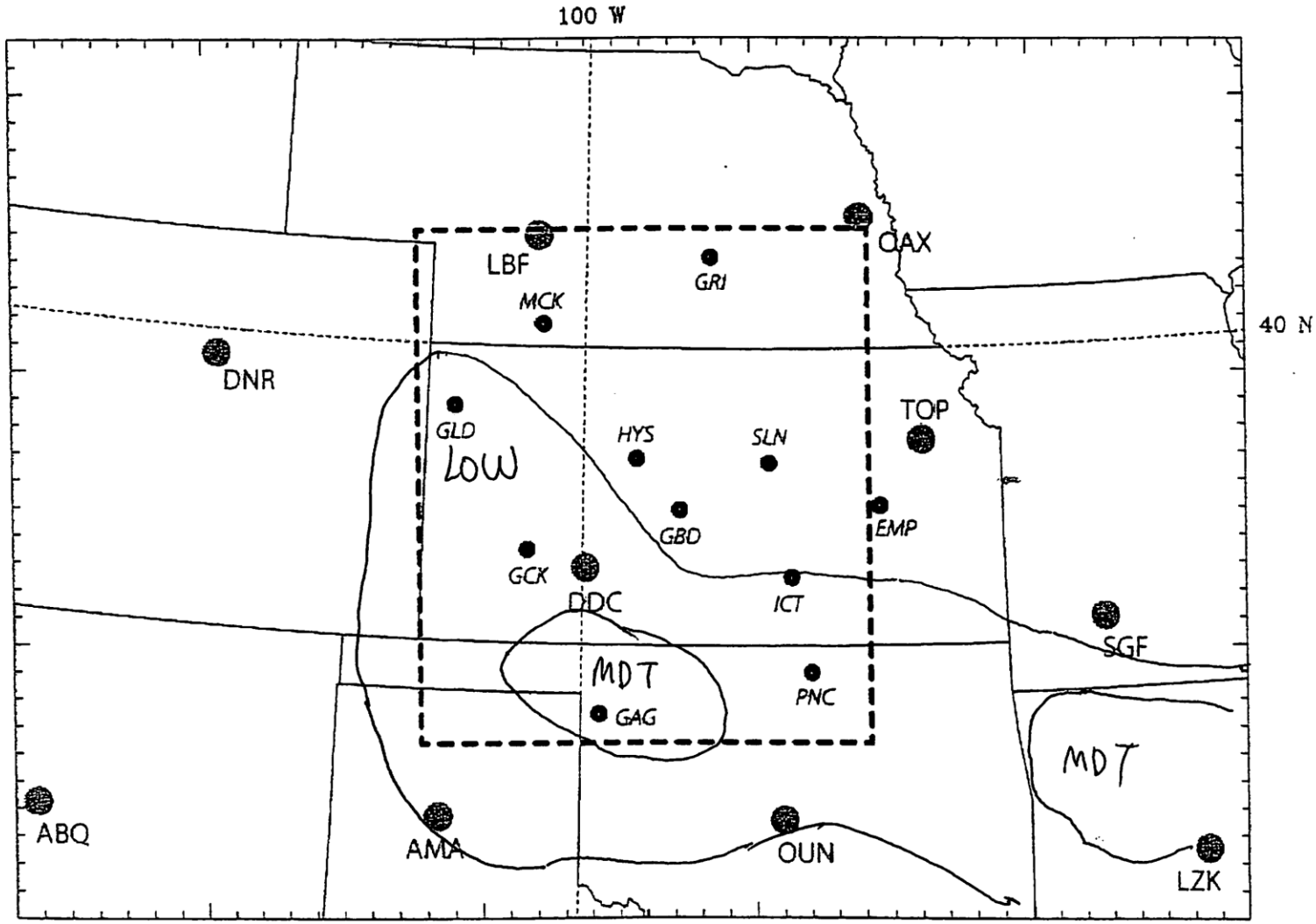
PECAN Forecasting and Nowcasting Plans

Thoughts after dry run

- Forecasts in general turned out to be surprisingly good, and weather was generally active
- No real bore-specific forecast products were present at that time, so bore forecasting was a bit of a stretch
- During active weather, the workload was a bit much for just one person, but in some cases, that was partly due to people still having to carry on somewhat normal lives back home, doing other work too!

