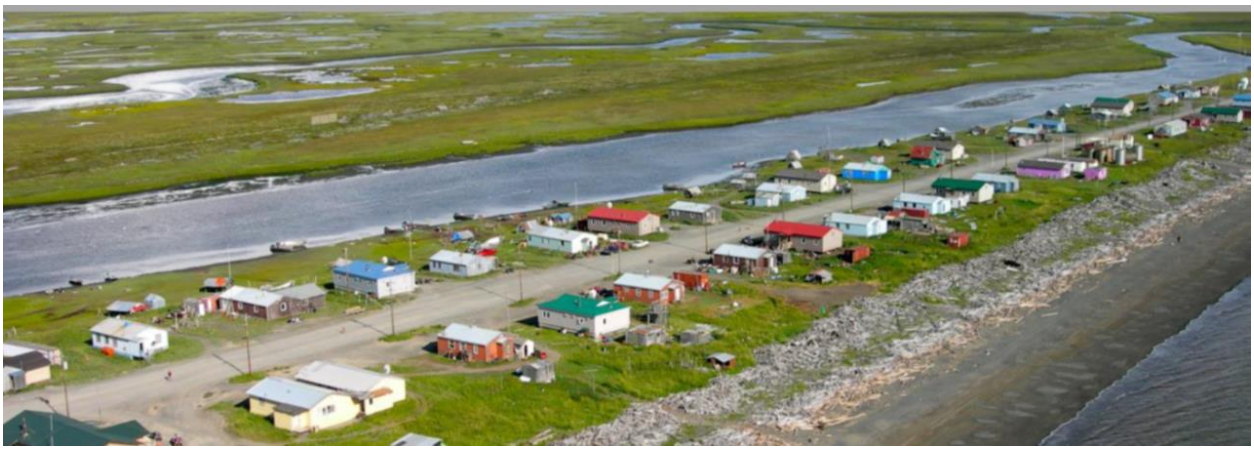
Proposal to the:
National Oceanic and Atmospheric Administration
Office of Coastal Management
2022-24 Digital Coast Fellowship Program

Project Title:

Harnessing Energy on Alaska Coastal Mapping Initiatives to Support Resilient Coastal Communities



Submitted by:
National States Geographic Information Council
Molly Schar, Executive Director

October 14, 2021

In partnership with:
State of Alaska - Department of Natural Resources
Alaska Geospatial Office and Division of Geological & Geophysical Surveys

Point of Contact:
Jacquelyn Overbeck, CFM
Geologist & Program Manager – Coastal Hazards Program
State of Alaska Department of Natural Resources Division of Geological & Geophysical Surveys
3651 Penland Pkwy
Anchorage, AK 99508
(907) 451-5026
Jacquelyn.overbeck@alaska.gov

1. Background and Introduction

The State of Alaska is seeking a Digital Coast Fellow to support coordination of federal, state and private coastal mapping initiatives and efforts to prioritize stakeholder interests. The selected individual will engage stakeholders, improve mapping equity, enhance data sharing and access, and become an active member of growing local, state, federal, and private partnerships. In partnership with the National States Geographic Information Council (NSGIC), the State of Alaska will mentor the Digital Coast Fellow.

Alaska's 66,000 miles of Arctic and sub-Arctic shorelines constitute a strategic, economic and ecological resource to the Nation. Alaska is also home to 229 federally recognized tribes and tribal organizations which utilize subsistence resources to support local economies and the locations of which leave many exposed to environmental threats (BIA, 2021). Alaska is warming twice as fast as the global average (Markon and others, 2018) and Alaska Native villages face hurdles such as the enormity of the cost to adapt infrastructure to the impacts of climate change, limited technical capacity, lack of transportation options, lack of redundancy of physical infrastructure systems, limited internet capabilities, and high cost of fuel which makes Alaska's communities more vulnerable to climate-related impacts (BIA, 2021). Coastal mapping datasets in the nearshore lead to informed management of coastal regions, maritime domain awareness, safe navigation, and increase resilience of coastal communities (Buzard and others, 2018) all of which strengthen the Blue Economy (AMEC, 2020). A series of coordinated efforts have led to structured working groups that are strategically mapping the coast of Alaska over the next 10 years.

Coastal mapping datasets include aerial imagery, shoreline vectors, and bathymetry from offshore to nearshore continuously extending into topography of the terrestrial environment.

