California
Department of
Conservation
California Geological
Survey

Updates on CISN Display Application and CSN Pilot Project

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Outline:

California Department of Conservation

CISN Display/QuakeWatch:

- ✓ Application's history
- ✓ CISN Display functions and new development
- ✓ Newly developed QuakeWatch application

Evaluation of Lower Cost Instrumentation:

- ✓ Application of lower cost instrumentation
- ✓ Pilot Project on assessment of usability of Community Seismic Network (CSN) data

CISN Display Application

Developed at Caltech and funded by:

- Federal Emergency Management Agency (FEMA)
- US Geological Survey (USGS)
- National Oceanic and Atmospheric Administration (NOAA)

Currently funded by:

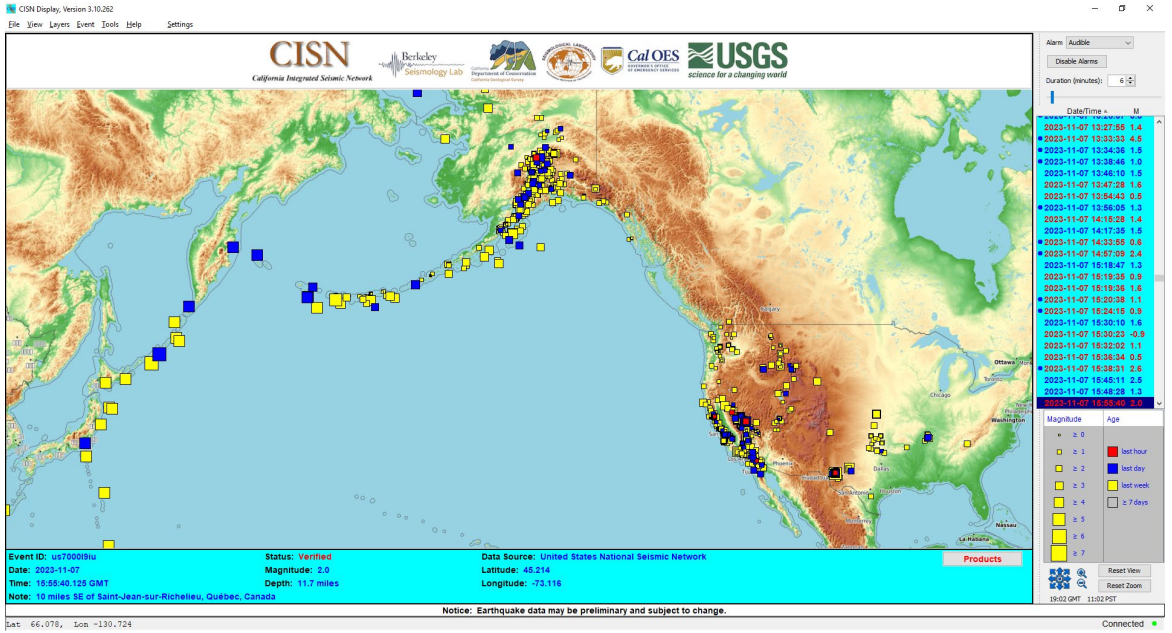
- California Governor's Office of Emergency Services (CalOES)
- California Geological Survey (CGS)

Development and technical support by:
Instrumental Software Technologies Incorporated (ISTI)

CISN Display Standalone Application

Main objectives:

- ✓ Real-time Earthquake Display
- ✓ Customized Features and View for Emergency Responders
- ✓ Redundancy for Access to Earthquake Information



