Science & Education Report

MS Roald Amundsen 24 July – 9th August, 2025

Alaska and British Columbia - Inside Passage, Bears and Aleutian Islands

When you arrived on the MS Roald 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 along the wild and wonderful Alaskan coast.

Arts, crafts & creativity

We witnessed the wild beauty of Alaska's landscapes and let it inspire us to create art reflecting our surroundings and our feelings. Through drawing sessions, painting sessions, sculpting sessions, and much more, we created tangible keepsakes of our journey. We even let our creativity flow through dance and movement sessions during our voyage!

Science & Education Program

The MS Roald Amundsen is more than a ship– it is a platform of opportunity for us to explore the world around us, collect meaningful data, and learn more deeply about the places we visit.

Our onboard naturalists guided our guests using scientific tools to investigate the world around us. We observed, documented, and discussed many interesting fauna, flora, and phenomena. From learning about whale anatomy to exploring the rock cycle, guests participated in sessions that gave a deeper understanding and appreciation for the world around us. Our historians put all of what we saw in the context of humans' relationships with this place– from the earliest inhabitants to modern society.

On the next pages you can find highlights of our onboard Science and Education Program and our Citizen Science Program.

History

As we set off into the Inside Passage, we voyaged among Tlingit land. Here we witnessed the thriving Tlingit culture expressed through art, cultural artifacts, and the stories of our local guides. We then sailed past the ancestral lands of the Sugpiaq as we headed east, coming to the Aleutian Islands: lands that have been home to the Unangax people since time immemorial. We learned about the Unangax culture and history while visiting Dutch Harbor and St. Paul. We then headed north to Nome: a name that evokes images of the modern 'last frontier' and gold-rush riches. But it is also a place that for thousands of years was a seasonal hunting settlement of the Inupiat until gold was discovered by American prospectors in 1898, forever changing the future of this region.

In our onboard lectures, we learned about the Native history of the region, as well as its settlement by Europeans, its purchase by the United States, and its eventual statehood. We also felt how the native histories and cultures of this region permeate all aspects of life here. We acknowledged that these histories hold pain, but also hope, and that they exist intertwined in a story that is still being written!

Science Boat

Learning in a lecture or workshop is one thing, but getting your hands ‘dirty’ in the pursuit of science is at another level. For the guests who chose to particpate in the Science Boat, they joined a participative experience focused on collecting meaningful data by ‘taking the lab outside’ – and underwater!

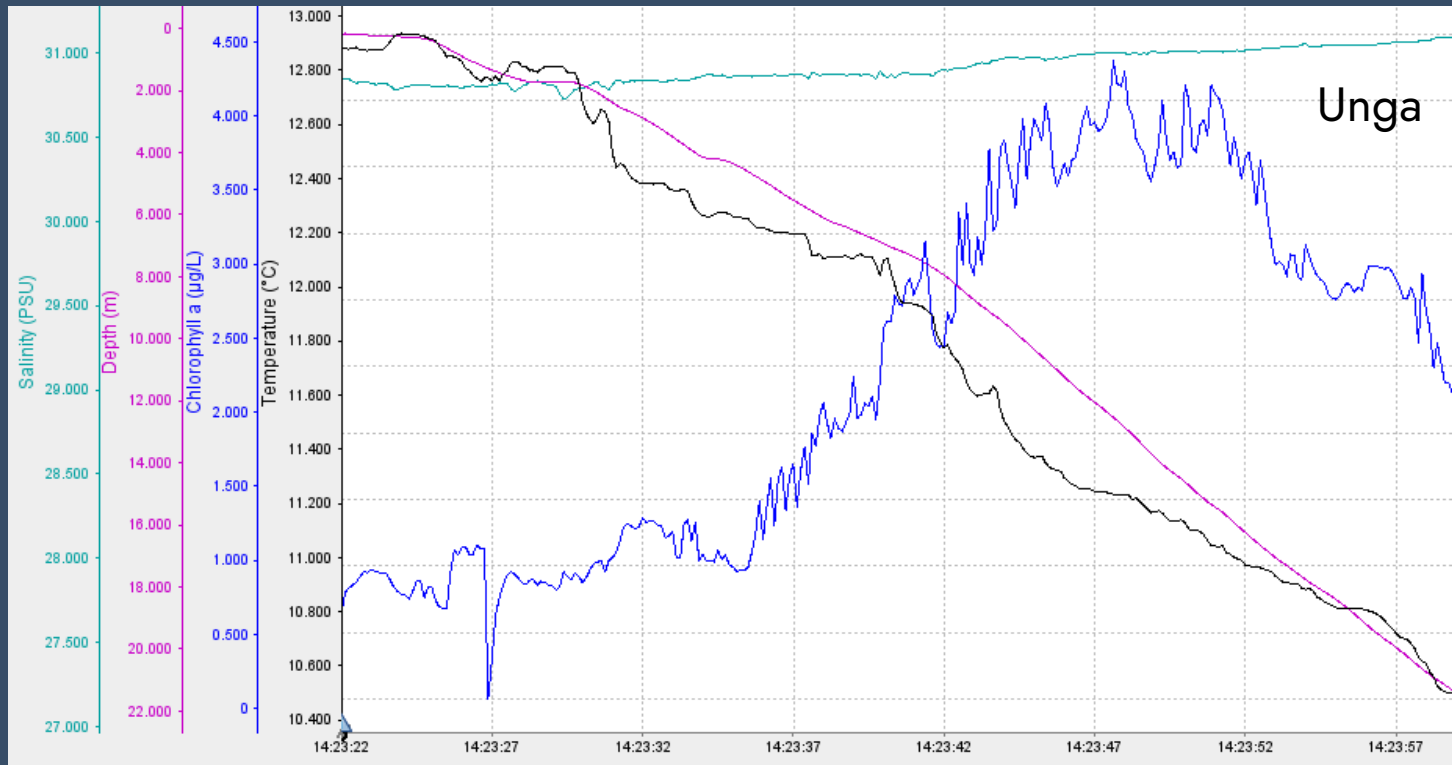
We investigated the underwater world in **10** Science Boat sessions in Misty Fjords, Icy Bay, Uyak Bay, Anakchiak Bay, and Unga Village. We observed and discussed the wildlife and geology in each location to better understand the area’s ecology. We deployed a plankton net to collect phytoplankton and zooplankton, used a CTD to create a physical profile of the water column, and took measurements of turbidity to submit to the Citizen Science project the Secchi Disk Project.

