

# PNSN Manager's Notes

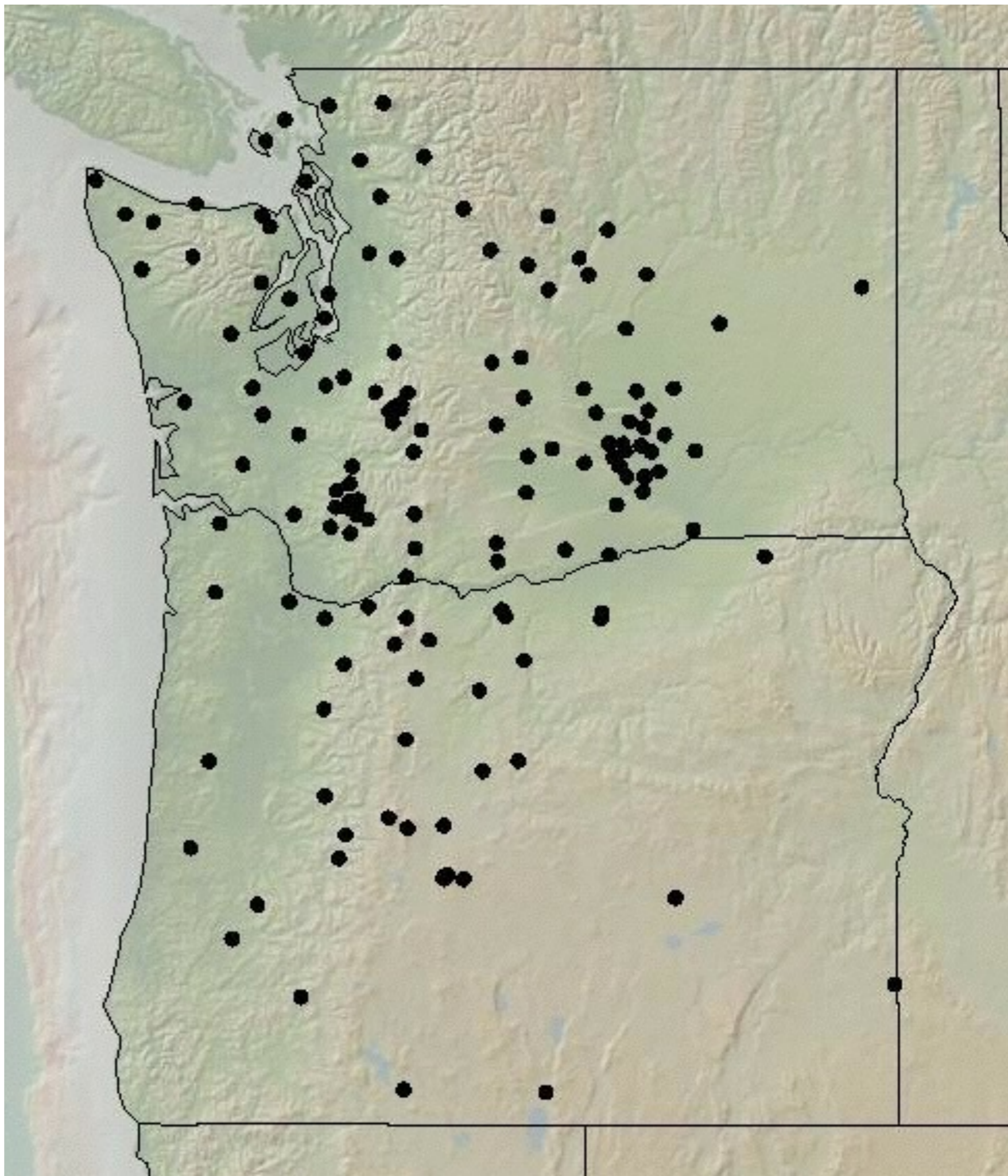
Prepared for PNSN 2014 annual ANSS Regional  
Advisory Committee Meeting, June 24, 2014

- Network Status
  - Operations
  - Funding
  - Organizational & Personnel
- Hanford & Eastern Washington
- Network Modernization
- Performance Standards
- NetQuakes
- Seattle Liquefaction Array

<http://earthweb.ess.washington.edu/pbodin/PNSN/>

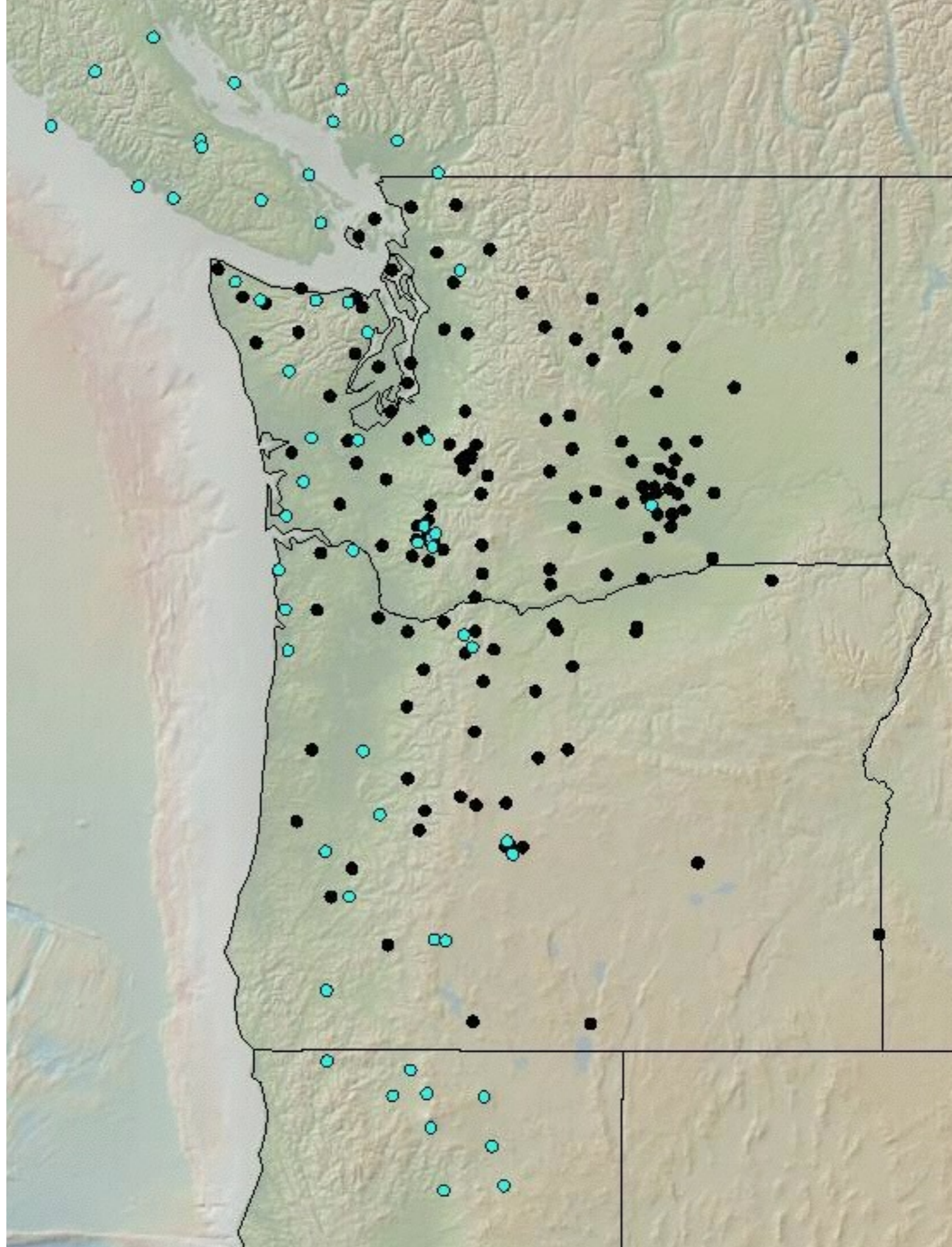
# Network Status

- Short - period “Backbone”.
- Stations we maintain.



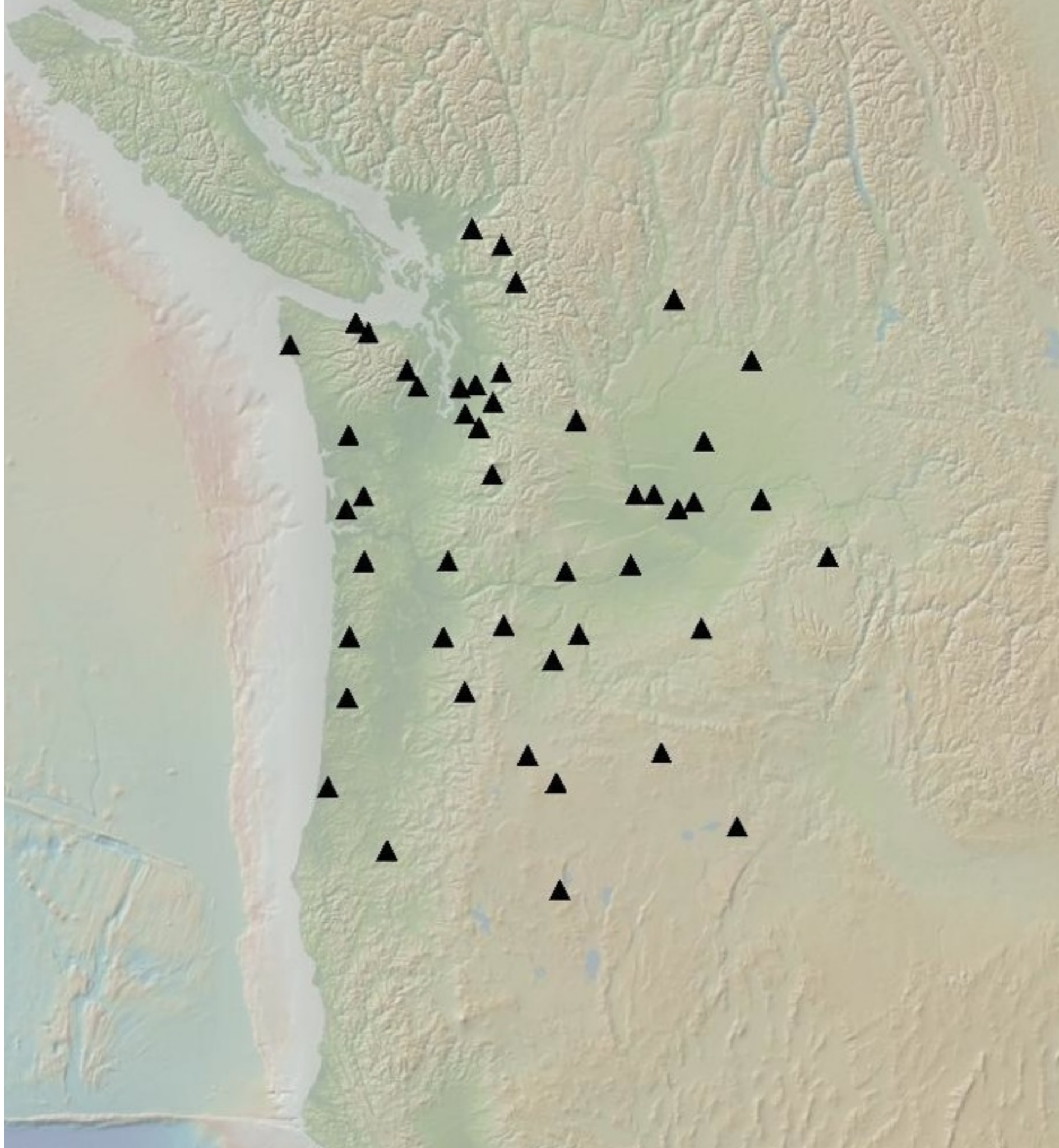
# Network Status

- Short - period “Backbone”.
- Stations we maintain.
- PLUS: contributed stations



