

Alaska High Latitude Proving Ground GOES-R Aviation Products Experiment

Volcanic Ash & SO₂ - MVFR/IFR and Cloud Products

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(especially Mike Pavolinis).

Alaska Region: RO and WFOs.

Thank you!



Summary

- First experiment and evaluation performed in 2011
 - Product flow is continuing indefinitely beyond end of evaluation period
- Aviation products in first evaluation period
- Volcanic ash and Sulphur Dioxide
- Cloud type and MVFR/IFR
- Positive feedback received from WFOs and AAWU

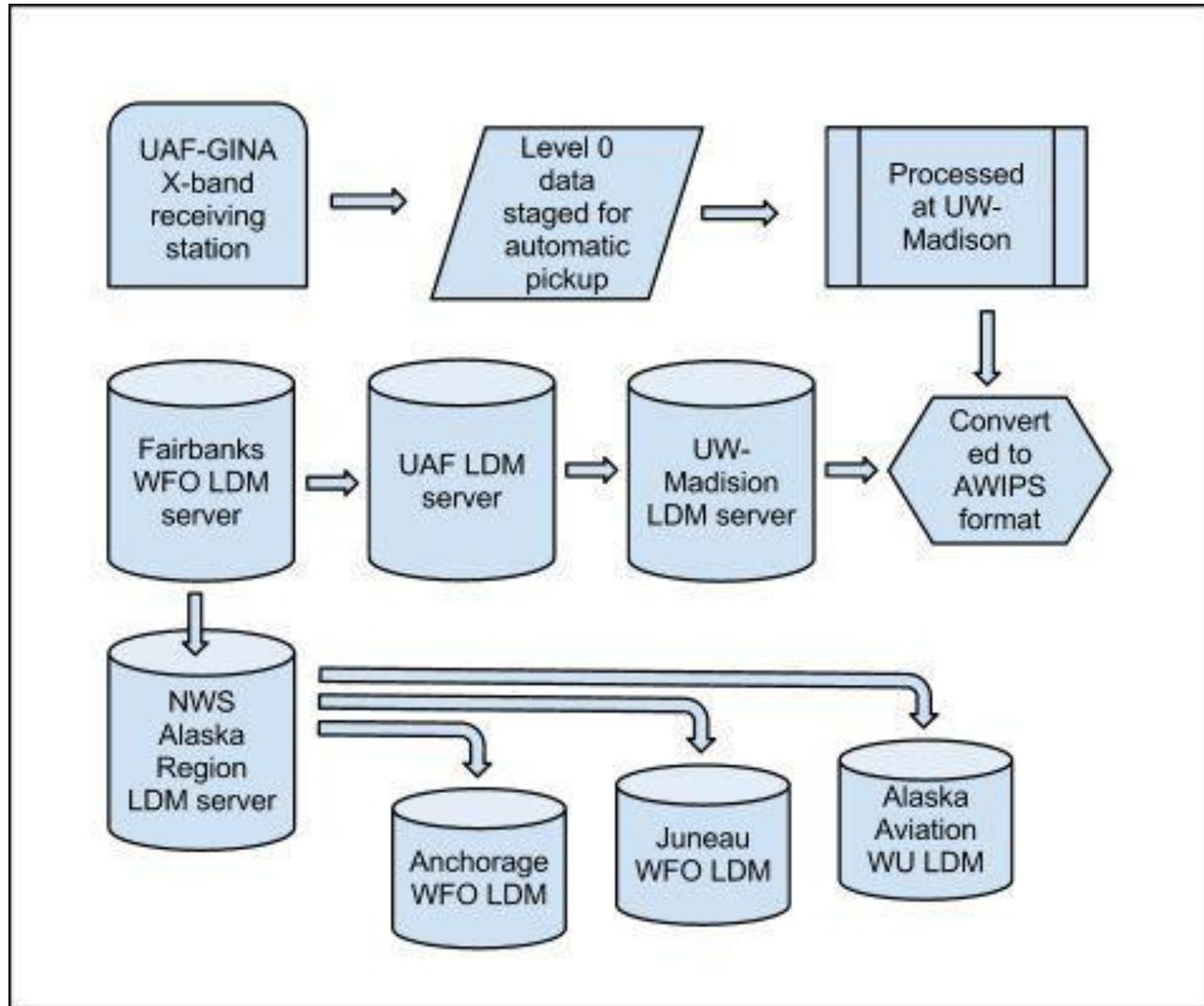


Real-time satellite data: GINA receives and processes satellite data on the UAF campus.



