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AMRC Final Project Report: NSF-OPP Grant #9725398
September 15, 1998 to February 29, 2000

1. Participants

a. People

THE SCHWERTFEGER LIBRARY
1225 W. Dayton Street
Madison, WI 53706

Charles Stearns	>160 Hours	PI
JT Young	<160 Hours	Co-PI
Matthew Lazzara	>160 Hours	Co-Site Coordinator
Dave Santek	<160 Hours	PM/Programmer
Matthew Whittaker	>160 Hours	Co-Site Coordinator

b. Other Partner Organizations

N/A

c. Other Collaborators

N/A

2. Activities And Findings

a. Research Activities

The AMRC collects, archives, generates and maintains meteorological data related to the southern polar region, primarily Antarctica, and making it available to others without charge. The AMRC operates two centers, one at the University of Wisconsin-Madison (UW-AMRC) in the Space Science and Engineering Center (SSEC) and a second at McMurdo Station, Antarctica (MCM-AMRC) in the Crary Science and Engineering Center (CSEC). The UW-AMRC serves as the primary data center that collects, processes, and distributes data to others. The MCM-AMRC collects data from the McMurdo weather office and the UW-AMRC for use by scientists at McMurdo to assist in their field operations. Data and data displays are provided to McMurdo Weather Operations for aircraft flights to remote areas of Antarctica, to other stations (including Palmer Station), or to ships participating in the United States Antarctic Program (USAP).

Matthew Lazzara was at the MCM-AMRC during January 2000. During that time he:

- Updated software and operating systems with help from ASA support personnel.
- Updated weather displays to the McMurdo Station Local Area Network/Intranet-Web.
- Attempted to connect the AMRC SSEC Desktop Ingestor (SDI) system to the operational system for improved acquisition of NOAA AVHRR data.
- Trained Antarctic Support Associates (ASA) and Spawar NISE-East personnel on the availability of meteorological data from UW-AMRC.
- Held discussions with operational forecasters regarding weather forecasting problems that impact the activities of the USAP.

- Discussed, outlined and began the return of weather displays to McMurdo's TV network (AMRC in 1992 through 1994 had its images displayed on the McMurdo TV system).
- Provided Antarctic meteorology demonstrations to distinguished visitors using the Man computer Interactive Data Access System (McIDAS) - the system the AMRC uses to generate products and displays of meteorological data.

The attempt to install the SDI failed. Continued efforts in the post season were non-productive due to subcontractors only willing to assist per orders from the USAP primary contractor.

b. Research Findings

AMRC data has been valuable for research activities of NSF-OPP funded and other scientists as well as for operational applications, especially at McMurdo Station Weather. The Antarctic Composite Infrared Images (ACII) that are uniquely generated at the AMRC have been an important part of past research projects such as Project FROST and its follow-up research. Recently review of all past ACIIs has pointed towards a new area of research that needs to be investigated: Storms tracks around the Antarctic continent seem to have a very different pattern during El Nino years than non-El Nino years. The composites have also been a key component in Antarctic weather forecasting operations for USAP flight operations between New Zealand and Antarctica and USAP research vessel operations. The ACIIs have also been widely used by researchers and forecasters worldwide.

c. Research Training

N/A

d. Educational And Outreach Activities

Educational Outreach

The staff members at the AMRC have been active in recent years in educational outreach activities, including visiting local and non-local schools. Visits have included slide shows on travel to and working in Antarctica along with substantial question and answer sessions. Visits primarily focused on Antarctic Meteorology. Schools visited include:

Local:

- Oregon, WI Prairie View Elementary School
- Madison, WI Mendota Elementary School
- Lodi, WI Middle School

Non-local:

- Burrilville, RI High School
- Medway, MA Elementary School
- Medway, MA Community Nursery School

Additionally, several schools around the US have been able to participate in AMRC's outreach activities via Internet. E-mail communication during field season

deployments to participating schools has allowed students to ask questions about work and life in Antarctica, as well as the opportunity to discuss AMRC and other science activities taking place.

Automatic Data Transfers

These transfers represent requests by people and organizations for certain types of data to be transferred to them on a regular basis (usually daily). "On demand" means that the data are put into a special file so that the user can access the data at their convenience.

Unidata Project	ACIIs (Antarctic Composite Infrared Image) every 3 hours to approximately 160 educational institutions throughout the United States.
Research vessels	Medium Range Forecast (MRF) model analyses and forecasts every 12 hours on demand.
McMurdo Station	ACIIs every 3 hours, MRF analyses and forecasts every 12 hours, water vapor and cloud drift winds every 12 hours, AWS real-time observations for the Meteorology Office on demand.
Palmer Station	MRF analyses every 12 hours on demand.
Project GLACIER- Rice University and American Museum of Natural History	Observations from Automatic Weather Stations sites transferred daily for educational use and interactive museum display.
British Antarctic Survey (BAS)	One ACII daily for monitoring.
Australian Bureau of Meteorology (AboM)	ACIIs daily for use in operational Southern Hemisphere analysis.
Austin Hogan - Cold Regions Research Lab., Hernan De Angelis - Instituto Antartico Argentino, Wolfgang Rack - Institute for Meteorology and Geophysics, University of Insbruck, Austria	Observations from selected Automatic Weather Station sites transferred daily for monitoring and support of science programs.

