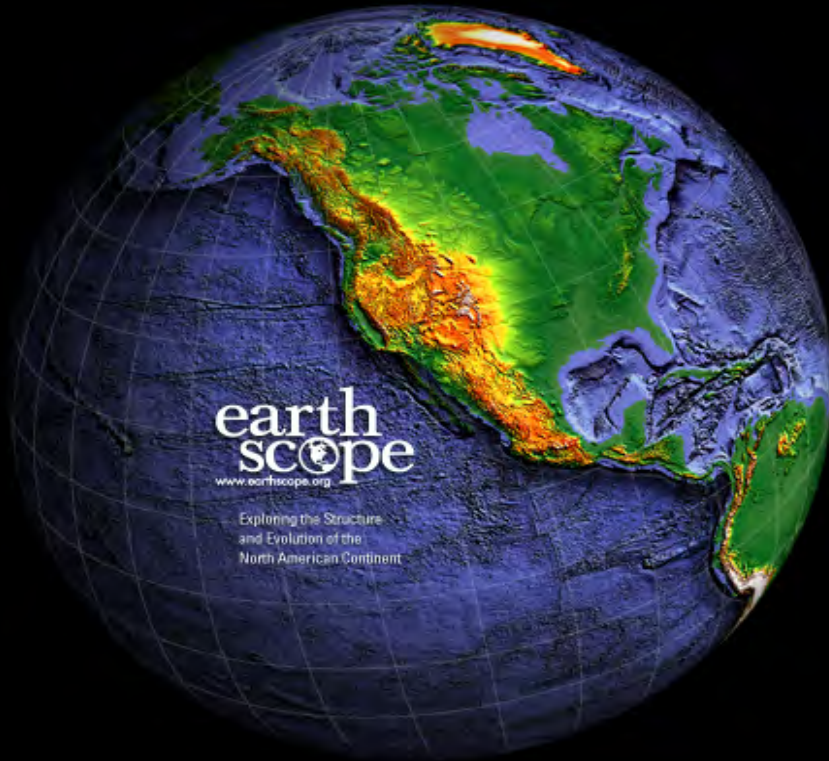


# USArray Meteorological Results



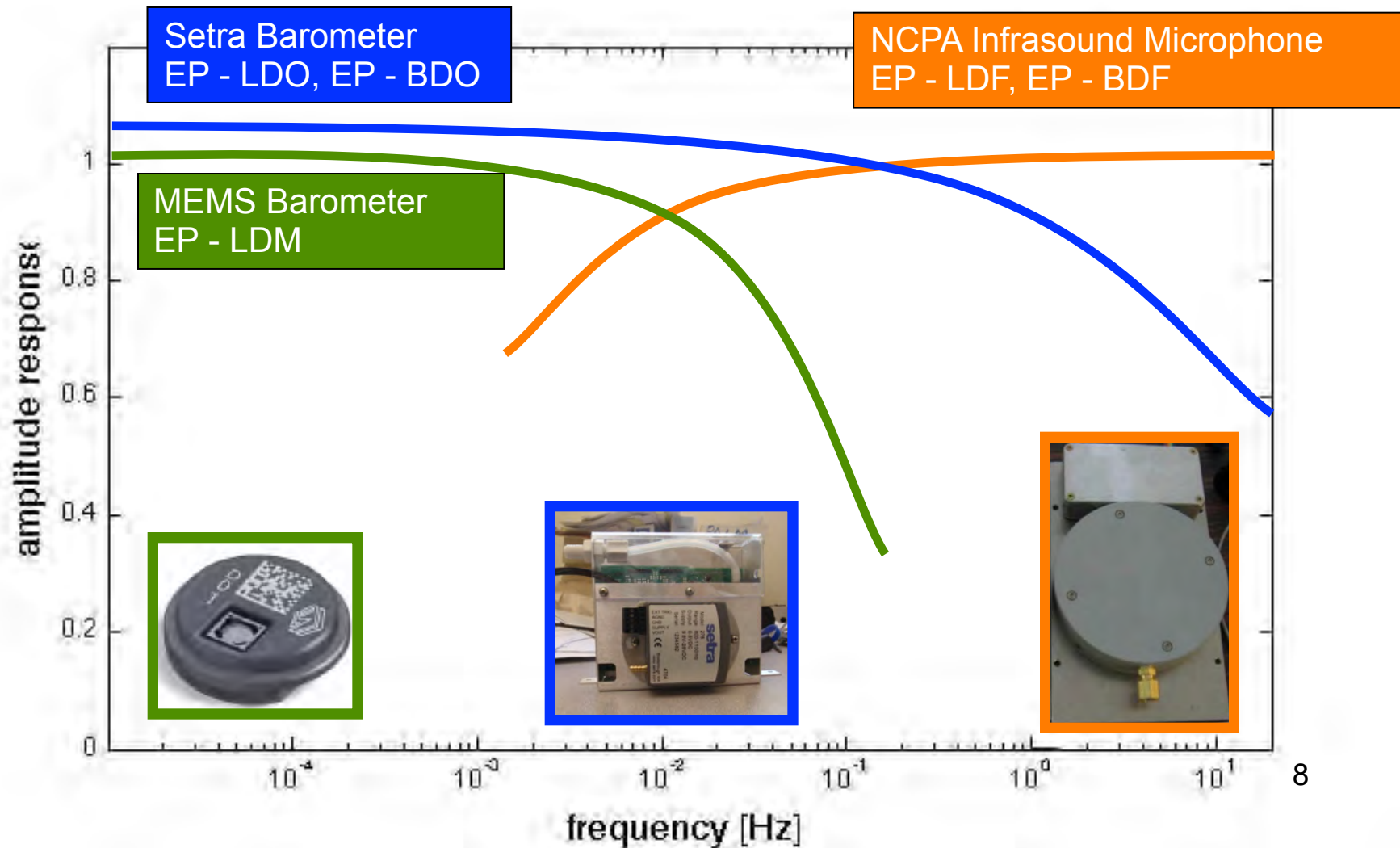
*Frank Vernon*

*Scripps Institution of Oceanography  
University of California, San Diego*

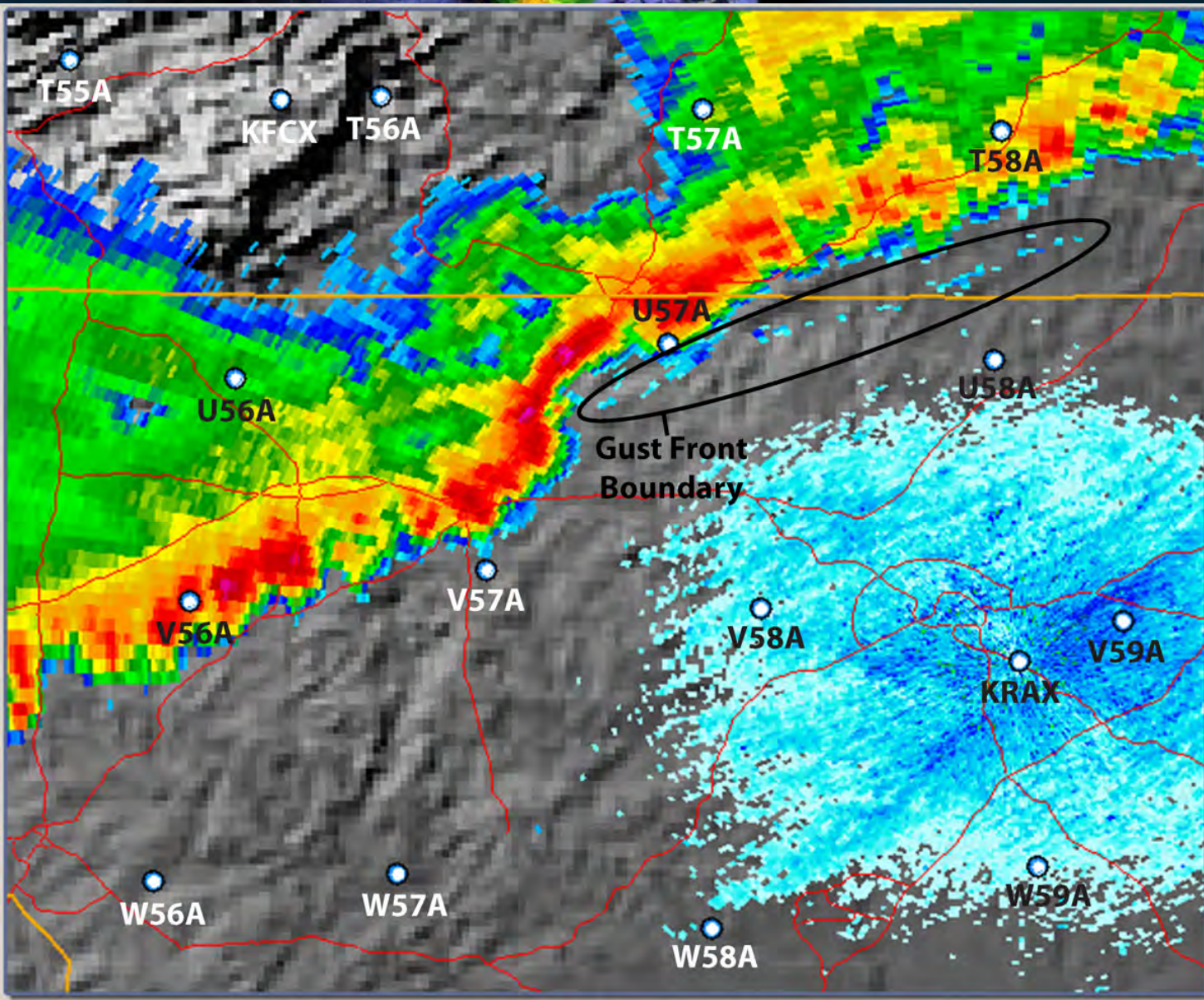
*Fairbanks AUG*

*19 Aug 2016*

- Overlapping pass-bands provides continuous coverage from DC to 20 Hz



