



House of Commons  
Environmental Audit Committee

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# The Changing Arctic

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## Twelfth Report of Session 2017–19

*Report, together with formal minutes relating  
to the report*

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## Environmental Audit Committee

The Environmental Audit Committee is appointed by the House of Commons to consider to what extent the policies and programmes of government departments and non-departmental public bodies contribute to environmental protection and sustainable development; to audit their performance against such targets as may be set for them by Her Majesty's Ministers; and to report thereon to the House.

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### Publications

Committee reports are published on the Committee's website at [www.parliament.uk/eacom](http://www.parliament.uk/eacom) and in print by Order of the House.

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### Committee staff

The current staff of the Committee are Lloyd Owen (Clerk), Leoni Kurt (Second Clerk), Ruth Cahir (Committee Specialist), Nicholas Davies (Committee Specialist), Laura Grant (Committee Specialist), Laura Scott (Committee Specialist), Jonathan Wright (Senior Committee Assistant), Baris Tufekci (Committee Assistant), Anne Peacock (Media Officer) and Simon Horswell (Media Officer).

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# Contents

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<b>Summary</b>	<b>3</b>
<b>1 Changes in the Arctic</b>	<b>5</b>
Purpose of the inquiry	5
What is the Arctic?	5
Environmental change in the Arctic	7
The decline of Arctic sea ice and land ice	7
The changing Arctic Ocean	9
Thawing permafrost and changes to Arctic ecology	10
Plastic pollution in the Arctic	12
Impact of changes on local Arctic communities	14
UK support for Arctic communities	15
The Arctic's influence on the UK	17
Impact on UK weather and climate systems	17
Impact on UK biodiversity	18
<b>2 UK Arctic research and funding</b>	<b>20</b>
The UK's Arctic research	20
Arctic natural science research in the UK	22
Social science and multidisciplinary Arctic research	23
Impact of leaving the European Union on UK Arctic research	26
European Polar Board	28
<b>3 The UK's relationship with the Arctic</b>	<b>29</b>
Sovereignty over the Arctic	29
The Arctic Council	29
Observers	30
Growing international interest in the Arctic	32
UK Arctic Policy	34
Scotland's Connection with the Arctic	36
<b>4 Commercialisation of the Arctic</b>	<b>38</b>
Sustainable development in the Arctic	38
Supporting sustainable economic development	39
Shipping in the Arctic	42
The Polar Code	44
Environmental issues	45

Tourism in the Arctic	47
<b>Conclusions and recommendations</b>	<b>50</b>
<b>Formal minutes</b>	<b>57</b>
<b>Witnesses</b>	<b>58</b>
<b>Published written evidence</b>	<b>59</b>
<b>List of Reports from the Committee during the current Parliament</b>	<b>60</b>

## Summary

The Arctic is warming twice as fast as the rest of the planet and is both the site and source of some of the world's greatest environmental changes. Rising temperatures have caused an acceleration of sea ice melt, and scientists predict that as early as the 2050s the Arctic could be seasonally sea ice free in summer. The Arctic Ocean is undergoing profound changes, such as acidification and "Atlantification", which threaten biodiversity and weather patterns. Evidence suggests that plastic pollution is now widespread in the Arctic, with the risk that 1,000 billion plastic particles currently frozen in sea ice could flow into the ocean if the ice melts. A study suggests that plastic litter on beaches in the remote Svalbard Archipelago is of a similar quantity to densely populated areas.

The environmental change in the Arctic is a global concern and a global responsibility. People living in the changing Arctic have not contributed to carbon emissions anything like as much the rest of the globe and yet their traditional ways of life are being disrupted by melting of transport networks across the sea ice, increasingly hazardous hunting grounds and an influx of commercial shipping. The challenges facing the Arctic are likely to have repercussions for climate systems around the world. The UK experienced the effect this year during the "Beast from the East", caused by a weakening of the polar vortex.

The eight sovereign Arctic states form the Arctic Council. While the UK is not an Arctic state, it is a near-Arctic neighbour. The UK's weather system is profoundly affected by changes in the Arctic's climate and sea currents. The UK has been an Observer to the Arctic Council since 1998. While the UK's scientific contribution to the Council is highly regarded and the publication of the UK's Arctic strategy in 2013 and 2018 has provided some clarity on the UK's Arctic interests, we found a lack of strategic direction and little evidence of measurable ambitions or targets. The Foreign and Commonwealth Office (FCO), which leads on co-ordinating Arctic policy, was not able to articulate the UK's position on a number of matters affecting the Arctic. This is concerning given that the FCO represents the UK at the Arctic Council. The Minister for the Polar Regions should fulfil his role in overseeing the coordination of UK Arctic policy by working to develop a set of strategic priorities along with targets to measure them. We recommend that the UK should appoint a special representative or envoy to the Arctic to play a co-ordinating role, in support of the Polar Regions Department and the Minister.

The UK's contribution to Arctic research is commendable. The UK is the fourth largest producer of Arctic research papers in the world and operates an Arctic research station in Ny-Ålesund, Svalbard. However, we believe that the UK's research approach needs to evolve to reflect the complexity of social and environmental change in the Arctic. We heard that Natural Environment Research Council (NERC) Arctic programmes are excellent at bringing together otherwise disparate research projects into one coordinated effort. However, NERC programmes do not currently cover emerging environmental threats in the Arctic such as permafrost and vegetation change. We recommend that NERC broadens the scope of its programmes to include these important, emerging issues in order to maintain a coordinated, effective Arctic research effort in the UK. Similarly, we heard that while there is good social science research in the Arctic, it is hard to identify. We recommend the Department for Business, Energy and Industrial

Strategy provides for the expansion of the NERC Arctic Office to coordinate the new UKRI Arctic Project and to identify disparate Arctic social science research already taking place in UK academic institutions.

Countries as distant as Singapore and China have taken a strong interest in the Arctic, recently becoming Observers to the Arctic Council in 2013. We heard that this brings fresh challenge to the UK's claim as a "near Arctic state". There is a risk that the UK's geographical proximity to the Arctic will be overshadowed by increased foreign investment and scientific research. The UK can play a role in ensuring that foreign interest in the Arctic is driven by a scientific understanding of the challenges facing the Arctic.

The vast reductions in sea ice and warmer temperatures have made the Arctic more accessible than ever. New commercial opportunities, such as tourism, freight shipping and mining have been created by the opening up of Arctic waters. We heard that if these opportunities are not managed correctly, the consequences could be dire. Large cruise and freight ships running on heavy fuel oils (HFOs) are permissible in the Arctic, despite being banned in the Antarctic. The risk of oil spills, pollution and damage to sea ice are immediate environmental threats. Furthermore, we heard that large cruise ships with over 6,000 passengers can overwhelm small Arctic communities. The UK has a responsibility to ensure that commercial opportunities in the Arctic are guided by the principle of sustainable development. The new focus on 'sustainable' rather than 'responsible' development in the UK Arctic policy is good progress, as is the reference to the Sustainable Development Goals (SDGs). However, we are concerned that the Government may only paying lip service to the SDGs, rather than using them to guide and monitor its approach to the Arctic. The FCO should use the SDGs to set strategic ambitions and measurable targets in the Arctic strategy.

We heard that not only is exploitation of oil and gas reserves in the Arctic incompatible with the SDGs, it is also incompatible with the UK's commitment to the 2015 Paris Climate Change Agreement. If the SDGs are to truly inspire and inform the UK's Arctic policy, the Government should reconsider its encouragement of UK businesses to explore oil and gas opportunities in the Arctic. In its response to this report, the Government should acknowledge the incompatibility of continued support for oil and gas exploitation in the Arctic "for decades to come" with the UK's SDG commitments and with the Paris Agreement, and set out plans to press members of the Arctic Council to adopt a similar approach.

# 1 Changes in the Arctic

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## Purpose of the inquiry

1. Climate change is disproportionately affecting the polar regions, causing the Arctic to warm twice as fast as the rest of the world. Changes in the Arctic have far reaching implications for the UK, as experienced this year, during a prolonged period of extreme weather caused by a weakening of the Arctic Polar Vortex, nicknamed the “Beast from the East”. We launched our inquiry in March 2018 to examine the environmental and social changes happening in the Arctic, the risks these changes pose to people living there, how Arctic change affects the UK and to scrutinise the Government’s Arctic Policy. We received 19 pieces of written evidence for this inquiry and conducted 3 hearings with climate change experts specialising in environmental and social Arctic research, meteorologists, experts on tourism, shipping and sustainable business in the Arctic, and Government Ministers. In August 2018, we visited Tromsø and Svalbard in the Arctic Circle to meet with leaders in Arctic politics, policy and scientific research.

## What is the Arctic?

2. There is no universally agreed definition of the Arctic. Current definitions used by the scientific community and policy makers vary from the area within the Arctic Circle (66° 34’ North); the area within the July 10°C isotherm (a line on a map connecting points having the same temperature at a given time or on average over a given period); and the area within the Arctic tree line. These definitions are shown in figure 1. The Arctic is home to diverse and globally important marine, freshwater and terrestrial ecosystems, with over 21,000 species of mammals, birds, fish, invertebrates, plants and fungi, which benefit from large areas of intact, functioning ecosystems. The polar regions of the world are often perceived as a pristine wilderness but, unlike Antarctica, which is only inhabited by scientists, the Arctic is home to between four and ten million people depending on the definition. This inquiry looked at the people, communities and businesses living through a changing world.

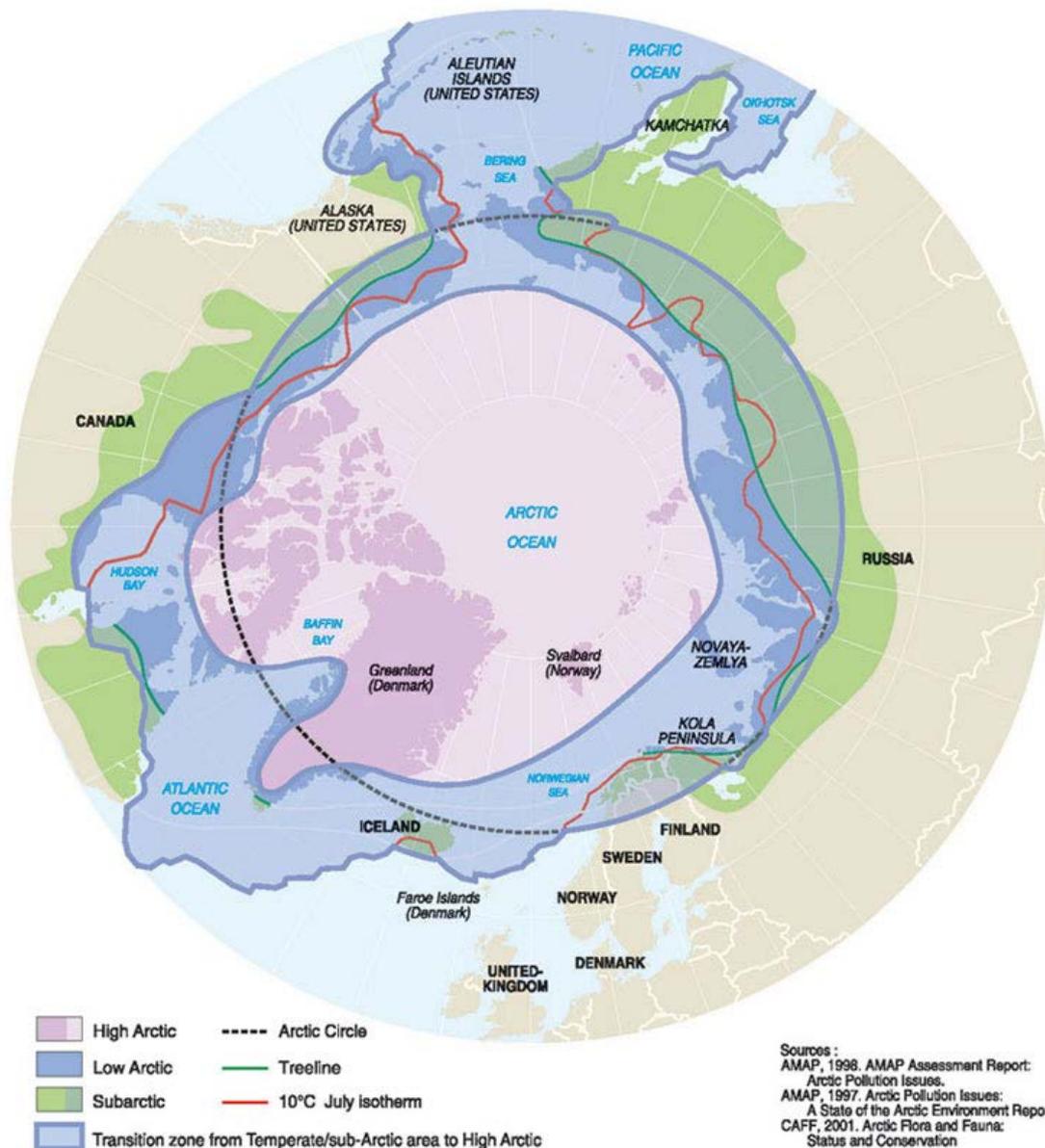


Figure 1: Source. Arctic Centre, University of Lapland

3. Although there is no agreement on where the Arctic begins and ends, the governance of the Arctic is defined and settled and largely rests with the sovereign Arctic States (Canada, Denmark, Iceland, Finland, Norway, Russia, Sweden and the United States). All eight Arctic states are members of the Arctic Council. The Arctic Council is the intergovernmental forum which promotes cooperation, coordination and interaction among the Arctic States, Arctic indigenous communities and other Arctic inhabitants on Arctic issues.

4. While the UK is not an Arctic state, it has been called “the Arctic’s nearest neighbour”. The UK’s weather system is profoundly affected by changes in the Arctic’s climate and many of the challenges facing Arctic communities, such as how to improve digital infrastructure and connectivity, are shared by remote communities in northern parts of the UK, like the Shetland Islands. The UK has been an Observer to the Arctic Council

since its establishment in 1996. The UK's approach to the Arctic is necessarily different to its approach to the Antarctic, as articulated by Sir Alan Duncan MP, Minister for the Polar Regions:

That is the difference between the Arctic and the Antarctic. With the Antarctic, so much of it is ours; with the Arctic, none of it is.<sup>1</sup>

## Environmental change in the Arctic

5. The Arctic is undergoing profound environmental changes. We heard that climate change is shifting the Arctic climate to a 'new normal', characterised by a warmer, wetter and more variable environment and reduced volume of sea and land-based ice.<sup>2</sup> International scientific research has explained a number of the processes at work in the Arctic, but we heard that many unknowns remain.<sup>3</sup> Professor Sheldon Bacon, Head of Marine Physics at the National Oceanography Centre, told us "there is the potential for the evolution of physical processes in the Arctic that we have not come to appreciate yet."<sup>4</sup> Dr Downie, Head of Polar Programmes at WWF said:

The Arctic was described by Ban-Ki Moon as the ground zero for climate change. Arctic people and Arctic wildlife are living on the frontline.<sup>5</sup>

6. Temperatures in the Arctic are rising rapidly, and faster than the global average.<sup>6</sup> Over the course of the 20th century the Arctic warmed by approximately 2 degrees Celsius. The National Oceanography Centre (NOC) explained that "surface temperatures there are rising twice as fast as the global average, a phenomenon known as Arctic amplification."<sup>7</sup> Professor Bacon explained that Arctic amplification is caused by the albedo effect:

... bright colours, whites and silvers reflect light and heat back to where it came from; dark colours absorb it. If you imagine a patch of land in Siberia that is exposed and is surrounded by snow, the dark patch will absorb heat, which will get warmer and melt more snow around it ... That writ large is what is happening to the Arctic.<sup>8</sup>

Warmer temperatures are causing sea ice to melt which exposes more of the dark ocean, which absorbs heat and amplifies melting. Accelerated warming of the Arctic is, in part, a product of these feedback processes.

## The decline of Arctic sea ice and land ice

7. Increased Arctic temperatures have caused a reduction of sea ice over time. We heard that melting of sea ice accelerated after the early 2000s and that sea ice extent is now at

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1 [Q257](#)

2 British Ecological Society ([ARC0011](#)), Edinburgh University Glaciology ([ARC0017](#)), The Royal Society ([ARC0014](#)), Met Office ([ARC0002](#)), Professor James Ford ([ARC0007](#))

3 [Q16](#), [Q17](#)

4 [Q17](#)

5 [Q62](#)

6 [Q8](#), British Ecological Society ([ARC0011](#)), The Royal Society ([ARC0014](#)), Met Office ([ARC0002](#)), The National Oceanography Centre ([ARC0001](#))

7 National Oceanography Centre ([ARC0001](#))

8 [Q8](#)

its lowest level since satellite measurements began in 1979.<sup>9</sup> Professor Bacon told us that sea ice “is melting and it is growing thinner and the minimum extent is reducing.”<sup>10</sup> Dr Richard Wood, Head of Oceans and Cryosphere at the Met Office, explained how the trend of reducing sea ice has developed in recent decades:

There are lots of year-to-year variations but if you look at the long-term decline you can split that time in two, before the early 2000s and after the early 2000s. It is certainly the case that the decline has been greater in the second half of that period.<sup>11</sup>

8. Climate models project that Arctic sea ice will continue to decline over the 21st century, but it is uncertain if the rate will keep getting faster. It is projected that the Arctic may be seasonally ice free during the summer as early as the 2050s.<sup>12</sup> The Met Office notes that the rate of decline of sea ice depends on future greenhouse gas emissions. Dr Wood explained that, under a low emissions scenario, it is possible that Arctic sea ice could remain in the summer if emissions were reduced:

A number of studies recently have looked at the difference in the likelihood of a seasonally ice-free Arctic under 1.5 degrees and 2 degrees warming. Pretty consistently they come up with the same kind of answer, which is that at 2 degrees there may be a 40% chance of a seasonally ice-free Arctic whereas at 1.5 the prognosis is dramatically lower, more like a few percent.<sup>13</sup>

The Met Office also said that “Arctic sea ice loss is expected to be broadly reversible if the underlying warming were reversed”.<sup>14</sup> During our visit to Tromsø, however, the Norwegian Polar Institute explained that climate models are currently based on the assumption that most ice in the Arctic is “multiyear”. In the past, Arctic sea ice was mostly made of ice that had remained frozen in the sea for multiple consecutive years. Recently however, more of the sea is “young”, having melted during summer and reformed only a year or two ago. Younger sea ice is more transparent and therefore has a higher albedo effect, leading to amplified melting.

