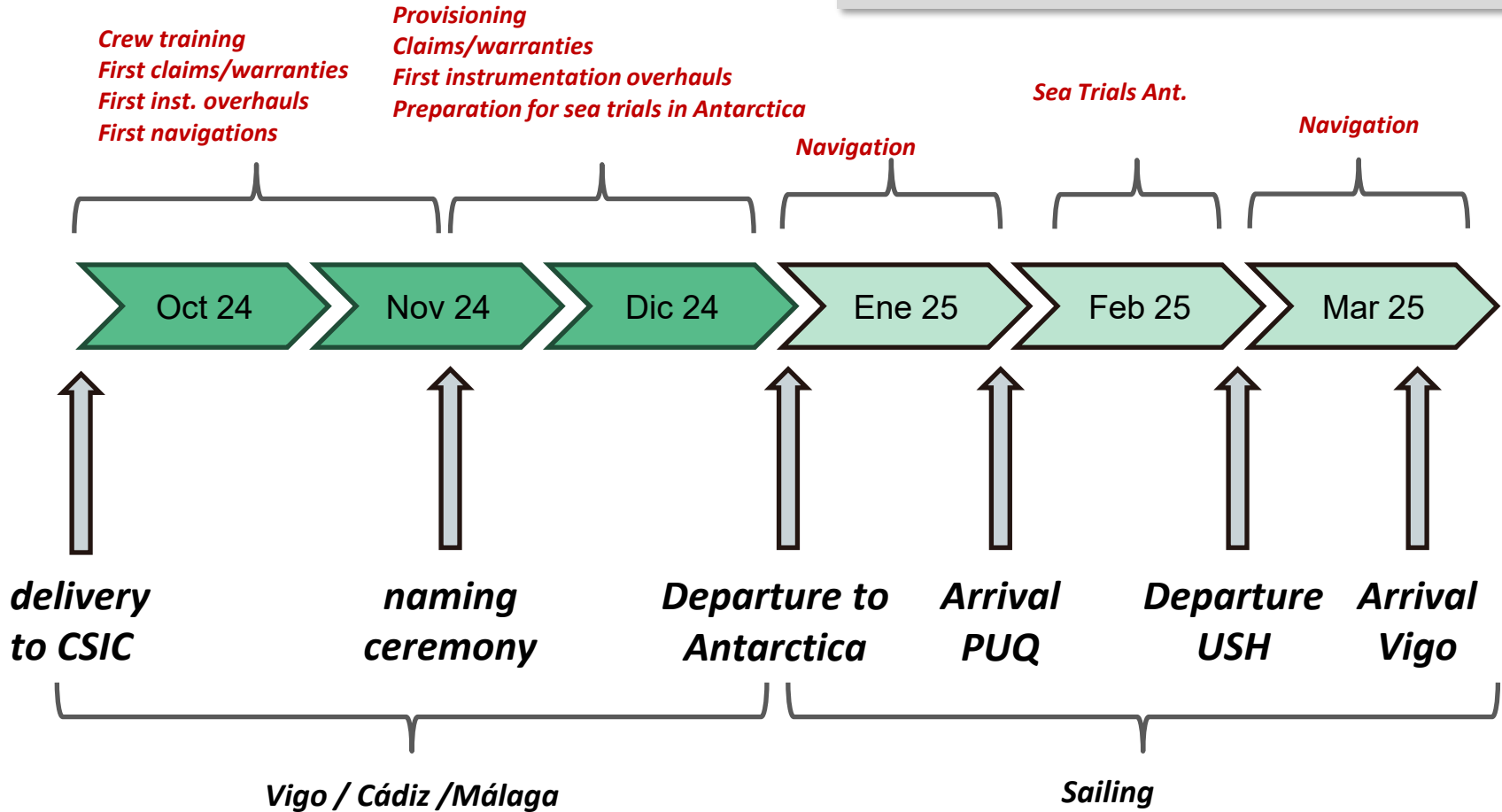




RV Odon De Buen: Sea trials in Antarctica





MAIN (PLATFORM TESTING)

TEST ATLANTIC NAVIGATION CONDITIONS

1. Long navigation (27 days)
2. Contrast warm zone (equator). Refrigeration/climate/refrigerator systems, etc. ...
3. LNG refuelling in the Americas (Chile / Argentina)

TEST COLD WATER NAVIGATION CONDITIONS

1. System checks according to Polar PC7 class recommendation recommended by Lloyd's Register Classification Society. (battery of tests)
2. Test ice navigation according to class PC7 (ship structure, navigation systems, propulsion-maneuvering, auxiliary systems)
3. Crew training ice navigation
4. Additional equipment - ship equipment and refrigeration equipment (crew and PAT)
5. Test of Logistics capabilities (station support)

EQUIPMENT TESTS and TECHNICAL TRAINING

- Ability to work in cold areas (deck, hangars, workspaces, common – acoustic control – winches control – cabinet)
- Test of basic equipment (underway sys., weather, probes, CTD winch-frame, frames, multipurpose winch)...
- Basic sampling equipment (dredgers, manta-trawl, box-corer)
- Active-heave compensation advanced function
- Basic software testing (logging and processing of probes, browsers and event logging)
- Communications
- External equipment (Connectivity and manoeuvring). ROTV Politolana / Multinet Groga
-

UTM & IEO technical teams work together. Notes of feasible improvements in operation / distribution of space (equipment / work techniques)

EQUIPMENT TESTS and TECHNICAL TRAINING

A. ANTARCTIC LOGISTICAL SUPPORT

1. Load Capacities (deck)
2. Heavy Lift Disembarkation/Embarkation Capabilities at the stations premises
3. Crew Training (Procedures)

B. Health and Safety Environment

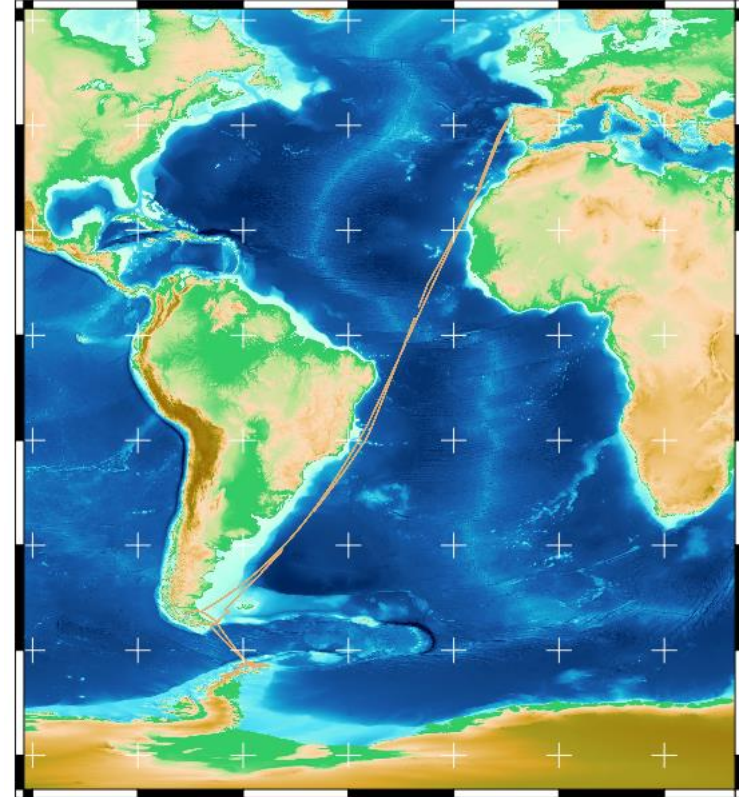
1. Review / Verification of protocols and PPE equipment in different manoeuvres
2. Proposals for improvements
 - a) Signage
 - b) EPIS
 - c) Maneuvers
 - d) Protocols / Documentation
 - e) Ergonomic details / improvements in access-covers for cold areas

