



**The NEES@UCSB Data Portal:
A Web-based Tool to Search,
View Waveforms, and Download Data
From Vertical Arrays**

Jamison H. Steidl



This Talk: How you can get to the earthquake data being recorded on Vertical Arrays every day

➤ New Web data dissemination tools:

Provide access to the data being collected from the permanently instrumented field sites to the engineering and seismology communities.



http://nees.ucsb.edu

NEES@UCSB - Permanently Instrumented Field Sites

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Permanently Instrumented Field Sites


The NEES@UCSB facility consists of permanently instrumented geotechnical test sites designed to improve our understanding of the effects of surface geology on strong ground motion. The instrumentation at these sites includes surface and borehole arrays of accelerometers and pore pressure transducers designed to record strong ground motions, excess pore pressure generation and liquefaction that occurs during large earthquakes. An instrumented structure is also monitored to improve our understanding of soil-foundation-structure interaction (SFSI) effects.

Wildlife Refuge Liquefaction Field Site




Located in the Imperial Valley of Southern California within the Imperial Wildlife Management Area, the Wildlife Liquefaction Array is a fully instrumented site in an area that has historically produced significant ground motion and liquefaction effects. [more →](#)

Garner Valley SFSI Field Site



The Garner Valley Array is a thoroughly characterized strong motion monitoring site with surface accelerometers, borehole pore pressure transducers and accelerometers, and an extensively instrumented Soil Foundation Structure Interaction (SFSI) test facility. The Garner Valley array records earthquakes on a daily basis, and is also used in active testing experiments. [more →](#)

News!



STATUS:
The data portal is running but we are still unable to solve a network/proxy issue so it is necessary to use the alternate address:
<http://nees.ucsb.edu:8080/data>

Safety First!
[NEES@UCSB Safety Policy](#)

Resources For:
[Engineers and Researchers](#)
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Done



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Geologic Conditions

The near-surface geology of the WLA site consists of a layer of saturated silty sand, from approximately 2 - 7 m, with silty clay above and below the layer. This confined silty sand layer is highly susceptible to increases in pore pressure and potential liquefaction. A geotechnical cross section of the site, based on extensive CPT work done at the site, is shown below along with the locations of instruments above, below, and within this liquefiable layer. The data from these instruments are continuously monitored and transmitted back to UCSB in real-time. Details of the site characterization work performed at the site can be found by clicking the "Facility and Equipment Technical Details" link below.

General Specifications

- **Instrumentation Guide** ... our guide to the instrumentation layout, location and specifications.
- **Component Interaction Diagram** ... a diagram of the component wiring and radio routing.
- **KML Map** → Google Earth KML map.

Geotechnical/Geophysical Specifications

- **Geotechnical Logs and Data (both field sites)** ... the geotechnical logs and data from both the Garner Valley and Wildlife field sites.
- **GIS Compatible Maps** ... a Geographic Information System (GIS) map with layers for all casings, boreholes, structures, etc, compatible with ArcGIS.
- **USGS Liquefaction Report** ... spreadsheets showing visually the liquefaction of various layers of soil.
- **Preliminary P-S Logs** ... a spreadsheet containing preliminary graphs and data relating depth to velocity at the site.
- **Permeability Tests** ... a file containing spreadsheets and data on the permeability of the site.
- **Detailed Geotechnical Information and Logs** ... This file contains Atterberg data, borehole logs, clay mineral data, soil consolidation data, hammer energy transfer data, x-ray pictures of the borehole, data on the specific gravity of the soil, and unconsolidated undrained lab test data.
- **Survey Data** ... the survey data from May 3rd 2004.
- **Previous USGS Study Data** ... a file containing CPT test data, cross-section diagrams of the soil, seismic data, and pore pressure dissipation data.

Photographs



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Stations Events Downloads

Select Station ...

- 226 - Superstition Mountain
- 5210 - USGS Imperial Wildlife
- 8040 - Alaska Delaney Park
- BVDA - Borrego Valley Downhole Array
- GVAR - Lake Hemet Dam
- GVDA - Garner Valley Digital Array**
- HEO - Hollister Downhole Array
- WLA - Imperial Wildlife Array

We assign location codes, e.g. 00 or 99 to the channel names to identify the instrument and its location. The images below show the relative position and depth. Survey maps are available for the site layouts.

