

The logo consists of a white square with a black border, containing the text "National Oceanography Centre" in white.

National
Oceanography
Centre

The background is a close-up photograph of a pink sea anemone with many tentacles, growing on a brown, textured rock surface. The lighting is dramatic, highlighting the delicate structure of the tentacles against a dark background.

ANNUAL REPORT & FINANCIAL STATEMENTS

2022/23

FOR THE YEAR ENDED 30 SEPTEMBER 2023

REGISTERED NUMBER 11444362

CHARITY NUMBERS 1185265 & SC049896

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NATIONAL OCEANOGRAPHY CENTRE
A COMPANY LIMITED BY GUARANTEE
Annual Report and Financial Statements

Year Ended 30 September 2023
Registered Number 11444362
Charity Numbers 1185265 & SC049896

FOREWORD BY THE CHAIR OF TRUSTEES



As Chair of the Board of Trustees, I extend my gratitude to the talented and dedicated staff at NOC, whose unwavering commitment to our mission is truly inspiring. I also express my appreciation to our partners, funders, and supporters who help us on this journey. Your collective efforts are at the heart of NOC's successes.

In this annual report, we celebrate the achievements, milestones, and progress that define the NOC's 2022/23 fiscal year. Our work is a testament to the power of scientific exploration and our shared responsibility to protect the ocean for generations to come.

I was shocked to learn how the eruption of the submerged Hunga Volcano in January 2022 triggered fatal tsunamis and pressure waves that travelled around the planet. And I was proud to see how an emergency research collaboration between our scientists and local organisations used data from broken subsea cables to better understand the hazards at other submerged volcanoes worldwide. This demonstrated our relentless commitment to protect people and economic infrastructure from marine-related disasters.

Another story closer to home, was the opening of the brand-new exhibition Worlds Beneath the Waves at The National Museum of the Royal Navy, Portsmouth Historic Dockyard. NOC has always been passionate about education, working with individuals from childhood to adulthood through their education and career journey. We inspire them with exhibitions and digital content, like our award-winning podcast, all the way through to their PhD.

As we celebrate the achievements of the past year, we look forward to the opportunities and challenges that lie ahead. We extend our thanks to our CEO, Professor Ed Hill, who has announced his retirement from NOC in 2024. His impact and contribution at NOC has been immeasurable, on behalf of everyone at NOC I would like to thank Ed for everything he has done for us. I will be working with our Trustees to find a suitable successor and we are confident NOC will continue to go from strength to strength. Our vision for the future is one of continued excellence, impact, and leadership in ocean science and we invite you to explore this report to learn more about our journey.

SIR JEREMY DARROCH
CHAIR OF BOARD OF TRUSTEES
13 DECEMBER 2023



The Discovery Collections on display at the Worlds Beneath the Waves exhibition at The National Museum of the Royal Navy

REPORT OF THE CHIEF EXECUTIVE



As we release the NOC's 2022/23 Annual Report, I am honoured to reflect on a year marked by significant strides in ocean research and technological innovation. At the forefront of discovery, NOC has been diligently working to deepen our understanding of our one ocean, address critical environmental challenges, and provide insights into the ever-evolving realm beneath the waves.

As we move forward, the challenges facing our ocean are more complex and pressing than ever. Climate change, plastic pollution, and biodiversity loss continue to threaten marine ecosystems. However, we are steadfast in our determination to understand and tackle these challenges at a local and global level. We're part of a global community of ocean experts influencing policies, prioritising science in decisions, and advocating for the ocean. COP28 is a chance to champion the ocean and the entire planet. We will be focusing on science's role in shaping solution-focused actions and fostering collaboration through spaces like the Ocean Pavilion. We continue to call for a future which involves continuous monitoring, understanding carbon absorption trends, and safeguarding against rising sea levels and disasters.

I hope you enjoy the fascinating discoveries we made this year. Our comprehensive inventory of creatures from the Clarion-Clipperton Zone (CCZ) provides essential insights for assessing potential environmental impacts from future mining activities. Additionally, we made a significant breakthrough by revealing that approximately half of the world's ocean has witnessed shifts in their plankton communities over the past two decades due to climate change. Moreover, we achieved a remarkable milestone in oceanography with 24.9% of the seabed now successfully mapped.

Leading NOC for almost twenty years has been a tremendous privilege, and I am confident that the time is right for me to pass the baton to someone with a fresh perspective. I will continue to actively lead and represent NOC until a successor is found. My gratitude goes to our dedicated teams, partners, and stakeholders, whose efforts are showcased in every story within this Annual Report. Together, we've driven ocean science forward, contributing to a sustainable future for our blue planet. I look forward to witnessing the continued success of NOC under new leadership.

PROFESSOR ED HILL CBE
CHIEF EXECUTIVE
13 DECEMBER 2023

PURPOSE AND PROGRESS

OUR PURPOSE

To gain deeper knowledge of the ocean to help every living thing on our planet flourish.

CHARITABLE OBJECTIVES

NOCs charitable objects, which were developed to benefit the public and the world in which we live together, are as follows:

THE ADVANCEMENT OF SCIENCE in particular, enhancing the scientific knowledge and understanding of oceanographic sciences, and the ocean and its interaction with the earth system, and facilitating the use and application of that knowledge and understanding, particularly by:

- Undertaking and causing to be undertaken research including through technology development, experimentation, analysis, long term ocean observation, monitoring, mapping, survey and modelling of a high international standard and disseminating the useful results of research.
- Providing access to scientific research and technology development facilities and infrastructure including research ships and other measurement platforms and systems to the ocean science community.
- Obtaining, managing, curating and providing access to digital data, samples and other specimens.
- Being the UK national focus for ocean science, exercising leadership for and promoting co-operation with the wider UK science community, and providing national and international visibility and expert representation for oceanographic sciences.
- Innovation or by encouraging and supporting innovation.

THE ADVANCEMENT OF EDUCATION IN OCEANOGRAPHIC SCIENCES and the ocean and its interaction with the earth system and relationship with people, particularly by:

- Contributing to the education (particularly post graduate higher education), training and development of the next generation of scientists, engineers, technologists including the supervision of postgraduate research students.
- Supporting the building of marine research scientific and technical capacity in other countries around the world.
- Communicating with and engaging with the public in relation to ocean science and technology through seminars, talks, leaflets, papers and other means.

OUR BENEFICIARIES We exist to make a difference, so our beneficiaries are at the forefront of all we do. They include:

- THE PUBLIC ALL OVER THE WORLD** - inspiring, informing and educating.
- MARINE LIFE AND ECOSYSTEMS** - protecting our world so it works in harmony.
- SCIENTISTS, ENGINEERS AND RESEARCHERS** - nationally, internationally and in developing countries.
- YOUNG PEOPLE AND STUDENTS** - encouraging study, research and careers in oceanography.
- GOVERNMENT** - informing decision making through robust evidence.
- OFFSHORE OPERATORS** - ensuring those who use the ocean do so in a safe and sustainable way.
- NOC TEAMS** - making sure our people have a career that inspires and motivates them.

OUR VALUES



RRS Discovery circumnavigating the largest floating iceberg on the planet, A76A

PUBLIC BENEFIT STATEMENT

In setting the vision and mission for the NOC, the Trustees gave due consideration to the guidance on public benefit, as outlined by the Charity Commission of England and Wales and the Scottish Charity Regulator OSCR.

NOC's key driver for selecting topics for research is always what will take ocean science forward for the furtherance of our charitable purpose, our touch stone in all endeavours is increasing knowledge to deliver public benefit.

To enable the organisation and individuals to exercise independent discretion in this decision making we have established an Activity Decision Tree. Its general principles are applied when deciding whether activity is routed through the National Oceanography Centre (NOC) or the trading subsidiary: National Oceanography Centre Innovations Limited (NOC Innovations Ltd). This includes examination of ethical considerations, reputational risks, organisation and scientific independence of NOC, where the benefit is accrued and risk and mitigations thereof.

Where contract research is undertaken by NOC we do so in line with the Commission's guidance on Research by Higher Education Institutions, and ensure it is funded at full economic cost, often by matching funding across the portfolio. NOC retains scientific control of any IP licensed so that it can continue to advance science and technology for the benefit of the public.

NOC and our trading subsidiary, NOC Innovations, bring benefits in a number of ways, including through scientific research, marine technology, education, information and advice.

Through our work, we aim to:



- **SUPPORT SUSTAINABLE DEVELOPMENT PROTECTING THE OCEAN'S FUTURE HEALTH;**



- **MAKE SENSE OF GLOBAL ENVIRONMENTAL CHANGES IN WHICH THE OCEAN IS DEEPLY IMPLICATED;**



- **ADDRESS ISSUES OF NATIONAL IMPORTANCE REQUIRING INTER-DISCIPLINARY SCIENCE.**



- **PROTECT PEOPLE & ECONOMIC INFRASTRUCTURE FROM MARINE-RELATED DISASTERS;**



- **EDUCATE HUMANKIND TO UNDERSTAND SCIENTIFIC EVIDENCE ABOUT THE OCEAN'S ROLE IN OUR LIVES;**



- **UNDERPINNED BY SUSTAINABILITY & SOCIAL RESPONSIBILITY**

IN THE MEDIA SPOTLIGHT

OCEAN COLOUR SCENE

New research, led by NOC scientists, unveiled a striking revelation about the Ocean: its colour is changing, and climate change is the cause.

Plankton communities, consisting of tiny organisms carried by tides and currents, play a pivotal role in this transformation. These communities include phytoplankton, minuscule plants, and zooplankton, diminutive animals.

Earth observation visualisation created using data from the US Geological Survey and LANCE/EOSDIS Rapid Response

© Joshua Stevens, NASA

“The satellite data we studied reveal a change in the colour of a massive portion of the ocean, representing an area larger than all the land on Earth.

The computer simulations we studied suggested that these colour changes may be due to climate change.

The hope is that this paper will inspire additional work into the causes and effects of these changes.”

Dr B. B. Cael, NOC Principal Scientist and Lead Author

258
PIECES OF MEDIA
COVERAGE

In a significant breakthrough, scientists from the UK and USA have shown that approximately half of the world's ocean has witnessed shifts in their plankton communities over the past two decades due to climate change. This finding overturns previous scientific consensus, which held that a thirty year span of satellite data would be necessary to detect a climate change-related alteration in ocean colour, particularly chlorophyll levels.

Using NASA's Moderate Resolution Imaging Spectroradiometer (MODIS) aboard the Aqua satellite, researchers analysed ocean colour measurements, including the blue-to-green ratio, often used to estimate chlorophyll levels. What makes this revelation even more ground-breaking is that it significantly reduces the time needed to gather crucial satellite-based data, as twenty years of observations are now sufficient to detect climate change-induced shifts in ocean colour.

This achievement marks a significant milestone, as it means that such monitoring can occur within the lifespan of a single satellite, which might not endure the full thirty years typically assumed for climate observations. Consequently, it's expected to stimulate further research involving multiple satellite missions to construct more comprehensive and long-term data records.

This ground-breaking study represents the most extensive detection of climate change's impact on ecosystems, covering over 56% of the Earth's surface, the entire ocean. While the exact consequences of this transformation on the ocean remain uncertain, scientists speculate that climate change could drive a shift toward smaller plankton dominance within ecosystems.


This transition to smaller plankton could raise concerns for the future, potentially limiting the ocean's capacity to store carbon. According to the Intergovernmental Panel on Climate Change (IPCC), plankton could account for 5% to 17% of new carbon intake into the ocean by 2100. Smaller plankton have a reduced capacity to store this carbon, potentially diminishing its overall effectiveness in mitigating climate change. This research underscores the need for continued vigilance and research to understand and address the evolving impact of climate change on our ocean.

9,539,073
TOTAL AUDIENCE
REACH

2,613
ALTMETRIC
ATTENTION SCORE



Earth observation visualisation created using data from the US Geological Survey and LANCE/EOSDIS Rapid Response © Joshua Stevens, NASA



BALANCING OCEAN PROSPERITY AND HEALTH

SUPPORT SUSTAINABLE DEVELOPMENT PROTECTING THE OCEAN'S FUTURE HEALTH

In a world where the ocean holds the key to both economic prosperity and environmental stability, NOC stands as a dedicated steward, working to strike this vital balance. From fisheries to shipping, renewable energy to tourism, the economic potential of marine-based industries is vast. However, this potential comes with a profound responsibility.

Our goal is to facilitate the sustainable development of these industries while safeguarding the very ecosystems that underpin their existence. We use evidence and experience to empower decision-makers, industries, and communities to make informed choices that propel marine-based economies forward without compromising the future health of our ocean.

UNVEILING THE CCZ'S HIDDEN BIODIVERSITY

World renowned researchers from NOC and the Natural History Museum published a comprehensive inventory of the Clarion-Clipperton Zone's (CCZ) biodiversity, vital for assessing environmental impacts from potential mining. The CCZ, spanning six million km² between Hawaii and Mexico, is under scrutiny with 17 mineral exploration contracts covering 1.2 million km².

Dr Tammy Horton, NOC Research Scientist and Co-author, explained:

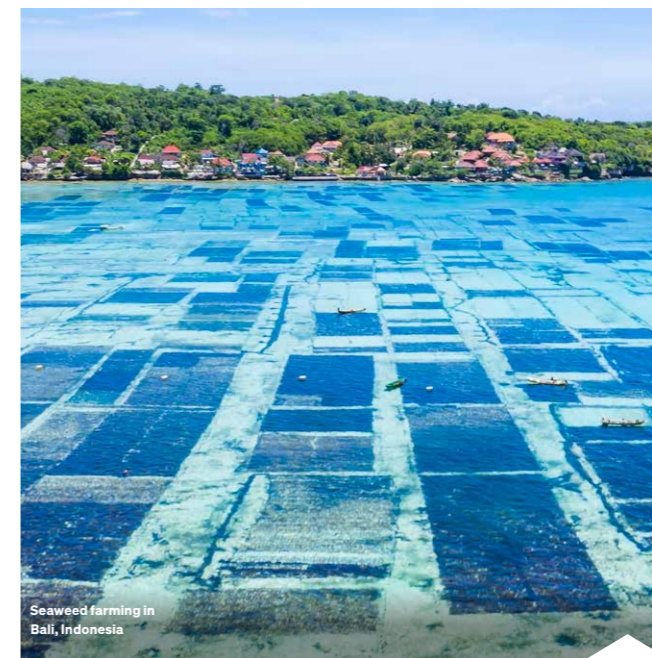
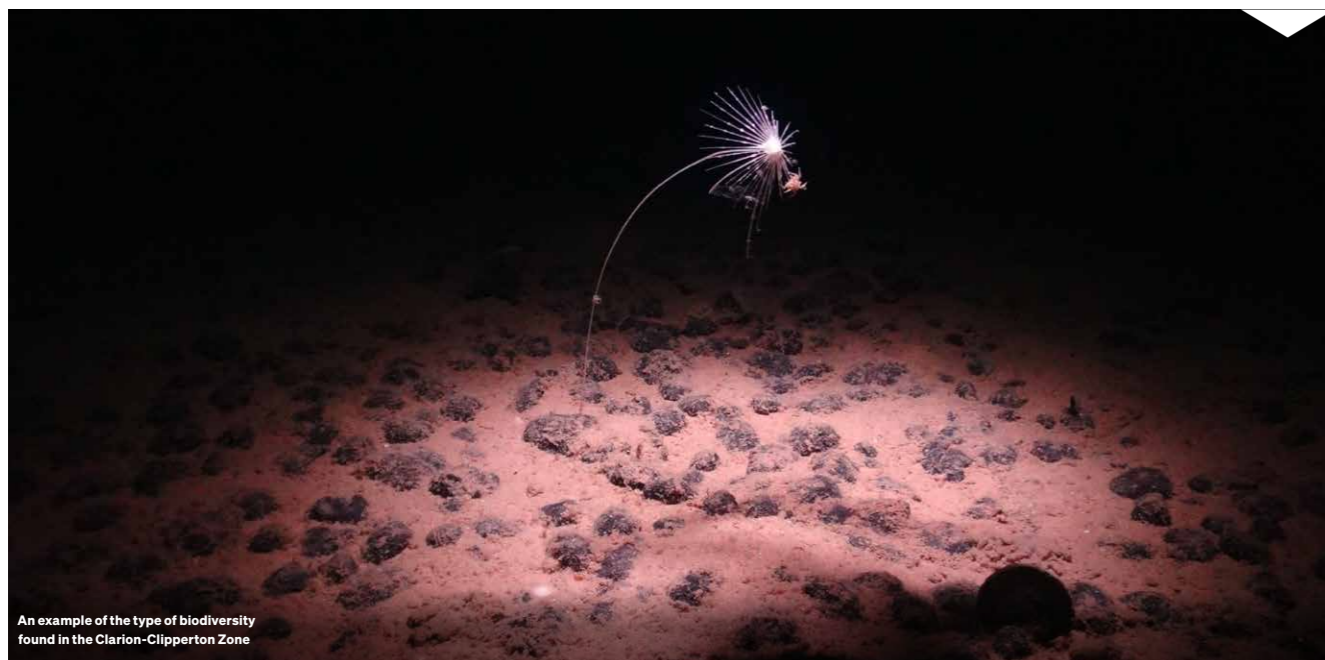
"We have been studying the biodiversity of the CCZ in collaboration with the Natural History Museum team for many years, and this study represents a major advance in our knowledge of the biodiversity of the region."

Dr Daniel Jones, NOC Principal Scientist and Co-author, highlighted:

"With deep-sea mining being considered in the area, it is incredibly important that

the unique and biodiverse deep-sea animals of this area are better documented. The records of these animals come primarily from deep-sea research expeditions, such as our recent SMARTEX expedition to the CCZ. In these rare opportunities to visit the remote CCZ we catch a glimpse of the diversity of life in this vast environment, for example using robotic submarines to photograph, study and collect some of the fascinating animals."

The team documented 185 species, with only six, like sea cucumbers, found elsewhere. The increase in data is due in part to the International Seabed Authority (ISA) requiring companies to collect and share environmental data for potential mining. This checklist supports the UN Ocean Decade **LEARN MORE: DECADE OF OCEAN SCIENCE - PAGE 56**, aiming to create field guides for CCZ wildlife.



OCEAN-DRIVEN CLIMATE SOLUTIONS

Our researchers are actively working to combat climate change through innovative solutions centred around our ocean and are geared towards providing vital information for policymakers to make evidence-based decisions.

We focus on cutting-edge monitoring tech to assess the impact of strategies, especially in offshore Carbon Capture and Storage (CCS). Our chemical monitoring, like "lab-on-chip" sensors, allow us to detect and quantify changes in seawater caused by CO₂ release, crucial for ensuring the integrity and compliance of CCS systems **LEARN MORE: LEADING CCS INNOVATIONS FOR CLIMATE MITIGATION - PAGE 54**. We also pioneer "blue carbon" and ocean-based CO₂ removal solutions, engaging in projects like SEA₀₂-CDR and ReSOW UK.

These multidisciplinary initiatives reflect our commitment to addressing climate change by driving forward sustainable and environmentally friendly solutions. Together, we're working towards a climate-resilient future.

MEASURING THE ATLANTIC

The Rapid Atlantic Meridional Overturning Circulation (Rapid-AMOC) observing system at 26 degrees north in the Atlantic has provided many new insights into ocean circulation and climate since its conception almost twenty years ago.

The NOC operated array of sensors and moorings measuring the AMOC have been serviced and improved by our teams every year since.

Continued observations from Rapid are so essential as the AMOC and its impacts are expected to continue to vary significantly and potentially decline on decadal time scales. This has been shown in Rapid-AMOC observations since 2004, and in the Intergovernmental Panel on Climate Change projections. A decline in the AMOC would contribute to extreme weather and climate decline in North America and Europe. This year we received further UK government funding from NERC (Natural Environment Research Council) to continue our work on Rapid-AMOC until 2026.

NO STOP FOR AMOC

OSNAP (Overturning in the Subpolar North Atlantic Program) is a transatlantic observing system, led by NOC, comprising sensors, moorings, and gliders, positioned north of Rapid-AMOC. Using data from OSNAP we discovered that the AMOC is not showing a detectable decline as previous studies from other scientists have suggested.

The study showed that the area between Greenland and Scotland has clear importance for climate projections, and that processes happening in centre of the Subpolar Gyre are critical, rather than in the surrounding currents as previously thought. For the first time, we've shown the relationship between the temperature and salinity of water inside the gyre and the strength of large ocean currents.

Professor Penny Holliday, NOC Associate Director, National Capability Science and OSNAP Principal Investigator, explained:

"There is no reason to assume that we are close to an overall shut down of the AMOC. While there is suggestive evidence for a slow-down in recent decades, there is no indication of its relevance over longer time-scales. We are confident that this discovery will provide a more accurate timeline of climate projections, as well as improve seasonal weather forecasts."

This will allow coast and city planners to enhance preparedness for extreme events, reducing risks and promoting resource-efficient practices for human health, safety, and prosperity. UK OSNAP is underpinned by National Capability funds from the Natural Environment Research Council (NERC).

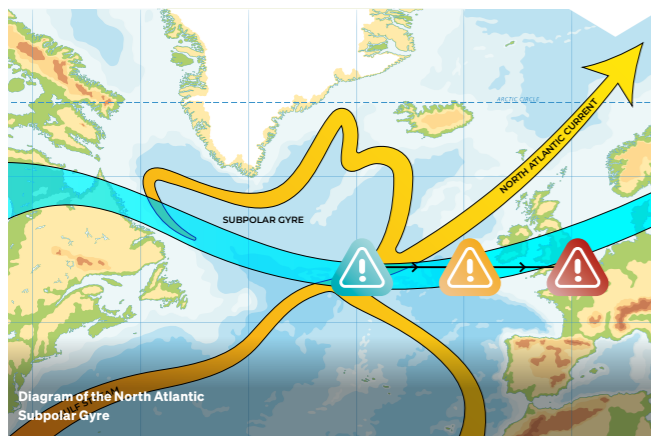


Diagram of the North Atlantic Subpolar Gyre

OCEAN RACE FINDS MICROPLASTICS

Findings from The Ocean Race Science Initiative have revealed alarming levels of microplastics in ocean waters. The analysis of 40 samples collected during the annual boat race, covering coastal regions to remote ocean zones, has detected microplastics in every sample, with some locations containing as many as 1,884 microplastics per cubic meter of water.

Race teams used a special filter system on-board to collect plastic particles, which were then analysed in our specialist laboratory by our microplastic experts with support from the University of Rhode Island. The findings highlighted that microplastics are pervasive, even in the most remote ocean regions, underscoring the urgent need to address plastic pollution.

Microplastic concentrations were highest near urban areas, such as Cabo Verde and South Africa, as well as in known "garbage patch" areas where ocean currents accumulate particles. Moreover, the study examines the chemical structure of plastic particles to understand which plastic products enter the ocean and break down into microplastics. The most common chemical found is polyethylene, used in various products, including single-use packaging and containers.

These results, which show significantly higher microplastic levels compared to the previous edition of The Ocean Race, provide critical data for understanding and addressing the plastic pollution crisis. This feeds into the Ocean Decade Odyssey project, endorsed by the Ocean Decade **LEARN MORE: DECADE OF OCEAN SCIENCE - PAGE 56.**



Scientists Katsiaryna Pabortsava & Victoria Fulfer analysing microplastic samples © Cherie Bridges, The Ocean Race



Restoring the lost UK seagrass meadows is vital to combat climate change

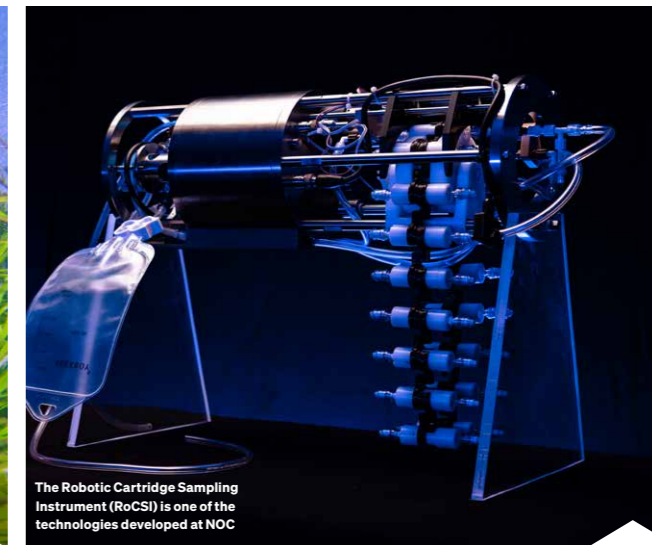
RESEARCH RESTORES SEAGRASS MEADOWS

Seagrass meadows are the powerhouses of coastal seas, providing a nature-based solution to climate change. They have been neglected for decades, which has led to their large-scale degradation and loss. In fact, they are some of the most threatened and degraded habitats on Earth and it is estimated that we have lost as much as 90% of UK seagrass beds over the last century.

We lead vital research into seagrass beds across the UK to determine the rate at which they capture and store carbon, as well as their contribution to supporting fisheries and coastal protection. The more we understand this, the more we can maximise their positive impacts and preserve biodiversity.

Beyondly's generous donation of £25,000 to NOC's Blue Carbon Fund is supporting the carbon coring and analysis of a key coastal site in Porthdinllaen Bay, on the northern Welsh coast. The site is a Special Area of Conservation (SAC) which is known for the presence of both seagrass and macro-algae.

The philanthropic partnership gives our researchers the opportunity to restore the seagrass meadows as part of our effort to combat climate change and prioritise ocean health through scientific evidence and information.



The Robotic Cartridge Sampling Instrument (RoCSI) is one of the technologies developed at NOC

SCALING UP TECHNOLOGY TRANSFER

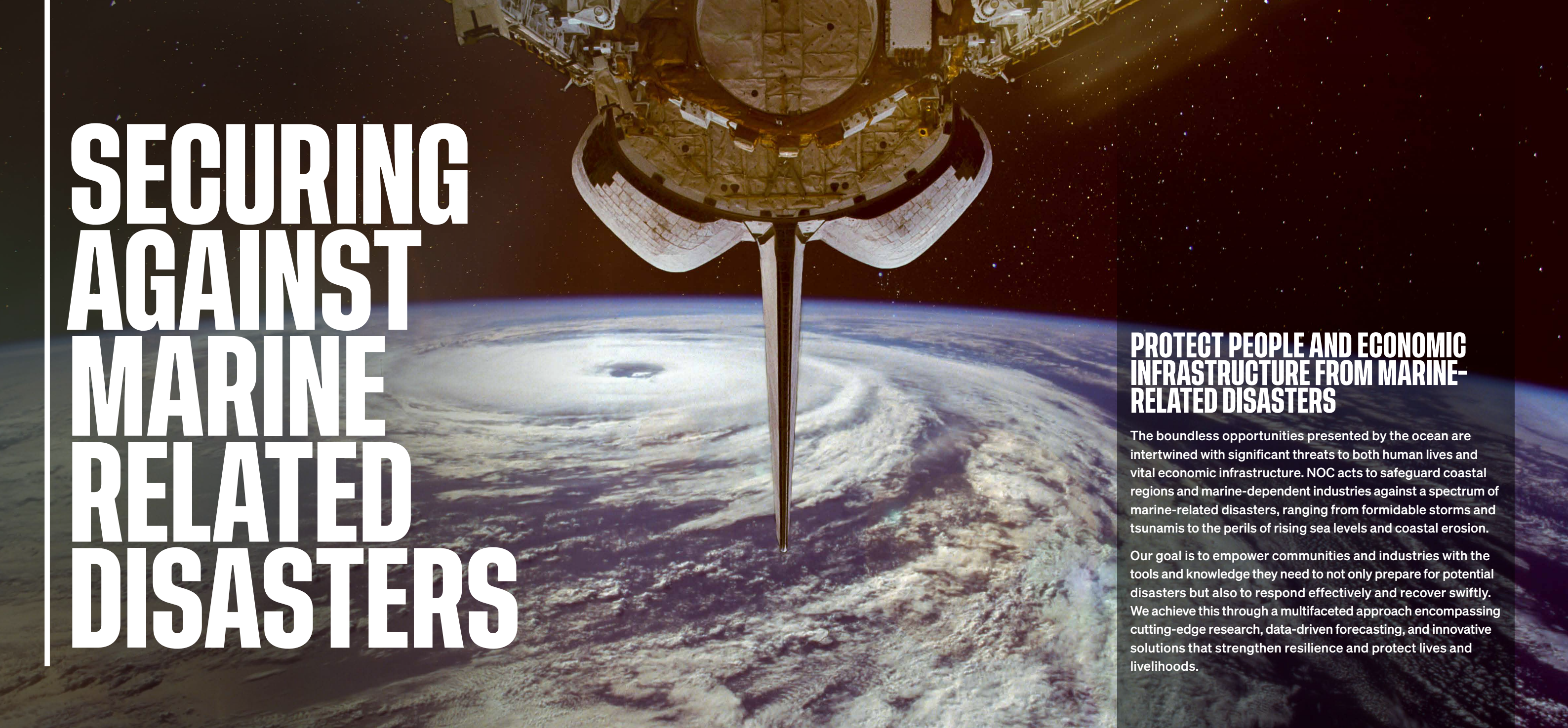
The NOC Innovations team supports and advances marine innovation for the benefit of science and society by researching challenges such as blue carbon, Carbon Capture, and Storage, reaching Net Zero and energy transition.

The team signed a five year agreement with Ploughshare to provide technology transfer services. They have increased the capability and capacity to discover, liberate, and scale our intellectual property into multiple industries, by helping us create licensing and spin-off products based on both novel and existing technology.

Huw Gullick, Managing Director at NOC Innovations, said:

"We have a long history of developing pioneering intellectual property and making scientific and engineering discoveries, and we always want to achieve impact from what we do."

Ploughshare has a demonstrated track record in helping to take intellectual property and discoveries to the world through models such as licensing and investment, and this is an excellent opportunity for us to scale up our science and research to the wider science community and general society."



