Precise High-Rate GPS

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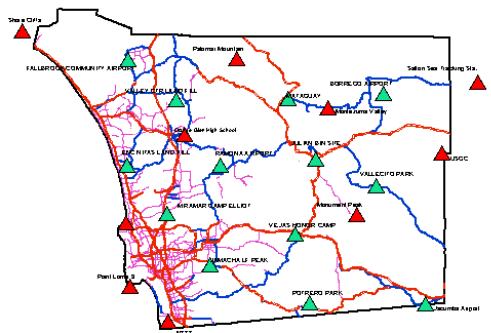
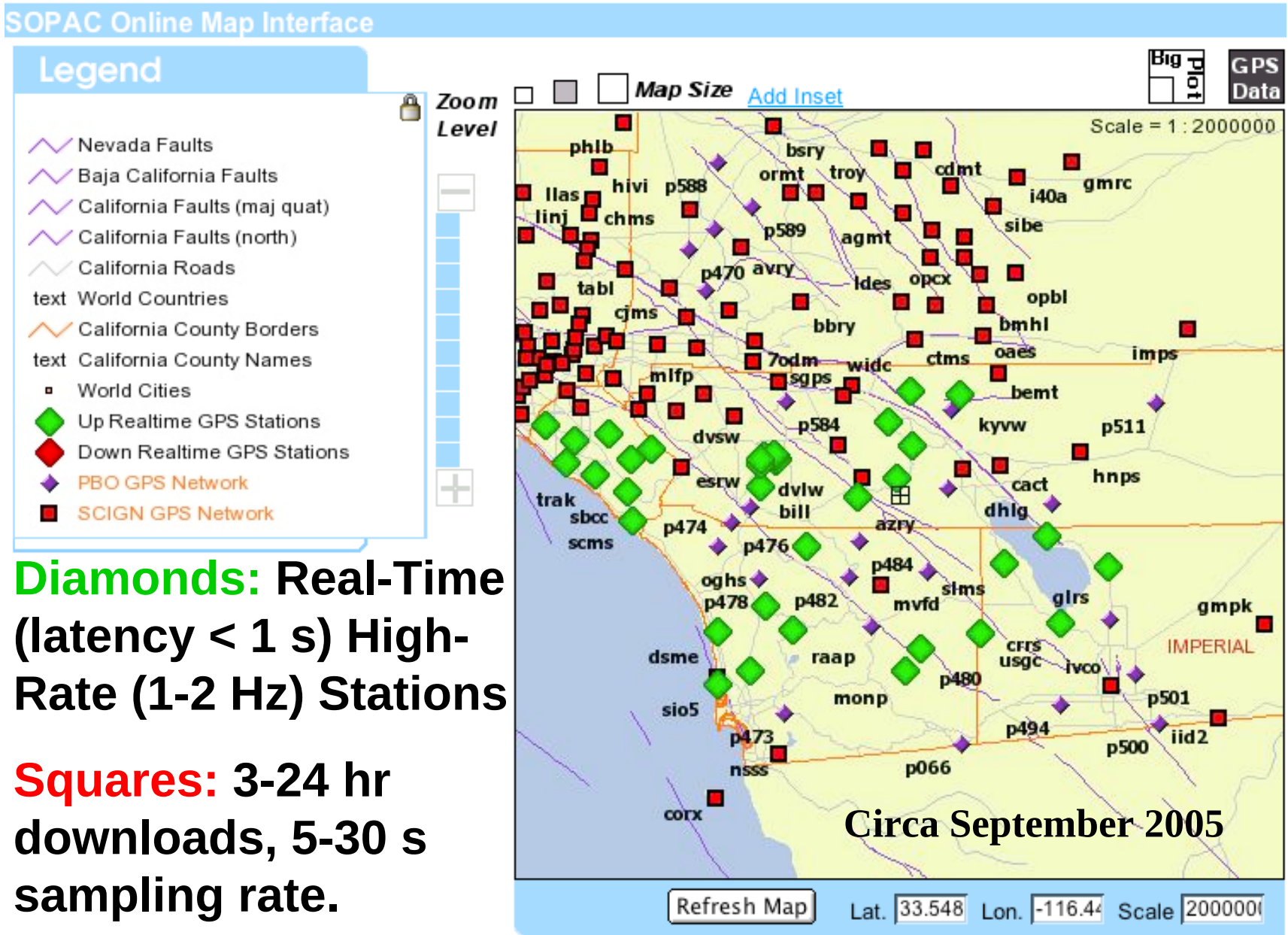


