

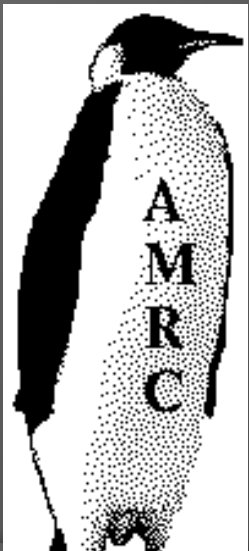
ANTARCTIC METEOROLOGICAL RESEARCH CENTER'S MCIDAS USAGE AND FUTURE CYBERINFRASTRUCTURE

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AMRC – SSEC

University of Wisconsin-Madison

McIDAS User Group Meeting 2015

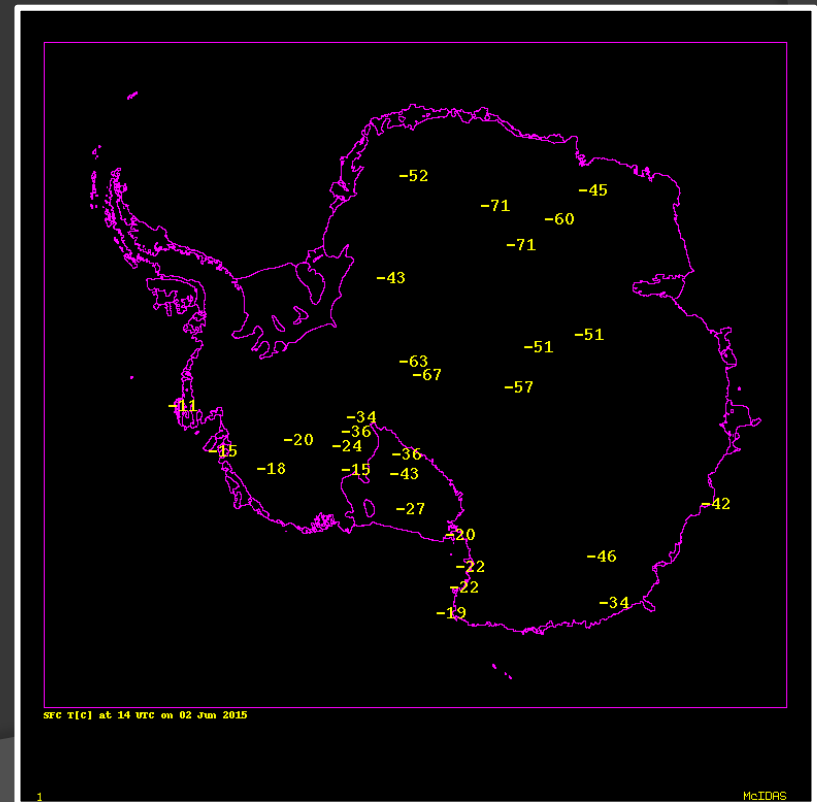
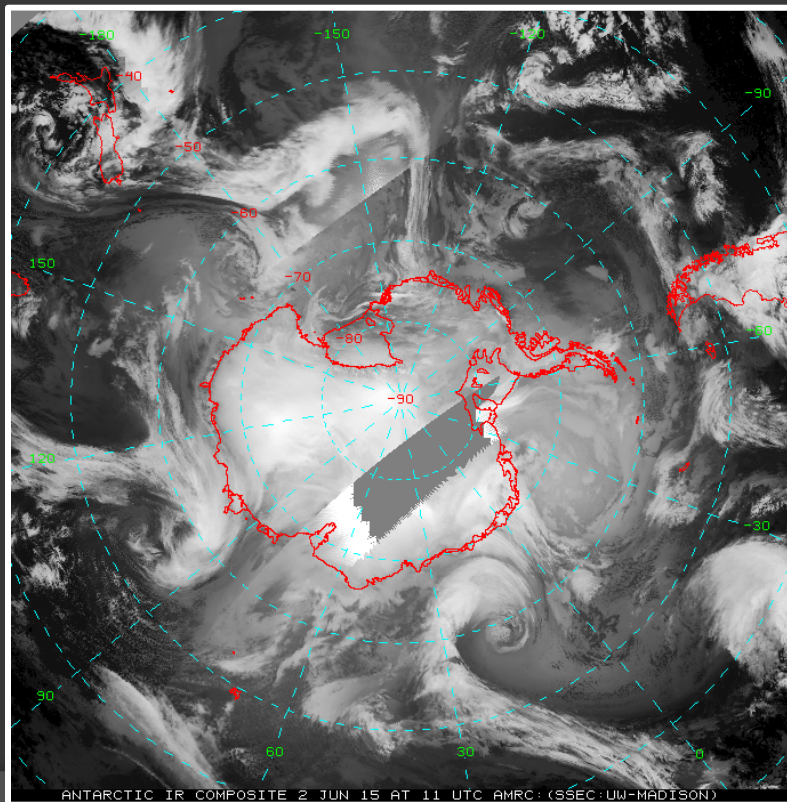


History

- ◆ Funded by the Division of Polar Programs, Geoscience Directorate of the National Science Foundation
- ◆ AMRC began in 1992
 - × A “marriage” between the SSEC McIDAS group and the Antarctic Automatic Weather Station project (AWS started in 1980 with currently ~58)
- ◆ Included:
 - × Satellite composite creation
 - × Meteorological data archive
 - × Forecasting (the “AMFC” – ended ~1998)
- ◆ Group vs. the Grant...
 - × The AMRC as a grant is ending...
 - × Transition: Cyberinfrastructure...

AMRC Introduction

- ◆ Study & display the weather in Antarctica in multiple ways using McIDAS in the toolbox
- ◆ AMRC project contributes to McIDAS-XRD

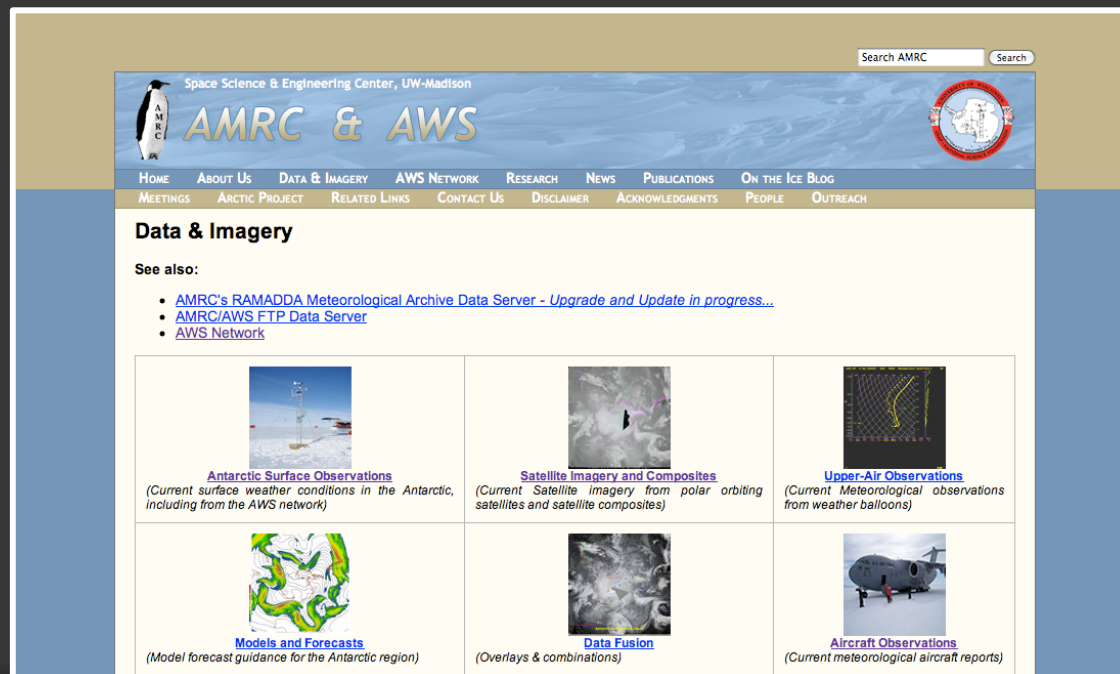


AMRC Historic SDI Usage


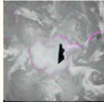
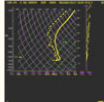
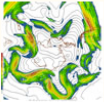
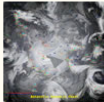

- ◆ AMRC Automatic Weather Station - Real-time
- ◆ Original SDI (running under Solaris 10)
 - ◆ 2 - McMurdo Station, Antarctica
 - ◆ 1 - Palmer Station, Antarctica
- ◆ Software to breakout NOAA DCS (Argos)
 - ◆ Hexidecimal AWS data via ADDE text server
 - ◆ Only working through NOAA-18
 - ◆ Running on SDI-104 in SSEC Data Center
- ◆ AMRC future usage pending with NSF

AMRC Website

- ◆ McIDAS is utilized to create AWS meteorograms, AWS hex and text listings, AWS obs plots, satellite composites, hodographs, skew-t, synoptic model data displays, aircraft obs, etc.



