



Polar Satellite Composite Imagery for the Arctic and Antarctic

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Abstract

In the remote polar regions, satellite data is the most spatially and temporally available dataset with which to study or forecast the weather. In order to make the data most useful, multiple swaths of both polar orbiting and geostationary satellite data are merged together to make one composite image. These images can provide a complete representation of the polar regions, and be a crucial element in examining the weather across the region. In 1992, the Antarctic Meteorological Research Center (AMRC) began generating infrared satellite composite images over the Antarctic region at 10 km resolution, including both polar and geostationary as well as United States, European, Asian, and other satellite data. Since the inception of the Antarctic composite imagery, the dataset has been expanded to include water vapor and experimental visible channels, and been improved to 5-km resolution data. In 2007, the same techniques used to generate the Antarctic images were expanded to the Arctic, where infrared, water vapor, short-wave, and long-wave images are now being generated with 5-km resolution. Both the Antarctic and Arctic images are available as one-and three-hourly composites. Below, several examples of both Antarctic and Arctic composite images are presented. Experimental composites methods are being tested to explore optimal ways to generate composite imagery for visual and scientific applications, and is shown as future work. All data is available free of charge via web, ftp, or by special data request.

Sample Data

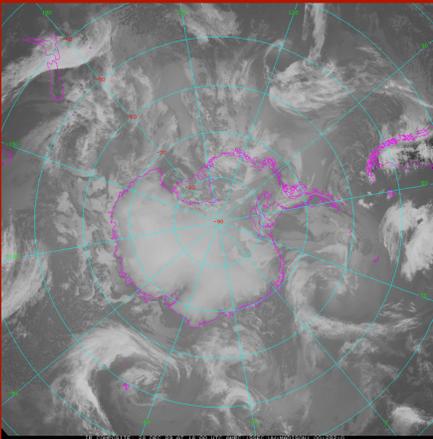


Figure 1. An example of an infrared Antarctic satellite composite image from 28 December 2009 at 18 UTC.

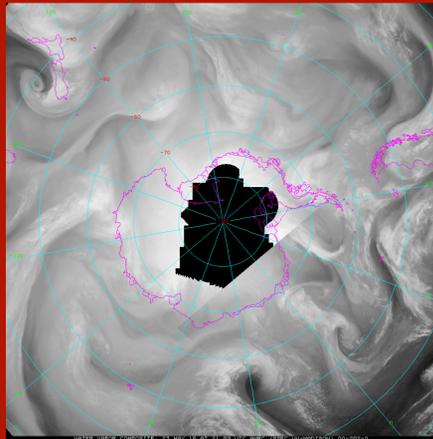


Figure 2. An example of a water vapor Antarctic satellite composite image from 23 May 2010 at 21 UTC.

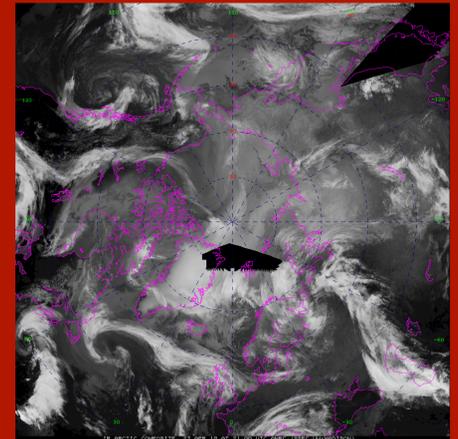


Figure 3. An example of an infrared Arctic satellite composite image from 23 April 2010 at 21 UTC.

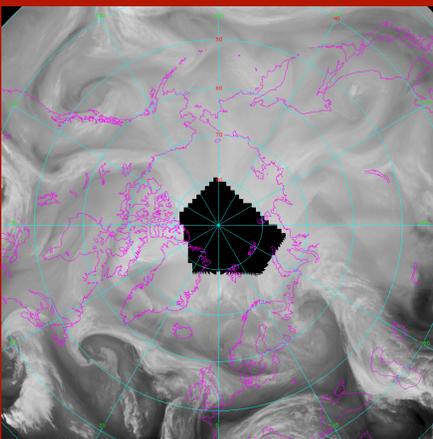


Figure 4. An example of a water vapor Arctic satellite composite image from 23 April 2010 at 21 UTC.

