



Arctic Bulletin



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Editorial

Just five more years to take action

Whatever our interest in the Arctic — sustainable livelihoods for indigenous peoples, conservation of biodiversity, improved governance for sustainable development, or the maintenance of viable populations of a single species — today we have no choice but to focus on the single biggest threat to these and many other arctic issues: climate change.

Such a statement is not news to those of us working in the region. We are now in a situation where, due to the implications of arctic climate change on the entire Earth system, climate science drives the global interest in the Arctic. Two recent examples suffice to illustrate my point: the release of the United Nations Environment Programme (UNEP) *Global Outlook for Ice and Snow* report, and a paper by some of the world's leading climate modellers that I believe changes the entire dynamic of the climate change debate.

On World Environment Day (appropriately themed “Melting Ice — A Hot Topic?”), the under secretary general of the UN and executive director of the UN Development Programme, Achim Steiner, launched the *Global Outlook for Ice and Snow* report, the result of an assessment process by more than 70 leading experts, plus the associated knowledge generated by the Intergovernmental Panel on Climate Change (IPCC). Drawing on a wealth of ice and snow data collected on land and the sea, from both polar regions and the world's mountains and glaciers the report summarises the current state and outlook for snow and ice, as well as their linkages with climate change and impact on societies and ecology.

Little in the report is new or surprising to those ‘in the industry’, but it is the first accessible and readable summary of the scientific basis for the tragedy of the Arctic: the ice is melting. I commend it to those who have not seen it: the entire report plus associated graphics are available at www.unep.org/geo/geo_ice/.

Why is the report so significant? In the words of Achim Steiner:

“... the report underlines that the fate of the world's snowy and icy places in a climatically challenged world should be cause for concern in every ministry, boardroom and living room across the world. Indeed the findings are as relevant to people living in the tropics and temperate climes — and in cities from Berlin to Brasilia and Beijing to Boston — as they are for the

people living in Arctic or in ice-capped mountain regions.

“The missing link is universal political action. Today's report should empower the public to take their leaders to task, should encourage them to ask how much hotter it has to get before we act on a fair and forward-looking emissions reduction deal in Bali this December.”

So much for political rhetoric. Scientific papers, on the other hand, are less commonly the place where one finds words such as ‘whipsawed’, ‘great dangers’, ‘cataclysm’, ‘devastating’, ‘imminent peril’, and ‘gravest danger’. However, a recent (May 2007) peer reviewed publication in the *Philosophical Transactions of the Royal Society* entitled “Climate change and trace gases” by Jim Hansen and five other leading US climate researchers used all of these.

This single publication has removed any doubt about the potential for catastrophic impacts as a result of a melting Arctic: the level of greenhouse gases that triggers ‘dangerous’ impacts is much lower than previously accepted by organisations such as the IPCC, and indeed may even have already been passed. A further one-degree Celsius temperature increase may be all it takes to start rapid, irreversible change. Interestingly, Hansen et al point out that preventing a complete arctic meltdown will require not just a massive reduction in carbon dioxide emissions, but also a major focus on reducing other atmospheric gases and components such as ozone, methane, black carbon, organic carbon, and N₂O. The need for governments to act decisively within the next few years, much more decisively than is currently being proposed by any government, is critical.

So where does this leave us? In a new world where arctic climate change consumes the attention of many ecologists, conservationists, and politicians. In a world where the local has global significance, and the now affects the future. We have perhaps only five years to implement binding agreements that will safeguard arctic ecosystems, and therefore the world.

So in 2012, the question will be: “Where were you five years ago, and what were you doing?”



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NORWAY WANTS SVALBARD LISTED AS WORLD HERITAGE SITE

WWF welcomes the announcement from the Norwegian government to apply to UNESCO to have the world-famous Svalbard archipelago designated as a World Heritage Site. The World Heritage list recognises outstanding examples of cultural diversity and natural wealth. Svalbard is around 1500 kilometres south of the North Pole and is home to a variety of arctic species including polar bears and arctic fox. Neil Hamilton, director of WWF's International Arctic Programme, said: "This is good news. A World Heritage designation will help to put the debate about petroleum exploration in the region on ice. WWF wants to see a permanent ban of oil and gas development both for the islands as well as the waters around them."

SMITHSONIAN ALTERS ARCTIC CLIMATE EXHIBITION

The US Smithsonian Institution toned down an exhibition on arctic climate change, fearing that it would anger US Congress and the Bush administration, a former museum administrator said. The official text of the exhibition was rewritten to minimise and add uncertainty about the relationship between global warming and people, said the former official, Robert Sullivan, who was associate director in charge of exhibitions at the Smithsonian's National Museum of Natural History. Officials omitted scientists' interpretations of some research and let visitors draw their own conclusions from the data, Mr. Sullivan said. In addition, graphs were altered "to show that global warming could go either way," he said. Museum officials denied that political concerns had influenced the exhibition, saying the changes were made to increase objectivity. Source: *New York Times* / *Associated Press*

Earth's climate approaching

NASA and Columbia University Earth Institute research finds that atmospheric greenhouse gases emitted by human activities have brought the Earth's climate close to critical tipping points, with potentially dangerous consequences for the planet.

The study, published in the current issue of

Atmospheric Chemistry and Physics, finds that global warming of 0.6°C in the past 30 years has been driven mainly by increasing levels of greenhouse gases in the atmosphere. Climate change tipping points can occur when the climate reaches a state where strong amplifying feedbacks are activated by only moderate additional

warming. Amplifying feedbacks include increased absorption of sunlight as melting of snow and ice exposes darker surfaces, and speedup of iceberg discharge as the warming ocean melts ice shelves that otherwise inhibit ice flow.

The researchers used data on earlier warm periods in Earth's history to estimate

Nowhere to go for Polar Bears

The most comprehensive study ever undertaken linking climate change and the population dynamics of a species predicts disaster for one of the world's most charismatic species. The fate of the polar bear in a world of rapidly changing climate is now in serious question.

The report by the US Geological Survey (USGS) predicts that changes in sea ice will result, at the very least, in the loss of about two-thirds of the world's polar bear population by 2050.

Scientists estimate that there are 20,000–25,000 polar bears living in the Arctic.

Many scientists characterise the report's conclusions as conservative because even the best available models substantially (by 30 percent or more) underestimate the actual decline in arctic sea ice.

Dr Neil Hamilton, director of the WWF International Arctic Programme said: "We now have official confirmation that the largest living land predator faces extirpa-

tion over the vast majority of its range, including all of Russia, Alaska, the Barents Sea, the Arctic Ocean, and the vast majority of Greenland and Canada."

During a six-month period of intensive analysis of both existing and new data, the USGS team, consisting of US and Canadian researchers, documented the direct relationship between the presence of arctic sea ice and the survival and health of polar bears. Models used by the USGS team project a 42 percent loss of optimal



'dangerous' tipping points

climate impacts as a function of global temperature, climate models to simulate global warming, and satellite data to verify ongoing changes. They conclude that only moderate additional climate forcing (i.e. imposed changes of the planet's energy balance) is likely to set in motion disintegration of the West Antarctic ice

sheet and arctic sea ice, and that regions providing fresh water sources and species habitat are under threat from continued global warming.

James Hansen, lead author of the report and head of NASA Goddard Institute for Space Studies, said: "If global emissions of carbon dioxide continue to rise at the rate of the past decade, this research

shows that there will be disastrous effects, including increasingly rapid sea level rise, increased frequency of droughts and floods, and increased stress on wildlife and plants due to rapidly shifting climate zones."

Source: NASA Goddard Institute for Space Studies

polar bear habitat from the Polar Basin during summer, a vital hunting and breeding period, by mid-century.

Polar bears depend on sea ice as a platform to hunt seals, their primary food. But sea ice is decreasing throughout their arctic range due to climate change.

Dr Hamilton said: "The world is still discussing whether or not to take rapid action against climate change.

"Politicians are fiddling at the edges while the arctic wilderness succumbs to global warming; but in the meantime, they are sending one of the world's greatest species on its way to extinction."

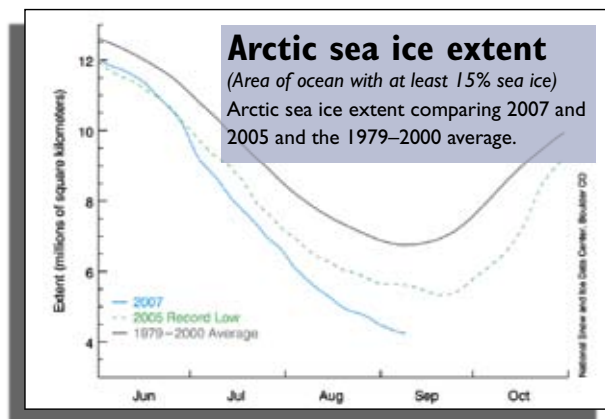
The study completely changes required approaches to polar bear conservation. WWF will be working closely with the research community, governments, and the indigenous peoples of the Arctic to find innovative solutions to this situation.

For more information: www.usgs.gov/newsroom/special/polar_bears/

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Sea ice at record low



The University of Illinois' Polar Research Group has reported that the 2007 arctic sea ice area has already broken the record for the lowest area ever since satellite measurements began in 1979.

The minimum sea ice area typically occurs in September, at the end of a melting period that lasts throughout the northern summer. With a month or more of sea ice melting still to occur this year, the sea ice area could decrease even further.

The Polar Research Group is measuring sea ice "area" and not sea ice "extent". Sea ice extent measures variations in the southern boundary of the sea ice edge, whereas sea ice area includes areas of open water within the central pack ice.

But sea ice extent is also

expected to break a new record low for 2007.

