



HM Government

Adapting To Change

UK policy towards the Arctic



Polar Regions Department

Foreign and Commonwealth Office,
King Charles Street,
London
SW1A 2AH

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Adapting To Change

UK policy towards the Arctic



Mark Simmonds
Minister for the Polar Regions
Foreign and Commonwealth Office

Foreword

“There is no doubt that the Arctic is on the frontier of global climate change impacts. Temperatures are rising twice as fast in the Arctic as over the rest of the world.”

The Arctic has proved, time and again, to be one of the most dynamic and influential regions of the world, despite its remoteness from large population centres and its often challenging geographical and climatic conditions.

The United Kingdom is not an Arctic State, but we are the Arctic’s nearest neighbour. This Policy Framework sets out for the first time the detail of the United Kingdom’s interests in the Arctic, how we will work with Arctic States and the wider international community, and what expertise the United Kingdom can offer to help meet some of the long-term challenges facing the region.

There is no doubt that the Arctic is on the frontier of global climate change impacts. Temperatures are rising twice as fast in the Arctic as over the rest of the world. Arctic sea-ice is shrinking rapidly – 2012 was the lowest recorded extent on record. Changes to the Arctic Ocean are now thought to have the potential to affect European weather and climate.

In turn, the region is seeing more commercial activity. Reductions in sea-ice cover mean long sought after sea routes to and from Asia are becoming increasingly ice-free for more days of the year. The Arctic is thought to hold large reserves of oil, gas, metals and rare earths, which are becoming more accessible with improvements in technology. Responding to these changes, while supporting rigorous protection of the environment, is one of the many challenges facing the region and wider world.

As this document sets out, the United Kingdom will continue to support and respect the sovereign rights of the Arctic States to exercise jurisdiction over their territory; the people who live and work in the Arctic; and the unique and fragile natural environment. At the same time it outlines the United Kingdom’s legitimate interests in the region, our priorities for practical action and our willingness to show leadership in appropriate areas. It recognises that what happens in the Arctic has a global impact and can be a legitimate concern of people far beyond the Arctic Circle. It commits the United Kingdom to working with international partners to balance the needs of human development with environmental protection.

The scale of the challenges facing the Arctic is immense and compounded by the speed of the changes. That is why the whole of Government has signed up to the comprehensive set of measures outlined in this Policy Framework. It is a practical example of how we will work together with all the Arctic States and the wider international community to ensure a sustainable future for the Arctic.

Contents

1. The Arctic: an overview	1
<hr/>	
A changing Arctic	
Why it matters	
2. The UK's approach to the Arctic	7
<hr/>	
Vision	
(i) Respect	
(ii) Leadership	
(iii) Cooperation	
This Framework	
Science	
3. The human dimension	13
<hr/>	
Governance	
Indigenous peoples	
4. The environmental dimension	17
<hr/>	
Climate change	
Biodiversity	
Safeguarding the environment from commercial activity	
5. The commercial dimension	23
<hr/>	
Energy security	
Shipping	
Tourism	
Fisheries	
Bioprospecting	
UK commercial expertise	
References and endnotes	31
<hr/>	

Acronyms

BAS	British Antarctic Survey
EU	European Union
IEA	International Energy Agency
IMO	International Maritime Organization
IPCC	Intergovernmental Panel on Climate Change
JNCC	Joint Nature Conservation Committee
MARPOL	International Convention for the Prevention of Pollution from Ships
MPA	Marine Protected Area
NERC	Natural Environment Research Council
RFMO	Regional Fisheries Management Organisation
UKHO	United Kingdom Hydrographic Office
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea

The Arctic States

(the Member States of the Arctic Council):

Canada

Norway

Kingdom of Denmark
(including the dependencies of
Greenland and the Faroe Islands)

Russian Federation

Finland

Sweden

Iceland

United States of America

1. The Arctic: an overview

The Arctic is one of the most pristine areas of the world. However, that does not mean it is empty. The area within the Arctic Circle is home to 4 million people. On a slightly wider definition of the Arctic, its population is around 10 million.

Indigenous peoples¹ have lived in the Arctic for millennia and have done so right across the Arctic lands. The different groups all have their own identities, cultures, languages and traditions. The Arctic has been connected to the wider world for just as long through trade and with pollution, even in Roman times, finding its way into the Arctic ice.

There is also a history of non-traditional activity in the Arctic. Onshore oil and gas exploration has been undertaken in parts of the Arctic since the 1960s; some areas of the region have been a popular tourism destination for decades; and fisheries in the Barents Sea have been sustainably managed for years.

When it comes to understanding the Arctic, it is not particularly useful to see it as a homogenous section of the world entirely covered by ice and snow. The Arctic is diverse in terms of its geographic, climatic and human dimensions. For example, some areas, such as off the coast of northern Norway, remain virtually ice-free all year round, while similar latitudes elsewhere are predominantly ice-covered (see figure 1).

There is also no universally agreed definition of the Arctic, but a number of common definitions are in use. These include: the area within the Arctic Circle (66° 34' North); the area within the July 10°C isotherm; and the area within the Arctic tree line (i.e. the northern limit of tree growth).

Figure 1a: winter sea-ice extent in the Arctic²

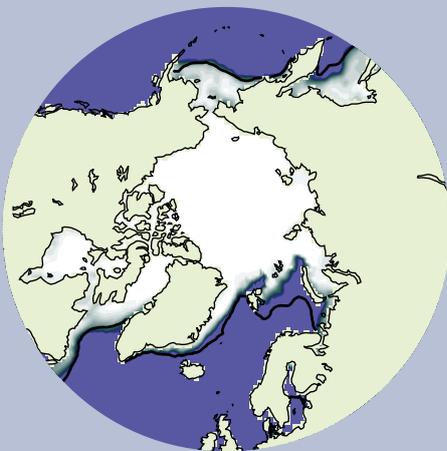


Figure 1b: summer sea-ice extent in the Arctic³

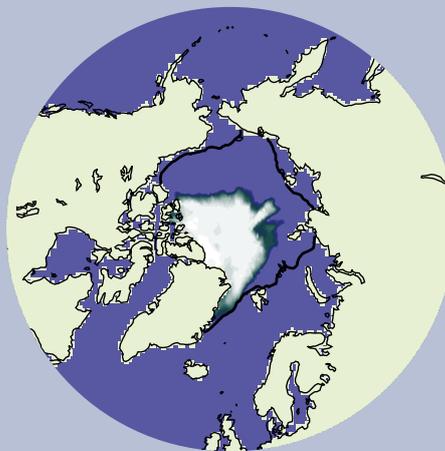
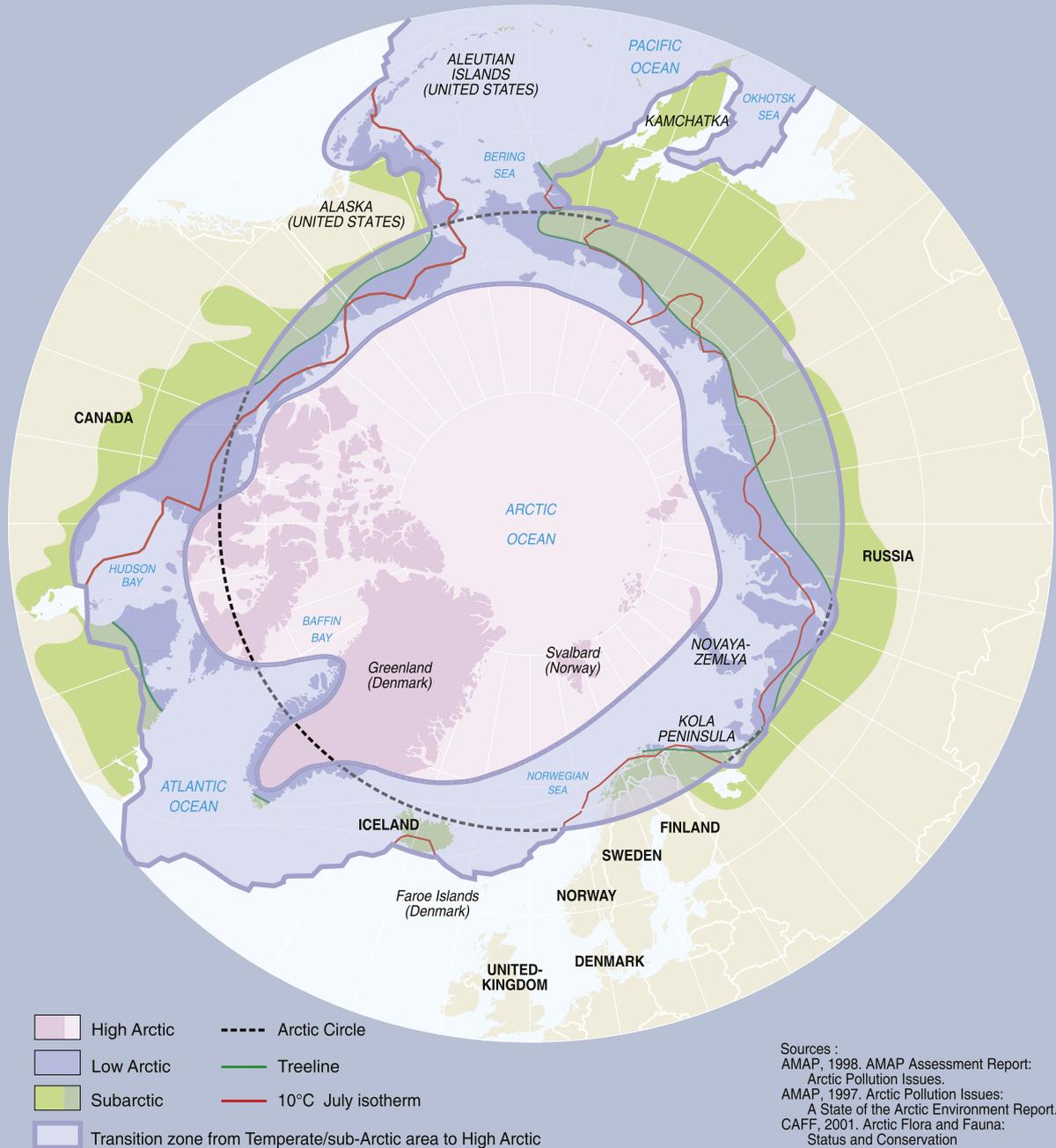


Figure 2: common definitions of the Arctic⁴



A changing Arctic

The Arctic, like many other parts of the world, is facing changes predominantly caused by the effects of climate change.

