MetFetch: Automated Meteorological Data Retrieval for Fast-Running Emergency Response Codes

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Problem Statement

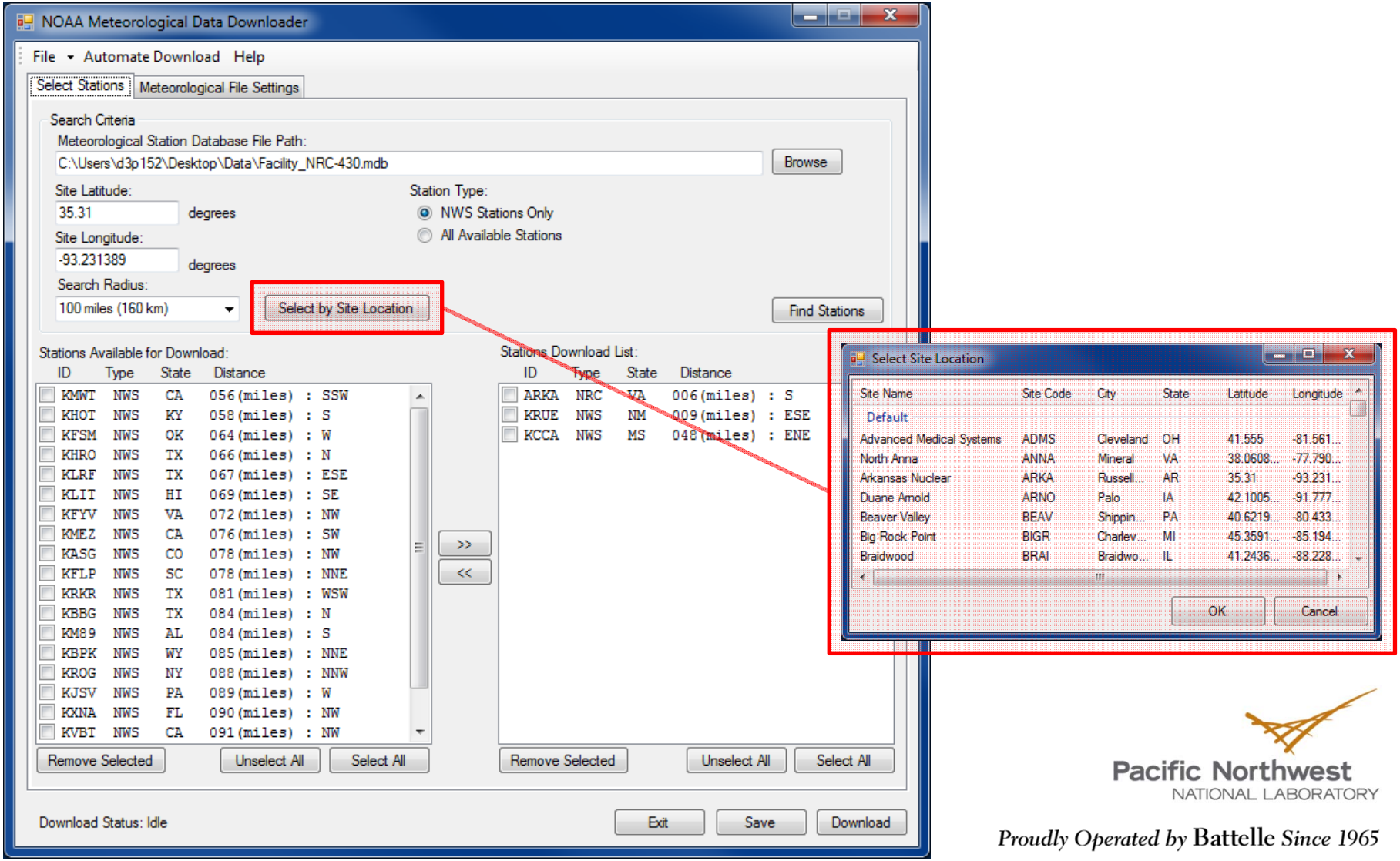
- Obtaining meteorological observations and forecasts for fast-running emergency response codes can be challenging; potential issues include:
  - Accident location may be “Anywhere USA”
  - Lack of site familiarity and station availability
  - Untimely data
  - Poorly-sited stations
  - Difficult data formats
  - Transcription errors