In the past WWF has reported on and followed sea ice extent as reported by the National Snow and Ice Data Centre (NSIDC) in Colorado, US.

According to the NSIDC, arctic sea ice extent for 2007 could also set a new record minimum — substantially below the current 2005 record.

The NSIDC website says: "At this point in the 2007 melt season, this much is already clear: the Arctic is experiencing an unprecedented sixth consecutive year with much less sea ice than normal, and it looks like this year's sea ice melt season may herald a new and steeper rate of decline."

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ICELAND STOPS WHALING DUE TO LOW DEMAND

The Icelandic government has called a halt to its controversial commercial whaling programme due to very low demand for its whale meat and products. Iceland's attempts to obtain an export license from Japan have so far been rejected, thereby closing off one of the only viable markets. Over the last year the Icelandic whaling industry killed 14 whales including seven fin whales, which are classified as "endangered" under the IUCN Red List of Threatened Species. Iceland's decision to resume commercial whaling in 2006 met with protests from over 25 countries. Einar K. Guofoinnsson, Iceland's fisheries minister, told Reuters: "The whaling industry, like any other industry, has to obey the market. If there is no profitability there is no foundation for resuming with the killing of whales."

CHINESE HAZE IN THE ARCTIC

Evidence of the booming Chinese economy is showing up in the seemingly clean arctic air. Scientists at a research station on Zeppelin Mountain in northern Norway are finding tiny chemical traces from many southern towns and factories. The highest levels still come from Russia and Europe but there is an increasing level of pollution from China and other developing nations in Asia. Kim Holmen, research director at the Norwegian Polar Institute, told Reuters: "Some days we can definitely tell that the air has come from China... The air is always mixing but you can do some detective work: the particles are slightly different in the United States, Russia, China, Europe or India."

Call for protection of Canada's forest

In a letter addressed to Canada's leaders, 1,500 highly respected scientists from more than 50 countries around the world called for protection of Canada's boreal forest.

The scientists identify the 566 million hectare forest as one of the largest intact forest and wetland ecosystems remaining on earth. It is a major source of North America's freshwater and home to the some of the planet's largest populations of wolf, grizzly bear, and woodland caribou.

Canada's boreal forest is also the single-largest terrestrial carbon storehouse in the world, making it

a significant shield against global warming.

However, the forest is under increasing pressure from logging, mining, and oil and gas operations. Only ten percent has been protected to date, far less than what is scientifically recognised as necessary to sustain the ecosystem over time.

David Schindler, Killam Memorial Chair and Professor of Ecology at the University of Alberta, Edmonton, said: "We are losing so many of the world's great forests, despite the best efforts of conservationists. Canada's boreal forest offers what may be our last, best chance to do things right, but

only if our leaders act decisively and act now."

The scientists' letter recommends preserving a minimum of half of the forest in protected areas while allowing only carefully managed development on the rest, in accordance with the Boreal Conservation Framework, a plan already endorsed by Canadian conservation groups, 25 Canadian First Nations, and more than 75 major businesses with annual sales of USD \$30 billion.

For more information:
www.borealcanada.ca;
www.borealbirds.org;
www.interboreal.org

Inuit and islanders join forces on climate change



**Mangrove Cay,
Chetumal Bay
Belize**

Members of Many Strong Voices, an alliance of arctic communities and Small Island Developing States (SIDS) who are pressing for significant reductions in greenhouse gas emissions, met in Belize City to prepare a five-year action plan.

The participants came from 16 countries and regions, including Alaska, the Caribbean, Fiji, the Canadian Arctic, and the

Overseas Countries and Territories Association of the European Union, including Greenland and French Polynesia.

The Many Strong Voices strategy includes plans to push for deep cuts in greenhouse gas emissions through the United Nations Framework Convention on Climate Change (UNFCCC). It also includes an assessment of the ability of SIDS to adapt to climate

change and a plan to inform and warn the world of the dramatic effects of climate change in their regions.

Taito Nakalevu, climate change officer with the Pacific Regional Environment Programme, based in Samoa, said: "Together, we have identified common problems as a consequence of climate change, and our communities are suffering.

"We insist that those countries that are causing the problems have a responsibility to those whose lives are being affected."

Participants from the Arctic and SIDS pointed to similar climate change effects, including the relocation of communities as well as changes in marine resources on which communities depend.

Patricia Cochran, chair of the Inuit Circumpolar Council, said: "In the Arctic, we know that melting ice and sea level rise are going to affect everyone on the planet, especially people in Small Island Developing States. This is why we have chosen to work together — amplifying our voices in global negotiations."

For more information go to: www.manystrongvoices.org

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New rules needed for the Arctic

New and better rules are urgently needed to counter the current rush for arctic territories and resources.

WWF believes that without improved international cooperation between arctic nations, one of the world's most fragile regions, which also plays a critical role in stabilizing the planet's climate, could face irreparable damage.

Dr Neil Hamilton, director of the WWF International Arctic Programme, said: "We urgently need sound international cooperation between arctic nations to guarantee that the region's development is sustainable."

"The political and symbolic gestures of recent expeditions asserting territorial claims and rights to unrestricted exploitation lead to nowhere and could revive conflicts that have affected the region in the past."

A Russian miniature submarine planted the Russian flag beneath the arctic sea ice on 31 July in an effort to claim 1.2 million square kilometres of the polar seabed and the potential mineral wealth trapped within.

WWF believes that ratification of the UN Convention on the Law of the Sea (UNCLOS) — the UN body regulating these activities — by all arctic nations is a necessary condition for management of the Arctic. However, with the melting of arctic sea ice, which allows the opening of new shipping routes and makes possible the explora-



tion of potentially vast reserves of minerals, oil, and gas, the convention is not sufficient. UNCLOS merely provides the framework in which region-specific plans can be developed, and provides no mechanisms for the conservation of biodiversity or management of environments under the stress of climate change.

"We need a new approach, which includes thinking about a solid Arctic Treaty and a multilateral governance body," Dr Hamilton added. "This is the only way to

ensure the implementation of sustainable development regimes and help the Arctic adapt to the severe impact of climate change and ultimately stabilize the world's climate."

WWF warns that the current race to find new sources of oil and gas in the Arctic will only lead to increased global warming and climate change.

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World Environment Day focuses on polar regions

WWF joined international human rights and environmental advocates in a round table discussion as part of the UN World Environment Day celebrations hosted by Tromsø, in the Norwegian Arctic.

The theme for this year's World Environment Day was: "Melting Ice — A Hot Topic".

Igor Chestin, CEO of WWF-Russia, joined Nobel Peace prize winner archbishop Desmond Tutu, human rights activist

Massoumeh Ebtekar from Iran, UN Environment Program (UNEP) director Achim Steiner, UN International Panel on Climate Change (IPCC) leader Dr Rajendra K. Pachauri, and former leader of the Inuit Circumpolar Conference and winner of the Norwegian Sophie Prize Sheila Watt Cloutier at the discussion.

Chestin emphasised the importance of Russia's participation in the global efforts on climate change. He said: "Large amounts

of the greenhouse gas methane are stored in the tundra. We risk that this will be released if the temperature in the Arctic increases as much as predicted by the UN IPCC report. We have to act fast."

WWF is urging world governments, and primarily those of the EU, US, and other G8 countries, to commit to a new, ambitious, and binding agreement to succeed the Kyoto agreement in 2012.

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Climate change threatens Siberian

An international team of scientists believes that catastrophic forest fire outbreaks in Siberia are happening more frequently because of climate change. In the extreme fire year of 2003, smoke plumes from Central Siberia were so huge that they caused air pollution in the United States.

Professor Heiko Balzter of the Department of Geography at the University of Leicester said: “Last century a typical forest in Siberia had about 100 years after a fire to recover before it burned again. But new observations by Russian scientist Dr Kharuk have shown that fire now returns more frequently, about every 65 years.”

At the same time, annual temperatures in Siberia have risen by almost two degrees Celsius — almost twice as fast as the global average. Warming of the region has become even faster since 1990.

Global warming has already been linked to warmer, earlier springs. A similar trend was observed in Siberia.

The scientists observed 18 years of satellite images of the region, and estimated the timing of the



onset and end of the growing season. From 1982 to 1999 almost all Siberian ecosystems showed an earlier onset of spring.

Professor Balzter said: “The changes in the timing of spring and also in fire occurrence are linked to temperature changes and a climate

pattern that scientists call the Arctic Oscillation.

He added: “Planet Earth is always more complicated than you think. The lengthening of the growing season that has been described in the scientific literature is a non-linear phenomenon. It is influ-

Higher costs and delays for gas pipeline

Imperial Oil Ltd. announced in May that the estimated cost of the Mackenzie Gas Project — a proposed 1220-kilometre pipeline along Canada’s Mackenzie Valley to connect northern onshore natural gas fields with North American markets — had grown to CAD \$16.2 billion, from \$7.5 billion just two years ago. Pipeline consortium partners Conoco Phillips and Royal Dutch Shell PLC reportedly told the Canadian government that the project is ‘effectively dead’ unless it provides financial assistance.

TransCanada Pipeline Ltd., which has bankrolled consortium partner Aboriginal Pipeline Group, said it would turn its attention to other projects.

Canada’s Minister of Indian Affairs and Northern Development, Jim Prentice, was forced to issue a

press release to quash rumours that the Canadian government would contemplate becoming an equity partner to salvage the project. He also reiterated that the Canadian government has “... absolutely no interest and no role in directly subsidizing a private sector project.”

The consortium partners must now decide if the project is economic without government intervention. They must also consider whether Mackenzie gas can be competitive with alternatives such as liquefied natural gas (LNG) terminals and coalbed methane when it reaches the market in 2014 at the earliest.

