

HOUSE OF LORDS

Select Committee on the Arctic

Report of Session 2014–15

Responding to a changing Arctic

Ordered to be printed 11 February 2015 and published 27 February 2015

Published by the Authority of the House of Lords

London : The Stationery Office Limited
£price

HL Paper 118

The Select Committee on the Arctic

The Select Committee on the Arctic was appointed by the House of Lords on 12 June 2014 “to consider recent and expected changes in the Arctic and their implications for the UK and its international relations.”

Membership

The Members of the Select Committee on the Arctic were:

<u>Lord Addington</u>	<u>Lord Ashton of Hyde</u>
<u>Baroness Browning</u>	<u>Lord Hannay of Chiswick</u>
<u>Viscount Hanworth</u>	<u>Lord Hunt of Chesterton</u>
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<u>Baroness Symons of Vernham Dean</u>	<u>Lord Teverson (Chairman)</u>
<u>Lord Tugendhat</u>	

Declaration of interests

See Appendix 1

A full list of Members’ interests can be found in the Register of Lords’ Interests:

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Cover: Ny-Ålesund, a centre for international Arctic scientific research and environmental monitoring in Svalbard, June 2014.

Photograph taken by Susannah Street.

CONTENTS

	<i>Page</i>
Summary	6
Chapter 1: Introduction	9
The diversity of the Arctic	9
Figure 1: The Arctic Ocean	10
Figure 2: Common definitions of the Arctic	11
Box 1: The Arctic and the Antarctic	12
The UK in the Arctic	12
The Committee's inquiry and report	12
Chapter 2: Climate change in the Arctic	14
Climate change is altering the Arctic	14
Rising temperatures	14
Figure 3: Arctic surface air temperature anomaly over land, 1900–2014	15
Figure 4: Polar amplification of warming in the last decade	15
The effects of temperature increases in the Arctic	17
Changes in Arctic sea ice	17
Figure 5: Sea ice extent changes, 1979–2014	17
Figure 6: September 2014 sea ice extent	18
Figure 7: September 1980 and September 2012 sea ice extents	19
Figure 8: Multi-year sea ice in the Arctic	20
The melting of land ice and reduction in snow cover	22
Figure 9: Loss of mass in the Greenland ice sheet	23
Figure 10: Snow cover changes in the Arctic, 1979–2012	24
The albedo effect	24
Permafrost melting and infrastructure problems	25
The potential for methane and carbon dioxide release	26
Further Arctic impacts of a changing climate	27
Ocean temperatures and ocean acidification	27
Arctic Ocean turbulence	28
Impacts beyond the Arctic	29
Potential effects upon the ocean circulation	29
Potential changes to the jet stream	29
Conclusions	30
Chapter 3: Globalisation and governance	31
The Arctic is not isolated	31
Increasing international attention on the Arctic	31
Causes of increasing attention	31
Increasing strategic interest	34
Intensifying globalisation	34
A scramble for the Arctic?	35
The Arctic is not unclaimed	35
The UN Convention on the Law of the Sea	35
Box 2: The UN Convention on the Law of the Sea	35
Figure 11: Exclusive Economic Zones	37
Claims to the North Pole	38
A peaceful and orderly region	39
The Arctic Council	40

Box 3: Arctic Council member states, Permanent Participants and observers	41
Evolution and challenges	42
Tensions within the Arctic states	45
The necessity of Arctic co-operation, and current tensions surrounding Russia	45
Russian remilitarisation?	46
Achievements of the Arctic Council	48
Arctic relations in the wake of increased tension over Crimea and events in eastern Ukraine	48
Observer status at the Arctic Council	49
New observer states	49
The EU's application for observer status	51
Pressures resulting from the growth in Arctic Council observers	52
Other international bodies and agreements affecting the Arctic	55
Conclusion	57
Chapter 4: The impact of Arctic changes: internal pressures and opportunities within the Arctic	58
Pressures within the Arctic	58
Changes to Arctic ecosystems	58
Terrestrial ecosystems	58
Sea ice, and marine ecosystems	59
Knowledge gaps, and a role for the UK	60
The impact upon Arctic residents	63
The indigenous peoples of the Arctic	64
Figure 12: Demography of indigenous peoples of the Arctic based on linguistic groups	65
Representation of indigenous peoples	66
How could the UK help?	68
Chapter 5: The impact of Arctic changes: pressures and opportunities arising from increasing external access to the Arctic	70
Accessibility	70
Attitudes and approaches to Arctic economic development	70
Striking a balance—a role for the UK?	72
Hydrocarbons and resource extraction: opportunities and constraints	73
Oil and gas	73
Mining and minerals	78
Increasing maritime access	80
The potential for new shipping routes	80
Table 1: Transits of the Northern Sea Route, 2010–2014	81
The growth in Arctic tourism	82
Risks and challenges associated with a growth in shipping	83
Figure 13: Illustrative search and rescue zones	84
Managing the risks	85
Fishing in the Arctic	87
The potential for long-term surprises, shocks and change	89
Chapter 6: The UK and the Arctic	91
The UK as a near-Arctic state	91
Stepping up the UK's Arctic engagement	92

Box 4: Trading links between the UK and the Arctic Council member states	93
How, when and where should the UK be prepared to step up in Arctic affairs?	94
Science and technology	94
Engaging with the Arctic region through British science and technology	94
The UK's current contribution to Arctic science and technology	95
UK Arctic science: the need for strategic drive and co-ordination	97
UK Arctic science: representation and funding	99
UK Arctic science: changes needed	100
Diplomacy	102
Co-ordinating the UK's diplomatic presence in Arctic co-operation	102
Increasing the UK's diplomatic presence in Arctic co-operation	104
Publishing a successor to the 2013 Arctic Policy Framework	105
Scrutiny	107
Bilateral relationships	107
Security	108
The UK's role in security co-operation around the Arctic	108
Arctic security resources	109
Other UK state-led contributions to Arctic co-operation	110
Drawing together commercial strengths	111
Drawing upon the UK's local strengths	112
Summary of Conclusions and Recommendations	114
Appendix 1: List of Members and Declarations of Interest	123
Appendix 2: List of Witnesses	126
Appendix 3: Call for Evidence	134
Appendix 4: Glossary of Terms and Abbreviations	136
Appendix 5: List of international agreements (or bodies with regulatory powers) of material relevance to Arctic debate, supplied by the Foreign and Commonwealth Office	138

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Q in footnotes refers to a question in oral evidence

SUMMARY

The Arctic is changing. Temperatures in the region are increasing at twice the global average, causing a range of physical and environmental changes. Sea ice is thinning and receding, although the pattern of change is variable, while land ice is melting and flowing into the sea. Processes in the Arctic have the potential to amplify climate change, causing further warming and further change; the exact nature and pattern of this feedback is difficult to predict and measure. Knowledge of many aspects of the Arctic environment, and how it is responding to change, is limited.

The UK is the Arctic's nearest neighbour and has long-standing political, economic and cultural ties with states and peoples in the region. Changes in the Arctic will affect the UK; at the same time, the UK can work with Arctic states and their citizens in responding to change. It is in the interests of the UK to be active and engaged on Arctic issues.

As changes expose potential opportunities and threats, international interest in the region has increased. Recent years have seen a significant expansion in the number of observers to the intergovernmental Arctic Council, with Asian states such as China, India, Japan, Singapore and South Korea becoming increasingly active in the region. The continued growth of international pressure for influence on the Arctic is inevitable, and the UK must respond accordingly.

The UK has, since 1998, been an observer to the Arctic Council; UK engagement with the Arctic occurs through this body and a number of other fora, and is co-ordinated through a small team based in the Polar Regions Department of the FCO. We conclude that the approach taken by the UK Government in recent years—exemplified by the 2013 Arctic Policy Framework—has been too hesitant and cautious. **We recommend a number of measures to strengthen our engagement and support our contribution. These measures include the appointment of a UK Ambassador for the Arctic, to ensure greater focus on and co-ordination of Arctic affairs in Government.**

UK scientists and researchers make an important contribution to global understanding of the changing Arctic. We believe, however, that this work could be more effectively utilised, and better support our engagement with Arctic states. **We recommend that the Government looks to establish a substantial and better co-ordinated long-term programme of Arctic research, and ensures fully effective UK representation on Arctic Council bodies; relevant partners from UK industry should be fully involved in this programme.**

Much attention has also been given to the potential for increased hydrocarbon extraction in the Arctic. **We conclude that current world oil prices may limit the potential for production in the short to medium term; this offers a window of opportunity for gaining increased clarity on whether oil and gas extraction in ice-affected Arctic waters can be achieved safely and responsibly.** The degree to which climate change in the Arctic will create other economic opportunities—such as shorter shipping routes—is not yet clear, but the UK must position itself as a premier partner in the Arctic so that it can respond to these changes effectively.

Across much of the Arctic, responsibility for striking a balance between development and environmental protection lies with the sovereign Arctic states

in whose territory such development would be taking place. This is not the case for the central Arctic Ocean, which is designated as international waters. **There are increasing concerns regarding the future of fish stocks in this area, and the UK Government should be involved in discussions on its future management; we recommend that a moratorium on fishing in this area is required, at least until a recognised management regime is agreed.**

In view of the rapid rise of tourism in the Arctic and particularly the prospect of large passenger ships sailing in Arctic waters, there is an urgent need to develop co-ordinated search and rescue facilities in the region. **The UK has a recognised expertise in search and rescue and we recommend that the Government should give urgent attention to developing a pan-Arctic search and rescue strategy along with the Arctic states.**

All states with Arctic interests, including the UK, should work to insulate Arctic co-operation from non-Arctic disputes. The Arctic has been a region of co-operation; the Arctic Council has played an important role in supporting and sustaining this stability. In enhancing our knowledge of Arctic changes, and building the capacity to respond appropriately, it will be important to maintain this stability in the years to come.

Responding to a changing Arctic

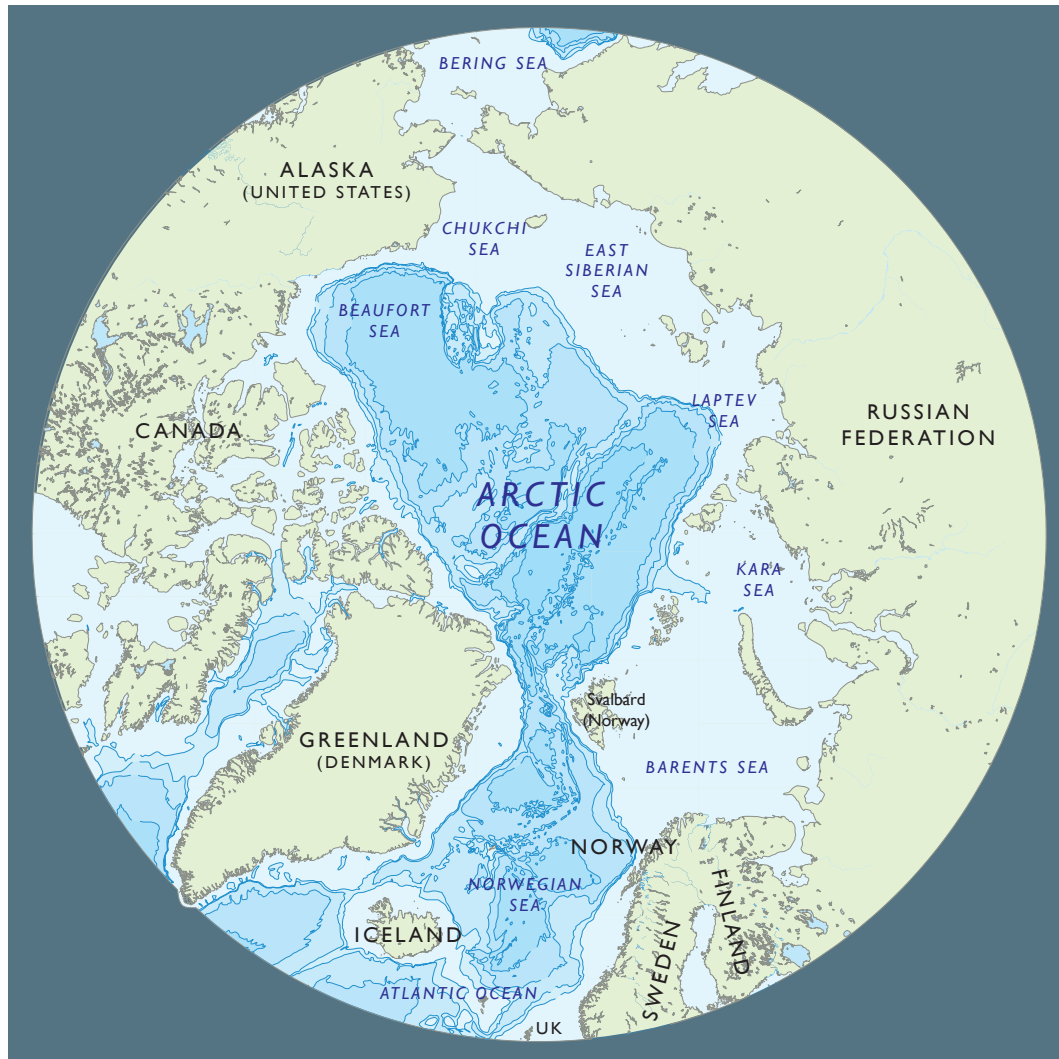
CHAPTER 1: INTRODUCTION

1. The Arctic climate and environment is changing. Average surface air temperatures in the Arctic have warmed at around twice the rate of the global average over the past few decades.¹ This is having profound effects in particular on the Arctic cryosphere—that part of the Arctic that is seasonally or perennially frozen—with implications for reduced sea ice, melting glaciers and ice caps and the thawing of permafrost.
2. These changes are predicted to have far-reaching impacts. The melting of the cryosphere presents an array of challenges, opportunities and risks that are still being researched and yet to be fully understood. Reductions in sea ice coverage (among other impacts) may open up new global trade routes, and improve access to land and maritime-based resources. At the same time, reductions in ice and snow cover have the potential to further amplify the impacts of climate change, creating feedback loops with local, regional and global implications.
3. These changes could have wide-reaching ramifications for the UK—the closest non-Arctic state. On 12 June 2014 the House of Lords agreed to establish a Committee to “consider recent and expected changes in the Arctic and their implications for the UK and its international relations, and to make recommendations”.
4. With this remit in mind, our focus was upon Arctic changes, the pressures, risks and opportunities arising from those changes, and the ways in which the UK should seek to respond. This Committee did not seek to examine global causes, processes or consequences of climate change.

The diversity of the Arctic

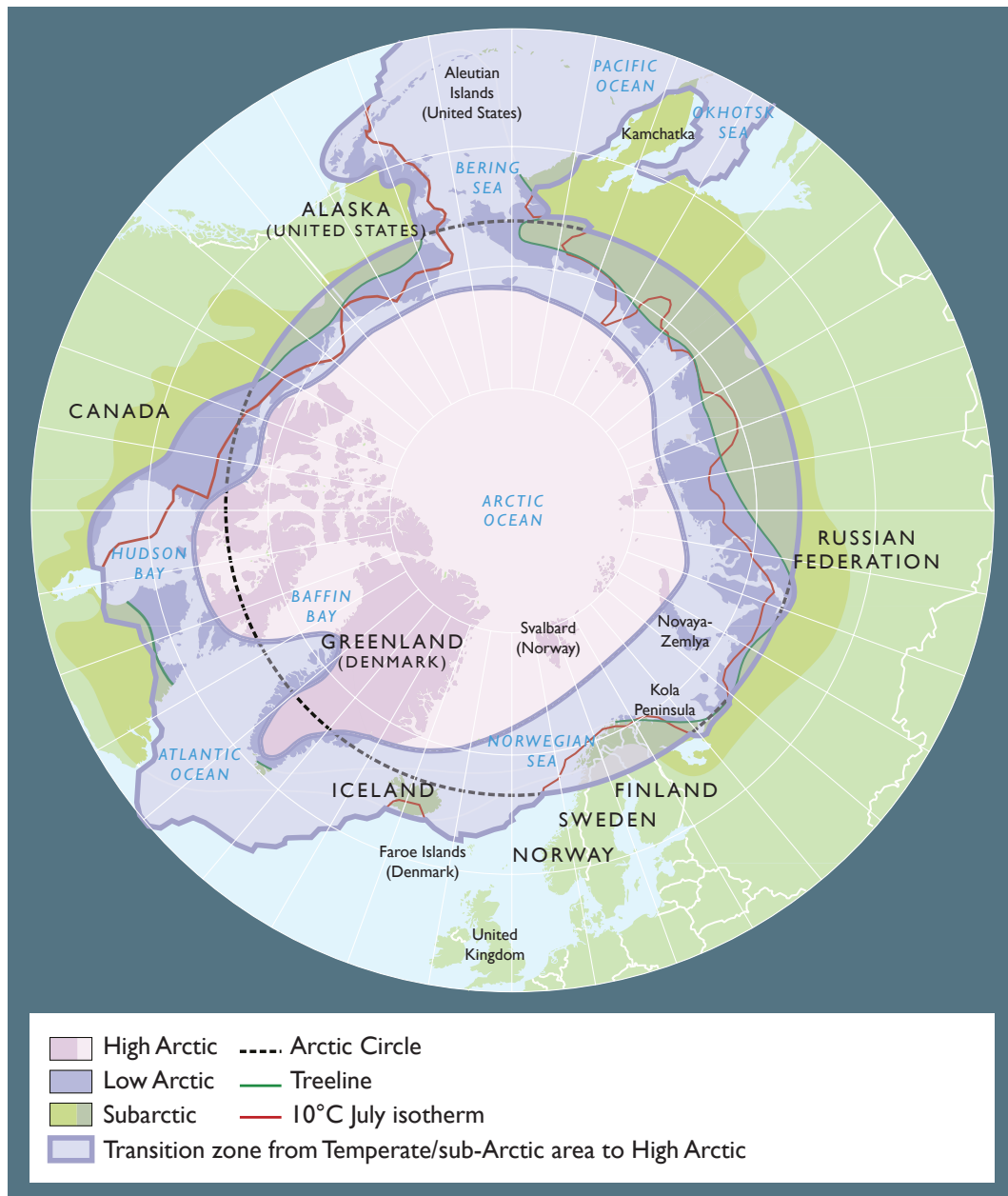
5. The Arctic Ocean is a semi-enclosed sea surrounded by five coastal states: Canada, Denmark (Greenland), Norway, Russia and the United States. The Arctic land masses are sovereign territories, while the Arctic Ocean is covered by national legal regimes as well as the 1982 UN Convention on the Law of the Sea. The five states with Arctic Ocean coastlines are sometimes known as the ‘A5’; there are eight Arctic states who have land territory inside the Arctic Circle (the ‘A8’), including Finland, Iceland and Sweden, who have no Arctic Ocean coastline.

¹ Arctic Monitoring and Assessment Programme (AMAP), *Snow, Water, Ice and Permafrost in the Arctic (SWIPA): Climate Change and the Cryosphere* (2011): <http://www.amap.no/documents/download/1448> [accessed 19 February 2015]

Figure 1: The Arctic Ocean

Source: Derived from original provided by British Antarctic Survey.

6. There is no universally agreed definition of ‘the Arctic’ and a number of definitions are in use. In approaching our inquiry we have not sought to restrict our focus to any one fixed spatial definition of ‘the Arctic’. The various definitions of ‘the Arctic’ are each appropriate to the context or disciplines from which they derive, and different definitions may be appropriate in different circumstances. The Arctic environment is highly diverse, and includes significant variations in landscapes, temperature, weather, light and ice conditions, and water depths. It is not a uniform, ice-covered, uninhabited environment. The region is home to biologically rich and diverse ecosystems, with the Arctic forming a primary habitat for many well-known species such as seals, whales, walrus, narwhal, reindeer and polar bears. It is also a seasonal ‘home’ to many migratory bird species.

Figure 2: Common definitions of the Arctic

Source: Foreign and Commonwealth Office, *Adapting to Change: UK policy towards the Arctic* (2013).

7. The region is also home to around four million people—a population larger than 70 of the members of the United Nations. This diverse population is spread across the eight states of the region, with approximately half residing in Russia, which is the largest Arctic state.² Arctic communities vary in size, from small villages and hamlets to the Russian port city of Murmansk, home to over 300,000 people.
8. Around 500,000 Arctic residents belong to indigenous groups.³ Indigenous peoples have lived in the Arctic for millennia and different groups have their own identities, languages and ways of life. Changes to the Arctic are impacting upon these groups in different ways and, in addition, the views of indigenous peoples towards the issues arising from those changes vary.

² Q 138 (Tom Paterson)

³ Arctic Council website: <http://www.arctic-council.org/index.php/en/about-us/permanent-participants/123-resources/about/permanent-participants> [accessed 19 February 2015]

9. In approaching our inquiry we have sought to appreciate and to respect the diversity of the Arctic, the variance of change across the region and the differing lifestyles and approaches of Arctic indigenous groups. We received evidence from the Arctic Athabaskan Council, the Inuit Tapiriit Kanatami and representatives of the Sámi Parliament of Norway; we also held discussions with the Indigenous Peoples' Secretariat of the Arctic Council. Arctic indigenous groups are highly aware that their ways of life are being affected by global changes. We were glad to have had the opportunity to undertake this important consultation with people who live and work in the Arctic.

Box 1: The Arctic and the Antarctic

There are a number of significant differences between the Arctic and the Antarctic. While the Antarctic is a continent surrounded by oceans, the Arctic is an ocean surrounded by continental landmasses and sovereign states. The Antarctic has no permanent human population, being home to no more than 4,000-5,000 scientists and researchers at any one time.⁴ The Arctic, by contrast, has around four million residents, living in long-established, permanent communities. The Antarctic Treaty, which entered into force in 1961, bans military activity on the continent and establishes the freedom of scientific investigation.⁵ There is no comparable treaty for the Arctic. There are, however, some similarities between the two polar regions. The UK has an important history of both Arctic and Antarctic exploration, commercial activity and scientific research, and the British Antarctic Survey and the Foreign and Commonwealth Office's Polar Regions Department have interests in both poles. Significantly, both Antarctica and the Arctic are being affected by climate change and are connected to planetary processes, with glacial retreat and the melting of ice sheets occurring in both polar regions.

The UK in the Arctic

10. The UK is the Arctic's nearest neighbour: Shetland's Out Stack is, at over 60° north, only 320 nautical miles south of the Arctic Circle. There is a long-standing history of British Arctic exploration, research, and engagement, dating back to at least the 16th century. The announcement during the course of our work that Parks Canada has found HMS *Erebus*, one of the two ships lost during the British Navy's ill-fated Franklin Expedition of 1845, serves as a reminder of this exploratory, commercial and scientific history. Present day political, institutional and economic ties complement historical associations. The UK's geographical proximity to the Arctic means that the UK needs to pay close attention to Arctic matters, especially during a time of unprecedented change in a region of increasing international focus.

The Committee's inquiry and report

11. Over the course of our inquiry we received 68 pieces of written evidence and took oral evidence from 61 witnesses over the course of 26 sessions. A delegation from the Committee also visited Tromsø, in northern Norway, and Svalbard in September 2014, holding valuable meetings with Arctic residents, institutions, businesses and research bodies. In addition, the

4 CIA World Factbook: <https://www.cia.gov/library/publications/the-world-factbook/geos/ay.html> [accessed 19 February 2015]

5 Secretariat of the Antarctic Treaty: <http://www.ats.aq/e/ats.htm> [accessed 19 February 2015]

Chairman was pleased to represent the Lord Speaker at the 2014 Conference of Parliamentarians of the Arctic Region in Whitehorse, Canada, and a member of our Committee joined other British delegates attending the 2014 Arctic Circle Assembly in Reykjavík, Iceland. We are grateful to all those who contributed to our work.

12. We also took the opportunity to seek the views of young British citizens on the future of the Arctic. On 9 January 2015, we hosted a debate in Westminster at which we heard the views of students from five schools on some of the key issues arising from changes in the Arctic. We offer our thanks to all the students who took part in this event, and to those who supported it.
13. In addition, we thank a number of experts who briefed the Committee at the start of our inquiry: Professor Jonathan Bamber (School of Geographical Studies, University of Bristol), Dr Cynan Ellis-Evans (British Antarctic Survey and head of the Natural Environment Research Council Arctic Office), Dr Dougal Goodman (Foundation for Science and Technology) and Matthew Willis (Royal United Services Institute).
14. We are also particularly grateful to Professor Klaus Dodds (Department of Geography, Royal Holloway, University of London), who has served as the Committee's Specialist Adviser.
15. Our report concentrates upon:
 - Climate change in the Arctic (Chapter 2)
 - Globalisation and governance (Chapter 3)
 - The impact of Arctic changes: internal pressures and opportunities within the Arctic (Chapter 4)
 - The impact of Arctic changes: pressures and opportunities arising from increasing external access to the Arctic (Chapter 5)
 - The UK and the Arctic (Chapter 6).

We make 67 conclusions and recommendations, which are summarised at the end of the report.

CHAPTER 2: CLIMATE CHANGE IN THE ARCTIC

Climate change is altering the Arctic

16. The Arctic is warming, with average surface air temperatures in the region increasing at around twice the global average rate over the past few decades.⁶ These rises in temperature have had, and if maintained or increased will continue to have, a number of fundamental effects upon the Arctic environment, both on land and at sea. Environmental and climatic changes in the region will generate changes further afield, including impacts which affect the UK and its weather patterns.
17. This chapter considers climate change in the Arctic, and its potential wider environmental and climatic implications. Subsequent chapters reflect upon Arctic opportunities, risks and challenges which result, primarily, from ongoing climate change in the Arctic, which is credited with increasing the accessibility of the region and heightening interest from non-Arctic states and other actors.
18. As this chapter makes clear, our evidence indicated that considerable uncertainty remains, although with a consensus emerging around the dominant trends of warming and climate change amplification. The relationship between climate change and accessibility in the Arctic is not, therefore, straightforward.

Rising temperatures

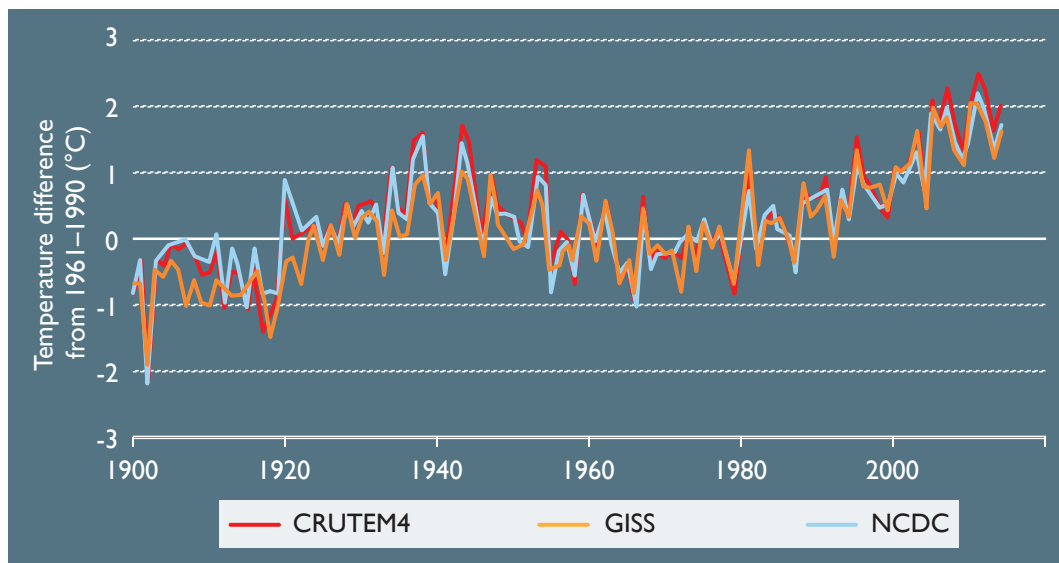
19. In its Fifth Assessment Report (2013–14), the Intergovernmental Panel on Climate Change (IPCC) reported that the globally averaged combined land and sea surface temperature warmed between 0.65 and 1.06°C from 1880 to 2012.⁷ The northern high latitudes, however, have experienced greater warming than the mid-latitudes or the southern high latitudes, as demonstrated in Figure 4. This increased warming at high northern latitudes was predicted in the First Assessment Report (1990) of the IPCC.⁸

6 AMAP, *Snow, Water, Ice and Permafrost in the Arctic (SWIPA): Climate Change and the Cryosphere* (2011): <http://www.amap.no/documents/download/1448> [accessed 19 February 2015]

7 IPCC, Fifth Assessment Report, 2014

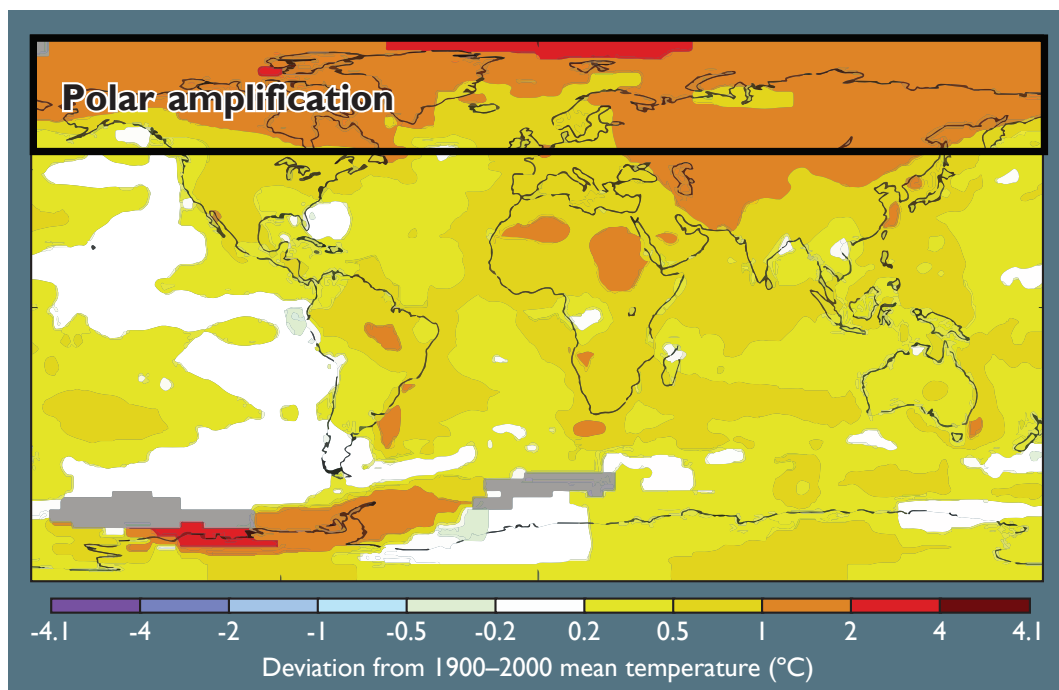
8 IPCC, First Assessment Report, 1990

Figure 3: Arctic surface air temperature anomaly over land, 1900–2014



Source: Met Office (2015).

Figure 4: Polar amplification of warming in the last decade



Source: Written evidence from the Norwegian Polar Institute ([ARC0061](#)), using NASA Goddard Institute for Space Studies data: <http://data.giss.nasa.gov>.

20. The evidence we received demonstrated that the average temperature in the Arctic had risen at around twice the global mean in recent decades.⁹ Dr Ed Hawkins of the University of Reading attributed this to ‘polar amplification’:

“As you warm the planet you melt the ice, as we have been seeing. That reduces the reflectivity of the planet so that more energy is absorbed into the oceans rather than reflected out into space, which amplifies the warming that we are seeing ... We expect to see amplified warming in the Arctic in the future, and on top of that we will see random fluctuations that are to a degree essentially unpredictable. They will mask or enhance temperature trends at different times in the future. However, we will see an overall warming with an Arctic amplification”.¹⁰

21. At most locations, temperatures measured since 2005 have been higher than at any time in the available historical record. Annual average temperatures across the whole Arctic have been consistently around 1.5°C or more higher than they were from 1961 to 1990.¹¹ We were told that winter is warming faster than summer in the Arctic,¹² and that land temperatures have increased at a greater rate than temperatures at sea.¹³
22. The limitations of past projections of Arctic climate change were consistently emphasised in the evidence we received. Dr Jan-Gunnar Winther of the Norwegian Polar Institute, for example, told us that he was “somewhat worried for future projections” and that researchers had, over the past ten years, “consistently and severely underestimated the rate of change”.¹⁴
23. Global temperatures have fluctuated during different historic periods; we received evidence explaining various drivers of these changes and the causes of variability.¹⁵ We were informed, however, that the scale of recent warming in the Arctic was important for two reasons: pace, and magnitude:

“There have been rapid changes [before]. However ... none of them is as rapid or has this magnitude. There are always small rapid changes but this magnitude of change is very large”.¹⁶

24. Greenpeace told us that these changes to the Arctic were “both rapid and fundamental. The data from the scientists about the extent and volume of sea ice tell us that the Arctic is in a pretty bad way. The overall trend is worrying”. They went on to state that the overall picture was “pretty stark” and should compel action.¹⁷

9 Written evidence from Prof Terry Callaghan ([ARC0030](#)), WWF-UK ([ARC0050](#)), Dr Ed Hawkins, Dr Sheldon Bacon and Prof Chris Rapley ([ARC0013](#)), the Geological Society ([ARC0031](#)), and the National Centre for Atmospheric Science ([ARC0021](#)). We were told that these measurements were usually based on land temperature data; measurements of temperature over the Arctic Ocean were more limited.

10 [Q 18](#) (Dr Ed Hawkins)

11 AMAP, *Snow, Water, Ice and Permafrost in the Arctic (SWIPA): Climate Change and the Cryosphere* (2011): <http://www.amap.no/documents/download/1448> [accessed 19 February 2015]. See also: AMAP, *Arctic Climate Issues 2011: Changes in Arctic Snow, Water, Ice and Permafrost* (2012): <http://www.amap.no/documents/doc/arctic-climate-issues-2011-changes-in-arctic-snow-water-ice-and-permafrost/129> [accessed 19 February 2015]

12 Written evidence from Prof Terry Callaghan ([ARC0030](#))

13 [Q 17](#) (Dr Ed Hawkins)

14 [Q 85](#) (Dr Jan-Gunnar Winther). See also written evidence from Prof Andy Shepherd ([ARC0045](#))

15 [QQ 17–19](#) (Prof Chris Rapley, Dr Ed Hawkins)

16 [Q 93](#) (Dr Nalân Koç)

17 [Q 174](#) (Ben Ayliffe)

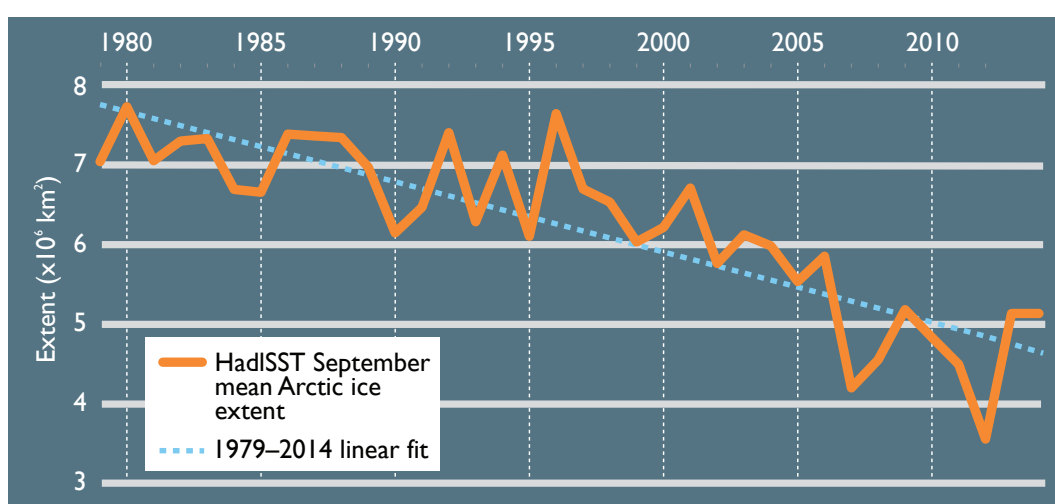
25. Our principal focus is upon the effects of these changes on the Arctic environment: rising temperatures have significant impacts upon sea-ice coverage, land ice, permafrost and the oceans more generally. These in turn have implications for ecosystem stability and the animal life that the region sustains on land and sea.

The effects of temperature increases in the Arctic

Changes in Arctic sea ice

26. Arctic sea ice cover expands each winter as sunlight is limited, before shrinking each summer as the sun rises higher in the northern sky. Sea ice is usually at its minimum annual extent in September. Since 1979, with the onset of satellite monitoring, it has been possible to obtain more accurate measurements of the extent of sea ice across the Arctic.

Figure 5: Sea ice extent changes, 1979–2014



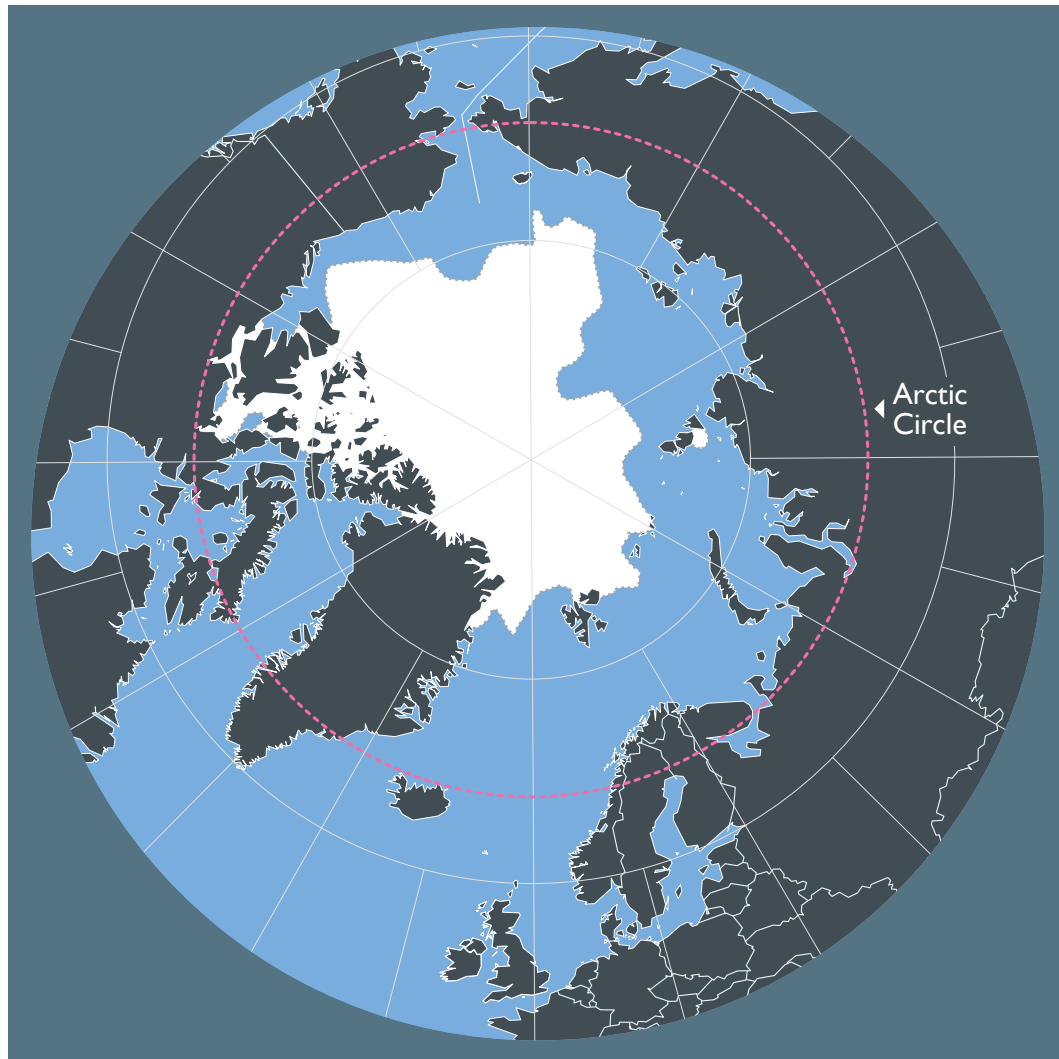
Source: Met Office (2015).

27. These measurements show that, at the start of the satellite era, the September minimum sea ice extent was typically around 7.5 million km². Since then, there has been an underlying downward trend (with some year-to-year variability), with a 13.3 per cent loss of coverage per decade.¹⁸ This has resulted in an average minimum ice extent, in recent years, of around 4.5 to 5 million km²; a low point of 3.4 million km² was reached in 2012. The last eight September minimum sea ice extents have been the lowest on satellite record.¹⁹ We were told that summer minima could be at their lowest point for 1500 years.²⁰

18 Written evidence from WWF-UK ([ARC0050](#)), and Dr Ed Hawkins, Dr Sheldon Bacon and Prof Chris Rapley ([ARC0013](#)). The loss is relative to the 1981–2010 average. The maximum extent of winter ice has decreased by around three to four per cent per decade over the same period.

19 Written evidence from WWF-UK ([ARC0050](#))

20 Written evidence from Dr Ed Hawkins, Dr Sheldon Bacon and Prof Chris Rapley ([ARC0013](#))

Figure 6: September 2014 sea ice extent

Source: Derived from US National Snow and Ice Data Centre: <https://nsidc.org>.

28. The Arctic Climate Impact Assessment (ACIA) report of the Arctic Council²¹ in 2004 was the first comprehensive assessment of climate change in the Arctic; this was further expanded in the 2011 Snow, Water, Ice and Permafrost in the Arctic (SWIPA) Report. A key finding of the SWIPA report was that observed reductions in sea ice extent in the Arctic had outpaced the projections from scientific modelling, including those used in the IPCC Fourth Assessment Report²² modelling scenarios.

²¹ See Chapter 3.

²² IPCC, Fourth Assessment Report, 2007

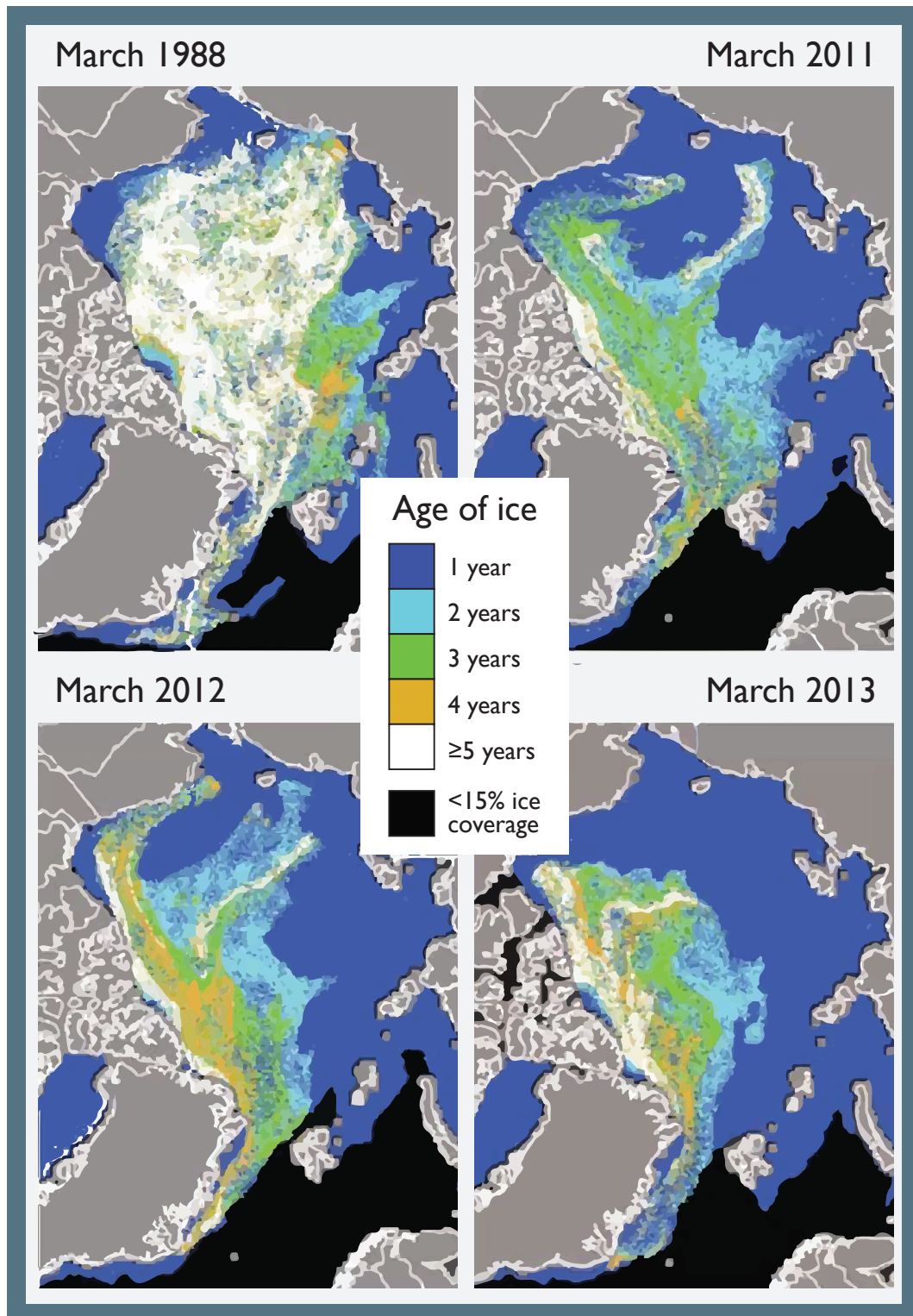
Figure 7: September 1980 and September 2012 sea ice extents

Source: Derived from US National Snow and Ice Data Centre: <https://nsidc.org>.

29. A reduction in Arctic sea ice extent could have some potentially beneficial implications, including the opening up of new shipping and trade routes and making some northern communities more accessible to destination-based shipping.²³ We were told, however, that the relationship between sea ice reduction and economic opportunities was not simple, with the increasing unpredictability brought about by changes to ice coverage being one limiting factor.²⁴

²³ These matters are discussed further in Chapter 5.

²⁴ Written evidence from Lloyd's Register ([ARC0048](#))

Figure 8: Multi-year sea ice in the Arctic

Source: US National Oceanic and Atmospheric Administration, Arctic Report Card 2013:
http://www.arctic.noaa.gov/report13/sea_ice.html.

30. Extent is only one measure of Arctic sea ice; the thickness of ice is also important, both as a factor in the total sea ice volume (and thereby an indicator of the rate of change) and because of how it relates to the nature of the ice. Estimating ice thickness—and therefore the overall volume of Arctic ice—is more complicated than measuring surface ice extent, as ice thickness varies across the Arctic depending on a range of conditions, and cannot be continuously assessed.

