



NOTES

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WINTER 2012

ISSUE NO. 78

nsidc.org

NSIDC Receives Award for Green Data Center Design

The Green Data Center Team at NSIDC received the Colorado 2011 Governor’s Award for High-Impact Research in November 2011. The team was recognized for its innovative data center redesign that slashed energy consumption for data center cooling by more than 90 percent, demonstrating how other data centers and the technology industry can save energy and reduce carbon emissions. The Green Data Center Team is led by NSIDC technical services manager David Gallaher, in collaboration with several Colorado-based companies and the National Renewable Energy Laboratory (NREL).

The Green Data Center went online in summer 2011. The heart of the design includes new cooling technology that uses a fraction of the energy required by traditional air conditioning. This is in addition to computer room consolidation, hot/cold aisles, and server virtualization. The second phase of the project, to be completed in late spring 2012, includes an extensive rooftop solar array that will result in additional energy savings.

Researchers around the world who study Earth’s snow, ice, and climates access data from NSIDC’s active data archive, a bank

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Ismail Samani Peak towers over a camp in Tajikistan in the High Asia region. The University of Colorado Boulder and the United States Agency for International Development are cooperating to assess snow and glacier contributions to the regions water resources. (Credit: F. Tyers)

CU-Boulder and USAID to Assess Water Resources in Asia Mountains

NSIDC scientist Richard Armstrong and Mark Williams of the Institute of Arctic and Alpine Research (INSTAAR) are leading a four-year study to assess snow and glacier contributions to water resources originating in the high mountains of Asia.

The study aims to make a comprehensive and systematic assessment of freshwater resources in the High Asia region, an area that encompasses five mountain ranges and watersheds that cover roughly one million square miles. The project is a partnership

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Kevin Schaefer (Credit: N. Vizcarra)

NSIDC Scientist Contributes to Report on Carbon from Thawing Permafrost

As Arctic temperatures rise, permafrost will thaw, releasing greenhouse gases that will accelerate the warming of the planet. But how much or how quickly is not well understood. In an editorial piece published last November in the journal *Nature*, NSIDC scien-

tist Kevin Schaefer joins a group of forty-one international experts working to pin down that number. The researchers calculate that permafrost thaw will have a greater effect on climate than previous modeling studies have predicted.

Arctic soil is thought to hold around 1,700 billion tons of organic carbon, around four times more than all the carbon ever emitted by modern human activity and twice as much as is currently in the atmosphere. As the Arctic warms,

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The Semantic Sea Ice Interoperability Initiative Releases First Ontologies

The Semantic Sea Ice Interoperability Initiative (SSIII) is a National Science Foundation-funded effort to enhance the interoperability of sea ice data and to foster a network of practitioners working to enhance semantic interoperability of all Arctic data. SSIII is a collaborative project between NSIDC and the Rensselaer Polytechnic Institute Tetherless World Constellation project. The SSIII seeks to build on the work initiated under the International Polar Year (2007 to 2009) and create a community of practice working to improve interoperability within the Polar Information Commons, the Sustained Arctic Observing Network, and broader global systems.

The SSIII will initially focus on the scientific understanding of sea ice by developing a suite of detailed, yet broad sea ice ontologies linked to relevant marine, polar, atmospheric, and global ontologies and semantic services. An ontology is a formal, explicit (machine-readable) description of concepts in a domain of discourse. The overall goal is to improve the interoperability, usefulness, and understanding of Arctic sea ice data using Semantic Web approaches and technologies. The Semantic Web approach exposes, shares, and connects pieces of data through the use of unique identifiers and standardized protocols for describing data.

The SSIII has recently released its first ontologies based on operational shipping needs. Seven small, interrelated ontologies have been published: sea ice, sea ice concentration, sea ice development, sea

ice form, ice of land origin, egg code, and Sea Ice Grid (SIGRID), also called SIGRID-3. Browse and access the ontologies at the SSIII project Web site (<http://nsidc.org/ssiii>).

