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USGS Alaska project status toward DOI priorities

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From: "Devaris, Aimee" <adevaris@usgs.gov>
Sent: Wed Feb 07 2018 16:57:44 GMT-0700 (MST)
To: Stephen Wackowski <stephen_wackowski@ios.doi.gov>
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Hi Steve,

Just sending this along for your SA and potential use. My boss, David Applegate, has a meeting with the Deputy Secretary tomorrow, and he was asked to brief on work USGS is doing in Alaska to support the Department. This isn't an exhaustive summary -- just some highlights.

Aimee

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USGS Alaska Project Status Toward DOI Priorities FY 2018 – FY2019

USGS is planning and convening scientific studies and assessments to support the BLM and FWS actions pertaining to the NPR-A and the Arctic Coastal Plain.

Oil and Gas Assessments

- Secretarial Order 3352 (signed May 31, 2017) directed the USGS to conduct updated assessments of undiscovered, technically recoverable oil and natural gas resources of the Alaska North Slope, focusing on Federal lands of the National Petroleum Reserve in Alaska (NPR-A) and the Arctic Refuge coastal plain (1002 Area). These assessments are being conducted in technical cooperation/collaboration with BLM and BOEM.
- The USGS completed an updated assessment of NPR-A in December 2017, <https://doi.org/10.3133/fs20173088>
- USGS has proposed completion of an updated assessment of the 1002 Area by January 1, 2019.
- In preparation for the 1002 Area assessment, the USGS:
 - Conducted field work in and near the 1002 Area in July-August 2017.
 - Plans additional field work in and near the 1002 Area in June-July 2018.
 - Contracted for reprocessing 1984-1985 2D seismic data from the 1002 Area.
 - Is conducting laboratory analyses of field and subsurface samples to improve understanding of key petroleum systems elements (petroleum source-rock and reservoir-rock quality, thermal maturity, uplift and exhumation history, etc.).
 - Plans to integrate results of field and laboratory research with interpretation of reprocessed 2D seismic data to further understand key petroleum systems elements and to evaluate significant uncertainties revealed by previous assessment.

Marine and Terrestrial Ecosystems Work

- USGS recently published a report, “Arctic Refuge Coastal Plain Terrestrial Wildlife Research Summaries,” to provide a summary of changes in terrestrial wildlife (i.e., caribou, muskoxen, polar bears) based on information from published literature and other public sources. This report was an update to a USGS-led report published in 2002.
- USGS plans to expand 2018 field research to increase observations of denning polar bears in the 1002 Area to evaluate forward looking radar (FLIR) based surveys (funded by FWS this winter) to monitor potential disturbance from winter seismic and development activities. We are also working on a polar bear abundance estimate for the 1002 Area for FWS, to update the 2010 estimate.
- Ongoing collaborative research with industry into the habituation of caribou to energy infrastructure to inform future development design criteria in NPR-A and 1002 Area.
- We are working with industry and BLM to quantify waterfowl resilience to disturbance from roads and aircraft in the NPR-A and continuing research into the expanding northern Alaska snow goose population in the NPR-A.
- We are also continuing surveys to determine the number of Pacific walrus using the land-based haul out near Point Lay, Alaska, which comprises the majority of the walrus in the northeastern Chukchi Sea during summer.

USGS responded rapidly to high profile transboundary river concerns through its strong regional partnerships and tribal relationships.

- After receiving an increase of \$300K in FY17 appropriations, USGS worked diligently with the US Forest Service (for permitting) to install a water quality supergauge on the Unuk River in Southeast Alaska.
- **The Unuk is one of Southeast's top five king salmon producers and its eulachon run** provides an important traditional fishery to local tribes. The tribes are concerned about potential water quality impacts from a proposed large gold and copper mine 18 miles upstream of the US border. USGS efforts are establishing baseline conditions and will provide a continuous monitor of transboundary water quality on the Unuk.
- The USGS is also developing a science plan to define watershed characteristics and evaluate potential water quality and ecological impacts from Canadian mines in the transboundary Stikine, Taku, Chilkat, and Unuk watersheds.

USGS is undertaking important minerals-related studies and assessments in collaboration with BLM and the State of Alaska.

