IX

Science & Education Report

MS Roald Amundsen

2 – 18 Jan 2026

Antarctic Circle 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 centre of learning and discovery. During 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 while sailing along the wild and wonderful coast of the Antarctic Peninsula to the Antarctic Circle.

Arts, Music, Crafts & Creativity

Inspired by the landscapes, wildlife, and special moments along our journey, we created art to express our feelings.

Through drawing sessions, painting sessions, craft sessions, and much more, we made tangible keepsakes of our voyage.

We also enjoyed the talents of our guests, staff, and crew who entertained us with poetry readings, dancing, and musical performances along the way.

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 onboard Naturalists guided our guests throughout our expedition. We documented and discussed the many interesting fauna, flora, and phenomena we witnessed. From replicating the true sizes of whales to learning about the properties of icebergs, guests participated in activities and workshops that gave you 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 and our Citizen Science Program.

History & Culture

The Heroic Age of Antarctic Exploration was brought to life by our Historian. He 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 South'. We also saw evidence of human history in Antarctica when we explored Base Y on Horseshoe Island and Base E and the US East Base on Stonington Island, cruised past Brown Station, Port Lockroy, and Vernadsky Station, visited the Wordie House, witnessed the hut at Damoy Point, 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 UKAHT'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:

- **Horseshoe Island**
- **Stonington Island**
- **Cuverville Island**
- **Deception Island**

Through the lens of the drone, we saw a variety of strange and beautiful creatures in their natural habitats: invertebrate communities, colourful algaes, swimming scallops, giant sunstars, and even some curious penguins. These are 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

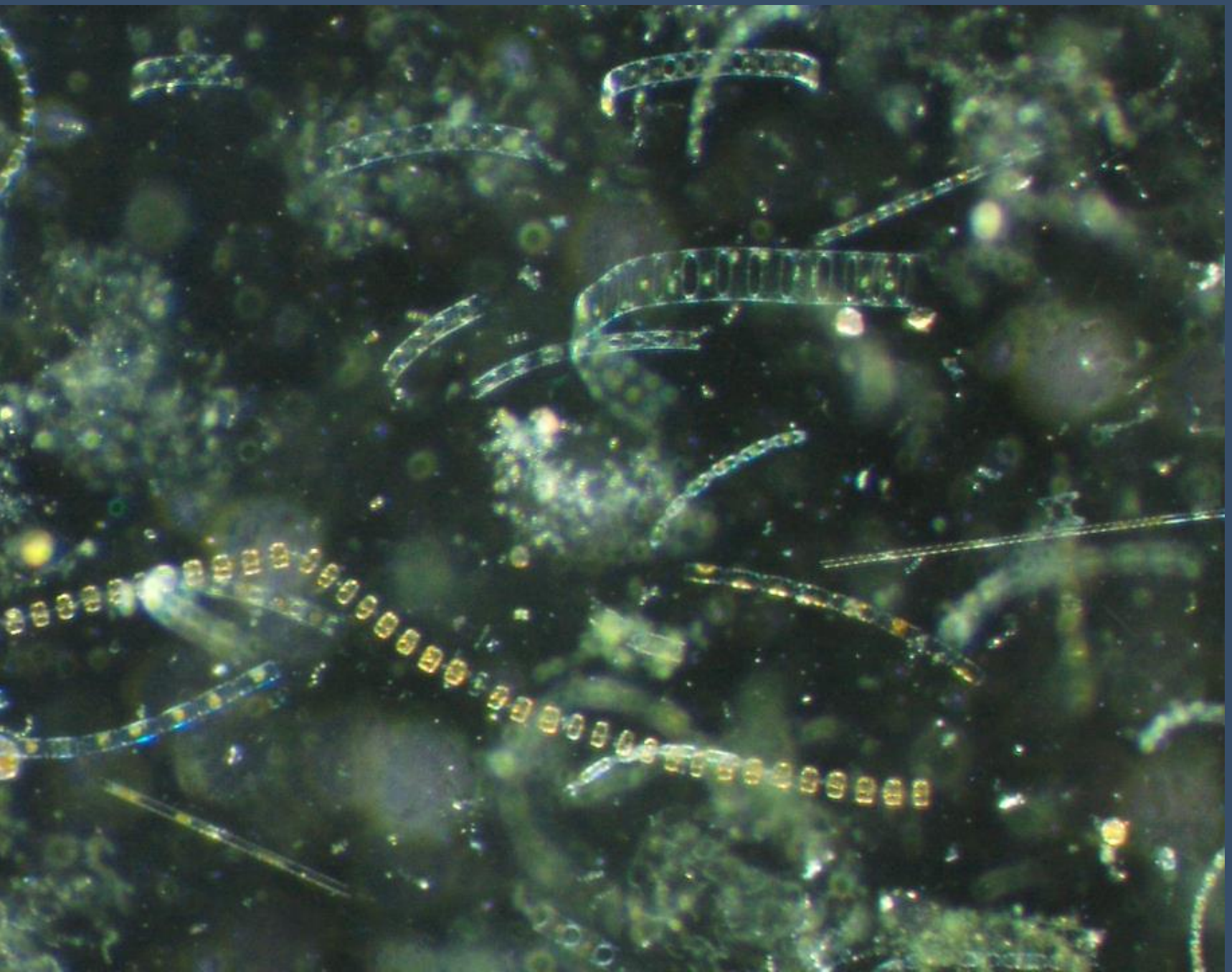
Learning in a lecture or workshop is one thing, but getting your hands wet (literally!) in the pursuit of science is quiet another! For the guests who participated in the science boat outings, they joined an experience focused on collecting meaningful data by 'taking the lab outside' – and underwater!

We investigated the underwater world during **18** Science Boat sessions in Antarctica at

- **Petermann Island**
- **Bongrain Point & Horseshoe Island**
- **Stonington Island**
- **Damoy Point**
- **Cuverville Island**
- **Whaler's Bay on Deception Island**

We observed the conditions in each location above to better understand the area's ecology.

