

AMRC 1st Annual Project Report: NSF-OPP Grant #0838834, October 1, 2009 to June 30, 2010

Antarctic Meteorological Research Center (2009-2011)

A Report to the Office of Polar Programs, National Science Foundation

Space Science & Engineering Center, UW-Madison

Antarctic Meteorological Research Center & Automatic Weather Stations Project

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The Antarctic Meteorological Research Center (AMRC) and Automatic Weather Station (AWS) program are United States Antarctic Program (USAP) sister projects focusing on observational Antarctic meteorological research, providing real-time and archived meteorological data and observations, and supporting a network of automatic weather stations in Antarctica.

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News

2010-May-01: What makes up a Wisconsin AWS [» More](#)

2009-Aug-22: Hourly infrared Antarctic satellite composites now available!
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2009-Aug-10: Iceberg movies! See animations of tabular Antarctic icebergs.
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Dr. Matthew A. Lazzara, Principal Investigator
Linda Keller, co-Principal Investigator

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University of Wisconsin-Madison

Submitted on July 6, 2010



Annual Report for Period: 10/2009 - 09/2010**Submitted on:** 07/06/2010**Principal Investigator:** Lazzara, Matthew A.**Award ID:** 0838834**Organization:** U of Wisconsin Madison**Submitted By:**

Lazzara, Matthew - Principal Investigator

Title:

Antarctic Meteorological Research Center (2009-2011)

Project Participants**Senior Personnel****Name:** Lazzara, Matthew**Worked for more than 160 Hours:** Yes**Contribution to Project:**

Matthew Lazzara, as Principal Investigator, has been directing the activities of the project. He has been overseeing the development of the new AMRC portal/Web site. He has been involved in the re-casting of data products for the new portal. He has directed the purchase and construction of Automatic Weather Stations funded by this project. Educational outreach has also been an activity over the past year. He is also directing the foundational work on the analysis of cloud mass transport systems using the AMRC satellite composites.

Name: Keller, Linda**Worked for more than 160 Hours:** Yes**Contribution to Project:**

Linda is the co-Investigator for this project, and is the alternate director of the project, and oversees aspects of the effort, including participating in the re-working of the AMRC data portal, and the foundation work for the cloud mass transport study using the Antarctic composites.

Post-doc**Graduate Student****Undergraduate Student****Name:** Rasmussen, David**Worked for more than 160 Hours:** Yes**Contribution to Project:**

DJ Rasmussen has participated in educational outreach activities, handled questions AMRC receives via e-mail as well as been a tester for the new AMRC web site portal.

Name: Schroeder, Nicole**Worked for more than 160 Hours:** No**Contribution to Project:**

Nicole has been providing support in documentation and organization of AMRC tasking, updating/correcting AMRC metadata information, and developing a new educational outreach presentation as a resource for AMRC team members.

Name: Uttech, Zach**Worked for more than 160 Hours:** No**Contribution to Project:**

Zach has play a role in overseeing the new AMRC portal, including aiding in the development of the new dynamic web displays as connected to underlying database, etc. He has worked on deploying and initial test of a RAMADDA services to offer data to the community (in progress).

Name: Willmot, Kathleen

Worked for more than 160 Hours: No

Contribution to Project:

Elena has worked on the development of the content of the new AMRC portal, along with responding to data requests, and assisting in product development. She has also responded to questions via e-mail from users and the community.

Technician, Programmer

Name: Lalande, John

Worked for more than 160 Hours: No

Contribution to Project:

John has provided technical computing support to the AMRC project, primarily with regards to data tape backup/archive; and assistance to keep AMRC computing assets complying with USAP IT regulations.

Other Participant

Research Experience for Undergraduates

Organizational Partners

Other Collaborators or Contacts

Activities and Findings

Research and Education Activities: (See PDF version submitted by PI at the end of the report)

This project focus is centered around three major themes:

1. Data Portal Upgrade
2. Cloud Mass Transport Studies
3. Automatic Weather Stations purchase

Beyond this, the AMRC project continues to conduct educational outreach activities

Findings:

The status of our project focal points are:

1. We will be announcing the new web site portal in July 2010. This new foundation will allow us to develop an improved means for providing AMRC's meteorological data collection in a more 'self-service' fashion.
2. Cloud Mass Transport Studies - Training of an undergraduate student who will be participating in the study has been accomplished over the last year.
3. AWS components have been purchased and 3 AWS constructed & awaiting deployment at Byrd Station. Two additional AWS components are being purchased for future AWS deployment.

Several educational outreach activities have been conducted, and more are planned.

Training and Development:

One of the key portions of the first year of this project is the training of new undergraduates students who have joined the project. They are learning new skills in computing, meteorology, data types, communications, etc.

