OBSIC Update: MSROC Meeting, Washington D.C., Dec. 18, 2024

- General Update since December 2023
- Instrument Requests
- Instrument Numbers and Types
- Rapid Response
- 2024/2025/2026 OBSIC Schedule
- Sensor Upgrades
- FDSN OBS-Standards Initiative
- Outreach
- Webpage

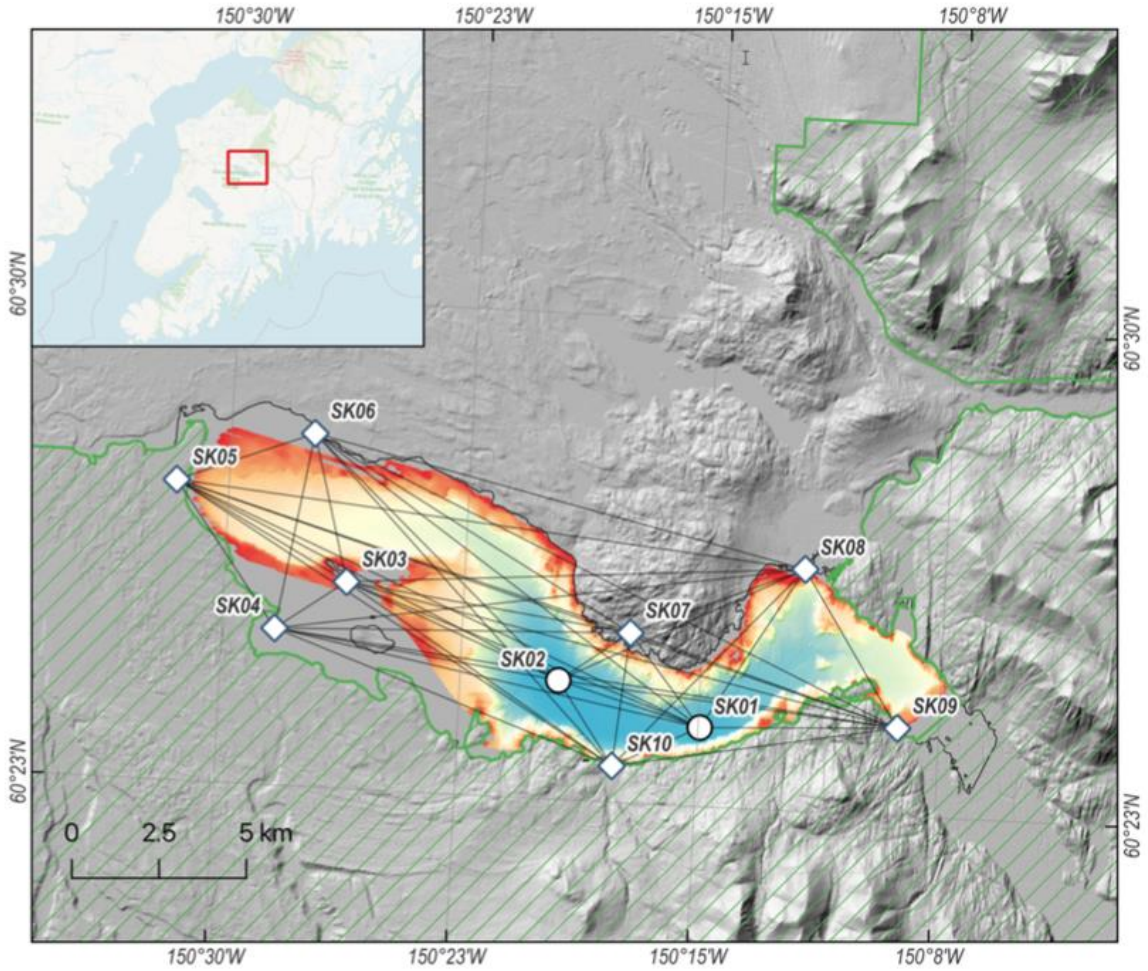
OBSIC Cruises 12/01/2022 – 12/08/2023

- Nov/Dec 2023: Puerto Rico (Active Source, WHOI/SIO; 31 SPOBS; 69 drops, *P. Canales*)
- Dec 2023: Tonga-Samoa Deployment (30 SIO BBOBS for 18 months, *S. Wei*)
- May 2024: Lake Basin Seismic Response Measurements for Lake Skilak, AK
  (2 BBOBS for 12 months. *N. Miller*, USGS)
- June/July 2024: Galapagos Plume-Ridge Recovery (53 WHOI BBOBS deployed for 15 months; *E. Hooft*)
- Sept 2024: Axial Seamount Recovery (10 SPOBS; 4 BBOBS; *W. Wilcock*)
- Nov/Dec 2024: Chain Transform (Active/Passive) Deployment (20 SIO SPOBS for 11 months. *J. Warren*)

Lake Basin Seismic Response Measurements for Lake Skilak, AK (USGS)

- Translating detailed lacustrine turbidite records into earthquake recurrence histories requires knowing how susceptible lake-bottom sediments are to shaking during earthquakes and tuning and amplification effects of the lake basin itself

- Measure ground motion amplification and tuning of earthquake arrivals using OBS and land stations



From: Miller, 2024

Skilak Lake, ctd.

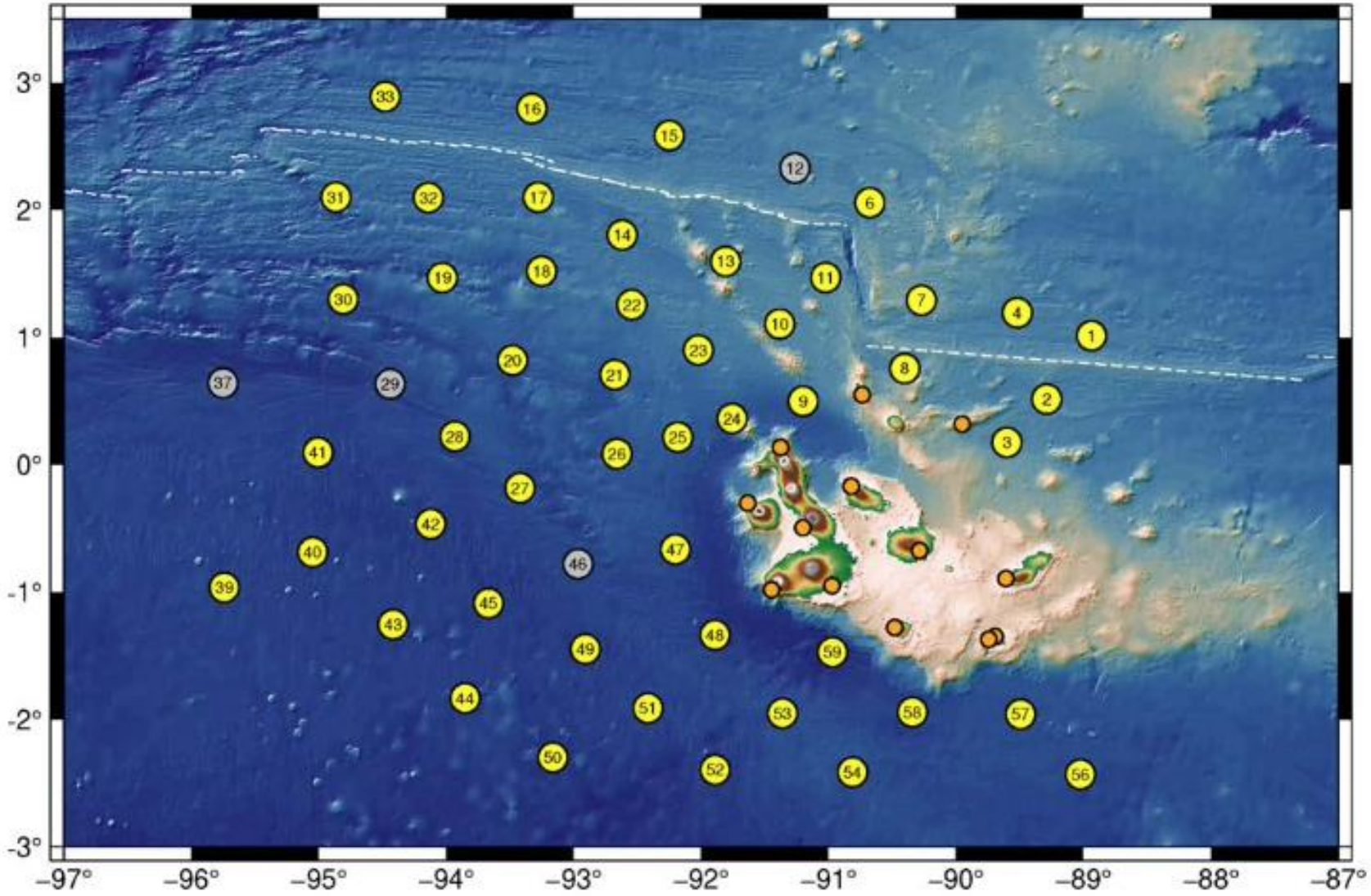
Lake had iced out 1 week prior to deployment