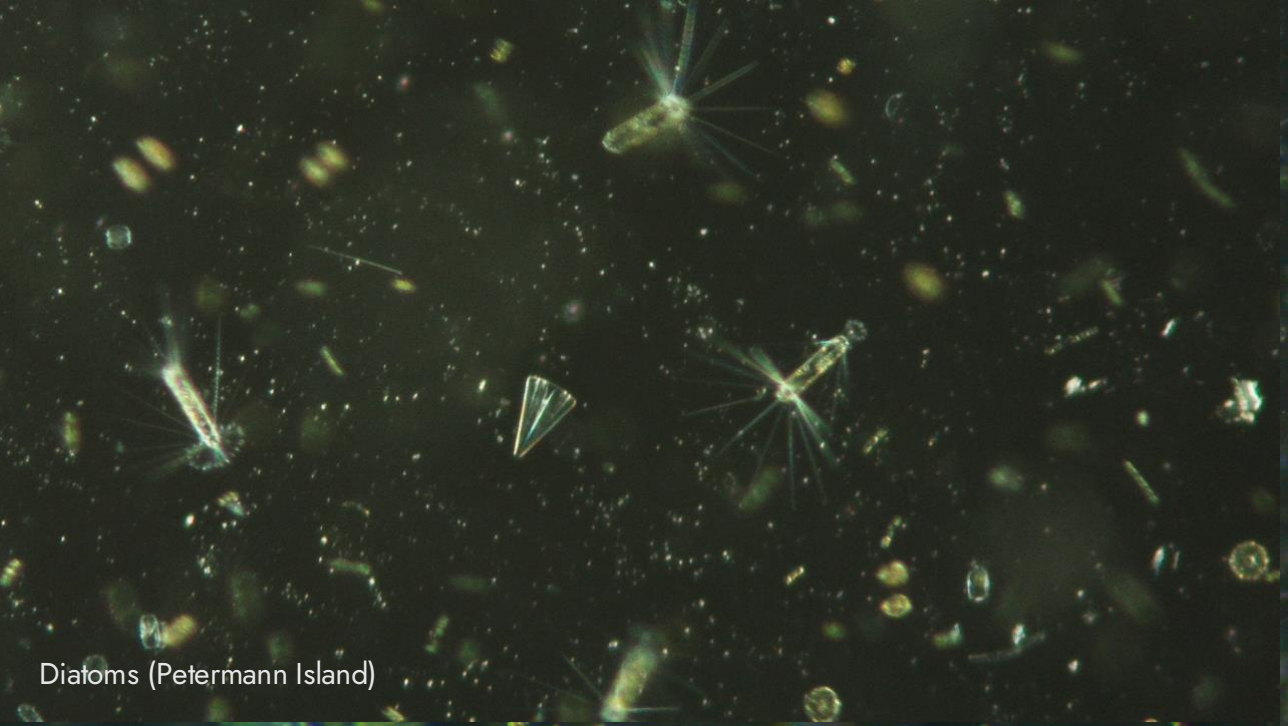
We deployed a plankton net to collect phytoplankton and zooplankton, used a CTD to create a physical profile of the water column, and took measurements of turbidity to submit to two Citizen Science projects: the Secchi Disk Project and FjordPhyto. The data we collected supports research on long-term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



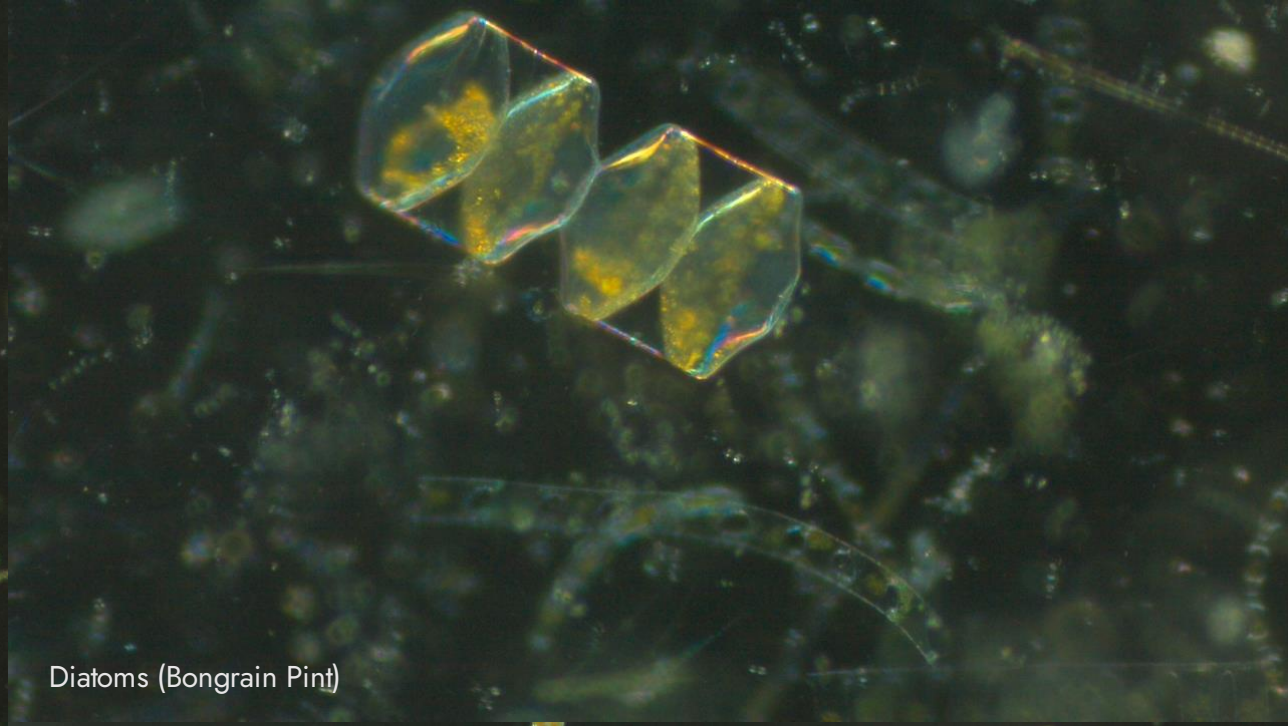
Plankton Samples

After we collected water samples on the science boat outing, 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 zooplankton like krill, 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, salinity, and amount of sunlight. In fact, below the Antarctic Circle we found much larger and more diverse blooms of phytoplankton. Here, daylight hours are greater than above the Circle, meaning phytoplankton have an even longer time to absorb sunlight over the course of the summer, leading to longer blooms.

