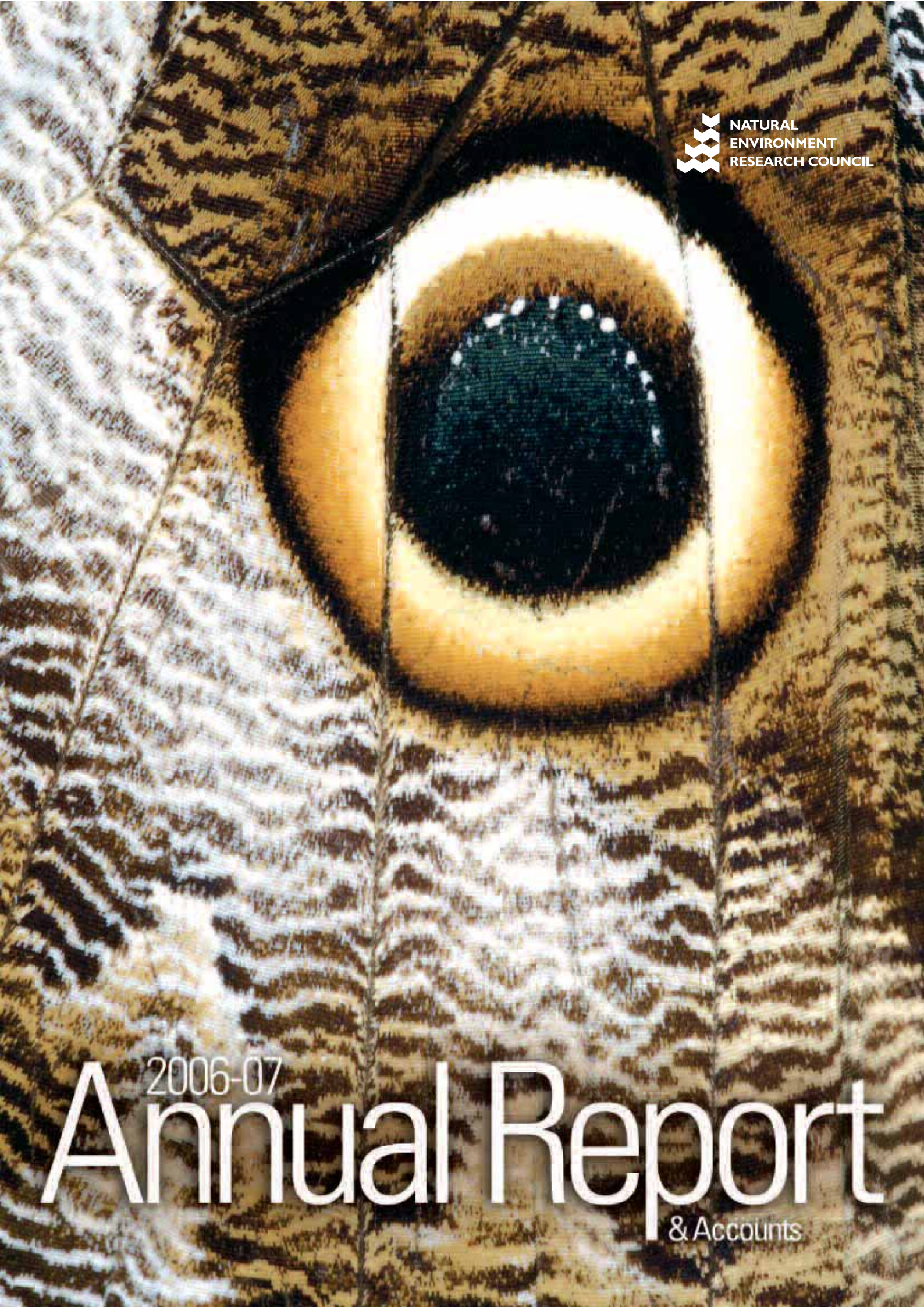

NATURAL ENVIRONMENT RESEARCH COUNCIL

2006-07 Annual Report & Accounts

Contents

Some of the research reported here may not yet have been peer-reviewed or published.

For a list of NERC Council members see page 67. For members of our other committees see our website www.nerc.ac.uk.

The Clear English Standard applies only to pages 1-64

INVESTOR IN PEOPLE

NATURAL ENVIRONMENT RESEARCH COUNCIL

Natural Environment Research Council
Annual Report and Accounts 2006-07

Presented to the Houses of Parliament under the Science and Technology Act 1965, c.4, s.2 (2).
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World-class science: sustainable solutions

About us

This annual report to Parliament describes selected achievements from 1 April 2006 to 31 March 2007. It highlights NERC's progress in delivering our five-year strategy *Science for a sustainable future.* A Delivery Report is presented to the Office of Science and Innovation every year, reporting progress on our deliverables and targets for the three years following Spending Review 2004 and contained in our Delivery Plan and Scorecard. These and other NERC publications are available at www.nerc.ac.uk/publications, or call 01793 411750.

The Natural Environment Research Council uses a budget of around £375 million a year to fund independent environmental research in the United Kingdom. The priorities we agree drive the marine, polar, atmospheric, earth, terrestrial and freshwater science communities.