Increases in average global near-surface temperatures since 1980 have been twice as high in the Arctic as they have over the rest of the world⁵. Even if international efforts to restrict

increases in global temperatures to less than 2°C above pre-industrial levels are successful, it is expected that the Arctic will still have warmed by twice as much.

This is having profound effects on the Arctic cryosphere – that part of the Arctic that is seasonally or perennially frozen – such as reduced sea-ice, melting glaciers and ice caps, and the thawing of permafrost.

Figure 3: Arctic surface air temperature anomaly over land 1900-2012

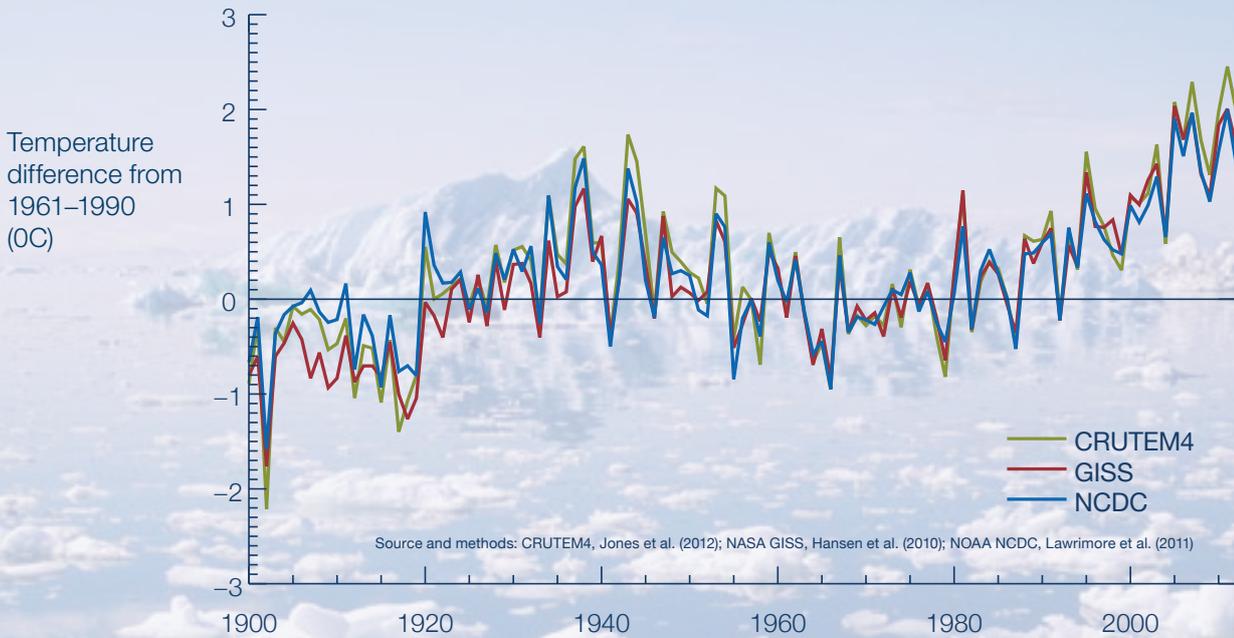
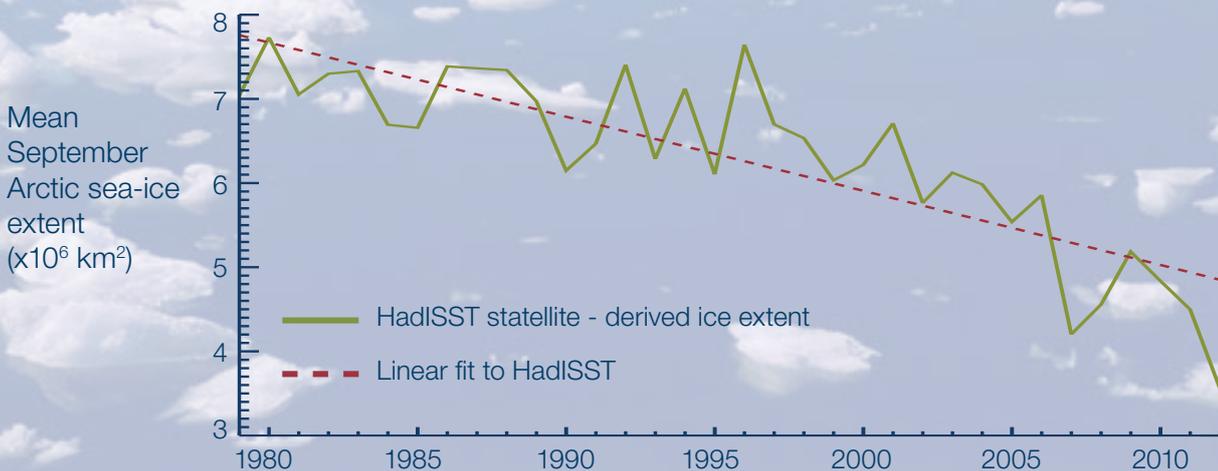


Figure 4: average monthly Arctic sea-ice extent (September 1979-2012)



Why it matters

The Arctic is inextricably linked to global processes, whether they are climatic, environmental, social, legal or economic.

Non-Arctic States have long had an impact on the Arctic, for example as sources of Arctic pollutants such as mercury; contributors to climate change; or as consumers of Arctic goods. Conversely, changes in the Arctic also impact on non-Arctic States.

Changes in the Arctic have impacts on the global climate and sea level. For example, melting Arctic glaciers, ice caps and the Greenland Ice Sheet contributed over 40% of the 3.1mm global sea level rise observed every year between 2003 and 2008⁶. It is now thought that decreasing sea-ice or increasing freshwater entering the Arctic Ocean may have the potential to affect the UK's weather and climate. Such effects will also impact on migratory species of mammals and birds from around the world, including the UK.

Increased acidification of the Arctic Ocean, caused by it absorbing ever-increasing amounts of carbon dioxide, could result in a shift in the distribution of marine species, including the fish upon which Arctic coastal communities rely as a source of food and income.

The Arctic is thought to hold 30% of the world's undiscovered gas and 13% of its undiscovered oil (84% of this is expected to be offshore)⁷ as well as large deposits of rare earths (metals used in the production of a wide variety of high-end technology products ranging from high refractive index glass and lasers to mobile phones and solar panels). Reductions in sea-ice cover could make some of these resources more accessible to current or future extraction techniques. Many of these resources would end up on world markets and potentially traded via or consumed in the UK.

The long sought after Arctic sea routes to the Far East are also becoming increasingly ice-free for more days of the year, with the potential to see growing levels of commercial shipping traffic between Europe and Asia over the coming decades.



The Arctic has seen large growth in tourism, including by British citizens. For example, the Arctic coast of Norway is becoming increasingly popular, with continually growing numbers of visitors from ever-larger cruise ships.

These factors, and the potential future impacts of continued Arctic climate change, have led to increased geopolitical, commercial, scientific and environmental interest in the Arctic from across the globe.

“Discovering the Arctic”

Polar matters are part of the English National Curriculum for geography at both primary and secondary school. To support delivery of the curriculum and promote education on polar matters generally, the Royal Geographical Society (with IBG), in partnership with the British Antarctic Survey and the Scottish Association for Marine Science, developed discoveringthearctic.org.uk.

Discoveringthearctic.org.uk is a unique, dedicated web-based microsite that facilitates in-depth analysis and commentary on issues relevant to the Arctic for UK secondary school pupils. The website provides guidance for teachers in its use in the classroom, and covers geography, biology, environmental science, physics, chemistry, geology, government and politics, leisure and tourism. The interactive, multimedia format supports a range of features including web-based media applications, discussion forums, teachers’ access and web links.

Since its launch in 2009 the site has been positively reviewed and well-used by teachers, and in April 2010 the website received a Silver Award from the Geographical Association being recognised for “its range of high quality resources and learning activities”. To date, users have accessed the site from over 40 countries. Future development of the site will include specialist sections extending its application to primary education.





2. The UK's approach to the Arctic

We will work towards an Arctic that is safe and secure; well governed in conjunction with indigenous peoples and in line with international law; where policies are developed on the basis of sound science with full regard to the environment; and where only responsible development takes place

The UK is the northernmost country outside of the eight Arctic States; the northern tip of the Shetland Islands being only 400km south of the Arctic Circle.

This closeness, combined with a long tradition of exploration, has given the UK a historic interest in the Arctic that dates back to the voyages of discovery.

However, the UK's interests go much further than simple geographical proximity or historical endeavour. The inextricable links between the Arctic and global processes means that non-Arctic States such as the UK have legitimate interests and roles to play in finding solutions to many of the most pressing issues facing the Arctic.

So what role should the UK play in the stewardship of the Arctic?

Vision

The UK will work towards an Arctic that is safe and secure; well governed in conjunction with indigenous peoples and in line with international law; where policies are developed on the basis of sound science with full regard to the environment; and where only responsible development takes place.

All the UK's policies towards the Arctic will contribute in some way towards the realisation of this vision. The vision will be supported by three principles:

(i) Respect

The debate around the Arctic is sometimes presented as a dichotomy between protecting the environment, portraying the Arctic as a pristine wilderness that needs to be saved in its current form, and the race for territory and resources, with an absolute disregard for the Arctic environment or those that live there.

In reality, policies need to be found and developed which recognise the differences between different parts of the Arctic; respect the needs and views of local Arctic communities; and which reconcile the responsibilities of countries to provide effective stewardship of the global environment while providing opportunities for growth and prosperity for their people.