Extension

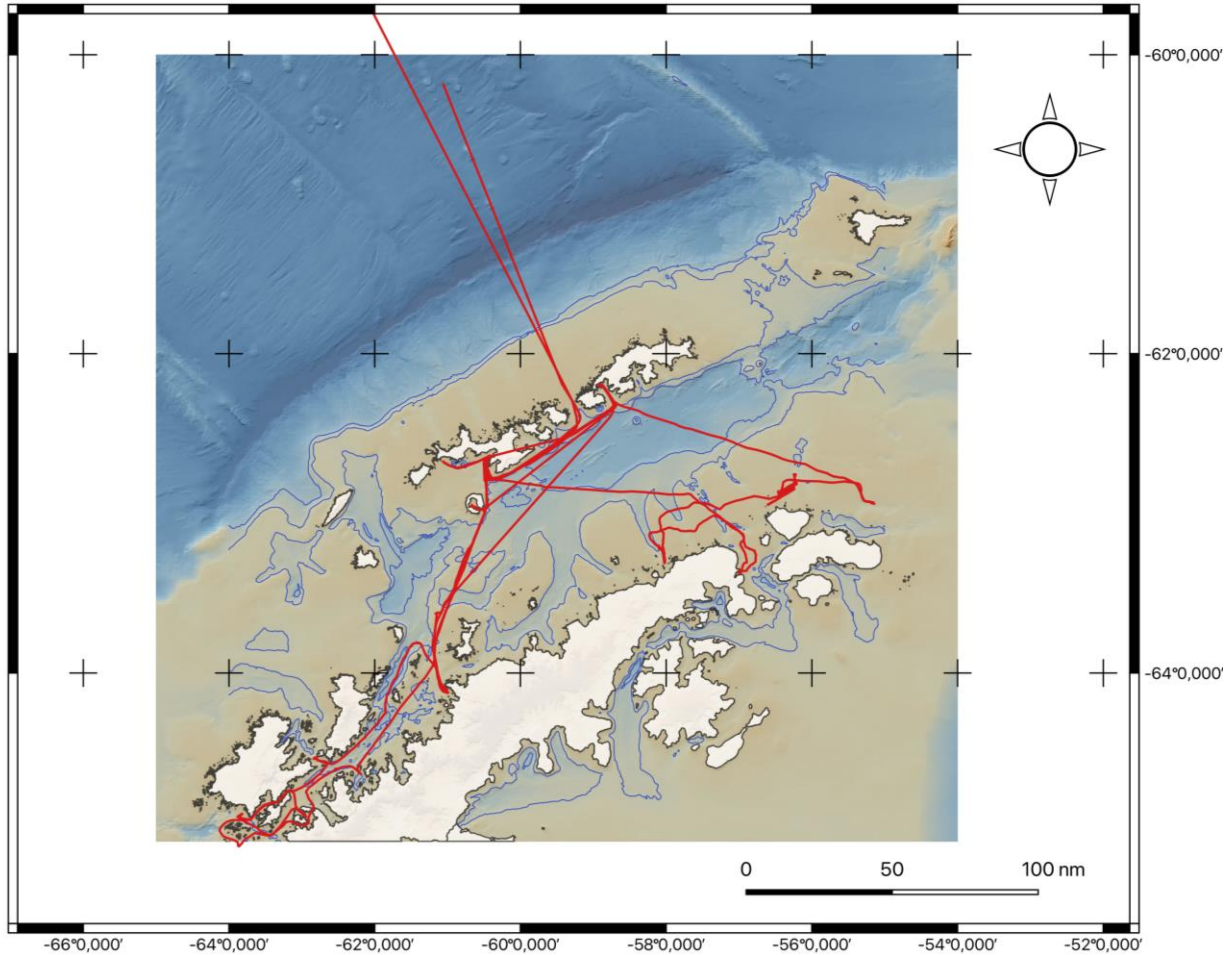
Atlantic Navigation : Vigo 3/01/25 – Punta Arenas 30-01/25

Antarctic Navigation: Punta Arenas 3/02/25 – Ushuaia 23-02/25

Atlantic Navigation: Ushuaia 24/02/25 – Vigo 25-03/25



Antarctic Zone



PLATFORM TESTING

System checks according to Polar PC7 class recommendation recommended by Lloyd's Register Classification Society. (battery of tests)

MACHINERY

- Prevention of snow ingestion at the air inlet
- Checking Heating Levels of the Machinery Compartment
- Verification of the air inlet temperature for machinery at a temperature that meets the manufacturer's requirements
- Control of ventilation and/or shield provision to prevent direct flow of cold air
- Prevention of ice ingestion and guarantee of the operation of seawater supplies for machinery systems operation of installed resistors
- Protection of batteries or other stored energy devices.
- Verification of humidity levels for control air, whistle and deck services.
- Verification of the freezing of the domestic freshwater system and the sanitary system.
- Heating requirements for diesel or suitable diesel/diesel grades for the expected temperatures.
- Verification of satisfactory operation of lube oil and heavy oil purifiers.
- Checking diesel filters to prevent wax build-up.
- Operation of the oil-water separator and action needed to prevent water freezing

System checks according to Polar PC7 class recommendation recommended by Lloyd's Register Classification Society. (battery of tests)

INSPECTION IN AUXILIARY ROOMS:

- Hydraulic pump rooms, steering gear compartment, emergency generator compartment, bow thruster compartment, all passages below deck and conduit keel and emergency fire pump compartment, water mist and spray pumps.
 - Check the viscosity of lubricants due to low temperatures.
 - Review policy for the use of fluids designed for cold weather operational requirements.
 - Check Operation of Space Heaters and Oil Tanks.

Verificaciones de sistemas según recomendación de clase Polar PC7 recomendados por Sociedad de Clasificación Lloyd's Register. (batería de tests)

DECK EQUIPMENT :