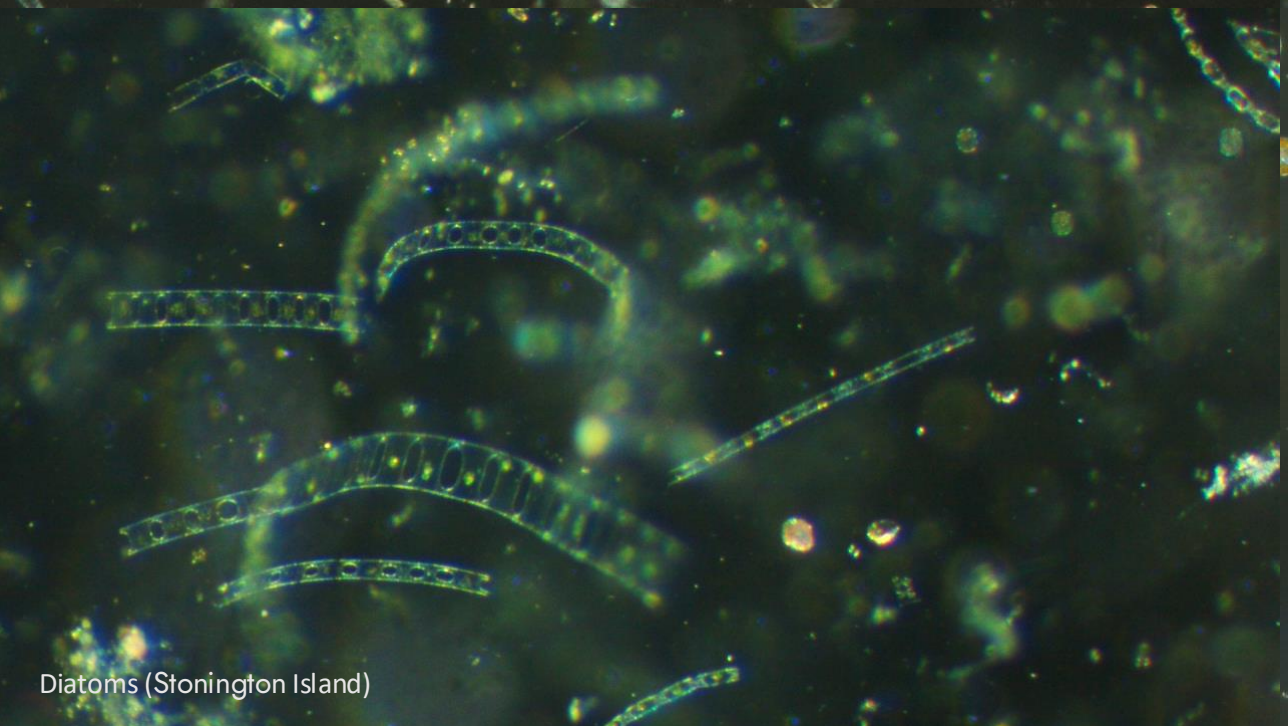
Let's take a closer look at some of what we found!



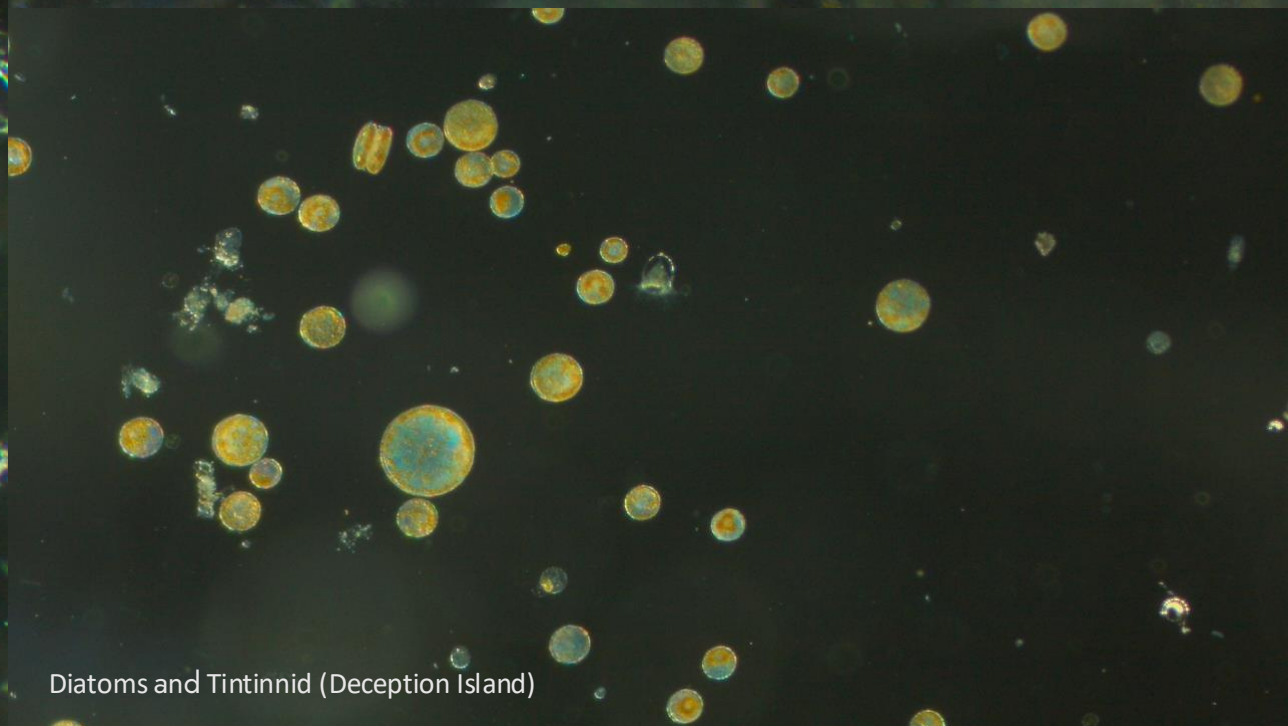
Diatoms (Petermann Island)



Diatoms (Bongrain Pint)



Diatoms (Stonington Island)



Diatoms and Tintinnid (Deception Island)

Copepod (Bongrain Point)

Krill zoea (Bongrain Point)