Data Requests

The AMRC Web site (<http://uwamrc.ssec.wisc.edu>) has unrestricted access; therefore many of the hits will be from those not active in Antarctic meteorology. This kind of public outreach provides valuable service to the general public: to see a movie of the clouds rotating around Antarctica or a

space-eye view of the iceberg off the Ronne Ice Shelf or more recently the Ross Ice Shelf Icebergs (B-15, B-16, B-17 and B-18). Each host is unique and each item accessed counts as one hit. The AMRC web site is used by Antarctic forecasters to view the ACII and MRF forecasts. The AMRC File Transfer Protocol (FTP) sites (<ftp://uwamrc.ssec.wisc.edu> and <ftp://uwaaws.ssec.wisc.edu>) are used by researchers active in Antarctic meteorology to transfer requested archived or product data from the AMRC. Additionally, the McIDAS client-server system, the Abstract Data Distribution Environment (ADDE) has been utilized over the last year or so. The Unidata community, USAP researchers and an internal display system at the University of Wisconsin-Madison campus have used this data for specific display of AMRC data.

Below are totals from December 1998 to March 2000 for AMRC Internet transfers from the web, FTP and ADDE services (See attached Figure 1):

Site	Total Hits	Number of Hosts	Megabytes Transferred
UWAMRC Web	1,539,544	166,082	87,777
UWAMRC FTP	24,630	815	28,213
UWAAWS FTP	103,752	875	4,661
UWAMRC ADDE	N/A	N/A	4,482

Custom Data Requests

Several data requests are often received daily at the AMRC. Some specific requests that required several hours to days to fulfill are:

- AWS support for Environmental Research Institute of Michigan (ERIM) International's Cape Roberts project.
- Extensive AWS data to Project GLACIER (Stephanie Shipp, Rice University and Kristen Karsh, American Museum of Natural History, New York) and others to a lesser degree for use by elementary, middle and secondary schools.
- DMSP navigation data for the NOAA/NESDIS group at Cooperative Institute for Meteorological Satellite Studies (CIMSS) for use with their applications of SSM/I data from the DMSP.
- NOAA AVHRR imagery for Scott Polk at Virginia Institute of Marine Sciences in support of ice coverage work in the Ross Sea.
- METAR observational data from McMurdo Station to Sylvia Nichol at the National Institute of Water and Atmospheric Research (NIWA) in New Zealand.
- MRF analyses to Dr. H. N. Dutta/N.C. Deb National Physical Laboratory/Indian Statistical Institute Requests for boundary layer studies around Maitri Station (India), Antarctica.
- 3-D animations of Antarctic weather for Natural History New Zealand.
- MRF model data, ACII and other satellite images to Robert Ryan at Lockheed Martin in support of tests for the new model of C-130 aircraft.
- Variety of AWS, satellite imagery, and other meteorological data to Susan Solomon, NOAA Aeronomy Lab.
- Several other requests were also filled including: Frabrizio D'Ortenzio (IFA/CNR, Italy), Gareth Marshall (BAS, UK), Akihisa Dougaki (NHK Japan Broadcasting Corp), Christophe Genthon (LGGE CNRS France), Jose Luis Ibarrola (Argentina), Stephan Kern (Germany), Bob Stone (NOAA/CMDL), Mitch Wittenben (Texas A&M)

Video Tape

The three hourly ACII were added to AMRC's videotape, which now covers the period 1 November 1992 to 30 April 1999. The videotape provides a visual record of the quality and availability of the images since each image is time stamped. The videotape shows the behavior of the cloud systems south of 40°S. Fifteen videotapes have been provided to interested individuals and organizations.

3. Publications And Products

a. Publications

Solomon, S and C.R. Stearns, 1999: On the role of the weather in the deaths of R.F. Scott and his companions. National Academy of Sciences. November 9, 1999, 96, 23, pp. 13012-13016.

Takahasi, S., T. Kameda, H. Enomoto, T. Shiraiwa, Y. Kodama, S. Fujita, H. Motoyama, O. Watanabe, G. A. Weidner, and C.R. Stearns, 1998: Automatic weather station program during Dome Fuji Project by JARE in east Dronning Maud Land, Antarctica. Annals of Glaciology, 27, pp. 528-534.

b. Internet/Web Sites

The AMRC operates the following Internet sites:

Web: <http://uwamrc.ssec.wisc.edu>

FTP: <ftp://uwamrc.ssec.wisc.edu>
<ftp://ice.ssec.wisc.edu>

Of special note, the Ross Ice Shelf Icebergs have recently become very popular with the general public:

Web: <http://uwamrc.ssec.wisc.edu/amrc/iceberg.html>
<http://uwamrc.ssec.wisc.edu/amrc/motion.html>

c. Specific Products

Data Inventory and Archive

The AMRC signature product is the Antarctic Composite Infrared Images that are constructed from infrared images from five geostationary and two or three polar orbiting satellites. The ACII is constructed every three hours using data within 50 minutes of a nominal image time. (See the attached Figure 2)

The AMRC has collected, archived and provided a large collection of meteorological data. The data collected by the AMRC are:

Composite satellite data	ACIIs at 3 hourly intervals 30 October 1992 to the present
Polar orbiter satellite data	NOAA satellite data 12 December 1992 to the present. There are some gaps in the data.

