

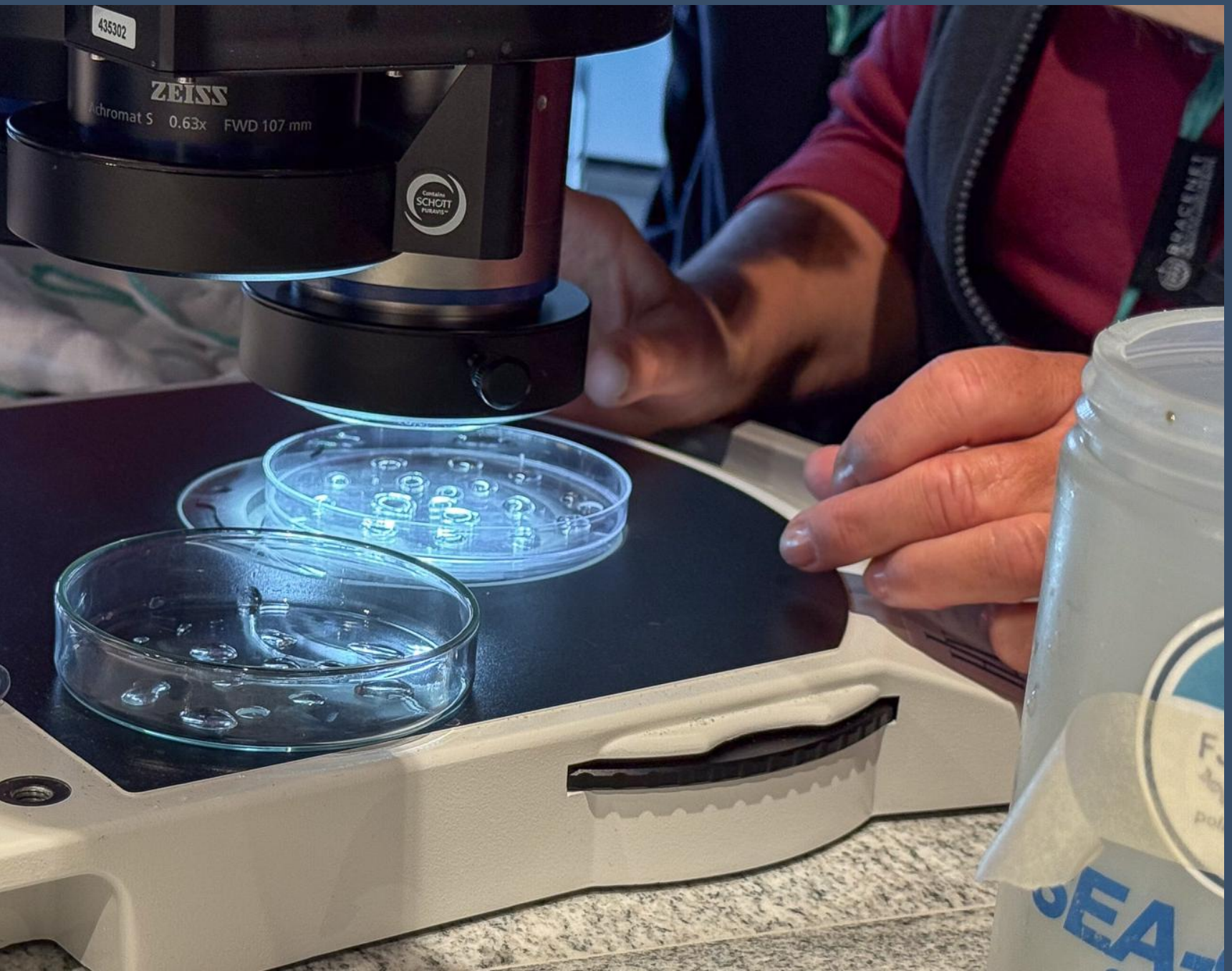
Science & Education Report

Alaska and British Columbia – Inside Passage, Bears and Aleutian Islands (Southbound)

MS Fridtjof Nansen

7 – 23 September 2026





Science & Education Programme

Together, we explored Alaska and British Columbia through lectures, workshops, time on deck, and experiences ashore, discovering more about their 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 gave us all the chance to look more closely, ask questions, and build a deeper connection with the places we visited throughout the voyage.



Science & Education Programme

Together, 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. Your involvement can continue beyond the journey, through observing, documenting, and contributing wherever you go.

History

On this voyage, MS Fridtjof Nansen sailed through the cultural landscapes of the Unangaxˆand Tlingit peoples, visiting places inhabited for thousands of years. Since Europeans arrived, beginning with Vitus Bering and his expedition in 1741, successive waves of explorers, traders, hunters, and colonists have left their mark on the land and its communities. Onboard presentations covered Russian colonisation, the first European expeditions, and the lasting impact of the forced evacuations during World War II on local cultures.

From Unalaska's bunker-lined coastline and the abandoned settlement of Unga to the totem poles of Sitka and Wrangell, the places we visited on this voyage revealed many layers of history. For those willing to listen, each landscape offered stories shaped by both Indigenous traditions and centuries of cultural change.



Geology

We traced Alaska's geological story across millions of years, from the 70-million-year-old volcanic rocks of St Matthew Island to the active volcanoes of the Aleutians and the mountain-building forces recorded in Wrangell's garnets.

Along the way, we discovered fossils preserved in volcanic ash, petrified forests that reveal a greener Aleutian past, and evidence of the tectonic activity that continues to shape Alaska today. Together, these sites showed how volcanism, plate movement, and mountain building have transformed Alaska's landscapes through time, and continue to do so.



Cryosphere

We explored Alaska's cryosphere through ice-shaped landscapes, from the permafrost of Nome to the glaciers of Icy Bay. Along the way, we discovered how frozen ground preserves clues to past climates, how advancing and retreating glaciers carved valleys and fjords, and how the dramatic retreat of Guyot Glacier has transformed the landscape within the last century.

The journey also highlighted the legacy of the last Ice Age, when vast ice sheets lowered sea levels and exposed Beringia, connecting continents and enabling the migration of animals and humans. Together, these sites revealed how ice has shaped Alaska's landscapes and continues to influence them today.





Wildlife Watch

As we travelled around Alaska and British Columbia, 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 deepened 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 we visited ashore.



Science Boat

Over 13 science boat sessions, we explored the waters along our route hands-on. Using a plankton net, CTD, and Secchi Disk, we collected samples and measurements to investigate plankton, water conditions, and water clarity. 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 gave us information about plankton abundance and water conditions.

On some days, strong currents prevented measurements, a reminder of how field conditions can shape scientific work. Each successful reading contributed another observation to the study of the marine environment.





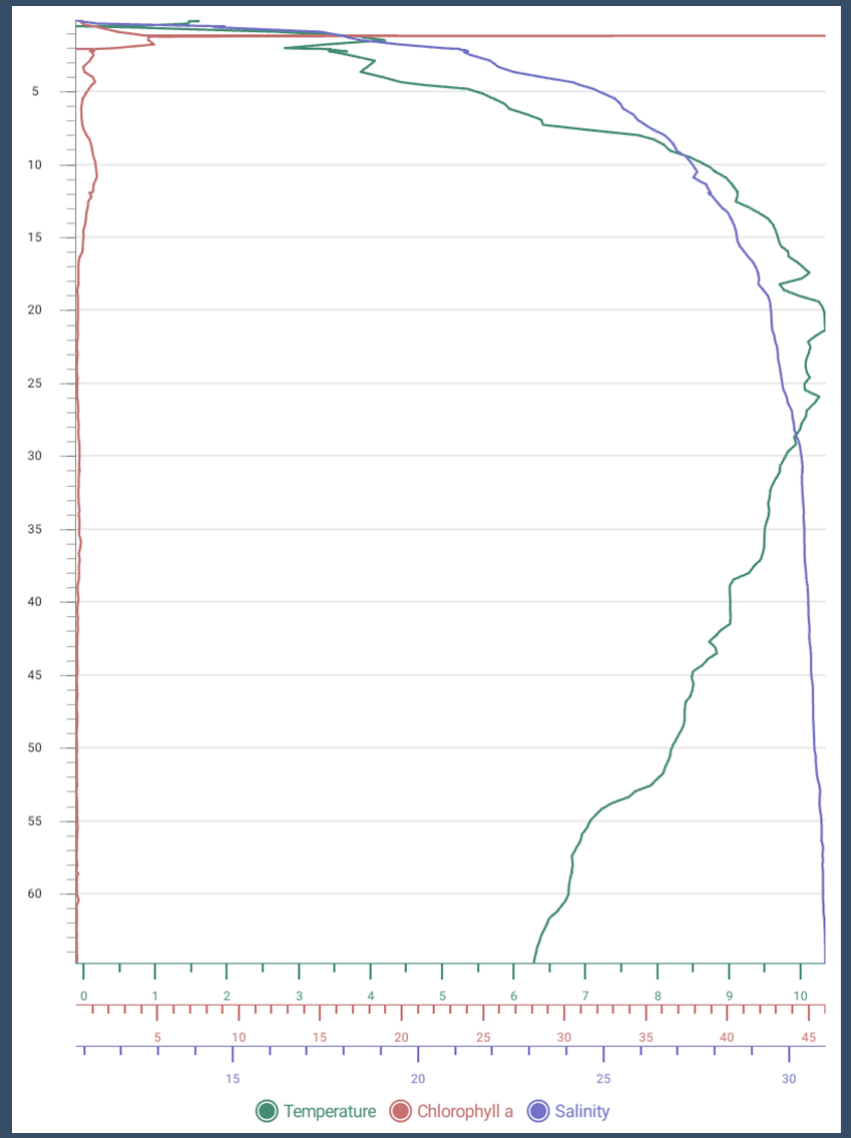
CTD

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: Icy Bay



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

Our CTD profile from Icy Bay shows a 6°C difference in temperature between the surface and 65 m depth, with the surface significantly colder than the water below. This was due to the ice in Icy Bay, which cools the surface water and creates a freshwater layer at the surface. These differences in temperature and salinity help drive ocean currents.