9. Rising surface temperatures are also causing Arctic land ice to melt.<sup>15</sup> Land ice, such as glaciers, are large stores of ice situated on land (either bedrock or sediment), whereas sea ice is the frozen ocean with liquid water underneath. Land ice contributes to sea level rise when it melts. Professor Martin Siegert of the Grantham Institute for Climate Change & Environment told us there are “glaciers dotted all around the Russian high Arctic, Norwegian high Arctic, but Greenland is by far the largest store of land ice and any ice in the Arctic.”<sup>16</sup> Multiple written evidence submissions noted that the Greenland ice sheet has been losing approximately 270 billion tonnes of ice per year on average since the early 2000s.<sup>17</sup> According to Professor Inall of the Scottish Association for Marine Science “a

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9 [Q3](#)

10 [Q8](#)

11 [Q3](#)

12 Scottish Association for Marine Science ([ARC0013](#))

13 [Q19](#)

14 Met Office ([ARC0002](#))

15 Edinburgh University Glaciology ([ARC0017](#))

16 [Q7](#)

17 Centre for Polar Observation and Modelling ([ARC0015](#)), The Royal Society ([ARC0014](#)), Edinburgh University Glaciology ([ARC0017](#))

quarter of the current sea level rise signal is from Greenland alone at the current rate of change”. Professor Siegert explained the trend of sea level rise and the contribution of the Greenland ice sheet:

In the latter part of the 19th century, sea level was going up at about 0.8 millimetres per year, in the middle part of the 20th century it was about 2.4 millimetres per year. There has been an acceleration in the rate of sea level rise. About half of it is due to thermal expansion of the ocean ... but the other half is due to melting ice and most of that is coming from the Arctic and some glaciers all around the world... If the Greenland ice sheet melts, the whole of it melts, sea level will go up by 7 metres globally.<sup>18</sup>

10. The Royal Society said that the increase in fresh water flux into the surrounding oceans from melting glaciers, including the Greenland ice sheet, has the potential to disrupt ocean circulation patterns, and impact air-sea interactions and related chemical exchange processes that can have consequences on a global scale.<sup>19</sup> The Scottish Association for Marine Science (SAMS) suggested that the influx of fresh water from Greenland could also disrupt ocean convection; the mixing of the ocean from deep water, bringing nutrient rich waters to the surface, essential for the marine food chain.<sup>20</sup> Professor Bacon noted that although the changing pace of currents in the Arctic ocean are not yet fully understood, they could have drastic consequences:

As the Arctic Ocean accelerates, it will get more turbulent and that has the potential to stir up the subsurface layer of heat and if that comes to the ocean surface then I think all bets are off. We really have not been able to explore the potential of that for the future of the Arctic Ocean, its environment and the surface layer of sea ice even in the middle of winter.<sup>21</sup>

11. Changes to ocean circulation caused by freshwater flows from melting land ice also have uncertain consequences for UK climate and weather. The NOC’s written evidence suggested that increased freshwater flows into the Arctic and northern North Atlantic could weaken the current that brings ocean heat to northern European latitudes with uncertain consequences for UK climate and weather.<sup>22</sup> In addition, SAMS state in their written evidence “the North Sea is thought to be particularly sensitive to increased freshwater export from the Arctic, with some model simulations predicting stagnation.”<sup>23</sup>

### ***The changing Arctic Ocean***

12. We heard that changes in the Arctic Ocean could lead to further environmental change, such as accelerating ice decline both at sea and on land. Professor Inall explained that the flow of heat from the north Atlantic into the Arctic is causing sea ice decline, particularly in the Barents Sea.<sup>24</sup> SAMS describe this warming of the Arctic marine system as “Atlantification.” The Arctic Ocean has traditionally been different from the Atlantic or Pacific, because the water gets warmer with depth (due to inflows from the

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18 [Q9](#)

19 [The Royal Society \(ARC0014\)](#)

20 [Scottish Association for Marine Science \(ARC0013\)](#)

21 [Q17](#)

22 [The National Oceanography Centre \(ARC0001\)](#)

23 [Scottish Association for Marine Science \(ARC0013\)](#)

24 [Q13](#)

Atlantic) rather than colder. Atlantification is causing the eastern part Arctic Ocean, the Eurasian Arctic, to become more like the Atlantic Ocean.<sup>25</sup> SAMS outlined the additional consequences of Atlantification in their written evidence:

The consequences associated with “Atlantification” of the Arctic include (i) greater heat and moisture exchange between the ocean and the atmosphere which is likely to influence midlatitude weather patterns; (ii) changes to biological productivity with associated effects on the food chain; and (iii) freshening of the ocean surface layers, fresh water storage and export within the Arctic.<sup>26</sup>

13. The Arctic Ocean is acidifying at twice the rate of the Atlantic and Pacific Oceans, as carbon dioxide is more soluble in cold water.<sup>27</sup> Professor Inall explained that acidification is affecting animals’ ability to create their shells from calcium carbonate and it affects the metabolism of some marine animals.<sup>28</sup> Dr Coffey, Parliamentary Under-Secretary of State for Environment, Food and Rural Affairs, told us that DEFRA’s chief scientist has undertaken a review of ocean acidification and what steps can be taken to relieve its impact on marine wildlife.<sup>29</sup>

### **Thawing permafrost and changes to Arctic ecology**

14. According to The Royal Society, changes to the Arctic climate system have resulted in thawing permafrost.<sup>30</sup> Permafrost is rock, soil or sediment that has been frozen for at least two consecutive years. Thawing permafrost releases methane, a greenhouse gas with 30 times more global warming potential than carbon dioxide (CO<sub>2</sub>). Permafrost thaw has local and regional impacts on hydrology, vegetation and the stability of land surfaces. Our predecessor’s 2012 report *Protecting the Arctic* expressed concern about the potency of methane as a greenhouse gas, especially given that the release of 1% of Arctic potential methane would triple the current rate of global warming. The British Ecological Society informed us that although there remains uncertainty around permafrost thaw, even a small amount of thaw would be significant:

The Arctic region contains approximately 1672 Petagrams (Pg) of soil organic carbon - 50% of the global total—much of which is stored in permafrost. While projections of thaw rates are highly uncertain, and the level of greenhouse gases released from permafrost has so far been small, the loss of even a small proportion of this carbon store could have significant climate impacts and permafrost thaw is expected to contribute substantially to future global greenhouse gas emissions.<sup>31</sup>

15. The British Ecological Society noted the important role of Arctic vegetation dynamics for determining the global climate system.<sup>32</sup> It told us that Arctic vegetation is “greening” due to gradual summer temperature increases, but also “browning” due to the increasing

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25 Scottish Association for Marine Science ([ARC0013](#))

26 Scottish Association for Marine Science ([ARC0013](#))

27 British Ecological Society ([ARC0011](#))

28 [Q27](#)

29 [Q208](#)

30 The Royal Society ([ARC0014](#))

31 British Ecological Society ([ARC0011](#))

32 British Ecological Society ([ARC0011](#))

frequency of extreme winter weather events. Vegetation cover is also moving progressively northwards. These changes in vegetation affect wildlife habitats, soil processes and carbon gains and losses. In particular “browning” increases the risk of wildfires, a previously unknown phenomenon in the Arctic.<sup>33</sup> During our visit to Tromsø, the Arctic Council Secretariat informed us that wildfires were, for the first time, a problem for Arctic States in 2018. They informed us that Sweden’s wildfires were so severe that they sought assistance from other countries, but that Finland was unable to help as they were grappling with the same issue. In addition, the Norwegian Polar Institute explained that, in some regions, the higher frequency and warmer temperatures had caused drought, leading to significantly smaller harvests.

16. Professor Inall suggested there remain a number of unknowns regarding how thawing permafrost and change to Arctic vegetation will influence the wider the role of the carbon cycle in the Arctic:

There are huge stores of carbon in the permafrost and we don’t know whether the Arctic is going to be creating more carbon in the atmosphere or less... [These] are the unknowns: the fate of the permafrost, the fate of vegetation moving northwards as permafrost thaws and greening. The greening is moving northwards of plants that take CO<sub>2</sub> out of the atmosphere, but there is also a browning effect whereby you unlock carbon that is stored in the permafrost and as there is more rain and non-frozen water it washes this carbon out into the ocean, which becomes available and possibly more efflux of carbon dioxide coming out of the atmosphere. We just don’t know which will dominate.<sup>34</sup>

17. **The Arctic is undergoing profound environmental change as physical processes react to warming surface and ocean temperatures. Sea ice extent and thickness have been reducing for decades, and melting has accelerated since the early 2000s. Sea ice is now at its lowest level since records began and the Arctic ocean is projected to be ice free in the summer as soon as the 2050s unless emissions are reduced. The loss of 270 billion tonnes of land ice from Greenland each year is contributing to sea level rise and disrupting ocean circulation patterns. The acidification and Atlantification of the Arctic Ocean are causes for significant concern as they threaten marine wildlife. Permafrost thaw has the potential to release potent greenhouse gases into the atmosphere and the “Greening” and “Browning” of Arctic vegetation has already led to wildfires and the destruction of habitats. The complex interactions between permafrost thaw, vegetation and the Arctic carbon cycle are not yet fully understood, nor is the rate at which sea ice will decline.**

18. *The environmental change in the Arctic is a global concern and a global responsibility. The major physical and ecological changes in the Arctic driven by rising temperatures highlight the need for the UK to strengthen its emissions targets to be in line with the UK’s obligations under the Paris Climate Agreement and the Climate Change Act—this should include setting a net-zero target by 2050 at the very latest. While scientific research has made great strides in understanding environmental changes in the Arctic, ‘known unknowns’ remain. We recommend that the Government increases funding and*

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33 British Ecological Society ([ARC0011](#))

34 [Q17](#)

***support to UK scientists to advance global understanding of these scenarios and ensure that these groups continue to have access to vital funding provided by the EU through programmes like Horizon 2020.***

## Plastic pollution in the Arctic

19. Evidence suggests plastics and microplastics (plastic particles smaller than 5mm) are widespread across the Arctic, including beaches, the deep sea floor, floating and frozen in sea ice.<sup>35</sup> Our predecessor Committee examined the environmental impacts of microplastics in 2016, and called for a ban on microbeads. The UK Government’s Arctic policy document, *Beyond the Ice*, published in 2018 states:

Large quantities [of fragments of plastic] have emerged in the Arctic and have become frozen into the sea ice. The accelerated melting of sea ice could release 1,000 billion plastic particles in the coming years. That’s 200 times the amount of plastic currently found in the ocean.<sup>36</sup>

20. The latest report commissioned by the Government, *The State of the Polar Oceans 2018*, by UK and Norwegian scientists, highlighted the scale of problem caused by plastic in the Arctic:

A Norwegian study recently found up to 234 microplastic particles in a single litre of melted Arctic sea ice. Once these particles enter the seas they are ingested by sea creatures who mistake them for food. The long-term effects of this are uncertain, but scientists are initiating monitoring programmes of plastic levels in both polar oceans, and working to understand the effect this proliferation of plastic waste is having on polar ecosystems.<sup>37</sup>

21. According to the Scottish Association for Marine Science (SAMS) “it has been estimated that between 62,000–105,000 tonnes of plastic enter [the Arctic] per year”. Beaches across the Arctic have plastic litter: “a study of beach litter in the Svalbard Archipelago recorded quantities similar to those from densely populated areas, with plastics representing over 80% of the overall litter mass”.<sup>38</sup> NERC states that coastal clean-up initiatives suggest that there are locally significant sources for this pollution including fishing vessels and other marine activity.<sup>39</sup> Professor Siegert from the Grantham Institute explained where most Arctic plastic pollution is coming from:

... a high proportion of the plastics that get into the North Sea will end up going further north and end up in the Arctic. By and large, plastics that we emit from rivers in the United Kingdom going into the North Sea, and possibly even to the west as well, will be tracking north and heading to the Arctic. It is difficult to ascribe, to attribute how much of that is our fault, but it is also quite difficult to see how that plastic can come from many places other than north-western Europe.<sup>40</sup>

35 Foreign and Commonwealth Office ([ARC0016](#))

36 *Beyond the Ice*, HM Government, 2018

37 *The State of the Polar Oceans: Making Sense of Our Changing World*, British Antarctic Survey and Norwegian Polar Institute, 2018

38 Foreign and Commonwealth Office ([ARC0016](#)),

39 Natural Environment Research Council (NERC) ([ARC0010](#))

40 [Q31](#)

22. Research by the Plastic Adrift team at Imperial College London, led by Dr Erik van Sebille, has found that ocean plastic pollution from the UK that does not wash back onto the beach or sink to the ocean floor drifts towards the Barents Sea, north of Norway, before circulating in the Arctic. When asked if the UK should be taking a large amount of responsibility for those plastics, Professor Siegert said:

Personally, yes, of course. We know it is happening, we know we are emitting plastics and we know where a lot of it is ending up.<sup>41</sup>

23. Plastic is also found floating in Arctic ice-free waters. SAMS noted that there may be a 6th so-called garbage patch forming in the Barents Sea due to the amount of floating plastic in the Arctic.<sup>42</sup> Plastic in the Barents Sea most probably originated in the North Atlantic region, including Northwestern Europe and the UK.<sup>43</sup> Dr Coffey told us that steps are in place to reduce marine litter, such as working with Commonwealth countries to reduce the amount of litter entering the marine environment.<sup>44</sup> *Beyond the Ice* states that monitoring and further research into marine litter are under way which “will be available to the Arctic Council and its working groups to help inform future policies on marine litter in the Arctic Ocean”.<sup>45</sup> Dominic Pattinson, Head of International Marine Policy at Defra, recognised “the main thing is to tackle the sources of plastic coming from the UK”.<sup>46</sup> Sir Alan Duncan MP, Minister for the Polar Regions, stated the Government’s actions to tackle plastic at source, internationally and domestically, are set out in *Beyond the Ice* and the 25-year Environment Plan.<sup>47</sup>

**24. One trillion plastic particles frozen into Arctic sea ice could be released into the ocean in the coming years through accelerated melting from rising temperatures. Between 62,000 and 105,000 tonnes of plastic enter the Arctic every year and plastic beach litter in the Arctic is comparable to densely populated areas, despite its remote and relatively uninhabited nature. The UK has contributed to plastic pollution in the Arctic and must therefore act swiftly to tackle pollution.**

***25. We welcome the Government’s commitment to tackle the sources of plastic pollution including the ban on the manufacture and sale of microplastics which our predecessor Committee called for in 2016, and which came into force in 2018. This ambition must be met with effective plastic reduction policies to ensure extended producer responsibility to include responsibility for collection, transportation, recycling, disposal, treatment and recovery of its packaging, improved design for recyclability and to create the necessary infrastructure to meet domestic demand. We recommend that the Government contribute to clean-up operations on Arctic beaches to take responsibility for the plastic pollution from the UK that has been transported to the Arctic by ocean currents. We heard that research into ocean plastics is in its infancy. The Government should commit funding to research the potential consequences of an influx of plastic particles trapped in melting Arctic sea ice and ensure that academics and scientists have continued access to research funding and opportunities by UK participation in EU schemes. Following our predecessor Committee’s report on microplastics we welcome the Chief Medical***

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41 [Q37](#)

42 Scottish Association for Marine Science ([ARC0013](#))

43 Grantham Institute, Imperial College London ([ARC0008](#))

44 [Q209](#)

45 *Beyond the Ice*, HM Government, 2018

46 [Q209](#)

47 Foreign and Commonwealth Office ([ARC0016](#))

*Officer's recent announcement of its consultation on the health implications of these plastic particles entering our food chains. In addition, in its response to this report, the Government should set out a clear timeline for a comprehensive and wide-ranging plan to reduce UK plastic pollution—not least because of its impact in the Arctic. That should include, for example, bringing forward the existing 2042 plastic waste phase-out date, a ban on plastics that are difficult or impossible to recycle, a commitment to reforming the Packaging Recovery Note scheme and expediting a nationwide Deposit Return Scheme.*

## Impact of changes on local Arctic communities

26. The significant environmental changes in the Arctic mean that many local communities need to change their way of life. We heard a range of concerns about Arctic communities adapting and adjusting as local knowledge of the environment becomes less reliable; increased melting of sea ice is causing hazardous hunting conditions, and trails connecting communities are melting away.<sup>48</sup> Many communities that rely on subsistence hunting are struggling to sustain themselves. Professor Wolff from the Royal Society suggested that the UK should recognise its partial responsibility for the change in the Arctic and how it affects people there:

The way that we in the UK tend to look at Arctic change is that it is something happening in the Arctic that might affect us but we do not tend to think so often about this other aspect that Rod [from WFF] was talking about, that Arctic change is something that the rest of us are doing that is affecting people in the Arctic. They have not contributed to it, even per capita, anything like as much as us, so they are innocent victims in this. The fact that we have such strength in Arctic research in the UK means that it is something that we can offer to them.<sup>49</sup>

27. Professor Ford explained that winter roads provide crucial access to isolated communities, and that unmaintained trails across the ice are vital for small, remote communities in the Arctic. He told us about the risks to community transportation networks:

The ice is thinner in areas where it is normally thick. We see the ice freezing up later in the year, thawing earlier in the year. We are seeing it taking longer for the ice to reach a thickness at which it can be safely used.

All these factors affect transportation on the ice. For Inuit communities in northern Canada and Greenland, which is where I do most of my work, that is the main means of transportation. There are no permanent roads between communities. People rely on semi-permanent trails on the sea ice and on the land. With climate change, it is an increasing danger. We do see increasing instances of people falling through the ice.<sup>50</sup>

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48 Professor James Ford ([ARC0007](#))

49 [Q74](#)

50 [Q62](#)

28. Permafrost thaw also presents a societal and economic challenge for Arctic communities. The British Ecological Society said that buildings and roads are vulnerable to structural damage, subsidence and collapse as thawing permafrost makes them unstable and weak. The potential cumulative cost from climate-related damage to Arctic infrastructure is estimated at up to US\$5.5 billion over the course of the century.<sup>51</sup>

29. Changes in wildlife species and changes in the sea ice have a direct impact on food security in the Arctic, especially for those people relying on subsistence farming. Dr Downie, from WWF explained:

The profound effects both on people and wildlife were very clearly articulated at a recent event [arranged by the All-Party Parliamentary Group for Polar regions (Arctic and Antarctic)]... called the Arctic Voices. This was a historic first, in which we had women from Inuit, Gwich'in and Sami communities come over and, for the first time ever in the Houses of Parliament, spoke with absolute passion and conviction about the effects of climate change on their societies, on their subsistence livelihoods ...

