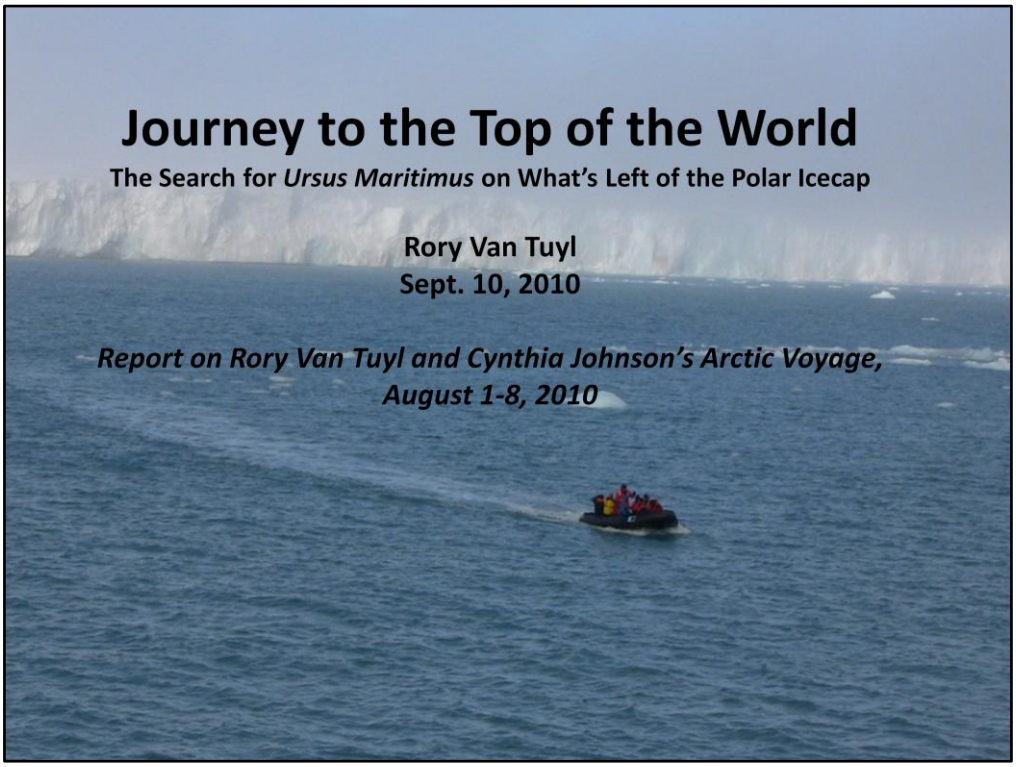


Journey to the Top of the World

The Search for *Ursus Maritimus* on What's Left of the Polar Icecap

Rory Van Tuyl

Sept. 10, 2010

Report on Rory Van Tuyl and Cynthia Johnson's Arctic Voyage, August 1-8, 2010

7 August 2010 Last updated at 13:23 ET

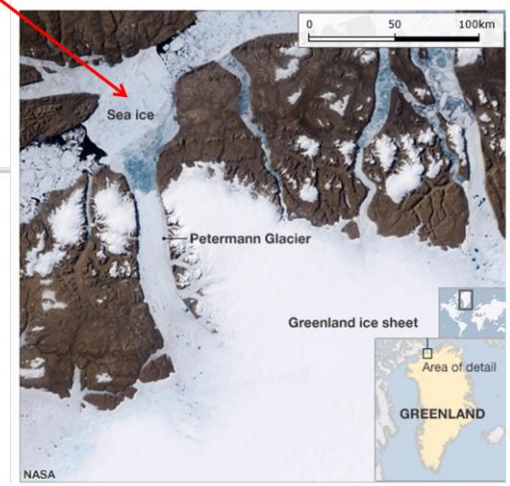
Huge ice sheet breaks from Greenland glacier

A giant sheet of ice measuring 260 sq km (100 sq miles) has broken off a glacier in Greenland, according to researchers at a US university.

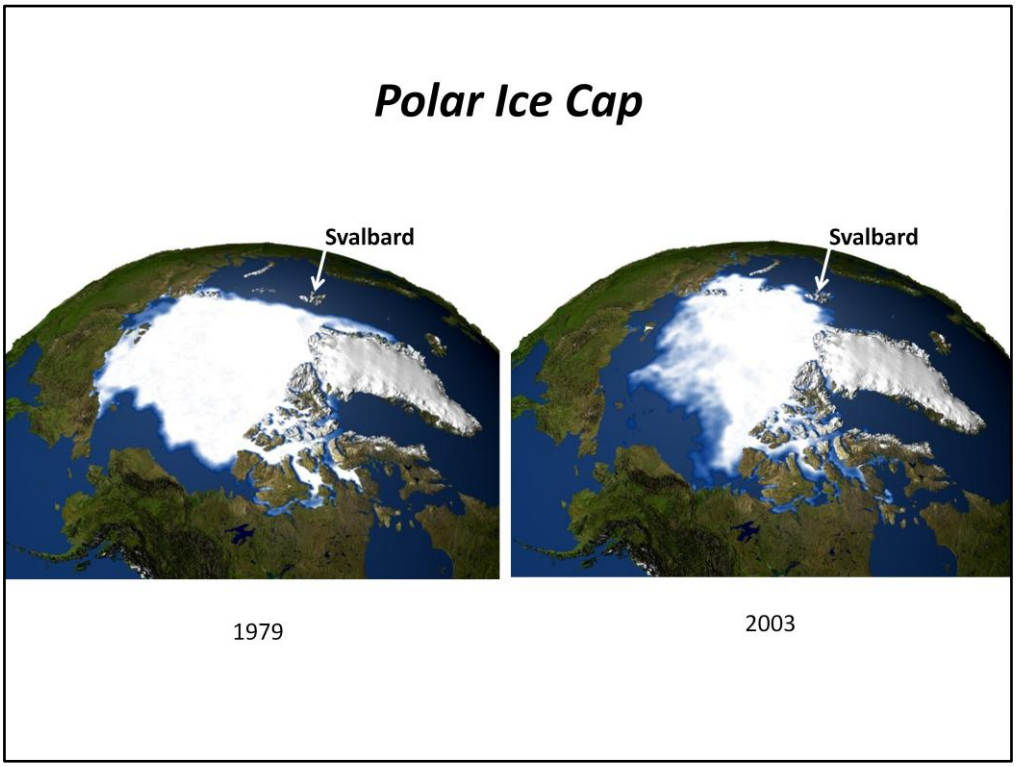
The block of ice separated from the Petermann Glacier, on the north-west coast of Greenland.

It is the largest Arctic iceberg to calve since 1962, said Prof Andreas Muenchow of the University of Delaware.

The first six months of 2010 have been the hottest on record globally, scientists have said.



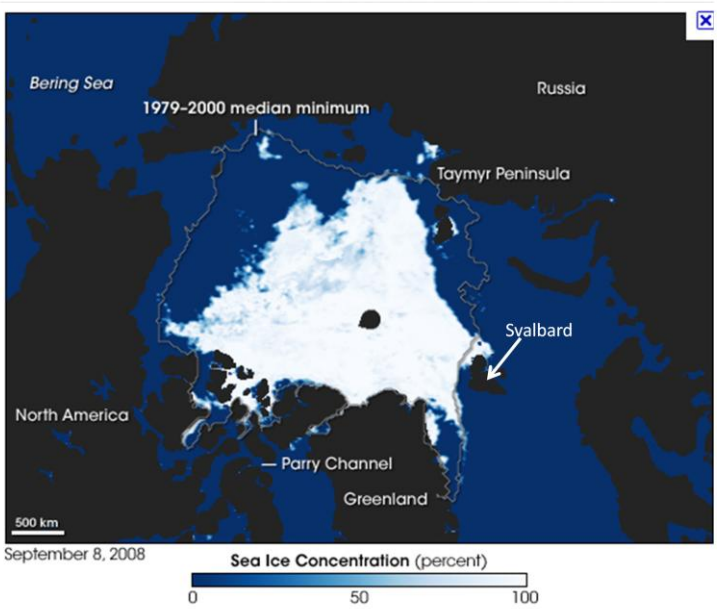
In August of 2010 a huge 100 square mile chunk of ice broke off a glacier in northern Greenland. This spectacular episode was the latest major event in the relentless retreat of the world's glaciers.



