British Antarctic Survey Strategy

2023-2033

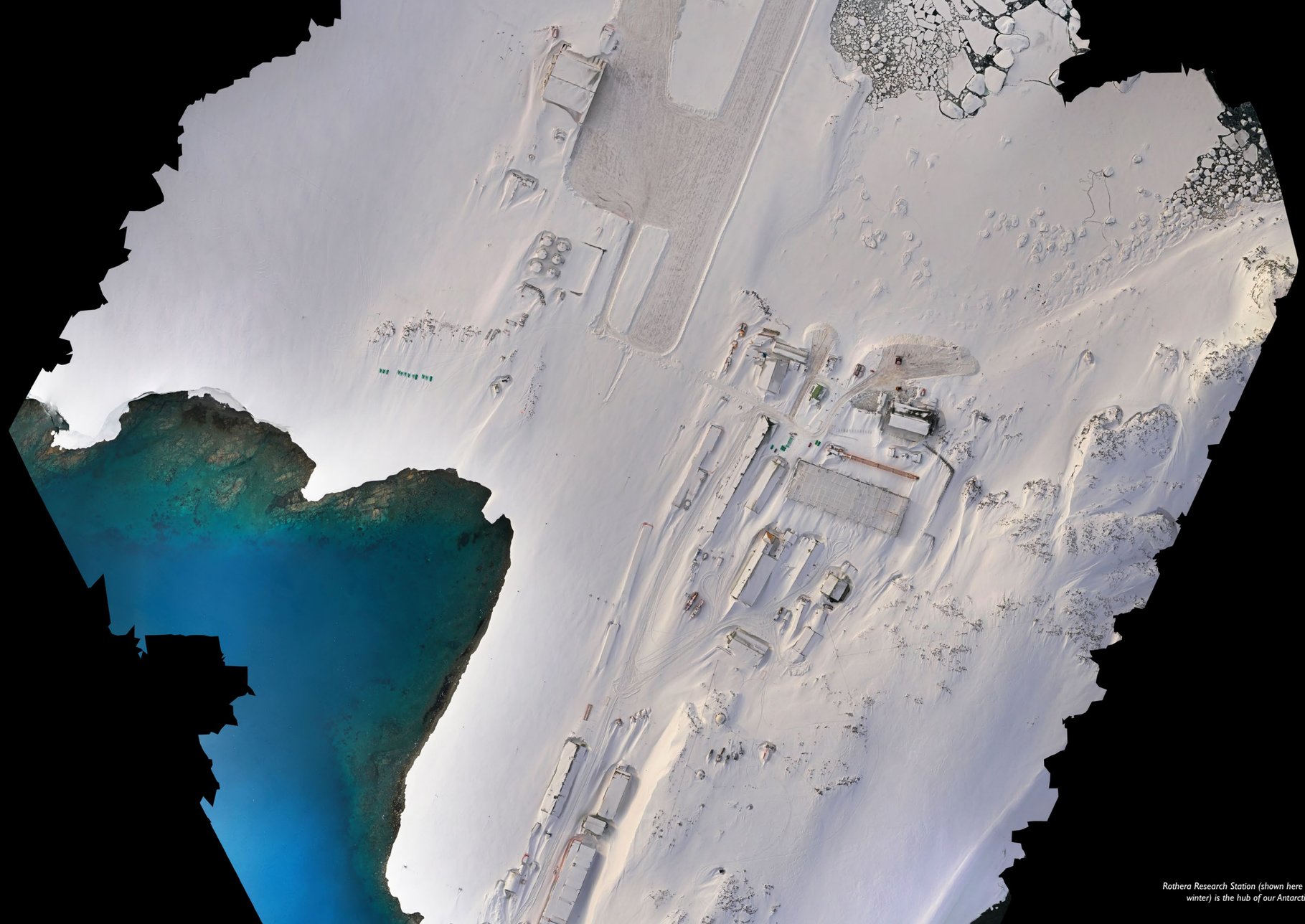
British Antarctic Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

POLAR SCIENCE

FOR A SUSTAINABLE PLANET

The white landscape of the polar cryosphere is responding rapidly to climate change, with impacts across our planet.



British Antarctic Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

Rothera Research Station (shown here during the winter) is the hub of our Antarctic activities

Welcome to our new strategy

Our planet is changing faster than we thought. Sea levels are rising, sea ice is melting and the polar oceans are warming. The Arctic is warming up to four times the global average and our field observations show that Antarctic ice shelves are melting from below due to ice-ocean interactions. The polar oceans are currently the world's largest sink for man-made heat and carbon – but for how long?