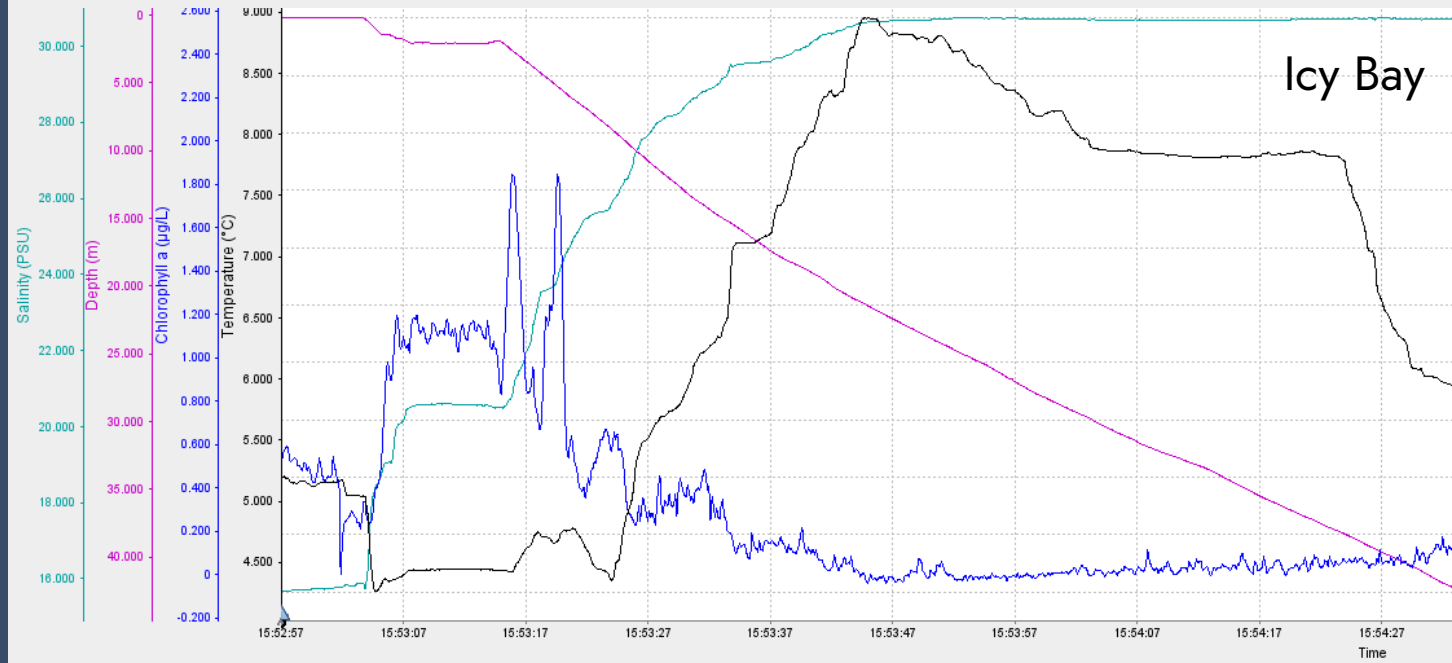
CTD Profiles

Our CTD casts gave us insight into the way salinity, temperature, and chlorophyll changed with depth. Each site had a unique profile!

Typically, salinity increases with depth while temperature decreases, since cold, salty water is more dense. This sinking of cold, salty water can cause stratification, or layering, to occur, giving different depths different characteristics. If there is no stratification, we call the water column "well mixed." Stratification can provide insights into the availability for nutrient replenishment at the surface, which is crucial for phytoplankton. Measuring chlorophyll– the photosynthetic pigments in phytoplankton-- gives us information on phytoplankton abundance and primary productivity.

Two of our CTD casts illustrate these concepts. At Unga, in a shallow bay facing the open ocean, we saw a classic well-mixed water column: the temperature decreased linearly with depth, and whole water column was of oceanic salinity. We also saw our chlorophyll maximum– indicative of the 'best' region for phytoplankton– at 13m, but with chlorophyll still sensed at all depths as well. Conversely, in Icy Bay, we saw the influence of the icebergs and glaciers clearly: temperature and salinity were lowest at the surface. Both then jumped up in magnitude as a different, marine water mass intruded around 20m, after which temperature began to drop with increasing depth, as typically expected, and salinity stayed constant and oceanic. Here the highest chlorophyll concentrations (at values half of Unga's) were in the first 10m of the water column; in the silty water of Icy Bay, that's the most efficient depth for phytoplankton to absorb sunlight!



