National Oceanography Centre

Making Sense of Changing Seas

Our Strategic Priorities 2020 – 2025

Introduction

The National Oceanography Centre (NOC) is one of the world's foremost oceanographic research organisations, with a long history and accumulated experience of working in some of the remotest, deepest and most hostile parts of the ocean.

The NOC is one of the few large oceanographic institutions in the world capable of supporting a truly global and multi-basin approach to ocean science and supporting the large research infrastructures needed.

The UK is a leading maritime nation and, through our scale and unique mission, the NOC leads and provides UK National Capability in oceanographic sciences on behalf of UK Research & Innovation and the Natural Environment Research Council (UKRI-NERC). The NOC is therefore a key enabling hub for the UK marine scientific community based in universities and other specialist marine research institutions. We engage with this scientific community in diverse ways, including formally through the NOC Association of Marine Science National Capability Beneficiaries.

The NOC underwent a major transformation by separating from UKRI-NERC control in November 2019. NERC has been our custodian for the most recent fifty years of our history, and our role as a national institution has evolved such that the natural next step on our journey was to become an independent, non-profit-distributing charitable company with a wholly owned trading subsidiary.

The NOC will continue to focus on delivery of public benefit by advancing ocean science and education, supported by continuing substantial public research investment. We now have more freedom to determine our own strategy, ways of working, and to diversify and generate additional income to support our primary charitable purpose – the advancement of science and education.

The National Oceanography Centre has been in existence in its various forms for over six decades, has an annual turnover of £60 million, employs a total of 600 staff, and is one of few research organisations globally that has the equipment and expertise to operate down to 6000 m water depth.

As an organisation, the NOC faces outwards to the following communities of stakeholders with an interest in what we do:

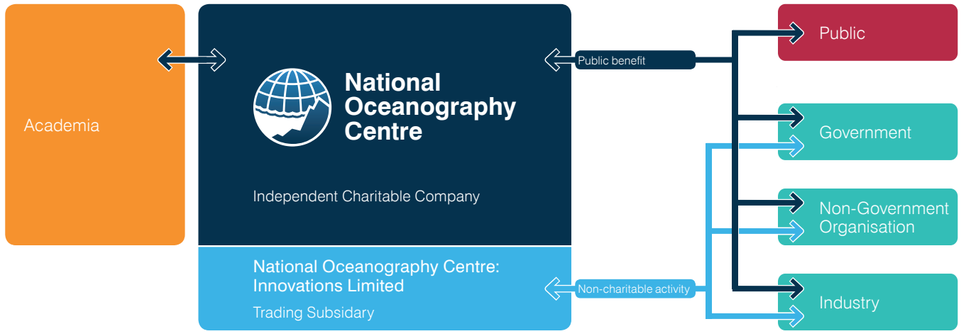
- **Academia** – scientists in universities and other independent research institutions with whom we collaborate in science projects and support with large research infrastructures, data and samples;
- **Public** – who are increasingly interested in ocean affairs and the benefits and impacts of human interactions with the ocean;
- **Government and non-governmental bodies** – who often turn to us as a source of independent scientific data and advice. This includes industry where they fund charitable research in line with our objects and where private benefit is incidental.

Through our trading subsidiary we may also engage with industry and others in a variety of ways. For example, where they come to us to help solve problems; where they can help turn our prototype technologies into reliable products for advancing science; and to commercialise intellectual property we develop through our research so as to generate additional revenue to support our public benefit purposes.

The NOC has an important role in education and informing others about new and existing knowledge and understanding of the ocean – thereby acting as a bridge between academic organisations primarily focused on fundamental research and the users of research and technology outcomes in government, industry and elsewhere. We therefore not only undertake and enable great research, but are well positioned to educate, inform and raise awareness of research outputs for public benefit.

This positioning is crucial because of the changing nature of how science is funded. A central pillar of the UK's research and innovation policy is for research investment to increase from its present 1.7% of Gross Domestic Product (GDP) to the Organisation for Economic Co-operation and Development average of 2.4% GDP by 2027. We will ensure we are well equipped to respond to new and diverse opportunities for sources of science funding and that the useful results of research are disseminated widely within a reasonable time frame to create beneficial impact.

