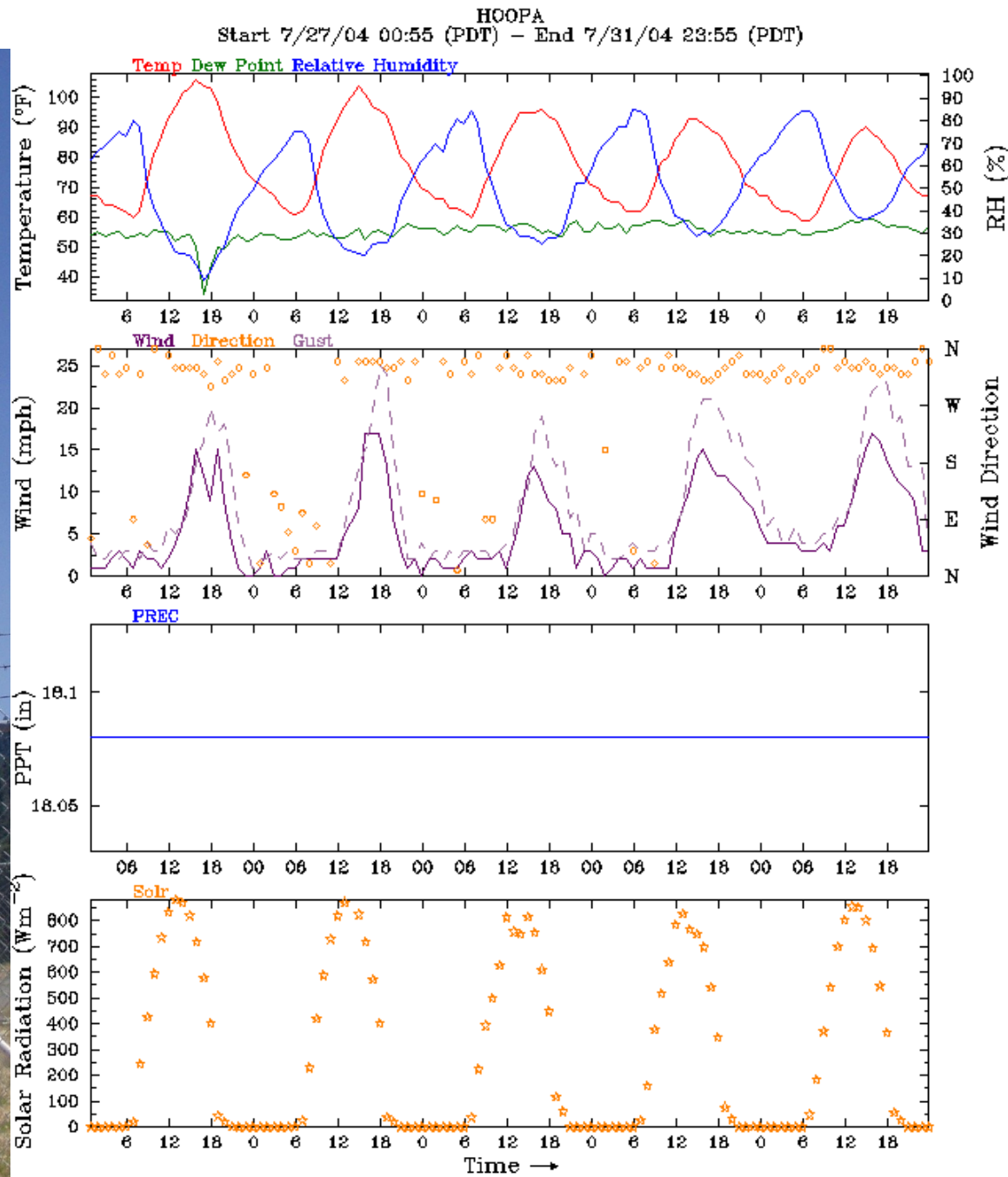


# Recognizing Observational Uncertainty

- Observations vs. the truth:
  - how well do we know the current state of the atmosphere?
- All that is labeled data is NOT gold!
  - Lockhart (2003)
- Effective use of analyses can expand utility of observations
- Resources on siting
- <http://www.wxqa.com/resources.html>



# HOOPA RAWS



# Getting a Handle on Siting Issues & Observational Errors

1. Metadata errors
2. Instrument errors (exposure, maintenance, sampling)
3. Local siting errors (e.g., artificial heat source, overhanging vegetation, observation at variable height above ground due to snowpack)
4. “Errors of representativeness” – correct observations that are capturing phenomena that are not representative of surroundings on broader scale (e.g., observations in vegetation-free valleys and basins surrounded by forested mountains)

