

Evaluating GOES-R Scanning Strategies at the Operations Proving Ground



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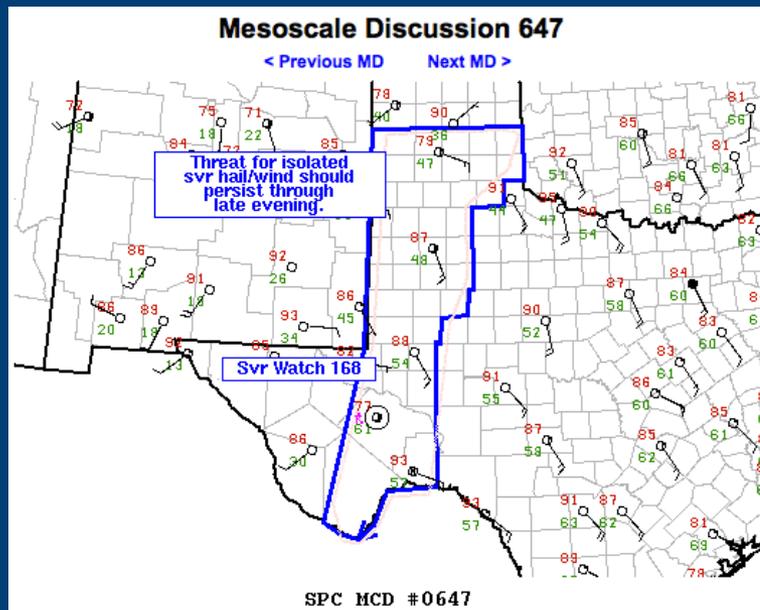
**GOES-R/JPSS Proving Ground / User-Readiness Meeting
4 June 2014**



Why Evaluate GOES-R Scanning Strategies?

- Differences of Opinion on Scan Mode
- Scan Mode 3 or Flex Mode
 - Full Disk image every 15 minutes
 - CONUS image every 5 minutes
 - 2 mesoscale locations with images every minute
- Scan Mode 4 or Continuous Full Disk Mode
 - Full Disk image every 5 minutes
- Potential Questions to Resolve...
 - How useful is 1-min imagery to the forecaster at a WFO?
 - Are there some tasks where 1-min imagery is more useful than others?
 - Can the forecaster assimilate 1-min imagery?
 - Does 1-min imagery extend warning lead time and improve forecasters' confidence?

From the Storm Prediction Center...



MESOSCALE DISCUSSION 0647

NWS STORM PREDICTION CENTER NORMAN OK

0715 PM CDT WED MAY 21 2014

AREAS AFFECTED...TX PANHANDLE SWD TO THE TX BIG BEND

CONCERNING...SEVERE THUNDERSTORM WATCH

VALID 220015Z - 220115Z

THE SEVERE WEATHER THREAT FOR SEVERE THUNDERSTORM WATCH 168 CONTINUES.

SUMMARY...AN ISOLATED SVR WIND GUST AND HAIL THREAT CONTINUES IN ASSOCIATION WITH A BROKEN LINE OF TSTMS FROM NEAR I-40 TO THE TX BIG BEND. THE LOSS OF DIURNAL HEATING IN THE NEXT COUPLE HRS SHOULD RESULT IN THIS THREAT SLOWLY DIMINISHING AND BECOMING MORE LOCALIZED.