These changes have impacts across our whole planet, with rising sea levels threatening one billion people living in coastal regions by 2050 and contributing to extreme weather events. It is a challenge for us all to cut greenhouse gas emissions and live in better balance with our planet.

The new British Antarctic Survey (BAS) strategy faces this challenge to decrease our carbon budget and live and work more sustainably. We focus on four main topics: digital innovation to unlock new science and improve polar operations; embedding environmental sustainability in everything we do; modernising our infrastructure and the way we work; and enhancing physical safety, mental health and social wellbeing for all our people.

These goals will be enabled by: world-class science to deliver the scientific evidence needed by decision-makers in policy, industry, and society; outstanding polar operations to support UK scientists in remote field locations; an efficient and effective organisation aided by more robust business systems; a strong focus on our people and their development; and valued partnerships across our wide range of stakeholders.

With our new icebreaker, RRS *Sir David Attenborough*, and its suite of autonomous vehicles, we are already saving fuel and collecting more data by satellite to improve our science forecasts. Changes in the way we operate our polar stations have saved energy, as have the hundreds of solar panels we have installed. Our staff are innovative and are enthusiastically embracing the challenge for environmental sustainability. This new strategy will help guide us towards a better world.

Professor Dame Jane Francis
Director of the British Antarctic Survey

BAS 10-year strategy 2023-2033

Our Vision

We aspire to be a world-leading centre for polar science, addressing issues of global importance and helping society adapt to a changing world

Our priorities for change

Digital innovation and technology
Integrate all areas of technology to unlock new science and new ways to deliver polar operations

Environmental sustainability
Embed environmental sustainability into everything we do

Modernisation
Modernise and future-proof assets and infrastructure

Safety culture
Develop safe and resilient staff who can confidently and successfully assess and manage hazards and risks

Enabled by

Excellent polar science for a sustainable planet
Deliver world-class science, providing trusted advice to policymakers

Outstanding polar operations
Enhance polar operations and transform future support to polar science

Exceptional organisation
Make BAS the most efficient, effective and agile organisation it can be

Brilliant people
Make BAS a place where people are proud to work, and where the development and wellbeing of our people is recognised as a priority

External partnerships, engagement and collaborations
Build impactful and lasting relationships with partners and collaborators

Our priorities for change

Digital innovation and technology

Our challenge: Integrate all areas of technology to unlock new science and new ways to deliver polar operations

We will:

- Enhance our capabilities in AI to deliver better science outcomes and to support more efficient polar operations
- Provide a robust data infrastructure that supports easy access to reliable data and drives data-centric analysis and decision making
- Modernise our computing infrastructure to make available fit-for-purpose digital assets and state-of-the-art systems
- Use technology to reduce exposure to risks while ensuring robust cyber and data security processes
- Develop the skills our staff need to maximise the use of new technologies
- Build confidence and trust to apply appropriate technology and digital approaches across our organisation

Environmental sustainability

Our challenge: Embed environmental sustainability into everything we do

We will:

- Aim for net zero carbon by 2040 in line with the UKRI Environmental Sustainability Strategy
- Explore new ways to deliver science and operations in a net zero future
- Make operational choices in the Polar Regions and Cambridge that protect the natural environment and ensure effective biosecurity
- Foster a responsible and sustainable use of resources
- Embed a culture that applies new technology, autonomous instrumentation and digital approaches to accelerate the transition to net zero and future sustainability

CASE STUDY

Renewable energy systems in Antarctic research stations

BAS is committed to reach net zero by 2040, in line with ambitions set by UK Research and Innovation (UKRI).

We have installed 300 photovoltaic panels at our Antarctic stations in 2023. We are currently installing a solar photovoltaic and energy storage system at Bird Island Research Station on the sub-Antarctic island of South Georgia to help cut carbon emissions. The new solar system will provide 50% of the current power requirements, to be increased in future.

The station at King Edward Point, South Georgia (owned by South Georgia Government, operated by BAS) is 80% powered by hydroelectricity, and we are planning to refurbish our station on Signy Island to cut its carbon budget.

Our goal is to reduce the use of Marine Gas Oil on all our Antarctic stations to zero by using renewable energy and reducing energy demand.

