# 2. HAFOS: MAINTAINING THE AWI'S LONG-TERM OCEAN OBSERVATORY IN THE WEDDELL SEA

Olaf Boebel[1], Mario Hoppema[1], Carina Engicht[1], Jacob Allerholt[1], Stefanie Spiesecke[1], Sandra Tippenhauer[1], Pedro Llanillo del Rio[1], Ole Pinner[1], Irene Roca Torrecilla[1], Clea Parcerisas[2]

[1]DE.AWI
[2]BE.VLIZ

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## Outline

The ocean is a key element of the global climate system due to its ability to store and transport large amounts of heat, to act as a sink of carbon dioxide, and due to the sea ice ocean albedo effect providing a positive feedback to sea ice melting. The response of the ocean to changes in the radiative and wind-driven forcing is controlled by its stratification as governed by the vertical structure of temperature and salinity. Until recently, ship-borne observations provided the only means to obtain sufficiently accurate vertical profiles of water mass properties. However, automated systems gained importance during the last decade. The current backbone of the oceanic observing system is Argo, an internationally financed and organized array of >3000 autonomous profiling floats with public, near-real time data access. However, Argo is by and large restricted to oceanic regions that are ice free year-round, as the floats need to surface regularly to be localized and to transmit their data. Furthermore, Argo does not access the deep ocean.

In an effort to overcome the observational constraints posed by high latitudes and the deep ocean, the Hybrid Antarctic Float Observing System (HAFOS) builds on vertically profiling, custom developed ice-resilient floats (Klatt et al. 2007) and a set of deep sea moorings deployed throughout the Weddell Gyre to record oceanographic data at selected sites. HAFOS also includes an ecological component using passive hydroacoustic recording devices embedded in each of the deep-sea moorings to collect data on the acoustic environment as shaped by manifold biotic and abiotic acoustic sources.

HAFOS was first established in its full extent in 2012/13 during *Polarstern* expedition ANT-29/2, yet subsets of the system existed in various configurations since 2002, allowing for the development and testing of components. The goal of this expedition is to service HAFOS by maintaining the mooring array to allow localizing ice-resilient floats deployed in 2018/19 and in preparation for the deployment of additional ice-resilient floats next year, and to recover and continue the deep temperature und salinity long-term time series monitoring the state of Antarctic Bottom Water.

## Objectives

Being the physical oceanography core project of this expedition, HAFOS intends to investigate the role of the Southern Ocean in the global climate system with focus on the Atlantic sector, including the Weddell Sea, where the densest bottom waters of the global oceans originate

(Behrendt et al. 2011; Fahrbach et al. 2011; Fahrbach et al. 2007). The production of these dense water is controlled by the balance between:

- supplies of fresh water through precipitation,
- the melting of continental and sea ice,
- the extraction of freshwater by sea ice formation and evaporation, and
- a supply of warm and salty water masses as transported by the subpolar gyres towards the continental margins of Antarctica, with the gyres of the Weddell and Ross Seas being their most prominent expressions.

The basic mechanism of dense water generation involves upwelling of Circumpolar Deep Water (CDW), which is relatively warm and salty, into the surface layer where CDW comes into contact with the atmosphere and sea ice, becoming cooled and freshened. The newly formed bottom water formed hereby is significantly colder and slightly fresher than the initial Circumpolar Deep Water, which indicates heat loss and the addition of freshwater. Since freshwater input in the upper oceanic layers would impede sinking due to increasing stratification of the water column, it has to be compensated by salt gain through freshwater extraction. Significant parts of salt accumulation occur on the Antarctic shelves in coastal polynyas. With extreme heat losses occurring over ice-free water areas, the polynyas are areas of intense sea ice formation. Offshore winds compress the newly formed sea ice and keep an open sea surface in the polynyas.

The properties and volume of the newly formed bottom water are subject to significant variability on a wide range of time scales, which can only scarcely be explored due to the large efforts needed to obtain measurements in ice-covered ocean areas. Seasonal variations of the upper ocean layers are only partially known and normally exceed other scales of variability in intensity. Impacts of longer-term variations of the atmosphere-ice-ocean system, such as the Southern Hemispheric Annular Mode and the Antarctic Dipole, are only poorly monitored and understood. Their influence on or interaction with oceanic conditions are merely guessed on the basis of models, which are only superficially validated due to lack of appropriate measurements.

This extreme regional and temporal variability represents a large source of uncertainty when data sets of different origin are combined. Therefore, circumpolar data sets of sufficient spatial and temporal coverage are required and until recently could only be acquired for surface or integral properties by satellite remote sensing. However, to penetrate into the ocean interior and validate the remotely sensed data, an ocean observing system is required, which combines remotely sensed data of sea ice and surface properties with long-term *in-situ* measurements of ocean interior properties, i.e., HAFOS.

**Work at sea**

The oceanographic studies during *Polarstern* expedition PS129 will concentrate on two major areas, the Greenwich Meridian and the Weddell Sea, continuing more than 30 years of *in-situ* observations in the Atlantic sector of the Southern Ocean. Employing moored instruments, we seek to obtain time series of water mass properties throughout the deep and the surface layers. For this purpose, moorings featuring current meters, temperature and salinity sensors, sound sources and passive acoustic recorders, will be recovered and redeployed (Tables 2.1 and 2.2). While, during the previous expeditions ANT-29/2, ANT-30/2 (PS89), PS103 and PS117, the recovery of moorings in ice-covered areas was facilitated significantly using the ultra-short line positioning system (POSIDONIA), it nevertheless was not possible to retrieve some moorings due to the ice conditions. For this reason, a ROV has been acquired and developed to recover moorings directly by hooking a recovery rope to the mooring rope.

**Tab. 2.1:** Scientific instrumentation of planned moorings recoveries during PS129

| Mooring | Latitude<br>Longitude | Decimal Lat<br>Decimal Lon | Water Depth [m] | Date<br>Time | Instrument<br>Type | Instrument<br>S/N | Instrument<br>Depth [m] |
|---|---|---|---|---|---|---|---|
| AWI 227-15 | 59° 03.02' S | -59.0503 | 4648 | 31.12.2018 | PAM | 1006 | 300 |
| | 00° 06.44' E | 0.1073 | | 10:10 | SBE37 | 12479 | 4597 |
| AWI 229-14 | 64° 01.26' S | -64.0210 | 5193 | 01.01.2019 | SBE37 | 9494 | 50 |
| | 00° 00.83' E | 0.0138 | | 22:38 | SBE37 | 9495 | 100 |
| | | | | | SBE37 | 9496 | 150 |
| | | | | | SBE37 | 9497 | 200 |
| | | | | | AquaD | 12654 | 230 |
| | | | | | SBE37 | 9492 | 231 |
| | | | | | PAM | 1060 | 300 |
| | | | | | SBE37 | 2098 | 330 |
| | | | | | SBE37 | 2385 | 430 |
| | | | | | SBE37 | 2382 | 530 |
| | | | | | SBE37 | 2396 | 630 |
| | | | | | SBE37 | 3811 | 734 |
| | | | | | AquaD | 12658 | 735 |
| | | | | | SBE37 | 12481 | 5152 |
| AWI 231-13 | 66° 31.03' S | -66.5172 | 4612 | 27.12.2018 | PAM | 1056 | 300 |
| | 00° 04.48' W | -0.0747 | | 18:34 | SBE37 | 10944 | 4534 |
| AWI 244-6 | 69° 00.08' S | -69.0013 | 2984 | 05.01.2019 | PAM | 1049 | 300 |
| | 07° 01.65' W | -7.0275 | | 20:01 | SBE37 | 8122 | 2903 |
| AWI 248-3 | 65° 58.12' S | -65.9687 | 5048 | 07.01.2019 | PAM | 1012 | 300 |
| | 12° 13.84' W | -12.2307 | | 10:37 | SBE37 | 8123 | 5003 |
| AWI 245-5 | 69° 03.64' S | -69.0607 | 4773 | 08.01.2019 | PAM | 1014 | 300 |
| | 17° 23.49' W | -17.3915 | | 14:20 | SBE37 | 8124 | 4693 |
| BGC-1 | 69° 00.07'S | -69.0012 | 4717 | 24.03.2021 | LOC | NaN | 40 |
| | 27° 00.07'W | -27.0012 | | 13:14 | ISUS | NaN | 40 |
| | | | | | CO2 | 219 | 40 |
| | | | | | RAS-500 | 12073 | 40 |
| | | | | | Ecotriplet | 17c | 40 |
| | | | | | SBE37 | 21026 | 40 |
| | | | | | ADCP WH | 12667 | 40 |
| | | | | | SBE 56 | 7824 | 60 |
| | | | | | SBE 37 | 2100 | 80 |

