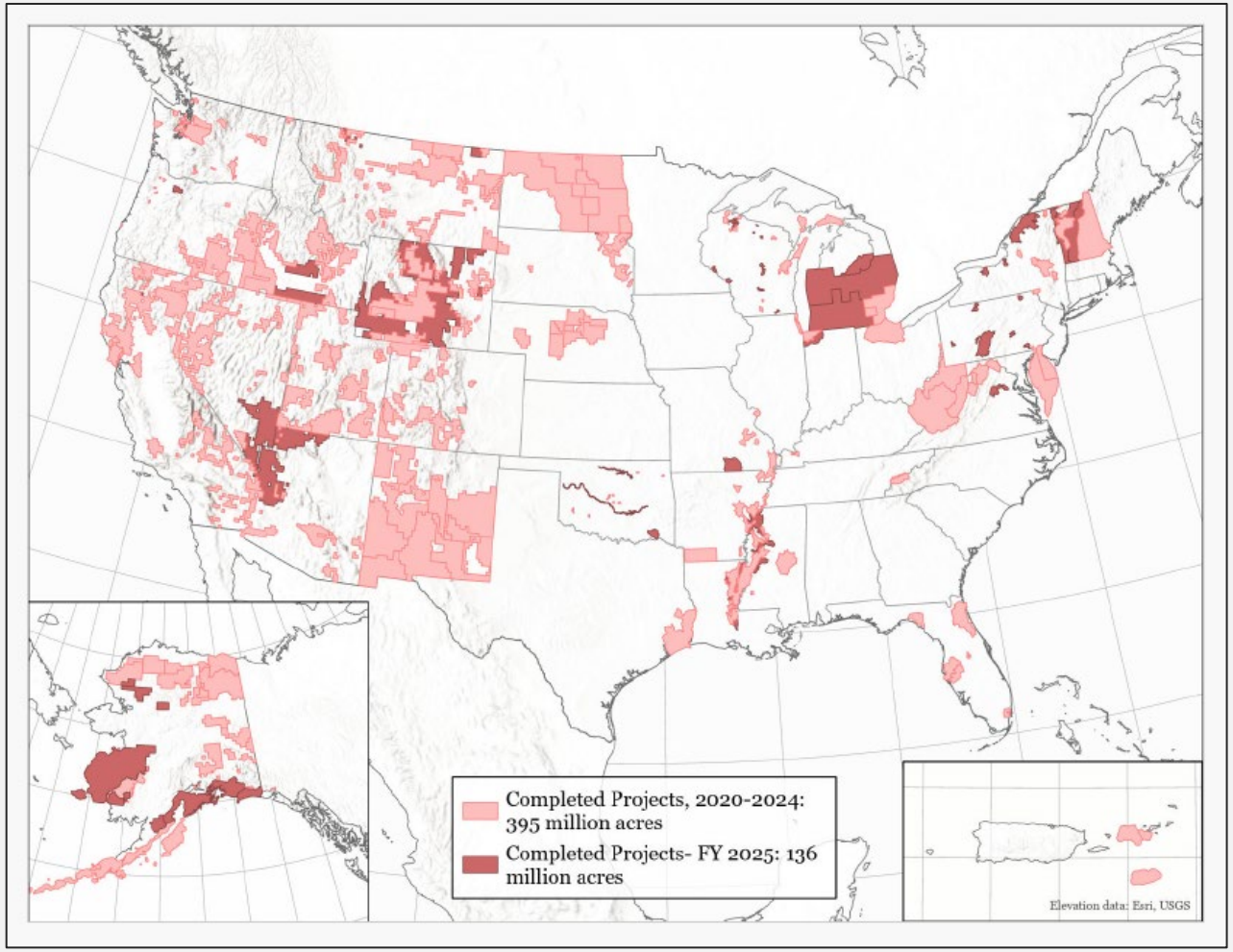
RECENT NWI UPDATES

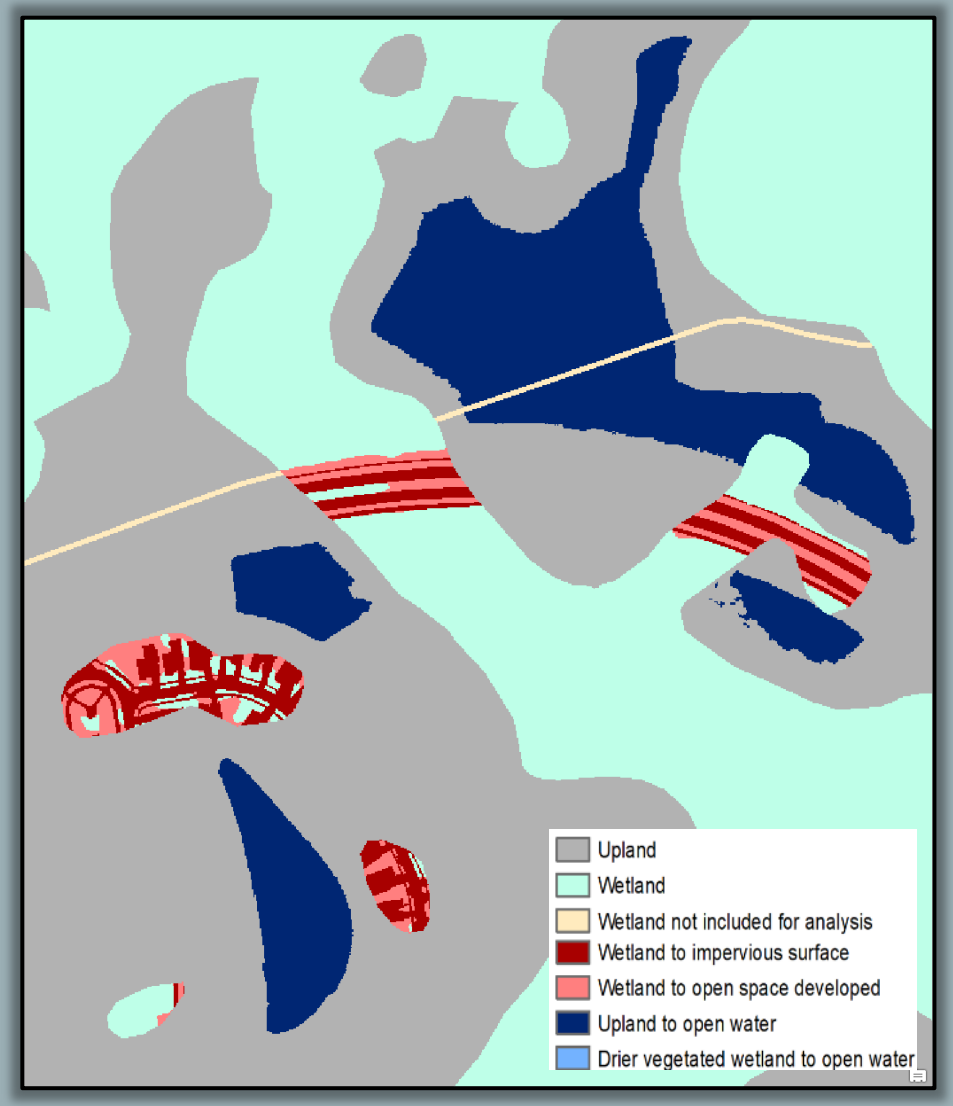
AREA UPDATED

- **2020:**
  - 22 states
  - 45.2M Acres
- **2021:**
  - 15 states
  - 58.1M Acres
- **2022:**
  - 19 states
  - 43.2M Acres
- **2023:**
  - 25 states
  - 92.5M Acres
- **2024:**
  - 21states
  - 156M Acres
- **2025:**
  - 24 states
  - 136.2M Acres



Majority of mapping is funded by states, as well as federal agencies, including BLM, EPA, and NRCS.

LEVERAGING ADVANCED TECHNOLOGIES



Difference Product

NWI Implements Advanced Workflows to Enhance Efficiency

Goal: faster, cheaper, better data production

Approach: Adaptively manage NWI's targeting, acquisition, and maintenance procedures to **leverage the best of all datasets and techniques**

Collaboration: NWI works with partners to identify and test new approaches – and offers tools that support efficiency and cost-effectiveness.

