

# Polar oceans in peril and a planet at risk

Briefing 2009

GREENPEACE

Defending our oceans

**image** Open ice and an iceberg, during sunset in the Southern Ocean.

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## Introduction

The Arctic and the Antarctic: two of the greatest wilderness areas on Earth, with ecosystems vital to the functioning of our planet. The snow-covered lands and icy waters of these polar regions are, for many people, the purest examples of true wilderness left on this planet. While the Arctic has been home to indigenous peoples for millennia, Antarctica has only played host to visiting explorers and scientists. Both polar oceans are, however, home to distinctive wildlife that has adapted to the extreme environmental conditions, such as the Arctic's polar bears and the Antarctic's penguins. Polar waters provide rich feeding grounds that sustain large populations of seabirds and marine mammals, including the majority of the world's great whales.

The Arctic and the Antarctic are under assault - from the impacts of rapidly accelerating climate change; from increased industrialisation; and from the unchecked consumption of our planet's resources. Indicators of the planet's health, the poles provide us with an early warning that we are compromising the Earth's ability to sustain life as we know it. It is already too late to avoid profound negative changes at the poles. But, we can limit further impacts by establishing boundaries that stop the commercial fishing fleets and the oil and gas industries from plundering and polluting these already damaged ecosystems.



image A leopard seal sits on hard ice sheets, Southern Ocean.



image Ice and water in the North Pole.

# The Arctic – current and future threats

**image** Chuckchi Sea: Walrus on iceflow, with Arctic Sunrise in background, investigating climate change effects on Arctic wildlife.

© GREENPEACE / DANIEL BELTRÁ



**image** A young girl wearing Greenlandic national dress.



## Climate change

Some parts of the Arctic are among the fastest warming areas on the planet and consequently the Arctic is experiencing some of the most severe climate impacts - most notably, the rapid decline in the thickness and extent of sea ice. Some models suggest the Arctic Ocean could be ice-free in summer by 2030. Others suggest it could be as early as 2012. Permafrost is thawing, glaciers are melting, and the massive Greenland Ice Sheet is losing ice at record rates. Sea ice underpins the entire Arctic marine ecosystem. As it shrinks and thins, there are major repercussions and new challenges for the Arctic's peoples and wildlife.

In addition, many other stresses brought about by human activities are simultaneously affecting life in the Arctic, including air and water contamination, overfishing, increased levels of ultraviolet radiation due to ozone depletion, habitat alteration, and pollution due to resource extraction. The sum of these factors threatens to overwhelm the adaptive capacity of some Arctic populations and ecosystems altogether.

## Effect on the Arctic's peoples and wildlife

Coastal erosion caused by the rising sea level and a reduction in sea ice are allowing higher waves and storm surges to reach the shore, and some coastal communities are already being forced to relocate. Indigenous peoples will also be increasingly subjected to negative effects as reduced sea ice causes the animals on which they depend for food to become less accessible and to decline in numbers. Some species are already facing extinction.

Polar bears are completely dependent on sea ice for their entire lifecycle – from raising their cubs to hunting seals that constitute their main prey. Researchers are reporting an increasing number of polar bears drowning because they have to swim longer distances between ice floes. Others are spending more time on land fasting as they wait for the sea ice to freeze up at the end of summer. Research has also found that, for the first time, polar bears are cannibalising each other due to lack of food.

Many other species, such as seals, whales and walrus, also depend on the sea ice. Ice-dependent seals, including the ringed seal, ribbon seal, spotted seal and bearded seal, are particularly vulnerable to the observed and projected reductions in Arctic sea ice because they give birth to and nurse their pups on the ice and use it as a resting platform. They also forage under the ice and near the ice edge. It is very unlikely that these species could adapt to life on land in the absence of summer sea ice.



**image** Polar bear, Beaufort Sea, near the US/Canadian border.

## The Arctic – current and future threats

continued



image Eastern Bristol Bay, Alaska. Undersized bycatch on a catcher boat.

