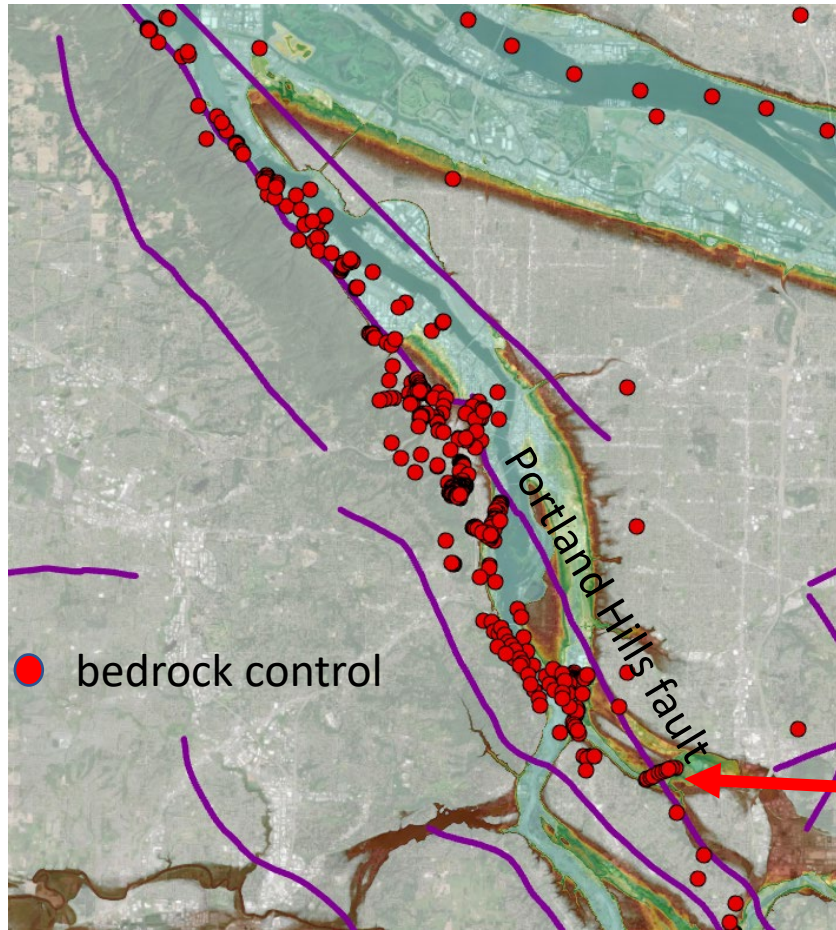


Seismic imaging of the Portland Hills fault

Lee Liberty
Boise State University



new seismic data collection through 2025 Crescent award



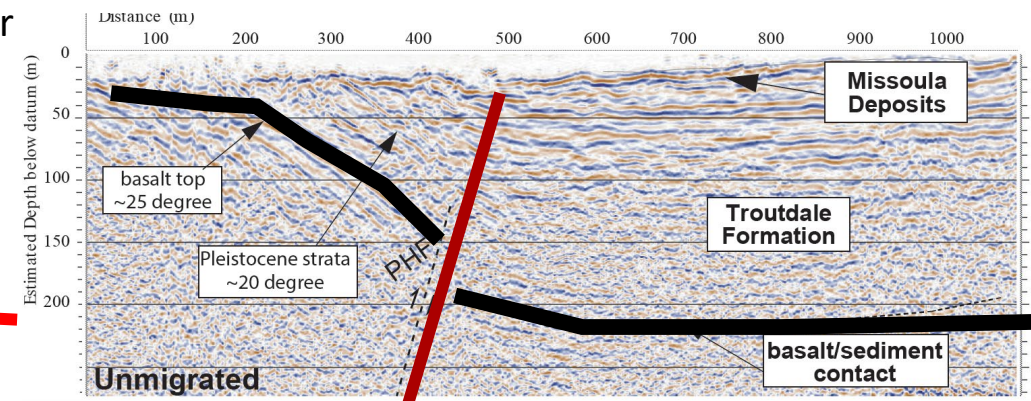
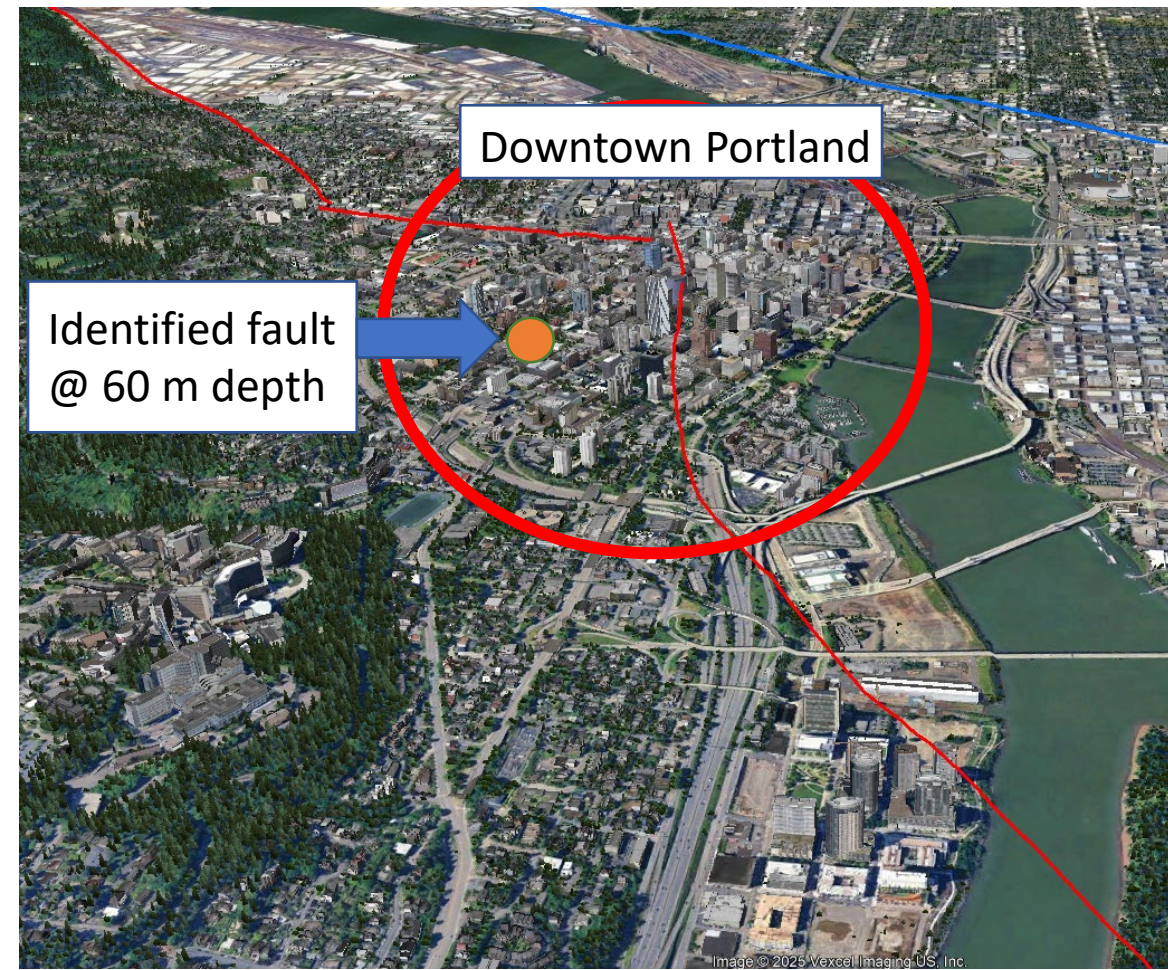
Where is the PHF?

Are sed above bedrock faulted?

What are the displacements?

As currently mapped
Slip Rate → Less than 0.2 mm/yr
Slip Sense → Reverse
Total Fault Length → 49 km
Date of Last Review → 2017 (DOGAMI)

Liberty et al (2003)



