DIGITAL COAST
ACCOMPLISHMENTS REPORT

Fiscal Years 2021 to 2023

NOAA OFFICE FOR COASTAL MANAGEMENT
coast.noaa.gov/digitalcoast

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Introduction

Dear Coastal Resilience Partner,

Digital Coast is government done right. The focus is on providing communities with the data, tools, training, and technical assistance needed to protect citizens, infrastructure, and economies from coastal hazards and other threats.

The program, which originated in 2007, helps communities be effective, creative, and science-based in their approach. The *Digital Coast website* is the most visible part of the effort. Content, which comes from many organizations including collaborations with the private sector, is curated and often spearheaded by NOAA for this target audience.

The *Digital Coast Partnership*, composed of eight national organizations that represent a significant portion of the user community, is another key component of Digital Coast's success. Their sustained involvement helps keep the content relevant and acts as a catalyst for bringing together these organizations and others to work toward common coastal management goals.

The website roster, which started at 145 data sets, five tools, and a handful of training courses, now includes over 3,200 data sets, 84 tools, and 174 learning products and services. Content comes from NOAA and close to 900 contributing partners, including nonprofits, academia, private firms, and local, state, tribal, and federal government agencies.

Digital Coast's success in helping thousands of coastal decision-makers culminated in December 2020 when the Digital Coast Act was signed into *law*, providing formal congressional support for the program. The legislation recognized the Digital Coast as a constituent-driven program that helps leaders make smart decisions about the coast.

A further testament to the importance and value of the Digital Coast is documented in *The Societal Value of NOAA's Digital Coast*, a study conducted by Resources for the Future. This report says the *Sea Level Rise Viewer*, for instance, yielded societal benefits of $1.1 million to $2.2 million in a single use case. Digital Coast instructor-led training programs yield benefits of $1.8 to $9.7 million annually, based on the number of offerings and participants.

In addition, the Digital Coast is making significant progress in achieving the objectives outlined in the *Digital Coast Strategic Plan*. Some of the achievements include increasing data availability in underrepresented areas, providing training programs that offer certification credits, improving online courses to make them accessible to diverse audiences, improving the website, and funding local projects. The success of the Digital Coast during this reporting period is detailed in the remainder of this document.

Thank you to everyone who contributed to the success of the Digital Coast.

Sincerely,
Nicholas Schmidt, Division Chief
Science and Geospatial Services
NOAA Office for Coastal Management

Overall visits are up by 47 percent during this reporting period.

Summarizing the Digital Coast Accomplishments Report

First released in 2007, the *Digital Coast* caters to the unique needs of coastal communities, delivering not only coastal data, but also the tools, training, and information needed to make these data truly useful. Since then, the success of the site led to formal congressional support for the program through the 2020 *Digital Coast Act*, which supports its growth and development.

The legislation outlines various areas of improvement, including developing additional content, thoughtfully coordinating with underserved communities, increasing the availability of land cover and other data for coastal communities, and documenting best practices of product and service delivery. It also emphasizes the need for continuous improvement of the website interface, making it more accessible, increasing decision-support tools, enhancing opportunities to leverage partnerships, and providing more fellowship opportunities.

The *Digital Coast Strategic Plan* was informed by congressional guidance and this report highlights significant achievements made between 2021 and 2023. During this period, the site received over 4,650,000 visits. The site can attribute much of this success to the value of the information resources that can be found there. Equally important is the user input used to keep the site relevant. Currently, the site contains

- 3,200 data sets
- 84 tools
- 174 learning products and services
- 118 stories from the field
- 900 contributing partners

This report follows the format of the *Digital Coast Strategic Plan*. A summary is provided below and additional details are included in the report.

OBJECTIVE 1: Provide Actionable Decision-Support Resources

- Tools: 18 tools developed by NOAA and contributing partners
- Training: 229 training sessions and 42 different courses delivered
- Technical Assistance: ~16,000 users received technical assistance through one-on-one support or training

OBJECTIVE 2: Increase Availability of Core Coastal Data Sets

- 118,000 downloads of custom data in fiscal year 2023, a 27 percent increase since fiscal year 2021
- 33 trillion lidar points, more than doubling holdings since the start of fiscal year 2021
- 200 terabytes of imagery, almost quadrupling over this period
- Improved access to data for typically underserved areas such as Guam, the Northern Mariana Islands, Alaska, and several Great Lakes tribal communities

OBJECTIVE 3: Advance the Digital Coast Partnership

- 8 national organizations representing over 100,000 members collaborate with NOAA to ensure that coastal leaders have access to relevant data, tools, training, and other resources
- 4 funded Digital Coast Connects projects engaged marginalized communities to improve coastal inundation impacts
- 6 Digital Coast Fellows provided technical assistance to Digital Coast Partners while receiving on-the-job training and educational opportunities

OBJECTIVE 4: Expand NOAA and Interagency Collaborations

- 8 federal agencies collaborating to share data, tools, and training to reduce duplication of efforts
- 4 terabytes of U.S. Army Corps of Engineers imagery added to the Digital Coast since fiscal year 2021
- 148 billion lidar points added to the Digital Coast from fiscal years 2020 to 2023 from U.S. Army Corps of Engineers sources
- 680 imagery data sets available on the Digital Coast through collaborations with the NOAA National Geodetic Survey
- Worked with FEMA to highlight Digital Coast resources that tribal communities could use to develop hazard mitigation plans
- Supported telecommunications infrastructure siting that included climate considerations using current and future coastal inundation