NOAA FCDAS Partnership: Satellite data is also received at GINA from NOAA's Fairbanks facility.

PG Data Flow



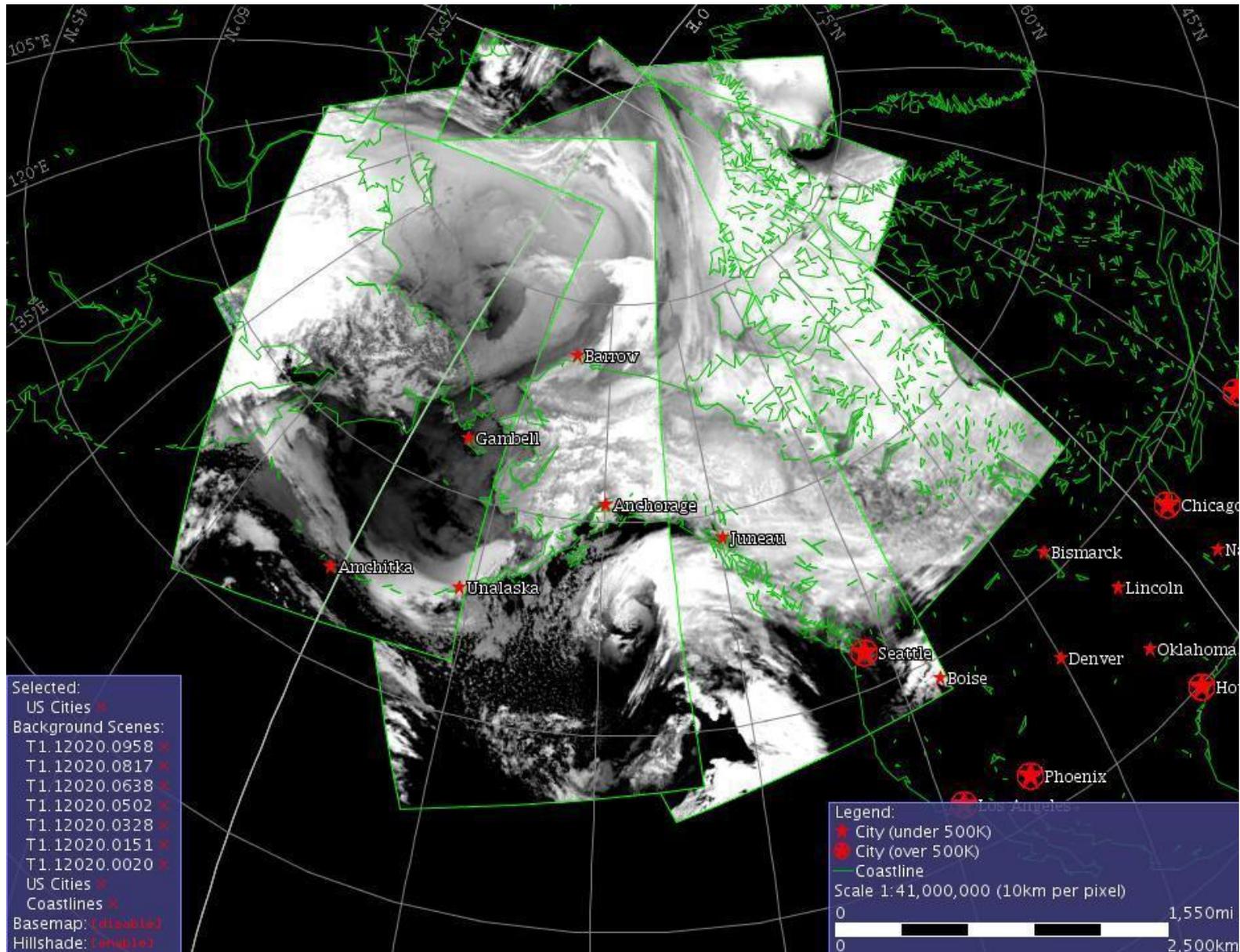
Why Aviation Products are important in Alaska

