



# BAID: The Barrow Area Information Database – an interactive web mapping portal and cyberinfrastructure for scientific activities in the vicinity of Barrow, Alaska.

[www.baid.utep.edu](http://www.baid.utep.edu)

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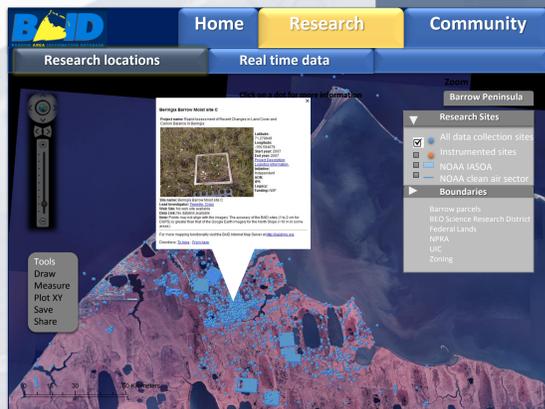
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## Abstract

In 2013, the Barrow Area Information Database (BAID, [www.baid.utep.edu](http://www.baid.utep.edu)) project resumed field operations in Barrow, AK. The Barrow area of northern Alaska is one of the most intensely researched locations in the Arctic. BAID is a cyberinfrastructure (CI) that details much of the historic and extant research undertaken within in the Barrow region in a suite of interactive web-based mapping and information portals (geobrowsers). The BAID user community and target audience for BAID is diverse and includes research scientists, science logisticians, land managers, educators, students, and the general public. BAID contains information on more than 12,000 Barrow area research sites that extend back to the 1940's and more than 640 remote sensing images and geospatial datasets. In a web-based setting, users can zoom, pan, query, measure distance, and save or print maps and query results. Data are described with metadata that meet Federal Geographic Data Committee standards and are archived at the University Corporation for Atmospheric Research Earth Observing Laboratory (EOL) where non-proprietary BAID data can be freely downloaded. Highlights for the 2013 season include the addition of more than 2000 additional research sites, providing Differential global position system (DGPS) support to visiting scientists, surveying over 80 miles of coastline to document rates of erosion, training of local GIS personal, deployment of a wireless sensor network, and substantial upgrades to the BAID website and web mapping applications.

## Maintaining, updating and innovating the existing suite of BAID geobrowsers

The suite of BAID geobrowsers is currently being updated from antiquated ArcIMS viewer to a suite of ArcGIS JavaScript applications utilizing HTML5 capabilities. Instead of attempting to replicate a full GIS desktop experience, a series of less complicated applications targeted to researcher and the community are being developed to add the user in finding the information they need. Beta version of the applications will be deployed early in 2014.

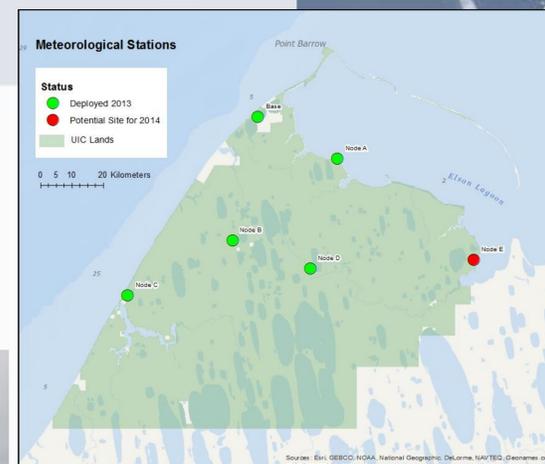


Mockup of new BAID geobrowser.

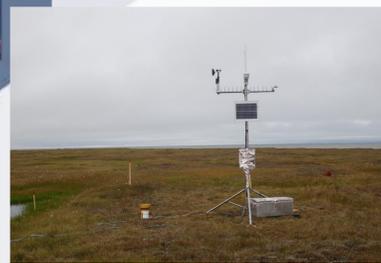
## Developing a wireless sensor network that provides web-based interaction with near-real time climate and other data

Four Campbell Scientific meteorological stations were deployed in 2013. Stations are currently logging and transmitting data to a base station in the Barrow Arctic Research Center. For 2014, a web application will be developed to visualize near real time data and Open Geospatial Consortium webservice will be published.

Current Sensors include:  
Soil Temp / Moisture  
Leaf Wetness  
Precipitation  
Windspeed / Direction  
Air Temp / Moisture  
Solar Radiation-PAR



BAID Meteorological Stations deployment status.



One of the meteorological stations deployed in 2013.

