Scotland and the New North
The Future States of the Arctic

“We need to save the Arctic not because of the polar bears, and not because it is the most beautiful place in the world, but because our very survival depends upon it.”

Lewis Gordon Pugh FRSGS
As the former President of Iceland says in his article on page 6, Scotland has tended to look southwards. Now there is a welcome new direction of view on the importance of Scotland’s geographical location as the Arctic emerges from under the pack ice and becomes a marine crossroads between western and oriental worlds.

This northerly orientation is not new. We know from the excellent geoarchaeological studies undertaken in recent years by many Scottish based geographers that there have been strong connections in the past. How far back they go is difficult to know because of the paucity of evidence, but connections are likely to stretch back to the 9th century. Analysis of DNA shows that the northern genetic strands have a strong presence in some parts of Scotland, particularly in the Northern Isles. And, more recently, there has been much Scottish-led exploration of the Arctic since the 18th century.

Why is the Arctic world so important to Scotland that we should devote a special edition of The Geographer to exploring the region? Apart from the aforementioned cultural connections, we depend on the Arctic for both our daily weather and our longer term climate. The ocean circulation system is substantially driven by the cold water inflows from the Arctic Ocean and surrounding lands, and is partly responsible for the warm water surface currents which reach our shores and warm our air. With the continuing warming of the globe, we face increasingly turbulent weather and rising sea levels which provide a threat to our coastal communities.

The increase in travel possibilities by sea and air has allowed more Scottish residents to visit the Arctic. Scotland can potentially provide a hub for such travel. It can also provide a transit point for the expected increase in shipping via the Arctic Ocean routes between the Atlantic and Pacific Oceans. Orkney and maybe Shetland have potentially significant roles to play.

We welcome the Scottish Government’s increasing alliances with Arctic nations through the Arctic Circle mechanism, and their support for this edition of The Geographer. We have a seat on the Scottish Government’s Arctic Policy Advisory Forum, and will play our part in developing the connections between Scotland and the Arctic.

Professor Roger Crofts CBE, Chair, RSGS

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Cover image: Inuit girl on ‘Hamlet Day’, Gjoa Haven, King William Island, Nunavut, Canada. © Martin Hartley
Masthead image: Arctic sunrise. © Martin Hartley

Top award for Social Bite

In November, we presented our Livingstone Medal to Josh Littlejohn for his work combating homelessness in Scotland. Josh is the co-founder of Social Bite, alongside Alice Thompson who also received the Medal but was unable to collect it in person.

Social Bite began life in 2012 as a small sandwich shop in Edinburgh. But there was a difference – as customers bought their food they could ‘pay forward’ a meal for a homeless person to collect later. From these humble but thoughtful beginnings, Social Bite has grown significantly, expanding into the restaurant business, developing a supported village for homeless people, and organising a series of high-profile ‘sleep-outs’ in cities across Scotland. Josh and Alice, and their staff and supporters, have highlighted a problem whilst also supplying vital day-to-day relief to vulnerable people.

University Medallists

We are pleased to announce our new University Silver Medallists as Pascale Crozier (University of Aberdeen), James Bishop (University of Dundee) and Eilish Barnes (University of Edinburgh). The University Medal recognises the outstanding graduating honours geography student as recommended by heads of department, and we warmly congratulate the Medallists of 2018.

Best of the blog

Our website is regularly updated with specialist blogs from a range of different geographical practitioners, supporters and volunteers. Over the past few months, these have included insights on the Mer de Glace from our Explorers-in-Residence Luke and Hazel Robertson; opinion pieces from our Chief Executive on topics as diverse as climate change and Remembrance Sunday; and, with the permission of the New Zealand Government, Prime Minister Jacinda Ardern’s thoughtful speech to the UN General Assembly in September. Head over to www.rsgs.org for more interesting reads!

New lesson plans

With the help of Lynne Robertson, an educational expert with Education Scotland, we have developed a series of new lesson plans to accompany editions of The Geographer magazine, covering topics such as single-use plastics and food insecurity. In addition, as a partner in the Discovering Oman Project, we are delighted to announce that we now have a series of innovative, curriculum-linked teaching resources which compare Oman and the UK across a whole range of geographical themes. Visit www.rsgs.org, where both sets of lesson plans are freely available.

Jolly good Fellow

The scheduled arrival of Michael Portillo drew a full house at Strathclyde Business School in Glasgow, where he spoke as part of our Inspiring People talks programme in November. As part of the event, which was greatly enjoyed by all, Michael was inducted as an Honorary Fellow of the Society. Presenting the award was our Treasurer, Tim Ambrose, who highlighted Michael’s inspiring work promoting train adventures and slow travel through the BBC television series Great Railway Journeys.
The art of the possible

At an event held at Dynamic Earth, Martin Valenti, Head of Strategic Initiatives at SEPA, received our prestigious President’s Medal in recognition of a career spent successfully tackling complex geographical problems and championing the art of the possible. His latest project is to take on the issue of vacant and derelict land in Scotland – quite a task given that there are approximately 12,000 hectares in our country. The RSGS is delighted to be a member of the task force being drawn together to address this problem.

Coppock Research Medallist

Our highest research-specific accolade has been presented to some of the leading figures in Scottish geography over the course of the last century: Brian Sissons, Chalmers Clapperton, David Sugden and Colin Ballantyne to name but a few. And in late November we were delighted to add Professor Kevin Edwards of the University of Aberdeen to this distinguished list.

As a geographer working at the forefront – and boundary – of palynology, archaeology and geomorphology, his wide-ranging research across the North Atlantic region has made a lasting transformation to understanding of the colonisation of some of the last settled places on Earth.

Mary Robinson and The Elders

RSGS Livingstone Medallist Mary Robinson has been appointed as Chair of The Elders (theelders.org), a group of independent global leaders working together for peace and human rights. In her first public message, she called for holistic leadership that places the interests of ordinary people centre stage. She said, “It is a huge honour to take up the role as Chair of The Elders at such a critical moment for peace, justice and human rights worldwide. Building on the powerful legacies of Archbishop Tutu and Kofi Annan, I am confident that our group’s voice can both be heard by leaders and amplify grassroots activists fighting for their rights.”

Arctic bird trap

Each year, thousands of birds travel from the tropics to the Arctic to breed. One of the reasons for this is the relatively lower rates of predation in higher latitudes. With increased polar warming, however, this pattern seems to be changing, according to an article published in the journal Science. By analysing 70 years of data from 40,000 nests, researchers found that predation rates on shoreline birds from animals such as foxes are now higher in the Arctic than the tropics. Indeed, there was a three-fold increase in Arctic predation rates during the study period. Dr Kubelka who worked on the study commented, “The Arctic, with recently elevated rates of nest predation, is no longer a safe harbour for breeding birds. On the contrary, the Arctic now represents an extensive ecological trap for migrating shorebirds from a nest predation perspective.”

Doors Open Day

In late September we welcomed more than 100 visitors to the Fair Maid’s House, for a Doors Open Day event with a theme of ‘Back to School’, as part of the Year of Young People. As adults perused a special display of early maps and mountain views, children won sweets for successfully completing a raft of challenging geographical quizzes put on by Kenny Maclean from our Collections Team (see here with some eager participants). A great day was had by all, and we are grateful, as ever, to the many volunteers who make such events possible.

Reaching out to young geographers

We are delighted to have been awarded a two-year grant from the Gannochy Trust, to help us to develop a range of opportunities to engage more young people with geography. Through the funded project, we aim to inspire children and young people to learn more about geographical sciences; to better support primary and secondary school teachers in teaching geographical sciences; and to equip young people with more skills, greater confidence and improved employability.

In recent years, we have been building a strong community of ‘geographers’ across Scotland, and beyond. We need to ensure that young people are actively involved in that community and network. So we are pleased to have seen a recent increase in the number of students who are joining the RSGS, encouraged perhaps by the annual membership rate of only £20! And if you are looking for an unusual Christmas gift for a young friend or family member, then please consider buying them RSGS membership – an inspiring gift!

Ashley Cooper exhibition

To coincide with Climate Week, we installed a month-long exhibition in our visitor centre, produced by esteemed photographer Ashley Cooper. Over the past 13 years, Ashley has dedicated his life to documenting the effects of climate change across our planet, from Ambleside to the Andes, and has built a remarkable collection of images documenting some of the most important issues and solutions. At the end of the exhibition, he presented a Tuesday night lecture at our headquarters. We would like to extend our thanks to Perth and Kinross Council for their support in bringing about these events.
Climate Literacy

On Monday 1st October, Cabinet Secretary Roseanna Cunningham launched Climate Week from our offices in Perth. As part of the event, she announced the pilot of a new Climate Literacy programme we are developing with the University of Stirling and a range of other partners – and supported by £20,000 of Scottish Government funding.

The programme seeks to engage senior managers across a range of different sectors with climate change, and in particular to help them understand what they can do as individuals and as organisations to deliver practical solutions. It is envisaged that the course will be delivered online and in short workshops to make it as easy as possible to participate. Following completion of the necessary units, individuals will receive acknowledgement of their learning and the opportunity for personal accreditation.

Businesses who engage will be able to work towards organisational accreditation and evidence engagement to shareholders and customers.

To support the launch, RSGS produced a promotional video (available at bit.ly/2qNoBfk) outlining the programme.

Collections corner

Over the past few months, we’ve acquired several unusual maps and are most grateful to the donors. Perhaps most interestingly, we received a rare example of a collapsible umbrella globe, printed on cloth. Produced in London by John Betts, it is considered to be an early example of colour lithography and, from the geographical information content and political boundaries shown, is thought to date from the late 1850s, though this requires further research from our in-house collections volunteers. To keep up-to-date with the work of our Collections Team, plus other exciting news, events and blogs, please sign up to our newsletter via the homepage on our website.

Book launch

Following Professor Alastair Dawson’s Inspiring People talk in Dundee on Tuesday 8th January, there will be a launch party and signing session for his new book, Introducing Sea Level Change. This comprehensive text examines the principal causes of sea level change, focusing on the issues of vertical land movements and changes in ocean volume. A discussion of the geological evidence for past changes in sea level is also included.

Postgraduate GIS students visit

The University of Edinburgh’s School of Geosciences brought 41 of their MSc Postgraduate GIS students for a tour of the RSGS, en route for Kindrogan Field Centre in October. This visit, now a yearly institution, included a number of overseas students, the Chinese contingent being particularly enthralled by a 445-year-old plan of Edinburgh showing the site of the Institute of Geography part-encircled by the Flodden Wall. They couldn’t believe they were allowed to hold it up for a selfie (suitably supervised), came back later for another look and, after asking if RSGS had any maps of China, were delighted that they were allowed to look through these!
Gazetteer for Scotland record

Congratulations to RSGS’s former Vice-Chairman Bruce Gittings on reaching the astounding total of 2,380,000 words on his Gazetteer for Scotland website www.scottish-places.info. In so doing he has overtaken the number of words in the original inspiration for the website, Francis Groome’s multi-volume Ordnance Gazetteer of Scotland: a survey of Scottish Topography, first published between 1882 and 1886, and still a staple text for all interested in Scotland’s geography, topography and local history.

Good Food Nation: update

Pete Ritchie, Nourish Scotland

Progress on the Good Food Nation Bill has been slow, with Scottish Government downgrading the ambition in its 2018 Programme for Government. We are still waiting for a consultation on much less wide-ranging legislation.

Narrowing the scope of the Bill would be a lost opportunity. It’s not just that there’s cross-party support for a joined-up food bill, and widespread support from the public; it’s that realigning the food system is a key part of tackling social and environmental challenges in Scotland and globally.

Business seems well ahead of government on this issue and making the connections with the Sustainable Development Goals. Unilever’s food strategy states clearly that business as usual is not an option, while in November Tesco and WWF announced a partnership to halve the environmental impact of the Tesco shopping basket, including through dietary change.

There’s a healthy, equitable, climate change-mitigating, resource efficient, ecosystem-restoring food system out there to be co-created by people, governments and food businesses large and small. Scotland could lead the way. But we won’t get there if we all focus on different bits of the food elephant and don’t look at the whole.

Marine microplastics

Marine creatures living in the deepest parts of the ocean have been feeding on microplastic particles for at least four decades, a study has revealed. Researchers at the Scottish Association for Marine Science in Oban delved into the institute’s archived samples from the Rockall Trough, an area of deep sea off the west coast of Scotland, to assess the extent of microplastic ingestion in the stomachs of bottom-dwelling starfish and brittle stars.

Traces of eight different plastics, including polyester and nylon, were found in the stomachs of specimens that lived more than 2,000 metres below the ocean surface between 1976 and 2015 – the levels of ingestion were similar throughout that period. Lead author Winnie Courtene-Jones said, “This data shows, for the first time, the long-term prevalence of microplastic pollution in the deep sea and indicated that microplastics may have been present on the sea floor of the Rockall Trough prior to 1976.”

RSGS, Kirriemuir and the Angus Glens

In October, a party of Kirriemuir Rotary Club Members enjoyed a tour of the Fair Maid’s House by John Lewington and a display from the collections by Margaret Wilkes. Preparation for this visit brought to light some charming links between the RSGS collections, Kirriemuir and the Angus Glens, including the signature of RSGS Livingstone Medallist Robert Falcon Scott (present in the Angus Glens prior to his tragic South Pole expedition). Other items featured RSGS Fellows Sir Hugh Munro of Lindertis (near Kirriemuir) and the Reverend A E Robertson, and early RSGS Council Member Sir Patrick Geddes.

Yours Isobel

Through a partnership with Craft Design House, Carlowrie Castle and the RSGS, a bespoke range of Yours Isobel accessories, clothing and homeware are now available to purchase, all inspired by Isobel Wylie Hutchison. Born at Carlowrie Castle (near Edinburgh) in 1889, Isobel was a ‘quiet explorer’, skilled botanist and articulate observer of people, who travelled extensively through the Arctic during the mid-20th century, documenting her travels through writings, artworks and films as she went. She was awarded the RSGS Mungo Park Medal in 1934 and appointed Vice-President and Honorary Editor of the Scottish Geographical Magazine from 1946 to 1953.

To launch the Isobel Wylie Hutchison collection, a party was organised in late October at Carlowrie Castle for RSGS Members and others. Speaking at this event were Martin Hartley, who has supplied a series of stunning images for this magazine, and skier and explorer Myrtle Simpson who, like Isobel, received our prestigious Mungo Park Medal. Visit carlowriecastle.co.uk/shop to view and purchase items from the collection.

RSGS Patron Donors

Our new Patron Donor scheme has already encouraged several Members to make a charitable donation to our work, on top of their membership subscription. Any individual Member (of any membership type except School) who has donated £100 or more over the past year, or who commits to donating £10 per month by Direct Debit, in addition to their membership subscription, is recognised as a Patron Donor.

We now have more than 50 Patron Donors who receive priority booking or guest invitations to the special events that we run.

In November, our Patron Donors enjoyed priority access to the public talk in Glasgow at which we presented Honorary Fellowship to Michael Portillo, and invitations to the private reception in Perth at which we presented our Livingstone Medal to Josh Littlejohn.

Regular unrestricted donations are an extremely valuable source of income for small charities like ours. Please consider becoming a Patron Donor and doing more to support our vital work. Simply sign up to make a Direct Debit payment of at least £10 per month or make a one-off payment of £100 (in addition to your membership subscription). Please get in touch with RSGS HQ on 01738 455050 or enquiries@rsgs.org for details.
Andrew Croft Memorial Fund

Colonel Andrew Croft (1906-98) was one of the rare larger-than-life, modest and unselfish characters of the last century with numerous achievements that are all but forgotten today. Holder of the Polar Medal and the Back Award of the RGS-IBG, he was one of the pioneer explorers and mappers of Greenland in the 1930s. He had an exceptional wartime record, mainly behind enemy lines as a member of SOE, and was recommended for two DSOs. After the war, he was tasked with putting through reforms in Army and Police training, and was in line to be Shipton’s deputy leader for the 1953 Everest expedition. Amongst his other achievements was the reintroduction, in the 1950s, of reindeer into the Cairngorms. His life is recounted in his memoirs, A Talent for Adventure.

The Andrew Croft Memorial Fund was established in his memory to continue his life-long devotion to youth leadership training. It awards grants to support the personal development of young people aged 16-30, primarily through field study in the Arctic. The combinations of challenge and adventure in unfamiliar environments and of science and general education to engender personal confidence and trust in others are viewed as crucial in unlocking talent potential and leadership qualities in the youth of today. Contact info@acmf.org.uk or enquiries@rsgs.org for further information.

New Honorary Fellows

Exemplary geographic work is recognised each year through our programme of Medals and Fellowships. And over the past few months, we’ve had the pleasure of formally introducing Dr Hermione Cockburn, Dr Walter Stephen and John Geiger into our extensive geographical network as Honorary Fellows of the Society.

Hermione received her Honorary Fellowship at SAGT’s annual teaching conference in late October. She was offered the award for communicating her passion for the natural world through her television and radio work, on programmes such as the BBC’s Coast and Tomorrow’s World, and for promoting the geographic sciences in her role as Scientific Director at Dynamic Earth in Edinburgh.

Honorary Fellowship was conferred on Walter for his significant efforts promoting the legacy of Patrick Geddes, through books such as Think Global, Act Local, and for his valuable contribution in promoting Geography during significant curricular change.

Honorary Fellowship was bestowed on John Geiger, the Chief Executive of the Royal Canadian Geographical Society, for his instrumental role in rejuvenating the organisation over the past five years, most notably through relocating the Society to its stunning new premises by the Rideau Falls in Ontario. But John’s contribution to geography does not end there: he is well-known for his penmanship, having authored a suite of bestselling books, including Frozen in Time and The Third Man Factor.

To nominate someone for an RSGS Medal or Fellowship, please visit our website www.rsgs.org/inspiring-people/medals-awards and complete a nomination form.