- Most dependant on general aviation and small aircraft commercial aviation of any state in the nation
- Anchorage International Airport is the second busiest cargo airport in the US (Memphis is #1- FedEx hub)

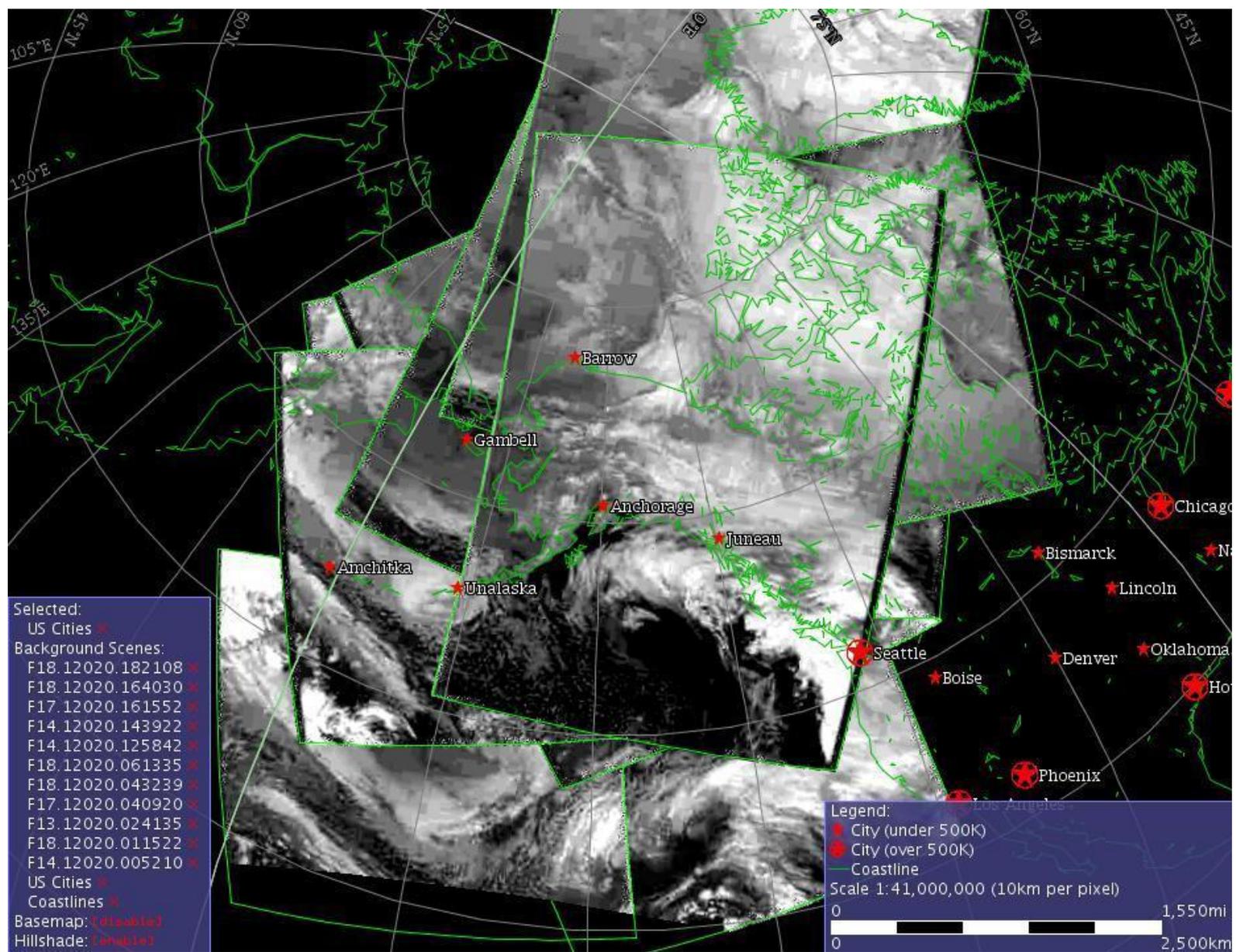


