JPSS/NPP Operations Concept in the High Latitude Proving Ground - Support of NPP Science and Transition to Operations

NOAA Satellite Science Week
Kansas City - May 2012

Tom Heinrichs, Jiang Zhu, Scott Macfarlane, Jay Cable, Dayne Broderson
University of Alaska Fairbanks
Geographic Information Network of Alaska (GINA)
www.gina.alaska.edu
tom.heinrichs@alaska.edu | +1-907-474-6897

Abstract

The National Weather Service (NWS), Alaska Region, is the largest operational forecasting user of polar orbiting satellite data in NOAA because of its unique high latitude location and forecasting and warning domains. In addition to polar orbiting data, geostationary satellite data is used effectively in southeast Alaska and the Aleutians and as a synoptic tool for the rest of the state. Effective use of polar orbiting data is essential for accurate forecasting and warning at high latitudes. To enable rapid access to NPP data for testing of algorithms and applications outside of NOAA routine operations, the High Latitude Proving Ground has installed a direct readout reception station at GINA at the University of Alaska Fairbanks campus. This station has implemented the JPSS-funded, CIMSS-developed Community Satellite Processing Package (CSPP). Near-real-time access to Level 0 data from NPP is available to the community in support of NWS operations and research. Additionally, CSPP and JPSS risk reduction products will be routed through the High Latitude Proving Ground to Alaska WFOs, leveraging existing programs and resources, speeding the use of NPP and JPSS data into NWS operations, and providing a valuable feedback loop between algorithm developers and operational forecasters.

Acknowledgements

Work funded by JPSS/NPP, GOES-R, NSF, and UAF.

Colleagues at NESDIS, NWS, STAR, CIMSS, and CIRA.

Alaska Region: RO and WFOs.

Thank you!

Geographic Information Network of Alaska

Real-time satellite data: GINA receives and processes satellite data on the UAF campus.	**NOAA FCDAS Partnership:** Satellite data is also received at GINA form NOAA's Fairbanks facility.

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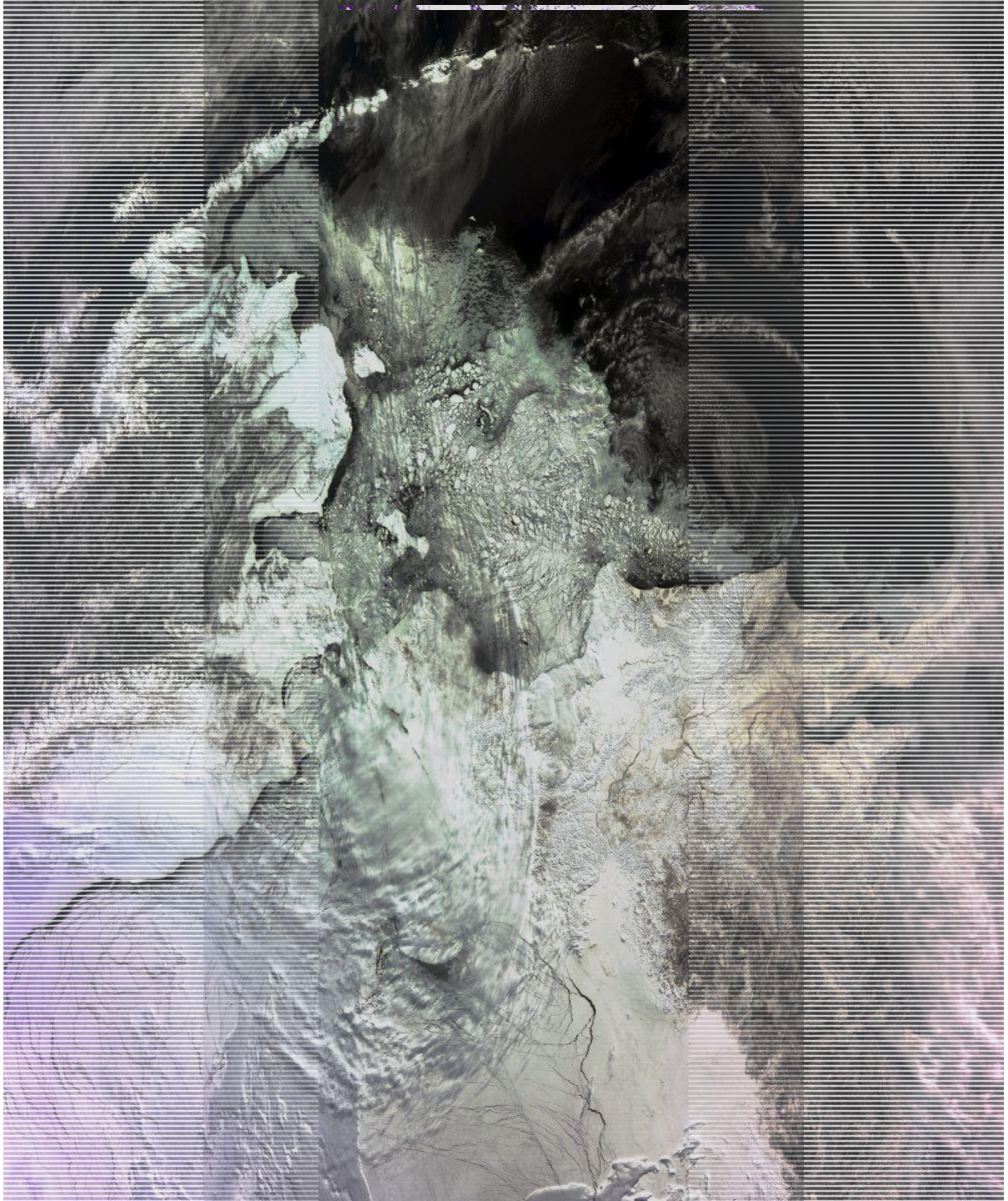
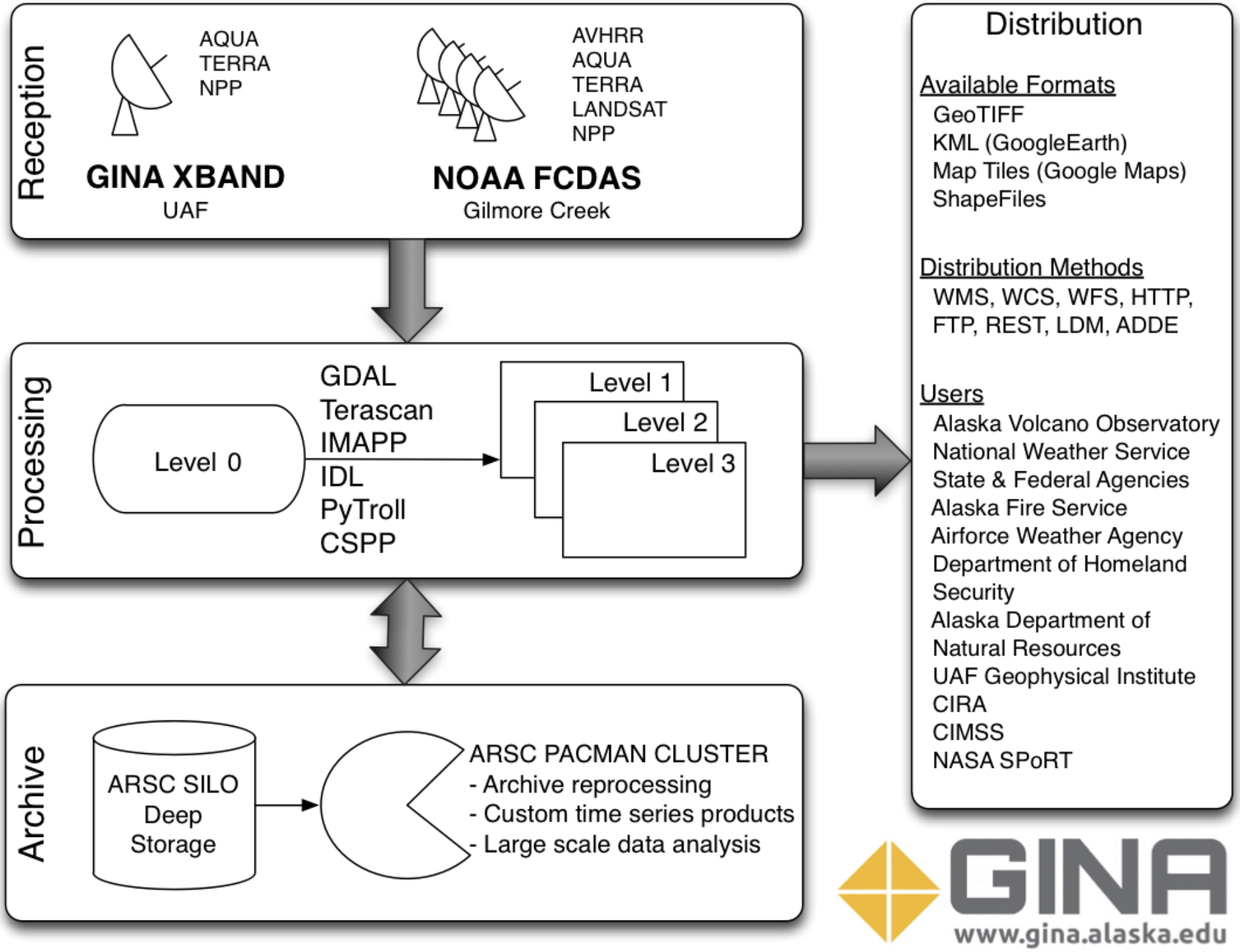
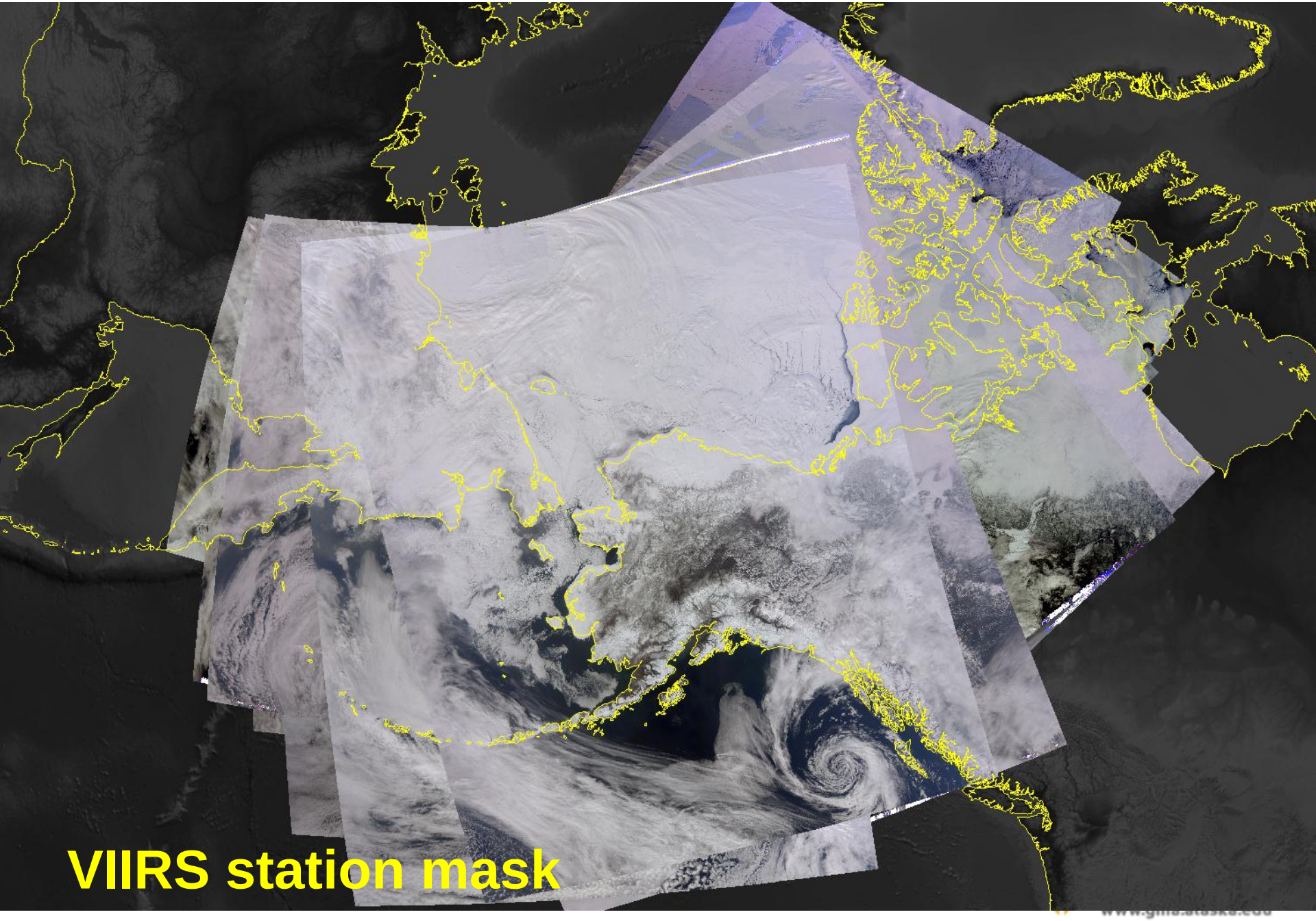
JPSS Funded Upgrade to GINA's X-band Ground Receiving Station to Receive NPP

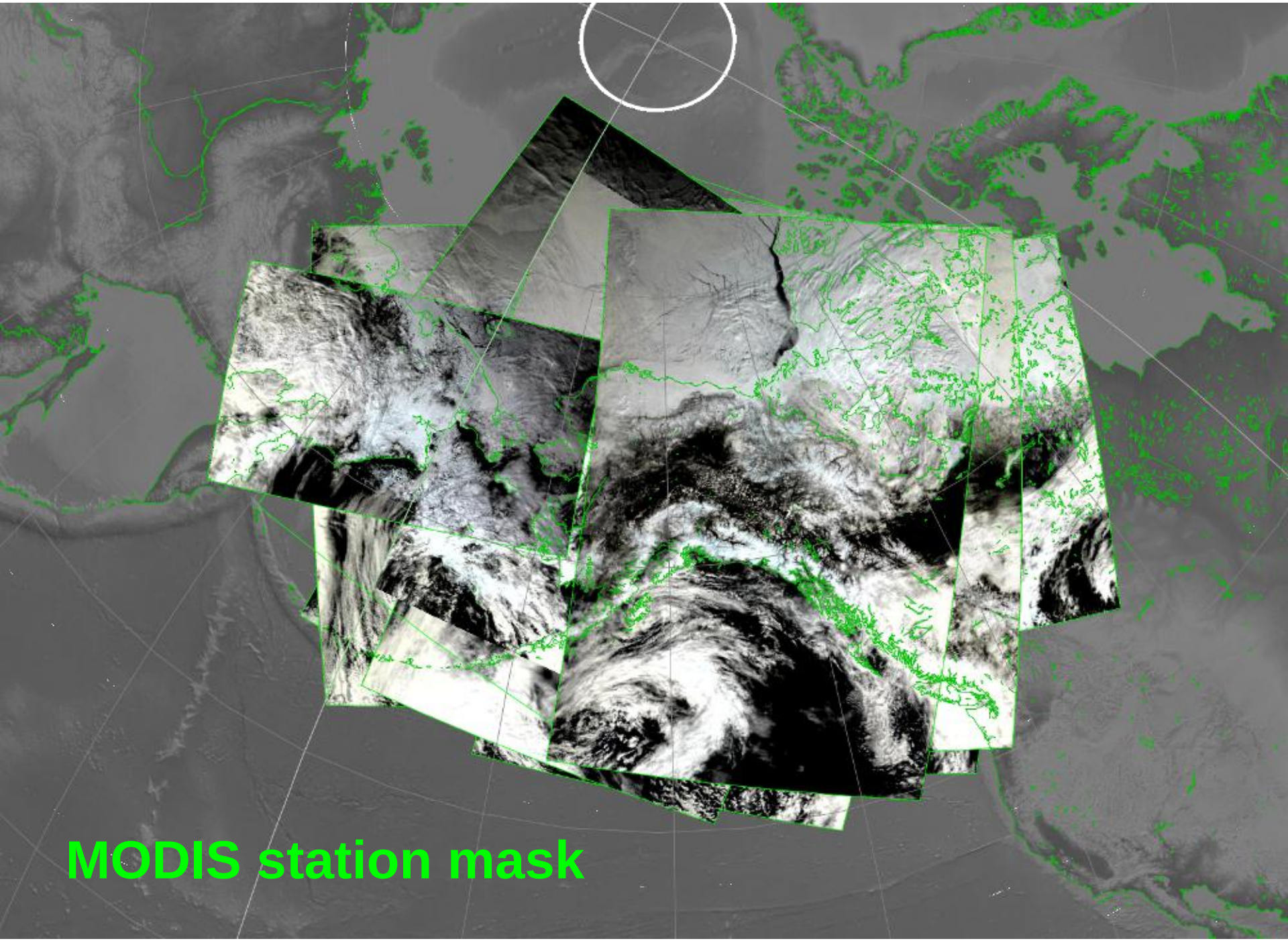
Unprojected VIIRS Swath Captured at UAF-GINA