# Squall Line Following 6/13/2013 Derecho



NEXRAD LEVEL-III  
BASE REFLECTIVITY  
KRAX - RALEIGH/DUR, NC  
06/13/2013 20:32:33 GMT  
LAT: 35/39/53 N  
LON: 78/29/23 W  
ELEV: 461 FT  
MODE/VCP: A / 212

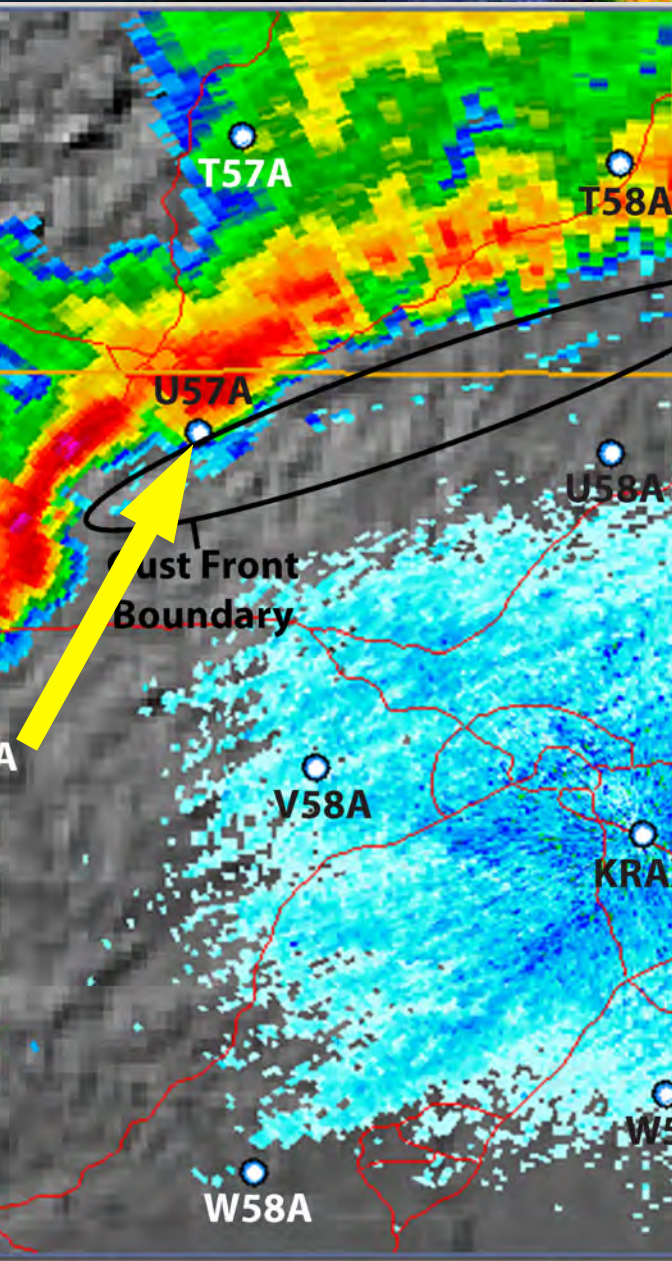
ELEV ANGLE: 0.50 °  
MAX: 63 DBZ  
RANGE: 248 NM