Meanwhile, the Joint Review Panel environmental impact assessment hearings into the proposed pipeline continue. WWF-Canada’s Pete Ewins and Julia Langer urged

the Joint Review Panel to acknowledge that oil sands developments in Alberta would be a significant market for Mackenzie gas. The oil sands are one of the most greenhouse-gas-intensive sources of oil because they use natural gas to produce the heat needed to release bitumen from the sand.

WWF will argue that greenhouse gas emissions from oil sands development must be included in the environmental impact assessment for the pipeline.

The full record of all public hearings can be found at www.ngps.nt.ca/

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forests



Boreal forest, Yamal.

CREDIT: Bryan & Cherry/Alexander Photography/www.arcticphoto.co.uk

enced by feedbacks between the atmosphere and the forest, which responds to rising greenhouse gas levels and higher temperatures.”

The research is published in the *Journal of Climate*, 1 August 2007.

Source: University of Leicester

Tracking polar bears in Beaufort Sea

WWF has donated five satellite collars to the US Geological Survey (USGS) Alaska Science Center. The collars will be used for studies to fill key information gaps on how polar bears utilise sea ice during different times of year.

The USGS has been following a number of female bears in the region since 1985 to help understand their movements and habitat use.

With the additional collars, the USGS team expects to learn more about polar bear use of sea ice and selection of ice type, as well as examine habitat needs both on ice and along the shore.

The research will particularly focus on understanding habitat relationships and developing predictive models of seasonal polar bear distribution relative to sea ice extent and composition. This information will provide science for conservation efforts and help scientists and managers better understand the effects of global-scale events including habitat loss and climate change.

While tagging and monitoring polar bears for the 2007 field season, the USGS research team noted that temperatures were unusually warm for spring (up to 0°C) and there was a near-complete absence of multi-year ice along the shoreline.

The decline of sea ice in this region is suspected to be the cause of a decline in average body weight of some polar bears and an increase in cub mortality in recent years. According to the World Conservation Union's (IUCN) Polar Bear Specialist Group, the southern Beaufort Sea sub-population is one of the five polar bear sub-populations — of a total of 19 around the Arctic — in decline.

The WWF-Canon Polar Bear Tracker will soon be following the southern Beaufort Sea polar bears online at www.panda.org/polarbears. You can currently follow the bears by downloading the Google Earth file at www.panda.org/polarbears/ge

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New nature reserve for Russian Arctic

A new nature reserve has been approved for Vaigach Island in the western Russian Arctic by the Nenets Autonomous District administration.

The new 2,430 square kilometres nature reserve will help protect threatened arctic species such as polar bears, Atlantic walrus and, white-beak loon, as well as one of the region's largest mass nestings of waterfowls.

The island is surrounded by the Barents and Kara seas and its coastal waters are frequented by a number of marine mammals including Atlantic walrus, grey seal, harbour porpoise, bottlenose dolphin, humpback whale, northern blue whale, northern fin whale, and sei whale. In recent years the populations of many of these species have become unstable.

WWF assisted in the creation of the nature reserve, which took two years to complete. It is hoped that the new protected area status will help protect the island from increasing industrial development in the region.

Oleg Sutkaitis, project coordinator of WWF's Barents Sea Ecoregion office, said: “We are satisfied that one of the most valuable places in the Russian Arctic is now under protection.

“We hope to continue our success and develop more protected areas in the Nenets Autonomous District.”

Vaigach Island is also culturally significant for the indigenous Nenets people who have visited the island for thousands of years to worship their gods. The main Nenets sacred site is on Cape Dyakonov,

where an idol depicting the seven-faced Vesako (the head of all Nenets deities) is surrounded by hundreds of small wood and stone idols.

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not rain and that makes the ice on lakes and rivers unstable. This has made traditional roads over the ice dangerous, causing accidents when we try to get to the herds. Two of my nephews went through the ice where it usually should have been safe at that time of year. One of them nearly drowned, but luckily they both came from it unharmed.

Ice covers the food

The changes in the weather make the conditions for reindeer herding difficult. The snow gets icy from the rain so that the reindeer cannot get through to the lichen — the food they depend on to survive in the winter. We can no longer predict the weather like we could before. In the beginning of the 1990s this was part of the reason why reindeer owners lost 90 percent of their herds.

Now we have to feed the reindeer in the winter. It is a long way to go to bring the food to them, and it is, of course, very expensive. However, it is the only choice we have if we want to keep herding. Still, reindeer numbers are going down. We don't know why but believe climate change to be the most probable cause.

Where we previously used to get snow in early October, we now sometimes have to wait until Christmas. The snow also disappears earlier every year. I used to hang out reindeer meat to dry in April. Now I have to do it in February to avoid the flies.

These are some of the reasons that climate changes have become an important topic to the Sámi people. With the warmer climate comes more insects, especially mosquitoes and flies. The reindeer do not like insects, which is pushing them further up in the mountains where food is scarcer.

► 15

Sámi reindeer herder sees uncertain future

Climate change is beginning to have an affect on the livelihood of Sámi reindeer herders, like Olav Mathis Eira, in northern Norway

Olav Mathis Eira has been a reindeer herder his whole life and lives in Lavangen municipality in northern Norway. He is worried about changes in the climate that he has noticed over the past 20 years and the impact they will have on his family's livelihood and traditional way of life.

My name is Olav Mathis Eira, a reindeer herder from northern Norway. I am 50 years old and have worked with reindeer my whole life. I have around 500 reindeer. My family has had this as a livelihood since the 1400s. I am married and have three sons.

During the last 20 years I have observed various changes in the climate. The most urgent change for us, the Sámi people who live off reindeer, has been the winter rains. Rain in the winter is normally very rare this far North. In the old days this used to happen only every 30 years, and we had ancient methods of foretelling the weather. Now this is no longer possible.

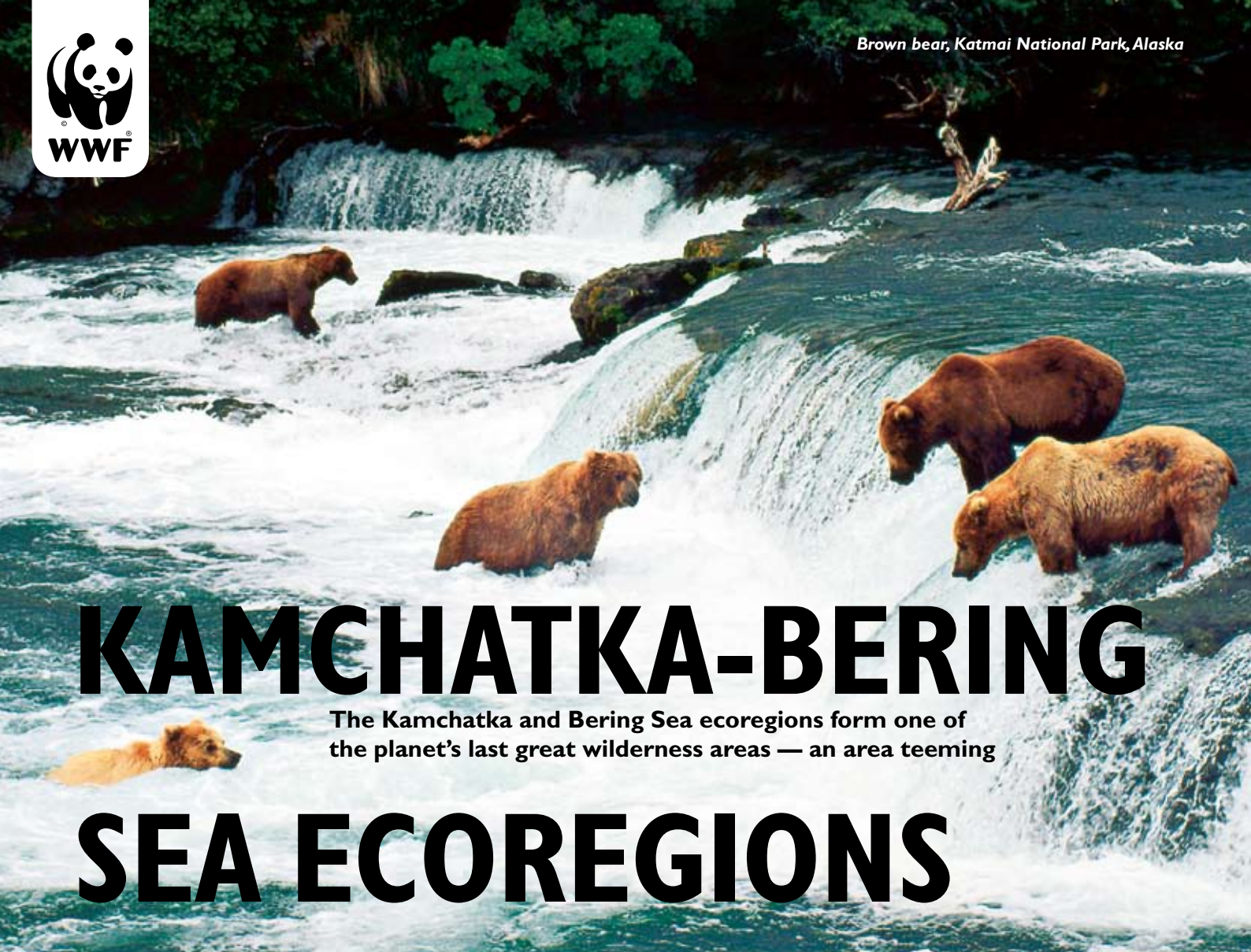
The number of storms and the amount of precipitation is increasing. It rains when it should

Olav hopes that one of his three sons will be able to continue the family tradition



CREDIT: Olav Mathis Eira

CREDIT: Olav Mathis Eira



KAMCHATKA-BERING

The Kamchatka and Bering Sea ecoregions form one of the planet's last great wilderness areas — an area teeming

SEA ECOREGIONS

CREDIT: © WWF-Canon / Kevin SCHAFER

Stretching north of the Pacific Ocean between the US and Russia, the Bering Sea washes the northern shores of the Kamchatka Peninsula, Chukotka, north-western Alaska, and the Commander and Aleutian Islands.