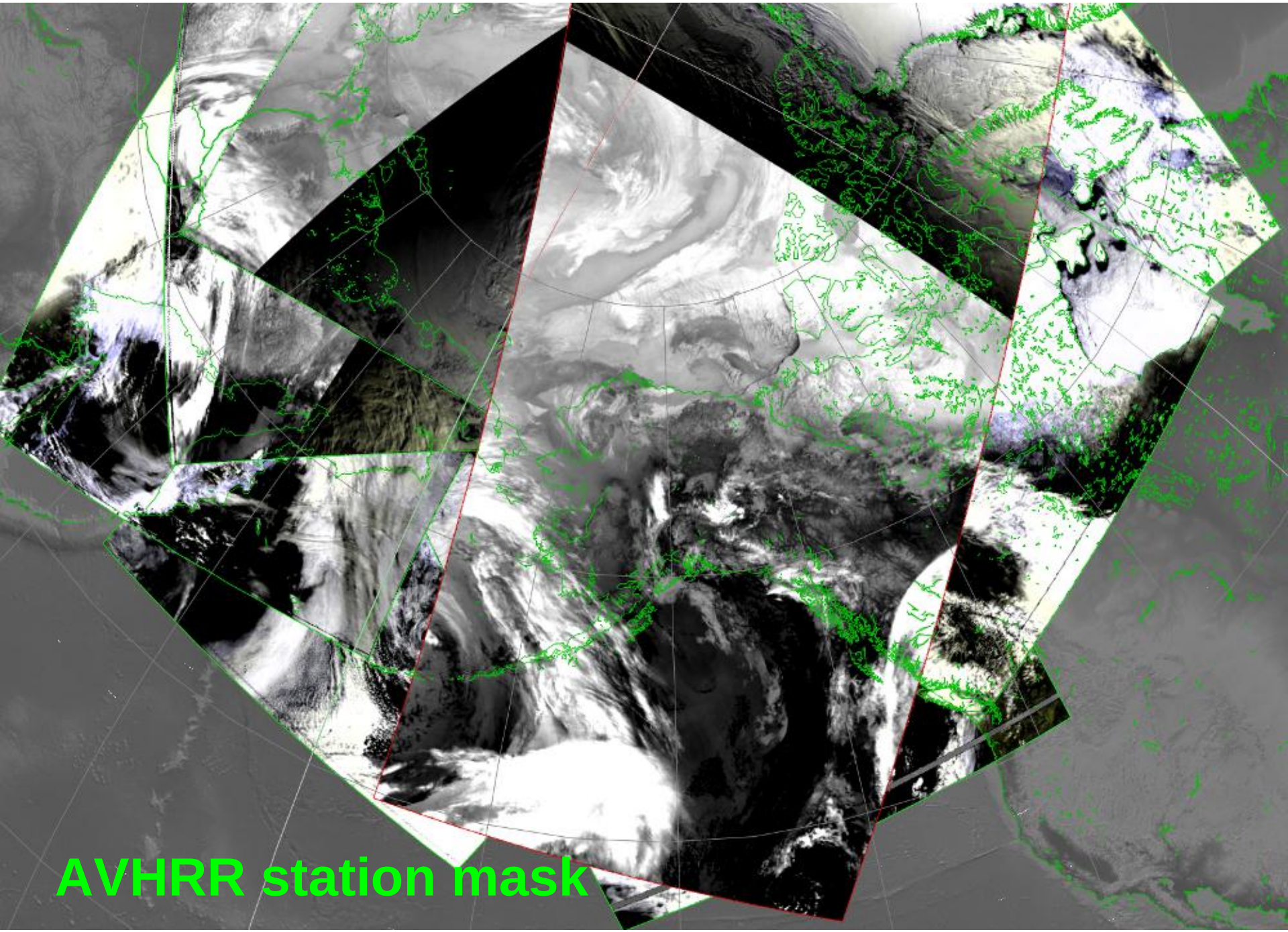
April 2012




Reception
AQUA
TERRA
NPP
GINA XBAND
UAF
AVHRR
AQUA
TERRA
LANDSAT
NPP
NOAA FCDAS
Gilmore Creek
Processing
Level 0
GDAL
Terascan
IMAPP
IDL
PyTroll
CSPP
Level 1
Level 2
Level 3
Archive
ARSC SILO
Deep
Storage
ARSC PACMAN CLUSTER
- Archive reprocessing
- Custom time series products
- Large scale data analysis
Distribution
Available Formats
GeoTIFF
KML (GoogleEarth)
Map Tiles (Google Maps)
ShapeFiles
Distribution Methods
WMS, WCS, WFS, HTTP,
FTP, REST, LDM, ADDE
Users
Alaska Volcano Observatory
National Weather Service
State & Federal Agencies
Alaska Fire Service
Airforce Weather Agency
Department of Homeland
Security
Alaska Department of
Natural Resources
UAF Geophysical Institute
CIRA
CIMSS
NASA SPoRT
GINA
www.gina.alaska.edu

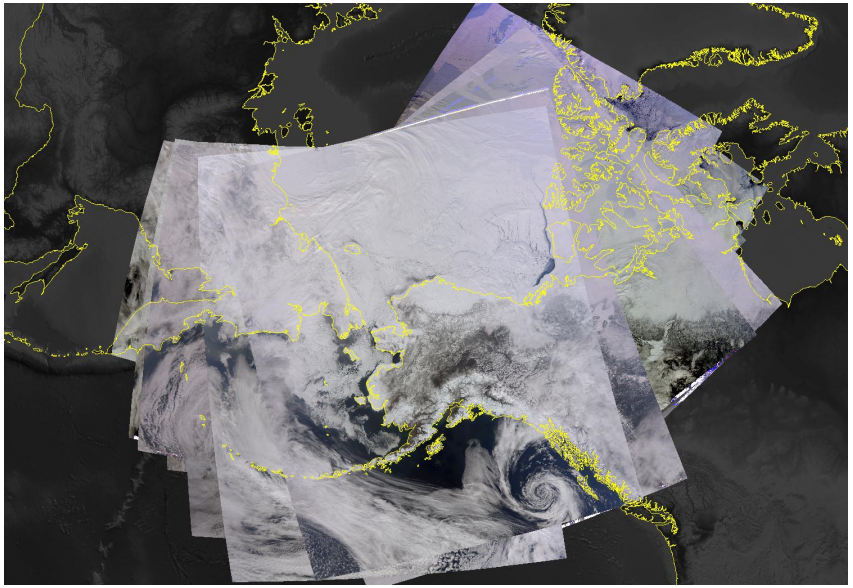

VIIRS station mask


MODIS station mask

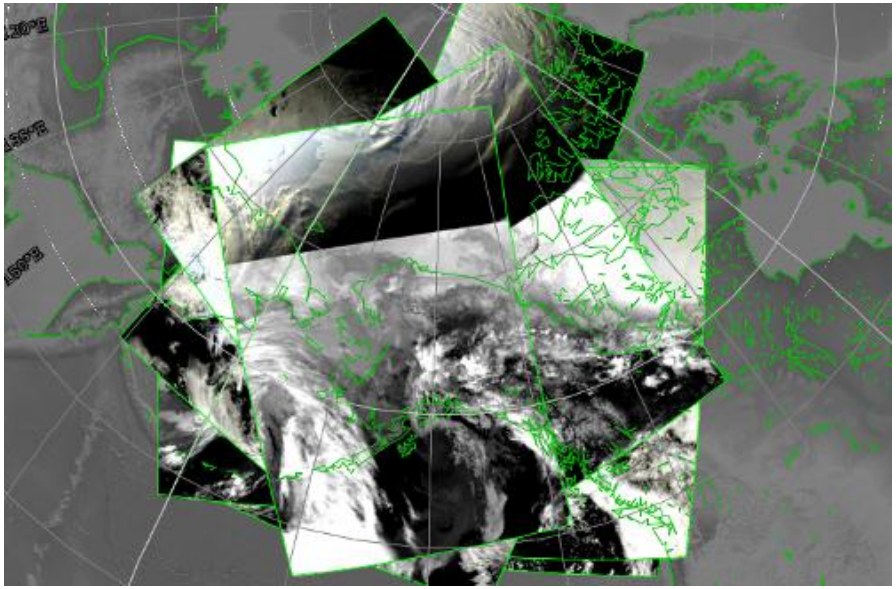

AVHRR station mask

Station Mask Comparison

NPP processing still in development at GINA
full swath NPP processing not yet in production



VIIRS station mask



MODIS station mask

Wider VIIRS swath results in the station mask extending further to the east and west.

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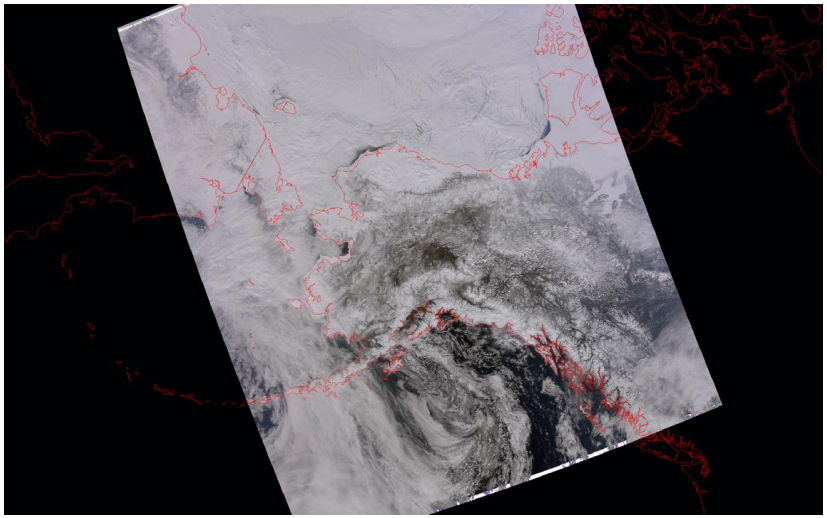
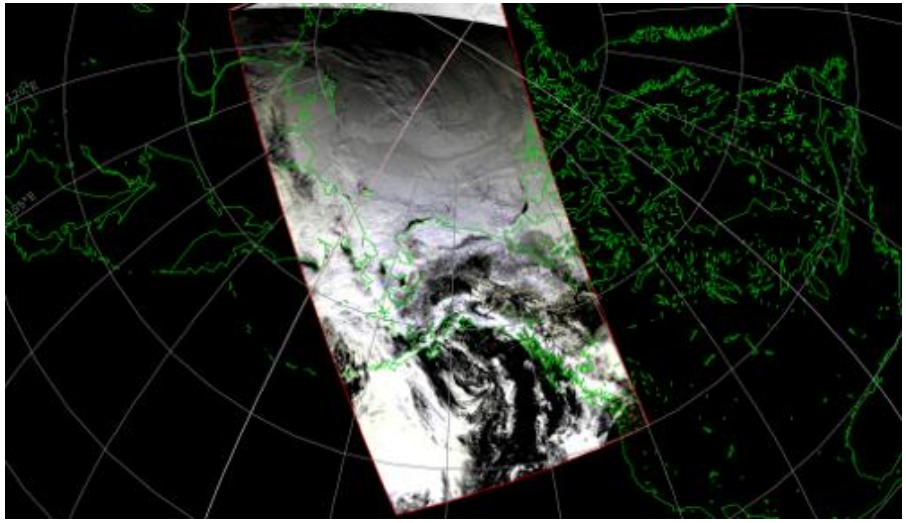
VIIRS vs AVHRR Swath comparison



NPP VIIRS - 2012.113.2203 UTC
Truecolor



AVHRR- 2012.113.2224 UTC

NPP VIIRS allows imaging the entire state of Alaska in a single pass.

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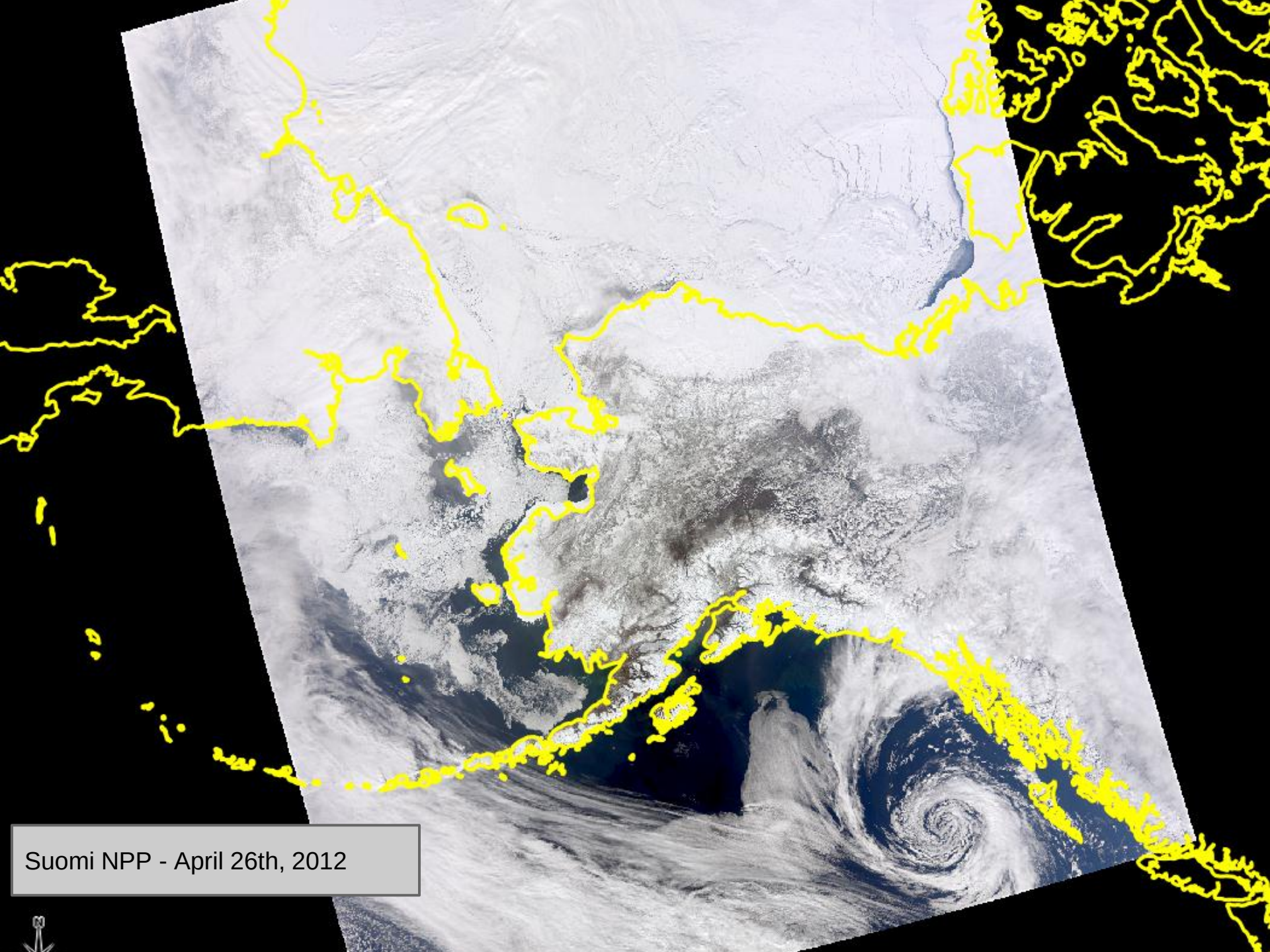
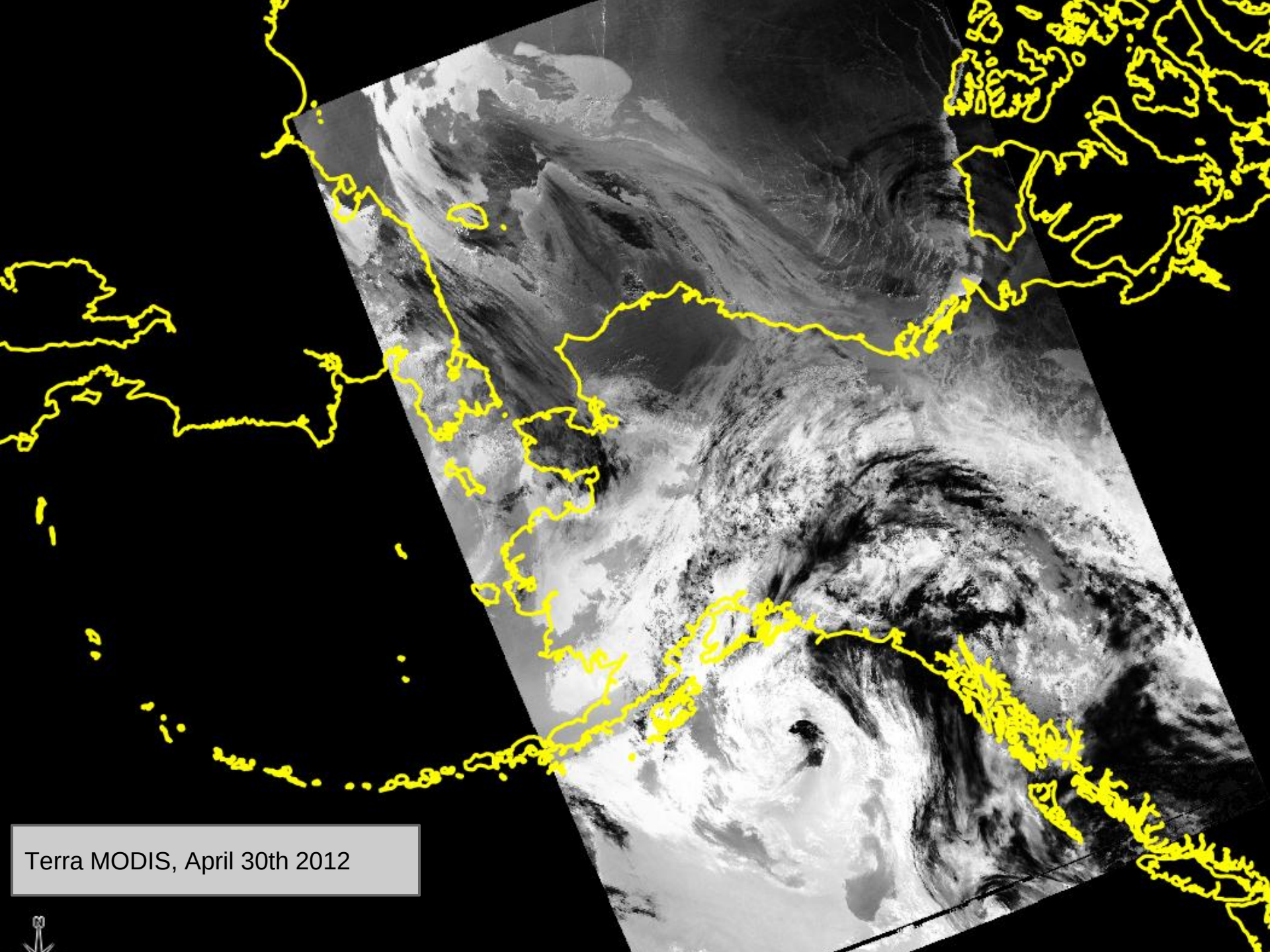
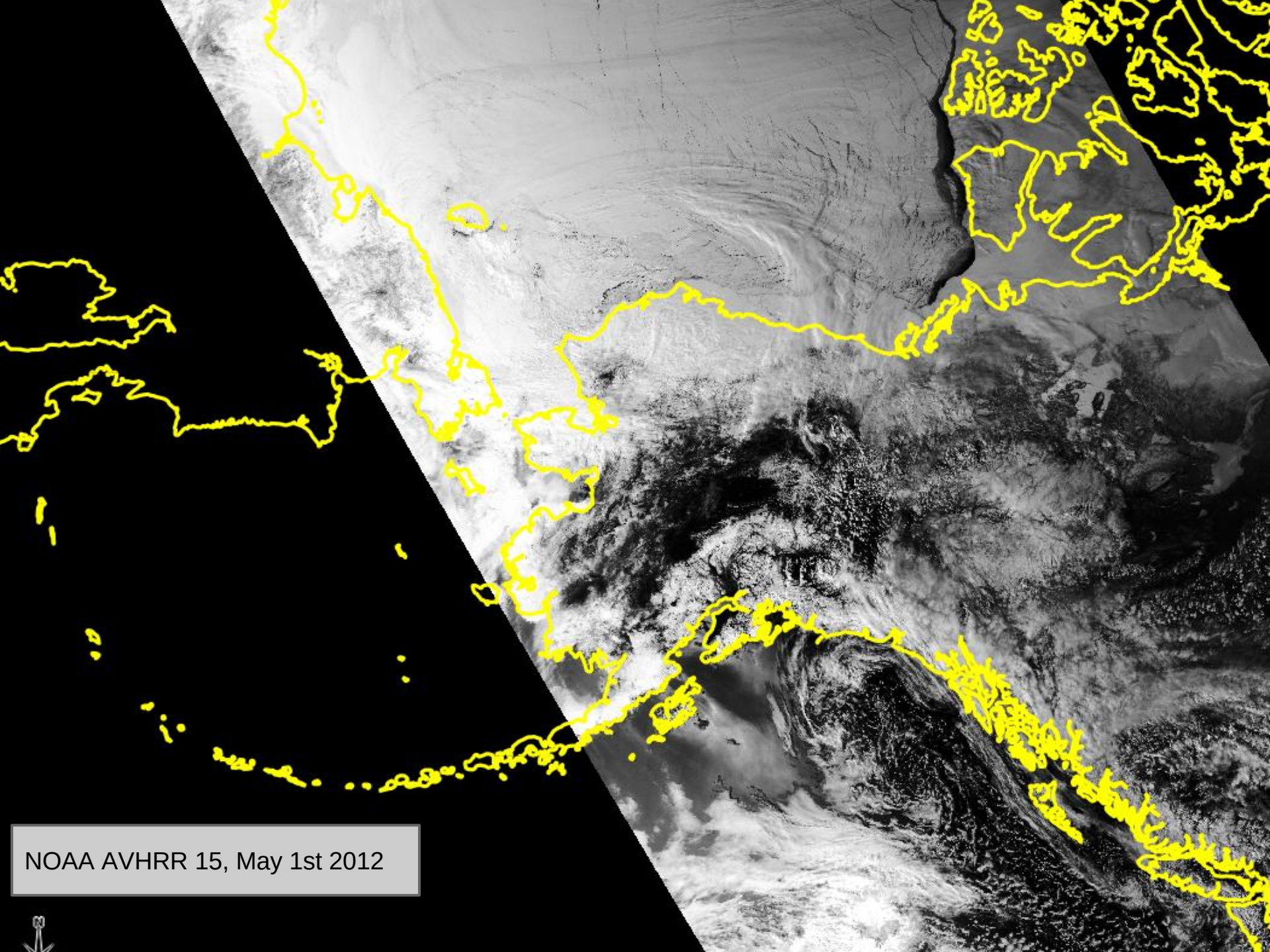
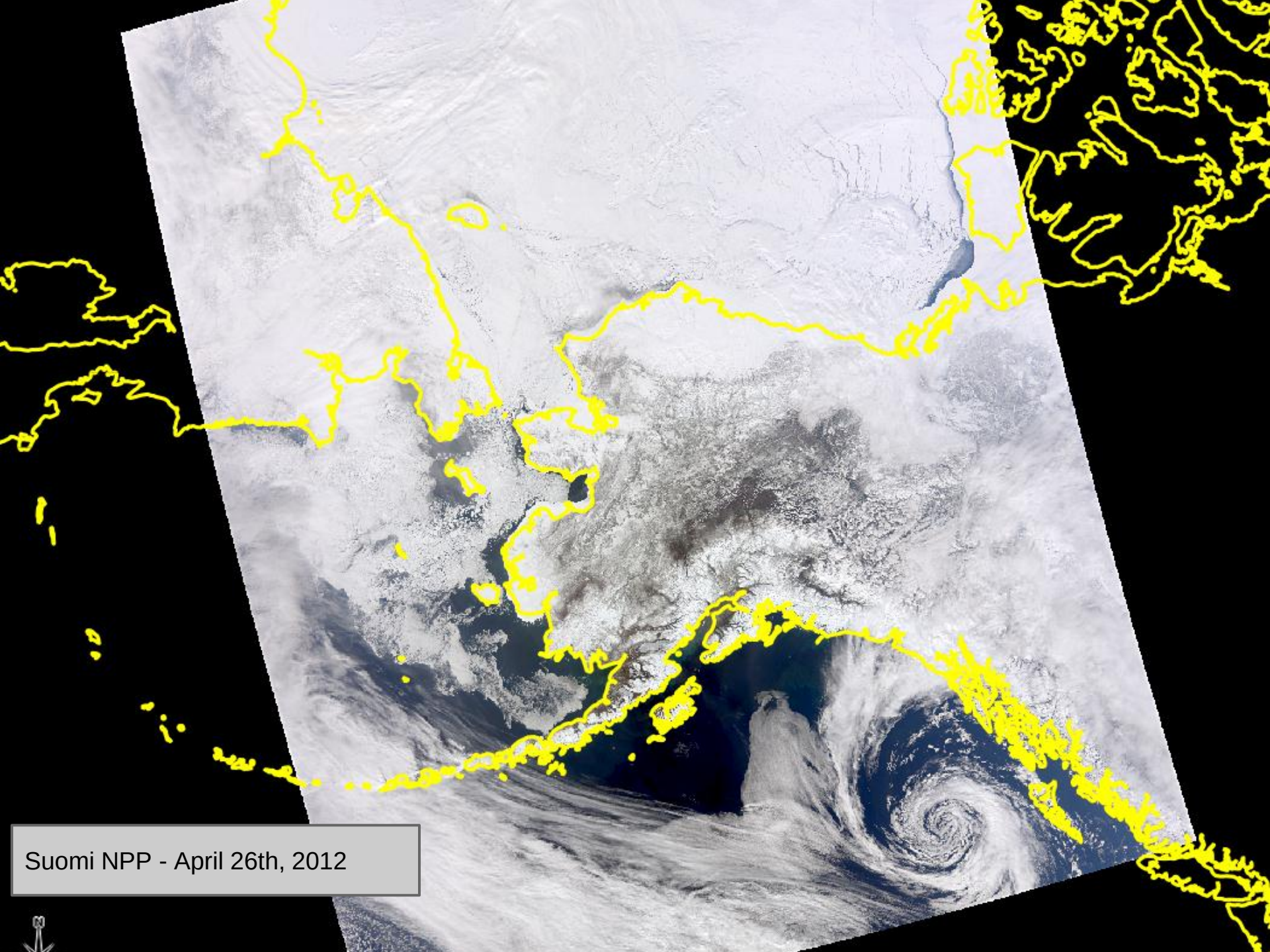