Christmas gift ideas

If you’re looking for a special Christmas (or New Year or birthday) gift, then the RSGS can help! We have a small stock of unusual items for sale from our Perth HQ.

The Fair City by Rob Hain

New small-sized limited edition print (30cm x 20cm): £60 unframed; £100 framed.

1,000-piece jigsaw: £25.

RSGS Membership

By gifting RSGS Membership, you will support the charitable work of the RSGS, and new Members will receive free entry to 90 Inspiring People talks, quarterly editions of this magazine, access to our academic journal, and involvement in our extensive geographical network.

The Explorer by Nick Hayes

Framed limited edition linocut print, signed by the artist (36cm x 48cm): was £72, now £50.

The Great Horizon by Jo Woolf

Signed copies of the book of stories of 50 great explorers from the RSGS: £25.

If you are not able to collect your purchases in Perth, we can post all but the largest items to you or to the person you want to treat. We will charge postage at cost, so it will vary accordingly. Please contact us on 01738 455050 or enquiries@rsgs.org to place your order.

David Lowenthal FBA (1923-2018)

Professor Charles Withers FRSGS, Geographer Royal for Scotland

It is with great sadness that the Society notes the death, on 15th September 2018, of the distinguished cultural geographer Professor David Lowenthal. Among other recognition for his world-leading work in cultural geography and in heritage studies – which latter field he did much to shape – David Lowenthal was awarded the RSGS’s Scottish Geographical Medal in 2004, the Society’s highest award. Born in New York City in 1923, he graduated from Harvard University with a degree in history in 1943. In the final months of his war service, he was the designated ‘geographer’ accompanying a photographic party recording roads, buildings and bridges as the American forces advanced into Europe. After the war, he completed his doctoral studies at the University of Wisconsin at Madison, the subject of his PhD being the work of George Perkins Marsh, who some consider America’s first environmental conservationist. Among numerous publications, Lowenthal’s The Past is a Foreign Country (1985) is probably the most influential. Lowenthal there explored how societies review, examine and employ notions of the past: heritage is not history, he argued, but, rather, the many ways in which we use history to help make the present and shape the future. He returned to this theme in his The Past is a Foreign Country – Revisited, for which he was, in 2016, awarded the British Academy Medal. His last book, Quest for the Unity of Knowledge, was in proof stage at the time of his death.
A geographer far, far away

Geographer Royal for Scotland, Honorary Fellow of the RSGS, Ogilvie Chair of Geography and, on occasion, notorious Sirh Lord. In late November, Edinburgh University geography students were stunned as renowned academic Professor Charles Withers delivered his final lecture dressed as Darth Vader. Despite ‘humidity issues’ affecting his vision, the costume-clad cartographer powered on through the hour-long session, highlighting key points with a blue lightsabre. “It was just a bit of fun at the end of my lecturing career,” he said.

Young Geographer II

In 2017, we published our first Young Geographer magazine – written and produced by young people from across Scotland, with the help of RSGS staff. We are delighted to announce that over the coming months we will be producing a second edition of the magazine with a new team of young editors.

Supported by the Scottish Government and the Gannochy Trust, the magazine will focus on the Arctic and will feature young voices and perspectives from the most northerly latitudes of our planet. If you, or a young person you know, might be interested in writing content, supplying ideas or helping with the design of the magazine, please contact our Communications Officer james.cave@rsgs.org.

Record-breaking adventures

In October, Inverness-based cyclist Jenny Graham smashed the women’s circumnavigation record, lopping nearly three weeks off the previous best. Covering over 18,000 miles, she travelled across 18 countries in just 124 days. “I get to live on my bike all day and don’t have to deal with adult stuff,” was an upside of her journey.

A few days later, endurance athlete Ross Edgley splashed into Margate harbour as the first person to swim around mainland Britain, having spent 157 days at sea, swimming 1,791 miles up to 15,000 calories per day and putting on over a stone of weight; and sleeping on a 16m catamaran overnight. He had consumed a bounty of produce, skilled chefs and stunning natural landscapes. “I am overwhelmed. Scotland is a beautiful place to live and work with a bounty of produce, skilled chefs and stunning natural landscapes.”

Connecting Cultures

We have helped five more young people secure places on the epic Connecting Cultures course, through our partnership with Outward Bound Oman. This week-long journey through the Omani desert aims to teach, share and enlighten young people through intercultural dialogue and specialist workshops, and is endorsed by the United Nations, UNESCO and governments around the world. To learn more about the course, read our blog post Discussions and Discovery in the Desert (rsgs.org/discussions-and-discovery-in-the-desert) by Meredith Adams, one of the candidates we supported on this inspiring journey.

Touching the Void

The acclaimed stage production of Touching the Void is coming to Perth Theatre next year. It marks the 30th anniversary of Joe Simpson’s best-selling memoir which charted his battle back from the brink of death on the treacherous Siula Grande in the Peruvian Andes. Call 01738 621031 or visit www.horsedcross.co.uk for further information.

Polar Academy

There have been some significant developments at the Polar Academy of late, particularly in terms of media interest. Most notably, the BBC has commissioned a two-part radio show and a four-part television documentary following the Bathgate Academy team as they journey through the Polar Academy experience, from training and preparations to the expedition and associated outreach. Talks regarding a CBBC film for younger audiences have also begun. Clearly the good work of the Polar Academy, led by our Explorer-in-Residence Craig Mathieson, is getting noticed. And it’s not surprising, given the many benefits the charity is having on young people, their families and local communities.

Thistle Regional Ambassador Award

The Scottish Thistle Awards are Scotland’s top awards for the tourism industry and offer the opportunity to recognise those people who have made valuable contributions to the sector across the country. The Johnstons of Elgin Regional Ambassador Award for Central East & Tayside went to Wendy Barrie of Scottish Food Guide. Wendy, who wrote for the summer 2018 edition of The Geographer, was commended for the passion that she shows in her job. She said, “I am overwhelmed. Scotland is a beautiful place to live and work with a bounty of produce, skilled chefs and stunning natural landscapes.”

Sponsor an event

We are thankful that several of our recent and upcoming events have been sponsored. In return, we have been able to offer priority seating and promotional opportunities. For upcoming dates, we are grateful to J&H Mitchell, Beautiful Perth and Zero Waste Perth, The Open University, Saffrey Champness and the Hillhouse Group, as well as Tiso for their overall partnership in our Inspiring People talks programme. There are plenty of other local and national events still available for such support; please contact enquiries@rsgs.org if your company or organisation might be interested.
Scotland in the Global Arctic

Ólafur Ragnar Grímsson, Chairman of the Arctic Circle, and President of Iceland 1996-2016

Scotland has throughout the centuries, especially in modern times, tended to look south to England and Europe when defining its geopolitical position. This vision has dominated the political and academic communities and been the running theme in Scottish analysis and discourse.

North of Scotland the small countries and the vast oceans were of little consequence; almost an empty space in the dominant Scottish perspective.

In the early decades of the 21st century, this view of Scotland’s global geopolitical position is becoming increasingly outdated. The North, ranging from Scotland through the oceans into the vast Arctic, is already a new global and dynamic playing field where not only the eight Arctic states, including the United States and Russia, but also the leading Asian powers – China, Japan, Korea and India – are establishing and strengthening their position and interests; and where Germany and France are giving their political representation a stronger and more consistent basis.

This transformation of the Arctic – or the High North, as this vast region is sometimes called – is among the most significant geopolitical changes in the first decades of this new century; a transformation of lasting and wide-ranging importance; occurring in a peaceful way within cooperative structures. It has therefore gained neither the media nor the public attention it truly deserves; the focus being consistently on the litany of crises in other parts of the world.

The Arctic was for centuries completely unknown to the enlightened Western world; only inhabited by indigenous communities who learned to live in harmony with cold, often ice-covered nature. When the Norwegian, British and Canadian explorers went into the Arctic a little over one hundred years ago, they became world-famous for their heroic endeavours; away for years, without any news of whether they were dead or alive. Then, the Cold War made the Arctic highly militarized and completely off-limits for any constructive cooperation. Military bases, missiles and submarines were the Arctic pillars in the East-West balance of terror.

It was therefore not until the end of the Cold War, not yet 30 years ago, that the Arctic could become a territory of cooperation and constructive engagement by states, institutions, enterprises and communities; an open field for research and science as well as a promising ground for various business and economic endeavours.

The term Arctic, as commonly used, does not communicate well its vastness and reach. This territory of our planet is almost the size of Africa when all its parts are taken together. Alaska is more than twice the size of Texas; the Canadian Arctic territories larger than the leading European states; the Russian Arctic covering seven time zones, more than twice the zones in the continental United States. And then there are the oceans: the North Atlantic leading into the Arctic oceans and the long Russian and North American coastlines that mark new sea routes between Asia and America and Europe; with melting of the Arctic sea ice increasingly offering alternative routes to the Suez Canal.

To simplify this new and large planetary framework, I sometimes divide the Arctic into three parts:

- the Western Arctic, which embraces Alaska and the northern territories of Canada;
- the Eastern Arctic, which ranges from the north of Scandinavia through the vastness of the Russian Arctic;
- the Centre Arctic, which numbers three small countries, in terms of population: Iceland, Greenland and the Faroe Islands; and links those through the North Atlantic to Norway and Scotland.

This Centre Arctic triangle brings Scotland a new geopolitical position. It is now an integral part of a dynamic global structure: the Centre Arctic and its linkage to the Western Arctic and the Eastern Arctic.

This geopolitical reality can be observed every October at the Arctic Circle Assemblies in Iceland. There, over 2,000 representatives from 50–60 countries come together to discuss the political, economic, strategic, scientific, social and cultural dimensions in the growing Arctic cooperation, multiple endeavours and projects.

The Arctic Circle Assemblies, established only five years ago, and now among the largest annual multi-sector gatherings in Europe, are attended by heads of states and governments, ministers, members of parliaments, officials, experts, scientists, entrepreneurs, business leaders, indigenous representatives, environmentalists, students, activists and others from the growing international community of partners and participants interested in the future of the Arctic.

In recent years, the First Minister of Scotland, other Ministers as well as Members of Parliament, scientists, environmentalists and activists from Scotland, have made strong contributions to the success of the Assemblies. At the 2016 Assembly with the support of the Scottish Government,
the Scottish design collective Lateral North installed the exhibit Prospect North in Reykjavík’s Harpa Conference Centre, an immersive cartography experience with augmented reality layers targeting the need to engage northern communities in geographically identifying challenges and solutions-building.

In addition to the annual Assemblies in Iceland, the Arctic Circle has convened special Forums in other countries. The first Forum was held in Alaska in 2015 on ports and shipping. Subsequent Forums have been held in Singapore on Asian involvement in the Arctic; in Greenland on economic development for the people of the North; in Quebec on regional development; in Washington on the United States and Russia in the Arctic; and in the Faroe Islands on Arctic Hubs. A Forum was held in Edinburgh in November 2017 under the title ‘Scotland and the New North’. In December 2018, the Arctic Circle Korea Forum will be held in Seoul; and in May 2019, a Forum on China in the Arctic will take place in Shanghai.

The annual Arctic Circle Assemblies in Iceland and the Arctic Circle Forums in Scotland, Greenland and the Faroe Islands demonstrate, together with the regular Arctic Frontiers conference in Norway, how the growing global importance of the Arctic has created a new and dynamic geopolitical reality for those North Atlantic neighbours, bringing Scotland through the North into a growing network of cooperation and engagement where all the leading economic powers of Asia and Europe are together with the United States and Russia among the major players.

The opportunities for Scotland to enhance its presence and influence within this new framework do not depend on Scotland’s constitutional position within the United Kingdom, since the ground rules of the Arctic Circle cooperation allow regions and sub-nation state entities to play an independent role as is demonstrated every year by the dynamic role taken within the Arctic Circle platforms by Alaska, Maine, Greenland, Quebec and Canadian territories, as well as various regional governments in Russia.

Scotland can therefore become ‘an Arctic State’ irrespective of its constitutional position or Britain’s relationship with the European Union. It is a fascinating future for Scotland on the international Arctic stage.

Looking North: an Arctic Policy for Scotland

Fiona Hyslop MSP

As Cabinet Secretary for Culture, Tourism and External Affairs, I am very pleased to be leading on the development of an Arctic Policy for Scotland.

Historically, Scotland has enjoyed many links with the Arctic region and has built on these to show our commitment to the Arctic today. We share many common social and cultural bonds with our near neighbours in the Nordic region and with Scottish communities in North America. Some of the great Western explorers of the Arctic were Scottish and, more recently, Scotland has been involved for over 25 years in the Northern Periphery and Arctic Programme.

In November 2017, the Scottish Government hosted ‘Scotland and the New North’, the first Arctic Circle Forum to be held in the UK. During the forum, I personally announced that we would be developing our own Arctic Policy Framework to strengthen our connections with the region and identify opportunities for future collaboration, growth and policy exchange.

I believe the purpose of the Arctic Policy Framework is twofold: firstly, to demonstrate that Scotland is a valuable partner to the Arctic region with key insight and expertise across a range of areas. A good example is our high ambition on tackling climate change and our innovative measures to deliver sustainable development, particularly in rural and remote communities.

Secondly, to identify concrete opportunities with our partners for Scotland, academically, economically and socially, to take forward projects or programmes of work related to the Arctic, and similarly to identify opportunities for policy exchange and learning between Scotland and the Arctic region.

My participation in the Arctic Circle Assembly in Reykjavík in October confirmed that our Arctic Policy – and the international engagement it enables – offers lots of opportunities for Scotland. By reshaping the map, focusing on the Arctic as a new centre for trade, innovation and investment, Scotland is no longer peripheral. We find ourselves in a key position, close to the central Arctic, linking the region with Europe and the wider world. I very much see our Arctic Policy as a window to a global view and I believe that this will help shape Scotland’s international engagement for years to come.

I also believe that, by working with Arctic partners facing similar challenges, we have the opportunity to redefine what it means to be ‘remote’, giving highlands and islands communities an opportunity not only to be at the core of our plans and initiatives but also to benefit from new ties with Arctic neighbours.

I am keen that the Arctic Policy Framework is of relevance to key interests across Scotland and reflects the extensive links to the Arctic already in existence between our communities, businesses, and civic society, as well as the new opportunities which are opening up. That is why the Scottish Government will be organising an Arctic Day in early 2019, which will be an opportunity to discuss Scotland’s modern, contemporary relationship with the Arctic region and to help shape Scotland’s Arctic Policy. I look forward to seeing many of you there.

Please email penny.rogers@gov.scot if you are interested in attending.
Governance and influence in the Arctic Ocean

Professor Elizabeth A Kirk, Professor of International Environmental Law, Nottingham Law School, Nottingham Trent University

As the world becomes increasingly aware of the rapid warming of the Arctic Ocean, countries such as Scotland and the UK are asking two, opposing, sets of questions. What benefits may these changes bring us? What can we do to help protect the Arctic’s fragile ecosystems?

It may seem at first that countries without an Arctic coastline can do little to benefit from or protect the Arctic ecosystems. Many of the benefits and the opportunities to protect the ecosystems may fall most clearly to the coastal States. For example, potentially exploitable oil and gas deposits will be located in areas of the sea bed which fall within the jurisdiction of the coastal States. Similarly, Arctic coastal States can establish marine protected areas or other measures to protect those parts of the Arctic Ocean that fall within their jurisdiction. Non-Arctic States do not have such direct routes to protect or benefit from Arctic resources.

There are, however, some other routes to participation provided through international law. A set of consistent, but quite general rules about use and protection of the oceans is provided by the United Nations Convention on the Law of the Sea 1982 (UNCLOS) and by the rules of customary international law. Although treaties are only binding on States party to them and there are some noticeable absences (for example, the USA is not a party to, and therefore not bound by, UNCLOS) the rules of customary international law are binding on all States. These rules include, for example, the rights of all States to enjoy navigation and fishing on the high seas. In exercising these rights, States must comply with any international obligations, but, as a general rule, the same rights and obligations apply to all States in areas of high seas.

‘Specialist’ treaties provide more detail on the action States can and should take in respect of conservation, fishing, and activities that may cause pollution such as shipping. These treaties do not, however, cover every possible activity, nor every area of the Arctic. For example, they may apply in one region of the Arctic only, such as the Barents Sea fisheries agreement. Other treaties will address a specific issue, but may do so from a global perspective. This means that they do not contain measures that address the specific requirements of the fragile and rapidly changing Arctic Ocean ecosystem. For example, the International Convention for the Prevention of Pollution from Ships (MARPOL) does not address the specific needs of shipping in areas subject to heavy ice. In this case a particular agreement has been adopted to supplement these global provisions: the Polar Code, which is designed to help protect fragile polar environments. More specific regional agreements also exist, such as the recently signed 2018 Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean.

It is left to States, acting alone or in cooperation with other States, to decide how all of these rules are to be interpreted and applied. Cooperation takes place through global and regional organisations, such as the Arctic Council. These organisations may help develop further guidance on how to interpret and apply existing treaties, or run programmes to develop understanding of ecosystems. The work of these organisations gives non-Arctic countries an opportunity to wield influence in the Arctic. Organisations such as NGOs and non-Arctic States can, for example, apply for what is called ‘Observer’ status of the Arctic Council and other intergovernmental organisations. This allows them to attend meetings, and Observers are sometimes able to support the implementation of projects, for example researching the impact of activities in the Arctic Ocean, or developing proposals for further regulation.

Non-Arctic States may also wield influence through global bodies which adopt regulations or guidance relevant to the Arctic. For instance, every member State in MARPOL, the shipping pollution treaty, can influence the development of new measures. The level of influence each has should, in theory, not vary, regardless of whether the measures being discussed are global in nature focused on the Arctic.