In fact, as we see in these images from 1979 and 2003, the north polar icecap is retreating rapidly.

The biggest change seems to be in the Alaskan and Siberian North Slopes and in the Canadian Arctic.

http://irascibleprofessor.com/comments-04-22-07.htm



In 2008, the summer icecap had retreated from its late 20th century extent pretty much everywhere but around the Svalbard Archipelago.

From Oslo

The Svalbard Archipelago is a collection of islands centered at about 79 degrees north latitude.

The main islands are Spitsbergen, Nordauslandet, Barentsoya and Edgeoya.

Svalbard belongs to Norway, but for historical reasons, a Russian settlement remains there.

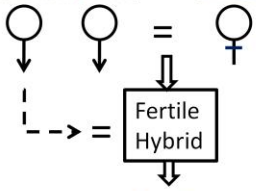
Also, scientists from around the world live here taking part in arctic research programs, and tourism has become a major industry.

Svalbard lies in the Barents Sea, a major population center for polar bears.

Close Relatives

Ursus Arctus Horribilus [Grizzly Bear]

Ursus Maritimus [Polar Bear]



By one definition, these are same species. But morphology and habitats are different.

Polar Bears are extremely close biologically to Grizzly Bears. In fact, the two species have been observed to interbreed to produce fertile offspring, so technically, they are the same species. But a Grizzly can't live on the ice and a polar bear can't live on land.

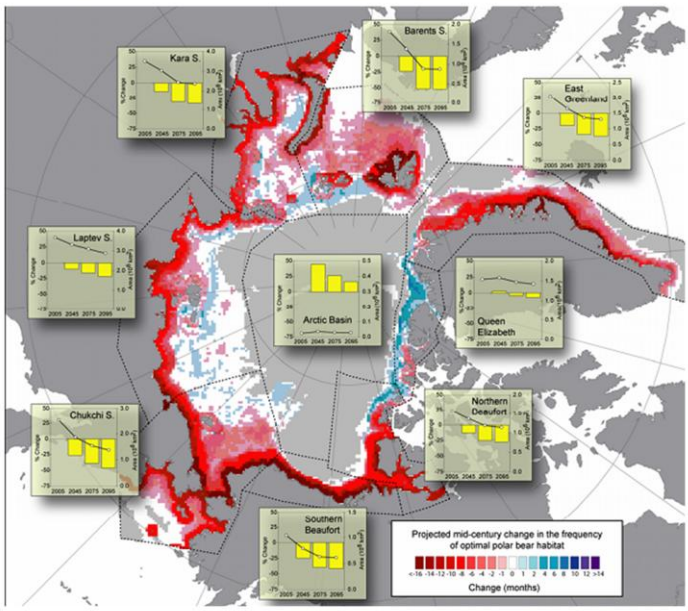
Polar bears inhabit the seasonal sea ice and the land it touches. They are born on land but go out on the ice as adults to hunt. They inhabit only the seasonal sea ice, not the constantly-frozen polar ice pack. Their habitat is rich with seals, their favorite prey, and is sometimes called the “Arctic Ring of Life”.

Bears Hunt Seals on Ice Floes

Bears Wait Patiently for Seals to Surface in their Breathing Holes Or Haul Out on the Ice to Rest

Ice bears lay in wait for ringed or bearded seals to emerge from breathing holes in the ice or to haul out onto the ice to rest. They prefer to eat just the blubber of the seal, which is the most efficient fuel for them in their race to put on weight.

Projected Habitat Loss over Next 50 Years



But the rapid retreat of the Arctic pack ice is a disaster for these bears. As you can see, they face habitat loss right around the north American and Siberian coasts, the east coast of Greenland and the Svalbard Archipelago.

Q- How Can You See Wild Polar Bears?

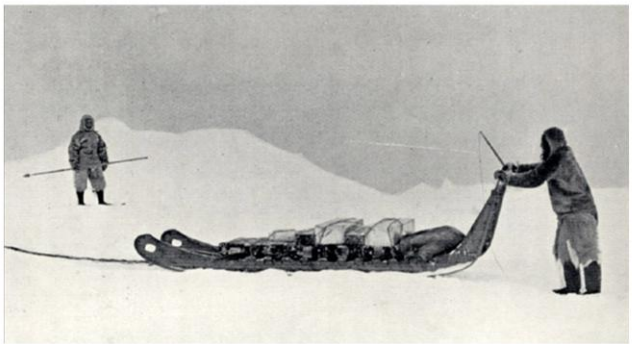
A- Go North, to the Arctic!

Q- How do You Travel in the Arctic?

A- There are Several Options…

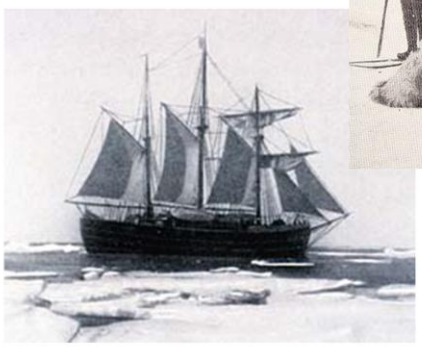
To see these bears, you have to travel north to the arctic. How do people do this? There are several options.

Robert Peary and the Dog Sledge



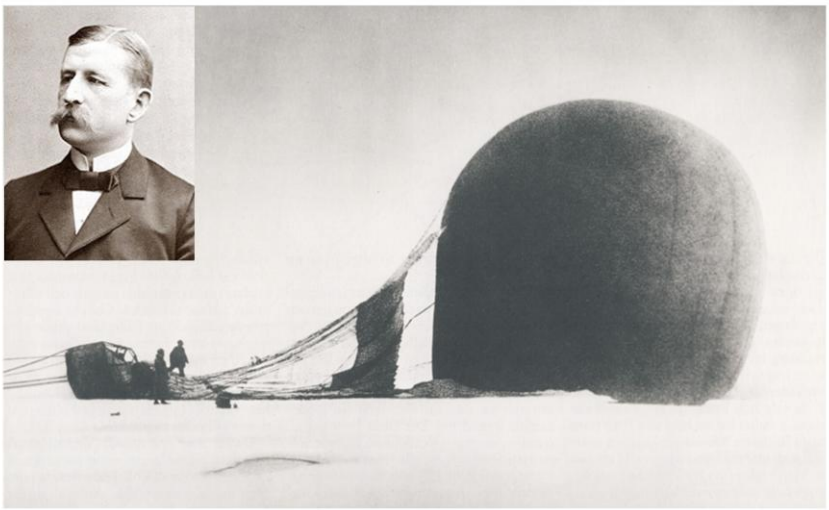
There's the time-honored dog sledge, as used by Robert Peary.

Fridtjof Nansen and the Fram



Fridtjof Nansen built a special ice-resistant ship – the *Fram*.

S. A. Andrée and the Hydrogen Balloon



And S. A. Andree tried to travel above it all in a hydrogen balloon. You can see how that worked out!

National Geographic Explorer

Owned and Operated by Lindblad Expeditions
Specializes in Arctic and Antarctic Cruising
148 Passengers, 98 Crew and Staff

We went the 21st century way, aboard the *National Geographic Explorer,* a modern, luxurious ship specially modified and equipped for Arctic and Antarctic travel.