We heard from those women how, for example, changes in caribou migration and distribution is changing across Alaska. We heard from the Inuit how sea ice loss is affecting their ability to travel and to hunt and to fish sustainably in the Arctic.<sup>52</sup>

30. Professor Ford expressed concern that food insecurity hits less affluent communities the hardest. He explained that those in remote communities who are financially secure can afford adaptive measures, such as a boat to enable hunting on open water, but those who cannot afford such equipment cannot adapt. He continued:

It is often those people who cannot afford it who also cannot afford to buy food in the store. If you go into an Arctic supermarket, you will see how expensive things are. I have seen a litre of milk for about £8, a loaf of bread for £6 or £7. Replacing food that people hunt and fish with food from the store is not always possible.<sup>53</sup>

### ***UK support for Arctic communities***

31. We heard that the Arctic may be used to understand how climate impacts might play out globally.<sup>54</sup> The Minister for Polar Affairs, Sir Alan Duncan explained “I think they [Arctic communities] are very vulnerable” but that the UK does “not get directly involved with local communities ourselves, because none of that territory belongs to the UK as such”. Instead, he explained that the UK has a co-ordinating role:

We are very focused on co-ordinating the people affected, businesses, scientists and environmentalists, to ensure that we know exactly what is going on, so that we can make and encourage the policy decisions that can best address the challenges that are definitely arising on the back of this.<sup>55</sup>

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51 British Ecological Society ([ARC0011](#))

52 [Q62](#)

53 [Q63](#)

54 Professor James Ford ([ARC0007](#))

55 [Q204](#)

32. The UK's Arctic policy paper, *Beyond the Ice*, also explains that researchers in the UK are committed to "listening to, and working with, indigenous communities, to ensure the best outcome for local communities and for science". The Minister explained how the UK helps remote Arctic communities through bilateral relationships:

I think wherever we have a strong bilateral relationship and identify an area of interest and importance we will use our diplomatic engagement to try to influence that country and work with them wherever possible.<sup>56</sup>

33. The key to helping local Arctic communities is to provide useful adaptation measures which will enable all members of the community, regardless of income, to adapt to the rapidly changing environment. Professor Ford expressed frustration at the lack of adaptation and resilience measures in both iterations of the UK's Arctic policy:

I read the 2013 document on the train here called "Adapting to Change" but in the text nowhere was there anything on adapting to change. What changes do we need to adapt to? What are the adaptation policies available?

I have read the 2018 one too and I also found very little information there about the adaptation policy landscape. What is taking place on the brief of adaptation? What policies at present are going to be affected by climate change both now and in the future? What are some of the policy needs? The policy science side of that thing is completely absent. That is one area that I think it is deficient and needs to be addressed moving forward.<sup>57</sup>

34. Defra leads on UK adaptation policy and works with the Foreign and Commonwealth Office on Arctic Policy. The UK has a commitment to increase the number of communities implementing adaptation policies under Sustainable Development Goal 11, Sustainable Cities and Communities. This SDG includes specific targets to provide safe transport and support positive economic, social and environmental links between communities. We heard that the scale of change facing Arctic communities is representative of change people around the world, including in the UK, will soon experience. Professor Inall noted that:

Scotland has a long history of rural communities having various trials and tribulations over the decades and centuries. Much of the history and the stories of those communities speaks a lot to some of the issues that are going on in the Arctic communities now who are finding their environment changing and being displaced. There is a strong link between rural, remote communities on how they develop in those changing environments and historically how communities have developed and how those lessons may be shared and learned.<sup>58</sup>

**35. Arctic amplification is forcing Arctic communities to adapt quickly to higher temperatures, threatening their transport networks and food security. As part of the United Nations' Sustainable Development Goals (SDGs), the UK has commitments to create sustainable communities at home and abroad. As part of these obligations the UK should build a net zero emission economy by 2050, which will help reverse the**

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56 [Q207](#)

57 [Q24](#)

58 [Q60](#)

albedo effect. We believe that Defra’s adaptation portfolio could benefit from sharing adaptation expertise, including the successes and failures of adaptation measures, with Arctic states.

36. *The UK has an opportunity to drive forward the Arctic Council’s focus on the SDGs. We recommend the Government set a series of adaptation targets for the next iteration of UK Arctic policy within the next twelve months, when the Government should publish an annex to the Arctic Policy Framework. These targets should outline how the UK will help Arctic communities to adapt to changes in the Arctic environment now and in the future. The Government should fund more research into the social consequences of climate change. We believe there is an opportunity for DEFRA to share expertise on adaptation policy which could prove mutually beneficial, helping Arctic communities to adapt whilst preparing for future UK adaptation measures.*

## The Arctic’s influence on the UK

### Impact on UK weather and climate systems

37. Physical processes in the Arctic interconnect with the UK’s climate and weather systems. The most recent example of this was the “Beast from the East”, an unusually prolonged cold spell in the UK in February 2018, caused by a weakening of the polar vortex. Dr Wood, from the Met Office explained that changes to UK weather patterns are caused by changes in the Arctic’s atmospheric circulation.<sup>59</sup> The Arctic is experiencing unusual weather; in March 2018, Svalbard was 20 degrees warmer than the average for that time of year.<sup>60</sup> Unusual weather events such as this drive more extreme weather patterns both in the UK and at mid-latitudes across the globe.<sup>61</sup>

38. Periods of extreme weather are also becoming more prolonged. As the Arctic warms faster than the rest of the planet, the temperature difference between the Arctic and the rest of the globe is decreasing.<sup>62</sup> This lack of tension in the global climate results in weather systems stalling, passing slowly or even stopping.<sup>63</sup> Dr Coffey noted that Arctic weather events are “relevant” to extreme weather events in the UK. The Minister said that the Government is taking action to address climate change on a broader scale and referred to the implementation of the 2008 Climate Change Act as an example.<sup>64</sup>

39. Additionally, some research shows a potential link between Arctic sea ice variations and the European climate.<sup>65</sup> According to the Met Office “the links are not fully established yet and this is an active area of research which will be addressed over the next few years”. We are pleased to hear that further research into the relationship between sea ice and the UK’s climate is already underway through the Polar Amplification Model Intercomparison Project (PAMIP).

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59 [Q42](#)

60 [Q197](#)

61 [Q197](#)

62 [Q45](#)

63 [Q45](#)

64 [Q215](#)

65 Met Office ([ARC0002](#))

40. **Arctic weather patterns affect UK weather and can cause extreme weather events. Predicting future implications for the UK’s climate requires complex modelling which is being undertaken by leading UK institutions including the Met Office. We welcome the ongoing research undertaken by the Met Office to understand the relationship between reductions in sea ice and the UK’s future climate and recommend this work by the Polar Amplification Model Intercomparison Project is fed into future National Adaptation Programmes at the earliest opportunity.**

### **Impact on UK biodiversity**

41. The Arctic is home to marine, freshwater and terrestrial ecosystems, harbouring over 21,000 species of mammals, birds, fish, invertebrates, plants and fungi.<sup>66</sup> The Arctic has many migratory species of importance to ecosystems across the world, “including Arctic breeding birds that migrate to the UK and as far south as Africa, and ocean mammals and seabirds that travel through the Bering Strait to the Pacific”.<sup>67</sup> The Arctic Council has a working group for the Conservation of Arctic Flora and Fauna (CAFF), which provides collaboration for scientists, indigenous peoples and conservation managers on issues affecting the conservation and sustainable utilisation of shared species and habitats in the Arctic.

42. The 2017 Climate Change Risk Assessment (CCRA) Evidence Report notes climate change is likely to cause reductions in population sizes and distribution ranges, leading to some species no longer breeding in the UK.<sup>68</sup> The British Trust for Ornithology (BTO) said that the UK supports internationally important populations of waterbirds during winter. Their written evidence states “significant warming is projected to reduce the Arctic and sub-Arctic breeding ranges of waterbirds by about 50% by the end of the century”.<sup>69</sup>

43. According to the BTO, the UK has obligations to conserve these globally important populations of water birds through the Convention on the Conservation of European Wildlife and Natural Habitats, Ramsar Convention on Wetlands of International Importance, and the Agreement on the Conservation of African-Eurasian Wintering populations of Arctic and sub-Arctic breeding waterbirds in Britain.<sup>70</sup> The UK also has a commitment to protect biodiversity under the UN Sustainable Development Goals 15 to “protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss”. The DEFRA Minister agreed that “protecting biodiversity in the Arctic area is absolutely key.”<sup>71</sup> The Arctic Biodiversity Assessment, an Arctic Council Report containing the best available science on the status and trends of Arctic biodiversity, concluded that although Arctic biodiversity is being degraded, decisive action can help to sustain ecosystems. The report recommended “improved monitoring and research to survey, map, monitor and understand Arctic biodiversity”.<sup>72</sup>

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66 British Ecological Society ([ARC0011](#))

67 British Ecological Society ([ARC0011](#))

68 *Climate Change Risk Assessment Evidence Report*, 2017, Adaptation Sub Committee, Committee on Climate Change, Chapter 3, *Natural environment and natural assets*, p127

69 BTO ([ARC0009](#))

70 BTO ([ARC0009](#))

71 [Q216](#)

72 *Arctic Biodiversity Assessment 2013*, Arctic Council working group on the Conservation of Arctic Flora and Fauna (CAFF)

44. We were encouraged to hear from Dr Coffey that the Joint Nature Conservation Committee (JNCC) has been monitoring Arctic water bird populations for decades and collaborates internationally.<sup>73</sup> According to the Government, the UK also helps to protect Arctic biodiversity in the marine environment by “continuing to keep our involvement with international agreements”, such as the International Whaling Commission. We were encouraged to hear the Government are working towards delivering new marine protected areas through UNCLOS, particularly as the UK is committed to “conserve and sustainably use the oceans, seas and marine resources for sustainable development” under SDG 14, Life Below Water.<sup>74</sup> We see the implementation of new Marine Protected Areas as crucial to help protect Arctic marine wildlife and meet our commitment to SDG 14.

**45. Arctic biodiversity is crucial for many ecosystems around the world. The UK’s biodiversity has significant links with the Arctic including many migratory birds, such as waterbirds. The waterbird population is expected to decline by about 50% by the end of the century due to Arctic warming. *For the UK to meet its commitment to “take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species” under Sustainable Development Goal 15, the protection of biodiversity in the Arctic area is absolutely key. We recommend that the Government set clear, measurable targets to protect Arctic biodiversity in line with SDG Goal 15. We would like to see monitoring and research to survey, map, and understand Arctic biodiversity extended, enabling the UK to contribute further research to Arctic Council working group on the conservation of Arctic flora and fauna (CAFF).***

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73 [Q217](#)

74 [Q216](#)

## 2 UK Arctic research and funding

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### The UK's Arctic research

46. Arctic researchers based in the UK produce a significant quantity of rigorous, independent and high quality science. We were pleased to hear that the UK is the fourth largest producer of Arctic research papers behind the United States, Canada and Russia and that two thirds of Arctic papers have international co-authors.<sup>75</sup> The Department of Business, Energy and Industrial Strategy (BEIS) is responsible for funding Arctic Research via UK Research and Innovation (UKRI), a new organisation that brings together the seven Research Councils, Innovate UK and Research England with a total budget of more than £6 billion. Arctic research is supervised and funded by the Natural Environment Research Council (NERC). There are some other research programmes, such as the Met Office's work on climate and weather, which are funded separately by the Government.<sup>76</sup>

47. NERC has a dual function in Arctic research funding. It funds and coordinates the NERC Arctic programmes such as The Arctic Research Programme and The Changing Arctic Ocean, and it funds research undertaken by multiple higher education institutions across the UK.<sup>77</sup> NERC is also responsible for funding the NERC Arctic Office based in Cambridge which is hosted by the British Antarctic Survey (BAS), the UK's interdisciplinary Polar research organisation. The NERC Arctic Office does not itself fund research, rather it works to maximise the impact of research and investment, appropriately advise policymakers and find new collaborative opportunities.<sup>78</sup>

48. The UK has an Arctic research station in Ny-Ålesund in Svalbard, at 80 degrees north which is overseen by the NERC Arctic Office and managed on the ground by BAS operations staff.<sup>79</sup> The station and the Arctic office are largely funded directly by NERC and subsidised by BAS core funds. We were due to visit the research station to experience first-hand the research being undertaken by world-leading UK scientists in the fast-changing environment. Unfortunately, due to an unseasonably severe storm, travel to the research station was deemed unsafe. We were told that such stormy weather was unprecedented in the Arctic and a demonstration of the kind of "new normal" the Arctic climate is shifting towards.

49. Infrastructure is critical to research in the polar regions due to the hazardous conditions and remote locations.<sup>80</sup> Henry Burgess, Head of the NERC Arctic Office, described the UK as a "full-spectrum player" when it comes to Arctic infrastructure, contributing to European Space Agency programmes and providing ships, planes and auto-submarines.<sup>81</sup> Possibly the most well-known is RRS Sir David Attenborough, a new state of the art research vessel operated by British Antarctic Survey (BAS) which is due to be launched in 2019.

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75 [Q54](#)

76 [Q57](#)

77 [Q55](#)

78 [Q113](#), [Q114](#)

79 BAS ([ARC0004](#))

80 [Q54](#)

81 [Q147](#)

50. We were however told that the UK's Arctic infrastructure is modest in comparison to that in the Antarctic and experts expressed a desire to see the UK's presence in the Arctic increased to reflect how important changes in the Arctic are to the UK.<sup>82</sup> Professor Wingham, Chief Executive of the NERC Arctic Office, told us that although funding on research is similar for the Arctic and Antarctic, the Arctic receives far less infrastructure spending; £2.3 million compared to £34million for Antarctica.<sup>83</sup> The cost of the NERC Arctic Office and the Arctic station in Ny-Ålesund combined is about £300,000. Professor Wingham said:

There is a geopolitical asymmetry in the Antarctic. The UK is responsible for an area of the sheet under the Antarctic Treaty. NERC has taken the responsibility from the UK Government since 1965 to maintain that activity. That activity is now the subject of a particular partition of our budget that is dedicated for that purpose. The activities we pursue under that dedicated budget of logistics are explicitly agreed with Government at each spending review and so on. Therefore, there is no equivalent of the need to maintain that territorial-related activity in the Arctic.<sup>84</sup>

51. UK-based researchers are increasingly involved in international programmes which is especially important due to the scale of the scientific challenge in the Arctic where collaboration is needed.<sup>85</sup> UK Arctic research addresses the vast amount of environmental change taking place in the Arctic which we discussed in the first chapter of this report. UK scientists are involved in a series of international Arctic projects including;

- the MOSAIC project which will enhance understanding of the regional and global consequences of Arctic climate change;
- the completed ICE-ARC project looking at current and future sea ice;
- the APPLICATE and Blue-Action projects looking at climate and weather implications of change; and
- the INTERACT project which funds trans-national access for researchers to other countries' Arctic Stations.<sup>86</sup> The State of the Polar Oceans 2018, a collaboration between the British Antarctic Survey and the Norwegian Polar Institute, has also recently been published (July 2018).

52. Aside from specific international projects, UK Arctic research also feeds into the work of Arctic Council through the Arctic Council's working groups.<sup>87</sup> Each working group has a different environmental or sustainable development focus. The work carried out by the UK researchers for the working groups helps to maintain our status as an observer to the Arctic Council.<sup>88</sup> The work of UK-based researchers also forms the basis of the UK Arctic policy. According to Sir Alan Duncan, Minister for the Polar Regions "science and scientific evidence runs throughout Beyond the Ice and is at the heart of

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82 [Q54](#), Edinburgh University Glaciology ([ARC0017](#))

83 [Q145](#), [ARC0023](#)

84 [Q129](#)

85 Natural Environment Research Council (NERC) ([ARC0010](#))

86 Natural Environment Research Council (NERC) ([ARC0010](#))

87 British Ecological Society ([ARC0011](#)), Natural Environment Research Council (NERC) ([ARC0010](#)), British Antarctic Survey ([ARC0004](#))

88 [Q233](#), [Q137](#)

UK Arctic policy.”<sup>89</sup> UK Arctic research also feeds into international policy making. The Intergovernmental Panel on Climate Change (IPCC) are currently drafting a special report on the Ocean and Cryosphere in a Changing Climate which has 6 UK-based authors out of a total of 103 contributors.<sup>90</sup>

**53. UK Arctic research is world leading and the UK ranks fourth in the world for the number of scientific papers produced. We were pleased to hear that this research is “at the heart” of UK Arctic policymaking and also fed into work conducted by the Intergovernmental Panel on Climate Change and Arctic Council working groups. We heard how important infrastructure is for research in extreme polar environments but were disappointed to hear that the UK’s infrastructure in the Arctic is modest compared to that in Antarctica. *While we understand the historical and geopolitical reasons behind this, we believe that due to the importance of the Arctic for the UK’s climate stability, the Department for Business, Energy and Industrial Strategy should significantly increase funding for Arctic research infrastructure. We recommend that the Government outline its plan for the developing the infrastructure in the Arctic.***

### **Arctic natural science research in the UK**

54. Around 50% of all polar research work in the UK is conducted in individual institutions, universities and research centres.<sup>91</sup> We heard concerns that this scattered effort has resulted in a lack of cohesion in the UK’s Arctic research.<sup>92</sup> Professor Inall from Scottish Association Marine Science suggested that “the Arctic research community in the UK could be harnessed by some more cleverly directed research within existing budgets.”<sup>93</sup> Professor Bacon praised the two NERC targeted programmes, the *Arctic Research Programme* (2011–2016) and *The Changing Arctic Ocean* (2017–22), for helping the scientific community to “gain impact and cohesion.”<sup>94</sup> The FCO told us that the 2011–2016 *Arctic Research Programme* supported nine main research projects led by 37 research institutes across the UK with many international partners.<sup>95</sup> We also heard praise for the work of the NERC Arctic Office for identifying and bringing together UK-based Arctic research.

