County Wetlands Data Guidebook

NACo National Association of Counties

The Voice of America's Counties

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of the County Services Department
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About NACo – The Voice of America's Counties

The National Association of Counties (NACo) is the only national organization that represents county governments in the United States. Founded in 1935, NACo provides essential services to the nation's 3,066 counties. NACo advances issues with a unified voice before the federal government, improves the public's understanding of county government, assists counties in finding and sharing innovative solutions through education and research, and provides value-added services to save counties and taxpayers money. For more information about NACo, visit www.naco.org.

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Introduction to Wetlands

County officials make key decisions about the future of their community based on the best available information. Accurate information is critical to decision makers managing the day to day operation of their county and in planning for their community's future. Land use decisions impact various aspects of a community, including the natural environment. Maintaining a balance between economic an environmental considerations is no easy task, especially when critical data is not accurately mapped.

Wetlands are a critical natural asset that provide a wide range of economic, public safety and ecological benefits to communities, yet they are often missing or inaccurate in county maps. The absence of or inaccuracies in wetlands information from county maps and plans is an obstacle to wetlands protection and truly "comprehensive" planning at the local level. With accurate data and maps, counties can work to fully protect functioning wetlands in order to maintain their numerous benefits including improved water quality, flood protection and habitat for economically important species.

Counties typically have many other types of activities and functions mapped accurately at the local scale. This information is stored in various formats, but typically, it is stored as data layer formats usable in GIS (Geographic Information Systems). These GIS data layers can include transportation systems, zoned areas, wetlands and numerous other layers. The different layers keep track of the nuts and bolts of society. Counties utilize this data by putting together different layers to make maps that represent their communities' assets. Local leaders then utilize this data to help with day to day operations and to plan for the future.

Many counties are seeking to avoid negative impacts on their wetlands in the future and are striving to learn where their wetlands are located, in order to decipher the best way to protect the wetlands they deem most valuable, mitigate the loss of others and restore degraded or destroyed wetlands. This guidebook is design0ed to be a practical introduction to wetlands data, so that county officials may learn about the issue, find wetlands data for their county and learn how colleagues in Baldwin County, Alabama and the Kenai Peninsula Borough, Alaska are using this data for the benefit of their communities.

Benefits of Wetlands

A wetland – whether it is called a swamp, marsh, fen or bottomland hardwood – is a unique place serving as the link between land and water. There are numerous types of naturally occurring wetlands which provide multiple benefits (See types of wetlands graphic on pages 4 and 5). One important distinction between types of wetlands is that between naturally occurring wetlands and constructed wetlands, with the later often created for stormwater retention and filtration (for more information on constructed wetlands visit, *www.epa.gov/owow/wetlands/watersheds/cwetlands.html*).

Wetlands provide a wide range of ecological, economic, public safety and social benefits to communities. They act as natural sponges and barriers that protect communities from severe storms, hurricanes, flooding, drought and harmful water pollutants. The natural functions of wetlands provide economic value through their role as nurseries to commercial and recreational fish species, by providing habitat for ecotourism and in their aesthetic value that in turn can boost local property values. Wetlands also serve as living laboratories for school children and researchers and provide recreational venues for fishing, hunting, swimming, boating, hiking and much more.

"Having accurate online interactive wetlands maps accessible to the public helps the borough protect this valuable resource. Realtors, developers and the community at large use these maps to learn the location of wetlands on their current or prospective property, thus saving on construction costs and avoiding future costs associated with wetlands loss."

-Borough Assembly Member Pete Sprague Kenai Peninsula Borough, Alaska

Types of Wetlands in the United States*

Prairie Potholes - are primarily freshwater marshes that exist in isolated depressions. The formerly glaciated landscape of the Upper Midwest, U.S. is pockmarked with an immense number of potholes, which fill with snowmelt and rain in the spring. The area is home to more than 50 percent of North American migratory waterfowl, making it one of the most important wetland regions in the world.

Tidal Marshes – can contain freshwater or saltwater but all serve the same purpose of slowing shoreline erosion and absorbing excess nutrients before they reach the oceans and estuaries. Tidal marshes can be found along protected coastlines on the Eastern Coast from Maine to Florida and continuing on to Louisiana and Texas along the Gulf of Mexico.

* Note: These five types of wetlands are examples of many different wetland types in the U.S.

Vernal Pools – are broadly defined as seasonal wetlands that predictably form in permanent basins during the cooler part of the year but are dry during the summer months. Often, vernal pools include many organisms that are regionally unique or rare, and thus perform an important local biodiversity function. Vernal pools are distributed throughout the U.S., but are particularly abundant on the Pacific Coast and in various forms in the glaciated landscapes of the North and Northeast, U.S.

Riparian (Riverine) Wetlands – are formed along rivers and streams, and where soils and soil moisture are influenced by the adjacent stream or river. These wetlands process large amounts of energy and materials from upstream systems, and are functionally connected to both upstream and downstream ecosystems. They may be broad valleys many miles wide in the Southern U.S. or narrow strips of streambank vegetation in the arid Western U.S.