Strategic positioning of the National Oceanography Centre as an organisation



Public benefit of the National Oceanography Centre

The NOC provides public benefit, as part of a global endeavour, by contributing to the advancement of scientific knowledge of the ocean, which is both a public good in its own right and can lead to applications which result directly or indirectly in public benefit.

We do this by:

- Undertaking **research and sustained ocean observations** and making results available in peer reviewed scientific journals and other media;
- Ensuring publicly funded data are openly accessible;
- Being an enabling hub and providing access for the entire UK scientific community to nationally-pooled research equipment, facilities and infrastructures, data and samples;
- Fostering and leading **national and international co-operation** in ocean research;
- Providing independent scientific and technical advice concerning:
  - Protecting people from marine related natural hazards and accidents;
  - Developing safe, sustainable human activity in the ocean environment whilst protecting the health of marine ecosystems;
  - Large-scale change and variability in the ocean and its effects on society;
- Working with universities and other institutions to **support education and training** of scientists, engineers and marine professionals, especially at postgraduate level;
- **Engaging the public** with the science of the ocean and its implications;

- **Engaging with industry and other users of research** to better understand their needs for scientific evidence and measurement technologies, and to engage in how enhanced scientific knowledge and understanding can better inform their actions. If such activity falls outside of the NOC's charitable purposes, and it can be justified as being in the best interests of the NOC to do so (for example the level of financial return), it may be routed through our trading subsidiary with profits reinvested back into our public benefit purposes.

The beneficiaries of our work are:

- **Scientists, engineers, and researchers** in UK universities and other research institutions, as well as internationally, including developing countries;
- **Those with responsibility for governing, managing or operating in the ocean environment** and seeking to do so in a safe and sustainable way informed by scientific evidence;
- **Public in the UK and worldwide** - by improving knowledge of the ocean and how it influences and is influenced by people - through inspiring, informing and educating;
- **Young people and students** with an interest in science, engineering and the ocean, whether as a career choice or more generally.

Although nothing lives there, Mars, Venus and the Moon are much more accurately mapped than the sea floor, which is teeming with life; in fact, there may be two million marine species still waiting to be discovered.

Strategic Context

There is only one ocean, divided into large basins. It is completely interconnected - moving vast amounts of water, heat, chemicals and microscopic life around the planet and respecting no national or political boundaries. It has powerful influences on all parts of the Earth - the atmosphere above, crust below, ice-covered regions, and the land's coastal zones. All these interactions in turn shape the ocean and its life.

The ocean profoundly impacts human society - both those living by the sea and others far inland. This impact is often unseen: the ocean produces half the oxygen we breathe and makes the Earth's climate habitable. It absorbs 93% of excess heat in the Earth system generated by greenhouse warming and takes up over 25% of human produced carbon dioxide. Some 95% of the UK's imports and exports are carried by sea along with a quarter of our energy supplies and nearly half our food, while about 95% of all internet traffic and financial transactions are carried by undersea cables.

The Organisation for Economic Co-operation and Development (OECD) predicts that the ocean economy will double from $1.5 to $3 trillion per year by 2030.

As the number of people living on Earth rises to nine billion by 2050, with populations growing fastest in low lying coastal regions, attention is turning to the ocean with increasing urgency to:

- Secure supplies of food, energy, minerals, medicines and natural products, whilst protecting and restoring the productive capacity and health of threatened ecosystems on which our health, wellbeing and 70% of the oceans' direct economic benefits depend;
- Increase resilience of coastal communities and infrastructures to marine-related natural disasters including flooding;
- Make sense of global-scale change and variability, unravelling what is natural from what is anthropogenic and alerting us to dangerous tipping points.

This is the context for our refreshed strategy, which embraces the challenges we face and the opportunities they present, and is written to inform partners of our motivation, values and goals, and to inspire and empower our people. It does not spell out everything we will do in detail - that will be in our business plan. Instead, it provides high-level signposts and a framework to empower those who will deliver, support and collaborate alongside us. This strategy also builds on what is not changing - our enduring mission and passion to advance knowledge of the ocean, and to be the focus for the UK's long-term national capability in oceanographic sciences.

