



Arctic Bulletin



No 1.07 • PUBLISHED BY THE WWF INTERNATIONAL ARCTIC PROGRAMME

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The Arctic Bulletin

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Date of publication:

February 1st, 2007
ISSN 1023-9081

Cover: A young man in Kamchatka learns how to herd reindeer as part of a WWF project to provide locals with sustainable livelihoods based on traditional lifestyles.
Photo: Laura Williams, WWF-Russia

Printed at Merkur-Trykk AS
on 100% recycled paper.

Editorial

A new age for the Arctic

The winds of change are blowing in the Arctic. Record after record is being 'set' as each new scientific paper catalogues decreases in ice area, ice thickness, and glacier melting, together with dramatic increases in temperature, river flow, and incidence of new southern species appearing at higher latitudes.

Similarly, there is record public interest in the Arctic as a result of the obvious impacts of climate change. Newspapers all over the world have almost daily coverage of yet another arctic 'catastrophe'. To use an Australian colloquialism: even Blind Freddy could not ignore what is happening!

There are also significant shifts in the flavour of arctic governance with the Arctic Council secretariat moving to Scandinavia and strongly renewed geopolitical interest in the region from many of the 'great powers'. This is a new age for the Arctic, one in which the arctic nations, peoples, and organisations such as WWF can work together to create a sustainable future – or an age in which change in the Arctic results in a merciless rush to extract its finite resources at the expense of the world.

In such a dynamic context I feel quite humbled writing my first editorial as director of the WWF International Arctic Programme following in the footsteps of two highly experienced, committed, and successful advocates for arctic conservation. The respect and influence WWF enjoys in the region is largely due to the efforts of Samantha Smith and Peter Prokosch, and those of their staff and colleagues around the world.

In spite of this work the necessity of achieving real, resilience-building outcomes in the Arctic is now urgent and daunting. Much more than simply the 'canary in the coal mine' of global climate change, the Arctic is the region where much of the world's future may be decided over the coming decades. That future will focus on our response to human-induced climate change.

The WWF Network and its partners are very well placed to shape the directions, decisions, and strategies that will be adopted.

The process of shaping this future cannot just be based on a continuation of past activities. The Arctic is now a global political issue and should remain one into the future. As I write, the *Summary for Policymakers* of the IPCC Working Group II (Impacts and Adaptation) is being debated, with early drafts echoing what most of those with an ear to the

ground already know: we are seeing major changes in ecosystem structure and function in the Arctic as a result of climate change, with global implications.

The much talked about 'positive feedbacks' and 'thresholds' may already be occurring. There is increasing evidence of more rapid disappearance of snow and sea ice cover in some areas (e.g., Siberia, Alaska, the Greenland Sea) leading to further climate change through decreased sunlight reflection (the albedo effect) and insulation effects. The basic physics of the magnification of global temperature rises in the Arctic (up to a factor of three times, but consistently double over the past several decades) indicate that enormous efforts are required in the Arctic and, more importantly, around the world.

Beyond these effects, we must now also take seriously the potential for processes that were previously regarded as improbable – including massive releases of methane from melting permafrost and currently solid deposits on the seafloor – which would hugely increase the amount of this powerful greenhouse gas in the atmosphere.

Such issues raise many challenges, not least the need to engage even more strongly with the scientific community, the nations who govern the region, the peoples who live in and use the Arctic, and indeed the wider global community.

We need to think carefully about appropriate conservation strategies, governance regimes, and ways to deal with the myriad of complex and interacting issues, often originating far from their points of impact. Importantly we need to learn to better speak many 'languages', including those of business, media, politics, and science, to communicate the burning need for action. Practical solutions are needed now at local and global scales and cannot be achieved by WWF alone.

The intrinsic values of the Arctic and the immediate threats to these values and to the rest of the world are sobering. However if we want to maintain a stable world, we have no alternative but to find solutions. Together, let us make it happen in the Arctic, and bring to life WWF's slogan: *For a Living Planet*.



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CLIMATE CHANGE COLLEGE 2007

Year two of the B&J's Climate Change College (in which WWF is a partner) is under way, with six ambassadors chosen from the UK, Ireland, Netherlands, and Germany. The College offers 18–30 year olds the chance to educate themselves about the causes and politics of, and potential solutions for, climate change with an emphasis on developing their own climate change campaign. Each of the ambassadors is tasked with using their personal experience to reach a wider audience. This could be through journalism, public speaking, or other kind of event. Their ultimate goal is to inspire carbon emissions reductions as well as the tangible goal of signing up 500 new e-campaigners for WWF. Read more about the College as well as the ambassador's blogs at: www.climatechangecollege.org

ORCAS ATTRACTED TO WARMER ARCTIC WATERS?

Orcas (or killer whales) appear to be showing up in greater numbers and staying longer in Hudson Bay, Canada. Jeff Higdon, a graduate student at the University of Manitoba working with the federal Department of Fisheries and Oceans, told Reuters: "For a number of years, Inuit hunters in the eastern Arctic have been reporting that the number of killer whales is increasing." The reason for their appearance is still unknown, although Higdon noted that there was a "significant correlation" between declining sea ice in Hudson Bay and increased recorded sightings of orcas. Although orcas have often frequented the waters of Hudson Bay, researchers and Inuit hunters are keen to understand the recent increase in sightings. Source: Reuters

IPCC and the Arctic

The latest report from the Intergovernmental Panel on Climate Change (IPCC) presents a dire outlook for the Arctic and the rest of the planet unless something drastic is done to curb greenhouse gas emissions.

The IPCC report confirms much of what is already known about the current and projected impacts of climate change in the Arctic. Over the last few decades, arctic surface air temperatures have warmed at around twice the global rate and major ecosystem shifts are beginning to be seen

in areas such as the Bering Sea (see box below).

If climate change continues along the scenario trajectories projected by the IPCC, then some arctic species, especially the top-level predators, could decline or disappear altogether.

IPCC experts state clearly that some climate change is already unavoidable, but that there is still time to protect against some of the most disastrous effects. This response must come as part of a broad and rapid change of develop-

Example climate change impacts in the Arctic*:



Hudson Bay: fewer polar bear cubs



Northern Siberia: methane emissions

■ Increased shoreline erosion already seen on Arctic Ocean & Beaufort Sea coasts due to climate warming (1970–2000 relative to 1954–1970).

■ The Arctic could change from a region that traditionally stores greenhouse gases such as carbon dioxide and methane, to a region that emits these gases in vast quantities as its permafrost melts. In Northern Siberia alone, methane emissions from wetlands are estimated to increase by 10–63 percent. This methane source comprises a positive feedback to climate change, as the thawing increases in response to further warming.

■ In both the Arctic and Antarctic, climate change will lead to reduced habitat (including sea ice) for migratory birds and mammals, with major implications for predators such as seals and polar bears that rely on sea ice for hunting.

■ The condition of adult bears has declined in the Hudson Bay region and first-year cubs come ashore in poor condition. The number of cubs as a proportion of the population has also fallen as a result of the early break-up of sea ice.

■ The pole-ward migration of existing species and competition from invading species will continue to

ment strategies, looking to avoid continued significant carbon dioxide emissions.

Dr Lara Hansen, chief scientist in WWF's Global Climate Change Programme, said: "The IPCC makes it clear that there is a window of opportunity – but that it's closing fast. The world needs to use its collective brains to think ahead for the next ten years and work together to prevent this crisis."

In the IPCC's strongest conclusion yet regarding the cause of climate change, it says that it is 90–99 percent likely that climate change is caused by humans.

Sea ice retreating faster than IPCC models predicted

A recent study by the National Snow and Ice Data Centre (NSIDC) and the National

Centre for Atmospheric Research (NCAR) concluded that satellite and other observations show that arctic ice cover is actually retreating more rapidly than estimated by any of the 18 computer models used by the IPCC in preparing its 2007 assessments.

Mark Serreze, NSIDC scientist and co-author of the study, said: "Our study indicates that the impacts of greenhouse gases on arctic sea ice are strong and growing."

See the back cover for a comparison of actual observations versus the decline predicted by IPCC models.

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Read an interview with Dr Robert Corell, chair of the Arctic Climate Impact Assessment, on page 14-16



Arctic ice retreating

alter species composition and abundance. These southern emigrants to the Arctic will also bring with them new parasites and/or diseases to which arctic species are not adapted, thereby increasing mortality.

■ Warming of areas of the northern polar oceans has already had a negative impact on community composition, biomass, and distribution of phytoplankton and zooplankton (read the article *Rapid climate change and the sea ice ecosystem* on page 14–16).

■ Arctic glaciers will continue to retreat with a consequent impact on global sea level.

