Advanced Image Compositing Techniques

David Santek, Rick Kohrs, Nick Bearson, Matthew Lazarra

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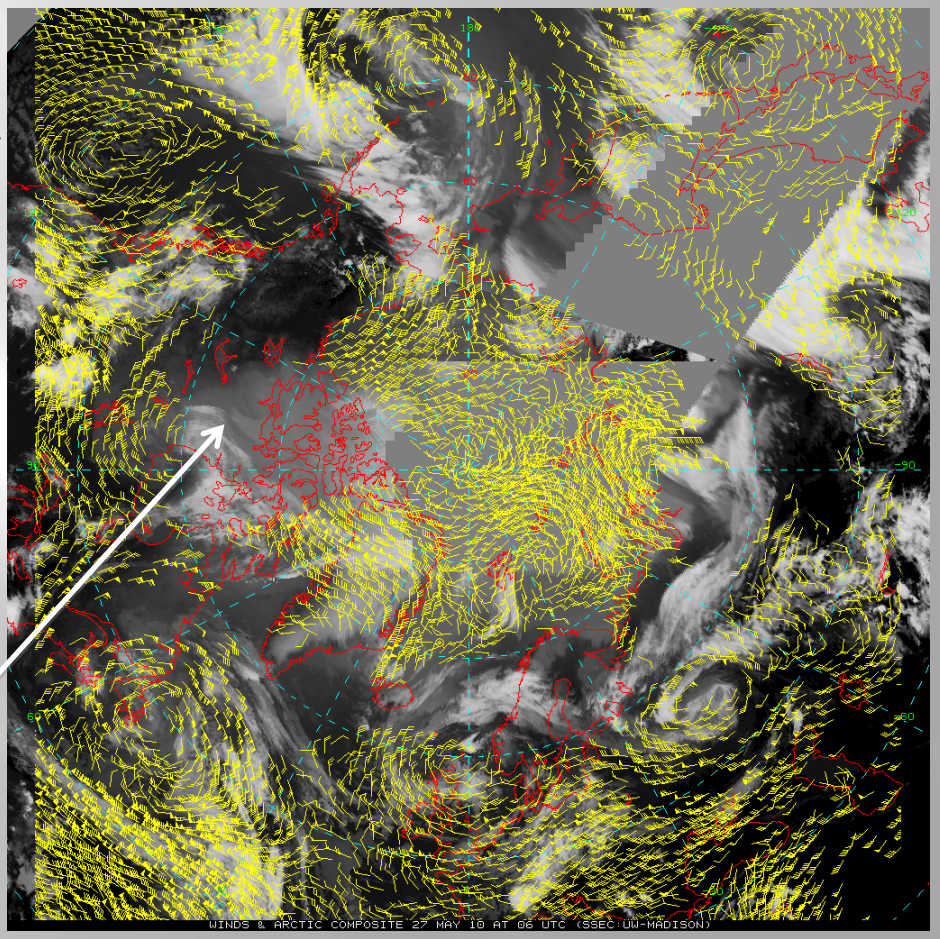
Outline

- Project overview
- IMGPARM
- COMP_ALLBAND
- Current results

Project Overview

- Combine data from polar and geostationary satellites to track clouds in high latitudes
  - Geostationary satellites are good up to 50º-60º latitude
  - Polar orbiting satellites are good poleward of 70º latitude
- This technique is designed to ‘fill the gap’



Project Issues

- Accounting for inter-satellite calibration differences
- Correcting for parallax in viewing the cloud tracers from different satellites and instruments
- Using the pixel time within the composite that corresponds to the viewing by each satellites when computing cloud velocity

