IX

Science & Education Report

MS Roald Amundsen 07 – 21 November 2024

Antarctica & Falklands Expedition

Photo: Sonja Storm

Science & Education Program

During our voyage from Ushuaia through the Drake Passage to Antarctica, the Falkland Islands and back to Ushuaia, you had the opportunity to get a deeper insight into and learn about the nature surrounding us and about the places we visited through a diverse onboard program provided by the science and education team.

We invited you to lectures, discovery sessions, citizen science projects and wildlife watches on various topics such as birds, marine mammals, geology, glaciology, climate change, polar exploration and many more.

We hope you enjoyed gaining a deeper understanding of the landscapes, flora and fauna and of the history of this remote part of the world.

Arts, Crafts & Creativity

In our «Art Corners» you could become creative and immerse yourself in bottle and watercour postcard painting. You got some tipps and tricks on how to paint a penguin, and altogehter you created a picturesque diorama of Antarctica.

Our guest lecturer and artist Sean enjoyed leading these art workshops focusing on basic drawing skills and color-mixing in watercolor.

History

We started our historical journey in the Drake Passage with one of the team giving us an introduction to Roald Amundsen by impersonating the character himself, delivering an incredible monologue. Here, he told us about his journey to become the first man to the South Pole.

In addition, the lecturers provided a plethora of great content, from artistic portrayals of Antarctica through the centuries, the Heroic Age of Antarctic Exploration, the Swedish Antarctic Expedition, Robert Falcon Scott, to the 'Rocky Balboa' of Antarctic exploration, Sir Ernest Shackleton. Truly inspirational!

To conclude, we covered the Falklands War between Argentina and Great Britain: an intricate and moving topic whose onboard coverage enriched our experience with monuments and memorials ashore, and explained much about those living on the island today, and their experiences.

Science Boat

During our voyage we went out with the science boat 9 times in 5 different locations in Antarctica and the Falkland Islands:

- Antarctic Peninsula: Petermann, Palaver Point, Weddel Sea
- South Shetland Islands: Deception Island
- Falkland Islands: Saunders Island

In order to investigate which plankton communities we find close to the coasts of the Antarctic Peninsula, the South Shetland Islands and the Falkland Islands in the early season, we took water samples and did measurements of the temperature, salinity and clarity of the water.

We did tows of the phytoplankton and zooplankton nets to collect water samples for investigation under the microscope and demonstrated how to use the Secchi disk to determine the clarity of the water, i.e. the abundance of phytoplankton. By deploying the CTD, we received information about the changes of temperature and salinity with depth in the water column.

Secchi Disk

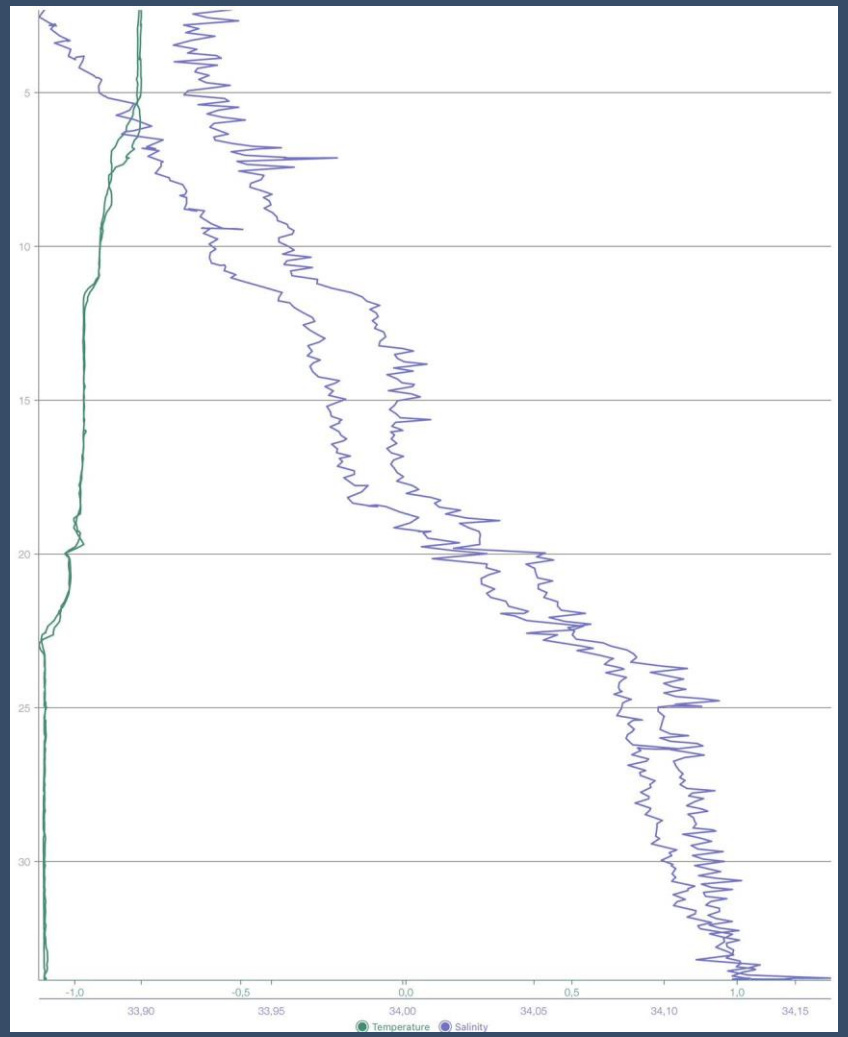
The turbidity of the water, i.e. the clarity of the water, provides information about the abundance of plankton. To determine the turbidity of the water, we used the Secchi Disk and measured the depth at which it could just not be seen anymore.
The measured depth is the Secchi Depth which can be submitted to the Secchi Disk Citizen Science Project to contribute to a world wide dataset accessible to researchers.

We demonstrated the Secchi Disk in 5 of the 9 science boat sessions. However, as the drift of the boat was too strong or it was too overcast during some of the measurements, we only submitted 1 readings done in Saunders Island.

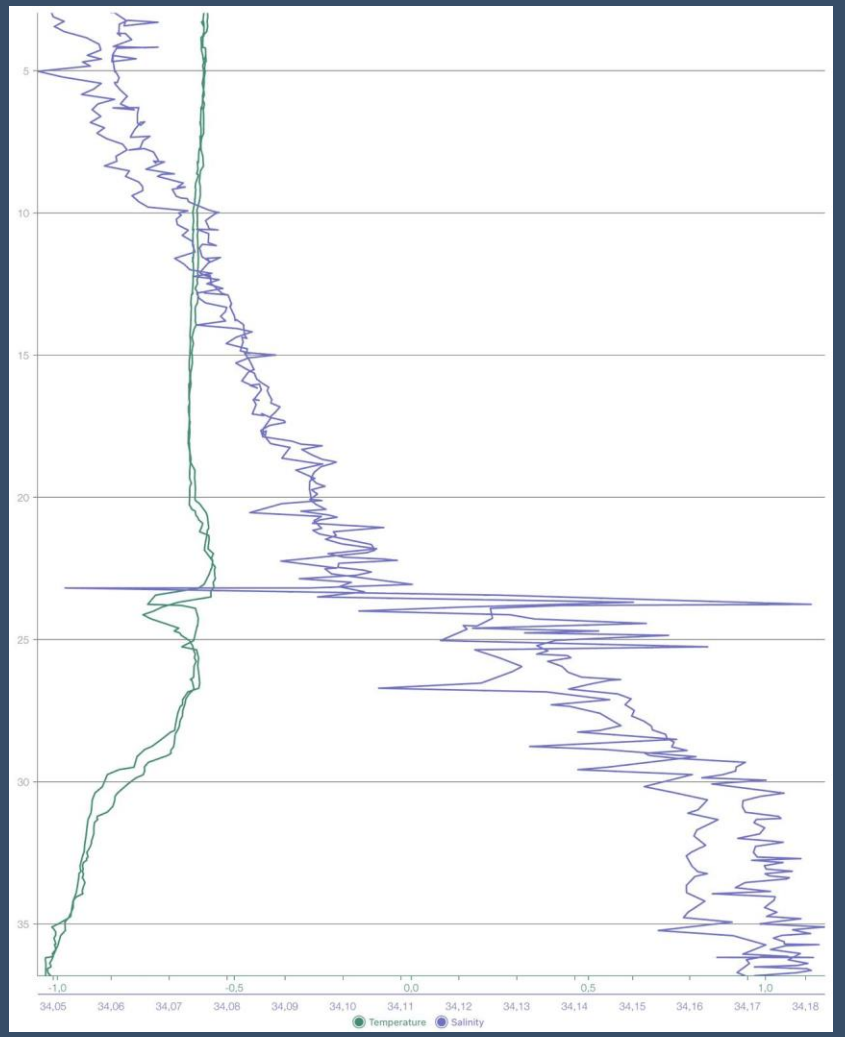
CTD

We utilize CTD (Conductivity, Temperature, Depth) profiles to analyse the stratification within the water column, as both temperature and salinity significantly influence water density. This stratification provides insights into nutrient replenishment at the surface, which is crucial for phytoplankton photosynthesis. Typically, salinity increases with depth while temperature decreases, since cold, salty water is denser than warm, less salty water.