**Information from the IPCC Fourth Assessment Report's Working Group II (impacts, adaptation and vulnerability). A summary for policy makers of the science report from Working Group I (science of climate change) was released in February 2007 and the summary from Working Group III (mitigation of climate change) was released in May 2007. For more information see: www.ipcc.ch*

PROPOSED PIPELINE CUTS THROUGH STRUGGLING CARIBOU HERD'S RANGE

The Mackenzie Valley Pipeline Joint Review Panel was told during a hearing in Inuvik, Northwest Territories (NWT), Canada, that the proposed Mackenzie Valley gas pipeline would cut through the middle of the range of the Cape Bathurst caribou herd. The herd's population has dropped alarmingly, from 17,500 in 1992 to 1,800 in 2006. John Nagy, a biologist with the NWT government, said: "The small number of calves in early July indicates that few yearlings will be recruited to the Cape Bathurst herd in 2007. This suggests that a further decline in the Cape Bathurst [herd] can be anticipated." The Canadian government recommends Imperial Oil, the lead partner in the pipeline project, monitor the herds and develop a management plan. Source: Canadian Broadcasting Corporation

BOWHEAD SANCTUARY CREATED BUT PROTECTION NEEDED FOR NARWHAL

A deal to create a sanctuary for bowhead whales in Isabella Bay, Nunavut, Canada, has been signed between the Canadian government and Nunavut's land claim organisation. Local people have been seeking protection for the area since 1982. The deal now needs to be ratified by Inuit groups and then signed off by the Canadian government. Pete Ewins, species director at WWF-Canada, says the deal is an essential step but pointed out that there are many areas of Nunavut that still require protection, such as Milne Inlet and Eclipse Sound in North Baffin, an important narwhal habitat, where there is increasing pressure to construct a year-round deepwater port to extract iron ore. Nunavut's caribou calving grounds are also threatened as the area has been subject to heavy mineral staking. Source: Globe and Mail

Ice-free arctic summers by 2040?

Unless greenhouse gas emissions are significantly reduced the recent retreat of arctic sea ice is likely to accelerate so rapidly that as early as 2040, the Arctic Ocean could become nearly devoid of ice during summer.

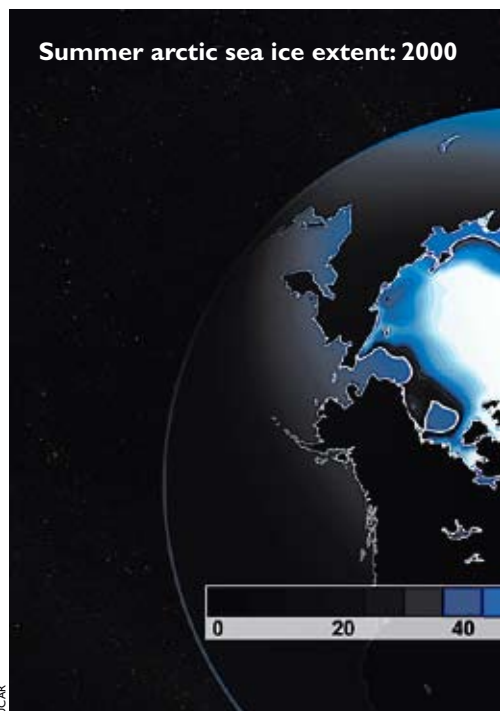
This is the conclusion of a study conducted by scientists from the US National Center for Atmospheric Research (NCAR), the University of Washington, and McGill University. By running model simulations on supercomputers, the team showed that the extent of sea ice each September could be reduced so abruptly that, within about 20 years, it may begin retreating four times faster than at any time in the observed record.

Arctic sea ice has retreated in recent years, especially in the late summer when ice thickness

and area are at a minimum. To analyse how global warming will affect the ice in coming decades, the team studied a series of seven simulations run on the NCAR-based Community Climate System Model, one of the world's leading tools for studying climate change.

The model results indicate that, if greenhouse gases continue to build up in the atmosphere at the current rate, the Arctic's future ice cover will go through periods of relative stability followed by abrupt retreat. For example, in one model simulation the September sea ice extent shrinks from about 5.9 million to 2 million square kilometres (2.3 million to 770,000 square miles) in a 10-year period.

In this model run only a small amount of perennial sea ice remains along the north coasts of



Greenland and Canada by 2040, while most of the Arctic Basin is ice-free in September. Winter ice also thins from about 3.6 metres (12 feet) thick to less than one metre (3 feet).

The scientists also concluded

Winter sea ice close to record low

National Snow and Ice Data Centre (NSIDC) scientists announced that the maximum extent of arctic sea ice in winter 2007 was the second-lowest in the satellite record, narrowly missing the March 2006 all-time lowest record.

Sea ice extent, or the area of ocean that is covered by at least 15 percent ice, was 14.7 million square kilometres (5.7 million square

miles) for March 2007, compared with 14.5 million square kilometres (5.6 million square miles) for March 2006, the current lowest record. The long-term monthly mean for March sea ice extent from 1979 to 2000 is 15.7 million square kilometres (6.1 million square miles).

Scientists monitor arctic sea ice year-round, paying special attention to its extent during March and

September. March usually marks the end of winter in the Arctic, a period when sea ice grows, or recovers, from the summer minimum.

Low winter recovery means that the ice is forming later in the autumn and growing at a slower pace during winter.

September usually marks the end of the summer melting season; low summer extent means that sea ice is melting faster during summer, leaving less ice to build on during winter recovery.

Walt Meier, NSIDC scientist, said: "This year's low wintertime extent is another milestone in a strong downward trend. We're still seeing near-record lows and higher-than-normal temperatures. We expect the downward trend to continue in future years."

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New director for the WWF International Arctic Programme

Dr Neil Hamilton is the new director of the WWF International Arctic Programme. A geographer by training, Neil has more than 15 years experience in the strategic development and leadership of national and international global change programmes on issues such as climate, the carbon cycle, water management, marine and bioregional planning and food security.

Neil said: "The next ten years



will seal the fate of the Arctic. Either it will be the victim of human greed and ignorance or the shining example of what can be achieved through collective effort to find real solutions.

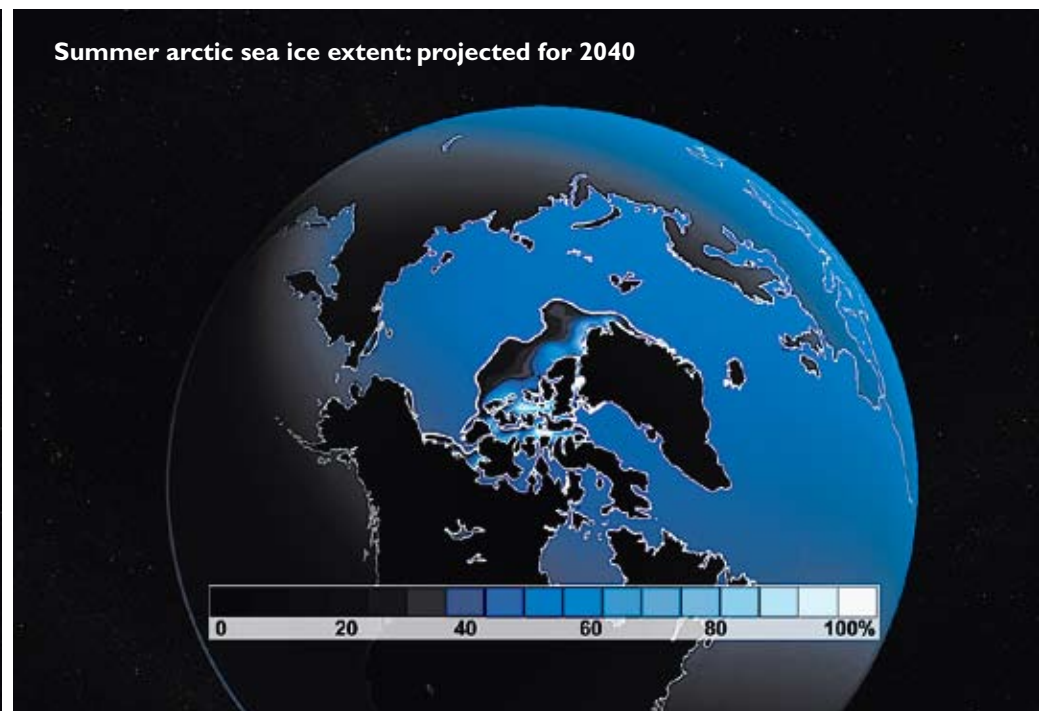
"The WWF International Arctic Programme works across the entire region to find those solutions in concert with the WWF network

and our partners in a way that no other body, official or otherwise, can or does. The role we play therefore is critical to the future of the Arctic. That's quite a responsibility to take on. I'm confident that we can collectively find those solutions and help implement them."

Neil left his position as Director of FEAST, a European Union/Australian funded initiative on science and technology cooperation in Canberra, Australia.



Summer arctic sea ice extent: projected for 2040



that if emissions of carbon dioxide and other greenhouse gases were to slow, the likelihood of rapid ice loss would decrease. Instead, summer sea ice would probably undergo a much slower retreat.

Marika Holland, NCAR scientist

and the study's lead author, said: "Our research indicates that society can still minimise the impacts on arctic ice."

The study was published in the December 12, 2006 issue of *Geophysical Research Letters*.

Animated simulations can be viewed at: www.ucar.edu/news/releases/2006/arcticvisuals.shtml

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Source: NCAR

By 2040, the Arctic may be nearly devoid of sea ice during the late summer unless greenhouse gas emissions are significantly curtailed.