- A critical mineral assessment for all of Alaska was published in 2016 in partnership with BLM and the State of Alaska, and an assessment for bedrock gold potential is in progress. Results are being used by USGS to prioritize research directions and activities and by BLM to aid in resource management planning.
- There are currently three major projects underway in Alaska: a tectonics and metallogeny study in the Lake Clark and Neacola Mountains area, a study of rare earth element (REE) potential in the Darby Mountains (Seward Peninsula), and a tectonics, metallogeny, and minerals study in eastern Alaska (Yukon-Tanana Uplands).
- There is significant precious and base metal potential in the Yukon-Tanana upland, as well as strong collaboration with Canada and synergy with the State of Alaska.
- Another high priority study area is the Porcupine River region (includes parts of the Arctic National Wildlife Refuge and Yukon Flats Wildlife Refuge) for potential REE and critical mineral potential. We acquired an aeromagnetic survey in FY17, and those data will be published later this year.

USGS is making steady and considerable progress delivering updated topographic maps and digital elevation models of the state, as well as rates of coastal shoreline change along the Arctic and Bering Sea coastlines.

- Alaska is the last US state to acquire a modern statewide digital base map of uniform resolution and accuracy. When we began this project, the map of Alaska was more than 50 years old and did not meet National Map Accuracy Standards. **Alaska's updated** digital elevation model is now 77% complete (95% flown), and the production and release of new topographic maps of Alaska is 57% complete.
- Modern geospatial information is key to responsible management of the public lands, creation of policy, decisions about infrastructure, and understanding of landscape changes as well as basic needs like navigation into airports, search and rescue work, wildfire response, evacuation planning, and flood prediction.
- The Alaska Mapping Executive Committee chaired by DOI W&S and NOAA guides this effort – bringing together USGS, BLM, FWS, NPS, NGA, NRCS, USFS, NOAA, and the

State of Alaska to fund and execute these projects. USGS has funded about half of the effort which exceeds \$50M so far.

- USGS is coordinating the support for a Pan-Arctic digital elevation model as well as an activity under the Arctic Council.
- In 2017, USGS released the shoreline change rate assessment for the northern (Arctic) coast of Alaska, showing coastal erosion rates are high and appear to be accelerating. (Measurements of historical shoreline positions from maps, charts, aerial photography, and satellite imagery, combined with recently collected airborne Lidar data of the coast, are being used to document rates of shoreline change.)
- USGS is preparing to release a similar assessment for the western (Bering Sea) coast of Alaska later this year. This information is important and highly regarded by the State of Alaska and our federal partners in land management. The state is concerned with dozens of communities which are highly vulnerable to devastation due to flooding and erosion. Two communities are already in the process of moving and others are likely to follow.

USGS is modernizing its volcano monitoring systems in Alaska and working with partners to leverage new observing networks.

- USGS is the lead agency and through Congressional appropriations a primary funding agency of the Alaska Volcano Observatory (AVO) and the Alaska Earthquake Center (AEC), a partnership among the USGS, UAF, and the State of Alaska.
- Alaska has more than 50 volcanoes that have been historical active, since about 1760. USGS through AVO operates over 185 monitoring stations on a subset of those volcanoes. These monitoring stations enable AVO to issue forecasts of activity on approximately 30 Alaskan volcanoes.
- AVO is in the midst of upgrading those stations from obsolete analog instrumentation to modern digital instruments that will enable better forecasts of volcanic activity. (~40% complete)
- The most significant and common hazards from Alaska volcanoes are those created by drifting ash clouds and ashfall. Aircraft avoid ash-contaminated airspace as volcanic ash is abrasive, melts at jet engine temperatures, and can cause engine failure. USGS helps limit economic loss and disruption to operation of the aviation industry and DOD by forecasting eruptions and working with NOAA to track drifting ash clouds.
- Most volcanoes in Alaska fall either completely or partly on NPS or FWS lands.
- Alaska is also the most seismically active state in the nation — more earthquakes occur in Alaska annually than in the rest of the US combined. USGS research in Alaska is focused on the high hazard potential of earthquakes and tsunamis and subduction zone science.
- We are also working closely with the AEC regarding the future of the NSF Transportable Array, a relatively dense grid of seismographs and atmospheric sensors temporarily deployed to provide intensive information to inform a range of research topics.