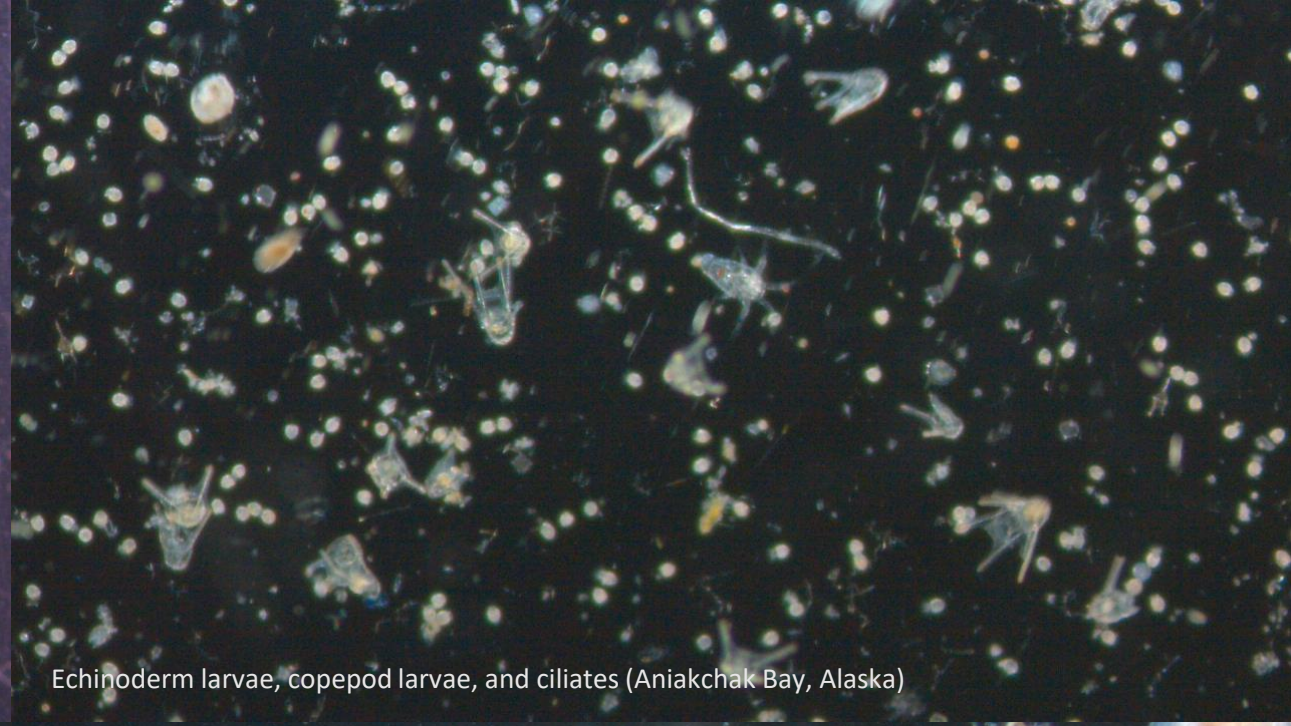


Plankton samples

After we collected water samples on the Science Boat, we brought them back to the Science Center to look at them under the microscope. From phytoplankton, those tiny photosynthetic organisms at the base of the food web, to larvae of more familiar animals like crabs, we encountered many different creatures. We noticed fewer phytoplankton than zooplankton in most samples; a sign that the summer phytoplankton blooms are coming to an end. Let's look at some of what we found!

We also analyzed all of our plankton samples for any species correlated to harmful algal blooms (HABs) and submitted this information to our partners at the Phytoplankton Monitoring Network (PMN). PMN is collecting observations of potentially dangerous species in order to help coastal communities better prepare for and manage these blooms. One sample from Uyak Bay had elevated levels of the HAB dinoflagellate species *Dinophysis*, and *Tipos*. This sample was sent to PMN for further analysis.

Arrow worm (Icy Bay, Alaska)



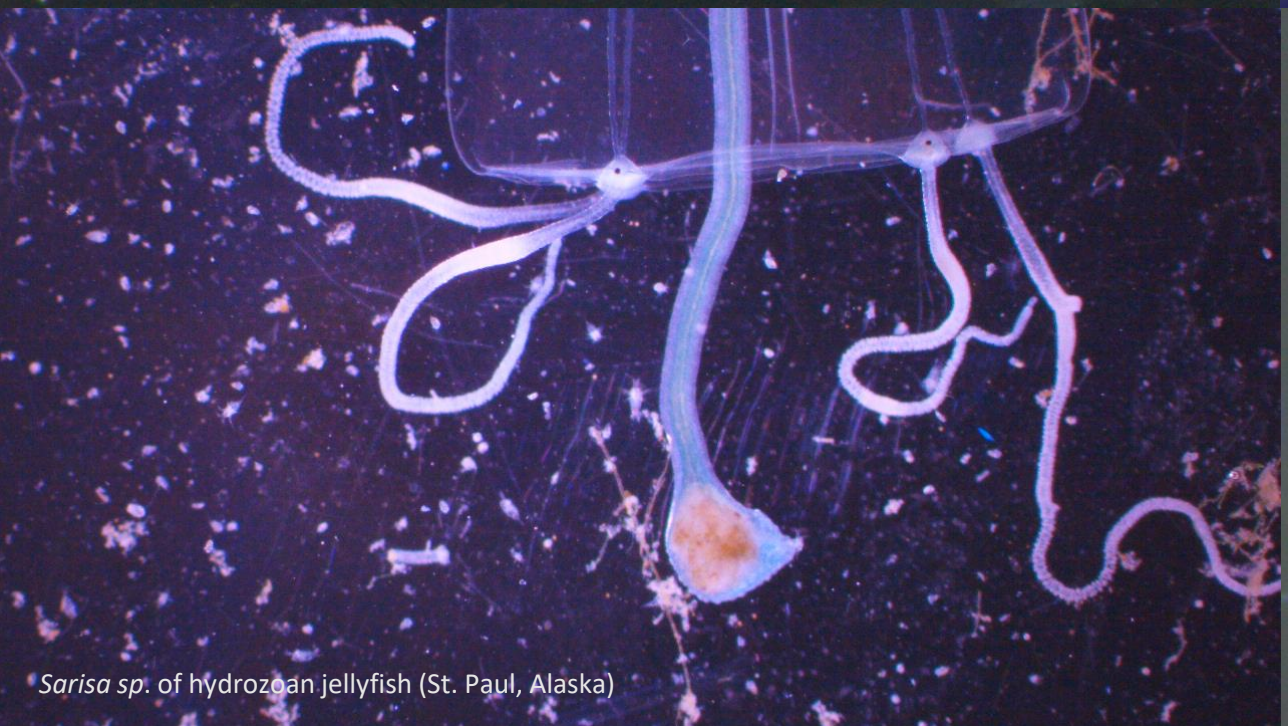
Echinoderm larvae, copepod larvae, and ciliates (Aniakchak Bay, Alaska)