Suomi NPP - April 26th, 2012

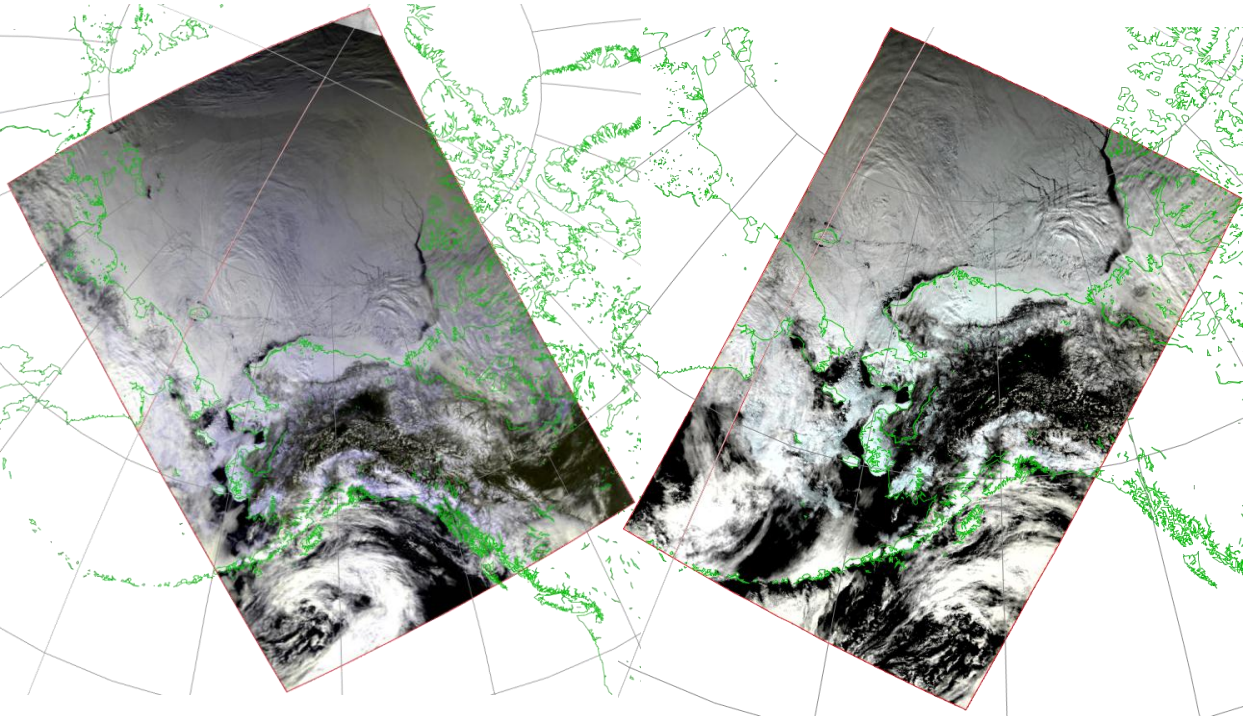


Terra MODIS, April 30th 2012


NOAA AVHRR 15, May 1st 2012

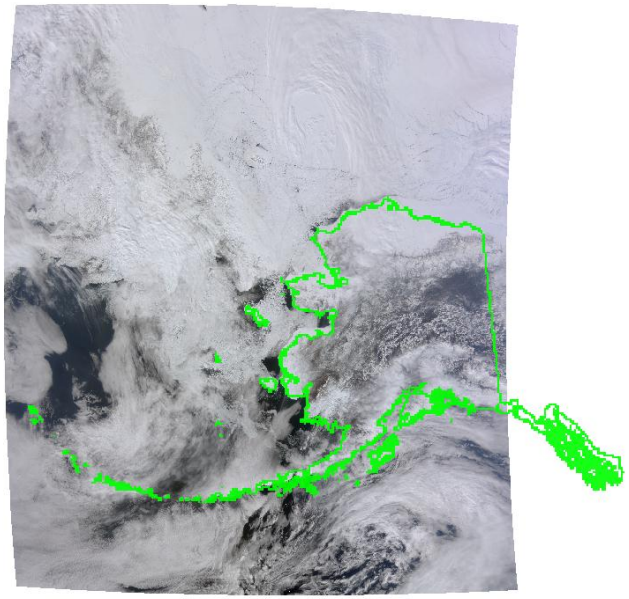

Suomi NPP - April 26th, 2012

Swath Size Comparisons

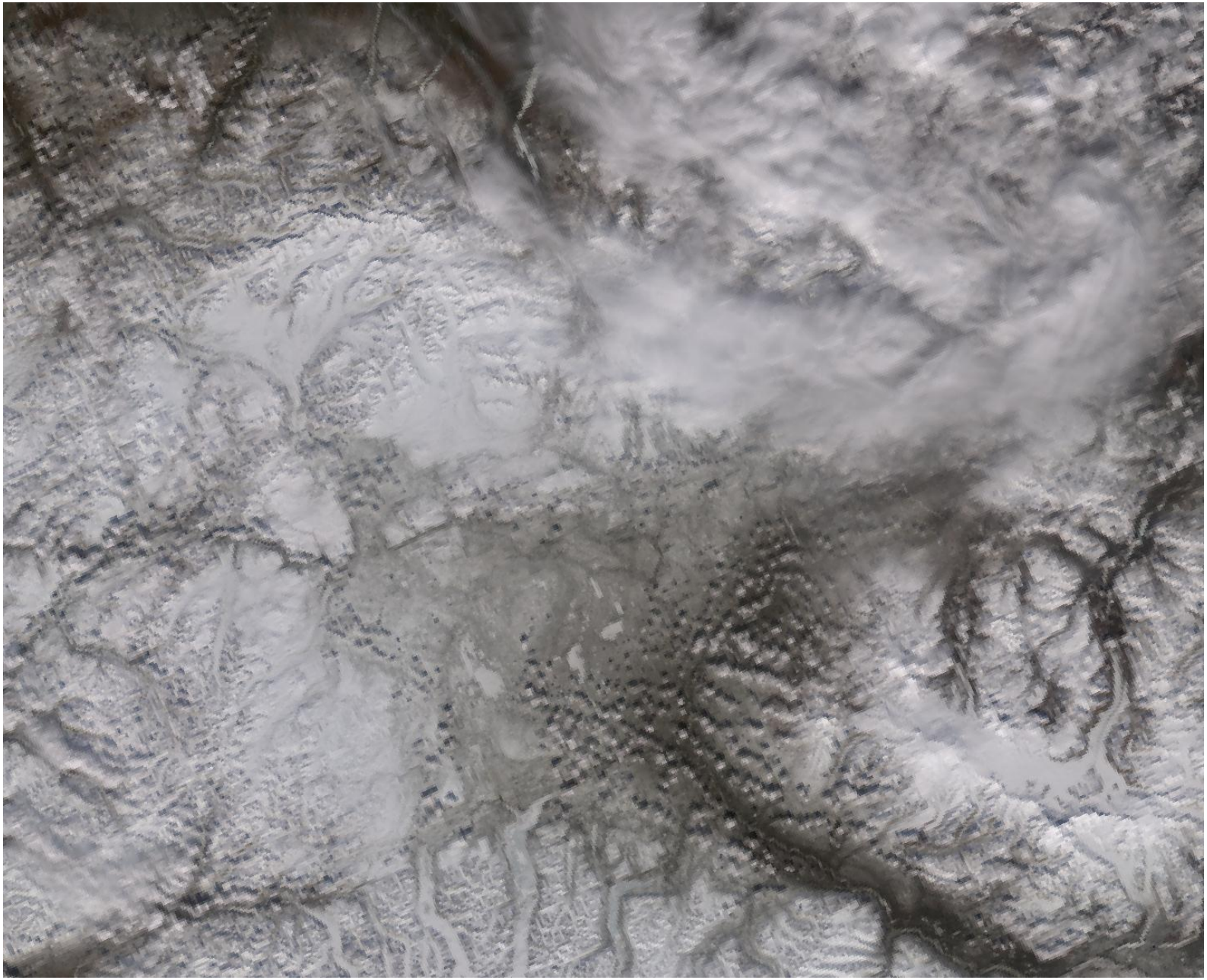


AVHRR
n18.12119.2258

MODIS
t1.12119.2214



VIIRS
npp.12119.2332



Alaska Range, Northeast of Anchorage

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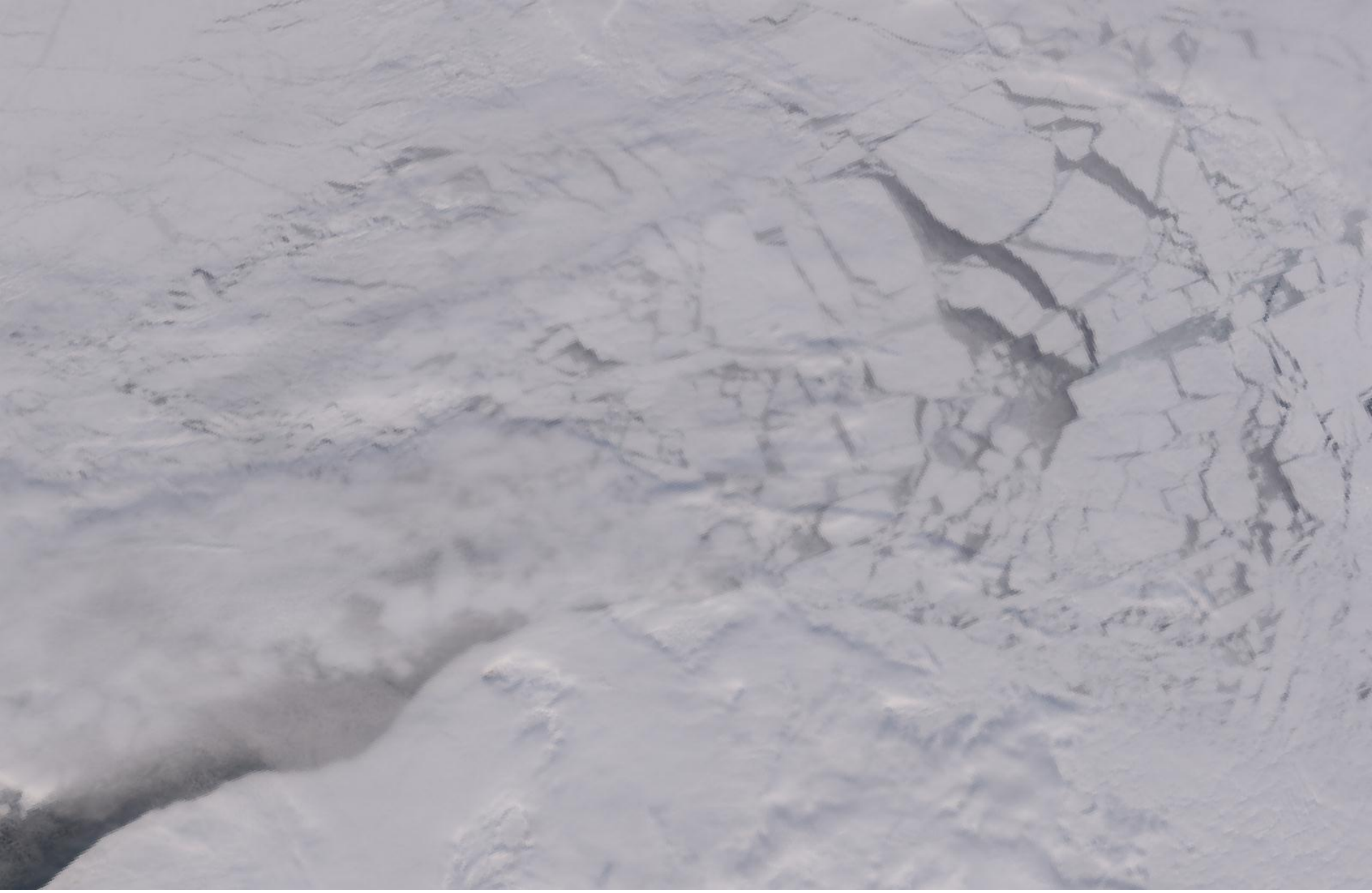