We are committed to achieving net zero by 2040

Our priorities for change *continued*

Safety culture

Our challenge: Develop safe and resilient staff who can confidently and successfully assess and manage hazards and risks

We will:

- Demonstrate positive safety leadership, captured in our Safety Together campaign
- Maintain competency for safe working across our staff in polar and mountain regions and Cambridge
- Build on a culture of continual learning, prevention and improvement
- Understand the conditions in which incidents happen to prevent or correct them
- Recognise the importance of good mental health and positive social wellbeing across all areas of our activities
- Develop a collaborative approach to safety management

Modernisation

Our challenge: Modernise and future-proof assets and infrastructure

We will:

- Modernise our assets, estate and activities to decrease our carbon footprint
- Embed energy efficiency, renewable energy sources and sustainability across our infrastructures
- Develop the communications infrastructure we need to support our future digital aspirations
- Improve quality of life for all staff using better BAS assets and facilities
- Optimise bandwidth availability on ship, aircraft, stations and field camps to improve science, enhance safety and improve communication
- Undertake long-term planning for future assets and infrastructures

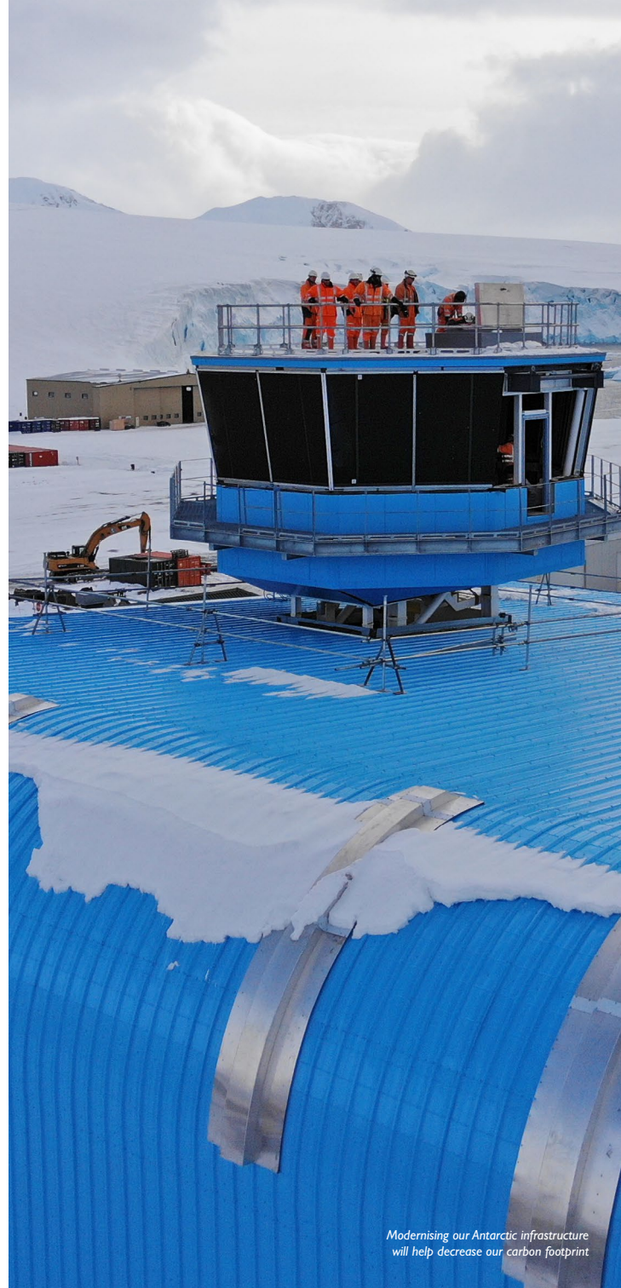
CASE STUDY

New science and operations facility at Rothera Research Station

As part of UKRI's investment in the Antarctic Infrastructure Modernisation Programme (AIMP), the Discovery Building will be a world-class scientific support and operations facility at Rothera Research Station in Antarctica. It will house science and field operations teams at the UK's main Antarctic research station and has been designed with a focus on environmental sustainability.

The building includes several features to improve energy efficiency, such as a new combined heat and power plant that will reduce carbon emissions by 25%.

To ensure the highest environmental and sustainability standards are met, we are working to a bespoke BREEAM accreditation and assessment system from the Building Research Establishment (BRE).