Bottomland Hardwoods – are river swamps commonly found wherever streams or rivers cause flooding beyond their banks along the coasts of the Southeast and South Central, U.S. They serve a critical role in the watershed by reducing the risk and severity of flooding to downstream communities by storing floodwater and serving as a barrier to severe coastal storms and hurricanes.

"It is important for counties to play a role in protecting and mapping our various wetlands because we are aware that wetland assets are critical to our community. That is why Ramsey County partnered with various state and federal agencies to map our wetlands."

-Commissioner Victoria Reinhardt, Ramsey County, Minnesota Board Member and Vice Chair of the NACo Environment, Energy and Land Use Steering Committee

Finally wetlands are critical sanctuaries for thousands of aquatic and terrestrial species, including numerous migratory birds. Nearly half of our nation's threatened and endangered species rely directly or indirectly on wetlands for their survival.

To learn more about the benefits of wetlands, including specific examples of benefits to counties, read *NACo's Benefits of Wetlands Brochure* at *www.naco.org/techassistance* under "Water Quality" then Publications.

The County Role in Wetlands Protection and Data

Under the federal Clean Water Act, states and the federal government regulate most direct impacts on wetlands such as dredging, filling or draining. Yet another cause of the damage to wetlands and their functions is caused indirectly by residential and commercial development that can be addressed at the local level. These indirect impacts are due to land use practices that are often within the land use regulatory authority of counties and other local governments. Counties can mitigate these impacts through multiple actions such as zoning, subdivision ordinances, stormwater criteria and other development regulations (Cappiella, et al. 1). However, county governments are hindered in these efforts if they do not obtain wetlands data accurate at a local scale.

In summary, wetlands are important to counties, yet state and federal wetland maps are unreliable at the local scale. Many wetlands, including isolated non-navigable wetlands, are not protected under federal laws so they fall under the responsibility of local government. County governments are in the best position to protect local wetlands through a variety of tools. For example, Lake County, Illinois' Watershed Development Ordinance balances the protection of wetlands (including isolated wetlands) and water resources with economic development.

To read more about Lake County's ordinance and isolated wetlands, read *NACo's Wetland Fact Sheet: Protecting Wetlands and Fostering Economic Growth: Lake County, Illinois' Watershed Development Ordinance* at *www.naco.org/techassistance* under "Water Quality" then Publications.

The Federal Role: Section 404

Section 404 of the Clean Water Act regulates the disposal of dredge or fill material into "waters of the U.S.". These activities are not prohibited by section 404, but must be done under a U.S. Army Corps of Engineers permit. The 404 permit program is administered jointly by the USEPA and the U.S. Army Corps of Engineers. The Corps handles the actual issuance of permits (both individual and general); it also determines whether a particular plot of land is a wetland or water of the United States. The USEPA issues guidelines and policies and plays a role in compliance and enforcement. It is also responsible for determining whether portions of the 404 program should be turned over to a state, territory, or tribe. (To date only a few states have assumed 404 responsibility for nontidal waters.) For more information see *www.epa.gov/owow/wetlands/pdf/reg_authority_pr.pdf.*

Did You Know?

An acre of wetland can store 1-1.5 million gallons of floodwater.

County Wetlands Data Needs

NACo Needs Assessment Analysis

NACo conducted a needs assessment of county officials who are members of the Environment, Energy and Land Use (EELU) Steering Committee, the Geographic Information Systems (GIS) Subcommittee, and the National Association of County Planners (NACP), as well as past Five Star Restoration Grant recipients and others in order to assess the availability and usefulness of wetlands data at the county level.

These groups represent a wide spectrum of NACo's membership. The EELU Steering Committee is made up of 120 county staff and officials from across the country that develop and review NACo's policy on all matters pertaining to environment, energy and land use. The GIS subcommittee plays a similar role in advising NACo's Steering Committees on GIS issues. NACP is an association of county planners that share best practices, knowledge and expertise and is an affiliate of NACo. Finally, the Five Star Grant Program provides modest financial assistance to assist counties and their partners with wetland, coastal and streambank restoration projects. NACo solicited feedback from its network of over 100 current and former project managers.

The responses provide insight into the data that is currently used in local wetlands protection policy formulation and enforcement processes.

Findings: County Officials' Wetlands Data Needs:

The majority or respondents were either county elected or appointed officials.

- State and federal regulations were identified as the primary reason wetlands are protected in the respondents' counties, and 62% said they also have county regulations that protect wetlands.
- 70% percent of respondents get their wetlands maps and data from the federal government, while 39% also have county staff create or enhance their wetlands data.
- Responses to the question, "Do available maps and data meet county wetlands protection needs were practically even with 54% saying "yes" and 46% saying "no".