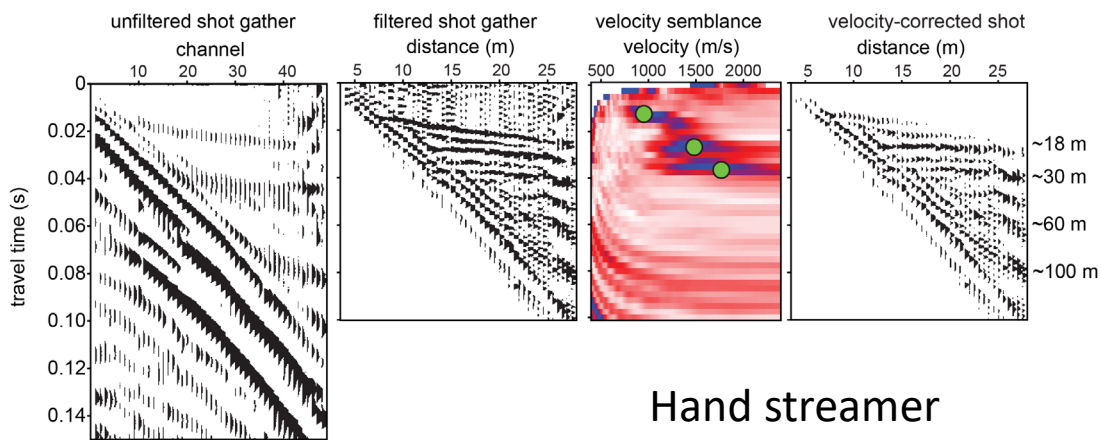
Seismic data collection

Hand streamer

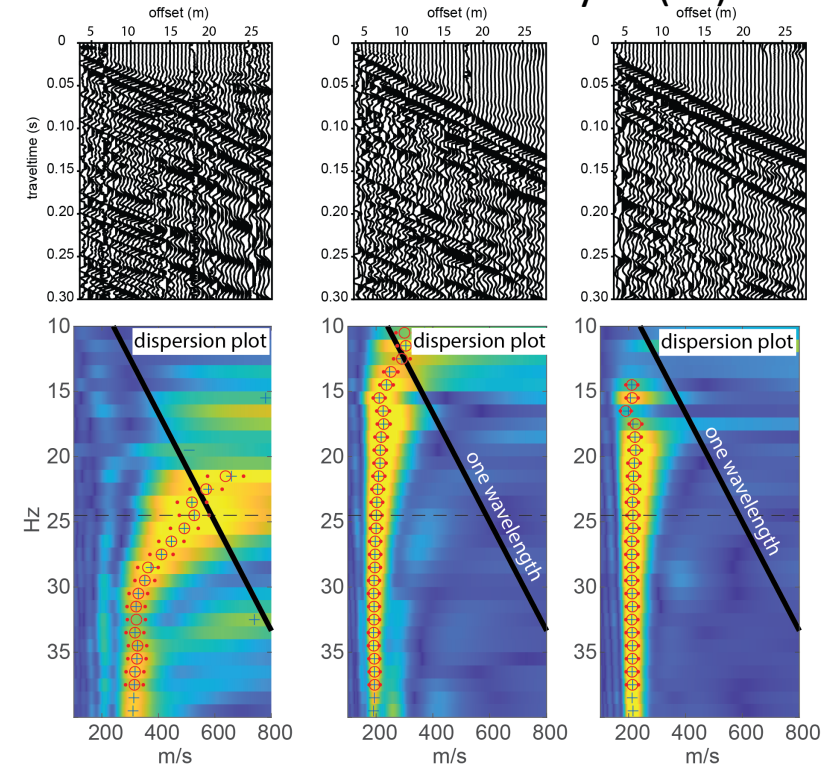
- 48-40 Hz geophones
- Spring-loaded electric hammer source
- 0.5 m spaced source and receiver positions
- Vs for upper ~5 m depth
- Reflections to ~100 m depth

Liberty and Otheim (2024)