55. Given the effectiveness of the NERC Arctic programmes, we were disappointed to hear that their scope was limited in comparison to the vast amount of change the Arctic is facing. Professor Bacon described the most recent Arctic programme as “a missed opportunity.”<sup>96</sup> These programmes did not cover important issues such as the effect of land ice melt on sea level rise, interaction between land, sea and air; or the relationship between permafrost thaw, glacier loss, vegetation change and the carbon balance.<sup>97</sup> The British Ecological Society said “these less publicly known issues are just as alarming as the more visible issues and therefore require an equal research attention.”<sup>98</sup>

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89 Foreign and Commonwealth Office ([ARC0016](#))

90 [Q132](#)

91 [Q54](#)

92 [Q55](#)

93 [Q56](#)

94 [Q56](#)

95 Foreign and Commonwealth Office ([ARC0016](#))

96 [Q55](#)

97 Professor Nienow, Edinburgh University Glaciology ([ARC0020](#)), British Ecological Society ([ARC0011](#))

98 British Ecological Society ([ARC0011](#))

56. When we asked Professor Wingham, NERC Executive Chair, if there were plans to expand the remit of NERC's Arctic research programmes he said "the short answer is no" but NERC is committed to investing in a number of Arctic science projects and "it would be quite wrong to imagine these single programmes are our only activity."<sup>99</sup> Henry Burgess also told us that NERC invests in a multitude of other Arctic research that is not necessarily captured by the coordinated programmes.<sup>100</sup> However, we heard that it is NERC's overarching strategic programmes that help to make the scientific community more cohesive. According to the Centre for Polar Observation and Modelling multi-year programmes would "allow for long term planning, and for strategic capability to be maintained and further developed."<sup>101</sup>

**57. The UK produces world leading research into the environmental changes taking place in the Arctic, funded by the Natural Environment Research Council. NERC's two targeted Arctic programmes have provided coordination and communication which has increased the impact and effectiveness of the research undertaken, but the scope of these programmes is limited. We would like to see the framework for the NERC programmes expanded to provide the same level of coordinated research for other important, emerging issues such as land ice melt, permafrost thaw, carbon balance, vegetation change and interactions between land, sea and air. This would also help to improve collaborations and reduce the "scattered" nature of UK Arctic research spread across UK universities and institutions.**

### **Social science and multidisciplinary Arctic research**

58. The first chapter of this report looked at the scale of the challenges facing local communities in the Arctic, outlined the UK's responsibility and commitment to helping these communities, and identified a lack of adaptation and resilience measures in current UK Arctic policy.<sup>102</sup>

59. The UK's Arctic policy, *Beyond the Ice*, recognises the importance of social science in the Arctic to understand fully how best to help local communities:

It is increasingly recognised that only by learning about the use of traditional and local knowledge from the indigenous and local communities themselves can changes be properly understood and genuinely sustainable responses proposed.<sup>103</sup>

60. However, some evidence we received argued that UK Arctic research is dominated by the environmental sciences and social science is not considered a priority. Professor Ford suggested that relatively little social science research has been done in the Arctic and that more interdisciplinary research is needed:

If you look at UK research to date, all these great numbers, I can count on one hand or list on one hand the number of people in the social sciences

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99 [Qq143-144](#)

100 [Q144](#)

101 Centre for Polar Observation and Modelling ([ARC0015](#))

102 [Q74](#)

103 *Beyond the Ice*, HM Government, 2018

working in the Arctic on climate change issues. Of all those papers, 500-plus papers per year by Arctic researchers in the UK, probably fewer than 10 are from the social sciences.<sup>104</sup>

61. Dr Powell from the Scott Polar Research Institute, University of Cambridge told us that, depending on how social science was defined, he could identify many more papers than the figure quoted above. He said that “there are excellent social sciences or humanities people all over the UK”, from the University of Highlands and Islands to University College London.<sup>105</sup>

62. We heard calls for an increased level of multidisciplinary work in Arctic research to provide a full appreciation of how physical, biological and social systems interrelate.<sup>106</sup> The Head of Polar Regions Department at the FCO, Jane Rumble, recognised the need for multidisciplinary research:

A lot of the solutions to the complex problems of the Arctic are going to come through linking different disciplines, so there are increasingly developing connections with social sciences, engineering, arts and humanities, and beyond.<sup>107</sup>

63. Given the importance of the work carried out by the NERC Arctic Office, we were surprised to hear from Henry Burgess, Head of the NERC Arctic Office, that it is made up of only “one and a half people”, himself and a colleague working there part time and that they “do not have a dramatic plan to expand; that is not the position we are in”.<sup>108</sup> Jane Rumble told us that, while the FCO sees the full picture of natural environment research thanks to the work of the Arctic Office, more could be done to capture the social and geopolitical science already going on in UK institutions.<sup>109</sup>

64. The importance of multidisciplinary research in the Arctic, particularly in finding ways to help achieve sustainable development and effective adaptation for local communities, is increasingly being recognised by the international community. The Arctic Council’s 2016 Arctic Resilience Report recommends a ‘social-ecological systems’ approach to building resilience to climate change:

A key aspect of this approach is that it sees people as a fundamental—and increasingly influential—part of nature. It emphasizes the unique human capacity for agency—for engaging in deliberate action.<sup>110</sup>

65. The G7 Academies (science academies from the G7 countries - The Royal Society being the UK’s one science academy) announced in May 2018 that a series of research summits would be taking place on the topic ‘The Global Arctic: Sustainability of Communities in the Context of Changing Ecosystems’. The joint launch statement said:

The G7 Academies stress the critical need to support and enhance basic Arctic research endeavours and cooperation that promote healthy and

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104 [Q18](#)

105 [Q148](#)

106 [Q57](#)

107 [Q228](#)

108 [Q62](#), [Q101](#), [Q113](#), [Q149](#)

109 [Q230](#)

110 *Arctic Resilience Report*, 2016, Arctic Council

thriving coastal communities in the context of changing ocean systems. To address this need, the G7 Academies propose a vision of broad international collaboration that includes natural, social, and health sciences, engineering, humanities, and Indigenous knowledge.<sup>111</sup>

However, the UK's contribution to the G7 summits could be limited by the fact that the Royal Society is predominantly a natural science institution, whereas the Royal Society of Canada for example is far more interdisciplinary.<sup>112</sup>

66. We heard that Economic and Social and Arts and Humanities Research Councils do not contribute significant amounts of funding for Arctic research in comparison to NERC.<sup>113</sup> Henry Burgess, Head of the NERC Arctic Office, cautioned against encouraging the Economic and Social Research Council (ESRC) to create a specific Arctic project on the grounds that ESRC “is working on a smaller budget” than NERC. However, as the FCO told us that “scientific evidence runs throughout *Beyond the Ice* and is at the heart of UK Arctic policy” the benefit of an increased multidisciplinary approach in UK Arctic research seems evident. Jane Rumble agreed that more could be done in terms of feeding the social science work that is being done into foreign policy but commented “that is what I would like, but obviously it is a decision for BEIS on the basis of its priorities.”<sup>114</sup>

67. **To remain as a world leader in Arctic research, the UK will need to move towards a multidisciplinary approach, which includes the social sciences and brings research together from across research councils. According to the Minister for the Polar Regions, “scientific evidence runs throughout *Beyond the Ice* and is at the heart of UK Arctic policy”, but we heard that despite the UK having world leading social scientists, this expertise is not being harnessed to inform UK Arctic policy. The Economic and Social Research Council and the Arts and Humanities Research Council do not fund Arctic research to the same degree as the Natural Environment Research Council due to limitations in their budgets.**

68. *We recommend the Government allocate specific funds for an Arctic project within UK Research and Innovation (UKRI) which would enable collaboration between the Economic and Social, Arts and Humanities and Natural Environment Research Councils. Multidisciplinary research is key to finding solutions to the complex problems of the Arctic and the NERC Arctic Office is facilitating this to the best of its ability given the limited resources available. We recommend the Department for Business, Energy and Industrial Strategy provides for the expansion of the NERC Arctic Office to coordinate the new UKRI Arctic Project and to identify disparate Arctic social science research already taking place in UK academic institutions. Expanding the NERC Arctic Office would enable it to increase its work on building international connections, new collaborations and encouraging multidisciplinary approaches. This would enable the Government to take a leadership role on developing climate resilience for remote communities, which would bring domestic benefits, and allow adaptation measures to assume a higher priority in UK Arctic Policy.*

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111 The Royal Society ([ARC0014](#))

112 [Q150](#), [Q151](#)

113 [Q148](#), [ARC0023](#)

114 [Q231](#)

## Impact of leaving the European Union on UK Arctic research

69. International co-operation is particularly important in polar research, due to the costs and complexities of operating in such extreme environments. Individual expertise in polar research is spread out across the world.<sup>115</sup> Professor Wolff from the Royal Society told us Arctic research “is impossible to do ... by yourself.”<sup>116</sup> He also noted that major Arctic projects could not have been done “without European funding because we would never have managed to glue together the money properly without having the European Union as the centre of it.”<sup>117</sup> NERC provided examples of UK-based Arctic research involved in EU-funded programmes:

- Horizon 2020 (the biggest EU Research and Innovation programme ever with nearly €80 billion of funding available over 7 years 2014 to 2020)
- The completed ICE-ARC project looking at current and future sea ice;
- The current APPLICATE and Blue-Action projects looking at climate and weather implications of change;
- The INTERACT project which funds transnational access for researchers to other countries’ Arctic Stations;
- The inclusion of the soon to be completed RRS Sir David Attenborough in the ARICE Arctic international icebreaker consortium.<sup>118</sup>

70. The European Union has its own Arctic policy, published in April 2016, which states “The European Union has an important role to play in supporting successful Arctic cooperation and helping to meet the challenges now facing the region”.<sup>119</sup> The EU policy for the Arctic builds on a number of existing EU activities and decisions that already have an impact on the region following the 2008 policy communication, Communication from the Commission to the European Parliament and the Council the European Union and the Arctic Region, and an update and overview of activities in 2012, Developing a European Union Policy towards the Arctic Region: progress since 2008 and next steps.

71. Three Arctic states are members of the EU: Finland, Sweden and Denmark through its Greenland connection; and Iceland and Norway are close partners. Professor Wolff from the Royal Society told us that this makes the EU particularly interested in the Arctic.<sup>120</sup> The Minister for the Polar Regions said that the UK will continue to play an active role in shaping the EU’s policy towards the Arctic, up to the point the UK leaves the EU.<sup>121</sup>

72. Two recurring concerns regarding the effect of leaving the EU on UK Arctic research were raised in the written evidence. Firstly, uncertainty over funding; whether the UK will continue to contribute to and benefit from large programmes such as the European Research Council (ERC), Horizon2020, Copernicus, Galileo, which is important for

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115 [Q18](#)

116 [Q18](#)

117 [Q18](#)

118 NERC ([ARC0010](#))

119 [https://eeas.europa.eu/arctic-policy/eu-arctic-policy\\_en](https://eeas.europa.eu/arctic-policy/eu-arctic-policy_en)

120 [Q101](#)

121 FCO ([ARC0016](#))

satellite monitoring of melting ice. Secondly, uncertainty about personnel, the ability to attract the best researchers to academic positions at all levels and collaborate with European partners.<sup>122</sup>

73. Jane Rumble, Head of Polar Regions, FCO told us that BEIS would lead on the future of science funding after the UK leaves the EU.<sup>123</sup> She noted that the UK, as the fourth biggest contributor to Arctic science, will still have “phenomenal Arctic expertise” after we leave the EU and that “the question comes back to where the funding will come from”.<sup>124</sup>

74. Professor Wingham, NERC Executive Chair, explained that funding for Arctic research comes from both national and EU budgets and that the UK wins about 15% of its funding each year from Horizon 2020 (approximately £4 billion a year). He said “whatever the future holds, we need to find a way of ensuring we can maintain all of the benefits that arise from that funding”.<sup>125</sup> Professor Wingham informed us that NERC is working with BEIS to consider “almost any scenario that may arise concerning funding” and noted “we will have to see what comes out of the negotiations with the EU.”<sup>126</sup>

75. We received evidence to suggest that Arctic research is already being affected by the decision to leave the EU. The Methane in the Arctic: Measurements and Modelling (MAMM) project, which was a NERC-funded Arctic research project, said that EU funding for laboratory work monitoring methane has already ceased:

A substantial amount of lab work at Royal Holloway analysing carbon isotopes in thousands of air samples from countries in Europe has now stopped. This was previously funded with EU money, and is no longer taking place. As there is not the capacity to process such large numbers of samples within Europe, it is our presumption that a lower standard of analysis is taking place instead, or a reduced number of samples fully analysed. This is a negative impact not only for scientists within Europe, but also for this crucial monitoring of methane and its isotopes.<sup>127</sup>

76. Additionally, we heard from the Centre for Polar Observation and Modelling (CPOM) that the UK does not participate in European Research Council user forums to decide and prioritise the next generation of polar satellite missions that monitor the loss of land and sea ice in the Arctic. CPOM pointed out that “although UK industry, via continued UK membership of the European Space Agency, can be involved in its build”, leaving the EU will mean “a lack of influence over mission direction” and may also affect the UK’s ability to obtain free satellite data. CPOM caution that this, in turn, will “affect the degree to which the UK can collaborate with other EU Arctic actors on climate data services”.<sup>128</sup>

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122 Edinburgh University Glaciology ([ARC0017](#)), Centre for Polar Observation and Modelling ([ARC0015](#)) Measurements and Modelling (MAMM) project ([ARC0018](#)), The Royal Society ([ARC0014](#)), Scottish Association for Marine Science ([ARC0013](#)), British Ecological Society ([ARC0011](#)), The National Oceanography Centre ([ARC0001](#)) and British Antarctic Survey ([ARC0004](#))

123 [Q232](#)

124 [Q233](#)

125 [Q155](#)

126 [Q157](#)

127 Measurements and Modelling (MAMM) project ([ARC0018](#))

128 Centre for Polar Observation and Modelling ([ARC0015](#))

### European Polar Board

77. We have heard that remaining a member of the European Polar Board (EPB) will be “crucial” for Arctic research to enable collaboration with European partners.<sup>129</sup> The EPB is an association of 27 members of European countries that have polar science activities. Henry Burgess, head of the NERC Arctic Office informed us:<sup>130</sup>

The European Polar Board is not a funding body. It is a representative body of the institutions that work in the Arctic and the Antarctic. What they are doing is coming together and combining their expertise. They produced recently a database of infrastructure, north and south, funded by the European Commission Horizon 2020 project, EU-PolarNet, which provides better access to those systems.

The Minister for the Polar Regions told us that it was “the full intention” that the UK will remain a member of the European Polar Board after we leave the EU.<sup>131</sup>

78. **A recurring concern raised in the evidence was uncertainty over Arctic funding following the UK’s decision to leave the European Union. We are pleased to hear that the UK will remain a member of the European Polar Board. It is not, however, known whether the UK will continue to contribute to large programmes such as the European Research Council (ERC), Horizon2020, Copernicus and Galileo. There is also uncertainty about scientific personnel and maintaining the ability to attract the best researchers to academic positions. These uncertainties are having a chilling effect on UK Arctic research. Maintaining the UK’s strong track record in Arctic research is vital, but UK institutions need secure funding sources and free movement for the brightest researchers to continue their world-leading research.**

79. *The Foreign and Commonwealth Office should emphasise the importance of securing funding for Arctic research to the Treasury and to the Department for Business, Energy and Industrial Strategy, given that UK Arctic research underpins all UK Arctic Policy. The Department for Business, Energy and Industrial Strategy should commit funds for any shortfalls in funding after we leave the European Union. Membership of the EU has been vital to UK leadership in arctic science. In negotiating the UK’s future relationship with the EU, the Government should seek to maintain the current level of collaboration and co-operation with the EU and ensure the same access to EU programmes.*

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129 British Antarctic Survey ([ARC0004](#))

130 [Q141](#)

131 [Q236](#)

## 3 The UK's relationship with the Arctic

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### Sovereignty over the Arctic

80. The Arctic has long been an area of commercial, geopolitical and strategic interest. The polar region has historically boasted economic opportunities in the form of shipping routes, natural minerals as well as fish, seals, walrus and whales. These opportunities have been capitalised on by many nations over the centuries. As early as the 15th century, British, Dutch, Norwegian, Russian and Danish explorers searched for a viable shipping route through to Asia. In the 17th century whale and walrus hunting was prominent across the Arctic, resulting in the collapse of Arctic mammal populations by the turn of the 20th century. From the 1900s onwards, coal mining and oil and gas extraction was widespread across Alaska, Yukon, the Russian North and Svalbard.

81. As global interest in the Arctic intensified at the beginning of the twentieth century, the state of sovereign rights over land and sea became more prominent. In the case of Svalbard, a treaty was signed in 1920 (which entered into force in 1925) to determine Norway's full and undivided sovereignty over the area. Signatories to the treaty such as Russia and the UK, however, were granted economic rights as part of a post-World War I settlement which ensured that Svalbard was demilitarised. Most land boundaries in the Arctic are undisputed, but maritime boundaries are less settled, including who 'owns' the North Pole area itself. Under the United Nations Convention on the Law of the Sea (UNCLOS), each coastal state has an 'Exclusive Economic Zone' stretching up to 200 nautical miles offshore, giving them sovereign rights over resource exploitation and development. The five Arctic coastal states (Canada, Denmark, Norway, Russia and the United States) reaffirmed their collective commitment to the 'Law of the Sea' (the US remains a non-signatory to UNCLOS) through the Ilulissat Declaration of 2008. All eight Arctic states met in Ilulissat in May 2018 to re-affirm their collective commitment to the principles enshrined in the Ilulissat Declaration of 2008. The Government's Arctic Policy, *Beyond the Ice states*:

Although the UK is not an Arctic State, we are its nearest neighbour, with Lerwick in the Shetland Islands closer to the Arctic Circle than it is to London. We have always been a world leader in polar affairs where British views have long held sway in the fields of polar science, exploration, diplomacy, business and environmental protection.

### The Arctic Council

82. The political stability of the Arctic is in part the result of the co-operation of the states through the Arctic Council. The eight Arctic states established the Arctic Council in 1996 as a "high-level intergovernmental forum to provide a means for promoting co-operation, coordination and interaction among the Arctic States". The Arctic Council includes other countries and organisations as recognised observers. The Council promotes circumpolar co-operation, coordination and interaction among the Arctic States, Arctic indigenous

communities (recognised as Permanent Participants<sup>132</sup>) and other Arctic inhabitants on common Arctic issues, in particular sustainable development and environmental protection.

