

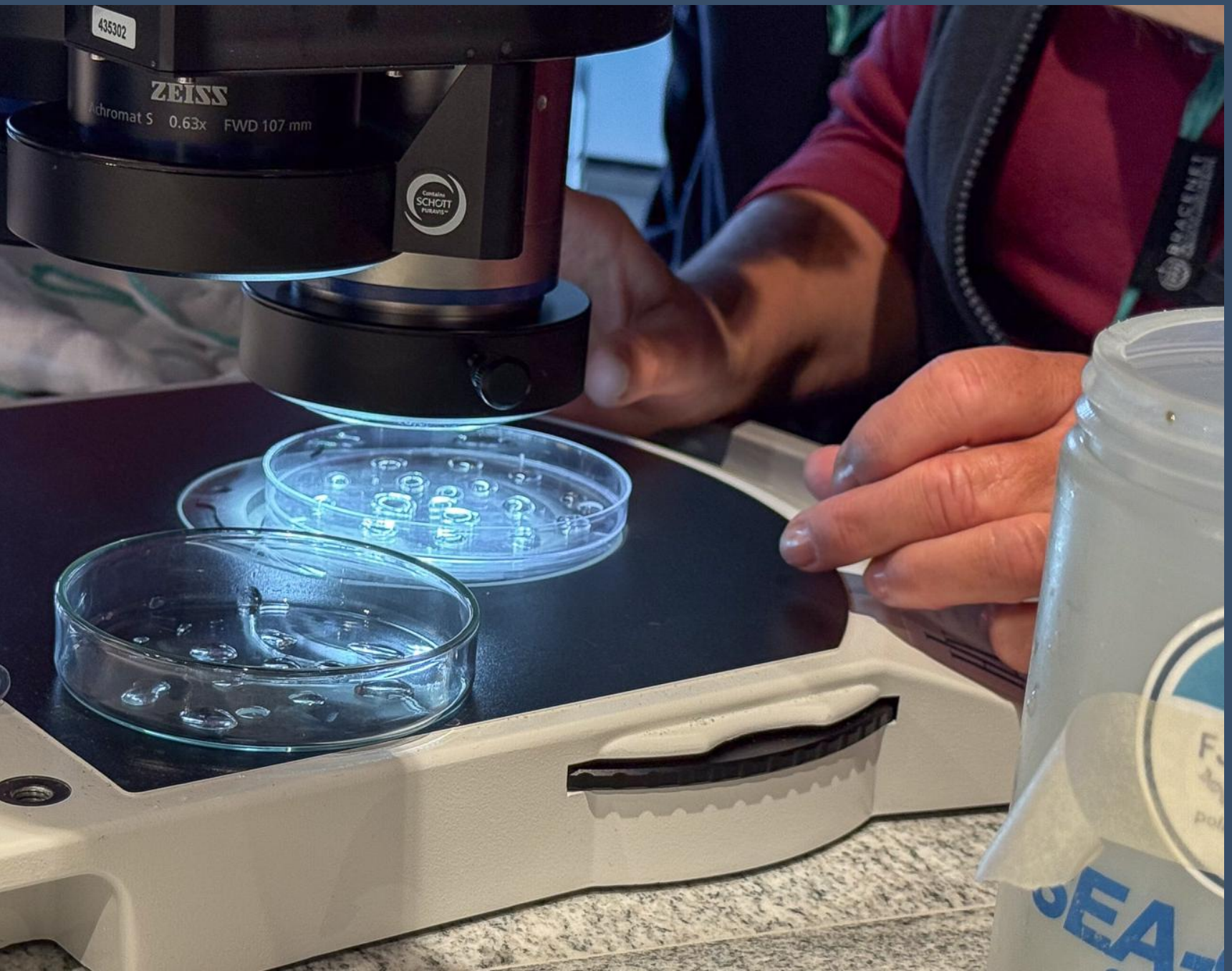
Science & Education Report

Northwest Passage – Through the Arctic Labyrinth

MS Fridtjof Nansen

15 August – 7 September 2026





Science & Education Programme

We explored the Northwest Passage through lectures, workshops, time on deck, and experiences ashore, discovering more about its coastlines, fjords, wildlife, plants, and weather along the way. By taking part in Citizen Science, we also contributed our own observations to a wider understanding of the natural world. These experiences offered opportunities to look more closely, ask questions, and build a deeper connection with the places visited throughout the voyage.



Science & Education Programme

We became part of a wider scientific effort by observing, recording, and sharing data through Citizen Science. Our contributions supported ongoing research while offering new ways to engage with the natural world throughout the voyage. That involvement can continue beyond the journey, through observing, documenting, and contributing wherever you go.

History

Throughout the voyage, we traced the routes of several Arctic explorers, including Franklin's 1845 expedition and Roald Amundsen's successful navigation of the Northwest Passage from 1903 to 1906. In 1818, Sir John Ross reported a mountain range blocking Lancaster Sound and named it the Croker Mountains. The feature was later shown to be a mirage, and MS Fridtjof Nansen sailed through the area and into the Northwest Passage.

The first landing took place at Dundas Harbour, where guests visited the remains of an abandoned Royal Canadian Mounted Police post.

At Beechey Island, guests visited the graves of three members of Franklin's expedition. The planned landing was delayed by a polar bear that swam around the ship before coming ashore near the historic site, where it rubbed against a grave marker and knocked over a commemorative plaque.



History

At Fury Beach, guests explored a site associated with explorers including John Ross, James Clark Ross, and William Edward Parry. The area also contained stone rings associated with the Thule Inuit culture, which were again observed on Murray Island.

MS Fridtjof Nansen transited Bellot Strait before anchoring near Gjoa Haven on King William Island, where Roald Amundsen overwintered during his successful Northwest Passage expedition. The voyage then continued through Rae Strait, named after John Rae following his 1854 exploration. On Victoria Island, guests visited the community of Cambridge Bay, followed by Ulukhaktok and Sachs Harbour on Banks Island. At Sachs Harbour, guests received a warm welcome from the local community. During the visit, guests also learned about the McClure Expedition, which was trapped in the region for three winters.

The voyage concluded in Nome, completing the Northwest Passage 120 years after Amundsen's successful transit.



Geology

The journey began in Greenland, where rocks dating to approximately 3.9 billion years ago provide evidence of some of the earliest stages of Earth's geological history.

Throughout the Northwest Passage, we encountered landscapes shaped by tectonic activity, marine deposition, glaciation, and erosion over hundreds of millions of years. At Prince Leopold Island, exposed sedimentary rock layers record deposition in an ancient marine environment dating to approximately 430 million years ago. At Murray Island, glacial striations and pressure-release features preserved evidence of past ice sheet activity. At the Smoking Hills, we observed an ongoing geological process where sulphur-rich lignite and pyrite-bearing mudstones, approximately 80 million years old, continue to oxidise and combust when exposed to air.

Together, these sites illustrated how geological processes operating over millions to billions of years have shaped the Arctic landscapes visible today.



Cryosphere

The voyage through the Northwest Passage provided opportunities to observe several components of the Arctic cryosphere.

In Eternity Fjord, we observed glaciers descending from the Maniitsoq Ice Cap and the U-shaped valleys formed by glacial erosion. In Ilulissat, icebergs calved from Jakobshavn Glacier illustrated the transfer of ice from the Greenland Ice Sheet to the ocean.

At Croker Bay, we examined evidence of past glaciation and the influence of ice sheets that once covered much of North America. Permafrost in the region continues to preserve evidence of past environmental conditions.

As the voyage progressed towards Nome, observations shifted from glacial ice to sea ice. Formed directly from seawater, sea ice drifts with winds and currents and plays an important role in the Arctic environment.

Together, these observations highlighted the diversity of Arctic ice environments and the processes that shape them.





Wildlife Watch

As we travelled around Greenland and the Canadian Arctic, time on deck offered opportunities to observe changing landscapes, weather, and wildlife. We searched the sea and coastline for signs of life, from seabirds riding the wind to whales and other wildlife appearing around MS Fridtjof Nansen.

Each sighting added to our understanding of the connections between land, sea, and sky. These observations became an important part of the journey, extending the experience beyond the places visited ashore.



Science Boat

Across 14 science boat sessions, we took part in hands-on exploration of the waters along our route. Using the plankton net, CTD, and Secchi Disk, we collected samples and measurements to investigate plankton, water conditions, and clarity beneath the surface. Each session offered a closer look at how scientific observations and measurements help us understand the marine environment.

Secchi Disk

We used the Secchi Disk to measure water clarity, lowering it into the water until it disappeared from view. These measurements provided information about plankton abundance and water conditions. On some days, strong currents prevented measurements, showing how field conditions can shape scientific work. Each successful reading contributed another observation to the study of the marine environment.