Pteropods/sea butterflies and copepod (Unga, Alaska)

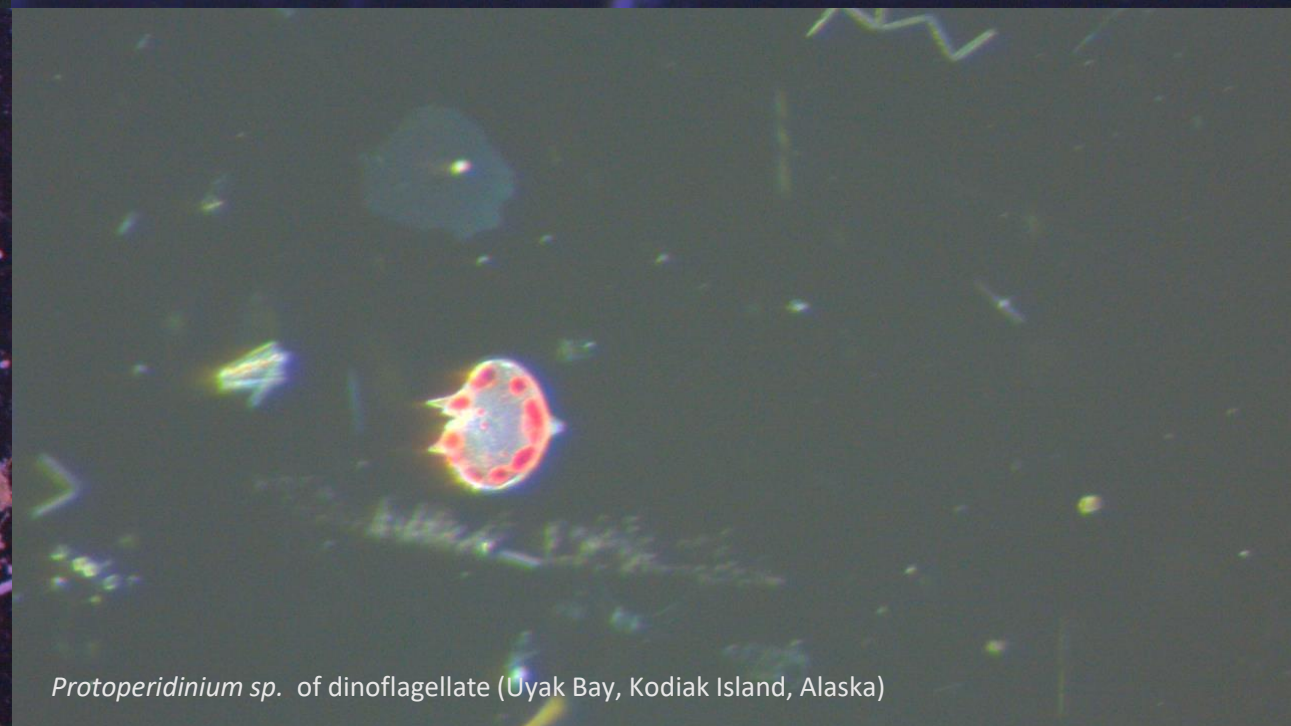
Copepods (Unga, Alaska)

Barnacle larvae and pennate diatoms (Unga, Alaska)

Copepod female with egg mass (St. Paul, Alaska)



Sarisa sp. of hydrozoan jellyfish (St. Paul, Alaska)



Protoperidinium sp. of dinoflagellate (Uyak Bay, Kodiak Island, Alaska)