That is why the UK's approach to the Arctic is based on respect:

- Respect for the sovereign rights of the Arctic States to exercise jurisdiction over their territory;
- Respect for the views and interests of people who live and work in the Arctic and call it home;
- Respect for the environment, its fragility and its central importance to the global climate.

Adopting an approach to the Arctic that does not respect all three of these elements would be counter-productive to UK influence and interests.



(ii) Leadership

The UK believes that fundamentally, leadership for Arctic stewardship rests with the eight Arctic States and the peoples within those States. These are the countries and peoples with the most direct interest in, and the most experience of, living, working and operating in the Arctic. It is they, first and foremost, that people look to and rely on to ensure a peaceful, well-governed Arctic with a sustainable future.

However, it would be wrong to say that the UK should not show any leadership on issues affecting the Arctic. Climate change is the greatest challenge facing the Arctic. It is the consequences of climate change that are driving many of the changes that are being seen there. The UK is a global leader on both pushing for reduced emissions of greenhouse gases and understanding its effects and is therefore leading the fight on tackling the underlying causes of the rapid changes facing the Arctic. But it is not just climate change. The UK is acting on all the trans-boundary issues as outlined in the following chapters.

These activities are not just attributable to the UK Government. The UK scientific community, industry and non-governmental organisations all have and do play an active role. Highly regarded UK science is present in most areas of Arctic research and also helps to underpin good policy, stable governance and responsible commerce. UK industry offers professional, high value and responsible products and services covering a range of industries and their supply chains. UK non-governmental organisations are active in promoting awareness and understanding of the Arctic environment and its intrinsic value.

(iii) Cooperation

The mix of actors, roles, interests and expertise at play in the Arctic means dialogue and co-operation should be at the heart of Arctic policy making.

The UK's long-standing aim of working closely and co-operatively with the Arctic States, indigenous peoples and others on the issues facing the Arctic therefore remains central to the Government's approach.

This Framework

This Framework is intended to be a clear exposition of Government policies towards the Arctic and will be reviewed regularly. As such, it is designed to set the overall direction for future policies towards the Arctic as well as a way of presenting existing policies to both a domestic and international audience.

The Framework is designed to be flexible enough to accommodate changes that will continue to

take place in the Arctic and help ensure that the UK continues to have the right mix of policies. It will form part of an ongoing dialogue between the Government and stakeholders.

The Framework sets out three tenets – covering the human, environmental and commercial dimensions – that between them contribute to the UK's overall vision for the Arctic. These are discussed in detail in the following chapters.

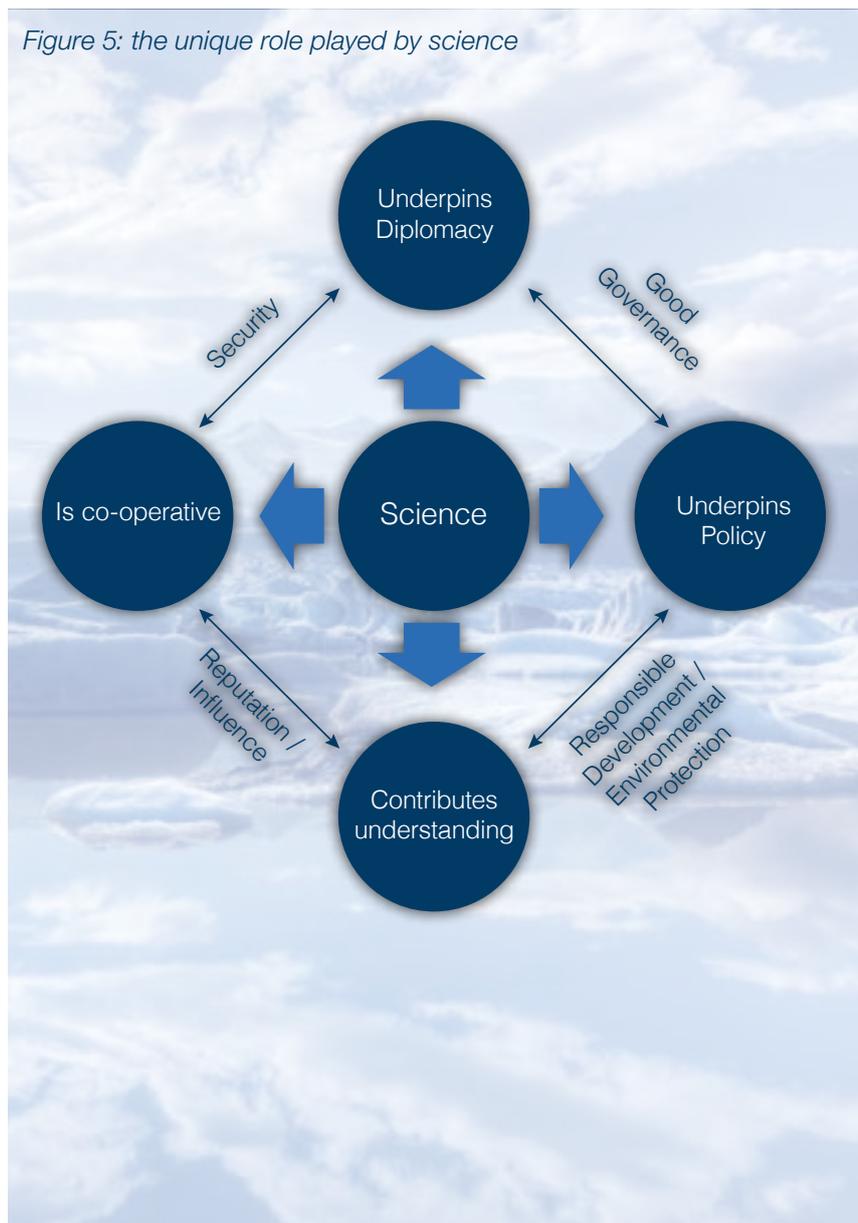
Science

Underpinning all of the tenets of the framework is the undertaking and use of high quality, independent science – an area in which the UK excels and has an outstanding international reputation.

By its nature, science contributes directly to diplomacy, policy and our understanding of the Arctic, and is the basis of much of our co-operation with Arctic States, the Arctic Council and other actors. High quality, independent science is therefore the main currency for delivering many of the UK's objectives.

Science, along with co-operation, respect and appropriate leadership, therefore remains central to the UK's approach to the Arctic.

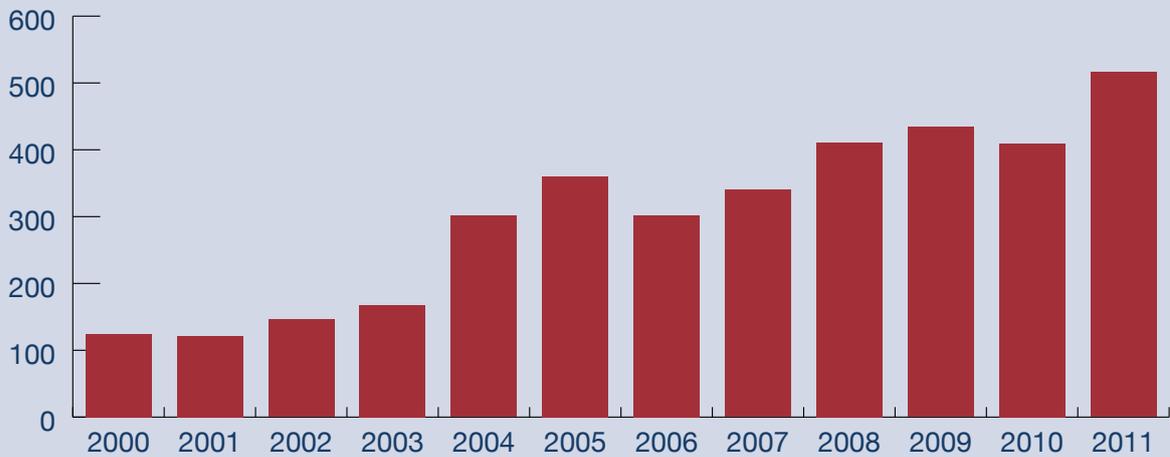
Figure 5: the unique role played by science



UK funded Arctic research

The UK has a large, active and growing Arctic science community, with at least 77 UK institutions involved in Arctic research, including 46 universities and 20 research institutes. In 2011 alone, more than 500 individual UK scientists with registered Arctic interests produced over 500 Arctic-related publications, four times as many as those produced in 2000.

Figure 6a: growing numbers of Arctic-related publications involving UK researchers



Funding for UK Arctic environmental research activities has steadily risen over the past decade with over £50m awarded to 138 individual research projects, including the new £15m of thematic funding provided for the Arctic Research Programme by the Natural Environment Research Council (NERC) that runs from 2011 to 2016.