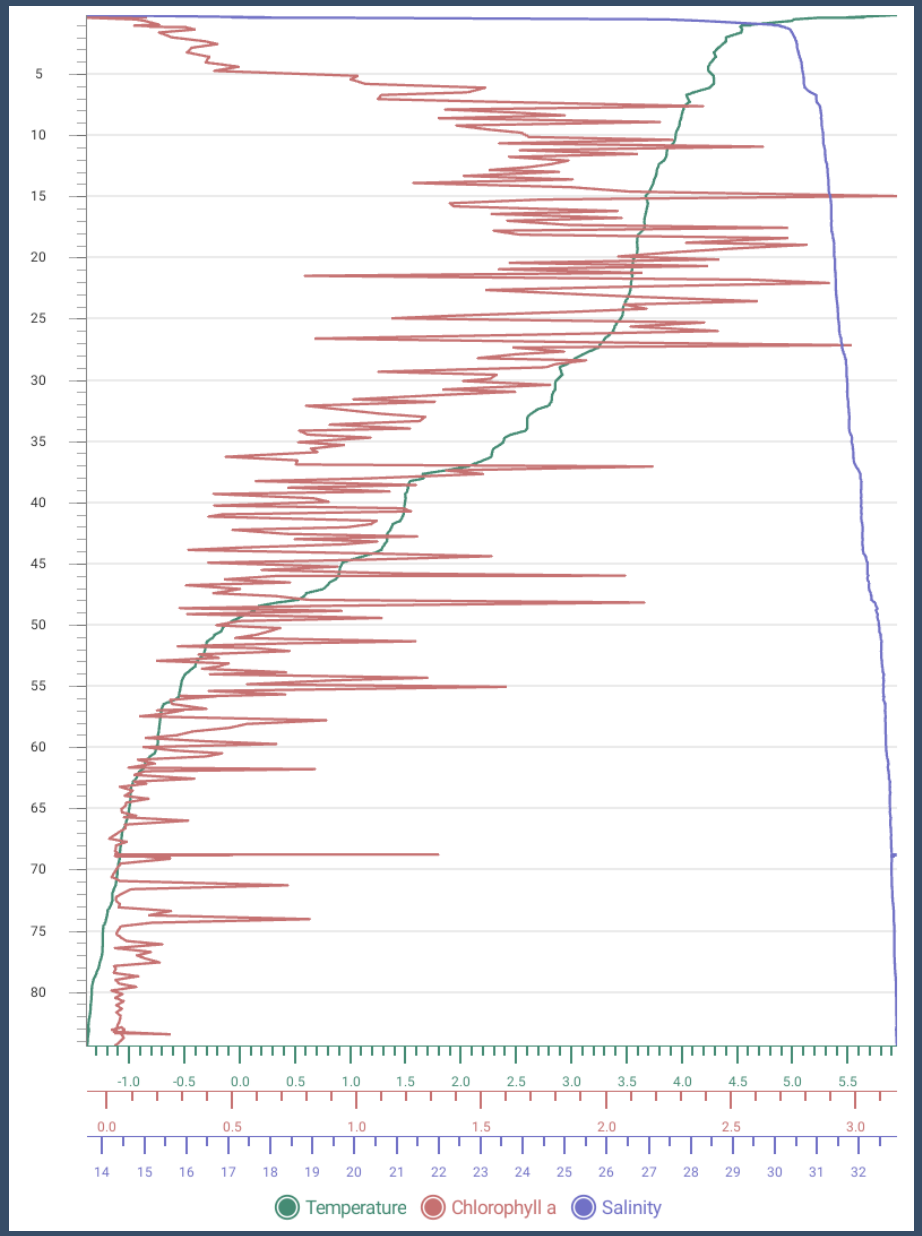
CTD

Beneath the surface, the ocean holds important clues about change.

With the CTD, we measured temperature, salinity, and depth, helping us better understand water conditions along our route.

Each profile added useful data on how freshwater, currents, and ocean layers shape these waters, one measurement at a time.

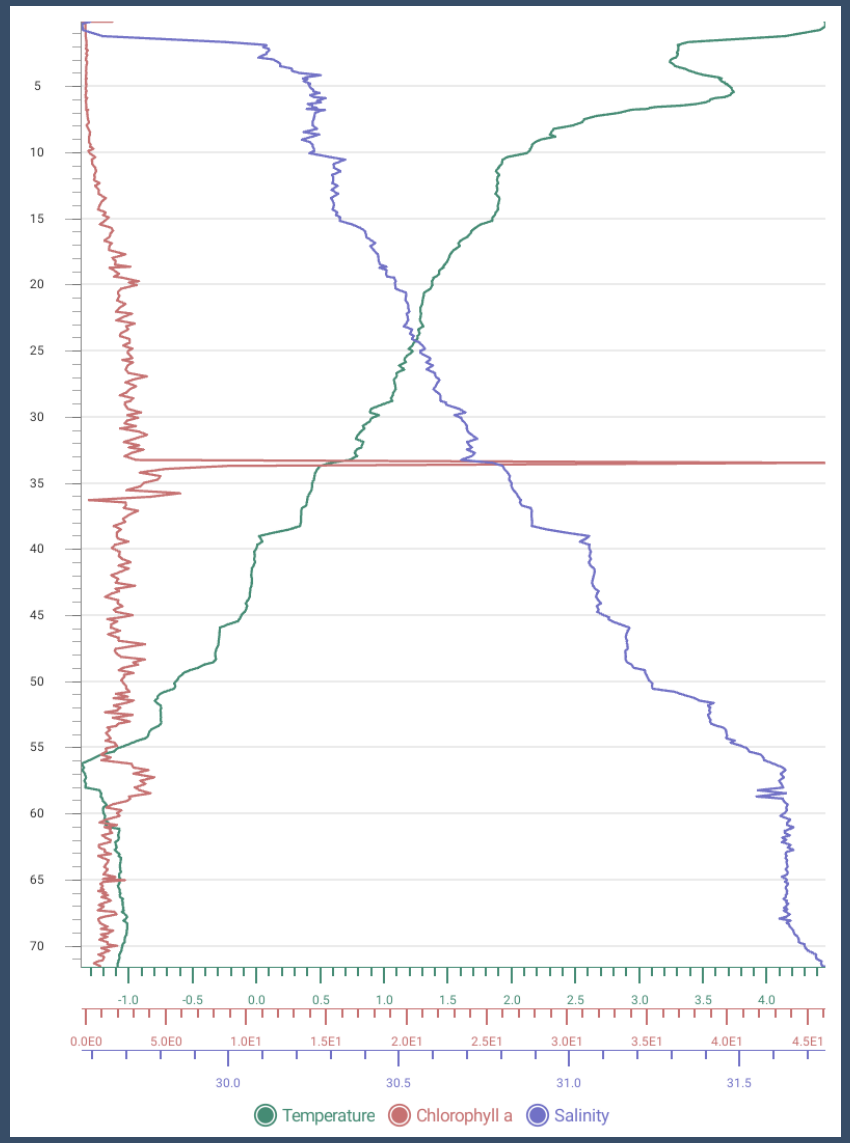
Depth Profile: Dundas Harbour



Temperature (°C)
Chlorophyll a (µg/l)
Salinity (PSU)

The CTD cast at Dundas Harbour showed a warm, fresh surface layer extending to approximately 25–30 m depth. Temperature decreased from around 5°C near the surface to below 0°C at depth, while salinity increased from approximately 25.6 PSU to 33 PSU. Chlorophyll a concentrations peaked near 30 m, coinciding with the transition between the fresher surface layer and the colder, more saline water below.

Depth Profile: Fury Beach



Temperature (°C)
Chlorophyll a (µg/l)
Salinity (PSU)

The CTD cast at Fury Beach revealed strong stratification in the water column. Surface waters were approximately 6°C warmer than the deepest measurements, while salinity increased from about 29.6 PSU at the surface to 33.3 PSU at depth. Chlorophyll a concentrations remained generally low throughout the profile, with a small peak observed at approximately 14 m depth.

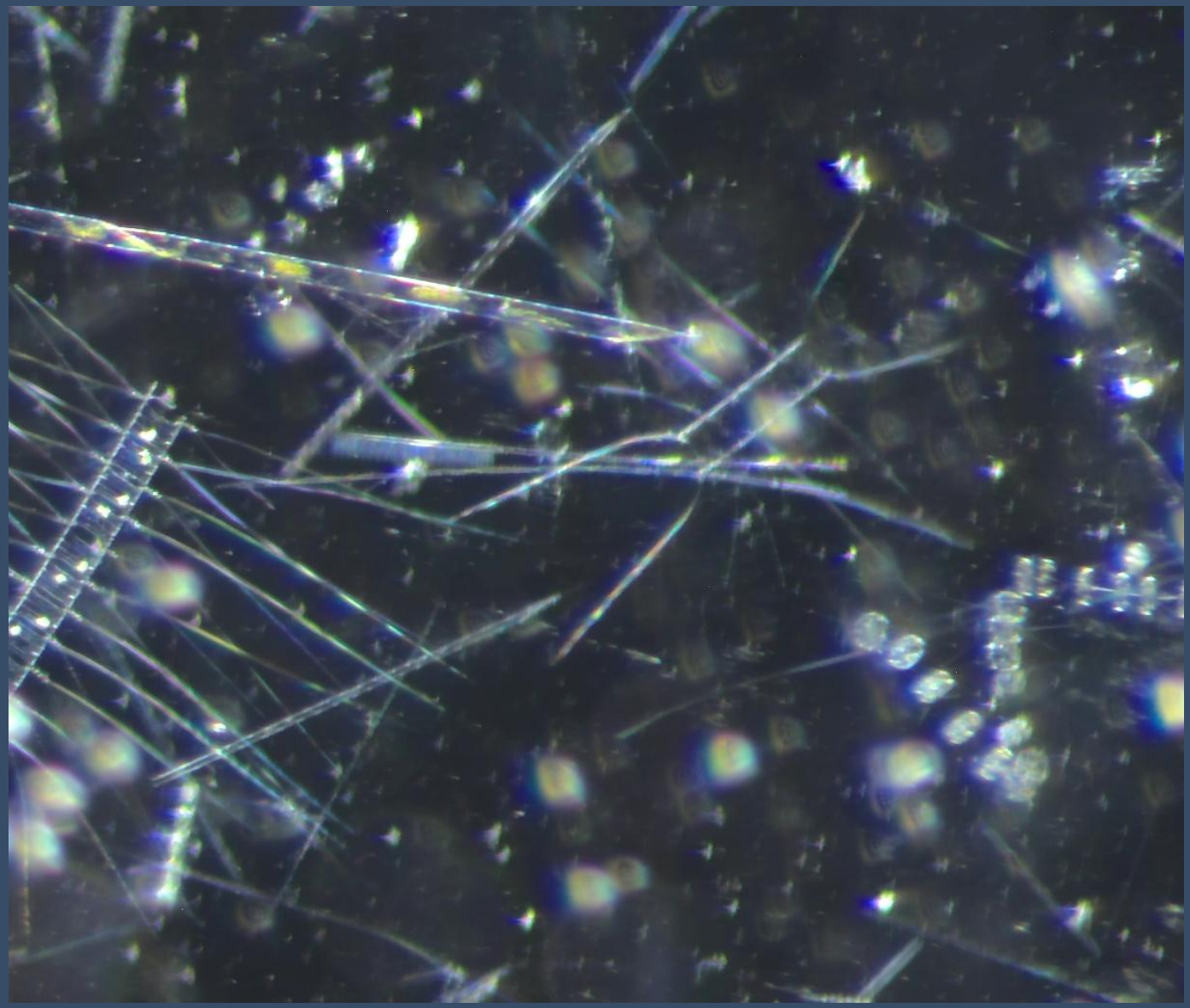
Water Sampling

During our expedition, we collected water samples from Dundas Harbour, Fury Beach, and Murray Island.