CISN Display Standalone Application

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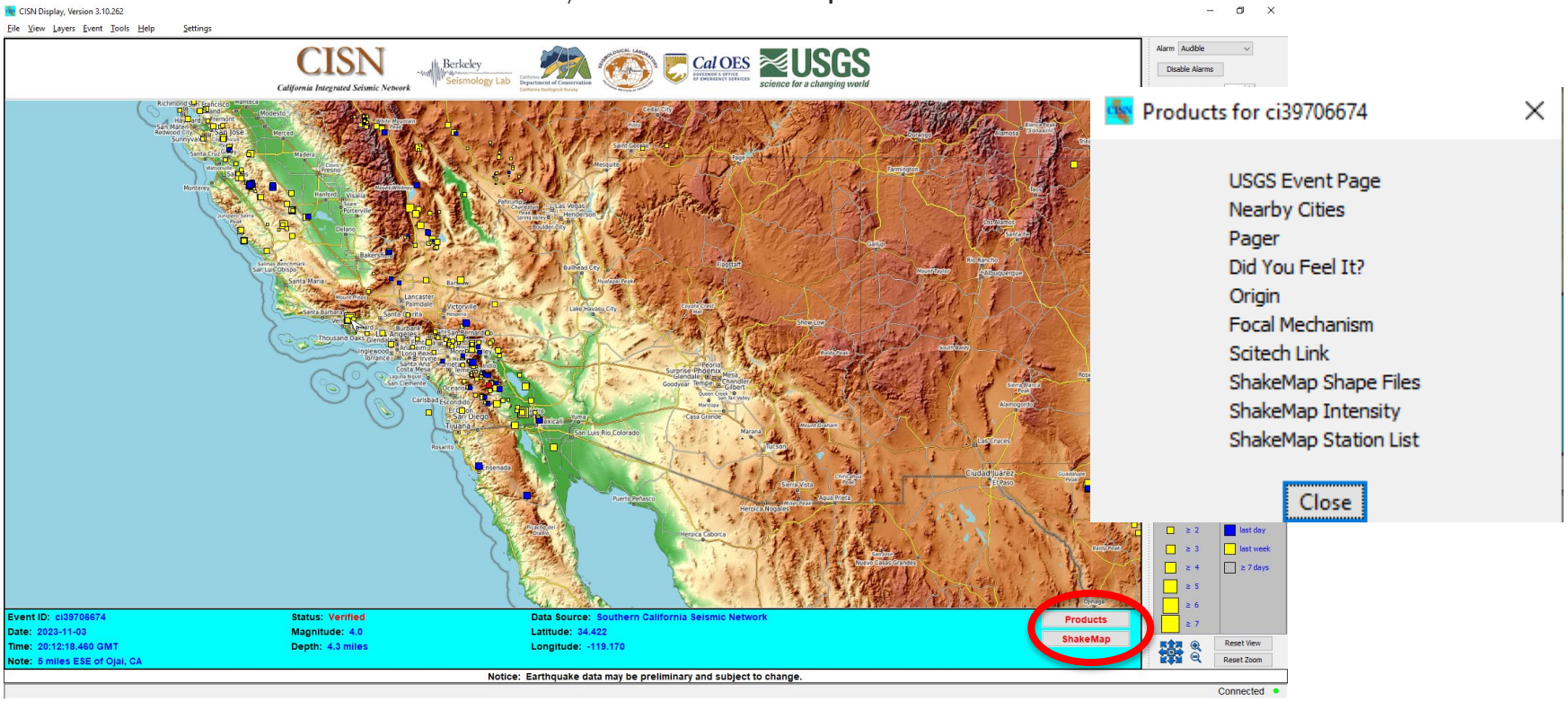
Gateway to Other Earthquake Products



