

North Slope Science Initiative



North Slope Facts:

- The North Slope is bordered by the foothills of the Brooks Range to the south and the Arctic Ocean to the north.
- The region encompasses roughly 89,000 square miles.
- The North Slope is thought to have the greatest remaining oil potential of any onshore area in the United States.
- The Trans-Alaska Pipeline System is about 800 miles long and runs all the way from Prudhoe Bay, on the North Slope, to Valdez, in Southcentral Alaska.

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Alaska's North Slope is bordered by the foothills of the Brooks Range to the south and the Arctic Ocean to the north. The North Slope Science Initiative (NSSI) was established to develop a collaborative science based program that integrates inventory, monitoring, and research activities to enhance the quality and quantity of the scientific information available for aquatic, terrestrial, and marine environments on the North Slope of Alaska, and make this information available to decision-makers, government agencies, industry, and the public.



A view of the Brooks Range from the foothills on the North Slope of Alaska (photo courtesy of Adam Mehlhorn).

NSSI Gets A New Director

The big news at the NSSI is that after the previous Executive Director, Ken Taylor, moved over to the Alaska Department of Fish and Game as the new Deputy Commissioner in April, John Payne from the BLM was appointed Acting Executive Director. John has now been appointed the official NSSI Executive Director. He has been involved with NSSI for many years since its inception. Previously John was the program manager for the wildlife, special status species, challenge cost-share and cooperative conservation initiative programs. He has been responsible for developing statewide budgets, providing program direction, national and state program focus, coordination with Federal, state and local governments, as well as non-government organizations. John is also the project leader for the integrated Bering Glacier science initiative managing and directing research activities with numerous principle investigators locally, nationally and internationally. John has worked previously with the BLM in Utah and Fish and Wildlife Service in King Salmon, AK. John has been in Federal service for 34 years.

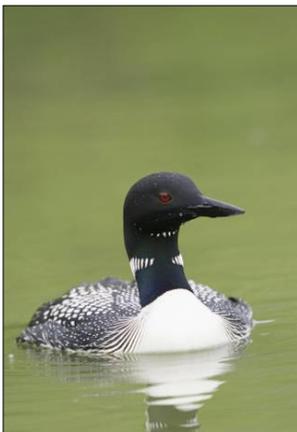
Getting Involved With the International Polar Year

NSSI has actively been participating in numerous inter-agency coordination efforts in 2007. As part of the International Polar Year (IPY), NSSI was represented at the North by 2020 workshop held in Fairbanks. North by 2020 is a forum to explore, discuss, plan, and prepare opportunities for sustainable development in a North experiencing rapid transformation. It will do so by facilitating research and education across disciplinary boundaries to address the real world concerns surrounding Northern futures while at the same time engaging public, private, and government stakeholders. North by 2020 uses a thematic structure to coordinate its projects and participants. The focus of the North by 2020 meeting was a water theme seeking participation by all those interested in the future of Alaska's water resources and water-related research.



Dall Sheep ewes along Atigun Pass on the Dalton Highway on Alaska's North Slope. The number of sheep seen from the highway has been higher than usual in the past several years (photo courtesy of USFWS).

NSSI is an inter-agency effort designed to provide a consistent approach to high-caliber science across the North Slope.



A common loon. The Common Loon is best known for its call and is one of the most recognizable wilderness sounds (photo courtesy of USFWS).