Phytoplankton, shown here as a measure of chlorophyll a (µg/l), showed a strong peak at 2 m and was low overall in the underlying water column. The strong peak was likely caused by light reflecting off silt rather than by actual chlorophyll a. This also explains why our plankton sample contained very few organisms.

Salinity was lowest at the surface, at just over 10 PSU, reaching 31 PSU at 65 m depth. This indicates a freshwater layer at the surface, formed by meltwater from the surrounding icebergs.

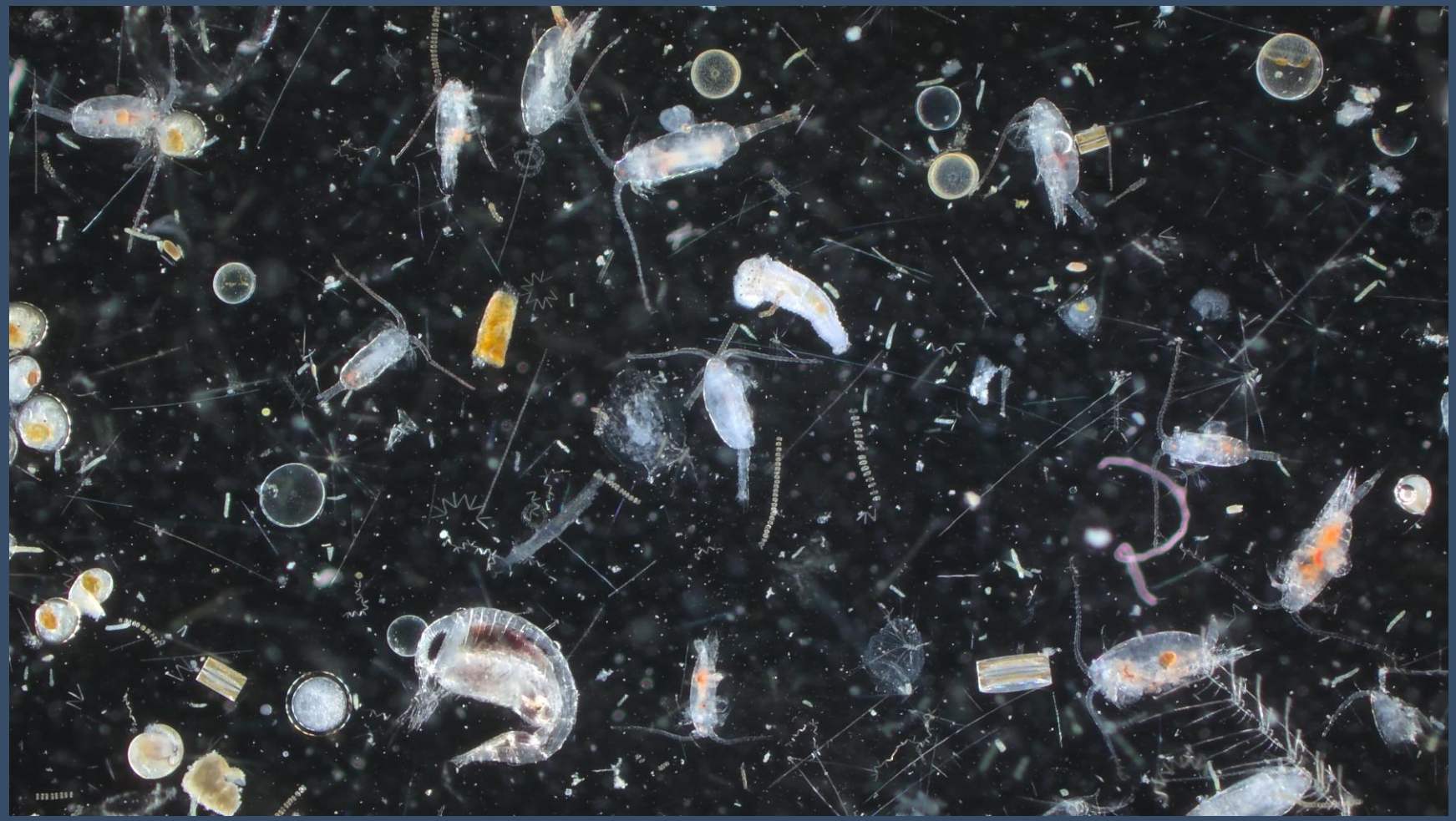
Water Sampling

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

From the science boat, guests deployed plankton nets and towed 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 Alaskan and Canadian coasts.