Depth Profile: Petermann



Depth Profile: Palaver Point



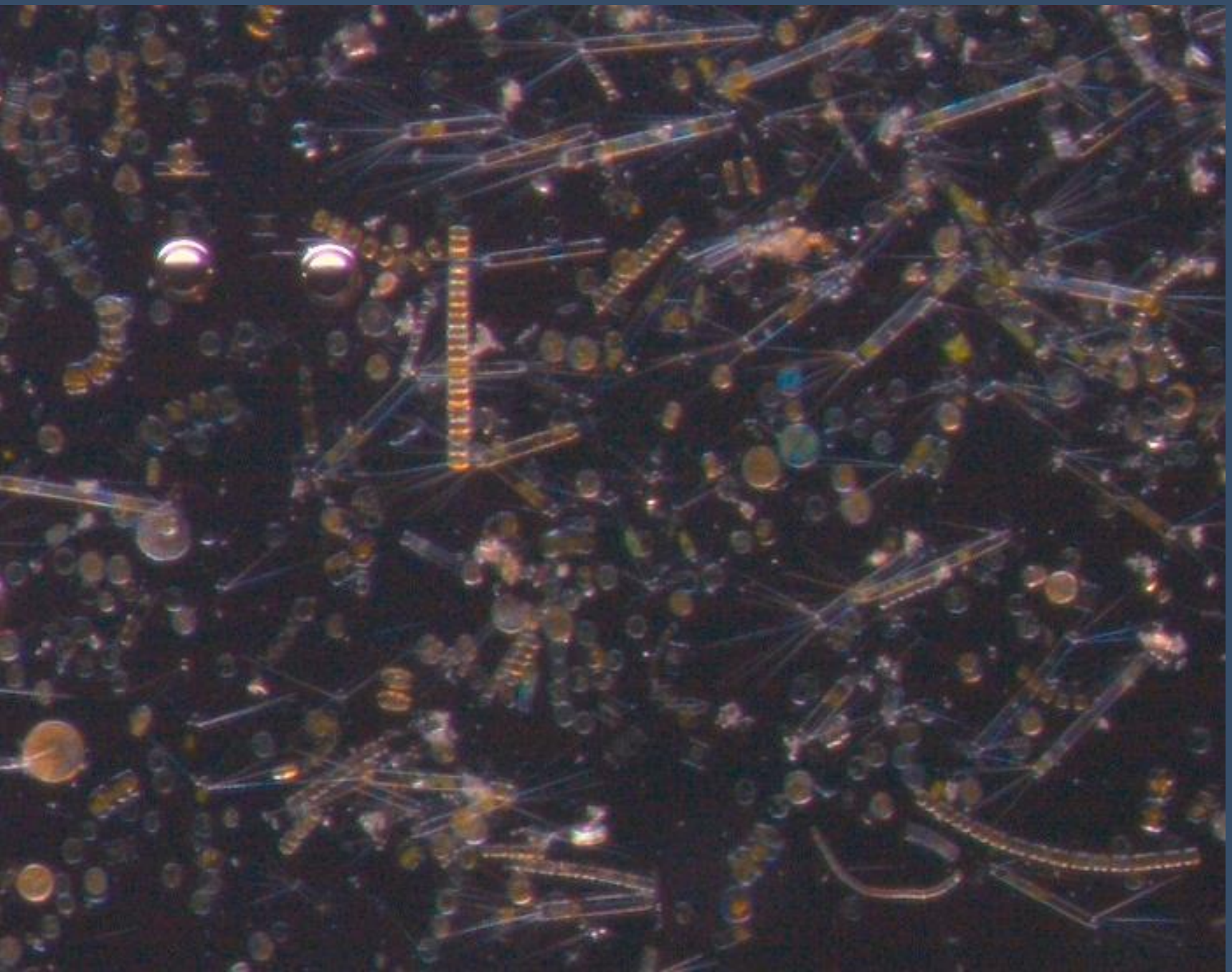
Temperature (°C)
Salinity (PSU)

Our CTD profile from Petermann Island and Palaver Point confirms the above described normal pattern, showing a clear increase in salinity and a decrease in temperature with depth. However, when looking at the scale bars we can see these are relatively small changes, suggesting a well-mixed water column This allows nutrients to be replenished to the surface waters for phytoplankton to use in photosynthesis

Water Sampling

We collected water samples in 5 different locations: Petermann, Palaver Point, Weddel Sea, Whalers Bay, Saunders Island.
All of the samples were taken from the science boat by either towing the phytoplankton net or the zooplankton net through the water fully submerged for 5-8 minutes.

The phytoplankton net had a mesh size of 20µm, the zooplankton net of 100µm.