Legend: dBZ

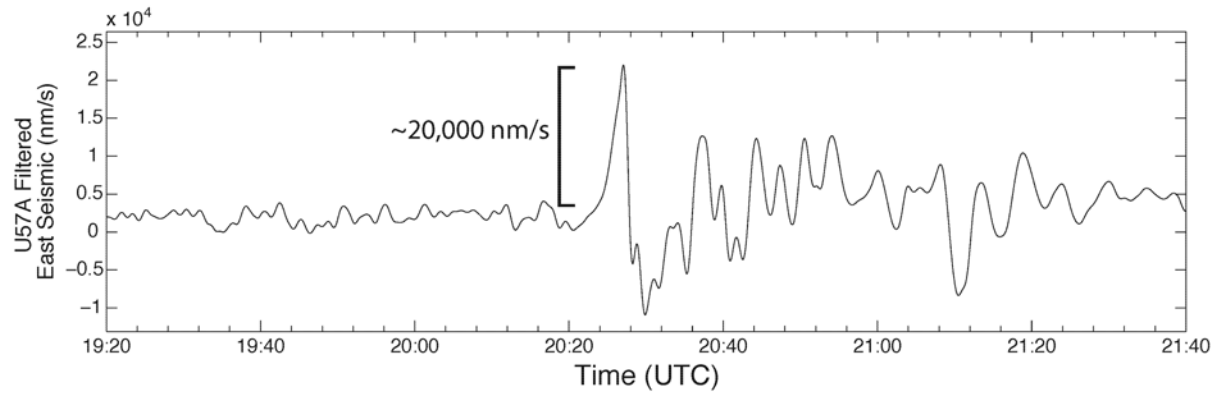
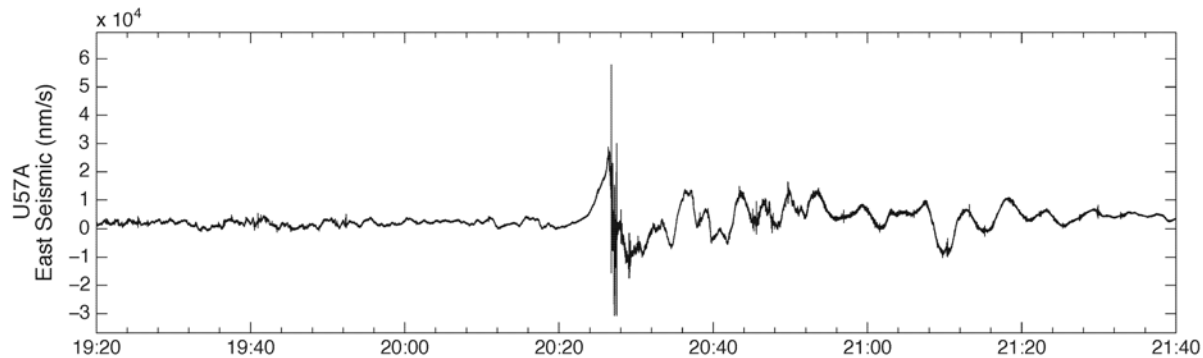
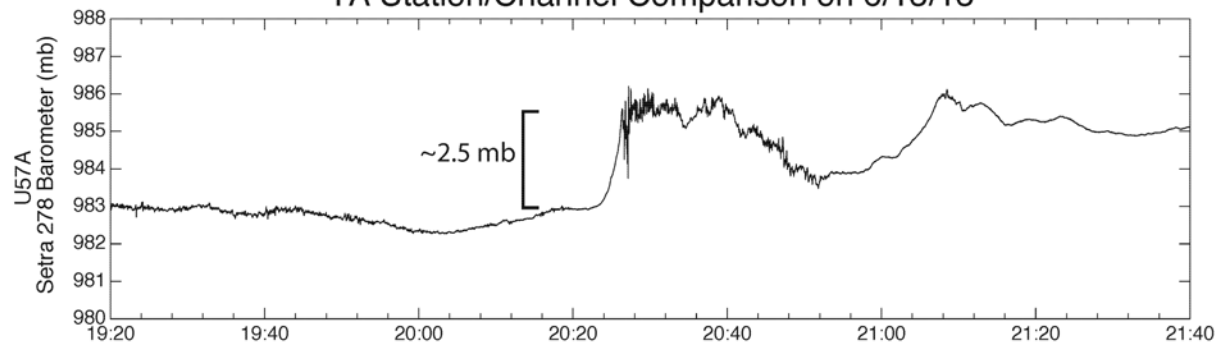
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
-10
-15
-20
-25
RF