We train and support a world-class community of environmental scientists.

We run the UK's fleet of research ships and scientific aircraft. We have bases in some of the world's most hostile environments and we invest in satellite technology to monitor environmental change on a global scale.

NERC brings these disciplines together and works with national and international partners towards a common goal: to provide knowledge and solutions to the 21st century's most pressing environmental challenges.

Wholly owned research centres

- British Antarctic Survey (BAS)
- British Geological Survey (BGS)
- Centre for Ecology & Hydrology (CEH)
- Proudman Oceanographic Laboratory (POL)

Collaborative centres 2006-07

- Centre for Population Biology
- National Centre for Atmospheric Science
- National Centre for Earth Observation
  - Centre for Observation of Air-Sea Interactions and Fluxes
  - Centre for Polar Observation and Modelling
  - Centre for Terrestrial Carbon Dynamics
  - Centre for the Observation and Modelling of Earthquakes and Tectonics
  - Climate and Land-Surface Systems Interaction Centre
  - Data Assimilation Research Centre
  - Environmental Systems Science Centre
- National Institute of Environmental eScience
- National Oceanography Centre, Southampton
- Plymouth Marine Laboratory
- Scottish Association for Marine Science
- Sea Mammal Research Unit
- Tyndall Centre for Climate Change Research

A large proportion of our budget funds research in universities throughout the UK.

Our many facilities and data centres support our staff and grant-holders.

See www.nerc.ac.uk

Top science highlights

Philip Taylor/CSF

Science Photo Library

Volcanic eruption sheds light on climate uncertainties
A major volcanic eruption has shown scientists just what happens to water vapour, clouds and the Earth's radiation balance when the climate system is disturbed. Page 13.

Spring advances across Europe
Spring arrives six to eight days earlier across Europe according to researchers who analysed 125,000 datasets across 27 countries. Page 12.

Bacteria demoted in the nitrogen cycle
Microscopic life forms known as archaea, thought to exist mainly in extreme environments, have been discovered to outnumber bacteria in an important step in the cycling of nitrogen in soils. Page 7.

Potential environmental risk of pandemic drug
Tamiflu, the antiviral flu drug recommended for avian flu in humans, could cause serious environmental pollution and encourage a new strain of virus to develop, if widely used. Page 19.

Desert storm
Scientists have quantified the influence of Saharan dust storms on the Earth's radiation balance. Page 11.

Stronger winds warming Antarctica?
Stronger winds, believed to be as a consequence of climate change, are driving more heat towards Antarctica, suggest researchers. Page 13.

Towards a unified theory of Southern Ocean ecology
The world's most powerful ocean current dominates life around Antarctica according to two decades of detailed research of the component parts of the Southern Ocean ecosystem. Page 7.

Virus causes coral bleaching
A virus that kills algae on coral reefs may be causing widespread bleaching. Page 8.

Walking with dinosaurs?
A 'tree of life' tracing the history of all 4500 mammal species on Earth shows that today's mammal diversity was not caused by the extinction of the dinosaurs 65 million years ago. Page 7.

Wild flowers increase hay yield
Growing hay meadows with many wild flower species boosts hay yields by 40 percent compared with growing just a few types of agricultural grasses, showing that biodiversity has an important economic role for humans. Page 16.

The year in review

Environmental research made the headlines in a big way this year. The value of this research to the UK economy was demonstrated repeatedly in a series of major reports. With our new stategy, NERC and partners are now putting in place the systems needed to provide solutions to the environmental challenges facing the UK in the coming decades.

This has been an important year for environmental research in the UK. The science has never had such a high profile. Two globally significant reports featured important inputs from scientists employed or funded by us: the Stern Review on the economics of climate change and the Intergovernmental Panel on Climate Change Fourth Assessment Report.

These reports pinpoint the scientific advances in climate change research as well as the remaining uncertainties. These and other authoritative reports, inform our new strategy *Next Generation Science for Planet Earth*, which we have been developing this year and, after external consultation, will unveil in the autumn. This sets out our science and organisational goals for the next five years. Examples of major new initiatives include *Oceans 2025*, our strategic marine science research programme and *Living with Environmental Change* (LWEC). We are developing LWEC, which will bring together a wide panorama of multidisciplinary science, with partners across research councils, government departments and industry.

During this year two major international projects were launched: International Polar Year and the African Monsoon Multidisciplinary Analysis (AMMA). The NERC-funded community has helped shape and drive both programmes and we confidently expect the research they produce to form the basis of future national and international policies.

The Princess Royal named NERC's new Royal Research Ship *James Cook* in February, following her visit to a British Antarctic Survey base in January. The new Minister for Science Malcolm Wicks also joined our scientists in Antarctica in February.

Researchers at Proudman Oceanographic Laboratory (POL) have been involved in designing and installing a tsunami warning system in the Indian Ocean. Closer to home, both POL and British Geological Survey researchers have looked at the tsunami risk to the UK. And scientists at Plymouth Marine Laboratory have discovered that marine algae could absorb significant amounts of carbon dioxide from power stations, providing another potentially commercially viable solution to reducing greenhouse gas emissions.