### Effects on the global climate

The Arctic has been called ‘the world’s refrigerator’, and one reason for this is the role of sea ice in regulating global climate. Sea ice reflects heat from the sun back into space, whereas the dark open waters of the Arctic Ocean absorb it. As sea ice melts, more of the Arctic Ocean is exposed, meaning that more heat energy is absorbed. This causes more warming, which in turn causes more sea ice to melt and causes yet more warming to occur, continuing the process; an example of a highly dangerous positive feedback loop.

Another positive feedback loop in the Arctic is melting permafrost. Permafrost is ground that is literally frozen solid, and it can be found throughout the Arctic land environment as well as the seabed below shallow parts of the Arctic Ocean. As temperatures rise, permafrost melts, releasing trapped methane - a powerful greenhouse gas - into the atmosphere; again, the warming is increased.

The Arctic meltdown caused by runaway climate change will have grave consequences for the entire planet.

### Box 1 ‘De-facto’ Arctic marine reserve under threat from industrial fisheries

Just as the receding ice is attracting the interest of those who hope to find and extract more climate-changing fossil fuels, so too is it attracting the interest of the industrial fishing industry.

After having fished out many of the stocks in temperate waters, the industrial fishing fleets are now looking at the Poles for new stocks to exploit. In the Arctic, they have their eyes on the fish that have historically been protected in a ‘de-facto’ marine reserve underneath the Arctic sea ice.

Arctic and sub-Arctic waters are among the most biologically productive in the world. At present, fishing in the Arctic Ocean is limited by the sea ice that exists for most or all of the year. Climate change means warmer waters moving north, and with them, fish stocks. It also means longer periods and larger areas of open water, leaving the once protected Arctic breeding grounds open to industrial fisheries. Marine life in the Arctic is already subject to massive pressure due to climate change and loss of sea ice; opening the area up to industrial fishing would be an act of madness that would further damage the fragile ecosystem just at the time when it most needs protecting.

Spurred on by concerns over the impacts of climate change on fishing in the region, the North Pacific Fisheries Management Council made the sensible decision in February 2009 to establish a moratorium on commercial fishing in a vast zone off Alaska’s northern coast. This move was applauded by Greenpeace, and will help give marine life in the Chukchi and Beaufort Seas a much better chance of surviving the loss of sea ice and the increasing ocean acidification that are predicted for Arctic waters in the coming decades.

image Melt lakes on the Greenland Ice Sheet, showing its vulnerability to warming temperatures.

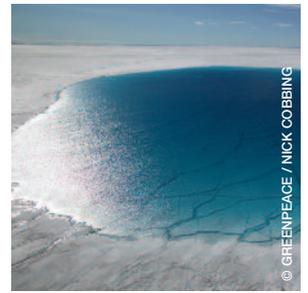


Figure 1.1 Map of the Arctic showing the average minimum sea ice extent from 1979 - 2000

Greenpeace believes that a 'line in the ice' should be drawn around this area, which has historically been protected under the ice, and a moratorium on all industrial activities should be put in place until a new overarching governance regime has been agreed and implemented.



## The Arctic – current and future threats

continued

### Drilling for oil in the Arctic: the wrong answer

The impacts of climate change in the Arctic underscore the urgency with which the world's governments must seriously reduce CO<sub>2</sub> emissions from burning fossil fuels. Yet, many are instead racing to secure their 'right' to drill for the oil that may be found underneath the Arctic ice. They show little interest in preventing devastating climate change by enacting policies to reduce CO<sub>2</sub> emissions and to increase the use of renewable energy resources. They appear to view the destruction of the Arctic ecosystem as an opportunity to pump out yet more climate destroying oil.

The world's leaders are facing an intelligence test. Should they drill and burn the fossil fuels reserves that are accessible only because climate change is causing the sea ice to melt? Or should they protect the Arctic and give it a chance to adapt to the already catastrophic changes taking place, while enacting policies that reduce national CO<sub>2</sub> emissions and putting in place renewable energy systems?