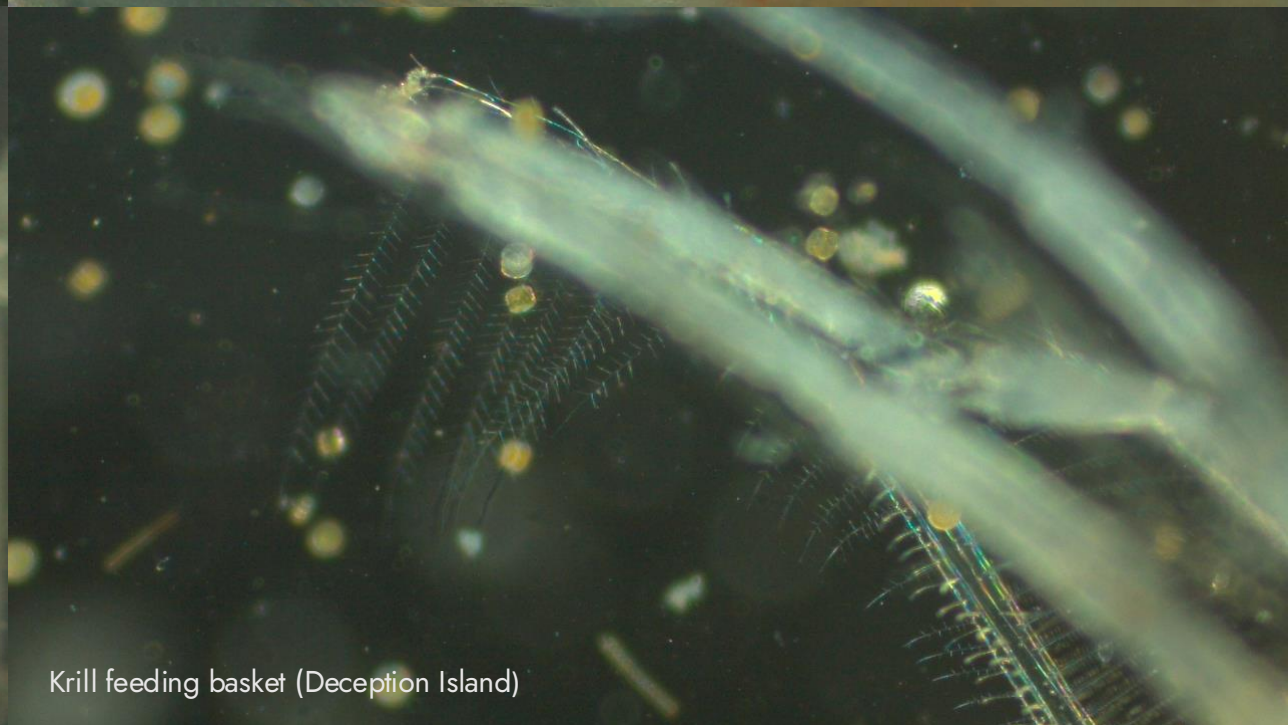
Ctenophore (Bongrain Point)

Acorn worm larvae (Horseshoe Island)

Polychaete worm trochophore larva (Horseshoe Island)

Krill eyes (Deception Island)

Amphipod (Deception Island)



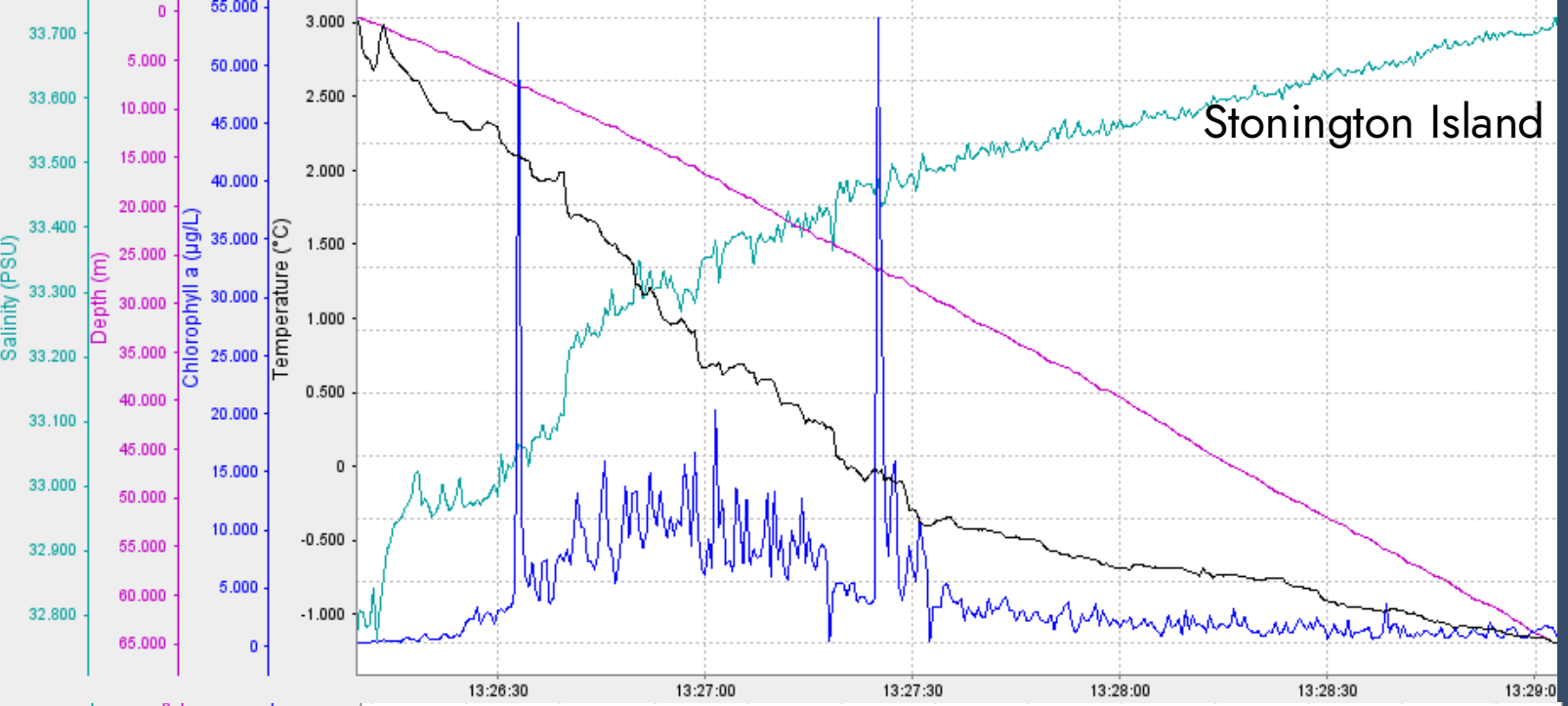
Krill feeding basket (Deception Island)