Example of a day 1 forecast for MCSs in 7-10z period

6/5/14 Day 1 MCS 7-10 Z



Improvements in tools since the dry run

- Bore forecasting tools have been developed (Steve Koch and Kevin) – Kevin will discuss later
- Chris Karstens adapted his Phi tool that was first used at the NOAA Haz Wx Testbed Spring Experiment last May-June, and this web-based system will be the primary vehicle by which forecast maps are created

High-res ensemble availability

- Xuguang at OU has planned for 12z and 18z runs of ensembles to be made available to the teams
- At 7am, a 10 member 4km ensemble (12z) will run to 48hrs, with 20 members going to 24 hrs – early lead time output will be available at 11 am, all of this output should be available around 1 pm (useful for 3 pm briefing)
- A 1 km run will be done at 7am as well out to 24 h
- At 1 pm, a 10 member 4 km ensemble (18z) will be run (10 members out to 42 h) with 20 members out to 18h – early lead time output available at 4 pm, with all output by 5:30 pm (useful for 9-10 pm day 2 update).

Forecasting/Nowcasting staff

- Expert forecasters/nowcasters – Stan Trier, David Imy, Jack Hales, Bill Gallus (generally will be in Hays for shifts lasting 7-21 days, with 3 of the 4 doing 2 shifts)
- Expert Nowcaster – David Blanchard will assist during Jun 22-Jul 6 period (could assist with forecasting if needed)
- Graduate student assistants (ISU crew- 2 on duty at all times, 1 will assist with nowcasting if needed) – Brad Carlberg, John Lawson, Sean Stelten, Brian Squitieri

Forecasting/Nowcasting staff (cont.)

- Other students from other institutions may help at times (Bethany Norris from U of IL likely will be there at most times)
- At least 1 expert forecaster and 1 student assistant will be present at all times on the forecast team
- Nowcasters only needed during IOPs, or about 20 days. On these days, goal will be to have at least 1 expert nowcaster and 1 student assistant
- Since we will always have at least 5 bodies present, at least one team will have more people on it

PECAN Forecasting Plans

- MCSs, bores, and pristine nocturnal Convective Initiation
- Probabilities of Low (0-30%) , Moderate (30-70%) , High (> 70%)
- 9:30 am conference call with NWS offices if significant weather is expected within their CWA
- Preliminary Day 1 forecast by 11:00-11:30 am (probabilities within 00-12 UTC) with brief mention of Day 2 if active day expected
- Primary forecast for Day 1, with lesser emphasis for Days 2,3 at 3 pm
  - MCS forecasts every 3 hours beginning with expected initiation period
  - Bore forecasts for 00-06, and 06-12 UTC
  - Pristine CI forecasts for 00-06 and 06-12 UTC
  - Day 2 forecasts for 00-12 UTC

- Possible consultation with incoming nowcast crew in the 4-5:30 pm window
- Day 2 Update at 9-10 pm (probabilities for 00-12 UTC period)

PECAN Nowcasting Plans (tentative)

- At 6 pm, update the 3 hour MCS forecasts and include a line segment with expected leading edge of MCS at the end of each 3 hour period. Also update the 6 hour CI forecasts
- At 7 pm, issue preliminary update on expected bore characteristics
- At 9 pm, do a bore parameter update for 03-06,06-12z
- Between 9-10 pm do an update of Day 2 forecast
- At 10 pm, update 3 hour bore forecasts for 06-09 and 09-12z, including line segment of expected leading edge of MCS at end of each 3 hour period. Also update CI 06-12z forecast.
- At 11 pm, update the 06-12z bore forecasts
- Midnight update of forecasted leading edge of MCS for 09-12z, and CI forecast for 09-12z

Schedule of Forecasters/Nowcasters

- Forecast crew (typically 1 or 2 experts, with 1 or 2 graduate student assistants) will generally work an 8am-5pm shift
- Nowcast crew (typically 1 or 2 experts, with 1 or 2 graduate student assistants) will work a roughly 4 pm-1 am shift (ending time is very flexibile)
- Nowcasters may benefit by arriving at 3 pm for the main briefing

Phi Tool – primary vehicle for issuing forecasts

- Created by Chris Karstens at CIMMS
- Had been used in NOAA Hazardous Weather Testbed last spring (2014)
- Chris has added to it greatly to meet the needs of the forecast teams for PECAN
- It can access many fields that are helpful for the forecasters to use as a guide for issuing their probability forecasts
- Allows drawing of contours (like NMAP2)

Model Output Available Plus Bore Tools

- 2015 version of the NSSL-WRF ensemble will be avaiable (Fields include MUCAPE, SBCAPE, SBCIN, 0-1 SRH, 0-3 SRH, Composite Reflectivity, 1 km AGL Reflectivity, 2 m Temperature, 2 m Dewpoint, 10 m wind speeds, 2-5 km Updraft Helicity, Hailcast, 3/6/12 hour QPF)

- NAM, GFS, and the HRRR output will be available with similar fields

- Xuguang and Aaron will be running special 4 km Ensemble – output will be available

- Bore Prediction Tools:

- Chris will build a widget allowing for grid-point extraction of data from the HRRR that can feed into Kevin's code.