Ice on the north slope

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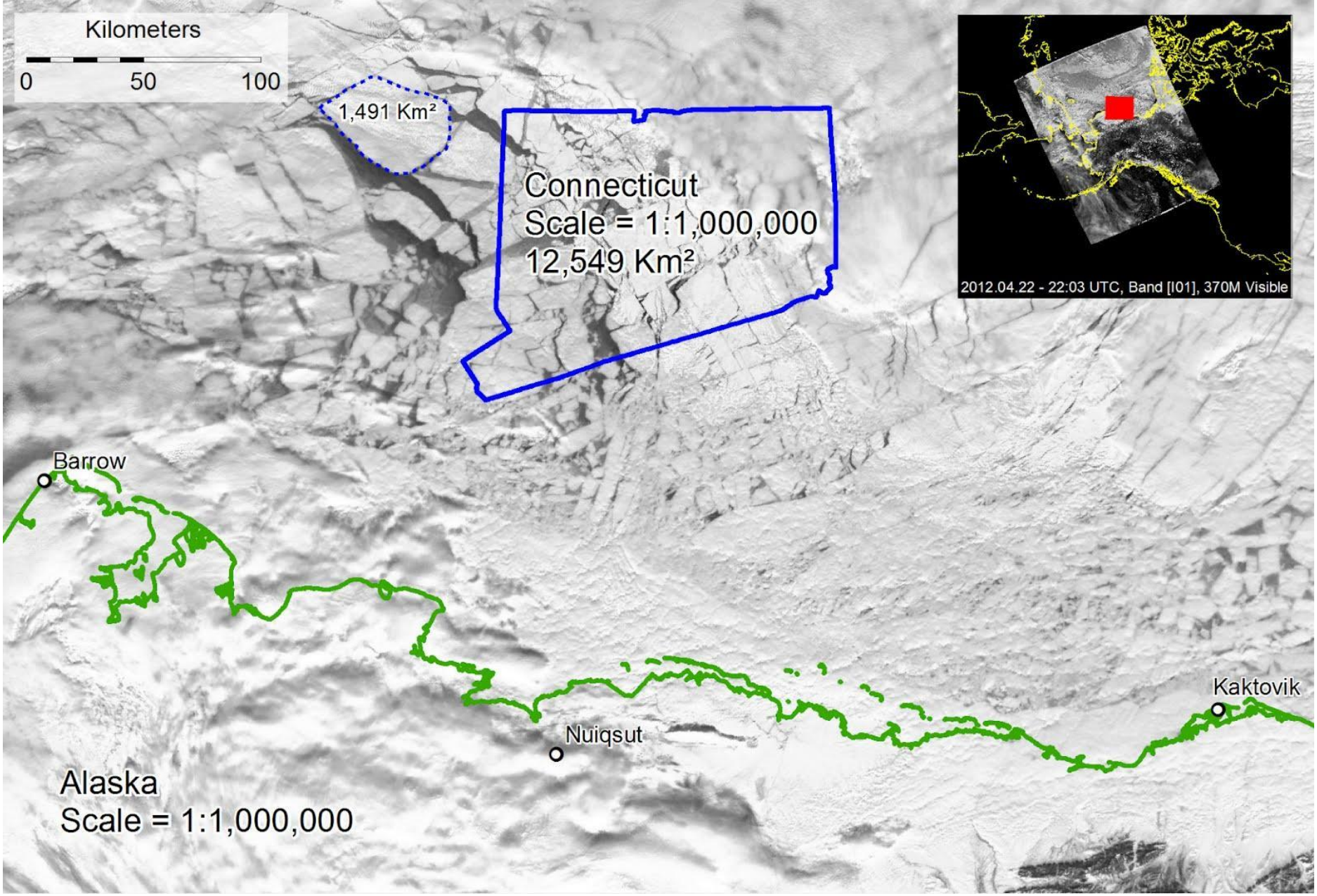

Ice in the Beaufort Sea

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Norton Sound, just south of Bering Strait
western Alaska

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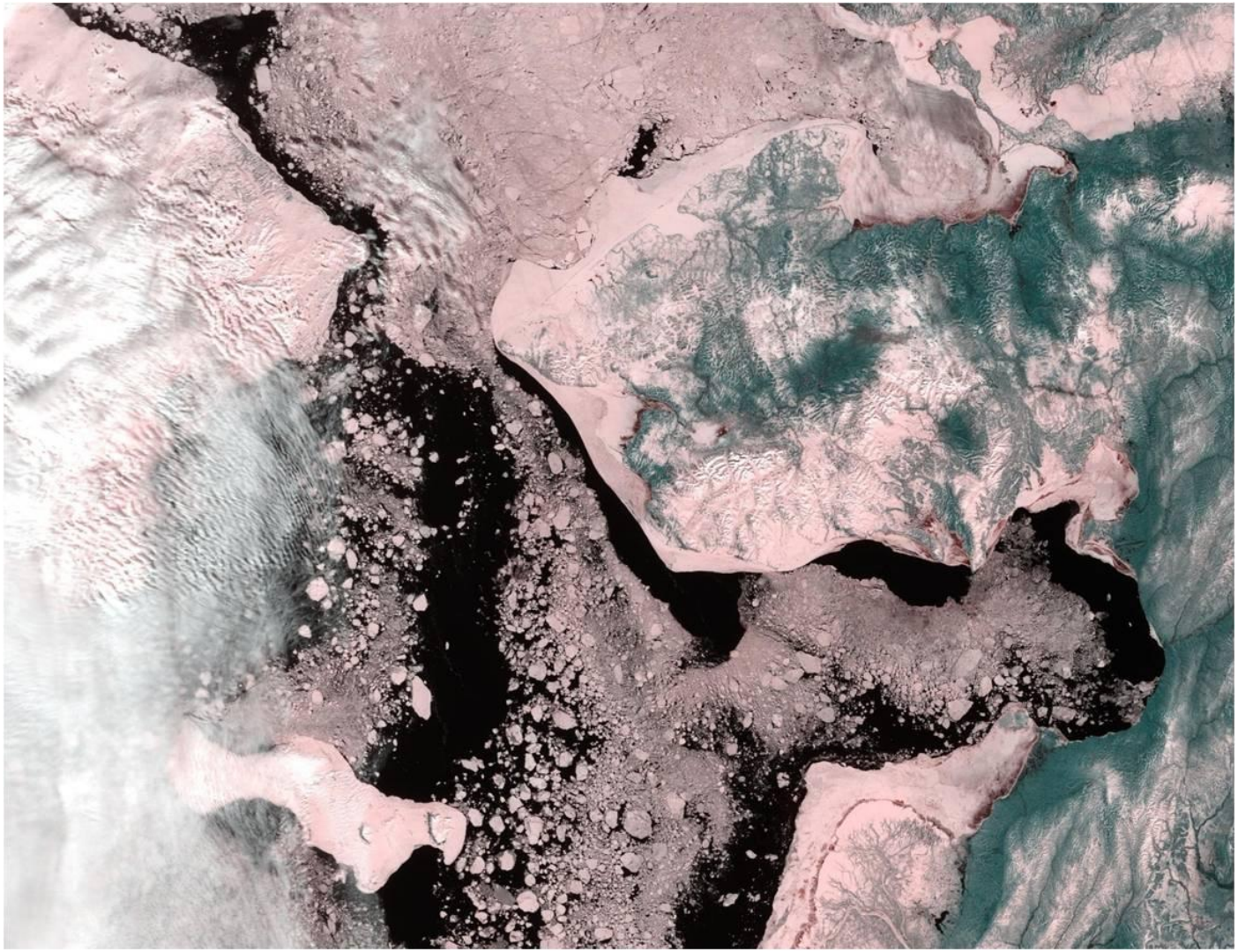
Arctic Sea Ice – Bering Strait



May 6, 2009 | MODIS sea ice enhanced color composite

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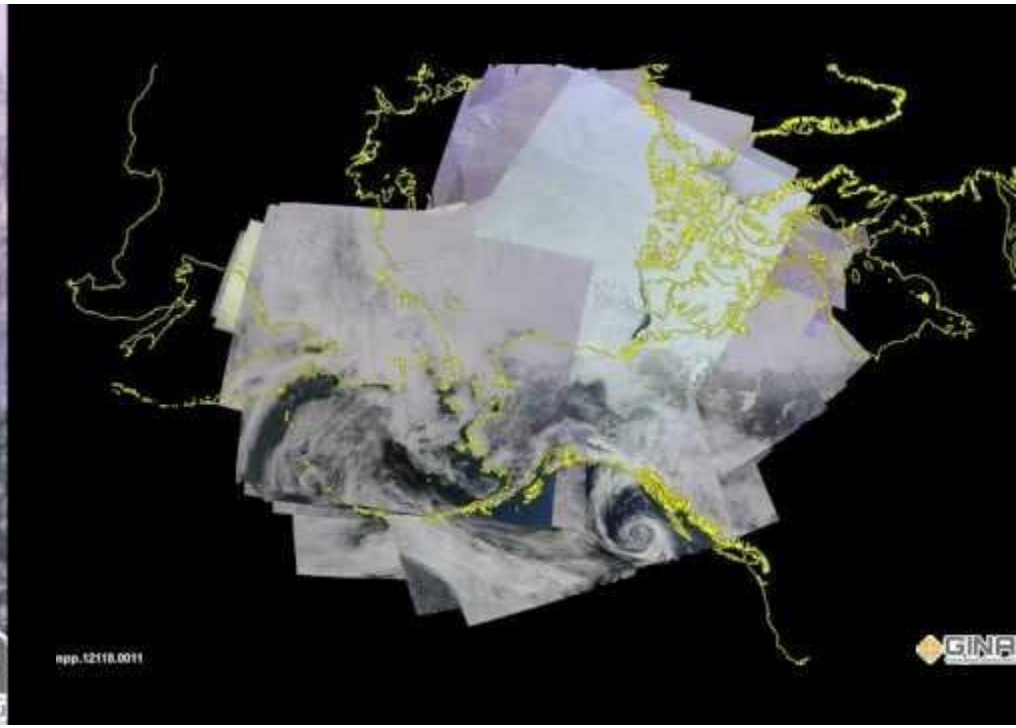
Animations



http://www.youtube.com/watch?v=vO9IM4iwyAQ
Animation of NPP VIIRS over the bering sea from the last week in April 2012.

http://www.youtube.com/watch?v=_PR54DWko6k
Animation of all passes from day 113 through day 120, stacking.

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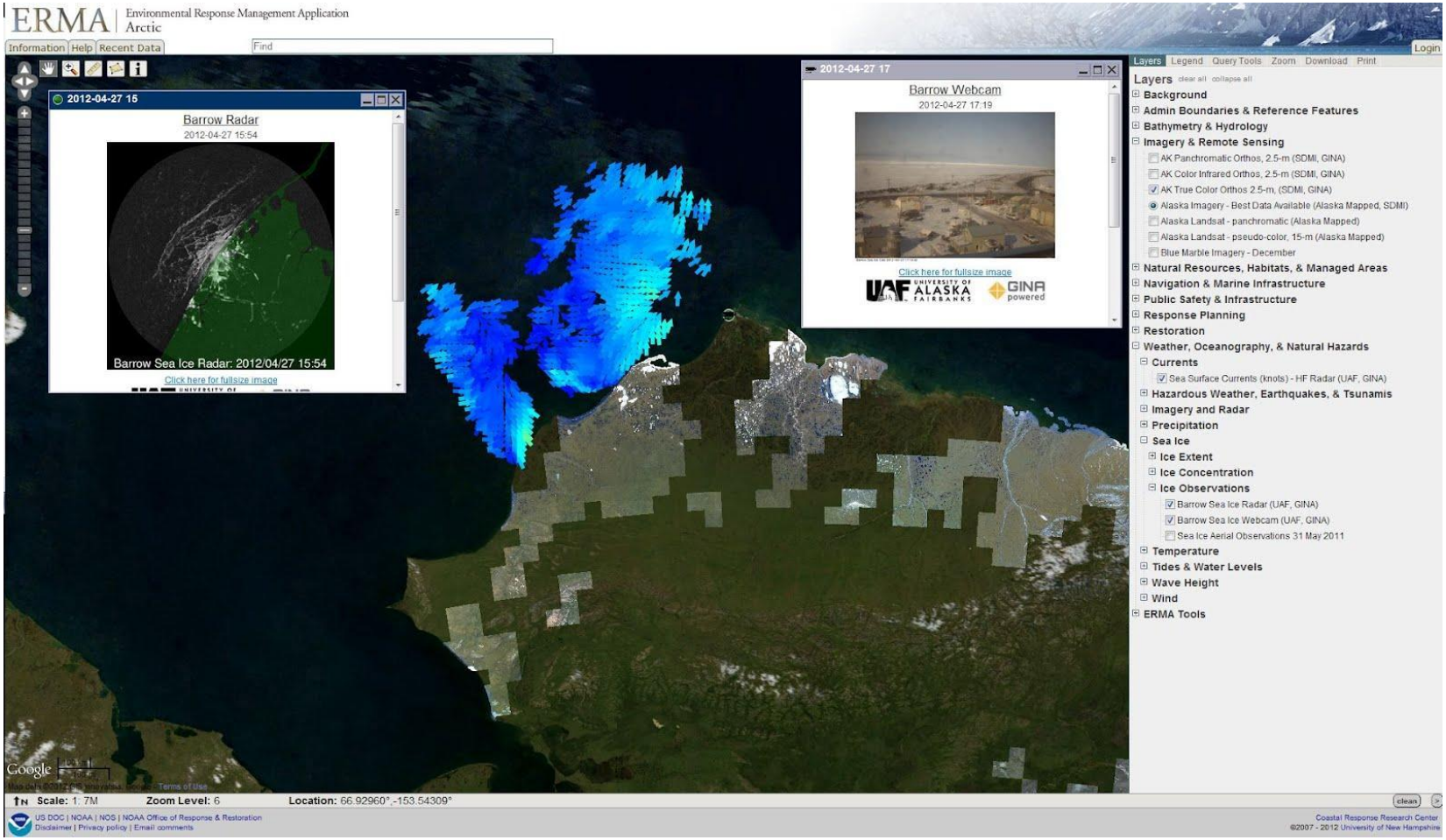
Arctic ERMA

NOAA NOS Office of Response and Restoration.



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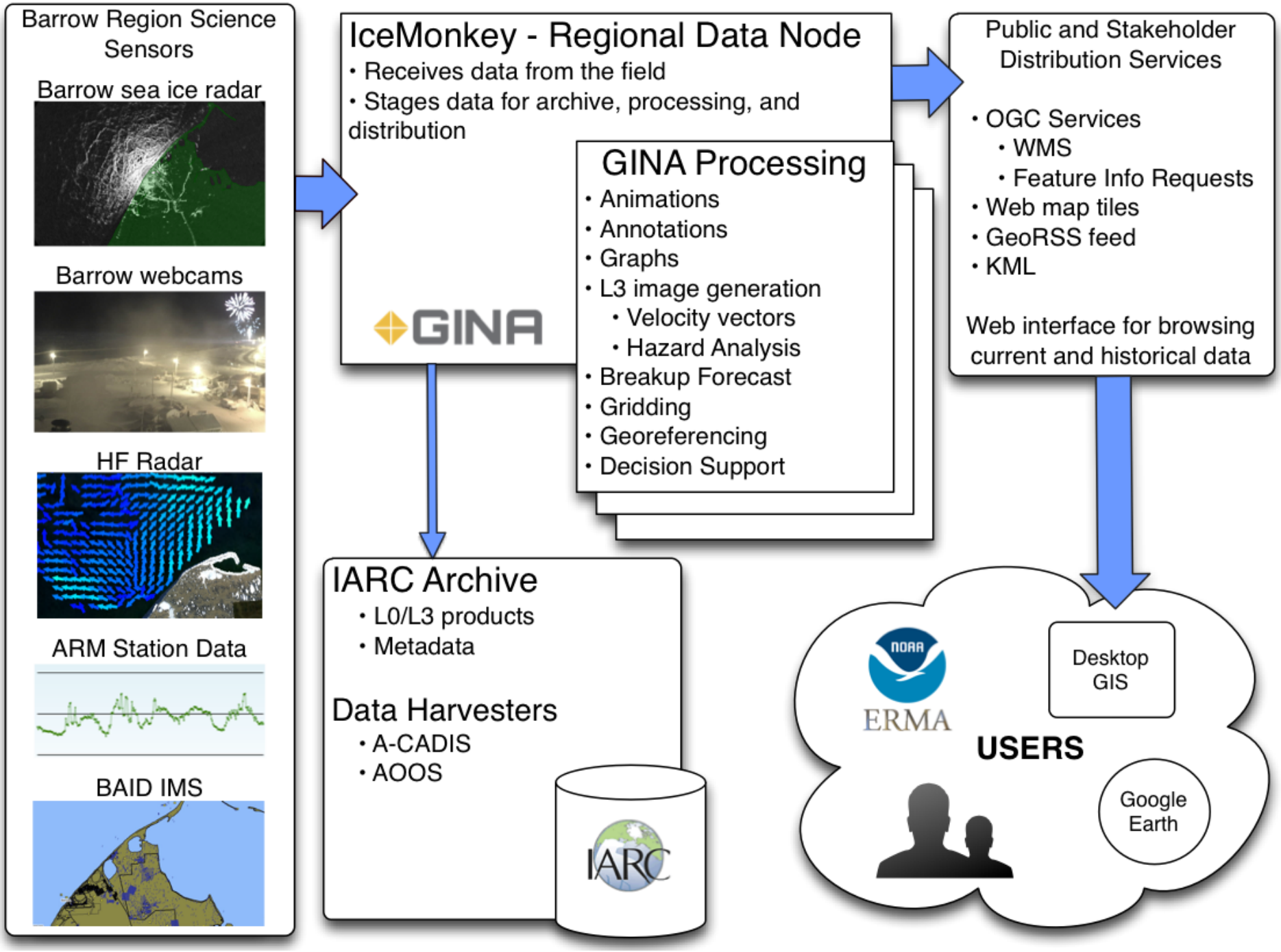
Barrow Region Science Sensors
Barrow sea ice radar
Barrow webcams
HF Radar
ARM Station Data
BAID IMS
IceMonkey - Regional Data Node
• Receives data from the field
• Stages data for archive, processing, and distribution
GINA
GINA Processing
• Animations
• Annotations
• Graphs
• L3 image generation
• Velocity vectors
• Hazard Analysis
• Breakup Forecast
• Gridding
• Georeferencing
• Decision Support
Public and Stakeholder Distribution Services
• OGC Services
• WMS
• Feature Info Requests
• Web map tiles
• GeoRSS feed
• KML
Web interface for browsing current and historical data
IARC Archive
• L0/L3 products
• Metadata
Data Harvesters
• A-CADIS
• AOOS
IARC
NOAA
ERMA
Desktop GIS
USERS
Google Earth

Other RGB band combos

Produced using PyTroll

Welcome to pytroll! — Pytroll - Google Chrome

Welcome to pytroll! — P

www.pytroll.org

Pytroll

NEXT

Welcome to pytroll! ¶

This is the home of the pytroll project. The pytroll project is a collaboration on weather satellite data processing between DMI and SMHI.

Its objective is provide different free and open source python modules for the reading, interpretation, and writing of weather satellite data.

The provided python packages are designed to be used both in R&D environments and in 24/7 operational production.