From the science boat, we deployed plankton nets, towing them through the water to capture these drifting life forms. The phytoplankton net (20 µm mesh) collected microscopic plant-like organisms that form the base of the marine food web in these fjord and coastal systems.

Each tow offered a glimpse into the hidden world beneath the surface, helping us understand how these tiny organisms support life along the Canadian coast.



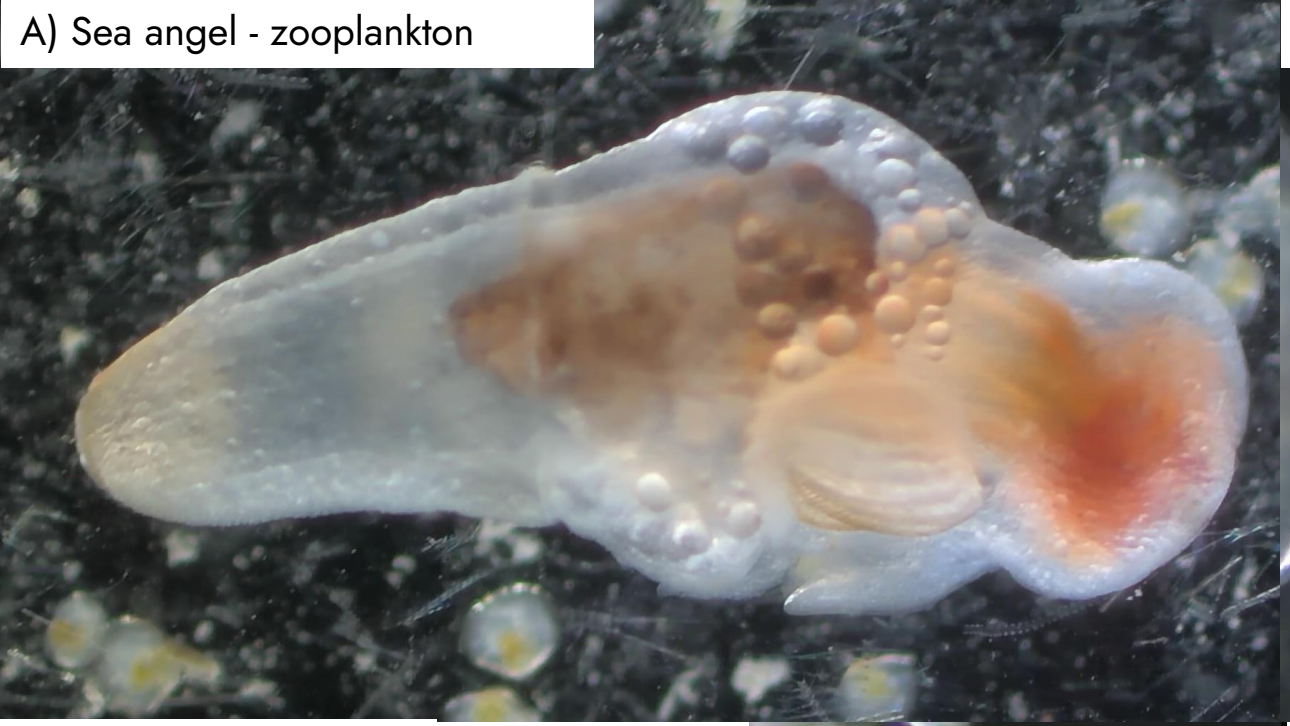


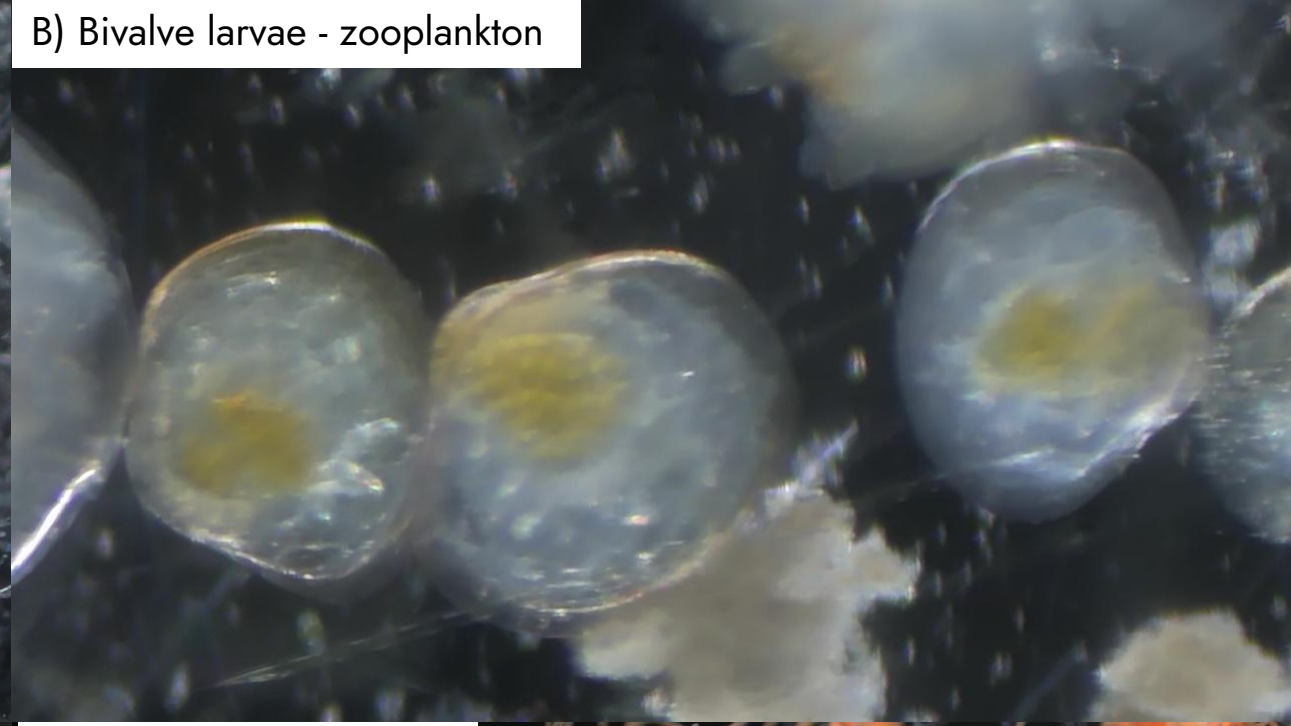
Plankton Samples

Back in the Science Centre, we brought the surface tow samples into focus under the microscope, revealing a hidden world of plankton.

Using the main screen and smaller microscopes, you could explore each drop of water up close.

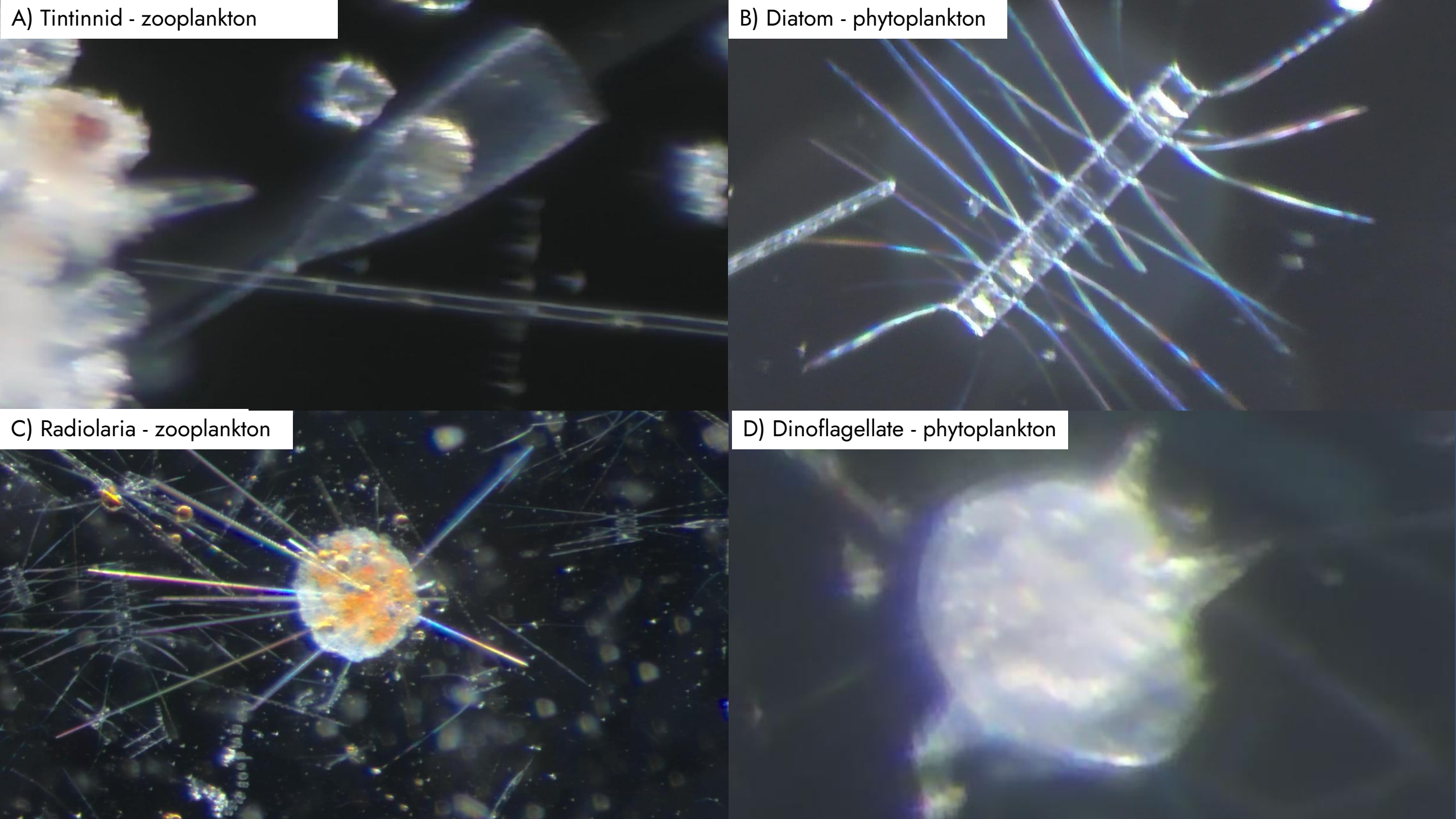
What appeared invisible to the naked eye quickly became a vivid reminder that these tiny organisms form the foundation of the rich ecosystems we have been travelling through.