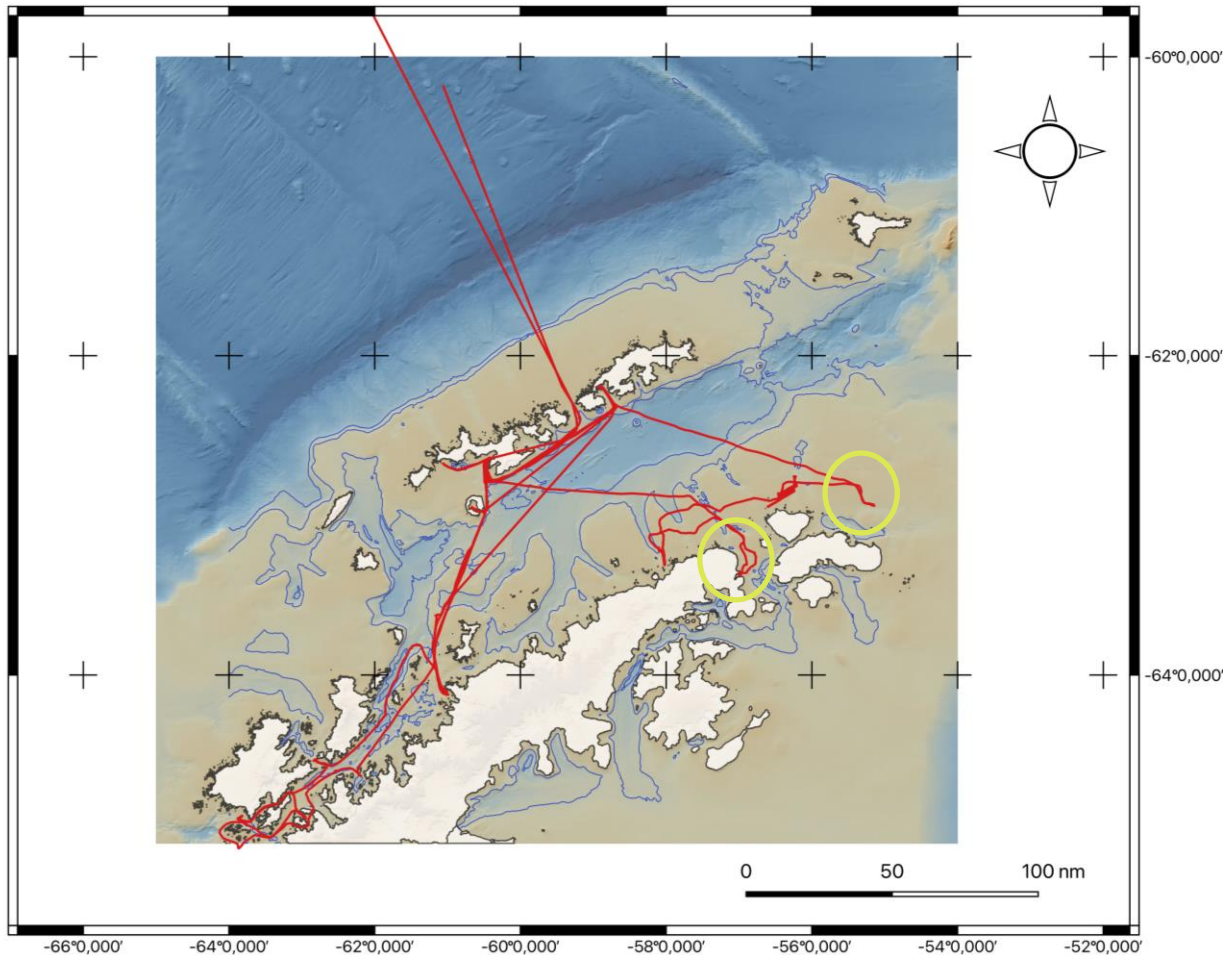
- Check the safe and efficient operation of cargo-handling cranes and hoses, including checks for ice formation on sheaves, which can cause cables to jump off. Slow hydraulic control and slipping brakes are common issues.
- Protection and testing of safety devices and all safety switches, i.e., derrick limit switches.
- Protection of exposed electric and pneumatic motors, accommodation ladders, and pilot ladders.
- Inspection of cargo hold ventilation and prevention of snow or ice ingestion at air intakes.
- Check the safe and efficient operation of hatch covers and ensure satisfactory sealing.
- Proper low-temperature lubrication of all exposed moving parts, e.g., butterfly nuts/bolts, flap hinges, vents, valve stems, sounding pipe caps, hydrant wheel spindles, steel claws for doors, wheels and rams, pilot ladder rollers and rail tracks, etc.
- Inventory and storage of de-icing materials.

Verificaciones de sistemas según recomendación de clase Polar PC7 recomendados por Sociedad de Clasificación Lloyd's Register. (batería de tests)

LIFE-SAVINGS APPLIANCES, FIRE DETECTION AND EXTINGUISHING EQUIP.:

- Operation and maintenance of heating systems, if installed.
- Maintenance of battery systems.
- Draining of exposed sections of fire and foam extinguishing lines.
- Protection of controls and equipment from freezing, snow accumulation, and ice buildup.
- Removal of snow and ice from access routes.
- Protection of fire extinguishing agents from freezing, with special attention to CO₂ systems.
- Storage of fire hoses and nozzles in a protected location near the hydrant.
- Storage of firefighting equipment in a warm and accessible area.
- Fuel requirements for survival craft.
- Inspection and use of provided thermal protective clothing, including instructions to personnel on the health hazards of extremely cold temperatures.