31. Notwithstanding this limitation, we were told that in the 1980s thick multi-year ice, which persists from one summer season to the next, had covered most of the Arctic Ocean. This had, over the years, been largely replaced with thinner and much less resilient ‘first-year’ ice, which forms in the winter but then typically melts in the summer.²⁵
32. Such a change in the thickness of sea ice means that, taken as a whole, the prospect of significant, rapid melting of the ice becomes more likely. We were told that:

“There is a new Arctic emerging with dominantly thin first-year ice; which also tells us that the situation is more vulnerable since it is easier to melt first-year ice. If the conditions are favourable for ice-melting, in theory, most of this sea ice could melt within one season”.²⁶
33. When taken together, the reduction in the thickness of the ice and the reduction in its spatial extent equate to a substantial loss of Arctic sea ice volume. Professor Peter Wadhams of the University of Cambridge told us that “the volume of summer sea ice in the Arctic went down by 75 per cent in the last 30 years ... That is a very serious change, and it is unprecedented, at least in the history of observations and given what we know from sediment cores from the history of the Arctic Ocean. It looks like it is heading in one direction only”.²⁷
34. Atmospheric temperatures are an important driver of these changes. Professor Andy Shepherd of the University of Leeds stated that the majority of changes to sea ice witnessed in “the past 50 or 60 years” could be attributed to greenhouse gas emissions and their effect on temperatures in the Arctic region. Prof Shepherd suggested that the length of the solar melt season had increased by around five days per decade, causing additional melting and retreat of the ice.²⁸
35. Temperature is not, however, the only causative factor. Changes in ocean circulation also have an impact: we were told that an increase in warm water coming into the Arctic from the Atlantic, and an increased northwards flow from the Bering Strait were acting to reduce sea ice coverage.²⁹ Ice thickness and extent can vary rapidly in response to weather, with seasonal conditions playing an important role in the minimum extent and spatial distribution of ice at the end of summer. In 2007, for example, persistent winds through the summer stacked up the ice, reducing its area to a new minimum record. In 2012, conditions were less favourable to ice retreat through the summer, but a strong cyclone in early August may have helped to break up the ice and enhance melt, resulting in a further record low.³⁰
36. While September ice extent increased in 2013 to 5.1 million km²,³¹ partly as a result of unusually cool summer conditions, that is nonetheless the seventh

25 [Q 83](#) (Dr Nalân Koç), written evidence from the Natural Environment Research Council (NERC) Arctic Office ([ARC0028](#))

26 [Q 83](#) (Dr Nalân Koç)

27 [Q 30](#) (Prof Peter Wadhams)

28 [Q 30](#) (Prof Andy Shepherd)

29 [Q 30](#) (Prof Peter Wadhams)

30 National Snow & Ice Data Center (NSIDC), ‘A summer storm in the Arctic’: <http://nsidc.org/arcticseaicenews/2012/08/a-summer-storm-in-the-arctic/> [accessed 19 February 2015]

31 National Oceanic and Atmospheric Administration (NOAA), *Arctic Report Card 2013: Sea Ice*: http://www.arctic.noaa.gov/report13/sea_ice.html [accessed 19 February 2015]

lowest extent since satellite records began.³² We were repeatedly told that, while ice extent would continue to vary from year to year, the underlying long-term trend was undoubtedly downwards.³³

37. We were told that the Arctic would be considered ‘ice free’ in the summer when ice coverage is less than 1 million km², and ‘reliably ice free’ when these conditions persist for five summers or more.³⁴ We explored with our witnesses the projections for when these milestones might be passed. The natural variability of oceanic and atmospheric conditions, coupled with continuing uncertainty regarding the intrinsic physics of sea ice and future temperatures, make precise prediction very difficult.³⁵ The extrapolation of trends is made additionally difficult by limitations on the availability of data from before 1979, and the lack of satellite observations for the entire Arctic before 2010.³⁶
38. Notwithstanding these limitations, we were given a range of estimates as to when the Arctic might be ‘ice free’ and ‘reliably ice free’. At one extreme, Prof Wadhams suggested that trends indicated a complete loss of summer sea ice “somewhere between next year and 2020”.³⁷ Others suggested that there was a possibility of occasional ice-free summers in the next 20 to 30 years.³⁸ There was, however, a general consensus that supported the IPCC prediction of a reliably ice-free Arctic summer by 2050–2080, with variability in trends along the way.³⁹
39. **While it is not currently possible to predict accurately when the Arctic Ocean will experience summers that are reliably free of sea ice, it is evident that there is a sharp underlying downward trend in sea ice extent and volume. It is a question of ‘when’ rather than ‘if’ the Arctic will be substantially free of sea ice in summer.**

The melting of land ice and reduction in snow cover

40. An ice sheet is a continuous thick glacial land ice mass that covers more than 50,000km². In the past, huge ice sheets covered Canada and Scandinavia; these disappeared due to historic climate change. At present, the only such example in the northern hemisphere is the Greenland ice sheet, which is 1.7 million km² in extent, up to 3km thick and several million years old. While the melting of sea ice does not affect sea levels, the volume of ice contained in the Greenland ice sheet would, if completely melted, be sufficient to raise global sea levels by 7.4m.⁴⁰

32 As detailed previously, satellite records began in 1979.

33 [Q 34](#) (Prof Peter Wadhams). See also written evidence from the Geological Society ([ARC0031](#)).

34 Written evidence from Prof Daniel Feltham, Prof Andy Shepherd, Prof Chris Rapley and Dr Sheldon Bacon and Dr Ed Hawkins ([ARC0049](#))

35 *Ibid.*

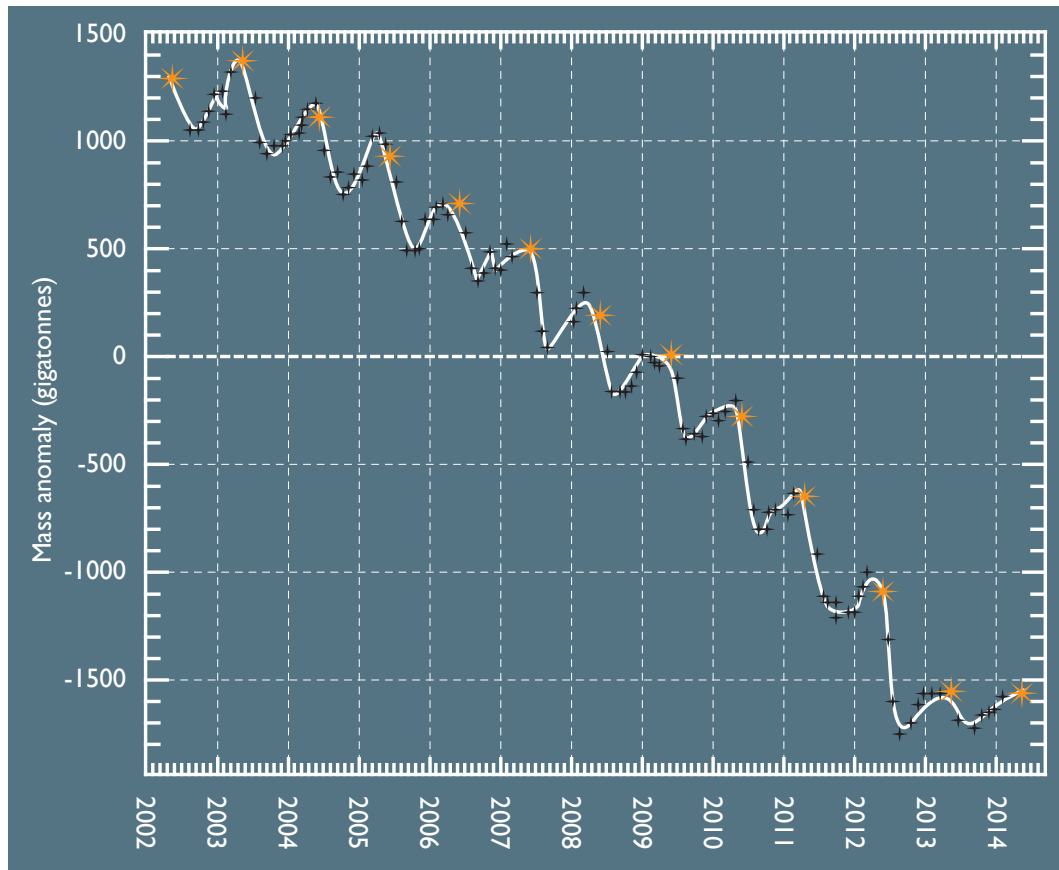
36 [Q 31](#) and [Q 34](#) (Prof Andy Shepherd), written evidence from Prof Andy Shepherd ([ARC0045](#))

37 Written evidence from Prof Peter Wadhams ([ARC0006](#))

38 Written evidence from Prof Andy Shepherd ([ARC0045](#))

39 Written evidence from Profs Daniel Feltham, Andy Shepherd, Chris Rapley and Drs Sheldon Bacon and Ed Hawkins ([ARC0049](#)), and Dr Ed Hawkins, Dr Sheldon Bacon and Prof Chris Rapley ([ARC0013](#))

40 Prof Jonathan Bamber *et al*, ‘A new bed elevation dataset for Greenland’, *The Cryosphere*, 7 (2), (2013) pp 499–510: <http://www.the-cryosphere.net/7/499/2013/tc-7-499-2013.pdf> [accessed 19 February 2015]

Figure 9: Loss of mass in the Greenland ice sheet

Monthly mass anomalies (in gigatonnes, Gt) for the Greenland ice sheet since April 2002, estimated from GRACE measurements. The anomalies are expressed as departures from the 2002–2014 mean value for each month. For reference, orange asterisks denote June values (or May for those years when June is missing).

Source: US National Oceanic and Atmospheric Administration, Arctic Report Card 2014: http://www.arctic.noaa.gov/reportcard/greenland_ice_sheet.html.

41. We were told, unequivocally, that the ice sheet is melting, and that this will contribute to rising sea levels:

“It is a very simple formula: if you warm up the ice on land, it flows straight into the oceans. In Greenland, that has been happening at an accelerating rate. The rate of loss from Greenland has increased by a factor of five over the past 20 years and enough ice is being lost to cause [global] sea levels to rise by about one millimetre per year, whereas in the 1980s the contribution was very slight”.⁴¹

42. The Greenland ice sheet is the most significant Arctic mass of land ice, but we were told that ice caps and glaciers across the region were also melting. This melting land ice is flowing, initially, into Arctic waters and thereafter will affect sea levels worldwide.⁴²
43. The Arctic Ocean is currently a carbon sink: at low temperature it readily absorbs carbon dioxide from the atmosphere. Increased freshwater flowing into the Ocean from melting land ice may affect the heat balance of the Arctic

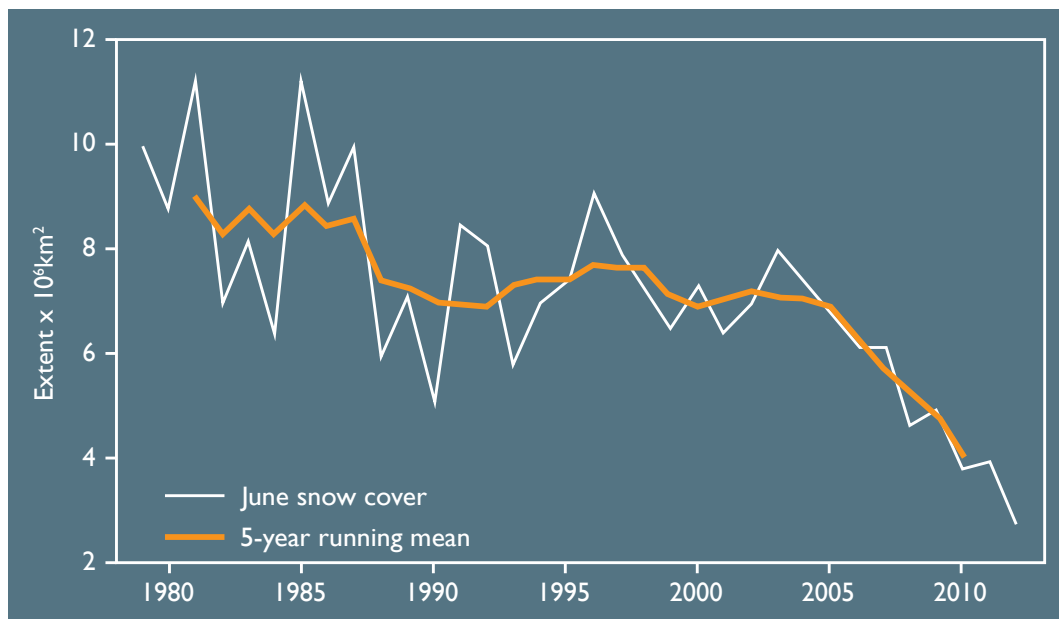
41 Q 33 (Prof Andy Shepherd)

42 Written evidence from the National Oceanography Centre (ARC0032)

Ocean.⁴³ Oceanic circulations might also be affected.⁴⁴ These feedback loops and cycles are considered in further detail in paragraph 60.

44. In terms of spatial extent, seasonal snow cover is the largest single component of the cryosphere⁴⁵ and has a mean winter maximum areal extent of 47 million km².⁴⁶ On average, across the entire Arctic, the duration of winter snow cover became four days shorter every decade in the period between 1972/73 and 2008/09.⁴⁷ We were told that snow cover duration reached a record low in 2012.⁴⁸ The rate of loss of June snow cover extent between 1979 and 2014 was 19.8 per cent per decade, which is greater than the loss of September sea ice extent (-13.3 per cent per decade) over the same period.⁴⁹

Figure 10: Snow cover changes in the Arctic, 1979–2012



Source: Adapted from C Derksen and R Brown, 'Spring snow cover extent reductions in the 2008–2012 period exceeding climate model projections', *Geophysical Research Letters*, vol 39 issue 19 (2012): <http://onlinelibrary.wiley.com/doi/10.1029/2012GL053387/pdf>.

The albedo effect

45. Reduced snow cover, the melting of land ice and reductions in sea ice coverage all work to reduce the albedo of the Arctic. Albedo refers to the fraction of solar energy reflected from the Earth back into space, particularly by ice and

43 Written evidence from the NERC Arctic Office (ARC0028). See also: Alfred Wegener Institute, 'Large-scale assessment of the Arctic Ocean: significant increase in freshwater content since 1990s' (24 March 2011): http://www.awi.de/en/news/press_releases/detail/item/large_scale_assessment_of_the_arctic_ocean_significant_increase_in_freshwater_content_since_1990s/?cHash=9ee44ce1b020d5b63e5ff3086d3ad689 [accessed 19 February 2015]

44 Written evidence from the NERC Arctic Office (ARC0028)

45 The cryosphere comprises those parts of the Earth's surface covered by frozen, or partially frozen, water.

46 Around 98 per cent of this cover is in the northern hemisphere. See NSIDC State of the Cryosphere website: https://nsidc.org/cryosphere/sotc/snow_extent.html [accessed 19 February 2015, last updated 6 February 2014]

47 AMAP, *Snow, Water, Ice and Permafrost in the Arctic (SWIPA): Climate Change and the Cryosphere* (2011): <http://www.amap.no/documents/doc/change-in-snow-cover-duration-for-autumn-snow-cover-onset-period-and-spring-snow-cover-melt-period-between-197273-and-200809/977> [accessed 19 February 2015]

48 Written evidence from Prof Terry Callaghan (ARC0030)

49 NOAA, *Arctic Report Card 2014: Terrestrial Snow Cover*: <http://www.arctic.noaa.gov/reportcard/snow-cover.html> [accessed on 19 February 2015]. See paragraph 27.

snow on the surface of the planet. As snow and ice melts, greater extents of darker coloured land and sea are exposed; these surfaces absorb more of the heat of the sun and therefore amplify the effects of warming.⁵⁰ In other words, loss of snow and ice has not only a direct effect, and impacts on ocean circulation and sea level: it also intensifies climate change by contributing to greater heat absorption.

46. We were told that the amplifying effects of the loss of albedo could have far-reaching consequences. The Arctic Methane Emergency Group told us that recent research had almost doubled the estimate of the effects of albedo loss, and that “The ultimate heat contribution, when the snow and sea ice have disappeared for much of the year, could be equivalent to a doubling of CO₂ ... Such an addition to the energy balance would kibosh all efforts to keep global warming to a safe level through emissions control”.⁵¹

Permafrost melting and infrastructure problems

47. Permafrost is ground that remains frozen for two or more years. IPCC Assessments have consistently highlighted that permafrost will be subject to melting as the Arctic region responds to climate change.⁵² We were told that, in some parts of the Arctic, permafrost has now disappeared altogether.⁵³ Whilst thawing permafrost can cause some immediate and obvious local impacts, the wider and longer-term effects of this melting are largely unknown and difficult to predict.
48. The most direct indicators of changes in permafrost state are active layer thickness and temperature. The active layer is the top layer of soil and/or rock, sitting above the subsurface permafrost; the active layer thaws during the summer and freezes again during the autumn. In the period between 1998 and 2012 active layer thickness increased across many parts of northern Russia, indicating that more of the permafrost is melting in summer.⁵⁴ A progressive increase in active layer thickness has also been observed in Nordic countries, including in the Abisko area of Sweden, where permafrost has disappeared altogether from several mire landscapes since 1995.⁵⁵
49. Permafrost temperature can be used as an indicator of long-term change. In 2013, new record high temperatures at 20 metres of depth were measured at two permafrost observatories on the North Slope of Alaska and in the Canadian High Arctic.⁵⁶
50. Thawing of permafrost will have local impacts upon infrastructure and the built environment for the foreseeable future, with subsurface movements and melting causing disruption to buildings, pipelines, transport routes and migration routes of animal populations. The 2011 SWIPA report also

50 Parliamentary Office of Science and Technology (POST), *Risks from Climate Feedbacks*, PN 454 (January 2014): <http://www.parliament.uk/business/publications/research/briefing-papers/POST-PN-454/risks-from-climate-feedbacks> [accessed 19 February 2015]

51 Written evidence from the Arctic Methane Emergency Group (AMEG) (ARC0055)

52 See, for example, IPCC First Assessment Report, 1990.

53 Written evidence from Prof Terry Callaghan (ARC0030)

54 NOAA, *Arctic Report Card: 2013 Update; Permafrost* (2013): <http://www.arctic.noaa.gov/report13/permafrost.html> [accessed 19 February 2015]

55 Prof Terry Callaghan *et al*, ‘A new climate era in the sub-Arctic: Accelerating climate changes and multiple impacts’, *Geophysical Research Letters*, vol. 37, (2010)

56 NOAA, *Arctic Report Card: 2013 Update; Permafrost* (2013): <http://www.arctic.noaa.gov/report13/permafrost.html> [accessed 19 February 2015]

noted that Arctic ecosystems were affected by habitat changes resulting from permafrost thaw.⁵⁷

51. Rising temperatures have other impacts on infrastructure: we were told that the period during which ice roads, essential for Arctic land transport in winter months, were usable had reduced by almost two months in recent decades.⁵⁸ All eight Arctic states are projected to suffer “steep declines” in inland accessibility as a result of lost potential for winter road construction.⁵⁹

The potential for methane and carbon dioxide release

52. Thawing Arctic permafrost is likely to have global impacts. Frozen soils at higher latitudes are carbon rich as they contain large amounts of dead, but only partially decomposed, plants. As the Arctic warms, however, the frozen soils will melt, allowing micro-organisms to grow. These micro-organisms will break down the plants and release carbon into the atmosphere. This additional carbon in the atmosphere could cause more warming, further melting and, therefore, further carbon release.⁶⁰
53. Drainage of the thawed zone is very important as the micro-organisms that break down plants work differently in wet and dry conditions.⁶¹ If the water drains away, it will allow oxygen into the soils and the micro-organisms will break down the plants aerobically. Aerobic decomposition is rapid and results in CO₂ emissions. If water remains and the soils are water logged, this will prevent oxygen entering the soils and the micro-organisms will break down the plants anaerobically. Anaerobic decomposition is slower but results in methane emissions. Methane is a considerably more potent greenhouse gas⁶² than CO₂ and concern has been expressed regarding the long-term implications of methane release for further regional and global warming.
54. Permafrost covers over 16 per cent of the Earth’s total land surface⁶³ and the landscape is highly variable, making it difficult to predict how the water of the thawing soils will respond. There is, therefore, a high degree of uncertainty over the actual and relative amounts of CO₂ and methane that will be released from the permafrost, and the feedback effect that this may have.
55. The projections of future temperature and climate change made by the IPCC to date do not take account of the effects of melting permafrost and the potential climate feedback that may result. This has resulted in some criticism of the projections, and the emissions targets that are derived from them.⁶⁴ The United Nations Environmental Programme (UNEP) has previously recommended that the IPCC should produce a special report on the effects of permafrost carbon feedback.⁶⁵

57 AMAP, *Snow, Water, Ice and Permafrost in the Arctic (SWIPA): Climate Change and the Cryosphere* (2011): <http://www.amap.no/documents/download/1448> [accessed 19 February 2015]

58 Written evidence from the NERC Arctic Office (ARC0028)

59 Written evidence from Dr Ed Hawkins, Dr Sheldon Bacon and Prof Chris Rapley (ARC0013)

60 Parliamentary Office of Science and Technology, *Risks from Climate Feedbacks*, PN 454 (January 2014): <http://www.parliament.uk/briefing-papers/POST-PN-454/risks-from-climate-feedbacks> [accessed 19 February 2015]

61 *Ibid.*

62 *Ibid.*

63 *Ibid.*

64 Dr Kevin Schaefer *et al*, ‘The impact of the permafrost carbon feedback on global climate’, *Environmental Research Letters*, vol. 9, (2014)

65 UNEP, *Policy implications of warming permafrost* (2013): <http://www.unep.org/pdf/permafrost.pdf> [accessed on 20 February 2015]

56. A related issue concerns the release of methane from the Arctic seabed. As oceanic temperatures increase, there is a concern that methane trapped within the Arctic seabed will be released into the atmosphere, causing still further warming. The Arctic Methane Emergency Group stated that observations showed that this was already happening.⁶⁶ Prof Wadhams told us:

“This is a much more serious and immediate problem than methane emissions from tundra, and it is going to build up to be an extremely serious problem ... over the next few decades. The immediate fear is the emission of methane from shallow offshore waters off the east Siberian shelf in the Arctic in the summer ... This is an unprecedented situation: the retreat of sea ice in the summer leading to warmer offshore waters over the shallow shelves of the Arctic, which is leading to offshore permafrost thawing, which is leading to a methane hydrate release as methane ... It is probably the most important problem that we are facing in the Arctic, and we need to study it most strongly”.⁶⁷

57. The Natural Environment Research Council (NERC) Arctic Office told us however that there is “no clear evidence of significant methane emissions reaching the atmosphere. The vast majority of methane appears to be oxidised within the water column”.⁶⁸ The Met Office identified methane emissions from terrestrial and marine sources as an “important data gap”.⁶⁹ The British Antarctic Survey (BAS) also acknowledged that research and knowledge in this field was lacking:

“The quantification of methane in near-surface terrestrial permafrost and marine sediments is only poorly assessed. The hypothesis that warming of the atmosphere, permafrost and/or coastal seas could release considerable quantities of this potent greenhouse gas, which would constitute a strong positive feedback amplifying climate change, will not be tested until more data on the distribution and release of methane has been acquired”.⁷⁰

58. **The potential for significant amounts of carbon dioxide and methane to be released from the Arctic permafrost and seabed, as a result of rising temperatures, is acknowledged but not yet fully measured or understood. Further research is required if the risks associated with these issues are to be fully calculated and planned for, both in the Arctic and beyond. We recommend that NERC should ensure that this issue is considered in any new dedicated Arctic research programme.**

Further Arctic impacts of a changing climate

Ocean temperatures and ocean acidification

59. As mentioned in paragraph 43, the colder waters of the Arctic are able to absorb more CO₂ than warmer regions. Uptake of CO₂, however, also makes water more acidic (lower pH values). Arctic waters are currently experiencing widespread and rapid ocean acidification, which has the potential to affect many ecosystems and biological processes negatively, including shell formation and calcification of coral and marine plankton species. We were told that

66 Written evidence from AMEG ([ARC0055](#))

67 [Q 35](#) (Prof Peter Wadhams)

68 Written evidence from the NERC Arctic Office ([ARC0028](#))

69 Written evidence from the Met Office ([ARC0044](#))

70 Written evidence from the British Antarctic Survey (BAS) ([ARC0018](#))

the Arctic Ocean had experienced long term declines in seawater pH and that these changes could have implications for marine ecosystems.⁷¹ A recent report by the Arctic Council concerning ocean acidification concluded that:

“The Arctic Ocean is rapidly accumulating carbon dioxide leading to increased ocean acidification—a long-term decline in seawater pH. This ongoing change impacts Arctic marine ecosystems that are already affected by rising temperatures and melting sea ice.

Arctic Ocean acidification has the potential to affect both commercial fisheries that are important to northern economies, and marine resources that are used by Arctic indigenous people”.⁷²

60. Concerns were also expressed regarding longer term reductions in the capacity of the Arctic Ocean to absorb CO₂. The Arctic Ocean is a region of deep-water formation, meaning that any CO₂ absorbed in high latitude waters is transported down to depth and removed from contact with the atmosphere, potentially for thousands of years.⁷³ We were told that influxes of freshwater from melting land ice mean that a continued freshening of the Arctic Ocean is likely to be observed, and that such freshening would reduce the density of the water in the Arctic. A reduction in density would slow the rate of deep-water formation.⁷⁴ A warming climate may, therefore, decrease the deep-water formation of the Arctic Ocean, with negative implications for CO₂ absorption and carbon storage in the ocean.⁷⁵
61. The general paucity of knowledge regarding the sinking of carbon in the Arctic, and its wider implications, was also consistently emphasised in the evidence that we received.⁷⁶ It is clear that further research is required to understand these important issues.

Arctic Ocean turbulence

62. The water column within the Arctic Ocean is highly stratified, with layers of water from different sources and with different levels of salinity, density and temperature overlying each other. Because currents in the Arctic are relatively slow, with water circulating at approximately 1–2cm per second, this stratification tends to be relatively stable.
63. A reduction in sea ice coverage exposes the ocean to direct forcing by the wind, allowing the wind to transmit momentum directly to the ocean circulation. We were told that this could potentially increase turbulence within the ocean, causing different layers of water to mix and causing heat stored in deeper waters to reach the ocean surface.⁷⁷
64. This would have the potential to act as another feedback mechanism, with increased surface water temperature leading to increased further loss of sea ice. Dr Sheldon Bacon of the National Oceanography Centre, who observed

71 Written evidence from Greenpeace UK (ARC0016)

72 AMAP, ‘Arctic Ocean Acidification Overview Report’ (May 2014): <http://www.arctic-council.org/index.php/en/resources/news-and-press/news-archive/872-amap-releases-arctic-ocean-acidification-overview-report> [accessed on 19 February 2015]

73 Written evidence from the National Oceanography Centre (ARC0032)

74 *Ibid.*

75 Written evidence from NERC (ARC0041) and National Oceanography Centre (ARC0032)

76 Written evidence from the NERC Arctic Office (ARC0028) and National Oceanography Centre (ARC0032)

77 Written evidence from the National Oceanography Centre (ARC0032)

that ocean ‘spin-up’ had already been witnessed in the Arctic Ocean north of Alaska, outlined the potential implications:

“If you enable a mechanism to mix heat up from below towards the surface, the confidently predicted seasonal decline of sea ice could very rapidly transform into a continuous absence through accessing the large subsurface reservoir of heat”.⁷⁸

Impacts beyond the Arctic

Potential effects upon the ocean circulation

65. Although representing only three per cent of the global ocean area, the Arctic Ocean receives ten per cent of the global total river flows.⁷⁹ Freshwater influx from major rivers that flow into the Arctic Ocean and from melting land ice has increased markedly over the past two decades.⁸⁰ We were told that an “enormous volume” of freshwater has now accumulated in the Beaufort Sea, with anticyclonic wind patterns and ocean currents acting to concentrate freshwater in this location.⁸¹ Should these environmental restraints weaken or disappear, there is the potential for substantial volumes of freshwater to be released from the Arctic Ocean into other oceans.
66. We were told that such a release could have potential implications for the large scale ocean circulation which currently draws warm Atlantic waters northwards towards the Arctic Ocean⁸², where they sink below colder Arctic waters. This movement of water influences the distribution of heat around the planet; as warm waters, for instance, pass by the UK, westerly winds extract heat from the ocean. The ocean cools, the atmosphere warms, and this contributes to the UK experiencing a relatively benign climate as compared to nations at comparable latitudes.
67. We were told that models were limited in their capacity to predict changes to the circulation; Dr Richard Wood of the Met Office suggested that “The idea of a rapid collapse or shutdown is something that has happened in the past, but the consensus is that it is very unlikely over the 21st century”. He went on to suggest that “a few” model simulations suggested that a collapse was possible in the 22nd century.⁸³
68. Disturbance to, or a slowdown of, this ocean circulation therefore has the potential to cause an overall cooling of the climate of the UK. The British Antarctic Survey (BAS) told us that this was an area of active and urgent research.⁸⁴

Potential changes to the jet stream

69. The jet stream is the term commonly used to describe high altitude winds which affect weather patterns in the northern hemisphere; it is fuelled, in part, by differentials in temperature between mid and high latitudes. As Arctic temperatures rise, and the temperature differential between mid-

78 [Q 23](#) (Dr Sheldon Bacon)

79 [Q 20](#) (Dr Sheldon Bacon)

80 Written evidence from the NERC Arctic Office ([ARC0028](#))

81 *Ibid.*

82 [Q 20](#) (Dr Sheldon Bacon)

83 [Q 223](#) (Dr Richard Wood)

84 Written evidence from BAS ([ARC0018](#))

latitudes and the Arctic accordingly reduces, there is the potential for the jet stream to slow down.⁸⁵

70. As the jet stream slows, there is the potential for it to meander, and to drift further southwards, causing changes in the distribution of temperature and precipitation patterns. This could have significant impacts for the weather of the UK; we were told that likely consequences could include heat waves in the summer and increased snow and heavy rain in winter.⁸⁶ There is also the potential for extreme weather to persist in one place for longer than would usually be the case⁸⁷; changes to the jet stream have been identified as causative factors in the 2013–14 ‘Arctic blast’ in Canada and the northern US.⁸⁸ Dr Nalân Koç of the Norwegian Polar Institute told us that:

“We can surely say that the Arctic is influencing climate patterns well beyond the boundaries of the Arctic itself. It is having an impact on the whole northern hemisphere”.⁸⁹

Conclusions

71. **The Arctic region is at the frontline of climate change and is being affected more rapidly by climate change than other parts of the globe. Particular concerns exist over melting land ice and a consequent rise in sea levels, as well as diminishing sea ice and melting permafrost. Loss of sea ice is expected to continue in the Arctic Ocean, with open water contributing to the further amplification of climate change. Physical, ecological, economic and geopolitical changes—both negative and positive—are arising as a result of the changing Arctic climate, and polar warming will have an impact upon ecosystem dynamics and human communities. While reductions in sea ice extent will make access to parts of the marine Arctic easier in future, changes such as permafrost and ice road melting may make investment in the terrestrial Arctic more difficult at least in the medium term, although there may be countervailing factors: the jury is out.**
72. **Understanding of the effects of climate change upon the Arctic and their causes in many places is lacking or severely limited. A great deal of further research is still required in order to assess and understand the effects and implications of Arctic climate change.**
73. The impacts of Arctic changes are considered in the remaining chapters of this report. The consequences of climate change in the Arctic will bring opportunities, costs and risks, all of which will need addressing and managing.

85 See Pallab Ghosh, ‘Wavier jet stream ‘may drive weather shift’, *BBC News*, (15 February 2014): <http://www.bbc.co.uk/news/science-environment-26023166> [accessed on 19 February 2015]

86 Written evidence from the National Oceanography Centre (ARC0032)

87 Written evidence from AMEG (ARC0055) and the NERC Arctic Office (ARC0028)

88 Q 83 (Dr Nalân Koç), Q 94 (Dr Jan-Gunnar Winther), written evidence from Arctic Methane Emergency Group (ARC0055)

89 *Ibid.*

CHAPTER 3: GLOBALISATION AND GOVERNANCE

The Arctic is not isolated

74. The Arctic region has long been connected to and affected by human activity in the rest of the world. Commercial activity and the use of natural resources in the Arctic has been taking place for hundreds of years, including hunting, mining since the 19th century, and oil and gas exploration since 1920.⁹⁰ Polar exploration has long involved non-Arctic nations such as the UK, while Japan set up an informal government section to deal with polar affairs more than 50 years ago.⁹¹
75. Even while being popularly imagined by ‘southern’ communities as isolated and impregnable, the Arctic has been altered unintentionally by those same communities. The Arctic is being modified both by global climate change and by the incursion of pollutants, invasive species and pathogens from the south (including the UK and the rest of the EU).⁹² The Arctic Athabaskan Council told us:

“Key drivers of change in the Arctic are the result not of actions in the region, but actions and decisions outside it. Emissions in tropical and temperate lands of heavy metals, including mercury, persistent organic pollutants such as insecticides, by-products of industrial burning processes, black carbon from inefficient diesel engines and, of course, greenhouse gases, eventually have a direct and accelerating impact in the circumpolar world.”⁹³

76. Terry Audla (President of Inuit Tapiriit Kanatami, the national Inuit organisation in Canada) reinforced this argument with a poignant demand: “climate change and carbon dioxide emissions are stemming not from the Arctic but from the industrialised nations. If you truly want to save the Arctic, you need to look in your own backyard”.⁹⁴ Alan Kessel, Deputy High Commissioner for Canada, noted that “five per cent of the mercury that we find in Canada and in our Arctic region comes from Canada, 95 per cent comes from elsewhere.”⁹⁵

Increasing international attention on the Arctic

Causes of increasing attention

77. Now, however, the Arctic is increasingly the subject of active international attention on a new scale, becoming “more dynamic”, and “more contested than ever before”.⁹⁶ A trend of growing international interest in the region was

90 Mining in Greenland dates to at least 1856—see Energy Security Initiative at Brookings, *The Greenland Gold Rush: Promise and Pitfalls of Greenland’s Energy and Mineral Resources* (September 2014): <http://www.brookings.edu/~media/research/files/reports/2014/09/24%20greenland%20energy%20mineral%20resources%20boersma%20foley/24%20greenland%20energy%20mineral%20resources%20boersma%20foley%20pdf%202.pdf> [accessed 19 February 2015]—and coal mining in Svalbard dates to the late 1890s. Written evidence from the International Association of Oil and Gas Producers (OGP) (ARC0034), see also written evidence from Dr Dougal Goodman (ARC0022).

91 Q 303 (HE Keiichi Hayashi)

92 Written evidence from Duncan Depledge (ARC0011) and Q 250 (Matthew King). See also written evidence from Prof Terry Callaghan (ARC0030)

93 Written evidence from Arctic Athabaskan Council (ARC0014). See also Q 317 (Alan Kessel).

94 Q 296 (Terry Audla)

95 Q 317 (Alan Kessel)

96 Q 287 (HE Claus Grube), written evidence from Luke Coffey (ARC0017), Q 1 (Jane Rumble)

almost universally noted in the evidence we received.⁹⁷ Pressures to increase external access to and investment in the region are growing and are often associated with real and perceived potentials in the Arctic.⁹⁸ Many of our witnesses spoke of the “opportunities” in the Arctic—as well as challenges and risks—for international interests as well as northern communities.⁹⁹

78. Increasing interest is partly explained by the drive of a growing and economically developing world population to find additional resources. Global demand has led to the exploration and development of major ore bodies and metal deposits in the Arctic.¹⁰⁰ According to the International Energy Agency’s 2013 World Energy Outlook, “the Arctic likely contains the world’s largest remaining area of conventional, undiscovered oil and natural gas, estimated at 13 per cent of recoverable oil and 30 per cent of recoverable natural gas resources.”¹⁰¹
79. At the same time, climate change in the Arctic—and in particular sea ice retreat—is making Arctic territory and resources apparently more accessible, generating “greater commercialisation opportunities” in the eyes of some (although changeable markets and the unclear effects of climate change may yet mean that uncertainty and disruption prevail over the realisation of those opportunities).¹⁰² As is considered below (see Chapter 5), climate change in the Arctic at least appears to enhance access to natural resources in the region, while sea ice changes might open up further shipping routes across the north coast of Russia (the ‘Northern Sea Route’), through the Northwest Passage (to a lesser degree) and even, eventually, across the centre of the Arctic Ocean.¹⁰³ Commercial fisheries may expand northwards as species move and more waters become accessible to trawlers, and tourism to the region may increase.¹⁰⁴ An expansion of economic development in the Arctic could also involve building up infrastructure and providing increased services to residents.¹⁰⁵ At the same time, improving technology and communications are making the region more accessible for all.¹⁰⁶
80. Ambassador Pekka Huhtaniemi of Finland told us that “the economic opportunities are really considerable in the Arctic regions”.¹⁰⁷ Investment in the Arctic could reach \$100 billion or more over 2012 to 2022 according to a 2012 report by Chatham House and Lloyd’s, but the authors noted that this

97 See, for example, [Q 312](#) (HE Pekka Huhtaniemi), [Q 316](#) (HE Nicola Clase), [Q 312](#) (Alan Kessel), [Q 1](#) (Jane Rumble), [Q 299](#) (Terry Audla) and written evidence from Dr Richard Powell ([ARC0053](#)).

98 [Q 158](#) (Tim Reilly), [Q 295](#) (Terry Audla), written evidence from Prof Terry Callaghan ([ARC0030](#)) and Tim Reilly ([ARC0060](#)).

99 [Q 302](#) (HE Keiichi Hayashi), [Q 299](#) (Terry Audla), [Q 314](#) (HE Nicola Clase), written evidence from Luke Coffey ([ARC0017](#)), Daniel Kochis ([ARC0019](#)), European Policies Research Centre, University of Strathclyde (EPRC) ([ARC0020](#)), Prof Terry Callaghan ([ARC0030](#)), Tim Reilly ([ARC0060](#)), Dr Nalân Koç ([ARC0061](#)) and OGP ([ARC0034](#)).

100 Written evidence from Dr Dougal Goodman ([ARC0022](#)). See paragraph 280. Written evidence from Dr Dougal Goodman ([ARC0022](#)).

101 Written evidence from OGP ([ARC0034](#)). See paragraph 259. Written evidence from OGP ([ARC0034](#)). We recognise that these estimates relate to geological probabilities and were not based on drilling.

102 Written evidence from the National Oceanography Centre ([ARC0032](#)).

103 See written evidence from Lloyd’s Register ([ARC0048](#)), [Q 303](#) (HE Keiichi Hayashi). See paragraph 291.

104 See [Q 289](#) (HE Claus Grube), [Q 314](#) (HE Pekka Huhtaniemi). See paragraphs 299 and 325.

105 See [Q 314](#) (HE Pekka Huhtaniemi), [Q 38](#) (Dr Jeffrey Mazo), written evidence from the National Oceanography Centre ([ARC0032](#)).

106 Written evidence from Dr Dougal Goodman ([ARC0022](#)). See, for example, Parliament of Canada, *The Arctic: Transportation, Infrastructure and Communication* (24 October 2008): <http://www.parl.gc.ca/Content/LOP/ResearchPublications/prb0808-e.htm> [accessed 19 February 2015].

107 [Q 314](#) (HE Pekka Huhtaniemi).

figure could be significantly higher or lower.¹⁰⁸ The degree to which such opportunities may, in fact, be exploited is explored in Chapter 5.

81. The Arctic is “a sphere of increasing competition”, both commercial and geopolitical.¹⁰⁹ The Royal Society saw environmental change in the Arctic as “awakening national interests in energy, fishing, shipping and tourism”.¹¹⁰ There was widespread agreement that the perception of increasing commercial opportunities in the Arctic has led to growing interest in the region from “a diverse range of industries and an increasing number of countries.”¹¹¹
82. The impacts of climate change in the Arctic are also generating external interest on non-commercial grounds, attracting attention from both Arctic and non-Arctic scientists and academics and from campaigning groups such as WWF and Greenpeace, as well as politicians.
83. Campaigns may focus on protecting or ‘saving’ the Arctic environment on behalf of planet Earth.¹¹² Like commercial pressures, these forces draw the Arctic into globalised networks: so much so that Mr Audla has compared Arctic environmental movements to a form of colonialism whereby ‘outside’ actors claim to speak and act on behalf of the Arctic, including its residents.¹¹³ He told us that Inuit see international campaigns that attempt to ‘protect and preserve’ the Arctic as:

“misguided attempts by government and non-governmental organisations to fundamentally change our lives to suit their differently oriented moral standards. It was not so long ago that such attitudes directed every aspect of our way of life. Back then we called it colonialism.”¹¹⁴
84. Globalising pressures are not only externally driven. Arctic residents can and do reach out to international audiences and markets: the Arctic Athabaskan Council told us that “A key challenge facing northerners and all who profess to have interests in the region, such as the UK, is to bring Arctic perspectives to bear on international and global decision-making.”¹¹⁵ Indigenous peoples are often interested in supporting sustainable business opportunities and in contributing to the commercial globalisation of the Arctic.¹¹⁶ The Arctic is also having an increasing effect on the rest of the world as climate change in the region impacts on global climates, weather, currents and sea levels, and on migratory species.¹¹⁷

108 Written evidence from Daniel Kochis (ARC0019); Chatham House and Lloyd’s, *Arctic Opening: Opportunity and Risk in the High North* (2012): <http://www.chathamhouse.org/sites/files/chathamhouse/public/Research/Energy,%20Environment%20and%20Development/0412arctic.pdf> [accessed 19 February 2015]

109 Q 158 (Prof Geoffrey Boulton), Q 313 (HE Pekka Huhtaniemi). See also Q 38 (Dr Jeffrey Mazo) and Q 42, Q 49 (Christian Le Mièrè)

110 Written evidence from the Royal Society (ARC0047)

111 Written evidence from the Foreign and Commonwealth Office (ARC0024), Q 38 (Christian Le Mièrè)

112 Q 296, Q 300 (Terry Audla). Greenpeace’s ‘Save the Arctic’ petition page reads “Sign the petition to join your voice to the movement of millions who believe that the Arctic belongs to all of us—and must be protected by us all”: <https://secure.greenpeace.org.uk/page/content/sta-time-is-running-out> [accessed 19 February 2015]

113 Q 296 (Terry Audla), written evidence from Terry Audla, ITK (ARC0058)

114 Q 296 (Terry Audla)

115 Written evidence from Arctic Athabaskan Council (ARC0014)

116 Q 11 (Jane Rumble), written evidence from Terry Audla, ITK (ARC0058), Dr Ilan Kelman (ARC0051)

117 Q 285 (HE Claus Grube), Q 302 (HE Foo Chi Hsia), Q 278 (HE Else Berit Eikeland), written evidence from the Joint Nature Conservation Committee (ARC0059), Foreign and Commonwealth Office (ARC0024)

Increasing strategic interest

85. Increasing access to at least the marine Arctic is making the region an area of increasing international economic and political strategic interest. The United States and Russia come into close proximity in the Arctic region, and the possibility of the Arctic serving as another arena for the flexing of China's muscles has excited much commentary—China describes itself as a 'near-Arctic state'.¹¹⁸ As seen above, commercial competition in the Arctic is often interpreted in exclusively inter-state terms. The European Policies Research Centre at the University of Strathclyde considered the Arctic "an area of growing strategic importance", and Dr Dmitriy Tulupov of the St. Petersburg State University agreed.¹¹⁹
86. Luke Coffey of The Heritage Foundation warned that the decrease of sea ice would mean "a larger military presence by more actors than ever before", although other witnesses disagreed over the Arctic's military-strategic importance and the significance of decreasing sea ice as a causal factor.¹²⁰ Greenlandic independence from Denmark might further increase geopolitical interest in the region, especially if an independent Greenland decided not to become a member of NATO and remained outside the EU.¹²¹
87. The Ministry of Defence's report *Global Strategic Trends: Out to 2045* reported that the economic development of the region "is already beginning to render its governance arrangements of deep significance"; it considered that "Inter-country disputes within the Arctic, driven by access to, and control over, resources, are possible", though unlikely to result in military conflict.¹²²

Intensifying globalisation

88. With such globalising forces in action, a narrative of a 'cold rush' has gained some traction, describing the Arctic as the last frontier for the claiming of new resources and strategic access.¹²³ While for reasons explored below this is an exaggeration (and historically not an unprecedented claim), the Arctic is nonetheless moving from a situation of comparative isolation and relative inaccessibility to becoming increasingly part of global geopolitical, trading and regulatory networks, and subject to multiplying claims on its resources and to its stewardship.¹²⁴
89. As an example, a 2009 EU ban on trade in seal products saw an expression of EU values affect the livelihoods of Arctic indigenous peoples, because as Mr Audla put it, Inuit require healthy markets to thrive "in a globalised economic environment."¹²⁵ Mr Audla asserted the legal rights of Inuit in a globalised world, telling us that "evolving principles of international law

118 See statement by the Ambassador of China to Sweden at the meeting between the Swedish Chairmanship of the Arctic Council and observers, 6 November 2013.

119 Written evidence from EPRC (ARC0020) and Dr Dmitriy S. Tulupov (ARC0009)

120 Written evidence from Luke Coffey (ARC0017) and Matthew Willis (ARC0043)

121 QQ 38–39 (Christian Le Mièrre)

122 Ministry of Defence, Strategic Trends Programme, *Global Strategic Trends: Out to 2045*, fifth edition (2014): https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/348164/20140821_DCDC_GST_5_Web_Secured.pdf [accessed 19 February 2015]

123 Q 11 (Jane Rumble). See also written evidence from Hugh Mackay (ARC0042), Michael Jonathan Dangerfield (ARC0063), Duncan Depledge (ARC0011), Q 202 (Dr John Campbell), Q 273 (Claude Perras). Charlie Kronick of Greenpeace said that the Arctic was "a frontier that is being pressed for expansion" (Q 179).

124 Written evidence from Arctic Advisory Group (ARC0060) and Prof Terry Callaghan (ARC0030)

125 Q 297 (Terry Audla)

[such as the UN Declaration on the Rights of Indigenous Peoples] mean that Inuit are a necessary partner in Arctic affairs”, while we heard from many witnesses the importance in the Arctic of international law on matters such as freedom of navigation.¹²⁶

90. The newly appointed US Special Representative for the Arctic, Admiral Robert J. Papp Jr., wrote in December 2014 that the Arctic was “quickly becoming a global cornerstone for scientific and academic research, trade, and tourism” and that “we are all connected through the Arctic, whether *environmentally*, through the global impacts of climate change; *economically* through international trade; or *scientifically* through multi-national research initiatives.”¹²⁷ Climate change, among other pressures, is bringing about fundamental state changes in the Arctic not just in environmental and geophysical terms, but politically, economically, culturally and imaginatively.

A scramble for the Arctic?