NSIDC Scientist Contributes to Yearly Arctic Report Card

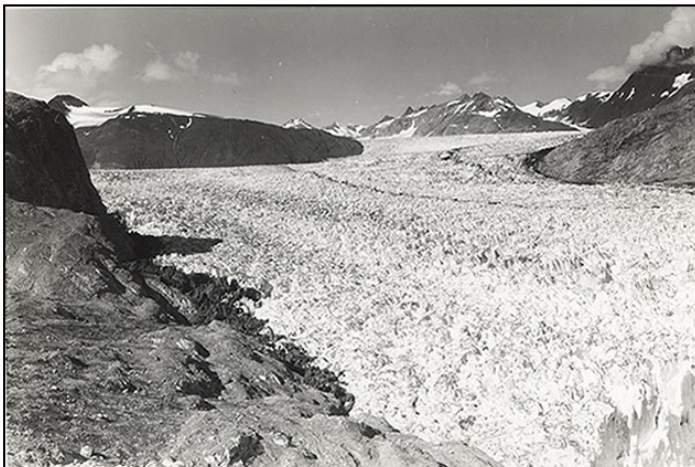
NSIDC scientist Walt Meier contributed to the 2011 Arctic Report Card, an annual compilation of scientific observations of the changing Arctic region. The report is released yearly by the National Oceanographic and Atmospheric Administration (NOAA). Meier co-wrote the section on Arctic sea ice.



Walt Meier (Credit: P. Gibbons)

Sea ice extent was the second-lowest in the satellite record this fall, continuing a downward trend in ice extent seen over the last 30 years. In addition to changing sea ice, the report chronicles warmer-than-average air temperatures in the Arctic, increasing vegetation on northern land, and acidification of the Arctic Ocean as it absorbs carbon dioxide from the atmosphere.

For more information, visit the NOAA Arctic Report Card Web site (<http://www.arctic.noaa.gov/reportcard/index.html>).



These photos show Muir Glacier, located in Glacier Bay, Alaska, photographed by W. Field in August 1941 (left) and by B. Molnia in August 2004 (right). The glacier has retreated so much since 1941 that it no longer reaches the sea. Presently, Muir is barely visible off in the distance, and lush vegetation has covered the outcrop on the left.

Adopt a Glacier

Glaciers are retreating at an alarming rate around the world in response to a warming Earth. To help promote awareness of glacier recession and to support the Roger G. Barry Resource Office for Cryospheric Studies (ROCS), NSIDC has created an Adopt a Glacier fundraising project. While adoption of a glacier is symbolic, the money raised will allow ROCS to purchase document boxes for

preserving manuscript materials in acid free folders, to purchase photo safe boxes for preserving our historic glacier photograph collection, and to assist in the ongoing preservation, organization, and digitization of historic materials. Three glaciers are available for adoption: Arapaho, Franz Josef, and Muir. Donors receive a certificate of adoption along with a photo and facts about the glacier they have adopted. For more information, see the Adopt a Glacier Web page (<http://nsidc.org/rocs/adopt-a-glacier>).

MEaSURES Antarctic Data Products Released

NSIDC is pleased to announce the release of two Antarctic data sets, which are part of the NASA Making Earth Science Data Records for Use in Research Environments (MEaSURES) project. The MEaSURES project aims to develop consistent global and continent scale data records related to earth science, or Earth System Data Records.

MEaSURES InSAR-Based Antarctica Velocity Map provides the first comprehensive, high-resolution, digital mosaic of ice motion in Antarctica. The data set was assembled from multiple satellite Interferometric Synthetic Aperture Radar data, acquired during the International Polar Year 2007 to 2009. Access the data at the product Web site (<http://nsidc.org/data/nsidc-0484.html>).

MEaSURES Antarctic Grounding Line from Differential Satellite Radar Interferometry provides a high-resolution map of grounding lines in Antarctica, derived using seventeen years of differential satellite Synthetic Aperture Radar data. See the product Web site for more information (<http://nsidc.org/data/nsidc-0498.html>).

The MEaSURES program at NSIDC also distributes ice velocity maps of Greenland and global freeze/thaw data. For more information see the NSIDC MEaSURES Web page (<http://nsidc.org/data/measurements/index.html>).

Update to SSM/I-SSMIS Brightness Temperatures Available

Updated Special Sensor Microwave Imager (SSM/I) and Special Sensor Microwave Imager/Sounder (SSMIS) brightness temperature data are now available. This quarterly update extends the time series of the both the Equal-Area Scalable Earth-Grid (EASE-Grid) and polar gridded data sets through 30 September 2011. For more information see the product Web pages:

- *Defense Meteorological Satellite Program (DMSP) SSM/I-SSMIS Pathfinder Daily EASE-Grid Brightness Temperatures* (<http://nsidc.org/data/nsidc-0032.html>).
- *Defense Meteorological Satellite Program Special Sensor Microwave Imager (DMSP SSM/I) and Special Sensor Microwave Imager/Sounder (SSMIS) Polar Gridded Brightness Temperatures* (<http://nsidc.org/data/nsidc-0001.html>).