Massive ice sheet breaks away

In December 2006, after piecing together evidence from seismic readings and satellite images, scientists revealed that a giant ice shelf had broken away in the Canadian High Arctic.

A huge section of Ayles Ice Shelf on Ellesmere Island in Nunavut, Canada, broke away and floated out to sea on 13 August 2005.

According to news reports, the break took less than an hour, and Dr Luke Copland, director of the University of Ottawa's Laboratory for Cryospheric Research, described the break as evidence of the Arctic's rapid response to warming temperatures.

Dr Copland said: "Since 1900, approximately 90 percent of the Ellesmere Island ice shelves have calved and floated away. This is a

one-way process as there is insufficient new ice formation to replace the ice that has been lost.

"The Ayles calving event was the largest in at least the last 25 years; a total of 87.1 square kilometres (33.63 square miles) of ice was lost in this event, of which the largest piece was 66.4 square kilometres (25.64 square miles) in area. This piece is equivalent in size to approximately 11,000 football fields or a little larger than the city of Manhattan."

More information: www.ice.ec.gc.ca/app/WsvPageDsp.cfm

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Source: NASA, Canadian Ice Service & University of Ottawa

Intense period of polar research

The 2007–08 International Polar Year (IPY), a period of intense study on the Arctic and Antarctic, officially began on 1 March 2007 with numerous ceremonies taking place around the world.

The official opening ceremony took place at the Palais de la Découverte, a renowned science museum in Paris, France.

The IPY represents one of the most ambitious coordinated international science programmes ever attempted, with over 60 countries participating in more than 200 projects, over 50 of which focus on education and outreach.

The poles are recognised as sensitive barometers of environmental change and IPY researchers will explore the strong links these regions have with the rest of the globe. Polar science is crucial to understanding our planet and our impact on it.

Stefan Norris, head of conservation for WWF's International Arctic Programme, said: "For WWF, the IPY presents a unique opportunity to pool resources towards the goal

of saving this planet from some of the major destructive forces it is facing.

"With more solid documentation and systems for understanding the functions and dynamics of the polar ecosystems, we will have much better tools and information for backing up WWF's work on securing the future for these incredibly important regions, and for the global processes they so strongly influence."

WWF has been working closely with, and also funding the work of, a number of the scientists who will be leading core IPY initiatives. We are also directly involved in several of the field projects being implemented under IPY.

Pete Ewins, species conservation director for WWF-Canada, said: "IPY only happens every 50 years or so, and the original intent way back in the 19th century – better integrated and focused scientific research in polar regions – is arguably even more pressing today than it was then."

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Narwhal quotas in Greenland continue to exceed recommended sustainable levels.



Greenland's narwhals still in trouble

Narwhal hunting in Greenland continues at levels significantly higher than the recommended sustainable level set by the North Atlantic Marine Mammal Commission (NAMMCO) of 135 whales annually.

NAMMCO has previously expressed grave concern about the apparent decline of narwhal and beluga stocks in West Greenland. While the commission commended Greenland for the recent introduction of quotas, it is still very concerned that present takes of narwhals and belugas in West Greenland

will lead to further depletion of the stocks.

WWF previously reported on the increase of the Greenland hunting quota for the 2005–06 hunting season from 260 to 310 narwhals following two illegal hunting events in West Greenland (see *Arctic Bulletin* 01.06).

For the 2006–07 hunting season, the quota was further increased to a record 385 narwhals – almost three times the recommended sustainable hunting level.

Back in 2004 when the quota system was introduced,

the Greenland government promised to reduce hunting pressure.

Greenland did enforce a voluntary ban in 2006 on export of all narwhal products, including tourist souvenirs. This came after a European Union import ban on narwhal products and after increasing pressure from the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

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Populations of polar bear in decline

Five of the 19 polar bear sub-populations in the world are in decline, an indication that the entire Arctic ecosystem is under immense stress as a result of climate change.

With the Arctic warming at more than twice the rate of the rest of the world, and sea ice over the Arctic projected to disappear in summer before the end of this century (see *Ice-free arctic summers by 2040?* on page 6–7), polar bears – which depend on sea ice to live, hunt, and breed – face serious trouble.

Stefan Norris, head of conservation for the WWF International Arctic Programme, said: “The polar bear’s powerful grip on the Arctic is slipping.

“We need to stop run-away warming. Climate change is melting the ice-bear’s toe-hold on life. This bad news for polar bears is also bad news for other arctic species, and for the indigenous peoples whose traditional ways of life depend on them.”

According to a newly published report by the World Conservation Union’s (IUCN) Polar Bear Specialist Group (PBSG), the two best-studied polar bear sub-

populations, the western Hudson Bay population (Canada) and the southern Beaufort Sea population (US/Canada), have declined by 22 percent and 17 percent, respectively, over the past two decades.

The other three sub-populations in decline are those in Baffin Bay and Kane Basin (Greenland/Canada) and Norwegian Bay (Canada).

The PBSG report also documents incidents of drowned polar bears and cannibalism, as well as increased numbers of ‘problem’ bears (bears looking for food near arctic communities) in many areas. These observations are consistent with predicted changes caused by climate warming.

The report’s findings have prompted WWF to issue an urgent call to action to the world’s governments to cut carbon dioxide emissions, the cause of dramatic warming in the Arctic.

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Read the feature *Time for action on polar bears* on page 20.

Adult polar bear walking through semi-frozen sea water, known as “grease ice”. Hudson Bay, Canada.

Bryan & Cherry Alexander Photography, www.arcticphoto.co.uk

Hunting of Chukotka’s polar bears?

After six years of negotiations, in December 2006 the US Congress passed the implementing legislation needed for a US-Russia agreement on the conservation and usage of the Chukotka-Alaska polar bear sub-population.

This agreement may allow limited hunting of polar bears, but WWF believes that serious monitoring should take place prior to any hunting.

Viktor Nikiforov, WWF-Russia’s regional programmes director, said: “For the first time since 1956, when hunting for polar bears was strictly

prohibited in Russian territory, limited hunting for polar bears may be allowed.

“At present the Chukotka-Alaska sub-population of polar bears is in a tough situation because of global warming. It is necessary to organise intense monitoring of the sub-population before starting to hunt for polar bears.”

After ratification of the agreement, a committee on polar bear conservation will be organised. Two commissioners from each party, Russia and the US, will be the representatives of indigenous people and governments.

Russia will be represented by the Ministry of Nature Resources of the Russian Federation, and the US will be represented by the US Fish and Wildlife Service.

At the first meeting, the commissioners should develop a list of recommendations, including key issues devoted to conservation and usage of the polar bear sub-population, hunting limits, and the period of any hunting season.

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Pipeline assessment must include how gas will be used

Environmental groups representing millions of North Americans are calling on the Joint Review Panel (JRP) for the Mackenzie Gas Project to consider, as an integral part of the project, how the gas carried by the pipeline would be used.

WWF-Canada has asked the Panel to consider end-use scenarios and thus address the project's full impact, including global warming impacts from all end products.

The project, backed with billions of dollars from big oil and Canadian federal and territorial governments, would trigger the petro-industrialisation of Canada's North, destroy parts of the region's boreal forest, and power greenhouse-gas-intensive projects such as further development of Alberta's tar sands, which fuel North America's cars

and trucks (see *Connected to the Arctic: What in tar nation?* on page 21–22).

Pipeline proponents continue to dispute a link between the gas, to be extracted from the Beaufort Sea, and the tar sands.

However the Sierra Club of Canada has obtained new maps, which indicate that a direct inter-connection is planned. The organisation insists the JRP must assess global warming and other impacts associated with using gas carried by the Mackenzie Gas Pipeline to produce the most carbon-intensive oil on the planet.

With the US as a major market for Canadian energy, US groups have been closely following the hearings as well.

The organisations have noted that only one-third of the gas

fields needed to provide gas for the pipeline has been included in the environmental assessment for the project.

It is particularly unbalanced to exclude the development and global warming impacts of the other two-thirds of the gas since the project's proponents have counted their economic benefits.

The JRP hearings on cumulative effects, and project sustainability and alternatives, have yet to be scheduled. It is expected that these vital topics will be covered later this year, and that the JRP's final report and recommendations will be submitted by December 2007.

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WWF assists with Norwegian oil spill

Specially trained WWF volunteers swiftly deployed to the west coast of Norway to help the Norwegian coast guard with clean-up efforts after a Cypriot oil tanker ran aground in bad weather, spilling several hundred tonnes of oil into the North Sea.

According to authorities, about one-

third of the oil spill has already been cleaned up, but some 300 tonnes of bunker oil leaked out, with oil already reaching the coast.

Rasmus Hansson, CEO of WWF-Norway, said: "This is very sad, but luckily the ship was in ballast and had only bunker oil. If this was a fully loaded

oil tanker it would have been a tragedy for this area."

WWF is concerned about the impact of the oil spill on the local coastal environment, particularly the eider duck population and other seabirds in the area.

Since 2005, WWF-Norway has been training volunteers in oil spill clean-up techniques. The cost-free programme offers a professional and practical training course, giving the volunteers a broad insight into oil-spill clean-up strategies, including organisation, execution, and general knowledge about the most common strategies for handling oil-spills in the open ocean, coastal areas, and shorelines.