The Arctic is not unclaimed

91. While the popular narrative of a ‘scramble for the Arctic’ might suggest that the Arctic is unclaimed territory, this is far from the case.¹²⁸ All of the Arctic’s lands are part of the eight Arctic states (the US, Canada, Denmark, Iceland, Norway, Sweden, Finland and Russia), while much of the Arctic’s waters are in the Exclusive Economic Zones (see below) of the five of those states with Arctic Ocean coastlines (the US, Canada, Denmark, Norway and Russia). There are a few remaining boundary disputes between the eight Arctic states, but none are considered particularly threatening to bilateral relations or regional order.¹²⁹

The UN Convention on the Law of the Sea

92. Claims to Arctic waters are regulated under the United Nations Convention on the Law of the Sea (UNCLOS), to which all of the Arctic coastal states are party, except the United States, which nevertheless treats the Convention as customary international law.¹³⁰

126 [Q 297](#) (Terry Audla), written evidence from Michael Jonathan Dangerfield ([ARC0063](#)), [Q 307](#) (HE Keiichi Hayashi), written evidence from the Foreign and Commonwealth Office ([ARC0024](#)), [Q 321](#) (Julian Brazier MP), written evidence from Prof Maurice Mendelson QC ([ARC0039](#)), Prof Robin Churchill ([ARC0038](#)), [Q 302](#) (HE Foo Chi Hsia)

127 Admiral Robert J. Papp Jr., ‘America Is an Arctic Nation’ (2 December 2014): <http://www.whitehouse.gov/blog/2014/12/02/america-arctic-nation> [accessed on 19 February 2015]

128 Written evidence from Matthew Willis ([ARC0043](#))

129 Examples of such disputes are the Hans Island dispute between Canada and Denmark and outstanding maritime delimitation in the Beaufort Sea between Canada and the United States (see written evidence from Dr Dmitriy S. Tulupov ([ARC0009](#)) and Prof Robin Churchill ([ARC0038](#)), [Q 57](#) (Prof Phillip Steinberg)). In 2010, Norway and Russia resolved their differences over the maritime delimitation of the Barents Sea (see written evidence from Prof Robin Churchill ([ARC0038](#)), [Q 6](#) (Jane Rumble)).

130 [Q 6](#) (Jane Rumble), [Q 55](#) (Prof Maurice Mendelson QC), [Q 77](#) (Kiran Khosla), written evidence from Prof Robin Churchill ([ARC0038](#)) and Prof Maurice Mendelson QC ([ARC0039](#))

Box 2: The UN Convention on the Law of the Sea

- UNCLOS contains rules for determining national ‘**baselines**’, which form the limit of a country’s internal waters over which it has exclusive territorial sovereignty with no general right of passage for foreign ships.
- Working out from there, the coastal state has first a **territorial sea** extending up to 12 nautical miles from the baseline over which it also enjoys territorial sovereignty (it can regulate, police and adjudicate these waters and exploit their natural resources and those of the seabed). Ships of all states enjoy the right of innocent passage through territorial seas.
- A coastal state can also claim an **Exclusive Economic Zone (EEZ)** extending up to 200 nautical miles from the baseline, within which the coastal state enjoys sovereign rights for the purpose of exploring, exploiting, conserving and managing natural resources (including fish) of the waters and seabed and certain economic activities (such as the production of energy from the waters, currents and winds), and exercises jurisdiction over marine scientific research and environmental protection.
- A coastal state also has ‘sovereign rights’ over its **continental shelf** (seabed and subsoil only—not the water column) for the purposes of exploring and exploiting its natural resources (such as hydrocarbons). The continental shelf is the natural underwater prolongation of the land territory as far as 200 nautical miles if the continental margin falls short of this distance, or to the outer edge of the continental margin if it continues beyond 200 nautical miles (nm).¹³¹
- Where a state believes its continental shelf extends beyond 200nm, a submission is made to the scientific **Commission on the Limits of the Continental Shelf (CLCS)** to determine the geological and oceanographic parameters of the extended continental shelf, which might extend up to and even beyond 350nm from the baseline. Where states are claiming overlapping areas of an extended continental shelf, those states must come to a settlement on how it is to be delimited.¹³²
- There is a process for compulsory adjudication or arbitration for disputes relating to UNCLOS, which can involve the International Tribunal for the Law of the Sea, the International Court of Justice or arbitration.¹³³
- Once the extended continental shelves of coastal states have been established, the **seabed** beyond that point becomes an area beyond national jurisdiction. The seabed lying beyond all states’ continental shelves is designated a global commons and managed by the International Seabed Authority.¹³⁴
- Beyond states’ EEZs, all parts of the sea (including above any continental shelves) are considered ‘**high seas**’ and internationally shared.¹³⁵

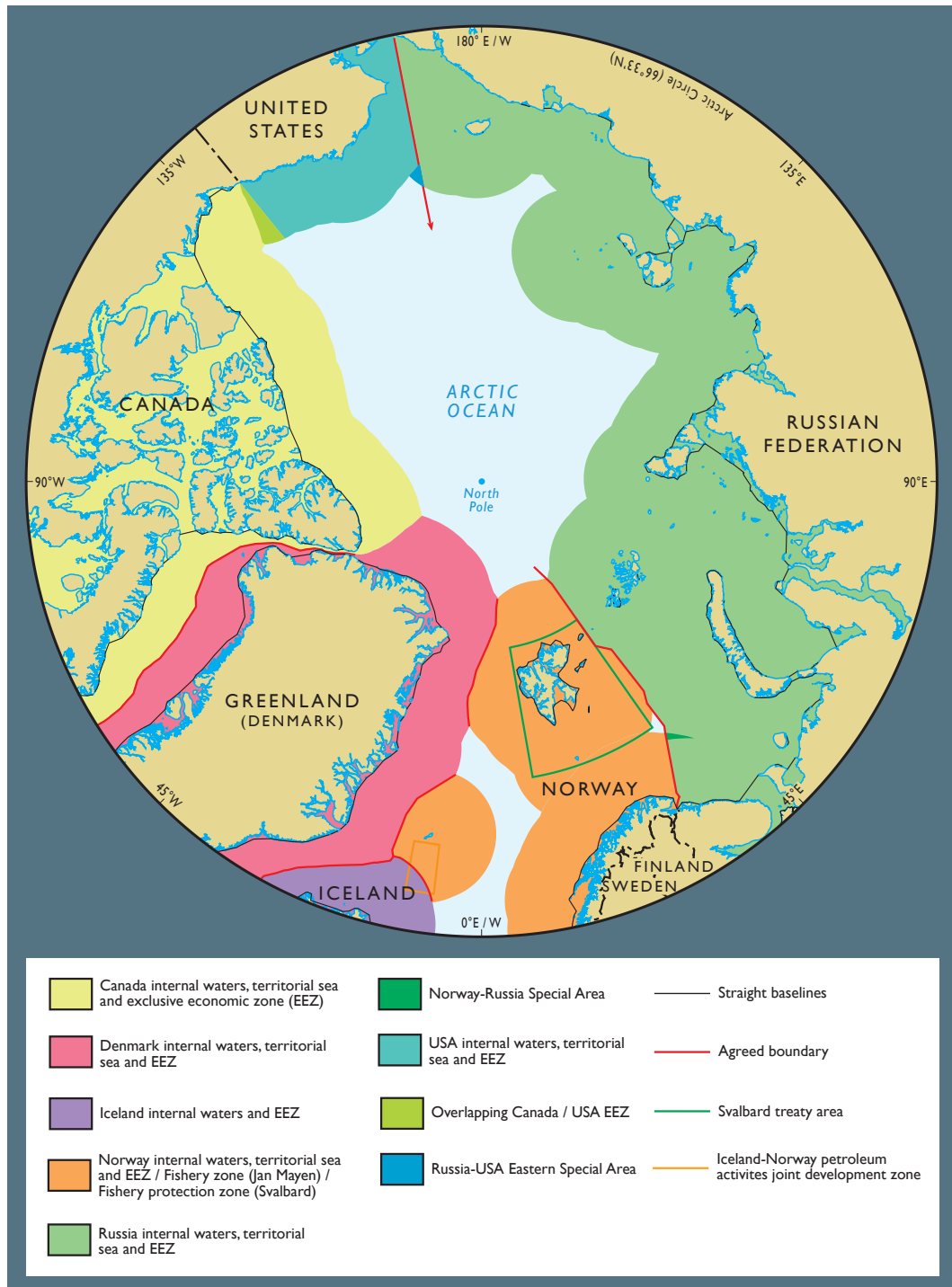
131 Written evidence from the Foreign and Commonwealth Office ([ARC0024](#)) and Prof Maurice Mendelson QC ([ARC0039](#))

132 [Q 6](#) (Jane Rumble), [Q 53](#) (Prof Philip Steinberg)

133 Readers are referred to the written evidence from Prof Maurice Mendelson QC ([ARC0039](#)) and Prof Robin Churchill ([ARC0038](#)) for the details of settlement processes and the International Tribunal for the Law of the Sea.

134 Written evidence from the Foreign and Commonwealth Office ([ARC0024](#)) and Prof Maurice Mendelson QC ([ARC0039](#))

135 *Ibid.*

Figure 11: Exclusive Economic Zones

Source and further information: IBRU, Durham University, UK: <http://www.durham.ac.uk/ibru/resources/arctic>.

93. The legal sub-divisions agreed under UNCLOS do not remove all territorial or access disputes from the Arctic. Canada and Russia use disputed interpretations of UNCLOS provisions to apply restrictive regulations to the Northwest Passage and the Northern Sea Route: Article 234 allows coastal states to enforce regulations to control marine pollution from vessels

in areas within the EEZ covered by ice for most of the year.¹³⁶ Christian Le Mière, Senior Fellow for Naval Forces and Maritime Security at the International Institute for Strategic Studies (IISS), told us that the Arctic coastal states “often jealously guard their stewardship of the Arctic Ocean and the resources in the Arctic”; as international interest increases, claims to stewardship may become more important and contested, especially where sea ice cover diminishes.¹³⁷

Claims to the North Pole

94. Reports of Arctic nations claiming the North Pole have generated much public interest. Despite the well-publicised (but purely symbolic) planting of a Russian flag on the Arctic seabed at the Pole in 2007,¹³⁸ Russia has not exerted any claim to sovereign rights over the Pole except through UNCLOS. Under that Convention, Russia, Denmark, Iceland, Norway and Canada are all at various stages of submitting materials to the CLCS regarding their sovereign rights to extended continental shelves beyond 200nm.¹³⁹ Russia and Denmark have claimed, and Canada is likely to claim, that the seabed at the North Pole is part of their extended continental shelves and that they should be able to exploit that seabed (subject to paying royalties to the International Seabed Authority), but the waters and airspace in the central Arctic Ocean are unambiguously un-claimable.¹⁴⁰
95. In the 2008 Ilulissat Declaration, the five Arctic coastal states committed themselves to the orderly settlement of overlapping seabed claims, so in the view of Matthew Willis from the Royal United Services Institute, “the odds favour a negotiated solution to current and future differences”.¹⁴¹ The “high-profile disputes” about Arctic territory “have little substance behind them”, Dr Jeffrey Mazo from the IISS told us.¹⁴²
96. Moreover, while it may be politically significant to claim the seabed at the Pole, we were told that there are no known hydrocarbon resources in that part of the Arctic Ocean.¹⁴³ Further, no state anywhere is yet exploiting minerals on its continental shelf beyond 200nm.¹⁴⁴ Dr Mazo and Mr Le Mière told us they “do not see any evidence of a race for resources in the Arctic” as 90 to 95 per cent of the known or expected resources in the Arctic, particularly oil and gas, are to be found in undisputed national territories or

136 Written evidence from the Foreign and Commonwealth Office (ARC0024), Q 56 (Prof Philip Steinberg), Q 158 (Dr Andrew Foxall), and written evidence from Prof Maurice Mendelson QC (ARC0039). Article 234 of UNCLOS says that “Coastal States have the right to adopt and enforce non-discriminatory laws and regulations for the prevention, reduction and control of marine pollution from vessels in ice-covered areas within the limits of the exclusive economic zone, where particularly severe climatic conditions and the presence of ice covering such areas for most of the year [i.e. six months and one day] create obstructions or exceptional hazards to navigation”: http://www.un.org/depts/los/convention_agreements/texts/unclos/part12.htm.

137 Q 42 (Christian Le Mière)

138 Written evidence from Dr Andrew Foxall (ARC0033), supplementary written evidence from the Henry Jackson Society (ARC0052), Q 6 (Jane Rumble), Q 166 (Dr Andrew Foxall). Tim Reilly told us “Russia putting a flag on the Arctic Ocean was about as significant as the United States putting a flag on the moon” (Q 166).

139 Written evidence from Prof Robin Churchill (ARC0038)

140 See written evidence from the Royal Society (ARC0047)

141 Written evidence from Matthew Willis (ARC0043)

142 Q 38 (Dr Jeffrey Mazo)

143 Q 166 (Tim Reilly)

144 Written evidence from the Foreign and Commonwealth Office (ARC0024) and Q 53 (Prof Philip Steinberg)

Exclusive Economic Zones.¹⁴⁵ The assumption underpinning talk of inter-state competition over energy resources is therefore “groundless”.¹⁴⁶

97. Further, we received evidence stating that the extraction of hydrocarbons in the Arctic typically required both political stability and international consortia, making extraction “inherently co-operative” and a catalyst for closer economic and political co-operation in the region.¹⁴⁷

A peaceful and orderly region

98. We heard that a national race for resources backed up by military power was very unlikely and that the Arctic is a stable region where tensions are, and have every reason to remain, low.¹⁴⁸ The 2008 Ilulissat Declaration (see paragraph 95) and the 2010 bilateral resolution of a maritime delimitation dispute between Russia and Norway in the Barents Sea were cited as showing that the Arctic was a peaceful and orderly region.¹⁴⁹
99. However, Dr Andrew Foxall, Director of the Russia Studies Centre at The Henry Jackson Society, expressed concern that while Russia had peacefully resolved one dispute, there was “no guarantee that it will do so again”.¹⁵⁰ He told us that “Russia argues that international law does not apply in the Arctic when its national interests are deemed at risk”, and that Russia no longer believed that its interests were properly served within existing rules and laws and as a result was seeking to maximise its Arctic territorial claims through UNCLOS. However, he suggested that if its claims were not accepted, Russia would “simply provide further science” to support its claims to an extensive extended continental shelf.¹⁵¹
100. Mr Le Mière argued that Russia was pursuing legal channels for its disagreements over continental shelves and maritime jurisdiction in the Arctic, and that its actions did not necessarily match the nationalistic and alarming rhetoric that sometimes emerged from Russia.¹⁵² Julian Brazier MP (Parliamentary Under-Secretary of State, Ministry of Defence), said that the polar region “is an area where Russia still sees its interests as lying in a stable, rules-based structure”.¹⁵³
101. **We conclude that the ‘scramble for the Arctic’ narrative is overly dramatic: territorial claims are overwhelmingly already settled, and where they are not there is widespread acceptance of the rules under which they should be settled, little material gain to be had from aggressive claims, and much material gain on offer from co-operation and peaceful settlement. There is no room for complacency, however.**

145 [Q 38](#) (Dr Jeffrey Mazo). Russia’s undisputed jurisdiction includes 52 per cent of the Arctic’s remaining reserves of undiscovered conventional oil and gas, Mr Willis told us, meaning Russia had no need to covet its neighbours’ seabeds (written evidence from Matthew Willis ([ARC0043](#))).

146 Written evidence from Matthew Willis ([ARC0043](#))

147 Written evidence from Matthew Willis ([ARC0043](#)) and OGP ([ARC0034](#))

148 [Q 42](#), [Q 41](#) (Christian Le Mière), [Q 38](#) (Dr Jeffrey Mazo), written evidence from Matthew Willis ([ARC0043](#))

149 [Q 166](#) (Dr Andrew Foxall), [Q 162](#) (Tim Reilly), written evidence from Matthew Willis ([ARC0043](#))

150 Written evidence from Dr Andrew Foxall ([ARC0033](#))

151 Written evidence from Dr Andrew Foxall ([ARC0033](#)), [Q 166](#) (Dr Andrew Foxall). See also written evidence from Duncan Depledge ([ARC0011](#)).

152 [Q 43](#) (Christian Le Mière). See also [QQ 162-3](#) (Tim Reilly).

153 [Q 327](#) (Julian Brazier MP)

102. **The international legal regime governing Arctic waters is important and must continue to be upheld by the Arctic states and the whole international community.**
103. The only coastal Arctic state which has not ratified the Law of the Sea Convention is the United States, which cannot submit its claim to an extended continental shelf until it has done so.¹⁵⁴
104. **The US would send a positive signal on international co-operation in the region if it were to engage with the process for ratifying UNCLOS during its upcoming chairmanship of the Arctic Council: a rules-based Arctic is to the advantage of everyone, not least the US.**

The Arctic Council

105. The eight Arctic states have recognised the case for an international rules-based approach to the region by coming together to co-operate on Arctic issues of mutual interest in the Arctic Council.¹⁵⁵ The Arctic Council was formed in 1996, and is the “premier body to promote international co-operation in the region”.¹⁵⁶
106. The Arctic Council holds Ministerial meetings every two years (with one state holding the Chairmanship for each two-year period) and meetings of the eight ‘Senior Arctic Officials’ twice a year. The Council’s activities are largely conducted by six permanent working groups and by time-limited task forces.¹⁵⁷ In addition, the Arctic Economic Council was formally set up under the Canadian Chairmanship in September 2014 as a circumpolar business forum.¹⁵⁸ The Arctic Council now has 32 ‘observers’, comprising 12 non-Arctic states (including the UK), nine intergovernmental and inter-parliamentary organisations, and 11 non-governmental organisations (NGOs).¹⁵⁹

154 Written evidence from Prof Maurice Mendelson QC ([ARC0039](#))

155 See [Q 8](#) (Jane Rumble)

156 Written evidence from Arctic Athabaskan Council ([ARC0014](#)). See also [Q 44](#) (Dr Jeffrey Mazo), written evidence from Duncan Depledge ([ARC0011](#)), Daniel Kochis ([ARC0019](#)) and the Foreign and Commonwealth Office ([ARC0024](#))

157 The six working groups are on Arctic contaminants, Arctic monitoring and assessment, the conservation of Arctic flora and fauna, protection of the Arctic marine environment, sustainable development, and emergency prevention, preparedness and response. The current four task forces are on Arctic marine oil pollution prevention, black carbon and methane, scientific co-operation and the establishment of the Arctic Economic Council: <http://www.arctic-council.org/index.php/en/about-us/working-groups> [accessed 19 February 2015]; <http://www.arctic-council.org/index.php/en/about-us/working-groups/task-forces> [accessed 19 February 2015]. See [Q 317](#) (Alan Kessel), [Q 277](#) (HE Else Berit Eikeland), and [Q 226](#) (Vincent Rigby)

158 [Q 228](#) (Vincent Rigby), [Q 274](#) (HE Else Berit Eikeland), [Q 291](#) (HE Claus Grube), [Q 314](#) (HE Nicola Clase). Arctic Council, ‘Arctic Economic Council’: <http://www.arctic-council.org/index.php/en/arctic-economic-council> [accessed 19 February 2015]

159 Arctic Council, ‘Observers’: <http://www.arctic-council.org/index.php/en/about-us/arctic-council/observers> [accessed 19 February 2015]

Box 3: Arctic Council member states, Permanent Participants and observers

The Arctic Council's members are the eight Arctic states: Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden and the United States.

Six international organisations representing Arctic indigenous peoples have Permanent Participant status: the Arctic Athabaskan Council, Aleut International Association, Gwich'in Council International, Inuit Circumpolar Council, Russian Association of Indigenous Peoples of the North and Saami Council.

Twelve non-Arctic countries have been admitted as observers to the Arctic Council:

- China (admitted May 2013)
- France (admitted October 2000)
- Germany (admitted September 1998)
- India (admitted May 2013)
- Italy (admitted May 2013)
- Japan (admitted May 2013)
- The Netherlands (admitted September 1998)
- Poland (admitted September 1998)
- Singapore (admitted May 2013)
- South Korea (admitted May 2013)
- Spain (admitted October 2006)
- United Kingdom (admitted September 1998)

Nine intergovernmental and inter-parliamentary organisations have been given observer status:

- International Federation of Red Cross & Red Crescent Societies (admitted October 2000)
- International Union for the Conservation of Nature (admitted October 2000)
- Nordic Council of Ministers (admitted September 1998)
- Nordic Environment Finance Corporation (admitted November 2004)
- North Atlantic Marine Mammal Commission (admitted October 2000)
- Standing Committee of the Parliamentarians of the Arctic Region (admitted September 1998)
- United Nations Development Program (UNDP) (admitted October 2002)
- United Nations Economic Commission for Europe (admitted September 1998)
- United Nations Environment Program (UNEP) (admitted September 1998)

Eleven non-governmental organisations are observers to the Arctic Council:

- Advisory Committee on Protection of the Seas (ACOPS) (admitted October 2000)
- Arctic Cultural Gateway (admitted November 2004)
- Association of World Reindeer Herders (admitted October 2000)
- Circumpolar Conservation Union (admitted October 2000)
- International Arctic Science Committee (admitted September 1998)
- International Arctic Social Sciences Association (admitted October 2002)
- International Union for Circumpolar Health (admitted September 1998)
- International Work Group for Indigenous Affairs (admitted October 2002)
- Northern Forum (admitted September 1998)
- University of the Arctic (admitted November 2004)
- World Wide Fund for Nature—Global Arctic Program (WWF) (admitted September 1998)

107. The current Chair of the Senior Arctic Officials (representing the 2013–15 Canadian Chairmanship), Vincent Rigby, described the Arctic Council as a body to promote “environmental protection and sustainable development, collaboration, co-operation and integration among the Arctic Council states”.¹⁶⁰ A key and unique aspect of its design was the inclusion of Arctic indigenous peoples as Permanent Participants, of which there are six, supported by a small Indigenous Peoples’ Secretariat.¹⁶¹
108. The Arctic Council’s remit explicitly excludes it from dealing with security issues; Mr Willis told us that this was a key condition of its establishment, to allow for “a political atmosphere in which potentially divisive issues could be kept off the table, helping to ensure that Russia never felt itself encircled or otherwise threatened” in the presence of the Council’s five NATO members.¹⁶² The Council operates by consensus.¹⁶³

Evolution and challenges

109. While the Council is considered an inter-governmental forum rather than an ‘international organisation’, in the 2013 Kiruna ‘Vision for the Arctic’, the Arctic Council states pledged to continue working “to strengthen the Arctic Council ... and pursue opportunities to expand the Arctic Council’s roles from policy-shaping into policy-making”.¹⁶⁴ Dr Mazo predicted that the

160 [Q 229](#) (Vincent Rigby)

161 [Q 299](#) (Terry Audla), [Q 226](#), [Q 231](#) (Vincent Rigby), [Q 313](#) (Alan Kessel), [Q 322](#) (Jane Rumble), [Q 42](#) (Dr Jeffrey Mazo)

162 [Q 44](#) (Dr Jeffrey Mazo), written evidence from Matthew Willis ([ARC0043](#)). See also [Q 313](#) (HE Nicola Clase), [Q 286](#) (HE Claus Grube)

163 [Q 313](#) (Alan Kessel), [Q 3](#), [Q 322](#), [Q 327](#) (Jane Rumble), [Q 42](#) (Dr Jeffrey Mazo), [Q 226](#), [QQ 228–9](#) (Vincent Rigby), [Q 251](#) (Matthew King), [Q 316](#) (HE Nicola Clase)

164 [Q 44](#) (Dr Jeffrey Mazo), written evidence from Matthew Willis ([ARC0043](#)), [Q 286](#) (HE Claus Grube), Arctic Council Kiruna Ministerial Meeting: <http://www.arctic-council.org/index.php/en/document-archive/category/425-main-documents-from-kiruna-ministerial-meeting> [accessed 19 February 2015]

Council would evolve over the next eight Chairmanships “into the central pillar of a multilayered, multi-instrument governance regime”.¹⁶⁵

110. Jane Rumble, head of the Polar Regions Department in the Foreign and Commonwealth Office (FCO), told us that the Council was “growing in its influence and ambition” and evolving in terms of its organisation and the breadth of the issues it considered.¹⁶⁶ Ambassador Else Berit Eikeland, for Norway,¹⁶⁷ saw an expansion of the Council’s focus from environmental issues to climate change and now “more focus on sustainable business development”.¹⁶⁸ Mr Rigby denied, though, any notion that “we have moved away from environmental protection” in the light of the creation of the Arctic Economic Council.¹⁶⁹
111. The Arctic states have negotiated two legally binding multilateral agreements under the auspices of the Council, on search and rescue (2011) and oil pollution preparedness and response (2013).¹⁷⁰ Ambassador Eikeland predicted that the Council will discuss new areas of co-operation and possibly new binding agreements (she raised scientific co-operation and the possibility of a further initiative on oil spill prevention).¹⁷¹ Mr Rigby confirmed that the Council is “looking at possibilities down the line” and that there might be “the beginning of a trend” towards legally binding agreements; other witnesses concurred.¹⁷²
112. A permanent Arctic Council secretariat of ten staff was established in Tromsø, Norway, in 2013, which is improving co-ordination and communication.¹⁷³ Ambassador Thórdur Aegir Óskarsson (for Iceland) felt that the Council “is moving really fast now”, but “Since the demands are increasing so fast, it needs to react much faster than it has done” and move more into decision-making. He told us that the secretariat was “weak for such a huge plethora of activities” but he was sure that it would be strengthened in the near future.¹⁷⁴ The Norwegian and Swedish ambassadors welcomed the strengthening of the Council, which looks likely to continue under the American Chairmanship (from late April 2015); Admiral Papp was reported in November 2014 as

165 [Q 44](#) (Dr Jeffrey Mazo); see also [Q 149](#) (Dr Richard C. Powell), written evidence from Dr Richard C. Powell ([ARC0053](#))

166 [Q 3](#), [Q 322](#) (Jane Rumble)

167 HE Else Berit Eikeland is Norway’s Polar Ambassador and Senior Arctic Official to the Arctic Council. The other Ambassadors, High Commissioner and Deputy High Commissioner who generously gave evidence to us were all representatives of their countries to the UK.

168 [Q 274](#) (HE Else Berit Eikeland), [Q 149](#) (Dr Richard C. Powell). Dr Martin Sommerkorn of WWF said that the Council’s working groups were set up some 20 years ago “for conservation purposes, protection of the environment and then sustainable development. In the 21st century, what we probably need is different working groups. It is now really important to integrate the working groups and establish processes between them so that they can deal with the issues of our time” ([Q 246](#)).

169 [Q 227](#) (Vincent Rigby). Mr Rigby explained the Arctic Economic Council as indicative of the Arctic Council addressing issues that were of direct concern to northern communities, including employment, trade and investment, “while still providing for environmental protection” ([Q 228](#)).

170 The Agreement on Co-operation on Aeronautical and Maritime Search and Rescue in the Arctic (2011) and the Agreement on Co-operation on Maritime Oil Pollution Preparedness and Response in the Arctic (2013).

171 [QQ 274–5](#) (HE Else Berit Eikeland)

172 [Q 227](#) (Vincent Rigby), [Q 286](#) (HE Claus Grube), [Q 275](#) (HE Thórdur Aegir Óskarsson), [Q 44](#) (Dr Jeffrey Mazo), [Q 314](#) (Alan Kessel), [Q 198](#) (Dr John Campbell). See also written evidence from Elizabeth Kirk ([ARC0015](#))

173 [Q 322](#) (Jane Rumble), [Q 229](#) (Vincent Rigby), [Q 44](#) (Dr Jeffrey Mazo)

174 [QQ 275–6](#) (HE Thórdur Aegir Óskarsson)

wanting to put the Arctic Council “on steroids” in order to promote a greater sense of institutional urgency.¹⁷⁵

113. Whether biennial rotating chairmanships encourage sufficient continuity in the Arctic Council’s work has been the subject of some speculation.¹⁷⁶ Ambassador Eikeland acknowledged the issue, saying that the Council was looking at the model of chairmanship ‘troikas’.¹⁷⁷ While Mr Rigby acknowledged that balancing chairmanship priorities with longer-term objectives was a “dilemma” for any international body with a rotating chair, he argued that rotating chairmanships “help to hold Arctic Council states’ and Permanent Participants’ feet to the fire”.¹⁷⁸ We also heard that the chairmanship system tended to emphasise continuity by increasing the ownership of policies and long-term stances.¹⁷⁹
114. **We encourage the Arctic Council to continue examining how best to achieve continuity between Chairmanships, in order to build on the considerable progress being made by the Arctic Council. We consider that troikas might be helpful in this regard.**
115. The extent to which the Council can ensure that agreed actions are actually implemented is unclear.¹⁸⁰ A 2014 report by the US Government Accountability Office identified concerns over this issue and the related problem of ill-defined, numerous and unprioritised recommendations.¹⁸¹ Reviews conducted by the Swedish National Audit Office in 2013¹⁸² and the Office of the Auditor General of Norway in 2014 arrived at similar conclusions.¹⁸³
116. Greenpeace argued that current international governance and security arrangements are not appropriate for dealing with present and anticipated challenges in the Arctic, because “major gaps remain in the regulation of the most damaging human activities in the Arctic, which allow Arctic coastal states to exploit the Arctic Ocean”.¹⁸⁴ In Chapter 5 we discuss the case for further agreements on marine protection and on the future of the Arctic high seas.
117. Greenpeace also argued for a legally binding instrument open to all countries to sign, with “sanctions to cover the whole of the Arctic marine region—both

175 [Q 274, Q 275](#) (HE Else Berit Eikeland), [Q 313](#) (HE Nicola Clase). See also ‘The Admiral who went into the cold’, *Arctic Journal* (4 November 2014): <http://arcticjournal.com/politics/1120/admiral-who-went-cold> [accessed on 19 February 2015]; ‘US-led Arctic Council to stress Arctic Ocean, climate change’, *Nunatsiaq Online*: <http://www.nunatsiaqonline.ca/stories/article/65674u.s.-led-arctic-council-to-stress-arctic-ocean-climate-change> [accessed on 19 February 2015]

176 Radio Canada International, ‘Blog: The Arctic Council at a crossroads: Still, and again’: <http://www.rcinet.ca/eye-on-the-arctic/2014/10/03/the-arctic-council-at-a-crossroads-still-and-again> [accessed on 20 February 2015]. See also [Q 228](#) (Vincent Rigby).

177 [Q 276](#) (HE Else Berit Eikeland). See also [Q 230](#) (Vincent Rigby), [Q 316](#) (Alan Kessel).

178 [Q 228](#) (Vincent Rigby)

179 [Q 316](#) (HE Pekka Huhtaniemi)

180 Written evidence from Elizabeth Kirk ([ARC0015](#))

181 US Government Accountability Office, *Arctic Issues* (May 2014): <http://www.gao.gov/assets/670/663245.pdf> [accessed 19 February 2015]. See also [Q 228](#) (Vincent Rigby).

182 Riksrevisionen (Swedish National Audit Office), *Sweden in the Arctic Council: Effective return from membership* (2013): http://www.riksrevisionen.se/PageFiles/20332/summary_2013_9.pdf [accessed 19 February 2015]

183 Riksrevisjonen (Office of the Auditor General of Norway), *Riksrevisjonens undersøkelse av myndighetenes arbeid med Arktisk råd* (17 December 2014): <https://www.riksrevisjonen.no/rapporter/Documents/2014-2015/ArktiskRaad.pdf> [accessed 19 February 2015]

184 Written evidence from Greenpeace UK ([ARC0016](#))

within and outside of EEZs”, because “Current governance regimes do not adequately protect the Arctic, or provide (non-Arctic) stakeholders with a say in managing the region.”¹⁸⁵ However, it seems unlikely that the Arctic states would agree to a new multilateral treaty regulating their activities within their national territories and EEZs. Current governance arrangements would seem to provide a good basis for future progress.

Tensions within the Arctic states

118. A further challenge to the consensus-based Council’s future effectiveness is that as its agenda expands, “it is getting even closer to the more sensitive issues all the time”.¹⁸⁶ Professor Geoffrey Boulton of the University of Edinburgh, was concerned that a major industrial pollution incident could make “what has hitherto been a relatively safe arena for discussion into a much more problematic one.”¹⁸⁷
119. Currently, some tensions are visible between the five Arctic Ocean coastal states (the ‘A5’) and the remaining three (Sweden, Finland and Iceland). Discussions within the A5 about the future of the international high seas area in the central Arctic Ocean, including in February 2014, irritated Iceland (as a major fishing nation which had previously been excluded from the 2008 Ilulissat Declaration) in particular.¹⁸⁸

The necessity of Arctic co-operation, and current tensions surrounding Russia

120. In a region defined by its climate, highly adaptive ecology and sunlight (or lack thereof) rather than political and legal boundaries, international co-operation is vital. The Danish Ambassador, HE Claus Grube highlighted that “Everybody has an interest ... in co-operation in the Arctic”, saying that the difficult conditions, huge distances and low population density meant that “No one can do it alone”.¹⁸⁹ International co-operation is important to implement projects that must cross borders to be effective, such as actions on preserving biodiversity, managing fisheries and minimising pollution, and work to protect people and assets, such as search and rescue agreements.
121. Cross-border collaboration is also essential on Arctic scientific research because of the physical difficulties of working in the Arctic and the need to ensure results are disseminated and built upon internationally.¹⁹⁰ Translation (especially of Russian-language materials) is an important part of results dissemination.¹⁹¹ We discuss Arctic science in Chapters 4 and 6 but note here that research collaboration can also help to reinforce diplomatic relations.¹⁹²
122. In the context of Arctic co-operation, many of our witnesses felt the Arctic region should be, in former Soviet Premier Gorbachev’s words, a ‘zone of

185 *Ibid.*

186 [Q 275](#) (HE Thórdur Aegir Óskarsson)

187 [Q 163](#) (Prof Geoffrey Boulton)

188 [Q 282](#) (HE Thórdur Aegir Óskarsson)

189 [Q 286](#) (HE Claus Grube). See also written evidence from Dr Dmitriy S. Tulupov ([ARC0009](#)).

190 Written evidence from the Royal Society ([ARC0047](#)), [Q 286](#) (HE Claus Grube). See also [Q 275](#) (HE Else Berit Eikeland).

191 [Q 267](#) (Prof Julian Dowdeswell)

192 Written evidence from the Royal Society ([ARC0047](#)). See paragraphs 204–6.

peace'.¹⁹³ Many of the Arctic state representatives we heard from reinforced this aim.¹⁹⁴

Russian remilitarisation?

123. Regional security co-operation and the 'security architecture' nevertheless lag behind Arctic political, environmental and economic co-operation.¹⁹⁵ Duncan Depledge (Royal Holloway, University of London) told us that "The biggest challenge facing international governance in the region concerns how relations are managed between Russia and the other Arctic states (and arguably the Arctic observer states)."¹⁹⁶
124. We were told that in the summer of 2013, Russia re-established a permanent military presence in the Arctic, and that Russia has "increased the Northern Fleet's forces, including commissioning a new icebreaker fleet and developing new nuclear attack submarines; modernised its forces in the three military districts that border the Arctic (Far Eastern, Leningrad and Siberian), including creating new Arctic brigades; begun constructing a missile early-warning radar in the Arctic; and re-opened Soviet-era military bases in the Arctic."¹⁹⁷ Mr Coffey wrote that:

"Russia's Northern Fleet, which is based in the Arctic, counts for two-thirds of the Russian Navy. A new Arctic command will be established by 2015 to co-ordinate all Russian military activities in the Arctic region. Over the next few years two new so-called Arctic brigades will be permanently based in the Arctic region, and Russian Special Forces have been increasing training in the region. ... The ultimate goal is for Russia to deploy a combined arms force in the Arctic by 2020 and it appears they are on track."¹⁹⁸

125. In Dr Foxall's view, these moves amounted to a Russian "remilitarisation" of the Arctic.¹⁹⁹ He told us that "it is clear that Russia poses a threat to its neighbours in the Arctic", and that "Russian politicians, including President Putin, have threatened to take their country's current standoff with the West to the Arctic."²⁰⁰ However, other witnesses saw these developments as instances of military restoration rather than expansion: Mr Le Mière argued that Russia was investing in renewing its military presence to a far lesser extent than it had during the Cold War, and Mr Willis saw the investment as a regeneration.²⁰¹ It should be noted that other states, such as Canada, Denmark and Norway, have also invested in their Arctic military capabilities and upgraded command structures in recent years.²⁰²

193 Written evidence from Matthew Willis ([ARC0043](#))

194 [Q 312](#) (HE Nicola Clase), [QQ 312-3](#) (HE Pekka Huhtaniemi), [Q 288](#) (HE Claus Grube), [Q 273](#) (HE Thórhður Aegir Óskarsson)

195 [Q 38](#) (Dr Jeffrey Mazo)

196 Written evidence from Duncan Depledge ([ARC0011](#))

197 [Q 170](#) (Dr Andrew Foxall), written evidence from Dr Andrew Foxall ([ARC0033](#))

198 Written evidence from Luke Coffey ([ARC0017](#))

199 [Q 169](#) (Dr Andrew Foxall). See also written evidence from Luke Coffey ([ARC0017](#))

200 Written evidence from Dr Andrew Foxall ([ARC0033](#))

201 [Q 43](#) (Christian Le Mière), written evidence from Matthew Willis ([ARC0043](#)). Mr Willis warned that the Western bloc must avoid defensive moves in relation to Russia involving the Arctic because this would risk turning the regeneration into something closer to a remilitarisation.

202 [QQ 161, 169](#) (Tim Reilly), written evidence from Matthew Willis ([ARC0043](#))

126. The build-up could also be interpreted as ‘securitisation’.²⁰³ Throughout the region, tasks such as aerial surveillance, anti-smuggling inspections and fisheries monitoring, patrolling, search and rescue, and assistance with oil spill response efforts fall to armed forces because they have a near monopoly on the training, equipment and capabilities necessary to operate in Arctic conditions.²⁰⁴ Russia aims to make the Arctic its ‘foremost strategic base for natural resources’ by 2020: to do so it must invest “massively” in both economic infrastructure and in the military means to police an enormous region being restored to national economic centrality.²⁰⁵
127. Julian Brazier MP concluded for the Government that Russia “have become much more active” in the Arctic, but “are still very much participants” in regional fora such as the Council, noting that “So far, proper notices have been given and the various protocols are being observed, and so on.”²⁰⁶
128. We note that the crisis relating to Crimea and Ukraine (discussed further below) has aggravated concerns about Russian strategic intentions and Russia’s long-term policy towards its near neighbours. Russian military activity in the Arctic region has increased, with Russian aircraft and (allegedly) submarines making incursions into the territorial waters and airspace of Arctic and near-Arctic states.²⁰⁷ Russia also clearly states that it has a ‘near abroad’ and ‘privileged interests’ policy and considers near neighbours to be within such a sphere of influence. Neither the UN nor international law recognise the concept of ‘near abroad’ let alone ‘sphere of influence’.
129. However, it does not necessarily follow, in our view, that Russia is intent on militarising the Arctic in a manner that threatens other nations. Russia has the longest Arctic coastline and an extensive Exclusive Economic Zone, and it would be surprising if it did not claim a legitimate right to expand its military presence in its Arctic maritime region. Our difficulty lies in interpreting the extent to which these developments are an attempt to regain the influence that Russia once held in the Soviet era, as opposed to pushing the ‘sphere of influence’ policy in a way that threatens neighbouring states. Inevitably the crises in Crimea and Ukraine have aggravated this fear.
130. The Committee was unable to persuade the Russian Embassy in the UK to engage with this inquiry. This reluctance to co-operate with the Committee, which we regret, has made it more difficult for us to interpret Russian motives and policies with clarity.
131. The Arctic Council may be able to ease any tensions arising over the Russian military build-up. The Royal Society argued that:
- “Environmental security discussions focused on international space could provide a co-operative framework through which to address military risks. ... Given that militaries are trained in providing disaster relief and search and rescue, clarifying their role in this context could increase transparency and maintain a dialogue that could eventually allow more sensitive issues to be addressed.”²⁰⁸

203 [Q 169](#) (Tim Reilly)

204 Written evidence from Matthew Willis ([ARC0043](#)), [Q 169](#) (Tim Reilly)

205 Written evidence from Matthew Willis ([ARC0043](#)), [Q 169](#) (Tim Reilly, Dr Andrew Foxall)

206 [Q 324](#) (Julian Brazier MP). See also [Q 274](#) (HE Thórhður Aegir Óskarsson)

207 Written evidence from Matthew Willis ([ARC0043](#)), [QQ 325, Q327](#) (Julian Brazier MP, Nick Gurr), [Q 47](#) (Christian Le Mière)

208 Written evidence from the Royal Society ([ARC0047](#))

Achievements of the Arctic Council

132. In the Government's view, the Arctic Council has engendered co-operation and co-ordination on cross-boundary issues that affect the Arctic, sharing and disseminating good practice, and developing the evidence base for policy decisions.²⁰⁹ Co-operation through the Council was praised to us by the Arctic state ambassadors, while in the opinion of Tim Reilly from the Arctic Advisory Group, the Council was "frankly amazing as an international forum in its collaboration, co-operation, and decision-making" and "a fantastic model for international co-operation between superpowers".²¹⁰
133. **The achievements of the Arctic Council as an intergovernmental forum are significant and welcome. The role of the Permanent Participants is ground-breaking in international affairs. Serious and comprehensive co-operation in the Arctic is in the global common interest, and this framework for continued progress must be nurtured and supported, including by the UK.**

Arctic relations in the wake of increased tension over Crimea and events in eastern Ukraine

134. Relations between North American and European countries on the one hand and Russia on the other have come under strain since the crisis in Crimea and Ukraine began. These tensions have so far had only limited consequences for Arctic co-operation.
135. In April 2014, Canada "boycotted" a Moscow meeting of an Arctic Council task force on black carbon issues as a protest over Russian involvement in Crimea, but all eight Arctic states have attended the Council's meetings since that point.²¹¹ Mr Willis noted that substantial efforts had been made to ensure Russian delegates attended Arctic Council meetings in Canada.²¹² Military diplomacy in the Arctic has been more substantially affected (see below), but Dr Mazo considered that "As long as the Arctic Council does not have a major security co-operation role, it is likely to stay insulated to some extent ... Russia's interest is very strongly in keeping the Arctic isolated [from tensions], so it is really a question of whether the other Arctic states feel that it is an appropriate venue for sanction."²¹³
136. International sanctions against the Russian oil and gas sector, in Mr Reilly's view, had linked the West's response to the Crimea crisis with the Arctic; Mr Willis called them "a strategic Arctic thrust".²¹⁴ Mr Willis warned that if left in place, the sanctions might change Russia's outlook towards Arctic co-operation, while Mr Reilly told us that he believed "the Russian response will be uncontained and international, geopolitical and strategic in response".²¹⁵ We noted, however, that the recent sharp fall in world oil prices, if sustained over time, is likely to have as big an effect on the prospects for oil exploration in the Arctic region as are economic sanctions (see paragraph 277). Michael

209 Written evidence from the Foreign and Commonwealth Office ([ARC0024](#)). See also written evidence from OGP ([ARC0034](#))

210 [Q 275](#) (HE Else Berit Eikeland), [Q 313](#) (Alan Kessel), [Q 313](#) (HE Nicola Clase), [Q 159](#) (Tim Reilly), written evidence from Michael Kingston ([ARC0054](#))

211 [Q 47](#) (Dr Jeffrey Mazo)

212 Written evidence from Matthew Willis ([ARC0043](#))

213 [Q 47](#) (Dr Jeffrey Mazo), written evidence from Matthew Willis ([ARC0043](#)). See also [Q 274](#) (HE Thórhður Aegir Óskarsson).

214 [Q 161](#) (Tim Reilly), written evidence from Matthew Willis ([ARC0043](#))

215 Written evidence from Matthew Willis ([ARC0043](#)), [Q 161](#) (Tim Reilly)

Kingston (DWF LLP) argued that it should be the UK's aim "to ensure that the Arctic Council is in no way damaged by any recent or future sanctions and if possible that the Arctic Council does not get embroiled in the mainstream political thoroughfare of the day".²¹⁶

137. We heard that the insulation around Arctic co-operation was highly resilient to the vagaries of international politics, with interconnected sub-national actors contributing to its maintenance.²¹⁷ Mr Willis argued that when it came to the Arctic region, "Everyone has an economic stake in its continued stability, and Russia's is of virtually existential size."²¹⁸ Jane Rumble, from the FCO, agreed that Russia wanted to continue engaging with its Arctic Council partners and felt that tensions over Crimea had not "led to a breakdown in the Council or its work"; Ambassador Grube, Ambassador Huhtaniemi and Mr Rigby concurred.²¹⁹
138. The impact of the crisis on Arctic scientific collaboration has also been relatively slight, we heard, while the scientific and legal framework of the Arctic Council might provide opportunities to maintain and renormalise international relations with Russia as and when appropriate.²²⁰ The Council has enabled Arctic states to know and build confidence in their neighbours.²²¹ Fora such as the Council are "important platforms, where the dialogue and co-operation hopefully can go on despite the tensions elsewhere", in Ambassador Huhtaniemi's view: such arrangements should therefore "continue as normally as possible, despite the tensions caused by the Ukrainian situation."²²²
139. The forces threatening to pull the Arctic into geopolitical disputes are another globalising pressure on the Arctic, but they are countered by other globalising forces: pressure to co-operate, and global demands for a stake in the Arctic's future.
140. **Russia's foreign policy has become increasingly difficult to predict, and we cannot be confident that peaceful co-operation in the Arctic will continue indefinitely. However, every effort should be made to insulate Arctic co-operation from geopolitical tensions arising in other parts of the world because there is a global interest in protecting this unusually vulnerable environment. All states with Arctic interests, including the UK, should therefore work to prevent Arctic co-operation from being damaged by non-Arctic disputes.**

Observer status at the Arctic Council

New observer states

141. As interest in the varied potentials in the Arctic has risen, an increasing number of states and other bodies have sought to gain observer status at the Arctic Council. At the Ministerial meeting in spring 2013, China, India, Italy, Japan, Singapore and South Korea were granted observer status. Including

216 Written evidence from Michael Kingston ([ARC0054](#))

217 Written evidence from Matthew Willis ([ARC0043](#)). See also written evidence from the EPRC ([ARC0020](#)).

218 Written evidence from Matthew Willis ([ARC0043](#))

219 [Q 327](#) (Jane Rumble), [Q 288](#) (HE Claus Grube), [Q 313](#) (HE Pekka Huhtaniemi), [Q 229](#) (Vincent Rigby)

220 [Q 161](#) (Prof Geoffrey Boulton), [Q 163](#) (Tim Reilly), [Q 162](#) (Dr Andrew Foxall)

221 [Q 313](#) (Alan Kessel), [Q 313](#) (HE Nicola Clase), [QQ 273–4](#) (HE Else Berit Eikeland)

222 [Q 313](#) (HE Pekka Huhtaniemi)

those nations, over 50 per cent of the world's population is now represented by members or observers at the Council.²²³ The UK's own observer status dates to the first tranche of admittances, in 1998.