Data Producers: Select the combination of approaches that allow them to meet the Mapping Standard most efficiently.

- This typically involves a combination of automated and manual workflows.

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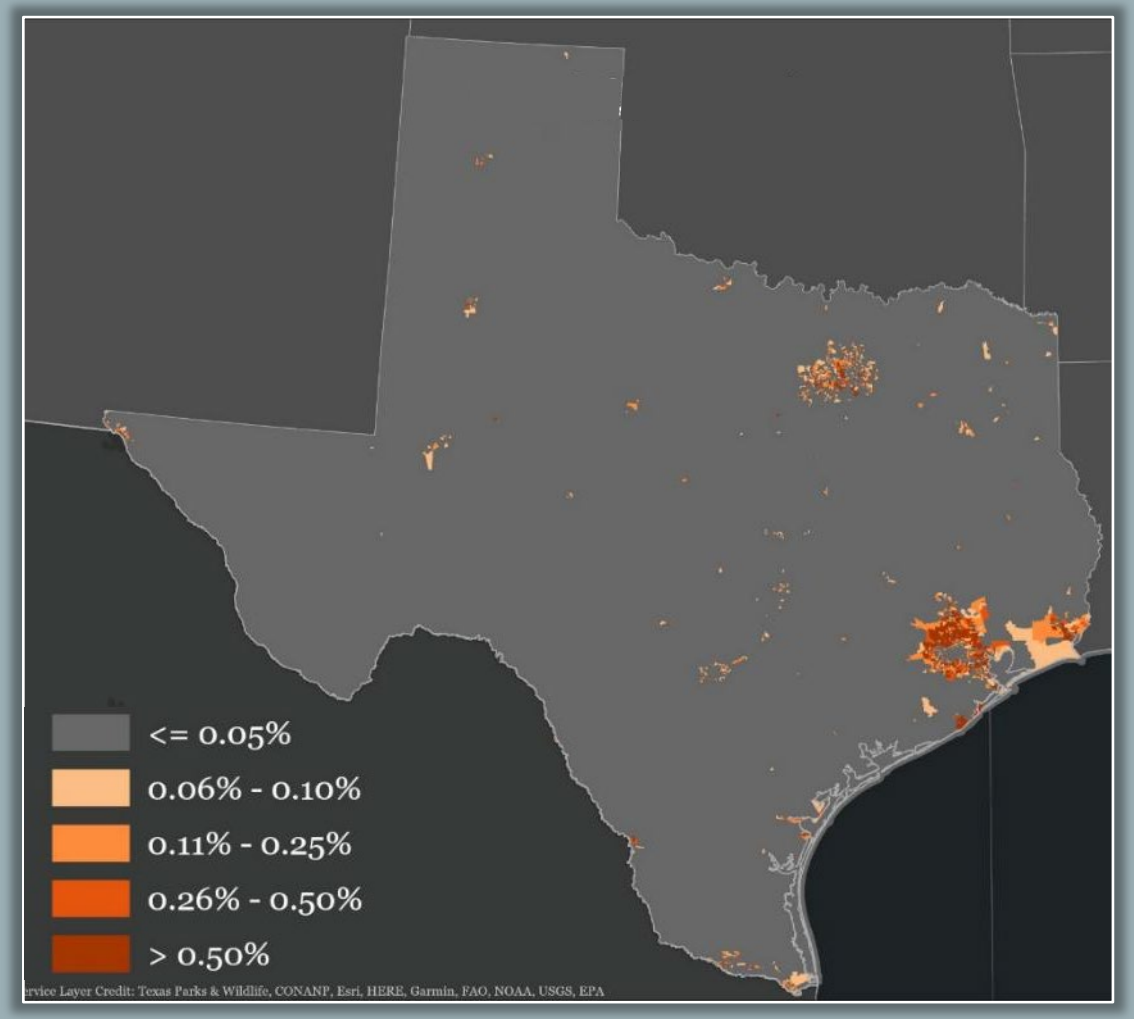