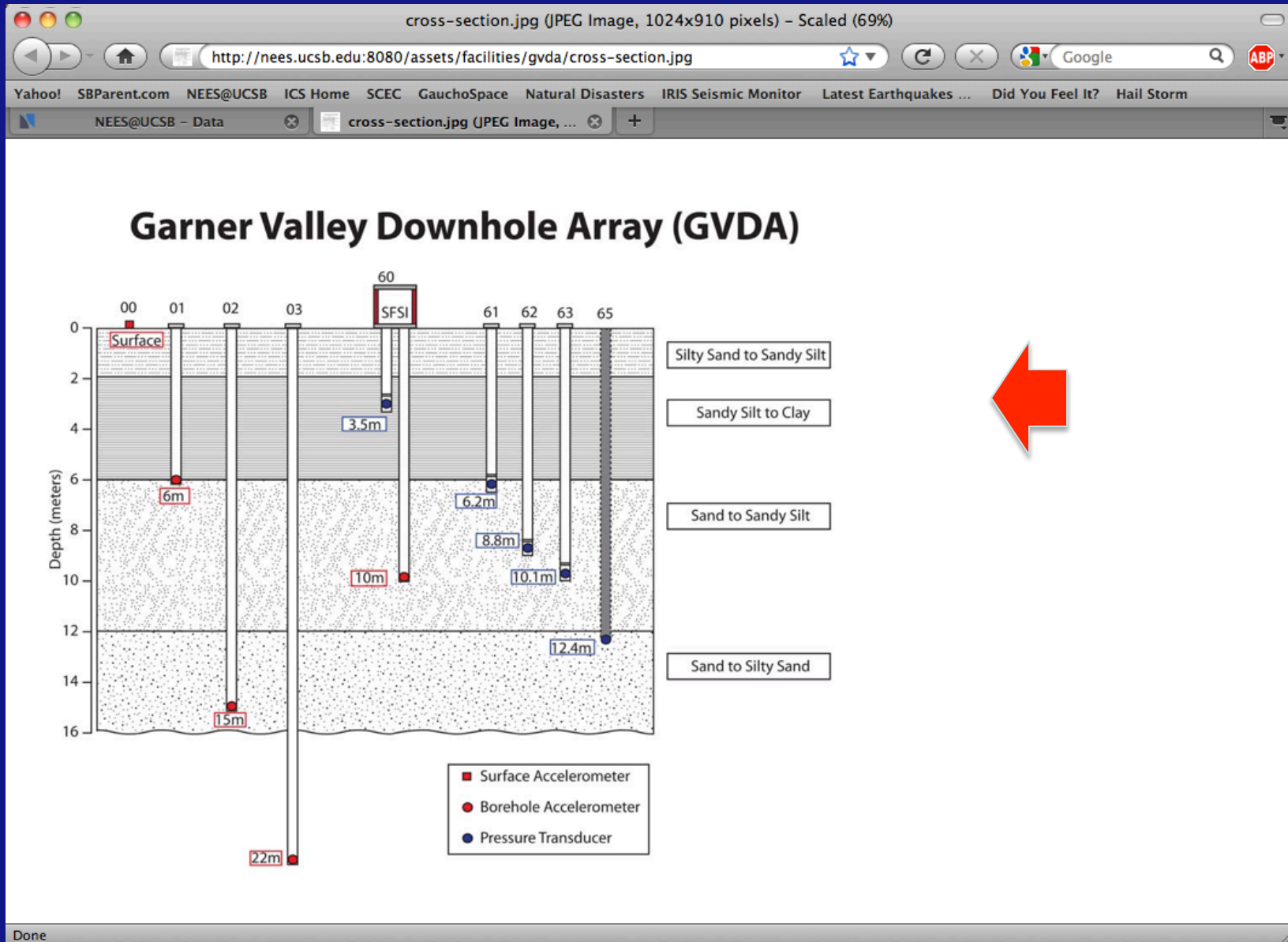
Location	Depth (m)	Measure
00	0.0	Acceleration
01	6.0	Acceleration
02	15.0	Acceleration
03	22.0	Acceleration
04	50.0	Acceleration

