



The business of the environment

NERC Delivery Plan 2016-20



About NERC

The Natural Environment Research Council (NERC) is the driving force of investment in environmental science. Understanding our changing planet is fundamental to our future wellbeing and economic prosperity. NERC advances the frontier of environmental science, by commissioning new research, infrastructure, innovation and training that delivers valuable scientific breakthroughs.

Our science explores the physical, chemical and biological processes on which our planet, life and our 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.

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I. Our vision

I.1 Environmental science for a changing world¹

The environment is everyone's business. We depend on it for shelter, heat, light, food and water. The way we live has changed our relationship with the environment. We are now the dominant source of environmental change in the UK and across the planet. To sustain livelihoods and prosperity, whilst living within the Earth's limits, is the greatest challenge we face.

NERC's goal is to fund excellent, peer-reviewed science that helps us to: understand and predict how our planet works; and manage our environment responsibly as we pursue new ways of living, doing business, escaping poverty and growing economies.

During 2016-20 we will deliver NERC's strategic priorities by investing in world-leading research, skills and innovation that enables UK business, government and citizens to:

- Benefit from natural resources² – to use natural resources safely and securely to sustain life, prosperity and wellbeing.
- Build resilience to environmental hazards³ – to save lives and costs, and protect business and infrastructure.
- Manage environment change – to understand and manage natural and man-made change for today and for future generations.
- Discover new knowledge – to reveal how the Earth works: past, present and future, unlocking profound new opportunities for social and economic benefit.
- Promote sustainable development – to use the UK's world-leading environmental science to tackle global challenges that support both UK aid and UN sustainable development goals.
- Support UK Industrial Strategy – to deliver the intelligence and innovation needed to boost productivity and growth across the whole economy.

I.2 Investing in environmental science

Recognising that science is vital to our country's prosperity, security and wellbeing, Government is providing real-terms stability for overall research funding from 2016 to 2020⁴.

Each year NERC will invest around £290m in resource and £34m capital in world class labs, plus additional capital in large research infrastructure. We will focus our investment where environmental science enhances prosperity, security and wellbeing in the UK and globally.

The new Global Challenges Research Fund (GCRF, £1.5bn over 5 years) combines UK aid or official development assistance (ODA) and research objectives. As a new budget administered by UKRI, GCRF provides a powerful and exciting opportunity for the UK's world-leading environmental scientists, in partnership with other disciplines, to address major challenges facing the developing world. Within our own resource budget of £290m pa, NERC investment in ODA will rise from £8m to £18m pa.

We will manage NERC budgets to support an environmental science base that balances: UK and international priorities; single and multi-disciplinary research; discovery science and strategically directed research; the diversity of environmental science disciplines, sectors and research centres. To achieve these balances we will review and evolve NERC budget processes and allocations as the implications of GCRF and ISCF emerge.

This delivery plan lays out NERC's budgets and investment priorities for the period 2016-20, including additional funding from the 2016 Autumn Statement from the National Productivity Investment Fund (NPIF) for research related to the industrial strategy and the Industrial Strategy Challenge Fund (ISCF).

¹ <http://www.nerc.ac.uk/latest/publications/strategycorporate/strategy/the-business-of-the-environment/>

² Natural resources include, for example: food, water, energy, minerals, and essential services from nature.

³ Natural and man-made hazards include, for example: floods, extreme weather, earthquakes, volcanoes, pollution, animal and plant diseases.

⁴ <https://www.gov.uk/government/publications/science-and-research-funding-allocation-2016-to-2020>

2. Delivering UK needs

UK environmental science leads the world, and other UK disciplines, on field-weighted citation impact⁵. NERC funding drives our world lead by supporting only the most excellent UK environmental science⁶.

NERC science underpins all economic, industry and policy sectors – from food and water, to energy and waste, to transport and infrastructure, to defence and healthcare⁷. We advance the frontiers of knowledge by commissioning new research and training that provides business, government and society with the evidence we need to manage our environment responsibly. This creates resilience, jobs and growth in regions across the UK – more than 70% of NERC funding is spent outside London and the South East⁸.