OBSIC Experiments June 2024 – October 2024

Hooft Galapagos Recovery Cruise

- 53 BBOBS deployed May 2023
- 49 OBS recovered June/July 2024

- Likely crevice corrosion on sea-water ground rod

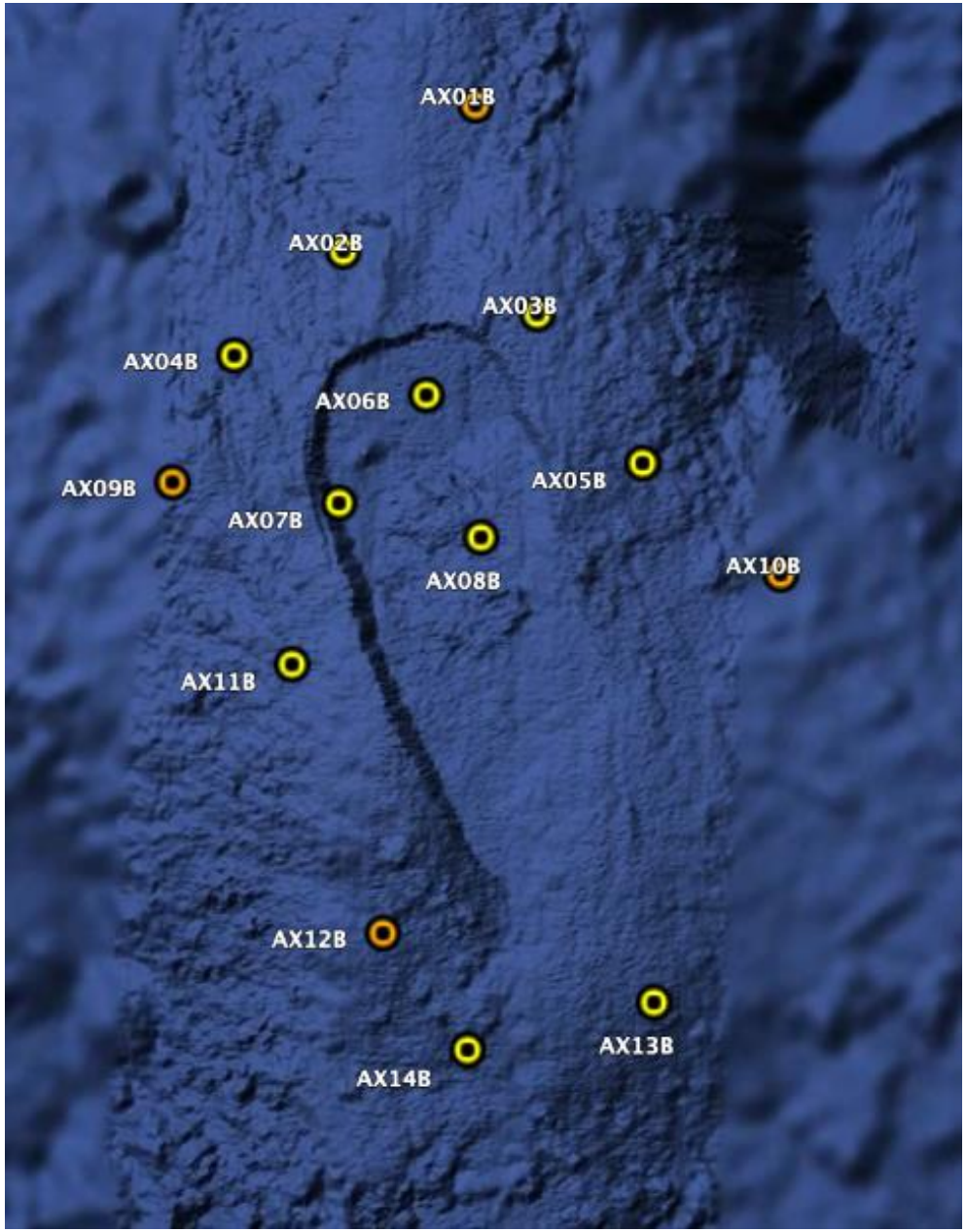


OBSIC Experiments June 2024 – October 2024

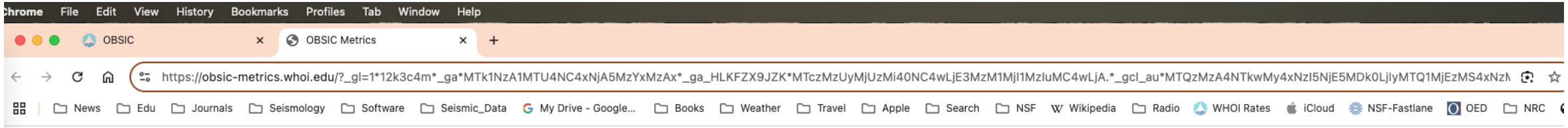
Wilcock Axial Seamount Year 2 Recovery Cruise

- 14 OBS (10 SPOBS; 4 BBOBS) deployed September 2023
- 14 OBS recovered September 2024

- 1 BBOBS (AX15A) deployed in September 2022 recovered by Jason on October 6



Data Metrics: https://obsic-metrics.whoi.edu/



OBSIC Metrics

OBSIC OBSIC Experiment List

Experiment Name	Network ID	Year	Status	Good hours, %
Galapagos (Marine IGUANA)	3H	2023	restricted	95
Puerto Rico Trench	3B	2023	restricted	97
Axial Seamount	2F	2023	restricted	89
Carolina Trough/Blake Plateau	1V	2023	restricted	98
Cayman Rise	9R	2023	restricted	92
NESMA	3A	2023	restricted	63
Guerrero Gap	X4	2022	restricted	95
OHANA	8Q	2021	restricted	88
Queen Charlotte Fault	YI	2021	restricted	82
CASIE21 (Cascadia)	YR	2021	open	86
Andreanof Islands	YM	2020	open	100
Gofar Transform Fault	8A	2019	restricted	89
Pacific Array (Old ORCA)	7B	2019	open	80
Bransfield Strait	ZX	2019	open	81
Pacific Array (Young ORCA)	XE	2018	open	56
AACSE	XO	2018	open	74
Hawaii-Emperor Seamounts	ZU	2019	open	97
New England Seamounts	7K	2018	open	96
Hawaii RAPID Response	Z6	2018	open	90
Yellowstone Lake	YL	2017	open	84
PICTURES	XW	2016	open	98

Performance assessment (Good hours, %) method.