SECURING AGAINST MARINE RELATED DISASTERS

PROTECT PEOPLE AND ECONOMIC INFRASTRUCTURE FROM MARINE- RELATED DISASTERS

The boundless opportunities presented by the ocean are intertwined with significant threats to both human lives and vital economic infrastructure. NOC acts to safeguard coastal regions and marine-dependent industries against a spectrum of marine-related disasters, ranging from formidable storms and tsunamis to the perils of rising sea levels and coastal erosion.

Our goal is to empower communities and industries with the tools and knowledge they need to not only prepare for potential disasters but also to respond effectively and recover swiftly. We achieve this through a multifaceted approach encompassing cutting-edge research, data-driven forecasting, and innovative solutions that strengthen resilience and protect lives and livelihoods.



The Hunga Volcano eruption the day before the main explosions took place

© Taniela Kula, Tonga Geological Services

FASTEST FLOWS

The eruption of the submerged Hunga Volcano in January 2022 triggered fatal tsunamis and pressure waves that travelled around the planet.

Our latest collaborative research shows that the sudden delivery of huge volumes of hot volcanic rocks, ash and gas into the ocean created avalanche-like flows, which travelled at speeds of up to 122km/hr causing extensive damage to the two sea-floor cables.

Subsea cables underpin our daily lives, carrying more than 99% of all digital data traffic worldwide, including the internet. When Tonga's only international cable was abruptly severed, the whole nation was disconnected from the rest of the world in the midst of a volcanic crisis.

Dr Isobel Yeo, NOC Volcanologist and Co-lead Author, said:

"A huge number of the world's volcanoes lie under the ocean, yet only a handful of those are monitored. As a result, the risk posed to coastal communities and critical infrastructure remains poorly understood, and more monitoring is urgently needed."

Just a few months after the eruption sea-floor sampling and surveys were collected by the research vessel RV Tangaroa, owned by New Zealand's National Institute of Water and Atmospheric Research (NIWA), revealing key evidence showing that the cable damage was caused by powerful and dense currents.

Dr Mike Clare, NOC Principal Researcher and Co-lead Author, added:

"The extremely fast flow speeds were caused by collapses of the eruption plume, which was up to 57km high. It then fell directly into the ocean onto very steep underwater slopes. Their initial speed was so fast, that these underwater flows were capable of running several hundred metres up-slope and for at least one hundred kilometres across the sea-floor. Their remarkable power explains the widespread damage to the sea-floor cables."

Richard Wysoczanski, NIWA Principal Scientist for Marine Geology and Co-author, concluded:

"Thanks to generous funding from the Nippon Foundation and incredible international collaboration, we now have this vital research that is relevant to anyone around the world who lives within proximity of underwater volcanoes, including countries around the Pacific Ring of Fire. We are armed with knowledge that will help keep communities informed and protected in the future."



A rainbow forming in a storm off the coast of Lundy, in the Bristol Channel

WARMING SEAS AND CHANGING STORMS

Our world-renowned scientists have made a significant contribution to the latest report from the UK Marine Climate Change Impacts Partnership (MCCIP), shedding light on the profound impact of climate change on the UK's seas and coastlines.

The report revealed evidence of the warming trend in sea surface temperatures around the UK, with a notable increase of approximately 0.3°C per decade over the past forty years. Projections indicate that UK seas are on course to warm by over 3°C by the year 2100, aligning with anticipated human-induced warming trends. Furthermore, the report highlights a concerning rise in the frequency of marine heat wave anomalies. Between 2000 and 2016, the average number of such anomalies increased by four per year, surging to as many as six annually in the northern UK regions. **LEARN MORE: HEATWAVE SUMMER - PAGE 25.**

Delving into storm and wave patterns, the report underscores how climate change has altered the Atlantic storm track. While UK waves are becoming calmer on average, the most extreme storms and associated waves are becoming more intense and more frequent. This comprehensive research not only equips policymakers with the latest data to inform protective measures for economic resources and vulnerable populations but also guides the scientific community in identifying critical research priorities.



A new tide gauge installed on the remote Ascension Island, South Atlantic Ocean

ASCENSION ISLAND'S INNOVATIVE TIDE GAUGE

We are at the forefront of sea-level science, enabling data collection and sharing through satellites, ocean robots, and a global network of tide-gauge monitoring systems. Collaborating closely with local scientists and organisations, we support national and international efforts, including capacity development initiatives in small island nations.

Recently, our engineers designed, constructed, and installed an advanced tide gauge on Ascension Island as part of the Climate Linked Atlantic Sector Science (CLASS) project. Located in the heart of the Atlantic Ocean, this device now provides invaluable data on sea-level changes in a region historically lacking in observations.

The near-real-time sea-level data delivered by the innovative tide gauge meets the stringent standards of the Global Sea Level Observing System (GLOSS), particularly for tsunami monitoring.

This tide gauge represents a vital addition to the South Atlantic Tide Gauge Network, established in 1985 under the ACCLAIM program. It transmits one-minute averaged sea-level data every six minutes to the Intergovernmental Oceanographic Commission of UNESCO's (IOC/UNESCO) Sea Level Station Monitoring Facility. This installation not only enhances our comprehension of sea-level fluctuations but also contributes significantly to monitoring coastal hazards.

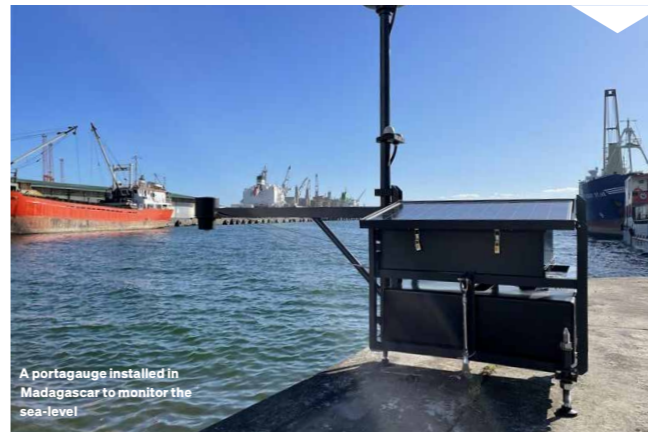
MADAGASCAR'S NEW SEA-LEVEL MONITORING SOLUTION

In collaboration with local and international partners, we have conceptualised a new sea-level monitoring system for Madagascar using low-cost relocatable tide gauges known as Portagauges. Currently, Madagascar lacks reliable tidal predictions and national sea-level monitoring due to the absence of functioning tide gauges.

Installing and maintaining numerous gauges along its extensive coastline is financially impractical and challenging for long-term upkeep. However, tidal information is vital for safety, infrastructure, and commerce, especially considering the potential impact of long-term sea-level rise on short-term hazards. Developed by engineers and scientists at NOC, the Portagauge is a portable tide gauge that allows easy and rapid deployment. The Portagauge monitors relative and absolute sea levels and land motion relative to geoid and local datums.

This year we've successfully demonstrated the concept's feasibility by deploying a Portagauge in Toamasina, Madagascar. Working closely with local stakeholders, we're currently developing a roadmap for deploying Portagauges at various locations along Madagascar's coast. This effort serves as a model for other coastal nations and island states facing similar challenges.

The Portagauge and Satellite Sea Level Monitoring System for the Southwest Indian Ocean (PASS-PWIO) project is funded by the European Space Agency.



A portagauge installed in Madagascar to monitor the sea-level

MANGROVE TREES AS COASTAL DEFENDERS

We made an exciting breakthrough discovery that could lead to significantly improved coastal defences using mangrove trees. Mangroves, which thrive in coastal salt-water, have proven effective in lowering water levels during extreme events like heavy storms and typhoons.

The research, conducted across the Pearl River Delta in the South China Sea, emphasises the vulnerability of rapidly growing Chinese mega-cities like Hong Kong, Shenzhen, and Guangzhou to flooding. While mangroves offer natural protection, this study reveals that combining mangroves with traditional flood defences like seawalls and levees can yield even better results. However, it also underscores the importance of location-specific numerical simulations for the optimal design of mangrove-based defences.

The NOC-led study, the first of its kind, fills a critical knowledge gap in understanding the factors controlling how coastal vegetation mitigates extreme water levels. It underscores the potential for nature-based coastal defences in delta areas housing large cities. Mangroves emerge as an effective tool for safeguarding coastal communities, not only reducing flooding but also offering benefits such as carbon storage, biodiversity, and erosion prevention.

Dr Michela De Dominicis, NOC Senior Scientist and Lead Author, said:

"Mangrove forests are one of the most powerful natural tools we have to protect coastal communities from rising sea levels and severe storms."



Mangrove trees could significantly improve coastal defences

© David Clode

NAVIGATING THE WORLD'S LARGEST ICEBERG

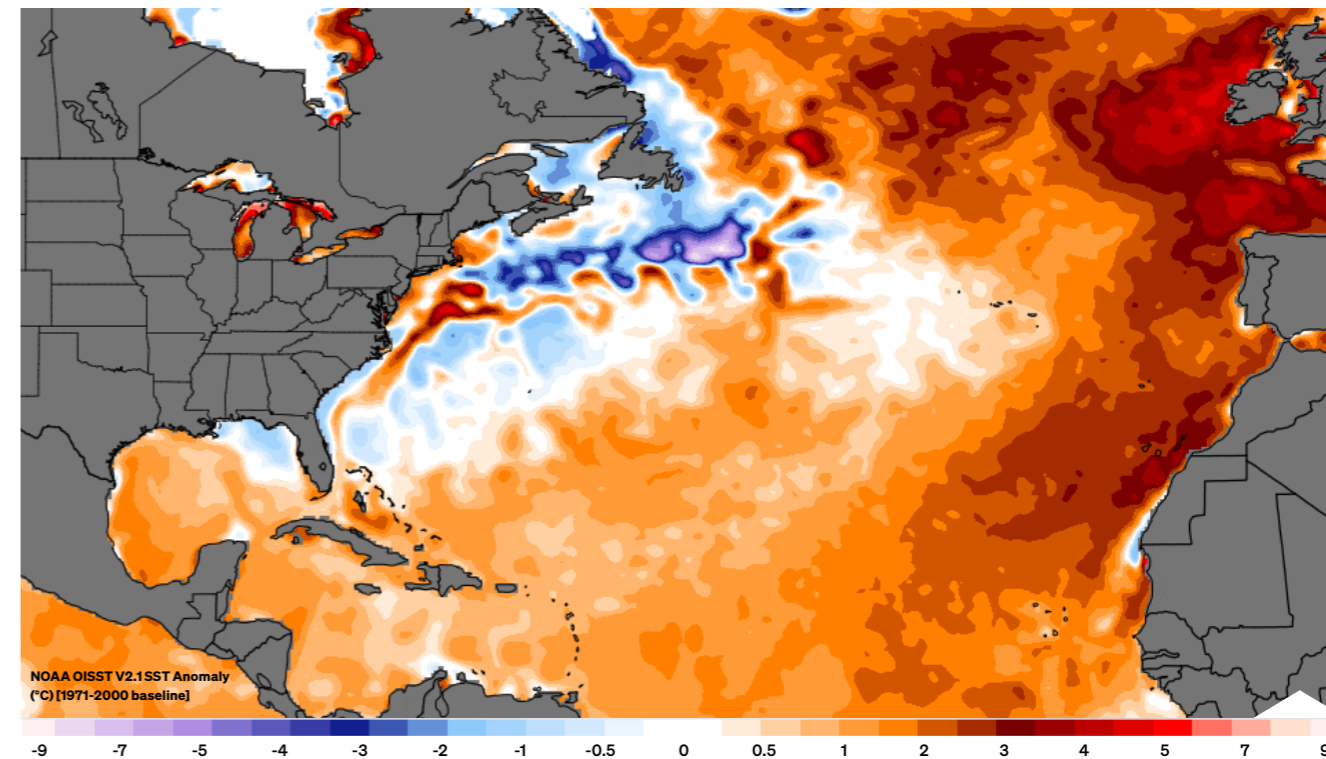
When returning from an expedition in South Georgia, our crew of the global-class Royal Research Ship (RRS) *Discovery* were asked to reroute and circumnavigate the largest floating iceberg on the planet – twice the size of Greater London.

At 135km long and 25km wide, A76A was thought to pose a significant threat to the local wildlife around South Georgia and the nearby Shag Rocks. Scientists on board from the British Antarctic Survey, were able to use the ship's world-class equipment to take critical samples of the water around the iceberg.

This collaboration and dynamic response to unfolding opportunities enabled 'chance-of-a-lifetime' measurements and observations to be gathered. The RRS *Discovery*, managed and operated by the NOC, is only one of a handful of ships able to navigate and operate in these latitudes [LEARN MORE ABOUT THE RRS DISCOVERY AND RRS JAMES COOK: SHIPS FOR GLOBAL SCIENCE - PAGE 44.](#)



The iceberg stretching into the distance as seen from RRS *Discovery*



HEATWAVE SUMMER

Record-breaking high sea surface temperatures are increasing globally. June's marine heatwave anomaly was tracked at the open-ocean Porcupine Abyssal Plain Sustained Observatory (PAP-SO), located in the northeast Atlantic Ocean. This is currently the only long-term time series site in the world that monitors the ocean from the surface to the abyssal seabed, and it has been operational for more than thirty years. It's operated by NOC, in collaboration with the Met Office, but shares data freely with the global science and data community.

June's sea surface temperature soared to 16.52°C, marking a significant deviation of more than 1.66°C from the mean recorded between 1982 and 2011 (14.86°C) based on Met Office data from the HadISST dataset. This rapid warming commenced approximately six

weeks earlier than the typical onset for this time of the year.

Climate change profoundly affects global ecosystems, impacting upper ocean biogeochemistry, plankton, and seabed organisms. Rising sea surface temperatures influence atmospheric circulation, affecting European weather. Globally, ocean temperature changes impact circulation, carbon sequestration, and the distribution of heat and nutrients in the ocean.

These developments emphasise the complex and interconnected nature of climate change's far-reaching consequences, and the importance of internationally significant facilities such as PAP-SO.



HELPING NAVIGATE GLOBAL ENVIRONMENTAL CHANGES

MAKE SENSE OF GLOBAL ENVIRONMENTAL CHANGES IN WHICH THE OCEAN IS DEEPLY IMPLICATED

In an era defined by rapid environmental transformation, NOC is dedicated to unravelling the intricate connections between the ocean and global environmental changes. We recognise that the ocean is both a barometer and a driver of environmental change, influencing climate patterns, sea-level rise, and ecosystem dynamics.

Our goal is to bring clarity to the complexity of these relationships. Through our research and insights, we arm policymakers, scientists, and communities with the knowledge required for informed decision-making, guiding us collectively towards a more sustainable and resilient future in harmony with the natural world.

A NEW LINE IN THE SAND

We unveiled a fascinating discovery at the bottom of the North Pacific Ocean: an underwater boundary reminiscent of the famous 'Wallace Line,' which was first identified in 1859 and separates the distinct life forms of Asia and Oceania. This newly found boundary exists on the ocean floor, specifically across the vast Clarion-Clipperton Zone (CCZ), an abyssal plain stretching for 5,000 kilometres between Mexico and Kiribati.

The CCZ, located at depths ranging from 3,500 to 6,000 meters, is currently a focal point for deep-sea mining activities. This study not only identified this biogeographical boundary but also revealed a surprising phenomenon: increased biodiversity with increasing depth. This challenges the conventional belief in deep-sea ecology that harsher conditions in deeper ocean regions limit biodiversity.

The NOC-led study posits that water chemistry, specifically calcium carbonate (CaCO_3) saturation (the mineral responsible for forming the shells and skeletons of many marine animals) might be an overlooked factor in delineating this boundary. It could also play a pivotal role in shaping biodiversity across this expansive region.

Dr Erik Simon-Lledó, NOC Deep-sea Ecologist and Lead Author, explained:

"Muddy abyssal seafloors were initially considered to be almost 'marine deserts'. But as deep exploration and technology progressed, these ecosystems keep unveiling a large biodiversity, comparable to that in shallow water ecosystems, only found on a much wider spatial spread."

Dr Adrian Glover, Natural History Museum Principal Scientist and Co-author, emphasised the significance of these findings:

"These new data revolutionise our understanding of abyssal Pacific biogeography and will be vital to inform urgent policy decisions on potential deep-sea mining."

Dr Daniel Jones, NOC Principal Scientist and Co-author, said:

"The research findings are the result of a ten-year-long study in collaboration with more than thirteen world-leading deep-sea research institutions, universities, and industry bodies, and involved twenty one deep-sea researchers. It shows the value of international collaboration in uncovering unknown patterns across huge areas of the ocean."

The study also sheds light on the distinctions between shallower and deeper regions within the vast abyssal nodule field habitat—a region currently in the cross-hairs of mining operations. The findings provide a fresh foundation for crafting regional-scale management strategies to safeguard biodiversity in the Earth's largest biome, the deep ocean.



An example of the type of biodiversity found in the Clarion-Clipperton Zone



Autosub 5, the latest in a long line of AUV's developed by NOC

DECADES OF INNOVATION

To develop effective strategies for dealing with rising sea-levels, we must understand what lies ahead. The main uncertainty lies in the Antarctic Ice Sheet, where observed thinning raises concerns about irreversible changes, potentially contributing over a meter to sea levels in centuries to come.

Our Drivers of Oceanic Change in the Amundsen Sea (DeCAdeS) project is using innovative techniques and engineering to fill gaps in our understanding of Amundsen Sea ocean temperatures. The continuing evolution of NOC's pioneering Autosub Long Range (ALR), aka Boaty McBoatface will enable it to anchor beneath pack ice, annually measuring currents carrying warm water toward the ice.

These measurements along with data from fixed instruments and seal-borne sensors, will be related to satellite records of sea surface changes over three decades.

This year our engineers have conducted extensive testing in our state-of-the-art

facilities and during missions in Loch Ness and Orkney. This research and development has been invaluable, fostering continuous learning, refinement, and ultimately leading to ground-breaking advancements explore and understand the ocean.

We're very confident that next year will see a successful trial of ALR securely anchored to the seabed, marking the first time such an operation has been carried out.

The ultimate goal is to have ALR stationed and anchored in the Pine Island Thwaites Trough for a year. In this remote location, ALR will be measuring the complex water flows beneath the Thwaites and Pine Island glaciers. Our findings will help the science community understand one of the remotest environments on the planet and ultimately contribute to addressing the challenges posed by rising sea levels.

GLIDERS REVOLUTIONISE CLIMATE DATA COLLECTION

We teamed up with the Met Office in a ground-breaking partnership, to complete the first continuous monitoring programme ever done using underwater robot gliders. These advanced gliders, provided and operated by NOC, collected crucial data on temperature and salinity west of the Orkney Islands along the Joint North Sea Information System (JONSIS) line (between 0° and 2.233°W at 59.28°N).

This information is integral to feed into the Met Office's software and computer models, creating an instant global database for scientists to use when forecasting weather and making predictions about climate change. During each project phase, several gliders were deployed, ensuring a continuous data stream.

In keeping with wider Net Zero commitments, the gliders were controlled remotely from NOC, eliminating the use of traditionally powered, large ships. This successful collaboration underscored the unwavering commitment of both institutions to cutting-edge scientific innovation and data, with a resolute focus on addressing the pressing societal challenges posed by climate change.



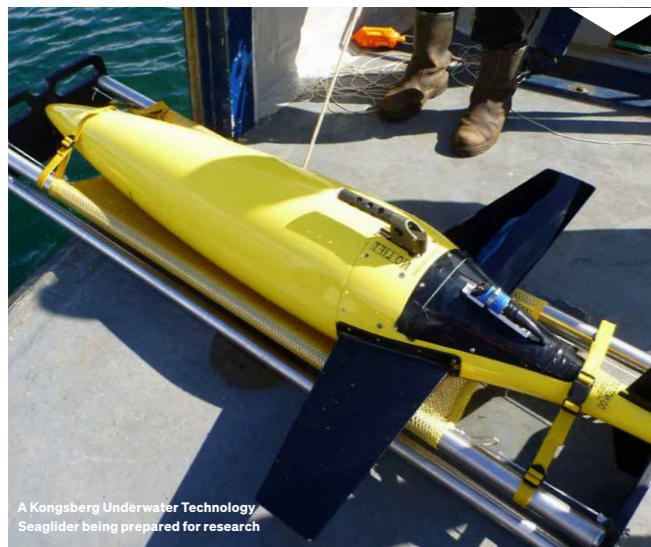
A Teledyne Slocum G3 Glider equipped with NOC sensors

ENHANCING NEAR-REAL-TIME OCEAN DATA SHARING

NOC's British Oceanographic Data Centre (BODC) collaborated with the Scottish Association for Marine Science (SAMS) to enhance the sharing of near-real-time ocean data with the broader scientific community. SAMS deploys two Seagliders annually as part of the Ellett Array, which continuously monitors critical ocean parameters along the European Shelf Edge Current.

BODC's innovative application has been introduced to facilitate the secure and authenticated retrieval of near-real-time Seaglider data. This enhances security protocols and streamlines the process of checking and transferring new data files to the BODC archive, making near-real-time data sharing more efficient.

This improved functionality has been instrumental in monitoring the recent marine heatwaves, providing invaluable modelling data for the UK Met Office and other operational entities. BODC plays a vital role in preserving and providing access to valuable ocean data for scientific research and environmental monitoring. BODC contribute significantly to advancing our understanding of marine systems and their impact on climate and ecosystems.



A Kongsberg Underwater Technology Seaglider being prepared for research

UNVEILING OCEAN INSIGHTS FROM SPACE

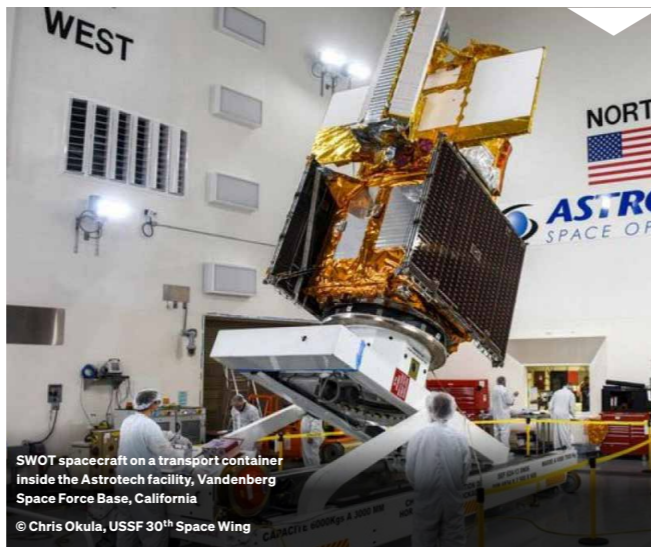
A ground-breaking UK-supported mission, the Surface Water and Ocean Topography (SWOT) satellite, has launched into space. This international endeavour is set to provide unparalleled insights into our world's ocean and surface water.

SWOT will comprehensively survey 90% of the Earth's surface, scrutinising changes in the ocean, lakes and rivers. The data generated will enhance our understanding of climate change and improve our ability to predicate and mitigate global flood risks.

Partnering with the Natural Environment Research Council (NERC), the UK Space Agency has invested £375,000 in the SWOT-UK research project. UK scientists, including satellite and data specialists at NOC, are actively engaged in evaluating and leveraging SWOT data for areas characterised by high tidal ranges and swift currents.

Professor Christine Gommenginger, NOC Principal Investigator and SWOT-UK Co-leader, said:

"One objective of SWOT-UK specifically is to demonstrate how satellite Earth observation data can be used with in situ instruments and numerical models to answer important questions for science and society."



SWOT spacecraft on a transport container inside the Astrotech facility, Vandenberg Space Force Base, California

© Chris Okula, USSF 30th Space Wing

BRITISH OCEANOGRAPHIC DATA CENTRE (BODC): A STATISTICAL SNAPSHOT

For period 01 April 2022 to 31 March 2023.

195
DATA DEPOSITS RECEIVED

100%
OF CRUISE DATA ARCHIVED WITHIN 1 MONTH OF RECEIPT

8,120
ARGO PROFILES DELIVERED TO THE MET OFFICE IN REAL TIME

74.8%
OF ARGO PROFILES WERE DELAYED-MODE QUALITY CONTROL

76,820
DATASETS SETS DOWNLOADED OR DELIVERED ON REQUEST

87,976
BATHYMETRY SETS DOWNLOADED

195,793,967
GEBCO WEB MAP SERVICE CALLS

494
DATASETS WITH A DIGITAL OBJECT IDENTIFIER (DOI)

86,225
ACTIVE REGISTERED USERS

44,335
NERC VOCABULARY SERVER USER SESSIONS

7,224,497
CALLS TO THE NERC VOCABULARY SERVER

36%
OF DATASETS AVAILABLE WITHIN TWO CLICKS OF MEDIN PORTAL

RAISING OCEAN AWARENESS AROUND THE WORLD

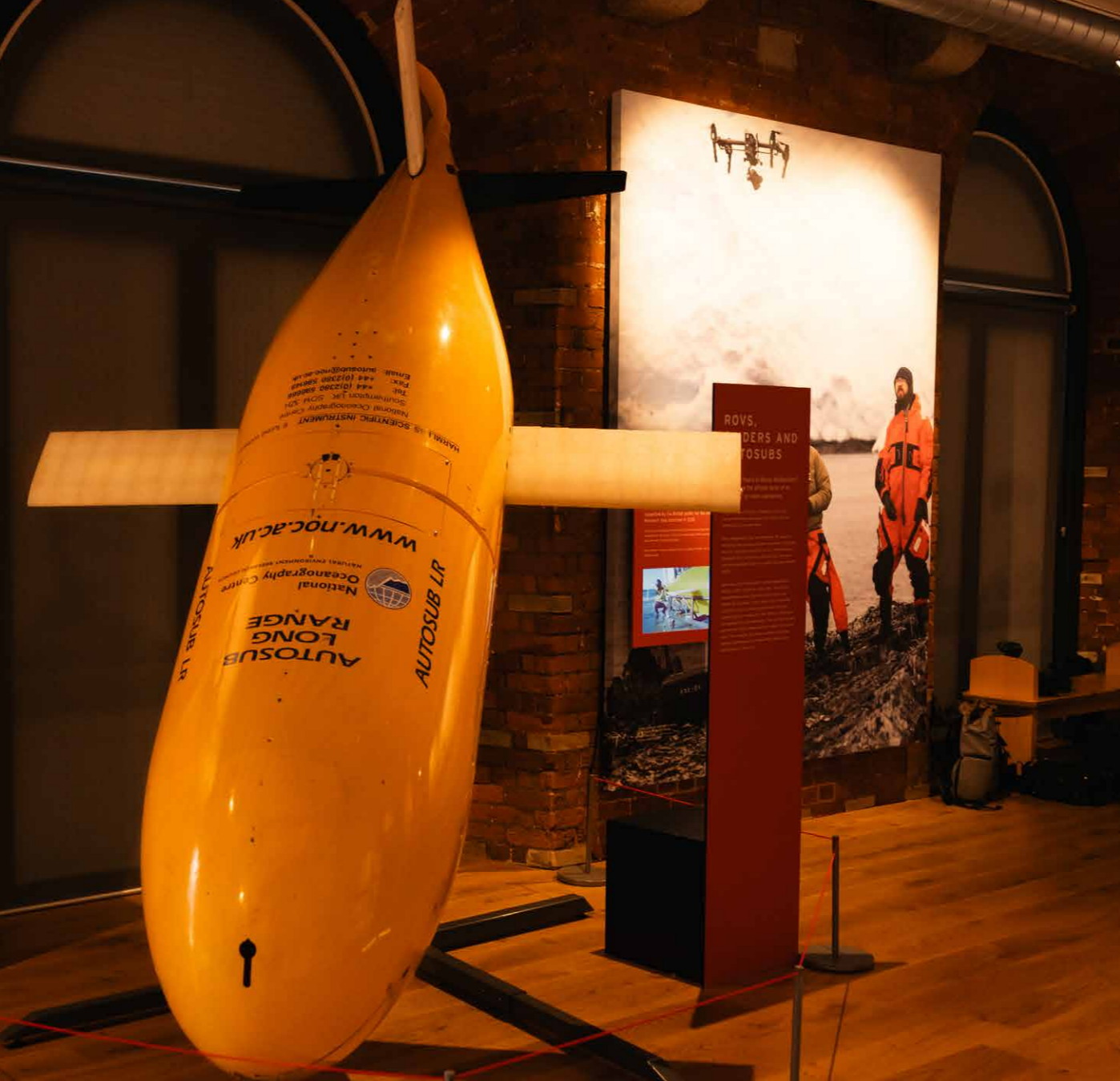


EDUCATE HUMANKIND ON THE OCEAN'S CRITICAL ROLE IN OUR LIVES THROUGH SCIENTIFIC EVIDENCE AND UNDERSTANDING

Our one Ocean is not merely a distant realm but an integral part of our daily lives, influencing weather patterns, regulating our climate and providing sustenance for billions.

As a premier research organisation, NOC provides scientific evidence to inform discussions, evoke wonder, and enhance awareness of the ocean's significance.

Our expert researchers, engineers and ambassadors engage with diverse stakeholders, ranging from local community groups and schools to national and international change makers, aiming to foster a deeper understanding of the ocean's profound impact on our world.



Boaty McBoatface on display in The National Museum of the Royal Navy at Portsmouth Historic Dockyard

SET YOUR SIGHTS ON BOATY MCBOATFACE

The extraordinary tale of HMS *Challenger's* expedition, the daring three-year scientific odyssey took place 150 years ago and forever changed our understanding of the Earth's ocean, is the fascinating and timely focus of a brand-new exhibition; *Worlds Beneath the Waves*, opening at The National Museum of the Royal Navy, Portsmouth Historic Dockyard.

The exhibition includes the chance to get up close and personal with NOC's scientifically significant assets such as Boaty McBoatface and specimens from The Discovery Collections.

With climate change and the state of the world's ocean dominating global headlines, *Worlds Beneath the Waves* traces the impact of *Challenger's* voyage and reveals how the UK is still at the forefront of scientific research centred on our ocean.

On the 21 December 1872, HMS *Challenger* set sail from Portsmouth on a scientific expedition to explore and survey our ocean. Their collective findings shattered long-held beliefs, challenging conventional wisdom and propelled marine science into a new era of enlightenment.

