

## **North Slope GIS Efforts in Support of Research and Logistics**

Bell Harbor International Conference Center

Seattle, Washington

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### **Summary**

Compiled and written by meeting chair [Allison Graves](#), Nuna Technologies

The goal of this meeting was to look at synergistic GIS efforts with respect to research and logistic support on the North Slope of Alaska. This meeting was a follow up to see how groups actively involved in GIS initiatives on the North Slope are moving forward with recommendations from the Arctic GIS meeting held in January, 2001. The recommendations included the value of developing demonstration projects and Spatial Data Infrastructure (SDI) in support of arctic research. Representatives of over twelve organizations presented their GIS needs, goals and current activities. The series of presentations revealed synergistic efforts with respect to data acquisition, archiving, metadata, application development and user access. The presentation forum was informal to encourage discussion and information exchange among the participants. This was followed by a discussion of future directions to keep the momentum building in working toward the long-term goal of developing an Arctic GIS or Arctic Information Infrastructure (AII).

Individual "Grassroots" GIS efforts show great promise for making additional linkages in working toward the long-term AII goal. In the absence of a coordinated AII "superstructure," the presentations demonstrated that the AII is emerging in a distributed network of data nodes with resources that can be integrated in a fashion that is transparent to the scientific community when users share information and use common standards. The network of registered Federal Geographic Data Committee (FGDC) clearinghouses may be searched seamlessly for data sets. Applications such as the Barrow Area Information Database – Internet Map Server demonstrate the ability to integrate a variety of spatial data, metadata and linkages to databases maintained by various organizations (Barrow Arctic Science Consortium, ARCUS, VECO Polar Resources, Arctic System Science Data Coordination Center, etc.) in a single web based interface. Two efforts demonstrated the need and success in acquiring key framework data sets such as the remotely sensed high resolution Digital Elevation Models and associated imagery for the Barrow Peninsula and the Kuparuk Basin. The Alaska Geobotany Center at the Institute of Arctic Biology in Fairbanks demonstrated the utility of a hierarchical GIS in which one could scale data from the level of the plant community to an Arctic vegetation map. Federal agency representatives from the US Geologic Survey, Bureau of Land Management and National Park Service shared information about North Slope Science Initiatives and plans for an Inventory and Monitoring program. A presentation of the Circum-Arctic Environmental Observatories Network (CEON) focused on the need for standard measurements between research hubs and the value of Spatial Data Infrastructure (SDI) for this network. Regional research hubs on the North Slope (at Barrow and Toolik Field Station) are clearly becoming established nodes within the growing AII. Representatives from the data centers at the Arctic System

Science (ARCSS) Data Coordination Center (ADCC) and the Geographic Information Network of Alaska (GINA) presented their resources and approaches for archiving and providing access to spatial data. The Barrow Arctic Science Consortium, VECO Polar Resources and ARCUS demonstrated examples of logistic based GIS projects.

### **Presentations**

- Barrow Arctic Science Consortium (BASC) (Allison Graves / Craig Tweedie)  
*Barrow Area Spatial Data Infrastructure /Barrow Area Information Database Internet Map Server*
- Michigan State University (Craig Tweedie)  
*Circum-Arctic Environmental Observatories Network (CEON)*
- Toolik Field Station, Institute of Arctic Biology (Andrew Balser)  
*Logistics and Science Management GIS Applications*
- Alaska Geobotany Center, Institute of Arctic Biology (Skip Walker)  
*Hierarchical GIS*
- University of Colorado (Bill Manley)  
*High Precision Remote Sensing Efforts*
- Institute of Northern Engineering, University of Fairbanks (Matt Nolan)  
*Mapping the Kuparuk Basin*
- National Science Foundation / VECO Polar Support (Renee Crain and Diana Garcia-Novick)  
*Logistics based GIS efforts*
- Geophysical Institute, University of Alaska (Buck Sharpton)  
*Spatial Data Management at the Geographic Information Network of Alaska (GINA)*
- National Snow and Ice Data Center (NSIDC) (Rudy Dichtl)  
*Spatial Data Management at the Arctic System Science (ARCSS) Data Coordination Center (ADCC)*
- Arctic Research Consortium of the United States (ARCUS) (Josh Klauder)  
*Overview of the Directory of Arctic Researchers & Arctic Logistics Information And Support (ALIAS)*
- US Geological Survey (Emily Binnian)  
*Overview of scientific efforts on the North Slope*
- US Bureau of Land Management (Robert Edson)  
*North Slope Science Initiative*

### **Funding**

NSF will accept suitably focused proposals to the Arctic Research Support and Logistics program (see the Arctic Research Opportunities solicitation NSF 03-574). Investigators are encouraged to form meaningful collaborations and to discuss their proposal ideas with Simon Stephenson or Renee Crain prior to submission. In addition, USGS funding opportunities for metadata training and development were highlighted.

## Workshop Recommendations

The one-day meeting produced a list of possible directions and considerations that are listed below. The need for improved communication was highlighted and it was decided that an “Arctic GIS” bulletin board would be the best forum for sharing information and promoting ongoing collaboration. If you are interested in becoming a part of this effort, please sign up at the link below.

### *Possible Directions*

- Multiple regional nodes
  - Individual or group efforts through proposal funding channels
- Transparent gateway (starting portal) as umbrella for nodes
  - Links and linkages; interconnectivity
  - Standards, interoperability, and templates
  - Avoid replicated effort, but promote accessibility from different perspectives
- Arctic Geospatial Information Infrastructure Forum
  - Exchange of knowledge among informed and active members of the Arctic geospatial community
  - Perhaps something like the Barrow Arctic Science Consortium Digital Working Group (BASC DWG) but for the North Slope, or the Circumarctic, or interrelated areas
  - Email list or bulletin board
  - Communicate funding opportunities
  - Communication among nodes
  - Bulletin board could be implemented quickly through ARCUS Arctic GIS site

### *Other considerations*

- Encompass agencies and stakeholders beyond NSF
- Beyond science community, engage stakeholders and policy makers (outreach/dialog and education)
- Nodes should coordinate with regional land-management and policy groups
- Funding for some of the geospatial development efforts can come from FGDC, or GSDI, or other sources
- Promote federal and international inter-agency cooperation (e.g., through SEARCH, CEON, UNEP, many other broad organizations)
- Encompass both GIS and remote-sensing infrastructure development
- Bottom-up initiatives for nodes
- Top-down initiatives for broad-scope communication and coordination
- Encourage/enforce metadata creation according to standards
- Support training materials and workshops for metadata creation (e.g., contact UNEP-GRID for tie-in)
- Strengthen the geospatial component of data coordination centers
- Prioritize efforts for data creation and metadata creation: “stop the bleeding” and stop repeating bad habits with long-term implications

- Data-rescue efforts are more difficult (preparation and distribution) than new datasets, but sometimes valuable
- Collect location information (lat/long etc.) for projects that might not be collected by VECO
- These notes and other possible directions could be shared with the broader community for comment