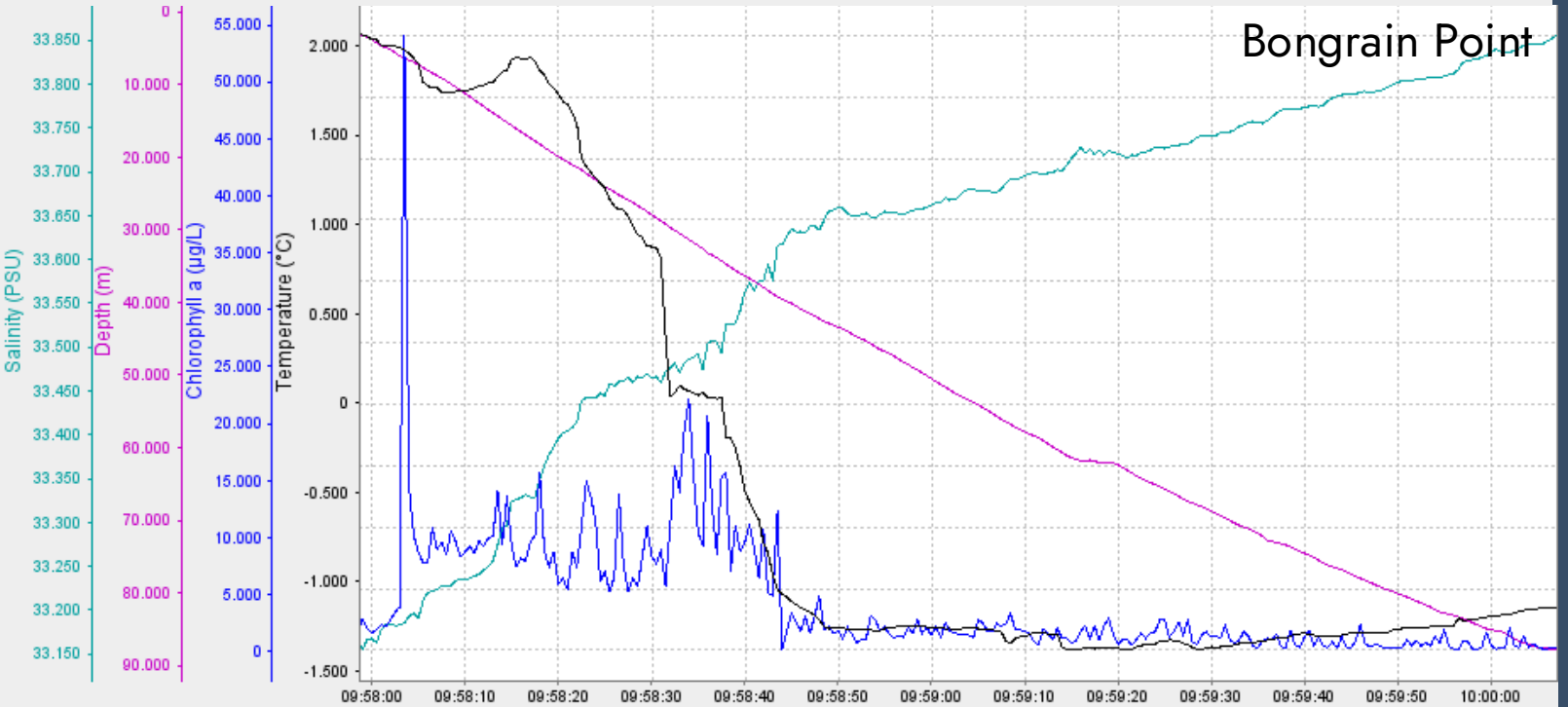
CTD Profiles

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 tell, there are many complex relationships influencing this ‘primary productivity’. The data we collect provides valuable insight for scientists to better understand how these ecosystems work!