There are also indirect opportunities for States, seemingly unconnected with the Arctic, to regulate activities there. For example, port States have, under international law, authority to enforce laws relating to the control of pollution from shipping. Should countries such as Scotland, or the UK more generally, be port States for goods transported through the Arctic, they can use their powers to ensure standards are enforced. There may also be opportunities for leadership in the creation of ‘cleaning technologies’. For example, many of the threats faced by the Arctic Ocean ecosystem are manifestations of global problems. Oil-based plastics litter the Arctic Ocean as well as the oceans more generally. Countries which lead in switching to non-petroleum based plastics have the potential to stimulate new and potentially sustainable industries at the same time as protecting the fragile Arctic Ocean ecosystem.

Although the governance of the Arctic Ocean may seem to fall largely to the Arctic coastal States, there are opportunities for all States and actors to help protect its resources and for all to benefit from, for example, the reduction in shipping times between the Atlantic and the Pacific created by the opening up of Arctic shipping routes as the Arctic Ocean ice melts.

“Many of the threats faced by the Arctic Ocean ecosystem are manifestations of global problems.”

Image © Professor AM Hansen
The Arctic Council: a successful international cooperation

Magnus Jóhannesson, Senior Adviser on Arctic Affairs, Icelandic Ministry of Foreign Affairs

19th September 1996 in Ottawa, Canada, proved to be a historical day for the Arctic Region. The Foreign Ministers of the eight Arctic States – Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden and the USA – signed the Ottawa Declaration. This established the Arctic Council and created the framework for cooperation between the Arctic States and the Indigenous Arctic peoples on Arctic affairs. The Arctic Council has grown in stature to become the primary organization dealing with Arctic issues. Now there are 13 States, 13 International Organizations and 13 Non-Governmental Organizations participating in its work. Involvement of the Arctic Indigenous peoples is unique, with six Indigenous peoples’ organizations having a permanent seat on the Arctic Council and participating in all deliberations of the Council. Their presence has strengthened decision making and enhanced the political discussions taking place.

The mandate for cooperation set out in the Ottawa Declaration is very broad. From the beginning, it has focused especially on two themes: Environmental Protection, and Sustainable Development. The only subject which it cannot deal with is Military Security. The cooperation is based upon consensus, and no decisions can be taken by the Council unless there is consensus among all the eight Arctic States.

The Arctic Council’s work takes place at three levels: expert or technical level, senior official level, and Ministerial level. The consensus principle prevails at all levels. The Council chairmanship rotates every two years between the Arctic States. Iceland will take over the chairmanship from Finland in May 2019.

Achievements by the Arctic Council

What have been the major achievements by the Arctic Council during its first two decades? In my opinion, the Arctic Council has been successful in its work.

Scientific and technical work of the Council has resulted in a number of actions, taken by the Ministers, that have aimed at better environmental protection and promotion of sustainable development in the Arctic. Decisions taken have been implemented by the Arctic States, and – in other cases – the Arctic States have used the Council’s findings to argue for effective agreements in other international fora.

Monitoring of persistent organic pollutants in biota and humans in the Arctic helped to generate a broad international consensus for the Stockholm Convention in 2001. We have seen reduced levels of some of the substances covered by that Convention in the Arctic. Similarly, the work of the Arctic Council led to the Minimata Convention on Mercury in 2013. Lastly, but perhaps most importantly, the Arctic Council’s Arctic Climate Impact Assessment, published in 2004, contributed significantly to the IPCC’s understanding of climate change itself.

There are other examples. The Council’s Arctic Marine Shipping Assessment from 2009 had considerable impact on the Polar Code of the International Maritime Organization which regulates shipping in the Arctic. Other notable achievements have been implementation of three ratified, legally binding agreements between the Arctic States. One is on Search and Rescue activities in the Arctic, another is on cooperation for Oil Pollution incidents in the Arctic and the third on enhanced Scientific Cooperation.

The strength of the Arctic Council lies in its structure and the strong emphasis that the Council has put on science and informed decision making. It is also of great significance that the results and findings that emerge from the Council’s work are discussed by officials and policy makers at the highest levels. Experience has shown that when experts and scientists from the Arctic States agree on the problems and recommendations for action, these are usually approved by the policy makers.

The consensus principle has proved to be quite successful in shaping effective policy measures. The fact that Ministers are greatly involved in shaping the Council’s research work has helped to make the work more meaningful and more prominent in discussions in other international organizations. Furthermore, the Arctic Council model has demonstrated the potential for making headway on relevant issues through the interaction of scientific advice and policy making by politicians and their officials.

Future challenges in the Arctic

The biggest task for the Arctic Council in the next two decades will be to ensure sustainability for life and the living conditions for the four million people living in the Arctic. Foreseeable changes and development in the Arctic due to climate change and increased human activities will provide the main challenge. Arctic science will continue to be a fundamental input for successful functioning of the Arctic Council.

To ensure a sustainable Arctic natural and human environment, the Arctic Council has to engage a variety of actors and stakeholders. Governments, businesses, communities and the people in the Arctic all have a role to play in this major challenge. Public-private partnerships should be established to deal with some of the infrastructure requirements, such as telecommunication, emergency preparedness and response, and green solutions for energy production.

Since many of the impacts that are affecting the Arctic are external to the area, the Arctic Council has to further strengthen cooperation with other stakeholders, such as the Observers in the Arctic Council. That may also help to get better focus and priority on Arctic issues in the relevant International Organizations that regulate or deal in some way with issues that are impacting the Arctic.

Iceland aims during its upcoming chairmanship of the Arctic Council to put emphasis on making progress on ocean issues, green energy and improved living conditions for the people in the Arctic.

Magnus Jóhannesson was the first Director of the Arctic Council Secretariat.
A region of emerging opportunities

Anu Fredrikson, Director, Arctic Economic Council Secretariat

It’s all about changing perspective. Turn the globe around and look at the world from the North Pole and down. What you see is a region with an estimated investment potential of one trillion dollars. This region connects 90% of the world economy, holds 20% of the world’s natural resources, and 0.05% of its population. This is the Arctic.

Often described as the last frontier, the Arctic is first and foremost home to four million people living in eight different countries. This equates to 0.05% of the world’s population in 15% of the global land area, making the Arctic a vast but sparsely populated region. But when speaking about the last frontier, one thing is often overlooked: the Arctic has been home to responsible industrial activity for decades.

Opportunities

With a rapidly changing climate, new opportunities as well as challenges arise. The opening of new sea lanes, new opportunities for energy production, and an increasing need for minerals are just some examples of the region’s potential and the role the Arctic can play. The effects of climate change are firstly and most fiercely visible in the Arctic. How do we balance the effects of climate change and the Arctic opportunities?

One of the reasons behind the establishment of the Arctic Economic Council (AEC) was the assumption that increased economic activity could increase the socio-economic conditions of living in the region. Considering the increased need for natural resources and the fact that the Arctic holds approximately one-fifth of the world’s resources, the region’s significance is not likely to diminish.

The AEC is an independent business organization whose establishment was facilitated by the inter-governmental Arctic Council. This is the first time the pan-Arctic business community joined its forces. The purpose of the AEC’s work is to facilitate the responsible economic development of the region – with the people of the Arctic in the driver’s seat.

From local to global

When operating in vulnerable areas, science-based operations and knowledge of local conditions are key elements in successful operations. Many of the opportunities in the Arctic are attractive for multinational companies and companies of non-Arctic origin.

Collaboration is key to mutual success: the Arctic is a small market on its own, and thus needs access to the global value chains. This is essential for the region’s value creation.

By facilitating collaboration between the international and local stakeholders (both businesses and local and indigenous communities) we can advance a development which takes place on terms set by those living and active in the Arctic. This way we can also benefit from the decade-long experience of responsible industrial activity in the region, and build sustainable future operations based on the centuries-long knowledge of the land.

Business experience and regulatory development

Businesses depend on having stable and predictable regulatory frameworks to succeed. When operating in the Arctic, the bar should be high to make sure operations in this vulnerable area are conducted sustainably.

However, the Arctic is not a single homogenous mass. Instead, there are great variations within the region in terms of geography, operating conditions, population, and degree of development. One size doesn’t fit all – and this is also true of business operations.

The Arctic business community possesses vast experience and knowledge about best practices on responsible operations. Hence, the voice of businesses should be included when discussing new regulations.

Sustainable operations

An insurmountable part of sustainable and responsible economic development in the Arctic is the use of best possible knowledge and technology. Industry should strive to science-based solutions and the use of traditional and indigenous knowledge.

With the signs of increased protectionism and financial nationalism, the AEC is concerned that the sustainability of operations in the Arctic can suffer. If the use of best possible technology is prohibited, this might lead to a scenario where operators go for the second or third best solution. Potential damage? First and foremost, on the environment.

With an estimated increased need for natural and man-made resources, whether that includes energy in all its forms, minerals or data highways, more and more eyes are expected to turn on the Arctic.
A Russian strategic priority in a global context

Dr Andrew Monaghan, Director of Research on Russia and Northern European Defence and Security, Oxford Changing Character of War Centre, Pembroke College

The Arctic has long been a priority for Russia. A traditional frontier for exploration and research, the USSR developed major settlements, and significant infrastructure and industrial facilities in the region. And the region occupies a central place in Russian economic and security thinking. During a visit in 2017 to the region with Prime Minister Dmitri Medvedev and Defence Minister Sergei Shoigu, President Putin noted the region’s wealth, stating that “natural resources, which are of paramount importance for the Russian economy, are concentrated in this region,” and indicated estimates of the Arctic’s mineral wealth of some $30 trillion. The Arctic also features prominently in Russian security thinking, since an important part of Russia’s sea-based nuclear deterrent is deployed there.

The Russian leadership often makes explicit its view that the Arctic is a nexus of many vital interests. Addressing a meeting of the Russian national security Council, the main body for formulating and overseeing Russian strategic planning, Putin stated in 2014 that the region represents “a concentration of practically all aspects of national security – military, political, economic, technological, environmental and that of resources.” “For dozens of years,” he continued, “systematically Russia has been strengthening its ... positions in the Arctic. Our goal is not only to restore fully these positions, but also to make them even stronger.”

This would be done by expanding Russia’s information, research and humanitarian presence in the region, reviving the Northern Sea Route (NSR), a shipping route linking Europe and Asia along Russia’s Arctic coast, constructing infrastructure such as the Arctic seaport (and Liquefied Natural Gas plant) of Sabetta, opened in late 2017, and restoring or building military infrastructure, including airfields and ports along the Arctic coast, and the establishment of a Joint Strategic Command in 2014. These latter developments have been accompanied by numerous military exercises, including airborne and amphibious landings, and coordinated with other military districts. Indeed, the Defence Ministry has dedicated so much attention to the region that Shoigu could state in late 2017 that “in the whole history of Arctic development, no other country in the world has carried out such extensive projects in the conditions of the far north.”

In many ways, however, the Arctic represents an ambiguous picture for the Russian leadership. On one hand, it is a source of potential, of opportunity for development: climate change is seen to offer the chance for developing the NSR into a more substantial shipping route, for instance, one that can compete with other global maritime transit routes, and, in so doing, breathe new economic life into Russia’s northern regions that have been in a state of decaying through a lack of resources for much of the post Cold War period. This has been a part of Russian thinking for some years already: in 2011, Putin indicated that state and private companies that used Arctic trading routes would stand to benefit. In September 2018, the container ship the Venta Maersk successfully completed the passage from Vladivostok to St Petersburg. Though the voyage was intended as a one-off trial run, and the company does not see the route as a commercially viable alternative to existing routes yet, Moscow’s focus is on the route becoming viable in the mid-2020s.

At the same time, there are concerns. Senior figures in the Russian leadership, including in the armed forces, often emphasise growing competition for resources and over trade routes, including in the Arctic, even indicating that such competition might result in war. Putin himself suggested in 2014 that Moscow saw “the collision of interests of Arctic nations,” and, importantly, the growing influence in the regions of states “far removed from the area.” This has spurred Moscow’s efforts to confirm Russia’s presence and capability in the region, including attempts to claim territory – Moscow submitted a bid in 2015 for a claim of some 1.2 million square kilometres of Arctic shelf.

If it is obvious that the Arctic is a central strategic priority for Russia, and that this will only become more emphatic over the next decade, it is also important to place it in its proper context: it is more appropriately seen as part of Moscow’s wider Polar focus. Russia inherited all the Soviet polar infrastructure, which is still seen in holistic terms. If Russian activity in the Arctic is now, albeit belatedly widely recognised, increased Russian activity in Antarctica – noted in passing in the Foreign Policy Concept of 2013 – is much less often remarked upon, even though it illuminates the more global view of Moscow’s military, economic and scientific activity. Indeed, seeing Russian activity in these broader, more global terms offers a better understanding of a range of questions, from how Moscow seeks to position Russia in terms of basing and questions of information management, for instance through GLONASS measurement stations, to the Russian leadership’s views of the global commons – all of which are only going to become more prominent over the next decade.

“(...)"}

Dr Monaghan is the author of *Power in Modern Russia: Strategy and Mobilisation* (Manchester University Press, 2017).
The Rights of Nature: the Indigenous way

Laura S Lynes LLM, President, The Rockies Institute, Canada

Natural entities with ecological and cultural significance to Indigenous peoples in the north could be good candidates for legal standing, especially if threatened due to climate change. Of course, this could mean the entire Arctic ecosystem.

In 2018, ArcticNet produced an Integrated Regional Impact Study of climate change in Canada’s Eastern Canadian Arctic. Documented in the study are local observations that illustrate the many impacts of warming on the region. This is the story playing out across the Arctic, whether defined by the area above the Arctic Circle, north of the tree line, or by temperature: unprecedented change is afoot. The local insights offered by ArcticNet are further affirmed by the newly released special 1.5°C report by the Intergovernmental Panel on Climate Change: warming of the Arctic is already two to three times greater than the global annual average.

With the warming of the Arctic, a new relationship between humans and the ecosystem is forming. For Indigenous peoples in the north, this is altering thousands of years of cultural practices and territorial understanding. For them, adapting to rapid and accelerating climate change is no longer a choice – it’s a reality.

Though the exact number of Indigenous people living in the Arctic is not easy to define due to differing definitions of ‘Indigenous’, researchers estimate they make up around 10% of the total population and are found in all but one of the Arctic countries. Culturally and linguistically diverse, all Indigenous peoples in the north share a common worldview of nature that is distinct from the nation state to which they also belong. For them, nature and humans are one and the same – part of an interconnected web of life. This is a profoundly important concept to grasp for anyone seeking to address climate change in an inclusive manner. Indigenous views on nature are considerably different than the worldview brought by European settlers that ultimately led to the separation of nature from humans.

The Rights of Nature could be a legal instrument in addressing climate change challenges in the north. It is encouraging that the number of Rights of Nature cases has steadily grown since legal standing for nature was written into Ecuador’s constitution. Perhaps the best model for a potential case in the Arctic is New Zealand’s Whanganui River Claims Settlement that created a ground-breaking legal framework around the interconnectedness between nature and humans. The Whanganui River settlement established legal standing for Te Awa Tupua, a term used to describe not just the river, but the wetlands, streams and tributaries, soil and even the airspace associated with it. Central to the decision for legal standing was the acceptance by the courts that Te Awa Tupua and humans are an inseparable entity; therefore, the health of the Whanganui River equates to health of the people in New Zealand, Indigenous and non-Indigenous.

Another reason why the Whanganui River case is a good reference for the Arctic is that much of the reasoning behind settlement relied on the courts’ willingness to consider the negative impacts of colonization in its decision. Arctic countries with legal histories that evolved from British common law, like Canada, could therefore be good places to pursue Rights of Nature cases in connection to nature that is culturally and ecologically significant to Indigenous peoples. While calls to deconstruct the negative impacts of colonialism are worldwide, Canada has made considerable efforts with the establishment of a Truth and Reconciliation Commission and guiding principles that guide governments of all levels and other stakeholders in repairing relationships with Indigenous peoples through active reconciliation and legal reform.

The Government of Canada recently introduced a unique approach to conservation by creating a new classification called Indigenous Protected Areas. Hailed as a form of active reconciliation, the new class provides the same environmental protection as a National Wildlife Area. Deemed culturally and ecologically significant, the first Indigenous Protected Area in the north encompasses 14,281km² of what is now called the Edéhzhíe Protected Area and National Wildlife Area. Similar to how many Rights of Nature agreements are managed, the Edéhzhíe will be overseen by a board that includes federal members, and places the Dehcho First Nations as guardians. While this approach is commendable, legal standing for nature would create a stronger standard for regulations than current environmental laws can offer. As outlined by the United Nations, the Rights of Nature establishes guidance for our actions in recognition of the shared, non-anthropocentric relationship between humans and nature that is much more aligned with Indigenous worldviews.

Funding and technical support to help Indigenous and local communities to mitigate and adapt to climate change is another strategy that many of the Arctic nations are using, but local mitigation and adaptation will be of little consequence if the
land and sea continue to be exploited by humans. The Rights of Nature could, however, be a novel approach to Indigenous capacity building and adaptation. By putting nature at the centre, a path is cleared for decision making that revolves around the health and wellness of the natural subject versus the competing rights of nations and people.

A legal framework based on cultural and ecological significance in the context of climate change seems especially promising when considering the long-standing principles of *common concern for humankind* and the *precautionary principle* that are often used to guide policymakers across jurisdictions. The *precautionary principle*, for example, could provide guidance on the potential harm to Arctic ecosystems, cultures, non-human entities and human populations due to climate change. These criteria could then be used to guide how the rights of a natural entity ought to be protected and what the consequences should be if violated. Such criteria would also be helpful in the attempt to determine harm and cumulative effects. Ecological and cultural significance that is aligned with the rights of Indigenous peoples also allows us to entertain reasoning that is outside the subjective determination of what it means to have duties or responsibilities, that is often used as a perquisite for the determination of rights.

