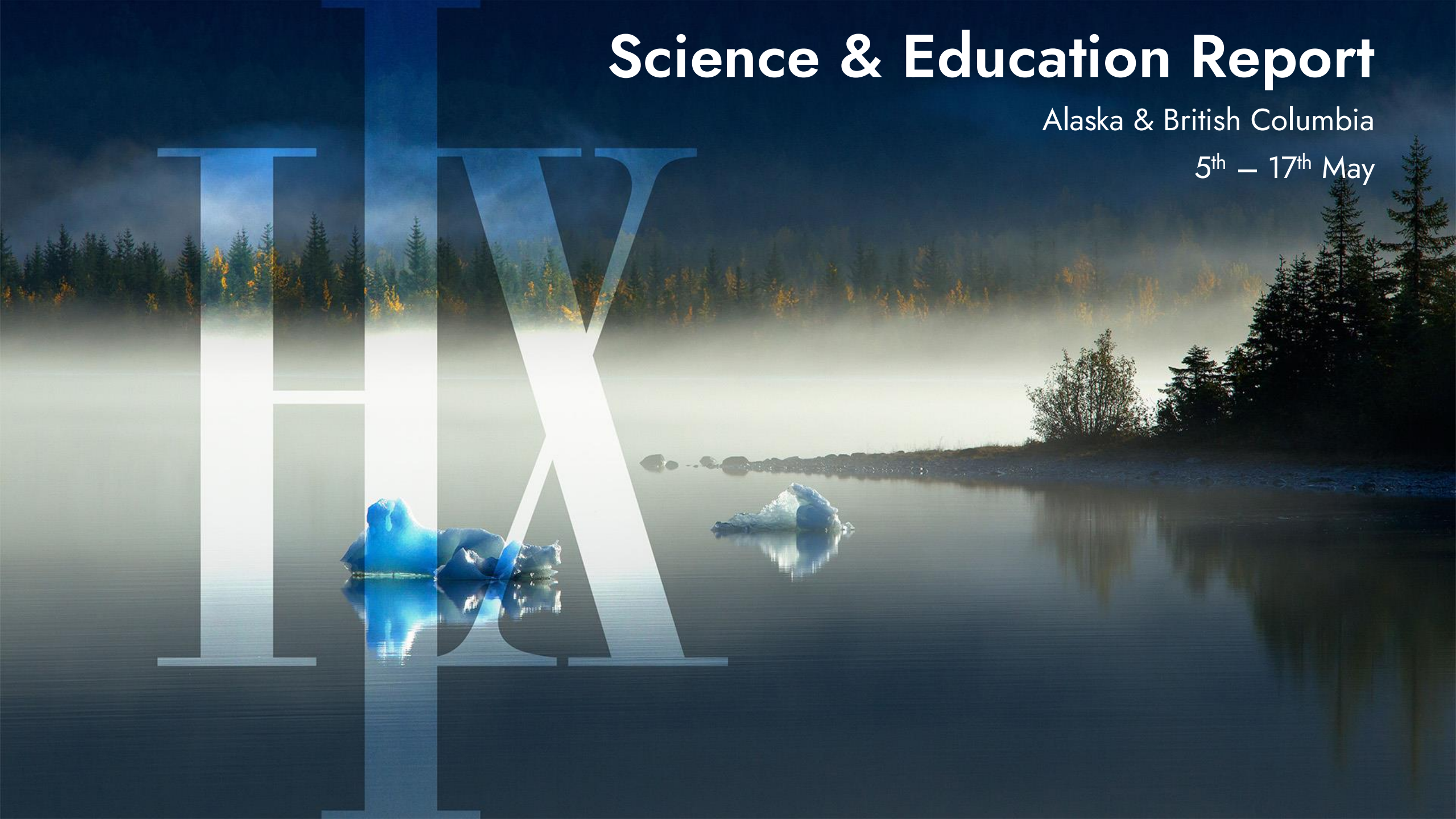
Science & Education Report

Alaska & British Columbia

5th – 17th May



MS Roald Amundsen 05–17 May, 2025

Alaska and British Columbia

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

Arts, Crafts & Creativity

We witnessed the amazing landscapes and culture of Alaska and British Columbia. We were inspired to create art reflecting our surroundings including watercolour post cards, and clay totem poles.

Science & Education Program

Our onboard naturalists guided our guests using scientific tools to investigate the world around us. Through lectures, discovery sessions, zodiac cruises, and visits ashore we aimed to make every expedition day a memorable and unique learning experience.

Alaska & British Columbia: Culture

One thing is hearing, reading or watching documentaries about the native cultures of Alaska. However, another very different one is to witness Norma, the best ambassador of her ancestral cultural heritage we could have hoped for, telling us all about her people, her culture, her language, her traditions, how they keep their heritage alive. How proud of their culture they are, to listen to her stories from childhood and so much more. This is the most genuine manner to learn about those cultures, and all the wisdom and knowledge Norma had to share with us we will not be able to find in any book or documentary!