Model analyses and forecasts*	Medium Range Forecast (MRF) from the National Center for Environmental Prediction (NCEP) from 2 July 1993 to the present with forecasts added in late 1994. Wind and Wave Forecast Model (WWFM) from NCEP from 4 December 1998, European Center for Medium Range Forecasting Model (ECMWF) from 5 December 1998. United Kingdom Meteorological Office model from 1 January 2000.
*This is an archive of data available from GTS in real-time and not the reanalysis.	
Synoptic observations	Synoptic observations south of 40°S from 1 January 1997.
Radiosonde observations	Antarctic mandatory/significant radiosonde levels from 1 November 1996 to present. McMurdo 1956 through 1979, Antarctic region 1980 through 1993, McMurdo and South Pole 1994 to the present (Late 1996 to present all available data south of 35°S have been added).
Water vapor winds	Wind vectors based on water vapor movement from the Geostationary Meteorological Satellite (GMS) satellite, 130°E to 180°, 40°S to 70°S, 27 October 1997 to the present
Cloud drift winds	Wind vectors based on infrared image cloud movement from GMS satellite, 130°E to 180°, 40°S to 70°S, 10 June 1998 to the present.
USAP Research vessel observations	Meteorological observations from the research vessels, April 1996 to present.
AWS observations	Antarctic automatic weather station (AWS) data, February 1980 to the present, as 3 hourly or 10 minute data.
AGO observations	Automatic Geophysical Observatory (AGO) ten minute meteorological data December 1992 through December 1998.
UK/BAS observations	Six hourly meteorological data from the British Antarctic Survey (BAS) 1957 through 1993 for Faraday, Halley, Rothera, and Signy Island Stations.
Manned Station Monthly means	Monthly means of air temperature and air pressure 1957 through 1996 for all available Antarctic manned stations
Palmer Station monthly summaries	Monthly summaries for Palmer Station from September 1992 to September 1993 and April 1998 to present. Amundsen-Scott Station (South Pole) January 1996 to present.

Web Specific Products Generated

The products generated for the UW-AMRC Web site include:

- A movie loop of eight ACIIs
- MRF movie loop grids for forecasts of 12 to 60 hours
- NOAA AVHRR images of the Ronne Ice Shelf iceberg (A-38)
- NOAA AVHRR and DMSP OLS images of the Ross Ice Shelf icebergs (B-15, -16, -17, and -18) including supplementary information.
- Plots of radiosonde data
- ACII overlain with the selected AWS and synoptic observations
- Meteorograms (time series) of AWS station air pressure, air temperature, wind speed and direction, and relative humidity
- NOAA AVHRR browse images

4. Contributions

a. Antarctic Atmospheric Science discipline

The AMRC has made and still makes significant contributions to the Antarctic atmospheric sciences. The diverse data holdings that are freely available without charge are substantial, especially with some of the unique data (e.g. AWS and ACII) that is available only from the AMRC. This is an important foundation from which educational outreach activities and future Antarctic atmospheric research activities can develop.

b. Other Science And Engineering Disciplines

One of the express purposes of the AMRC is to aid and assist non-meteorological science and engineering research activity that are in need of meteorological data and consulting. During the duration of this grant, the AMRC has continued and significantly expanded this role with its outreach activities in the research community.

c. Educational And Human Resources

As noted in the educational and outreach section, the AMRC has expanded its outreach roles greatly. This has been a significant benefit to the schools that the AMRC has interacted with.

d. Physical, Institutional, And Information Resource For Science And Technology

Within the University of Wisconsin's SSEC, the AMRC compliments the Center's expertise in satellite and polar meteorology.

e. Public Welfare Beyond Science And Engineering

With the meteorological data collections available to anyone free of charge, the AMRC is a beneficial resource to the public at large. See the appended section regarding AMRC's role in the B-15, B-16, B-17 and B-18 Iceberg verification, and depiction.

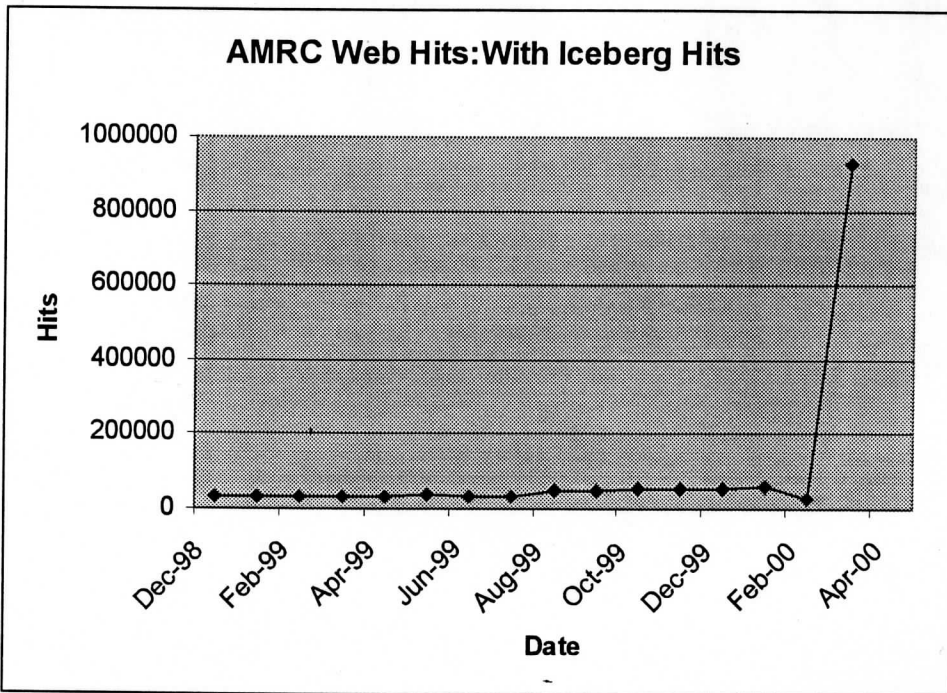
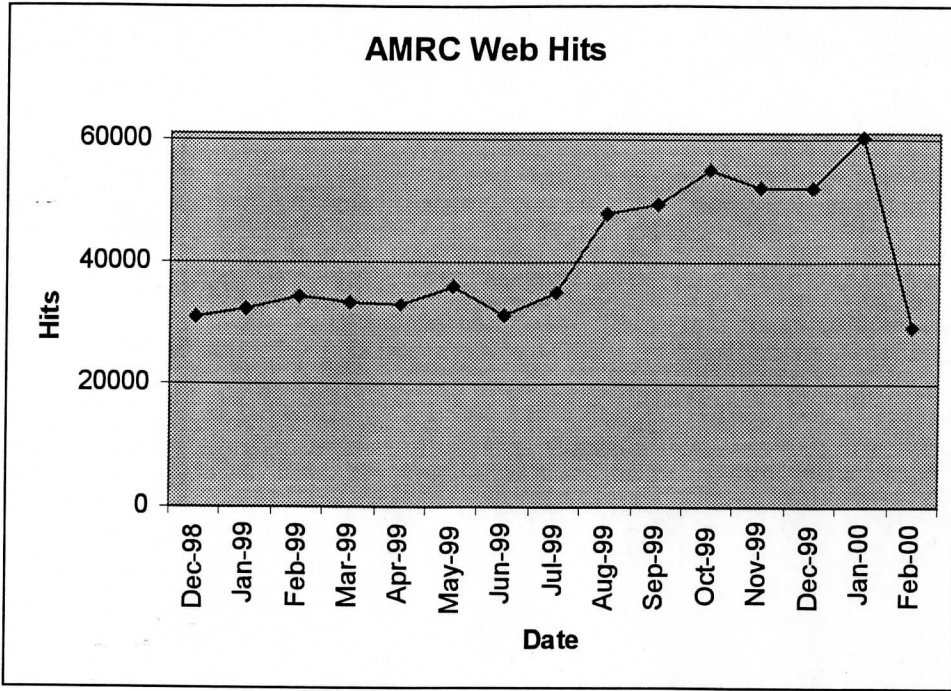


