NERC SCIENCE OF THE ENVIRONMENT

Natural Environment Research Council
Annual Report and Accounts 2017-18

HC 1262

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Overview

The science of our changing world

The Natural Environment Research Council (NERC) drives investment in environmental research, infrastructure, innovation and training – to advance the frontiers of knowledge and to deliver solutions, such as clean growth, for our economy and wellbeing.

Our science explores the physical, chemical and biological processes on which our planet, life and economy depends – from safe food and water to energy and minerals; from air quality and flooding to long-term changes in our environment and climate.

Our future prosperity depends on a healthy environment. The environment we live in directly enables – and can limit – our wellbeing, productivity and economic growth. Every business, public service and consumer benefits from natural resources (for example minerals, energy, water and food) while incurring the economic and health costs of environmental hazards, pollution and degradation.

Governments, businesses and public agencies worldwide recognise that integrated social, economic and environmental policy delivers better public health, a stronger economy (innovation, productivity, jobs) and resilience to shocks.

Our goals

To fund excellent, environmental science that helps all of us:

- understand and predict how our planet works;
- manage our environment responsibly as we pursue new ways of living, doing business, escaping poverty and growing economies.

With our researchers and stakeholders, we develop the priorities that provide focus for the environmental science community. Our research is often multidisciplinary and designed and delivered in collaboration with national and international partners. NERC is committed to developing UK and international capability across the environmental sciences. We fund centres and universities to carry out research and to train and support a world-class community of environmental scientists.

NERC operates a fleet of research ships and aircraft. We work in some of the world's most hostile environments and we invest in satellite technology to monitor environmental change on a global scale. This national capability allows the UK to deliver world-leading environmental science, support national strategic needs, and respond to emergencies. It includes the research and development activities that keep this capability at the cutting edge.

NERC research centres and other service and facilities providers play a leading role in managing and delivering this capability for the UK. These are strategic investments that often take place over the long term, and will rarely be subject to open competition.

NERC's six environmental research centres are:

British Antarctic Survey (BAS)

British Geological Survey (BGS)

Centre for Ecology & Hydrology (CEH)

National Centre for Atmospheric Science (NCAS)

National Centre for Earth Observation (NCEO)

National Oceanography Centre (NOC)

Where their names appear in this report, they have been abbreviated.

Chairman and Chief Executive's Summary

During 2017-18 NERC's investments have continued to push the frontier of environmental science, sustaining our world-leading research that contributes to a healthy environment, lives and economy. We work in partnership with business, government and society to shape the environmental research and innovation agenda and to provide the knowledge, skills and technology. Together we deliver new ways of living, doing business, escaping poverty and growing prosperity.

Achieving prosperity and wellbeing

NERC's 2017 Impact Report confirms the value and importance of over 50 years of sustained investment and partnership that has achieved prosperity and wellbeing throughout the UK by providing solutions that deliver a cleaner, more productive and resilient world.

Our environmental science is world leading, providing global leadership that brings together scientists across disciplines and nations to tackle complex challenges. Our latest study demonstrates how NERC science has delivered real benefits to people, economies and the environment in every UK region, reflecting our investment in excellent research and innovation throughout the country, with over 73 per cent of NERC funding spent outside of London and South East England. In particular, it shows how:

NERC science has reduced the economic and health costs of pollution and degradation, delivering solutions for clean air, water and energy.

Achieving clean growth is a challenge for the whole economy and the need for transition to a low-carbon energy-efficient economy with reduced CO_2 emissions is widely recognised. The UK is fortunate to have the world's largest capacity for offshore wind energy, 50 per cent of Europe's tidal energy and 35 per cent of Europe's wave energy, together with world-leading capability in environmental impact monitoring. Environmental science innovations in impact monitoring have already enabled government licensing and reduced operating costs for offshore renewable energy in Scotland, Northern Ireland and northern England. Our 2017 Impact Report reveals how NERC science helps deliver cleaner energy thanks to increased renewable energy capacity, such as the BGS expertise that has assisted the planning and development of the 2.4GW Dogger Bank offshore wind farm that will provide cleaner power for two million homes.

Our science has boosted the economy by delivering more productive ways of working, smart regulation and skilled people.

Government and the private sector are investing massively to upgrade infrastructure as a universal enabler of productivity and growth for the whole UK for generations. Engineering consultancies, transport networks, energy and water companies constantly look to innovation in environmental science to guide risk assessment, investment, design and operation of the UK's essential infrastructure. Our study shows that the cheaper, safer design and construction of key infrastructure enabled by NERC-funded scientists have delivered extensive benefits for owners, operators, regulators and users. The growth of the UK's onshore infrastructure benefits in particular from the ready availability of detailed, reliable geological models developed and maintained by NERC scientists. For instance, during construction of the major Crossrail interconnection at London's Farringdon Station, BGS models helped tunnellers identify and reduce health, safety and financial risks to the project.

NERC science has saved lives, money and disruption by enabling government, businesses and society to respond better to natural hazards.

Accurate prediction of short-term weather patterns and longer-term climate trends is crucial to the UK's prosperity, competitiveness and resilience. Widespread short and long-term benefits have resulted from NERC's longstanding partnership with the Met Office that has delivered vital advances in weather forecasting and climate prediction capabilities. Our recent analysis shows that NERC science is key to the delivery of an estimated £680m of annual benefits through its role in enabling the Met Office to provide a world-leading weather and climate service. The benefits of the collaboration are especially evident in the insurance industry, a field in which the UK is an international centre, worth £29bn a year to the economy. Storms cause more than half the risk to the sector, costing £13.7bn in global insured losses in 2014. In this area, improved global climate models developed by NERC with the Met Office are helping UK-based insurers understand and price environmental and climate risks, and transform their business models, saving up to £130m annually.

Major scientific discoveries

NERC investment has led to significant discoveries during 2017-18 that are relevant to citizens of the UK and beyond, advancing the frontiers of environmental science to deliver sustained benefits in an ever-changing world.

In June 2017, researchers found that a rise in the production of a gas commonly used to strip paint and decaffeinate drinks could delay the recovery of the ozone layer by up to 30 years. As the previously ignored chemical, called dichloromethane, may now be contributing to ozone depletion it should be considered for control under the Montreal Protocol to improve future predictions of ozone recovery.

Scientists also announced in June that they had taken highly targeted and sensitive measurements in the very challenging environment of the Southern Ocean. These measurements have been captured in some of the coldest abyssal ocean waters on Earth during the first Antarctic voyage of the yellow robotic submersible known as Boaty McBoatface, an Autosub Long Range (ALR), one of the latest type of autonomous underwater vehicle (AUV) developed by NOC. The new technology has enabled scientists to collect data in conditions that were deep and turbulent, and had very strong currents. The project focussed on the Orkney Passage, a submarine valley that connects the Atlantic Ocean to the Weddell Sea between South Georgia and Antarctica. A large proportion of the cold waters entering the global ocean abyss from Antarctica flow through this passage, which is a hotspot for ocean mixing. The information will be analysed to examine the complex mixing process and its effects on climate change, giving scientists a greater understanding of changes in the Antarctic region and shaping a global effort to tackle climate change.

Supporting technological innovation and development where UK science strengths and business capabilities combine is a core part of the Government's approach to the industrial strategy. In the case of the natural environment, the application and development of artificial intelligence in particular has the potential to provide solutions for a variety of social, economic and environmental challenges. NERC is supporting the development of AI technology through our Marine Autonomous Systems capabilities. This is a key area of strength for the UK in research and technology and the main UK expertise is at NOC in Southampton and on the south coast. The £3m investment in the Marine Robotics Innovation Centre (MARSIC) coupled with skills investment (£2.5m) in the joint NERC – Engineering and Physical Sciences Research Council (EPSRC) Centre for Doctorial Training in the use of smart and autonomous observation systems (NEXUSS) will place the UK at the leading edge of

scientific endeavour and innovation in the marine environment.

A study conducted by CEH, published in June 2017, examined the impact of neonicotinoid pesticides on honeybees and wild pollinators in a field trial spanning three countries. The findings from their pan-European field trial revealed the negative impacts on bees and attracted international media coverage. Following the results, Secretary of State Michael Gove announced that the UK would back a total ban on neonicotinoids based on the scientific evidence, which included NERC research and the field trial in particular.

Another study, published in July 2017, from an international team of researchers led by BAS showed that wind-driven incursions of warm water forced the retreat of glaciers in West Antarctica during the past 11,000 years. These new results enable researchers to better understand how environmental change may affect future sea-level rise from this climate-sensitive region. Ice loss from this part of West Antarctica is already making a significant contribution to sea-level rise and is one of the largest uncertainties in global sea-level rise predictions. Combined with the contribution from other melting glaciers around the world and expansion of the world's oceans, it will have an impact upon society through flooding of low-lying coastal regions. Computer model simulations have suggested that ice-sheet melting through warm water incursions could initiate a collapse of the WAIS within the next few centuries, raising global sea level by up to 3.5 metres. Understanding what has happened in the distant past provides another important piece of the jigsaw.

The first joint Rockefeller Foundation – NERC – Economic and Social Research Council (ESRC) report published in July 2017 found that the environment is central to achieving the United Nation's Global Goals agreed by 193 world leaders in 2015 that aim to end extreme poverty, inequality and climate change by 2030. The report concludes that a clear understanding of the multiple ways we, as humans, affect the environment and how the environment, in turn, affects us is essential to achieving each of the UN's 17 Global Goals on Sustainable Development. The findings will provide a basis for prioritising the most appropriate research and innovation around the world necessary to fulfil the ambitious goals in an integrated and systematic way.

A NERC-funded study examining the role of disease in the dynamics of natural populations revealed the importance of certain genes in regulating an individuals' susceptibility to infectious disease. The research, undertaken at the NERC-funded Centre for Genomics Research at Liverpool, focused on field voles in the Kielder forest, Northumberland, and forms part of a long-term experiment in this location. The work aims to use wild populations as a natural resource to uncover novel infection biology that could help our wider understanding of why some individuals are more susceptible to disease than others are. Work published this year has established the importance of specific genes that regulate the toleration of, as well as the resistance to, infection and is uncovering the genetic basis for variation between individuals. This group of genes is largely similar across all vertebrates. By studying a natural population of voles, we are improving our fundamental understanding of how individual genes can affect the health of populations of animals in the wild.

Investing in large research infrastructure and scientific facilities

In 2017-18, we maintained a focus on ensuring our national capability funding is well equipped to sustain the UK's world leading environmental science.

Meeting future energy demand for the UK will require new technologies and in April 2017 NERC announced the establishment of the new £31m UK Geoenergy Observatories that will see scientists gather critical data on the use of geoenergy technologies from two research field sites in Cheshire and Glasgow.

Commissioned by NERC and delivered by BGS, these facilities will attract world-leading geologists, engineers and other scientists to undertake energy-related research.

This research will underpin the development of the technologies and science needed for carbon storage, energy storage, underground storage of waste material and shale gas and advance our understanding of the underground environment which modern society uses extensively for water, pipelines, tunnels, building materials, landfill, drainage and more.

In July 2017, the Science Minister opened the new BAS Aurora innovation centre that will support cross-discipline research to tackle environmental challenges and increase the real-world benefit of polar research. Located at BAS in Cambridge, the £4.3m investment aims to generate new academic, business and policy partnerships and stimulate new ideas in the areas of climate change, environmental stewardship and technologies for challenging environments, which will unlock the potential of polar science to benefit society and economy.

Construction has been progressing well on the RRS *Sir David Attenborough* during the year – one of the most advanced polar research vessels in the world. Commissioned by NERC, operated by BAS, and built by Cammell Laird, the £200m vessel is set to transform UK polar research capability. From 2019 onwards, scientists researching oceans, ice and the atmosphere will have access to the vessel's state-of-the-art facilities, helping maintain Britain's position at the forefront of environmental science and providing a floating multidisciplinary research platform from which scientists will tackle some of the most important environmental issues facing humanity.

Major milestones were realised in August and September 2017 with the arrival of the 900 tonne stern section at Cammell Laird's shipyard in Birkenhead, having travelled 692 miles by barge from Hebburn-based shipyard A&P Tyne (Newcastle), and the craning of the last of the vessel's engines into the hull ready for connection to the advanced Rolls-Royce propulsion system. November 2017 saw the ship successfully inched out of the construction hall and onto the slipway to allow the necessary space to join the remaining steel blocks for the bow and to complete the hull. As the vessel begins to take shape, the scientists involved have been refining the new laboratories and associated science equipment. In readiness for bringing the completed ship into service, plans are being made for the sea-trials of science equipment in 2019, and the first polar cruises to rehearse science operations in 2020. It will not be long before the vessel will be operational and enabling exciting new discoveries from the Arctic and Southern oceans.

NERC announced the Hydro-JULES programme in October 2017, a major five-year £6m investment in national capability to develop a new generation of terrestrial hydrological models linked to, and in collaboration with, the Joint UK Land Environment Simulator (JULES) model. The project will deliver a major advance in the land surface and hydrological science required to represent the terrestrial water cycle in models fully, improving the simulation of water movement and enabling advances in flood and drought forecasting. The programme, supported by national capability funding to CEH, BGS and NCAS, began in April 2018.

In January 2018, NERC announced a £4.3m investment to launch air quality research-supersites in Manchester, Birmingham and London. Expected to be operational by the end of the year, the laboratories will deliver a new network of advanced air quality monitoring instruments that will allow researchers to detect harmful air pollutants and their sources in more detail than ever before. The investment will also include new instruments to detect a variety of greenhouse gases and ozone-depleting chemicals, at a range of observatories,

and so help the UK comply with legally binding targets set out in the Climate Change Act. Improving air quality in UK cities is a national priority and challenging targets for cutting emissions are in place over the next decade. This investment will provide the scientific evidence that is vital to design solutions that will help clean up our air.

Our research and innovation initiatives

We continued to invest in world-leading innovative science during 2017-18, helping to find solutions to the environmental challenges that affect us all.

In November 2017, the Industrial Strategy Challenge Fund (ISCF) announced the award of £68m to the latest ground-breaking research and innovation projects in robotics and artificial intelligence systems. As part of this, we are collaborating with Innovate UK and EPSRC on a programme investigating their development and deployment in extreme environments. The programme aims to develop solutions to increase productivity and make a safer working environment in industries such as offshore energy, nuclear energy, space and deep mining. NERC has also awarded £4.3m to fund five research projects to develop sensors capable of working in the ocean's extreme conditions. Compatible with existing marine robotic vehicles and those in development at NOC, these sensors will be able to perform different functions whilst out at sea, helping researchers to answer questions about our changing oceans.

In July 2017, the Research Councils' Global Challenges Research Fund (GCRF) collective fund for interdisciplinary research announced the investment of £225m to tackle some of the most serious global challenges across 37 interdisciplinary projects. Development of this ambitious international research programme aims to grow research capacity around the globe and to strengthen and broaden skills and expertise to address specific challenges of developing regions. Each project is a collaboration between institutions in developing countries and the UK and they will lead to partnerships, ideas and knowledge that will outlast the life of the four-year programmes. NERC funded projects range from the application of the high-tech world of UK marine science to the fishery problems of the Western Indian Ocean to boosting African weather forecasting by training meteorologists.

On top of the Research Councils UK (RCUK) collective fund, the Biotechnology and Biological Sciences Research Council (BBSRC), Arts and Humanities Research Council (AHRC), Medical Research Council (MRC), ESRC and NERC drew on their individual GCRF allocations to support a call for Global Agriculture and Food Systems.

In July 2017, the partnership announced the award of £16m investment to 35 projects that will address a number of threats to the sustainable production of safe and nutritious food. Ranging from tackling pests and disease through to the sustainability of agricultural soils and the wider social context of food and farming, the complexity of the research requires a collaborative effort from a range of disciplines. This is an exemplar of research councils coming together to address broad international development challenges.

In April 2017, we partnered with ESRC, EPSRC and the Department for Business, Energy & Industrial Strategy (BEIS) to fund a new £8.6m research programme that will investigate ways to remove greenhouse gases from the atmosphere to counteract global warming. By evaluating the implications of a variety of options, the programme is addressing the challenges of climate change by providing world-leading, independent research to inform decision-making that will ensure future wellbeing and prosperity for the UK and internationally. Aligning with the UK's commitment to the 2015 Paris Agreement, this multi-disciplinary research embodies the research councils' shared commitment to working together to provide vital answers to society's most pressing questions.

The UK and China joined forces in September 2017 to develop the next generation of offshore renewable energy technologies. Researchers from both nations will work together on five projects to develop new technologies that will enable the safe, secure, cheap and efficient provision of clean energy. The collaborative, multidisciplinary three-year-long projects will use environmental science, technology and engineering to tackle key challenges affecting the development of offshore renewable energy systems and maximise their environmental and socio-economic benefits. NERC, EPSRC and the National Natural Science Foundation of China (NSFC) are supporting the projects, with UK investment amounting to nearly £4m, building on a successful history of international collaboration between the partners.

In recognition of the need to make the science we fund more accessible to non-expert audiences we launched the Evidence Synthesis Training pilot scheme in October 2017. We awarded grants to seven UK research institutes to deliver training to NERC-funded researchers that will develop capacity in the research community in the synthesis of evidence. This approach provides a robust mechanism for translating research into evidence to inform decision-making for business, policy and research.

NERC has decided, for safety reasons, that it would not staff its Halley VI Research Station during the 2018 Antarctic winter. This is the second time that a complex and unpredictable glaciological situation will disrupt the year-round operation of the station, which is located on a floating 150m-thick ice shelf. Access to the station is made extremely difficult during the winter months of 24-hour darkness, extremely low temperatures and the frozen sea. However our Antarctic summer research operation will continue as planned as we are confident of mounting a fast uplift of personnel should the need arise. Since the winter closure last season, BAS science and engineering teams have worked on solutions to secure long-term scientific data, including relocating scientific instruments and developing automated data capture technologies.

Public engagement and communications

Our science reaches across the globe and into all parts of our lives. During the year, our public engagement and communication programme has demonstrated this to a wide audience, helping to make environmental research more accessible by showcasing its relevance to society.

In 2017-18, we partnered with the UK Association for Science & Discovery Centres (ASDC) to develop a programme of activities that will explore the importance of environmental science in helping us understand our changing world. Together we launched 'Operation Earth' in September 2017, a two-year-long national programme that will engage, inspire and involve school-age children and their families with NERC's environmental research, and this has already reached thousands of families across the UK.

The programme highlights the relevance of contemporary environmental science issues to everyone's daily lives and to society's future. It is led by ASDC and three development partners, Dynamic Earth, the Eden Project and the Natural History Museum, with scientific expertise from NERC. Eleven of the UK's science and discovery centres and museums will deliver the activities, engaging over 100,000 children and adults throughout 2018. The activities aim to give young people and their families the confidence, curiosity and interest to continue to explore and ask questions into the future.

We also took another big step towards achieving our ambitious, long-term goals for public engagement with environmental research through the Engaging Environments programme. In October 2017, we awarded a total of £500,000 to six projects that will

equip the environmental research sector to deliver effective, national-scale public engagement activities. The projects will build consortia across 15 universities, three NERC research centres and a diverse range of partner organisations, and they will use a number of approaches, including audits, scoping, networking, and training. We are delighted to be funding such a range of innovative programmes and look forward to seeing these build bigger, better and more meaningful engagement in the enormous range of environmental topics that affect all of us.

In November 2017, we invited the public to meet NERC scientists at a free environmental science showcase in Edinburgh. 'UnEarthed' offered people of all ages the chance to get closer to the environmental science that shapes their lives. More than 100 scientists from across the country were on hand to share their research and demonstrate scientific equipment, from predicting the weather with the help of the University of Edinburgh's supercomputer technology to protecting our forests with the Royal Botanical Gardens, Edinburgh. Operation Weather Rescue, UnEarthed's flagship citizen-science project was also on show, thanks to the thousands of people that took part in digitising Victorian weather records. We also presented NERC research relating to air quality, natural resources, infrastructure and international policy at an event in Holyrood to engage the Scottish parliamentary audience.

The showcase featured strongly in the media, from a package on BBC Scotland to the Guardian's coverage of our UK-wide photo competition, significantly improving our reach. In total, over 7,000 members of the public got hands-on with environmental science at the event, including 1,100 school pupils and feedback showed that they learned a huge amount and appreciated the opportunity. The event was also invaluable in helping us articulate a clear identity and position for NERC, building our profile and influence by successfully driving awareness of the value and impact of NERC science, and strengthening our reputation as a leader in environmental science. We were delighted with the reaction to the UnEarthed experience and it has been our most successful showcase to date.

UK Research and Innovation

On 1 April 2018, NERC became part of UK Research and Innovation (UKRI). UKRI collectively will drive investment in mission-led research and innovation, bringing multiple partners and disciplines together to support UK prosperity and wellbeing. NERC will often play a lead role in shaping these mission-led challenges, priorities and solutions in UKRI. New funding for UKRI also allows NERC to think more ambitiously, more broadly and more generously about the solutions that environmental science, together with other disciplines, can bring for business and public sector services.

Professor Duncan Wingham
Chief Executive
22 June 2018

Sir Anthony Cleaver
Chairman

Going concern assessment

NERC's statutory financial statements have been prepared using accruals accounting in accordance with the UK Government's Financial Reporting Manual (FReM) for 2017-18 and the accounts direction issued by the Secretary of State.