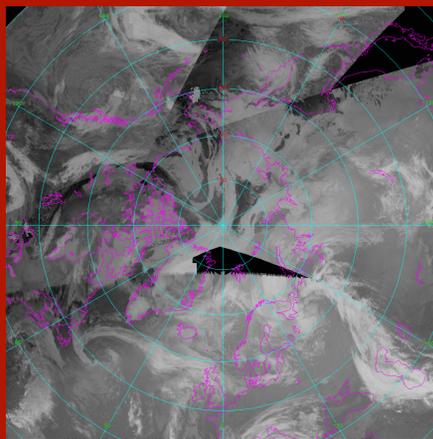


Figure 5. An example of short wave Arctic satellite composite image from 23 April 2010 at 21 UTC.

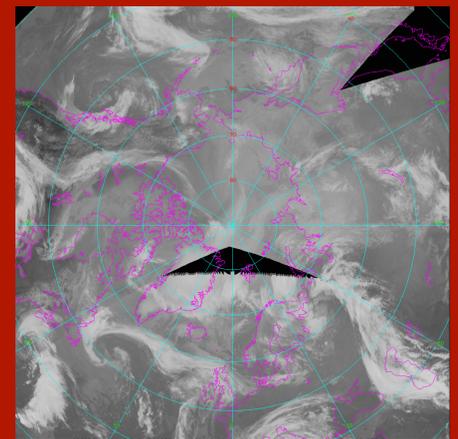


Figure 6. An example of a long wave Arctic satellite composite image from 23 April 2010 at 21 UTC.

Future Work

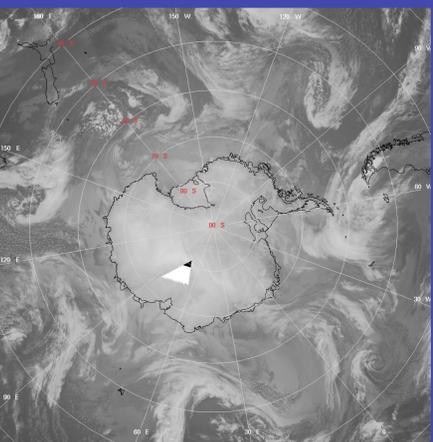


Figure 7. An example of a composite created choosing the maximum brightness temperature from several geostationary and polar orbiting satellites. Data for all satellites are required to be within ± 50 minutes to the top of the synoptic hour. This image is valid 10 May 2010 at 6 UTC.

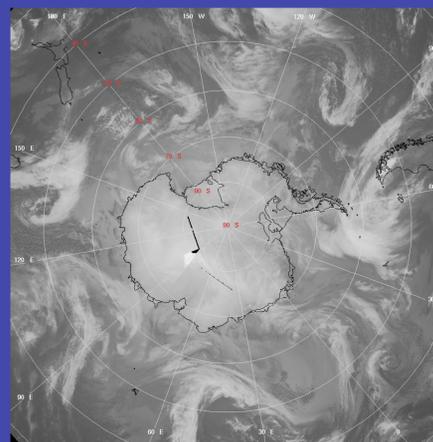


Figure 8. An example of a composite created choosing the maximum brightness temperature from several geostationary and polar orbiting satellites. Data for all satellites are required to be within ± 50 minutes to the top of the synoptic hour. This image is valid 10 May 2010 at 6 UTC.

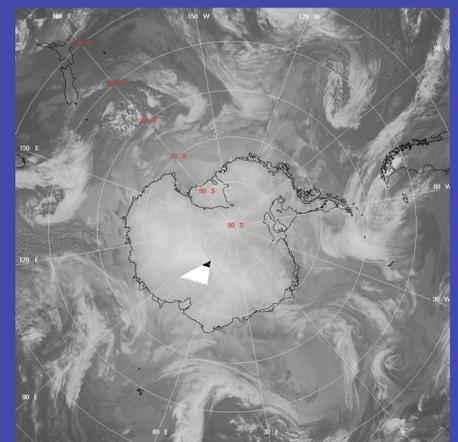


Figure 9. An example of a composite created choosing the maximum brightness temperature from several geostationary and polar orbiting satellites. Data for all satellites are required to be within ± 50 minutes to the top of the synoptic hour. This image is valid 10 May 2010 at 6 UTC.

Contact Information and Acknowledgments

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