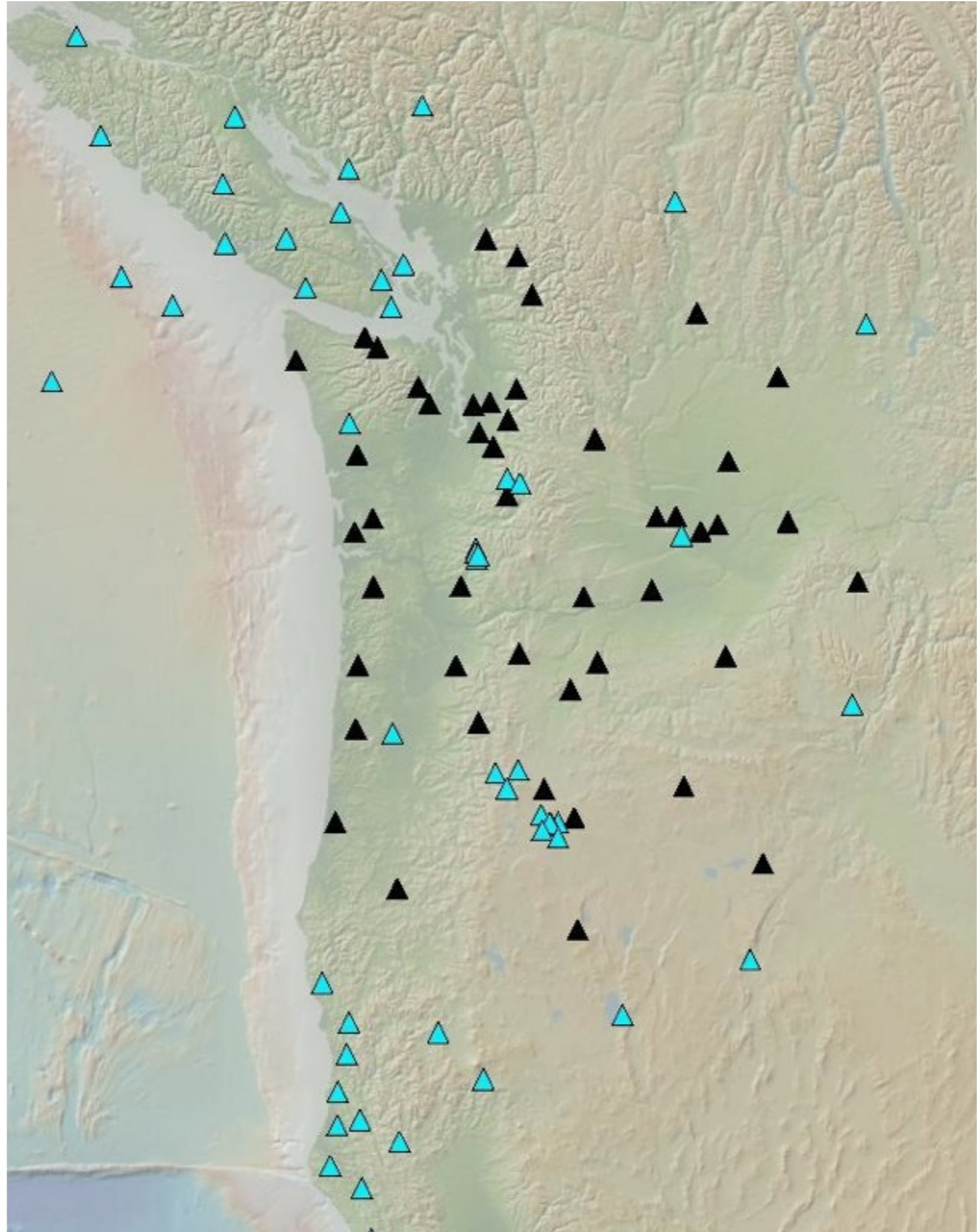
# Network Status

- Broadband “Backbone”.
- Stations we maintain.
- (Upgraded CREST stations + TA adoptions)



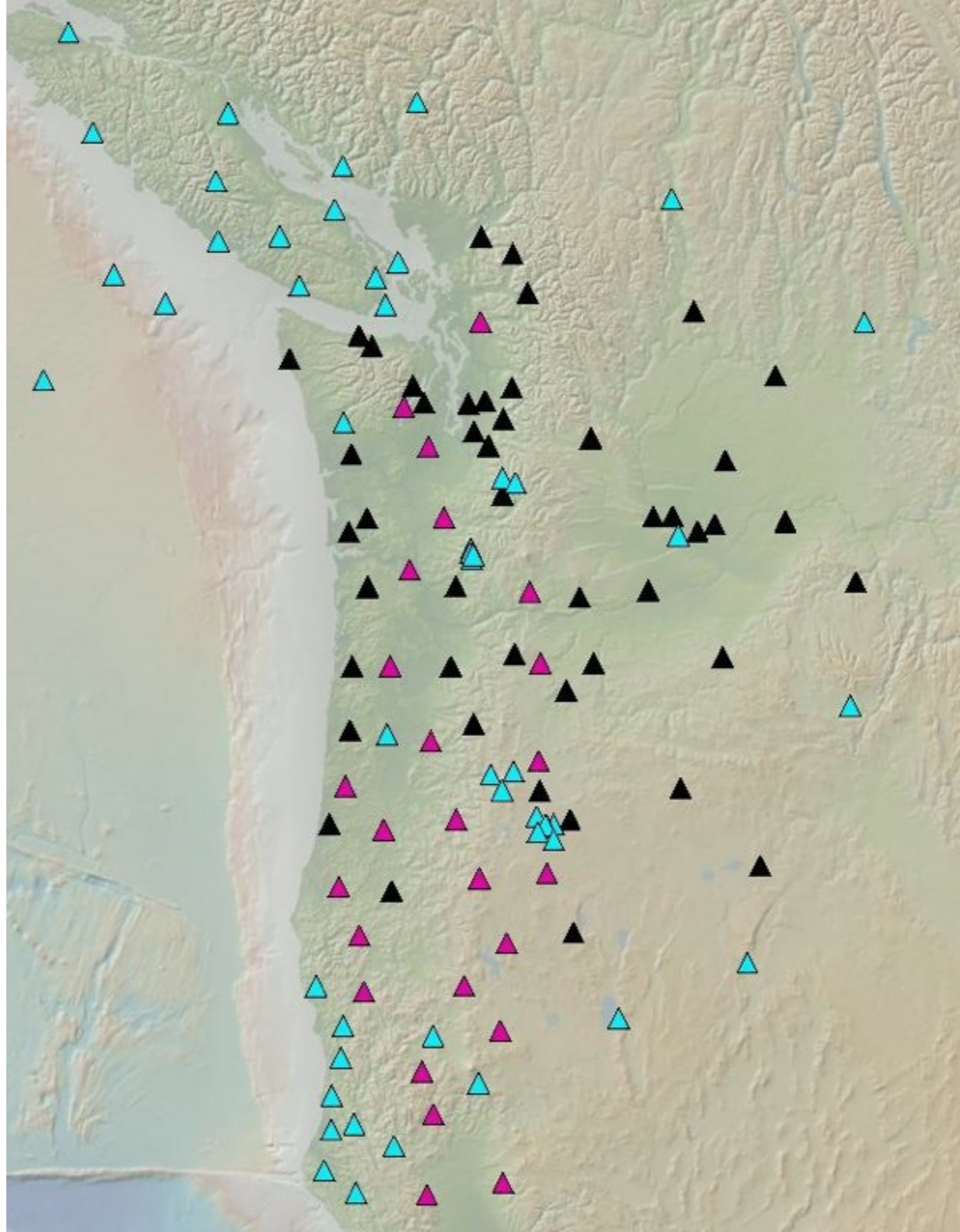
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- Broadband “Backbone”.
- Stations we maintain.
- (Upgraded CREST stations + TA adoptions)
- PLUS Contributed station data (CC, US, NC, BK, CN, IU, NV)



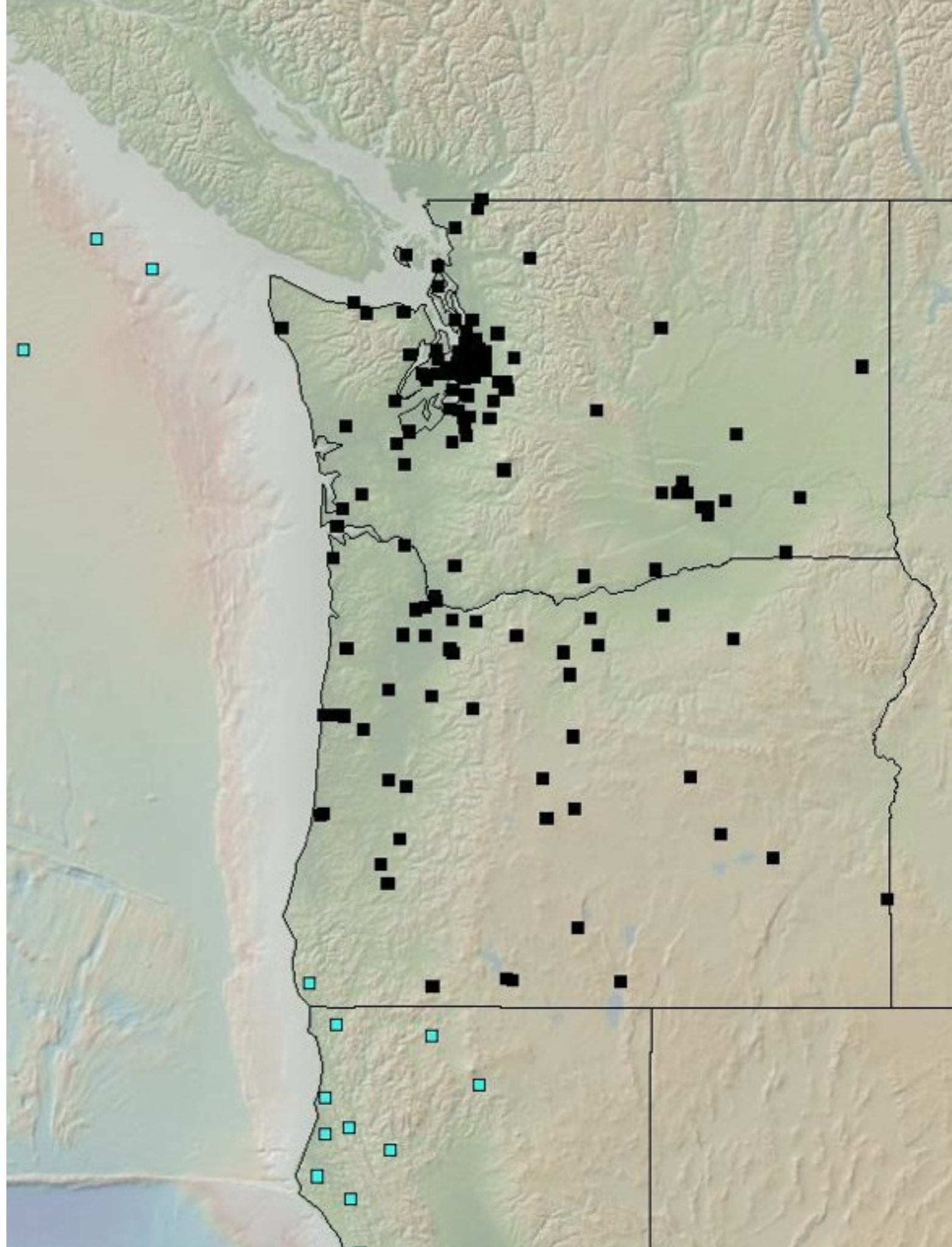
# Network Status

- Broadband “Backbone”.
- Stations we maintain.
- (Upgraded CREST stations + TA adoptions)
- PLUS Contributed station data (CC, US, NC, BK, CN, IU, NV)
- PLUS Contributed Cascadia Initiative stations. Don't want to lose!



