IX

Science & Education Report

MS Roald Amundsen

23 December 2025 – 2 January 2026

Highlights of Antarctica Expedition

When you arrived on MS Roald Amundsen you boarded a research-focused expedition ship, fully equipped as a floating laboratory, and designed to be a center of learning and discovery. In your time on board, you contributed to scientific studies and expanded your knowledge of the world around you. Let's take a look back on our journey and what we accomplished together while sailing along the wild and wonderful coast of the Antarctic Peninsula.

Arts, Music, Crafts & Creativity

Inspired by the landscapes, wildlife, and special moments along our journey, we created art to express our feelings. Through drawing, painting, and craft sessions, and much more, we made tangible keepsakes of our voyage.

We were able to share not only a wonderful journey, but we also celebrated Christmas and the New Year together. We created recycled ornaments, decorated holiday cookies, sang carols, danced, and played together in a show of joy and mirth.

Science & Education Programme

MS Roald Amundsen is more than a ship – it is a platform of opportunity for us to explore, collect meaningful data, and learn more deeply about the places we visit.

Our naturalist Expedition Team members guided our guests throughout our expedition. We observed, documented, and discussed the many interesting fauna, flora, and phenomena we witnessed. From replicating the true size of whales and dolphins to learning about the properties of icebergs, guests participated in activities and workshops that gave our guests a deeper understanding and appreciation for the natural world around us.

On the next pages you can find some highlights of our onboard Science and Education Programme as well as our Citizen Science Programme.

History & Culture

The ‘Heroic Age’ of Antarctic exploration was brought to life by our historian, who told us of the triumphs and tragedies of Shackleton, Amundsen, Scott, and many of the other brave explorers who dared to head into the unknown. We also saw evidence of human history in Antarctica in person when we visited the historic hut at Damoy, explored Almirante Brown Station, and stood among the remains of the former whaling station on Deception Island.

In addition to those physical reminders of Antarctic history, we were treated to a visit by the staff of Port Lockroy on behalf of the UK Antarctic Heritage Trust. We learned from them about the trust’s efforts in preserving Antarctic structures and artefacts. We also got a sample of what it’s like to be a modern day ‘Antarctican’ living and working at an Antarctic base!

Underwater Drone

The underwater world is endlessly fascinating: it seems as if it holds an entire universe in its depths. Luckily, with our state-of-the-art underwater drone, we are able to explore some of those places that we would otherwise only be able to imagine! We had the opportunity to deploy our underwater drone during our journey at the following sites:

- **Petermann Island, Antarctica**
- **Brown Station, Antarctica**
- **Deception Island, Antarctica**

Through the lens of the drone, we saw a variety of strange and beautiful creatures in their natural habitats. Invertebrate communities, colorful algaes, and even some curious penguins – the subsurface citizens of Antarctica, as glimpsed with this tool of modern exploration.

View the highlights from our underwater drone footage on HX Underwater Drone Footage YouTube Channel

Science Boat

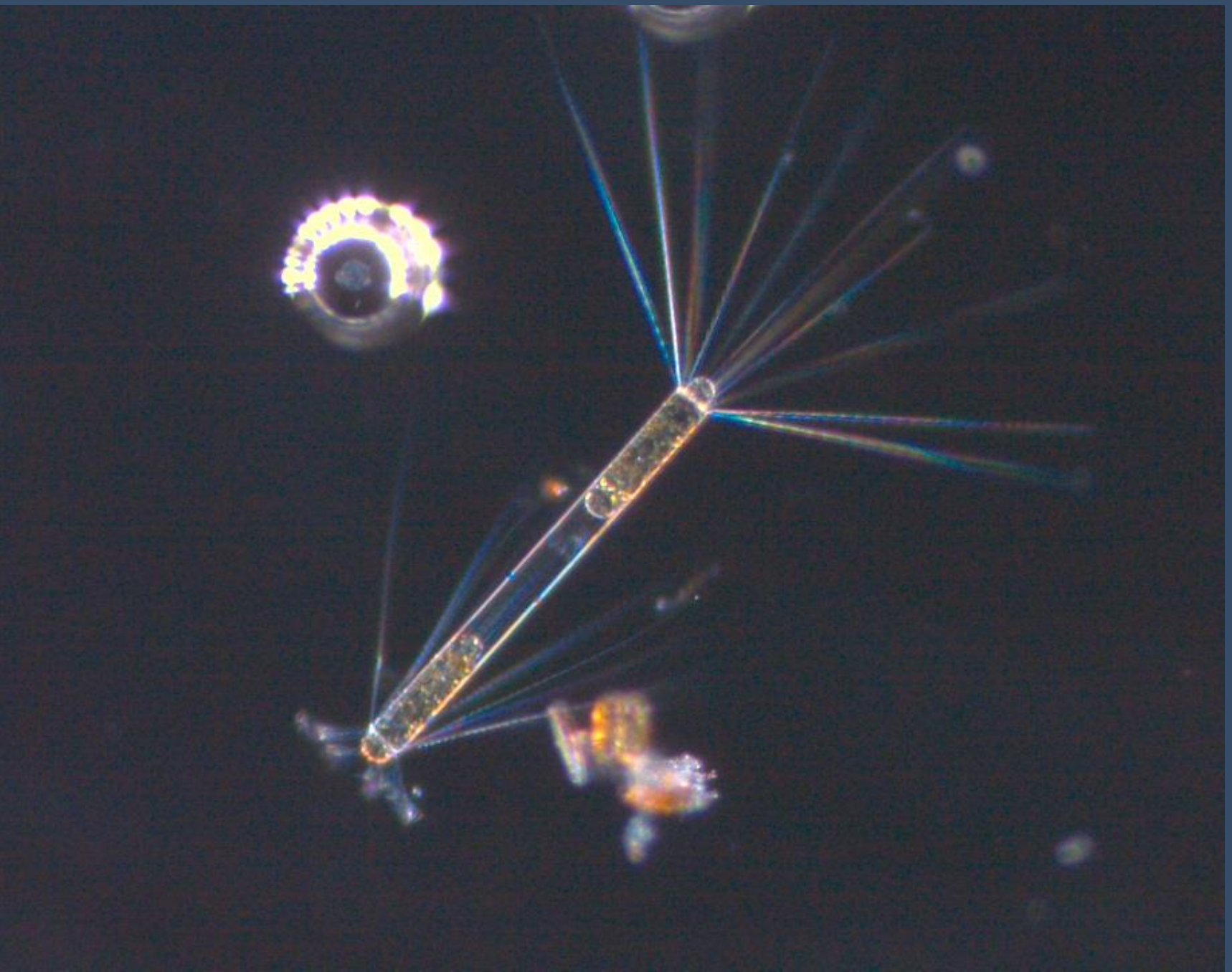
Learning in a lecture or workshop is one thing, but getting your hands wet (literally!) in the pursuit of science is quite another! For the guests who participated in the Science Boat sessions, they joined an experience focused on collecting meaningful data by 'taking the lab outside' – and underwater!