Data Metrics: https://obsic-metrics.whoi.edu/

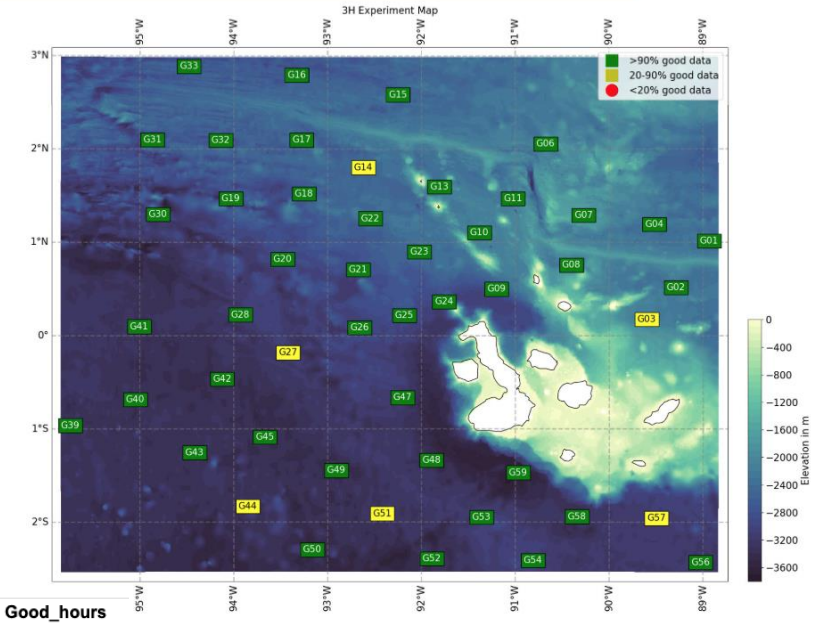
OBSIC

Experiment Metrics: Galapagos (Marine IGUANA)

OBSIC Home OBSIC Experiment List OBSIC Metrics

Experiment	Galapagos (Marine IGUANA)
Network Code	3H
Earliest Start	2023-03-23
Latest End	2024-07-04
% Good Data	95
Ancillary Data1	10.7284/909985
Ancillary Data2	10.7284/910549

3H_experiment_metrics.csv



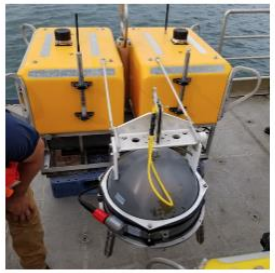
Station	Instrument Type	Depth, m	Deployed	Recovered	Orientation,°	Error,°	Clock drift, ms/day	% Good_hours
G01	WHOI_Angler	2352	2023-04-08	2024-06-24	197	3	-0.763	99
G02	WHOI_BBOBS	2369	2023-04-08	2024-06-27	130	12	0.279	97
G03	WHOI_BBOBS	2205	2023-04-08	2024-06-24	194	2	0.5	74
G04	WHOI_Angler	2260	2023-04-08	2024-06-24	348	3	0.333	98
G06	WHOI_Angler	2330	2023-04-09	2024-06-24	90	3	-1.099	99
G07	WHOI_ARRA	1642	2023-04-09	2024-06-24	7	2	0.019	98
G08	WHOI_BBOBS	2134	2023-04-07	2024-06-24	201	2	3.027	98
G09	WHOI_Angler	2716	2023-04-07	2024-06-21	82	4	1.327	99
G10	WHOI_BBOBS	2092	2023-04-06	2024-06-23	139	4	-0.657	98
G11	WHOI_BBOBS	2137	2023-04-06	2024-06-24	93	3	3.682	98
G13	WHOI_BBOBS	2313	2023-04-06	2024-06-23	33	3	2.119	99
G14	WHOI_ARRA	2489	2023-04-04	2024-06-24	29	2	-0.029	73
G15	WHOI_BBOBS	2389	2023-04-05	2024-06-27	246	2	1.409	98
G16	WHOI_BBOBS	2668	2023-04-05	2024-06-27	78	2	0.686	98
G17	WHOI_BBOBS	2586	2023-04-05	2024-06-28	154	2	1.201	98
G18	WHOI_BBOBS	2716	2023-04-04	2024-06-28	232	2	1.766	98

Data Metrics: https://obsic-metrics.whoi.edu/

Station Metrics: Galapagos (Marine IGUANA), G04

OBSIC | OBSIC Experiment List | OBSIC Metrics | 3H Metrics

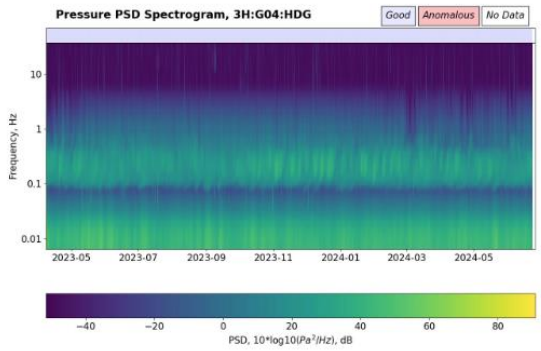
Experiment	Galapagos (Marine IGUANA)
Network Code	3H
Station	G04
Instrument Type	WHOI_Angler
Station Start	2023-04-08
Station End	2024-06-24
% Good, HDG	99
% Good, HH1	98
% Good, HH2	98
% Good, HHZ	98
% Good, G04	98