History & Culture

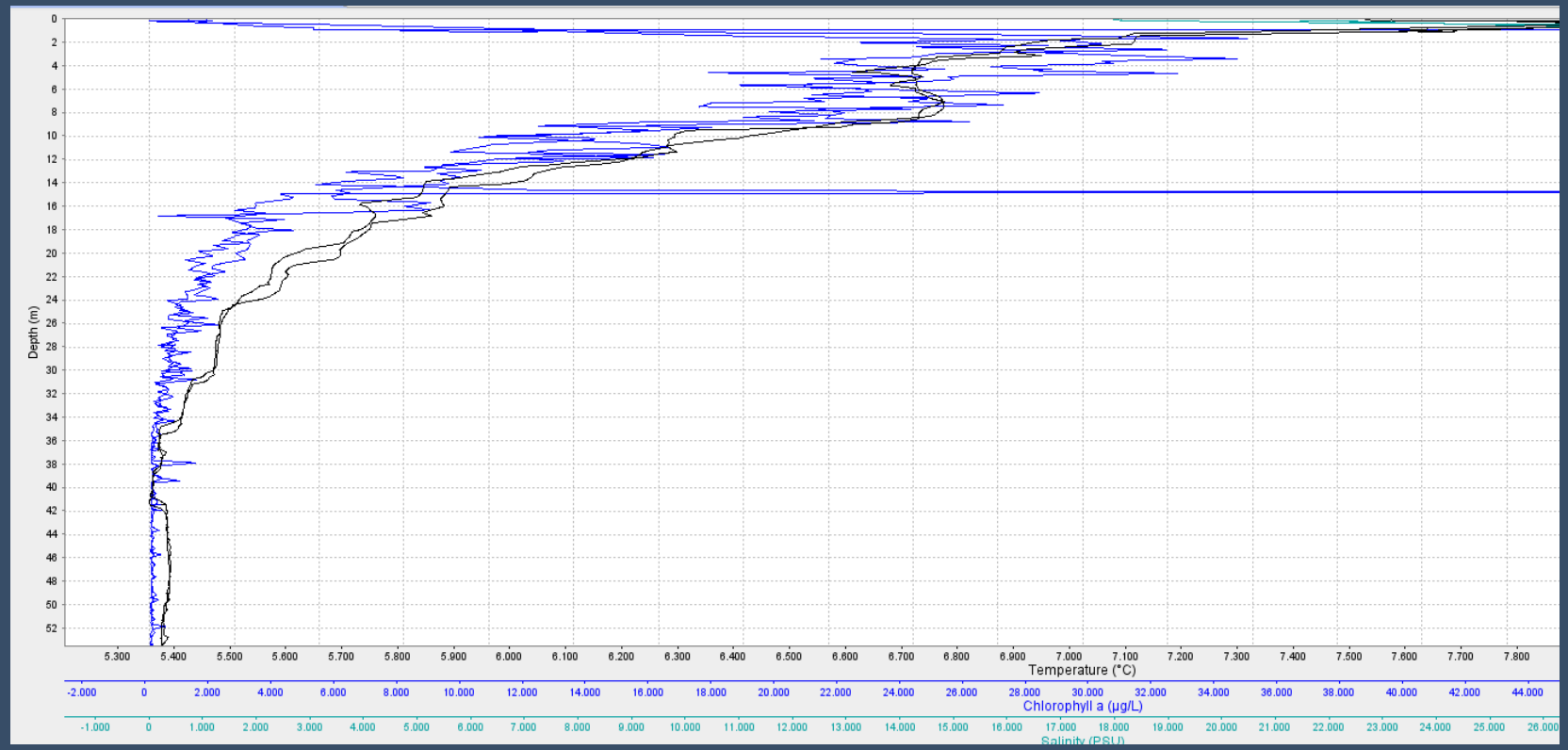
Apart from the native Alaskan cultures, during this voyage we have dived deep into the human history from the moment the Russians invaded this territory and how it evolved during the last centuries. We learned the Russians monetary motivations, the time of their glory, their fall, and how it dramatically impacted the lives of those who lived here before. We also learned about the reasons behind the US purchase of Alaska and how it developed from then on. In the end, we finalized with the forgotten episode during WWII, when the Japanese bombarded and invaded US soil, how the US took it back, and all the human consequences for those involved.

Science Boat

During our voyage we conducted plankton sampling techinques focused on the the abundance and species of phytoplankton present in Alaskan waters.

The samples and data which you recorded provided invaluable data for the NOAA-funded Harmful Algal Bloom (HAB) project, to monitor potentially harmful phytoplankton blooms.

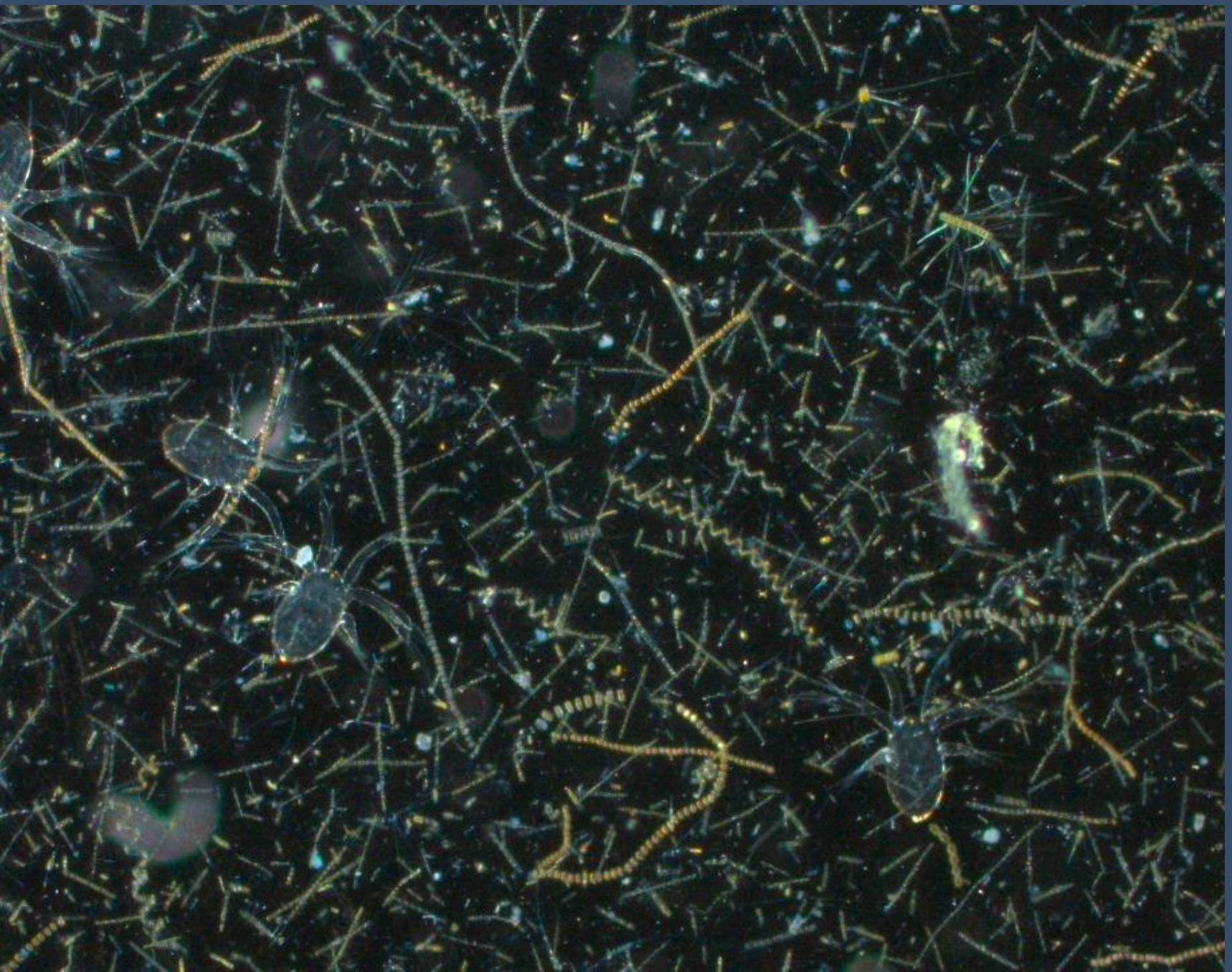
During the science boats in Kelp Bay, Tracy Arm, and Icy Bay, we used a CTD to create a physical profile of the water column, took measurements of turbidity to estimate phytoplankton abundance, then deployed a plankton net to collect phytoplankton and zooplankton.