Under the Higher Education and Research Act 2017, UK Research and Innovation (UKRI) incorporated the assets, liabilities and functions of the seven Research Councils, Innovate UK and Government's funding of research in higher education from 1 April 2018. Confirmation of UKRI's budget allocation for 2018-19 to 2020-21 was received from BEIS which shows continued funding for the functions exercised by NERC. As such it remains appropriate for the NERC financial statements to be prepared on a going concern basis. Further details can be found in Note 1.3 Going Concern in the Financial Statements.

Financial summary

NERC concludes the accounting period with a balanced financial position with a 0.0% variance compared to available budget for near cash and capital. There is a non-cash surplus of £6.2m. A comparison with the previous accounting period is shown in Table 1.

The reconciliation between NERC's outturn with its Annual Accounts for 2017-18 is shown in Table 2.

Table 1: NERC outturn 2017-18 and 2016-17 comparison

	2017-18 £000	2016-17 £000
Science budget	501,890	416,109
Other BEIS funding	7,551	16,265
Earned income	71,134	70,356
Total funding	**580,575**	**502,730**
Expenditure	574,326	507,676
(Deficit) / Surplus	**6,249**	**(4,946)**
Variance (%)	1.1%	-1.0%
Surplus excluding non-cash	*94*	*33*
Variance (%) excluding non-cash	*0.0%*	*0.0%*

Table 2: NERC outturn and annual accounts reconciliation 2017-18

	2017-18 £000
Net expenditure[1]	392,311
Provision movements	270
Other BEIS funding[2]	(7,551)
Direct Capital	110,644
NBV capital disposals	(33)
Outturn	**495,641**
Science budget	501,890
Reported surplus[3]	**6,249**

Notes:
1. Taken from the Statement of net expenditure for the year ended 31 March 2018.
2. Includes BEIS notional costs of £5,643k.
3. Reported surplus of £6,249k comprises of £94k near cash surplus and £6,155k non-cash surplus.

Forward Look

The coming year will see significant change to the funding landscape in which NERC operates. As set out in the Higher Education and Research Act 2017, the creation of a new organisation – UK Research and Innovation – took place in April 2018. Operating across the whole of the UK and with a combined budget of more than £6bn, UKRI brings together the seven Research Councils, Innovate UK and a new body, Research England. The organisation's ambition is to be the best research and innovation agency in the world, building on the strengths of its component parts and providing a strong, unified voice.

NERC has a proud record of advancing understanding of the environmental system, identifying environmental problems and informing policy/regulation. NERC-funded environmental science is already among the best in the world. Now we will show greater ambition and leadership in building solutions to environmental problems locally and across the world. We will work with industry, government, wider society and across the UKRI councils to deliver a clean and productive economy, a healthy and resilient environment, and improve wellbeing – for everyone, everywhere.

Collaborative working

NERC will continue to build on national and international collaborations in the coming year in order to deliver its strategic priorities. For example, the $20m programme NERC and National Science Foundation (US) are co-funding to substantially improve both decadal and longer-term (century-to multi-century) projections of ice loss and sea-level rise originating from Thwaites Glacier in West Antarctica. The research will have a direct and significant impact on understanding the stability of marine ice sheets and specifically the West Antarctic Ice Sheet near Thwaites Glacier, and will contribute to the ice-sheet modelling community toolkit to narrow the uncertainties in sea-level projections. The programme will also directly contribute to improving risk assessments that coastal communities need for decisions about adaptation and long-range planning.

NERC has launched a new programme this year on Emerging Risks of Chemicals in the Environment. There are many tens of thousands of chemicals that we use in our homes, industries and food systems and the market is growing by about 2,000 new compounds per year. The potential environmental impact of these chemicals is very poorly understood. In collaboration with Defra, Environment Agency, Scottish Environmental Protection Agency, Natural Resources Wales and the UK Water Industry Research group, this programme will be researching novel risks that are arising from chronic lifetime exposures to the multitude of new chemicals and aims to develop a predictive capability to support the management of chemicals in the future.

The extension and expansion of the Newton Fund in recent years has presented numerous opportunities and has enabled NERC to contribute further to the delivery of the UK's Official Development Assistance (ODA) objectives. The Understanding the Impacts of Hydrometeorological Hazards programme is an example of a multi-national, multi-partner collaboration supported by the Newton Fund. It involves five research programmes that aim to improve understanding of the impacts of hazards, such as floods, droughts, landslides and storm surges, in Indonesia, the Philippines, Vietnam, Malaysia and Thailand. This improved understanding will enable increased preparedness and resilience to future events.

In the last year, NERC has been developing new collaborations with Peru and Colombia, through the Newton Fund. Peru hosts 71 per cent of the world's tropical glaciers and relies on glacial runoff to provide water for drinking, agriculture, hydroelectricity and industry. This supply of water is now at risk due to significant reduction in the surface area of glaciers in the Peruvian Andes. Changes in glacial runoff are also leading to increased risks from glacial outburst floods and glacial avalanches. The NERC Peru collaboration will be undertaking research to understand the rate of glacial retreat in Peru and the impact of this on water security and natural hazards. NERC and AHRC are also working with two Colombian regional funding agencies on a programme on Exploring and Understanding Colombian Bio Resources. This seeks to improve our understanding of socio-ecological systems, their response to environmental change and the underpinning role and value of biodiversity in these ecosystems.

Major projects

After receiving Ministerial approval in October 2017, NERC moved into the preparation phase of the Governance, Responsibilities and Ownership programme. We will now progress all the activities required to demonstrate readiness of CEH and NOC to transition to independent institutes. 'Readiness to implement' will be tested in Gateway 4 and the resulting business case submitted for ministerial review and approval.

NERC also looks forward to celebrating two major milestones in the construction of the RRS *Sir David Attenborough* in 2018. The first is the 'Hull in the water'

launch in summer 2018 where key stakeholders and selected business guests will come together to celebrate the successful completion of an iconic construction milestone. The second is the Royal ceremonial naming in autumn 2018 which will be a high profile public event involving stakeholders, the media and the science community.

Environmental management strategy

As a publicly funded body, NERC has a responsibility not just to our staff, grant holders and partners, but also to society. By acting with the highest standards across all our operations and investments, we build on our public mandate to deliver excellent science.

The science NERC supports benefits the environment. It also comes with an environmental cost. We aim to continue to improve the way we manage our environmental impact to minimise this cost, without reducing the quality or quantity of the research supported. At its December 2017 meeting, NERC Council agreed an environmental management strategy that describes our approach to managing the environmental impact of our operations and investments across short term (to 2020), medium term (to 2030) and long-term (2050) horizons. The strategy focuses on four themes (climate, resource use, living systems and quality of life) and requires NERC to set initial baselines in seven key areas (carbon emissions, waste, water, plastics, food, NO_x, and Sulphur emissions) before implementing specific commitments.

Performance Analysis

NERC regularly monitors, evaluates and reports on progress against its mission objectives, strategy and delivery plan. This informs our decision-making and demonstrates we are investing public funds effectively and efficiently to make economic and social contributions both in the UK and internationally.

The current delivery plan lays out budgets and investment priorities for the period 2016 to 2020. After April 2018, NERC's strategic objectives will be set in the wider UKRI context. However, NERC will continue to deliver its priorities by investing in world-leading research, skills and innovation that enables UK business, government and citizens to benefit from natural resources, build resilience to environmental hazards, manage environment change, discover new knowledge, and promote sustainable development.

The impact of our research

Details of the impact of our funding are published in the 2017 Impact Report, available at **https://nerc.ukri.org/about/perform/reporting/reports/impactreport2017/**. Highlights include:

- **NERC invests in the best of the best** – UK environmental science leads the world on field-weighted citation impact according to latest (2017) Elsevier study.

- **NERC science delivers prosperity and wellbeing throughout the UK** – The value of our work is felt throughout the country. Our analysis highlights examples of impact from every part of the UK, showing how NERC science has delivered real benefits to people, economies and the environment.

- **NERC science maximises gains for UK infrastructure while minimising risks to and from the natural environment** – Infrastructure shapes our lives and is the foundation upon which our economy is built. NERC solutions for UK energy, transport and other infrastructure deliver extensive benefits for owners, operators, regulators and users that improve people's quality of life and boost the economy. The report shows how they have provided cost savings, safety improvements, increased revenues and resilience.

- **Cutting-edge science saves lives and money through better weather forecasting** – Accurate prediction of short-term weather patterns and longer-term climate trends is crucial to the UK's prosperity, competitiveness and resilience. Our analysis shows that NERC science is key to the delivery of an estimated £680m of annual benefits through its role in enabling the Met Office to provide a world-leading weather and climate service.

- **NERC delivers top talent and skills** – NERC PhD investment keeps the UK competitive and innovative. NERC analysis shows that seven years after graduation 40 per cent of NERC PhDs are working outside academia, including 25 per cent in the private sector. We profiled people who are using the skills developed during their PhDs to deliver benefits by working in the Met Office, and by contributing to infrastructure development.

- **NERC engages the public to benefit science and society** – Our report shows how NERC's latest activities have delivered public engagement outcomes that benefit science and the contribution it makes to national life.

Environmental science for a changing world

NERC fosters UK and international partnerships so that scientists, business, government and civil society can work together to address the challenges and opportunities of managing the environment; co-design and co-deliver new environmental science; find and apply existing scientific knowledge; and drive UK innovation, jobs, economic growth and societal wellbeing.

In 2017, NERC launched its £10m programme, 'Changing Arctic Ocean', demonstrating a commitment to high-quality research in the Arctic region and developing an understanding of how this complex marine environment is changing in response to global climate change. Research into the impacts of stressors on Arctic marine ecosystems – including diminishing sea ice, ocean acidification and pollutants – will help scientists understand and predict future environmental change. The programme will be vital to understanding how to manage environmental change globally and will inform appropriate decision-making on the use of natural resources.

NERC continues to work collaboratively with other Research Councils and international partners on programmes such as the Atmospheric Pollution & Human Health in a Chinese Megacity programme (APHH China). With a joint investment of around £12m, NERC, MRC, and NSFC will deliver this Newton Fund programme, making the UK the first international partner to commission research with NSFC at such a high level. The programme is also significant to policy makers as it will challenge existing models used for predicting air pollution.

Innovation

NERC has continued to work across the innovation ecosystem to enhance the impact of our research, transforming the knowledge, data, capabilities and skills of our community into innovative value-adding approaches, tools and solutions for UK business, policy-making and regulation.

Working in partnership with ESRC and the Department for International Development (DFID), NERC has co-developed and co-funded a disaster risk financing call. This led to an investment of £1.8m in seven projects, drawing from environmental science to inform the design of disaster risk financing instruments. This is currently a topic of global significance, as demonstrated at the 2017 UN Climate Conference with the launch of the 'InsuResilience Global Partnership for Climate and Disaster Risk Finance and Insurance Solutions'. In July 2017, the Prime Minister announced a new London-based Global Centre for Disaster Protection that will be developed by DFID and will support developing countries in risk assessment and development of financial planning and instruments (e.g. insurance).

Over the past year, NERC has co-funded 14 innovation placements with businesses, NGOs and government bodies, further strengthening our relationships with partners. The focus of the placements is to accelerate and amplify economic impact and improvements in quality of life from NERC-funded research. The 2017 Innovation placement call saw a 160 per cent increase in applications, a 33 per cent success rate and attracted more senior researchers than in previous years.

NERC has also sought to increase and accelerate the uptake and impact of NERC-funded research outputs - including via commercialisation – through its call on 'Enabling Innovation in the UK and Developing Countries'. Projects could be purely UK-focused or aimed at improving economic growth and welfare in developing countries, fulfilling part of NERC's ODA commitments. This is part of a range of activities supporting broader community preparation for large-scale UKRI collective funds (e.g. GCRF). Twelve international and six UK proposals were funded including:

- Care for the Land project - Realising land management change in degraded Maasai grazing lands (international project);
- Scaling-Up National Assessment of Emergency Response Accessibility During Flooding (domestic project)

In 2017, NERC announced its 'Innovative Monitoring Approaches' Call, an investment of up to £3.5m for projects tackling industry, policy, regulator or other relevant 'end-user' challenges. The call is a cross-Innovation Programme investment (Environmental Risks to Infrastructure Innovation Programme (ERIIP); the Innovation Programme in Oil and Gas (IPOG); and an initial activity to test the feasibility of innovation projects in renewable energy) and will involve nearly 200 project partners covering oil and gas, defence, utility, manufacturing, transport, engineering, and IT companies.

We have undertaken a review of NERC's Innovation Programme mechanism to inform the identification, scope and development of the programme's future activity. We identified a number of key strengths, indicating that the programme provides:

- A welcome platform for academic-industrial collaboration focussed on 'real-world problems that are aligned with stakeholders' needs'.
- Close alignment of Programme Members' (industry) and Principle Investigators' (academic) motivations for involvement and NERC's translational objectives.
- A Programme Coordinator with deep domain knowledge and extensive contacts.

Changes planned because of the review include:

- Raising the scale and ambition of innovation mechanisms, standardising the routes by which we recruit programme members and adopting an explicit co-design and implementation approach.
- Evolving the scale of our support to enable impact at scale and across the right timeframes.
- Trialling more flexible ways of funding, including considering mid-point reviews, to allow fund allocation in the most effective and efficient way.

Strategic research programmes

Strategically directed research provides the knowledge needed to meet the greatest challenges facing society. NERC funds programmes that help business, government and society benefit from natural resources and ecosystem services, build resilience to environmental hazards, and manage environmental change. NERC works with national and international partners to co-design, co-fund and co-deliver programmes that meet UK stakeholder needs and leverage additional funding, drawing upon the world-leading excellence and creativity of the UK researcher base.

NERC is investing £7m in 'Role of the Southern Ocean in the Earth System' (RoSES), a five-year research programme which aims to substantially reduce uncertainty in 21st century global climate change projections through improved assessment of the Southern Ocean carbon sink. The research will provide the scientific basis to inform international

climate policy on the role of the Southern Ocean in 21st century global climate change. By substantially reducing uncertainty in projections through improved assessment of the Southern Ocean carbon sink, RoSES will bolster the UK's capacity to encourage other nations to strengthen their emission reduction ambitions through the five-year review and 'ratchet' mechanism.

Defra, the Environment Agency, the Scottish Environment Protection Agency, the Welsh Government and Natural Resources Wales have co-designed the Natural flood management (NFM) programme with NERC. The goal of the proposed programme is to improve understanding of the suitability and effectiveness of different NFM measures for a range of flood risk scenarios. The outputs of the programme will fall into two categories: novel methodologies that can be applied to a range of catchments and the location specific information on flood risk that will be generated by case studies. The novel methodologies are expected to be of particular interest to policymakers, measuring authorities, large landowners (such as the National Trust and the Royal Society for the Protection of Birds), and environmental consultancies who have an interest in flood management in a number of regions.

NERC's highlight topics focus strategic research on a defined subject area. Based on ideas from the science community, they can be up to £4m in value and four years in length. Current examples include:

- **Closing the global methane budget** – The objective of this highlight topic is to understand the difference between estimates derived from process studies of methane sources ('bottom up') which are 20 per cent higher than those from direct observation of the air ('top down'). This is being undertaken through new observations and further analysis of existing data.

- **Environmental pathways, impacts and fate of manufactured nanomaterials** – The aim of this highlight topic is to increase the understanding of how manufactured nanomaterials (NMs) behave in the real world. The outcomes of the research should help to inform the development of management strategies and policies that minimise the environmental and health risks of NMs without overly precautionary regulation.

- **New insights into space weather impact on UK national grounded infrastructure** – This work aims to enhance our geophysical understanding of how the UK near-surface and subsurface responds to severe space weather, information that will ultimately lead to tools for assessing space weather impacts on grounded infrastructure, together with industry and other partners.

- **Reducing uncertainty in the integrity of potential carbon capture and storage sites** – This highlight topic aims to improve knowledge of the integrity of the sedimentary overburden of potential CO_2 storage reservoirs in the North Sea region.

National capability

National capability (NC) funding describes the element of NERC-funded activity directly procured by NERC due to a combination of its scale and complexity. These features result in a need for NC provision with a critical mass of size and budget that makes direct procurement the only practical option.

NERC NC comprises: NC-science, which integrates over at least national and decadal time-scales; NC-large-scale research infrastructure such as ships; smaller-scale NC-services, facilities and data that provide a service to the environmental science research community; and delivering NC-national and public good activities, which comprise advice to government departments and wider information to the public at large. Budgets for these four NC categories are determined by NERC Council as part of its business planning to deliver NERC's strategy.

Achievements in 2017-18 include:

- New capital was awarded by BEIS in 2017-18 for:
  - **EISCAT_3D** – £6.2m has been allocated for this award to be delivered collaboratively through the EISCAT Scientific Association. The collaboration will deliver a new world-leading radar in Europe to monitor and improve understanding of the Earth's atmosphere and space weather. It will also provide essential validation for new models under development to forecast space weather. This information is critical to reducing the risks posed to the communications systems, satellites and power grids, which we all rely on.
  - **Ion Microprobe** – £2.9m has been allocated for this capital investment that will support the purchase of a new ion microprobe to perform high precision / high throughput measurements of geological samples. This new investment will provide access to the whole NERC community, to be hosted at Edinburgh University through the Edinburgh Ion Micro-Probe Facility, who will develop new laboratory facilities around the equipment.

- NERC's Arctic Research Station has been reclassified within the NERC NC portfolio to Large-scale Research Infrastructure (NC-LRI) and has been commissioned on a ten-year basis from spring 2018. The station continues to provide laboratory space, equipment and field support to facilitate UK environmental research in the Arctic.

- A major upgrade is being made to double the storage available in JASMIN – a globally unique data intensive supercomputer for environmental science funded by NERC. The upgraded system will support the global analysis of the next generation of climate models and provide a venue for UK academia and industry to exploit Earth observation data. It will also continue to provide the 'UK environmental data commons' - an online collaborative space bringing together data, algorithms and expertise – underpinning much of academic environmental science.

- In April 2017, NERC confirmed the £31m capital investment in the UK Geoenergy Observatories project. Commissioning is underway to establish the two centres in Cheshire and Glasgow. The facilities will allow independent, rigorous and replicable observations of subsurface processes and stimulate research on underground energy technologies, answering vital questions about how they affect the environment, and contribute to the responsible development and management of new energy technologies both in the UK and internationally.

- In 2016-17, NERC commissioned all six of its centres to undertake work in low income countries as part of NERC's commitments to undertake ODA eligible research; this work is now underway. Projects are addressing challenges faced by emerging economies to strengthen resilience and response to crisis. Challenges include: Risk assessment and early warning for atmospheric hazards (NCAS); Geoscience for sustainable futures (BGS); Challenges for coastal communities (NOC/PML/MBA); Polar expertise supporting development (BAS); Sustainable use of natural resources to improve human health and support economic development (CEH); State of the art Earth Observation for addressing ODA need (NCEO).

In September 2017, NERC completed a review of its Services and Facilities (S&F) portfolio, drawing on advice from an independent strategic advisory group of expert users which was set up to assess future requirements for the S&F portfolio, evidence from the 2016 S&F evaluation and input from a community consultation. Plans for NERC support of each service and facility have been developed in order to maintain a world-class portfolio of S&F for the UK environmental science community. Consequently, some S&F will remain essentially the same, others will change, and strategic opportunities for new NERC S&F will be explored.

The first round of S&F commissioning took place in autumn-winter 2017, with the following facilities commissioned for a five-year period from 1 April 2018. Further rounds of commissioning will take place through 2018 for funding to begin in April 2019. Those facilities commissioned in the first round are:

- Atmospheric Measurement Facility (AMF)
- Chilbolton Facility for Atmospheric & Radio Research (CFARR) & Mesosphere Stratosphere Troposphere Radar Facility (MSTRF)
- European Incoherent Scatter Radar UK Support Facility (EISCAT)
- Geophysical Equipment Facility (GEF)
- Ion Microprobe Facility (IMF)
- Culture Collection of Algae and Protozoa (CCAP)

Discovery science

Discovery science – research driven by curiosity rather than by high-level strategic priorities - leads to fundamental advances in our knowledge of how the Earth works in the past, present and future and underpins the world-leading position of UK environmental science. It has repeatedly delivered lasting benefits to our economy, society and wellbeing that were unforeseen when the research began. NERC's large grants support adventurous, large-scale and complex research projects costing up to £3.7m, tackling big science questions that other NERC funding opportunities cannot address.

Throughout August 2017, NERC's BAe146 aircraft (operated by the Facility for Airborne Atmospheric Measurements) provided support for 'Cloud and Aerosols Radiative Impact and Forcing' (CLARIFY), a major consortium programme consisting of five UK universities, the UK Met Office and numerous international project partners. The aircraft measured aerosols from biomass burning around the remote Ascension Island, providing information on the physical properties of the aerosols and the atmosphere in the South East Atlantic. This will contribute to a better overall understanding of global climate and weather systems.

NERC awarded an urgency grant in 2017 for a project investigating the effects of a large oil spill on the coastal marine ecosystem in the Mediterranean Sea (10 September 2017, Agia Zoni II, Greece). This presented a rare opportunity to study in situ the impact of a large oil spill in natural settings. It was recognised that the project could enable the design of better oil remediation and management strategies for future spills, limiting the damage caused to coastal environments and marine life.