- Met garbage in = Plume garbage out

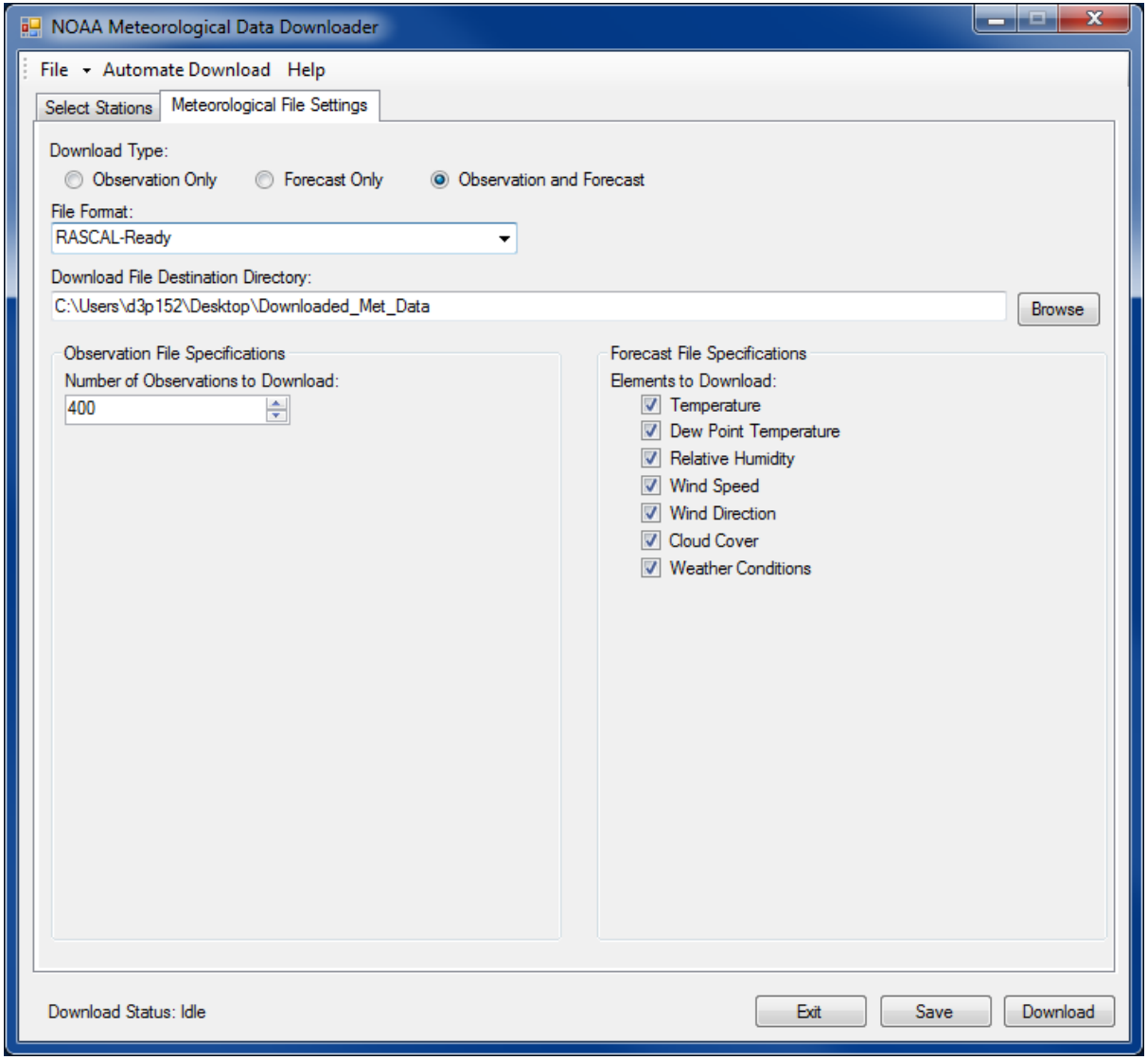
The RASCAL Solution: MetFetch

- Developed for RASCAL V4.3
  - Radiological Assessment System for Consequence AnaLysis (RASCAL)
  - Used by the U.S. Nuclear Regulatory Commission's (NRC's) Operations Center to make independent dose and consequence projections during radiological emergencies
- What does MetFetch do?
  - Standalone application within the RASCAL “toolbox”
  - Retrieves meteorological observations and forecasts from the internet for use in RASCAL
  - The downloaded data can then be imported directly into RASCAL through the RASCAL interface
  - MetFetch has been used by the NRC staff since its release in Sept 2013 during exercises with good results

