

# OBSIP Experiment Archive

**Year:** 2011

**Experiment Name:** Cascadia

The Cascadia Initiative is a community seismic experiment.

**Principal Investigator(s):** Doug Toomey, Team Leader (U Oregon)

Cascadia Cruises are led by the Cascadia Initiative Expedition Team (CIET), comprised of the following team of scientists:

Richard Allen (UC-Berkley)

John Collins (WHOI)

Bob Dziak (OSU/NOAA)

Emilie Hooft (U Oregon)

Dean Livelybrooks (U Oregon)

Jeff McGuire (WHOI)

Susan Schwartz (UC-Santa Cruz)

Maya Tolstoy (LDEO)

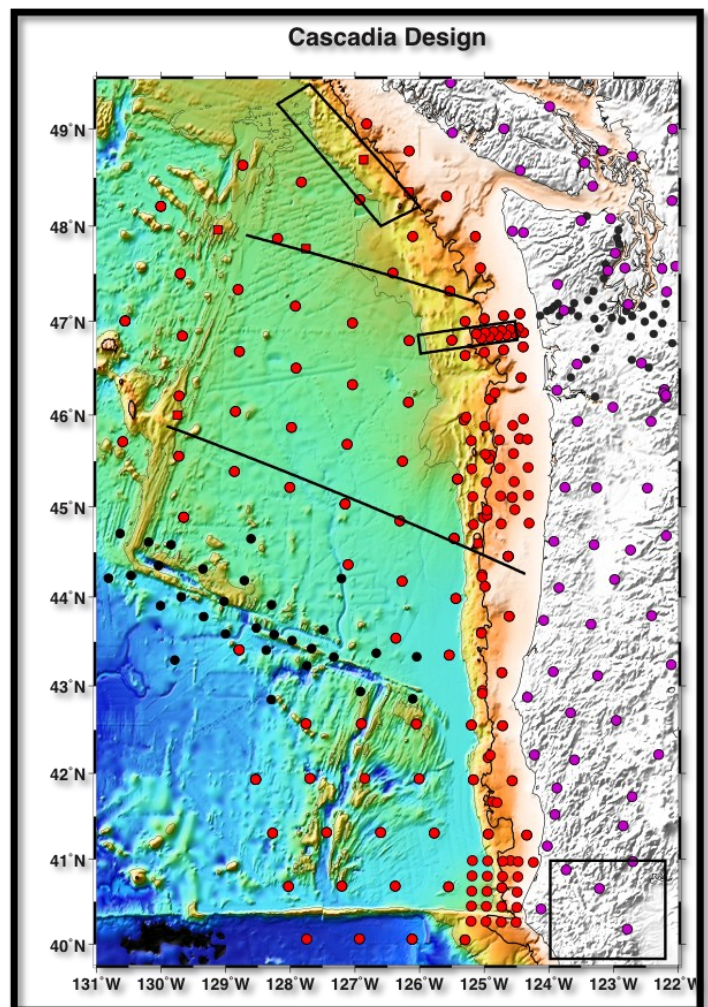
Anne Trehu (OSU)

William Wilcock (U Washington)

**Experiment Summary:** The Cascadia Initiative is an onshore/offshore seismic and geodetic experiment deployed in the Pacific Northwest to study questions ranging from megathrust earthquakes to volcanic arc structure to the formation, deformation and hydration of the Juan De Fuca and Gorda plates.

As part of the 2009 Stimulus or ARRA (American Recovery and Reinvestment Act) spending, NSF's Ocean Sciences (OCE) division funded the construction of an amphibious array of 60 Ocean Bottom Seismometers by the three IIC's for OBSIP.

Twenty of the Lamont OBSs will be installed in trawl-resistant enclosures and will be available for deployments in water depths extending from the shelf down to 1,000 m. These 20 OBSs will be deployed via the ship's wire and recovered using a Remotely-Operated Vehicle. *Continued Next Page*



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**Experiment Summary:** ...The OBSs will be utilized in four one-year deployments. These experiments will provide an offshore extension of the Earth- Scope Transportable Array (~70 km spacing) as well as 3 dense experiments focused on either imaging various properties of the thrust interface and forearc or recording local seismicity.