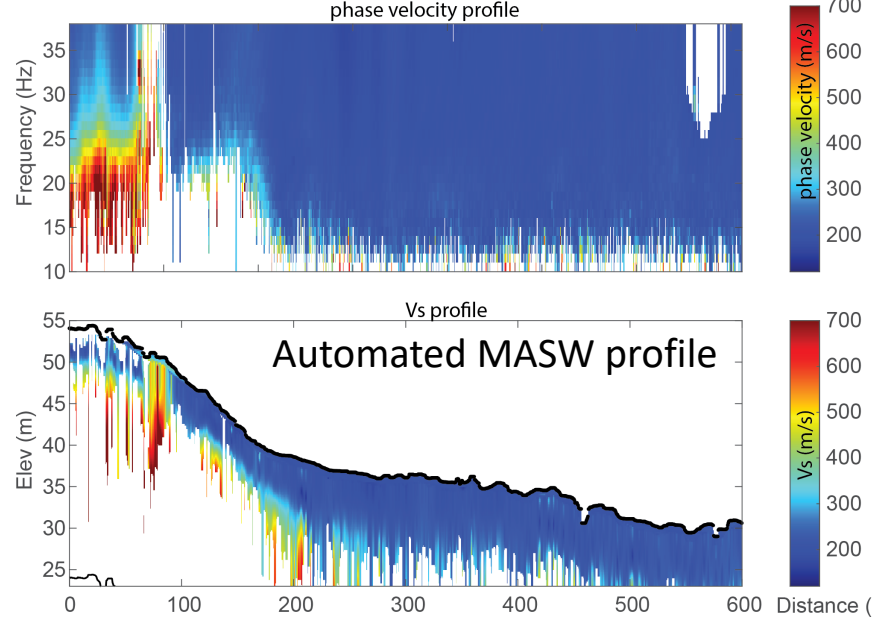
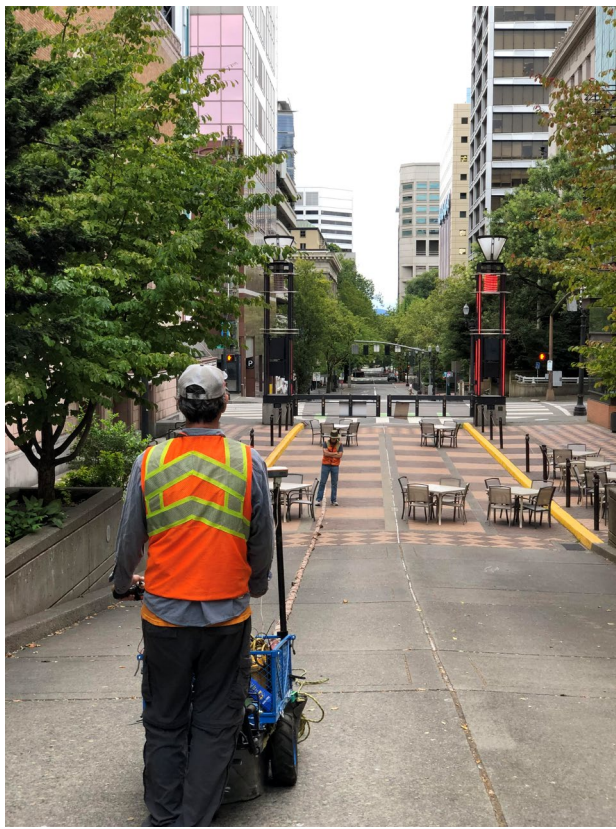
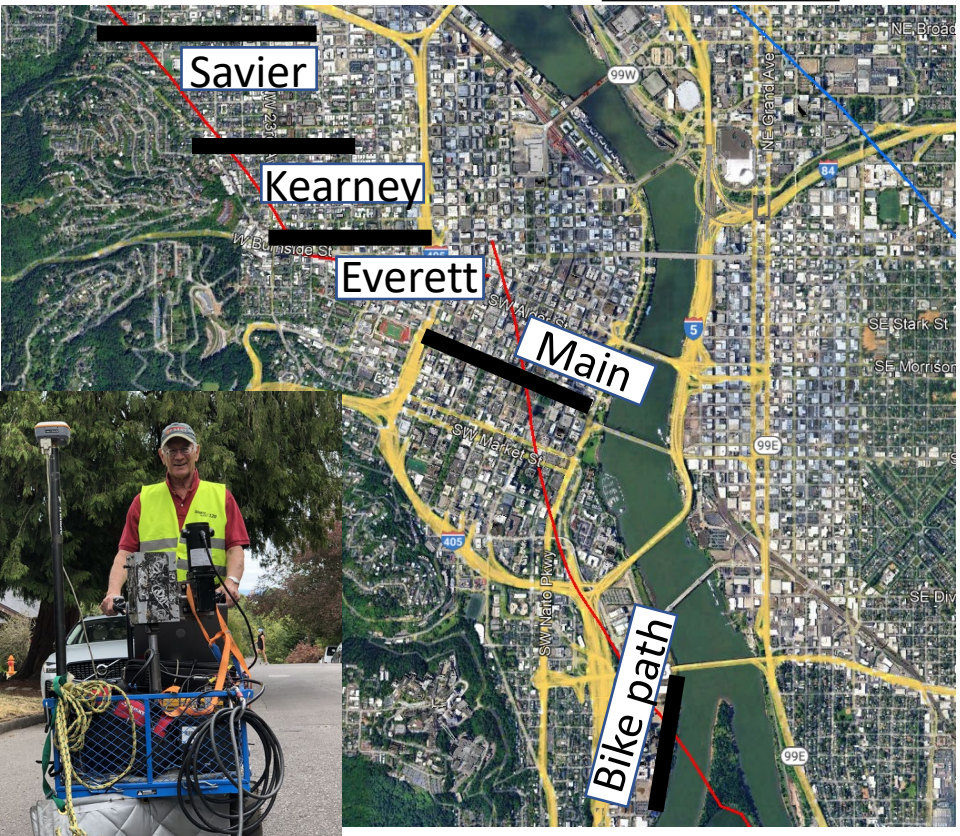
Reflection profiling