We investigated the underwater world during **21** Science Boat sessions in Antarctica at

- **Petermann Island**
- **Damoy Point**
- **Brown Station**
- **Orne Harbor**
- **Whaler's Bay on Deception Island**

We observed and discussed the wildlife and geology in each location to better understand the area's ecology.

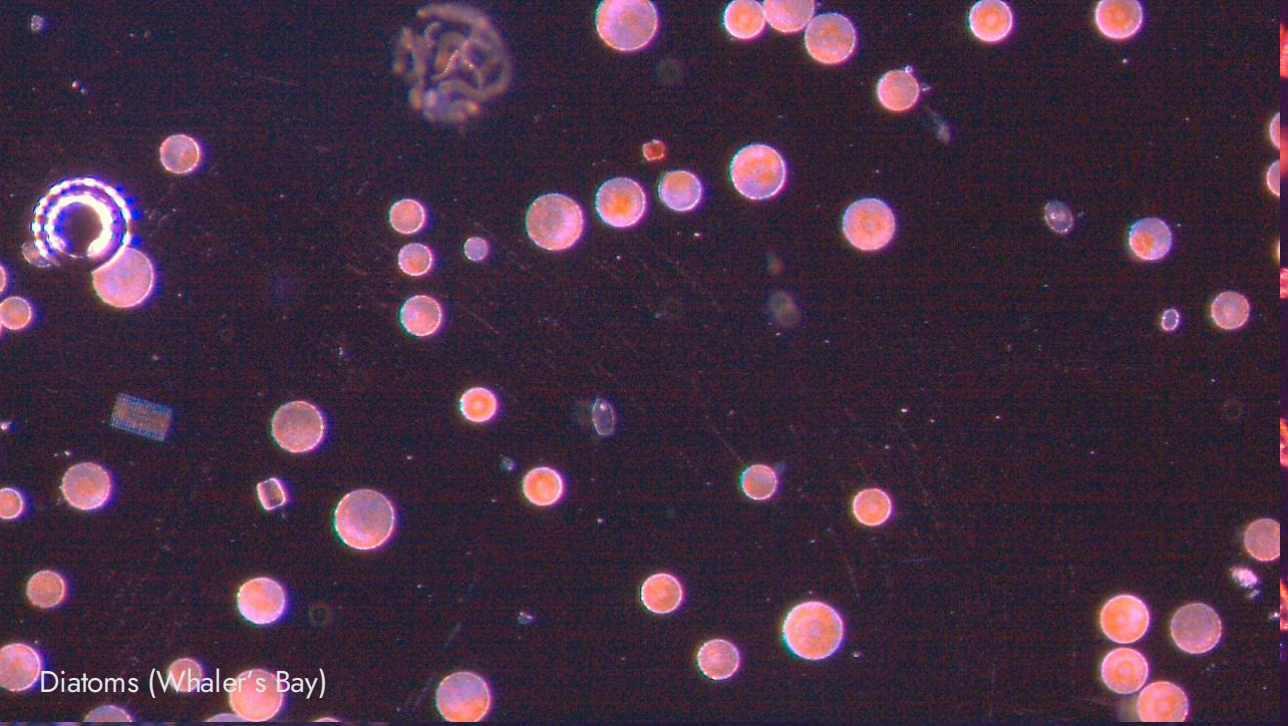
We deployed a plankton net to collect phytoplankton and zooplankton, used a CTD to create a physical profile of the water column, and took measurements of turbidity to submit to two Citizen Science projects: the Secchi Disk Project and FjordPhyto. The data we collected supports research on the long-term changes in the phytoplankton communities of the Antarctic Peninsula.