NERC science repays our annual public investment many times over, benefiting the UK by billions of pounds every year through better flood warning, more secure food and energy, cleaner air and water¹⁰.

Reducing the costs of flooding

More accurate and earlier flood warnings during the winter 2013-14 storms protected a million homes, saved £2bn in UK insurance pay-outs, and avoided £2.6bn of lost working in London.



Growing the food industry

NERC science gave us new tools for environmental assessment and regulation. This added £79m pa to the £800m Scottish fish-farming industry and avoided millions of fish deaths from harmful algae.



Keeping UK airspace open

Volcanic ash from Iceland in 2010 and 2011 disrupted aviation. NERC science avoided unnecessary closure of UK airspace and saved airlines £290m a day.



Cleaning up our air

NERC science led to better air pollution policy, reducing sulphur pollution and acid rain by more than 80%. This generated at least £1.2bn a year in economic benefits to the UK.



⁵ <https://www.gov.uk/government/publications/performance-of-the-uk-research-base-international-comparison-2013>

⁶ <http://www.nerc.ac.uk/about/perform/evaluation/evaluationreports/citations-study-2012/>

⁷ <http://www.nerc.ac.uk/about/perform/reporting/reports/>

⁸ <http://www.nerc.ac.uk/about/whatwedo/factsfigures/region/>

2.1 World-leading research for the UK (c41% of budget⁹)

Benefiting from natural resources

Natural resources sustain life, wellbeing and economies. Growing populations make ever greater demands on food, water, energy, minerals and other environmental services we depend upon. To support our need for the secure and sustainable supply of natural resources, NERC investment priorities include sustainable food production, renewable energy and, for example:

- Strategic research to assess the true value of UK natural capital (essential resources and services we get from the environment) for use in policy and business decisions.
- Capital investment in new UK GeoEnergy Observatories (UKGEOs) will provide a new platform for science to inform UK energy policy, regulation, safety and practice.

Resilience to environmental hazards

Environmental hazards – including extreme weather, volcanoes, earthquakes, space weather, pollution, novel diseases and invasive species – have serious impacts on people, supply chains and essential infrastructure. Many hazards are becoming more frequent and severe with the growth of populations, cities and environmental change. The World Economic Forum has identified climate change catastrophe as the biggest threat to the global economy¹⁰.

NERC will invest in strategic research and innovation programmes to build resilience to environmental hazards and emergencies. For example:

- We will invest in science that manages flood risk naturally, provides more precise and earlier flood warning, protects UK homes and businesses, and reduces the economic costs of flooding.
- With industry¹¹ we will develop evidence to mitigate environmental risks and impacts on essential UK transport and energy infrastructure.

Managing environmental change

Some environmental variability is natural, but human activities are directly causing additional physical, chemical and biological changes to our planet – often at scales and speeds never before encountered. NERC will invest in strategic research to understand how the Earth system works, from global to local scale, and help our partners use this knowledge to inform responsible management of the environment for multiple benefits. For example:

- With the Met Office we will invest in the UK's world-leading Earth-system modelling, weather and climate prediction capability.
- With international partners we will mobilise the NERC fleet of research ships and autonomous vehicles to find out how the Southern Ocean absorbs and releases the heat and carbon that drives our climate and weather.

Discovery science

NERC will fund researchers to ask big questions and discover new knowledge about how the world works: past, present and future. We will support the whole breadth of NERC's remit, including physical, chemical and biological research of the atmosphere, ocean, land, freshwater, deep Earth, polar regions, and impacts of the Sun on Earth.

Discovery science unlocks profound social and economic benefits that are often unforeseen when the research starts. For example, discovery of the ozone hole by NERC-funded scientists in the 1980s led to international agreement through the Montreal Protocol to ban ozone-depleting substances. This continues to save the UK £1.3bn each year in avoiding 300 skin cancer deaths and £740m of crop losses.¹²

⁹ Estimated share of NERC programme budget 2016/17, including projected ODA spend. Subject to Council decisions to achieve a balanced investment portfolio 2016-20 in light of emerging GCRF implications (see Section 1.2).