So far, 150 volunteers have been trained. More will be trained in an on-site emergency training session for additional volunteers if necessary.

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WWF volunteers helping with oil-spill clean up efforts. Fedje, Norway.



WWF-Canari/Kevin Schaller

*View of
summer sunset
over Bristol
Bay, Alaska.*

Bush lifts drilling ban in Alaska's Bristol Bay

US President George W. Bush has lifted a ban on oil and gas drilling in Bristol Bay, Alaska, which has been protected since 1989 through a presidential withdrawal first declared by President George H. Bush.

The US government has spent US\$95 million to buy back the oil and gas leases it sold in Bristol Bay prior to the withdrawal.

Bill Eichbaum, managing director and vice-president of the marine portfolio at WWF-US, said: "I am very disappointed with the president's action. Bristol Bay should be off the table for drilling.

"We will now work with Congress to override the president's action and re-instate the Congressional moratorium on oil and gas devel-

opment in Bristol Bay which was allowed to expire in 2004."

Bristol Bay supports important fish stocks as well as marine mammals, including the world's most endangered whale species, the North Pacific population of northern right whales.

Eichbaum said: "Why risk ruining a billion dollar fishery, a valuable sport hunting and fishing industry, a critical resource for Native Alaskans, and one of the most important places for marine wildlife populations in the Bering Sea?

"An oil spill in Bristol Bay would have devastating impacts with little chance of a complete recovery."

Bristol Bay and the North Aleutian shelf experience intense

storms with high winds and massive seas through the winter months. Offshore infrastructure would be exposed to the full fury of these storms at a time of year when response efforts would be effectively impossible. In addition, the seismic testing required to find oil and gas reserves is known to disturb marine mammals and even fish and crabs.

Bristol Bay represents just a minor part of Alaska's oil and gas potential. Natural gas drilling at Prudhoe Bay — where the field is delineated and infrastructure is in place — is a much more substantial energy source.

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Sustainable livelihoods

Communities in Russia's Kamchatka Peninsula are working with WWF to revive their traditional lifestyle and strengthen nature protection. WWF-Russia's Laura Williams reports.

In early 2006, WWF launched an ambitious two-year project, with funding from the European Union (EU) through the Tacis Institution Building Partnership Programme, to help revive reindeer herding and indigenous traditions in Koryakia, an autonomous republic located on the northern part of the Kamchatka Peninsula in the Russian Far East.

The overall objective of the project is to improve protection of biodiversity in and around the Koryaksky Nature Reserve by creating opportunities for sustainable livelihoods in indigenous communities.

There are 61 ethnic groups in the region, the majority of which are Russians, Koryaks, Chukchis, and Itelmens.

WWF's work is helping build capacity for reviving local traditions based on reindeer herding, hunting, and fishing, which in many settlements have been replaced with the modern-day woes of alcoholism, unemployment, and economic hardship.

Indigenous children have been uprooted from their cultures and their families. Without appropriate education, positive influences, or opportunities, they too become the victims of alcoholism and poverty. Some turn to poaching to feed their families, while others give up and leave for other parts of Russia. Ironically, all of this hardship is against the backdrop of one of the richest regions in Russia for mineral resources, and an area where nature has been preserved in a more or less pristine state.

One of the project's target groups is the indigenous community of Khailino, where a model project and business plan for implementing best practices in reindeer herding is being developed and master classes on traditional handicrafts are encouraging a new generation of artists and artisans.

The winner of the indigenous clothing sewing contest displays her work at an exhibit on Reindeer Herders' Day.



oods in Kamchatka

The reindeer herding industry has the potential to offer jobs to youths and adults alike, steering people away from poaching and other unsustainable forms of nature use. However, the current state of reindeer herding enterprises is such that the industry has become uncompetitive in modern market conditions.

While there are federal and regional government programmes aimed at supporting traditional indigenous livelihoods and reviving the reindeer herding industry in the Russian North, these mostly provide stop-gap measures and humanitarian aid as opposed to building capacity and expertise in best practices, marketing, and environmentally sound management.

In Koryakia, only reindeer meat is used, with the skins, fur, and antlers generally being discarded. These could be made into leather, clothing, and ornaments as was once the tradition. Given the high costs of transportation to get reindeer products to market, reindeer herding can only become viable if the entire reindeer is used and processed.

The Korfsky Reindeer Farm, in the indigenous community of Khailino, is one example of an enterprise that holds potential and has regular air communications with the district

centres. WWF has chosen the farm as a model site. A business plan and marketing strategy to identify potential markets for reindeer products and traditional handicrafts has been developed with the participation by the indigenous staff and members of the local community.

With support from the EU and the Administration of Koryakia, WWF organised training courses for reindeer herders and artisans, as well as youths interested in becoming reindeer herders.

WWF is also supporting four master classes for artisans in the community, aimed at teaching skills for making traditional handicrafts and artwork. Taught by village elders and targeting schoolchildren, unemployed youths, and women with children, the classes help to pass on traditions to the younger generation by teaching the art of wood carving and souvenir making, beadwork, treating reindeer skins, and sewing traditional clothing.

In conjunction with annual Reindeer Herders' Day, held in the village of Khailino at the end of February, WWF supported a contest and exhibit of the works from the master classes. The winners received prizes and recognition to provide them incentives to continue producing similar products.



Laura Williams/WWF-Russia

Young students with the most potential will be selected to participate in an all-Russia exhibit of traditional indigenous products in Moscow at the end of April to help them develop contacts and learn from experiences in other regions.

A teacher works with local children to teach them how to make beaded jewelry.

For reindeer herders, courses at the Saami Education Centre in Finland are planned in the autumn of 2007. WWF also supports a training course for young reindeer herders at the end of the school year before the herds go to summer pastures. The top six students will earn stipends to spend the summer tending reindeer in the field with experienced herders. This practical experience is crucial to ensure they learn the skills required, and that the elder reindeer herders pass their experience onto the younger generation.

WWF hopes that efforts to revive indigenous traditions in a model community in Koryakia will contribute to conservation of the region's unique and relatively intact biodiversity by promoting the traditional lifestyle that has existed for generations.

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Laura Williams/WWF-Russia

Children proudly display their work

Rapid climate change and the sea ice ecosystem

Much attention is paid to the effect of climate change and melting sea ice on the polar bear. But as Dr Brendan Kelly of the University of Alaska explains, the decline of sea ice will affect an entire ecosystem.

Over millennia Inuit and Alaskan Eskimos have evolved a rich culture supported by the Arctic's seasonal sea ice and the plant and animal life adapted to this ice habitat. Their dependence on the sea ice ecosystem is clearly evident: in the late 1800s, immediately following the decimation of bowhead whale and walrus populations by commercial whalers, approximately 50 percent of the Eskimo population in the Bering Strait region starved to death.

The whales and walruses exist, of course, not in isolation but as part of an ecosystem. This particular ecosystem is dominated by seasonal sea ice which strongly influences the climate, oceanography, and biology of the Arctic Ocean and surrounding lands.

Sea ice influences not only arctic climate but, in fact, global climate in several ways, most notably through a phenomenon first described to me by Alex Akeya, a Siberian Yupik walrus hunter on St. Lawrence Island in the Bering Sea.

As we travelled around the island in his walrus skin boat, Alex told me that in his language, the island is named *Savouqaq*, a reference to its shape. The island looks like something that has been wrung out like a wet rag. A Yupik creation story describes a raven diving to the bottom of the Bering Sea, taking mud in its beak, and, back at the surface, wringing out the mud to form the island. How, I asked Alex, did his ancestors know the shape of this large island – nearly 160 kilometres long – without the benefit of an aerial view? He explained that in the autumn, when the island is snow covered and the surrounding sea is not yet ice covered, an image of the island is occasionally reflected onto the cloud cover due to the high reflectivity of the snow in contrast to the low reflectivity of the water.

Indeed, it is now known scientifically that snow and ice reflect as much as 80 percent of the incoming sunlight, while sea water absorbs over 90 percent of the sunlight.

That differential reflection explains not only how ancient Yupiks knew the shape of *Savouqaq*, but also contributes strongly to the faster rate of climate change experienced today in polar regions.

One consequence of our warming climate is the melting of sea ice. Once that melt begins, it is accelerated by the resulting change in reflectivity. As the ice changes to water, the reflectivity of the surface goes from more than 80 percent to less than ten percent – resulting in further warming, more ice melt, and yet a further decrease in reflectivity. The importance of this *polar amplification* effect to global climate can be appreciated when the surface area of the polar seas – as much as 34 million square kilometres (13.1 million square miles) in the recent past – is taken into account.

Dependence on plankton

At the base of the sea ice ecosystem is a specialised type of algae adapted to very low light levels. Blooms of

Climate change impact on marine mammals

Two examples of the varied and often counterintuitive ways that climate change impacts species in the Arctic.

Walruses

Walruses feed on clams and other bottom-dwelling organisms. Over a nursing period of two or more years, the females alternate their time between attending a calf on the ice and diving to the bottom to feed. Record ice retreats observed in recent summers have seen the



Walrus and other marine mammals are already being affected by a decline in sea ice.