MetFetch Interface—Select Stations

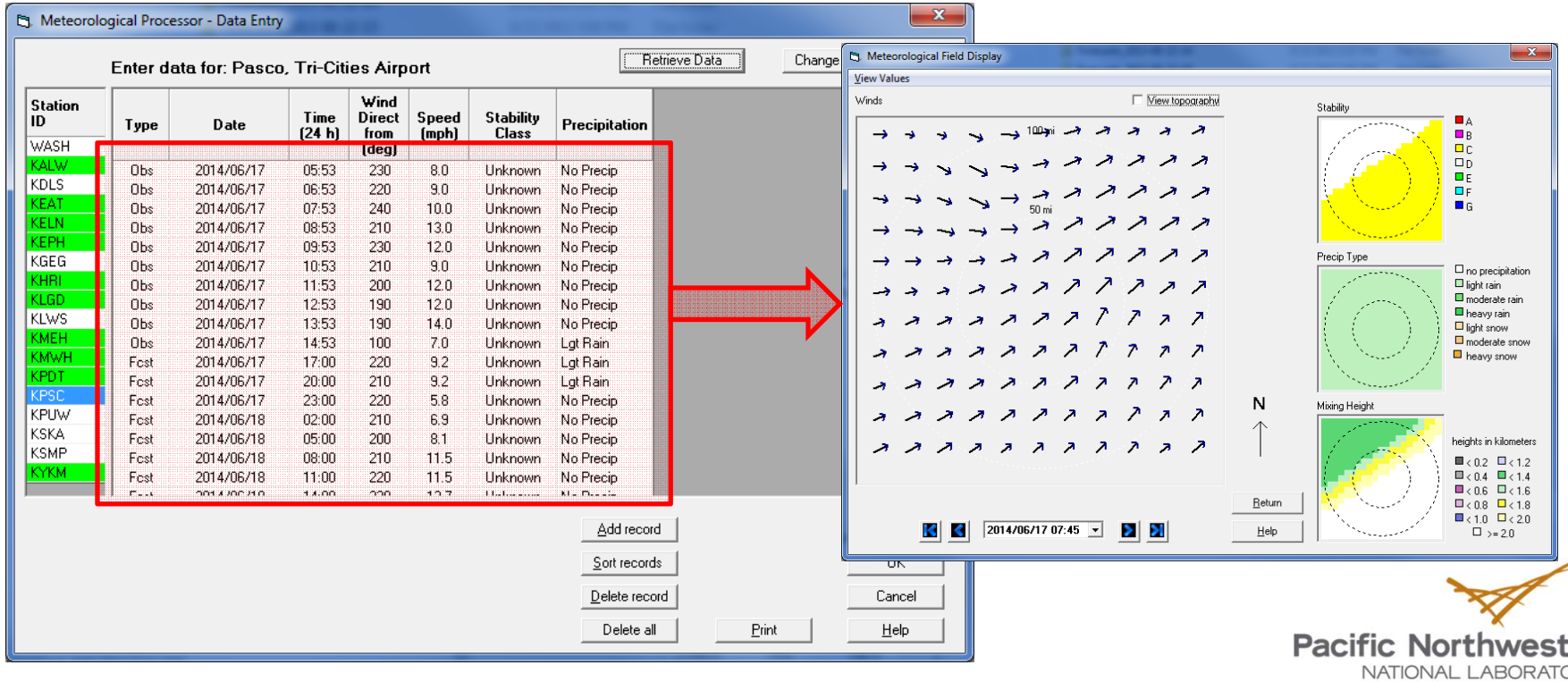


MetFetch Interface—Meteorological File Settings



Importing MetFetch Data into RASCAL

- Downloaded observation and forecast files are available to "retrieve" within RASCAL for a given reactor location.
- Data are used to create gridded fields for plume dispersion.