OBJECTIVE 5: Enhance the Digital Coast Platform

- 4,651,595 overall visits, a 47 percent increase, during this time frame
- Digital Coast website was completely redesigned in fiscal year 2023
- Increased visitors in core sections – 105 percent increase for data, 48 percent increase for tools, and 47 percent increase for training
- 6,000 percent increase in overall navigation use on mobile devices, thanks to the website redesign that focused on improvements for mobile users
- 500 percent increase in site visits due to clear links to topic pages
- 6 minutes 30 seconds average time spent on pages, a 22 percent increase (industry benchmark is about 47 seconds, and the government average is 2 minutes 36 seconds)*

Sources: Contentsquare's 2023 Digital Experience Benchmark report and Government Services Administration's Digital Analytics Program Google Analytics

OBJECTIVE 1:

Provide Actionable Decision-Support Resources Through Tools, Training, and Technical Assistance

While data is the foundation of the Digital Coast, the site also provides the related tools, learning resources, and technical assistance needed to ensure effective use of the data as people make decisions about the future of coastal communities. An added benefit: providing these resources via the Digital Coast also makes them more accessible to a broader range of audiences.

Tools: Decision-Support Products

ACCOMPLISHMENTS

During this reporting period, the Digital Coast added 18 tools developed by NOAA and contributing partners, removed outdated tools, and improved several others, including the *U.S. Interagency Elevation Inventory*, *Historical Hurricane Tracks*, *Sea Level Rise Viewer*, *Data Access Viewer*, and *Coastal County Snapshots*.

EXAMPLES

- **Sea Level Rise Viewer.** In Mississippi, the Jackson County Utility Authority needed a new location for a facility that collects, treats, and repurposes wastewater. The *Sea Level Rise* Viewer helped community leaders find an optimum spot—one that would remain safe from floodwaters through the next 50 years. This is an example of a science-based decision that saves the community money and mitigates the potential for service interruptions.
- **NOAA's Coastal Flood Exposure Mapper.** During an anti-poverty summit, Florida's Miami-Dade County Office of Resilience used *this tool* to familiarize residents with community-specific flooding risk. Many eyes were opened when shown the risk that exists beyond the shoreline and waterfront. Maps developed with this tool prompted discussions about flood risk and how residents and the community could increase their resilience.
- **Coastal County Snapshots.** *This tool* allows users to learn about their county's exposure and resilience to flooding, economic benefits from the ocean and Great Lakes, and impacts of sea level rise. The tool was completely rebuilt in 2022 to add data and enhance functionality. Current snapshot topics include marine economy, total coastal economy, sea level rise, and special flood hazards.
- **Coastal Change Hazards Portal.** *This portal*, developed by the U.S. Geological Survey, provides scientifically credible data suitable for use in land use planning projects, storm response and recovery protocols, and infrastructure, ecosystem, and cultural resource management decision-making. Resources are organized under three coastal hazard themes: extreme storms, shoreline change, and sea level rise.
- **Tree Equity Score.** Developed by American Forests, the *Tree Equity Score tool* measures how well urban tree canopy benefits are reaching those who need them most. Scores are based on tree canopy, surface temperature, income, employment, race, age, language, and health factors. These scores guide investment in communities living on low incomes, communities of color, and all those disproportionately affected by extreme heat, pollution, and other environmental hazards.

Training: Digital Coast Academy

ACCOMPLISHMENTS

Empowering decision-makers to effectively manage the coast is the mission of the Digital Coast. The *training section* integrates a wide range of learning products and services to provide practical guidance on coastal issues and to help coastal managers develop their skills. Learners can register for live courses led by expert trainers. Over the past three years, trainers have provided 42 courses totaling 229 deliveries. Ninety-three percent of learners attending these courses reported learning something applicable to their work. To better meet the needs of busy working professionals, the Digital Coast Academy also provides engaging, on-demand resources, such as interactive modules, videos, recorded webinars, publications, quick references, and case studies. The academy hosts 211 on-demand resources—47 of which are new. The average user rating for the interactive modules during this time frame was 4.4 stars (out of 5).

EXAMPLES

- **Increased On-Demand Learning.** The COVID-19 pandemic increased the need for online learning. In addition to the existing on-demand portfolio, the Digital Coast Academy team transitioned in-person instructor-led courses to online learning environments. This brought the number of instructor-led courses provided online to 24—meeting a critical need during the pandemic.
- **Blended Learning.** Instructor-led training and on-demand resources do not exist in isolation. Instead, instructional designers and trainers craft innovative learning experiences that blend resource types to maximize learning. Instructor-led sessions focus on discussion, engagement, problem-solving, and project development—while complementary on-demand resources replace traditional lectures by promoting self-study and providing on-the-job support.
- **Novel Strategies.** Over the past three years, the team has implemented a wide range of approaches to enhance the learning experience, such as
    - » Piloting a learning management system to promote personalized, asynchronous learning.
    - » Partnering with professional organizations like the Association of State Floodplain Managers to co-develop interactive modules.
    - » Developing Spanish translations of select learning resources and instructor-led survey tools.
    - » Using new product development approaches to enhance accessibility and use of mobile devices.
    - » Implementing learner-focused principles in the redesign of the Digital Coast Academy website.
- **Relevant Subject Matter.** The Digital Coast Academy teams developed new courses and products on a range of essential coastal management topics, including adaptation planning, nature-based solutions, effective risk communications, and coastal economics. The academy also strengthens the use of Digital Coast data and tools by providing self-paced instructional resources for *lidar data*, the *Sea Level Rise Viewer*, and the *Coastal Flood Exposure Mapper*.

"This NOAA course was essential to a successful collaborative resilience planning initiative that resulted in establishing a multi-jurisdictional steering committee and successfully receiving grant funding to develop a whole community plan."

"Best tutorial ever. Quick, simple, easy to follow, and to the point."