Terra MODIS mosaic of Jan 20th, 2012

MODIS-Terra captured by UAF-GINA and NOAA FCDAS

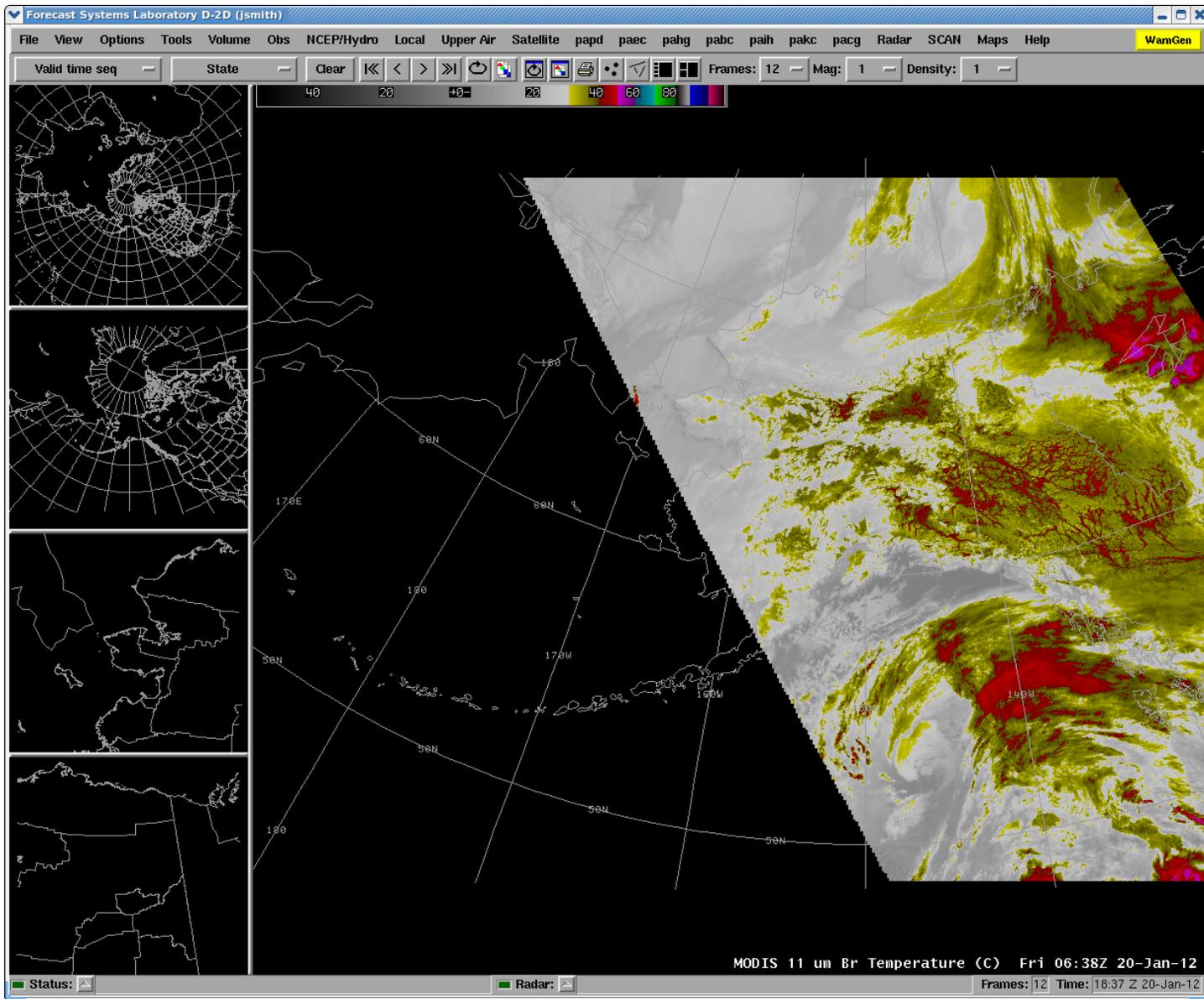


DMSP-OLS mosaic of Jan 20th, 2012 received by NOAA-FCDAS - Processed, archived, and distributed by UAF-GINA