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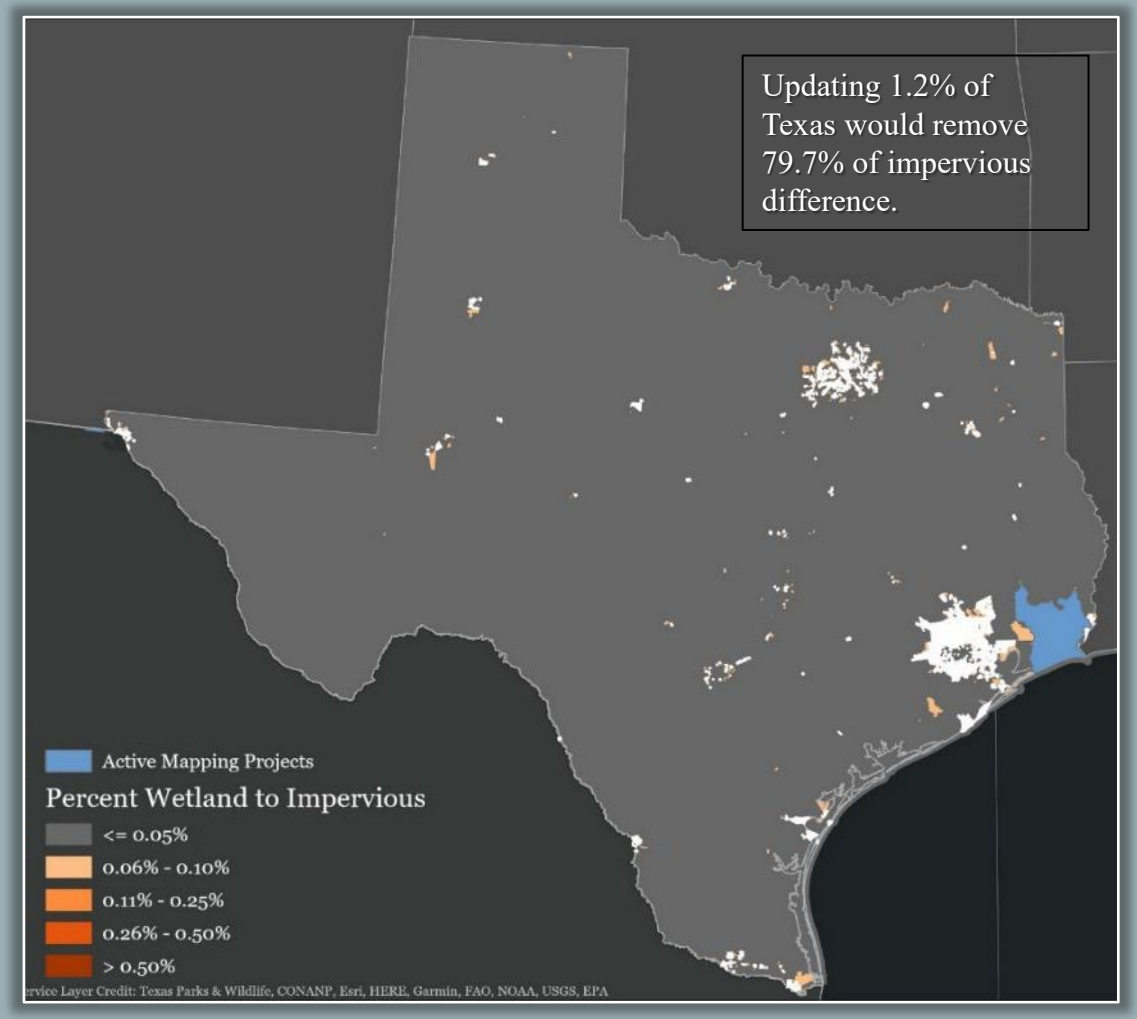

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NWI GEOSPATIAL DATASET

Summary

- NWI is America's National Wetlands Data Layer!
- It is created by and for the wetlands community as guided by federally mandated minimum standards
  - Ensure high-quality data that meet a broad array of user requirements
  - Enable dataset use across jurisdictional boundaries
  - Support interoperability with other national datasets
  - Facilitate collaboration across the public and private sectors
- NWI takes an adaptive approach to data production – integrating the data and techniques that meet the FGDC standards most efficiently.
- NWI stands ready to assist in data modernization!

For more information, please contact megan_lang@fws.gov