- Kevin's code will compute bore diagnostics displayed in the PHI tool, likely in a pop-up window.

- In addition, forecasters will be able to view the sounding that was used in the initial computation to fine-tune the variables used in the bore diagnostic computation, if needed.

OTHER AVAILABLE DATA

- Most current satellite data (at least the latest 3-5 hours of visible, IR and WV imagery), available every half hour (:15 and :45 minutes past the hour, with 15 minute latency) from IEM

- Radar data (at least the past 1-2 hours) including:
- Composite Reflectivity
- 1 km AGL Reflectivity
- Maximum Estimated Size of Hail (MESH) tracks
- Azimuthal Shear (Rotation) tracks

- An extrapolation tool that can time the movement of features (on satellite or radar)

- Surface data

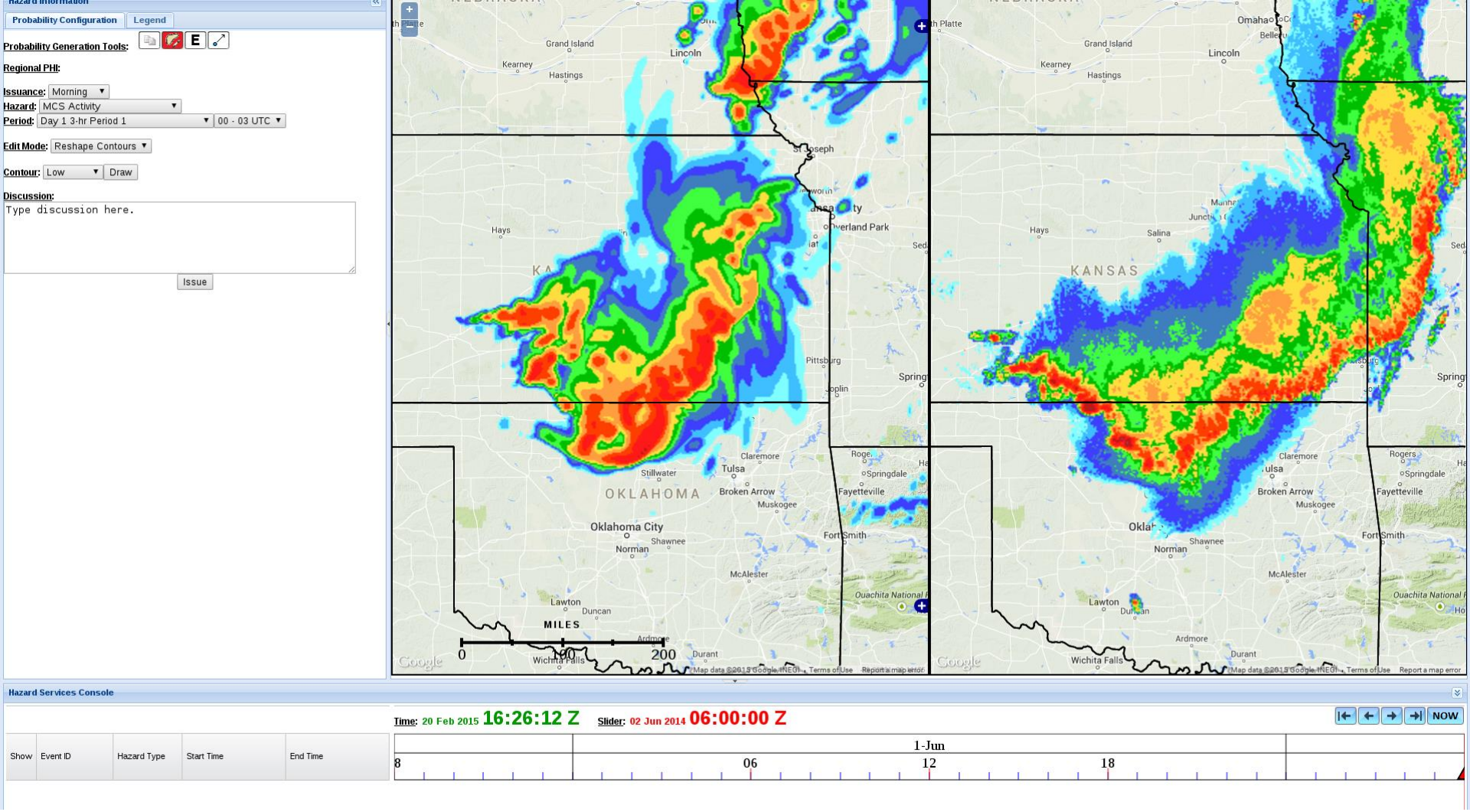
- GFS and NAM 3, 6 and 12 hourly QPF

- Improved the drawing capability on the tool, added some new contour editing tools, including the following:

- Drag contours, Resize contours, Rotate contours, Vertex reshaping, Eraser abilities

- Surface mesoanalysis page data -- Using 13 km RAP surface OA (arrives 52 minutes past the hour)

- Overlay of SPC Convective Outlooks (Severe and higher resolution thunder)



The tool allows one to compare simulated radar with observed radar at a particular time

SSL Prototype Probabilistic Hazard Information (PHI) Tool

Hazard Information

Probability Configuration | Legend

robability Generation Tools:

egional PHI:

ssuance: Morning

azard: MCS Activity

eriod: Day 1 3-hr Period 1 | 00 - 03 UTC

dit Mode: Reshape Contours

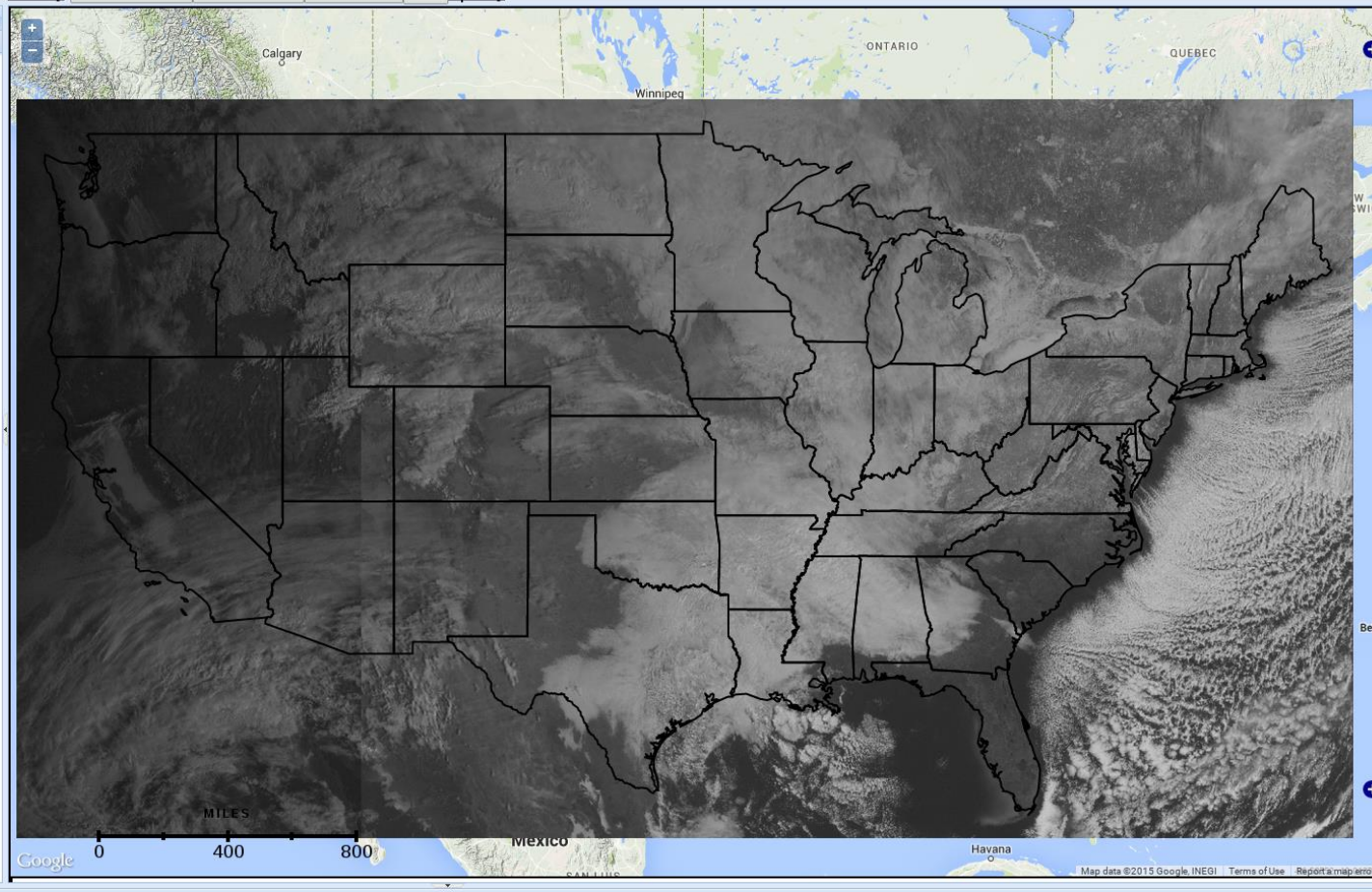
ontour: Low | Draw

iscussion:

Type discussion here.