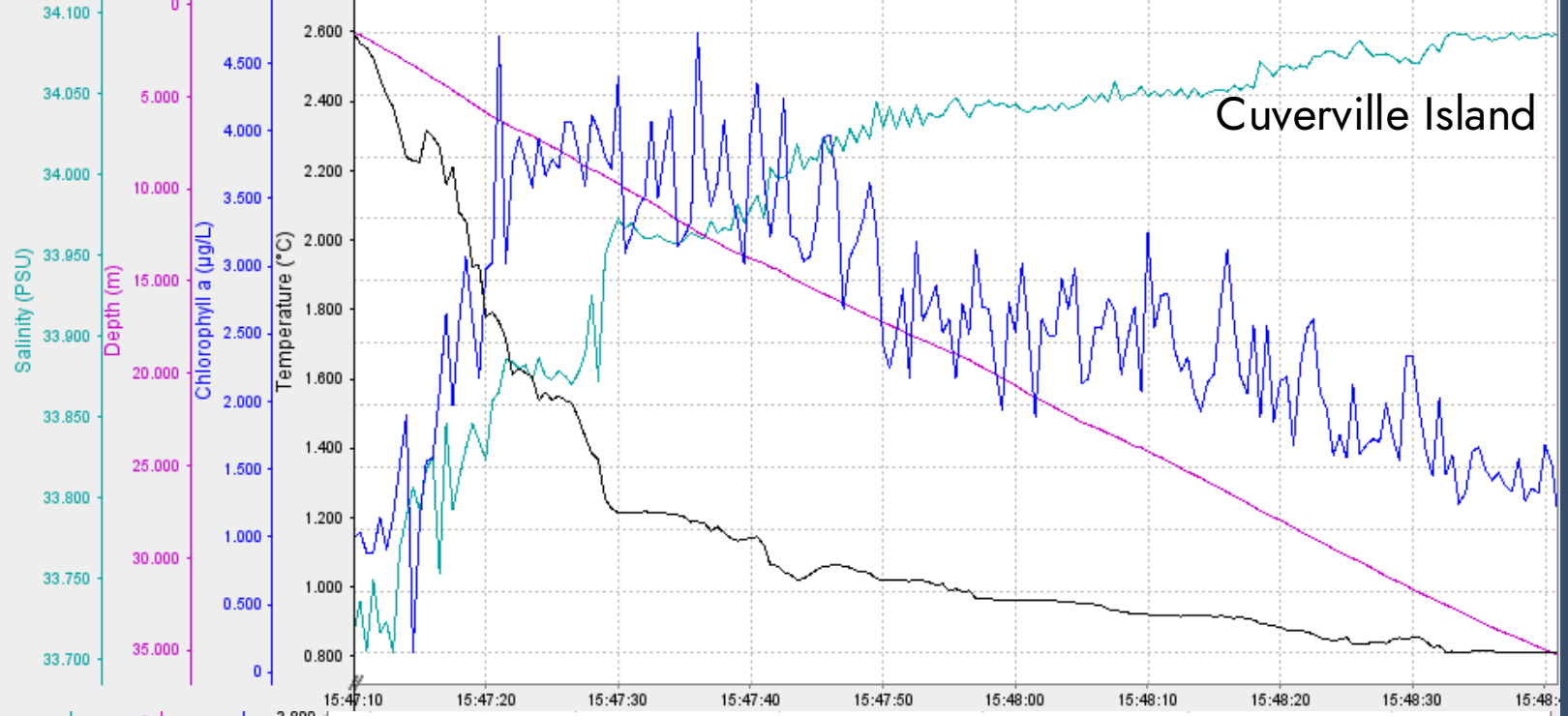
CTD Profiles

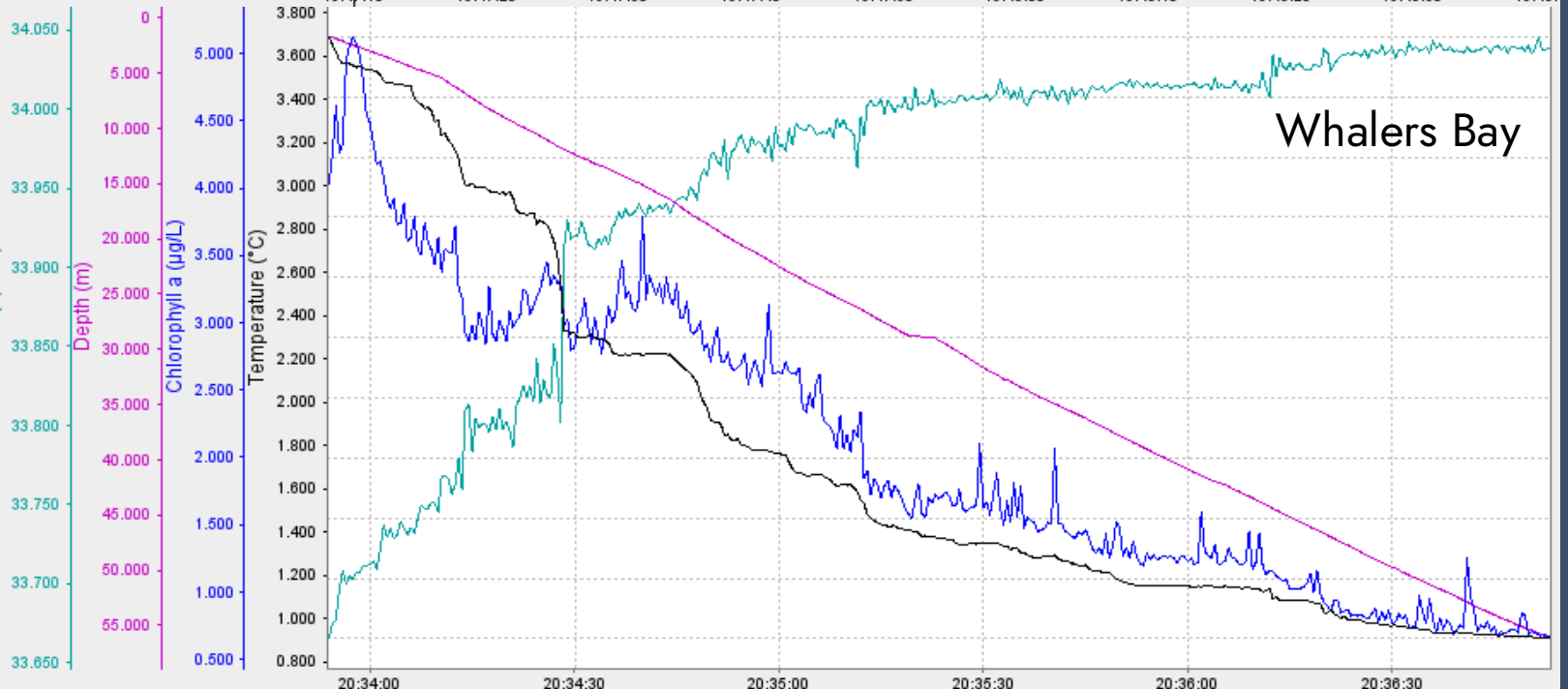
South of the Antarctic Circle

Our CTD casts from Bongrain Point, Horseshoe Island, and Stonington Island all showed impressively similar trends. There was a huge chlorophyll spike at all sites around 5m and continued elevated levels of phytoplankton until around 30m deep. This, combined with consistent Secchi depth measurements of around 2m, supports that there is a very large phytoplankton bloom happening. This makes sense, as for the past few weeks there has been 24 hours of continuous daylight for phytoplankton to take advantage of!

Temperature profiles were also similar at the three sites. At the surface, Horseshoe Island and Bongrain Point, which are only about 10mi/16km apart and face the open ocean, were both around 2°C for the first 10m. Below a 20m thermocline, temperatures dropped sharply to a low of -1.5°C at 90m. Stonington Island, located 30mi/50km further south, surprisingly had higher surface water temperatures of 3°C with no thermocline; temperatures dropped steadily to -1.0°C.

At all sites, there was an extremely small difference in salinity between surface and bottom waters; surface waters were very slightly more fresh, but we would consider all of these sites 'well mixed' and at normal seawater salinity. Such a small difference can be explained by saltier, colder water sinking due to higher density, rather than an influence of freshwater from melting ice.





CTD Profiles

North of the Antarctic Circle

At our sampling sites above the Antarctic Circle, we saw distinct profiles at each site. At Cuverville and Damoy, we also observed elevated amounts of phytoplankton, but at lower depths (20m–30m at Damoy and 7m–20m at Cuverville) and lower abundances (half the abundances of the southern sites!). Petermann Island, in contrast, had no elevated levels of phytoplankton at any depth. It is possible that at these sites, compared to the southern ones, the season's largest blooms have already come and gone.