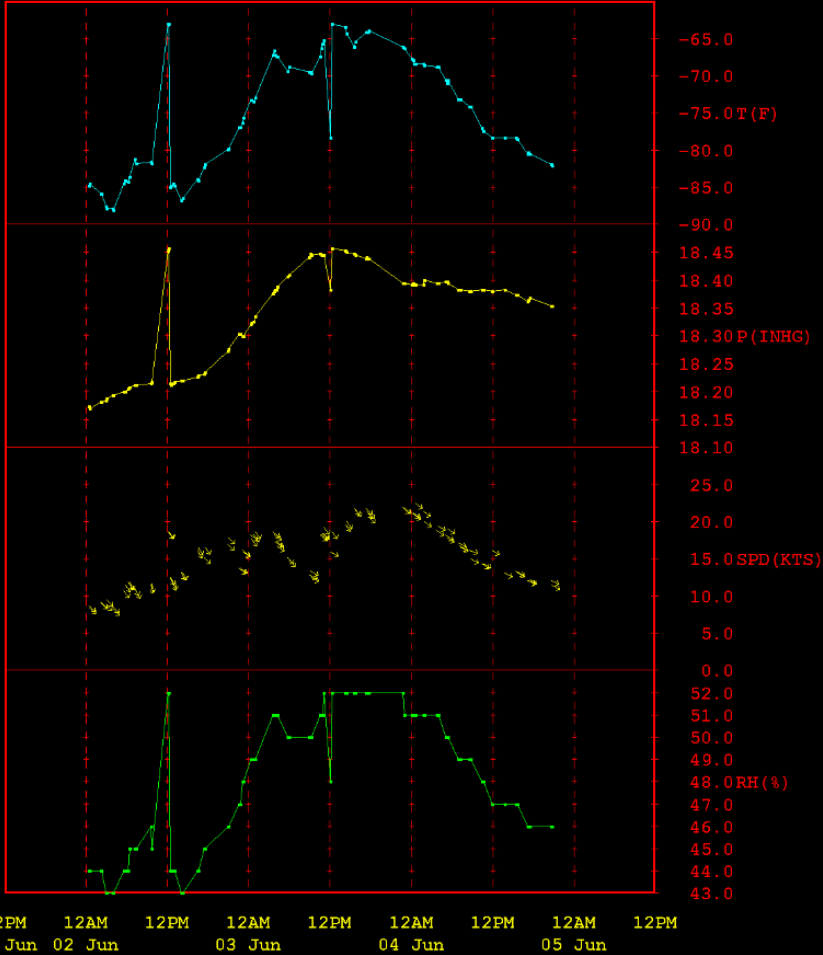
The screenshot displays the AMRC & AWS website interface. At the top, there is a search bar with the text "Search AMRC" and a "Search" button. Below the search bar is the AMRC & AWS logo, which includes a penguin icon and the text "Space Science & Engineering Center, UW-Madison". The main navigation menu consists of the following items: HOME, ABOUT US, DATA & IMAGERY, AWS NETWORK, RESEARCH, NEWS, PUBLICATIONS, ON THE ICE BLOG, MEETINGS, ARCTIC PROJECT, RELATED LINKS, CONTACT US, DISCLAIMER, ACKNOWLEDGMENTS, PEOPLE, and OUTREACH. The "Data & Imagery" section is highlighted, and the text "See also:" is followed by three links: "AMRC's RAMADDA Meteorological Archive Data Server - Upgrade and Update in progress...", "AMRC/AWS FTP Data Server", and "AWS Network". Below this, there is a grid of six data visualization options, each with a representative image and a brief description:

 <p>Antarctic Surface Observations (Current surface weather conditions in the Antarctic, including from the AWS network)</p>	 <p>Satellite Imagery and Composites (Current Satellite imagery from polar orbiting satellites and satellite composites)</p>	 <p>Upper-Air Observations (Current Meteorological observations from weather balloons)</p>
 <p>Models and Forecasts (Model forecast guidance for the Antarctic region)</p>	 <p>Data Fusion (Overlays & combinations)</p>	 <p>Aircraft Observations (Current meteorological aircraft reports)</p>

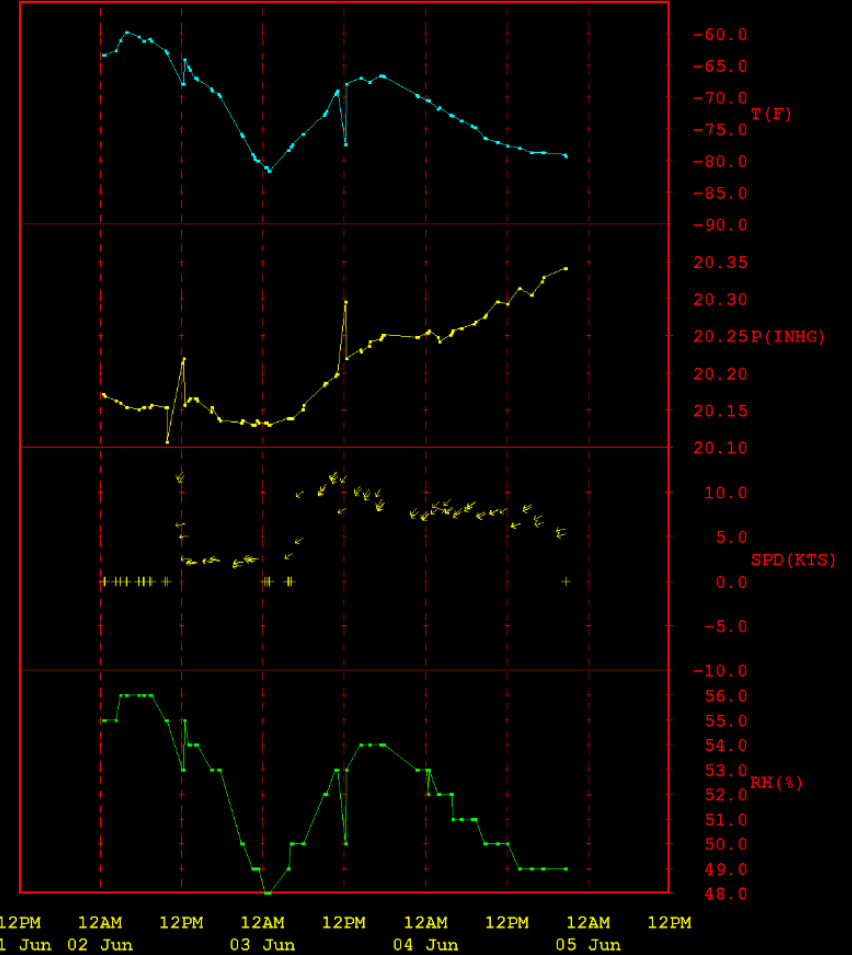
OWL: SSEC's On-line Weather Looper!