Figure 1: Top: Chart showing AMRC Web Hits increasing during the grant. Bottom: Chart Showing the same information with the Ross Ice Shelf Iceberg hits included.

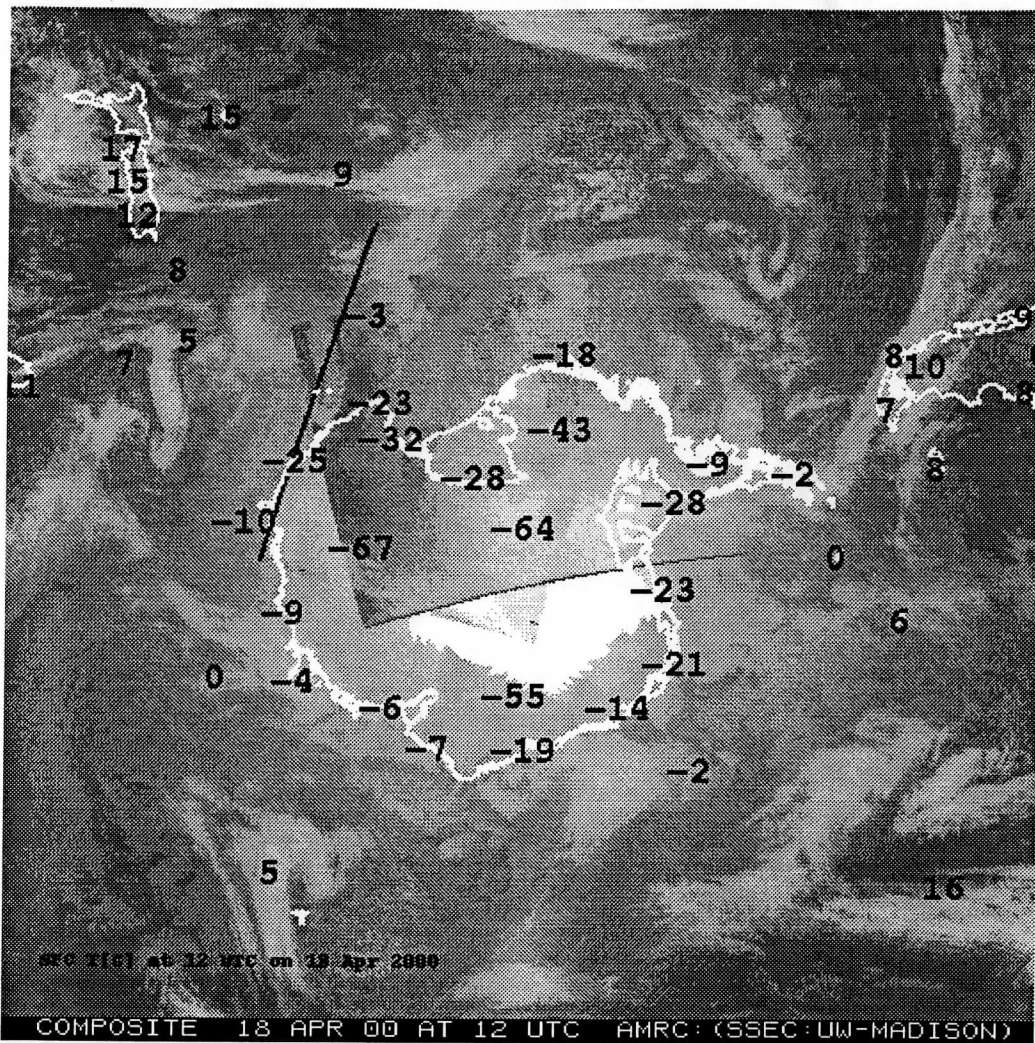


Figure 2 AMRC's Antarctic Composite Infrared Image (ACII) with surface temperatures in degrees Celsius from Automatic Weather Stations (AWS), synoptic-manned stations, ships, and buoys.

