# OBSIC: MSROC Early Career Meeting, December 09, 2024

# Ocean Bottom Seismometer Instrument Center (OBSIC)

- Funded by NSF-OCE Marine Geology and Geophysics.
- OBSIC replaces the Ocean Bottom Seismograph Instrument Pool (OBSIP) that was created by NSF in 1999 and jointly operated/managed by WHOI, SIO, and LDEO until 2011, and thereafter managed by IRIS.
- 5-Year Cooperative Agreement (CA) between WHOI and NSF-OCE. Start-Date August 1, 2018.
- Second 5-Year CA commenced August 1, 2023.
- Provides and operates OBS to support NSF-sponsored investigators, and to investigators at other research or educational institutions with government, private, or industry funding.
- Base Budget: $2M/year (OBS Maintenance; OBS Mobilization/De-Mobilization; Data Archiving; 1$^{st}$ 8 hours at sea)
- Experiment Support: Expendables (batteries etc.); Shipping; Travel, O/T or “sea-time” for sea-going personnel.
- https://obsic.whoi.edu/

# OBSIC Governance

- Governing Entity is the *OBSIC Operations Sub-Committee (OBSIC-OS)*

- *Members:*
  - *Jim Gaherty* (Chair, Northern Arizona University)
  - *Anne Becel (LDEO)*
  - *Emilie Hooft (U. Oregon)*
  - *Helen Janiszewski (U. Hawaii)*
  - *Ross Parnell-Turner (SIO)*
  - *Susan Schwartz (U. California Santa Cruz)*
  - *Matt Wei (U. of Rhode Island)*

- Three-year terms.
- Meets twice a year.
- Terms of Reference at: https://www.unols.org/sites/default/files/OBSIC-OS_TOR_v1.0_2June2020_0.pdf

- Sub-Committee of the *Marine Seismic Research Oversight Commi*ttee (MSROC)
- MSROC is a UNOLS (University-National Oceanographic Laboratory System) committee.
- Current Chair: Lindsay Worthington (U. New Mexico, Albuquerque)
- Remit includes all NSF-supported marine seismic facilities (OBS, MCS, High-Res., Portable Source)