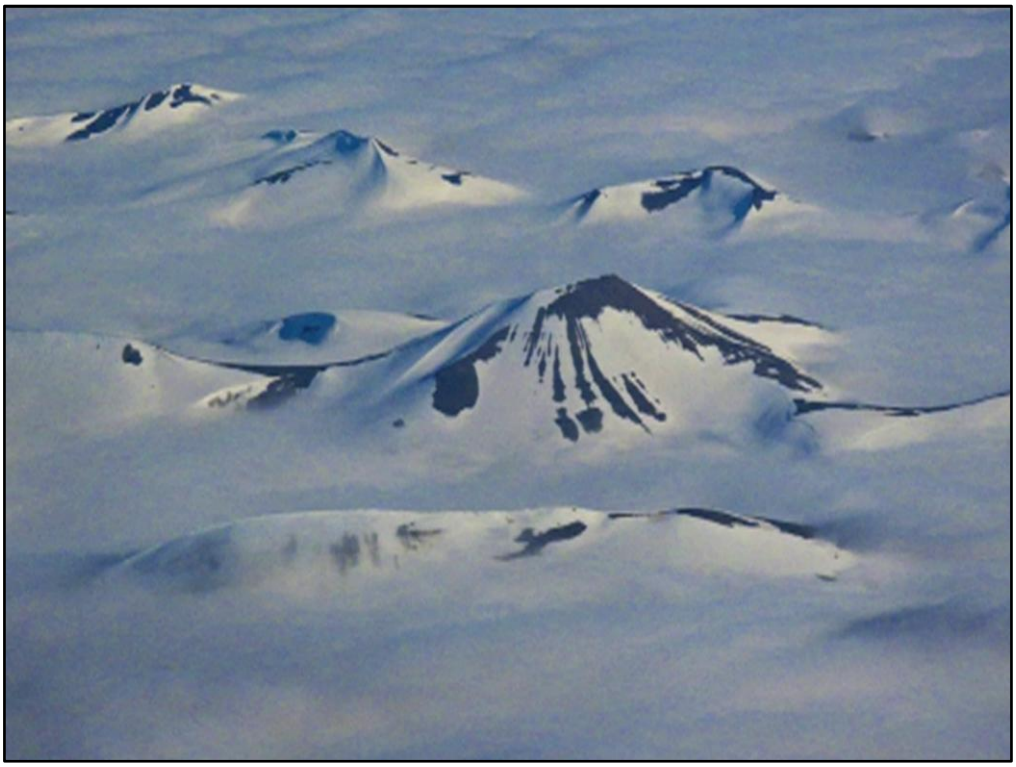
It's owned and operated by Lindblad Expeditions, and carries up to 148 passengers along with a crew and staff of 98.

This is the way to go!!!

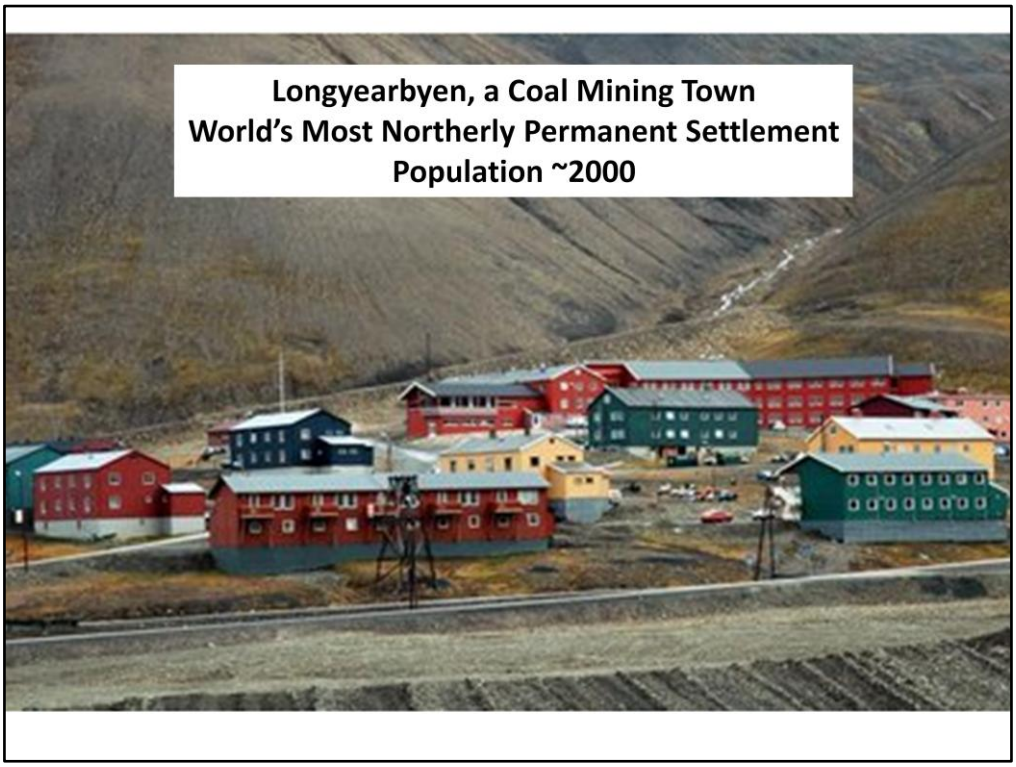
Built as a ferry in 1982, this ship was purchased by Lindblad Expeditions, who remodeled her for Arctic and Antarctic exploration a couple of years ago.

She's 367 feet long but exquisitely maneuverable, with variable-pitch twin screws and bow thrusters. She has also been reinforced for travel through ice.

We flew to Longyearbyen, the largest settlement on the Svalbard Archipelago.



As we flew over southern Spitsbergen on July 31st, we got a preview of what this island is all about: ice and snow! Sixty percent of Svalbard is covered with glaciers.



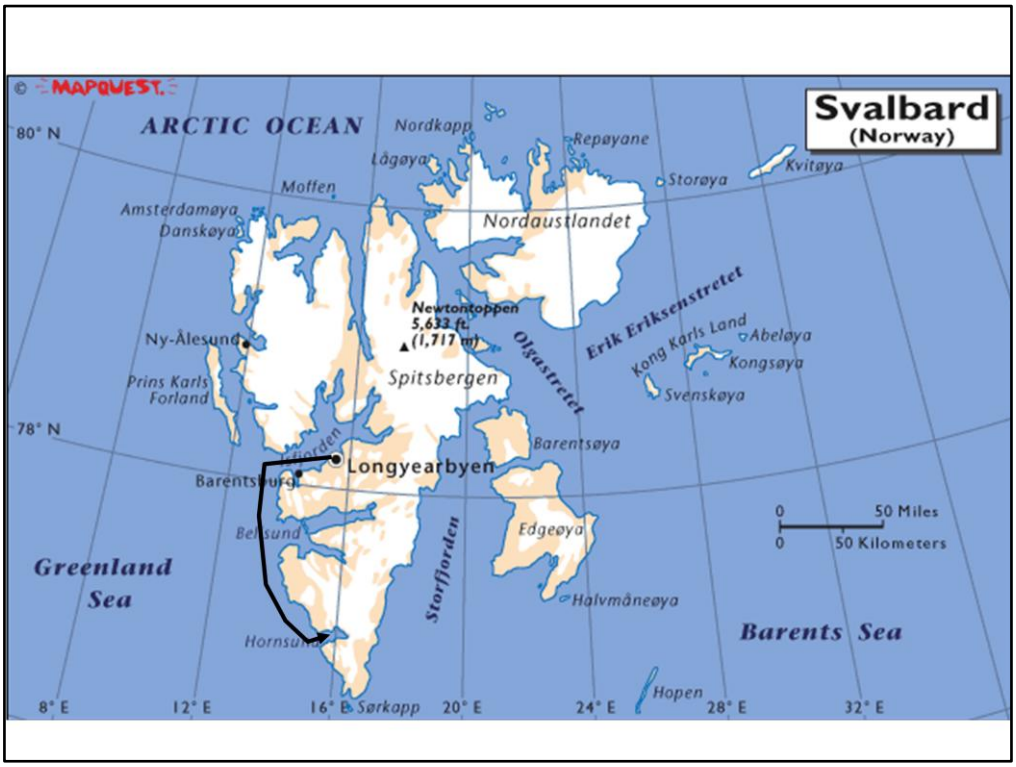
Longyearbyen, the capital, is named after American Coal Mine operator J. M. Longyear, who established the Arctic Coal Company here back in 1906.
With just over 2000 inhabitants, Longyearbyen is the northernmost city in the world.

(A historical tidbit: Longyearbyen was actually shelled by the famous German battlecruiser *Scharnhorst* in 1943, in an effort to end Norwegian underground resistance operations against German weather observatories.)

Longyearbyen's harbor is ice-free year 'round, thanks to warm ocean currents. So we could easily hop on a Zodiac here to board the National Geographic Explorer.

Underway in the Arctic Ocean

We were soon underway, cruising at 14 knots on a calm ocean under blue skies with temperatures in the high 30s to mid-forties.