83. The Arctic Council is considered the primary international forum for cooperation on Arctic matters. It does not 'govern' the Arctic, but it provides a forum for the negotiation of three legally binding agreements among the Arctic States (see box 1). Henry Burgess, Head of the NERC Arctic Office, explained the limitations of the Arctic Council:

... the important thing we need to remember all the time is that the Arctic Council is not a regulatory body. It does not have power to regulate in the Arctic. It is a body where people can discuss environmental and sustainability issues, but it is not a body that regulates in the Arctic. It provides guidance reports, best practice and assessments.<sup>133</sup>

**Box 1: Legally binding agreements signed by Arctic states**

2011: The Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic. Signed in Nuuk, Greenland.

2013: The Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic. Signed in Kiruna, Sweden.

2017: The Agreement on Enhancing International Arctic Scientific Cooperation. Signed in Fairbanks, Alaska.

Source: <https://arctic-council.org/index.php/en/about-us>

## Observers

84. Observer status is open to non-Arctic states; intergovernmental and inter-parliamentary organisations, global and regional; and non-government organisations. The UK has been an Observer to the Arctic Council since 1998 and was present at the signing ceremony in September 1996. At the 2013 Kiruna Ministerial meeting, the Arctic Council formally adopted an Observer Manual for Subsidiary Bodies. The Manual outlines how Observers can participate in Arctic Council meetings:

Observers may, at the discretion of the Chair, make statements, present written statements, submit relevant documents and provide views on the issues under discussion. On any agenda item under discussion, the Chair should ensure that speakers from Arctic State and Permanent Participant delegations have first had an opportunity to intervene and discuss the agenda item, before considering opening the discussion to further interventions from all delegations to the meeting, including speakers from Observer delegations.<sup>134</sup>

132 The category of Permanent Participant was created to provide for active participation and full consultation with the Arctic indigenous peoples within the Arctic Council. They include: the Aleut International Association, the Arctic Athabaskan Council, Gwich'in Council International, the Inuit Circumpolar, Russian Association of Indigenous Peoples of the North and the Sami Council.

133 [Q128](#)

134 <https://oaarchive.arctic-council.org/handle/11374/939> (it was revised in 2015 and 2016).

85. In essence, the role of an Observer is to observe the proceedings of the Arctic Council and only to participate when called to. Dr Downie, Head of Polar Programme at WWF, which is also an Observer to the Arctic Council, noted that Observers could be “critical friends to the Arctic Council” providing crucial challenge to their deliberations and negotiations. Dr Downie made the case for a more progressive, strengthened role for Observers, especially given how engaged Observers are in the working groups of the Arctic Council:

For us observer is a misnomer because we are very active right across the working groups.<sup>135</sup>

86. The Geological Society emphasised that the UK should capitalise on its position as an Observer State:

In our role as an Observer State, there is room for the UK to expand its influence on the Arctic Council but to also use that position to learn from the successes in other countries, such as the Canadian regulatory regime for extractives. The Arctic Council is viewed internationally to have an important role in international diplomacy and offers opportunities to engage with other countries outside of central government negotiations. The UK’s place on the Council and its access to alternative routes to diplomacy and knowledge sharing should be taken full advantage of.<sup>136</sup>

87. The Minister for the Polar Regions however seemed reluctant to increase the UK’s activities:

I think we are fully engaged, and I think the cleverness of our engagement is that it is not overly bossy and didactic... I think the role we play is in being a very significant and, I think, highly respected participant in international organisations and fora that develop relevant policies.<sup>137</sup>

**88. The Arctic Council is the most important international forum for Arctic matters and the UK is a long-standing Observer. The UK has carefully balanced its role in assisting and influencing the Council with the fact that the UK is not an Arctic State. The Arctic Council has established clear parameters for the level of involvement Observers can have, but within those the UK should provide more clarity on what it intends to do as an Observer over the long term.**

***89. We recommend that the Government should set out explicitly what it hopes to achieve through the UK’s position as an Observer to the Arctic Council over the next 10 years. This may help the strategic direction of the Council, as the two year rotation of the chairmanship can bring frequent changes to priorities for the Council. In addition, the UK should be more transparent about its work with the Arctic Council. The Government should publish the ‘reporting card’ it produced to reaffirm its status as an Observer as well as publishing its contributions to the six Arctic Council working groups.***

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135 [http://wwf.panda.org/knowledge\\_hub/where\\_we\\_work/arctic/what\\_we\\_do/arctic\\_council.cfm](http://wwf.panda.org/knowledge_hub/where_we_work/arctic/what_we_do/arctic_council.cfm)

136 Geological Society ([ARC0006](#))

137 [Q222](#)

## Growing international interest in the Arctic

90. The Arctic has become a subject of greater strategic interest over the past few years, due in part to the overwhelming evidence of climate change alongside increasing interest in the region's natural resources, tourism potential and emerging shipping routes. From 2013 onwards, there has been a significant increase in the number of state Observers to the Arctic Council. At the Kiruna Ministerial meeting in 2013, Italy, Japan, China, India, Korea and Singapore became approved Observers. In 2017, Switzerland also became an Observer bringing the total number of state Observers to thirteen. Dr Richard Powell, Lecturer and Fellow of Fitzwilliam College, Scott Polar Research Institute, University of Cambridge said:

The argument that the United Kingdom is the closest neighbour and, therefore, we should always be at the table - we have always been in the room listening to the discussion since the first meeting of the Arctic Council back in 1996 - has inevitably been disrupted by new actors. That is not just China but lots of other Asian states are increasingly interested in the region. There are definitely lots of issues about global responsibilities and particular state national interests in the region.<sup>138</sup>

91. Beyond the Ice recognises that “the growth of interest in the Arctic has led to a significant interest in the region from both governments and civil society”.<sup>139</sup> Jane Rumble of the FCO explained that while it might seem counterintuitive, China and other Asian states have legitimate interest in the Arctic:

It really comes down to those countries that recognise the importance of the polar regions, in terms of driving the whole global systems. We were talking earlier about the sea ice melting in the north. Bizarrely... what happens in the north will disproportionately affect the south, and what happens in the south will disproportionately affect the north ... That explains why countries a very long way from the Arctic are sitting up and taking notice of the changes there.<sup>140</sup>

The Minister for the Polar Regions expressed support for the increase in the number of Observers, stating that “the more people who take a direct interest and are well intentioned in what they do - that it is the key - the better.”<sup>141</sup>

92. We did however hear concerns that the UK's position could weaken due to the rise in the number of Observers. In his 2018 book, *Britain and the Arctic*, Duncan Depledge is critical of the lack of presence of UK scientists at key Arctic science meetings, stating that China, Japan and Korea are enhancing their profile at such meetings. Depledge is concerned that the UK may lose influence if it does not maintain a high-profile presence in the appropriate Arctic scientific forums because of the diplomatic status accorded to Arctic science.<sup>142</sup> Japan recently hosted the Top of the World Arctic Broadband Summit in June 2018, which involved discussions between policy leaders, researchers, tech industry

138 [Q140](#)

139 *Beyond the Ice*, HM Government, 2018

140 [Q239](#)

141 [Q223](#)

142 *Britain and the Arctic*, Duncan Depledge, 2018, Palgrave Macmillan

experts and other executives around the need and potential for broadband across the Arctic, and how to best prepare for the many opportunities and challenges the new technology will bring with it.

93. The European Commission, Finland and Germany will co-host the 2nd Arctic science ministerial meeting in Berlin in October this year. The 1st Arctic Science Ministerial, hosted by the White House in 2016, brought together science ministers from 24 governments, EU representatives and delegates from Arctic Indigenous peoples' organisations. Their discussions centred on collective efforts to step up international scientific cooperation in the Arctic. The aim of the 2nd Arctic science ministerial is "to promote the results of the deliverables agreed at the 1st meeting, increase capacity to respond to major societal challenges in the Arctic, encourage further scientific cooperation among a large number of countries and representatives of indigenous people."

94. Richard Powell said that the UK can no longer rely on its geographic proximity, and scientific contribution to, the Arctic given that other countries have substantially increased investment in the Arctic:

The People's Republic of China is making the same argument about being a near neighbour. The spatial geographical link argument is very similar but the UK's investment in science and wider activities is dwarfed by China.<sup>143</sup>

95. Other countries are positioning themselves as 'near-Arctic states' and working closely with 'gateway' Arctic countries such as Finland and Iceland—which themselves are eager to develop a competitive advantage over other Arctic states. Relative geographical proximity to the Arctic region no longer necessarily confers commercial, scientific and geopolitical advantage to the UK. Dr Alexandra Middleton, Assistant Professor at the University of Oulu made a similar argument and welcomed stronger involvement in the Arctic from the British Government stating:

Scotland is much closer to the Arctic Circle than China and China claims itself as a near-Arctic nation. You could have a stronger statement as well.<sup>144</sup>

96. China unveiled a plan for a 'Polar Silk Road' as part of its Arctic policy in January 2018. The country would like to "jointly understand, protect, develop and participate in the governance of the Arctic, and advance Arctic-related cooperation under the Belt and Road Initiative," according to the white paper. On 6th September, the 36,000 tonne Chinese cargo ship Tianen completed its maiden voyage from Beijing to Rouen, France, through the Arctic Circle.<sup>145</sup> China's Arctic policy also outlines an interest in the development of oil, gas, mineral and other non-fossil energies, fishing and tourism in the region while respecting the traditions and cultures of indigenous people and conserving the natural environment. Recent Chinese investments include an agreement to exploit Greenland's rare earth minerals and a Northern Lights research institute in Iceland (funded by China's Polar Research Institute). China, as part of the terms and conditions to become an Observer to the Arctic Council in 2013, acknowledged the sovereignty and sovereign rights of the eight Arctic states and the special position of indigenous peoples as Permanent Participants.

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143 [Q140](#)

144 [Q109](#)

145 <https://www.thetimes.co.uk/article/china-opens-arctic-route-to-europe-vzf7xmchx>

97. The United Kingdom is a long-standing Observer to the Arctic Council and has a strong reputation for engaging with the work of the Council and contributing scientific expertise to the working groups. The significant increase in the number of State Observers to the Arctic Council since 2013 brings a fresh challenge to the UK's claim as a "near Arctic state". There is a risk that the UK's geographical proximity to the Arctic will be overshadowed by increased foreign investment and scientific research by others. The UK can play a role in ensuring that foreign interest in the Arctic is driven by a scientific understanding of the challenges facing the Arctic.

98. *The Arctic Council is becoming an increasingly global forum for securing agreements, cooperation and dialogue on Arctic issues. The Government should ensure that there are UK representatives at all important Arctic science meetings and scientific forums, including the upcoming Arctic Scientific Forum in Berlin. The UK should offer to host a forthcoming Arctic Scientific Forum, possibly in collaboration with an Arctic State.*

## UK Arctic Policy

99. The UK has its own Arctic Policy. The first iteration of the policy was published in 2013, following a recommendation from our predecessor Committee in their 2012 report *Protecting the Arctic*. The Committee called on the Government to:

... begin the development of an Arctic Strategy to bring together the UK's diverse interests in the Arctic and engage all stakeholders. Without one there is a risk that government departments may not be working in a cross-cutting way. Such a Strategy should include analysis of the potential impact of climate change on the Arctic and necessary responses, as well as how and where the Government would act to support sustainable development in the Arctic.<sup>146</sup>

100. The UK's original Arctic policy *Adapting to Change* set out three overarching principles: respect, leadership and cooperation.

- Respect, for the sovereign rights of the Arctic States and their Governance in the Arctic, for the interests of people who live in the Arctic, and for the environment;
- leadership on some of the greatest challenges facing the Arctic due to climate change through highly regarded UK science; and
- cooperation with the Arctic States, indigenous peoples and others on the issues facing the Arctic.<sup>147</sup>

101. The revised 2018 policy, *Beyond the Ice*, reaffirms the UK's commitment to these overarching principles stating that they "remain the right ones and are central to our approach in the Arctic."<sup>148</sup>

102. *Beyond the Ice* has been praised for its ambition and wide-ranging scope. Henry Burgess of the NERC Arctic Office said that "the fact the science story flows through all

146 *Protecting the Arctic*, Second Report of the Session 2012–13, Environmental Audit Committee

147 *Adapting to Change*, HM Government, 2013

148 *Beyond the Ice*, HM Government, 2018

the three categories of the document... is a fantastic story for the UK science community to be a part of and to tell.”<sup>149</sup>The National Oceanography Centre expressed a similarly positive view of the UK’s Arctic policy noting that from the outset, “UK-based Arctic science was identified as having a unique role in contributing to policy, reputation and influence.”<sup>150</sup>

103. The Foreign and Commonwealth Office has overall lead on Arctic Policy, with the Minister for the Polar Regions supported by the Polar Regions Department. Different departments lead on various aspects of UK Arctic Policy such as the Department for Business, Energy and Industrial Strategy (BEIS), the Department for Transport (DfT) and the Department for Environment, Food and Rural Affairs (DEFRA). The Minister for the Polar Regions, Sir Alan Duncan, said that his role “is to oversee the co-ordination of UK Arctic policy in the UK’s engagement with the Arctic Council.”<sup>151</sup>

104. However, the Minister’s view of the UK’s Arctic policy was at times lacking. When asked how the FCO views the role of the Natural Environment Research Council (NERC) in the development of UK Arctic policy, the Minister said it was “the responsibility of BEIS”.<sup>152</sup> While BEIS is responsible for funding NERC, the FCO claims in its written evidence that “scientific evidence runs throughout Beyond the Ice and is at the heart of UK Arctic policy”.<sup>153</sup> We would have expected the Minister to have a view on how NERC funded science is put to work in informing UK policy and scientific diplomacy. We would also have expected the FCO to have a view on issues such as shipping, sustainable development, search and rescue, and tourism.<sup>154</sup>

105. The Polar Regions Department in the FCO oversees the development and implementation of UK policy in both the Antarctic and the Arctic. Head of the Department, Jane Rumble explained that whereas in the Antarctic the UK “has full policy responsibility for absolutely everything” because of the British Antarctic Territory, in the Arctic the FCO’s role is “more co-ordinating and representational.”<sup>155</sup> Jane Rumble also explained the FCO has about the same level of resource dedicated to the Arctic as the British Antarctic Survey; about one and a half people.<sup>156</sup> While there are important historic and political reasons for more resource being dedicated to the Antarctic, the Arctic is an increasingly complex region that should command more resource within the FCO.

106. The Minister for the Polar regions is also Minister for Europe and the Americas. With such an extensive brief, we are concerned that the Minister may not be able to prioritise taking a more active role in co-ordinating UK Arctic activity. The appointment of a UK special representative or envoy to the Arctic would help to address those gaps in governance and representation. Our concerns have been shared by our colleagues in other Parliamentary Committees. For example, in its report “Responding to a Changing Arctic”, published February 2015, the House of Lords Select Committee on the Arctic stated 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

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149 [Q131](#)

150 The National Oceanography Centre ([ARC0001](#))

151 [Q203](#)

152 [Q226](#)

153 Foreign and Commonwealth Office ([ARC0016](#))

154 [Q203](#)

155 [Q221](#)

156 [Q228](#)

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.<sup>157</sup>

It also stated 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.<sup>158</sup>

Similarly, in its report “On Thin Ice: UK Defence in the Arctic”, published in August 2018, the House of Commons Defence Committee asked the Government to:

Reconsider its decision not to appoint an Arctic Ambassador to improve co-ordination of policy in Whitehall and bolster UK representation in Arctic Affairs.<sup>159</sup>

### **Scotland's Connection with the Arctic**

107. Beyond the Ice notes that “due to its proximity to the European Arctic, Scotland enjoys a long history of shared economic, social and cultural links.”<sup>160</sup> Professor Inall, from the Scottish Association for Marine Science (SAMS) outlined that Scotland has taken a keen interest in the ‘New North’ or the ‘High North’ as an opportunity for sharing expertise in the social needs and economic opportunities of Scottish communities and those of Arctic nations such as Iceland and Norway. Issues include sustainable fisheries management, port infrastructure, the supply chain for oil and gas, sustainable tourism and social issues.<sup>161</sup> The Arctic Circle Forum event, ‘Scotland and the New North’, hosted in Edinburgh in 2017, was an effective platform for both Scotland and the UK to promote their expertise in responsible development and industry best practise to an audience dominated by Arctic nations.

108. The Scottish Government announced that it would develop its own Arctic Strategy on devolved matters at the Arctic Circle Forum in Edinburgh in November 2017. When we asked the Minister for the Polar Regions about the FCO’s relationship involvement in the Scottish Arctic Strategy, he told us that the Arctic is primarily a UK policy area and that FCO officials work closely with the Scottish Government to ensure that the UK’s

157 *Responding to a Changing Arctic*, House of Lords Arctic Select Committee, 2015

158 *Responding to a Changing Arctic*, House of Lords Arctic Select Committee, 2015

159 Defence Committee, Twelfth Report of Session 2017–19, [On Thin Ice: Defence in the Arctic](#), HC 388.

160 *Beyond the Ice*, HM Government, 2018

161 [Q60](#)

Arctic policy represents the interests of Scotland. However, Dr Powell from the Scott Polar Research Institute suggested that Scotland has some issues with the UK's claim to be the Arctic's nearest neighbour, given that it is the Shetland Islands that are close to the Arctic.<sup>162</sup>

109. Our predecessor Committee called for a UK Arctic policy that would ensure Government departments work together in a cross-cutting way. The second iteration of the resulting UK Arctic strategy, *Beyond the Ice*, is a commendable document that covers the breadth of the UK's interests in the Arctic. However, we found that the Foreign and Commonwealth Office (FCO), which leads on co-ordinating Arctic policy, was not able to articulate the UK's position on a number of matters affecting the Arctic. This is concerning given that the FCO represents the UK at the Arctic Council. While there are important geopolitical reasons for more departmental resource within the FCO to be dedicated to the Antarctic, we believe that the speed and complexity of change in the Arctic means that British engagement with the region should be increased. The Committee recognises that the Minister for the Polar regions is also Minister for Europe and the Americas and that it is therefore unfair to expect the Minister to take a more active role in co-ordinating UK Arctic activity. *We therefore recommend that the Government further considers the recommendations by the House of Lords Select Committee on the Arctic in 2015, and the House of Commons Defence Committee in 2018, that the UK should appoint a special representative or envoy to the Arctic to play a co-ordinating role, in support of the Polar Regions Department and the Minister.*

110. *In order effectively to influence the Arctic Council, the UK needs to have a coordinated Arctic policy led by the FCO. When our predecessor Committee recommended the introduction of an Arctic strategy to ensure cross-cutting departmental work, they envisaged a deeper level of coordination than the production of a shared Government document. The Minister for the Polar Regions should fulfil his role in overseeing the coordination of UK Arctic policy by working to develop a set of strategic priorities along with targets to measure them. To facilitate the establishment and measurement of these Arctic priorities, the FCO should dedicate more departmental resources to the Arctic to ensure that the UK is capitalising on the opportunities in the Arctic and fully participating in the work of the Arctic Council.*

## 4 Commercialisation of the Arctic

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### Sustainable development in the Arctic

111. As the Arctic changes and warms new economic and social opportunities have the potential to be created. Reduced sea ice is making the Arctic more accessible and navigable, especially in the summer. The Scottish Association for Marine Science (SAMS) notes that increased shipping, exploitation of newly available mineral resources and tourism are among the opportunities available.<sup>163</sup> The United States Geological Survey (USGS) estimates that about 30 percent of the world’s undiscovered gas and 13 percent of the world’s undiscovered oil may be found in the Arctic, mostly offshore and under less than 500 metres of water. It may or may not be commercially recoverable. SAMS suggests that UK Arctic policy “must balance new economic and social opportunities with environmental concerns, particularly as our international relationships change with the advent of Brexit.”