In 2016, an inaugural Alaska Coastal Mapping Summit was held to identify priority needs with regards to stakeholders and data acquisitions across the state. Due to widespread interest in improving coastal mapping data during the 2016 Summit, a more formal follow up meeting was held in 2018. The coastal mapping needs and interests were highlighted by lively group discussions on both success stories and challenges around the state, technologies and specifications, and need for improved coordination and collaboration (Kumle, 2018). In 2019, a survey was conducted to identify geographic areas of interest with highest level priority needs providing guidance for project development (Kumle and Overbeck, 2021). The surveyed stakeholders included local representatives of each of the coastal regions of Alaska as well as primary data user sectors (i.e., engineering, hazards and mitigation, land and resource management, and vessel navigation). The survey results indicated stakeholders are focused on segments of coast where communities and infrastructure are currently present, and the highest priority datasets include topobathymetric lidar (Kumle and Overbeck, 2021). Many stakeholders have overlapping priority areas (Kumle and Overbeck, 2021), showing the potential benefit of collaboration across sectors on future projects.

In 2019 a Presidential memo was released to increase ocean mapping of the U.S. exclusive economic zone and shoreline and nearshore of Alaska (Executive Office of the President, 2019). The Presidential memo directed federal agency coordination through the Alaska Mapping Executive Committee (AMEC) with the State of Alaska, which led to the creation of the Coastal Mapping Subcommittee (CS) of AMEC. Through federal and state coordination the AMEC-CS has developed the Alaska Coastal Mapping Strategy (AMEC, 2020) a 10-year plan to map the coast. AMEC-CS is currently seeking public input on the Implementation Plan for coastal mapping in Alaska. Key components of success involve coordination, data sharing, and outreach with local stakeholders and will be facilitated with close coordination with the Alaska Geospatial Council (AGC). AGC serves to coordinate regional and local stakeholders and provide public access to geospatial data critical to decision-making and is directed by the State's Geospatial Information Officer. In 2021, AGC created the Coastal & Ocean Technical Working Group (TWG) to build an Alaska-based community to support these statewide initiatives.

To help ensure future coastal mapping investments are dedicated equitably, it is critical to increase engagement with currently under-represented groups and communities including the State of Alaska, Alaska Native associations and corporations, Indigenous organizations, and tribal governments. It is critical to ensure inclusiveness and thereby gain feedback on how to improve communication pathways, accessibility of data, and creation of the right data products according to the diverse and often under-represented group of users.

A Digital Coast Fellow will engage local stakeholders and provide support to AGC to ensure services, data, and work is prioritized with consideration of all stakeholders, including those often affected by issues such as coastal erosion, flooding and are faced with the severity of climate impacts. The Fellow would multiply the force of this effort and provide focused attention where staff resources are currently limited. Delivery of the vast amounts of data currently being acquired by state and federal agencies is essential. The Digital Coast Fellow will be responsible for carrying out an inventory of existing coastal mapping datasets to ensure access across users and data portals. For many stakeholders, coastal mapping datasets have not been made available in their service area or region. The Digital Coast Fellow will conduct outreach to provide technical guidance to users to ensure data access and usability given many of the technology and broadband challenges in many of the under-represented communities.

2. Goals and Objectives

Goal 1: Improve engagement with Alaska coastal mapping stakeholders by increasing participation in AMEC and AGC Coastal & Ocean TWG.

> **Objective 1.1:** Work with AGC co-chairs to identify additional stakeholders including Alaska Native organizations, and other local partners to engage and join annual coastal mapping summits and quarterly AGC Coastal & Ocean TWG meetings.
>
> **Objective 1.2:** Carry out a series of surveys of AGC partners on communication pathways, accessibility, and products beneficial to stakeholder community.
>
> **Objective 1.3:** Provide updates on existing data, communicate survey results, and AGC progress to the Alaska Mapping Executive Committee.

Goal 2: Enhance access and data sharing of existing and future coastal mapping datasets.

> **Objective 2.1:** Create an inventory and web map of existing coastal mapping datasets from AGC partners.
>
> **Objective 2.2:** Lead AGC Coastal & Ocean TWG meetings and activities on data sharing.
>
> **Objective 2.3:** Coordinate submission of existing dataset to NOAA Digital Coast data portals and State of Alaska Open Data Geoportal.
>
> **Objective 2.4:** Host webinars and provide technical guidance for AGC community on accessing and utilizing coastal mapping datasets and resources.