Antarctica

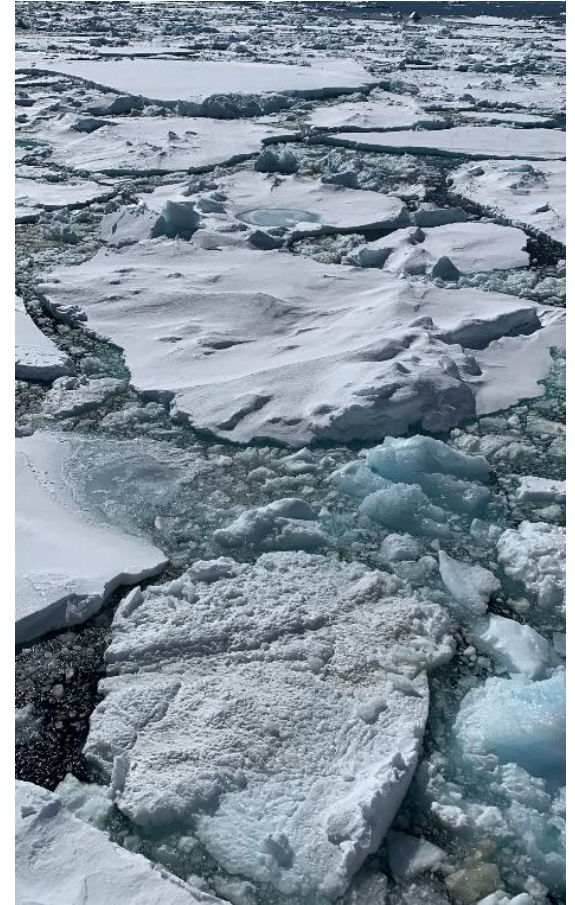


***Ice Navigation
(day/night)***

Ice Navigation



Antarctica

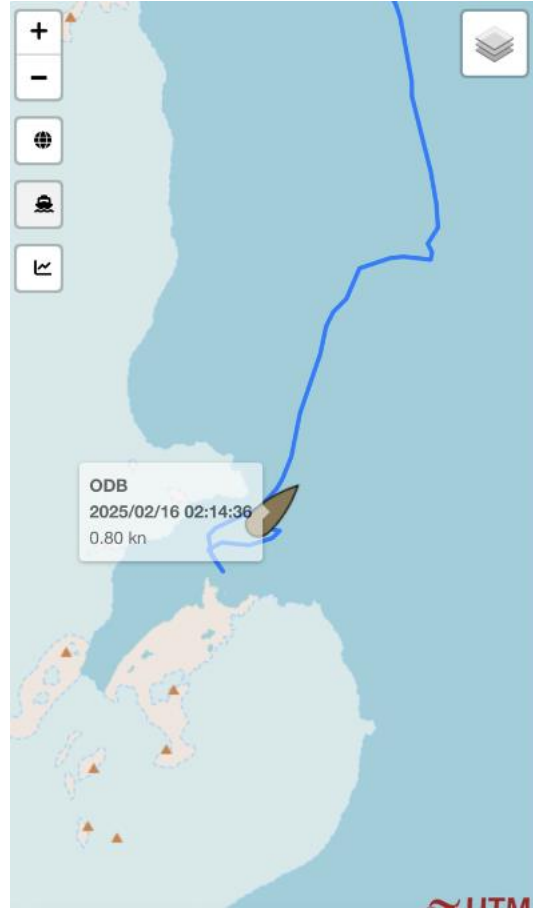


Ice Navigation

Antarctica



Antarctica



Ice Navigation

Equipment Test

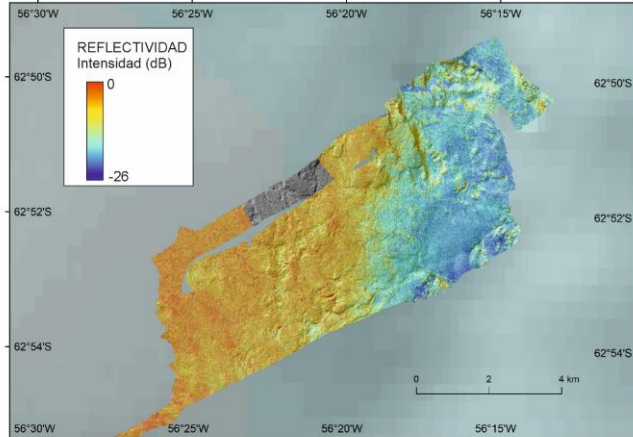
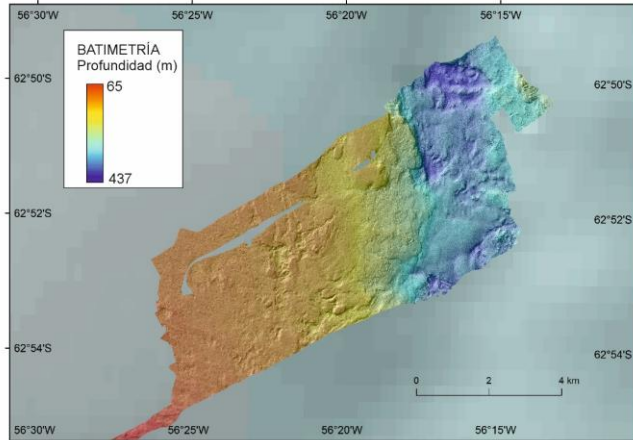
Equipo	Condiciones	Aparejo
Ecosondas multihaz EM712 y EM124	navegando	
Sonda paramétrica EM124SBP	navegando	
Perfilador SVP Plus Deep Sea	navegando	
Sondas biológicas	navegando	
Salinómetro	navegando+estación	
ADCP	navegando+estación	
Marport	navegando	
HiPap	navegando+estación	
Draga shipek	en estación	Chigre hidrográfico
Draga Van Veen	en estación	Chigre hidrográfico
Draga Box-Corer	en estación	Chigre hidrográfico
Draga roca	en estación	Chigre hidrográfico
MegaboxCorer	en estación	Chigre Multipropósito
ROTV Politolana	navegando	Chigre CTD
ROV BlueROV 150	navegando	Chigre CTD
CTD y Roseta	en estación	Chigre CTD
Perfilador SVP	en estación	Chigre hidrográfico
Manta trawl	navegando	Chigre hidrográfico
Red multinet	Navegando	Chigre Multipropósito
Red mesopelagos micronecton	Navegando	Chigre Multipropósito y tambor de red

26 techs. (13 UTM + 13 IEO)

Testing of different sampling methodologies and their feasibility in the Odón and in Antarctica: ROV, towed video (ROVT), CTD, underway, multibeam EM712, EM124, EK80, SPB, manta trawl, plankton and pelagic fish nets, and sediment sampling (rock, Shipek, Van Veen, and box corer).

Multibeam Echosounders

Equipment Test



- Functionality check of EM712 and EM124 (Kongsberg), and the SBP function of the EM124
- Mainly using the EM712 due to the depth of the work area
- Synchronized through the K-Sync synchronization unit
- Sound velocity profile measured with the AML Valeport profiler, which was integrated into the processing using the CARIS HIPS and SIPS software

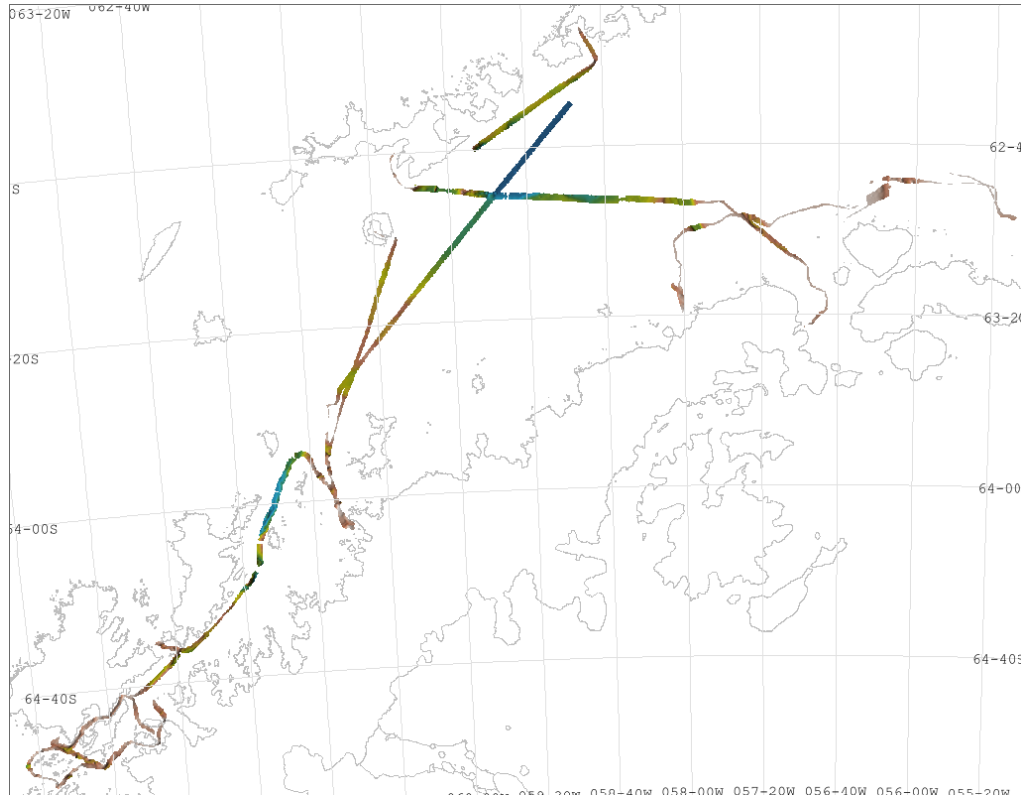
The process was divided into three distinct phases:

Acquisition

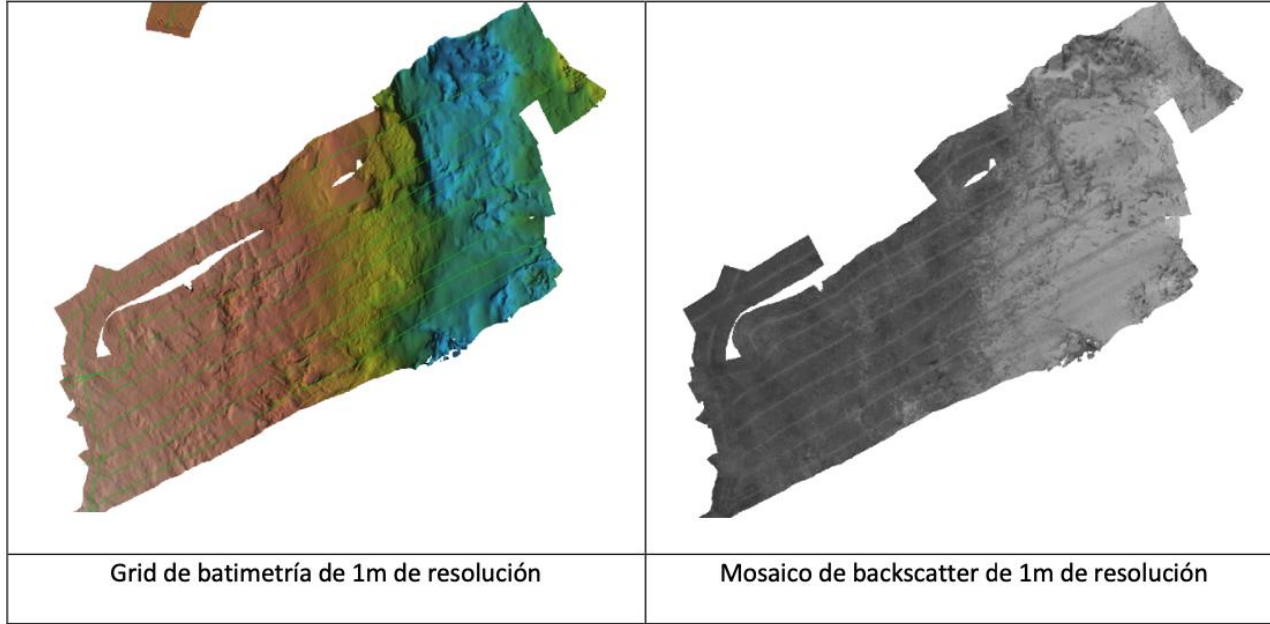
Parameter setup

Overlap testing

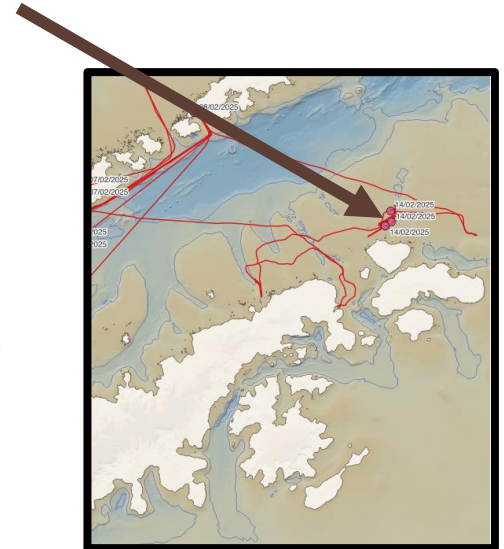
Noise testing with the echosounders in synchronization



- In total, including all transits and tests, an area of 2,219.68 km² was surveyed over a total of 1,526.66 km of navigation.
- Data within a depth range from 18 m to 1,554 m, achieving a grid resolution of 50 cm at a depth of 90 m.
- Data were processed onboard using CARIS HIPS & SIPS v12, applying sound velocity profiles acquired with the profiler and the onboard CTD, as well as synthetic profiles generated during transits using the WOA13 database.

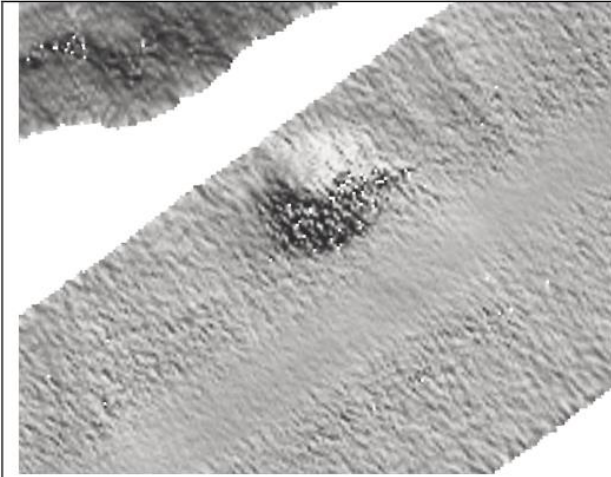


Joinville Island
East Bransfield St.

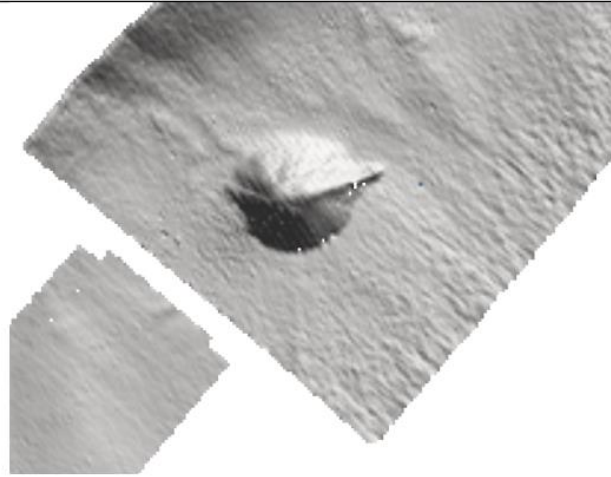


Multibeam Echosounders

Equipment Test



Datos adquiridos con la ecosonda Hydrosweep DS, B/O Sarmiento de Gamboa

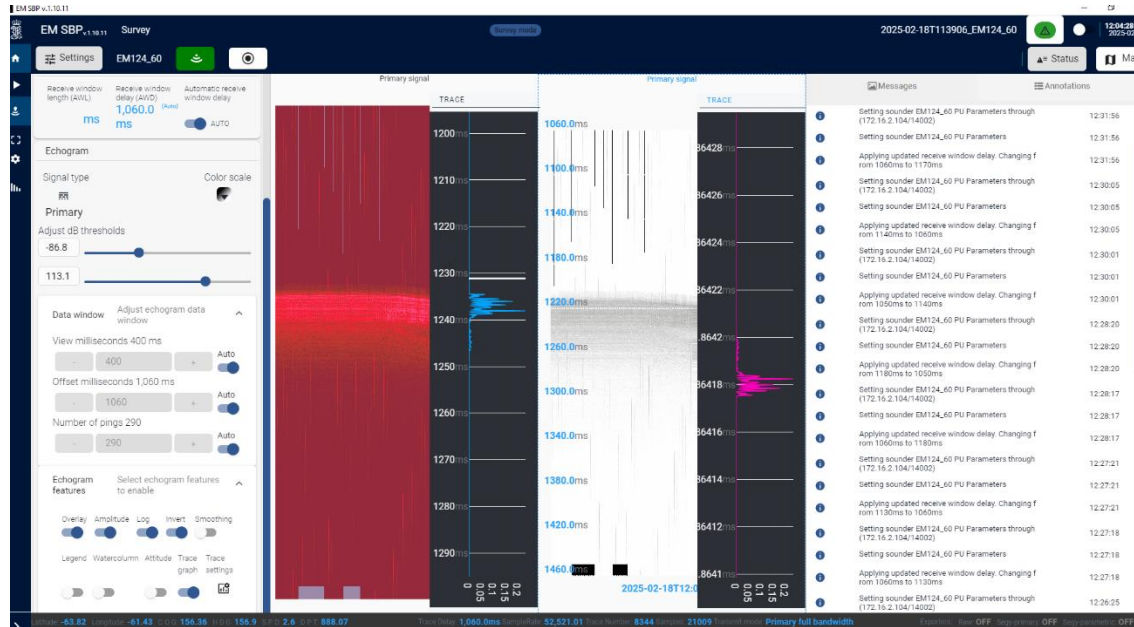


Datos adquiridos con la ecosonda EM124, B/O Odón de Buen



South King George Is.