The Kamchatka Peninsula is alive with volcanic activity. Over 30 active volcanoes — many of which are listed as UNESCO World Heritage sites — spew ash and lava that provide important nutrients and make the ecosystems so rich. The famous “Valley of the Geysers”, which was partially destroyed by a mudslide in June 2007, is one of the five largest geyser fields in the world.

The Bering Sea ecoregion is home to more than 450 species of fish, crustaceans, and mollusks, 200 species of birds, and 25 species of marine mammals. This natural abundance of sea life supports the last-remaining great ocean fishery in North America. Over half of all fish caught in US waters and about one-third of Russia's catch come from the Bering Sea.

The Kamchatka Peninsula boasts a number of unique species, including an endemic species of snow sheep. It is also home to some of the largest wild reindeer

in the world, the second largest brown bear subspecies in the world — with a stable population of about 15–16,000 animals, representing about five percent of the global population — and the world's largest wintering grounds for the rare Stellar's sea eagle.

The environment has sustained hundreds of hardy coastal communities that have lived in the region for thousands of years. The traditional knowledge of these native peoples is widely recognised as an essential component to understanding sustainable use of these ecoregions' exceptional marine life and terrestrial resources.

Threats

The combination of an altered physical environment and greatly increased human exploitation of natural resources over the last century has caused significant damage in parts of the ecoregions, while other areas remain pristine and can serve as a basis for long term wilderness conservation.

In recent decades there has been a sharp decline of Steller sea lions, northern fur seals, various seabirds, and a number of fish stocks. In the western Bering Sea, Pacific walrus populations also are severely depleted. Many factors may be contributing to these declines, including illegal fishing, overfishing, and the incidental deaths of

non-target species, or bycatch; pollution, shipwrecks, and oil spills; and the introduction of non-native species such as rats, which can devastate island seabird colonies.

Environmental changes such as global warming and the shrinking of sea ice also represent a dire threat to the marine ecosystem.

In Kamchatka, the growing threats of poaching, overfishing, gold and platinum mining, and oil and gas exploration on the continental shelf could lead to the rapid demise of this wilderness area.

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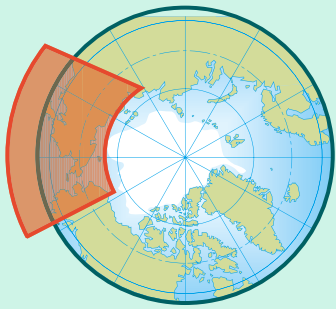


CREDIT: David Gordon/Pacific Environment



CREDIT: © WWF-Canon/Kevin SCHAFER

SPECIES OF THE BERING SEA ECOREGION



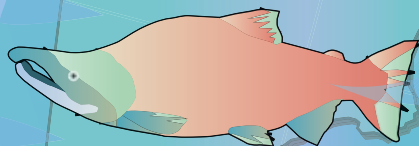
BROWN BEAR

Kamchatka has the highest density of brown bears in the world and the local subspecies is second only in size to the Kodiak bear in Alaska.



OKHOTSK SEA

Kamchatka Peninsula



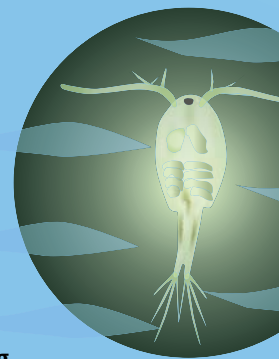
SALMON

Kuril Lake, at the southern tip of the Kamchatka Peninsula, is the largest sockeye salmon-spawning lake in the world. Almost one-quarter of Pacific salmon are from Kamchatka where they spend their adult life before migrating up the rivers of Alaska and Russia to spawn.*

Commander Islands



Great Circle Route
Around 7,000 ships travel across the Bering Sea every year.



B E R I N G

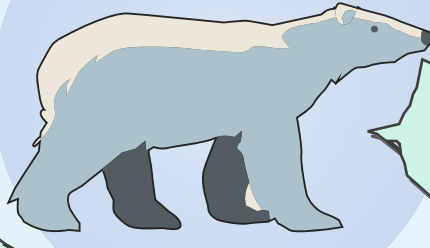
0 200 400 km

Aleutian

* <http://www.wildsalmoncenter.org/programs/kamchatka/>

** http://www.habitat.adfg.state.ak.us/geninfo/kbrr/coolkbayinfo/kbec_cd/html/ecosys/estuarin/eelgrass.htm

CHUKCHI SEA



POLAR BEAR

There are around 2,000 polar bears in the Bering Sea and Chukchi Sea areas. Polar bears are under increasing pressure as the sea ice continues to decline. Villages in northeastern Russia are seeing a surge of polar bears.

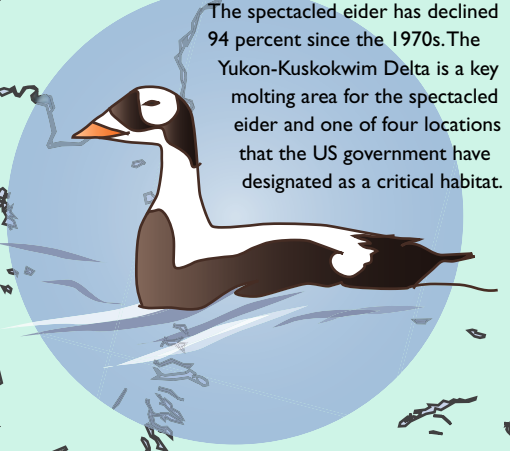
Chukotka Peninsula

Seward Peninsula

St. Lawrence Island

SPECTACLED EIDER

The spectacled eider has declined 94 percent since the 1970s. The Yukon-Kuskokwim Delta is a key molting area for the spectacled eider and one of four locations that the US government have designated as a critical habitat.



St. Matthew Island

ING SEA

COPEPOD

Copepods and other invertebrate are the main food source for salmon and are the basis of a complex food web that leads all the way up to polar bears and whales.

Maximum sea ice extent

Pribilof Islands

Bristol Bay

M/V Selendang Ayu oil spill (2004)
1,270,883 litres



EEL GRASS

Izembek Lagoon has one of the world's largest eel grass beds. Almost the entire population of Pacific black brant geese (150,000 birds) stop at the lagoon during their migration from Baja California to Alaska and Canada to feed on the eel grass. **



I s l a n d s

CHALLENGES

facing the Kamchatka and Bering Sea Ecoregion and WWF's solutions

The marine environment in the Bering Sea is highly productive. It harbours critical feeding and breeding grounds for marine mammals and seabirds, important nursery areas for US and Russian fisheries, and many diverse cultural and economic resources.

WWF is working in partnership with Russian and US coastal people, scientists, biologists, hunters, fishers, subsist-

ence users and other conservation organisations to develop sound, long-term conservation strategies that will endure the political, social, and economic events of the new millennium. Our understanding of and concern for the lives of indigenous peoples keep us focused on building a sustainable balance between humans and nature.

Mitigating the impact of climate control

CHALLENGE: The loss of the multi-year arctic sea ice resulting from warming air and sea temperatures is having dramatic impacts on marine and coastal environments, including changes in marine productivity, shifts in distribution of fish, increased shoreline erosion, and loss of habitat for ice-dependent species.

SOLUTION: Research the biological and physical changes induced by climate change in critical habitats, work with scientists and communities to develop adaptive management strategies that will bolster ecosystem resiliency to coming change, empower residents of the region to become active advocates and leaders to effect change in energy policies and carbon dioxide emissions.



CREDIT: © WWF-Camryn/Kevin SCHAFER

Higher standard in shipping safety

CHALLENGE: Each year, 7,000 vessels navigate the Great Circle Route between Asia and North America. Many of these traverse Unimak Pass in the Aleutian Islands, a marine wildlife superhighway. Navigating some of the world's stormiest waters, the risk of accidents posed by these vessels is a major threat to the region's fish and wildlife. Oil spills and rats escaping from ships can permanently destroy the marine and island ecosystems.

SOLUTION: Collaborate with local and national governments and engage industries to help prevent shipping accidents and associated oil spills; introduce necessary equipment and other preventive measures; develop safety policies and implement best practices to reduce pollution brought in by ships; prevent the introduction of invasive non-native species; and create protected areas around critical marine habitats to move shipping routes out of migratory corridors.



CREDIT: Alaska Department of Fish and Game

Establish sustainable fishing practices

CHALLENGE: Destructive fishing practices along with illegal fishing and overfishing are depleting some fish stocks. Non-commercial and non-target species are being caught as bycatch, and vital marine habitats are being destroyed.

SOLUTION: Work with governments and industry to track the illegal trade in marine fish products, stop overfishing, and enforce sustainable fishing practices; introduce incentives to reduce the bycatch of marine mammals and sea birds.