A thermocline was recorded at all three of the above sites, with stable, warm temperatures above 20m. Surface temperatures did differ at each site though: 0.9°C at Petermann, 1.4°C at Damoy, and a very warm 2.6°C a Cuverville! At Damoy and Cuverville, temperatures down to 70m were also close to 1°C, which is quite warm for such depths. We have observed similarly warm temperature since December at these sites, lending evidence to a marine heatwave occurring in the area. Salinity behaved the same as at the sites below the Antarctic Circle.

Not unexpectedly, Whalers Bay was a bit different from all other sites. Temperatures were highest here, and chlorophyll levels were concentrated above 20m. Salinity remained at standard seawater levels.

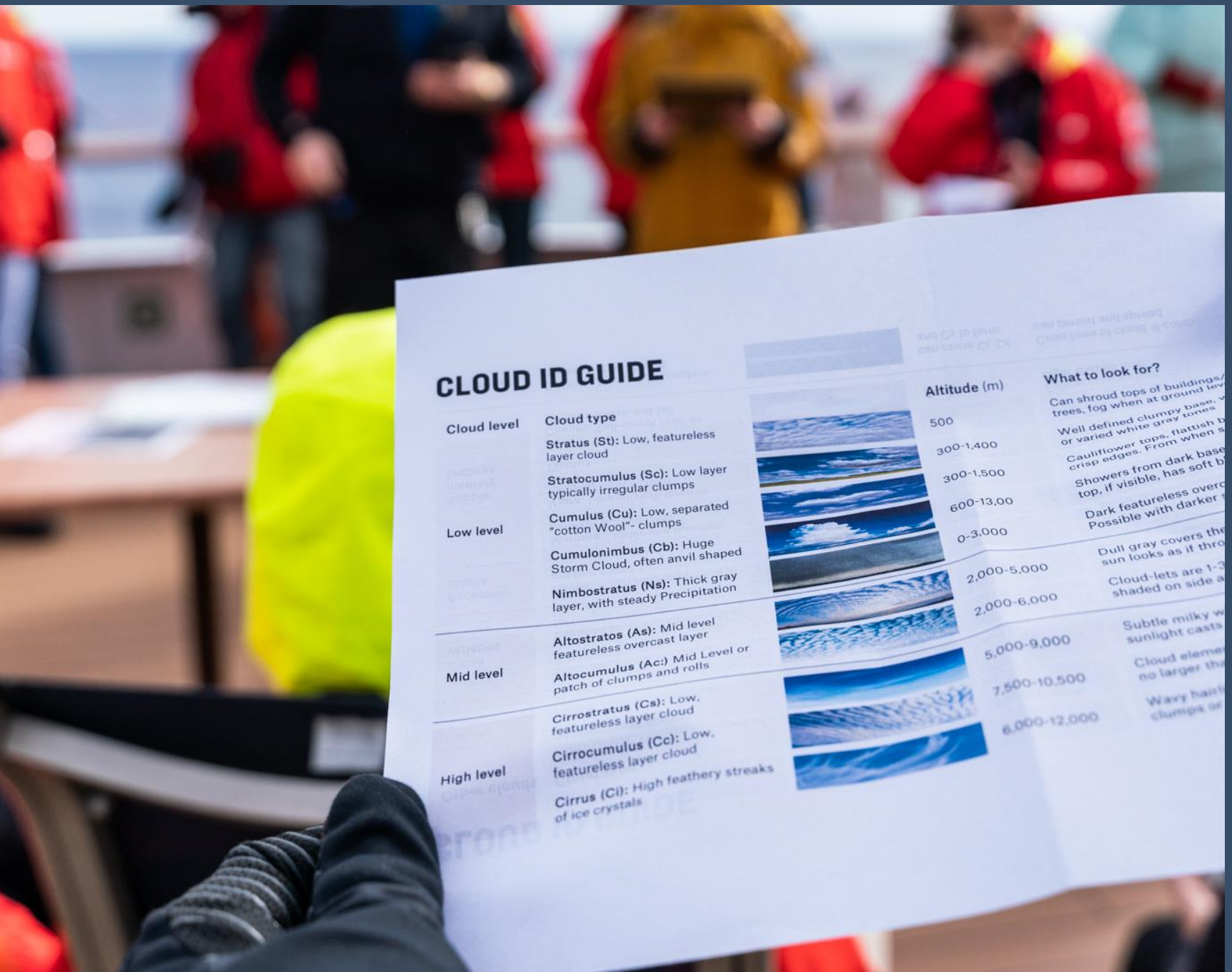
Citizen Science

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 that will 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 **10** 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 app.

View our data on the global map

Citizen Science

iNaturalist

When you ask someone what creature 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-celled algae living in the snow to giant whales – and even some very hardy plants! Every Antarctic observation is important since there is so little data available here 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. We also made a record for HX: on this trip we made more iNaturalist observations than any previous Antarctic voyage! Our observations are available to be used in global scientific research.

In total we recorded:

- **77** Species
- **889** Observations

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

View our data submitted on our iNaturalist project 2026 Jan 02 - 18: MS Roald Amundsen: Antarctic Circle 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 **28** bird species across **58** 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:
AMANT2516 - Antarctic Circle - 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: Happywhale uses the fingerprint-like patterns on humpback whales' flukes to identify them. By using AI to match images of each individual whale's unique markings, Happywhale can track individuals as they migrate across the world and through their lives! When you submit a photo, you will be notified of any past and future matches of that individual!

On this voyage we submitted photos of **47 humpback** individuals to be identified. We have already received **20** matches back! We also submitted **5 orca, 8 Weddell seals,** and **9 leopard** seal photos. This data has added to Happywhale's catalogue of identified whales and seals across the world.

View MS Roald Amundsen's submissions to Happywhale during our voyage:
MS Roald Amundsen 02-18 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 cruise that will help inform conservation decisions and policy in the future.

On our voyage, we surveyed **494.9 km** of ocean for cetaceans!

