



# National Wetlands Inventory (NWI) Hawai'i & Pacific Trust Update

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USFWS National Wetlands Inventory Program

*Hanalei NWR – DOI Instagram*



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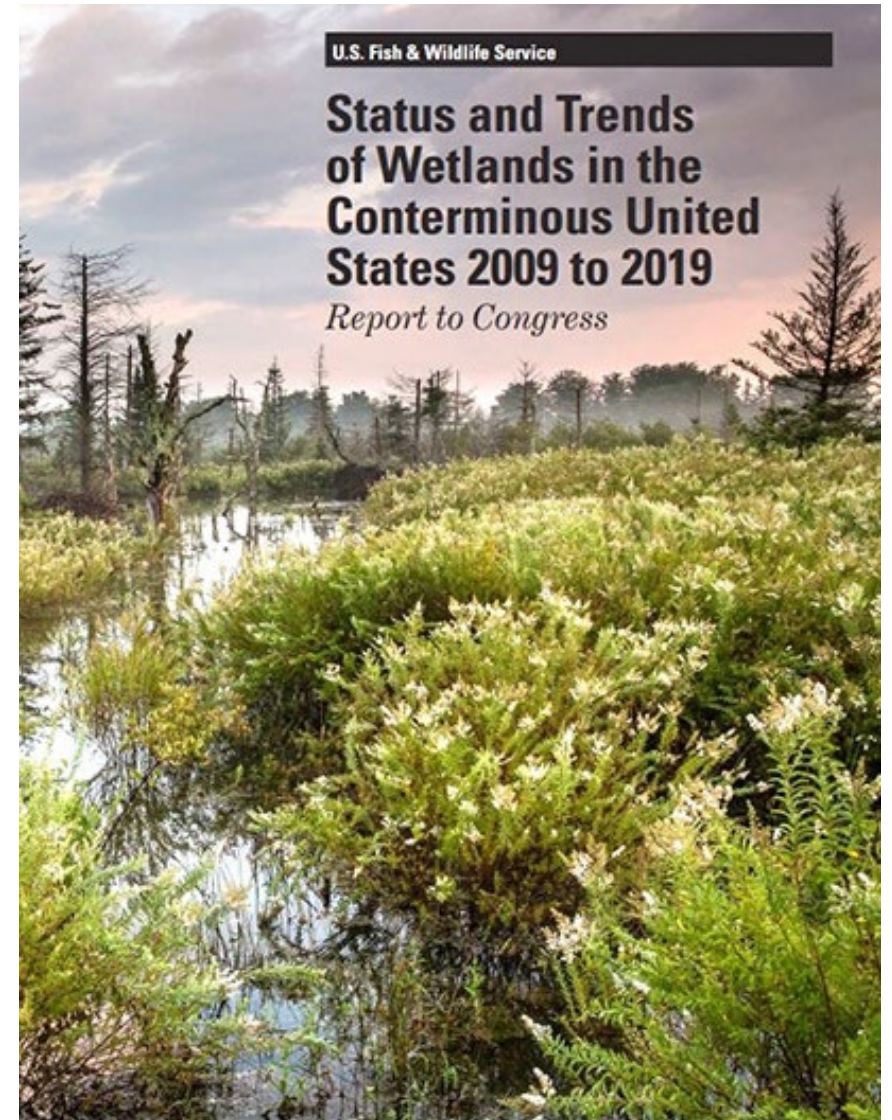
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# NWI Program Overview

- USFWS is the principal 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
  - Provide decadal 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)





# Federal Policies and Procedures



- All federally funded wetland inventory mapping projects must comply with the [Federal Wetland Mapping Standard: FGDC–STD-004-2013 Classification of Wetlands and Deepwater Habitats of the United States](#) (often referred to as the “Cowardin” system originally published in 1979).
- Wetland map producers are required to use the [Data Collection Requirements and Procedures for Mapping Wetland, Deepwater, and Related Habitats of the United States](#) as a guide.
- When conducting field verification activities, all vendors are responsible for acquiring the necessary approvals and permits to comply with land access, National Environmental Policy Act, National Historic Preservation Act Section 106, and Endangered Species Act Section 7.