Science Boat: CTD data

Our CTD casts gave us insight into the way salinity, temperature, and chlorophyll changed with depth. Typically, salinity increases with depth while temperature decreases, since cold, salty water is more dense. Measuring chlorophyll– the photosynthetic pigments in phytoplankton– gives us information on phytoplankton abundance and primary productivity.

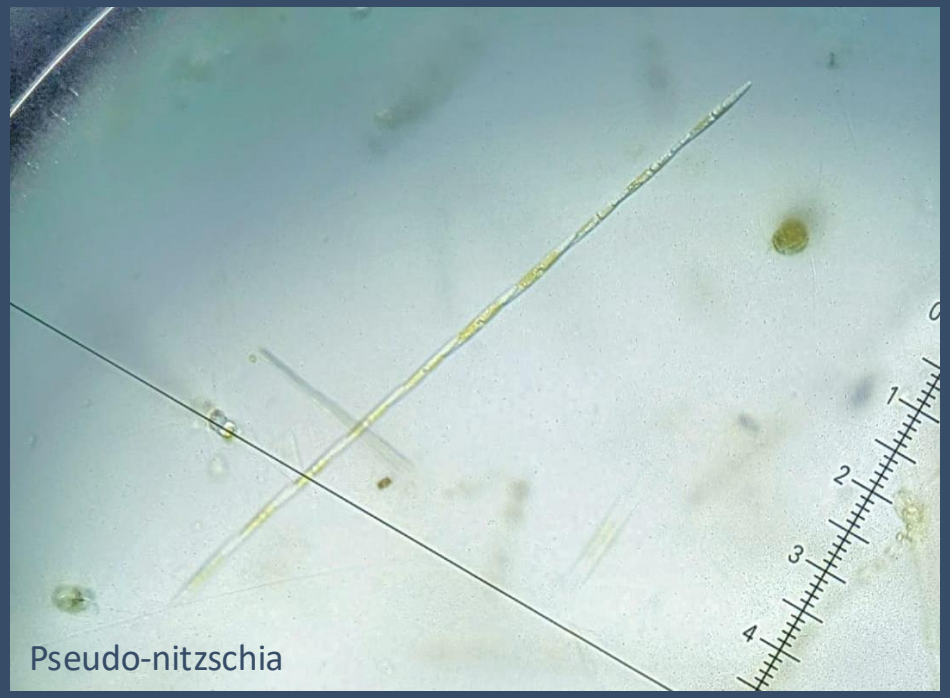
	Secchi depth (m)	Previous years Secchi depth average (m)	Water temp (celcius)
Kelp Bay	3.5		7
Tracy Arm	1.5		5
Icy Bay	1.8		1.5

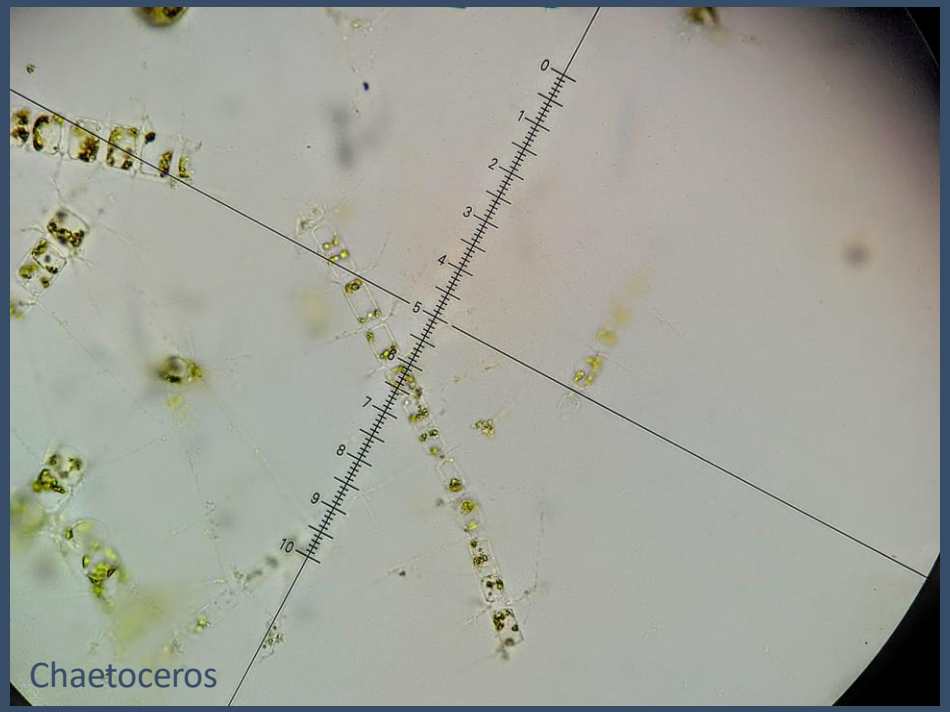


Plankton samples

Plankton are ocean drifters transported by currents and tides, and the lack of ability to navigate against these natural forces. Animals (zooplankton) and plant-like algae (phytoplankton) play a key role in supporting the marine food web and health of our oceans.

The image on the left shows a plankton sample from Kelp Bay, AK. Including Copepod naupilus larvae, as well as mix of phytoplankton, including Radiolaris, Chaetocerus, and Thalassiosira


Pseudo-nitzschia


Chaetoceros

Phytoplankton & Harmful Agal Bloom (HAB) Project

Phytoplankton underpin the marine food web as they, like plants on land, contain photosynthetic pigments (chlorophyll) that convert sunlight into energy and oxygen, and also sequesters carbon dioxide.

We collected phytoplankton samples in Kelp Bay, Tracy Arm, and Icy Bay and reported the abundance and species present for the HAB project, to detect harmful blooms of microalge.

These blooms, caused by excessive nutrient pollution and environmental changes, can produce toxins that harm aquatic life, disrupt ecosystems, and pose health risks to humans. The HAB project aims to monitor outbreaks, identify contributing factors, and develop strategies to predict, prevent, and manage HABs through scientific research.

The data we collected suggested **a potential HAB in Kelp Bay on the 9th May 2025**, with elevated levels of chaeotoceros and pseudo-nitzchia phytoplankton (left) in our sample, which has since been reported to HAB.