A) Sea angel - zooplankton


B) Bivalve larvae - zooplankton


C) Barnacle larvae - Cyprid - zooplankton


D) Medusa - zooplankton


A) Tintinnid - zooplankton
B) Diatom - phytoplankton
C) Radiolaria - zooplankton
D) Dinoflagellate - phytoplankton



NASA's GLOBE Cloud Observer

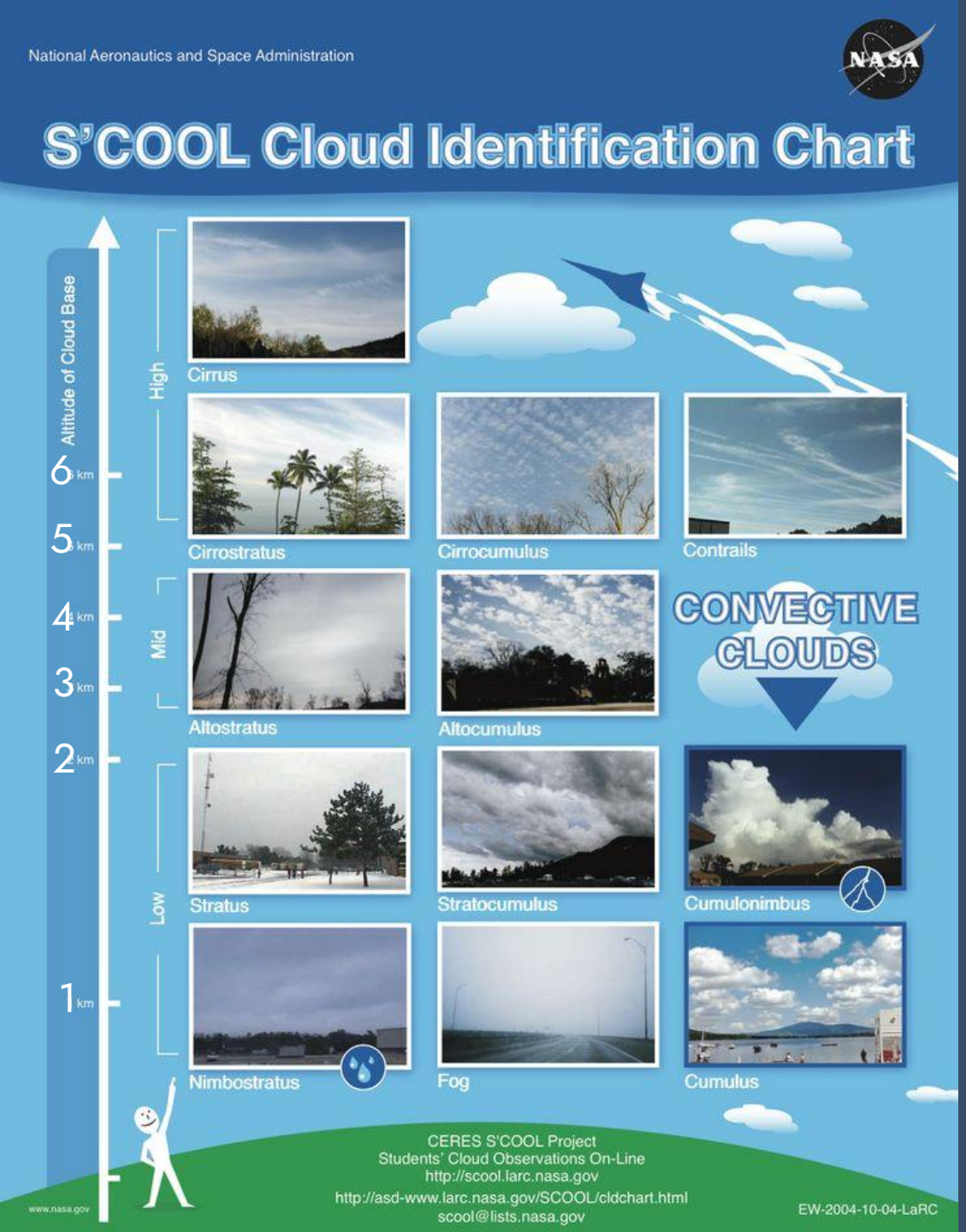
During our voyage, guests contributed to NASA's **GLOBE Cloud Observations**, collecting data on:

- **August 19th** (At sea)
- **August 20th** (At sea)
- **August 23th** (Devon Island)
- **August 24th** (Prince Leopold Island)
- **August 26th** (Bellot Strait)
- **August 30th** (Murray Island)
- **September 2nd** (Smoking Hills)
- **September 3rd** (At sea)
- **September 4th** (Beaufort sea)
- **September 5th** (At sea)
- **September 6th** (Bering sea)

By comparing our observations with satellite data, scientists can improve cloud classification, weather forecasting, and climate models.

You can continue contributing from home using the GLOBE Observer app.

View our data on the global map



NASA's GLOBE Cloud Observer

High Clouds (Base above 6,000 metres):

- **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 metres):

- **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 metres):

- **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.

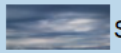
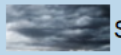
Remember that these cloud types can vary in appearance and behaviour, but this basic classification helps meteorologists understand weather patterns and atmospheric conditions. If you'd like to explore more examples, you can check out NASA's On-Line Cloud Chart.

View our data on the global map

GLOBE Cloud Satellite Match

GLOBE Cloud Observations Paired with NASA Satellite Data

Useful Resources: Observation Tips & Tricks | Cloud Cover | Cloud Type | Cloud Opacity | Cloud Satellite Comparisons

Observation	Your GLOBE Ground View	NASA PACE View
Universal Date/Time	2026-08-19 16:36:00	2026-08-19 16:48:24
Latitude	70.72	70.7204 to 71.5204
Longitude	-61.15	-61.1523 to -60.3523
Total Cloud Cover	Overcast (>90%)	Overcast (100%)
High Clouds		PACE satellite image available above.
Mid Clouds		
Low Clouds	 Nimbostratus  Stratus  Stratocumulus Cover: Overcast (>90%) Opacity: Opaque	

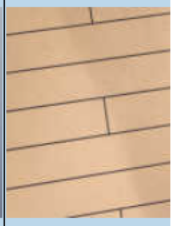
Sky and Surface Conditions	North	East	South	West	Up	Down
Sky Conditions Sky Visibility : no report Sky Color : no report **Surface Conditions** Snow/Ice : No Standing Water : Yes Muddy : No Dry Ground : No Leaves on Trees : No Raining or Snowing : Yes						

GLOBE Cloud Satellite Match

GLOBE Cloud Observations Paired with NASA Satellite Data

Useful Resources: Observation Tips & Tricks | Cloud Cover | Cloud Type | Cloud Opacity | Cloud Satellite Comparisons

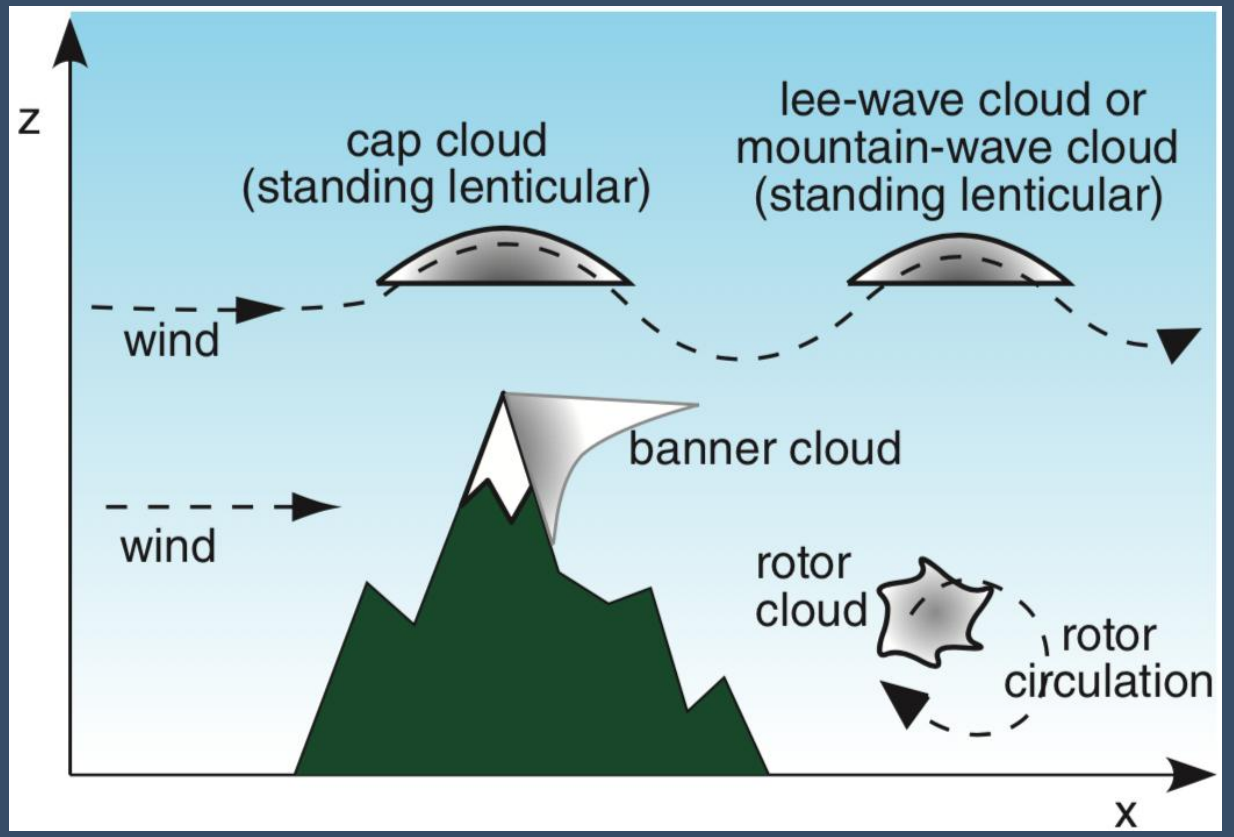
Observation	Your GLOBE Ground View	NOAA-20 View	NASA PACE View
Universal Date/Time	2026-08-20 17:21:00	2026-08-20 17:19:00	2026-08-20 17:23:00
Latitude	72.24	71.83 to 72.63	72.2377 to 73.0377
Longitude	-70.23	-70.61 to -69.81	-70.2311 to -69.4311
Total Cloud Cover	Scattered (25-50%)	Broken (58.65%)	Overcast (100%)
High Clouds	 Cirrus Cover: Few (<10%) Opacity: Translucent		
Mid Clouds			PACE satellite image available above.
Low Clouds	 Stratus Cover: Scattered (25-50%) Opacity: Translucent	Cover: Broken 58.64% Altitude: 0.6 (km) Phase: Ice/Water Mix 275.77 (K) Opacity: Translucent	