We cruised overnight with the sun still well up in the sky to Hornsund, a sound on south Spitzbergen.

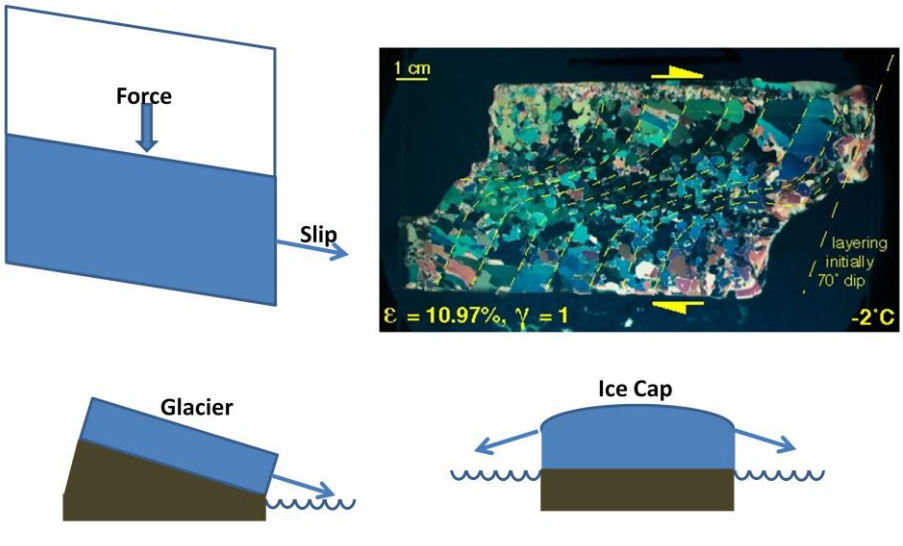
Day 1 – Glacier in Hornsund

60% of Svalbard is covered with Glaciers and Icecaps

Where we first observed one of the many glaciers we would encounter on this trip.

Another glacier in Hornsund was typical of many retreating glaciers we viewed. Beautiful, but dying.

Glacier Ice Recrystallizes Metamorphically



Glacier ice is quite different from sea ice. It re-crystallizes under pressure, just like metamorphic rocks do The ice has grain structure and exhibits plastic deformation, just like any crystalline solid. . Grain sizes are of order 1 centimeter.

The difference between a glacier and an icecap is that glaciers flow downhill on sloped ground. Icecaps flow under self-induced pressure caused by thickness variation.

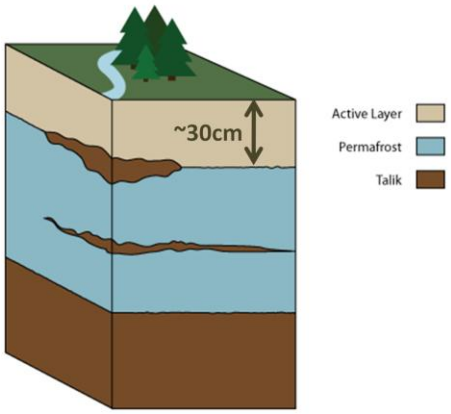
Polar Bears on Land

Our first polar bear sighting was this pair of young males summering on a snow patch on bare ground.

Arctic Tundra and Permafrost

Arctic Tundra

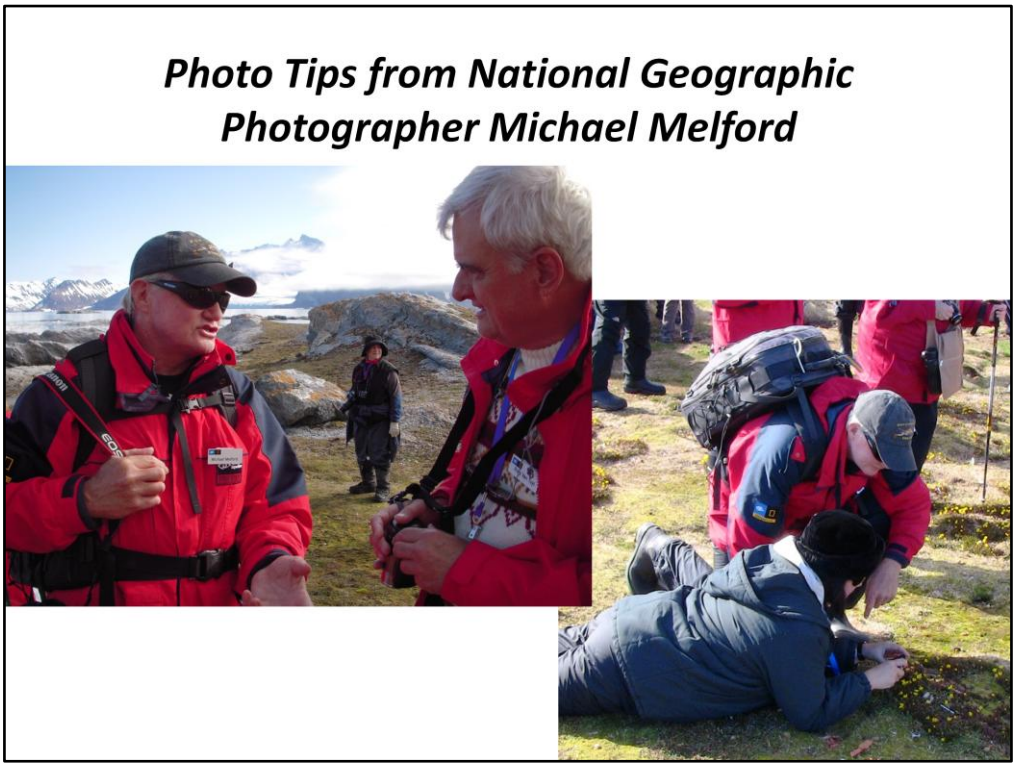
Permafrost



All the land around Hornsund which is not covered by glaciers is what's called *Tundra*. Tundra is land completely devoid of trees, but often covered by small vegetation. In summer, the top 30cm of ground thaws, but below that lies the *Permafrost* – the perpetually-frozen ground.

The Arctic Tundra

This area of tundra was especially scenic.

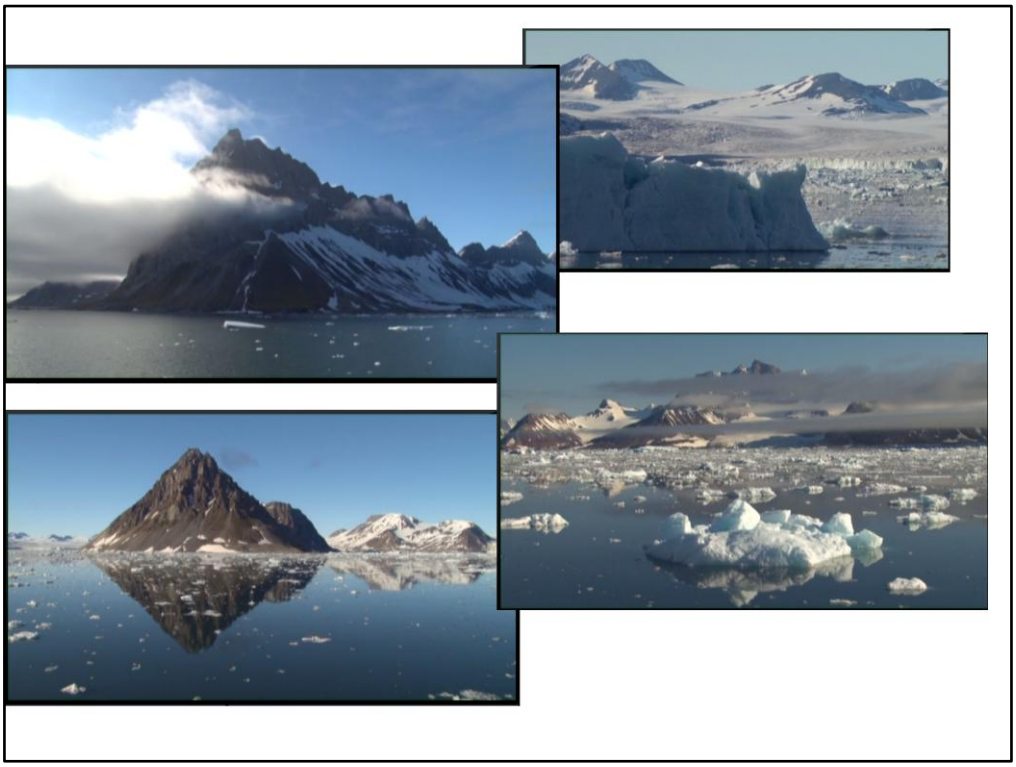


We got photo tips from Mike Melford, a veteran National Geographic photographer who came along on this voyage to advise us. His philosophy: seek unusual angles and shoot *into* the sun!