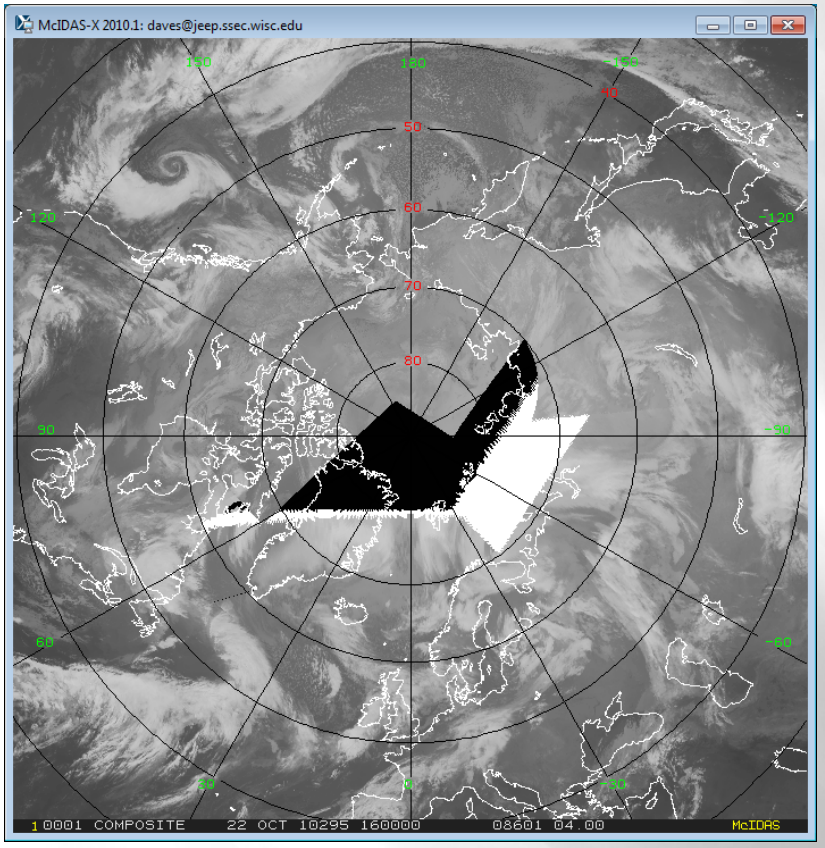
IMGPARM: Create multi-band files

Band	Description
1	Grayscale values (brightness temperature)
2	Time difference from nominal time (sec)
3	Distance from satellite subpoint (km)
4	Pixel area (km^2)
5	McIDAS Satellite Sensor number (SS)
6	Wavelength
7	Parallax distance (km*10)
8	Parallax direction (degrees)

COMP_ALLBAND

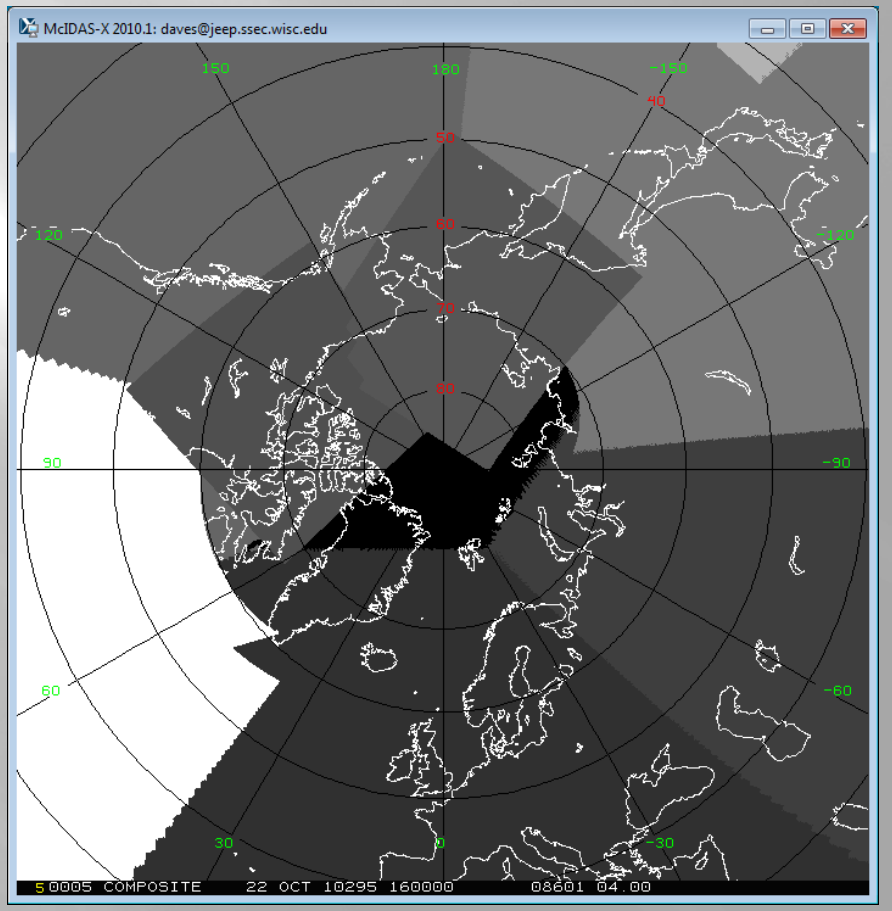
- All IMGPARM files are remapped with REMAP2 into a common projection
- COMP_ALLBAND then combines many IMGPARM files into a single file
- Choose highest resolution pixel
- Ensure pixels are in time range
- Retain all IMGPARM bands