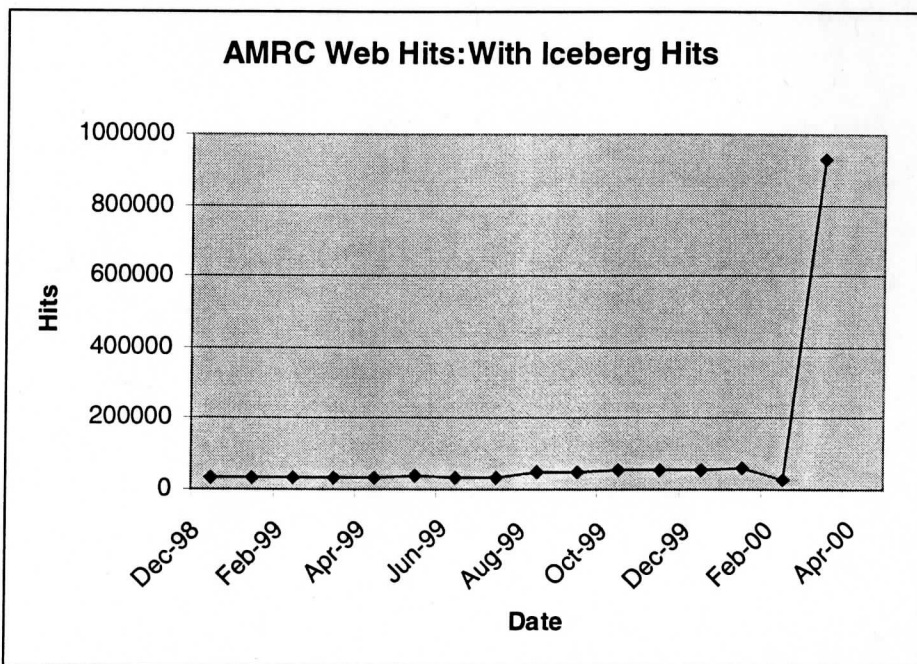
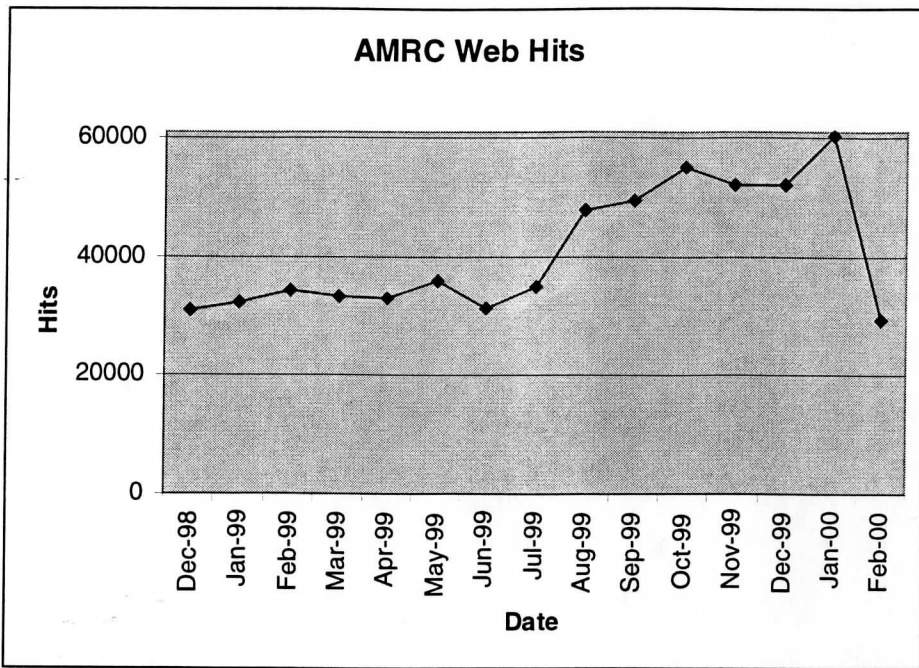


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Figure 2 AMRC's Antarctic Composite Infrared Image (ACII) with surface temperatures in degrees Celsius from Automatic Weather Stations (AWS), synoptic-manned stations, ships, and buoys.

APPENDIX

AMRC MEDIA CONTACTS FOR THE ROSS ICE SHELF ICEBERGS (B-15, B-16, B-17 & B-18)

March/April 2000 Iceberg In The News (SSEC/UW-Madison)

Iceberg B-15 kept Matthew Lazzara busy from the time the calving event was released on March 22 by the University of Wisconsin-Madison. People from around the world called and emailed SSEC to express awe and concern upon seeing or hearing news of the iceberg breaking off the Ross Ice Shelf. They heard it on NPR and on local radio news programs. They saw it on the Web, on the New York Times online version, on UniSci and many other Web sites. They read about it in local papers and saw it on national TV. We've received publicity and email from literally every major media outlet, especially radio and Web, and local and regional newspapers and some TV, and from every corner of the world. CBS and ABC TV News programs used the imagery.

