

Alaska North Slope Science Initiative

The North Slope of Alaska, which extends from the crest of the Brooks Range to the Arctic Ocean and from the Canadian border on the east to the Chukchi Sea on the west, provides unique habitats for a range of fish and wildlife, and also contains substantial oil resources that can help replace diminishing U.S. supplies. Argonne's Environmental Science Division (EVS) was called upon to help facilitate the development of a multi-agency North Slope Science Initiative (NSSI) that integrates inventory, monitoring, and research activities to support resource-management decisions on the North Slope of Alaska.

PROBLEM/OPPORTUNITY

Oil fields on land and off the coast of Alaska's North Slope produced about 14 billion barrels (bbl) of crude oil through the end of 2002. North Slope oil has averaged about 20% of U.S. domestic production since 1977, and it currently provides about 11% of annual domestic production of approximately 3.3 billion bbl and 5% of the annual domestic consumption of 7 billion bbl. As much as 20 billion additional bbl of oil could be extracted from the area, if all lands within the North Slope boundaries were open to exploration and development. The North Slope of Alaska includes the continental shelf and coastal water, flat coastal tundra, undulating foothills, rivers, lakes, and mountain slopes. The area provides important habitat for four caribou herds; is an important production and staging area for migratory birds; provides important ocean and estuarine habitat for marine mammals, migratory birds, and fish; and is vital to Alaska Natives and their communities.

A major concern is that any activities related to the recovery of the substantial North Slope oil and other resources are consistent with sustainability of the healthy and biologically diverse ecosystems.

APPROACH

In 2003, a multi-agency North Slope Science Initiative (NSSI) was established with the objective of integrating the inventory, monitoring, and research activities to support a science-based decision-making process for resource-management decisions on the North Slope of Alaska. Argonne's EVS (formerly the Environmental Assessment Division) was called upon to develop and



help facilitate three public workshops that brought together industry, government, nongovernmental organizations, interested citizens, and Alaska Native representatives to discuss the scope and issues that should be addressed by the NSSI.

RESULTS

EVS staff produced a report on the results of the workshop,¹ plus a draft strategy document that outlined key elements considered to be essential for a successful program and implementation plan.²

Key objectives of the NSSI were identified, including:

- Develop an understanding of informational needs for regulatory and land management agencies, local governments, and the public;
- Identify and prioritize informational needs for inventory, monitoring, and research activities to address the impacts of past, ongoing, and anticipated developmental activities on the North Slope;
- Coordinate ongoing and future inventory, monitoring, and research activities to minimize

duplication of effort, share financial resources and expertise, and assure the collection of high-quality information;

- Identify priority informational needs not addressed by existing agency science programs, and develop a funding strategy to address those needs;
- Maintain and improve public and agency access to accumulated and ongoing research and to contemporary traditional and local knowledge; and
- Ensure, through appropriate peer review, that the science conducted under the oversight of the NSSI and by participating NSSI agencies and organizations is of the highest technical quality.

The NSSI was structured to use a system-based conceptual framework to select North Slope natural and human attributes that are the subject of inventory, monitoring, and research projects. All NSSI studies need to utilize rigorous statistical approaches that include, as appropriate, control and treatment areas, random samples, repeated measures, and adequate sample sizes. Trend analyses may have to be used to examine temporal effects and determine cause and effect when control areas cannot be reasonably assigned.

One of the important aspects of the NSSI is the recognition that decisions related to resource management rely on information that contains an element of uncertainty. Uncertainty can be a natural component of the system (e.g., biological variability, such as population fluctuations) or related to the quality or type of information available to a decision maker (e.g., sampling issues or model error). Recognizing that uncertainty is associated with resource-management decisions provides the impetus to use an adaptive-management approach that evaluates uncertainty and allows new information to be incorporated into management actions.

COMMUNICATIONS OF RESULTS

The NSSI will benefit from a method to share and disseminate information among agency participants, the scientific community, and the public. It will be necessary to design and implement an information system that can accommodate a variety of information types ranging from spatial data, inventory and monitoring results, and traditional and local knowledge. The system should be robust and transparent to all users with a minimum of bureaucratic constraints. The system should also embrace a broad user community and adhere to standard data quality procedures including the use of metadata.

FUTURE

The NSSI provides a means to ensure that inventory, monitoring, and research activities are systematically integrated across disciplines and individual projects or programs. The NSSI adopts a strategic framework that provides natural resource managers with the data and analyses they need to evaluate multiple simultaneous goals and objectives related to land stewardship and legislative mandates for energy resource exploration and development on the North Slope. The NSSI will utilize and complement the information produced under other North Slope science programs, where appropriate. The NSSI also provides a strategy in which information sharing can occur among agencies, nongovernmental organizations, industry, academia, and members of the public to increase communication and reduce redundancy among science programs.

¹ Krummel, J.R., K.E. LaGory, R. Edson, and R. Schuchman. 2004. *North Slope Science Initiative Workshop Summary*. Environmental Assessment Division, Argonne National Laboratory, Argonne, Illinois.

² Krummel, J.R., and K.E. LaGory. 2004 draft. *North Slope Science Initiative, A Strategy for Inventory, Monitoring, and Research*. Environmental Assessment Division, Argonne National Laboratory, Argonne, Illinois.