# Current OBSIC Fleet

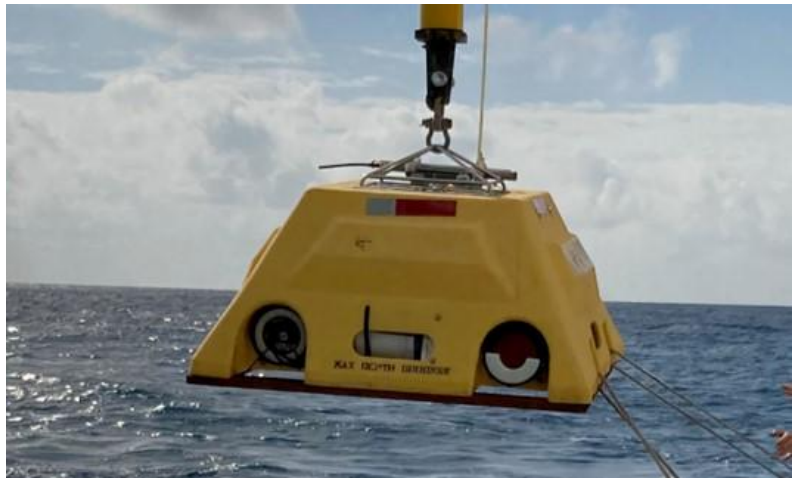
- 25 SPOBS
- 81 BBOBS
- 10 RROBS

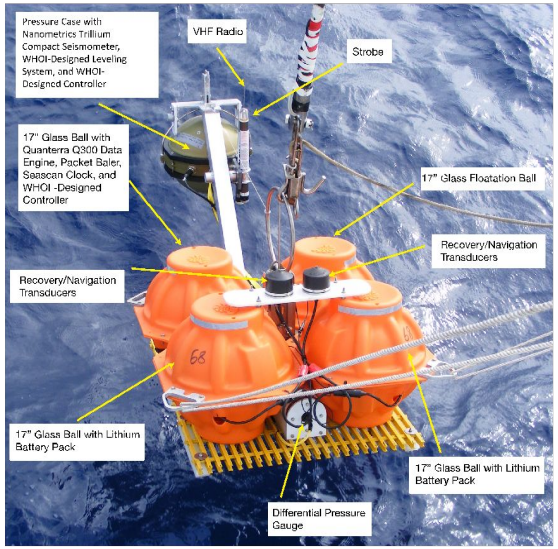
- *35 MSRI-funded BBOBS coming*

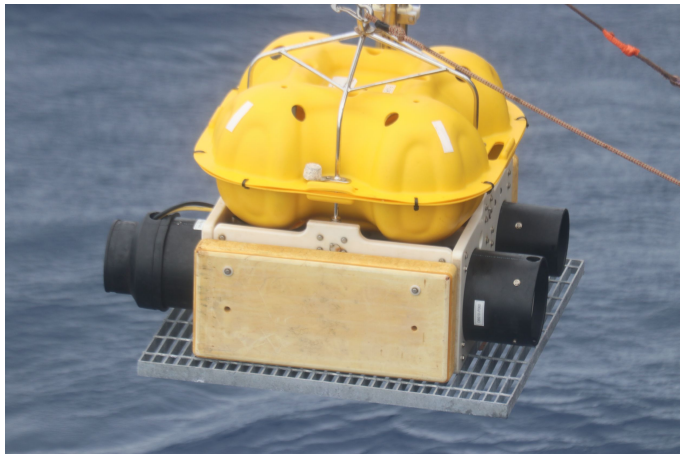
*SIO OBS Fleet*
- 30 BBOBS
- 50+ SPOBS

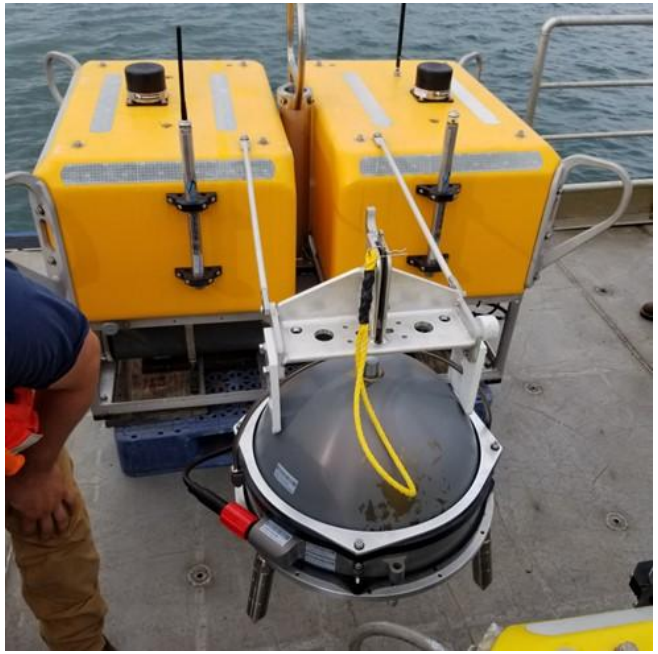
| OBS Type | Count |
|---|---|
| Short-Period OBS (WHOI "D2"): 4.5 Hz geophone; hydrophone; Quanterra Q330 data logger; Seascan clock | 25 |
| Broadband OBS (Glass-Ball Floatation): Nanometrics Trillium Compact seismometer in WHOI leveling system; Differential Pressure Gauge; Quanterra Q330 data logger; Seascan clock | 28 |
| Broadband OBS (Glass-Ball Floatation): Nanometrics Trillium Compact seismometer in Nanometrics leveling system; Differential Pressure Gauge; Quanterra Q330 data logger; Seascan clock | 5 |
| Broadband ARRA OBS (Syntactic Foam Floatation): Nanometrics Trillium Compact seismometer in Nanometrics leveling system; DPG; Quanterra Q330 data logger; Microsemi CSAC | 15 |
| Broadband ARRA OBS (Syntactic Foam Floatation): Nanometrics Trillium Compact seismometer in Nanometrics leveling system; DPG; Quanterra Q8 data logger; power-cycled Teledyne CSAC | 2 |
| 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 |
| Rapid Response OBS (Sercel MicrObs): MEMS accelerometer and hydrophone, rechargeable battery; Glass-ball housing. Under evaluation. | 10 |