Figure 6b: increasing NERC funding for Arctic science

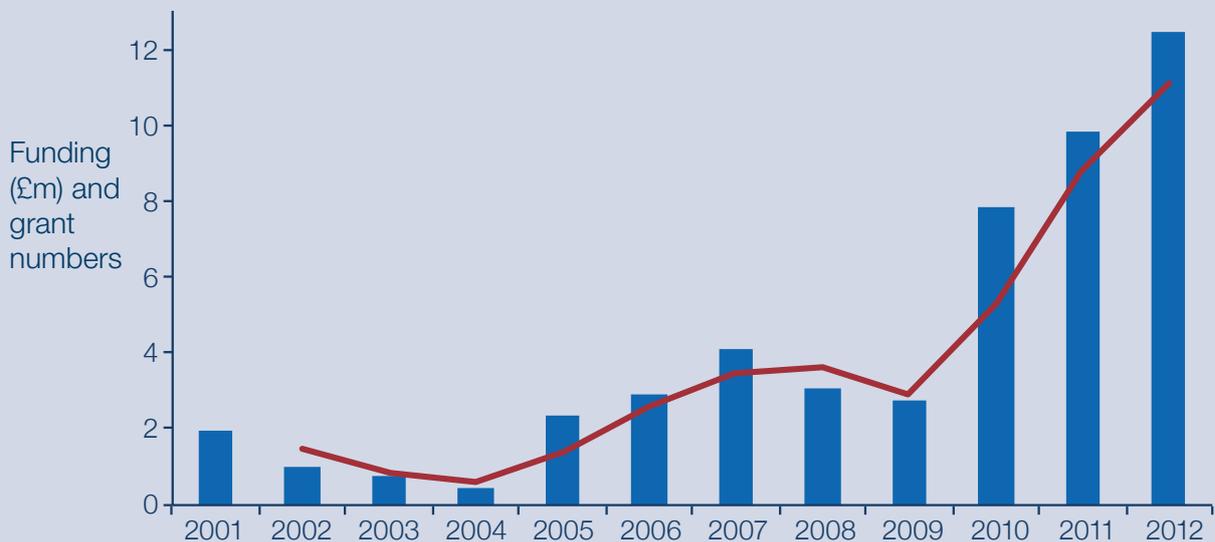




Photo credit: British Antarctic Survey

UK research base on Svalbard

The UK research station, established by NERC in 1991 in the international research village of Ny-Ålesund, northwest Svalbard, provides a summer research facility in the High Arctic. It has consistently been one of the most active of the research stations in Ny-Ålesund with 95 Arctic research projects supported over the past decade alone. Fourteen of these projects have been led by non-UK scientists, reflecting the collaborative nature of UK science in the Arctic.

The research is varied, including: glaciology; geology; hydrology; terrestrial and marine biology; and atmospheric physics. Through the station the UK has also influenced and led the adoption of best practice for field safety, environmental management and research coordination by the Ny-Ålesund international community.

Deploying other UK polar assets in the Arctic

The UK has two ice-capable research vessels operated by the British Antarctic Survey (BAS). One of these, the RRS James Clark Ross, with its advanced facilities for oceanographic research, now operates two to three research cruises every year in the western Arctic. In recent years it has been facilitating research on topics such as ocean circulation, ocean acidification, sea-ice processes, aerosols, marine plankton and methane hydrates.

Both BAS and its parent organisation NERC operate a fleet of research capable aircraft. In summer 2012, NERC's BAe-146 atmospheric chemistry aircraft undertook a campaign to study the sources and patterns of distribution of methane and other greenhouse gases in northern Scandinavia and the Barents Sea. In 2013, the same aircraft will work alongside a BAS-operated Twin Otter aircraft, the RRS James Clark Ross and other research vessels to study Arctic clouds and aerosols to help better understand short lived climate forcers and long distance pollution in the Arctic.

UK Antarctic science in the Arctic

BAS gives the UK a very substantial national capability in Antarctic science. The close linking of its science programmes with essential logistics support makes it very effective in carrying out the complicated and sophisticated scientific field programmes that are necessary today. Additionally, the UK's wider Antarctic science community is substantial. This means the UK is well placed to transfer knowledge and expertise across both polar regions. A recent example of this is the European-funded, UK-led ice2sea project that has provided the 5th Intergovernmental Panel on Climate Change (IPCC) Report with improved understanding and estimates of ice sheet melting, including Greenland and the West Antarctic Ice Shelf, and its significance for better sea-level rise predictions.



3. The human dimension

Work towards an Arctic that is safe and secure; well governed in conjunction with indigenous peoples and in line with international law

The bedrock on which all of the UK's policies towards the Arctic are based is the fact that the region must be one that is peaceful, stable and well governed.

Therefore, the first tenet of UK policy towards the Arctic is to support and work cooperatively and constructively with the eight Arctic States and the Arctic's indigenous peoples, bilaterally and multilaterally, through fora such as the Arctic Council.

The UK remains committed to preserving the stability and security of the Arctic region. This objective will be pursued through a wide range of defence engagement and bilateral security co-operation with a number of close allies and partners in the region. This will include the essential training needed for the military on cold weather training exercise. The role of NATO will remain central, as will the UK's participation in the Arctic Security Forces Roundtable forum, which promotes security co-operation on issues such as situational awareness and search and rescue missions.

Governance

Promoting good governance of the Arctic through existing fora and legal mechanisms

The vast majority of territory in the Arctic falls clearly within the sovereign jurisdiction of the eight Arctic States. It is they, first and foremost, that the world looks to and relies on to provide leadership and good governance of the Arctic. The UK will support and respect the sovereign rights of the Arctic States to exercise jurisdiction over their territory.

Upon signing the Ilulissat Declaration in 2008, the five coastal Arctic States committed themselves to the existing legal framework and to the orderly

settlement of overlapping territorial claims. The UK will strongly support moves by the Arctic States that promote governance in conjunction with international law.

The Arctic Council was formed in 1996 by the eight Arctic States and has been successful in helping promote practical co-operation and engagement between them, particularly regarding environmental and sustainable development issues. The UK will support the Arctic Council as the pre-eminent regional forum for discussing Arctic issues and the stability it provides for discussion amongst Arctic States.

The UK has been an active and engaged Observer of the Arctic Council since its inception in 1996, contributing scientific expertise to many of the Council's Working Groups (page xx). The UK supports the Arctic Council's objectives and 'Vision for the Arctic' and will play an active role in the work of the Council, contributing expertise on areas of mutual interest.

Some Arctic issues are purely regional in their effects. Others have global impacts or are caused by global processes. The UK believes that those aspects of Arctic policy that are either affected by or contribute to wider global impacts are best discussed by open dialogue with a broad range of actors. The UK will actively encourage the Arctic Council and other regional fora to further engage non-Arctic countries in Arctic matters of global importance.

Governance of the Arctic rests with the sovereign Arctic States, supplemented and complemented by international agreements and treaties, in particular the UN Convention on the Law of the Sea (UNCLOS). The current arrangements are working and provide a solid foundation for responsible management of the Arctic Ocean.

The UK considers moving towards a specific Arctic Treaty at this time neither necessary nor beneficial.

Indigenous peoples

Respecting the views and interests of Arctic indigenous peoples and supporting their role in Arctic decision-making

Indigenous people have lived in the Arctic for millennia and have done so right across the Arctic lands. Different groups have their own identities, cultures, languages and traditions. The views of

indigenous peoples towards the rapid changes in the Arctic vary, as does their involvement in decisions that affect them. The UK will respect the views, interests, culture and traditions of Arctic indigenous peoples and promote the participation of indigenous peoples in decision-making.

Representatives of the six main indigenous groups in the Arctic are seated at the Arctic Council's decision-making table, where they are considered Permanent Participants. The UK will support the right of Permanent Participants to be heard at the decision-making level of the Arctic Council.

Figure 7: demography of indigenous peoples of the Arctic based on linguistic groups⁸





Some examples of UK involvement in Arctic Council Working Group activities

- In 2004, UK natural and social scientists contributed to the Sustainable Development Working Group's "Arctic Human Dimension Report".
- Since 2008, the UK's Natural Environment Research Council (NERC) has been a member of the Arctic Council-sponsored "Sustaining Arctic Observing Network", which aims to provide an international setting for co-ordinating Arctic observational networks.
- In 2009, researchers from the University of Lancaster contributed to the Arctic Monitoring and Assessment Programme's "Persistent Organic Pollutants" report.
- In 2010, UK conservation research groups, notably the Zoological Society of London, the International Wader Study Group and UNEP-WCMC, helped develop the Conservation of Arctic Flora and Fauna's "Arctic Biodiversity Trends" report.
- In 2011, eight UK researchers made significant contributions to the Arctic Monitoring and Assessment Programme's "Snow, Water, Ice and Permafrost" (SWIPA) report.
- Between 2011 and 2013, the Plymouth Marine Laboratory has been part of the Arctic Council's "Ocean Acidification Expert Group". NERC's Ocean Acidification Programme has links with the Arctic Monitoring and Assessment Programme's 2013 work on ocean acidification.
- In 2012, UK researchers were involved in scoping the Arctic Council's "Arctic Change Assessment" - a follow up to the 2004 Arctic Climate Impact Assessment that UK researchers helped develop.
- In 2012 and 2013, the UK's Joint Nature Conservation Committee input into work on ecosystem-based management undertaken by the Arctic Council's Expert and Protection of Arctic Marine Environment groups.

UK science in action: supporting governance

Scott Polar Research Institute

The Scott Polar Research Institute, part of the University of Cambridge's Geography Department, has a long tradition of social sciences and humanities research in the Arctic. Its Circumpolar History and Public Policy Research Group aims to address issues of contemporary relevance to the Polar Regions by bringing together historical analysis and public policy debate. It uses historical, ethnographic, and economic research to explore policy issues and options over a longer timeframe, focusing in particular on science policy, traditional knowledge of northern peoples, and transnational governance. It has undertaken a number of groundbreaking studies in this field over recent years.

Case study: The Life of Field Stations - a History of Community Participation in Scientific Practice at the Igloolik Laboratory (1974-2004)

What news coverage of the Arctic does not tell us is how Inuit have been able to access and commission specialised scientific studies to organise their own political and cultural responses to major issues like sustainability and climate change. The story of the Inuit finding ways to bridge their own traditional knowledge with the sciences can be traced back to the needs of 18th century scientific travellers to acquire local knowledge. However the opportunity for sustained dialogue between knowledge systems began when Inuit communities began to host semi-permanent scientific field stations and government-appointed scientists began to live in the communities. Over time Inuit Elders, translators, and guides became regular features of field station life. The Igloolik Elders' Society developed their own projects to contribute to disciplines including ecology, traditional law, history, and astronomy. Inuit policy makers incorporated the Igloolik field station into their strategies to preserve and even increase their mastery of their own highly precise environmental vocabulary. They also acquired skill in advising visiting researchers from distant universities on many aspects of their fieldwork. How governments and indigenous groups have developed a shared understanding of the procedures and uses of field-based scientific research, is a little known story behind the emergence of an approach to international scientific governance that is unique to the Arctic.