CREDIT: © WWF-Camryn/Kevin SCHAFER

Protecting habitats from offshore oil and gas development

CHALLENGE: America's fish basket, Bristol Bay, once protected under US Congressional moratorium on offshore drilling, may now be available for lease sales for oil and gas development. Other areas such as the Chukchi Sea, home to the polar bear, and the western Kamchatka Shelf, a critical marine salmon habitat, are being targeted



CREDIT: Statoil

for development. An oil spill in these areas would have devastating impacts with little chance of a complete recovery.

SOLUTION: Introduce legislation to permanently protect places such as Bristol Bay and the Chukchi Sea, and provide

leadership in calling for best practices and creating marine protected areas in planned areas for oil exploration in the Okhotsk Sea, work to develop innovative approaches for international oil and gas companies.



WWF is the world's largest and most experienced independent conservation organisation, with almost five million supporters and a global network active in 90 countries. WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature. WWF continues to be known as World Wildlife Fund in Canada and the United States of America.

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10 ► **Higher tree line**

The tree line climbs higher year by year. I believe it increases more year by year, and the forest down here gets thicker.

We observe new birds and insects, which do not have a name in Sámi. Parasites that normally die during winter, survive. My neighbour lost 70 reindeers this way.

We have seen years with poor grazing before, but from the mid-1980s there were several years of inadequate grazing, something which happened again in the beginning of the 1990s, when we lost so much of the stock.

Since the start of the 1990s, reindeer owners have pretty much agreed that what we see now is completely unnatural. There are no long periods of frost anymore. This also makes the big migration of the reindeer in spring more difficult. The numbers of losses during this period are increasing.

In the beginning the weather changes caused enormous problems for us. We were thinking about how we should survive in this business. Where would we move? It causes instability in our lifestyle. But we are adjusting by moving the reindeer earlier, and no longer keep to the old traditions of when this is to be done. We have taught our reindeer to eat pellets despite how expensive they are. After all, we have ascertained that the climate changes are inevitable. They are already upon us.

Now a research project, Ealat, a cooperation between several organisations and research institutes, amongst them the World Reindeer Herders Union, is trying to map out how climate change will affect reindeer herding.

Maybe we have to turn the whole cycle around in the future? If it rains when it is not supposed to rain we might have to stay by the coast during spring and summer instead of on the plains.

I have three sons. One of them will hopefully keep to the family tradition of reindeer herding. But it is no longer a good life. It is an insecure future.

Olav Mathis Eira is a Climate Witness who provided his testimonial to the WWF Climate Witness Programme. His testimonial and that of other Climate Witnesses from around the world can be found at: www.panda.org/climatewitness



CREDIT: Maria Gavrilov

Russian ice refuge for ivory gulls

An extensive survey of the Russian Arctic identified a small island surrounded by heavy sea ice as providing a sanctuary for the world's ivory gull population. Maria Gavrilov of the Russian Arctic and Antarctic Research Institute reports.

Despite rising concern over its population status, the ivory gull remains one of the least-known seabird species in the world. Observed climate changes in the Arctic along with a potential build up of toxic chemicals in the birds suggest that the species may be in trouble. Populations have probably been declining in several parts of its range for a long time, but global data to support this has been lacking.

Recent studies in the Canadian Arctic found a dramatic decline in ivory gull breeding populations. This led delegates at a BirdLife International forum to discuss the need to re-evaluate the species' conservation status in the World Conservation Union's (IUCN) Red List of Threatened Species. However, lack of data from Russia, Norway (Svalbard), and Denmark (Greenland) — where ivory gulls also breed — has made it difficult to scientifically ground such a reassessment. The only surveys of ivory gull numbers ever conducted in Russia, for example, where almost two-thirds of the global breeding

population is believed to be located, took place in the 1990s.

To fill in some of the knowledge gaps, the Russian Arctic and Antarctic Research Institute surveyed ivory gull nesting grounds in Russia, as part of a wider survey of such grounds in the Norwegian and Russian Arctic. The surveys formed part of Russian-Norwegian environmental cooperation in the Barents Sea region in summer 2006.

In Russia, ivory gulls are known to breed in around 50 colonies on high-latitude islands and archipelagos stretching from the north-western Barents Sea to the eastern Kara Sea. The survey team planned to check the most important of these colonies in three different areas: Severnaya Zemlya Archipelago, Franz-Josef Land Archipelago, and Victoria Island.

This ambitious plan to survey a vast and remote area in the short arctic breeding season and under difficult conditions required close cooperation with the Russian Arctic Border Guard network, which provided two of their helicopters ► 16

15 ► to conduct the aerial surveys.

The team flew 4,850 kilometres during the 13-day survey. Dense fog and poor visibility seriously affected planned aerial surveys, but the team nevertheless managed to visit the principal sites in all three areas.

The first stop was Domashny Island—a tiny isle within the Sedov Archipelago (part of Severnaya Zemlya Archipelago) where ivory gulls have been recorded as breeding since the 1930s. A direct total count of incubating birds provided the highest-ever recorded figure of 1,890 breeding pairs (in the 1990s, the population fluctuated between 166 and 1,100 pairs).

Another four occupied colonies were found on the islands of Franz-Josef Land, with between 3 and 450 breeding pairs each.

Victoria Island, the westernmost point of the survey, was reported as an important breeding area for ivory gulls in the 1960s, with the largest colony of 750 pairs observed in the mid-1990s (see *Arctic Bulletin* 03.95). No breeding ivory gulls were observed in 2006, however to the survey team mapped almost 900 old nest bases and holes.

Altogether, the team obtained information for seven breeding colonies with almost 3,000 breeding pairs, including two colonies reported by personnel of weather stations.

The survey confirmed estimates made in the mid-1990s that as many as 10,000 pairs, out of 14,000 worldwide, breed in Russia in good years. It also indicated that in Russia, there is no clear trend in overall population number, but that the number of breeding pairs fluctuates from year to year depending on environmental conditions.

The most obvious environmental difference between the three survey areas was ice conditions: there was no sea ice around Victoria Island, relatively light ice cover in the Franz-Josef Land area, and a vast area of pack ice in the eastern Kara Sea around Domashny Island.

This difference is believed to explain the observed distribution of breeding ivory gulls. Good sea ice cover probably provided better

foraging conditions for the gulls, which feed on sympagic (species that live permanently under polar sea ice) fish and crustaceans. Most of the birds were breeding in close proximity to human settlements and managed to survive human impacts and stray dogs.

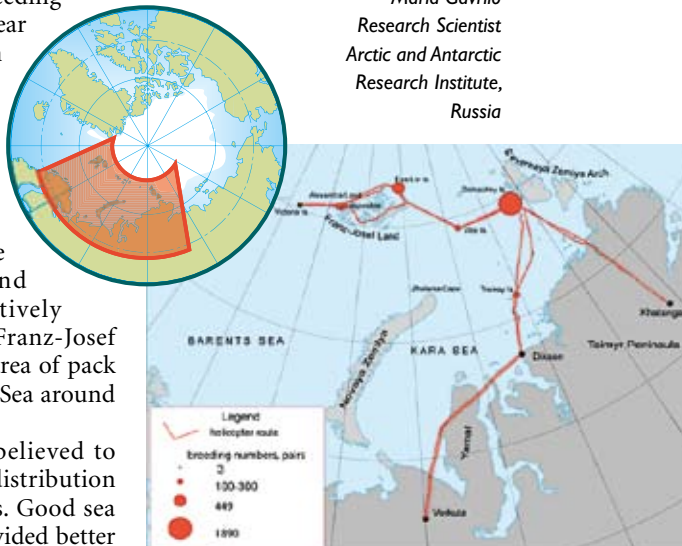
Overall, the 2006 ivory gull breeding season was favourable, especially in the eastern Kara Sea where a very high breeding density and large clutch sizes were observed. The team reported the highest-ever percentage of three-egg clutches, earlier hatching dates, and a greater body mass both in breeding adults and chicks at hatching.

The northeast Barents Sea and eastern Kara Sea remain the main breeding area for the ivory gull at the global level—and the importance of this region is growing given the recent ice cover retreat in other breeding grounds such as the Atlantic sector of the Arctic.

However, the gulls' tendency to aggregate in large numbers for breeding—as evidenced by the record number of pairs on Domashny Island, which accounted for around 20 percent of the estimated Russian population—also indicates that the species is highly vulnerable to various threats that may impact on the population level.

Ongoing monitoring and research of the ivory gull in this key area is crucially important in order to develop a conservation strategy with a circumpolar perspective. This work is ongoing within the Arctic Council's Conservation for Fauna and Flora seabird expert group.

Maria Gavrilov
Research Scientist
Arctic and Antarctic
Research Institute,
Russia



Humpback whale.


Disturbed, — climate change

The Arctic's whales are facing increasing threats from climate change, according to a new report published by WWF and the Whale and Dolphin Conservation Society (WDCS). Joanna Benn reports.

The impact of climate change on whales, dolphins, and porpoises is growing. And with climate change impacts currently being greatest in polar regions, the Arctic's cetaceans are particularly vulnerable.

According to a report released by WWF and WDCS, *Whales in Hot Water — The Impact of A Changing Climate on Whales, Dolphins, and Porpoises*, cetaceans that rely on polar, icy waters for their habitat and food resources—such as belugas, narwhals, and bowhead whales, which are permanently resident in the Arctic—are likely to be affected by reduced sea ice cover. In the case of bowhead whales in the western Arctic, one study identified significant reductions in ice cover in eight of the 16 assessed regions of seasonal importance to this species.

In addition to the direct loss of ice-edge habitat, a warmer Arctic with less ice and more exposed ocean may cause more temperate species to expand their normal distributions northward. This could result in changes in food webs and



hungry, and lost impacts on whales

CREDIT: Bryan & Cherry Alexander Photography www.arcticphoto.co.uk

potentially alter any competitive interactions between species.

