

Let's get Shaking!

Intro to Seismology with Raspberry Shake

The earth is ALWAYS moving.. even if we can't feel it

Seismology is the study of how the ground moves

Key Terms

Seismic/Seismicity: Describes ground motion waves and the instruments measuring these motions

Seismograph: A device that measures and records seismic movement

Geologic Fault: A fracture, or break, in the earth's crust

Seismic Wave: Acoustic energy that moves through the earth's layers (the crust, mantle and the inner/outer core)

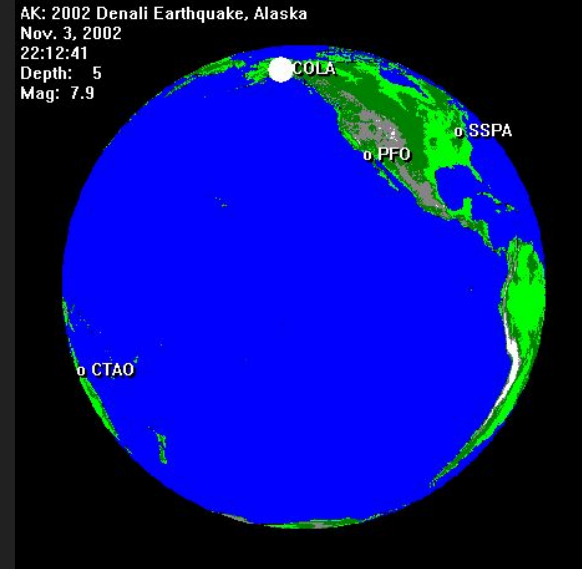
Geophone: An environmental sensor that detects vibrations in the ground

How do earthquakes (and other seismicity) work?

Think of the ripple when you drop a rock in the water.
Earthquakes are very similar

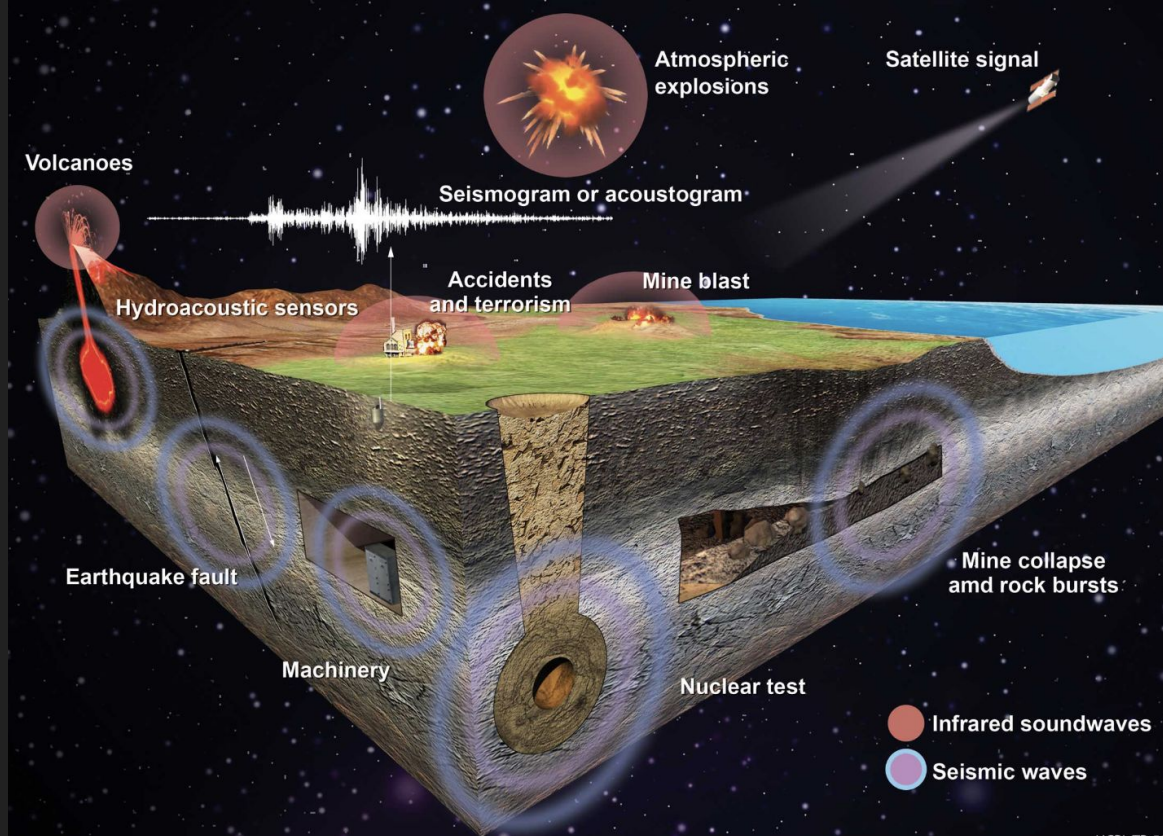
The release of energy in or on top of the earth can create low-frequency acoustic energy waves, known as seismic waves.