AMSR-E/Aqua Global Daily Gridded Brightness Temperature Data Update

Global daily gridded brightness temperature data from the Advanced Microwave Scanning Radiometer-EOS (AMSR-E) on the Aqua satellite have been updated through 27 September 2011. These include data in all three Equal-Area Scalable Earth Grid (EASE-Grid) projections (north, south, and global) as well as global quarter-degree latitude-longitude gridded data. See the product Web pages for further information and data access:

- *AMSR-E/Aqua Daily EASE-Grid Brightness Temperatures* (<http://nsidc.org/data/nsidc-0301.html>)
- *AMSR-E/Aqua Daily Global Quarter-Degree Gridded Brightness Temperatures* (<http://nsidc.org/data/nsidc-0302.html>)

Sea Ice Trends and Climatologies from SMMR and SSM/I

The Sea Ice Trends and Climatologies from Scanning Multichannel Microwave Radiometer (SMMR) and Special Sensor Microwave Imager (SSM/I) has been updated through 31 December 2010 for all portions of the product derived from the NASA Team algorithm. This is a suite of value-added products that aid in investigations of the variability and trends of sea ice cover. Updates include ice extent, ice persistence, monthly means, and the ocean masks, available on the FTP site. The final updates to the dataset, specifically to the portions derived from the Bootstrap algorithm, are anticipated in 2012. For more information and access to the data set, see the product Web page (<http://nsidc.org/data/nsidc-0192.html>).

Collaborative Sea Ice Product Released

NSIDC contributed to a new sea ice concentration product developed by the European Meteorological Satellite (EUMETSAT) program's Ocean and Sea Ice Satellite Application Facility. Brightness temperature data from the Nimbus-7 SMMR and the DMSP SSM/I instruments were reprocessed with updated algorithms and dynamic tie-points to produce sea ice concentration data from 1979 to 2009. This data set is especially useful for cross-validation studies between the NASA Team and Bootstrap algorithms. The data are distributed by EUMETSAT. More information can be found on the product Web page (<http://nsidc.org/data/nsidc-0508.html>).

GLIMS Project Updates

A new glacier inventory is being served from the Global Land Ice Measurements from Space (GLIMS) Web site. The Randolph Glacier Inventory 1.0 has been compiled to meet the needs of the sea level chapter of the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. It now includes glacier outlines although without the attributes, IDs or links to other data that the GLIMS outlines have. Eventually, this new inventory will be incorporated into the multi-temporal glacier database of GLIMS.

NSIDC has developed software to merge large sets of glacier outlines and associate the proper identifiers that tie together outlines pertaining to the same glacier. This allows examination of geospatial relationships between the sets of outlines to assign attributes and linkages accordingly. It is expected that the GLIMS Glacier Database will have complete global coverage by the end of 2012 through the work done at NSIDC and that of the greater glaciological community. See the GLIMS Web site for more information (<http://glims.org>).

ICESat/GLAS Updates

The Ice, Cloud, and land Elevation Satellite (ICESat) Science Investigator-led Processing System (I-SIPS) team continues to reprocess the Geoscience Laser Altimeter System (GLAS) data to Release-33. GLAS Release-33 data are now available for all Laser 2 and Laser 3 campaigns.

NSIDC is awaiting the Laser 1A/B campaign, which is the final campaign that will complete the Release-33 reprocessing effort. However, until all campaigns are reprocessed, Release-31 and Release-33 will continue to be available from NSIDC.

Note: GLAS Release-33 data should not be mixed with previous releases of data for science analysis. Processing enhancements have produced differences in the orbit and attitude information as well as small differences in the surface elevations.

This release includes important changes to the processing code:

- The saturation correction for Laser 3 has been improved.
- The standard fit signal threshold was lowered starting with Laser 3I to provide more elevations for the low signal areas. The qualities of the low signal elevations have not been fully evaluated.
- A new atmospheric characterization and confidence flag has been added to allow for more consistency in identifying atmospheric effects on the elevation estimates.
- The calibration of the atmospheric product parameters has been improved.
- New parameters have been added to the elevation products, including: distance to the reference track, a WGS84-referenced elevation, campaign repeat cycle and track number.

For more information about all of the Release-33 changes, see the ICESat/GLAS Data Releases Web page (http://nsidc.org/data/icesat/data_releases.html).