Example composite



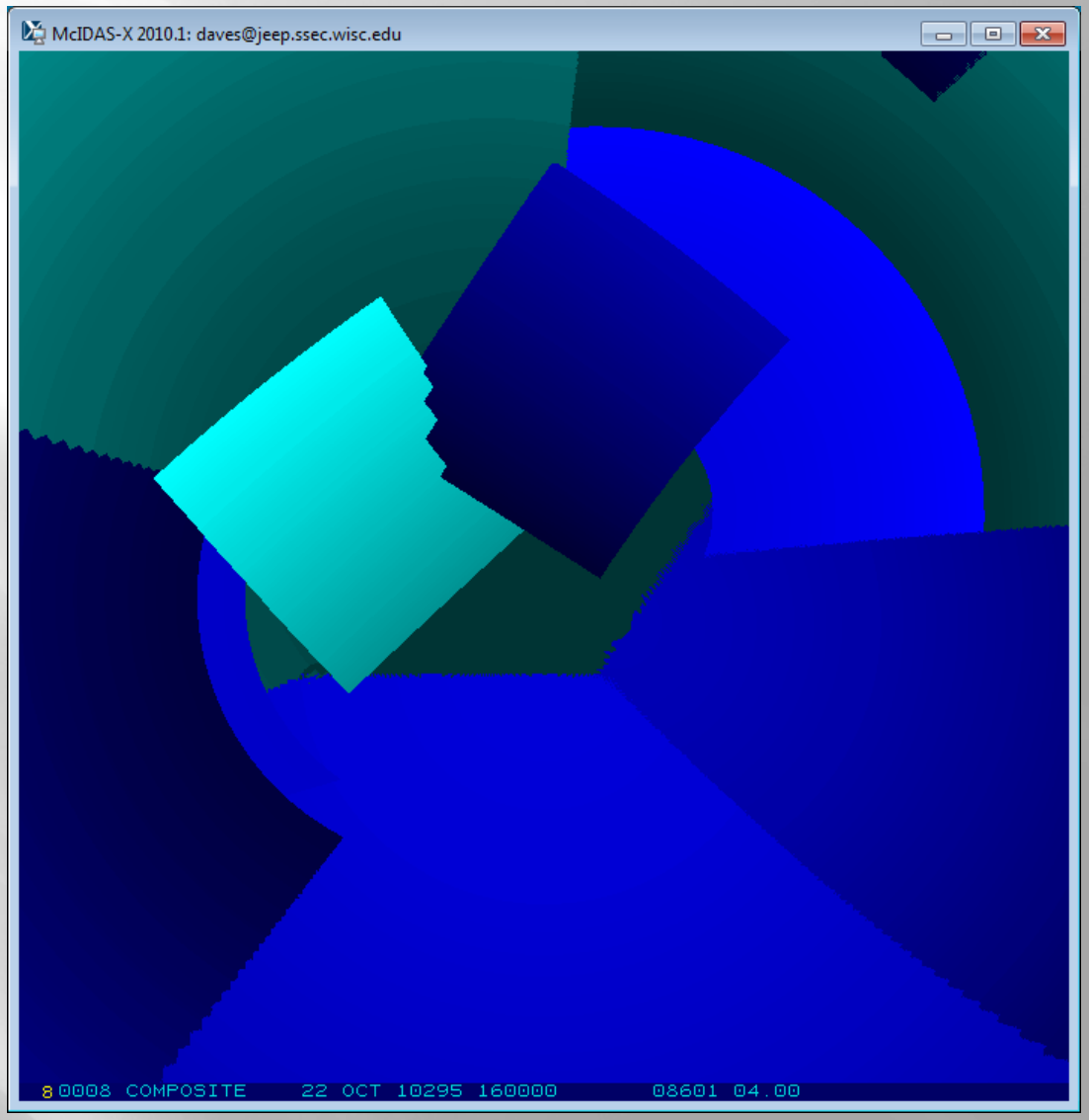
Infrared composite

Satellite ID number