# 6/13/2013 Derecho U57A

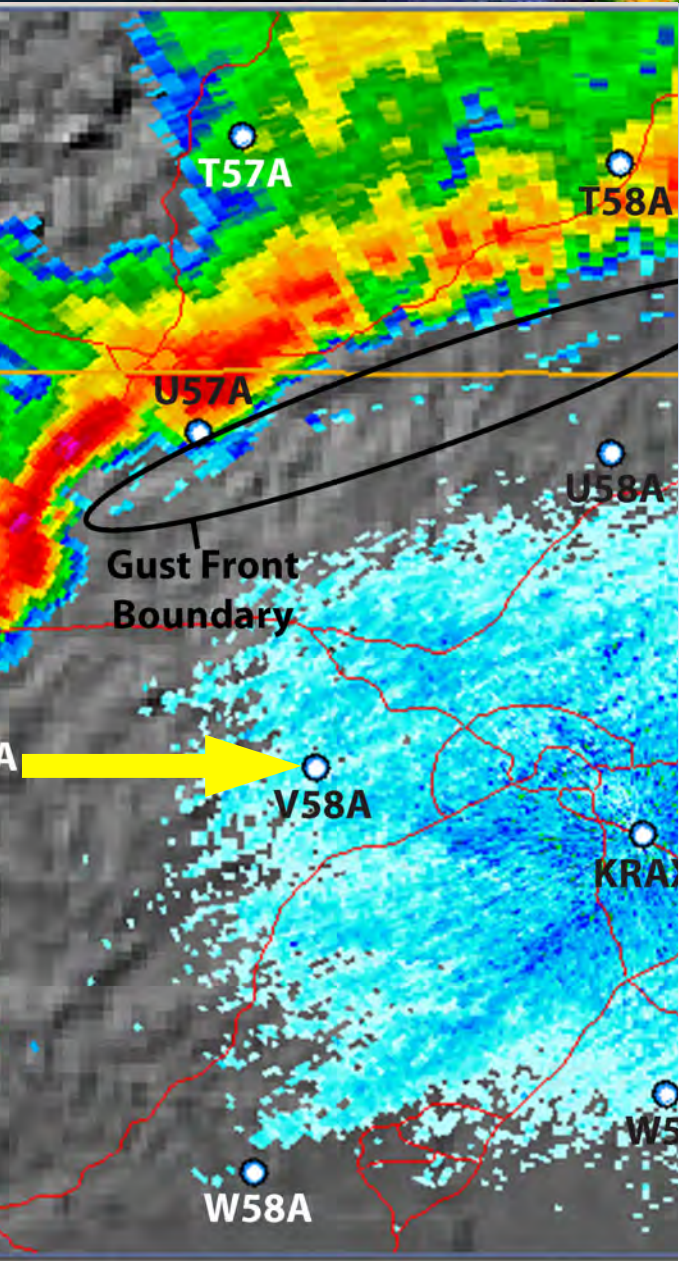


TA Station/Channel Comparison on 6/13/13

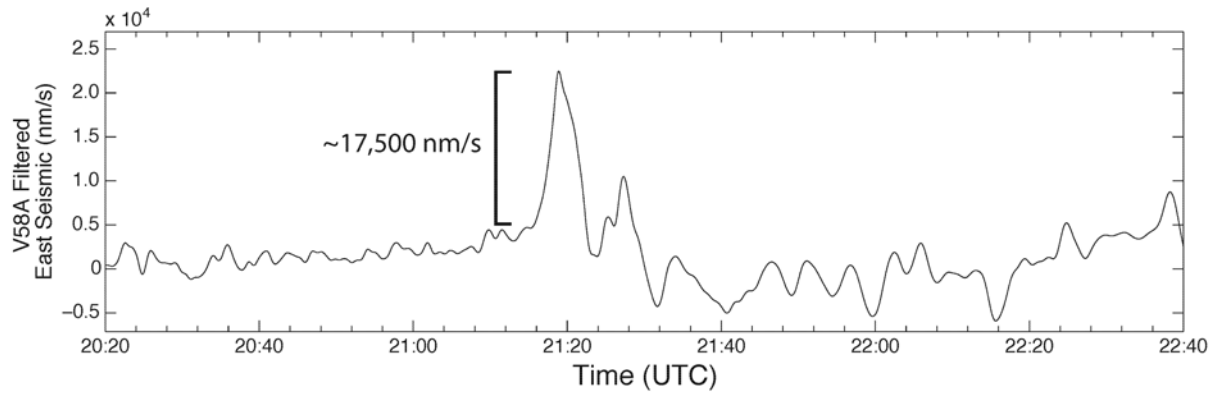
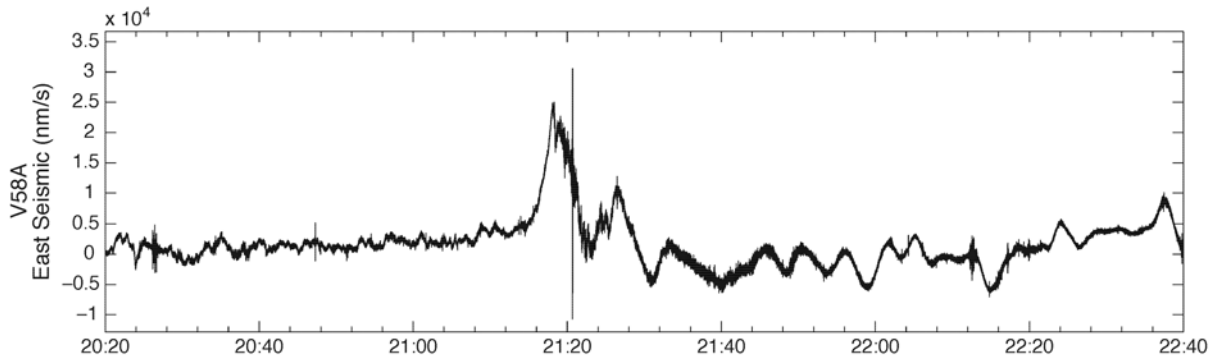
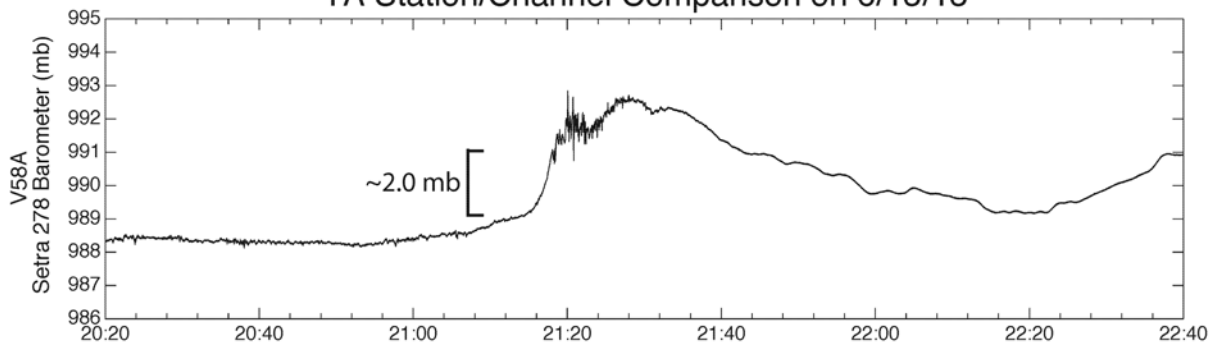