Like Scotland, Canada has a mixed legal system of common and civil law (the latter being only in the Province of Québec) which makes it a promising country for the Rights of Nature. After all, common law is a system of rules based on precedent to guide judges; it is flexible and can adapt to changing circumstances. Climate change most certainly presents a new circumstance. Though establishing legal standing for non-human entities would not guarantee that no harm will come, or that nature will have an absolute right, it does establish an enforceable instrument that could deter further destruction to a place that is under increasing threat from global warming. Finding new ways to fast-track climate action in the Arctic is imperative. Despite all the goodwill efforts, the Arctic remains a battle ground of competing ‘rights’; the ecosystem and those attempting to live in a symbiotic relationship with it are the victims. Perhaps the introduction of legal standing for nature could be a mechanism to honour Indigenous rights while at the same time protecting that which they have been stewards of since time immemorial. Using Canada as an example, true reconciliation with Indigenous peoples in the north should include pathways for their views on nature to influence policy going forward. The Rights of Nature is one such path.

“I used to think they would be the last mammal in the world to be exterminated owing to the inaccessibility of their ice guarded habitat. Now I have my doubts, with these aircraft already there – with the Oxford party – and more to follow next year and submarines to come. Poor beggars, the Museum is the place where the next generations will have to go to study them.”

Prophetic words from RSGS Fellow and Council Member William Burn-Murdoch, writing and drawing on the subject of polar bears in the early 20th century.
Increasing concern in the 1970s about the state of migratory salmon stocks around the North Atlantic prompted the need for their rational management through international cooperation. The major driver was the development of offshore fisheries catching salmon at sea, especially off West Greenland and in the Northern Norwegian Sea. This meant that fish caught in these distant waters were unable to return to their rivers of origin to reproduce. This resulted in the creation of the Convention for the Conservation of Salmon in the North Atlantic Ocean in 1983, and an intergovernmental organization, the North Atlantic Salmon Conservation Organization (NASCO).

Headquartered in Edinburgh, NASCO’s objective has always been to conserve, restore, enhance and rationally manage wild Atlantic salmon, with management based on the best available scientific advice obtained from the International Council for the Exploration of the Seas.

The Convention immediately created a large protected zone, free of targeted fisheries for Atlantic salmon in most areas beyond 12 nautical miles from the coast. One immediate effect was the cessation of the salmon fishery in the Northern Norwegian Sea. NASCO developed management measures for the distant-water fisheries off West Greenland and around the Faroe Islands. Communities particularly dependent on salmon, such as Greenland, the Faroe Islands, in the Republic of Ireland and in Canada, were initially given special consideration under the Convention. It took some years, therefore, for these fisheries to be reduced in accordance with the scientific advice.

It became clear that conservation and restoration of salmon stocks could not be achieved by these localised management measures alone. NASCO, therefore, broadened its operation throughout the North Atlantic to include the management of salmon fisheries by States of Origin, habitat protection and restoration, and the effects of aquaculture and related activities. International Agreements and Guidelines have been developed on each of these topics.

All salmon fisheries have reduced significantly in recent years and many conservation measures, both national and international, instituted. However, salmon stocks continue to decline. Some of this decline might be associated with the marine phase of the salmon’s life. Certainly, the rates of return of adult salmon to their rivers of origin have declined significantly in some parts of its range, especially in rivers in the southern part of the North Atlantic. The reasons for this are uncertain, but as overfishing has been virtually eliminated, the decline may be linked to factors such as rising sea temperatures, reduction in the prey stocks for salmon, increased pollution, and increased impact of disease and dilution of wild salmon genes related to the growth of salmon aquaculture. Additionally, warming temperatures also affect the river environments in which salmon spend their early life. Clearly, without all the measures taken over the years the migratory stocks would have been in an even worse state. NASCO will continue to act on the best scientific advice and continue its efforts to conserve, restore, enhance and rationally manage wild Atlantic salmon.

The multiple challenges faced by this migratory species are also affecting the numerous other species which share the habitats that Atlantic salmon both live in and pass through. A large and uncertain pressure is undoubtedly climate change. It is unclear what level of impact climate change will have on salmon in the Atlantic, but it is anticipated to change the range of the species, with expansion towards the northern end of its distribution while populations in the southern and central part of the range may experience reductions in productivity.

Similar changes in range are predicted for the various salmon species in the North Pacific. This shared uncertainty of the impact of climate change for the Pacific and Atlantic salmon species is one of the topics that organizations, researchers and salmon-dependent communities are coming together to consider across the Northern Hemisphere. Sharing of experiences, concerns and exchange of possible conservation interventions is happening as part of the International Year of the Salmon (IYS, www.yearesalmon.org). 2019 will be the focal year for the IYS, and in Scotland you can expect to see events and outreach activities raising the profile of the Atlantic salmon and NASCO.
**Swimming away! Arctic fisheries cooperation**

Andreas Østhagen, Research Fellow, Fridtjof Nansen Institute, Norway, and University of British Columbia, Canada

In 2008, the European Union (EU) stated that “climate change will fuel existing conflicts over depleting resources, especially where access to those resources is politicised.” Arctic fisheries are a good example. In 2009, Iceland and the Faroe Islands unilaterally decided to increase their annual quotas on mackerel by 6,500% and 340%. Warmer waters had caused the mackerel stock to change its patterns and venture northwards, leading to an advantageous situation for the two island states.

Fisheries are especially prone to small-scale conflicts erupting, as both resources and maritime boundaries are hard to control and monitor. Fish constitutes a mobile and transnational resource of great value. This is particularly the case with migrating fish stocks, often traversing across invisible maritime borders. Fish itself – at least straddling fish stocks – constitutes a ‘global common’, defined as an ‘environmental object’ that cannot be appropriated to any individual group. When states exploit stocks independently of each other to maximise their own immediate short-term benefits, a so-called ‘tragedy of the commons’ takes place and the stocks become subject to depletion. Therefore, dispute and conflict between states over fisheries have been commonplace throughout history.

The Cod Wars (1950s-60s) and the Turbot War (1990s) provide recent historical examples of conflict erupting over straddling fish stocks. Both took place in waters connecting to the Arctic Ocean. The world’s oceans are faced with a new challenge, different from these historical cases. At large, humanity is experiencing a widespread reduction in the total biomass of marine resources, closely linked to human exploitative activities. At the same time, stocks are changing their migratory patterns because of changes in the geophysical marine environment. Nowhere is this more apparent than in the Arctic.

The various Arctic sub-regions are home to some of the most profitable fish stocks in the world. Failure to reach agreements on marine resource management holds relevance for the whole region, with the Barents and Bering Seas historically prone to such disputes. Some have gone so far as to argue that the failure to agree on fisheries quotas was the primary reason for Iceland’s decision to end its EU membership bid on 12th March 2015. Others foresee an increase in the failure of cooperation more generally, as the impact of climate change on fish stocks becomes increasingly apparent. The five Arctic coastal states (Norway, Denmark (Greenland), Canada, the United States and Russia) have together with other countries agreed on a moratorium on fisheries in the central Arctic Ocean in advance of a conflict.

So why did cooperation over fisheries in the Norwegian Sea fail? As the story goes, Iceland and the Faroe Islands decided to ignore the existing quota-setting for mackerel, claiming – and taking – its right to a piece of the pie, as the stock had entered its waters in 2005. Alternatively, Norway and the EU blocked Iceland from partaking in the multilateral quota-setting, as a deliberate measure to ensure their hegemony within this system and ensuring their relatively large share of the pie.

In any case, cooperation suffered breakdown as the distribution of the resource and the interests of the actors drastically shifted. Consequently, the international cooperation that had developed to avoid a tragedy of the commons scenario failed, and the fish stock in question, in this case mackerel, is arguably being exploited beyond sustainable levels (although there are many diverging views on this). Still, today, there is no solution to this conflict over who-gets-what in the Norwegian Sea.

When the UK leaves the EU on 29th March 2019, it will become another party to the international negotiations over fisheries and quotas. One prevalent argument in both the BREXIT and Scottish independence campaigns has been to ‘take back our waters’. But questions remain how exactly quotas will be distributed and whether other EU countries are willing to give up their quotas in UK waters without also excluding UK fishermen from their own waters.

As fisheries are likely to continue to change in tandem with a changing climate, understanding how countries adapt and can continue to cooperate on shared stocks is of utmost relevance. The initial prediction that climate change will “fuel existing conflicts” over resources needs to be further questioned, as there is more than one dimension to this statement. At the same time, we should not underestimate the importance of fisheries for local communities and national pride. As the United Nations launches the Decade of Ocean Science for Sustainable Development (2021-2030), fisheries will continue to figure on international as well as national agendas and may, if left to its own devices, lead to further conflict between countries intent on retaining ‘their waters’.

**“Dispute and conflict between states over fisheries have been commonplace throughout history.”**
When the sun retreats below the horizon in the Arctic, the region is plunged into 24-hour darkness – a period known as the Polar Night.

Until recently the popular conception of this time of the year was one of impenetrable darkness, extraordinarily low temperatures, an ice-covered ocean and a biologically barren landscape. From the human perspective this is a reasonable appreciation of the Polar Night.

From the ocean perspective the picture turns out to be quite different. Only relatively recently have we been able to lift the lid on the black box that is the Arctic Polar Night, and the more we look into the box the more we are discovering.

The Arctic is a region of great geographic importance; despite being only 1% of the global ocean volume, it represents 25% of the global coastline and 35% of the global continental shelf, which is the relatively shallow (less than 300m deep) productive waters that fringe the coastline.

It is experiencing a period of intense change. Air temperature is increasing at twice the global average, sea ice area is decreasing at a rate of 14% per decade, and warmer ocean water is promoting movement of species into the Arctic from lower latitudes. Critically, we lack key areas of knowledge to understand how the Arctic functions, particularly in the data-sparse period of Polar Night.

To tackle this, seven UK research institutes (including five from Scotland) are working on a £1.5 million project to understand how the biology and chemistry of the Arctic Ocean respond to the presence of sea ice and light as the seasons move from winter through spring to summer. The project, Arctic Productivity in the Seasonal Ice Zone (Arctic PRIZE), has focused its efforts on the Barents Sea – oceanographically significant and economically booming.

Armed with this new knowledge the Arctic PRIZE team hope to develop predictive capabilities to anticipate how the Arctic might change in the future.

Arctic PRIZE is working in co-operation with Norwegian partners, primarily at UiT The Arctic University of Norway, based in Tromsø. UiT are leaders in Arctic marine research and have pioneered efforts to understand the Polar Night. Their research vessel Helmer Hanssen is a 65m converted factory trawler with exceptional capabilities of operating in the demanding conditions of the Polar Night. The Scottish-Norwegian partnership is based on more than a decade of research collaborations between the Scottish Association for Marine Science and UiT, and is the scientific manifestation of the current Scottish Government Arctic Strategy to look towards our Nordic neighbours for intellectual, economic and cultural ties.

Heading into the Polar Night can be daunting. The darkness is intense, relieved only by the beauty of the Northern Lights, and the working conditions on deck are demanding. Arctic PRIZE is focusing on the interactions between the properties of the ocean and ice and the ocean chemistry, and how this supports and fuels the overwintering communities of small algal cells (phytoplankton) and tiny marine animals (zooplankton). These microscopic organisms need to be sustained so that when the sun emerges and light floods the upper ocean there is an explosion of life called the Spring Bloom.

Even after we’ve departed the area and returned to harbour, we can continue to measure the response of the ocean to the changing environmental conditions. Arctic PRIZE has used ocean robots that glide through the water, descending to 200m and returning to the surface, for weeks on end. They fill in the data ‘black hole’ that occurs when using ships to collect data. The gliding robots gather data on water temperature and salinity, biological activity and light. Our data show the relatively low levels of biological material suddenly increasing as the daylight returns – we’ve captured the moment of the Spring Bloom. We’ve also used acoustic instruments moored to the seabed, sitting out in the dark ocean through the entire year, to monitor how the zooplankton respond to light, food and ice. Remarkably, we detect the zooplankton responding to exceptionally subtle changes in illumination (moon light and cloud cover) which determine how close they come to the surface to feed, yet minimise their risk of being eaten by predators. This extraordinarily precise movement and its timing is linked to both their sensing of the changes in light and their internal rhythms. In the Polar Night, the more we look, the more we find.

Arctic PRIZE is based at the Scottish Association for Marine Science and involves the University of Strathclyde, University of Edinburgh, University of St Andrews, and Scottish Universities Environmental Research Centre. It is funded through UKRI Natural Environment Research Council, part of the Changing Arctic Ocean programme.
Arctic geoscience research in Scotland

What drives Arctic research? We hear of big geoscience challenges in the Arctic: declining sea ice extent and thickness, thinning of the land-based ice sheets, and transformations of Arctic ecosystems. But media headlines have only recently heralded these challenges. Science progress is driven as much by human curiosity as it is by headlines. Perhaps it also needs a particular disposition when it comes to studying remote, sometimes beautiful, and often harsh environments.

Looking through the geographical lenses of history and landscape, it is clear in many ways that Scotland is far closer to the Arctic than we might at first imagine. We live in a post-glaciated landscape uncovered from beneath a kilometre and a half of thick ice sheet during only the last twenty thousand years. Ice lost, a complex shoreline and ice-carved interior revealed. One reminiscent of Greenland, Svalbard, Nova Zemlya and Northern Canada; and perhaps foretelling the future for these places.

Scotland’s Arctic connections are not only geophysical. The Arctic Circle Assembly, the largest network of international dialogue and co-operation on the future of the Arctic, meets annually in Iceland with more than 2,000 participants from 60 countries. Scotland is welcomed there, not as an outsider, but as both a cultural and geographic ‘closest’ neighbour, with many common values of identity and sense of place.

Within that international Arctic context, the strength of Scotland’s university sector and Arctic research expertise is unquestioned. We may even quantify our strength with so-called ‘REF’ statistics: under the banner of Scottish Alliance for Geoscience, Environment and Society (SAGES, www.sages.ac.uk), Scottish universities and research centres overpower the combined might of Oxbridge plus London by 60%.

Returning to the Arctic Circle. Speeches by the First Minister and the Cabinet Secretary for Culture, Tourism and External Affairs have received warm welcomes from the Arctic Circle Assembly. And at this year’s Assembly the Cabinet Secretary announced the development of an Arctic Strategy for Scotland: which can only mean more opportunities for researchers in Scotland to contribute to Arctic studies!

SAGES and the RSGS offer many avenues for scientists, policy makers, and all those interested to engage with Scotland’s Arctic interests. SAGES offers early career exchanges, small grants, and conference attendance funds, and since 1902 the RSGS has supported polar expeditions.

What ‘makes’ a polar scientist?

Dr Sian Henley is a SAGES Theme Leader and Lecturer at the University of Edinburgh.

“My first research trip to the polar regions was to Rothera Research Station on the Antarctic Peninsula for my PhD studies. The most striking things were just how breath-taking the rugged glaciated mountain scenery was, and the excitement of driving speedboats around towering icebergs during an average ‘day at the office’. My most recent polar trip was an Arctic research cruise in the Barents Sea and into the sea ice further north. The working days were long and exhausting, but the reward was huge with important science, inspiring people and incredible wildlife.”

Brice Rea is Chair of SAGES Executive, and Professor of Geography at the University of Aberdeen.

“My first time in the Arctic, in the summer of 1989, was for my undergraduate dissertation: I spent two weeks at the Reading University hut in Okstindan, Norway, undertaking work on subglacial abrasion. I spent time measuring striae, collecting debris from the basal ice of a glacier, and generally becoming spellbound by glaciers and the Arctic. My most recent trip to the Arctic was in 2016: I spent three weeks in Southwest Greenland, with long walks to field sites, carrying all our food and equipment, collecting organics and rock samples to constrain the geometries and chronologies of a large tidewater glacier, during the last deglaciation and a subsequent 20km advance and retreat, which occurred during the last millennium.”

Arctic geoscience challenges

Often quoted is the fact that the Arctic is warming at a rate approximately twice the global average. Wider, sub-arctic changes to weather patterns affect Scotland directly: winter phenomena, like the 2018 ‘Beast from the East’, are a consequence of weaker temperature differences between us and the north. The direct geophysical effects in the Arctic are more extreme.

1) As air and sea temperatures rise, sea ice loss is expected to accelerate to give summer ice-free conditions within a few decades. That is incredible – an Arctic with no sea ice! Melting and thinning of the Greenland Ice Sheet drives a greater export of fresh water from the Arctic into the northern Atlantic, with most studies predicting a resultant slowdown in ocean circulation.

2) Loss of sea ice cover brings increased light and wind energy entering the Arctic Ocean, potentially transforming the summer Arctic Ocean into sub-arctic ‘mediterranean’ sea, in which wind and light energy drive strong surface currents, mix upwards nutrient-rich water from below, and spark a green revolution of more productive seas.

3) With more energy and more food, ecosystem shifts are inevitable. As habitats push north with rising temperatures, some habitable niches disappear altogether. A large unknown though is ‘greening’ versus ‘browning’: will more carbon be released as ice-locked carbon-rich soils thaw, or will greater plant growth in a warmer Arctic absorb more carbon dioxide? We simply do not know.
The making and remaking of the Global Arctic

Professor Klaus Dodds, Professor of Geopolitics, Royal Holloway, University of London

In the past decade, there has been a cascade of articles, documentaries and other media outputs pertaining to the Arctic. 2007 was peak Arctic. Two stories catapulted the geographies of the northern latitudes into the global imagination.

First, it was revealed that the Arctic sea ice maximum extent was at its lowest since the advent of satellite measurements. From the late 1970s, satellite coverage of the Arctic Ocean has allowed scientists to measure sea ice extent, and thus build an archive of sea ice behaviour. In 2007, sea ice extent for the month of September was around 4.2 million square kilometres. Two years earlier, the recorded figure was 5.5 million square kilometres. The decline was precipitous, and brought to public attention something that was worrying scientists, namely the unrelenting shrinkage of sea ice.