Antarctic Automatic Weather Station Time Series

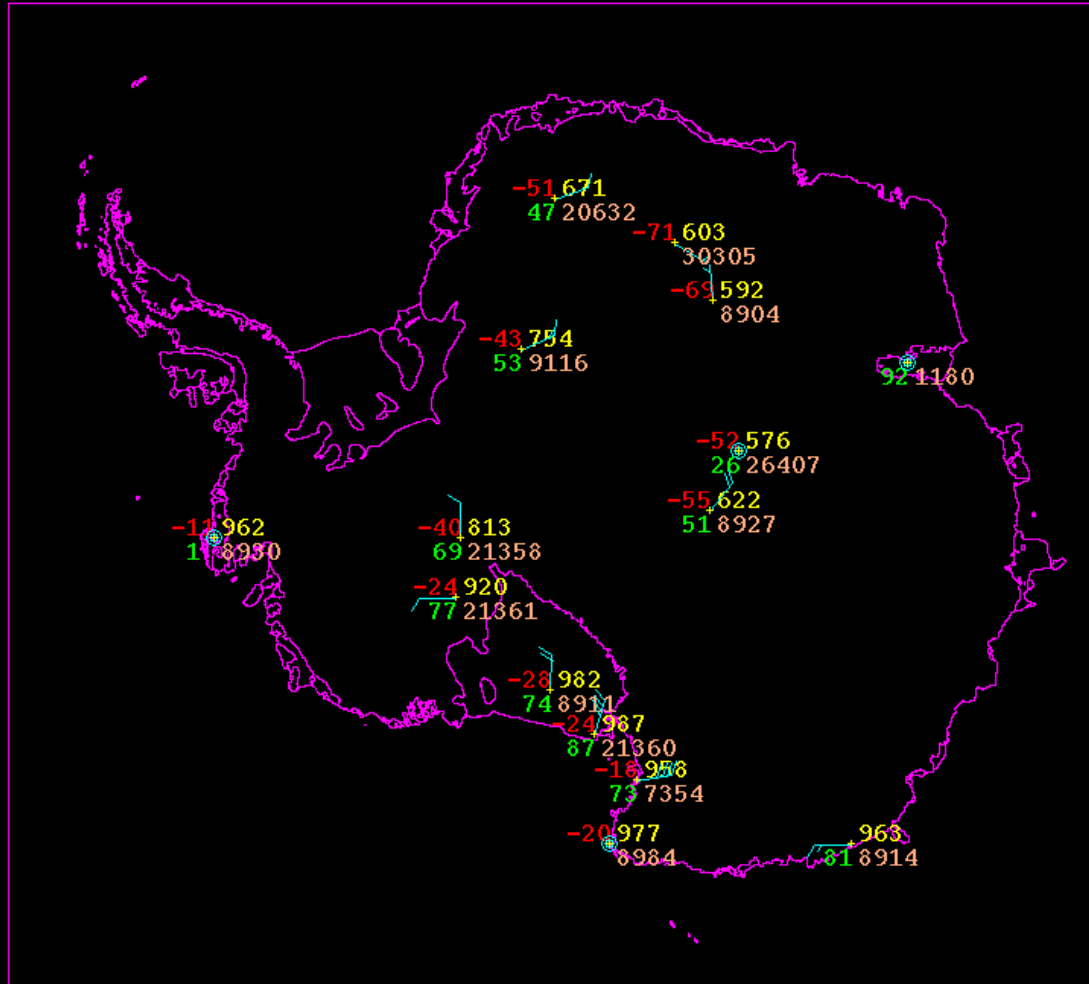
8927 AGO-4 82.01S -96.76E 3597M
02 Jun 2015 12:00AM to 05 Jun 2015 12:00AM (NZST)