When asked why they answered no to that question, respondents gave a few reasons, including:

- wetlands are not mapped to the same accuracy level as our other maps and data
- wetland areas are missing from the map
- descriptive information about each wetland area is insufficient

NACo's needs assessment found that most counties protect their wetlands through various measures beyond state and federal regulations. These methods include county regulations, comprehensive planning and incentive programs. Most counties also get wetlands information from the federal government with over 40% creating or enhancing that data. Finally, almost half of respondents found that available maps and data do not meet county wetlands protection needs because of inaccuracies, missing data, and insufficient maps and data at the local scale. To learn more about the full needs assessment, visit *www.naco.org/techassistance* under "Water Quality" then Resources.

The Association of State Wetland Managers and the Center for Watershed Protection have compiled a list of actions counties can take to strengthen their wetlands restoration and protection efforts. For a full list of these regulatory and non-regulatory options read, **Protecting and Restoring Wetlands: Strengthening the Role of Local Governments,** *available at www.aswm.org or the Center's Wetland and Watershed Article Series at* www.cwp.org.

Lessons Learned from County Wetlands Information Forum

NACo built upon information learned through its needs assessment with the County Wetlands Information Forum. The forum took place on Monday, March 6, 2006 during NACo's 2006 Legislative Conference and provided NACo with feedback from over 70 county elected and appointed officials on how wetlands data issues relate to local wetlands protection. County officials and federal and state agency representatives presented information on the uses of and current trends in wetlands data creation and maintenance. Perspectives and experiences shared through the facilitated discussion helped inform this guidebook.

County officials expressed interest in several ideas to improve local wetlands data through the forum and needs assessment. The National Wetlands Inventory or NWI came up frequently. The U.S. Fish and Wildlife Service (FWS) is the federal agency that maintains NWI, which provides wetlands data for much of the country. The data is especially useful at the national level, but some coverage gaps exist across the country and the age of the data varies widely. Despite these shortcomings, many counties turn to NWI as a first step in mapping their wetlands. Some county officials suggested that the NWI data and other federal wetlands data should be mapped at a scale that is more suitable to the local level and tested to guarantee better accuracy. Other county officials suggested that grant funding be made available for counties to map their wetlands. In addition, county officials found the various sources of federal and state wetlands data confusing. They suggested that a central data clearinghouse for data could help provide the most up to date data available from important federal sources such as NWI, the U.S. Geological Survey's (USGS) water data, the U.S. Department of Agriculture's (USDA) soil data, the Federal Emergency Management Agency's (FEMA) floodplain data and the U.S. Army Corp of Engineers' (USACE) list of regulatory permits.

Simplification and open sharing of data were other themes of the discussion. Both the USACE and the U.S. Environmental Protection Agency (USEPA) responded to the request for simplification and better data with news about two new federal initiatives. USACE is continuing to improve its regulatory tracking database and is willing to share this information with counties if they contact their USACE District. In addition, the USEPA along with other federal agencies is working through the Federal Geographic Data Committee's Wetlands Subcommittee to coordinate federal data providers through a national wetlands mapping standard. The new standard will allow all federal, state and local agencies to input their wetlands data into the national map at multiple compatible scales and in multiple time frames. It is a first step in improving the quality of NWI data for counties and other stakeholders.

Did You Know?

At least $18 billion in economic activity is generated annually by the 17 million Americans that participate in coastal wetland-dependent recreational fishing.

Getting Started

It should be noted that at the most basic level, it is important for county officials to know where their wetlands are in order to incorporate the management of this resource into the other important data contained within county government. However, collecting data is not the first step in wetlands management. Before undertaking wetlands data collection, it is critical for a county to decide how it will utilize wetlands data.

It is a good idea to involve key stakeholders in your community, such as land trusts and watershed organizations that may already have some wetlands data. Additionally, state and federal partners may allow your county to incorporate wetlands data collection into regulatory requirements, such as Section 404 permits, Total Maximum Daily Loads or NPDES permits, which are discussed later in this document. Finally, other counties may wish to obtain wetlands data in order to enforce local regulations or guide planning.

For the purposes of this guidebook, we simply recommend that you set your own wetland protection goals and then recognize the importance of wetlands data for meeting those goals. However, the Center for Watershed Protection, a nonprofit organization that provides local governments and watershed organizations around the country with technical assistance for protecting water resources, recommends collecting wetlands data as part of a larger plan to protect wetlands through watershed planning principles.

Merging Wetlands Protection with Watershed Protection

The emerging practice of watershed planning is utilized by many communities to protect their water resources. A watershed is defined by the USEPA as the area in which all water, sediments and dissolved materials flow or drain from the land into a common river, lake or other body of water. A watershed-based approach to water protection is a collaborative planning process that brings together citizens, nonprofit organizations, businesses, and local, state, tribal and the federal governments to address the strains to land, air and water in a manageable land area. The Center for Watershed Protection is a leader in watershed planning resources and assists communities with the application of regulatory and non-regulatory tools designed to implement this approach. The Center asserts that "incorporating wetland protection into the local watershed planning process can help minimize impacts to wetlands. Practically, this means that local wetlands must be inventoried, assessed and managed in the context of the entire watershed rather than on a site-by-site basis" (Cappiella et al. 2).