¹⁰ <http://www.weforum.org/reports/the-global-risks-report-2016>

¹¹ Industry partners include, for example: HighSpeed2, Atkins, Arup, National Grid.

¹² <http://www.nerc.ac.uk/about/perform/reporting/reports/>

2.2 Skills for future leaders (c13% of budget⁹)

Advanced skills are vital for the UK economy – one fifth of UK workers are employed in science-based jobs, and more than half of businesses report a shortfall in STEM-skilled staff¹³. Doctoral graduates boost innovation and growth, and NERC-trained PhD graduates are employed across the economy in a wide range of industry, policy and charity sectors.

We will sustain the flow of top talent for UK business, government and science employers by investing in PhD training and future leaders. NERC independent fellowships will support outstanding scientists to develop as future international leaders in environmental research and innovation.

NERC doctoral training partnerships (DTPs) will support university consortia, in partnership with employers, to deliver excellent PhD training environments where students can address any environmental research topic whilst experiencing multiple disciplines and organisations. In 2016/17 we will evaluate existing DTPs to inform the commissioning of the next round of DTPs in 2018.

Centres for doctoral training (CDTs) will train students in specified research topics and skills that NERC and our partners in business and government identify as national priorities. We will launch new CDTs in: the use of smart and autonomous observation technology for environmental science (2016/17); modelling and quantitative skills in ecology and evolution (2018/19).

In 2017/18 the National Productivity Investment Fund (NPIF) will enable us to support an additional 95 CDT, DTP and industrial CASE studentships, aligned to UK industrial strategy challenge areas.

2.3 Driving innovation, jobs and growth for the UK (c7% of budget⁹)

Science and technology sustains the UK's world-class performance in business innovation and international competitiveness. NERC investment in environmental science brings the intelligence and innovation across the whole economy, such as providing for clean growth, a resilient economy and productive regulation. We will help industry and government find and use NERC-funded research and technology to increase productivity and growth.

NERC will support the government's industrial strategy and industry sector priorities, for example:

- With industry we will invest in research and innovation partnership programmes for sustainable water; sustainable agriculture and fish-farming; and environmental risks to businesses.
- With the UK energy industry, we will invest to develop environmental management expertise for decommissioning infrastructure; develop capability in renewables; and grow the supply of PhDs with training in environmental science and industry practice.
- With Innovate UK and partners we will establish an environmental data innovation hub, making big data accessible for business and policy users to solve complex problems, innovate, create growth, wellbeing and resilience – for example in urban management, water and health.

We will support the government's local science and innovation audits, and regional growth, for example:

- NERC's regional impact from science of the environment (RISE) programme will fund research organisations to work with business, policy-makers, local enterprise partnerships for growth and societal benefit in their region. For example to establish more research and innovation hubs where enterprising universities, NERC research centres and local partners are co-located (eg Edinburgh, Cambridge, NW England).
- Through the industrial strategy challenge fund (ISCF), we will support the Marine Robotics Innovation Centre at Southampton¹⁴ to develop autonomous vehicles with environmental sensors for maritime, defence and energy industries to operate undersea at less cost, growing UK SMEs in a £9bn global market.

¹³ <http://www.nerc.ac.uk/about/perform/reporting/reports/impactreport2015/>

¹⁴ At the NERC National Oceanography Centre, in partnership with Innovate UK, DSTL, SMEs, LEPs.

2.4 UK national capability (c37% of budget⁹)

NERC supports essential national assets and research centres – our “national capability” – that allow the UK environmental science community to conduct world-leading strategic and discovery science on decadal time-scales and national to global geographic-scales.

We will invest in the capabilities that UK scientists need to reach and observe all parts of our environment: large research infrastructure (specialist research ships and aircraft); scientific services and facilities (for storage and analysis of environmental samples); data centres and high-performance computing such as the JASMIN supercomputer (for environmental data storage, analysis and modelling).

