Nowcasting Applications

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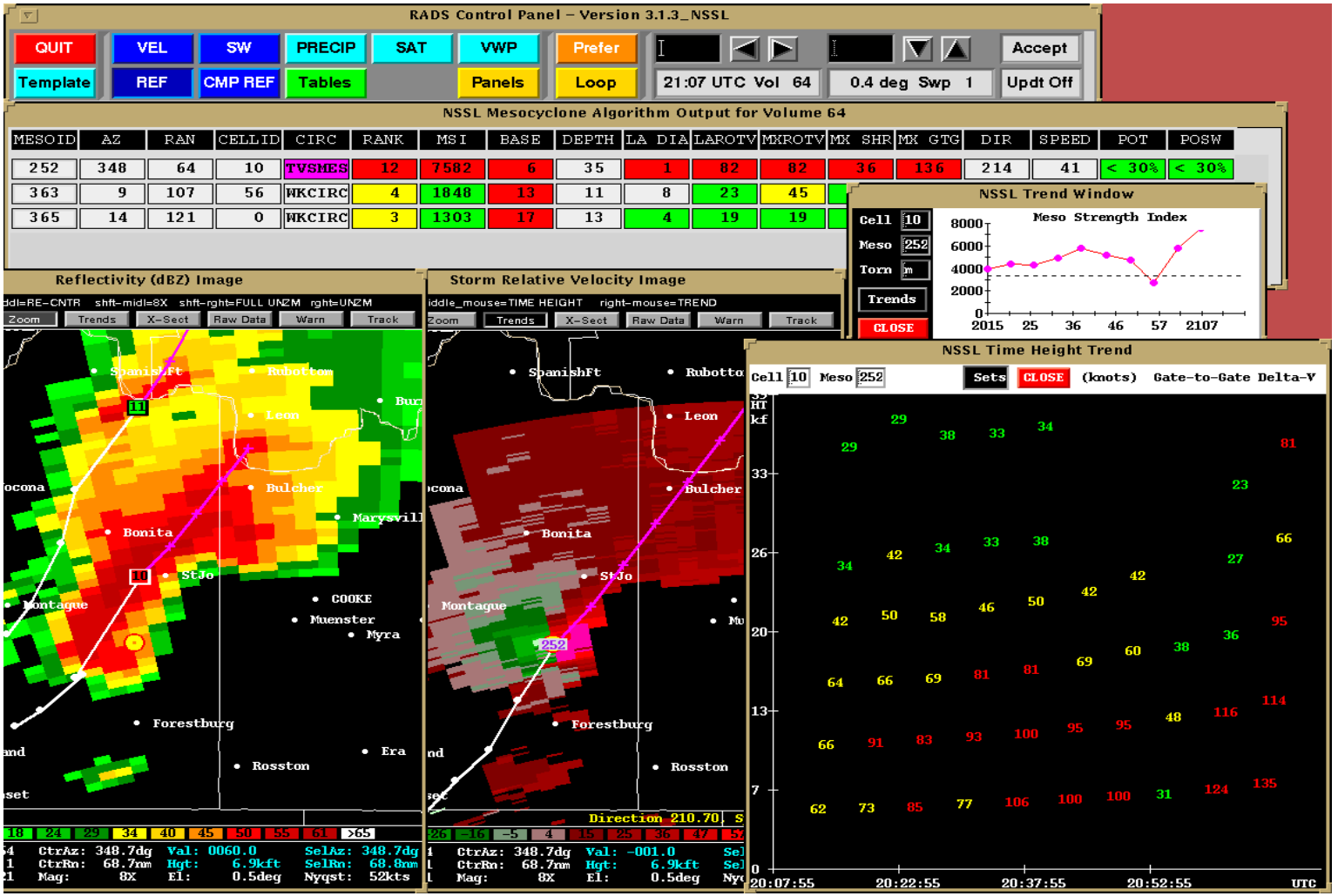
Hazardous Weather Forecasts & Warnings