The UK's Future of the Seas Foresight Report (2018) identified a need to improve ocean literacy and apply a more co-ordinated, long-term and global approach to further UK marine interests.

Our Mission

Our enduring mission is: **making sense of changing seas**.

The three supporting pillars of this are:

- Undertaking and enabling world-class **science and technology development**;
- Providing **large research facilities and access to** data and samples for the benefit of UK science;
- **Creating value and public benefit** by supporting, with scientific evidence, the development of public policy, hazard assessment, ocean governance and regulation, and sustainable development.

Going forwards, we will better exploit the synergies across these different supporting pillars of our mission to drive novel and innovative approaches to our work, enabling us to do things that are distinctive and that few others could do.

Our Vision

As an organisation, our vision is for the NOC by 2025 to be seen as the world's most innovative oceanographic institution. In this way, through advancing science, we will contribute to a broader international vision, e.g. the planned outcomes of the UN Decade of Ocean Science for Sustainable Development 2021-2030 for:

- A clean ocean whereby sources of pollution are identified, quantified and reduced and pollutants removed from the ocean;
- A healthy and resilient ocean whereby marine ecosystems are mapped and protected, multiple impacts, including climate change, are measured and reduced, and provision of ocean ecosystem services is maintained;
- A predicted ocean whereby society has the capacity to understand current and future ocean conditions, forecast their change and impact on human wellbeing and livelihoods;
- A safe ocean whereby people are protected from ocean hazards and where the safety of operations at sea and on the coast is ensured;
- A sustainably harvested and productive ocean ensuring the provision of food supply and livelihoods;
- A transparent and accessible ocean whereby all nations, stakeholders and citizens have access to ocean data.

Our Values

Through wide discussion across all levels of the NOC, we have reached consensus on our shared values. These guide not just what we do, but how we do it, and how we make decisions.

The NOC recognises that diversity of many kinds underpins all our shared values. Investigating the ocean is a global endeavour, bringing together many talents and ideas. Diversity is especially important for driving innovation by enlivening what we do - and how we do it - with different perspectives, experiences and backgrounds.

Excellence

We value excellence as the foundation on which the NOC is built

Innovative thinking

We value considering different approaches, finding different ways of doing things and seeking creative solutions

Empowerment

We value people and teams
as the NOC's most important assets

Environmental responsibility

We value the ocean, recognising our reliance on it, and consider our environmental impact in everything we do

Integrity

We value independence and integrity and treat each other with respect and trust

Working in partnership

We value the benefits of working together and actively seek to exchange knowledge, skills and resources

Our Strategic Goals

Our Strategic Goals are a balanced series of aims that will help us work together as 'one NOC' in driving forwards the whole organisation towards our common vision. Under each of these goals are high-level Strategic Objectives that emphasise **integration** and **innovation**. These are being used to set specific, measurable, achievable, realistic, and time bound (SMART) objectives, which are the basis of our business plan.

The first four goals relate directly to different aspects of our primary purpose of advancing science.

Goal 1

Undertake internationally excellent research and technology development to advance the frontiers of knowledge about the ocean

- Advance frontiers of ocean science and technology to the highest international standards of research excellence;
- Deliver unique underpinning capabilities and support the UK contribution to global ocean observation and modelling and international ocean science programmes;
- Build upon and diversify NOC-wide capabilities across four strategic science and technology priorities, in order to effectively tackle the major societal and environmental challenges in the ocean; the priorities are:
  - Oceans, climate and the carbon cycle;
  - Coastal zone and shelf seas;
  - Sea floor resources and habitats;
  - Platform, sensor, model and data systems development;
- Forge strategic partnerships to address key science gaps and the most ambitious and societally relevant challenges through an interdisciplinary and multi system approach;
- Support and enable the education and training of future generations of scientists, particularly through contributing to postgraduate level supervision and training;
- Maintain a productive, innovative and sustainable research community with a critical mass of capabilities and create a positive environment for research and generating new ideas.