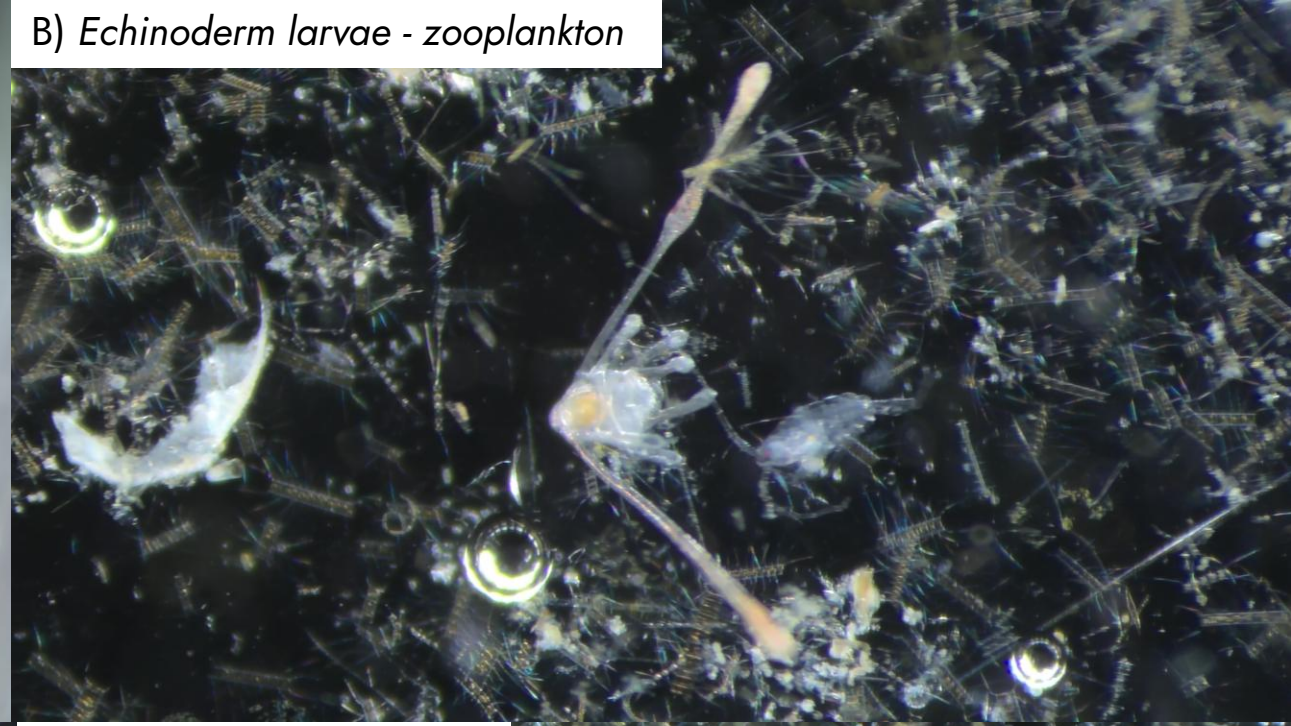
Plankton Samples

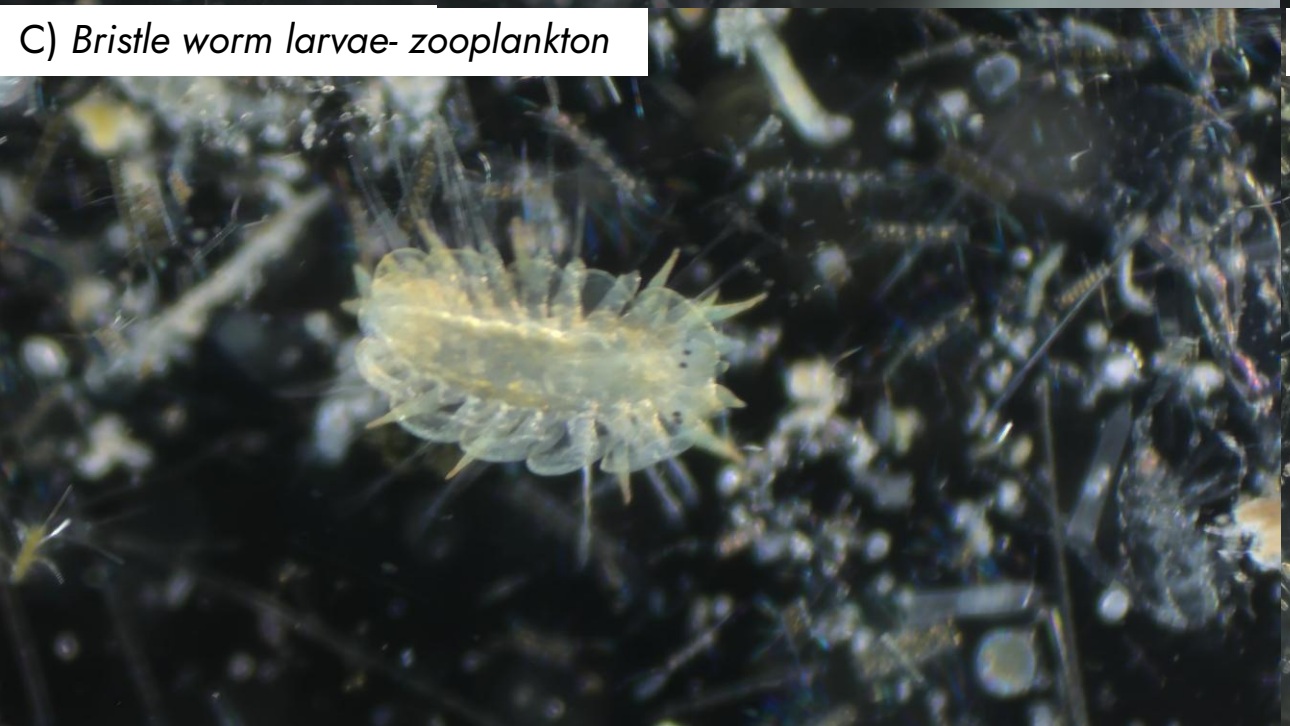
Back in the Science Centre, we brought the surface tow samples into focus under the microscope, revealing a hidden world of plankton.

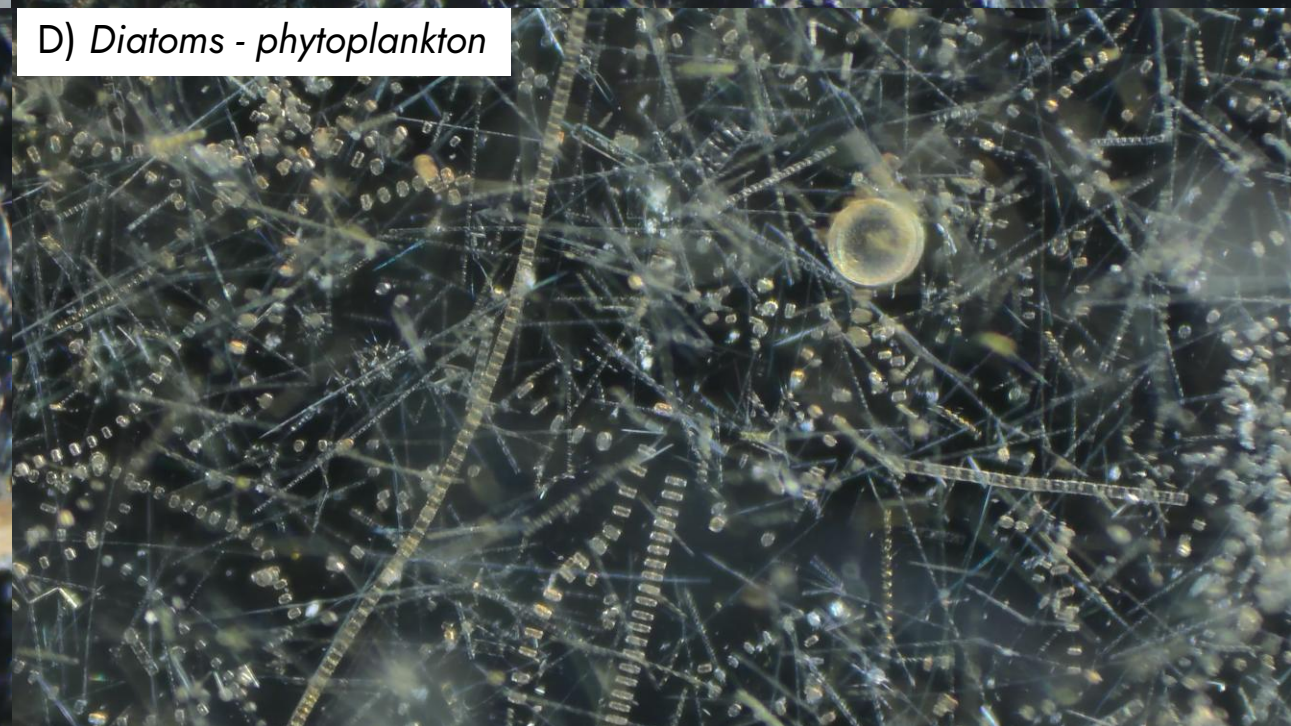
Using the main screen and smaller microscopes, we explored each drop of water up close.

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) *Decapoda - zooplankton*


B) *Echinoderm larvae - zooplankton*


C) *Bristle worm larvae- zooplankton*


D) *Diatoms - phytoplankton*



NASA Cloud Observer

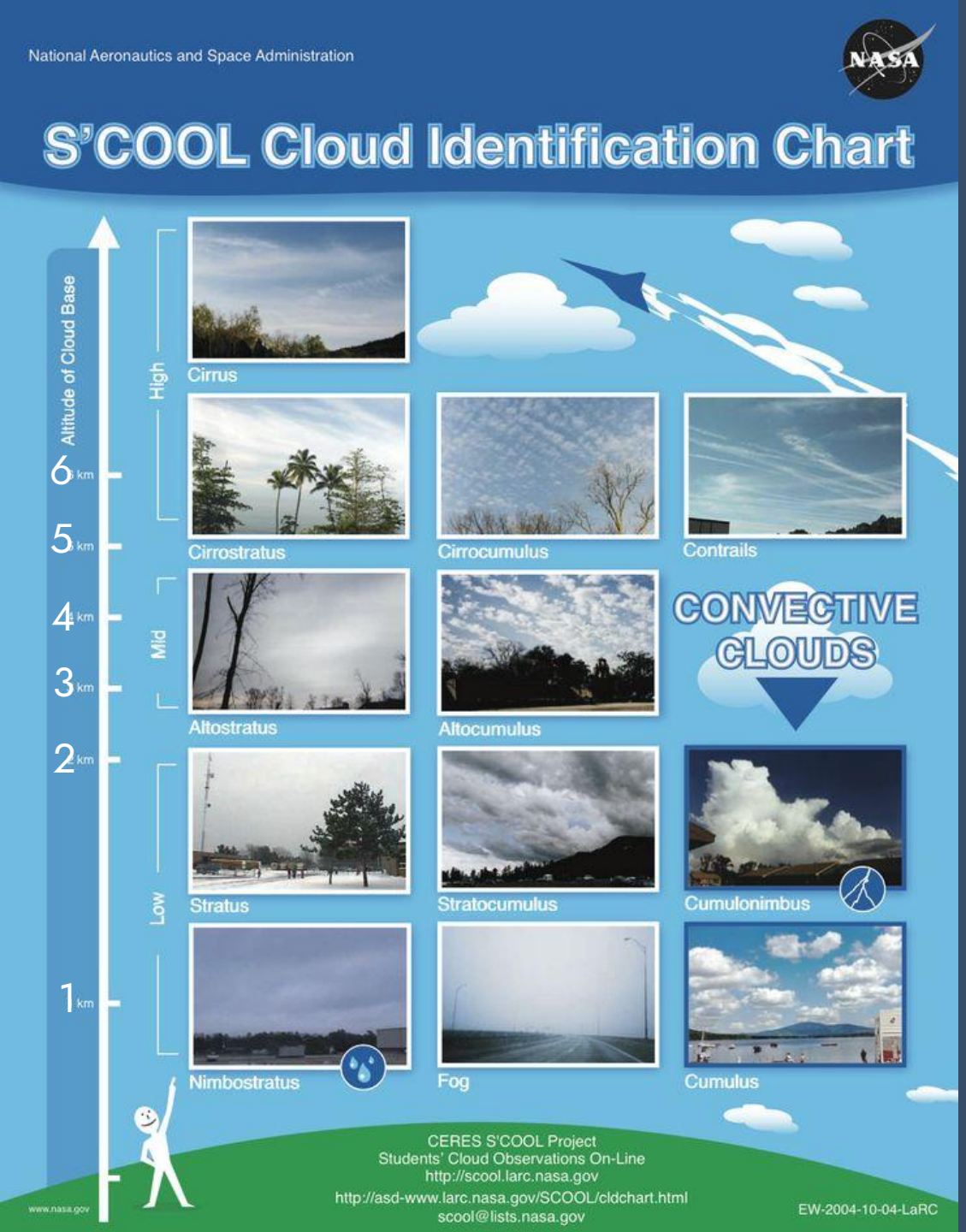
During our voyage, we contributed to NASA's GLOBE Cloud Observer, collecting data on:

- 10 September (at sea)
- 12 September (Dutch Harbour)
- 16 September (Kukak Bay)
- 17 September (at 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 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, greyish-white clouds with rounded edges. They often form parallel rows or patches.
Altostratus: Thick, greyish clouds that partially obscure the sun or moon. They lack the distinct features of cirrostratus.

Low Clouds (Base below 2,000 metres):

Stratus: Uniform, greyish 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 grey clouds associated with steady rain or snow.

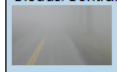
These cloud types can vary in appearance and behaviour, but this basic classification helps meteorologists understand weather patterns and atmospheric conditions. To explore more examples, visit NASA's On-Line Cloud Chart.

