STATEMENT OF WORK

NOAA/SEA GRANT REGIONAL INTEGRATION

PI: Davin Holen, PhD, Coastal Community Resilience Specialist, Alaska Sea Grant, College of Fisheries and Ocean Sciences, dlholen@alaska.edu, 907-274-9697

Project Dates: September 1, 2017 – August 31, 2018

This proposal responds to the National Sea Grant College Program opportunity for regional integration with the NOAA Region Collaboration Team. The National Weather Service (NWS) in Alaska has the ability through their website and radio broadcasts to broadly deliver a detailed weather forecast for communities throughout Alaska. Alaska has many remote communities connected by air travel and sea routes, and inclement weather is common. Local residents rely heavily on weather forecasts for preparing for storm events that may flood their communities, for safety when traveling between communities, or when conducting wild resource harvesting activities. How well Alaska residents understand weather forecasts and to what degree they have confidence in the forecasts for preparing for extreme events, and making decisions regarding travel and safety is important for the NWS. When consulting NOAA leadership in Alaska regarding this regional integration initiative, a list of high priority projects was compiled, which included working with the National Weather Service Alaska region. During discussions on what the scope of an outreach and extension project should encompass, it was determined that a priority is obtaining feedback from communities on improvements in delivery of weather forecasts, obtaining feedback from traditional knowledge holders to better understand perceptions of weather and local decision making, and finally how to better notify residents of coastal hazards such as powerful storms and coastal inundation. Alaska Sea Grant (ASG) has a Coastal Community Resilience Specialist, Davin Holen, who has been working with stakeholders across Alaska to understand how communities respond to coastal hazards, extreme weather, and a changing climate as part of a series of coastal resilience workshops. The NWS has been involved in these resilience workshops and has expressed an interest in working closer with communities in this effort. In addition, ASG has Marine Advisory Program (MAP) Faculty in coastal communities throughout the State of Alaska who have connections with local stakeholders in their communities and regions.

In 2017, ASG assisted in organizing Arctic Coastal Community Resilience Workshops in partnership with the Aleutian and Pribilof Islands Association, the Aleutian and Bering Sea Islands and Western Alaska Landscape Conservation Cooperatives, NOAA, and Agnew::Beck Consulting. These workshops were held in four communities in western Alaska; Nome, Unalaska, King Salmon, and Kotzebue. Over 200 participants from Bering Sea communities were involved in the workshops, which presented the latest downscaled climate data for the region, and then facilitated discussions about community and regional experiences with climate and environmental change, and coastal hazards. The NWS participated in the workshops in King Salmon and Kotzebue. Residents articulated their concerns about the severity of storms in fall and early winter, coastal inundation, and safety when traveling due to unpredictable

weather. Our planning team, now called Adapt Alaska (www.adaptalaska.org) intends to continue working with communities in western Alaska. This partnership between ASG and the NWS could enable Adapt Alaska to host information on the website that would be useful to communities and possibly be a mechanism for feedback from communities on extreme events such as severe storms in the early winter.

Most of the powerful storms that lead to coastal inundation and erosion occur in western Alaska. These storms are common, and, with warmer fall and early winter weather in recent years, shore fast sea ice is forming and stabilizing later in the winter. This means that when high winds and waves occur there is no shore fast ice barrier to buffer the shoreline from wave impact or mitigate coastal inundation and erosion. What once came as blowing snow from the sea is now arriving as waves and surge causing flooding and erosion. While the ability to forecast storm surge exists for many coastal communities, it is difficult to convey specific community threats with official NWS dissemination methods. Official forecasts broadly cover hundreds of miles of complex coastline with limited actionable details to assist local decision makers. To better understand how to deliver information that would be useful for communities to monitor conditions and plan for mitigation the NWS would like to work with regional partners in western Alaska. ASG will partner with the NWS in Alaska to work with local communities in western Alaska to better understand how to create and deliver weather forecasts.

For example, some questions that might be asked include; 1) How do local individuals receive a weather forecast, especially with limited bandwidth? 2) How far in advance do residents need a forecast for powerful storms and potential coastal inundation for residents to adequately prepare for the event? 3) How do users interpret terms related to confidence? 4) Are there preferred methods of communicating confidence in the forecast? 5) How do residents use their own knowledge system of weather integrated with weather forecasts to make decisions? 6) What would be a locally available mechanism for residents to provide feedback to the NWS, who could then archive observations during storm events to inform future predictions? 7) What structures or other infrastructure is impacted and at what water (surge) levels? Finally, 8) what improvements could be made in weather forecasts and delivery, especially warnings about powerful storms and potential coastal inundation? This will involve working with institutions in regional hub communities in western Alaska to understand what information is most valuable for communities when delivering the weather and how to tailor the message to smaller communities to enhance understanding of the message.

Goals and Objective

As noted above this project responds to NOAA and NWS priorities for Alaska. The goals and objectives of this project are as follows.

1. Understand what information is important in a forecast for making decisions regarding community response and coastal inundation, including communication of forecast confidence.
2. Document how residents use local knowledge of weather, and how is this is integrated into their understanding of weather forecasts.
3. Define a process in collaboration with the NWS for improvements. The NWS can develop and test improvements to products, services, and communication.
4. Test the improvements with a small sample of interested residents in the target region.

Methodology

The PI for this project will coordinate activities with the National Weather Service regional office, incorporating feedback from NWS field offices. The project will include two community visits to the western Alaska regional hub communities of Dillingham in Bristol Bay, and Nome in the Bering Strait region. ASG MAP faculty; Gay Sheffield in Nome and Gabe Dunham in Dillingham, will provide guidance and help arrange meetings with regional stakeholders. This guidance includes what kind of meetings will work best for area stakeholders, whether it be a workshop type of environment or multiple meetings in the form of an interview or small focus group. They will also provide guidance on what types of questions should be asked that will be beneficial for their regions. In attendance will be Holen as well as a member of the NWS regional team. As coastal inundation is a severe coastal hazard in the region, the Alaska Department of Natural Resources, Division of Geological and Geophysical Services (DGGS) will provide materials for the meetings to facilitate discussion about extreme events and how residents respond to forecasts that relate to coastal inundation and erosion. DGGS is creating coastal inundation maps for communities (http://dggs.alaska.gov/webpubs/dggs/rdf/text/rdf2016_001.pdf) and also installing independently powered water level monitoring equipment in coastal communities in western Alaska, including where they worked with Sheffield (http://dggs.alaska.gov/pubs/id/29730). At the conclusion of the project a second visit will be made to test improvements with a small sample of interested residents that were identified during the initial visit.

Timeline and Products

This project will run from September 1, 2017 to August 31, 2018. Meetings are best held during winter when residents are not as actively engaged in subsistence activities as they are from Spring to Fall. In late fall 2017 Holen will work with MAP faculty and others in Nome and Dillingham to plan the best time that works for community members to meet. This might include time when there is a meeting in town that brings representatives from regional tribes to the regional hub. In addition to Nome and Dillingham, Holen will also be working in Bethel during this period of time to work with colleagues and local organizations to plan a coastal resilience workshop. An additional meeting may be arranged in collaboration with the Association of Village Council Presidents, the local regional tribal nonprofit. Meetings will most likely occur sometime between November 2017 and March 2018. The follow-up meeting will be held in late summer 2018, just before the conclusion of the project. The final product will be a short report in collaboration with the NWS and other interested parties detailing comments from stakeholders as well as recommendations for potential products, services, and communication.