Communications and public engagement

During 2017, the Communications and Engagement function worked across NERC to build the profile and

influence of the organisation and of environmental science. Building on the experiences of recent years in delivering stakeholder events, showcases, media campaigns and pilot public engagement activities, we were able to develop targeted activities to engage key audiences.

This year saw good relationships built with parliamentary organisations to enable greater access to environmental science and NERC expertise to elected representatives and their staff and a strong NERC profile with these groups via events in Westminster and Holyrood parliaments. For example our Westminster reception had a very high parliamentary attendance rate, ten of whom were MPs, five were Peers, two Chief Scientific Advisors and two MP researchers. The relationships we have built with the Parliamentary Office of Science and Technology and All-Party Parliamentary Groups (APPGs) have also been successful, leading to an invitation to run a parliamentary briefing session and requests for our researchers to sit on advisory boards for two APPGs.

We moved our public engagement programme from its pilot phase to delivery, awarding our first major grant round and launching, with partners, a new environmental science show in science centres and museums around the UK. Our annual showcase was strongly targeted at engaging audience groups who are often unable to access science by providing specially created content, local connection and removing financial barriers to engagement. The supporting media campaign ensured a broad audience reach and visibility of the event.

We also worked during the year on collaborating and developing processes for working with the other Councils who form UKRI, so that we could prepare for the new organisation and be part of its strong single voice for research and innovation.

Postgraduate training

Doctoral training equips the next generation of researchers with essential knowledge and skills for UK science, business and government across all sectors of the economy. NERC invests around £27m a year in postgraduate training funding, with over 1,500 students at any time in universities, research institutes and industrial partners.

In October 2017, NERC announced investment in a Centre for Doctoral Training (CDT) in freshwater bioscience and sustainability. The CDT will train the next generation of UK environmental scientists in the specialist, interdisciplinary and transferrable skills necessary to monitor, evaluate, and sustainably manage freshwater resources to meet the needs of the wide range of relevant stakeholders in this sector.

Thirty-five CASE studentships were funded through the 2017 CASE Studentship competition. CASE studentships provide doctoral students with a first-rate, challenging research training experience in the context of a mutually beneficial collaboration between academic and non-academic partner organisations.

Thirteen fellowships were funded through the 2017 Independent Research Fellowships competition. This scheme is designed to develop scientific leadership among the most promising early-career environmental scientists. It gives all fellows five years' support, which will allow them sufficient time to develop their research programmes and to establish themselves as research leaders.

Enabling change

To deliver our strategic goals for excellence, impact and efficiency, NERC has undertaken a programme of self-assessment and continuous improvement during the year. That programme, which has assessed themes ranging from our internal organisational structures to our funding mechanisms, has helped to ensure that our organisation is fit for the future, regardless of what that future holds.

NERC also continues to work with other research councils, BEIS and other partners to ensure that projects, proposals and change programmes align with the direction of travel indicated by the Higher Education and Research Act.

This year, NERC has reformed BGS's funding, commissioning and governance arrangements, establishing a new, more arm's-length relationship between NERC/UKRI and BGS, but without legal separation. This will better enable:

- NERC to focus on its role in funding/commissioning excellent science;
- BGS to have more responsibility for its own future;
- BGS to exercise any additional freedoms and flexibilities agreed with government; and
- BGS to pursue its mission – which is different to other NERC research centres – including recognition of the differences between National & Public Good (NPG) and research activities.

As set out in the Forward Look, NERC is also progressing activities required to demonstrate readiness of CEH and NOC to transition to independent institutes as part of the wider GRO programme.

Grants, fellowships and studentships

NERC continues to monitor the impact of the demand management measures implemented in 2015 for discovery science standard grants. Designed to reduce the number and size of proposals from research organisations and to raise the grant success rates, they ensure research excellence, efficiency and value for money for the taxpayer.

NERC is continuing to monitor success rates across gender and diversity groups to identify any bias in NERC policies or review systems. A study was undertaken in 2017 to better understand the equality and diversity characteristics of the environmental science community. There continues to be a lower proportion of female applicants than male applicants involved in research grant applications, except for early-career applications, but that reflects the lower proportion of women to men in mid- to senior-academic positions in environmental sciences. Trend data have shown that the proportion of women applying for research grants, and their subsequent success rate, remain relatively constant. A higher proportion of fellowship applicants are female (reflecting the higher proportion in the community at that career stage) and their success rate has remained higher than that for male applicants again this year.

Discovery science grant applications and success rates

	2017-18	2016-17
Number of proposals	455	511
Number of grants	101	113
Total £k	45,733	47,301
Success rate %	22	22

Success rates for grants by gender

	Men	Women
Number of proposals	820	256
Number of grants	234	64
Success rate %	29	25

Success rates for fellowships by gender

	Men	Women
Number of proposals	93	44
Number of grants	6	7
Success rate %	6	16

Directly employed staff by gender as at 31 March 2018[1]

	Men	Women
Directly employed staff	1,476	1,018
%	59	41

Staff, students and fellows

	2017-18	2016-17
Directly employed staff	2,494	2,496
Staff in research organisations[2]	3,808	3,501
Fellows	118	84
PhD[3]	1,549	1,346

1. NERC is committed to equality, diversity and inclusion as an employer, decision-maker and funder and in March 2018 published a report on the average hourly pay and bonuses of male and female employees, known as the 'gender pay gap'. The report includes our next steps to reduce the gender pay gap at NERC and is available at: https://nerc.ukri.org/about/policy/foi/staff/gender-paygap-report/
2. Headcount of all academic and research staff named on research grants that were active at the end of the financial year.
3. PhD data are based on number of students directly funded by NERC grants. These do not include co-funded studentships where another funder administers the award. PhD data are recast annually to include studentships that had not previously been entered into the system, by award holders, at the time of publication. The figures for 2017-18 are higher than those for previous years; this reflects the increased numbers of co-funded studentships following the adoption of the Doctoral Training Partnership and Centre for Doctoral Training models for delivering postgraduate training and the increasing number of students being funded through these mechanisms each year as old training schemes conclude.

Science budget expenditure in research organisations (£000)

	Total
University of Leeds	19,514
Science & Technology Facilities Council	11,061
University of Edinburgh	9,732
University of Exeter	9,483
University of Oxford	9,339
University of Bristol	9,119
University of Reading	7,580
Imperial College London	7,228
University College London	7,092
The University of Manchester	6,682
University of York	6,576
University of East Anglia	5,971
University of Southampton	5,553
Plymouth Marine Laboratory clg	5,535
University of Cambridge	5,078
University of Leicester	4,946
University of St Andrews	4,794
Lancaster University	4,076
University of Liverpool	3,943
Engineering & Physical Sciences Research Council	3,931
University of Sheffield	3,902
University of Birmingham	3,645
University of Durham	3,190
Eiscat Scientific Association	3,100
Biotechnology and Biological Sciences Research Council	2,862
University of Newcastle Upon Tyne	2,381
Cranfield University	2,072
University of Aberdeen	2,012
Natural History Museum	1,905
Cardiff University	1,685
University of Glasgow	1,525
Heriot-Watt University	1,442
The Scottish Association for Marine Science (SAMS Group)	1,368
Met Office	1,300
University of Southampton	1,185
University of Plymouth	1,117
Bangor University	1,112
University of Stirling	933
University of Nottingham	909
University of Warwick	817
Queen Mary University of London	761
Aberystwyth University	730
North Wyke Research	728
University of Sussex	702
King's College London	673
University of Bath	660
University of the West of England	637
Medical Research Council	626
Marine Biological Association	612
University of Essex	606
Other research organisations	13,446
Research Centre awards	14,742
Total	**220,618**

How we spent the science budget (£000)*

National Capability	
Large Research Infrastructure	
Facility for Airborne Atmospheric Measurement	3,553
National Marine Facilities	16,177
Services, Facilities & Data	16,322
National Public Good	9,444
Long Term Science	30,845
Long Term Science Multidiscplinary	7,399
National Capability GCRF	6,500
International Subscriptions	
International Institute for Applied Systems Analysis	728
Integrated Ocean Drilling Programme	2,600
Other Subscriptions	574
NERC Corporate Activities	484
Sub-total	**94,626**
National Capability – Antarctic Logistics and Infrastructure (ALI)	
Large Research Infrastructure	31,433
National Public Good	1,425
Long Term Science	454
Sub-total	**33,312**
Discovery Science	
Standard Grants	36,764
Large Grants	11,033
Discovery Science ODA	2,751
Discovery Science Other Funding Activities	2,070
Sub-total	**52,618**
Strategic Research	
1.5°C Pathways and Impacts	395
AMR in the Environment	1,485
Analytical Science & Technology PhD Studentships	23
Arctic Ocean	2,521
Arctic Programme	383
Atmospheric Pollution & Human Health in a Chinese Mega-City	812
Atmospheric Pollution and Human Health in an Indian Mega-City	59
Big Data	1,041
Biodiversity & Ecosystem Service Sustainability	27
Biosphere Evolution, Transitions and Resilience	997
Carbon Capture & Storage	1,116
Chile Ecosystems	417
Climate Predictability and Inter - Regional Linkages	666
Coastal Morphology	1,070
Drivers of Variability in Atmospheric Circulation	749
Ecology of Infectious Diseases	55
Ecosystem Services for Poverty Alleviation (ESPA)	665
Environmental DNA	808
Environmental Microbiology and Human Health	1,428
Environmental Nanomaterials	823
Evolutionary Biotic Response	1,371
Flooding from intense rainfall	149
Freshwater Ecosystems	794
Future Climate for Africa	989
Greenhouse Gas Emissions	137
Greenhouse Gas Removal	2,560
Human modified Tropical forests	1,100
Ice Sheet Stability	195
Integrated Autonomous Observing	327
Macronutrient Cycles	201
Magmatic-Hosted Ore Deposits	961
Marine Ecosystems	868
Mathematics and Informatics for 'omics	740
Methane Budget	868
Mineral Resources	1,673
Natural Flood Management	468
Natural Hazards	285
Ocean Acidification	72
Ocean Shelf-Edge Exchange	37
ODA CZO (Sustaining Soils)	263
ODA India Water Resources	178
Radiation Belts	899
Radioactivity and the Environment	418
RAPID-AMOC (Atlantic Meridional Overturning Circulation)	1,056
Resilience of the UK food system in a global context	1,500
Resource recovery from Waste	809
Role of the Southern Ocean in the Earth System	1,281
Science for Humanitarian Emergencies and Resilience (SHEAR)	821
Shelf Seas Biogeochemistry	341
Soil Security	2,680
South Asian Monsoon	872
Space Weather	893
Strategic Research Development Fund	198
Strategic Research Other Funding Activities	2,907
Technologies Proof of Concept Phase 2	512
Tree Health	273
Trends in Surface Temperature	888
UK Droughts	829
UK IODP Phase 3	2,105
UKERC III	436
Understanding Atmospheric Convection across Scales	1,042
Valuing Nature	1,666
Volatiles, Geodynamics and Solid Earth Controls on the Habitable Planet	1,718
GCRF El Nino	632
GCRF Global Agri Food Systems	132
GCRF Infections, NCDs and VBD	500
Sub-total	**55,184**

Post Graduate Training	
Doctoral Training Partnerships	18,518
Centres for Doctoral Training	1,886
CASE Studentships	2,718
Advanced Skills Training	1,382
Post Graduate Training Other Funding Activities	770
Sub-total	**25,274**
Fellowships	
Fellowships	7,793
Innovation	
Enabling Research Organisations	4,675
Innovation Programmes	7,460
Innovation Other Funding Activities	6,781
Innovation GCRF	703
Sub-total	**19,619**
Ringfenced – Newton	
Newton APHH in a Chinese Mega-City	958
Newton APHH in an Indian Mega-City	1,773
Newton Brazilian Biomes	690
Newton CZO (Sustaining Soils)	1,175
Newton Exploring & Understanding Colombian Bio Resources	5
Newton Food Security	197
Newton Increasing resilience to hydrometeorological hazards	25
Newton India – UK Water Quality Research Programme	278
Newton India Water Resources	967
Newton Minerals	454
Newton Natural Hazards	1,008
Newton Peruvian Glacial Retreat	37
Newton Programme Delivery	333
Newton RCUK Brazil	36
Newton RCUK Chile	168
Newton RCUK South East Asia – Indonesia	383
Newton RCUK South East Asia – Malaysia	150
Newton RCUK South East Asia – Thailand	116
Newton RCUK South East Asia – Vietnam	353
Newton RCUK Turkey	182
Newton Sustainable Gas Futures	318
Newton Wallacea	43
Sub-total	**9,649**
Ringfenced – other programmes	
NPIF PhDs	1,167
NPIF Research Talent	937
MAS – Oceanids	350
GCRF Collective Fund	1,963
Sub-total	**4,417**
Public Engagement	**767**
Enabling Change	**4,560**
Administration costs	**11,856**
Non-Cash	
Depreciation	38,247
Amortisation	669
Impairments	109
Foreign Exchange Gains	-30
Sub-total	**38,995**
Capital Grants	
Equipment, well found labs, Research Centres,	15,787
JASMIN	8,000
Ion Microprobe	2,755
MAS – Oceanids	2,238
Sub-total	**28,780**
Capital Income	
Antarctic Logistics and Infrastructure Partition	-2,021
Capital income – NERC other	-399
Sub-total	**-2,420**
Capital	
Antarctic Logistics and Infrastructure	
Partition	2,964
RRS *Sir David Attenborough* and Associated Projects	79,828
Halley VI Relocation	967
Rothera Modernisation	859
Equipment, well found labs, Research Centres	15,557
UKGEOS	6,321
MAS – Oceanids	4,148
Asset Disposals	-33
Sub-Total	**110,611**
TOTAL NERC EXPENDITURE	**495,641**

Comprises:	
Resource **	385,030
Capital	110,611
Total	**495,641**

Notes

* This table shows how NERC has spent the BEIS science allocation. All figures are net of other income received.

** Resource figure differs from the net expenditure for the year by £7,281k, which is broken down as follows:

	£000
Other funding received from BEIS recorded as financing	7,551
Provision movements	-270
	7,281

Sustainability Report

Overview

NERC operates four wholly owned research centres located across the UK, which have multiple sites and operates research bases in Antarctica and the Arctic. In addition, it also funds a number of research projects based within the Higher Education sector.

NERC funded staff and students work around the globe in many diverse locations supported by a fleet of research ships and research aircraft.

Though the nature of scientific research may sometimes mean short-term environmental disruption, NERC is dedicated to making responsible, far-sighted decisions as long-term custodians of the environment, and sharing its decision-making processes to foster understanding.

Through a new Environmental Management Strategy agreed in 2017, NERC has made a commitment to minimise its environmental impact whilst continuing to ensure maximum scientific outcome and quality.

The strategy covers all NERC investments, as well as its own operations, and focuses on four themes: climate, resource use, living systems, and quality of life. It requires NERC to set initial baselines in seven key areas (carbon emissions, waste, water, plastics, food, NO_x, and sulphur emissions) and from there implement specific commitments over timescales up to 2050.

Summary of performance in 2017-18

In 2017-18 NERC has seen an overall decrease of 8 per cent in carbon emissions compared to 2016-17, which is driven by a reduction in conversion factors of 11 per cent and a real increase of 3 per cent due to small increases in energy consumption and business travel related emissions. There was a 25 per cent reduction in total waste produced and a reduction of 2 per cent in water consumed.

Progress towards 2019-20 Greening Government Commitments

NERC reports on a quarterly basis against the Greening Government Commitments (GGC). NERC is committed to meeting these targets and exceeding them where possible.

Greening Government Commitment: To reduce total greenhouse gas emissions across UK operations by at least 40 per cent by 2019-20 from a 2009-10 baseline.

Progress: In 2017-18 NERC reduced carbon emissions by 24 per cent when compared to the 2014-15 baseline. Energy consumption has reduced by 3 per cent compared to the 2014-15 baseline although there was a slight increase compared to 2016-17.

Greening Government Commitment: To reduce the amount of waste going to landfill to less than 10 per cent by 2019-20.

Progress: NERC has set a more challenging target of less than 5 per cent of waste going to landfill. In 2017-18 NERC sent 28 tonnes of total waste generated to landfill or 8.8 per cent of total waste generated, down from 20 per cent in our 2014-15 baseline year. This marks an improvement in our performance over the last two years through waste diversion and greater recycling efforts across the NERC Estate.

Greening Government Commitment: To continue to further reduce water consumption.

Progress: As a specific target had not been set, NERC set a target to reduce water consumption across the UK estate by 10 per cent by 2019-20 based on a 2014-15 baseline, standardised over floor area. In 2017-18 NERC reduced water consumption by 23 per cent when compared to the 2014-15 baseline. There was a small reduction in consumption compared to 2016-17, despite a major leak occurring at National Oceanography Centre (NOC) Southampton.

Greening Government Commitment: To reduce paper consumption by 50 per cent by 2019-20 based upon a 2009-10 baseline.

Progress: Works are ongoing to improve the quality of paper purchase data. Based upon the proxy 2014-15 baseline we reduced paper consumption by 46 per cent between 2014-15 and 2017-18.

Greening Government Commitment: Continue to buy more sustainable and efficient products and services with the aim of achieving the best long-term, overall value for money for society.

Progress: NERC have engaged UK SBS over the last year to create a Sustainable Procurement tracker based upon the criteria set out in ISO BS 20400:2017 – International Guidance for Sustainable Procurement. This will be reviewed an updated annually.

Greening Government Commitment: To provide commentary on activities taken to ensure climate change adaptation.

Progress: Centres are encouraged to adopt their own Climate Change Adaptation Plans. NOC Southampton has adopted a climate change adaptation plan over the last year.

Greening Government Commitment: To provide commentary on activities taken to promote sustainable procurement of food and catering services.

Progress: Centre activities include local food sourcing initiatives, composting, stocking Fairtrade goods and offering a range of vegan and vegetarian meals.

Greening Government Commitment: To provide commentary on activities taken to promote Sustainable Construction.

Progress: Centre activities include adoption of voluntary site waste management plans, BREEAM (Building Research Establishment Environmental Assessment Method) assessments for all new builds across the NERC Estate and building of environmental criteria into the procurement process.

Governance and certification

In 2017-18 NERC maintained the Carbon Trust Standard, committing the research council to year on year carbon reduction (measured at CO_2e).

The NERC Chief Operating Officer has board level responsibility for environmental management. As part of demonstrating its commitment to managing environmental impact NERC has created and adopted a new Environmental Management Strategy. This sets a holistic framework for environmental management across our investment portfolio, expanding it from focusing solely on our UK estate, and bringing within the range of NERC investments including grants and international operations. The NERC Director, Corporate Affairs, oversees NERC corporate responsibility at Board level and is now working in tandem with the Chief Operating Officer to implement NERC's new approach. To achieve this, NERC has allocated additional resource to ensure effective implementation of this strategy

including a Head of Corporate Responsibility and Environmental Sustainability and team. NERC will also work closely across UKRI to ensure good practice.

All wholly owned NERC Research Centres hold certification the ISO 14001: 2015 Standard for Environmental Management and NERC participates in the Carbon Reduction Commitment Energy Efficiency Scheme. NERC will leave the scheme this year following the creation of UKRI but will continue to pursue carbon reductions in line with new Environmental Management Strategy.

NERC maintains a 'cap' on domestic business flights currently set at 638 per year. In 2017-18, NERC logged 596 business travel flights which was the same as 2016-17. International travel is essential for some research activities that we engage in, we are striving to use alternatives and 'travel smarter' to reduce our greenhouse gas emissions and have not increased the total number of flights over the last year.

As part of the Greening Government Commitment, NERC reports its sustainability performance quarterly to BEIS (Department for Business, Energy & Industrial Strategy). As the result of changes to our environmental accounts and improved guidance the quality and breadth of our data submissions has improved notably over the last year.

Investment in sustainability

NERC continues to invest in new buildings and technologies to reduce energy usage, which has made a significant contribution towards meeting our targets.

Recent examples of NERC's continued investment to improve our environmental performance include:

- The UK's new polar research vessel, *Sir David Attenborough*, is designed to meet all current and anticipated future environmental legislation. Its power generators burn very low sulphur fuel and the exhaust gases are treated to minimise nitrogen oxides and sulphur oxide. The hull is painted with a high technology coating to maximise fuel efficiency and minimise bio-contamination. It has holding tanks and garbage treatment systems to avoid discharging pollutants. It has very low noise propulsion to minimise impact on sensitive marine life.
- Installation of new more efficient fume cupboards at the Centre for Ecology & Hydrology (CEH Lancaster), the NOC Southampton and the British Geological Survey (BGS) Keyworth.
- Lighting upgrades at all NERC Research Centres and Head Office.
- Commissioning of the company RAMBOLL to undertake an assessment of energy efficiency improvements that could be made at the British Antarctic Survey (BAS) Rothera Antarctic Base.
- Installation of new window controls at NOC Liverpool.
- Investment in electric vehicles and charging points.
- Refurbishment of the Head Office site restaurant include new low energy lighting and equipment.