View our data on the global map

GLOBE Cloud Satellite Match: At Sea, Leaving St Paul

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	GOES-18 View	NOAA-20 View
Universal Date/Time	2026-09-10 22:27:00	2026-09-10 22:33:00	2026-09-10 22:27:00
Latitude	56.76	56.44 to 57.08	56.31 to 57.11
Longitude	-169.98	-170.3 to -169.66	-170.48 to -169.68
Total Cloud Cover	Sky Obscured	Overcast (100.00%)	Overcast (100.00%)
High Clouds	Sky Obscured by Fog/Stratus Clouds/Contrails > 25% Obscured 		
Mid Clouds			
Low Clouds		Cover: Overcast 100.00% Altitude: 0.57 (km) Phase: Water 279.23 (K) Opacity: Opaque	Cover: Overcast 100.00% Altitude: 0.43 (km) Phase: Water 280.09 (K) Opacity: Opaque

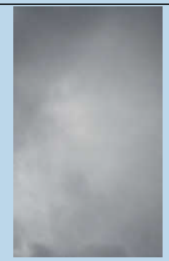
Sky and Surface Conditions	North	East	South	West	Up	Down
Sky Conditions Sky Visibility : no report Sky Color : no report **Surface Conditions** Snow/Ice : No Standing Water : Yes Muddy : No Dry Ground : No Leaves on Trees : No Raining or Snowing : No						
Field Notes						

GLOBE Cloud Satellite Match: Dutch Harbour

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	GOES-18 View	NASA PACE View
Universal Date/Time	2026-09-12 22:38:00	2026-09-12 22:33:00	2026-09-12 22:29:51.84
Latitude	53.9	53.58 to 54.22	53.9017 to 54.7017
Longitude	-166.53	-166.85 to -166.21	-166.5295 to -165.7295
Total Cloud Cover	Overcast (>90%)	Overcast (100.00%)	Overcast (100%)
High Clouds		Cover: Overcast 100.00% Altitude: 9.27 (km) Phase: Ice/Water Mix 239.94 (K) Opacity: Opaque	PACE satellite image available above.
Mid Clouds			
Low Clouds	 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 : Yes Leaves on Trees : No Raining or Snowing : No						
Field Notes						

GLOBE Cloud Satellite Match: Kukak Bay

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	GOES-18 View
Universal Date/Time	2026-09-16 22:41:00	2026-09-16 22:33:00
Latitude	58.28	57.96 to 58.6
Longitude	-154.29	-154.61 to -153.97
Total Cloud Cover	Overcast (>90%)	Overcast (100.00%)
High Clouds		Cover: Isolated 24.32% Altitude: 6.88 (km) Phase: Ice/Water Mix 246.85 (K) Opacity: Transparent
Mid Clouds	 Altocumulus Cover: Isolated (10-25%) Opacity: Translucent	Cover: Broken 75.68% Altitude: 4.34 (km) Phase: Water 259.03 (K) Opacity: Translucent
Low Clouds	 Cumulus  Stratocumulus Cover: Broken (50-90%) Opacity: Opaque	

Sky and Surface Conditions	GLOBE Sky Images
Sky Conditions Sky Visibility : no report Sky Color : no report **Surface Conditions** Snow/Ice : No Standing Water : Yes Muddy : No Dry Ground : Yes Leaves on Trees : No Raining or Snowing : No	Your sky photos are missing. Photos help NASA scientists assess cloud detection approaches used for different satellite missions.
Field Notes	

iNaturalist

Throughout this voyage, we played a vital role in documenting the biodiversity of Alaska and British Columbia.

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

Together, we gathered:
1171 Observations
314 Species Identified
18 Observers Participating

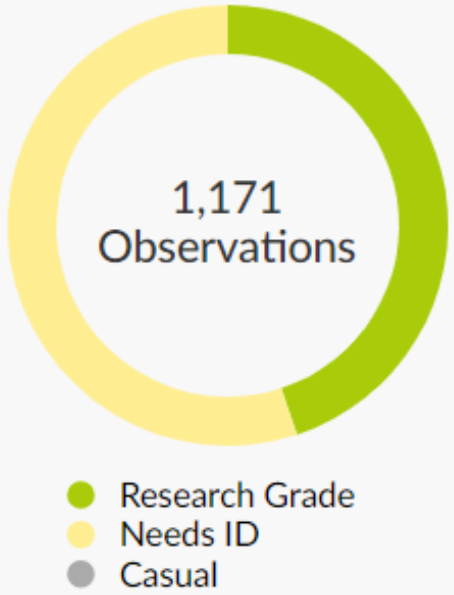
Follow the link to view our collective data and see the impact of your contributions:

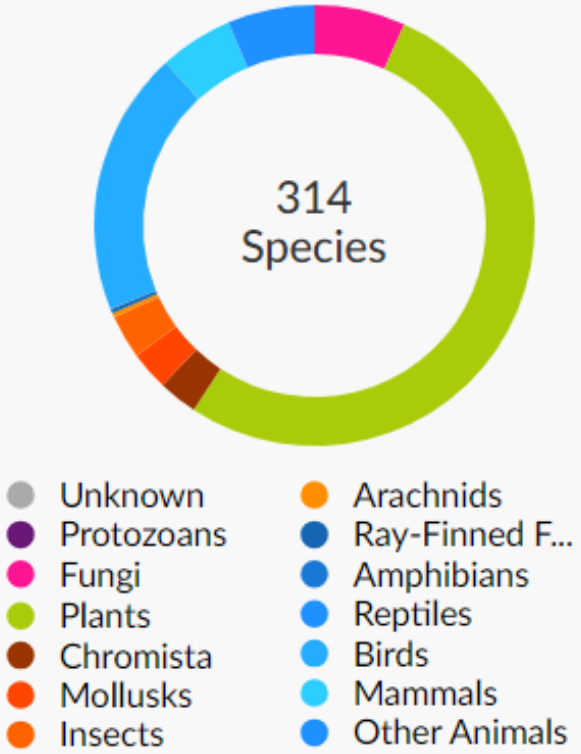
View our data on the iNaturalist website



MS Fridtjof Nansen 7 – 23 September 2026

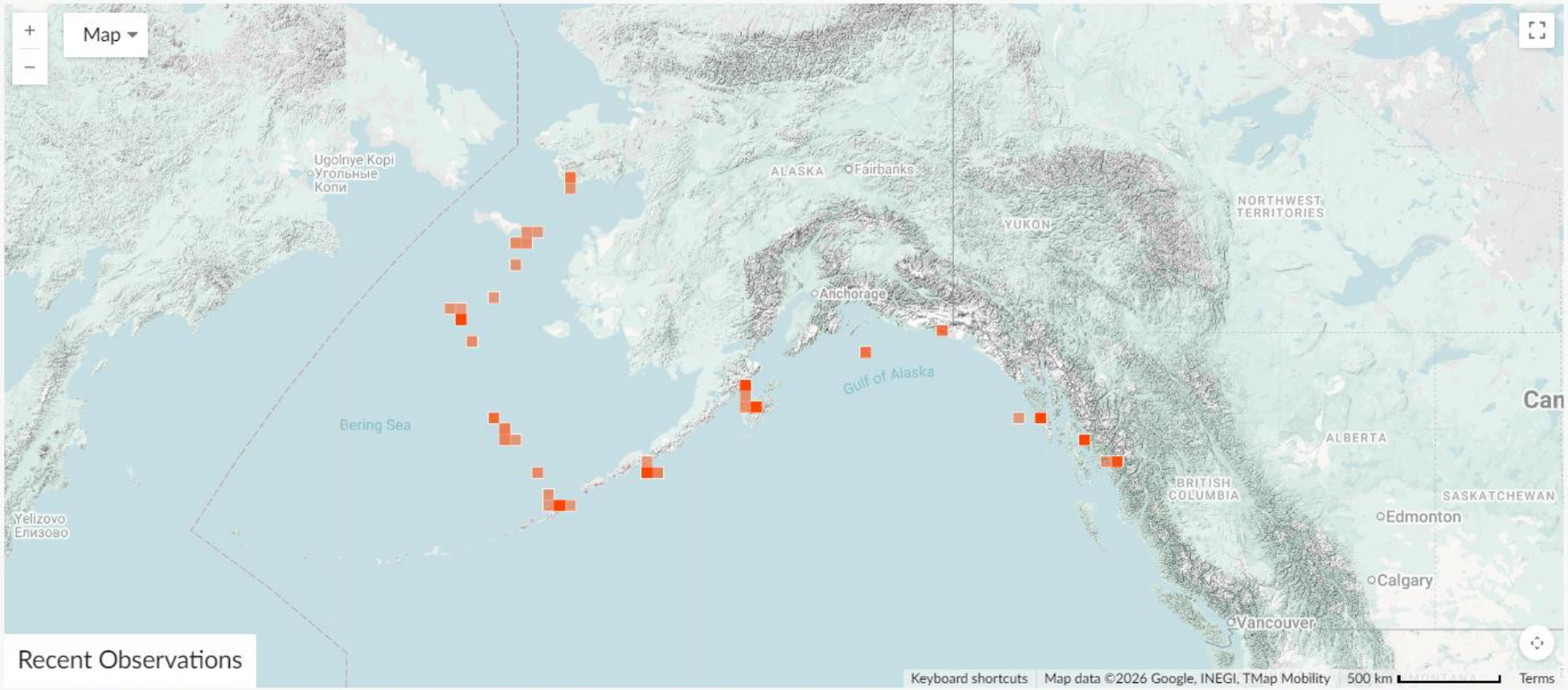
Stats





MS Fridtjof Nansen 7 – 23 September 2026

Map of Observations



Recent Observations





eBird

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

During our voyage, our onboard Ornithologists and guests conducted 18 wildlife watches, completed 33 checklists, and recorded 43 bird species.

