



The State of Minnesota and the Digital Coast

The Digital Coast is a partnership effort and community resource for organizations that manage the nation's coastal resources.

Initiated and led by the National Oceanic and Atmospheric Administration (NOAA) Office for Coastal Management, the Digital Coast provides geospatial data and the tools and methods needed to turn these data into useful information. Digital Coast resources range from high-resolution data to on-site training opportunities. People use these resources to address timely coastal issues, including land use, coastal conservation, hazards, ocean planning, community resilience, and coastal economics, all of which are of critical importance to the state of Minnesota. The site was launched in 2008.

Minnesota Benefits

The numbers below are from fiscal year 2015.

DIGITAL COAST BY THE NUMBERS

4,308 Minnesota visitors to the Digital Coast website

186 Minnesota communities that used the Digital Coast

3,464 Gigabytes of high-resolution elevation data available for the state

456,615 Total visitors to the Digital Coast website

411% Return on investment*

*More information on the benefits and costs of the Digital Coast can be found here: <http://1.usa.gov/1O8fDa>

DATA

Minnesota elevation, land cover, aerial imagery, and county-level socioeconomic data, provided by various trusted sources, are available through the Digital Coast's Data Access Viewer. Some of the most commonly accessed Minnesota-based data are highlighted below.

Coastal Lidar

coast.noaa.gov/digitalcoast/data/coastallidar

Over 3,464 gigabytes of high-resolution elevation data covering Minnesota's entire coastal zone are available. This type of data is critical to the development of models that examine potential local flooding impacts from coastal storms and sea level rise.

Land Cover

coast.noaa.gov/digitalcoast/data/ccapregional

Land cover data provide inventories of coastal intertidal areas, wetlands, and adjacent uplands for the coastal regions. These data are used to identify high-priority landscapes for Minnesota's coastal protection and restoration efforts.

Economics: National Ocean Watch

coast.noaa.gov/digitalcoast/data/enow

This program provides time-series data on the ocean and Great Lakes economy, which includes six economic sectors dependent on the oceans and Great Lakes. Minnesota's coastal counties can use this information to gain insight into their local coastal economies.

TOOLS

The Digital Coast website provides access to over 50 data analysis, visualization, and other decision-support tools that assist coastal managers in deriving critical information from coastal data sets. Many of these tools are web-based, which extends the reach of GIS functions to anyone with an Internet connection.

Lake Level Viewer (U.S. Great Lakes)

coast.noaa.gov/digitalcoast/tools/llv

Visualize lake level changes that range from six feet above to six feet below historical long-term average water levels in the Great Lakes, along with potential shoreline and coastal impacts. Communities can use the data behind the tool for habitat and hydrological analysis.

Coastal County Snapshots

coast.noaa.gov/digitalcoast/tools/snapshots

Complex local data sets are automatically formatted into easy-to-understand stories, complete with charts and graphs, with this web tool. Local officials use the snapshots as a planning tool, since the information helps them assess their county's resilience to flooding and understand the benefits provided by natural resources.

C-CAP Land Cover Atlas

coast.noaa.gov/digitalcoast/tools/lca

This tool from the Coastal Change Analysis Program (C-CAP) makes land cover data easier to access and understand by eliminating the need for desktop GIS software. General trends in land cover change (such as forest losses or new development) are summarized, and specific changes of interest (salt marsh losses to open water, for instance) can be highlighted. This type of information is useful for planning purposes. Minnesota's officials found it particularly helpful as they worked to monitor watershed health along with land use changes.

Economics: National Ocean Watch Explorer

coast.noaa.gov/digitalcoast/tools/enow

Making Minnesota's economic data easier to use is the goal of this tool. The economic data provided by the Digital Coast focus on six sectors that depend on the oceans and Great Lakes: living resources, marine construction, marine transportation, offshore mineral resources, ship and boat building, and tourism and recreation. This tool helps users discover which sectors are the largest contributors to Minnesota's coastal economy in various parts of the state, which sectors are growing and declining, and which account for the most jobs, wages, and gross domestic product.