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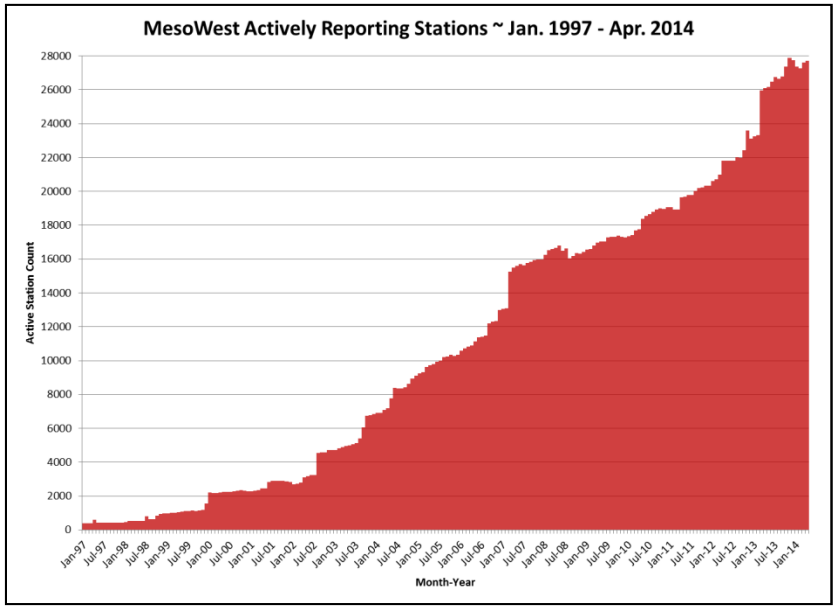
MetFetch Observations: MesoWest

- MesoWest provides access to current and archived weather observations across the United States
- Cooperative project between the University of Utah and the National Weather Service (NWS)
- Meteorological networks are managed by government agencies, private firms, and educational institutions.
- Rapid increase in actively reporting stations (~28,000)



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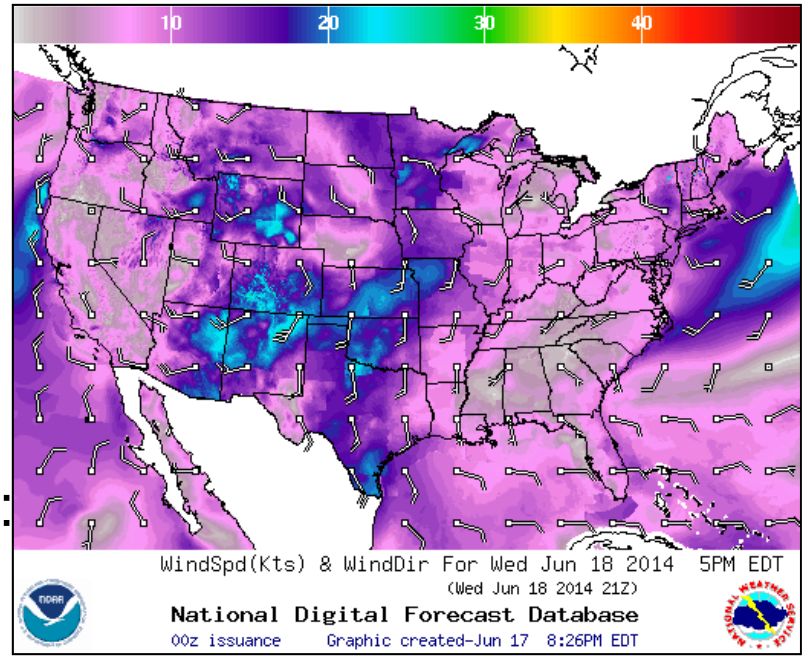
MetFetch Observations (Cont'd): MesoWest

- Observations are encoded in Extensible Markup Language (XML)
- Includes standard variables (temp, dew point, wind, precipitation, cloud cover, pressure)
- Format is predictable and repeatable
- Includes station quality flag to indicate "bad" data

MetFetch Forecasts: NWS NDFD

- The National Weather Service (NWS) has developed the National Digital Forecast Data (NDFD) for disseminating their forecasts
  - Available to the public as a "web service"
  - Includes standard forecast variables
  - Spatial resolution is ~2.5 km
  - Temporal resolution depends on variable; standard variables:
    - 3 hours out to 72 hours
    - Then 6 hours out to 168 hours
  - Similar to observations, the forecast data are encoded in XML