This approach offers multiple benefits including the ability to choose the highest quality and most vulnerable wetlands in need of protection, along with sites best suited for restoration. Counties may also help ensure that wetland protection efforts maximize water quality improvement goals for the watershed, clarify state and federal wetland permit decisions for landowners and promote voluntary conservation and restoration programs (ASWM).

The Center has developed a framework to help communities undertake this work. This framework, *Using Local Watershed Plans to Protect Wetlands* can be accessed at *www.cwp.org.*

Collecting Wetlands Data

There is not one correct method for collecting data and mapping wetlands. Rather, there are numerous sources of data that counties can collect to build a wetlands map. The accuracy and utility of maps is only as good as its data components. Compiling these components can range from a small

amount of data collection on the general location of wetlands to an in-depth search for indicator data which adds detail and accuracy to wetlands maps.

Due to the variety of data resources available, it is recommended that a Geographic Information System be used to store and organize all collected data. The data can then be integrated with other county GIS data layers and incorporated into GIS decision support systems which allows wetland assets to be incorporated into decision making processes.

An excellent website resource with various national data sets such as land cover, soil, water resources, flood maps and other useful information such as elevation and satellite imagery is available from the NEMO network at **http://clear.uconn.edu/geospatial/datasets.**

Wetland Mapping Layers

Wetland Mapping Data	Description	Source
National Wetlands Inventory (NWI)	Based on varying ages of wetlands data and tends to underestimate wetland size, especially those smaller than 3 acres and ephemeral wetlands. Maps cover 90% of U.S., but only 40% of the lower 48 states is available in GIS	Mapping Information is available at www.mwi.fws.gov and a list of regional and state U.S. Fish and Wildlife Service contacts is available at *www.fws.gov*
State and Other Local Government Wetland Inventories	These inventories are often more accurate than federal sources, but not all localities have coverage	Check with neighboring localities and your Regional Council of Governments (COG). The National Association of Regional Councils has information on COGs at *http://narc.org.* In addition, state natural resource departments typically retain state wetlands data.
Natural Resource Conservation Service (NRCS) wetland determinations	Also known as farmed wetlands or "Swampbuster" maps. Available as paper maps only for individual sites	Soil Conservation District Offices. To find your local Soil Conservation District go to *www.nacdnet.org/resources/cdsonweb.html*
USACE Section 404 permit wetland determinations	Paper maps of individual sites can be requested. A centralized database is under construction that may be searched by watershed	Contact your USACE District Office to request information about decisions within a particular county. Visit *www.usace.army.mil/divdistmap.html* or *https://epermit.usace.army.mil*
Created and restored wetlands	Locally generated layers of mitigation sites and stormwater treatment practices	State transportation departments or USACE District Offices may be good sources for mitigation sites. Local public works or other departments may have data layers on stormwater treatment practices

Table adapted from Center for Watershed Protection, Cappiella et al., page 9

Quick Tip:

Before you begin collecting wetlands data, check in with the U.S. Army Corps of Engineers to ensure that your local data meets a certain threshold established by USACE. Local data that meets USACE thresholds may assist your community with certainty and timeliness in the Section 404 permitting process and strengthen local comprehensive plans.

Basic Wetland Mapping Layers: First Steps

Most counties begin to map their wetlands by collecting data layers of mapped wetlands. Despite its gaps and accuracy shortcomings for local use, the National Wetlands Inventory (NWI) is usually the first source counties turn to for free mapped wetlands data. State or regional governments may also possess and share wetlands data. In addition, the USDA Natural Resource Conservation Service wetland determinations, USACE Section 404 permit wetland determinations and created or restored wetlands sites all provide supplemental mapped data information.

Supplemental Wetland Mapping Layers: Building More Detail

Due to the limitations of most mapped wetland layers, counties seeking wetland maps that are accurate at the local level must supplement these sources with data that helps indicate the presence of wetlands. This type of data is called wetland indicator layers because it provides data that strongly indicates the presence of wetlands. This data also helps determine the quality of wetlands and their functions. Each of these sets of data has its strengths and weaknesses and applications to different decision making efforts.