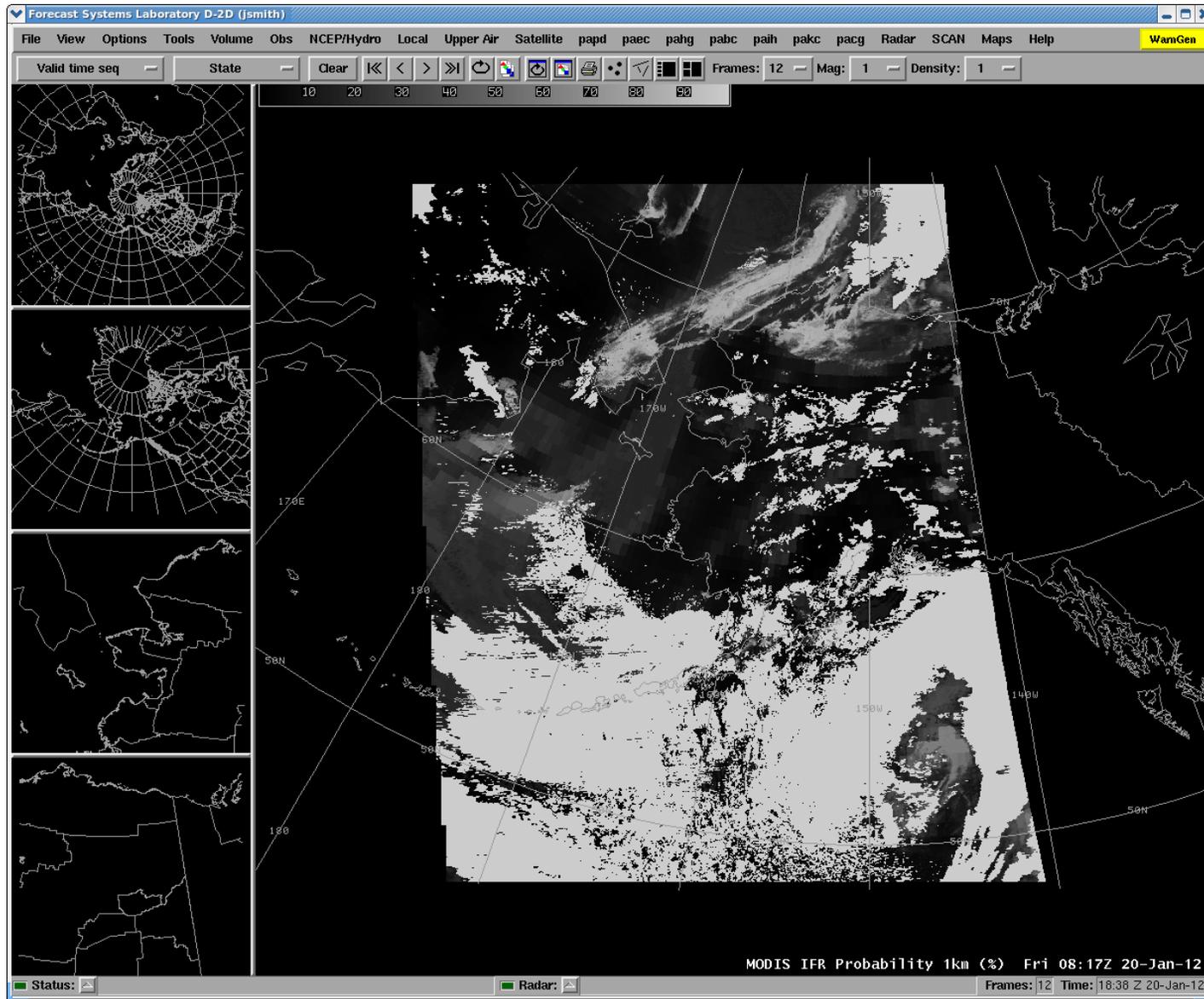
Products Evaluated

1	MODIS Ash Mass Loading AK
2	MODIS Ash Height AK
3	MODIS Ash Effective Radius AK
4	GEOCAT MODIS SO2 Detection AK
5	GEOCAT MODIS SO2 Loading AK
6	GEOCAT MODIS IFR AK
7	GEOCAT MODIS MVFR AK
8	GEOCAT MODIS Fog Depth AK
9	GEOCAT MODIS Cloud Type AK