DISCUSSION...A BROKEN LINE OF TSTMS GENERALLY ORIENTED N-S ACROSS W TX CONTINUES TO BE MAINTAINED AS AN IMPULSE EJECTS NEWD OUT OF NM. EMBEDDED MULTICELL CLUSTERS HAVE PRODUCED ISOLATED INSTANCES OF SVR WIND/HAIL...INCLUDING A 63 MPH GUST SAMPLED NEAR MORTON PER THE TTU WEST TEXAS MESONET. **GOES 14 ONE-MINUTE IMAGERY SHOWS CONTINUED UPDRAFT GENERATION WITHIN A MORE MATURE CLUSTER JUST E OF AMA...AND ADDITIONAL TSTM DEVELOPMENT W OF MAF...SUGGESTIVE OF A CONTINUED SVR HAIL/WIND THREAT FOR AT LEAST THE NEXT 1-2 HRS.** HOWEVER...THE LOSS OF DIURNAL HEATING...ALONG WITH CONTINUED BOUNDARY LAYER STABILIZATION VIA CONVECTIVE COLD POOL GENERATION...SHOULD FOSTER A SLOW DOWNTREND IN TSTM INTENSITY...WITH THE SVR THREAT BECOMING MORE LOCALIZED WITH TIME.

..ROGERS.. 05/22/2014

From the 2014 Hazardous Weather Testbed...

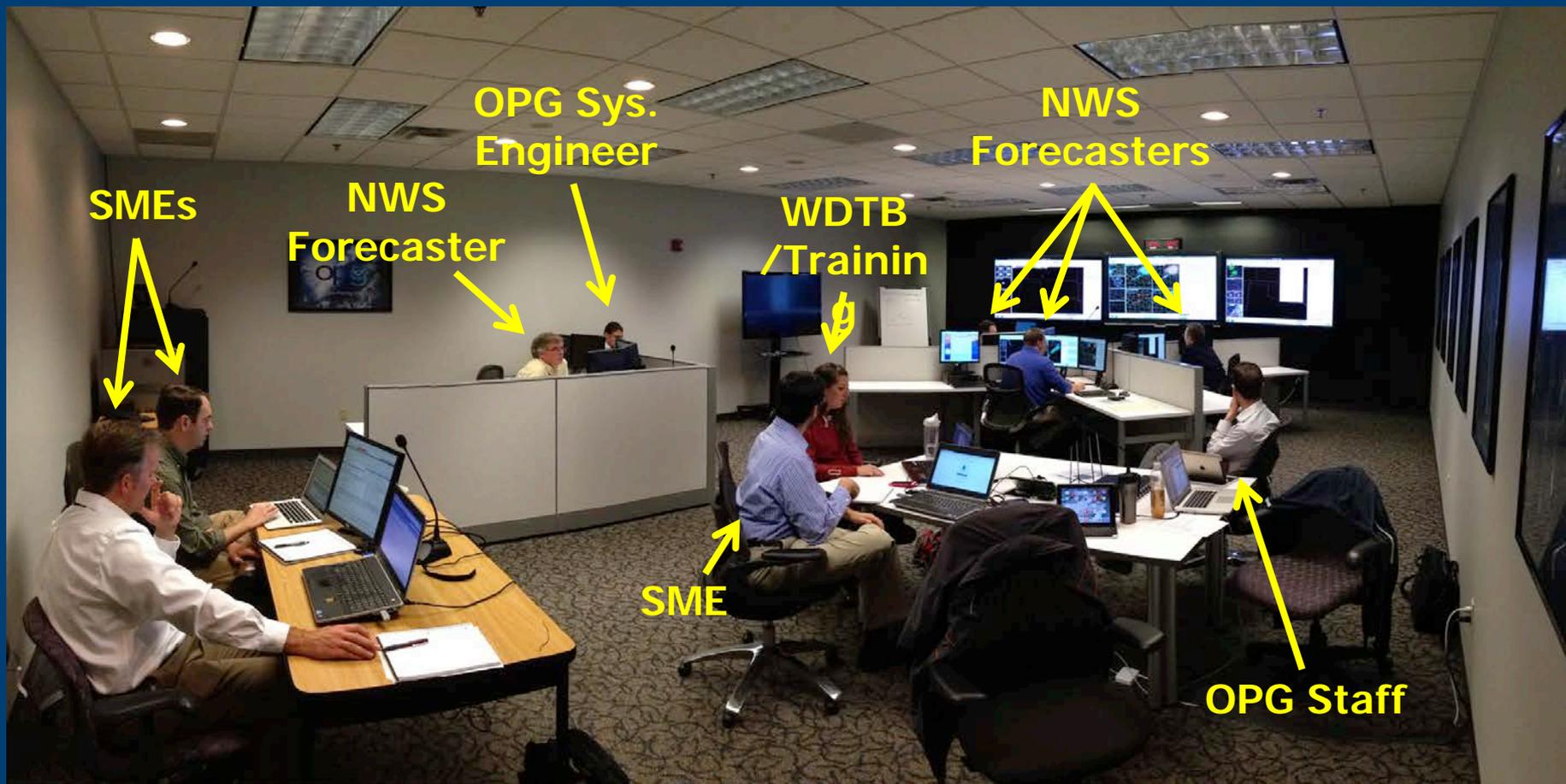
- *"I saw subtle boundaries that I wouldn't otherwise see."*
- *"Around the Great Lakes while looking at advection fog, I wish we had 1-minute updates so we could see how much fog is spreading inland."*
- *"Watching a storm with an enhanced V and OT, the OT collapsed, and I issued a warning. This had positive lead time to hail reports."*
- *"As soon as the CU moved into the cirrus, it died off. It is something that in 15 minute scans you just couldn't see."*
- *"In the office, many times you're waiting 15 minutes for the next scan. With 1-minute data, you can see convective attempts, failures, and dead anvils."*

