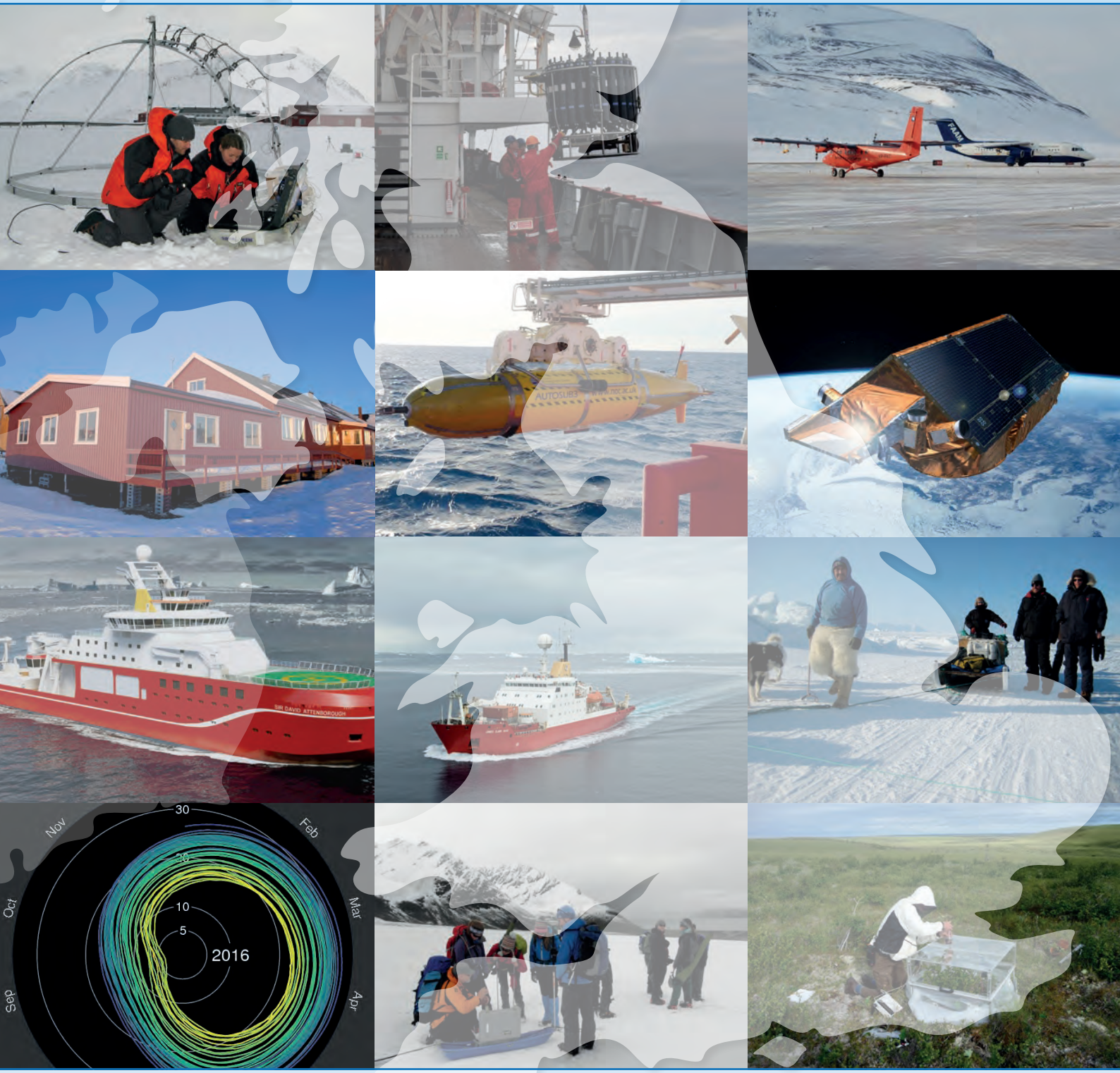
The United Kingdom and Arctic Science



The United Kingdom and Arctic Science

As the United Kingdom Arctic scientific research community, we undertake ground-breaking research in the Arctic region, covering a wide range of fields, including regional and global climate, ecosystems, cryospheric science, engineering and technological development, and social science. We want to continue to support and deliver the best knowledge and understanding of this key and particularly sensitive part of the Earth System. This document sets out the principles which embody our approach and provides further details on how and why we will continue to pursue this vital research area.