We will fund national to global scale research, survey and monitoring in specialist research centres that direct critical mass and expertise to address UK priorities. And we will support those research centres to provide independent scientific information and advice to government and society for national security, resilience and emergency response.

2.5 Antarctic logistics and infrastructure (partitioned budget: £33m in 2016/17)

Government has established a budgetary partition to support UK presence and environmental science capability in the Antarctic region. Operated by the NERC British Antarctic Survey (BAS), this capability will meet government requirements for a permanent and visible UK presence, and provide access for UK scientists and their international partners to conduct excellent science of regional and global importance. NERC capability in the Antarctic will include: four permanently occupied multi-disciplinary research stations; one summer-only station; research and logistics ships and aircraft.

Additional allocations will support relocation of the Halley VI station, an invest-to-save upgrade of the Rothera station and rising costs of operating in hostile polar environments. This investment is necessary to access remote locations, to ensure health and safety, and to support Antarctic Treaty requirements for environmental protection. By 2019/20 we will invest capital to replace two older ships with a single new vessel, the *RSS Sir David Attenborough*, that provides £100m lifetime savings in operating costs.

2.6 Supporting international development in the UK interest (£13m in 2016/17)

To support the UK’s commitment to the UN target to spend 0.7% of Gross National Income as Official Development Assistance (ODA), the government has announced a new £1.5bn Global Challenges Research Fund (GCRF)¹⁵. This fund combines international development goals with research objectives to enable the UK’s world-leading researchers to take a leading role in tackling challenges faced by developing countries – for example to strengthen resilience and respond to crisis.

Around half of the GCRF will be managed through UKRI for multi-partner, multi-disciplinary research that meets ODA goals. Environmental scientists frequently tackle global research challenges through international and multidisciplinary collaboration that benefits developing nations¹⁶. NERC will engage with partners and researchers to proactively shape GCRF priorities and partnerships, and to realise GCRF funding opportunities.

By 2017/18, £10m pa of GCRF will be allocated directly to NERC, in addition to the £8m pa NERC already spends on ODA-compliant research. NERC is also successful in partnering developing countries through the growing Newton Fund. Working with DfID and international partners, we will invest in programmes that enable progress towards the UN Sustainable Development Goals and the objectives of the UK strategy. For example:

- Improving climate models for sustainable resource use and resilience in Africa and Asia.
- Tackling air pollution in Asian mega-cities – using UK expertise in particulate and chemical pollution to safeguard health, food and soils in India and China.
- Understanding impacts of El Niño and La Niña changes in sea surface temperature and weather patterns – to improve resilience to disease, floods and droughts in Asia, Africa and South America.

¹⁵ <https://www.gov.uk/government/publications/uk-aid-tackling-global-challenges-in-the-national-interest>
<https://www.gov.uk/government/topical-events/autumn-statement-and-spending-review-2015>

¹⁶ In 2013/14, 64% of NERC-funded scientific publications were co-authored with international collaborators.

2.7 Engaging the public with environmental science (c1% of budget⁹)

The NERC mission sets our responsibility to encourage public engagement and dialogue. Recent reviews have challenged us to strengthen our approach to public engagement and dialogue¹⁷, which is now guided by three objectives:

- To convene public debate about contested issues informed or raised by environmental science.
- To inform, inspire and interest the wider public in environmental science and the process of research, in a way that is visible and accessible and makes environmental science relevant.
- To engage in public dialogue about NERC's priorities for funding, to help us deliberate, reflect, and come to conclusions about NERC research. This supports NERC's commitment to act in a way that is transparent, participatory and accountable.

We will continue to support researchers to deliver public engagement through all our grants and funding¹⁸. From 2016/17 we established a dedicated funding line to commission public engagement and dialogue activities, working with the Association of Science and Discovery Centres. NERC will also deliver an annual 'showcase' event to engage schools, public, media, business and policymakers with environmental sciences: London in 2015, Manchester in 2016, and Edinburgh in 2017.