Outreach Activities:

The AMRC has participated in several public outreach and classroom outreach activities:

- * Madison West Rotary Club, Madison, WI
- * SSEC Public Tours, UW-Madison, Madison, WI
- * Deerfield Middle School, Deerfield, WI
- * E-mail contacts with the public and Antarctic community

Journal Publications

Books or Other One-time Publications

Web/Internet Site

URL(s):

<http://amrc.ssec.wisc.edu>

Description:

This is the main web site for the AMRC project. It is co-located with the AWS project. It is currently in the process of being upgraded, and a new web site will be debuted in mid-July 2010. Continued improvements to the functionality and data content on the site will be made in the coming year.

Several other internet dissemination techniques that are utilized including:

- FTP server
- rsync server
- Antarctic-IDD/LDM services
- RAMADDA server (still in development)
- E-mail service
- McIDAS ADDE server

Other Specific Products

Product Type:

Data or databases

Product Description:

AMRC created and collected data sets:

Created Datasets:

Antarctic Satellite Composites

- * Infrared
- * Water Vapor
- * Experimental Visible
- * Pseudo-color

Composite Atmospheric Motion Vectors
Antarctic Automatic Weather Station Observations (shared with AWS project)

Collected Datasets:

NOAA LAC satellite imagery
Field Camp Observations
USAP research vessel meteorological observations
USAP station observational datasets
Antarctic and Adjacent Southern Ocean area Observations:
* METAR observations
* Synoptic observations
* Ship and Buoy observations
* Radiosonde (Mandatory and Significant level) observations
* Aircraft observations
Text/Coded observations/forecasts:
* Coded METAR from USAP airfields
* TAF from USAP airfields
* Coded AIREPs from the McMurdo and Auckland Airspace
Numerical Model output:
* GFS
* ECMFW
* UKMET
* WWFM
Gridded analysis:
* Sea Surface Temperature Analysis
* Sea Ice Concentration Analysis
Meteorological Satellite Navigation
* Two Line Element
* McIDAS System Navigation

Sharing Information:

The AMRC project shares its created and collected data to the community via the following means:

Method:

Web Site/Portal
FTP Server
RAMADDA Server
Antarctic-IDD/LDM Service
Rsync Server
E-mail distribution (upon request)

We will continue to make sure the metadata filed on the Antarctic Master Directory (AMD) are kept updated for AMRC datasets.

Contributions

Contributions within Discipline:

The AMRC collection provides an important contribution to the meteorological and atmospheric sciences with its data set offerings. The updated AMRC portal aims to improve this contribution.

The AWS hardware purchased on this project will improve the observing base in the Antarctic - benefiting the entire Antarctic and global meteorological community providing observations in locations that have never been routinely observed (deep West Antarctica, etc.)

Contributions to Other Disciplines:

Contributions to Human Resource Development:

Currently, undergraduate students who are participating in the project are gaining experiences on this project. They are developing new skills and expanding existing skills and combining skill sets to help accomplish the goals of the project. Examples of this include:

- Satellite image display and manipulation
- Addressing science questions posed by the general public
- Developing clear writing, speaking, and people skills with tour groups
- Exploring new computer resources (e.g. RAMADDA, LDM, McIDAS, Web design, etc.)

Contributions to Resources for Research and Education:

The AMRC is the central polar meteorology center and complements other projects within the Space Science and Engineering (SSEC) Center, University of Wisconsin-Madison. The AMRC is an asset beyond the University as it is a information resource to the Antarctic meteorological and United States Antarctic Program community.

Contributions Beyond Science and Engineering:

Conference Proceedings

Special Requirements

Special reporting requirements: None

Change in Objectives or Scope: None

Animal, Human Subjects, Biohazards: None

Categories for which nothing is reported:

Organizational Partners

Any Journal

Any Book

Contributions: To Any Other Disciplines

Contributions: To Any Beyond Science and Engineering

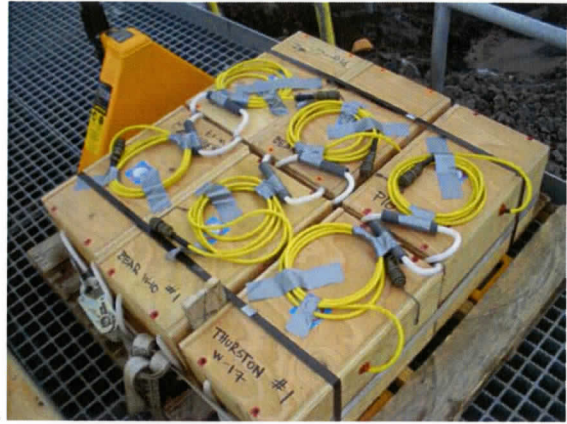
Any Conference



Figure 1. The new AMRC web portal provides a modern look with new functionality (which is continuing to be developed).



Figure 2. The availability of real-time and archival data will all be provided through the new web portal.



a. b.
Figure 3. The some of Automatic Weather Station (AWS) purchased as a part of this project prepared for shipment to West Antarctica including (a) packaged electronics/sensors and (b) batteries.