Future opportunities

NERC seeks to further improve its environmental performance through implementation of its new Environmental Management Strategy. It will work with individuals from the Centres and wider investment portfolio to improve the quality of our environmental data collection and drive continual improvement. It will seek greater collaboration with its partners within UKRI, within higher education and government departments. NERC, as a Council of UKRI will work with the other UKRI Councils to explore the potential of obtaining the Carbon Trust Standard for UKRI.

Area		2017-18	2016-17	2015-16	2014-15
Greenhouse gas emissions (scopes 1, 2 and 3) (tCO_2e)[1]		10,001	10,907	12,272	13,094
Energy[2]	Consumption (in million kWh)	32.8	31.7	33.7	33.8
	Expenditure (£m)	2.1	2.3	2.2	2.4
Travel	Generation (tCO_2e)	1,187	949	827	917
	Expenditure UK business travel (£m)	2.2	2.2	2.0	2.1
Waste[3]	Generation (tonnes)	320	429	522	579
	Expenditure (£k)	247	255	357	287
Water[4]	Consumption – whole estate (m^3)	34,897	35,598	45,667	45,346
	Expenditure (£k)	89	106	134	137

Notes:
1. Greenhouse gas emissions include direct (scope 1) and indirect (scope 2) emissions from UK buildings and business related transport (scope 3). Emissions from ships, airplanes and overseas travel are not included.
2. Energy consumption includes gas consumption (scope 1) and electricity consumption (scope 2).
3. Waste generation consists reused/recycled waste, waste landfill, incinerated/energy from waste and hazardous waste.
4. Consists of water consumption for the whole UK – predominantly specialist non-office – estate.
5. Quarter 4 data is part estimated due to invoice availability and the time of report publication.

Professor Duncan Wingham
Chief Executive and Accounting Officer
22 June 2018

Accountability Report

Corporate Governance Report

Directors Report

Statutory disclosures

In accordance with the Companies Act 2006, the following statutory disclosures are presented for the accounting period 2017-18:

Pensions

NERC's pension schemes are discussed in the Remuneration and Staff Report.

Directors, governance and risk

Full details of NERC directors, management board, governance and risk are included in the Remuneration and Staff Report and Governance Statement within the Annual Accounts. The NERC policy on risk is disclosed in Accounting Policy 1.6 Financial Instruments.

Significant interests

Potentially relevant significant interests of NERC's Council members where they are affiliated to other organisations are presented in the Remuneration and Staff Report to the main accounts and in Note 13 to the Annual Accounts. No issues regarding conflict with their managerial responsibilities have materialised. NERC's Council Secretariat manages a Register of Interests which is available on NERC's website **www.nerc.ac.uk/about/organisation/boards/council/membership/interests-register/**

Overseas operations

NERC itself has no branches outside the UK, although its research centre BAS operates several bases in the Antarctic and one in the Arctic.

Auditors

NERC's accounts are audited by the Comptroller and Auditor General who has been appointed under statute and is responsible to Parliament. The cost of the statutory audit was £80,000. No remuneration was paid to the external auditors in respect of non-audit work in 2017-18. Independent internal audit was provided by the Government Internal Audit Service. The total cost of internal audits undertaken during 2017-18 was £186k. No remuneration was paid to the internal auditors in respect of non-audit work during 2017-18.

Public sector information

NERC has complied with the cost allocation and charging requirements set out in HM Treasury and Public Sector Information guidance, but is exempt from the requirements of The Re-use of Public Sector Information Regulations 2005.

Payment policy

NERC observes the Confederation of British Industry Code of Practice regarding prompt payment, and in accordance with the Government direction, is committed to paying its suppliers within five days of receipt of a valid invoice or earlier if suppliers terms dictate. During 2017-18, 78.2 per cent of payments were made within five working days (77.6 per cent 2016-17) and 96.8 per cent within 30 days (97.5 per cent 2016-17). In accordance with the guidance of the Statutory Instrument 1997/571, trade creditor days for the period are 32 days (2016-17: 29 days).

Information assurance and security

NERC is required to report compliance against government security standards to the Cabinet Office through an annual health check. We have put policies, procedures and reporting in place to manage information risk and cyber security. We have maintained Cyber Essentials and Cyber Essentials Plus certification for our internal IT provider and across our centres during 2017-18. Raising staff awareness of cyber security was a priority during 2017-18, with refresher awareness sessions rolled out to all staff at Head Office and the Research Centres. Regular six-monthly reports on cyber security and information assurance are provided to the NERC Audit & Risk Assurance Committee. The number of major personal data loss incidents is recorded and in 2017-18 there were no such incidents.

Openness and transparency

NERC is subject to the Freedom of Information Act 2000 and the Environmental Information Regulations 2004. During 2017, we answered 55 requests for information specifically under the legislation. The requests covered a broad variety of subjects, from research policy and operations to contracts. We answered 93 per cent of requests, some of which were complex and wide ranging, within the statutory time limits. Much of our information is readily available without making a Freedom of Information Act request. For details, see our publication scheme at: **www.nerc.ac.uk/about/policy/foi/publication/**

Categories of requests made under the Freedom of Information Act/ Environmental Information Regulations in 2017

Research policy and operations	20
Contracts	6
Business policy and operations	24
Research outputs	-
Funding applications	3
Personal information	2

Health and safety

The health and safety performance data for 2017-18 indicates that the safety performance across NERC and its Research Centres remains generally consistent with previous years while also showing an encouraging reduction of injury incident reports. The total number of injuries and work-related ill health reported by staff within NERC in 2017-18 was 176 compared to 228 in 2016-17.

The number of reportable events within NERC's UK operations under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 2013 increased from one to five. Due to the small numbers involved, the RIDDOR rate can fluctuate significantly year to year and does not provide a particularly reliable measure of performance. The majority were related to time off work (more than seven days lost time) with only one significant injury. There were two RIDDOR like occurrences: a slip/trip/fall on rough ground while walking between buildings at Rothera resulting in a fractured wrist, and a slip/trip/fall onboard a NOC ship while in refit in Amsterdam where the injured person fractured two fingers resulting in 89 days lost time.

In 2017-18, the NERC RIDDOR reportable injury rate per 1,000 employees was 2.1. This compares with the Health and Safety Executive's (HSE) average RIDDOR

reportable injury rate per 1,000 employees across all industries of 2.63 between 2012-16 (the last years for which national statistics are published).

Marine Accident Investigation Board (MAIB) reportable incidents reduced by 50 per cent from four to two reportable incidents. Firstly, a crew member fell from steps onto the ship's deck receiving a twisted ankle and head injury. The second was an incident involving the failure of an HP air system during seismic operations, although no injuries were involved. Both incidents were acknowledged by MAIB and no further action was required.

The 352 non-injury incidents reported across the organisation show that the major cause of potential harm within NERC in 2017-18 continues to be workplace conditions. Overall, the non-injury incident and injury incident reporting statistics show a positive approach to health and safety reporting. There was a continued increase in the ratio between non-injury incidents and injury incidents or work related ill health, an indicator of good health and safety culture, from 1.58:1 in 2016-17 to 2:1 2017-18.

The legal requirements for health and safety and radiation protection in NERC are subject to scrutiny by the relevant regulatory authorities. The HSE look after health and safety for land-based UK activities. The Environment Agency has responsibility for certain aspects of work with radioactive materials in the UK. The Maritime and Coastguard Agency regulate our work on ships. The Civil Aviation Authority and their subsidiary, Air Safety Support International, look after safety on our aircraft in the UK and overseas. The Office for Nuclear Regulation (ONR) has responsibility for the transport of radioactive material goods within the UK. This year the ONR inspected NERC by visiting the BGS site at Keyworth to assess compliance with the requirements for transport of radioactive material under ADR (International Carriage Dangerous Goods by Road). They made a number of minor observations with recommendations, for which evidence of compliance was provided within the timescale set by ONR.

There was one regulatory intervention from the HSE in respect of a rock crushing machine incident. The HSE investigated and made a number of recommendations to BGS and the machinery supplier. The HSE were notified that all recommendations had been implemented within the required time period. The HSE also informed NERC of their intention to bring a prosecution against NERC under the Health and Safety at Work Act 1974 in relation to the management of legionella at the BGS site at Keyworth in 2014. There has been no further action from the HSE since then.

The 2017-18 NERC corporate health and safety audit programme examined ergonomics in the workplace and in particular compliance with the Health and Safety Display Screen Equipment Regulations 1992. Four NERC centres: BGS Keyworth, BAS Cambridge, NOC Southampton and CEH Edinburgh were visited. All recommendations from these audits have been completed.

Statement of Chief Executive's Responsibilities with Respect to the Financial Statements

Under Paragraph 3 of Schedule 1 to the Science and Technology Act 1965, the Secretary of State for the Department for Business, Energy and Industrial Strategy has directed the Natural Environment Research Council to prepare for each financial year a statement of accounts in the form and on the basis set out in the Accounts Direction. The accounts are prepared on an accruals basis and must give a true and fair view of the state of affairs of the Natural Environment Research Council and of its comprehensive net expenditure, changes in taxpayers' equity and cash flows for the financial year.

In preparing the accounts the Accounting Officer is required to comply with the requirements of the Government Financial Reporting Manual and in particular to:

- observe the Accounts Direction issued by the Department for Business, Energy and Industrial Strategy, including the relevant accounting and disclosure requirements, and apply suitable accounting policies on a consistent basis;

- make judgements and estimates on a reasonable basis;

- state whether applicable accounting standards as set out in the *Government Financial Reporting Manual* have been followed, and disclose and explain any material departures in the financial statements; and

- prepare the financial statements on a going concern basis.

The Department for Business, Energy and Industrial Strategy has appointed the Chief Executive as Accounting Officer of the Natural Environment Research Council. The responsibilities of an Accounting Officer, including responsibility for the propriety and regularity of the public finances for which the Accounting Officer is answerable, for keeping of proper records and for safeguarding the Natural Environment Research Council's assets, are set out in *Managing Public Money* published by the HM Treasury.

The Accounting Officer has taken all reasonable steps to ensure that he is aware of any relevant audit information and to ensure that NERC's auditors are aware of that information. As far as the Accounting Officer is aware, there is no relevant audit information of which the NERC's auditors are unaware.

The Accounting Officer has taken all reasonable steps to ensure that the annual report and accounts as a whole is fair, balanced and understandable and has taken personal responsibility for the annual report and accounts and the judgements required for determining that it is fair, balanced and understandable.

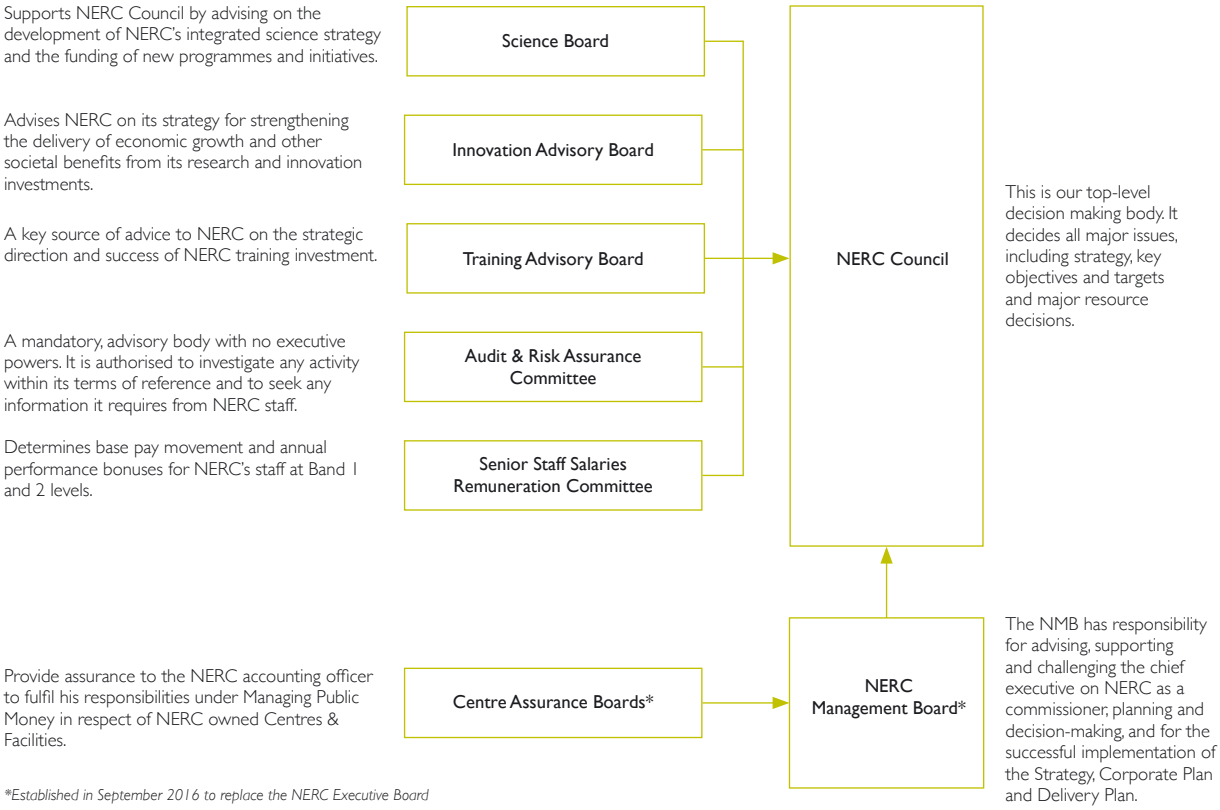
Governance Statement

Introduction

As Accounting Officer, I have responsibility for acting within the authority delegated to me by our sponsor department, The Department for Business, Energy & Industrial Strategy (BEIS), to ensure that NERC operates effectively and with a high standard of propriety. NERC has established a robust governance framework that supports effective decision-making and sound financial management, which in turn, enables the achievement of NERC's policies, aims and objectives.

This governance statement sets out the governance, risk and internal control arrangements for NERC. It applies to the financial year 1 April 2017 to the 31 March 2018 and the approval of the Annual Report and Accounts, accords with HM Treasury Guidance.

NERC Governance Framework



**Established in September 2016 to replace the NERC Executive Board*

NERC's governance framework enables us to efficiently run an organisation that funds excellent, peer-reviewed environmental science that helps us understand and predict how the planet works, while acting in the public interest at all times in accordance with the seven Principles of Public Life.

NERC Council

Council and its sub-committees use a range of management information to monitor the performance of NERC, including data on finance, human resources, performance indicators and operations.

During the year, Council met four times and provided strategic input and advice on a range of NERC priorities. Topics discussed in 2017-18 included:

- Setting environmental science research and innovation priorities for NERC
- UK Antarctic Hub
- Corporate responsibility
- Governance, Responsibilities and Ownership (GRO)
- Services and facilities commissioning
- NERC's approach to the Industrial Strategy Challenge Fund

NERC Council agendas and meeting summaries are published here:
www.nerc.ac.uk/about/organisation/boards/council/meetings/

Audit and Risk Assurance Committee (ARAC)

NERC Council is supported in its work by the ARAC. During the year, ARAC met four times providing assurance on the quality of NERC's consolidated accounts, audit arrangements, governance structures, risk management, major project reviews, health and safety and cyber security integrity. NERC Council receive regular updates from ARAC and has considered ARAC's Annual Report. ARAC have completed a number of deep-dive exercises.

- Official Development Assistance (ODA) funding
- Updates from NERC/BAS Operations and Safety Assurance/Advisory Group (NBOSAAG), including annual report in October 2017
- H&S update regarding British Antarctic Survey (BAS) aircraft
- NERC Head Office Staff Survey
- Formation of UK Research and Innovation
- H&S update from Centre for Ecology and Hydrology (CEH)

Senior Staff Salaries Remuneration Committee (SSSRC)

The SSSRC supports Council in its work. The SSSRC met once in September to review the base pay movement and annual performance bonuses for NERC's staff at Band 1 and 2 levels. The SSSRC did not review the pay of anyone who was a member of the committee.

Details of membership and terms of reference for these committees can be found at:
www.nerc.ac.uk/about/organisation/boards/

NERC Management Board (NMB)

NMB examined specific, high risk issues at monthly meetings to ensure that the management of NERC is in accordance with the required standards of accountability, regularity and propriety, achieving high standards of efficiency, effectiveness, economy and health and safety.

Between April 2017 and March 2018 NMB met to discuss a number of topics, which included:

- Corporate responsibility
- Environmental management
- H&S Annual report

- New funding model and its implications
- Updates from the Centre Assurance Boards (CABs)
- Research integrity
- NERC top risk register and associated mitigation activities

NERC appoints board members and non-executive directors through a process of fair and open competition in line with the guidelines for the Office of the Commissioner for Public Affairs. NERC advertises positions centrally through the Cabinet Office Public Appointments website.

Council, ARAC, SSSRC and NMB members are required to declare any personal or business interests which may, or may be reasonably perceived to influence their judgement in performing their function and obligation. NERC holds a register of interests to record these declarations. The minutes record if a Council or committee member declares a potential conflict at meetings.

Centre Assurance Boards (CABs)

I meet formally with each Research Centre Director during the CAB meetings every six months. These meetings allow me and my executive team to examine key pieces of information pertaining to the effective management of the Research Centres. The CABs provide assurance to the Accounting Officer in the long-term interdependent nature of our relationships with the Research Centres and fulfils NERC's obligations under Managing Public Money to address issues relating to finance, risk, HR and health and safety.

During the meetings that took place last year, the Centres were able to provide assurance in the following areas:

- **Financial planning.** Using a process known as the Research Centre Activity and Resource Plans (CARP) the Centres document and explain their financial plans, business activity and workforce development plans for the next three years. Reviewing the information from this process enables NERC to ensure that the Centres financial plans are in alignment with the NERC strategy and provides an overview of the effectiveness of internal control in this area.
- **Risk Management.** Each Centre provides their top-level risk register and associated assurance surrounding the controls outlined to mitigate their risks. Useful outputs from this process include informing internal audit requirements for Centres and identifying common risks to capture at a NERC level.
- **Health and Safety.** Further to the annual health and safety reporting processes, the CAB requires Centres to provide statistics on a range of health and safety information. The information is useful for benchmarking purposes and to identify emerging trends.
- **Cyber security and information assurance.** Further to the ongoing work to achieve Cyber Essential accreditation at each of NERC's Centres, the CAB requests Centres provide a range of information on cyber security and information assurance.

The NERC leads in each area review all information the Centres provide during the CAB process. These reviews identify issues for discussion during the CAB meetings and where follow up action may be required.

Antarctic operations

The UK has operated a science presence in the Antarctic for over 60 years. The government exercises oversight of this activity via a joint committee, chaired by BEIS but containing representation from NERC/BAS, the FCO, MOD and Cabinet Office.

Since 2015, NERC has received a separate funding line (within the science budget) from BEIS in respect of costs of Antarctic infrastructure and logistics, so that this is tensioned against other science budget priorities by BEIS, rather than by NERC.

In recognition of the inherent risk of operating in Antarctica, NERC has established the NERC/BAS Operations and Safety Assurance Group to provide independent advice and assurance on Antarctic operations and safety. The minutes, decisions and actions as agreed by NBOSAAG reports into the BAS CAB where I am provided an overview of any major issues. Where applicable, NMB may review specific issues that cannot be dealt with within this process. An annual report is provided to ARAC.

Council & ARAC performance and effectiveness

In December 2017, Sir Anthony Cleaver began the annual appraisal of Board members to complement the self-assessment of Council performance. The self-assessment exercise will further the work originally completed during the external review of Council in 2015. Sir Anthony summarised the self-assessment and appraisals during the Chair's briefing session on 28 February 2018 at Council.

In December 2017, ARAC reviewed their performance and discussed the NAO facilitated assessment conducted in 2016. This review concluded the activities outlined in the action plan from NAO.

I am satisfied that NERC Council, ARAC and the SSSRC have the appropriate balance of skills, experience, independence and knowledge of NERC to enable them to discharge their responsibilities effectively.

Board and Committee attendance for the financial year 1 April 2017 to 31 March 2018

	Meeting attendance per board member of meetings eligible to attend		
Board Member	Council	ARAC	SSSRC
Sir Anthony Cleaver*	4/4		1/1
Professor Dame Georgina Mace DBE	4/4		
Lord Willis of Knaresborough	4/4		
Professor Louise Heathwaite	1/1		
Professor Ian Boyd	3/4		
Mr Nick Folland**	4/4	4/4	1/1
Mr Ian Simm	3/4		
Ms Christine Tacon CBE	1/1		1/1
Professor Ian Poll OBE***	3/4	4/4	
Ms Juliet Davenport OBE	3/4		
Ms Leslie Heasman	4/4		
Mr Imran Khan	4/4		
Professor Guy Orpen	2/4		
Professor Lesley Yellowlees CBE	3/4		
Professor Paul Monks		3/4	
Mr Steve Turner		4/4	
Mr Richard Gledhill		3/4	
Professor Duncan Wingham	4/4	4/4	1/1
Mr Paul Fox	4/4	4/4	1/1
Mrs Jan Juillerat			1/1

Council Members
Independent Member
Management

Notes:
* NERC Chairman
**Chair of ARAC
***Also ARAC member

Approach to risk management

Being the UK's leading public funder of environmental science, spending money economically, efficiently and effectively, whilst also safeguarding and accounting for it, requires a robust approach to risk management. NERC actively manages risks that may affect the ability to deliver the NERC strategy, as well as those that arise in the delivery of that strategy. All staff have the responsibility to identify and take action to manage risks. NERC assess its risk in four key areas; Purpose, Resource, People and Reputation. The NERC Management Board reviews risks identified as being outside of the organisations tolerance in any of these key areas.