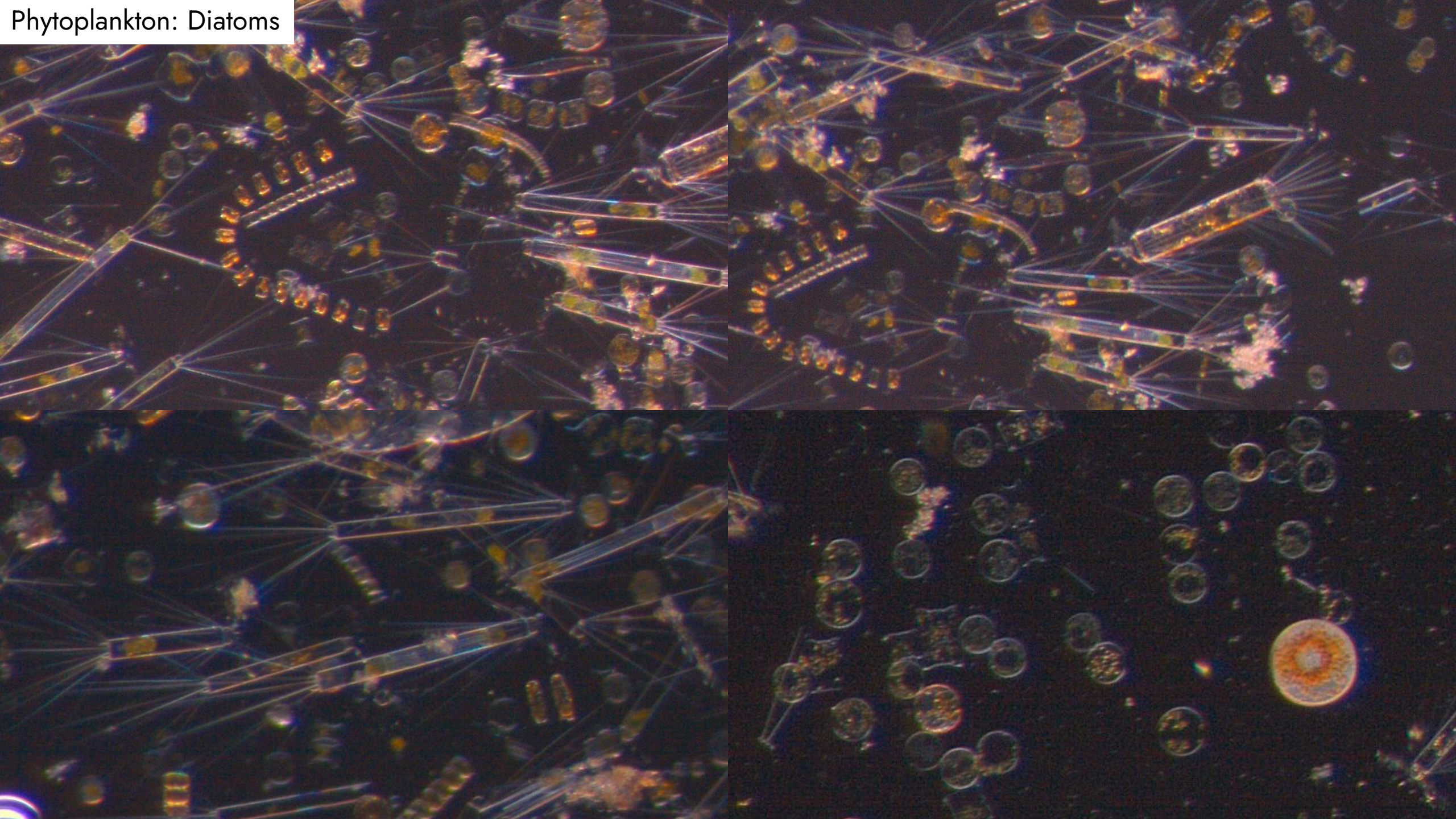


Plankton Samples

We investigated all of our water samples under the microscopes in the science center in oder to identify the different species of phytoplankton and zooplankton. The images of the big research microscope could be projected to the screen so that everyone around could see what we found in the drops of water. Guests could also use the smaller binocular microscopes to get hands-on and try to find the tiny organisms in our water samples.

We found mainly diatoms (phytoplankton) in our samples and almost no zooplankton. The reason might be that it is still early in the season, spring just started, the light is just coming back, the meltwater adds nutrients to the sea water and the phytoplankton (food source for zooplankton) only just starts to bloom. We expect the amount of zooplankton to increase in the following weeks.

Phytoplankton: Diatoms



Phytoplankton: Diatoms

Zooplankton: Part of a crustacean?

Zooplankton: Female crustacean laying eggs?

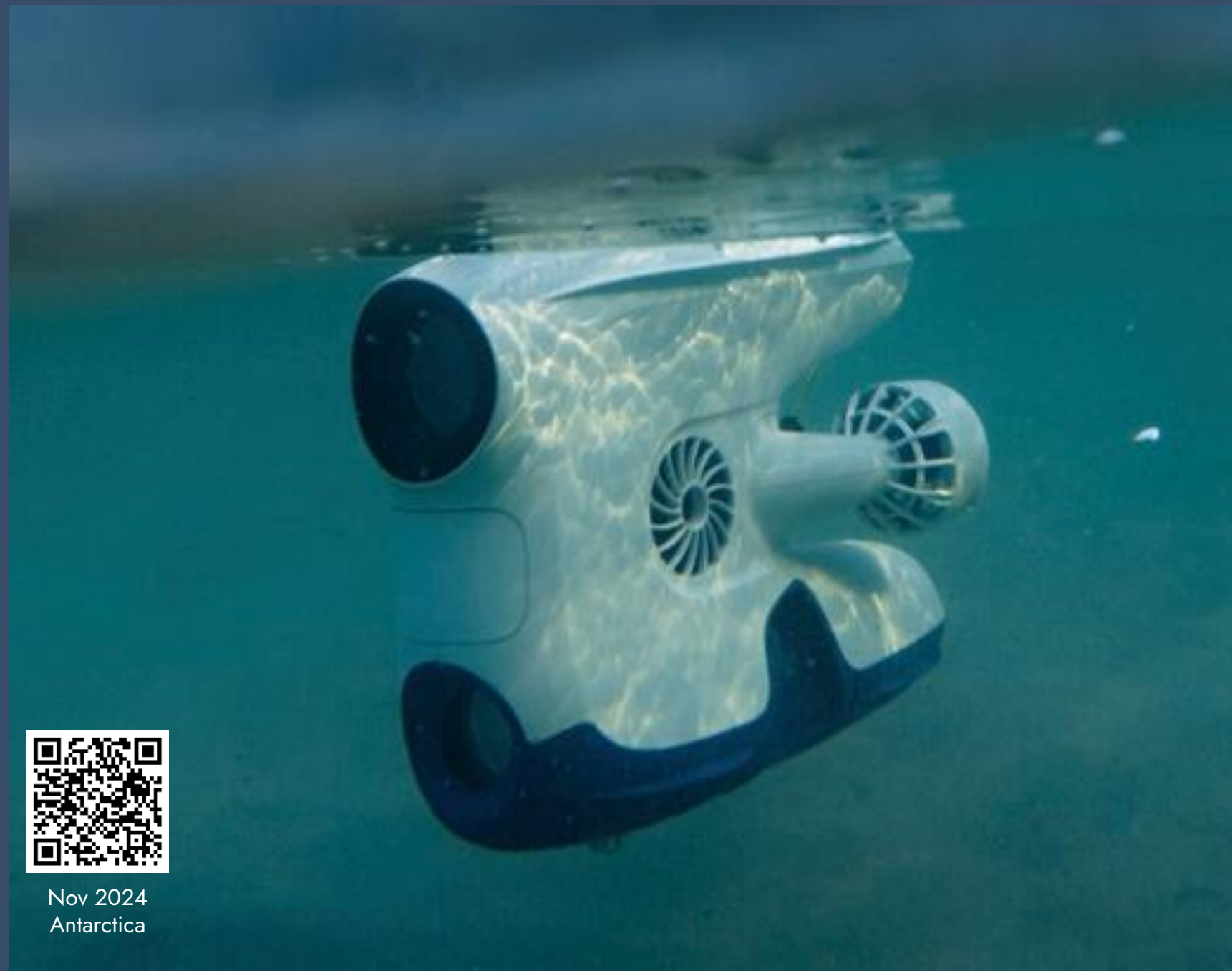
Zooplankton: Copepod

Underwater Drone

We deployed our underwater drone from the expedition boat in Petermann, Damoy, Deception Island and the Weddel Sea.

We had a closer look at the different types of ice underwater, observing rich sea ice algae and krill under ice floes in the Weddell Sea contrasting with clear glacier brash ice in Damoy.
Throughout all of our benthic observations, echinoderms – sea stars, sea urchins and brittle stars – were the dominant taxa observed.