142. The granting of observer status to these six new nations doubled the number of observer states, and expanded the realm of observer countries beyond Europe for the first time. This generated much press attention: was China's move part of a 'cold rush', or another aspect of China's meteoric rise to superpower status?²²⁴ China, South Korea, India and Japan are among the ten states (including the UK) who have established Arctic research stations at Ny-Ålesund in Svalbard. The 1920 Svalbard treaty provides all signatories (of which there are now 42) equal rights to engage in commercial activities on the islands. While Svalbard is undeniably Norwegian territory, rumours that there was a Chinese interest in purchasing land in Svalbard suggest that the archipelago remains the focus of international interest.²²⁵ New observers to the Arctic Council, such as Singapore, might also be interested in establishing a scientific presence on Svalbard.
143. Much has been made of rumours and realities of Chinese bodies making investments in Iceland and Greenland.²²⁶ Mr Le Mière told us that while it was "very easy to see nefarious motivations behind China's activities" in the region, "in reality China has been a relatively positive engager with the Arctic" and was not likely to gain "undue influence" over Iceland or Greenland.²²⁷ He said that, despite some concerns among Nordic states, there was "a welcoming atmosphere for Chinese investment, as there must be if you wish to develop some of the resources of the high north, which are difficult to get to" and that China was likely to be one of the largest clients for some of those resources.²²⁸
144. The new Asian observer states, like their European counterparts, have different interests and varying levels of desire to be involved in the Council.²²⁹ We heard that Japan's interest is driven by China's interest but also that, as Mr Reilly put it, there is some justification in countries like China "saying that, because the Arctic is the epicentre of climate change on the earth, they

223 Q 44 (Dr Jeffrey Mazo)

224 See Q 11 (Jane Rumble).

225 Andrew Higgins, 'A Rare Arctic Land Sale Stokes Worry in Norway', *The New York Times* (27 September 2014): <http://www.nytimes.com/2014/09/28/world/europe/a-rare-arctic-land-sale-stirs-concerns-in-norway.html> [accessed 19 February 2015], Trude Pettersen, 'Norway stops Chinese tycoon's bid on Svalbard', *Barents Observer* (23 May 2014): <http://barentsobserver.com/en/arctic/2014/05/norway-stops-chinese-tycoons-bid-svalbard-23-05> [accessed 19 February 2015]

226 QQ 11–12 (Jane Rumble), Q 291 (HE Claus Grube), QQ 42–3 (Christian Le Mière). See for example: 'Chinese Billionaire Huang Readies Iceland Bid on Power Shift', *Bloomberg News* (14 August 2013): <http://www.bloomberg.com/news/articles/2013-08-14/chinese-billionaire-huang-readies-iceland-bid-after-power-shift> [accessed 19 February 2015], 'China's Greenland to Invest \$2 Billion in London Projects' *The Wall Street Journal* (7 January 2014): <http://www.wsj.com/articles/SB10001424052702304887104579305842680386498> [accessed on 19 February 2015], 'Iceland's president expects to strengthen co-operation with China', *China Daily* (1 October 2014): http://www.chinadaily.com.cn/business/2014-10/01/content_18691030.htm [accessed on 19 February 2015], Ministry for Foreign Affairs, 'Iceland First European Country to Sign Free Trade Agreement with China', April 2013: <http://www.mfa.is/news-and-publications/nr/7655>, 'Chinese Workers — In Greenland?', *Business Week* (10 February 2013): <http://www.businessweek.com/articles/2013-02-10/chinese-workers-in-greenland> [accessed 19 February 2015]

227 Q 42 (Christian Le Mière). Ambassador Grube considered that regarding Greenland "interest has been greater in the newspapers and the media than among commercial investors" and partially generated by prospective investors (Q 291).

228 Q 42 (Christian Le Mière), Q 42 (Dr Jeffrey Mazo)

229 Q 42 (Dr Jeffrey Mazo), see also Q 7 (Jane Rumble).

have a right to be involved in the solution to it and in the endeavour to find out” about it.²³⁰ HE Foo Chi Hsia, High Commissioner for Singapore, agreed: “The growth in interest by Asian states ... is a natural reaction to the global implications of developments in the Arctic.”²³¹

The EU’s application for observer status

145. The European Union has been an ‘ad hoc’ observer at the Arctic Council since 1998 and applied for ‘permanent’ observer status in 2008. In 2013, the EU’s latest application was received “affirmatively”, but a final decision on implementation was deferred “with the understanding that the EU may observe Council proceedings” for the moment.²³²
146. The EU’s application is supported by the EU’s three Arctic Council member states (Denmark, Finland and Sweden).²³³ The Arctic Athabaskan Council (AAC), one of the Council’s six Permanent Participants, told us that “taking Arctic perspectives on transboundary issues to the world is the key challenge facing the Arctic Council” and that this was “why AAC fully supports the application by the European Union to become a full observer”.²³⁴
147. Three of the Council’s member states and seven of its observer states are EU members, the Arctic region includes part of the European continent, the EU has spent considerable sums on Arctic research in recent years, and the EU is a key actor on fisheries management in northern seas.²³⁵ **The European Union’s case for permanent observer status at the Arctic Council is overwhelming.**
148. The EU’s application for observer status is widely understood to have been blocked in recent years by Canada because of anger over the EU ban on the import of seal products.²³⁶ We heard that “Inuit oppose the entry of the European Union to the Arctic Council as it continues to defend its unlawful seal trade ban. We feel that any observer coming into the Arctic Council has to be able to show that it can make decisions that are intelligent and based on scientific fact, as well as to be inclusive with respect to the traditional knowledge of the indigenous people who live in the Arctic.”²³⁷
149. While an exemption was included to allow the import of seal products arising from indigenous seal harvesting practices, indigenous peoples have argued that the ban destroyed the market for seal products from all sources.²³⁸ Anger over the ban is indisputably deeply felt, but 28 EU member states agreed the ban, including three Arctic Council member states and seven observer states, while Russia and the US have also implemented similar bans.²³⁹

230 Q 42 (Dr Jeffrey Mazo), Q 168 (Tim Reilly)

231 Q 303 (HE Foo Chi Hsia), Q 303 (HE Keiichi Hayashi)

232 Kiruna Declaration: <http://www.arctic-council.org/index.php/en/document-archive/category/425-main-documents-from-kiruna-ministerial-meeting> [accessed 19 February 2015], written evidence from Arctic Athabaskan Council (ARC0014), Q 236 (Vincent Rigby)

233 Q 287 (HE Claus Grube), Q 313 (HE Pekka Huhtaniemi), Q 317 (HE Nicola Clase)

234 Written evidence from Arctic Athabaskan Council (ARC0014)

235 See QQ 287–9 (HE Claus Grube), Q 265 (Prof Jane Francis), Q 265 (Dr Ray Leakey)

236 QQ 250–1 (Matthew King), Q 287 (HE Claus Grube), Q 299 (Terry Audla), Q 9 (Jane Rumble). Mr King added that “There was a sense that the EU was too big for the Arctic Council to swallow” (Q 251).

237 Q 299 (Terry Audla)

238 Q 9 (Jane Rumble), Q 253 (Matthew King), Q 288 (HE Claus Grube), QQ 297–9 (Terry Audla), written evidence from Terry Audla, ITK (ARC0058)

239 Q 297, Q 299 (Terry Audla), Q 251 (Matthew King)

150. While progress has recently been made regarding the seal ban dispute and Canada's objection to EU observer status has been lifted, it now seems possible that the EU's application will continue to be treated opportunistically, this time as a foil for Russia's anger over Western sanctions relating to Ukraine.²⁴⁰
151. **The EU's application for observer status at the Arctic Council should be treated on its merits. The UK should continue to voice its strong support for the EU to be granted permanent observer status at the 2017 Ministerial meeting at the latest.**²⁴¹

Pressures resulting from the growth in Arctic Council observers

152. We heard that the increasing numbers of observer states and organisations at the Arctic Council are creating new pressures and a concern that "the bigger and more unwieldy the Council and observers gets the less efficient it will be".²⁴² Other logistical difficulties arise because of the desire to hold meetings in the Arctic's often small and isolated communities.²⁴³ The Chair of the Senior Arctic Officials told us that there have been back-room discussions about "the number of observers and the point at which we say 'enough is enough', to put it crudely".²⁴⁴
153. More fundamentally, there are real tensions over the current and future role of the Council's 32 observer states and bodies.²⁴⁵ We heard different interpretations of that role.
154. The Danish, Swedish and Norwegian ambassadors and Jane Rumble for the FCO were clear that the main contribution observers could make was to the scientific and technological work of the working groups (and the scientific assessments that fed into them) and task forces.²⁴⁶ The parts played by observers included "sending experts, circulating reports, hosting meetings or participating in the funding, which is very important, or field studies".²⁴⁷
155. Mr Audla saw the role of observers as "to support the work of Arctic nations to respect the participation of indigenous peoples and to encourage greater capacity for participation by indigenous representatives ahead of their own objectives".²⁴⁸

240 [Q 253](#) (Matthew King), [Q 288](#) (HE Claus Grube), [Q 313](#) (HE Pekka Huhtaniemi), [Q 313](#) (Alan Kessel)

241 See [Q 9](#) (Jane Rumble).

242 [Q 42](#) (Dr Jeffrey Mazo)

243 [Q 42](#) (Dr Jeffrey Mazo)

244 [Q 234](#) (Vincent Rigby)

245 Observers are notified of and able to attend all Council Ministerial, Senior Arctic Official (SAO), working group and task force meetings (written evidence from the Foreign and Commonwealth Office ([ARC0072](#))). At SAO meetings, observers sit at the sides of the room, but can indicate their wish to speak if necessary ([Q 1](#), [Q 7](#) (Jane Rumble)). At working group and task force meetings, participants from observer states (often scientists) can participate more fully in the discussions and report writing, although this is variable. Observers cannot chair or co-chair working groups or task forces, but they can propose projects through an Arctic state or Permanent Participant; this does not appear to be a common occurrence and the UK has not done so to date (written evidence from the Foreign and Commonwealth Office ([ARC0072](#))). The Council's Rules of Procedure state that financial contributions from all observers to any given project may not exceed the financing from the Arctic states, unless otherwise decided by the SAOs: <http://www.arctic-council.org/index.php/en/document-archive/category/425-main-documents-from-kiruna-ministerial-meeting?download=1781:rules-of-procedure> [accessed 23 February 2015]

246 [Q 287](#) (HE Claus Grube), [Q 317](#) (HE Nicola Clase), [Q 277](#) (HE Else Berit Eikeland), [Q 321](#) (Jane Rumble)

247 [Q 317](#) (HE Nicola Clase)

248 [Q 299](#) (Terry Audla)

156. Dr Mazo and Dr Foxall both suggested that new observers had been admitted for the ulterior purpose of obtaining their acknowledgement of the Council's status and legitimacy and the primacy of UNCLOS (noted in the criteria for admittance).²⁴⁹
157. The Norwegian, Swedish and Danish ambassadors expressed particular enthusiasm for engagement with observers and inclusivity.²⁵⁰ Somewhat in contrast, however, Vincent Rigby, the Canadian Chair of the Senior Arctic Officials, told us that "Ultimately, [observers'] primary role is to observe and understand even more the impact that their policies may have on the Arctic and the impact that policies in the Arctic may have on them".²⁵¹
158. Mr Le Mière told us that Canadian Prime Minister Stephen Harper had "opined that the Arctic Council has expanded too quickly and involved too many observers from outside the Arctic, which is diluting and complicating the interactions of the Arctic states themselves."²⁵² Alan Kessel (Deputy High Commissioner for Canada) noted that the Arctic states "are extraordinarily beholden to observers and the contribution that they can make" but immediately added "It goes without saying that 99 per cent of the pollution that we find in our Arctic region emanates from some of those observers who are with us. If those states really want to do something, domestic regulation on issues [such as mercury pollution] would be helpful".²⁵³ Prof Boulton felt that Russia (the other of the two largest Arctic states) was also "rather sensitive to the potential that the Arctic Council might expand".²⁵⁴
159. The Japanese and Icelandic ambassadors raised concerns over the lack of clarity regarding the role of observers and Mr Rigby accepted that there needed to be further discussions on the subject.²⁵⁵
160. Our evidence indicates there is a careful balance yet to be worked out between the degree of contribution (financial, scientific and political) that Arctic states wish observers to make in return for their presence, and the degree of influence that the observers want in return for their contribution. Mr Rigby had the sense from a lot of observers that they would like to do more and "have a slightly more prominent place in the Arctic Council"; we heard this expressed by the Japanese Ambassador.²⁵⁶ Ben Ayliffe of Greenpeace found it hard to imagine observers such as China and India "agreeing to the status quo where they are in effect kept on the side-lines of what is an increasingly important and geostrategic forum."²⁵⁷
161. On the other hand, Mr Reilly felt that it was now implicit to observers that "if you want to join the party, you must share the burden and ask what you bring to the party"; he noted as a recent development in Arctic affairs "Explicit demands from the [Arctic Council] for Observer countries to increase their

249 [Q 168](#) (Dr Andrew Foxall), [Q 42](#) (Dr Jeffrey Mazo), Arctic Council Rules of Procedure. See also [Q 178](#) (Nathalie Rey), [Q 179](#) (Ben Ayliffe).

250 [Q 274](#), [Q 277](#) (HE Else Berit Eikeland), [Q 287](#) (HE Claus Grube), [Q 317](#) (HE Nicola Clase)

251 [Q 232](#) (Vincent Rigby), see also [Q 317](#) (Alan Kessel). The Council's Rules of Procedure say "The primary role of Observers is to observe the work of the Arctic Council."

252 [Q 45](#) (Christian Le Mière)

253 [Q 317](#) (Alan Kessel)

254 [Q 158](#) (Prof Geoffrey Boulton), [Q 168](#) (Dr Andrew Foxall)

255 [Q 308](#), [Q 310](#) (HE Keiichi Hayashi), [Q 275](#) (HE Thórdur Aegir Óskarsson), written evidence from Elizabeth Kirk ([ARC0015](#)), [Q 232](#) (Vincent Rigby)

256 [Q 232](#) (Vincent Rigby), [Q 308](#) (HE Keiichi Hayashi)

257 [Q 179](#) (Ben Ayliffe)

burden sharing responsibilities (including budgets).”²⁵⁸ Observers are already required to submit information every two years “about relevant activities and their contributions to the work of the Arctic Council”.²⁵⁹ It is likely that, in the near future, the contribution of observers to the Arctic Council will be more closely monitored by the secretariat, and this might in turn have implications for the four-yearly renewal of observer status.²⁶⁰

162. Mr Ayliffe told us that the Council “felt like a boys’ club for the top of the world” and that, given the global importance of changes in the Arctic, if the Arctic Council wished to maintain its credibility and central role in the region’s governance it would have to open up or “lose its relevance”.²⁶¹ The Council is having to tread a difficult line in mediating between the varying desires of the Arctic states and Permanent Participants to guard their rights to stewardship of the region and the independent determination of the Arctic’s future, and the wider claims of the global community to treat the Arctic not as a fiefdom but as a region of international concern—and one which includes international waters.
163. **The Arctic Council will need to ensure observer states feel that their voice is listened to if it wants to either benefit further from their contributions or place more demands upon them. The UK should push for the criteria governing observer participation to be reviewed within the US Chairmanship (2015–17), with the aim of ensuring that observers such as the UK feel encouraged and incentivised to participate proactively and extensively in Arctic co-operation.**
164. **One way forward might be for the Arctic Council to consult different groups of observers according to the issue or geographical focus under discussion, rather than treating them as a homogenous bloc.**²⁶²
165. **Those concerned with the Arctic should seek to use the momentum around the region being generated by the enthusiasm of new observer states efficiently and effectively. Consideration should be given by the Arctic Council and observer states to how observer bodies’ Arctic efforts, especially in science, can be voluntarily co-ordinated to maximise results.**
166. **The continued growth of international pressure for influence on the Arctic region is inevitable.**²⁶³ The Arctic has a global importance in terms of climate, its unique environment, and its potentials as a possible world trade route and source of scarce resources, as well as including the global commons of the Arctic high seas, so the widest possible co-operation on the Arctic’s future is vital.²⁶⁴ The rest of the world has a legitimate interest in the Arctic, so while an effective

258 [Q 168](#) (Tim Reilly), written evidence from Arctic Advisory Group ([ARC0060](#)). Admiral Papp was reported as saying in autumn 2014 that “Being an observer state is not just sitting there and listening, it’s being actively engaged, it’s participating. Perhaps not just ideas, but perhaps resources as well” (‘The Admiral who went into the cold’, *Arctic Journal* (4 November 2014): <http://arcticjournal.com/politics/1120/admiral-who-went-cold> [accessed on 19 February 2015]).

259 Arctic Council Rules of Procedure, Annex 2

260 Arctic Council Rules of Procedure, Annex 2

261 [Q 179](#) (Ben Ayliffe)

262 See [Q 7](#) (Jane Rumble).

263 See [Q 168](#) (Tim Reilly).

264 See written evidence from Greenpeace UK ([ARC0016](#)).

Arctic Council is necessary, the Council must also be open to further co-operation beyond its own membership.

Other international bodies and agreements affecting the Arctic

167. The Arctic Council, though pre-eminent, is not the only international governance arrangement involving the region: the Arctic is “covered by a dense web of collaboration, co-operation and co-ordination mechanisms and networks”, some of which were listed for us by the FCO (see Appendix 5).²⁶⁵
168. Five of the eight Arctic states—four of the five littoral states—are members of NATO, which conducts biennial Cold Response training exercises in the Norwegian Arctic.²⁶⁶ There are differences of opinion within the Arctic NATO states and within NATO over the extent to which NATO should be involved in the region and currently its direct engagement with the Arctic is minimal.²⁶⁷
169. For this reason, Mr Coffey found “curious” the assertion in the Government’s 2013 Arctic Policy Framework that in terms of Arctic stability and security, “The role of NATO will remain central”. Mr Coffey considered the UK to be “the best placed NATO member to broker an agreement on what NATO’s role in the Arctic should be” and argued that “Ahead of the next NATO Summit in Poland, the UK should work to ensure that consensus inside the alliance on the issue of Arctic security is achieved.”²⁶⁸
170. International co-operation on security issues in the Arctic has taken place in recent years through the Arctic Security Forces Roundtable (ASFR), including annual Arctic Chiefs of Defence meetings.²⁶⁹ The ASFR promotes Arctic security co-operation on issues such as situational awareness and search and rescue, and provides a forum for the Arctic states and a number of observer nations (including the UK) to discuss collective security challenges facing the Arctic.²⁷⁰ Nick Gurr, Director for International Security Policy for the Ministry of Defence, told us that the UK had been able to have constructive discussions about security issues within that forum.²⁷¹
171. This trust-building Roundtable has been “the most notable casualty” of tensions over Crimea, Mr Willis told us: the Chiefs of Defence meetings seem to be suspended and Russia has had no significant recent involvement with the ASFR.²⁷² Mr Willis was concerned that “If the absence of the Arctic’s single most capable player continues for long, the value of the ASFR will be substantially diminished” and that “Most damagingly, the channels for military-to-military communication it has helped open between Russia and its neighbours—vital to co-ordinating a response to any emergency—are

265 Written evidence from EPRC ([ARC0020](#))

266 [Q 4](#) (Debbie Brothers), [Q 14](#) (Martin Molloy), [Q 170](#) (Dr Andrew Foxall), [Q 324](#) (Julian Brazier MP), written evidence from Matthew Willis ([ARC0043](#)), Dr Andrew Foxall (the Henry Jackson Society) ([ARC0033](#)) and Luke Coffey ([ARC0017](#))

267 [Q 4](#) (Debbie Brothers), [QQ 45–6](#) (Christian Le Mièrè), [Q 324](#) (Nick Gurr), written evidence from Matthew Willis ([ARC0043](#)) and Luke Coffey ([ARC0017](#))

268 Written evidence from Luke Coffey ([ARC0017](#))

269 [Q 45](#) (Christian Le Mièrè), [Q 324](#) (Nick Gurr), written evidence from the Foreign and Commonwealth Office ([ARC0024](#)). The twelve members are Canada, Denmark, Finland, France, Germany, Iceland, the Netherlands, Norway, Russia, Sweden, the United Kingdom and the United States.

270 Written evidence from Luke Coffey ([ARC0017](#)), Duncan Depledge ([ARC0011](#)) and Matthew Willis ([ARC0043](#)), Foreign and Commonwealth Office, *Adapting To Change: UK policy towards the Arctic* (2013)

271 [Q 324](#) (Nick Gurr)

272 Written evidence from Matthew Willis ([ARC0043](#)), [Q 47](#) (Christian Le Mièrè), [Q 324](#) (Nick Gurr)

likely to close up.”²⁷³ The future of the Roundtable is currently uncertain, but Mr Gurr told us that the desire to co-operate persisted.²⁷⁴ The North Atlantic Coast Guard Forum, which includes all eight Arctic states, proceeded without Russian involvement in 2014, Mr Le Mière noted.²⁷⁵

172. Various regional groupings are relevant to Arctic co-operation, including the Barents Euro-Arctic Council²⁷⁶, Nordic Council of Ministers²⁷⁷, Northern Group²⁷⁸, Council of the Baltic Sea States²⁷⁹, the Northern Research Forum²⁸⁰ and the ‘Northern Dimension’, a joint policy of the European Union, Russia, Norway and Iceland which “offers the EU a framework to advance the EU’s Arctic objectives in the European Arctic area together with the [other Northern Dimension] partners, in particular in the fields of environmental protection and nuclear safety and improving transport and logistics”.²⁸¹
173. While none of our witnesses saw an immediate role in the Arctic for the Organisation for Security and Co-operation in Europe (OSCE), we consider that, in certain circumstances, the fact that all eight Arctic states are members of the OSCE could provide a useful mechanism for handling a situation of increasing tension, were such a situation to arise.²⁸²
174. Groupings, agreements and treaties applying to particular Arctic-related fields are also a part of the picture.²⁸³ As discussed above, UNCLOS establishes the legal framework for the maritime Arctic, while the London-based International Maritime Organisation of the UN is in the process of agreeing a Polar Code for shipping (see Chapter 5); various fisheries bodies are relevant to the regulation of Arctic fishing (see Chapter 5).
175. In environmental protection, a number of UN environmental bodies are relevant, including the UN Environment Program (which is an Arctic Council observer), while a sizeable array of environmental protection agreements such as the Convention on International Trade in Endangered Species (CITES) have application in the region.²⁸⁴ Climatic and meteorological bodies such as the World Meteorological Organisation are also germane.²⁸⁵
176. A number of other fora on Arctic issues have sprung up in recent years alongside the Arctic Council, often open to wider audiences and broader participation. The Arctic Circle Assembly has been held annually in Reykjavík

273 Written evidence from Matthew Willis ([ARC0043](#))

274 [Q 325](#) (Nick Gurr)

275 [Q 47](#) (Christian Le Mière)

276 [Q 313](#) (HE Pekka Huhtaniemi), [Q 250](#) (Matthew King), [Q 118](#) (Jon Petter Gintal), written evidence from the European Commission ([ARC0064](#)) and EPRC ([ARC0020](#))

277 Written evidence from the European Commission ([ARC0064](#)) and EPRC ([ARC0020](#))

278 Written evidence from Luke Coffey ([ARC0017](#)) and Matthew Willis ([ARC0043](#))

279 Written evidence from the European Commission ([ARC0064](#))

280 UArctic Institute, ‘The Northern Research Forum (NRF)’: <http://www.uarctic.org/organization/institutes/northern-research-forum> [accessed 19 February 2015]

281 [Q 252](#) (Matthew King), written evidence from the European Commission ([ARC0064](#)) and EPRC ([ARC0020](#))

282 [Q 4](#) (Jane Rumble), [Q 4](#) (Debbie Brothers), [Q 4](#) (Martin Molloy), [Q 46](#) (Christian Le Mière), [Q 46](#) (Dr Jeffrey Mazo), [Q 326](#) (Jane Rumble), written evidence from the Foreign and Commonwealth Office ([ARC0024](#))

283 Written evidence from Elizabeth Kirk ([ARC0015](#))

284 [Q 48](#) (Christian Le Mière), [Q 48](#) (Dr Jeffrey Mazo), [Q 320](#) (Jane Rumble), written evidence from the Foreign and Commonwealth Office ([ARC0001](#)). See written evidence from the Joint Nature Conservation Committee for details of Arctic-related environmental bodies and agreements ([ARC0059](#)).

285 Written evidence from the World Meteorological Office’s Polar Prediction Project ([ARC0026](#))

since 2013,²⁸⁶ and the Arctic Frontiers conference has been held annually since 2007 in Tromsø, Norway.²⁸⁷ The Conference of Parliamentarians of the Arctic Region is a biennial conference for parliamentarians representing the eight Arctic countries and the European Parliament, with Arctic indigenous peoples represented as Permanent Participants (plus observers—our Chairman attended its 2014 meeting in Whitehorse, Canada).²⁸⁸

177. **Arctic fora in addition to the Arctic Council are important for building international consensus on Arctic issues, and should be encouraged.**
178. It is quite probable that yet more bodies and agreements will come to acquire relevance in the Arctic as the sea ice melts and the region at least appears more open to further activities and international influences, and as additional agreements such as the Polar Code are concluded and implemented, further tying the Arctic into global legal and multilateral frameworks. Elizabeth Kirk from the University of Dundee criticised the “fragmentation” in Arctic governance arrangements, but there was widespread agreement that a treaty along the lines of the Antarctic Treaty would not be appropriate to the Arctic because of the very different legal, geographical, demographic and geopolitical circumstances.²⁸⁹

Conclusion

179. **As access to at least the maritime Arctic increases and international commercial, scientific, campaigning, personal and governmental attention on the region strengthens, a significant and difficult challenge facing Arctic states and residents and non-Arctic interests will be managing global demands to either exploit or to exercise stewardship over this simultaneously inhabited and wild region and its changing environment.**
180. **The Arctic will be the site of economic, geopolitical and cultural claims, conversations and disputes in the years ahead, although the risk of territorial or military conflict seems low. The UK’s interest, the global interest, and the interest of Arctic citizens will be best served by the highest possible degree of rules-based negotiation and the widest possible scope of international co-operation and consent. The UK needs to be ready to bring its influence to bear in the region where appropriate to further its own interests and those of the common good.**

286 [Q 281](#) (HE Thórdur Aegir Óskarsson), [Q 281](#) (HE Else Berit Eikeland), [Q 308](#), [Q 310](#) (HE Foo Chi Hsia), [Q 319](#) (Jane Rumble)

287 [Q 281](#) (HE Else Berit Eikeland)

288 The Conference’s Standing Committee is an Arctic Council observer.

289 Written evidence from Elizabeth Kirk ([ARC0015](#)), [Q 14](#) (Jane Rumble), [Q 51](#) (Prof Maurice Mendelson QC)

CHAPTER 4: THE IMPACT OF ARCTIC CHANGES: INTERNAL PRESSURES AND OPPORTUNITIES WITHIN THE ARCTIC

Pressures within the Arctic

181. We have explored above the ways in which forces within the Arctic are contributing to its further ‘globalisation’ and the international relations aspects of this shift. In this chapter and the next we consider the other pressures that may arise within the Arctic region and their possible significance, including for the UK. This chapter focuses upon ‘internal’ challenges within the Arctic region which arise, mainly but not exclusively, from the effects of climate change and the warming of the Arctic. The next chapter considers the extent to which the Arctic is opening up and examines the pressures and opportunities arising from increasing access to the Arctic by ‘external’, non-Arctic actors.

Changes to Arctic ecosystems

182. The Arctic is home to a rich and varied biodiversity, with many iconic species living within the region for all or part of the year. This includes over half of the world’s shorebird species, 90 per cent of geese populations, several million reindeers, and beluga whales, polar bears and narwhals. These ecosystems and species are linked to regions beyond the Arctic, including the UK; of the 25 breeding seabird species in the UK, only six do not breed in the Arctic.²⁹⁰ The UK is connected intimately to the biogeography of the Arctic region.
183. We received evidence that the Arctic’s ecosystems are changing in response to warming temperatures and associated environmental developments.²⁹¹ Dr Jan-Gunnar Winther of the Norwegian Polar Institute told us that ecosystem changes were “taking place at a phenomenal rate” and that “every year, there is migration of species and new species. There is a phenomenal response in the ecosystem to the physical changes but this has not received as much attention in the media as it should”.²⁹²
184. We were told that Arctic ecosystems were “very sensitive to disturbance”.²⁹³ Short Arctic summers mean that many plants and animals grow slowly, and live for many years to compensate; this is necessary for reproduction.²⁹⁴
185. The pace, scale and nature of change are not homogenous; there is a high degree of variability, reflecting the diversity of the Arctic region. The degree of knowledge and understanding of ecosystem changes also varies across different parts of the Arctic, and according to whether terrestrial or marine ecosystems are being considered.

Terrestrial ecosystems

186. Some projections of Arctic responses to ongoing climate change have suggested that, as temperatures increase, growth of vegetation will be promoted at more northerly latitudes. We were told that 37 per cent of Arctic vegetation

290 Foreign and Commonwealth Office, *Adapting To Change: UK policy towards the Arctic* (2013): <https://www.gov.uk/government/publications/adapting-to-change-uk-policy-towards-the-arctic> [accessed 19 February 2015]

291 Written evidence from the Royal Society ([ARC0047](#)), Greenpeace UK ([ARC0016](#)), WWF-UK ([ARC0050](#))

292 [Q 93](#) (Dr Jan-Gunnar Winther)

293 Written evidence from Prof Terry Callaghan ([ARC0030](#)), [Q 314](#) (HE Pekka Huhtaniemi)

294 Written evidence from Prof Terry Callaghan ([ARC0030](#))

has significantly increased in growth over the past three decades.²⁹⁵ Tree and shrub growth is moving further north, but not in a universal pattern.

187. Vegetation growth in response to increases of temperature can be limited by other events, including tundra fires, insect or pest outbreaks and extreme winter weather events resulting from climate change.²⁹⁶ The latter includes rain-on-snow incidents and periods of winter warming which melt the snow pack, which then refreezes. Such events prevent animals from reaching their food or escaping predators; millions of wild reindeer have died in the past three decades as a result of a growing number of such events. We were also told that increasing temperatures are encouraging some species to migrate northwards, and that competition from these spreading species is having a negative impact on species such as the Arctic fox.²⁹⁷
188. The Arctic Council's biodiversity working group (Conservation of Arctic Flora and Fauna) published an assessment in 2013, which stated that climate change poses the main threat to Arctic biodiversity. It concluded that ecosystems and species could demonstrate some resilience to environmental changes, but that anticipated paces and levels of change will probably exceed the capacity for some species to adapt.²⁹⁸

Sea ice, and marine ecosystems

189. Sea ice is an important element of the Arctic ecosystem for many species, from unicellular algae on the underside of the ice (and the food chain depending upon it) to large mammals such as polar bears. As temperatures increase and sea ice melts, the unique environment that it provides for ice-associated species is modified, or even irreversibly lost.
190. Marine ecosystems play a number of particularly important roles in the Arctic, and global, environment. These include the 'cycling' of carbon from the surface of the Arctic Ocean down to the seabed; supporting marine productivity and, thereby, fisheries; and supporting wider biodiversity by acting as a food source for species, including migrant species that come to the UK.²⁹⁹
191. We were told that marine ecosystems within the Arctic Ocean were "almost certain to change" as climate change continues.³⁰⁰ There are, however, huge knowledge gaps concerning the current status of such ecosystems, meaning that exact impacts are difficult to predict or project.
192. The effects of a removal of sea ice cover could, for some species, have positive effects. Dr Ray Leakey, Principal Investigator and Arctic Research Theme Leader at the Scottish Association for Marine Science (SAMS), told us that an increase in levels of light entering the ocean could promote plant growth, and that this increased plant growth could feed up through to a more productive ecosystem.³⁰¹ Ocean 'spin-up' (see Chapter 2) and vertical mixing of the different strata of the Arctic Ocean could also promote plant

295 *Ibid.*

296 *Ibid.*

297 *Ibid.*

298 Conservation of Arctic Flora and Fauna Working Group, *Arctic Biodiversity Assessment* (2013): <http://www.arcticbiodiversity.is> [accessed 19 February 2015]

299 Q 270 (Dr Ray Leakey)

300 Q 24 (Dr Sheldon Bacon)

301 Q 270 (Dr Ray Leakey)

growth, by moving nutrients necessary for growth closer to the surface.³⁰² As conditions change, however, species that are highly adapted to Arctic environments may be negatively affected, altering the fundamental character of the Arctic ecosystem.³⁰³

193. For those species that live on, rather than beneath, the ice, the impacts of a reduction in sea ice cover may be predicted with a greater degree of confidence. The 2013 Arctic Biodiversity Assessment suggested that, as the environment changes, the population of polar bears could reduce by 30 per cent over the next 45 years.³⁰⁴ Dr Martin Sommerkorn of WWF told us that changes to sea ice could have significant negative impacts for the survival of some mammals:

“That is because very often receding ice means that the contact between that ice and coastlines or with shallow shelf seas is lost. There is no longer any overlap between the ice layer and either the coastline or the shallow seas that provide food ... When the ice recedes in the summer, we will have a threshold crossed for many populations of polar bears. They cannot survive on ice alone”.³⁰⁵

Knowledge gaps, and a role for the UK

194. It is clear that knowledge and understanding of Arctic ecosystems is variable and that, in many areas of study, a lack of detailed baseline information makes the monitoring of trends, and prediction of future impacts, extremely difficult. This is particularly the case for marine ecosystems, which were consistently highlighted as a fundamental ‘knowledge gap’ in the evidence that we received.³⁰⁶
195. The NERC Arctic Office suggested that a relatively incomplete knowledge of Arctic marine ecosystems meant that even experts were poorly placed to understand the effects of environmental change upon ecosystems and indigenous species.³⁰⁷ The British Antarctic Survey argued that there was an urgent need for baseline studies of Arctic Ocean marine species to be undertaken. It was important that these were initiated before human activity in the region intensified, in order that the impacts of increased activity could be properly understood. Such studies “may eventually allow the underlying causes of changes in these ecosystems to be ascribed”.³⁰⁸
196. This information deficit is particularly acute for the area that lies beneath the ice covering the central Arctic Ocean. Dr Leakey of SAMS said:

“The central Arctic is a big knowledge gap. Some expeditions have been through there but they are few and far between. So we know something about the biodiversity and productivity there but certainly much less than we know about the more marginal seas ... that central Arctic area will potentially become more important if the ice edge moves north. If

302 Q 24 (Dr Sheldon Bacon)

303 Q 270 (Dr Ray Leakey)

304 Conservation of Arctic Flora and Fauna Working Group, *Arctic Biodiversity Assessment* (2013): <http://www.arcticbiodiversity.is> [accessed 19 February 2015]

305 Q 240 (Dr Martin Sommerkorn)

306 Written evidence from Greenpeace UK (ARC0016), NERC Arctic Office (ARC0028), BAS (ARC0018), Canadian Polar Commission (ARC0040), Elizabeth Kirk (ARC0015), Dr Sheldon Bacon, Dr Ed Hawkins and Prof Chris Rapley (ARC0013)

307 Written evidence from the NERC Arctic Office (ARC0028)

308 Written evidence from BAS (ARC0018)

that lid of ice is removed from the central Arctic, we can envisage that area becoming potentially more productive and certainly more attractive in terms of fisheries in the longer term”.³⁰⁹

197. **Knowledge of Arctic ecosystems, particularly marine ecosystems, is limited and in some areas severely lacking. This knowledge gap hampers our ability to understand the effects of climate change, and of human activity, on marine species in the region.**
198. **Significant further research is required on Arctic ecosystems as a matter of priority. Research collaboration and knowledge sharing is essential to this mission. Understanding the systems that stand to be affected by increased human interventions in the Arctic environment is vital to making policy decisions about what interventions can be made with an acceptable level of risk or damage to Arctic biological diversity. A precautionary approach must be pursued by commercial interests until the scientific understanding of Arctic ecosystems is sufficient to allow fully-informed decision making.**
199. While knowledge of terrestrial ecosystems in the Arctic region is more developed, the capacity for understanding responses to environmental change and human impacts currently has limitations. The Canadian Polar Commission told us that more data regarding the functioning of northern ecosystems was required, including assessments of baseline conditions and understanding of wildlife population sizes, trends, geographic ranges, and the impacts of habitat change. The Commission suggested that existing UK Antarctic knowledge and capacity (discussed in Chapter 6) meant that the British research community would be “well placed to transfer its expertise across the Polar Regions where relevant to assist in addressing environmental gaps in knowledge in the Arctic”.³¹⁰
200. It is clear that the UK could make a positive contribution to developing understanding in this area; the UK has “particular expertise” in polar ecology and ecosystems.³¹¹ The UK research community also has a strong oceanography and marine biology tradition, as well as expertise in terrestrial ecology.³¹² The UK leads in some developing areas of marine research activity—including the use of autonomous instruments to monitor underwater conditions—and can therefore make a contribution in areas where Arctic nations and other partners may not be as strong.³¹³ The Government told us that the UK had contributed to an Arctic Resilience Report currently being undertaken by the Arctic Council to examine the resilience of ecosystems and human communities to change, and to work on ecosystem-based management.³¹⁴ We welcome UK input into this important work.
201. The scientific strengths of the UK in key areas of Arctic research are important and valuable. The challenges and changes facing the region, however, are international in nature. Progress in addressing and understanding the key aspects of Arctic change will, therefore, be dependent in large part upon sustained international co-operation.

309 [Q 270](#) (Dr Ray Leakey). See Chapter 6.

310 Written evidence from Canadian Polar Commission ([ARC0040](#))

311 This is discussed further in Chapter 6.

312 [Q 261](#) (Prof Julian Dowdeswell)

313 [Q 261](#) (Dr Ray Leakey), written evidence from Prof Damon Teagle ([ARC0029](#))

314 Written evidence from the Foreign and Commonwealth Office ([ARC0024](#)). An interim report was published in 2013; the final report is due to be published in May 2016.

202. The importance of collaboration on Arctic science was emphasised throughout our evidence; we also heard that the UK was an active player in many international collaborations on Arctic research, including through the International Arctic Science Committee (IASC).³¹⁵ The IASC seeks to encourage and facilitate co-operation on all aspects of Arctic science, promoting the sharing of knowledge and data across all countries engaged in Arctic research. This activity is delivered through a number of working groups and overseen by a Council made up of delegates from 22 different countries. The UK is represented by the Head of the NERC Arctic Office (see paragraph 359 below).
203. HE Keiichi Hayashi, the Japanese Ambassador to the UK, told us about work that Japan was undertaking to promote international co-operation on these matters:
- “We are concerned with developing an international joint research exchange programme not only with the Arctic countries but with other observer countries such as the UK, by making the most of Japan’s historically accumulated expertise in science—observation and research of the Arctic, as well as advanced technology. Japan will feed back as much as possible on the outcome of initiatives relevant to international fora such as the working groups and task forces of the Arctic Council”.³¹⁶
204. The European Union is able to play an important role in promoting international co-operation on Arctic science. Since May 2012 an EU-funded project has worked to develop a joint EU/Russian facility³¹⁷ to promote the sharing of Arctic research between Russia, Norway and EU member states.³¹⁸ We were told that “EU funding is very good for Arctic work because it allows multinational partners to work together on one project, and it provides quite a lot of funding”.³¹⁹
205. The need to develop and maintain links with Russian scientists was of particular concern to our witnesses.³²⁰ Professor Geoffrey Boulton, speaking on behalf of the Royal Society, told us that in the period immediately following the Cold War, environmental research and monitoring facilities in the Russian Arctic had suffered from substantial degradation. There had been a partial recovery in this capacity, but “enormous” data gaps remained.³²¹ We were told that, in seeking to recover this capacity and to enhance international access to Russian data and research, bilateral relationships would be more effective than large consortia or intergovernmental arrangements.³²²
206. Prof Boulton told us that The Russian Academy of Sciences had recently invited the Royal Society to take part in a bilateral meeting on major Arctic issues.³²³ He suggested that, when considering joint work with Russian scientists, the UK should take a steer from work undertaken by Germany:

315 [QQ 263–5](#) (Prof Jane Francis and Prof Julian Dowdeswell), written evidence from Canadian Polar Commission ([ARC0040](#))

316 [Q 307](#) (HE Keiichi Hayashi)

317 The Nansen International Environmental and Remote Sensing Centre, based in St Petersburg.

318 See the European Commission Community Research and Development Information Service, ‘Uniting EU–Russian polar research’ (14 January 2015): http://cordis.europa.eu/result/rcn/151474_en.html [accessed on 19 February 2015]

319 [Q 265](#) (Prof Jane Francis)

320 [Q 21](#) (Prof Chris Rapley), [QQ 267](#) (Prof Jane Francis and Prof Julian Dowdeswell)

321 [Q 164](#) (Prof Geoffrey Boulton)

322 [Q164](#) (Prof Geoffrey Boulton), written evidence from Dr Dimitriy S. Tulupov ([ARC0009](#))

323 [Q 161](#) (Prof Geoffrey Boulton)

“The Germans have a long history of strong collaboration ... They have a large marine geophysical and oceanographic capacity in the North Atlantic and Norwegian Sea and are thinking about ways in which they can engage with the Russian scientific effort that will not embarrass the Russian position”.³²⁴

207. In 2011 Germany and Russia held a bilateral year of science; a Russian-German Academy of Young Scientists was established as part of this initiative. The Academy has since taken forward a number of joint projects, including a 2012 symposium on Russian-German synergies in the scientific exploration of Northern Eurasia and the Arctic Ocean.³²⁵

208. Newer Arctic Council observer states have also worked to develop bilateral science co-operation with Russia. India and Russia last year agreed a joint statement which declared that:

“India and Russia recognise the importance of the Arctic and the contributions in promoting cooperative activities to address Arctic issues by the Arctic Council ... The sides agreed to facilitate scientific co-operation to study the challenges (like melting ice, climate change, marine life and biodiversity) facing the rapidly-changing Arctic region”.³²⁶

209. **The challenges and changes facing the Arctic are international in nature and there is a strong case for greater international co-operation and communication on Arctic research to be promoted. The UK has existing strengths in collaborative science and research, and should seek to play a role in bringing Arctic scientific communities together. In addition, the Government should support research funders such as the Natural Environment Research Council (NERC) in promoting international collaboration and networking when awarding funding to UK Arctic scientists.**

210. **It is likely that different types of relationship and collaboration will be appropriate for different circumstances. The Government and NERC should examine the role that bilateral relationships could play in enhancing co-operation with Russian researchers and scientists.**

The impact upon Arctic residents

211. The effects of climate change in the Arctic, and related changes to temperatures, weather and ecosystems, will impact upon the estimated four million people who live above the Arctic Circle. Some of these impacts and effects are occurring now; others are projected or predicted for the future.

212. The melting of permafrost, for example, is known to have caused damage to the foundations of properties and other infrastructure, including pipelines and transportation networks.³²⁷ As mentioned in Chapter 2, the period in which ice roads are useable has reduced by almost two months in recent decades, as a result of melting.³²⁸ In March 2010 a state of emergency was

324 [Q 164](#) (Prof Geoffrey Boulton)

325 Nova Acta Leopoldina, *Russian-German Synergies in the Scientific Exploration of Northern Eurasia and the Adjacent Arctic Ocean*, Volume 117, No. 399, (2014)

326 For full statement see Government of India, Press Information Bureau: <http://pib.nic.in/newsite/PrintRelease.aspx?relid=113166> [accessed 23 February 2015]

327 Written evidence from Terry Audla, ITK ([ARC0058](#)), NERC Arctic Office ([ARC0028](#)) and Duncan Depledge ([ARC0011](#))

328 Written evidence from the NERC Arctic Office ([ARC0028](#))

declared in 11 communities in Canada which could not receive supplies due to the melting of ice roads.³²⁹ In addition, as sea ice melts and oceanic turbulence increases, a greater number of communities are exposed to the risk of coastal erosion, with evidence suggesting that the removal of coastal sea ice allows waves to erode shorelines. We were told that:

“The residents, the indigenous peoples, will almost certainly have to retreat from some areas because it will be hugely expensive and quite difficult to protect ... The coastal communities are by and large not rich, so poor people are seeing what infrastructure and property they have threatened”.³³⁰

213. Many Arctic residents earn their living from, or rely for subsistence upon, the natural resources of the region. Changes to ecosystems and biodiversity will therefore have implications for food security and, accordingly, an impact upon the lives of Arctic residents. Food costs in the Arctic are typically considerably higher than those found in southern parts of the Arctic states.
214. The effects of change can sometimes be positive for local people, at least in the short term. WWF told us that Inuit fishermen and hunters in Greenland and northern Canada had welcomed catches that included new species of bigger fish.³³¹ In the longer term, increased investment in the Arctic would bring new employment opportunities for local workers, and new infrastructure.
215. Modifications to weather patterns, however, are already having a negative impact, for example, upon reindeer herders, with freezing rain in winter affecting the ability of reindeer to find food sources.³³² We were told that historically valuable fish stocks are moving northwards, beyond areas in which they were traditionally hunted and caught,³³³ and that hunters who travel over ice had been stranded as patterns of ice coverage changed.³³⁴
216. The process of Arctic change, therefore, will have a direct impact upon the lives of those who live in the region. These residents are not UK citizens; it would be inappropriate for our Committee or the British Government to make direct recommendations regarding the citizens of other sovereign states. The UK has a relationship and dialogue with the indigenous peoples of the Arctic, however, through observer membership of the Arctic Council in which indigenous peoples have a special status as Permanent Participants. We therefore offer the following assessments and recommendations regarding UK interaction with indigenous peoples under the auspices of the Arctic Council.

The indigenous peoples of the Arctic

217. Of the approximately four million current residents of the region, around 500,000 are from indigenous groups, with a long history and cultural heritage in the Arctic. We were pleased to be able to meet with representatives of the

329 AMAP, *Snow, Water, Ice and Permafrost in the Arctic (SWIPA): Climate Change and the Cryosphere* (2011): <http://www.amap.no/documents/download/1448> [accessed 19 February 2015]

330 Q 26 (Prof Chris Rapley)

331 Q 244 (Dr Martin Sommerkorn). It is important to state that WWF also noted that such changes were unpredictable, and that positive short term effects may then give way to negative trends.

332 Written evidence from Prof Terry Callaghan (ARC0030)

333 Q 185 (Nathalie Rey), Q 289 (HE Claus Grube), written evidence from the National Oceanography Centre (ARC0032)

334 Written evidence from Terry Audla, ITK (ARC0058)

Sámi Parliament of Norway, the Inuit Tapiriit Kanatami (ITK)³³⁵ and the Indigenous Peoples' Secretariat of the Arctic Council, in addition to receiving written evidence from the Arctic Athabaskan Council (one of the Arctic Council's Permanent Participants). Their insights have proved particularly important in developing our views on these matters.

218. The diversity of the region is once again significant: different Arctic indigenous communities have their own identities, cultures, languages and traditions, and have different approaches to and perspectives on the changes facing their lands. Some groups, such as the Inuit, have a close relationship with the ice bound and coastal environments. Others, such as the Sámi people of northern Europe, and the Athabaskan peoples of Canada and Alaska, are more concerned with terrestrial and migratory species of wildlife, such as reindeer or caribou.

Figure 12: Demography of indigenous peoples of the Arctic based on linguistic groups



Source: Foreign and Commonwealth Office, 'Adapting to Change: UK policy towards the Arctic' (2013).

219. In addition, the rights and circumstances of Arctic indigenous peoples vary substantially from one state to the next. In Canada, for example, land claims agreements have significantly empowered indigenous communities, giving them control over many of their traditional lands and allowing them

335 A national organisation representing 60,000 Canadian Inuit.

to negotiate directly with business interests, government agencies and other stakeholders who wish to undertake developments in these territories. We were told that Inuit now control more than 50 million hectares of land through five constitutionally protected treaties “stretching from one end of Canada to the other”.³³⁶ Indigenous communities are now one of the largest landowners in Canada.