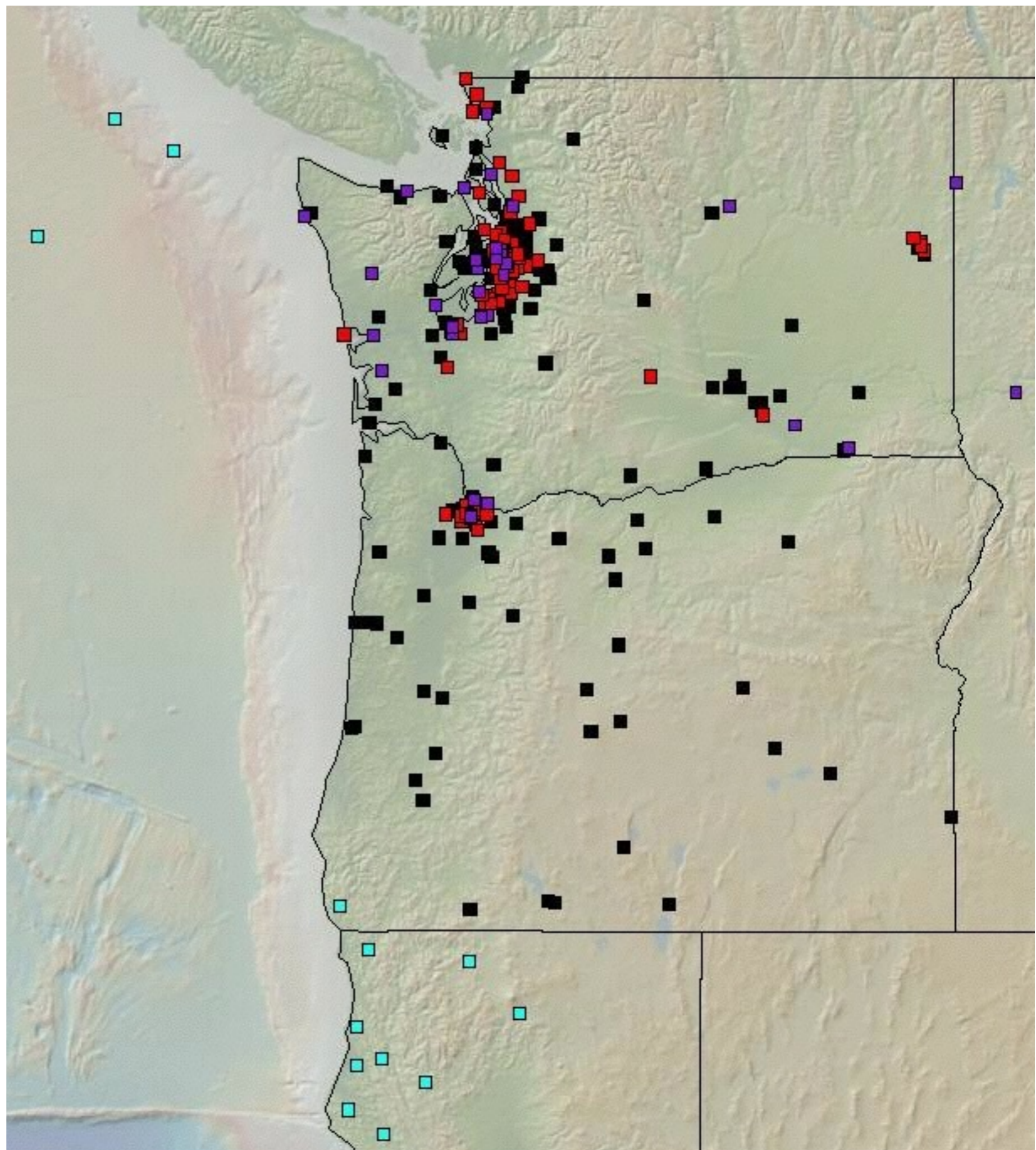
# Network Status

- Continuous Strong Motion “Backbone”.
- Stations we maintain.
- PLUS contributed continuous SMO channels.



# Network Status

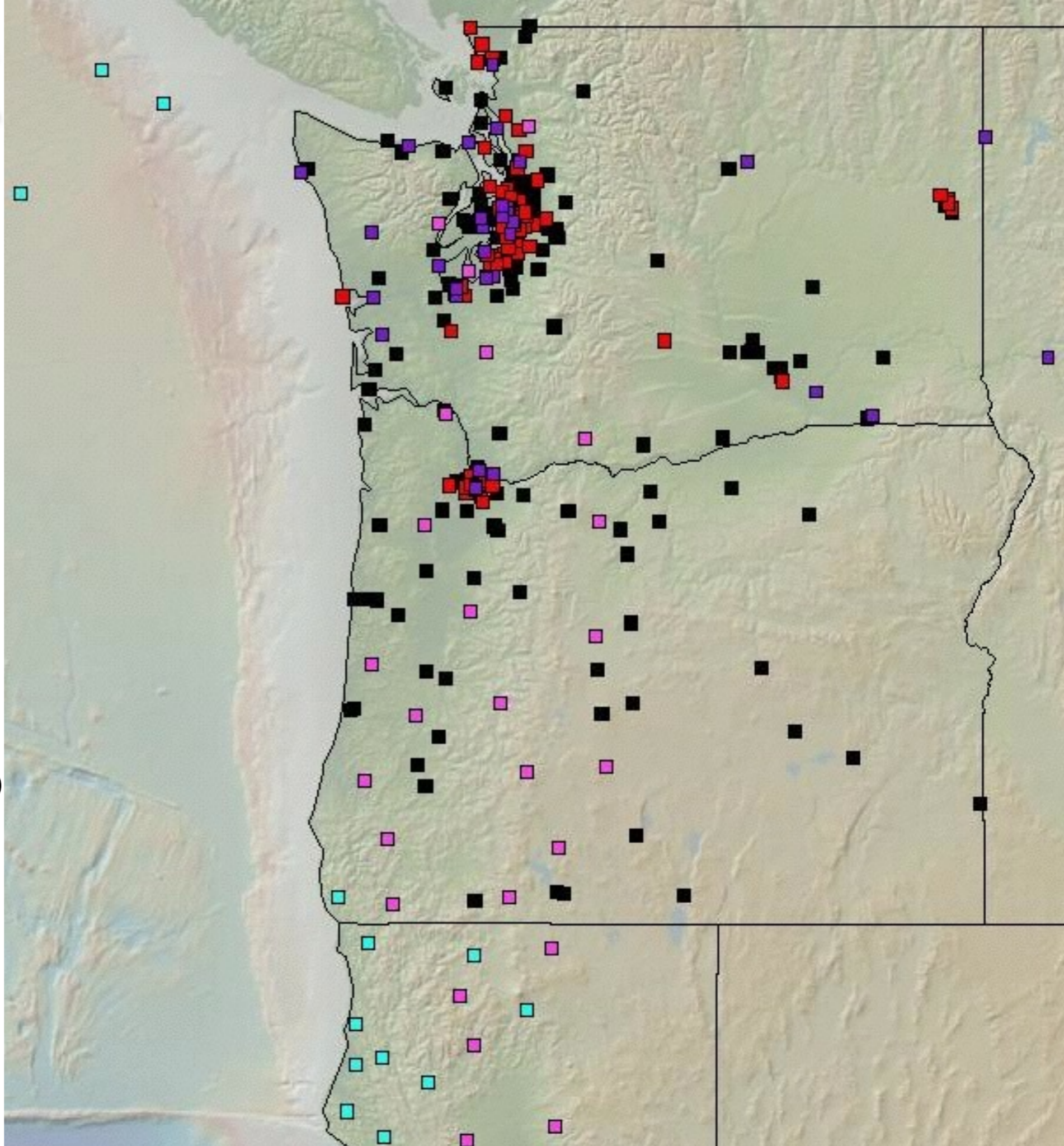
- Continuous Strong Motion “Backbone”.
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- PLUS Triggered SMO stations (NetQuakes and NSMP)





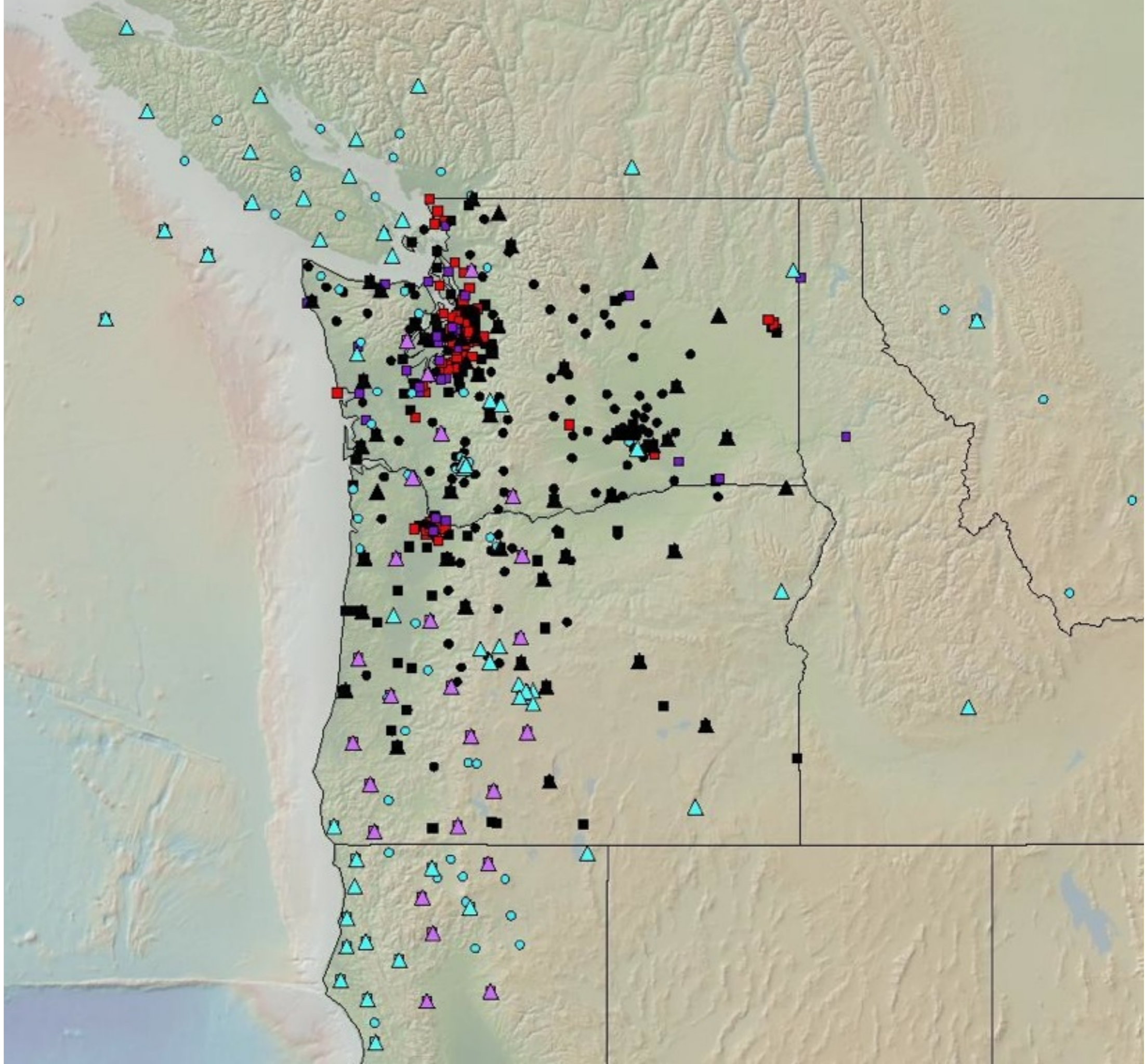
# Network Status

- Continuous Strong Motion “Backbone”.
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- PLUS Cascadia Initiative stations.



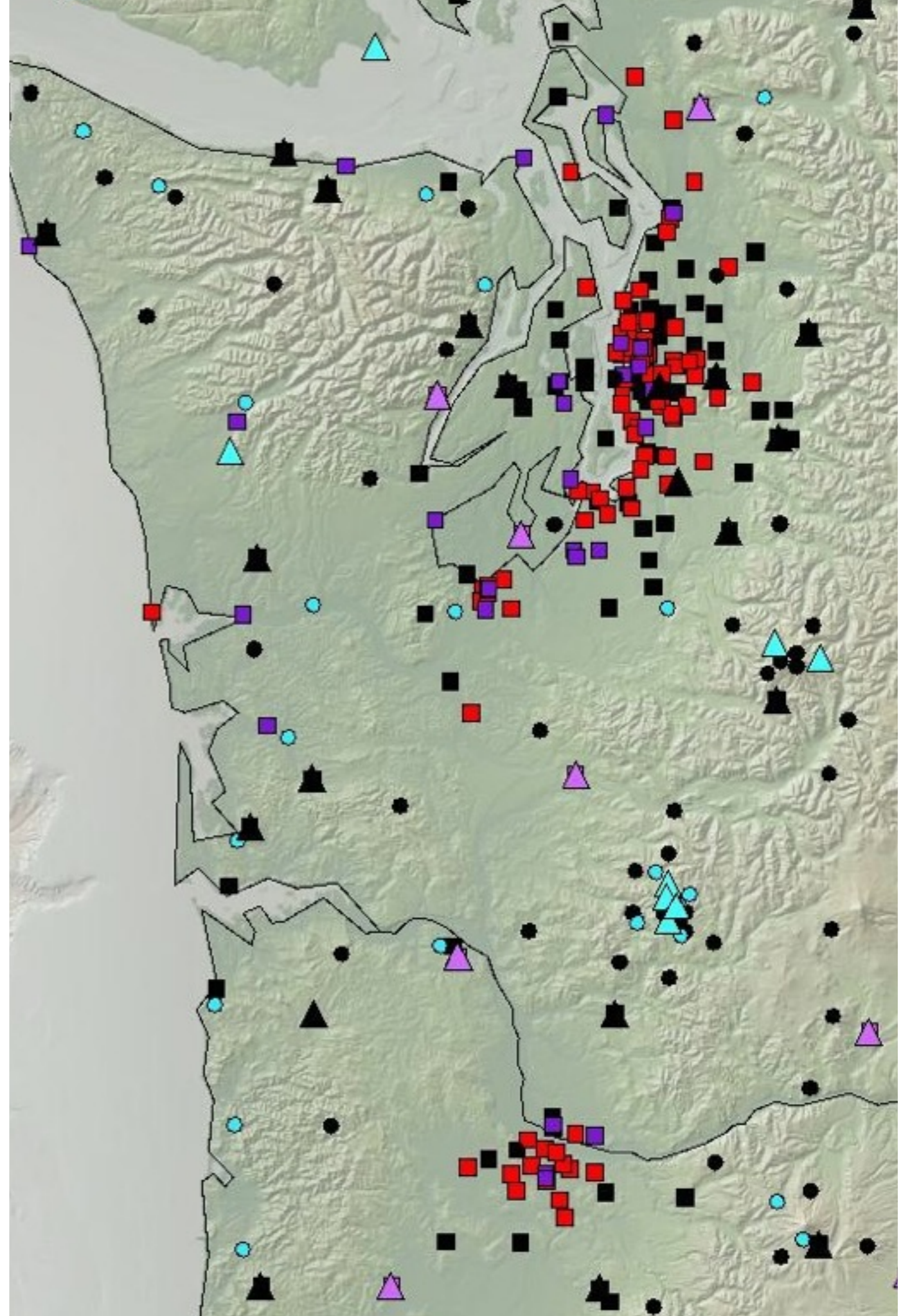
# Network Status

- The whole enchilada.