We are:

Ambitious for science

We are fully committed to researching the most important Arctic environmental, geophysical and socio-economic questions, and to delivering improved knowledge and understanding of Arctic systems, and their response to – and impact on – global changes. Focusing on these issues will allow us to contribute to an enhanced understanding of our planet and of the Arctic itself. We do this because of our shared fascination with the region, but also because it will make a real difference in how this region is best managed, used and protected for the future.

Flexible and capable

We are proud of the long history of high-impact research across the whole of the Arctic region and across the full range of disciplines, and of our ability to respond quickly to challenges. We are committed to effective and safe field operations and providing capable logistical assets, platforms, models, infrastructure and experienced scientists and support staff. We have taken leading roles in connecting diverse international research facilities across the Arctic. We seek to become even more valuable partners of choice for international collaboration.

Focused on impact

The United Kingdom is a leading nation in Arctic research and has an increasingly cohesive and multidisciplinary Arctic research community. Today, we continue to seek new partners, including those outside the conventional natural and physical science disciplines, for example within Arctic communities themselves or in the commercial sector, to ensure that the impact of our research remains as relevant and strong as possible. By impact, we mean the ability to support sound decision-making, and to benefit lives and sustainable livelihoods.

Committed to the long term

We do not take such impact for granted, so we are committed to remaining at the forefront of educating and training the next generation of Arctic science leaders at our world-leading universities and research centres. Our focus on high-quality research and identifiable impact, as well as working in an established research culture with a rigorous evidence-based approach to polar issues and their broader implications, is central to this.

Successful

According to a study published in 2014, the United Kingdom is ranked third in the number of published articles and fourth in relative citations on Arctic research.[1] We are committed to continue to deliver Arctic research of the highest quality.

[1] Aksnes, D. et al., Polar Research in the Kingdom of Denmark 2013. Nordic Institute for Studies in Innovation, Research and Education, 2014.

Motivation – the reasons to know more about the unprecedented changes in the Arctic and their effects on local, regional and global systems are many and varied. There is an urgent need for reliable long-term information from this rapidly changing part of the world so that we can properly understand the implications for climate, natural hazards, transport and infrastructure, human and social interaction, sustainable development and effective stewardship. The potential impact of changes in Arctic sea ice on mid-latitude climate is a good example of the potential direct and practical relevance of our research to countries such as the United Kingdom.

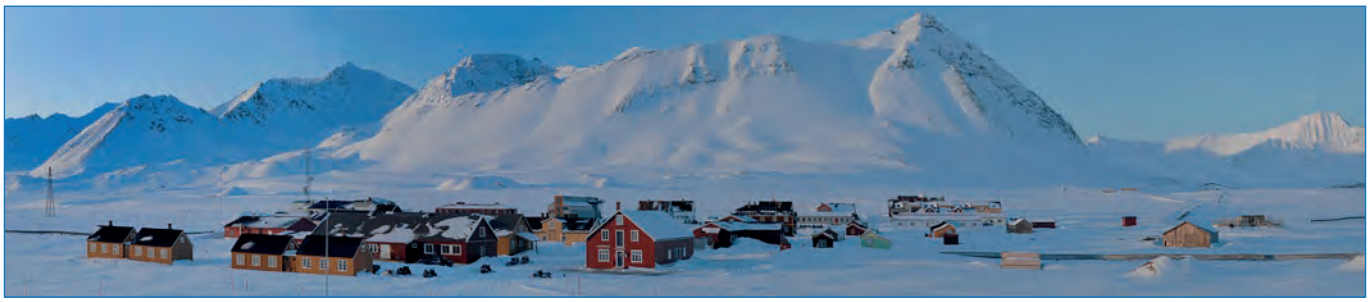
Resources – the United Kingdom has over 70 universities and research centres which carry out Arctic research in the biological, geological, physical and social sciences, as well as in the arts and humanities, and often in collaboration with researchers from Arctic states and beyond. Every year large numbers of British-based researchers visit the Arctic to conduct their field and laboratory work, with many more working on Arctic-focused projects in the United Kingdom using resources such as computer models and satellite data. We work closely with our international partners to develop joint projects. Researchers in the United Kingdom are actively engaged at all levels of public outreach and provide rigorous and independent Arctic evidence and advice to a wide range of policymakers and other interested parties to help inform key decisions.