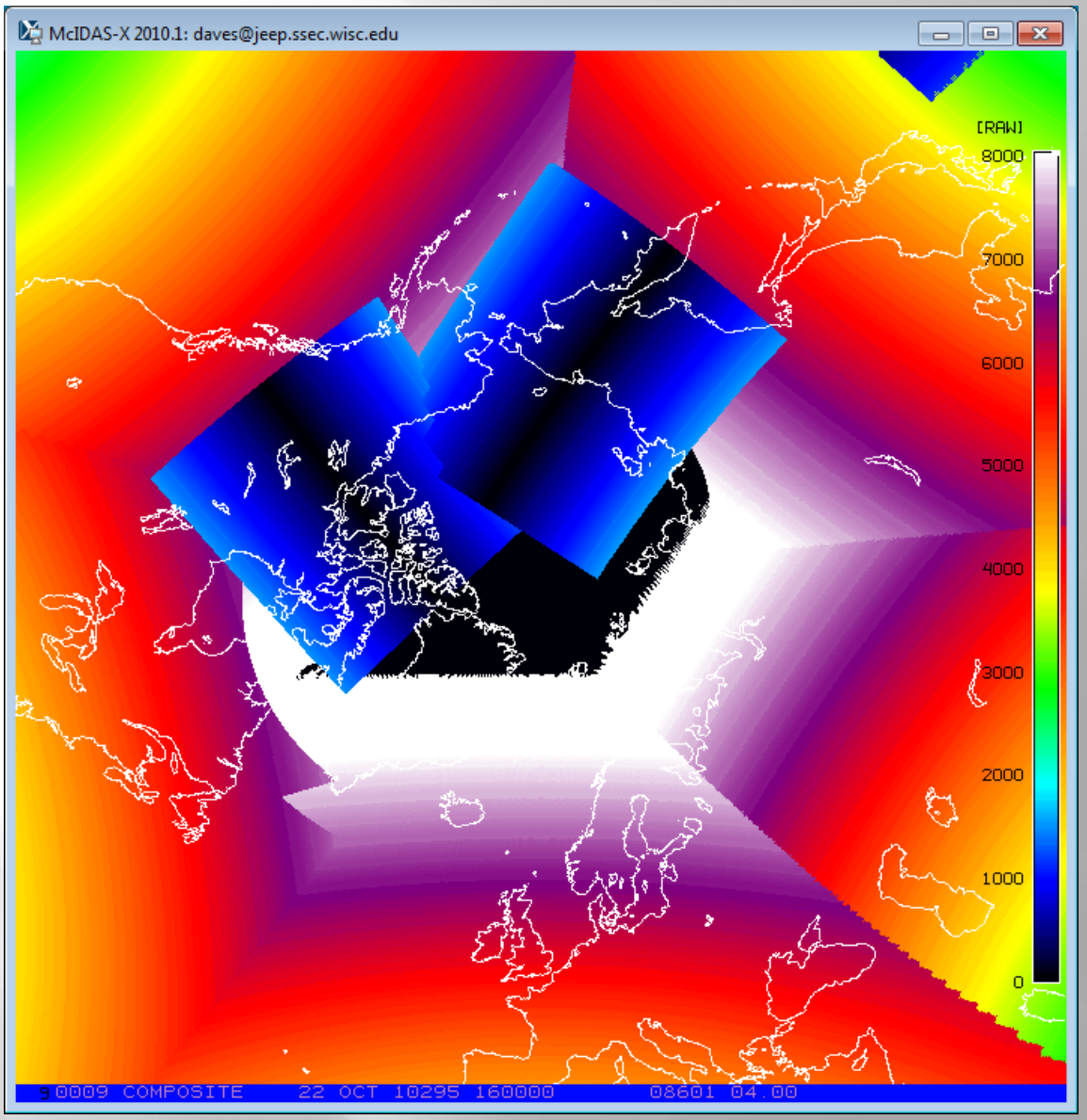


Pixel Time (Difference from a nominal time)