On Friday, March 17 at about 18:00 UTC, forecasters at McMurdo Station in Aviation Technical Services saw a very large iceberg in an image from a U.S. Air Force satellite (the Defense Meteorological Satellite Program, DMSP). The forecasters and McMurdo Station managers told The National Science Foundation (how over sees the US Antarctic Program) who in turn told Douglas MacAyeal, a geophysicist with the University of Chicago. Doug had worked with Matthew Lazzara and others in SSEC's Antarctic Meteorological Research Center, through his National Science Foundation funding, so he knew SSEC had access to satellite information. Doug asked Matthew to watch for the new massive iceberg on the high-resolution polar-orbiting satellite imagery that the AMRC receives. While the AMRC used imagery from NOAA and DMSP satellites, the Canada Center for Remote Sensing monitored their own high resolution radar data (SAR on board the RADARSAT satellite).

The National Science Foundation is the primary funding agency for Antarctic research projects. AMRC is technically between NSF funding cycles, but Matthew, Principal Investigator Chuck Stearns and SSEC decided to provide the imagery on the Internet. NSF released news of the new iceberg, named B-15 by the National Ice Center, and B-16, a small fragment that broke early from the big berg and drifted immediately out to sea. NSF linked to the AMRC iceberg Web page. The University of Wisconsin-Madison's Office of News and Public Affairs released the story at about the same time.

http://uwamrc.ssec.wisc.edu/amrc/iceberg.html	Icebergs
http://www.news.wisc.edu/wisweek/view.msql?id=3834	University release
http://www.ssec.wisc.edu/media/media.html	SSEC releases
http://www.nsf.gov/od/lpa/news/press/pressrel.htm	NSF releases

On March 30, while monitoring polar-orbiting satellite imagery, Matthew found a new iceberg, just to the east of B-15. Roughly half the size of B-15, the new iceberg probably was "calved," or broken off, because the larger berg rubbed against the ice shelf. On April 3, Amy VanBuskirk of the National Ice Center named the new berg B-17. Sometime later, a substantial piece of B-17 began to drift away and was named B-18. Stories of the new iceberg ran in online and print versions of UW-Madison's Wisconsin Week. One of them began: "COLOSSAL ICEBERGS SPUR SPECULATION" The observation by UW-Madison scientists of two huge icebergs breaking off the Antarctic ice pack has set off a worldwide chain of concern."

Full story: <http://www.news.wisc.edu/wisweek/view.msql?id=4778>
News Coverage

A deluge of media requests and an avalanche of email fell on AMRC and SSEC, from March 22 when news of B-15 was released through discovery of new icebergs B-17 and B-18. On March 23, Terry Devitt of UW-Madison's Office of News and Public Affairs reported: "Nick Weaver, our Web guy, says the iceberg news item has generated the most hits on our Web site of any news story ever." According to Nick, some 15,000 pages were requested between 2:30 p.m. and midnight on March 22, and another 20,000 hits from then to 1:30 p.m. March 23. By the afternoon of March 31, SSEC's powerful AMRC server with its 15 Internet connections was completely bogged down. By April 5, the tide had ebbed somewhat. AMRC's Matthew Lazzara, PI Chuck Stearns, Rob Holmes, George Weidner, and Linda Keller (AOS) all fielded requests with the bulk falling to Matthew, who maintains the satellite imagery and discovered the second big iceberg.

On March 23, National Public Radio's Scott Simon interviewed Mary Root Keller of the National Ice Center on Morning Edition. While AMRC was not mentioned, Scott did use our size analogy: "Delaware is not," he said, "one of our larger states," implying that the iceberg could not be a big deal if it was no bigger than twice the size of Delaware. Mary set him straight—think of it, she said, as the size of Maryland stretched out. Scott then asked if there might be cause for concern about an iceberg this large floating loose. Mary replied that it took two years for B-9 to get into shipping lanes.

Later that morning, Matthew appeared on Michael Feldman's internationally broadcast show, Whad'Ya Know? as expert of the week. Wisconsin seemed to Mike a good vantage point to study the Antarctic ice shelf, because, "if you're standing there, sometimes you don't see these things." Matthew agreed that satellites gave everyone around the world a chance to monitor the iceberg, but he'd also like to put automatic weather stations on it. The interview is available on the Web, although it's misdated March 18.

<http://notmuch.com/Features/Place/2000/03.18.html> Place to Be

On March 27, Gary Tessler spoke with Matthew on Common Sense, a talk show on Radio for Change, broadcast on KWAB and on the Web from Boulder, Colorado. Gary introduced iceberg B-15 as "a fairly titanic ice cube," and asked all the questions people have asked since forecasters first noticed iceberg B-15. Will it drift out to sea? How long will it take to melt? How far can it go? Matthew explained that colleagues at the University of Chicago are using his satellite observations to numerically simulate the iceberg's movements and ascertain what will happen to it. After answering, "How far down does it go? If it's so cold, will it melt at all? Has there ever been one this big? Are there shipping lanes it could drift into?" Matthew noted the possibility of interfering with supply routes to McMurdo Station, the main U.S. research station in Antarctic. Gary also asked, "What part do the winds play in its movement? What does affect its motion? Could you tow an iceberg this size to use as a fresh water source? How often do these things break off?" Then, he began to make the inevitable connection with global warming of the oceans, wondering if the iceberg is connected with the ozone hole and loss of the Arctic ice shelf. Matthew answered that currently scientists see no cause-effect relationship to any of these. Gary asked Matthew to give his Web site's address on the air.

<http://www.radioforchange.com/> Working Assets Radio

UW-Madison's Office of News and Public Affairs keeps a clipping file and publishes the more obscure clips in its In the News Web page. It notes that the Irish Times for March 27 reported that B-15 is worth paying attention to because of its immense size. Matthew said, "This is a very big iceberg, close to a record, if not a record. It's not often that you see them of this magnitude."