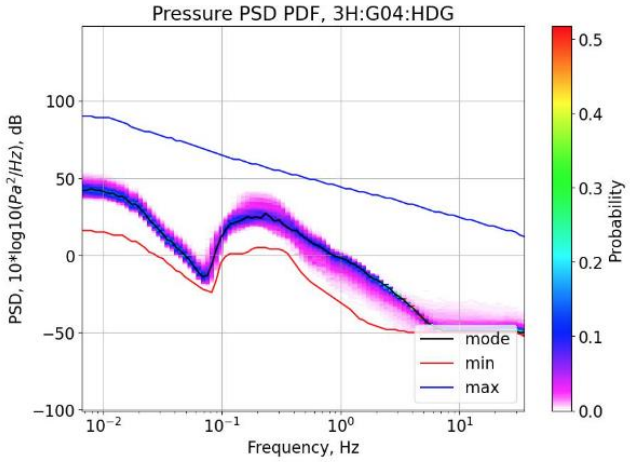
Spectrograms

HDG

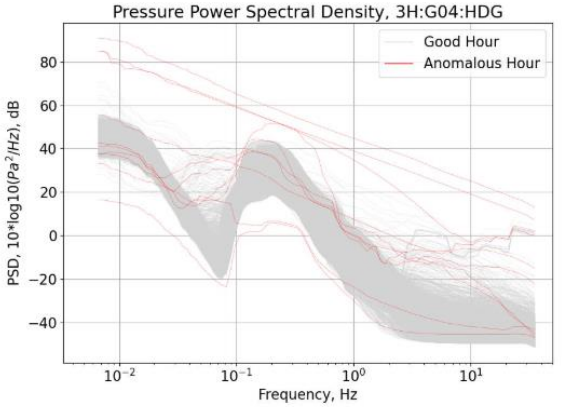
Screenshot



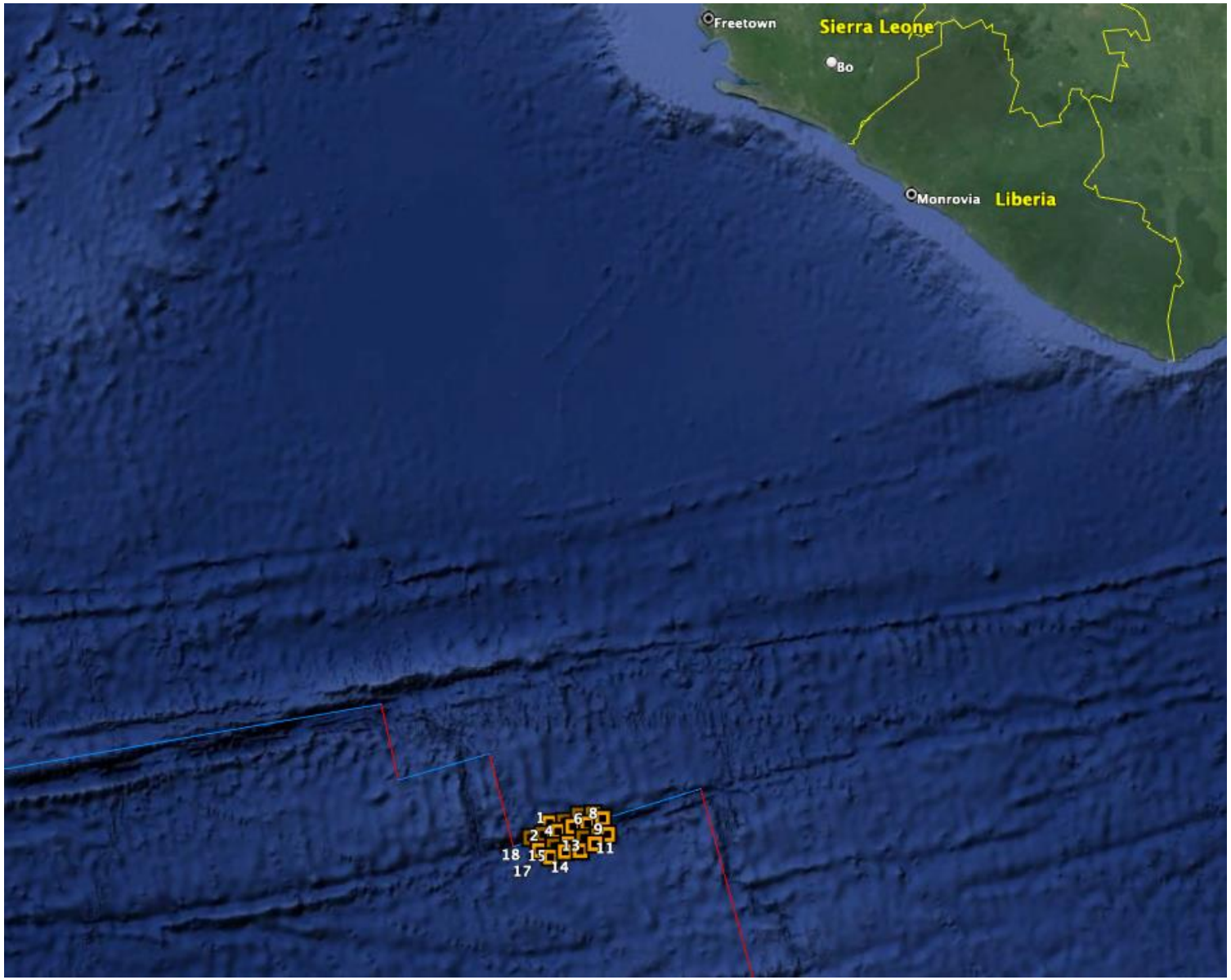
Psd Pdfs



Hourly Psds



Warren: Deployment of 20 SPOBS for 11 months at Chain Transform



Data Submissions

- Blake Plateau (H. Van Avendonk) — Network Code: 1V: 2023; Assembled Data Set: 23-026
- Axial Seamount (W. Wilcock) — Network Code: 2F 2022-2024
- Puerto Rico Trench (P. Canales) — Network Code: 3B: 2023; Assembled Data Set: 23-027

- Galapagos Plume (E. Hooft) — Network Code: 3H: 2023-2024

Year-2 Axial Seamount (W. Wilcock) delivered to Navy for review.

OBSIC Formal Instrumentation Requests (11/01/2023–10/26/2024)

# of short-period OBS requested	Total # of OBS deployments requested	Experiment Location
52	52	Western Central Atlantic
65	65	Equatorial Pacific
20	60	Offshore Brazil
154	235	Northern Pacific
55	110	South-Eastern Pacific
65	65	Equatorial Pacific

Requests for *short-period OBS* to support active-source experiments

# of broadband OBS requested	Data recording duration requested (months)	Experiment Location
15	12	Mediterranean
13	15	Caribbean
5/5	18/18	Western Central Atlantic
30	12	Gulf of Mexico
40	15	Northern Pacific
0	0	North-East Pacific
8	12	Northeastern Pacific

Requests for *Broadband OBS*

Current OBSIC Fleet

- 25 SPOBS
- 80 BBOBS
- 10 RROBS

- *35+ MSRI-funded BBOBS coming*

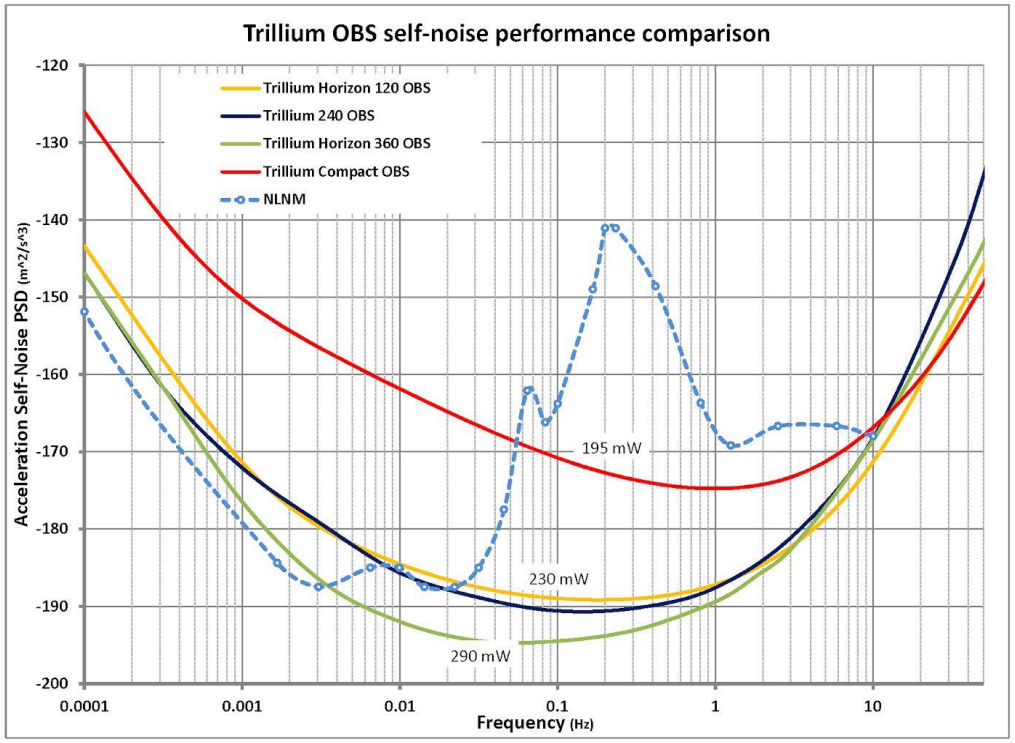
SIO OBS Fleet
- 30 BBOBS
- 50+ SPOBS

OBS Type	Count
Short-Period OBS (WHOI "D2"): 4.5 Hz geophone; hydrophone; Quanterra Q330 data logger; Seascan clock	25
Broadband OBS (Glass-Ball Floatation): Nanometrics Trillium Compact seismometer in WHOI leveling system; Differential Pressure Gauge; Quanterra Q330 data logger; Seascan clock	27
Broadband OBS (Glass-Ball Floatation): Nanometrics Trillium Compact seismometer in Nanometrics leveling system; Differential Pressure Gauge; Quanterra Q330 data logger; Seascan clock	7
Broadband ARRA OBS (Syntactic Foam Floatation): Nanometrics Trillium Compact seismometer in Nanometrics leveling system; DPG; Quanterra Q330 data logger; Microsemi CSAC	13
Shielded Broadband Abalone OBS with Nanometrics Trillium Compact in Nanometrics leveling system, DPG; Nanometrics Pegasus OBS data logger; Seascan clock	15
Broadband Angler OBS (Syntactic Foam Floatation): Nanometrics T-240 seismometer in WHOI leveling system; DPG; Q8 data; logger; power-cycled CSAC; power-cycled Teledyne CSAC	10
Broadband Angler OBS (Syntactic Foam Floatation): Nanometrics T-120 Horizon seismometer in WHOI leveling system; DPG; Q8 data; logger; power-cycled CSAC; power-cycled Teledyne CSAC	6
Broadband Angler OBS (Syntactic Foam Floatation): Nanometrics Trillium Compact seismometer in Nanometrics leveling system; DPG; Quanterra Q8 data logger; power-cycled Teledyne CSAC	2
Rapid Response OBS (Sercel MicrObs): MEMS accelerometer and hydrophone, rechargeable battery; Glass-ball housing. Under evaluation.	10

Seismometer Purchases ($458K)

Delivery Expected mid-November, 2024
6 Nanometrics T-360 OBS; 6 Nanometrics 120 Horizon

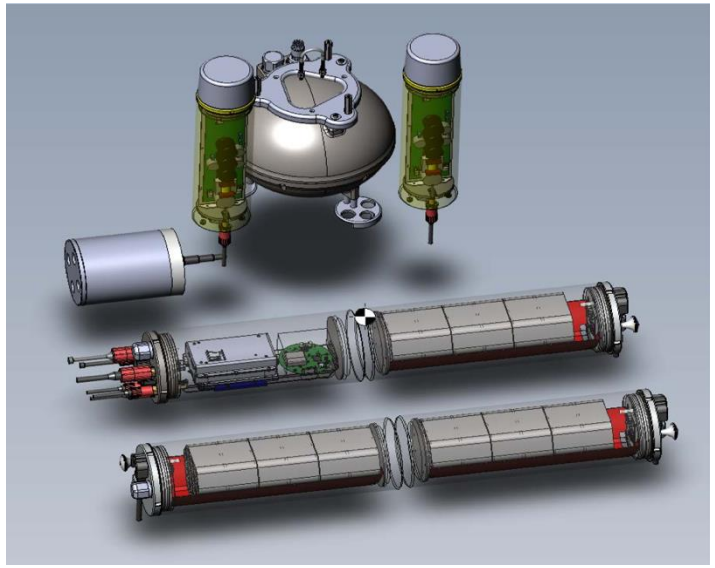
Result: Will be able to field 34 surface-wave sensors. (Remaining units are Trillium Compacts.)