# Evolution of National Wetlands Inventory

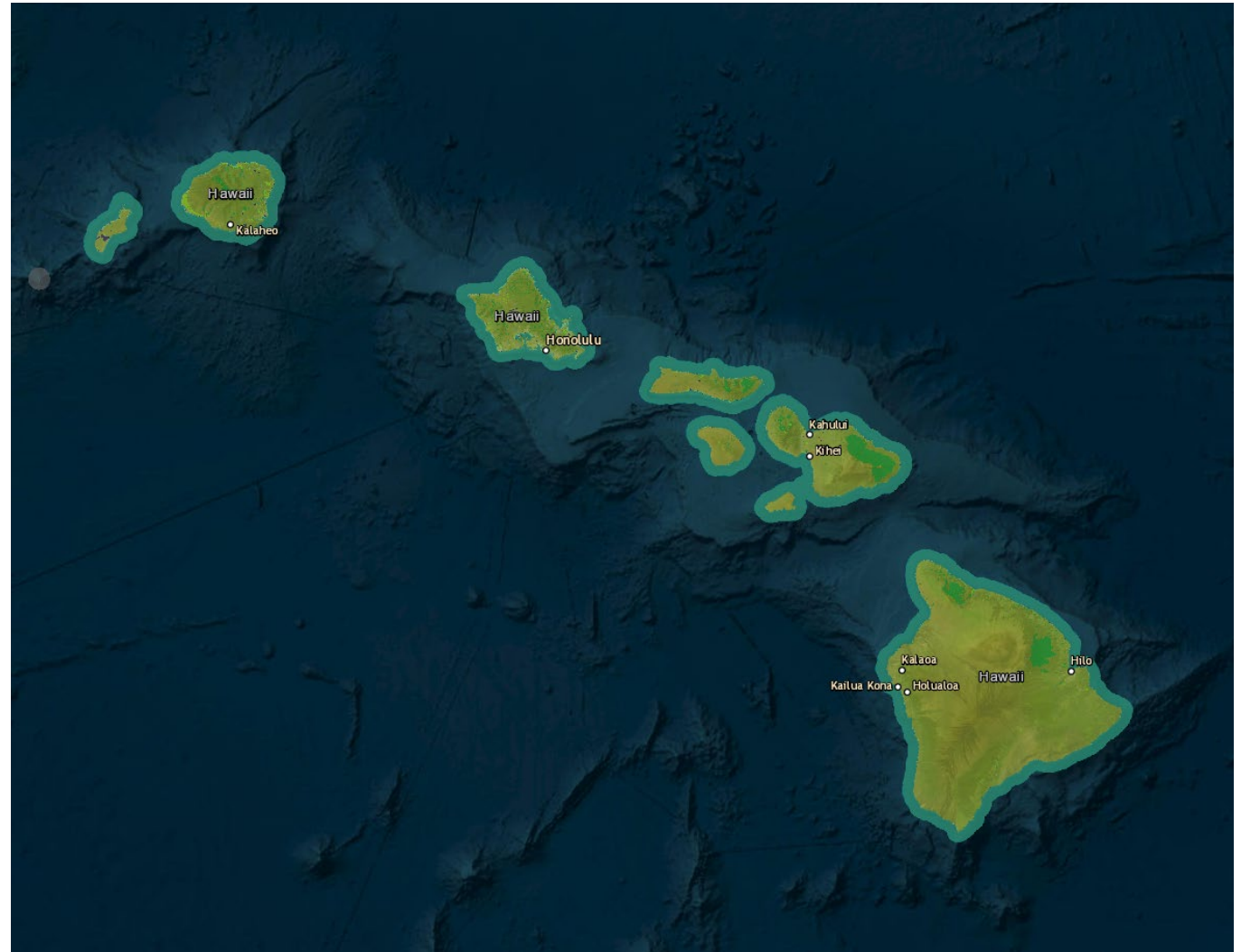
- NWI has evolved from a collection of paper maps into an FGDC National Geospatial Data Asset
- NWI data completed digitally for the Continental United States in 2016
- Every polygon is now searchable within the dataset
- Codes were converted to a normalized database with code restrictions
- These capabilities have been used to better understand and utilize NWI data to aid in conservation, decision support and habitat assessment and modelling



# 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)
- Updates primarily funded through partnerships
  - States
  - Other Federal Agencies
  - Wetland Development Grants

*America's only national wetlands data layer.*



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



# NWI Wetland Dataset Usage

- Infrastructure projects (e.g. roads, pipelines, renewable energy) by state and federal agencies and private sector
  - Energy transmission planning
  - Energy exploration and generation siting
- Baseline data for NEPA documents
- Land purchase and development by property owners and realtors (estimated 70% of calls)
- HUD Development Grants
- Flood/Drought mitigation and planning
- Enhancement of recreational opportunities (e.g. hunting, fishing, bird watching)
- Functional assessments

- Estimated \$8.25 M saved annually through USACE's Clean Water Act Section 404 permit review process
- Several million in additional savings claimed by states (including MN, MI, DE, & WA) and commercial sector





# 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”:
  - 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.*

## NWI uses a non-regulatory definition



# 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, 95% confidence
    - 5 m wetlands
    - 15 m for estuarine & deepwater habitats
  - Feature and Attribute Accuracy
  - Target Mapping Unit