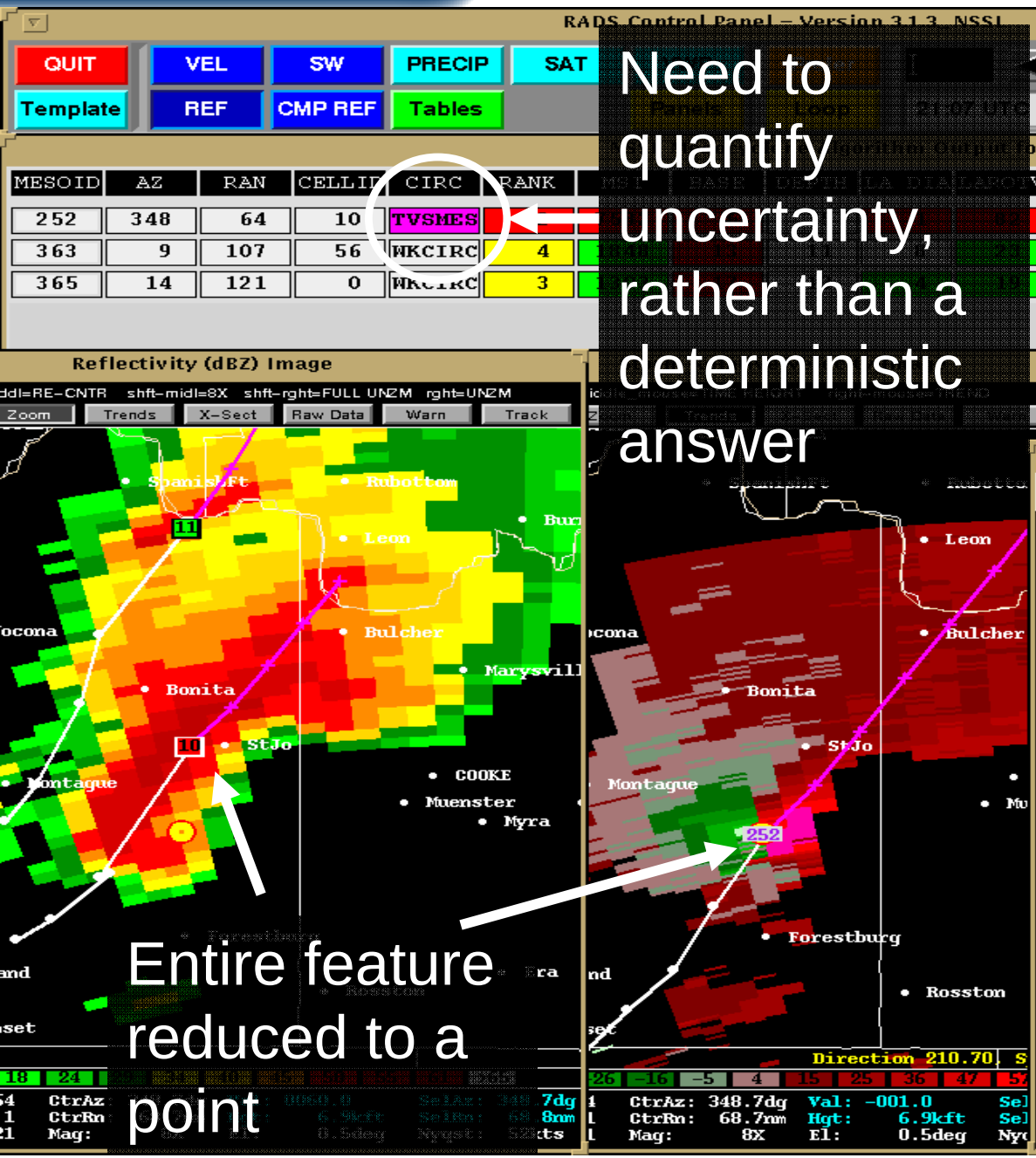
“Nowcasting” Applications

- Remotely sensed ***detection***
- 0-2 hour ***warning*** / forecast
- High temporal and spatial resolution



Assistance for warning decision-making.