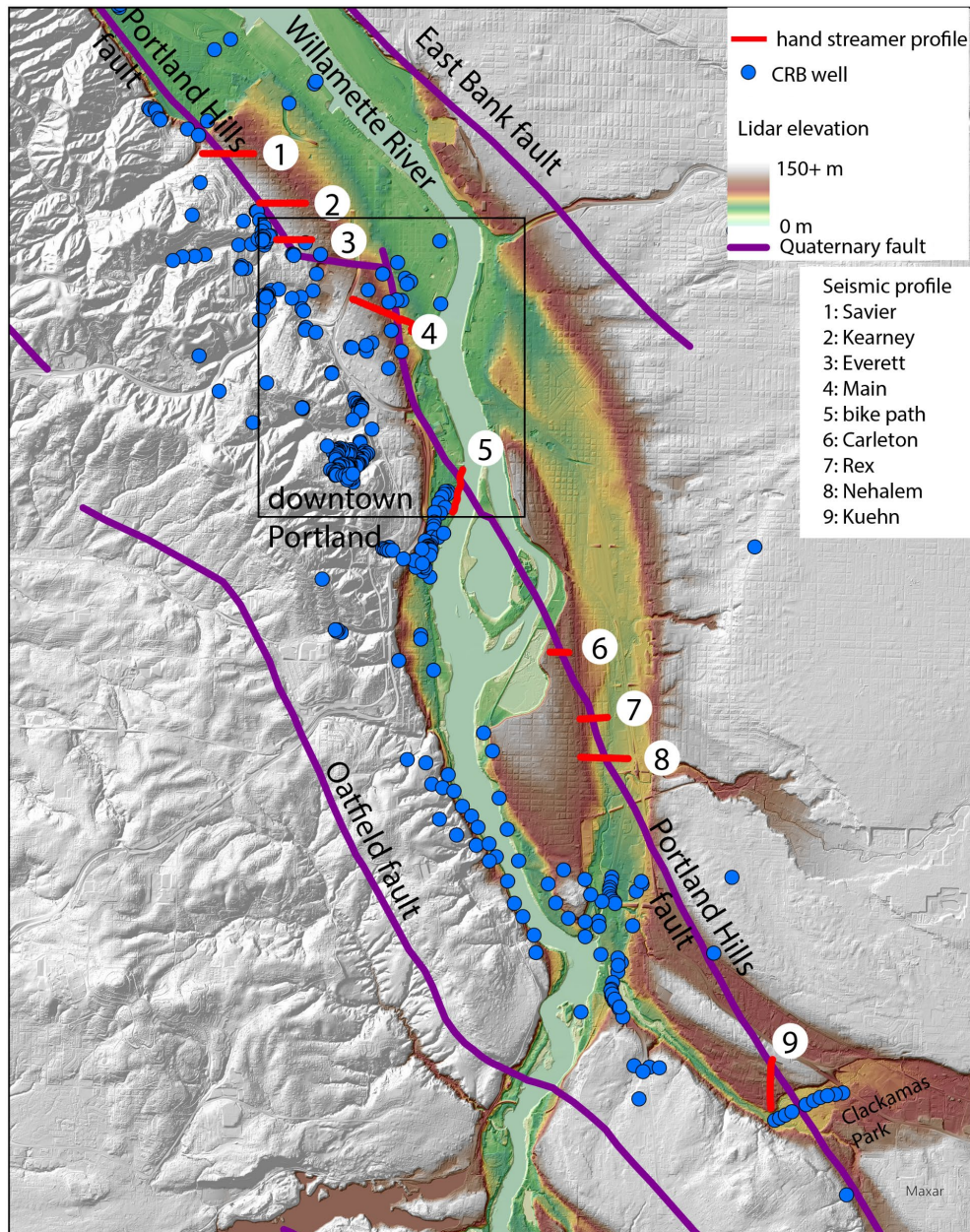
Surface wave analysis (Vs)



