A New Mapping Standard

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On July 7, 2009, a new national standard for mapping wetlands was approved by the Federal Geographic Data Committee (FGDC), the interagency organization that promotes national-level coordination and data-sharing for federal mapping activities. The wetlands mapping standard supplements an existing national classification standard for wetlands. Compliance with these national standards is required for all federal agencies and any other entities that use federal funds to map wetlands. Finalization of the national wetlands mapping standard follows three years of interagency coordination and response to public comments.

Global warming, sea-level rise, storm-severity changes, drought, water rights, energy development, population shifts, and infrastructure expansion are all factors driving efforts to modernize wetland mapping and increase sharing of this data between government agencies, nongovernmental organizations, industry, and the public. For over three decades, the U.S. Fish and Wildlife Service (FWS) has been acquiring, updating, and providing wetlands inventory mapping data. Their Wetlands Master Geodatabase (also known as the National Wetlands Inventory (NWI)) contains the most comprehensive digital map coverage of U.S. wetlands available. Currently, about 65 percent of the United States has been mapped for wetlands in modern digital format and is available online.

However, to date, federal funding has only allowed for an average of less than two percent of the national wetlands map to be completed each year. At this rate, it would take over 50 years to complete this mapping of U.S. wetlands. Even at a 20-year refresh interval as currently planned by FWS, the Wetlands Master Geodatabase would be unlikely to meet the demand for the high-quality, up-to-date digital wetland mapping data that will be needed to support current federal, state, and tribal environmental initiatives. Obviously, more agencies and organizations will need to join in the effort of acquiring and providing mapping data for wetlands in order to complete the national picture. Thus, a standard is needed to allow diverse groups to produce wetlands mapping data that would be compatible and consistent in quality.

The intent of the national wetlands mapping standard is to provide a set of minimum quality guidelines that anyone can follow to produce wetland mapping data suitable for inclusion in the wetlands master geodatabase, the National Spatial Data Infrastructure (NSDI), or the National Map. The standard presents technical specifications for both source and base imagery, feature classification, accuracy, data verification, projection (for data submission), metadata, quality control, and coordination with the FWS..

The standard is not designed to limit mapping detail or scale, only to set base or minimum requirements, which mapping entities may exceed if funding is available or if greater detail is needed. Nothing in the standard prevents the use of additional source data or methods to improve wetland mapping (such as soil data, Digital Elevation Models, LiDAR, radar, etc.). In fact, it is anticipated that these ancillary or collateral data sources will become even more important as technology progresses.

Having such a standard in place drives the production of consistent and compatible geographic data that can be easily shared and meets the needs of many end-users. In this way, the wetland mapping efforts of all federal agencies can be "recycled," providing greater value to the public for the investment of time and money. While the standard is required for use by federal agencies, it is also designed to encourage and facilitate wetland inventory mapping by states, tribes, counties, local governments, nongovernmental organizations, and the private sector. With a standard in place, there will be more opportunities to collaborate and more possible sources of funding.

The new standard draws upon conventional biological and remote sensing criteria for mapping the occurrence of wetland habitats. It builds upon the definitions and criteria in the existing national wetlands classification standard. For the purposes of the NSDI, wetlands are mapped as a habitat type or land-cover classification, regardless of their potentially changing legal status.

Most importantly, the national wetlands mapping standard does NOT rely on or apply to the mapping of wetland jurisdictional or legal boundaries under any federal, state, tribal, or other regulatory program. For example, the site-specific mapping of an individual wetland, such as the wetland jurisdictional boundary for Clean Water Act §404 permitting, is exempt from meeting the requirements of the standard.

The standard is also not applicable to map data produced prior to the standard's FGDC endorsement. Existing wetlands mapping data, and data already in production prior to July 7, 2009, need not be brought up to the standard. Additionally, the standard allows that if there is no compliant wetlands mapping data available, FWS will always be allowed to provide public access to the best available wetlands mapping data, at the discretion of the FWS.

An implementation plan for the new standard is currently in development. The Implementation Working Group is focusing on two core areas, administrative assistance and technical support, in order to address needs such as:

Resources

The Federal Geographic Data Committee's Endorsed Wetlands Mapping Standard can be found online at www.fgdc.gov/standards/projects/FGDC-standards-projects/wetlands-mapping/index_html

The project history, response to public comments, and link to the Wetlands Subcommittee are also on the FDGC website.

Read more about the Wetland Mapping Consortium on the Association of State Wetland Manager's website, www.aswm.org/swp/mapping/index.htm.

Check out the National Spatial Data Infrastructure at www.fgdc.gov/nsdi/nsdi.html.

The U.S. Fish and Wildlife Service's National Wetlands Inventory is located at www.fws.gov/wetlands/.

Learn how to contribute data to the Wetlands Master Geodatabase, at www.fws.gov/wetlands/WetlandsLayer/ContributedData.html.