<http://www.news.wisc.edu/inthenews/> Scroll down to 3-27-00

Iceberg News

On March 22nd:

Reuters news wire, Voice of America, BBC Radio (heard on WORT-FM's evening news), ABC News with Peter Jennings (AMRC provided background information), WKOW (Madison's Ch.27—Bob Lindemeier mentioned it in his 5:30 p.m. weathercast).

<http://www.ascribe-news.com/cgi-pub/showrel.pl?fname=2000-03/20000322.123653>
AScribe, Public Interest Newswire

http://dailynews.yahoo.com/h/nm/20000322/sc/science_iceberg_2.html
Yahoo! News—Reuters

<http://earthobservatory.nasa.gov/Newsroom/MediaAlerts/2000/200003222106.html>
Earth Observatory Newsroom

sci.space.news (UW-Madison news release)

On March 23 (many of these called again for the second big iceberg)

Milwaukee Journal Sentinel—Meg Jones interviewed Matthew for the first print story we saw. It appeared March 23.

Wisconsin State Journal

USA Today

<http://www.theage.com.au/news/20000324/A26415-2000Mar23.html>
The Age, Australia

Top story on UniSci March 23. The site posts daily university science news.

<http://unisci.com/stories/20001/0323005.htm>

UniSci

http://news.bbc.co.uk/hi/english/sci/tech/newsid_688000/688121.stm

BBC News Online

Associated Press Online: New York Times, Yahoo! News, Washington Post

CBS Marketwatch—UPI story incorrectly mixed AMRC's iceberg monitoring with NOAA scientists' report on warming oceans.

Other Online: USA Today, Environmental News Network

UseNet News/Newsgroups: sci.geo.meteorology (AP article)

Radio: CBS Radio (In Madison, WIBA), BBC World News Service (London), BBC Scotland, BBC Falklands, Canadian Broadcasting Co., National Public Radio, Public Radio International—LA Marketplace Radio, WMAQ (Chicago), KCBS San Francisco
Dan Rather's Evening News on CBS-TV unfortunately used the iceberg images in a story on global ocean warming. Yes, scientists report a global increase in ocean temperature. Yes, the Ross Ice Shelf has calved a mammoth iceberg, a normal occurrence. The one has not caused the other, but CBS made it seem so.
Madison's WMTV—a straightforward story on the iceberg, till the anchors hoped aloud that it would not venture north to Wisconsin.

From the 24th onward:

The Chicago Tribune, both the paper and online, emphasized the role of University of Chicago geophysicist Douglas MacAyeal. From McMurdo Station forecast reports, Doug told Matthew about the large iceberg calving from the Ross Ice Shelf. Doug continues to model future movements of the iceberg.

Associated Press Television News broadcast from London the satellite pictures on their video wire, "so that journalists around the world can conveniently use your images in their news reports."

Gwen Carleton made Matthew's iceberg page the Capital Times' Web site of the week on March 31. "What is 295 km long, 37 km wide and very, very cold?" she asked. By now, we know the punchline is "B-15."

- Print: The Capital Times (Madison, WI, March 25)
 The Irish Times, March 27
 Vancouver Sun newspaper
 La Libre Belgique newspaper (Brussels)
 Denver paper
 Disasters map (L.A. Times, syndicated nationally)
 The Daily Cardinal (UW-Madison student newspaper)
 Ciel et Espace (French science magazine)
 Science News, April 1
 Washington Times, April 2
 New York Times, Science Times, April 11
 Sailing magazine Latitude 38 in San Francisco
- Radio: BBC-Scotland
 <http://www.notmuch.com/Features/Place/2000/03.18.html>
 Whad'ya Know?, Place to Be
 Earth Watch Radio (run after 4-5)
 KSLR, San Antonio, Pat Rogers Morning Magazine
 Art Bell "Dreamland" radio show
 ABC News
- Online: <http://earthobservatory.nasa.gov/Newsroom/>
 Media Alerts, Massive Iceberg
 http://dailynews.yahoo.com/h/nm/20000322/sc/science_iceberg_2.html
 Yahoo! News, Science
 <http://www.theage.com.au/news/20000324/A26415-2000Mar23.html>
 The Age, Hobart, Australia
 Yahoo! Hong Kong-News (Channel NewsAsia, March 25)
 <http://www.solcomhouse.com/globalwarming.htm>
 solcomhouse
 www.artbell.com (Art Bell)
 MSNBC
 La Tercera, Chilean national newspaper
 Swedish newspaper Aftonbladet (first and subsequent icebergs)
 Drudge Report (AP)
 Television/video: ABC News, for an April special
 Italian National Public Television System RAI

2nd group of icebergs (B-17, B-18)

Starting with releases from NSF and UW-Madison on March 30

- <http://www.news.wisc.edu/wisweek/view.msql?id=4778>
Wis.Week Icebergs 2
<http://www.ascribe-news.com/cgi-pub/showrel.pl?fname=2000-03/20000330.150315>
AScribe

<http://unisci.com/stories/20001/0331001.htm>

UniSci Iceberg 2, lead spot March 31

<http://www.wired.com/news/technology/0,1282,35586,00.html>

Wired

Yahoo!

Milwaukee Journal Sentinel, March 31

WHA Radio, Kathleen Dunn show (caller mentioned it)

German Press Agency

Tom Skilling, WGN-TV, Chicago

BBC Radio

Badger Herald

Reuters covered both discoveries.

NASA's Earth Observatory Newsroom Web site showed all the icebergs in New Images.

The image was the top image on April 17.