8985 Henry 89.00S 0.39W 2741M
02 Jun 2015 12:00AM to 05 Jun 2015 12:00AM (NZST)

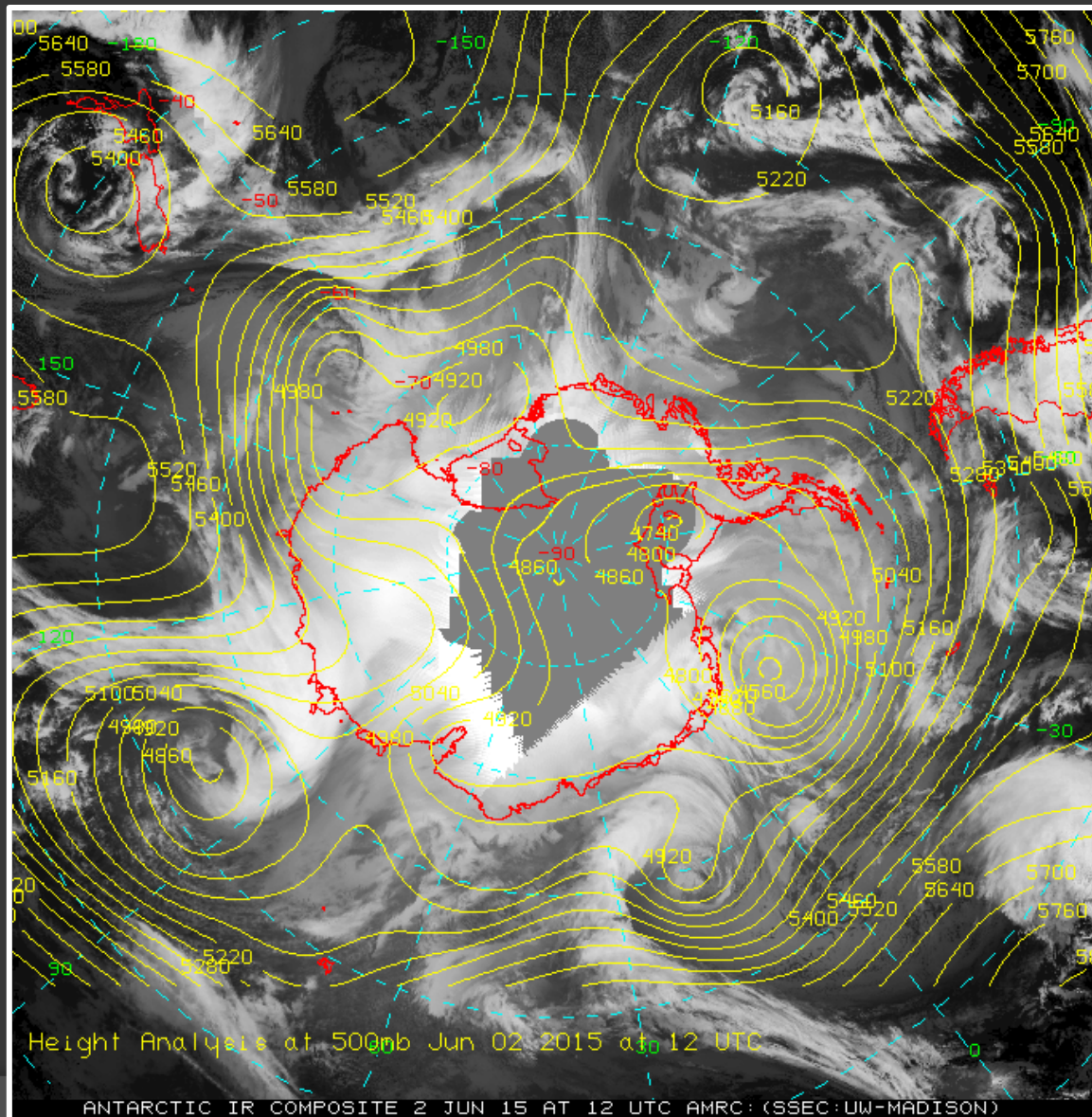


AWS Map Displays



SFC APL0T[METRIC] at 15 UTC on 02 Jun 2015

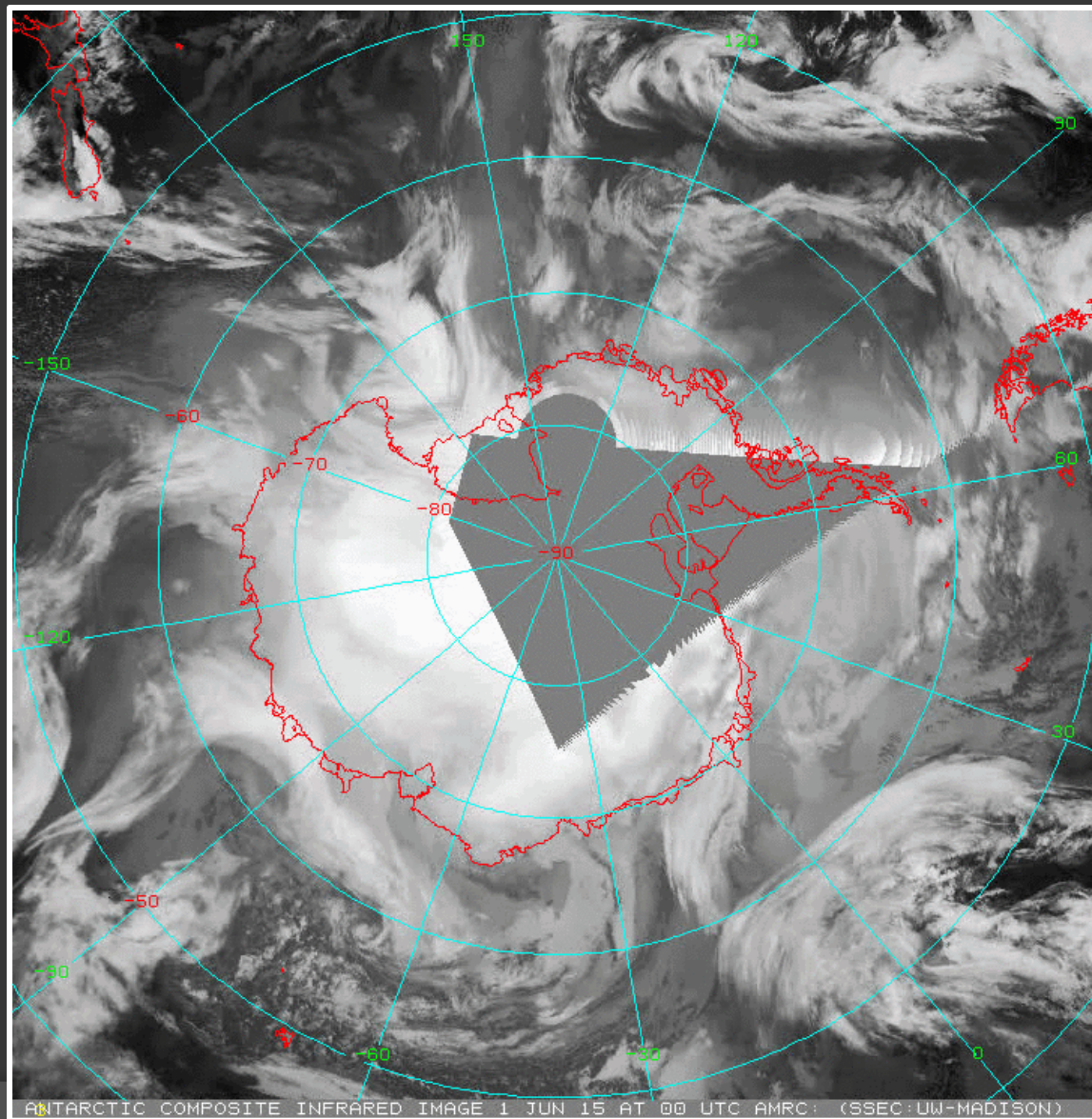
Model Data Fusion



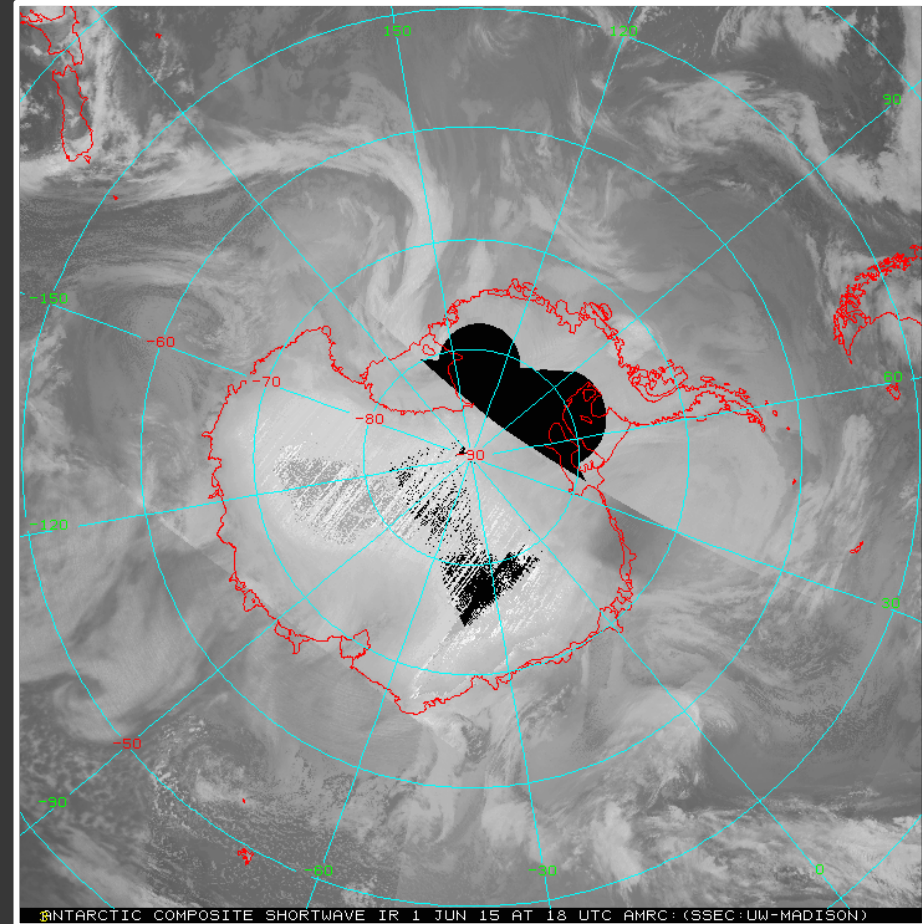
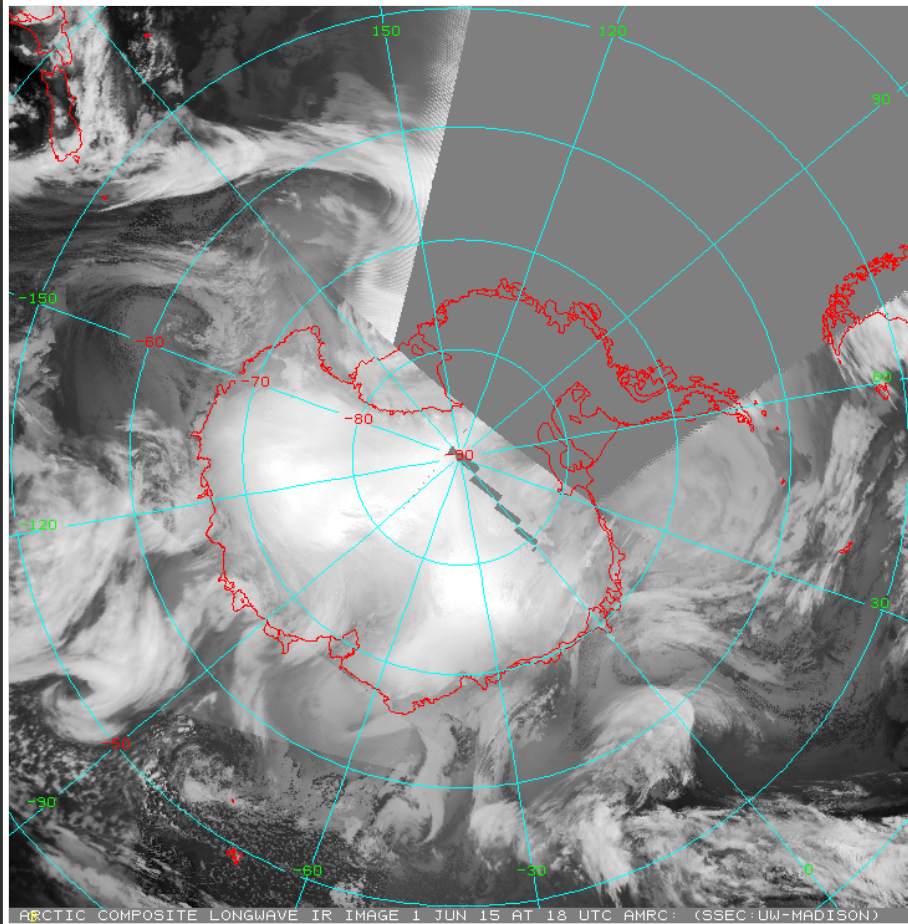
Antarctic and Arctic Composites