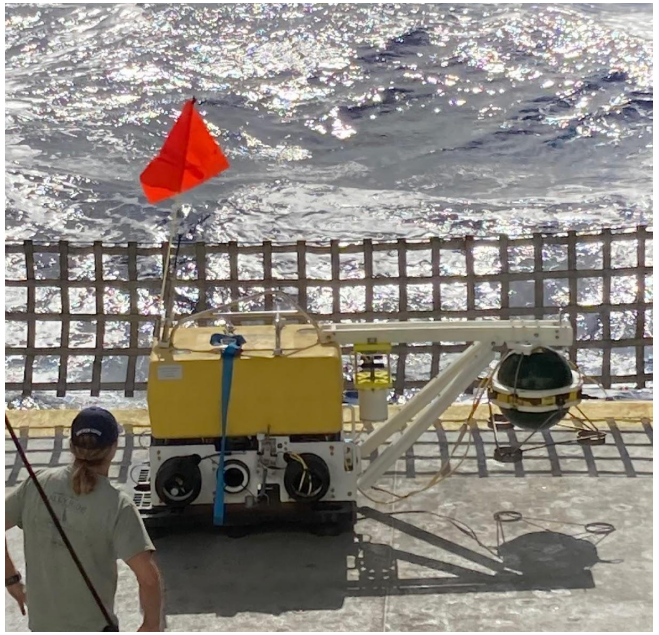
# Examples of OBSIC Instrumentation

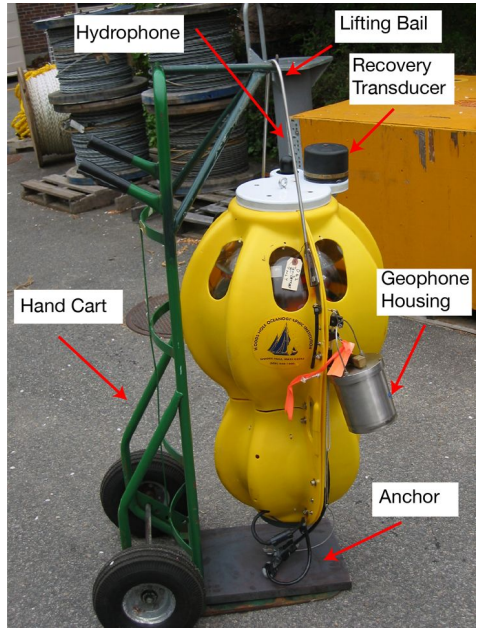




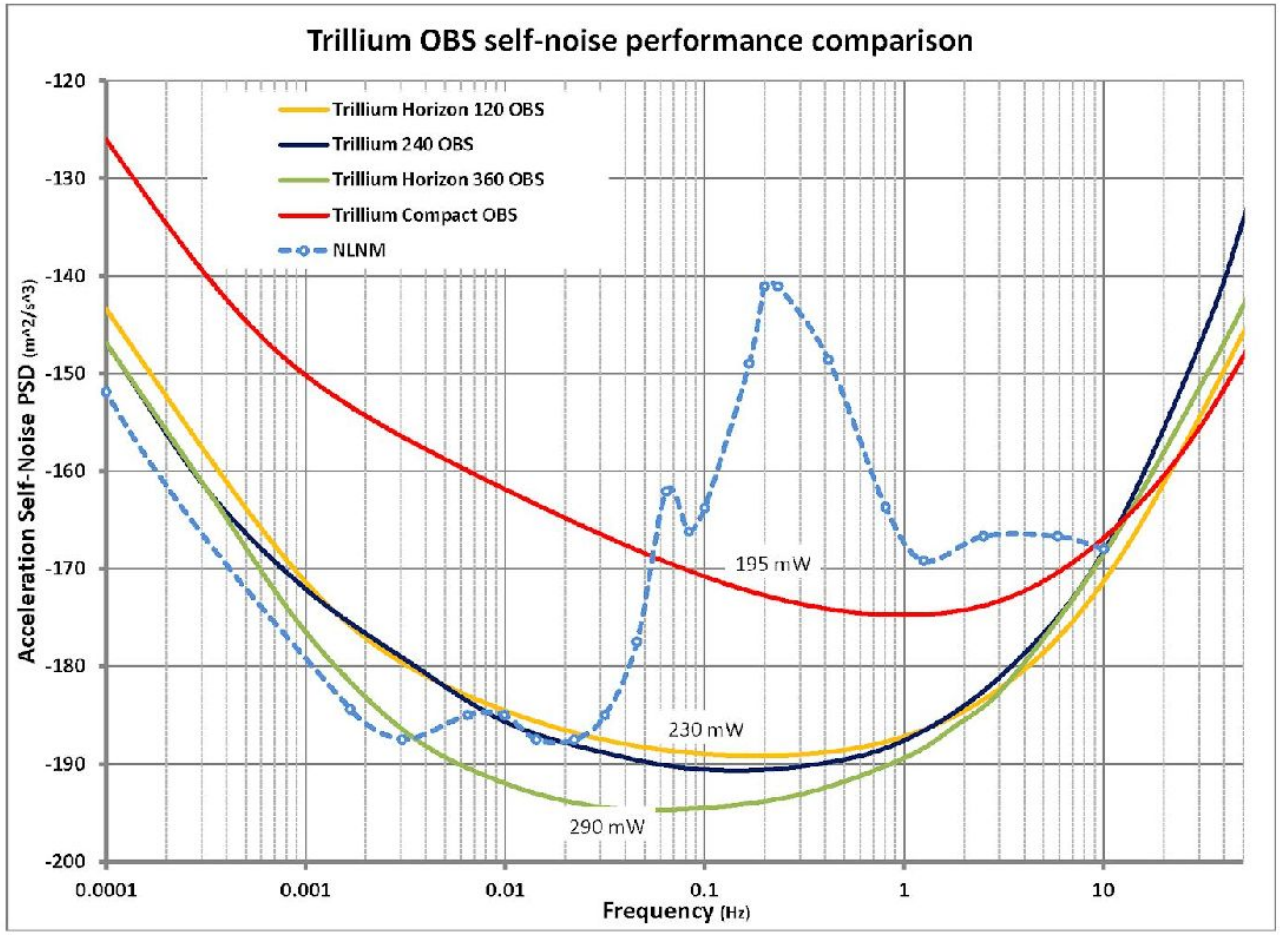









# New Trillium 120 OBS Seismometer




**T-120 OBS**
Clip Level: 16.6 mm/s (< 10 Hz); 0.12 g (>10 Hz)
Power: 250 mW

**Trillium Compact**
Clip Level: 26 mm/s (< 10 Hz); 0.17 g (>10 Hz)
Power: 195 mW

# NSF Experiment Support

- For NSF-funded projects, all OBS costs (instrument preparation, shipping, complete at-sea support, data reduction and archiving) are supported through a cooperative agreement between NSF-OCE and OBSIC.

- OBS costs for experiments supported by the Marine Geology and Geophysics (MGG) Program within the Ocean Sciences Division are not included in the PI's proposed budget, but do come out of the MGG science budget and thus, ***an Informational Budget*** that summarizes the anticipated costs of supporting the experiment, both ashore and at sea, ***must be included in the proposal*.**

- PIs submitting to NSF programs other than MGG should contact a program officer in MGG for information on how to include OBSIC costs in their proposal.

- For experiments seeking support from MGG, the required procedure for requesting and using OBSIC instrumentation is available at: https://obsic.whoi.edu/policies-and-procedures/

- PIs requesting OBS instrumentation will typically seek ship-time from UNOLS (University-Nationals Oceanographic Laboratory System, https://www.unols.org). The ship-time and OBS request processes are separate, but both requests must be included in the PI's proposal. The ship-time request (number of science days, number of days at sea, proposed ports of departure and return, preferred cruise dates) must be consistent with the OBS request.

# OBSIC Instrument Request

1 PI Info 2 Proposal Info 3 Instrument Requirements 4 Logistical Requirements 5 Risks

6 Preview Submission

Request Type *

- (•) New Request
- ( ) Update Existing Request

## CONTACT INFO

Name *

John (First)

Collins (Last)

Institution/Agency *

WHOI

Address *

Street Address

360 Woods Hole Road

Address Line 2

City

Woods Hole

State / Province / Region

Massachusetts

ZIP / Postal Code

02543

Country

United States

Email *

jcollins@whoi.edu (Enter Email)