Kittiwakes flee predators like this Arctic Fox. He's gray now, but in winter his coat turns white, and it's this winter pelt that's a prized fur for humans.

Norwegian Trapper's Cabin from 1971

As recently as 1971 Norwegian trappers would overwinter here, in this tiny cabin, to tend their traps.



In a branch of Hornsund we found one of the most mystically beautiful sights of the trip. The sun was shining and we were dazzled by this display of small icebergs floating on a mirror-calm surface.

That night we cruised north and east to Freemansund, a strait separating the islands Barentsoysa and Edgeoya, the smallest of the major islands in Svalbard. “Oya” means “island” in Norwegian.

The Shore Excursion

On the north shore of Edgeoya we went ashore on the tundra once again.

Karen Copeland, Our Intrepid Guide

Our guide for this excursion was the intrepid Karen Copeland. She came equipped with an encyclopedic knowledge of flora, fauna and avia, a pair of binoculars, a 2-way radio, a flare gun to scare away polar bears, and – if all else were to fail – a bolt-action rifle with four thirty aught six rounds in the clip.

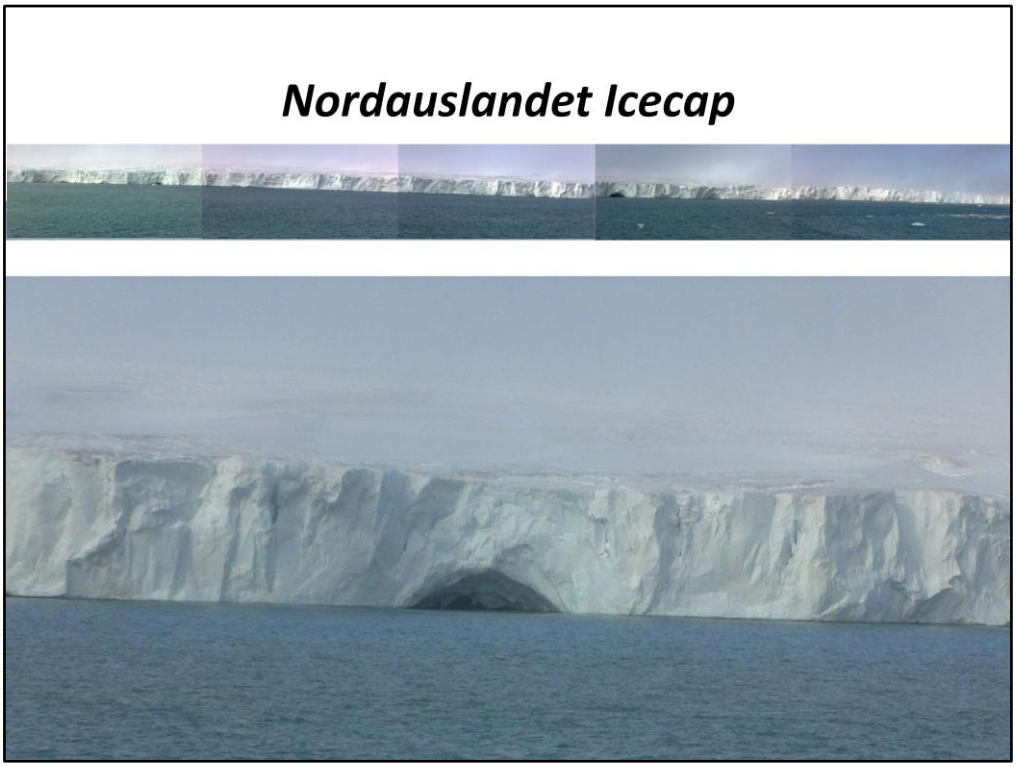
Karen talked to us about the vegetation on this tundra. It grows very low to the ground, as you can see from the blooming plants on the left.

This is *Saxifrage*, a hardy plant that blooms only in the month-long summer. (Note the low angle recommended by the National Geographic photographer).

But we did get to see – in the distance – these Svalbard Caribou, a small subspecies of arctic reindeer.

And unfortunately, on the hillside but at an even farther distance, we spotted a blob of white fur. Since polar bears are hungry and can move very fast if they decide to , we got back in the zodiac and headed for the ship.

On the third day headed north in search of what we could find on or near Nordauslandet.



Nordauslandet is home to the world's third-largest icecap after Antarctica and Greenland. I've tried to show the lateral extent of this in the thin photomontage above. It stretched from horizon to horizon. I would estimate it to be around one to two hundred feet thick at the edge. Just a magnificent spectacle!

We boarded Zodiacs to check out Isispunten, so called because until 30 years ago it was connected to the mainland by ice, and appeared to be a point. Its actually an island with a few chunks of ice floating around it. We saw this mother bear and two cubs conserving energy for the winter. Only about 1/3 of the female polar bears are available for mating in any season, because the rest are tending cubs. After these cubs head out on their own, they have only a 40% chance of surviving the year.

Polar Bear Reproductive Lifecycle: Mating

Here are some facts about Polar Bear Reproduction…

Females can Reproduce at age 4
Their Courtship is in April and May on the Sea Ice where Food is Plentiful
Eggs are Suspended while the Female Hunts to Gain Weight
If she gains enough weight, the Eggs will Implant in August or September.

Polar Bear Reproductive Lifecycle: Birth of Cubs

The Female then Makes her Den on Land.
She Hibernates before she Gives Birth
The Cubs are Born between November and February

Polar Bear Reproductive Lifecycle: Mother and Cubs Emerge from the Den

Mother and cubs Emerge from the Den in February thru April
The Cubs Nurse until the mother can kill prey for herself and the cubs.

Polar Bear Reproductive Lifecycle:
Go onto the Ice to Hunt Seals

They go out on the pack ice in spring so mother can hunt seals for their food and teach the cubs to hunt.

Cubs stay with their mother for 2.5 years.

The Typical Fertility is 2 Cubs Every 3 Years

But Cubs Have only a 40% chance of Surviving their First Year, and risk starvation every year thereafter

Polar Bear Reproductive Lifecycle:
Survive the Summer without Food

A Female May Have 5 Litters in her Lifetime of 15-18 Years

Crunch these numbers and you see that an average mama bear may produce 5 daughters, have 2 survive the first year, with perhaps 1 - 2 surviving to reproduce. This is not much safety margin for survival of the species!

We returned to the ship, which was anchored well away from the Nordauslandet icecap, happy to have glimpsed a polar bear mother with her cubs

The Amazing Undersea World

One of the best surprises on this trip was the undersea life. Lindblad's Dave Cothran caught some amazing views of the Arctic sea floor using a remotely operated undersea vehicle [R.O.V.]

At this point, we were all really anxious to see some Bears on ice floes.
A reconnaissance of Kvitoya showed little of interest, so we headed north, into the pack ice.

On the Bridge

Above 80 degree north, you start to see rafts of broken-up pack ice. This is the preferred habitat for those bears who decided to brave it at sea for the summer.

Looking for Bears: No Success

But despite hours of searching, and partly due to fog, we saw no bears close to the ship.

So when we reached 28 degrees east longitude, we headed south to Storoya.
This turned out to be a smart decision.

The Frisky Walruses of Storøya

What we saw at Storoya was quite remarkable…

This amazing gaggle of walrus was something even the experienced guides had never seen.

Walruses were hunted to near-extinction, but have staged a remarkable comeback since being protected in the 1960s.

There was obviously some food in the water. Just look at those birds getting in on the action.

We pulled up close and were able to stare them right in their whiskered faces.