The National Map produced by the U.S. Geological Survey can be found at www.nationalmap.gov/.

Visit the U.S. Department of Agriculture's Agricultural Research Service website at www.ars.usda.gov.

Classification of Wetlands and Deepwater Habitats of the United States can be found at www.fgdc.gov/standards/projects/FGDC-standards-projects/wetlands/index_html, as well as at www.fws.gov/.

Geospatial one-stop, the U.S. Government's geospatial portal for information about GIS resources is located at http://gos2.geodata.gov/wps/portal/gos

- accelerating the availability of data to update the Wetlands Master Geodatabase
- providing outreach/training related to standard requirements
- building funding coalitions and identifying grant opportunities
- providing examples of contractual language
- developing a communication forum to provide discussion and support for ongoing technical challenges, and facilitate access to technical expertise within the wetland science and geospatial communities
- addressing other technical and strategic issues from public comments

In support of implementing the national wetlands mapping standard, and promoting its adoption among states, local governments, and wetland professionals, the Association of State Wetlands Managers has formed the Wetland Mapping Consortium to provide long-term support for wetlands mapping and the integration of new technologies. This new group hopes to provide a valuable discussion forum for the emerging wetlands mapping community. Plans for developing online training materials with FWS and U.S. Environmental Protection Agency are underway.

The standard was developed by a diverse working group of the FGDC Wetlands Subcommittee. The working group was comprised of members of federal agencies, states, tribes, environmental organizations, management associations, and local government associations with an interest in improving quality and consistency in wetlands mapping efforts. The draft standard was used on a trial basis by FWS to support acceptance of data into the Wetlands Master Geodatabase for over a year prior to its final FGDC endorsement. ■

Mapping Coalitions

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Federal funding for large-scale wetland mapping, particularly the U.S. Fish and Wildlife Service (FWS) funds that supported the creation of the National Wetlands Inventory, are mostly a thing of the past. FWS is still very active in the business of making wetland maps; but nowadays their role has been reduced from all-inclusive services to a more limited portfolio of coordination and quality control. Currently, FWS can support new or updated maps on only two percent of the lower 48 states each year, and they generally use this funding to match state and local initiatives.

The good news is that geographic information system (GIS) tools have made it so anyone with high-quality imagery, a good computer and the right training can map wetlands. Alternatively organizations can acquire the imagery and subcontract the wetland mapping to an expert third party.

These changes have led to the creation of successful wetland mapping coalitions, which may be regional, state-based, or local.

There are two kinds of coalitions to think about: one to acquire the imagery, and the second to develop the wetland maps. Some potential partners may have no interest in mapping wetlands; but they do want good imagery, including high-resolution color infrared photography for other purposes. For example, local communities need the infrared photography to map impervious surfaces. Other groups may want to partner to create wetland maps. A conservation organization may have an interest in identifying wetland wildlife habitat. A public utility may want to know where wetlands are to include in plans for future transmission or sewer lines.

A good place to start searching for coalition members is the statewide GIS coordinator. Every state has one and they will know a lot about mapping efforts within the state. In addition, the U.S. Geological Survey (USGS) has National Spatial Data Infrastructure (NSDI) specialists, who are knowledgeable about mapping in the federal agencies. A list of state GIS coordinators can be found on the National State Geographic Information Committee website at www.nsgic.org/. The liaisons are listed by state on the National Geospatial Program, Geospatial Liaison Network www.usgs.gov/ngpo/ngp_liaisons.html. In addition, the Farm Services Agency does aerial photography on a regular basis. Usually this is after the growing season is well established—too late for the leaf-off imagery generally required for identifying wetlands—but they may be involved in other mapping efforts and have resources to share.

Do not stop there. It is amazing how many individual agencies, units of government, nonprofits, and private organizations are trying to develop maps, and it is important to seek out all potential parties. Restoring rivers, managing for natural hazards, building roads and highways, managing wildlife populations, and developing land ownership maps are only a few of the many reasons why groups need either good imagery or new wetland maps.

States have access to various funding sources, local government may be able to tap others, and both private companies and nonprofit organizations can request funding from places unavailable to government. In the past, sources of funding for purchasing imagery and making maps has included the Department of Homeland Security, the State Department of Public Health, conservation organizations such as Ducks Unlimited, the Forest Service, USGS, local governments, and metropolitan mosquito control districts.

Make sure the coalition seeks out information about the best technology for the project. RADAR is a promising new form of remote sensing for mapping forested wetlands. However, aerial imagery works very well in nonforested areas, such as the prairie potholes. Explore whether combining wetland mapping with other waters, such as rivers and streams, will bring more partners to the table. Planning the project carefully, reaching out broadly, and thinking creatively can lead to a successful mapping project and perhaps even greater benefits. ■