- ◆ Infrared, Longwave, Shortwave, Water Vapor, Visible, and Pseudo-Color (only Antarctic)
- ◆ Published Kohrs et al., 2014
- ◆ Composites created hourly at a 4km resolution using polar orbiting and geostationary satellites data that is available within the hour
- ◆ Use McIDAS to create area files, multiple sized gif images, and animations

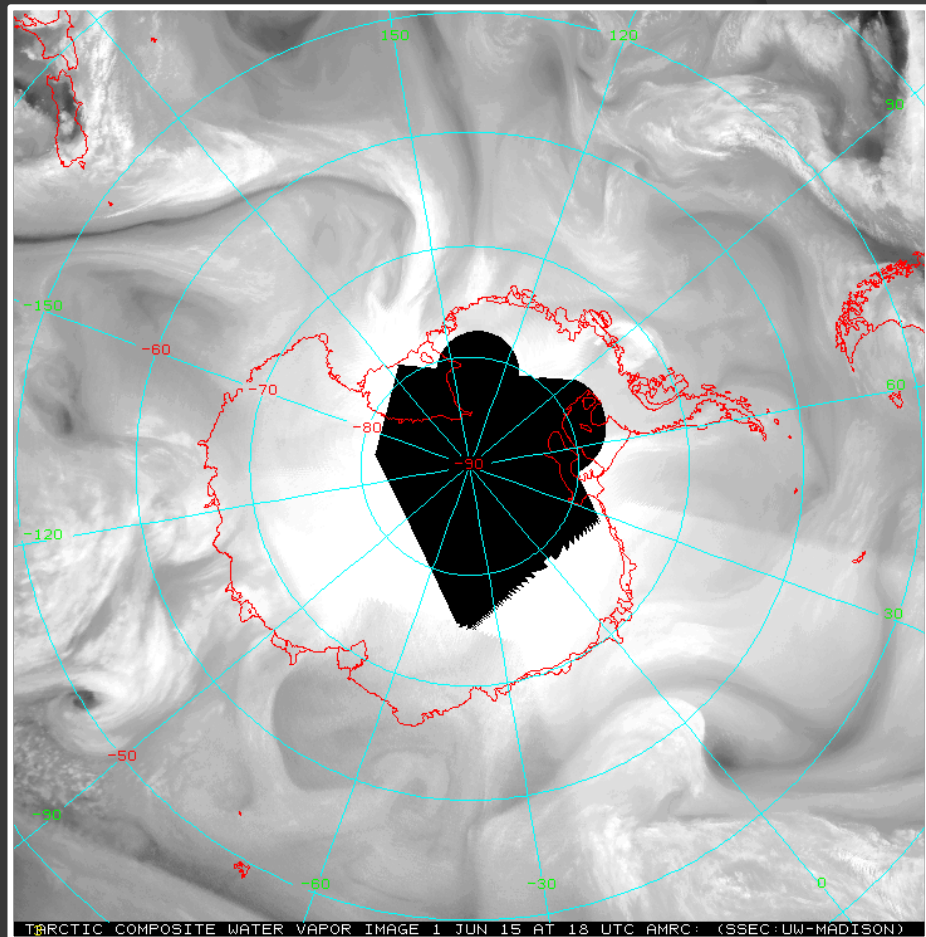
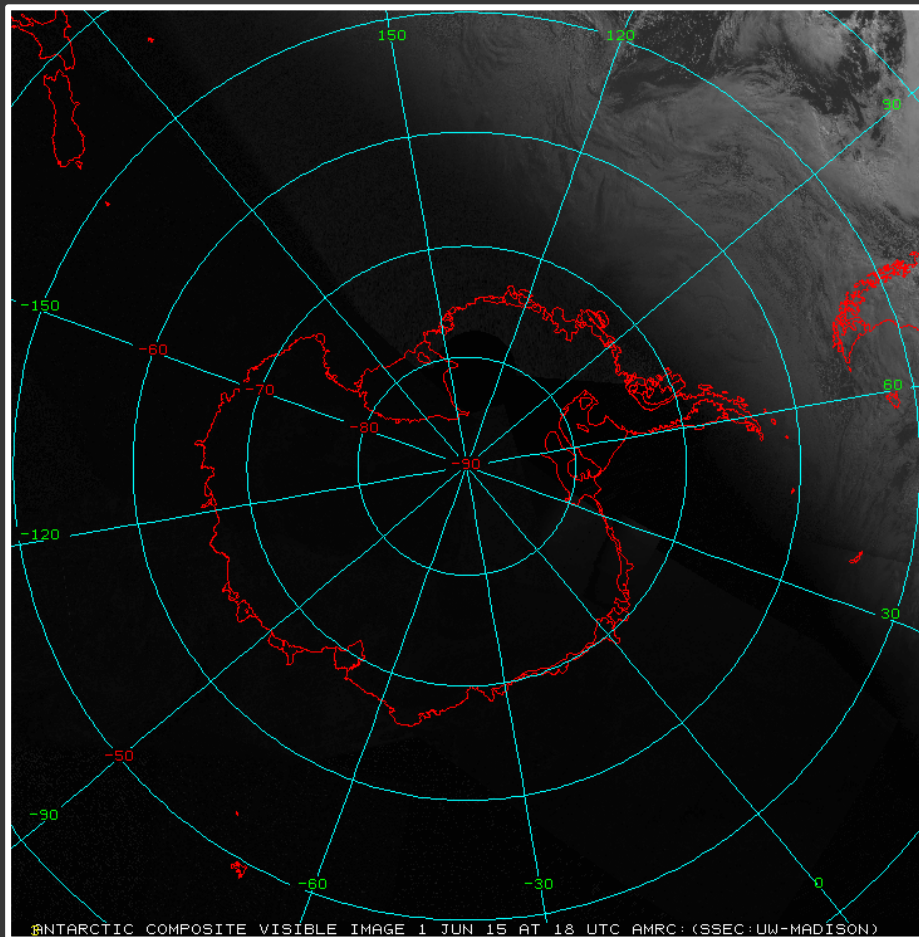
Antarctic Infrared Animation