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



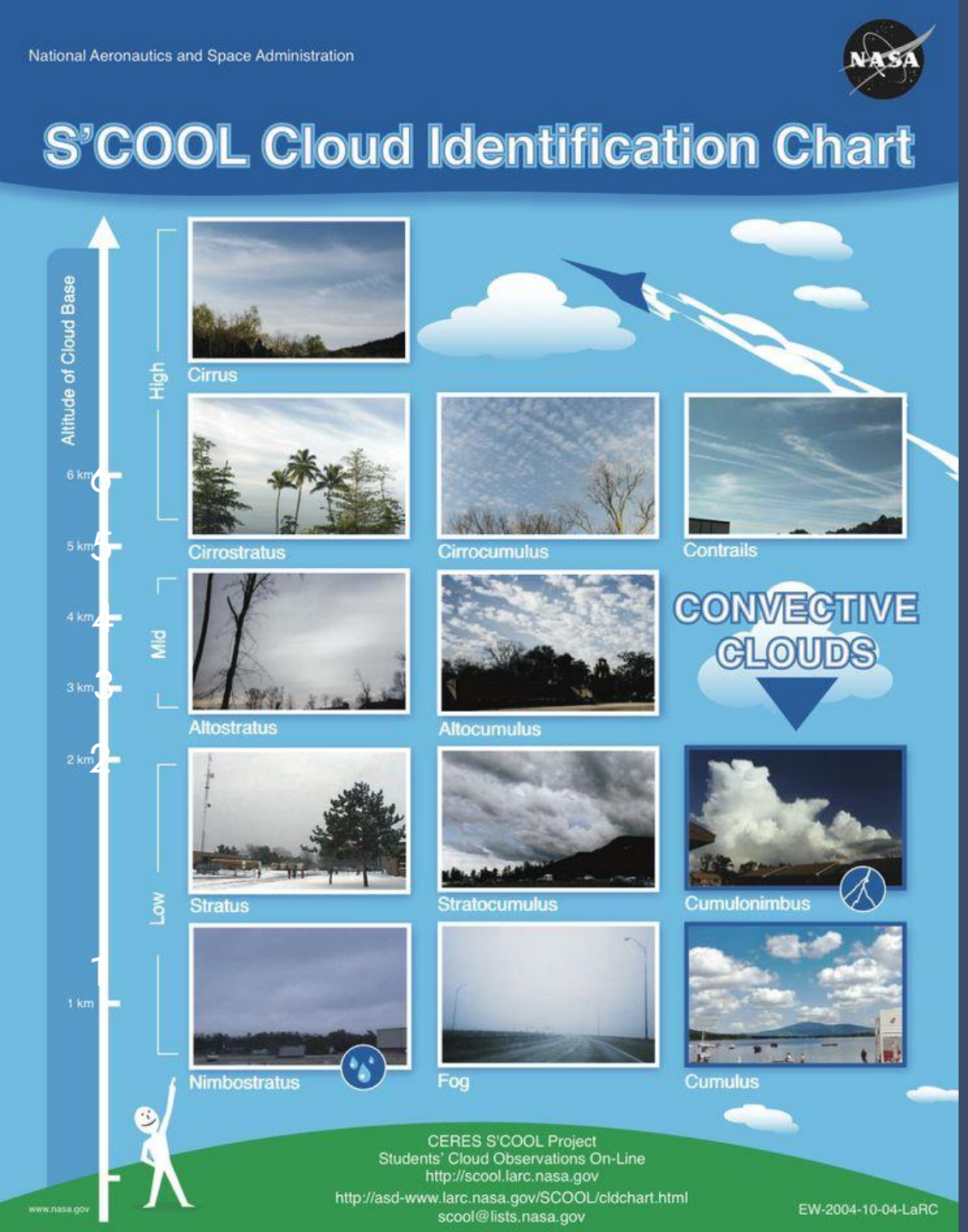
Nov 2024
Antarctica

NASA Cloud Observer

Our NASA citizen scientists met in 5 sessions to perform GLOBE Cloud Observations. Together, we submitted 5 observations from the ships iPads to the global database run by NASA. This time, none of our observations were matched to data from weather satellites orbiting above. However, they will still be used to better understand global weather phenomena. Several guests had the app installed on their mobile devices and carried out and submitted their own observations.

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

View our data on the global map



NASA Cloud Observer

High Clouds (Base above 6,000 meters):

- **Cirrus**: Thin, wispy clouds composed of ice crystals. They often appear as delicate streaks or feathery wisps high in the sky.
- **Cirrostratus**: Thin, sheet-like clouds that cover large portions of the sky. They can create a halo around the sun or moon.
- **Cirrocumulus**: Small, fluffy clouds in a regular pattern, resembling fish scales or ripples.

Medium Clouds (Base between 2,000 and 6,000 meters):

- **Altocumulus**: Puffy, grayish-white clouds with rounded edges. They often form parallel rows or patches.
- **Altostratus**: Thick, grayish clouds that partially obscure the sun or moon. They lack the distinct features of cirrostratus.

Low Clouds (Base below 2,000 meters):

- **Stratus**: Uniform, grayish clouds that cover the sky like a blanket. They can bring drizzle or light rain.
- **Stratocumulus**: Low, lumpy clouds with defined edges. They often appear in rows or patches.
- **Nimbostratus**: Thick, dark gray clouds associated with steady rain or snow.

Remember that these cloud types can vary in appearance and behaviour, but this basic classification helps meteorologists understand weather patterns and atmospheric conditions. If you'd like to explore more examples, you can check out NASA's On-Line Cloud Chart.

View our data on the global map

GLOBE Cloud Observations Paired with NASA Satellite Data

Total Satellite Comparisons: 2

Useful Resources: How to Read My NASA GLOBE Clouds Satellite Comparison Table, How to Compare My Cloud Observations with Satellite Data, Cloud Cover, Cloud Type, Cloud Opacity, Satellites

Observation	GLOBE	NOAA-20 Satellite
Universal Data/Time	2024-11-14 17:44:00	2024-11-14 17:49
Latitude	-63	-63.41 to -62.61
Longitude	-60.51	-60.88 to -60.08
Total Cloud Cover	Sky Obscured	Broken 88.03%
High Clouds	Sky Obscured by Snow/Ice Clouds/Contrails > 25% Obscured 	Cover: Few (1.59%) Altitude: 6.57 (km) Phase: Ice 234.23 (K) Opacity: Transparent
Mid Clouds		Cover: Scattered 27.28% Altitude: 3.91 (km) Phase: Ice/Water Mix 248.24 (K) Opacity: Translucent
Low Clouds		Cover: Broken 59.16% Altitude: 1.35 (km) Phase: Water 263.33 (K) Opacity: Translucent
GLOBE Cloud Photos and Corresponding NASA Satellite Images. Click Image to view -->> *Note: Photos submitted though GLOBE need approval before being displayed, this may take a few days.*	**GLOBE Photos** North East South  West Up Down 	***VIIRS NOAA-20*** Worldview  Worldview Tutorial
Sky Conditions, Surface Conditions and Observer Comments	**Sky Conditions** Sky Visibility : no report Sky Color : no report **Surface Conditions** Snow/Ice : Yes Standing Water : No Muddy : No Dry Ground : No Leaves on Trees : No Raining or Snowing : No	Are there any comments you would like to add? Be sure to add the name of the satellite for our record. Submit Comment

NASA Cloud Report

The „NASA GLOBE Cloud Satellite Match“ reports provide an overview of our observation (blue) compared with the satellites‘ observations (white).

This data is used by NASA to verify their satellite data, to fill gaps in the satellite observations and to improve forecasting the weather.

View our data on the global map

iNaturalist

Our onboard naturalists and guests recorded their observations of flora and fauna on the citizen science platform iNaturalist. Many of our observations have been peer reviewed and are available to be used in scientific research around the world.

In total, 17 observers recorded:
- 104 Species
- 236 Total Observations

Submissions are still possible!

View our data submitted on our iNaturalist project here:

2024 21 Oct - 7 Nov: MS Roald Amundsen - Antarctica & Patagonia Expedition (AMANT2412)