For example, floodplain maps indicate the land area around waterbodies that during flood events are wetlands and in non-developed areas are sometimes permanent wetlands. Floodplain maps also help to identify wetlands that serve the important public safety function of storing excess water during flood events. Therefore, wetland indicator layers help build accuracy and usability in wetland maps as counties are able to compare different data layers to ensure that the location of wetland maps and indicators match up. Furthermore, this helps to prioritize the protection and restoration of wetlands that serve the most important functions to communities. See table for more information. In addition, a quick link to information about most of these resources and their availability for particular regions is available for download from the U.S. Geological Survey's National Map at *http://nationalmap.gov.*

Wetland Indicator Layers

Wetland Mapping Data	Description	Source
NRCS hydric soils and inclusions	State-wide or county-wide soil survey maps that designate hydric soils. Not all communities have soils digitally but you can get paper maps often from county soil conservation districts	*http://soidatamart.nrcs.Usda.gov*
Federal Emergency Management Agency (FEMA) floodplains	Flood data is available for 100 year and 500 year floodplains	*www.msc.fema.gov/product.shtml*
Topography	Digital elevation maps for Digital Line Graphs	Available from USGS *www.usgs.gov/pubprod*
State or local vegetation maps and surveys	Maps created from satellite imagery, plant surveys and other sources that identify wetland vegetation.	Varies
Aerial photos	High resolution aerials (preferably no more than 5 years old and 1" = 600' resolution)	*www.geoeye.com*
U.S. Geological Survey (USGS) Hydrologic Unit Maps	These maps represent part or all of a surface drainage basin or distinct hydrologic (water) feature. They help standardize watershed classification.	*http://water.usgs.gov/GIS/huc.html*

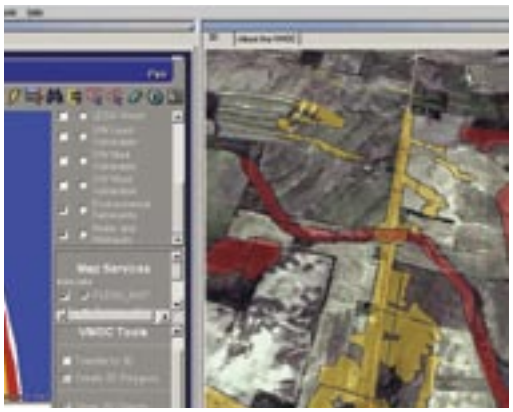
Table adapted from Center for Watershed Protection, Cappiella et al., page 9

Turning Data into Maps for Local Use: Putting it All Together

Compiling the above mentioned wetland mapping and indicator levels into a Geographic Information System will allow a county to map and analyze its wetland resources. However, the data often needs manipulation to fit with your local GIS and to be accurate at the local scale. Map coverage gaps may also exist for certain data layers, which will necessitate manipulation of your existing data to make educated guesses about wetlands in sections of a county. In some cases, counties have found field testing, of the accuracy of their wetland data and maps, an important supplement to their data that eventually saves costs. Therefore, this phase in wetland mapping will require your county staff, partner organizations or consultants to enhance wetlands information so that it is as accurate as needed.

Equipped with accurate data and maps, multiple options exist for utilizing wetland maps. Many counties incorporate their wetlands data into their county GIS and utilize it for traditional planning and management functions. The Kenai Peninsula Borough allows easy access to wetland maps on its website so that the whole community can incorporate wetlands data into their parcel planning.

Other counties are beginning to use GIS decision support tools. These tools work by bringing together data and models to create real life scenarios depicting each decision option that is available to communities. Many of these tools are being utilized to incorporate wetland and water resource protection into other local land use decisions. To learn more about GIS decision support tools, including county best practices and commonly used tools available to counties read *County Water Quality Issue Brief: Using GIS Tools to Link Land Use Decisions to Water Resource Protection* at *www.naco.org/techassistance* under "Water Quality" then Publications.



Additional Sources

The Center for Watershed Protection recommends that localities compile additional wetlands information, beyond the mapping and indicator layers listed. Additional wetlands information, including mapping layers and indicator layers, is often contained in state and federal documents. One important resource is the USEPA's Advance Identification Program (ADID) which often creates excellent data in advance of USACE permit applications to identify the location and quality of wetlands. Additional sources include USACE Special Area Management Plans, State Wetland Conservation Plans, Natural Heritage surveys, flooding analyses, North American Breeding Bird surveys, 305(b) monitoring data and other plans, reports and monitoring data. To learn more about these sources of information read *Using Local Watershed Plans to Protect Wetlands* at *www.cwp.org.*

How to Fund Wetland Mapping Efforts

Data collection efforts and mapping take time and resources. Counties can take several steps to ease their burden in these efforts. First, counties can seek to incorporate wetlands mapping efforts into their current state and federal water and other regulatory programs. Second, counties can seek out a diverse coalition of local, state and federal partners that can add expertise and resources. Lastly, some grant funding is available to assist with wetlands mapping.

Incorporating Wetland Mapping into Existing Efforts

Counties face multiple mandates from the federal government that are usually passed down through a state environmental agency. These mandates often require in-depth planning designed to ensure the attainment of water quality standards. Incorporating wetlands identification and later protection into these plans will often lead to more effective local management plans. The USEPA's National Pollutant Discharge Elimination System (NPDES) Program and Total Maximum Daily Load (TMDL) Program both offer opportunities for counties to incorporate wetland information and mapping into existing efforts.