So far, the melting sea ice has driven a rush of seabed studies, each aimed at showing the continuation of the continental shelf to the North Pole, and thus sovereignty over those parts of the Arctic. The US, Canada and Russia have dispatched icebreakers, submarines and prime ministers to pursue their sovereignty claims, and other Arctic states are also involved in the melee. The planting of a Russian flag on the Lomonosov Ridge, a 1,200-mile underwater mountain range, and Russia's claim that it had enough evidence to prove it is part of Russia's continental shelf, made worldwide headlines in 2007.

The 'race' to exploit the oil rumoured to be under the Arctic ice also threatens global security. It has been identified as a serious threat to global peace with the increased activity in the region leading to discussions at NATO and to increases in Arctic military spending by the US, Canada, Russia and other Arctic nations.

We need to act now to prevent a new 'cold war' from developing in the Arctic.

### Box 2 Impacts of opening new sea routes

As the decline in Arctic sea ice causes historically closed routes such as the Northwest and Northeast Passages to open up, questions arise regarding security and safety. New access to shipping routes and new opportunities for oil extraction bring with them the increasing risk of environmental degradation caused by these activities. One obvious concern is oil spills and other industrial accidents. It is clear from studies and experience that the effects of oil spills in a high-latitude, cold ocean environment last much longer and are far worse than in other areas. Oil spill clean-up is rarely effective but in the Arctic conditions any clean-up attempt at all will be impossible for much of the year due to extreme darkness, temperature and solid or broken ice conditions.



image British Petroleum's controversial Northstar oil production facility. Construction site, Alaska, USA.

image Aurora borealis, Northern Lights, over the Greenpeace ice camp Sirius, in Alaska.



## Current and Future Governance

Unlike Antarctica, there is no single overarching treaty governing activities in the Arctic.

With only a patchwork of different rules and regulations in place, most of which are not legally binding, the Arctic environment and its marine life are currently wide open to exploitation, bad practice and illegality.

Set up in 1996, the Arctic Council - a high-level intergovernmental forum comprised of the eight Arctic nations (Canada, Denmark/Greenland/Faroe Islands, Finland, Iceland, Norway, Russia, Sweden, and the USA) and six Indigenous Peoples' organisations - plays an important role. However it remains to be seen if it will be the protector of the Arctic or its exploiter.

Despite recognising the vulnerable and unique nature of the region, and having now had many years in which to develop an appropriate governance regime, the Arctic Council has only managed to put forward non-binding recommendations with no enforcement. In the meantime, the agenda of the members of the Arctic Council appears to be moving towards opening up the Arctic Ocean for oil exploration and industrial fishing, thus taking advantage of the melting ice instead of taking the action required to protect the already damaged ecosystem.

Given the issues of global significance affecting the Arctic and the many significant gaps in the existing legislation, there is a clear need for an overarching Arctic multi-lateral agreement or treaty, in which the Arctic Council could play a leading role, which ensures the highest levels of protection for the Arctic and in particular for the areas of the Arctic Ocean that have traditionally been protected under the ice. While such a transparent, participatory and equitable agreement is being negotiated, nations and stakeholders must 'freeze the footprint' of growing industrial activities in the Arctic by establishing a moratorium on further industrial development in the areas made accessible by the retreating sea ice.

Greenpeace calls upon the United Nations and governments around the world to commit to the following course of action to save the Arctic:

- **Establish an immediate moratorium on industrial development in the area of the Arctic Ocean that has historically been covered by sea ice year-round. This 'line in the ice' is the average minimum sea ice extent between 1979 and 2000, the period before significant sea-ice loss due to climate change was recorded.**
- **Create a long-term solution by agreeing a permanent, equitable and overarching treaty or multi-lateral agreement that protects the Arctic Ocean environment and ecosystems and the peoples who depend on them.**