## Collecting data on research activities, generating geospatial data, and providing mapping support

Ongoing field data collection will continue to be focused in the Barrow area as defined above. Each year, the BAID field team interacts with personnel from between 30 and 50 projects conducting research in the Barrow area. Utilizing Differential Global Positioning System (DGPS), high precision location information is obtained for the approximately 500-2000 research sites added to BAID every year. Where appropriate, we assist researchers with site selection and establishment; determine potential location-specific conflicts (e.g. plant studies on a historical fertilizer experiment); conduct field surveys and interviews to ascertain the nature of research being conducted and where interested users of BAID may find more information or access data; provide mapping support; and provide information on historic, ongoing and planned research that a research group may find to be complementary or detrimental to their activities. We also provide mapping support for the production of the annual report of the Barrow Environmental Observatory. BAID has been particularly successful at fostering collaboration between researchers who are often eager to co-locate their research effort with existing science infrastructure (towers, boardwalks, power, etc.), instrumentation or sampling conducted by synergistic efforts.



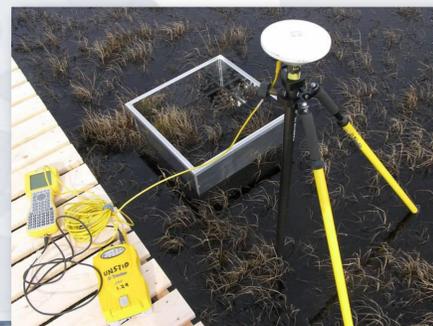
UTEP student Keith Kofeod and UMIAQ technician Qaiyaan Aiken conducted DGPS surveys in 2013..



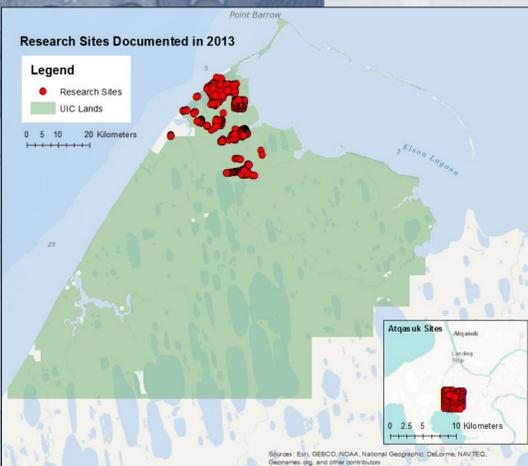
The new BAID homepage..

## Documenting Research Sites

Over 2000 research site locations were surveyed and documented in 2013. This increases to total number of sites in the BAID database to over 12,000.



Research site being surveyed with DGPS for the BAID database.



Research Sites Documented in 2013..

## Linking BAID to data archives at the National Snow and Ice Data Center (NSIDC)

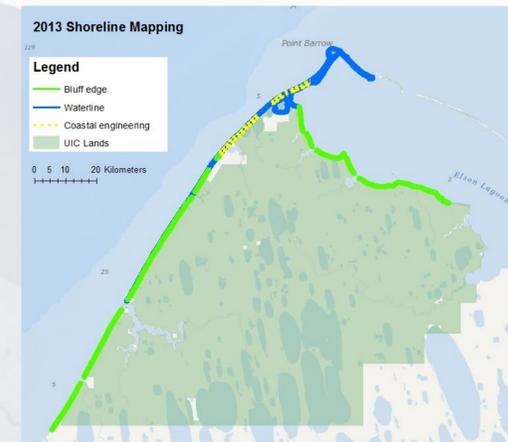
An applied research effort that will enhance the functionality of BAID and provide a basis for improved interoperability for developing pan-Arctic data systems will be conducted as a new collaboration with Collins at NSIDC. Although this study will encompass only a small fraction of archived data from the Barrow area, this pilot study will be used to explore how archived data at NSIDC (and other data centers) can be made more readily available to BAID and other CI like BAID. We propose to identify relevant data and test different web-service-based approaches to making these data directly available to BAID and other systems. The effort will enhance BAID by providing a direct connection to relevant data and will be made possible through the proposed development of the BAID 2D geobrowser described in activity 2 above. NSIDC will benefit by knowing, through the exploration and documentation of different webservices and protocols, how future development of Arctic data systems can be designed to improve interoperability with CI like BAID

## Coastal Erosion Mapping

In 2013 DGPS surveys were conducted for 84 km of coastline. Shoreline reference features including bluff edge, waterline, and coastal engineering were documented.



UTEP student Keith Kofeod surveys the bluff edge on the Chukchi Sea coast.



Coastal surveys conducted in 2013.



The Micro Topographic Grid, originally sampled in 1974 as part of the International Biological Program, is an example of a historic research site in BAID that has been resampled.

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