| Mooring | Latitude<br>Longitude | Decimal Lat<br>Decimal Lon | Water Depth [m] | Date<br>Time | Instrument<br>Type | Instrument<br>S/N | Instrument<br>Depth [m] |
|---|---|---|---|---|---|---|---|
| | | | | | SBE 56 | 7825 | 120 |
| | | | | | SBE 37 | 386 | 147 |
| | | | | | Octopus | NA | 156 |
| | | | | | Suna | 1122 | 156 |
| | | | | | Vp6 | 7LP | 156 |
| | | | | | SBE 56 | 6513 | 158 |
| | | | | | Sedimenttrap | 2009404 | 511 |
| | | | | | SonoVault | 1024 | 918 |
| | | | | | Sedimenttrap | 2009406 | 1525 |
| AWI 249-3 | 70° 53.22' S | -70.8870 | 4407 | 20.01.2019 | PAM | 1010 | 300 |
| | 28° 56.97' W | -28.9495 | | 12:00 | SBE37 | 8126 | 4357 |
| AWI 208-9 | 65° 41.78' S | -65.6963 | 4766 | 23.01.2019 | PAM | 1020 | 300 |
| | 36° 41.01' W | -36.6835 | | 16:01 | AquaD | 12685 | 806 |
| | | | | | SBE37 | 3812 | 807 |
| | | | | | SBE37 | 9841 | 4758 |
| AWI 250-3 | 68° 28.85' S | -68.4808 | 4141 | 24.01.2019 | PAM | 1048 | 300 |
| | 44° 05.94' W | -44.0990 | | 20:28 | AquaD | 12718 | 819 |
| | | | | | SBE37 | 3813 | 820 |
| | | | | | SBE37 | 9839 | 4094 |
| AWI 257-2 | 64° 12.94' S | -64.2157 | 4215 | 27.01.2019 | PAM | 1033 | 3001 |
| | 47° 29.38' W | -47.4897 | | 17:50 | RCM | 11888 | 813 |
| | | | | | SBE37 | 10944 | 814 |
| | | | | | SBE37 | 9493 | 4285 |
| AWI 207-11 | 63° 39.36' S | -63.6560 | 2555 | 29.01.2019 | SBE37 | 10934 | 250 |
| | 50° 48.66' W | -50.8110 | | 17:08 | ADCP QM150 | 23548 | 291 |
| | | | | | PAM | 1032 | 300 |
| | | | | | AquaD | 12745 | 802 |
| | | | | | SBE37 | 6928 | 803 |
| | | | | | SBE37 | 10937 | 2200 |
| | | | | | AVT | 3517 | 2248 |
| | | | | | SBE39 | 8641 | 2259 |
| | | | | | SBE39 | 8642 | 2305 |

| Mooring | Latitude<br>Longitude | Decimal Lat<br>Decimal Lon | Water Depth [m] | Date<br>Time | Instrument<br>Type | Instrument<br>S/N | Instrument<br>Depth [m] |
|---|---|---|---|---|---|---|---|
| | | | | | SBE39 | 8643 | 2355 |
| | | | | | SBE37 | 10943 | 2406 |
| | | | | | ADCP QM150 | 24053 | 2545 |
| | | | | | SBE37 | 9847 | 2545 |
| AWI 251-3 | 61° 01.38' S | -61.0230 | 335 | 01.02.2019 | PAM | AU0085 | 179 |
| | 55° 58.68' W | -55.9780 | | 18:30 | PAM | 1002 | 181 |
| | | | | | AZFP | 55037 | 288 |
| | | | | | ADCP QM150 | 5373 | 322 |
| | | | | | SBE37 | 2096 | 322 |

**Tab. 2.2:** Scientific instrumentation of planned mooring deployments during PS129

| Mooring | Latitude<br>Longitude | Decimal Lat<br>Decimal Long | Water Depth [m] | Date<br>Time | Instrument<br>Type | Instrument<br>S/N | Instrument Depth [m] |
|---|---|---|---|---|---|---|---|
| AWI 227-16 | 59° 03.02' S | -59.0503 | 4648 | | SonoVault | | 300 |
| | 00° 06.44' E | 0.1073 | | | SBE37 | 10933 | 800 |
| | | | | | SBE37 | ... | 4562 |
| AWI 229-15 | 64° 01.26' S | -64.0210 | 5193 | | SBE37 | 10929 | 256 |
| | 00° 00.83' E | 0.0138 | | | SonoVault | ... | 300 |
| | | | | | SBE37 | 10930 | 355 |
| | | | | | SBE37 | 2092 | 455 |
| | | | | | SBE37 | 10931 | 555 |
| | | | | | SBE37 | 2093 | 655 |
| | | | | | SBE37 | 10932 | 755 |
| | | | | | SBE37 | ... | 5016 |
| AWI 231-14 | 66° 31.03' S | -66.5172 | 4612 | | SonoVault | ... | 300 |
| | 00° 04.48' W | -0.0747 | | | SBE37 | 9848 | 800 |
| | | | | | SBE37 | ... | 4536 |
| EWS 001-01 | 70° 47.87' S | -70.7978 | | | SBE 37 | 7729 | 19 |
| | 12° 13.05' W | -12.2175 | | | SBE56 | ... | 150 |
| | | | | | SBE56 | ... | 300 |
| | | | | | ADCP QM150 | 23807 | 341 |