Every entry adds to a growing database that helps scientists track migration patterns, monitor populations, and understand bird behaviour in regions not often visited.

View our data on the eBird website

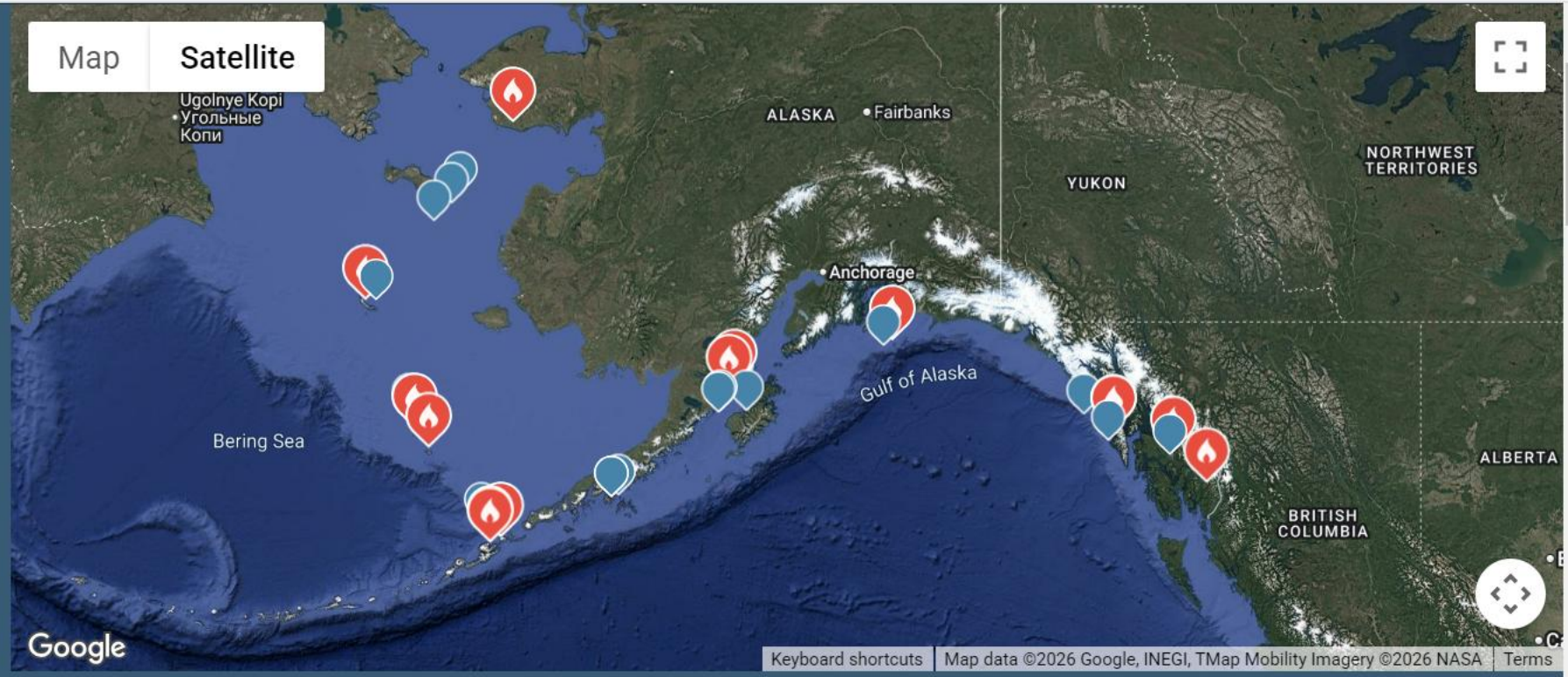
Alaska and British Columbia (Southbound) - MS Nansen (September 7 - 23, 2026)

7 – 23 Sep 2026 (17 days)

Public

Alaska, United States

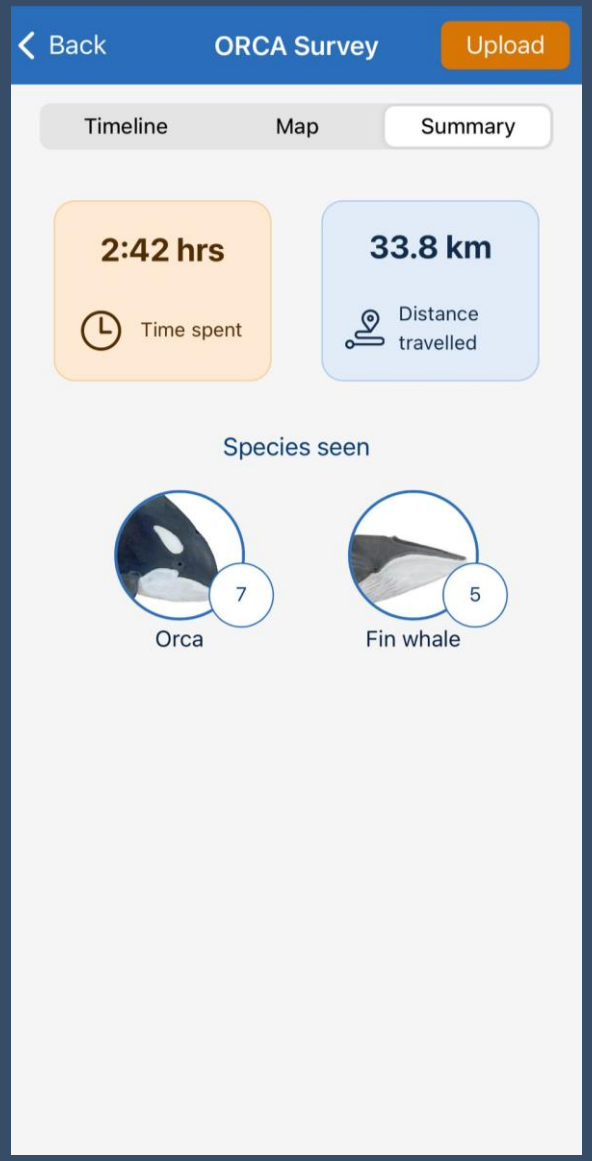
Aleutians East Borough |
Aleutians West Census Area |
Bethel Census Area |
Chugach Census Area |
Ketchikan Gateway Borough |
Kodiak Island Borough |
Nome Census Area |
Sitka City and Borough |
Wrangell City and Borough

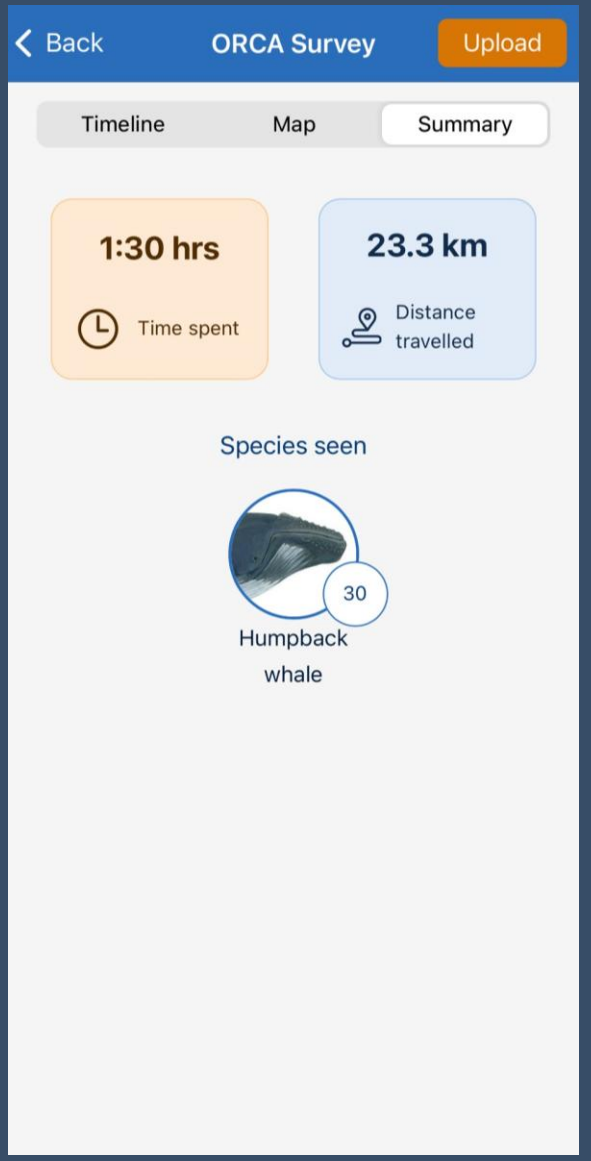


ORCA

During the voyage through Alaska and British Columbia, we were joined by ORCA Ocean Conservationist Eilidh, who collected data on whales, dolphins, and porpoises. Eilidh recorded these sightings using the OceanWatchers App and sent them back to ORCA, making the data available to many organisations interested in cetacean conservation.

On this voyage, we collected 27 hours and 29 minutes of survey data, spanning a distance of 537.8 km. We recorded nine marine mammal species during these surveys, with a total of 121 individuals.