112. Mismanagement of the new opportunities in the Arctic created through climate change could have a profound impact on the environmental and social stability of the region. Professor Wolff from the Royal Society told us that if growing access to the Arctic due to melting ice is completely unmanaged it would be “quite horrendous.”<sup>164</sup> Rod Downie from the WWF told us that “the actions of nations that sit outside of the Arctic have quite dire and important consequences for sustainable development in the Arctic.”<sup>165</sup> As our expert witnesses reiterated, the Arctic is intimately connected to global actors, processes, and markets.<sup>166</sup>

113. One of the key changes between the UK’s first Arctic policy and the revised 2018 version is the explicit inclusion of sustainable development. Jane Rumble of the FCO, explained this development of the policy:

In the original report, we probably put the focus a bit more on responsible development. It was feedback from NGOs that said we should say “sustainable”. We had a long discussion on what is the difference between “responsible” and “sustainable”. Of course, there is a clear difference. We wanted to bring out that actually under responsible we sort of meant to include the whole umbrella of looking at these things from the pillars of sustainable development, so in the second report we just made that much more explicit.<sup>167</sup>

114. Rod Downie of WWF told us that the shift from responsible development to sustainable development was “very important” and that WWF had influenced the FCO to recognise the UN Sustainable Development Goals (SDGs) in Arctic policy.<sup>168</sup> Sustainable

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163 Scottish Association for Marine Science ([ARC0013](#))

164 [Q91](#)

165 [Q74](#)

166 [Q22](#), [Q24](#), [Q197](#)

167 [Q242](#)

168 [Q107](#)

development is an established focus for the Arctic States. Under the current two-year Finnish Chairmanship of the Arctic Council, the SDGs have been established as a key priority alongside the Paris Agreement on Climate Change.<sup>169</sup>

115. UK Arctic Policy has identified three SDGs as particularly relevant to the Arctic; Climate Action (Goal 13), Life Below Water (Goal 14) and Life on Land (Goal 15) which focuses on biodiversity.<sup>170</sup> The Minister for the Polar Regions explained that “the entire policy... is essentially inspired by and consistent with the SDGs, because it is our broader climate change policy; it is biodiversity and making sure that any development does not undermine the environmental quality of the Arctic.”<sup>171</sup> Beyond the Ice states:

When the United Nations set the Global Goals for Sustainable Development in 2015, it recognised the importance of taking urgent action to combat climate change and its impacts; to conserving and sustainably using marine resources; and of life on land. The UK is firmly committed to delivering the Goals at home and around the World.<sup>172</sup>

### **Supporting sustainable economic development**

116. New commercial opportunities emerging in the Arctic could benefit the numerous communities living there, if managed appropriately. Professor Wolff, from the Royal Society, explained that the G7 Academy has launched a new collaborative research effort on the subject *The Global Arctic: the sustainability of communities in the context of changing ocean systems*:

It [the G7 statement] particularly commented on the aspect that there are commercial opportunities in the Arctic that could help the livelihoods of people living in the Arctic but that assessing how to make those work for people in the Arctic rather than just for everybody else, rather than just being an imposition... does require a lot of thought and a lot of work.<sup>173</sup>

117. Dr Alexandra Middleton, Assistant Professor at the University of Oulu, emphasised that “we should stop looking at the Arctic as just a land of natural resources and minerals” and consider other economic opportunities that would help people living there to thrive.<sup>174</sup> Dr Downie also noted that “a very diverse group of people... call the Arctic home and they all have aspirations ... for prosperity and to be part of the wage economy.”<sup>175</sup> Business Index North (BIN) is a report published annually that analyses ten regions in northern Norway, Finland, Sweden and Russia. The report provides an overview and a detailed picture of the socio-economic development and business opportunities within the BIN area and highlights the following topics of major relevance for the area: People, Life, Work, Performance of Business, Innovations, Connectivity, and Maritime Transportation through the Northern Sea Route. The 2018 report concluded that population growth in the Nordic BIN area is 2.7 times slower than in Nordic countries as a whole, and that

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169 <https://vnk.fi/en/arctic-issues/finland-to-chair-the-arctic-council>

170 [Q246](#)

171 [Q246](#)

172 Beyond the Ice, HM Government, 2018

173 [Q76](#)

174 [Q108](#)

175 [Q73](#)

across the whole BIN area the population is ageing and tertiary education is lower than the average across Nordic countries.<sup>176</sup> Professor Middleton told us how economic growth in the Arctic could be incentivised:

First of all, I think it is providing an attractive education, because we also see disparity in tertiary education attainment in these territories, and universities should be multi-faceted. They should be providing very modern and comprehensive education. Then we would think about supporting vibrant communities, the cultural life, to attract women and families. Of course, urban planning and healthcare are the main solutions and digital connectivity is very important as well.<sup>177</sup>

118. The Arctic Council focused its interest in the economic development of the Arctic through the establishment of the Arctic Economic Council (AEC) in 2014 under the Canadian chairmanship of the Arctic Council. The AEC is an independent organization that facilitates Arctic business-to-business activities and responsible economic development through the sharing of best practices, technological solutions, standards, and other information. Members include both large oil and gas companies and smaller indigenous businesses, such as reindeer herders.

119. While we welcome the UK's commitment to delivering the SDGs in the Arctic, we are concerned that the FCO has not made any material change to their Arctic policy in light of the move from "responsible" to "sustainable" development. Rod Downie from WWF praised *Beyond the Ice* for "its focus on climate change" but stated that "we clearly need to meet those words with actions."<sup>178</sup> When we asked what had changed following the move to sustainable development the Minister responded:

The reason I was slightly puzzled is that they are absolutely inherent and embedded in the structure of entire policy and everything we are doing in this area. In terms of what they actually add and change, it is slightly more difficult to say "we built this in this way but not in that way."<sup>179</sup>

120. We had hoped to have a more explicit link of policy to specific SDGs. In particular, the application of SDG 13 "Climate Action" to the Arctic seems inconsistent. For example, SDG 13 includes the target to "integrate climate change measures into national policies, strategies and planning" but the UK's Arctic Policy notes that supplying the world's continuing demand for oil and gas "for decades to come" will "require exploration of new potential resources, with the Arctic with its significant hydrocarbon reserves, potentially playing a major role."<sup>180</sup>

121. In recent years there has been a move away from drilling for oil and gas in the Arctic thanks in part to lower oil prices. Rod Downie told us that since the last Environmental Audit Committee report on Protecting the Arctic in 2012, there has been "something of a groundswell of commitments not to drill for oil and gas in the Arctic."<sup>181</sup> Commitments have come from both nations and private companies. For example, in December 2016,

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176 Business Index North, 2018

177 [Q70](#)

178 [Q107](#)

179 [Q246](#)

180 *Beyond the Ice*, HM Government, 2018

181 [Q92](#)

the Prime Minister of Canada Justin Trudeau committed to an indefinite moratorium on new rights to drill in Canadian Arctic waters. At a private company level, in May 2016 the French oil giant Total ruled out Arctic oil drilling. Rod Downie commented that “very interestingly, they cited not only the high risks of operating in the Arctic but also that they felt [their decision] was incompatible with the Paris climate change agreement.”<sup>182</sup>

122. Dr Yumashev of Lancaster University explained that to meet inevitable residual demand for fossil fuels, a limited amount of fossil fuels needs to be used in order to meet the Paris Agreement and that “the Arctic fuels, if we want to pursue that 2 degree target - or even more ambitious - appear to be too expensive.”<sup>183</sup> When we asked the Minister for the Polar Regions about the Government’s position on drilling in the Arctic he responded that “as a specific issue it has never come across my desk to be put in that sort of way.”<sup>184</sup> Following the evidence session, the Minister wrote to us to say that “the UK approach supports measures to reduce the demand for oil and gas though the development of a low-carbon economy while opposing restrictions that would affect the UK’s security of supply, affordability and sustainability.” The Minister also commented that, under the Paris Agreement, any emissions resulting from the extraction and use of hydrocarbons in the Arctic would be a matter for the nation concerned rather than the UK but that the “UK will continue to lead international calls for ambitious action to tackle climate change.”<sup>185</sup>

**123. The loss of sea ice creates new economic and social opportunities and risks in the Arctic. We heard that if these opportunities are not managed correctly, the consequences could be dire for the Arctic. The UK has a responsibility to ensure that commercial opportunities in the Arctic are guided by the principle of sustainable development. The new focus on ‘sustainable’ rather than ‘responsible’ development in the UK Arctic policy is a welcome change in the Government’s intentions, as is the explicit reference to the Sustainable Development Goals (SDGs). However, we are concerned that the Government may only be paying lip service to the SDGs, rather than using them to guide and evaluate its approach to the Arctic.**

**124. The UK has identified three SDGs relevant to the Arctic; Climate Action (Goal 13), Life Below Water (Goal 14) and Life on Land (Goal 15), but the Minister for the Polar Regions was not able to explain how the SDGs applied in an Arctic context, nor how their implementation is audited. Even though the Government has identified Goal 13 as particularly relevant to the Arctic, the Minister told us that the compatibility of drilling for oil and gas in the Arctic with the ambition of Goal 13 had not been explicitly put to him. We heard that not only is drilling for oil and gas in the Arctic incompatible with the SDGs, it is also incompatible with the UK’s commitment to the 2015 Paris Climate Change Agreement. However, the UK’s Arctic policy notes that it supports the use of “the highest possible standards” in Arctic oil and gas activities, rather than supporting the termination of drilling in the Arctic.**

***125. If the SDGs are to inspire and inform the UK’s Arctic policy, the Government should consider ending its encouragement of UK businesses to explore oil and gas opportunities in the Arctic. In its response to this report, the Government should acknowledge the***

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182 [Q92](#)

183 [Q195](#), Professor Ford from the Priestley Centre for Climate Change at the University of Leeds explained that working in the Arctic will always be dangerous and expensive due to the extreme climate and market dependencies, [Q94](#)

184 [Q248](#)

185 FCO letter

*incompatibility of continued support for oil and gas exploitation in the Arctic “for decades to come” with the UK’s SDG commitments and with the Paris Agreement, and set out plans to press members of the Arctic Council to adopt a similar approach.*

*126. Additionally, as recommended earlier in this report, the FCO should set a series of strategic priorities and targets for the UK’s sustainable engagement with the Arctic. The SDGs should be used to set and evaluate these priorities. There are more than three SDGs relevant to the Arctic and this should be acknowledged throughout the next iteration of the UK Arctic policy, such as; Goal 7 (affordable and clean energy), Goal 8 (decent work and economic growth) and Goal 11 (sustainable cities and communities). The use of the SDGs will ensure that the UK takes a sustainable approach to Arctic tourism, social issues and economic development in Arctic communities.*

### Shipping in the Arctic

127. As Arctic summer sea ice melts, new shipping routes are becoming accessible.<sup>186</sup> As far back as the 15th century explorers searched for a navigable route through the Arctic from Europe to East Asia, which would provide a more direct alternative to the Suez or Panama Canal routes. Much of the written evidence we received noted that, due to climate change, this is now close to becoming a reality. At present, most Arctic shipping is around the coastal periphery of the Arctic Ocean and is primarily for supplying communities in the region, marine tourism or transiting natural resources such as liquefied gas.<sup>187</sup> Destination-based shipping is widespread along the Northern Sea Route (NSR), but climate change is opening up some transit shipping routes, such as the Northwest and Northeast passages (see figure 2.)

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186 Michael Kingston told us record rates of ice melting combined with an increase in technological ability of ships to deal with ice was leading to more shipping in the Arctic, [Q166](#)

187 Dr Downie told us that 90% of all goods are brought into remote Arctic communities by boat, [Q76](#)

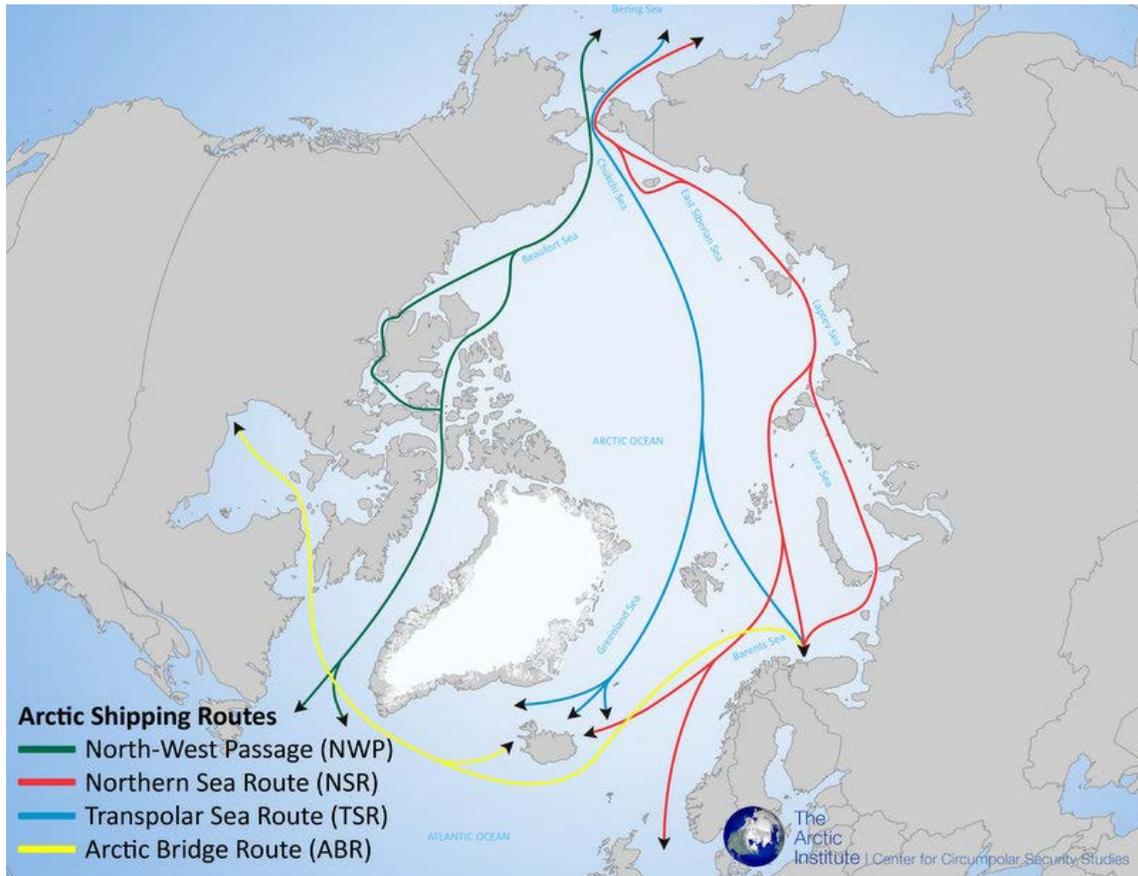


Figure 2: Arctic shipping routes. Credit: The Arctic Institute, Centre for Circumpolar Security Studies.

128. The NSR is one-third of the distance of the Suez Canal route, cutting journey travel time by approximately 13 or 14 days. In its Arctic strategy, China announced a ‘Polar Silk Road’ project as part of its existing Belt and Road Initiative to “facilitate connectivity and sustainable economic and social development of the Arctic.”<sup>188</sup> Although Russia has made use of the NSR for destination shipping for decades, using costly icebreaker ships to help navigation, there has been a marked increase in commercial shipping in recent years. In 2010, just four ships went through the NSR and numbers increased to 34 in 2011 and 67 in 2012. In terms of tonnage, shipping through the NSR has increased from 2.8 million tonnes in 2013 to 10.2 million tonnes in 2017.<sup>189</sup> Russian freight ship, the *Venta Maersk* was the first ship to navigate the route without an icebreaker in August 2018. Dr Downie from WWF told us about the environmental risks increased shipping brings:

Safe and environmentally responsible shipping is crucial. Of course, as Arctic shipping is set to increase, as we are seeing more ships and more vessels in the Arctic, that brings increased risks to Arctic wildlife through spills, through the introduction of invasive species, through underwater noise affected cetaceans, ship strikes and also just breaking up sea ice, which is an absolutely critical habitat for seals and polar bears and other species.<sup>190</sup>

129. Shipping in the Arctic carries serious safety risks. Professor James Ford explained in his written and oral evidence that growing tourism in the Arctic increases the likelihood

188 <https://www.ft.com/content/a53ebabc-0268-11e8-9650-9c0ad2d7c5b5>

189 [Q165](#)

190 [Q76](#)

of a “marine emergency” such as a ship foundering or an outbreak of disease on board, and that many regions of the Arctic would not be equipped to manage such an incident. There is a lack of Search and Rescue (SAR) facilities.

### **The Polar Code**

130. Some risks posed by shipping in the Arctic have been mitigated through the introduction of the Polar Code. The Polar Code was agreed and introduced by the International Maritime Organisation (IMO) in 2017. The Polar Code amends the three cornerstone conventions of the IMO and introduces regulations to cover safety and limitations of ships and lifesaving equipment, additional crew requirements for operating in the Arctic and environmental provisions.

#### **Box 2: International Code for Ships Operating in Polar Waters (Polar Code)**

The Polar Code was introduced by the International Maritime Organisation through amendments to three cornerstone conventions of the IMO: the Convention for Safety of Life at Sea, the MARPOL Convention for the Prevention of Pollution and the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers. The Code principally applies above 60 degrees north and below 60 degrees south. The Code is enforced by national procedures and ships require a polar ship certificate to demonstrate compliance with the Code.