In partnership with NOC, the Royal Navy is still collecting data through the deployment of ships such as; HMS *Protector*; Autosubs, the most famous of which is Boaty McBoatface, underwater gliders and Remotely Operated Vehicles (ROVs).

Diana Davies, The National Museum of the Royal Navy's Head of Conservation, said:

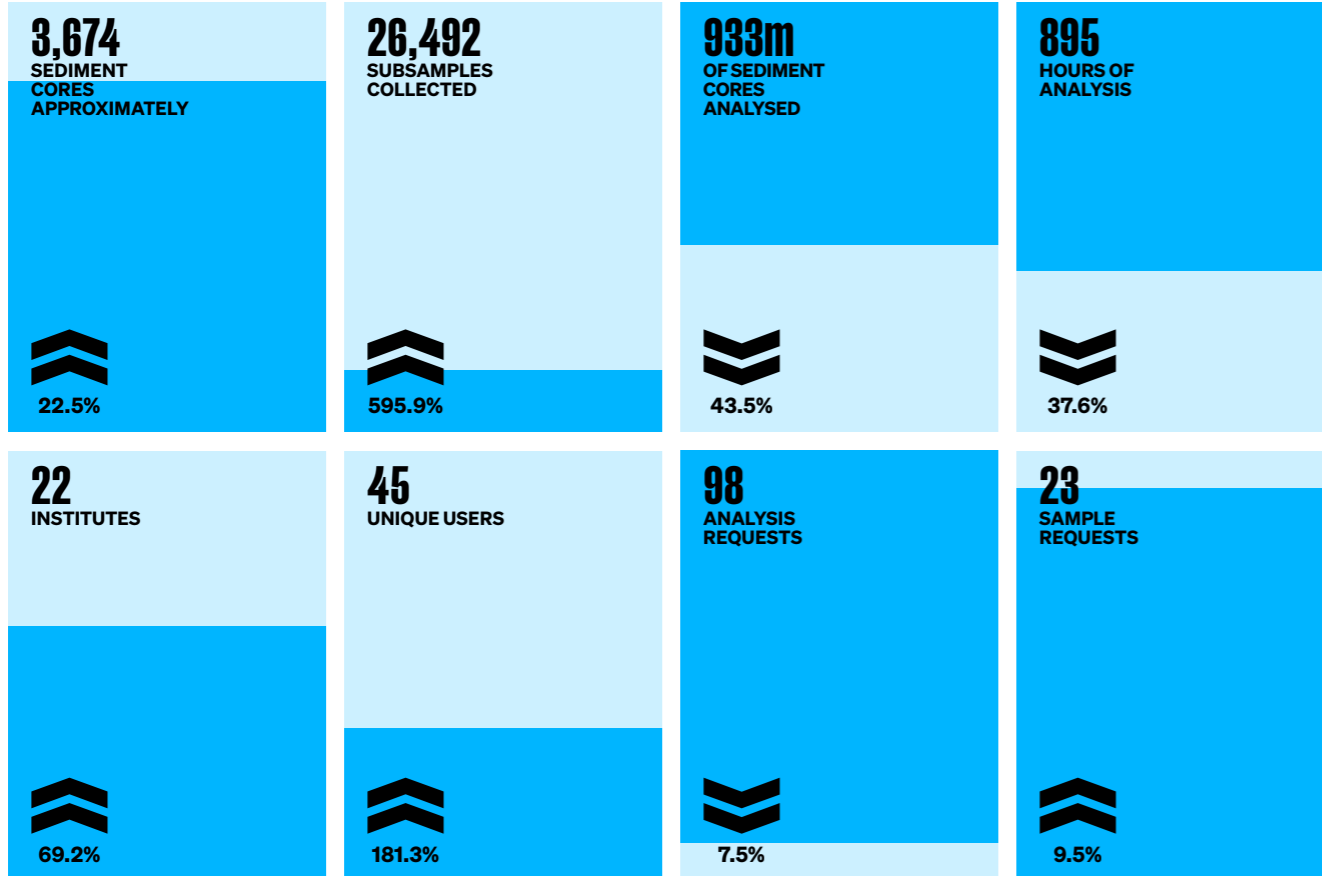
"It's never been more important to understand the role the ocean plays in the future of our planet, and we're so excited to welcome visitors to this new exhibition on a journey of discovery that takes you through the very beginnings of true oceanography, to the work of the modern navy and the findings of contemporary marine scientists at the forefront of their field."

Alice Kloker, NOC Stakeholder Engagement Manager, said:

"This inspiring exhibit is an excellent opportunity to raise awareness of the challenges our ocean faces, the knowledge needed inform solutions, and role emerging technologies play in delivering these answers."

BRITISH OCEAN SEDIMENT CORE RESEARCH FACILITY (BOSCORF): A STATISTICAL SNAPSHOT

Below is a visual comparison of this year's BOSCORF data compared to 2021/22*.



*for more information and to see the details of last year's performance, please read our Annual Report 2021/22

EQUIPPED FOR THE FUTURE

The upgrade of the Geotek Core Workstation (MSCL-XYZ) at our British Ocean Sediment Core Repository and Facility (BOSCORF) marks a leap in our capacity to deliver geochemical datasets derived from marine sediment samples.

One of the stand-out features of this upgraded workstation is its automated multi-core logging system. This innovation operates tirelessly around the clock, requiring minimal user intervention. This means that researchers can process large volumes of marine sediment samples efficiently, speeding up data collection.

It is fully shielded, ensuring the safety of the user while providing unobstructed visibility of the logging operation. This protective shield ensures that researchers can work confidently, even when handling challenging or sensitive samples.

This upgrade represents our commitment to staying at the forefront of marine sediment research, contributing to a deeper understanding of our planet's history and environmental changes.



The upgraded Geotek Core Workstation (MSCL-XYZ) in our BOSCORF facility

NURTURING OUR FUTURE ENGINEERS

Our dedication to nurturing the next generation of engineers is a top priority, and we have launched an initiative to inspire and support early career marine engineers and technologists.

To share our expertise and resources to help them thrive in the field we've introduced a special educational institute membership option at our renowned Marine Robotics Innovation Centre. In South Hampshire, college memberships include Fareham, Eastleigh, and Southampton City.

Our collaboration with Fareham College has already brought valuable benefits to the college and its students. One such advantage is the provision of free tickets to our highly regarded annual event, the Marine Autonomy and Technology Showcase (MATS), enabling students to have a first-hand look at the cutting-edge innovations and breakthroughs in the field of marine robotics and technology.

By extending this opportunity to all educational institutes we hope to inspire and equip the next generation with the knowledge and motivation they need to excel in their careers.



Students from Fareham College visiting the Marine Autonomy and Technology Showcase 2022



Early Career Researchers from under-represented countries attending the Ocean Twilight Zone Symposium

EMPOWERING GLOBAL OCEAN SCIENCE EDUCATION

The Joint Exploration of the Twilight Zone Ocean Network (JETZON) program, supported by a Grantham Foundation bursary, has made a significant impact on science students worldwide. A \$75,000 donation facilitated the attendance of students from under-represented countries like Cameroon, Nigeria, and Mexico at the Ocean Twilight Zone Symposium.

This international conference covered various critical ocean topics, emphasising the Twilight Zone's significance for biodiversity and climate regulation through helping the ocean store carbon.

The bursary further supported over half of the 130 attendees, as early career scientists, by covering their registration fees. This initiative aimed to foster global collaboration and education for scientists worldwide.

Led by NOC, JETZON is an endorsed UN Ocean Decade Programme **LEARN MORE: DECADE OF OCEAN SCIENCE - PAGE 56** and serves as a global coordinator for Twilight Zone studies.

ADVANCING POSTGRADUATE EDUCATION IN GEOSCIENCES

The launch of the Geosciences Advanced E-Learning Academy (GAEA) underscores our unwavering commitment to postgraduate education and providing access to world-class resources for the national and international science community.

GAEA serves as a virtual educational space, supported by the UK's Natural Environment Research Council (NERC), offering a wide array of courses, materials, and opportunities for researchers at all career stages. The site has reported 5.9k users since October 2022, with 302 registered learning accounts from 51 countries.

The educational courses and materials have been crafted and contributed to by world-leading experts in their field, including staff from our own British Ocean Sediment Core Repository and Facility (BOSCORG).

BOSCORG is a vital resource housing ocean floor sediment cores, acting as a time capsule of Earth's history. Scientists study past climates, ecosystems, and geological processes, revealing information about sea levels, environmental changes, and predicting future climate trends. This accessible treasure trove supports global researchers in developing expertise in environmental science and technology.

PRESTIGIOUS AWARD FOR PODCAST

We were delighted when our Into the Blue podcast received the prestigious Babcock First Sea Lord's Award for Best Use of Digital Media at the Maritime Media Awards 2022. This recognition is a testament to the podcast's significant contribution to enhancing public awareness of maritime issues and highlighting the critical role of the ocean.

For over two decades, the Maritime Media Awards have celebrated the work of journalists, authors, filmmakers, digital creators, and others whose media initiatives have played a pivotal role in fostering a deeper understanding of maritime matters and the UK's reliance on the sea.

The award for Best Use of Digital Media commended the podcast for its "stimulating and engaging" content.

Launched in 2022, Into the Blue explores topics such as climate change and satellite oceanography, featuring insights from NOC and external experts, empowering listeners with a profound understanding of the ocean and its challenges. Season two is available on all podcast platforms and YouTube.



Dr Zoe Jacobs presenting on the set of our award winning podcast; Into the Blue

INSPIRING STEM ENGAGEMENT

We hosted Protect Our Planet 22, as part of our unwavering commitment to schools and STEM engagement. This remarkable event was broadcast live from our Boaty McBoatface workshop in Southampton, offering an enriching experience for students and educators alike.

Hosted by planetary scientist Dr Suzie Imber and science TV presenter Dallas Campbell, the event attracted 106,308 viewers, featuring engaging activities, live link-ups, talks, and explorations. Experts like Angela Hatton, Allison Schaap, Tammy Horton, and Matt Kingsland contributed to the success. This educational extravaganza reached 6,181 teachers and an impressive 100,127 students.

The event was organised by the UK Space Education Office (ESERO-UK) at STEM Learning, in close collaboration with the European Space Agency and the UK Space Agency. Our involvement emphasised our commitment to inspiring the next generation of scientists and explorers to safeguard our ocean's future.



Dr Suzie Imber and Dallas Campbell presenting from the ALR workshop

MONSTERS OF THE DEEP ON TOUR

With a Vampire Squid and a model of Boaty McBoatface; the Historic Dockyard Chatham became the latest stop for Monsters of the Deep described as the most technically sophisticated and lavish sea monster-themed showcase ever produced.

Dr Tammy Horton, said:

"The Discovery Collections are made up of specimens and samples collected since 1925 from the open ocean and deep sea that provide a picture of how the ocean is today and to understand how the ocean is changing, the impact we are having on the ocean, and planet at large, and this research allows us to provide answers to societal questions such as climate change."

The exhibition encourages visitors to explore centuries-old myths and legends of mermaids, tales of deep-sea creatures, explore the fake news stories that proliferate today, and meet the real monsters of the deep housed in tall 'bubbling' enigmatic glass tubes containing specimens that will change the way visitors view sea 'monsters'.



The Monsters of the Deep exhibition at the NMMC, Falmouth



TREC included many interactive exhibitions such as a virtual reality tour of a Royal Research Ship

SOLENT COMMUNITY ENGAGES IN COASTAL EXPLORATION

We were thrilled to be a part of the European Molecular Biology Laboratory's (EMBL) Traversing European Coastlines (TREC) expedition during their week in the Solent, exemplifying our responsibility to engage with our local community **LEARN MORE: COMMUNITY+CULTURE - PAGE 70**. Southampton served as one of 22 public engagement stops on TREC's pan-European journey, uniting ocean exploration with coastal sampling to provide EMBL with a ground-breaking census of European coastal ecosystems.

We opened our doors to offer a range of engaging activities focused on planetary biology, marine science, and ocean ecosystems. The program included interactive, game-based workshops, guided tours, and an exhibition area where participants had the opportunity to interact with NOC scientists and gain insights into their research.

To ensure accessibility, we exhibited at WestQuay Shopping Centre, inviting individuals to delve into the microscopic world of our ocean, featuring organisms like plankton. These minute life forms play a pivotal role in planetary health, and we provided microscopes and models to showcase the vast biodiversity of our ocean and the interconnected marine food chain. We also participated in science talks held at a local pub, creating an informal and approachable environment to learn about the research that we are conducting to better comprehend planetary health and our changing ocean.



Princess Olivia Investigates is written by Lucy Hawking and illustrated by Zoe Persico © Penguin Books

BOOK COLLABORATION COMBATS PLASTIC POLLUTION

Princess Olivia Investigates: The Sea of Plastic, the second book in Lucy Hawking's middle-grade series, was launched this summer and follows ex-princess Olivia Alez, now a science investigator, as she confronts the urgent issue of ocean pollution.

Lucy Hawking collaborated closely with our world-leading experts for scientific accuracy and inspiration. Dr Chelsey Baker, Dr Sara Fowell, Professor Steph Henson, Dr Alice Marzocchi, and Dr Katsia Pabortsava, contributed their knowledge and insights to the book. Their collaboration enabled the narrative to incorporate real-world marine science topics seamlessly.

Throughout the story, readers encounter science inserts written by these experts, enhancing the educational value of the book. *Princess Olivia Investigates* not only entertains but also educates young readers about the critical issue of ocean pollution and its impact.

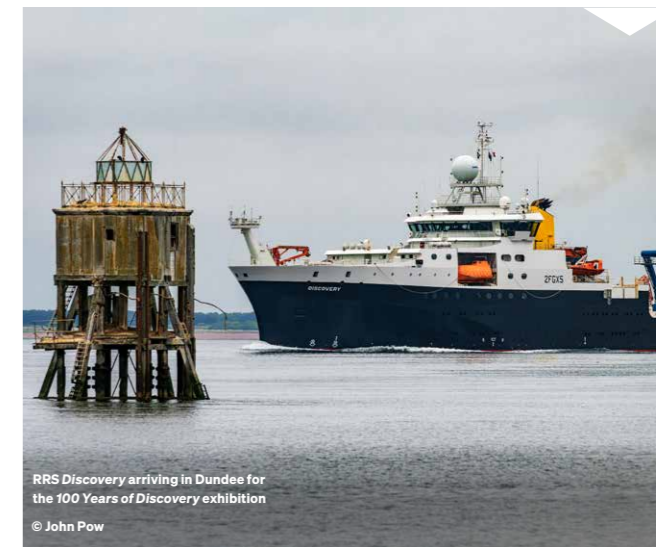
This collaboration serves as a powerful example of how literature and science can come together to engage and inspire the next generation. It encourages young readers to explore the wonders of marine science and empowers them to take action in protecting our ocean.

HISTORIC MEETING OF MARITIME EXPLORATION

The historic meeting between the modern RRS *Discovery* and the original *Discovery* in Dundee marked a significant moment in the world of maritime exploration and scientific research. This event was the first time that the two iconic vessels were together.

The original RRS *Discovery's* fame is primarily associated with its pivotal role in Captain Scott's 1901 expedition to Antarctica. This expedition marked the beginning of exploration and scientific discovery in some of the world's most challenging environments. The modern RRS *Discovery* worked directly with the Dundee Heritage Trust to open its doors to visitors and schools, allowing them to gain insight into the ship's cutting-edge research on the ocean and climate.

Meanwhile, the crew of the modern *Discovery* visited the original vessel in Dundee, where they were presented with an original piece of the deck, a symbolic gesture that bridged the past and present. The event underscored the enduring spirit of discovery and emphasised the vital role that ships like the RRS *Discovery* continue to play in advancing our understanding of the natural world.



RRS Discovery arriving in Dundee for the 100 Years of Discovery exhibition © John Pow



SHIPS FOR GLOBAL SCIENCE

CRITICAL COLLABORATION

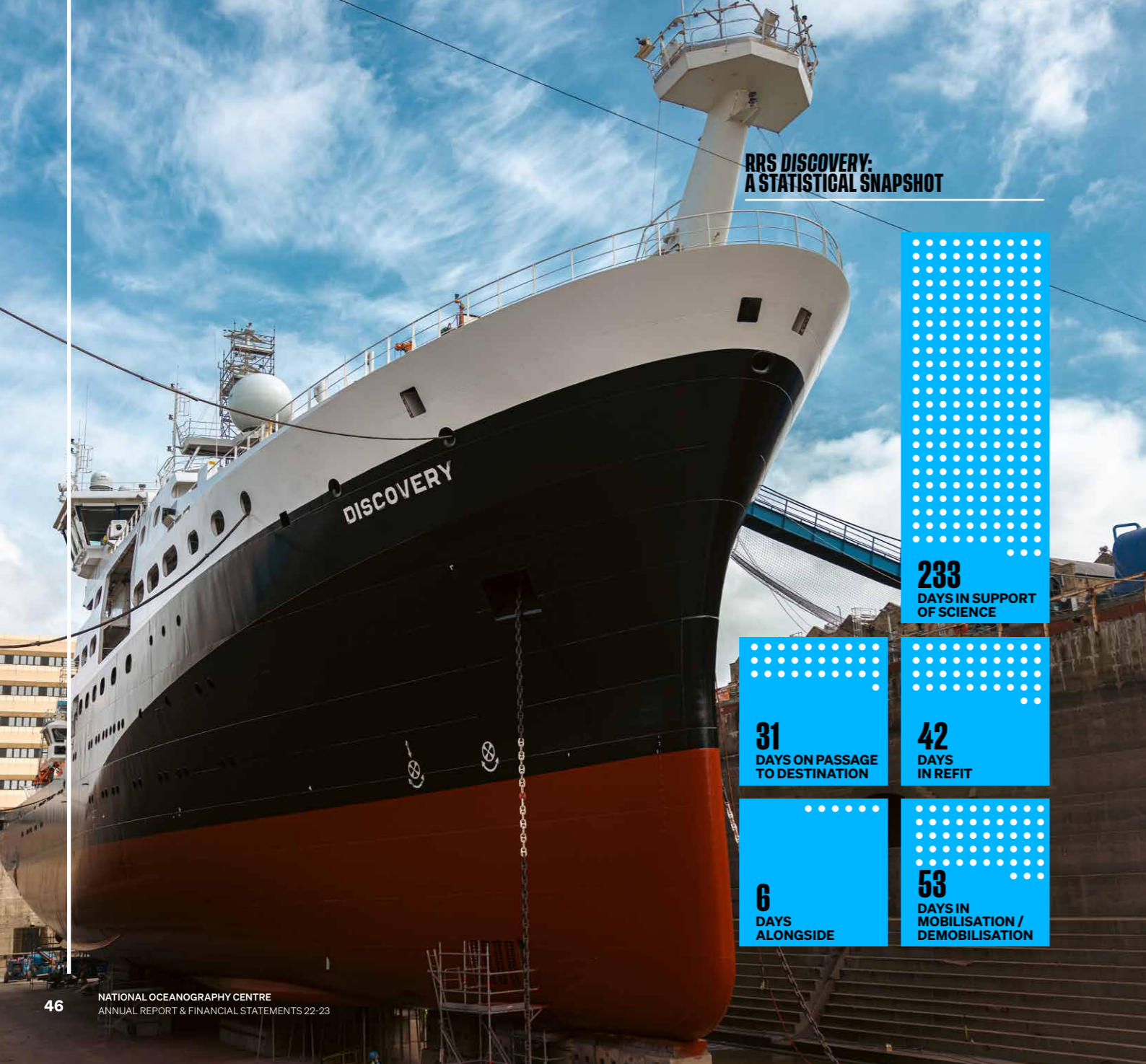
In the ever-evolving landscape of scientific exploration, the NOC-operated research ships; RRS *Discovery* and RRS *James Cook*, have embarked on remarkable journeys in a testament to global co-operation and shared aspirations.

The newly painted hull of the RRS *Discovery* being inspected

REFIT IN ROSYTH

RRS *Discovery* was the first UK Royal Research Ship to be refitted in Babcock's Rosyth facilities as part of the Government's £45 million award to maintain its flagship scientific research vessels.

During its time in dry dock the maintenance crew were able to clean the hull and propulsion equipment, which has lowered fuel usage and increased overall speed making RRS *Discovery* more efficient.



RRS DISCOVERY: A STATISTICAL SNAPSHOT

233
DAYS IN SUPPORT
OF SCIENCE

31
DAYS ON PASSAGE
TO DESTINATION

42
DAYS
IN REFIT

6
DAYS
ALONGSIDE

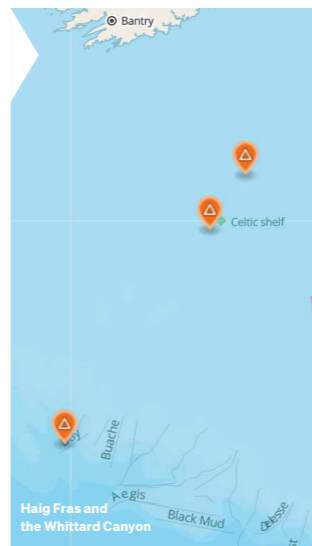
53
DAYS IN
MOBILISATION /
DEMOBILISATION

DY166

Led by NOC engineers, technologists and data experts, this mission focused on our innovative marine technology.

Rigorous testing of our latest autonomous underwater vehicles proved their readiness for integration into the National Marine Equipment Pool (NMEP). These trials pushed technological boundaries, offering the science community advanced tools for better understanding the ocean's impact on climate and biodiversity.

We also launched our updated online live tracker for all the ships and vehicles, providing easier access and a streamlined user experience so anyone can follow along on our missions and expeditions.

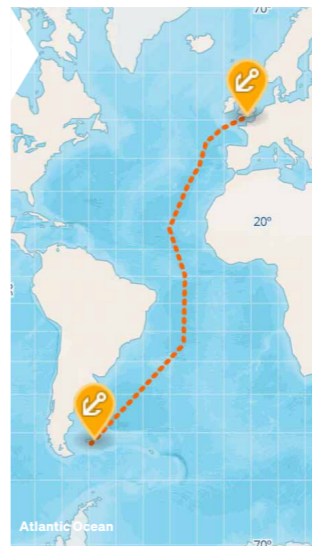


DY157

The expedition to the Atlantic Meridional Transect (AMT), led by the Plymouth Marine Laboratory (PML), was a scientific odyssey across the Atlantic Ocean.

A collaborative effort of international marine scientists, they gathered crucial data on the ocean's properties and ecosystems. By sampling at various depths and latitudes, the expedition deepened our understanding of the ocean's role in climate dynamics and marine life.

This voyage exemplified global co-operation and the pursuit of knowledge, providing insights that will inform conservation and climate change mitigation.

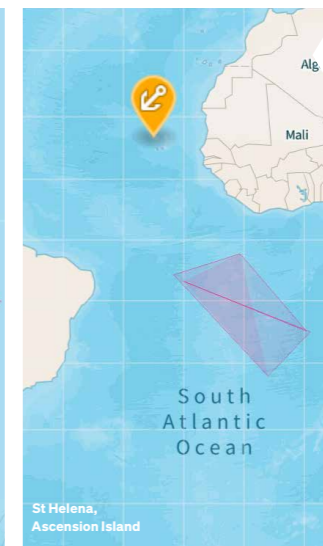


Map imagery credit @Mapbox

DY158

The expedition to the Southern Ocean with the British Antarctic Survey (BAS), saw us supply twenty-two crew members and six highly skilled technicians who provided underwater sensor technology and enabled the facilitation of marine data gathering.

BAS provided the scientific expertise to understand the long-term variability in krill biomass and the influences from climate variability, fishing pressure and predation. The expedition also included the rapid reroute to explore the nearby A76A iceberg [SEE NAVIGATING THE WORLD'S LARGEST ICEBERG - PAGE 24](#).



DY159

RRS Discovery took a CEFAS-led team of researchers on a six-week voyage from Southampton to the remote British Overseas Territories of Ascension Island and St Helena, supported by the UK Government's Blue Belt Programme.

A collaborative effort of marine scientists, ecologists, and oceanographers, this mission utilised cutting-edge technology to unveil the biodiversity and intricate ecosystems of these uncharted waters. The expedition's findings could offer essential insights for the conservation of these fragile marine environments and inform future policies.



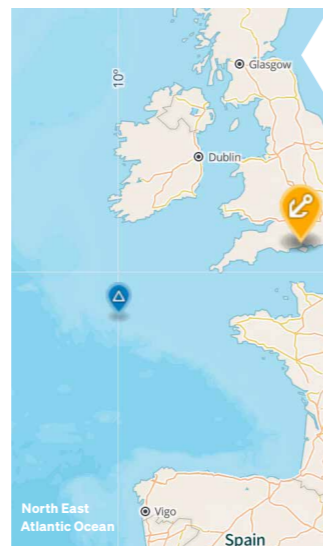
JG243

Under the leadership of Fisheries and Oceans Canada (DFO), this charter played a pivotal role in continuing the Atlantic Zonal Monitoring Program.

Starting in 1998, these annual expeditions focus on the comprehensive collection and analysis of biological, chemical, and physical oceanographic data. Since 2000, the program has consistently produced the State of the Ocean Condition Report, contributing significantly to the scientific communities understanding of the Atlantic Ocean's health and dynamics. We've also signed a 5 year collaborative framework agreement with DFO and Natural Resources Canada. This will see further charters and opens more collaborative opportunities.



Canadian Waters, Newfoundland and Labrador Shelf



North East Atlantic Ocean

JG247

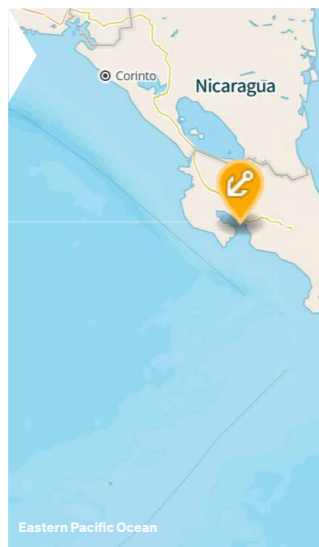
Part of the NERC funded Climate Linked Atlantic Sector Science project (CLASS), NOC scientists visit PAP-SO every year to take samples, make new observations, and maintain the autonomous in situ infrastructure, such as a large surface ocean mooring operated in collaboration with the Met Office.

We deliver the latest observations and data to study causes and consequences of multi-decadal change in the North East Atlantic and collect data to monitor essential ocean variables such as ocean temperature and salinity, carbon dioxide, oxygen, nutrient content, particulate matter, and the abundance of phytoplankton, zooplankton, and sea-floor invertebrates.

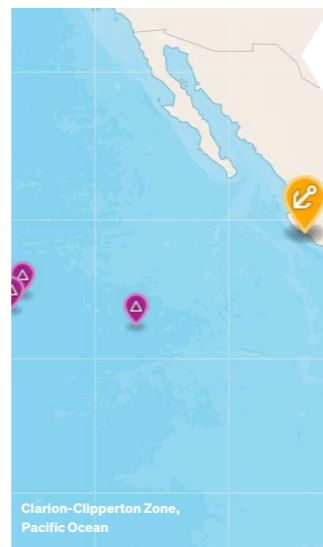
JG228

Led by the Helmholtz Centre for Ocean Research Kiel and University of Southampton this expedition delivered key information about changes in the Earth's crust beneath the sea.

Using tools like seismic instruments and underwater robots, scientists looking for clues about rock formations and the timing of certain geological processes, like the transformation of rocks into serpentine. They collected samples and mapped the ocean floor to enhance our understanding of Earth's history and its ongoing transformations.



Eastern Pacific Ocean



Clarion-Clipperton Zone, Pacific Ocean

JG241

NOC researchers embarked on a month-long research expedition from Costa Rica to the Central Pacific to understand the possible impacts of deep-sea extraction of polymetallic nodules on the seabed.

The findings will provide the critical scientific understanding to reduce the risk of extracting these nodules in a 6 million km² region of the central Pacific Ocean. The project is one of four from NOC currently endorsed as a UN Ocean Decade Action and supports our commitment to the United Nation Sustainable Development Goals **LEARN MORE: DECADE OF OCEAN SCIENCE - PAGE 56.**

RRS JAMES COOK: A STATISTICAL SNAPSHOT

54
DAYS ON PASSAGE TO DESTINATION

71
DAYS IN REFIT

0
DAYS ALONGSIDE

49
DAYS IN MOBILISATION / DEMOBILISATION

191
DAYS IN SUPPORT OF SCIENCE





BRINGING SCIENCE TO BIG CHALLENGES

ADDRESS ISSUES OF NATIONAL IMPORTANCE REQUIRING INTER- NATIONAL SCIENCE; A STRONG EMPHASIS IN GLOBAL INFLUENCE

In our contemporary world, the challenges confronting the ocean are intricate, interwoven issues that extend beyond mere geographic borders. NOC bridges this gap through holistic, cooperative approaches that unite experts from diverse fields to confront pressing matters head-on.

Our goal is to nurture international collaborations that not only push the boundaries of scientific knowledge but also contribute to the collective efforts of nations in addressing shared challenges. Guided by visionary leadership, we assume a pioneering role in tackling multifaceted issues, cementing our status as a global thought leader in the realm of multidisciplinary science.

OCEAN TAKES CENTRE STAGE AT UN CLIMATE CONFERENCE

We attended the 27th Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC).