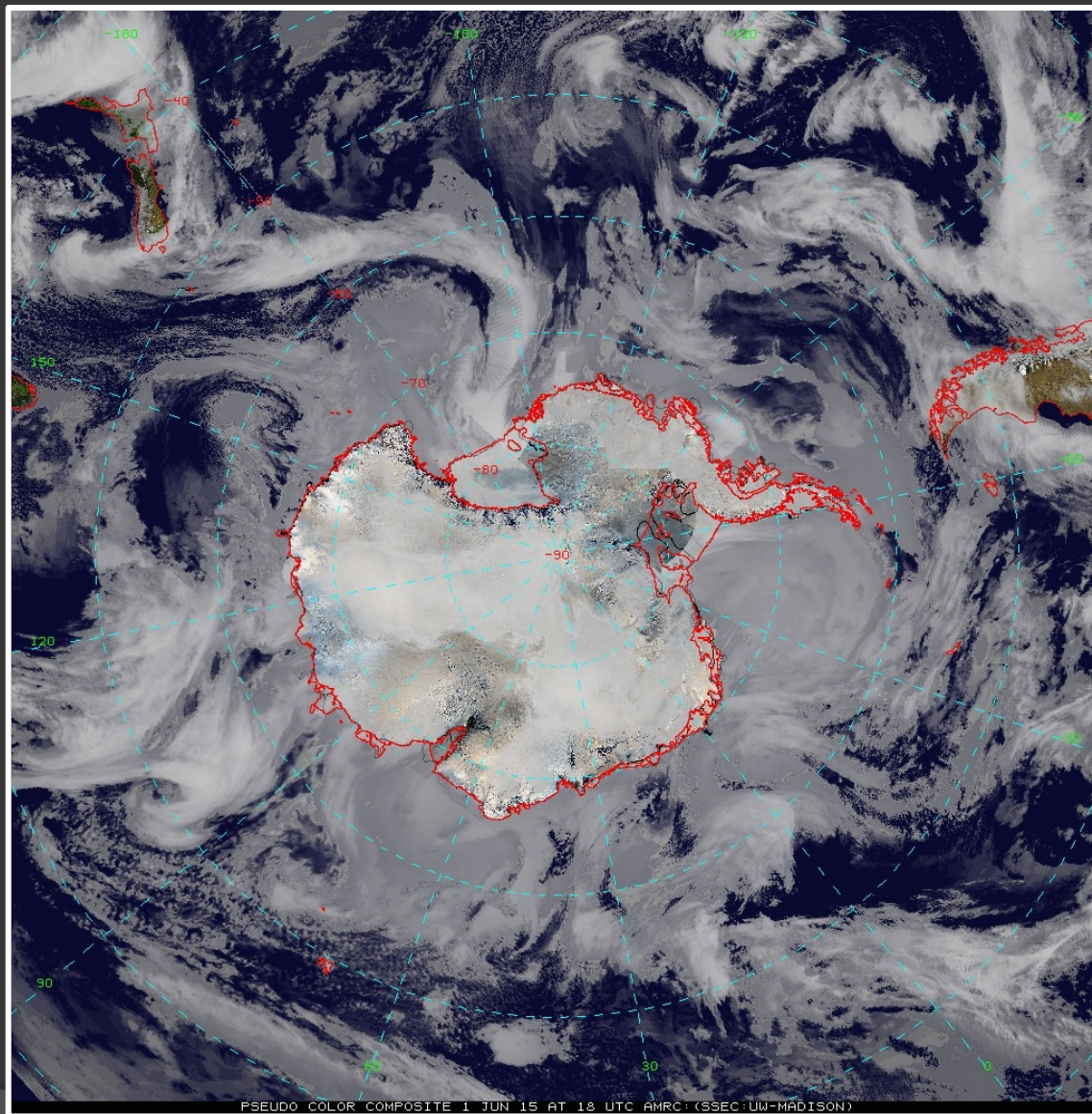
Antarctic Longwave and Shortwave



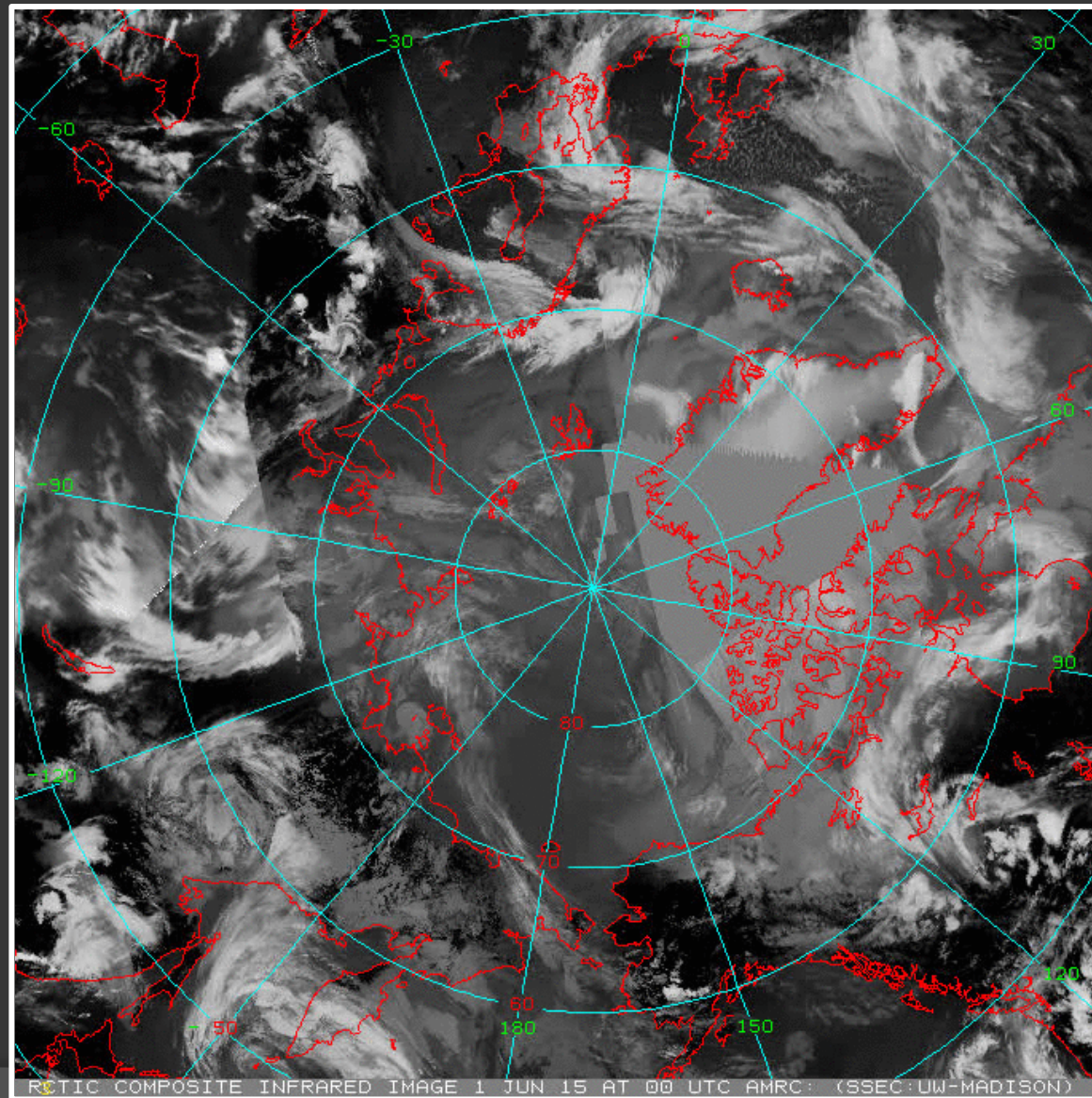
Antarctic Visible and Water Vapor



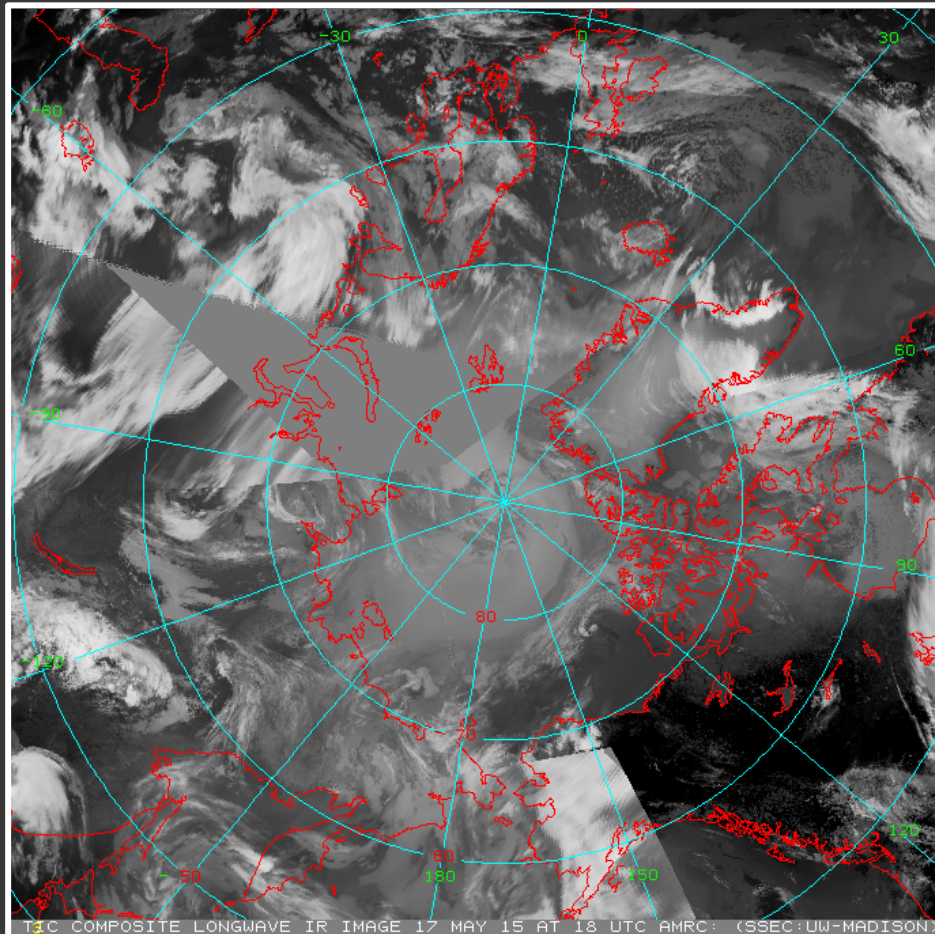