The discussion of risk registers is encouraged at departmental meetings with the escalation of risks, where appropriate, to management. The NERC Management Board reviews and updates our top-level risk register on a monthly basis and NERC conducts a review of Research Centre risk registers as part of the Centre Assurance Board (CAB) meetings. NERC shares the top-level risks with Council, ARAC and BEIS as part of their quarterly assessment of Partner Organisations. All reviews are fed back into the risk management cycle.

Significant risks and issues in 2017-18

Maximising access to new funding

With an unprecedented investment in science by the Government, NERC has been working hard to meet the challenges this presents, and we will of course need to remain agile to make the most of the opportunities created. In November 2017, NERC was successful in an award for £16m from the Industrial Strategy Challenge Fund (ISCF) to fund a programme that aims to develop robotic solutions to make a safer working environment in industries such as offshore energy, nuclear energy, space and deep mining, increase productivity and to open up new cross-disciplinary opportunities. The ISCF is a strategic element of the government's industrial strategy that aims to ensure the UK continues to be one of the best places in the world for science and innovation. We are working closely with the other research councils and Innovate UK in taking a leading role in delivering this funding, operating across the country to ensure the UK secures maximum benefit from science and innovation.

Smooth transition to UK Research and Innovation (UKRI)

Since 2016 NERC has been working towards the setup of UKRI, helping to resolve some of the challenges creating such a cross-cutting organisation inevitably creates. UKRI offers many opportunities for NERC to build on our world-leading reputation as part of a single, strong voice of UK research and innovation. NERC has worked closely with BEIS to transfer our UK based assets and contracts to UKRI, fed into discussions with the EU to understand the implications to current and future contracts, and engaging in the design and delivery of the UKRI project with key members of staff being involved at all levels. While we are still transitioning into UKRI, I feel confident that we have successfully managed many of the risks which will ensure that we complete the transition as smoothly as possible.

Governance, Responsibilities and Ownership Programme

In October 2017, the Minister of State for Universities, Science, Research and Innovation agreed that plans for the Centre of Ecology and Hydrology (CEH) and the National Oceanography Centre (NOC) working to become independent research institutes, (companies listed by guarantee with charitable status) should move into preparation phase. This is an important step forward in enabling NOC and CEH to become stronger, more agile and financially more resilient, with more freedoms and flexibilities to deliver their missions and to do so with a greater range of external partners and funders. This decision allowed us to progress all the activities required to demonstrate readiness to transition to independent institutes. We will protect

the missions, purpose, and scientific integrity of CEH and NOC and the detail of managing future and ongoing options, risks and issues will remain at the forefront of the process.

Ensuring NERC continues to produce world-class science

For NERC to continue to produce world-class science, we must continue to push the boundaries of where and how we do that science. Operating in the Antarctic has its challenges but produces vitally important scientific data. Halley Research Station is an internationally important platform for global earth, atmospheric and space weather observation in a climate sensitive zone. Due to the hostile and rapidly changing environment in the region, we still face the risk of losing the Halley VI base due to a large crack in the Brunt ice-shelf increasing. We have previously mitigated this risk by relocating the station, however further decisions need to be made about how we are to operate in Antarctica if we wish to continue to do so. This includes our decision to automate the instruments to preserve the continuity of data streams acquired at Halley to minimise the impact of withdrawing from over-winter occupation.

We have invested £31m into the UK Geoenergy Observations Project (UKGEOS) to establish two new centres which will provide world-leading research capabilities into the subsurface environment. The knowledge these centres generate will contribute to the responsible development of new energy technologies, both in the UK and internationally. While there is controversy surrounding subsurface drilling, the centres will allow independent, rigorous and replicable observations of subsurface processes. The UK Geoenergy Observatories will stimulate research on underground energy technologies that will answer vital questions about how they affect the environment and ensure NERC facilitates ground breaking research in this area.

Equality and diversity

In March 2018 NERC published our gender pay gap report which we are legally required to do on an annual basis. NERC's gender pay gap is lower than the national average and NERC is amid the group when compared with the other Research Councils. The 2016-17 pay remit resulted in BEIS approving a flat one per cent increase, which we applied as an average of pay band. This produces a small benefit for staff lower down the pay band to mitigate the removal of progression. We continue to pay attention to pay on appointment and the use of bonuses and allowances to ensure objectivity and transparency. There is ongoing training in unconscious bias to help to address organisational and individual practices. The Trade Unions have engaged positively with our work in this area.

EU exit

Following the referendum on 23 June 2016, the UK is now scheduled to leave the EU on 29 March 2019. This has created a risk around the future ability of the UK to access EU funding after it has left the EU and the nature of future immigration arrangements with the EU. These will form part of the negotiations which at the time of the laying of this report are still underway. These are important issues for the NERC and we are addressing this risk through monitoring developments and working closely with colleagues in government and the wider sector to ensure an effective and joined up approach to the implications of leaving the EU.

Key governance activities

Regularity and propriety

NERC is committed to establishing and applying appropriate regularity and proprietary standards. This includes developing and maintaining appropriate cultures and behaviours; NERC does not tolerate any form of fraud, bribery and/or corruption. The key policies we deploy to effect this are:

- NERC fraud policy
- NERC gifts and hospitality policy
- Research Council whistleblowing policy
- Research Council code of conduct

All NERC Head Office staff have now received Maintaining Organisational Controls training over the course of 2016-17 and 2017-18. This training ensures that there is an awareness of their responsibilities to operate within the various policies, Cabinet Office controls and other guidance. 2017-18 also saw the Maintaining Organisational Controls training given to key staff at our Research Centres for further dissemination to their staff.

NERC operate a system of both preventative and retrospective controls to provide assurance to the adherence of policies and controls and that our accounting data accurately reflects business activity.

Pay setting arrangements throughout the Civil Service are set out in guidance issued by HM Treasury. I can confirm that NERC was compliant with the requirements.

Internal audit opinion

In 2017-18, the Government Internal Audit Agency (GIAA) provided our internal audit services. I can confirm that based on the delivery of the agreed programme of work, the internal audit opinion classification is 'Moderate'. GIAA term this classification as 'some improvements required to enhance the adequacy and effectiveness of the framework of Governance, Risk Management and Control'.

Of the 14 individual pieces of internal work undertaken for the NERC core plan, two received 'Substantial' assurance, seven reflected 'Moderate' assurance and five were advisory audits. The nine audits that received either 'Substantial' or 'Moderate' assurance were relating to:

- Cyber security [Moderate]
- Centre establishment audits for the:
  - British Antarctic Survey (BAS) – [Moderate]
  - British Geological Survey (BGS) – [Moderate]
  - Centre for Ecology and Hydrology (CEH) – [Moderate]
  - National Oceanographic Centre (NOC) – [Moderate]
- Project audit of UKGEOS – [Substantial]
- Project audit of MAS OCEANIDS – [Moderate]
- Pay remit – [Moderate]
- Custom warehouse – [Substantial]

GIAA issued 43 audit recommendations as a result of these audits. NERC has completed a review of audit recommendations issued during the course of the year as well as any outstanding recommendations from previous years. The purpose of this review is to highlight which audit recommendations NERC would still need to implement on transitioning to UKRI and which were no longer relevant due to the transition.

Alongside the NERC core plan, GIAA also completed 23 cross-council audits, of which, six received 'Limited' assurance outcomes. These audits were:

- Transfer of assets and liabilities to UKRI
- Compliance with harmonised financial policies and procedures
- Change management: RCUK Digital and technology project (Phase 1)

- Change management: RCUK Digital and technology project (Phase 2)
- GDPR: Implementation project (Phase 3)
- Retained function assurance: GPC and iExpenses

Cross-council working groups are managing the implementation of recommendations made to address the control weaknesses highlighted by these reports. The Governance, Risk, Assurance and Information function of UKRI will monitor progress of these going forward.

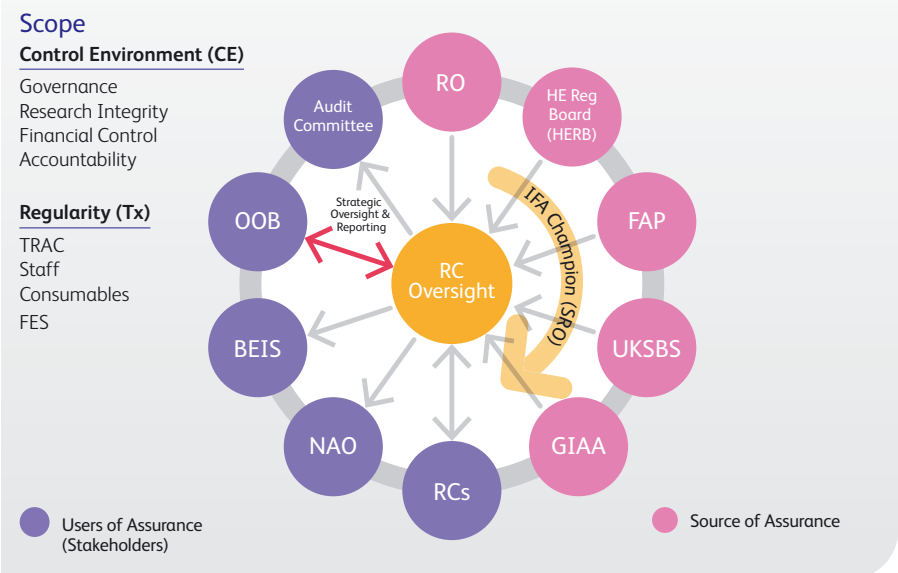
Research grant funding assurance

Across the RCUK community research funding totals £3.3bn of which £220.6m relates to NERC. There are two major funding streams:

1. Grants administered through the Siebel system £153.4m and awarded to eligible Research Organisations (ROs);
2. Funding distributed outside the Siebel system £67.2m including Strategic partnerships.

In 2016, the Research Councils set up a Funding Assurance Working Group (FAWG) that has continued to review the Integrated Funding Assurance (IFA) framework and improve the approach to IFA. This framework establishes appropriate accountability within the Research Organisation in receipt of funding and collates assurance from a range of sources.

IFA Framework



An International Assurance sub-group has also been set up which includes the Funding Assurance team. This sub-group has continued to develop and refine the approach to due diligence and assurance specifically for overseas funding.
The assurance provided though this framework indicates a very low level of current and historic errors for all Councils. In his report the Head of Funding Assurance provides a 'Moderate' assurance based upon the programme of work undertaken.

Some of the key changes during the year have been:

- Amendments to the grant terms and conditions – to provide clarity on Research Councils' expectations relating to due diligence and assurance
- Auditing of UK research organisations approach to due diligence and assurance
- Development of draft International funding assurance policy, framework and process

- Increased resources for funding assurance team
- Further development of the processes relating to GCRF

The Research Councils have demonstrated compliance to the Cabinet Office Minimum Grant Standards in 2017 and have also been part in the Grants Accelerator work. The Councils have been able to evidence the overall self-scoring rates of 'established/advanced'.

Non-Siebel awards/funding

Strategic partnerships represent the major part of NERC non-Siebel funding to third parties. Major components include:

- Contract funding to HEIs of £25.8m. This includes £8.5m to the University of Leeds and £3.8m to the University of Leicester relating to the NCAS and NCEO research centres. £13.4m of spend is with other HEIs, including capital contributions of £4.3m to the University of York, £3m to the University of St Andrews and £2.8m to the University of Edinburgh.
- Contract funding to non HEIs of £26.4m which includes £18.4m to other Research Councils where assurance is taken from common accountability frameworks and common sponsor department requirements.
- Contract funding awarded by NERC Research Centres of £14.7m. This includes funding awarded to marine delivery partners and services and facilities run by Centres.

I take assurance on these activities primarily through the governance frameworks in place, including:

- Memorandum of understandings, concordats, etc. setting out the rules and relationships for our engagement
- Funding awarded under contracts, as the contract route is used to provide an increased level of assurance over key research activity
- Representative roles within the key organisations e.g. Board Members, seats on governing bodies Committees
- Linked to the above, we take assurance from externally audited Accounts and audit reports
- Detailed review of financial records and progress reporting for overseas grants

Audit Activity

During 2017-18 GIAA conducted two cross-council audits relevant to the IFA framework:

- Retained Function: Grants Processing [Moderate Assurance]
- Integrated Funding Assurance: Non-Siebel Funding Activity [Moderate Assurance]

The Governance, Assurance, Risk and Information function within UKRI will take forward the recommendations from the report.

By taking assurance that the control systems within Higher Education Institutions (HEIs) are working effectively and combining this with the transaction level testing undertaken by the Funding Assurance Programme (FAP), Research Councils are able to provide a high level of assurance to the public that funding is spent in accordance with the principles contained within Managing Public Money.

The assurance provided through IFA framework indicates a number of funding pressures and the very nature of the activities is that they are complex and novel. Nevertheless, I am reassured through the mechanisms described here that they are being managed in an appropriate manner and that there are no major issues that warrant reference here.

NERC funding assurance outcomes

This year the Funding Assurance Programme visited two of NERC's Research Centres, CEH and NOC. As a result of the routine visit, CEH received a 'Limited' assurance opinion, while NOC's assurance opinion was 'Moderate'. We are working with CEH to address the issues outlined in this audit and have agreed an action plan with the FAP team. During 2018-19 the FAP team will revisit CEH, where they will review the progress against the action plan.

Major project assurance

The Project Management Office (PMO) delivers our infrastructure through clear plans and with robust governance. This activity allowed us in Head Office to allow more in depth conversations about projects like the RRS Sir David Attenborough and BGS boreholes that are looking into geothermal energy in Glasgow and Cheshire. The PMO provides assurance on major projects by working with the Centres to provide management updates on progress. GIAA, BEIS and the Infrastructure and Project Authority (IPA) provide further assurance on project activity. The PMO manage and monitor these reviews, as well as the resulting action plans, which provides onward assurance to the CABs and ARAC.

Cyber security & information security

Further to maintaining Cyber Essentials accreditation during 2017-18, NERC undertook a cyber security internal audit which focussed on five areas in the 10 Steps to Cyber Security that Cyber Essentials does not cover. The outcome of this audit was Moderate assurance.

In July 2017 NERC engaged with a cyber security services provider to deliver refresher information security training sessions to all staff. We have raised awareness of cyber security and information risk with senior management through a presentation by The National Archives to the NERC Management Board in December 2017. Similarly, team presentations and e-learning raised staff awareness of the General Data Protection Regulation.

During 2017-18 the NERC Information Assurance & Security Group (IASG) continued to meet to coordinate information security and information risk management. The NERC ARAC receive six monthly reports on information assurance and cyber security. NERC receives IT infrastructure services in support of common key business services from UK SBS. These are subject to regular audits and performance reviews, including the review of information security incidents and cyber security threats that are subject to continuous assessment and challenge.

I am able to assure NERC's handling of information assets and staff awareness in respect of data handling. I base my opinion on the following:

- There is a clear recognition of the importance of good information and data security at senior management level and funding is available to support a range of information security related initiatives across NERC.
- The Audit and Risk Assurance Committee keep our information assurance and security approach under regular review.
- We have committed to ensuring staff are up to date with Cabinet Office e-learning training for staff being responsible for information and working with security classifications.
- Staff have reconfirmed sign up to the NERC personal responsibility statement.
- Face to face information security awareness sessions for all staff (as mentioned above).
- Awareness raising of the General Data Protection Regulation for staff.
- Staff are required to report data losses promptly using an easily accessible incident reporting system and robust procedures are in place to handle incidents.

General Data Protection Regulation (GDPR)

The introduction of GDPR, on 25 May 2018, brings about substantial changes to the existing Data Protection Act 1998. The Information Commissioner's Office has indicated that they expect to see organisations striving for compliance rather than achieve full compliance on day one. Nevertheless, failure to comply could result in fines up to €20m or four per cent of turnover and significant reputational damage. A cross Council and Innovate UK project has been established to take forward the changes. A 'health check' led by the Professional Support Unit, with assistance from internal audit, identified the project as a 'medium' bordering on a 'low risk'. This, however, continues to be a key risk due to the significant impact of non-compliance if there is an incident where we are at fault.

Effectiveness of whistleblowing arrangements

Throughout 2017-18 NERC have been working hard to raise the awareness of its Whistleblowing policy through the Maintaining Organisation Controls and Regularity training programme. This training programme is an ongoing initiative within NERC to educate staff and provide context for important policies, such as Whistleblowing.

During 2017-18 we had two whistleblowing cases, the first investigation is complete with no further action required and the second case is still on-going.

Tax arrangements of public sector appointees

The government's review of tax arrangements of public sector appointees highlighted the possibility for artificial arrangements to enable tax avoidance. I can confirm that NERC's senior staff are all paid through the payroll and that tax arrangements are in place to provide assurance to BEIS that appropriate tax arrangements are in place to cover other in-year appointees. NERC provide BEIS with tax assurance evidence on a yearly basis, which forms part of their summary of BEIS tax assurance data that can be found at **www.gov.uk**

Quality assurance modelling

As per the recommendations made in 2013 following the review of quality assurance of Government analytical models undertaken by Sir Nicholas Macpherson, NERC perform a yearly review of their use of analytical models. During 2017-18 NERC have not identified any models that are business critical.

Assurance relating to back office transactional processing

The UK Shared Business Services Ltd (UK SBS) provides processing services in human resources, procurement, payroll, finance and IT to all 7 Research Councils.

The UK SBS Executive Director has written to me stating that the Head of their Internal Audit has provided an opinion of 'Moderate' assurance for both the internal operations within UK SBS and for its customer facing operations.

In order to provide additional assurance we operate a number of supplementary controls. GIAA has examined the additional controls, the outcomes of which were:

- Payroll – [Moderate Assurance]
- Human Resources – [Moderate Assurance]
- Government Procurement Card (GPC) and iExpenses – [Limited Assurance]
- Order and payment processing – [Moderate Assurance]
- Procurement – [Moderate Assurance]

To address the issues highlighted in the 'Limited' GPC and iExpenses audit, NERC have conducted a deep dive review into GPC and iExpenses compliance, with a

particular focus on the root causes of non-compliance. This resulted in the issuing of additional training and guidance to all staff. We will continue to focus on this in 2018-19.

UK Research and Innovation (UKRI)

The Higher Education and Research Bill, which included the proposal for the creation of UKRI on 1 April 2018, received Royal Assent on 27 April 2017. UKRI will operate across the whole of the UK with a combined budget of more than £6 billion and is bringing together the seven Research Councils, Innovate UK and a new organisation, Research England. UKRI intends to be an outstanding organisation that ensures the UK maintains its world leading position in research and innovation.

The present systems used by the Research Councils are successful and key elements of these systems will remain, including existing controls, and continue into 2018-19. UK and International asset transfers are well underway and are scheduled to complete before October 2018, during which time the existing legacy bodies will remain legal entities. The structures and committees for the internal governance of UKRI are all agreed and terms of reference exist for the main committees. An overview of the structure of UKRI governance can be found here – **www.ukri.org/about-us/governance-and-structure/**

Conclusion

I have considered the evidence provided regarding the production of the Annual Governance Statement and independent advice and assurance provided by the ARAC. I conclude that NERC has satisfactory governance and risk management systems.

Remuneration and Staff Report

Remuneration Report

Council and Committee Remuneration (except Chief Executive)

Remuneration Policy (unaudited information)

Remuneration rates are the same across the Research Councils. The rates are reviewed each year by the Department for Business, Energy and Industrial Strategy (BEIS). In considering the new rates, BEIS may take into account the increase given to the senior civil service. BEIS consults with the Research Councils and the agreed change is implemented in October.

Appointments are non-pensionable and there is no entitlement to compensation for loss of office.

Standard fees (£ per annum)	2017-18	2016-17
Council Chair	16,430	16,430
Council Members	6,850	6,850
Non-Executive Directors[1]	10,000	10,000
Science Board and Audit & Risk Assurance Committee Chairs	9,110	9,110
Peer Review College Chairs	1,000	1,000

Note:
1 Audited information.

Membership of NERC Council 2017-18

	Period of Appointment From	To	Remuneration £000 2017-18	Remuneration £000 2016-17
Sir Anthony Cleaver (Chair)	01/01/14	31/10/18	15 - 20	15 - 20
Professor Duncan Wingham[1] (Chief Executive and Deputy Chair)	01/01/12	31/12/20	0	0
Professor Ian Boyd[1]	01/02/13	31/10/18	0	0
Ms Juliet Davenport OBE	01/08/15	31/10/18	5 - 10	5 - 10
Mr Nick Folland[2]	01/08/13	31/10/18	0 - 5	0
Ms Leslie Heasman	01/08/15	31/10/18	5 - 10	5 - 10
Mr Imran Khan	01/08/15	31/10/18	5 - 10	5 - 10
Professor Dame Georgina Mace DBE	01/08/11	31/10/18	5 - 10	5 - 10
Professor Guy Orpen	01/08/15	31/10/18	5 - 10	5 - 10
Professor Ian Poll OBE	23/09/14	31/10/18	5 - 10	5 - 10
Mr Ian Simm	01/08/13	31/10/18	5 - 10	5 - 10
Lord Willis of Knaresborough	01/08/11	31/10/18	5 - 10	5 - 10
Professor Lesley Yellowlees CBE	01/08/15	31/10/18	5 - 10	5 - 10
Professor Louise Heathwaite[1]	17/12/12	31/08/17	0	0
Ms Christine Tacon CBE	01/08/13	31/07/17	5 - 10	5 - 10

Notes:
1 Honoraria are not payable to members who are civil servants, employees of NERC or full time employees of organisations whose funds are derived from Votes of Parliament.
2 Was not entitled to Honoraria whilst Chief Executive of CPS March 2016-November 2017.