Feedback received from a training participant

Technical Assistance: One-On-One Help

ACCOMPLISHMENTS

Digital Coast teams offer various types of technical assistance. NOAA's regional staff, located throughout the nation's coastal zone, provide technical assistance, ranging from an email or phone call to more involved work that can include workshops, training programs, and product demonstrations. Since October 2020, about 16,000 coastal professionals received technical assistance, covering everything from geospatial support, outreach, facilitation and process design, presentation support, making network connections, strategic planning, and meeting planning and support.

EXAMPLES

- **Diving into the Digital Coast Webinars.** *These regionally focused webinars* highlighted the data, tools, and training relevant to the specific geography. Included in this effort were events in the Pacific Northwest, California, and American Samoa. In addition to state partners, the team was able to serve Indigenous communities in Washington and several in California through the Tribal Marine Stewards Network.
- **Wild Rice Restoration Support.** Across the Lake Superior and Michigan-Huron basins, NOAA Digital Coast staff provided a convening and technical assistance role to support manoomin (wild rice) restoration, monitoring, and mapping. Much progress was made, including new funds for the restoration, new data points regarding cultural and ecosystem information, and a program that provided guidance about protecting and harvesting this food source. Additional project work expanding to address unmet geospatial and technical assistance needs is anticipated starting in fiscal year 2024 and will continue over the next two years.
- **Expanding Capacity for Technical Assistance in Alaska.** The recently established Alaska regional geospatial coordinator position has enabled the agency to assist tribes and tribal organizations by collecting baseline data; planning for flooding, erosion, and permafrost degradation; and responding to and recovering from natural disasters. Specifically, the coordinator connected the Native Villages of Nelson Lagoon and Quinhagak, which are actively engaged in climate adaptation, with partners who support flooding and erosion-focused projects. Going forward, plans to relocate infrastructure will be bolstered by lidar data collection, contracted for acquisition by Digital Coast. Community lidar collection areas were co-produced with tribal partners to cover current community footprints, potential relocation or expansion sites, and areas of cultural importance.
- **Tailoring Local Water Level Monitoring to Support Decision-Making.** Tools such as NOAA's *Sea Level Rise Viewer* and *VDatum* provide data-driven visualizations and datum transformation functionality to help communities identify and quantify flood inundation areas and impacts to ecosystems and infrastructure. In many remote areas water level observations do not exist to validate or refute tide predictions. In fiscal years 2021 and 2022, technical assistance was provided to rural communities in Maine to monitor local water levels and develop methods to communicate flood risk.

"NOAA in Charleston has beautifully supplied 2010 LiDAR cross section from the sea inland across the Lower Coastal Plain of Georgia. The flights, the software allowing elevation profiles of landscape (except for buildings) and the expertise of NOAA and team and this portal are superlative . . . Thank you."

Comment received from the website

OBJECTIVE 2:
Increase Availability of Core Coastal Data Sets

The Digital Coast works to ensure that all users have easy access to the best data available. Challenges associated with this goal include data coverage gaps as well as gaps in the technical capabilities of some communities. Efforts to address these challenges are provided below.

Data Acquisition

ACCOMPLISHMENTS

The Digital Coast leveraged the resources of NOAA, other federal agencies, state partnerships, and external partners to acquire and disseminate foundational data sets. Many were acquired in partnership with private sector firms, and include elevation, land cover, marine cadastral, imagery, and economic data.

EXAMPLES

- **Expanded Imagery and Data Holdings.** The Digital Coast's imagery and data holdings have almost doubled, and lidar data holdings have more than doubled, as shown in *Figure 1*.
- **Rise in Custom Data Downloads.** Digital Coast imagery, landcover, and lidar custom data downloads increased from 93,000 in fiscal year 2021 to 118,000 in fiscal year 2023.
- **Added More Data to "the Cloud."** A recent Digital Coast initiative is putting more data in the cloud, which makes it easier to download large data volumes and therefore widens the range of people who can access and use these data holdings. Over 25 terabytes of data is downloaded per month for lidar alone.
- **Increased Data Collections.** Digital Coast added data collections in areas where data are frequently difficult to obtain because of the location, extent of data needed, or the condition of the terrain. This includes new data provisions for Guam, Northern Mariana Islands, Alaska, and several tribal lands in the Great Lakes. *Figure 2* shows where NOAA's Office for Coastal Management plans to supplement lidar acquisitions near tribal communities in Alaska in coordination with the Alaska Mapping Executive Committee. In addition, a number of tribal communities in the Great Lakes coordinated with the office to acquire hyperspectral imagery, as shown in *Figure 3*.
- **Enhanced Tools.** An important Digital Coast tool, the *Coastal Flood Exposure Mapper*, was updated for the first time with Pacific and Caribbean territory data.