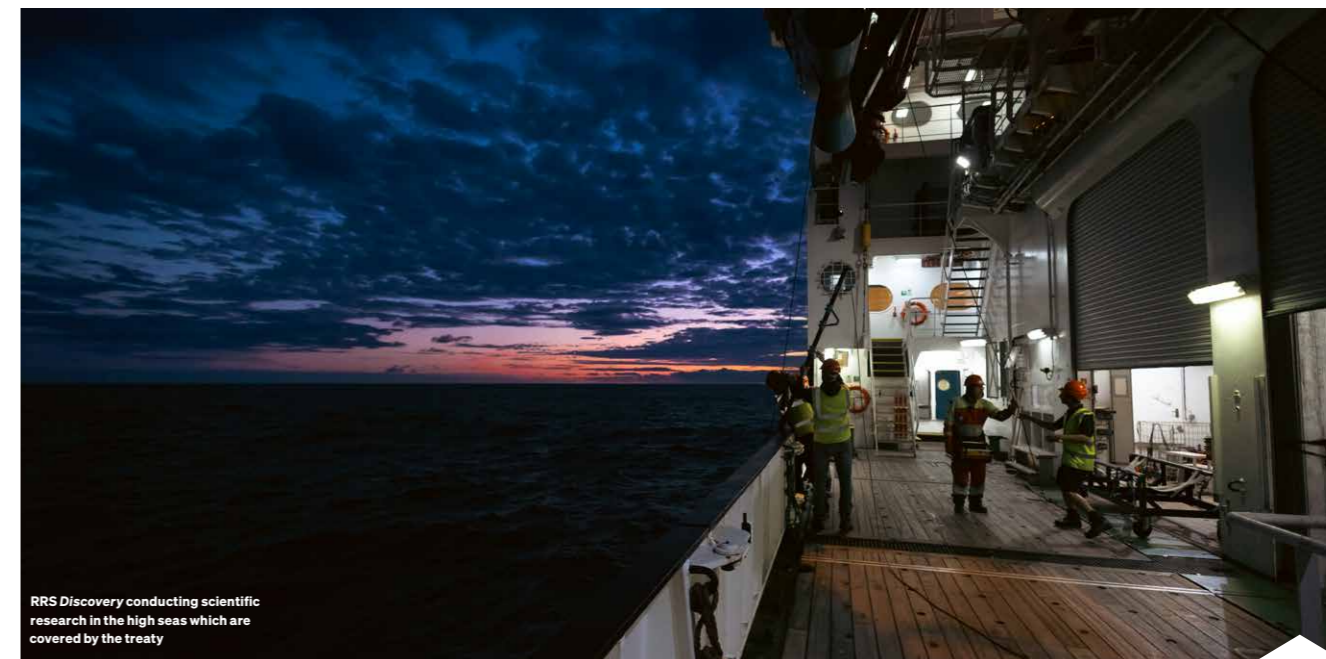
For the first time, the ocean was addressed in a dedicated sub-section, continuing the momentum initiated at COP26. This involved the commitment to an ongoing formal ocean and climate change dialogue process.

Furthermore, the plan encouraged participating nations to consider ocean-based actions within their national climate goals, emphasising the potential of the ocean in achieving climate and sustainable development objectives.

We were present to advise in our official capacity as UK delegation and to open the brand new Ocean Pavilion. This collaboration space brought together leading oceanographic institutions, including NOC, to facilitate scientific briefings on topics such as; digital twins of the ocean, blue carbon, ocean observations, and ocean acidification.



Scientific conference held in the Ocean Pavilion, a collaboration between oceanographic institutions from around the world



RRS Discovery conducting scientific research in the high seas which are covered by the treaty

KEY ROLE IN HISTORIC HIGH SEAS TREATY SIGNING

Global media took a big interest in the signing of the High Seas Treaty back in March 2023, with NOC's Alan Evans appearing on TV to speak about the historic moment:

“A critical outcome of the new Treaty is the ability to more readily realise the target of establishing 30% of the global ocean as Marine Protected Areas (MPAs) by 2030. Prior to the Treaty there was no means for States to declare MPAs beyond their national jurisdiction. As such the new Treaty supports a holistic ocean governance framework to implement the obligations to protect and preserve the marine environment as included in the United Nations Convention on the Law of the Sea (UNCLOS).

If you look at industries that could broaden their scope onto the High Seas, or new emerging opportunities, there was no mechanism in place to ensure robust oversight. The new Treaty now provides a framework where environmental risk assess-

ments will have to take place and need to be inclusive by way of broad consultation with stakeholders. Such obligations will support the desire to conserve the inherent value of biodiversity of areas beyond national jurisdiction.

This is a truly historic agreement that will strengthen governance of the world's ocean. The new Treaty goes beyond enabling protection, it also provides the framework to manage the ocean and sustainably use its biological resources, furthermore, it addresses the imbalance of those who can and cannot contribute to management of the ocean by way of provisions that bring about equity such that every State can contribute to a truly global effort to better manage our one shared ocean.”

Alan served as a technical adviser to the UK Government in the BBNJ JIGCs, offering practical insights and bringing in subject domain experts for specialist issues.

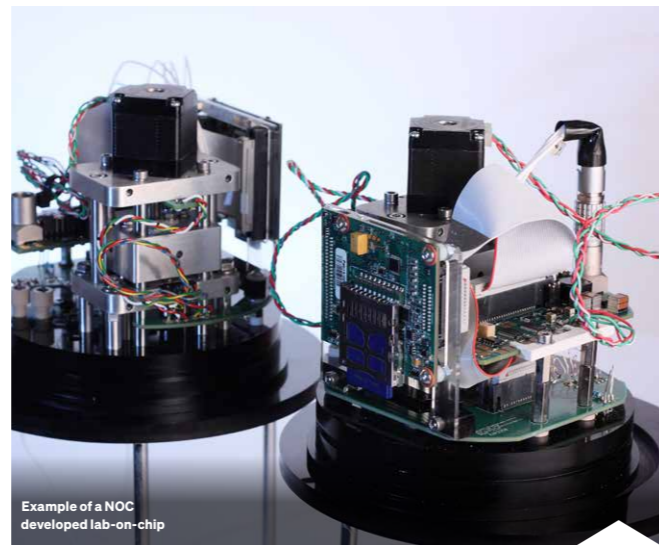
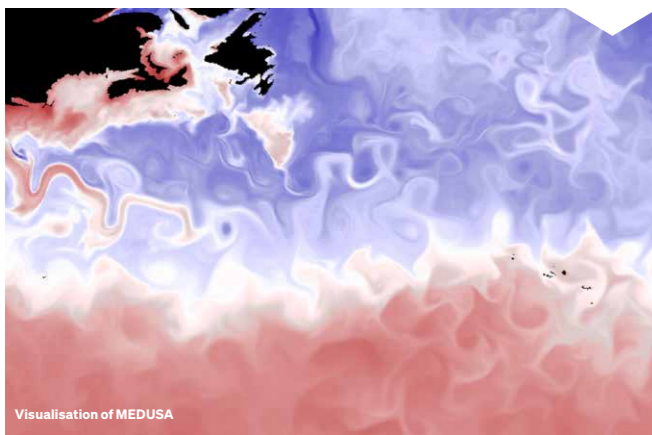
MODELLING MEDUSA

NOC is at the forefront of ocean modelling, engaging in two ground-breaking modelling endeavours, NEMO and UKESM, which have played significant roles in advancing the evolution of MEDUSA, the marine ecosystem model created and developed by NOC.

NEMO is a state-of-the-art ocean physics framework utilized across both oceanography and climate science for research, operational and climate forecasting purposes. It has been developed through collaborative efforts with European partners, ensuring its long-term reliability and sustainability.

The UK Earth System Model (UKESM) is another cutting-edge model, developed through the close co-operation of a core team of UK scientists drawn from the Met Office and NERC research centres, including NOC. From its surface waters to its abyssal depths, MEDUSA represents the ecology and biogeochemistry of the ocean, and serves as a key tool for addressing contemporary marine topics. As well as research questions, MEDUSA's simulation of living systems from coastal regions to the open ocean informs policy, from fisheries and marine amenities through to nature-based solutions for achieving net-zero.

By integrating MEDUSA into both the NEMO and UKESM modelling frameworks, we bolster our ability to simulate and understand the intricate relationships within marine ecosystems and with the wider Earth system. This collaborative approach of NOC empowers researchers and policymakers to confront marine and environmental challenges directly, providing them with valuable insights into the complex web of life that exists beneath the ocean's surface.



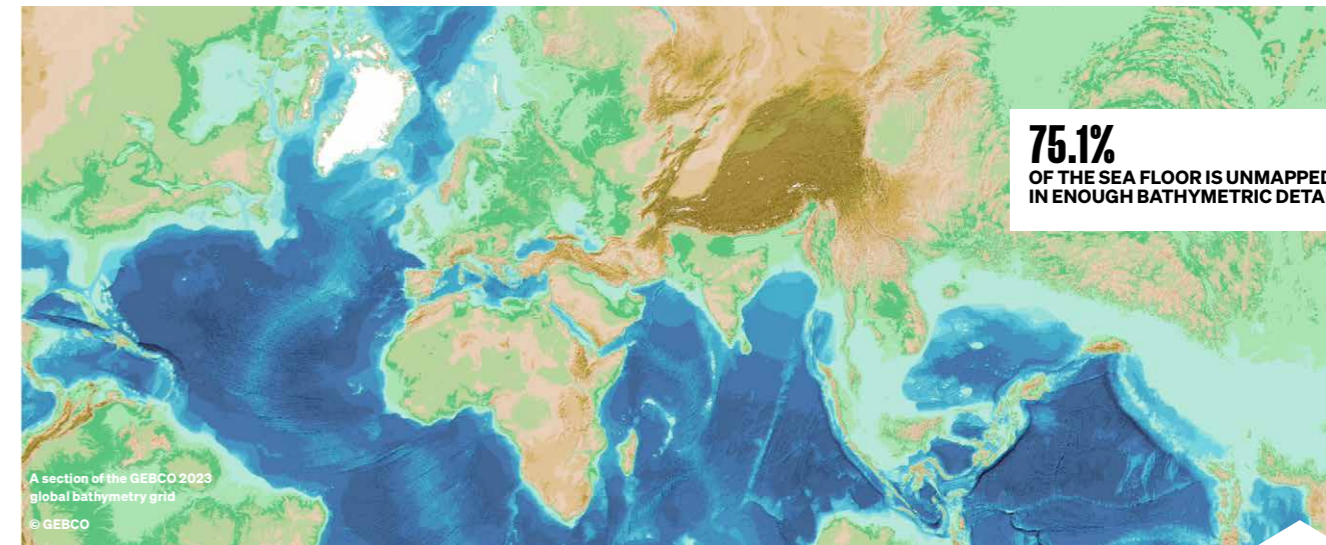
LEADING CCS INNOVATIONS FOR CLIMATE MITIGATION

We are at the forefront of collaborative efforts with both government and industry to research and develop Carbon Capture and Storage (CCS) as a sustainable and safe solution in the fight against climate change.

CCS is a critical technology that involves capturing carbon dioxide (CO₂) emissions from industrial processes and power plants and then safely storing them underground to prevent their release into the atmosphere. We pioneer novel chemical sensors, including lab-on-chip sensors, to detect and quantify CO₂ releases in offshore environments.

Project Greensand advances these technologies to create a robust CCS monitoring system, ensuring long-term integrity and compliance with regulatory requirements. This ensures that stored CO₂ remains contained and does not pose risks to the environment or human health. We have also collaborated closely with government agencies and industry partners to inform CCS regulations, policies, and best practices.

This collaboration ensures that CCS can be deployed safely and effectively on a large scale. Our commitment to CCS research underscores our dedication to addressing climate change by advancing innovative and climate solutions **LEARN MORE: OCEAN-DRIVEN CLIMATE SOLUTIONS - PAGE 15.**



MAPPING 24.9% OF THE WORLD'S OCEAN FLOOR

An additional 5.4 million square kilometres of data, equivalent to an area twice the size of Argentina, has been added to the map of the world's ocean floor. This means that 24.9% of the seabed is now mapped, a feat celebrated during the International Hydrographic Organization (IHO) Assembly in Monaco, where HSH Prince Albert II of Monaco made the announcement.

The global initiative to map the entire ocean floor by 2030 is led by Seabed 2030, a collaborative project between The Nippon Foundation and the General Bathymetric Chart of the Ocean (GEBCO), a joint program of the IHO and the Intergovernmental Oceanographic Commission of UNESCO. NOC's British Oceanographic Data Centre (BODC), plays a pivotal role as the Global Centre for Seabed 2030.

This project is essential for informing decisions related to resource management, environmental changes, and ocean conservation, aligning directly with UN Sustainable Development Goal 14, which focuses on conserving and sustainably using the ocean.

Pauline Weatherall, NOC Data Scientist and GEBCO Digital Atlas Manager, said:

"In the year that marks the 120th anniversary of the initiation of the GEBCO chart series, we are proud to continue BODC's role in managing and delivering GEBCO's

global bathymetric grid on behalf of the project and our continuing collaboration with the Seabed 2030 Regional Centres and wider sea-floor mapping community."

Seabed 2030, established during the UN Decade of Ocean Science, addresses the challenge of mapping the ocean floor. Since 2017, it has made significant progress, acquiring 90 million square kilometres of bathymetric data through global partnerships. Discoveries include a catalogue of over 19,000 undersea volcanoes, advancing ecology and oceanography. Challenges like the vast ocean scale persist, but Seabed 2030 prioritizes capacity building through initiatives like The Nippon Foundation's GEBCO training program and the IHO's Empowering Women in Hydrography, fostering a diverse community of ocean mappers aligned with UN development goals.

As we celebrate GEBCO's 120th anniversary, we reflect on the significant progress made over the past century and look ahead to the exciting discoveries and accomplishments yet to come in our ongoing exploration of the world's ocean.

DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT

The Ocean Decade provides a common framework to ensure that ocean science can fully support countries to achieve the 2030 Agenda for Sustainable Development.

The Agenda recognises that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, all while tackling climate change and working to preserve our ocean and forests.

This year we've had several more programmes, projects and initiatives officially endorsed as part of the Ocean Decade, in addition to those in 2021/22; FLAME, ATLANTOS, SMARTEX, WORMS and DITTO.

THE SCIENCE WE NEED FOR THE OCEAN WE WANT

The seven Ocean Decade Outcomes describe the ocean we want:



A CLEAN OCEAN where sources of pollution are identified and reduced or removed.



A HEALTHY AND RESILIENT OCEAN where marine ecosystems are understood, protected, restored and managed.



A PRODUCTIVE OCEAN supporting sustainable food supply and a sustainable ocean economy.



A SAFE OCEAN where life and livelihoods are protected from ocean-related hazards.



AN ACCESSIBLE OCEAN with open and equitable access to data, information and technology and innovation.



A PREDICTED OCEAN where society understands and can respond to changing ocean conditions.



AN INSPIRING AND ENGAGING OCEAN where society understands and values the ocean in relation to human wellbeing and sustainable development.

10 CHALLENGES

The UN Ocean Decade presents a bold vision and mission for addressing the pressing issues facing our ocean. The vision, succinctly encapsulated in the phrase; the science we need for the ocean we want, underscores the importance of scientific innovation and collaboration in shaping a sustainable future for our ocean.

The mission of the Ocean Decade is to harness transformative ocean science solutions that will support sustainable development, fostering connections between people and the ocean. Only by taking on and overcoming these 10 Challenges can we realise the seven vital Ocean Decade Outcomes;



CHALLENGE 01: UNDERSTAND AND BEAT MARINE POLLUTION

Understand and map land and sea-based sources of pollutants and contaminants and their potential impacts on human health and ocean ecosystems and develop solutions to remove or mitigate them.



CHALLENGE 02: PROTECT AND RESTORE ECOSYSTEMS AND BIODIVERSITY

Understand the effects of multiple stressors on ocean ecosystems, and develop solutions to monitor, protect, manage and restore ecosystems and their biodiversity under changing environmental, social and climate conditions.



CHALLENGE 03: SUSTAINABLY FEED THE GLOBAL POPULATION

Generate knowledge, support innovation, and develop solutions to optimise the role of the ocean in sustainably feeding the world's population under changing environmental, social and climate conditions.



CHALLENGE 04: DEVELOP A SUSTAINABLE AND EQUITABLE OCEAN ECONOMY

Generate knowledge, support innovation, and develop solutions for equitable and sustainable development of the ocean economy under changing environmental, social and climate conditions.



05: UNLOCK OCEAN-BASED SOLUTIONS TO CLIMATE CHANGE

Enhance understanding of the ocean-climate nexus and generate knowledge and solutions to mitigate, adapt and build resilience to the effects of climate change across all geographies and at all scales, and to improve services including predictions for the ocean, climate and weather.



CHALLENGE 06: INCREASE COMMUNITY RESILIENCE TO OCEAN HAZARDS

Enhance multi-hazard early warning services for all geophysical, ecological, biological, weather, climate and anthropogenic related ocean and coastal hazards, and mainstream community preparedness and resilience.



CHALLENGE 07: EXPAND THE GLOBAL OCEAN OBSERVING SYSTEM

Ensure a sustainable ocean observing system across all ocean basins that delivers accessible, timely, and actionable data and information to all users.



CHALLENGE 08: CREATE A DIGITAL REPRESENTATION OF THE OCEAN

Through multi-stakeholder collaboration, develop a comprehensive digital representation of the ocean, including a dynamic ocean map, which provides free and open access for exploring, discovering, and visualizing past, current, and future ocean conditions in a manner relevant to diverse stakeholders.



CHALLENGE 09: SKILLS, KNOWLEDGE AND TECHNOLOGY FOR ALL

Ensure comprehensive capacity development and equitable access to data, information, knowledge and technology across all aspects of ocean science and for all stakeholders.



CHALLENGE 10: CHANGE HUMANITY'S RELATIONSHIP WITH THE OCEAN

Ensure that the multiple values and services of the ocean for human wellbeing, culture, and sustainable development are widely understood, and identify and overcome barriers to behaviour change required for a step change in humanity's relationship with the ocean.



OSA includes case studies of countries in the Western Indian Ocean

EXPANDING EDUCATIONAL VIDEO VAULT

Ocean Science in Action (OSA) is now available for free on our website, offering an exciting collection of educational videos. OSA is all about exploring cutting-edge marine technologies and their role in preserving our ocean.

In these videos, you'll dive into the world of marine robotics, remote sensing, and ocean modelling. We take you on a journey through the Indian Ocean, showcasing real-life examples of how these technologies are used. From protecting artisanal fisheries to preserving vital blue carbon ecosystems and supporting coastal communities facing the impacts of climate change, OSA covers it all.

What makes OSA special is its global collaboration. We partner with various research projects to create an ever-expanding library of engaging video lectures. These videos demonstrate how marine science plays a crucial role in achieving the UN Sustainable Development Goals and addressing the challenges of the Ocean Decade 2030.

Originally designed for a SOLSTICE Project MOOC and hosted by FutureLearn, OSA is now open to everyone. Whether you're a student, a curious mind, or an ocean enthusiast, these videos offer a unique opportunity to learn about marine science in action.

ADDRESSING UN OCEAN DECade CHALLENGES:



ALLIANCE EXPANDS ROV SENSORS FOR CLIMATE RESEARCH

The BORA Blue Ocean Research Alliance®, a partnership between NOC and Subsea7, expanded the fleet of Subsea7 Remotely Operated Vehicles (ROVs) operating with an integrated BORAbox® following a successful prototype trial in 2022.

Information gathered by the BORAbox®, an integrated suite of sensors developed by our scientists, feeds into a global understanding of climate change and its impact on the ocean. As a result, the research will be used by scientists to better predict how the ocean and weather systems will react over the coming decades.

By combining our scientific prowess with Subsea7's global reach through its diverse fleet, we're ramping up the delivery of marine research around the world for the benefit of humanity. The BORA Blue Ocean Research Alliance® is an example of how research institutions and businesses can partner together to make sense of the changing seas.



The BORAbox® integrated suite of sensors developed through a partnership between NOC and Subsea7



Dr John Siddorn championing the emerging field of digital twin technology

ADVANCING ENVIRONMENTAL DIGITAL TWINS FOR RESEARCH

Building upon the comprehensive Information Management Framework for Environmental Digital Twins (IMFe) roadmap we established in 2021, we are creating a robust foundation for secure, resilient, and interoperable environmental digital twins.

The next big paradigm shift in the way we forecast our world, digital twins are virtual representations of real-world objects or systems that evolve with real-time observations. They hold immense potential to enhance our comprehension of the natural environment. By consolidating data from diverse sources, environmental digital twins can provide invaluable insights into current and future societal challenges.

The Pilot IMFe project embodies the roadmap's principles by creating a digital twin for the Haig Fras Marine Protected Area, an endorsed UN Ocean Decade Action. It also establishes a public digital twin asset register for reusable components, promoting interoperability across projects and maximising impact on environmental research. In collaboration with IMFe roadmap partners NERC/UKRI and the Met Office, the project advances digital capabilities through global cooperation.

ADDRESSING UN OCEAN DECADE CHALLENGES:



CARBON'S ROLE IN TACKLING CLIMATE CHANGE

The ocean plays a crucial role in absorbing vast amounts of carbon dioxide (CO₂) that would otherwise be present in our atmosphere. Marine organisms are central to this carbon storage process.

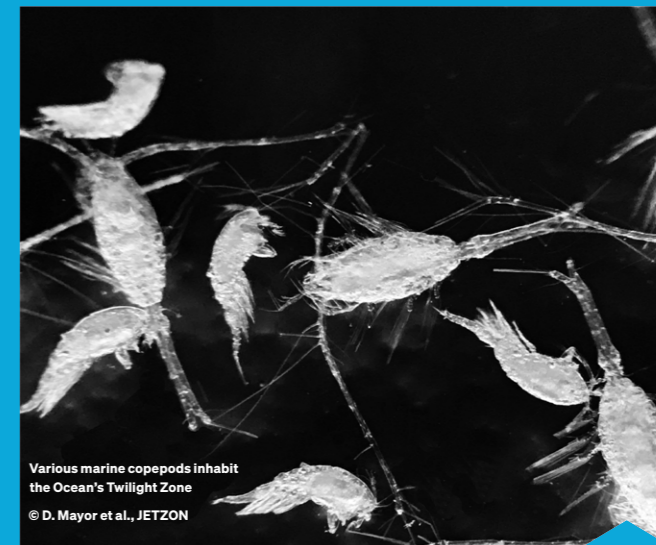
However, recent research suggests that existing climate models may not fully consider their impact, which can undermine carbon policies and national net-zero targets. NERC's BIO-Carbon programme is dedicated to advancing our comprehension of biological processes in the ocean and providing reliable predictions about how the ocean will store carbon in a changing climate.

This endorsement by the UN Ocean Decade acknowledges the vital contribution of BIO-Carbon in addressing this global concern. NOC's Dr Adrian Martin, BIO-Carbon champion, emphasises the importance of this endorsement, highlighting the UK's significant contribution to addressing a pressing worldwide issue.

ADDRESSING UN OCEAN DECADE CHALLENGES:



A sediment trap being deployed to help us understand the movement and storage of carbon



Various marine copepods inhabit the Ocean's Twilight Zone
© D. Mayor et al., JETZON

UNLOCKING THE SECRETS OF THE OCEAN'S TWILIGHT ZONE

The Joint Exploration of the Twilight Zone Ocean Network (JETZON) programme led by NOC, sheds light on one of the most mysterious and crucial parts of our planet. Known also as the mesopelagic zone, it's the layer of the ocean situated between the sunlit surface waters and the dark, abyssal depths below.

JETZON is a collaborative effort involving scientists from around the world, all joining forces to unlock the secrets hidden within this crucial part of the ocean. The twilight zone is home to a wide array of unique and often undiscovered species, some of which play a vital role in the planet's carbon cycle.

By understanding the creatures and processes of the twilight zone, we can gain crucial insights into climate change, marine ecosystems, and even potential new sources of food and medicine. The exploration network employs advanced technologies gather data and images from the depths, enabling a clearer picture of this mysterious world.

ADDRESSING UN OCEAN DECADE CHALLENGES:





UNDERPINNED BY SUSTAINABILITY AND SOCIAL RESPONSIBILITY

NOC's commitment to sustainability and social responsibility (SSR) is the compass that guides its research, innovation, and outreach activities. It shapes our decisions, influences partnerships, and ultimately, helps create a more sustainable, equitable, and prosperous world. Through this commitment, we showcase the importance of aligning scientific endeavours with ethical principles, setting a powerful example for organisations and individuals worldwide.



PEOPLE+CULTURE

NOC thrives because of the dedication and talent of our people, who work collectively towards our purpose. Our dedicated and diverse teams, including scientists, engineers, researchers, and support staff, forms the core of our organisation.

Our People & Culture 2020/25 Strategy continues to commit us to high standards of employee engagement, making employee well-being a priority and ensuring that our people work in an environment that respects and appropriately rewards them.

The Wellness Day would not have been possible without the dedication of the Culture Club

CULTURE CLUB

With NERC funding, we introduced a dedicated Cultural Cohesion Lead with resource to champion Diversity, Inclusion, and Cultural Development.

This is enabled through the new Culture Club with a strategic focus to foster an inclusive internal culture, aligning with existing strategies like Sustainability and Social Responsibility (SSR), Diversity, Equity and Inclusion (DEI), People and Culture, Marketing, and Health, Safety, and Well-being. We collaborate with recruitment, retention, reward, and recognition teams to integrate cultural considerations.

The Club was pivotal in supporting the Pride, Carers Community and Black History Month (coming October 2023), along with a staff blog for sharing experiences and allyship.

UNITE IN PRIDE

Across all four sites, from ships to shore, we proudly hosted our inaugural Progress flag-raising event during Pride Month, a global celebration of LGBTQIA+ rights and achievements, and a poignant reminder of the ongoing fight for equality. Our active participation in this celebration underscores the pivotal role diversity plays in propelling innovation and progress across diverse fields, such as academia, oceanography, and engineering.

The flag-raising event was a powerful moment of connection, uniting LGBTQIA+ staff and allies in a resounding message of solidarity. This spirit extended throughout the month, with the creation and sharing of various resources, including staff-authored blogs, posters, and educational materials.



The Culture Club were instrumental in our first Pride Flag raising event

LIVING LEADERSHIP

We recognise the pivotal role that strong, visionary leadership plays in fostering innovation, driving transformation, and enabling teams to reach their full potential. To ensure that our senior leadership team are equipped with these essential skills and capabilities, we implemented the Living Leadership Programme.

However, leadership is not merely about seniority. Leaders can be found across the organisation, guiding and motivating individuals toward a shared vision and fostering a culture of continuous improvement. Thus, to support all our line managers we continue to invest in our world-class manager programme.



Dr Maaten Furlong who became a member of the Executive Committee in 2023



Dr Elena Garcia-Martin sharing her experience working in STEM

DR ELENA GARCIA-MARTIN

This International Women's Day Dr Elena Garcia-Martin shared her own personal story of studying marine science and working for the ocean at a special STEM event hosted by the Southern Universities Network.

Elena said:

"For years women have been under-represented in science, technology, engineering and mathematics (STEM) degrees and occupations. I talk about the gender gap and why we are so few, my personal experiences while studying Marine Science and working in oceanography, and what can be done to balance the numbers."



The resident mother duck caring for the baby ducks in the NOC Southampton courtyard

CARERS COMMUNITY

Launched during Carers Week 2023, our Carers Community provides support and assistance to employees who are caring for children or adults, recognising the challenges they face in balancing care-giving responsibilities with work.

The community has hosted sessions in both Liverpool and Southampton, offering a platform for sharing practical advice, experiences, and solutions, creating a supportive network within the NOC family.

While acknowledging that none of its members are experts, the community emphasises the value of collective learning and support, providing a safe space for NOC staff to navigate the challenges of care giving while pursuing their careers.

DR PAULINE WEATHERALL MBE

We were incredibly proud of Pauline Weatherall, who was honoured with an MBE for her outstanding contributions to bathymetry, the science of mapping the sea floor. Pauline serves as the Digital Atlas Manager for the General Bathymetric Chart of the Ocean (GEBCO), the definitive map of the world's ocean floor.

For over three decades, Pauline's dedication has revolved around gathering digital seabed data from across the globe and integrating it to enhance and continually update the world ocean seabed map. This map is a vital resource, providing authoritative bathymetry data sets for the world's ocean. In recent years, GEBCO's map has become the cornerstone of the Seabed 2030 project, a global endeavour aimed at detailed mapping of the entire world ocean by 2030.

Pauline's expertise has earned her international recognition. She has contributed to numerous ground-breaking reports, including the Intergovernmental Oceanographic Commission of UNESCO's State of the Ocean Report. Her efforts have significantly advanced our understanding of the ocean floor's depth and shape, crucial for comprehending ocean phenomena, environmental changes, underwater hazards, and much more.



Dr Pauline Weatherall MBE has continually worked to enhance the world ocean seabed map

OUR PEOPLE: A STATISTICAL SNAPSHOT

36.03%
OF WORKFORCE IDENTIFY AS FEMALE

32.65%
OF PEOPLE MANAGERS IDENTIFY AS FEMALE

80%
OF EMPLOYEES AGREE NOC IS A GREAT PLACE TO WORK

70%
OF WORKFORCE HAVE ACTIVE BYSTANDER TRAINING

90.60%
OF MANAGERS COMPLETE DEVELOPMENT PROGRAMME

67.65%
OF WORKFORCE ARE ON CLG TERMS & CONDITIONS

11
EMPLOYEE'S TRAINED AS MENTAL HEALTH FIRST AIDERS

28
EMPLOYEE'S WITH FORMAL FLEXIBLE WORKING

175
VACANCIES FILLED



DR SVETLANA JEVREJEVA

Dr Svetlana Jevrejeva achieved remarkable recognition by winning the prestigious International Journal of Climatology Editors Award for 2022. This award is a testament to her outstanding contributions in the field of weather, climate, and related disciplines. Svetlana was part of a dedicated team of authors, including Mike Kendon and Dr Mark McCarthy from the Met Office, Professor Tim Sparks, a volunteer with the Woodland Trust, and other co-authors.

Together, they have been annually producing the State of the UK Climate Report, which have been published as a Special Supplement to the International Journal of Climatology since 2017.

This recognition is a testament to the dedication, commitment, and invaluable contributions made by Svetlana and her colleagues in monitoring and understanding the evolving climate patterns, which are critical for addressing challenges like coastal erosion, flood risk, and rising sea levels.



DR JOHN SIDDORN

The Alan Turing Institute, known for its expertise in data science and artificial intelligence (AI), launched the ground-breaking Turing Research and Innovation Cluster for digital twins (TRIC-DT). Dr John Siddorn, our Director of Data, Science and Technology and NOC Chief Scientist was appointed as the co-director of TRIC-DT. In this role, he leads a dynamic team of experts in the field of digital twins.

Since joining NOC in 2020, John has played a pivotal role in fostering growth and collaboration within the digital twin community. His contributions to the Information Management Framework for Environmental Digital Twins (IMFe) demonstrate his leadership in shaping digital twin innovation.