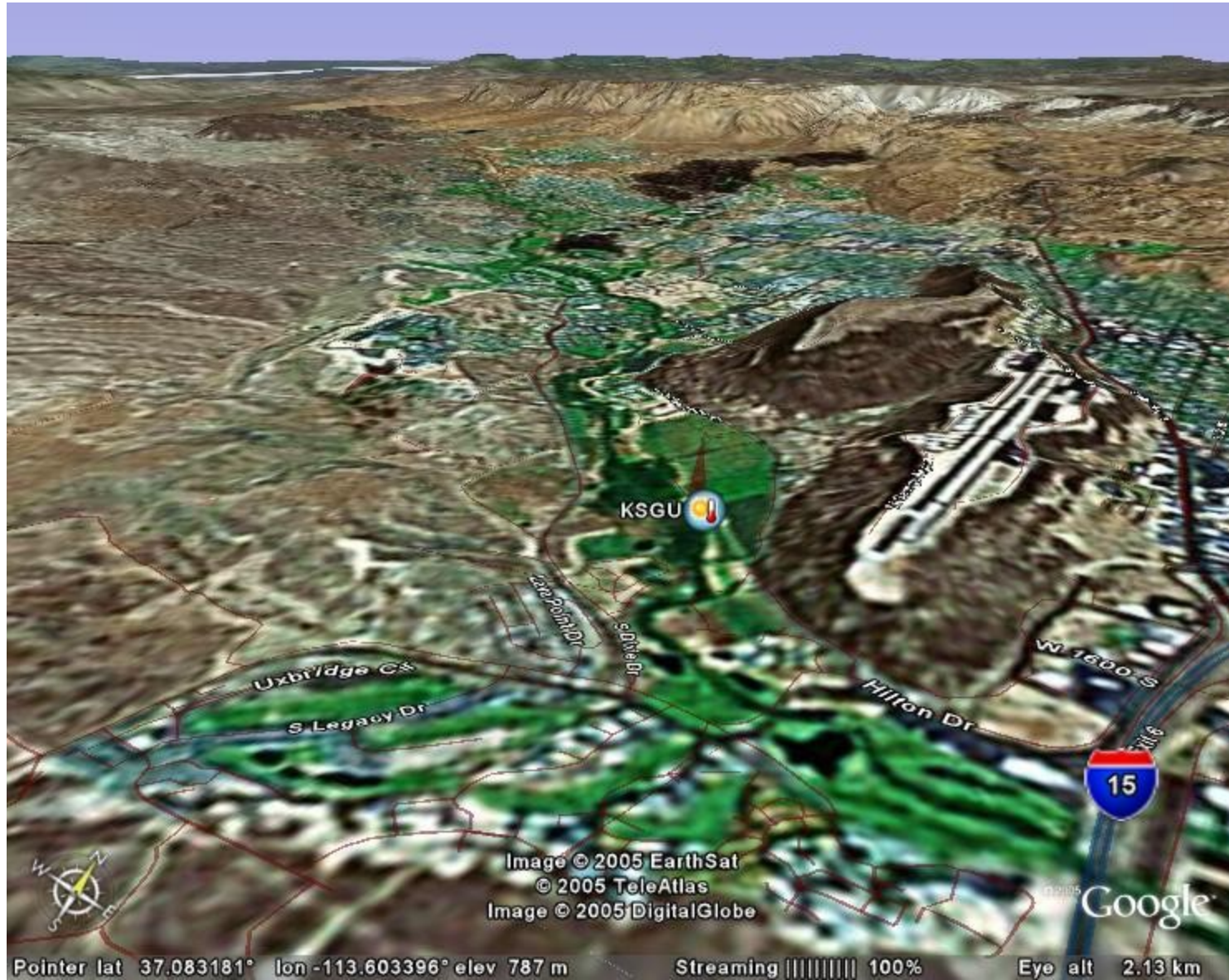


# Are All Observations Equally Good?

- Why was the sensor installed?
  - Observing needs and sampling strategies vary (air quality, fire weather, road weather)
- Station siting results from pragmatic tradeoffs: power, communication, obstacles, access
- Use common sense and experience
  - Wind sensor in the base of a mountain pass will likely blow from only two directions
  - Errors depend upon conditions (e.g., temperature spikes common with calm winds)
  - Pay attention to metadata
- Monitor quality control information
  - Basic consistency checks
  - Comparison to other stations