Shrimp larvae, Tracy Arm


Amphipod, Kelp Bay

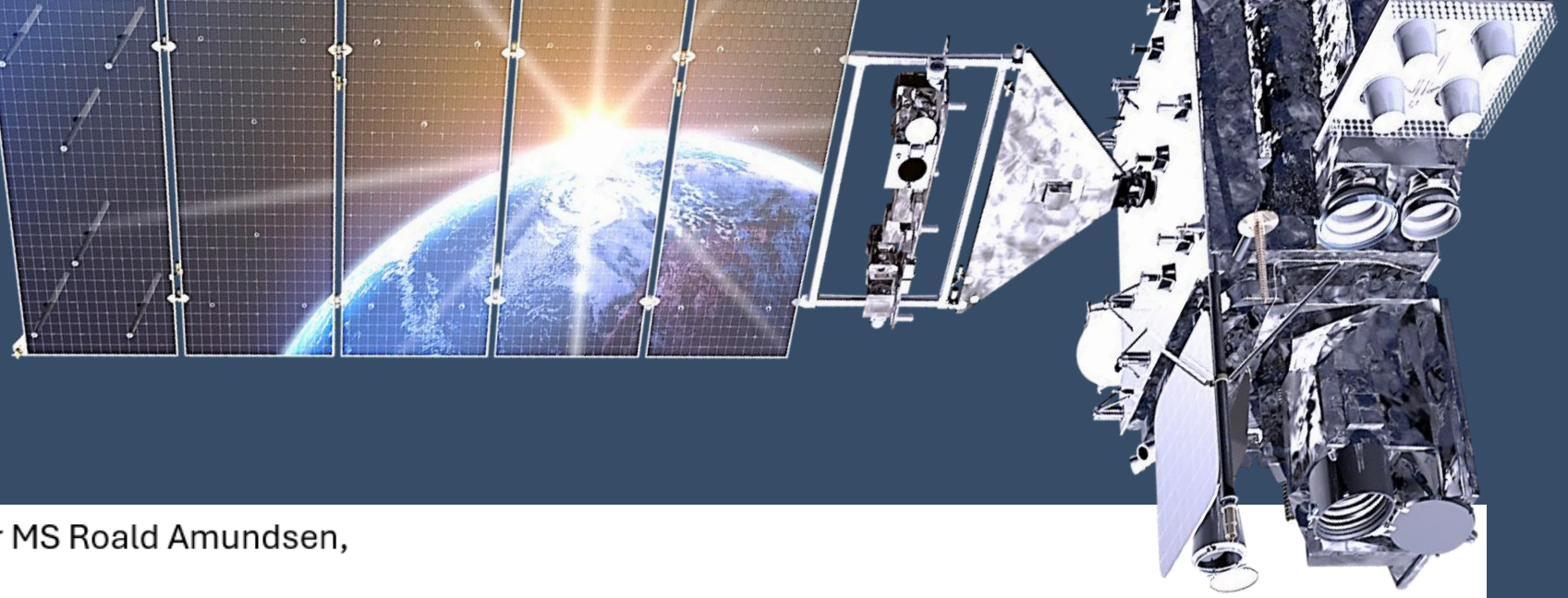

Arrow worm, Icy Bay


Copepod, Icy Bay

Zooplankton

We also collected zooplankton samples in Tracy Arm, Kelp Bay, and Icy Bay. Samples included ‘holoplankton’ which remain planktonic their whole life cycle, such as copepods, and arrow worms (pictured bottom left) . And ‘meroplankton’ which are only planktonic for part of their life cycle e.g shrimp larvae (pictured top left).

The photos taken on our microscopes have also been added to our iNaturalist project, to help monitor plankton bioidiversity.



Citizen Science

NASA Cloud Observer

Clouds aren't just shapes in the sky; they are important components of 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 such data.

Our citizen scientists **submitted 8 observations over 7 sessions** to the global database run by NASA. Our observations were matched to data from weather satellites orbiting above and will be used to better understand global weather phenomena.

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

View our data on the global map

Dear MS Roald Amundsen,

Thank you for your NASA GLOBE cloud observation! The NASA GLOBE Clouds Team matched your cloud observation with corresponding satellite data. The satellite match is based on the time and location of your cloud report. You can learn more about how to understand your satellite match at GLOBE Clouds Satellite Comparison. The link(s) below show your data. The satellite names shown correspond to the satellites that matched the time and place of your report.

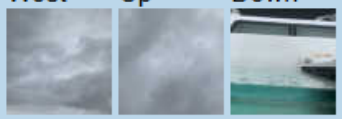
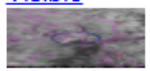
Measurement 2025-05-07 17:46:00 GOES-18

Satellite: 'GOES 18'.
Operator: NOAA / NASA.
Mass: 5192 kg.
Launched: 1st March 2022.
Orbit: Geostationary.
Application: Rainfall, fire, cloud cover and air quality.

GLOBE Cloud Observations Paired with NASA Satellite Data

Total Satellite Comparisons: 209

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	GOES-18 Satellite
Universal Date/Time	2025-05-07 17:46:00	2025-05-07 17:33
Latitude	55.09	54.77 to 55.41
Longitude	-131.12	-131.44 to -130.8
Total Cloud Cover	Overcast (>90%)	Overcast 94.23%
High Clouds	 Cirrostratus Cover: Few (<10%) Opacity: Translucent	Cover: Few (7.69%) Altitude: 7.11 (km) Phase: Ice 241.37 (K) Opacity: Transparent
Mid Clouds	 Altostratus Cover: Overcast (>90%) Opacity: Translucent	Cover: Broken 67.31% Altitude: 3.81 (km) Phase: Ice/Water Mix 255.45 (K) Opacity: Translucent
Low Clouds	 Nimbostratus  Stratocumulus Cover: Broken (50-90%) Opacity: Opaque	Cover: Isolated 19.23% Altitude: 1.53 (km) Phase: Ice/Water Mix 268.97 (K) Opacity: Transparent
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 	***GOES-18*** Visible  Infrared  GEO Tutorial

Remember: We couldn't see the high clouds due to the heavy cover of low clouds. However the satelitte could, and now our data can be combined!

NASA Cloud Observer

The light blue collumn marks the data we took together out on Deck 7 that very day.

The white collumn marks the data collected by the satellite 'GOES 18'.

When we have both these collumns together side by side, we can fill in the gaps between ground observations and space orbital observations.