The decline in Arctic sea ice was and is worrisome for a variety of reasons, including its capacity to interfere with regional and global climate dynamics. Put simply, less sea ice means that more solar radiation is absorbed by open water. Ocean and surface air temperatures rise, marine and under-ice ecologies undergo perturbation, and a more ‘open’ Arctic facilitates the entry of new species and activities. Sea ice loss is potentially disastrous for marine mammals such as polar bears, seals and walruses who depend on its existence for reproduction, hunting and everyday survival.

Second, a month earlier in August 2007, a Russian flag was gently deposited on the bottom of the central Arctic Ocean. Images of the flag, once circulated, precipitated media framings such as ‘new race for the North Pole’ and ‘scramble for territory’. Planting flags in overseas spaces was and is integral to European colonial practices, and went hand in hand with the colonization of the Americas, Asia, Africa and Oceania. To compound matters further, it was the Russian flag rather than say a UN flag cited in the images, and coincided with renewed concerns in the West at least about Russia’s strategic and military behaviour.

Images, however, matter to the business of geopolitics and statecraft, and even more so when the area in question is remote, inaccessible and usually invisible. The central Arctic Ocean seabed rarely features on BBC nature documentary programmes. The circulation not only precipitated media and political speculation but arguably precipitated a raft of new developments, including the main Arctic states of Canada, Denmark/Greenland, Norway, Russia and the United States finding new ways forward to ensure that any disagreement over the ownership of the resources of the central Arctic Ocean did not turn into conflict. Unwittingly, the images of the flag coincided with a more global interest in the Arctic, with China, Korea and Singapore leading the way in articulating their interests.

The Central Arctic Ocean: a new global commons

The waters of the Central Arctic Ocean (CAO) are international waters or high seas so they don’t belong to any one state or states. Arctic states such as Canada and Russia have sovereign rights in the waters and seabed lying 200 nautical miles from their coastline. As high seas, the CAO is akin to a global common and that means that the management of this maritime area will involve Arctic and non-Arctic states.

In the last three years, we have seen the emergence of a new agreement regarding a moratorium on commercial fishing in the CAO involving Arctic states and extra-territorial players such as China and the European Union (which of course included the UK at least until March 2019). The ten parties agreed upon 16 years as the moratorium period, with at least one party wanting four years and others wanting over 30 years. Sixteen years is in itself a considerable achievement given that so little is known about the 2.8 million square kilometres involved.

The moratorium is about buying time; time to do essential research on the changing state of the Arctic Ocean. As sea ice retreats so the ocean changes and there is a distinct possibility that the ecology of the region will change. Species will shift northwards as southerly waters alter. The Atlantification and Pacification of the Arctic Ocean will continue, alongside warming due to the exposure of open water in the high North. It is possible that cod, haddock and other fish stocks will move to the CAO, and the ten parties concerned were aware that there was no regional fisheries management organization in place at the moment.

A previously remote ocean, the Arctic Ocean is being reimagined and readdressed in radically different ways. Twenty years ago, no one spoke of a CAO. In the past, it would have been common to think of the Arctic Ocean as an inaccessible frozen desert. Accessible to only ice breakers and nuclear powered submarines. This is no longer the case.

"The waters of the Central Arctic Ocean are international waters or high seas so they don’t belong to any one state or states."
Remaking the Global Arctic

Geophysical state-change in the Arctic is transforming our sense of place. Now it is common to speak of Arctic shipping routes such as the Northern Sea Route and Northwest Passage as being open to commercial transit traffic and tourist vessels. Some believe that we will also witness the development of CAO shipping routes. The Earth’s ‘top’ will become ever more accessible as ice retreats, especially in the summer season. There will still be ice, coldness and darkness but it will all appear far less severe, especially if ice retreat continues apace.

Two things follow from that. The Arctic is going to be ever more globalized as extra-territorial parties such as China, Korea, UK and other actors including corporations and NGOs want to be involved in trade and investment, environmental protection, exploitation, and defence and protection. The UK has just launched an Arctic defence strategy, and both the UK and Scotland have Arctic policy positions. In the advent of a deterioration in relations with Russia, it is striking that the Scottish base, RAF Lossiemouth, will be receiving US financial investment in the coming years. The UK and its NATO parties including the US and Norway are worried about the changing geopolitical picture.

Second, parties inside the Arctic region, including the eight Arctic states such as Finland, Iceland and Russia as well as Indigenous communities, will make their own demands on this globalizing Arctic. Indigenous actors in the North American Arctic alongside the Government of Greenland are significant resource owners, and they might well wish to pursue commercial relationships with Asian states that don’t match up well with the strategic ambitions of governments in Ottawa, Copenhagen and Washington DC. China is very interested in Greenland and the Government of Greenland is keen to generate new resource-related revenues in mining and fishing. Independence is a possibility, but money is the single biggest barrier.

So when you think of the Arctic, it makes sense to think of it as a complex regional space that is being pushed and pulled in all kinds of directions by multiple stakeholders. There is no one Arctic; there are many Arctics.
As a frequent visitor to the Arctic, my overwhelming impressions are the scale of the land and sea, which literally distorts one’s visual perspective, and the sheer beauty of the landscapes: nature in all of its majesty, and so many textbook examples of physical features and forms being created in front of one’s eyes from glacial, glaciofluvial and periglacial processes. As one of the ‘three poles’, along with the Antarctic and Himalayas, its future is vital to the future of life on our planet. We recognise the Arctic as the place at the top of the map, but maybe it should be at the centre given its global importance.

Arctic models of international cooperation
Only a few countries can legitimately claim to be in the Arctic: Canada, Finland, Denmark through Greenland, Iceland through Grímsey, Norway, Russia, Sweden and the USA. But many more stake a claim because of its strategic importance in navigation, trade and geopolitics. This is evidenced, for example, by ten countries having permanent research bases at Ny-Ålesund, Spitzbergen, Svalbard; the archipelago itself being governed by a multilateral treaty signed by 46 countries. The Arctic Council is the formal mechanism and significantly still works by consensus. It has a strong research focus commissioned by the Council members, and the results are used to make evidence-based decisions: a vital attribute in our modern world where knowledge is all too often derided.

More recently the informal Arctic Circle was established. At the Arctic Circle conference in Edinburgh 2017, former President of Iceland, Ólafur Ragnar Grímsson, made it clear that Scotland has a legitimate part to play in the future of the Arctic, and the First Minister for Scotland clearly accepted the invitation with the by-line Scotland and the New North.

A cultural crossroads
We tend to think in a European context of the Arctic being a place for colonisation from the Nordic world, but archaeological investigations have forced us literally to widen our horizons and recognise the interplay of Nordic, Scandic and Celtic interchange through sea travel over many centuries. Reading the Icelandic Sagas, for example, gives a clear impression of the cultural interchange between the lands of the north Atlantic. In addition, there has been migration from the Pacific of the Inuit and other cultures into North America and Greenland. More recently there is a clear influence from Scottish culture through whalers, resulting in crossovers in areas such as music and dance. Now the interchange is even greater with the interest shown in opening up Arctic sea routes between the Pacific and Atlantic Oceans for commerce and tourism and the growth in the non-indigenous population of the Arctic lands.

A scientific laboratory for climate change
Freshwater inflows to the ocean circulation system from melting of Arctic ice is just one of many fundamental scientific studies that have increased our understanding of global ocean circulation. The importance of these flows to the continuation of the system is well known, but cannot be guaranteed in the future; hence, continuing to improve our scientific understanding is vital. Satellite monitoring of the pack ice has enabled the link between ocean and atmosphere changes to be monitored and provided an indicator of thermal warming of the oceans. The effect of the global temperature increase on the permafrost areas has increased concerns about the release of one of the more potent greenhouse gases, methane, and the effect on human wellbeing of the Inuit and other Arctic dwellers. Long-standing measurements at the international research base at Ny-Ålesund have shown the increasing upwards trend of CO2 concentrations in the atmosphere. Maintaining the variety, quality and international collaboration of these scientific studies is vital. It is the preferred way to ensure that, before decisions are taken, participants have the most accurate, validated and up-to-date knowledge available.

Resources for exploitation
The Arctic has long been an area for exploring and exploiting natural resources, but with the melting ice there is continuing and reasonable disquiet about resource extraction, given the risks of pollution so evident from previous accidents, such as Exxon Valdez in Alaska, soil and water pollution at the mining settlements, and intrusion into pristine environments and the effects on indigenous communities. In a country which views the Arctic as inhospitable, it is easy to forget that over four million people are at home in the Arctic. Increasing land claims by and on Arctic nation states are a worrying trend. This is especially so when seen from the perspective of indigenous communities who see themselves, quite rightly, as part of nature and deeply dependent on it for their survival and wellbeing.
For many, the Arctic region first and foremost reminds them of the dramatic environmental changes seen in recent years. It should come as no surprise then that ‘sustainability’ is a key topic in any discussion of Arctic politics. Since the publication of the UN’s Our Common Future report in 1987, the idea of ‘sustainable development’ has become particularly important in political discourse. However, what this means in practice is not always straightforward: What do we mean by development, and what does it mean that it is sustainable? And perhaps more importantly, who gets to decide which meaning prevails? These are questions that decision-makers and stakeholders have to contend with not just in the Arctic, and which have occupied geographers for many years. There is often a paradox at the heart of the idea of ‘sustainable development’: trying to combine neoliberal economic development with concerns for environments threatened because of that very same economic system.

Few places is this paradox more obvious than in the Arctic region. Here, economic opportunities and ‘development’ are often enabled by the climatic changes brought on by the most unsustainable practices. For example, new shipping routes from Europe to Asia, new opportunities for natural resource extraction, new fish stocks appearing in the north, or new tourist destinations ‘opening up’ are all providing hope and optimism in the Arctic states. Yet as we know, these are all a result of a rapidly changing climate – the same change that could bring about catastrophic effects both within and beyond the Arctic. And worrying, they are all contributing to these same changes, accelerating the processes that enabled them in the first place.

In spite of such unsustainable practices, the eight Arctic states nevertheless all seem to be in agreement that sustainability (however defined) is important and necessary. However, in these areas as elsewhere in the world, people are concerned about not just climate change, but also what may seem to be the more ‘immediate’ availability of jobs, education, healthcare, food, and housing – that is, the sustainability of their way of life. There are notable differences between the eight states in how sustainability is articulated. For example, while state representatives from Norway often talk explicitly about economic sustainability. In this way, sustainability becomes a matter of preserving also tradition, society, and indeed a political system. And more than this, the notion becomes tied to those of national identity and ‘who we are’; sustainability becomes embedded in the idea of being Arctic.

In my research on Arctic identity among state representatives from Norway, Iceland, and Canada, many of them spoke about the importance of nature and environments for their sense of being Arctic. Yet, in the next moment they could emphasise the importance of economic sustainability too, such as exploiting more areas of that same nature. Some Norwegian officials were proud of the country’s track record of ‘sustainable’ oil and gas extraction, while Canadian officials talked about the perceived benefits of new industries moving to the north.

While there may seem to be an irreconcilable tension between environmental concerns and economic growth, it shows us how sustainability narratives are inherently multiple and contested. Arctic sustainability can be about sustaining both the unique Arctic environments and Arctic peoples’ lives and societies – it is finding the balance between the two that often poses a practical challenge.

Pursuing both aims at once requires careful consideration, not just by Arctic state representatives as those above, but by all engaging with the region. Among others, this includes the UK as an observer to the Arctic Council, and the many British scientists who contribute knowledge to its working groups.

Arctic state representatives in governmental offices might have strong feelings of what it means to ‘be’ Arctic, but in the end, it is the peoples living there whose narratives we should be listening to: what do they want to ‘sustain’ for the future; how do they want to do it; and importantly, how can the international community facilitate them doing so? This is where the value of international collaboration, knowledge exchange, and contact really shows; and here, the UK has a welcome role to play.

As audience members at the Arctic Circle Forum ‘Scotland and the New North’ in Edinburgh in 2017 were reminded, the ties between countries and their northern peoples have a long history. By ‘sustaining’ these ties, and by ‘sustaining’ channels of communication and participation, the narrative of Arctic sustainability remains an inclusive and open one too: where peoples and environments are empowered for a future in and as Arctic.

The issue of Arctic sustainability and how it relates to postcoloniality is further explored in the recently published collection The Politics of Sustainability in the Arctic: Reconfiguring Identity, Space, and Time edited by Ulrik Pram Gad and Jeppe Strandsbjerg, where Ingrid A Medby has contributed a chapter on ‘Sustaining the Nation-State’ (www.routledge.com/The-Politics-of-Sustainability-in-the-Arctic-Reconfiguring-Identity-Space/Gad-Strandsbjerg/p/book/9781138491830).
The Arctic is extremely vulnerable to climate change and is projected to warm more than any other region on Earth. Over recent decades, Arctic temperatures have increased at twice the global rate, causing melting. The consequences of this are that Arctic sea ice is retreating, its snow cover is declining, and the thawing of permafrost is both releasing into the atmosphere carbon and other greenhouse gases that have been trapped in the ground for thousands of years, and making the ground unstable as the Arctic’s solid ice layers melt. This process has serious implications for the rest of the world because the Arctic region acts as a global cooling system by cooling down warm ocean water. This natural cycle is a critical influence on the climate and weather throughout the world, as it makes the climate milder in areas where it would otherwise be very cold and cooler in areas where it would otherwise be very hot.

Black carbon is a powerful short-lived climate pollutant (SLCP). It is particularly detrimental in the Arctic context and is estimated to cause 20-25% of warming in the Arctic. SLCPs are gases and particulates that remain in the atmosphere for a relatively short time compared to longer-lived greenhouse gases such as carbon dioxide (CO₂). However, their potential to warm the atmosphere can be many times greater. For example, after CO₂, black carbon is the most important pollutant forcing climate change.

In the Arctic, black carbon warms the climate by absorbing solar radiation and thus warming the atmosphere. It also affects the microphysics of clouds, which in turn impacts upon the climate. Falling black carbon darkens snow and ice surfaces on which it settles, thus reducing the albedo effect and enhancing the absorption of radiation. This warms the lower atmosphere and accelerates snow and ice melting. In addition to being powerful climate forcers, some SLCPs, especially black carbon, are deadly air pollutants that have harmful effects on human health and on the environment. Therefore, the detrimental effect of black carbon is twofold.

It would be possible to make substantial reductions in the most significant SLCPs, such as black carbon, using existing technologies. To mitigate the effects of long-term warming of the Arctic, significant cuts in CO₂ emissions are a priority. However, in the short term (up to 2050), reducing SLCP emissions would represent a prompt and positive response to the challenge presented by Arctic climate change. Moreover, due to black carbon’s dual role as both an air pollutant and a climate forcer, efforts to mitigate it offer a means of combining climate change measures with environmental and human health measures. This may provide benefits both in mitigating climate change and in protecting human health and the environment.

All of the carbon emissions affecting the Arctic enter from outside it and the majority are caused by incomplete combustion of fossil fuels and biomass. In Europe, for example, the principal sources of black carbon include diesel-driven vehicles and residential wood combustion. Because of this external aspect, mitigating black carbon emissions in the Arctic region requires not only regional but also global action.

Until recently, international efforts have mainly focused on long-term climate change mitigation focusing on CO₂ and not so much on SLCPs. Black carbon is tackled on a rather sporadic basis through a complex and multi-layered legal and governance framework that principally comprises international and regional environmental agreements as well as soft law instruments and public-private partnerships. The key international legal instruments include the Convention on Long-Range Transboundary Air Pollution (CLRTAP) and especially its Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-Level Ozone, as well as the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement. Some European Union (EU) legal instruments, such as the National Emissions Ceiling Directive, are of relevance to the Arctic in relation to black carbon. However, the relevant EU legislation tackles black carbon and the threat it poses as an air pollutant, but not as a climate forcer. The Arctic Council’s Framework for Action on Enhanced Black Carbon and Methane Emissions and the Climate and Clean Air Coalition (CCAC) are examples of non-legal approaches.

The interlinkages and potential for positive synergies between climate change and air protection policies are particularly clear in the context of black carbon. Despite the clear and feasible climate as well as health and environment benefits that could be achieved by effective mitigation of black carbon, the threat it presents is not currently being countered by a comprehensive legal and governance response or by tangible measures. There is, therefore, a clear need to strengthen international and regional approaches to tackling this issue. Some positive developments are, however, in sight. The importance of reducing SLCP emissions, black carbon especially, is gaining more attention globally as well as regionally. For example, in May 2017, the eight Arctic States adopted a collective but voluntary goal to reduce the emissions of black carbon by at least 25-33% below 2013 levels by 2025.

FURTHER READING
Norwegian Polar Institute (www.npolar.no/en)
Climate and Clean Air Coalition (www.ccacoalition.org)
Arctic Monitoring and Assessment Programme (www.amap.no)
Scientists associated with the Lyell Centre, the home of the British Geological Survey in Scotland (a joint collaboration with Heriot-Watt University in Edinburgh), intend to create a scientific observatory by drilling into a magma body sitting around 2,200m below the Icelandic volcano Krafla in Northern Iceland. The objective of the Krafla Magma Testbed (KMT, www.KMT.is) is to create an observatory for scientists and technologists all over the world, bringing the world to a new age in energy generation and a closer understanding of magma. The KMT is a major global challenge – a ‘moon-shot’ for the geosciences.

Magmas in volcanic systems that have melted at depths below Earth’s crust at temperatures in excess of 1,200˚C migrate to the surface and cool and change chemistry and physical properties, such as gas content, as they interact with the rocks and fluids they pass through. Understanding magma is central to understanding the differentiation of planets (basic science), reducing the risk of volcanic disasters (volcano monitoring), and increasing the quantity and efficiency of geothermal energy production.

Harnessing the heat inside the Earth is not new to humankind. Warm and hot water reaching the surface has been used in spas and buildings since antiquity. The KMT will take us to the ultimate challenge: harnessing energy directly from the molten rock of around 1,000˚C that is erupted in volcanoes and is often located at accessible depths. The KMT will develop new drilling technology and sensor systems capable of working in extreme environments. It will establish the state-of-the-art technology and solutions that will allow us to harness near-magma heat in regions across the planet. It will multiply by orders of magnitude the energy we can use from a sustainable heat system.