# Network Status

- Heart of the network.



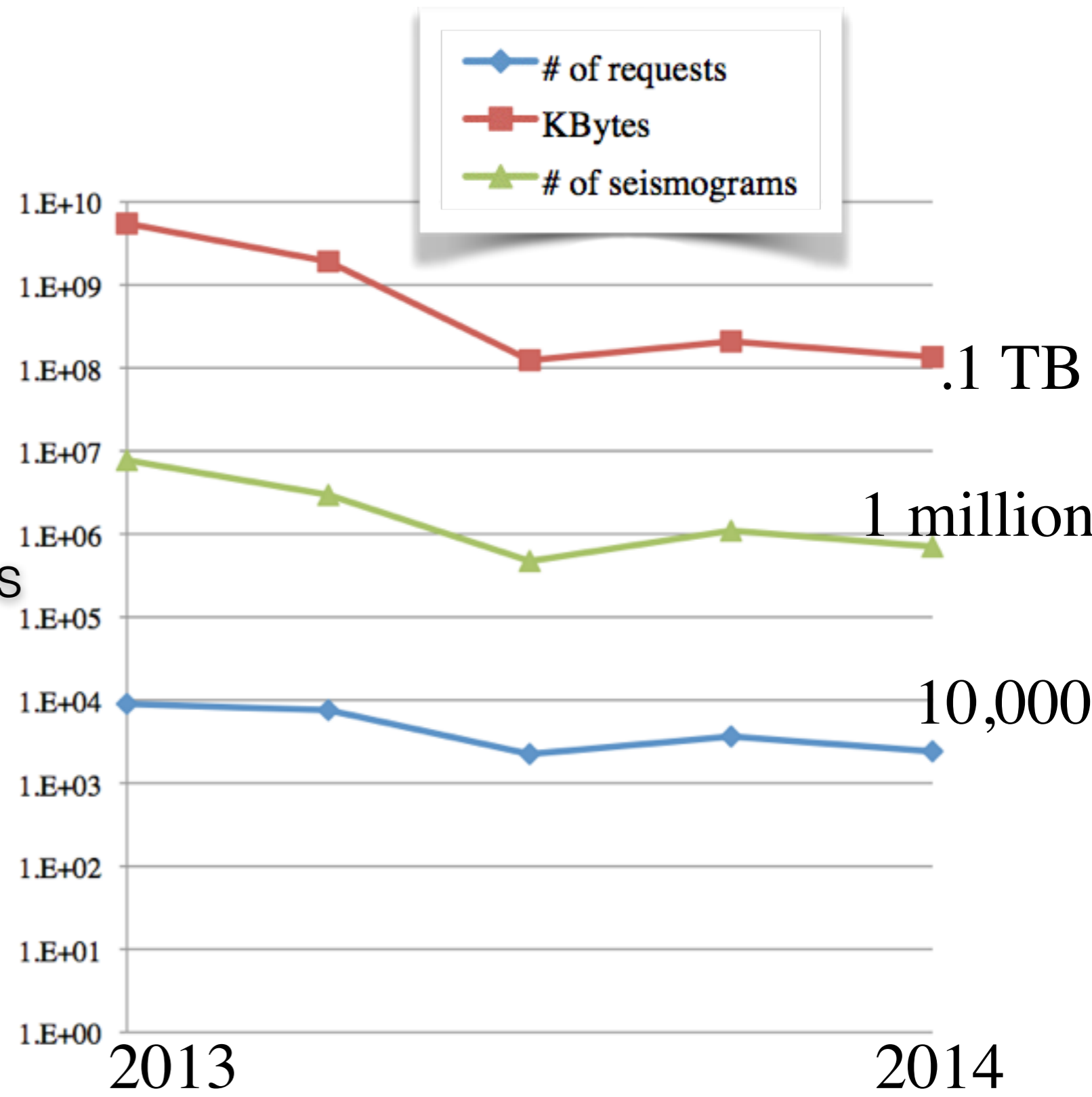
# Data Use

<http://www.iris.edu/IRISDataUse.htm>  
 A list of citations for other networks can be found online at:  
<http://www.iris.edu/IRISDataUse.htm>  
 During the period from 10/01/2013 to 01/01/2014,  
 the following list of individuals received data from the IRIS DMC, made available  
 from your network:

NET	NAME	INSTITUTION	#_reqs	#_bytes	#_seismograms
00	Weiwei	weiw@uic.edu			34
1243940	11279				1
127	Wang	WANG@IRIS.EDU			231
127	Zavies				1
0290	18				0
1404	11				1
10073	2				2
972047	3				3
972047	2				2
972047	33				33
972047	44				44
128	1				1
128	1				1
2244	63				2
972047	181				1
18024	93				1
14717	69				1
213	17				1
1432176	21843				1
3920	33				1
972047	41639				0
2247720	11637				270
8089383	27331				180
19133013	18648				2419
6078	87				1
10891	144				0
379170	5383				2
13786	3				1
30144	176				1
19808	186				2
24933	33				1
213940	18170				163
663266	1843				180
620162	113				31
28024	1880				29