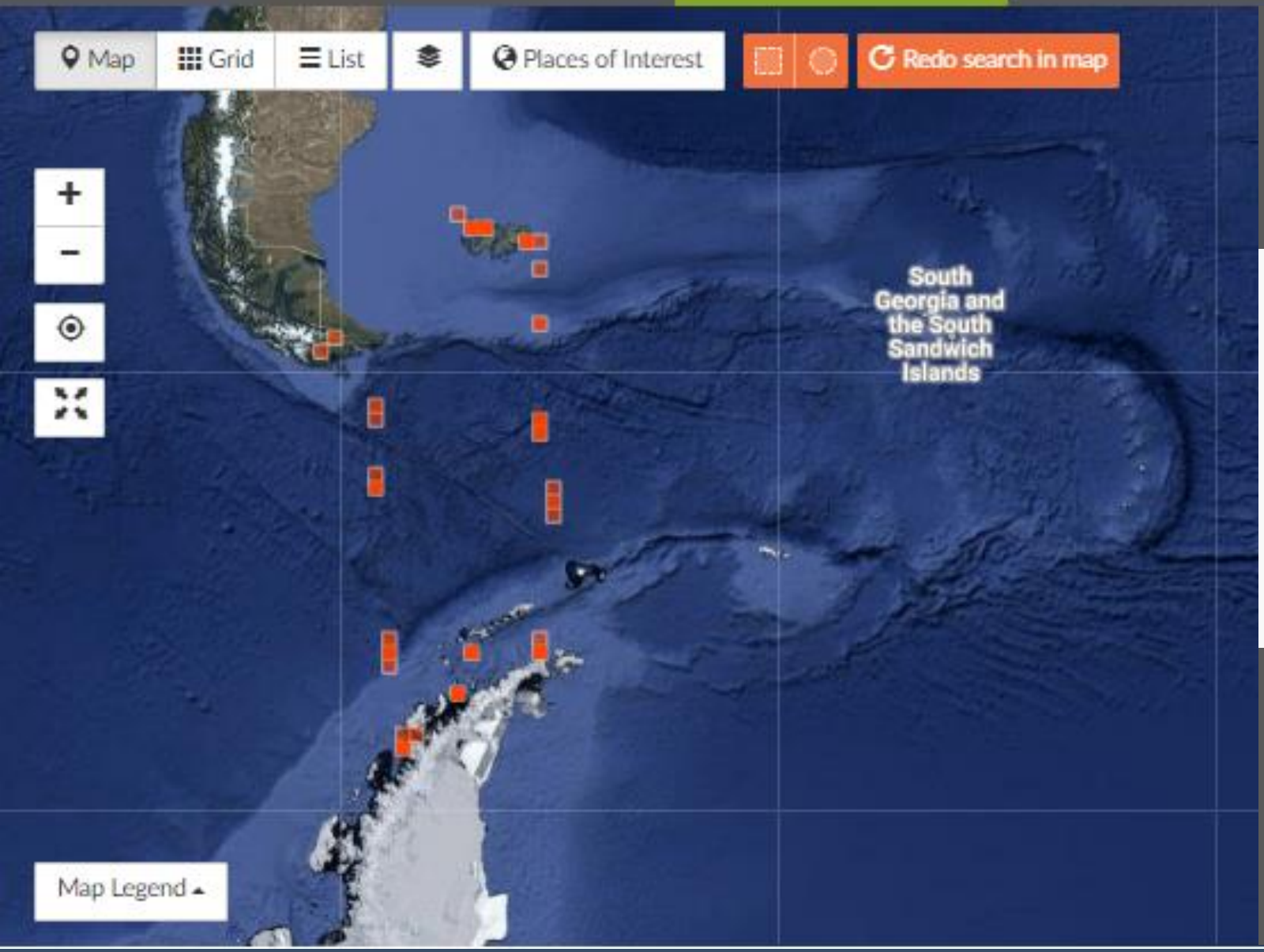
The World

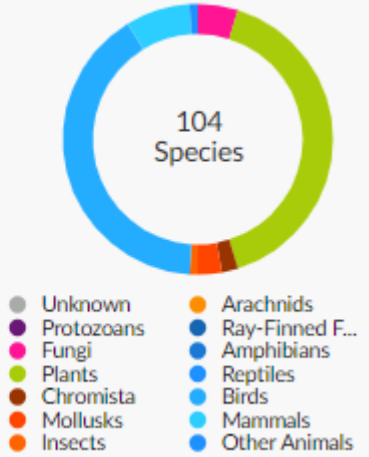
236 OBSERVATIONS

104 SPECIES

56 IDENTIFIERS

17 OBSERVERS





eBird

Our onboard ornithologists were constantly surveying the birdlife we encountered along our route. Including 11 formal wildlife watches we recorded 63 species across 40 eBird checklists. Through the eBird platform, the data we collected is available for scientists around the world.

View our data for this trip here:
Antarctica and the Falklands on the Amundsen, 07 Nov - 21 Nov 2024 - eBird Trip Report

Antarctica and the Falklands on the Amundsen, 07 Nov - 21 Nov 2024

7 – 21 Nov 2024 (15 days) Public

Antarctica | Argentina | Chile | Falkland Islands (Malvinas) | High Seas Subregions

Brendan Murtha, Sean Murtha

Share Edit

Narrative

Owners and editors of a Trip Report may write a narrative.

Add narrative

DATA FOR: Group (all people)

63	42	21
Species Observed	Checklists	Species with Photos
+5 other taxa		

Species Observed

Show all details

84	Upland Goose *Chloephaga picta*	1 5
44	Kelp Goose *Chloephaga hybrida*	5

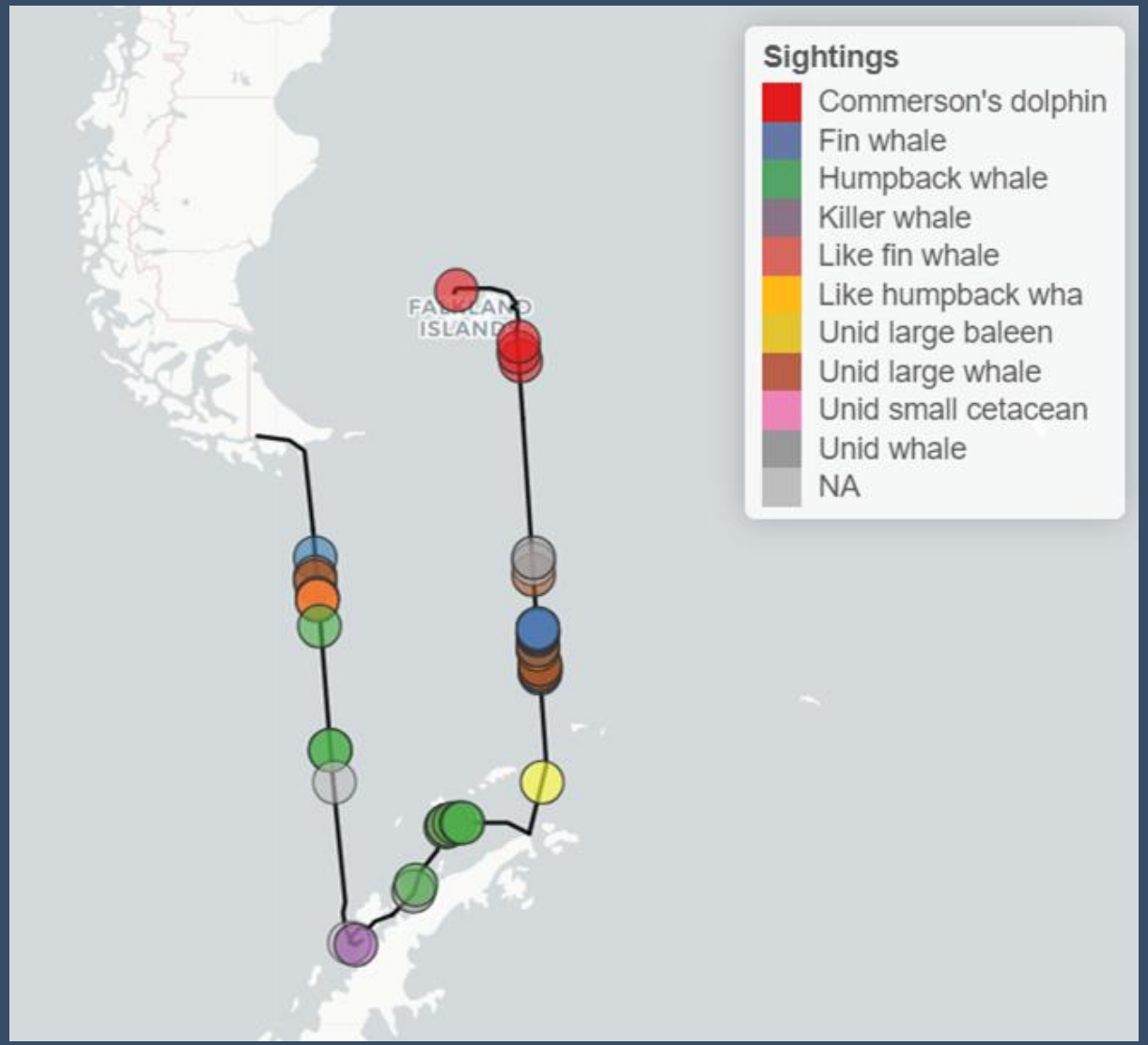
Overall ORCA Survey Effort:

- 418.7km
- 20hrs 45mins
- 7 species
- 144 individuals

Species Name	Number seen
Fin whale	20
Humpback whale	52
Killer whale	10
Peale's dolphin	7
Commerson's dolphin	32
South American Sea Lion	1
Antarctic Fur Seal	5
Unidentified whale	9
Unidentified dolphin	6