Modernising our Antarctic infrastructure will help decrease our carbon footprint

Enablers

Excellent polar science for a sustainable planet

Our challenge: Deliver world-class science, providing trusted advice to policymakers

Our science strategy aims to:

- Assess the critical role of the polar oceans, climate and biochemistry in the global carbon cycle to aid future forecasts and resilience
- Understand change to the cryosphere, past and present, to forecast global sea-level change in order to protect coastal societies and infrastructures
- Mitigate the impacts of space weather on polar satellites and power supplies
- Determine changes to water resources from mountain glaciers and impact on polar fisheries to sustain livelihoods and societies
- Understand how polar ecosystems will respond to change to conserve polar biodiversity
- Understand and predict extreme events and tipping points to assess risks and safeguard our future

Outstanding polar operations

Our challenge: Enhance polar operations and transform future support for polar science

We will:

- Deliver environmentally responsible and sustainable operations, minimising environmental impact
- Respond and adapt to climate change impacts on our polar operations
- Develop agile operating models through the use of innovative technology, such as geospatial mapping, automation, AI and digital twins
- Establish a planning capability to align scientific and operational demand, capability and capacity across all areas and functions
- Develop and use cross-cutting skills across our teams to increase resilience and support activity
- Generate long-term plans to direct our assets and infrastructure towards the commitment to achieve net zero by 2040

CASE STUDY

AI support for polar navigation for RRS *Sir David Attenborough*

Artificial Intelligence (AI) will enable ships navigating in ice-covered polar seas to be more efficient using a new route-planning tool developed by BAS AI scientists. The project team has developed an AI application called PolarRoute that makes use of a wide variety of existing environmental datasets and forecasts to develop a navigational route planner that updates as conditions change, similar to an in-car navigation system.

The new PolarRoute toolkit will be used by the Master of the UK's polar research ship, RRS *Sir David Attenborough*, to make decisions about route planning in the Polar Regions. This will enable the Master to compare and evaluate possible routes between destinations in terms of their fuel and carbon costs. This capability will also be deployed for future route planning of marine autonomous vehicles.

Innovative technology is key to the success of our science

Enablers *continued*

Exceptional organisation

Our challenge: Make BAS the most efficient, effective and agile organisation it can be

We will:

- Take an integrated approach to planning and management to operate effectively and minimise the impact of collective risks
- Ensure we are financially sustainable
- Enhance our governance structures and ensure our business practices are clear and transparent
- Identify new efficient ways of working that build resilience
- Invest in a workforce of the right size with the skill set to support our future needs
- Transform processes, improve business systems, and enhance data accuracy to make fair and well-considered business decisions

Brilliant people

Our challenge: Make BAS a place where people are proud to work, and where the development and wellbeing of our people is recognised as a priority

We will:

- Create an environment with a sense of inclusion, equity and belonging for staff
- Embrace the current diversity of BAS and work towards an even more diverse and inclusive workforce
- Attract, retain, and develop our staff
- Encourage external collaboration to foster creativity
- Recognise, reward and celebrate good practice and excellence in individuals and teams
- Listen to and understand the changing needs of our staff and partners

CASE STUDY

Breaking the 'ice ceiling' for gender equality and inclusiveness

BAS achieved an Athena Swan Silver Award in 2023 in recognition of our actions to advance the careers of women and under-represented groups across BAS.

When BAS staff started their journey towards a more equal workforce, female staff were under-represented in senior roles. The female membership of the Executive Team has now increased from 40% to 80% since 2017, and the Science Strategy Executive Group now has 41% females, up from 28%. The newly-formed Science Management Team has an equal gender representation.

BAS and the Foreign, Commonwealth & Development Office (FCDO) established the Diversity in Polar Science Initiative in 2019 to foster an inclusive work environment across all polar activities. Polar Pride is now an internationally-recognised event on 18th November each year to celebrate diversity in polar science.

People are at the heart of our strategy

Enablers *continued*

External partnerships, engagement, and collaborations

Our challenge: Build impactful and lasting relationships with partners and collaborators

We will:

- Contribute to government and external stakeholders
- Provide trusted advice to partners and key decision-makers
- Support the needs of the UK scientific community
- Harmonise our use of technology with polar partners to support interoperability and collaboration
- Develop partnerships with industry to share best practice
- Deliver impact from our work through engagement with scientists, government, industry, public and other stakeholders