TRIC-DT aims to establish a knowledge exchange network to address critical societal challenges across multiple domains. It will focus on environmental sustainability, infrastructure resilience, and improving human health and well-being, collaborating closely with partner organisations to generate tangible societal benefits.



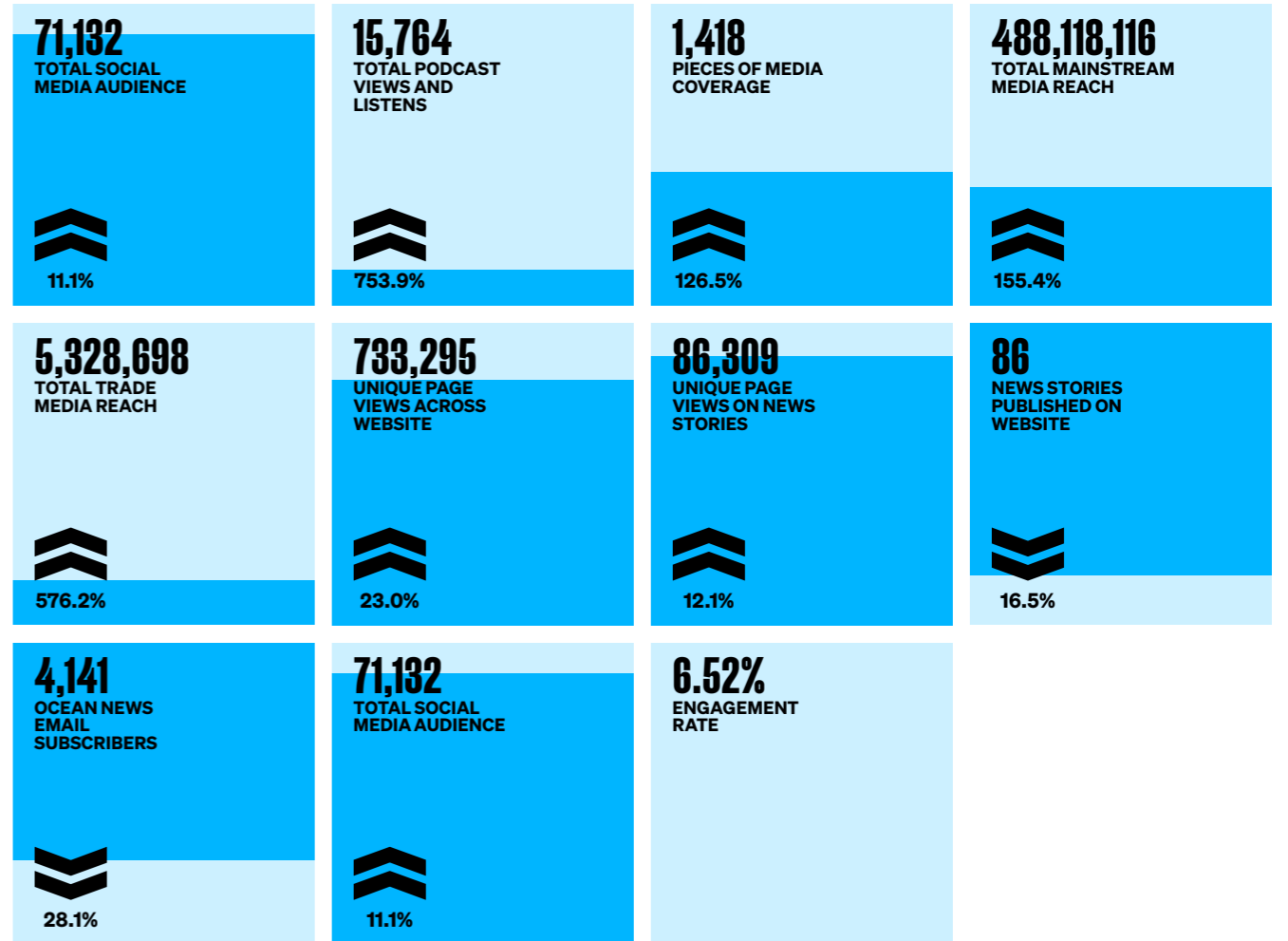
COMMUNITY+CULTURE

We recognise that our actions impact the local and global community, so we are committed to fostering positive relationships, knowledge sharing, and collaboration. Our engagement with the community extends from outreach and education initiatives to partnerships with local organisations, ensuring that our scientific research benefits society as a whole.

By prioritising community as a pillar of our SSR strategy, we strengthen our bonds and collective responsibility for the well-being of our planet's ocean and environment. This commitment reflects our dedication to creating a sustainable and inclusive future for all.

EDUCATION & OUTREACH: A STATISTICAL SNAPSHOT

Below is a visual comparison of this year's Education & outreach data compared to 2021/22*.



*for more information and to see the details of last year's performance, please read our Annual Report 2021/22

EVENTS 2023



GEBCO CONFERENCE



MENTAL HEALTH AWARENESS WEEK



PARLIAMENTARY RECEPTION FOR STAKEHOLDERS



OFFSHORE EUROPE 2023



OCEAN QUESTION TIME LABOUR PARTY CONFERENCE



WORLD OCEAN SUMMIT AND EXPO



MARINE AUTONOMOUS TECHNOLOGY SHOWCASE (MATS) 2023



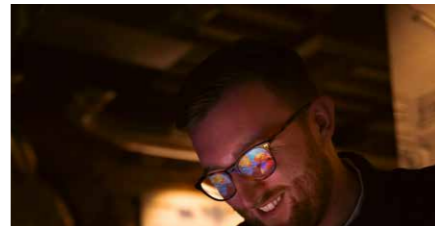
OCEAN BUSINESS 2023



SUMMER CELEBRATION AND VALUES AWARDS



OCEAN QUESTION TIME CONSERVATIVE PARTY CONFERENCE



BENEATH THE WAVES



UN CLIMATE CHANGE CONFERENCE (COP27)

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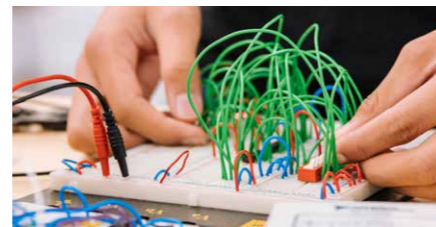
PROTECT OUR PLANET

PAGE 41



UNITE IN PRIDE

PAGE 65



INSPIRING STEM 2023

PAGE 42



MONSTERS OF THE DEEP

PAGE 42



SCIENCE IN WESTQUAY

PAGE 42



ENVIRONMENT+CULTURE

As an organisation dedicated to understanding the world's ocean, we recognise our profound responsibility to safeguard the environment in all that we do. This commitment extends to reducing our carbon footprint, conserving biodiversity, and championing sustainable practices in oceanography and marine research.

Our dedication to environmental stewardship aligns with our mission to advance knowledge, inform solutions, and foster a more sustainable coexistence with our planet's vital marine ecosystems.

LEARN MORE: STREAMLINED ENERGY AND CARBON REPORTING (SECR) - PAGE 96.

The LEAF standard aims to enhance the sustainability and efficiency of our laboratories

ENVIRONMENTAL MANAGEMENT REACCREDITATION

A big success this year was re-accreditation to ISO14001. The audit, conducted in January 2023, yielded outstanding results with zero non-conformities. This remarkable achievement underscores our unwavering commitment to environmental management excellence.

By maintaining the ISO14001 accreditation, we not only demonstrated our dedication to sustainability but also ensures that our operations aligned with the highest international standards. Such achievements are a testament to the collective efforts in promoting responsible environmental practices, setting a commendable example for organisations worldwide.

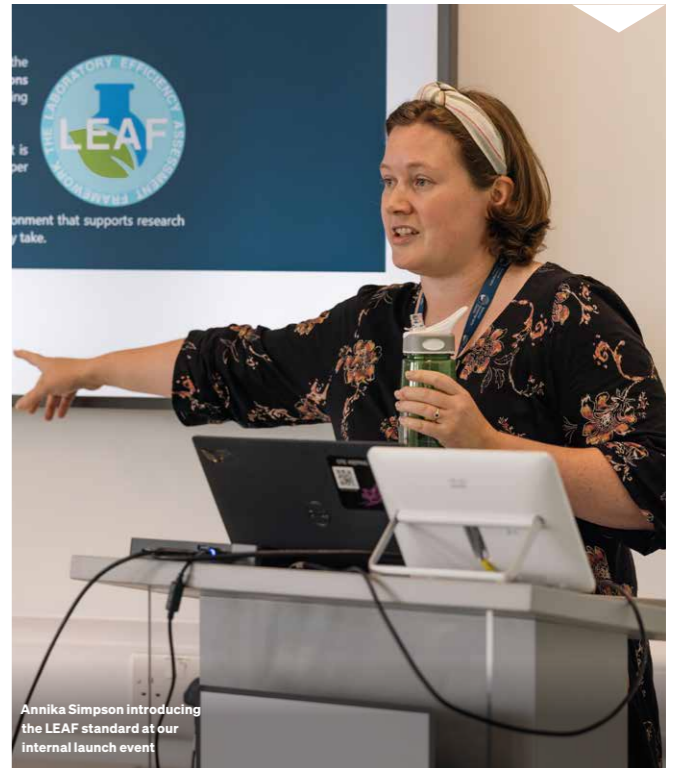


Our Estates team conducted a plastic waste audit as part of our continuous environmental improvements

LABORATORY EFFICIENCY ASSESSMENT FRAMEWORK

Our first three laboratories achieved Bronze accreditation from the Laboratory Efficiency Assessment Framework (LEAF) this year. LEAF is a globally recognised standard developed by University College London, designed to enhance the sustainability and efficiency of laboratories.

Participation in the LEAF program demonstrates our commitment to reducing carbon emissions within labs and workshops, fostering a research environment that upholds the highest standards of quality. We have set a challenging target to have Bronze in all labs by the end of 2023, Silver by the end of 2024, and Gold by end of 2025.



Annika Simpson introducing the LEAF standard at our internal launch event

ALTERNATIVE FUEL

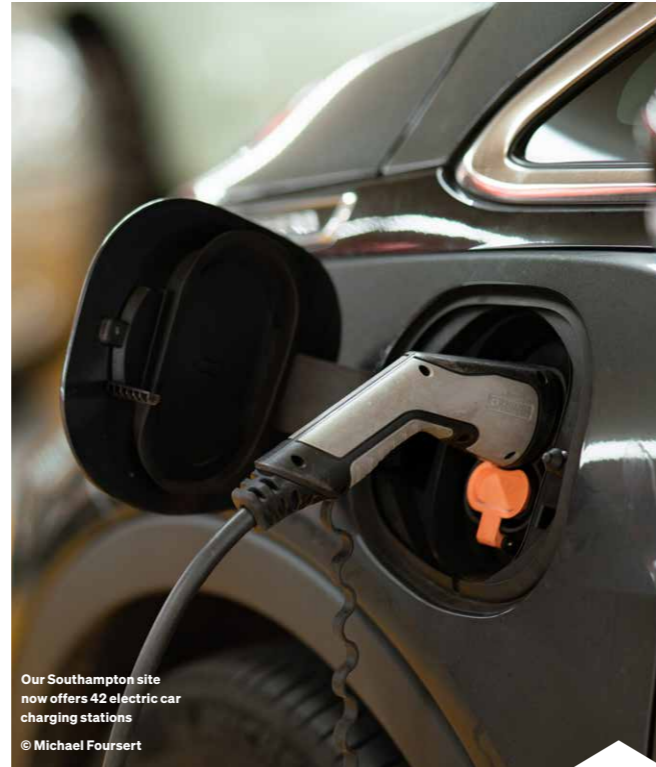
In collaboration with NERC, we are conducting a trial of Hydro-processed Vegetable Oil (HVO) as an alternative fuel source for the RRS James Cook and the RRS Discovery. This trial aims to reduce carbon emissions from marine science operations and aligns with NERC's goal to achieve 'net-zero' operational carbon emissions.

The sustainability, availability, cost, logistics, and emissions implications of HVO are carefully considered, including engagement with potential suppliers and regulatory bodies like the International Sustainability and Carbon Certification (ISCC) initiative.

As marine infrastructure accounts for a significant portion of NERC's carbon footprint, NOC's Marine Carbon Project is part of broader efforts to de-carbonise marine activities. Future actions include upgrading propulsion systems, facilitating renewable shore power supplies, and integrating carbon considerations into marine planning. The trial's outcomes will inform decisions on wider adoption, and findings will be shared with the marine industry to support its journey to net zero.



HVO trialled as an alternative fuel source for the RRS Discovery



Our Southampton site now offers 42 electric car charging stations
© Michael Foursert

ELECTRIC VEHICLE CHARGING POINTS

To further our commitment to environmental consciousness, we've significantly expanded our Electric Vehicle Charging points at our Southampton site, now offering 42 charging stations. This expansion not only promotes eco-friendly commuting for our staff but also lays the groundwork for an upcoming staff EV car scheme in the next financial year.

The charging points are part of our 100% green energy tariff, another great example of mitigating the carbon footprint associated with our purchased electricity.

Plus, we're always excited to demonstrate and encourage sustainable practices among our workforce while reducing our environmental footprint.



The Award winners were announced at the Leonardo Royal Grand Harbour Hotel
© Jim Linwood*

RECOGNITION FOR NET ZERO EMISSIONS

Our commitment to being a net zero organisation earned us a nomination for the Net Zero Navigator Award at the UK Maritime Solent Awards.

Our innovative collaborations, technology licenses, and dedication to reducing the carbon footprint of environmental research demonstrate our resolve to create a more sustainable world.

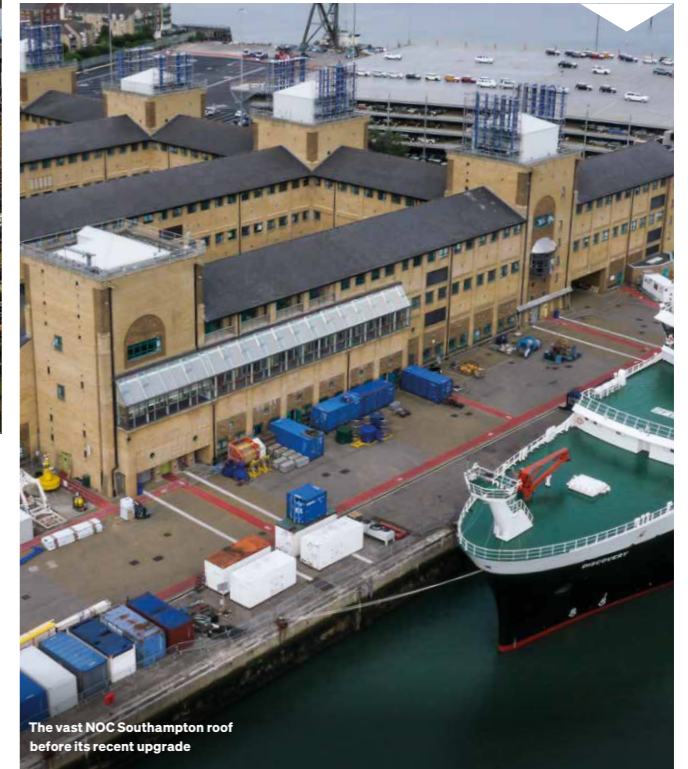
This recognition is a testament to our efforts to advance nature-based climate solutions and environmental data collection methods while contributing to a greener future in the Solent region and beyond.

ECO-CONSCIOUS ROOF UPGRADE

The recent installation of Europe's largest zinc roof at our Southampton site has delivered positive environmental improvements.

Not only has it enhanced the building's energy efficiency to EPC Grade C, but the use of ecological, durable, and 100% recyclable materials reflects our strong commitment to sustainability and environmental responsibility.

This achievement exemplifies our dedication to making eco-conscious choices while maintaining the highest standards in construction and design.



The vast NOC Southampton roof before its recent upgrade



The Fit for Future project is transforming our built environment

BUSINESS+CULTURE

Our commitment to sustainable business operations extends to responsible procurement, ethical governance, and promoting awareness and good governance within its workforce.

By prioritising these aspects of business operations, we not only set a positive example for others but also ensures the long-term resilience and capacity to fulfil our scientific mission.



One of the many spaces being transformed as we look to the future

FIT FOR FUTURE

The Fit For Future project has begun to transform our Southampton site into an inspiring, future-ready space for staff to work and bring out their best.

Leveraging advanced tech hardware and software, we have created collaborative zones that encourage cross-functional teamwork and spark creative thinking.

The project's aim was to adapt to post-pandemic working styles and promote sustainability, unity, and creativity. This innovative environment now not only serves as an exceptional workplace but also showcases the NOC's commitment to excellence.

CYBER ESSENTIALS ACCREDITATION

The attainment of Cyber Essentials accreditation this year marks a significant milestone in our ongoing commitment to safeguarding our digital assets and ensuring the security of our information and services. It demonstrates our unwavering dedication to maintaining the highest standards of cybersecurity.

In addition, successful IT network upgrades on both vessels have bolstered compliance with marine industry rules and data security standards. Aligned with cybersecurity benchmarks such as NIST and ISO27001, these enhancements fortify protection against cyber threats, safeguarding research data integrity.

This achievement is attributed to the dedication, hard work, and adaptability of contractors, suppliers and crew who met stringent vessel refit schedules **LEARN MORE: CYBER SECURITY AND DATA PROTECTION - PAGE 91.**



Cyber Essentials is a key milestone in protecting the NOC



Our commitment include vetting suppliers and site visits
© Meuricio Gutiérrez

SUSTAINABLE PROCUREMENT

At Ocean Business 2023, we engaged with our top ten suppliers to talk to them about the new Sustainable Procurement Strategy and how we can work together to achieve its aims. This represented £5.1m of NOC supply chain spend in FY2021/22.

Together, we emphasised the need to prioritise eco-friendly practices and foster collaborative efforts to minimise environmental impacts. The outcomes of these discussions were promising, revealing our suppliers' strong dedication to sustainability. Their willingness to collaborate with us represents a significant stride toward embedding sustainable practices across our supply chain, fostering positive change in the marine science and research field.

INVESTING FOR THE FUTURE

Our new Investment Committee will ensure that we have the reserves and investments required for long-term success and to meet the strategic objectives of the organisation.

The Unrestricted reserves will be monitored by the Committee, and they will ensure they are also invested in accordance with our strategic objectives and charitable purpose.

The investment plan for Unrestricted reserves will be drawn up by the Committee and regularly reviewed.

TACKLING MODERN SLAVERY

In our annual Modern Slavery statement review, we enhanced our approach by benchmarking against best practices. We identified areas for improvement and enacted a successful action plan.

Key achievements included a 25% reduction in international suppliers aimed to strengthen our supply chain assurance and having 99% of all purchases go through our Procurement Team in order to ensure we know who we do business with. We conducted comprehensive Modern Slavery Awareness training at divisional meetings, covering the definitions, risks, NOC's actions, and warning signs of modern slavery and human trafficking and there was additional engagement via a NOC intranet news story available to all NOC employees.

LEARN MORE ABOUT RELATED ARRANGEMENTS WHICH SUPPORT OUR INTEGRITY AND ETHICS: GOVERNANCE ARRANGEMENTS - PAGE 91.



Staff enjoying the garden games at Summer Celebration 2023



RESEARCH+CULTURE

We are committed to ensuring our stakeholders will have trust and confidence in all our results, the methods used and the processes by which these results were obtained.

We will commit to ensuring that there is trust and confidence in the academic integrity of those who undertake our research.

Our research studies the chemical processes driving the storage of carbon in the ocean

ETHICAL RESEARCH TRAINING

Our Research Integrity course, a new addition to the standard compulsory induction for all incoming research staff, provides essential guidance on ethical research practices.

We've ensured current staff also benefit from this training by delivering numerous dedicated sessions.

This initiative underscores our commitment to maintaining the highest standards of integrity, honesty, and ethical conduct in our research endeavours.

We believe that nurturing a culture of research integrity not only upholds our reputation but also fosters trust and collaboration within our research community, promoting the responsible and ethical pursuit of knowledge.

LEARN MORE ABOUT OUR ETHICS AND RESEARCH INTEGRITY FRAMEWORK: SECTION 172 STATEMENT - PAGE 95.



Training can take non-conventional routes to inspire new ideas and thinking

RESEARCH PAPERS: A STATISTICAL SNAPSHOT

183
RESEARCH PAPERS PRODUCED



157 - 86%
GOLDEN OPEN ACCESS

26 - 14%
GREEN OPEN ACCESS

28
NON COMPLIANT RESEARCH PAPERS





Engaging with the wider community and sharing our innovations during a visit from UKRI

MANAGEMENT, STRUCTURE AND GOVERNANCE

OVERVIEW

NOC was incorporated on 2 July 2018 as a charitable company limited by guarantee and commenced trading on 1 November 2019. It is registered as a charity with the Charity Commission in England & Wales and the Scottish Charity Regulator and is governed by articles of association in accordance with the Companies Act 2006.

OUR BOARD

ORGANISATIONAL STRUCTURE AND DECISION-MAKING POLICIES - BOARD OF TRUSTEES

NOC's Board of Trustees, who are also Non-Executive Directors for the purposes of company law, have overall responsibility for ensuring that NOC is carrying out its purpose for the public benefit; the continued financial viability of the organisation; and for ensuring that we meet all of our legal and compliance requirements. The Trustees oversee the day-to-day delivery of NOC's strategy which is led by the Executive Committee. Trustee Directors are appointed by the existing Trustee Directors for a term of three years and are eligible for re-appointment for a further three years. The Board of Trustees during the financial year was as follows:

CHAIR

Sir Jeremy Darroch

DIRECTORS

Dr Ruth Boumphrey	Daniel Hook
Professor Sir Ian Boyd	Sarah Kenny OBE
David Gee	Dr Sarah McMath

DELEGATION OF DECISION MAKING - EXECUTIVE COMMITTEE

The Board delegates the day-to-day leadership and operations of NOC to its Executive Committee, which is made up of the Chief Executive Officer; the Chief Operating Officer/ Chief Financial Officer; the Director, Data, Science and Technology; and six Associate Directors. The Executive Committee meets monthly, reviewing progress against NOC's goals; the KPIs set by the Board; and both current and longer-term priorities for the organisation. The Board has approved a formal Statement of Delegations for the Executive Committee to allow them to conduct the business of the organisation effectively. During the financial year, the Board approved an updated Executive Roles

and Responsibilities framework, setting out accountabilities for each member of the Executive Committee.

BOARD MEETINGS

The NOC Board meets formally at least quarterly. Standing items covered in Board meetings include strategy, performance, risk and compliance, and sustainability and social responsibility. The Executive reports quarterly to the Board on progress against KPIs set at the start of the financial year, which cover each of NOC's goals. A strategic away day with the Board and wider Executive Team identified key strategic areas for development including Digital Ocean, commercialisation, autonomy and science areas identified for strategic growth. Other activities included providing advice and guidance for moving NOC to a more active role as an ocean advocate and reviewing and approving the business case for the commercialisation of NOC's trading subsidiary.

DELEGATION OF DECISION MAKING - COMMITTEES

The Board of Trustees has established four formal committees: the Audit & Risk Committee; the Nominations Committee; the Remuneration Committee; and the Scientific and Technology Advisory Committee. Their role is to undertake detailed scrutiny of specific subject matters and to make recommendations on those topics. The committees are Chaired by a Trustee Director appointed by the Board and report directly to the Board. The constitution of the committees and their respective Terms of Reference are reviewed at least annually.

AUDIT AND RISK COMMITTEE

The Audit and Risk Committee is chaired by David Gee and meets quarterly. On behalf of the Board, it has overall responsibility for financial reporting and controls; risk management; audit; and whistle-blowing. The committee acts independently from the NOC Executive, to ensure that the interests of the charity are properly protected and to ensure the integrity of the company financial reporting. Standing items within the agenda include cyber security and GDPR. Each quarter the committee also completes a deep dive into one of the strategic risks being managed across the business. During 2022/23 the committee reviewed our due diligence approach for decision-making, for the work being completed by NOC Innovations and they have provided feedback on our budgeting and business planning approaches.

REMUNERATION COMMITTEE

The Remuneration Committee is chaired by Sarah Kenny OBE, and meets quarterly.

It provides a forum for developing policy on trustee and executive remuneration; to recommend levels of remuneration for Directors; and to review the remuneration policy and reward package for all employees. It oversees any major changes in the employee benefits structure throughout the organisation. During 2022/23, the committee advised on the development of a Career Pathways Framework, this has included a new leadership and behavioural framework, career development and organisational re-grading tool-kits. The committee also reviewed and approved Executive pay and performance.

NOMINATION COMMITTEE

The Nomination Committee has the role of leading the process for Board appointments and making recommendations to the Board and meets at least twice a year. It is chaired by Sir Jeremy Darroch and is responsible for long-term succession planning for future trustees, seeking to ensure there is a formal, rigorous, and transparent procedure for the appointment of new directors to the Board and reviewing and evaluating the balance of skills, knowledge, experience and diversity on the board. The Board analyses the capabilities of the existing Trustee Directors using a skills matrix, which is reviewed annually. The committee had oversight of the recruitment and appointment of the new Chair of Trustees. The committee has started the recruitment process for new trustees to join the organisation.

SCIENCE AND TECHNOLOGY ADVISORY COMMITTEE

The Science and Technology Advisory Committee is chaired by Professor Sir Ian Boyd. Its remit is to provide independent advice to support the Board of Trustees and the Director Science & Technology in their responsibilities for development and delivery of the research strategy for NOC and on sustaining the quality and impact of NOC's research performance, its research environment and the health of its intellectual capital base. The committee is chaired by a member of the NOC Board and has a membership of no more than 10 people with expertise covering the breadth of NOC's main areas of scientific research and technology development. Members are drawn from outside NOC, taking due consideration of diversity, and bringing stakeholder and international perspectives commensurate with NOC's role as one of a relatively small number of large-scale oceanographic institutions in the world.

TRUSTEES' INDEMNITIES

Under NOC's governing documents, directors and former directors are entitled to an indemnity against liability incurred by them to a third party in the proper performance of their duties as a director or officer of NOC. The governing document also gives NOC powers to provide indemnity insurance for the Trustees in respect of liability arising from breach of trust or duty, negligence, subject to the conditions of s.189 of the Charities Act 2011 (which excludes from such insurance any criminal and regulatory fines and penalties). NOC maintains such insurance for the Trustees, with an annual cap on liability.

PAY POLICY FOR SENIOR STAFF

This year one Trustee received remuneration as disclosed under note 7 to the financial statements. Details of Trustees' expenses incurred in the course of their duties and reimbursed are disclosed under note 7. The Remuneration Committee has responsibility for developing, implementing and reviewing the remuneration, considering market



The public engaging with our science at our TREC event

value; performance; capabilities, values and leadership behaviours, and using up to date and relevant comparative salary information. The Chair of the Remuneration Committee recommends the remuneration package of the Chief Executive Officer to the Chair of the Board, who in turn reports to the Board.

INDUCTION AND TRAINING OF TRUSTEES

As part of our on-boarding process, new Trustees receive an induction to introduce them to our work, which includes an introduction to each member of the Executive team, presentations, tours and meeting various colleagues to learn about the different functions of NOC. NOC also provides a trustee handbook with guidance on both NOC itself, and on charity governance requirements. This year the Chartered Governance Institute (CGI) provided refresher training to all of our Trustees and a number of our staff to help remind us all of the role of the Trustees and to provide an overview to charity Governance.

REVIEW OF BOARD PERFORMANCE

During the spring of 2022 we worked with an external provider to undertake a Board Effectiveness review. The results were discussed with the Board of Trustees at our annual Board review meeting in September 2022. The outcomes of the review were extremely positive, giving us confidence that the Board of Trustees and Executive are working effectively to deliver our purpose. An action list for areas of suggested improvements has been put into place during the year. In August 2023 an internal review of Board Effectiveness was also undertaken with input from Trustees with the outputs of this meeting used to inform the Board's further areas of focus for the next financial year.

SUBSIDIARY GOVERNANCE AND RELATED PARTIES

NOC's wholly owned subsidiary, National Oceanography Centre Innovations Limited ('NOC Innovations'), was established in 2019 as a private limited company. Its role is to undertake more applied and commercial work, to facilitate knowledge exchange and encourage innovation. It has covenanted to donate to NOC all profits earned which it may legally donate and to re-claim gift aid on its profits to NOC. The NOC Innovations Board is chaired by David Gee, and its other directors are members of the Executive Committee. The NOC Innovations Board meets quarterly. Its Associate Director, Huw Gullick, provides regular updates to the NOC Board of Trustees on the activities and financial reporting of NOC Innovations. NOC is eligible to bid for funding from UKRI, including the Natural Environment Research Council (NERC). NOC manages the National Capability funding on behalf of NERC working in partnership with marine centres throughout the UK.

MEMBERS OF THE NOC AND LIABILITY

The Members of the Charity are the Trustee Directors. They guarantee to contribute an amount not exceeding £1 to the assets of the Charity in the event of winding up.

DISCLOSURE OF INFORMATION TO AUDITOR

Each of the persons who are Trustees at the time when this Trustees' Report was approved has confirmed that: so far as that Trustee is aware, there is no relevant audit information of which the charitable company's auditor is unaware; and that Trustee have taken all the steps that ought to have been taken by the Trustees in order to be aware of any relevant audit information and to establish that the charitable company's auditor is aware of that info.

OUR STAKEHOLDERS

During the year, NOC has continued developing formal framework for engagement with stakeholders, led by the Executive Committee, with the Board being briefed on and involved with setting the strategy.

The Board reviewed its interaction with stakeholders, and that of NOC as a whole, as part of its annual Board Effectiveness review in August 23 and is developing actions to embed and extend stakeholder engagement further during the next financial year.