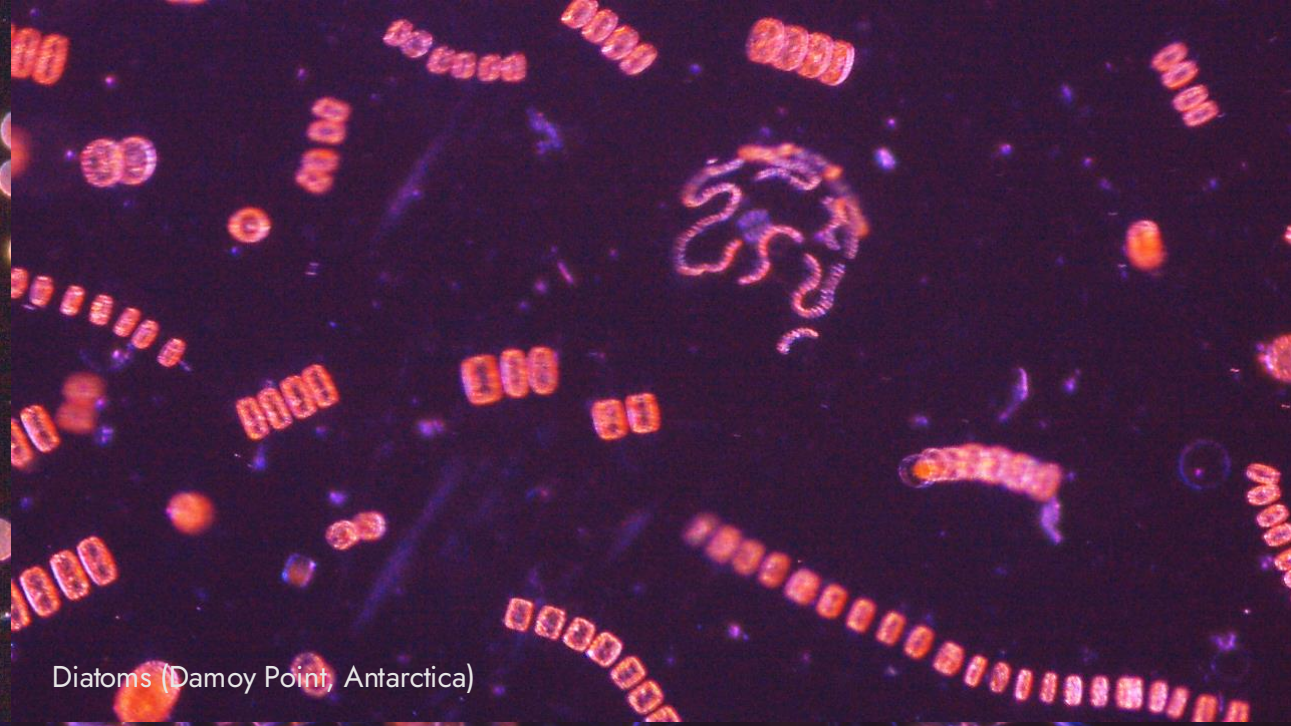
Plankton Samples

After we collected water samples on the Science Boat, we brought them back to the Science Centre to look at their contents under the microscope. From phytoplankton, those tiny photosynthetic organisms at the base of the food web, to crustaceans like amphipods, we encountered many different creatures. We noticed a difference in the communities of phytoplankton found among our sites in Antarctica: different species were dominant in certain areas, which could be related to differences in conditions including temperature and salinity. We saw only diatoms, the most common group of phytoplankton. There was no evidence of dinoflagellates or other unicellular organisms!

Let's take a closer look at some of what we found!

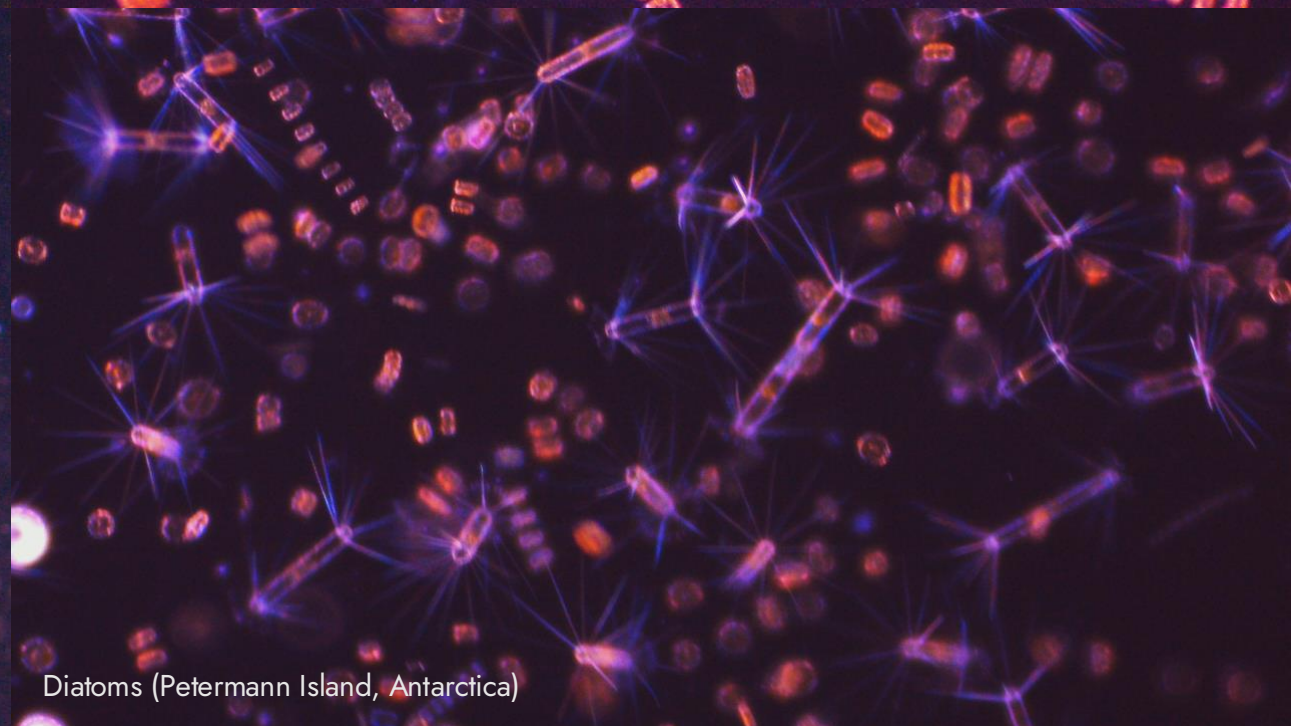


Diatoms (Whaler's Bay)



Diatoms (Damoy Point, Antarctica)

Amphipod (Damoy Point, Antarctica)