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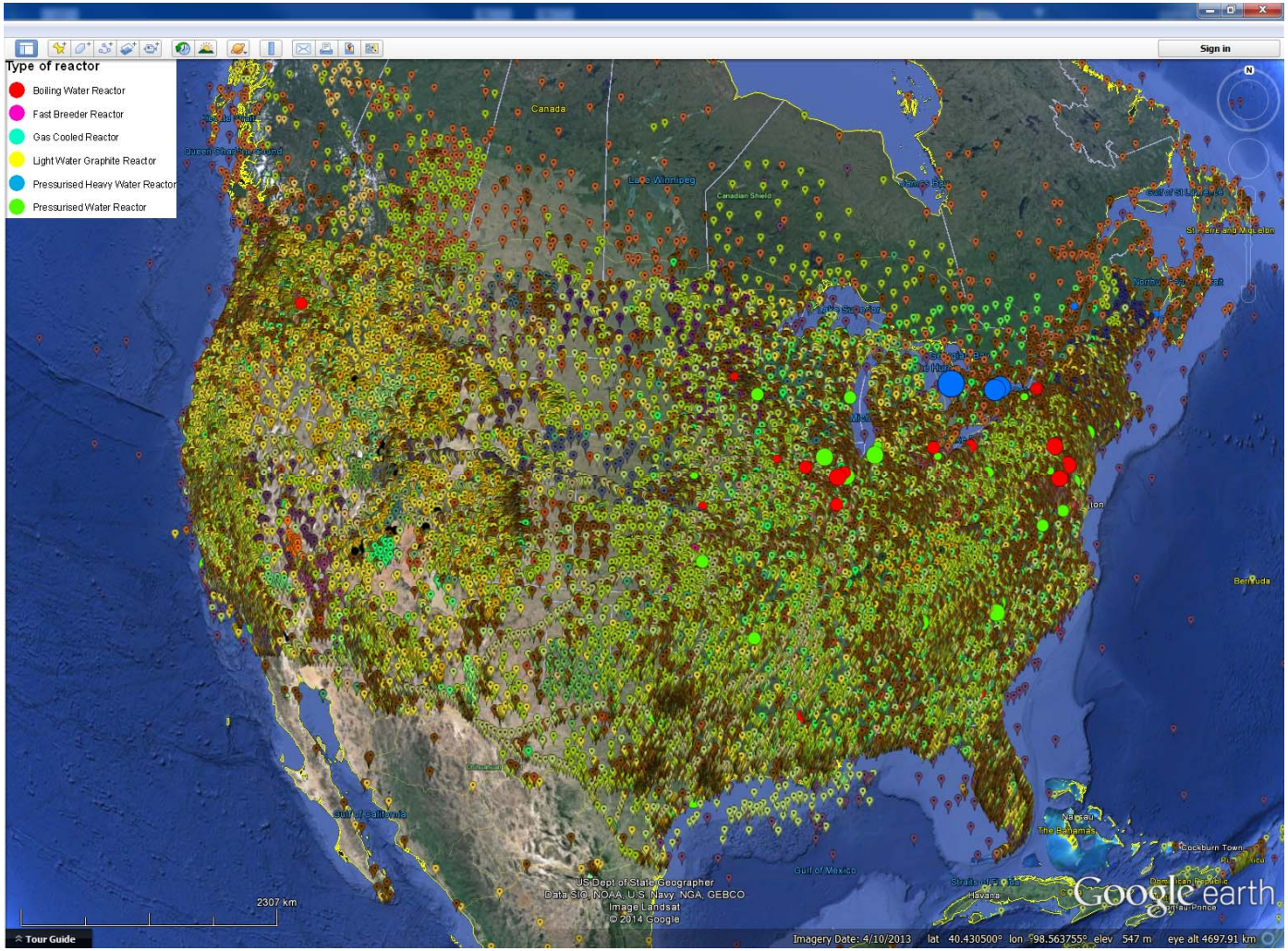
Available Meteorological Networks/Stations