For more information about ICESat/GLAS data and ordering options, see the ICESat/GLAS Overview Web page (<http://nsidc.org/data/icesat>).

IceBridge Data Management Updates at NSIDC

NSIDC continues to release IceBridge data on an accelerated schedule as we receive data and sensor information from the data providers. For a complete listing of available data sets, please see the IceBridge Data Summaries Web page (http://nsidc.org/data/ice-bridge/data_summaries.html).

Development continues on the IceBridge Data Portal. The data portal now allows users to view flight lines from the 2010 Greenland and Alaska campaigns on a map and in a list format. Users can select a flight line and see more details about the flight, including the instruments in operation. Direct links to the FTP site to

download instrument data are now available within the data portal. Explore the new features at the IceBridge Data Portal Web page (<http://nsidc.org/icebridge/portal>).

If you are interested in IceBridge-related updates, please contact NSIDC User Services (nsidc@nsidc.org) and request your name be added to the email list, or subscribe to the NSIDC Data News RSS feed (http://nsidc.org/data/rss_feed_data_news/data_news.xml).

AGDC Releases New Data

The Antarctic Glaciological Data Center (AGDC) at NSIDC has released new data sets relating to Antarctic firn samples, ice cores, and ice motion. The following data sets are now available for download, along with documentation describing the data.

- *Microparticle, Conductivity, and Density Measurements from the WAIS Divide Deep Ice Core, Antarctica* (<http://nsidc.org/data/nsidc-0499.html>)
- *Methane Isotopes in South Pole Firn Air, 2008* (<http://nsidc.org/data/nsidc-0502.html>)
- *Alkanes in Firn Air Samples, Antarctica and Greenland* (<http://nsidc.org/data/nsidc-0504.html>)
- *WAIS Divide Snowpit Chemical and Isotope Measurements, Antarctica* (<http://nsidc.org/data/nsidc-0506.html>)
- *GPS Ice Flow Measurements, Allan Hills, Antarctica* (<http://nsidc.org/data/nsidc-0507.html>)

Antarctic glaciology researchers funded by the National Science Foundation Office of Polar Programs are required to submit their data to AGDC. For more information, see the AGDC Submit Data Web page (<http://nsidc.org/agdc/submit.html>).

Reverb to Replace WIST in Winter 2012

After more than a year of collaboration with the EOS Clearing House (ECHO) and other NASA data centers, NSIDC is pleased to announce Reverb as the successor to the Warehouse Inventory Search Tool (WIST). Reverb provides science data access and discovery across NASA's Earth Observing System (EOS) through a modernized user interface. By decreasing the number of page transitions and seamlessly integrating services, the Reverb interface has improved the data discovery and access experience. Please begin using Reverb today, as is it replacing WIST permanently in the near futures. Access the interface at the Reverb Web site (<http://reverb.echo.nasa.gov/reverb>).

CU-Boulder and USAID, continued from page 1

between the United States Agency for International Development (USAID) and the University of Colorado Boulder (CU-Boulder).

“USAID wants to know how the High Asia water resources affect local populations,” Armstrong said. “They are looking at this challenge from a sustainability perspective, including what is going to happen to rivers like the Indus and the Brahmaputra in the next twenty years.”

The researchers will use remote sensing satellite data from NASA, the European Space Agency and the Japanese Space Agency to develop time series maps of seasonal snowfall amounts and recent changes in glacier extent, said Williams. They also will use local meteorological and river discharge data from throughout the High Asia study area.

The assessment will be crucial in forecasting the future availability and vulnerability of water resources in the region, beginning with accurate assessments of the distinct, separate contributions to river discharge from melting glacier ice and seasonal snow. Such data ultimately provides a better understanding of the timing and volume of runoff in the face of climate change.

For more information read the press release on the NSIDC News Web site (http://nsidc.org/news/press/20111207_usaid.html)

NSIDC Scientist Contributes, continued from page 1

the frozen soil thaws and microbes begin to break down frozen plant and animal matter, releasing carbon dioxide and methane into the atmosphere.

In this paper, researchers in a group called the Permafrost Carbon Network predicted how much of the permafrost is likely to thaw, how much carbon that will release, and how much of that carbon will be in the form of methane, which has a much greater effect on warming than carbon dioxide. Their collective estimate is that the amount of carbon released by 2100 will be 1.7 to 5.2 times greater than reported in several recent modeling studies.

For more information and a link to Schaefer’s research, see the press release on the NSIDC News Web site (http://nsidc.org/news/press/20111130_permafrost.html).