Garner Valley Downhole Array (GVDA)

Done



<http://nees.ucsb.edu/data>





The Event Search

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NEES@UCSB - Data Waveform Explorer

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GVDA - Garner Valley Digital Array



Latitude: 33.6688
Longitude: -116.6729
Elevation: 1314m
[Google Earth View: Download](#)

Stations **Events** Downloads >>

<< Stations

Max. Distance:
Min. Magnitude:
Max. Magnitude:
Start Date:
End Date:

Event 1 to 36 of 36 events.

Select	Date	M(l)	Distance(k)	Depth(k)	Latitude	Longitude	Azimuth	Authority	Event ID
<input checked="" type="radio"/>	2009-01-09 03:49:46	4.45	76.0	14.2	34.107	-117.304	310.090	SCSN	10370141
<input type="radio"/>	2009-01-09 04:47:40	3.28	75.5	15.1	34.098	-117.306	309.416	SCSN	10370177
<input type="radio"/>	2009-01-11 01:06:00	3.60	74.6	7.0	34.308	-116.915	342.640	SCSN	10370561
<input type="radio"/>	2009-03-13 03:42:22	3.01	62.0	15.1	34.016	-117.197	308.727	SCSN	14429152
<input type="radio"/>	2009-03-21 11:24:46	3.30	51.2	3.8	33.252	-116.439	154.838	SCSN	14432280
<input type="radio"/>	2009-03-21 20:12:18	3.07	96.1	4.7	33.313	-116.730	114.082	SCSN	14432456

Done



The Event Search

- From 1/1/2005 to 12/31/2010
 - 3748 M1+ events available at GVDA
 - 5309 M1+ events available at WLA
- We use a radius that increases as magnitude increases, so small events only from very close to site. Progressively larger events from progressively farther away.



Select Your Event

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Stations Events Downloads

Map showing earthquake locations in Southern California. A red arrow points to a specific event location near Brawley, CA. A tooltip displays the following data:

Magnitude: 3.53
Distance: 5.835
Depth: 14
Latitude: 33.633
Longitude: -116.719
Azimuth: 226.939
Date: 2009-07-26
Time: 04:54:03.590

Max. Distance: 50
Min. Magnitude: 3.0
Max. Magnitude: 9.0
Start Date: 1/1/2009
End Date: 12/31/2009
Update

Event 1 to 5 of 5 events.

Select	Date	M(l)	Distance(k)	Depth(k)	Latitude	Longitude	Azimuth	Authority	Event ID
<input type="radio"/>	2009-06-19 15:30:37	3.20	41.0	13.4	33.377	-116.403	142.279	SCSN	14476736
<input checked="" type="radio"/>	2009-07-26 04:54:03	3.53	5.8	14.0	33.633	-116.719	226.939	SCSN	14491232
<input type="radio"/>	2009-10-16 10:03:39	3.44	43.4	14.9	33.975	-116.964	321.789	SCSN	10481781
<input type="radio"/>	2009-11-15 07:54:22	3.29	44.9	13.5	33.914	-117.059	307.500	SCSN	10497213
<input type="radio"/>	2009-11-16 13:54:34	3.61	28.5	8.0	33.415	-116.635	172.876	SCSN	10497645



Choose Waveforms to View




NEES@UCSB - Data

http://nees.ucsb.edu:8080/data

Download Packages (requires up to 1 minute per package)

Note: The January 2010 month is currently unavailable for waveform viewing but can still be downloaded.