The available python packages at the moment are:

- pyresample for resampling satellite data
- mipp for reading weather sat
- mpop for processing weathe
- python-bufr for reading bufr f

Some more packages are in the
us a hand):

- pyorbital for computing satel
- pycoast for putting coast line

Contents:

- Installation and configuration
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  - Configuration
- Quickstart with MSG SEVIRI

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Installation and configuration
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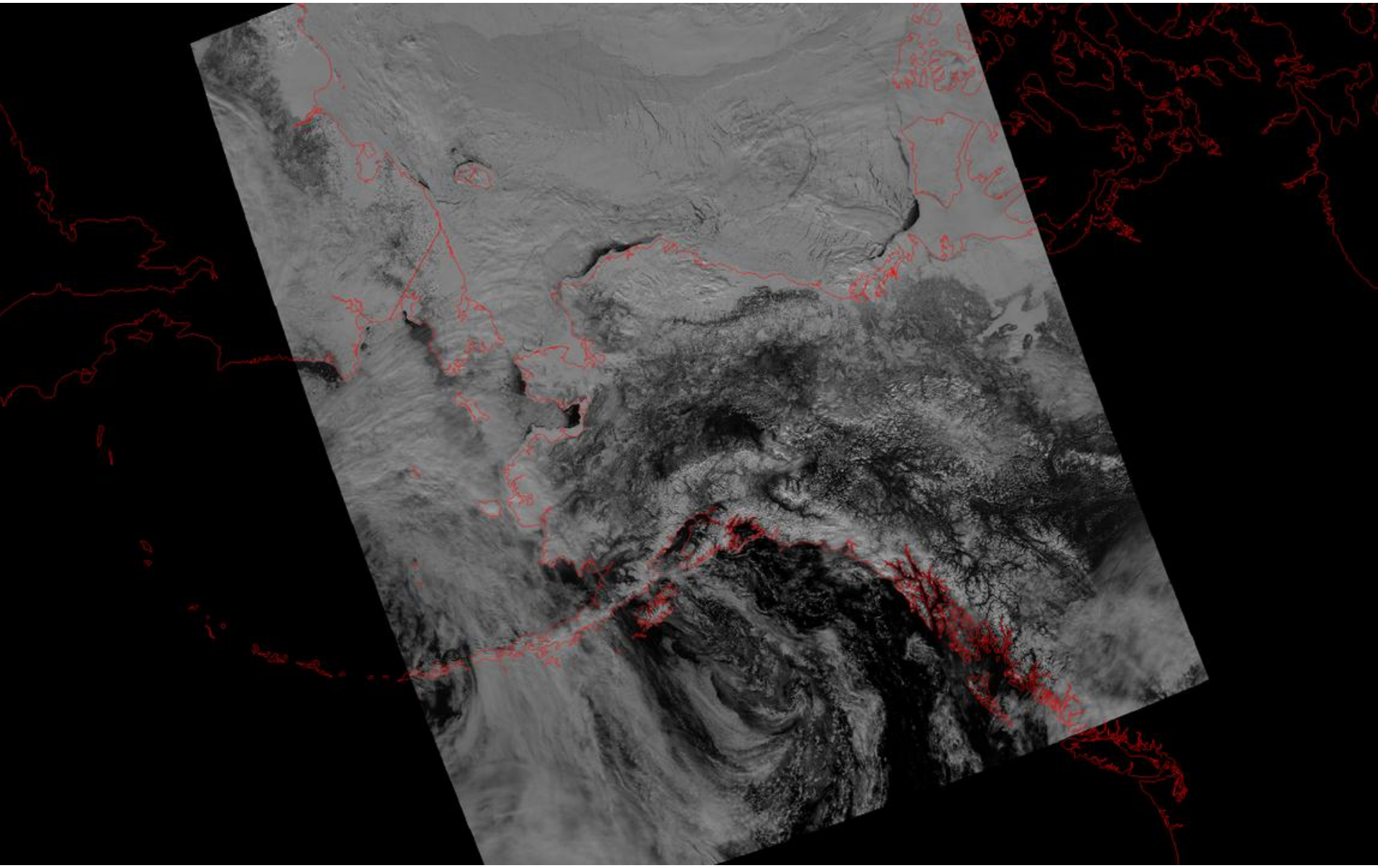
Quickstart with custom data
WMO file formats
Recipes: Operational Pytroll

Pytroll project is a collaboration on weather satellite data processing between DMI and SMHI.
Supports VIIRS so GINA tested it out.



2012.04.22 - 22:03 UTC
370M Visible [I01] Grayscale

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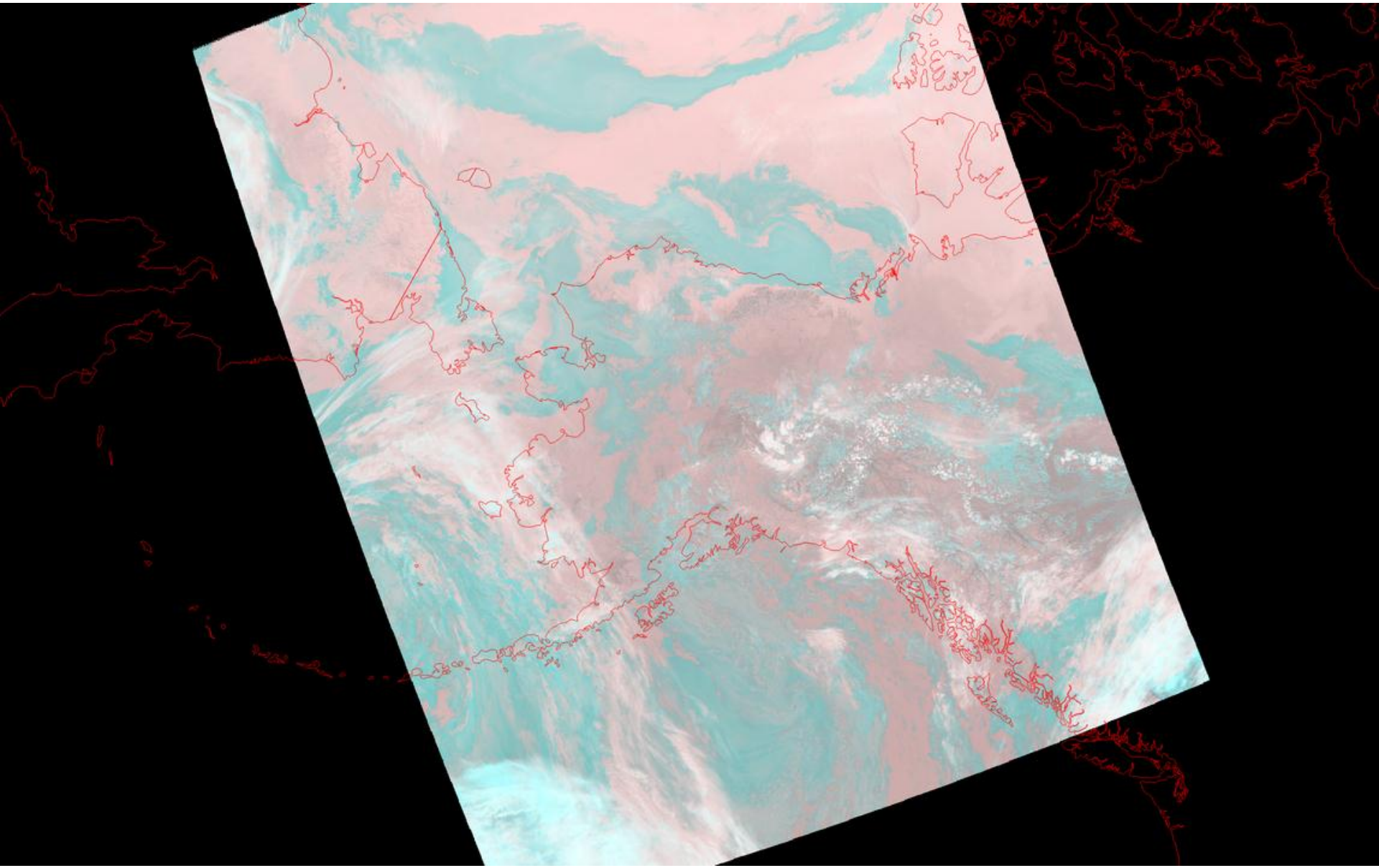

2012.04.22 - 22:03 UTC
Cloudtop [-M12, -M15, -M16] (RGB)

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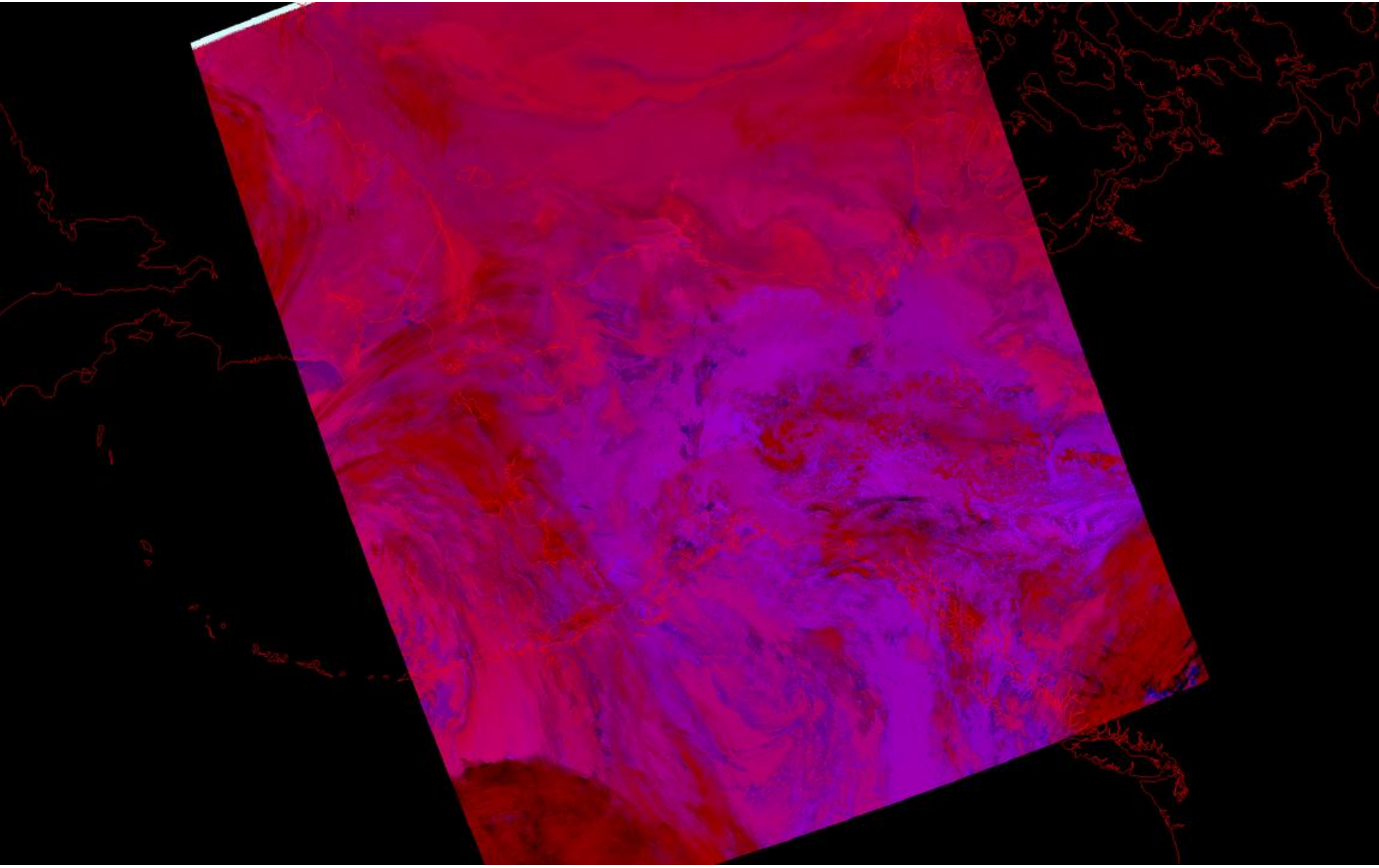

2012.04.22 - 22:03 UTC
"Night Fog" [M16-M15, M15-M12, M15] (RGB)

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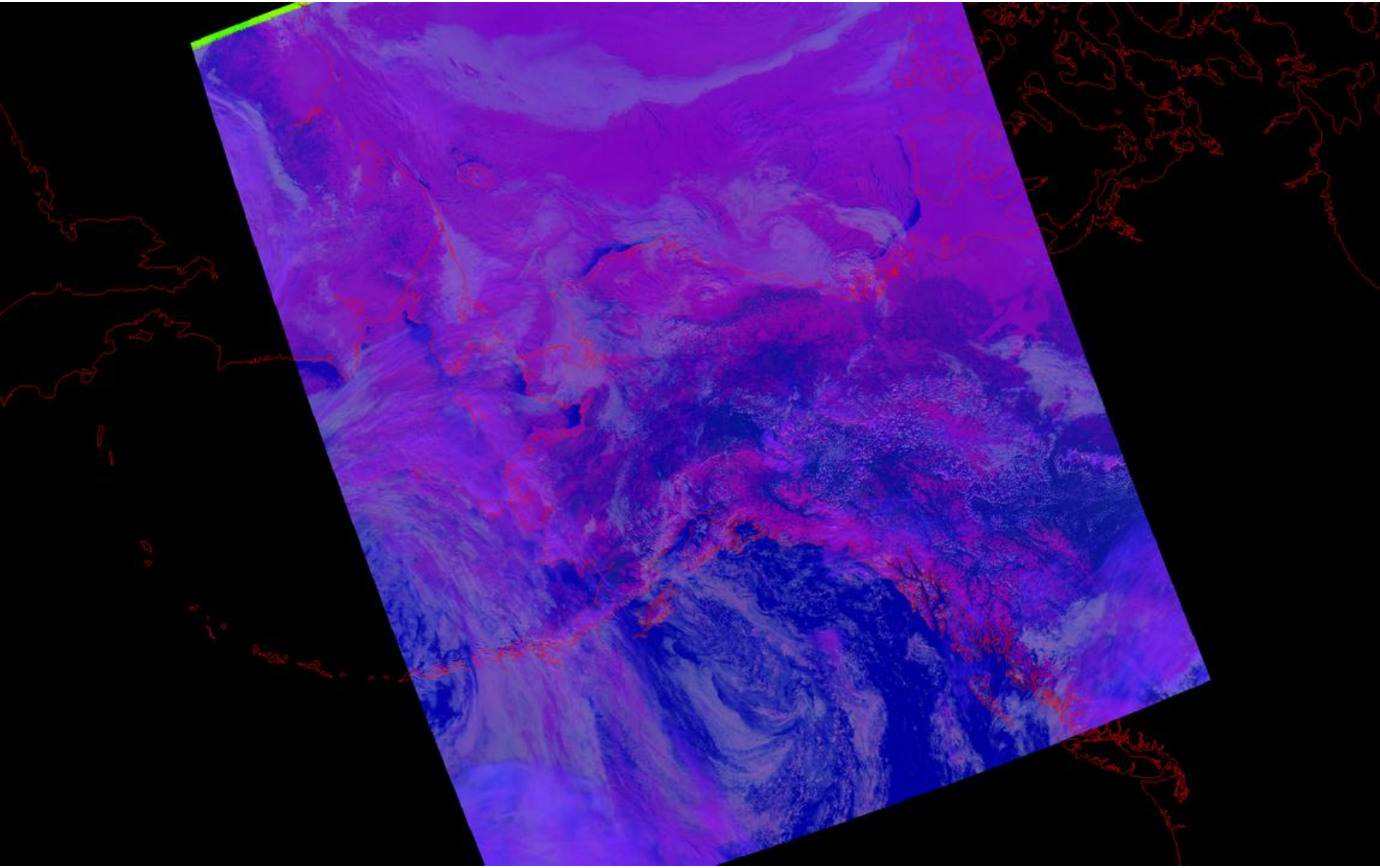

2012.04.22 - 22:03 UTC
370M "Red Snow" [I01, I03, -I05] (RGB)

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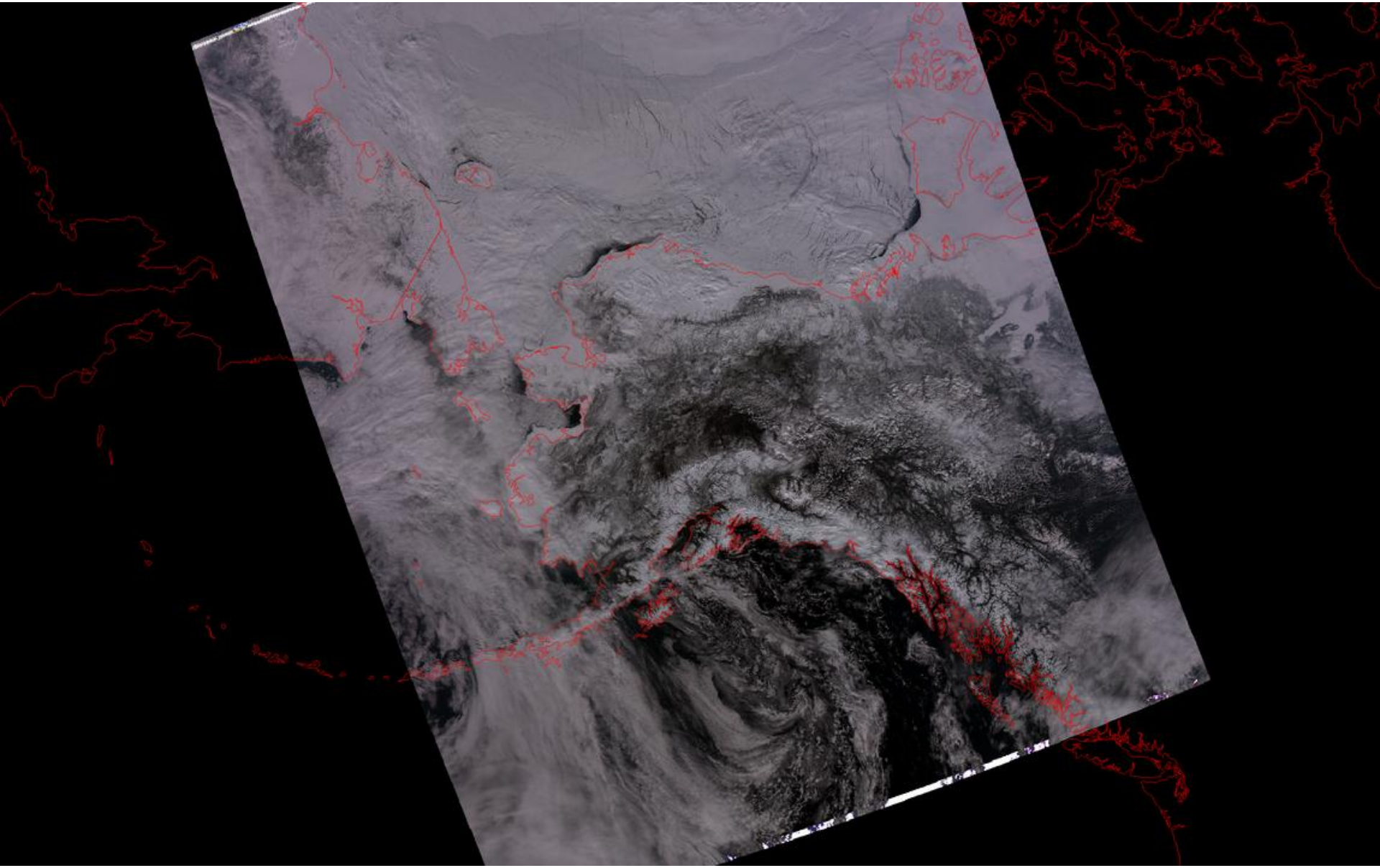

2012.04.22 - 22:03 UTC
Band 543 [M05, M04, M03] (RGB)