jcollins@whoi.edu (Confirm Email)

Phone *

(508) 289-27

Fax

Lead PI

Is the person above the lead PI for this Request?

- (•) Yes
- ( ) No, Someone else is the Lead PI

Next Back to Last Page

# OBSIC Instrument Request



## PROPOSAL INFORMATION

Project Title

A Self-Deploying OBS

Co-PIs & Institution

Full Proposal Title

Please enter the full proposal title

Design and Testing of a Self-Deploying OBS

Funding Agency*

- (●) NSF-MGG
- ( ) NSF-Other
- ( ) Other

Program Manager

Gail Christeson

Deadline Date

02/15/2024

Short Description

Please provide a short description with emphasis on logistics and objectives of field work.

Previous  Next  Back to Last Page

# OBSIC Instrument Request



## INSTRUMENT REQUIREMENTS

## DEPLOYMENT INFORMATION

Types of Instruments Required

- [ ] Short Period
- [x] Long Period
- [ ] TRM
- [ ] Other

Long Period Instrument Total

5

Long Period Deployments

Please list each deployment on a single row. Add rows as necessary.

| Deployment Number | Instrument Count | Deployment Duration (Days) | Sample Rate (Samples/sec) |
|---|---|---|---|
| 1 | 5 | 365 | 100 |

Other Requirements

Previous Next Back to Last Page

# OBSIC Instrument Request



## LOGISTICAL REQUIREMENTS

### Location of Experiment

**Please indicate the center of deployment**

Decimal Latitude

39

Please enter a number from **-90** to **90**.

Decimal Longitude

-63

Please enter a number from **-180** to **180**.

Details

Please provide a short description of the details of your proposed deployment.

UNOLS Ship *

- (•) Yes
- ( ) No

Ship

R/V Arn

Enter Ship or Class of Ship Requested

Number of Legs

2

Cruise Legs

| Leg Number | Departure Date | Departure Port | Arrival Port | Days (Sea+Transit) |
|---|---|---|---|---|
| 1 | 02/14/2025 | Woods Hole | Woods Hole | 10 |

Other Special Requirements/Considerations

(e.g. PASSCAL component, weather windows)

Previous Next Back to Last Page

# OBSIC Instrument Request



## RISKS

Minimum Depth (m)

4,000

Maximum Depth (m)

5,000

Other Anticipated Risks

(e.g. volcanic activity, ice, fishing)

Previous Next Back to Last Page

PUBLICATIONS

# OBSIC Instrument Request

PI Info | Proposal Info | Instrument Requirements | Logistical Requirements | Risks