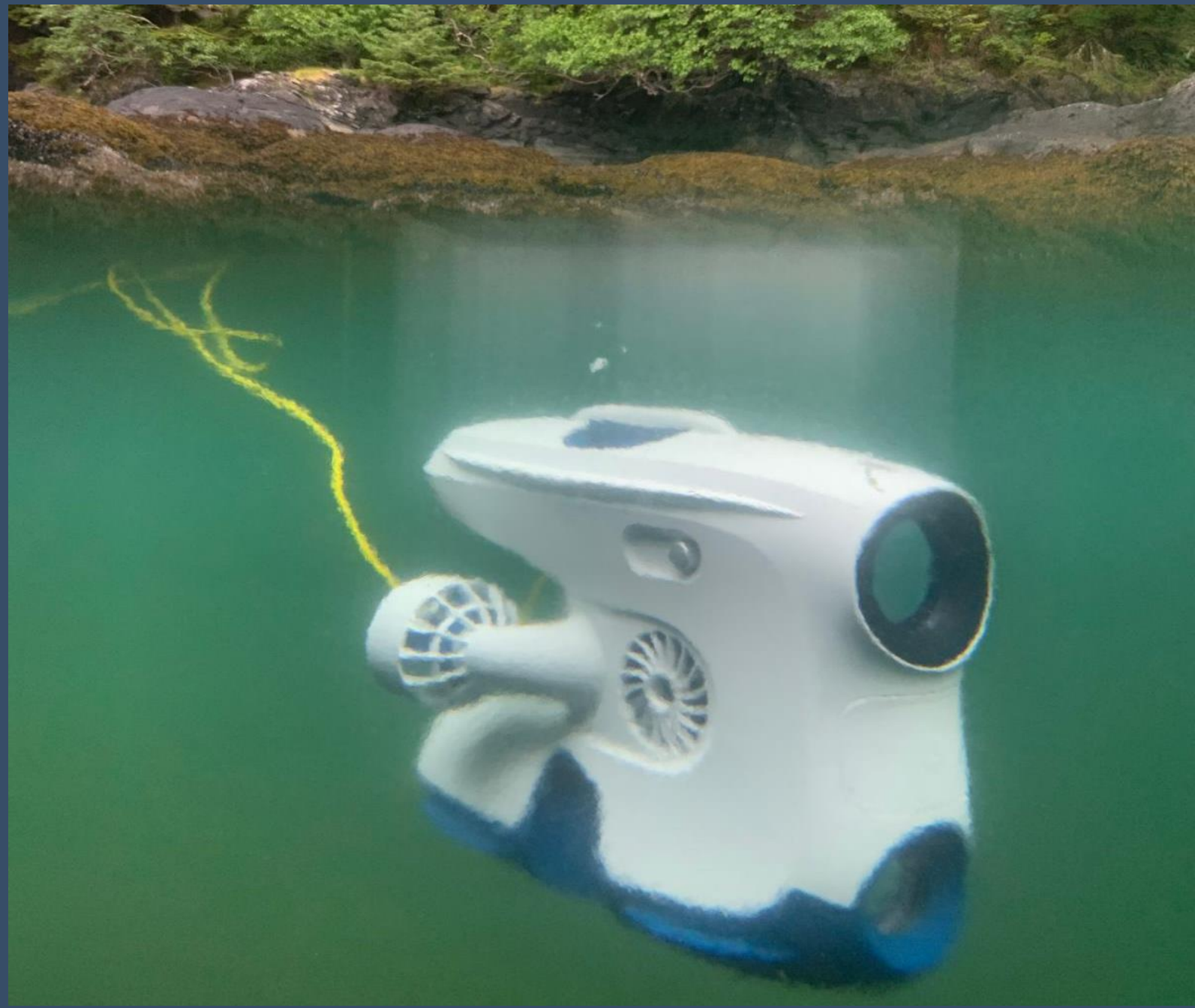
Underwater drone

The underwater world is endlessly fascinating: it seems as if it holds an entire universe in its depths. Luckily, with our state of the art underwater drone, we are able to explore some of those places that we would otherwise only be able to imagine! We had the opportunity to deploy our drone at the following sites:

- **Kinak Bay**
- **Sitka**
- **Misty Fjords**

Through the lens of the drone, we saw a variety of strange and beautiful creatures in their natural habitats. Fish, invertebrate communities, kelp forests, seastars and urchins– the citizens of coastal Alaska, as glimpsed with this tool of modern exploration.

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



Citizen Science

NASA Cloud Observer

Clouds aren't just fluffy shapes in the sky; they are incredibly important components to Earth's heat budget and balance. Information about when, where, and what types of clouds are forming helps scientists understand more about Earth's climate and climate change. Through NASA's GLOBE Cloud Observer program, we help contribute this kind of data.

Our citizen scientists submitted **8** observations 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

Citizen Science
iNaturalist

In our voyage through Alaska we traversed many ecosystems and biomes. From the temperate rainforests of Southeast Alaska to the tundra of Nome, each place presented new and unique species. The impressive amount of species and observations we documented reflects how biologically diverse Alaska is!

We used the citizen science app iNaturalist to identify and record the flora and fauna seen on our journey. Our observations are available to be used in global scientific research.

In total we recorded:

- **267** Species
- **961** Observations

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

View our data submitted on our iNaturalist project here:
2025 July 24 - Aug 9: MS Roald Amundsen - Alaska & British Columbia · iNaturalist

Citizen Science

eBird

From seabirds to passerines, coastal Alaska has both an abundance and diversity of birdlife. Our onboard naturalists were constantly surveying the avifauna we encountered along our route.