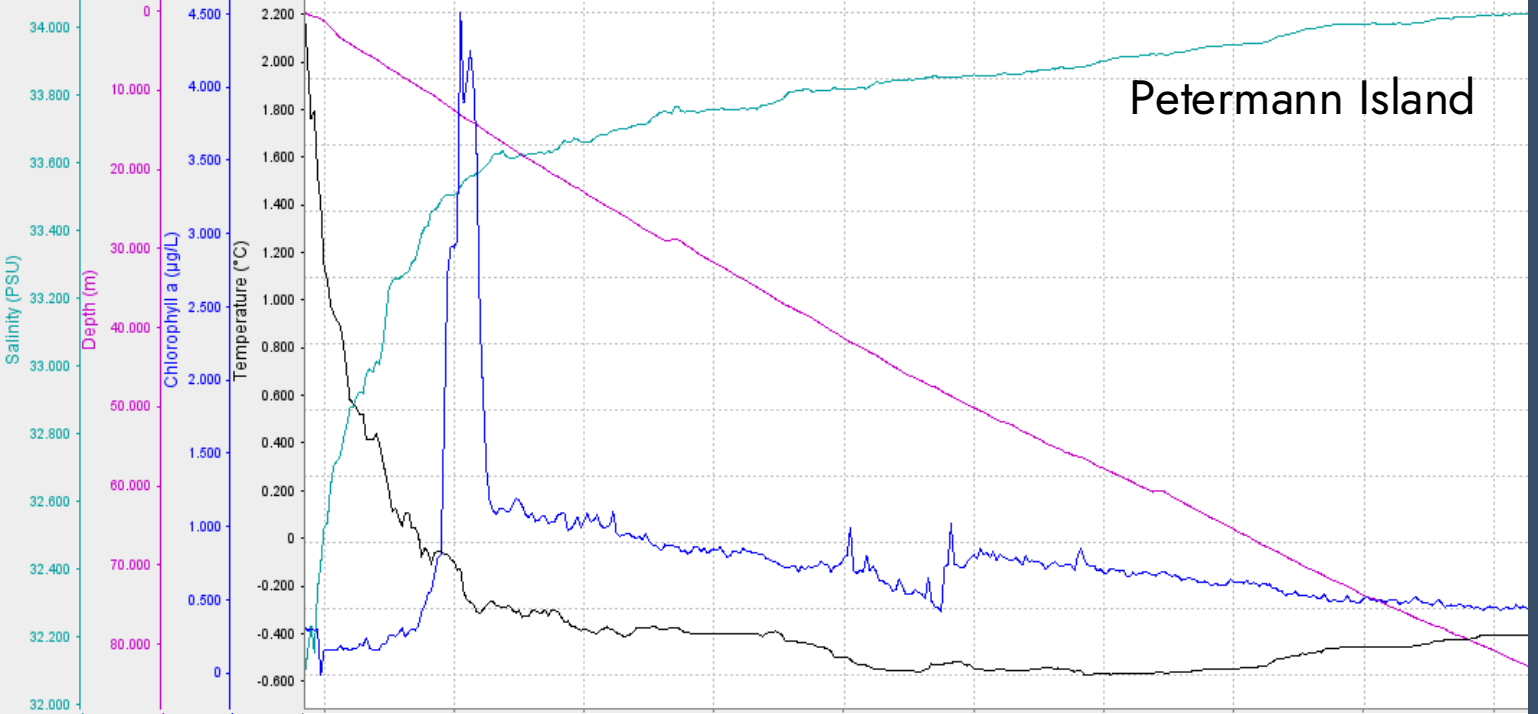
Diatoms (Petermann Island, Antarctica)

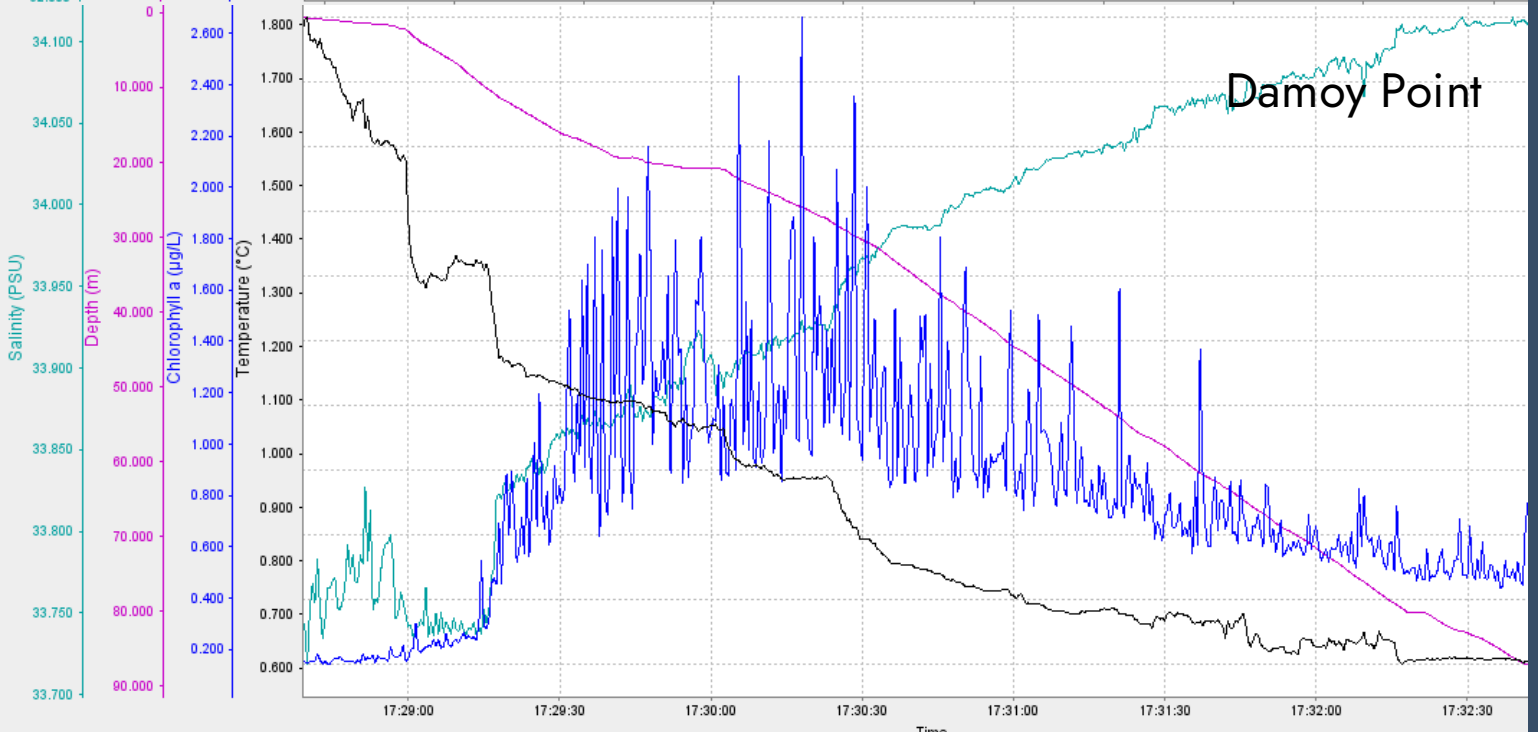
CTD Profiles

Our CTD casts gave us insight into the way salinity, temperature, and chlorophyll changed with depth. Every sampling site had a unique profile!