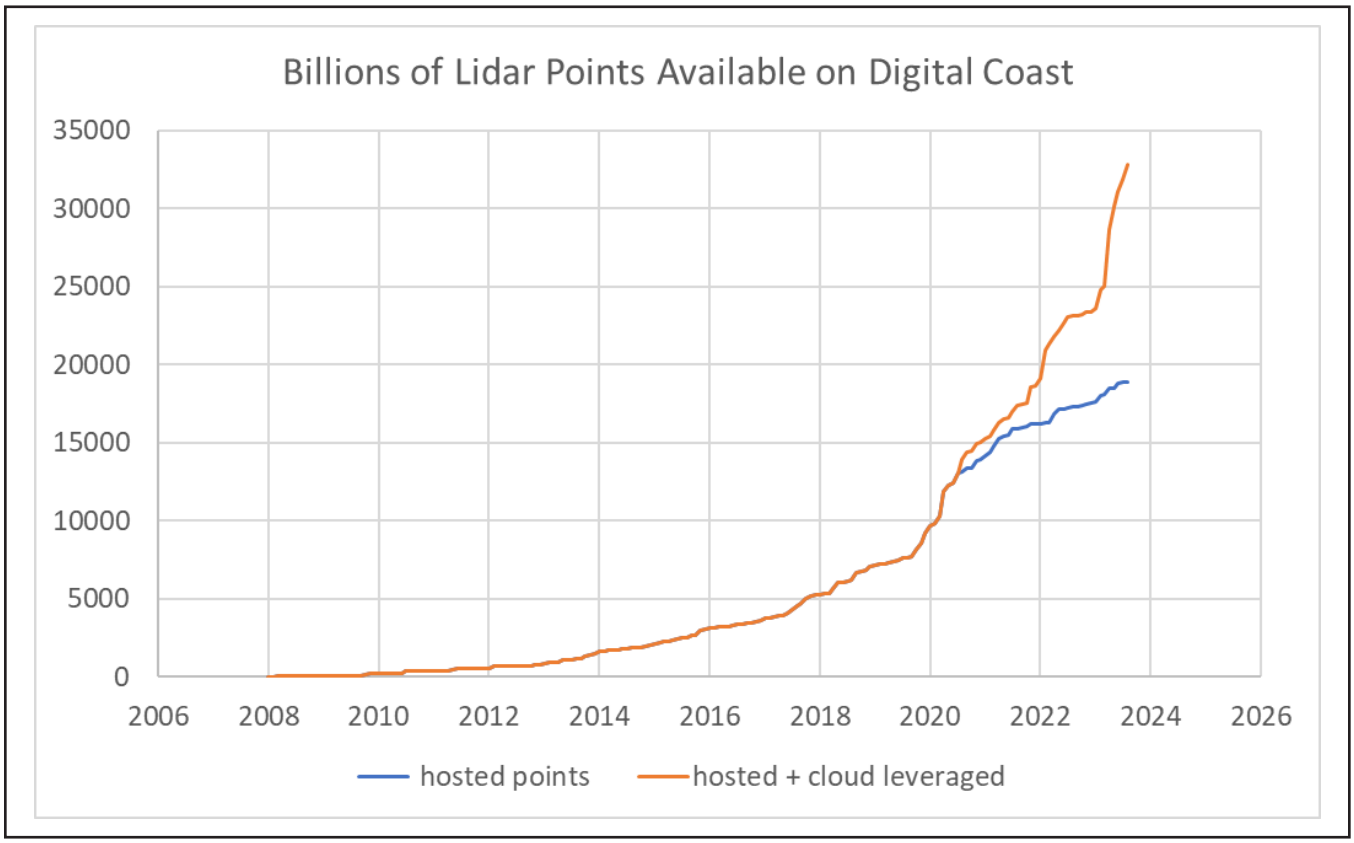

Figure 1. Digital Coast maintains the hosted points data (blue line) on premise. The cloud-leveraged data points (red line) are maintained by another organization, usually the U.S. Geological Survey, and can be streamed for processing through the Digital Coast. The site's data access viewer adds access to custom processing while reducing duplication and storage costs.