Sightings on Survey

Species	Number of individuals seen
Humpback whale *(Megaptera novaeangliae)*	35
Fin whale *(Balaenoptera physalus)*	16
Minke whale *(Balaenoptera acutorostrata)*	31
Orca *(Orcinus orca)*	12
Dall's porpoise *(Phocoenoides dalli)*	20
Unidentified whale	7
Harbour seal *(Phoca vitulina)*	7
Northern fur seal *(Callorhinus ursinus)*	4
Sea otter *(Enhydra lutris)*	7
Steller sea lion *(Eumetopias jubatus)*	5
Unidentified seal	2

Happywhale

We contributed to cetacean research by submitting sightings of humpback whales, fin whales, and orcas to Happywhale, helping scientists track individual animals and better understand their movements and life histories.

During the voyage, we uploaded our whale observations, which now await matching with known individuals or identification as new whales in the database.

You can explore MS Fridtjof Nansen's Happywhale submissions from this voyage, follow individual whales for future updates, or contribute your own photos from this voyage and past encounters.



cNAMMs

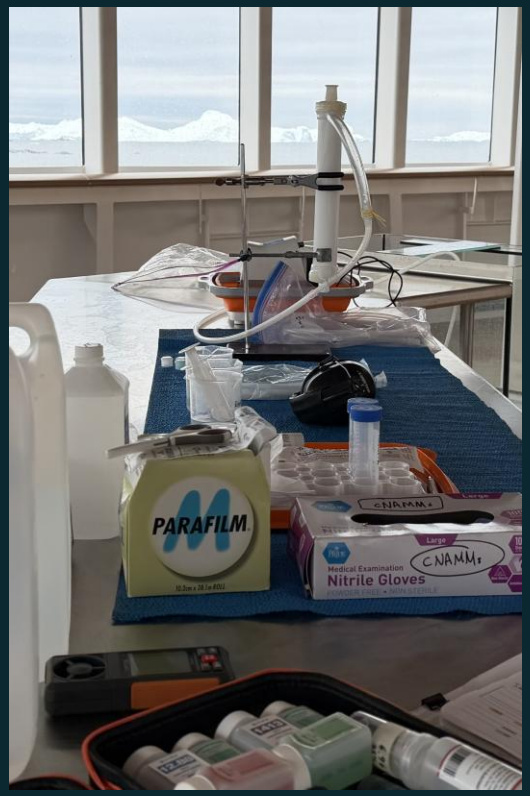
Circumnavigation North American Marine Microbe Survey – Guest Scientist Dr Tom Dietz

Surveying marine microbes along the Northwest Passage and Alaska



Dr. Tom collecting water for filtering

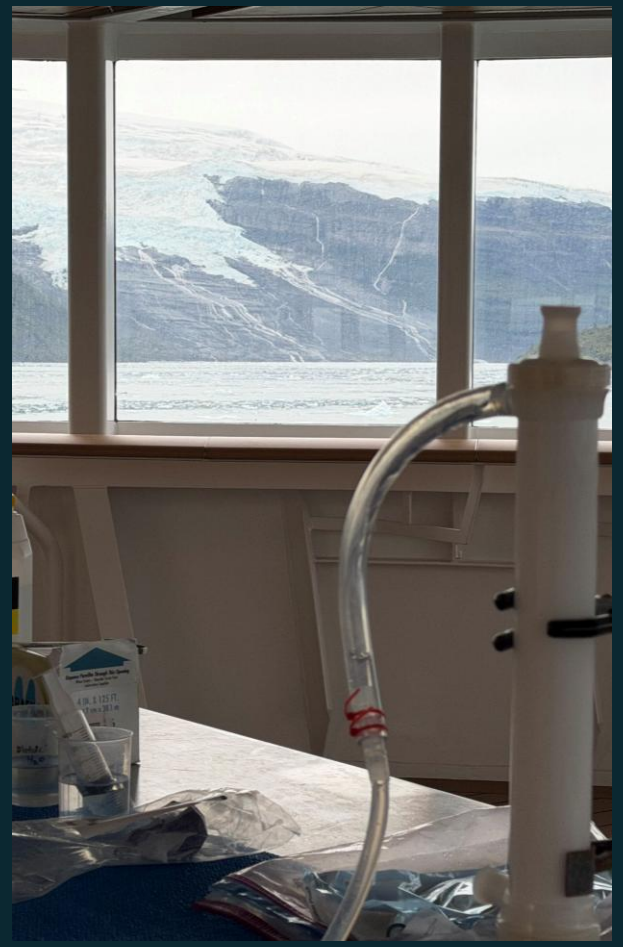
Deck 6 Wet Lab - filtering the collected seawater to trap bacteria and viruses





Evaluating filtered samples for the presence of plankton

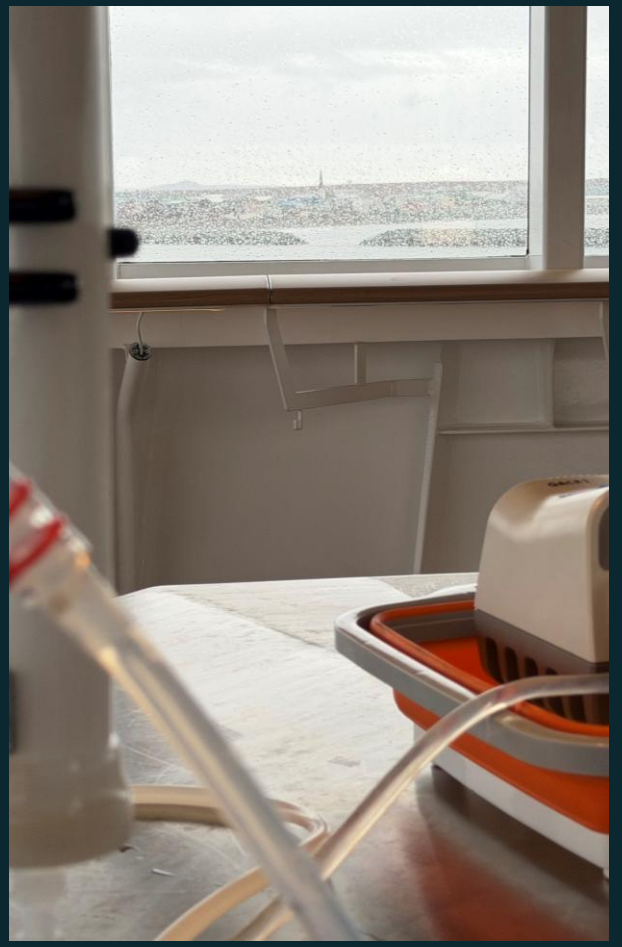
The best laboratory views in the world



Icy Bay, AK

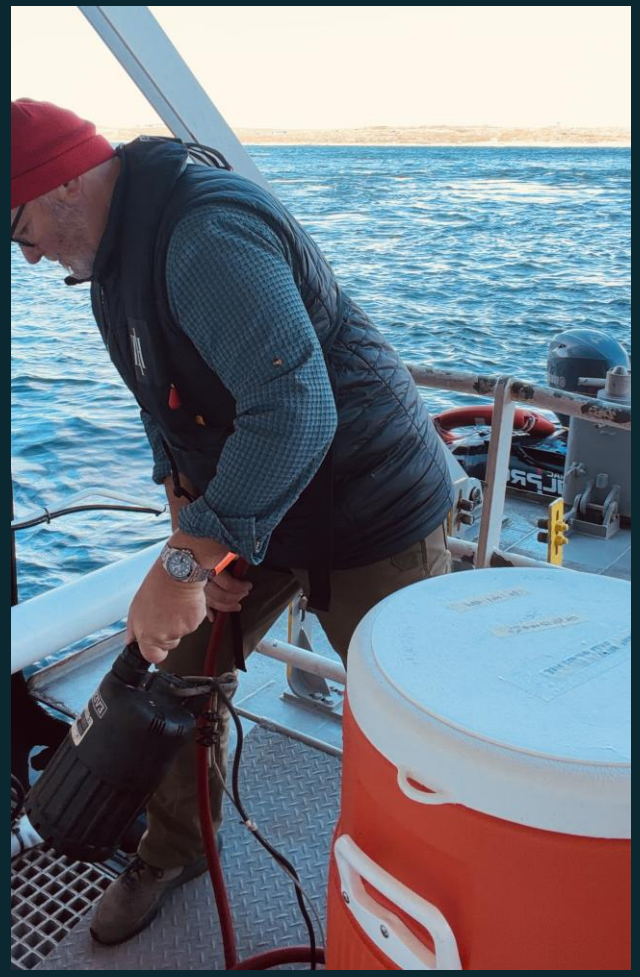
Kukak Bay, AK





Nome, AK

Looking for new species and how a changing climate affects the ones we know and need



Preparing the pump to collect seawater off the tender pit



Preparing the filtration apparatus to isolate marine bacteria and viruses

The Expedition

-The Explorers Club Flag 76

- Rolex Explorers Club Watch #3

-The Adventurers Club Flag 129

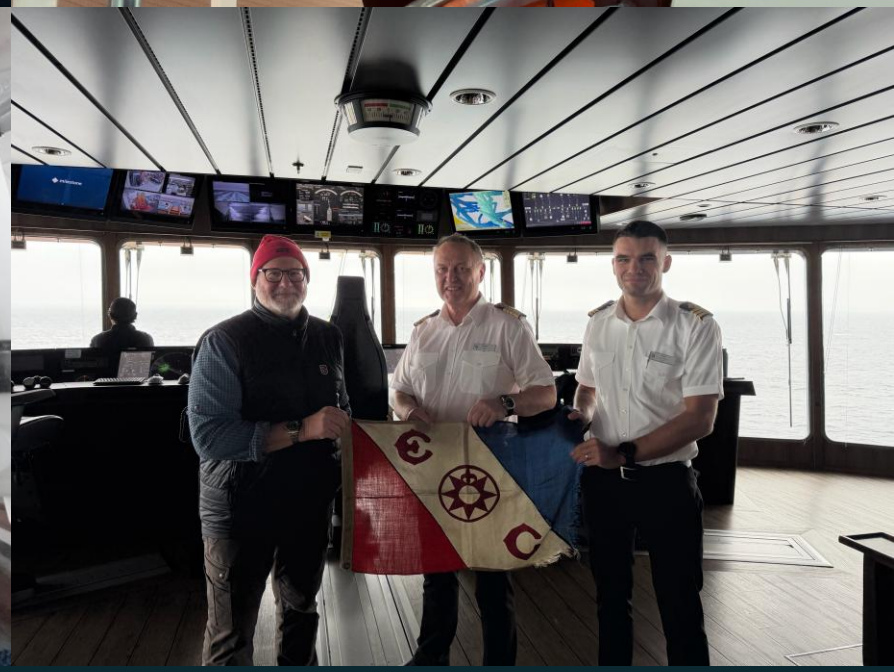
- GAC Research Inst.