Limitations of early algorithms

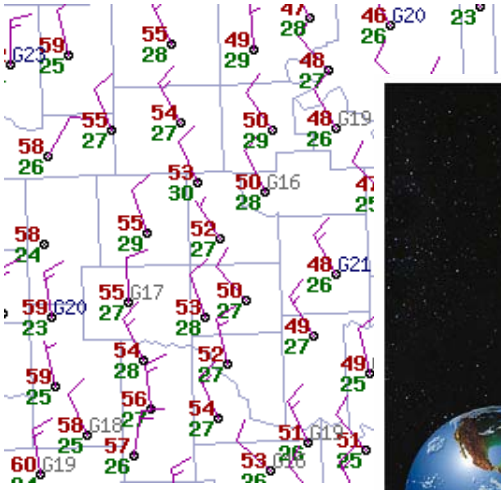


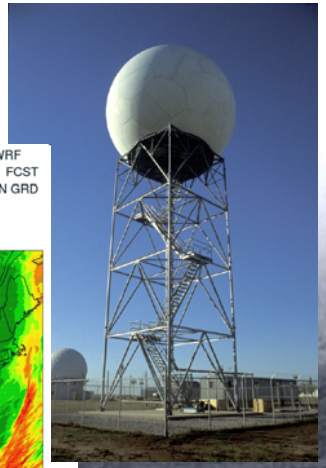
Need to quantify uncertainty, rather than a deterministic answer

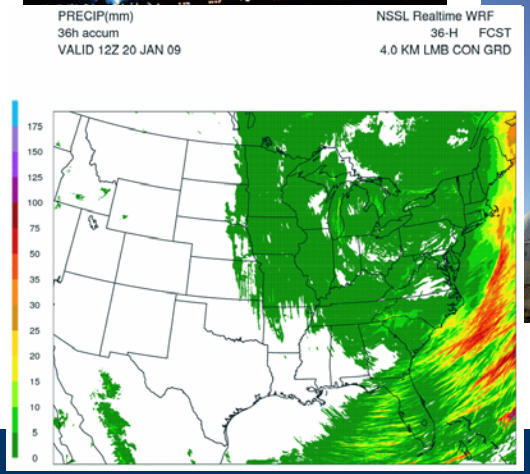
Entire feature reduced to a point

- Need better quality control and higher resolution data
- Need all meteorological information that went into algorithm decision
- Not easy to integrate data from multiple sensors