This project, led by Dr. Michael Bravo of the University of Cambridge, clarified what "conditions enable community participation at field stations to be so successful, what policymakers can reasonably expect to ask of community-based knowledge projects, and in return what approaches to strategic funding are needed for projects like these to proliferate elsewhere."

4. The environmental dimension

Promote an Arctic where policies are developed on the basis of sound science with full regard to the environment

The Arctic is a unique environment of global significance. It is an environment that is changing rapidly and will continue to change; and yet it is an environment that is still not fully understood.

The second tenet of the UK's policy towards the Arctic is therefore to promote greater understanding of the Arctic through international scientific collaboration and to promote policy development on the basis of sound science.

The UK strongly believes that sound science should underpin global Arctic policy and this is reflected by the fact that the UK has a large and active Arctic science community. The UK's commitment to Arctic science is highlighted by the Natural Environment Research Council's (NERC) £15m Arctic Research Programme which is investigating environmental and climate issues in the region. The Government will promote UK Arctic science and encourage more international collaboration and co-ordination between scientific communities.

Global Arctic policy needs to keep up with the rapid changes being seen in the Arctic and use the scientific evidence available. The UK will encourage the timely feedback of robust evidence into decision making mechanisms.

Climate change

Acting to limit the global average temperature rise to below 2°C above pre-industrial levels

Climate change is the greatest threat facing the Arctic. The UK's goal, shared by the EU and recognised by all countries following the 2010 UN climate summit in Cancun, is to establish clear objectives for reducing human-generated greenhouse gas emissions over time to limit the global average temperature rise to below 2°C above pre-industrial levels. The temperature rise in the Arctic would likely be considerably higher than this with subsequent regional and global impacts. Achieving this goal will require the mitigation of greenhouse gas emissions on a global scale. The UK will play a leading role in diplomatic efforts to avoid dangerous climate change, including through the negotiation of a legally binding global climate change agreement to be agreed in 2015.

The UK is working with other countries to build an understanding of the threats posed by climate change and the opportunities for action. The UK helps build capacity for action by funding practical projects that match the priorities of different countries to the areas the UK has expertise in. We also share information about what the UK is doing to mitigate climate change. The UK will support action in other countries, including through over 200 practical projects sharing UK expertise and helping build mitigation capacity in countries around the world.

The UK is leading by example having committed to reducing UK emissions of greenhouse gases by 34% on 1990 levels by 2020 and by 80% by 2050 through the Climate Change Act 2008. The UK is committed to achieving substantial emissions reductions through a range of measures designed to reduce demand and investment in low-carbon technologies.

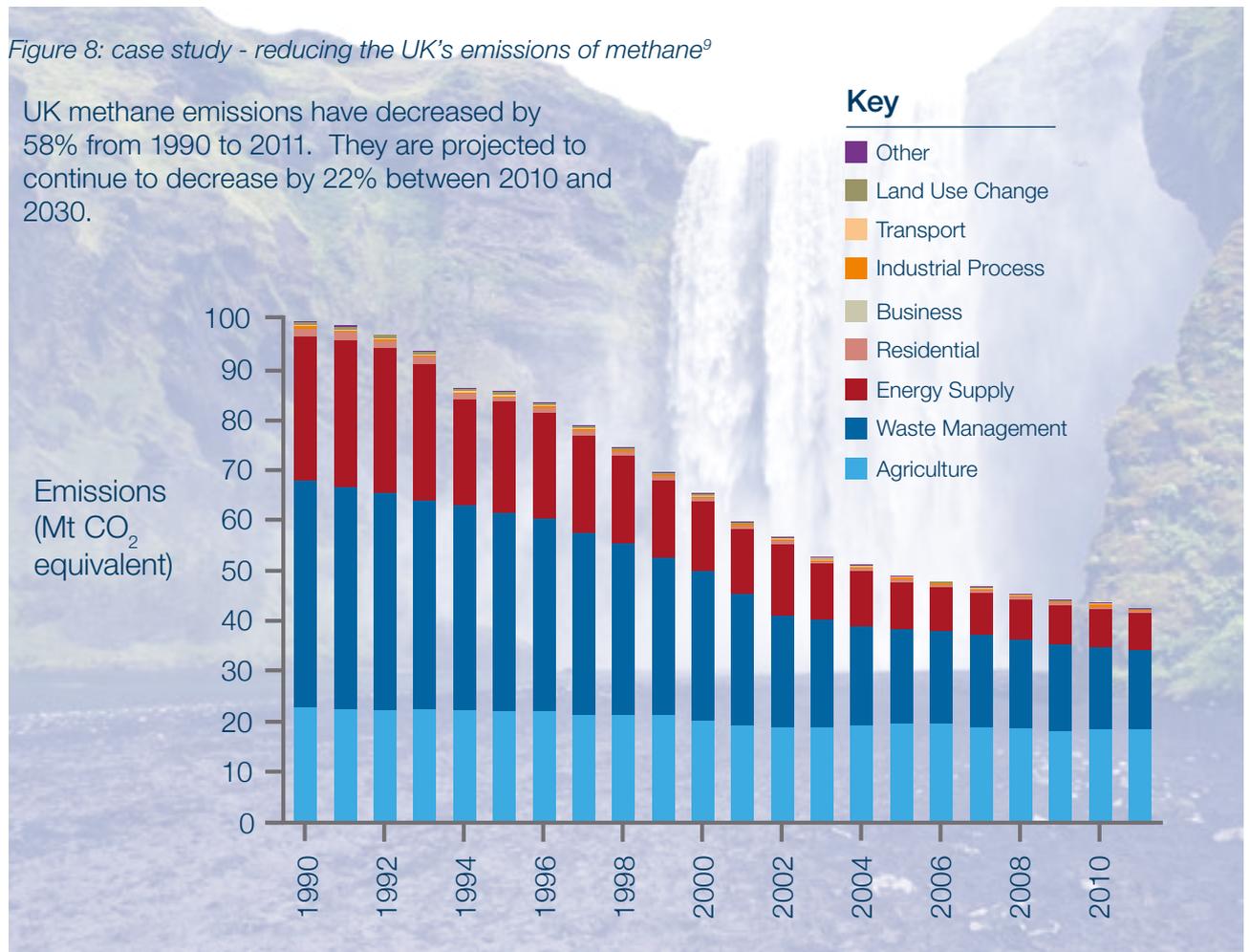
Actions to reduce Short Lived Climate Forcers, including methane and black carbon (soot), are a crucial complement to reducing emissions of carbon dioxide in tackling climate change. The UK will build understanding of the climate impacts of black carbon in the Arctic; reduce its domestic emissions of methane in line with the Climate Change Act 2008; work with the International Maritime Organization (IMO) to reduce emissions of black carbon from Arctic and other shipping;

and work through the UN Economic Commission for Europe's Convention on Long-Range Transboundary Air Pollution to address black carbon emissions.

The scientific evidence that the world's climate is changing and that this is mainly the result of human activities is extensive, robust and clear. Nevertheless further research is needed to refine our understanding of how the climate system works and how the climate will change in coming decades, including in the Arctic. The UK will continue to fund top class climate research, through, for example, the Met Office Hadley Centre's Climate Programme and the Natural Environment Research Council's £15 million, five-year Arctic Research Programme, to increase understanding of the changes in the Arctic and their impacts on the global system.

Figure 8: case study - reducing the UK's emissions of methane⁹

UK methane emissions have decreased by 58% from 1990 to 2011. They are projected to continue to decrease by 22% between 2010 and 2030.



Biodiversity

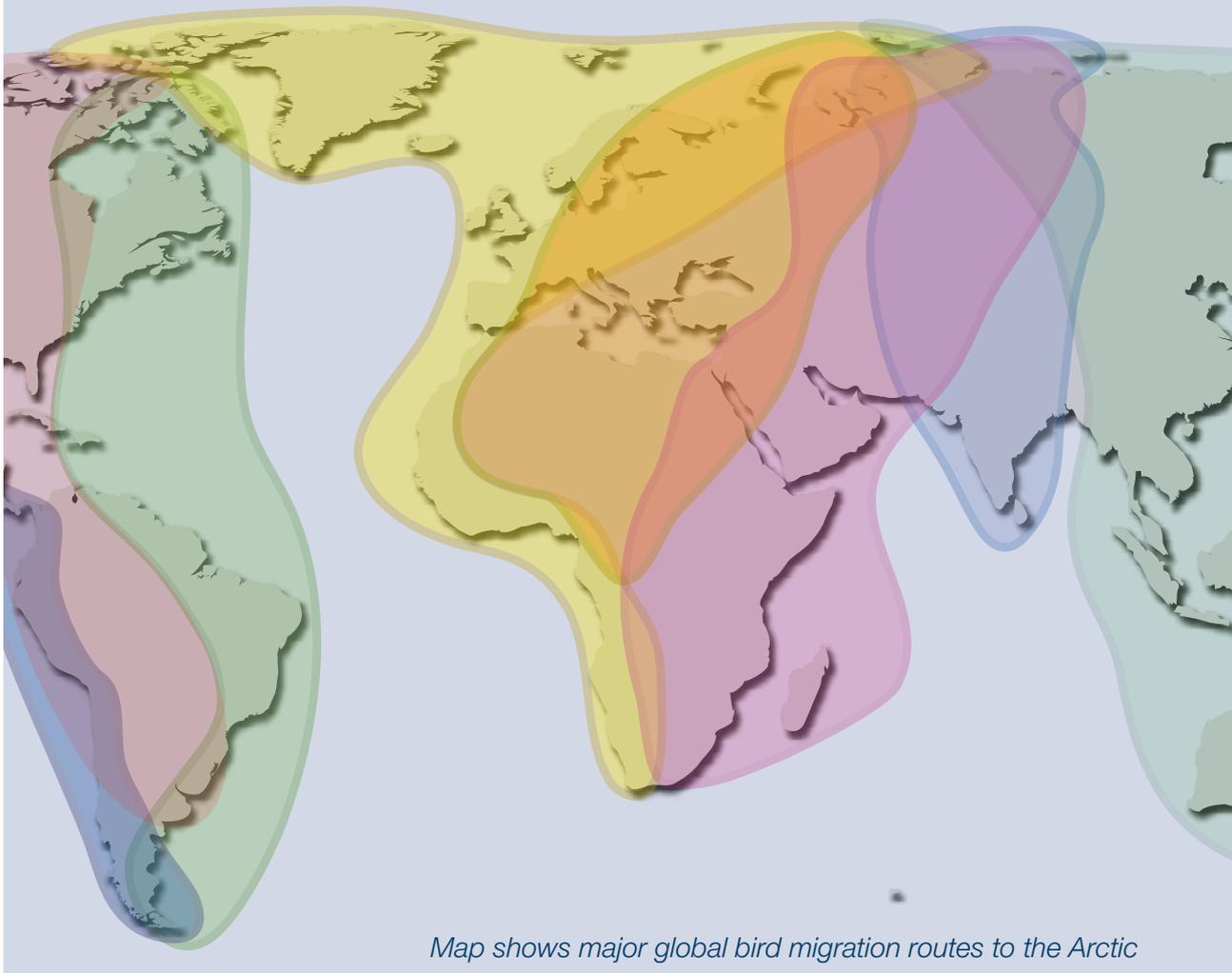
Promoting the conservation and sustainable use of biodiversity in the Arctic