Stratification, or layering, can occur with salinity and temperature, causing different depths to have different characteristics. Typically, salinity increases with depth while temperature decreases, since cold, salty water is denser than warm, less salty water. If there is no stratification, we call the water column ‘well mixed’. Stratification can provide insights into nutrient replenishment at the surface, which is crucial for photosynthesis in phytoplankton. The presence or absence of phytoplankton can give us an idea of the productivity of an area: a region with a lot of phytoplankton means there is a lot of food at the base of the food web. We estimate phytoplankton abundance by measuring chlorophyll – the photosynthetic pigments in phytoplankton.

Different species have different tolerances to temperature, salinity, and sunlight, and all of these factors influence who can live where. As you can see, there are many complex relationships influencing this ‘primary productivity’. The data we collected provides valuable insight for scientists to better understand how these ecosystems work.





CTD Profiles

Our CTD profiles were each distinct from each other, but some trends emerged. The most distinct profile came from Petermann Island, where we saw a spike in phytoplankton in the first 10m of the water column, and very low phytoplankton concentration below. This was in contrast to our other sites, exemplified by Damoy Point, where phytoplankton were distributed primarily below 20m without any 'spike.' At all of our sites along the Antarctic Peninsula we observed a small difference in salinity in the top metres of the water column. This is indicative of some freshwater influence from melting ice. This salinity difference was not seen at Deception Island – all seasonal snow and ice had already melted, and no icebergs are present there.

Temperature was the most interesting part of all of our profiles: we captured the signal of a known marine heatwave. Our highest recorded surface temperature was at Brown Station, where we recorded a striking 4°C! Water temperatures in this region are typically between 0°C and 1°C. While this might sound like good news for a polar plunge, such high temperatures even for short periods can have significant effects on the marine community, from phytoplankton to krill. These temperatures may also be influencing why phytoplankton were concentrated at lower depths at our most of our Peninsula sites.

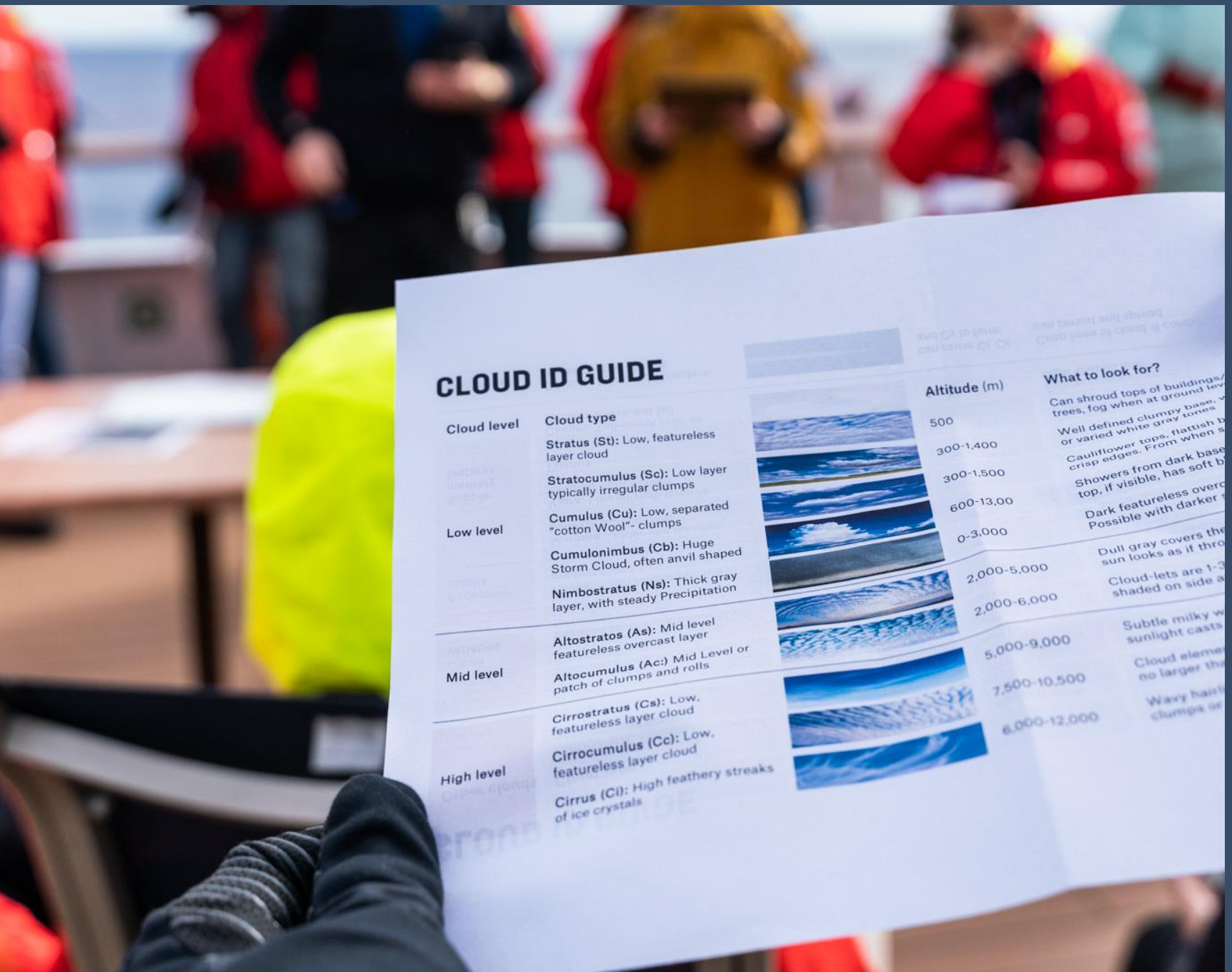
Citizen Science

FjordPhyto & the Secchi Disk Project

FjordPhyto is a Citizen Science project that investigates the influence of melting Antarctic glaciers on plankton communities in the Southern Ocean. For this project we took seawater samples to be analyzed to determine the abundance of different species of phytoplankton across the season. We also took DNA samples that will be used to investigate the genetic response of phytoplankton to climate change.