2.8 Driving an efficient research base

UK research is the most productive in the world¹⁹. The Research Councils will continue to work with BEIS, HEFCE, Universities UK and the HEI sector to promote collaboration and sharing of infrastructure, data assets and other resources to further raise efficiency and productivity across the sector. Using our expertise as funders of research and facilities, we will work with the sector to pioneer policies, incentives and performance measures for efficient sharing and utilisation of research assets. In addition, NERC will drive efficiency and productivity in the research organisations and infrastructure it funds:

Efficiency of national capability

We will invest new capital to replace two older polar research and logistics vessels with a single ship that delivers £100m savings in lifetime operating costs. Continuing investment in marine autonomous vehicles and sensors will, over a decade, reduce our dependence on large research ships that are costly to operate.

We will increase the efficiency of scientific services, facilities and data centres by concentrating them in regional or national centres of excellence with capital investment in new technology. When commissioning services to operate large research infrastructure, we will set strong controls on their operating costs.

NERC national capability investments in large-scale, long-term science programmes will promote efficient integration and use of UK capabilities across different owners of capability (eg NERC, BBSRC, Met Office).

To enable these actions, we will implement new approaches to commissioning and evaluating NERC national capability investments, based on greater clarity of requirements between NERC and providers of national capability.

Efficiency of grant writing and reviewing

The world-leading performance of UK environmental science is driven by competition for research grants and a rigorous focus on excellence as the primary criterion for funding. Researchers invest a lot of time in writing and reviewing research grant proposals, so we aim to optimise value-for-money by encouraging research organisations (ROs) to focus on developing the best proposals.

NERC introduced demand management for standard grants in 2015 and agreed to review the impacts of these practices after two years. The review found that success rates for discovery science standard grants have risen from 10-13% to 20%, because of a large decrease in the number of low-quality submissions. There is no evidence for a fall in the number of awards to new investigators or for a reduction in multi-institute awards.

¹⁷ <http://www.rcuk.ac.uk/Publications/policy/commscapabilityreview/> and <http://www.nerc.ac.uk/about/whatwedo/engage/engagement/stakeholdersurvey/>

¹⁸ NERC Grants Handbook, section H <http://www.nerc.ac.uk/funding/application/howtoapply/forms/grantshandbook/>

¹⁹ Based on article volume and citations per pound invested: <https://www.gov.uk/government/publications/performance-of-the-uk-research-base-international-comparison-2013>

3. Effectiveness through partnerships

Effective partnership and leverage are essential for the UK and NERC to achieve our strategic ambitions. The multi-disciplinary and collaborative, national and global nature of environmental science naturally demands a partnership approach. NERC will lead and broker partnerships to address large-scale research and innovation challenges that deliver major economic and societal benefits.

3.1 International partnership

The science of our planet and its environment transcends national boundaries, as do UK interests. As the world leader in excellent environmental science, NERC will shape and lead international research agendas and partnerships. For example we will:

- Use the convening power of international businesses and charities to define global research and innovation challenges and actions for a resilient environment and sustainable development.
- Lead and fund international programmes on drivers of our climate and weather – for example the changing Arctic, and temperature circulation in the Atlantic – with US and European partners.
- Participate in the new Global Challenges Research Fund (GCRF) to support UK research for international development (see section 2.6).
- Participate in the growing Newton Fund to extend our research and innovation partnerships with rapidly developing economies such as India, China, South East Asia and Brazil.
- Shape international research priorities, and reduce administrative barriers to partnership, through bilateral and multi-lateral agreements between funding agencies – including US agencies, EU initiatives (Horizon 2020, JPI, ERA-nets) and the Belmont Forum²⁰.
- Participate in infrastructure sharing and bartering initiatives – for example in global environmental observing systems, research ships and aircraft.

RAPID Climate Change (2004-2020)

- ✓ Led by NERC with US and European partners.
- ✓ Observing North Atlantic circulation and temperature to understand climate variability.
- ✓ Found that weaker ocean circulation is associated with cold winters in the UK and USA.

For the UK, benefits of NERC international partnerships include: global leadership and influence (including in ungoverned spaces such as oceans, atmosphere, Antarctic); global economic development and security; new export markets and inward investment; shared expensive research infrastructure; leveraged funding.