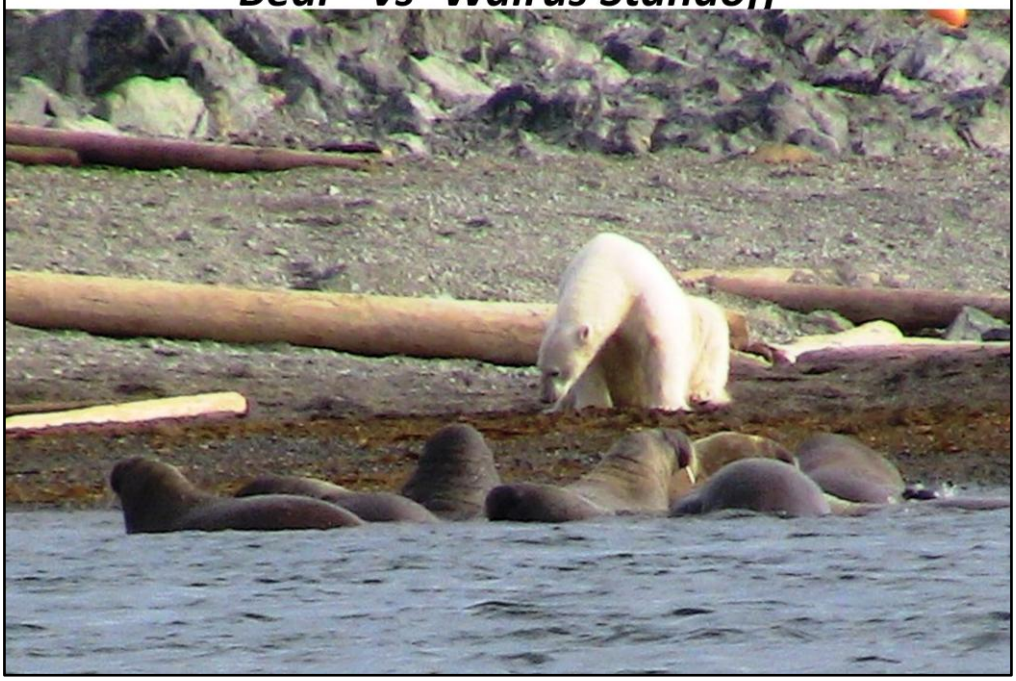
Arctic Tern

That bird hovering and diving around the walruses, by the way, was the *Arctic Tern.*

Resting Females

A whole harem of female walruses was taking it easy on the beach.

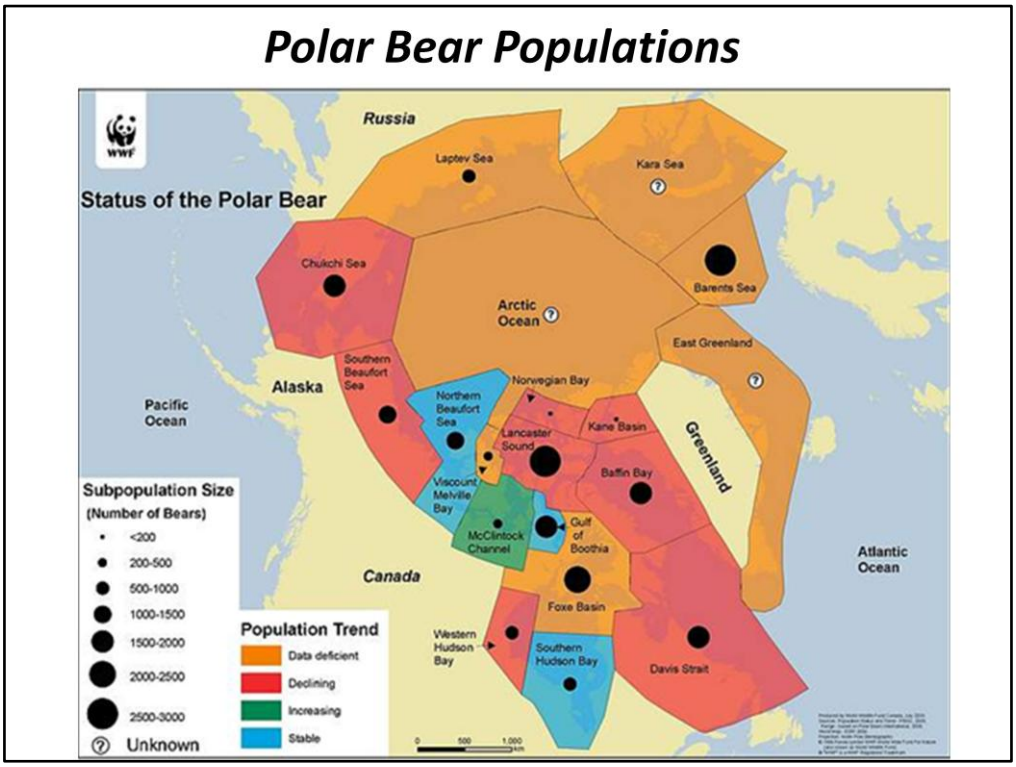
Bear –vs- Walrus Standoff



And nearby, a young, hungry Polar Bear was nosing around, hoping for a rare summertime snack.
But he was outnumbered by this posse of tuskers.

Hungry Bear on the Beach

I caught this shot of a hungry bear on the beach. He looks pretty thin.
Remember, there is a high mortality for polar bears in Svalbard. He may not survive the season.



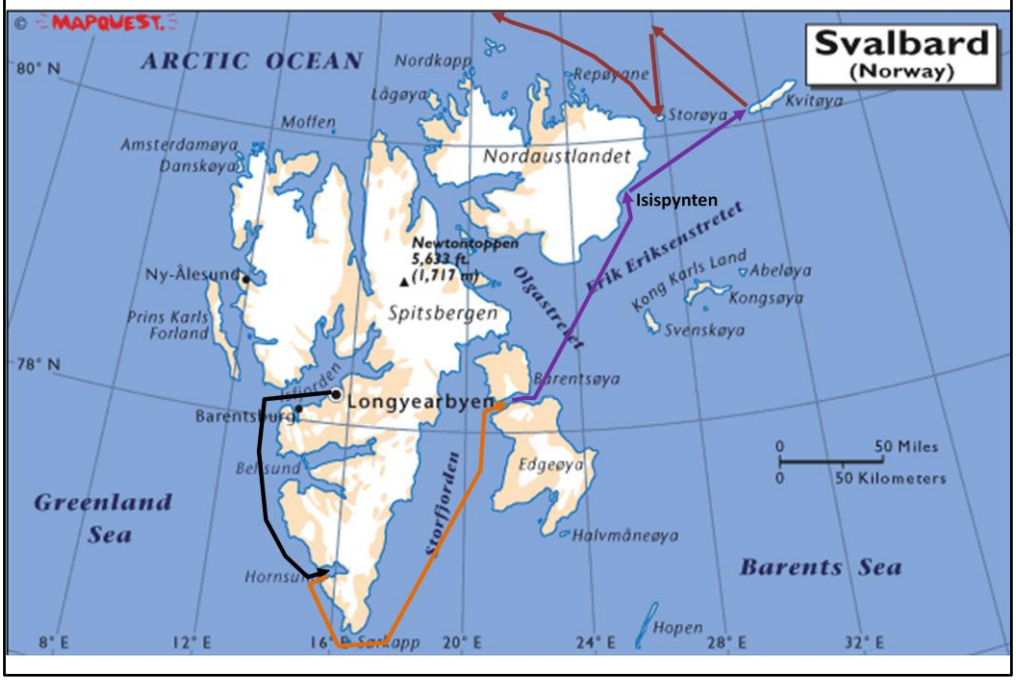
There are 19 distinct breeding populations of ice bear. Eight of these are known to be declining in population, three are stable and one is increasing. There is insufficient data on the other 7 populations. There are about 20 to 25 thousand in all. Around 10% of them live in the Barents sea near the Svalbard Archipelago.

Because they depend so critically on Sea Ice, Polar Bears are extremely vulnerable to climate change. [WWF]

Based on extremely conservative forecasts about the future extent of the sea ice, scientists have estimated that two thirds of the polar bear population could become extinct by 2050. [WWF]

If the sea ice continues to retreat at the speed witnessed during the last few years, the situation will become even more critical. [WWF

North to 81.5º - 585 Miles from Pole



We were having a hard time finding populated ice floes in the south, so we headed north again, farther north than the *Explorer* had ever gone.