| Mooring | Latitude<br>Longitude | Decimal Lat<br>Decimal Long | Water Depth [m] | Date<br>Time | Instrument Type | Instrument S/N | Instrument Depth [m] |
|---|---|---|---|---|---|---|---|
| | | | | | SBE 37 | 7730 | 346 |
| | | | | | SBE56 | ... | 400 |
| | | | | | SBE56 | ... | 460 |
| | | | | | SBE 37 | 7731 | 520 |
| | | | | | SBE56 | ... | 580 |
| | | | | | ADCP WH600 | 1002 | 652 |
| | | | | | SBE56 | ... | 652 |
| | | | | | SBE 37 | 10928 | 693 |
| EWS 002-01 | 70° 35.17' S | -70.5861 | | | SBE 37 | 7733 | 18 |
| | 12° 51.46' W | -12.8576 | | | SBE56 | ... | 100 |
| | | | | | SBE56 | ... | 200 |
| | | | | | ADCP QM150 | 22283 | 341 |
| | | | | | SBE 37 | 8122 | 346 |
| | | | | | SBE56 | ... | 500 |
| | | | | | SBE56 | ... | 600 |
| | | | | | SBE56 | ... | 700 |
| | | | | | SBE 37 | 9490 | 800 |
| | | | | | SBE56 | ... | 900 |
| | | | | | SBE56 | ... | 1000 |
| | | | | | SBE 37 | 10949 | 1100 |
| | | | | | SBE56 | ... | 1200 |
| | | | | | ADCP WH300 | 951 | 1302 |
| | | | | | SBE 37 | ... | 1393 |
| EWS 003-01 | | -70.3464 | | | SonoVault | ... | 290 |
| | | -13.5746 | | | SoSo | ... | 794 |
| | | | | | Aquadopp | ... | 795 |
| | | | | | SBE 37 | 3814 | 795 |
| | | | | | SBE 37 | 224 | 2959 |
| AWI 245-06 | 69° 03.64' S | -69.0607 | 4773 | | SonoVault | ... | 300 |
| | 17° 23.49' W | -17.3915 | | | SoSo | ... | 841 |
| | | | | | Aquadopp | ... | 841 |
| | | | | | SBE37 | 9838 | 841 |
| | | | | | SBE37 | 218 | 4691 |

| Mooring | Latitude<br>Longitude | Decimal Lat<br>Decimal Long | Water Depth [m] | Date<br>Time | Instrument<br>Type | Instrument<br>S/N | Instrument Depth [m] |
|---|---|---|---|---|---|---|---|
| AWI 249-04 | 70° 53.22' S | -70.8870 | 4407 | | SonoVault | ... | 300 |
| | 28° 56.97' W | -28.9495 | | | SoSo | ... | 809 |
| | | | | | Aquadopp | ... | 809 |
| | | | | | SBE37 | 9832 | 809 |
| | | | | | SBE37 | ... | 4319 |
| CWS 001-01 | 69° 57.55' S | -69.9592 | 4243 | | Aural | | 291 |
| | 36° 43.87' W | -36.7312 | | | SonoVault | | 293 |
| | | | | | SoSo | | 795 |
| | | | | | AquaD | | 819 |
| | | | | | SBE37 | 7727 | 797 |
| | | | | | SBE37 | 233 | 4200 |
| AWI 209-09 | 66° 36.45' S | -66.6075 | | | SonoVault | ... | 300 |
| | 27° 07.29'W | -27.1215 | | | SoSo | ... | 809 |
| | | | | | AquaD | ... | 809 |
| | | | | | SBE37 | 9832 | 809 |
| | | | | | SBE37 | ... | 4319 |
| AWI 208-10 | 65° 41.78' S | -65.6963 | 4766 | | PAM | | 300 |
| | 36° 41.01' W | -36.6835 | | | AquaD | | 806 |
| | | | | | SBE37 | | 807 |
| | | | | | SBE37 | | 4758 |
| AWI 250-04 | 68° 28.85' S | -68.4808 | 4141 | | PAM | | 294 |
| | 44° 05.94' W | -44.0990 | | | SoSo | | 795 |
| | | | | | AquaD | | 797 |
| | | | | | SBE37 | 2101 | 797 |
| | | | | | SBE37 | | 4057 |
| WWS 002-01 | 66° 34.62' S | -66.5770 | 3517 | | Aural | | 291 |
| | 44° 00.91' W | -50.0152 | | | SonoVault | | 293 |
| | | | | | SoSo | | 792 |
| | | | | | AquaD | | 795 |
| | | | | | SBE37 | 9488 | 795 |
| | | | | | SBE37 | 232 | 4057 |
| AWI 257-03 | 64° 12.94' S | -64.2157 | 4215 | | PAM | | 311 |
| | 47° 29.38' W | -47.4897 | | | SoSo | | 811 |
| | | | | | AquaD | 11330 | 811 |
| | | | | | SBE37 | 7690 | 811 |

| Mooring | Latitude<br>Longitude | Decimal Lat<br>Decimal Long | Water Depth [m] | Date<br>Time | Instrument<br>Type | Instrument<br>S/N | Instrument Depth [m] |
|---|---|---|---|---|---|---|---|
| | | | | | SBE37 | | 4279 |
| AWI 207-12 | 63° 39.36’ S | -63.6560 | 2555 | 29.01.2019 | SM37 | 8131 | 249 |
| | 50° 48.66’ W | -50.8110 | | 17:08 | QM150 | 23456 | 290 |
| | | | | | SonoVault | | 300 |
| | | | | | SM37 | 10951 | 805 |
| | | | | | SM37 | 8129 | 2200 |
| | | | | | AquaD | 11348 | 2203 |
| | | | | | SBE39 | | 2210 |
| | | | | | SBE39 | | 2260 |
| | | | | | SBE39 | | 2310 |
| | | | | | SBE39 | 8643 | 2355 |
| | | | | | SM37 | 2234 | 2410 |
| | | | | | QM150 | 24052 | 2500 |
| | | | | | SBE37 | 2009 | 2500 |
| AWI 261-02 | 63° 30.87’ S | -63.5145 | 1726 | | PAM | | 290 |
| | 50° 38.20’ W | -51.6367 | | | SBE37 | 9840 | 790 |
| | | | | | SBE56 | | 1150 |
| | | | | | SBE37 | 2092 | 1200 |
| | | | | | SBE56 | | 1250 |
| | | | | | SBE37 | 2093 | 1291 |
| | | | | | SBE56 | | 1350 |
| | | | | | SBE37 | 9834 | 1400 |
| | | | | | SBE56 | | 1450 |
| | | | | | SBE37 | 12478 | 1491 |
| | | | | | ADCP QM150 | 14088 | 1491 |
| AWI 251-04 | 61° 01.38’ S | -61.0230 | 335 | | PAM | | 179 |
| | 55° 58.68’ W | -55.9780 | | | PAM | | 181 |
| | | | | | AZFP | | 288 |
| | | | | | ADCP LR 075 | 22858 | 322 |
| | | | | | SBE37 | 2395 | 322 |

***Abbreviations:***

| | |
|---|---|
| *ADCP LR075* | *RD Instruments Doppler Current Profiler, Type Long Ranger 75 kHz* |
| *ADCP QM150* | *RD Instruments Doppler Current Profiler, Type Quarter Master 150 kHz* |
| *ADCP WH600* | *RD Instruments Doppler Current Profiler, Type Workhorse 600 kHz* |
| *AquaD* | *Nortek Aquadopp Acoustic Current Meter* |
| *Aural* | *Multi-Electronique (MTE) Aural Passive Acoustic Recorder* |
| *AVT* | *Aanderaa Current Meter with Temperature Sensor* |
| *AZFP* | *ASL Environmental Sciences Acoustic Zooplankton and Fish Profiler* |
| *PAM* | *Passive Acoustic Monitor (Type: AURAL or SONOVAULT)* |
| *RCM11* | *Aanderaa Doppler Current Meter (acoust.)* |
| *SBE37* | *SeaBird Electronics MicroCat Conductivity and Temperture Logger* |
| *SBE39* | *SeaBird Electronics Temperature Logger* |
| *SBE56* | *SeaBird Electronics Temperature Logger* |
| *SonoVault* | *Develogic SonoVault Passive Acoustic Recorder* |
| *SOSO* | *Develogic RAFOS Sound Source* |
| *-----* | |
| *Ecotriplet* | *Fluorescence sensor* |
| *ISUS* | *Nitrate Sensor* |
| *LOC* | *Lab on Chip sensors* |
| *RAS-500* | *Remote Access Sampler RAS-48-500* |
| *Sedimenttrap* | *KUM sediment traps* |
| *Suna* | *Nitrate Sensor* |
| *VVP6* | *Underwater Vision Profiler 6* |

To enhance the vertical resolution and to calibrate moored sensors, CTD stations will be occupied at the mooring locations. The CTD / water sampler consists of a SBE911plus CTD system in combination with a carousel water sampler SBE32 with 24 12L bottles. To determine the distance to the bottom, an altimeter from Benthos is mounted. A transmissometer from Wetlabs, a SBE43 oxygen sensor from Seabird Electronics and a fluorometer will be incorporated in the sensor package. Additionally, two RDI-150 kHz ADCPs, one pointing upward, one pointing downward are attached to the rosette sampler to measure the current velocity profile.