Multiple sensors



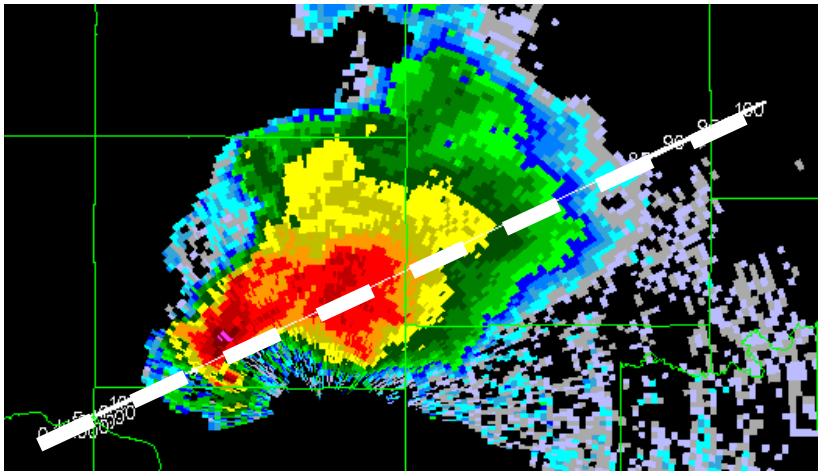


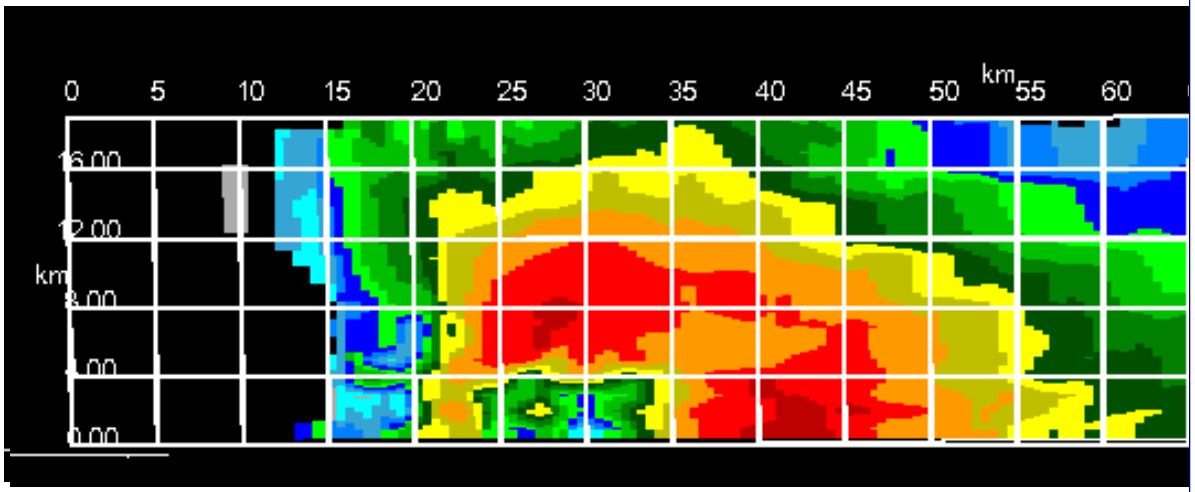


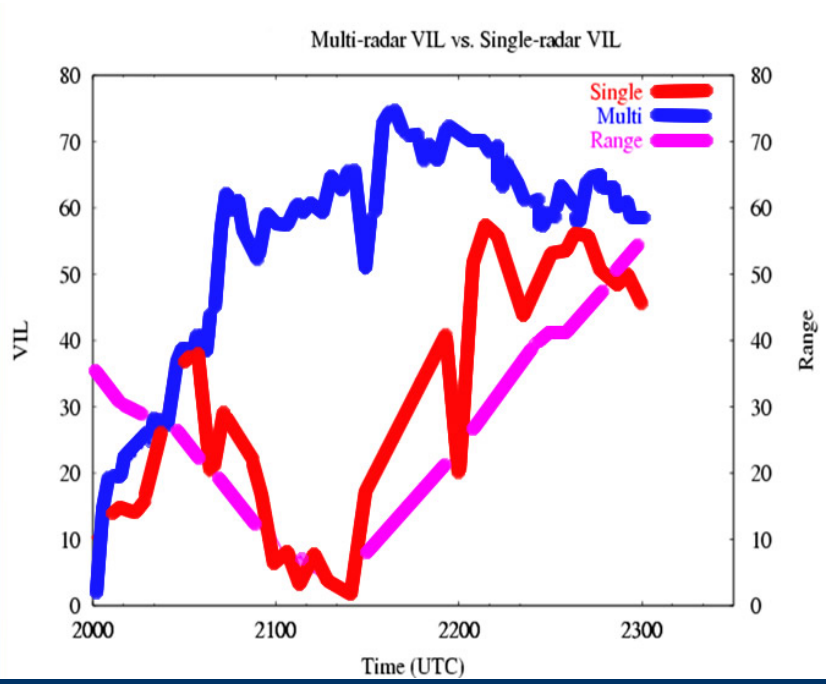
Blended 3D multi-radar data

Radars in network supplement each other:

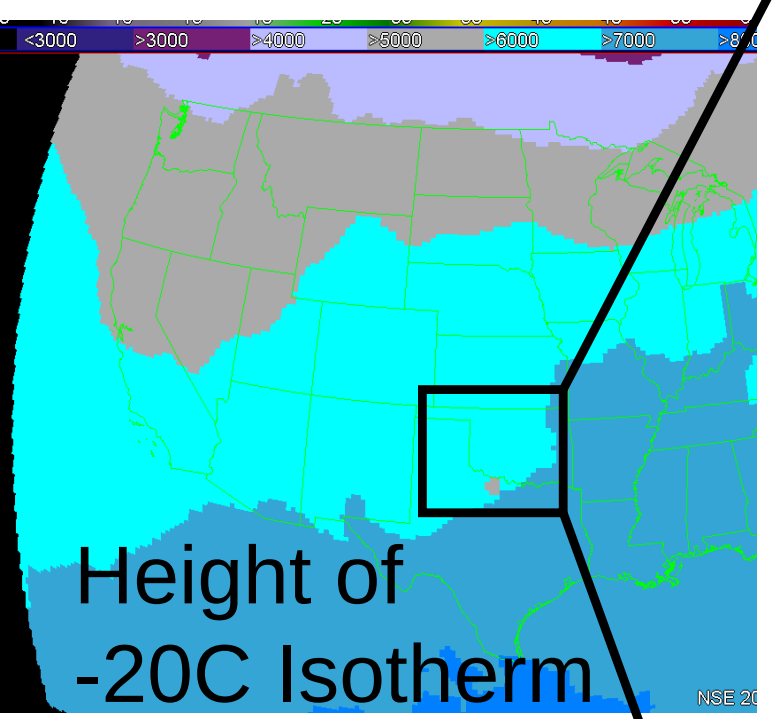
- Overlapping coverage
- Fills in gaps from terrain blockage
- Increased sampling frequency