3 & 4. Project Description, Milestones, and Outcomes

The Digital Coast Fellow will be responsible for completing AGC functions over the 2-year project period. The project hinges on 5 primary tasks: 1. orientation and work planning, 2. outreach to expand AGC membership, 3. designing and implementing communication survey, 4. creating an existing data catalog, and working with AGO to ensure publicly availability 5. implementation of survey recommendations and outreach to educate AGC members on using coastal datasets and maps. Current progress on these tasks will be vastly improved thanks to the focused efforts of the Digital Coast Fellow.

Task 1—Orientation and Work Plan
Timeline: Fall 2022
The fellow will be on-boarded with the Alaska Division of Geological & Geophysical Surveys (DGGS) and provided information and guidance to learn how to operate within state government. The fellow will be given time and resources to learn computing and communication software necessary to carry out project goals, including MS Teams, SharePoint, OneDrive, Google Drive, Adobe, and ESRI products and solutions. Previous work and documentation will be provided to the fellow as background research to prepare for developing following project milestones. The fellow will participate in Office of Coastal Management informational seminars and web meetings where they will learn steps to developing project management skillsets including work plans, timelines, checklists, and project progress tracking.

During fall, multiple online and potentially in-person forums will be held, where the fellow will be introduced to project partners. These meetings include quarterly AGC Executive Board and Working Group meetings, Fall Alaska Mapping Executive Committee Meeting, NOAA Hydrographic Services Review Panel, and Alaska Tribal Conference for Environmental Managers. The fellow will also help with planning for the annual Coastal Mapping Summit.
Outcome/Milestones:

- Develop 2-year work plan.
- Make connections with project partners and collaborators.

Task 2—Outreach to New AGC Membership
Timeline: Winter 2023
The fellow will reach out to existing membership of AGC with low participation as well as potential new members that can better represent local, Alaska Native, and Indigenous interests. The fellow will develop information materials to provide to potential new members, including 1-page informational documentation on the AGC Coastal & Ocean TWG. The fellow will update existing website (ArcGIS Hub site) for the TWG. The fellow will be given creative freedom to suggest additional outreach materials and media platforms (i.e., storymaps). This is a major task for the fellow given the broad geography which the coastline covers and the complex governance frameworks of Alaska coastal communities. Alaska is composed of 12 coastal regions that are represented by non-profit Alaska Native associations along with for-profit Alaska Native corporations of which some residents are members. Each community along the coast of Alaska may also have some combination of local tribal, city/municipal, borough, or corporation governance. Developing personal relationships with a broad group of organizations will be central to success in far-reaching engagement.
Outcome/Milestones:

- New membership list and added participation in AGC Coastal & Ocean TWG meetings.

Task 3—Design & Carry Out Communication Survey
Timeline: Winter-Spring 2023
Concurrent with new outreach and engagement with AGC membership, the fellow will work with AGC co-chairs to design a series of surveys of the membership to identify communication pathways and priority focus areas of the AGC Coastal & Ocean TWG. The fellow will research online applications and meeting structures that contribute to equitable participation of meeting attendees. The survey can be carried out through Survey123 as well as through personal communications. Methods to engage with new partners may be hampered by a lack of internet bandwidth or access in rural Alaska. The fellow will be tasked with researching creative or novel ways of communicating to present to AGC membership.
Outcome/Milestones:

- Communication survey design.
- Summary report of survey results with recommendations.

Task 4—Support Data Inventory and Archiving
Timeline: Fall 2023
During the second year of the fellowship, the fellow will work with AGC co-chairs and AGO imagery and elevation portal data managers to update an existing inventory of coastal mapping data holdings. The fellow will identify historic and recent data that has not been made publicly available and coordinate with portal managers to publish data with appropriate metadata. The fellow will work to link existing data holdings to the State of Alaska Open Data Portal as well as the NOAA Digital Coast data portals.
Outcome/Milestones:

- Coastal mapping datasets made available to the public.
- A data inventory to help prioritize new near-term projects.