Issue

Overlay: Observations | Satellite | Visible | Clear Opacity: 100%

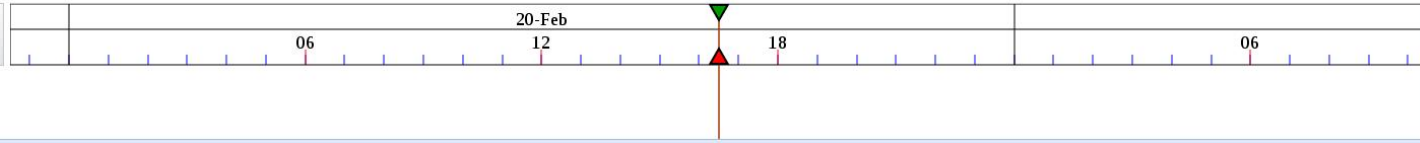


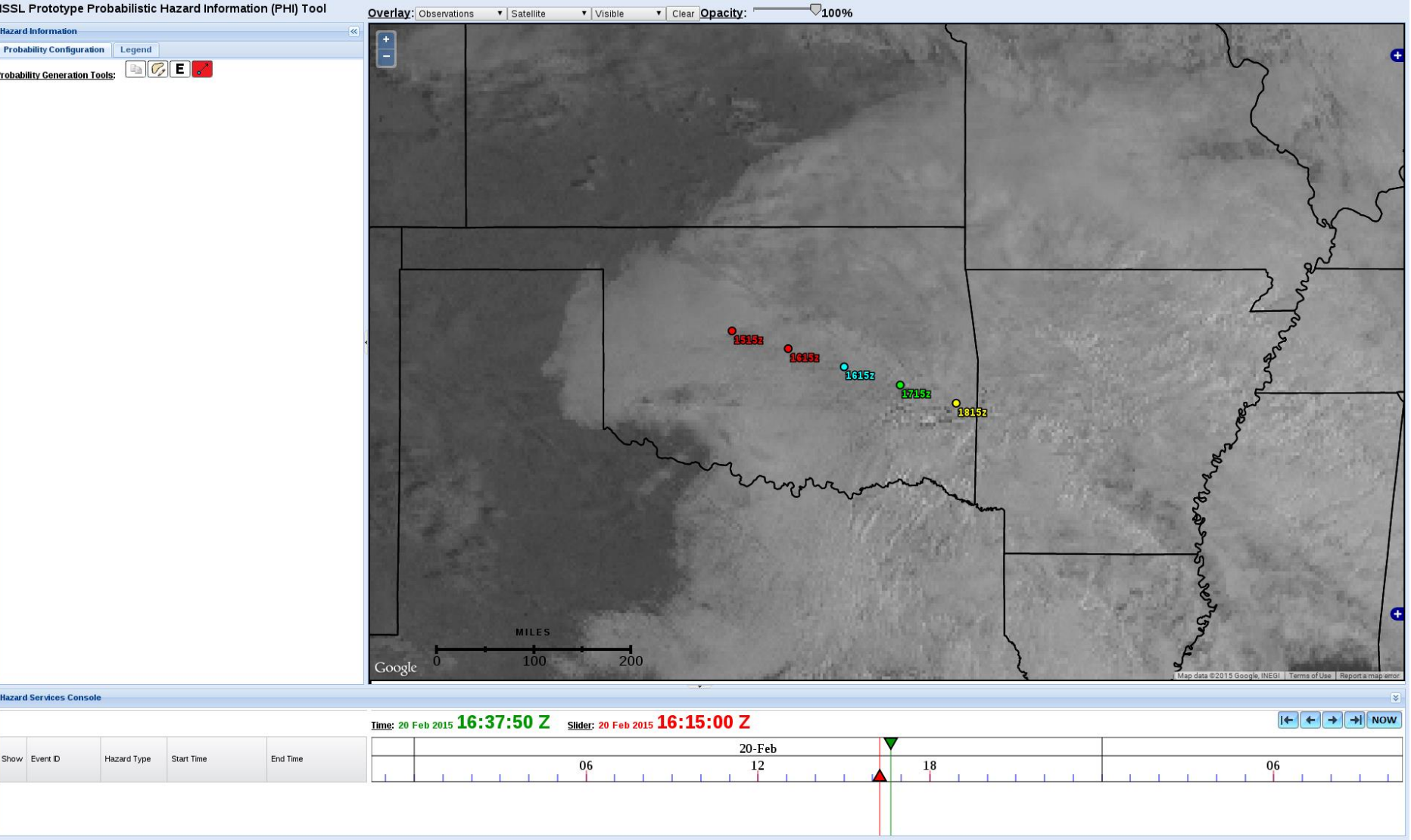
Hazard Services Console