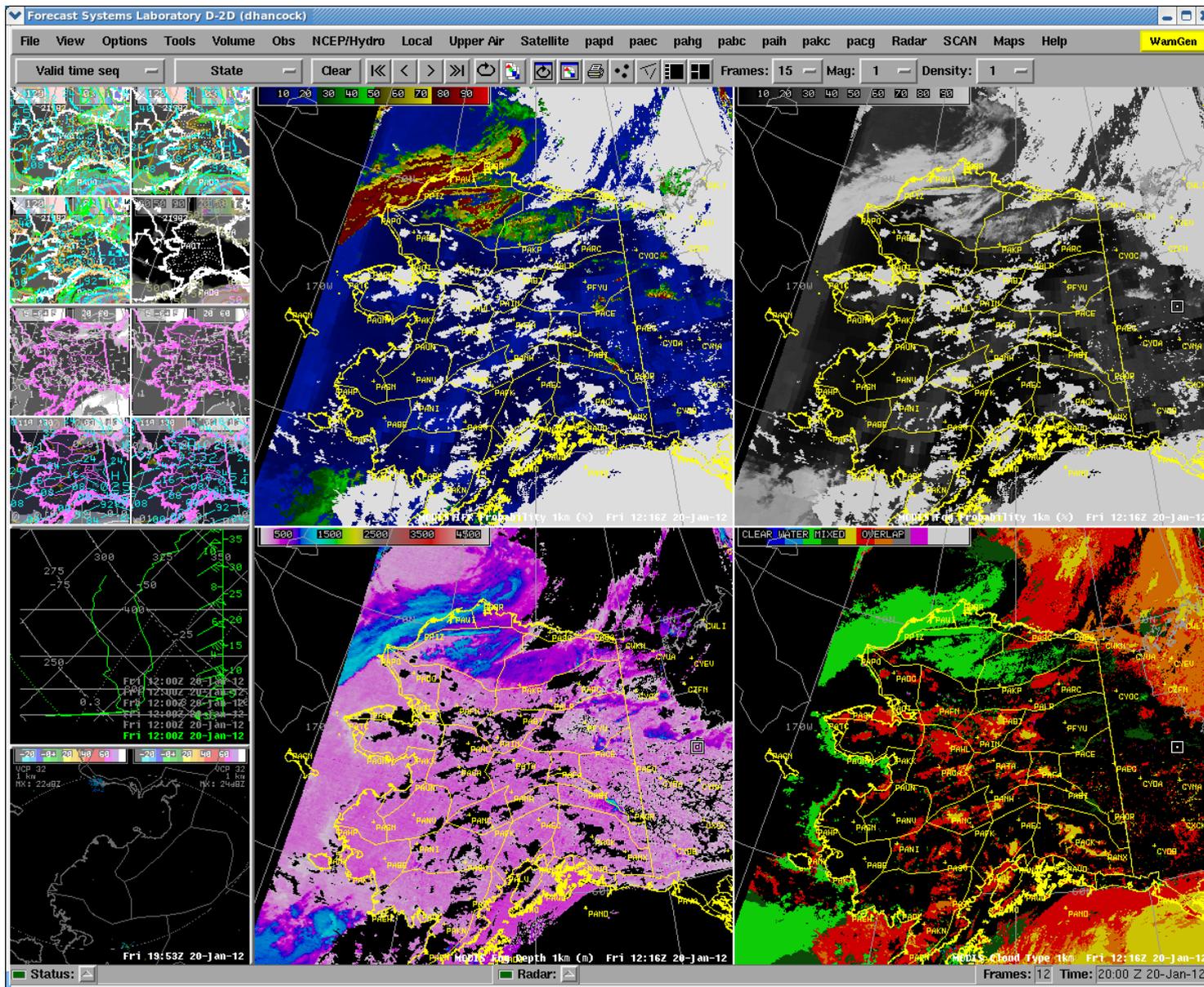
MODIS 11 um BrTemp

"The most useful type of image we receive. It is used primarily for tracking synoptic scale features" - Dan Hancock