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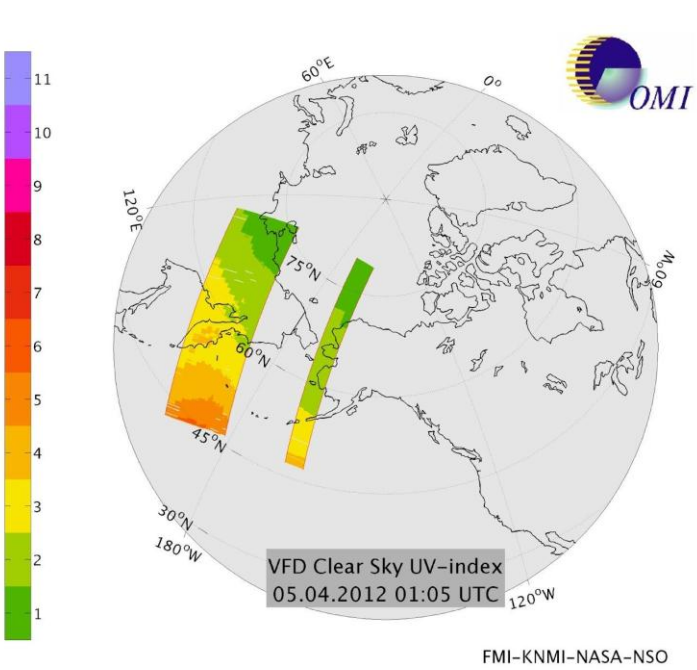
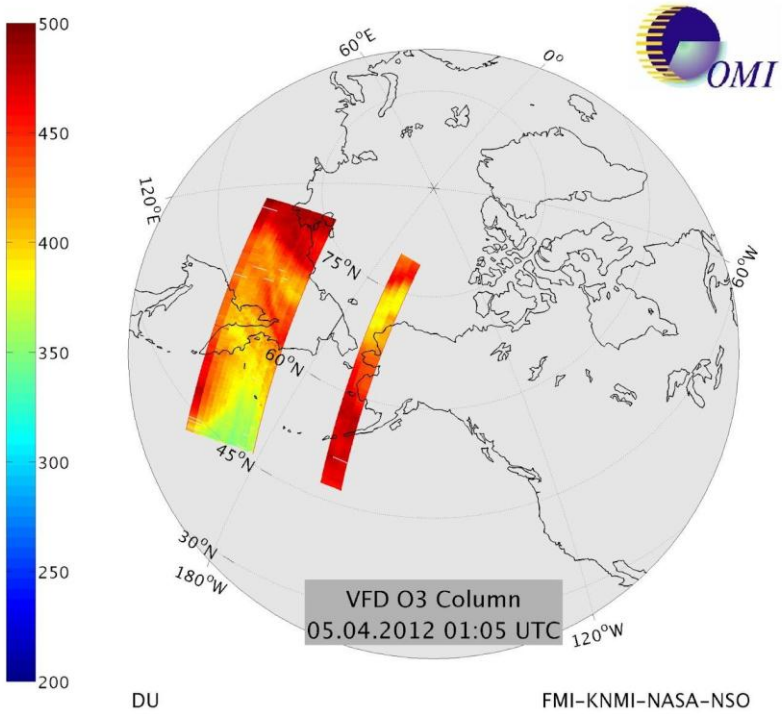
Bonus - AURA:
Ozone Monitoring Instrument
thanks to NASA and Finish Met Office





GINA Puffin Feeder:

An interface for the masses

(i.e. for those who (thankfully) don't have to know what an ADDE server is)

VIIRS data products will also go into Open Geospatial Consortium web services

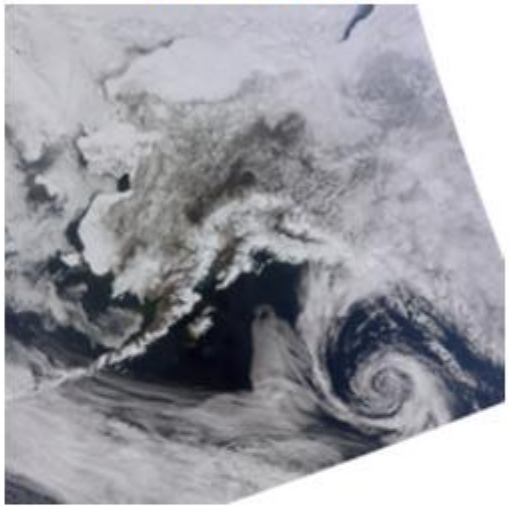
NPP Truecolor Images

« First | ‹ Prev | 1 | 2 | 3 | 4 | 5 | Next › | Last »

2012-4-27 12:14

2012-4-27 00:11

2012-4-26 22:28



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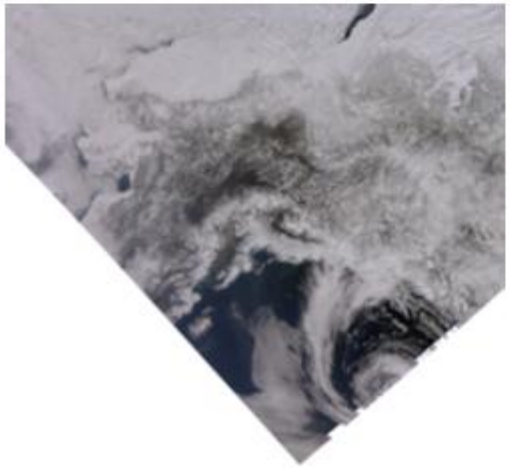

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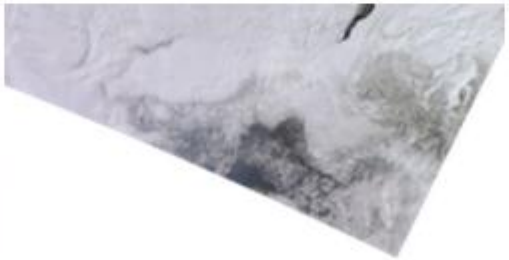

2012-4-26 15:53

http://feeder.gina.alaska.edu/npp-gina-alaska-truecolor-images

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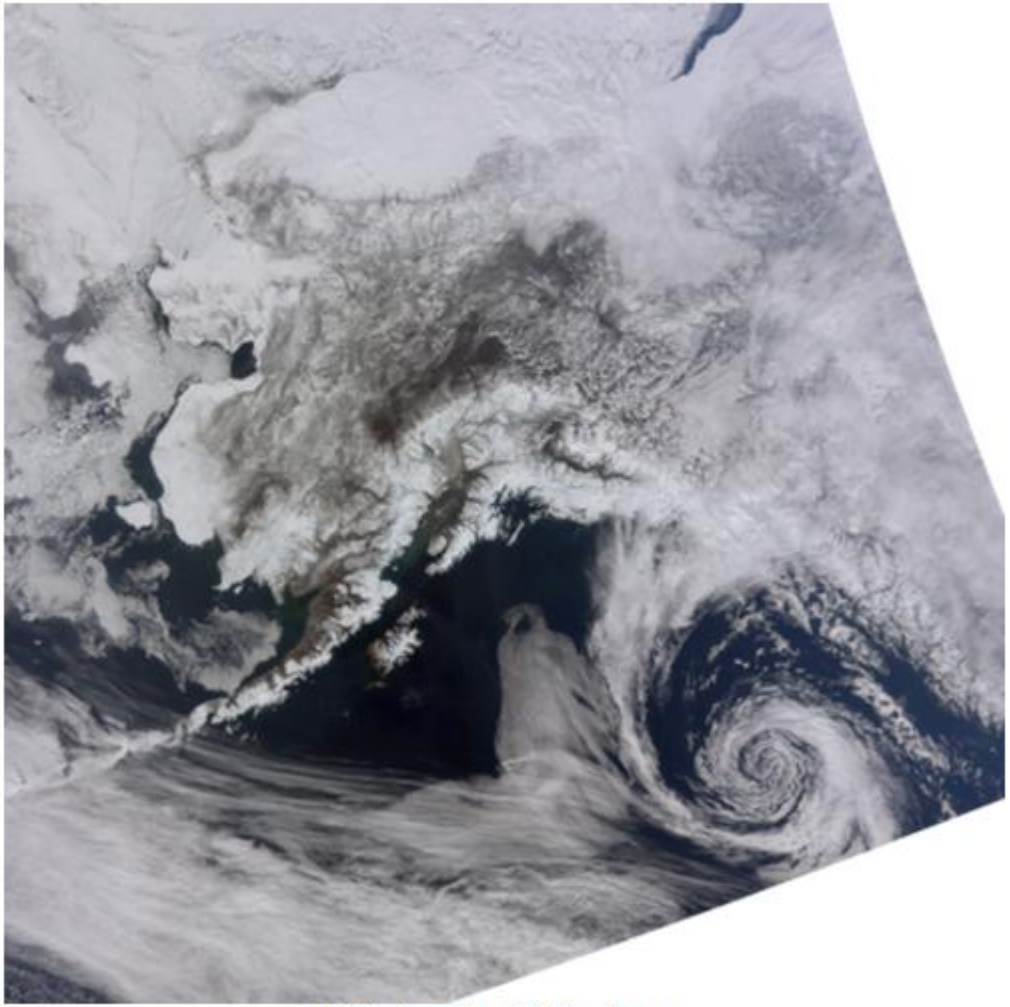
NPP Truecolor Images

2012-4-26 22:28



Click here for fullsize image

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http://feeder.gina.alaska.edu/npp-gina-alaska-truecolor-images/2012_4_26_22_28

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VIIRS in AWIPS

Thanks CIMSS!

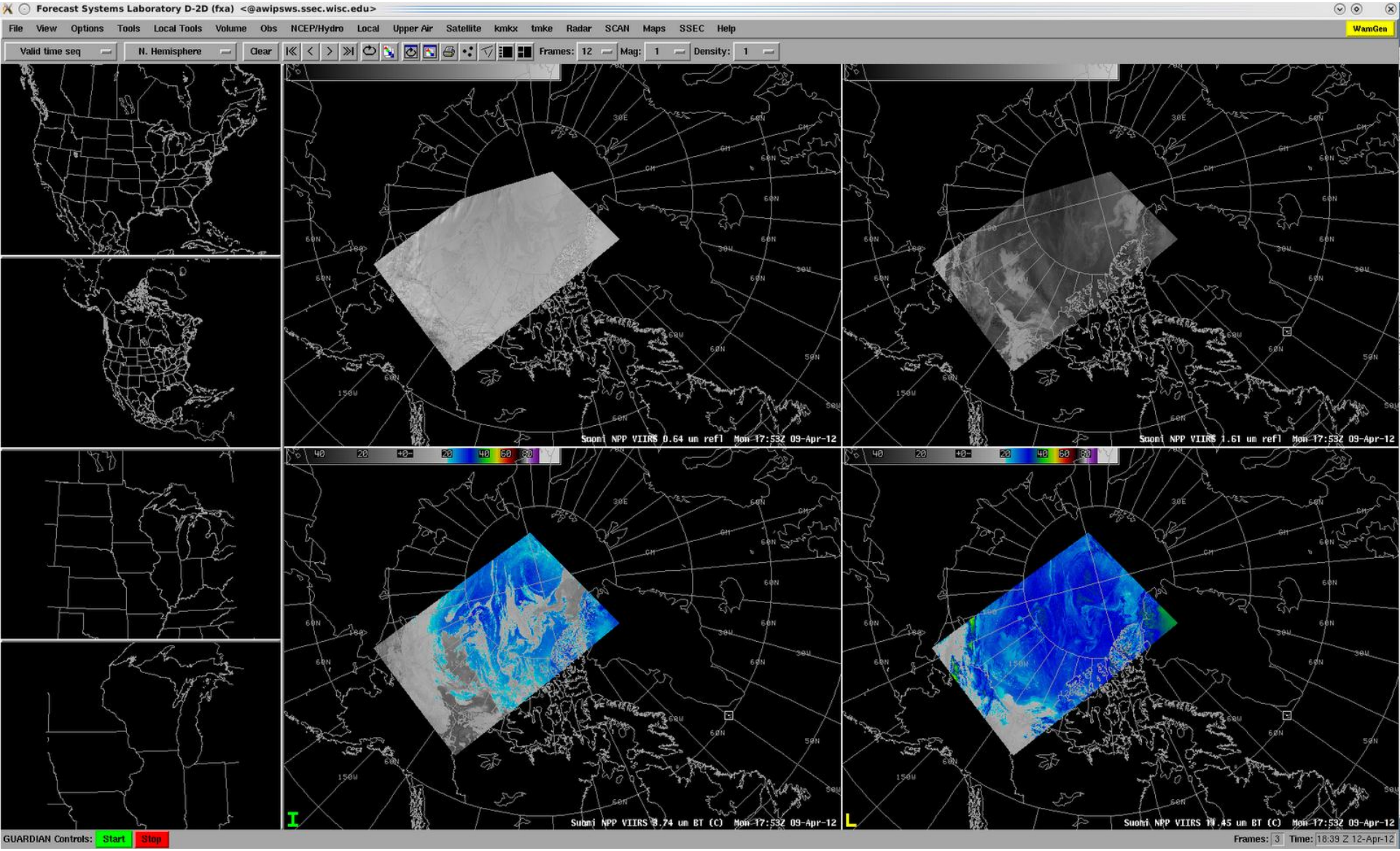
VIIRS in AWIPS
Alaska Polar Projection Demonstration Examples using CSPP

Data from Geographic Information Network of Alaska (GINA) Direct Broadcast antenna using NPP data processed by the Community Satellite Processing Package (CSPP)

NOAA NESDIS

University of Wisconsin-Madison, CIMSS/SSEC

VIIRS in AWIPS 9 April 2012 17:53 UTC



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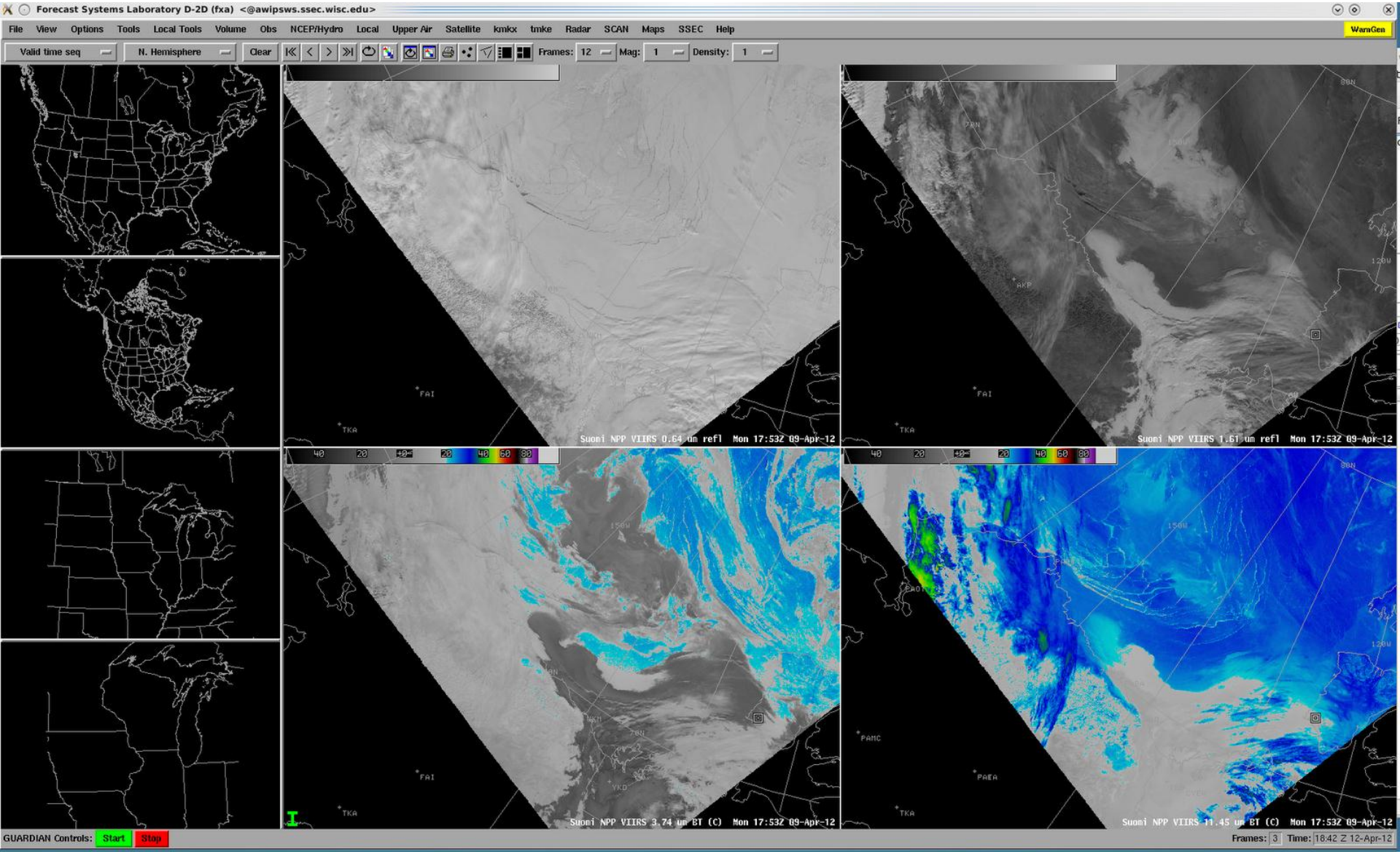
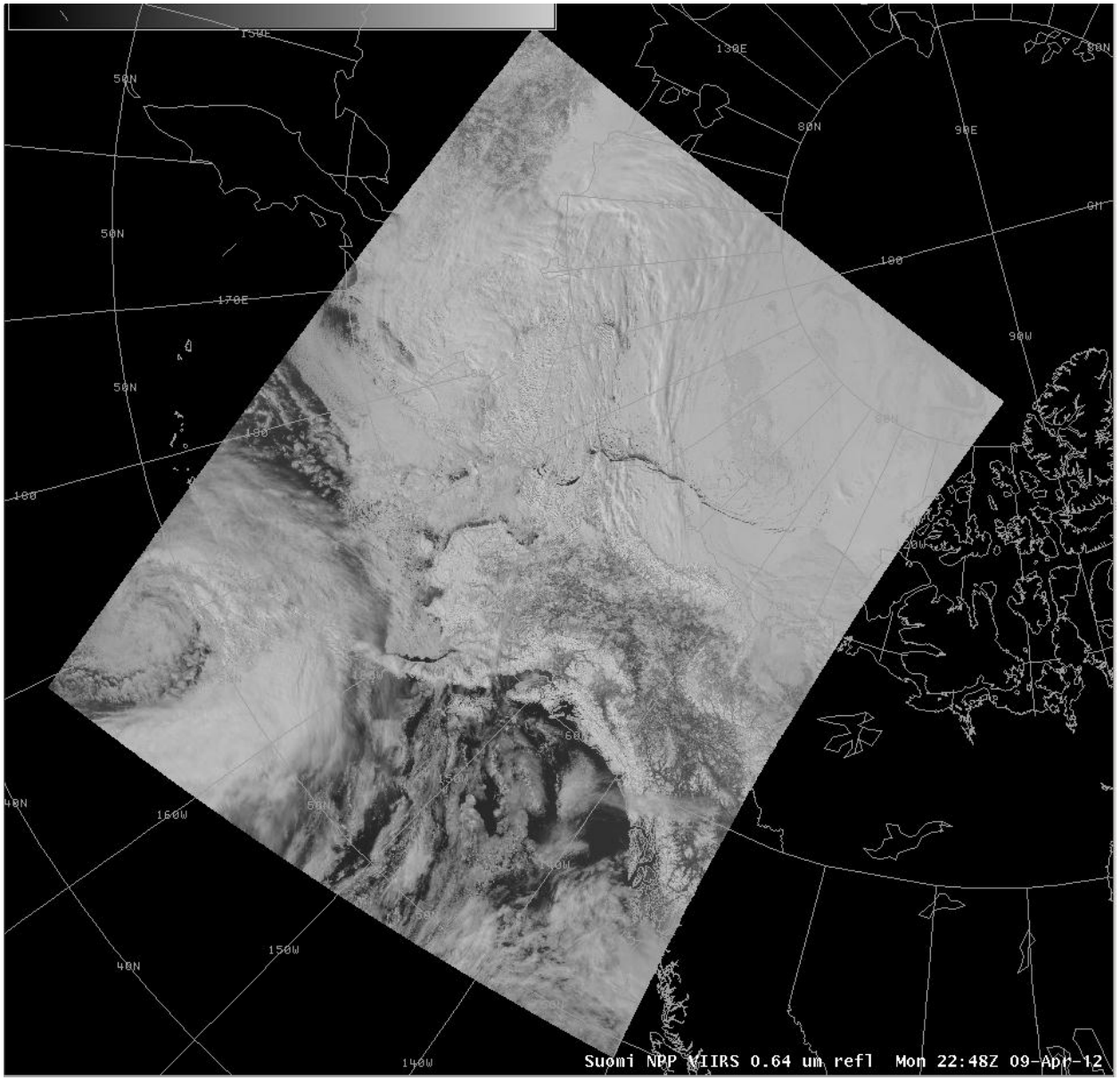
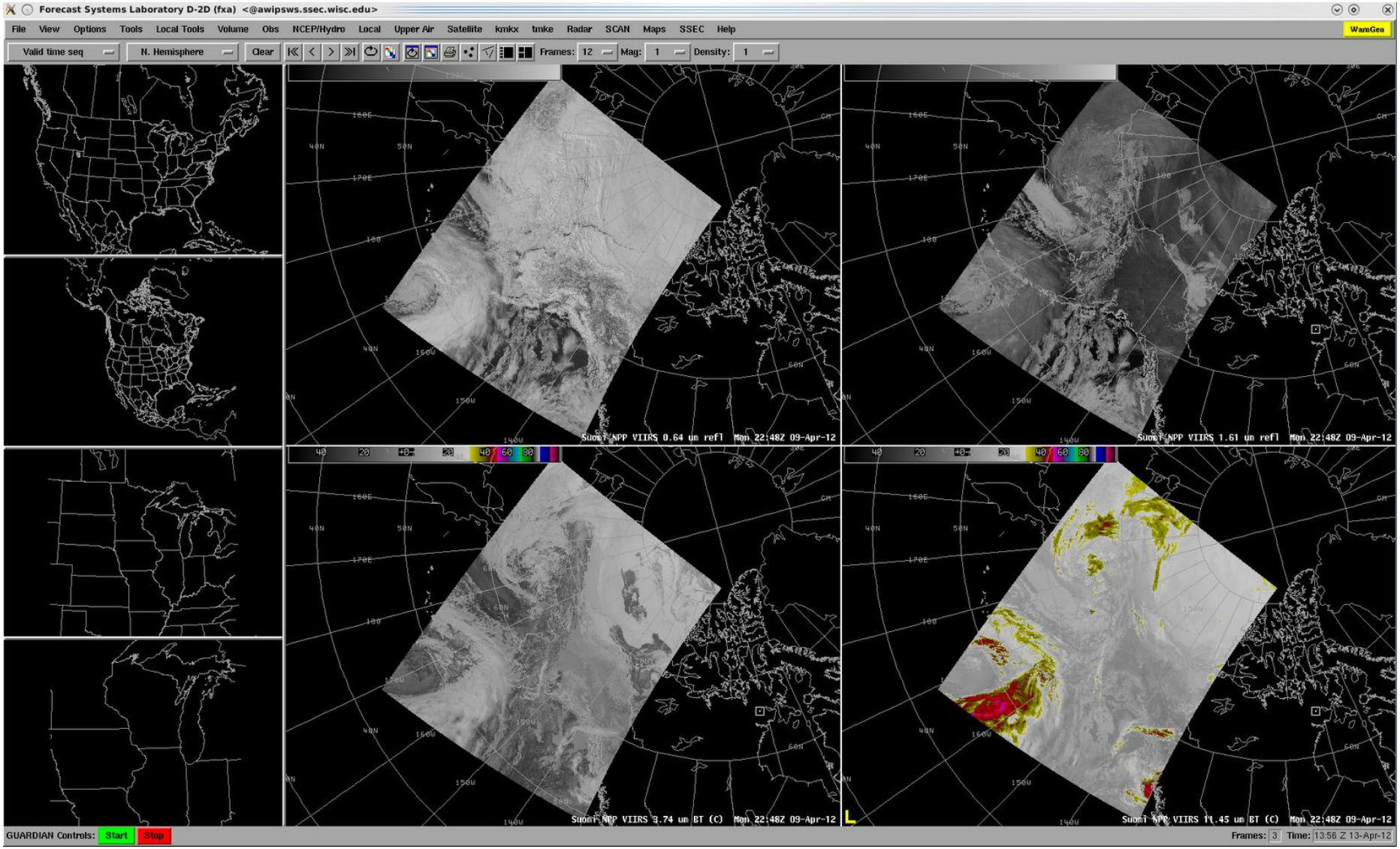