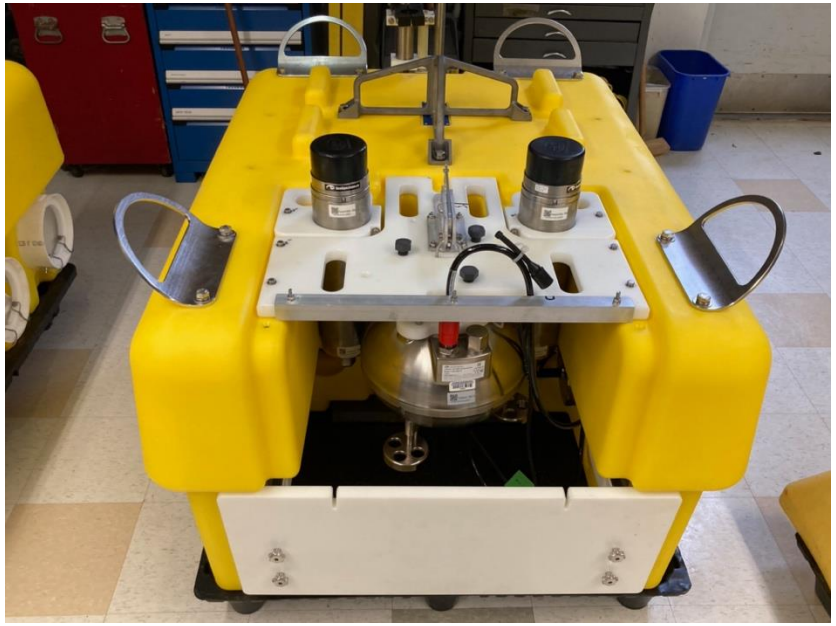


Data sheets say: 250 mW for 360 & 120; 230 mw for Horizon

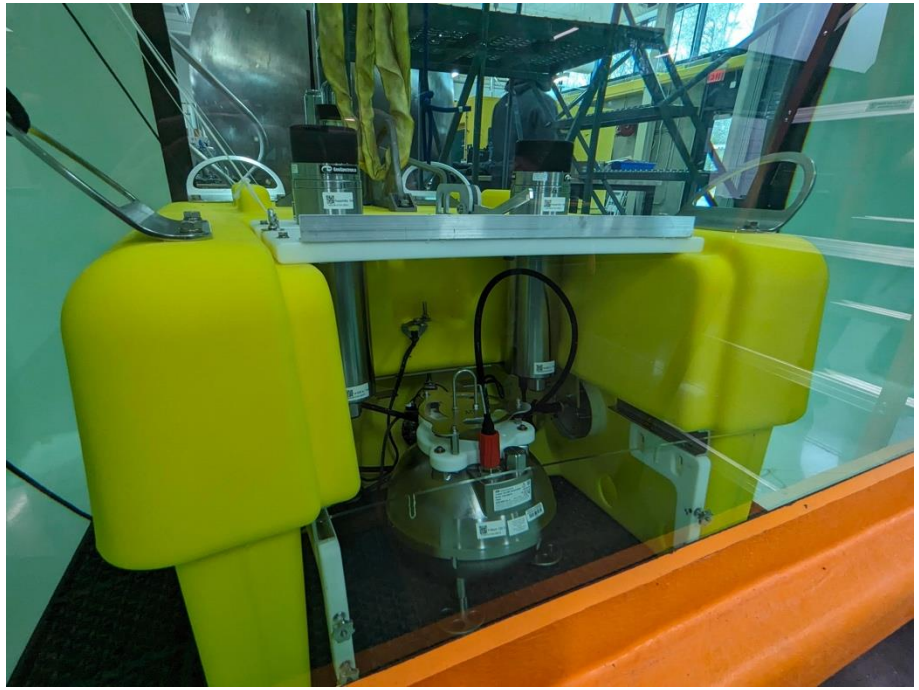
2021 MSRI Award to Build 35 Wideband/Broadband OBS

- OBSIC responded to the 2020 MSRI program call by submitting a $20M proposal to recapitalize its OBS fleet. The proposal was funded at $6.5M, which meant a substantial reduction in scope. These funds are being used to design and build a mix of 35+ wideband/broadband OBS. These OBS will be available in 2025.
- Now have all data-loggers, seismometers, Ti pressure housings and roto-molded frames in-house.
- Extensive testing of sensor deployment in tank in AVAST space at WHOI David Center
- Assembly spring 2025





Testing of Seismometer Release Mechanism in WHOI's AVAST Space



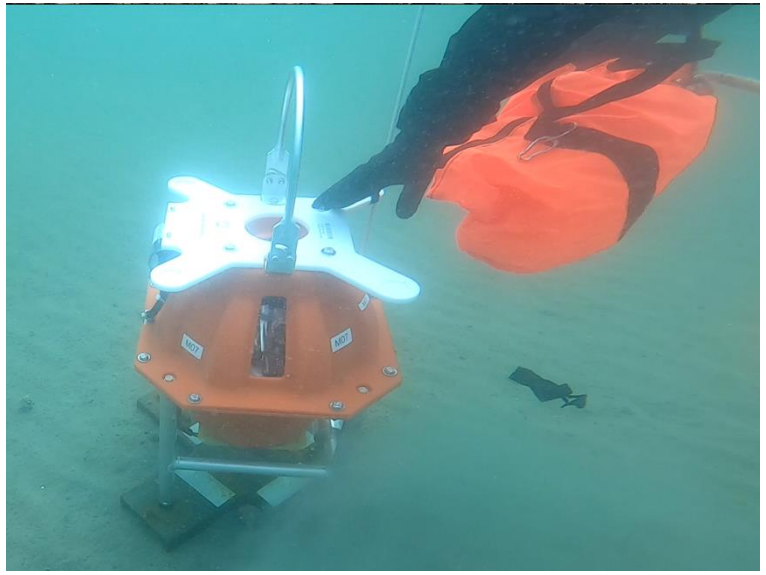
USGS-Funded Rapid Response Capability

- 10 Sercel MicrObs delivered!
- 6,000 m capable (but glass-ball housing!)
- Deployment duration on re-chargeable Li-ion battery: 45 days
- 4-components: 3-axis MEMS accelerometer and hydrophone
- Accelerometer self-compensates for tilt
- Accelerometer low-frequency performance better than a geophone