Arctic Observing Networks and NSSI

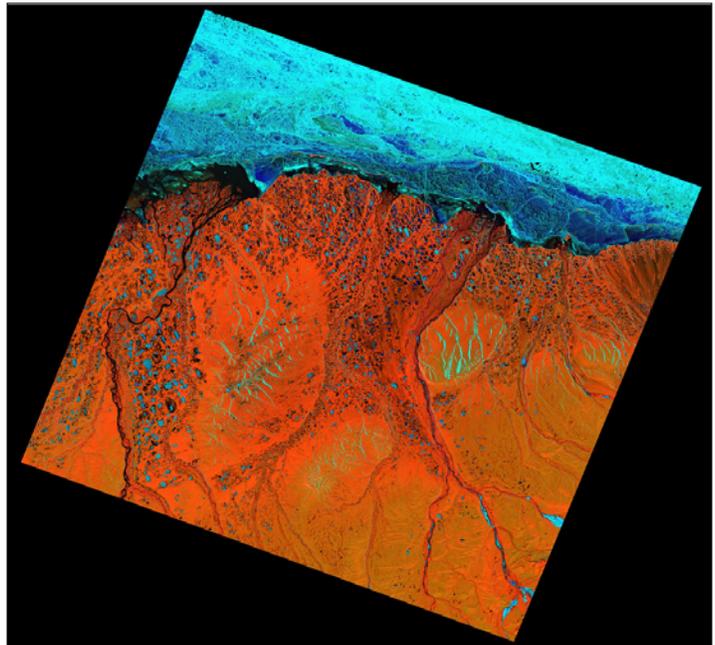
The NSSI Director, John Payne, is one of the principle investigators for the Arctic Observing Network (AON) initiative. AON held its first meeting in Boulder, CO in late March 2007. NSSI involvement with AON will promote substantial influence in the design of a system for the NSSI and greater management of North Slope resources. The National Science Foundation has the lead in developing AON as part of the IPY and the future of data collection and storage about the Arctic environs will continue well beyond the IPY. There is a strong need for well coordinated scientific and social efforts in Arctic nations.

In the fall of 2006, the Arctic Council urged all Arctic nations to maintain and extend long-term monitoring of change in the Arctic with a view to building a lasting legacy of IPY. Principle investigators have been tasked to develop a set of recommendations on how to achieve long-term Arctic-wide observing and activities that provide free, open and timely access to high quality data that will realize pan-Arctic and global value-added services and provide societal benefits. NSSI is a key player in the design and development of such an Arctic observing network with its current links to the Geographic Information Network of Alaska and to the U.S. Arctic Research Commission. The final design and implementation of a quality Arctic observing network will provide access to significant information that all DOI, state and local agencies can use for planning and managing activities in the future.

Geographic Information Network of Alaska

The University of Alaska's Geographic Information Network of Alaska (GINA) will provide data services in support of the NSSI. GINA's mission is focused on providing geospatial data and expertise in support of scientific analysis and fact-based decision-making. GINA already provides public service to Alaska, the Nation, and the circum-Arctic. The project partnership among GINA and the NSSI is needed to realize the potential of science data gathered on the North Slope.

GINA will provide data in formats and through web data services and download that make science-based decision-making more efficient. Through this cooperative program, GINA's primary (cont'd on next page)



Landsat 5 image of the North Slope oil industrial area, June 15, 2005 (courtesy of GINA). Captured under a program established by GINA, this image was purchased by industry in 2005. GINA performed the final image processing.

GINA (continued)...

objective is to reduce the effort and expense required to access North Slope data. By reducing barriers and expense, GINA's mission of service to Alaska and the NSSI's mission of enhancing science-based decision-making will be served. Specific objectives include: ingesting data layers from a prioritized list, developing standardized gridded data sets, provision of open standards web services and download for NSSI data, provision of metadata services, and supporting the development of decision support system tools.

Implementing NSSI Projects in 2007 and Beyond

Based on funding that NSSI received in 2007 there will be three new hydrologic gauging stations staged across the North Slope to increase understanding of North Slope hydrology. These stations will be compliant with USGS requirements. The two areas determined so far for the location of the gauging stations include the Tama-yariak River and the Canning River in the Arctic National Wildlife Reserve (ANWR); the third location will be within the National Petroleum Reserve-Alaska (NPR-A).