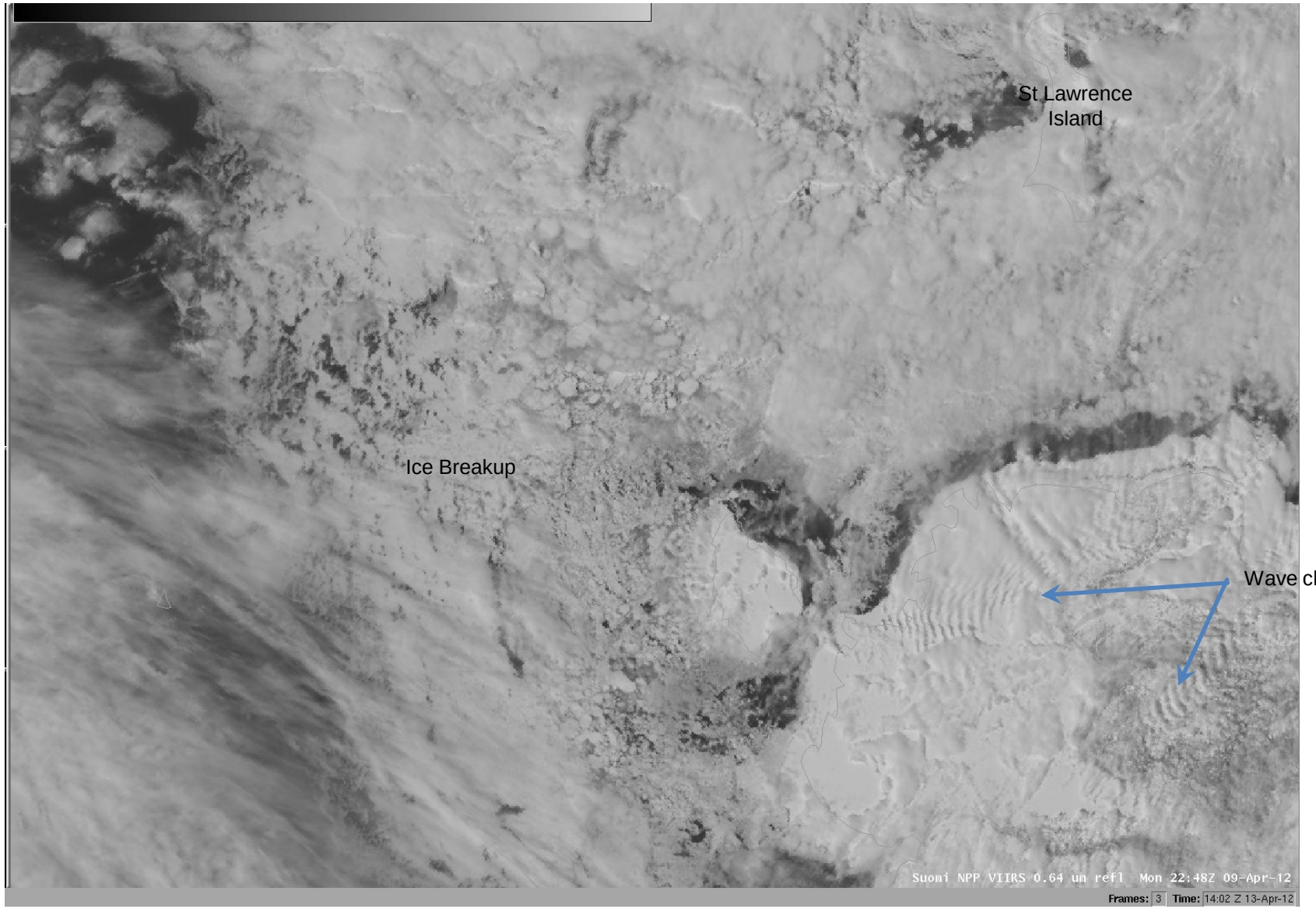
VIIRS in AWIPS 9 April 2012 22:48 UTC
Band I01



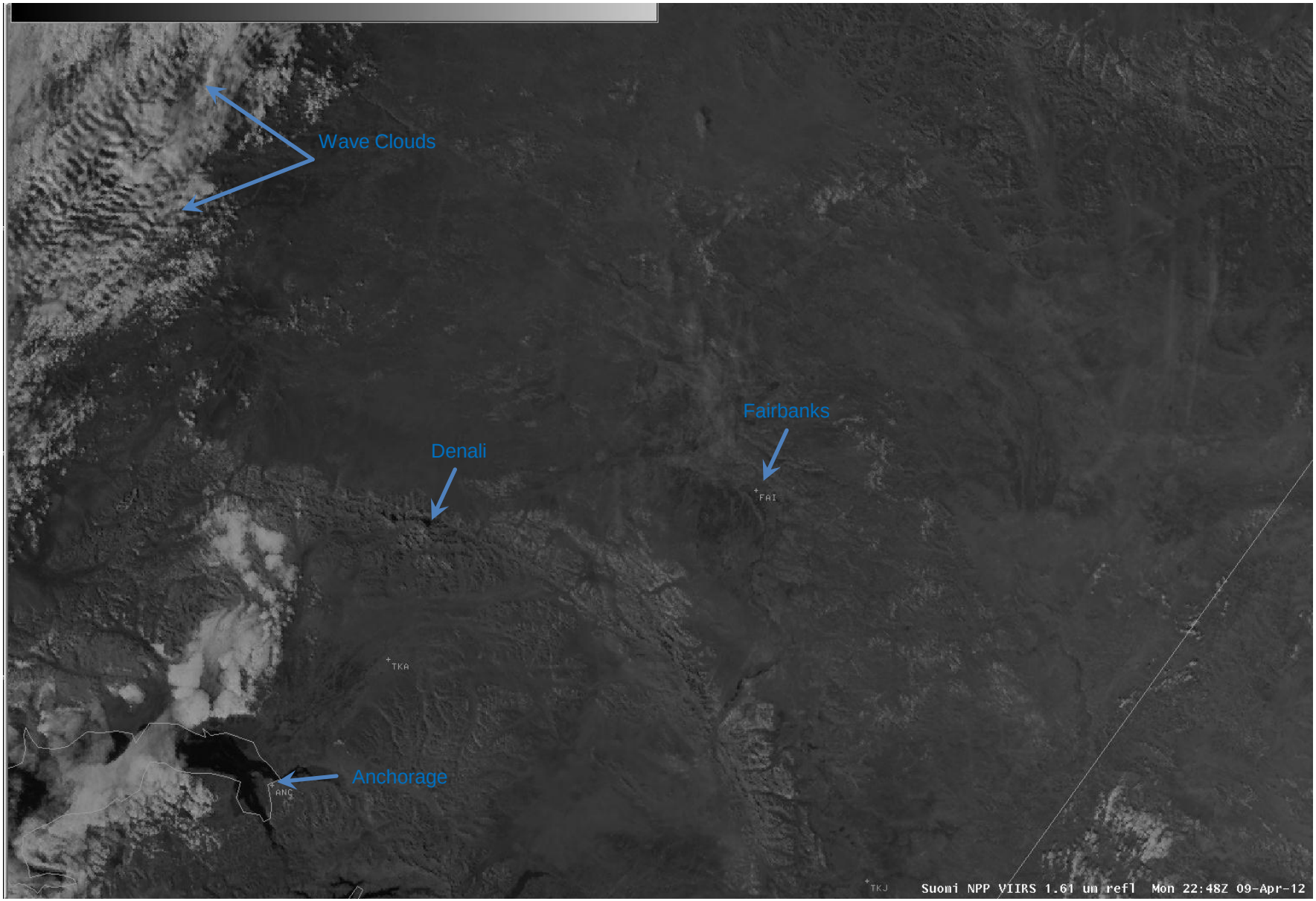
VIIRS in AWIPS 9 April 2012 22:48 UTC Multipanel



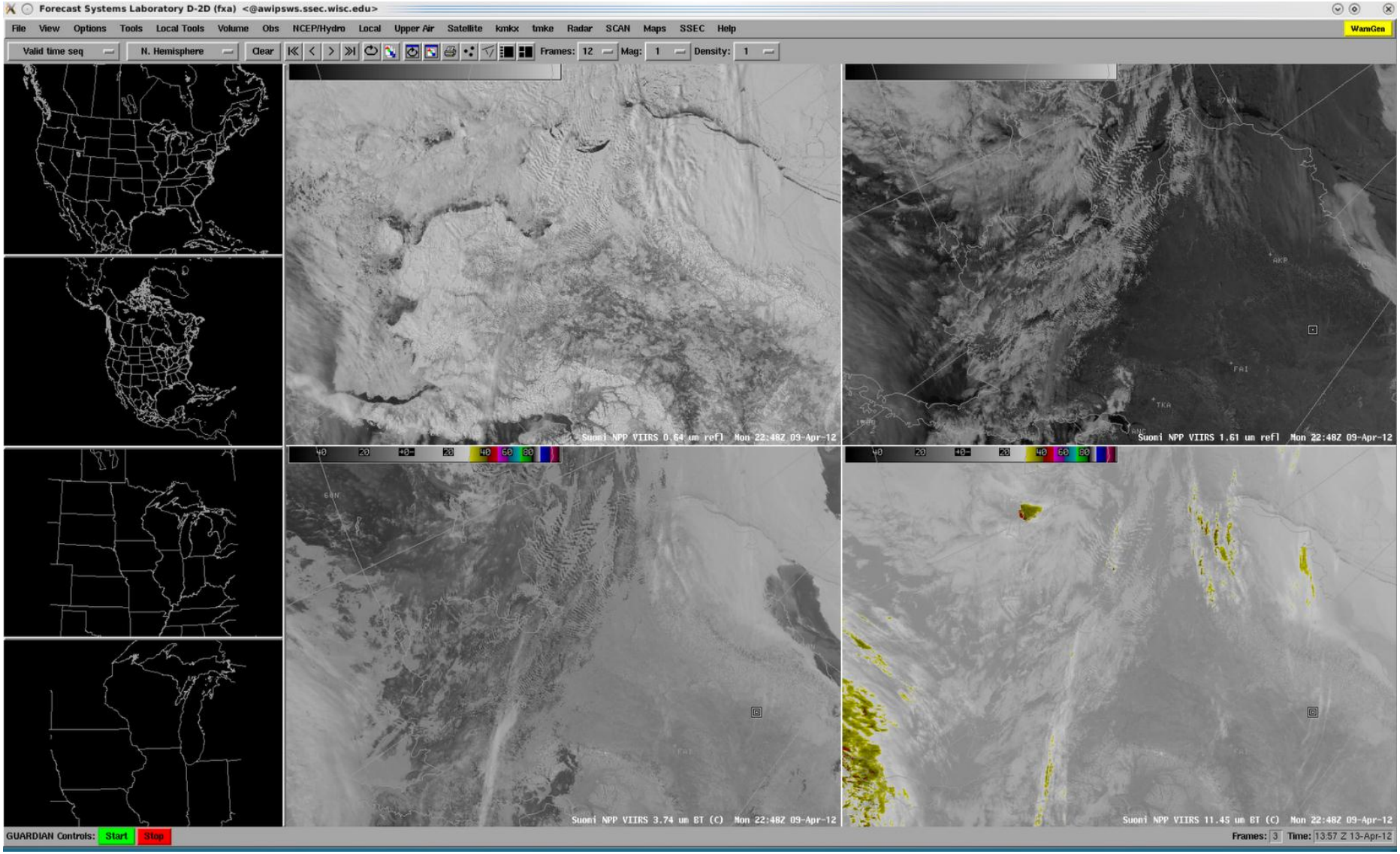
VIIRS in AWIPS 9 April 2012 22:48 UTC
Bering Sea Ice