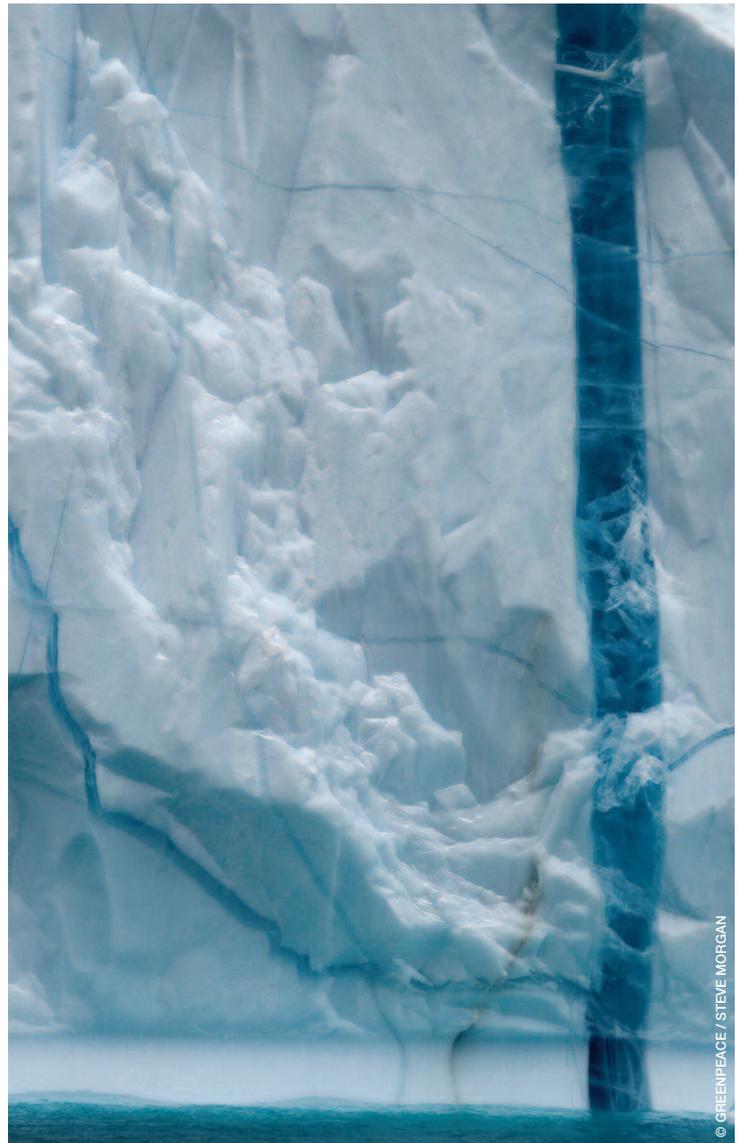


image Glacier melt: ice in the fjord of Scoresbysund, Greenland.

## Antarctica – current and future threats

**image** The Greenpeace ship Esperanza, in the Antarctic ice of the Southern Ocean.

© GREENPEACE / JIRI REZAC



Unlike the Arctic, for the past 50 years activities in Antarctica have been regulated by the Antarctic Treaty and the related agreements that make up the Antarctic Treaty System (ATS). Together, these constitute the overarching governance regime that has set many important precedents over the years. In particular, the historic 1991 agreement to prohibit all mineral extraction in Antarctica for 50 years set an example for a new relationship with planet Earth. Agreed after many years of negotiation and campaigning, the moratorium provided the equitable and environmentally-safe solution to settling international claims to the oil reserves under the ice, a lesson that would be well applied to the current situation in the Arctic. Greenpeace played a major role in securing this moratorium and for bringing countries onside in support of the 'World Park Antarctica' campaign.

Despite the existence of the ATS, Antarctica and the surrounding Southern Ocean are not safe from a range of current and emerging threats.

### Climate change

Climate change is driving major changes in Antarctic, just as it is in the Arctic. Although some areas are apparently cooling, recent studies show that the continent as a whole appears to be warming.