# Inaccurate Metadata



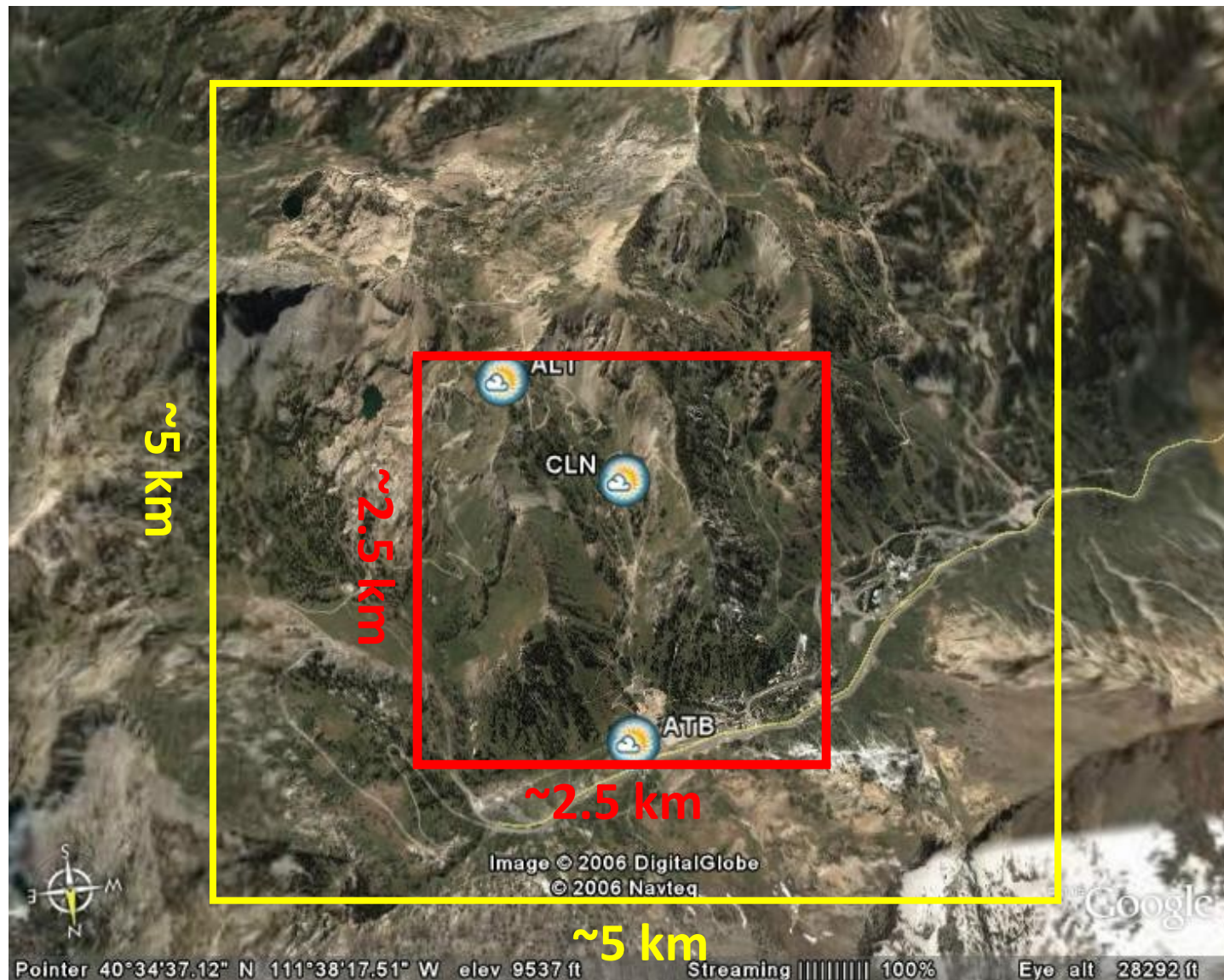
# Representativeness Errors

- Observations may be accurate...
- But the phenomena they are measuring may not be resolvable on the scale of the analysis
  - This is interpreted as an error of the *observation* not the analysis
- Common problem over complex terrain
- Also common when strong inversions
- Can happen anywhere



Sub-5km terrain variability (m)  
(Myrick and Horel, WAF 2006)