Sky and Surface Conditions	North	East	South	West	Up	D
Sky Conditions Sky Visibility : Somewhat Hazy Sky Color : Blue **Surface Conditions** Snow/Ice : No Standing Water : Yes Muddy : No Dry Ground : No Leaves on Trees : No Raining or Snowing : No						





Lenticular clouds
(*Altocumulus lenticularis*)



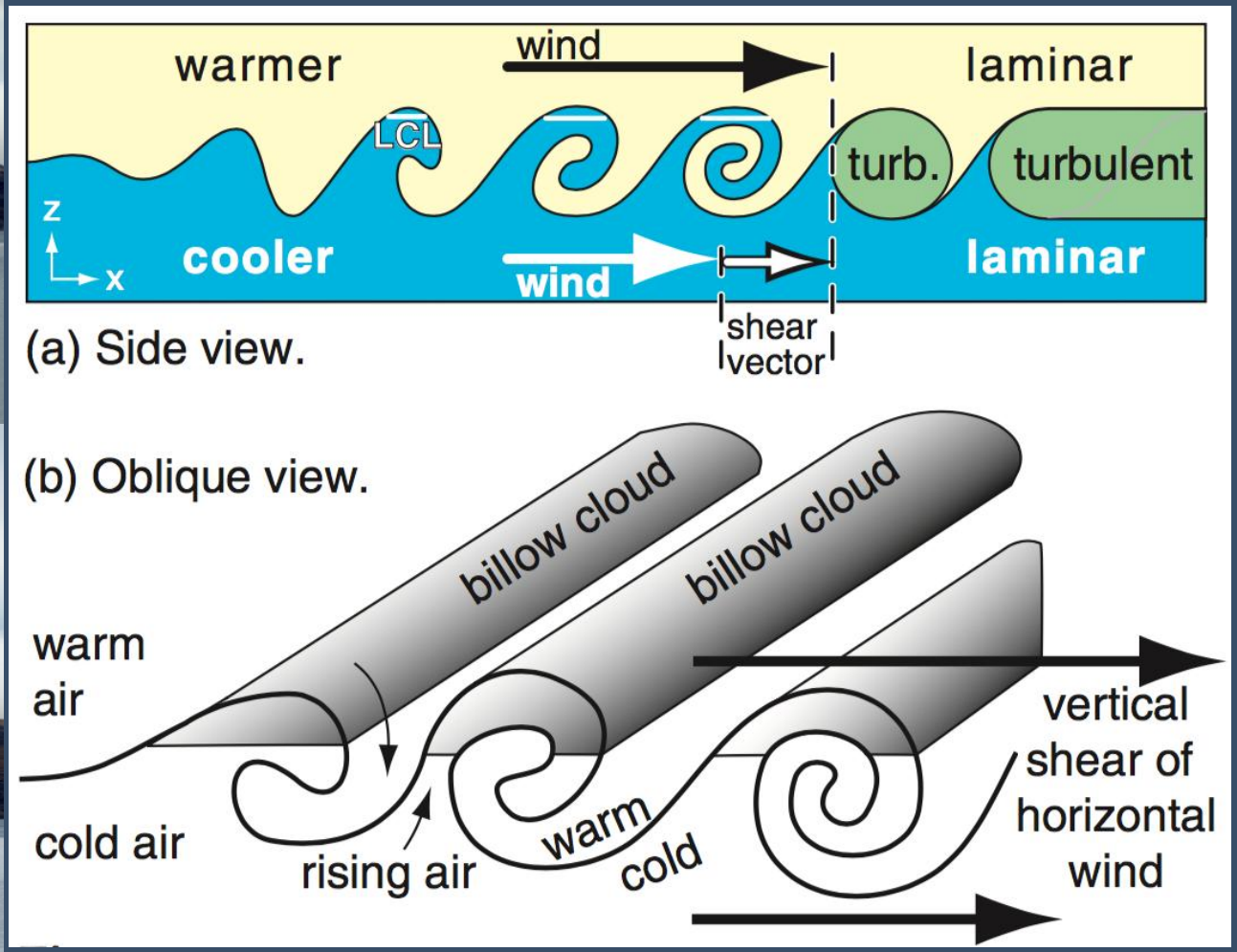
(UBC)

➡ **Orographic** cloud

« Oro » = Mountain and « graph » = writing

Leaving Murray Island 30 August

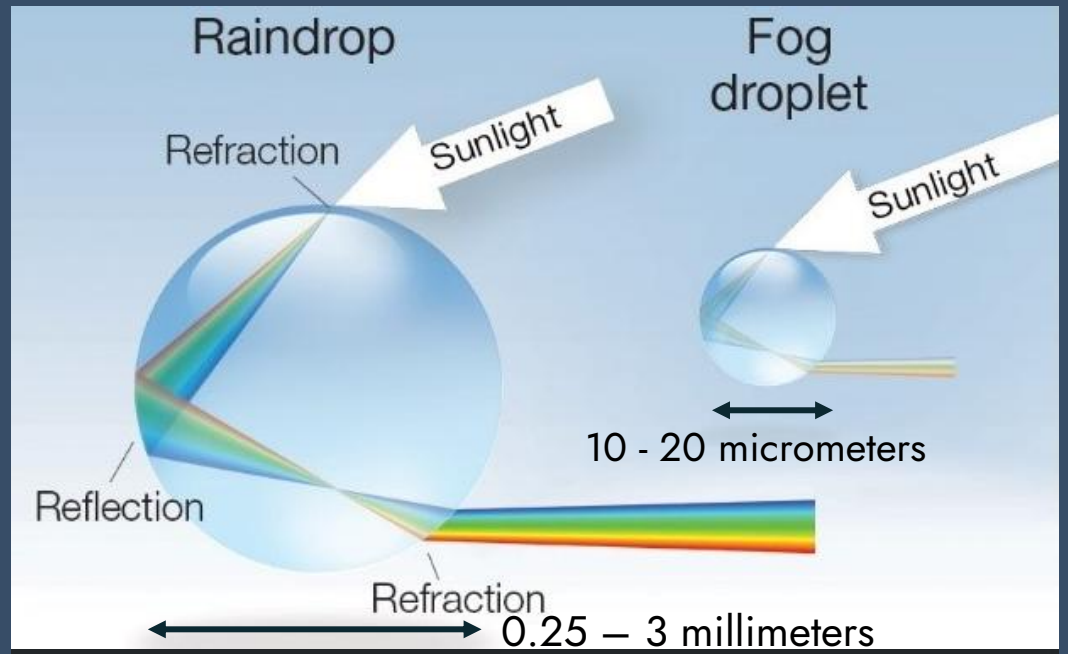
Kelvin-Helmholtz clouds

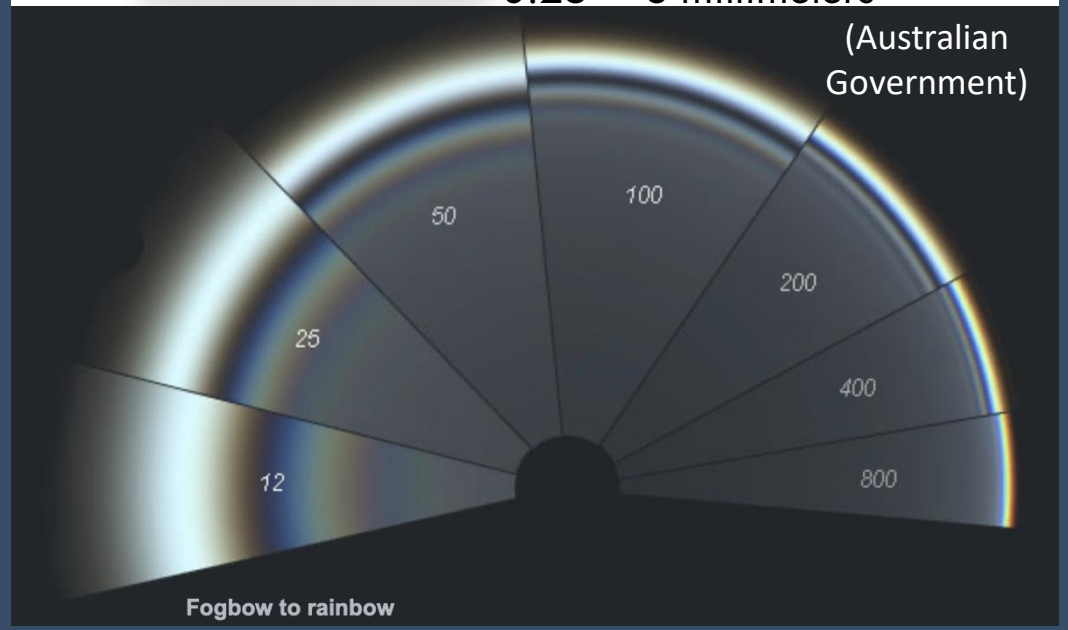


(UBC)

At sea 03 September

Fogbow/Cloudbow





iNaturalist

Throughout this voyage, you played a vital role in documenting the incredible biodiversity of the High Arctic.