Time: 20 Feb 2015 16:30:48 Z Slider: 20 Feb 2015 16:30:17 Z

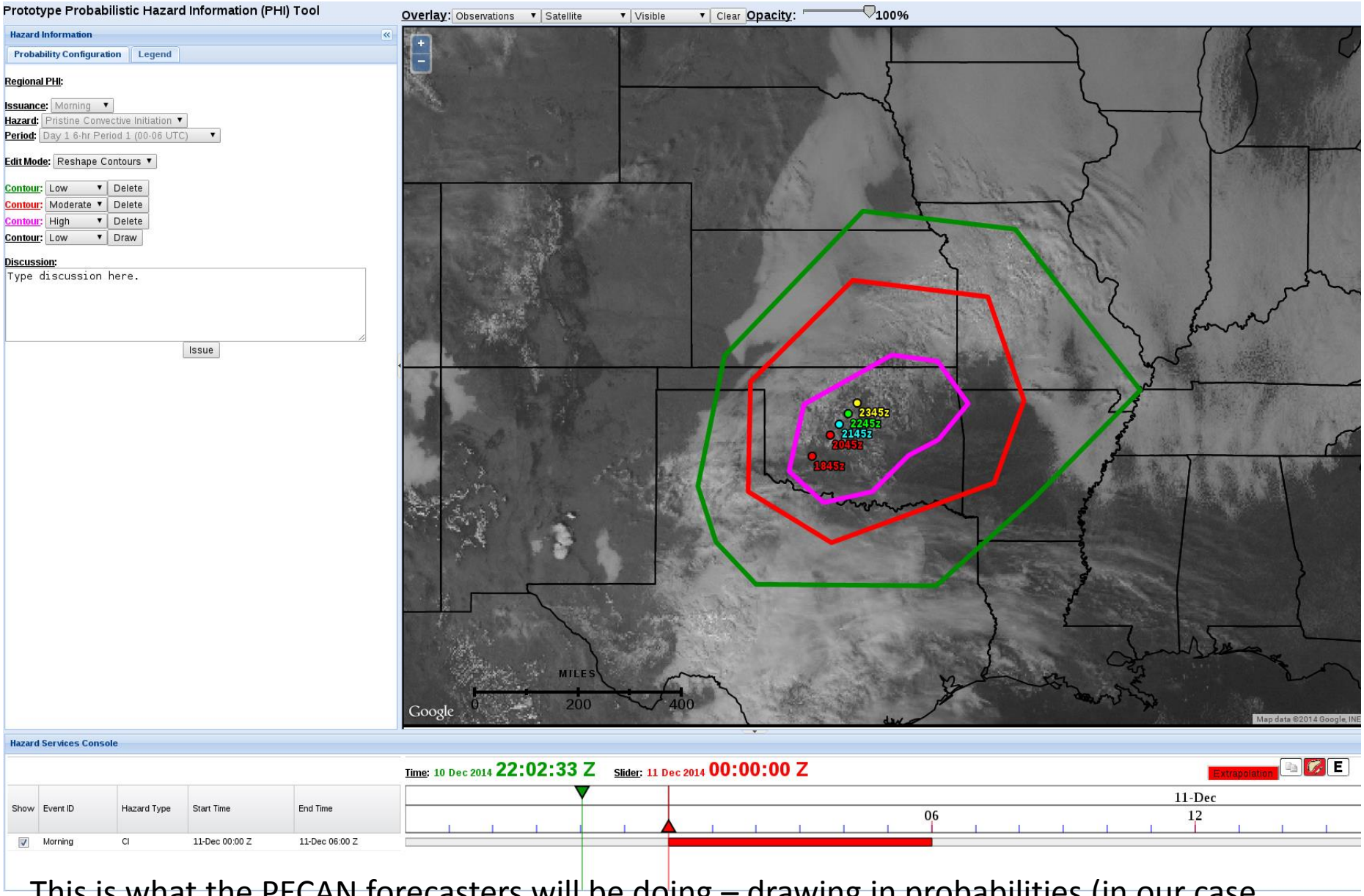
NOW

Show	Event ID	Hazard Type	Start Time	End Time





Extrapolated movement of features can be determined