The most dramatic changes are happening around the Antarctic Peninsula, which is one of the most rapidly warming regions on Earth. A recent review showed that over the last 61 years, 87% of the glaciers on the Antarctic Peninsula have retreated. This retreat began at the northern tip of the Antarctic Peninsula and, over time, has moved southwards as temperatures have risen.

### Effects on Antarctica's wildlife

While there has been an increase in sea ice in some parts of Antarctica - a change linked to increased offshore winds resulting from the ozone hole - there has also been a significant reduction in duration and extent of winter sea ice west of the Antarctic Peninsula. Just as sea ice is critical to the marine life of the Arctic, so it is to the marine life of the Antarctic. Krill, the basis of the Antarctic food web, use winter sea ice as a nursery and its loss leads to a fall in krill numbers the following summer. In turn, the fall in krill numbers has consequences for the whales, seals and penguins that feed on them.

In addition, Adélie and emperor penguins rely on the sea ice in Antarctica for breeding and feeding, just like polar bears do in the Arctic. Polar bears and emperor penguins may live at opposite ends of the Earth, but it turns out they may have more in common than we realised - and not in a good way. Already, it appears that in some places ice-dependent Adélie penguins are being replaced by open-water species. According to a recent Woods Hole study, a large emperor penguin colony in Terre Adélie, Antarctica, could face the loss of 95% of its population by the end of the century.



image Adélie penguins near islands south of Buckle Island, Balleny group.



image Humpback whales feed near the Antarctic ice edge.

## Antarctica – current and future threats

continued

### Box 3 Krill

Antarctic krill are small shrimp-like crustaceans that are the principle food source for many Antarctic predators including seals, penguins, albatross, various fish species and the seven species of baleen whales that feed in the Southern Ocean. Occurring in vast swarms, krill have long been targeted by fishing vessels from several nations. The advent of new technology that enables a single state-of-the-art trawler to vacuum up as much as 45,000 tonnes in a single season, together with growing markets for aquaculture feed and nutritional supplements, are likely drivers for a massive expansion of the krill fishing industry in the near future. Even at current levels there are concerns that localised depletion of krill may be impacting on populations of krill predators. Factor into this the possible impacts of climate change and observed krill declines in some parts of the Southern Ocean and there is real reason to fear that the whole basis of the Antarctic food web is at risk.

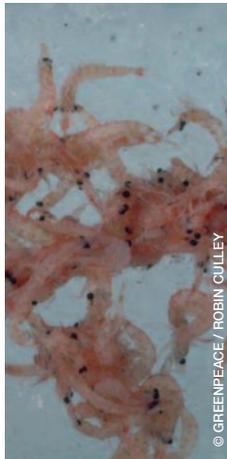


image Krill.

### Box 4 Whales

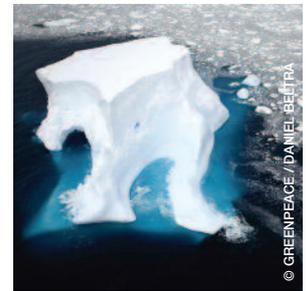
The devastation of whale populations due to commercial whaling in the Southern Ocean is well documented, with 95% of the biomass of whales lost and the blue whale being brought to the edge of extinction. The 1986 moratorium on commercial whaling and the subsequent 1994 designation of the Southern Ocean Whale Sanctuary should have stopped whaling in the Southern Ocean once and for all, but the government of Japan has continued its hunt, despite international opposition, under the guise of so-called 'scientific' whaling.

Whale populations are facing many other threats aside from the harpoon. These include climate change, ship strikes, underwater noise and expanded fishing for krill. Although Antarctic blue whales have been officially protected since 1965 there are no signs that this species has recovered, with only around 1% of an estimated original population of 250,000 remaining. The reasons for this failure to recover are unknown, but environmental factors are likely to be important.



image Sperm whale diving.

image Iceberg in the Southern Ocean.