6 Preview Submission

**Request Type**

New Request

## Contact Info

**Name**

John Collins

**Institution/Agency**

WHOI

**Address**

360 Woods Hole Road

Woods Hole, Massachusetts 02543

United States

Map It

**Email**

jcollins@whoi.edu

**Phone**

(508) 289-2733

**Lead PI**

Yes

## Proposal Information

**Project Title**

A Self-Deploying OBS

**Full Proposal Title**

Design and Testing of a Self-Deploying OBS

**Funding Agency**

NSF-MGG

**Program Manager**

Gail Christeson

**Deadline Date**

02/15/2024

## Deployment Information

**Types of Instruments Required**

- Long Period

**Long Period Instrument Total**

5

**Long Period Deployments**

| Deployment Number | Instrument Count | Deployment Duration (Days) | Sample Rate (Samples/sec) |
|---|---|---|---|
| 1 | 5 | 365 | 100 |

## Logistical Requirements

**Decimal Latitude**

39

**Decimal Longitude**

-63

**UNOLS Ship**

Yes

**Ship**

R/V Armstrong

**Number of Legs**

2

**Cruise Legs**

| Leg Number | Departure Date | Departure Port | Arrival Port | Days (Sea+Transit) |
|---|---|---|---|---|
| 1 | 02/14/2025 | Woods Hole | Woods Hole | 10 |

## Risks

**Minimum Depth (m)**

4,000

**Maximum Depth (m)**

5,000

Previous | Submit

# Example OBSIC Information Budget Page for Inclusion as Supplementary Documentation in NSF Proposal

OBSIC
Ocean Bottom Seismic Instrument Center

This is an informational budget provided to prospective users of instruments at the Ocean Bottom Seismic Instrument Center at Woods Hole Oceanographic Institution. OBSIC will provide complete engineering and technical support for OBS operations at sea. The cost of providing this support (e.g., instrument charges, personnel support, shipping and travel) will be funded directly through the Center; these costs do not need to be included in individual NSF science proposals. NSF does, however, require PIs to provide an informational budget estimating these costs in any proposal requesting OBSIC instruments. For more information on OBSIC, see https://obsic.whoi.edu.

**Project Title** *Western Pacific Old Crust and Mantle Structure*

**Principal Investigator(s)** *John Collins*
**Funding Agency** *NSF-MGG*
**Submission Deadline** *10/1/2023*

**Instruments**
*Short Period (active)* *Deployments*
*Short Period (passive)* *Deployments*
*22 Long Period* *1 Deployments*

**Ports** *Apia, Samoa to/from Apia, Samoa*

**Deployment Risk**
[X] *No Additional Risk*
[ ] *Increased Risk*

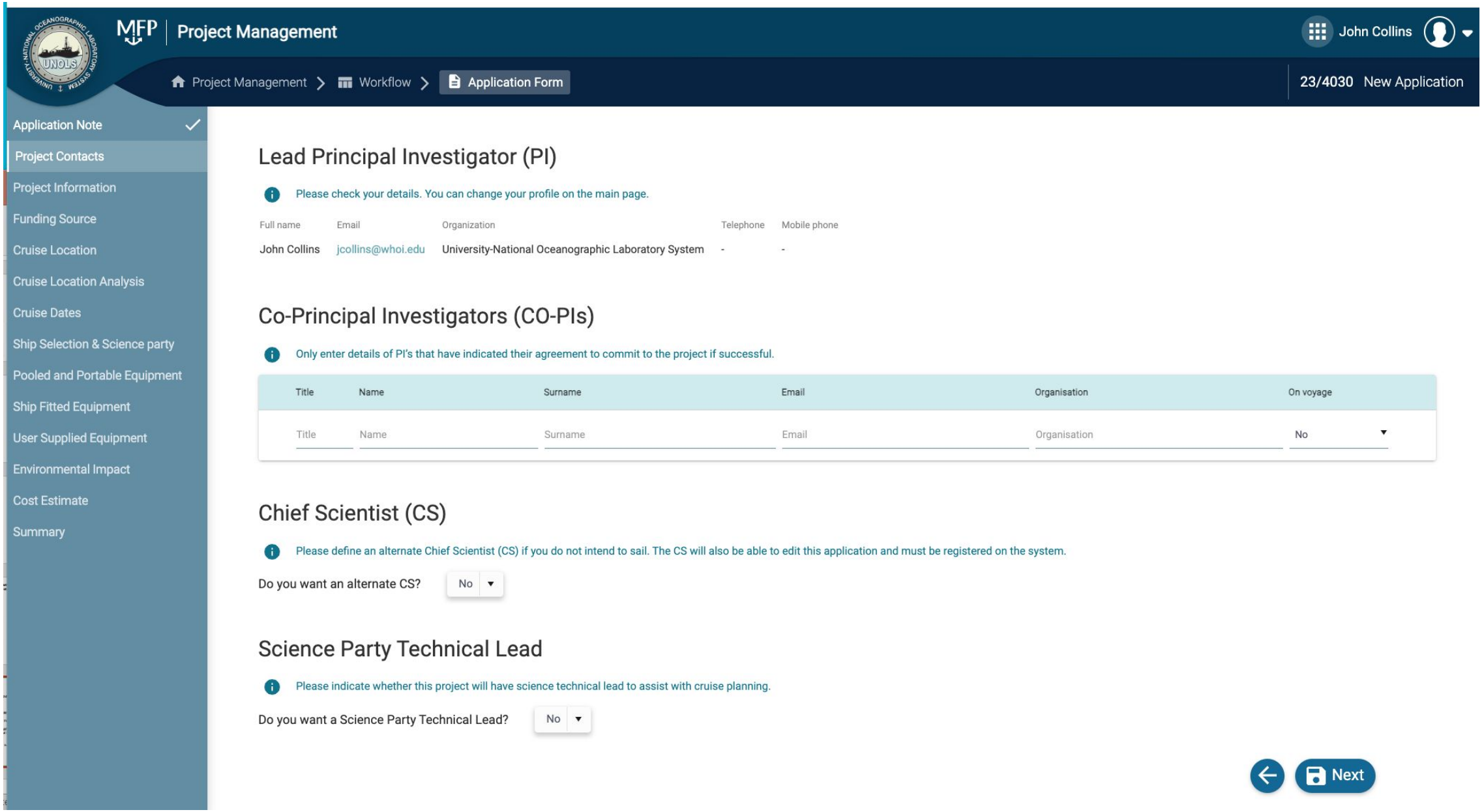
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Proposed Date* | *5/1/2025* | *5/1/2026* | | | | | |
| *Cruise Type* | *Deploy* | *Recover* | | | | | |
| *Cruise Duration* | *23* | *13* | | | | | |
| *# Instruments* | *22* | *22* | | | | | |
| ***Baseline Facility Costs*** | | | | | | | **Totals** |
| On-Shore Labor | $73,587 | $72,005 | $0 | $0 | $0 | $0 | **$145,592** |
| At-Sea Regular Labor | $68,923 | $43,609 | $0 | $0 | $0 | $0 | **$112,532** |
| **Total Baseline Facility Costs** | **$142,510** | **$115,614** | **$0** | **$0** | **$0** | **$0** | **$258,124** |
| ***Experiment Specific Costs*** | | | | | | | |
| At-Sea Labor Uplift | $84,854 | $42,586 | $0 | $0 | $0 | $0 | **$127,440** |
| Instrument Costs | $143,889 | $33,078 | $0 | $0 | $0 | $0 | **$176,967** |
| Long Lead Items | $539,725 | $0 | $0 | $0 | $0 | $0 | **$539,725** |
| Shipping | $150,358 | $148,954 | $0 | $0 | $0 | $0 | **$299,312** |
| Travel | $17,572 | $17,572 | $0 | $0 | $0 | $0 | **$35,144** |
| Instrument Modifications | $0 | $0 | $0 | $0 | $0 | $0 | **$0** |
| **Total Experiment Specific Costs** | **$936,398** | **$242,190** | **$0** | **$0** | **$0** | **$0** | **$1,178,588** |
| **Total:** | **$1,078,908** | **$357,804** | **$0** | **$0** | **$0** | **$0** | **$1,436,712** |