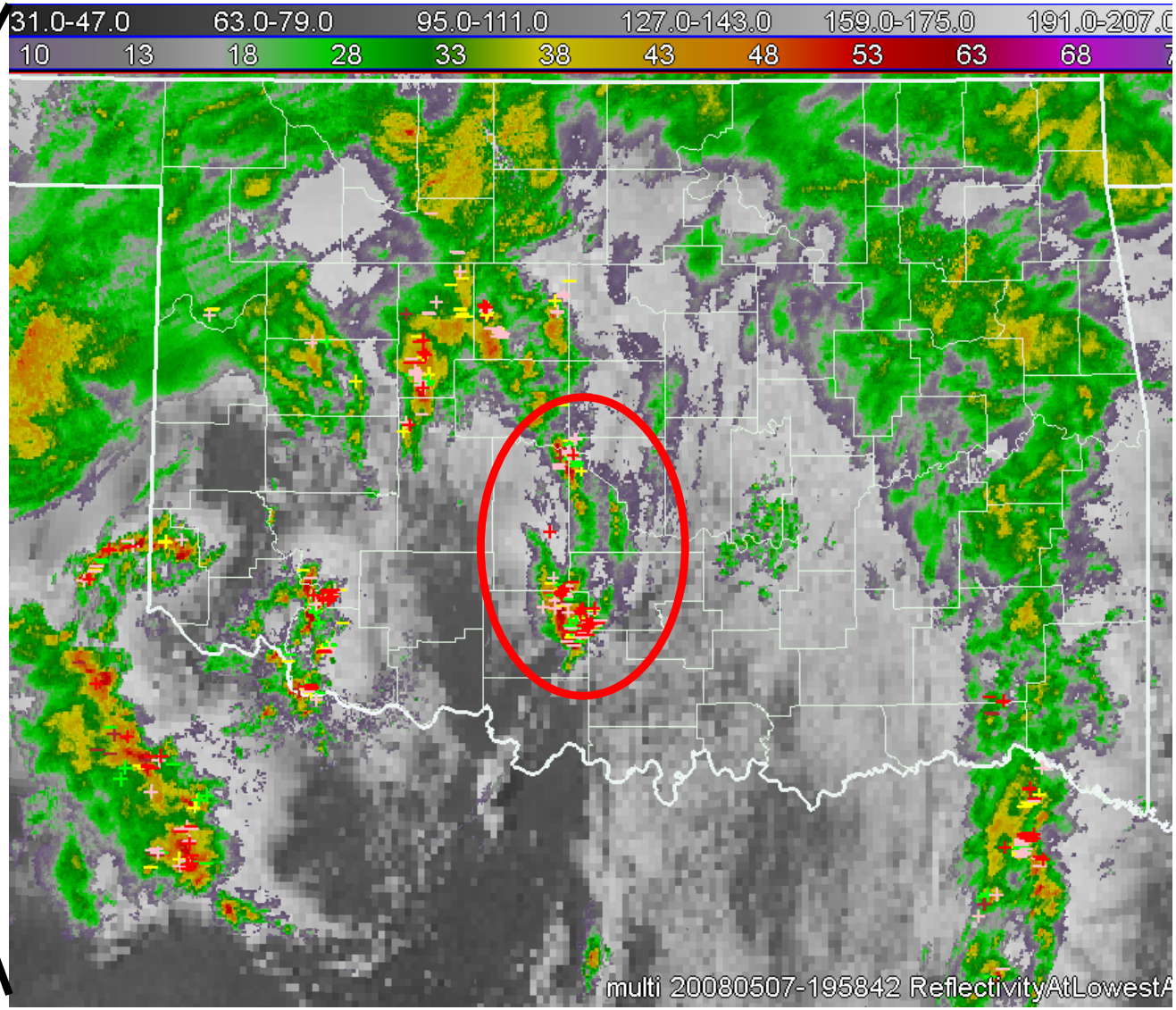




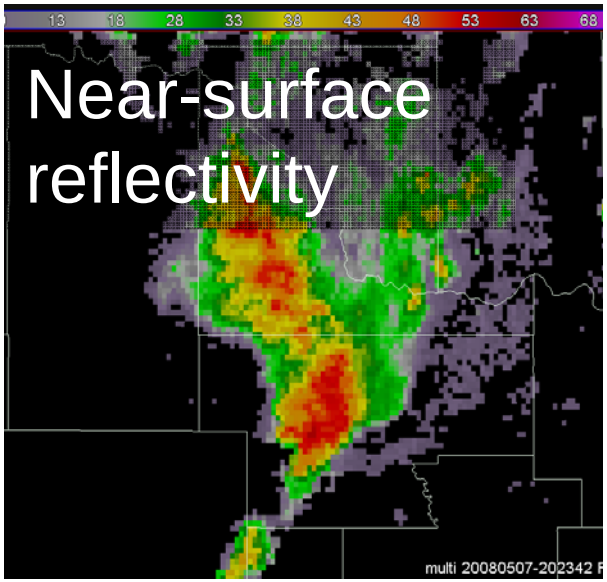
Example: Blending data from multiple sources