Moorings will contain sound sources, providing RAFOS signals for retrospective under-ice tracking of 23 NEMO floats deployed during PS129 (Table 2.3, Fig. 2.2) and passive acoustic recorders to record ambient (biotic and abiotic) sounds. During PS129, 5 Argo floats will be deployed for the Bundesamt für Seeschifffahrt und Hydrographie (BSH, Table 2.4) across the ACC throughout the Weddell Sea. Further 9 biogeochemical Argo floats shall be deployed for Scripps Institution of Oceanography (Table 2.5). A CTD / l-ADCP section shall be conducted between mooring 217-5 (near 45° E) and the tip of the Antarctic Peninsula (Fig. 2.1) aiming at delineating the export plume of Antarctic Bottom Water.

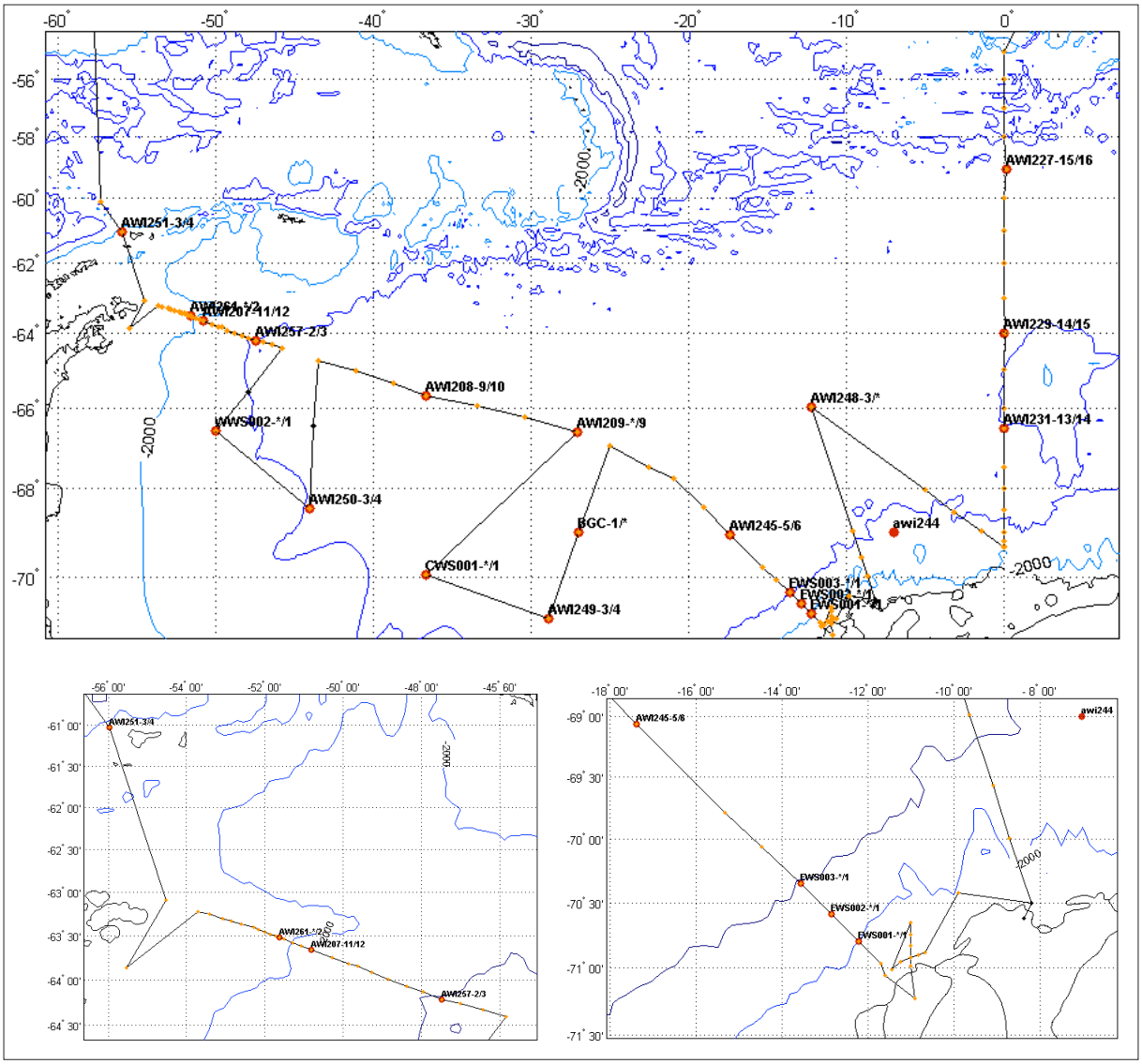


*Fig. 2.1: Overview (top) and zoomed-in (bottom left: Antarctic Peninsula; bottom right: Kapp Norvegia) charts of the study area with planned expedition track. Red circles with labels: Locations and names of oceanographic moorings to be recovered (labels featuring numerals preceding slash) and redeployed (labels featuring numerals following slash). Orange dots: Locations of planned stations*

**Tab. 2.3:** List of planned ice-resilient Argo float deployments during PS129. All floats are of type APEX by Teledyne Webb Research and their planned deployments have been registered with www.ocean-ops.org.

| AWI-ID | Apex float S/N | WMO | IMEI | Deployment latitude | Deployment longitude | Water depth [m] |
|---|---|---|---|---|---|---|
| PS129-1 | 8878 | 7900971 | 300125061811150 | 68° 00.00’ S | 0° 00.00’ E | 4522 |
| PS129-2 | 8879 | 7900972 | 300125061814250 | 69° 00.00’ S | 0° 00.00’ E | 3421 |
| PS129-3 | 8886 | 7900979 | 300125061326710 | 69° 21.84’ S | 0° 00.00’ E | 2303 |
| PS129-4 | 8887 | 7900980 | 300125061324710 | 68° 59.75’ S | 1° 27.67’ W | 3031 |