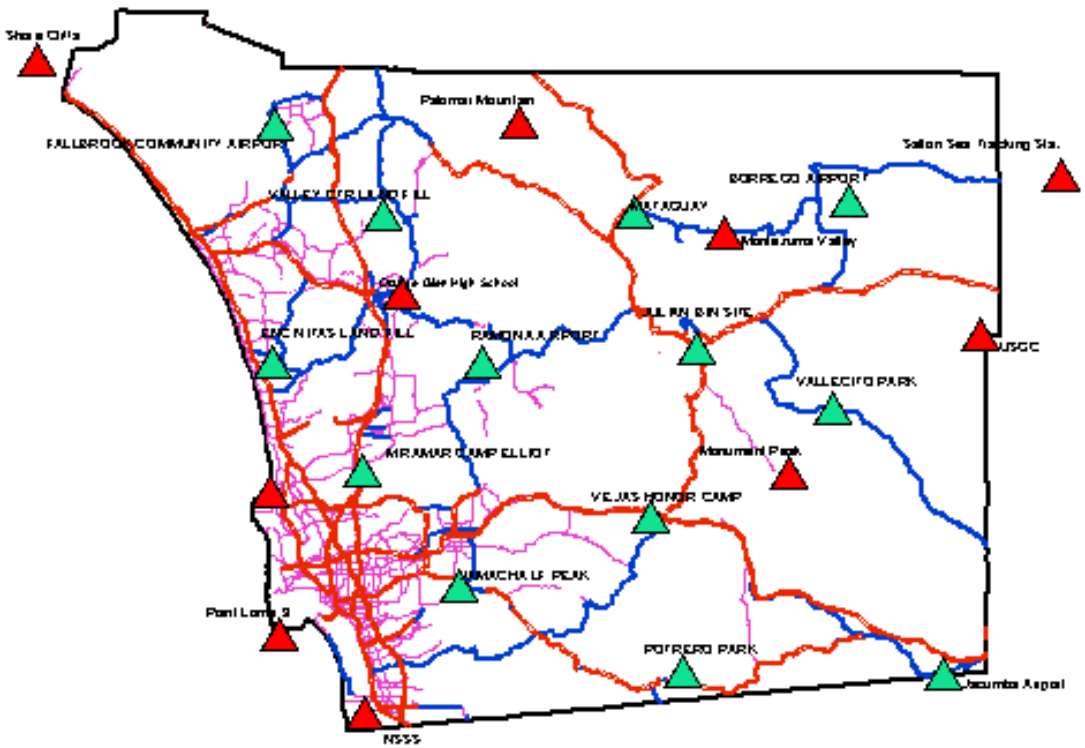
4-County Real Time Stations



Diamonds: Real-Time (latency < 1 s) High-Rate (1-2 Hz) Stations

Squares: 3-24 hr downloads, 5-30 s sampling rate.

San Diego County Real Time Network



Map prepared by Ross Carlson, SDDPW

- **Total of 22 stations**
- **7 existing SCIGN stations (3 upgraded)**
- **4 <u>new</u> sites built by County to SCIGN standards, 20 Hz receivers**
- **11 PBO stations (6 built)**
- **Seismic/GPS collocation at Monument Peak and Camp Elliott**
- **Using Sheriff's Dept. and HPWREN communications backbone**

Collaborators:

San Diego Dept. of Public Works and Sheriff's Dept.,

UCSD (ROADNet, HPWREN, SOPAC), PBO, SCIGN, CSRC

Typical Hardware

banner

Banner

Palomar Observatory

Ramona Airport

Precise GPS Positioning

GPS RTK Rovers

Serial

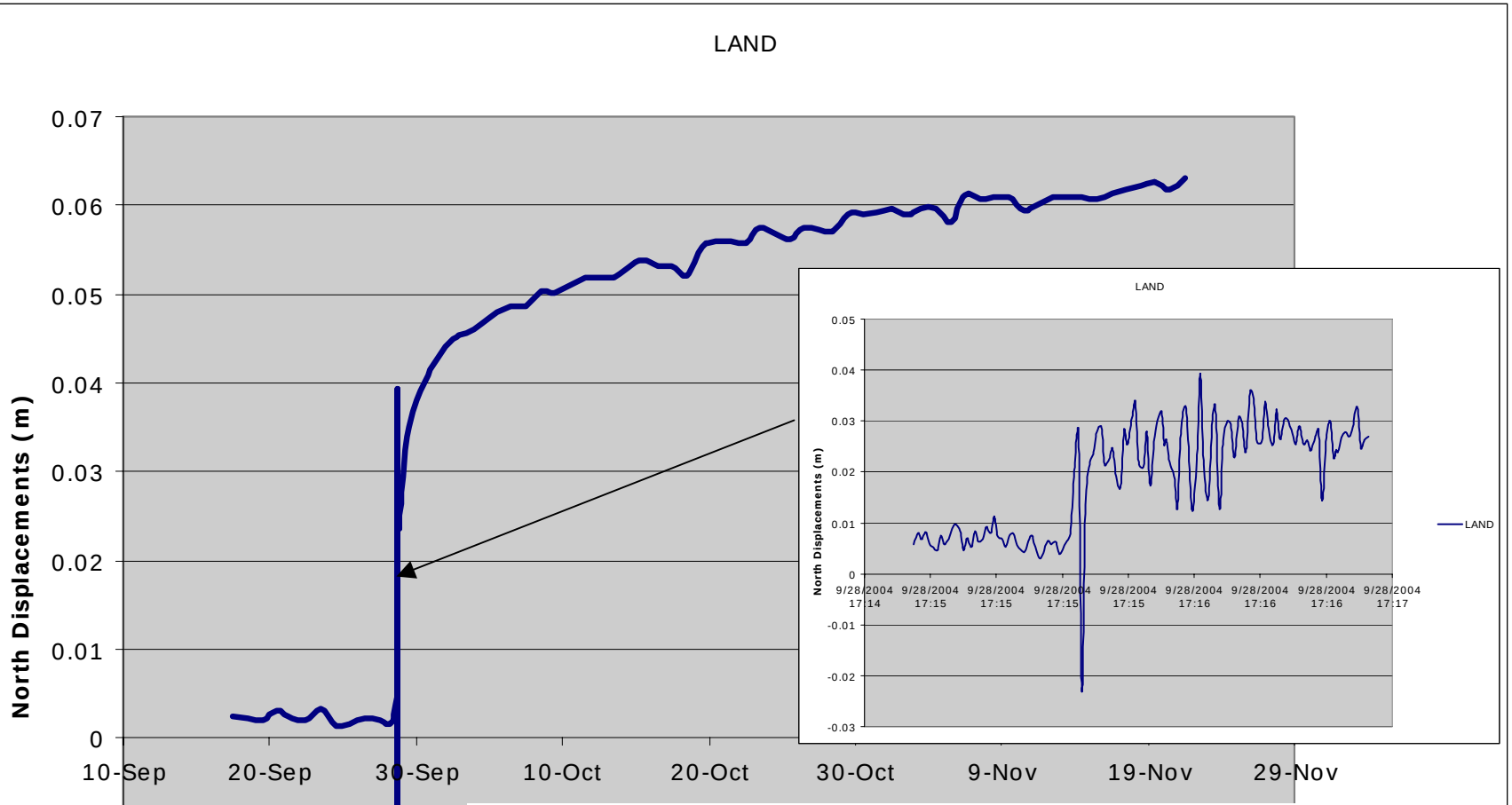
CPU + Wireless Card

Base Stations

Radio

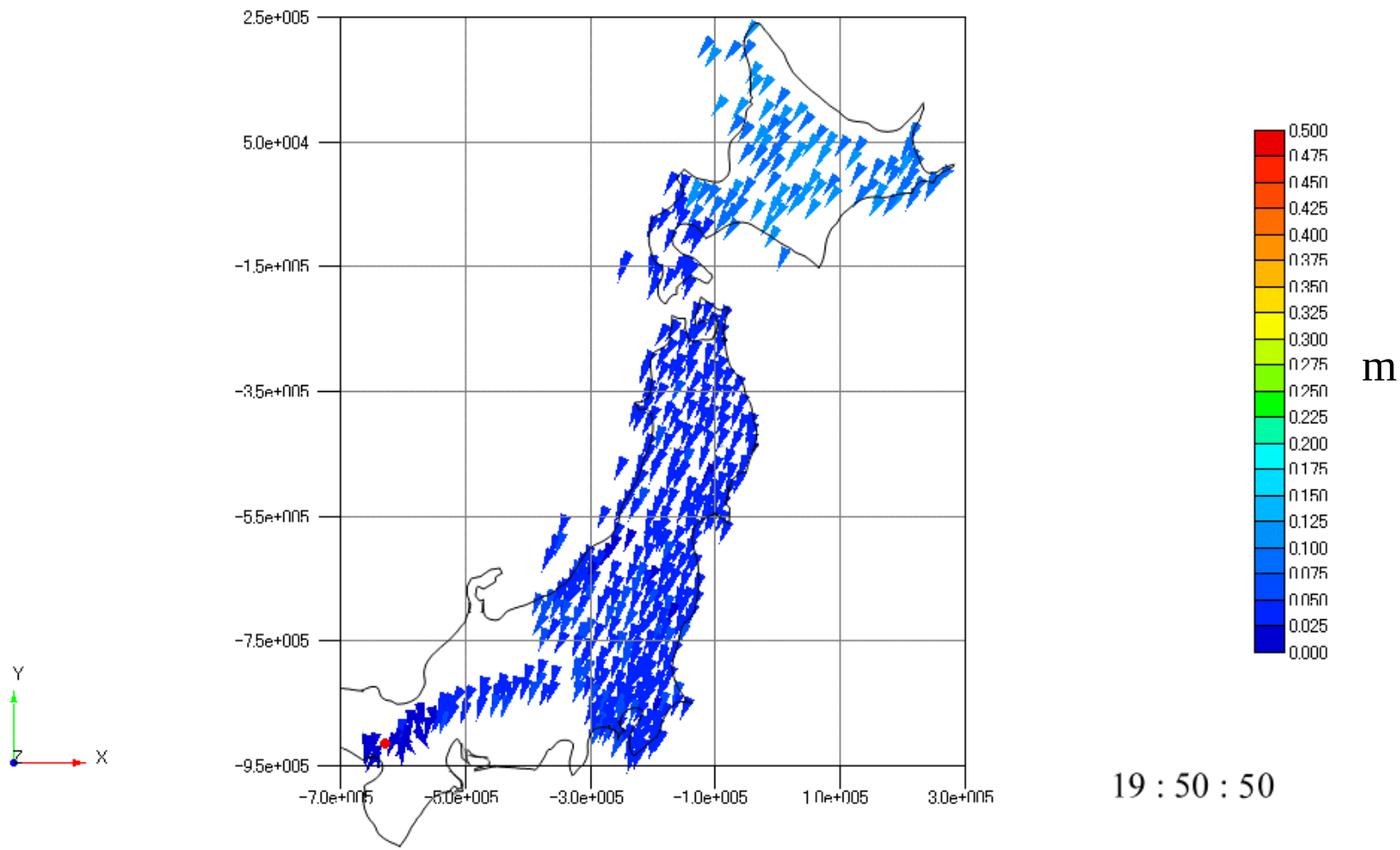
Internet

9/28/04 Mw=6.0 Parkfield Earthquake