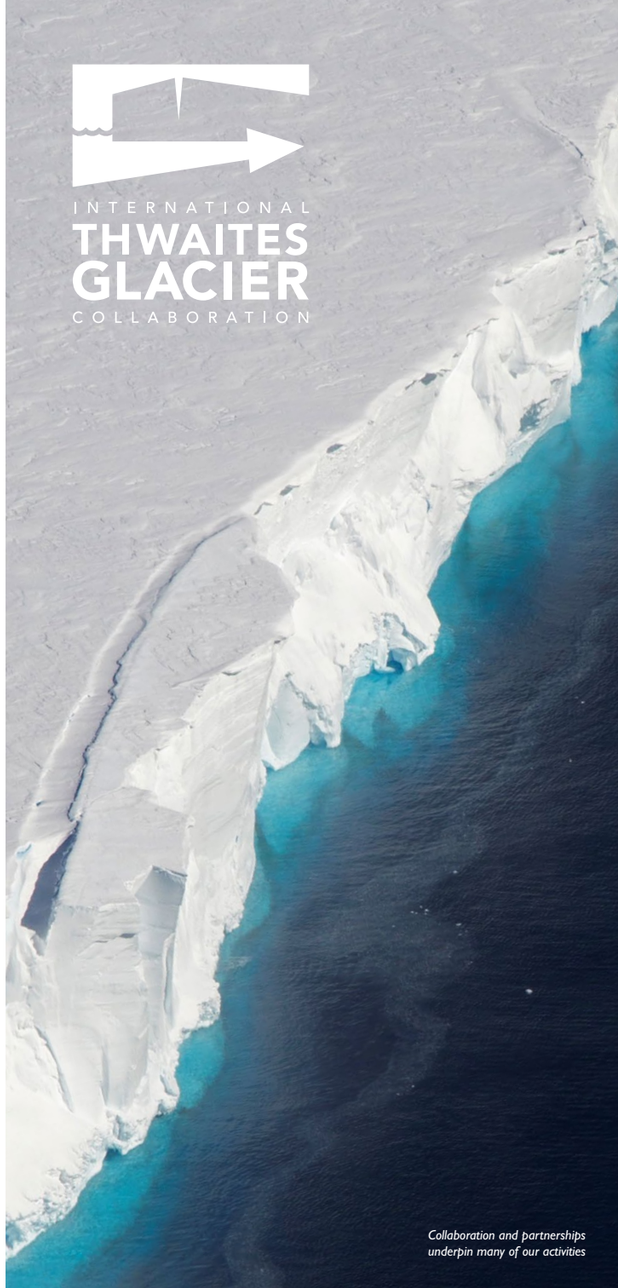
CASE STUDY

The International Thwaites Glacier Collaboration (ITGC)

The US National Science Foundation (NSF) and UK Natural Environment Research Council (NERC) are collaborating on a long-term, multi-agency programme to study Thwaites Glacier in West Antarctica and its adjacent ocean region.

ITGC is the largest joint UK-US project undertaken on the southern continent in 70 years. The $50M project involves more than 100 researchers and logistics experts using research ships, aircraft and tractor traverses.

Over the past 30 years, the amount of ice flowing out of this 120km-wide region has nearly doubled. Thwaites Glacier is the size of Great Britain and straddles some of the deepest bedrock in Antarctica. Data collected will underpin future global sea-level rise predictions from the glaciers in West Antarctica, providing governments with the right information for policy and business actions that will help protect coastal cities, ecosystems and vulnerable communities.



Collaboration and partnerships underpin many of our activities

Our strategy will build upon successes in both Polar Regions and high mountain environments across the world.

We will apply our expertise to ensure the impact of our work has a global reach.

British Antarctic Survey

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BAS manages the NERC Arctic Station at Ny-Ålesund, Svalbard