Membership of NERC Council by gender as at 31 March 2018

	Male	Female
Number of Members	9	4
% of members	69%	31%

Committee rates (£ per day)

	2017-18	2016-17
Committee Chair	230	230
Committee Members	170	170
Peer Review College Members	200	200

Chief Executive and NERC Executive Directors (audited information)

BEIS Remuneration Committee

The Chief Executive's remuneration is determined by the Permanent Secretary of BEIS. The Permanent Secretary is advised by a Remuneration Committee chaired by the Director General of Research Councils. The Chair of NERC Council is consulted.

NERC Remuneration Committee

The remuneration of NERC Executive Directors is reviewed and adjusted annually by the Council Remuneration Committee. The committee is chaired by the Chair of Council and other membership comprises the Chief Executive and two Council Members. Membership of the Remuneration Committee is listed within the Governance Statement.

Remuneration Policy

The Remuneration Committee works in accordance with the public sector policy on senior staff pay. In 2017-18, this policy stipulated that 90 per cent of senior staff were eligible for a general award of one per cent on average and that 25 per cent of senior staff were eligible for a non-consolidated performance bonus, on the basis of the level of performance against objectives as assessed by the individual's manager.

Contractual Policy

Professor Wingham started his tenure on 1 January 2012. His initial contract was for a period of four years and was extended for a further period of two years. This was subsequently extended for a further two years with him becoming NERC's Executive Chair effective 1 April 2018 following the creation of UK Research and Innovation (UKRI).

All senior officers covered by this report, apart from the Chief Executive, hold appointments that are open-ended with notice periods of three months.

It should be noted that no other senior staff are on a service contract.

NERC Management Board (NMB) (unaudited information)

Membership of NMB as at 31 March 2018	Position
Professor Duncan Wingham	Chief Executive & Accounting Officer
Mr Paul Fox	Chief Operating Officer
Dr Phil Heads	Associate Director, Strategy and Impact
Ms Alison Robinson	Director, Corporate Affairs and Change Management
Ms Claire Turner	Director, Finance
Professor Tim Wheeler	Director, Science & Innovation
Mr Richard Gledhill	Non-Executive Director
Mr Paul Hayden OBE	Non-Executive Director

Membership of NMB by gender as at 31 March 2018

	Male	Female
Number of Members	6	2
% of Members	75%	25%

Remuneration of Senior Employees (audited information)

	Single total figure of remuneration							
NMB Members	Salary (£'000)		Bonus Payments (£'000)		Pension Benefits (£'000)		Total (£'000)	
	2017-18	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18	2016-17
Professor Duncan Wingham	135 - 140	130 - 135	10 - 15	5 - 10	64	52	210 - 215	190 - 195
Mr Nigel Bird [1]	-	25 - 30	-	5 - 10	-	4	-	35 - 40
Mr Paul Fox	100 - 105	100 - 105	5 - 10	10 - 15	56	39	165 - 170	150 - 155
Dr Phil Heads[2]	70 - 75	65 - 70	-	0 - 5	89	15	160 - 165	80 - 85
Ms Alison Robinson[3]	90 - 95	85 - 90	-	10 - 15	39	63	130 - 135	160 - 165
Ms Claire Turner [4]	70 - 75	45 - 50	-	-	45	18	115 - 120	60 - 65
Professor Tim Wheeler[5]	110 - 115	110 - 115	-	-	26	1,051	135 - 140	1,160 - 1,165

Notes:
1 Stood down as Director, Finance effective 31 July 2016, full year equivalent salary was £75-80,000.
2 Full year equivalent salary at 31 March 2018 is £75-80,000.
3 Full year equivalent salary at 31 March 2018 is £95-100,000.
4 Full year equivalent salary at 31 March 2018 is £75-80,000 (2016-17 £70-75,000).
5 2016-17 figures include the transfer in of funds from another pension scheme.

Salary and Allowances

Salary and Allowances include gross salaries, performance related bonuses and pension benefits. It does not include severance payments, employer pension contributions and the cash equivalent transfer value of pensions. Bonus figures are those paid out during the year.

Compensation for Loss of Office

There have been no compensation payments for loss of office of senior managers in 2017-18 or 2016-17.

Payments to Past Directors

There have been no payments to past directors in 2017-18 or 2016-17. All payments detailed in the remuneration table occurred during employment.

Fair Pay Disclosures

Reporting bodies are required to disclose the relationship between the remuneration of the highest paid director in their organisation and the median remuneration of the organisation's workforce.

The banded remuneration of the highest paid director in NERC (the Chief Executive) in the financial year 2017-18 was £145,000-£150,000 (2016-17: £140,000-£145,000). This was 4.7 times (2016-17: 4.7) the median remuneration of the workforce, which was £31,220 (2016-17: £30,612).

No employees received remuneration in excess of the highest-paid director in 2017-18 or 2016-17. Remuneration ranged from £10,680 to £111,100 (2016-17: £10,680 to £111,057).

Total remuneration includes salary, non-consolidated performance-related pay and benefits-in-kind. It does not include severance payments, employer pension contributions and the Cash Equivalent Transfer Value (CETV) of pensions.

Pension Benefits (audited information)

NMB Members	Accrued pension and lump sum at pension age as at 31/03/18	Real increase in pension and lump sum at pension age	Cash equivalent transfer value as at 01/04/18	Cash equivalent transfer value as at 31/03/17	Real increase in cash equivalent transfer value
	£000	£000	£000	£000	£000
Professor Duncan Wingham	20 - 25	2.5 - 5	321	255	49
Mr Paul Fox	25 - 30	2.5 - 5	334	278	34
Dr Phil Heads	100 - 105	7.5 - 10	882	738	88
Ms Alison Robinson	20 - 25	2.5 - 5	219	183	12
Ms Claire Turner	10 - 15	2.5 - 5	135	103	16
Professor Tim Wheeler	55 - 60	0 - 2.5	707	646	16

Details of pension scheme

All senior employees are ordinary members of the Research Councils' Pension Scheme (RCPS) which is an unfunded public service defined benefit scheme with pension costs met from employer and employee contributions on a pay-as-you-go basis and the balance covered by grant-in-aid.

The accrued pension quoted is the pension the member is entitled to receive when they reach pension age or immediately on ceasing to be an active member of the scheme if they are already at or over pensionable age. Pensionable age is 60 for members of Classic, Classic Plus and Premium and 65 for members of Nuvos. Pensionable age for the new Alpha scheme is the later of 65 and the members' state retirement age.

Further details about the RCPS and the new Alpha scheme can be found below in the Staff Report.

Cash Equivalent Transfer Value

A Cash Equivalent Transfer Value (CETV) is the actuarially assessed capitalised value of the pension scheme benefits accrued by a member at a particular point in time. The benefits valued are the member's accrued benefits and any contingent spouse's or partner's benefits from the scheme. A CETV is the amount that would be paid by a pension scheme when the member leaves a scheme and chooses to transfer the benefits accrued. The pension figures shown relate to the benefits that the individual has accrued as a consequence of their membership of the pension scheme, not just their service in a senior capacity to which disclosure applies.

The CETV figures include the value of any pension benefit in another scheme which the individual has transferred to the Research Councils' pension arrangement and for which the RCPS has received a transfer payment commensurate with the additional pension liabilities being taken on. They also include any additional pension benefit accrued to the member as a result of their purchasing additional years and additional pension at their own cost.

CETVs are calculated in accordance with The Occupational Pension Schemes (Transfer Values) (Amendment) Regulations 2008 and do not take account of any actual or potential reduction to benefits resulting from Lifetime Allowance Tax which may be due when pension benefits are taken.

Real increase in the value of the CETV

The real increase in the value of the CETV reflects the increase effectively funded by the employer. It takes account of the increase in accrued pension due to inflation and contributions paid by the employee (including the value of any benefits transferred from another pension scheme) and uses common market valuation factors for the start and end of the period.

Staff Report

Staff numbers (audited information)

	2017-18 No.	2016-17 No.
Permanent staff	1,937	1,966
Temporary and contract staff	383	382
Staff on inward secondment/loan	11	8
Agency	13	9
	2,344	**2,365**

Senior staff by band[i]

	2017-18 No.	2016-17 No.
Band 1	5	6
Band 2	17	16
	22	**22**

Note:
i As per FReM 5.3.27, senior staff is defined as those equivalent to members of the senior civil services. In NERC this covers bands 1 & 2.

Staff composition by gender

	2017-18 No.		2016-17 No.	
	Female	Male	Female	Male
Directors	2	6	2	6
Other senior staff	5	9	4	10
Other employees	902	1,420	891	1,452
	909	**1,435**	**897**	**1,468**

Sick absence per full-time employee equivalent (unaudited information)

	2017-18	2016-17
Sick absence rate	1.9%	1.8%
Equivalent in days	4.6	4.5

Staff costs

See Note 3 of the Annual Accounts for details of staff costs.

Details of pension scheme (unaudited information)

Most employees of NERC are members of the Research Councils' Pension Scheme (RCPS), which is an unfunded public service defined benefit scheme with pension funded costs met from employer and employee contributions on a pay-as-you-go

basis and the balance covered by an annual grant-in-aid. The RCPS is in all respects 'by-analogy' with the Principal Civil Service Pension Scheme (PCSPS), except that the employer's contribution is determined separately. The scheme provides retirement and related benefits based on final or average emoluments. Redundancy and injury benefits are administered and funded by NERC. The scheme is administered by the Research Councils' Joint Superannuation Service with the associated grant-in-aid managed by BBSRC.

Employees may be in one of four defined benefit scheme arrangements; either a 'final salary' scheme (Classic, Classic Plus or Premium); or a career average scheme (Nuvos). Pensions payable are increased annually in line with changes in the Consumer Prices Index (CPI).

On 1 April 2015 Civil Service Pensions launched a new pension scheme called Alpha. This scheme is similar to the Nuvos career average scheme but with the retirement age aligned to the state pension age. RCPS cannot operate by analogy to the Alpha scheme as the legislation does not permit this. Reform plans are in progress and expected to be implemented in April 2019. In the meantime BEIS have given permission for RCPS to continue 'as is' beyond April 2019.

The employer contribution rate is agreed by the RCPS Board of Management on the recommendation of the Government Actuary's Department (GAD) and is set at 26 per cent of pensionable pay. During 2017-18 employee contribution rates varied between 4.6 per cent and 8.05 per cent depending on scheme and annual pensionable earnings (see table below). NERC paid costs in the year of £19,659k (2016-17: 19,679k).

Annualised pensionable earnings

	Contribution %
Up to £21,422	4.60
£21,423 - £51,005	5.45
£51,006 - £150,000	7.35
Over £150,000	8.05
Over £150,000	8.05

Formal actuarial valuations are used to determine employer and employee contribution rates. The last actuarial valuation undertaken for RCPS was at 31 March 2006 and was completed in 2008-09. An actuarial valuation as at 31 March 2010 was initiated but not completed due to HM Treasury suspending all public sector pension scheme valuations whilst reform policies were being developed. HM Treasury concluded their reform policy which enabled the Government Actuary Department to start the process of completing a revised scheme valuation. This valuation will be as at 31 March 2012 in accordance with HM Treasury revised scheme valuation directions. The conclusion of the scheme valuation is directly linked to the reform of the RCPS and therefore future employer contribution rates will be established once the scheme reforms are implemented.

It is expected that in April 2019 the RCPS will transfer in to Civil Service pension arrangements. Active RCPS members who had less than 10 years to their scheme pension age as at 1 April 2012 are fully protected and will remain in their current scheme section. Those with between 10 and 13.5 years to their scheme pension age as at 1 April 2012 will be subject to tapered enrolment in the new career average Alpha scheme with this occurring between the time of the RCPS transfer and 1 February 2022. All other members will transfer to the Alpha scheme at the time of the RCPS transfer.

For further details about the Research Councils Pension Scheme pension arrangements can be found at the website **http://jsspensions.nerc.ac.uk/**

A Partnership Pension Account was made available to new recruits from 1 October 2002, based on the portable Stakeholder Pension introduced by the Government in 2001. This is a defined contribution scheme. The employers pay the RCPS 0.8 per cent of pensionable pay to cover death in service and ill-health benefits. The employers pay an age related contribution to the employee's private pension provider.

NERC also paid contributions during the year to a number of other multi-employer pension schemes for specific groups of employees. Details of these schemes are shown below:-

Scheme	Rate of contribution	Year of last valuation
Merchant Navy Officers' Pension Fund	20%	2015
Merchant Navy Ratings' Pension Fund	2%	2014
Merchant Navy Ratings Group Personal Pension Plan [i]	4%	n/a

i A rate of 2% is applicable for employees who are also members of the MNRPF scheme.

Expenditure on strategic consultancy

During the year NERC expenditure on strategic consultancy totalled £37k (2016-17: £59k).

Staff initiatives and communication

Key people initiatives implemented across NERC in 2017-18 include:

- the safe transfer of all NERC staff into a new organisation, UK Research and Innovation (UKRI), under a staff statutory transfer order provided for by the Higher Education & Research Act 2017;
- implementation of plans for new apprenticeships across NERC;
- concluding NERC's two-year Equality and Diversity Action Plan, and identifying priority areas to feed into the new UKRI plan;
- Centre for Ecology & Hydrology achieving both Investors in People reaccreditation, and Athena SWAN bronze award reaccreditation;
- British Geological Survey achieving silver level Investors in People accreditation.

NERC uses a range of approaches to keep staff informed on matters of concern to them, including financial and economic factors affecting the organisation, such as the transfer into UKRI. These include regular staff meetings, ad hoc briefings, the opportunity to hear from directors and the chief executive, intranet updates and regular newsletters.

Staff have the opportunity to share their views and thoughts, particularly through regular employee surveys. NERC Head Office participated in the Civil Service People Survey for the second time in 2017-18. This showed that our staff engagement index had fallen slightly (by 4 per cent) from the previous survey in 2015-16, to 66 per cent, a trend which is not uncommon during a period of significant change. However, this still compares very favourably with the Civil Service People Survey average.

Arrangements are also in place for regular consultative meetings with the trade unions representing NERC staff, which in 2017-18 included a Joint Consultative Committee in relation to the transfer of staff to UKRI.

Staff policies – equal opportunities

NERC applies the Research Council Equality & Diversity Policy and publishes data to enable effective benchmarking. NERC also published its first gender pay gap report in March 2018, in line with new legislation. This showed a mean gender pay gap of 15.1 per cent, which is lower than that for the UK as a whole (18.4 per cent in 2017, as reported by the ONS in the Annual Survey of Hours and Earnings). However, NERC is committed to reducing this gap and also published actions to achieve this.

NERC is committed to the principle of using objective, transparent and non-discriminatory criteria in recruitment and promotion, to making reasonable adjustments for applicants with a disability, to enabling existing staff to continue in employment if they develop a disability, and to encouraging all employees to develop to their full potential.

Trade Union facility time

During 2017-18 NERC had 60 employees who were deemed to be union officials (56.9 full-time equivalent staff). Of these employees, 27 spent less than 1 per cent of their working hours on facility time and 33 spent between 1 per cent and 50 per cent of their working hours on facility time.

The total cost of paying facility time to employees who were relevant union officials during 2017-18 was £50,134. NERC's total pay bill was £113,634,380 (including capitalised staff costs but excluding exit costs) and the percentage of the total pay bill spent on facility time was 0.04 per cent.

Time spent on paid trade union activities as a percentage of total paid facility time hours was 57 per cent.

Off-payroll engagements

At 31 March 2018 NERC had two engagements costing more than £245 per day and lasting for longer than 6 months both of which reached six months duration between 1 April 2017 and 31 March 2018 and were assessed as not caught by IR35. Processes are in place to provide assurance that appropriate tax arrangements, as set out by the Alexander review (2012), are in place to cover all in-year appointees.

Staff exits

Exit package band	Exit package cost band	Total number of exit packages by cost band[i]	
		2018	Restated [ii] 2017
1	<£10k	13	11
2	£10k-£25k	6	4
3	£25k-50k	5	3
4	£50k-£100k	9	8
Total exit packages agreed		**33**	**26**
Total costs of exit packages agreed [ii, iii & iv]		**1,119**	**820**

Notes:

i All payments were within contracted entitlement.

ii The exit packages for 2016-17 have been restated to incorporate the additional £82k paid out in 2017-18 due to Civil Service Compensation Scheme (CSCS) reverting back to the 2010 CSCS terms following a judicial review in July 2017.

iii Full costs of all exit packages agreed during the year, including costs that were covered by the release of provisions as per Note 11 of the Annual Accounts. These costs may therefore differ from the total amount charged for the year.

iv The highest exit package agreed during the year was for £95k. The lowest exit package agreed during the year was for £2k. The median of all exit packages agreed was £21k.

Parliamentary Accountability and Audit Report (audited information)

Regularity of expenditure

I can confirm that for the financial year ended 31 March 2018, neither I nor my staff authorised a course of action, the financial impact of which is that transactions infringe the requirements of regularity as set out in Managing Public Money, and that Treasury approval has been obtained for all novel, contentious or repercussive transactions relating to 2017-2018.

Contingent liabilities

As at 31 March 2018 NERC has two unquantifiable contingent liabilities with regards to legal cases. One of these relates to the intended prosecution of the Health and Safety Executive against NERC under the HSWA 1974 in relation to the management of legionella at the British Geological Survey centre at Keyworth in 2015 (no summons has been received at the date of signing the accounts).

Losses and special payments

NERC has incurred the following losses and special payments during the year:

Losses statement

Type	31 March 2018 £000	2016-17 £000
Stores losses [i]	38	72
Fruitless payments	5	2
Claims abandoned	-	131
Total value of losses	**43**	**205**
Total number of losses	**7**	**15**

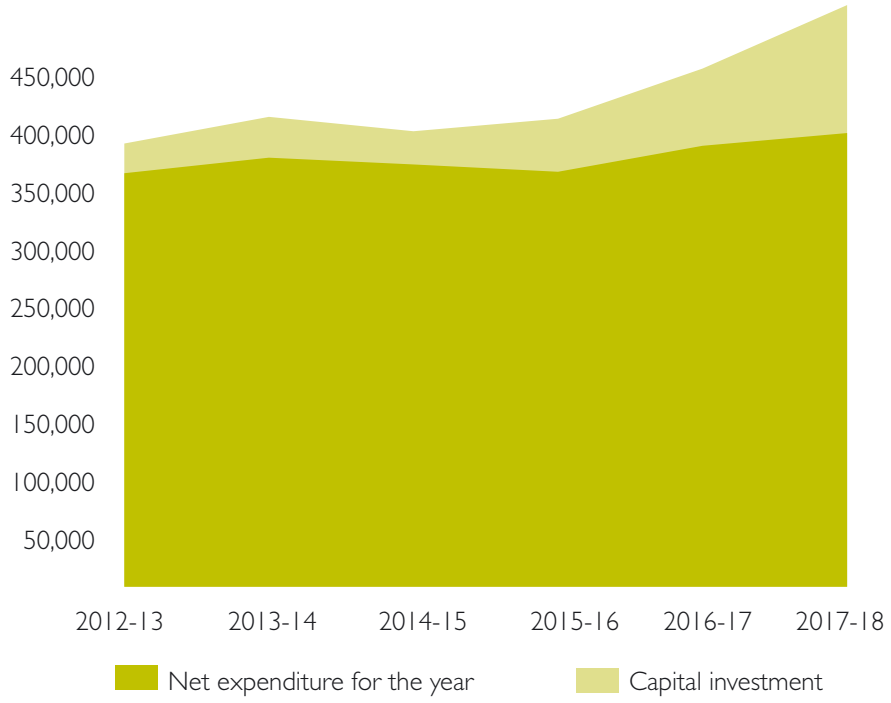
Note:
i Store losses consist of 1 assets lost during normal operations and 3 thefts.

Special payments

Type	31 March 2018 £000	2016-17 £000
Ex-gratia payments [i]	187	199
Total value of special payments	**187**	**199**
Total number of special payments	**2**	**7**

Note:
i Ex-gratia payments relate to settlements of 2 legal claims.

Trends in NERC annual expenditure and investment (in £000)



Professor Duncan Wingham
Chief Executive and Accounting Officer
22 June 2018

The Certificate and Report of the Comptroller and Auditor General to the Houses of Parliament

Opinion on financial statements

I certify that I have audited the financial statements of the Natural Environment Research Council for the year ended 31 March 2018 under the Science and Technology Act 1965. The financial statements comprise: the Statements of Comprehensive Net Expenditure, Financial Position, Cash Flows, Changes in Taxpayers' Equity; and the related notes including the significant accounting policies. These financial statements have been prepared under the accounting policies set out within them. I have also audited the information in the Accountability Report that is described in that report as having been audited.