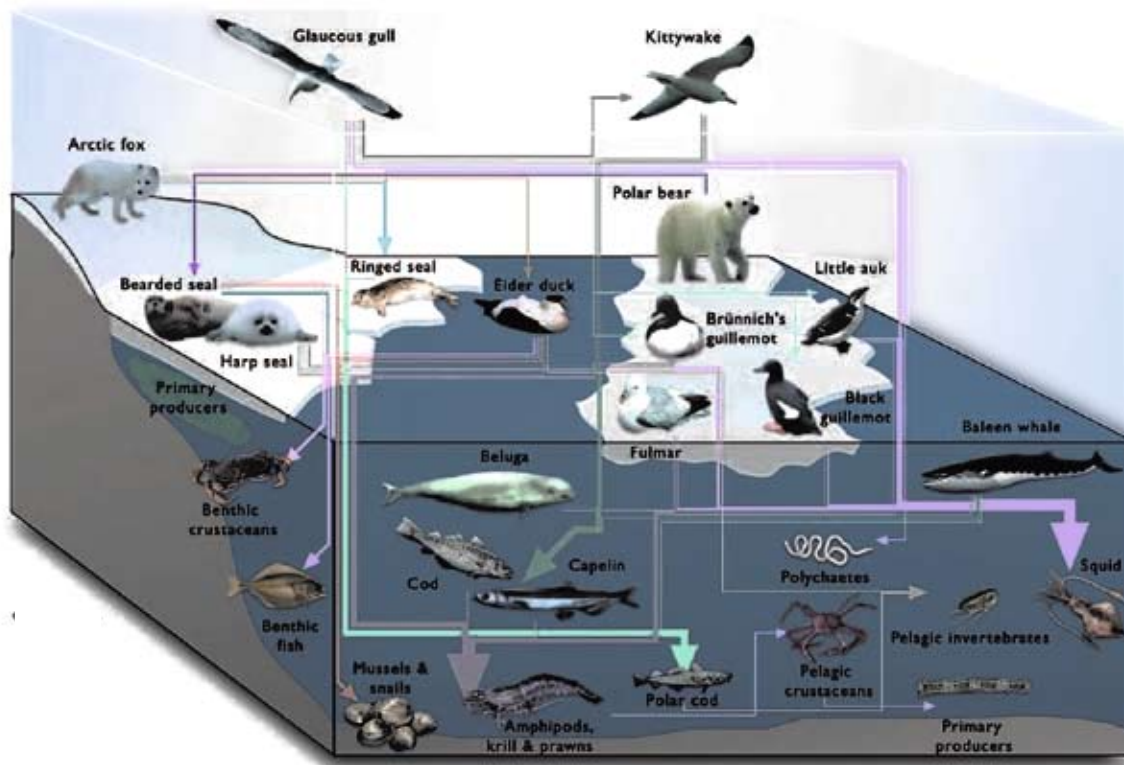
remaining ice over water too deep for the female walruses to feed.

Thus, the habitat suitable for nursing for adult feeding is becoming disconnected from the suitable nursing habitat. The prediction is for walrus populations to decline.

Ringed seals

Ringed seals can dive and feed at greater depths – their vulnerability to climate change

Arctic marine food web



Research in the Beaufort Sea suggests that ice algae at the base of the marine food web may have already been profoundly affected by warming over the last few decades.

these algae on the undersurface of the ice are the basis of an elaborate food web leading through zooplankton and fish to seals, whales, and polar bears. Sea ice also strongly influences winds and water temperature, both of which influence upwelling and other oceanographic phenomenon whereby nutrient-rich water is brought up

to depths at which there is sufficient sunlight for phytoplankton to make use of those nutrients.

The Bering Sea produces the US's largest commercial fish harvests as well as supporting subsistence economies of Alaskan Natives. Ultimately, the fish populations depend on plankton blooms controlled by the extent and loca-

tion of the ice edge in spring.

Many other organisms, such as seabirds, seals, walruses, and whales, also depend on primary production, mainly in the form of those plankton blooms. As arctic sea ice continues to diminish, the location, timing, and species make-up of the blooms is changing in ways that appear to favour a different

► 16

instead involves their dependence on the snow covering sea ice. The

Ringed seal pups die when warmer weather collapses their snow caves.



Bryan & Cherry Alexander Photography, www.arcticphoto.co.uk

major prey of polar bears and an important resource to Inuit, ringed seals face the counter-intuitive prospect of freezing deaths as a consequence of global warming.

Ringed seals give birth in snow caves excavated above breathing holes they maintain in the sea ice. The snow caves protect the pups from extreme cold and, to a large extent, from predators.

As the climate warms, however, snow melt comes increasingly early in the Arctic, and the seals'

snow caves collapse before the pups are weaned.

The small pups are exposed without the snow cover and die of hypothermia in subsequent cold periods.

The prematurely exposed pups are also more vulnerable to predation by arctic foxes, polar bears, gulls, and ravens. Furthermore, gulls and ravens are arriving increasingly early in the Arctic as springs become warmer, further increasing their potential to prey on the seal pups.

15 ► kind of ecosystem.

The spring melt of sea ice in the Bering Sea has long favoured the delivery of organic material to a bottom-dwelling community of clams, crabs, and other organisms. Those organisms, in turn, are important food for walruses, gray whales, bearded seals, and eider ducks. The earlier ice melts resulting from a warming climate, however, lead to later phytoplankton blooms that are largely consumed by zooplankton near the sea surface, vastly decreasing the amount of organic material reaching the bottom community. The result may well be a radically altered community of organisms favouring a different suite of upper level consumers. The subsistence and commercial harvests of fish and other marine organisms could be altered radically.

Ecosystem changes, of course, will be profound and affect more components than the fish. Many changes have already been observed (see box on pages 14–15) and are predicted to accelerate along with the rates of climate change. The changes to the arctic sea ice ecosystem will be especially rapid and profound. In the past few decades, we have already lost over 25 percent of the summer ice cover (see *Ice-free arctic summers by 2040?* on pages 6–7).

The scientific community is working diligently to understand the manifold impacts of our changing climate. For many researchers, there is a real sense of urgency given the pace of change and the tremendous economic and social impacts that will ensue. Many of the changes will not be readily obvious or, seemingly, even counterintuitive.

Ecosystems have changed before; species have become extinct before. What is critically important with our current changing climate is the rapid rate of change. Adaptation – biological and social – requires time. The current rates of change, however, are very steep. If the biological and social environments change too rapidly, species and societies will not be able to keep pace.

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Arctic view on global climate report

The WWF International Arctic Programme's Nigel Allan spoke to Dr Robert Corell, senior policy fellow with the American Meteorological Society and lead scientist on the Arctic Climate Impact Assessment, about the latest assessment report from the Intergovernmental Panel on Climate Change (IPCC) and its implications for the Arctic.

Nigel Allan: *Did the IPCC Fourth Assessment Report present what you would consider an accurate picture of the current scientific understanding of climate change in the Arctic?*

Dr Robert Corell: I would say very much so. I think the only thing in it that has been overtaken by more recent science in the public literature is the estimates on sea level rise, particularly from the melting of places like Greenland and some parts of the Antarctic. But by and large it's an outstanding document.

In the 2001 IPCC assessment, the sea level rise projections were based on models plus a reasonable understanding of what is happening with the ice sheet, particularly in places like Greenland. The most recent IPCC assessment in 2007 based their estimates on models only, and then put a couple of caveat statements afterwards saying that it is likely to be higher than this due to the rapid melting of glaciers and ice sheets like Greenland but that our ability to predict that with any confidence is not high enough to report herein.

But recent studies would strongly suggest that sea level rise is going to be accentuated by the melting of ice in Greenland and it is probably going to push it up closer to one metre than the smaller number that is in IPCC report now.

That doesn't take away from the fact that the IPCC increased our overall confidence in our science

Recent studies would strongly suggest that sea level rise is going to be accentuated by the melting of ice in Greenland.