FGDC Document Number FGDC-STD-015-2009



## Wetlands Mapping Standard

FGDC Wetlands Subcommittee

July 2009

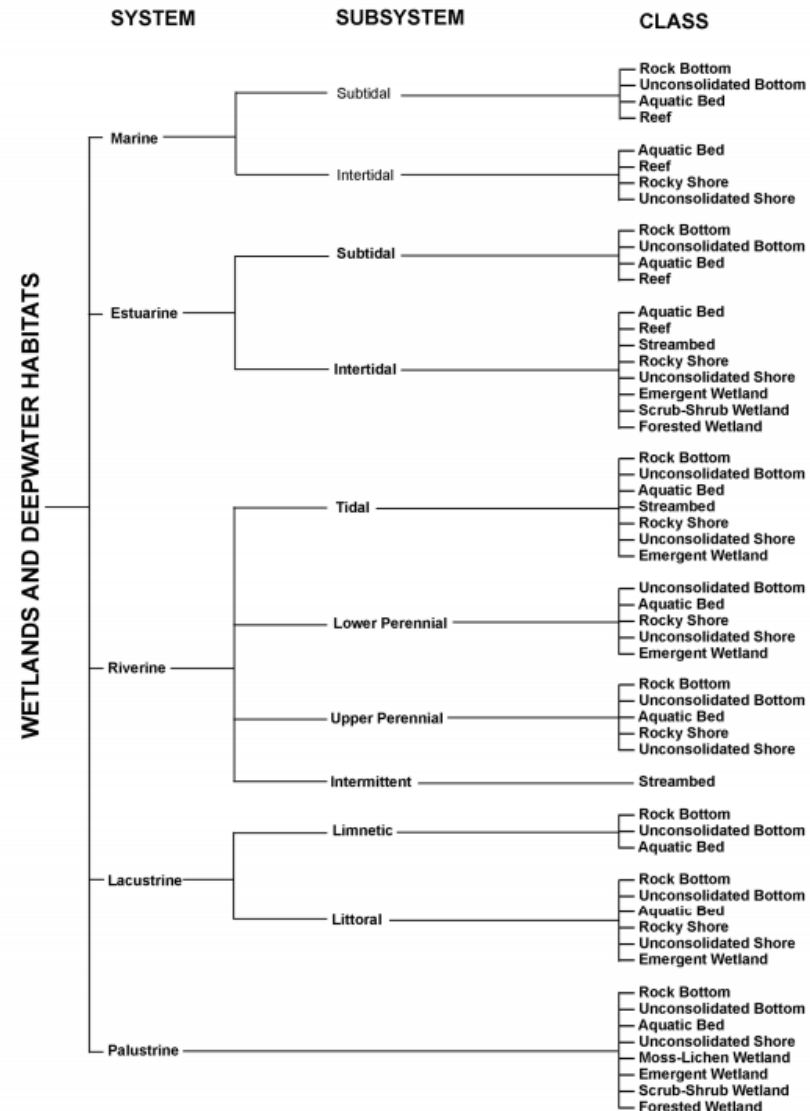


# Cowardin Classification

## “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”)





# NWI Standard Compliant Data Production

- Primarily produced by external contractors & Cooperators using ESRI Software
- NWI's schema file geodatabase
  - Datum: NAD83
  - Projection: Albers Equal-Area Conic
- Interpretation of primary imagery (snapshot in time)
- Ancillary datasets inform mapping & classification
  - NHD, SSURGO, lidar derivatives, vegetation data, field photos and datasheets
- Wetlands Coordinator conducts iterative Quality Control review of 20% of the project area
- Visual review at 1:12,000 Assesses
  - Horizontal accuracy
  - Errors of commission and omission
  - Incorrect classification
  - Sufficiently detailed line work
- National Quality Assurance Review 10% of project area
- Automated reviews: NWI Wetlands Verification Tools



# Metadata

## • Map Processing Report contains at a minimum:

- Project Area/ID
- Image Year
- Ancillary datasets
- Target Mapping Unit\*
- Description of the geological, climatological, and other geophysical properties in the project area
- Specialized or regional conventions

