EARTHQUAKE EARLY WARNING

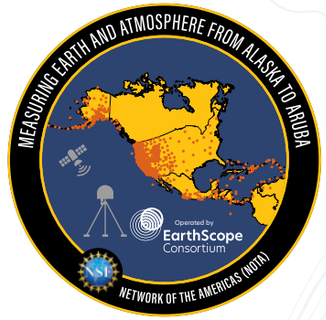
Stations in the Network of the Americas are part of the United States Geological Survey's ShakeAlert® Earthquake Early Warning system. When earthquake shaking reaches the nearest seismometers and GPS stations, this system **DETECTS THE EARTHQUAKE** so an alert can be issued to other areas before strong shaking arrives. For example, with just a few seconds of warning individuals can Drop, Cover, and Hold On to protect themselves, and trains can safely slow down or stop.

GPS stations are particularly valuable for earthquakes greater than magnitude 6.5 because they improve the system's ability to quickly and accurately estimate their magnitude.

You can receive these alerts on your cell phone in Washington, Oregon, and California.

NETWORK OF THE AMERICAS

NOTA is an international geophysics sensor network spanning over **20 COUNTRIES** and composed of more than **1,200 INSTRUMENTS** that are continuously operating, including high-precision GPS stations and borehole strainmeters. These data have a wide range of uses, from geoscience research and hazards monitoring to weather forecasting and precision agriculture.



NSF | GAGE SAGE | Operated by EarthScope Consortium

USGS science for a changing world | NASA

The SCIENCE OF GEODESY

EarthScope Consortium

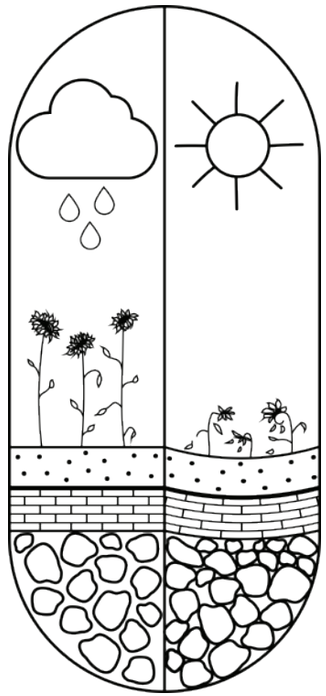
GEODESY
[jee-OD-es-see]
the science of precisely measuring the Earth's surface, gravity, and orientation

UNDERSTANDING OUR CHANGING EARTH

WHAT WE DO EarthScope Consortium operates the National Science Foundation's GAGE and SAGE facilities. We support geoscience research to understand Earth processes and help society become more resilient to natural hazards by providing access to instruments and data, as well as education resources and internships.

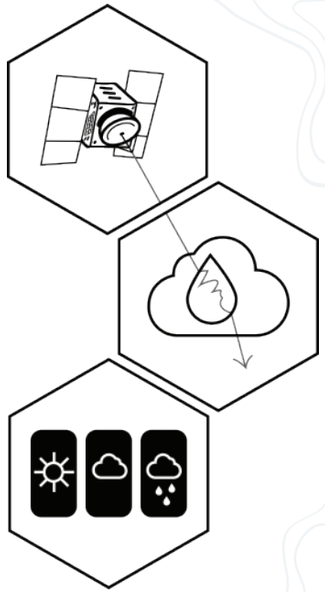
WATER RESOURCES

The ground surface can move vertically as a result of changes in groundwater levels. This occurs because sediment compacts more tightly when water is withdrawn from the tiny spaces between grains, and because the Earth's crust sags under the weight of the water it holds. By precisely measuring vertical ground movement, we can **MONITOR WATER RESOURCES** during periods of drought.

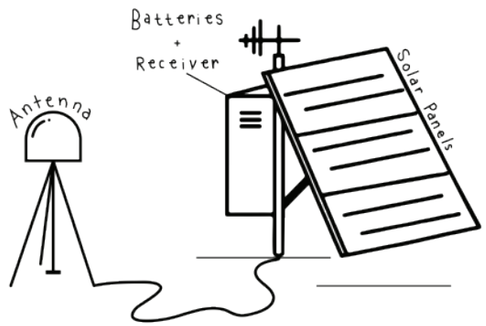


WEATHER FORECASTING

The technology that makes GPS stations so precise allows them to measure things other than ground motion. For example, the signal from GPS satellites is slowed by water vapor in the atmosphere, resulting in reduced accuracy. Correcting this error also allows us to estimate the amount of water vapor, and these data are used to **IMPROVE WEATHER FORECAST MODELS**.



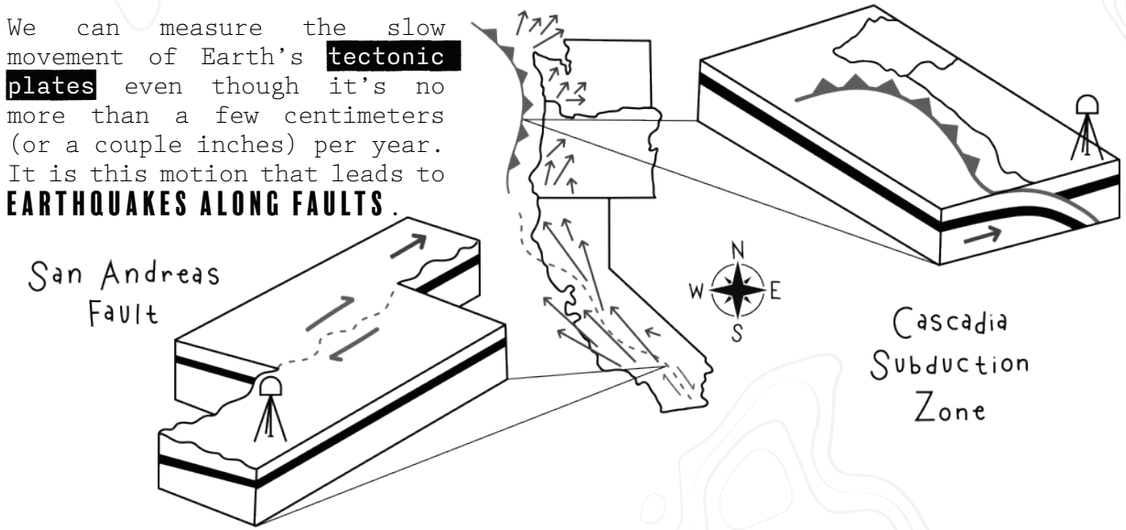
GPS FOR GEOSCIENCE



GPS stations are used to measure the shifts and bulges of our planet using the same technology as your cell phone. However, they are far more precise, allowing us to measure ground movement as slow as a millimeter (0.04 inches) per year by recording positions day after day and year after year.

PLATE TECTONICS

We can measure the slow movement of Earth's tectonic plates even though it's no more than a few centimeters (or a couple inches) per year. It is this motion that leads to **EARTHQUAKES ALONG FAULTS**.



While seismometers record the shaking caused by seismic waves, GPS stations measure the **SHIFTING OF THE FAULT** during an earthquake. The stress that causes earthquakes accumulates because the two sides of the fault are moving but the fault itself is stuck, until the stress is too great and the fault slips.

GPS STATIONS also enable us to monitor the accumulation of stress between earthquakes.

37.21544° N Photo Location 112.97891° W

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