Research infrastructure – in addition to human resources, the United Kingdom has a wide range of tools for operation and measurement in the Arctic, but international collaboration is vital if we are to deliver the full range of science to which we aspire. We have a long-running research station in Ny-Ålesund, Svalbard (Norway); two ice-strengthened research vessels that can be deployed to the Arctic; and six specially-equipped aircraft capable of carrying out scientific measurements and logistical support in the Arctic.

A new, larger and even more scientifically-capable replacement ice-strengthened vessel, the RRS *Sir David Attenborough*, will be in service from 2018 to support polar research. British researchers are leading the way in using highly-innovative autonomous and remotely-operated vehicles, including assets with very long range capabilities. We are key partners in satellite systems monitoring the polar regions, including CryoSat, and have developed cutting-edge tools and models to use its findings for science and to support operational activities.

Coordinating new activity – Researchers in the United Kingdom have been working in all parts of the Arctic – often in collaboration with Arctic partners – for many decades. Together, real progress has been made in understanding the fundamentals of how the regional physical environment and ecosystems function. Yet because the Arctic remains one of the most inaccessible places in which to conduct research, it is under-sampled and under-researched in relation to its influence on global systems. At a time of uncertainty in relation to the speed and impact of the globally changing climate, this is a considerable concern. We are committed to playing our part in helping to develop the kind of approaches that fill these research and policy gaps.

Understanding and predicting changing systems – The United Kingdom is a world leader in developing, refining and connecting the kinds of advanced system models that are necessary to understand the past and to help predict future changes. These include the areas of oceans, atmosphere and climate, sea-ice and land-ice, and terrestrial, freshwater and marine ecosystems. Our multi-disciplinary regional and global models are areas of strength and are attracting growing attention.



Human and social engagement – The Arctic is the home and workplace of at least four million people, with communities as diverse as the region itself. Ranging from indigenous populations with distinct ethnic and cultural identities with a living connection to the land, water and sea ice through subsistence fishing, hunting and herding, to others with direct links to the globalised economy and lifestyles related to their homes in large towns and cities. We are committed to working closely with Arctic residents within their Arctic programmes and initiatives. We fully respect the views and interests of Arctic indigenous peoples and other northern communities and will support their role in decision-making, including in relation to scientific research.

Throughout history, Arctic communities have needed to be resilient and adaptable to survive and thrive. Today, the increased pace of climatic, social and economic change poses considerable challenges. We are building experience, in partnership with others, in understanding the response of people to their changing environment and the impacts of physical and socio-economic changes on that environment, such as the effect on coastal communities; changes in mammal movements and patterns of behaviour; and the physical impact, including the effect of melting permafrost, on the built environment and access to natural resources. We are ready to work collaboratively and respectfully with partners and communities in the Arctic.

Economic connections - We recognise that people in the Arctic have the right to seek economic prosperity. A changing Arctic will bring economic opportunity as well as challenges. Whether this opportunity is in long-standing industries such as mineral extraction and fisheries, or in newer ones such as tourism or innovative technology, the key is that such activity must be well-governed, legitimate and responsible. We will increasingly strive to be partners of choice for those wanting to work in the Arctic, not least in the transfer of innovative technology from science applications to sustainable and responsible commercial activity.

Arctic governance and research planning - The United Kingdom is the most northerly country outside the eight Arctic states. This proximity, together with shared scientific, economic and social objectives, means that Britain has well-established interests in understanding the future of this vitally important region, particularly the links between the Arctic and the Earth System more broadly. Since its inception in 1996, the United Kingdom has worked closely with the Arctic Council as an Observer, and engages successfully with the Council's Working Groups and other bodies. The United Kingdom is also an active member of the International Arctic Science Committee (IASC), ensuring that we are well placed to support the overall strategic direction of Arctic research, and to contribute to identifying and articulating key questions.

United Kingdom Arctic and Antarctic Partnership

This document has been produced by the UK Arctic and Antarctic Partnership (UKAAP), supported by the Natural Environment Research Council's Arctic Office. UKAAP is a community-led initiative, which brings together researchers across a broad range of disciplines to collaborate in providing strategic direction, support and coordination to British-based polar researchers. The organisation is independent of Government and its Research Councils, with all independent members drawn from across the United Kingdom Arctic science community. Further information is available at **www.ukaapartnership.org.uk**

Further information

To find out more about Arctic research in the United Kingdom and about opportunities to collaborate please contact the Natural Environment Research Council Arctic Office on 0044 (0)1223 221468 or **arctic@bas.ac.uk**. Further details are also available through **www.arctic.ac.uk** and **@Arctic_Office**

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