**Notes:** *Budget based on request OBSIC2023-0000XX.*

The cruise dates and durations in the Instrument Request should be consistent with the PI's ship-time request (typically UNOLS).

OBSIC Management Office September 26, 2023
**OBSIC Experiement Estimate Number:** 24014.xx Collins: Western Pacific Crust

# UNOLS Shiptime Request



# Data from OBSIC Instrumentation

- All data (clock-corrected) must be archived by OBSIC at the Earthscope Data Management Center.
- Data may be embargoed for up to two years.
- All data archived by OBSIC in miniseed format.  Metadata archived in StationXML format.
- If active source, then shot data archived as SEGY.

# OBSIC Data Metrics


| Experiment Name | Network ID | Year | Status | Good hours, % |
|---|---|---|---|---|
| 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 |

# OBSIC Data Metrics, ctd.

OBSIC Home  OBSIC Metrics

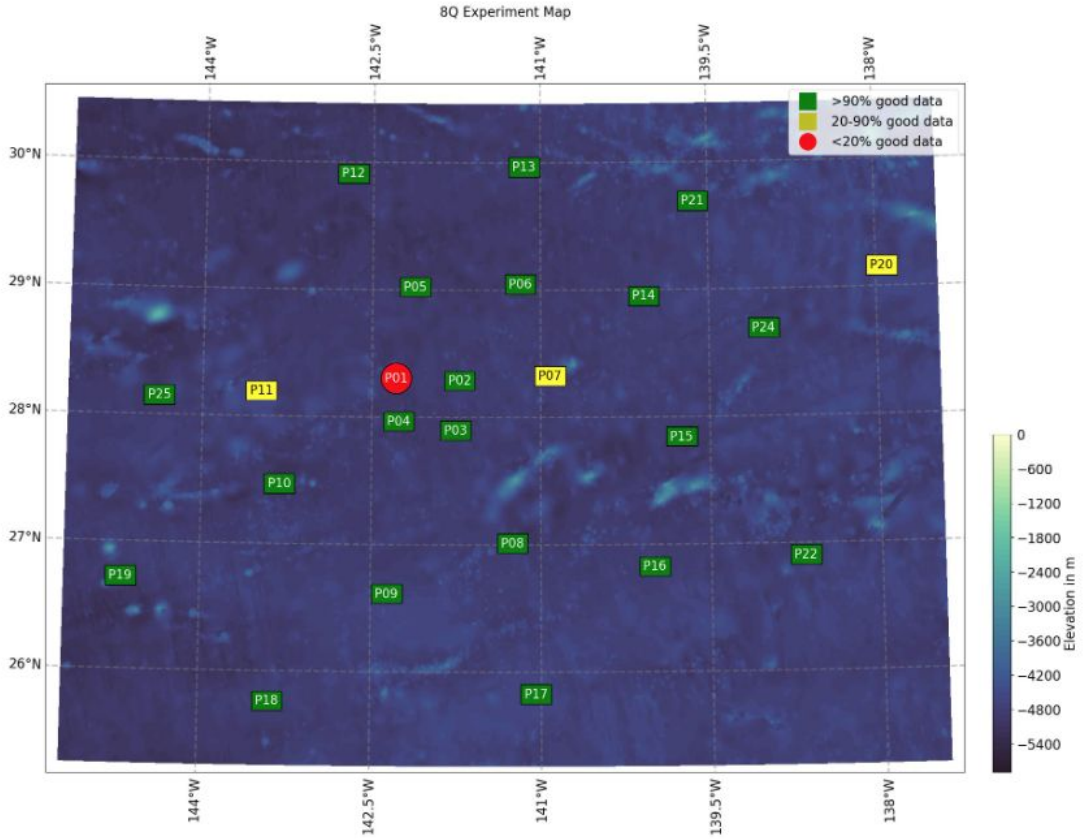
**Experiment:** OHANA

**Network Code:** 8Q (IRIS MDA page)

**Earliest Start:** 2021-11-09

**Latest End:** 2023-02-07

**Performance:** 88% good data



# OBSIC Data Metrics, ctd.

Experiment: OHANA

| Station | Instrument Type | Elevation | Deployed | Recovered | Orientation | Error | Clock drift | % Good Hours |
|---|---|---|---|---|---|---|---|---|
| P01 | SIO_LP | -4918 | 2021-11-12 | 2023-01-30 | -- | -- | N/C | 14 |
| P02 | SIO_LP | -4820 | 2021-11-20 | 2023-02-02 | 180 | 0 | 0.43 | 98 |
| P03 | SIO_LP | -4993 | 2021-11-20 | 2023-01-31 | 185 | 0 | 1.10 | 99 |
| P04 | SIO_LP | -4996 | 2021-11-13 | 2023-01-30 | 186 | 0 | 0.44 | 99 |
| P05 | SIO_LP | -5053 | 2021-11-21 | 2023-02-03 | 176 | 0 | -0.09 | 99 |
| P06 | SIO_LP | -4974 | 2021-11-22 | 2023-02-02 | 275 | 0 | 0.44 | 99 |
| P07 | SIO_LP | -4890 | 2021-11-22 | 2023-02-01 | -- | -- | 1.09 | 24 |
| P08 | SIO_LP | -4894 | 2021-11-20 | 2023-01-31 | 140 | 0 | 2.25 | 99 |
| P09 | SIO_LP | -4706 | 2021-11-20 | 2023-01-27 | 9 | 0 | -0.12 | 99 |
| P10 | SIO_LP | -4936 | 2021-11-12 | 2023-01-27 | 257 | 0 | 1.19 | 99 |
| P11 | SIO_LP | -4998 | 2021-11-10 | 2023-01-29 | 216 | 1 | -0.06 | 73 |
| P12 | SIO_LP | -4995 | 2021-11-21 | 2023-02-03 | 288 | 1 | -2.63 | 99 |
| P13 | SIO_LP | -4934 | 2021-11-21 | 2023-02-04 | 340 | 0 | -3.41 | 99 |
| P14 | SIO_LP | -4868 | 2021-11-22 | 2023-02-05 | 148 | 1 | 0.20 | 98 |
| P15 | SIO_LP | -4942 | 2021-11-22 | 2023-02-05 | 29 | 0 | 1.75 | 99 |
| P16 | SIO_LP | -4793 | 2021-11-25 | 2023-01-26 | 250 | 0 | 3.72 | 99 |
| P17 | SIO_LP | -1754 | 2021-11-25 | 2023-01-26 | 71 | 0 | 0.52 | 98 |
| P18 | SIO_LP | -4876 | 2021-11-19 | 2023-01-28 | 101 | 0 | 1.34 | 99 |
| P19 | SIO_LP | -4961 | 2021-11-09 | 2023-01-28 | 100 | 1 | 2.65 | 99 |
| P20 | SIO_LP | -4691 | 2021-11-23 | 2023-02-07 | -- | -- | 1.99 | 24 |
| P21 | SIO_LP | -1 | 2021-11-23 | 2023-02-04 | 191 | 0 | 1.23 | 99 |
| P22 | SIO_LP | -4869 | 2021-11-24 | 2023-01-25 | 208 | 0 | 1.82 | 99 |
| P24 | SIO_LP | -4814 | 2021-11-23 | 2023-02-06 | 248 | 0 | 0.08 | 99 |
| P25 | SIO_LP | -5031 | 2021-11-11 | 2023-01-29 | 158 | 0 | 0.74 | 99 |

8Q_experiment_metrics.csv

# OBSIC Data Metrics, ctd.

OBSIC OBSIC Metrics 8Q Metrics

**Experiment:** OHANA

**Network Code:** 8Q (IRIS MDA page)

**Instrument Type:** SIO_LP

**Station Start:** 2021-11-20

**Station End:** 2023-02-02

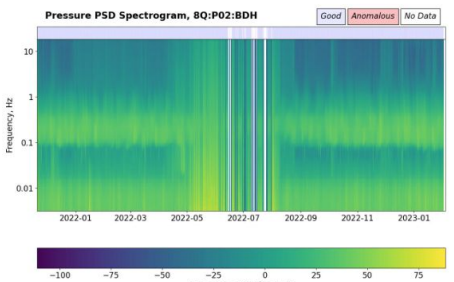
**Performance:** 98% good data

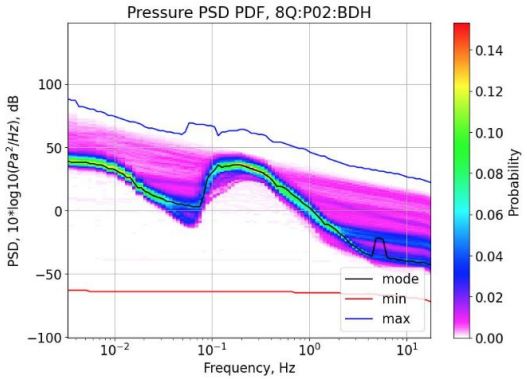
| Channel | Good hours, % |
|---|---|
| BDH | 95 |
| BH1 | 99 |
| BH2 | 99 |
| BHZ | 98 |