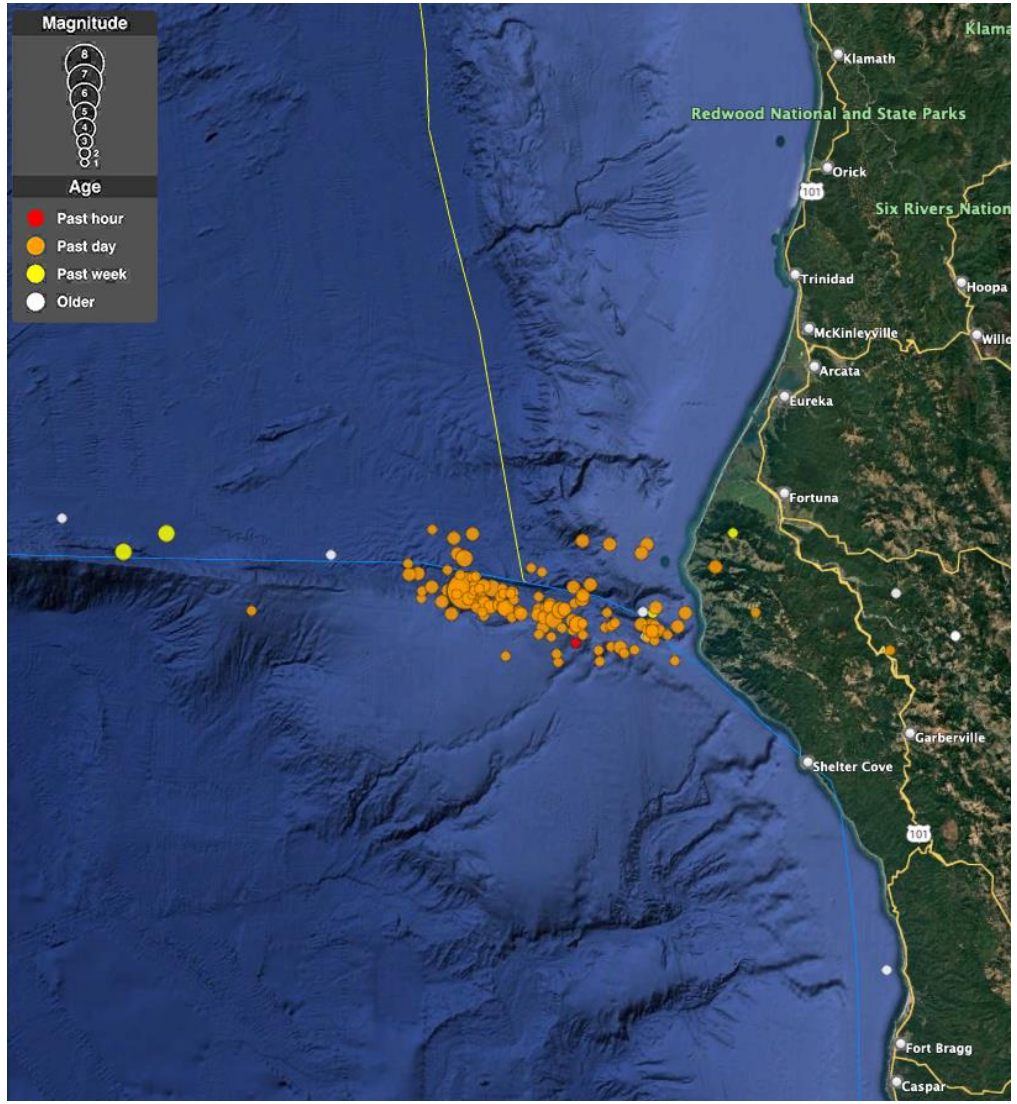
- Rapid-response only. Not to be used for standard experiments.
- OBS stored in dedicated container, with dedicated clocks, acoustic deck box, computers, etc.
- Protocol still to established but supported events to be decided by USGS and WHOI.

100% Funded by USGS Coastal and Marine Hazards and Resources Program (Nathan Miller, USGS Woods Hole)

Rapid Response Exercise; April 1-2, 2024



Mw 7.0 2024-12-05 18:44:31Z



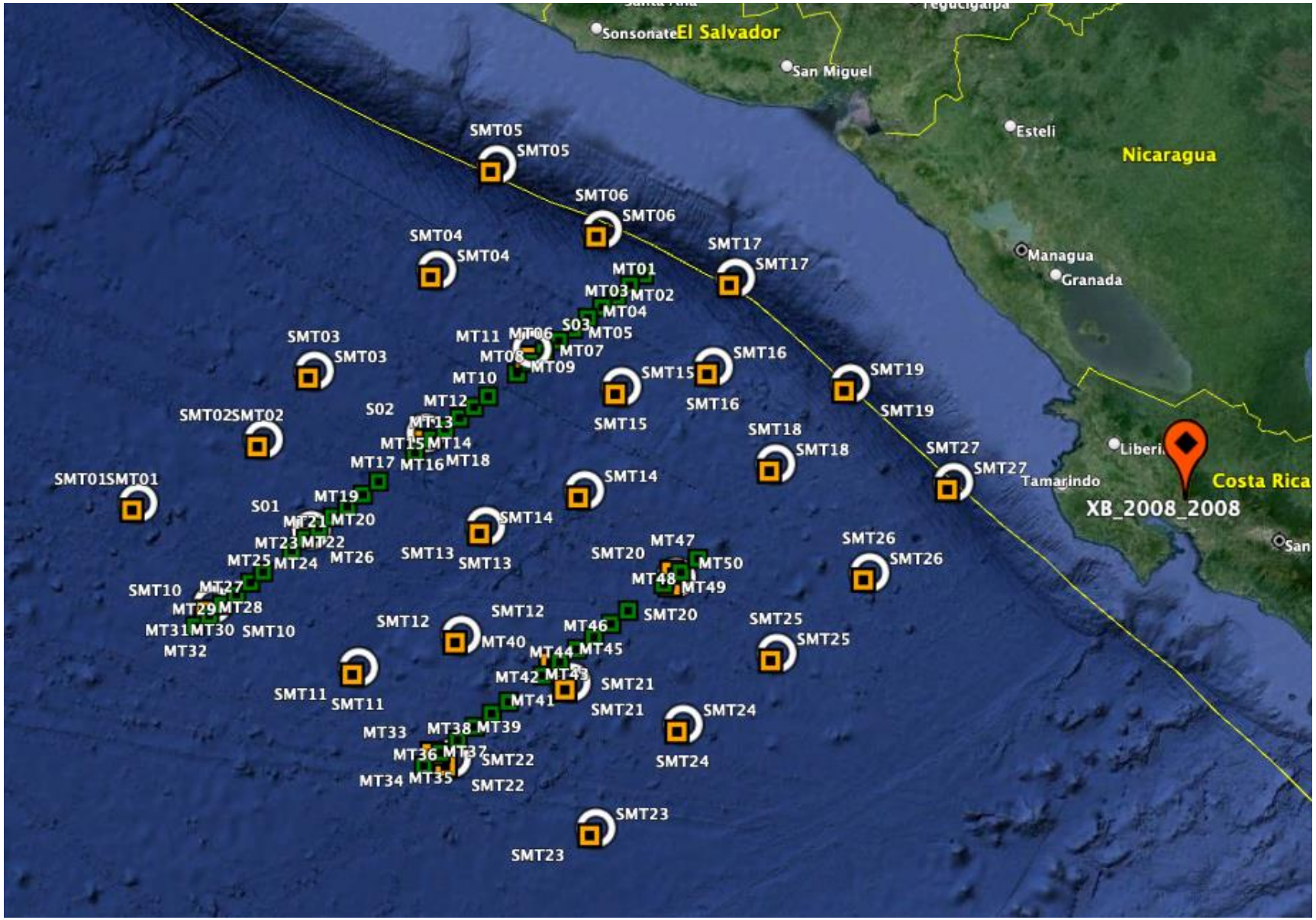
10 MicrOBS will ship from WHOI on Monday Dec 09. Plan is to deploy Friday/Saturday Dec. 13/14.

Deploy from Cal. Poly Humboldt 90’ research vessel R/V Coral Sea.