# 6/13/2013 Derecho V58A

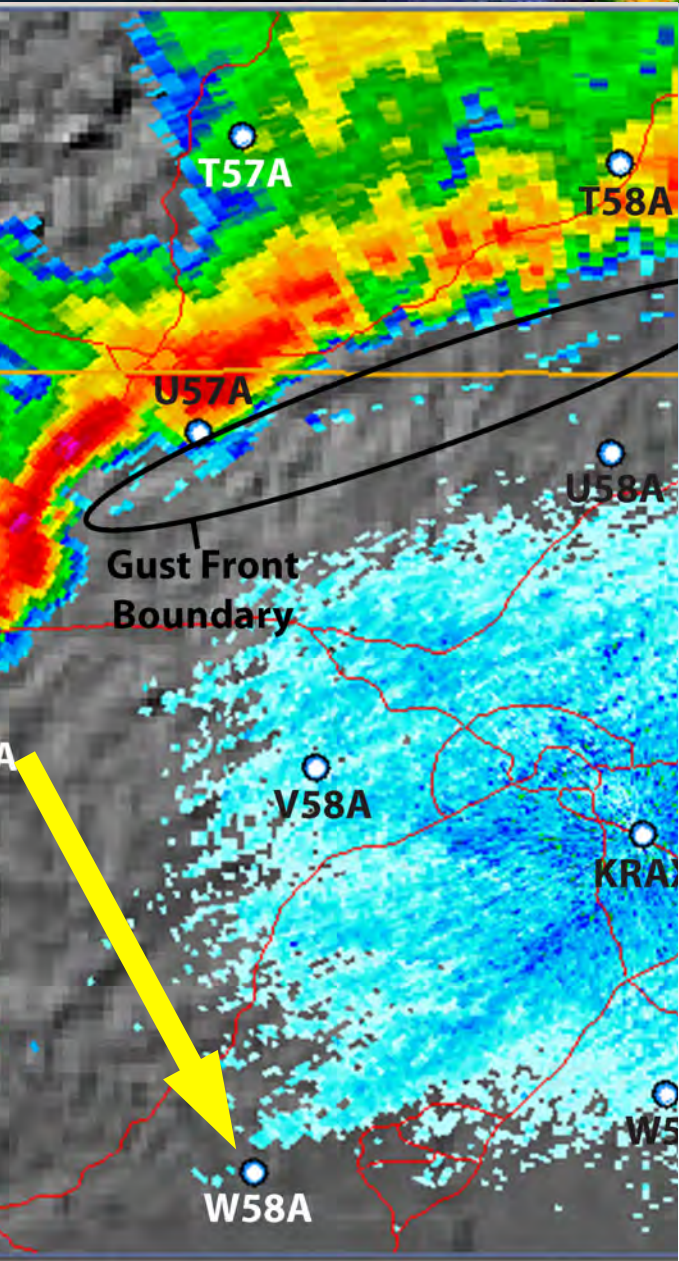


TA Station/Channel Comparison on 6/13/13

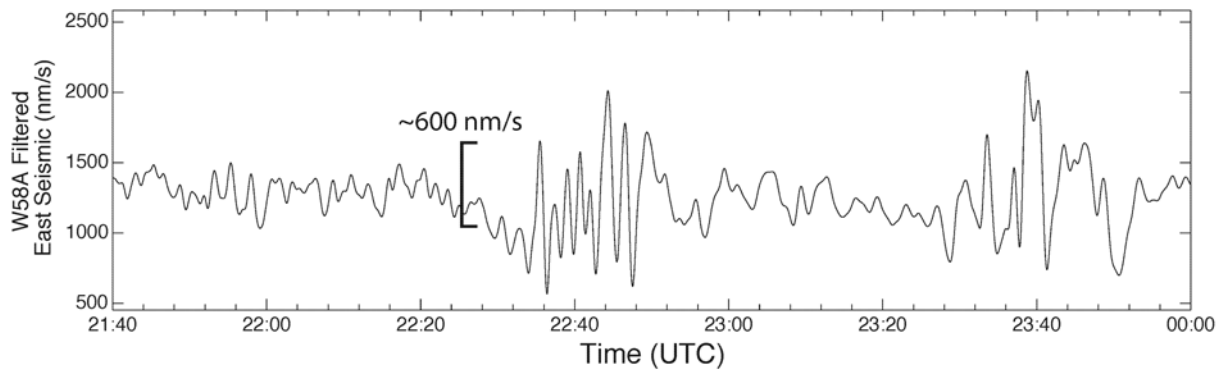
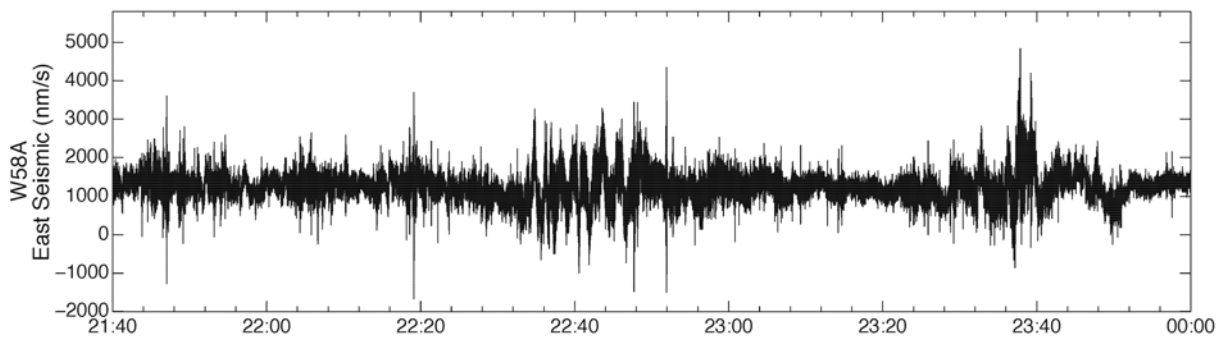
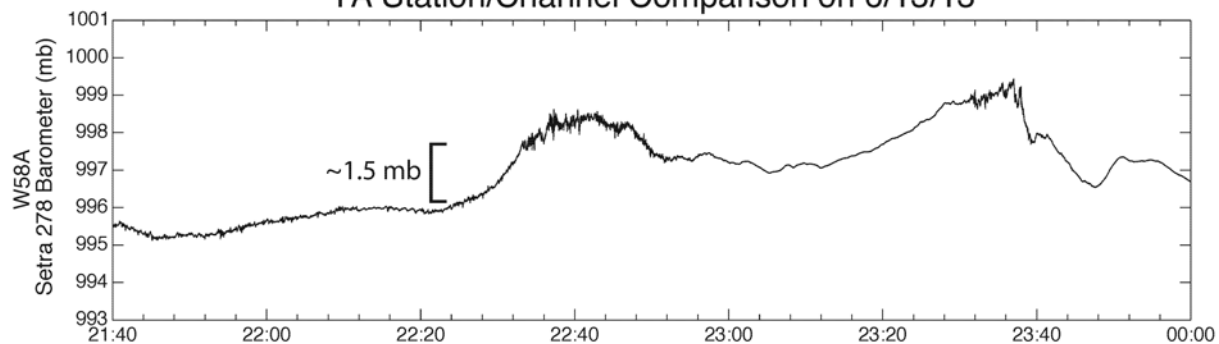




# 6/13/2013 Derecho W58A

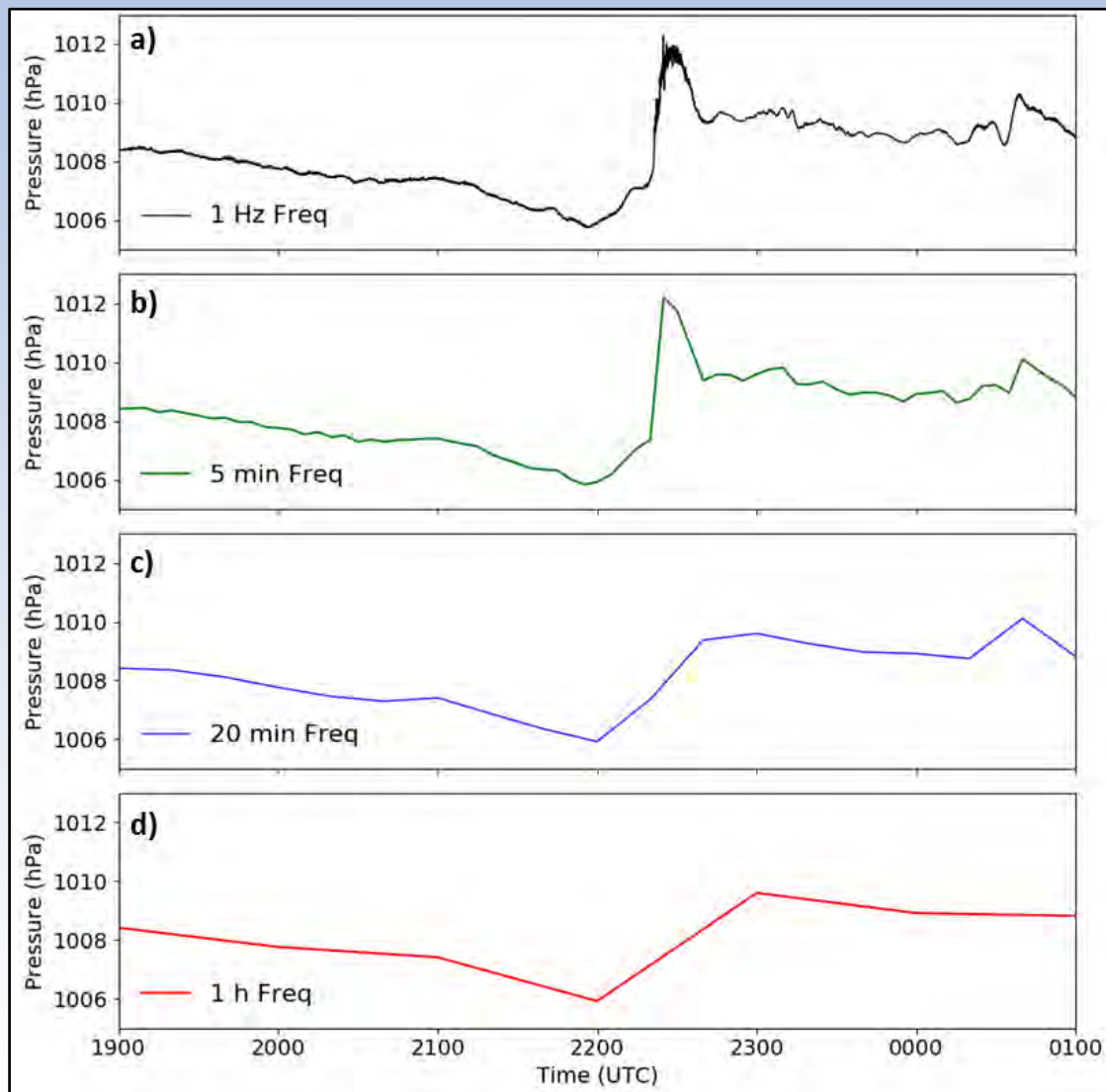


TA Station/Channel Comparison on 6/13/13





- Surface pressure been used to evaluate many phenomena:
  - Convection and gravity waves (e.g., Ruppert and Bosart 2014)
  - Diurnal and semidiurnal tides (e.g., Mass et al. 1991)
  - Baroclinic systems (e.g., Zishka and Smith 1980)
- Operational observation networks still have issues
  - Data frequency
  - High-res data access
  - Horizontal spacing
- TA provides opportunity to circumvent many of these concerns