| AWI-ID | Apex float S/N | WMO | IMEI | Deployment latitude | Deployment longitude | Water depth [m] |
|---|---|---|---|---|---|---|
| PS129-5 | 8888 | 7900981 | 300125061323740 | 68° 32.69’ S | 3° 10.23’ W | 4087 |
| PS129-6 | 8889 | 7900982 | 300125061326720 | 68° 02.47’ S | 5° 01.47’ W | 4421 |
| PS129-7 | 8890 | 7900983 | 300125061321650 | 68° 59.12’ S | 9° 37.84’ W | 4297 |
| PS129-8 | 8891 | 7900984 | 300125061321740 | 69° 34.18’ S | 9° 04.82’ W | 3397 |
| PS129-9 | 8892 | 7900985 | 300125061810140 | 69° 59.33’ S | 8° 42.40’ W | 2855 |
| PS129-10 | 8893 | 7900986 | 300125061813240 | 70° 25.19’ S | 9° 53.30’ W | 1696 |
| PS129-11 | 9212 | 7900987 | 300125061140800 | 70° 57.93’ S | 11° 42.32’ W | 752 |
| PS129-12 | 9213 | 7900988 | 300125061142720 | 70° 47.87’ S | 12° 13.05’ W | 1810 |
| PS129-13 | 9214 | 7900989 | 300125061756090 | 70° 35.17’ S | 12° 51.46’ W | 2198 |
| PS129-14 | 9215 | 7900990 | 300125061143710 | 70° 20.78’ S | 13° 34.48’ W | 3234 |
| PS129-15 | 9216 | 7900991 | 300125061163760 | 70° 03.61’ S | 14° 28.25’ W | 4755 |
| PS129-16 | 9217 | 7900992 | 300125061246210 | 69° 47.26’ S | 15° 20.49’ W | 4755 |
| PS129-17 | 9218 | 7900993 | 300125061165760 | 69° 03.64’ S | 17° 23.49’ W | 4774 |
| PS129-18 | 9219 | 7900994 | 300125061148800 | 70° 53.22’ S | 28° 56.97’ W | 4367 |
| PS129-19 | 9220 | 7900995 | 300125061144830 | 70° 53.22’ S | 28° 56.97’ W | 4367 |
| PS129-20 | 9221 | 7900996 | 300125061167760 | 69° 57.55’ S | 36° 43.87’ W | 4243 |
| PS129-21 | 9222 | 7900997 | 300125061163750 | 69° 57.55’ S | 36° 43.87’ W | 4243 |
| PS129-22 | 9223 | 7900998 | 300125061162770 | 68° 28.85’ S | 44° 05.94’ W | 4081 |
| PS129-23 | 9224 | 7900999 | 300125061162760 | 66° 34.62’ S | 50° 00.91’ W | 3517 |

**Table 2.4:** List of planned standard Argo float deployments during PS129. All floats provided by BSH.

| BSH-ID | Apex float S/N | WMO | IMEI | Deployment latitude | Deployment longitude | |
|---|---|---|---|---|---|---|
| PS129-BSH1 | | | | 45° 0’ S | 10° 30.00’ E | |
| PS129-BSH2 | | | | 47° 0’ S | 9° 00.00’ E | |
| PS129-BSH3 | | | | 50° 0’ S | 6° 30.00’ E | |
| PS129-BSH4 | | | | 58° 30.00’ S | 0° 30.00’ E | |
| PS129-BSH5 | | | | 59° 30.00’ S | 0° 00.00’ E | |

**Tab. 2.5:** List of planned biogeochemical Argo float deployments during PS129. All floats provided by Scripps Institution of Oceanography.

| Scripps ID | float S/N | WMO | IMEI | Deployment latitude | Deployment longitude | Water depth [m] |
|---|---|---|---|---|---|---|
| | | | | -37.5000 | 14.9200 | |
| | | | | -40.5000 | 13.3000 | |
| | | | | -62.0000 | 0.0000 | |
| | | | | -65.0006 | 0.0237 | |
| | | | | -69.0057 | -6.9823 | |
| | | | | -65.9682 | -12.2520 | |
| | | | | -66.6075 | -27.1210 | |
| | | | | -65.6205 | -36.4220 | |
| | | | | -64.3321 | -46.4369 | |

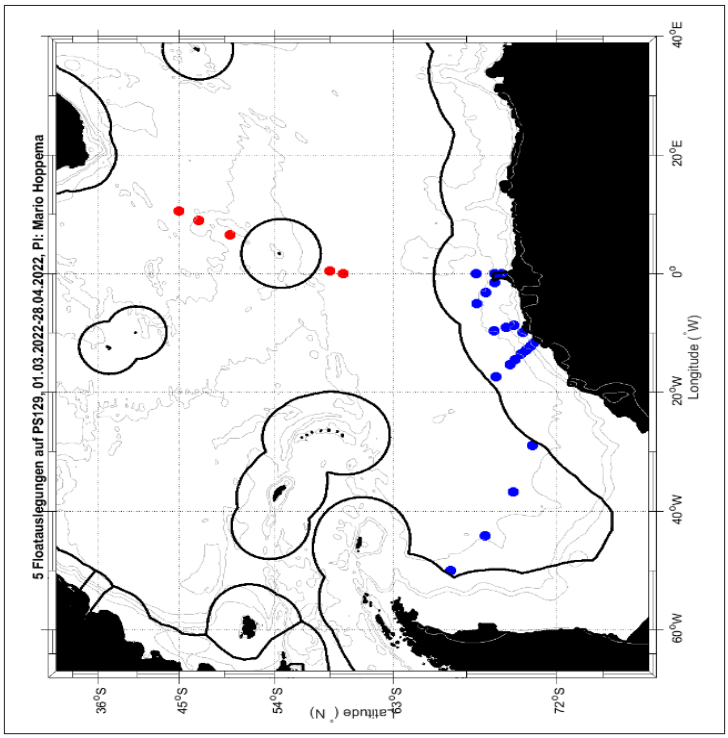


*Fig. 2.4: Map of deployments sites for ice-resilient (blue) and standard (red) Argo floats during PS129. Graphics courtesy of Birgit Klein, BSH*

### Expected results

We expect to secure data from a large proportion of the instruments currently moored, together with ship-based CTD- and lowered ADCP data.

### Data management

Environmental data will be archived, published and disseminated according to international standards by the World Data Center PANGAEA Data Publisher for Earth & Environmental Science (https://www.pangaea.de) within two years after the end of the cruise at the latest. By default, the CC-BY license will be applied.

Metadata of recoded data will be made available through the expedition report. Mooring and CTD data will be made available after validation through the PANGAEA database. Float data will be made available through the Argo System and PANGAEA (Reeve et al., 2016). The processing of the lowered ADCP will last several months but as soon as these data were processed and documented they will be available in PANGAEA too. Results will be published in international journals.

In all publications, based on this cruise, the grant no. AWI_PS129_00 will be quoted and the following *Polarstern* article will be cited:

Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung (2017) Polar Research and Supply Vessel POLARSTERN Operated by the Alfred-Wegener-Institute. Journal of large-scale research facilities, 3, A119. http://dx.doi.org/10.17815/jlsrf-3-163.

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Fahrbach E, Hoppema M, Rohardt G, Boebel O, Klatt O, Wisotzki A (2011) Warming of deep and abyssal water masses along the Greenwich meridian on decadal time scales: The Weddell gyre as a heat buffer. Deep-Sea Research II, 58, 2509-2523, https://doi.org/10.1016/j.dsr2.2011.06.007.