Reson Teledyne Hydrosweep DS RV Sarmiento de Gamboa vs EM124 RV Odón de Buen

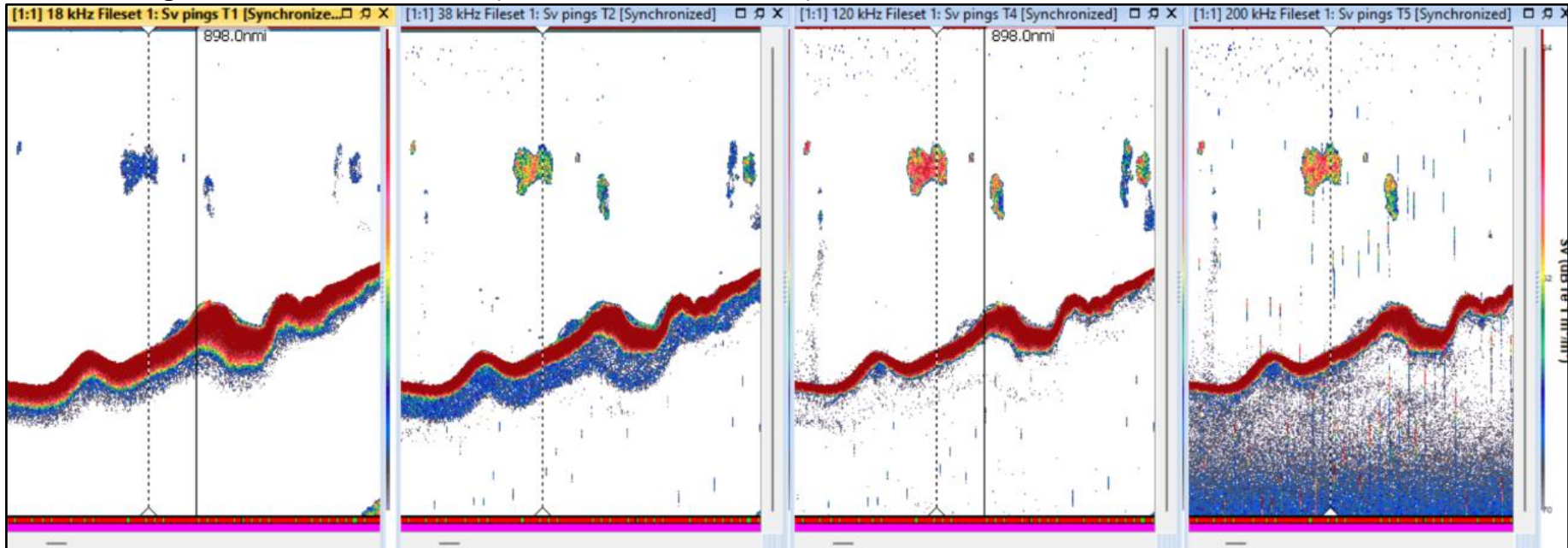


The primary frequency was successfully adjusted, but it was not possible to obtain a quality echogram with the parametric system, as neither the seafloor nor the processed signal could be detected.

EK80 and EM70 echosounders have been tested.

High data storage requirements: EK80 data were recorded in Continuous Wave (CW) mode (narrowband, discrete frequencies) for 29.4 hours, consuming 373 GB. With the EM70 multibeam echosounder, 42 minutes of recording (single sector) consumed 1 GB.

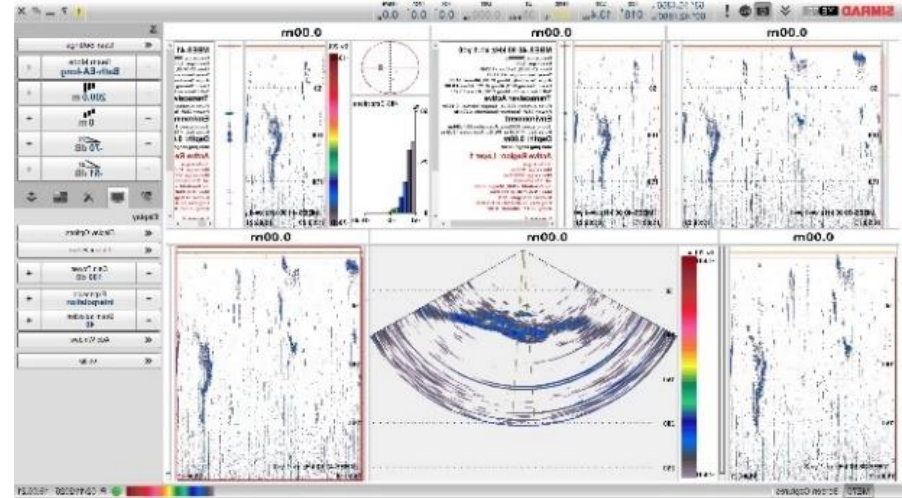
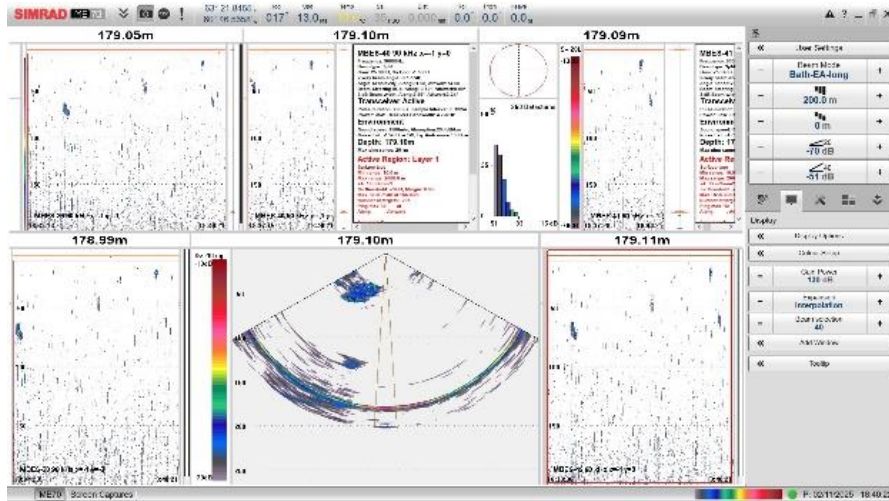
The biological and fisheries sonars (SU90, MF90, and MS70) were not tested.