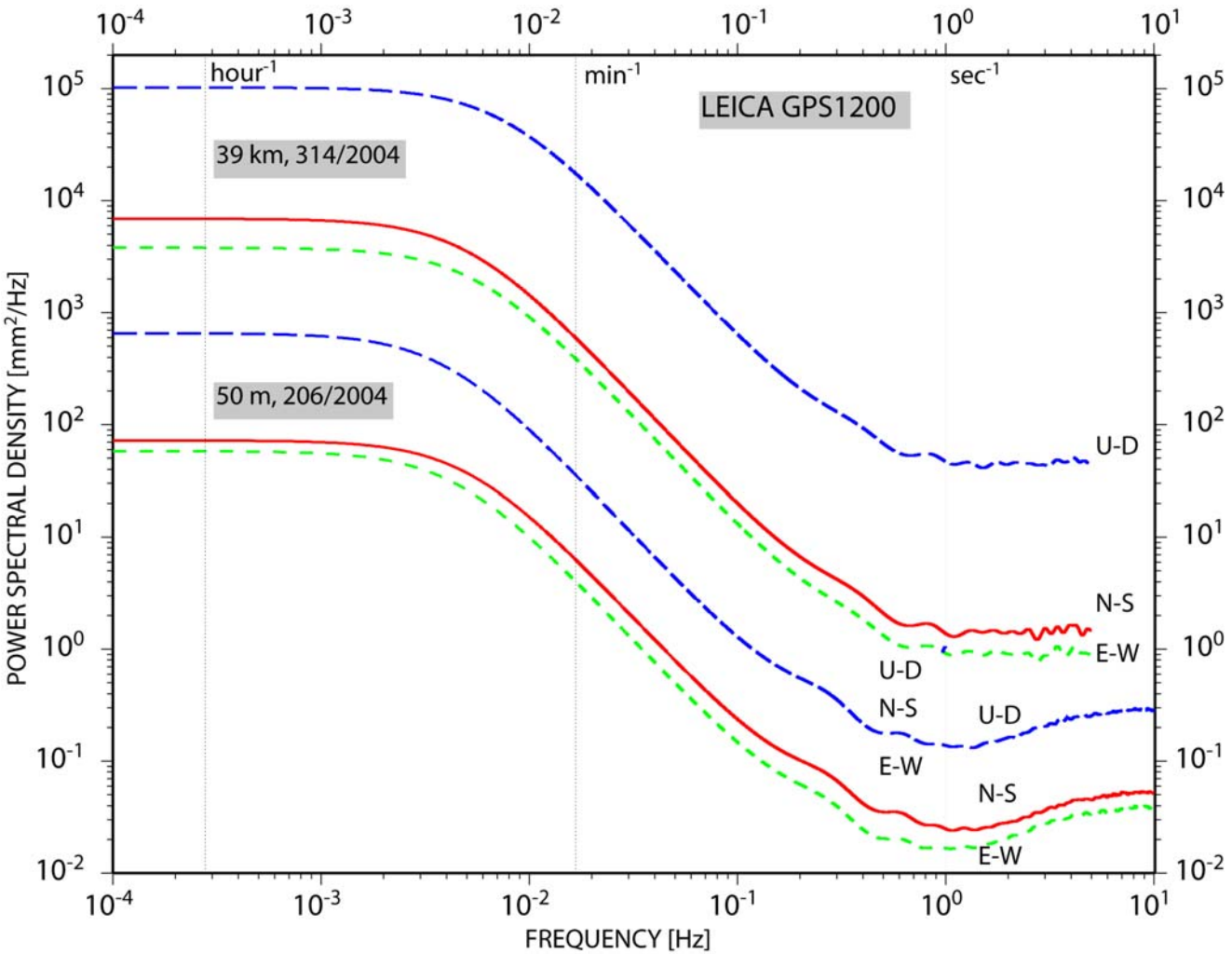
CGPS provides measurements of interseismic, seismic, coseismic and postseismic deformation. Shown is the position time series for site LAND, based on 1 Hz instantaneous positions computed in real time.

Replay of Mw 8.0 2003 Tokachi-Oki Earthquake



1 Hz instantaneous positions of GSI stations computed with RTD software

Very-High-Rate (20 Hz) Instantaneous Positions



- **Ultra-high frequency response is flat ("white noise" above 0.05-0.5 Hz (<2-20 s) for 10-20 Hz instantaneous positions.**
- **Precision of 10-20 Hz data is similar to 1 Hz data for short- and medium-scale baselines.**
- **Can benefit from "square-root-of n" averaging to improve precision of, for example, 1 Hz samples.**