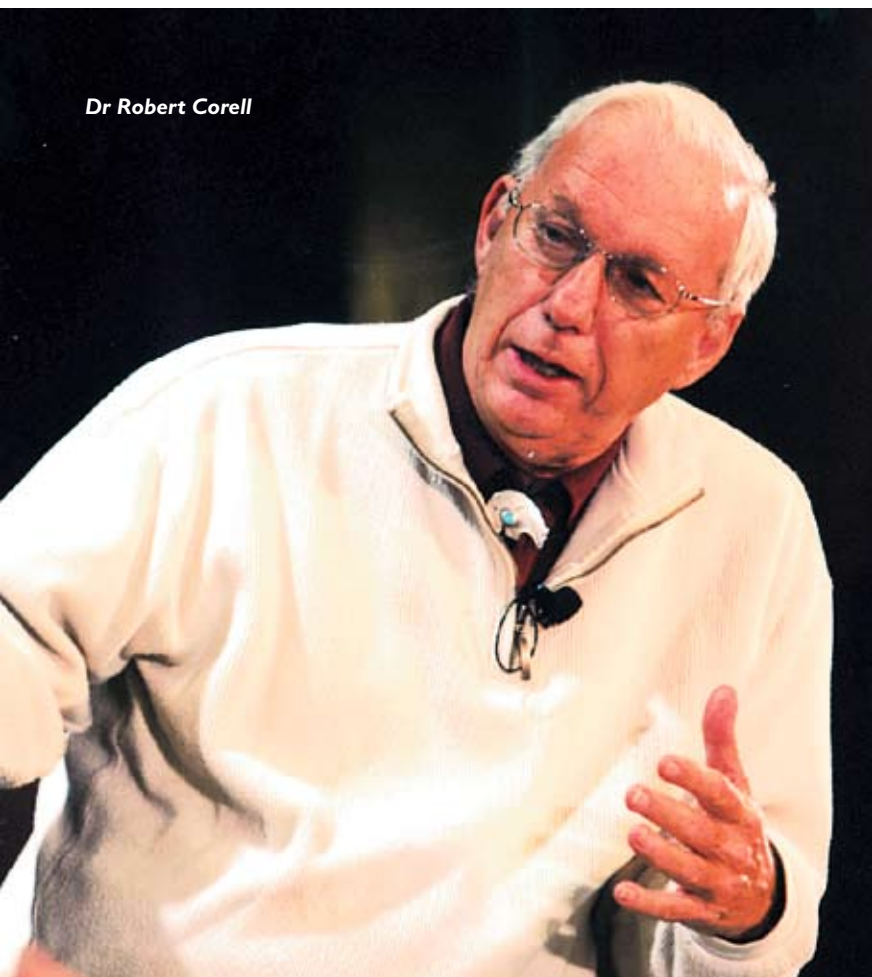
about the projections in the future rather substantially, so it is a really good report.

NA: *Did the IPCC report adequately cover the issue of acceleration of climate change in the Arctic, particularly in relation to increased surface reflectivity, acceleration of ice-sheet flows, and massive greenhouse gas release from thawing permafrost and methane hydrates?*

RC: The issue was covered, but the arctic section in the IPCC report is not as comprehensive as the Arctic Climate Impact Assessment (ACIA) was, mainly because this had 300 people working for four years whereas the IPCC report had a much smaller group to write the polar section. They do make clear that these are likely to be accelerators in the warming but there is not as much data in there as we might like.

NA: *Will the IPCC report summary elicit a response from governments that is urgent enough and adequate enough to address climate change?*

Dr Robert Corell



The Heinz Center for the Environment

RC: I think a number of things have happened over the last year or so that have accelerated the interests of governments, industry, and citizens at large to begin to take more aggressive action to address the climate change issue – everything from the Al Gore movie [*An inconvenient truth*] to the ACIA to the recognition that countries are really vulnerable. So I think we are going to see more action.

Now my personal opinion is that the one thing we do not understand fully as societies around the world is that, as Jim Hansen at NASA indicates, we really do not have much time to act because if we get a warming of three degrees or so, we are going to be in a different world than we have ever been in before and it is really going to be hard for societies to come to grips with the realities of what a three degree [warmer] world looks like. So keeping [warming] down to one or two degrees is an imperative in my view.

NA: Though the results of the Kyoto Protocol proceedings are important, there is a clear understanding that

they will be far from enough to reduce emissions to the levels needed. What other processes and initiatives do you see that might significantly contribute to achieving global emissions reductions?

RC: I see a number of things happening. In the US, we have a number of local city governments and state governments taking action. The US is not a participant in Kyoto and I think even the countries that are, are recognising that the efforts to date are not strong enough to accomplish the Kyoto Agreement, but I think there is a redoubling of effort now that the Kyoto agreement starts in 2008, which is not very far away.

So I see us moving into a regime where all of these targets for major reductions in a short time scale

If we get a warming of three degrees or so, we are going to be in a different world.

are overriding the original goals of Kyoto, all of which I think is a good thing.

NA: What about the Arctic Council?

RC: I think that the Arctic Council has major opportunities to address the climate change issue, because it is so evident in the region. I think the Arctic Council, being a consensus organisation, has had a difficult time to really be highly visible on that, particularly over the last couple of years.

I think under the three Nordic countries, Norway, Denmark, and Sweden, who will be the chairs over the next six years, my guess is we'll see more concerted effort within the Arctic Council to address more directly a number of the opportunities they have as a body, to address climate change.

Back to the issue of methane hydrates, I think in the Arctic the big issue is the methane potential, and one thing that is clear, is that the Arctic Countries are interested in pursuing research and assessments to better understand that potential and I think that's a good thing.

NA: In your opinion, how can a global conservation organisation, such as WWF, maximise its potential for influencing global policy developments in the right direction?

RC: I think for WWF and the National Wildlife Federation and many others who have become more active in this arena, the best thing they can do is help transfer knowledge into forms that the policy community can first understand and then act upon.

One of the big problems is we have science speaking science language and advocacy organisations speaking advocacy and we haven't connected those two as well as I think we can. If we can make it clear that the advocacy is based on solid scientific information, then its credibility and its ability to move policy is going to increase quite dramatically. So I would argue that the trend of these organisations to work more and more closely with the scientific community, is a good trend and in the long run it will make their advocacy arguments stronger and therefore more likely to influence policy.

Whaling undermines wh

Whaling in Iceland presents a significant threat to the country's highly profitable and popular whale watching industry. Asbjörn Björgvinsson, chairman of the Icelandic Whale Watching Association and Manager for the Húsavík Whale Museum, reports.

After a 21-year international moratorium, Iceland's relatively new fisheries minister, Einar K. Gudfinnsson, announced in October 2006 that he had decided to allow the resumption of commercial whaling. This hunt included a quota of nine fin whales, a species listed as threatened in the World Conservation Union's (IUCN) Red List of Endangered Species.

Iceland has not engaged in commercial whaling since the International Whaling Commission (IWC) moratorium began in 1985. The government has however permitted whaling under its 'scientific whaling' programme, from 1985 to 1989 and then from 2003 to the present, in accordance with article eight of the International Convention for the Regulation of Whaling.

Meanwhile, Icelanders have found a sustainable and much more profitable way to benefit from the whale stocks around Iceland – whale watching. This activity has rapidly become one of the most popular aspects of tourism in Iceland.

The country's whale watching industry has grown enormously from only a few hundred customers in the early 1990s, to serving more than 89,000 visitors in 2006. With its rapid growth and especially its contributions to the economies of small coastal communities in addition to the overall Icelandic economy, the whale watching business has created an entirely

new dimension within Icelandic tourism.

Despite the success of this industry (which is completely dependent on having access to whales that are not scared off by boats) completely dependent upon having access to whales that are not scared off by boats in coastal waters, the Icelandic government decided to permit the resumption of scientific whaling in August 2003 and commercial whaling in October 2006. The large and growing tourism industry in Iceland, along with nature conservation organisations and many Icelanders, believes these hunts are not only unnecessary and wasteful – given the small market for whale products – but also that they seriously undermine the emerging whale watching business and damage Iceland's image and reputation.

Many politicians in Iceland have not considered the economic importance of whale watching when making decisions on the whaling issue. The revenue from whale watching is already almost as high as the contribution of commercial whaling during its peak from 1950 to 1980. As there is currently only a very limited domestic market for whale meat, and no international market, it is not expected that the value of the current whale hunt will ever reach previous levels.

Erich Hoyt, senior research fellow with the Whale and Dolphin Conservation Society, recently conducted an economic analysis of the whale watching industry in Iceland. Hoyt says: "Whale watching is actually far more valuable to the Icelandic economy than whaling. In 2006, 89,000 whale watchers spent an estimated US\$18 million on their whale watching trips, with a further US\$29.6 million in terms of total tourism expenditures: a massive boost to the Icelandic economy.

"The turnover from whaling is meagre by comparison: a dead minke whale currently fetches around US\$10,500 (down from

US\$13,000 two years ago)." This is if it can be sold at all.

According to the official policy of Iceland's government, all natural resources in the ocean that are utilised must be done so in a sustainable way. Sustainability is defined by three main criteria: it must take into account the economic value, social effects, and the resource base.

Whaling cannot be defined as a sustainable industry in Iceland at this point. There are no economic benefits from whaling as there are no markets for the products. Whaling



Whale watching in Iceland

is also damaging Iceland's image around the world as a nature destination, and thus is also damaging businesses and activities that currently flourish due to this image.

According to Hoyt some UK tour operators claim that bookings have dropped by around 25 percent because of the recent resumption of commercial whaling. He says: "It is likely that without whaling, whale watching tourism would be even more valuable to the Icelandic economy."

Whaling may also have a serious impact on Iceland's reputation in

connection with the larger issues of conservation and sustainable management of living marine resources.

It's hard to find any positive social effects from whaling, while whale watching on the other hand has provided many new jobs and created new businesses all around Iceland, such as new guesthouses, hotels, restaurants, museums, and tourist handicraft centres.

It is time that politicians and decision makers in Iceland, as well as the general public, understand that the reduction of Iceland's

whale population by 200 minke whales each year will neither save Icelandic fish stocks nor rebalance the marine ecosystems in Iceland. What is certain, however, is that it will seriously damage the country's profitable, growing, and sustainable whale watching and larger tourism industries.