220. In the Nordic countries, indigenous peoples have been empowered through the creation of Sámi Parliamentary bodies in Norway, Sweden and Finland, giving the Sámi an important right to be consulted on developments that affect them and powers over certain aspects of policy pertaining to their cultural heritage including education.³³⁷ Land settlements have been less common, although the Finnmark Act of 2005 transferred around 46,000 square kilometres of land from the Norwegian state to the Sámi people.
221. We welcome these developments, which were widely praised in the evidence we received. The situation in Russia is, however, less positive; it was reported that the Russian Association of Indigenous Peoples of the North (RAIPON) had been closed down for a period in 2012–13.³³⁸ We were told that, upon reopening, “people from the Government had been put there instead of their chosen representatives”.³³⁹ Former members of RAIPON, and their families, had been subject to surveillance; we were also told that indigenous leaders returning to Russia from meetings abroad had been “arrested on arrival and punished for going out and working on indigenous issues”.³⁴⁰ We would have liked to discuss these developments with official Russian representatives but were unable to do so.
222. **All Arctic states should work to ensure that Permanent Participants are allowed to undertake their work without undue restrictions and limitations. We support the view that Permanent Participants, representing indigenous peoples, should enjoy full and effective involvement in the Arctic Council and in other bodies that affect their lives and interests.**

Representation of indigenous peoples

223. Representatives of six indigenous groups³⁴¹ have the status of Permanent Participants at the Arctic Council. This status, established when the Council was initiated in 1996, gives the groups representation at Ministerial meetings and meetings of the Senior Arctic Officials, and an opportunity to be consulted on decisions taken by the Council. The six Permanent Participants are supported by the Indigenous Peoples’ Secretariat, with a small staff based in Copenhagen.
224. The current Chair of the Senior Arctic Officials, Vincent Rigby, told us that he often referred to the Permanent Participants as “the real connective tissue

336 Written evidence from Terry Audla, ITK ([ARC0058](#))

337 [Q 118](#) (Jon Peter Gintal) and [Q 119](#) (Runar Myrnes Balto)

338 European Human Rights Advocacy Centre, School of Law, University of Middlesex, *Bulletin No. 19* (2013): <http://www.ehrac.org.uk/wp-content/uploads/2014/10/EHRAC-Bulletin-19-ENG.pdf> [accessed 19 February 2015]. See also ‘Moscow orders closure of indigenous peoples organization’, *Barents Observer* (12 November 2012): <http://barentsobserver.com/en/arctic/moscow-orders-closure-indigenous-peoples-organization-12-11> [accessed 19 February 2015]

339 [Q 120](#) (Jon Petter Gintal), [Q 117](#) (Runar Myrnes Balto)

340 [Q 121](#) (Runar Myrnes Balto)

341 The Aleut International Association, Arctic Athabaskan Council, Gwich’in Council, Inuit Circumpolar Council, RAIPON and the Saami Council.

to the work of the Arctic Council and the people on the ground in the north”.³⁴² Mr Rigby went on to explain that, under the Canadian Chairmanship of the Council (2013–2015), the emphasis had very much been upon “development for the people of the north”, and that Permanent Participants and indigenous communities had helped to define that agenda.³⁴³ The UK Government told us that indigenous groups play a “key role” in steering the work of the Arctic Council.³⁴⁴

225. It is apparent, however, that there are a number of practical limitations upon the ability of indigenous representatives to participate fully in the work of the Arctic Council and its task forces and working groups. We received evidence which suggested that the expansion in the number of observer states and organisations had had a limiting effect upon the ability of indigenous peoples to participate. Dr Mazo told us that the expansion of the number of observers risked “diluting the role of the indigenous peoples, who have a unique position on the Arctic Council—a position that they do not have in similar forums for other parts of the world”.³⁴⁵

226. In addition, we heard that the expansion in the sheer volume of work undertaken by the Council and its sub-divisions, and the finite resources possessed by indigenous groups, meant that it was not always possible for representatives to attend meetings. Mr Audla, reflecting on his work with the Inuit Circumpolar Council (ICC), told us that:

“ICC has been active in various working groups and program areas of the Arctic Council ... However, it is fair to say that funding—including the resources of the Indigenous Peoples’ Secretariat—has not kept pace with the increasing attention on the Arctic and the demands of Inuit in Canada and around the circumpolar world to respond. There is an almost overwhelming amount of work going on in the Arctic Council. With our limited resources we struggle to keep up. We don’t currently have the capacity to attend and contribute to working groups and activities as we would like”.³⁴⁶

227. The Indigenous Peoples’ Secretariat suggested that resource limitations, and the expansion of the work of the Arctic Council, had meant that over time there had been a shift from indigenous bodies leading projects and task groups to, instead, participating or attending meetings led by others. Mr Rigby acknowledged the resource limitations of indigenous representatives, stating that:

“If I were going to speak about resources, I would focus more on making sure that Permanent Participants have the tools to do the job than anything else. This has been an issue for a long time in the Arctic Council—that Permanent Participants are not Governments. While we may bemoan the fact that we do not have as many resources as we would like on the Government side, the Permanent Participants are in an even more difficult position”.³⁴⁷

342 [Q 226](#) (Vincent Rigby)

343 *Ibid.*

344 Written evidence from the Foreign and Commonwealth Office ([ARC0024](#))

345 [Q 42](#) (Dr Jeffrey Mazo)

346 Written evidence from Terry Audla, ITK ([ARC0030](#))

347 [Q 231](#) (Vincent Rigby)

228. **Indigenous groups have played an important role in the work of the Arctic Council to date. The recognition and status afforded to the six Permanent Participants within the Council is to be commended.**
229. **It is clear to us, however, that the expansion in the workload of the Council poses challenges to full participation by indigenous representatives. The Arctic Council should make appropriate structural and financial provision to allow full and effective participation by indigenous representatives. We also believe that the UK Government should continue actively to support the right of Permanent Participants to participate effectively within the Arctic Council.**

How could the UK help?

230. Arctic Council observer states may be in a position to offer greater assistance to the Permanent Participants. Representatives of the Sámi Parliament of Norway told us that “observer states can look into different issues that concern indigenous peoples and maybe help them to build up confidence and capacity”.³⁴⁸ The Indigenous Peoples’ Secretariat also suggested that capacity building was important, with funding opportunities and the provision of education, training or scholarships being highlighted as areas where observer states could make a potential contribution. We were told that any UK support for such initiatives would be welcomed.
231. WWF—which also enjoys observer status on the Council—told us about work that it had undertaken to develop a Permanent Participant fund. The proposal is for an engagement fund that would support indigenous representatives to follow up on the responsibilities and opportunities presented at the Arctic Council. WWF stated that they would ask observer nations to contribute to the fund.³⁴⁹
232. The Arctic Athabaskan Council (AAC) described some of the work undertaken on the 2005 Arctic Climate Impact Assessment. In the early stage of this assessment, Permanent Participants approached the FCO Polar Regions Department for assistance in developing their approach and contributions to the Assessment. The FCO was able, through the University of Aberdeen, to provide some support to this enterprise. The AAC told us that this “provides a compelling example of how the UK can be helpful in Arctic matters”.³⁵⁰ This provides a useful precedent for the future development of such collaborative work.
233. There are other areas of the UK’s academic and scientific expertise which may be able to assist indigenous peoples both in their interactions with governments and in adjusting to the effects of Arctic change. Professor Terry Callaghan (University of Sheffield and National Research Tomsk State University, Russia) suggested that the UK’s work on ecosystem services and biodiversity could potentially improve the well-being of local communities, while modelling of changes to vegetation, snow and permafrost and their implications for water resources could forewarn local communities of likely future challenges. Prof Callaghan suggested that the UK’s research base

348 [Q 123](#) (Jon Petter Gintal)

349 [Q 247](#) (Dr Martin Sommerkorn)

350 Written evidence from Arctic Athabaskan Council ([ARC0014](#))

should be encouraged to develop a greater number of activities that were relevant to local communities.³⁵¹

234. Dr Ilan Kelman (University College London and Norwegian Institute of International Affairs) suggested that mechanisms that support the ability of Arctic communities to deal with change should be a future priority topic for research.³⁵² We were also told that the community of social scientists and humanities scholars working on the Arctic in the UK is significant and diverse. Dr Richard Powell (University of Oxford) suggested that a key, distinctive strength of the UK's contribution to Arctic social sciences is the academic, objective assessment of resource developments and their wider socioeconomic and environmental impacts, based on long-standing knowledge and expertise.³⁵³ Professor Mike Bradshaw (Warwick Business School) highlighted expertise in Arctic social sciences at the Scott Polar Research Institute, Cambridge University, and University of Aberdeen, but suggested that co-ordination of these interests was limited.³⁵⁴
235. We were told that Singapore—another Arctic Council observer—had developed a sustained programme of collaborative work with Arctic indigenous peoples, intended to “exchange experiences on how to adapt to change”.³⁵⁵ The High Commissioner of Singapore in the UK, HE Foo Chi Hsia, explained that this activity included customised study visits to Singapore for Permanent Participant representatives, along with full scholarships for short training courses on various aspects of public policy and administration, including public health, education, port management and climate change adaptation. In addition, a postgraduate scholarship for a one-year masters in maritime law at the National University of Singapore was available to Arctic indigenous peoples.³⁵⁶
236. **States with observer status at the Arctic Council should work to build the capacity of indigenous groups participating in the work of the Council. We recommend that the Government consider further how observer states, including the UK, might act to support the work of the Indigenous Peoples' Secretariat. Such support could include the provision of training and scholarships through the UK's academic institutions, and secondments to and from its public bodies.**
237. **The UK is home to world-class climate and social sciences research which could assist and enhance the capacity of Arctic indigenous peoples to respond to changes in their region. The Government, along with research funders such as the Natural Environment Research Council and the Economic and Social Research Council, should consider how this research can be made available and accessible to Arctic indigenous communities, and how this sector in the UK could further benefit from strengthening its relationships with indigenous communities in the Arctic.**

351 Written evidence from Prof Terry Callaghan ([ARC0030](#))

352 Written evidence from Dr Ilan Kelman ([ARC0051](#))

353 Written evidence from Dr Richard Powell ([ARC0053](#))

354 [Q 153](#) (Prof Mike Bradshaw)

355 [Q 306](#) (HE Foo Chi Hsia)

356 *Ibid.*

CHAPTER 5: THE IMPACT OF ARCTIC CHANGES: PRESSURES AND OPPORTUNITIES ARISING FROM INCREASING EXTERNAL ACCESS TO THE ARCTIC

Accessibility

238. As climatic conditions change, and Arctic sea ice reduces, parts of the region that were once considered to be largely inaccessible will begin to open up. Increasing access to the Arctic is likely to bring the opportunity for increased economic development and investment—although not without some countervailing difficulties.
239. The Arctic is home to significant projected hydrocarbon and other mineral resources. More open waterways may bring the potential for greater volumes of transit and destination-based shipping, in addition to increased tourist traffic. Any such economic intensification would have environmental, social, regulatory and political consequences, both positive and negative. While opportunities would arise for Arctic residents and international investors, the struggle to find a balance between economic development and environmental protection was a consistent theme in the evidence that we received.

Attitudes and approaches to Arctic economic development

240. It is important to re-emphasise that the Arctic is not a pristine, untouched wilderness. There is a long history of economic activity, across a range of sectors and throughout the region. Coal has, for example, been mined in Svalbard for many decades; the world's largest apatite mines, on the Kola Peninsula, have been mined since the 1930s and exploration for oil and gas off the shore of Alaska began in the 1970s. Harvesting of natural resources, including industries such as logging in Finland, has long been an important source of income for local communities. Arctic islands and waterways in Alaska and northern Scandinavia also saw substantial military and security activity during World War II and the Cold War.
241. Some of these historic developments have caused environmental damage. Professor Frances Wall of the University of Exeter described the legacy of mining on the Kola Peninsula:

“All efforts went into mining and—you already know the next thing that I am going to say—very little effort went into environmental remediation. There is certainly some environmental damage there that everybody can see. You drive along the road past the smelter at Monchegorsk and there are tens of kilometres of black aureole around the town where acid mine drainage from the smelter has destroyed the forest, which is then destroyed by fires. The first thing to say is that the Arctic is not necessarily pristine”.³⁵⁷

242. The regulations governing economic development of Arctic resources, together with shipping, are defined by each of the eight Arctic states individually, complemented by a number of relevant international agreements (such as the forthcoming Polar Code³⁵⁸) and treaties, including those such as UNCLOS which cover the Arctic Ocean. As such, it is principally for the Arctic states, working where appropriate within the provisions of

357 [Q 145](#) (Prof Frances Wall)

358 See paragraphs 309–18.

international agreements, to determine the approach taken to economic investment, the standards and regulations required of developers and investors and the environmental protections and safeguards that accompany such developments. The exception is the international high seas area of the central Arctic Ocean, which is currently largely ice-covered and inaccessible, and the potential exploitation of the central seabed lying beyond all states' continental shelves.

243. The Arctic Council has set out the importance of balancing any new economic development with the need for environmental protection. The Swedish Ambassador to the UK described the position adopted by the Council at its 2013 Ministerial meeting:

“The real issue is how we manage economic development so that commercial advantage is not gained at the expense of the life of the indigenous people or environmental destruction. This is very much echoed in the Kiruna declaration from 2013, which stresses the importance of the sustainable use of resources and environmental protection and commits to strengthen efforts to diminish the negative effects of climate change on the fragile Arctic environment”.³⁵⁹

244. Greenpeace and WWF, however, felt that the recent track record of the Council in this respect was not entirely positive.³⁶⁰ The formation of the Arctic Economic Council (AEC) in 2014 was viewed as a particular cause for concern, with the WWF worried that the proposed body would be “neither open nor transparent, and accountable to no-one but the large industries expected to cover the costs of the group”.³⁶¹ Greenpeace told us that the formation of the AEC represented a “swing towards economic development” and that it “seems to be more a forum to give business and oil companies a direct link to the senior officials”.³⁶²

245. Vincent Rigby, the current chair of the Senior Arctic Officials, told us that the AEC had been established as an independent body and that businesses had decided on its governance structures and operating procedures. Mr Rigby suggested that debate was ongoing amongst Arctic states as to the relationship between the AEC and the Arctic Council itself.³⁶³ We believe that the need for high standards of transparency and accountability should be emphasised in the ongoing debate concerning this relationship.

246. WWF told us that they were not in favour of fossil fuel developments in the Arctic (or elsewhere in the world) but, in principle, they supported development in the region that sought to integrate environmental protection and management:

“We are definitely not saying no to development. In the wider sense, economic development relates to human development and we would not deny anyone who has the right to develop resources to do so. We do not view several recent developments as necessarily a good idea, but in a wider fashion we are also desperately urging, in the 21st century that we are in, where the world is a connected place and we see the limits of

359 [Q 314](#) (HE Nicola Clase)

360 Written evidence from Greenpeace UK ([ARC0016](#)) and WWF-UK ([ARC0050](#))

361 Written evidence from WWF-UK ([ARC0050](#))

362 [Q 178](#) (Nathalie Rey)

363 [Q 228](#) (Vincent Rigby)

our planet in front of us, that policies on development and ecology come together and become integrated”.³⁶⁴

247. We were told that we should “proceed from the premise that development of Arctic Ocean resources is inevitable”.³⁶⁵ Dr Ilan Kelman argued that the challenge lay in ensuring that changes brought advantages and opportunities for local communities:

“Change in the Arctic is inevitable and few people and communities object to the principle of change. Change can and should bring advantages and opportunities, but it takes effort to ensure that occurs, rather than only disadvantages and difficulties resulting”.³⁶⁶

248. We consistently heard that Arctic residents were not systemically opposed to new industrial and economic developments in their territories, providing that they were properly consulted about such developments, and were able to secure an appropriate degree of benefit from them.³⁶⁷ Safeguards to limit the potential for environmental damage, and to protect ecosystems, were also important.³⁶⁸

249. It was apparent, however, that when companies pursued projects that were not seen to adhere to these principles, problems could ensue. Representatives of the Sámi Parliament of Norway told us that difficulties had been encountered with some mining companies that lacked a positive record of engaging with local people, and that the livelihoods of reindeer herders could be negatively affected by poorly planned development.³⁶⁹

250. Canadian Inuit views were summarised to us as follows:

“There is no one-size-fits-all response to resource development inquiries. It is about striking a balance and making economic development work in tandem with social development—wherein lies the trick of trying to keep that balance so that it is done in an environmentally responsible manner, as well as a socially responsible manner”.³⁷⁰

Striking a balance—a role for the UK?

251. In order to strike this balance, and pursue development in an environmentally responsible manner, a thorough understanding of communities, ecosystems, environmental change, and the environmental effects of development are required. We have already considered, in the previous chapter, the current deficiencies in baseline surveying of some Arctic ecosystems. The UK could play a significant role in improving knowledge in this area.
252. We were told by NERC that UK science funding supports a range of activities that could provide evidence to inform decisions about the potential

364 [Q 243](#) (Dr Martin Sommerkorn)

365 Written evidence from Dr Dimitriy S. Tulupov ([ARC0009](#))

366 Written evidence from Dr Ilan Kelman ([ARC0051](#))

367 Written evidence from Michael Kingston ([ARC0054](#)), Dr Ilan Kelman ([ARC0051](#)), UCL Institute for Risk Management ([ARC0027](#)), Hugh Mackay ([ARC0042](#)), OGP ([ARC0034](#)), [Q 315](#) (HE Nicola Clase, HE Pekka Huhtaniemi and Alan Kessel), [Q 295](#) (Terry Audla)

368 [Q 208](#) (Claude Perras)

369 [Q 123](#) (Runar Myrnes Balto)

370 [Q 295](#) (Terry Audla)

environmental impact of economic development activities.³⁷¹ It is apparent that the UK can make a wider contribution to supporting environmentally sustainable development in the Arctic. The Canadian Polar Commission stressed the challenges involved in operating in the sensitive, remote and cold environment of the Arctic and the consequential need for new scientific and technological approaches to inform the sustainable development and management of commercial opportunities. The Commission suggested that “given the strength of the UK research and technology development community” (see paragraph 276 below) this was an area in which the UK could make “a substantial contribution”.³⁷²

253. The UK has played an important role in helping to deal with Russia’s nuclear legacy from the Soviet Union, particularly that associated with the nuclear submarine fleet in north-west Russia.³⁷³ This work, undertaken in collaboration with states including Norway, provides an example of how the UK can work in partnership with Arctic states to manage and limit environmental risks.
254. In addition, London is a global centre for the finance and insurance sectors. WWF suggested that UK-registered financial institutions could have an important role to play in backing sustainable business development which will be of benefit to the Arctic and its peoples, and in seeking not to support unsustainable activities in the Arctic.³⁷⁴
255. There is a significant history of economic and commercial development in the Arctic. Further development is inevitable, but will need to be balanced and achieved in tandem with actions to limit environmental damage and preserve biodiversity. To achieve that, further advancements in understanding of the environmental and social consequences of change will need to be made at a rate that keeps ahead of development. The UK can play a significant role in developing the scientific knowledge and understanding required to inform policy decisions.
256. In addition, the UK’s research and technology strengths can be used to develop new techniques and approaches for undertaking developments in sensitive climates; its significant financial and insurance sectors also have a role to play in ensuring that only sustainable business developments are pursued in the Arctic.
257. **We urge the Government to consider how the UK’s expertise can be used to maximum advantage in pursuing balanced and responsible economic development in the Arctic.**

Hydrocarbons and resource extraction: opportunities and constraints

Oil and gas

258. Currently, around 10 per cent of global oil production and 25 per cent of gas production takes place in the Arctic; 97 per cent of this oil and gas production

371 Written evidence from the Natural Environment Research Council (NERC) ([ARC0041](#)). Resources include the Extended Ellet Line, which measures ocean properties in the north east Atlantic where waters flow into and out from the Arctic region and MASOX (Monitoring Arctic Seafloor—Ocean Exchange) where NERC and the National Oceanography Centre provide instrumentation for a deep sea sustained observatory to monitor methane outputs.

372 Written evidence from the Canadian Polar Commission ([ARC0040](#))

373 Written evidence from the Ministry of Defence ([ARC0073](#))

374 Written evidence from WWF-UK ([ARC0050](#))

comes from onshore fields in Russia and Alaska (with the clear majority of this in Russia). Overall production of oil and gas in the Arctic has remained relatively stable since the late 1980s.³⁷⁵

259. In 2008 the United States Geological Survey estimated that undiscovered conventional oil and gas north of the Arctic Circle amounted to about 90 billion barrels of oil, 1.67 trillion cubic feet of natural gas and 44 billion barrels of natural gas liquids. The total estimated resources amount to about 30 per cent of the world's undiscovered, recoverable, gas and 13 per cent of its undiscovered, recoverable, oil. Around 84 per cent of the undiscovered resources are expected to be found offshore and under less than 500 metres of water.³⁷⁶
260. This potential for significant hydrocarbon discoveries in the Arctic has led to sustained interest from governments, businesses and the media in recent years, as well as from campaign groups opposed to further extraction in the region. Although rising temperatures and receding sea ice could improve access to energy resources, we received evidence concerning the wider effects of climate change, including thawing permafrost, increased wave and storm action and unpredictable sea ice movements, all of which would hinder construction, extraction and transport to markets.³⁷⁷
261. The Government's 2013 Arctic Policy Framework highlights the importance to the UK economy of natural gas imports from Norway (in 2012, 55 per cent of UK gas imports were from Norway), stating that "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".³⁷⁸
262. British companies active in the Arctic region include BP, which has projects in the US, Canada, Greenland and Norway (in addition to owning 19.75 per cent of the Russian company Rosneft),³⁷⁹ and Shell, which is active in Alaska, Canada and Greenland.³⁸⁰ Cairn Energy, a smaller UK company, drilled a number of exploratory wells off the coast of Greenland between 2008 and 2010, at an estimated cost of over \$1 billion,³⁸¹ but did not find commercially significant amounts of oil.³⁸²
263. There are a number of barriers to future development of Arctic energy resources—particularly those to be found offshore. The average lag for Arctic oil between discovery and going on-stream is more than 13 years, the second longest in the world.³⁸³ The barriers to exploiting energy resources in the Arctic include the distance to markets; supply chains; lack of infrastructure;

375 Le Mière and Mazo, *Arctic Opening: Insecurity and opportunity*, 2013

376 Ibid.

377 Written evidence from Dr Ed Hawkins, Dr Sheldon Bacon, and Prof Chris Rapley (ARC0013), the Geological Society (ARC0031), NERC Arctic Office (ARC0028) and Prof Terry Callaghan (ARC0030)

378 Foreign and Commonwealth Office, *Adapting to Change: UK policy towards the Arctic* (2013)

379 Written evidence from Daniel Kochis (ARC0019)

380 See Shell 'How we operate in the Arctic': <http://www.shell.com/global/future-energy/arctic/shell-in-the-arctic.html> [accessed 19 February 2015]

381 Chatham House and Lloyd's, 'Arctic Opening: Opportunity and Risk in the High North', (2012): <http://www.chathamhouse.org/sites/files/chathamhouse/public/Research/Energy,%20Environment%20and%20Development/0412arctic.pdf> [accessed 19 February 2015]: Cost estimate is up to 2011.

382 Written evidence from Hugh Mackay (ARC0042)

383 See Infield Offshore Arctic Oil & Gas Market Report To 2018: <http://www.infield.com/brochures/offshore-arctic-oil-gas-market-forecast-report.pdf> [accessed 19 February 2015]

seasonal restrictions on operations, due to the presence of sea ice in some oil and gas provinces and extreme weather conditions; onshore transportation difficulties due to surface thawing of roads in summer; high labour costs due to travel distances and conditions and stringent natural environment regulations.

264. The presence of sea ice is a significant complicating factor in undertaking Arctic oil operations. Statoil told us that their approach to the Arctic divided the region into three different zones. The first was the ‘workable Arctic’, in which “hardly any” sea ice was present.³⁸⁴ The next was the ‘stretch Arctic’, where exploration was taking place, but further technological development was required. The third zone was the ‘extreme Arctic’, where ice was present for almost all of the year, and where Statoil, while holding licences, “did not see that we will have any development for the coming many years”.³⁸⁵
265. We were told that the Norwegian government had restricted oil and gas activity in certain parts of the Barents Sea. These restrictions were informed, in part, by the presence of sea ice, with a prohibition on any drilling within 50 kilometres of the sea ice edge.³⁸⁶
266. We received substantial evidence concerning the environmental effects of oil and gas development in the Arctic. Much of this evidence centred on the extent to which oil spilt from offshore projects or from the shipping of oil could be successfully retrieved without causing significant environmental damage. The International Association of Oil and Gas Producers (OGP) highlighted some of the factors that needed to be taken into account when considering prospective energy developments in the Arctic:

“Arctic conditions that must be fully understood include weather, daylight, remoteness, tides, water depths, ice, biological systems and ecosystem services important to local communities and indigenous peoples ... In any territory, oil spill response is challenging and the first priority for OGP members is prevention. Arctic conditions (e.g., ice, cold temperatures, remoteness, darkness) can add to these challenges. However, oil spill response is entirely possible in the Arctic”.³⁸⁷
267. It is important to note that the risk of oil spillage arises not just from exploration or extraction, but also from transportation; the 1989 Exxon Valdez oil tanker spill off the coast of Alaska resulted in 1,300 miles of shoreline contaminated with oil. We detail, in paragraphs 307 and 308, a number of shipping hazards in the Arctic, including poor hydrography and limited GPS capacity, which exacerbate this risk.
268. The eight Arctic states, in 2013, negotiated an agreement on marine oil pollution preparedness and response. This sets out requirements for the monitoring of oil spill incidents, establishes contacts between the Arctic states for communicating the occurrence of spills and introduces provisions for Arctic states to reimburse one another for assistance rendered in the event of a spill. Greenpeace were critical of the agreement, stating that it contained

384 Q 98 (Rúni M Hansen)

385 Q 98 (Rúni M Hansen)

386 Q 81 (Dr Jan-Gunnar Winther)

387 Written evidence from OGP (ARC0034)

“no worthwhile *de minimis* technical standards” and no enforcement mechanisms.³⁸⁸

269. OGP noted that techniques for containing and cleaning up a spill in the Arctic could include the use of booms and skimmers, in-situ burning and chemical dispersants.³⁸⁹ They also detailed the testing of oil spill responses that was being undertaken through their Joint Industry Programme.³⁹⁰

270. Ben Ayliffe of Greenpeace told us that sea ice was the biggest driver of their concerns regarding Arctic oil drilling, explaining that:

“When you consider that there is no known way of cleaning oil that is spilled in ice, we do not think that you should be operating there. The challenge is mechanical recovery: booms and skimmers simply do not work in ice-infested waters; in-situ burning is disrupted by wind and things like that; and we do not know the long-term eco-toxicological impacts of putting chemical dispersants in the Arctic. The colder waters reduce the efficacy of the chemicals themselves. All in all, a spill in the Arctic would be the nightmare scenario”.³⁹¹

271. OGP representatives acknowledged that retrieving every drop of oil from a spill “had proved impossible”³⁹² and that sea ice was a complicating factor. While broken sea ice could act to physically contain a spill, oil trapped under sea ice was “much more of a challenge”.³⁹³ The former UK Chief Coastguard, Rod Johnson, was sceptical of the prospects for recovering spilt oil from ice-affected water:

“Skimming is not possible in ice-covered water because there is literally ice in the way. The oil would go under the ice. In addition, oil is very temperature sensitive. To pump around a cargo of crude oil or oil fuel it needs to be the temperature of a very hot cup of tea to make it flow. Therefore, as soon as you introduce it into cold water under ice it becomes very viscous and difficult to deal with. I have seen incidents of small losses of lighter fractions of oil as a result of grounding in the Northwest Passage and conventional booming technology—in other words, putting an inflatable boom around the ship—has contained the spill. However, we have not seen an incident involving a large-scale loss of a viscous fraction where ice is present, so at the moment that is indeterminate. I certainly would not want to try it”.³⁹⁴

272. There are, therefore, valid concerns regarding the capacity, at present, for recovering substantial amounts of spilt oil from ice-affected waters. This presents a challenge to the development of energy resources in such areas.

273. In addition, Arctic oil resources—for all of the reasons highlighted above—are at the more expensive end of the cost spectrum. Dr Mazo explained why, in his view, the prospects for immediate Arctic oil development were limited:

388 Written evidence from Greenpeace UK ([ARC0016](#))

389 Written evidence from OGP ([ARC0034](#))

390 [Q 196](#) (Dr John Campbell)

391 [Q 175](#) (Ben Ayliffe)

392 [Q 197](#) (Dr John Campbell)

393 *Ibid.*

394 [Q 221](#) (Rod Johnson)

“One of the reasons why we do not see hydrocarbon extraction in the Arctic as likely to have a greater relative share of the global energy market is that it is one of the most expensive options. It is certainly the most expensive oil and gas at the moment, more expensive than conventional oil and gas and in some cases more so than some of the unconventional sources”.³⁹⁵

274. A more immediate challenge to Arctic energy extraction, therefore, is presented by current world oil prices. Analysis suggests that developments in the Barents Sea, such as OMV Group’s Arctic Wisting discovery, require prices of around \$110 a barrel in order to break even.³⁹⁶ With oil prices falling to \$50 a barrel in January 2015,³⁹⁷ the development of Arctic resources may not be viable in the current economic climate. In late 2014 Statoil handed back three of its four Greenland offshore oil and gas exploration licences.³⁹⁸

275. While OGP were of the view that Arctic resources may ultimately be required to meet projected demand over the next 30 to 50 years³⁹⁹, Professor Mike Bradshaw from Warwick Business School felt that the need to “book reserves” might sustain energy company interest in the Arctic, without substantive development of such reserves actually taking place.⁴⁰⁰ Charlie Kronick of Greenpeace offered a broadly similar assessment:

“There never was a high likelihood of extraction any time soon. We would certainly argue, and we have heard from many people in the capital markets, that the exploration, certainly in Alaska but to a certain extent in Russia and Norway as well, is about reserve replacement. I am sure you well know that oil companies are valued largely in the capital markets by their reserve replacement ratios. The question I would ask is are these genuine plays for production or are they about reserve replacement”.⁴⁰¹

276. The UK has an excellent science, technology and research base supporting oil, gas and mineral exploration and extraction, as well as a thriving and respected industry (particularly in Scotland) which has much to offer in terms of expertise and leadership to any burgeoning hydrocarbons industry in the Arctic.⁴⁰² We were told that UK companies—large and small—had substantial experience of developing technologies and approaches for working in harsh environmental conditions, and for responding to oil spills.⁴⁰³ The UK is, therefore, in a position to make a contribution to enhancing the understanding of operating in Arctic conditions, and developing the approaches and technologies required to undertake operations safely.

277. Given the relatively high costs of hydrocarbon extraction in the Arctic, and current low global energy prices, there may be limited potential

395 Q 40 (Dr Jeffrey Mazo)

396 Rystad Energy, cited by Reuters: <http://www.reuters.com/article/2014/10/28/oil-europe-investment-idUSL4N0SM3Y420141028> [accessed 19 February 2015]

397 See ‘Oil prices fall to fresh lows’, *Wall Street Journal*, 12 January 2015: <http://www.wsj.com/articles/brent-crude-falls-below-50-in-asian-trading-1421039495> [accessed 19 February 2015]

398 See ‘RPT-Statoil hands back three Greenland exploration licences’, *Reuters* (14 January 2015): <http://www.reuters.com/article/2015/01/14/statoil-greenland-idUSL6N0UT33R20150114> [accessed 19 February 2015]

399 Q 190 (Dr Michael Engell-Jensen)

400 Q 156 (Prof Mike Bradshaw)

401 Q 174 (Charlie Kronick)

402 Written evidence from The Geological Society (ARC0031)

403 Written evidence from Dr Dougal Goodman (ARC0022) and Dr Dimitriy S. Tulupov (ARC0009)

for new Arctic oil and gas production in the short to medium term. This may offer a window of opportunity for taking stock and gaining increased clarity on whether oil and gas extraction in ice-affected Arctic waters can be achieved safely and responsibly and, if so, how.

278. **Maximum advantage needs to be taken of this ‘breathing space’ to establish whether it is possible to reach a point where it is categorically clear that the risks of a major spill are acceptably low and that the damage caused by a major spill could be contained. This should also provide an opportunity to improve wider understanding of the impacts of oil spills in ice-affected waters and to consider whether any international standards on where drilling can be undertaken in relation to ice can be agreed.**
279. **The UK has significant technological and research expertise in oil spill responses, and operations in harsh environments; the Government should work, with UK Trade & Investment, research funders and others, to ensure that the UK is in a position to make a strong contribution to this work.**

Mining and minerals

280. Non-petroleum minerals, such as nickel, gold, zinc, lead and rare earths are also to be found in the Arctic. Arctic sources of these minerals are significant to both global supplies and investors and the economies of the countries concerned. We were told, for example, that 20 per cent of Swedish tax revenue comes from iron ore mining in Kiruna.⁴⁰⁴ In 2010, 36.8 per cent of Alaska’s foreign export earnings came from exports of zinc, gold, lead and copper, generating \$1.3 billion.⁴⁰⁵ In Canada, mining accounts for around half of the income of the Northwest Territories.⁴⁰⁶
281. The Arctic region—particularly in Russia and Scandinavia—has important platinum metal deposits, valuable for technology such as fuel cells and catalytic converters. In addition, it is estimated that 25 per cent of the world’s future supply of rare earth minerals might be found near Kvanefjeld in Greenland.⁴⁰⁷ Rare earth elements are a group of 17 chemically related elements for which there has been increasing demand in recent decades for a range of uses, from electronic displays and ICT equipment through to glass polishing.
282. A number of UK companies are active in Arctic mining operations—either as the principal operators of mines, or as junior project partners.⁴⁰⁸ Anglo American operate a significant diamond mine at Snap Lake in the Canadian Northwest Territories and have also undertaken work, since 2004, to develop a copper-nickel-platinum group mine in Sakatti, in northern Finland.⁴⁰⁹ Smaller UK companies active in the Arctic include Beowulf Mining, who are involved in the development of iron ore resources in northern Sweden.⁴¹⁰

404 [Q 146](#) (Prof Frances Wall)

405 Chatham House and Lloyd’s, *Arctic Opening: Opportunity and Risk in the High North* (2012): <http://www.chathamhouse.org/sites/files/chathamhouse/public/Research/Energy%2C%20Environment%20and%20Development/0412arctic.pdf> [accessed 19 February 2015]

406 *Ibid.*

407 [Q 146](#) (Dr Richard Powell)

408 Written evidence from Prof Frances Wall ([ARC0056](#))

409 See Anglo American, *Anglo American and Sakatti project*: <http://finland.angloamerican.com/~media/Files/A/Anglo-American-Finland/documents/anglo-american-sakatti-project.pdf> [accessed 19 February 2015]

410 See Beowulf Mining homepage: <http://www.beowulfmining.net> [accessed 19 February 2015]

283. The scale of investment required to establish a new mining operation in the Arctic should not be underestimated. The Baffinland iron ore mine in Canada, which commenced production last year, required the construction of a new port, new roads, an airstrip, and the development of accommodation for a substantial number of migrant workers. The up-front investment required for the project was in the region of \$6 billion.⁴¹¹
284. In addition, we were told that the effects of climate change may make mining in the Arctic more difficult. Professor Frances Wall from the University of Exeter explained that mining companies “have to deal with having less time in which they can drive over the ice roads ... those roads will be open for shorter periods of time. Increased precipitation is likely to be an effect of climate change so they will have to deal with more snow and that can give them slope stability problems and so on.”⁴¹²
285. As detailed previously, historical mining in the Arctic has left a negative environmental legacy. We were assured that modern standards of operation and environmental management were much more stringent. Whilst regulatory regimes vary from one jurisdiction to another, it is usually the case that mining companies are required to undertake extensive environmental assessments and social licensing agreements before progressing with new projects.⁴¹³ In addition, a closure plan is typically produced and approved before operations commence, setting out how the environmental legacy of mining operations will be managed.⁴¹⁴ Richard Morgan of Anglo American explained how and why standards had changed over time:
- “I think that standards have got progressively more demanding, whether that is coming from the Governments *per se* ... or from our own self-governance. Obviously from a reputational point of view you need to be seen to have covered every potential risk as well as you can, because if you have a reputation for having not done something well in a sensitive environment, you are not likely to get permission to do it again somewhere else. It is a mixture of greater scrutiny and greater standards. I think there are shared standards across international bodies now, under which everyone knows what you are referring to when you say, ‘Yes, we will meet that standard or this standard’. There is greater expectation”.⁴¹⁵
286. Social licensing—securing the consent and participation of local communities for mining operations—is also important. Mining operations in the Arctic can be a particularly important source of employment for indigenous peoples and local populations. Mr Morgan told us that 60 per cent of the workforce at the Hudson Bay mine operated by Anglo American came from the Cree community.⁴¹⁶ We were told that an Impact Benefit Agreement was usually negotiated, in which targets for local employment and training were agreed by the developer and local authorities, along with a timescale for the replacement of expatriate labour by local people.⁴¹⁷

411 See Baffinland Iron Mines Corporation, *Baffinland Iron Mines Mary River Project* (27 September 2011): http://www.baffinchamber.ca/sites/default/files/Baffinland_Tom_Paddon.pdf [accessed 19 February 2015]

412 Q 154 (Prof Frances Wall)

413 Written evidence from London Mining (ARC0046)

414 Q 145 (Prof Frances Wall) and Q 209 (Claude Perras)

415 Q 209 (Richard Morgan)

416 Q 210 (Richard Morgan)

417 Q 210 (Claude Perras)

287. Mining industry representatives suggested that it is sometimes more straightforward for large companies to deliver against these enhanced requirements than it is for smaller companies, because of their capabilities and experience.⁴¹⁸
288. UK companies are active in Arctic mining operations, and receive some support from UK Trade & Investment (UKTI—see paragraph 439 below). We were told that “there is no reason why UK companies should be anything other than world leaders in responsible mining practices”.⁴¹⁹
289. **To protect Arctic species, indigenous livelihoods and tourism, as well as to ensure that the UK remains a respected partner in Arctic operations, UK companies engaged in mining operations in the Arctic—at all levels of operation—should pursue the highest possible environmental standards of operation and remediation. They should engage proactively and effectively with local residents when developing their operations, and source as much of their labour as possible from local communities, investing in training and capacity building. We recommend that the Government encourage such high standards, and promote this sustainable approach to UK businesses in all future UKTI activities.**

Increasing maritime access

The potential for new shipping routes

290. At present, most Arctic shipping is around the periphery of the Arctic Ocean and is primarily for re-supplying communities in the Arctic, marine tourism or moving natural resources out of the Arctic. This is usually known as destination-based shipping. The 2009 Arctic Marine Shipping Assessment reported that there were around 6,000 vessels active in the Arctic.⁴²⁰
291. As sea ice continues to melt, two shipping routes for transiting all the way through the Arctic Ocean may become increasingly commercially viable. These are the various waterways located along the Canadian Arctic coast known as the Northwest Passage, and the Northern Sea Route along the Russian Arctic coast.⁴²¹ While it is possible to traverse the Northern Sea Route (NSR) and the Northwest Passage at present, access is inconsistent, and is restricted to summer months due to the presence of sea ice.
292. As sea ice melts these routes may become more accessible. Estimates suggest that shipping routes between Asia and Europe through the Arctic could be up to 30 per cent shorter than routes via the Suez Canal. The journey from Yokohama to Rotterdam, for instance, would be cut from 11,212 nautical miles to 7,825,⁴²² theoretically bringing substantial reductions to fuel costs and associated emissions. There has been significant media interest in this

418 **Q 209** (Richard Morgan, Claude Perras)

419 Written evidence from Prof Frances Wall (**ARC0056**)

420 Arctic Council, *Arctic Marine Shipping Assessment*, (2009). See: <http://www.pame.is/index.php/projects/arctic-marine-shipping/amsa> [accessed 19 February 2015]

421 A third potential route, travelling directly over the North Pole, has been identified, but we received no evidence to suggest that this would become viable in the foreseeable future.

422 Written evidence from Lloyd's Register (**ARC0048**)

prospect, even comparing the NSR to a new ‘Great Silk Road’ between Europe and Asia.⁴²³

293. There are limitations, however. We were told that both the NSR and Northwest Passage would have shallower draft restrictions than the Suez Canal and the Panama Canal (once new locks are inaugurated on the latter).⁴²⁴ Licence fees are also applied on some parts of the NSR⁴²⁵, as are regulatory requirements to inform the Russian authorities some 15 working days in advance of any NSR transit.⁴²⁶ In addition, the average cost for icebreaker escort through the NSR is \$200,000.⁴²⁷ All of these factors limit the potential advantages.
294. However, recent years have, on balance, seen an increase in the number of ships traversing the NSR. The overall volume of ships involved, though, is small and there was a steep fall in usage in 2014, when sea ice conditions were not as favourable as in preceding years.

Table 1: Transits of the Northern Sea Route, 2010–2014

2010	4
2011	41
2012	46
2013	71
2014	31

Sources: Northern Sea Route Information Office and Arctic Bulk AG⁴²⁸

295. Lord Fairfax of Cameron, a member of the board of Russian shipping company SovComFlot, explained the potential benefits of the NSR, telling us that “the distance saving is massive. When we did our first shipment, we might have saved as much as 50 per cent in mileage, and therefore you have saved fuel and emissions”.⁴²⁹ He went on to explain that there were, however, considerable challenges, including the need to invest substantially in the shipping hardware required for traversing Arctic routes.⁴³⁰ These limitations were also set out by Dr Dougal Goodman (Foundation for Science and Technology):

“Although the Northern Sea Route offers advantages of shorter voyage distances from Europe to south east Asia or vice versa, not many ship operators are taking advantage of the option probably because the ice conditions can be very variable from year to year, the high cost of fees to transit the route, the few places of refuge if a mechanical problem develops and water depth limits along parts of the route”.⁴³¹

423 See The Jamestown Foundation, ‘Moscow Sees Northern Sea Route Vitiating Great Silk Road’: http://www.jamestown.org/single/?tx_ttnews%5Btt_news%5D=41822&no_cache=1 [accessed 19 February 2015]

424 Written evidence from Lloyd’s Register (ARC0048)

425 Written evidence from Dr Dougal Goodman (ARC0022)

426 See Northern Sea Route Information Office: http://www.arctic-lio.com/nsr_howtogetpermit [accessed 19 February 2015]

427 Lloyd’s and Chatham House, *Arctic Opening: Opportunity and Risk in the High North* (2012)

428 See Arctic Bulk, NSR Transits: http://www.arcticbulk.com/page/241/NSR_Transits [accessed 19 February 2015]

429 Q 132 (Lord Fairfax of Cameron)

430 *Ibid.*

431 Written evidence from Dr Dougal Goodman (ARC0022)

296. Tom Paterson, Senior Vice-President, Ship Owning, Arctic and Projects for Fednav, concluded that:

“With the ice being so unpredictable ... you cannot possibly plan your voyage. The most important thing to understand is that the newspaper clips we see of Chinese vessels going from China to New York via the Northwest Passage or through the Northern Sea Route to Europe are not going to happen. I would not use the word ‘probably’; it is not going to happen because it does not make money”.⁴³²

297. While the potential for trans-Arctic container shipping may be limited at present, the prospects may differ for destination-based shipping. We were told that this traffic was likely to increase.⁴³³ This was attributed, in part, to a potential increase in wider economic activity in the Arctic, and the need to move resources and products in and out of the region.⁴³⁴

The growth in Arctic tourism

298. The Arctic is an increasingly popular destination for tourists, attracted by the unique and changing environment of the region. The number of tourist passengers staying overnight at Longyearbyen in Svalbard grew from under 10,000 in 2000 to almost 60,000 in 2012.⁴³⁵ Dr Goodman told us that:

“Adventure tourism has grown rapidly and represents an important income stream for settlements that can be easily accessed by sea in the summer by tour ships. Longyearbyen ... and Nuuk in Greenland are popular destinations”.⁴³⁶

299. As a result of this increased interest, cruise and tourist traffic in the region has increased substantially in recent years with, for example, the number of cruise ships stopping at ports in Greenland doubling between 2003 and 2008.⁴³⁷ We heard that these cruise trips included significant numbers of British tourists.⁴³⁸ In 2003 an Association of Arctic Expedition Cruise Operators was set up to establish best practice for small cruise operators, principally in the Norwegian Arctic.

300. In August 2010 the MV *Clipper Adventurer* cruise ship, carrying 128 passengers and 69 crew, ran aground in the Canadian Arctic. The Canadian coastguard took two days to reach the vessel.⁴³⁹ We heard that, currently, rescue capability in the Arctic is insufficient for the number of passengers carried on typical cruise ships.⁴⁴⁰ Lloyd’s Register told us that recent media coverage had highlighted the prospect of larger cruise ships (with 1,000 or more passengers) operating closer to ice or attempting sailings through the Northwest Passage.⁴⁴¹

432 Q 132 (Tom Paterson)

433 Q 134 (Tom Paterson, Lord Fairfax of Cameron)

434 Q 134 (Lord Fairfax of Cameron)

435 Foreign and Commonwealth Office, *Adapting to Change: UK policy towards the Arctic* (2013)

436 Written evidence from Dr Dougal Goodman (ARC0022)

437 Written evidence from Lloyd’s Register (ARC0048)

438 Q 12 (Jane Rumble)

439 See Transportation Safety Board of Canada, ‘Marine Investigation Report M10H0006’: <http://www.tsb.gc.ca/eng/rapports-reports/marine/2010/m10h0006/m10h0006.asp> [accessed 19 February 2015]

440 Written evidence from Prof Terry V. Callaghan (ARC0030)

441 Written evidence from Lloyd’s Register (ARC0048)

Risks and challenges associated with a growth in shipping

301. Growing destination-based shipping and cruise traffic in the Arctic could pose a number of environmental and safety challenges. We heard that environmental concerns centred upon the use and carriage of heavy grade fuel oil,⁴⁴² airborne emissions from vessels (including black carbon) and the discharge of ballast water from ships.⁴⁴³
302. Black carbon was identified as a particular threat throughout the evidence we received.⁴⁴⁴ In particular, the potential for black carbon to contaminate Arctic snow cover, reducing its reflectivity and leading to increased surface heat absorption, was highlighted as a significant environmental concern.⁴⁴⁵
303. Ballast water in ships is known to transport non-native species from one ocean to another, with the potential to endanger native species through competition for resources. The Ballast Water Convention was agreed by the International Maritime Organisation in 2005, but has not yet entered into force.
304. The use of heavy grade fuel oil has been prohibited in the Antarctic since 2011, with cargo ships and passenger vessels required to switch to lower density fuel when transiting in Antarctic waters. There is, currently, no general prohibition in the use of such fuels in Arctic seas, although restrictions were introduced in the waters around Svalbard at the beginning of 2015.
305. There are, additionally, a number of safety and security concerns regarding Arctic shipping. Many parts of the Arctic are remote, and infrastructure to support disaster recovery and search and rescue can be lacking. In addition, the harsh environmental conditions including the presence of sea ice, prolonged darkness and low temperatures introduce additional demands for vessels operating in the region. Dr Goodman summarised the safety concerns that needed to be addressed in planning Arctic shipping operations:

“A cruise ship operator intending to visit Ilulissat ... in Greenland knows that tourists would like to go there to see the icebergs calving into the bay but has to decide whether the design of the ship can cope with sea ice in the bay, a collision with an iceberg ... and whether the charts are sufficiently accurate to avoid grounding. The operator also has to judge whether the remote location, limited search and rescue support and lack of ocean going tug capacity, port of refuge and supply facilities are too great a risk for vessel operation”.⁴⁴⁶
306. Of particular concern is the extent to which Arctic waterways have been accurately and appropriately charted. Manson Oceanographic Consultancy suggested that there was “a dire shortage” of up-to-date, accurate charts for the Arctic region and that “the gathering of such information will be costly and time-consuming”.⁴⁴⁷

442 Written evidence from Greenpeace UK ([ARC0016](#)) and WWF-UK ([ARC0050](#))

443 Written evidence from the National Oceanography Centre ([ARC0032](#)) and WWF-UK ([ARC0050](#))

444 This evidence principally concerned emissions from ships; it is, however, also important to note that aviation can be another cause of black carbon emissions.