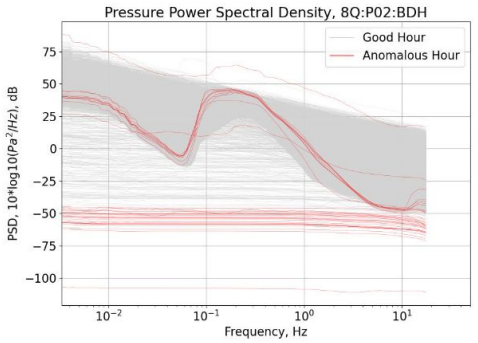
Experiment: OHANA
Station: P02

**Spectrograms** | **Psd Pdfs** | **Hourly Psds**

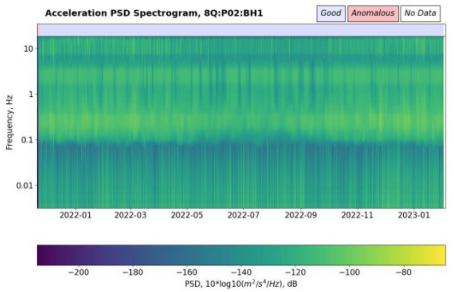
**BDH**

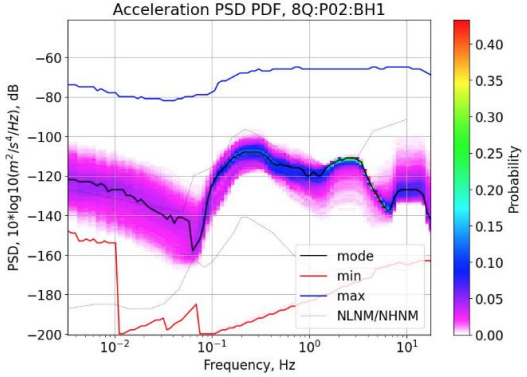


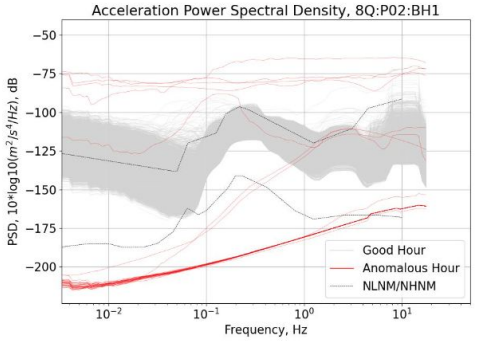




**BH1**

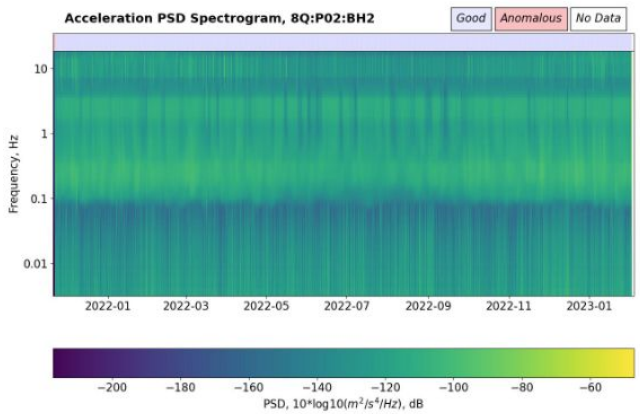


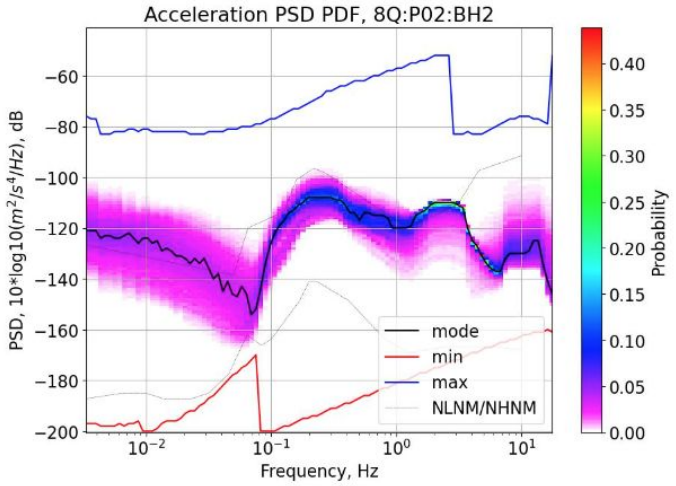



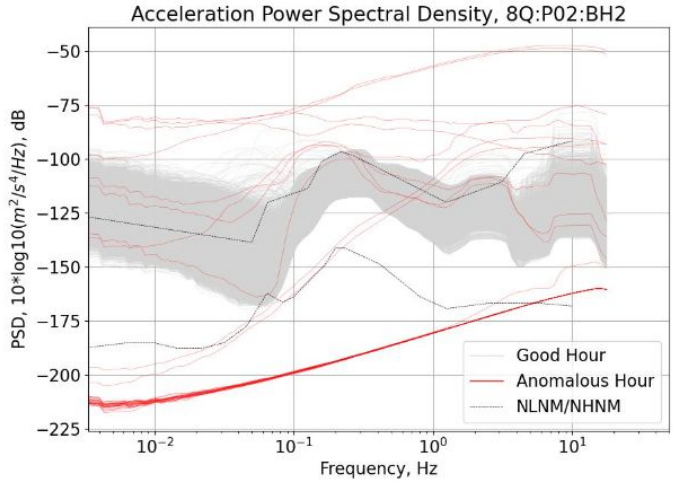



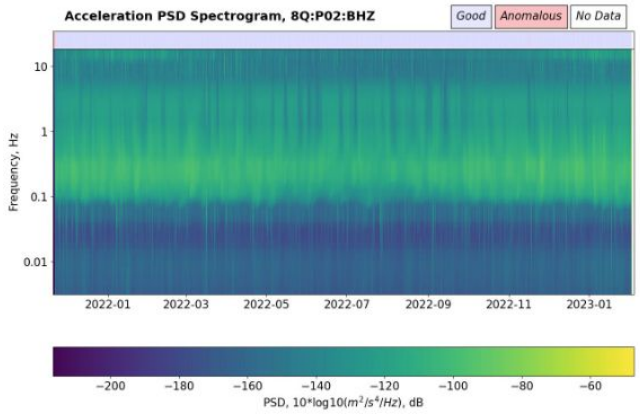
# OBSIC Data Metrics, ctd.