CISN Display Standalone Application

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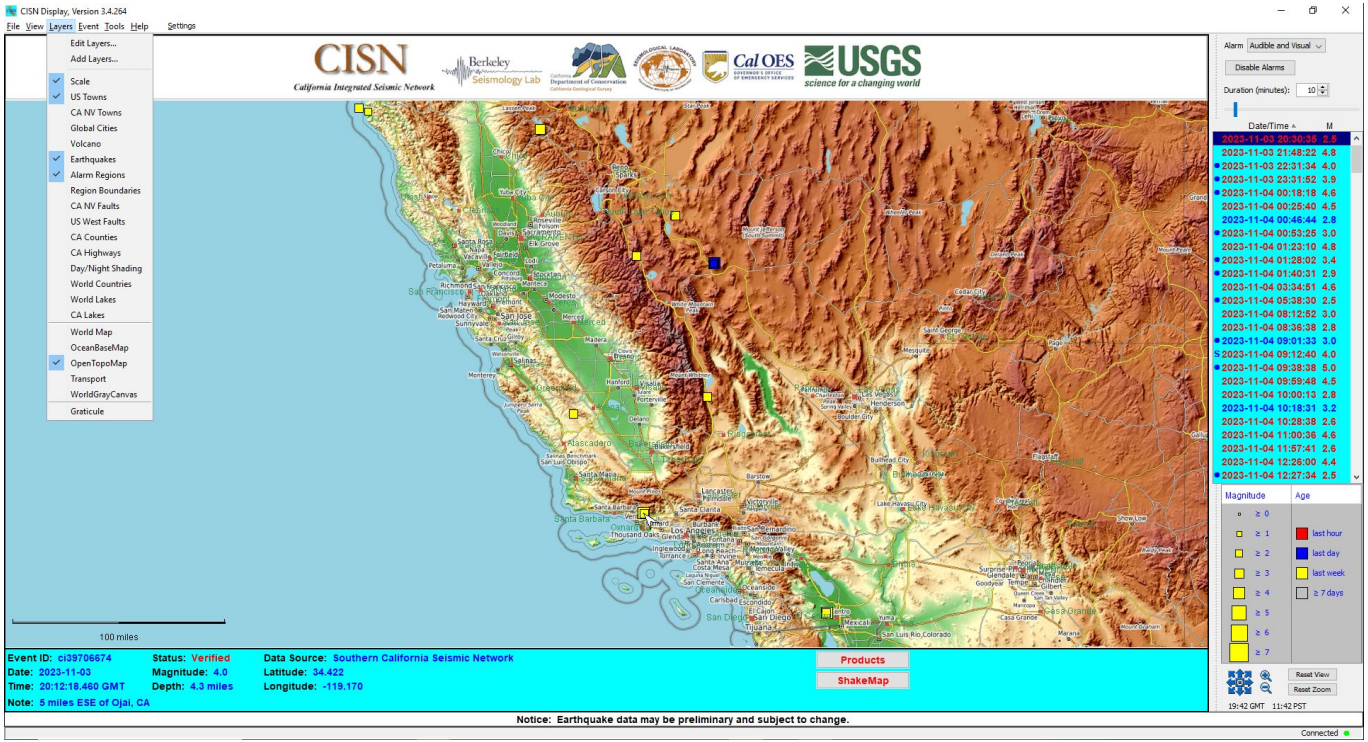
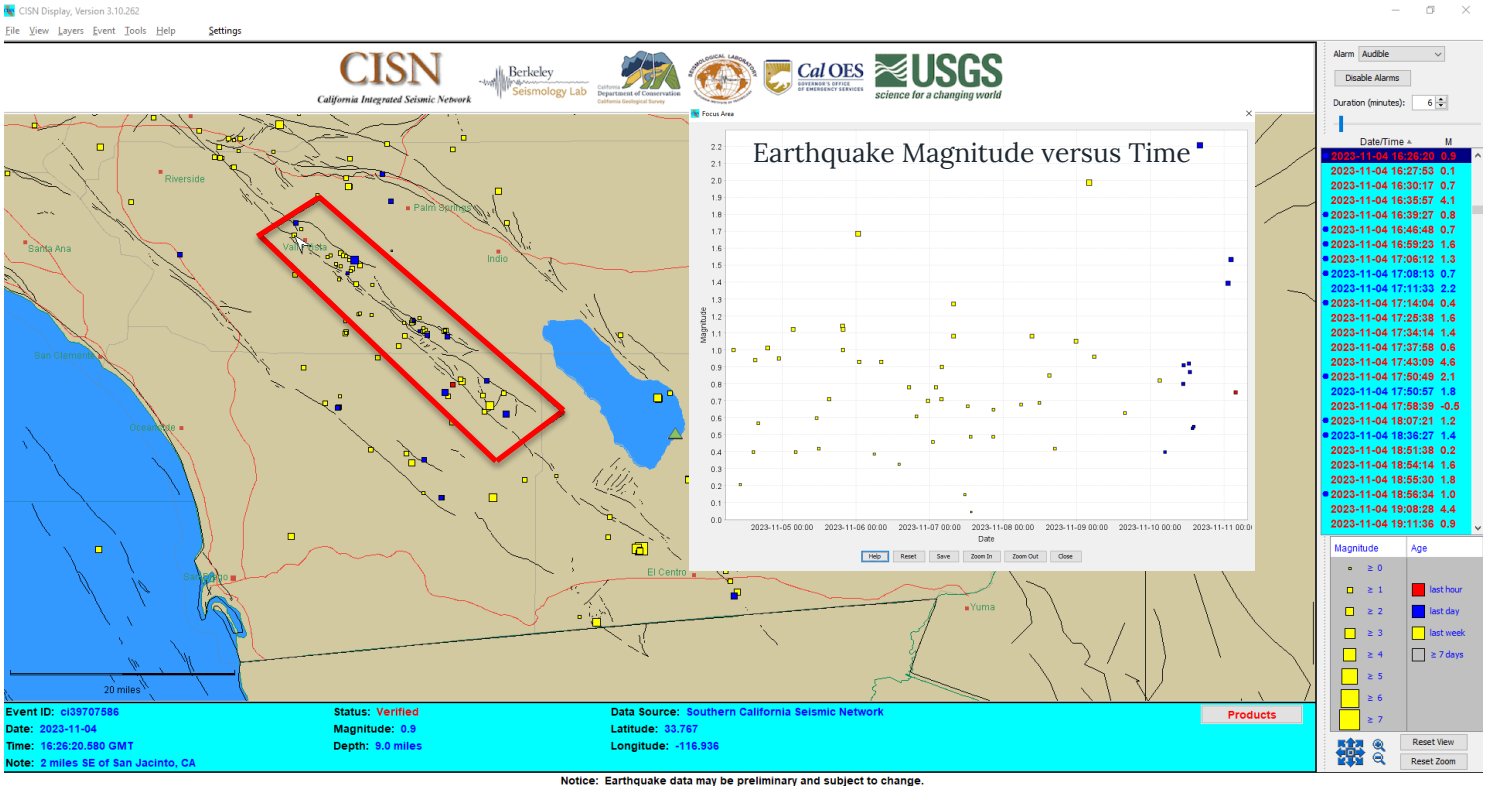
GIS Mapping Capabilities