By capturing and submitting images of wildlife and plant life, you contributed to a global effort to track species distribution and monitor ecosystems across some of the Arctic's most remote and ecologically rich coastlines.

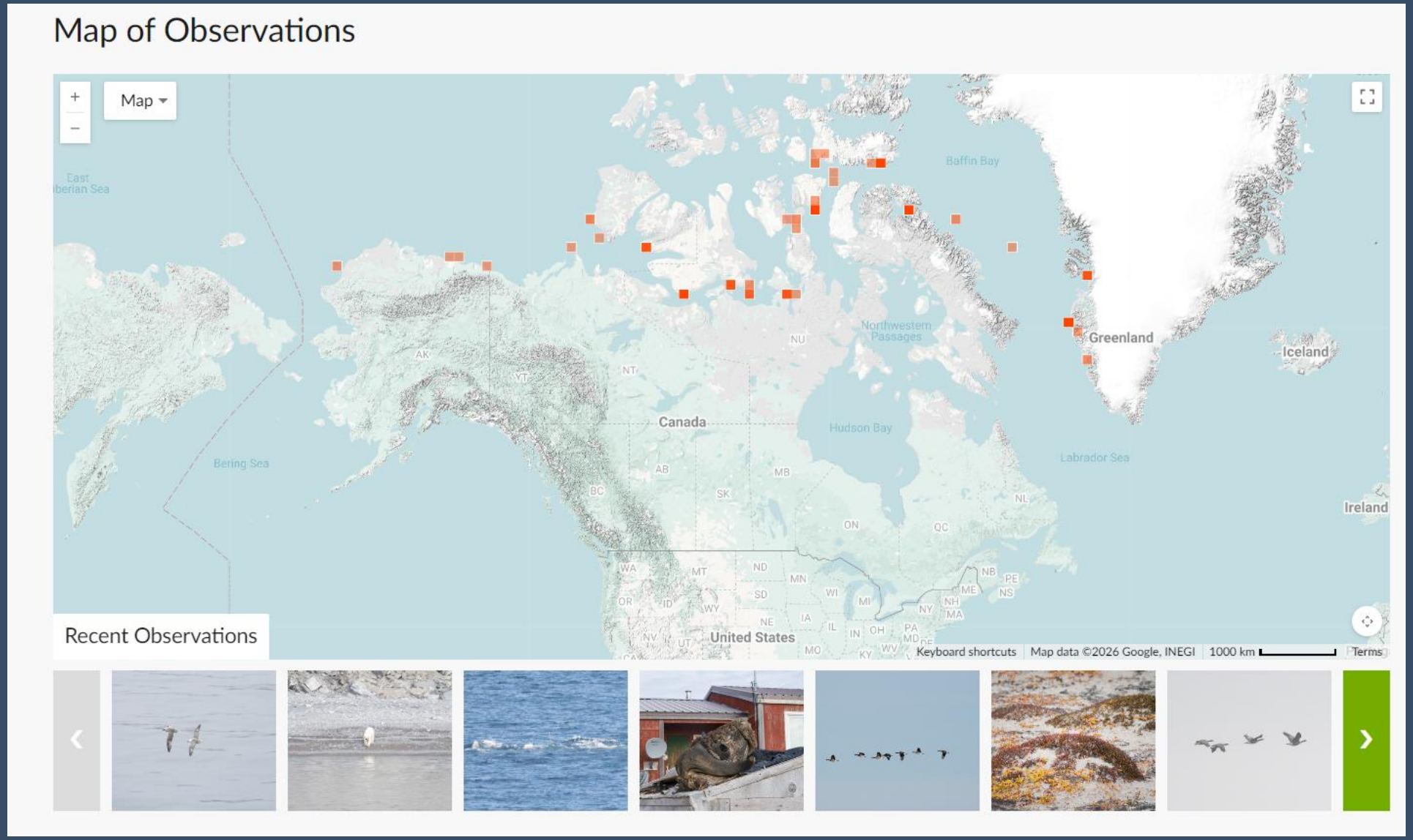
Together, we gathered:
840 Observations
226 Species Identified
17 Observers Participating

Click on the link to view our collective data and see the impact of your contributions:

View our data on the iNaturalist website



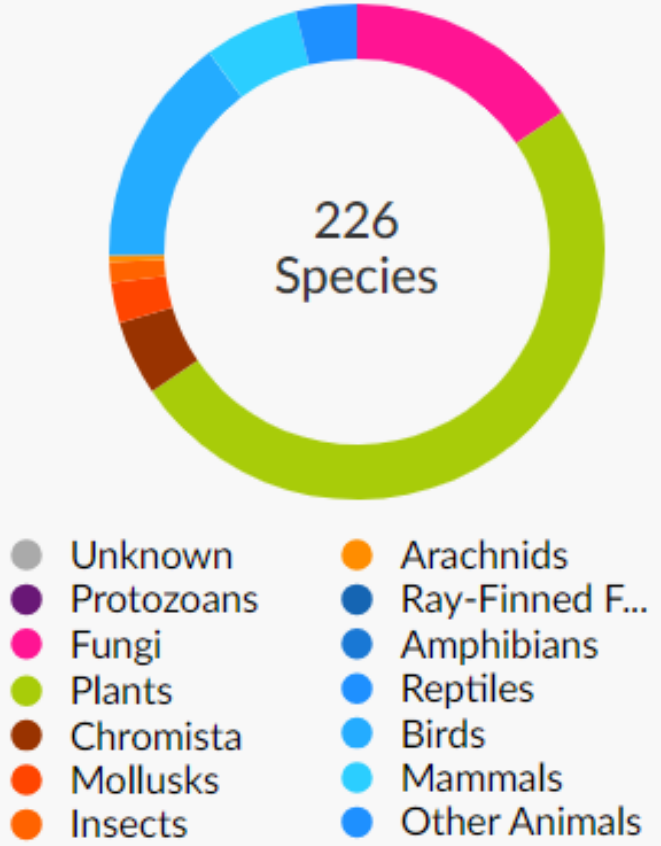
MS Fridtjof Nansen 15 August – 7 September 2026



MS Fridtjof Nansen 15 August – 7 September 2026

Stats







eBird

Bird-watching is not just a hobby; it is a powerful tool for science. eBird, a global Citizen Science platform, allows bird enthusiasts to record and share sightings, contributing valuable data for research and conservation.

During our voyage, we conducted 26 wildlife watches, completed 51 checklists, and recorded 42 bird species.

Every entry adds to a growing database that helps scientists track migration patterns, monitor populations, and understand bird behaviour in remote regions like the Arctic.

View our data on the eBird website

Northwest Passage Cruise: Greenland to Alaska - MS Nansen (August 15 - September 7, 2026)

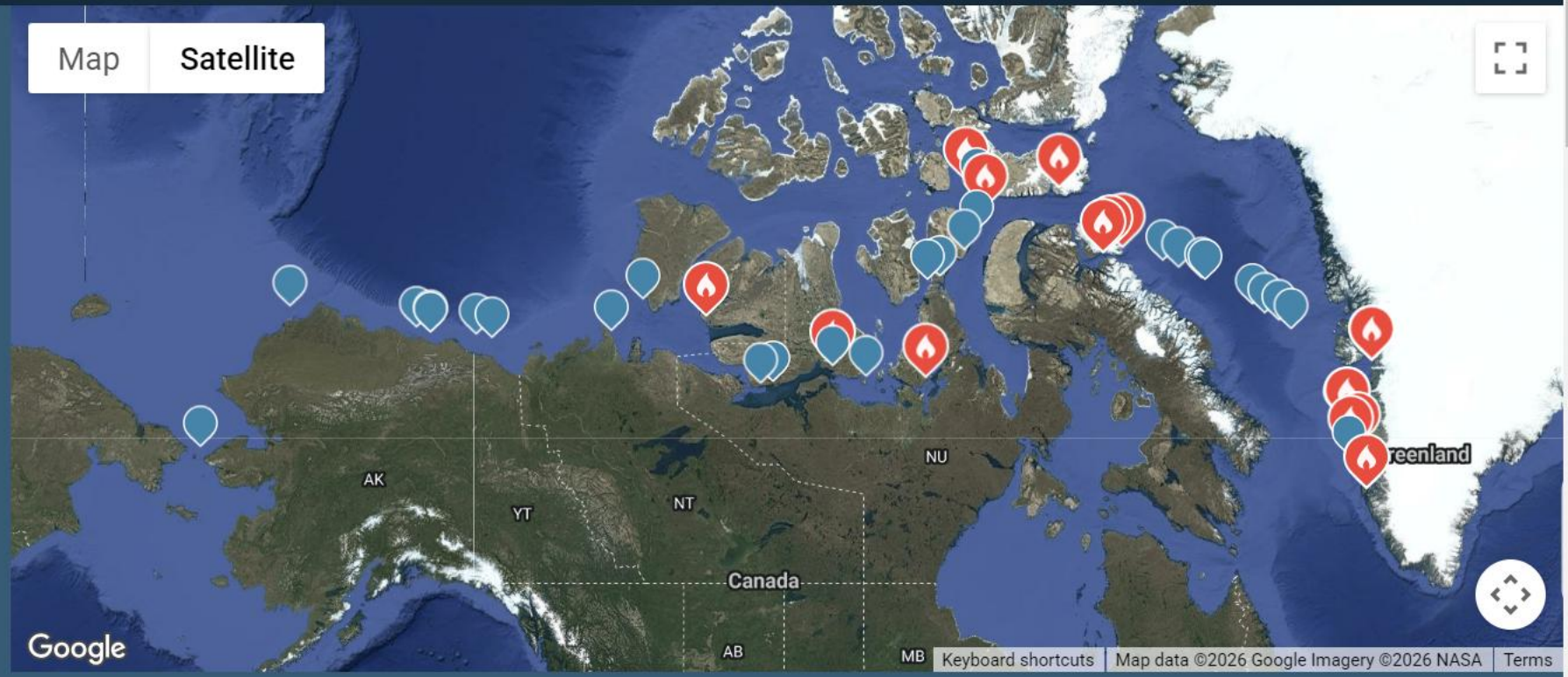
15 Aug – 7 Sep 2026 (24 days)

Public

Canada | Greenland | United States

Subregions

Science Coordinator, Eilidh Morrison, Lancy Cheng





ORCA

ORCA Ocean Conservationist Eilidh Morrison joined us as we recorded sightings of marine mammals during this voyage.