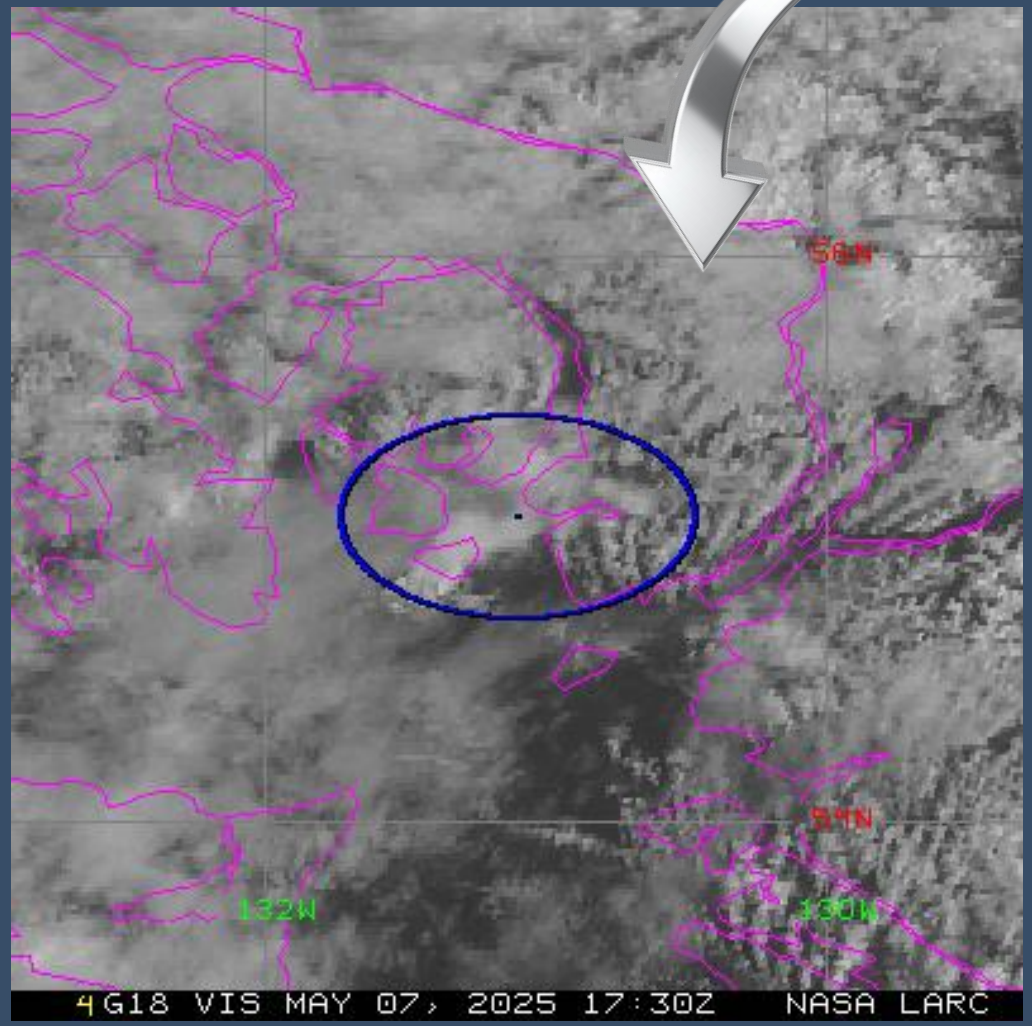
On this day, the clouds obscured the satelittes vision through the high and mid level clouds.

You can see that in the 'Low Clouds' row, we knew it was around 90% cloud cover that day. While the satelitte could only estimate at around 19%.

Thanks for helping collect this amazing data together.

