VERQUIN

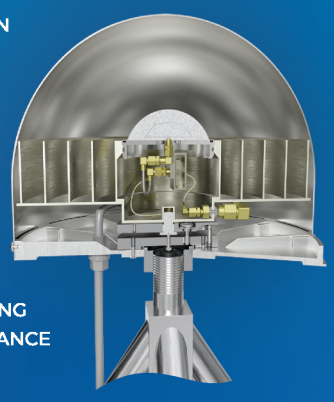
CENTURIAL GEODETIC INFRASTRUCTURE

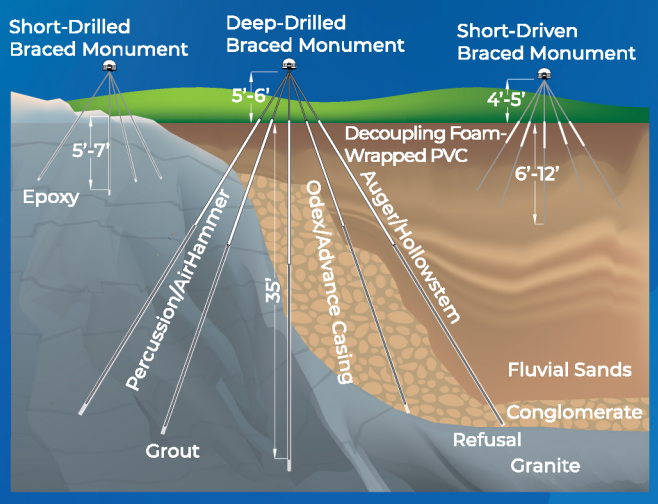
Our mission at **VerQuin Geodetic Engineering** is to expand proven geodetic-grade GNSS monumentation in any sector that relies on long-term, high precision positions.

We integrate our expertise in geology, geodesy, data communications, construction, power designs, and QC analysis to develop reliable, continuously operating GNSS reference station (cGNSS or CORS) networks. VerQuin provides high-quality positions over the arc of decades for infrastructure, earthquake/volcano early warning, surveying, hydrology, astrophysics, and autonomous vehicle navigation. Our advantage is nimbleness, geologic expertise, and twenty-nine years of geodetic infrastructure experience.

SERVICES

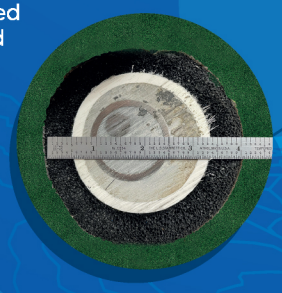
- Geodetic network design
- Geodetic network modernization
- Geologic assessment
- Monument selection and installation
- Power system design and installation
- Security design and telemetry
- Quality control and state of health monitoring
- Operations and maintenance
- Data analysis





GEOLOGY

Ensure your installation is designed correctly and on stable ground before investing in a geodetic reference station. As geologists and geodesists, we make the geologic assessment a core process for CORS installation to ensure proper drilling technique and long-term stability.
We install deep-drilled, short-drilled, and short-driven braced monuments as well as hybrids. All monument materials and fittings are 304 or 316 stainless steel. The monument that is selected is based upon geology, access, project goals, and budget.



Cutaway of a deep-drilled braced monument leg showing 1/2" rebar, 1-1/4" stainless steel pipe, grout, and foam-wrapped PVC.

STABILITY

The deep-drilled braced monument wins.

Numerous comparative, peer reviewed studies of geodetic infrastructure costing over $200M illustrate that the DDBM is the most stable geodetic monument. It is a 3,500lb anchor into the Earth's crust. The short-drilled braced monument is a close second for stability.