SCIENTISTS, ENGINEERS AND RESEARCHERS

Enabling scientists and researchers is one of our core goals, with activities including;

- operating research ships; **SHIPS FOR GLOBAL SCIENCE - PAGE 44**
- providing key data, and; **ENHANCING NEAR-REAL-TIME OCEAN DATA SHARING - PAGE 32**
- marine robotics facilities. **GLIDERS REVOLUTIONISE CLIMATE DATA COLLECTION - PAGE 31**

MARINE RESEARCH ORGANISATIONS AND PUBLIC AUTHORITIES

We are the hub of many marine networks, providing us with a position of authority and influence, including through;

- the NOC Association of Marine National Capability Beneficiaries;
- the Marine Facilities Advisory Board, and;
- the Cruise Programme Review Group, which provide formal feedback to us from beneficiaries around major areas of our activities.

Our work allows collaborative relationships with national and international marine institutions, as well as government.

OCEAN TAKES CENTRE STAGE AT UN CLIMATE CONFERENCE - PAGE 52

PUBLIC IN THE UK AND WORLDWIDE

By embracing digital technology and hybrid opportunities we have continued to expand our public engagement. We hosted live in-person events and have invested in collaborations with prestigious museums.

SOLENT COMMUNITY ENGAGES IN COASTAL EXPLORATION - PAGE 42
SET YOUR SIGHTS ON BOATY
MCBOATFACE - PAGE 36

OUR EMPLOYEES

We continue to be driven by our values, engaging with our people; Trade Unions; and developing our Equality, Diversity and Inclusion approach.

PEOPLE+Culture, PAGE 64

YOUNG PEOPLE AND STUDENTS

We continue to work closely with universities, including the Universities of Southampton and Liverpool, and collaborate with schools within our local area and wider.

INSPIRING STEM ENGAGEMENT - PAGE 41

OUR FUNDERS

We regularly engage with funders day to day through the delivery of projects, as well as through more formal interactions with Board Observers from UKRI-NERC and strategic meetings.

OUR BOARD - PAGE 85

OUR SUPPLIERS

Our Procurement team engage with suppliers from tender stage to delivery, building good relationships and high standards.

BUSINESS+CULTURE- PAGE 78

OUR EXECUTIVE COMMITTEE



PROFESSOR ED HILL CBE
CHIEF EXECUTIVE



JULIE PRINGLE-STEWART
CHIEF OPERATING OFFICER AND
CHIEF FINANCIAL OFFICER



DR JOHN SIDDORN
DIRECTOR OF DATA, SCIENCE & TECHNOLOGY
AND CHIEF SCIENTIST



DR MAATEN FURLONG
ASSOCIATE DIRECTOR FOR
NATIONAL MARINE FACILITIES



DR JON BLOWER
ASSOCIATE DIRECTOR FOR
DIGITAL OCEAN



NATALIE CAMPBELL
ASSOCIATE DIRECTOR FOR
CORPORATE BUSINESS SUPPORT



PROFESSOR DOUG CONNELLY
ASSOCIATE DIRECTOR FOR
SCIENCE & TECHNOLOGY



HUW GULLICK
ASSOCIATE DIRECTOR FOR
NOC INNOVATIONS & ENGAGEMENT



PROFESSOR PENNY HOLLIDAY
ASSOCIATE DIRECTOR FOR
NATIONAL CAPABILITY SCIENCE

OUR BOARD OF TRUSTEES

SIR JEREMY DARROCH CHAIR OF THE BOARD

For 14 years, Jeremy was instrumental in leading Sky into a new era of environmental awareness with a substantial commitment to environmental sustainability. He helped launch major initiatives designed to bring awareness to the challenges facing the environment. Jeremy was knighted in 2023 for his services to business, charity and sustainability.



DAVID GEE AUDIT AND RISK COMMITTEE CHAIR

David is a strategically orientated senior business manager and finance professional with a focus on value creation with a proven track record of strategic definition and management.



SARAH KENNY OBE REMUNERATION COMMITTEE CHAIR

Sarah is the Chief Executive Officer at the BMT Group, a leading international multi-disciplinary engineering, science and technology consultancy offering a broad range of services, particularly in the defence, energy, environment, shipping and ports and logistics sectors.



NOC EXECUTIVE ATTENDEES

Professor Ed Hill CBE
Julie Pringle-Stewart, Company Secretary
Dr John Siddorn
Professor Angela Hatton

DR RUTH BOUMPHREY

Ruth is the Chief Executive Officer at Lloyd's Register Foundation, a global charity protecting life and property and supporting education, engineering-related research and public engagement.



PROFESSOR SIR IAN BOYD FRs

Ian is a marine and polar scientist who was Chief Scientific Adviser to the UK Government on Food and the Environment. He is currently a Professor at the University of St Andrews and the Chairman of the UK Research Integrity Office.



OBSERVERS

NERC
Alison Robinson
NOC Association
Mark Inall

DANIEL HOOK

Dan is a Naval Architect and Chartered Engineer with over 18 years' experience in the marine industry. Dan worked on the development, testing and trials of a wide range of specialist craft. He is now the Co-CEO at RAD Propulsion as well as a consultant at Ocean Infinity and Director of several start-up marine tech companies.



DR SARAH MCMATH

Sarah is the Chief Executive Officer of Market Operator Services Ltd (MOSL) which allows 1.2 million businesses, public sector bodies, charity and not-for-profit organisations in England to choose who provides their water retail services.



GOVERNANCE ARRANGEMENTS

GOVERNANCE FRAMEWORK

We continue to improve and evolve our governance framework in line with the evolving needs of the organisation. Our framework is comprised of three areas: our policies, our statement of delegation and our committees that support and have oversight of our operations. Our internal audit programme continues to provide assurance and feedback on the effectiveness of, and how our governance enables and supports the organisation.

This year we established a project to review all the policies developed at the time we became independent from government. The aim of this review is to understand if the controls are effective and also, importantly, whether they are enabling our day-to-day operations. This will allow our professional heads across the business to update and improve our ways of working. The project is due for completion in summer 2024.

CYBER SECURITY AND DATA PROTECTION

Our Cyber Security has been significantly enhanced this year with investment in our networks and infrastructure. We were delighted to receive Cyber Essentials Accreditation **LEARN MORE: BUSINESS+CULTURE- PAGE 78** and to have delivered a new Information Security (IS) Policy for the organisation. We now partner with an external provider to further enhance our security with our systems, monitored 24 hours a day, 7 days a week, to provide a constant proactive security presence. We adopted the Centre for Security Controls standards to benchmark ourselves and to provide a prescriptive approach to continuous improvement that aligns with best practices. We also procured and now successfully manage our own IS/Cyber Security training platform, which we use to report on a regular basis to NOC Audit and Risk Committee, Associate Directors and Group Heads for the non-completion of training by staff. Since implementing the platform we have seen an increase from 75% to 97% overall completion rates of the mandatory IS/Cyber modules for users who are registered with a NOC account. There have been 0 IS/Cyber incidents that have affected NOC's regulatory obligations.

This year the NOC governance team have sourced an external provider to deliver Information Governance training going forward. This will become part of the NOC induction and on-boarding package, with refresher training to be rolled out for staff throughout the year. The Head of Legal and Governance has completed a review of our IS Policy and procedures and we now have an action plan for a project to update our ways of working during the next financial year. There were no reportable data protection breaches during the financial year.

RISK MANAGEMENT

The Trustees keep oversight of the strategic risks that the organisation faces and provide their guidance and their position with regards to our risk tolerances. This year we have considered how we can improve ease of use and understanding of our risk approaches, looking to align ways of working with other areas of the organisation such as learning from our Health & Safety practices. Our risk management approach is explained to all new starters across the organisation and is embedded well as part of our operational committee meetings. We continue to take feedback from the organisation and tested our understanding of risk via an internal audit and a pulse survey.

ETHICS, SAFEGUARDING AND CONFLICTS OF INTEREST

Research Integrity continues to be a focus for NOC, and we have reviewed and updated our policy and created Research Integrity Training for all of our research staff **LEARN MORE: RESEARCH+CULTURE - PAGE 82**.

DUE DILIGENCE

We continue to improve and evolve our approach to Due Diligence, to enable effective decision-making and to manage our risks. This year the Audit & Risk Committee completed an audit of the approach to counter party due diligence which was undertaken prior to NOC and/or National Oceanography Centre Innovations Limited (NOC Innovations) entering into an agreement with a third party, testing and ensuring our critical assurance approach is effective. This year we made the decision to create a new professional group within Corporate Support to lead and develop our approach to Assurance and Due Diligence. This is a significant area for our organisation that needs central oversight to help coordinate and support everyone throughout the organisation. Next financial year we aim to define and deliver a new assurance service provision to support all at NOC.

For details of how we're improving due diligence in our supply chain **LEARN MORE: BUSINESS+CULTURE- PAGE 78**, how we've established a new Investment Committee and went above and beyond to improve our approach to Modern Slavery. There were no externally reportable conflicts of interest and no significant governance or control issues during the financial year.



The crew of the RRS Discovery during the visit to Discovery Point, Dundee

REFERENCE & ADMINISTRATIVE DETAILS

COMPANY REGISTERED NO.

11444362

CHARITY REGISTERED NO.

1185265 and SC049896

REGISTERED OFFICE

National Oceanography Centre
European Way
Southampton
SO14 3ZH

INDEPENDENT AUDITOR

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Southampton
SO14 3TL

BANK

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TAX ADVISORS

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Level 12, Thames Tower
Reading
Berkshire
RG1 1LX

CHAIR

Sir Jeremy Darroch

DIRECTORS & TRUSTEES

Sir Jeremy Darroch

Chair

Professor Sir Ian L Boyd

Dr Ruth Boumphrey

Sarah Kenny OBE

Dr Sarah McMath

David Gee

Daniel Hook

SENIOR MANAGEMENT

Professor Ed Hill CBE

Chief Executive

Julie Pringle-Stewart

Chief Operating Officer,
Chief Financial Officer
and Company Secretary

Dr John Siddorn

Director of Data, Science &
Technology and Chief Scientist

Dr Maaten Furlong

Associate Director for
National Marine Facilities

Dr Jon Blower

Associate Director for
Digital Ocean

Natalie Campbell

Associate Director for
Corporate Business Support

Professor Doug Connelly

Associate Director for
Science & Technology

Huw Gullick

Associate Director for National
Oceanography Centre: Innovations Ltd
and Associate Director for Engagement

Professor Penny Holliday

Associate Director for
National Capability Science

Danielle Rossiter Head of Finance

Matt Eades Head of People and Skill

SECTION 172 STATEMENT

The NOC Board of Trustees have acted in a way that they consider to be in good faith, that would be most likely to promote the success of the company for the benefit of its members as a whole, and in doing so have regard to the matters set out in s172(1)(a-f) of the Companies Act 2006, in the decisions taken during the year.

The Board of Trustees are briefed on their legal duties as part of their induction and are able to seek further advice from the Company Secretary, Head of Legal & Governance or access external independent advice if required.

STRATEGY AND CONSIDERATION OF THE CONSEQUENCE OF LONG-TERM DECISIONS

This year we took a strategic decision to evolve our brand to tell a more compelling story whilst clarifying our purpose and creating a distinctive look and feel, to enthuse, engage and enrol our stakeholders. We undertook a detailed analysis, interviewing our industry peers and colleagues to determine the 'old' brand equity and 'new' potential. The results have delivered a stronger charity brand to enable us to reach a wider audience, to boost our voice above the crowd and be the authority on the ocean. Our reinvigorated purpose unites us: To gain deeper knowledge of the ocean to help every living thing on our planet flourish.

We have now finished the third year of delivery of our five-year strategy "Defining our Future" which aims to preserve the very best of what we do and grow our work – exploring new depths; creating the most innovative technologies; being the most exciting place to learn and work. Throughout the year, decisions and considerations at Board meetings are consistently linked to how NOC meet its strategic objectives and how NOC can build and develop further to the environment around and in turn, contribute further to achieving public benefit.

Decisions are underpinned by a detailed business plan, with budgets built from funded projects and forecasts across the following 5 years, based on experience of research funding; pipeline research areas; and market research on future areas of growth.

The Board also considers the longer-term prospects and funding landscape for NOC, taking into account expected changes in technology and skills required and types of research and data analysis to be undertaken in the next 10-15 years, and conscious of NOC's aim to diversify income over the longer term.

SUSTAINABILITY AND SOCIAL RESPONSIBILITY

As a registered charity with public benefit at the heart of the organisation, NOC's aim is to make a positive contribution to society by advancing ocean science and education,

supported by continuing substantial public research investment. As the national centre and a world leader in marine science, NOC's aim is to lead by example.

We have now finished the second year of delivery of our Sustainability and Social Responsibility (SSR) Strategy, which we've celebrated in Section 3.6. The SSR Committee has met regularly within the organisation, leading strategic progress towards the pillars of People; Operations; Community; Environment; and Research. In its delivery of this plan, NOC is aiming to work to the principles of ISO 26000 Social Responsibility. The Board reviews SSR as part of its regular programme.

OUR PEOPLE

The Board considers that developing and maintaining good employee engagement and cementing NOC's reputation as an employer of choice, are fundamental to the delivery of the NOC Strategy.

This year we have focused on our ability to attract and retain the best talent. This has included making the decision to end the use of Fixed Term Appointment and to recruit open-ended contracts instead. We have continued to invest in our world-class manager programme recognising the importance of strong leadership as critical to staff experience **LEARN MORE: PEOPLE+CULTURE - PAGE 64**. The major programme of work this year has been the Career Pathways. This has included the creation of a Career development tool-kit and the framework itself has a new leadership and behavioural framework and an organisational re-grading tool-kit. We have maintained proactive engagement with the Trade Unions in setting pay for the year and reviewing our approach to allowances. We continue to engage employees through our Staff Focus Group and Open Staff Meetings, that continue to evolve based on the feedback we encourage.

We completed a Diversity, Equality and Inclusion employee survey. The outputs were shared with staff and the actions identified are being implemented and monitored through the "Culture Club." We launched the new diversity information on UNIT4 that will help us next year to work towards improving our information and data to help us have a better understanding of employee feedback. We continued to run Active Bystander training which has been undertaken by 41 employees.

Further detail on the comprehensive people-focused initiatives undertaken by NOC during the year, and overseen by the Board **LEARN MORE: PEOPLE+CULTURE, PAGE 64**.

HIGH STANDARDS AND BUSINESS CONDUCT

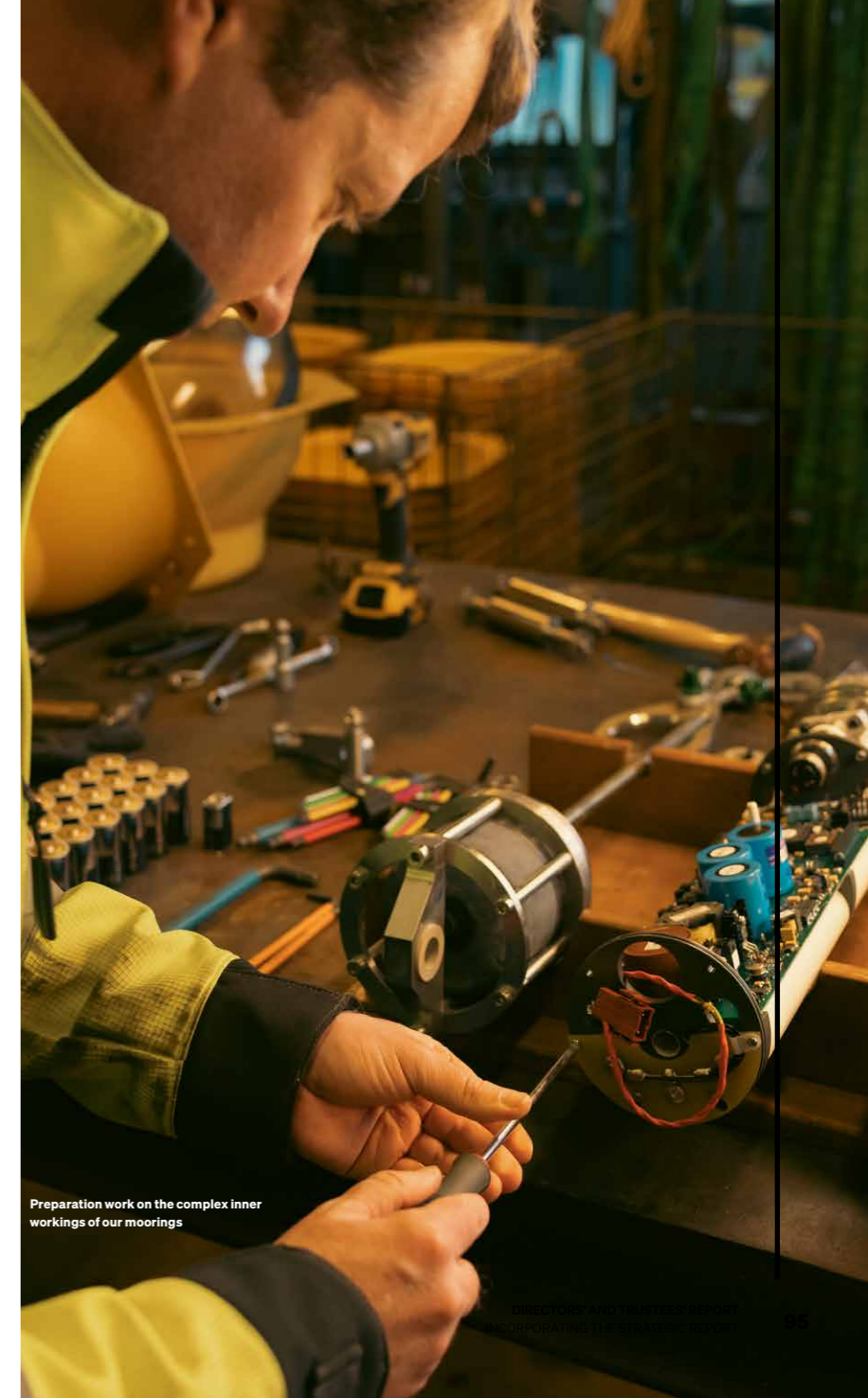
NOC's values of Excellence, Innovative Thinking, Empowerment, Environmental Responsibility; Integrity; and Working in Partnership, underpin the way in which the

Trustee Directors take decisions and set standards for the way in which the organisation operates. Through the delivery of our strategy, NOC's intention is to promote our reputation, reflecting responsible behaviour and maintaining high standards of business conduct **LEARN MORE: BUSINESS+CULTURE - PAGE 78**.

The Board reviews the NOC's Ethics & Research integrity frameworks annually. During the financial year, the Board has had oversight of the operation of the NOC's Ethics Committee, the remit of which is to review new business proposals against NOC's charitable purposes and objectives. NOC continues to be committed to following the Seven Principles of Public Life, which outline the ethical standards to which those working in the public sector are expected to adhere and which complement NOC's own values.

MEMBERS

The Trustee Directors are also the Members of NOC. The Directors, in consultation with the Executives, take decisions jointly, in accordance with company law, and regularly review any conflicts of interest they may have in their other capacities or wider activities.



Preparation work on the complex inner workings of our moorings

STREAMLINED ENERGY & CARBON REPORTING (SECR)

In line with our values and SSR strategy, we have undertaken several initiatives to mitigate our environmental impact, particularly in the areas of Greenhouse Gas emissions, waste reduction, and transportation [LEARN MORE: ENVIRONMENT+CULTURE - PAGE 74.](#)

In the fiscal year FY2022/23, our commitment to environmental responsibility remained at the forefront as we tracked and reported our carbon dioxide equivalent emissions (CO₂e). This year, we recorded a total of 18,354 tonnes CO₂e. To provide context for our pursuit of lower emissions, we reflect on the previous FY2021/22, when our total CO₂e emissions stood at 15,223 tonnes CO₂e. The increase seen over the FY is the result of an increase in business travel, commuting and buildings use as business practices move closer to pre-pandemic norms.

In 2022/23, our intensity ratio reached 0.34 (tCO₂e/m²) and 339.67 (kgCO₂e/m²) (refer to Table 1), while the previous year saw us at an intensity ratio of 0.28 (tCO₂e/m²) and 281.64 (kgCO₂e/m²) (refer to Table 1). These intensity ratios have changed to reflect greater post-pandemic use of the buildings.

Collectively, we have seen a 20.1% increase in our emissions from FY2021/22, reflecting the ongoing challenges we face as we strive to reduce our carbon footprint while sustaining our commitment to environmental stewardship.

EMISSION DETAILS

SCOPE 1 EMISSIONS

In the category of Scope 1 emissions, NOC is responsible for emissions resulting from gas combustion, which amounted to 969 tonnes of CO₂e, emissions from the consumption of fuel for ship transport, totalling 16,172 tonnes of CO₂e, and emissions resulting from fleet vehicles, which amounted to 18 tonnes of CO₂e. Scope 1 emissions total 17,160 tCO₂e.

The 24% increase in carbon emissions from our research ships compared to last FY can be attributed to their successful re-mobilisation for scientific deployment post-pandemic. Read Alternative Fuel Story to see how we're reducing the environmental impact of our ships whilst continuing critical ocean observations in pursuit of a thriving ocean.

The 48% decrease in emissions from our fleet vehicles compared to last FY shows the success of streamlining our operations, allowing for more efficient routes and reduced fuel consumption.

SCOPE 2 EMISSIONS

Additionally, in the Scope 2 emissions category, our annual emissions from the purchase of electricity for internal consumption amounted to 1147 tonnes of CO₂e, and our annual emissions from the purchase of heating at our Liverpool office amounted to

18 tonnes CO₂e. Scope 2 emissions total 1165 tCO₂e. We have moved onto a 100% green energy tariff [LEARN MORE: ECO-CONSCIOUS ROOF UPGRADE - PAGE 77](#), to mitigate the carbon footprint associated with our purchased electricity.

SCOPE 3 EMISSIONS

Expanding our environmental impact assessment, Scope 3 emissions encompass a range of factors. These include emissions arising from water, business travel, which encapsulates rental cars, employee-owned vehicles, and air and rail travel emissions. Moreover, our commitment to responsible waste management is reflected in emissions from various waste practices such as incineration, landfill disposal, food waste management, anaerobic digestion, and recycling. Collectively, our approach to emissions evaluation extends to Scope 3, with a total emissions figure in this category of 15 tCO₂e reinforcing our dedication to sustainability and environmental awareness.

It's noteworthy to emphasise that while there has been a surge in business travel, it only accounts for a mere 0.07% of our total carbon footprint.

We've witnessed a commendable increase in our recycling rates, a trend that aligns with our sustainability objectives and signifies progress in the right direction. To find out more about our accredited laboratories [LEARN MORE: LABORATORY EFFICIENCY ASSESSMENT FRAMEWORK - PAGE 75.](#)

SOURCES OF EMISSIONS

GAS USE FOR HEATING

The annual energy consumption attributed to gas combustion, for which the organisation is responsible, was 5,310.28 m³.

RRS DISCOVERY AND RRS JAMES COOK SHIP FUEL

RRS Discovery used 2,529 tonnes of ship fuel while RRS James Cook used 2,530 tonnes.

FLEET VEHICLE FUEL

For the consumption of fuel for fleet vehicles, we utilised 6,149 litres of diesel.

ELECTRICITY

The annual energy consumption resulting from electricity purchases for internal use was 5,299 kWh.

HEAT PURCHASED - LIVERPOOL

The annual consumption of heat purchased for our Liverpool office was 100 mWh.

BUSINESS TRAVEL

In the realm of Scope 3 emissions, our focus primarily revolves around business travel.

This category encompasses emissions stemming from fuel utilization for business transportation. We spent £7,080 on vehicle fuel and drove 50,110 miles for business purposes.

WATER

In our operations, we used 10,667 litres of water in our office building.

WASTE (TABLE 2)

Shifting our focus to waste management, we conduct an extensive examination. This encompasses emissions stemming from diverse waste management methods, including incineration, landfill disposal, food waste management, anaerobic digestion, and recycling. Specifically, we recycled 93 tonnes of waste, directed 48 tonnes to heat recovery incineration, disposed of 19 tonnes in landfills, and processed 4 tonnes via anaerobic digestion, yielding renewable biogas.

ADDITIONAL REPORTING - AIR AND RAIL EMISSIONS (TABLE 3)

CO₂e data for rail and air travel related primarily to scientist attendance at conferences, scientific research trips, and essential operational travel for ship crews, scientists, and mariners was obtained from our transport provider.

EMISSIONS AND ENERGY DATA

We employed the following methodologies to calculate the disclosed information regarding emissions and energy data:

SCOPE 1 SOURCES

GAS USE FOR HEATING

Energy data collected from the main meters at our sites was converted into CO₂e using the UK Government GHG Conversion Factors for corporate reporting.

RRS DISCOVERY AND RRS JAMES COOK SHIP FUEL

Ship fuel data is reported by ship Captains and converted into CO₂e using carbon conversion factors for Marine Gas Oil.

FLEET VEHICLE FUEL

Transport data for fleet vehicles was compiled from our Logistics Group's turnover records and converted into CO₂e using carbon conversion factors for LPG and Diesel (100% mineral oil).

SCOPE 2 SOURCES

ELECTRICITY

Energy data collected from the main meters at our sites was converted into CO₂e using the UK Government GHG Conversion Factors for corporate reporting.

PURCHASED HEAT - LIVERPOOL

Energy data was collected from our Liverpool site meters and converted into CO₂e using the UK Government GHG Conversion Factors for corporate reporting.

SCOPE 3 SOURCES

BUSINESS TRAVEL

A third-party hire company provided us with the annual spending on fuel consumption, which we converted into litres using the cost of petrol per litre. We then calculated the CO₂e emissions by applying the emission factor for an average petrol car, as separate data for petrol and diesel were unavailable.

We calculated the transportation of employee-owned vehicles used for business travel by using the mileage claims from our Finance system. The total mileage was then converted into CO₂e emissions using the emission factor for an average car.

WASTE (TABLE 2)

Our approach to collecting data for Scope 3 waste management is rooted in meticulous scrutiny. We gather comprehensive information pertaining to waste practices, including incineration, landfill disposal, food waste management, anaerobic digestion, and recycling. Data is obtained from various sources, such as waste management reports, disposal records, and recycling statistics. Through rigorous data collection and analysis, we ensure a transparent and accountable assessment of our waste emissions, underscoring our commitment to environmentally responsible practices.

ADDITIONAL REPORTING - AIR AND RAIL EMISSIONS (TABLE 3)

CO₂e data for rail and air travel related primarily to scientist attendance at conferences, scientific research trips, and essential operational travel for staff, ship crews, scientists, and mariners was obtained from our travel provider.

TABLE 1: PRINCIPAL SOURCES

UNITS	SCOPE	REPORTING YEAR 2021-22			REPORTING YEAR 2022-23		
		SOUTHAMPTON	LIVERPOOL	TOTAL	SOUTHAMPTON	LIVERPOOL	TOTAL
Gas Consumption m ³	1	5,394.96	-	5,394.96	5,310.28	-	5,310.28
RRS Discovery Fuel tonnes	1	2,762.40	-	2,762.40	2,529.00	-	2,529.00
RRS James Cook Fuel tonnes	1	1,657.00	-	1,657.00	2,530.00	-	2,530.00
Fleet Vehicles Fuel litres	1	-	-	11,637.01	6,149.00	-	6,149.00
Gas Used for Transport Purposes- Fleet Vehicles tonnes	1	-	-	1.30	0.61	-	0.61
Electricity kWh	2	4,931.72	318.59	5,250.31	4,996.00	303.00	5,299.00
Heat Purchased for Own Use (CHP/District Heating) mWh	2	-	103.12	103.12	-	100.03	100.03
Business Travel - Rental Car Fuel £GBP	3	-	-	-	-	-	7,080.00
Fuel Used for Business Transport - Employee Owned Vehicles miles	3	-	-	252.69	-	-	50,110.14
Metred Mains Water Consumption and Waste Water m ³	3	10,158.00	500.00	10,658.00	10,338.00	329.00	10,667.00
RESULTING EMISSIONS	SCOPE	SOUTHAMPTON	LIVERPOOL	TOTAL	SOUTHAMPTON	LIVERPOOL	TOTAL
Gas Consumption tonnes CO ₂ e	1	988.14	-	988.14	969.34	-	969.34
RRS Discovery Fuel tonnes CO ₂ e	1	7,666.74	-	7,666.74	8,219.23	-	8,219.23
RRS James Cook Fuel tonnes CO ₂ e	1	5,385.23	-	5,385.23	7,953.32	-	7,953.32
Fleet Vehicles Fuel tonnes CO ₂ e	1	-	-	35.22	16.28	0.09	16.37
Gas Used for Transport Purposes- Fleet Vehicles tonnes CO ₂ e	1	-	-	-	1.82	-	1.82
Electricity tonnes CO ₂ e	2	1,047.15	67.65	1,114.80	1,083.96	62.78	1,146.74
Heat Purchased for Own Use (CHP/District Heating) tonnes CO ₂ e	2	-	18.82	18.82	-	18.32	18.32
Business Travel - Rental Car Fuel tonnes CO ₂ e	3	-	-	8.52	-	-	11.09
Fuel Used for Business Transport - Employee Owned Vehicles tonnes CO ₂ e	3	-	-	0.74	-	-	13.44
Metred Mains Water Consumption and Waste Water tonnes CO ₂ e	3	4.28	0.21	4.49	4.00	0.12	4.12
Total tonnes CO ₂ e		-	-	15,222.70	-	-	18,353.79
Floor Space m ²		51,234.80	2,800.00	54,034.80	51,234.80	2,800.00	54,034.80
Intensity Ratio tCO ₂ e/m ²		-	-	0.28	-	-	0.34
Intensity kgCO ₂ e/m ²		-	-	281.72	-	-	339.67

TABLE 2: ADDITIONAL REPORTING WASTE

	REPORTING YEAR 2021-22			REPORTING YEAR 2022-23		
	SOUTHAMPTON	LIVERPOOL	TOTAL	SOUTHAMPTON	LIVERPOOL	TOTAL
Incinerated Waste tonnes	39.36	0.37	39.73	48.02	0.36	48.38
Landfill tonnes	2.28	-	2.28	18.76	-	18.76
Anaerobic Digestion of Food Waste, Producing Renewable Biogas tonnes	3.24	-	3.24	4.25	-	4.25
Recycled tonnes	35.47	1.15	36.62	89.84	2.71	92.55
Total Emissions from Disposal of Waste Generated In Operations for which the Company Does Not Own or Control Scope 3 / tCO ₂ e		Sub Total tCO ₂ e	2.72		Sub Total tCO ₂ e	11.49

TABLE 3: ADDITIONAL REPORTING - AIR AND RAIL EMISSIONS

BUSINESS TRAVEL	REPORTING YEAR 2021-22		REPORTING YEAR 2022-23	
	TOTAL	TOTAL	TOTAL	TOTAL
Domestic Air emissions tCO ₂ e	10.29		32.58	
Short-Haul Air tCO ₂ e	51.63		123.12	
Long-Haul Air tCO ₂ e	90.39		446.59	
International Air tCO ₂ e	41.35		340.44	
Domestic Rail tCO ₂ e	14.97		15.24	
International Rail tCO ₂ e	0.09		0.13	
Travel Sub Total tCO ₂ e	208.72		958.10	
Grand Total tCO ₂ e	15,434.14		19,323.38	

RISK MANAGEMENT STATEMENT

NOC takes risks in pursuit of its strategic objectives within a pre-defined risk appetite. We maintain a thorough record of the risks arising from the activities of the organisation which is discussed regularly throughout the organisation.