In my opinion:

- the financial statements give a true and fair view of the state of Natural Environment Research Council's affairs as at 31 March 2018 and of the net expenditure for the year then ended; and
- the financial statements have been properly prepared in accordance with the Science and Technology Act 1965 and Secretary of State directions issued thereunder.

Opinion on regularity

In my opinion, in all material respects the income and expenditure recorded in the financial statements have been applied to the purposes intended by Parliament and the financial transactions recorded in the financial statements conform to the authorities which govern them.

Basis of opinions

I conducted my audit in accordance with International Standards on Auditing (ISAs) (UK) and Practice Note 10 'Audit of Financial Statements of Public Sector Entities in the United Kingdom'. My responsibilities under those standards are further described in the Auditor's responsibilities for the audit of the financial statements section of my certificate. Those standards require me and my staff to comply with the Financial Reporting Council's Revised Ethical Standard 2016. I am independent of the Natural Environment Research Council in accordance with the ethical requirements that are relevant to my audit and the financial statements in the UK. My staff and I have fulfilled our other ethical responsibilities in accordance with these requirements. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

Responsibilities of the Natural Environment Research Council and Accounting Officer for the financial statements

As explained more fully in the Statement of Accounting Officer's Responsibilities, the Natural Environment Research Council and the Accounting Officer are responsible for the preparation of the financial statements and for being satisfied that they give a true and fair view.

Auditor's responsibilities for the audit of the financial statements

My responsibility is to audit, certify and report on the financial statements in accordance with the Science and Technology Act 1965.

An audit involves obtaining evidence about the amounts and disclosures in the financial statements sufficient to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or error. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs (UK) will always detect a material misstatement when it exists.

Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with ISAs (UK), I exercise professional judgment and maintain professional scepticism throughout the audit. I also:

- identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Natural Environment Research Council's internal control.

- evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Natural Environment Research Council's ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify my opinion. My conclusions are based on the audit evidence obtained up to the date of my auditor's report. However, future events or conditions may cause the entity to cease to continue as a going concern.
- evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

I communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that I identify during my audit.

In addition, I am required to obtain evidence sufficient to give reasonable assurance that the income and expenditure reported in the financial statements have been applied to the purposes intended by Parliament and the financial transactions conform to the authorities which govern them.

Other information

The Natural Environment Research Council and the Accounting Officer are responsible for the other information. The other information comprises information included in the annual report, other than the parts of the Accountability Report described in that report as having been audited, the financial statements and my auditor's report thereon. My opinion on the financial statements does not cover the other information and I do not express any form of assurance conclusion thereon. In connection with my audit of the financial statements, my responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or my knowledge obtained in the audit or otherwise appears to be materially misstated. If, based on the work I have performed, I conclude that there is a material misstatement of this other information, I am required to report that fact. I have nothing to report in this regard.

Opinion on other matters

In my opinion:

- the parts of the Accountability Report to be audited have been properly prepared in accordance with the Secretary of State directions made under the Science and Technology Act 1965;
- in the light of the knowledge and understanding of the Natural Environment Research Council and its environment obtained in the course of the audit, I have not identified any material misstatements in the Performance Report or the Accountability Report; and
- the information given in Performance Report and Accountability Report for the financial year for which the financial statements are prepared is consistent with the financial statements.

Matters on which I report by exception

I have nothing to report in respect of the following matters which I report to you if, in my opinion:

- adequate accounting records have not been kept or returns adequate for my audit have not been received from branches not visited by my staff; or
- the financial statements and the parts of the Accountability Report to be audited are not in agreement with the accounting records and returns; or
- I have not received all of the information and explanations I require for my audit; or
- the Governance Statement does not reflect compliance with HM Treasury's guidance.

Report

I have no observations to make on these financial statements.

Sir Amyas C E Morse
Comptroller and Auditor General

National Audit Office
157-197 Buckingham Palace Road
Victoria
London
SW1W 9SP

5 July 2018

Financial statements

Statement of comprehensive net expenditure for the period ended 31 March 2018

	Notes	2017-18 £000	2016-17 £000
Operating income	6	**(71,134)**	**(70,356)**
Operating expenditure			
Staff costs	3	111,891	112,961
Purchase of goods and services	4.1	85,965	84,786
Depreciation, amortisation and impairments	4.2	39,025	55,321
Provision expense		229	4,784
Research and development grants	5	220,618	190,519
Notional service charge		5,643	5,950
Other operating expenditure		32	(1,869)
Total operating expenditure		**463,403**	**452,452**
Net operating expenditure		**392,269**	**382,096**
Finance income		(51)	(1,102)
Finance expense		93	289
Net expenditure for the year		**392,311**	**381,283**
Other comprehensive expenditure		(5,944)	307
Comprehensive net expenditure for the year		**386,367**	**381,590**

The notes on page 61 to 76 form part of these accounts.

Statement of financial position as at 31 March 2018

	Notes	31 March 2018 £000	31 March 2017 £000
Non-current assets			
Property, plant and equipment	7	544,203	467,540
Intangible assets		2,448	1,638
Financial assets		152	94
Trade and other receivables	8	47	58
Total non-current assets		**546,850**	**469,330**
Current assets			
Assets held for sale		-	-
Trade and other receivables	8	24,028	24,785
Cash and cash equivalents	9	5,872	1,677
Total current assets		**29,900**	**26,462**
Total assets		**576,750**	**495,792**
Current liabilities			
Trade and other payables	10	(61,534)	(57,388)
Provisions	11	(655)	(605)
Total current liabilities		**(62,189)**	**(57,993)**
Total assets less current liabilities		**514,561**	**437,799**
Non-current liabilities			
Trade and other payables	10	(523)	(2,007)
Provisions	11	(13,821)	(14,178)
Total non-current liabilities		**(14,344)**	**(16,185)**
Total assets less liabilities		**500,217**	**421,614**
Taxpayers' equity			
General fund		399,764	318,082
Revaluation reserve		100,453	103,532
Total equity		**500,217**	**421,614**

The notes on page 61 to 76 form part of these accounts.

Professor Duncan Wingham
Chief Executive and Accounting Officer
22 June 2018

Statement of cash flows for the period ended 31 March 2018

	Notes	2017-18 £000	2016-17 £000
Cash flows from operating activities			
Net expenditure for the year		(392,311)	(381,283)
Adjustments for non-cash transactions		39,057	53,452
Decrease/(increase) in trade and other receivables	8	768	(708)
Increase/(decrease) in trade and other payables	10	4,029	(2,796)
Notional service charge		5,643	5,950
(Decrease)/increase in provisions	11	(307)	4,014
Net cash outflow from operating activities		**(343,121)**	**(321,371)**
Cash flows from investing activities			
Purchase of property, plant and equipment	7	(109,203)	(71,583)
Purchase of intangible assets		(1,441)	(344)
Proceeds of disposal of property, plant and equipment, intangible assets and investments		-	5,159
Net cash outflow from investing activities		**(110,644)**	**(66,768)**
Cash flows from financing activities			
Funding received from BEIS		459,327	388,273
Capital element of finance lease		(1,367)	(1,258)
Net cash inflow from financing activities		**457,960**	**387,015**
Net increase/(decrease) in cash and cash equivalents in this period		**4,195**	**(1,124)**
Cash and cash equivalents at the beginning of the period		1,677	2,801
Cash and cash equivalents at the end of the period		**5,872**	**1,677**

The notes on page 61 to 76 form part of these accounts.

Statement of changes in taxpayers' equity for the period ended 31 March 2018

	General fund £000	Revaluation reserve £000	Total equity £000
Balance as at 1 April 2016	**294,794**	**114,187**	**408,981**
Grant-in-aid and other BEIS funding	388,273	-	388,273
Net expenditure for the year	(381,283)	-	(381,283)
Movements in reserves:			
Notional charge	5,950	-	5,950
Revaluation in year	-	(307)	(307)
Transfers between reserves	10,348	(10,348)	-
Balance at 1 April 2017	**318,082**	**103,532**	**421,614**
Grant-in-aid, notional costs and other BEIS funding	459,327	-	459,327
Net expenditure for the year	(392,311)	-	(392,311)
Movements in reserves:			
Notional charge	5,643	-	5,643
Revaluation in year	-	5,944	5,944
Transfers between reserves	9,023	(9,023)	-
Balance at 31 March 2018	**399,764**	**100,453**	**500,217**

The notes on page 61 to 76 form part of these accounts.

Notes to the Accounts

1. Statement of accounting policies

1.1 Basis of accounting

These accounts have been prepared in accordance with The Science and Technology Act 1965, the 2017-18 Government Financial Reporting Manual (FReM) issued by HM Treasury and with directions made by the Secretary of State. They meet the accounting and disclosure requirements of the Companies Act 2006 and accounting standards issued or adopted by the Accounting Standards Board in as far as these requirements are appropriate in accordance with the FReM.

The accounting policies contained in the FReM apply International Financial Reporting Standards (IFRS) as adapted or interpreted for the public sector context. Where the FReM permits a choice of accounting policy, the accounting policy which is judged to be most appropriate to the particular circumstances of the Natural Environment Research Council (NERC) for the purpose of giving a true and fair view has been selected. The particular policies adopted by NERC for material transactions or where management has exercised judgement in selecting the accounting policy, are described below. They have been applied consistently in dealing with items that are considered material to the accounts.

These financial statements are presented in pounds sterling, NERC's functional currency, and have been rounded to the nearest thousand pounds (£000).

1.2 Accounting convention

These accounts have been prepared under the historical cost convention modified to include the fair valuation of property, plant and equipment, intangible assets and inventories to the extent required or permitted under IFRS as set out in the relevant accounting policies.

1.3 Going concern

The Higher Education and Research Bill received Royal Asset on 27 April 2017 confirming the creation of a single executive non-departmental public body, UK Research and Innovation (UKRI). Under the Higher Education and Research Act 2017, UKRI incorporated the assets, liabilities and functions of the seven Research Councils, Innovate UK and Government's funding of research in higher education from 1 April 2018.

Confirmation of UKRI's budget allocation for 2018-19 to 2020-21 was received from the Department for Business, Energy and Industrial Strategy (BEIS) in March 2018 which shows continued funding for the functions exercised by NERC for this period.

As the functions previously provided by NERC will continue to be provided by UKRI with the same assets and liabilities, it remains appropriate for the financial statements of NERC for the financial year ended 31 March 2018 to be prepared on a going concern basis in accordance with the Government Financial Reporting Manual issued by HM Treasury.

1.4 Non-current assets

Property, plant and equipment

Property, plant and equipment held for their service potential and in use are carried at current value in existing use. Property, plant and equipment recently held for their service potential, but surplus and with restrictions on sale, will continue to

be carried at current value in existing use; property, plant and equipment that are surplus, but without any restrictions on sale, are held at fair value using IFRS 13 *Fair Value Measurement*. Property, plant and equipment not held for their service potential are valued in accordance with IFR 5 *Assets held for Sale* or IAS 40 *Investment Properties*.

The capitalisation threshold for property, plant and equipment is £10,000. This includes the purchase of land and buildings, construction and services projects, and equipment.

Revaluation

Land, buildings, ice stations in Antarctica, ships and aircraft are independently and professionally revalued every five years. These assets are subject to annual indexation when a full revaluation is not completed.

The British Antarctic Survey (BAS) Antarctic Research Stations were valued in 2016-17 by Rafe Staples BSc (Hons), MRICS and Jenefer Bugge MA (Hons) MLE MRICS acting as external valuers, on the basis of depreciated replacement cost. The reinstatement costs were calculated by Turner & Townsend and adjusted by BAS and Powis Hughes in accordance with the RICS Valuation - Professional Standards (January 2014).

The UK land and building assets were subject to revaluation in 2016-17. The valuations were undertaken jointly by GVA and Powis Hughes and prepared by RICS registered valuers acting as external valuers. They were completed in accordance with NERC's accounting policies and the RICS Valuation - Professional Standards (January 2014). Non-specialist operational properties have been assessed to fair value, interpreted as market value for existing use, with specialist operational assets valued at depreciated replacement cost. Non–operational assets are valued at market value.

The four research ships, RRS *Discovery*, RRS *James Clark Ross*, RRS *Ernest Shackleton* and RRS *James Cook*, were revalued in 2013-14 by E.A. Gibson Shipbrokers Ltd. All aircraft were also revalued in 2013-14 by the International Bureau of Aviation Group Limited.

All other plant, equipment and transport are revalued using relevant indices.

Any surplus or deficit on revaluation is taken to a revaluation reserve, except that any permanent diminution in value is charged to the statement of comprehensive net expenditure in the year in which it is recognised. Where subsequent evidence suggests a partial or complete reversal of the diminution in value, this is also reflected in the statement of comprehensive net expenditure in the year in which it is recognised as per IAS 36.

Increased depreciation charges arising from the revaluation are matched by annual transfers from the revaluation reserve to the income and expenditure reserve. On the disposal of a revalued asset, that element of the revaluation reserve which becomes realised as a result is transferred directly to the income and expenditure reserve.

Impairments

If any indication of impairment exists in any item of property, plant or equipment, the recoverable amount of the asset is estimated in order to determine the extent of any impairment loss. The recoverable amount is the higher of fair value less costs to sell and value in use. Impairment losses are charged to the statement of comprehensive net expenditure.

Any reversal of an impairment charge is recognised in the statement of comprehensive net expenditure to the extent that the original charge, adjusted for subsequent depreciation, was previously recognised, with any remaining amount recognised in the revaluation reserve.

Depreciation
Property, plant and equipment are depreciated at rates calculated to write them down to the estimated residual values on a straight line basis over the estimated useful lives. Assets under construction are not depreciated until the asset is brought into use.

Freehold land is not depreciated and other property, plant and equipment assets are normally depreciated over the following periods:

Leasehold land	over the terms of the lease
Freehold buildings	up to 50 years or valuer's estimates of economic life
Long leasehold buildings	up to 50 years (or the length of the lease if less)
Short leasehold buildings	over the length of the lease
Antarctic ice stations	up to 35 years or valuer's estimates of remaining useful life
Plant and machinery	5-15 years
Ships and aircraft	minimum of 20 years for ships, 15 years for aircraft
Scientific, office and major computing equipment	3-10 years
Motor vehicles	3-10 years

Component accounting
Property, plant and equipment may have parts with different useful lives. In accordance with the provisions of IAS 16 each part of an item of property, plant and equipment with a cost that is significant in relation to the total cost of the item is depreciated separately.

1.5 Cash and cash equivalents

Cash and cash equivalents comprise cash balances and deposits which are repayable on demand.

1.6 Financial instruments

NERC recognises and measures financial instruments in accordance with IAS 39 *Financial Instruments: Recognition and Measurement* as interpreted by the FReM.

Financial assets and liabilities are initially measured at fair value plus transaction costs, with exception of those that are carried at fair value through profit or loss, in which case transaction costs are charged to operating costs.

Financial assets are derecognised when the rights to receive future cash flows have expired or are transferred and NERC has transferred substantially all the risks and rewards of ownership.

Financial liabilities are derecognised when the obligation is discharged, cancelled or expires.

Trade receivables
Trade receivables are carried at original invoice amount less allowance for impairment. Provision for impairment is established when there is objective evidence that NERC will not be able to collect all amounts due according to the

original terms of the receivable. The amount of provision is the difference between the carrying amount and recoverable amount and is recognised in the statement of comprehensive net expenditure.

Trade and other payables
Trade and other payables are recognised in the period in which related money, goods or services are received or when a legally enforceable claim against NERC is established or when the corresponding assets or expenses are recognised.

Risk
Due to the non-trading nature of its activities and the way in which NERC is financed, NERC is not exposed to the degree of financial risk faced by non-public sector entities. NERC has very limited powers to borrow or invest surplus funds. Financial assets and liabilities are generated by day-to-day operational activities and are not held to change the risks facing NERC in undertaking its activities.

NERC is subject to foreign currency risk through the maintenance of bank accounts in foreign currencies (predominantly the EUR and the USD) to deal with day-to-day overseas transactions. The risk is low level and not actively managed by NERC.

1.7 Provisions

Provisions are recognised and measured in accordance with IAS 37 *Provisions, Contingent Liabilities and Contingent Assets*. Where the time value of money is material, provisions are discounted to present value using HM Treasury's real discount rates, currently +0.10% for pension provisions and for all other provisions: short-term -2.42 per cent, medium-term -1.85 per cent and long-term -1.56 per cent.

1.8 Grant-in-aid and other BEIS funding

Under the FReM, Non-Departmental Public Bodies (NDPBs) regard grant-in-aid and other funding received for revenue purposes as contributions from controlling parties giving rise to a financial interest in the body. As a result, grant-in-aid and other funding received from BEIS are credited to the general fund, rather than being recognised as income in the statement of comprehensive net expenditure.

1.9 Operating income

Operating income is income that relates directly to the operating activities of NERC and is measured at the fair value of consideration received or receivable. It is recorded net of trade discounts, value added tax and other taxes.

1.10. Grant and training awards payable

The majority of research grants and fellowships are paid by the Council on an instalment basis in arrears in accordance with an agreed payment profile. The majority of studentship payments are paid on a quarterly instalment basis in advance directly to the research institute.

Research and training grants made in advance or in arrears are accounted for on an accruals basis in the financial statements. Future commitments at the balance sheet date are disclosed in Note 12 of the financial statements.

1.11 Ownership of equipment purchased with NERC grants

Equipment purchased by an institution with research grant funds supplied by NERC belong to the institution and are not included in NERC's property, plant and equipment. Through the conditions of grant applied to institutions funded, NERC reserves the right to determine the disposal of such equipment and how any disposal proceeds are to be utilised.

1.12 Pensions

Payments are made to the Research Councils' Pension Scheme in respect of superannuation benefits for Council staff. In addition NERC also pays contributions to a number of other multi-employer pensions schemes for specific groups of employees, such as the Merchant Navy Officers' and Ratings' Pensions Funds and Plans.

1.13 Early retirements

The costs of early retirements are charged to NERC's accounts in the year in which the binding decision is taken to release staff and liabilities recognised. Payments by the Council of early retirement lump sums are recoverable from the Research Councils' Pension Scheme when recipients achieve normal retirement age. Recoverable amounts are recognised as receivables in these accounts and offset against annual staff restructuring costs.

1.14 Employee benefits

In accordance with IAS 19 *Employee benefits*, NERC recognises short term employee benefits when an employee has rendered service in exchange for those benefits. An example of this is the employee annual leave accrual.

1.15 Value Added Tax

As NERC is partially exempt for VAT purposes, irrecoverable VAT is charged to the relevant expenditure category or included in the capitalised purchase cost of property, plant and equipment. Where output tax is charged or input tax is recoverable the amounts are stated net of VAT. NERC has charitable status for VAT purposes.

1.16 Leases

Leases are recognised in accordance with IAS 17 *Leases*.

Leases in which a significant portion of the risks and rewards of ownership are retained by the lessor are classified as operating leases. The cost of the lease and any lease incentive are charged to the statement of comprehensive net expenditure over the lease term on a straight-line basis unless another systematic basis is more appropriate.

For ship leases where NERC has the use of a ship for which substantially all risks and rewards of the asset are transferred to the Council, the assets are treated as if they had been purchased outright at the present value of the total rentals payable during the period of the lease. The corresponding leasing commitments are shown as obligations to the lessor in payables. Charges are made to the statement of comprehensive net expenditure in respect of:

- Depreciation, which is charged on a straight line basis over the shorter of its useful economic life or the lease period
- Finance charges, which are allocated over the period of the lease in accordance with the interest rate within the contract.

1.17 Contingent liabilities

Contingent liabilities are disclosed in accordance with IAS 37 *Provisions, Contingent Liabilities and Contingent Assets*, e.g. where a potential liability is deemed to have arisen but the obligation has yet to be confirmed due to the lack of a reliable estimate or where it is not deemed probable that an outflow will ensure, unless the likelihood of an outflow is remote.

1.18 Accounting estimates and judgements

The preparation of the financial statements requires management to make key judgements, estimates and assumptions that affect the reported amounts of assets and liabilities and income and expenditure based on experience and expected events. Actual results may differ from these estimates under different assumptions and conditions. Specific policies for judgemental areas such as provisions, which include estimates of useful economic lives and decommissioning costs of Antarctic assets, are shown above.

1.19 Changes to IFRS

All International Financial Reporting Standards and interpretations and amendments to published standards which are effective at 1 April 2017 have been adopted in these financial statements, taking into account the specific interpretations and adaptations included in the FReM.

The IASB and IFRIC have issued certain standards and interpretations with an effective date after these financial statements, which have not been applied to these financial statements. The standards most relevant to NERC are IFRS 9 *Financial Instruments*, IFRS 15 *Revenue from Contracts with Customers*, IFRS 16 *Leases* and IFRIC 22 *Foreign Currency Transactions and Advance Consideration*. These will be adopted at the effective date.

IFRS 9 *Financial Instruments* is being introduced to replace IAS 39 *Financial Instruments: Recognition and Measurement*. The new standard simplifies the classification and measurement of financial assets as well as amending when and how impairments are calculated and reported, moving from an incurred loss to an expected loss model. This will result in impairments of financial assets being recognised earlier than under IAS 39. Effective date of implementation is 1 January 2018.