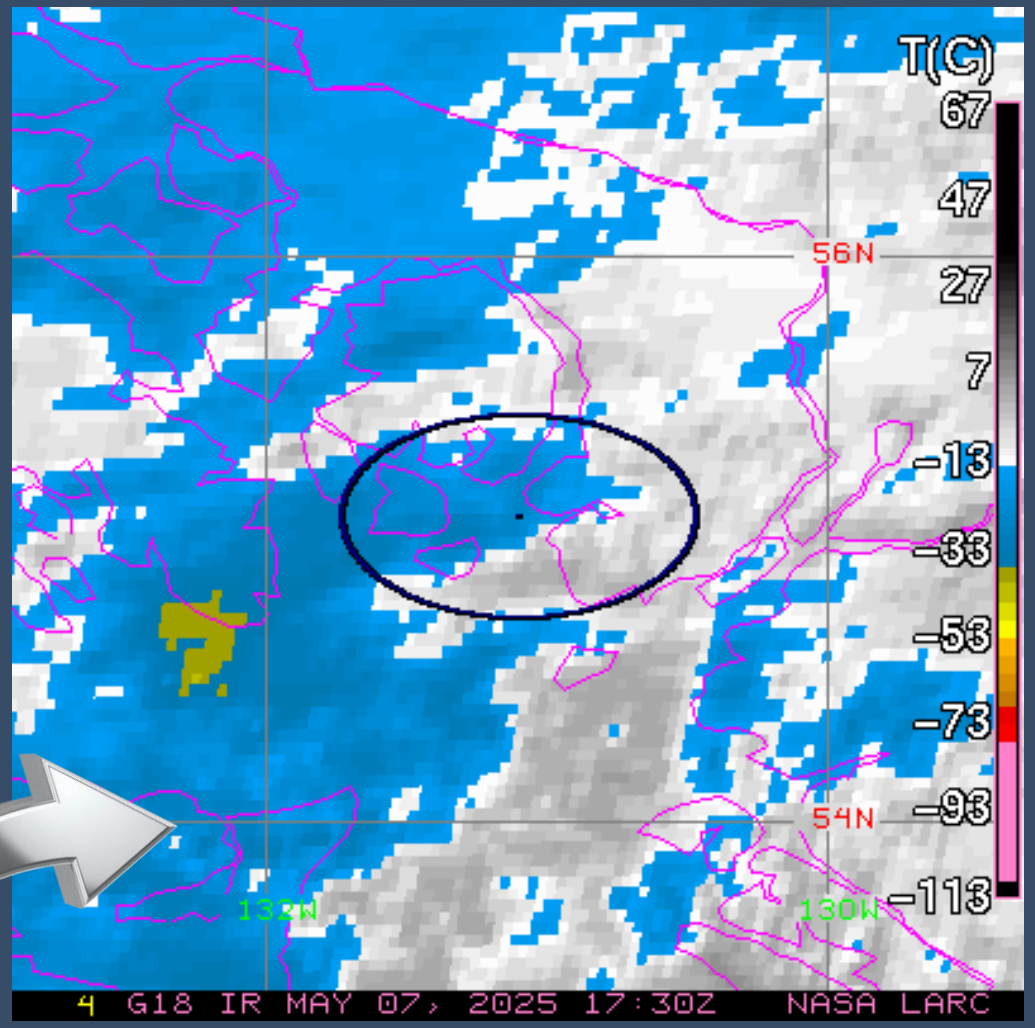
View our data on the global map

NASA Cloud Observer



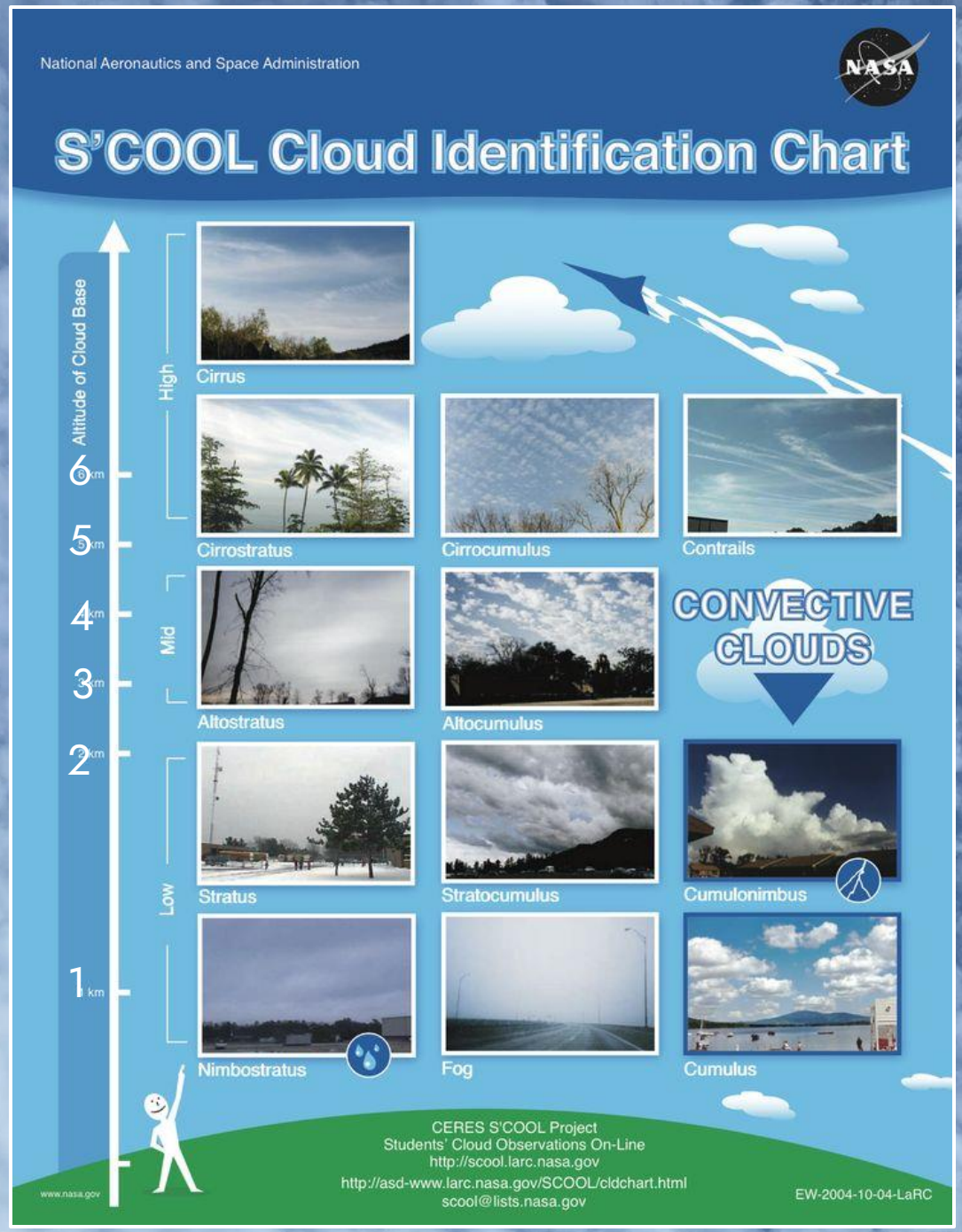
Real colour image. Blue dot marks us on the ship that day. The blue circle indicates a 40km diameter from out single data point.

Grey marks the cloud cover while darker hues are land close by the ship.



Infrared image where the data legend is in temperature (‘C). Blue colours are around -13’C. Yellows are around -53’C and grey hues are positive celcius around 7’C.

View our data on the global map



Citizen Science

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 clouds that cover large portions of the sky. They can create a halo around the sun or moon.

Cirrocumulus: Small, fluffy clouds, 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, gray 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.

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

Citizen Science

Happywhale

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

We spotted a humpback whale just outside of Tracy Arm and submitted a photo of its fluke to Happywhale and got a match: this whale has been seen already 18 times since 1986, between Aaska and Hawaii!

View the MS Roald Amundsen's submissions to Happywhale during our voyage

Azawad (FS)

ID SEAK-1203

SEX Unknown

Humpback Whale

Also Known As:

HW-MN0400109

OSUWTG-MnSEAK099

HI07-0212

PWF-NP_5007

SPLASH-474099

Sightings: 18

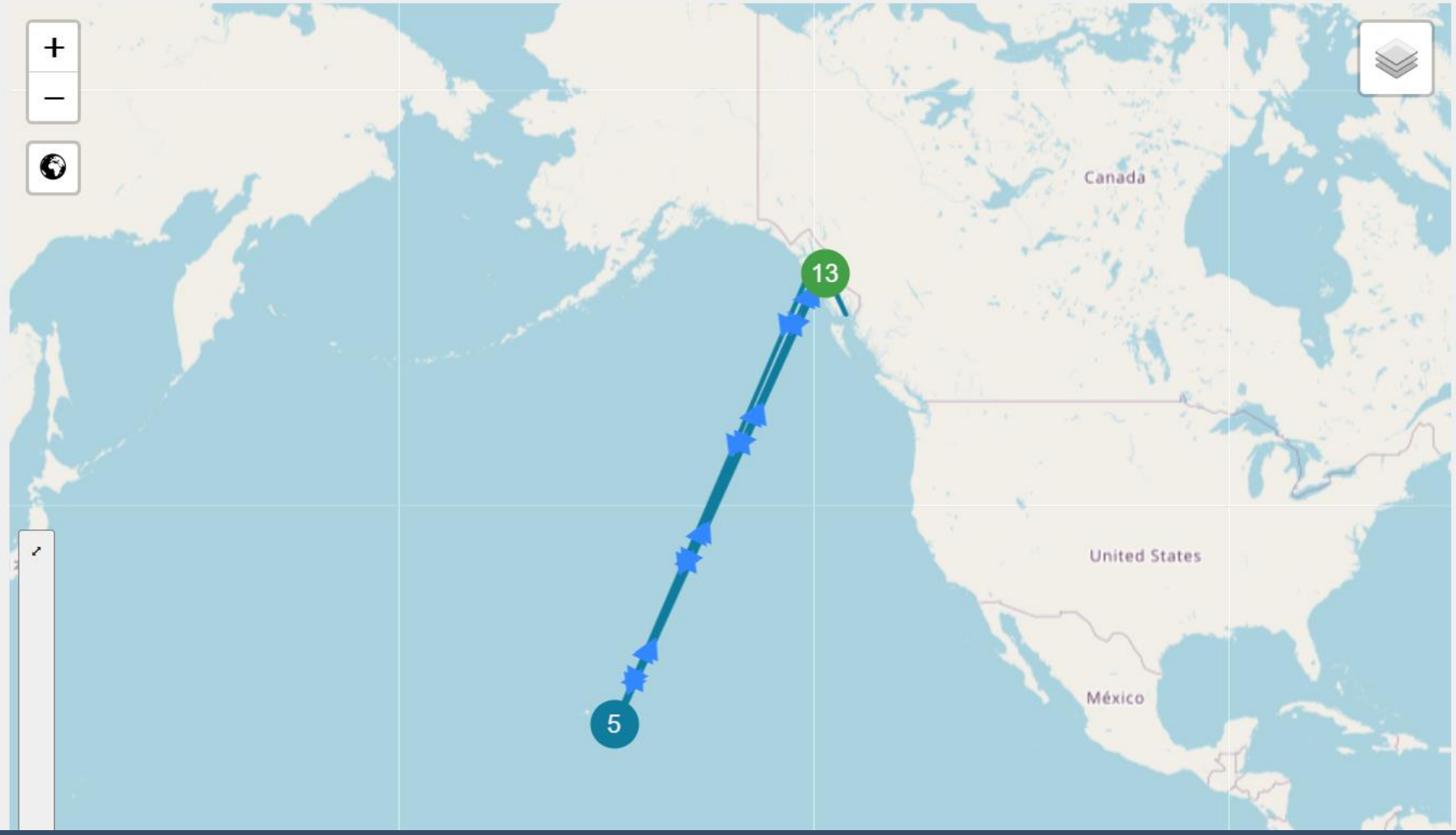
First:  1986-01-28
Hawaii, United States

Last:  2025-05-10
Alaska, United States

Followers
5

Follow

Seen this individual?



Citizen Science
iNaturalist

During our voyage we had the chance to explore many different ecosystems: from the rainforest, to the intertidal zone and the kelp forest; from rivers and lakes to glaciated fjords. In these habitats we observed a big variety of trees, flowers, marine invertebrates, mammals and birds.

In total we recorded:

- **94** Species
- **179** Observations

… and counting; as you upload more photos from home our datatset grows! Through iNaturalist, these observations can now be used as data in global scientific research.

Thank you for joining the project and contributing to this amazing citizen cience platform.

View our data submitted on our iNaturalist project here:
2025 May 5 - 17: MS Roald Amundsen - Alaska & British Columbia (AMALA2503)

Citizen Science

eBird

At sea and on land, our onboard ornithologists were constantly surveying the avifauna we encountered along our route. The diversity of habitats we traveled through provided us with an equally diverse array of birds, from majestic albatrosses at sea to resplendent jungle parrots.

Including 8 onboard Wildlife Watches and eBird sessions on deck, we recorded **49 bird species** across **13 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:
AMALA2503a Alaska and British Columbia - Wilderness, Glaciers and Culture (Northbound) May 05 to 17, 2025 - eBird Trip Report

Wildlife List - Birds

Wildlife List – Birds

SCIENTIFIC NAME	ENGLISH	DEUTSCH	FRANÇAIS	NORSK
Branta canadensis	**Canada Goose**	Kanadagans	Bernache du Canada	Kanadagås
Spatula clypeata	**Northern Shoveler**	Löffelente	Canard souchet	Skjeand
Anas platyrhynchos	**Mallard**	Stockente	Canard colvert	Stokkand
Histrionicus histrionicus	**Harlequin Duck**	Kragenente	Arlequin plongeur	Harlekinand
Melanitta perspicillata	**Surf Scoter**	Brillenente	Macreuse à front blanc	Brilleand
Melanitta deglandi	**White-winged Scoter**	Höckersamtente	Macreuse à ailes blanches	Knoppsjøorre
Clangula hyemalis	**Long-tailed Duck**	Eisente	Harelde kakawi	Havelle
Bucephala islandica	**Barrow's Goldeneye**	Spatelente	Garrot d'Islande	Islandsand
Mergus merganser	**Common Merganser**	Gänsesäger	Grand Harle	Laksand
Mergus serrator	**Red-breasted Merganser**	Mittelsäger	Harle huppé	Siland
Dendragapus fuliginosus	**Sooty Grouse**	Küstengebirgshuhn	Tétras fuligineux	Sotjerpe
Podiceps grisegena	**Red-necked Grebe**	Rothalstaucher	Grèbe jougris	Gråstrupedykker
Columba livia	**Rock Pigeon**	Felsentaube	Pigeon biset	Klippedue (Bydue)
Haematopus bachmani	**Black Oystercatcher**	Klippenausternfischer	Huîtrier de Bachman	Amerikasvarttjeld
Charadrius vociferus	**Killdeer**	Keilschwanz-Regenpfeifer	Pluvier kildir	Tobeltelo

Wildlife List – Birds

SCIENTIFIC NAME	ENGLISH	DEUTSCH	FRANÇAIS	NORSK
Phalaropus lobatus	**Red-necked Phalarope**	Odinshühnchen	Phalarope à bec étroit	Svømmesnipe
Actitis macularius	**Spotted Sandpiper**	Drosseluferläufer	Chevalier grivelé	Flekksnipe
Calidris pusilla	**Semipalmated Sandpiper**	Sandstrandläufer	Bécasseau semipalmé	Sandsnipe
Cerorhinca monocerata	**Rhinoceros Auklet**	Nashornalk	Macareux rhinocéros	Neshornlunde
Fratercula cirrhata	**Tufted Puffin**	Gelbschopflund	Macareux huppé	Topplunde
Brachyramphus marmoratus	**Marbled Murrelet**	Marmelalk	Guillemot marbré	Marmordvergteist
Cepphus columba	**Pigeon Guillemot**	Taubenteiste	Guillemot colombin	Beringteist
Uria aalge	**Common Murre**	Trottellumme	Guillemot marmette	Lomvi
Rissa tridactyla	**Black-legged Kittiwake**	Dreizehenmöwe	Mouette tridactyle	Krykkje
Chroicocephalus philadelphia	**Bonaparte's Gull**	Bonapartemöwe	Mouette de Bonaparte	Kanadahettemåke
Larus brachyrhynchus	**Short-billed Gull**	Kurzschnabel-Sturmmöwe	Goéland à bec court	kortnebbmåke
Larus smithsonianus	**Herring Gull**	Kanadamöwe	Goéland hudsonien	Amerikagråmåke
Larus glaucescens	**Glaucous-winged Gull**	Beringmöwe	Goéland à ailes grises	Gråvingemåke
Gavia pacifica	**Pacific Loon**	Pazifiktaucher	Plongeon du Pacifique	Amerikastorlom
Ardenna grisea	**Sooty Shearwater**	Dunkler Sturmtaucher	Puffin fuligineux	Grålire