View more information about our partnership with ORCA here

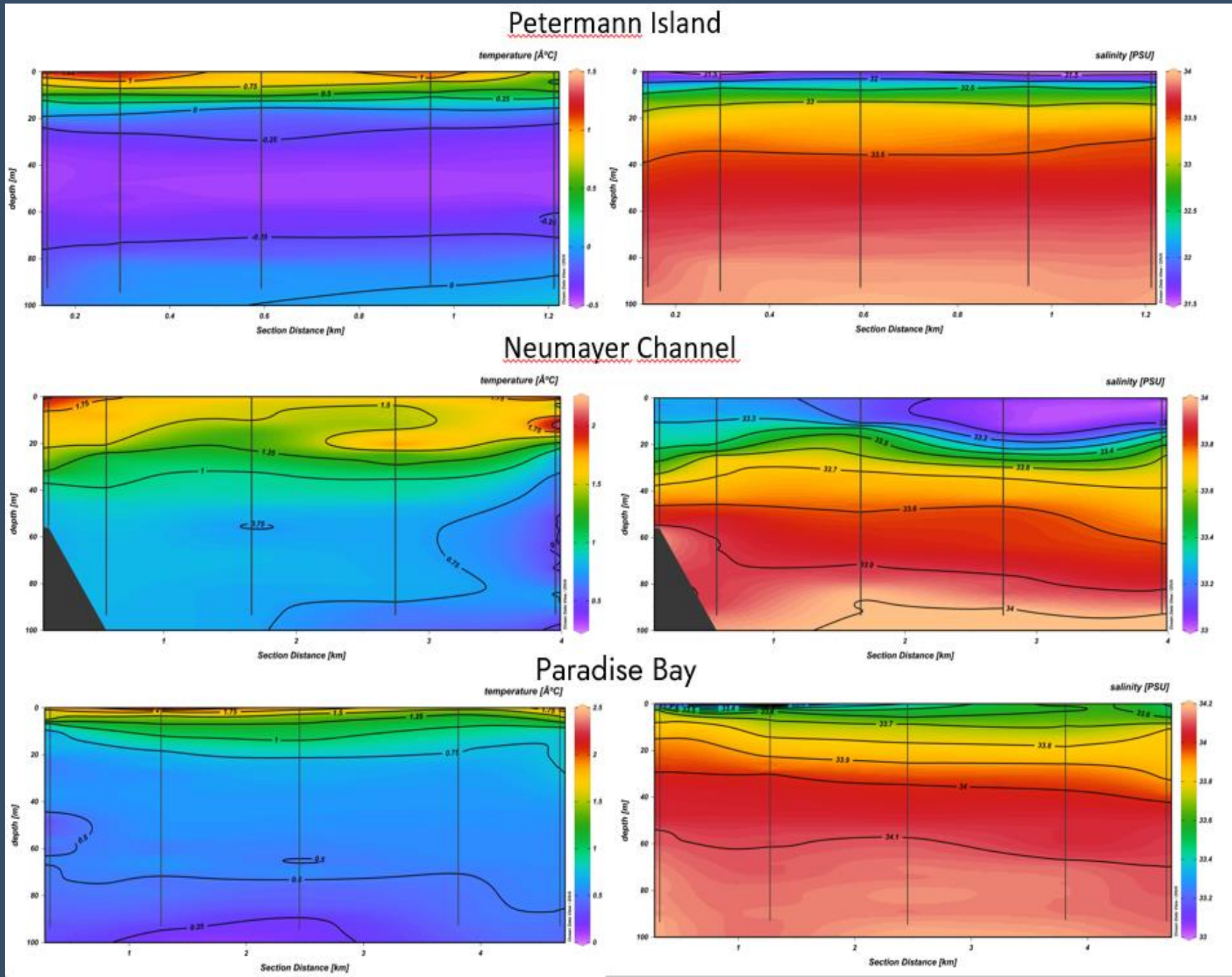
ORCA | HX Expeditions

Partnership

Guest Scientists

We were fortunate to be joined on this voyage by Dr Juan Höfer and his student Constanza, Guest Scientists from the **Pontifical Catholic University of Valparaíso** in collaboration with the **Norwegian Polar Institute (NPI).** We first visited the NPI field camp at Petermann Island, where we picked up Constanza after she spent two weeks monitoring the penguin colonies there and collecting data on their feeding habits. For the rest of the voyage, Juan and Constanza collected data on ocean temperature and salinity from the sites we visited. Using a CTD, they sampled along a transect, starting near glacier faces and moving away from them. The data they collected shows how glacial meltwater is influencing the biological and physical characteristics of coastal waterbodies along the Antarctic peninsula.

Antarctic waters are typically well mixed, but they found evidence of the impact of glacial meltwater on salinity (see the right-side plots) and increased temperatures (see the left-side plots) of surface waters, causing stratification in the water column. Constanza'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 exulans*
Diomedea epomophora	**southern royal albatross**	Südkönigsalbatros	albatros royal	*Diomedea epomophora*
Phoebetria palpebrata	**light-mantled albatross**	Graumantelalbatros	albatros fuligineux	*Phoebetria palpebrata*
Thalassarche chrysostoma	**grey-headed albatross**	Graukopfalbatros	albatros à tête grise	*Thalassarche chrysostoma*
Thalassarche melanophris	**black-browed albatross**	Schwarzbrauenalbatros	albatros à sourcils noirs	*Thalassarche melanophris*
Oceanites oceanicus	**Wilson's storm petrel**	Buntfuß-Sturmschwalbe	océanite de Wilson	*Oceanites oceanicus*
Fregetta tropica	**black-bellied Storm petrel**	Schwarzbauch-Sturmschwalbe	océanite à ventre noir	*Fregetta tropica*
Macronectes giganteus	**southern giant petrel**	Riesensturmvogel	pétrel géant	巨鷸
Fulmarus glacialoides	**southern fulmar**	Silbersturmvogel	fulmar argenté	银灰暴风鷸
Thalassoica antarctica	**Antarctic petrel**	Antarktiksturmvogel	pétrel antarctique	南极鷸
Daption capense	**pintado petrel**	Kapsturmvogel	damier du Cap	花斑鷸
Pagodroma nivea	**snow petrel**	Schneesturmvogel	pétrel des neiges	雪鷸
Halobaena caerulea	**blue petrel**	Blausturmvogel	prion bleu	蓝鷸
Pachyptila desolata	**Antarctic prion**	Taubensturmvogel	prion de la Désolation	鸽锯鷸
Pachyptila belcheri	**slender-billed prion**	Dünnschnabel-Sturmvogel	prion de Belcher	细嘴锯鷸
Procellaria aequinoctialis	**white-chinned petrel**	Weißkinn-Sturmvogel	puffin à menton blanc	白颏风鷸
Ardenna grisea	**sooty shearwater**	Dunkler Sturmtaucher	puffin fuligineux	灰鷸

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
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
Orcinus orca	**killer whale, orca**	Schwertwal, Orca	orque	虎鲸
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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