Task 5—Implementation of Recommendations & Project Outcome Outreach
Timeline: Winter 2023-Spring 2024
The final quarters of the fellowship will be focused on implementing recommendations of the AGC communications survey. The fellow will continue engagement with AGC to educate membership on data holdings, accessibility, and utilization. For members that have never had access to coastal mapping data, fellow will provide technical guidance and webinars on using the Open Data Geoportal, creating maps, and utilizing web maps to answer management or science questions with partners.
Outcome/Milestones:

- Informational webinars and documentation on utilizing coastal mapping datasets.
- New formats or forums for communication among AGC membership.

After completion of the fellowship, the fellow will be very well positioned to join existing agencies or organizations continuing work on the 10-year Alaska Coastal Mapping Strategic Plan or similar efforts in other states (such as the Florida or California Coastal Mapping Programs).

5. Diversity, Equity, Inclusion, and Justice

The State of Alaska values diversity and inclusion in the workplace. All State employees are required to participate in multi-day respectful workplace and diversity trainings hosted by the State Equal Employment Opportunity Program. According to a 2021 memo from DGGS: “The State of Alaska, as an employer and service provider, recognizes the need to respect and treat equally all people it hires and serves. We also recognize that the state can teach by example and offer leadership in being respectful and sensitive to diversity. Our concept of diversity is broad, extending beyond those categories of peoples formally recognized and protected by law. Valuing diversity of a workforce, representative of all Alaskans, enriches the quality of our service to the people of Alaska.”

A primary goal of this Digital Coast Fellowship is to include under-represented groups including Alaska Native associations and corporations, Indigenous organizations, and tribal governments in AMEC and AGC working groups and initiatives.

6. Fellow Mentoring

AGC Executive Director and GIO Leslie Jones and DGGS Coastal Hazards Program lead scientist and program manager, Jacquelyn Overbeck, will provide mentorship to the proposed fellow. The fellow will be housed at DGGS facility in Anchorage, Alaska for direct communication, oversite, and training by Jones and Overbeck and access to the State of Alaska network and resources.

Dr. Jones is the Geospatial Information Officer for Alaska providing statewide coordination for geospatial data, initiatives, and policies. She serves the principal role in advancing geospatial goals for the state and is Executive Director for the Alaska Geospatial Council. Leslie has 21 years of experience as a geospatial

statistician in applied research science. She has 17 peer-reviewed publications and has successfully funded $4.8M in externally funded projects focused on geospatial technologies.

Overbeck has been the Coastal Hazards Program Manager since 2015 and currently co-chairs both the AMEC-CS and the AGC Coastal & Ocean TWG. Overbeck has led state, tribe, and federally funded projects to assess, map, and monitor coastal geologic hazards in western Alaska. She is responsible for providing technical guidance to the public regarding coastal geohazards, mapping, and community resilience.

The Digital Coast Fellowship proposed here is a self-led initiative that will require a candidate with strong communication and organizational skills, as well as technical knowledge. Jones and Overbeck will provide guidance and mentorship and ensure the fellow is given the tools, training and resources required to succeed. Regular check-ins will be scheduled with the fellow to track progress and ensure alignment with major goals and deliverables. The fellow will be welcomed into the DGGS office and treated as an existing staff member. AGO and DGGS personnel will work directly with the fellow to complete project goals. Most training will be conducted “on-the-job”. Project mentors will provide hands-on training, while also making on-line training and professional development resources accessible (i.e., ESRI and geospatial technologies). The fellow will be given the opportunity to attend meeting facilitation and leadership training programs and shadow the project leads.

7. Office Environment

The State of Alaska encourages all staff to work on-site to maintain social interactions and a collaborative work environment. The Geologic Material Center is home to DGGS offices in Anchorage, Alaska. Throughout the COVID-19 pandemic, as cases have increased or hospital capacities been overwhelmed, full-time telework has been encouraged but never required. The State of Alaska provides home computing resources and access to internal data networks through a VPN and/or remote desktop but does not cover the cost of internet.

Fellow mentors currently work a mix of telework and in-office. During the fellowship, a schedule will be determined between the fellow and mentors to ensure there is sufficient in-person coordination, unless COVID-19 outbreaks do not allow. This fellowship depends on collaborations with partners outside of the DGGS office across many organizations with varying policies on telework. Currently, most partners are available for collaboration via telework only. With most coastal communities and regional governing entities off the road system, telecommunication is the only way to engage without air travel. Because of this limitation, it is critical that the fellow learn to develop relationships with collaborators via telecommunications regardless of local restrictions or mandates. The fellow will be given necessary tools to carry this work out effectively, including a high-quality web camera, headset, laptop, and phone line.