CISN Display Standalone Application

Monitor Focused Areas



CISN Display Standalone Application

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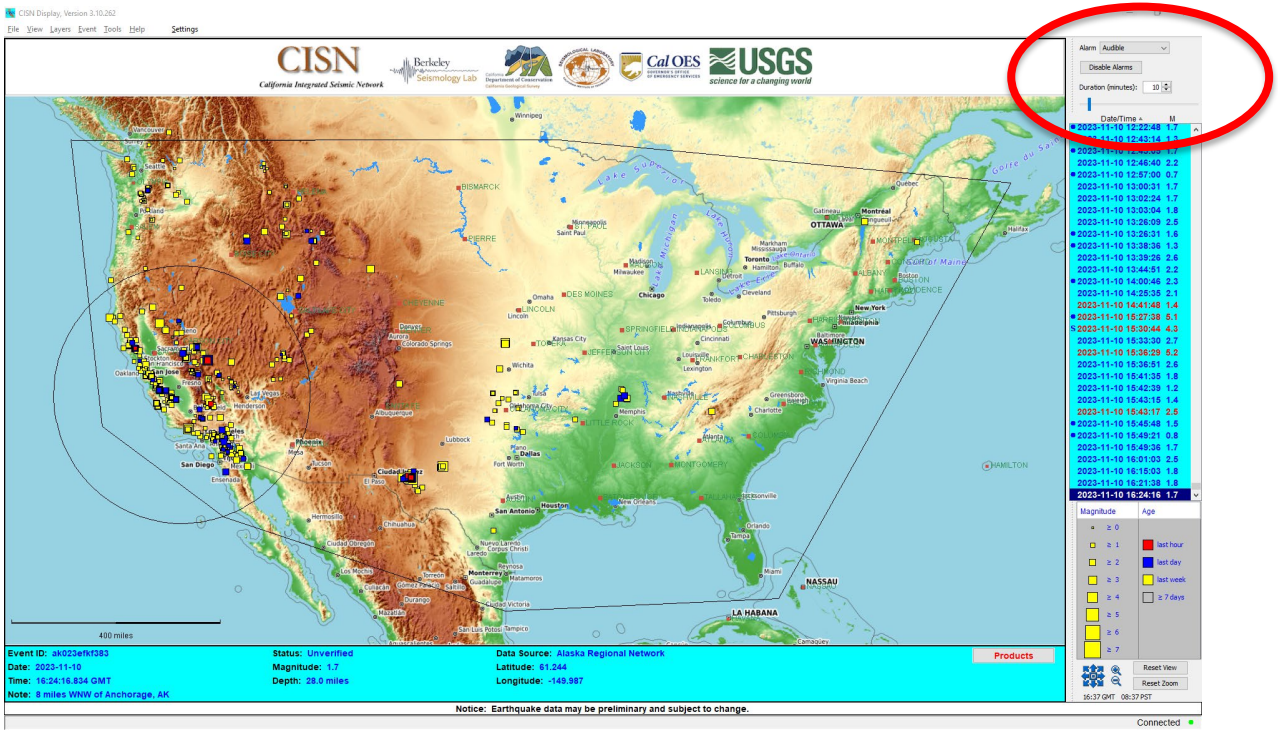
Earthquake Audible and Visual Alarming Tool



QuakeWatch Web Application

Why a web application?

- ✓ More advanced functions are available for the web application
- ✓ More user friendly
- ✓ Users do not need to install the web application locally