Fahrbach E, Boebel O, Hoppema M, Klatt O, Rohardt G, Schröder M, Wisotzki A (2007) Decadal scale variations of water mass properties in the Weddell Sea. NOTUS: the AGCS Newsletter, 2, https://epic.awi.de/id/eprint/21649/

## Appendix 1

Current planning of stations to be occupied during PS129

| Station | Cast | Latitude | Longitude | Water Depth [m] | Instrument | Comment |
|---|---|---|---|---|---|---|
| WP | none | -32.699 | 17.9331 | 22 | Cape Town(sf) | |
| 1 | 1 | -55 | 0 | 2008 | CTD/RO | |
| 2 | 1 | -56 | 0 | 3597 | CTD/RO | |
| 3 | 1 | -57 | 0 | 3852 | CTD/RO | |
| 4 | 1 | -58 | 0 | 4010 | CTD/RO | |
| 5 | 1 | -59.0503 | 0.1073 | 4777 | MOOR/R | Recovery AWI227-15 |
| 5 | 2 | -59.0503 | 0.1073 | 4777 | CTD/RO | Attention keep 2 nm off mooring |
| 5 | 3 | -59.0503 | 0.1073 | 4777 | MOOR/D | Deployment AWI227-16 |
| 6 | 1 | -60 | 0 | 5149 | CTD/RO | |
| 6 | 2 | -60 | 0 | 5149 | MN | |
| 6 | 3 | -60 | 0 | 5149 | RMT | |
| 6 | 4 | -60 | 0 | 5149 | ICAM | |
| 7 | 1 | -61 | 0 | 5437 | CTD/RO | |
| 8 | 1 | -62 | 0 | 5177 | CTD/RO | |
| 8 | 2 | -62 | 0 | 5177 | MN | |
| 8 | 3 | -62 | 0 | 5177 | RMT | |
| 8 | 4 | -62 | 0 | 5177 | ICAM | |
| 9 | 1 | -63 | 0 | 5293 | CTD/RO | |
| 10 | 1 | -64.021 | 0.0138 | 5056 | MOOR/R | Recovery AWI229-14 |
| 10 | 2 | -64.021 | 0.0138 | 5056 | CTD/RO | Attention keep 2 nm off mooring |
| 10 | 3 | -64.021 | 0.0138 | 5056 | MOOR/D | Deployment AWI229-15 |
| 11 | 1 | -65 | 0 | 3856 | CTD/RO | |
| 11 | 2 | -65 | 0 | 3856 | MN | |
| 11 | 3 | -65 | 0 | 3856 | RMT | |
| 11 | 4 | -65 | 0 | 3856 | ICAM | |
| 12 | 1 | -66 | 0 | 3490 | CTD/RO | |
| 12 | 2 | -66 | 0 | 3490 | MN | |
| 12 | 3 | -66 | 0 | 3490 | RMT | |
| 12 | 4 | -66 | 0 | 3490 | ICAM | |
| 12 | 5 | -66 | 0 | 3490 | TRAPS | |
| 13 | 1 | -66.5172 | -0.0747 | 4543 | MOOR/R | Recovery AWI231-13 |
| 13 | 2 | -66.5172 | -0.0747 | 4543 | CTD/RO | Attention keep 2 nm off mooring |
| 13 | 3 | -66.5172 | -0.0747 | 4543 | MOOR/D | Deployment AWI231-14 |
| 14 | 1 | -67.5 | 0 | 4667 | CTD/RO | |
| 15 | 1 | -68 | 0 | 4522 | CTD/RO | |

| Station | Cast | Latitude | Longitude | Water Depth [m] | Instrument | Comment |
|---|---|---|---|---|---|---|
| 15 | 2 | -68 | 0 | 4522 | FLOAT | |
| 16 | 1 | -68.5 | 0 | 4255 | CTD/RO | |
| 17 | 1 | -69 | 0 | 3421 | CTD/RO | |
| 17 | 2 | -69 | 0 | 3421 | FLOAT | |
| 18 | 1 | -69.224 | 0 | 2784 | CTD/RO | |
| 18 | 2 | -69.224 | 0 | 2784 | SUIT | |
| 18 | 3 | -69.224 | 0 | 2784 | MN | |
| 18 | 4 | -69.224 | 0 | 2784 | RMT | |
| 18 | 5 | -69.224 | 0 | 2784 | ICE | |
| 18 | 6 | -69.224 | 0 | 2784 | ICAM | |
| 19 | 1 | -69.329 | 0 | 2437 | CTD/RO | |
| 20 | 1 | -69.364 | 0 | 2303 | CTD/RO | |
| 20 | 2 | -69.364 | 0 | 2303 | FLOAT | |
| 21 | 1 | -68.9958 | -1.4612 | 3031 | FLOAT | |
| 22 | 1 | -68.5448 | -3.1705 | 4087 | FLOAT | |
| 23 | 1 | -68.0412 | -5.0245 | 4421 | FLOAT | |
| 24 | 1 | -65.9687 | -12.2307 | 5022 | MOOR/R | Recovery AWI248-3 |
| 24 | 2 | -65.9687 | -12.2307 | 5022 | CTD/RO | Attention keep 2 nm off mooring |
| 25 | 1 | -68.9854 | -9.6307 | 4297 | FLOAT | |
| 26 | 1 | -69.5697 | -9.0803 | 3397 | FLOAT | |
| 27 | 1 | -69.9888 | -8.7067 | 2855 | FLOAT | |
| WP | none | -70.504 | -8.2 | 258 | waypoint | |
| WP | none | -70.6166 | -8.3666 | 282 | Neumayer arrival | |
| WP | none | -70.6166 | -8.3666 | 282 | Neumayer departure | |
| WP | none | -70.504 | -8.2 | 258 | waypoint | |
| 28 | 1 | -70.4198 | -9.8883 | 1696 | FLOAT | |
| 29 | 1 | -70.883 | -10.663 | 281 | SUIT | |
| 29 | 2 | -70.883 | -10.663 | 281 | MN | |
| 29 | 3 | -70.883 | -10.663 | 281 | RMT | |
| 29 | 4 | -70.883 | -10.663 | 281 | ICE | |
| 29 | 5 | -70.883 | -10.663 | 281 | ICAM | |
| 29 | 6 | -70.883 | -10.663 | 281 | TRAPS | |
| 29 | 7 | -70.883 | -10.663 | 281 | ROV | |
| 29 | 8 | -70.883 | -10.663 | 281 | TVMUC | |
| 29 | 9 | -70.883 | -10.663 | 281 | TVMUC | |
| 29 | 10 | -70.883 | -10.663 | 281 | MG | |
| 29 | 11 | -70.883 | -10.663 | 281 | OFOS | |
| 30 | 1 | -70.9 | -10.835 | 308 | LANDER | |
| 30 | 2 | -70.9 | -10.835 | 308 | MG | |