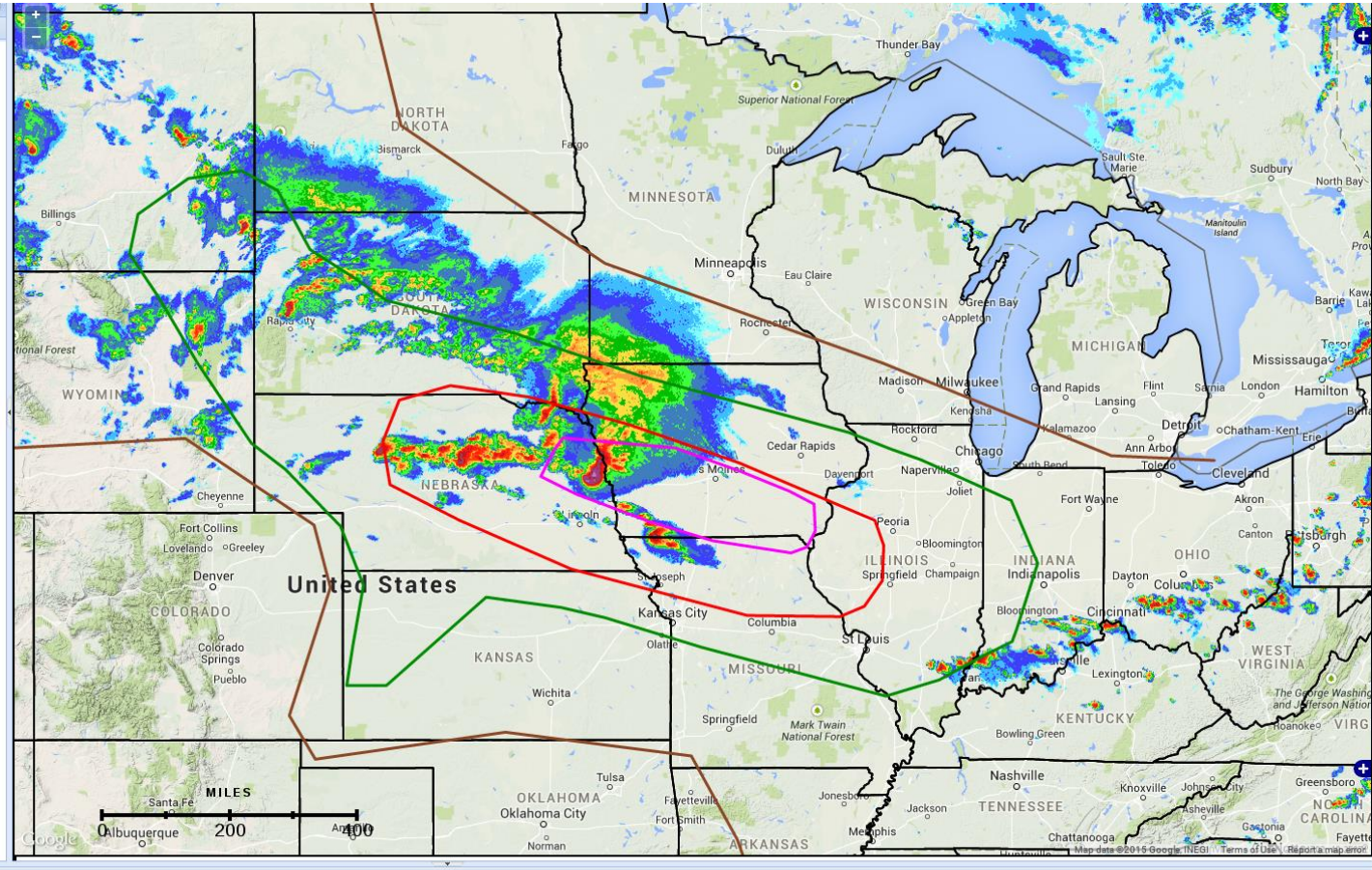


This is what the PECAN forecasters will be doing – drawing in probabilities (in our case, LOW, MDT, HIGH) – and can choose whatever they fell is most useful to have as background