The Polar Code comprises two parts that include both mandatory requirements and non-mandatory recommendations. The Code takes into account the unique risks associated with operating in the polar regions including ice; low temperatures; high latitude; remoteness; severe weather; limited charting; the pristine environment; and lack of training.

- a) Part I addresses safe design, construction and operation of vessels. It enters into force under the International Convention for the Safety of Life at Sea. It also describes the enhanced training and certification requirements for crew members working on polar ships, the provisions of which enter into force under The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers.
- b) Part II addresses environmental protection with significant requirements for pollution prevention and the way garbage and sewage is dealt with. It enters into force under International Convention for the Prevention of Pollution from Ships.

Source: International Maritime Organisation

131. The Polar Code requires ships travelling to the Arctic, and whose routes start and end in different countries, to take extra safety precautions to deal with the uncertain environment. Dr James Lea, from the University of Liverpool, outlined that changes in iceberg frequency could significantly impact the viability and safety of shipping routes. Professor Lea notes that predicting changes in the frequency of the creation of icebergs is extremely difficult as glaciers can often remain stable for decades, but the cumulative effect of climate change can cause them to suddenly destabilise and retreat several kilometres in just a few years and that these “rapid, year-to-year changes in iceberg frequency are likely

to represent an unexpected hazard for those operating in Arctic waters in the future.”<sup>191</sup> The Polar Code requires operators to demonstrate understanding of, and preparation for, a worst-case scenario in polar conditions in order for a polar ship certificate to be issued. Michael Kingston, a shipping lawyer, explained that operators work with the International Ice Charting Working Group and that the Polar Code includes a requirement for real time meteorological information to be received while operating in Polar waters.<sup>192</sup> However, as Dr Lea notes, predicting sea ice and iceberg change is complex. It is concerning that while the effects of climate change may have helped economic development in the Arctic by opening up new shipping routes, it may also hinder it by making them less accessible (and predictable) than they originally seemed.

### **Environmental issues**

132. While the Polar Code is a landmark achievement for international governance of shipping in the Arctic, it lacks detail on environmental issues. Dr Downie, Head of Polar Programme at WWF explained that the Polar Code is “weaker than its original intentions.”<sup>193</sup> Part II of the Polar Code includes a total ban on the disposal of oil, plastics, food waste, animal carcasses and noxious substances into polar oceans. However, it does not cover some crucial environmental issues such as marine noise, the use of heavy fuel oils in Arctic waters and polar-specific areas of invasive species. Dr Downie explained that although at present relatively few invasive species have become established in the Arctic, “this is absolutely set to change because we are seeing an increase in shipping but also because the thermal barriers are breaking down for these non-native species.”<sup>194</sup>

133. Heavy fuel oil (HFO) is the viscous leftover from the oil refining process. Only the largest ships can burn HFO and it is the preferred fuel for the marine shipping industry because it is cheap and widely available. The consequences of an HFO spill in the Arctic would be disastrous, as HFO does not disperse and break down in the marine environment. The Arctic Council working group on Protection of the Marine Environment (PAME) concluded in their 2009 Arctic Marine Shipping Assessment that the most significant environmental threat from ships to the Arctic marine environment is the release of oil through accidental or illegal discharge.<sup>195</sup> The Polar Code contains a ban on the use and carriage of HFO in the Antarctic but not the Arctic. This could be for economic reasons, as the Arctic’s location makes it strategically useful for commercial shipping routes and the vast majority of the 100,000 or so commercial cargo vessels in the world today use HFO. Arctic states do disagree on issues such as the use of heavy fuels with countries such as Finland leading the way in calling for their prohibition. Canada and Russia have been reluctant to call for an outright ban.<sup>196</sup>

134. The cost and benefit of increased shipping in the Arctic is likely to be unevenly distributed among communities. Professor Ford explained that when ships break through ice in the Arctic, not only are they affecting natural habitats, they are also affecting the transportation routes that people rely on:

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191 University of Liverpool ([ARC0003](#))

192 [Q184](#)

193 [Q77](#)

194 [Q86](#)

195 *Arctic Marine Shipping Assessment*, Arctic Council working group on Protection of the Marine Environment (PAME), 2009

196 <http://www.maritimejournal.com/news101/industry-news/canada-and-finland-disagree-over-arctic-fuel-ban>

In the past there have been examples where people have been stuck on ice that has drifted out to sea, because people have crossed the lead created by an icebreaking ship or the icebreaking ship by creating that lead means that people cannot get across the ice.<sup>197</sup>

The Polar Code does not contain provisions to engage with communities about when ships are coming in and what precautions to take on the broken ice. The PAME Arctic Marine Shipping Assessment concluded that “many local Arctic residents today depend heavily on marine resources for subsistence and the local economy; over-the-ice travel and boat transport allow the use of large marine areas during much of the year. Such life in the Arctic is dependent on movement over the ice and ocean and sea ice is integral to this movement.” Communication with Arctic communities is essential to ensure that everyone in the Arctic feels the benefits of increased shipping, or at the very least is not disadvantaged.

135. Although the Polar Code is not as comprehensive as it might be, updating and extending it would be a lengthy, complicated process. Dr Downie from WWF told us that Phase 1 of the Polar Code took nearly a decade to produce and that extending environmental provisions in “Phase 2” could take a similar time.<sup>198</sup> The risks to the environment from shipping are too immediate to wait another decade. The precautionary principle should be applied to the use of HFO, the risk of marine noise and invasive species and the danger to traditional indigenous ways of life.

136. **As Arctic sea ice melts, new shipping routes are becoming increasingly accessible. We heard that by 2050, the Arctic could be ice free in summer. However, it will be some time until the Arctic seas can be fully utilised for transit shipping. We are concerned that there is a quickening “albedo effect” in the economic exploitation of the Arctic; as sea ice melts, more shipping is possible but this in turn further threatens the environment. The risk of oil spills, higher carbon emissions and plastic pollution threaten the fragile environment of the Arctic.**

137. *The Polar Code should be amended to protect the Arctic from the risks from increased shipping. The Polar Code includes some provisions on environmental protection in the Arctic such as a ban on the disposal of food and plastic waste, but the Arctic has fewer environmental protections than the Antarctic. The ban on dangerous heavy fuel oils currently applied in the Antarctic should be extended to the Arctic as soon as is technologically feasible. Provisions on marine noise and invasive species should also be added to ensure that increasing shipping does not threaten Arctic biodiversity and marine wildlife.*

138. *The UK Government should press the International Maritime Organisation (IMO) to ban HFO in the Arctic as soon as is technologically feasible and strengthen its involvement in the Protection of the Arctic Marine Environment working group of the Arctic Council to ensure that the Arctic Council is itself able to make an influential, science-driven representation to the IMO. The UK should push the IMO to make the Arctic designated as a special sensitive area under MARPOL annex 6 and thus join other seas such as the ‘Antarctic area’.*

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197 [Q86](#)

198 [Q80](#)

## Tourism in the Arctic

139. One of the major drivers of economic development in the Arctic is the growing amount of tourism enabled by the increasingly long summer season, and reduced sea ice. The Geological Society note that economic opportunities enabled by climate change come with a certain level of risk:

In addition to the contribution of melting sea ice to global sea level rise, it opens the Arctic up to more industry and tourism-related traffic and development which in turn increases the risk of environmental impacts and incidents occurring in the Arctic.<sup>199</sup>

140. Tourism in the Arctic has grown dramatically over recent years. Edda Falk, from the Association of Arctic Expedition Cruise Operators (AECO) told us that over the past decade Arctic cruising has increased from around 50,000 passengers per year to around 80,000 in 2016. There is a risk that the thousands of tourists who travel to see a pristine, remote and unspoilt Arctic landscape are contributing to degradation of the very environment they came to see. Not only is there an environmental threat, there is a risk that as Arctic tourism expands there may not be enough capacity to deal with the significant risks posed by shipping in the Arctic.

141. The UK's Arctic policy, *Beyond the Ice*, recognises that “while the majority of visits to the region are trouble-free, more visitors put greater strain on modest search and rescue capability, and increase the potential for harm to the fragile environment.”<sup>200</sup> The Polar Code requires operators to have adequate lifesaving equipment to cater for passengers to survive for five days in the event of a marine emergency. However, as noted by Michael Kingston, as this is not possible with current equipment, operators must mitigate the risk in other ways, such as by tracking other ships in the vicinity to ensure close proximity to another ship in the event of an emergency. AECO, an industry body for small cruise ships of fewer than 500 passengers, explained that they have a live tracking system for their vessels and that “if anything happens, there are procedures in place.”<sup>201</sup>

142. The safety and security of conventional, large cruise ships however, appears less certain. Professor Ford told us that if a ship went down or ran into difficulties in the Arctic “there is very little capability to deal with that in rescue and also in treating for any injuries that might result from such an incident.”<sup>202</sup> There is no size restriction on ships sailing in Arctic waters. Conversely, in the Antarctic there is a restriction that any ship over the size of 500 passengers cannot conduct landings. The UK Government acknowledges that while the Arctic States take their search and rescue responsibilities seriously, capacity to deal with major incidents in the high north is limited. Travel advice to British nationals states:

You should be aware that in these regions, search and rescue response will often need to be despatched from many hundreds of miles away, and assistance to stranded vessels may take several days to arrive, particularly

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199 The Geological Society ([ARC0006](#))

200 *Beyond the Ice*, HM Government, 2018

201 [Q185](#)

202 [Q86](#)

in bad weather. Search and rescue assets are also likely to offer only basic transport and basic medical care, and are unlikely to be capable of advanced life-support.<sup>203</sup>

143. Additionally, we heard concerns about the social impact of large cruise ships. Professor Ford explained that large influxes of tourists can overwhelm small Arctic communities:

There are concerns. If you are in a community like Grise Fiord with 330 people, if a cruise ship of 1,000 people comes into town, that is a lot of people coming in... a cruise ship can turn up without announcing itself. The community has no idea a cruise ship is coming in and then all of a sudden you have twice the population coming in, walking around, peering in people's windows, asking questions. There are opportunities, for sure, but it is a challenge of finding ways to manage those opportunities.<sup>204</sup>

144. Professor Ford suggested that the opportunities from tourism need to be correctly managed in order to be sustainable.<sup>205</sup> During our visit to the Arctic, we met with expedition cruise operator Hurtigruten. According to AECO expedition cruising with their members is expected to grow by 44.5% from 2017 to 2020 - from 26,296 passengers in 2017 to 38,000 passengers in 2020.<sup>206</sup> Hurtigruten's Head of Communications told us that the Arctic states have an opportunity to decide what kind of tourists the Arctic wants to attract, and what limits to growth should be established. Sustainable Development Goal (SDG) 8, Decent Work and Economic Work, contains a target to "devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products by 2030." Beyond the Ice details a project run by the British Embassy in Helsinki to identify key areas where the UK and Finland share strong expertise that could benefit the development of the Arctic. The project identified sustainable solutions, maritime and tourism as key areas of expertise. The UK should use this expertise not only to map new business opportunities but also to help the Arctic to develop carefully considered, sustainable tourism.

**145. Arctic tourism can bring numerous economic opportunities to the region if it is managed correctly. Over the past decade the number of people going on Arctic cruises has increased from around 50,000 passengers per year to around 80,000 in 2016, and the market for small cruises in particular is expected to grow by almost 50% over the next three years. There is a risk that the thousands of tourists who travel to see a pristine, remote and unspoilt Arctic landscape are contributing to degradation of the very environment they came to see, and increased tourism can disrupt traditional ways of life. We heard that very large cruise ships with around 6,000 passengers are docking in small Arctic communities and overwhelming them. Large cruise ships also heighten risks of plastic pollution and place additional strain on already limited search and rescue capacity in the Arctic.**

**146. *The Arctic states have an opportunity to place limits on the type of tourism acceptable in the Arctic region. The UK should work with the Sustainable Development Working Group of the Arctic Council to push for a ban on cruise ships of over 500 passengers, and instead promote sustainable and considered Arctic tourism. The UK should engage with***

203 <https://www.gov.uk/foreign-travel-advice/denmark/arctic-travel>

204 [Q88](#)

205 [Q88](#)

206 Association Arctic Expedition Cruise Operators ([ARC0021](#))

*the Permanent Participants on the Arctic Council to ensure that they have the capacity, in collaboration with Arctic states, to influence the development of Arctic tourism so it is managed in a way that benefits their communities.*

## Conclusions and recommendations

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### Changes in the Arctic

1. The Arctic is undergoing profound environmental change as physical processes react to warming surface and ocean temperatures. Sea ice extent and thickness have been reducing for decades, and melting has accelerated since the early 2000s. Sea ice is now at its lowest level since records began and the Arctic ocean is projected to be ice free in the summer as soon as the 2050s unless emissions are reduced. The loss of 270 billion tonnes of land ice from Greenland each year is contributing to sea level rise and disrupting ocean circulation patterns. The acidification and Atlantification of the Arctic Ocean are causes for significant concern as they threaten marine wildlife. Permafrost thaw has the potential to release potent greenhouse gases into the atmosphere and the “Greening” and “Browning” of Arctic vegetation has already led to wildfires and the destruction of habitats. The complex interactions between permafrost thaw, vegetation and the Arctic carbon cycle are not yet fully understood, nor is the rate at which sea ice will decline. (Paragraph 17)
2. *The environmental change in the Arctic is a global concern and a global responsibility. The major physical and ecological changes in the Arctic driven by rising temperatures highlight the need for the UK to strengthen its emissions targets to be in line with the UK’s obligations under the Paris Climate Agreement and the Climate Change Act—this should include setting a net-zero target by 2050 at the very latest. While scientific research has made great strides in understanding environmental changes in the Arctic, ‘known unknowns’ remain. We recommend that the Government increases funding and support to UK scientists to advance global understanding of these scenarios and ensure that these groups continue to have access to vital funding provided by the EU through programmes like Horizon 2020.* (Paragraph 18)
3. One trillion plastic particles frozen into Arctic sea ice could be released into the ocean in the coming years through accelerated melting from rising temperatures. Between 62,000 and 105,000 tonnes of plastic enter the Arctic every year and plastic beach litter in the Arctic is comparable to densely populated areas, despite its remote and relatively uninhabited nature. The UK has contributed to plastic pollution in the Arctic and must therefore act swiftly to tackle pollution. (Paragraph 24)
4. *We welcome the Government’s commitment to tackle the sources of plastic pollution including the ban on the manufacture and sale of microplastics which our predecessor Committee called for in 2016, and which came into force in 2018. This ambition must be met with effective plastic reduction policies to ensure extended producer responsibility to include responsibility for collection, transportation, recycling, disposal, treatment and recovery of its packaging, improved design for recyclability and to create the necessary infrastructure to meet domestic demand. We recommend that the Government contribute to clean-up operations on Arctic beaches to take responsibility for the plastic pollution from the UK that has been transported to the Arctic by ocean currents. We heard that research into ocean plastics is in its infancy. The Government should commit funding to research the potential consequences of an influx of plastic particles trapped in melting Arctic sea ice and ensure that academics and scientists have continued access to research funding and opportunities by UK participation*

*in EU schemes. Following our predecessor Committee's report on microplastics we welcome the Chief Medical Officer's recent announcement of its consultation on the health implications of these plastic particles entering our food chains. In addition, in its response to this report, the Government should set out a clear timeline for a comprehensive and wide-ranging plan to reduce UK plastic pollution—not least because of its impact in the Arctic. That should include, for example, bringing forward the existing 2042 plastic waste phase-out date, a ban on plastics that are difficult or impossible to recycle, a commitment to reforming the Packaging Recovery Note scheme and expediting a nationwide Deposit Return Scheme. (Paragraph 25)*

5. Arctic amplification is forcing Arctic communities to adapt quickly to higher temperatures, threatening their transport networks and food security. As part of the United Nations' Sustainable Development Goals (SDGs), the UK has commitments to create sustainable communities at home and abroad. As part of these obligations the UK should build a net zero emission economy by 2050, which will help reverse the albedo effect. We believe that Defra's adaptation portfolio could benefit from sharing adaptation expertise, including the successes and failures of adaptation measures, with Arctic states. (Paragraph 35)
6. *The UK has an opportunity to drive forward the Arctic Council's focus on the SDGs. We recommend the Government set a series of adaptation targets for the next iteration of UK Arctic policy within the next twelve months, when the Government should publish an annex to the Arctic Policy Framework. These targets should outline how the UK will help Arctic communities to adapt to changes in the Arctic environment now and in the future. The Government should fund more research into the social consequences of climate change. We believe there is an opportunity for DEFRA to share expertise on adaptation policy which could prove mutually beneficial, helping Arctic communities to adapt whilst preparing for future UK adaptation measures. (Paragraph 36)*
7. Arctic weather patterns affect UK weather and can cause extreme weather events. Predicting future implications for the UK's climate requires complex modelling which is being undertaken by leading UK institutions including the Met Office. *We welcome the ongoing research undertaken by the Met Office to understand the relationship between reductions in sea ice and the UK's future climate and recommend this work by the Polar Amplification Model Intercomparison Project is fed into future National Adaptation Programmes at the earliest opportunity. (Paragraph 40)*
8. Arctic biodiversity is crucial for many ecosystems around the world. The UK's biodiversity has significant links with the Arctic including many migratory birds, such as waterbirds. The waterbird population is expected to decline by about 50% by the end of the century due to Arctic warming. *For the UK to meet its commitment to "take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species" under Sustainable Development Goal 15, the protection of biodiversity in the Arctic area is absolutely key. We recommend that the Government set clear, measurable targets to protect Arctic biodiversity in line with SDG Goal 15. We would like to see monitoring and research to survey, map, and understand Arctic biodiversity extended, enabling the UK to contribute further research to Arctic Council working group on the conservation of Arctic flora and fauna (CAFF). (Paragraph 45)*