Whale species that currently migrate into arctic waters to feed may also fare poorly if their prey populations are reduced or have moved outside of feeding grounds. In the case of the last 300 or so endangered North Atlantic right whales, climate change could be the final nail in the coffin: calf survival has been directly related to the effects of climate variability on prey abundance.

In addition, as sea ice cover decreases, there will be more human activities — such as commercial shipping, commercial fishing, oil, gas and mining exploration and development and military activities — in previously untouched areas of the Arctic.

Wendy Elliott, Species Manager at WWF and lead author of the

report, says: “This will result in much greater risks from oil and chemical spills and entanglement in fishing nets, worse acoustic disturbance, and more collisions between whales and ships.”

Other potential impacts on arctic whales from the projected impacts of climate change include: ocean acidification due to absorption of growing quantities of carbon dioxide; an increased susceptibility to diseases; and reduced reproductive success, body condition, and survival rates.

Mark Simmonds, international director of science at WCDS, says: “Whales, dolphins, and porpoises have some capacity to adapt to their changing environment, but the climate is now changing at such a fast pace that it is unclear to what they will be able to adjust, and we believe many populations

to be very vulnerable to predicted changes.”

WWF and WCDS are urging governments to cut carbon dioxide global emissions by at least 50 percent by the middle of this century. The latest report of the Intergovernmental Panel on Climate Change (IPCC) showed it was possible to stop global warming if the world’s emissions start to decline before 2015.

However it is clear that changes in our climate are already occurring, and will continue to occur in the future even under the most optimistic predictions for emission reduction. It is therefore critically important that climate change considerations be incorporated into conservation plans, assessments, and strategies for cetaceans. WWF and WDCS released the *Whales in Hot Water* report at the recent meeting of the International Whaling Commission (IWC), held in Anchorage, Alaska, where it generated significant press attention and interest from many of the 77 governments than are members of the IWC. Mexico, South Africa, UK, Austria, India, Mali, Australia, Senegal, Argentina, Costa Rica, Ecuador, and Spain all made strong interventions during the meeting about the importance of addressing climate change, and the IWC agreed to hold a scientific workshop to further investigate the issue.

For more information, download the report at: www.panda.org/arctic/publications

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Whales of Bristol Bay

This year the Arctic hosted the International Whaling Commission — and brought international attention to the whales of Alaska’s Bristol Bay. Wendy Elliott, of the WWF Global Species Programme, reports.

This year, Anchorage hosted the annual meeting of the International Whaling Commission (IWC) — the international body responsible for the regulation of whaling and the conservation of whales. Nearly 80 governments descended on the city and the usual lively debates were had between pro- and anti-whaling factions.

The location of the meeting meant that — for the first time in the IWC context — issues of

concern to the people and whales of the Arctic were given the international spotlight they deserve.

Of particular relevance to the Arctic was the adoption of the new Aboriginal Subsistence Whaling Quota. The quota granted was a total of 280 bowhead whales from the Bering-Chukchi-Beaufort Seas stock for the period of 2008–2012, shared between the indigenous people of Alaska, US, and Chukotka, Russia. This quota



► 18 marks a victory for the indigenous peoples concerned. In previous years, Japan and its allies have blocked the passing of a quota, stating they would only support it if Japan were granted a quota for their coastal whaling activities — which are entirely commercial in nature and thus banned under the current international moratorium on all commercial whaling.

The moratorium was established to prevent the loss of many whale species that had been pushed to the brink of extinction by unsustainable commercial whaling activities. However, subsistence whaling by communities dependent on whale products for nutritional reasons is allowed.

Besides whaling, many issues of conservation importance to whales were discussed in various committee meetings held prior to the main meeting, such as the Scientific Committee and Conservation Committee, as well as in the main Commission meeting itself.

One important paper presented by WWF to the Scientific Committee outlined the extremely significant threats posed to the whales of Alaska's Bristol Bay by the proposed leasing of the area for oil and gas exploration and development.

Bristol Bay is home to 16 whale species, including bowhead whales, blue whales, fin whales, sei whales, humpback whales, and sperm whales. Most importantly however, Bristol Bay contains critical habitat for the world's most endangered whale population, the Eastern North Pacific right whale. This population is so small that the loss of just one cow or calf could spell disaster. The Scientific Committee

discussed the issue and made an expression of concern about the situation — a powerful message from the world's largest and most respected collection of whale experts.

WWF also released a report outlining the impacts of oil and gas development on Bristol Bay's whales in the main Commission meeting, which generated further concern among governments from all over the world. The report was launched at a press conference attended by local, national, and international journalists, with speakers including WWF, a representative from the Bering Sea Fishermen's Association, and a local resident of Bristol Bay.

In the main Commission meeting, the minister for the UK, Barry Gardiner, spoke out strongly on the issue, and was backed up by Mexico. These important statements send a strong message to the international community is watching — and will not support oil and gas development that could lead to the extinction of one of Alaska's whale populations, as well as threaten the area's delicate biodiversity, commercial and sport hunting fisheries, and natural resources that scores of Alaskan indigenous peoples rely on for food.

The meeting concluded with continuing animosity between pro- and anti-whaling governments, with many pro-whaling governments refusing to participate in critical votes. As this impasse continues, more and more whales are being killed through loopholes in the moratorium such as 'scientific whaling', with Japan proposing to increase its scientific whaling catch even further and to include additional species such as the endangered bowhead whale. All the meat from Japan's scientific whaling catch is sold on the commercial market.

WWF will continue to work with governments in our efforts to resolve this impasse and turn the IWC into a forum that is truly able to deliver significant conservation benefits for the whales, dolphins, and porpoises of the Arctic and the world.

Wendy Elliot
Manager, Species

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Will Canada

So far Canada has failed to take adequate measures to restore bowhead whale numbers to levels known in pre-commercial whaling days. Pete Ewins at WWF-Canada and Ben Wheeler at Jacques Whitford environmental consultants report.

The bowhead whale is the world's longest-lived mammal species, with adults recorded older than 200 years. Hunted to near-extinction by the early 1900s, this remarkable and iconic gentle giant is superbly adapted to sea ice conditions — which of course are now rapidly altering due to global climate change linked to fossil fuel combustion.

Population status information on Canada's eastern arctic bowhead whale population (shared with western Greenland) is still unclear, mainly due to inadequate funding for government research efforts. Inuit knowledge and scientific research results point to steadily increasing numbers, and there are probably a few thousand whales today. However, numbers are still well below historic, pre-whaling levels. Accordingly, the World Conservation Union (IUCN) lists the population as 'Endangered', and Canada's SARA currently lists it as 'Threatened'.

Despite major efforts over the past 30 years by Inuit, scientists, and organisations like WWF, Canada continues to approve industrial decisions and military ventures in the bowhead's silent icy waters, without any satisfactory regional marine plans for this species or its essential habitats. Major research conducted in Canada, the US, Russia, and Europe has shown that most of these industrial developments, and other activities they trigger, cause adverse impacts on arctic whale species and bring high risks to sensitive arctic ecosystems.

The long-term Recovery

provide what bowheads need?

Strategy for Canada's eastern arctic bowhead whale population is also still not completed, approved, or being implemented, as required under Canada's Species At Risk Act (SARA). A stunning low priority persists in the federal government for arctic marine mammal research and conservation initiatives. This is very puzzling, given the public's clear concern nowadays that elected leaders walk their environmental talk.

Is this imbalanced approach acceptable to Canadians or other nations, especially from a G8 country still claiming to be committed to world-class 'sustainability' and balanced long-term development?

WWF believes not. The organisation recently completed a two-year project to map suitable habitats for bowhead whales so that protection measures for high value and critical areas can then be prioritised, including their identification and legislated protection as 'critical habitat'.

The WWF-funded study built on the excellent Inuit Knowledge Bowhead Study (IBKS) completed under the Nunavut Land Claims Agreement, to identify areas known or predicted to be of former or current high importance to these bowheads.

By combining information from Inuit Traditional Knowledge, historic whaling data, government aerial transect surveys, and private sector/industry surveys, and analysing oceanographic records for the partial ice cover period (June–October), WWF's study predicted areas most suitable and important for bowhead whales.

Twenty-one such areas were identified in Canadian waters, characterised by three main factors: ice cover; chlorophyll concentrations (an index of marine primary biological productivity, i.e., available plankton food for bowheads); and sea-surface temperature. Many of these areas are well-known to Inuit, and comprise some of the strongest candidates for 'critical habitat' designation and firm

protection measures.

In recent years, Canada and Greenland have placed satellite radio transmitters on some bowheads, generating a crucial new understanding of their movements and habitat use. Although these data are not yet fully analysed or published, they do confirm that bowheads are dependent on many of the 21 identified areas. The data also identify other crucial areas such as the heavy summer ice in Prince Regent Inlet and Gulf of Boothia to the northwest of Baffin Island.

Looking ahead it is now very clear that based on the good information and analyses available, the eastern arctic bowhead whale population can continue to recover steadily — but only provided this network of confirmed key marine habitats is protected.

With so many changes and future uncertainties arising from rapid climate change and its effects, on top of progressive industrialisation, shipping, and military activities in bowhead waters, the governments of Canada and Greenland must surely realise that conservation options must be properly

planned and pursued — now.

To foreclose such options by approving further industrial projects before completing species conservation and protection measures would clearly risk driving bowheads into decline once again, and thus contravene the very purpose of international commitments such as the Convention on Biological Diversity, as well as Canada's Species At Risk Act.

At this point WWF and Inuit partners remain optimistic that these conservation planning steps will now be taken as a high priority, thereby avoiding forced solutions via legal actions. This would be in the interests of bowhead whales and of Inuit desires to continue with a sustainable traditional hunt for this very important species.