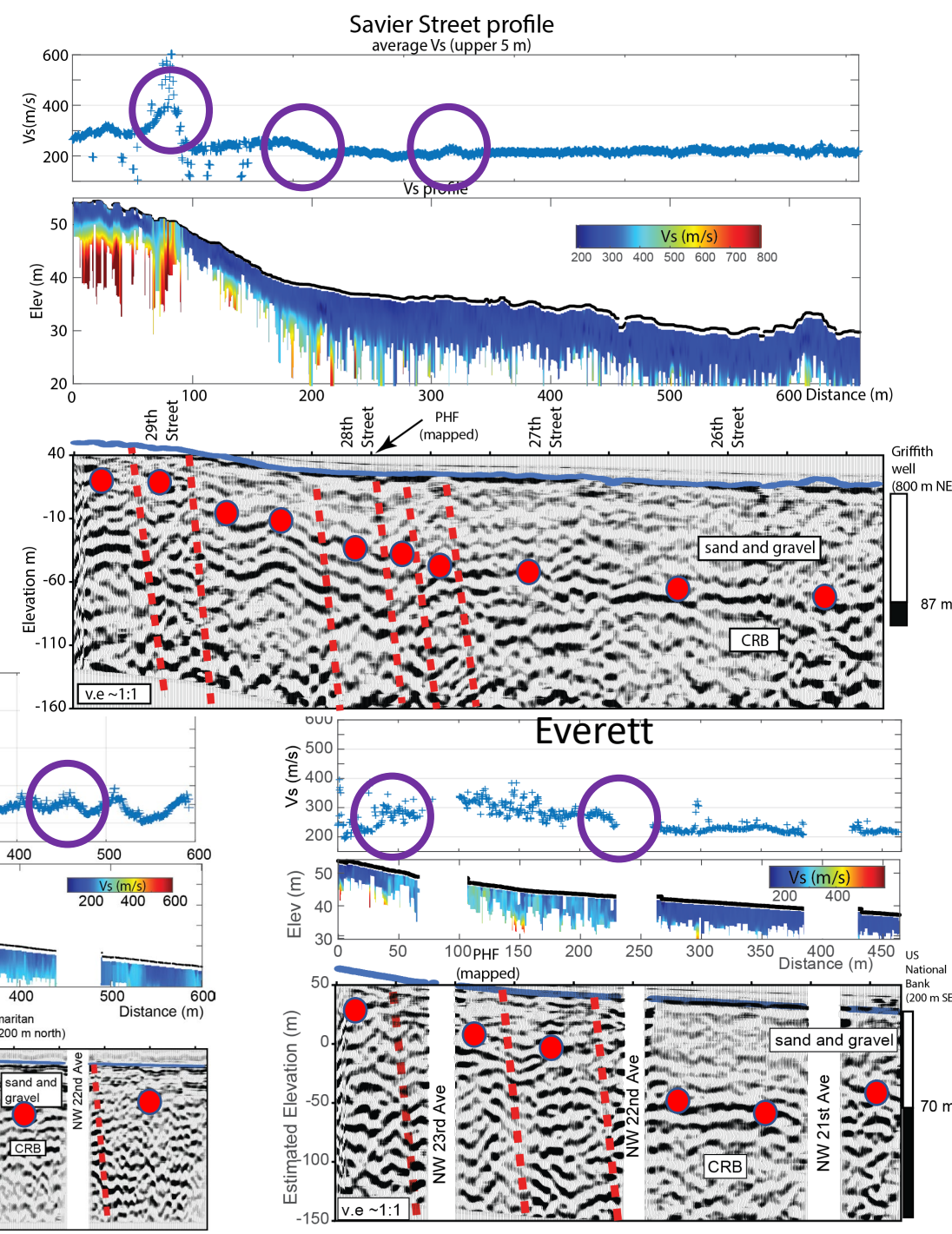
Hand streamer



North Portland

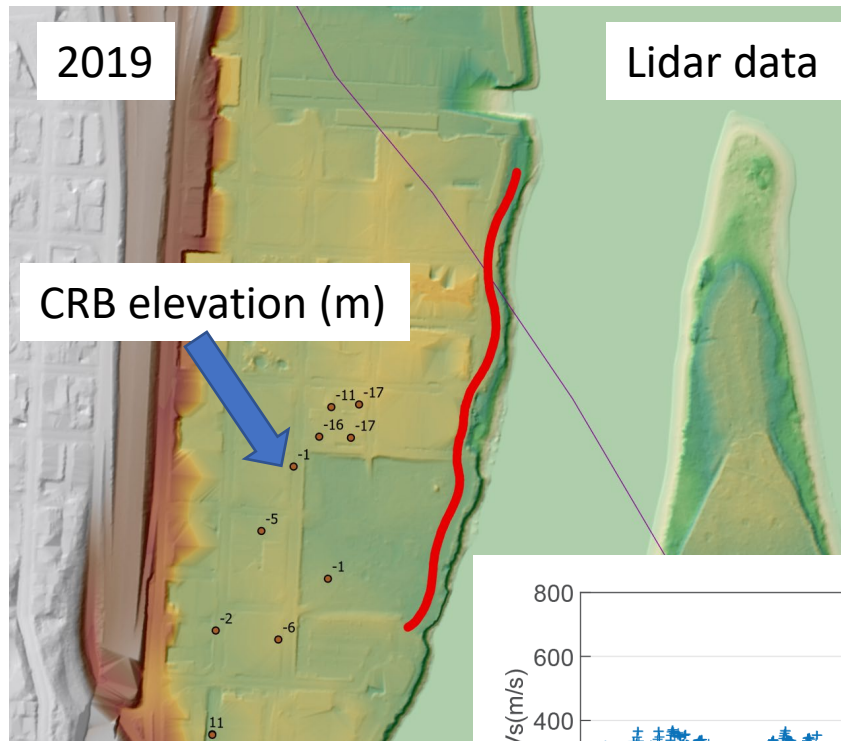
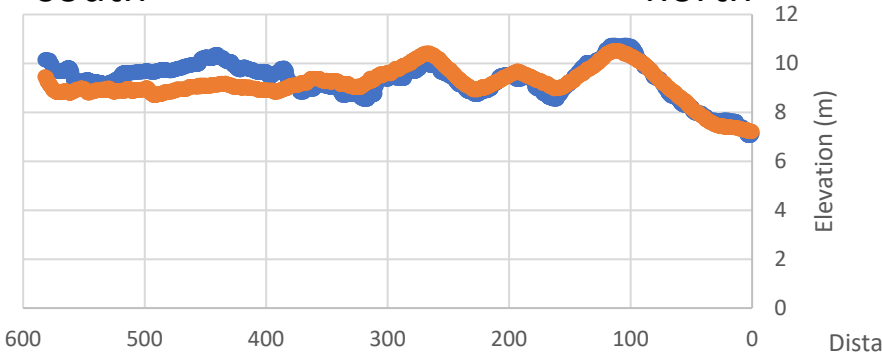


- **Folded and faulted CRB strata distributed ~300 m**
- **Elevated Vs where faults are mapped**