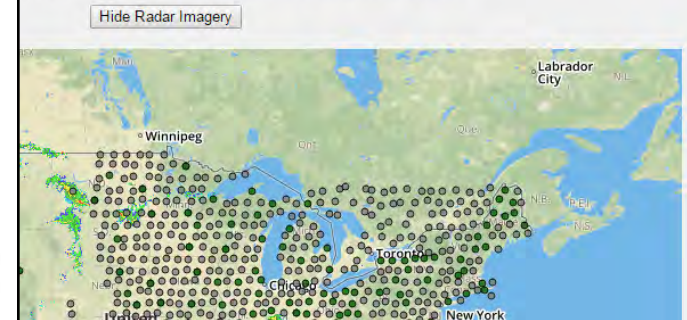
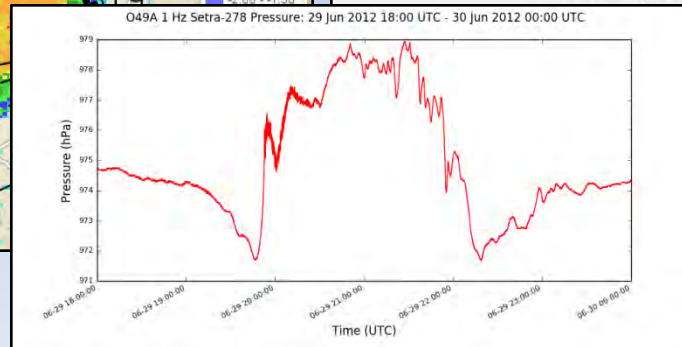
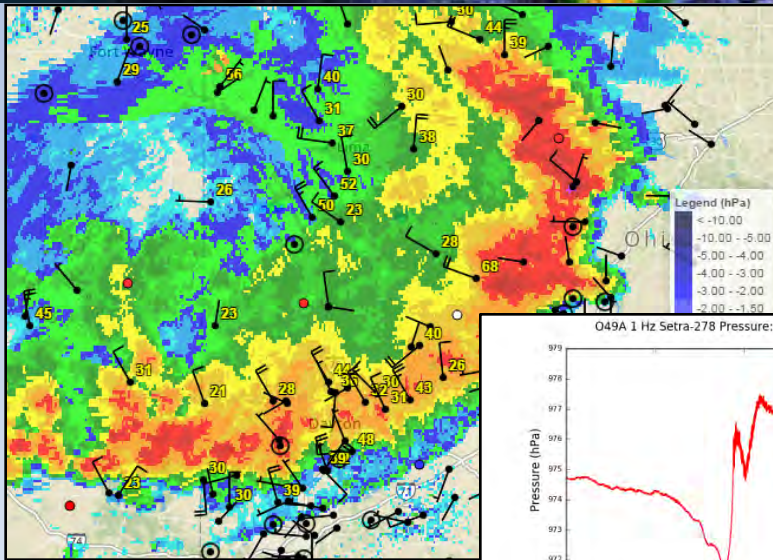
## USArray Archived Data Interface

This interface provides access to archived and real-time microbarograph data from 1118 USArray stations via graphical products.

Data Archive Period:	2010-01-01 to 2016-07-23
Stations Reporting in Real-Time:	300
Stations with Archived Data:	818

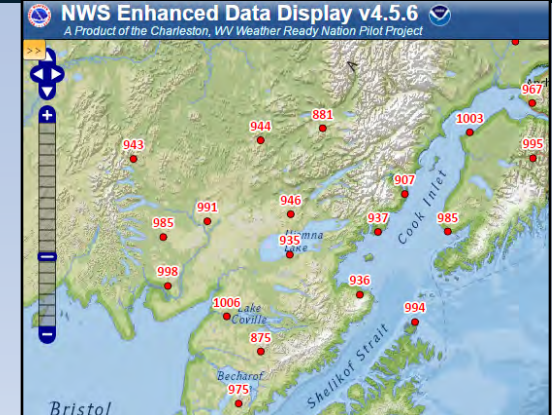
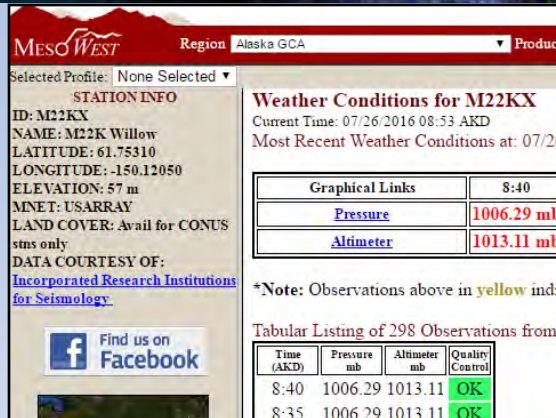
The interactive map below displays active stations in **green**, while inactive stations are shown in gray.

For those interested in downloading the 1 Hz surface pressure data from stations on this web interface, we encourage users to visit an official repository created within the [NCAR Research Data Archive \(RDA\)](#).

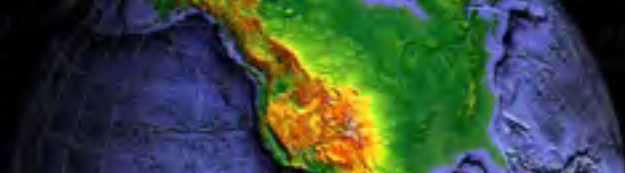


- Research-based Website (<http://meso1.chpc.utah.edu/usarray>)
- Graphical map-based and time series products visualizing:
  - Real-time TA data (5 min averages via MesoWest)
  - Archived 1 Hz pressure and perturbation TA data
  - Pressure signatures assessed as part of Jacques et al. (2015)
  - Archived radar mosaics and MesoWest wind observations





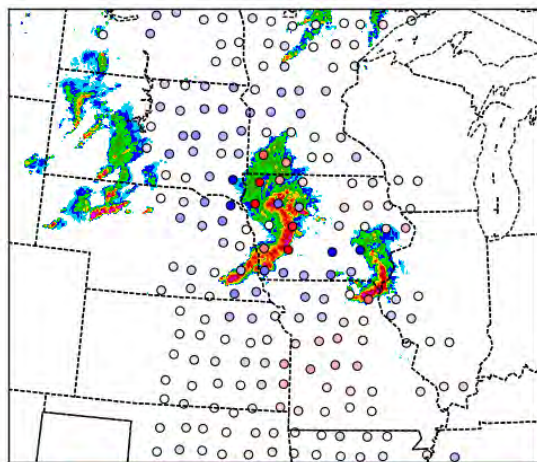
- MesoWest: Ingest of 5-minute average TA observations since 2012
- Available via several MesoWest-based products (e.g., MesoWest Data API Services <http://mesowest.org/api>)
- Disseminated to NWS Western Region and NOAA Meteorological Automated Data Ingest System (MADIS)
- Via MADIS, also provided to NCEP for potential inclusion in global model data assimilation systems



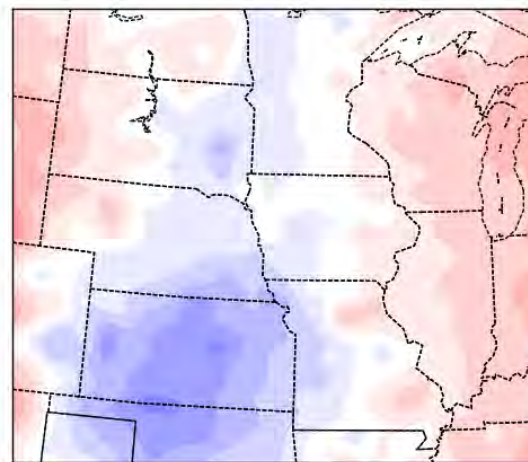
# Generating 5 Minute Analysis Grids - Jacques (2016)

Mesoscale Perturbation Analysis - 0200 UTC 27 Jun 2011

Radar +  
TA Mesoscale  
(10 min - 12h)  
Perturbations  
(points using  
bottom-right  
color bar)