| Station | Cast | Latitude | Longitude | Water Depth [m] | Instrument | Comment |
|---|---|---|---|---|---|---|
| 30 | 3 | -70.9 | -10.835 | 308 | OFOS | |
| 31 | 1 | -70.921 | -11.016 | 360 | SUIT | |
| 31 | 2 | -70.921 | -11.016 | 360 | MN | |
| 31 | 3 | -70.921 | -11.016 | 360 | RMT | |
| 31 | 4 | -70.921 | -11.016 | 360 | ICE | |
| 31 | 5 | -70.921 | -11.016 | 360 | ROV | |
| 31 | 6 | -70.921 | -11.016 | 360 | LANDER | |
| 31 | 7 | -70.921 | -11.016 | 360 | TVMUC | |
| 31 | 8 | -70.921 | -11.016 | 360 | TVMUC | |
| 31 | 9 | -70.921 | -11.016 | 360 | MG | |
| 31 | 10 | -70.921 | -11.016 | 360 | OFOS | |
| 32 | 1 | -70.954 | -11.247 | 357 | LANDER | |
| 32 | 2 | -70.954 | -11.247 | 357 | TVMUC | |
| 32 | 3 | -70.954 | -11.247 | 357 | MG | |
| 32 | 4 | -70.954 | -11.247 | 357 | OFOS | |
| 33 | 1 | -71.009 | -11.435 | 433 | LANDER | |
| 33 | 2 | -71.009 | -11.435 | 433 | TVMUC | |
| 33 | 3 | -71.009 | -11.435 | 433 | MG | |
| 33 | 4 | -71.009 | -11.435 | 433 | OFOS | |
| 34 | 1 | -70.651 | -11 | 1432 | AGT | |
| 34 | 2 | -70.651 | -11 | 1432 | AGT | |
| 34 | 3 | -70.651 | -11 | 1432 | LL | |
| 34 | 4 | -70.651 | -11 | 1432 | LL | |
| 35 | 1 | -70.743 | -11 | 1133 | LANDER | |
| 35 | 2 | -70.743 | -11 | 1133 | AGT | |
| 35 | 3 | -70.743 | -11 | 1133 | AGT | |
| 35 | 4 | -70.743 | -11 | 1133 | LL | |
| 35 | 5 | -70.743 | -11 | 1133 | LL | |
| 35 | 6 | -70.743 | -11 | 1133 | TVMUC | |
| 35 | 7 | -70.743 | -11 | 1133 | MG | |
| 35 | 8 | -70.743 | -11 | 1133 | OFOS | |
| 36 | 1 | -70.831 | -11 | 474 | SUIT | |
| 36 | 2 | -70.831 | -11 | 474 | MN | |
| 36 | 3 | -70.831 | -11 | 474 | RMT | |
| 36 | 4 | -70.831 | -11 | 474 | ICE | |
| 36 | 5 | -70.831 | -11 | 474 | ICAM | |
| 36 | 6 | -70.831 | -11 | 474 | TRAPS | |
| 36 | 7 | -70.831 | -11 | 474 | ROV | |
| 36 | 8 | -70.831 | -11 | 474 | LANDER | |
| 36 | 9 | -70.831 | -11 | 474 | AGT | |

| Station | Cast | Latitude | Longitude | Water Depth [m] | Instrument | Comment |
|---|---|---|---|---|---|---|
| 36 | 10 | -70.831 | -11 | 474 | AGT | |
| 36 | 11 | -70.831 | -11 | 474 | LL | |
| 36 | 12 | -70.831 | -11 | 474 | LL | |
| 36 | 13 | -70.831 | -11 | 474 | TVMUC | |
| 36 | 14 | -70.831 | -11 | 474 | MG | |
| 36 | 15 | -70.831 | -11 | 474 | OFOS | |
| 37 | 1 | -70.988 | -11 | 377 | LANDER | |
| 37 | 2 | -70.988 | -11 | 377 | TVMUC | |
| 37 | 3 | -70.988 | -11 | 377 | MG | |
| 37 | 4 | -70.988 | -11 | 377 | OFOS | |
| 38 | 1 | -71.2307 | -10.9097 | 606 | MOOR/D | |
| 38 | 2 | -71.2307 | -10.9097 | 606 | CTD/RO | |
| 39 | 1 | -71.056 | -11.597 | 344 | SUIT | |
| 39 | 2 | -71.056 | -11.597 | 344 | MN | |
| 39 | 3 | -71.056 | -11.597 | 344 | RMT | |
| 39 | 4 | -71.056 | -11.597 | 344 | ICE | |
| 39 | 5 | -71.056 | -11.597 | 344 | ICAM | |
| 39 | 6 | -71.056 | -11.597 | 344 | TRAPS | |
| 39 | 7 | -71.056 | -11.597 | 344 | ROV | |
| 39 | 8 | -71.056 | -11.597 | 344 | LANDER | |
| 39 | 9 | -71.056 | -11.597 | 344 | TVMUC | |
| 39 | 10 | -71.056 | -11.597 | 344 | TVMUC | |
| 39 | 11 | -71.056 | -11.597 | 344 | MG | |
| 39 | 12 | -71.056 | -11.597 | 344 | OFOS | |
| 40 | 1 | -70.9655 | -11.7053 | 752 | MOOR/D | |
| 40 | 2 | -70.9655 | -11.7053 | 752 | CTD/RO | |
| 40 | 3 | -70.9655 | -11.7053 | 752 | FLOAT | |
| 41 | 1 | -70.7978 | -12.2175 | 1810 | MOOR/D | EWS001-1 Deploy |
| 41 | 2 | -70.7978 | -12.2175 | 1810 | CTD/RO | |
| 41 | 3 | -70.7978 | -12.2175 | 1810 | FLOAT | |
| 42 | 1 | -70.5861 | -12.8576 | 2198 | MOOR/D | EWS002-1 Deploy |
| 42 | 2 | -70.5861 | -12.8576 | 2198 | CTD/RO | |
| 42 | 3 | -70.5861 | -12.8576 | 2198 | FLOAT | |
| 43 | 1 | -70.3464 | -13.5746 | 3234 | MOOR/D | EWS003-1 Deploy |
| 43 | 2 | -70.3464 | -13.5746 | 3234 | CTD/RO | |
| 43 | 3 | -70.3464 | -13.5746 | 3234 | FLOAT | |
| 44 | 1 | -70.0602 | -14.4709 | 4755 | CTD/RO | |
| 44 | 2 | -70.0602 | -14.4709 | 4755 | FLOAT | |
| 45 | 1 | -69.7877 | -15.3415 | 4755 | CTD/RO | |
| 45 | 2 | -69.7877 | -15.3415 | 4755 | FLOAT | |

| Station | Cast | Latitude | Longitude | Water Depth [m] | Instrument | Comment |
|---|---|---|---|---|---|---|
| 46 | 1 | -69.0607 | -17.3915 | 4774 | MOOR/R | Recovery AWI245-5 |
| 46 | 2 | -69.0607 | -17.3915 | 4774 | CTD/RO | Attention keep 2 nm off mooring |
| 46 | 3 | -69.0607 | -17.3915 | 4774 | MOOR/D | Deployment AWI245-6 |
| 46 | 4 | -69.0607 | -17.3915 | 4774 | FLOAT | |
| 47 | 1 | -68.4464 | -19.0801 | 4839 | CTD/RO | |
| 48 | 1 | -67.7429 | -20.9806 | 4915 | CTD/RO | |
| 49 | 1 | -67.476 | -22.5503 | 4907 | CTD/RO | |
| 50 | 1 | -66.9705 | -25.0575 | 4876 | CTD/RO | |
| 50 | 2 | -66.9705 | -25.0575 | 4876 | MN | |
| 50 | 3 | -66.9705 | -25.0575 | 4876 | RMT | |
| 50 | 4 | -66.9705 | -25.0575 | 4876 | ICAM | |
| 50 | 5 | -66.9705 | -25.0575 | 4876 | TRAPS | |
| 51 | 1 | -69.0012 | -27.0012 | 4708 | MOOR/R | BGC-1 Recovery |
| 51 | 2 | -69.0012 | -27.0012 | 4708 | CTD/RO | |
| 52 | 1 | -70.887 | -28.9495 | 4367 | MOOR/R | Recovery AWI249-3 |
| 52 | 2 | -70.887 | -28.9495 | 4367 | CTD/RO | Attention keep 2 nm off mooring |
| 52 | 3 | -70.887 | -28.9495 | 4367 | MOOR/D | Deployment AWI249-4 |
| 52 | 4 | -70.887 | -28.9495 | 4367 | SUIT | |
| 52 | 5 | -70.887 | -28.9495 | 4367 | ICE | |
| 52 | 6 | -70.887 | -28.9495 | 4367 | FLOAT | |
| 52 | 7 | -70.887 | -28.9495 | 4367 | FLOAT | |
| 53 | 1 | -69.9592 | -36.7312 | 4243 | CTD/RO | |
| 53 | 2 | -69.9592 | -36.7312 | 4243 | MOOR/D | Deploy CWS001-1 |
| 53 | 3 | -69.9592 | -36.7312 | 4243 | SUIT | |
| 53 | 4 | -69.9592 | -36.7312 | 4243 | ICE | |
| 53 | 5 | -69.9592 | -36.7312 | 4243 | FLOAT | |
| 53 | 6 | -69.9592 | -36.7312 | 4243 | FLOAT | |
| 54 | 1 | -66.6075 | -27.1215 | 4844 | MOOR/D | Deployment AWI209-9 |
| 54 | 2 | -66.6075 | -27.1215 | 4844 | CTD/RO | Attention keep 2 nm off mooring |
| 55 | 1 | -66.2488 | -30.435 | 4823 | CTD/RO | |
| 56 | 1 | -65.9374 | -33.4566 | 4800 | CTD/RO | |
| 57 | 1 | -65.6963 | -36.6835 | 4701 | MOOR/R | Recovery AWI208-9 |
| 57 | 2 | -65.6963 | -36.6835 | 4701 | CTD/RO | Attention keep 2 nm off mooring |
| 57 | 3 | -65.6963 | -36.6835 | 4701 | MOOR/D | Deployment AWI208-10 |
| 58 | 1 | -65.3545 | -38.7161 | 4723 | CTD/RO | |
| 59 | 1 | -65.0407 | -41.1417 | 4716 | CTD/RO | |
| 60 | 1 | -64.7425 | -43.522 | 4600 | CTD/RO | |