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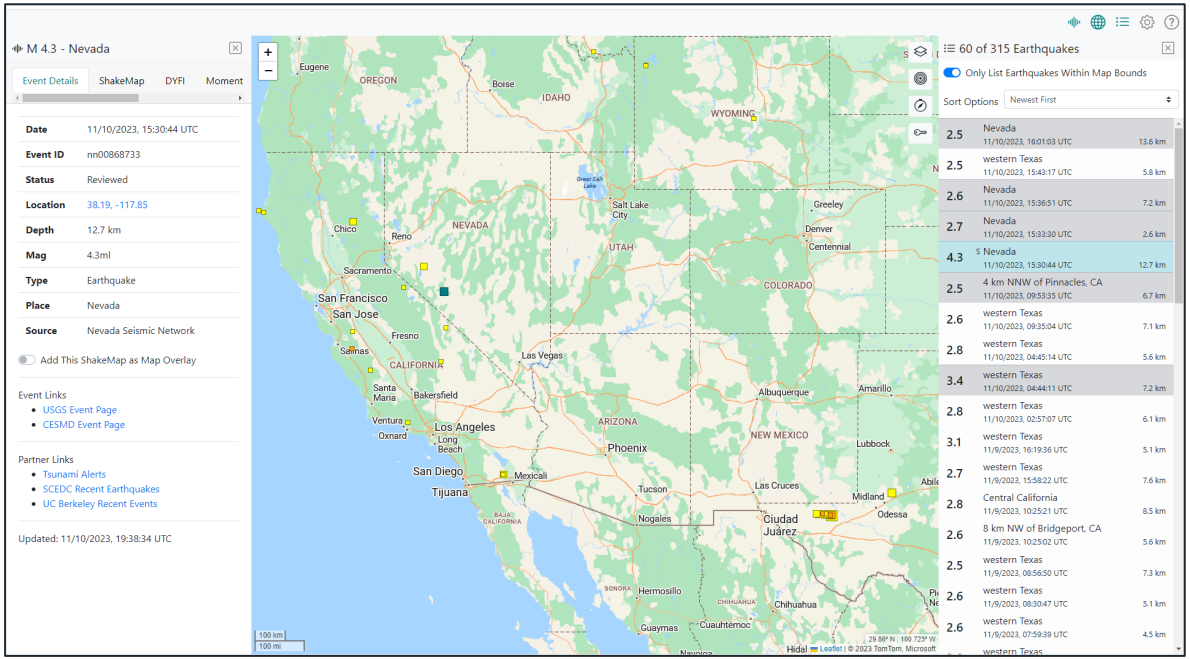
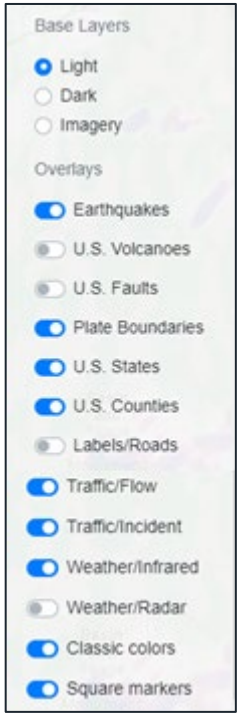
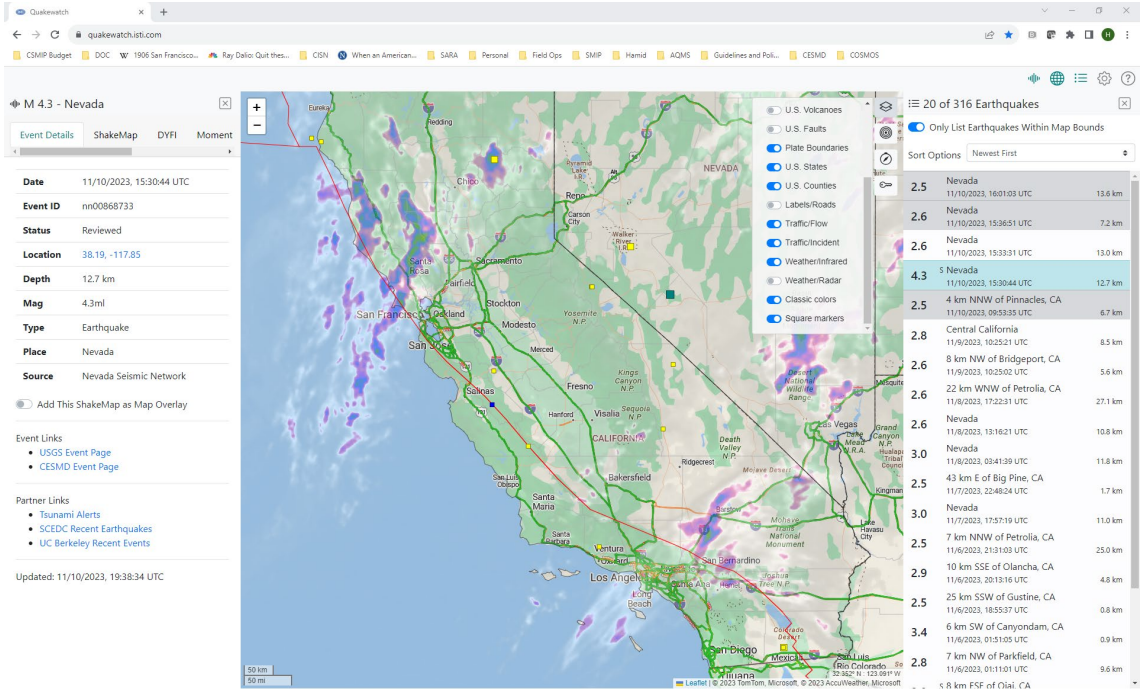


QuakeWatch Web Application Layers





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- ✓ **Pilot Project on assessment of usability of Community Seismic Network (CSN) data**

Application of Strong-Motion Instrumentation

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<u>High resolution instruments :</u>