- **If elevated Vs relates to faulting, faults are latest Quaternary active**
- **PHF offsets CRB by 10's of meters**

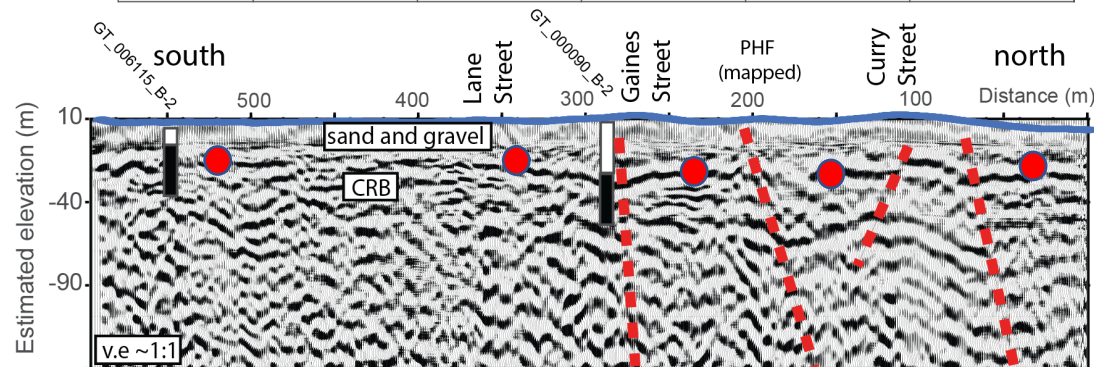
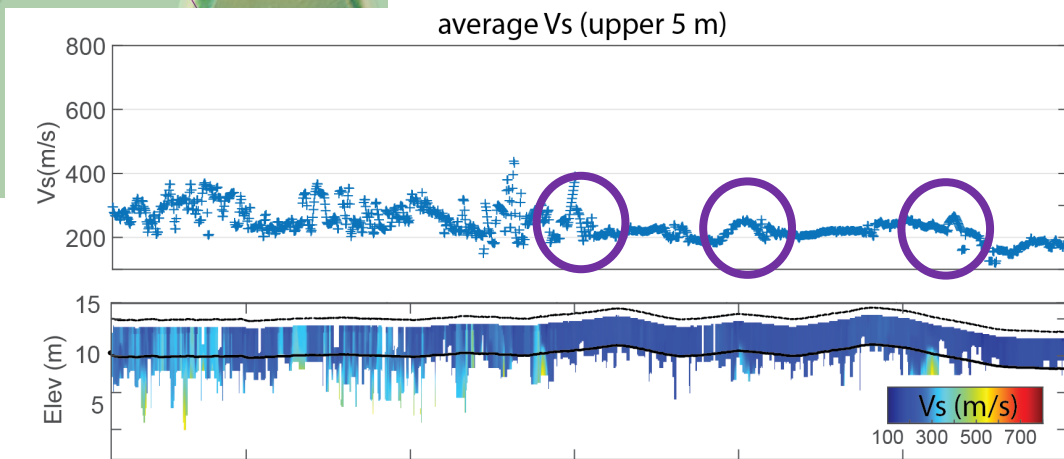
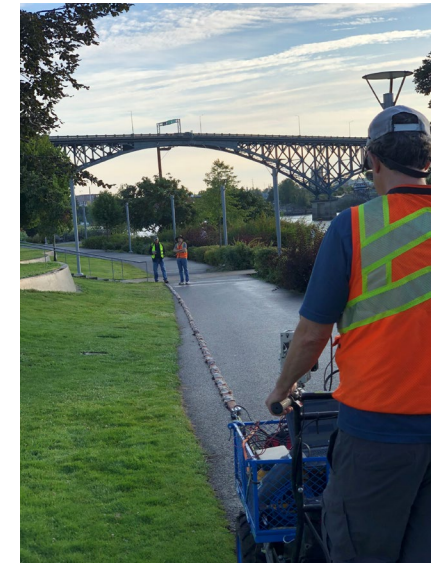