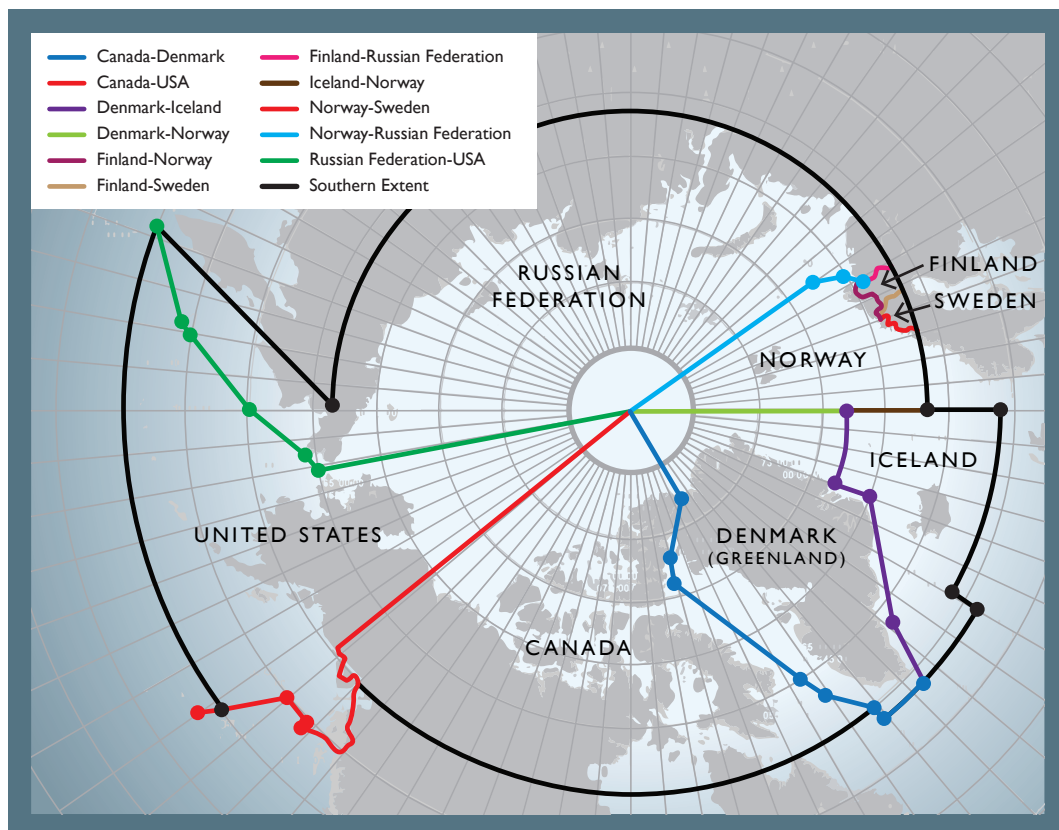
445 Written evidence from the UCL Institute for Risk and Disaster Reduction ([ARC0027](#)), and the National Centre for Atmospheric Science ([ARC0021](#))

446 Written evidence from Dr Dougal Goodman ([ARC0022](#))

447 Written evidence from Manson Oceanographic Consultancy ([ARC0005](#))

307. The UK's National Hydrographer, Rear Admiral Tom Karsten, explained that currently accessible charts were of variable quality and relied on relatively old data, while other parts of the Arctic were not particularly well charted at all. The technical standards applied in producing some current charts were also lacking; we were told that depth anomalies may exist, as well as horizontal inaccuracies with, for example, "the point of a rock being as much as 500 metres or half a mile out of position".⁴⁴⁸
308. In addition, communications infrastructure can also be limited by Arctic conditions. The accuracy of GPS systems becomes limited in high northern latitudes,⁴⁴⁹ and satellite systems can also be disturbed due to the effects of the ionosphere and the sun.⁴⁵⁰ We were told that "Polar navigation is not for the inexperienced; it is an art form".⁴⁵¹
309. The Arctic Council member states, in 2011, signed an agreement on search and rescue in the region.⁴⁵² The agreement delimits the area of search and rescue (SAR) responsibility of each state party.

Figure 13: Illustrative search and rescue zones



Source: Adapted from Arctic Portal, 'Arctic Search and Rescue Agreement': <http://www.arcticportal.org/features/751-arctic-search-and-rescue-agreement>.

310. While this treaty is a welcome development, we heard concerns that a fundamental lack of SAR infrastructure throughout the Arctic would continue to be an issue.⁴⁵³ Rod Johnson, former Chief Coastguard, told us

448 Q 217 (Rr Admiral Tom Karsten). See also Q 272 (Prof Julian Dowdeswell)

449 Q 71 (Colin Manson), Q 220 (Rod Johnson)

450 Q 220 (Rod Johnson)

451 *Ibid.*

452 Formally entitled 'Agreement on Co-operation on Aeronautical and Maritime Search and Rescue in the Arctic'.

453 Written evidence from Greenpeace UK (ARC0016)

that any major SAR operation in the Arctic would need to be an international operation:

“The Arctic Council’s search and rescue agreement was ratified last year and has been [artificially] tested twice. I have looked at the output report from the last exercise in 2013, which was SAREX Greenland Sea. It was very interesting. It has identified that any SAR operation up there would of necessity be an international effort. No one nation has enough resources to do the sort of operation you were contemplating for a large number of tourists”.⁴⁵⁴

Managing the risks

311. A range of international conventions currently apply to shipping throughout the world, including the Arctic. These include SOLAS⁴⁵⁵ and MARPOL⁴⁵⁶, negotiated and agreed under the auspices of the London-based International Maritime Organisation (IMO), a UN body. Agreement was recently reached on new mandatory standards for polar shipping, known as the Polar Code.
312. The IMO told us that the main goal of the Polar Code⁴⁵⁷ is “to provide for safe ship operation and the protection of the polar environment by addressing risks present in polar waters and not adequately mitigated by other IMO instruments”.⁴⁵⁸ The Code will be made mandatory through amendments to the existing SOLAS and MARPOL regulations.
313. The Code has two parts, dealing separately with safety measures and pollution prevention measures. The safety measures of the Code were adopted in November 2014; the pollution prevention measures are expected to be adopted in May 2015.⁴⁵⁹ Provisions within the Code will only apply to passenger and cargo ships above a certain size;⁴⁶⁰ there is anticipation that a future ‘second phase’ of Polar Code development will extend provisions to other ships, including fishing vessels. Enforcement will be undertaken by flag states where the ships are registered, or on their behalf by recognised organisations such as classification societies.⁴⁶¹ We were told that the Polar Code should be entering into force on or around 1 January 2017.⁴⁶²
314. Progress towards agreement and adoption of the Code is to be welcomed. We were told that the Code would introduce additional restrictions concerning the discharge of waste products in ice-affected waters.⁴⁶³ The safety elements of the Code set out three different categories⁴⁶⁴ of ship which may operate in polar waters. Ships intending to operate in these waters must apply for a Polar Ship Certificate, defining which of the three categories the vessel belongs to. These requirements were welcomed in the evidence that we received.⁴⁶⁵

454 [Q 215](#) (Rod Johnson)

455 International Convention for the Safety of Life at Sea, 1974 as modified by the 1988 SOLAS Protocol

456 International Convention for the Prevention of Pollution from Ships, 1973/1978

457 Formally entitled ‘The International Code for Ships Operating in Polar Waters’.

458 Written evidence from the International Maritime Organisation ([ARC0066](#))

459 *Ibid.*

460 All passenger ships and all cargo ships over 500 gross tonnes that are engaged on international voyages.

461 [Q 141](#) (Rob Hindley)

462 Written evidence from Lloyd’s Register ([ARC0048](#))

463 Written evidence from Manson Oceanographic Consultancy ([ARC0005](#))

464 Categories are defined according to the presence and amount of ice in the waters that the ship intends to navigate.

465 Written evidence from Michael Kingston ([ARC0070](#))

315. Concerns were expressed, however, regarding the extent of the environmental provisions of the Code. Greenpeace noted that:

“Whilst the Polar Code will phase in a ban on all discharges of oil and oil mixture, it will still allow ships to carry and use the most dangerous and polluting type of oil (heavy fuel oil) when transiting through the fragile Arctic environment”.⁴⁶⁶

316. WWF were of the view that, despite clear original intentions to develop a comprehensive Code addressing all aspects of shipping safety and environmental protection, the environmental protection provisions of the Polar Code had slipped. They suggested that the Government “should champion robust environmental protection measures in Phase Two of the Polar Code”.⁴⁶⁷

317. Lloyd’s Register, however, told us that “the Polar Code text is now complete”.⁴⁶⁸ The Marine Environment Protection Committee of the IMO, in the report of its 67th meeting,⁴⁶⁹ noted the concerns expressed regarding environmental provisions but concluded that any measures to further modify the Code would need to be initiated as a new programme of work:

“The Committee noted the concerns expressed and stressed that any future amendments to the Polar Code to introduce additional or new environment-related requirements would need the approval of the Committee as a new output, in accordance with the Committees’ guidelines”.⁴⁷⁰

318. The UK is the host country of the IMO, and is a major centre for the shipping insurance and finance markets. In addition, the UK is home to certifying authorities, including Lloyd’s Register, who provide a classification service to independently review designs and an inspection service to operators intending to supply ships or other offshore facilities in the Arctic region. The UK can, therefore, play a role in ensuring that future Arctic shipping operates in a safe and environmentally sensitive manner and in full conformity with the Polar Code once it enters into force.

319. **Concerns have been expressed regarding the adequacy of the environmental provisions contained within the Polar Code. Black carbon, heavy fuel oils and discharged ballast water all pose a threat to the Arctic environment and ecosystems; these threats should be addressed as the regulatory regime concerning Arctic shipping continues to evolve. In any future discussions regarding the development or expansion of the Polar Code all Government departments should promote actively the inclusion of additional robust environmental measures.**

320. **Full and rigorous implementation of the Polar Code is vital. The UK is home to a range of maritime regulation and standards interests, including the IMO, insurance and finance providers and classification societies, which will make an important contribution.**

466 Written evidence from Greenpeace UK ([ARC0016](#))

467 Written evidence from WWF-UK ([ARC0050](#))

468 Written evidence from Lloyd’s Register ([ARC0048](#))

469 Held in October 2014.

470 International Maritime Organisation, *Report of the Marine Environment Protection Committee on its sixty-seventh session*, October 2014

We urge the Government, and all relevant UK interests, to pursue full implementation of the Code as a matter of urgency and, also, to consider ways in which its implementation could be monitored.

321. **In view of the rapid rise of tourism in the Arctic and particularly the prospect of large passenger ships sailing in Arctic waters, there is an urgent need to develop co-ordinated search and rescue facilities in the region. This is an immense task but it is a necessary one. While we recognise that work is being done on this, we emphasise that those involved must not wait for a major incident before developing a comprehensive strategy towards Arctic search and rescue.**
322. We heard that Denmark would value a contribution of resources from the UK to Arctic search and rescue efforts, and that Iceland wanted the UK to make a stronger contribution in this area, as the UK “has great capacity and experience to contribute to that work.”⁴⁷¹ The UK has contributed its expertise in recent years through training officers from Finland, Iceland and Canada and participating in fora such as the North Atlantic Coast Guards Forum.⁴⁷²
323. **The UK has a recognised expertise in search and rescue and the Government should give urgent attention to developing a pan-Arctic search and rescue strategy along with the Arctic states.**
324. **We believe that consideration should be given to whether the Arctic maritime tourism industry should be required to make a contribution to strengthening search and rescue in the region.**

Fishing in the Arctic

325. The previous chapter referred to the movements in fish stocks that have been seen as some marine species respond to climate change. Should commercially valuable fish stocks move further north, in response to warming temperatures and changing oceanic conditions, it is likely that the fishing industry will pursue them; we were told that there was evidence to suggest that this was already happening.⁴⁷³
326. In many parts of the oceans, Regional Fisheries Management Organisations (RFMOs) have been established between coastal and fishing states in order to manage fisheries in international waters.⁴⁷⁴ Whilst some RFMOs (such as the North East Atlantic Fisheries Commission, or NEAFC) extend to waters adjoining the Arctic, there is as yet no such body covering the international high seas that lie in the central Arctic Ocean.⁴⁷⁵ The European Union supports an extension of NEAFC into the Arctic, but both Russia and Norway are opposed to this proposal.⁴⁷⁶

471 [Q 290](#) (HE Claus Grube), [Q 279](#) (HE Thórdur Aegir Óskarsson)

472 [Q 216](#) (Rod Johnson)

473 [Q 185](#) (Nathalie Rey)

474 Established under the auspices of UNCLOS, as well as the UN Code of Conduct for Responsible Fisheries and the United Nations Agreement on the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, both of which were established in 1995.

475 The Convention for the Protection of the Marine Environment of the North East Atlantic (commonly known as OSPAR) covers a triangular area extending up to the North Pole from the North Atlantic. Programmes and measures relating to fisheries management cannot, however, be adopted under the Convention.

476 [Q 256](#) (Matthew King)

327. There is, therefore, no current legal provision to prevent the over-fishing of fish stocks in the central Arctic Ocean, if or when fishing there becomes possible and profitable. Professor Robin Churchill from the University of Dundee told us:

“As for fishing, within 200 miles⁴⁷⁷ that would be regulated by coastal states, but if in several decades the central Arctic [Ocean] becomes ice-free and open to fish—and, indeed, if there are fish there—there is still no regime beyond the general obligations of the Law of the Sea Convention to co-operate. The general view is that some sort of regime ought to be developed fairly quickly in a precautionary way to prevent the same kind of destruction of high-seas fisheries as has happened elsewhere”.⁴⁷⁸

328. The lack of knowledge of Arctic marine ecosystems is particularly important here. The 2013 Arctic Biodiversity Assessment designated 63 marine fish species as ‘Arctic’. Due to a lack of data, 95 per cent of these species have yet to be evaluated for threat status according to IUCN criteria.⁴⁷⁹ Greenpeace highlighted the vital role that fish play in Arctic marine food chains, along with the current lack of data, stating that the “scientific uncertainty of what is happening there means that we need to take a very cautious approach to expanding the fisheries”.⁴⁸⁰

329. Greenpeace have proposed a moratorium on fishing in the central Arctic Ocean, as part of their wider proposal for an Arctic sanctuary.⁴⁸¹ The United States and Canada have already introduced fishing moratoria and limitations in waters lying off their northern coastlines in the Beaufort Sea.⁴⁸²

330. The FCO Polar Regions Department was of the view that a future international agreement concerning fisheries in the high seas area of the central Arctic Ocean would be required.⁴⁸³ Jane Rumble explained the UK approach:

“Our general view is that, where the science suggests that it would be useful and there is a scientific basis for it, protection should be given. The science for the Arctic is not yet there, so we very much support the idea that there should be more science activity. I think that we would be sympathetic towards a moratorium, but we have yet to see the exact detail, which we understand the five Arctic [coastal] states are working up between themselves”.⁴⁸⁴

331. Ambassadors from Arctic states acknowledged that discussions between the five littoral states were ongoing on this matter⁴⁸⁵; Iceland had also sought to join these discussions, but had thus far been unable to do so.⁴⁸⁶ Given that these discussions concern international waters, it is essential that all nations and regional organisations with a legitimate interest (such as the EU) are

477 200 nautical miles of the coast or, in other words, within the Exclusive Economic Zone of the coastal state.

478 Q 53 (Prof Robin Churchill)

479 Conservation of Arctic Flora and Fauna Working Group, *Arctic Biodiversity Assessment*, (2013). See: <http://www.arcticbiodiversity.is/the-report/synthesis/suggested-conservation-and-research-priorities>. ‘IUCN’ is the International Union for Conservation of Nature.

480 Q 185 (Nathalie Rey)

481 Written evidence from Greenpeace UK (ARC0016)

482 Q 185 (Nathalie Rey)

483 Q 330 (Jane Rumble)

484 *Ibid.*

485 Q 289 (HE Claus Grube), Q 282 (HE Thórdur Aegir Óskarsson)

486 Q 282 (HE Thórdur Aegir Óskarsson)

allowed to play an active role in developing regulatory solutions to avert a ‘tragedy of the commons’ situation. We were told that the UK Government had “made those representations to the Arctic littorals” and that the Arctic littoral states “well understand that they could not control this area on their own. The idea is that they want to show leadership”.⁴⁸⁷

332. **The central Arctic Ocean is, under the provisions of UNCLOS, designated as international waters and the discussion of future ways to sustainably manage fish stocks in this area is, therefore, an international issue. We recommend that the Government seeks to promote and to play an active role in such discussions. The Government should push for real international consultation and progress on this issue well before any fishing begins. That consultation should include nearby RFMOs, which might have a part to play.**
333. **Given the current lack of understanding of Arctic marine ecosystems and their responses to climate change, we recommend that a moratorium on fishing in the high seas area of the Arctic Ocean is required, at least until a recognised management regime for the area is agreed. We recommend that the UK Government should pursue a precautionary approach in any negotiations on this matter. The Government should advocate for any future management regime to be based upon sound and responsive science. We also recommend that any future Arctic fisheries management organisation, once established, should be granted observer status on the Arctic Council.**

The potential for long-term surprises, shocks and change

334. The Arctic is part of many global networks and an increasingly global economy. The prospects for development of many of the resources described in this chapter, including hydrocarbons, minerals and the potential for transit shipping, depend in part upon situations and changes elsewhere in the world. Dr Mazo, commenting upon the prospects for Arctic shipping, told us:

“In the timeframe that we are looking at, whether the Arctic is a better alternative than the Cape, for example, even though that would be much further, depends on a huge range of economic variables, the most important of which is the cost of fuel. In a scenario where the Middle East goes down and the cost of fuel rises significantly, that saving in the Arctic will be significant”.⁴⁸⁸

335. Likewise, we were told that a proposal to develop an iron ore mine in Greenland would not, under the current global pricing climate for iron ore, be viable, but that this would change if alternate supplies of ore from elsewhere in the world were restricted.⁴⁸⁹ It is important to stress, therefore, that the potential for development of Arctic resources and routes may change if the availability of resources and routes elsewhere in the globe is restricted or enhanced. Geopolitical instability elsewhere in the world may also impact upon the degree to which the Arctic is viewed by external investors as an attractive space for further business and industry development.
336. **The commercial opportunities that could arise in the Arctic are significant. However, the volatility of global markets for resources,**

487 [Q 330](#) (Jane Rumble)

488 [Q 40](#) (Dr Jeffrey Mazo)

489 [Q 204](#) (Claude Perras)

and the changing degree to which resource sources and shipping routes in other parts of the world compete with opportunities in the Arctic, suggest there will be long-term uncertainty about the extent to which Arctic potentials will be realised. At the same time, the local effects of climate change may help economic development in the Arctic, but they may also hinder it. There is therefore no straightforward correlation between climate change and the creation of real economic opportunities in the Arctic.

337. These uncertainties reinforce the need for the UK to be fully engaged with the region, so that it can maximise any opportunities that arise, and also be vigilant about potential challenges and risks.
338. These uncertainties also, however, provide one particularly important opportunity: for international knowledge and understanding of the vulnerable Arctic environment to get ahead of further substantial human interventions. Any substantial interventions must be informed by that knowledge, so that any harm they might cause can be judged and minimised.
339. As international engagement with the Arctic intensifies, the Government should work to ensure that the UK, as a near Arctic state, takes a leading role in this work.

CHAPTER 6: THE UK AND THE ARCTIC

The UK as a near-Arctic state

340. The UK is the northernmost country which does not cross the Arctic Circle—the Arctic’s nearest neighbour.⁴⁹⁰ It is part of many Arctic-related international bodies and hosts an array of scientific, academic, legal, financial and commercial hubs of expertise on issues regarding the Polar Regions. The International Maritime Organisation and OSPAR Commission, for example, are headquartered in London.
341. In Government, the UK’s Arctic interests are co-ordinated by the Polar Regions Department (PRD) in the Foreign and Commonwealth Office. The PRD chairs a cross-Whitehall Arctic network which usually meets twice a year and involves representatives of departments and agencies including the Department of Energy and Climate Change, Department for Environment, Food and Rural Affairs, the Department for Business, Innovation and Skills (BIS), the Ministry of Defence (MoD), the Department for Transport, the Maritime and Coastguard Agency and the Natural Environment Research Council’s Arctic Office.⁴⁹¹
342. In October 2013, the Government published its Arctic ‘Policy Framework’, *Adapting To Change: UK policy towards the Arctic*, to detail the country’s Arctic interests while reinforcing the UK’s support for Arctic governance arrangements and recognising the sovereign jurisdiction of the Arctic states. It set out how the UK works with those eight states and the wider international community, as well as the expertise the UK can offer relating to the challenges facing the region.⁴⁹² Its publication was spurred by “the new and increased enthusiasm from other [Arctic Council] state observers” (see Chapter 3 above) leading the Government to feel that it needed “to be much clearer about what the UK’s interests are.”⁴⁹³
343. Jane Rumble, head of the PRD, told us that each of the Arctic states had welcomed the Policy Framework and that they had received particularly positive feedback from some of the states, including Norway and Denmark, which we heard reflected by representatives of those countries.⁴⁹⁴
344. The Framework was welcomed by a number of our witnesses;⁴⁹⁵ Dr Dmitriy Tulupov of St. Petersburg State University found the Government’s approach to the Arctic “balanced and well-thought” and believed the vision outlined in the Framework sent “a positive signal to other stakeholder countries.”⁴⁹⁶ The Arctic Athabaskan Council was “impressed with the UK Policy toward the Arctic” and added that it greatly valued the country’s commitment to research in the Arctic and “its track record as a constructive observer in the Arctic Council”.⁴⁹⁷

490 [Q 1](#), [Q 319](#) (Jane Rumble), written evidence from Luke Coffey ([ARC0017](#)), Daniel Kochis ([ARC0019](#)), Foreign and Commonwealth Office, *Adapting To Change: UK policy towards the Arctic* (2013)

491 [Q 10](#) (Henry Burgess), written evidence from the NERC Arctic Office ([ARC0028](#)), Duncan Depledge ([ARC0011](#))

492 [Q 4](#), [Q 319](#) (Jane Rumble), Foreign and Commonwealth Office, *Adapting To Change: UK policy towards the Arctic* (2013)

493 [Q 1](#), [Q 4](#), [Q 319](#) (Jane Rumble)

494 [Q 2](#) (Jane Rumble), [Q 280](#) (HE Else Berit Eikeland), [Q 287](#) (HE Claus Grube)

495 Written evidence from WWF-UK ([ARC0050](#)), [Q 249](#) (Rod Downie), written evidence from the Arctic Advisory Group ([ARC0060](#)), and Dr Dougal Goodman ([ARC0022](#))

496 Written evidence from Dr Dmitriy S. Tulupov ([ARC0009](#))

497 Written evidence from Arctic Athabaskan Council ([ARC0014](#))

345. The UK's contribution to Arctic issues, particularly through its participation in the Arctic Council's working groups, was praised by the Canadian Deputy High Commissioner, the Chair of the Council's Senior Arctic Officials, and Norway's Polar Ambassador, who said that Norway wanted to work even more closely with the UK on the Arctic.⁴⁹⁸

Stepping up the UK's Arctic engagement

346. The UK works for the global public interest when it works to support Arctic biodiversity, to preserve the Arctic's vulnerable environment, to reduce the impact of warming and melting in the Arctic on the global climate and world sea levels, and to uphold the human rights of Arctic indigenous peoples.⁴⁹⁹ Arctic engagement is also strongly in the UK's self-interest for a number of compelling reasons.⁵⁰⁰
347. First, the Arctic is strategically important for the UK. The Arctic is the UK's neighbourhood, and the UK has a large stake in good governance, stability and healthy co-operation in this region which is both geographically proximate and significant for access to the north Atlantic.⁵⁰¹ The UK does not want to find itself disconnected from the fast-paced and wide-ranging changes occurring in its own neighbourhood—it needs to be part of that co-operation and governance. As Mr Coffey told us, “With the Arctic becoming increasingly important for economic and geo-political reasons, now is not the time for the UK to turn away from its own backyard.”⁵⁰²
348. Second, as touched on in Chapter 5, the Arctic has the potential to bring increasing benefits to the British economy.⁵⁰³ As Daniel Kochis of The Heritage Foundation told us, “changes to global shipping, as well as the tourism, fishing, mining, and oil and natural gas industries should make the Arctic an important part of future planning for the UK economy”.⁵⁰⁴ The UK has established strengths in shipping, maritime financial services and insurance, mining and the oil and gas industry, and some large British companies are already active in the Arctic region.⁵⁰⁵ Expanding human activity in the Arctic will depend on and drive technological development, which could create further opportunities for British national research centres, universities and businesses.⁵⁰⁶ Some of our witnesses also highlighted the importance to the British economy of energy supply security, and the levels of energy currently imported from Norway.⁵⁰⁷

498 [Q 317](#) (Alan Kessel), [Q 233](#) (Vincent Rigby), [Q 274](#), [Q 280](#) (HE Else Berit Eikeland)

499 See [Q 1](#) (Jane Rumble)

500 [Q 1](#) (Jane Rumble)

501 Written evidence from Luke Coffey ([ARC0017](#)), Daniel Kochis ([ARC0019](#)), [Q 1](#) (Jane Rumble)

502 Written evidence from Luke Coffey ([ARC0017](#))

503 [Q 1](#) (Jane Rumble)

504 Written evidence from Daniel Kochis ([ARC0019](#))

505 Written evidence from Stratton Park Associates ([ARC0025](#)), [Q 319](#) (Jane Rumble), written evidence from Daniel Kochis ([ARC0019](#)), see also written evidence from Duncan Depledge ([ARC0011](#)). Examples include BP, Shell and Anglo American.

506 Written evidence from Duncan Depledge ([ARC0011](#))

507 [Q 201](#) (Dr Michael Engell-Jensen), written evidence from Daniel Kochis ([ARC0019](#)), [Q 1](#), [Q 319](#) (Jane Rumble), written evidence from OGP ([ARC0034](#)), the Geological Society ([ARC0031](#)), Duncan Depledge ([ARC0011](#))

Box 4: Trading links between the UK and the Arctic Council member states

Economic relationships between the UK and the Arctic states are already important. Half of the member states of the Arctic Council—the United States, Russia, Canada and Sweden—are also top 20 trading partners for the UK.⁵⁰⁸ Exports to Sweden were worth £5.6 billion in 2013; in the same year, exports to Russia were worth £5.2 billion and exports to Canada were worth £4.5 billion.⁵⁰⁹

Norway supplies 30 per cent of UK energy in total,⁵¹⁰ and 55 per cent of UK gas imports.⁵¹¹ Bilateral trade between the UK and Norway is worth £18 billion per annum.⁵¹²

The UK is the 9th largest importer to Finland: UK imports to Finland totalled £1.75 billion in 2013.⁵¹³ The UK is the largest supplier of imported services to Iceland, and the 10th largest total supplier of imported goods for Iceland.⁵¹⁴

349. Third, the Arctic is increasingly being understood as having a direct effect on the UK through its impact on the British climate and weather.⁵¹⁵ We were told that “changes in oceanic, atmospheric and cryospheric conditions in the Arctic may lead to further repeats of the very cold winters experienced in 2009 and 2010” and winter flooding of 2013–14, while extreme weather events may be becoming increasingly likely and lasting longer, all with associated costs.⁵¹⁶
350. The Arctic is also directly linked to the UK through the UK’s sharing of Arctic migratory species, and also waters—just five miles west of the Shetland Islands and 500 metres down lies a freezing cold body of Arctic water, we heard, “so the Arctic is part of our territorial waters”.⁵¹⁷ Finally, the UK is connected to the Arctic through the presence of British citizens on cruise ships and other boats (such as trawlers) in the region.⁵¹⁸
351. **The breadth of the UK’s interests in the Arctic demonstrates the importance of this region to the UK. While we commend the work that the Polar Regions Department has done to date to articulate and pursue the UK’s Arctic interests, the speed of change in the region**

508 Written evidence from Daniel Kochis (ARC0019)

509 HMRC, Summary of import and export trade with EU and non-EU countries: <https://www.uktradeinfo.com/Statistics/Pages/Annual-Tables.aspx> [accessed 19 February 2015]. Figures have been adjusted for rounding.

510 Joint statement by the Prime Ministers of Norway and the UK, January 2011: <https://www.gov.uk/government/news/norway-and-the-united-kingdom-a-bilateral-and-global-partnership> [accessed 19 February 2015]

511 Foreign and Commonwealth Office, *Adapting To change: UK policy towards the Arctic* (2013)

512 Joint statement by the Prime Ministers of Norway and the UK, January 2011: <https://www.gov.uk/government/news/norway-and-the-united-kingdom-a-bilateral-and-global-partnership> [accessed 19 February 2015]

513 Written evidence from Daniel Kochis (ARC0019)

514 *Ibid.*

515 Q 269 (Prof Jane Francis), Q 83 (Dr Nalân Koç)

516 Written evidence from Duncan Depledge (ARC0011) and WWF-UK (ARC0050), Q 83 (Dr Nalân Koç) Q 269 (Jane Francis). See paragraph 70.

517 Q 20 (Dr Sheldon Bacon), written evidence from the Joint Nature Conservation Committee (ARC0059), NERC (ARC0041), National Oceanography Centre (ARC0032)

518 Q 1, Q 12 (Jane Rumble)

and the emerging opportunities and challenges mean that British engagement with the region now needs to intensify.

352. **British policies towards the Arctic have to date been more reactive than proactive. The UK's approach needs to be more strategic, better co-ordinated, and more self-confident and proactive, or the UK risks being outmanoeuvred by other states with less experience in the Arctic but a more positive and forward-looking engagement.**
353. **By dint of its combination of Arctic proximity, history, skills, knowledge and research, its competitive advantage in applicable business sectors, and its own international standing, the UK should be positioned as the premier partner for Arctic states and other interests in Arctic co-operation: the Government should adopt this as its ambition in Arctic affairs.**

How, when and where should the UK be prepared to step up in Arctic affairs?

354. The diversity of the UK's interests in the Arctic is matched by the diversity of its connections with the Arctic, all of which present opportunities for improving the UK's standing in Arctic affairs. The UK can best engage with the region through a number of different routes.

Science and technology

Engaging with the Arctic region through British science and technology

355. The UK's established expertise in Arctic science and technology is important for improving British understanding of processes that are likely to affect and raise opportunities for this country, as well as for gaining insight into Arctic changes with local and global impacts.⁵¹⁹ It is also crucial to its standing in the Arctic community, and earns the country influence in Arctic affairs.⁵²⁰
356. Scientific research is widely seen as the UK's biggest contribution to Arctic co-operation, and as valued by the Arctic states.⁵²¹ The British Antarctic Survey argued that the UK's status as a non-Arctic nation meant that its science is "well positioned to provide unbiased advice particularly on issues of stewardship", while "UK skills and knowledge about accessing remote and hostile environments to address globally important scientific questions, as well as UK experience in managing multi-national scientific collaborations, means the UK science community could provide strong support to influence Arctic affairs."⁵²² Professor Terry Callaghan also saw a role for the UK in advising on the "Stewardship of the Arctic environment", and playing the part of "honest broker".⁵²³

519 See [Q 269](#) (Prof Jane Francis). Prof Boulton said, "My view—I think the [Royal] Society's view—very much is that there is a big opportunity here for us to engage in a fundamental way in an area of the earth that is changing probably more rapidly than any other and is going to suffer from very important human intervention" ([Q 164](#)).

520 See written evidence from Dr Aki Tonami ([ARC0008](#))

521 Written evidence from Prof Andy Shepherd ([ARC0045](#)), [Q 13](#) (Jane Rumble), [Q 269](#) (Prof Julian Dowdeswell)

522 Written evidence from BAS ([ARC0018](#))

523 Written evidence from Prof Terry V. Callaghan ([ARC0030](#))

The UK's current contribution to Arctic science and technology

357. The UK is a leader in an extensive range of Arctic science areas.⁵²⁴ The UK has a strong science base and a strong reputation in Arctic science among the international community, placing the UK “in the forefront in setting the science agenda in the Arctic in groups such as the International Arctic Science Committee”.⁵²⁵ Dr Mazo told us the UK “punches well above its weight” as it is “by far the greatest producer outside the Arctic states of scientific research that deals with the Arctic” in terms of both output and the percentage of its research budget.⁵²⁶
358. UK Arctic research is particularly impactful: we heard from Professor Andy Shepherd that nine per cent of all published scientific papers on the Arctic included a UK organisation, rising to 18 per cent in the last decade, while the UK contributes approximately four per cent of global expenditure on research and development, “So the relative impact of UK research is disproportionately high”.⁵²⁷ He added that “the UK makes scientific contributions in all elements of the Arctic climate system, including the ocean, sea ice, land ice, the atmosphere, and the terrestrial and marine ecosystems.”⁵²⁸
359. A “large and active” community of Arctic researchers in the UK is funded by the Natural Environment Research Council (NERC). Since 2009 NERC has funded an Arctic Office to co-ordinate UK research and logistics in the Arctic region, support the British Arctic research community, raise the profile of the UK in the Arctic region, advise Government departments (including the FCO) and build international co-operative links.⁵²⁹ The Arctic Office is hosted by the British Antarctic Survey, which is the country’s leading polar science body.
360. NERC also funds an Arctic Research Programme managed by the British Antarctic Survey (which is increasing its work in the Arctic) with support from the Arctic Office. This programme, worth £15 million over 2010–15, aims to consolidate and enhance research capabilities, address scientific uncertainties, and improve the capability to predict changes in the Arctic.⁵³⁰ Professor Jane Francis, Director of the British Antarctic Survey, told us that she hoped something longer-term could be established to follow this

524 Q 27, written evidence from Dr Ed Hawkins, Dr Sheldon Bacon and Prof Chris Rapley (ARC0013)

525 Q 261 (Prof Julian Dowdeswell). See also written evidence from Prof Terry V. Callaghan (ARC0030), Q 263 (Prof Julian Dowdeswell), written evidence from the Geological Society (ARC0031), the Royal Society (ARC0047), NERC Arctic Office (ARC0028), Q 13 (Jane Rumble), Q 27 (Dr Sheldon Bacon). The Arctic Office represents the UK on international Arctic science co-ordination bodies including the International Arctic Science Committee (IASC) Council, the Forum of Arctic Research Operators and SAON (Sustaining Arctic Observing Networks), and is a permanent observer to the European Polar Board. The Office told us that it has organised a significant UK presence in all the IASC scientific working groups and supported UK involvement in more focussed Arctic co-ordination bodies such as the International Science Initiative in the Russian Arctic, as well as supporting the UK Polar Network and the international Association of Polar Early Career Scientists (written evidence from the NERC Arctic Office (ARC0028)).

526 Q 49 (Dr Jeffrey Mazo)

527 Written evidence from Prof Andy Shepherd (ARC0045). Jane Rumble told us, “A Danish report quite recently put the UK as having the third largest share of articles on the Arctic and also a high citation index” (Q 13).

528 Written evidence from Prof Andy Shepherd (ARC0045)

529 Written evidence from NERC (ARC0041), the Royal Society (ARC0047), NERC Arctic Office (ARC0028)

530 Written evidence from NERC (ARC0041), the Geological Society (ARC0031), the Royal Society (ARC0047), the National Oceanography Centre (ARC0032), Q 263 (Prof Jane Francis). The NERC Arctic Research Programme funding has been supplemented by additional, associated projects funded by NERC, the US Office of Naval Research, and the Department of Energy and Climate Change.

Programme, the programme management for which is due to expire in March 2016.⁵³¹

361. The UK is making major contributions to understanding the cryosphere and biosphere, we were told, and is “strong in research on physical (energy exchange), biological (greenhouse gas emissions) and cryospheric (glacier decline) processes that lead to globally important issues such as sea level rise and amplified warming”.⁵³² UK science is a world leader on climate modelling, sea ice prediction, Greenlandic ice sheet evolution and atmospheric sciences.⁵³³
362. UK centres of excellence include the Met Office,⁵³⁴ the Scottish Association for Marine Science (SAMS), the NERC National Oceanography Centre, the NERC Centre for Polar Observation and Modelling,⁵³⁵ the NERC National Centre for Atmospheric Science (NCAS), the British Antarctic Survey, the Scott Polar Research Institute, CASP (Cambridge Arctic Shelf Programme), University College London and the Universities of Oxford, Reading, Bristol and Leeds.⁵³⁶ The National Centre for Atmospheric Science told us that “The UK (through NCAS, NERC and the Met Office) is a world-leader in monitoring the Arctic, interpreting the observed changes, and developing sea-ice and Arctic forecasting.”⁵³⁷ The British Antarctic Survey has led an international EU-funded programme on the contribution of glaciers (including Arctic glaciers) to future sea-level rise and is leading another such programme on sea-ice change in the Arctic and its physical, social and economic impacts.⁵³⁸
363. British science is also particularly strong on ecology, polar ecosystems and biodiversity research, and devotes significant resources to monitoring Arctic birds that winter in this country.⁵³⁹ According to NERC, the UK “plays a key role in world-wide environmental and oceanographic monitoring and assessment.”⁵⁴⁰ In terms of technology, we were advised that the UK leads in marine observation through autonomous systems and sensors, while Professor Chris Rapley from University College London stressed the British contribution to the development of the European Space Agency’s Earth-observing satellites including the UK-led ‘CryoSat’ programme which

531 [Q 263](#) (Prof Jane Francis)

532 Written evidence from Prof Terry V. Callaghan ([ARC0030](#)). See also written evidence from the National Oceanography Centre ([ARC0032](#))

533 Written evidence from the Met Office ([ARC0044](#)), Alan Gadian ([ARC0036](#)), [Q 27](#) (Dr Ed Hawkins), written evidence from Dr Ed Hawkins, Dr Sheldon Bacon, and Prof Chris Rapley ([ARC0013](#)), the National Centre for Atmospheric Science ([ARC0021](#)) and Prof Andy Shepherd ([ARC0045](#)), [Q 261](#) (Prof Jane Francis)

534 We heard that the Met Office runs “one of the foremost global operational weather forecasting systems” and “has one of the best Arctic ice models” (written evidence from the World Meteorological Office’s (WMO’s) Polar Prediction Project ([ARC0026](#)), [Q 13](#) (Jane Rumble). See also written evidence from Prof Andy Shepherd ([ARC0045](#)).

535 This Centre “provides world-leading expertise in observing and modelling Arctic sea and land ice” (written evidence from Prof Andy Shepherd ([ARC0045](#))).

536 Written evidence from Dr Ed Hawkins, Dr Sheldon Bacon, and Prof Chris Rapley ([ARC0013](#)). See also written evidence from the WMO’s Polar Prediction Project ([ARC0026](#)).

537 Written evidence from the National Centre for Atmospheric Science ([ARC0021](#)), Prof Andy Shepherd ([ARC0045](#)). See also written evidence from NERC ([ARC0041](#)), National Oceanography Centre ([ARC0032](#)), [Q 272](#), [Q 261](#) (Prof Julian Dowdeswell)

538 ‘Ice2sea’ and ‘ICE-ARC’: written evidence from the British Antarctic Survey (BAS) ([ARC0018](#))

539 [Q 270](#) (Dr Ray Leakey), [Q 261](#) (Prof Julian Dowdeswell), written evidence from the Joint Nature Conservation Committee ([ARC0059](#))

540 Written evidence from NERC ([ARC0041](#))

monitors polar ice.⁵⁴¹ Expertise in polar oceanography, bathymetry, marine geology and the geophysics of the Arctic was also highlighted.⁵⁴² British technology providers are also recognised as world leading in a range of areas relevant to the Arctic, from the oil and gas industry to the establishment of a data storage hub in Arctic Sweden.⁵⁴³

364. NERC has infrastructural capabilities in polar ocean observations including a strengthened research vessel which is deployed in the sub-Arctic region during the Antarctic summer, and Autonomous Underwater Vehicles which can be deployed under ice.⁵⁴⁴ Investments have also been made into sustained observation programmes in the North East Atlantic and Svalbard.⁵⁴⁵ The British Antarctic Survey has used its aircraft to investigate cloud formation in the Arctic, while the Arctic Office supports a NERC-funded UK Arctic Research Station at Ny-Ålesund in Svalbard which costs around £150k per year.⁵⁴⁶
365. The Government is also investing around £200 million in a new polar research ship with ice-breaking capacity ready for 2019.⁵⁴⁷ However, the Geological Society's understanding was that the new ship was intended to replace two in Antarctica, resulting in a significant overall reduction in research capacity with possible impacts on ship days in the Arctic.⁵⁴⁸ BAS noted that when BAS ships and aircraft are used outside the Antarctic, BAS must recover the costs of deploying these platforms in science support roles and on commercial charters in order to meet Government budgetary requirements.⁵⁴⁹

UK Arctic science: the need for strategic drive and co-ordination

366. We heard that in spite of its high quality there is a lack of strategic drive and co-ordination in UK Arctic science. The Arctic Office recognised that “there has been relatively limited co-ordination and prioritisation” of UK researchers’ “essentially bottom-up driven work” as there has been no overarching and ongoing Arctic science strategy.⁵⁵⁰ The projects funded by the 2010–15 Arctic Research Programme represented the best of UK Arctic expertise, rather than being driven by strategic aims; Prof Francis noted that “Some effort will be made to co-ordinate results”.⁵⁵¹
367. At present, because researchers can reach the Arctic without the logistical support needed to reach Antarctica, there is no UK Arctic agency with a co-ordinating role equivalent to that of the British Antarctic Survey for

541 Written evidence from Prof Damon A.H. Teagle (ARC0029), Q 261 (Dr Ray Leakey), Q 27 (Prof Chris Rapley), Q 13 (Jane Rumble), written evidence from Prof Andy Shepherd (ARC0045)

542 Q 261 (Prof Julian Dowdeswell), written evidence from the Geological Society (ARC0031)

543 David Crouch, ‘UK firm takes the cloud to chillier climes with Swedish data centre’, *The Guardian*, (22 October 2014): <http://www.theguardian.com/technology/2014/oct/22/cloud-storage-data-centre-sweden-arctic-hydro66> [accessed 19 February 2015]

544 Written evidence from NERC (ARC0041), the National Oceanography Centre (ARC0032), Q 27 (Prof Chris Rapley), written evidence from the Geological Society (ARC0031), the British Antarctic Survey (BAS) (ARC0018) and the NERC Arctic Office (ARC0028)

545 Written evidence from NERC (ARC0041)

546 Written evidence from the British Antarctic Survey (BAS) (ARC0018), NERC (ARC0041), Q 27 (Prof Chris Rapley), the Geological Society (ARC0031), NERC Arctic Office (ARC0028)

547 Written evidence from NERC (ARC0041), the Geological Society (ARC0031), and Prof Andy Shepherd (ARC0045)

548 Written evidence from the Geological Society (ARC0031)

549 Written evidence from the NERC Arctic Office (ARC0028), BAS (ARC0018), and Duncan Depledge (ARC0011)

550 Written evidence from the NERC Arctic Office (ARC0028), see Q 263 (Prof Jane Francis)

551 Q 263 (Prof Jane Francis)

Antarctic science.⁵⁵² Prof Francis told us that about 400 or 500 scientists in the UK working on the Arctic (across at least 60 institutions) had been identified: “We just about know who they are now through meetings that we have organised.”⁵⁵³ UK scientists attending Arctic Council meetings are not expected to report to the FCO or other co-ordinating bodies.⁵⁵⁴

368. Prof Shepherd told us that he “would be surprised if the Government were able to use UK scientific expertise on the Arctic effectively, as it is widely distributed among many organisations, and there is no obvious activity overseeing the combined effort”.⁵⁵⁵ He argued in favour of establishing a scientific body “to appraise and perhaps co-ordinate” British Arctic research.⁵⁵⁶ The Arctic Office saw the need for a “strategic plan for growing a more co-ordinated on-going Arctic science presence” in order for the UK to contribute effectively to sustained Arctic observational studies.⁵⁵⁷
369. An integrated research programme on the Arctic, including socio-economic issues and involving industry partners, was recommended by Prof Wall as a successor to the expiring Arctic Research Programme; international law, geopolitics, indigenous affairs and governance might also be usefully included, as UK social scientists have also made contributions directly and indirectly to the work of the Arctic Council working groups.⁵⁵⁸
370. The UK Arctic and Antarctic Partnership, established in 2014 and consisting of representatives from academia and institutes with polar interests (including social scientists), is intended to “bring together the Arctic community to be a little more influential and a bit more coherent, with a proper strategy for Arctic science.”⁵⁵⁹
371. UK Antarctic science is better co-ordinated.⁵⁶⁰ The Government recently published *UK Science in Antarctica 2014–2020*, which outlines the UK’s high-level ‘direction’ for Antarctic science and aims to foster UK and international partnerships.⁵⁶¹ The Director of the Norwegian Polar Institute, Dr Jan-Gunnar Winther, told us that his Institute has a technical and strategic advisory role to the Norwegian government, including the Ministry of Foreign Affairs, and had given advice on where oil drilling should be allowed to take place in relation to sea ice.⁵⁶² When we asked Prof Francis whether any UK Arctic body had a similar role, she replied: “The British Antarctic Survey is now extending its remit ... we are officially broadening out and extending our work into the Arctic”; BAS stated that its commitment to scientific and operational excellence helped it sustain a leading position for the UK in Antarctic affairs, and that it would “welcome the opportunity to provide

552 [Q 262](#) (Prof Jane Francis)

553 [Q 262](#) (Prof Jane Francis), [Q 262](#) (Dr Ray Leakey)

554 [Q 321](#) (Jane Rumble)

555 Written evidence from Prof Andy Shepherd ([ARC0045](#))

556 Written evidence from Prof Andy Shepherd ([ARC0045](#))

557 Written evidence from the NERC Arctic Office ([ARC0028](#))

558 Written evidence from Prof Frances Wall ([ARC0056](#)). UK social scientists have made contributions directly through participating in the work of Arctic Council groups and indirectly through producing peer-reviewed research cited in Arctic Council working group assessments and reports.

559 [Q 262](#) (Prof Jane Francis). See also written evidence from NERC ([ARC0041](#)) and the NERC Arctic Office ([ARC0028](#)), [Q 268](#) (Prof Julian Dowdeswell).

560 See written evidence from the NERC Arctic Office ([ARC0028](#)).

561 HM Government, *UK Science in Antarctica 2014–2020*: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/341645/bis-14-979-uk-science-in-antarctica-2014-to-2020.pdf [accessed 19 February 2015]

562 [Q 81](#) (Dr Jan-Gunnar Winther)

similar support to the UK in the Arctic.”⁵⁶³ Prof Francis also confirmed that “We do not as yet have an Arctic strategy, but we are developing one.”⁵⁶⁴

372. Dr Winther told us that the UK would gain from increasing its scientific work in the Arctic, arguing, “You are an observer to the Arctic Council, you are located where you are located and you are affected by climate change in the Arctic region”, as well as having well-recognised science institutions and a strong record of collaboration: “It makes sense to have increased activity in the north.”⁵⁶⁵
373. In its framework for Antarctic science, the Government proclaims that Antarctic research “leads to new insight and discovery about our world, ensures an active and influential Antarctic regional presence for the UK, and is critical for informing and involving Government, civil society and business.”⁵⁶⁶ Much the same could be said for Arctic research and the role of UK Arctic science therein.