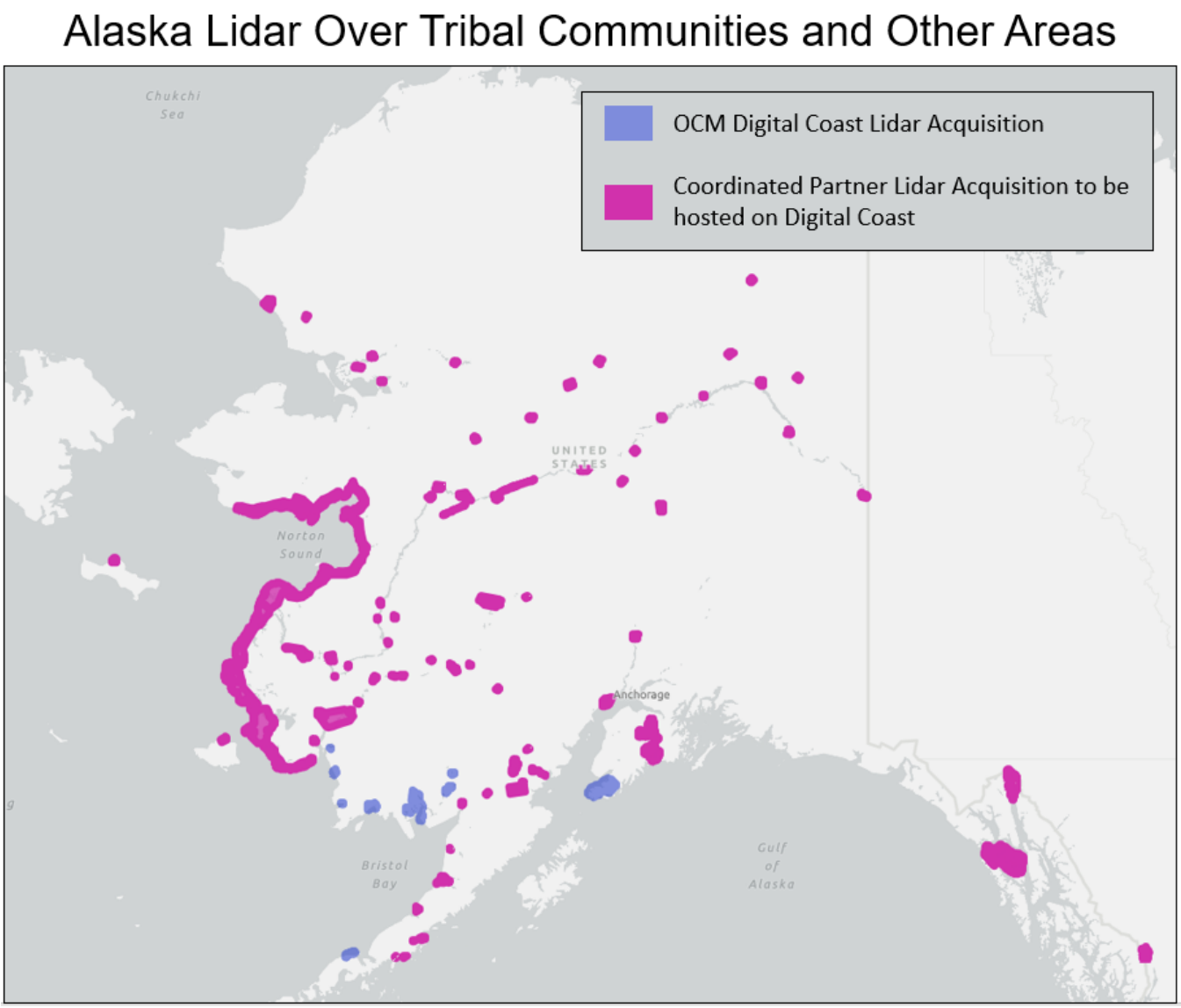

Figure 2. Areas planned for statewide lidar collection by the State of Alaska and federal agencies that participate in the Alaska Mapping Executive Committee. Digital Coast acquired additional areas (purple) to fill gaps in coverage. This additional investment provided lidar coverage for over 50 tribal communities without previous lidar access. These data will provide a better understanding of post-Typhoon Merbok disaster response, flooding or erosion issues, permafrost degradation studies, landslide hazard assessments, and much more.

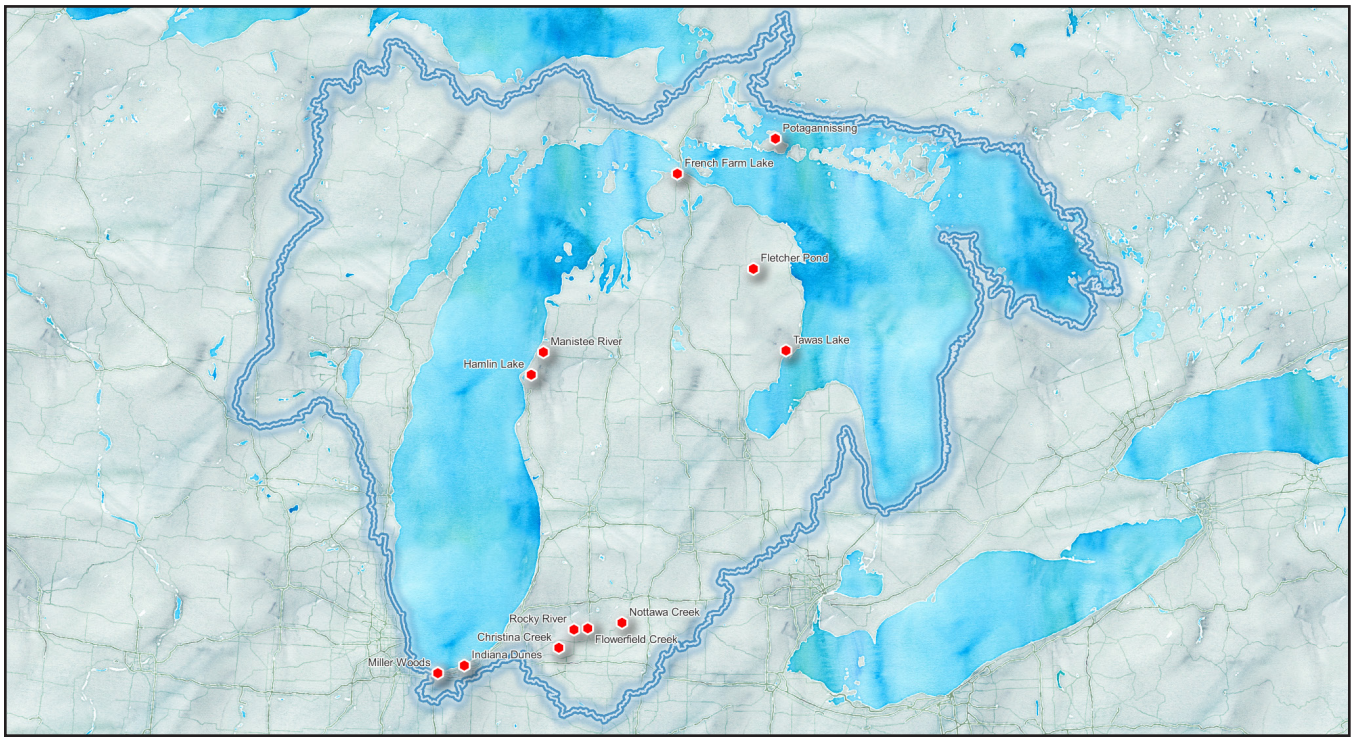

Figure 3. Great Lakes hyperspectral imagery data sets were collected with support from tribal communities for 12 areas of interest (red dots). The data are being used to help identify and monitor wild rice stands that are significant to the tribal community (see example under this report's "Technical Assistance" section). These data were reviewed by the tribal community members and added to the Digital Coast with the permission of those tribal communities.

A Collaborative Approach for Data Gathering

ACCOMPLISHMENTS

Another way the Digital Coast is increasing the availability and discoverability of previously hard-to-get data is by working with different organizations, agencies, and the private sector. This approach also brings down the cost of delivering this data for all parties.