ORCA Looking out for Whales and Dolphins

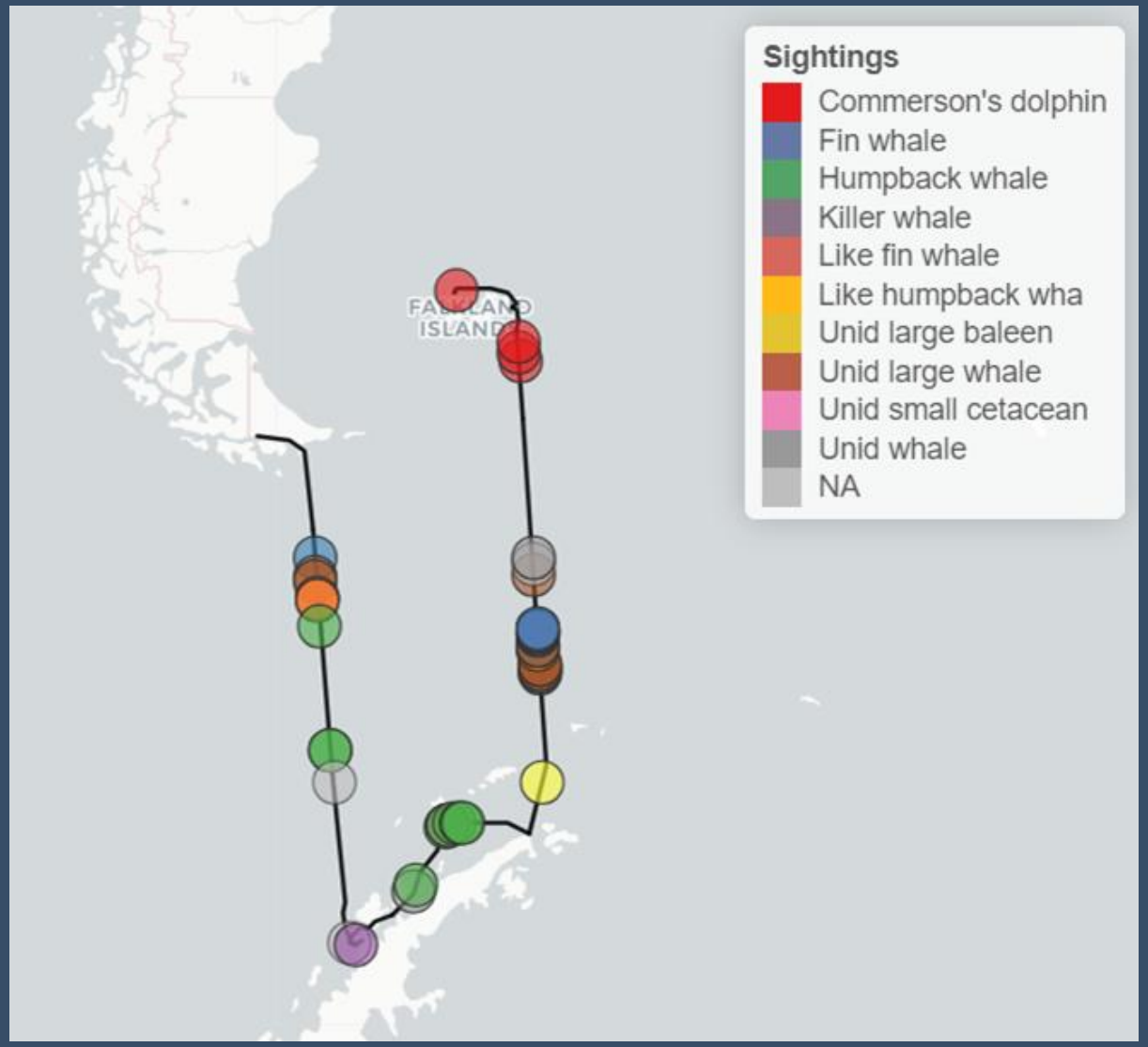
Polar Whale Watch



Target species:

Species	No. sightings	No. animals
Fin whale	6	17
Humpback whale	9	20
Like fin whale	2	4
Like humpback whale	2	2

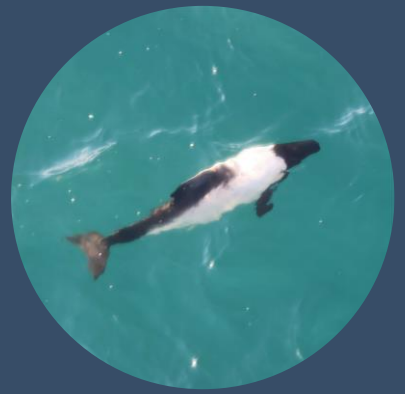
Polar Whale Watch



Humpback whale

Fin whale

Orca



Commerson's dolphin

UNIVERSITY of TASMANIA

IMAS

Institute for Marine and Antarctic Studies

Sea Ice Seals

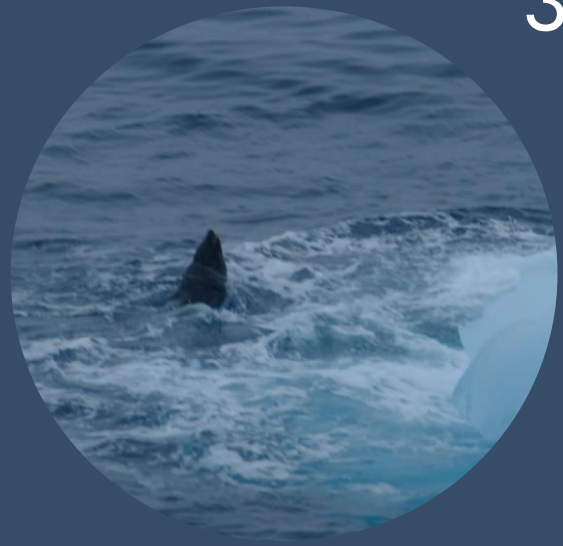
On thin ice – the behaviour and habitat use of pinnipeds in the antarctic peninsula 2024

Gabby Burke & Charlotte Patterson

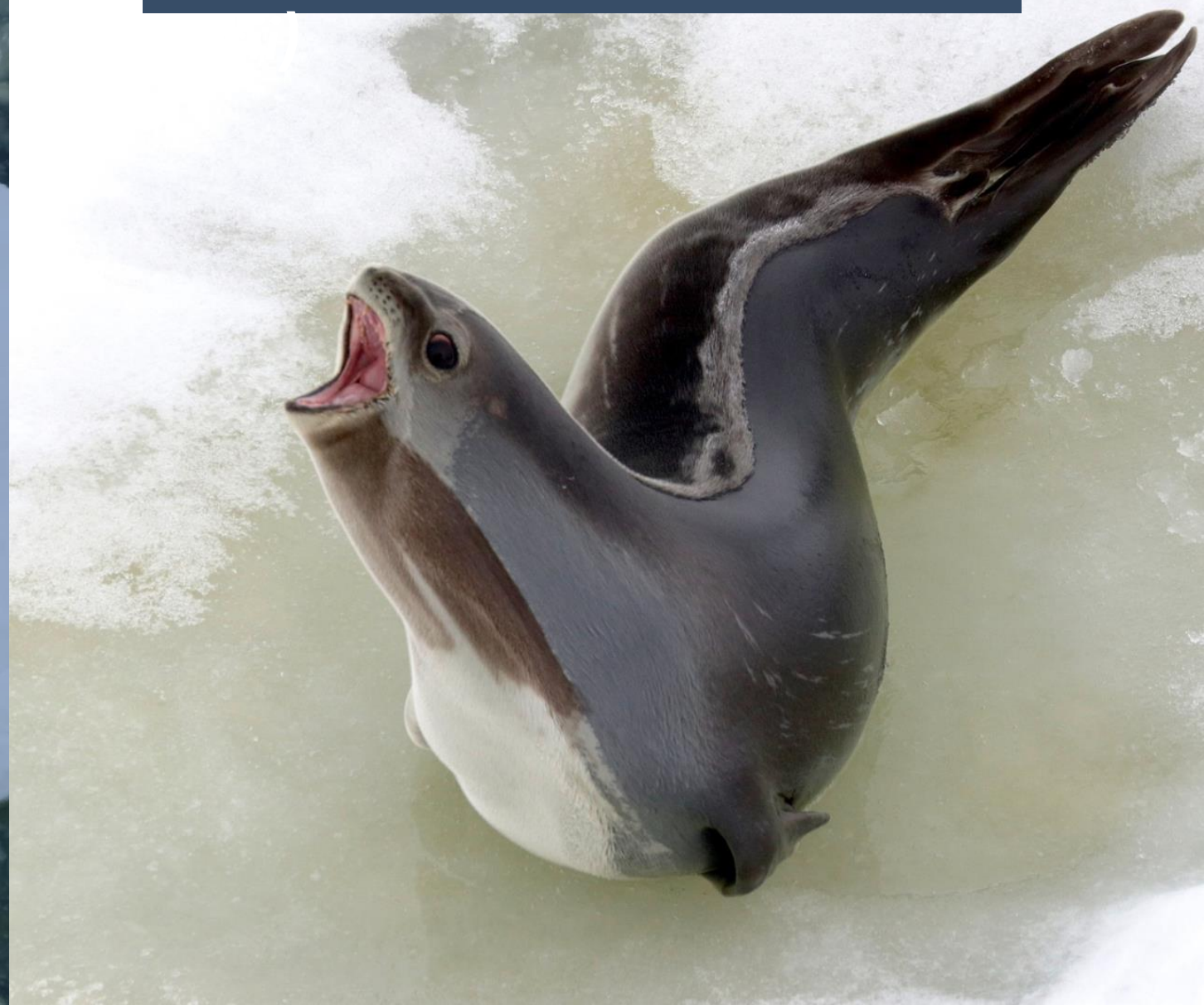
View our data for this trip here: https://ebird.org/tripreport/286554