## Articles/Links:

[Cascadia Experiment Website](#)

[Science Advances Article](#)

[UCSB—The Current](#)

[Science Article](#)

[Berkley News Article](#)



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## Cruises:

*During 2015, OBSIP supported the following Cascadia cruises:*

- Cascadia 5A, RV Oceanus, Recover 15 WHOI OBS instruments - August/September
- Cascadia 5B, RV Oceanus, Recover 15 SIO OBS instruments - September
- Cascadia 5C, RV Atlantis, Recover 29 LDEO OBS instruments - September/October

*During 2014, OBSIP supported the following Cascadia cruises:*

- Cascadia 4A, RV Oceanus, Recover 25 WHOI OBS instruments - June
- Cascadia 4B, RV Oceanus, Recover 15 SIO OBS instruments - June
- Cascadia 4C, RV Atlantis, Recover 30 LDEO OBS instruments - June/July
- Cascadia 4D, RV Oceanus, Deploy 25 WHOI OBS instruments - August
- Cascadia 4E, RV Oceanus, Deploy 15 SIO OBS instruments - August
- Cascadia 4F, RV Oceanus, Deploy 30 LDEO OBS instruments - August/September

*During 2013, OBSIP supported the following Cascadia cruises:*

- Cascadia 3A, RV Oceanus, Recover 25 WHOI OBS instruments - June
- Cascadia 3B, RV Oceanus, Recover 15 SIO OBS instruments - June
- Cascadia 3C, RV Atlantis, Recover 30 LDEO OBS instruments - June/July
- Cascadia 3D, RV Oceanus, Deploy 25 WHOI OBS instruments - August
- Cascadia 3E, RV Oceanus, Deploy 15 SIO OBS instruments - August
- Cascadia 3F, RV Oceanus, Deploy 30 LDEO OBS instruments - August/September

*During 2012, OBSIP supported the following Cascadia cruises:*

- Cascadia 2A, RV Oceanus, Recover 15 OBS instruments - May
- Cascadia 2B, RV Thomas Thompson, Recover 24, Deploy 6 OBS instruments - July
- Cascadia 2C, RV New Horizon, Recover 15 OBS instruments - July
- Cascadia 2D, RV Oceanus, Deploy 15 OBS instruments - August
- Cascadia 2E, RV Oceanus, Deploy 15 OBS instruments - August/September
- Cascadia 2F, RV Oceanus, Deploy 24 OBS instruments - September
- Cascadia 2G, RV Oceanus, Contingency Cruise - November

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**Data Availability:** Below is the availability of the Cascadia Data in the IRIS DMC.

[2011-2012 Deployment](#) (.xls)

[2012-2013 Deployment](#) (.xls)

[2013-2014 Deployment](#) (.xls)

[2014-2015 Deployment](#) (.xls)

## Channel Naming Conventions:

[Cascadia Initiative Channel Naming Conventions](#)