| Station | Cast | Latitude | Longitude | Water Depth [m] | Instrument | Comment |
|---|---|---|---|---|---|---|
| WP | none | -66.4528 | -43.8719 | 4295 | waypoint | |
| 61 | 1 | -68.4808 | -44.099 | 4081 | MOOR/R | Recovery AWI250-3 |
| 61 | 2 | -68.4808 | -44.099 | 4081 | CTD/RO | Attention keep 2 nm off mooring |
| 61 | 3 | -68.4808 | -44.099 | 4081 | MOOR/D | Deployment AWI250-4 |
| 61 | 4 | -68.4808 | -44.099 | 4081 | ICE | |
| 61 | 5 | -68.4808 | -44.099 | 4081 | SUIT | |
| 61 | 6 | -68.4808 | -44.099 | 4081 | SOSOCAL | |
| 61 | 7 | -68.4808 | -44.099 | 4081 | SOSOCAL | |
| 61 | 8 | -68.4808 | -44.099 | 4081 | FLOAT | |
| 62 | 1 | -66.577 | -50.0152 | 3517 | MOOR/D | |
| 62 | 2 | -66.577 | -50.0152 | 3517 | SOSOCAL | |
| 62 | 3 | -66.577 | -50.0152 | 3517 | SOSOCAL | |
| 62 | 4 | -66.577 | -50.0152 | 3517 | FLOAT | |
| WP | none | -65.5845 | -47.9297 | 3987 | waypoint | |
| 63 | 1 | -64.4098 | -45.8455 | 4400 | CTD/RO | |
| 63 | 2 | -64.4098 | -45.8455 | 4400 | SUIT | |
| 63 | 3 | -64.4098 | -45.8455 | 4400 | MN | |
| 63 | 4 | -64.4098 | -45.8455 | 4400 | RMT | |
| 63 | 5 | -64.4098 | -45.8455 | 4400 | ICE | |
| 64 | 1 | -64.3321 | -46.4369 | 4400 | CTD/RO | |
| 65 | 1 | -64.2574 | -47.0054 | 4289 | CTD/RO | |
| 66 | 1 | -64.2157 | -47.4897 | 4171 | MOOR/R | Recovery AWI257-2 |
| 66 | 2 | -64.2157 | -47.4897 | 4171 | CTD/RO | Attention keep 2 nm off mooring |
| 66 | 3 | -64.2157 | -47.4897 | 4171 | MOOR/D | Deployment AWI257-3 |
| 67 | 1 | -64.1342 | -47.9651 | 4082 | CTD/RO | |
| 68 | 1 | -64.0665 | -48.3813 | 3926 | CTD/RO | |
| 69 | 1 | -63.9874 | -48.8512 | 3675 | CTD/RO | |
| 70 | 1 | -63.9173 | -49.2678 | 3407 | CTD/RO | |
| 71 | 1 | -63.8471 | -49.6199 | 3161 | CTD/RO | |
| 72 | 1 | -63.816 | -49.8579 | 2984 | CTD/RO | |
| 73 | 1 | -63.7427 | -50.2799 | 2600 | CTD/RO | |
| 74 | 1 | -63.656 | -50.811 | 2494 | MOOR/R | Recovery AWI207-11 |
| 74 | 2 | -63.656 | -50.811 | 2494 | CTD/RO | Attention keep 2 nm off mooring |
| 74 | 3 | -63.656 | -50.811 | 2494 | MOOR/D | Deployment AWI207-12 |
| 75 | 1 | -63.6163 | -51.0719 | 2320 | CTD/RO | |
| 76 | 1 | -63.58 | -51.2986 | 2165 | CTD/RO | |
| 77 | 1 | -63.5395 | -51.5014 | 1993 | CTD/RO | |

| Station | Cast | Latitude | Longitude | Water Depth [m] | Instrument | Comment |
|---|---|---|---|---|---|---|
| 78 | 1 | -63.5148 | -51.6367 | 1730 | CTD/RO | |
| 78 | 2 | -63.5148 | -51.6367 | 1730 | MOOR/D | Deployment AWI261-2 |
| 79 | 1 | -63.4972 | -51.7338 | 1453 | CTD/RO | |
| 80 | 1 | -63.4783 | -51.8732 | 1210 | CTD/RO | |
| 81 | 1 | -63.4527 | -51.9968 | 1016 | CTD/RO | |
| 82 | 1 | -63.4283 | -52.1555 | 882 | CTD/RO | |
| 83 | 1 | -63.4033 | -52.2868 | 678 | CTD/RO | |
| 84 | 1 | -63.3654 | -52.5998 | 500 | CTD/RO | |
| 85 | 1 | -63.3349 | -52.8537 | 457 | CTD/RO | |
| 86 | 1 | -63.3064 | -53.0668 | 424 | CTD/RO | |
| 87 | 1 | -63.2553 | -53.4056 | 400 | CTD/RO | |
| 88 | 1 | -63.22 | -53.7067 | 332 | CTD/RO | |
| 88 | 2 | -63.22 | -53.7067 | 332 | MOOR/D | |
| 89 | 1 | -63.862 | -55.5333 | 298 | TVMUC | |
| 90 | 1 | -63.0882 | -54.5248 | 405 | CTD/RO | |
| 91 | 1 | -61.023 | -55.978 | 264 | MOOR/R | Recovery AWI251-3 |
| 91 | 2 | -61.023 | -55.978 | 264 | CTD/RO | Attention keep 2 nm off mooring |
| 91 | 3 | -61.023 | -55.978 | 264 | MOOR/D | Deployment AWI251-4 |
| 92 | 1 | -60.119 | -57.3267 | 3879 | SOSOCAL | |
| 92 | 2 | -60.119 | -57.3267 | 3879 | SOSOCAL | |
| WP | none | -51.7 | -57.8333 | 1 | Stanley | |