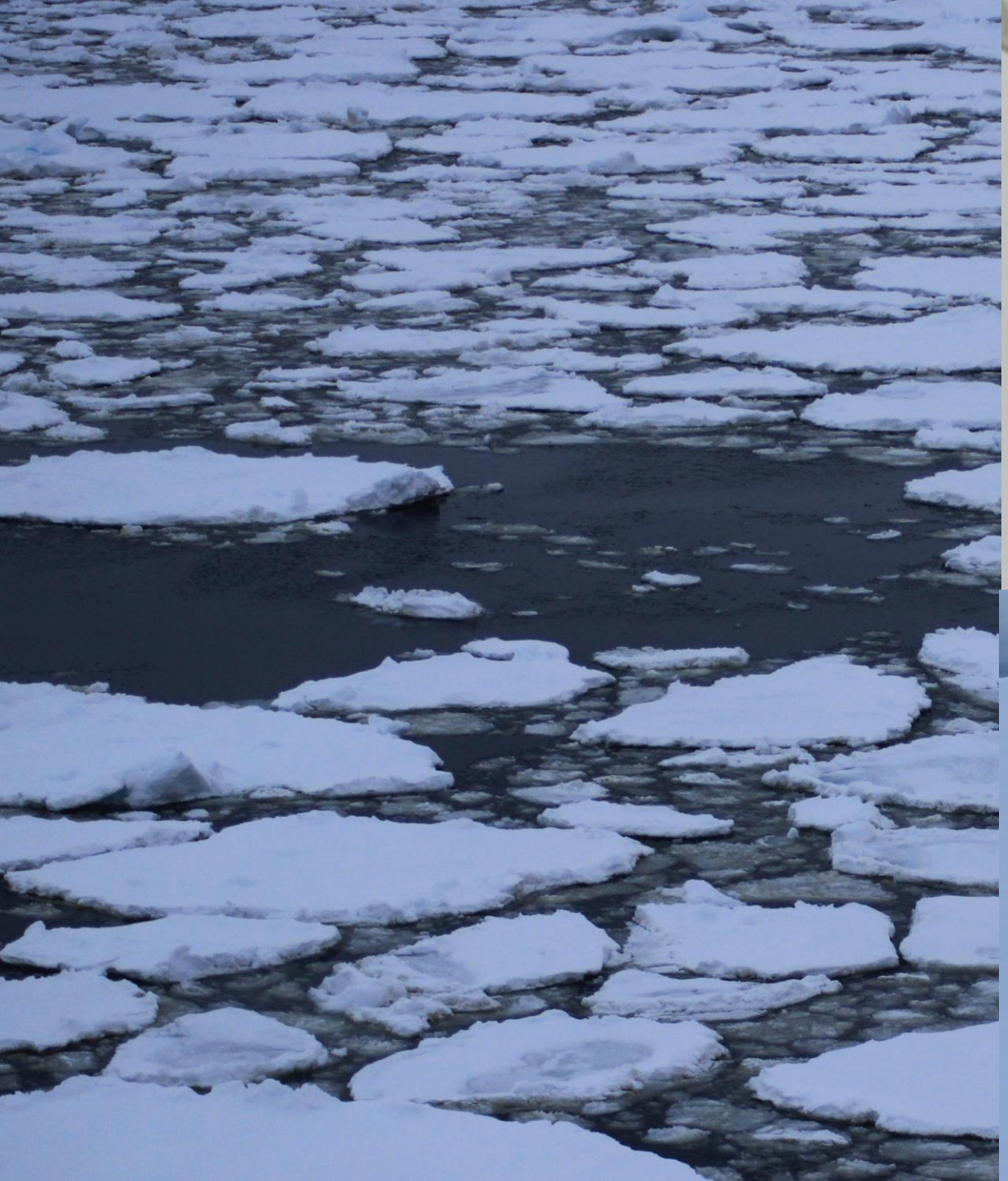
- Weddell seal (14)
- Crabeater seal (5)
- Leopard seal (3)
- Antarctic Fur Seal (1)
- Ross Seal (1)
- ??? (12)

30 in total!



Ross Seal (*Ommatophoca*





Crabeater Seal (*Lobodon carcinophagus)*

Ice: 25 Water: 1 Snow: 4

Weddell Seal (*Leptonychootes Wedellii)*

Wildlife List - Birds

Wildlife List – Birds

Scientific Name	English	Deutsch	Francais	Norsk
Chloephaga picta	**Upland Goose**	Magellangans	Ouette de Magellan	Sebragås
Chloephaga hybrida	**Kelp Goose**	Kelpgans	Ouette marine	Taregås
Chloephaga rubidiceps	**Ruddy-headed Goose**	Rotkopfgans	Ouette à tête rousse	Brunhodegås
Tachyeres brachypterus	**Falkland Steamer Duck**	Falkland-Dampfschiffente	Brassemer des Malouines	Falklandsskovleand
Lophonetta specularioides	**Crested Duck**	Schopfente	Canard huppé	Duskand
Mareca sibilatrix	**Chiloe Wigeon**	Chilepfeifente	Canard de Chiloé	Sørblesand
Anas flavirostris	**Yellow-billed Teal**	Südandenente	Sarcelle tachetée	Gulnebbkrikkand
Chionis albus	**Snowy Sheathbill**	Weißgesicht-Scheidenschnabel	Chionis blanc	Antarktisslirenebb
Haematopus leucopodus	**Magellanic Oystercatcher**	Magellanaustern fischer	Huîtrier de Garnot	Magellantjeld
Haematopus ater	**Blackish Oystercatcher**	Südamerikanischer Austernfischer	Huîtrier noir	Tykknebbsvarttjeld
Gallinago paraguaiae	**Magellanic Snipe**	Magellanbekassine	Bécassine de Magellan	Søramerikabekkasin
Calidris fuscicollis	**White-rumped Sandpiper**	Weißbürzel-Strandläufer	Bécasseau à croupion blanc	Bonapartesnipe
Stercorarius antarcticus	**Brown Skua**	Subantarktikskua	Labbe antarctique	Sørhavsjo
Stercorarius maccormicki	**South Polar Skua**	Antarktikskua	Labbe de McCormick	Sørjo
Stercorarius chilensis	**Chilean Skua**	Chileskua	Labbe du Chili	Kaneljo
Chroicocephalus maculipennis	**Brown-hooded Gull**	Patagonienmöwe	Mouette de Patagonie	Sørhettemåke
Leucophaeus scoresbii	**Dolphin Gull**	Blutschnabelmöwe	Goéland de Scoresby	Magellanmåke
Larus dominicanus	**Kelp Gull**	Dominikanermöwe	Goéland dominicain	Taremåke