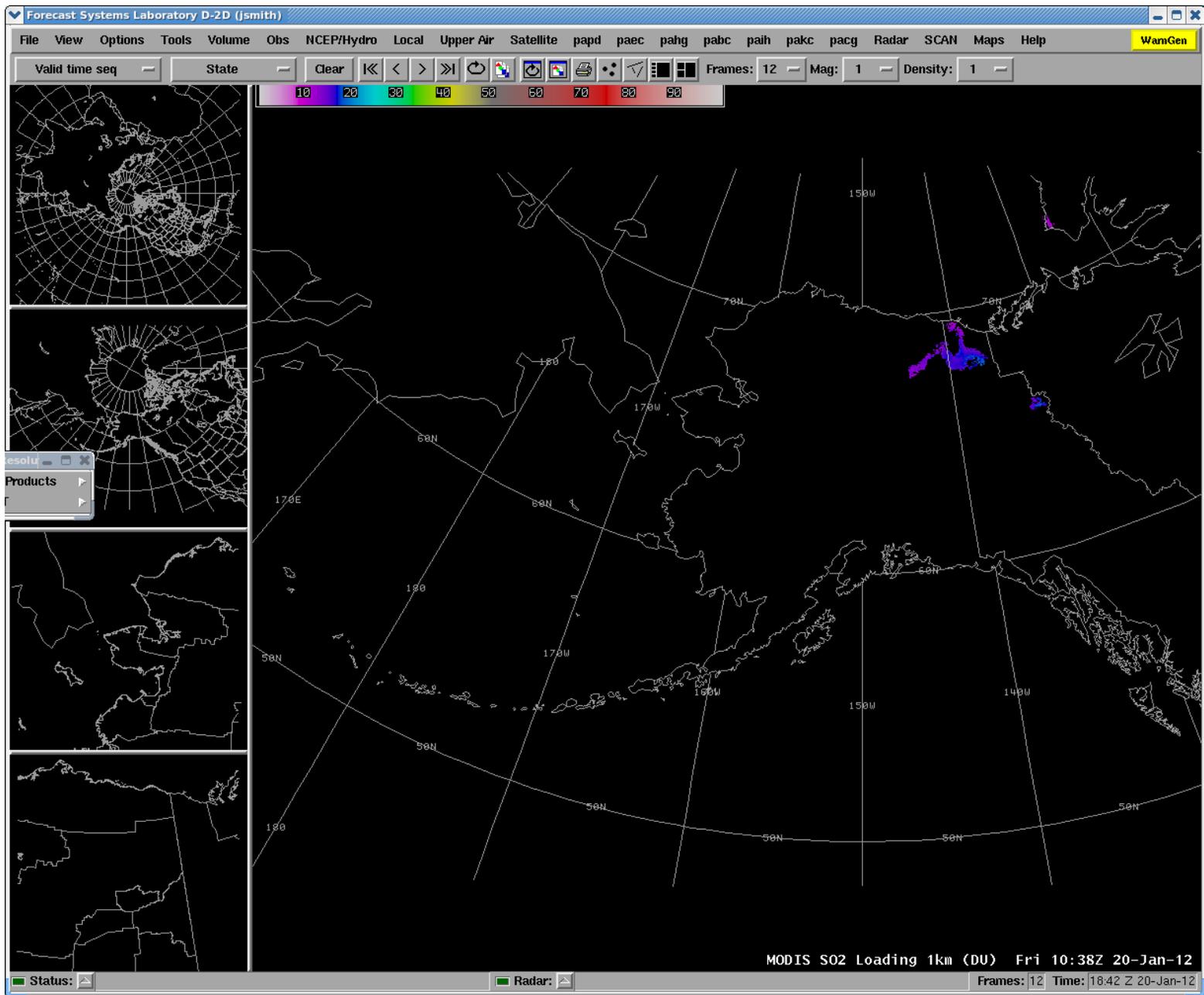
MODIS IFR
Probability 1km

"IFR/VFR proven to be very useful"
- Eric Stevens, Fairbanks WFO SOO



MODIS IFR, fog, depth, cloud

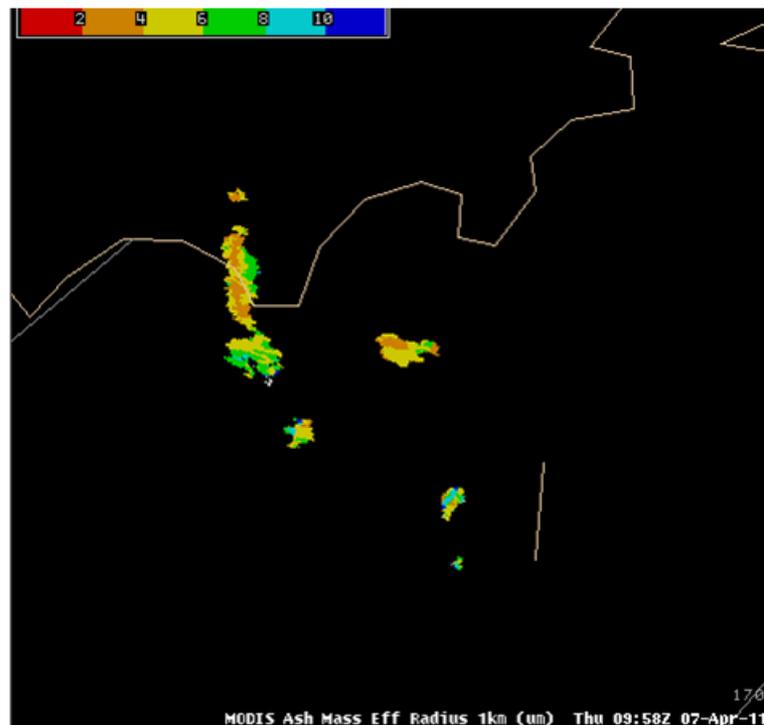
"The combined product performs well as a detector of low stratus and/or fog" - Dan Hancock



MODIS SO2 loading

Kamchatka Volcanoes – Spring 2011

- Volcanic ash products
 - In AWIPS in NWS Alaska WFOs and AAWU
 - Training completed
- March 29th, 2011: eruption of Kizimen Volcano
- April 7th, 2011: Kizimen and Sheveluch Volcano Event
 - “The ash heights from Kizimen were in good agreement, not only with Tokyo VAAC who was doing the forecasting, but also with the wind analysis from 500mb winds.” *Nathan Eckstein, Anchorage VAAC SOO*



GOES-R Ash Effective Radius Product using MODIS imagery. 0958Z 7 April 2011. Much of the ash detected shows moderate size ash particles which gives forecasters an idea of atmospheric residency times. In this particular case, ash was detectable for longer than expected given the relatively low heights.

Lessons learned regarding forecaster engagement

- Adoption of volcanic products in Alaska
AWU and VAAC is good
 - For better or for worse, not a lot of events during the evaluation period
- Regardless of current adoption, the information you gather from possibly short time you have forecasters' attention is valuable:
 - Example: Naming of MVF/IFR product suite
 - Example: Mike Pavolonis' training is useful education in its own right.

Future plans