EXAMPLES

Collaboratively Distributing Data. Using one platform to distribute data from numerous sources allows agencies to disseminate data to a wider audience without having to build their own infrastructure. The National Geodetic Survey and the U.S. Army Corps of Engineers, for instance, use the Digital Coast to distribute coastal lidar and imagery. Statewide lidar data from the North Carolina Department of Transportation and Division of Emergency Management are hosted in the Digital Coast. State agencies from Florida, New York, Pennsylvania, Rhode Island, and South Carolina provide lidar data to the U.S. Geological Survey for access through the Digital Coast.

Data in Action

ACCOMPLISHMENTS

Here are a few examples of communities using data found on the Digital Coast.

EXAMPLES

- **Elevation Data.** This Digital Coast data set is used by numerous coastal communities and private firms to develop baseline elevation models, monitor sand movement and erosion, develop shoreline maps, and delineate tsunami warning areas. Example: In California, elevation data allowed the Morro Bay National Estuary Program and California Polytechnic State University to study geomorphological changes in the intertidal zone after an estuary-wide eelgrass collapse caused erosion to increase. The data collected are expected to yield insights about climate change impacts on coastlines.
- **Land Cover Data.** To scientifically analyze the health of Texas' Galveston Bay, a group of citizens created the Galveston Bay Report Card. They used NOAA's land cover data to calculate wetland loss. After Hurricane Harvey, the report card provided details regarding how habitats and conditions recovered, and gave context for what makes Houston and Galveston flood prone. As a direct result of the report card, groups volunteered to restore salt marshes in the watershed, 150 people attended Wetland Walkabout tours of a restored freshwater ecosystem, and 160 people attended Squawk Walk to learn about local and migratory birds in freshwater wetlands.

"Thank you, Digital Coast Data Team, for compiling all the elevation data for use by our firm. Down through the years, clients are simply amazed at this product. Keep up the good work!"

Comment received from the website

OBJECTIVE 3:
Advance the Digital Coast Partnership

Goal three of the *Digital Coast Strategic Plan* is focused on strengthening, expanding, and leveraging the external partnerships that represent the diverse people and communities who depend on Digital Coast resources. A strong commitment to partnerships ensures the success of Digital Coast, and the site provides an effective platform for these groups to work together to address coastal issues.

Improving Coastal Management Through the Partnership

Much of the Digital Coast's success is owed to the *Digital Coast Partnership*. The partnership, representing organizations with well over 100,000 members, collaborates with NOAA to ensure the site is focused on the relevant data, tools, and training communities need to make informed decisions about the nation's coastal resources. A model for service delivery, the partnership provides ongoing user engagement that is crucial for NOAA to effectively evaluate, assess, and respond to evolving user needs.

The Digital Coast Partnership includes the following organizations.

- *American Planning Association*
- *Association of State Floodplain Managers*
- *Coastal States Organization*
- *National Association of Counties*
- *National Estuarine Research Reserve Association*
- *National Oceanic and Atmospheric Administration*
- *National States Geographic Information Council*
- *The Nature Conservancy*
- *Urban Land Institute*

ACCOMPLISHMENTS

The Digital Coast Partnership collaborates on joint projects prioritizing important issues such as coastal resilience, climate change impacts, and diversity, equity, and inclusion. The partnership improves the distribution and usage of the resources and data provided by various partners, and helps advance coastal management initiatives across the nation. The partnership also works to unify groups that might not otherwise work together, often through Digital Coast Connects projects and the Digital Coast Fellowship.

Example: the Association of State Floodplain Managers and the Coastal States Organization worked together to develop the *Community Rating System Green Guide* and co-hosted three Digital Coast Fellows. The Green Guide empowers participating communities to enhance their credits in 25 of the "green" elements in the Community Rating System. Fellowship projects focused on coastal flood risk management policies, FEMA's Community Rating System, and repetitive flood loss, which culminated in the development of the *Repetitive Flood Loss Training Series*.

EXAMPLES

- **Digital Coast Connects.** A collaborative effort among Digital Coast partners and their member organizations to address coastal issues. It's all about "connecting" to increase local, on-the-ground collaboration and improve effectiveness in addressing coastal issues. In 2022, the National Estuarine Research Reserve Association received Digital Coast Connects funding to support two reserves engaging marginalized communities to improve coastal inundation impacts.
  - » **North Carolina Reserve.** The North Carolina Research Reserve is developing an engagement strategy to support the Scuppernong Regional Water Management Study. Through a series of workshops, the reserve will work with underserved coastal counties on the peninsula to reduce tension and misunderstandings among regional stakeholders.
  - » **Chesapeake Bay Virginia Reserve.** The Chesapeake Bay Virginia Reserve Digital Coast Connects project is empowering underserved communities in Virginia's Middle Peninsula through knowledge exchange and tool sharing. The two-pronged approach includes regional workshops to discuss risks, hazards, and potential solutions for coastal inundation, and producing a series of informative videos for property owners to demonstrate the benefits of nature-based strategies to minimize flooding impacts.

Digital Coast Fellowship

ACCOMPLISHMENTS

Since its launch in 2012, the Digital Coast Fellowship has provided invaluable opportunities for postgraduate students to gain practical knowledge and training in coastal resource management and policy while working with Digital Coast Partnership organizations. Up to three fellows are placed with Digital Coast Partnership organizations every other year. Fifteen fellows have been placed with seven Digital Coast Partnership organizations since the program's inception, and six since the Digital Coast Act passed in December 2020.

The Digital Coast Fellowship, along with other fellowship programs originating with NOAA's Office for Coastal Management, is dedicated to promoting diversity, equity, inclusion, and justice. Example: partner organizations must provide career development training for fellows and describe how their project will advance these principles. Some of the accomplishments achieved by past fellowship projects are provided below.