Wildlife List – Birds

Scientific Name	English	Deutsch	Francais	Norsk
Sterna vittata	**Antarctic Tern**	Antarktikseeschwalbe	Sterne couronnée	Sørhavsterne
Sterna hirundinacea	**South American Tern**	Falklandseeschwalbe	Sterne hirundinacée	Svaleterne
Aptenodytes patagonicus	**King Penguin**	Königspinguin	Manchot royal	Kongepingvin
Pygoscelis adeliae	**Adelie Penguin**	Adeliepinguin	Manchot d'Adélie	Adeliepingvin
Pygoscelis papua	**Gentoo Penguin**	Eselspinguin	Manchot papou	Bøylepingvin
Pygoscelis antarcticus	**Chinstrap Penguin**	Kehlstreifpinguin	Manchot à jugulaire	Ringpingvin
Spheniscus magellanicus	**Magellanic Penguin**	Magellanpinguin	Manchot de Magellan	Magellanpingvin
Eudyptes chrysocome	**Southern Rockhopper Penguin**	Südfelsenpinguin	Gorfou sauteur	Klippehopperpingvin
Eudyptes chrysolophus	**Macaroni Penguin**	Goldschopfpinguin	Gorfou doré	Gulltoppingvin
Diomedea exulans	**Snowy Albatross**	Wanderalbatros	Albatros hurleur	vandrealbatross
Diomedea epomophora	**Southern Royal Albatross**	Südkönigsalbatros	Albatros royal	Kongealbatross
Phoebetria palpebrata	**Light-mantled Albatross**	Graumantelalbatros	Albatros fuligineux	Gråalbatross
Thalassarche chrysostoma	**Grey-headed Albatross**	Graukopfalbatros	Albatros à tête grise	Gråhodealbatross
Thalassarche melanophris	**Black-browed Albatross**	Schwarzbrauenalbatros	Albatros à sourcils noirs	Svartbrynalbatross
Oceanites oceanicus	**Wilson's Storm Petrel**	Buntfuß-Sturmschwalbe	Océanite de Wilson	Wilsonstormsvale
Fregetta tropica	**Black-bellied Storm Petrel**	Schwarzbauch-Sturmschwalbe	Océanite à ventre noir	Svartbukstormsvale
Garrodia nereis	**Grey-backed Storm Petrel**	Graurücken-Sturmschwalbe	Océanite néréide	Gråryggstormsvale

Wildlife List – Birds

Scientific Name	English	Deutsch	Francais	Norsk
Macronectes giganteus	**Southern Giant Petrel**	Riesensturmvogel	Pétrel géant	Sørkjempepetrell
Fulmarus glacialoides	**Southern Fulmar**	Silbersturmvogel	Fulmar argenté	Sørhavhest
Thalassoica antarctica	**Antarctic Petrel**	Antarktiksturmvogel	Pétrel antarctique	Antarktispetrell
Daption capense	**Cape Petrel**	Kapsturmvogel	Damier du Cap	Flekkpetrell
Pagodroma nivea	**Snow Petrel**	Schneesturmvogel	Pétrel des neiges	Snøpetrell
Halobaena caerulea	**Blue Petrel**	Blausturmvogel	Prion bleu	Blåpetrell
Pachyptila desolata	**Antarctic Prion**	Taubensturmvogel	Prion de la Désolation	Antarktishvalfugl
Pachyptila belcheri	**Slender-billed Prion**	Dünnschnabel-Sturmvogel	Prion de Belcher	Smalnebbhvalfugl
Procellaria aequinoctialis	**White-chinned Petrel**	Weißkinn-Sturmvogel	Puffin à menton blanc	Hvithakepetrell
Ardenna gravis	**Great Shearwater**	Großer Sturmtaucher	Puffin majeur	Storlire
Ardenna grisea	**Sooty Shearwater**	Dunkler Sturmtaucher	Puffin fuligineux	Grålire
Puffinus puffinus	**Manx Shearwater**	Atlantiksturmtaucher	Puffin des Anglais	havlire
Pelecanoides urinatrix	**Common Diving Petrel**	Subantarktis-Lummensturmvogel	Puffinure plongeur	Smalnebbdykkpetrell
Phalacrocorax magellanicus	**Magellanic Cormorant**	Felsenscharbe	Cormoran de Magellan	Magellanskarv
Leucocarbo atriceps	**Imperial Shag**	Kaiserscharbe	Cormoran impérial	Knoppskarv
Leucocarbo bransfieldensis	**Antarctic Shag**	Antarktikscharbe	Cormoran antarctique	Antarktisskarv
Nycticorax nycticorax	**Black-crowned Night Heron**	Nachtreiher	Bihoreau gris	Natthegre

Wildlife List – Birds

Scientific Name	English	Deutsch	Francais	Norsk
Cathartes aura	**Turkey Vulture**	Truthahngeier	Urubu à tête rouge	Kalkunkondor
Geranoaetus polyosoma	**Variable Hawk**	Rotrückenbussard	Buse tricolore	Andesvåk
Phalcoboenus australis	**Striated Caracara**	Falklandkarakara	Caracara austral	Brungumpkarakara
Cinclodes antarcticus	**Blackish Cinclodes**	Falkland-Uferwipper	Cinclode fuligineux	Sotbergkall
Muscisaxicola maclovianus	**Dark-faced Ground Tyrant**	Maskengrundtyrann	Dormilon bistré	Magellanmarktyrann
Cistothorus platensis	**Grass Wren**	Pampazaunkönig	Troglodyte de Latham	engsmett
Troglodytes cobbi	**Cobb's Wren**	Falklandzaunkönig	Troglodyte de Cobb	Falklandssmett
Turdus falcklandii	**Austral Thrush**	Magellandrossel	Merle austral	Umbratrost
Passer domesticus	**House Sparrow**	Haussperling	Moineau domestique	Gråspurv
Anthus correndera	**Correndera Pipit**	Correnderapieper	Pipit correndera	Correnderapiplerke
Spinus barbatus	**Black-chinned Siskin**	Bartzeisig	Tarin à menton noir	Sørsisik
Leistes loyca	**Long-tailed Meadowlark**	Langschwanzstärling	Sturnelle australe	Storlerketrupial
Melanodera melanodera	**White-bridled Finch**	Weißbart-Ammertangare	Mélanodère à sourcils blancs	Gulvingespurv

Wildlife List - Marine Mammals

Wildlife List – Marine Mammals

SCIENTIFIC NAME	**ENGLISH**	DEUTSCH	FRANÇAIS	NORSK
Balaenoptera physalus	**Fin Whale**	Finnwal	Rorqual Commun	Finhval
Megaptera novaeangliae	**Humpback Whale**	Buckelwal	Balaine à Bosse	Knølhval
Orcinus orca	**Orca**	Schwertwal	Orque	Spekkhogger
Sagmatias australis	**Peale's Dolphin**	Peale-Delfin	Dauphin de Peale	Peales delfin
Cephalorhynchus commersonii	**Commerson's dolphin**	Commerson-Delfin	Céphalorhynque de Commerson	Commersondelfin
Arctocephalus gazella	**Antarctic Fur Seal**	Antarktischer Seebär	Arctocéphale de Kerguelen	Antarktis pelssel
Arctocephalus australis	**South American Fur Seal**	Südamerikanischer Seebär	Otarie à Fourrure Australe	Søramerikansk pelssel
Otaria byronia	**South American Sea Lion**	Mähnenrobbe	Otarie à Crinière	Søramerikansk sjøløve
Hydrurga leptonyx	**Leopard Seal**	Seeleopard	Léopard de Mer	Leopardsel
Leptonychotes weddellii	**Weddell Seal**	Wedellrobbe	Phoque de Weddell	Weddellsel
Lobodon carcinophaga	**Crabeater Seal**	Krabbenfresser	Phoque Crabier	Krabbeetersel
Ommatophoca rossii	**Ross seal**	Rossrobbe	Phoque de Ross	Ross-sel

Connect With Your Inner Scientist

Photo: Oscar Farrera