The Secchi Disk Project also invesitgates the presence of phytoplankton, not only in Antarctica, but throughout the world's oceans. You can make your own Secchi disk and continue this project at home.

Learn more about these projects at the FjordPhyto website and Secchi Disk Project Website.



Citizen Science

GLOBE Cloud Observer

They are more than just shapes in the sky; clouds are incredibly important components to Earth's heat budget and balance. Information about when, where, and what types of clouds are forming helps scientists understand more about Earth's climate and climate change. Through NASA's GLOBE Cloud Observer program, we help contribute this kind of data. Submissions from data-poor areas like the polar regions are especially important!

Our Citizen Scientists submitted **8** observations to the global database run by NASA. Our observations were matched to data from weather satellites orbiting Earth and will be used to better understand global weather phenomena.

If you would like to continue cloud observations at home, you can download the GLOBE Observer.

View our data on the global map

Citizen Science
iNaturalist

When you ask someone what animal they associate with Antarctica, the response is most likely “penguins!” But, as our Citizen Scientists documented, there is a wealth of life to be found here, from tiny single-called algae living in the snow to the giant whales – and even some very hardy plants! Every observation here is important since there is so little data available for this region compared to the rest of the world.

We used the Citizen Science app iNaturalist to identify and record the flora and fauna seen on our journey. Our observations are available to be used in global scientific research.

In total we recorded:
- **81** Species
- **314** Observations

… and counting; as you upload more photos from home our dataset grows!

View our data submitted on our iNaturalist project 2025 Dec 23 - 2026 Jan 02: MS Roald Amundsen: Highlights of Antarctica Expedition · iNaturalist

Citizen Science

eBird

Penguins, petrels, prions, and beyond – our trip to Antarctica was replete with seabirds of all shapes and sizes. From the charismatic penguins to the majestic great albatrosses, we spent hours on deck watching these splendid creatures. Our guests and onboard naturalists were constantly surveying and recording the avifauna we encountered along our route.

We recorded **27** bird species across **26** eBird checklists. Through the eBird platform, the data we collected is available for scientists around the world to help understand patterns of bird distribution, migration, and habitat use.

View our data for this trip here:
AMANT2515 - Highlights of Antarctica - eBird Trip Report

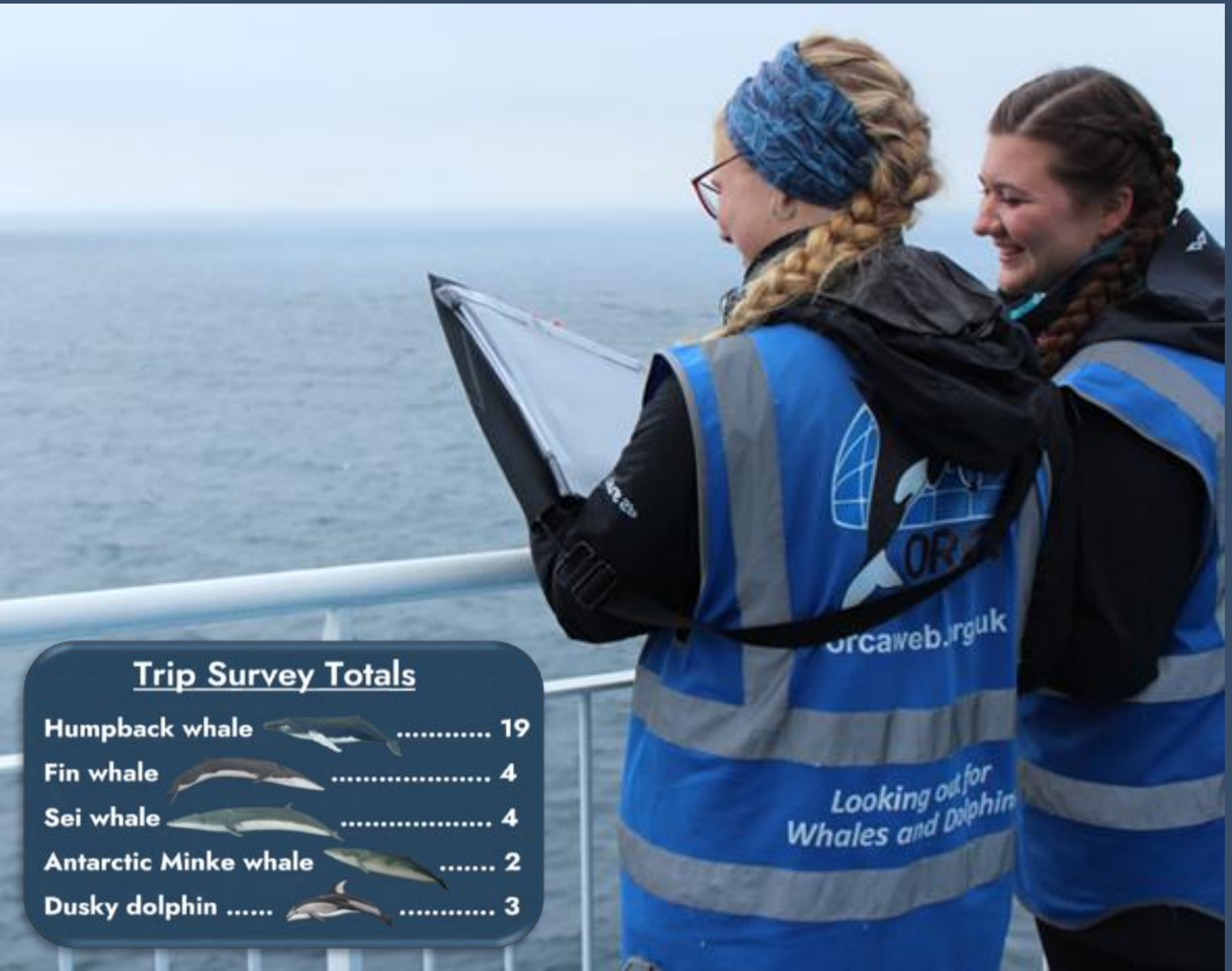
Citizen Science

Happywhale

Cetaceans — whales, dolphins, and porpoises – capture our imaginations and our hearts whenever we witness them. And, doing something as simple as taking a photo of them can help scientists learn more about these animals. That's where Happywhale comes in: by using AI to match images of each individual whale's unique markings, they can track individuals as they migrate across the world and through their lives. When you submit a photo, you will also be notified of any past and future matches of that individual!

