Seismologists expand stadium monitoring for NFC championship game

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The Pacific Northwest Seismic Network installed a third seismograph at CenturyLink Field this week in the wake of the Seattle Seahawks win over the New Orleans Saints last weekend that provided a trial by fire of the network's website and new monitoring tools.

Before last weekend's game, network scientists set up two near real-time seismic monitors at CenturyLink to augment data from a third seismograph about a block away. Together they provided a scientific measurement of the energy of Seahawks' "12th man" – the fans – and the most difficult real-life test for the recently redesigned website, pnsn.org, as fans inundated the site.

"I was watching the traffic from the CenturyLink Field press box and saw the web slow way down as tens of thousands of requests for seismograms were arriving almost simultaneously," said Jon Connolly, a seismic network software engineer. "I was able to tune and rebalance how the requests were managed and we learned a lot about how to reorganize some services to be ready for the next big earthquake or volcanic eruption."

Those seismograms, dubbed "Hawk-O-Grams," were so popular that Steve Malone, a UW professor emeritus of Earth and space sciences, had to shut down his experimental "Fan-O-Meter," which combined the three stations' outputs in a streaming graph that was almost synchronized with the TV broadcast delay.

"Folks were getting bounced out after a few minutes or could not see the display at all when the servers became overwhelmed by the demand," Malone said. But a private version of his software running within the seismic network turned out to be very useful for associating crowd reaction with seismic signals.

"We could tell from these signals something about what we were about to see on TV seconds later, due to the broadcast delay," Malone said.

The seismometers picked up local traffic, trains and the stadium's powerful heating and cooling pumps. It also picked up a strange harmonic vibration a couple of minutes after Seahawks touchdowns.

The signal from the heating and cooling pumps was so strong at one of the stations that technicians this week moved that instrument to a quieter spot near the field, and placed an additional seismograph on the third deck of the stadium.

That means the network now has four instruments ready to measure the seismic aftermath of what they expect will be another "Beast Quake" during Sunday's game between the Seahawks and the San Francisco 49ers, which will determine which team wins the NFC championship and goes to the Super Bowl on Feb. 2 in East Rutherford, N.J.

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