Many state and federal officials are eager to work with counties on incorporating wetlands identification and mapping into regulatory programs because it helps ensure holistic protection of water resources. Communities also may benefit through having better information to move forward with complex permitting decisions. In addition, expensive remediation efforts for water quality standards that are not met may be avoided. For more information on Water Quality Standards and TMDLs read *NACo's County Water Quality Issue Brief: Total Maximum Daily Loads (TMDLs) A Watershed Planning Tool for Counties* visit www.naco.org/techassistance under "Water Quality" then Publications.

Building a Diverse Coalition of Partners

A diverse coalition of local, state and federal partners is a critical component to successful wetland mapping efforts. Potential partners may not be readily apparent to counties just beginning to engage in wetland mapping efforts, but the list of possible partners is extensive. Partners are the stakeholders with the technical resources and/or funding available to help make mapping efforts a reality. Land trusts, nonprofits, transportation and utility departments, federal and state agencies, private consultants and regional governing bodies are all potential partners that should be approached. Both Baldwin County, Alabama and the Kenai Peninsula Borough, whose wetland mapping efforts are profiled later in the guidebook; maintain a diverse set of successful partnerships.

Did You Know?

The U.S. Fish and Wildlife Service estimates that up to 43% of the federally threatened and endangered plant and animal species rely directly or indirectly on wetlands for their survival (e.g., the wood stork, Florida panther, whooping crane, and plants such as the swamp pink and Canby's dropwort).

Engaging these potential partners early in your planning efforts will help increase partner involvement and ensure that mapping efforts are compatible with your partners' resources. Successful partnership building will lead to a mapping network with technical resources and funding. This mapping network will usually start small, with a county engaging partners with whom it has worked in the past, and then branching out to all potential partners working through their networks of county partners and beyond to pull in all resources possible.

Potential Wetland Mapping Partners

Federal partners:

- USEPA Regional Offices- www.epa.gov/epahome/locate2.htm
- USEPA Wetlands Division – www.epa.gov/owow/wetlands
- U.S. Fish and Wildlife Service Regional Offices - www.fws.gov/offices/
- U.S. Army Corp of Engineers District Offices - www.usace.army.mil/divdistmap.html
- NOAA's Coastal Services Center –www.csc.noaa.gov
- Natural Resources Conservation Service: *http://offices.sc.egov.usda.gov/locator/app*

State partners:

- State environmental agencies – Visit *www.ecos.org/section/states* to view the Environmental Council of States list of state environmental agencies
- State departments of transportation – Visit *www.fhwa.dot.gov/webstate.htm* for a list of state transportation websites

Local partners:

- County Cooperative Extension Service or other Academic Institutions: *www.csrees.usda.gov/Extension*
- Local Conservation District: *http://offices.sc.egov.usda.gov/locator/app*
- Land Trusts – Visit *www.ltanet.org/findlandtrust* for a list of land trusts that are members of the Land Trust Alliance
- River Network – Visit *www.rivernetwork.org*
- American Rivers- Visit *www.americanrivers.org*
- Local Watershed Organization – Visit *www.epa.gov/win/region/* to view the USEPA's Watershed Information Network to find various local and regional water resources, including watershed organizations

Grant Funding and Technical Assistance

Some key wetland mapping partners offer funding in the form of cash and/or in-kind technical assistance. Below is a short description of some of these opportunities. Numerous other opportunities may exist and should be solicited from the list of potential partners. A good source to explore all federal grants is *www.grants.gov.* Remember to be creative when looking into grant and technical assistance opportunities. Some opportunities may allow counties to creatively incorporate wetland mapping efforts into other water quality or wetland protection efforts. See below for several that fit well with wetland mapping efforts.

USEPA Wetland Grants – The USEPA's Wetland Program Development Grants provide eligible applicants (including counties) an opportunity to conduct projects that promote the coordination and acceleration of research, investigations, experiments, training, demonstrations, surveys, and studies relating to the causes, effects, extent, prevention, reduction and elimination of water pollution. For more information, visit *www.epa.gov/owow/wetlands/grantguidelines*.

Advance Identification of Disposal Areas (ADID) – The ADID program is a planning process that assists communities, states and tribes to identify wetlands and other water resources that are suitable or unsuitable for development. The ADID process helps communities collect and distribute information about the values and functions of their wetlands. The U.S. Army Corps of Engineers and States or Tribes are involved. The process can be helpful in getting communities started with local wetland data collection and mapping efforts.

For more information about ADID visit *www.epa.gov/OWOW/wetlands/facts/fact28.html* or contact your USEPA regional office's staff member involved in wetland and Section 404 permitting. These staff contacts can be obtained by calling the USEPA's Wetland Information Hotline at 800.832.7828.

USEPA Section 319 Grants – Section 319 of the Clean Water Act contains the USEPA's Nonpoint Source Management Program. Under Section 319, states, territories and tribes receive grant money and often pass the funding along to counties and other local groups to support a wide variety of activities including technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and monitoring to assess the success of specific nonpoint source implementation projects. For more information about section 319 grant funding, the USEPA has compiled a list of state contacts. Wetlands protection efforts often complement nonpoint source pollution reduction efforts. Interested counties should contact their state Nonpoint Source Pollution Program Coordinator. The most up to date list of state coordinators is available at www.epa.gov/owow/nps/319hfunds.html.