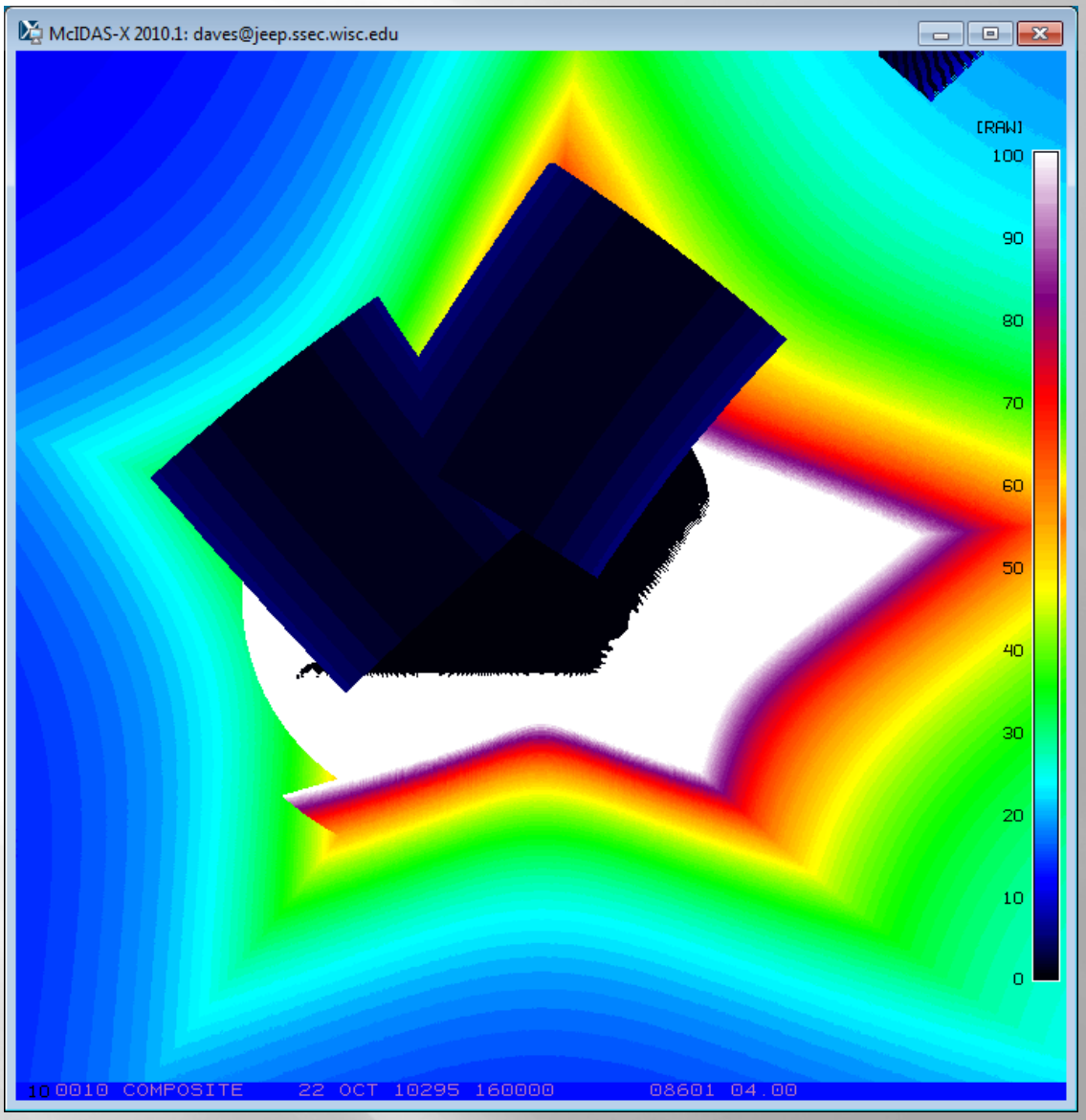
- Blue: 0 to 15 minutes before nominal time
- Green: 0 to 15 minutes after nominal time