The KMT grand challenge will teach us how to monitor magma inside the Earth, providing us with the ability to predict, and potentially control, volcanic eruptions near highly-populated areas.

The first stage of the project is to drill a 2,200m borehole into the only well-known magma chamber in the world. Discovered during deep geothermal drilling, scientists have identified the precise location of a magma chamber at 2,100m depth and 900˚C temperature. To take advantage of this discovery, an ambitious international collaboration of some 50 research institutes, government agencies, and universities from 12 countries, including the UK, Canada, Denmark, France, Germany, Iceland, Italy, New Zealand, Russia, South Korea and the United States, developed the KMT concept. As the project gathers momentum, it is gathering further interest from Mexico, Chile, Switzerland and Japan.

The Krafla Magma Testbed
Professor John Ludden CBE, Executive Director, British Geological Survey

“It will multiply by orders of magnitude the energy we can use from a sustainable heat system.”
Greenland is the largest island in the world. It is located in the Arctic with more than half of the country situated above 66 degrees North and therefore within the Arctic Circle. Covered by inland ice, only the coastal areas are habitable. Despite the harsh environmental conditions under the Arctic climate, people established communities and cultures here since the beginning of the first century. A population of c56,000 Greenlanders continue to live and thrive here today. Around 88% of Greenland’s population are Inuit (Kalaallit) or mixed Danish and Inuit. The remaining 12% are of European descent, mainly Danish.

Greenland is in many ways a land of contrast. Though the towns of Greenland are rather small in size, you still find many features characteristic of larger cities, such as crowded airports, busy fishing ports, high-rise buildings, modern enterprises, international car brands, educational institutions, cafés and cinemas. However, in many ways Greenland is still a country that has managed to retain its identity; in many of the villages, hunting (seal, caribou, muskoxen, polar bear, walrus, whales, etc) and fishing are still the primary sources of income. Life in the villages is lived at a quiet pace, a long way from the more urban life which you can find in the three biggest towns – Nuuk, Ilulissat and Sisimiut – but the roots of the old traditions are not forgotten in either the towns or the smaller settlements.

Today, Greenland is acquiring an increasingly international outlook in terms of politics and business, and the Government of Greenland pursues international investments in development of extractive industries to supplement the national economy. Mineral and hydrocarbon extraction are considered among the main economic pillars to be developed alongside fisheries and tourism in the coming years, according to the coalition agreement between the parties in government. Mineral extraction and hydrocarbon exploration are not new to Greenland, but over the last four decades the initiatives by the government to promote development have intensified. While no viable hydrocarbon reserves have been found to date, there are several mines in Greenland which have been and/or still are active. According to Statistics Greenland, 16 hydrocarbon exploration licences in Greenland were active in 2016, alongside seven mineral production licences and 44 small-scale mining licences.

On the governmental website on mining and exploration (govmin.gl) the support for development of extractives is expressed: “There is more than 400,000km² ice-free areas to explore with deep-water fjord access to most of the areas. Greenland’s pro-mining government and population, as well as its private land (no first nations land rights issues) also aid exploration and project development.”

The expectation and promotion of mineral and hydrocarbon extraction as an important economic stimulant is in line with an idea generally supported and widely held on the international scene. The promotion of extractive industries as an economic pillar does, however, lead to various concerns by NGOs, citizens and some politicians in Greenland as pressing questions remain unanswered. The concerns raised involve, amongst others, the potential future of communities exposed to development, while there is scepticism towards initiatives taken to secure such development as insufficient to overcome the negative outcomes of these projects and secure sustainable development of the communities. These concerns are supported by various international studies, which have found that the local social and economic costs of development tend to be greater, and the benefits less, than often expected in relation to resource development.

To prepare for the challenges of securing benefits and mitigating negative impacts on local communities, impact assessments are to be conducted by companies operating in Greenland according to the national legislation. Impact assessments are to cover both environmental and social impacts. Furthermore, so-called impact benefit agreements are to be negotiated based on the findings in the impact assessments. The impact benefit agreements are to be agreed upon between the operating companies, the national and the local government (municipality). However, today no major projects have been implemented, and the systems capability to secure a desired development when a major project is implemented is yet to be proved. In the case of an oil find or a large-scale mine, the impact assessment systems effectiveness remains uncertain.

One of the most controversial projects in Greenland, the ‘Kuannersuit’, is presently under consideration. It is a large-scale project focused on extraction of rare earth metals. As a by-product, the mine will be extracting uranium alongside the rare earth metals. The potential mine site is located in a sheep farming community and just 25km from the small town Narsaq, home to 1,800 residents. Exploration has been taking place in the area since 2002 and just now the company Greenland Minerals and Energy are applying for a licence to go into production. Kuannersuit just may become the mine to test the Greenland impact assessment systems effectiveness in ensuring a sustainable and environmentally sound path towards future development.

FURTHER READING

Dale B, Veland S, Hansen AM (accepteret/in press) Petroleum as a challenge to Arctic societies: Ontological security and the oil-driven ‘push to the north’ (Extractive Industries and Society)

Hansen AM, Johnstone RL (2017) Improving Public Participation in Greenland Extractive Industries (Current Developments in Arctic Law)
It’s time to listen to the Inuit on climate change
Sheila Watt-Cloutier

When other regions of Canada and the world are struck with major environmental and natural disasters, communities, first responders and the media rush to their aid. Not so for the Inuit and other Indigenous peoples of our country, who have already experienced life-threatening emergencies on many levels, and are now at the front lines of the slow, multifaceted disaster that is climate change. Because temperatures in the Arctic are rising faster than anywhere else in the world, we must look to the experiences of Inuit as a harbinger of what is to come, and seek their guidance on how to live more sustainably.

Virtually every community across the North is now struggling to cope with extreme coastal erosion, thawing permafrost, and rapid destructive runoff, which particularly affects coastal communities in Alaska and in northern and western Canada. Despite our cold northern winters, sea ice remains in rapid decline. Glacial melt, long relied on for drinking water, is now unpredictable. In one stunning case, the Kaskawulsh Glacier in the Yukon has receded so far that its meltwater has changed direction, flowing south toward the Gulf of Alaska and the Pacific Ocean instead of north toward the Bering Sea. Ice that used to serve as our winter highways is giving way and invasive species are travelling much further north than ever before.

While the impact and extent of each change varies across the North, the trends are consistent. The change is not just coming, it is already here.

Melting Arctic ice has also attracted the attention of foreign governments, researchers and corporations who see an opportunity to access its wealth of resources. But, this interest has to be better informed by awareness of what is happening to Indigenous communities, who are trying to cope with the grave reality of their changing environment.

Recently, the United Nations Intergovernmental Panel on Climate Change (IPCC) issued a special report on the impacts of global warming 1.5°C above pre-industrial levels. The report paints a stark picture: humans have already caused approximately 1.0°C of global warming and without an immediate and concerted effort to reduce greenhouse gas emissions, the 1.5°C threshold will be reached sometime between 2030 and 2052. In order to arrest this dangerous trajectory, the world has to take note of what is happening in the Arctic – because what happens in the Arctic does not stay in the Arctic. Arctic ice is the planet’s air conditioner; as it melts, that air conditioner is breaking down, creating havoc around the world.

Since then, environmental advocates around the world have sought to protect human rights affected by dangerous climate change through various kinds of legal proceedings. Given that the United States is walking away from the Paris Agreement and other governments have been slow to act, recent cases in the Netherlands, Colombia and the United States suggest that climate litigation may increasingly be seen as an essential tool to protect human rights and to safeguard the environment.

Although it can be hard for individuals to grasp the urgency of the situation, make no mistake: climate change will negatively impact our quality of life. Asserting this human perspective could help to spur action where other approaches – such as highlighting only the impact on wildlife like polar bears and coral reefs – have not yet achieved sufficient results.

Inuit have much wisdom to share with the world about living sustainably, in harmony with nature, all while coping with the effects of climate change. Inuit and Indigenous peoples provided life-saving guidance to early European visitors unfamiliar with the severe conditions of this land, which they ignored at their peril. The whole planet benefits from a frozen Arctic and Inuit still have much to teach the world about the vital importance of Arctic ice, not only to our culture, but to the health of the rest of the planet.

“We must look to the experiences of Inuit as a harbinger of what is to come.”

Sheila (Siila) Watt-Cloutier is a senior fellow at the Centre for International Governance Innovation, a 2007 Nobel Peace Prize nominee and author of the acclaimed book The Right to Be Cold, published in 2015. She is Inuk and one of the most widely respected political figures to emerge from the Arctic.

Images © Martin Hartley
Sápmi: the true jewel of the Arctic

Silje Karine Muotka, member of the Executive Council of the Sámi Parliament in Norway

The Sámi people in the Arctic are facing an increasingly global interest in our traditional homeland.

Long before national borders were drawn between Norway, Sweden, Finland and Russia, Sápmi was home to the Sámi people in the Arctic. Our traditional homeland stretches deep into Norway, across the northern parts of Sweden and Finland and all the way to the Kola Peninsula in Russia, covering about 388,000 square kilometres. As one of several indigenous peoples that have inhabited the Arctic for generations, we Sámi have our own language, social organization, and a measure of self-determination.

The Sámi people also have at least one thing in common with other peoples of the Arctic: interwoven with our identity and cultural self-perception are the resources and landscapes that have been the backdrop of our existence for generations. Many aspects of indigenous cultures in the Arctic are dependent on our specialized utilization of the renewable resources in these vast areas. The Sámi traditional livelihoods, especially in relation to reindeer husbandry, fresh and seawater fishing, small-scale farming, and hunting and gathering, have been the key to survival of Sámi peoples and our culture for centuries.

Today, these livelihoods face serious threats from both climate change and increasingly global interests in the Arctic as one of the world’s last energy frontiers. The warmer climate and the melting of the ice cap is increasingly opening up the Arctic for the world. Non-renewable resources like oil, gas and minerals are now more accessible to the global industry.

The Arctic has also become Norway’s most important foreign policy priority, and the government has become a more important industrial policy player globally. Geopolitical and geopolitical interests, in addition to climate change, are driving the direction of these high north policies. As we see it, the approach is how those in the Arctic must adapt strategies to geopolitical and climatic change to promote economic development and economic growth. Indigenous peoples in this corner of the world have long been involved in struggles to secure our traditional ways of life, our languages and the foundation of our culture. We have had to adapt to and negotiate the impacts and consequences of resource exploration and development. It is unacceptable if the green shift becomes a new colonialist way to displace indigenous industries and culture.

We experience that there is an eagerness from the federal government of Norway to develop mineral resources and add more renewables to its energy mix by supporting projects situated in Sámi homelands. Due to this, conflicts have erupted over wind turbine parks, hydroelectric projects and, more recently, plans for a copper mine in Kvalsund municipality by the company Nussir ASA, which is of great concern to the Sámi Parliament. Our concern is the project’s severe impact on reindeer herding, calving land, grazing land and migration routes in this area. About 10,000 reindeers use this land in the spring, summer and autumn time.

The Norwegian Environment Agency has already accepted the zoning plan for the project and granted Nussir ASA a permit to deposit tailings from the company’s copper project in the Repparfjord. We are very sceptical about the environmental consequences about dumping millions of tonnes of tailings a year into a vulnerable Arctic fjord, and fear that they will detrimentally affect both fishing and the Sámi marine culture in a negative manner. A copper mine here will also impede migration routes and have other negative impacts for the herders. The Sámi Parliament has consequently opposed this proposed mine.

We believe the Sámi people must have a key role in shaping our own future, as the main stakeholders in an area where we have been present since time immemorial. I would like to point to the fact that the Storting, the supreme legislature of Norway, in 2009 adopted a new Minerals Act without the endorsement of the Sámi Parliament. The Sámi Parliament is still of the opinion that the Minerals Act does not meet the state’s obligations under international law in respect of the Sámi people.

In our opinion, current legislation of Norway does not allow co-existence between traditional and new industries. While we Sámi people are determining the path of our own development, future development and growth in the Arctic must ensure more latitude to tailor new economic activities to the contexts and needs of the communities they affect. The Sámi people must be able to express our values, priorities, and perspectives on our full participation in the economy, on the impacts of development, on what constitutes sustainable development and environmental protection, and on fundamental human rights.

We are seeking a balanced view of the Arctic which also considers the state of the climate and the vulnerable Arctic environment and communities. We would like to see a greater initiative to build other kinds of industries that are more eco-friendly, as for instance responsible tourism. The Arctic is splendid with spectacular nature and landscape, wonderful seasons and powerful seasonal changes and, more importantly, distinct indigenous cultures that are thriving. To those in search of minerals, I would like to point out that this is the true jewel of the Arctic; an irreplaceable contribution to the diversity of the world.
The Arctic sea ice is melting at an accelerating pace. For the shipping industry, this development implies greater access to the Arctic Ocean. The trans-Arctic shipping routes, linking the Atlantic and Pacific Oceans, are gradually opening up. In fact, some climate models predict a seasonally ice-free Arctic Ocean before 2040, making it possible to cross the North Pole on voyages between the west and the east. The Northern Sea Route along Russia’s northern coast is currently the most accessible Arctic seaway. Using this route on seaborne trade between Atlantic and Pacific ports may cut the sailing distance by as much as 50% compared to the southern routes via the Suez or Panama Canals. Time saving and reduced fuel consumption may give substantial cost saving.

However, this potential comes at a very significant cost: Arctic shipping poses great threats to the highly sensitive ecosystems of the region. An oil spill incident, for instance, is expected to be catastrophic for the marine environment, with long-lasting and widespread damage. Navigation in the Arctic is extremely difficult, with hazards such as ice, fog, strong winds and very low temperatures. The risk of an incident leading to accidental spill of fuel or cargo is therefore high. In the event of an oil spill, the remoteness and hostile environment of the region make both response and clean-up operations extremely difficult, if at all possible. Other potential environmental dangers of Arctic shipping include operational discharges and emissions, leakage of dangerous cargoes, and introduction of alien species. Noise by regular passage may also disrupt the migration patterns of marine mammals. It is hence necessary to implement strict regulations that adequately protect the highly vulnerable Arctic ecosystems from all these, potentially very disastrous, calamities.

The United Nations Convention on the Law of the Sea of 1982 (UNCLOS) is the international legal framework for regulation of activity in the world’s oceans, including Arctic shipping. However, this Convention was negotiated before climate change and melting of Arctic sea ice became an issue on the international agenda. The only provision designed for the Arctic Ocean, especially, is a vague and narrow exception, the so-called ‘Arctic exception’. This Article 234 provides coastal States with competence to adopt extraordinary environmental protective measures against vessels navigating in areas ice-covered for most of the year. However, the shrinking Arctic sea ice is challenging the understanding of these criteria. Areas that previously were covered with sea ice most of the year are becoming permanently ice-free. At the same time, navigation in Arctic waters continues to be an extremely difficult undertaking, and increased ice movement together with more unpredictable weather and fog conditions following ice melting may make navigation even more hazardous. Thus, it is a question as to whether the progressive deterioration of the Arctic sea ice will render Article 234 a worthless tool in protecting the highly unique and extremely vulnerable Arctic environment from the threats posed by the expected growth of Arctic shipping.

The Polar Code that entered into force on 1st January 2017 does to some extent enhance the protection of the Arctic marine environment through requirements of ship safety and pollution prevention. However, the Polar Code has been criticized for favouring navigational interests at the expense of environmental protection. For example, HFO, which by volume is the most commonly used ship fuel in the Arctic, is considered to represent one of the greatest threats to the Arctic marine environment. Nonetheless, according to the Polar Code, ships are only ‘encouraged’ not to use HFO. In comparison, the use of HFO has been banned in the Antarctic since 2011.

“The only provision designed for the Arctic Ocean, especially, is a vague and narrow exception, the so-called ‘Arctic exception’.”
Managing sustainable tourism in the Arctic

Edda Falk, Communications Manager, Association of Arctic Expedition Cruise Operators

More travellers are seeking destinations off the beaten path and there is a growing interest in nature-based tourism. For many, the ideal holiday involves travelling to a warmer climate, but more and more people are starting to look north in search of a truly unique experience. Scandinavia and Scotland are gaining popularity among international travellers. In 2017, Scotland saw a 15% increase in overseas arrivals, according to numbers from the UK Office of National Statistics. Some of the growth is believed to be fuelled by influences from popular culture such as Nordic noir, series like Outlander and Vikings, and Disney’s Frozen. Whatever the motivation, growth in tourism must be managed responsibly to ensure sustainable development. This is especially true when it comes to the Arctic.

The Arctic is sometimes painted as a pristine and fragile region. When thinking about the Arctic, images of polar bears balancing on icebergs and the looming threat of climate change may come to mind. The Arctic is in fact a very diverse region as well as being the home of roughly four million people. Most of the influx of tourists will be absorbed by the cities, well established destinations and places with highly developed infrastructure. However, quite a few tourists choose to visit more remote and less populated areas. In these sites, tourism needs to be well managed to avoid disturbance of flora, fauna, and cultural heritage sites. And of course, visitors need to understand and respect the communities that they visit.

Fifteen years ago, tour operators and local authorities in Svalbard were pondering how to best manage the growing tourism to the archipelago. The island group, located midway between continental Norway and the North Pole, is protected by the Svalbard Environmental Protection Act. The purpose of the Act is to preserve a virtually untouched environment in Svalbard with respect to continuous areas of wilderness, landscape, flora, fauna and cultural heritage. How could one combine rigorous environmental conservation with tourism? One of the strategies to achieve this was the establishment of the Association of Arctic Expedition Cruise Operators (AECO).