VIIRS in AWIPS 9 April 2012 22:48 UTC



VIIRS in AWIPS 9 April 2012 22:48 UTC



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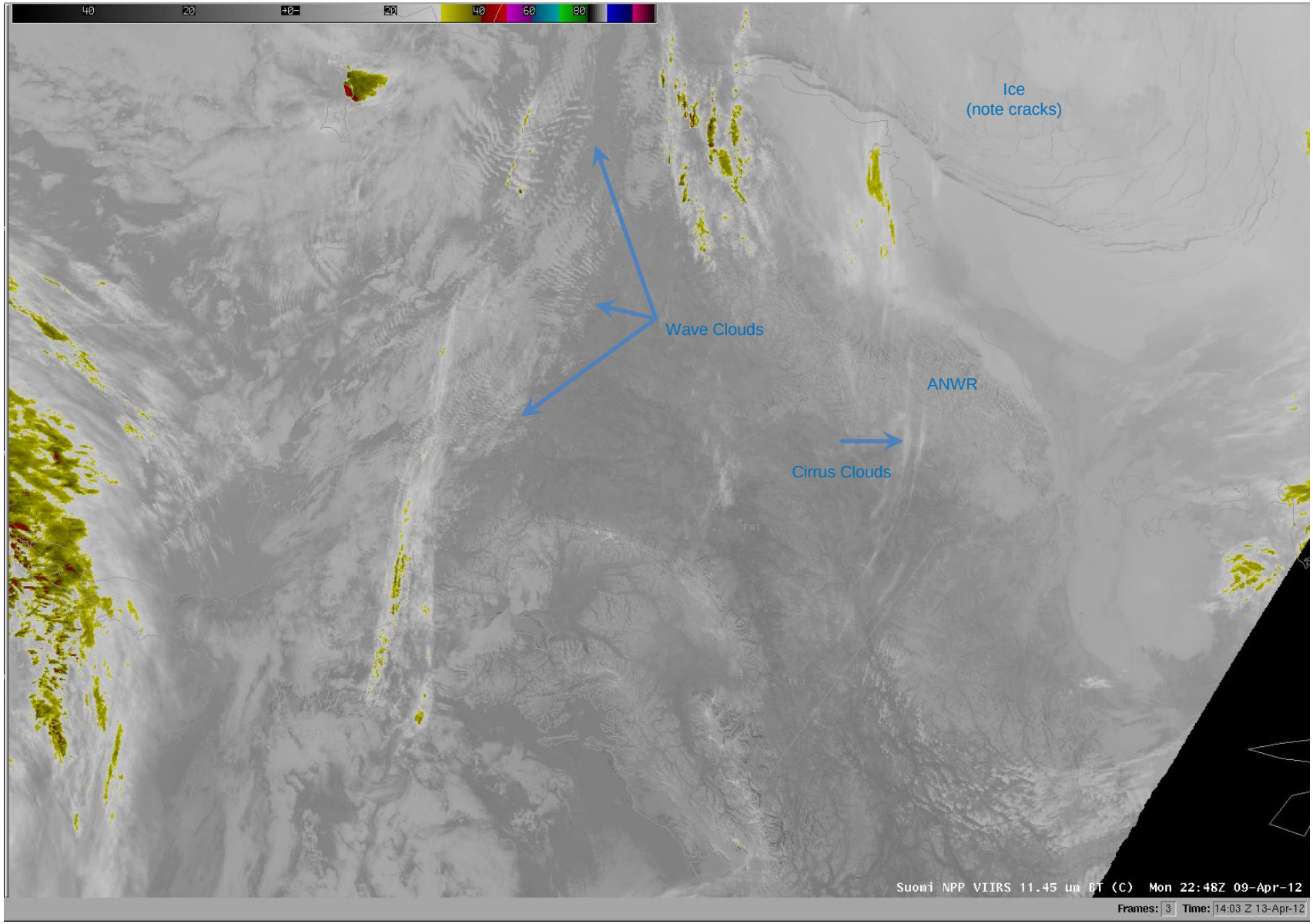
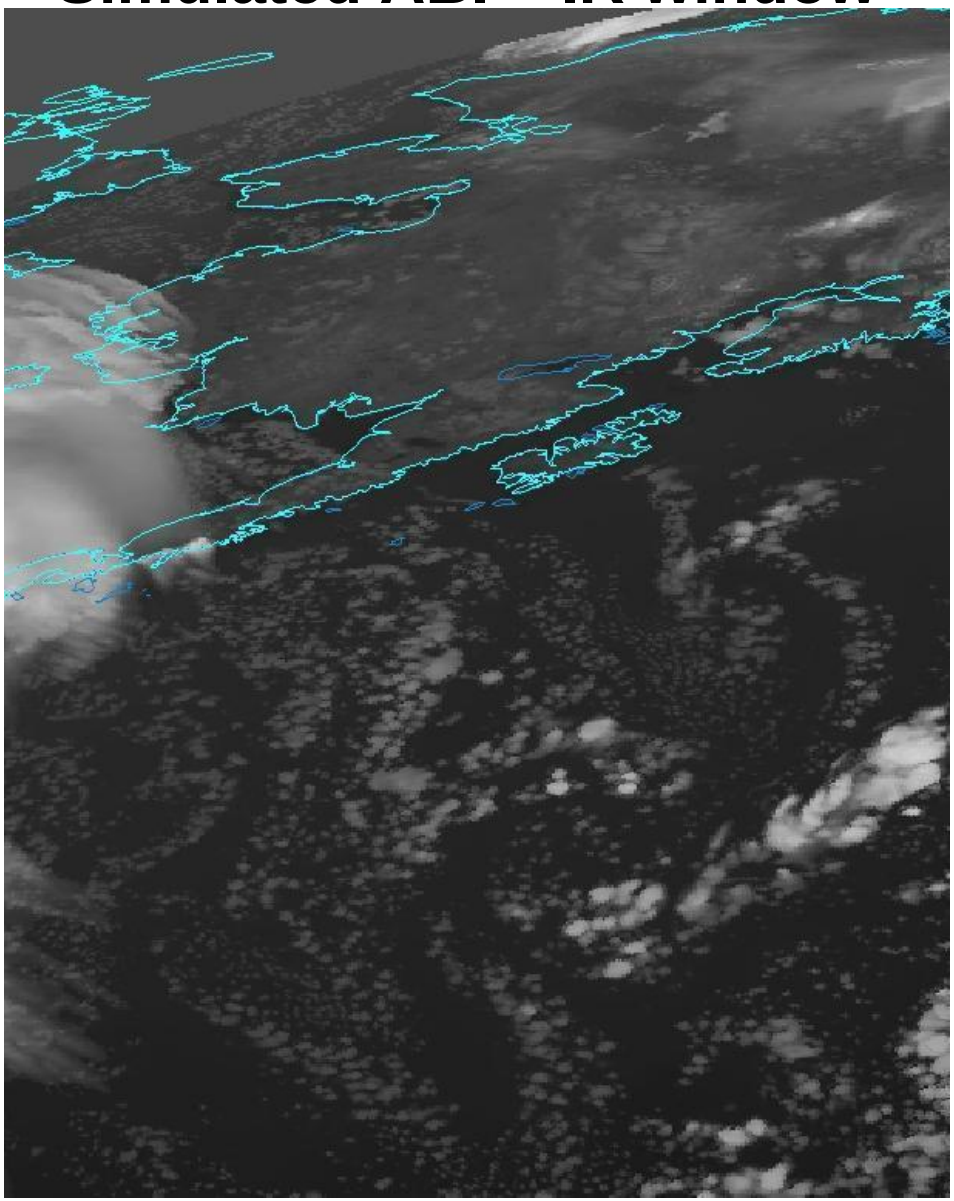
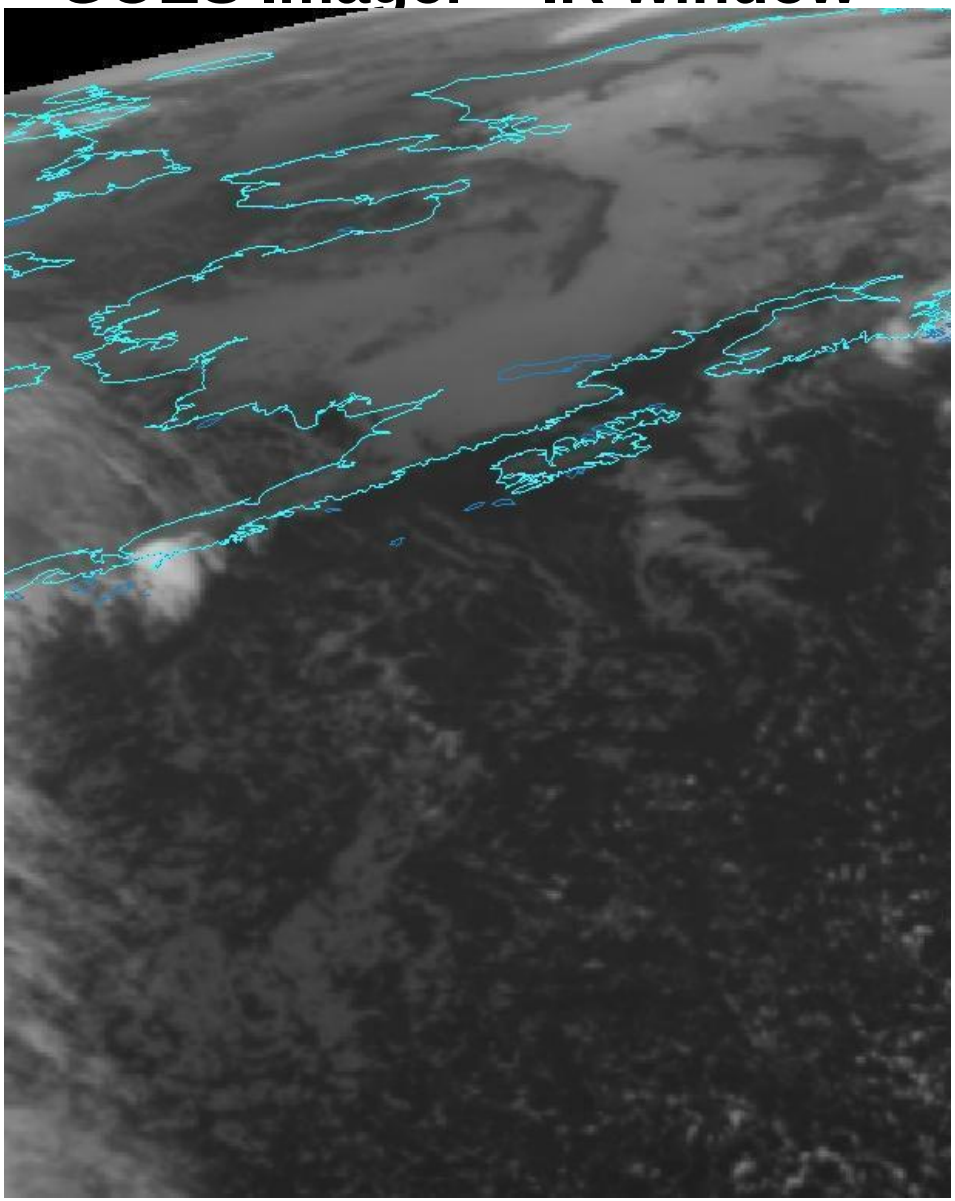


Simulated ABI – IR window

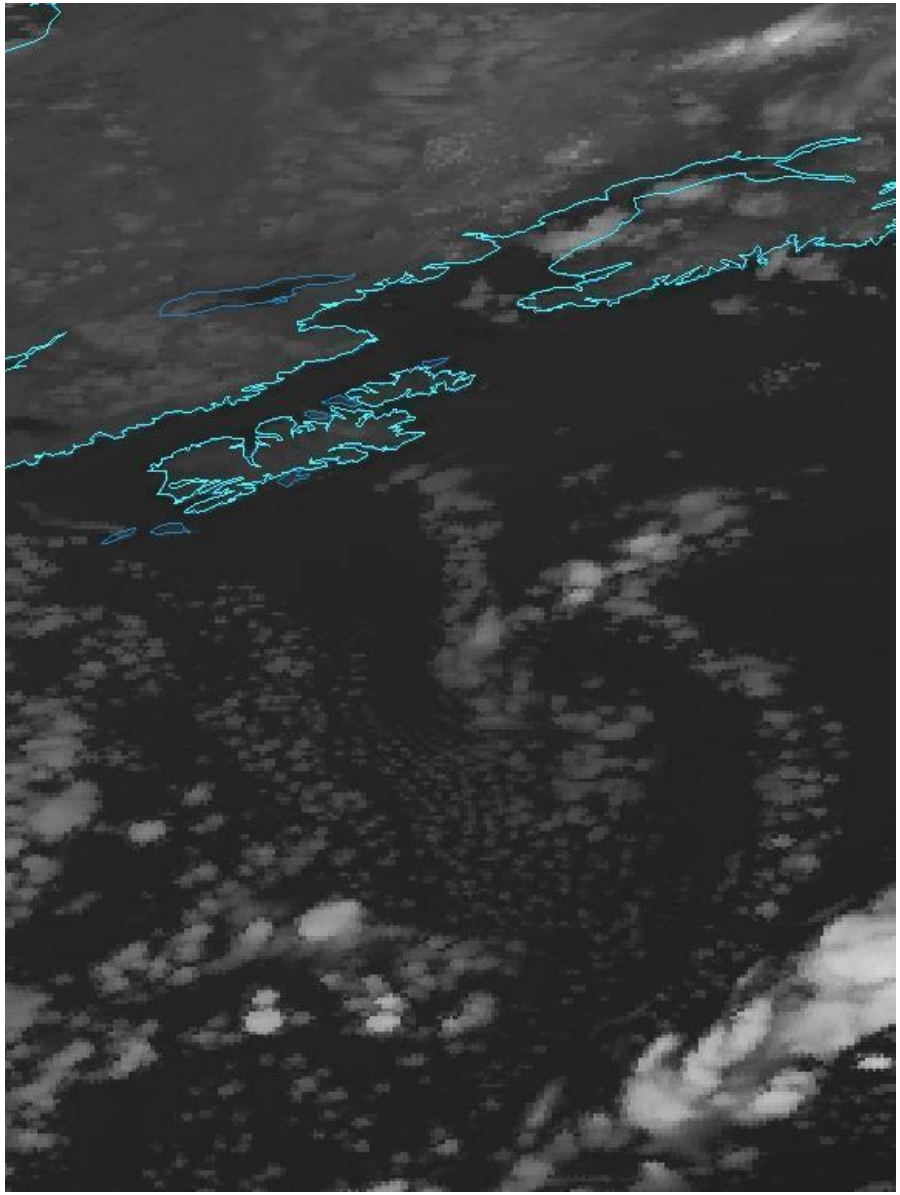


GOES Imager – IR window

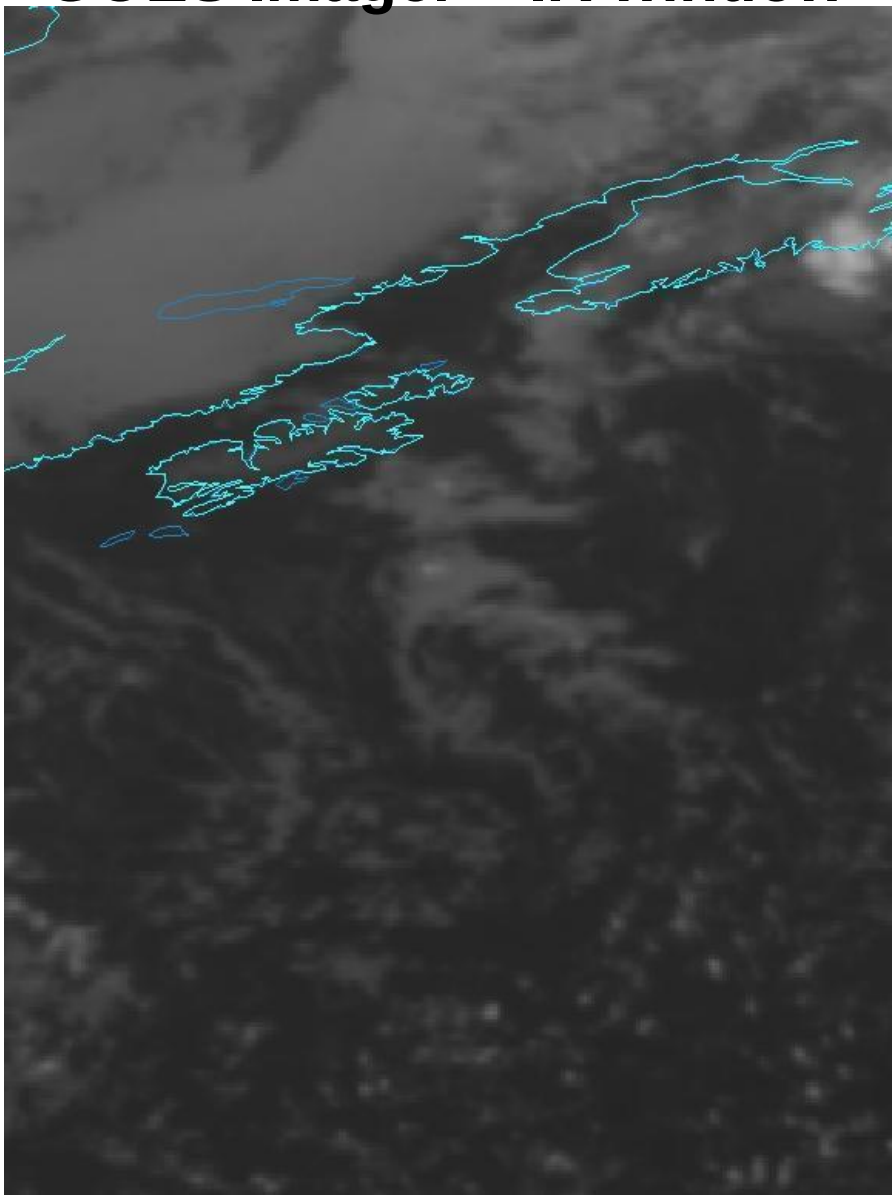


Both images shown in ABI projection using McIDAS-V. September 29, 2011 at 06 UTC

Simulated ABI – IR window



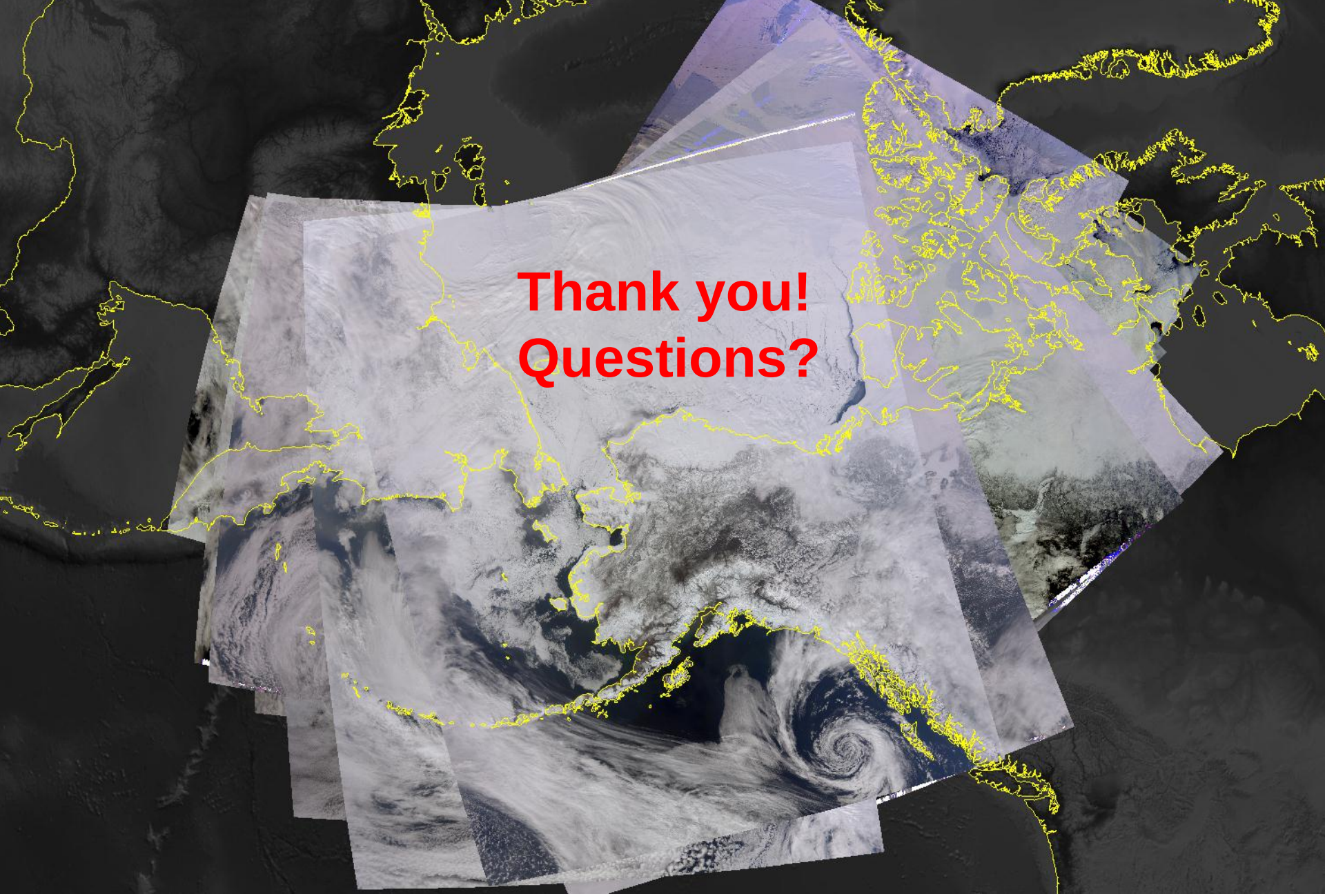
GOES Imager – IR window



Both images shown in ABI projection using McIDAS-V. September 29, 2011 at 06 UTC

WRF runs at the UAF Arctic Region Supercomputing Center | slide from Tim Schmidt - CIMSS/STAR

This all goes back to NOAA NESDIS-FCDAS and Alaska Region NWS collaborations supported by UAF, GOES-R, and JPSS. Thanks!



tom.heinrichs@alaska.edu www.gina.alaska.edu

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www.gina.alaska.edu