QUAKEFINDER NEWS

Third Quarter 2008

A few words from the Vice President's corner

We presented a poster at the International Union of Radio Science (URSI) Conference held in Chicago in August. Our presentation concentrated on the results we had obtained looking at Ultra Low Frequency (ULF) pulsations, air conductivity and infra red signals, all detected weeks prior to the Alum Rock M5.4 earthquake in Oct 2007. We had an interesting conversation with Dr. Hattori of Japan who also presented a paper about ULF signals detected prior to quakes in Japan, and in looking at his data more closely, we noticed that he too had detected the same type of 2-10 sec wide pulsations in his data prior to the earthquakes in Japan. This is another small step in validating our research.

Tom Bleier

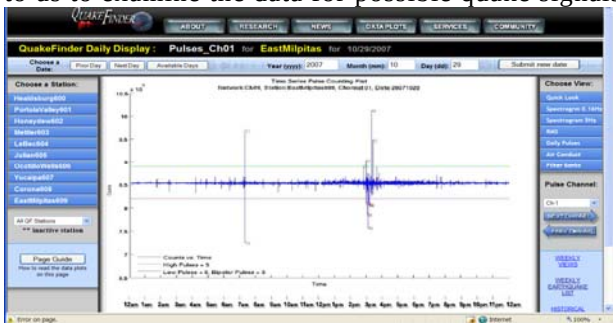
VP for Humanitarian R&D/QuakeFinder

Data Center Automation

We are making steady progress with automating the processing of the large data volume collected each day from our CalMagNet sensors. The goal is to look at the data using many different algorithms to "tease" the signals out of the ambient noise. New algorithms now shown on the web page include:

Pulse counting: Daily Images

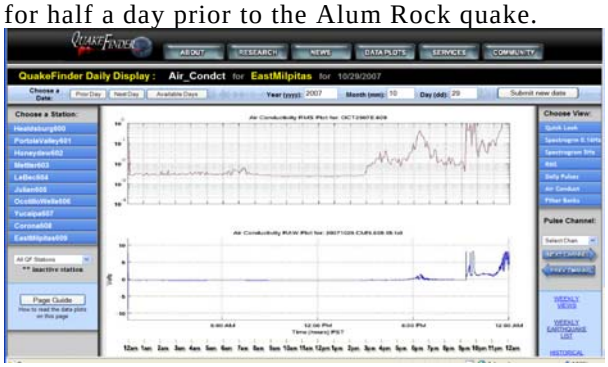
The large pulsations observed prior to Alum Rock can be seen in the example below, and so a new algorithm was generated to count these positive, negative, and bi-polar pulses if they exceed a threshold limit shown on the example page below. Pulse counts in the hundreds per day raises an alert to us to examine the data for possible quake signals.



Air Conductivity: Daily Image

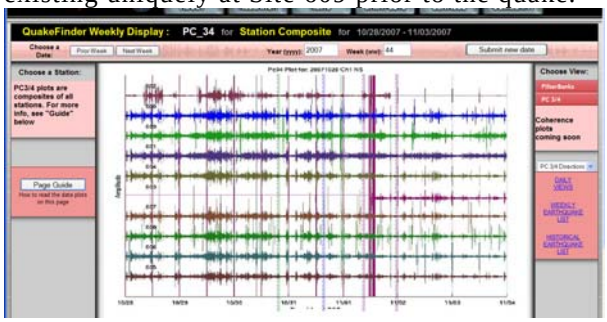
Air conductivity changes were also observed in the evening prior to the Alum Rock quake, and now we can see both the log of the values as well as the raw time series each day for 25 sites in the network.

An example below shows the site at East Milpitas on the day before the quake. This signal continued for half a day prior to the Alum Rock quake.



Pulse Continuous type 3,4 pulsations: Weekly

Since the sun occasionally generates magnetic storms, it is important to look at multiple stations in the 0.01 Hz band to see if they are showing these solar-induced signals vice the signals from the local area. Below is an example of a network-wide display of pulsations that are solar-generated. A more detailed view of this showed many pulses existing uniquely at Site 609 prior to the quake.



We have also created an algorithm that recognizes very large worldwide earthquakes, calculates the time of arrival of this mechanical shaking motion at our sites, and warns the analyst that signals detected on the magnetometers may be "false" due to this mechanical motion of the coils. This is part of the more sophisticated processing we are using to help eliminate "false alarms" in our data.

More algorithms, and better weekly and monthly displays are in work now, and they should be migrated to our web site soon.