Dr. Tom Dietz
Captain Raymond Martinsen
Security Officer Sergii Shyltsyn



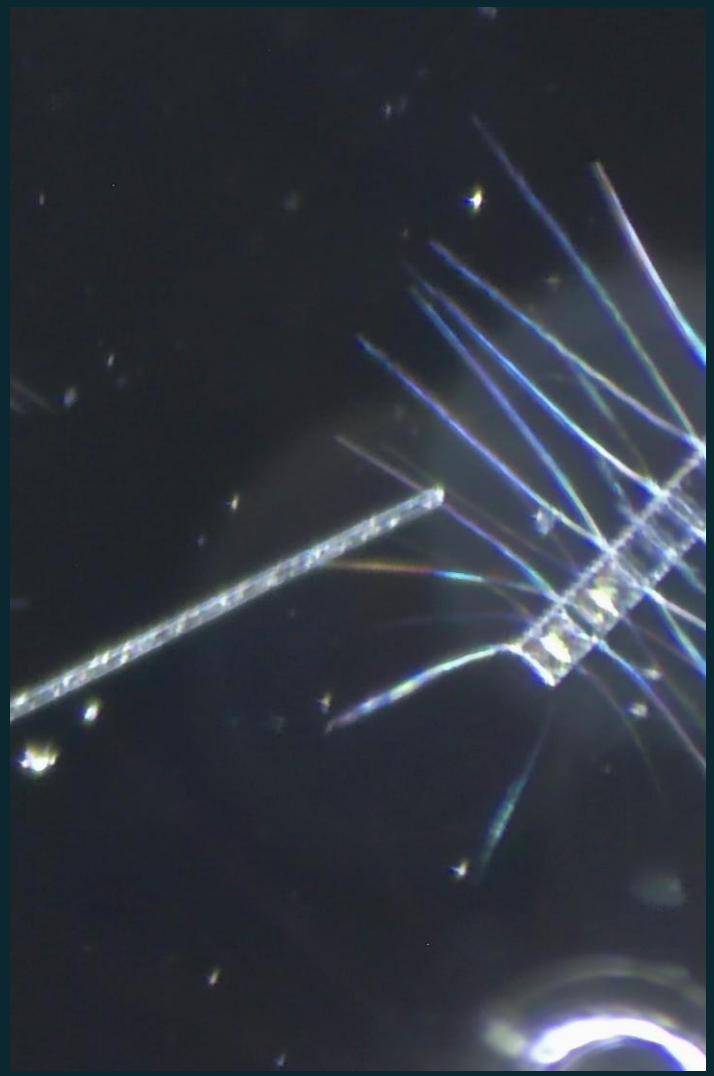




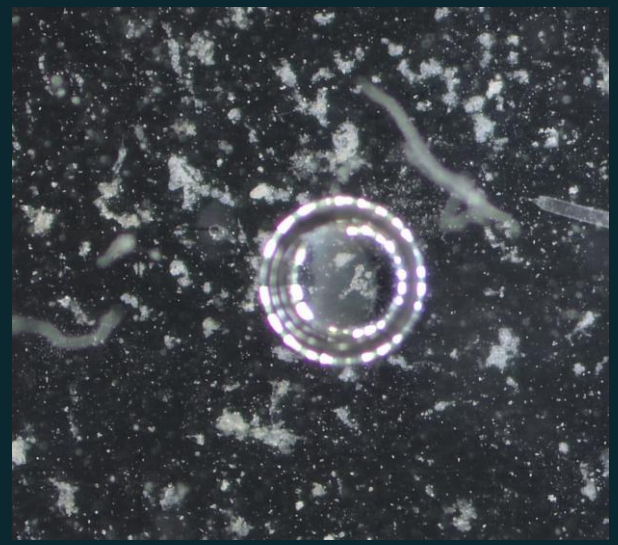


Observing the plankton that concentrated along with the bacteria







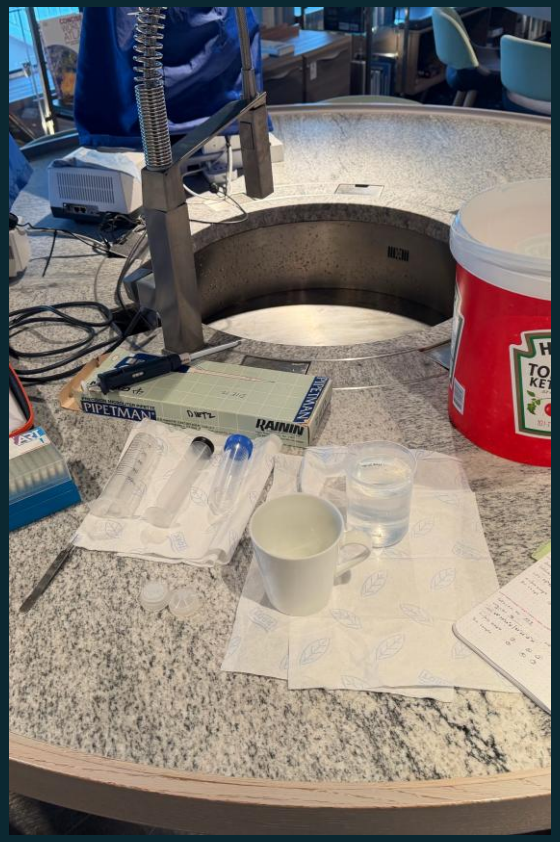


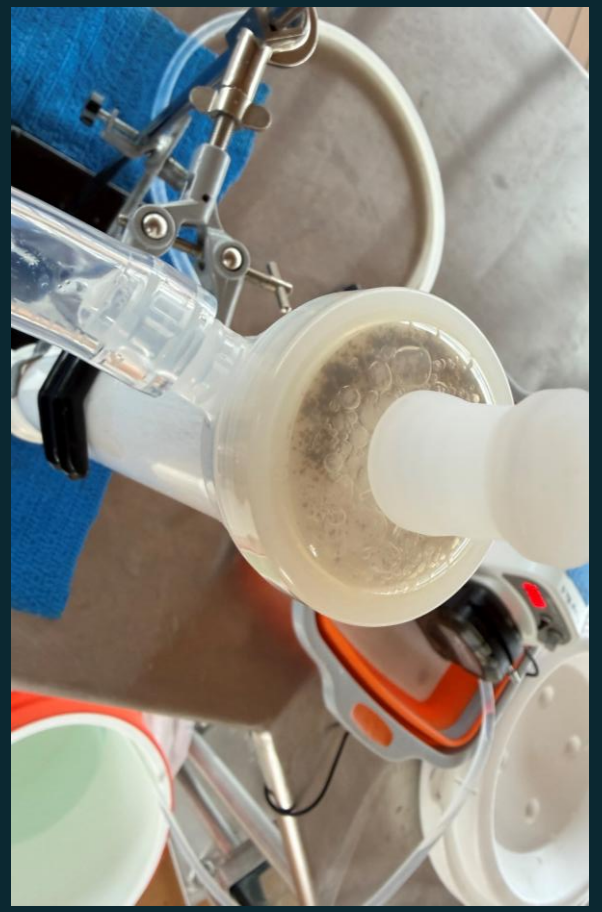
Hunting for microplastics and the bacteria that live on them