Our Risk Management Framework provides management with the ability to anticipate the evolution of risks and the mitigations necessary to remain within appetite; to increase our resilience to change, and to reduce the threats and uncertainty faced by the organisation. It also supports management in the maximisation of opportunities by better facilitating informed decision-making whilst also providing assurance that the company taking steps to ensure it is operating within appetite.

The Executive play a lead role in identifying and managing risk throughout the organisation, acting as the escalation route for risks to the Executive, the Risk and Audit Committee and the Board of Trustees. The Board and management are aided by a Risk Management function providing oversight, advice, challenge, and guidance for the management of risk; support for risk reporting and the development of policies, procedures, regulatory compliance and training.

PRINCIPAL RISKS AND UNCERTAINTIES

The Board of Trustees and the Risk and Audit Committee provide essential and valued external challenge and advice through an ongoing assessment of the company's emerging and principal risks. Notably, our Board committees have provided challenge and support to management on the key risks impacting the company over the past 12 months. Principal amongst these risks have been:

- managing the risks associated with changes to the NOC's infrastructure, systems and controls put in place since independence to support the company as an organisation operating independently from government;
- continued challenges in the management of prevailing economic conditions characterised by high inflation especially for energy and raw materials;
- supply chain shortages and delays resulting from ongoing shortages of raw materials and as an outcome of the introduction of new import / export requirements as the UK adjusts to operating outside the EU;
- the ongoing challenges associated with the retention and recruitment of staff to ensure we remain competitive and as a result of barriers to continued reliance on talent based in the EU;
- ongoing management of the continuously evolving threat of cyber-attack through the implementation of available safeguards and recommended best practice whilst also maintaining access to the scientific data we manage and support the communities who access our IT estate; and
- NOC's goal to increase the diversity of its sources of funding against an uncertain landscape for funding from our traditional and largest sources.

NOC continues to evolve its Risk Management Framework in support of improvements in risk insights, accountability, and the future evolution of the organisation.



Autosub Hover 1 being prepared for a trial in Southampton

FINANCIAL REVIEW

RESULTS FOR THE YEAR

The net income and total increase to reserves for the year ended 30 September 2023 amounted to £229k (2022: £4,613k)

INCOME

Total income for the year for the group amounted to £85,401k (2022: £78,717k). The income was principally derived from UKRI-NERC funding for research, the operation of research infrastructure, data management and services and facilities of £61.6m (2022: £64.0m). A further £14.0m (2022: £9.1m) of other grant income was derived from other grants such as EU and GCRF funding.

EXPENDITURE

Total expenditure for the year amounted to £85,202k (2022: £74,093k). Staff costs accounted for £38,002k (45%) (2022: £35,055k, 48%) of expenditure in the year. The increase in staff costs compared to the prior year relates to the annual pay award.

RESERVES POSITION AND POLICY

NOC recorded a net increase in unrestricted reserves of £2,027k (2022: £6,506k increase) and a £1,411k increase (2022: £812k decrease) recorded in restricted reserves. This is due to the phasing of projects with income being earned on restricted projects and released as unrestricted funds to cover central overhead on projects. The restricted fixed asset reserves decreased by £3,239k (2022: £1,081k decrease) being the net of capital additions, capital disposals and depreciation charged during the year.

It is the policy of the Trustees to ensure that an amount is held in the unrestricted reserves to mitigate against operational risk likely to

£2,057k
INCREASE IN UNRESTRICTED RESERVES

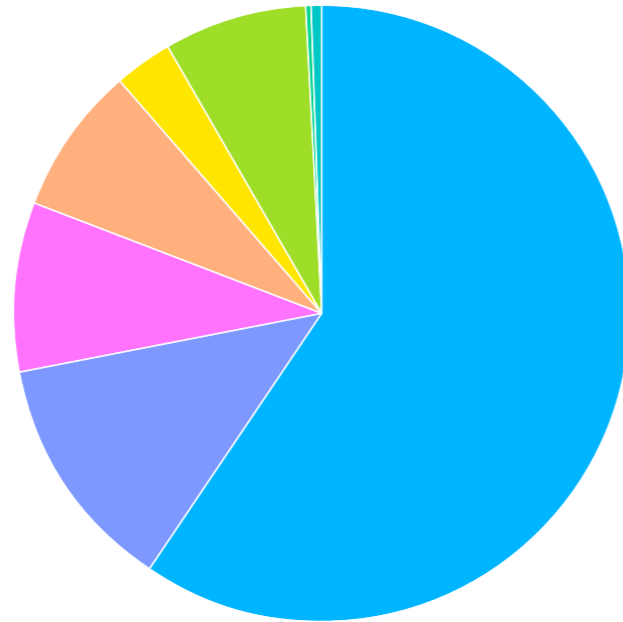


CHART 1: INCOME	£'000
Core Grant	50,825
Other UKRI Grant	10,787
Other Grant	7,480
EU Grant	6,567
NOC Innovations income	2,610
Trading income	6,380
Investment income	444
Other income	244
Donations	51
TOTAL INCOME	85,388

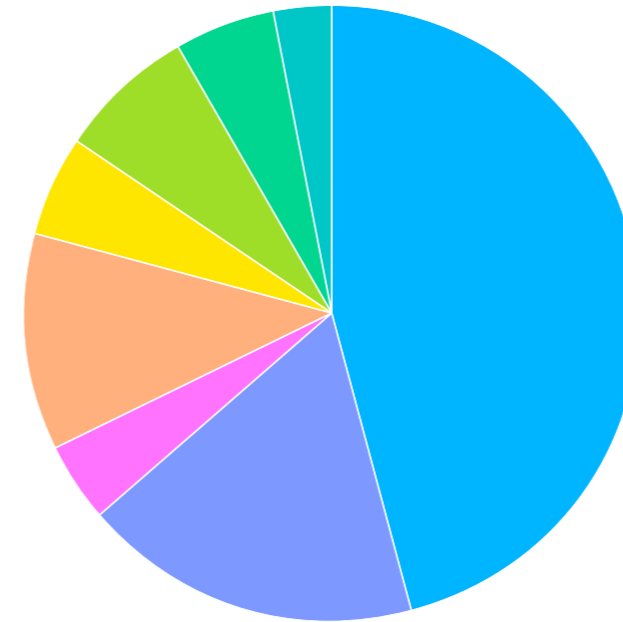


CHART 2: EXPENDITURE	£'000
Staff Costs	38,002
Vessel Costs	14,665
Research Equipment & Consumables	3,428
Research Services	9,386
Premises & Estate Costs	4,446
Administration Costs	5,993
Depreciation & Amortisation	4,320
Other costs	2,334
TOTAL EXPENDITURE	82,574

materialise over any 12-month period.

On commencing its activities, NOC's reserve policy was that a £2,000k unrestricted sustainability reserve is held for working capital to be grown by £6m over the next 5 years to cover the operational risk. In FY23 the financial and operational risk of the charity changed with some indemnities and guarantees from UKRI-NERC falling away. In addition, rising inflation saw the operational costs of the charity increase against a fixed committed income. In considering these changes the reserves policy has been agreed as unrestricted reserves to £7.5m needed as free cash for operational risk cover.

As at 30 September 2023 unrestricted reserves were £17,649k (2022: £15,622k). The planned investment of unrestricted reserves is set out in the Investment Policy below.

INVESTMENT POLICY

The investment policy ensures that unrestricted reserves earmarked for investment opportunities are agreed, prioritised and approved in line with the NOC Strategy and Business Plan. As well as ensuring the delivery of the associated benefits and enhanced capability, whether this is financial or qualitative or both.

NOC use the TRAC (Transparent Approach to Costing) FEC (Full Economic Cost) as the framework for pricing all contracts and projects and so ensuring it monitors its sustainability. Under TRAC there is the Margin for Sustainability and Investment (MSI) that is built into the FEC recovery that will contribute to the unrestricted reserves annually and then become the overall investment pot and provide ongoing risk cover. It is in the interests of the charity and the beneficiaries of NOC

£3.5M
COMMITTED INVESTMENT IN FY24

6 BUSINESS CASES APPROVED

to continue to invest in replacing assets as well as in new capability and further the aims of the charity in terms of its advance of science. TRAC requires that NOC does not hold too much in the sustainability reserve and encourages continual investment using the amount over the sustainability margin.

The continual investment is managed by the Finance and Investment Committee against a 5-year investment plan approved by the Board of Trustees. The Committee regularly invite staff to submit business cases for investment as part of the engagement with growth in new capability. In considering each case the Finance and Investment Committee ensures it is for the purposes of making a return as well as advancing the strategic aims and charitable objectives of NOC. Approved business cases will be kept under regular review for performance.

At the end of the FY23 year the committee had approved the use of £7.5m of unrestricted reserves. £4m of this is designated funds earned from revenue generating opportunities to be used for the running of the research ships. The £3.5m of approved investment opportunities were; £1.4m of core IT infrastructure, £1m investment into the autonomous capability and capacity at NOC, £850k to upgrade and replenish assets and £206 of approved business cases.

During the current year the Trustees approved investment of free and designated cash into cash deposits to mitigate against the rising costs due to inflation. Deposits placed yielded interest of £444k (2022: £18k) during the year.

TRADING SUBSIDIARY

NOC's trading subsidiary, National Oceanography Centre Innovations Limited, was incorporated on 9 October 2019 and is a wholly-owned subsidiary of NOC. In the year to 30 September 2022 the subsidiary reported a loss for the financial year of £4k (2022: loss £37k). NOCI has a strong opportunity pipeline and a high-level certainty that this will be converted to revenue and increase profits in FY24.

£206k VALUE OF BUSINESS CASES

There is an Operating Agreement in place between the charity and the trading subsidiary to ensure there is a structured and governed relationship. This includes detailed clauses which ensure the protection of licensed IP for the charity.

The trading subsidiary undertakes four significant areas of activity; product sales (marine data products), Events (Commercial activity only), Intellectual Property licensing (agreements) and Marine Robotic Innovation Centre – membership and renewal.

The Chair of NOC Innovations reports to the NOC Board of Trustees. The Board of Trustees review the progress of the subsidiary, ensuring that the strategic objectives of the subsidiary are not in conflict with its own and that the financial return is satisfactory. One member of the NOC Board of Trustees is a member of the trading subsidiary board.

FUNDRAISING POLICY

NOC seeks to ensure all fundraising activity is conducted with due regard to the guidance of the Charity's Commission and the Fundraising Regulator. NOC has undertaken limited fundraising activity during the year to 30 September 2023. Going forward, NOC's approach to fundraising will be to seek support from charitable foundations, trusts and corporations through their foundations. In addition, there will be the opportunity for the public to donate via regular or one-off giving or supporting fundraising events.

GOING CONCERN

In assessing the ability of the NOC to continue as a going concern management have considered the future pipeline of income and costs to build a bottom up budget for the financial years 2024 – 2026. The income for FY24 is anticipated to be greater than the current year due to an extra award of National Capability and a strong pipeline of commercial opportunities which are highly likely to materialise. This profile of

income is expected to continue cross the three-year period. The Large Research Infrastructure funding went through a mid-term commission review and NERC have agreed a funding approach for the next 4 years. The resource required for projects is covered by funded projects. Detailed resource planning is in place to inform recruitment with plans to continue to grow across FY24 -26.

Taking into consideration, signed Awards for National Capability infrastructure and science facilities and services, current indications of recommissioning for National Capability Science, previous success rates in research grant rounds with sustained bid submission and forecast of future income based on a strong commercial pipeline, indications are that NOC can continue to cover its managed cost base over the coming three-year period.

In conclusion there are no material uncertainties to cast doubt on NOC's ability to continue as a going concern.

AUDITOR

The auditor, BDO LLP, has indicated their willingness to continue in office. The designated Trustees will propose a motion reappointing the auditor at a meeting of the Trustees.

Approved by order of the members of the board of Trustees and signed on their behalf by



SIR JEREMY DARROCH
CHAIR OF BOARD OF TRUSTEES
13 DECEMBER 2023

STATEMENT OF TRUSTEES' RESPONSIBILITIES

The Trustees (who are also the directors of the Charity for the purposes of company law) are responsible for preparing the Trustees' Report including the Strategic Report and the financial statements in accordance with applicable law and United Kingdom Accounting Standards (United Kingdom Generally Accepted Accounting Practice).

Company law requires the Trustees to prepare financial statements for each financial year. Under company law the Trustees must not approve the financial statements unless they are satisfied that they give a true and fair view of the state of affairs of the Group and the Charity and of the incoming resources and application of resources, including the income and expenditure of the Group for that period. In preparing these financial statements, the Trustees are required to:

- select suitable accounting policies and then apply them consistently;
- observe the methods and principles in the Charities SORP;
- make judgements and accounting estimates that are reasonable and prudent;
- state whether applicable UK Accounting Standards have been followed, subject to any material departures disclosed and explained in the financial statements; and
- prepare the financial statements on the going concern basis unless it is inappropriate to presume that the Company will continue in business.

The Trustees are responsible for keeping adequate accounting records that are sufficient to show and explain the Charity's transactions and disclose with reasonable accuracy at any time the financial position of the Charity and enable them to ensure that the financial statements comply with the applicable accounting regulations. They are also responsible for safeguarding the assets of the Group and the Charity and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

Financial statements are published on the Charity's website in accordance with legislation in the United Kingdom governing preparation and dissemination of financial statements, which may vary from legislation in other jurisdictions. The maintenance and integrity of the Charity's website is the responsibility of the trustees. The Trustees' responsibility also extends to the ongoing integrity of the financial statements contained therein.

Approved by order of the members of the board of Trustees and signed on their behalf by:



SIR JEREMY DARROCH
CHAIR OF BOARD OF TRUSTEES
13 DECEMBER 2023



Equipment developed by our Ocean Technology and Engineering (OTE) department being lowered into the dock

INDEPENDENT AUDITOR'S REPORT

TO THE MEMBERS AND TRUSTEES OF NATIONAL OCEANOGRAPHY CENTRE

OPINION ON THE FINANCIAL STATEMENTS

In our opinion the financial statements:

- give a true and fair view of the state of the Group's and of the Parent Charitable Company's affairs as at 30 September 2023 and of the Group's incoming resources and application of resources and the Parent Charitable Company's incoming resources and application of resources for the year then ended;
- have been properly prepared in accordance with United Kingdom Generally Accepted Accounting Practice; and
- have been prepared in accordance with the requirements of the Company's Act 2006, Charities and Trustee Investment (Scotland) Act 2005 and regulations 6 and 8 of the Charities Accounts (Scotland) Regulations 2006, as amended.

We have audited the financial statements National Oceanography Centre ("the Parent Charitable Company") and its subsidiary ("the Group") for the year ended 30 September 2023 which comprise the consolidated statement of financial activities, the consolidated and charity balance sheets, the consolidated statement of cash flows and notes to the financial statements, including a summary of significant accounting policies. The financial reporting framework that has been applied in their preparation is applicable law and United Kingdom Accounting Standards, including Financial Reporting Standard 102 The Financial Reporting Standard applicable in the UK and Republic of Ireland (United Kingdom Generally Accepted Accounting Practice).

BASIS FOR OPINION

We conducted our audit in accordance with International Standards on Auditing (UK) (ISAs (UK)) and applicable law. Our responsibilities under those standards are further described in the Auditor's responsibilities for the audit of the financial statements section of our report. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

INDEPENDENCE

We are independent of the Group and the Parent Charitable Company in accordance with the ethical requirements that are relevant to our audit of the financial statements in the UK, including the FRC's Ethical Standard, and we have fulfilled our other ethical responsibilities in accordance with these requirements.

CONCLUSIONS RELATING TO GOING CONCERN

In auditing the financial statements, we have concluded that the Trustees' use of the going concern basis of accounting in the preparation of the financial statements is appropriate.

Based on the work we have performed, we have not identified any material uncertainties relating to events or conditions that, individually or collectively, may cast significant doubt on the Group and the Parent Charitable Company's ability to continue as a going concern for a period of at least twelve months from when the financial statements are authorised for issue.

Our responsibilities and the responsibilities of the Trustees with respect to going concern are described in the relevant sections of this report.

OTHER INFORMATION

The Trustees are responsible for the other information. The other information comprises the information included in the Annual Report & financial statements, other than the financial statements and our auditor's report thereon. Our opinion on the financial statements does not cover the other information and, except to the extent otherwise explicitly stated in our report, we do not express any form of assurance conclusion thereon. Our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the course of the audit, or otherwise appears to be materially misstated. If we identify such material inconsistencies or apparent material misstatements, we are required to determine whether this gives rise to a material misstatement in the financial statements themselves. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact.

We have nothing to report in this regard.

OTHER COMPANIES ACT 2006 REPORTING

In our opinion, based on the work undertaken in the course of the audit:

- the information given in the Trustees' Report, which includes the Directors' Report and the Strategic report prepared for the purposes of Company Law, for the financial year for which the financial statements are prepared is consistent with the financial statements; and

- the Strategic report and the Directors' Report, which are included in the Trustees' Report, have been prepared in accordance with applicable legal requirements.

In the light of the knowledge and understanding of the Group and the Parent Charitable Company and its environment obtained in the course of the audit, we have not identified material misstatement in the Strategic report or the Trustees' report.

We have nothing to report in respect of the following matters in relation to which the Companies Act 2006 and the Charities Accounts (Scotland) Regulations 2005 requires us to report to you if, in our opinion:

- proper and adequate accounting records have not been kept by the Parent Charitable Company, or returns adequate for our audit have not been received from branches not visited by us; or
- the Parent Charitable Company financial statements are not in agreement with the accounting records and returns; or
- certain disclosures of Directors' remuneration specified by law are not made; or
- we have not received all the information and explanations we require for our audit.

RESPONSIBILITIES OF TRUSTEES

As explained more fully in the Trustees' responsibilities statement, the Trustees (who are also the directors of the charitable company for the purposes of company law) are responsible for the preparation of the financial statements and for being satisfied that they give a true and fair view, and for such internal control as the Trustees determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the Trustees are responsible for assessing the Group's and the Parent Charitable Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the Trustees either intend to liquidate the Group or the Parent Charitable Company or to cease operations, or have no realistic alternative but to do so.

AUDITOR'S RESPONSIBILITIES FOR THE AUDIT OF THE FINANCIAL STATEMENTS

We have been appointed as auditor under 44(1)(c) of the Charities and Trustee Investment (Scotland) Act 2005 and the Companies Act 2006 and report in accordance with the Acts and relevant regulations made or having effect thereunder.

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. 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.

EXTENT TO WHICH THE AUDIT WAS CAPABLE OF DETECTING IRREGULARITIES, INCLUDING FRAUD

Irregularities, including fraud, are instances of non-compliance with laws and regulations. We design procedures in line with our responsibilities, outlined above, to detect material misstatements in respect of irregularities, including fraud. The extent to which our procedures are capable of detecting irregularities, including fraud is detailed below:

NON-COMPLIANCE WITH LAWS AND REGULATIONS

Based on:

- Our understanding of the Group and Charitable Company and the sector in which it operates;
- Discussion with management and those charged with governance;
- Obtaining and understanding of the Group's and Charitable Company's policies and procedures regarding compliance with laws and regulations; and

We considered the significant laws and regulations to be the Companies Act 2006, Charity regulations in England and Scotland and UK tax legislation.

The Group and Charitable company is also subject to laws and regulations where the consequence of non-compliance could have a material effect on the amount or disclosures in the financial statements, for example through the imposition of fines or litigations. We identified such laws and regulations to be the health and safety legislation.

Our procedures in respect of the above included:

- Review of minutes of meeting of those charged with governance for any instances of non-compliance with laws and regulations;
- Review of correspondence with tax authorities for any instances of non-compliance with laws and regulations;
- Review of financial statement disclosures and agreeing to supporting documentation;

FRAUD

We assessed the susceptibility of the financial statements to material misstatement, including fraud. Our risk assessment procedures included:

- Enquiry with management and those charged with governance regarding any known or suspected instances of fraud;
- Obtaining an understanding of the Group and the Charitable Company's policies and procedures relating to:
 - Detecting and responding to the risks of fraud; and
 - Internal controls established to mitigate risks related to fraud.
- Review of minutes of meeting of those charged with governance for any known or suspected instances of fraud;
- Discussion amongst the engagement team as to how and where fraud might occur in the financial statements;
- Performing analytical procedures to identify any unusual or unexpected relationships that may indicate risks of material misstatement due to fraud;

Based on our risk assessment, we considered the areas most susceptible to fraud to be the posting of inappropriate journal entries to manipulate financial results, particularly in relation to recording revenue in the correct period.

Our procedures in respect of the above included:

- Testing a sample of journal entries throughout the year, which met a defined risk criteria, by agreeing to supporting documentation;

We also communicated relevant identified laws and regulations and potential fraud risks to all engagement team members who were all deemed to have appropriate competence and capabilities and remained alert to any indications of fraud or non-compliance with laws and regulations throughout the audit.

Our audit procedures were designed to respond to risks of material misstatement in the financial statements, recognising that the risk of not detecting a material misstatement due to fraud is higher than the risk of not detecting one resulting from error, as fraud may involve deliberate concealment by, for example, forgery, misrepresentations or through collusion. There are inherent limitations in the audit procedures performed and the further removed non-compliance with laws and regulations is from the events and transactions reflected in the financial statements, the less likely we are to become aware of it.

A further description of our responsibilities for the audit of the financial statements is located at the Financial Reporting Council's ("FRC's") website at:

<https://www.frc.org.uk/auditorsresponsibilities>. This description forms part of our auditor's report.

USE OF OUR REPORT

This report is made solely to the Charitable Company's members, as a body, in accordance with Chapter 3 of Part 16 of the Companies Act 2006. Our audit work has been undertaken so that we might state to the Charitable Company's members those matters we are required to state to them in an auditor's report and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the Charitable Company, the Charitable Company's members as a body, for our audit work, for this report, or for the opinions we have formed.

DocuSigned by:

David I Anson

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**DAVID I'ANSON (SENIOR STATUTORY AUDITOR)
FOR AND ON BEHALF OF BDO LLP, STATUTORY AUDITOR
SOUTHAMPTON, UK
19 DECEMBER 2023**

BDO LLP is a limited liability partnership registered in England and Wales (with registered number OC305127).

CONSOLIDATED STATEMENT OF FINANCIAL ACTIVITIES

FOR THE YEAR ENDED 30 SEPTEMBER 2023 INCORPORATING AN INCOME & EXPENDITURE ACCOUNT

	NOTE	UNRESTRICTED FUNDS £'000	RESTRICTED FUNDS £'000	RESTRICTED FIXED ASSET FUNDS £'000	TOTAL 2023 £'000
INCOME FROM:					
Donations, grants and legacies	1	50,889	24,513	308	75,710
Income from trading subsidiary	10	2,623	-	-	2,623
Other trading activities	2	6,356	24	-	6,380
Investments	3	444	-	-	444
Other		244	-	-	244
Total incoming resources		60,556	24,537	308	85,401
EXPENDITURE ON:					
Expenditure	10	2,628	-	-	2,628
Charitable activities	4	53,566	25,326	3,682	82,574
Total expenditure		56,194	25,326	3,682	85,202
Net income/ (expenditure)		4,362	(789)	(3,374)	199
Transfers between funds	15	(2,027)	2,200	135	-
Net movement in funds	15	2,027	1,411	(3,239)	199
RECONCILIATION OF FUNDS:					
Fund balances at beginning of year	15	15,622	1,139	10,313	27,074
Net movement in funds		2,027	1,411	(3,239)	199
Total fund balances at 30 September 2023	15	17,649	2,550	7,074	27,273

The notes on pages 115-128 form part of these financial statements.

FOR COMPARATIVE PURPOSES – FINANCIAL PERFORMANCE FOR THE PRIOR FINANCIAL YEAR

	NOTE	UNRESTRICTED FUNDS £'000	RESTRICTED FUNDS £'000	RESTRICTED FIXED ASSET FUNDS £'000	TOTAL 2022 £'000
INCOME FROM:					
Donations, grants and legacies	1	36,495	29,100	7,563	73,158
Income from trading subsidiary	10	1,122	-	-	1,122
Other trading activities	2	4,215	92	-	4,307
Investments	3	18	-	-	18
Other		110	2	-	112
Total incoming resources		41,960	29,194	7,563	78,717
EXPENDITURE ON:					
Expenditure	10	1,158	-	-	1,158
Charitable activities	4	40,198	27,471	5,266	72,935
Total expenditure		41,356	27,471	5,266	74,093
Net income/ (expenditure)		604	1,723	2,297	4,624
Transfers between funds	15	5,902	(2,535)	(3,378)	(11)
Net movement in funds	15	6,506	(812)	(1,081)	4,613
RECONCILIATION OF FUNDS:					
Fund balances at beginning of year (as restated)	15	9,116	1,951	11,394	22,461
Net movement in funds		6,506	(812)	(1,081)	4,613
Total fund balances at 30 September 2022	15	15,622	1,139	10,313	27,074

All amounts are derived from continuing activities during the above two periods. The consolidated statement of financial activities includes all gains and losses recognised in the year.

The notes on pages 115-128 form part of these financial statements.

CONSOLIDATED BALANCE SHEET

AT 30 SEPTEMBER 2023

	NOTE	2023 £'000	2023 £'000	2022 £'000	2022 £'000
COMPANY NUMBER: 11444362					
FIXED ASSETS					
Intangible assets	8		1		45
Tangible assets	9		14,411		15,645
			14,412		15,690
CURRENT ASSETS					
Investments	10	4,000		-	
Stocks	11	553		583	
Debtors	12	13,527		16,639	
Cash at bank and in hand	17	33,347		43,243	
		51,427		60,465	
Creditors: amounts falling due within one year	13	(38,566)		(49,081)	
Net current assets			12,861		11,384
Net assets	16		27,273		27,074
FUNDS					
Unrestricted	15		17,649		15,622
Restricted	15		2,550		1,139
Restricted fixed asset	15		7,074		10,313
Total funds	15, 21		27,273		27,074

The financial statements were approved and authorised for issue by the Trustees and signed on their behalf by:



SIR JEREMY DARROCH
CHAIR OF BOARD OF TRUSTEES
13 DECEMBER 2023

The notes on pages 115-128 form part of these financial statements.

CHARITY BALANCE SHEET

AT 30 SEPTEMBER 2023

	NOTE	2023 £'000	2023 £'000	2022 £'000	2022 £'000
COMPANY NUMBER: 11444362					
FIXED ASSETS					
Intangible assets	8		1		45
Tangible assets	9		14,390		15,598
			14,391		15,643
CURRENT ASSETS					
Investments	10	4,000		-	
Stocks	11	553		583	
Debtors	12	13,457		17,773	
Cash at bank and in hand	17	32,681		41,853	
		50,691		60,209	
Creditors: amounts falling due within one year	13	(37,671)		(48,645)	
Net current assets			13,020		11,564
Net assets	16		27,411		27,207
FUNDS					
Unrestricted	15		17,787		15,755
Restricted	15		2,550		1,139
Restricted fixed asset	15		7,074		10,313
Total funds	15		27,411		27,207

As permitted by S408 of the Companies Act 2009, the Charity has not presented its own income and expenditure account and related notes. The Charity's surplus for the year was £204k (2022: surplus £4,662k).

The financial statements were approved and authorised for issue by the Trustees and signed on their behalf by:



SIR JEREMY DARROCH
CHAIR OF BOARD OF TRUSTEES
13 DECEMBER 2023

The notes on pages 115-128 form part of these financial statements.

CONSOLIDATED STATEMENT OF CASH FLOWS

	NOTE	2023 £'000	2022 £'000
CASH FLOWS FROM OPERATING ACTIVITIES			
Net income for the year:		199	4,624
Depreciation charges	9	4,302	4,737
Amortisation charges	8	44	529
Loss on disposal of equipment		340	109
Investment income	3	(444)	(18)
Decrease/ (increase) in stocks	11	30	(95)
Decrease in debtors	12	3,112	14,016
Decrease in creditors	13	(10,515)	(19,002)
Net cash (used in)/ provided by operating activities		(2,932)	4,900
CASH FLOWS FROM INVESTING ACTIVITIES			
Investment income	3	444	18
Proceeds from sale of tangible assets		16	-
Increase in cash deposits > 30 days		(4,000)	-
Purchase of tangible assets	9	(3,424)	(4,535)
Net cash used in investing activities		(6,964)	(4,517)
(Decrease)/ increase in cash and cash equivalents in the year		(9,896)	383
Cash and cash equivalents at the beginning of the year	17	43,243	42,860
Cash and cash equivalents at the end of the year	17	33,347	43,243

A net debt reconciliation has not been prepared as the Group does not have any debt.

The notes on pages 115-128 form part of these financial statements.

NOTES TO THE FINANCIAL STATEMENTS

COMPANY AND CHARITABLE STATUS

National Oceanography Centre, a public benefit entity, is incorporated in England and Wales as a company limited by guarantee not having share capital. There are currently seven Trustees who are also the members of the company. Each member has undertaken to contribute to the assets in the event of winding up a sum not exceeding £1. National Oceanography Centre is a registered charity. The registered office and charity registration numbers are given on **PAGE 93**.

The financial statements have been prepared in accordance with the Charities SORP Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) (effective 1 January 2019), the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) and the Companies Act 2006.