© GREENPEACE / DANIEL BEUTRA

### Box 5 Toothfish fishing

Toothfish can reach 2 metres in length and can weigh as much as 100kg. Living up to 35 years, they become sexually mature when they are 6 to 9 years of age. Because their populations recover very slowly they are highly vulnerable to over-exploitation, yet they are targeted by both legal and illegal vessels.

Fishing for toothfish is mainly conducted with longlines - fishing lines tens of kilometres long, each one carrying hundreds of baited hooks - and has been responsible for very high levels of 'bycatch', the term used for fish and animals that are unintentionally caught and then thrown overboard, often dead or injured.

Bycatch has been reduced to very small numbers in the legal fishery but the pirate fishing fleets are almost certainly still catching high numbers of seabirds and other animals. Pirate fishing, officially referred to as illegal, unreported and unregulated (IUU) fishing, remains a major threat to the Antarctic fishery. As soon as the pirate fleet has taken all the fish from one area, it moves on - it has been estimated that, in some areas, the illegal catch is 10 times greater than the legal catch.

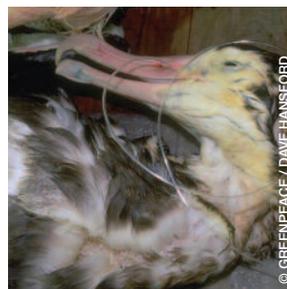
A recent development among the toothfish pirates is the use of plastic monofilament gillnets instead of longlines. No data are available on the birds, mammals and other marine species caught as bycatch in gillnets within the area, but it is known to be a fishing method with high levels of bycatch. Additionally, lost nets may carry on 'ghost fishing,' continuing to trap and kill fish and other species as they drift through the ocean.

Both legal and illegal toothfish vessels operate in the Ross Sea, one of the last areas of pristine ocean on our planet. The Ross Sea's unique marine life gives it a biological and evolutionary significance comparable to that of the Galapagos Islands. It is madness to lose this priceless treasure to the commercial interests of a handful of fishing vessels.

To preserve this unique ocean ecosystem, with its entire food chain and top predators intact, the Ross Sea must be protected as a marine reserve. This will also provide us a 'living laboratory' to help us further understand the impacts of climate change and how undisturbed ocean ecosystems function.



© GREENPEACE / ROGER GRACE



© GREENPEACE / DAVE HANSFORD

image above Patagonian toothfish.  
image left Wandering albatross caught on longline.

## Antarctica – current and future threats

continued

### Effects on the global climate

The most spectacular physical changes in the Antarctic environment relate to the ice shelves of the Antarctic Peninsula. These are floating extensions of a grounded ice-sheet and most of them are located in bays around the Antarctic continent. It has been estimated that 14,000 square kilometres of ice have been lost from 10 floating ice shelves in Antarctica over the last 50 years. Although these ice shelves are floating - and therefore, their breaking off will not contribute to sea-level rise directly - their loss will accelerate the speed at which glaciers feeding into the ice shelves move towards and eventually dump ice into the sea. This will contribute to sea-level rise.

The British Antarctic Survey lists seven ice shelves that have been seriously impacted by warming on the Antarctic Peninsula. In some cases dramatic collapses have occurred, such as the loss of the Larsen A ice shelf in 1995, which collapsed in a matter of weeks. The Prince Gustav ice shelf also collapsed in 1995, having retreated progressively during the late 20th century. This was followed in 2002 by the collapse of the Larsen B ice shelf.

The Wilkins ice shelf is likely to be next. Its collapse has been predicted since it lost around 1000 square kilometres in 1998. Ten years later, in March 2008, a further 400 square kilometres was lost. In late November 2008, new rifts developed on the Wilkins ice shelf. In April 2009, the 25-mile long ice bridge connecting the Wilkins Ice Shelf to the Antarctic continent splintered, putting the entire ice shelf at risk of further disintegration.

