



FAQs: Wetland Mapping and the NWI

A Fact Sheet for Tribal Wetland Programs

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Q: What is the National Wetland Inventory (NWI) and what is it for?

A: The U.S. Fish and Wildlife Service (USFWS) established the [National Wetlands Inventory](#) (NWI) to provide resource managers with information on the location, extent, and types of wetlands and deepwater habitats. The objective of NWI mapping is to produce medium resolution information on the location, type, size of these habitats such that they are accurate at the product scale of 1:12,000 (1:63,360 in Alaska). It is not designed or intended to yield legal or regulatory products, but may be used to support management decision-making processes.

Q: Are there standard protocols or procedures for NWI mapping?

A: To ensure the effectiveness and reliability of wetland map data, the USFWS has established quality standards, instituted quality assurance, and quality control protocols. The goal of these protocols is to ensure that the data collection, analysis, verification, and reporting methods are used to produce uniform information. The USFWS has published [technical procedures](#) that serve as a reference for conducting the image analysis work associated with mapping wetlands and deepwater habitats.

Q: Briefly, how is digital wetland mapping done?

A: The mapping process involves three basic steps: feature identification, classification, and field verification. The current predominant approach to mapping is the on-screen method. This method involves viewing digital map data that overlays digital imagery on a computer screen. Some basic elements that can aid in the identification of wetland habitats from aerial photographs or digital imagery include: tone (or color), size, shape, texture, pattern, association (context).

Q: What kind of data are needed for wetland mapping?

A: Minimal data requirements for mapping wetlands using the on-screen method are digital imagery, digital topographic maps, and if conducting map updates, existing NWI map data. Optional ancillary data may include digital soils data, digital elevation models, and hydrology data (e.g., flow models). When acquiring data, defining the project area in geographical terms is important for acquiring the appropriate digital data from the USFWS wetlands geodatabase and other sources.

Q: Are there guidelines on what type of digital imagery should be used?

A: Only high-quality imagery should be acquired and used (e.g., resolution of 1.0 meter or better). In general, the most recent era imagery available should be used to update resource maps. If possible, leaf-off (early spring or late fall) imagery should be used, as it allows for better identification of wetland boundaries, areas covered by water, drainage patterns, and separation of coniferous from deciduous forest.

Q: Why are digital topographic maps useful?

A: USGS topographic maps include contour lines that provide information on slope and elevation, which can help identify basins where wetlands are more likely to occur. Most topo maps also indicate known wetlands with [marsh symbols](#) and differentiate between perennial and intermittent streams. Alternatively, digital elevation model-derived data such as hillshade or contour intervals can provide similar information.

Q: Why is previous wetland mapping data useful?

A: The existing NWI dataset is an invaluable tool for updating or re-mapping wetland maps. It can help current mappers spot wetlands with more subtle appearances in aerial imagery. The historical classification of a wetland can also help determine whether that wetland has been modified (drained, impounded, farmed, etc.) and may provide insight into the water regime (seasonally vs. intermittently flooded). The USGS [National Hydrography Dataset](#) can also provide information on the presence and persistence of streams and ponds.

Q: How can soils data be used to help identify wetlands?

A: NRCS soil survey maps include the location, classification, and description of soil types at a county level. When used by an experienced image analyst, soil maps can assist in separating upland from wetland (hydric) soils. The soil survey geographic ([SSURGO](#)) database duplicates the original soil survey maps and presents the information in the most detailed digital form available.

Q: What is the purpose of the field verification element of the wetland mapping process?

A: Field reconnaissance can address questions regarding image interpretation, land use practices, and classification of wetlands. Initial field reconnaissance provides an opportunity for image analysts to become familiar with vegetation communities and land use patterns across wetland types and geographical settings within the project area. Fieldwork is also done as a quality control measure to verify that mapping information is correct. Every NWI mapping project requires a field trip report that includes the details of the trip (who, when, where), ancillary data sources used, general descriptions of wetlands observed, details about the quality and interpretation of the aerial imagery, and any special conventions.

Q: What do investigators look for in the field to help identify and classify wetlands?

A: The three indicators of a wetland are hydrology, vegetation, and soils. The presence of wetland plant species can provide important information to help determine if a site is a wetland, or to gain insight to length and periodicity of flooding. Federal agencies have generated national and regional wetland plant lists that are updated regularly and available [online](#). Soil characteristics can also be used to identify wetlands. The guide “[Field Indicators of Hydric Soils in the United States](#)” (2018) can help distinguish wetland soils in the field.

Q: How is the quality of wetland data ensured?

A: Wetland map data must pass [quality control procedures](#) established by the USFWS to ensure the information is accurate. The steps include: 1) review by technical specialist(s) 2) pass automated verification routines, and 3) pass final verification and data integrity inspection as provided by National Wetlands Inventory staff. The agency has constructed customized data verification tools to automate (to the extent possible) the technical quality control functions necessary to ensure the geodatabase is accurate.

View the USFWS Wetlands Mapper online: <https://www.fws.gov/program/national-wetlands-inventory/wetlands-mapper>

What do NWI codes mean? Check this [online diagram](#) of the Cowardin classification system. USFWS also provides a downloadable [wetlands code interpreter tool and a decoder table](#).

** The primary source for these FAQs is the USFWS report “Data Collection Requirements and Procedures for Mapping Wetland, Deepwater, and Related Habitats of the United States (version 3)” ([Dahl et al. 2020](#)).