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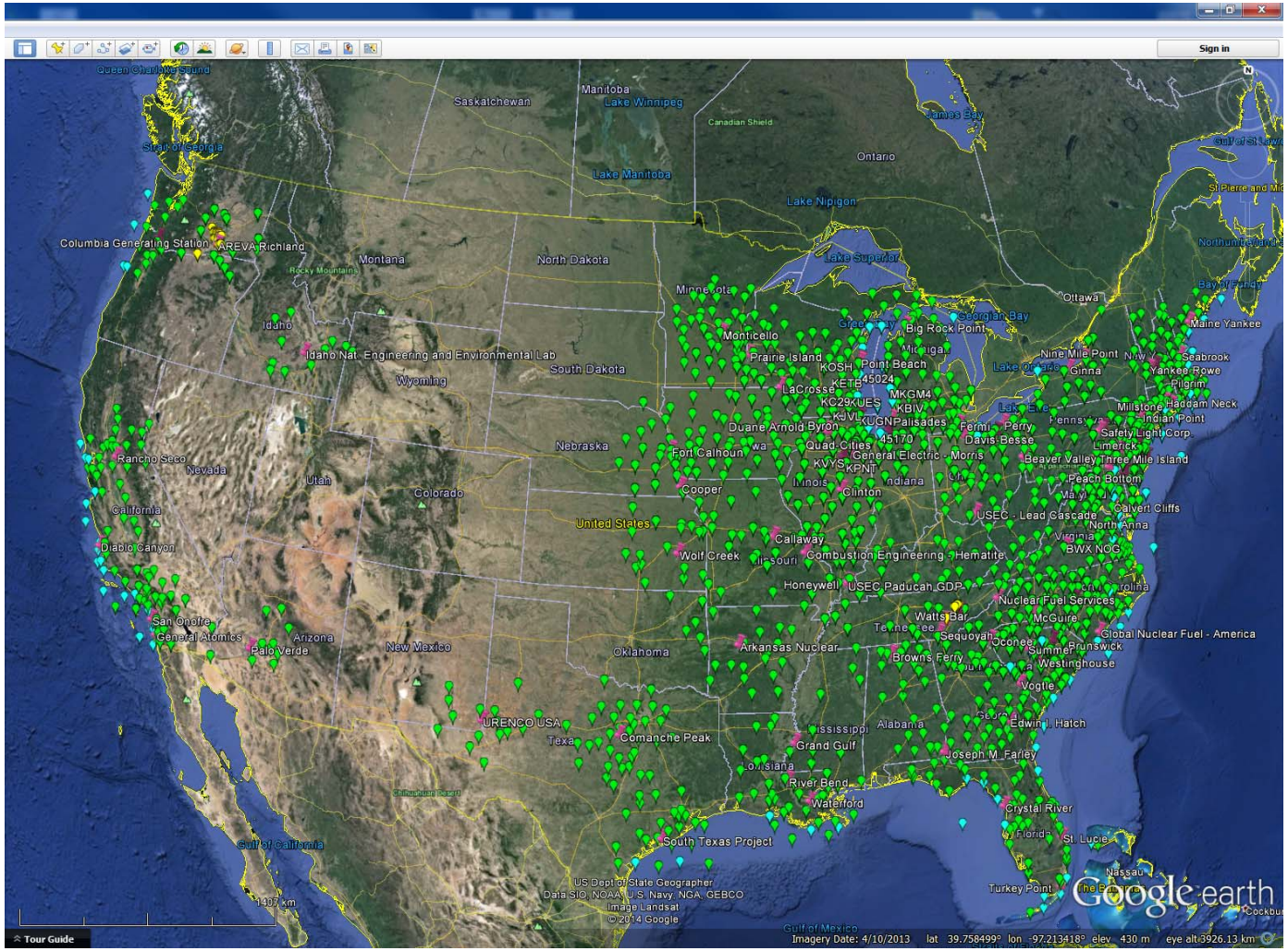
Available Meteorological Networks/Stations in RASCAL



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MetFetch V2.0

- Potential updates to MetFetch include:
  - Incorporating a map-based station selection option using GIS (MapWindows)
  - Allowing browsing of “all” meteorological networks
  - Reporting on station data and quality within the interface
  - Including the ability to generate RASCAL-ready surface roughness and terrain files
  - Customizing output file formats for other fast-running emergency response codes

Questions?

- Contacts:
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- How to obtain MetFetch (or RASCAL)
  - Google “NRC RASCAL”
  - http://www.nrc.gov/about-nrc/regulatory/research/safetycodes/rascal.html

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MetFetch/RASCAL Sponsor

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