From the WFO Boulder, CO in AWIPS-II...

- *"When viewing storm development, 1-min imagery may be too frequent. I would like to compare it to 3- or 5-minute data. My thought is that 3- or 5-minute data may be overall more efficient and effective than 1-minute data."*
- *"I see the one minute imagery being very helpful for developing low clouds near KDEN, one of the busiest airports in the world. Latency of less than 5 minutes is very helpful."*
- *"I would think that every 4-5 minutes would suffice with the rapid scan imagery. I can see some other uses, such as wild fires showing smoke plumes doing wild fire ignitions."*
- *"It certainly was fun to look at, but in terms of warning operations it was not all that useful. With the slow loading of AWIPS-II for this amount of imagery, it takes too long to load in a warning mode."*

Why an Evaluation in the Operations Proving Ground?

- Ops-Like Environment with Supporting Cast





Why an Evaluation in the Operations Proving Ground?

- **Ops-Like Environment with Supporting Cast**
- **Controlled and Focused Evaluations**
- **Usefulness and Usability**
- **Workflow**
- **Social Science - Risk Communication**
- **Training Needs and Development**



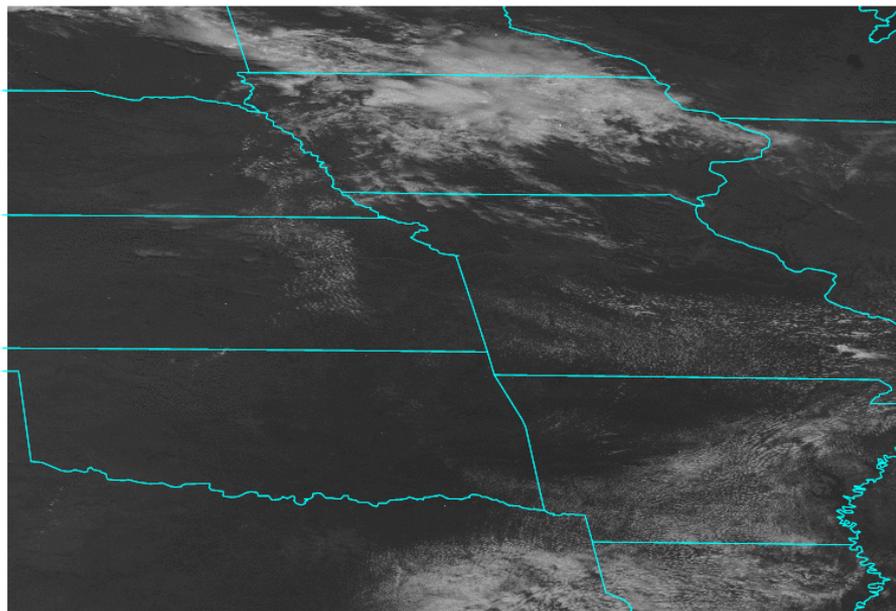
How Can GOES-R Scanning Strategies Be Evaluated?