DATA QUALITY

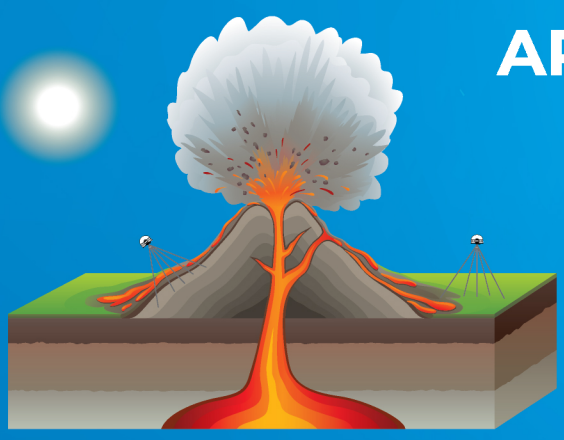
Numerous factors go into position data quality before processing. Environmental objects such as vegetation, signage, fencing, and transient reflectors, or radio frequency interference can not only degrade the robustness of the data and increase errors but can actually induce an artificial shift in the positions. Hardware issues/failures such as improperly terminated/corroded antenna cable connections, receiver glitches, antenna LNA failure, and others can also create frustrating impacts to data that are at times hard to troubleshoot. Quality control and troubleshooting are two of the primary services where VerQuin excels.

CONTACTS

www.verquin.net
info@verquin.net

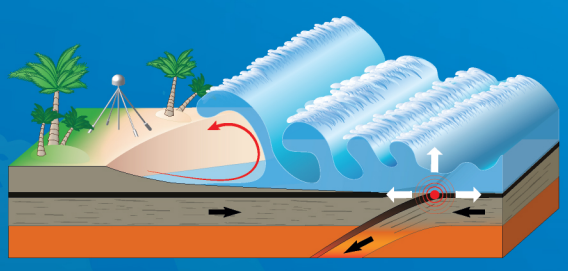
VerQuin | 949-374-1535, San Clemente, CA

APPLICATIONS OF GPS/GNSS



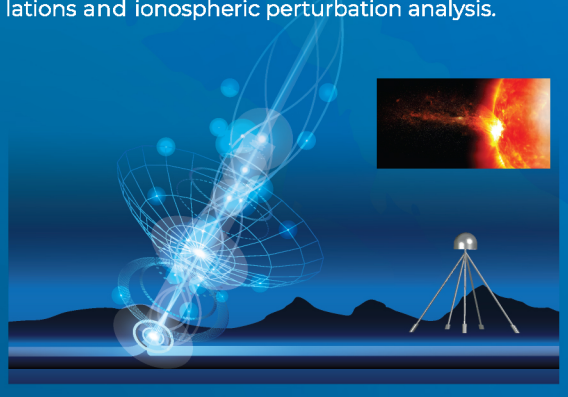
VOLCANOES

GNSS is used to assess magma chamber growth and deflation, as well as volcanic ash clouds.



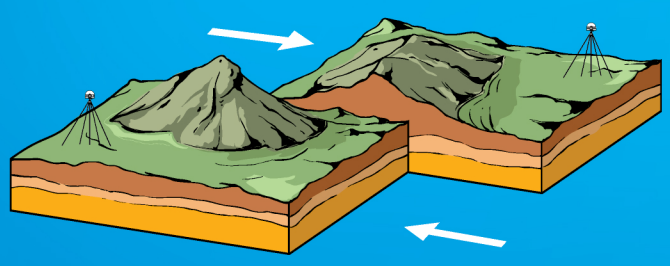
EARTHQUAKE & TSUNAMI EARLY WARNING

Earthquake magnitude and Tsunami height early warning are achieved through rapid position calculations and ionospheric perturbation analysis.



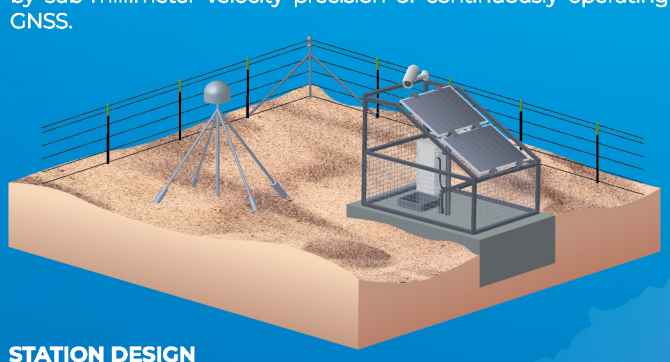
SPACE WEATHER

Space weather such as solar flairs are measured through GNSS signal deviations in the ionosphere.