The waves are not only on the surface, but also go throughout the earth's interior.



There are different types of seismicity

- Earthquakes (movement along faults)
- Volcanic Activity
- Human caused (nuclear tests, explosions, fracking)



Understanding how the earth moves is important

Earthquakes can be devastating, but understanding the and knowing how to prepare for them can greatly reduce their risk.

Seismologists, scientists who study seismic events, help engineers, architects, and governments to mitigate earthquake risk.

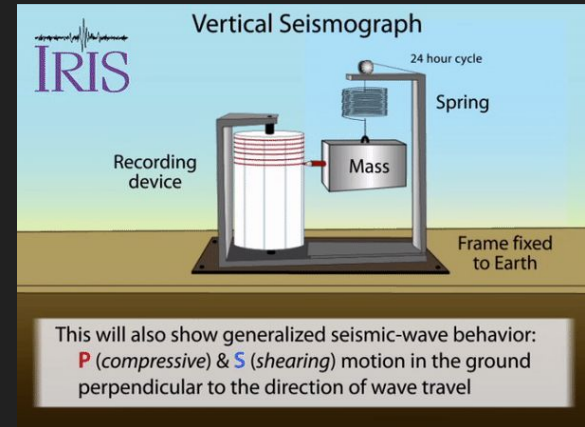


Measuring Seismicity

The measurement of seismicity is done with **seismometers**.

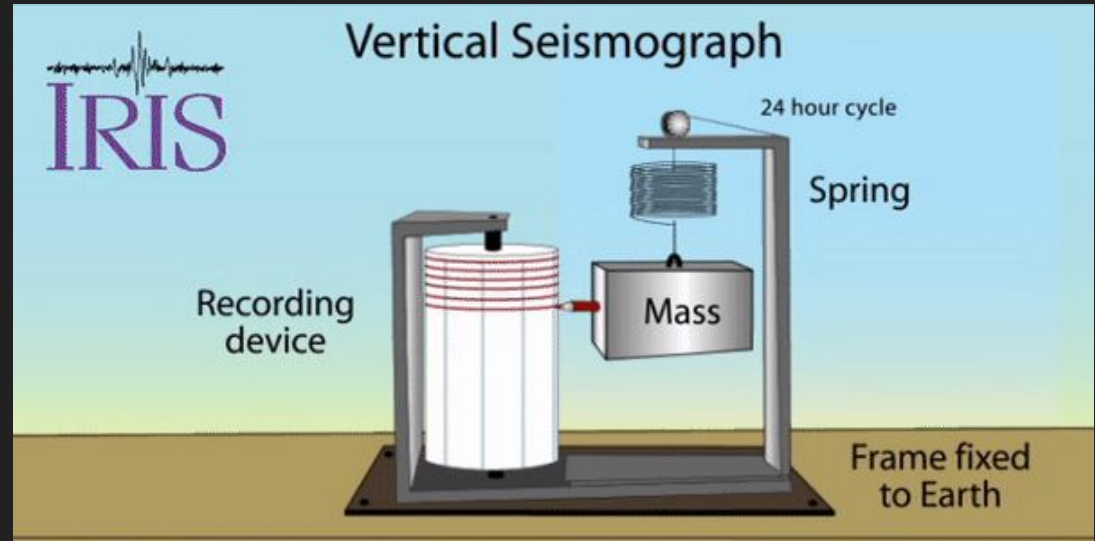
Most record data with a suspended mass attached to a fixed base. When the earth shakes, the base moves and the mass does not.

Seismographs do not only measure earthquakes. *All* ground vibrations are “heard” by the sensors. Traffic, thunder, construction, even *footsteps* can be detected and measured



Seismograph

- Device that Measures and records seismic activity
- Has a suspended inertial mass, that stays still while the surroundings move.
- That movement is then recorded.



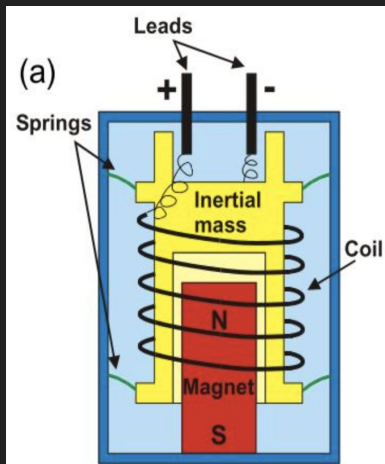
This will also show generalized seismic-wave behavior:
P (*compressive*) & **S** (*shearing*) motion in the ground perpendicular to the direction of wave travel

The Raspberry Shake Seismograph



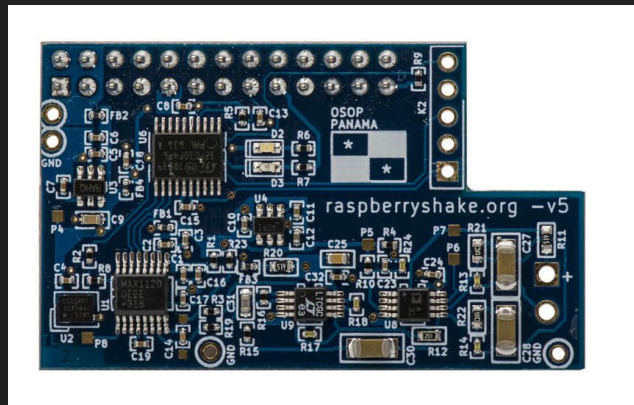
How Does it Work?