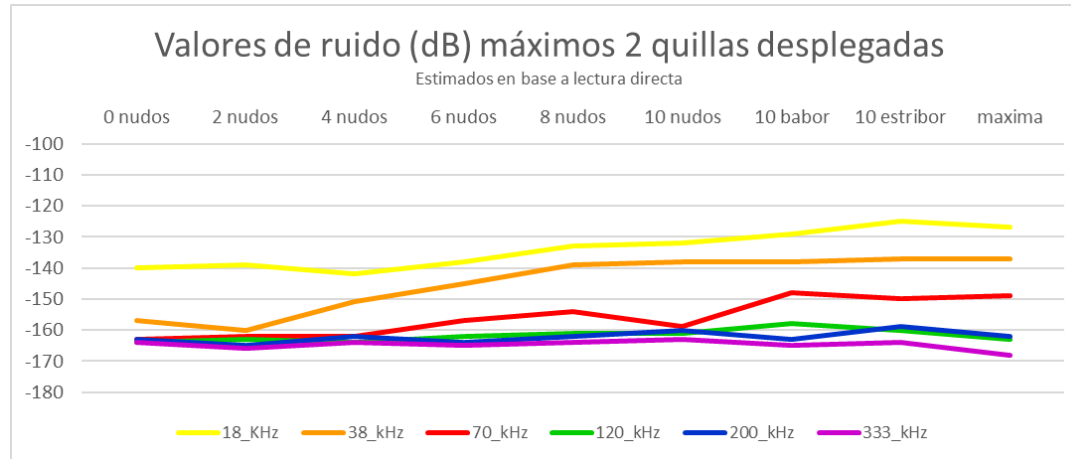
Biological Acoustics

- EM70 test
- High storage requirements

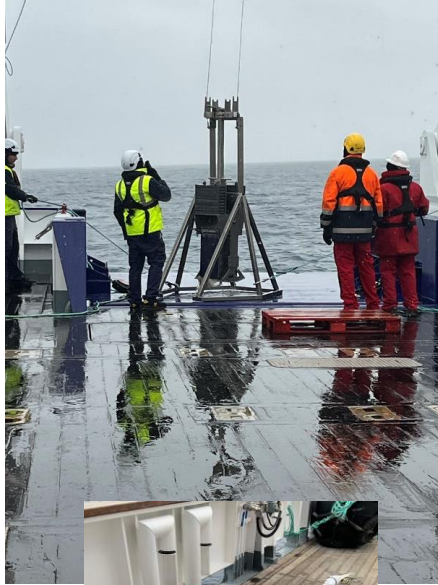
Equipment Test



- A radiated noise test was conducted at a depth of between 150 and 250 m, with both keels flush and unfurled.
- Preliminary results (direct readings) from the noise tests revealed inconsistencies, especially at 18 and 38 kHz, indicating the need for specific noise tests and calibration of the various transducers.
- The noise detected by the EK80 at 18 and 38 kHz disappeared when the EA640 stops transmitting at 12 kHz.



Sampling and Nesuton



Equipment Test

- 2 BOX-CORER & DRAGA Shipeck, Manta Trawl.
 - A-frame
 - T-frame
-
- No problems with the T-Frame
 - With the multipurpose winch (adding an intermediate block, calibrating the winch)
 - Improvement of the sample sorting area (drainage, proximity to water intake)

Active Heave Compensation (AHC) on winches

Equipment Test



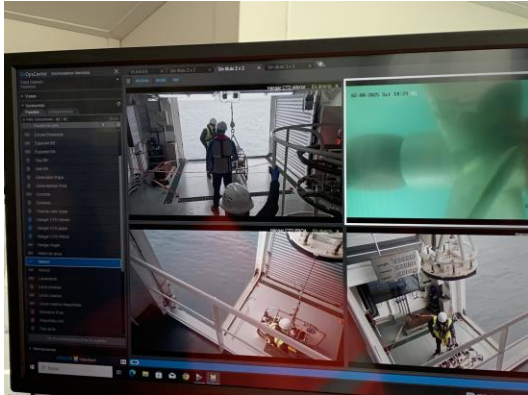
- Good heave compensation (waves of 3 m, crosswise to the sea. Stabilization +/- 10 cm)
- Tested with ROVT & CTD

CTD



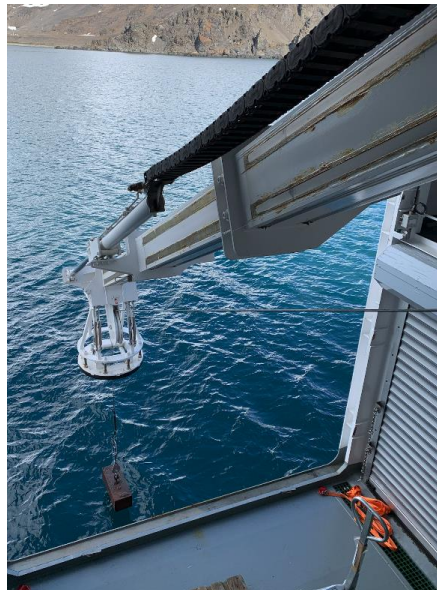
Equipment Test

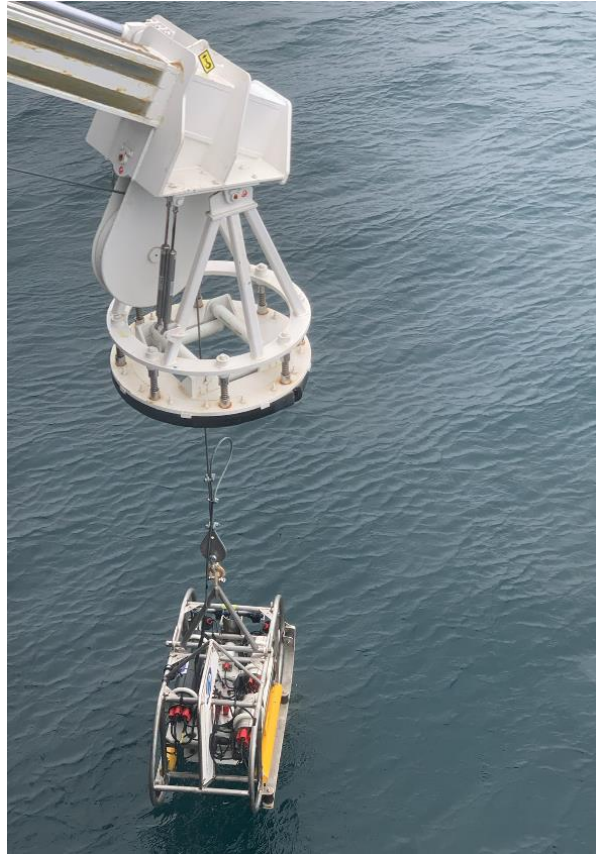
- SBE 911+ CTD with 24 bottles carousel with auxiliary sensors
- 4 casts in different locations
- CTD hangar ok (dimensions / operation)
- Winch control area some changes proposed
- CTD winch controls complex but safe and reliable



Pórticos

Equipment Test





- Connected to CTD winch with 8.000 m cable
- With AHC “flying” a 1.4 m from bottom at 0.5 Kt speed
- Fiber optics winch to be tested