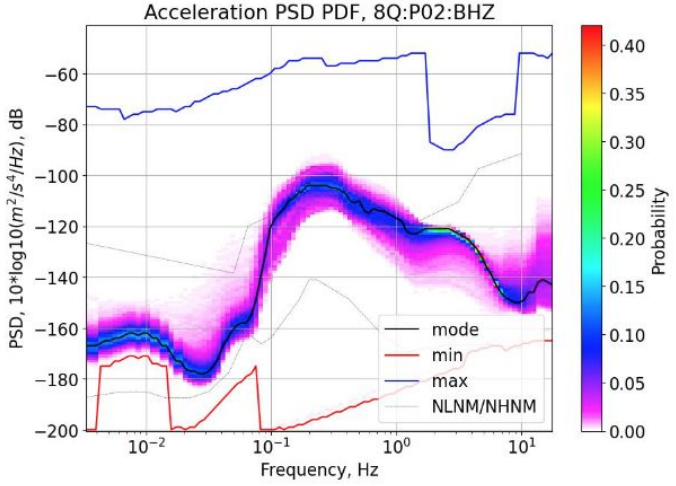
Experiment: OHANA
Station: P02

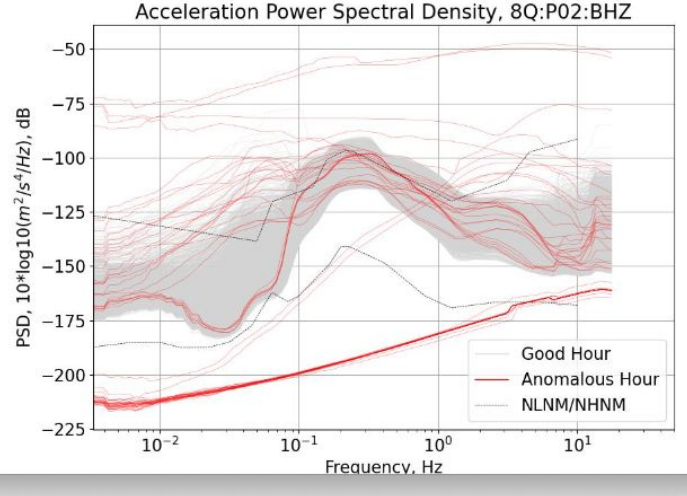


# Provision of tilt correction

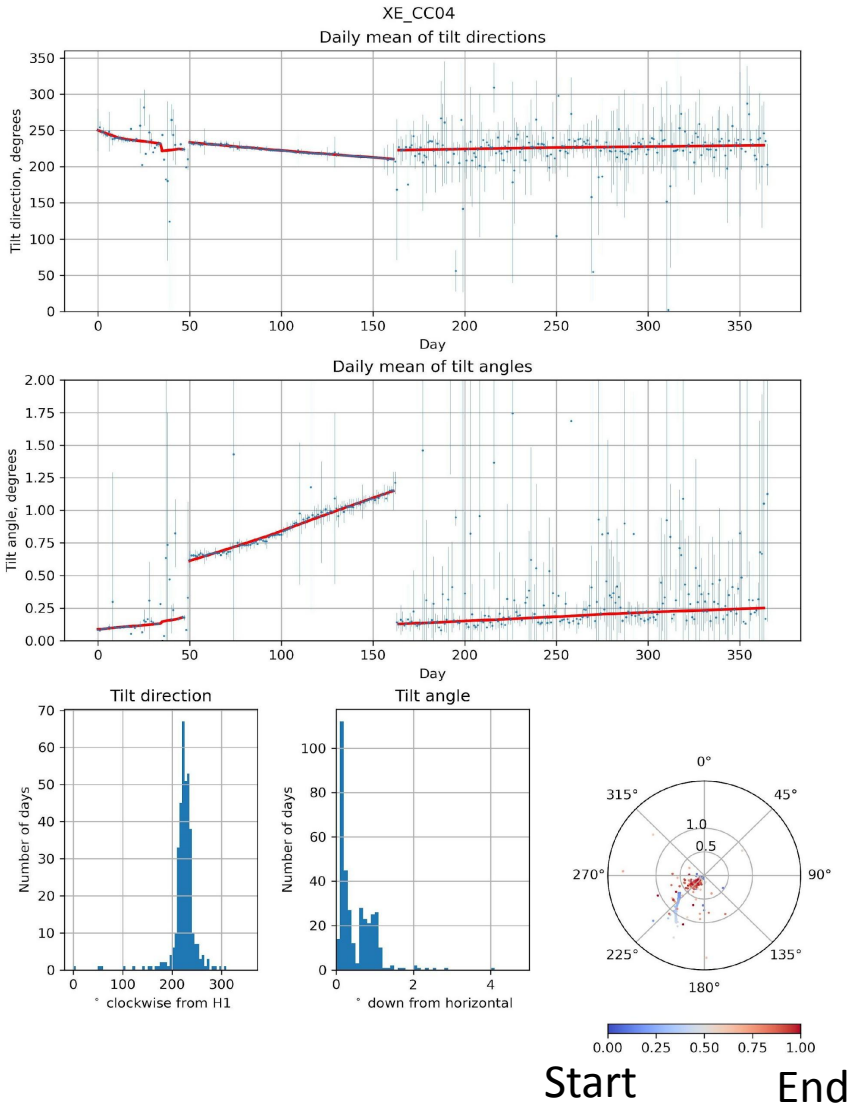
Calculate hourly direction of maximum Z-H coherence and tilt angle

Discard 0-quality hours, teleseisms

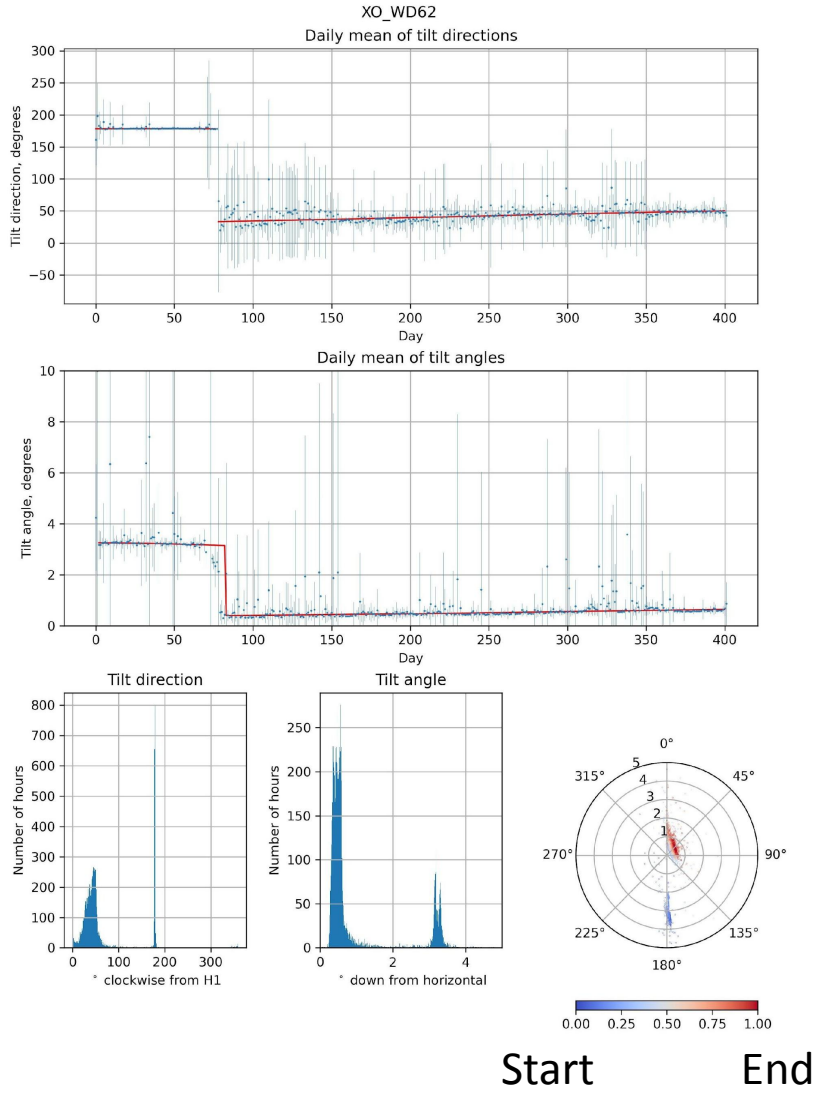
Determine daily weighted averages

Calculate piecewise smooth model

8Q_P02
Day, dir (CW from H1), angle (degrees)
2023-01-23 255 0.51
2023-01-24 255 0.52
2023-01-25 254 0.45
...




Start End




Start End

- Prospective users are strongly encouraged to contact the OBSIC Management Office (e-mail: obsic.who.iedu) during the proposal development phase for more information about OBSIC procedures and instrument capabilities.

- This is ***essential*** if instrument modifications are being considered, if the OBS are to be deployed in areas deemed high risk, or if the OBS will be deployed from a non-UNOLS ship.

- *OBSIC treats instrument-request specifics, e.g. P.I. names, experiment location, dates, numbers and types of OBS, etc., as confidential until the experiment is either funded or recommended for funding.*

- Potential (new) users should read the OBSIC Instrument Use Policies and Procedures and review both the UNOLS Cruise Planning webpage and the OBSIC Cruise Planning examples.

- ***https://obsic.whoi.edu/***