The Arctic is one of the world's most pristine and biologically rich environments. Due to its geographic location the UK shares a common marine and avian biodiversity with much of the Arctic and is thus intrinsically linked to the region with a significant stake in protecting the area's ecosystem. The UK will engage with Arctic States and the Arctic Council on measures to protect Arctic migratory species.

The rapid changes taking place in the Arctic pose immense management challenges for Arctic nations as they endeavour to maintain the sustainability of the natural, cultural, and economic resources of the region¹¹. Ecosystem-based management provides a flexible approach to managing ecosystems subject to these challenges. The UK will encourage experts to engage with the Arctic States and Arctic Council on ecosystem based management to help underpin the resilience of Arctic ecosystems and communities.

Figure 9: UK and the Arctic – seabirds: an example of shared biodiversity¹⁰

Of the 25 breeding seabird species in the UK, only 6 do not breed in the Arctic. Of the 25 breeding seabird species in the Arctic's "Atlantic sector", only 6 do not breed in the UK.



Map shows major global bird migration routes to the Arctic



Due to its geographic location the UK shares a common marine and avian biodiversity with much of the Arctic...

The UK is a strong supporter of the efforts of Parties to the Convention on Biological Diversity to strive for marine protected areas and other area based protection mechanisms covering 10% of the world's oceans by 2020. The UK will support the principle of designating Marine Protected Areas in international waters, including in the Arctic, where the science supports it.

As a Party to the Oslo and Paris Convention for the Protection of Marine Environment of the North East Atlantic (OSPAR) - a Regional Sea Convention that partly covers Arctic waters - the UK supported OSPAR's ten-year strategy to establish an effective, managed ecologically coherent network of Marine Protected Areas by 2016. The UK will promote delivery of a well-managed ecologically coherent network of Marine Protected Areas within the OSPAR Convention area, including the relevant Arctic region.

Currently, areas beyond national jurisdiction identified as Marine Protected Areas by competent bodies, such as regional seas

conventions, are only binding on the Parties to the relevant Convention or Treaty. The UK will work towards a new mechanism to improve the conservation of marine biodiversity in high seas, including a globally accepted regime for Marine Protected Areas preferably through a new Implementing Agreement under the UN Convention on the Law of the Sea.

The Arctic forms a primary habitat to seventeen different whale species, including dolphins and porpoises. As an active member of the International Whaling Commission, the UK strongly supports the moratorium on commercial whaling.

The UK fully implements the EU-wide policy on trade in seal products. This includes a clear exemption to allow the free trade of seal products from hunts traditionally conducted by Inuit and other indigenous communities that contribute to their subsistence.



The UK will advocate for the use of the highest environmental and drilling standards in the Arctic, as elsewhere...

Safeguarding the environment from commercial activity

Minimising the environmental impact from responsible development of the Arctic

Large-scale onshore extraction of hydrocarbons in the Arctic has a long history and is well-established. Furthermore, interest in exploration and development of the region's offshore oil and gas fields is steadily increasing. There is also the growing possibility of increased mining for mineral and rare earth deposits.

Decisions on whether to proceed with exploration and extraction projects are commercial matters for operators to make in the light of prevailing market and regulatory conditions. In turn these will be affected by the prevailing environmental conditions of the area in question.

The regulation of such projects is a matter for the relevant national authorities of the Arctic States in whose jurisdiction they take place. However, the UK is very aware of the environmental risks associated with oil, gas and mining activities in parts of the Arctic. The UK will advocate for the use of the highest environmental and drilling standards in the Arctic, as elsewhere, and will provide advice where this is sought.

The United Nations Convention on the Law of the Sea (UNCLOS) remains paramount in the prevention of pollution from ships, with the International Convention for the Prevention of Pollution from Ships (MARPOL), developed in the

forum of the IMO, continuing to be authoritative. All environmental regulations contained in MARPOL apply to ships and fixed or floating platforms in Arctic waters.

An increase in shipping in the Arctic has clear ramifications for environmental protection. The UK considers that the Arctic should receive the level of protection from ship-source pollution which it needs and it is immensely important that the expansion of shipping in the Arctic should not have a damaging effect on the environment. Where scientific evidence demonstrates that a particular vulnerability requires an increase in the level of protection that should be applied in Arctic waters under MARPOL, or any other IMO international instrument, the UK will work in the IMO to endeavour that the necessary protection is achieved.

The UK's overriding principle towards the management of fishing activity in the Arctic, including any new fisheries, will be the precautionary and ecosystem-based approach. All fishing activity should be carried out on the basis of the best available scientific information and in a sustainable manner. The application of the precautionary principle is particularly important where the status of a given stock is uncertain. Fisheries should be conducted on the basis of cooperation between all interested States. The UK will work with and through the EU on discussions on sustainable management of Arctic fishing and fisheries.

UK science in action: understanding the Arctic Environment

UK environmental research on the Arctic

UK scientists contribute substantially to important polar research areas such as: oceanography; atmospheric chemistry; sea-ice and ice sheet dynamics; hydrology; terrestrial biology; and both regional modelling of the Arctic and their incorporation into large global climate models through interaction with the UK Met Office Hadley Centre. British scientists are contributing to understanding what role a future essentially ice-free Arctic Ocean will play in the global carbon cycle; and how the vast stocks of carbon

present in the permafrost soils of Siberia and North America will respond to a warming climate as permafrost thaws. The threat of substantial release of methane and carbon dioxide from Arctic soils and marine sediments could transform existing models of future global warming and so needs urgent investigation. The impact of ocean acidification on polar marine ecosystems is also a globally relevant issue where British scientists are making substantial contributions to our understanding and identifying the implications for natural systems and important fisheries.

Case study: UK climate science

The loss of Arctic sea-ice is arguably the most significant visible change in the Arctic that is attributable to climate change. It impacts on both the ocean and the atmosphere of the Arctic and appears to have significance for extreme weather at lower latitudes, facilitates increased coastal erosion around polar coastlines but also increases access to the Arctic region. UK researchers have an international reputation for their studies of the Arctic climate system and particularly the interaction of oceans, sea-ice and the atmosphere. British scientists have used submarines and more recently satellites (notably the UK-led European Space Agency satellite Cryosat 2) to demonstrate decreasing sea-ice thickness across the Arctic. Innovative use of the Cryosat data and new marine technology is also providing insight to how the ocean circulation will alter as sea-ice diminishes over time. This research is also confirming sophisticated models of this oceanic circulation developed by other UK researchers.

Global warming has led to large amounts of fresh water in the Arctic Ocean in recent decades and this has been documented by scientists from various nations. British researchers have now used remote sensing satellites to demonstrate that in fact a dome of fresh water has formed in the western Arctic Ocean increasing by roughly 8000 cubic kilometres in the past 15 years. Strong Arctic winds are accelerating a

great clockwise ocean circulation called the Beaufort Gyre, trapping the fresh water, which is evidenced by the reduced amount reaching the Atlantic over the same period. If these winds change direction, as happened between the mid-1980s and mid-1990s, the water could spill out into the rest of the Arctic and potentially flow into the North Atlantic. This could cool Europe by slowing down a key ocean current derived from the Gulf Stream, which keeps the continent relatively mild compared with countries at similar latitudes. This is one of the major issues being addressed through the NERC funded Arctic Research Programme (2011-2016) which will provide detailed understanding of how ocean, sea-ice and atmosphere interact and respond under climate change and contribute new Arctic regional models to the large scale climate models developed by the UK Met Office Hadley Centre.

The UK has played a significant role in most of the EU-funded projects concerned with the Arctic over the past decade. British researchers have already led European funded research, which will feed into the upcoming IPCC report, on how melting of polar ice sheets under climate warming contributes to global sea level rise (ice2sea project). The UK is again taking the leadership role for another large EU-funded project - ICEARC - which will begin in 2014 investigating the impact of warming climate on Arctic sea-ice and quantitatively evaluating the economic consequences of Arctic change for that region and for Europe.

5. The commercial dimension

Promote an Arctic where only responsible development takes place

Decisions to invest in commercial projects are dependent on a combination of complex factors, including political will, economic viability, legal regimes and patterns of investment. However, the changes being seen in the Arctic and the reduction in summer sea-ice coverage in particular have led to growing commercial interest in the Arctic, both from a growing number of industries and a growing number of countries from across the world.

People in the Arctic, like anywhere else, have a right to pursue economic prosperity. The UK supports that right. However, extreme care has to be taken to ensure that in the pursuit of commercial opportunities, long-term or irreparable damage is not done to the natural environment or ecosystems of the Arctic, which themselves underpin the economic prosperity of many Arctic communities.

The third tenet of the UK's policy towards the Arctic is therefore to support legitimate and responsible business activity in the Arctic.