As the name suggests, AECO focuses on expedition cruising in the Arctic. Expedition cruising is becoming an increasingly popular way to experience the Arctic. In conventional cruising, the focus is often on the facilities and activities on board the ship; expedition cruising is characterized by bringing people close to nature. Expedition cruise ships typically carry only 100-200 passengers. The relatively small number of passengers makes it possible to bring guests on land using tender boats, making the ship less reliant on port infrastructure. These ships are able to visit remote parts of the Arctic that are otherwise rarely visited by people. When going on shore in these remote sites, it is important to tread carefully, both literally and figuratively.

AECO has developed a number of guidelines to protect wildlife, flora and cultural heritage sites from disturbance. Especially useful are the Site-Specific Guidelines that have been created for certain sites visited by expedition cruise tourists. The guidelines give detailed information on how to visit the site, about everything from moss that can be damaged by trampling to nesting birds that may attack to protect their chicks. AECO’s site guidelines for Svalbard have served as a model for site guidelines for Russia’s Arctic National Park, and have inspired similar initiatives in Canada, Greenland and Iceland.

In addition to environmental protection, AECO also focuses on other aspects of responsible tourism such as safety and community engagement. AECO works closely with authorities, local communities and other stakeholders in an ongoing effort to set the highest possible operating standards for the association’s members.

AECO, which represents the great majority of expedition cruise operators in the Arctic, has established itself as a forum for industry self-regulation. In many cases, AECO’s guidelines and standards are stricter than local regulation. For example, AECO has banned the recreational use of drones by passengers on AECO vessels. While flying drones can be done legally in parts of the Arctic, there is a risk of disturbing wildlife or even polluting the environment if the drone is lost. AECO also supports a phase-out of the use of HFO (heavy fuel oil) by ships in the Arctic.

AECO offers an example of successful tourism management in a region where environmental consideration and safety is paramount. Responsible tourism benefits the environment, local communities, travellers and the tourism industry, especially in the long term. As tourism to ecologically sensitive areas continues to grow, it will be in everyone’s interest to conserve these unique and beautiful places for future generations.

“Tourism needs to be well managed to avoid disturbance of flora, fauna, and cultural heritage sites.”
We are all increasingly aware of the omnipresence of plastic in our environment, so it is no surprise that the Arctic has not been spared. It is found floating, washing ashore, on the seafloor, but also breaking into small elements known as microplastics.

Over 15 years ago, Oceanwide Expeditions, an expedition cruise operator, approached the Governor of Svalbard to offer help with removing waste washing on the shores of Svalbard. This was welcomed, and the local authorities took responsibility for the disposal and handling of marine litter in Longyearbyen, the small community of Svalbard. Clean Up Svalbard was born, and many other expedition cruise operators now join the campaign, collecting thousands of kilos of marine litter from remote beaches every year.

The Governor of Svalbard also organises two volunteer cruises a year for locals to get involved, and the local outdoor sports association Aktiv i Friluft has organised clean-ups around Isfjord area for the last two years. This past summer, the Norwegian Coastguard and the Norwegian Royal Family also got involved. Thanks to everyone’s efforts, over 40,000 kg of marine litter were collected this summer alone.

Although clean-ups are important in the fight against marine litter, work is also needed to stop pollution at the source. The UN Environment Programme (UNEP) invited the Association of Arctic Expedition Cruise Operators (AECO) to join the Clean Seas campaign, a UN-led campaign to combat marine plastic pollution.

AECO is an international association for expedition cruise operators in the Arctic, and others who support its vision of responsible, environmentally-friendly and safe tourism in the Arctic. AECO signed a memorandum of understanding with UNEP and, thanks to external funding from the Svalbard Environmental Protection Fund and the Norwegian Environment Agency, launched its Clean Seas Project in May 2018. With over 25,000 international passengers travelling to the Arctic each year, the association has a great opportunity for direct outreach.

AECO is working to drastically cut back on single-use plastics on polar expedition cruise vessels. Installing water and soap dispensers, removing single-use items such as plastic bottles, cups and straws, and requiring products to come in different packaging are various ways to reduce our plastic footprint.

We are also enhancing our contribution to Clean Up Svalbard by collecting and reporting data such as locations and the nature of marine litter. In 2018, over 130 clean-up actions were reported and over 6,000 kg were picked up by AECO members alone. The information gathered on board can be used by scientists and policy makers to tackle waste at its source and eventually help turn the tap off.

Finally, the association is focusing on educating passengers, ship crew and the general public on what can be done to reduce single-use plastic consumption and prevent marine plastic pollution. To that effect, we are developing educational material such as guidelines, online articles, as well as lectures for use on board vessels. It is inspiring to see visitors and crew from around the world engage and share their experience of this worldwide issue.
**About a bear: wildlife tourism in the Polar North**

**Dr Lizanne Henderson**, School of Interdisciplinary Studies, University of Glasgow

*Ursus maritimus*, the polar bear, is symbolic of the North and an icon of anthropogenic climate change. Everyone from NGOs to tour operators uses images of Nanuk to attract clientele; the bear elicits feelings of awe and is, for most wildlife-seekers, a ‘bucket-list’ animal. The polar bear has become the ‘poster child’ for global warming, giving a ‘face’ to complex scientific issues. But how effective have these (mostly negative) images actually been, and at what expense? While the sight of emaciated bears struggling on melting ice appeals to our emotions, do these depictions actually encourage understanding about broader Arctic conservation and the people who live there?

From the 1880s, steamers sailed to Svalbard offering tourists the chance to experience the Midnight Sun, while some offered passengers the opportunity to hunt wildlife, including bears. Today, Svalbard is still a prime location for Arctic cruising, generally viewed within the industry as a success story. With ever-increasing media attention given to the Arctic, some tour operators have plugged so-called ‘last chance tourism’. Needless to say, the Arctic is a big place and so tourism growth is uneven, mainly concentrated around more accessible areas, such as Scandinavia and Alaska, which can collectively attract over two million visitors annually, while the Canadian territory Nunavut brings in only 15,000 per year. One to watch is Greenland, which has been heavily investing in developing its infrastructure – proposals are currently under discussion for three new airports and several harbours – though some have warned there has been inadequate discussion about tourism impacts and carrying capacity. Reduction of sea ice has been a boon for cruise ship tourism – the first luxury liner Crystal Serenity took over 1,000 guests on a 32-day voyage through the Northwest Passage in 2016 – but is less welcomed by the bears who depend upon the ice to hunt. There have been notable increases in bear-human conflict for local people and within the tourism sector. In Greenland in 2014, 12 bears were shot by locals in self-defence, the highest figure ever recorded, while in Svalbard in 2018, a bear was killed after it injured a guard helping tourists off the cruise ship *MS Bremen*.

Wildlife tourism is globally on the rise, promoted as an economic regenerator that supports local communities as well as aiding in conservation. Wildlife encounters via tourism inevitably carry some level of impact, though it is not an easy thing to measure. There are guidelines available, such as AECO whose members are obliged to operate in accordance with international law and to observe considerate conduct. Reputable tour companies will observe such guidelines, minimizing stressors to the animal, but in wilderness areas this is often based on a trust system.

The ‘polar bear capital of the world’, Churchill (Kuugjuaq), Manitoba, situated on the western edge of Canada’s Hudson Bay, attracts 10,000 visitors every autumn for guaranteed sightings of the bears as they wait for the sea ice to freeze. Tourist impact is minimized by using specially designed tundra vehicles for ‘up-close and personal’ encounters. While the carbon footprint for getting to Churchill is high, the town has started to offset these emissions by implementing carbon-neutral programs and offering eco-friendly accommodation. While Churchill is making concerted efforts to promote responsible wildlife tourism, elsewhere the picture is less clear. Kaktovik, Alaska, for instance, which has witnessed an overall decrease in polar bear numbers but an extension in the time bears spend near the town due to delayed sea ice, is experiencing a dramatic rise in tourists. Permits for commercial viewing of bears (issued by the United States Fish and Wildlife Service) rose from one to 19 between 2010 and 2016, while the annual number of tourists went from around 50 to 2,500.

Unscrupulous practices, such as attracting bears with food from the back of tour boats or approaching the bears too closely, have been reported. Before becoming too cynical, there are positive aspects to wildlife tourism ventures: employment and income generation, increased protection for threatened species or fragile landscapes through private or government funding, the creation of national parks and nature reserves, educational benefits and awareness-raising, not to mention the inestimable pleasure of spending time in the presence of wild animals and untamed landscapes.

With over 20 years’ experience working with tour company Adventure Canada, I have been privileged to see polar bears in the wild and observe tourist responses to these magnificent creatures. My involvement as a guide has led me to wonder whether wildlife tourism can change attitudes, or have any lasting behavioural impacts on the participants. My current research project, *Picturing Polar Bears: Tourism, Climate Change and Environmental Education: Impacts and Perceptions in Arctic Expeditionary Travel*, asks, do wildlife encounters leave a social or environmental legacy? Is it possible that responsible Arctic tourism could play a role in decelerating global warming? For the bear, and all our sakes, let us hope so.
I began my polar diving career with the British Antarctic Survey, where I ran the UK’s scientific diving programme on the white continent. My penchant for sub-zero conditions was a natural progression from teaching night diving in winter near my Aberdeen home. After my tenure with BAS, my sights turned north to commercial tourism in the Arctic. I was exploring Svalbard, Greenland and Canada, shooting underwater footage and creating short documentaries. Underwater Antarctica can reward us with charismatic megafauna such as leopard seals and curious penguins; however, the Arctic can be equally thrilling. I would dive to discover venomous skeleton shrimp clinging to kelp, lightbulb-like larvaceans drifting in their millions through green waters, and spawning sea cucumbers delicately producing tiny packets of life, adding to the keystone planktonic soup. Thinking the frigidity and darkness would prohibit such abundance, guests soon realised the richness of the polar marine ecosystem.

Glaciers impact the marine environment, depositing huge amounts of moraine, a by-product of their abrasive overland journeys. This results in thick seafloor muck creating shelter and nutrition for numerous species. Peppering the seafloor are glacial ‘erratics’ – once-captive boulders dropped off by retreating glaciers. These rocks are colonised by sedentary life such as sponges, tunicates and anemones, which gain purchase and more flow of water up off the seabed. These festooned rocks make for a sudden and surprising burst of colour.

The Arctic landscape is significantly marked by its human history. Visible remains of hundreds, sometimes thousands of years of human presence are found onshore and underwater. Sadly, this signature can be plastic waste and discarded fishing gear as prevailing ocean currents stream north. Similar currents have carried hewn timber from Siberia dated at 700 years old; beaches in Svalbard and Jan Mayen bear both modern and ancient human markers.

The very nature of the Arctic – an ocean surrounded by continents – has led to some extraordinary endeavours to form navigable links between oceans, or to exploit once-abundant populations of marine mammals. Vessels succumbed to impenetrable and dynamic sea ice or foundered in storms. Some ships died in battle and others lost their way. The most remarkable finds of recent times have been the ironic tone; the ice that sealed their fate is now victim to anthropogenically-induced climate change.

Recently, the wreckage of Scottish whaling ship Nova Zembla was discovered off Baffin Island by researchers from the University of Calgary. The research team made the discovery in only eight hours using drone footage and SONAR imaging gathered by a remote-operated vehicle, in a search area identified after months of research. This is the first High Arctic whaling ship discovered and offers unique insight into the lives of the sailors involved in this dark trade.

The use of technology to explore isn’t restricted to recent times. In 1931, Australian explorer Sir Hubert Wilkins narrowly failed in becoming the first to cross under the North Pole in a submarine. The WWI vintage submarine set out from Norway in August of that year, only 600 miles from the North Pole. The expedition was hampered by technical problems and suspected sabotage, forcing them to turn back. However, it did prove that subs could operate under ice, and paved the way for future successful expeditions.

In 2019, the Five Deep Expedition will reach the Molloy Deep, a trench midway between Svalbard and Greenland. This astonishing venture is the dream-child of a private individual who commissioned a submersible capable of repeatedly reaching the hadal zone (full ocean depth) and intends to dive to the deepest reaches of the Atlantic, Pacific, Indian, Southern and Arctic Oceans. EYOS Expeditions (www.eyos.com) is managing and leading these extraordinary expeditions to the bottom of the ocean and we are combining true exploration with scientific study. The technology involved has been compared in significance to the Apollo spacecraft used to explore the Moon.

Whereas drones and robotic devices can penetrate unexplored areas and see with different eyes, it is an innate human behaviour to explore and see unknown places for ourselves. Ocean exploration can reveal our past and offer knowledge for the future. The underwater Arctic holds secrets waiting to be discovered.

Ocean exploration can reveal our past and offer knowledge for the future.
The Arctic of myth

Gregory L Sharp, Research Associate, The Arctic Institute

In 1869, W A Foster, an essayist and lawyer from Toronto, explained in the Toronto Globe that “The old Norse mythology, with its Thor hammers and Thor hammerings, appeals to us, for we are a Northern people, as the true out-crop of human nature, more manly, more real than the weak marrow-bones superstition of an effeminate south.” In his way, Foster was continuing a centuries-old process of mythicizing the North that went hand in hand with European colonialism. The Arctic, as per this narrative, is a harsh, bleak, barren wasteland on the far-flung periphery of civilization. It is an empty canvas upon which (predominantly) European men could project their masculinity in service of empire or personal glory. The Indigenous peoples of these areas were either rendered as mere facets of the landscape or, alternatively, as savages living in a state of nature against which the entrepreneurial ingenuity of the pioneering European frontiersmen could be contrasted.

These images of the Arctic were, of course, not produced in the Arctic. These geographic imaginaries were the output of colonial administrators, artists, explorers, politicians, and writers based many thousands of kilometres to the south. The production of this mythic Arctic – one not grounded in the lived experiences of the North – finds important parallels today. In the visual arts, for example, the Arctic is often portrayed as a mythic, sublime landscape; beautiful yet cold and devoid of life, culture, and community. In literature and cinematography the trope of the Arctic as a savage, primal force found in Jack London’s Call of the Wild is alive and well today. To name but one example, this much is evidenced by the recent Netflix thriller, Hold the Dark, in which an unsettling and sinister vision of rural Alaska takes centre stage.

Beyond the arts, this tendency to project southern ideas of what the Arctic is (or should be) has crept in to policy discussions and academic debates. Headlines warn us of a neo-colonial scramble for northern resources while policymakers and academics debate whether or not cooperation or conflict will reign on the ‘frozen frontier’. This is dangerous. On one hand, it projects the interests and insecurities of the south onto a region where these concerns simply might not be relevant. The idea that Russia is going to steal the North Pole, or somehow invade Arctic North America, is an excellent example. As Canada’s then-chief of the Defence Staff explained in 2009, “If someone were to invade the Canadian Arctic, my first task would be to rescue them.”

Furthermore, by bringing this southern depiction of the Arctic northwards, there is the risk that the issues that matter to northerners (ranging from food security to improved infrastructure and job diversity) will be overlooked. The anti-sealing campaign spearheaded by Greenpeace, a campaign that ultimately ended up devastating the livelihoods of many Inuit hunters and artisans, is just one of many examples. There is also the danger that the dynamism and creativity of the North could be overshadowed. This would be a shame as, even within the last few decades, northerners have been at the vanguard of political innovation. The Arctic Council has proven that there is much gained by having Indigenous peoples at the table during international negotiations. Ongoing multilevel cooperation (involving coast guards, diplomats, academics, and to some extent militaries) between Russia and NATO members has ensured the region remains defined by cordial relations and respect for international law. At a sub-regional level, Arctic communities have developed and implemented remarkable new forms of governance including, for example, the territorial government in Nunavut which is a fusion of a Westminster parliamentary system and local Inuit values.

This is not an argument to throw out Call of the Wild or abandon the political trajectories of those in capitals from Ottawa to Oslo. The Arctic is more than ever before connected to, and affected by, what happens in the rest of the world. Keeping an eye on the larger picture is important. This is instead a reminder that the Arctic communities have both their own set of concerns relevant to their lived experiences, as well as their own unique and valuable perspectives on larger problems, such as climate change. It is also a reminder to avoid succumbing to the idea that the Arctic is a barren, empty, frontier wasteland. The Arctics – for there are many, something I have failed to adequately capture in this North American-centric account – are dynamic, vibrant, diverse, and innovative places. More than anything, Arctic communities are called home by more than four million people – something that is all too often forgotten.

“The Arctic is more than ever before connected to, and affected by, what happens in the rest of the world.”

© Martin Hartley
2018 marked the 200th anniversary of the British Navy’s major new initiative to discover the Northwest Passage. 1818 also saw the publication of Mary Shelley’s Frankenstein, a short, unexceptional novel by an author who began and ended her story in the Arctic of her imagination. In the past year, there has been much celebration of Mary and virtually none of John Ross from Stranraer who led the 1818 expedition. Unfortunately for him, he failed to penetrate Lancaster Sound because he detected what he thought was a mountain range blocking access. For this he was mercilessly pilloried, while Frankenstein (now thought to have been co-written with Mary’s husband) was lauded. The Shelleys considered the Arctic “a country of eternal light.” Most of the Scots who went there would not have agreed.

Ross was given a second chance when he was given command of a private vessel, a steam packet which eventually had to be abandoned (though there was some merit in the idea, which eventually convinced the Navy to harness steam). Accompanied by his nephew, James Clark Ross, who was fast becoming Britain’s greatest Arctic explorer and who would also leave his name on Antarctica, John Ross overwintered for four years in the Gulf of Boothia [named after Felix Booth, the gin baron who had funded his expedition] – it was a record at the time and a phenomenal achievement. James Clark Ross studied the Inuit, shared their igloos, hunted with them and learned Inuktitut. He had sailed on four expeditions under William Parry, and in 1831 he discovered the position of the North Magnetic Pole. It is remarkable that three of the four greatest 19th-century Arctic explorers came from Dumfries and Galloway.