Loc.	Chan.	PGA (cm/s/s)	PGV (cm/s)	S/N	View
00	HNE	32.69831	0.59602	5557.17	<input checked="" type="checkbox"/>
00	HNN	38.32537	0.70043	4885.12	<input checked="" type="checkbox"/>
00	HNZ	30.39081	0.22537	2066.00	<input checked="" type="checkbox"/>
01	HNE	21.50010	0.23057	4384.80	<input type="checkbox"/>
01	HNN	19.89083	0.37698	2897.57	<input type="checkbox"/>
01	HNZ	13.48807	0.12507	1250.36	<input type="checkbox"/>
02	HNE	22.97894	0.28959	5858.00	<input type="checkbox"/>
02	HNN	24.81769	0.31181	8435.67	<input type="checkbox"/>
02	HNZ	12.84965	0.12142	1871.86	<input type="checkbox"/>
03	HNE	13.56358	0.23802	576.29	<input type="checkbox"/>
03	HNN	21.19217	0.26936	2161.00	<input type="checkbox"/>
03	HNZ	10.03416	0.09944	682.13	<input type="checkbox"/>
04	HNE	8.15423	0.14661	1663.00	<input type="checkbox"/>
04	HNN	17.17439	0.21584	8756.50	<input type="checkbox"/>
04	HNZ	6.62733	0.09663	1689.50	<input type="checkbox"/>
05	HNE	7.43148	0.10122	7578.00	<input type="checkbox"/>
05	HNN	14.11177	0.14575	14390.00	<input checked="" type="checkbox"/>
05	HNZ	4.97393	0.05271	5072.00	<input checked="" type="checkbox"/>
06	HNE	1.59358	0.02120	77.38	<input type="checkbox"/>
06	HNN	6.76855	0.09075	197.20	<input type="checkbox"/>
06	HNZ	1.26506	0.01545	44.48	<input type="checkbox"/>