3.2 UK government departments and public agencies

NERC invests in independent, excellent scientific evidence that informs public policy and regulation. We will maintain active partnerships with government departments and delivery bodies: to identify policy needs; to shape environmental science priorities; and to translate scientific evidence for use by policy-makers. Our public sector partnerships will ensure effective and efficient use of public funds across government and help to leverage, or 'crowd in', private investment.

NERC supports evidence programmes with many UK and devolved government partners. The ratio of co-funding between NERC and government partners is typically 4:1 (£63m to £16m at 2014/15). We will continue to review and evolve our partnership funding mechanisms.

AVOID (2009-2016)

- ✓ 12 organisations convened under the NERC Living With Environmental Change (LWEC) Partnership.
- ✓ Funded by NERC, DECC, Defra.
- ✓ Impartial, robust, policy-relevant science for UK government analysts and negotiating teams.
- ✓ Informs decisions on avoiding dangerous climate change and setting UK carbon budgets.

²⁰ The Belmont Forum group of funding agencies from leading and emerging research nations, co-founded by NERC.

We will work with our partners to provide environmental science evidence for UK policy priorities, for example:

Defra : UK flooding, natural capital (valuing nature), environmental quality (air, water, soil), agri-environment schemes, water supply, waste, marine resources, biodiversity, conservation.

DfID : sustainable development goals, poverty reduction and disaster risk resilience.

BEIS : safe and secure UK energy, carbon capture and storage, climate change obligations.

Met Office : world-leading weather and climate research, Earth-system modelling, infrastructure (research aircraft, high-performance computing) and prediction capability.

UK Space Agency : public and commercial exploitation of environmental data from UK and European Space Agency investments in satellite observation of the Earth.

Innovate UK : through our growing strategic relationship we will drive innovation in marine robotics and autonomous sensors; exploiting environmental data for public and commercial use; and urban living.

Natural Hazards Partnership (since 2011)

- ✓ NERC research centres with 12 government partners.
- ✓ Hazard information and analysis for UK civil contingencies, governments, emergency responders.
- ✓ World-leading approach to resilience: national risk assessment, daily hazards bulletin.

3.3 Supporting interdisciplinary research

The UK Research Councils are recognised internationally as leaders and innovators in supporting interdisciplinary research. Many other funders look to us for best practice. At any one time, more than 50% of Research Council grant portfolios are interdisciplinary²¹.

We have a strong track record of co-facilitating and co-funding interdisciplinary research, innovation and PhD training – through individual Council investments and through multi-agency ‘grand challenge’ programmes. We are agile in responding to emerging UK needs and new partnership opportunities.

We will now use our experience and convening power as UKRI to help design and implement the new, multi-agency funds including the Industrial Strategy Challenge Fund (ISCF) and the Global Challenges Research Fund (GCRF). We will work with BEIS to develop new approaches to maximise the impact of these funds in meeting industrial strategy, aid and research goals.

Urban Living Partnership (from 2016)

- ✓ Funded by 7 Research Councils with Innovate UK.
- ✓ Tackling complex urban challenges in 5 pilot cities.
- ✓ Total 11 universities with 70 local authority, business and service partners.
- ✓ Every £1 from RCUK-IUK leverages £1 from UK city partnerships.

3.4 Shaping our priorities

To realise the UK’s ambitions, NERC cannot act alone. Our evolving investment priorities will be informed by ongoing dialogue – listening to our partners and stakeholders across government, business, non-governmental organisations, wider society, UKRI and our research communities – so that NERC helps to shape national priorities and is agile in responding to them.

We will consult and engage through open calls for evidence and for strategic research ideas, through dialogue with our partners, through our advisory bodies, and through public engagement with research.

²¹ RCUK analysis of open data available on Gateway to Research (<http://gtr.rcuk.ac.uk/>), based on active grants in 2014 where investigators come from different departments.