Including during **10** onboard Wildlife Watch and eBird sessions, we recorded **110** bird species across **66** 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:
Vancouver to Nome on the Amundsen, 24 July - 9 August 2025

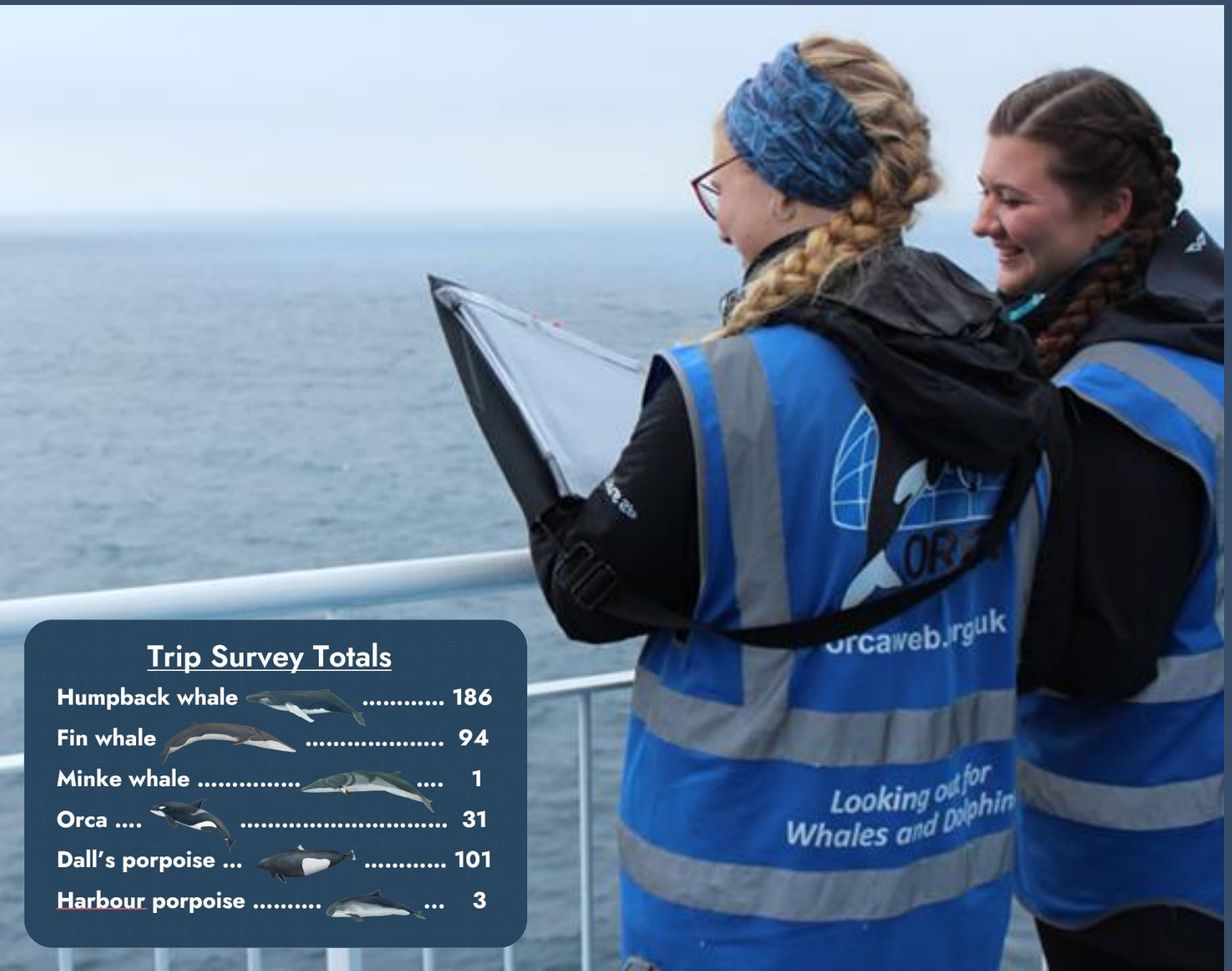
Citizen Science

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 over time, they can track individuals as they migrate across the world and through their lives! And when you submit a photo, you will be notified of any past and future matches of that individual!

On this voyage we photographed **9 humpback whale** individuals and already received **6** matches back. For 5 of these individuals, we have recorded their first ever sightings in Alaska! This data has added to Happywhale's catalogue of identified whales across the world.

View the MS Roald Amundsen's submissions to Happywhale during our voyage:
Happywhale: MS Roald Amundsen - July 08 to July 24



Trip Survey Totals

Humpback whale	186
Fin whale	94
Minke whale	1
Orca	31
Dall's porpoise	101
Harbour porpoise	3

Partnership
ORCA

Our partners at the whale and dolphin conservation charity ORCA are committed to conducting research that helps to identify important whale and dolphin habitats by using "platforms of opportunity" including expedition ships like the Roald Amundsen! Our onboard ORCA Conservationist, with the help of our guests, recorded vital sightings data across the course of our cruise that will help inform conservation decisions and policy in the future.

View more information about our partnership with ORCA here

ORCA | HX Hurtigruten Expeditions

Wildlife List - Birds

Wildlife List – Birds

SCIENTIFIC NAME	ENGLISH	DEUTSCH	FRANÇAIS
Anas platyrhynchos	**Mallard**	Stockente	Canard colvert
Anas acuta	**Northern Pintail**	Spießente	Canard pilet
Anas carolinensis	**Green-winged Teal**	Carolinakrickente	Sarcelle à ailes vertes
Aythya marila	**Greater Scaup**	Bergente	Fuligule milouinan
Somateria spectabilis	**King Eider**	Prachteiderente	Eider à tête grise
Somateria mollissima	**Common Eider**	Eiderente	Eider à duvet
Histrionicus histrionicus	**Harlequin Duck**	Kragenente	Arlequin plongeur
Melanitta perspicillata	**Surf Scoter**	Brillenente	Macreuse à front blanc
Melanitta deglandi	**White-winged Scoter**	Höckersamtente	Macreuse à ailes blanches
Clangula hyemalis	**Long-tailed Duck**	Eisente	Harelde kakawi
Bucephala islandica	**Barrow's Goldeneye**	Spatelente	Garrot d'Islande
Mergus merganser	**Common Merganser**	Gänsesäger	Grand Harle
Aechmophorus occidentalis	**Western Grebe**	Renntaucher	Grèbe élégant
Selasphorus rufus	**Rufous Hummingbird**	Rotrücken-Zimtelfe	Colibri roux
Haematopus bachmani	**Black Oystercatcher**	Klippenausternfischer	Huîtrier de Bachman
Pluvialis fulva	**Pacific Golden Plover**	Tundra-Goldregenpfeifer	Pluvier fauve