Click the view button and launch waveform viewer

dbwfserver

NEES / EarthScope Collaboration

Thanks to EarthScope Array Network Facility

Rob Newman

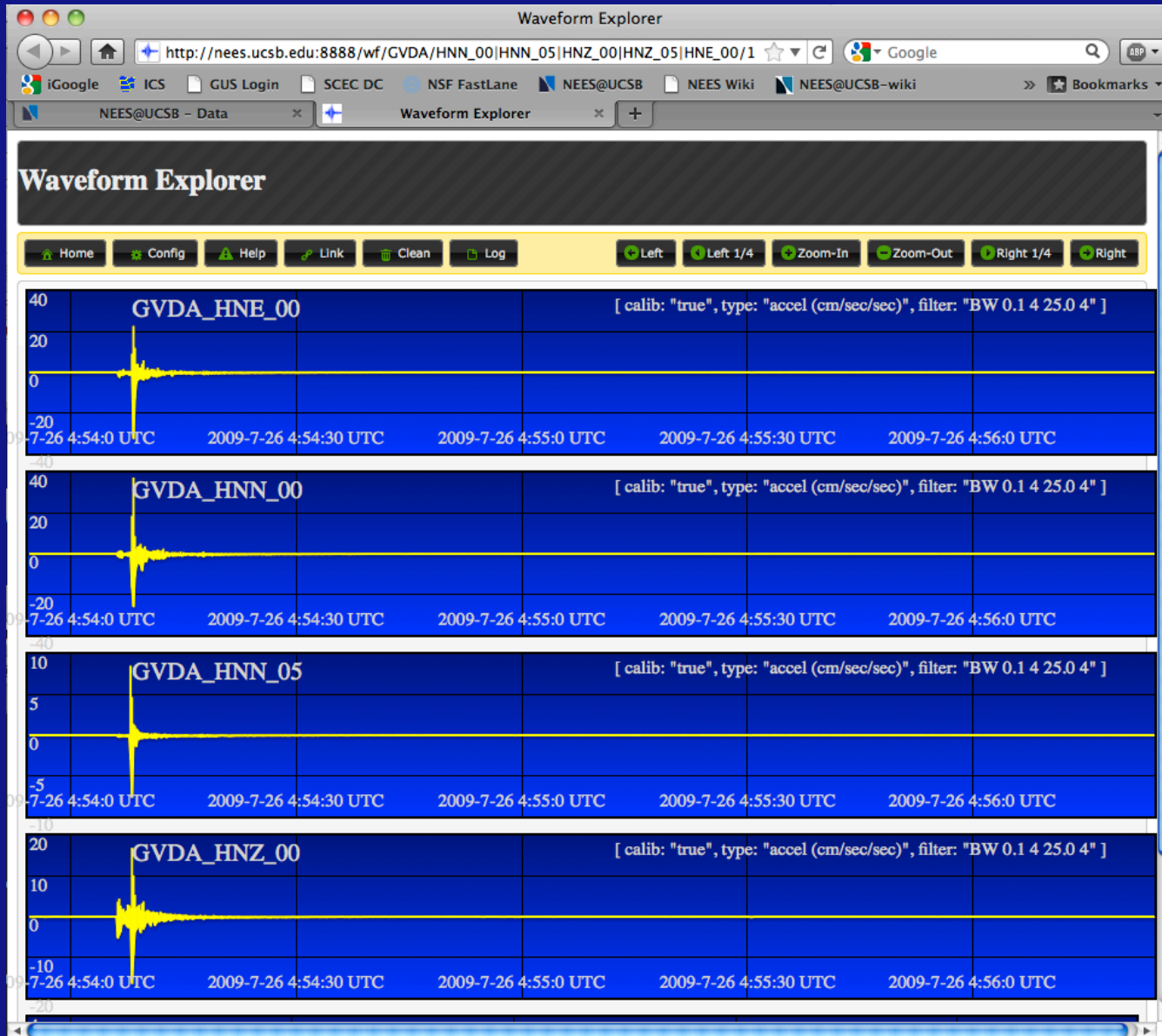
Juan Reyes

Kent Lindquist

Frank Vernon



Waveform Viewer





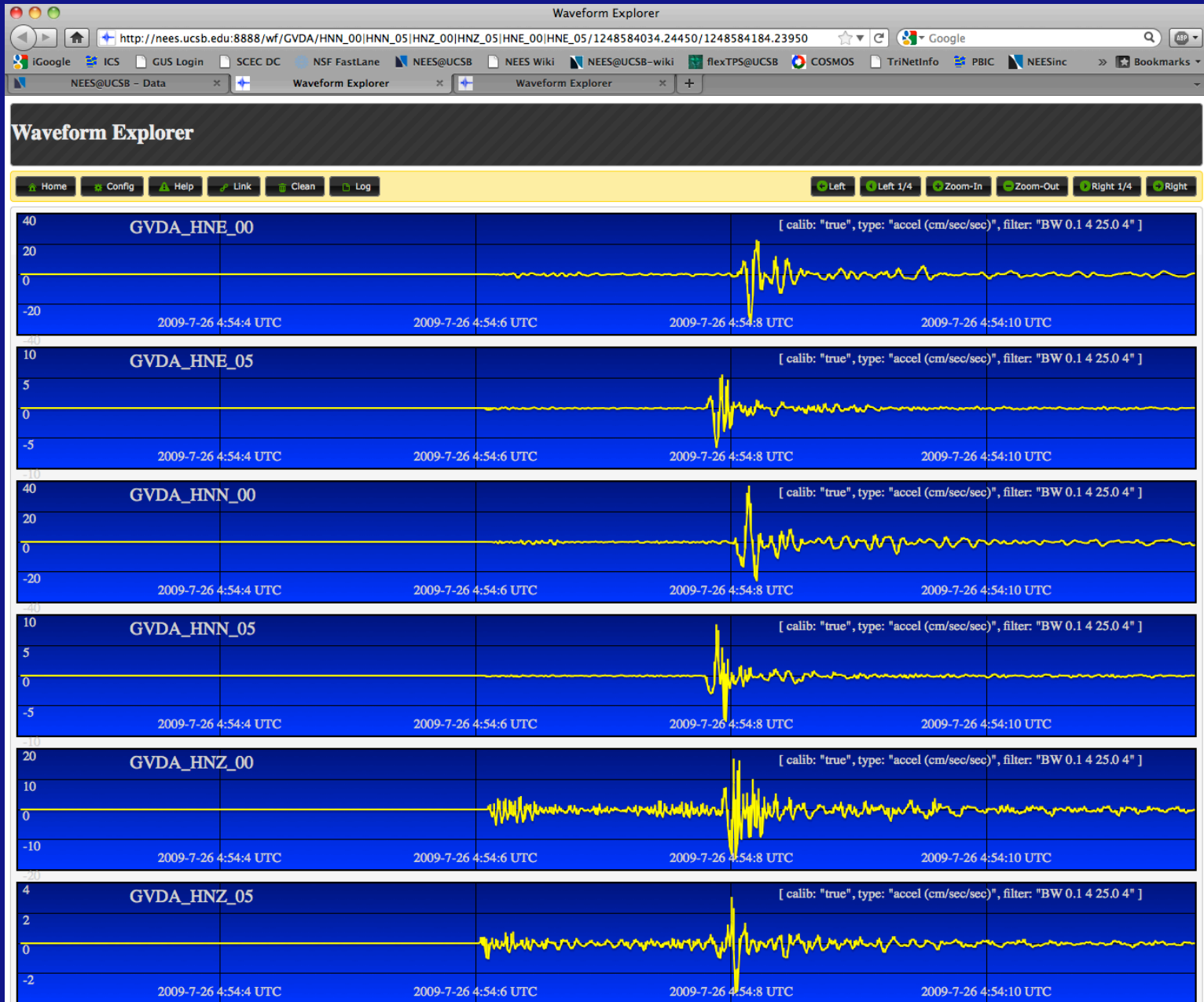
Waveform Viewer User Config

The screenshot displays the Waveform Explorer web application. The main interface features four stacked waveform plots for stations GVDA_HNE_00, GVDA_HNN_00, GVDA_HNN_05, and GVDA_HNZ_00. A blue arrow points to the 'Config' button in the top navigation bar. A configuration window is open, showing the following settings:

- Current database:** /Library/www_resources/pub-cluster/dbcentral
- Traces:** Big, Medium, Small; Waveforms, Coverage; Show Phases; Show Points
- Filters:** BW 0.1 4 25.0 4
- Timezone:** UTC, Local
- Acceleration Units:** cm/sec/sec, nm/sec/sec
- Realtime refresh in seconds:** 10
- Colors:** Background Top Color: Navy; Background Bottom Color: Blue; Tick Color: Black



Waveform Viewer Zoom & Scroll





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Magnitude: 3.29
Distance: 44.948
Depth: 13.5
Latitude: 33.914
Longitude: -117.059
Azimuth: 307.500
Date: 2009-11-15
Time: 07:54:22.700

Stations Events Downloads

<< Events

Formats:
 MiniSEED
 SAC
 ASCII/Excel
 RDV

Options:
 Apply calib
 Zero first sample time

Add Package

Packages:
3.29 @ GVDA, 10497213, ascii

Remove Selected Packages

Please Enter an Email Address
steidl@eri.ucsb.edu

Download Packages
(requires up to 1 minute per package)

Note: Viewing traces is only available for 2009 data at this time.

Loc.	Chan.	PGA (cm/s/s)	PGV (cm/s)	S/N	View
00	HNE	0.16955	0.00411	133.10	<input checked="" type="checkbox"/>
00	HNN	0.14858	0.00260	104.49	<input checked="" type="checkbox"/>
00	HNZ	0.26957	0.00331	90.36	<input checked="" type="checkbox"/>
01	HNE	0.08021	0.00147	26.89	<input type="checkbox"/>

Done



Yahoo!