Captain Leif Skog explained that the only depth soundings he had to go on in this area were taken in the 1880s!

But the conditions were perfect, so he decided to go for it.

In the 1890s, the *Fram* had drifted through these waters for 3 years, frozen solid in sea ice.

Around midnight we got word that a bear had been spotted in the distance, so many of us gathered on deck with binoculars and cameras to see what we could see.

>There he was, feasting on his kill! And has none too happy to see us.

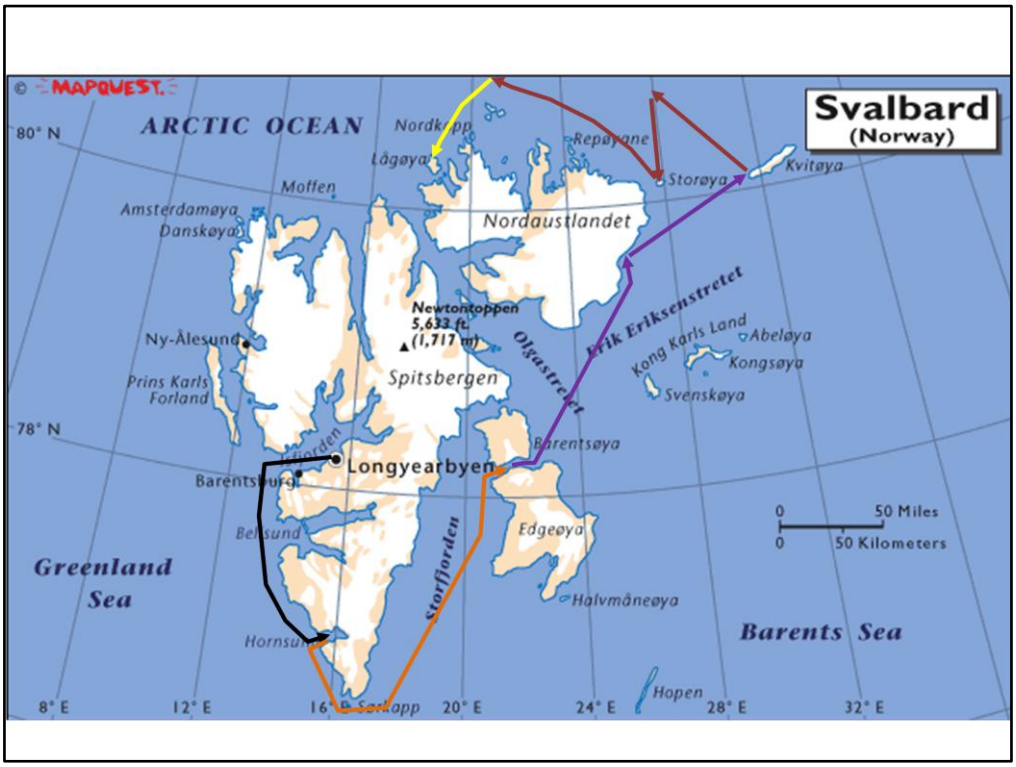
>He hesitated a bit, then started dragging his kill away.

>The Captain slowed the boat, trying not to scare him off

>But he had decided it was time for some privacy

>So he dragged his kill into the water

>And we soon parted company.

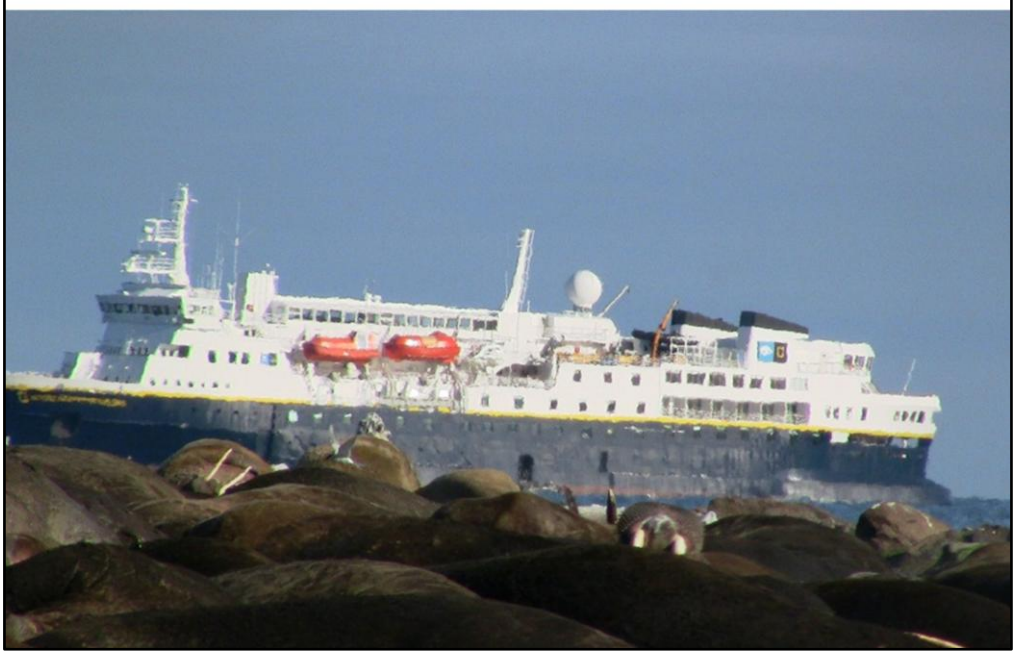


We had ventured to eighty one and a half degrees north – about 510 nautical miles from the north pole – in search of bears.
All we found was one male, but at least he was enjoying his kill and would probably survive the year.
It was time to turn south and have a look at some other Arctic sights.

The Rocky Isle of Lagøya

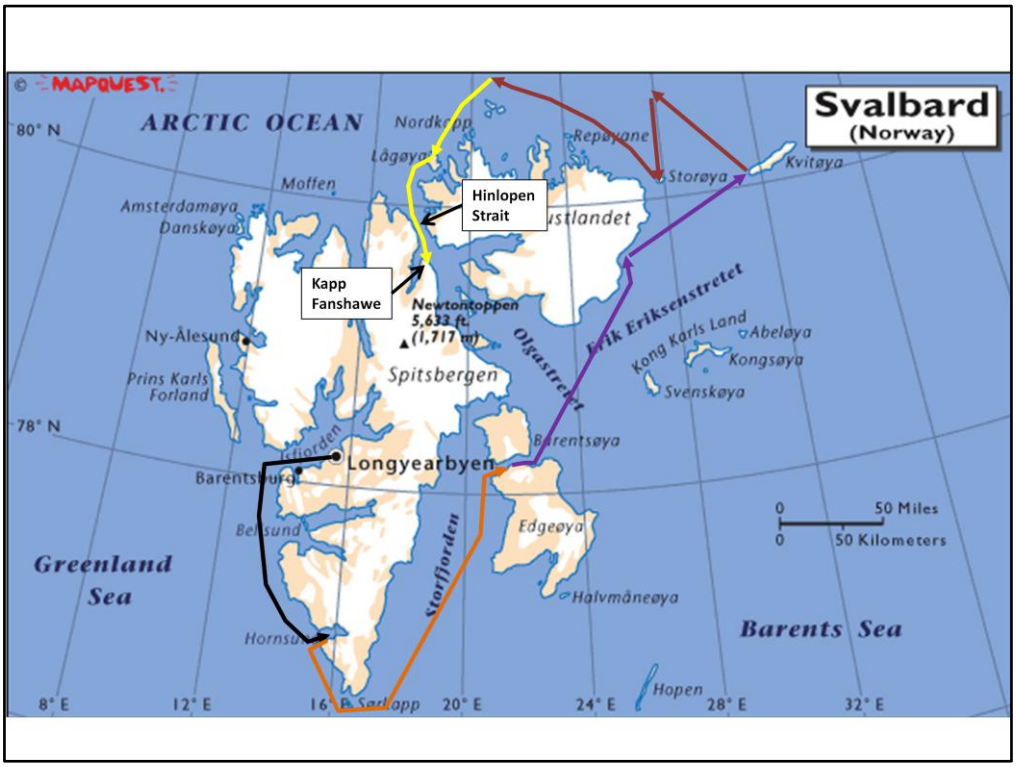
We headed for Lagoya, a flat island covered with glacial moraine, rocks of every size and type.