4. An effective and efficient organisation

4.1 UK Research and Innovation: partners working together

The Research Councils will continue to participate actively in a suite of government reforms involving BEIS partners across the UK research and innovation funding landscape. These reforms aim to deliver the best return on public investment while we ensure that the UK is the best place in the world to do research, to innovate and to grow businesses. They include: government reform of higher education; implementation of the Nurse Review recommendations²²; BEIS organisational and efficiency reform; common technology platform; grants programme.

As proposed by Sir Paul Nurse, and subject to Parliament, we will work with government and BEIS partners to bring together the seven Research Councils, Research England and Innovate UK as 'UK Research and Innovation' (UKRI). This new organisation will take responsibility for national research strategy, simplify transactional operations and reduce administration costs. In parallel we will work with Innovate UK to address the recommendations of the Dowling Review²³ to simplify public support for innovation.

For successful reform, we will be mindful of key principles identified by Sir Paul Nurse, government and the Research Councils²⁴. These principles include: commitment to the dual support system for funding UK research; clear delegation from government for research funding decisions and their management; commitment to the Haldane principles; recognition of the breadth and scale of research investments within and across disciplines.

In preparation for reform, the Research Councils will plan and implement internal change and cost-reduction from 2016, ensuring that our changes support the wider government reforms.

4.2 Effectiveness and efficiency in NERC

NERC aims to deliver as much value as possible from constrained public research and administration budgets. We are committed to driving productivity and efficiency in our own operations.

From 2016/17 NERC will work with BEIS and partners to shape and put into practice the reforms described above. We will play our full role in developing the new 'UK Research and Innovation' organisation.

Within NERC we will strengthen our role as an effective and efficient commissioner of environmental science. To achieve this we will:

- Continue to establish an impartial and transparent commissioner-supplier relationship with NERC research centres, within a robust assurance framework, and prepare for some centres to change ownership. As a result, centres will be more likely to maintain research excellence and financial sustainability in the long term, while NERC and government will achieve clearer roles and better value for money.
- Continue to transfer research centre support functions out of head office into centres.
- Optimise our commissioning and funding operations through new approaches, greater expertise, integration of common tasks and sharing staff resource flexibly. As a result, we will be more effective and efficient in targeting and commissioning NERC investments.
- Maintain our focus on continuous improvement and lean business processes to drive efficiency.
- Reduce NERC administration costs year on year.

²² https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/478125/BIS-15-625-ensuring-a-successful-UK-research-endeavour.pdf

²³ <https://www.gov.uk/government/publications/business-university-research-collaborations-dowling-review-final-report>

²⁴ <http://www.rcuk.ac.uk/documents/documents/strategicprioritiesandpendingplan2016/>

4.3 Equality and diversity in NERC

NERC aspires to attract and employ people from the widest possible pool of talent. We see diversity as a powerful driver of performance and innovation. RCUK and NERC are implementing new action plans to promote equality and diversity in our roles as employers, decision-makers and commissioners of science.

We have already achieved 50% representation of women on NERC's governing council. NERC will continue to increase diversity among our staff, leaders and governance bodies by setting annually reported targets. We will continue to implement best practice in recruitment and management through schemes such as Disability Confident, Athena Swan, Investors in People, leadership development, unconscious bias training.

As a commissioner, we will ensure that our investment processes are free from bias. And we will work with the organisations we fund to understand and drive equality and diversity across the UK population of environmental scientists.

4.4 Evaluating Research Council investment

The UK's dual support system for publicly funded research²⁵ provides a holistic and efficient investment appraisal and evaluation cycle compliant with HM Treasury guidance²⁶. Playing complementary roles, Research Councils focus on *prospective quality assurance* through rigorous peer reviewed competition for grants, while Higher Education Funding Councils focus on *retrospective quality evaluation* through the research excellence framework (REF). Besides informing Funding Council allocations, REF evaluates the excellence and impact (economic and societal benefit) of university research supported by all funders, including Research Councils.

Research Councils also evaluate or audit specific investments and processes, during or after their lifetimes. Large capital proposals require business cases and economic valuation to inform investment decisions and to evaluate benefits realised.

We will use our own performance data, commission independent studies, and rely on external evidence such as REF to evaluate NERC's performance against our mission objectives and to demonstrate long-term impact outcomes²⁷.