Hazard Information

Probability Configuration | Legend

Probability Generation Tools:



Hazard Services Console

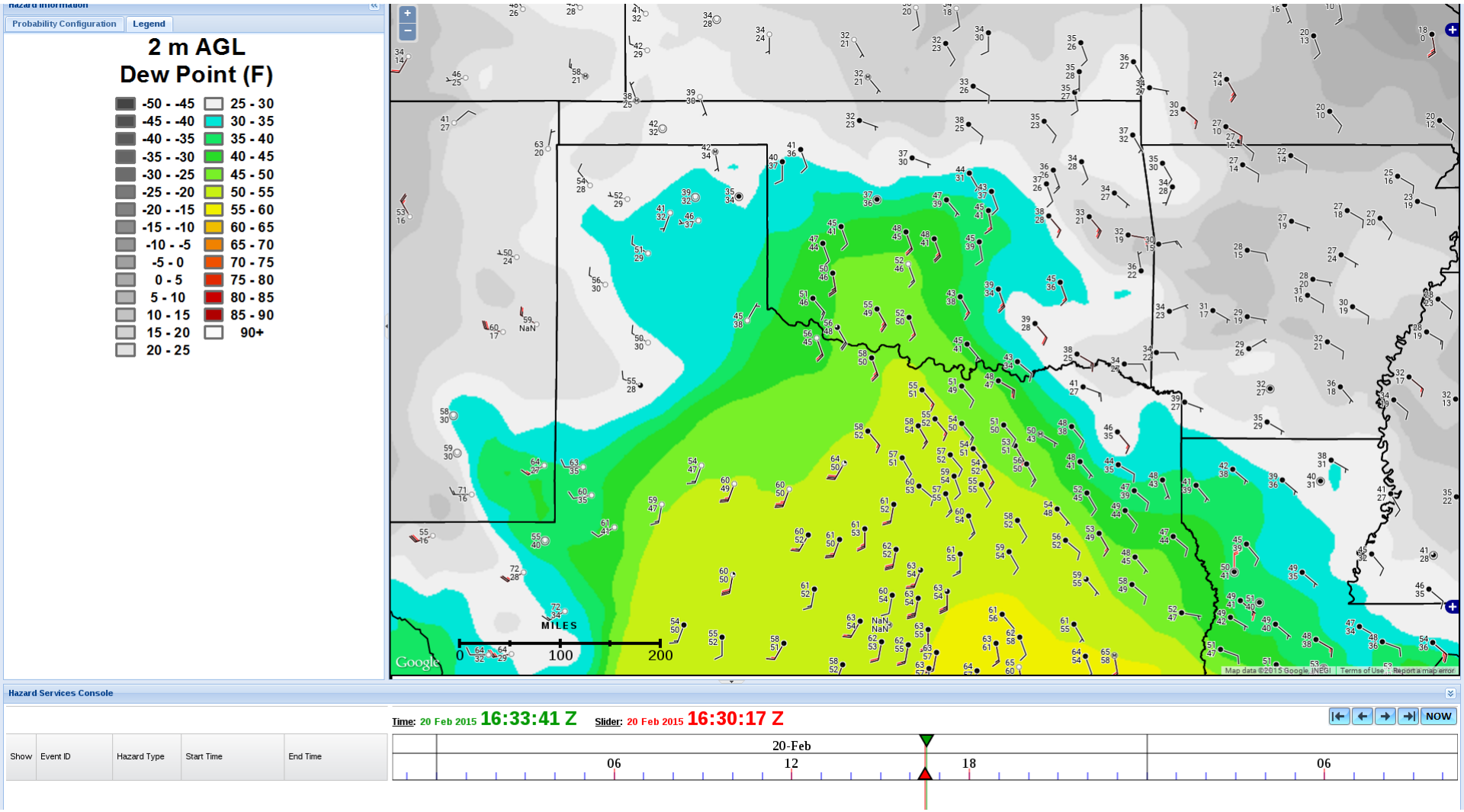
Time: 20 Feb 2015 16:43:18 Z Slider: 03 Jun 2014 21:00:00 Z

NOW

Show	Event ID	Hazard Type	Start Time	End Time

3-Jun

06 12 18 06



Surface data – in this case, dew point

Time to “bore” you…..