Antarctic Pseudo-Color



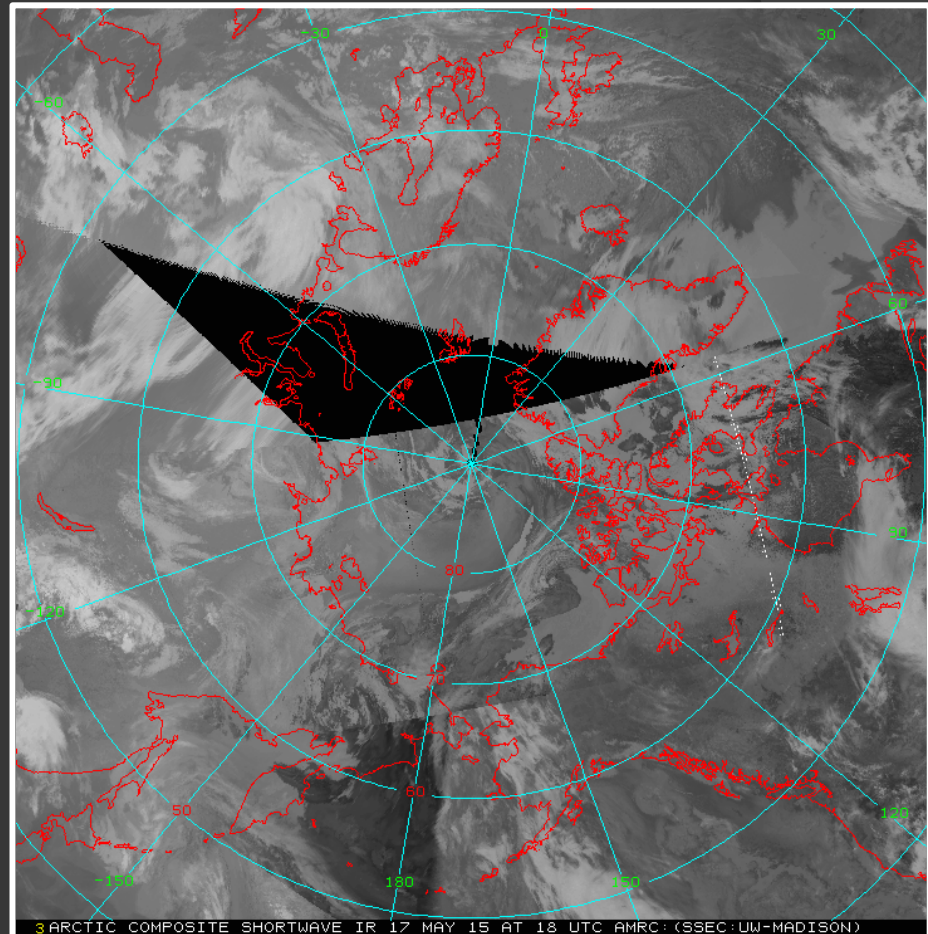
Arctic Infrared Animations



Arctic Longwave and Shortwave

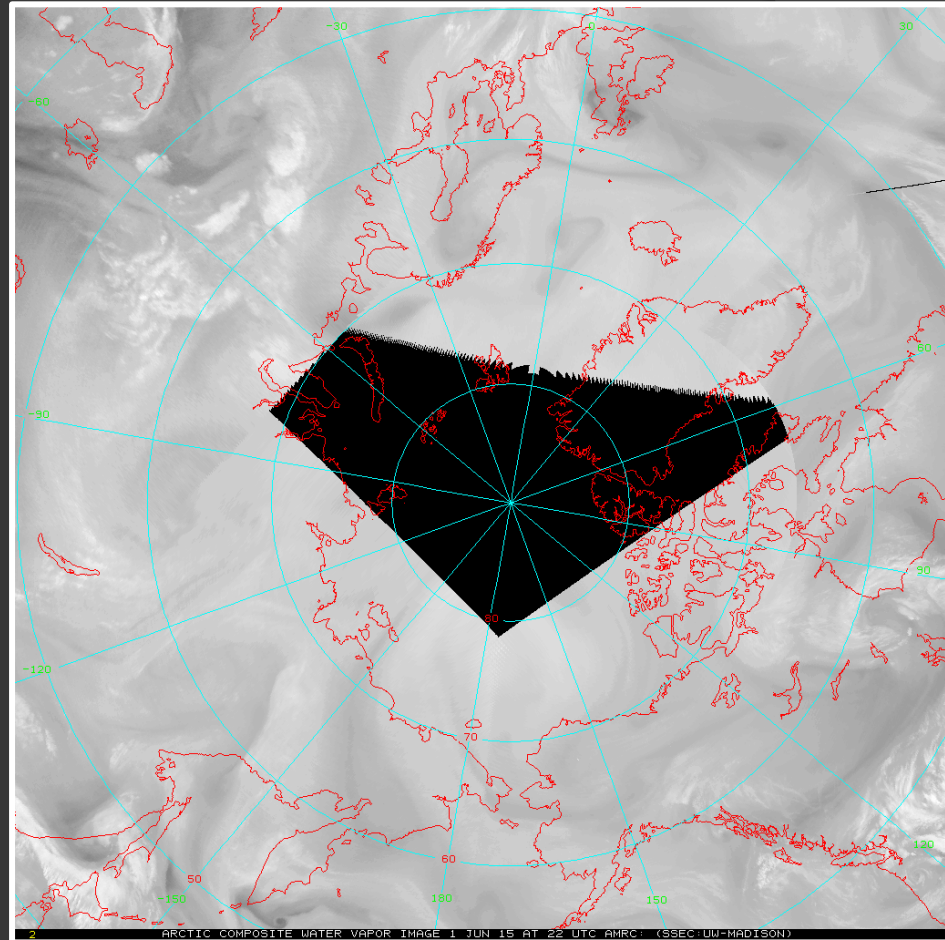
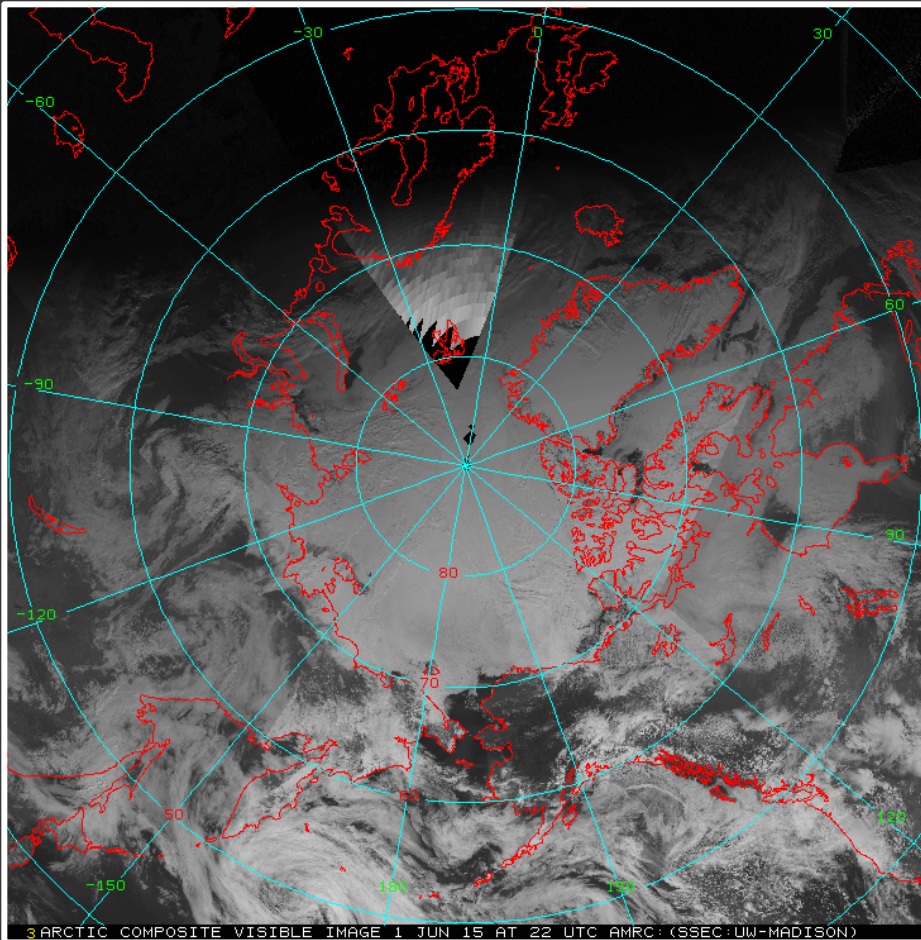