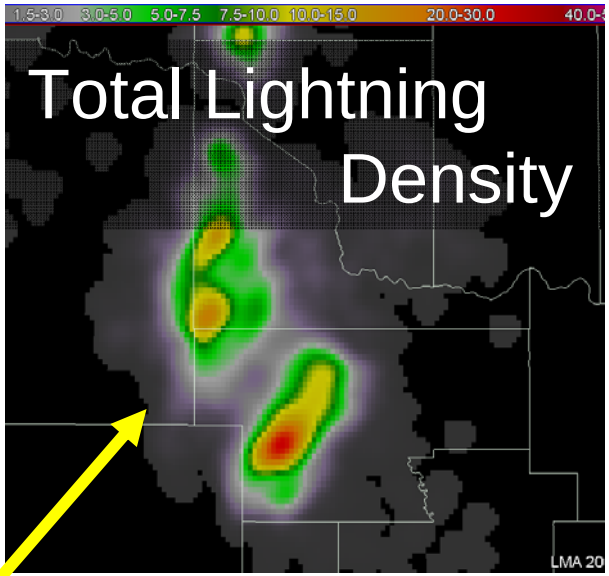


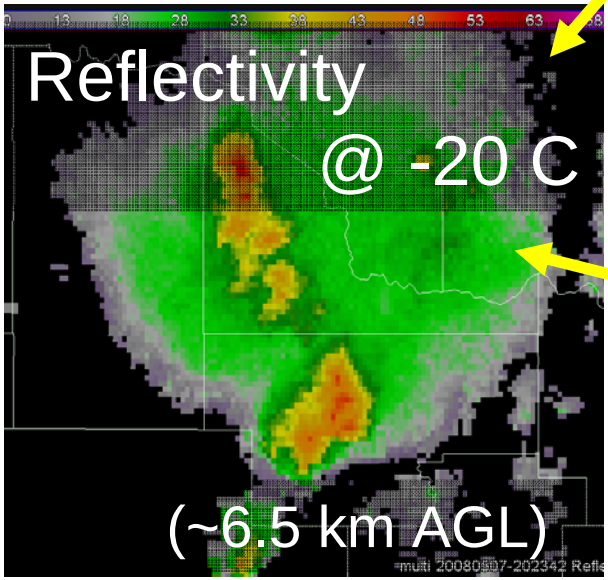
Satellite
Radar
Lightning

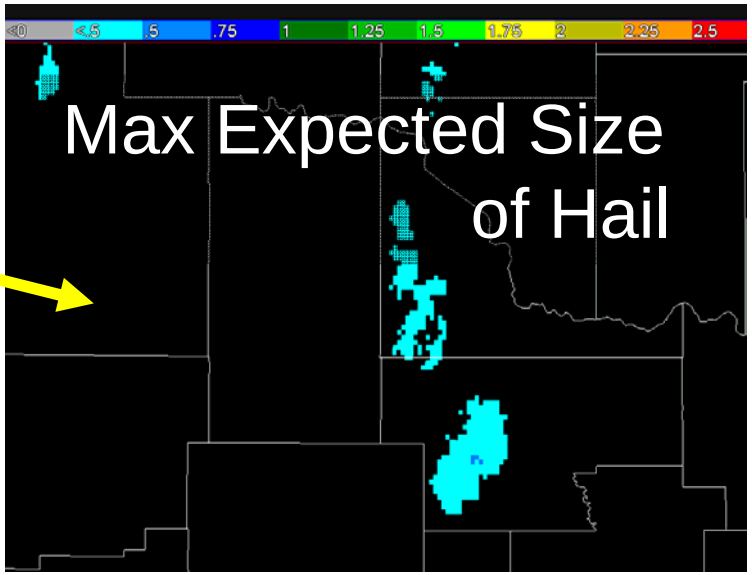


Examples: Multi-sensor data fields





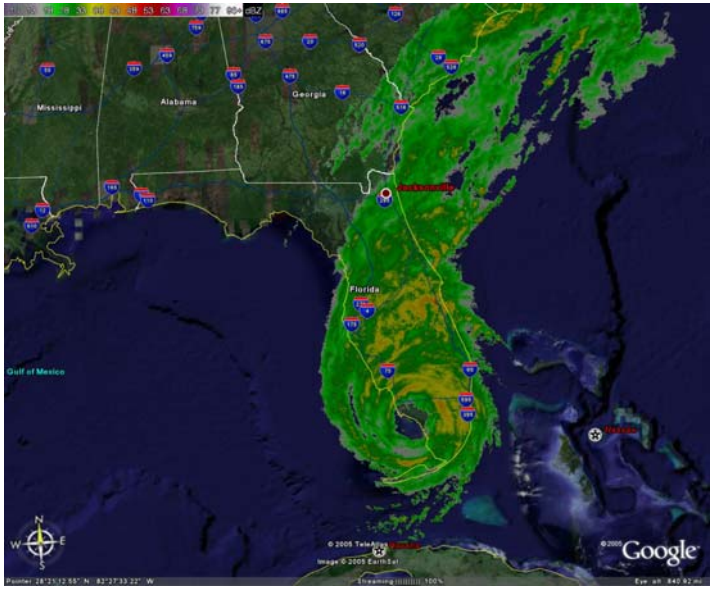




- Show physical relationships between data fields from multiple sensors
- Storm tracks and trends can be generated at any spatial scale, for any data fields

Users

- We produce about 100 different data fields in real-time
  - Storm Prediction Center operations (& other NCEP)
  - 5 NWS Forecast Offices – direct feeds
  - Google Earth layer: 12,000 unique users, 3.5M to 12M hits per month (including additional NWS users)
  - Licensed to private industry: 46% of US TV stations
- Transition to NWS operations once AWIPS2 deployed