- **Overarching Goal: Provide guidance to NWS management and the NOAT on...**
 - usefulness (what is the value-added?) of 1-min imagery in NWS Operations
 - forecasters' ability to assimilate 1-min imagery in real time
- **Late Fall and Early Winter 2014-2015**
- **4 weeks long (at a minimum), 4 NWS forecasters each week**
- **Tim Schmit and Dan Lindsey have agreed to assist as SMEs.**
- **Using cases from the two 3-week long GOES-14 1-min special experiment this summer...archived at CIRA.**
 - Convective Cases
 - Fog and Low Stratus Cases
 - Fire Weather Cases
- **Use Heinselman et al. 2012 framework**

How Can GOES-R Scanning Strategies Be Evaluated?

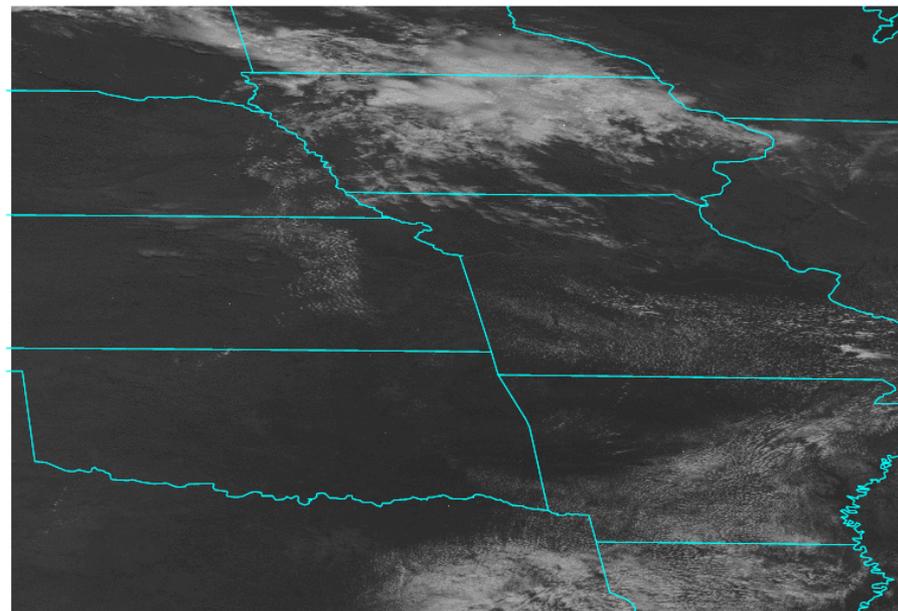
- Compare NWS forecaster decisions with two control groups (1-min vs 5-min)