Using ORCA's OceanWatchers App, we registered multiple sightings all across the Northwest Passage:

- 32 individuals, including polar bears, harp seals, bearded seals, ringed seals, walruses, bowhead whales, and minke whales.
- 27 survey sessions.
- More than 2,000 minutes of active surveying.
- 20 encounters with polar bears, cetaceans, and pinnipeds.

ORCA

While on our journey through the Northwest Passage, we were joined by ORCA Ocean Conservationist Eilidh, who was collecting data on whales, dolphins, and porpoises. The data were collected using the ORCA OceanWatchers App and sent back to ORCA to be made available for many organisations interested in cetacean conservation.

On this journey, a total of 51 hours and 19 minutes of data were collected, spanning a distance of 545.7 km. Eight species of marine mammals were recorded during these surveys, with a total of 256 individuals recorded.



Sightings on Survey

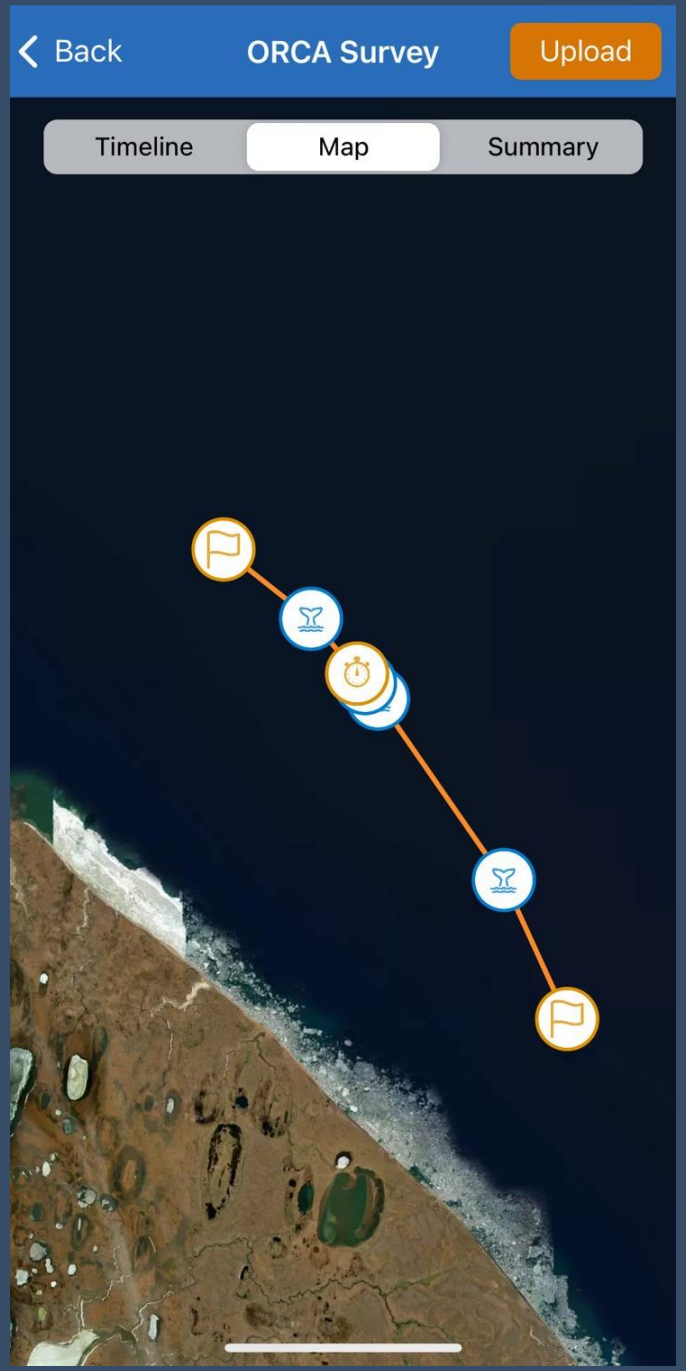
Species	Number of individuals seen
Humpback whale *(Megaptera novaeangliae)*	3
Fin whale *(Balaenoptera physalus)*	1
Bowhead whale *(Balaena mysticetus)*	31
Beluga *(Delphinapteras leucas)*	4
Unidentified whale	5
Harp seal *(Pagophilus groenlandicus)*	157
Ringed seal *(Pusa hispida)*	19
Walrus *(Odobenus rosmarus)*	1
Unidentified seal	33
Polar bear *(Ursus maritimus)*	2

Back ORCA Survey Upload

Timeline | Map | Summary

Please do not forget to upload this survey!

18:22	Finish
18:07	Sighting
18:01	30 Minutes
18:00	Sighting
17:55	Sighting
17:52	Sighting
17:37	Sighting
17:14	Start



Back ORCA Survey Upload

Timeline | Map | Summary

1:07 hrs
Time spent

23.2 km
Distance travelled

Species seen



Bowhead whale

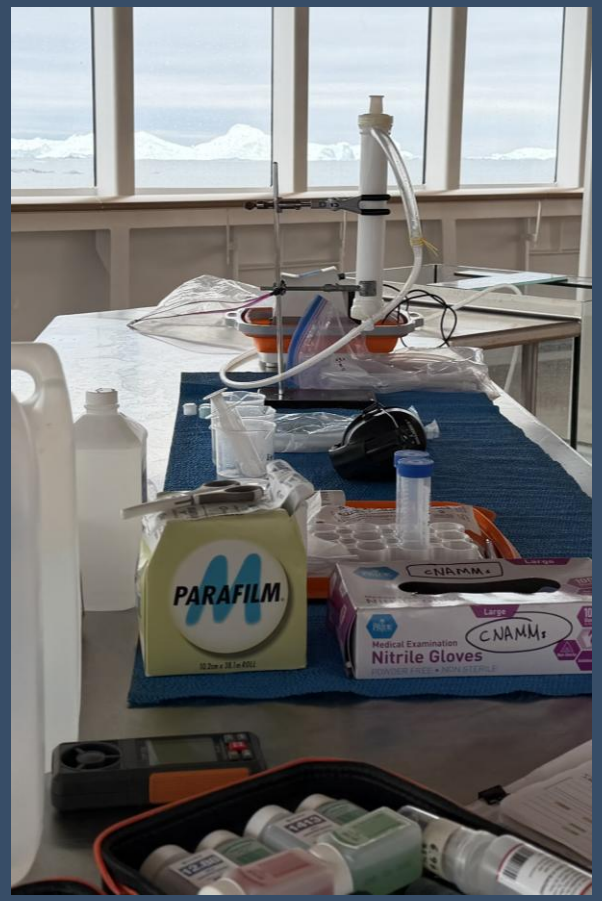
cNAMMs

Circumnavigation North American Marine Microbe Survey – Guest Scientist Dr Tom Dietz

A First Comprehensive Survey of Marine Microbes Along the Northwest Passage



Dr Tom is collecting water for filtering at Evighedsfjorden

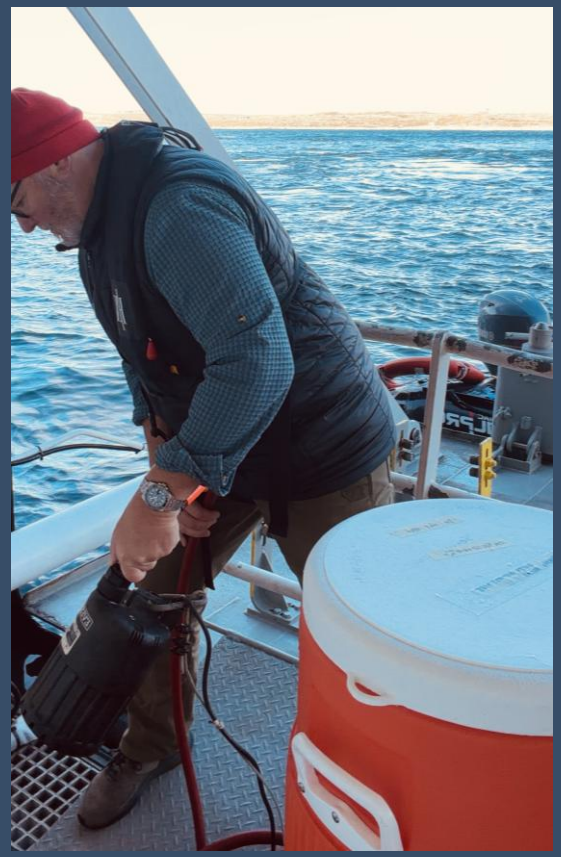


Deck 6 Wet Lab – filtering the collected seawater to trap bacteria and viruses in Ilulissat



Dr Tom evaluating his filtered samples for the presence of plankton

A First Comprehensive Survey of Marine Microbes Along the Northwest Passage



Dr Tom preparing the pump to collect seawater off the tender pit – Gjoa Haven



Dr Tom's expedition carries flags from The Explorers Club, The Adventures Club, and the GAC Research Institute