Happywhale uses the fingerprint-like patterns on humpback whales' flukes to identify them. On this voyage we submitted photos of **15 humpback whale** individuals to be identified. We have already received **5** matches back! We also submitted **3 Weddell seals** and **1 leopard** seal photos. This data has added to Happywhale's catalogue of identified whales and seals across the world.

View the MS Roald Amundsen's submissions to Happywhale during our voyage:
Happywhale: MS Roald Amundsen 23 December 2025 to 02 January 2026



Partnership
ORCA

Our partners at the whale and dolphin conservation charity ORCA are committed to conducting research that helps to identify important whale and dolphin habitats by using 'platforms of opportunity' including expedition ships like MS Roald Amundsen! Our onboard ORCA Ocean Conservationist, with the help of our guests, recorded vital sightings data across the course of our expedition that will help inform conservation decisions and policy in the future.

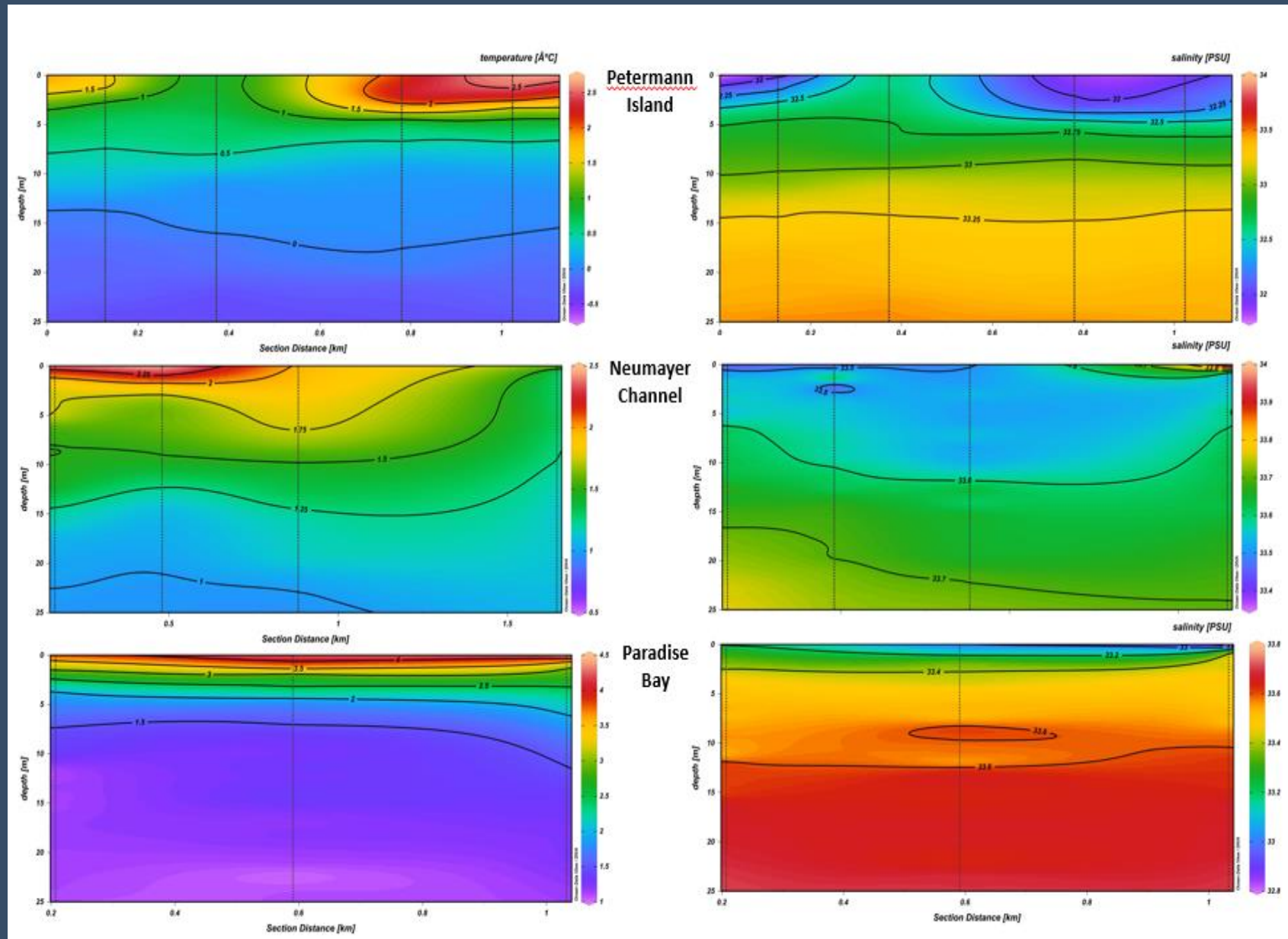
On our voyage, we surveyed **292.6km** of ocean for cetaceans!