CanVis

coast.noaa.gov/digitalcoast/tools/canvis

This visualization tool helps users "see" potential impacts from coastal development or water level change. Users can download background pictures and insert objects (hotels, houses, and other features) of their choosing. This tool helped Minnesota visualize lake level changes and green infrastructure techniques.

OpenNSPECT

coast.noaa.gov/digitalcoast/tools/opennspect

This tool is being used to investigate potential water quality impacts from development, other land uses, and climate change. The tool simulates erosion, pollution, and their accumulation from overland flow. Uses include helping communities identify areas for restorable wetlands and riparian buffers to reduce pollution and flooding in watersheds.

TRAINING

In fiscal year 2015, over 1,500 coastal professionals received training on a variety of technical and process-based topics through the Digital Coast (coast.noaa.gov/digitalcoast/training/list). Courses taught participants a variety of skills, such as planning and facilitating collaborative meetings and best practices for risk communication.

GEOSPATIAL CONTRACTING

Through the Digital Coast, coastal organizations in need of geospatial data or services benefit from the use of the NOAA Office for Coastal Management's Coastal Geospatial Services Contract (coast.noaa.gov/idiq/geospatial.html). This contracting vehicle provides a way for local, state, and federal agencies to take advantage of a streamlined process to obtain services from the nation's top geospatial firms. In fiscal year 2015, over \$1.85 million was awarded to private geospatial firms to conduct mapping projects in the Great Lakes coastal zone, including mapping land use patterns and the Great Lakes.

DIGITAL COAST IN ACTION

The following stories illustrate how Digital Coast users are applying geospatial information resources to address coastal issues in Minnesota and the Great Lakes.

Advancing Restoration in the Great Lakes Region

coast.noaa.gov/digitalcoast/stories/advancerestoration

The Great Lakes is the largest system of freshwater resources in the world, but development along the shoreline is degrading the quality of these resources and posing risks to the environment and human health. Improving the quality of the Great Lakes is a top priority for local, state, and federal managers, who used the Digital Coast's Habitat Priority Planner and accompanying data to analyze strategic areas for habitat restoration along the watersheds leading into the lakes. The tool allowed managers to look at sites for wetland restoration, as well as developed areas to be converted into green space and habitat. The tool expedited the process and allowed for prioritization of wetland and habitat restoration.

Helping Minnesota Residents Understand Local Flooding Issues and Potential Solutions

coast.noaa.gov/digitalcoast/stories/duluth

Duluth, Minnesota, experienced a major flooding event in 2012 that cost over \$100 million in damages. With increasing urban development and increasing storm frequency, managers knew they needed to engage local residents in discussions about flooding impacts and mitigation techniques. Minnesota Sea Grant worked with NOAA's Digital Coast to hold a community open house and educate residents about recently identified flood impacts and costs, as well as green infrastructure techniques to reduce those impacts. By using storyboards, members of the community were able to visualize potential flood impacts and understand how to implement mitigation measures.

Communicating Coastal Flooding Risks around the Great Lakes

coast.noaa.gov/digitalcoast/stories/greenbay

Living along Lake Michigan, residents understand the risks their homes suffer from flooding but lack the resources to determine the extent of floodwaters and their proximity to this hazard. Managers worked with members of the Association of State Floodplain Managers to find ways to communicate these risks to homeowners. By using the Digital Coast's CanVis tool, they were able to easily show potential flooding and its impacts to shore-abutting residences. From these visualizations, homeowners will gain critical insight into how to protect themselves both physically and financially from the threats of coastal flooding.

The Digital Coast Partnership

One of the goals of the Digital Coast is to unify groups that might not otherwise work together. As a result, the Digital Coast Partnership is building not only a website, but also a strong collaboration of coastal professionals intent on addressing common needs. Currently, the eight members of the Digital Coast Partnership include the American Planning Association, Association of State Floodplain Managers, Coastal States Organization, National Association of Counties, National Estuarine Research Reserve Association, National States Geographic Information Council, Nature Conservancy, and Urban Land Institute. The responsiveness of these organizations and the direct lines of communication fostered by the effort have proven essential for ensuring the success and continuing relevance of the Digital Coast, and for allowing the platform to evolve and adapt to changing needs and priorities.