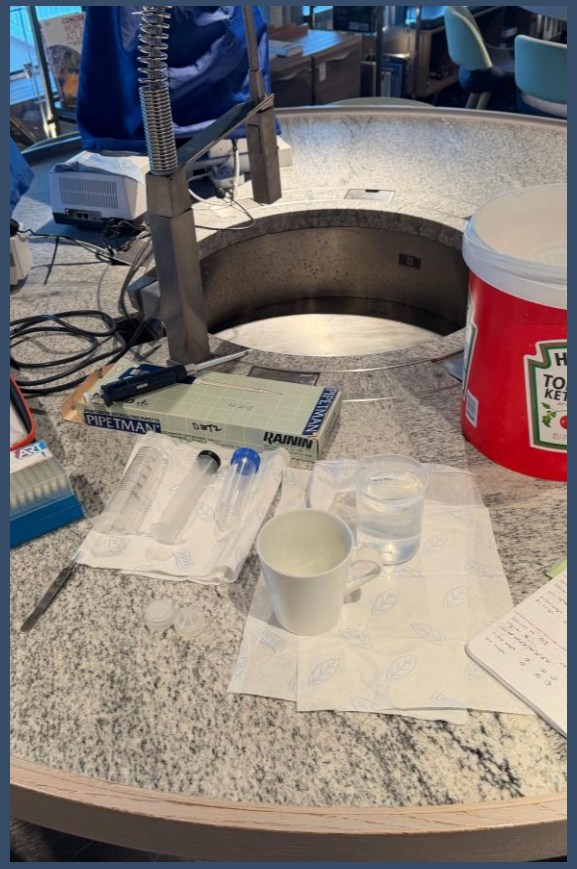


The laboratory of the day – Radstock Bay

Hunting for Microplastics and the Bacteria That Live on Them



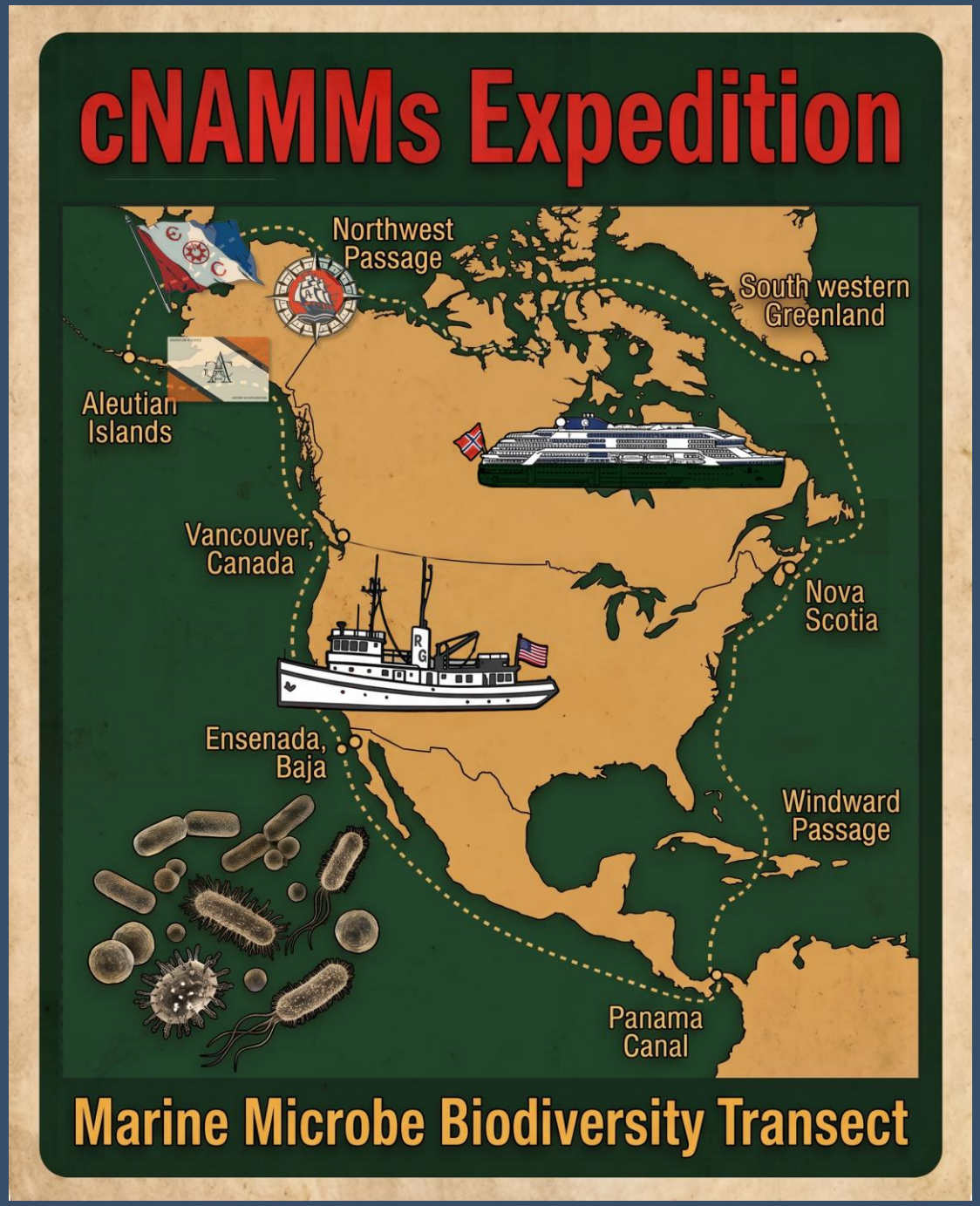
Dr Tom is filtering samples to trap microplastics for further analysis



Microplastics filtering station. Will a difference be found between the surface water and the samples collected for bacterial analysis?



Dr Tom is filtering in Sachs Harbour, and his cold and loud wet lab



Summary

Earth's marine environment is the planet's largest habitat, playing a critical role in regulating its climate. Evaluating the world's biodiversity is key to understanding the effects of a changing climate, especially on organisms that play critical roles in the health of our climate.

During this expedition, Dr Dietz collected 16 samples from Nuuk to Nome, will collect 8 more samples through to Vancouver, and will collect 38 samples around continental North America.

Dr Dietz now heads to the lab to analyse what we have collected and looks forward to publishing the results from the cNAMMs Expedition over the next year.

If you are interested in seeing the conclusions drawn from this expedition, you can email Dr Tom at tdietz@gentadv.com

Wildlife List – Land Mammals



Wildlife List — Land Mammals

SCIENTIFIC NAME	ENGLISH	DEUTSCH
Ovibos moschatus	muskox	Moschusochse
Lepus arcticus	arctic hare	Polarhase
Lemmus trimucronatus	brown lemming	Brauner Lemming
Mustela erminea	stoat	Hermelin

Wildlife List – Marine Mammals



Wildlife List – Marine Mammals

SCIENTIFIC NAME	English	Deutsch
Megaptera novaeangliae	humpback whale	Buckelwal
Balaenoptera physalus	fin whale	Finnwal
Balaena mysticetus	bowhead whale	Grönlandwal
Monodon monoceros	narwhal	Narwal
Delphinapterus leucas	beluga	Weisser Wal
Phocoena phocoena	harbour porpoise	Schweinswal
Erignathus barbatus	bearded seal	Bartrobbe
Pagophilus groenlandicus	harp/Greenland seal	Sattelrobbe
Pusa hispida	ringed seal	Ringelrobbe
Odobenus rosmarus	walrus	Walross
Ursus maritimus	polar bear	Eisbär

Wildlife List – Birds



Wildlife List – Seabirds

SCIENTIFIC NAME	ENGLISH	DEUTSCH
Gavia stellata	red-throated diver	Sterntaucher
Gavia pacifica	Pacific diver	Pazifiktaucher
Phalaropus lobatus	red-necked phalarope	Odinshühnchen
Stercorarius parasiticus	Arctic skua	Schmarotzerraubmöwe
Stercorarius pomarinus	pomarine jaeger	Spatelraubmöwe
Stercorarius longicaudus	long-tailed jaeger	Falkenraubmöwe
Fulmarus glacialis	northern fulmar	Eissturmvogel
Ardenna grisea	sooty shearwater	Dunkler Sturmtaucher
Phalacrocorax carbo	great cormorant	Kormoran
Rissa tridactyla	black-legged kittiwake	Dreizehenmöwe
Larus marinus	great black-backed gull	Mantelmöwe
Larus hyperboreus	glaucous gull	Eismöwe
Larus glaucoides	Iceland gull	Polarmöwe
Xema sabini	Sabine's gull	Schwalbenmöwe
Sterna paradisaea	Arctic tern	Küstenseeschwalbe
Uria lomvia	Brunnich's guillemot / thick-billed murre	Dickschnabellumme
Uria aalge	common murre	Trottellumme
Cepphus grylle	black guillemot	Gryllteiste

Wildlife List – Seabirds

SCIENTIFIC NAME	ENGLISH	DEUTSCH
Fratercula arctica	Atlantic puffin	Papageitaucher
Alle alle	little auk / dovekie	Krabbentaucher
Cerorhinca monocerata	rhinoceros auklet	Nashornalk
Aethia psittacula	parakeet auklet	Rotschnabelalk
Aethia cristatella	crested auklet	Schopfalk
Aethia pusilla	least auklet	Zwergalk
Fratercula corniculata	horned puffin	Hornlund
Fratercula cirrhata	tufted puffin	Gelbschopflund
Phalaropus lobatus	red-necked phalarope	Odinshühnchen

Wildlife List – Waterbirds

SCIENTIFIC NAME	ENGLISH	DEUTSCH
Cygnus columbianus	tundra swan	Zwergschwan
Branta hutchinsii	cackling goose	Zwergkanadagans
Gelbschnabeltaucher	brent goose	Ringelgans
Anser albifrons flavirostris	Greenland white-fronted goose	Blassgans
Anser caerulescens	snow goose	Schneegans
Anas platyrhynchos	mallard	Stockente
Anas acuta	northern pintail	Spießente
Somateria mollissima	common eider	Eiderente
Clangula hyemalis	long-tailed duck	Eisente
Charadrius semipalmatus	semipalmated plover	Amerikanischer Sandregenpfeifer
Arenaria interpres	ruddy turnstone	Steinwälzer
Calidris bairdii	Baird's sandpiper	Bairdstrandläufer
Calidris fuscicollis	white-rumped sandpiper	Weißbürzel-Strandläufer
Calidris alba	sanderling	Sanderling
Calidris melanotos	pectoral sandpiper	Graubrust-Strandläufer

Wildlife List – Landbirds

SCIENTIFIC NAME	ENGLISH	DEUTSCH
Antigone canadensis	sandhill crane	Kanadakranich
Oenanthe oenanthe	northern wheatear	Steinschmätzer
Calcarius lapponicus	Lapland longspur/ bunting	Spornammer
Plectrophenax nivalis	snow bunting	Schneeammer
Anthus rubescens	American pipit	Pazifikpieper
Eremophila alpestris	horned lark	Ohrenlerche
Falco peregrinus	peregrine falcon	Wanderfalke
Zonotrichia leucophrys	white-crowned sparrow	Dachsammer
Falco rusticolus	gyrfalcon	Gerfalke
Antigone canadensis	sandhill crane	Kanadakranich


Thanks for your participation!