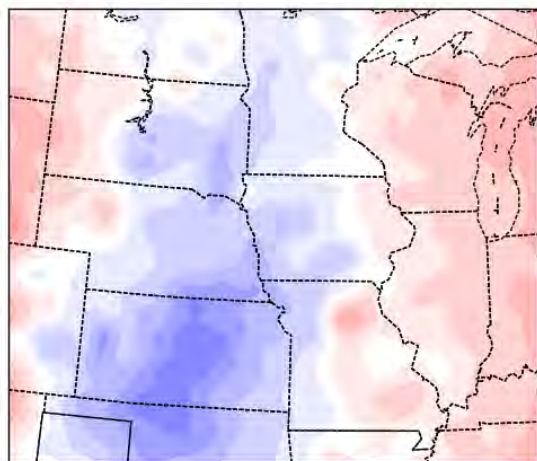
20 25 30 35 40 45 50 55 60 65  
Radar Reflectivity (dBZ)



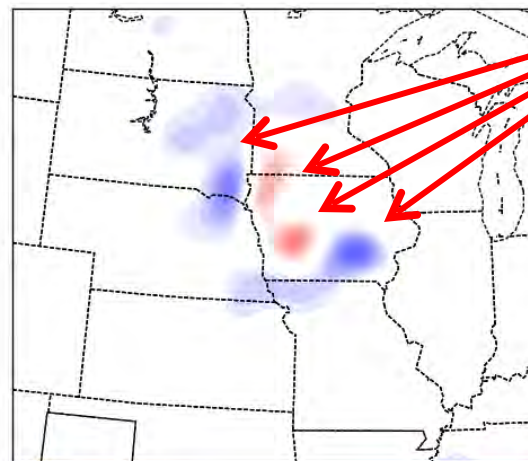
988 994 1000 1006 1012 1018 1024 1030  
RTMA Background Altimeter (hPa)

RTMA  
"Background"

Analysis  
Pressure  
Grid



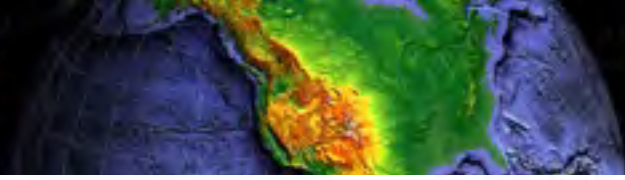
988 994 1000 1006 1012 1018 1024 1030  
Analysis Altimeter (hPa)



-3.0 -2.2 -1.5 -0.8 0.0 0.8 1.5 2.2 3.0  
Mesoscale Perturbations (hPa)

