Case Study

Strong Motion Networks
NetQuakes project
California, USA

GeoSIG
swiss made to measure

In Cooperation With GeoSIG Partner

Seismic Systems

Background

Any country as large as the USA faces difficult choices within its earthquake monitoring strategy. Striking the right balance between the possibility of a large earthquake in a remote area causing little disruption and a smaller earthquake in a densely populated causing massive damage is a risk to be very carefully managed. A current area of significant risk has been identified as surrounding the San Francisco East Bay and the Hayward fault areas.

Challenge

On 6 Jun 2009 a 3.1 earthquake rattled the East Bay, but there were no immediate reports of injury or damage. Scientists then probed the Lucas Valley for earthquake clues as the one almost certain thing around the East Bay area is that something bigger now appears to be looming. On 25 Jun 2009 the USGS described the Hayward fault as “a tectonic time bomb, due any time for another magnitude 6.8 to 7.0 earthquake and that the coming Hayward fault earthquake will probably kill hundreds of people and cause damage worth perhaps $100 billion.” This locality has therefore been identified as an area where the precise seismic risk of earthquake is not yet fully understood.

Solution

The USGS is trying to achieve a denser and more uniform seismograph spacing in the Bay Area to provide better measurements of ground motion during earthquakes. Our Partner — Seismic Systems in Simi Valley, California, USA — specializes in purchasing, installation, and service of earthquake and monitoring equipment, and they have been licensed by the City of Los Angeles for over 20 years. Seismic Systems was chosen to implement the solution. To do this, over 500 NetQuakes stations to date have been deployed to communicate their data to the USGS via the Internet. These instruments connect to an existing local network using WiFi and use existing Broadband connections to transmit data after an earthquake.

This new instrumentation has been sought to monitor the emerging situation and included finding suitable locations within built-up areas to accept and install earthquake monitoring systems.

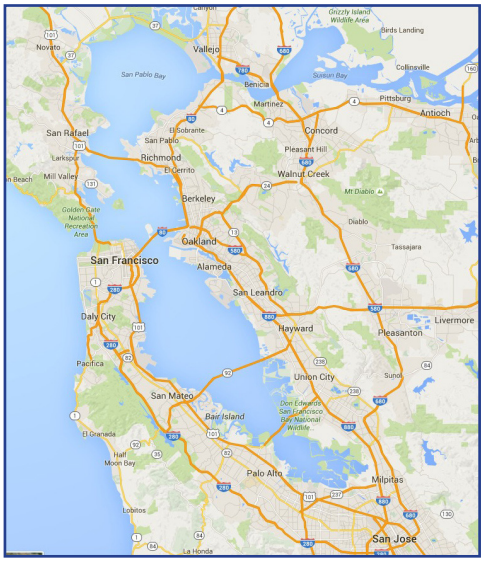
The NetQuakes seismographs specification requires access to the Internet via a wireless router connected to an existing Broadband Internet connection. The seismograph then transmits data to the USGS only after earthquakes above the magnitude of around 3, but will not consume any significant bandwidth and should require only minimal maintenance. The stations include NQS software designed for and in coordination with USGS to operate under a linux OS environment. Volunteers in private residences, businesses, public buildings and schools with an Internet connection in certain locations each host a seismograph.

While enhancing the Strong Motion Network coverage in this seismically high-risk area, the measurements improve also the ability to make rapid post-earthquake assessments of expected damage and contribute to the continuing development of engineering standards for construction projects. They may well also shape future requirements within other urban areas over a longer time period.

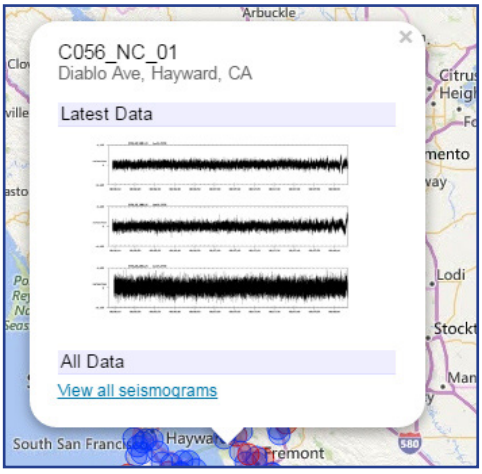
Another Solution using GeoSIG instruments and a capable Partner effectively showing that quality and reliability can also be cost-effective.

Product link

GMS NetQuakes recorder



This shows the area included in the NetQuakes earthquake hazards program.



Data from the instruments are available here on the USGS website.

GMS NetQuakes recorder