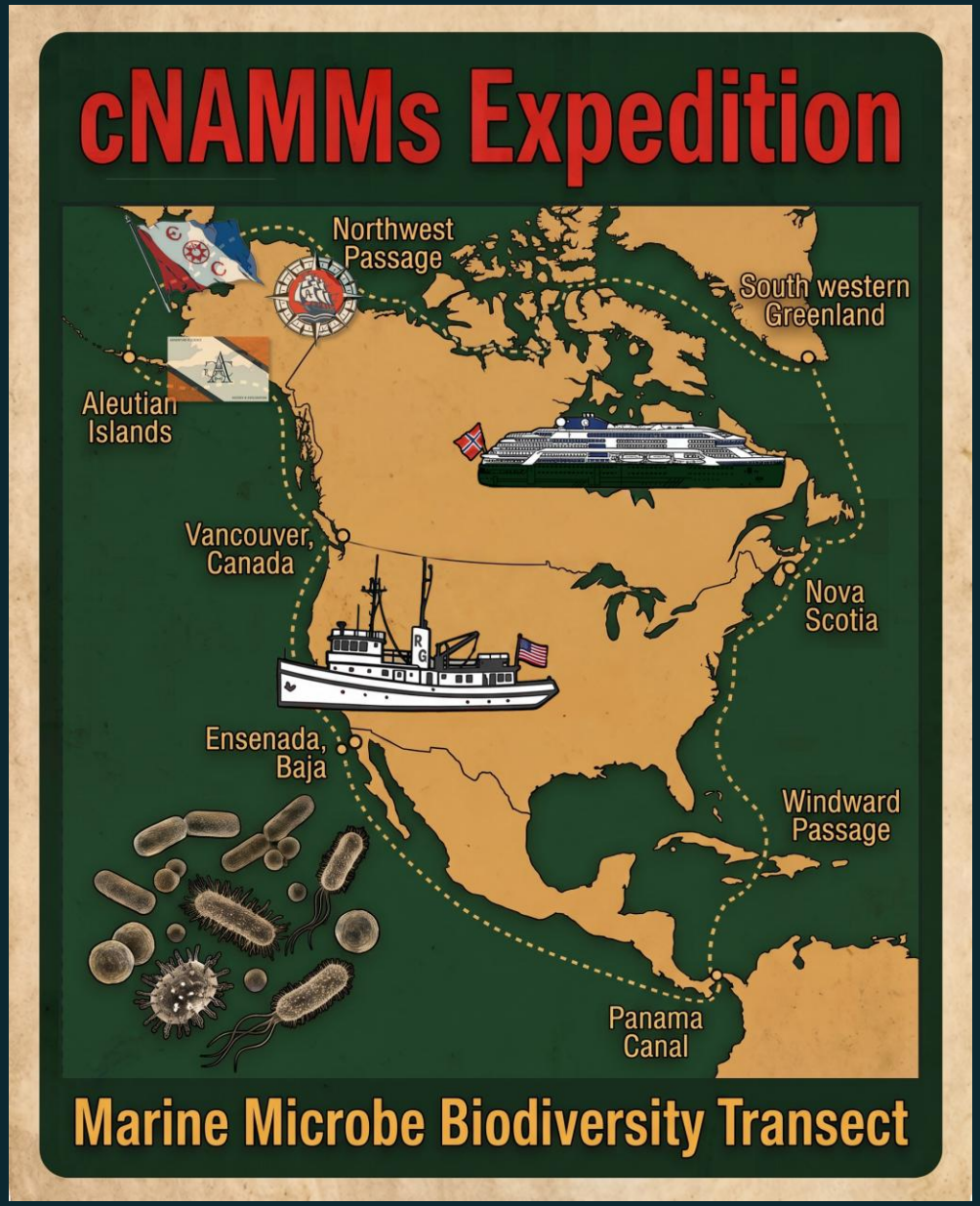
Filtering samples to trap microplastics for further analysis

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





Impurities concentrate at the top of the filter from waters collected at Uyak Bay, Kodiak, AK



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

The cNAMMs Expedition was designed to collect microbe samples around the North American continent. We collected 12 samples from Nome to Vancouver, adding to the 15 samples previously collected from Nuuk, Greenland, to Nome. Overall, the expedition collected 40 samples in total.

We now head to the lab to analyse what we have collected from Nuuk to Vancouver, and we look forward to publishing the results from the complete cNAMMs Expedition over the next year. A paper covering the southern sampling route is currently under review.

If you are interested in the conclusions drawn from this expedition, email Dr Tom Dietz at tdietz@gentadv.com and include a photo of yourself.

Wildlife List — Land Mammals



Wildlife List – Land Mammals

Scientific Name	**English**	**Deutsch**
Ovibos moschatus	Muskox	Moschusochse
Lepus arcticus	Arctic hare	Polarhase
Vulpes vulpes	Red fox	Rotfuchs
Spermophilus parryii	Arctic ground squirrel	Arktische Ziesel
Marmota marmota	Marmot	Murmeltier
Ursus arctos	Brown bear	Braunbär
Ursus americanus	Black bear	Schwarzbär
Alces alces gigas	Alaskan Moose	Elch
Odocoileus hemionus	Sitka deer	Sitka Reh
Lontra canadensis	River otter	Flussotter

Wildlife List - Marine Mammals



Wildlife List – Marine Mammals

Scientific Name	**English**	**Deutsch**
Megaptera novaeangliae	Humpback whale	Buckelwal
Balaenoptera physalus	Fin whale	Finnwal
Phocoena phocoena	Harbour porpoise	Schweinswal
Odobenus rosmarus	Walrus	Walross
Phocoenoides dalli	Dall's porpoise	Weissflankenschweinswal
Baleonoptera acutorostrata	Minke whale	Zwergwal
Orcinus orca	Orca	Schwertwal
Lagenorhynchus obliquidens	Pacific white-sided dolphin	Pazifischer Weissseitendelphin
Eumetopias jubatus	Steller Sea lion	Stellerscher Seelöwe
Callorhinus ursinus	Northern fur seal	Nördlicher Seebär
Enhydra lutris	Sea otter	Seeotter
Phoca vitulina	Harbour seal	Seehund

Wildlife List — Birds



Wildlife List – Seabirds

Scientific Name	English	Deutsch
Stercorarius parasiticus	Parasitic Jaeger	Schmarotzerraubmöwe
Stercorarius pomarinus	Pomarine Jaeger	Spatelraubmöwe
Fratercula cirrhata	Tufted Puffin	Gelbschopflund
Fratercula corniculata	Horned Puffin	Hornlund
Aethia pusilla	Least Auklet	Zwergalk
Aethia pygmaea	Whiskered Auklet	Bartalk
Aethia cristatella	Crested Auklet	Schopfalk
Brachyramphus marmoratus	Marbled Murrelet	Marmelalk
Cepphus columba	Pigeon Guillemot	Taubenteiste
Uria lomvia	Thick-billed Murre	Dickschnabellumme
Uria aalge	Common Murre	Trottellumme
Synthliboramphus antiquus	Ancient Murrelet	Silberalk
Rissa tridactyla	Black-legged Kittiwake	Dreizehenmöwe
Rissa brevirostris	Red-legged Kittiwake	Klippenmöwe
Xema sabini	Sabine's Gull	Schwalbenmöwe
Larus brachyrhynchus	Short-billed Gull	Kurzschnabel-Sturmmöwe
Larus smithsonianus	Herring Gull	Kanadamöwe
Larus hyperboreus	Glaucous Gull	Eismöwe

Wildlife List – Seabirds

Scientific Name	English	Deutsch
Larus californicus	California Gull	Kalifornienmöwe
Larus glaucescens	Glaucous-winged Gull	Beringmöwe
Larus glaucoides	Iceland Gull	Polarmöwe
Sterna paradisaea	Arctic Tern	Küstenseeschwalbe
Phoebastria immutabilis	Laysan Albatross	Laysanalbatros
Phoebastria nigripes	Black-footed Albatross	Schwarzfußalbatros
Phoebastria albatrus	Short-tailed Albatross	Kurzschwanzalbatros
Oceanodroma furcata	Fork-tailed Storm Petrel	Gabelschwanz-Wellenläufer
Fulmarus glacialis	Northern Fulmar	Eissturmvogel
Pterodroma inexpectata	Mottled Petrel	Regensturmvogel
Ardenna grisea	Sooty Shearwater	Dunkler Sturmtaucher
Ardenna tenuirostris	Short-tailed Shearwater	Kurzschwanz-Sturmtaucher
Phalacrocorax urile	Red-faced Cormorant	Rotgesichtscharbe
Phalacrocorax pelagicus	Pelagic Cormorant	Meerscharbe
Nannopterum auritus	Double-crested Cormorant	Ohrenscharbe

Wildlife List – Waterbirds

Scientific Name	English	Deutsch
Anas platyrhynchos	Mallard	Stockente
Histrionicus histrionicus	Harlequin Duck	Kragenente
Melanitta perspicillata	Surf Scoter	Brillenente
Bucephala islandica	Barrow's Goldeneye	Spatelente
Ardea herodias	Great Blue Heron	Kanadareiher
Haematopus bachmani	Black Oystercatcher	Klippenausternfischer
Pluvialis fulva	Pacific Golden Plover	Tundra-Goldregenpfeifer
Phalaropus lobatus	Red-necked Phalarope	Odinshühnchen
Arenaria melanocephala	Black Turnstone	Schwarzkopf-Steinwälzer
Calidris ptilocnemis	Rock Sandpiper	Beringstrandläufer

Wildlife List – Landbirds

Scientific Name	English	Deutsch
Lagopus muta	Rock Ptarmigan	Alpenschneehuhn
Haliaeetus leucocephalus	Bald Eagle	Weißkopf-Seeadler
Falco peregrinus	Peregrine Falcon	Wanderfalke
Megaceryle alcyon	Belted Kingfisher	Gürtelfischer
Cyanocitta stelleri	Steller's Jay	Diademhäher
Corvus brachyrhynchos	American Crow	Amerikakrähe
Corvus corax	Common Raven	Kolkrabe
Turdus migratorius	American Robin	Wanderdrossel
Leucosticte tephrocotis	Grey-crowned Rosy Finch	Schwarzstirn-Schneegimpel
Calcarius lapponicus	Lapland Longspur	Spornammer
Plectrophenax nivalis	Snow Bunting	Schneeammer
Plectrophenax hyperboreus	McKay's Bunting	Beringschneeammer
Junco hyemalis	Dark-eyed Junco	Winterammer
Zonotrichia atricapilla	Golden-crowned Sparrow	Kronenammer
Passerculus sandwichensis	Savannah Sparrow	Grasammer
Melospiza melodia	Song Sparrow	Singammer


Thanks for your participation!