The decision to invest in commercial projects in the Arctic is a matter for the individual companies concerned and the relevant national authorities of the Arctic States in whose jurisdiction they take place. The UK will encourage UK business to engage directly with the Arctic Council, Arctic States, indigenous peoples and other actors, as appropriate. The UK will facilitate responsible business activity in the region by UK companies.

UK companies in the Arctic

The Anglo American mining project in Sakatti, Finland

The Sakatti exploration project is a copper-nickel-platinum group elements grassroots discovery in Finland, 150 kilometres north of the Arctic Circle. Anglo American have been working in the region since 2004 and have regularly engaged with a range of stakeholders, including regional and municipal governments, the local community and landowners.

Being a responsible miner means taking a serious approach to environmental stewardship and minimising and mitigating potential environmental risks. Anglo American have worked in collaboration with their drilling partner Oy Kati Ab to develop a semi-closed loop drilling system that allows drilling in challenging conditions at the same time as reducing waste and water use and minimising the overall environmental footprint.

Anglo American carries out its activities in consultation with other land users. For example, drill plans are discussed with local reindeer herders to understand which areas they will be using for winter grazing.

The Sakatti project is an example of the importance of working in partnership with contractors and the local community to understand environmental sensitivities, and then working to deliver innovative solutions that respond to those sensitivities.



Energy security

Ensuring security of supply through a diverse set of sources

The UK's energy security must be delivered alongside achievement of legally binding targets on reducing carbon emissions and promoting renewable energy. However, as the UK transitions to a low carbon economy, and with a decline in domestic oil and gas production, the UK will become increasingly reliant on imported energy.

The UK believes that natural gas will continue to play an important role in the UK energy mix for many decades to come.

In 2012, 55% of UK gas imports were from Norway. With fixed infrastructure, geographical

proximity and a long-standing and reliable energy partnership, Norway will remain a key supplier for years to come. Furthermore, Norway has over 30 years experience developing offshore oil and gas in its Arctic waters with an excellent safety record. Norwegian success in further developing its Arctic gas reserves is important to UK energy security and for British companies that are active on the high northern areas of the Norwegian Continental Shelf. To help satisfy projected long-term demand for imported gas and our transition to a low-carbon economy, the UK supports investment in new infrastructure that would connect Norway's new Arctic gas finds with the existing North Sea pipeline network.

Energy security, global markets and the Arctic

The UK believes that national and international action to tackle climate change is essential and fully supports the steps being taken to reduce greenhouse house gas emissions. However the UK also recognises that the world economy will continue to rely on fossil fuels even as we move to decarbonise our economies and that new sources of hydrocarbons will be needed to meet this demand.

The International Energy Agency's (IEA) 2012 World Energy Outlook makes it clear that the world will need to develop new fossil fuel production capacity over the next couple of decades. Under the IEA's 450 Scenario, which sets out an energy pathway consistent with a 50% chance of meeting the goal of limiting the increase in average global temperature to 2°C, world oil demand will fall from 87.4 million

barrels per day (mb/d) in 2010 to 79.0 mb/day in 2035. However it makes clear that even under this scenario the decline in output from existing sources of oil and other liquid fossil fuels will require the development of nearly 40mb/d of new production capacity by 2035.

Under the same IEA 450 scenario, world gas demand will rise from 3,307 billion cubic metres (bcm) in 2010 to 3,971 bcm in 2035, with unconventional production increasing as a proportion of total output.

The IEA work shows that even under the most ambitious of their scenarios new oil and gas production capacity will be necessary. Where that oil will be produced is a matter for the commercial judgement of those involved, in the light of relevant regulatory and economic conditions, although the IEA suggest that Arctic resources could play an important role in meeting such demand.



Shipping

Ensuring maritime transport in Arctic waters is carried out in a safe, environmentally sound manner and in accordance with customary international law

Maritime transport, and shipping in particular, is an international, global industry in which the UK has a prominent role. It is the UK view that regulation of the industry should, therefore, take place on a global basis and be regulated universally without prejudice using an equitable approach. The forum in which this is and should be carried out is the IMO, where the UK plays, and will continue to play, a leading role. The IMO is an effective body with a substantial record of achievement. The UK will promote the IMO as the most appropriate authority for the regulation of international shipping, including that in Arctic waters.

The UK considers the existing international regimes robust. UNCLOS remains paramount and in the fields of maritime safety and prevention of pollution respectively the International Convention for the Safety of Life at Sea (SOLAS) and the International Convention for the Prevention of Pollution from Ships (MARPOL), both of which were developed in the forum of the IMO, will continue to be authoritative. The UK does not believe that it will be necessary or appropriate to make fundamental changes to existing international regimes for regulating Arctic, or other, shipping.

The Arctic is an area of increasing importance for maritime transport. One of the principal effects of climate change on the Arctic will be to make the region more accessible to shipping.

The increased access to both the Northwest Passage (through the waters north of Canada and Alaska) and the Northern Sea Route (through the waters north of Russia) offer significantly shorter travelling distances between Europe and Asia and will increase shipping traffic in Arctic waters, especially during the summer months. It is widely considered that the use of ice-free Arctic sea lanes could be quicker and cheaper than using traditional shipping routes through the Suez Canal or round the Cape of Good Hope. The UK believes that the UK ports and shipping industry, together with the wider UK maritime cluster, are generally well placed to take advantage of any commercial opportunities that expansion of Arctic shipping may present in the short term. The UK intends to keep under review, in the longer term, whether there is anything that it is best placed to do, in order both to facilitate worthwhile trade opportunities and to help ensure that this is done with due regard to safety and the environment.

An increase in shipping in the Arctic has ramifications for navigational safety. Navigation in Arctic latitudes continues to be hazardous and uncertain, and great care must be taken to ensure navigational safety. Ships operating in the Arctic environment are exposed to a number of unique risks such as poor weather conditions, the relative lack of good charts, very restricted Search and Rescue capabilities and the lack of shore infrastructure and other navigational aids which pose challenges for mariners. Cold temperatures may reduce the effectiveness of numerous components of the ship. When ice is present, it can impose additional loads on hull and propulsion systems.

The UK considers that the development of the mandatory Polar Code within the IMO must produce a clear direction on the design, equipment and, where appropriate, operational methods of shipping which will transit or be employed within this fragile environment. The UK will play a leading role in the development of the mandatory Polar Code so as to ensure it comprehensively addresses safety and environmental issues, and press for its early adoption.

The UK welcomes the positive steps taken by the Arctic Council regarding Arctic shipping, particularly the Council's 2011 Arctic Search and Rescue Agreement and focus on safe Arctic

shipping under the Canadian Chairmanship. The UK will work with Arctic States and the Arctic Council to further promote safe Arctic shipping.

The UK, through the UK Hydrographic Office (UKHO), has considerable experience and expertise in surveying in the Arctic. UKHO maintains a comprehensive portfolio of charts and publications covering the region, from Norway to the Bering Strait, and around the USA and Canada, which make a significant contribution to navigational safety in the Arctic.

The UK will seek to obtain observer status at the Arctic Regional Hydrographic Commission to share its knowledge and expertise of Arctic hydrography.

Tourism

Promoting safe and sustainable tourism in the Arctic

The Arctic is an increasingly popular destination for British travellers, primarily as passengers on cruise ships but also for those undertaking on-shore activities such as adventure tourism. However, the isolation of certain parts of the Arctic combined with the harsh environment and modest capacity of search and rescue infrastructure poses unique challenges to safe

tourism. The challenges are likely to rise as the opportunities for Arctic tourism continue to increase. Recognising this, the UK will ensure that it provides specific online travel advice that is accurate, up-to-date and aimed at British citizens who are thinking of travelling to the region. The UK will work closely with representatives of the travel industry when reviewing its travel advice to discuss continuing concerns and to suggest practical solutions, including how best vessels can provide each other with timely and effective mutual support.

Figure 10: number of tourist passengers staying overnight at Longyearbyen, Svalbard¹³



Fisheries

Promoting sustainable management of fisheries in the Arctic based on the best available science

Commercial fishing activity in the Arctic should take place fully taking into account the possible impacts on the wider marine ecosystem.

Negative impacts on other species and vulnerable marine ecosystems should be avoided. Basing fisheries on the best available science is therefore vitally important.

The UK supports the work of Regional Fisheries Management Organisations (RFMOs) in managing fish stocks and marine ecosystems, including in the waters of the Arctic. RFMOs fulfil some of the requirements of the United Nations Convention on the Law of the Sea (UNCLOS) and the United Nations Fish Stocks Agreement in bringing together interested nations to cooperate in the management of fish stocks. The UK takes an active part in a number of RFMOs and we will continue to work with the EU to ensure that they operate in an effective manner so that ecosystem sustainability and science are at the forefront of decision making in the organisations.



Bioprospecting

Ensuring fair and transparent access to genetic resources in the Arctic and fair and equitable sharing of the benefits from their use

The UK is a signatory to the Nagoya Protocol on Access and Benefit Sharing, which allows fair access to genetic resources in return for a share of the benefits for their use, potentially paving the way for exciting new medicinal and genetic innovations. The UK is in the process

of putting in place measures to implement the Nagoya Protocol. These measures will seek to ensure that UK users respect any access and benefit sharing regulatory requirements of Arctic States that are Parties to the Nagoya Protocol. The UK will ensure that any UK public funding for bioprospecting is mindful of requirements to seek Prior Informed Consent under the Nagoya Protocol.



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UK commercial expertise

Promoting UK commercial expertise in industries operating in the Arctic

UK companies have substantial expertise in a broad range of sectors operating or supporting activity in the Arctic, including insurance and risk management, maritime, hydrocarbons and mineral extraction. These companies are well-placed to contribute bespoke products and services to the many industries that are growing in the Arctic. The UK Government will promote the UK as a centre of commercial expertise with direct relevance to many industries that are growing in the Arctic.