Wildlife List — Birds

SCIENTIFIC NAME	ENGLISH	DEUTSCH	FRANÇAIS
Ptychoramphus aleuticus	**Cassin's Auklet**	Aleutenalk	Starique de Cassin
Aethia pusilla	**Least Auklet**	Zwergalk	Starique minuscule
Aethia pygmaea	**Whiskered Auklet**	Bartalk	Starique pygmée
Aethia cristatella	**Crested Auklet**	Schopfalk	Starique cristatelle
Aethia psittacula	**Parakeet Auklet**	Rotschnabelalk	Starique perroquet
Brachyramphus brevirostris	**Kittlitz's Murrelet**	Kurzschnabelalk	Guillemot de Kittlitz
Brachyramphus marmoratus	**Marbled Murrelet**	Marmelalk	Guillemot marbré
Cepphus columba	**Pigeon Guillemot**	Taubenteiste	Guillemot colombin
Uria lomvia	**Thick-billed Murre**	Dickschnabellumme	Guillemot de Brünnich
Uria aalge	**Common Murre**	Trottellumme	Guillemot marmette
Synthliboramphus antiquus	**Ancient Murrelet**	Silberalk	Guillemot à cou blanc
Rissa tridactyla	**Black-legged Kittiwake**	Dreizehenmöwe	Mouette tridactyle
Rissa brevirostris	**Red-legged Kittiwake**	Klippenmöwe	Mouette des brumes
Xema sabini	**Sabine's Gull**	Schwalbenmöwe	Mouette de Sabine
Chroicocephalus philadelphia	**Bonaparte's Gull**	Bonapartemöwe	Mouette de Bonaparte
Larus brachyrhynchus	**Short-billed Gull**	Kurzschnabel-Sturmmöwe	Goéland à bec court

Wildlife List — Birds

SCIENTIFIC NAME	ENGLISH	DEUTSCH	FRANÇAIS
Larus smithsonianus	**Herring Gull**	Kanadamöwe	Goéland hudsonien
Larus schistisagus	**Slaty-backed Gull**	Kamtschatkamöwe	Goéland à manteau ardoisé
Larus hyperboreus	**Glaucous Gull**	Eismöwe	Goéland bourgmestre
Larus californicus	**California Gull**	Kalifornіermöwe	Goéland de Californie
Larus glaucescens	**Glaucous-winged Gull**	Beringmöwe	Goéland à ailes grises
Sterna paradisaea	**Arctic Tern**	Küstenseeschwalbe	Sterne arctique
Gavia stellata	**Red-throated Loon**	Sterntaucher	Plongeon catmarin
Gavia pacifica	**Pacific Loon**	Pazifiktaucher	Plongeon du Pacifique
Gavia immer	**Common Loon**	Eistaucher	Plongeon huard
Gavia adamsii	**Yellow-billed Loon**	Gelbschnabeltaucher	Plongeon à bec blanc
Phoebastria immutabilis	**Laysan Albatross**	Laysanalbatros	Albatros de Laysan
Phoebastria nigripes	**Black-footed Albatross**	Schwarzfußalbatros	Albatros à pieds noirs
Oceanodroma furcata	**Fork-tailed Storm Petrel**	Gabelschwanz-Wellenläufer	Océanite à queue fourchue
Oceanodroma leucorhoa	**Leach's Storm Petrel**	Wellenläufer	Océanite cul-blanc
Fulmarus glacialis	**Northern Fulmar**	Eissturmvogel	Fulmar boréal

Wildlife List — Birds

SCIENTIFIC NAME	ENGLISH	DEUTSCH	FRANÇAIS
Ardenna grisea	**Sooty Shearwater**	Dunkler Sturmtaucher	Puffin fuligineux
Ardenna tenuirostris	**Short-tailed Shearwater**	Kurzschwanz-Sturmtaucher	Puffin à bec grêle
Puffinus puffinus	**Manx Shearwater**	Atlantiksturmtaucher	Puffin des Anglais
Phalacrocorax urile	**Red-faced Cormorant**	Rotgesichtscharbe	Cormoran à face rouge
Phalacrocorax pelagicus	**Pelagic Cormorant**	Meerscharbe	Cormoran pélagique
Nannopterum auritus	**Double-crested Cormorant**	Ohrenscharbe	Cormoran à aigrettes
Ardea herodias	**Great Blue Heron**	Kanadareiher	Grand Héron
Pandion haliaetus	**Osprey**	Fischadler	Balbuzard pêcheur
Haliaeetus leucocephalus	**Bald Eagle**	Weißkopf-Seeadler	Pygargue à tête blanche
Buteo jamaicensis	**Red-tailed Hawk**	Rotschwanzbussard	Buse à queue rousse
Megaceryle alcyon	**Belted Kingfisher**	Gürtelfischer	Martin-pêcheur d'Amérique
Sphyrapicus ruber	**Red-breasted Sapsucker**	Feuerkopf-Saftlecker	Pic à poitrine rouge
Colaptes auratus	**Northern Flicker**	Ostgoldspecht	Pic doré
Empidonax difficilis	**Western Flycatcher**	Feuchtwald-Schnäppertyrann	Moucherolle obscur
Cyanocitta stelleri	**Steller's Jay**	Diademhäher	Geai de Steller