Other projects being carried forward in 2007 include a North Slope hydrography digital database that will be completed in partnership with USGS. NSSI is also funding the development of a digital landcover database to update current individual agency landcover databases and create both a consistent landcover classification across agencies and complete a change detection program for regional scale landcover changes in relation to climate models. Affiliates of the NSSI will also deploy a second generation of remotely controlled ALWAS water quality buoys that are both efficient and cost effective and measure baseline water quality parameters for North Slope lakes, rivers, and near-shore waters (more information on ALWAS is available in the January newsletter available on the NSSI website). Finally on the advice of the Science Technical Advisory Panel, the NSSI staff committee, various stakeholders and with the approval of the Oversight Group, the NSSI will begin to accept project proposals for available funding of future projects.

Other NSSI Activities in 2007

The NSSI was represented and delivered a presentation at the Climate Change Executive Roundtable discussion sponsored by the Fish and Wildlife Service in Anchorage on July 12. Topics of discussion included monitoring of physical parameters including stream gauging, climate, and air quality and monitoring of biological parameters including species, species groups, invasive species and ecosystems. There was also a report on the Alaska Climate Impact Assessment Commission. The presentation delivered by NSSI discussed using NSSI as a possible model that may have application for monitoring climate change in Alaska. Furthermore, the presentation provided examples of NSSI integrated and collaborative approaches to monitoring ecological change.

Finally, the NSSI has representation on the Department of Interior (DOI) Climate Change Committee. The task force involves a hundred individuals including the department's assistant secretaries and other top leaders as well as career scientists, park superintendents, refuge managers, and others from across the country. This committee will examine how to develop future policies regarding possible effects from climate change and the ability to be good stewards of wildlife, national parks and other landscapes as well as the DOI responsibility to help moderate greenhouse gas emissions. The task force will also examine how possible climate changes would affect disaster management, water resource management, habitat management, and devising new management responses for changing landscapes.



Peregrine falcon at a nesting sight in the Arctic. The Colville River on the North Slope has one of the largest densities of nesting raptors in the world, such as the peregrine falcon above (photo courtesy of USFWS).

The three fastest warming regions on the planet in the last two decades have been Alaska, Siberia and parts of the Antarctic Peninsula.



USCGC Healy cuts through young Arctic ice during the first day the cruise is underway (photo courtesy of NOAA).

NORTH SLOPE SCIENCE INITIATIVE

222 W. Seventh Ave, #13
Anchorage, AK 99513

Phone: 907-271-3431
Fax: 907-271-5479

E-mail: jpayne@ak.blm.gov



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Useful Web sites for North Slope Information

- International Polar Year: www.ipy.org
- Arctic Observing Network: <http://dels.nas.edu/prb/aon/>
- North By 2020: <http://www.alaska.edu/ipy/north2020/main.xml>
- Barrow Arctic Science Consortium (BASC): www.arcticscience.org
- Arctic Research Consortium of the United States: www.arcus.org
- Arctic Slope Regional Corporation: www.asrc.com
- North Slope Borough: www.north-slope.org
- University of Alaska-Fairbanks: www.uaf.edu
- North Pacific Research Board: www.nprb.org
- Alaska Oil and Gas Conservation Commission: www.aogcc.alaska.gov
- BP in Alaska: alaska.bp.com
- ConocoPhillips Alaska: www.conocophillipsalaska.com
- Conservation of Arctic Flora and Fauna: www.caff.is
- CircumArctic Rangifer Monitoring & Assessment: www.rangifer.net



A Look at Ice on the North Slope



Aufeis in a river drainage on the northern foothills of the Brooks Range (photo courtesy of Adam Mehlhorn).

Aufeis, German for "ice on top," accumulates during winter along stream and river valleys in arctic and subarctic environments. Aufeis forms by upwelling of river water behind ice dams, or by ground-water discharge. The latter mechanism prevails in high-gradient alpine streams as they freeze solid. Ground-water discharge is blocked by ice, perturbing the steady-state condition, and causing a small incremental rise in the local water table until discharge occurs along the bank at the top of the previously formed ice. During winter, successive freezing of the onlapping ice layers can lead to aufeis accumulations several meters thick. Aufeis typically melts out during summer and will form in the same place year after year. The location and extent of aufeis may be useful to relate local hydrology to geologic structure (information courtesy of USGS, Wanty, RB et. al 2002).

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