EXAMPLES

- **Digital Coast Tools and Resources.** The Nature Conservancy hosted a fellow to enhance its membership's ability to use Digital Coast tools and resources, especially after hurricanes, when there is a high demand for nature-based solutions that improve coastal resilience. For example, the *Scaling Up Nature-Based Solutions* project identified and promoted nature-based solutions for resiliency in the Florida panhandle.

- **Reducing Flood Damages and Costs.** The Association of State Floodplain Managers partnered with the Coastal States Organization to host a fellowship project to tackle one of the biggest challenges for reducing flood damages and costs in a changing climate—properties that are repeatedly flooded. This fellow led efforts to develop the *Community Resilience Guide for Repetitive Floods Loss*, a web-based resource that provides technical assistance and training for local floodplain managers. A *Repetitive Flood Loss Training Series* was developed to introduce the necessary knowledge, skills, and abilities required to use GIS data and tools for floodplain management. This training series also covers funding sources for flood mitigation efforts and provides flood awareness for community members.
- **Coastal Wetland Migration Pathway Information.** The National Estuarine Research Reserve Association hosted a fellow to explore the need for coastal wetland migration pathway information, including how wetlands might move when facing sea level rise and other hazards. The objective was to identify preferred communication approaches and develop the best available wetland migration data and tools.
- **Responding to Coastal Storms.** The National States Geographic Information Council hosted a fellow to help Alaskan communities respond to coastal storms through the development of an online tool used for visualizing flood risk. This tool is being used to communicate flood risks and help communities develop their own risk analysis. Building on the success of *this project*, the National Coastal Resilience Fund awarded more than $1 million dollars to map flood risks and identify hazard data gaps for 44 additional Alaska Native communities.

"It's incredibly rewarding to know there's a new generation of educated and energetic individuals that want to make a difference in floodplain and coastal management. It is rewarding and refreshing to work with, share with and learn from them."

Feedback received from a Digital Coast Fellowship Host

OBJECTIVE 4:
Expand NOAA and Interagency Collaborations

Providing access to resources from across NOAA and other federal agencies is good for the taxpayer. The Digital Coast approach helps reduce duplication of effort and expand the user community for each product. Below are examples that showcase some of the popular data, tools, and training provided by Digital Coast contributor organizations, as well as some of the more notable partnership initiatives and assistance.

EXAMPLES: DATA AND TOOLS

- *U.S. Interagency Elevation Inventory* is hosted on the Digital Coast and provides access to all lidar data through a strong interagency effort. Contributors include NOAA, the U.S. Geological Survey, the Federal Emergency Management Agency, the U.S. Army Corps of Engineers, the U.S. Department of Agriculture's Natural Resource Conservation Service, the U.S. Department of Agriculture's U.S. Forest Service, and the National Park Service.
- U.S. Geological Survey data and tools, including the *Hazard Exposure and Reporting Analytics* tool, provide insight into potential population, economic, land cover, and infrastructure vulnerability.
- U.S. Environmental Protection Agency tools, including the *National Stormwater Calculator* and the *Environmental Justice Screening and Mapping Tool*, visualize data to identify communities that may be disproportionately affected by environmental hazards.
- Tools to support equitable climate adaptation and resilience, developed through interagency collaborations led by the White House and U.S. Global Change Research Program, include the Climate and Economic Justice Screening Tool, and the *Climate Mapping for Resilience and Adaptation Assessment Tool*.
- U.S. Army Corps of Engineers and the *Joint Airborne Lidar Bathymetry Technical Center of Expertise* provide access to their lidar and imagery data through the Digital Coast. As of October 2023, this includes 342 billion points of lidar data and 60 imagery data sets.
- NOAA's *National Geodetic Survey* provides imagery and lidar data via the Digital Coast. As of October 2023, this includes 2.3 trillion points of lidar data and 680 imagery data sets.

EXAMPLES: PARTNER INITIATIVES AND ASSISTANCE

- Continued coordination with interagency groups, including Multi-Resolution Land Characteristics Consortium, 3D Elevation Program, National Digital Orthoimagery Program, and Commerce Imagery Users Group, is undertaken to expand partnership opportunities, increase collaboration, and decrease duplication of effort.
- Digital Coast staff worked with staff from the U.S. Geological Survey's Coastal and Marine Hazards and Resources Program to share best practices and lessons learned from the development of the Digital Coast effort. This information was used by the Geological Survey when developing its Coastal Science Navigator product, which was released in 2023. In addition to sharing information on the Digital Coast's approach to end user-driven service delivery, this support included coordinating an opportunity for Digital Coast users to provide feedback on the beta product during the Coastal GeoTools conference in February 2023.

- Continued coordination with the Federal Emergency Management Agency on the Hazard Mitigation Planning program resulted in a presentation highlighting Digital Coast resources that tribal entities could use to develop hazard mitigation plans.
- Digital Coast information products and services focused on flooding resilience were provided as part of a NOAA-led effort with the National Telecommunications and Information Administration to incorporate climate considerations into local decisions about telecommunications infrastructure.
- Digital Coast staff were instrumental in developing a job aid that outlines the steps federal agencies can use to determine the future floodplain as part of the Federal Flood Risk Management Standard. The simplified climate-informed science approach for coastal communities provides guidance on the use of the Digital Coast Sea Level Rise Viewer to incorporate relative sea level rise projections into floodplain determination efforts. In addition, staff from the Digital Coast Academy developed a *companion video* to explain key concepts on the Federal Flood Risk Management Standard effort and its implementation by federal agencies.