UK Arctic science: representation and funding

374. The UK’s Arctic science strengths may be considerable, but we heard that the UK should make better use of them in international fora.⁵⁶⁷ Iceland saw science work as one of the key areas for the UK to strengthen in its Arctic co-operation, saying that “UK representatives have been attending the scientific working group to some extent but not very visibly.”⁵⁶⁸ The UK’s representation on Arctic Council working groups was described as “Fairly sparse”, “at best patchy” and “very local”.⁵⁶⁹
375. Ambassador Eikeland told us that “that there is a wish for the UK to participate more in working groups. But, to be blunt, if you are going to participate, you need more predictable funding.”⁵⁷⁰ We heard that there is no well-established funding mechanism for supporting UK Arctic scientists’ participation in the Council’s work, making it difficult for UK natural and social scientists to get funding to attend remote and expensive meetings—those who do attend are often there as representatives of international associations.⁵⁷¹
376. Prof Francis highlighted that while the FCO encourages UK Arctic science, there is no ongoing FCO funding for Arctic science—even for the support of

563 [Q 268](#) (Prof Jane Francis), written evidence from the British Antarctic Survey ([ARC0018](#))

564 [Q 268](#) (Prof Jane Francis)

565 [QQ 81–2](#) (Dr Jan-Gunnar Winther)

566 HM Government, *UK Science in Antarctica 2014–2020*: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/341645/bis-14-979-uk-science-in-antarctica-2014-to-2020.pdf [accessed 19 February 2015]

567 [Q 49](#) (Dr Jeffrey Mazo), [Q 249](#) (Dr Martin Sommerkorn), [Q 249](#) (Rod Downie), written evidence from WWF-UK ([ARC0050](#))

568 [Q 279](#) (HE Thórdur Aegir Óskarsson)

569 [Q 263](#) (Dr Ray Leakey), [Q 27](#) (Prof Chris Rapley). See also [Q 317](#) (Alan Kessel), written evidence from Elizabeth Kirk ([ARC0015](#)). The UK has been involved in contributing to the Arctic Monitoring and Assessment Programme, Protection of the Arctic Marine Environment and Conservation of Arctic Flora and Fauna working groups, and the UK has embedded Arctic researchers in recent Arctic Council projects on Arctic biodiversity, persistent organic pollutants, black carbon, greenhouse gases, ocean acidification, cryosphere interactions with the climate and Arctic scientific co-operation ([Q 263](#) (Dr Ray Leakey), written evidence from the NERC Arctic Office ([ARC0028](#))).

570 [Q 280](#) (HE Else Berit Eikeland)

571 [Q 27](#) (Prof Chris Rapley), written evidence from Dr Richard Powell ([ARC0053](#)), [Q 277](#) (HE Else Berit Eikeland)

the Ny-Ålesund base in Svalbard.⁵⁷² When she told us that BAS (funded by BIS through NERC) is developing an Arctic science strategy, she added “We are not particularly funded for scientific work in the Arctic specifically, so we have to do that on grants.”⁵⁷³ She said that BAS was hoping to “establish something a bit longer term” after the expiry of the Arctic Research Programme but there seems not to be clarity about what may be arranged; the Year of Polar Prediction beginning in 2017 underlines the urgency of organising a replacement.⁵⁷⁴ Prof Francis also highlighted the importance of the UK exerting influence in Brussels to promote more EU funding for Arctic science.⁵⁷⁵

377. Dr Jan-Gunnar Winther told us that “if you invest one penny in studying the Arctic, you gain more in improving your domestic management of your resources” because of the effects of climate change in the Arctic on climate, weather and flooding at home.⁵⁷⁶
378. We note that in *UK Science in Antarctica 2014–2020*, Ministers from BIS and the FCO clearly cited the connection between investing in polar science and deriving benefits for the UK: “We fund science that benefits humanity, sustainable use of resources, helps protect the planet and generates economic and social impact. ... Innovation and research are at the heart of the UK growth agenda. The advancement of Antarctic knowledge and understanding is essential to a promising future for the UK. As the key Ministers with responsibilities for investment and increased national and international collaboration in Antarctic research, infrastructure and governance, we expect UK polar science to continue to be amongst the best in the world.”⁵⁷⁷

UK Arctic science: changes needed

379. The UK may hold no Arctic territory but having an influential voice in co-operative activity in a rapidly-changing Arctic is important to furthering national interests and addressing issues of global importance. The Arctic is geographically close to the UK and the extent and quality of British Arctic science and technology can and should earn the UK a voice in Arctic science policy and wider co-operation. The opportunity for this exists through Arctic Council bodies but at present it is not being fully exercised.
380. Two distinct but related problems emerge from the evidence we heard:
- the UK is playing a less effective part in the Arctic Council bodies than it can and should, and
 - the UK’s substantial presence in Arctic science comprises a range of admirable but disparate, poorly co-ordinated, and largely curiosity-driven research projects.

572 [Q 263](#), [Q 267](#) (Prof Jane Francis), written evidence from the Canadian Polar Commission ([ARC0040](#)), written evidence from Duncan Depledge ([ARC0011](#)) and written evidence from the Foreign and Commonwealth Office ([ARC0024](#))

573 [Q 268](#) (Prof Jane Francis)

574 [Q 263](#) (Prof Jane Francis), written evidence from the Met Office ([ARC0044](#)) and the WMO’s Polar Prediction Project ([ARC0026](#))

575 [Q 265](#) (Prof Jane Francis)

576 [Q 94](#) (Dr Jan-Gunnar Winther). See also written evidence from the National Oceanography Centre ([ARC0032](#)), [Q 267](#) (Dr Ray Leakey), written evidence from Prof Terry V. Callaghan ([ARC0030](#)), and the Canadian Polar Commission ([ARC0040](#)).

577 HM Government, *UK Science in Antarctica 2014–2020*: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/341645/bis-14-979-uk-science-in-antarctica-2014-to-2020.pdf [accessed 19 February 2015]

381. As long as UK Arctic science is funded as it is at present, on a project-by-project basis, the quality will remain high but there will be little opportunity for further co-ordination beyond that which is already done through the NERC Arctic Office and the host of informal UK and European fora. The relatively short duration of Research Council funding and its spread across a range of Arctic disciplines means that there is relatively little opportunity or incentive for UK researchers to significantly contribute to, let alone influence, the work of the Arctic Council bodies. It has already been noted that there is no budget for non-government UK representatives to attend these meetings and because attendance is occasional and by different people, attendees can be little more than passive observers at the meetings. In any case there is no agreed policy that they should be advancing nor any reporting process.
382. It follows, however, from the evidence from many sources outlined above that there is a clear case to be made for a more coherent and conspicuous UK Arctic research presence both on grounds of foreign and commercial policy and broader scientific and technological considerations. UK Arctic science requires funding and investment appropriate to the vital importance of research to the UK's role and standing in the Arctic, the scale of the challenges and knowledge gaps found there, and the increasing impact of Arctic changes on the UK.
383. To achieve this, the UK must establish a new national Arctic research programme, including both natural and social sciences, with clear objectives and its own dedicated long-term funding. This new programme should be the vehicle for substantial increases in funding for and investment in UK Arctic science through the next two Parliaments (surpassing the £15 million programme for 2010–15). Although science in the Arctic is significantly less expensive than that carried out in the Antarctic, it still requires continuity of funding at an effective level. The role of the Arctic Office is likely to be central to the co-ordination and implementation of this long-term programme, implying a senior and influential role for the director or co-ordinator of Arctic science.
384. There will also need to be clear policy decisions on UK requirements for regular representation on Arctic Council bodies: appropriate individuals will need to be identified and properly funded to attend. They should submit reports to the FCO and head of the Arctic research programme, who should ensure that they are properly disseminated and published where appropriate. We consider that it makes sense to co-locate any organisational centre for UK Arctic science with the British Antarctic Survey, as at present, but operational budgets for Arctic and Antarctic science will need to be clearly separate.
385. **We recommend that discussions be initiated by the FCO, involving the Government Chief Scientific Adviser and the UK Research Councils, with a view to establishing a substantial long-term programme of Arctic research and fully effective representation on Arctic Council bodies. Relevant partners from industry and technology developers and appropriate NGOs should be fully consulted and involved in the programme.**

Diplomacy

Co-ordinating the UK's diplomatic presence in Arctic co-operation

386. We heard from Arctic scientists that “the best the UK can do in the Arctic context” is to furnish the best scientific advice and “provide leadership in the international political realm based on that advice.”⁵⁷⁸ The Geological Society also saw in the development of the Arctic an opportunity for the UK to demonstrate “international leadership” in a number of areas, including science, the extractive industry, robust regulation, and environmental monitoring and protection.⁵⁷⁹
387. However, the impression we have gained is that, despite the best efforts of the FCO’s Polar Regions Department, the UK’s current presence in Arctic co-operation is lacking in prioritisation and co-ordination and needs to be strengthened in order to increase British influence in the region.⁵⁸⁰ The PRD admitted that it was “a challenge” to ensure it had a broad overview of the issues arising or likely to arise in the UK’s Arctic interests and co-operation and that Government policies touching on the Arctic were consistent with each other.⁵⁸¹ The Department does a lot of “facilitating” engagement with the Arctic Council and other Arctic bodies by a range of Government departments and agencies, using the cross-Whitehall Arctic network.⁵⁸² Jane Rumble told us that in co-ordinating Arctic-related policies, the PRD had “had some hits and some misses.”⁵⁸³
388. All eight Arctic states have appointed special Arctic envoys, special representatives or Arctic Ambassadors.⁵⁸⁴ France, Japan, Poland and Singapore have also appointed Ambassadors in charge of Arctic affairs; we heard that it was probably good practice for Government departments and agencies to have a focal point on the Arctic and one person to oversee all the diverse issues and actors.⁵⁸⁵ Duncan Depledge recommended that the Government should appoint a special representative to the Arctic based in the PRD, who would be accountable for the delivery of UK Arctic policies, chair the cross-Whitehall Arctic network, be able to scrutinise the development of Arctic-related policy across Government, and provide a rallying point for stakeholders (including businesses and NGOs).⁵⁸⁶
389. The PRD have considered whether a UK Arctic Ambassador is necessary, and “come to the conclusion ‘probably not’”.⁵⁸⁷ Ms Rumble’s assessment was that existing observer state Arctic Ambassadors had not had as much impact as had been hoped for them, perhaps because they were not sufficiently integrated and “across all the detail”.⁵⁸⁸
390. **The UK can and should be more active in Arctic affairs. Our view is that the Government should follow the example of others in appointing**

578 Written evidence from Dr Sheldon Bacon, Dr Ed Hawkins and Prof Chris Rapley ([ARC0013](#))

579 Written evidence from the Geological Society ([ARC0031](#))

580 Written evidence from Prof Terry V. Callaghan ([ARC0030](#))

581 [Q 10](#) (Jane Rumble)

582 [Q 10](#) (Jane Rumble), [Q 10](#) (Henry Burgess), written evidence from Michael Kingston ([ARC0054](#))

583 [Q 320](#) (Jane Rumble)

584 [Q 320](#) (Jane Rumble), [Q 310](#) (HE Keiichi Hayashi). HE Else Berit Eikeland, who provided oral evidence, is Norway’s Polar Ambassador: [Q 273](#) (HE Else Berit Eikeland).

585 [Q 310](#) (HE Keiichi Hayashi), [Q 320](#) (Jane Rumble)

586 Written evidence from Duncan Depledge ([ARC0011](#))

587 [Q 320](#) (Jane Rumble)

588 [Q 320](#) (Jane Rumble)

a UK Ambassador for the Arctic, based in the FCO's Polar Regions Department, to ensure greater focus on and co-ordination of Arctic affairs in Government. The Ambassador should chair the cross-Whitehall Arctic network. He or she should also prioritise bringing together the UK Arctic science, policy, academic, industry and business communities in order to strengthen opportunities for the UK in the region and spearhead UK interests in the Arctic.

391. The post-holder would work to raise awareness of the growing importance of the Arctic within Government, to co-ordinate Government policies touching on the Arctic, and to build a UK Arctic community stretching beyond Government. He or she should ideally have scientific credentials, enabling close working with the director or co-ordinator for UK Arctic research discussed above, and improving the connection between science and policy in the country's Arctic engagement.⁵⁸⁹
392. One of the roles of the UK Ambassador to the Arctic could be to gather together frequently those in the UK with Arctic expertise, including in the commercial sector (see paragraph 348 above), so that they can gain from each other's knowledge and experience of working in the region. Government officials and even Ministers working on the Arctic in the FCO would thus meet regularly in large and small fora with colleagues not just in other Government departments and agencies, but also with the UK's Arctic natural and social science communities and with UK industry and campaign groups with Arctic interests, so that intelligence about the Arctic can be shared. That intelligence would include research-based information and insights into the direction of events in the Arctic including within its international relations and international scientific co-operation. In this way, investment in supporting the UK's research on the Arctic and diplomatic presence in Arctic co-operation would reap economic (as well as political) benefits for the UK.
393. Such an Arctic champion within Government might also help to ensure a greater prominence for the Polar Regions Department within the FCO. The PRD consists of seven civil servants, of whom only three work on the Arctic, none exclusively. Dr Dmitriy Tulupov recommended establishing a special analytical division within the PRD of five to seven specialists to provide "full-fledged information support of the UK Arctic policy decision-making."⁵⁹⁰ The PRD sits within the Overseas Territories Directorate because it administers the British Antarctic Territory, but this is not a completely natural fit for Arctic affairs. The relevant Minister has so many disparate areas of responsibility that the Arctic is not mentioned on the website describing his role.⁵⁹¹
394. **As the Arctic grows in importance, the resourcing and possibly the organisational location of the PRD may need to be reviewed.**

589 See [Q 28](#) (Prof Chris Rapley)

590 Written evidence from Dr Dmitriy S. Tulupov ([ARC0009](#))

591 Responsibilities of the Parliamentary Under Secretary of State for Foreign and Commonwealth Affairs: <https://www.gov.uk/government/ministers/parliamentary-under-secretary-of-state--23> [accessed 19 February 2015]. The official website (as at 7 January 2015) describes the Ministerial responsibilities of James Duddridge MP as "Africa; overseas territories (not Falklands, SBAs or Gibraltar); conflict issues; consular; protocol; ministerial oversight for FCO services; the Caribbean (not including Dominican Republic, Haiti or Cuba); illegal Wildlife Trade". See [Q 10](#) (Henry Burgess).

Increasing the UK's diplomatic presence in Arctic co-operation

395. We heard that the UK needs to be better represented at international meetings relating to the Arctic (see paragraph 381 above). The PRD co-ordinates Government representation and scientific input through the cross-Whitehall Arctic network and Arctic Office. Jane Rumble told us that the issue of funding for attending meetings came up “all the time”, saying “We just cannot attend every single meeting.” She emphasised that “we always weigh up the value for money—what we would expect to achieve and how important it is for the UK.”⁵⁹²
396. While Ms Rumble could not think of an example where the PRD felt that the UK needed to be represented and the funding could not be found, the FCO had increasingly been relying on representation by various locally-based Science and Innovation Network officers as “a creative way of reducing the resource burden”.⁵⁹³
397. Ms Rumble also argued that “you do not necessarily have to be there at every meeting to make sure that your interests are not prejudiced” and that the PRD had prioritised its engagement, engaging less with the working groups than at a level feeding into them.⁵⁹⁴ From June 2013 to November 2014, the Government was represented at only two working group meetings out of 18 (on conservation of Arctic flora and fauna, and sustainable development), and at seven task force meetings out of 16 (although the Government was given insufficient notice of one meeting to attend), although these figures do not take into account participation by UK scientists at those meetings or in the work feeding into them.⁵⁹⁵
398. Ms Rumble conceded that “Some of the Arctic states say, ‘You should come along more often’”, and this was echoed by Ambassador Eikeland, who stressed that “observers cannot come to only one meeting in a working group and then come back next year, and expect to have influence. You have to have continuity and you need commitment.”⁵⁹⁶ We regard face-to-face meetings as important for developing relationships, but we note the possibility for participants taking part remotely through videoconferencing: the Arctic Council should be encouraged to explore the opportunities for doing so, given the large distances involved.
399. The PRD also get invited to so many conferences on the Arctic that they “cannot cover them all”.⁵⁹⁷ Elizabeth Kirk stressed the importance, given the limitations on UK participation in the Arctic Council and other regional fora, of seeking “additional locations for action”, such as global climate change negotiations and organisations on shipping and the regulation of extractive industries—the UK has been particularly active in the International Maritime Organisation’s work on the Polar Code.⁵⁹⁸ The UK is a member of a number of international intergovernmental organisations which monitor changes in the Arctic. We note that UN agencies use regional areas of application which bifurcate around the Pole, rather than dealing with the Arctic as a coherent

592 [Q 321](#) (Jane Rumble)

593 *Ibid.*

594 *Ibid.*

595 Written evidence from the Arctic Council Secretariat ([ARC0068](#)), [Q 321](#) (Jane Rumble)

596 [Q 321](#) (Jane Rumble), [Q 280](#), [Q 277](#) (HE Else Berit Eikeland)

597 [Q 12](#) (Jane Rumble)

598 Written evidence from Elizabeth Kirk ([ARC0015](#)), [Q 249](#) (Rod Downie), written evidence from Michael Kingston ([ARC0054](#)) and ([ARC0070](#)), [Q 3](#) (Jane Rumble)

region: UK delegates to those agencies should be aware of their potential relevance to the Arctic, and communicate with the PRD about any relevant issues. Stratton Park Associates recommended that the UK should play a central role in the drawing up of an integrated and coherent EU Arctic Policy during 2015.⁵⁹⁹

400. **While we appreciate the PRD's sensitivity to ensuring value for money in the representation of the Government and UK Arctic research in Arctic fora, our view is that it is important for the UK to be not just occasionally but consistently and authoritatively represented at Arctic Council meetings, meetings of other Arctic co-operation bodies, and meetings of organisations working on Arctic-related issues and treaties. The appointment of a UK Arctic Ambassador, with funding to support that role, would be central to the delivery of this objective. When it is the collective view that the UK ought to be represented at a particular Arctic meeting the relevant department or research council should be required to provide and fund such representation.**
401. **The UK Parliament should also make a contribution to representing the UK in Arctic fora: we recommend that the House of Lords and House of Commons should ensure that UK Parliamentarians regularly attend the Conference of Parliamentarians of the Arctic Region as observers.**

Publishing a successor to the 2013 Arctic Policy Framework

402. Re-emphasising the Government's commitment to Arctic engagement would help the UK to make a full contribution diplomatically, scientifically and economically.⁶⁰⁰
403. **The UK must become more effective in communicating its connections to the Arctic and its strengths in knowledge, skills and businesses with relevance to the Arctic, and what it offers to the Arctic as a near Arctic state.**
404. Jane Rumble explained that the Government's 2013 document, *Adapting To Change: UK policy towards the Arctic*, was a 'policy framework' rather than a 'strategy' because of an understanding that some Arctic states felt that a 'strategy' implied direct control.⁶⁰¹ The Government has strategies in various policy areas relating to the Arctic, such as climate change and the safety of shipping, and these are brought together in the policy framework rather than the UK having an overarching Arctic 'strategy'.⁶⁰² We note, however, that Ambassador Eikeland nonetheless referred to the Policy Framework as "the British Arctic strategy", suggesting that there may be more sensitivity about the word in British circles than elsewhere.⁶⁰³
405. Tim Reilly (Arctic Advisory Group) criticised the confusion and hesitation "constitutionally" engendered by the Policy Framework, and argued that

599 Written evidence from Stratton Park Associates ([ARC0025](#)), Council of the European Union, Foreign Affairs Council Meeting, Brussels, 12 May 2014, *Council conclusions on developing a European Union Policy towards the Arctic Region*: http://www.consilium.europa.eu/uedocs/cms_Data/docs/pressdata/EN/foraff/142554.pdf [accessed 19 February 2015]

600 Written evidence from Duncan Depledge ([ARC0011](#))

601 [Q 2](#), [Q 322](#) (Jane Rumble), written evidence from Arctic Advisory Group ([ARC0060](#))

602 [Q 322](#) (Jane Rumble)

603 [Q 280](#) (HE Else Berit Eikeland)

there was a need for a “definitive UK Arctic Policy” reflecting increasing British interests in the region—a need, he considered, compounded by fierce and increasing competition from non-Arctic states which he argued have “created substantive national Arctic policies with the *full acknowledgment and encouragement*” of the Arctic Council. He feared that the lack of a definitive ‘policy’ might indicate to other states “a lack of British economic/societal commitment, and political intent” regarding the Arctic. Without “a clear strategic policy” representing the UK’s unique contribution, he concluded, “the UK’s efforts in the Arctic will be limited—tactical rather than strategic, non-linear in effect, and incoherent to our allies in the region”.⁶⁰⁴

406. Jane Rumble defended the Government’s stance, saying that Arctic states were not telling the Government that the UK needed to do things differently, and reiterating the need to tread a fine line between engaging with Arctic states on matters of mutual interest “while not saying suddenly that we are more Arctic than one of the Arctic states.”⁶⁰⁵ We were told that the UK had been the first non-Arctic country to produce its own Arctic vision, and that if new Arctic Council observer states such as Singapore, South Korea and Japan seemed more enthusiastic than the UK, this was because they were “playing catch-up” while the UK was “leading the pack”.⁶⁰⁶
407. **The Government’s 2013 Arctic Policy Framework was a good first step. However, in the quickly changing context of Arctic co-operation it now seems too hesitant and cautious. Other Arctic Council observer states are assertive about their interests in the Arctic and the UK should be too. The Government should commission a new version of the document within the next year. The new version should be bolder in presenting the UK as a premier partner in the Arctic.**
408. **The UK’s boosted focus on and enthusiasm for engagement in the Arctic should be reflected by upgrading the revised document to an Arctic ‘strategy’; in our view this would in no way diminish the Government’s proper respect for the primacy of Arctic states and residents.**
409. Duncan Depledge recommended a review of the Policy Framework in 2015, and that as part of this review, every Government department involved in Arctic policy development should be required to reassess whether the priority afforded to their Arctic-related interests was still appropriate given the dynamism of regional developments.⁶⁰⁷ The PRD will no doubt consult across the Government and, we hope, the UK Arctic natural and social science community in devising an Arctic strategy. The Government should also consult the UK’s devolved administrations in doing so, as Arctic expertise and interests are distributed widely across the country.
410. The Government has pledged to keep the Policy Framework under review and subject to renewal.⁶⁰⁸ **The Arctic strategy should be updated at least every five years, and more often if the rapid pace of change in the Arctic demands.**⁶⁰⁹

604 Written evidence from Arctic Advisory Group ([ARC0060](#)). See also [Q 249](#) (Rod Downie).

605 [Q 319](#) (Jane Rumble)

606 [Q 319](#) (Julian Brazier MP), [Q 319](#) (Jane Rumble)

607 Written evidence from Duncan Depledge ([ARC0011](#))

608 [Q 319](#) (Jane Rumble), written evidence from the Foreign and Commonwealth Office ([ARC0024](#))

609 See written evidence from WWF-UK ([ARC0050](#)), [Q 249](#) (Rod Downie), written evidence from Duncan Depledge ([ARC0011](#))

411. WWF also recommended that the FCO share its experience of developing Arctic policy with other non-Arctic states with interests in the region: we are sure the PRD would not miss the soft power benefits to be had from such international engagement.⁶¹⁰

Scrutiny

412. The PRD's role in ensuring sufficient attention within Government to the opportunities and challenges arising in the Arctic should be supported by the focusing effect of ongoing public and Parliamentary scrutiny. The Government will respond to this report in a Command Paper published after the General Election and a debate in the House of Lords will follow.
413. **We recommend that the Government should write to the Chairman of the House of Lords Liaison Committee (which recommended the establishment of this *ad hoc* Committee) to update the House on the progress that has been made between a year and 18 months after the publication of the Government's response.**
414. **We further recommend that the Minister responsible for the Polar Regions should write to the Chairman of the House of Commons Foreign Affairs Committee at least annually, updating that Committee on the progress of Arctic co-operation and the UK's contribution to it through all Government departments, sections of the FCO and Government-funded work.**

Bilateral relationships

415. The UK's bilateral relationships with Arctic states are also, naturally, important. The UK has very strong bilateral relationships with many of the eight Arctic states, including through history, trade, defence alliances and science.⁶¹¹ We received plentiful evidence about the desirability of closer bilateral co-operation, particularly on Arctic science, with other Arctic Council observer states such as Japan and Singapore; Dr Aki Tonami of the University of Copenhagen suggested setting up a forum with countries such as Japan to engage political, business and scientific communities on the Arctic.⁶¹²
416. **The UK should continue to look for opportunities to strengthen its bilateral relationships with the eight Arctic states, and to build bilateral links related to the Arctic with other Arctic Council observer states, in order to make progress on Arctic science and policy issues and look for efficiencies. For example, the UK should explore whether it might be helpful to invite observer states without Svalbard research bases (such as Singapore) to use British scientific resources at Ny-Ålesund in order to enhance its relationships with those states, and possibly share burdens. The UK Arctic Ambassador would be well-placed to look for such opportunities.**

610 Written evidence from WWF-UK ([ARC0050](#)), [Q 249](#) (Rod Downie)

611 See for example written evidence from the Canadian Polar Commission ([ARC0040](#)) and Dr Dmitriy S. Tulupov ([ARC0009](#))

612 Written evidence from Prof Damon A.H. Teagle ([ARC0029](#)), Dr. Aki Tonami ([ARC0008](#)), and Prof Alex Calvo ([ARC0007](#))

Security

The UK's role in security co-operation around the Arctic

417. The Arctic Policy Framework says that the UK “remains committed to preserving the stability and security of the Arctic region.”⁶¹³ It is very much in the UK’s interest to continue to engage with its allies in the region militarily.⁶¹⁴ NATO is central to the UK’s relationship with the five Arctic states which are members of NATO, and is the primary route through which the UK discusses security and defence relationships with those countries.⁶¹⁵
418. Although neither the 2010 Strategic Defence and Security Review or the 2010 National Security Strategy discussed the Arctic region, the 2014 UK National Strategy for Maritime Security said that the opening of Arctic shipping routes presents the UK with potential new maritime security threats, and noted that international co-operation would be an essential means of managing this.⁶¹⁶ The MoD is aware of the importance of anti-submarine operations in this area and will need to keep this issue under constant review, together with its NATO allies.
419. Professor Alex Calvo (Law Department of Nagoya University) argued that the Government “must ensure that the Armed Forces retain and develop the means and expertise to operate in Arctic and near-Arctic environments”, as only countries with those capabilities were likely to become serious players in the region, including economically. He recommended increasing military co-operation and joint training with Canada and Norway, and including Japan.⁶¹⁷
420. Elements of the UK Armed Forces undertake cold-weather training in Norway and engage in Norwegian-led Arctic-based NATO exercises.⁶¹⁸ The UK also engages in bilateral partnerships and plurilateral security co-operation groupings including the Northern Group: these reassure allies and help them improve their defence capacities, yield training opportunities for UK forces, and “generally contribute to a strong political and military fabric across the ‘sub-Arctic’ region”.⁶¹⁹
421. The MoD told us that the Armed Forces’ cold-weather warfare training has been reduced since 2010.⁶²⁰ Matthew Willis (Royal United Services Institute) argued that the Government should commit to maintaining or increasing cold-weather training in Norway, both to ensure the facilities remain open and to provide the kind of tangible engagement that he considered Norway was seeking from its NATO allies.⁶²¹

613 Written evidence from Luke Coffey (ARC0017), Foreign and Commonwealth Office, *Adapting To Change: UK policy towards the Arctic* (2013)

614 Q 49 (Christian Le Mièrè)

615 Q 4 (Debbie Brothers)

616 Written evidence from Luke Coffey (ARC0017), Her Majesty’s Government, *The UK National Strategy for Maritime Security*, Cm 8829 (May 2014): https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/322813/20140623-40221_national-maritime-strat-Cm_8829_accessible.pdf [accessed 19 February 2015]

617 Written evidence from Prof Alex Calvo (ARC0007)

618 Q 4 (Debbie Brothers), Q 324 (Julian Brazier MP)

619 Written evidence from Matthew Willis (ARC0043)

620 Q 14 (Martin Molloy), written evidence from the Ministry of Defence (ARC0002)

621 Written evidence from Matthew Willis (ARC0043)

Arctic security resources

422. We heard about limitations to the UK's physical capabilities for operating in polar conditions: the MoD has reduced its Antarctic helicopter capability,⁶²² its surface ships go to the high north but not into Arctic waters, and the UK has had no significant maritime patrol aircraft capability since the last of the Nimrod MR2s was retired in 2010.⁶²³
423. The UK should replace its maritime patrol capability through the 2015 Strategic Defence and Security Review, Mr Willis recommended, saying that Norway had been patrolling a portion of the North Sea that would ordinarily be the UK's responsibility, and that the expenditure was justified by the likelihood of increased maritime traffic in the Greenland-Iceland-UK gap and North Sea.⁶²⁴ Luke Coffey (The Heritage Foundation) argued that without maritime patrol aircraft, "the UK is blind in the Arctic" and that while the UK had mitigated the loss of the capability with short-term solutions, the gap "could become a critical and long-term problem".⁶²⁵
424. Nimrod aircraft were previously available at short notice for search and rescue operations, and were used to locate aircraft, ships and people in the water and co-ordinate rescue efforts, as well as carrying survival equipment. Former Chief Coastguard Rod Johnson told us that since the loss of the maritime patrol aircraft, what the UK had been able to offer Iceland and Denmark in terms of support for search and rescue activities had been limited in terms of reach.⁶²⁶ We discuss search and rescue in paragraphs 309 and 310.
425. Julian Brazier MP, Parliamentary Under-Secretary of State at the MoD, told us that the 2015 Strategic Defence and Security Review will look "very carefully" at the question of the UK's maritime patrol aircraft capacity. We were told that Nimrod aircraft had not generally been deployed outside the UK region for search and rescue purposes, but that other assets including HMS Scott, the Royal Navy's ice-enabled ocean survey vessel, and other aircraft were capable of operating in the region.⁶²⁷
426. Manson Oceanographic Consultancy recommended that the UK should use the Royal Navy's survey vessels to gather hydrographic data in the Arctic (collaborating with Arctic partners where possible), highlighting that doing so would have the benefit of exercising the UK's rights as a non-littoral state to operate within Arctic waters, and suggested that the Government consider developing its capability to support policing in the Arctic high seas area.⁶²⁸
427. **Given the increasing importance of the Arctic region and the UK's interests in the Antarctic, the Ministry of Defence should maintain and develop its cold-weather operational capabilities, expertise and resources.**

622 HMS *Protector*, the Royal Navy's ice patrol ship, does not have helicopter capacity; the ship it replaced in 2013, HMS *Endurance*, did have such capacity.

623 Q14 (Martin Molloy), written evidence from Luke Coffey (ARC0017)

624 Written evidence from Matthew Willis (ARC0043). 'UK called on Nato help in sub search', *BBC News* (9 December 2014): <http://www.bbc.co.uk/news/uk-scotland-30398114> [accessed 19 February 2015]

625 Written evidence from Luke Coffey (ARC0017)

626 Q 216 (Rod Johnson)

627 Q 323, Q 328 (Julian Brazier MP), Q 323 (Nick Gurr)

628 Written evidence from Manson Oceanographic Consultancy (ARC0005)

428. **The 2015 Strategic Defence and Security Review must give urgent consideration to reintroducing a maritime patrol capability for the UK. This is needed for both defence and search and rescue operations.**

Other UK state-led contributions to Arctic co-operation

429. The UK has strengths and capacities relevant to Arctic co-operation in fields such as search and rescue (see above), hydrography and weather prediction, in addition to its scientific expertise. The UK leads the world in hydrography, Julian Brazier MP told us; the maps produced by the UK Hydrographic Office (UKHO, a trading fund of the MoD) cover large areas of the Arctic and its work there is supported by the Royal Navy's survey vessels.⁶²⁹
430. However, mapping the Arctic is a comparatively low priority for the UKHO: the UK's national hydrographer, Rear Admiral Tom Karsten, told us that he wanted to increase engagement with his Russian colleagues to improve hydrography along the Northern Sea Route, and that the UK was seeking to become an observer at the Arctic Regional Hydrographic Commission.⁶³⁰ Rear Admiral Karsten wished to be able to "continue to offer such expertise as we have for the greater good of hydrography around the world, particularly in the Arctic".⁶³¹ Manson Oceanographic Consultancy told us that the UK should support the improvement of charts for the Arctic, not least to retain the UKHO's "prime position" in the world.⁶³²
431. The UK Met Office is a world leader for global and North Atlantic forecasting, and should be supported in developing an Arctic weather and ice forecasting service, Manson Oceanographic Consultancy argued, noting that UKHO and the Met Office are ideally placed to "provide world class forecasting and charting services that would also provide significant income streams for the UK."⁶³³ The Met Office forecast is one of the leading global forecast products.⁶³⁴
432. The UK is also well known for its higher education sector, which includes centres of expertise on Arctic issues reaching beyond natural science to include social science relating to Arctic indigenous peoples, geography and politics.⁶³⁵ Dr Jan-Gunnar Winther told us that when Norway had decided to make the high north its "first priority", the government chose to "build up academic capacity", including bringing social sciences, natural sciences and technology experts together in the Fram Centre in Tromsø (where we met him).⁶³⁶
433. The government of Singapore is partnering with the National University of Singapore to set up an Arctic affairs programme, and providing research fellowships on Arctic legal issues at the University's Centre for International Law, while companies there are working with the University's Corporate Laboratory to undertake research in Arctic technology. A postgraduate scholarship, open to Arctic indigenous peoples, is offered every year for a

629 [Q 326](#) (Julian Brazier MP, Nick Gurr), [Q 224](#), [Q 217](#) (Rear Admiral Tom Karsten)

630 [Q 217](#), [Q 218](#), [Q 222](#) (Rear Admiral Tom Karsten)

631 [Q 225](#) (Rear Admiral Tom Karsten)

632 Written evidence from Manson Oceanographic Consultancy ([ARC0005](#))

633 Written evidence from Manson Oceanographic Consultancy ([ARC0005](#)). See also [Q 224](#) (Dr Richard Wood).

634 [Q 219](#) (Dr Richard Wood)

635 [Q 153](#) (Prof Mike Bradshaw), written evidence from Dr Richard C. Powell ([ARC0053](#))

636 [Q 82](#) (Dr Jan-Gunnar Winther)

masters in maritime law at the University.⁶³⁷ British academics are represented at the University Centre in Svalbard, which teaches international students Arctic courses in English.

434. The UK is also home to world-famous institutions with relevance to the Arctic such as the British Library, National Maritime Museum, Royal Geographical Society and Scott Polar Research Institute Museum, the latter of which has substantial volumes of Russian Arctic research and literature.⁶³⁸
435. **The UK higher education sector could further build on its Arctic strengths by building up courses and offering international scholarships at all levels in Arctic science, technology, geology, engineering, social sciences, health and mental health and strengthening its academic collaborations with Arctic states and other Arctic observer states such as Singapore and Japan, and with Arctic academic institutions such as the University Centre in Svalbard.**
436. **The UK's existing world-class museum and cultural sector should build further connections and collaborations with similar institutions in the Arctic region. There is already impressive evidence of collaboration within the UK, but this could be expanded upon as part of the enhancement of UK soft power.**⁶³⁹
437. **The UK should be making use of its expertise in areas such as hydrography, weather and ice prediction in its relationships with the Arctic states through the Arctic Council and other Arctic fora in order to ensure that the UK is considered a primary partner in the Arctic, earning the UK both influence and commercial benefits in the region. The Government should support the UK Hydrographic Office in developing the links required to work effectively with partners in Arctic states, in order that it is able to respond to demand for new charting of Arctic waters.**

Drawing together commercial strengths

438. As explored above (see Chapter 5), there are many commercial entities based in or particularly connected with the UK which operate in Arctic industries, territories and waters or provide technologies, materials and services to those which do.⁶⁴⁰ It is in the UK's economic interests to expand its commercial involvement in the region.⁶⁴¹ The Government told us that it "will advocate for and facilitate responsible business activity in the region by British companies".⁶⁴² Ambassador Óskarsson (Iceland) felt that on resource development in the Arctic, "the UK could raise its profile individually much more than it does today."⁶⁴³
439. UK Trade & Investment (UKTI) has promoted opportunities for British mining companies in the Arctic by hosting a mining trade mission to Finland in 2013 and an Arctic mining conference in London in 2014, and sponsoring

637 [Q 303](#), [Q 306](#) (HE Foo Chi Hsia)

638 Written evidence from Dr Richard C. Powell ([ARC0053](#)), [Q 267](#) (Prof Julian Dowdeswell)

639 British Museum, 'Arctic research visit underlines importance of community partnerships': http://www.britishmuseum.org/research/news/research_visit_to_igloolik.aspx [accessed 19 February 2015]

640 Written evidence from Dr Dougal Goodman ([ARC0022](#))

641 [Q 49](#) (Christian Le Mièrè)

642 Written evidence from the Foreign and Commonwealth Office ([ARC0024](#))

643 [Q 279](#) (HE Þórdur Aegir Óskarsson)

an Arctic event at the International Festival for Business in Liverpool in June 2014 as well as “various prosperity events across the Arctic”.⁶⁴⁴ UK diplomatic posts in Arctic states also offer assistance.⁶⁴⁵ Jane Rumble told us that there was “quite an active forum of support” for UK companies involved with the Arctic, although there have been no Arctic-specific trade missions to the Arctic in the last three years.⁶⁴⁶

440. Richard Morgan, head of government relations for the mining firm Anglo American, was not aware of Arctic-specific support from the Government, and Claude Perras, head of sustainability for London Mining, was critical of embassy support and felt the Government “could do much more to support British industry”, including through supporting the development of local infrastructure necessary for commercial resource development, which he said other countries were doing.⁶⁴⁷ Dr Tulupov saw a role for the Government in supporting bilateral intergovernmental forums that created platforms for the promotion of regional projects by politicians and business leaders: he suggested a UK-Russian forum or commission on Arctic co-operation.⁶⁴⁸
441. A number of our witnesses suggested efforts to bring together UK commercial expertise on the Arctic. Mr Kingston proposed a UK forum on Arctic maritime issues for sharing knowledge between industry, Government, the research community and others (as well as a circumpolar forum along similar lines).⁶⁴⁹ Professor Wall suggested a mechanism to ensure Arctic mining interests in the UK were involved in and kept up to date with the results of research and best practice studies in the UK, and that the Government could help ensure that there was a mechanism for such results to be shared with the Arctic Council.⁶⁵⁰ Mr Reilly suggested that external expertise should be invited to participate in Government committees or meetings working on UK Arctic policy formulation.⁶⁵¹
442. As discussed in paragraph 390 above, we recommend that a UK Arctic Ambassador work to connect UK expertise on Arctic diplomatic relations, science and commercial opportunities and intelligence.

Drawing upon the UK’s local strengths

443. It should not be forgotten, in considering the contribution of ‘the UK’ to activities in the Arctic, that expertise on the Arctic is distributed across different parts of the country, sometimes with specific interests.
444. Northern and Eastern UK ports might be well-placed to take advantage of the expansion of shipping through the Northern Sea Route (and eventually the polar route).⁶⁵² Cambridge is home to the Scott Polar Research Institute and British Antarctic Survey, Aberdeen is a centre of knowledge and experience

644 Written evidence from the Foreign and Commonwealth Office ([ARC0024](#)), [Q 11](#) (Jane Rumble), [Q 320](#) (Julian Brazier MP), written evidence from Prof Frances Wall ([ARC0056](#)). See also [Q 206](#) (Richard Morgan) and written evidence from Michael Kingston ([ARC0054](#))

645 [Q 11](#) (Jane Rumble)

646 [Q 11](#) (Jane Rumble), written evidence from the Foreign and Commonwealth Office ([ARC0004](#)), [Q 206](#) (Claude Perras)

647 [Q 206](#) (Richard Morgan, Claude Perras)

648 Written evidence from Dr Dmitriy S. Tulupov ([ARC0009](#))

649 Written evidence from Michael Kingston ([ARC0054](#))

650 Written evidence from Prof Frances Wall ([ARC0056](#))

651 Written evidence from Arctic Advisory Group ([ARC0060](#))

652 [Q 79](#) (Colin Manson), written evidence from Manson Oceanographic Consultancy ([ARC0005](#))

on hydrocarbon extraction,⁶⁵³ and London is a particularly well-established hub for maritime law and maritime service industries, including insurance and reinsurance, brokerage and financing.⁶⁵⁴

445. The fact that cities such as London and Aberdeen are already recognised to some extent as centres of Arctic expertise brings home the degree to which UK scientists, academics, diplomats, businessmen and other experts are already respected partners in the Arctic, as well as accentuating the UK's proximity to the region. The Government needs to ensure that the devolved administrations are able to participate appropriately in the UK's Arctic activities.
446. **The UK is the Arctic's nearest neighbour and the Arctic is the UK's neighbourhood: the Government must invest in this relationship to reap benefits for the UK and for international common interests.**

653 [Q 110](#) (Rúni M Hansen). Rúni M Hansen, Vice-President of the Arctic Unit at Statoil, told us in Tromsø that Statoil had recently opened a large office in Aberdeen. See also [Q 201](#) (Dr Michael Engell-Jensen).