# Representative errors to be expected in mountains Alta Ski Area



# Alta Ski Area



Looking up the mountain

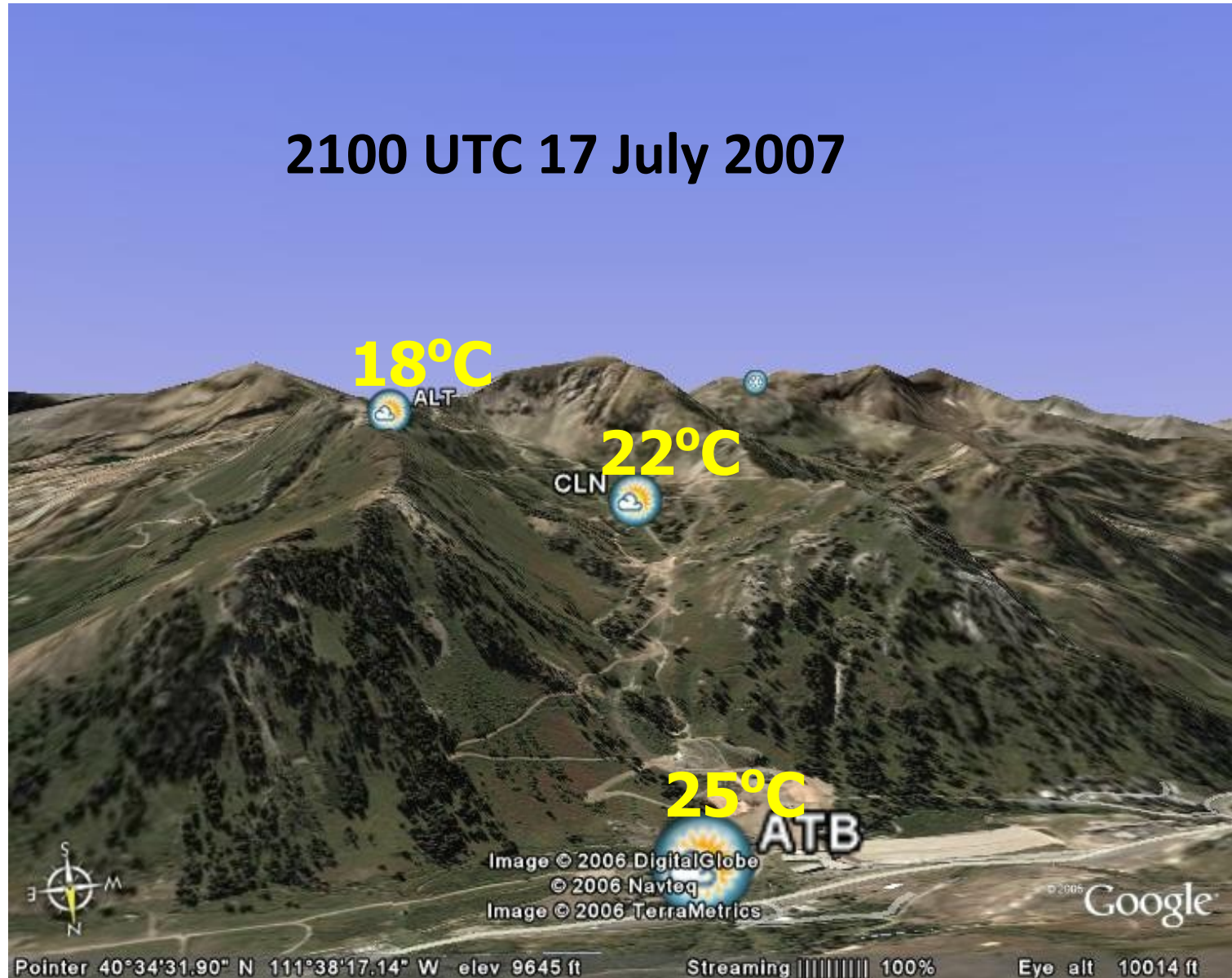


Looking up Little Cottonwood Canyon



# Alta Ski Area

2100 UTC 17 July 2007





Alta Coop

# Alta Collins



40.576097, -111.638989

# Alta Collins

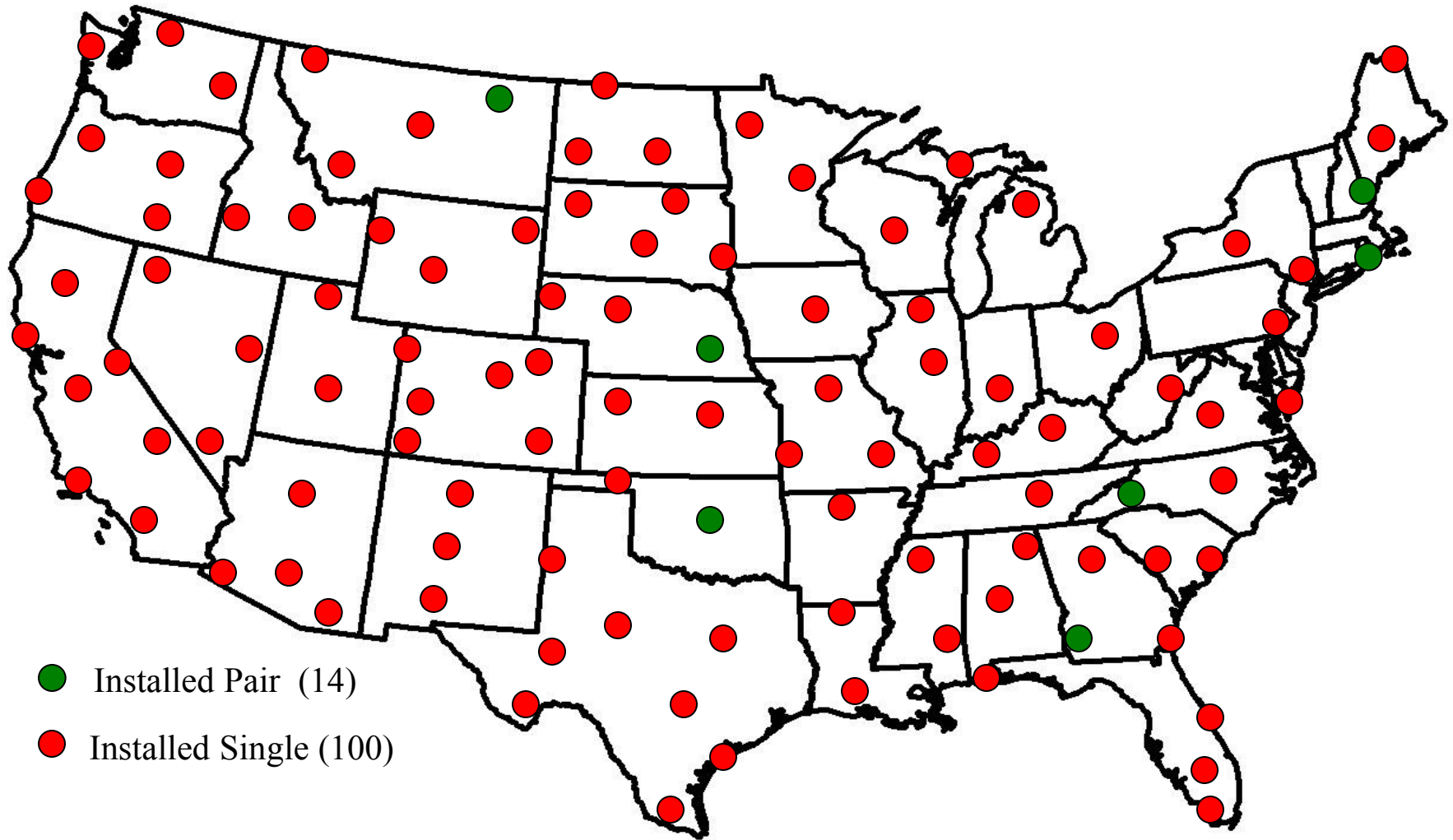


August 21, 2005

J. Horel



# USCRN CONUS Deployments



- Installed Pair (14)
- Installed Single (100)

+ 4 in Alaska and 2 in Hawaii

As of August 15, 2008

# USCRN sensors

<http://www.ncdc.noaa.gov/crn/instrdoc#SENSORS>

# AL Gadsden 19 N, Sand Mountain Research Extension (Northwest Pasture)

34.3 N 86.0 W 1160'

April 14, 2005



# AZ Yuma 27 ENE, U.S. Army Yuma Proving Ground (Redbluff Pavement Site)

32.8 N 114.2 W 600'

March 19, 2008





CA Redding 12 WNW, Whiskeytown National Recreation Area (RAWS Site)

40.7 N 122.6 W 1412'

March 25, 2003



# UT Brigham City 28 WNW, Golden Spike National Historic Site

41.6 N 112.5 W 4938'

October 26, 2007



# UT Torrey 7 E, Capitol Reef National Park (Goosenecks Road Site)

38.3 N 111.3 W 6211'

October 2, 2007