1 Arctic Composite Longwave IR Image 17 May 15 at 18 UTC AMRC: (SSEC:UW-MADISON)

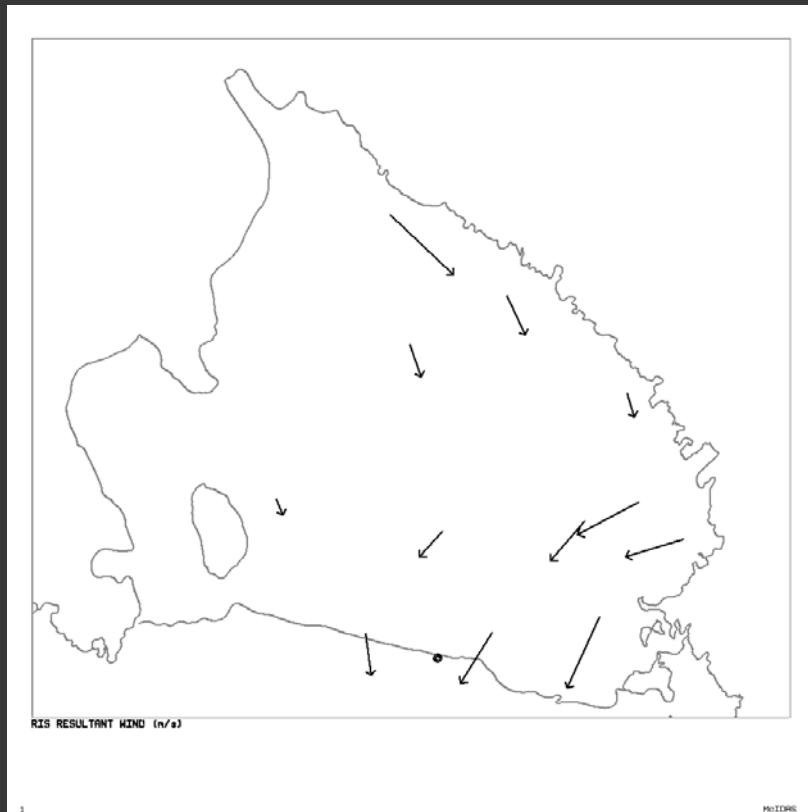


3 Arctic Composite Shortwave IR 17 May 15 at 18 UTC AMRC: (SSEC:UW-MADISON)

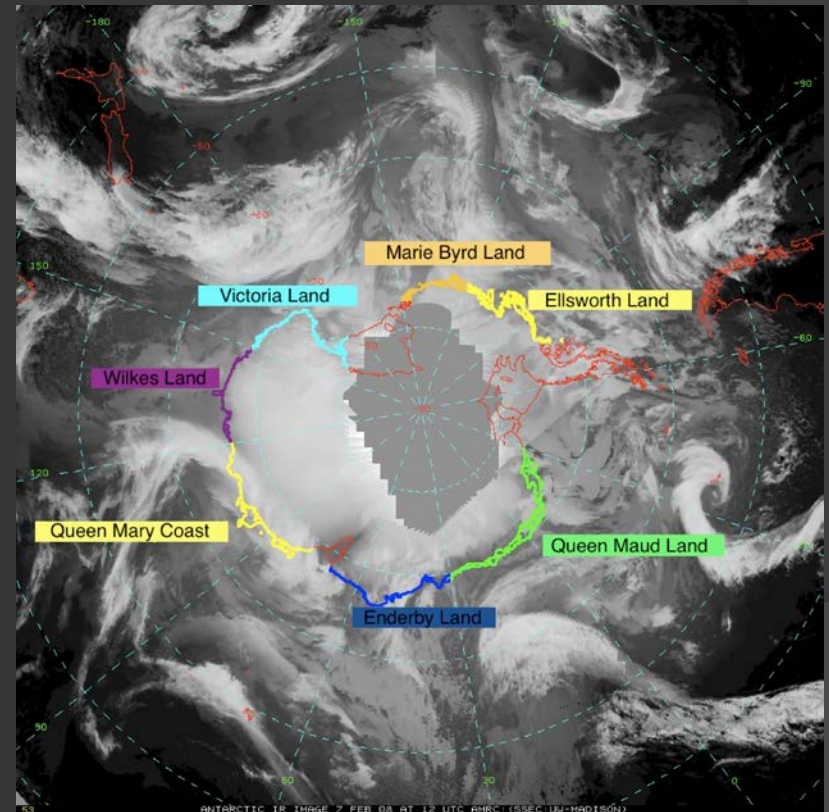
Arctic Visible and Water Vapor



Using McIDAS for Research AWS and Satellite Composites



Climatology by C. Costanza



Cloud Mass Transport by J. Nettesheim

Cyber-Infrastructure

- ◆ Archive of nearly 35 years of data could use an update of better cyber infrastructure
- ◆ Need to create a database for both internal and external users
- ◆ About to be funded to engage a task force for advice on best ways to continue the creation and management of Antarctic meteorological datasets – **Sustainability!!**

Future

- ◆ Future tasks are unclear and still taking shape:
 - × Real time AWS, displays, and composites future is pending with NSF's Antarctic Infrastructure and Logistics section
 - × Cyberinfrastructure will maintain some essential elements for approximately 2 years
 - × Beyond that will be task force recommendation dependent
- ◆ McIDAS-V
 - × More routine implementation
 - × Improved displays ?

Thank You!



Questions?

- ◆ The authors appreciate the support of the University of Wisconsin-Madison Antarctic Meteorological Research Center for the data set, data display, & information, NSF grant number ANT-1141908.
- ◆ <http://amrc.ssec.wisc.edu>