- Processing will be moved from Madison, Wisconsin to the NOAA NESDIS satellite ground receiving facility in Fairbanks, Alaska in the first half of 2012. This will reduce product latency and provide 24/7 monitoring by NESDIS staff.
- When setting up data feeds to flow data into AWIPS will also setup secondary feeds into archiving and browse systems such as the UAF-GINA SwathViewer, a web accessible mapping system tuned for viewing remote sensing products on a virtual globe.
- Evaluate what other file formats and delivery locations might expand the places the data can be integrated into forecasters environments, such as the IC4D system for the Aviation Weather Unit.
- Plan to use the NWS product archive system in the Anchorage WFO in order to have post event evaluations of how well the data performed.
- Since the start of the Alaska experiment, the GOES-R products have been improved significantly. The improved products can be provided should another evaluation take place.
- Provide additional product training.

**Thanks to NESDIS-FCDAS and Alaska
Region NWS collaborations supported
by UAF, NSF, GOES-R, and JPSS.**



A satellite image of Okmok Volcano in Alaska, showing a large plume of ash and smoke rising from the crater. The surrounding landscape is rugged and mountainous, with some green vegetation visible on the slopes. The image is taken from a high angle, providing a clear view of the volcano's structure and the surrounding terrain.

Thank you!
Questions?

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MODIS - Okmok Volcano - July 13, 2008