For more information about Baldwin County's successful use of the ADID program and USEPA Wetland Program Development Grants, read the case study found in this guidebook.

County Best Practices

"The borough's wetland mapping program has been very beneficial to me and other Realtors. It enables the development community to have easily accessed information about the location and quality of wetlands, thus helping us avoid costly construction delays and permitting issues."

-Scott Connelly
Kenai Peninsula Borough, Alaska
Realtor and former president of the Kachemak Board of Realtors

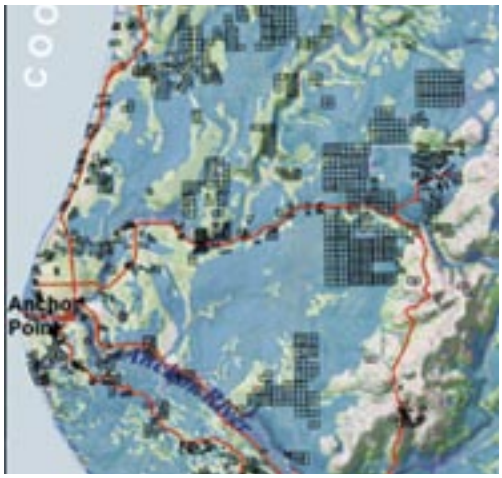
Numerous counties have taken great strides in wetlands data collection and mapping. Two of these efforts are profiled below. In addition, information on additional county efforts is presented.

Kenai Peninsula Borough, Alaska:

Saving Development Costs through Wetland Maps

The Kenai Peninsula Borough is able to host an interactive wetlands map on its website due to an innovative wetlands mapping partnership. The borough with roughly 50,000 people spread over 16,000 square miles of territory needed a map of its wetland resources in order to help protect its water resources and prevent costly construction delays of land parcels with hidden wetlands . By 2004, with the help of Kenai Watershed Forum, the USEPA, Cook Inlet Keeper, the Kenai River Center and the USDA's Natural Resource Conservation Service, wetlands in the lowlands of the borough, areas that were most likely to be developed, were mapped. Now any borough resident (and anyone around the world) with a web browser and internet connection can view wetlands and their association with parcel lines through an Internet Map Server (IMS).

"The partners realized that the borough's largely pristine watersheds could suffer the same fate as other watersheds across the country where wetlands have lost function" said Mike Gracz, Wetland Project Manager at the Kenai Watershed Forum. He added that, "many of these communities are now spending large amounts to restore wetlands. The partnership sought to help the development community realize the extent of wetlands on the Kenai Peninsula through accurate wetland maps." Constructing on wetlands is expensive, involves permits and can have adverse impact on neighboring parcels. The partners reasoned that given accurate information development will naturally move away from wetland areas thus saving costs and protecting wetlands. If developers do build on wetlands they will know what they have to deal with from the



A Sampling of vacant private parcels less than 10 acres in size that are on wetlands (blue).

Did You Know?

A study assessing the world's natural ecosystems estimated that the global value of wetland resources was $14.9 trillion, accounting for 45% of the value of all natural ecosystems.

start. Like many developing communities, the borough is seeking to learn from its urbanizing neighbors by "doing things right, from the start" (Gracz, et al).

Mapping the borough's lowlands required several steps. The U.S. Fish and Wildlife Service's National Wetlands Inventory was incomplete. Aerial photography, the Natural Resources Conservation Service's soil survey and field visits to verify accuracy provided the majority of data needed. Wetlands were identified and classified from the soil survey data using a system based on a wetlands position in the landscape and the water table level. This classification system included indicators such as types of vegetation and soils. The borough is careful to note that the tool is for planning purposes only and does not represent a jurisdictional determination of wetland locations by the U.S. Army Corps of Engineers.

The wetlands mapping and classification project yields numerous benefits for the borough, its partners and the community. On a practical level, the tool has saved the borough staff time. More importantly, accurate information is leading to less costly development that is directed away from valuable wetlands and water resources. "Having accurate online interactive wetlands maps accessible to the public helps the borough protect this valuable resource. Realtors, developers and the community at large use these maps to learn the location of wetlands on their current or prospective property, thus saving on construction costs and avoiding future costs associated with wetlands loss. In addition, wetlands help reduce the impacts from storm water runoff, which in turn helps maintain high water quality, which is particularly important to keeping healthy salmon runs," said Borough Assembly Member Pete Sprague.

The Kachemak Bay area Realtor community is also supportive of the wetland mapping program. "The borough's wetland mapping program has been very beneficial to me and other Realtors. It enables the development community to have easily accessed information about the location and quality of wetlands, thus helping us avoid costly construction delays and permitting issues," said Scott Connelly, a local Realtor and former president of the Kachemak Board of Realtors.