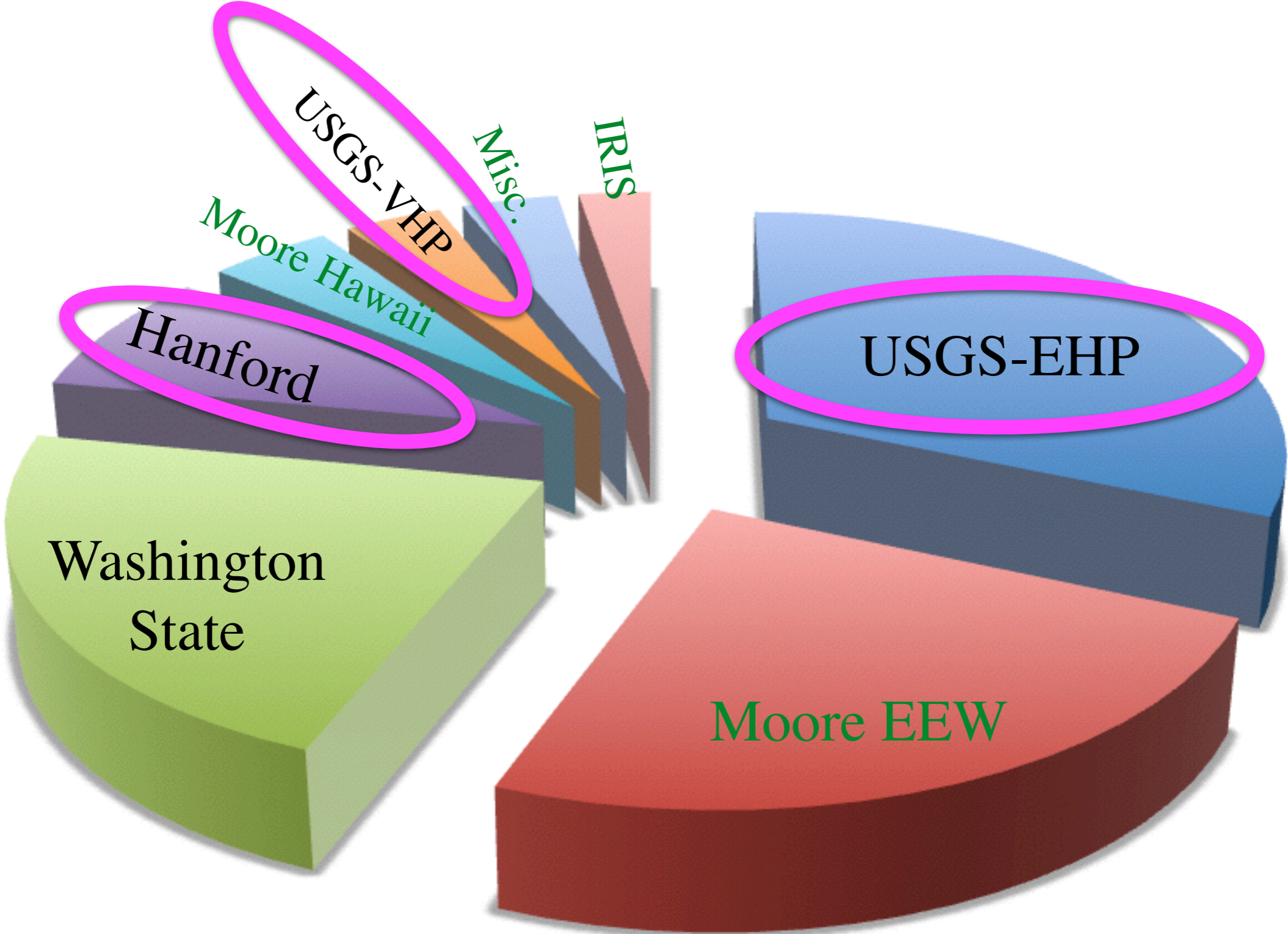
## Quarterly Stats

- ✱ 0.1 - 1 TB
- ✱ ~1 - 9 million seismograms
- ✱ 5,000 - 10,000 requests

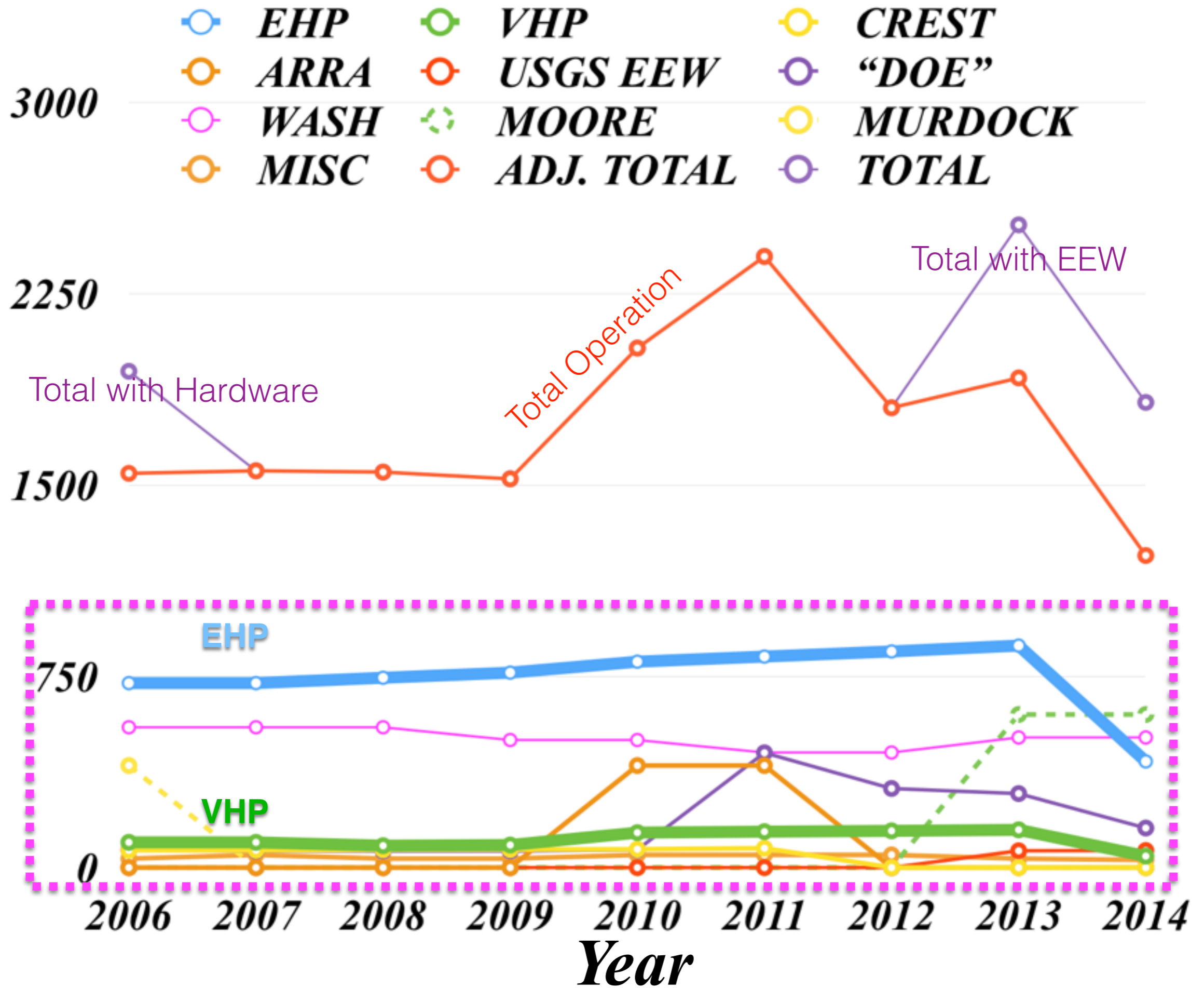


# Funding Status

Total: 2.6 M

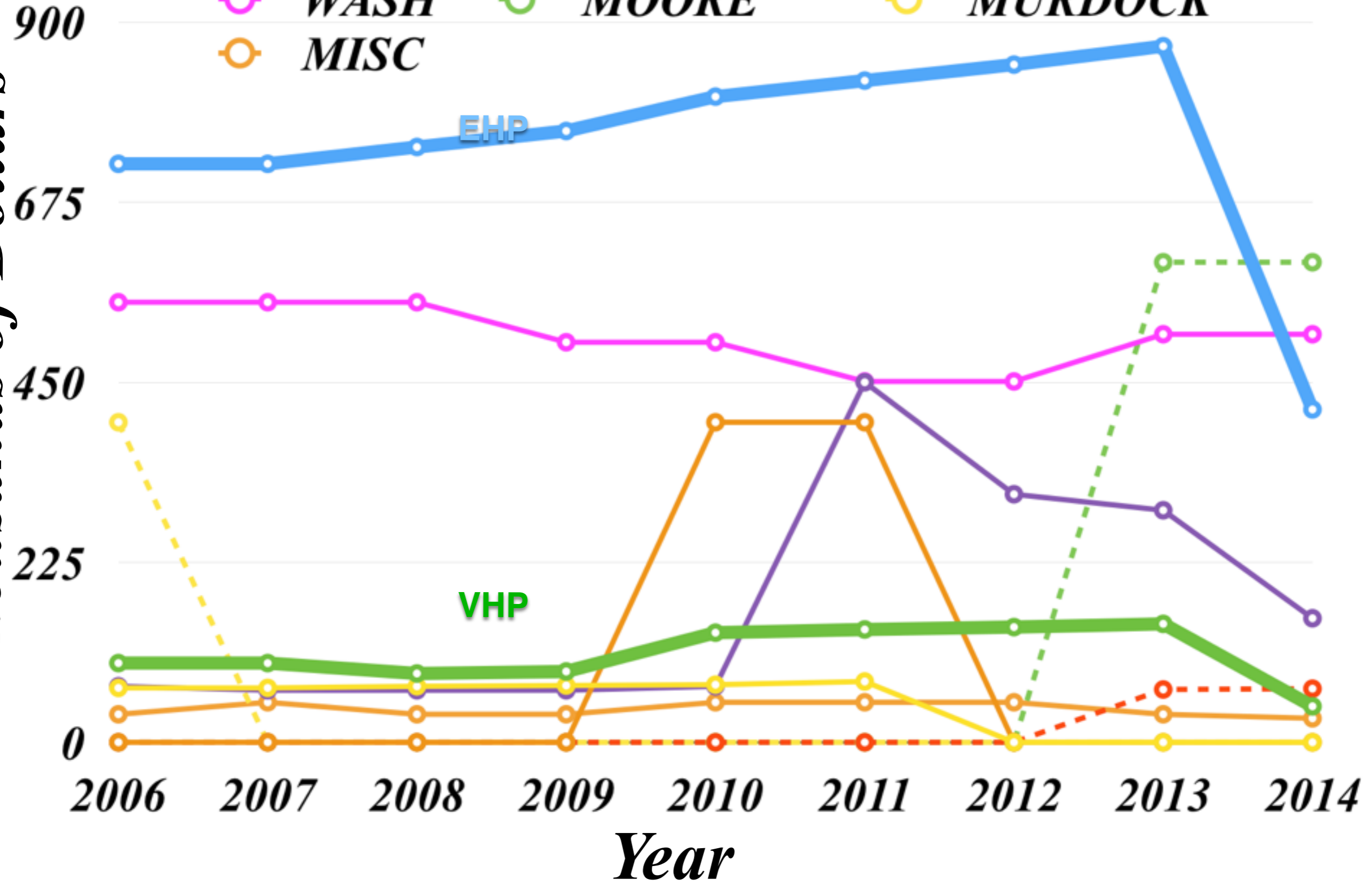


*Thousands of Dollars*



Thousands of Dollars

- EHP*
- ARRA*
- WASH*
- MISC*
- VHP*
- USGS EEW*
- MOORE*
- CREST*
- “DOE”*
- MURDOCK*



# Volcanoes and Earthquakes

- New request for proposals for 5-year Coop agreements due next month.
- VHP and EHP funding will be separated.
- Funding levels uncertain—probably won't rise!



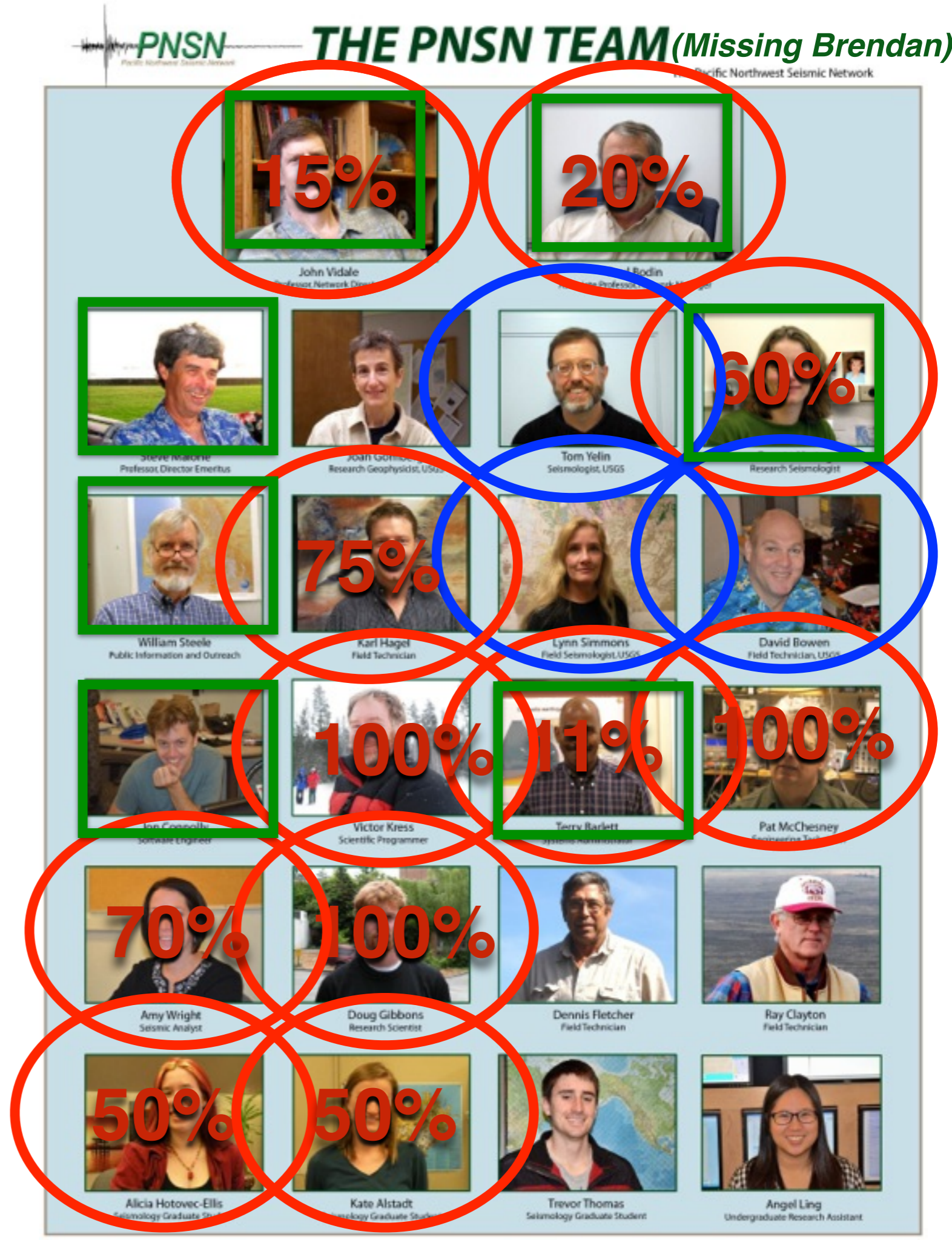
# Organizational

- Station maintenance.
  - Telemetry
    - analog
    - digital
    - numerous contracts
- Equipment inventory, etc.
- Station metadata (punishing)
- IT/Computer network
  - Networking (Byzantine)
  - Hardware (no joy)
- Acquisition/Processing software/review
- Product generation software
- Website/Public Information
- Interpretation/Advocacy
- Funding and management
  - (just now 3 long-term contracts in play)



# PNSN Personnel

- State of Washington
- ANSS EHP + VHP
- USGS Personnel
- McChesney retirement
  - Where to site replacement?
- E. Washington?
- EEW Installs...



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# Hanford Evolution

## ISSI Report Recommendations:

- “Transfer or Decommission” 11 Stations.
- Upgrade 8-10 stations.
- Install 2 new (on site) stations .

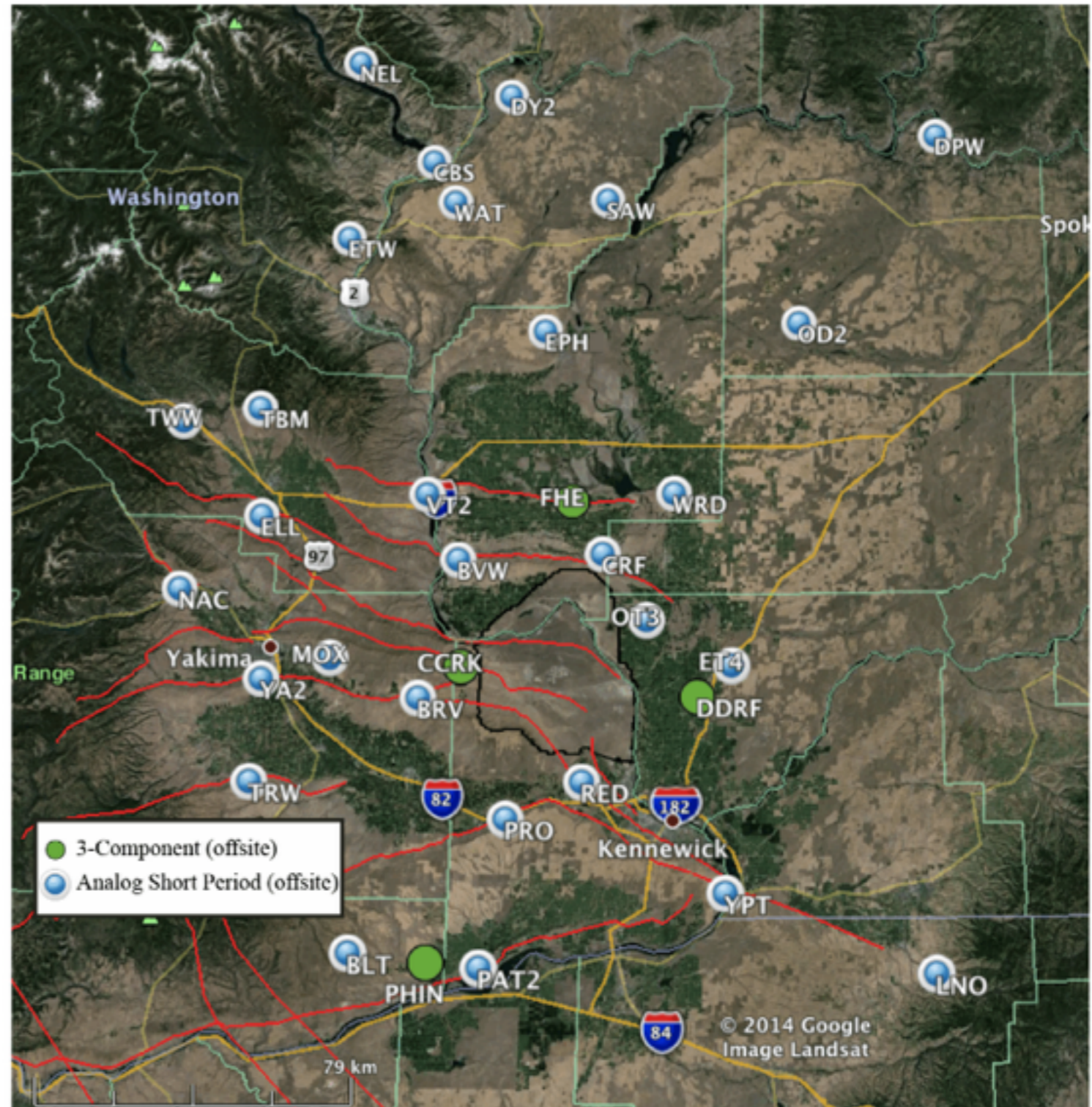


Figure 3: Existing MSA Supported Offsite Stations Configuration

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ISSI Report  
Recommendations:

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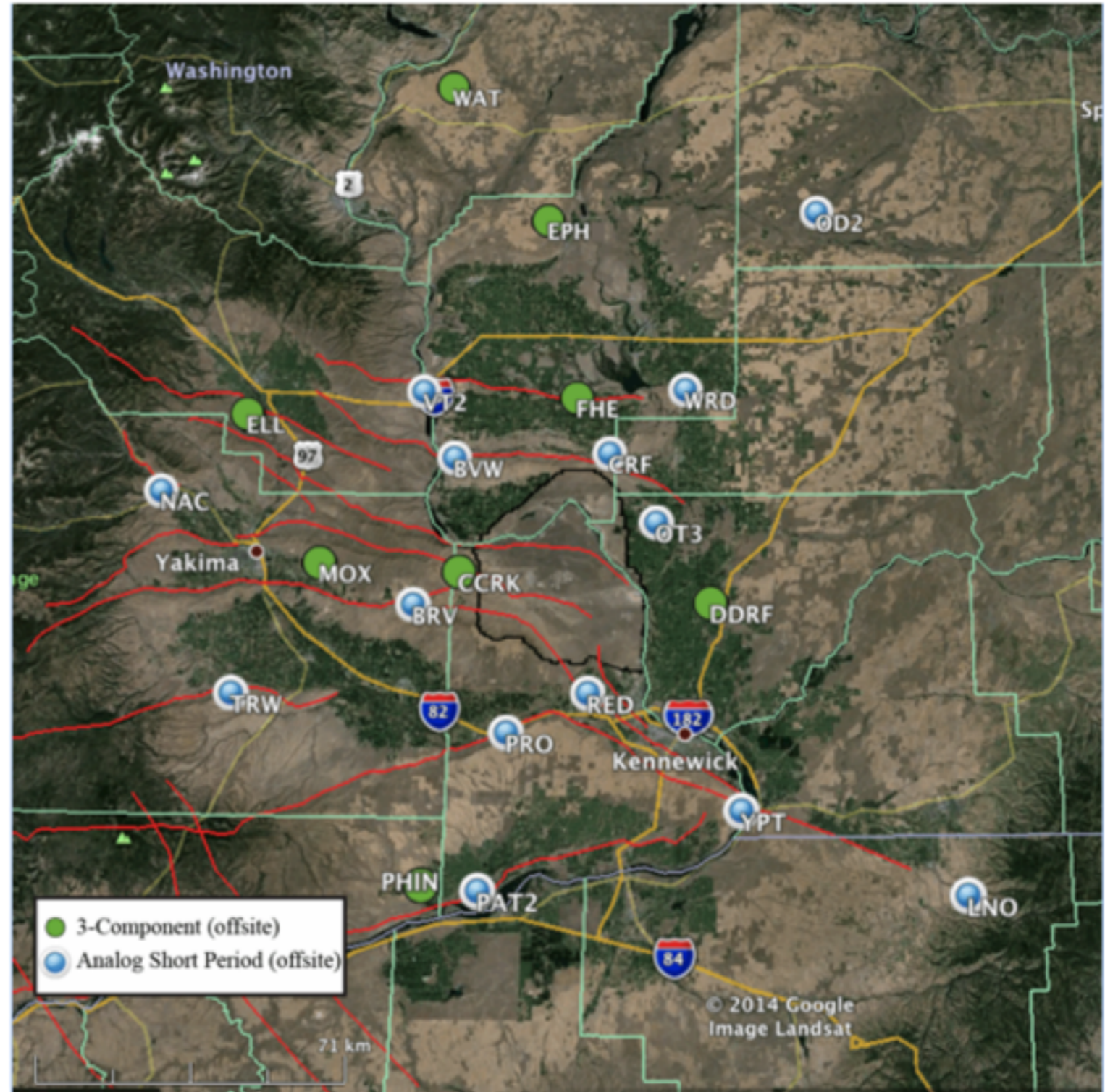


Figure 4: A proposed MSA supported Offsite station configuration

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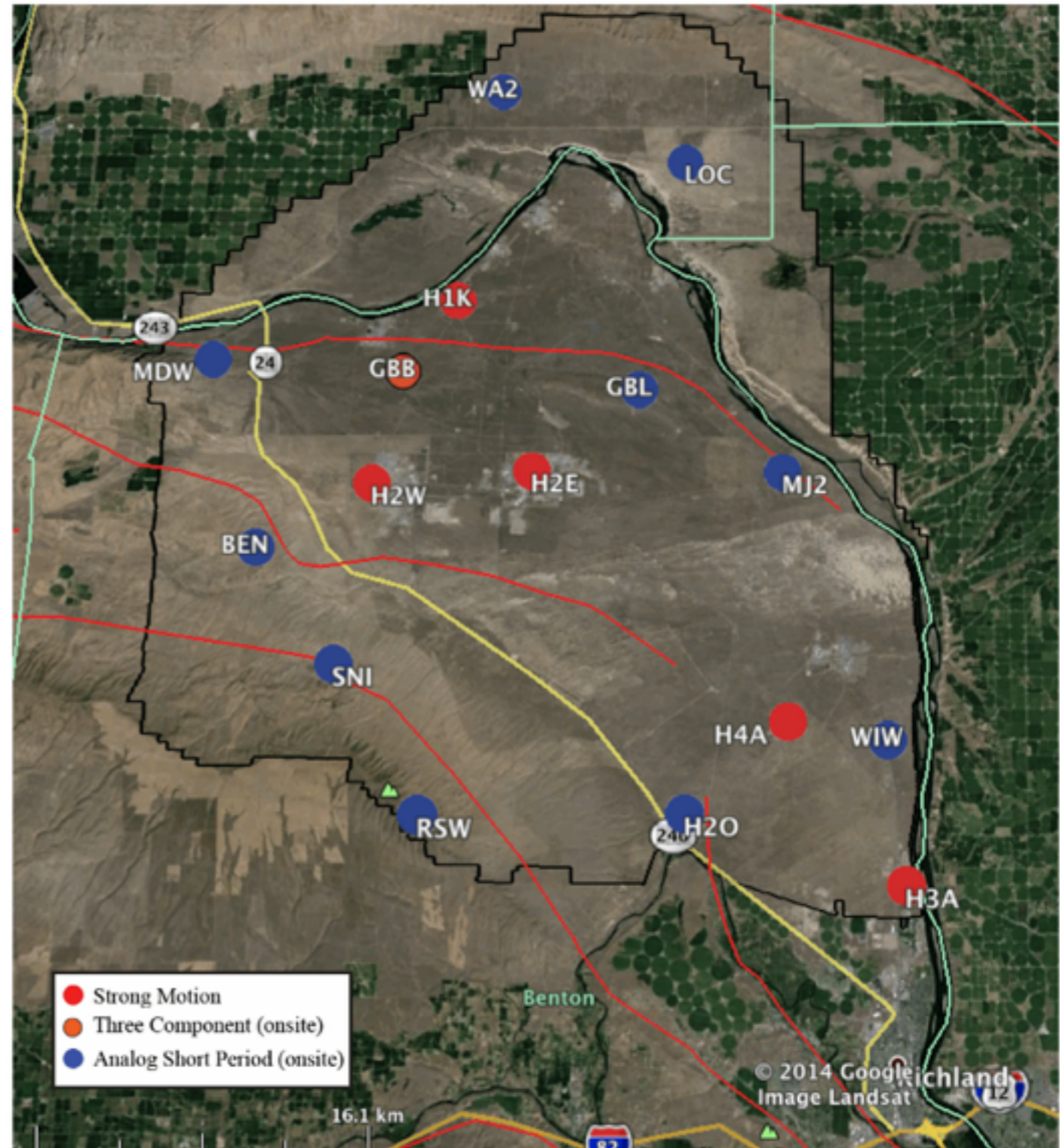


Figure 1: Existing MSA Supported Onsite Stations

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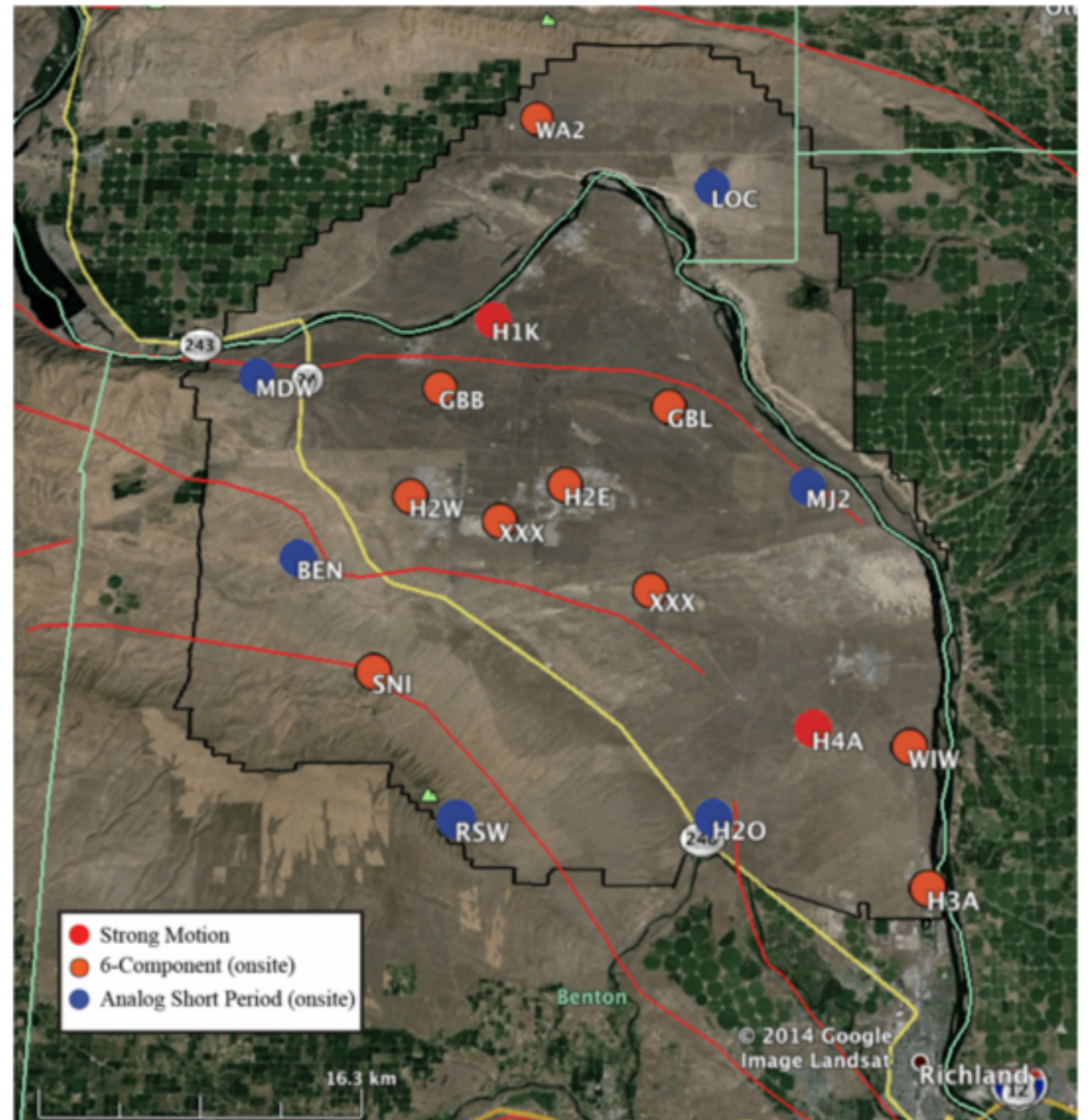


Figure 2: A proposed configuration for Onsite stations

# Hanford Evolution

The 300-thousand dollar question:

What funding will DOE/MSA make available to implement ISSI recommendations?