Contact BAS

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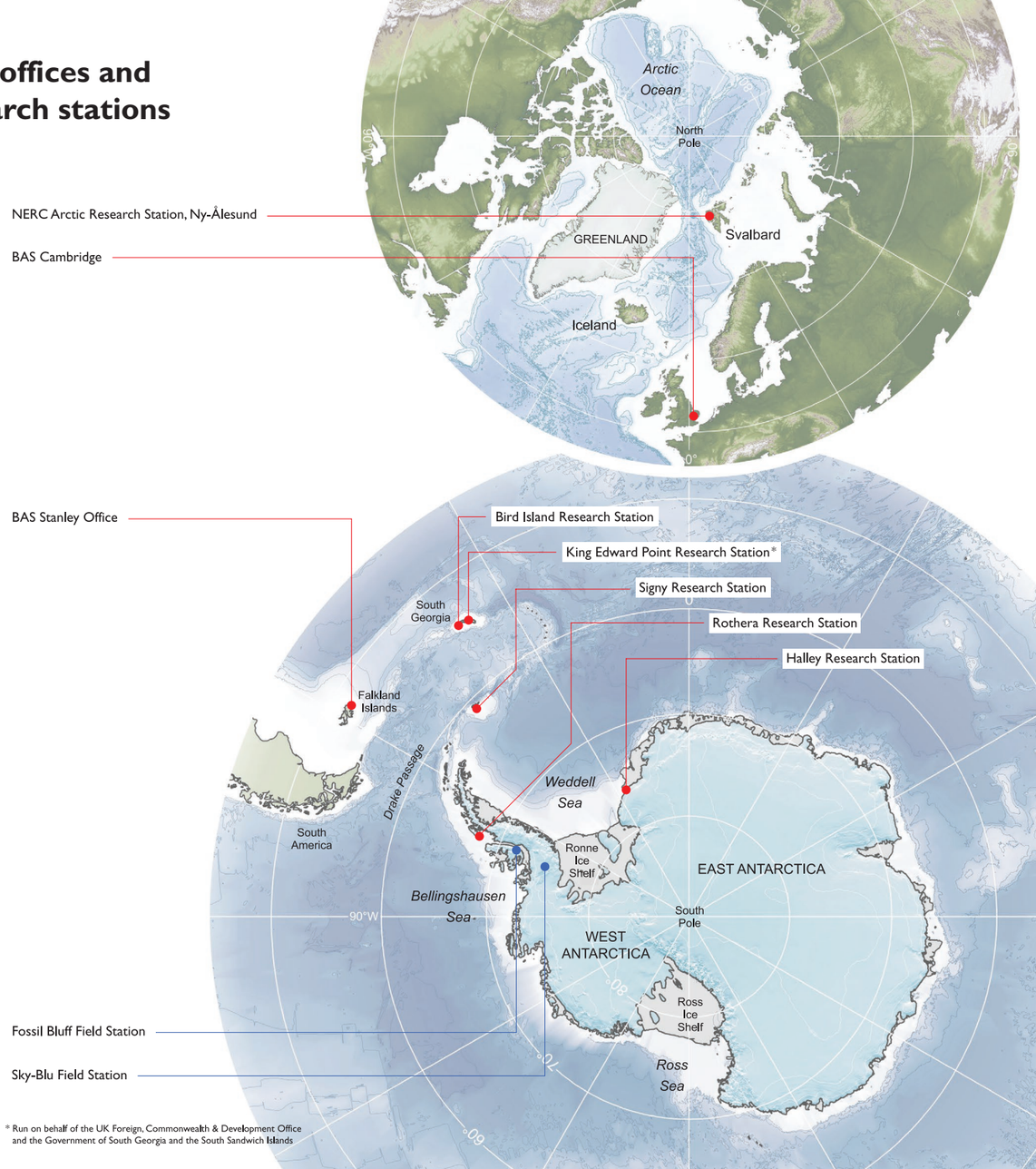
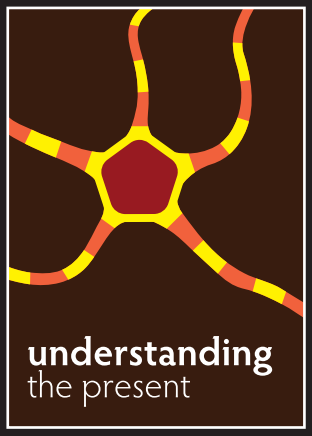
BAS offices and research stations



* Run on behalf of the UK Foreign, Commonwealth & Development Office and the Government of South Georgia and the South Sandwich Islands



The British Antarctic Survey strives to uncover the secrets of the Polar Regions and the frozen regions of the Earth. Our expertise spans the depths of the oceans to the inner edge of space.

Our research highlights the fragility of the Earth's frozen environments, and what that means for our planet. We have been living and working in the extremes of Antarctica and the Arctic for over 60 years. Our scientists discovered the hole in the ozone layer and identified key evidence for climate change in ancient ice – our science continues to inform decision-makers.

We provide the UK's national polar capability by operating research stations, aircraft and Royal Research Ship *Sir David Attenborough*, supporting science at the poles and securing the UK's presence in Antarctic affairs.

The British Antarctic Survey is part of the Natural Environment Research Council (NERC). NERC is part of UK Research and Innovation.

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UKRI Natural Environment Research Council