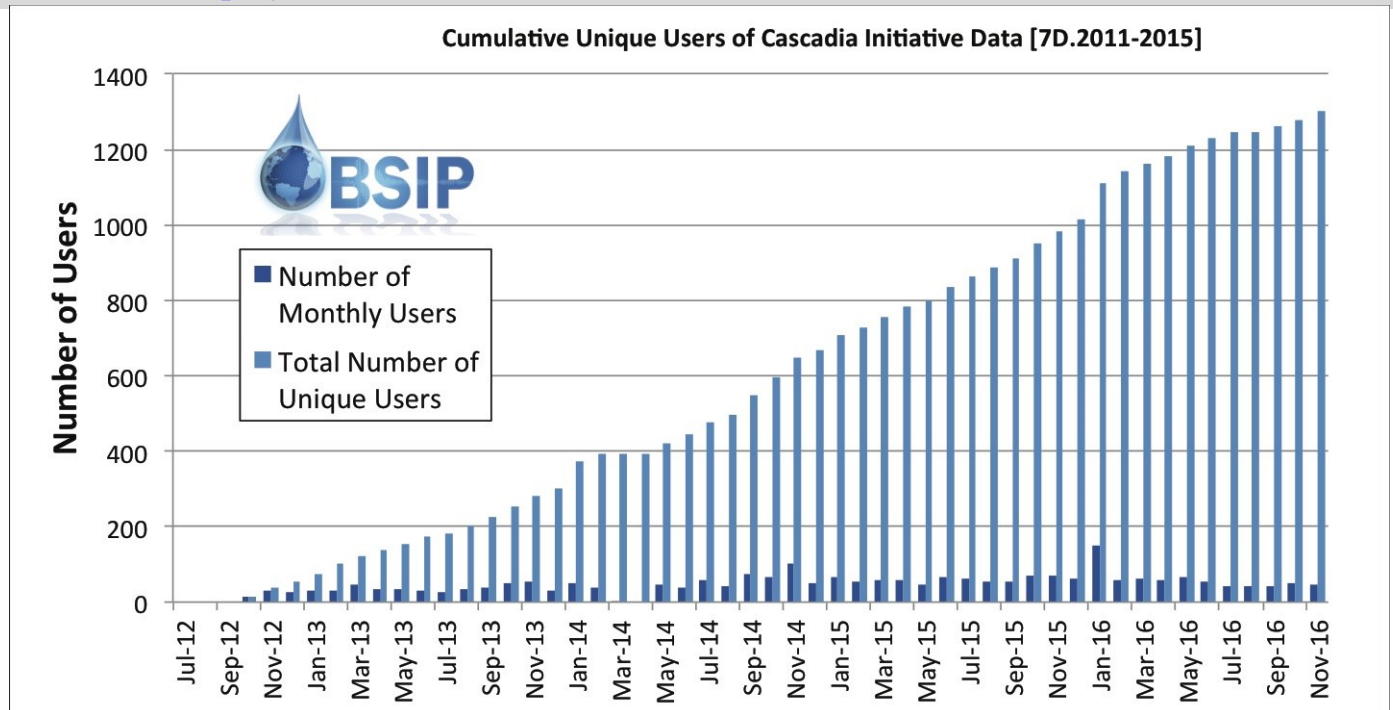
**Channel Uptime and Data Quality Rating:** The OBSIP Management Office has put together a summary of the Cascadia Channel Uptime and a qualitative measure of the data quality (usable vs unusable). This is meant as an initial guide for station performance, researchers should make their own assessment for their specific research project.

Each station has three lines indicating the three seismometer channels. The lines are merged so unless they differ it is difficult to see the three distinct lines. The top line is HH1, the second HH2, and the bottom is HHZ.

[2011-2012 Deployment](#)

[2012-2013 Deployment](#)

[2013-2014 Deployment](#)



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## Data Archive:

Data from the ocean bottom seismometers will be archived at the IRIS DMC under temporary network code [7D](#) (four years of OBSIP deployments) and [7A](#) (first deployment of WHOI-Keck). Temporary and permanent broadband land stations are archived under the network codes 5E (PASSCAL 2014-2015), BK (Berkeley Digital Seismograph Network), IU (Global Seismograph Network), TA (EarthScope Transportable Array), UO (University of Oregon Regional Network), US (US National Seismic Network), and UW (Pacific Northwest Regional Seismic Network). All stations will be available using the virtual network [CASCADIA](#).

**Data Updates and Changes:** As a community experiment, Cascadia Initiative data are immediately available to researchers. Sometimes updates to the data need to be made after the data has been released. The following is a list of updates and changes that has been made to the Cascadia Dataset.