Done

Active Channel	Start Time	Time GVDA	GVDA.HNZ_12 units	Units
	2009-10-16 10:03:35.735	0.000	9.0354769788E2	cm/s**2
	2009-10-16 10:03:35.740	0.005	9.0354964791E2	cm/s**2
	2009-10-16 10:03:35.745	0.010	9.0355549801E2	cm/s**2
	2009-10-16 10:03:35.750	0.015	9.0355549801E2	cm/s**2
	2009-10-16 10:03:35.755	0.020	9.0355549801E2	cm/s**2
	2009-10-16 10:03:35.760	0.025	9.0356134811E2	cm/s**2
	2009-10-16 10:03:35.765	0.030	9.0355549801E2	cm/s**2
	2009-10-16 10:03:35.770	0.035	9.0354769788E2	cm/s**2
	2009-10-16 10:03:35.775	0.040	9.0355354798E2	cm/s**2
	2009-10-16 10:03:35.780	0.045	9.0355549801E2	cm/s**2
	2009-10-16 10:03:35.785	0.050	9.0354574785E2	cm/s**2
	2009-10-16 10:03:35.790	0.055	9.0354574785E2	cm/s**2
	2009-10-16 10:03:35.795	0.060	9.0355939808E2	cm/s**2
	2009-10-16 10:03:35.800	0.065	9.0355549801E2	cm/s**2
	2009-10-16 10:03:35.805	0.070	9.0354964791E2	cm/s**2
	2009-10-16 10:03:35.810	0.075	9.0355744804E2	cm/s**2
	2009-10-16 10:03:35.815	0.080	9.0355744804E2	cm/s**2
	2009-10-16 10:03:35.820	0.085	9.0355159795E2	cm/s**2
	2009-10-16 10:03:35.825	0.090	9.0355744804E2	cm/s**2
	2009-10-16 10:03:35.830	0.095	9.0356134811E2	cm/s**2
	2009-10-16 10:03:35.835	0.100	9.0355549801E2	cm/s**2
	2009-10-16 10:03:35.840	0.105	9.0355939808E2	cm/s**2
	2009-10-16 10:03:35.845		9.0355549801E2	cm/s**2
	2009-10-16 10:03:35.850		9.0354379781E2	cm/s**2
	2009-10-16 10:03:35.855		9.0354964791E2	cm/s**2
	2009-10-16 10:03:35.860		9.0356134811E2	cm/s**2
	2009-10-16 10:03:35.865		9.0356914824E2	cm/s**2
	2009-10-16 10:03:35.870		9.0356524818E2	cm/s**2
	2009-10-16 10:03:35.875		9.0355939808E2	cm/s**2
	2009-10-16 10:03:35.880		9.0356329814E2	cm/s**2
	2009-10-16 10:03:35.885		9.0355939808E2	cm/s**2
	2009-10-16 10:03:35.890		9.0355744804E2	cm/s**2
	2009-10-16 10:03:35.895		9.0355354798E2	cm/s**2
	2009-10-16 10:03:35.900		9.0355159795E2	cm/s**2



Concurrent Development at NEEShub

NEES - Events

http://nees.org/dataview/spreadsheet/events/?filter=Events.Magnitude|>=4

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Map **Events**

Show 10 entries First Previous 1 2 3 4 5 Next Last Search:

Event ID	Station	Magnitude	Latitude	Longitude	Depth	Time	Azimuth	Distance
10295849	GVAR	4.06	34.156	-116.981	9.3	2007-12-19 12:14:09	335.164	60.204
10319593	286	4.06	31.997	-115.557	6	2008-04-21 14:16:23	166.68	109.537
10319993	GVDA	4.14	34.866	-116.34	5.5	2008-04-23 01:55:29	12.852	136.748
10321561	286	4.19	33.443	-116.454	10.8	2008-05-01 03:55:35	312.988	79.963
10321561	BVDA	4.19	33.443	-116.454	10.8	2008-05-01 03:55:35	327.982	15.26
10321561	GVDA	4.19	33.443	-116.454	10.8	2008-05-01 03:55:35	140.993	32.32
10347253	286	4.63	32.347	-115.23	15	2008-09-05 21:54:33	140.376	87.639
10370141	BVDA	4.45	34.107	-117.304	14.2	2009-01-09 03:49:46	315.286	122.768



Future Work

- Matlab reader automatically added to download package for MiniSEED files
- Choose relative or absolute scaling for waveform viewer
- Expand Holdings: Include vertical array data from other national and international providers
 - Greece
 - Turkey
 - Taiwan
 - Japan



Questions?

Thank You!