Wildlife List — Birds

SCIENTIFIC NAME	ENGLISH	DEUTSCH	FRANÇAIS
Pica hudsonia	**Black-billed Magpie**	Hudsonelster	Pie d'Amérique
Corvus brachyrhynchos	**American Crow**	Amerikakrähe	Corneille d'Amérique
Corvus corax	**Common Raven**	Kolkrabe	Grand Corbeau
Poecile rufescens	**Chestnut-backed Chickadee**	Rotrückenmeise	Mésange à dos marron
Tachycineta bicolor	**Tree Swallow**	Sumpfschwalbe	Hirondelle bicolore
Hirundo rustica	**Barn Swallow**	Rauchschwalbe	Hirondelle rustique
Regulus satrapa	**Golden-crowned Kinglet**	Indianergoldhähnchen	Roitelet à couronne dorée
Certhia americana	**Brown Creeper**	Amerikabaumläufer	Grimpereau brun
Troglodytes pacificus	**Pacific Wren**	Pazifikzaunkönig	Troglodyte de Baird
Cinclus mexicanus	**American Dipper**	Grauwasseramsel	Cincle d'Amérique
Sturnus vulgaris	**European Starling**	Star	Étourneau sansonnet
Turdus migratorius	**American Robin**	Wanderdrossel	Merle d'Amérique
Bombycilla cedrorum	**Cedar Waxwing**	Zedernseidenschwanz	Jaseur d'Amérique
Anthus rubescens	**American Pipit**	Pazifikpieper	Pipit d'Amérique
Pinicola enucleator	**Pine Grosbeak**	Hakengimpel	Durbec des sapins

Wildlife List — Birds

SCIENTIFIC NAME	ENGLISH	DEUTSCH	FRANÇAIS
Leucosticte tephrocotis	**Grey-crowned Rosy Finch**	Schwarzstirn-Schneegimpel	Roselin à tête grise
Acanthis flammea	**Common Redpoll**	Birkenzeisig	Sizerin flammé
Spinus pinus	**Pine Siskin**	Fichtenzeisig	Tarin des pins
Calcarius lapponicus	**Lapland Longspur**	Spornammer	Plectrophane lapon
Plectrophenax hyperboreus	**McKay's Bunting**	Beringschneeammer	Plectrophane blanc
Passerella iliaca	**Fox Sparrow**	Fuchsammer	Bruant fauve
Junco hyemalis	**Dark-eyed Junco**	Winterammer	Junco ardoisé
Zonotrichia atricapilla	**Golden-crowned Sparrow**	Kronenammer	Bruant à couronne dorée
Passerculus sandwichensis	**Savannah Sparrow**	Grasammer	Bruant des prés
Melospiza melodia	**Song Sparrow**	Singammer	Bruant chanteur
Melospiza lincolnii	**Lincoln's Sparrow**	Lincolnammer	Bruant de Lincoln
Leiothlypis celata	**Orange-crowned Warbler**	Orangefleck-Waldsänger	Paruline verdâtre
Setophaga coronata	**Yellow-rumped Warbler**	Kronenwaldsänger	Paruline à croupion jaune
Setophaga townsendi	**Townsend's Warbler**	Townsendwaldsänger	Paruline de Townsend
Cardellina pusilla	**Wilson's Warbler**	Mönchswaldsänger	Paruline à calotte noire

Wildlife List - Marine Mammals

Wildlife List – Marine Mammals

SCIENTIFIC NAME	ENGLISH	DEUTSCH	FRANÇAIS	NORSK
Megaptera novaeangliae	**Humpback whale**	Buckelwal	Baleine à bosse	Knølhval
Balaenoptera physalus	**Fin whale**	Finnwal	Rorqual commun	Finhval
Balaenoptera acutorostrata	**Common minke whale**	Zwergwal	Rorqual à museau pointu	Vågehval
Orcinus orca	**Orca**	Schwertwal	Orque	Spekkhogger
Phocoena phocoena	**Harbor porpoise**	Schweinswal	Marsouin commun	Nise
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
Callorhinus ursinus	**Northern Fur Seal**	Nördliche Seebär	Otarie à fourrure du Nord	Nordlig pelssel
Phoca vitulina	**Harbour Seal**	Seehund	Phoque commún	Steinkobbe
Enhydra lutris	**Sea Otter**	Meerotter	Loutre de mer	Havoter

Wildlife List - Land Mammals

Wildlife List – Terrestrial Mammals

SCIENTIFIC NAME	ENGLISH	DEUTSCH	FRANÇAIS	NORSK
Tamiasciurus hudsonicus	**American Red Squirrel**	Gemeines Rothörnchen	Écureuil roux américain	Amerikansk ekorn
Ursus arctos	**Brown Bear**	Braunbär	Ours brun	Isbjørn
Ursus americanus	**American Black Bear**	Amerikanischer Schwarzbär	Ours noir	Amerikansk svartbjørn
Mustela erminea	**Ermine/Stoat**	Hermelin	Hermine	Hermelin
Neogale vison	**Mink**	Nerz	Vison	Mink
Oreamnos americanu	**Mountain Goat**	Schneeziege	Chèvre des montagnes Rocheuses	Snøgeit
Alopex lagopus	**Arctic Fox**	Polarfox	Renard artique	Fjellrev
Odocoileus hemionus	**Blacktail Deer**	Maultierhirsch	Cerf à queue noire	Mulhjort

IX

Connect With Your Inner Scientist