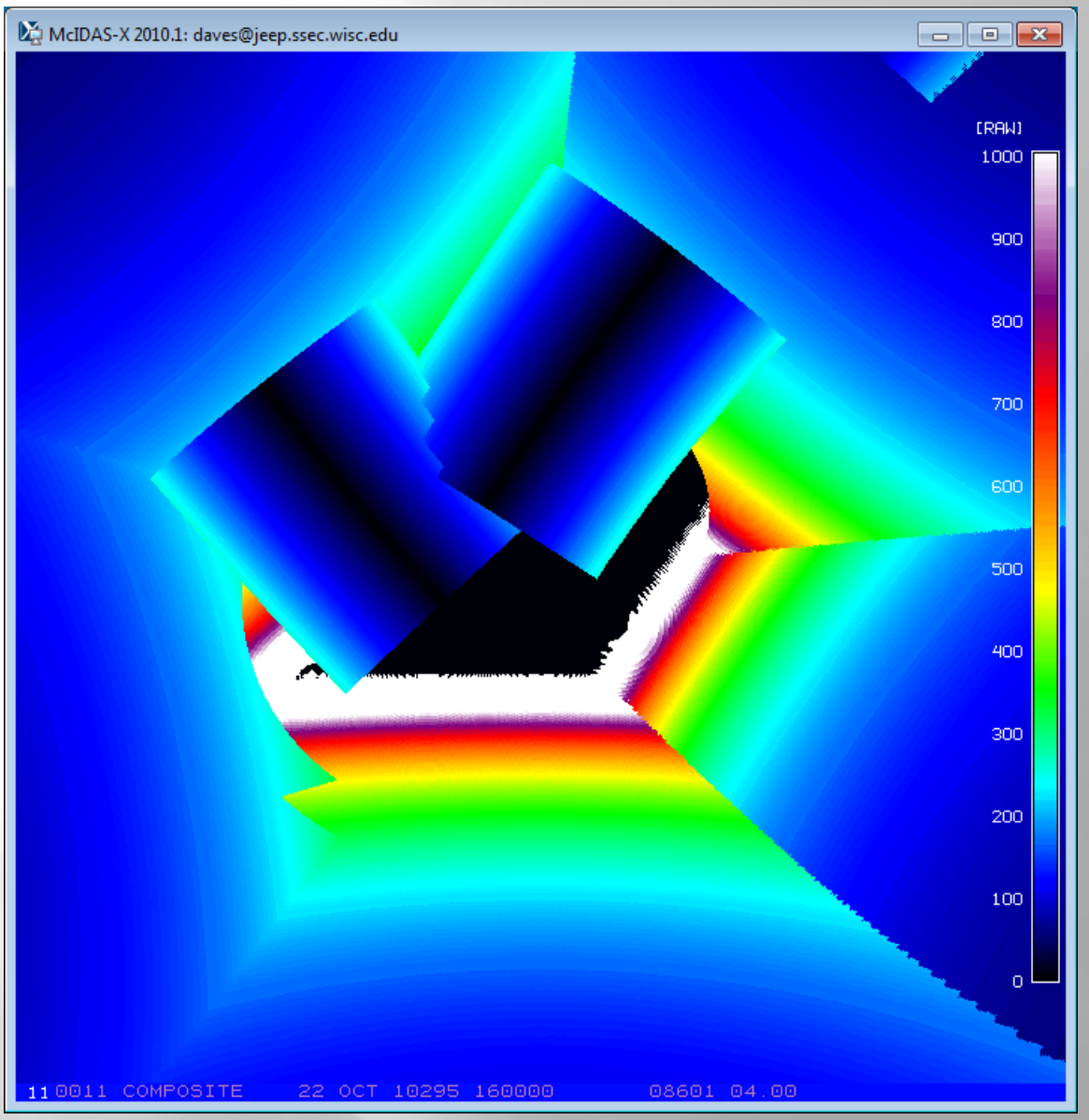
Pixel Distance (km) from Subpoint



Pixel Area (km^2)