It is remarkable that three of the four greatest 19th-century Arctic explorers came from Dumfries and Galloway. John Richardson of Dumfries, having studied medicine and natural history at Edinburgh, was invited to join John Franklin’s overland expedition to the Arctic Sea, 1819-22. The aim was to explore the north shore of the American continent. “The whole affair was disastrously disorganised, a veritable boorach.” Richardson displayed considerable courage in attempting to swim the chilled waters of the Coppermine River, but he is better known, if at all, for the execution of one of the expedition’s hunters, Michel, who was suspected of providing him and others with meat that turned out to be human. Michel also murdered the British officer, Robert Hood. Richardson, John Hepburn a rating from East Lothian, and Franklin were not far from death themselves by the time they reached safety. Of the 20 men in Franklin’s party 11 died, a staggering statistic which should have ensured that he was never again entrusted with a command. Instead, he returned in 1825-27 to complete the survey of what would become the Northwest Passage, a much better organised affair. Richardson’s greatest achievement was his conception of the remarkable four-volume Fauna Boreali Americana, the first substantial natural history of northern America, in which he was aided by the talented Forfar naturalist, Thomas Drummond.

Others who played their part in the Arctic saga were David Buchan, Thomas Simpson, and of course the redoubtable Orcadian, John Rae. The latter is now the most studied of the Arctic brotherhood, famously traduced for returning to London with evidence that the doomed followers of Franklin had indulged in cannibalism, a crime which, in the case of Richardson 25 years earlier, had been hushed up. Much has been made of Rae’s Inuk designation of ‘Aglugga’ which translates as ‘the long strider’ but James Clark Ross and Francis Crozier, Franklin’s second-in-command, were similarly honoured. I have asked several Inuit about the meaning of the appellation but no one knew. I have previously wondered, only half in jest, if the word might mean, ‘one who comes from far away to travel he knows not where’. The Inuit must have been totally mystified as to why the Brits wandered around for no obvious purpose!

Other authorities include the whaling master William Penny from Peterhead, a colourful character who first went to sea aged 12. He speculated that it would be more effective to overwinter in the north to catch the early season whales rather than to hunt the ‘fish’ as they were called during the summer months only. He was the first to winter in Cumberland Sound, and in 1857-8, his wife accompanied him. He also played a notable part in the Franklin search. Margaret Penny became the first European woman to overwinter on Baffin Island. She became close friends with Inuit women and she sometimes wrote the ship’s journal. Indeed, when William Penny was off scoping whaling grounds, he left his wife in charge of the ship. What his crew thought of this is unknown.

There were many others. The Scottish contribution, especially of the whalers who were present from start to finish, was highly significant. And what of the ‘country of eternal light’? Perhaps John Ross, thinking as a typical Scot, had the answer: “the bright side of life is not easily seen through the dark one.”
In any survey of the historiography surrounding Scotland’s early modern era one can expect to find frequent and fleeting references to turnpikes or toll roads. This is also true of popular literature, as mentions of this once-extensive but largely forgotten road system punctuate Scotland’s many guide books, travel aids, and outdoor works. Many of us today make use of the same roads that in the not too distant past made up the toll road network, or we are aware of one of the 400 or so surviving toll houses that can be found scattered across Scotland’s landscape.

That the legacy of Scotland’s turnpikes is hard to escape is testament to the sheer size of the network and the fact that they were Scotland’s most important routes of transport for well over half a century. Indeed, between 1750 and 1870 there were some 370 road and bridge acts passed in Scotland to establish turnpike trusts, leading to a road network that ran for thousands of miles with construction costs running well into millions of pounds.

In 1750, Scotland was on the brink of a period of major industrial and agrarian change that would transform the lives of the Scottish people. Key to this was the simultaneous arrival of the turnpike era that would revolutionise Scotland’s road network and play a pivotal role in the coming century. From the historical sources coupled with the maps it is clear that turnpikes were economically influential. However, their impact cannot simply be restricted to the economy; Scotland’s turnpikes also played an influential role in the social and cultural transformations of their era and ultimately in transforming the very fabric of Scottish life. The toll road maps demonstrate the scale and extent of Scotland’s first industrial revolution, and the importance of communications and connectivity in the formation of modern Scotland.

James McEwan sought to fill the gap in understanding by charting the chronological and geographical development of Scotland’s turnpikes; one crucial element of which is the mapping of the toll roads. He used GIS software (ESRI’s ArcGIS 10.5 Geographic Information System) to map Toll Roads for three periods: 1750-70, 1770-90, 1790-1800.

There were three stages to the GIS mapping undertaken. The first stage involved identifying the Toll Roads using a combination of historical literature (Old Statistical Accounts, New Statistical Accounts, various volumes and editions of the Statutes at Large / Public General Statutes, the Journals of the House of Commons, minutes of road authorities, and a variety of other primary material notably the ‘improving’ literature of the late 18th century), a road atlas, Google Maps, and two digital datasets of the road network of Scotland (OpenStreetMap and OS OpenData). The second stage involved searching for the road of interest, sub-setting the map dataset to create a new road map layer, and then adding two new fields to the road attribute tables of the sub-setted data: Toll Road (Y/N) and Year (1750, 1770 or 1790). The third stage involved populating the two new fields for each road with the help of Google Maps and a modern road atlas. Once completed, the map layers were checked several times and then mapped using the ArcGIS View function to produce the Toll Road map shown here.

Mapping of the toll roads has provided a way to help improve our understanding of an innovation that played a critical role in an equally critical period of Scottish history. The maps produced have helped to visualise the evolution of the toll road network over both space and time, opening a door to further study of this forgotten road network. The result is a simple GIS map, but one that provides significant insight into the major periods of growth and decline in the Scottish toll road network, and can be clearly linked to major economic, operational, and social transformations.

“The toll road maps demonstrate the scale and extent of Scotland’s first industrial revolution.”

This article summarises the findings of a University of Aberdeen research project. See www.abdn.ac.uk/geosciences/departments/geography-environment/gis-history-1343.php for more information.
Maps have immense power. They can change not only the way we think about the world, but also the way we act within it, and this power can be seen in its most profound way through military maps. Over time, these maps have often deliberately encouraged their users towards destructive ends: to attack other countries, to destroy buildings, infrastructure and resources, and even to kill their fellow human beings. Of course, these maps also reflect great ingenuity, intelligence and expertise, and many also plan or show imaginative defensive works, constructing protection from other aggressors. But collectively, as warfare has flared up and down over the centuries, maps have been an intrinsic component for both sides.

Scotland has a unique and fascinating military history, and our new book Scotland: Defending the Nation specifically uses six centuries of military maps of Scotland to examine this history. The selected maps begin in the 1450s and come through to the latest digital mapping. By looking at who made these maps, why, and their wider contexts, many broader themes can be better understood, most of which are inherently geographical. Through these maps, for example, we can see the dramatic changes in the military forces that threatened the Scottish state – England in the 15th to the 17th centuries, the Jacobites in the first half of the 18th century, France in the early 19th century, and then Germany and Russia in the 20th century. Some of the most detailed and frightening maps of Scotland were made by external aggressors.

Maps also show us how the geography of Scotland’s military past changed rapidly over time. The War of the Rough Wooing in the 1540s, for example, brought a huge influx of military map-making into Scotland with new forts, defences and armies clashing in battle, but this primarily affected just the Lowlands and Borders. With successive Jacobite risings, military infrastructure steadily spread northwards. The Napoleonic Wars initiated a new shift to the east, with a network of coastal batteries constructed from Hackness in Orkney to Dunbar. A century later, massive defences were constructed in and around the Forth estuary to defend the new naval base at Rosyth. These maps also demonstrate the complete transformation in military technologies over time. From the 17th century, traditional castles in the larger cities witnessed major upgrades to cope with more powerful and mobile artillery, whilst in the 18th century new defensible barracks were constructed across the Highlands to counter the growing threat of Jacobite insurgency. All of these defences were largely superseded by the 20th century, with greater concerns over coastal and then airborne attacks. These in turn were largely superseded by nuclear weapons.

Perhaps most importantly, these maps show us both more and less of the landscapes that they portray. The art and artistry of cartography, the conscious and unconscious selections and exclusions that all map-makers need to make, as well as the deliberate embellishments or distortions for particular purposes, all allow many different ways of seeing the same world. The contrasting maps produced by the defenders or attackers of the same place, or by the victors or losers of the same battle, clearly reflect this point. Military maps needed to boost morale and inspire their users to believe in their superior topographic intelligence. They also needed to communicate essential military or tactical information quickly in times of war, especially by reducing or removing non-military ‘clutter’ from the map. Meanwhile, for civilian topographic mapping of military features, the ‘cartographic silences’ of those military sites excluded from view is very obviously illustrated by state censorship, which has rapidly risen and fallen at particular times in the past. These maps all represent the world, but they do not do so in a simple fashion.

The book takes a similar style and format to Scotland: Mapping the Nation and Scotland: Mapping the Islands, using rich and detailed colour images of maps to tell wider stories about Scotland’s history and geography. Many of these maps have not appeared in print before, and all have been selected for the particular insights – personal, institutional, national and international – that they offer in understanding Scotland’s military past and present.
Flowering friendships: Isobel Wylie Hutchison’s natural gift

Jo Woolf, RSGS Writer-in-Residence

In August 1927, Isobel Wylie Hutchison stepped off a Danish supply ship to become the first Scotswoman ever to set foot in Greenland. Aged 38, defiantly unmarried and quietly independent, she had travelled hundreds of miles from her home at Carlowrie Castle in West Lothian. In her ample luggage she carried collecting cases which she hoped to fill with hundreds of botanical specimens during her five-month stay.

For this little-known Arctic explorer, botany provided a passion and a purpose. The discovery of a rare flower brought her intense joy, and sometimes inspired her to write exquisite poetry; but the quest also gave her a reason to meet people, to exchange knowledge, and share experiences.

Finding only friendliness and warmth in Isobel’s manner, the Inuit people liked her instinctively, and Isobel quickly shed much of her natural shyness. She was enthralled when they told her about a place that was sacred in their culture: a grove of birches that grew by a lake on the shore of Tasermuit Fjord, reputed to be the only trees in that part of Greenland, and haunted – so they assured her – by the spirits of very tall men who left footprints in the sand. Desperate to go there, Isobel used all her powers of persuasion to engage a party of oarsmen, and a few days later the ‘Scottish expedition’, as she laughingly called it, set off up the fjord.

As always, much of Isobel’s pleasure came from the company of others: keen as she was to see the trees for herself, she was just as delighted to witness the excitement of her hosts – in particular the curiosity of an eight-year-old child who had never seen a tree before in his life, and lost no time in clambering up into the branches. Realising that her companions were slightly spooked by the place, Isobel helped them gather rowan branches (the rowan, she noted, grew only as a shrub in that region) and used them to decorate the boat, assuring them that the rowan was said to protect against evil spirits: an age-old Celtic tradition speaking to an Inuit one, just as ancient, across the water.

“When we reach our tents again at the bottom of the lake, only Filippus, with his strange sixth sense, declares that he can see traces of unknown visitors. If so, they have left no tangible sign and must surely have been fairies, for the lovely day on Taserssuak can best be described as a day in Fairyland.” (“On Greenland’s Closed Shore”)

At night, Isobel joined the Greenlanders in feasting on freshly-caught salmon, and listened to them singing as she watched the Northern Lights flicker across the sky. She had already reached an understanding that many explorers failed to grasp in a lifetime. Her ability to communicate with people from all walks of life was perhaps her greatest gift.

Six years later, in 1933, Isobel was once again in the Arctic, but this time on the windswept coastline around Prince of Wales Cape in Alaska. Her companions were three men, dressed in boiler suits and well-worn jackets: Ira Rank, Russian-born owner of Trader, a 30-ton schooner that was travelling up the coast to Barrow; and Icelandic brothers Pete and Kari Palsson, the ship’s captain and engineer. They had set off from Nome at the beginning of August, but a few days later a gale sent them running for shelter in the harbour below the Cape.

For years, Ira Rank and the Palsson brothers had navigated the treacherous waters of the Beaufort Sea, making occasional death-defying runs across the Bering Strait to Siberia where Ira still had a price on his head from the days of the Russian Revolution. They were tough and resourceful, and were more than slightly surprised at the unexpected appearance of Isobel, who had met them in Nome and politely requested a berth on their vessel. Instead of exclaiming at the cramped conditions, she cheerfully proceeded to cook them stew out of tins, and made light of the fact that the toilet was a bucket in the engine room.

On the slopes above Prince of Wales Cape, Isobel was delighted to find a wildflower meadow: she recorded Saxifraga iyallii, Geum glaciale and Draba borealis, among many others. It is impossible to know which of these species the three men are holding in their hands, but in Isobel’s photograph they have each picked a posy, and seem to be making the best of it. It has to be said that Kari, clutching his flowers proudly while gazing at Isobel on bended knee, seems to have got more into the spirit of the occasion than his two companions. During the five-week voyage they all developed a real affection for Isobel, who treated them like brothers; Ira would later write to her in Scotland with an open invitation to join them on another expedition.

Snapshots in the life of an extraordinary woman: glimpses of humour, of human nature, of the exhilaration that comes from adventure. Of course there were hardships and anxieties, and when Isobel made it to Barrow across
a storm-tossed ocean and bade farewell to her shipmates, she found another challenge awaiting her. She was, after all, less than half-way through her journey across Alaska and Arctic Canada. More than 700 plant specimens went with her, including, perhaps, the blossoms picked by Ira, Kari and Pete, but the friendships she made were just as important to her. In Barrow, even a hot bath and a comfortable bed could not dispel her wistfulness at parting:

“...as I gazed from my windows through the darkness at the riding lights of Trader swaying gently in the harbour away beyond – could it be – ? Was I feeling just a little bit homesick for my old damp bunk under the low deck, for the chequer-board, the galley-fire, the tin mugs, and my three friends, Ira (the Watchful), Peter (the Rock), and Kari (the Storm)?” ('North to the Rime-ringed Sun')

Saxifraga lyallii, red-stemmed saxifrage. © NPS / Jacob W Frank

Arctic harebell on Kulusuk Island, East Greenland. © Alexandre Lavrov

Kari and Pete Palsson, and Ira Rank, at Prince of Wales Cape.
Erebus
The Story of a Ship
Michael Palin (Random House Books, September 2018)
Erebus was one of the great exploring ships, a veteran of ground-breaking expeditions to the ends of the Earth. In 1848, it disappeared in the Arctic, its fate a mystery. In 2014, it was found. This evocative account of an extraordinary adventure follows the Erebus from its launch in 1826 to the epic voyages of discovery that led to glory in the Antarctic and to ultimate catastrophe in the Arctic. The ship was filled with fascinating people: the dashing and popular James Clark Ross, who charted much of the Great Southern Barrier; the troubled John Franklin, whose chequered career culminated in the Erebus’s final, disastrous expedition; and the eager Joseph Dalton Hooker, a brilliant naturalist – when he wasn’t shooting the local wildlife dead.

Scaling the Heights
Measuring Scotland’s Mountains
The Munro Society (The Munro Society, October 2018)
Ever since Hugh Munro drew up his Tables, there has been an interest in checking the heights of hills, not least by Munro himself using a pocket aneroid. With the advent of satellite GPS technology, precision has greatly improved. The Munro Society embarked on an eight-year programme of measuring some of the more ‘marginal’ Munros, Munro Tops and Corbetts. This book is a fascinating account of history, science and practicalities of measuring the mountains. Amongst other things, it discusses the creation of the Tables, the changes that have taken place over the years, the science behind using satellites to determine the heights of hills and mountains, and the many hill lists which have followed on from Munro’s original one. Contact info@themunrosociety.com for more information.

The Cod Hunters
John Goodlad (Shetland Heritage Publications, May 2018)
This is the incredible story of the Shetlanders who fished for cod around Faroe, Rockall, Iceland and Greenland. No dry history of boats and fish, it is a story about ordinary people who did extraordinary things. The geographical scope extends from the remote fjords of west Greenland to the elegant dining tables of 19th-century London, from the fishing banks off Faroe to the best restaurants in the Basque country, from the taverns of Torshavn to the prison cells of Lerwick. What do a retired railway worker in New York, an embittered Fishery Officer in Lerwick, a bankrupt banker, the daughter of the explorer David Livingstone, and a Faroese Prime Minister have in common? They were all involved in the story of the Shetland cod hunters.

Barbara Rae
The Northwest Passage
Barbara Rae, Duncan Macmillan, Tom Muiir, Tagak Curley (Royal Academy of Arts, August 2018)
In 2015 artist and printmaker Barbara Rae travelled to Greenland on the trail of her namesake and fellow Scot, the surgeon and explorer Dr John Rae (1813-93) who, captivated by the ‘wild sort of life’, travelled to the Arctic in 1846, learning local languages and survival techniques. This book is the artistic result of Barbara’s journey. Through her deft handling of colour and line, the frozen landscape of the Arctic jumps into life from the page, taking the reader on a journey of discovery from Scotland to the Arctic, and back again. Her vivid images are combined with insightful texts from expert authors.

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The Arctic
Richard Sale (author) and Per Michelsen (photographer) (Whittles Publishing, reprint December 2018)
One of the last great wildernesses on the planet, the Arctic can be harsh but also stunningly beautiful, with days during which the sun glints on ice, and nights illuminated by the ethereal dancing light of the aurora. Many travel to the Arctic to see the animals and birds, but the area also has an absorbing human history. However, this magnificent region is now under severe threat. Global warming is causing the sea ice to shrink, in both area and volume. Due to feedback mechanisms, the Arctic warms about twice as fast as the Earth. The area therefore acts in the way that canaries once acted in coal mines, giving an early warning of danger: melting sea ice not only threatens the local wildlife but indicates the threat to the Earth as a whole. This remarkable book encompasses the diverse facets of this magnificent area and its vital importance as an indicator of the planet’s health.

Readers of The Geographer can purchase The Arctic for only £22.50 (RRP £25) with FREE UK P&P. To order, please telephone 01593 731333 and quote reference ‘RSGS’.

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