5-min Imagery



GOES-14 1km VIS 20140510/1800

1-min Imagery

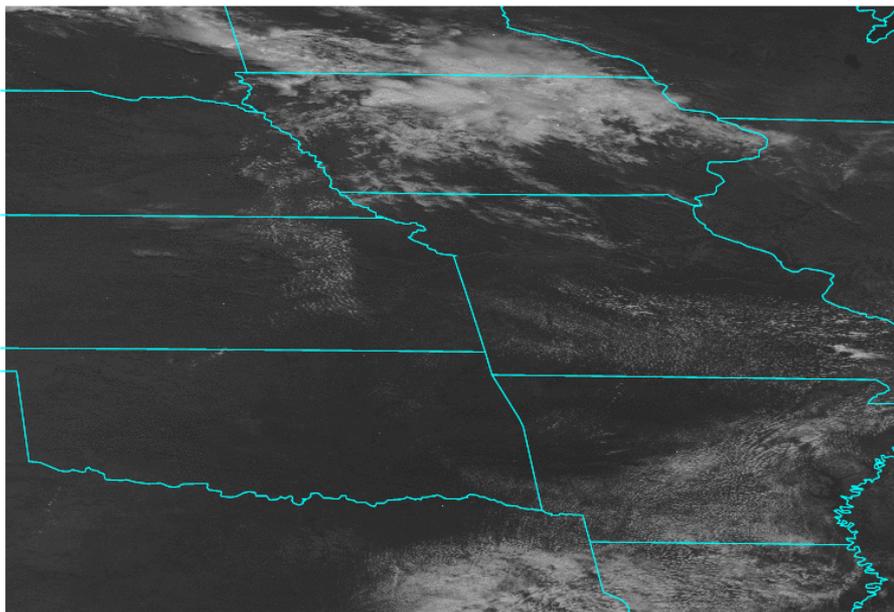


GOES-14 1km VIS 20140510/1800

How Can GOES-R Scanning Strategies Be Evaluated?

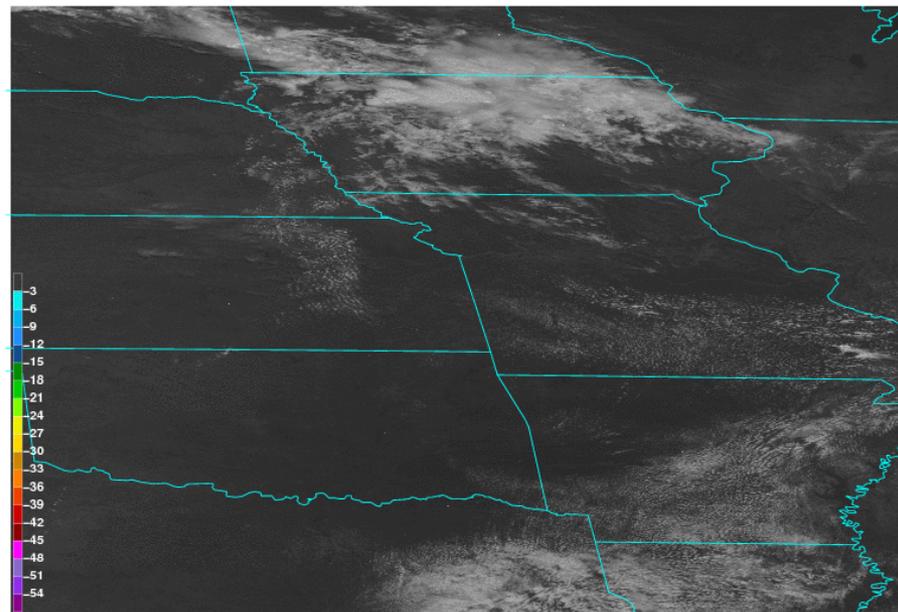
- Compare NWS forecaster decisions with two control groups (1-min vs 1-min with Future Capabilities)

1-min Imagery



GOES-14 1km VIS 20140510/1800

1-min Imagery and Future Capabilities (e.g., CTC/OT)



GOES-14 1km VIS 20140510/1800
GOES-R Instantaneous Cloud-Top Cooling [K/15-min] and OTs 20140510/1800

- **Monday Afternoon**
 - Training
 - Getting Comfortable with 1-min imagery
- **Tuesday**
 - Two convective cases in the morning (mesoanalysis)
 - Two convective cases in the afternoon (warning operations)
- **Wednesday**
 - Two convective cases in the morning (1-min w/ or w/o Future Capabilities)
 - Two fog and low stratus cases in the afternoon
- **Thursday**
 - Two fire cases in the morning
 - One high-impact convective case in the afternoon (full ops simulation)
- **Friday Morning**
 - Wrap up with discussion and feedback

Comments and/or Questions?