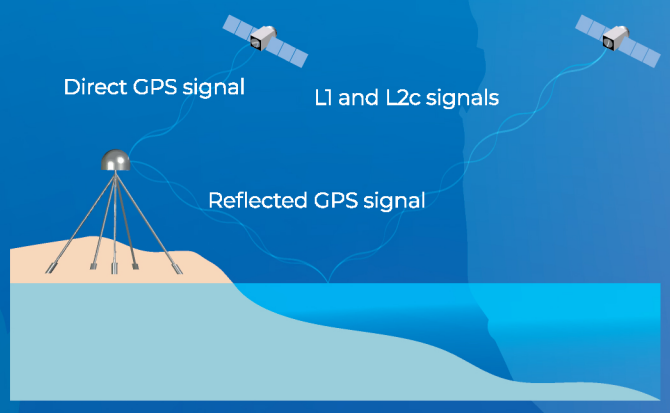
TECTONICS

Tectonic plate motion and individual fault activity are measured by sub-millimeter velocity precision of continuously operating GNSS.



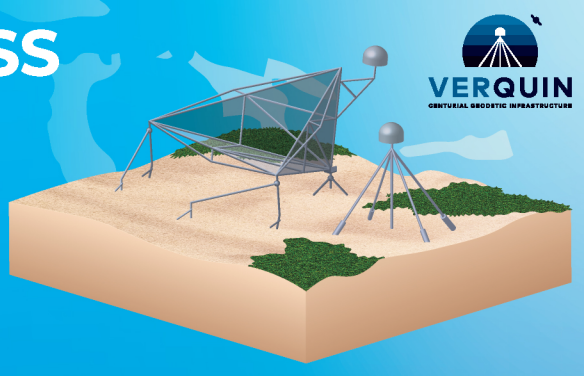
STATION DESIGN

GNSS Monument (deep-drilled braced, short-drilled/driven), Power System, Communications, Security, Lightning Protection.



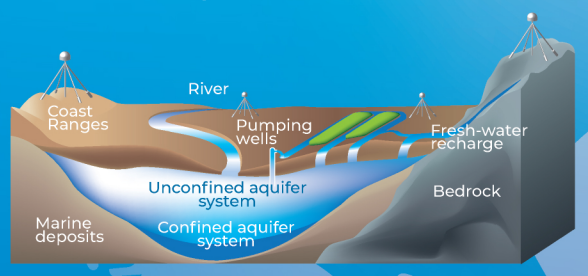
SEA LEVEL

Sea or Flood Level is calculated through reflected GNSS signals where stations are positioned near bodies of water.



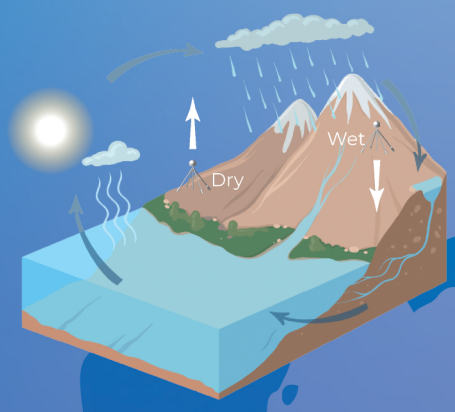
RADAR SATELLITE VALIDATION

GNSS is used as validation for InSAR, SAR, and NISAR radar satellites at ground control corner reflectors.



LAND SUBSIDENCE & UPLIFT

Land Subsidence and Isostatic rebound caused by groundwater withdrawal/injection, sediment loading/unloading/mining, water/snow load are recorded by cGNSS stations.



HYDROLOGIC CYCLE

Hydrologic Cycles are monitored through GNSS precipitable water vapor and hydrologic loading/unloading studies. Snow depth and soil moisture are calculated through reflected signals.