IFRS 15 *Revenue from Contracts with Customers* will replace IAS 18 *Revenue* and IAS 11 *Construction Contracts*, unifying the concepts in these two standards into a single model to recognise revenue as a performance obligation under a contract is satisfied. Effective date of implementation is 1 January 2018.

IFRS 16 *Leases* will replace IAS 17 *Leases*. The new standard amends the accounting for lessees, removing the distinction between recognising an operating lease (off-balance sheet financing) and a finance lease (on-balance sheet financing). The new standard requires recognition of all leases which last over 12 months to be recognised as a finance lease (on-balance sheet). Effective date of implementation is 1 January 2019.

IFRIC 22 *Foreign Currency Transactions and Advance Consideration*. The new standard covers foreign currency transactions when an entity recognises a non-monetary asset or non-monetary liability arising from the payment or receipt of advance consideration before the entity recognises the related asset, expense or income. It requires that the date of the transaction, for the purpose of determining the exchange rate, is the date of initial recognition of the non-monetary prepayment asset or deferred income liability. Effective date of implementation is 1 January 2018.

The potential effects of the new standards are not anticipated to have a significant impact on the future UKRI financial statements.

Details for the transfer of NERC assets, liabilities and functions to the new executive non-departmental public body, UK Research and Innovation (UKRI) from 1 April 2018 can be found in Note 1.3 Going Concern.

1.20 Research and development

As an organisation wholly engaged in research, NERC does not classify research and development expenditure separately in the accounts. It is reported under operating expenditure in the statement of comprehensive net expenditure.

2. Analysis of net expenditure by operating segment

NERC reports income and expenditure by segment in accordance with IFRS 8 *Operating segments*. Operating segments are funding streams about which separate financial information is available that is regularly evaluated by the chief operating decision maker, the NERC Management Board.

NERC's assets and liabilities are shared across all funding streams and therefore not separately identified and disclosed.

Analysis of net expenditure by funding stream 2017-18

	National Capability	Antarctic Logistics and Infrastructure Partition	Discovery Science	Strategic Research	Post-Graduate Training	Fellowships	Innovation	Research Centres	Other	Total
	£000	£000	£000	£000	£000	£000	£000	£000	£000	£000
Operating Income [i]	**(1,933)**	**(5,947)**	**(394)**	**(15,954)**	**(1,018)**	**-**	**(1,427)**	**(44,162)**	**(299)**	**(71,134)**
Expenditure										
Staff costs	2,124	15,803	216	1,160	222	3	781	83,813	7,769	111,891
Purchase of goods and services	12,753	19,133	41	594	105	16	546	50,473	2,304	85,965
Depreciation, amortisation and impairments	-	-	-	-	-	-	-	-	39,025	39,025
Provision expense	-	-	-	-	-	-	-	-	229	229
Grants and training awards	44,188	-	45,542	67,114	26,571	8,354	13,624	14,741	484	220,618
Notional service charge	-	-	-	-	-	-	-	-	5,643	5,643
Other operating expenditure	-	-	-	-	-	-	-	-	32	32
Internal transfers [ii]	67,975	2,072	7,596	14,440	561	357	6,117	(105,676)	6,558	-
Total expenditure	**127,040**	**37,008**	**53,395**	**83,308**	**27,459**	**8,730**	**21,068**	**43,351**	**62,044**	**463,403**
Net operating expenditure	**125,107**	**31,061**	**53,001**	**67,354**	**26,441**	**8,730**	**19,641**	**(811)**	**61,745**	**392,269**

Notes:
i Business units receive external funding for research from the UK public sector, European Commission and private sector. In addition they receive other operating income, such as software and data sales and royalties and license fees from intellectual property.
ii Internal transfers result from sharing of resources, internal trading and internal awards between funding streams. The overall net impact on the organisation is zero.

Analysis of net expenditure by funding stream 2016-17

	National Capability £000	Antarctic Logistics and Infrastructure Partition £000	Discovery Science £000	Strategic Research £000	Post-Graduate Training £000	Fellowships £000	Innovation £000	Research Centres £000	Other £000	Total £000
Operating income	**(3,080)**	**(2,448)**	**(346)**	**(14,818)**	**(233)**	**-**	**(1,101)**	**(48,378)**	**48**	**(70,356)**
Expenditure										
Staff costs	2,275	15,084	106	570	3	-	877	86,386	7,660	112,961
Purchase of goods and services	13,140	19,591	22	539	55	7	489	48,211	2,732	84,786
Depreciation, amortisation and impairments	-	-	-	-	-	-	-	-	55,321	55,321
Provision expense	-	-	-	-	-	-	-	-	4,784	4,784
Grants and training awards	18,449	-	44,677	68,285	24,564	6,715	12,395	14,339	1,095	190,519
Notional service charge	-	-	-	-	-	-	-	-	5,950	5,950
Other operating expenditure	-	-	-	-	-	-	-	-	(1,869)	(1,869)
Internal transfers	66,223	13	7,787	14,630	543	176	6,054	(102,623)	7,197	-
Total expenditure	**100,087**	**34,688**	**52,592**	**84,024**	**25,165**	**6,898**	**19,815**	**46,313**	**82,870**	**452,452**
Net operating expenditure	**97,007**	**32,240**	**52,246**	**69,206**	**24,932**	**6,898**	**18,714**	**(2,065)**	**82,918**	**382,096**

3. Staff costs

	2017-18 £000	2016-17 £000
Wages and salaries [i]	82,951	84,236
Social Security costs	9,078	8,832
Pension costs	19,862	19,893
Total	**111,891**	**112,961**

Note:
i Wages and salaries includes £1,201k of exit costs (2016-17: £738k), £307k (2016-17: £534k) for temporary, contracted and seconded staff and £779k (2016-17: £583k) for Agency Staff.

The total amount capitalised for staff costs in 2017-18 is £2,945k (2016-17: £1,176k). This relates to an estimated 44.1 full-time equivalent staff (2016-17: 16.5 FTE) who are adding value to assets, such as those engaged in project management or building of assets.

4.1 Purchase of goods and services

	2017-18 £000	2016-17 £000
Rentals under operating leases	459	436
Accommodation	9,092	10,261
Professional services	8,193	9,592
Finance and HR services	14	68
IT costs / support costs	7,114	6,097
Training and other staff costs	1,932	1,793
Travel and subsistence	10,791	10,039
Telecommunications cost	1,927	1,721
Advertising and publicity	420	411
Media and design services	16	2
Audit fees [i]	80	109
International subscriptions	4,267	3,800
Professional subscriptions	1,252	922
Postage and freight	1,291	861
Hire of conference facilities	1,782	1,693
Catering services	440	491
Outsourced programme management services	1,174	1,076
Miscellaneous other costs	3,077	3,323
Cost of goods sold	72	66
Losses and compensation	2	130
Other audit costs	244	212
Purchase of scientific equipment	6,576	6,107
Ships and aircraft operations	17,884	18,334
Materials, consumables and spares	7,866	7,242
Total[ii]	**85,965**	**84,786**

Note:
i Audit fees include NAO statutory audit fee of £80k (2016-17: £80k).
ii Adjusted to show £35k of bank charges as Finance Expense to match treatment in BEIS Accounts.

4.2 Depreciation, amortisation and impairments

	2017-18 £000	2016-17 £000
Depreciation	38,247	40,778
Amortisation of intangible assets	669	670
Impairment of property, plant and equipment	140	13,873
Reversal of impairments of investments	(31)	-
Total	**39,025**	**55,321**

5. Research and development grants

	2017-18 £000	2016-17 £000
Research grants [i]	127,881	123,612
Research contracts [ii]	65,570	40,905
Post graduate training awards [iii]	27,167	26,002
Total	**220,618**	**190,519**

Notes:
i Research grants for 2017-18 include £1.3m awarded out of the new Global Challenges Research Fund (2016-17: nil) and £8.5m awarded out of Newton funding (2016-17: £7.5m).
ii Research contracts for 2017-18 include £27.5m capital grants awarded to UK and overseas research organisations (2016-17 £2.0m), including £1.6m for NCAS, £4.3m for the University of York, £2.8m for the University of Edinburgh, £3.0m for the University of St Andrews, £7.8m for STFC, £3.2m for PML and £3.1m for EISCAT.
iii Post graduate training awards for 2017-18 include new NPIF funding of £1.3m (2016-17: nil).

6. Operating income

	2017-18 £000	2016-17 £000
Current grants from European Commission [i]	8,282	8,544
Income from private sector	19,780	20,328
Income from other governmental departments and public sector	32,619	29,780
Miscellaneous income [ii]	4,983	6,276
Rental income	1,231	1,192
Sales of goods and services	4,239	4,236
Total	**71,134**	**70,356**

Notes:
i Income from the European Commission consists of cash receipts of £8,158k and accrued income of £124k.
ii Miscellaneous income includes £1,718k (2016-17 £2,549k) of monies from the University of Southampton paid to the National Oceanography Centre concerning their joint occupation of the Waterfront Campus.

7. Property, plant and equipment

Cost or valuation	Land [i]	Buildings and Antarctic stations	IT equipment	Plant and machinery	Fixtures and fittings	Transport [ii]	Assets under construction	Total
	£000	£000	£000	£000	£000	£000	£000	£000
At 1 April 2017	37,256	326,145	9,384	86,073	1,013	320,637	70,695	851,203
Additions	-	883	2,761	6,001	192	4,789	94,577	109,203
Disposals [iii]	-	(1)	(1,323)	(6,676)	(13)	(369)	-	(8,382)
Impairments [iv]	-	(131)	-	(9)	-	-	-	(140)
Reclassifications [v]	-	1,103	13	4,949	43	-	(6,128)	(20)
Revaluations	825	6,720	170	5,429	20	(3,269)	-	9,895
At 31 March 2018	**38,081**	**334,719**	**11,005**	**95,767**	**1,255**	**321,788**	**159,144**	**961,759**
Depreciation								
At 1 April 2017	(6,179)	(150,215)	(4,865)	(44,453)	(400)	(177,551)	-	(383,663)
Charged in year	(279)	(8,693)	(1,396)	(10,758)	(200)	(16,921)	-	(38,247)
Disposals [iii]	-	1	1,323	6,643	13	369	-	8,349
Reclassifications [v]	-	(3)	1	3	-	-	-	1
Revaluations	(141)	(2,496)	(91)	(4,552)	(10)	3,294	-	(3,996)
At 31 March 2018	**(6,599)**	**(161,406)**	**(5,028)**	**(53,117)**	**(597)**	**(190,809)**	**-**	**(417,556)**
Net Book Value At 31 March 2018	**31,482**	**173,313**	**5,977**	**42,650**	**658**	**130,979**	**159,144**	**544,203**
At 1 April 2017	31,077	175,930	4,519	41,620	613	143,086	70,695	467,540

Notes:

i Cost or valuation includes £19,017k in respect of freehold land which is not depreciated (2016-17: £18,605k).

ii The Net Book Value of the leased ship is £5,776k (2016-17: £9,484k). The annual depreciation charge on this asset held under the finance lease is £4,357k (2016-17: £3,930k).

iii Within Plant and Machinery losses amounting to £31k were recognised for an item originally impaired in 2016-17 and now deemed lost. NERC conducts research activity in some of the most extreme environments across the globe. Whilst every effort is made to safeguard assets, the risk of loss can only be minimised, not eliminated.

iv The impairments of Buildings and Antarctic relate to works at the Bird Island base that include the demolition and replacement of Beck House along with the base's steel walkways. Plant and machinery include £32k for two underwater sensor packages for which contact was lost during the year and which do not currently deliver economic benefits, £13k for underwater equipment which has been deemed irrecoverable and the reversal of the 2016-17 impairment of underwater sensor package, which has now been written off.

v Reclassifications relate to bringing into service of assets under the course of construction along with the delayed recognition of equipment elements of major building projects after the buildings have come into service and some small misclassifications of intangible assets as equipment.

Cost or valuation	Land	Buildings and Antarctic stations	IT equipment	Plant and machinery	Fixtures and fittings	Transport	Assets under construction	Total
	£000	£000	£000	£000	£000	£000	£000	£000
At 1 April 2016	40,995	334,918	8,518	82,044	949	318,086	21,786	807,296
Additions	-	513	1,611	5,121	6	4,498	59,834	71,583
Disposals[i]	(2,699)	(6,403)	(747)	(5,259)	-	(879)	-	(15,987)
Impairments[ii]	-	(7,434)	-	237	-	(10,170)	-	(17,367)
Reclassifications	-	4,926	(167)	2,390	39	3,533	(10,925)	(204)
Revaluations	(1,040)	(375)	169	1,540	19	5,569	-	5,882
At 31 March 2017	**37,256**	**326,145**	**9,384**	**86,073**	**1,013**	**320,637**	**70,695**	**851,203**
Depreciation								
At 1 April 2016	(6,049)	(143,941)	(4,070)	(38,557)	(199)	(160,159)	-	(352,975)
Charged in year	(362)	(9,939)	(1,461)	(10,030)	(190)	(18,796)	-	(40,778)
Disposals[i]	1,261	2,981	717	4,922	-	559	-	10,440
Impairments[ii]	-	-	-	-	-	3,494	-	3,494
Reclassifications	-	-	41	5	(5)	-	-	41
Revaluations	(1,029)	684	(92)	(793)	(6)	(2,649)	-	(3,885)
At 31 March 2017	**(6,179)**	**(150,215)**	**(4,865)**	**(44,453)**	**(400)**	**(177,551)**	**-**	**(383,663)**
Net Book Value as at 31 March 2017	**31,077**	**175,930**	**4,519**	**41,620**	**613**	**143,086**	**70,695**	**467,540**
At 1 April 2016	34,946	190,977	4,448	43,487	750	157,927	21,786	454,321

Notes:

i Disposals of Land & Buildings during the year include the sale of the Edinburgh Loanhead (£1,311k net) and Murchison House (£3,550k net) properties following the relocation of BGS's Edinburgh operations to the new Lyell Centre on the campus of Heriot Watt University.
During the year 4 assets were identified which had either been lost or damaged. As a result losses amounting to £38k were recognised within the Plant and Machinery category. NERC conducts research activity in some of the most extreme environments across the globe. Whilst every effort is made to safeguard assets, the risk of loss can only be minimised, not eliminated.

ii The net impairment costs of £13,873k as shown in note 4.2 consist of impairment costs of £16,963k less the reversal of previous impairment costs amounting to £3,090k. These costs are included in the expenditure for the year in the statement of changes in taxpayer equity.
The impairments of Buildings and Antarctic Stations relate to revaluation of properties to below their depreciated historic cost, the impairment reversals reflect the revaluation of properties above their depreciated historic cost where these properties had been impaired as a result of previous valuations.
The net impairment costs are as follows:
- Halley VI Antarctic Research Base (£7,281k), Lancaster (£577k), Bangor (£322k), Wallingford (£695k) and Edinburgh Lyell Centre (£1,376k) properties being impaired to their professionally revalued amounts.
- Bush (-£266k) and Keyworth (-£2,551k) prior year impairments partially reversed due to subsequent professional revaluation.
The impairments of Plant and machinery include £36k for an underwater sensor packages for which contact was lost during the year and which does not currently deliver economic benefits; as well as the reversal of impairments for three underwater sensor packages for which contact was lost during 2015-16 and which are now deemed to be lost.
The impairment of Transport Equipment wholly relates to the reduction of the RRS *James Clark Ross* research vessel to its open market value following an impairment review of Antarctic vessels carried out as part of a wider review of NERC's Antarctic capital base.

8. Receivables

	31 March 2018 £000	31 March 2017 £000
Amounts falling due within one year:		
Trade receivables	9,052	9,203
Other receivables	264	205
Staff receivables	78	61
Prepayments and accrued income [i]	14,634	15,316
	24,028	**24,785**
Amounts falling due after more than one year:		
Staff receivables	47	58
Total	**24,075**	**24,843**

Note:
i Prepayments are due to contractual obligations, such as international subscriptions, license and maintenance costs, many of which are due to be paid at the beginning of a calendar year.

9. Cash and cash equivalents

	2017-18 £000	2016-17 £000
Balance as at 1 April	**1,677**	**2,801**
Net change in cash and cash equivalent balances	4,195	(1,124)
Balance as at period end date	**5,872**	**1,677**
The following balances were held at 31 March:		
Government Banking Service	3,718	605
Commercial banks and cash in hand	2,154	1,072
Total [i]	**5,872**	**1,677**

Note:
i In addition to the above NERC holds £775k (2016-17: £2,746k) on behalf of 3rd party European Commission programme collaborators.

10. Payables

	31 March 2018 £000	31 March 2017 £000
Amounts falling due within one year:		
VAT payable	1,171	901
Other taxation and social security	2,104	2,114
Trade payables	10,119	8,576
Other payables	175	106
Accruals and deferred income	46,480	44,324
Finance lease	1,485	1,367
	61,534	**57,388**
Amounts falling due after more than one year:		
Finance lease	523	2,007
Total	**62,057**	**59,395**

11. Provisions for liabilities and charges [i]

	31 March 2018 £000	31 March 2017 £000
Balance at 1 April [ii]	**14,783**	**10,769**
(Released)/provided in the year	(1,047)	4,580
Provision utilised in the year	(330)	(539)
Changes in price level	1,240	57
Unwinding of discount	(170)	(84)
Balance at reporting date	**14,476**	**14,783**

Notes:
i The discount rate used is 0.10% for pension provisions (2016-17: 0.24%). For all other provisions the discount rate is -2.42% for 0-5 years, -1.85% for 6-10 years and -1.56% for over 10 years (2016-17:-2.70% for 0-5 years, -1.95% for 6-10 years and -0.80% for over 10 years).
ii Includes provisions for Antarctic Treaty costs representing the Council's liability to remove any items from the Antarctic no longer used.

Analysis of expected timing of discounted cashflows

	31 March 2018 £000	31 March 2017 £000
Provision due within one year	655	605
Between one and five years	1,430	1,679
Between five and ten years	2,575	2,615
Later than ten years	9,816	9,884
Total	**14,476**	**14,783**

12. Commitments

12.1 Forward commitments on approved research grants, contracts and training awards

	31 March 2018 £000	31 March 2017 £000
Within one year	179,594	170,586
Between one and five years	176,589	189,118
Later than five years	593	31
Total	**356,776**	**359,735**

12.2 Finance lease obligations

	31 March 2018 £000	31 March 2017 £000
Within one year	1,485	1,367
Between one and five years	523	2,007
Total	**2,008**	**3,374**

12.3 Operating lease commitments

	31 March 2018 £000	31 March 2017 £000
Within one year	287	286
Between one and five years	510	315
Later than five years	8,857	8,930
Total	**9,654**	**9,531**

12.4. Capital commitments

As at the date of these accounts, NERC is committed to a sum of £60.2m in respect of major capital contracts and commitments, which includes £59.6m for the New Polar Research Vessel and associated works due to be completed in 2019-20.

12.5. International subscriptions

NERC has commitments of £4,163k for international subscription costs, which includes £1,950k for the Integrated Ocean Drilling Programme and £1,847k for the International Institute for Applied Systems Analysis.

12.6. Bonds and guarantees

In relation to overseas contracts NERC has a number of bonds and guarantees lodged with Lloyds Bank totalling £58k at 31 March 2018 (31 March 2017 £1,139k). The costs of these bonds and guarantees are born by external customers.

13. Related party transactions

NERC is a non-departmental public body sponsored by BEIS.

BEIS is regarded as a related party. During the year, NERC has had various material transactions with BEIS and with other entities for which BEIS is regarded as the parent Department, viz: Engineering and Physical Sciences Research Council, Biotechnology and Biological Sciences Research Council, Science and Technology Facilities Council, Medical Research Council, Economic and Social Research Council, Arts and Humanities Research Council, Innovate UK, Higher Education Funding Council for England, UK Space Agency and UK SBS. NERC has also had various transactions with other Government departments and other central Government bodies.

During the year NERC made no research grant payments to Council members.

There have been no material transactions with any children, spouses or partners of Council members that require disclosure.

NERC made the following aggregated payments in respect of NERC funded awards or contracts to Institutions where Council members are also senior members of staff.

Institution	Amount £000	Related party
University of St Andrews	4,794	Professor Ian Boyd
University College London	7,092	Professor Dame Georgina Mace DBE
University of Bristol	9,119	Professor Guy Orpen
Cranfield University	2,072	Professor Ian Poll OBE
University of Edinburgh	9,732	Professor Lesley Yellowlees CBE
Lancaster University	4,076	Professor Louise Heathwaite

No Council members were involved in the approval of awards to the institution where he/she is a senior member of staff.

14. Events after the reporting period

In accordance with the requirements of IAS 10 *Events after the Reporting Period*, events after the date of the Statement of Financial Position are considered up to the date on which the Accounts are authorised for issue. This is interpreted as the same date as the date of the Certificate and Report of the Comptroller and Auditor General.

As set out in Note 1.3 Going Concern, under the Higher Education and Research Act 2017, UKRI incorporated the assets, liabilities and functions of the seven Research Councils, Innovate UK and Government's funding of research in higher education from 1 April 2018.

NERC SCIENCE OF THE ENVIRONMENT

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