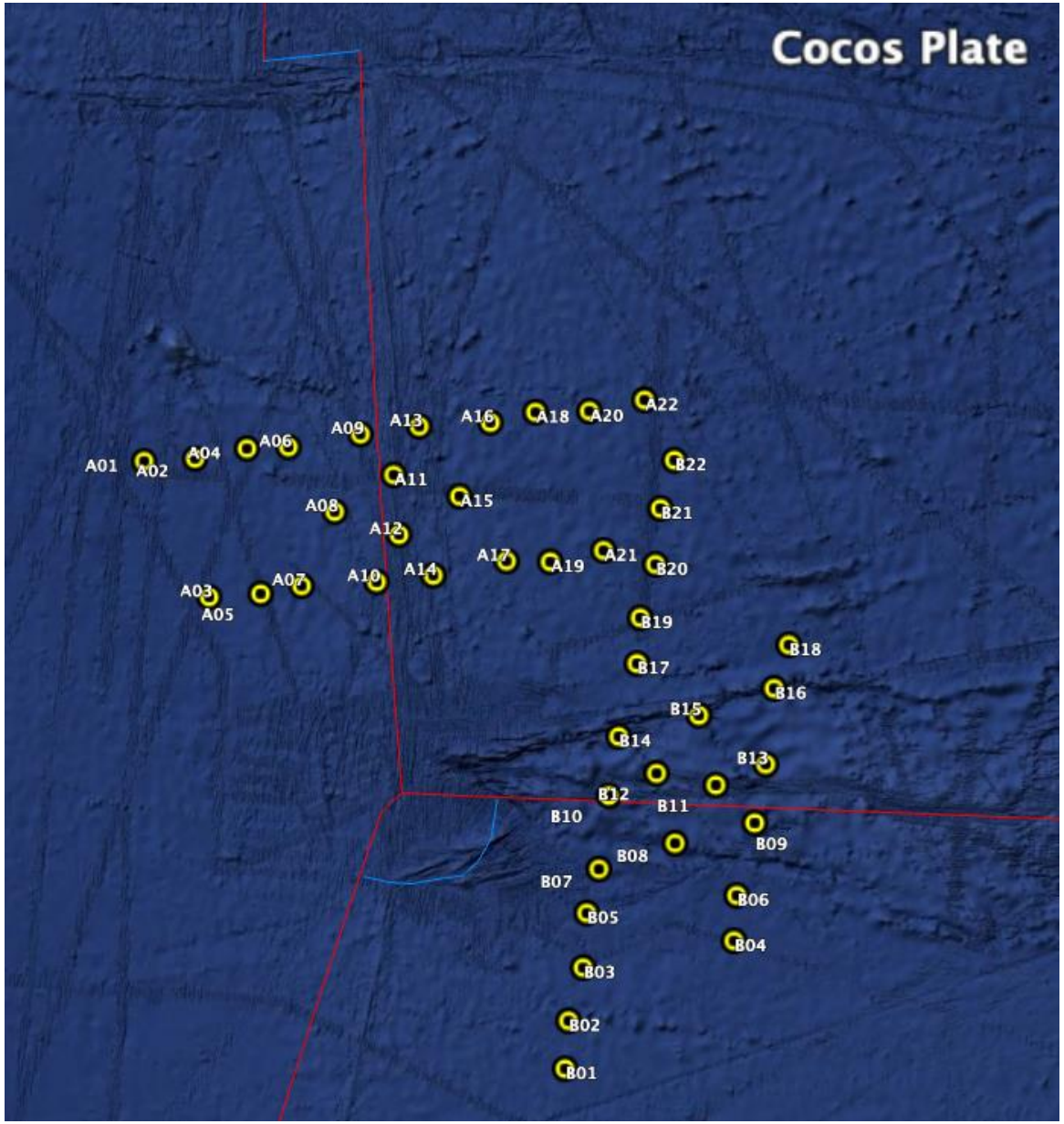
OBSIC Cruises 2025

Naif Cocos Plate Deployment 03/12/2024 – 04/07/2024	27 WHOI BBOBS (+42 SIO OBEM) for 12 months R/V Marcus Langseth (Puntarenas/Puntarenas)
Eilon Galapagos Triple Junction Deployment (Year-1) 04/12/2024 – 05/09/2024	44 WHOI BBOBS for 15 months R/V Marcus Langseth (Puntarenas/San Diego)
Miller Skilak Lake Recovery (not UNOLS) May 2025	2 BBOBS
Wei Tonga-Samoa Interaction Recovery (SIO) 08/05/2025 – 08/21/2025 (move left?).	29 BBOBS R/V Kilo Moana (Pago Pago/ Pago Pago)
Shuck EN(F)A(I)M Atlantic Active-Source (WHOI/SIO) 09/29/2025 – 11/10/2025	52 SPOBS R/V Marcus Langseth (Charleston/Charleston)
Warren Chain Transform Recovery (SIO) 10/09/2025 – 11/12/2025	20 SPOBS R/V Revelle (Cape Verde/Cape Verde)

Naif: 12 month Deployment of 27 BBOBS and 42 OBEM (not all OBEM for 12 months)



Eilon Year-1: 15 Month Deployment of 44 OBS at Galapagos Triple Junction

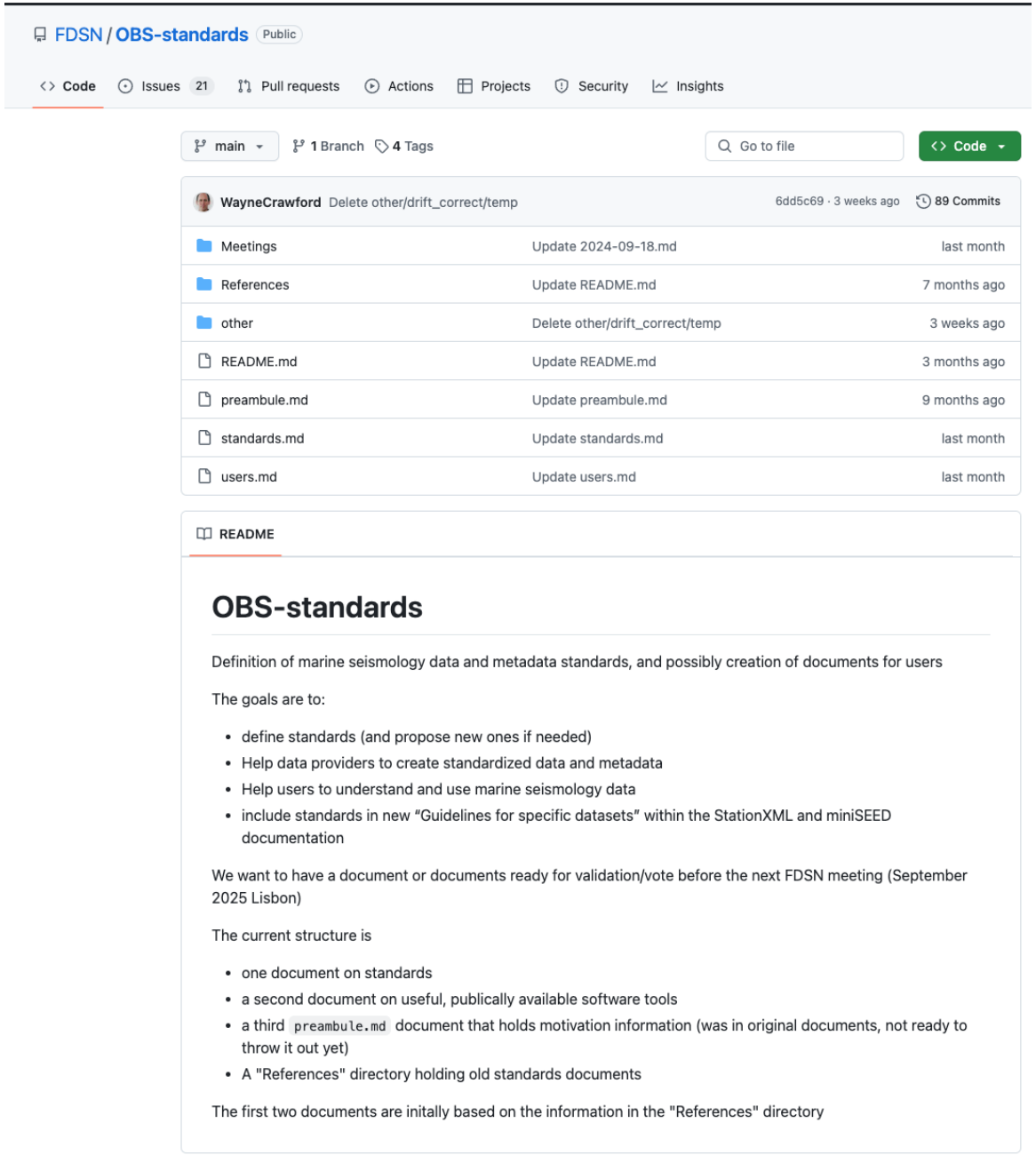


Shuck: 52 OBS Active-Source Experiment

Funded OBSIC Cruises (To Be Scheduled)

Wiens Matthew Hunter Trench Deployment 2026	20 WHOI BBOBS for 15 months
Abers Northwest New Zealand Deployment 2026	20 WHOI BBOBS for 15 months
Naif Cocos Plate Recovery April 2026	27 WHOI BBOBS (+ 42 SIO OBEM) for 12 months
Eilon Galapagos Triple Junction Recovery (Year-1) July 2026	44 WHOI BBOBS for 15 months

FDSN OBS-Standards Initiative



- Action Group for OBS data/metadata standards
- Part of FDSN Working Group V – Portable Instrumentation
- Wayne Crawford (IGPP) lead
- Active Participants from: France, Germany, Portugal, China, and U.S.A.
- https://github.com/FDSN/OBS-standards/