8. Project Partners

This project is built on established collaborations of state, national, federal, regional, and local partners that share a mission to collectively support Alaskans in addressing coastal management priorities.

National States Geographic Information Council (NSGIC)

NSGIC promotes the efficient development and management of location-based information resources and advocates for innovative, strategic use of these assets to advance the interest of states, tribes, regions, local governments and the nation through public forums, biennial meetings, annual conferences, newsletters, and social media. In particular, NSGIC maintains a Coastal Caucus with the explicit goal of advocating for and providing awareness of coastal mapping issues and initiatives. NSGIC will facilitate presentations at the annual meetings as well as a newsletter and social media outlet to

educate states other than Alaska about this innovative project. This outreach will be conducted by AGC, DGGS, and the project fellow with the information materials produced by the project fellow.

Alaska Division of Geological & Geophysical Surveys (DGGS)

The DGGS Coastal Hazards Program is tasked with coordinating state and national efforts to map the coast of Alaska not only for flood and erosion issues but for all stakeholder needs. Through investment in the program, the State has contributed to each of the Alaska Coastal Mapping Summits and efforts to identify and document priorities of coastal stakeholders as a leader of these projects.

Alaska Geospatial Office (AGO)

The Alaska Geospatial Office (AGO) coordinates with public and private stakeholders across Alaska to develop and manage geographic information and how it is shared. AGO administers the Alaska Geospatial Council, an independent advisory council for geospatial initiatives and the State of Alaska Geoportal, a one-stop-shop for geospatial data, maps, and apps managed by government agencies.

Alaska Geospatial Council (AGC)

AGC is an advisory council which functions under five priority initiatives: (1) build collaborative relationships; (2) create a shared geospatial framework; (3) establish data governance and policy; (4) provide access to decision support tools; and (5) enhance geospatial knowledge through training, education and outreach. The council holds regular meetings amongst its working groups, of which many apply to coastal hazard mapping and coordinates closely with the Alaska Mapping Executive Committee. Executive Director, Jones, was recently elected to the National States Geographic Information Council (NSGIC) Board of Directors. The project fellow will be incorporated into regular AGC meetings and advise AGC on coastal mapping priorities. The AGC Coastal & Ocean TWG is chaired by Jacquelyn Overbeck (DGGS), Hillary Palmer (Dewberry) the Alaska Coastal Mapping Project Manager for NOAA, and Hadley Owen (NOAA) the Alaska Navigation Manager. Chairs work together to implement goals of the Alaska Coastal Mapping Strategy and Implementation Plan, which, through AGC, focus on coordination among Alaska-based stakeholders, data sharing, and outreach to the public.

Alaska Mapping Executive Committee (AMEC)

AMEC, a consortium of State and Federal agencies with the shared goal of improving the quality of geospatial data in Alaska, is undertaking an effort to accurately map Alaska's 66,000 miles of coastline. To this end, AMEC has developed the Alaska Coastal Mapping Strategy (ACMS), which sets goals to complete this effort within ten years.

9. Cost-Share Description

The cash match of $7,500 annually for two years (total $15,000) will be provided by State of Alaska DGGS from capital improvement project (CIP) appropriations that will go towards the personnel costs of the Digital Coast fellow. Costs associated with fellow computing (hardware and software), office space, phone, and internet will be provided by DGGS at the DGGS Geological Material Center located in Anchorage, Alaska. Personnel costs for IT and GIS technical staff will be covered by State of Alaska general funds, while the project mentor personnel costs will be covered by the CIP.

10. Strategic Focus Area

This project lays the foundation to benefit each of the strategic focus areas: healthy coastal ecosystems, resilient coastal communities, and vibrant and sustainable coastal economies. Alaska is historically data-poor, but the ACMS is directing an unprecedented data collection campaign. This project advises data

collection priorities and specifications to benefit the wide group of stakeholders that would use them to support coastal ecosystems, communities, and economies.

Alaska has over 160 communities on the coast. Most face some level of environmental risk such as storm surge flooding, erosion, and tsunami. Sea level rise and even relative sea level fall further complicate coastal management. Most do not have a mapped floodplain, tidal datum, tide gage, high-resolution bare earth elevation model, or recent bathymetry. This cascades into less reliable weather and wave forecasts, limited hazard communication, and infrastructure built in unmapped hazard zones. This project seeks to identify and implement adequate communication with local leaders to assist in hazard awareness and mitigation. Mapping and awareness can bring a paradigm shift in the resilience of historically data-poor coastal communities.