OBJECTIVE 5:
Enhance the Digital Coast Platform

The efficient and effective delivery of all Digital Coast products and services depends on an innovative user interface, online infrastructure, and administrative team to keep the site in tip-top shape. Also important: vetting the content for relevance and providing a standardized entry for each product and service.

Redesign Improves User Experience

ACCOMPLISHMENTS

In fiscal year 2023, the Digital Coast website was completely redesigned, resulting in an improved user experience. Web analytics were used to identify areas for improvement, and best practices were implemented to ensure that the site is accessible to all. The analysis revealed that mobile users were facing issues in accessing the site, so the website was enhanced to address this. The resulting changes helped create an 82 percent increase in mobile user access.

The website's navigation, search functionality, and filtering options were further improved, making the site even simpler to use. The inclusion of environmental justice and other filters made search results more streamlined, and backend configurations were improved to allow faster upgrades and content additions. Other improvements include access to the "Topics" section from the home page, allowing users to quickly find resources on flooding, ocean economy, risk communication, adaptation planning, and more, and an enhanced "Stories from the Field" section where users filter by region or topic to see how others are using Digital Coast resources to make an impact.

During the redesign, a user feedback mechanism was also added to all training pages. This feedback provides customer insight that informs updates and changes to trainings, the website, and other ways to enhance the customer experience.

The redesign significantly improved the user experience. The overall navigation use, which was previously challenging to access on mobile devices, saw a 6,000 percent increase. Use of the search function has more than doubled and clear links to the topic pages boosted site visits to this section by 500 percent. Visitors spend more time in all sections, interacting with the sections five times more frequently.

EXAMPLES

- **Core Sections See Visitor Increases.** "Data" section access increased by 105 percent, "Tools" by 48 percent, and "Training" by 47 percent.
- **Site Navigation Improvements.** Use of the site navigation interface on mobile devices has increased by 6,000 percent. Use of the search function has doubled.
- **More Time Spent on Pages.** Time spent on a page is a consumer satisfaction indicator, one that shows impressive interest and use from Digital Coast constituents. The average time currently is 6 minutes 30 seconds (up 22 percent), significantly longer when compared to the all-industry benchmark of 47 seconds, or even the government average of 2 minutes 36 seconds.*

Sources: Contentsquare's 2023 Digital Experience Benchmark report and Government Services Administration's Digital Analytics Program Google Analytics

Driving Traffic to the Website

ACCOMPLISHMENTS

Partners recognize the value of Digital Coast and provide links to the Digital Coast website from their own sites. These "buddy links" bring users to the Digital Coast. In the last three fiscal years alone, these links have generated 1,585,969 visits. The Digital Coast prioritizes maintaining and cultivating these buddy links both to and from the website.

Digital Coast's outreach efforts through social media posts and the newsletter also play a vital role in increasing website access and partner visibility. The organization's social media accounts have experienced consistent growth, surpassing government averages. The Digital Coast Connections newsletter (*subscribe*) is published monthly and highlights new data, tools, trainings, and more.

EXAMPLES

- **Buddy Link Increased Traffic to and from NOAA Sites.** Visitors from other NOAA sites to Digital Coast increased by 33 percent. Additionally, Digital Coast boosted traffic to other NOAA sites by 106 percent.
- **Buddy Link Increased Traffic to and from Non-NOAA Sites.** Visitors from non-NOAA sites to the Digital Coast have increased by 41 percent. Likewise, Digital Coast has boosted traffic to non-NOAA sites by 31 percent.
- **Social Media Generates Interest.** Almost 70,000 visitors landed on the site after seeing a social media post. The actual number is likely significantly higher, as studies suggest that most visitors don't click on social media links but use alternative ways to access the information, such as search engines.
- **Digital Coast Connections Newsletter.** There were over 17,000 visits from fiscal years 2021 to 2023 generated by this newsletter (an increase of 76 percent in comparison to the previous period).

The Future

The content, service delivery, and, most importantly, the use of Digital Coast have significantly increased since the Digital Coast Act became law in 2020. NOAA's Office for Coastal Management has led this initiative, but it would not have been possible without the input, support, and development efforts of the contributing partners, the private sector, and the Digital Coast Partnership. The Office for Coastal Management is grateful for this ongoing support. As the project teams continue to address the requirements and objectives outlined in the legislation, the staff is excited to implement the following initiatives.

- Digital Coast resources will continue to provide and improve upon equitable service delivery. Example: specialized training and geospatial data and tools for underserved areas in Alaska and the territorial islands.
- The Digital Coast Partnership organizations will continue to focus on innovative ways to build partnerships with underserved communities to address climate resiliency, including through the implementation of local Digital Coast Connects projects that support marginalized communities impacted by coastal flooding.
- The site will meet the demand for a wider range of learning resources including virtual and on-site instructor-led courses, off-line study opportunities for individuals, and on-demand courses and learning resources.
- Additional professional certification credits for training courses and additional training resources from partners will be provided.
- The Office for Coastal Management will continue to offer support to the Digital Coast partner organizations in the form of 2-year fellows. Products developed by these fellows are made available via the Digital Coast to empower coastal resilience efforts at the local, state, and national levels.
- The Digital Coast Partnership and contributing partners will convene at a national forum to share knowledge regarding user needs and will co-develop potential solutions.
- The Digital Coast will add data, tools, and training generated as part of the recent historic investments in coastal resilience. Enhanced tools with increased data will support coastal community efforts to address future extreme water levels and sea level rise and build a climate-ready workforce.
- The Office for Coastal Management will develop a best practices report to describe the Digital Coast efforts, highlighting the website, partnerships, and customer service approach.
- Digital Coast staff will continue to answer the needs and goals as addressed in the Digital Coast Act of 2020, including increased data access, decision-support tools, trainings, local partnership projects, and the sharing of best practices.