Director's Report, North Slope Science Initiative
Activities from December 9, 2010 through February 22, 2011

First, I would like to welcome Jason Taylor on detail to the NSSI Deputy Director position. Jason is a landscape ecologist working at the BLM National Operations Center. He will be here through March 2011.

Good News! The 2010 Report to Congress has been signed by the Secretary of the Interior and transmitted to both the House and Senate. No changes in the report were recommended this year! A special thanks for the continuing help of Karen Laubenstein and Vanessa Rathbun, BLM Office of Communications for the layout and editorial review. A second thanks to those members of the Senior Staff Committee whose suggestions were very helpful.

Since the last Oversight Group meeting on December 8, 2010, substantial effort has been put into two priorities: the STAP connectivity paper and the upcoming NSSI Barrow workshop.

Weekly conference calls with STAP members have been held throughout November and are continuing as the NSSI workshop plans solidify. The North Slope Borough has been very active in helping the NSSI organize and plan the workshop, and several STAP members have been fully engaged. The workshop is planned for March 29-31, 2011, in Barrow and will have a unique setup in its organization (more later).

The STAP connectivity paper is coming along nicely. As with any activity planned and written by a collective body of people, it has been a challenge keeping the paper on track. A complete rewrite of the paper was accomplished in late October and the draft presented at the December 8th Oversight Group meeting will lead to the final document. Thanks to all of the STAP members, and especially Bill Streever for their continued dedication in developing this important paper. The final paper is to be released at this meeting.

The STAP is also working on new emerging issue papers that include: reclamation, fisheries and cultural. Drafts of the reclamation and cultural will be presented to the Oversight Group on December 8th. Time commitments for the Barrow workshop planning and the connectivity paper have precluded further refinement of both the reclamation and cultural papers. However, thanks to Robyn Angliss (Senior Staff Committee), the fisheries paper is moving through the review process. Robyn convened an expert group at the Alaska Marine Science Symposium that helped get the paper off to a good start.

Logistical planning for the North Slope land cover project, a cooperative effort with the Alaska Natural Heritage Program, National Resources Conservation Service, Ducks Unlimited, Inc. and Spatial Solutions, Inc. has started. Scott Guyer, BLM, is the logistical coordinator and team lead. We were hopeful to be able to complete the field work and image processing this year with the help of the Arctic Landscape Conservation Cooperative, but the Department of the Interior is still on a continuing resolution making funding from the Arctic LCC uncertain.

The University of Alaska Fairbanks received a National Fish and Wildlife Foundation grant to utilize synthetic aperture radar to characterize water bodies across the North Slope. The initial products will be a data layer that uses algorithms developed by other researchers who have characterized lakes on limited areas of the North Slope. This will be the first comprehensive look at freeze/no freeze that covers the entire North Slope. Partners for this include the Alaska SAR Facility, GINA and Michigan

Technology University. The first data analysis was completed in November 2010, with a final product due in late summer 2011.

Data Integration and Project Tracking

Project information in Catalog (catalog.northslope.org) is currently being updated based on input from the recent January STAF/STAP meeting in Fairbanks as well as through follow-up with individual NSSI member organizations. Project updates for BLM, NSB and NPS are complete. GINA has participated in the design of automated project metadata standards with the Alaska Data Integration Working Group (ADIwg) and will implement this standard in generating the 2011 update of NSF and USGS Catalog project information.

Data within Catalog have been completely refreshed with new information. There are currently over 244 data records available in Catalog which represent a wide variety of data types. Users can access data directly from the GINA archive or are referred to appropriate web sources that are maintained by other entities (ie. NSIDC, ADFG, etc). GINA will continue to update Catalog data holdings and is participating in the Arctic LCC Geospatial Data Working Group (GEOwg) meetings and data development activities.

Developing participation in Catalog is important. As part of the project update cycle for 2011, NSSI organizations will be provided with a user login to facilitate maintenance of project records and the integration of Catalog with existing automated project tracking systems will be encouraged. Collaborative development of Catalog resources is being pursued with additional partners (USFWS/Arctic LCC, AOOS, USGS and USARC).

GINA, together with UAF/ASF and MTRI, is developing information products relevant to the availability of winter liquid water within North Slope lakes (NFWF Grant). This can be relevant to ecological evaluations and development planning. Also GINA is in the process of developing orthoimagery (2.5m resolution) for the entire North Slope through the SDMI project. The 2009-2010 SDMI acquisitions provide good coverage of the North Slope region (www.alaskamapped.org/assets/25/spot-accepted-2010.10.jpg) and acquisition will be continuing. GINA is a reception facility for the MODIS satellites and is working with partners such as NPS-Arctic I&M Network in developing products and analysis for the North Slope region. All these information products will be provided to NSSI Catalog users.

NSSI Public Website

The NSSI public website (www.northslope.org) went through its third revamp. The site is now far easier to use and is based on new software. A training video has been posted on the website. The site is being used for the Barrow workshop for registration and agenda postings.

Arctic Communication and Coordination

The DOI continues to hold monthly conference calls for communicating Arctic information between the various DOI Alaska bureaus and the Washington, DC DOI offices. The majority of these calls are about communicating international efforts with such entities as the Arctic Council. The NSSI participates in these monthly calls. The NSSI has been selected as the co-lead with Denmark on the Terrestrial Monitoring program for the Conservation of Arctic Flora and Fauna, a subgroup of the Arctic Council. The first joint meeting between the Arctic countries was held in Iceland on February 1-3, 2011. The U.S. Arctic Research Commission is co-leading with the NSSI as the U.S. partners. An Arctic (U.S. only)

specific terrestrial monitoring workshop is being planned for the near future. Two, larger, international workshops are also planned: one in Anchorage and the other in Denmark over the next three years.

Science Frontiers and NSSI

Working with Michigan Tech Research Institute and the University of Michigan, the NSSI partnership has developed a new algorithm and successfully evaluated functionality to estimate water depth and volume of lakes on the North Slope of Alaska. The algorithm utilizes synthetic aperture radar (SAR) data collected in late winter in combination with electro-optical (EO) satellite data collected in the summer such as Landsat, Aster, or commercial fine resolution to estimate depth and volume without the need for in-situ collected control points. After co-registering the SAR/EO data sets, the lake shoreline (zero depth) is identified. The SAR data is then used to classify lakes as frozen (less than ~2 m deep) or having some liquid water (greater than 2 m depth). The SAR data is then used to obtain the 2 m depth contour through observed changes in backscatter return. These depth values (shoreline and 2 m) are then used as inputs to calibrate a light attenuation model that calculates depth values for all depths in optically shallow water. The algorithm can utilize any SAR satellite data set and has been tested on Landsat, Aster, and commercial fine resolution EO satellite data. The combined microwave/EO algorithm when tested on ERS and Landsat data sets produced depth values that were within one half meter of the water depth independently measured by in-situ fathometers. The SAR data used in this project is being developed through GINA and UAF SAR facility.

Meetings and Coordination

January and February are typically busy months with the Alaska Marine Science Symposium, Alaska Forum on the Environment and the Alaska Surveying and Mapping Conference. NSSI continues to participate in all of these as time permits.