Wildlife List – Birds

SCIENTIFIC NAME	ENGLISH	DEUTSCH	FRANÇAIS	NORSK
Ardenna tenuirostris	**Short-tailed Shearwater**	Kurzschwanz-Sturmtaucher	Puffin à bec grêle	Smalnebblire
Phalacrocorax pelagicus	**Pelagic Cormorant**	Meerscharbe	Cormoran pélagique	Beringskarv
Ardea herodias	**Great Blue Heron**	Kanadareiher	Grand Héron	Herodiashegre
Haliaeetus leucocephalus	**Bald Eagle**	Weißkopf-Seeadler	Pygargue à tête blanche	Hvithodehavørn
Buteo jamaicensis	**Red-tailed Hawk**	Rotschwanzbussard	Buse à queue rousse	Rødhalevåk
Megaceryle alcyon	**Belted Kingfisher**	Gürtelfischer	Martin-pêcheur d'Amérique	Belteisfugl
Sphyrapicus ruber	**Red-breasted Sapsucker**	Feuerkopf-Saftlecker	Pic à poitrine rouge	Rødbrystsevjespett
Falco columbarius	**Merlin**	Merlin	Faucon émerillon	dvergfalk
Falco peregrinus	**Peregrine Falcon**	Wanderfalke	Faucon pèlerin	Vandrefalk
Cyanocitta stelleri	**Steller's Jay**	Diademhäher	Geai de Steller	Furuskrike
Corvus brachyrhynchos	**American Crow**	Amerikakrähe	Corneille d'Amérique	Amerikakråke
Corvus corax	**Common Raven**	Kolkrabe	Grand Corbeau	Ravn
Poecile rufescens	**Chestnut-backed Chickadee**	Rotrückenmeise	Mésange à dos marron	Kastanjemeis
Tachycineta thalassina	**Violet-green Swallow**	Veilchenschwalbe	Hirondelle à face blanche	Talassinsvale
Corthylio calendula	**Ruby-crowned Kinglet**	Rubingoldhähnchen	Roitelet à couronne rubis	Rubinfuglekonge

Wildlife List – Birds

SCIENTIFIC NAME	ENGLISH	DEUTSCH	FRANÇAIS	NORSK
Regulus satrapa	**Golden-crowned Kinglet**	Indianergoldhähnchen	Roitelet à couronne dorée	Ildkronefuglekonge
Troglodytes pacificus	**Pacific Wren**	Pazifikzaunkönig	Troglodyte de Baird	Barsmett
Cinclus mexicanus	**American Dipper**	Grauwasseramsel	Cincle d'Amérique	Gråfossekall
Ixoreus naevius	**Varied Thrush**	Halsbanddrossel	Grive à collier	Båndtrost
Catharus ustulatus	**Swainson's Thrush**	Zwergmusendrossel	Grive à dos roussâtre	Brunkinnskogtrost
Catharus guttatus	**Hermit Thrush**	Einsiedler-Musendrossel	Grive solitaire	Eremittskogtrost
Turdus migratorius	**American Robin**	Wanderdrossel	Merle d'Amérique	Vandretrost
Anthus rubescens	**American Pipit**	Pazifikpieper	Pipit d'Amérique	Myrpiplerke
Spizella passerina	**Chipping Sparrow**	Schwirrammer	Bruant familier	Brunissespurv
Passerella iliaca	**Fox Sparrow**	Fuchsammer	Bruant fauve	Revespurv
Junco hyemalis	**Dark-eyed Junco**	Winterammer	Junco ardoisé	Vinterjunko
Zonotrichia atricapilla	**Golden-crowned Sparrow**	Kronenammer	Bruant à couronne dorée	Gulkronespurv
Passerculus sandwichensis	**Savannah Sparrow**	Grasammer	Bruant des prés	Musespurv
Melospiza melodia	**Song Sparrow**	Singammer	Bruant chanteur	Sangspurv
Melospiza lincolnii	**Lincoln's Sparrow**	Lincolnammer	Bruant de Lincoln	Gråbrynspurv
Regulus satrapa	**Golden-crowned Kinglet**	Indianergoldhähnchen	Roitelet à couronne dorée	Ildkronefuglekonge

Wildlife List – Birds

SCIENTIFIC NAME	ENGLISH	DEUTSCH	FRANÇAIS	NORSK
Leiothlypis celata	**Orange-crowned Warbler**	Orangefleck-Waldsänger	Paruline verdâtre	Oransjekroneparula
Setophaga coronata	**Yellow-rumped Warbler**	Kronenwaldsänger	Paruline à croupion jaune	Myrteparula
Setophaga townsendi	**Townsend's Warbler**	Townsendwaldsänger	Paruline de Townsend	Granparula
Cardellina pusilla	**Wilson's Warbler**	Mönchswaldsänger	Paruline à calotte noire	Kalottparula

Wildlife List - Mammals

Wildlife List – Marine Mammals

SCIENTIFIC NAME	ENGLISH	DEUTSCH	FRANÇAIS	NORSK
Megaptera novaeangliae	**Humpback whale**	Buckelwal	Baleine à bosse	Knølhval
Orcinus orca	**Killer whale, orca**	Schwertwal, Orka	Orque	Spekkhogger
Eschrichtius robustus	**Gray whale**	Grauwal	Baleine grise	Gråhval
Phocoenoides dalli	**Dall's porpoise, Dall porpoise**	Weißflankenschweinswal	Marsouin de Dall	Dalls nise
Eumetopias jubatus	**Steller Sea Lion**	Stellerscher Seelöwe	Lion de mer de Steller	Hvalross
Phoca vitulina	**Harbour Seal**	Seehund	Phoque commún	Steinkobbe
Enhydra lutris	**Sea Otter**	Meerotter	Loutre de mer	Havoter

Wildlife List – Terrestrial Mamals

SCIENTIFIC NAME	ENGLISH	DEUTSCH	FRANÇAIS	NORSK
Tamiasciurus hudsonicus	**American Red Squirrel**	Gemeines Rothörnchen	Écureuil roux américain	Amerikansk ekorn
Ursus americanus	**American black bear**	Amerikanischer Schwarzbär	Ours noir	Amerikansk svartbjørn

Thank you for participating!