Cascadia Initiative Updates and Changes

Date	Data Change
5/2/14	All Year 1 and Year 2 data were re-uploaded to have the same horizontal channel conventions BH2/HH2 90° clockwise of BH1/HH1 (left-handed convention) BH2/HH2, BH1/HH1 azimuth values set to 0,0 For more information go to Reupload page
6/9/14	Year 3 WHOI BX?, BY?, LH?, BXH data uploaded
7/28/14	Year 3 SIO BX?, BXH data uploaded
8/28/14	Year 3 WHOI BH?, BN?, BDH data uploaded
9/11/14	Year 3 SIO BH?, BDH data uploaded
10/30/14	Year 3 LDEO HH? data uploaded
10/30/14	Station FN14A latitude corrected from 46.02° to 47.02°
11/21/14	Year 1, Year 2, Year 3 SIO BDH, BXH response files updated
12/4/14	Year 1, Year 2, Year 3 SIO BX?, response files updated
9/16/15	Station M08C longitude corrected from -124.1185° to -124.8954°
11/13/15	Year 4 WHOI BX?, BY?, LH? data released
1/3/16	Year 4 SIO BX?, HX? data released
1/4/16	Year 4 WHOI BH? BDH data released
3/22/16	Year 4 LDEO HX? data released
3/28/16	Year 4 LDEO HH? HDH data released
5/3/16	Year 4 SIO BH? HH? BDH HDH data released
7/22/16	Year 4 LDEO HDH data released
8/9/16	Station J09B latitude corrected from 40.2011° to 43.1510°
9/19/16	Year 4 LDEO HH1, HH2, HHZ, HX1, HX2, HXZ channel polarity reversed and re-uploaded

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## Data Restriction and Reupload Information:

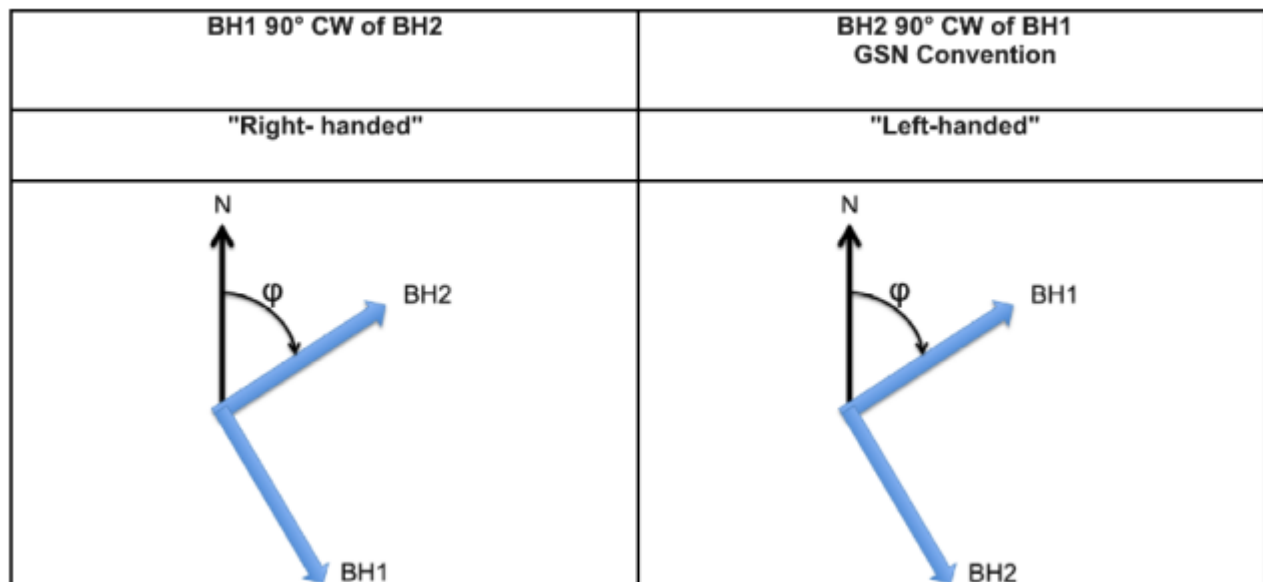
The OBSIP Management Office (OMO) restricted access on 2/28/2014 to the Cascadia Initiative dataset (network ID 7D) at the IRIS Data Management Center (DMC) in order to resolve a channel naming error that results in a large number of stations having an incorrect relative orientation.