Asbjörn (Abbi) Björgvinsson

Chairman of the Icelandic

Whale Watching Association

Manager of the Husavik Whale Museum

For a full report see: www.icewhale.is/default.asp?id=571

A humpback whale breaches before a boatload of whale watchers. Skjálfandi Bay, North Iceland





Large male polar bear eight kilometres north of Oliktok, Alaska, US, in the Beaufort Sea.

Eric V. Regehr/USGS

Time for action

Thirty-four years after the Agreement on the Conservation of Polar Bears was concluded and in light of recent decisions on the conservation status of polar bears, Professor Nigel Banks of the University of Calgary and Dr Douglas Clark of Wilfrid Laurier University, argue that it is time action.

In November 1973 the governments of Canada, Denmark, Norway, the then Soviet Union, and the US, recognising their special responsibility to the world community, agreed to the text of the Agreement on the Conservation of Polar Bears.

The Agreement is a hard law instrument (a treaty) that requires each Party to take “appropriate action to protect the ecosystems of which polar bears are a part” (the “environmental objective”) and to manage polar bear populations in accordance with sound conservation practices based on the best available scientific data. It is a strong legal commitment to protect

not just the bears but also the arctic ecosystem of which they are a part. Importantly the Agreement requires the Parties to take “appropriate” action; this cannot mean inaction – and it cannot mean action that falls manifestly short of the Agreement’s environmental objective.

The Agreement is frequently and correctly celebrated as an important example of successful international conservation, but it has significant institutional shortcomings. In particular it doesn’t provide any mechanism to assess whether it is effective in meeting its environmental objective. There are

no regular meetings of the Parties, and the Agreement itself establishes no formal scientific advisory body.

It’s true that Norway did convene one meeting of the Parties in 1981 (to decide that the Agreement should continue in force beyond its initial five-year term), but this is hardly the same as a continued assessment of the effectiveness of the Agreement.

It is also the case that the World Conservation Union’s (IUCN) Polar Bear Specialist Group (PBSG), formed in 1968, continues to meet every four years to assess the health of polar bear populations and review polar bear science. However,

there is a disconnect between the PBSG and the Agreement, since there is no clear feedback loop linking the PBSG's work with the assessment of the effectiveness of the Agreement to achieve its core environmental objective.

If all were well with the Arctic's ecosystems perhaps none of this would matter; but things are far from well. The Arctic Climate Impact Assessment predicts continued and increasing loss of sea ice – the key habitat both for polar bears and their main prey species, ringed seal. Studies in Western Hudson Bay and the Beaufort Sea suggest climate change is already affecting those polar bear sub-populations (see *Polar bear populations in decline* on page 9).

In 2006 the IUCN re-assessed the polar bear as “vulnerable” and added it to the Red List of Threatened Species. The same year, the US Fish and Wildlife Service proposed listing the polar bear as threatened throughout its range under the US Endangered Species Act (ESA). Conserving polar bears is now a more complex task than was likely envisioned in 1973, and will require innovative, adaptive, and coordinated policies at regional, national, and international scales.

All of this suggests that it is time for the Parties to re-convene. Article IX of the Agreement contemplates continuing consultation by the Parties with the object of giving further protection to polar bears, and Article X(6) of the Agreement allows any Party to initiate “consul-

tations ... with a view to convening a meeting” to consider revisions or amendments. Norway might take a leadership role here and convene the meeting since it is both the legal depositary for the Agreement and currently the chair of the Arctic Council.

What should be on the agenda? First, the Parties need to re-commit themselves to the environmental objective of the Agreement.

As concrete evidence of this, the Parties should develop a coordinated and comprehensive Conservation Action Plan. Such plans already exist for all other bear species worldwide. Development of such a plan ought to be an inclusive process, incorporating the knowledge and values of diverse stakeholders such as indigenous peoples, co-management bodies, environmental organisations, and industry.

Second, the Agreement might be amended to provide for regular meetings of the Parties to assess – among other things – the extent to which the Agreement is meeting its environmental objective and what further steps might need to be taken.

Third, the Parties might amend the Agreement to establish a re-structured PBSG as a subsidiary body of the Agreement. The new PBSG should provide a clear role for indigenous peoples; this would be consistent with developments under the Convention on Biological Diversity (CBD) and the recognition of the importance of indigenous knowledge. The amendment

would provide the PBSG with a clear mandate to develop an appropriate methodology for assessing progress in meeting the environmental objective of the Agreement and helping to develop and implement the Conservation Action Plan.

Common to all three agenda items is emphasis on the need for broadly conceived, coordinated action to complement and supplement the unilateral and domestic action that will flow from a US ESA listing.

It is also important that these measures make some effort to address the underlying cause of the continued and increasing loss of sea ice – i.e., climate change. The Parties must recall that the Framework Convention and the Kyoto Protocol do not represent an exhaustive statement of a State's legal obligations that may be relevant to the climate change debate.

The Parties to the Agreement on the Conservation of Polar Bears need to demonstrate to the world how they are discharging their special responsibility to protect polar bears, and the arctic ecosystems they inhabit. A meeting alone is not action, but a meeting could provide a springboard for a concrete plan of action.

Professor Nigel Banks

Professor of Law

University of Calgary

Dr Douglas Clark

Lecturer, Dept. of Geography &

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Wilfrid Laurier University

What in tar nation?

The effects of the energy-hungry tar sands project in Alberta, Canada, are being felt in the Arctic – and its growth continues to undermine Canada's commitment to reduce carbon emissions. James Leaton, senior policy adviser for WWF-UK, reports.

Canada is seeing a new gold rush as oil companies seek to exploit huge tar sands deposits sitting under the boreal forest in Alberta. The deposits are not a new find, but the current high oil price makes them economically viable. Unfortunately the energy- and water-intensive process to extract oil from the



sands makes this oil a highly unsustainable form of energy.

Extracting oil from tar sands (or oil sands, as the industry has rebranded them) produces three times as much carbon dioxide per barrel of oil as normal oil production. This is not the clean fuel of the future we need. Tar sands oil

21 ➤ is significantly contributing to Canada's greenhouse gas inventory before it's even near a petrol station. Canada has announced it will not meet its Kyoto commitments – and the main reason for this is the growth of the country's tar sands developments. To compound the problem most of Canada's tar sands petroleum products such as gasoline, are bound for the US, which has a highly inefficient fleet of vehicles.

Meanwhile oil companies are looking to the Arctic to supply precious natural gas to fuel further tar sands developments. There is currently no strategic plan to guide the more efficient use of gas at a national level and provide a sustainable energy supply for Canada. Conoco Phillips, Exxon, Imperial Oil, and Shell have proposed a 1,220 kilometre pipeline system, the Mackenzie Gas Pipeline, as a potential transit route from the Mackenzie Delta in Canada's Northwest Territories.

The delta is thought to be home to significant hydrocarbon reserves – which the industry is hoping will fuel the unfettered expansion of Alberta's tar sands. The delta is also, however, a wetland of global importance, providing major staging and breeding habitats for migratory birds. WWF is intervening in the Joint Review Panel environmental impact assessment hearings into the proposed

pipeline – whose estimated costs have risen to C\$10 billion (US\$8.8 billion) – to ensure that a representative system of protected areas is established before the Mackenzie Valley is opened up to huge infrastructure development.

Previous experience has shown that such developments lead to indirect impacts such as improved access for poaching, and that the extent of oil and gas activity often multiplies beyond the original proposal. The First Nations communities in the Northwest Territories are considering the Mackenzie Gas Pipeline proposals. Beyond an initial boom and inflation of the economy, there is concern that the pipeline will introduce negative impacts to traditional lifestyles, rather than positive changes.

If the expansion of Canada's tar sands is not limited, then it's not only greenhouse gas emissions that will be out of control. The energy derived from natural gas is mainly used to produce hot water or steam to activate the tar into a more mobile form that disengages from the sand. This separation process results in waste water being pumped to vast tailings lagoons, which are left for decades to settle. The huge open pit mines and tailings ponds are so large they can be seen from space.

The province of Alberta is home to vast swathes of boreal forest.

Much of this forest has already been sliced up by seismic exploration surveys and wells searching out the extent of the oil. This habitat fragmentation means there are fewer and fewer interconnected or undisturbed areas which can offer habitat to caribou and other wide-ranging mammals such as grizzly bears and wolverine.

Operators have made promises to return the forest to the condition they found it in; indeed this has formed the subject of a Shell Canada advertising campaign. Yet the slow recovery rate of this type of ecosystem means that there has been little success to date in delivering any large-scale reclamation of land, and no land has yet been certified as reclaimed by the Canadian government.

The town of Fort McMurray, the centre of the gold rush, is seeing an unsustainable level of activity. House prices and wages have shot through the roof, with basic services and retailers struggling to find employees who have not been tempted by the tar sands. Coffee shops are offering golden handshakes of C\$5,000 (US\$4,400) to entice new employees. Oil companies are flying employees in on a daily basis due to the lack of housing.

The huge impacts of tar sands projects represent a backwards step for the oil industry. Companies are more determined to cash in on the high petrodollars than to deliver on commitments to tackle climate change or protect the environment.