<http://earthobservatory.nasa.gov/Newsroom/>

SSEC collaborators wrote from far-flung outposts to report that they'd seen names of UW-Madison and researcher Matthew Lazzara in local news sources. Andrew Collard of England's Met. Office in Bracknell found the iceberg in BBC News Online, Brian Osborne found it in Hamilton, New Zealand's local paper and his mother in Hamilton heard it on Radio New Zealand News. Closer to home, EOS Project Scientist Michael King reported seeing iceberg news on Washington area TV news programs. or perhaps the evening news last night

Canadian Broadcasting Corporation asked for images.

The Tampa Bay Tribune and a couple European news outlets

USA Radio Network, out of Dallas

USA Today

CNN Italia, the Italian-language Web site of CNN Interactive, used the satellite images of the iceberg with pieces from the Associated Press and Reuters newswires. On March 23, they said they'd quote the UW-Madison news release.

Brian's mother heard it on Radio New Zealand News, 7:30 the morning of March 23. New Zealand compared the iceberg to "the size of Jamaica."

Swedish online newspaper, the Aftonbladet, covered it twice, using two different size analogies: bigger than Östergötland (an island in Sweden) and twice the size of Öland, an island where ancestors of Professor Suomi lived.

Other Iceberg Coverage

University of Chicago's News Office linked to a story by the Chicago Tribune (March 24), and wrote one of their own

<http://www-news.uchicago.edu/index.shtml>

<http://www-news.uchicago.edu/citations/2000/000324.iceberg.html> Trib

A MODIS color composite image produced by SSEC's Dave Santek and showing Iceberg B-15 will be used on NASA's poster during the press release for Terra data.

TV: CBS Evening News with Dan Rather used the satellite images in a story about global ocean warming

A BBC children's education program interviewed Rob Holmes, also of the AMRC and Rob was interviewed by WIBA.

NASA's Earth Observatory News Room featured all the icebergs in New Images on April 14.

After Henry Fountain's story appeared in the New York Times Science Times, a reader noted that the number AMRC had provided for an equivalent amount of water seemed wrong. Sure enough. AMRC's rough calculation of 3.4 trillion gallons of water was probably closer to 600 to 1000 trillion gallons of water. PI Chuck Stearns calculated it to be about $2.4 \times 10^{12} \text{ m}^3$ (or, tongue-in-cheek, roughly "a zillion gallons") of water. Henry said the 3.4 trillion figure seemed right to him—the iceberg looked about the size of Lake Michigan, and it holds about that much water.

Susan Solomon of NOAA's ALS in Boulder, CO wrote a book with Chuck Stearns on the [year] Scott expedition which ended tragically. She's writing a new book and will include one of Matthew's iceberg picture.

Lest all this media coverage makes it look like Matthew is monitoring the icebergs singlehandedly with a little help from colleagues in AMRC, let us acknowledge many folks who worked together to discover, track and explain icebergs B-15 through B-18. Douglas MacAyeal in the University of Chicago's Geophysics Department, forecasters at McMurdo Station who saw the first iceberg on NOAA satellite imagery, Andy Archer of Antarctic Support Associates—the NSF support contractor, the National Ice Center's Mary Root Keller, and many many others.

Email Reactions

People from everywhere emailed Matthew with their questions and reactions. Most email questions are incorporated in the FAQ [link]. Some other select reactions are:

What a privilege to see these pictures. Who would have dreamed that I would ever be able to actually see something like this. It is just (or almost) like being there.

I just wanted to tell you what a good job you do with the Web pages, links, etc. I'm just a homemaker in southwest Missouri, back in the Ozark hills, but I am very impressed [with the satellite images of the iceberg].

Just thanks for posting the incredible photos of the birth of the new Antarctic iceberg: It is a powerful thing to be able to see it in several ways so clearly. During these days of technology, not only can I read of the Antarctic, I can see it as well from the satellites that orbit the earth. I appreciate you taking the time to post your work for all to see and learn. The other day Antarctica was ten thousand miles from my home. Today it is in my living room.—Gary Knepper

Awesome! thanks for the pictures!—Douglas, NB, Canada

Thank you so much for sharing with us this exciting event. My wife and I are following it with great interest. The images are outstanding in spite of the clouds. We are following it on a day by day basis.—Fred A. Hatfield, Brevard, NC

I was in Antarctica in January 1998 as a Teacher Experiencing Antarctica. ... It is hard sometimes to put a "scale" on iceberg pictures at times. No one believes how big they can truly be. Perhaps this will lend some of the extreme possibilities in perspective for them.

We had a dinner party on Friday night and my guests also loved the new iceberg images.—Elizabeth vander Zaag

Thank you so much for your iceberg web site and the animation today was just marvelous. I am thoroughly enjoying watching this. Any expansion n your labeling and comments about the iceberg would be appreciated by this ignorant amateur, but not if it would hold up the postings.—Kay Murphree

You've got many nice pics on your site and I look forward to new images. I was quite disappointed to see that your real-time funding has expired and those images are not available. Could hardly have happened at a more inoportune time. Keep up the good work.—Doug Poland

Thanks again for your response, tantamount to a personal phone call-back. It's nice to know there are real people out there who read, and respond to sincere email.--Dan Lovil

THANKS for putting the pictures of this "happening" on the Web. Our fifth grade class is so interested I wish we could show them the actual size. Great work in getting kids interested.--Jarrod Heidtman

I wish news organizations would provide answers to these questions so that you would not have to waste time answering letters like this one. Hopefully, you don't mind.--Bal Simon

You must love your job! During my studies of Antarctica, I have been amazed by the history, environment, wildlife and current events of this marvelous continent. I had no idea it was such a fascinating place! I hope to convey my intrigue to the children so that they may want to find out more on their own.--Cathy Post