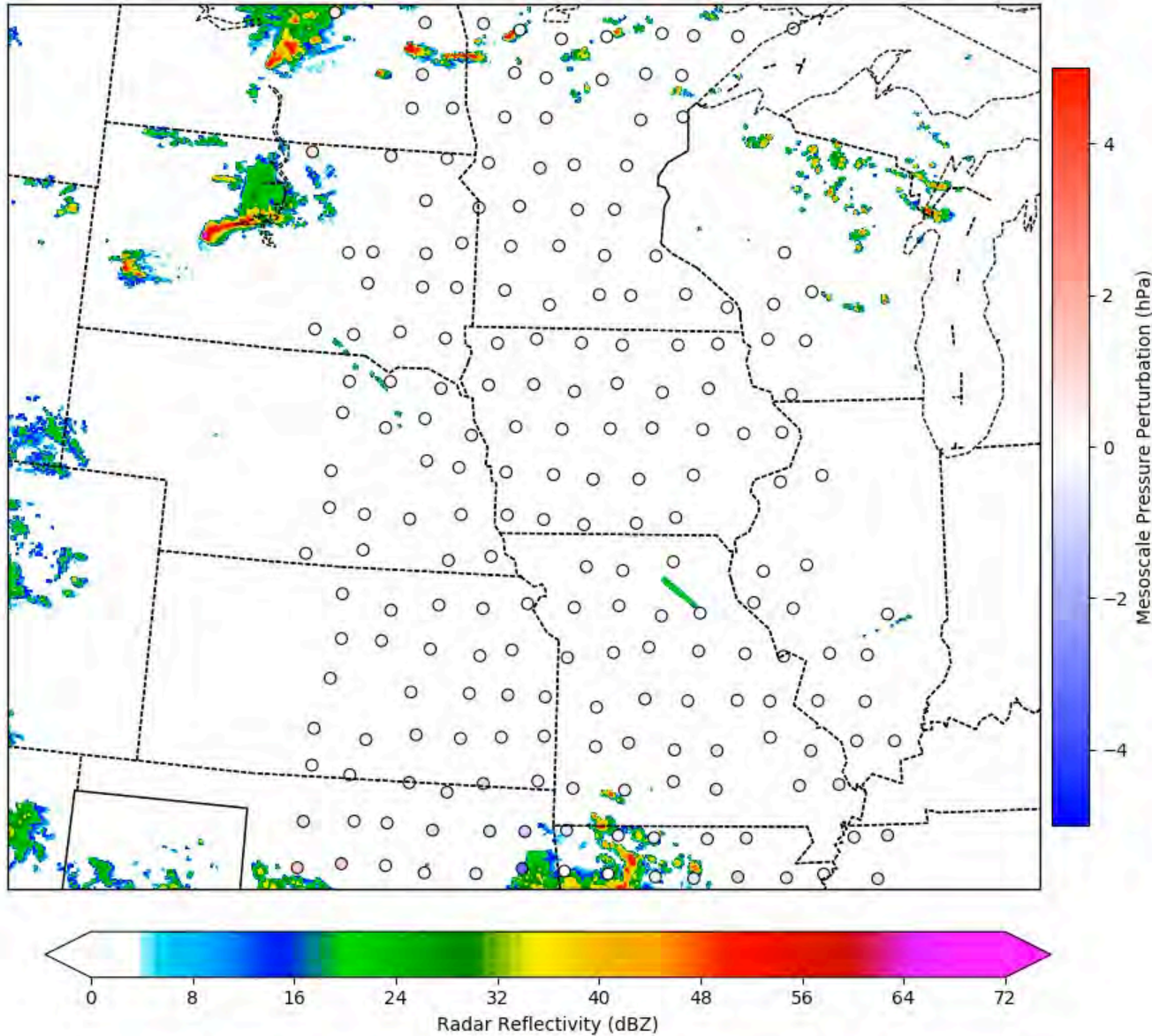
Features to be  
assessed

10min - 12h  
Mesoscale  
Perturbations



# 2011 08 11 Mesoscale Convective Systems - Jacques (2016)

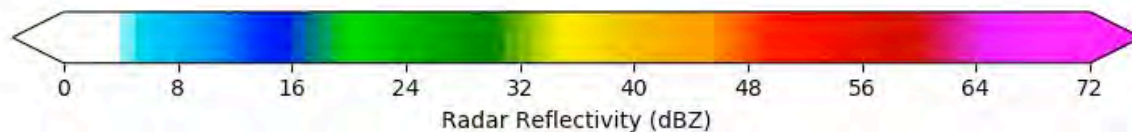
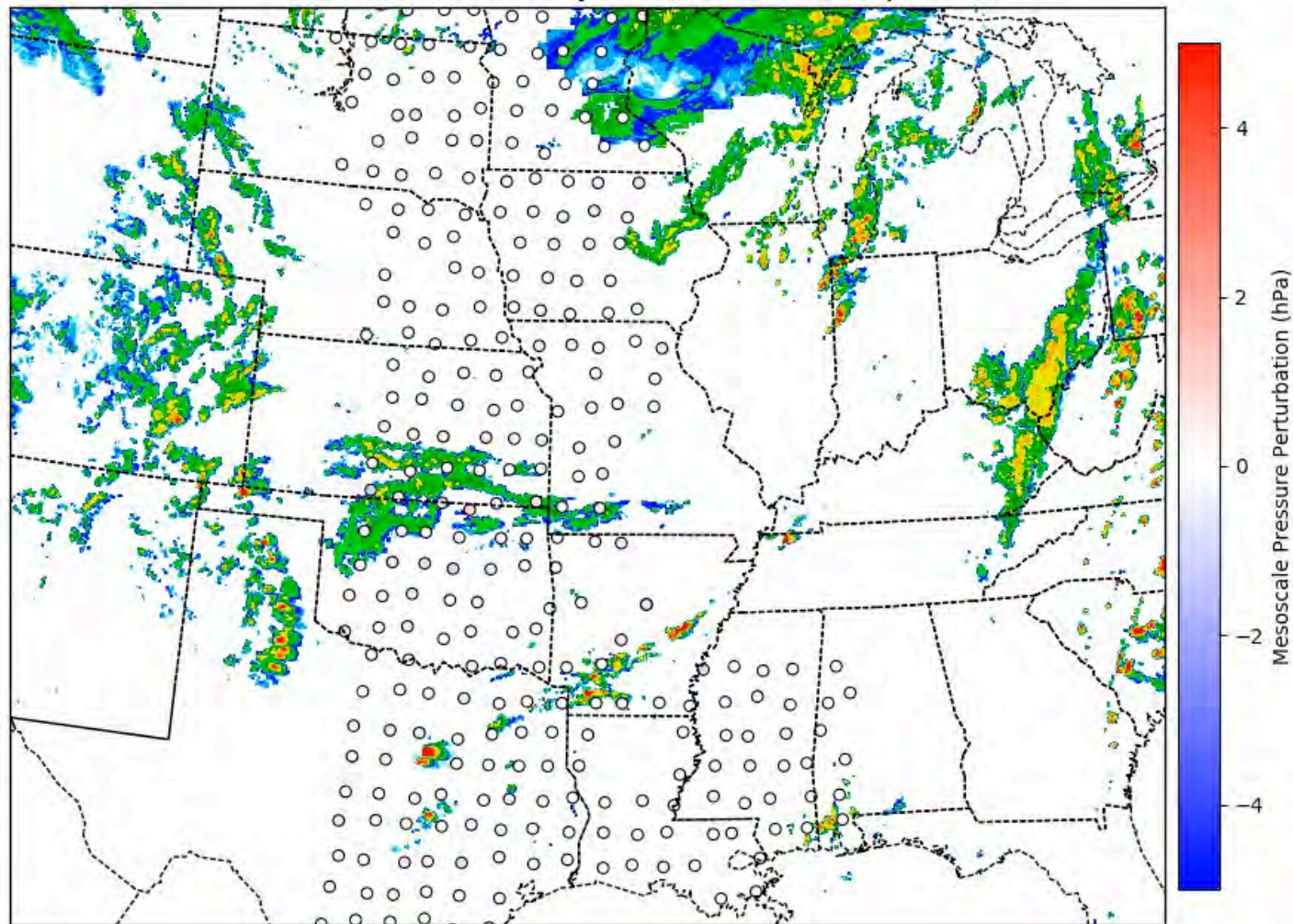
Feature Track Analysis - 2000 UTC 11 Aug 2011





# 2011 04 26-27 Gravity Wave Jacques (2016)

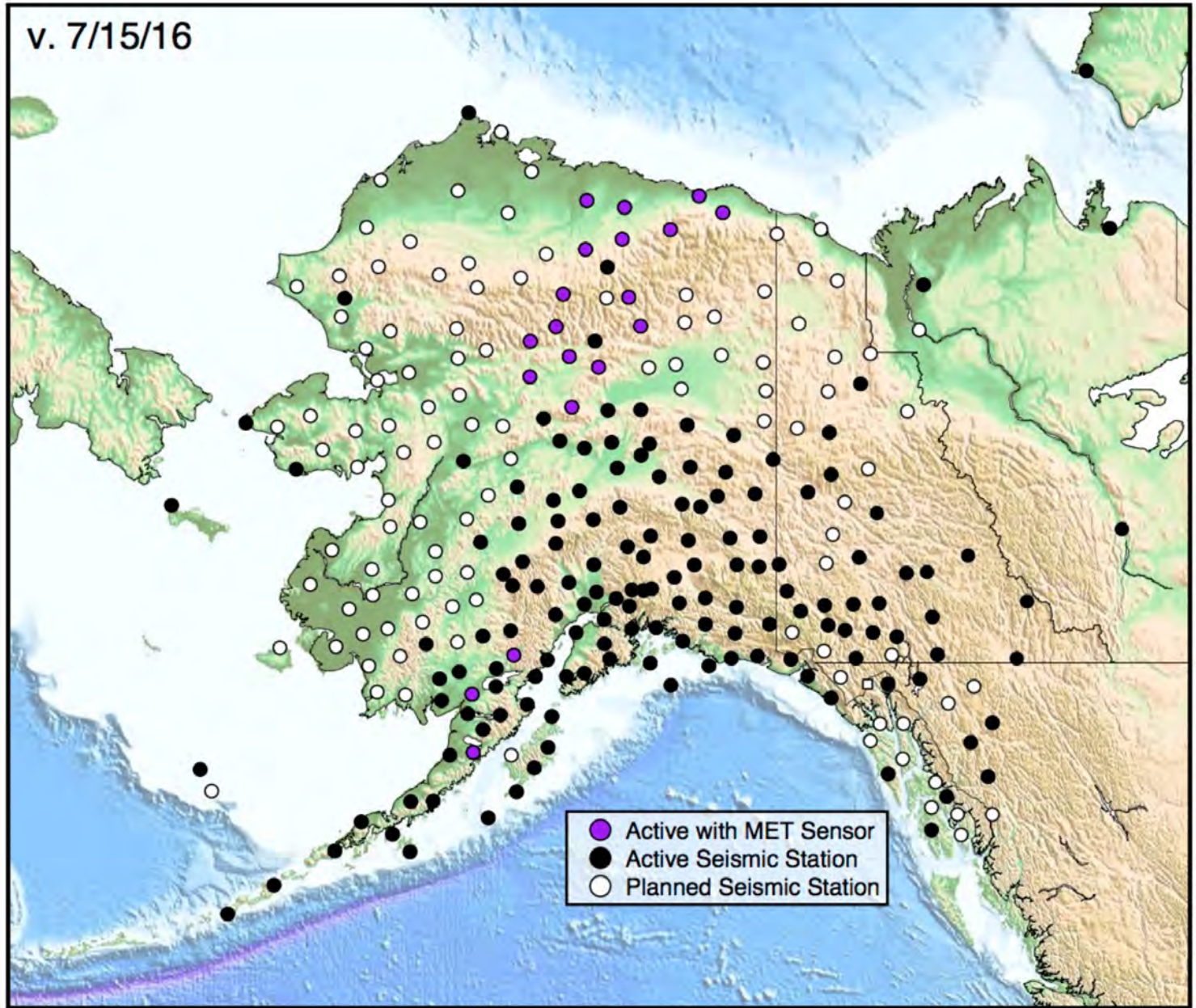
Feature Track Analysis - 2000 UTC 26 Apr 2011





# TA InfraMet

v. 7/15/16



- Meteorological sensors can enhance understanding of seismic data
- Meteorological sensors can create opportunities for collaboration between different scientific communities
  - real time monitoring
  - hazards
  - civil defense
- Seismic networks provide sites, permitting, real time telemetry