Case study: UK commercial expertise

Arctic Opening: Opportunity and Risk in the High North

In April 2012 in Oslo, Lloyd's of London launched a report that explores how the rapidly changing Arctic environment is creating both opportunities and risks for business operating in this region. "Arctic Opening: Opportunity and Risk in the High North" was produced in co-operation with Chatham House and highlights the uncertainties and knowledge gaps that exist around the nature of environmental change and the region's potential commercial opportunities, including resource extraction and shipping.

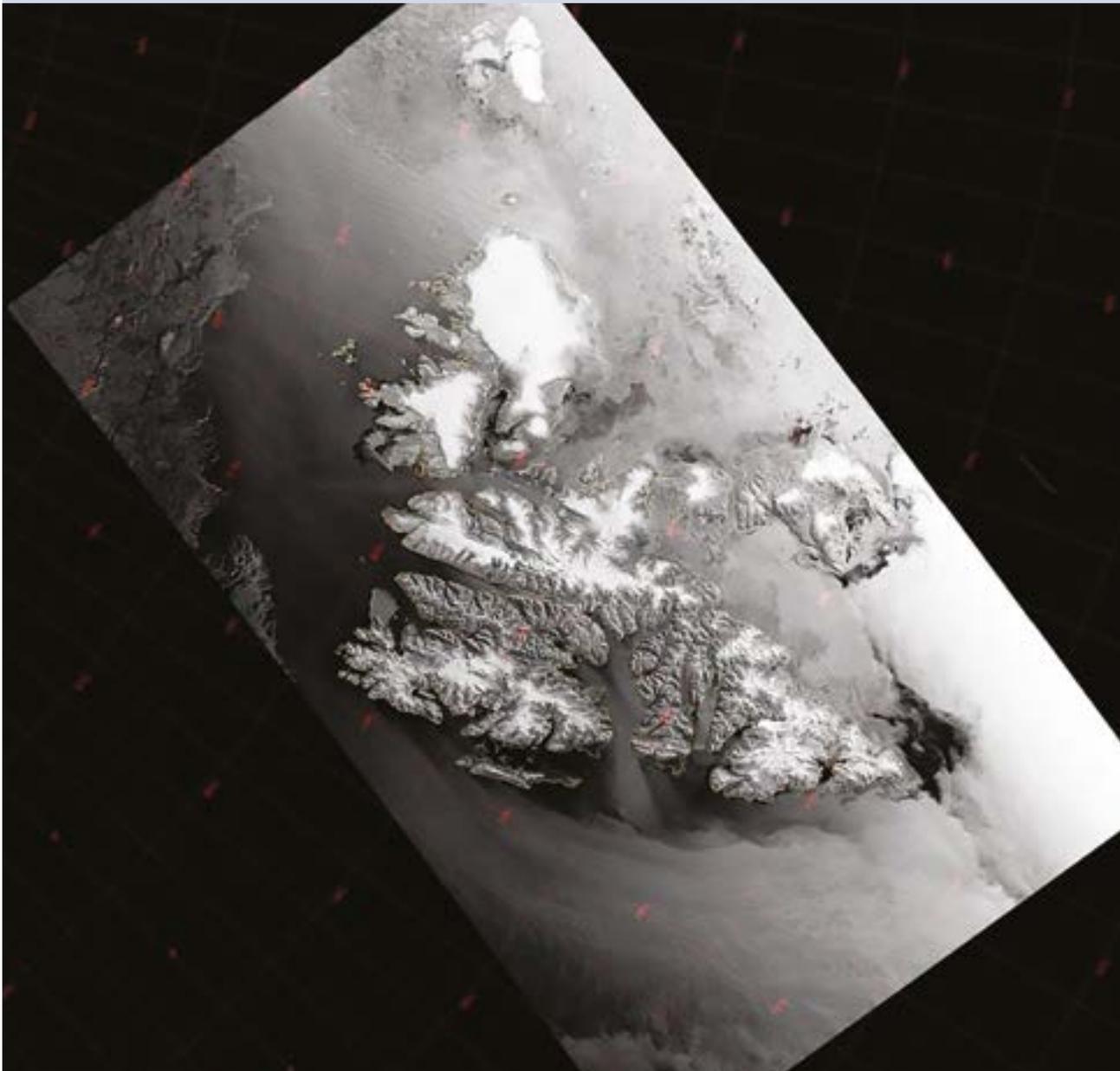
The report also explores the challenges and risks of operating in the harsh and remote Arctic environment. It explores the steps companies can take to manage the unique set of risks facing them in the Arctic and ensure future development is carried out safely and sustainably in the region.

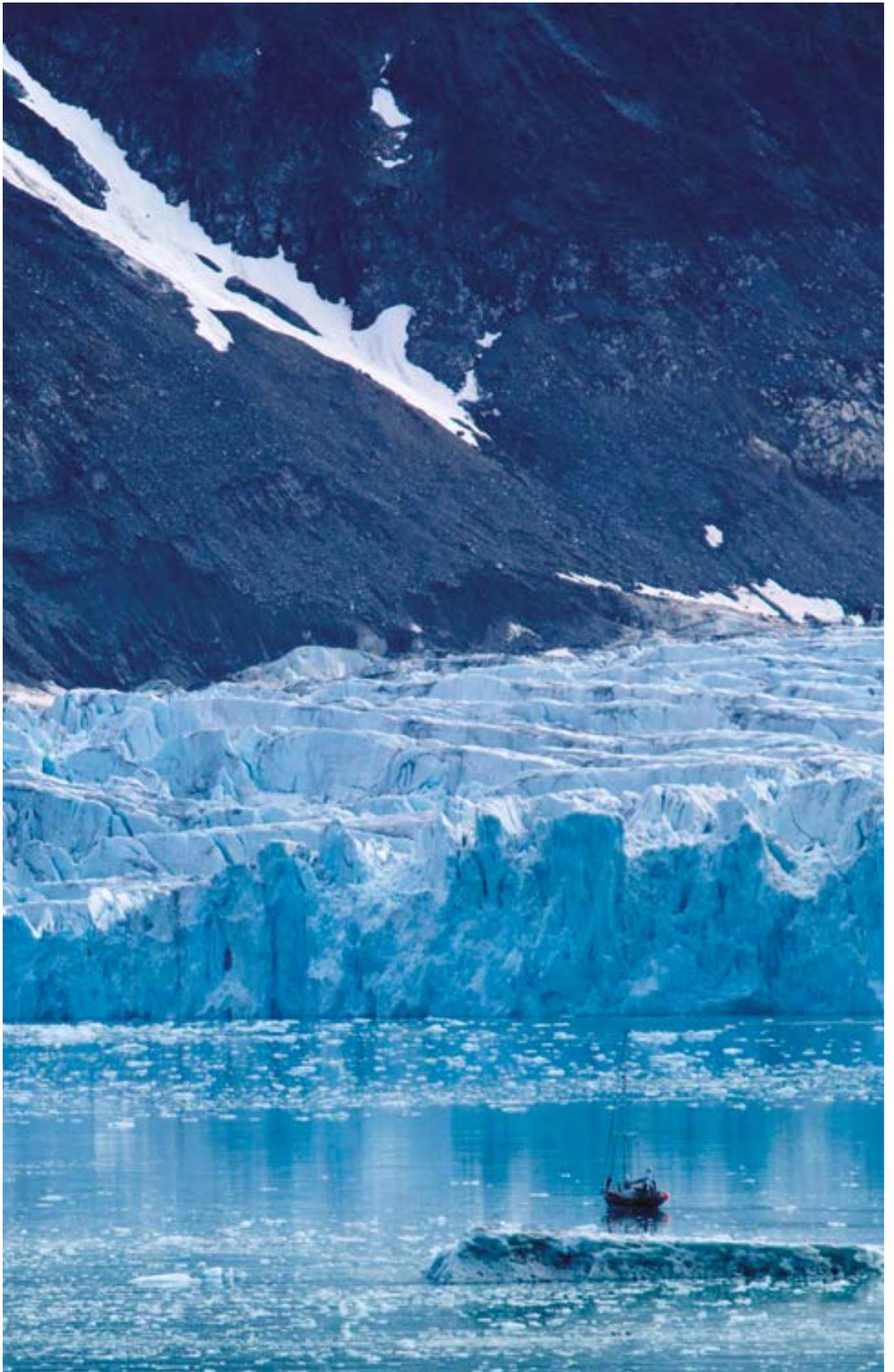
UK science in action – underpinning responsible commerce in the Arctic

Both the Arctic and Antarctic are experiencing increased levels of shipping resulting in more vessels transiting through hazardous ice-infested waters. Sea-ice is a significant hazard to shipping and up to date knowledge of conditions reduces the risk of accidents. Timely information also reduces costs for ships operating in sea-ice by allowing more efficient routing decisions and reducing the impact of hull damage from sea-ice. BAS plays a leading role in the Polar View consortium, delivering near-real-time information about sea-ice direct to ships in the Arctic and Antarctic.

Together with partnering organisations, including the Arctic national ice services, Polar View has used operational understanding of sea ice and expertise in remote sensing methods to produce new information services. Polar View is now the world's leading network for delivering satellite-based services to users concerned with monitoring ice and snow. With a proven track record in providing relevant, operational and reliable monitoring solutions, the members of Polar View serve a global client base comprising both government organisations and growth industries.

Figure 11: satellite Synthetic Aperture Radar (SAR) imagery provides a cloud-free view of Svalbard and shows areas of sea-ice to the top and left hand side of the picture. This type of imagery is used to optimise navigation choices through and around hazardous sea ice. This image was acquired by the European Space Agency ENVISAT satellite.





References and endnotes

1. The use of the term “peoples” in the Arctic Policy Framework shall not be construed as having any implications as regards the rights which may attach to the term under international law.
2. March 2013. Source: Met Office Hadley Centre
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9. Source: UK GHG Inventory: <http://naei.defra.gov.uk/about/national-inventory-system>. Projections are taken from the UK’s 2013 submission to the EU Monitoring Mechanism (EUMM) and are based on historic data taken from the 2012 inventory.
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13. Source: Port of Longyearbyen



HM Government

Polar Regions Department

Foreign and Commonwealth Office,
King Charles Street,
London

SW1A 2AH

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