### Box 6 Shipping and tourism

Antarctic tourism has been growing at a rapid pace for well over a decade, with more than 40,000 tourists visiting Antarctica in the 2007/2008 season. However, alongside the increase in shipping traffic comes an increase in the threats to the continent. The most serious of these is the potential for oil spills and the release of other toxic chemicals into the sensitive environment if ships have accidents.

Unfortunately ships do occasionally have accidents. The sinking of the tourist vessel MV Explorer in November 2007 and the grounding of the Ocean Nova in February 2009 are two recent examples. Ships routinely carry fuel and toxic substances on board that could be released when they sink or run aground. Polar waters are less able to recover from spills due to short seasons for growth and reproduction, harsh temperatures, and limited or at times no sunlight.

Strict regulations need to be put in place covering all vessels operating in the Southern Ocean, including fishing and whaling vessels, and Antarctic Treaty members need to develop a comprehensive system for regulating tourism in Antarctica.

### Current and Future Governance

Although progressive in many ways, the Antarctic Treaty and its sister body, the Commission on the Conservation of Antarctic Marine Living Resources (CCAMLR) do not currently provide the protection that the Southern Ocean and its unique marine life needs in the face of the existing and emerging threats. Although all the legal and procedural mechanisms to establish a comprehensive and representative network of marine reserves in the Southern Ocean exist within the Antarctic Treaty System, progress to date has been pitifully slow.

At the 50th meeting of the Antarctic Treaty in Baltimore in April 2009, parties agreed to work in conjunction with CCAMLR to establish a comprehensive and representative network of marine protected areas – but, crucially, no clear targets or timelines were set. Now that both bodies are united to work on identifying and establishing areas, it is vital that they make up for lost time and set at least 40% of the Southern Ocean as fully-protected marine reserves.

### Greenpeace calls upon the United Nations and governments around the world to commit to action to save Antarctica.

Antarctic Treaty member states must honour their commitment to dedicate the continent to ‘peace and science’ and implement their obligations to establish a comprehensive and representative network of marine reserves in the Southern Ocean. To be effective, this network should be of sufficient scale, covering at least 40% of the Southern Ocean.



image A leopard seal sits on hard ice sheets at sea.

image A huge iceberg in the Southern Ocean.



© GREENPEACE / DANIEL BELTRA

## Solutions

### Marine reserves provide the best potential solution at both Poles.

The profound physical changes happening at the ends of the Earth are a wake-up call that we ignore at our peril. How we treat the Polar Oceans has major consequences for the planet as a whole. Our generation has a unique opportunity and responsibility to take action to bring us back from the brink of runaway climate change, and to protect some of the most fragile and essential ecosystems on Earth.

There is a compelling body of scientific evidence that demonstrates that setting aside large areas of the ocean from industrial activities, such as fishing and oil and gas extraction, provides protection for valuable species and habitats, maintains important ecosystem functions and allows degraded areas to recover. This is even more important for the Polar Oceans, since the Arctic and Antarctic are warming faster than the rest of the globe and so are under increased stress.

Creating marine reserves in the Polar Oceans will make them both more resilient to the impacts of climate change and will help prevent further, catastrophic, climate change.

### Greenpeace calls upon the United Nations and governments around the world to commit to the following course of action to save the Arctic and Antarctic:

- Establish an immediate moratorium on industrial development in the area of the Arctic Ocean that has historically been covered by sea ice year-round. This 'line in the ice' is the average minimum sea ice extent between 1979 and 2000, the period before significant sea ice loss due to climate change was recorded.
- Create a long-term solution by agreeing a permanent, equitable and overarching treaty or multi-lateral agreement that protects the Arctic Ocean environment and ecosystems and the peoples who depend on them.
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© GREENPEACE / JIRI REZAC

image An iceberg floating in the Southern Ocean.

image Aurorā borealis, Northern Lights.

© GREENPEACE / GAVIN NEWMAN



Greenpeace is an independent global campaigning organisation that acts to change attitudes and behaviour, to protect and conserve the environment and to promote peace.

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