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Canada needs to ensure that adequate habitat protection for the endangered bowhead whale is in place ahead of further industrial development in the eastern Canadian Arctic



Polar bear and walrus refugees in

As they often lack the special means for stopping and scaring bears away, the patrol resort to the traditional Chukchi method of raising a spear-like stick in front of a bear.



Photos: Sergei Kavry

bears traveling in late autumn along the shoreline. In October and November 2006, 80 walrus carcasses were moved to a feeding point about ten kilometres north-west from the village.

Polar bears appear

Although polar bears can be found on the arctic coast of Chukotka all year round, they are particularly abundant in autumn when they come ashore after a summer of hunting on the sea ice. Pregnant females look for suitable places to den while other bears hunt and scavenge.

In late October polar bears began appearing along the coast and on 21 November, after a week-long blizzard, the patrol met bears 16 kilometres northwest of Vankarem. The number of bears increased daily and reached a peak by 3 December, when observers counted 175 bears, 88 of which were at the feeding point.

The feeding point was very successful. Although bears still appeared in the village, they remained at the feeding point for a while and did not appear suddenly in the village. This helped the patrol to monitor and manage the situation. Only a few bears moved further southeast while the majority stayed close to Vankarem until the sea froze. Many bears avoided encounters with poachers and did not become “problem bears” in coastal villages.

The patrol also engaged in awareness-raising activities in the village and kept people updated on polar bear activity in the area.

Hunters participating in the project proposed that next year they split the feeding point to several sites. This will prevent dominant bears from driving the younger ones away and into the village looking for food.

Collecting data

A system was set up so the patrol could collect valuable information on polar bears appearing near the village. WWF provided the patrol with portable two-way radios, GPS receivers, a notebook computer, and

WWF and the village of Vankarem in northeast Russia successfully completed a project to manage the influx of walrus and polar bears seeking refuge on the coast. Dr Andrei Boltunov at the All-Russian Research Institute for Nature Protection and Viktor Nikiforov at WWF-Russia report.

The decline of summer sea ice along the coast of northeast Russia has put increasing pressure on polar bears, walrus, and people. With less sea ice on which to travel, rest, and hunt, the polar bears and walrus are forced to spend more time on land. The people who live in the region must now manage the increased number of these visitors.

In 2006, the village of Vankarem requested support from WWF to conserve a unique coastal haul-out of Pacific walrus less than one kilometre from the village and to resolve conflict situations with polar bears passing the settlement each autumn.

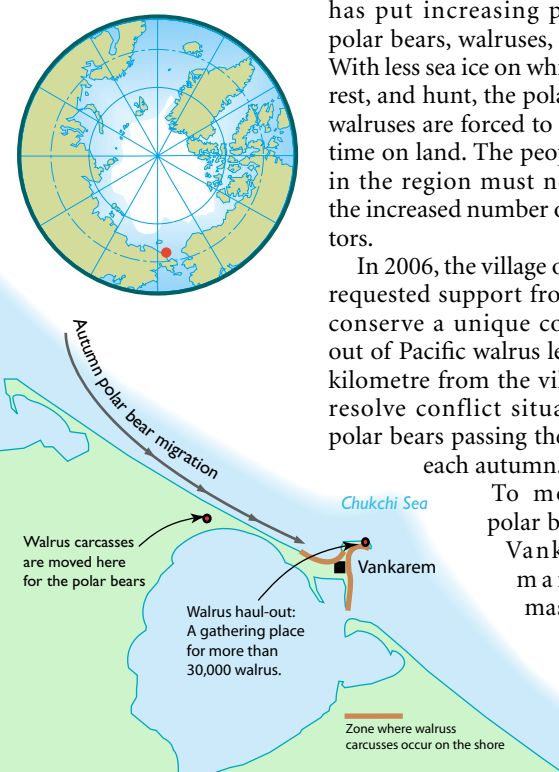
To monitor the polar bears around Vankarem and manage the massive walrus

haul-out, WWF and the Vankarem residents set up a pilot project called the “Polar Bear Patrol” which ran successfully from October 2006 to May 2007. The patrol consisted of a team of five experienced hunters, working under the leadership of local hunter Sergei Kavry.

Largest gathering of Pacific walrus

The walrus haul-out at Cape Vankarem is the biggest and most western haul-out of Pacific walrus, with roughly 30,000 animals gathering there in 2006.

Each year a number of walrus are killed in panic stampedes. The hunters usually threw the carcasses into the ocean during an annual clean-up after the walrus left for their wintering grounds in the Bering Sea. It was proposed that instead, the carcasses be used to create a “feeding point” for polar



Chukotka

searchlights. WWF also paid for use of a tractor for transporting walrus carcasses from Cape Vankarem to the feeding point.

Polar bear monitoring covered 300 kilometres of coastal area from Cape Shmidta to Nutepelmen village, but the most complete observations were around Vankarem. The monitoring provided impressive results and revealed that on the arctic coast of Chukotka, polar bears are most vulnerable and easily available for poachers in a comparatively short period — from the moment they appear on the shore in November until the coastal waters freeze in early December. In this period, effective measures for preventing poaching and human-polar bear conflicts can be undertaken.

Delegation visits

In March 2007, Vankarem village was visited by a delegation of representatives and experts from WWF-Russia, WWF-US, the All-Russian Research Institute for Nature Protection, Chukotka branch of the Pacific Research Fishery Center, US Fish and Wildlife Service, *New York Times* newspaper, and the Chukotka Administration.

The delegation discussed and considered the results of the first season of the Polar Bear Patrol project and planned for the next season. The patrol received additional GPS receivers, portable two-way radios, and winter camouflage and recruited a new member from Nutepelmen, a coastal village about 60 kilometres from Vankarem.

The patrol was commended for its excellent results. Despite their limited resources, the objectives of the project were achieved with no human or polar bear casualties.

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The impact of climate change on arctic politics and biology

Dr Karin Lochte, professor for biological oceanography at the Leibniz Institute of Marine Sciences at the University of Kiel, Germany spoke to the WWF International Arctic Programme's Nigel Allan about what we need to do, to understand and adapt to the impact that climate change is having on the biological production of the Arctic Ocean.

Nigel Allan: *What changes are we seeing in the biological production of the Arctic Ocean as a result of climate change?*

Karin Lochte: We know we will have changes in biological productivity in the Arctic Ocean because sea ice phytoplankton [microscopic plants] will be replaced by phytoplankton production in open waters. We already observe a steady and substantial decline in the sea ice cover.

We really need to look at what effect this change in productivity will have for fish and fisheries and then sea birds, whales, and eventually polar bears. We are already seeing that the decline of sea ice will have a significant impact but we still have little idea of how it will change.

Victor Smetacek, professor of biological oceanography at the Alfred Wegener Institute, has hypothesised that a reduction of iron (which phytoplankton need to process nutrients) from continental shelves into the central Arctic could change the Arctic

to a HNLC (high nutrient – low chlorophyll) sea like the Antarctic. Sea ice production on the continental shelf will be declining and this sea ice is a transport medium for trace metals, such as iron, and also nutrients both of which assist phytoplankton production in the Arctic Ocean.



Dr Karin Lochte

21 ► The biggest changes will happen at the arctic coastal regions. These areas are subjected to the most intense effects of climatic change. For instance, some coasts are stabilised by permafrost, which is starting to melt, and this will change the sediment erosion and the types of organisms around the arctic coast. Most likely the water cycle (rainfall) and the freezing regime of the rivers will change, leading to higher transport of material from the land to the sea and that again will have a massive impact on the coastal ecosystem. We will have to look at the coasts most of all.

NA: *What research has to happen for us to better understand the systems?*

KL: Firstly we need better observation systems. We do not have enough data at the moment, especially about how the weather and the ocean are behaving and how the ice changes. So we need to develop automated systems which can provide physical, chemical, and biological data. We need to know how the system is behaving.

And the second thing is we need to better understand what the loss of sea ice means for biological productivity and what feedbacks will happen in the food web as sea ice declines.

As well as the observational data, we also need to have better models and also stronger links between the observations and the models. I know that people are making great efforts to develop higher resolution models but they need to know what

data to put into the models and all the data is not yet there.

I think a special challenge for the Arctic is the need to develop regional models, because the global models are not able to show what is happening at the regional level. For example it is important to know what is happening or will be happening in areas such as the Lena Delta or the coast of Greenland.

NA: *What do governments need to be doing to address climate change and adapt to the changes that we are now seeing in the Arctic?*

KL: The efforts of natural sciences need to be better linked to economics and social science. Only then can you make the link that governments will understand. They want to know what does it cost and what solutions we have. So in addition to making everyone aware of carbon dioxide emissions, we need to help governments address the changes that we think are likely to happen in the Arctic to prevent the worst and to adapt to the changes.

There are natural resources that can be exploited in the Arctic. But it will be very important to come to international agreements. The Arctic has a lot of national territories so it is important to create international treaties which protect the Arctic.

Of course these countries are all eager to find out what benefits there are and I think this is natural, but at the same time we have to be really careful that this is not done

to the detriment to the whole system. It needs to be done in a way that does not destroy the environment. An agreement needs to have an obligation for nations to monitor changes and devise technical

and legal solutions to prevent excessive pollution or other destruction.

Polar research and dealing with changes in the polar ecosystems is a truly international business. In the Arctic cooperation is very well developed and I hope we can continue to work together.

NA: *What part can NGOs such*

as WWF play to encourage policy-makers to adequately address climate change?