Goal 2

Create public benefit from all of the National Oceanography Centre's capabilities

- Be a trusted source of up-to-date, independent, marine data, information, samples and advice;
- Provide leadership for the UK marine science community through co-ordinating National Capability programmes and providing visibility in the UK and internationally;
- Enable co-ordination of marine science inputs into UK Government and its Devolved Administrations and Overseas Territories, including for science-based ocean assessments, emerging ocean issues of national and international importance, and emergencies where our unique scientific and technical capabilities can help;
- Exercise influence internationally by contributing scientific expertise to international bodies that support and inform ocean science and ocean governance, through international co-ordination, collaboration and science diplomacy;
- Develop opportunities for people exchange at the science-policy interface to improve knowledge exchange, innovative thinking, mutual understanding and dialogue for public benefit and the benefit of science;
- Support international development and delivery of the UN Sustainable Development Goals and the transformative ambitions of the UN Decade of Ocean Science for Sustainable Development 2021-2030;
- Communicate the outcomes of marine science and technology development to the public with a focus on strategic and topical issues and 'live' engagement with research being undertaken at sea;
- Improve ocean literacy and inspire future generations to engage their talents in the field of ocean science.

Goal 3

Successfully translate world-leading and innovative research and technology developments to achieve wider impact

- Engage users of the marine environment to understand the real world challenges they face, enabling us to formulate interesting new science questions, which would not otherwise be apparent. Thus helping shape our research, in areas such as environmental impacts;
- Foster a culture of innovation across the NOC;
- Exploit our intellectual property and other know-how and expertise generated from our primary purposes of advancement of science by working in partnership with businesses to make high quality, robust, reliable products and services that can serve science and other public benefit users and to generate additional revenue for the NOC's public benefit purposes;
- Promote and utilise our unique capabilities to provide consultancy and information products to support our primary public benefit purpose by sustaining critical mass of scientific and technical expertise;
- Recognise the achievements of our staff and students for their high-quality knowledge exchange activities and celebrate and reward their successes;
- Build a professional support team and transparent, robust processes and policies for technology transfer and commercialisation of the NOC's intellectual property and other capabilities in support of the NOC's public benefit purpose.

Goal 4

Provide world-class underpinning capabilities that enable the UK and global ocean scientific endeavour

- Provide the UK marine science community with access to two of the most advanced oceanographic research ships (RRS *Discovery* and RRS *James Cook*) thereby enabling excellent science;
- Be a world leader in the integrated provision of scientific technology for marine science with 'ready-to-go' equipment, novel capabilities and strong partnerships;
- Develop ambitious, innovative ocean measurement and platform technologies, operating practices, and enabling data management capabilities - driven by the science need to transform ocean observations to a more continuous, distributed ocean presence and to reach previously inaccessible locations, such as under ice;
- Develop strong national and international partnerships that leverage the investments we have made in the research ships and National Marine Equipment Pool and the strengths we have in technology development;
- Advance theory and practise of marine data management and innovate technologies and technical infrastructure supporting data archiving and dissemination;
- Innovate the 'platform-to-desktop' data life cycle by providing an autonomous data ingestion and archival system that is integrated with all data collection platforms and provides users with a suite of easy-to-use data discovery and delivery tools;
- Apply big data, machine learning and artificial intelligence techniques to the analysis and interpretation of ocean data;
- Develop a centre of excellence for sea floor autonomous mapping, imaging, analytics and high value information products.

The remaining three goals enable those above.

Goal 5

Responsibly grow and diversify revenue to sustain our mission with a critical mass of scientific and technical capability

- Continue to bid strongly for UK Research & Innovation funding - the primary UK source of support for fundamental science;
- Grow income from more diverse sources such as industry and overseas R&D and consultancy that recovers full costs and sufficient margins to:
  - Expand our critical mass of scientific and technical capability, drive innovation and grow and support new talent;
  - Support our national-scale infrastructure and sustain a world-class research environment;
  - Build sufficient unrestricted reserves over the next five years to buffer year-to-year variation in competitively won income, respond flexibly to changing needs, and reinvest in new and emerging areas with growth potential;
- Promote integrated science and technology-based offers that support the needs of a more diverse range of customers;
- Facilitate income diversification and integrated science via effective professional and expert approaches to business planning, strategic risk management and project management, guiding cost-effective and environmentally and corporately responsible use of all the NOC's resources;
- Generate sufficient income from any under-utilised capacity on research ships and other national marine facilities to sustain those capabilities for the benefit of UK marine science.