Geophone



Analog Data

Digitizer

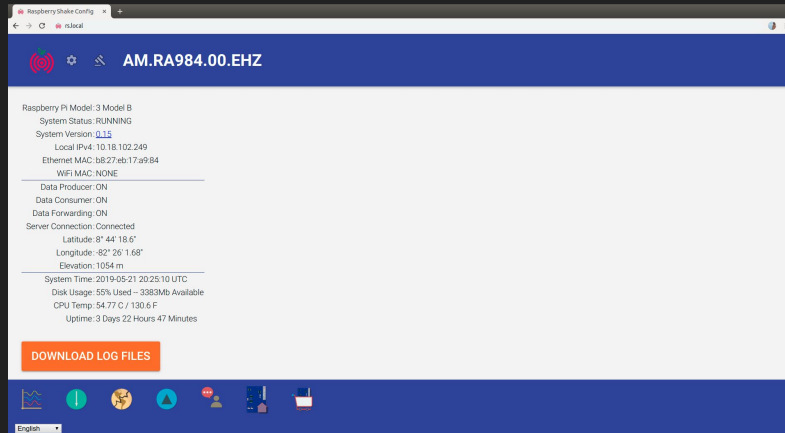


Digital Data

The Raspberry Shake Network

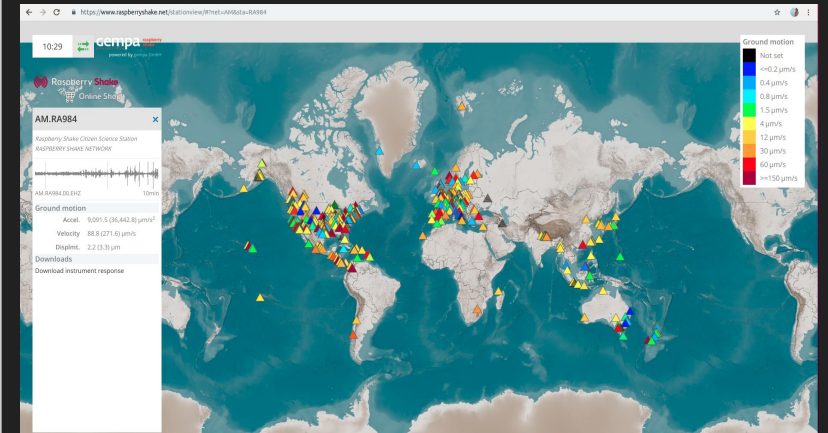
Local Connectivity:

- Control your Shake from your browser through your local network



Global Connectivity:

- Connect to the world's largest citizen-powered seismic network



Detect Earthquakes... and more!



NATURAL

- Tremors
- Earthquakes
- Landslides
- Underground Water
- Movement
- Volcano Eruptions
- Sinkholes



HUMAN

- Fracking
- Quarry Explosions
- Nuclear Blast Testing
- Wastewater Injection
- Demolition
- Structural Movements
- Reservoir / Dam Vibrations



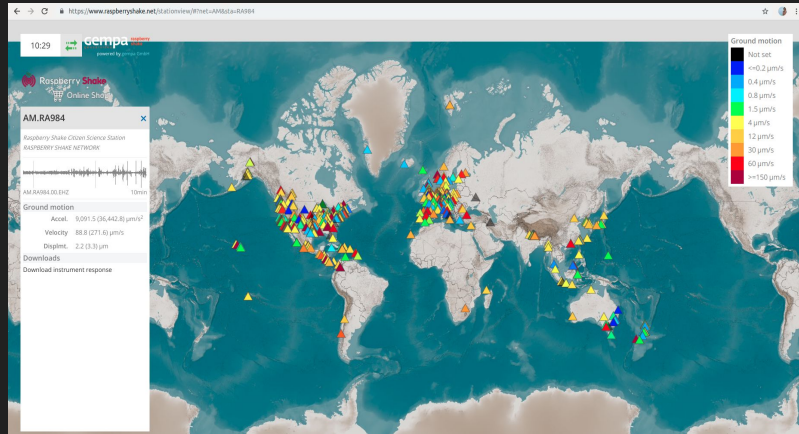
FUN STUFF

- Rush Hour Traffic
- Construction
- Footsteps
- Doors Closing
- Cheering
- Washing Machines
- Noisy Neighbors

Practice: Explore the Raspberry Shake Network!

Get out a computer and go to:

- raspberrysake.net/stationview/



Get out a computer and go to:

- raspberrysake.net/eqview/