WDT

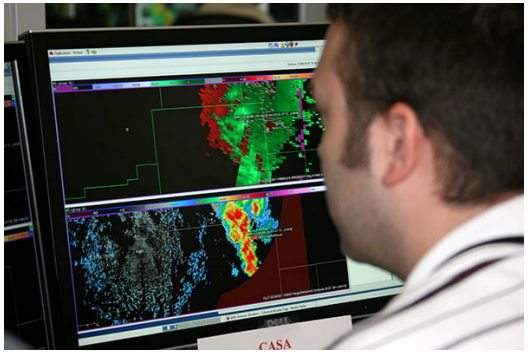
Storm Prediction Center
Norman, Oklahoma

WEATHERCENTRAL

NATIONAL WEATHER SERVICE

Hazardous Weather Testbed / Experimental Warning Program

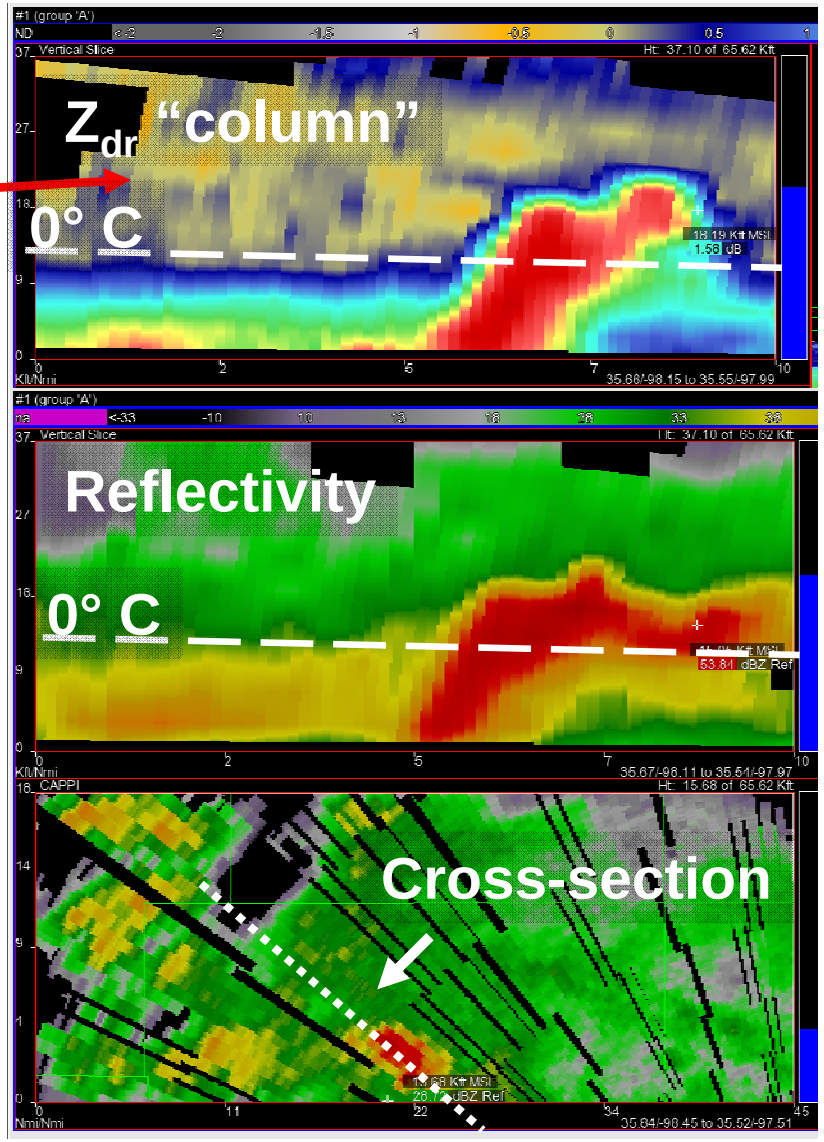
Continued collaboration with forecasters is vital!



Ongoing / Future research

Integrating new data sources

- Polarimetric radar data
- Phased Array Radar
- Total Lightning (GOES-R & ground-based sensors)



CONUS-scale 3D radar re-analysis at 1km / 5 min –

- data mining
- 1995 – present

Summary

Science and applications to support nowcasting:

- Multi-sensor applications
- Forecaster-driven
- Products show physical process relationships
- Moving towards probabilistic hazard information
- Wide use across NWS and private sector