NSIDC Receives Award, continued from page 1

of computers and storage devices that require a cool environment to operate. The machines themselves generate heat. Cooling NSIDC’s computer room previously required over 840,000 kilowatt-hours of energy per year, enough to power 95 homes.

The new indirect evaporative cooling units, manufactured by Colorado Corporation, cool by blowing air over water, using much less energy than compressors. Unlike traditional evaporative cooling, indirect evaporative cooling does not add humidity to the room, maintaining the dry environment that computers need. Overall, the new design will save about \$54,000 in electricity costs alone.

For more information, including a monitor of computing center energy usage and cooling, see the NSIDC Green Data Center Web site (<http://nsidc.org/about/green-data-center>).



NSIDC technical services manager David Gallaher points out features of the new cooling units during the construction of the NSIDC Green Data Center. A key element of the redesign, these new evaporative units reduce cooling energy by more than 90 percent, compared to the traditional air conditioning units that they replaced. (Credit: Ron Weaver, NSIDC)



Participants from North America, Greenland, Asia, Europe, and Australia attend the 2011 ELOKA Workshop held at the CU Boulder campus. (Credit: David Oonk)

ELOKA Workshop Report

More than 75 participants from North America, Europe, Asia, and Australia attended the Exchange for Local Observations and Knowledge of the Arctic (ELOKA) Workshop. Titled *Data Management and Local Knowledge: Building a Network to Support Community-Based Research and Monitoring*, the workshop engaged members of Indigenous communities from Alaska, Siberia, the Canadian Arctic, and the Boulder area, as well as university researchers, federal government representatives, students and others. It was held 15 to 17 November at the University of Colorado Boulder.

The program included more than 35 talks, a poster session, and a series of working sessions. The workshop significantly strengthened links between ELOKA and the broader network of community members and researchers working with Arctic communities.

Workshop presentations and abstracts are available online at the ELOKA Workshop Web page (<http://eloka-arctic.org/news/agenda.html>).

24th Polar Libraries Colloquy

NSIDC is co-hosting the 24th Polar Libraries Colloquy in Boulder, held 11 to 14 June 2012. The conference theme is *Cold Regions: Pivot Points, Focal Points*. Scientists, economists, and governments are focused on the evolving role of polar regions in world affairs. Polar libraries are evolving as well. The colloquy will feature a number of interesting presentations and panels, a field trip to one of the coldest labs in the world, and discussion on addressing practical problems in polar libraries.

For more information, visit the colloquy Web site (<http://plc24.blogspot.com>).

NSIDC TRIVIA

Last issue's question

On an iceberg, what is the name of the part that lies beneath the water?

Answer

This part is called the keel and it not only refers to the mass beneath the water, but is also a reference to depth. For example, scientists may refer to the measurement of how deep an iceberg reaches beneath the surface as the keel. Additionally, the part that is above water is referred to as the freeboard.

This issue's question

What is watermelon snow? For help, see the NSIDC Cryosphere Glossary (<http://nsidc.org/cgi-bin/words/glossary.pl>).

Post your answer on our Facebook page (<http://facebook.com/nsidc>). We will publish the answer on the NSIDC Facebook page on Friday 24 February, or you can find it here in the next issue.

PERSONNEL

Arrivals

Danielle Harper	Software Developer
Erika Lenz	Message Center Supervisor/Web Designer
Liz Schlagel	ACADIS Data Curator
Lynn Yarmey	ACADIS Data Curator

Departures

David Korn	User Services Representative
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CITING NSIDC DATA

Please acknowledge NSIDC as the source when you obtain data from us. Refer to the data set documentation for suggested forms of acknowledgement and citation, or contact User Services for more information.

NSIDC also requests one reprint or the exact reference of any publication that was supported by data received from NSIDC. We also greatly appreciate reprints of any publication related to snow and ice research, for inclusion in the World Data Center Information Center collection.

If you have published data that you wish to archive and make available to the scientific community, please contact User Services to discuss the content, form, and size of the data set. A list of guidelines for submitting data in electronic format is available.

SUBSCRIPTION, SUBMISSION & CONTACT INFORMATION

For information about any of the products or services offered by NSIDC, or to subscribe to NSIDC Notes, please contact User Services.

NSIDC welcomes the submission of short items from our readers that are of interest to the cryospheric community. Please use the address on the right to submit news items, publication notes, research notices, or brief articles for publication in NSIDC Notes.

View back issues on the NSIDC Web site (<http://nsidc.org/pubs/notes>).

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