For more information about wetland mapping and classification in the Kenai Peninsula Borough visit *www.kenaiwetlands.net/index.htm.* To view the online interactive wetland map visit *www.borough.kenai.ak.us/gisdept/ims/disclaimer.htm.*

Baldwin County, Alabama:

Partnership Building and Grant Writing Yield Sophisticated Wetlands Mapping Tool

Baldwin County's wetland mapping efforts provide an excellent example of the benefits of building partnerships and funding resources to develop an increasingly sophisticated wetlands map. This rapidly growing coastal county with numerous wetland resources began actively assessing and acquiring wetlands mapping data in 1995. The USEPA's ADID program provided the funding for this initiative and resulted in the mapping and categorization of 89,000 acres of wetlands.

The county expanded its efforts in 1999 with the help of a USEPA Wetland Program Development Grant. With the funding the county developed the Baldwin County Wetlands Conservation Plan which included a GIS Decision Support System, known as the Remote Functional Wetland Assessment Model or RFWAM. The tool is designed to compile the county's wetlands data into a format that is usable for decision makers and the community at-large when making land use decisions. The initial data collected included the NWI data that staff members manipulated to increase local accuracy. In addition, water resource data from the U.S. Geological Survey filled in NWI data gaps.

Baldwin County's wetlands GIS decision support "…tool has been very beneficial to our county. I recommend that other counties also partner with local, state and federal partners to collect wetlands data and turn that data into maps and tools that fit local needs."

-Ken McIlwain
Baldwin County, Alabama
Natural Resource Planner

This Smart Board with a plasma screen viewer can be utilized at community meetings to help incorporate wetland data into county planning processes.

The final product of the data collection projects was a complete GIS data layer of wetlands in Baldwin County. The county assessed the accuracy of the completed mapping information and found it to be extremely accurate in representing the presence of jurisdictional wetlands. Additional partners helped the county increase the usefulness of the data through collaboration on the completion of the RFWAM tool. These partners included the USEPA, U.S. Fish and Wildlife Service, the Alabama Department of Conservation and Natural Resources State Lands Division, the Alabama Department of Environmental Management and the University of South Alabama. The partners suggested that the county gather data such as flood zones and endangered species in order to assess the function and values of its wetlands. By 2003 the RFWAM visually represented all of the compiled wetlands information and allowed the county to categorize and prioritize all wetlands as suitable for either conservation, enhancement or restoration.

Baldwin County steadily built its wetlands data layer into a sophisticated tool that has led to numerous successful initiatives within the county to link land use decision to their impacts on wetlands. "The RFWAM tool has been very beneficial to our county. I recommend that other counties also partner with local, state and federal partners to collect wetlands data and turn that data into maps and tools that fit local needs," said Ken McIlwain, Baldwin County Natural Resource Planner.

The RFWAM tool has led to increased grant funding for wetland restoration projects, protection of some of the most valuable wetland resources and incorporation of wetland protection language into subdivision regulations that can be enforced quickly and clearly. In addition, private landowners and the development community have access to accurate wetlands information. The county plans to continue to improve its RFWAM tool through the incorporation of USDA-NRCS digital soil data and detailed land use/land cover data, recently acquired by the county. Also, Baldwin County hopes to continue to work with municipal governments to develop consistent wetlands and land use policies throughout the county.

For more information about Baldwin County's wetland mapping efforts visit *www.wetlands.co.baldwin.al.us* or read *County Water Quality Issue Brief: Using GIS Tools to Link Land Use Decisions to Water Resource Protection* at *www.naco.org/techassistance* under "Water Quality" then Publications.

Additional County Efforts

There are numerous examples of wetland data collection and mapping efforts undertaken by county governments and their partners. The Association of State Wetland Managers compiled a list of local government data collection and mapping efforts in *Protecting and Restoring Wetlands: Strengthening the Role of Local Governments*, available at *www.aswm.org.* The publication includes brief case studies with links to more information for Kane County, Illinois; Thurston County, Washington and Cass County, Minnesota.

Conclusion

County governments have the ability to influence the management of wetlands through their multiple planning and regulatory functions. Accurate information is critical to decisionmakers managing this resource and is often missing or inaccurate at the county level. This often leads to the loss or degradation of wetlands and unnecessary costs for communities and individuals. However, there is information available to help counties map their wetlands and with the right mix of leadership within the county, partnership building, grant funding and other resources counties across the country are collecting wetlands data and making accurate local wetland maps. Counties are using these maps to minimize future impacts, save present costs and help prioritize restoration efforts to correct the impacts of wetland loss and degradation that occurred in the past.

Accumulating wetlands data and producing accurate maps is a key step in the protection of a county's wetlands; however, it is just one step. Counties have multiple options available to them to protect their wetlands. Accurate and usable wetlands data allows communities to exercise their options with the confidence that they possess the data necessary to effectively and accurately protect this valuable resource.

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