south north

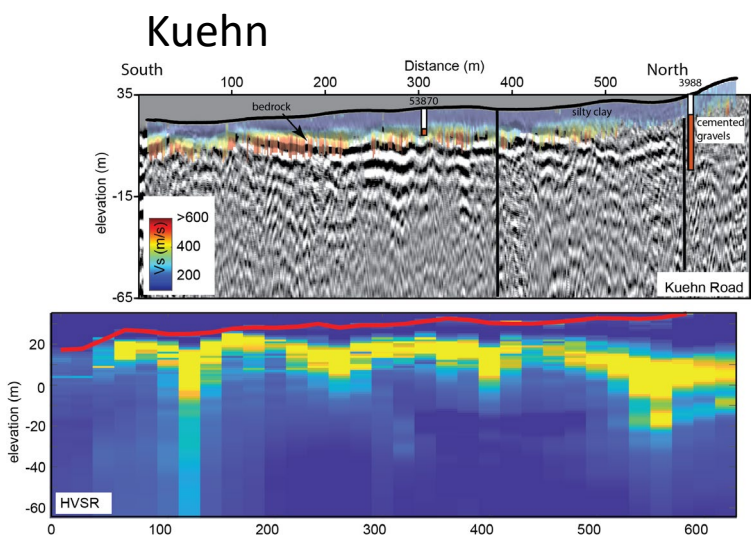
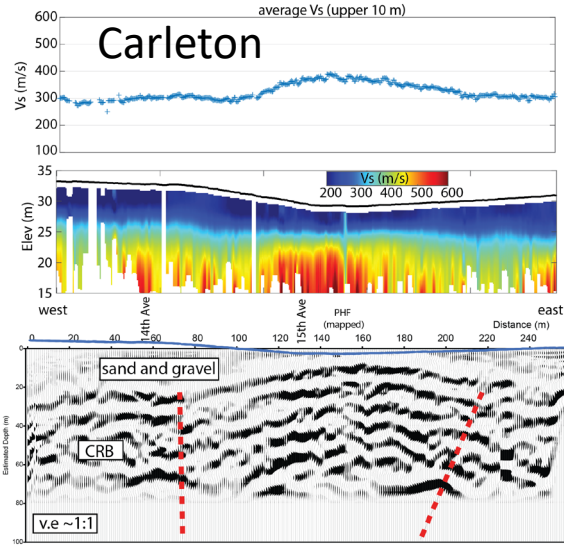


Bike path
downtown Portland



Portland Hills fault

Westmoreland, South Portland
Active source streamer/HVSR



- Folded and faulted CRB strata distributed ~200 m
- Elevated Vs where faults are mapped
- Ambient noise (20 minute occupations) profile shows top of CRB