## UK Arctic research and funding

9. UK Arctic research is world leading and the UK ranks fourth in the world for the number of scientific papers produced. We were pleased to hear that this research is “at the heart” of UK Arctic policymaking and also fed into work conducted by the Intergovernmental Panel on Climate Change and Arctic Council working groups. We heard how important infrastructure is for research in extreme polar environments but were disappointed to hear that the UK’s infrastructure in the Arctic is modest compared to that in Antarctica. *While we understand the historical and geopolitical reasons behind this, we believe that due to the importance of the Arctic for the UK’s climate stability, the Department for Business, Energy and Industrial Strategy should significantly increase funding for Arctic research infrastructure. We recommend that the Government outline its plan for the developing the infrastructure in the Arctic.* (Paragraph 53)
10. The UK produces world leading research into the environmental changes taking place in the Arctic, funded by the Natural Environment Research Council. NERC’s two targeted Arctic programmes have provided coordination and communication which has increased the impact and effectiveness of the research undertaken, but the scope of these programmes is limited. *We would like to see the framework for the NERC programmes expanded to provide the same level of coordinated research for other important, emerging issues such as land ice melt, permafrost thaw, carbon balance, vegetation change and interactions between land, sea and air. This would also help to improve collaborations and reduce the “scattered” nature of UK Arctic research spread across UK universities and institutions.* (Paragraph 57)
11. To remain as a world leader in Arctic research, the UK will need to move towards a multidisciplinary approach, which includes the social sciences and brings research together from across research councils. According to the Minister for the Polar Regions, “scientific evidence runs throughout Beyond the Ice and is at the heart of UK Arctic policy”, but we heard that despite the UK having world leading social scientists, this expertise is not being harnessed to inform UK Arctic policy. The Economic and Social Research Council and the Arts and Humanities Research Council do not fund Arctic research to the same degree as the Natural Environment Research Council due to limitations in their budgets. (Paragraph 67)
12. *We recommend the Government allocate specific funds for an Arctic project within UK Research and Innovation (UKRI) which would enable collaboration between the Economic and Social, Arts and Humanities and Natural Environment Research Councils. Multidisciplinary research is key to finding solutions to the complex problems of the Arctic and the NERC Arctic Office is facilitating this to the best of its ability given the limited resources available. We recommend the Department for Business, Energy and Industrial Strategy provides for the expansion of the NERC Arctic Office to coordinate the new UKRI Arctic Project and to identify disparate Arctic social science research already taking place in UK academic institutions. Expanding the NERC Arctic Office would enable it to increase its work on building international connections, new collaborations and encouraging multidisciplinary approaches. This would enable the Government to take a leadership role on developing climate resilience for remote communities, which would bring domestic benefits, and allow adaptation measures to assume a higher priority in UK Arctic Policy.* (Paragraph 68)

13. A recurring concern raised in the evidence was uncertainty over Arctic funding following the UK's decision to leave the European Union. We are pleased to hear that the UK will remain a member of the European Polar Board. It is not, however, known whether the UK will continue to contribute to large programmes such as the European Research Council (ERC), Horizon2020, Copernicus and Galileo. There is also uncertainty about scientific personnel and maintaining the ability to attract the best researchers to academic positions. These uncertainties are having a chilling effect on UK Arctic research. Maintaining the UK's strong track record in Arctic research is vital, but UK institutions need secure funding sources and free movement for the brightest researchers to continue their world-leading research. (Paragraph 78)
14. The Foreign and Commonwealth Office should emphasise the importance of securing funding for Arctic research to the Treasury and to the Department for Business, Energy and Industrial Strategy, given that UK Arctic research underpins all UK Arctic Policy. The Department for Business, Energy and Industrial Strategy should commit funds for any shortfalls in funding after we leave the European Union. Membership of the EU has been vital to UK leadership in arctic science. In negotiating the UK's future relationship with the EU, the Government should seek to maintain the current level of collaboration and co-operation with the EU and ensure the same access to EU programmes. (Paragraph 79)

### The UK's relationship with the Arctic

15. The Arctic Council is the most important international forum for Arctic matters and the UK is a long-standing Observer. The UK has carefully balanced its role in assisting and influencing the Council with the fact that the UK is not an Arctic State. The Arctic Council has established clear parameters for the level of involvement Observers can have, but within those the UK should provide more clarity on what it intends to do as an Observer over the long term. (Paragraph 88)
16. *We recommend that the Government should set out explicitly what it hopes to achieve through the UK's position as an Observer to the Arctic Council over the next 10 years. This may help the strategic direction of the Council, as the two year rotation of the chairmanship can bring frequent changes to priorities for the Council. In addition, the UK should be more transparent about its work with the Arctic Council. The Government should publish the 'reporting card' it produced to reaffirm its status as an Observer as well as publishing its contributions to the six Arctic Council working groups.* (Paragraph 89)
17. The United Kingdom is a long-standing Observer to the Arctic Council and has a strong reputation for engaging with the work of the Council and contributing scientific expertise to the working groups. The significant increase in the number of State Observers to the Arctic Council since 2013 brings a fresh challenge to the UK's claim as a "near Arctic state". There is a risk that the UK's geographical proximity to the Arctic will be overshadowed by increased foreign investment and scientific research by others. The UK can play a role in ensuring that foreign interest in the Arctic is driven by a scientific understanding of the challenges facing the Arctic (Paragraph 97)

18. *The Arctic Council is becoming an increasingly global forum for securing agreements, cooperation and dialogue on Arctic issues. The Government should ensure that there are UK representatives at all important Arctic science meetings and scientific forums, including the upcoming Arctic Scientific Forum in Berlin. The UK should offer to host a forthcoming Arctic Scientific Forum, possibly in collaboration with an Arctic State. (Paragraph 98)*
19. Our predecessor Committee called for a UK Arctic policy that would ensure Government departments work together in a cross-cutting way. The second iteration of the resulting UK Arctic strategy, *Beyond the Ice*, is a commendable document that covers the breadth of the UK's interests in the Arctic. However, we found that the Foreign and Commonwealth Office (FCO), which leads on co-ordinating Arctic policy, was not able to articulate the UK's position on a number of matters affecting the Arctic. This is concerning given that the FCO represents the UK at the Arctic Council. While there are important geopolitical reasons for more departmental resource within the FCO to be dedicated to the Antarctic, we believe that the speed and complexity of change in the Arctic means that British engagement with the region should be increased. The Committee recognises that the Minister for the Polar regions is also Minister for Europe and the Americas and that it is therefore unfair to expect the Minister to take a more active role in co-ordinating UK Arctic activity. *We therefore recommend that the Government further considers the recommendations by the House of Lords Select Committee on the Arctic in 2015, and the House of Commons Defence Committee in 2018, that the UK should appoint a special representative or envoy to the Arctic to play a co-ordinating role, in support of the Polar Regions Department and the Minister. (Paragraph 109)*
20. *In order effectively to influence the Arctic Council, the UK needs to have a coordinated Arctic policy led by the FCO. When our predecessor Committee recommended the introduction of an Arctic strategy to ensure cross-cutting departmental work, they envisaged a deeper level of coordination than the production of a shared Government document. The Minister for the Polar Regions should fulfil his role in overseeing the coordination of UK Arctic policy by working to develop a set of strategic priorities along with targets to measure them. To facilitate the establishment and measurement of these Arctic priorities, the FCO should dedicate more departmental resources to the Arctic to ensure that the UK is capitalising on the opportunities in the Arctic and fully participating in the work of the Arctic Council. (Paragraph 110)*

### Commercialisation of the Arctic

21. The loss of sea ice creates new economic and social opportunities and risks in the Arctic. We heard that if these opportunities are not managed correctly, the consequences could be dire for the Arctic. The UK has a responsibility to ensure that commercial opportunities in the Arctic are guided by the principle of sustainable development. The new focus on 'sustainable' rather than 'responsible' development in the UK Arctic policy is a welcome change in the Government's intentions, as is the explicit reference to the Sustainable Development Goals (SDGs). However, we are concerned that the Government may only be paying lip service to the SDGs, rather than using them to guide and evaluate its approach to the Arctic. (Paragraph 123)

22. The UK has identified three SDGs relevant to the Arctic; Climate Action (Goal 13), Life Below Water (Goal 14) and Life on Land (Goal 15), but the Minister for the Polar Regions was not able to explain how the SDGs applied in an Arctic context, nor how their implementation is audited. Even though the Government has identified Goal 13 as particularly relevant to the Arctic, the Minister told us that the compatibility of drilling for oil and gas in the Arctic with the ambition of Goal 13 had not been explicitly put to him. We heard that not only is drilling for oil and gas in the Arctic incompatible with the SDGs, it is also incompatible with the UK's commitment to the 2015 Paris Climate Change Agreement. However, the UK's Arctic policy notes that it supports the use of "the highest possible standards" in Arctic oil and gas activities, rather than supporting the termination of drilling in the Arctic. (Paragraph 124)
23. *If the SDGs are to inspire and inform the UK's Arctic policy, the Government should consider ending its encouragement of UK businesses to explore oil and gas opportunities in the Arctic. In its response to this report, the Government should acknowledge the incompatibility of continued support for oil and gas exploitation in the Arctic "for decades to come" with the UK's SDG commitments and with the Paris Agreement, and set out plans to press members of the Arctic Council to adopt a similar approach. (Paragraph 125)*
24. *Additionally, as recommended earlier in this report, the FCO should set a series of strategic priorities and targets for the UK's sustainable engagement with the Arctic. The SDGs should be used to set and evaluate these priorities. There are more than three SDGs relevant to the Arctic and this should be acknowledged throughout the next iteration of the UK Arctic policy, such as; Goal 7 (affordable and clean energy), Goal 8 (decent work and economic growth) and Goal 11 (sustainable cities and communities). The use of the SDGs will ensure that the UK takes a sustainable approach to Arctic tourism, social issues and economic development in Arctic communities. (Paragraph 126)*
25. As Arctic sea ice melts, new shipping routes are becoming increasingly accessible. We heard that by 2050, the Arctic could be ice free in summer. However, it will be some time until the Arctic seas can be fully utilised for transit shipping. We are concerned that there is a quickening "albedo effect" in the economic exploitation of the Arctic; as sea ice melts, more shipping is possible but this in turn further threatens the environment. The risk of oil spills, higher carbon emissions and plastic pollution threaten the fragile environment of the Arctic. (Paragraph 136)
26. *The Polar Code should be amended to protect the Arctic from the risks from increased shipping. The Polar Code includes some provisions on environmental protection in the Arctic such as a ban on the disposal of food and plastic waste, but the Arctic has fewer environmental protections than the Antarctic. The ban on dangerous heavy fuel oils currently applied in the Antarctic should be extended to the Arctic as soon as is technologically feasible. Provisions on marine noise and invasive species should also be added to ensure that increasing shipping does not threaten Arctic biodiversity and marine wildlife. (Paragraph 137)*
27. *The UK Government should press the International Maritime Organisation (IMO) to ban HFO in the Arctic as soon as is technologically feasible and strengthen its involvement in the Protection of the Arctic Marine Environment working group of the*

*Arctic Council to ensure that the Arctic Council is itself able to make an influential, science-driven representation to the IMO. The UK should push the IMO to make the Arctic designated as a special sensitive area under MARPOL annex 6 and thus join other seas such as the 'Antarctic area'. (Paragraph 138)*

28. Arctic tourism can bring numerous economic opportunities to the region if it is managed correctly. Over the past decade the number of people going on Arctic cruises has increased from around 50,000 passengers per year to around 80,000 in 2016, and the market for small cruises in particular is expected to grow by almost 50% over the next three years. There is a risk that the thousands of tourists who travel to see a pristine, remote and unspoilt Arctic landscape are contributing to degradation of the very environment they came to see, and increased tourism can disrupt traditional ways of life. We heard that very large cruise ships with around 6,000 passengers are docking in small Arctic communities and overwhelming them. Large cruise ships also heighten risks of plastic pollution and place additional strain on already limited search and rescue capacity in the Arctic. (Paragraph 145)
29. *The Arctic states have an opportunity to place limits on the type of tourism acceptable in the Arctic region. The UK should work with the Sustainable Development Working Group of the Arctic Council to push for a ban on cruise ships of over 500 passengers, and instead promote sustainable and considered Arctic tourism. The UK should engage with the Permanent Participants on the Arctic Council to ensure that they have the capacity, in collaboration with Arctic states, to influence the development of Arctic tourism so it is managed in a way that benefits their communities. (Paragraph 146)*

# Formal minutes

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**Tuesday 20 November 2018**

Members present:

Mary Creagh, in the Chair

Philip Dunne	Caroline Lucas
Zac Goldsmith	Kerry McCarthy
Robert Goodwill	Anna McMorrin
James Gray	Alex Sobel

Draft Report (*The Changing Arctic*), proposed by the Chair, brought up and read.

Paragraphs 1 to 146 read and agreed to.

Summary agreed to.

*Resolved*, That the Report be the Twelfth Report of the Committee to the House. Ordered, That the Chair make the Report to the House.

*Ordered*, That embargoed copies of the Report be made available, in accordance with the provisions of Standing Order No. 134.

[The Committee adjourned]

## Witnesses

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The following witnesses gave evidence. Transcripts can be viewed on the [inquiry publications page](#) of the Committee's website.

### Tuesday 3 July 2018

**Professor Sheldon Bacon**, Head of Marine Physics and Ocean Climate Change, National Oceanography Centre; **Dr Richard Wood**, Climate, Cryosphere and Oceans Group, Met Office Hadley Centre; **Professor Mark Inall**, Director of Scottish Alliance for Geoscience, Environment and Society, Scottish Association for Marine Science; and **Professor Martin Siegert**, Co-director, Grantham Institute for Climate Change & Environment, Imperial College London.

[Q1–60](#)

**Professor James Ford**, Research Chair and Professor at the Priestley International Centre for Climate, University of Leeds; **Mr Rod Downie**, Chief Advisor, Polar Regions, WWF; **Professor Eric Wolff**, Professor, Department of Earth Sciences at Cambridge University, The Royal Society; and **Dr Alexandra Middleton**, Assistant Professor, University of Oulu.

[Q61–109](#)

### Wednesday 11 July 2018

**Henry Burgess**, Head of the Arctic Office, British Antarctic Survey; **Professor Duncan Wingham**, NERC Executive Chair, Natural Environment Research Council; and **Richard Powell**, University Lecturer and Fellow of Fitzwilliam College, Scott Polar Research Institute, University of Cambridge.

[Q110–162](#)

**Edda Falk**, Communications Manager, Association of Arctic Expedition Cruise Operators; **Michael Kingston**, Lawyer, Specialist Advisor to the Arctic Council, Advisor to Lloyd's of London; and **Dr Dmitry Yumashev**, Senior Research Associate, Lancaster University Management School.

[Q163–200](#)

### Thursday 19 July 2018

**Dr Thérèse Coffey MP**, Under-Secretary of State for Environment, Food and Rural Affairs, **Sir Alan Duncan MP**, Minister for Europe and the Americas, Foreign and Commonwealth Office, **Jane Rumble**, Head of Polar Regions, Foreign and Commonwealth Office, and **Dominic Pattinson**, Head of International Marine Policy, Department for Environment Food and Rural Affairs.

[Q201–274](#)

## Published written evidence

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The following written evidence was received and can be viewed on the [inquiry publications page](#) of the Committee's website.

ARC numbers are generated by the evidence processing system and so may not be complete.

- 1 Association Arctic Expedition Cruise Operators ([ARC0021](#))
- 2 British Antarctic Survey ([ARC0004](#))
- 3 British Ecological Society ([ARC0011](#))
- 4 BTO ([ARC0009](#))
- 5 Centre for Polar Observation and Modelling ([ARC0015](#))
- 6 Department for Education and Department for Business, Energy and Industrial Strategy ([ARC0023](#))
- 7 Edinburgh University Glaciology ([ARC0017](#))
- 8 Equinor (UK) Ltd ([ARC0019](#))
- 9 Foreign and Commonwealth Office ([ARC0016](#))
- 10 Grantham Institute, Imperial College London ([ARC0008](#))
- 11 Measurements and Modelling (MAMM) project ([ARC0018](#))
- 12 Met Office ([ARC0002](#))
- 13 Natural Environment Research Council (NERC) ([ARC0010](#))
- 14 Professor Elizabeth Kirk ([ARC0005](#))
- 15 Professor James Ford ([ARC0007](#))
- 16 Rt Hon Sir Alan Duncan MP ([ARC0022](#))
- 17 Scottish Association for Marine Science ([ARC0013](#))
- 18 The Geological Society ([ARC0006](#))
- 19 The National Oceanography Centre ([ARC0001](#))
- 20 The Royal Society ([ARC0014](#))
- 21 University of Edinburgh ([ARC0020](#))
- 22 University of Liverpool ([ARC0003](#))

## List of Reports from the Committee during the current Parliament

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All publications from the Committee are available on the [publications page](#) of the Committee's website. The reference number of the Government's response to each Report is printed in brackets after the HC printing number.

### Session 2017–19

First Report	Plastic bottles: Turning Back the Plastic Tide	HC 339
Second Report	Disposable Packaging: Coffee Cups	HC 657
Third Report	The Ministry of Justice: Environmental Sustainability	HC 545
Fourth Report	Improving air quality	HC 433
Fifth Report	UK Progress on Reducing F-gas Emissions	HC 469
Sixth Report	Green finance: mobilising investment in clean energy and sustainable development	HC 671
Seventh Report	Greening Finance: embedding sustainability in financial decision making	HC 1063
Eighth Report	The Government's 25 Year Plan for the Environment	HC 803
Ninth Report	Heatwaves: adapting to climate change	HC 826
Tenth Report	Hand car washes	HC 981
First Special Report	The Future of Chemicals Regulation after the EU Referendum: Government Response to the Committee's Eleventh Report of Session 2016–17	HC 313
Second Special Report	Marine Protected Areas Revisited: Government Response to the Committee's Tenth Report of Session 2016–17	HC 314
Third Special Report	Sustainable Development Goals in the UK: Government Response to the Committee's Ninth Report of Session 2016–17	HC 616
Fourth Special Report	Plastic bottles: Turning Back the Plastic Tide: Government Response to the Committee's First Report	HC 841
Fifth Special Report	Disposable Packaging: Coffee Cups: Government's Response to the Committee's Second Report	HC 867
Sixth Special Report	The Ministry of Justice: Environmental Sustainability: Government's Response to the Committee's Third Report	HC 982
Seventh Special Report	Improving air quality: Government Response to the Committee's Fourth Report	HC 1149
Eighth Special Report	UK Progress on reducing F-gas Emissions: Government's Response to the Committee's Fifth Report Eighth	HC 1406
Ninth Special Report	Green finance: mobilising investment in clean energy and sustainable development: Government Response to the Committee's Sixth Report	HC 1450

Tenth Special Report	Heatwaves: adapting to climate change: Government Response to the Committee's Ninth Report	HC 1671
Eleventh Special Report	Greening Finance: embedding sustainability in financial decision making: Government Response to the Committee's Seventh Report	HC 1673
Twelfth Special Report	The Government's 25 Year Plan for the Environment: Government Response to the Committee's Eighth Report	HC 1672