Sustainable limits need to be imposed on tar sands activities before water and forest resources disappear. Both national and provincial governments need to consider how they can deliver sustainable energy for the future, rather than creating a carbon-intensive tar nation.

WWF believes that Canada should develop a renewable energy strategy before approving any further major hydrocarbon projects in the Mackenzie Basin.

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Senior Policy Adviser
WWF-UK
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A tar sands upgrading plant north of Fort McMurray, Alberta, Canada in winter.



Forthcoming arctic meetings & events

Arctic Council events

AMAP Human Health Expert Group meeting

WHERE: Lofoten, Norway • WHEN: May 7–10, 2007 • MORE INFO: Email: amap@amap.no

AMAP Downscaling Workshop

WHERE: Oslo, Norway • WHEN: May 14–16, 2007 • MORE INFO: Email: amap@amap.no

Conferences and workshops

World Environment Day 2007: Melting Ice – A Hot Topic?

WHERE: Tromsø, Norway • WHEN: June 4–5, 2007 • MORE INFO: www.wed.npolar.no/

Third Workshop on Remote Sensing of the Coastal Zone: From Inland to Marine Waters

WHERE: Bolzano, Italy • WHEN: June 7–9, 2007 • MORE INFO: Email: rainer.reuter@uni-oldenburg.de

Cryogenic Resources of Polar Regions International Conference

WHERE: Salekhard City, Polar Circle, West Siberia, Russia • WHEN: June 11–15, 2007 • MORE INFO: www.ikz.ru/permafrost

The 17th (2007) International Offshore (Ocean) and Polar Engineering (ISOPE) Conference and Exhibition

WHERE: Lisbon, Portugal • WHEN: July 1–6, 2007 • MORE INFO: www.isopec.org/call4papers/call4papers.htm

International Sea-Ice Summer School

WHERE: University Centre in Svalbard, Norway • WHEN: July 2–13, 2007 • MORE INFO: www.seaice.info

Alaska Soil Geography Field Trip: Soils Affected By Permafrost Field Course

WHERE: Fairbanks, Alaska, US • WHEN: July 5–13, 2007 • MORE INFO: Email: pfclp@uaa.alaska.edu

Summer Field Course – Arctic Plant Ecology

WHERE: Svalbard, Norway • WHEN: July 8 – August 3, 2007 • MORE INFO: www.unis.no/studies/

Remote Sensing for Ecosystem Assessment Field Course

WHERE: Kola Peninsula, Russian • WHEN: July 26 – August 10, 2007 • MORE INFO: Email: wgr2@cam.ac.uk

Northern Encounters Conference and PhD Course

WHERE: Tromsø, Norway • WHEN: August 6–8, 2007 • MORE INFO: uit.no/planlegging/northernencounters

IPY GeoNorth 2007 – The “First International Circumpolar Conference on Geospatial Sciences and Applications”

WHERE: Yellowknife, N.W.T., Canada • WHEN: August 20 – 24, 2007 • MORE INFO: ess.nrcan.gc.ca/ipygeonorth/

International Glaciological Society – International Symposium on Snow Science

WHERE: Moscow, Russia • WHEN: September 3–7, 2007 • MORE INFO: www.igsoc.org/symposia/2007/russia/

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

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

WWF and Canon join forces on Polar Bear Tracker

WWF and Canon Europe have launched a new educational microsite for children on the WWF-Canon Polar Bear Tracker website and have started tracking four new bears.

Building on Canon's long-term support of WWF as a Conservation Partner since 1998, the new agreement ensures that WWF is now able to increase its support for polar bear research and to gain valuable information on how changes in sea ice affect this charismatic species.

The “Save the Polar Bear” microsite is aimed at 7 to 11 year-olds, and includes interactive games and prizes, downloadable packs for teachers and parents, and tips on how everyone can help fight climate change by making small lifestyle changes such as switching off unnecessary lights.

The microsite has been translated into German, French, Spanish, Italian, Dutch, Danish, Finnish, Norwegian, and Swedish.

Paul Steele, WWF International's chief operating officer said: “Canon Europe was our first-ever conservation partner and we are very grateful to the company for its ongoing support. We are particularly thrilled to be partnering with Canon Europe to undertake our first ever pan-European educational campaign for children.”

The Polar Bear Tracker has recently started following four new bears on the Norwegian archipelago

of Svalbard in the High Arctic. The bears were tagged in April 2007 by researchers from the Norwegian Polar Institute with support from WWF and Canon Europe.

The movements of selected polar bears can be followed on the new improved WWF-Canon Polar Bear Tracker website: www.panda.org/polarbears.

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Arctic Bulletin supported by the Weston Foundation

This issue of the *WWF Arctic Bulletin* is made possible by The W. Garfield Weston Foundation, a Canadian charitable foundation committed to making grants in Canada for the benefit of Canadians. The Foundation's grants are directed primarily to

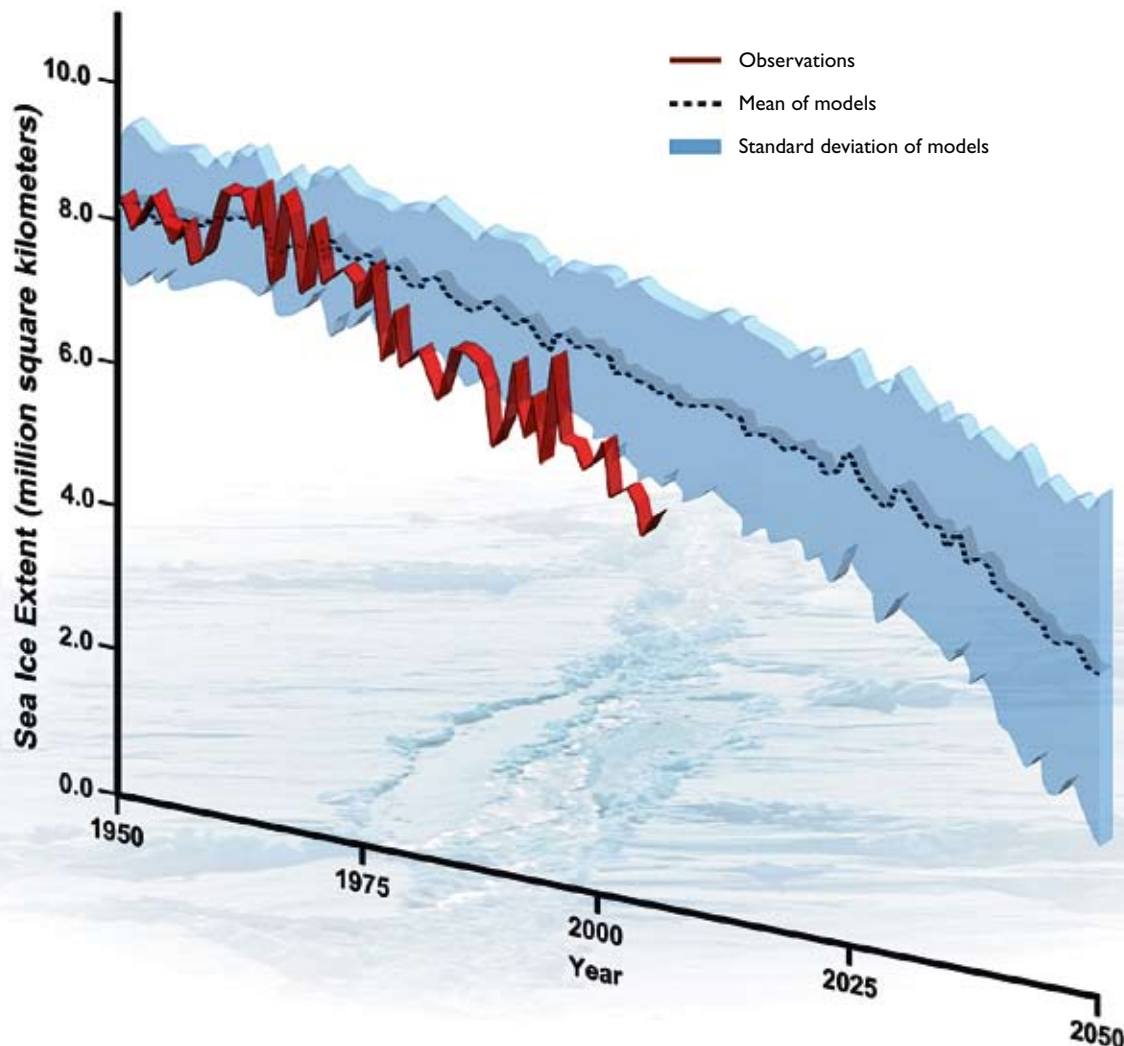
THE W. GARFIELD WESTON FOUNDATION

specific organisations in the fields of education and environment. In supporting the *WWF Arctic Bulletin*, the Foundation is ensuring that information about the unique

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.

Models underestimate loss of arctic sea ice

Arctic sea ice is melting at a significantly faster rate than projected by the most advanced computer models, a new study concludes. Actual observations of September arctic sea ice, in red, show a more severe decline than any of the 18 computer models, averaged in a dashed line, that the 2007 IPCC reports reference. See page 5 for details.



NSIDC data/UCAR image

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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.