Goal 6

Transform the way the National Oceanography Centre is governed and operated

- Establish the NOC as a legally independent charitable company with its own independent governance, business systems, policies and trading subsidary, which are fit for supporting our vision whilst ensuring compliance with regulatory frameworks;
- Enable financial growth and sustainability, providing timely business data and information to support a risk-based approach to reinvestment in the NOC's priority areas, assets and infrastructure base in support of world-class science with world-class facilities;
- Provide an innovative, efficient, integrated, flexible, quality, cost effective and pro-active customer service to all staff by our corporate business support services by identifying opportunities for improvement through communication, exchange of knowledge, best practice and change management;
- Realise the benefits, as a project-based organisation, of a co-ordinated and flexible, professional approach to project management across the NOC;
- Effectively and efficiently provide access and availability to IT infrastructure and resilient support services and to assist all our staff in making the best use of technology.

Goal 7

Invest and reinvest in the National Oceanography Centre and its people

- Ensure the NOC continues to be a great place to work, where our people succeed and deliver great results;
- Attract, develop, mentor and retain talented, high performing and engaged people who are valued and recognised for their contribution and impact, and who are especially motivated in working together in large, diverse teams to address big ocean challenges;
- Enable our people to achieve and sustain high performance, be adaptable, and continuously improve and promote a positive workplace where people are valued and trusted;
- Invest in and provide a positive built environment that encourages collaboration and transparency in line with the 'one NOC' culture;
- Invest in scientific equipment and other research infrastructures to sustain world-leading capabilities.

The NOC Executive team will lead delivery of our seven Strategic Goals, and our Strategic Objectives will be cascaded through the organisation giving a shared sense of purpose, with everyone able to see their part in the bigger picture, and empowered to exercise their own creativity and ingenuity in delivering our vital endeavour.

Over the next five years we will implement this strategy with the aim of achieving our vision, and to support global efforts striving to ensure that the ocean and all those who depend upon it have a sustainable future. We invite all those of like mind to join us in contributing to this endeavour.

Measuring Success

At the highest levels we will measure success in achieving beneficial outcomes, including:

- Safeguarding strategically important scientific capabilities essential for delivering public benefit;
- Sustaining and supporting the health of the UK science base in oceanography;
- Improving the productivity of UK science by sharing costs of our national-scale infrastructure across a more diverse range of customers.

More specifically we will measure progress in achieving our goals through demonstrating:

- **High quality scientific outputs, research teams and research environment** through strong performance in independent evaluations of the NOC, highly cited research publications, and high levels of international co-authorship;
- **Research achieving beneficial public benefit impact in wider society** through positive reviews of independent evaluation of impact case studies, feedback on the uptake and impact of advice provided into governmental, intergovernmental, and other bodies, and the penetration of media coverage and feedback from public engagement activities;
- **Prototype technologies being transformed into reliable, robust products available for science** and other uses through tangible evidence of commercial products stemming from the NOC's intellectual property that have reached and penetrated wider markets that make them available for public benefit;
- **High quality research facilities, data and samples widely accessible for advancement of science** through information collected on access and usage of national-scale research facilities and data assets as well as independent evaluation of feedback from users on the quality of support provided;

- **Successfully sustaining critical mass of capabilities, managing financial risks and reinvesting in science** through diversification of income by the end of year five after independence, (including charitable donations, new sources of public funding, international activities and through profits generated by our trading subsidiary) to build an unrestricted reserve sufficient to buffer the level of risk and to enable a reinvestment in promising new areas;
- **Governed and operating in an exemplary way as an independent scientific organisation** through a high performing Board of Trustees in line with the Charity Governance Code, as well as cost-effective corporate business support services providing timely management information, operating to high environmental, health and safety, security and other standards as independently assessed, and innovating in line with internal and external customer feedback;
- **Attracting, developing and retaining top scientific talent motivated by the organisation's values** through high levels of employee satisfaction and where our research environment is judged superb and standards of research equipment are judged high, as measured by independent evaluations.

noc.ac.uk