- Complex system that needs training and adjustments



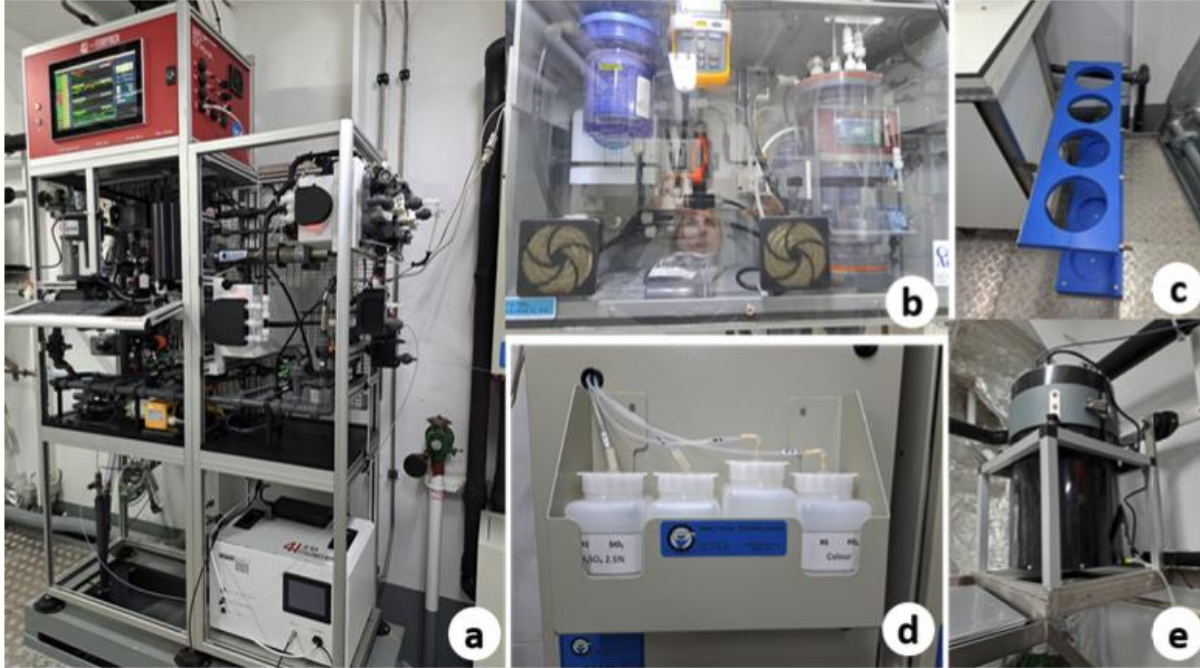
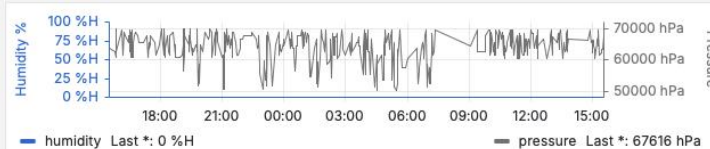
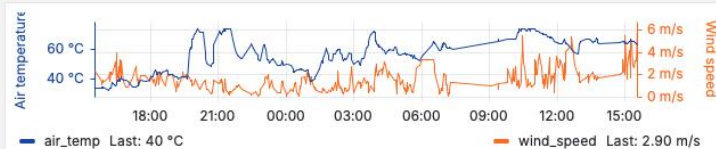


Figura 7. a) Módulo principal del sistema Ferrybox. b) Sistema de medición en continuo de la pCO₂. c) Soporte para las botellas de gases estándares. d) Reactivos para el análisis de la concentración de nutrientes inorgánicos. e) Citómetro de flujo.

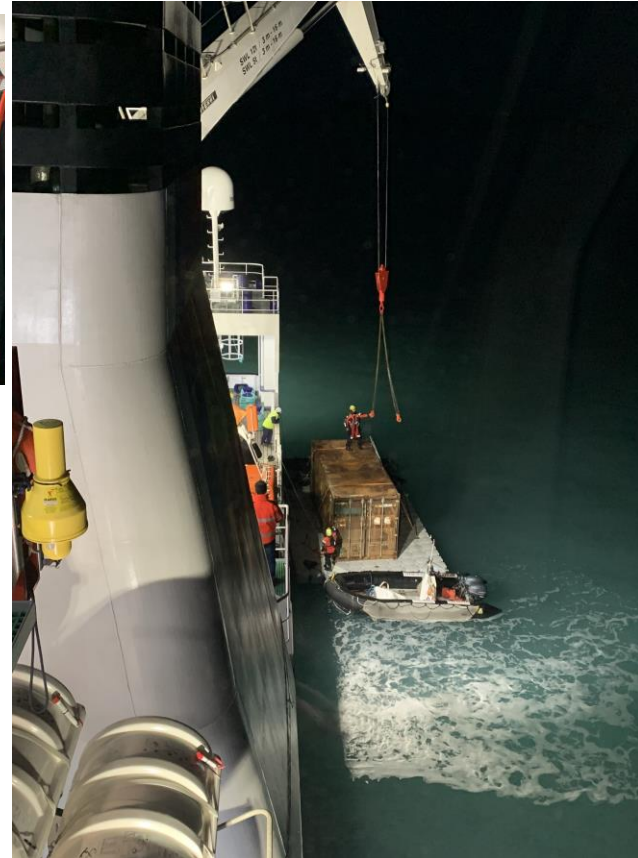
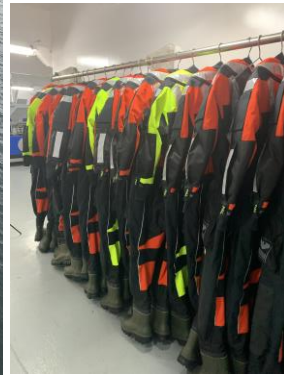
- The data collected by the entire system are stored in daily files.
- Distributed by Matrix systems to all devices connected..
- Transmitted in real time to shore (UTM servers).



ODÓN DE BUEN METEO



Logistics Capabilities



Shipyard Claims



Reclamo de garantía
Warranty claim

Construcción (Vessel): V140 – ODÓN DE BUEN	
Código de reclamo de garantía (Warranty claim code): G13	
Fecha informe (Report date): 23-01-2025	Fecha incidente (Incident date): 10-01-2025
Código de archivo (File Code): V140.2025.S4 G13	Redactado por (WC Writer): MANUEL PORTABALES

Descripción del reclamo de garantía (Warranty claim description):

La tornillería y las ruedas de las mamparas de las duchas se están deteriorando con demasiada rapidez, la tripulación está ajustando y apretando dichas ruedas pero en ocasiones éstas rompen con el propio movimiento de las mamparas a la hora de la ducha.

Se deben sustituir las piezas rotas en garantía y a ser posible de mayor calidad para evitar reclamaciones futuras y alguna de respeto, en su día se comentara de instalar un cierre entre las hojas móviles de las mampara para evitar su movimiento en navegación y asegurar una durabilidad mayor.

Warranty Claims

Garantias	Contabilización
Completo	44
Astillero	29
CRIONORM	1
Detegasa	1
Exacta	1
Frizonia	1
Novofri	1
Tecnisa	2
Wartsila	8
En progreso	30
Astillero	29
Ghenova	1
Sin iniciar	21
Astillero	14
Ghenova	1
SEDNI	1
Tecnisa	1
Wartsila	4
En preparación	26
Astillero	25
Frizonia	1
Total general	121



Thank you !