- Poster: S33C-3312

The Federation of Digital Seismology Networks Action Group on Marine Seismology Data and Metadata Standards
Wayne Crawford, Kasey Aderhold, Yinshuang Ai, Jerry Carter, John Collins, Carlos Corela, Susanne Hemmleb, Takehi Isse, Joel Simon, Maria Tsekhmistrenko

OBSIC Web-Page Addition

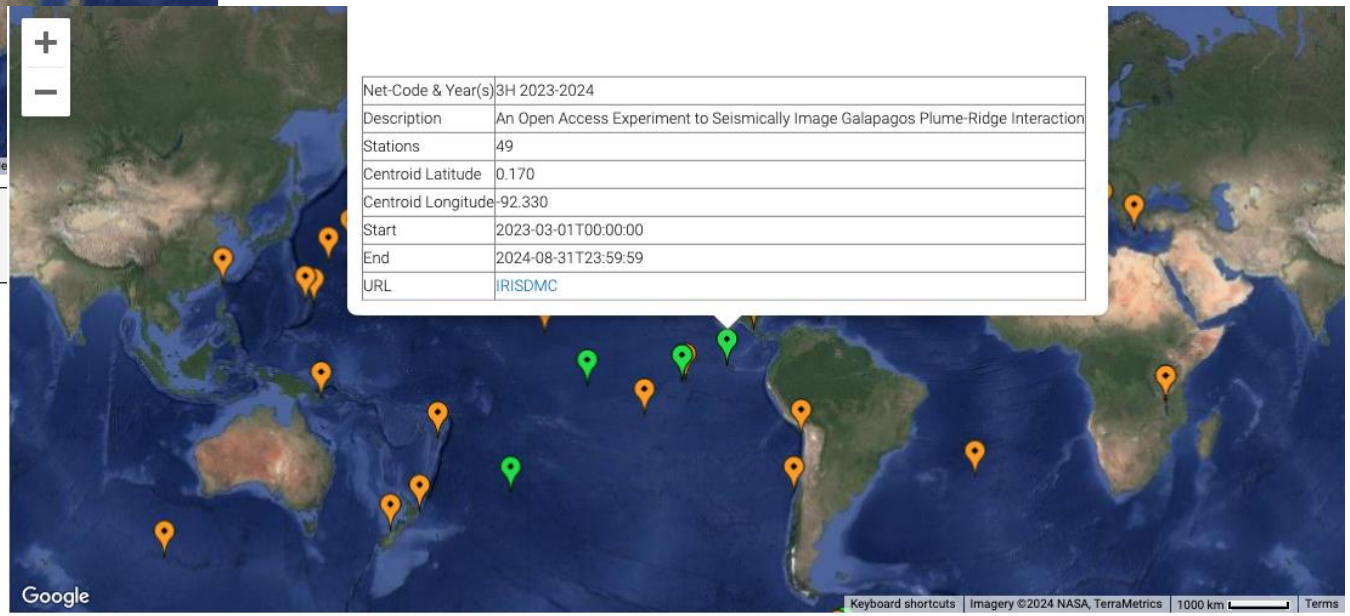
Experiment Map

Completed Experiments: Prior to 2018 (orange); 2018 - Current (green)

Click on the icon for information about the project and link to available data sets.

You may have to zoom in to access all of the icons.

Did You Know? OBSIP/OBSIC INSTRUMENTS HAVE SPENT 1,306 YEARS AT THE BOTTOM OF THE OCEAN



Net-Code & Year(s)	3H 2023-2024
Description	An Open Access Experiment to Seismically Image Galapagos Plume-Ridge Interaction
Stations	49
Centroid Latitude	0.170
Centroid Longitude	-92.330
Start	2023-03-01T00:00:00
End	2024-08-31T23:59:59
URL	IRISDMC

Did You Know? OCEAN BOTTOM SEISMOGRAPHS HAVE BEEN DEPLOYED AT 2,943 STATIONS SINCE 2001 AS PART OF OBSIP/OBSIC

OBSIP/OBSIC Assembled Data Sets

2001 – 2023: 43 Assembled Data Sets

Report No.	Name	Nickname	Start	End	Format	Type	Data
02-011	Southeast I	SEIR	2001	2002	SEGY	OBSIP	Y
03-006	Far-Offset A	FAIM	2001	2001	SEGY	OBSIP	Y
04-003	Contrasting	EXMOUTH	2001	2001	SEGY	OBSIP	Y
03-003	Hydrate Ric	HYDRATE	2002	2002	SEGY	OBSIP	Y
04-018	Baja	BAJA	2002	2002	SEGY	OBSIP	Y
04-020	Tolstoy	TOLSTOY	2003	2007	SEGY PSE	OBSIP-SIO	Y
07-002	Seismicity,	STAG	2003	2003	SEGY	OBSIP	Y
06-009	SE Caribbe	SECA	2004	2004	SEGY	OBSIP	Y
07-030	COLZA Cru	COLZA-OB	2007	2009	PSEGY	OBSIP	Y
08-002	TAIGER (ac	TAIGER	2008	2008	none	PASSCAL/OBSIP	Y
08-003	Seis.Meas.	COSTARIC	2008	2008	SEGY	OBSIP	Y
08-012	Seis.Meas.	COSTARIC	2008	2008	SEGY	OBSIP	Y
08-014	Oceanic Tra	QDG	2008	2009	SEGY	OBSIP	Y
08-022	TAIGER-OB	TAIGER-se	2008	2009	SEGY	OBSIP	Y
08-023	TAIGER-OB	TAIGER-ps	2008	2009	PSEGY	OBSIP	Y
08-024	Seis.Meas.	CostaRica-	2008	2008	PSEGY	OBSIP	Y
09-012	Lau Spread	LSCAN	2009	2009	SEGY	OBSIP	Y
09-013	Lau Spread	LSCAN-pse	2009	2009	PSEGY	OBSIP	Y
09-014	3-D Seismic	ETOMO	2009	2009	SEGY	OBSIP	Y
10-022	Shatsky Ris	SHATSKY	2010	2010	SEGY	OBSIP	Y
11-016	Bering Sea	BERINGSE	2010	2011	SEGY	OBSIP	Y
11-017	Gulf of Alas	GOALASKA	2010	2011	SEGY	OBSIP	Y
11-018	Gulf of Mex	GOMEXICO	2011	2011	SEGY	OBSIP	Y
11-024	Alaska Lan	ALEUT	2011	2011	SEGY	OBSIP-SIO	Y
11-025	Salton Sea	SaltonSea-	2011	2011	SEGY PSE	OBSIP	Y
12-001	No Melt	NOMELT	2011	2013	SEGY	OBSIP	Y
12-008	Marianas	MARIANAS	2012	2012	SEGY	OBSIP	Y
12-015	Evolution a	OCEANUS	2012	2012	SEGY	OBSIP	Y
13-007	MARINER:	MARINER	2012	2014	SEGY	OBSIP	Y
14-005	Eastern No	ENAM	2014	2014	SEGY	OBSIP	Y
15-008	Crustal mag	Santorini	2015	2016	SEGY	OBSIP	Y
16-010	Study of Ex	SEGMeNT	2015	2015	SEGY	OBSIP	Y
16-003	Evolution o	CREST	2016	2016	SEGY	OBSIP	Y
16-005	Chile as a l	Chile-SIO	2016	2016	SEGY	OBSIP	Y
18-015	Seismic ima	HI-Emperor	2018	2019	SEGY	OBSIP	Y
18-017	Bransfield S	Bransfield	2019	2020	SEGY	OBSIC	Y
19-026	Alaska Amp	AACSE	2019	2019	SEGY	WHOI	Y
20-026	Andreanoff	Andreanoff	2020	2020	SEGY	OBSIC	Y
21-012	Queen Cha	QCF	2020	2022	SEGY	OBSIC	Y
21-008	An Open-Ac	Cascadia	2021	2021	SEGY	OBSIC	Y
22-008	Guerrero Ga	Guerrero	2022	2022	SEGY	OBSIC	Y
23-026	Rift dynami	Blake	2023	2023	SEGY	OBSIC	Y
23-027	Seismic Ha	PuertoRico	2023	2023	SEGY	OBSIC	Y