**\*The TMU may be exceeded as project objectives dictate and funding allows**

**Examples available:**

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

**National Wetlands Inventory Map Report**  
**Kealia Pond National Wildlife Refuge, Maui County, Hawaii**

**Project ID:** R01Y15P05: Kealia Pond NWR, Hawaii

**Project area is restricted to all or parts of the following USGS 7.5 minute quadrangle maps in Maui County, Hawaii.**

USGS_QD_ID	QUAD_NAME
20156-F4	Maalaea
20156-G4	Wailuku

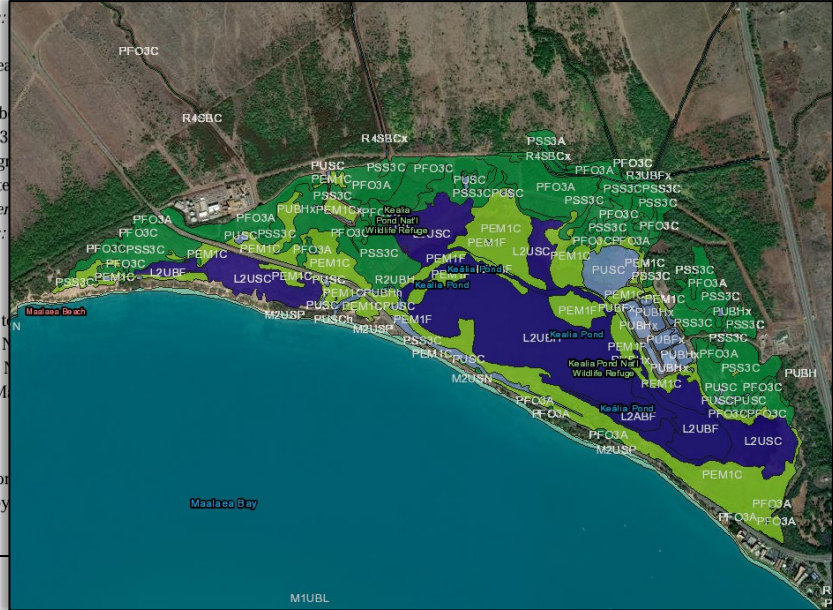
**Source Imagery:**  
*Citation:* For project area listed above:  
*Citation\_Information:*  
*Originator:* USDA-FSA-APFO Aerial Photography Field Office  
*Publication\_Date:* 2013  
*Publication place:* Salt Lake City, Utah  
*Title:* Digital Orthoimagery Series of Maui  
*Geospatial\_Data\_Presentation\_Form:* raster digital data  
*Other\_Citation\_Details:*

*Citation:* For project area listed above:  
*Citation\_Information:*  
*Originator:* Digital Globe  
*Publication\_Date:* 08/23/2011  
*Publication place:* Long Beach, CA  
*Title:* NextView Satellite Imagery  
*Geospatial\_Data\_Presentation\_Form:* raster digital data  
*Other\_Citation\_Details:*

**Collateral Data:**

- USGS 1:24,000 Topographic Maps
- USGS – NED – National Elevation Dataset
- USGS – NHD – National Hydrography Dataset
- Soil Survey of Maui

**Inventory Method:**  
 Wetland identifications were completed using the National Wetlands Inventory (NWI) Manual and mapping were completed by the U.S. Fish and Wildlife Service.





# Hawai'i'an & Pacific Trust Island NWI Update



Hawai'i Major	Hawai'i - Minor	Pac Trust	Pac Trust
Maui	French Frigate Shoals	Agrihan Island	Kingman Reef
Oahu	Gardner Pinnacles	Aguijan Island	Maug Islands
Kauai	Kaula	Alamagan Island	Ofu Island-Olosega Island (AS)
Molokai	Kure Atoll	Anatahan Island	Pagan Island
Lanai	Laysan Island	Asuncion Island	Palmyra Atoll
Niihau	Lisianski Island	Baker Island	Rose Atoll
Kahoolawe	Maro Reef	Farallon de Medinilla	Rota Island
	Midway Islands	Farallon de Pajaros	Saipan Island
	Necker Island	Guam	Sarigan Island
	Niihoa Island	Guguan Island	Swains Island
	Pearl and Hermes Atoll	Howland Island	Ta'u Island (AS)
		Jarvis Island	Tinian Island
		Johnston Atoll	Tutuila Island (AS)
			Wake Island





# Project Objectives

Primarily an update

- Improve spatial accuracy
- Capture change
  - Removed or altered wetlands
- Missed wetlands
- Improve classification accuracy
- Conventions for wetlands of special significance







# Project Deliverables

- Timeline:
  - Project initiation in December 2024
  - Close out September 2026
- NWI standard compliant data
  - 0.5-acre Target Mapping Unit
  - Limited field work component, but supported by local biologists in the region (outreach ongoing)
- Data producer will be Ducks Unlimited
  - The only NWI vendor with current experience mapping tropical environments





# Community Involvement

## Contributing to the Mapping Process

### Goal: Comment Period for Milestones

- 25% November 2025
- 50% January 2026
- 75% April 2026
- 100% June 2026

- Potential “Trouble Spots”
  - Wetlands of special concern
  - Wetlands under canopy
- Geotagged photos of wetlands
- State, County, Municipal datasets that support identification of unique wetland types



# Questions?