Where Walruses Come to Sunbathe



Lagoya also serves as a summer resort for walruses. Sometimes they look like a field of rocks.

These big males were taking it easy, scratching their itches.



After Lagoya, we headed for the Hinlopen Strait, where we were in for a surprise.

Encounter with a Blue Whale

>Blue whales were abundant in nearly all the oceans until the beginning of the twentieth century. For over 40 years, they were hunted almost to extinction by whalers until protected by the international community in 1966.

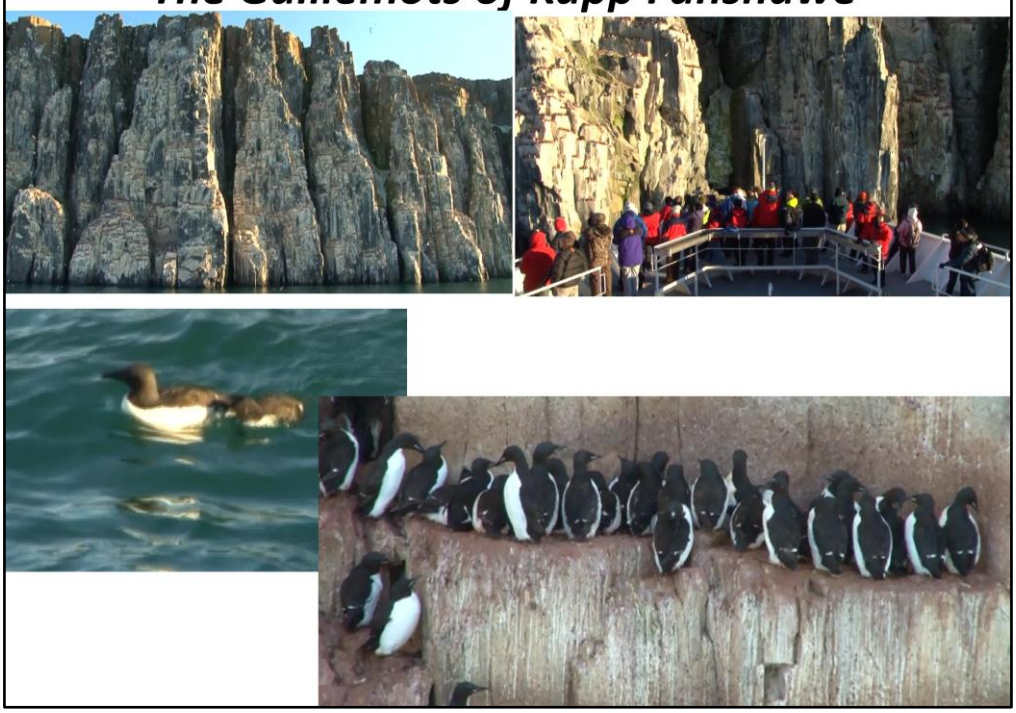
>A 2002 report estimated there were 5,000 to 12,000 blue whales worldwide[8]

>We got to see one of them right here, next to our ship.

>There he goes, diving down for probably 45 minutes.

>We bade goodbye to the whale and sailed for Kapp Fanshawe and one of the most amazing sights of the trip.

The Guillemots of Kapp Fanshawe



Kapp Fanshawe is a major rookery for the **Brünnich's** **Guillemot**
This is the bird that fills the ecological niche occupied by the penguin in the Antarctic.
>Young birds are pushed off the ledge into the water and are accompanied by their fathers.
For the next 6 weeks or so, dad stays with the babies as they learn to fly.
>It's a truly amazing sight to see these thousands upon thousands of birds.
➢The captain brought the ship right up to the cliff so we could have a closeup view.
➢This was one of the most wonderful sights of the trip!

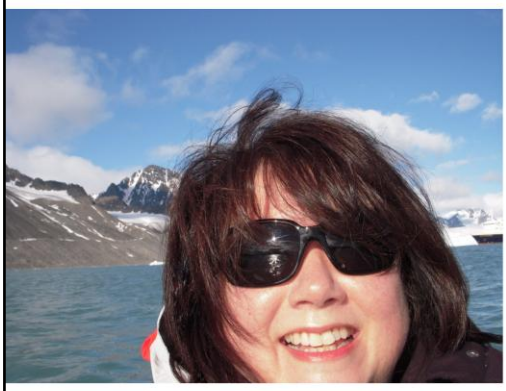
That night we pulled out of Hinlopen Strait and headed west.

Monaco Breen

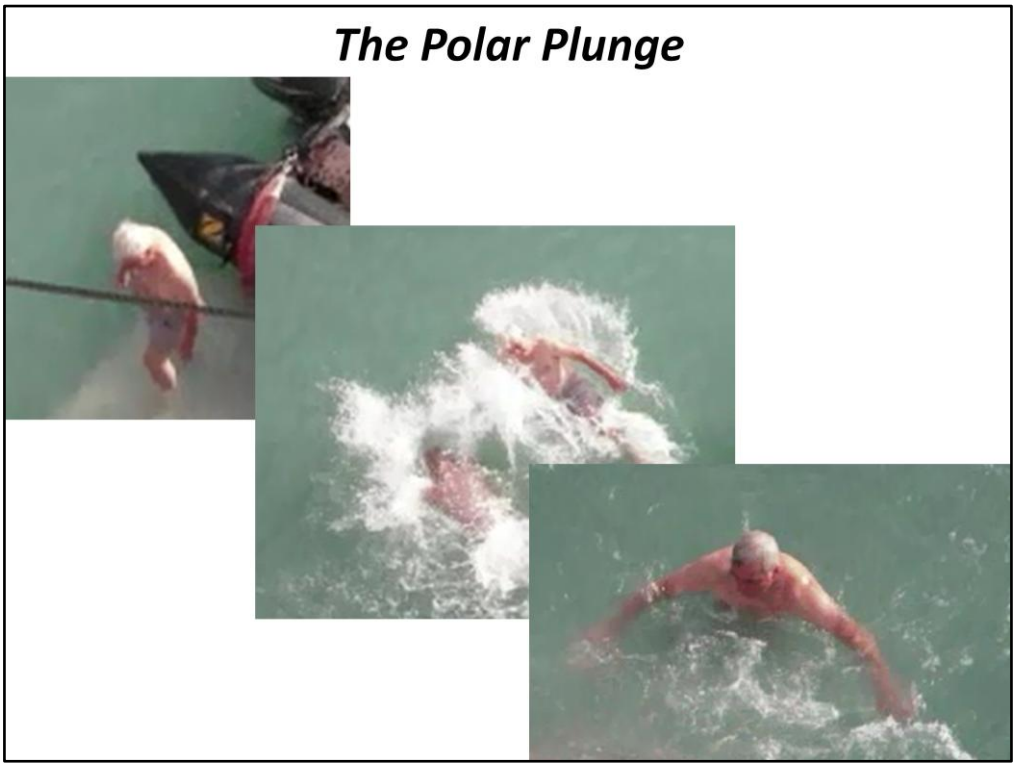
Our next stop was a beautiful glacier known as Monaco Breen

Here’s where we left the comfort of the ship to go kayaking!

Two Polar Explorers



It’s hard to take a photo of yourself in a kayak, but here you have it…Two Intrepid Polar Explorers!



And finally, a bit of foolishness: the Polar Plunge!
>Watch that polar bear in the white shirt and white hair…
>Ohmigod, there he goes
>He hesitates
>Then takes the plunge
>Yikes!
>
>
>Amazingly, he survived the ordeal!

From here on, it was pretty much sailing for home, overnight down the west coast of Spitsbergen.
By the time we got back to Longyearbyen, we had covered some 1200 miles in 7 days and nights of cruising.

What started out as a search for Polar Bears had turned into much more. A trip not to be forgotten.

And though you don't see a sunset in the arctic summer, here's the closest thing I could come up with…

Thank you for listening.