²⁵ Dual support: Higher Education Funding Councils provide stable 'quality-related' (QR) funding to support research capability in universities; Research Councils operate at arms-length from government under the Haldane principles (<http://www.publications.parliament.uk/pa/cm200809/cmselect/cmdius/168/16807.htm>) and provide specific project funding to named researchers.

²⁶ HMT Green Book and Magenta Book: ROAMEF cycle.

²⁷ See, for example, Research Council impact reports: <http://www.rcuk.ac.uk/media/news/impact/>

Annex NERC financial allocations

Table 1 Resource	2015/16	2016/17	2017/18	2018/19	2019/20
£m	baseline	confirmed	confirmed	indicative	indicative
NERC Programme	259.5	253.5	248.1	243.9	241.3
NERC GCRF / ODA	0	5.0	10.0	10.0	10.0
NERC UKGEOs	0	0	2.5	2.5	2.5
NERC Programme Total	259.5	258.5	260.6	256.4	253.8
NERC Antarctic Logistics & Infrastructure	29.5	29.5	29.5	29.5	29.5
NERC Antarctic L&I Pressures	0	3.1	3.7	4.3	5.0
NERC Antarctic L&I Total	29.5	32.6	33.2	33.8	34.5
Newton Fund (see note 7)	4.5	8	9	12.7	11.6
ISCF: Marine Autonomous Systems	0	0	0.4	0.6	0.8
NPIF: Studentships	0	0	1.2	2.2	2.1
NPIF: Research talent	0	0	1.1	tbc	tbc
NPIF & ISCF Total	0	0	2.7	2.8	2.9

Table 2 Capital	2015/16	2016/17	2017/18	2018/19	2019/20
£m	baseline	confirmed	confirmed	indicative	indicative

World Class Labs

NERC World Class Labs	28.0	26.5	26.5	26.5	24.0
NERC Antarctic L&I World Class Labs	7.0	7.0	7.0	7.0	7.0
NERC Halley VI	0	6.0	5.0	1.0	0
JASMIN supercomputer upgrade (see note 8)	0	0	3.7	0	0

Grand Challenge Projects

NERC New Polar Research Vessel	15.0	25.0	75.0	75.0	30.0
NERC UKGEOs (see note 6)	0	0	6.5	16.4	5.3
Rothera station upgrade (see note 8)	0	0	4	0	0

Industrial Strategy Challenge Fund Projects

Marine Autonomous Systems (see note 8)	0	0	6.65	3.45	2.2
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Explanatory notes

1. Allocations announced by BEIS in March 2016²⁸ are confirmed for 2 years, then indicative for 2 years.

²⁸ <https://www.gov.uk/government/publications/science-and-research-funding-allocation-2016-to-2020> and <http://www.rcuk.ac.uk/documents/documents/strategicprioritiesandspendingplan2016/>

2. Excludes NERC administration budget, which is allocated annually by BEIS (£12m in 2017/18).
3. Programme and ODA resource budgets, and world class labs capital, support NERC's investment in world-leading research, innovation, skills, national capability and public engagement (see section 2).
4. Partitioned budgets for Antarctic Logistics and Infrastructure (ALI) support UK capability and presence in the Antarctic (see section 2.5).
5. Some of the new Global Challenges Research Fund (GCRF, ODA) has been allocated directly to NERC as shown. Some of NERC's Programme spend (£8m in 2015/16) also contributes to ODA (see section 2.6).
6. Investment in UK GeoEnergy Observatories (UKGEOs), announced by Chancellor Osborne, will provide a new platform for science to observe underground processes to inform UK energy policy, regulation, safety and practice. UKGEOs allocations are subject to confirmation of spend profile.
7. The 2015/16 and 2016/17 Newton Fund figures are based on expenditure and not allocations. Allocation letters have been received for the 2017/18 budget onwards.
8. BEIS allocation letters, and consequently confirmed spend profiles, are pending for the JASMIN, Rothera station upgrade and the Marine Autonomous Systems capital investments.



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