KL: NGOs have a big effect on governments — more than science. So I would hope or wish that NGOs and science can work closer together so that the results produced by research are quickly translated for the public and when we see that there is a problem, NGOs can use their resources to quickly address them.

Sometimes the link between the science community and NGOs is a bit disturbed. Maybe scientists say that NGOs are too one-sided and NGOs say that scientists' interests are too narrow in their focus. But we have to work together.

Scientists are interested in the maintenance of this world so we should really try to have a better exchange of information and knowledge. NGOs may go a different way to activate policy but we should not go against each other.

The efforts of natural sciences need to be better linked to economics and social science. Only then can you make the link that governments will understand.

BOOK REVIEW

Oil, Globalization, and the War for the Arctic Refuge

David M. Standlea

ISBN: 0791466329

Pages: 209

Published: State University of New York Press – January 2006

In *Oil, Globalization, and the War for the Arctic Refuge*, David Standlea explores and analyses the fight to protect the Arctic Refuge within a larger global and historical context.

Standlea frames the drilling debate as a non-violent battle in the "resource wars" and a conflict between these very different world-views.

He is particularly interested in the underlying belief systems, values and assumptions that all of the players bring to the drilling debate in the Arctic Refuge. It is after all these conscious and subconscious

...we need to better understand what the loss of sea ice means for biological productivity and what feedbacks will happen in the food web as sea ice declines.

Forthcoming arctic meetings & events

Arctic Council events

Arctic Monitoring and Assessment Programme — Mercury Experts Group meeting

WHERE: Copenhagen, Denmark • WHEN: 29–31 October • MORE INFO: www.amap.no

Sustainable Development Working Group meeting

WHERE: Vadsø, Norway • WHEN: 30–1 October • MORE INFO: www.sdwg.org

Senior Arctic Officials meeting

WHERE: Narvik, Norway • WHEN: November 28–29 • MORE INFO: www.arctic-council.org/

Conferences and workshops

15th Arctic Conference

WHERE: Pocatello, Idaho • WHEN: 1–3 November • MORE INFO: E-mail: maschner@isu.edu

First Workshop on Sustaining Arctic Observing Networks

WHERE: Stockholm, Sweden • WHEN: 12–14 November • MORE INFO: www.arcticobserving.org/

“On the Role and Place of Universities in Sustainable Development of the Arctic and the North” Conference

WHERE: Dubna, Moscow, Russian Federation • WHEN: 20–22 November • MORE INFO: E-mail: 40584@mail.ru

4th ArcticNet Annual Scientific Meeting

WHERE: Collingwood, Ontario, Canada • WHEN: 11 – 14 December
MORE INFO: www.arcticnet-ulaval.ca/index.php?fa=ASM.2007conference

The Arctic Natural Climate Change Workshop

WHERE: University of Tromsø, Tromsø, Norway • WHEN: 12–14 December
MORE INFO: siempre.arcus.org/4DACTION/wi_cal_getEvent/952

2nd Annual Arctic Frontiers Conference

WHERE: Tromsø, Norway • WHEN: 20 – 25 January, 2008 • MORE INFO: www.arctic-frontiers.com

“Living with Climate Change: Are There Limits to Adaptation?” Conference

WHERE: London, UK • WHEN: 7 – 8 February, 2008
MORE INFO: www.tyndall.ac.uk/research/programme3/adaptation2008/index.html

Arctic Discourses 2008

WHERE: Tromsø, Norway • WHEN: 21 – 23 February, 2008 • MORE INFO: uit.no/humfak/arkdisk/4?Language=en

Arctic Science Summit Week 2008

WHERE: Syktyvkar, Russia • WHEN: 26 March – 1 April, 2008 • MORE INFO: www.iasc.se

For more on these events and other meetings, please visit:

<http://www.arcus.org/Calendar/upcomingEvents.shtml> • www.iasc.no/SAM/samtext.htm

beliefs that inform how we interact with nature — whether we see it as a resource to be exploited or something that we need to protect and manage or a place that we rely for our survival.

On one side of the debate are the oil companies and the US Bush administration, which Standlea describes as the “corporate-military complex” and on the other side of the resource war is the coalition of conservation groups, social justice groups, and the Gwich’in Athabaskan Nation, who according to Standlea generally represent “true democratic values”.

And within these two different camps are further distinctions. The corporations are primarily driven by the need to generate a profit, whereas some politicians appear to be driven by ideology and the need to create a legacy. Standlea looks at the history of the environ-

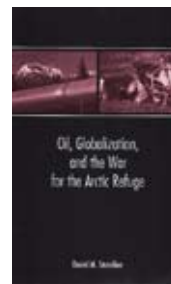
mental movement and its gradual shift from the early environmental ethic of the 1970s to the embrace of “sustainability” in the 1980s and the need to balance economic and social arguments.

Standlea’s background is political science and political ecology — a discipline typically used to understand social issues in the “third world”. It feels like a book written by an academic but it is a

very engaging and an interesting read, and I found the notes at the end of the book very informative.

As we see nations rushing to stake territory and mineral claims in the Arctic, a book like this that examines the complexities of the wider conflict at play is very timely.

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Arctic Bulletin supported by the Weston Foundation

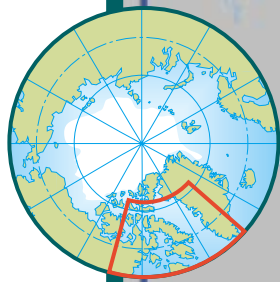
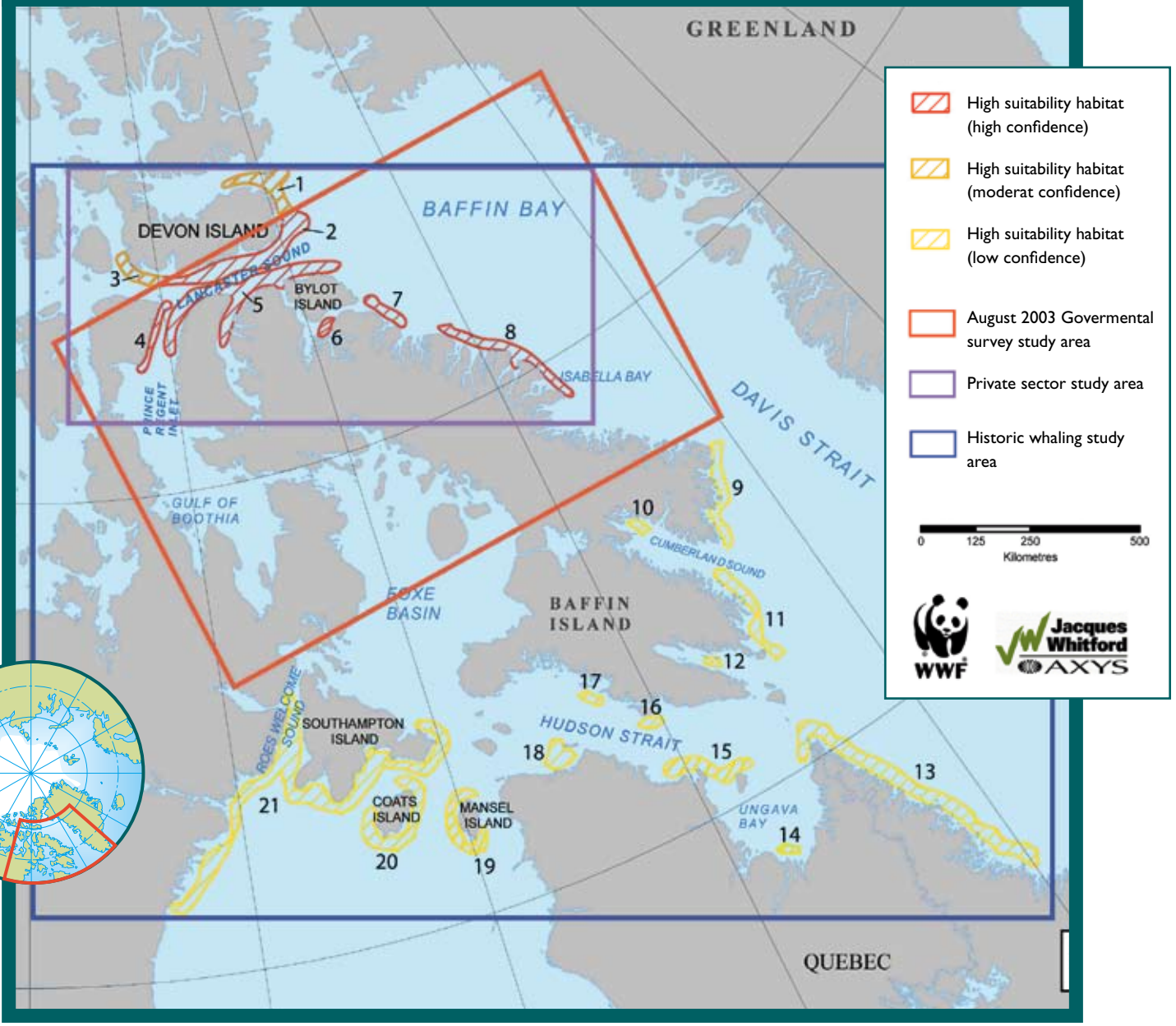
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beauty and importance of the Arctic, so integral to the Canadian consciousness, is shared with those who have a stake in its conservation. WWF gratefully acknowledges The W. Garfield Weston Foundation for its support.

Identified high suitability/critical bowhead whale habitat Eastern Canadian Arctic



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WWF is the world's largest and most experienced independent conservation organisation, with almost five million supporters and a global network active in 90 countries. WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature. WWF continues to be known as World Wildlife Fund in Canada and the United States of America.



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