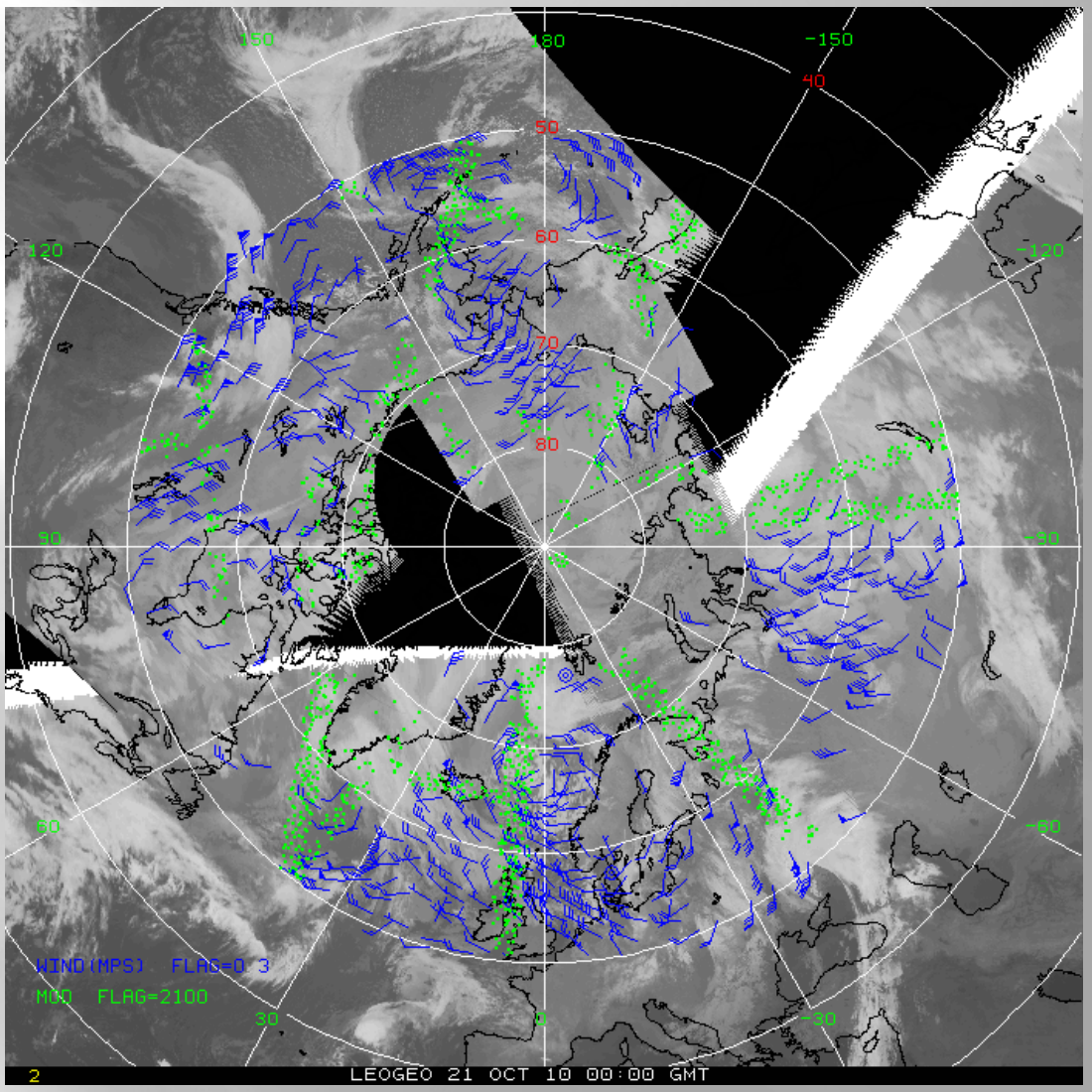


Parallax Distance (km)



Satellite-derived winds

- Triplets of ½ hourly composites
- Composite building delayed by 3 hours
- Wind flags (blue) at all levels
- Potential targets (green) not tracked due to overlapping satellite data



Arctic for 21 October 2010

Summary

- IMGPARM, REMAP2, COMP_ALLBAND process:
  - 3-hour delay before running process
  - Up to 60 input files every 15 minutes
  - Each polar region takes about 3 minutes
  - ADDE dataset (images and winds)
    - DATALOC ADD LEOGEO LEOGEO.SSEC.WISC.EDU
  - Composite with winds overlayed (LEO-GEO):
    - http://stratus.ssec.wisc.edu/products/rtpolarwinds/
- IMGPARM and COMP_ALLBAND will be in McIDAS-XRD