- ✓ Instrumentation of representative structures and geologic environment
- ✓ Application of data for structural design
- ✓ Application of data for seismic design code improvement
- ✓ Application of data for earthquake early warning and earthquake rapid response

<u>Lower resolution instruments:</u>

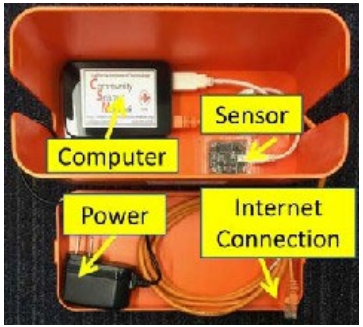
- ✓ Dense monitoring of ground and structural response to earthquakes for return to service
- ✓ Monitoring aftershocks (USGS Raspberry Shake)
- ✓ Monitoring larger ground motion close to major faults (CGS QuakeRocks)
- ✓ Application for rapid response to earthquake

Community Seismic Network (CSN)

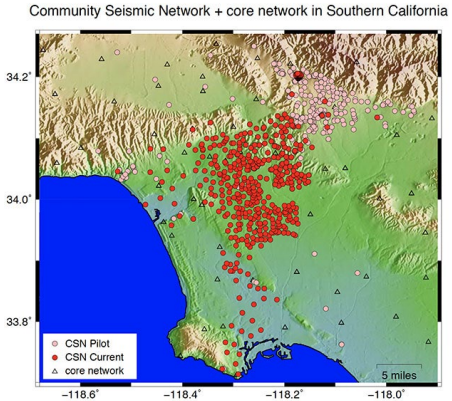
An example of lower cost instruments

CSN was developed at Caltech

- 3-axis MEMS accelerometer package



- Study seismic wave propagation in Los Angels area using a dense CSN array



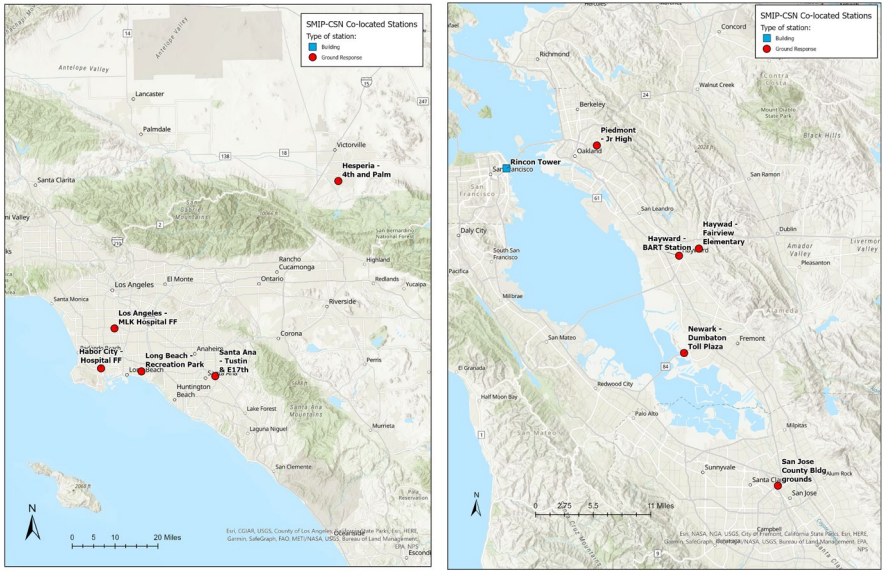
CSN pilot Project

Objectives:

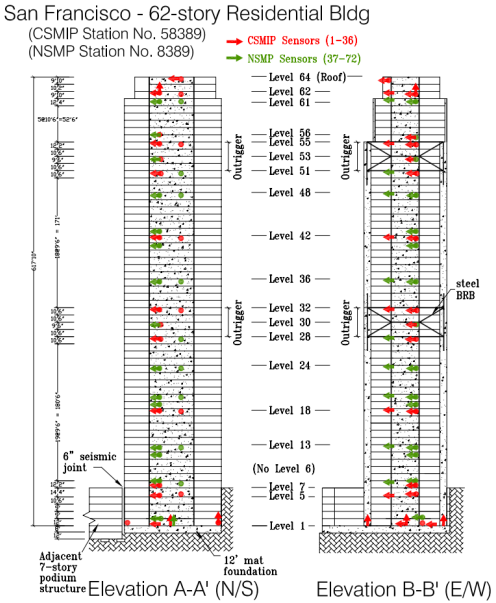
- Collocate CSN packages with high resolution CSMIP instruments at 10 ground response stations and one building.
- Record earthquakes by both instrument types
- Evaluate usability of CSN records

CSN Collocated Stations

10 Ground Response Stations



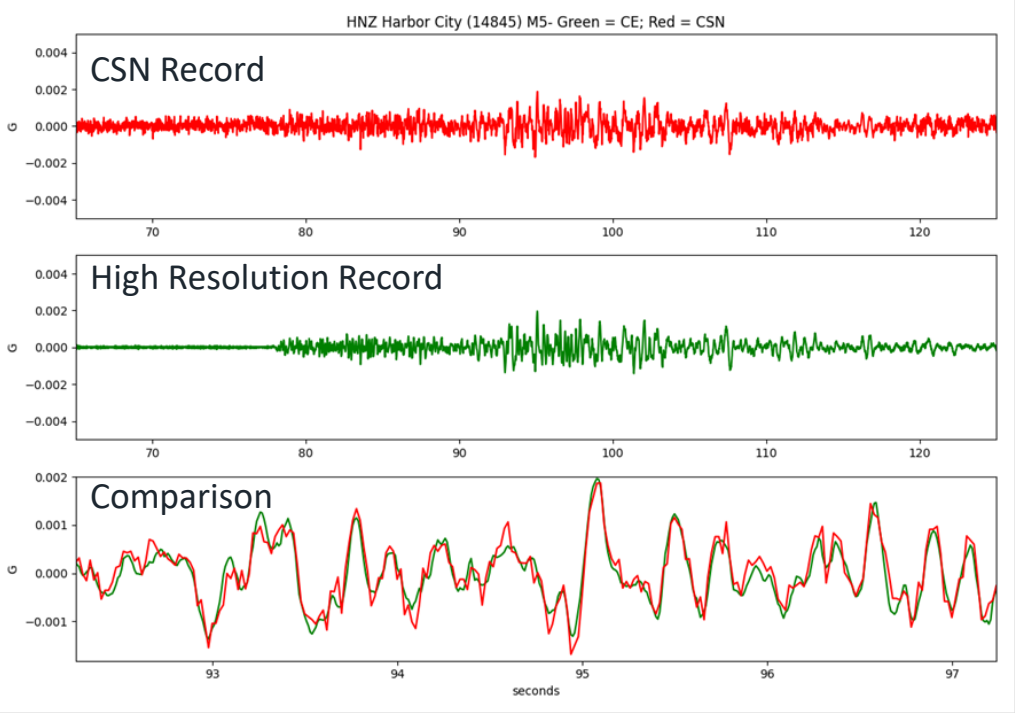
62-story building in San Francisco



CSN pilot Project

Data from collocated instruments will be used to evaluate usability of lower resolution instrumentation

Example of Data from Collocated instruments



Summary

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CISN Display and QuakeWatch Applications:

- ✓ Primarily a tool for earthquake response.
- ✓ CISN Display tool's functions have been improved and some new features have been added.
- ✓ QuakeWatch is a web application tool with additional and more user-friendly functions.
- ✓ New functions are being developed for both tools to assist earthquake emergency responders.

Lower Resolution Instruments Usability:

- ✓ A pilot project for evaluating usability of lower resolution instruments.
- ✓ Lower resolution instruments may be used for dense monitoring and fill the instrumentation gaps.
- ✓ Also, such instruments can be used for rapid response to earethquakes and assessment of structural damage.

THANK YOU

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