View more information about our partnership with ORCA here
ORCA | HX Hurtigruten Expeditions

Partnership

Guest Scientists

We were fortunate to be joined on this voyage by Dr. Juan Hofer and students Constanza and Rafaella, Guest Scientists from the **Pontifical Catholic University of Valparaíso** in collaboration with the **Norsk Polar Institute.** First we visited the NPI field camp at Petermann Island, where we dropped Constanza off so she could swap with Rafaela as part of a team monitoring the penguin colonies there. Rafaela then joined Juan on board, where they collected data on how glacial meltwater is influencing the biological and physical characteristics of coastal waterbodies along the Antarctic Peninsula. Using a CTD, they sampled along a transect, starting near glacier faces and moving away, collecting data on temperature and salinity. Where Antarctic waters are typically well-mixed, they found evidence of the impact of glacial meltwater on the salinity of surface waters (right-side plots). They also found evidence supporting the occurance of a marine heatwave, with surface temperatures as high as 4°C and a stark thermocline (left-side plots). Rafaella's GPS-tracking data showing penguins foraging further offshore supports that these conditions may be impacting the marine ecosystem.



Wildlife List — Birds

Wildlife List – Birds

Scientific Name	English	Deutsch	Français	中文
Chionis albus	**snowy sheathbill**	Weißgesicht-Scheidenschnabel	Chionis blanc	白鞘嘴鸥
Stercorarius antarcticus	**brown skua**	Subantarktikskua	labbe Antarctique	大贼鸥
Stercorarius maccormicki	**south polar skua**	Antarktikskua	labbe de McCormick	麦氏贼鸥
Stercorarius chilensis	**Chilean skua**	Chileskua	labbe du Chili	智利贼鸥
Leucophaeus scoresbii	**dolphin gull**	Blutschnabelmöwe	goéland de Scoresby	豚鸥
Larus dominicanus	**kelp gull**	Dominikanermöwe	goéland dominicain	黑背鸥
Sterna vittata	**Antarctic tern**	Antarktikseeschwalbe	sterne couronnée	南极燕鸥
Sterna hirundinacea	**South American tern**	Falklandseeschwalbe	sterne hirundinacée	南美燕鸥
Pygoscelis adeliae	**Adélie penguin**	Adeliepinguin	manchot d'Adélie	阿德利企鹅
Pygoscelis papua	**gentoo penguin**	Eselspinguin	manchot papou	白眉企鹅
Pygoscelis antarcticus	**chinstrap penguin**	Kehlstreifpinguin	manchot à jugulaire	纹颊企鹅
Spheniscus magellanicus	**Magellanic penguin**	Magellanpinguin	manchot de Magellan	南美企鹅
Leucocarbo atriceps	**imperial cormorant**	Kaiserscharbe	cormoran impérial	蓝眼鸬鹚

Wildlife List – Birds

Scientific Name	English	Deutsch	Français	中文
Diomedea exulans	**snowy albatross**	Wanderalbatros	albatros hurleur	-
Diomedea epomophora	**Southern Royal albatross**	Südkönigsalbatros	albatros royal	-
Phoebetria palpebrata	**light-mantled albatross**	Graumantelalbatros	albatros fuligineux	-
Thalassarche chrysostoma	**grey-headed albatross**	Graukopfalbatros	albatros à tête grise	-
Thalassarche melanophris	**black-browed albatross**	Schwarzbrauenalbatros	albatros à sourcils noirs	-
Oceanites oceanicus	**Wilson's storm petrel**	Buntfuß-Sturmschwalbe	océanite de Wilson	-
Fregetta tropica	**black-bellied storm petrel**	Schwarzbauch-Sturmschwalbe	océanite à ventre noir	-
Macronectes giganteus	**southern giant petrel**	Riesensturmvogel	pétrel géant	巨鹱
Fulmarus glacialoides	**southern fulmar**	Silbersturmvogel	fulmar argenté	银灰暴风鹱
Thalassoica antarctica	**Antarctic petrel**	Antarktiksturmvogel	pétrel antarctique	南极鹱
Daption capense	**pintado petrel**	Kapsturmvogel	damier du Cap	花斑鹱
Pagodroma nivea	**snow petrel**	Schneesturmvogel	pétrel des neiges	雪鹱
Halobaena caerulea	**blue petrel**	Blausturmvogel	prion bleu	蓝鹱
Pachyptila desolata	**Antarctic prion**	Taubensturmvogel	prion de la Désolation	鸽锯鹱
Pachyptila belcheri	**slender-billed prion**	Dünnschnabel-Sturmvogel	prion de Belcher	细嘴锯鹱
Procellaria aequinoctialis	**white-chinned petrel**	Weißkinn-Sturmvogel	puffin à menton blanc	白颏风鹱
Ardenna grisea	**sooty shearwater**	Dunkler Sturmtaucher	puffin fuligineux	灰鹱

Wildlife List — Marine Mammals

Wildlife List – Marine Mammals

Scientific Name	English	Deutsch	Français	中文
Balaenoptera bonaerensis	**Antarctic minke whale**	Südlicher Zwergwal	rorqual à museau pointu de l'Antarctique	南极小须鲸
Balaenoptera borealis	**sei whale**	Seiwal	rorqual de Rudolphi	塞鲸
Balaenoptera physalus	**fin whale**	Finnwal	rorqual commun	长须鲸
Megaptera novaeangliae	**humpback whale**	Buckelwal	baleine à bosse	大翅鲸
Cephalorhynchus commersonii	**Commerson's dolphin**	Commerson-Delfin	véphalorhynque de Commerson	黑白海豚
Lagenorhynchus australis	**Peale's dolphin**	Peale-Delfin	lagénorhynque de Peale	皮氏斑纹海豚
Lagenorhynchus cruciger	**hourglass dolphin**	Stundenglasdelfin	lagénorhynque sablier	沙漏斑纹海豚
Lagenorhynchus obscurus	**dusky dolphin**	Schwarzdelfin	lagénorhynque obscur	暗色斑纹海豚
Otaria byronia	**South American sea lion**	Mähnenrobbe	lion de mer d'Amérique du Sud	南海狮
Hydrurga leptonyx	**leopard seal**	Seeleopard	léopard de mer	豹海豹
Leptonychotes weddellii	**Weddell seal**	Weddelrobbe	phoque de Weddell	韦德尔氏海豹
Lobodon carcinophaga	**crabeater seal**	Krabbenfresser	phoque crabier	食蟹海豹
Mirounga leonina	**southern elephant seal**	Südlicher See-Elefant	eléphant de mer austral	南象海豹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