The preparation of financial statements in compliance with FRS 102 requires the use of certain critical accounting estimates. It also requires management to exercise judgement in applying the Group's accounting policies.

The following principal accounting policies have been applied consistently:

BASIS OF CONSOLIDATION

The Consolidated Statement of Financial Activities (SOFA) and Consolidated Balance Sheet consolidate the financial statements of the Company and its subsidiary undertaking. The results of the subsidiary are consolidated on a line-by-line basis.

The Parent Charitable Company has taken advantage of the exemption allowed under section 408 of the Companies Act 2006 and has not presented its own Statement of Financial Activities in these financial statements.

EXEMPTIONS FOR QUALIFYING ENTITIES UNDER FRS 102

The Parent Charitable Company has taken advantage of the following disclosure exemptions available in FRS 102:

- from preparing a statement of cash flows;
- from financial instruments disclosures; and
- from the aggregate remuneration of the key management personnel as their remuneration is included in the totals for the group as a whole.

GOING CONCERN

The Trustees have reviewed whether it is appropriate for the financial statements to be prepared on a going concern basis.

In assessing the ability of the NOC to continue as a going concern management have considered the future pipeline of income and costs to build a bottom up budget for the Financial Years (FY) 2024 – 2026. The income for FY24 is anticipated to be greater than the current year due to an extra award of National Capability and a strong pipeline of commercial opportunities which are highly likely to materialise. This profile of income is expected to continue cross the three-year period. The Large Research Infrastructure funding went through a mid-term commission review and NERC have agreed a funding approach for the next 4 years. The resource required for projects is covered by funded projects. Detailed resource planning is in place to inform recruitment with plans to continue to grow across FY24 -26.

Taking into consideration, signed Awards for National Capability infrastructure and science facilities and services, current indications of recommissioning for National Capability Science, previous success rates in research grant rounds with sustained bid submission and forecast of future income based on a strong commercial pipeline, indications are that NOC can continue to cover its managed cost base over the coming three-year period.

In conclusion there are no material uncertainties to cast doubt on NOC's ability to continue as a going concern.

INCOME

All income is recognised once the Group has entitlement to the income, it is probable that the income will be received, and the amount of income receivable can be measured reliably.

Grants are included in the Consolidated Statement of Financial Activities on a receivable basis. The balance of income received for specific purposes but not expended during the year is shown in the relevant funds on the Balance Sheet. Where income is received in advance of entitlement of receipt, its recognition is deferred and included in creditors as deferred income. Where entitlement occurs before income is received, the income is accrued. Donations and grants for particular purposes are included in income as restricted funds.

Donated fixed assets are measured at fair value, unless it is impractical to measure this reliably, in which case the cost of the item to the donor is used. The gain is

recognised as income from donations and a corresponding amount is included in the appropriate fixed asset class and depreciated over the useful economic life, in accordance with the Group's accounting policies.

Investment income relates to interest on funds held on deposit and is included when receivable and the amount can be measured reliably by the Group; this is normally upon notification of the interest paid or payable by the institution with whom the funds are deposited.

Incoming resources from charitable trading activity are accounted for when earned.

Where a contract for services is performed gradually over time the revenue is recognised as the activity progresses. The amount of revenue reflects the costs incurred up to the balance sheet date.

EXPENDITURE

Expenditure is recognised once there is a legal or constructive obligation to transfer economic benefit to a third party, it is probable that a transfer of economic benefits will be required in settlement and the amount of the obligation can be measured reliably.

Expenditure is classified by activity. The costs of each activity are made up of the total of direct costs and shared costs, including support costs involved in undertaking each activity.

Direct costs attributable to a single activity are allocated directly to that activity. Shared costs which contribute to more than one activity and support costs which are not attributable to a single activity are apportioned between those activities on a basis consistent with the use of resources. Central staff costs are allocated on the basis of time spent, and depreciation charges allocated on the portion of the asset's use.

Expenditure on raising funds includes all expenditure incurred by the Group to raise funds for its charitable purposes and includes costs of all fundraising activities events and non-charitable trading.

Expenditure on charitable activities is incurred on directly undertaking the activities which further the Group's objectives, as well as any associated support costs.

Governance costs include those incurred in the governance of the Charity and its assets and are primarily associated with constitutional and statutory requirements.

FOREIGN CURRENCIES

The financial statements are prepared in Sterling, which is the functional currency

of the Group. Monetary amounts in these financial statements are rounded to the nearest thousand pounds.

Monetary assets and liabilities denominated in foreign currencies are translated into sterling at rates of exchange ruling at the reporting date.

Transactions in foreign currencies are translated into sterling at the rate ruling on the date of the transaction.

Exchange gains and losses are recognised in the Consolidated Statement of Financial Activities.

INTANGIBLE ASSETS AND AMORTISATION

Intangible assets are capitalised and recognised when future economic benefits are probable, and the cost or value of the asset can be measured reliably.

Intangible assets are initially recognised at cost. After recognition, under the cost model, intangible assets are measured at cost less any accumulated amortisation and any accumulated impairment losses.

At each reporting date the Charity assesses whether there is any indication of impairment. If such indication exists, the recoverable amount of the asset is determined to be the higher of its fair value less costs to sell and its value in use. An impairment loss is recognised where the carrying amount exceeds the recoverable amount.

Amortisation is provided on intangible assets at rates calculated to write off the cost of each asset on a straight-line basis over its expected useful life.

The estimated useful lives are as follows:

Computer software - 5 years straight line

TANGIBLE FIXED ASSETS AND DEPRECIATION

Tangible fixed assets are capitalised and recognised when future economic benefits are probable, and the cost or value of the asset can be measured reliably.

Tangible fixed assets are initially recognised at cost. After recognition, under the cost model, tangible fixed assets are measured at cost less accumulated depreciation and any accumulated impairment losses. All costs incurred to bring a tangible fixed asset into its intended working condition should be included in the measurement of cost.

Assets in the course of construction are included at costs incurred to date. Depreciation on these assets is not charged until they are brought into use.

At each reporting date the Charity assesses whether there is any indication of impairment. If such indication exists, the recoverable amount of the asset is determined to be the higher of its fair value less costs to sell and its value in use. An impairment loss is recognised where the carrying amount exceeds the recoverable amount.

Depreciation is charged on a straight-line basis over their estimated useful lives.

Depreciation is provided on the following bases;

Scientific equipment - 5 years

Marine pool - 5 years

Fixtures and fittings - 5 years

Computer equipment - 3 years

Plant and machinery - 5 years

The assets' residual values, useful lives and depreciation methods are reviewed, and adjusted prospectively if appropriate, or if there is an indication of a significant change since the last reporting date.

Gains and losses on disposals are determined by comparing the proceeds with the carrying amount and are recognised in the Consolidated Statement of Financial Activities.

INVESTMENTS

Investments in subsidiaries are valued at cost less provision for impairment. Included in investments are deposits that do not classify as cash and cash equivalents, these are presented as short-term investments.

STOCKS

Stocks comprise of fuel held in storage for vessels and ship bond stock. Fuel stock is recorded at cost. Ship bond stock is valued at the lower of cost and net realisable value after making due allowance for obsolete and slow-moving stocks.

DEBTORS

Trade and other debtors are recognised at the settlement amount after any trade discount offered. Prepayments are valued at the amount prepaid net of any trade discounts due.

Work in progress reflects the costs incurred to balance sheet date on a contract for services.

CASH AND CASH EQUIVALENTS

Cash at bank and in hand includes cash on hand and on demand deposit accounts. Cash equivalents are short term highly liquid investments with a short maturity of three months or less from the date of acquisition or opening of the deposit or similar account.

LIABILITIES AND PROVISIONS

Liabilities and provisions are recognised when there is an obligation at the reporting date as a result of a past event, it is probable that a transfer of economic benefit will be required in settlement, and the amount of the settlement can be estimated reliably.

Liabilities are recognised at the amount that the Group anticipates it will pay to settle the debt or the amount it has received as advanced payments for the goods or services it must provide.

Provisions are initially measured at the best estimate of the amount required to settle the obligation at the reporting date and subsequently reviewed at each reporting date and adjusted to reflect the current best estimate of the amount that would be required to settle the obligation. Any adjustments to provision previously recognised are recognised as surplus or expenditure in the statement of financial activities.

FINANCIAL INSTRUMENTS

The Group only has financial assets and financial liabilities of a kind that qualify as basic financial instruments. Basic financial instruments are initially recognised at transaction value and subsequently measured at their settlement value with the exception of bank loans which are subsequently measured at amortised cost using the effective interest method.

LEASES

Rentals paid under operating leases are charged to the Consolidated Statement of Financial Activities on a straight-line basis over the lease term. The organisation has not entered into any finance leases.

PENSIONS

The Group operates a defined contribution pension scheme, and the pension charge represents the amounts payable by the Group to the fund in respect of the year.

The Group is also participating in a multi-employer plan with the National Environmental Research Council which is a defined benefit scheme funded from annual grant

in aid on a pay as you go basis. It is not possible for the Group to obtain sufficient information to enable it to account for the plan as a defined benefit plan, it therefore accounts for the plan as a defined contribution plan.

National Oceanography Centre, as a registered charity, is exempt from corporation tax to the extent that surpluses are applied to its charitable activities. No corporation tax charge arises in the charity's subsidiary due to its policy of gifting all taxable profits to National Oceanography Centre each year.

Irrecoverable VAT is charged against the category of total expenditure for which it was incurred.

TAXATION

National Oceanography Centre, as a registered charity, is exempt from corporation tax to the extent that surpluses are applied to its charitable activities. No corporation tax charge arises in the charity's subsidiary due to its policy of gifting all taxable profits to National Oceanography Centre each year.

Irrecoverable VAT is charged against the category of total expenditure for which it was incurred.

FUND ACCOUNTING

General funds are unrestricted funds which are available for use at the discretion of the Trustees in furtherance of the general objectives of the Group and which have not been designated for other purposes.

Designated funds comprise unrestricted funds that have been set aside by the Trustees for particular purposes. The aim and use of each designated fund is set out in the notes to the financial statements.

Restricted funds are funds which are to be used in accordance with specific restrictions imposed by donors or which have been raised by the Group for particular purposes. The costs of raising and administering such funds are charged against the specific fund. The aim and use of each restricted fund is set out in the notes to the financial statements.

Restricted fixed asset funds are funds for the sole use of acquiring the moveable assets of NOC on the 1 November 2019 and the expenditure is the subsequent depreciation of these assets.

Investment income, gains and losses are allocated to the appropriate fund.

GIFT AID DONATIONS MADE TO THE CHARITY

Donations made by the subsidiary to the Parent Charity are recognised as income in the charity either when paid or at the date when the subsidiary has a legal liability to make the donation payment if earlier.

RESEARCH VESSELS

NOC operates and manages two research vessels owned by UKRI under a bareboat charter at peppercorn rates. The terms of the bareboat charter do not meet the definition of a lease and, due to the unique nature of the vessels, it is not possible to reasonably quantify the value ascribed to the ownership and operation of them.

CRITICAL ACCOUNTING ESTIMATES AND AREAS OF JUDGEMENT

Estimates and judgements are continually evaluated and are based on historical experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances.

CRITICAL ACCOUNTING ESTIMATES AND ASSUMPTIONS

The Group makes estimates and assumptions concerning the future. The resulting accounting estimates and assumptions will, by definition, seldom equal the related actual results. The estimates and assumptions that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year are discussed below.

CRITICAL AREAS OF JUDGEMENT

Depreciation is a key estimate in the accounts which requires management judgement over the useful life of the assets and the residual values. The policy has been set out in the notes above.

1 INCOME FROM DONATIONS, GRANTS AND LEGACIES

	UNRESTRICTED FUNDS 2023	RESTRICTED FUNDS 2023	RESTRICTED FIXED ASSET FUNDS 2023	TOTAL FUNDS 2023	TOTAL FUNDS 2022
	£'000	£'000	£'000	£'000	£'000
DONATIONS					
Other donations	1	50	-	51	19
	1	50	-	51	19
INCOME FROM GRANTS					
UKRI NERC grant	26,484	24,048	293	50,825	57,636
UKRI other grants	10,464	323	-	10,787	6,350
Other grants	13,940	92	15	14,047	9,153
	50,888	24,463	308	75,659	73,139
	50,889	24,513	308	75,710	73,158

2 INCOME FROM OTHER TRADING ACTIVITIES

	UNRESTRICTED FUNDS 2023	RESTRICTED FUNDS 2023	TOTAL FUNDS 2023	TOTAL FUNDS 2022
	£'000	£'000	£'000	£'000
Rental	1,300	-	1,300	1,767
Disbursements	1,909	-	1,909	1,025
Maintenance and repairs income	3,062	24	3,086	1,423
Bond sales	66	-	66	51
Ship charter income	19	-	19	41
Other trading income	16	25	41	25
	6,356	24	6,380	4,307

3 INVESTMENT INCOME

	UNRESTRICTED FUNDS 2023	TOTAL FUNDS 2023	TOTAL FUNDS 2022
	£'000	£'000	£'000
Bank interest	444	444	18

4 EXPENDITURE ON CHARITABLE ACTIVITIES

	STAFF COSTS 2023	VESSEL COSTS 2023	RESEARCH COSTS 2023	ESTATE COSTS 2023	DEPRECIATION 2023	OTHER COSTS 2023	TOTAL 2023	TOTAL 2022
	£'000	£'000	£'000	£'000	£'000	£'000	£'000	£'000
ACTIVITIES UNDERTAKEN DIRECTLY								
Scientific research	27,372	14,665	3,428	554	3,760	11,196	60,974	51,543
Support costs:								
- Operations & finance staff	10,630	-	-	-	-	-	10,630	10,181
- Management, operations & facilities costs	-	-	-	3,892	-	5,993	9,885	9,729
- Depreciation	-	-	-	-	560	-	560	1,229
- Governance costs	-	-	-	-	-	524	524	253
	38,002	14,665	3,428	4,446	4,320	17,713	82,574	72,935

Total expenditure on charitable activities for the year was £82,574k (2022: £72,935k). Of that expenditure £53,566k (2022: £40,198k) was unrestricted, £25,326k (2022: £27,471k) was restricted and £3,682k (2022: £5,266k) was restricted fixed asset funds.

	TOTAL FUNDS 2023	TOTAL FUNDS 2022
	£'000	£'000
ANALYSIS OF GOVERNANCE COSTS		
Fees payable to the charity's auditor (inclusive of VAT):		
- The audit of the charity's financial statements	113	98
- The audit of the charity's subsidiary pursuant to legislation	12	-
- Tax advisory services	178	28
Trustee remuneration and expenses (Note 7)	8	9
Legal and professional fees	200	102
Finance costs	13	16
	524	253

5 TOTAL EXPENDITURE

	2023	2022
	£'000	£'000
TOTAL EXPENDITURE INCLUDES:		
Depreciation of tangible fixed assets	4,302	4,737
Amortisation of intangible fixed assets	44	529
Loss on disposal	340	109
Operating lease charges	1,500	1,500
Loss/ (Gain) on foreign exchange	288	(173)

6 STAFF COSTS

	2023	2022
GROUP AND CHARITY	£'000	£'000
Wages and salaries	30,337	27,556
National insurance contributions	3,219	2,871
Pension costs	4,446	4,628
	38,002	35,055

During the year there were redundancy costs of £61k (2022: £378k) which were paid to 9 (2022: 23) members of staff. Of these 2 (2022: 14) were statutory redundancy pay and 7 (2022: 14) were severance pay.

The average number of employees for the year was as follows:

	2023	2022
GROUP AND CHARITY	NUMBER	NUMBER
Science and research staff	266	237
Fundraising staff	2	4
Operations and finance staff	207	201
Engineers and technicians	112	119
Mariners	86	86
	673	647

All staff are employed by the charity. No staff are employed directly by the subsidiary entity.

The number of employees whose employee benefits (excluding employer pension costs and National Insurance) exceeded £60,000 was:

	2023	2022
	NUMBER	NUMBER
£60,001 - £70,000	46	28
£70,001 - £80,000	19	10
£80,001 - £90,000	5	5
£90,001 - £100,000	3	1
£100,001 - £110,000	1	-
£110,001 - £120,000	-	2
£120,001 - £130,000	1	-
£130,001 - £140,000	1	-
£140,001 - £150,000	-	1
	2023	2022
	£'000	£'000

Key management personnel salaries (inc. employer pension contributions and employers National Insurance) (Key management personnel are the Senior Management Team, as set out on **PAGE 89** of this report)

	2023	2022
	£'000	£'000
	539	438

7 TRUSTEES' REMUNERATION AND EXPENSES

During the year, one Trustee (David John Gee) received £8k (2022: £9k) in relation to remuneration or other benefits.

The remuneration was agreed and provided under a provision in the governing document of the Charity. Remuneration was provided due to the Trustees' role as the Chair of the Audit and Risk Committee, which requires a range of specialist knowledge and experience and has a wide remit in terms of the role that the Trustee is required to provide. No other benefits were provided.

During the year ended 30 September 2023, one Trustee was reimbursed £0.5k (2022: one Trustee received £0.5k) for expenses in relation to travel and subsistence.

During the year indemnity insurance of £78k (2022: £47k) was purchased in respect of all the Trustees and Officers of the Charity.

8 INTANGIBLE ASSETS

COMPUTER SOFTWARE AND TOTAL

GROUP AND CHARITY	£'000
COST	
At 1 October 2022	1,609
Additions	-
At 30 September 2023	1,609
AMORTISATION	
At 1 October 2022	1,564
Charge for the year	44
At 30 September 2023	1,608
NET BOOK VALUE	
At 30 September 2023	1
At 30 September 2022	45

9 TANGIBLE FIXED ASSETS

GROUP	SCIENTIFIC EQUIPMENT £'000	MARINE POOL £'000	FIXTURES & FITTINGS £'000	COMPUTER EQUIPMENT £'000	PLANT & MACHINERY £'000	TOTAL £'000
COST OR VALUATION						
At 1 October 2022	18,485	9,441	47	2,082	2,286	32,341
Additions	1,482	1,897	-	359	(314)	3,424
Disposals	(1,154)	(16)	-	-	(78)	(1,248)
At 30 September 2023	18,813	11,322	47	2,441	1,894	34,517
DEPRECIATION						
At 1 October 2022	10,160	4,020	-	1,137	1,379	16,696
Charge for the year	2,537	1,223	26	211	305	4,302
On disposals	(811)	(8)	-	-	(73)	(892)
At 30 September 2023	11,886	5,235	26	1,348	1,611	20,106
NET BOOK VALUE						
At 30 September 2023	6,927	6,087	21	1,093	283	14,411
At 30 September 2022	8,325	5,421	47	945	907	15,645

9 TANGIBLE FIXED ASSETS (CONTINUED)

CHARITY	SCIENTIFIC EQUIPMENT £'000	MARINE POOL £'000	FIXTURES & FITTINGS £'000	COMPUTER EQUIPMENT £'000	PLANT & MACHINERY £'000	TOTAL £'000
COST OR VALUATION						
At 1 October 2022	18,485	9,441	-	2,082	2,286	32,294
Additions	1,482	1,897	-	359	(314)	3,424
Disposals	(1,154)	(16)	-	-	(78)	(1,248)
At 30 September 2023	18,813	11,322	-	2,441	1,894	34,470
DEPRECIATION						
At 1 October 2022	10,160	4,020	-	1,137	1,379	16,696
Charge for the year	2,537	1,223	-	211	305	4,276
On disposals	(811)	(8)	-	-	(73)	(892)
At 30 September 2023	11,886	5,235	-	1,348	1,611	20,080
NET BOOK VALUE						
At 30 September 2023	6,927	6,087	-	1,093	283	14,390
At 30 September 2022	8,325	5,421	-	945	907	15,598

10 INVESTMENTS

INVESTMENT IN SUBSIDIARIES

The following is a subsidiary undertaking of the Charity:

NAME	COMPANY NUMBER	REGISTERED OFFICE OR PRINCIPAL PLACE OF BUSINESS	PRINCIPAL ACTIVITY	CLASS OF SHARES	HOLDING
National Oceanography Centre Innovations Limited	12250763	National Oceanography Centre, European Way, Southampton, UK, SO14 3ZH	Development of products and services based on the output of ocean science research and engineering	Ordinary	100%

	2023 £'000	2022 £'000
Income	2,623	1,122
Expenditure	(2,628)	(1,158)
Net liabilities	(4)	(36)

INVESTMENT IN CASH DEPOSITS

The value of cash deposits held as investment as at 30 September 2023:

	2023 £'000	2022 £'000
Cash Deposits with maturity of more than three months on inception	4,000	-

11 STOCKS

	2023	2022
	£'000	£'000
Marine fuel	501	546
Ship bond	52	37
	<u>553</u>	<u>583</u>

12 DEBTORS

	GROUP 2023	GROUP 2022	CHARITY 2023	CHARITY 2022
	£'000	£'000	£'000	£'000
Trade debtors	4,094	10,705	3,965	10,577
Due from subsidiary company	-	-	216	1,360
Prepayments	1,888	1,505	1,888	1,505
Accrued income	7,180	4,337	7,023	4,239
Other debtors	365	92	365	92
	<u>13,527</u>	<u>16,639</u>	<u>13,457</u>	<u>17,773</u>

13 CREDITORS AMOUNTS FALLING DUE WITHIN ONE YEAR

	GROUP 2023	GROUP 2022	CHARITY 2023	CHARITY 2022
	£'000	£'000	£'000	£'000
Trade creditors	768	1,861	768	1,861
Due to Marine and EU partners	118	3,347	118	3,347
Pension accrual	294	268	294	268
Social security and other taxes	2,228	2,062	2,048	1,851
Accruals	2,532	4,017	2,532	4,007
Deferred income (see note 14)	32,626	37,526	31,911	37,311
	<u>38,566</u>	<u>49,081</u>	<u>37,671</u>	<u>48,645</u>

14 DEFERRED INCOME

	GROUP 2023	GROUP 2022	CHARITY 2023	CHARITY 2022
	£'000	£'000	£'000	£'000
At 1 October	37,526	59,672	37,311	59,655
Released to income	(78,502)	(72,043)	(78,486)	(72,027)
Amounts deferred in year	73,602	49,897	73,086	49,683
Carried forward	<u>32,626</u>	<u>37,526</u>	<u>31,911</u>	<u>37,311</u>

Deferred income relates to grant income, including research grants, which are received in advance of specific conditions being met. The income is shown as deferred until those conditions are fully satisfied.

15 FUNDS

	BALANCE AT 30 SEPTEMBER 2022	INCOME	EXPENDITURE	TRANSFERS	BALANCE AT 30 SEPTEMBER 2023
GROUP	£'000	£'000	£'000	£'000	£'000
UNRESTRICTED FUNDS					
Designated unrestricted:					
Designated funds	-	-	-	3,924	3,924
General unrestricted:					
Unrestricted funds	15,622	60,556	(56,194)	(6,259)	13,725
Total unrestricted funds	<u>15,622</u>	<u>60,556</u>	<u>(56,194)</u>	<u>(2,335)</u>	<u>17,649</u>
RESTRICTED FUNDS					
Restricted funds	1,139	24,537	(25,326)	2,200	2,550
Restricted fixed asset funds	10,313	308	(3,682)	135	7,074
Total restricted funds	<u>11,452</u>	<u>24,845</u>	<u>(29,008)</u>	<u>2,335</u>	<u>9,624</u>
Total funds	<u>27,074</u>	<u>85,401</u>	<u>(85,202)</u>	<u>-</u>	<u>27,273</u>

	BALANCE AT 30 SEPTEMBER 2022	INCOME	EXPENDITURE	TRANSFERS	BALANCE AT 30 SEPTEMBER 2023
CHARITY	£'000	£'000	£'000	£'000	£'000
UNRESTRICTED FUNDS					
Designated unrestricted:					
Designated funds	-	-	-	3,924	3,924
General unrestricted:					
Unrestricted funds	15,755	57,933	(53,566)	(6,259)	13,863
Total unrestricted funds	<u>15,755</u>	<u>57,933</u>	<u>(53,566)</u>	<u>(2,335)</u>	<u>17,787</u>
RESTRICTED FUNDS					
Restricted funds	1,139	24,537	(25,326)	2,200	2,550
Restricted fixed asset funds	10,313	308	(3,682)	135	7,074
Total restricted funds	<u>11,452</u>	<u>24,845</u>	<u>(29,008)</u>	<u>2,335</u>	<u>9,624</u>
Total funds	<u>27,207</u>	<u>82,778</u>	<u>(82,574)</u>	<u>-</u>	<u>27,411</u>

15 FUNDS (CONTINUED)

GROUP	BALANCE AT 30 SEPTEMBER 2021	INCOME	EXPENDITURE	TRANSFERS	BALANCE AT 30 SEPTEMBER 2022
	AS RESTATED				2022
	£'000	£'000	£'000	£'000	£'000
UNRESTRICTED FUNDS					
General unrestricted:					
Unrestricted funds	9,116	41,960	(41,356)	5,902	15,622
Total unrestricted funds	9,116	41,960	(41,356)	5,902	15,622
RESTRICTED FUNDS					
Restricted funds	1,951	29,194	(27,471)	(2,535)	1,139
Restricted fixed asset funds	11,394	7,563	(5,266)	(3,378)	10,313
Total restricted funds	13,345	36,757	(32,737)	(5,913)	11,452
Total funds	22,461	78,717	(74,093)	(11)	27,074
CHARITY					
UNRESTRICTED FUNDS					
General unrestricted:					
Unrestricted funds	9,210	40,838	(40,198)	5,905	15,755
Total unrestricted funds	9,210	40,838	(40,198)	5,905	15,755
RESTRICTED FUNDS					
Restricted funds	1,951	29,194	(27,471)	(2,535)	1,139
Restricted fixed asset funds	11,394	7,563	(5,266)	(3,378)	10,313
Total restricted funds	13,345	36,757	(32,737)	(5,913)	11,452
Total funds	22,555	77,595	(72,935)	(8)	27,207

General funds are unrestricted funds which are available for use at the discretion of the Trustees in furtherance of the general objectives of the Group and which have not been designated for other purposes.

Designated funds comprise unrestricted funds that have been set aside by the Trustees for particular purposes. The designated funds is the surplus earned from revenue generating opportunities to be used to the running of the research ships.

Restricted funds are funds which are to be used in accordance with specific restrictions imposed by donors or which have been raised by the Group for particular purposes. The costs of raising and administering such funds are charged against the specific fund.

Restricted funds comprise of NMF ship operating income, charter income balance and NMEP capital replacement.

Restricted fixed asset funds are the donated funds for the sole use of acquiring the moveable assets of NOC upon independence the 1 November 2019 and the expenditure is the subsequent depreciation of these assets.

16 NET ASSETS

GROUP	FIXED ASSETS 2023	INVESTMENTS 2023	CURRENT ASSETS 2023	CURRENT LIABILITIES 2023	TOTAL 2023
	£'000	£'000	£'000	£'000	£'000
General unrestricted	2,539	-	34,729	(23,543)	13,725
Designated unrestricted	-	-	3,924	-	3,924
Restricted	3,862	-	13,711	(15,023)	2,550
Restricted fixed asset	8,011	-	(937)	-	7,074
	14,412	-	51,427	(38,566)	27,273
CHARITY					
UNRESTRICTED FUNDS					
General unrestricted:					
General unrestricted	47	-	51,435	(35,860)	15,622
Designated unrestricted	-	-	-	-	-
Restricted	5,330	-	9,030	(13,221)	1,139
Restricted fixed asset	10,313	-	-	-	10,313
	14,412	4,000	47,469	(38,658)	27,223
RESTRICTED FUNDS					
Restricted funds	1,951	29,194	(27,471)	(2,535)	1,139
Restricted fixed asset funds	11,394	7,563	(5,266)	(3,378)	10,313
Total restricted funds	13,345	36,757	(32,737)	(5,913)	11,452
Total funds	22,555	77,595	(72,935)	(8)	27,207
CHARITY					
UNRESTRICTED FUNDS					
General unrestricted:					
General unrestricted	-	-	51,179	(35,424)	15,755
Designated unrestricted	-	-	-	-	-
Restricted	5,330	-	9,030	(13,221)	1,139
Restricted fixed asset	10,313	-	-	-	10,313
	15,643	-	60,209	(48,645)	27,207

17 CASH AND CASH EQUIVALENTS

	GROUP 2023	GROUP 2022	CHARITY 2023	CHARITY 2022
	£'000	£'000	£'000	£'000
Cash at bank	21,347	43,243	20,681	41,853
Cash equivalents	12,000	-	12,000	-
	33,347	42,243	32,681	41,853

18 OPERATING LEASE

As at 30 September 2023 the group and charity had future minimum lease payments of:

	GROUP & CHARITY 2023	GROUP & CHARITY 2022
	£'000	£'000
No later than 1 year	1,500	1,500
Between 1 and 5 years	250	1,750
	1,750	3,250

19 PENSION COMMITMENTS

UKRI-NERC employees are entitled to be members of the Research Council's Pension Scheme which is a defined benefit scheme funded from annual grant-in-aid and pay-as-you-go basis. The pension scheme is contributory and is administered by the Research Council's Joint Superannuation Service.

The scheme is a multi-employer scheme, for which a separate Research Council's Pension Scheme account is published. NERC are unable to identify their share of the underlying assets and liabilities and those relating to NOC.

Employees who joined after 1 November 2019 are entitled to be members of the National Oceanography Centre Group Pension Scheme. This is a defined contribution pension scheme administered by Legal and General. Contributions for the year were employer's 10% and employees a minimum of 5%.

The pension costs charge for the year represents contributions payable to the schemes and amounted to £4,446k (2022: £4,628k).

20 RELATED PARTY TRANSACTIONS

The Charity recharged employment costs of £919k (2022: £514k) to National Oceanography Centre Innovations Limited, its subsidiary and also incurred costs of £1,666k (2022: £616k) on behalf of its subsidiary.

At the year end the Charity was owed £216k (2022: £1,360k) by National Oceanography Centre Innovations Limited.

Transactions with Trustees are detailed in note 15.

STAY IN TOUCH

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Cover image: An example of the type of biodiversity found in the Clarion-Clipperton Zone

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