3-year agreement to start October.

or

No seismic monitoring of Eastern Washington.

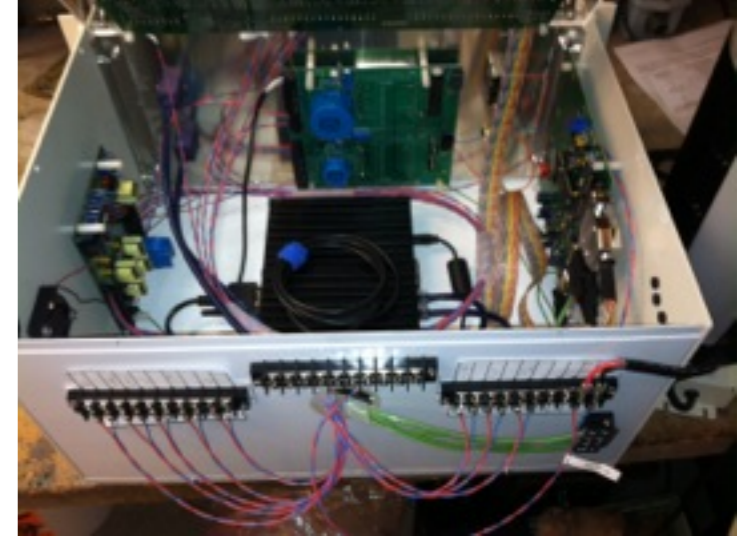




# Network Modernization

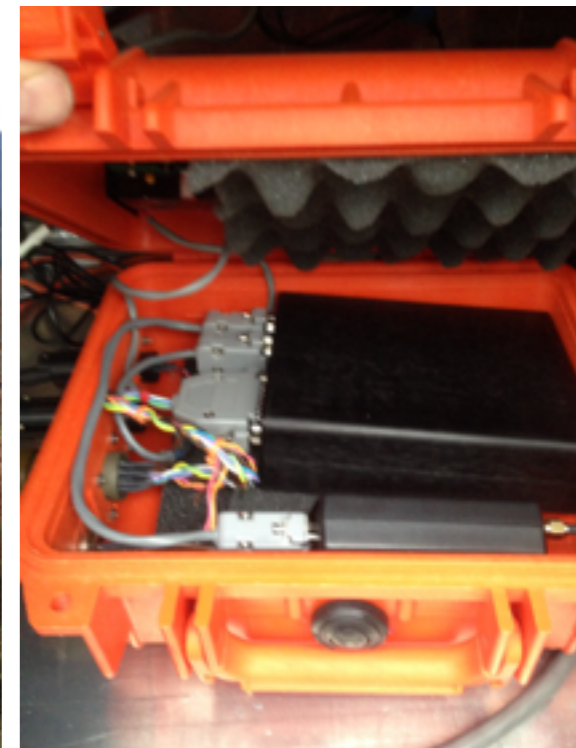
## “Ringworm”

- remote Earthworm digitizing system.
- replaces huge rack
- PSN boards/inexpensive clocks
- McChesney “Mc8” discriminator
- low-power fanless Linux system



## “Cascades 16 Digitizer”

- Rick Lahuesen @ CVO
- “front end” by Pat McChesney
- 16-bit, 4-channel
- low power



# Performance Standards

# MUSTANG

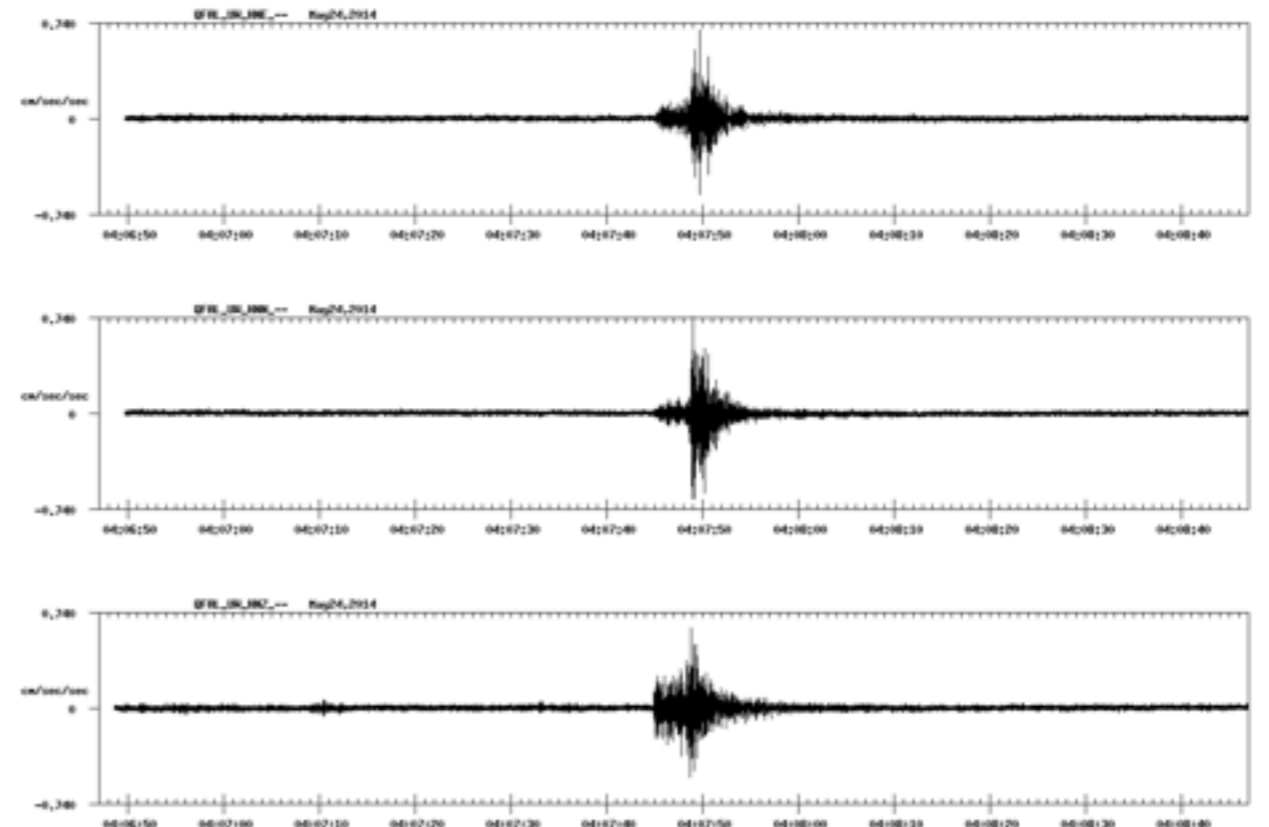
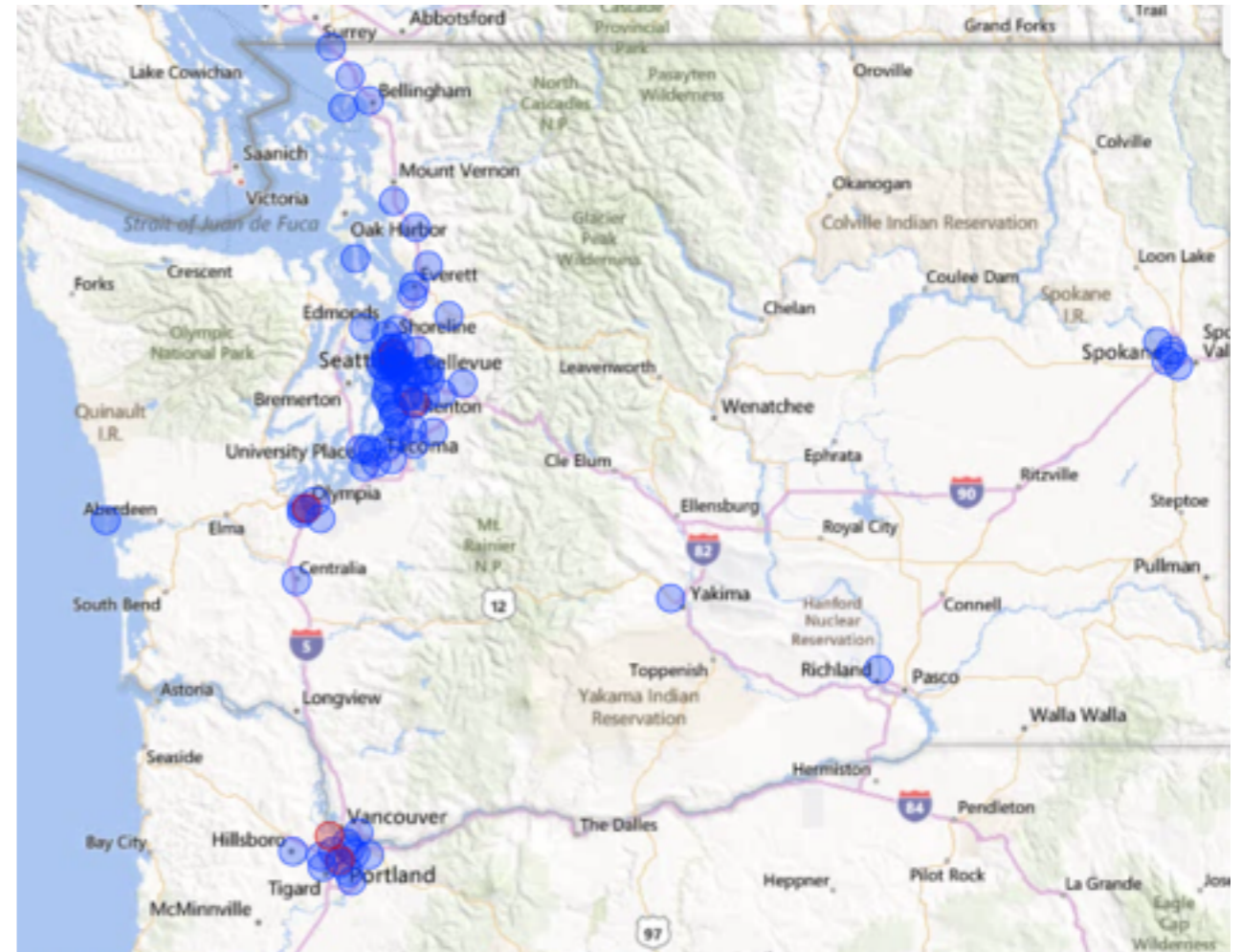
- Bleh, I don't really want to talk about this.
- It's VERY tedious.

The screenshot shows the IRIS DMC MUSTANGBETA metrics Web Service Documentation page. The page title is "IRIS DMC MUSTANGBETA metrics Web Service Documentation". The page content includes a "Description" section and a "Current list of all metrics" section. The "Current list of all metrics" section lists various metrics such as amplifier\_saturation, calibration\_signal, channel\_up\_time, clock\_locked, cross\_talk, data\_latency, dc\_offset, dead\_channel\_exp, digital\_filter\_charging, digitizer\_clipping, event\_begin, event\_end, event\_in\_progress, feed\_latency, glitches, max\_gap, max\_overlap, max\_stalta, missing\_padded\_data, num\_gaps, num\_overlaps, num\_spikes, orientation\_check, pct\_above\_nhnm, pct\_below\_nhnm, percent\_availability, polarity\_check, pressure\_effects, sample\_max, sample\_mean, sample\_median, sample\_min, sample\_rms, sample\_snr, spikes, station\_completeness, suspect\_time\_tag, telemetry\_sync\_error, timing\_correction, timing\_drift, timing\_quality, total\_latency, and transfer\_function. Each metric is accompanied by a brief description of what it measures and how it is calculated.

The screenshot shows a web browser displaying a list of metrics and their values. The browser address bar shows the URL "www.iris.edu/files/MUSTANG/reports/UW.metrics.txt". The page content is a text file listing various metrics and their corresponding values. The metrics listed include amplifier\_saturation, calibration\_signal, channel\_up\_time, clock\_locked, cross\_talk, data\_latency, dc\_offset, dead\_channel\_exp, digital\_filter\_charging, digitizer\_clipping, event\_begin, event\_end, event\_in\_progress, feed\_latency, glitches, max\_gap, max\_overlap, max\_stalta, missing\_padded\_data, num\_gaps, num\_overlaps, num\_spikes, orientation\_check, pct\_above\_nhnm, pct\_below\_nhnm, percent\_availability, polarity\_check, pressure\_effects, sample\_max, sample\_mean, sample\_median, sample\_min, sample\_rms, sample\_snr, spikes, station\_completeness, suspect\_time\_tag, telemetry\_sync\_error, timing\_correction, timing\_drift, timing\_quality, total\_latency, and transfer\_function. The values for each metric are listed in a column to the right of the metric name.