The channel-naming errors affected LDEO OBS data in Year 1 and Year 2 and the SIO OBS data for Year 2. As a result of this change, OBSIP will make all of the Cascadia Initiative data consistent in relative orientation.

The relative orientation of the horizontal components for the Cascadia Stations were incorrectly defined. There are two options for the relative orientation of the horizontal channels.

Because OBSIP instruments are built and operated by three different IIC's, the usage of default relative horizontal orientation of channels varied in Year 1. In Year 2, all of the data was intended to be uploaded in the GSN convention (BH2 90° CW of BH1). The Cascadia data was corrected from both Year 1 and Year 2 so that all data follows the GSN convention (BH2 90° CW of BH1).

**As of 5/2/2014, the data has been corrected and unrestricted.**



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## Data Restriction and Reupload Information: ...continued

### Updated Conventions (after restriction)

Year 1	
IIC	Convention
LDEO	BH2 90° CW of BH1 Left-Handed
SIO	BH2 90° CW of BH1 Left-Handed
WHOI	BH2 90° CW of BH1 Left-Handed
Year 2	
LDEO	BH2 90° CW of BH1 Left-Handed
SIO	BH2 90° CW of BH1 Left-Handed
WHOI	BH2 90° CW of BH1 Left-Handed

### Previous Conventions (prior to restriction)

Year 1	
IIC	Convention
LDEO	BH1 90° CW of BH2 Right-handed
SIO	BH2 90° CW of BH1 Left-Handed
WHOI	BH1 90° CW of BH2 Right-Handed
Year 2	
LDEO	BH1 90° CW of BH2 Right-Handed
SIO	BH1 90° CW of BH2 Right-Handed
WHOI	BH2 90° CW of BH1 Left-Handed

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## Horizontal Orientations:

The OBSIP Management Office generated horizontal orientations for Years 1-3 of the Cascadia OBS Deployments.

### Year 3—Current Version is 2.1

- [Cascadia Horizontal Orientation Report 2013-2014](#) (15.1 MB)
- [Appendix B - Heli Plots long period filtered](#) (269 MB)
- [Appendix Bb - Heli Plots short period filtered](#) (5269 MB)
- [Appendix C - PDF-PSD](#) (5 MB)
- [Appendix D - Orientations](#) (11.4 MB)
- [Appendix E - Information about Data Re-upload and Horizontal Convention Change](#) (110 KB)
- [Appendix F - Methods for Determining Possible Errors in Channel Orientations](#) (3.4MB)

### Year 2—Current Version is 1.0

- [Cascadia Horizontal Orientation Report 2012-2013](#) (4.2MB)
- [Appendix B - Heli Plots](#) (247.2 MB)
- [Appendix C - PDF-PSD](#) (4.6MB)
- [Appendix D - Orientations](#) (68.3MB)
- [Appendix E - Information about Data Re-upload and Horizontal Convention Change](#) (107 KB)
- [Appendix F - Determining Possible Errors in Channel Orientations](#) (3.2MB)

### Year 1—Current Version is 3.0

- [Cascadia Horizontal Orientation Report 2011-2012](#) (9.1MB)
- [Appendix B - Heli Plots](#) (337MB)
- [Appendix C - PDF-PSD](#) (4.8MB)
- [Appendix D - Orientations](#) (55.5MB)
- [Appendix E - Information about Data Re-upload and Horizontal Convention Change](#) (107 KB)