Alaska's economy depends on oil and gas (25% of the worlds remaining supply), fishing (#1 port for fishery landings for over 20 years-2018 value of $1.8B), mining (2018 value of $1.7B), tourism ($2.2B in visitor spending with 58% of visitors coming via cruise ships), and logging, all of which occur at the coastal margin or require ocean shipping support (NOAA, 2021). One road connects Alaska to the United States, and nearly half of the population is not on the road system. Coastal managers are responsible for enormous areas (larger than some states) with limited tools and outdated maps. In many regions of Alaska, the century-old navigational charts do not show hundreds of feet of erosion, new sandbars, and changing river channels. This project seeks to connect coastal managers and share existing datasets to ensure the best-available information is used to inform safe navigation. It will also identify needs and data gaps, prioritizing bathymetric and tidal datum collections to suit the needs of coastal managers and boost coastal economies.

Alaska relies on healthy coastal ecosystems to support subsistence harvesting, fisheries, tourism, and recreation. Over 3,000 miles of Alaska's coastline is managed by the National Park Service (more shoreline than most coastal states have total). Fishing is more than an income source: coastal communities in Alaska rely on fishing as the primary food resource. Improved mapping can help protect vulnerable coastal ecosystems from environmental stressors such as shipwrecks, oil spills, or hazardous infrastructure built in floodplains or erosion hazard areas.

This project seeks to convene meaningful partnerships from the community to federal level that will identify and direct data collection priorities. The fellow will work directly with local leaders and agency representatives to improve access and use of science-based tools to be implemented in economic development, hazard mitigation, and land management plans.

References

Alaska Mapping Executive Committee (AMEC), 2020, Alaska Mapping Strategy: National Oceanic & Atmospheric Administration. 19 p. https://iocm.noaa.gov/about/documents/strategic-plans/alaska-mapping-strategy-june2020.pdf

Bureau of Indian Affairs (BIA), 2020, The unmet infrastructure needs of tribal communities and Alaska Native villages in process of relocating to higher ground as a result of climate change: Bureau of Indiant Affairs Informational Report, 152 p.

Buzard, R.M., Maio, C., Overbeck, J., Lujan, E., Flensburg, Susan, Holen, D., and Dunham, G., 2018, Dobbyn, P. (ed), Montano, D. (design), Laying the foundation for resilient coastal communities: case studies—Port Heiden and Goodnews Bay: Alaska Sea Grant, 14 p. https://adaptalaska.org/wp-content/uploads/2018/11/Resilient-Coastal-Communities-bulletin_lowres.pdf

Executive Office of the President, November 2019, Ocean Mapping of the United States Exclusive Economic Zone and the Shoreline and Nearshore of Alaska: Document 84 FR 64699. https://www.federalregister.gov/documents/2019/11/22/2019-25618/ocean-mapping-of-the-united-states-exclusive-economic-zone-and-the-shoreline-and-nearshore-of-alaska

Kumle, M., April 2018, 2018 Alaska Coastal Mapping Summit Summary Report: Alaska Ocean Observing System, 416 p. https://dggs.alaska.gov/webpubs/dggs/ago/documents/2018CoastalMappingSummit/ACMS_SummaryReportFinal_20180430_with_Appendix.pdf

Kumle, M. and Overbeck, J.R., 2021, 2019 Alaska Coastal Mapping Prioritization Survey: Alaska Ocean Observing System, 44 p. https://aoos.org/wp-content/uploads/2019-AK-Coastal-Mapping-Prioritization-Survey-final-web.pdf

Markon, C., and others, Reidmiller, D. R. and others (ed), 2018, Impacts, risks, and adaptation in the United States: Fourth National Climate Assessment, Volume II: U.S. Global Change Research Program, 1176-1232 p.

NOAA, 2021, Alaska Region: [website] found at: https://www.regions.noaa.gov/alaska/index.php/noaa-resources-in-the-region/

Overbeck, J.R., ed., 2018, Alaska coastal mapping gaps & priorities: Alaska Division of Geological & Geophysical Surveys Information Circular 72, 34 p. https://doi.org/10.14509/30096