NWS Alaska Region Observation Program Priorities and Expansion

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The National Weather Service (NWS) Alaska Region relies on a sustainable network of meteorological, hydrological, and climate observations to provide decision support services for a broad array of users to protect life and property. For instance, the State Emergency Operations Center (SEOC) consults with the NWS on a weekly basis to ensure they have situational awareness for storms and other weather and environmental-related hazards that may impact communities across all of Alaska. This information enables SEOC to "tee up" other support mechanisms to help mitigate or respond to a high-impact weather event. The USCG relies on accurate NWS products and services in support of Search and Rescue (SAR) missions. Marine products help ships transiting Alaska's waters to avoid stormy areas that could be disastrous. Coastal and river water-level information and forecasts are necessary for coastal and riverine communities in developing hazard resilience. Observations of ocean currents and sub-surface temperatures are crucial for understanding and anticipating sea-ice development and the time of "freeze up" – a critical forecast parameter for marine transportation, offshore oil and gas operations, and Arctic coastal communities. Lightning detection information is critical for fire-weather forecasts supporting land managers and fire crews as well as for pilots and mariners. Profiles of wind speed and direction are key to understanding turbulence and icing potential and predicting where ash will be transported after a volcanic eruption.

However, there are significant gaps in the observation platforms that must be resolved. For instance, additional water level measurements are needed on the northern and western coasts of Alaska where communities are threatened by storm surge and flooding. Additional wave buoys are needed in the Arctic Ocean, Bering Sea, the western Gulf of Alaska, and the southeast. River gauges are needed on rivers on the North Slope and in the western interior as well as southwest and eastern interior. For sea ice, the main observational needs are satellite imagery, but observations are also needed from buoys to moorings, which can provide information on water temperature and salinity and can be used to forecast freeze-up dates. While potential solutions have been identified, they are highly reliant on additional funding or collaboration with outside partners. For instance, in collaboration with USGS, NASA, and Department of Energy, the NWS is currently working with a NSF-funded EarthScope project called the Transportable Array in Alaska and the Yukon, to deploy inexpensive meteorological sensors on some of the nearly 300 seismograph stations that make up this network. The NWS is also working with the Navy's Arctic Submarine Laboratory to acquire real-time observations from their ice camps north of Prudhoe Bay. The NWS partners with USGS for access to data from their river gauges so we can monitor river levels and potential impacts due to ice jams during spring break up. The NWS utilizes web cams supported by the FAA at numerous mountain passes in order to enhance our forecast products for the general aviation community that services small communities.

Other collaboration being pursued would leverage various community-based observational networks as part of the NWS effort to expand its Cooperative Observer Program. This includes a project supported by the Arctic Domain Awareness Center (ADAC), a Department of Homeland Security center of excellence located at the University of Alaska Anchorage. There are other community-based monitoring networks with whom the NWS is trying to develop a closer partnership, such as the Arctic Risk Management Network (ARMNet).

There are many research projects that are being conducted within the Arctic region, data from which would be valuable to the NWS, not only from a real-time operational perspective but also for reanalysis

and verification purposes. One such example is an upcoming two-year international field campaign sponsored by the World Meteorological Organization (WMO) Year of Polar Prediction (YOPP), which will include intensive observation periods in the Arctic region from mid-2017 to mid-2019. Efforts are underway to ensure the data collected from the many platforms contributing to this project will be made available in real time.

This presentation will discuss the observational challenges and gaps the NWS faces in trying to meet its mission, describe some of the partnerships in which the NWS already has established and those being pursued not only with the research community but with industry and other partners, such as Shell, and solicit feedback from the audience with the goal of identifying additional linkages with the scientific research community that could help address our observational needs.