654 Written evidence from Manson Oceanographic Consultancy ([ARC0005](#)), Dr Dougal Goodman ([ARC0022](#)), and Michael Kingston ([ARC0054](#))

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Chapter 2: Climate change in the Arctic

1. While it is not currently possible to predict accurately when the Arctic Ocean will experience summers that are reliably free of sea ice, it is evident that there is a sharp underlying downward trend in sea ice extent and volume. It is a question of ‘when’ rather than ‘if’ the Arctic will be substantially free of sea ice in summer. (Paragraph 39)
2. The potential for significant amounts of carbon dioxide and methane to be released from the Arctic permafrost and seabed, as a result of rising temperatures, is acknowledged but not yet fully measured or understood. Further research is required if the risks associated with these issues are to be fully calculated and planned for, both in the Arctic and beyond. We recommend that the Natural Environment Research Council should ensure that this issue is considered in any new dedicated Arctic research programme. (Paragraph 58)
3. The Arctic region is at the frontline of climate change and is being affected more rapidly by climate change than other parts of the globe. Particular concerns exist over melting land ice and a consequent rise in sea levels, as well as diminishing sea ice and melting permafrost. Loss of sea ice is expected to continue in the Arctic Ocean, with open water contributing to the further amplification of climate change. Physical, ecological, economic and geopolitical changes—both negative and positive—are arising as a result of the changing Arctic climate, and polar warming will have an impact upon ecosystem dynamics and human communities. While reductions in sea ice extent will make access to parts of the marine Arctic easier in future, changes such as permafrost and ice road melting may make investment in the terrestrial Arctic more difficult at least in the medium term, although there may be countervailing factors: the jury is out. (Paragraph 71)
4. Understanding of the effects of climate change upon the Arctic and their causes in many places is lacking or severely limited. A great deal of further research is still required in order to assess and understand the effects and implications of Arctic climate change. (Paragraph 72)

Chapter 3: Globalisation and governance

5. We conclude that the ‘scramble for the Arctic’ narrative is overly dramatic: territorial claims are overwhelmingly already settled, and where they are not there is widespread acceptance of the rules under which they should be settled, little material gain to be had from aggressive claims, and much material gain on offer from co-operation and peaceful settlement. There is no room for complacency, however. (Paragraph 101)
6. The international legal regime governing Arctic waters is important and must continue to be upheld by the Arctic states and the whole international community. (Paragraph 102)
7. The US would send a positive signal on international co-operation in the region if it were to engage with the process for ratifying UNCLOS during its upcoming chairmanship of the Arctic Council: a rules-based Arctic is to the advantage of everyone, not least the US. (Paragraph 104)

8. We encourage the Arctic Council to continue examining how best to achieve continuity between Chairmanships, in order to build on the considerable progress being made by the Arctic Council. We consider that troikas might be helpful in this regard. (Paragraph 114)
9. The achievements of the Arctic Council as an intergovernmental forum are significant and welcome. The role of the Permanent Participants is ground-breaking in international affairs. Serious and comprehensive co-operation in the Arctic is in the global common interest, and this framework for continued progress must be nurtured and supported, including by the UK. (Paragraph 133)
10. Russia's foreign policy has become increasingly difficult to predict, and we cannot be confident that peaceful co-operation in the Arctic will continue indefinitely. However, every effort should be made to insulate Arctic co-operation from geopolitical tensions arising in other parts of the world because there is a global interest in protecting this unusually vulnerable environment. All states with Arctic interests, including the UK, should therefore work to prevent Arctic co-operation from being damaged by non-Arctic disputes. (Paragraph 140)
11. The European Union's case for permanent observer status at the Arctic Council is overwhelming. (Paragraph 147)
12. The EU's application for observer status at the Arctic Council should be treated on its merits. The UK should continue to voice its strong support for the EU to be granted permanent observer status at the 2017 Ministerial meeting at the latest. (Paragraph 151)
13. The Arctic Council will need to ensure observer states feel that their voice is listened to if it wants to either benefit further from their contributions or place more demands upon them. The UK should push for the criteria governing observer participation to be reviewed within the US Chairmanship (2015–17), with the aim of ensuring that observers such as the UK feel encouraged and incentivised to participate proactively and extensively in Arctic co-operation. (Paragraph 163)
14. One way forward might be for the Arctic Council to consult different groups of observers according to the issue or geographical focus under discussion, rather than treating them as a homogenous bloc. (Paragraph 164)
15. Those concerned with the Arctic should seek to use the momentum around the region being generated by the enthusiasm of new observer states efficiently and effectively. Consideration should be given by the Arctic Council and observer states to how observer bodies' Arctic efforts, especially in science, can be voluntarily co-ordinated to maximise results. (Paragraph 165)
16. The continued growth of international pressure for influence on the Arctic region is inevitable. The Arctic has a global importance in terms of climate, its unique environment, and its potentials as a possible world trade route and source of scarce resources, as well as including the global commons of the Arctic high seas, so the widest possible co-operation on the Arctic's future is vital. The rest of the world has a legitimate interest in the Arctic, so while an effective Arctic Council is necessary, the Council must also be open to further co-operation beyond its own membership. (Paragraph 166)

17. Arctic fora in addition to the Arctic Council are important for building international consensus on Arctic issues, and should be encouraged. (Paragraph 177)
18. As access to at least the maritime Arctic increases and international commercial, scientific, campaigning, personal and governmental attention on the region strengthens, a significant and difficult challenge facing Arctic states and residents and non-Arctic interests will be managing global demands to either exploit or to exercise stewardship over this simultaneously inhabited and wild region and its changing environment. (Paragraph 179)
19. The Arctic will be the site of economic, geopolitical and cultural claims, conversations and disputes in the years ahead, although the risk of territorial or military conflict seems low. The UK's interest, the global interest, and the interest of Arctic citizens will be best served by the highest possible degree of rules-based negotiation and the widest possible scope of international co-operation and consent. The UK needs to be ready to bring its influence to bear in the region where appropriate to further its own interests and those of the common good. (Paragraph 180)

Chapter 4: The impact of Arctic changes: internal pressures and opportunities within the Arctic

20. Knowledge of Arctic ecosystems, particularly marine ecosystems, is limited and in some areas severely lacking. This knowledge gap hampers our ability to understand the effects of climate change, and of human activity, on marine species in the region. (Paragraph 197)
21. Significant further research is required on Arctic ecosystems as a matter of priority. Research collaboration and knowledge sharing is essential to this mission. Understanding the systems that stand to be affected by increased human interventions in the Arctic environment is vital to making policy decisions about what interventions can be made with an acceptable level of risk or damage to Arctic biological diversity. A precautionary approach must be pursued by commercial interests until the scientific understanding of Arctic ecosystems is sufficient to allow fully-informed decision making. (Paragraph 198)
22. The challenges and changes facing the Arctic are international in nature and there is a strong case for greater international co-operation and communication on Arctic research to be promoted. The UK has existing strengths in collaborative science and research, and should seek to play a role in bringing Arctic scientific communities together. In addition, the Government should support research funders such as the Natural Environment Research Council (NERC) in promoting international collaboration and networking when awarding funding to UK Arctic scientists. (Paragraph 209)
23. It is likely that different types of relationship and collaboration will be appropriate for different circumstances. The Government and NERC should examine the role that bilateral relationships could play in enhancing co-operation with Russian researchers and scientists. (Paragraph 210)
24. All Arctic states should work to ensure that Permanent Participants are allowed to undertake their work without undue restrictions and limitations. We support the view that Permanent Participants, representing indigenous

peoples, should enjoy full and effective involvement in the Arctic Council and in other bodies that affect their lives and interests. (Paragraph 222)

25. Indigenous groups have played an important role in the work of the Arctic Council to date. The recognition and status afforded to the six Permanent Participants within the Council is to be commended. (Paragraph 228)
26. It is clear to us, however, that the expansion in the workload of the Council poses challenges to full participation by indigenous representatives. The Arctic Council should make appropriate structural and financial provision to allow full and effective participation by indigenous representatives. We also believe that the UK Government should continue actively to support the right of Permanent Participants to participate effectively within the Arctic Council. (Paragraph 229)
27. States with observer status at the Arctic Council should work to build the capacity of indigenous groups participating in the work of the Council. We recommend that the Government consider further how observer states, including the UK, might act to support the work of the Indigenous Peoples' Secretariat. Such support could include the provision of training and scholarships through the UK's academic institutions, and secondments to and from its public bodies. (Paragraph 236)
28. The UK is home to world-class climate and social sciences research which could assist and enhance the capacity of Arctic indigenous peoples to respond to changes in their region. The Government, along with research funders such as the Natural Environment Research Council and the Economic and Social Research Council, should consider how this research can be made available and accessible to Arctic indigenous communities, and how this sector in the UK could further benefit from strengthening its relationships with indigenous communities in the Arctic. (Paragraph 237)

Chapter 5: The impact of Arctic changes: pressures and opportunities arising from increasing external access to the Arctic

29. There is a significant history of economic and commercial development in the Arctic. Further development is inevitable, but will need to be balanced and achieved in tandem with actions to limit environmental damage and preserve biodiversity. To achieve that, further advancements in understanding of the environmental and social consequences of change will need to be made at a rate that keeps ahead of development. The UK can play a significant role in developing the scientific knowledge and understanding required to inform policy decisions. (Paragraph 255)
30. In addition, the UK's research and technology strengths can be used to develop new techniques and approaches for undertaking developments in sensitive climates; its significant financial and insurance sectors also have a role to play in ensuring that only sustainable business developments are pursued in the Arctic. (Paragraph 256)
31. We urge the Government to consider how the UK's expertise can be used to maximum advantage in pursuing balanced and responsible economic development in the Arctic. (Paragraph 257)
32. Given the relatively high costs of hydrocarbon extraction in the Arctic, and current low global energy prices, there may be limited potential for new

Arctic oil and gas production in the short to medium term. This may offer a window of opportunity for taking stock and gaining increased clarity on whether oil and gas extraction in ice-affected Arctic waters can be achieved safely and responsibly and, if so, how. (Paragraph 277)

33. Maximum advantage needs to be taken of this ‘breathing space’ to establish whether it is possible to reach a point where it is categorically clear that the risks of a major spill are acceptably low and that the damage caused by a major spill could be contained. This should also provide an opportunity to improve wider understanding of the impacts of oil spills in ice-affected waters and to consider whether any international standards on where drilling can be undertaken in relation to ice can be agreed. (Paragraph 278)
34. The UK has significant technological and research expertise in oil spill responses, and operations in harsh environments; the Government should work, with UK Trade & Investment, research funders and others, to ensure that the UK is in a position to make a strong contribution to this work. (Paragraph 279)
35. To protect Arctic species, indigenous livelihoods and tourism, as well as to ensure that the UK remains a respected partner in Arctic operations, UK companies engaged in mining operations in the Arctic—at all levels of operation—should pursue the highest possible environmental standards of operation and remediation. They should engage proactively and effectively with local residents when developing their operations, and source as much of their labour as possible from local communities, investing in training and capacity building. We recommend that the Government encourage such high standards, and promote this sustainable approach to UK businesses in all future UKTI activities. (Paragraph 289)
36. Concerns have been expressed regarding the adequacy of the environmental provisions contained within the Polar Code. Black carbon, heavy fuel oils and discharged ballast water all pose a threat to the Arctic environment and ecosystems; these threats should be addressed as the regulatory regime concerning Arctic shipping continues to evolve. In any future discussions regarding the development or expansion of the Polar Code all Government departments should promote actively the inclusion of additional robust environmental measures. (Paragraph 319)
37. Full and rigorous implementation of the Polar Code is vital. The UK is home to a range of maritime regulation and standards interests, including the International Maritime Organisation, insurance and finance providers and classification societies, which will make an important contribution. We urge the Government, and all relevant UK interests, to pursue full implementation of the Code as a matter of urgency and, also, to consider ways in which its implementation could be monitored. (Paragraph 320)
38. In view of the rapid rise of tourism in the Arctic and particularly the prospect of large passenger ships sailing in Arctic waters, there is an urgent need to develop co-ordinated search and rescue facilities in the region. This is an immense task but it is a necessary one. While we recognise that work is being done on this, we emphasise that those involved must not wait for a major incident before developing a comprehensive strategy towards Arctic search and rescue. (Paragraph 321)

39. The UK has a recognised expertise in search and rescue and the Government should give urgent attention to developing a pan-Arctic search and rescue strategy along with the Arctic states. (Paragraph 323)
40. We believe that consideration should be given to whether the Arctic maritime tourism industry should be required to make a contribution to strengthening search and rescue in the region. (Paragraph 324)
41. The central Arctic Ocean is, under the provisions of UNCLOS, designated as international waters and the discussion of future ways to sustainably manage fish stocks in this area is, therefore, an international issue. We recommend that the Government seeks to promote and to play an active role in such discussions. The Government should push for real international consultation and progress on this issue well before any fishing begins. That consultation should include nearby Regional Fisheries Management Organisations, which might have a part to play. (Paragraph 332)
42. Given the current lack of understanding of Arctic marine ecosystems and their responses to climate change, we recommend that a moratorium on fishing in the high seas area of the Arctic Ocean is required, at least until a recognised management regime for the area is agreed. We recommend that the UK Government should pursue a precautionary approach in any negotiations on this matter. The Government should advocate for any future management regime to be based upon sound and responsive science. We also recommend that any future Arctic fisheries management organisation, once established, should be granted observer status on the Arctic Council. (Paragraph 333)
43. The commercial opportunities that could arise in the Arctic are significant. However, the volatility of global markets for resources, and the changing degree to which resource sources and shipping routes in other parts of the world compete with opportunities in the Arctic, suggest there will be long-term uncertainty about the extent to which Arctic potentials will be realised. At the same time, the local effects of climate change may help economic development in the Arctic, but they may also hinder it. There is therefore no straightforward correlation between climate change and the creation of real economic opportunities in the Arctic. (Paragraph 336)
44. These uncertainties reinforce the need for the UK to be fully engaged with the region, so that it can maximise any opportunities that arise, and also be vigilant about potential challenges and risks. (Paragraph 337)
45. These uncertainties also, however, provide one particularly important opportunity: for international knowledge and understanding of the vulnerable Arctic environment to get ahead of further substantial human interventions. Any substantial interventions must be informed by that knowledge, so that any harm they might cause can be judged and minimised. (Paragraph 338)
46. As international engagement with the Arctic intensifies, the Government should work to ensure that the UK, as a near Arctic state, takes a leading role in this work. (Paragraph 339)

Chapter 6: The UK and the Arctic

47. The breadth of the UK's interests in the Arctic demonstrates the importance of this region to the UK. While we commend the work that the Polar Regions

Department (PRD) has done to date to articulate and pursue the UK's Arctic interests, the speed of change in the region and the emerging opportunities and challenges mean that British engagement with the region now needs to intensify. (Paragraph 351)

48. British policies towards the Arctic have to date been more reactive than proactive. The UK's approach needs to be more strategic, better co-ordinated, and more self-confident and proactive, or the UK risks being outmanoeuvred by other states with less experience in the Arctic but a more positive and forward-looking engagement. (Paragraph 352)
49. By dint of its combination of Arctic proximity, history, skills, knowledge and research, its competitive advantage in applicable business sectors, and its own international standing, the UK should be positioned as the premier partner for Arctic states and other interests in Arctic co-operation: the Government should adopt this as its ambition in Arctic affairs. (Paragraph 353)
50. We recommend that discussions be initiated by the Foreign and Commonwealth Office (FCO), involving the Government Chief Scientific Adviser and the UK Research Councils, with a view to establishing a substantial long-term programme of Arctic research and fully effective representation on Arctic Council bodies. Relevant partners from industry and technology developers and appropriate NGOs should be fully consulted and involved in the programme. (Paragraph 385)
51. The UK can and should be more active in Arctic affairs. Our view is that the Government should follow the example of others in appointing a UK Ambassador for the Arctic, based in the FCO's Polar Regions Department, to ensure greater focus on and co-ordination of Arctic affairs in Government. The Ambassador should chair the cross-Whitehall Arctic network. He or she should also prioritise bringing together the UK Arctic science, policy, academic, industry and business communities in order to strengthen opportunities for the UK in the region and spearhead UK interests in the Arctic. (Paragraph 390)
52. As the Arctic grows in importance, the resourcing and possibly the organisational location of the PRD may need to be reviewed. (Paragraph 394)
53. While we appreciate the PRD's sensitivity to ensuring value for money in the representation of the Government and UK Arctic research in Arctic fora, our view is that it is important for the UK to be not just occasionally but consistently and authoritatively represented at Arctic Council meetings, meetings of other Arctic co-operation bodies, and meetings of organisations working on Arctic-related issues and treaties. The appointment of a UK Arctic Ambassador, with funding to support that role, would be central to the delivery of this objective. When it is the collective view that the UK ought to be represented at a particular Arctic meeting the relevant department or research council should be required to provide and fund such representation. (Paragraph 400)
54. The UK Parliament should also make a contribution to representing the UK in Arctic fora: we recommend that the House of Lords and House of Commons should ensure that UK Parliamentarians regularly attend the Conference of Parliamentarians of the Arctic Region as observers. (Paragraph 401)

55. The UK must become more effective in communicating its connections to the Arctic and its strengths in knowledge, skills and businesses with relevance to the Arctic, and what it offers to the Arctic as a near Arctic state. (Paragraph 403)
56. The Government's 2013 Arctic Policy Framework was a good first step. However, in the quickly changing context of Arctic co-operation it now seems too hesitant and cautious. Other Arctic Council observer states are assertive about their interests in the Arctic and the UK should be too. The Government should commission a new version of the document within the next year. The new version should be bolder in presenting the UK as a premier partner in the Arctic. (Paragraph 407)
57. The UK's boosted focus on and enthusiasm for engagement in the Arctic should be reflected by upgrading the revised document to an Arctic 'strategy'; in our view this would in no way diminish the Government's proper respect for the primacy of Arctic states and residents. (Paragraph 408)
58. The Arctic strategy should be updated at least every five years, and more often if the rapid pace of change in the Arctic demands. (Paragraph 410)
59. We recommend that the Government should write to the Chairman of the House of Lords Liaison Committee (which recommended the establishment of this *ad hoc* Committee) to update the House on the progress that has been made between a year and 18 months after the publication of the Government's response. (Paragraph 413)
60. We further recommend that the Minister responsible for the Polar Regions should write to the Chairman of the House of Commons Foreign Affairs Committee at least annually, updating that Committee on the progress of Arctic co-operation and the UK's contribution to it through all Government departments, sections of the FCO and Government-funded work. (Paragraph 414)
61. The UK should continue to look for opportunities to strengthen its bilateral relationships with the eight Arctic states, and to build bilateral links related to the Arctic with other Arctic Council observer states, in order to make progress on Arctic science and policy issues and look for efficiencies. For example, the UK should explore whether it might be helpful to invite observer states without Svalbard research bases (such as Singapore) to use British scientific resources at Ny-Ålesund in order to enhance its relationships with those states, and possibly share burdens. The UK Arctic Ambassador would be well-placed to look for such opportunities. (Paragraph 416)
62. Given the increasing importance of the Arctic region and the UK's interests in the Antarctic, the Ministry of Defence should maintain and develop its cold-weather operational capabilities, expertise and resources. (Paragraph 427)
63. The 2015 Strategic Defence and Security Review must give urgent consideration to reintroducing a maritime patrol capability for the UK. This is needed for both defence and search and rescue operations. (Paragraph 428)
64. The UK higher education sector could further build on its Arctic strengths by building up courses and offering international scholarships at all levels in Arctic science, technology, geology, engineering, social sciences, health and mental health and strengthening its academic collaborations with Arctic states and other Arctic observer states such as Singapore and Japan, and

with Arctic academic institutions such as the University Centre in Svalbard. (Paragraph 435)

65. The UK's existing world-class museum and cultural sector should build further connections and collaborations with similar institutions in the Arctic region. There is already impressive evidence of collaboration within the UK, but this could be expanded upon as part of the enhancement of UK soft power. (Paragraph 436)
66. The UK should be making use of its expertise in areas such as hydrography, weather and ice prediction in its relationships with the Arctic states through the Arctic Council and other Arctic fora in order to ensure that the UK is considered a primary partner in the Arctic, earning the UK both influence and commercial benefits in the region. The Government should support the UK Hydrographic Office in developing the links required to work effectively with partners in Arctic states, in order that it is able to respond to demand for new charting of Arctic waters. (Paragraph 437)
67. The UK is the Arctic's nearest neighbour and the Arctic is the UK's neighbourhood: the Government must invest in this relationship to reap benefits for the UK and for international common interests. (Paragraph 446)

APPENDIX 1: LIST OF MEMBERS AND DECLARATIONS OF INTEREST

Members

Lord Addington
 Lord Ashton of Hyde (until 16 July 2014)
 Baroness Browning
 Lord Hannay of Chiswick
 Viscount Hanworth
 Lord Hunt of Chesterton
 Lord Moynihan
 Baroness Neville-Jones (from 14 October 2014)
 Lord Oxburgh
 Lord Soley
 Baroness Symons of Vernham Dean
 Lord Teverson (Chairman)
 Lord Tugendhat

Declarations of interest

Lord Addington
No relevant interests declared

Lord Ashton of Hyde (until 16 July 2014)
Non-executive Director, Aegis Managing Agency Limited

Baroness Browning
Member, Advisory Committee on Business Appointments (to end 2014)
Chair, Advisory Committee on Business Appointments (from 1 January 2015)

Lord Hannay of Chiswick
Member, Advisory Board, Centre for European Reform
Member, Future of Europe Forum, Advisory Board for Centre for British Influence through Europe
Member, Council, University of Kent
Member, European Leadership Network
Shareholdings, BHP Billiton, Black Rock World Mining Trust, Royal Dutch Shell plc, Weir Group

Viscount Hanworth
Emeritus Professor of Econometrics and Computational Statistics, University of Leicester
Shareholdings, Royal Dutch Shell plc

Lord Hunt of Chesterton
President, Advisory Committee on Protection of the Sea (ACOPS)
Director, Cambridge Environmental Research Consultants Ltd
Consultant, Atlas Elektronik (MoD contractor)
Emeritus Professor, University College London (Earth Sciences)
Fellow, Royal Meteorological Society (UK), Royal Society (UK), Academia Europaea, American Institute of Physics (USA)
Honorary degrees Uppsala (Sweden), Western University (Ontario, Canada)
Fellow, Royal Society

Lord Moynihan
Director and Shareholder, Rowan Companies plc; an international oil and gas drilling company with a fleet of jack-up rigs and ultra-deep-water

drill ships which provide contract drilling services and rigs to oil and gas operators. In its 90-year history, Rowan has developed the expertise and technology to operate drilling rigs in extreme cold environments, such as land rigs on the North Slope of Alaska and jack-up rigs on the Grand Banks of Eastern Canada and the Cook Inlet of Alaska. The Company's land drilling division operated north of the Arctic Circle; however, the Company has since divested this division. The Company's sole focus is now offshore and it has never operated offshore rigs north of the Arctic Circle.

Director of a number of renewables and clean tech companies in the UK and the USA, none of which are active in the Arctic.

Fellow, the Royal Geographical Society

Shareholdings, Canadian Natural Resources Limited (until January 2015)

Baroness Neville-Jones (from 14 October 2014)

Member, Engineering and Physical Sciences Research Council

Lord Oxburgh

Director, 2OC

Director, Green Energy Options

Fellow, The American Geophysical Union

Fellow, The Geological Society

Fellow, The Geological Society of America

Fellow, The Royal Society

Foreign Member, US & Australian Academies of Sciences

Honorary Fellow, Royal Academy of Engineering

Lord Soley

Chairman and Director, Good Governance Foundation

Member, International Institute for Strategic Studies (IISS)

Baroness Symons of Vernham Dean

Consultant, Consolidated Construction Company (CCC) UK in relation to their interests in the Middle East North Africa region. CCC UK has interest in oil and gas in that region, but has no activity in the Arctic region

Lord Teverson (Chairman)

Director, Marine Management Organisation (non-departmental public body)

Co-Chair of the Liberal Democrat Parliamentary Party Committee on Energy and Climate Change

Fellow, Chartered Institute for Securities and Investment

Trustee, Regen SW (renewable energy agency for South West England)

Lord Tugendhat

*Shareholdings in Rio Tinto, Shell, BP, Exxon, Chevron, and ETFS
Commodity Securities*

A full list of Members' interests can be found in the Register of Lords' Interests: <http://www.parliament.uk/mps-lords-and-offices/standards-and-interests/register-of-lords-interests>

Professor Klaus Dodds (Specialist Adviser)

Council Member, Canada-UK Council

Member, Polar Partnership Committee - an academic committee dedicated to discussing polar science co-ordination.

Study tour to Tromsø and Svalbard courtesy of the Royal Norwegian Embassy in London, May 2012.

Susannah Street (Clerk)

Study tour to Tromsø and Svalbard for officials and UK-based researchers,

2–5 June 2014, courtesy of the Royal Norwegian Embassy in London. Including transport, meals, accommodation, short boat trip, and briefings by the Norwegian Joint Headquarters, the Norwegian Coast Guard, Statoil, the Norwegian Polar Institute, the Arctic Council Secretariat, the office of the Governor of Svalbard, Longyearbyen University Centre, Kings Bay AS, the Norwegian Mapping Authority, the French-German research station at Ny-Ålesund, SvalSat, and the Association of Arctic Expedition Cruise Operators

APPENDIX 2: LIST OF WITNESSES

Evidence is published online at <http://www.parliament.uk/arcticcom> and available for inspection at the Parliamentary Archives (020 7219 3074).

Evidence received by the Committee is listed below in chronological order of oral evidence session and in alphabetical order. Those witnesses marked with ** gave both oral and written evidence. Those marked with * gave oral evidence and did not submit any written evidence. All other witnesses submitted written evidence only.

Oral evidence in chronological order

- | | |
|---|---------------------------------|
| ** Henry Burgess, Deputy Head of Polar Regions Department, Foreign & Commonwealth Office | <u>QQ 1–15</u> |
| ** Debbie Brothers, Deputy Head of Bilateral Relations, NATO and Europe Policy, Ministry of Defence | |
| ** Martin Molloy, Senior Executive Officer, United Nations, OSCE and Arctic Policy, Ministry of Defence | |
| ** Jane Rumble, Head of Polar Regions Department, Foreign & Commonwealth Office | |
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| ** Dr Sheldon Bacon, National Oceanography Centre | <u>QQ 16–28</u> |
| ** Dr Ed Hawkins, University of Reading | |
| ** Professor Chris Rapley, University College London | |
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| ** Professor Danny Feltham, University of Reading | <u>QQ 29–36</u> |
| ** Professor Andy Shepherd, University of Leeds | |
| ** Professor Peter Wadhams, University of Cambridge | |
|
 | |
| * Christian Le Mièrre, International Institute for Strategic Studies | <u>QQ 37–49</u> |
| * Dr Jeffrey Mazo, International Institute for Strategic Studies | |
|
 | |
| ** Professor Robin Churchill, University of Dundee | <u>QQ 50–62</u> |
| ** Professor Maurice Mendelson QC, Blackstone Chambers | |
| * Professor Philip Steinberg, Centre for Borders Research, University of Durham | |
|
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| * Kiran Khosla, International Chamber of Shipping | <u>QQ 63–80</u> |
| ** Colin Manson, Manson Oceanographic Consultancy | |
| * Dr Martin Stopford, Clarksons Research | |
|
 | |
| ** Dr Nalân Koç, Research Director, Norwegian Polar Institute | <u>QQ 81–97</u> |
| * Dr Jan-Gunnar Winther, Director, Norwegian Polar Institute | |

- ★ Erik Haaland, Leader, Arctic Non-Technical Risk, Statoil [QQ 98–115](#)
- ★ Rúni M Hansen, Vice-President, Arctic Unit, Statoil

- ★ Runar Myrnes Balto, Political Adviser to Ms Aili Keskitalo, President of the Sámi Parliament of Norway [QQ 116–130](#)
- ★ Jon Petter Gintal, Senior Adviser, Department of Rights and International Affairs, the Sámi Parliament of Norway

- ★ Lord Fairfax of Cameron, Chairman of Sovcomflot Overseas Holding Ltd [QQ 131–141](#)
- ★★ Rob Hindley, Lead Specialist in Arctic Technology, Lloyd's Register
- ★ Tom Paterson, Senior Vice-President, Shipowning, Arctic, and Projects, Fednav

- ★★ Professor Mike Bradshaw, Warwick Business School [QQ 142–157](#)
- ★★ Dr Richard Powell, University of Oxford
- ★★ Professor Frances Wall, Camborne School of Mines, University of Exeter

- ★ Professor Geoffrey Boulton OBE FRS FRSE, University of Edinburgh [QQ 158–172](#)
- ★★ Dr Andrew Foxall, Director of the Russia Studies Centre at The Henry Jackson Society
- ★★ Tim Reilly, Arctic Advisory Group

- ★★ Ben Ayliffe, Head of Campaigns for the Greenpeace Arctic Programme, Greenpeace International [QQ 173–188](#)
- ★★ Charlie Kronick, Senior Climate Advisor, Greenpeace UK
- ★★ Nathalie Rey, Deputy Unit Head of the Political and Business Unit of Greenpeace International, Greenpeace International

- ★★ Dr John Campbell, Technical Director, International Association of Oil and Gas Producers (OGP) [QQ 189–202](#)
- ★★ Dr Michael Engell-Jensen, Executive Director, International Association of Oil and Gas Producers (OGP)

- ★★ Claude Perras, Head of Sustainability, London Mining [QQ 203–213](#)
- ★ Richard Morgan, Head of Government Relations, Anglo American

- ★★ Rod Johnson, former Chief Coastguard [QQ 214–225](#)
- ★ Rear Admiral Tom Karsten RN, UK National Hydrographer

- ★★ Dr Richard Wood, Head of Oceans Cryosphere and Dangerous Climate Change, Met Office
- ★★ Vincent Rigby, Chair of the Senior Arctic Officials, Canadian Chairmanship, the Arctic Council [QQ 226–236](#)
- ★★ Rod Downie, Polar Programme Manager, WWF UK [QQ 237–249](#)
- ★★ Dr Martin Sommerkorn, Head of Conservation, Global Arctic Programme, WWF
- ★★ Matthew King, Head of Unit C1, Maritime Policy, Atlantic, Outermost Regions and Arctic, Directorate-General of Maritime Affairs and Fisheries, European Commission [QQ 250–259](#)
- ★ Professor Julian Dowdeswell, Director, Scott Polar Research Institute [QQ 260–272](#)
- ★★ Professor Jane Francis, Director, British Antarctic Survey (BAS)
- ★ Dr Ray Leakey, Arctic Research Theme Leader, Scottish Association for Marine Science
- ★ HE Else Berit Eikeland, Norway’s Polar Ambassador and Senior Arctic Official to the Arctic Council [QQ 273–283](#)
- ★ HE Thórdur Aegir Óskarsson, Ambassador of Iceland to the United Kingdom
- ★ HE Claus Grube, Ambassador of Denmark to the United Kingdom [QQ 284–291](#)
- ★★ Terry Audla, President of Inuit Tapiriit Kanatami (ITK) [QQ 292–301](#)
- ★ HE Foo Chi Hsia, High Commissioner for Singapore to the United Kingdom [QQ 302–310](#)
- ★★ HE Keiichi Hayashi, Ambassador of Japan to the United Kingdom
- ★ HE Nicola Clase, Ambassador of Sweden to the United Kingdom [QQ 311–318](#)
- ★ HE Pekka Huhtaniemi, Ambassador of Finland to the United Kingdom
- ★ Alan Kessel, Deputy High Commissioner for Canada to the United Kingdom
- ★★ Julian Brazier MP, Parliamentary Under-Secretary of State, Ministry of Defence [QQ 319–330](#)

- ** Henry Burgess, Deputy Head of Polar Regions
Department, Foreign & Commonwealth Office
- ** Nick Gurr, Director for International Security Policy,
Ministry of Defence
- ** Jane Rumble, Head of Polar Regions Department, Foreign
& Commonwealth Office

Alphabetical list of all witnesses

- * Anglo American
Arctic Methane Emergency Group (AMEG) [ARC0055](#)
- ** Arctic Advisory Group [ARC0060](#)
- ** The Arctic Council Secretariat [ARC0068](#)
Arctic Athabaskan Council [ARC0014](#)
Captain Anders Backman, President, Viking Ice Council [ARC0054](#)
- ** Dr Sheldon Bacon, National Oceanography Centre [ARC0013](#)
[ARC0049](#)
- ** Professor Michael Bradshaw, Warwick Business School
- ** Professor Jane Francis, British Antarctic Survey (BAS) [ARC0018](#)
Professor Terry V. Callaghan, University of Sheffield and [ARC0030](#)
National Research Tomsk State University, Russia
Professor Alex Calvo, Nagoya University, Japan [ARC0007](#)
Canadian Polar Commission [ARC0040](#)
Professor Robin Churchill, University of Dundee [ARC0038](#)
- * Clarksons Research Services
- * HE Nicola Clase, Ambassador of Sweden to the United
Kingdom
Luke Coffey, Margaret Thatcher Fellow, The Heritage [ARC0017](#)
Foundation
Michael Jonathan Dangerfield, University of Oxford [ARC0063](#)
Duncan Depledge, Royal Holloway, University of London [ARC0011](#)
- * Professor Julian Dowdeswell, Director, Scott Polar
Research Institute
- * HE Else Berit Eikeland, Polar Ambassador of Norway and
Senior Arctic Official to the Arctic Council
- ** European Commission [ARC0064](#)
European Policies Research Centre (EPRC), School of [ARC0020](#)
Government and Public Policy, University of Strathclyde
- * Lord Fairfax of Cameron, Chairman of Sovcomflot
Overseas Holding Ltd
- * Fednav
- ** Professor Daniel Feltham, University of Reading [ARC0049](#)

- ★ HE Foo Chi Hsia, High Commissioner for Singapore to the United Kingdom
- ★★ Foreign and Commonwealth Office [ARC0001](#)
[ARC0004](#)
[ARC0024](#)
[ARC0072](#)
- ★★ Dr Andrew Foxall, The Henry Jackson Society [ARC0033](#)
[ARC0052](#)
- Dr Alan Gadian, National Centre for Atmospheric Sciences and University of Leeds [ARC0036](#)
- The Geological Society [ARC0031](#)
- Dr Dougal Goodman OBE FREng [ARC0022](#)
- ★★ Greenpeace UK [ARC0016](#)
- ★ HE Claus Grube, Ambassador of Denmark to the United Kingdom
- ★★ Dr Ed Hawkins, University of Reading [ARC0013](#)
[ARC0049](#)
- ★★ HE Keiichi Hayashi, Ambassador of Japan to the United Kingdom [ARC0069](#)
- HE Pekka Huhtaniemi, Ambassador of Finland to the United Kingdom
- Elizabeth Kirk [ARC0015](#)
- Daniel Kochis, Research Assistant, The Heritage Foundation [ARC0019](#)
- ★★ International Association of Oil and Gas Producers (OGP) [ARC0034](#)
[ARC0067](#)
- ★ International Chamber of Shipping
- International Maritime Organization [ARC0066](#)
- International Polar Foundation UK [ARC0037](#)
- ★★ Roderick Johnson, former Chief Coastguard [ARC0065](#)
- ★★ Inuit Tapiriit Kanatami (ITK) [ARC0058](#)
- Joint Nature Conservation Committee [ARC0059](#)
- ★ Rear Admiral Tom Karsten RN, UK National Hydrographer
- Dr Ilan Kelman, University College London and Norwegian Institute of International Affairs [ARC0051](#)
- ★ Alan Kessel, Deputy High Commissioner for Canada to the United Kingdom
- Michael Kingston DWF LLP [ARC0054](#)
[ARC0070](#)
- ★★ Dr Nalân Koç, Research Director, Norwegian Polar Institute [ARC0061](#)

- * Christian Le Mière, International Institute for Strategic Studies
- * Dr Ray Leakey, Arctic Research Theme Leader, Scottish Association for Marine Science
- ** Lloyd's Register [ARC0048](#)
- ** London Mining [ARC0046](#)
- Hugh Mackay [ARC0042](#)
- ** Colin Manson, Manson Oceanographic Consultancy [ARC0005](#)
- * Dr Jeffrey Mazo, International Institute for Strategic Studies
- ** Professor Maurice Mendelson QC, Blackstone Chambers [ARC0039](#)
- ** Met Office [ARC0044](#)
[ARC0071](#)
- ** Ministry of Defence [ARC0002](#)
[ARC0073](#)
- National Centre for Atmospheric Science (NCAS) [ARC0021](#)
- National Oceanography Centre [ARC0032](#)
- The Natural Environment Research Council (NERC) [ARC0041](#)
- Natural Environment Research Council (NERC) Arctic Office [ARC0028](#)
- * HE Thórhður Aegir Óskarsson, Ambassador of Iceland to the United Kingdom
- ** Dr Richard C. Powell, Mansfield College, Oxford [ARC0053](#)
- Professor Chris Rapley, University College London [ARC0013](#)
[ARC0049](#)
- ** Vincent Rigby, Chair of the Senior Arctic Officials, Canadian Chairmanship, the Arctic Council [ARC0068](#)
- Åke Rohlén, President, Arctic Marine Solutions [ARC0054](#)
- The Royal Society [ARC0047](#)
- * The Sámi Parliament of Norway
- ** Professor Andy Shepherd, University of Leeds [ARC0045](#)
- * Statoil
- Dr Dmitriy S. Tulupov, St. Petersburg State University [ARC0009](#)
- * Professor Philip Steinberg, Centre for Borders Research, University of Durham
- Stratton Park Associates [ARC0025](#)
- Professor Damon A.H. Teagle, Director of Research, Ocean & Earth Science, National Oceanography Centre and Deputy Director (Research) Southampton Marine & Maritime Institute [ARC0029](#)
- Dr Aki Tonami, Researcher, Nordic Institute of Asian Studies, Department of Political Science, University of Copenhagen [ARC0008](#)

	University College London, Institute for Risk and Disaster Reduction	<u>ARC0027</u>
**	Professor Peter Wadhams, University of Cambridge	<u>ARC0006</u>
**	Professor Frances Wall, Camborne School of Mines, University of Exeter	<u>ARC0056</u>
	Matthew Willis, Royal United Services Institute for Defence and Security Studies	<u>ARC0043</u>
*	Dr Jan-Gunnar Winther, Director, Norwegian Polar Institute	
*	Dr Richard Wood, Head of Oceans, Cryosphere and Dangerous Climate Change, Met Office	
	World Meteorological Office's (WMO's) Polar Prediction Project	<u>ARC0026</u>
**	WWF-UK	<u>ARC0050</u>

Members of the Committee, accompanied by the Committee's Clerk and Specialist Adviser, travelled to Tromsø (northern Norway) and Svalbard in September 2014, where they held meetings with:

	The British Ambassador to Norway, Sarah Gillett CMG CVO	
**	Dr Nalân Koç, Research Director, and Dr Jan-Gunnar Winther, Director, Norwegian Polar Institute	<u>QQ 81–97</u>
	Magnús Jóhannesson, Director, and Nina Buvang Vaaja, Deputy Director, Arctic Council Secretariat	
*	Erik Haaland, Leader, Arctic Non-Technical Risk, and Rúni M Hansen, Vice-President, Arctic Unit, Statoil	<u>QQ 98–115</u>
	Elle Merete Omma, Executive Secretary, and Alona Yefimenko, Technical Advisor, Arctic Council Indigenous Peoples' Secretariat	
*	Runar Myrnes Balto, Political Adviser to Ms Aili Keskitalo, President of the Sámi Parliament of Norway, and Jon Petter Gintal, Senior Adviser, Department of Rights and International Affairs, the Sámi Parliament of Norway	<u>QQ 116–130</u>
	Jens Olav Sæther, Vice Governor of Svalbard	
	Terje Aunevik, Managing Director, Pole Position Logistics AS (Longyearbyen)	
	Kjetil Bråten, Harbour Master, Port of Longyearbyen	
	Alexander Veselov, General Director, State Trust "Arcticugol", Moscow (the coal mining company owned by the government of Russia operating in Barentsburg, Svalbard)	
	Professor David Vaughan, Director of Science, British Antarctic Survey and Nicholas Cox, Manager, UK Arctic Research Station, Ny-Ålesund, Svalbard	

Per Andersson, Managing Director/CEO, Store Norske Spitsbergen Grubekompani (the coal mining company 99.9 per cent owned by the government of Norway operating in Svalbard)

Eva Therese Jenssen, Information Manager, the University Centre in Svalbard (UNIS), Professor Jan Otto Larsen, head of the UNIS Arctic technology department, Adjunct Associate Professor Lars Henrik Smedsrud (University of Bergen and UNIS), and Adjunct Professor Jørgen Berge (University of Tromsø and UNIS)

Frigg Jørgensen, Executive Director, Association of Arctic Expedition Cruise Operators.

Note: refreshments were on occasion offered to the Committee by the hosts of these meetings.

The Committee also wishes to thank the students and teachers from the five schools that took part in the debate, chaired by Lord Teverson, in the House of Lords on Friday 9 January 2015:

Ibstock Place School, Roehampton

Redland High School, Bristol

St Leonards-Mayfield School, Mayfield, East Sussex

Thames Christian College, London

Ysgol Dyffryn Amam, Ammanford

APPENDIX 3: CALL FOR EVIDENCE

Select Committee on the Arctic

The House of Lords Select Committee on the Arctic, chaired by Lord Teverson, was appointed on 12 June 2014 to consider recent and expected changes in the Arctic, and to consider their implications for the UK and its international relations. The Committee invites interested individuals and organisations to submit evidence to this inquiry.

The Committee in particular will explore the following key issues in detail, and would welcome your views on any or all of the following questions. Please note that questions are not listed here in any particular order of importance.

Written evidence should arrive no later than 29 September 2014. Public hearings will be held in July, October and November 2014. The Committee will report to the House, with recommendations, in February 2015. The report will receive a response from the Government, and the report and response will be debated in the House.

Background

Over the last fifty years access to the Arctic Ocean has become much easier as the average extent of summer sea ice has declined. The melting of the ice—along with other physical changes—presents a set of unique and rapidly evolving risks and opportunities. These have led to an intensification of international interest in the region. The UK, the Arctic's 'nearest neighbour' and an observer state in the Arctic Council, published an 'Arctic Policy Framework' in October 2013 but UK interests in the changing Arctic stretch far beyond Government, to encompass commercial actors, researchers, those concerned with preserving Arctic ecosystems and livelihoods, and many others.

Scope

The effects of recent and expected climate change in the Arctic region form the background to the Committee's inquiry, but the Committee will not be looking at the direct effects that climate change in the Arctic might have on the rest of the globe, such as worldwide sea level changes. The Committee's focus will be on the opportunities and risks that changes in the Arctic will bring, including their impacts on UK interests, and the UK's international relations.

Questions

1. What are the main issues arising from recent and expected changes in the Arctic region? How will these changes impact upon the Arctic, and what is the impact for the UK?
2. Will changes in the Arctic lead to new economic and commercial opportunities? What are these opportunities, and how might they be delivered? What should be the role of the UK Government, of British businesses and of other sections of civil society?
3. How should economic development be balanced with environmental protection in the Arctic? Are appropriate systems in place to ensure the correct balance is found and maintained? How should the UK be involved in establishing this balance?
4. What are the human aspects of the expected climatic and economic changes in terms of local populations, current and future?

5. Are there sufficient data on the Arctic to make informed policy decisions? If not, where are the gaps and how should they be remedied?
6. Are there climate change mitigation and adaptation strategies local to the Arctic that should be deployed or tested? What contribution can the UK make?
7. Are current international governance and security arrangements appropriate for dealing with anticipated challenges in the Arctic? How should the UK support the Arctic states in their stewardship of the region?
8. How effectively does the UK interact with Arctic governance structures? Is the UK Government's approach, as set out in the Arctic Policy Framework, proportionate and appropriate?

APPENDIX 4: GLOSSARY OF TERMS AND ABBREVIATIONS

A5	The five states with Arctic Ocean coastlines: Canada, Denmark, Norway, Russia and the United States
A8	The eight states who have land territory inside the Arctic Circle: Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden and the United States,
AAC	Arctic Athabaskan Council
AEC	Arctic Economic Council
ASFR	Arctic Security Forces Roundtable
BAS	British Antarctic Survey
BIS	Department for Business, Innovation and Skills
CASP	Cambridge Arctic Shelf Programme
CBD	United Nations Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species
CLCS	Commission on the Limits of the Continental Shelf
CMS	Convention on the Conservation of Migratory Species of Wild Animals
EEZ	Exclusive Economic Zone
EU	European Union
FCO	Foreign and Commonwealth Office
GPS	Global Positioning System
IASC	International Arctic Science Committee
ICC	Inuit Circumpolar Council
IISS	International Institute for Strategic Studies
IMO	International Maritime Organisation
IPCC	Intergovernmental Panel on Climate Change
ITK	Inuit Tapiriit Kanatami
IUCN	International Union for Conservation of Nature
MOD	Ministry of Defence
NATO	North Atlantic Treaty Organisation
NCAS	National Centre for Atmospheric Science
NEAFC	North East Atlantic Fisheries Commission
NERC	Natural Environment Research Council
NGO	Non-governmental organisation
NOC	National Oceanography Centre
NSR	Northern Sea Route
MARPOL	The International Convention for the Prevention of Pollution from Ships

OGP	International Association of Oil and Gas Producers
OSCE	Organisation for Security and Co-operation in Europe
OSPAR	The Convention for the Protection of the Marine Environment of the North-East Atlantic
PRD	Polar Regions Department, Foreign and Commonwealth Office
RAIPON	Russian Association of Indigenous Peoples of the North, Siberia and Far East
RFMOs	Regional Fisheries Management Organisations
SAMS	Scottish Association for Marine Science
SAR	Search and Rescue
SOLAS	International Convention for the Safety of Life at Sea, 1974
SWIPA	Snow, Water, Ice and Permafrost in the Arctic Report, 2011
UKTI	UK Trade & Investment
UN	United Nations
UNCLOS	The United Nations Convention on the Law of the Sea
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change
WWF	World Wide Fund for Nature

APPENDIX 5: LIST OF INTERNATIONAL AGREEMENTS (OR BODIES WITH REGULATORY POWERS) OF MATERIAL RELEVANCE TO ARCTIC DEBATE, SUPPLIED BY THE FOREIGN AND COMMONWEALTH OFFICE

Name of agreement	Category	Summary	Signatories
United Nations Convention on the Law of the Sea (UNCLOS)	Governance	Lays down a comprehensive regime of law and order in the world's oceans and seas establishing rules governing all uses of the oceans and their resources. It enshrines the notion that all problems of ocean space are closely interrelated and need to be addressed as a whole. The Convention comprises 320 articles and nine annexes, governing all aspects of ocean space, such as delimitation, environmental control, marine scientific research, economic and commercial activities, transfer of technology and the settlement of disputes relating to ocean matters. Separate briefing to follow.	166 ratifications, including all Arctic States except the United States, and the UK
International Maritime Organization	Shipping	A specialized agency of the United Nations, IMO is the global standard-setting authority for the safety, security and environmental performance of international shipping. Its main role is to create a regulatory framework for the shipping industry that is fair and effective, universally adopted and universally implemented.	Has 170 Member States, including all Arctic States and the UK, and three Associate Members

Name of agreement	Category	Summary	Signatories
The Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)	Environment	OSPAR is the mechanism by which fifteen Governments of the western coasts and catchments of Europe, together with the European Union, cooperate to protect the marine environment of the North-East Atlantic. It started in 1972 with the Oslo Convention against dumping. It was broadened to cover land-based sources and the offshore industry by the Paris Convention of 1974. These two conventions were unified, up-dated and extended by the 1992 OSPAR Convention. The new annex on biodiversity and ecosystems was adopted in 1998 to cover non-polluting human activities that can adversely affect the sea.	Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom
Regional Fisheries Management Organisations (RFMOs)	Fisheries	RFMOs are international organisations formed by countries with fishing interests in an area. Some of them manage all the fish stocks found in a specific area, while others focus on particular highly-migratory species. The organisations are open both to countries in the region (“coastal states”) and to countries with interests in the fisheries concerned. While some RFMOs have a purely advisory role, most have management powers to set catch and fishing effort limits, technical measures, and control obligations. The two main geographical based RFMOs overlapping with the Arctic are the North East Atlantic Fisheries Commission (NEAFC) and the Northwest Atlantic Fisheries Commission (NAFO).	<p>NEAFC: Denmark*, European Union, Iceland, Norway, Russian Federation.</p> <p>NAFO: Canada; Cuba; Denmark*; European Union; France**; Iceland; Japan; South Korea; Norway; Russia; Ukraine; United States of America</p> <p>*in respect of Faroe Islands and Greenland</p> <p>**in respect of Saint Pierre and Miquelon</p>

Name of agreement	Category	Summary	Signatories
Food and Agriculture Organisation of the United Nations	Food supply /fisheries	Three main goals are: the eradication of hunger, food insecurity and malnutrition; the elimination of poverty and the driving forward of economic and social progress for all; and, the sustainable management and utilization of natural resources, including land, water, air, climate and genetic resources for the benefit of present and future generations. Have a role regarding some RFMOs and the UN Fish Stocks Agreement.	194 member countries including all Arctic States and the UK
UN Fish Stocks Agreement	Fisheries	Full name is “The Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks”. The agreement sets out principles for the conservation and management of those fish stocks and establishes that such management must be based on the precautionary approach and the best available scientific information. The Agreement elaborates on the fundamental principle, established in the Convention, that States should cooperate to ensure conservation and promote the objective of the optimum utilization of fisheries resources both within and beyond the exclusive economic zone.	81 ratifications, including all Arctic States and the UK

Name of agreement	Category	Summary	Signatories
UN Framework Convention on Climate Change (UNFCCC)	Climate	<p>International environmental treaty negotiated at the United Nations Conference on Environment and Development (UNCED), informally known as the Earth Summit, held in Rio de Janeiro from 3 to 14 June 1992. The objective of the treaty is to “stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”. The treaty provides a framework for negotiating specific international treaties (called “protocols”) that may set binding limits on greenhouse gases.</p>	196 Parties to the Convention, including all Arctic States and the UK
UN Convention on Biological Diversity (CBD)	Environment	<p>The Convention establishes three main goals: the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising from the use of genetic resources. There is no specific focus on Arctic issues. However, pursuant to article 4 of the Convention, all the relevant provisions of the Convention apply to all areas within the limits of national jurisdiction, including the Arctic. The Arctic also often gets a specific mention within Decisions of the Conference of the Parties and a number of reports have been provided to the CBD on the topic. For example, Decision XI/6 contains a specific section on collaboration on arctic biodiversity. In addition, all cross-cutting issues, in particular the ecosystem approach, guidelines for the incorporation of biodiversity considerations in EIA and SEA procedures, are applicable to arctic ecosystems.</p>	194 Parties to the Convention, including all Arctic States except the United States, and the UK

Name of agreement	Category	Summary	Signatories
Stockholm Convention on Persistent Organic Pollutants	Environment	Global treaty to protect human health and the environment from persistent organic pollutants (POPs). The Stockholm Convention is strongly linked to Arctic issues and the concerns of the Inuit and other indigenous peoples of the Arctic since Arctic ecosystems and indigenous communities are particularly at risk because of the biomagnification of persistent organic pollutants and that contamination of their traditional foods is a public health issue.	179 Parties to the Convention, including all Arctic States and the UK
Convention on the Conservation of Migratory Species of Wild Animals (CMS)	Environment	Aims to conserve terrestrial, marine and avian migratory species throughout their range. Parties to CMS work together to conserve migratory species and their habitats by providing strict protection for the endangered migratory species listed in Appendix I of the Convention. CMS has no specific focus on the Arctic region or Arctic issues. However, the range of many species of CMS interest includes Arctic areas, and these species depend on Arctic habitats/ ecosystems for at least part of their life cycle.	120 Parties. All Arctic States are Range States or Parties to the convention. The UK is a Party to the Convention.
Convention on Long-range Transboundary Air Pollution	Environment	The aim of the Convention is to limit and, as far as possible, gradually reduce and prevent air pollution including long-range transboundary air pollution. The Convention has been extended by eight protocols ⁶⁵⁵ that identify specific measures to be taken by Parties to cut their emissions of air pollutants.	51 Parties including all Arctic States and the UK

Name of agreement	Category	Summary	Signatories
Convention on International Trade in Endangered Species	Environment	Aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival, as well as addressing issues of illegal trade. Species are offered three levels of protection according to the level of threat posed by international trade. CITES has no specific focus on the Arctic region or Arctic issues but species of CITES interest include those found in Arctic areas. The status of the Polar Bear under CITES is the subject of contentious and repeated discussion.	180 Parties, including all Arctic States and the UK

655 United Nations Economic Commission for Europe, 'Protocols': http://www.uncece.org/env/rtap/status/rtap_s.html [accessed 23 February 2015]