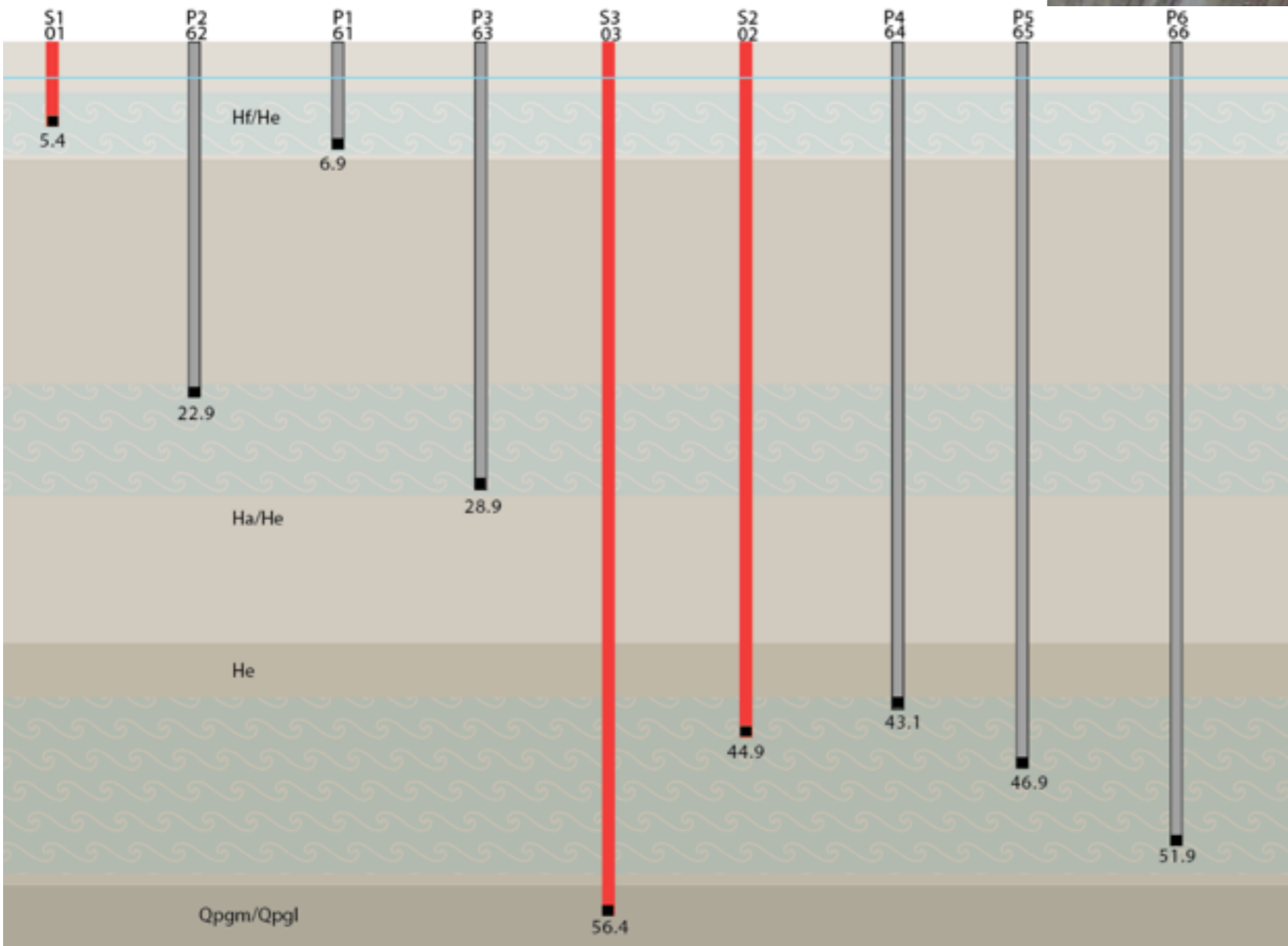
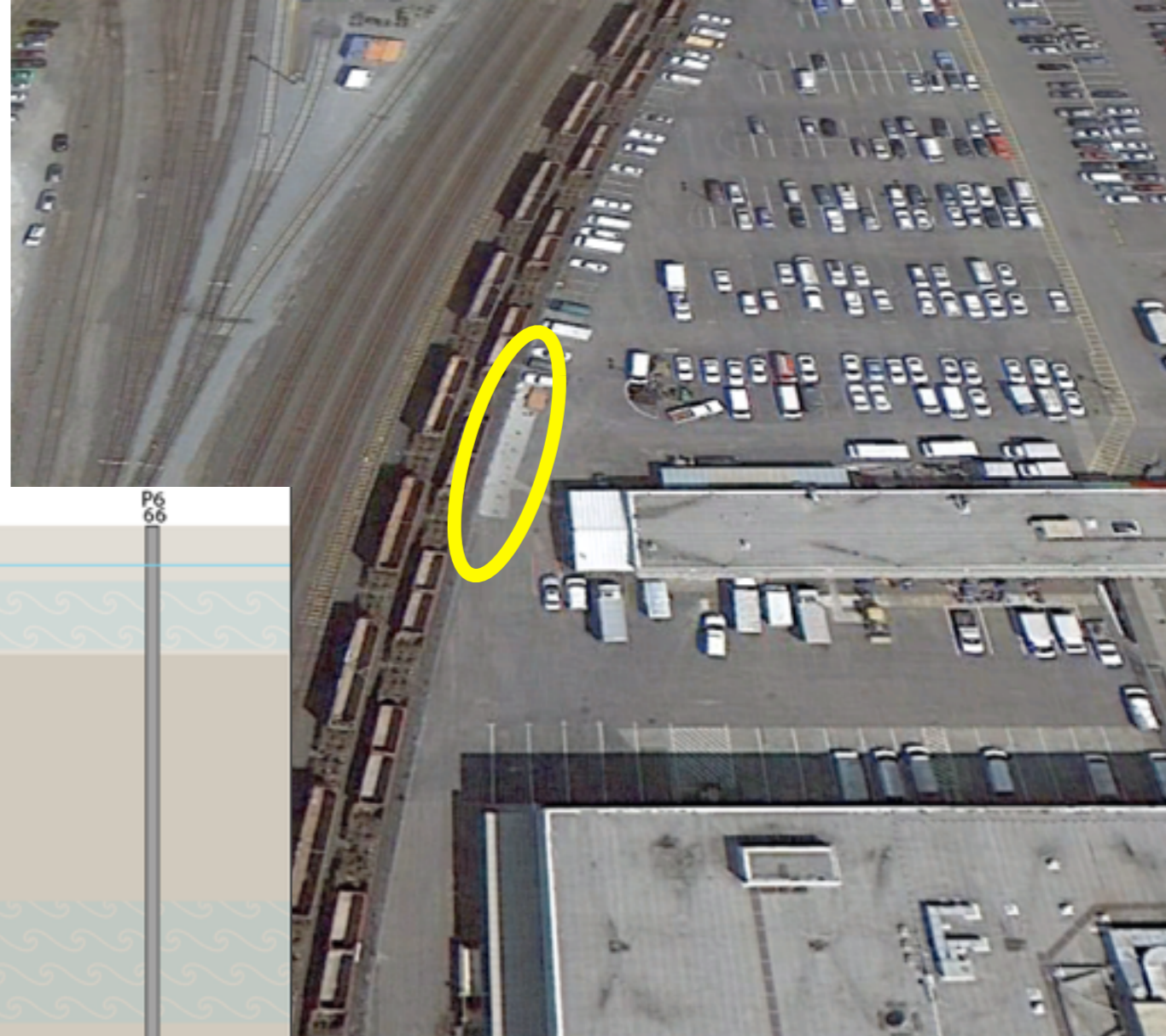
# NetQuakes

- USGS NetQuakes support “not going away” (D. Oppenheimer, pers. comm., 2014)
- However, other (cheaper) options are being explored.
- Currently, fresh deployments are on hiatus.



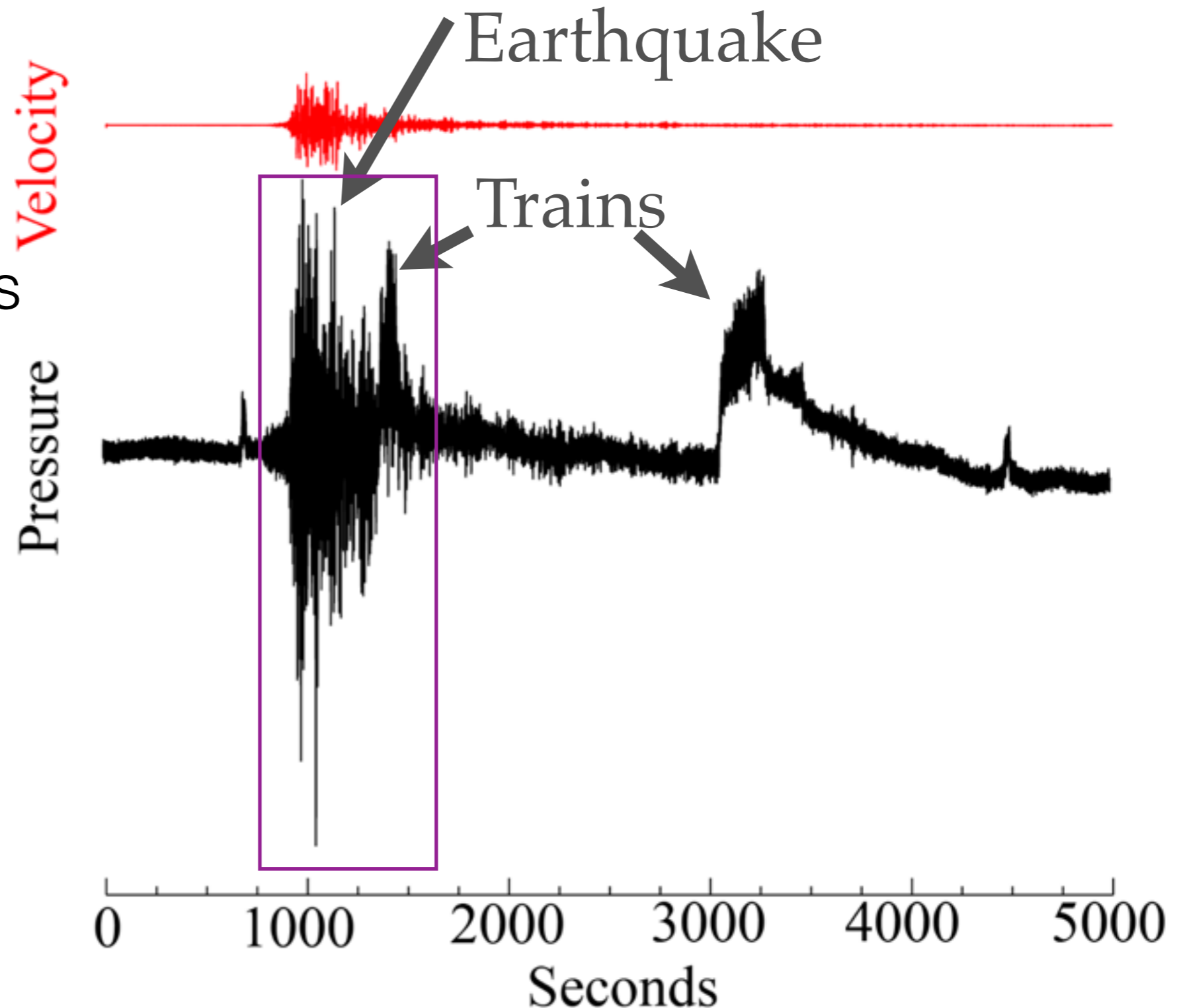
# Seattle Liquefaction Array

- Deep, Noisy



# Seattle Liquefaction Array

- Seismic pressure waves from Haida Gwaii same size as train signals.
- Trains clearly pumped up pressure--did seismic waves?
- No



# Seattle Liquefaction Array

- Where to get data
- [www.iris.edu/mda/UW/SLA](http://www.iris.edu/mda/UW/SLA)



# Long Range Considerations

- Virtualization - Cloud computing
- “Cheap” sensor arrays
- Offshore monitoring
- GPS Seismogeodetics
- Catalog review - double differences