NERC held five events to celebrate and communicate the achievements of eight

Clockwise from top left:

Training Afghan geologists.

Ethiopia: the birth of an ocean.

Alan Thorpe, NERC Chief Executive.

Ed Wallis, Chairman.

themed research programmes, which now draw to a close. Highlights from these programmes, reported here and in previous annual reports, include the first mapping of the underside of an ice shelf and evidence that it is possible to track atmospheric pollution on a transcontinental scale.

We take communicating the outcomes of NERC-funded scientific research very seriously. We held a lively event in January to talk with stakeholders about our science achievements over this year and discuss NERC's future priorities. We aim to hold more of these events. Our quarterly magazine *Planet Earth* won a national award – external magazine of the year 2006 – and, to engage with the public on environmental issues, we held an energetic web debate 'The Climate Change Challenge' which attracted sceptics from around the world.

This has been a year of major changes to NERC's senior management team. Our Chairman Sir Rob Margetts, who has been hugely influential during his six years in office, left in December. His leadership has been both tireless and selfless. He will be greatly missed. Our new Chairman Ed Wallis joined us in January and he is already making his mark. We have also welcomed five new Council Members: Paul Curran, Michael Lockwood, John Mitchell, Colin Paynter and Marjorie Wilson. David Falvey, director of the British Geological Survey (BGS), and Chris Rapley, director of the British Antarctic Survey (BAS), both announced their retirement this year. They have been inspirational leaders and great assets to the NERC community. John Ludden joined us as the new director at BGS and Nick Owens, director of the Plymouth Marine Laboratory, takes over as the new director of BAS this summer. We welcome them and wish them every success.

Finally, we hope you are as inspired by the achievements of the UK environmental science community as we are. These achievements are only possible by the NERC-funded community working with key partner organisations in the UK and collaborating with colleagues from around the world. All that is left to say is congratulations to all scientists and supporting staff who have helped make this year so successful.

Ed Wallis, Chairman
Alan Thorpe, Chief Executive

Science highlights

From witnessing the birth of an ocean to helping rebuild Afghanistan's ruined economy, this has been a challenging year for environmental science in the UK.

Clockwise from top:

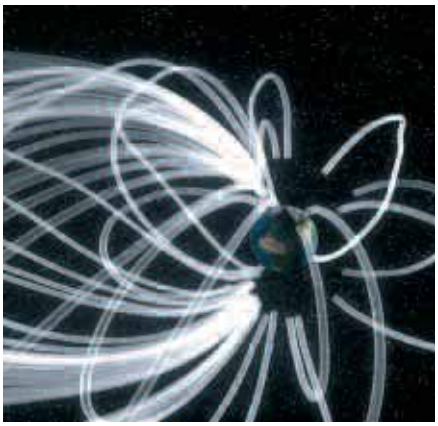
Soay sheep.

The albatross.

Archaea can live in the most inhospitable places such as this hot geyser.
© I.Shpilenok/WILDLIFE/stillpictures

British and Ethiopian scientists checking a seismic station in Afdera, Ethiopia.

View of the Earth's magnetic field. © NASA



Earth's life-support systems

A year of discoveries: from a virus that causes coral bleaching to the origin of Earth's wobble. These and our other achievements are increasing knowledge of how life on this planet thrives.

This year we invested £102 million, or 28 percent of our budget, in projects investigating the complex interactions that make this planet habitable.

Bacteria demoted as a key player in the nitrogen cycle

Microscopic life forms known as archaea, thought to exist mainly in extreme environments, have been discovered to outnumber bacteria in an important step in the cycling of nitrogen in soils.

Scientists have found that a group of archaea – crenarchaea – living in soils and seawater can oxidise ammonia, a chemical produced when animal and plant material decomposes, to nitrite.

'Although we knew crenarchaea existed, we did not know what they did or how important they might be,' said Jim Prosser from the University of Aberdeen.

Before this work, researchers thought bacteria were the major players in ammonia oxidation.

The team, with colleagues from Norway, found evidence that these ammonia-oxidising archaea outnumber their bacterial counterparts.

'This is a key step in the nitrogen cycle and leads to production of the greenhouse gas nitrous oxide,' said Jim.

Professor James Prosser
j.prosser@abdn.ac.uk

Archaea predominate among ammonia-oxidizing prokaryotes in soils. Nature *17 August 2006*

Towards a unified theory of Southern Ocean ecology

The Antarctic Circumpolar Current, the world's largest ocean current, is the dominating force in the Southern Ocean, mixing nutrients that fertilise huge algal blooms across the Atlantic region and bringing vital food supplies to penguins and seals. The current also plays a key role in bringing the effects of El Niño to the Antarctic region.

These are some of the key findings of two decades of detailed research of components of the Southern Ocean ecosystem by British Antarctic Survey scientists. The work, brought together and published in *Philosophical Transactions of the Royal Society B: Biological Sciences*, provides new insights into how this whole system works.

Lead author Eugene Murphy said, 'As the climate changes, our analyses indicate that we can expect potentially rapid shifts – over a few decades – in entire biological communities. So, for example, a reduction in the amount of Antarctic krill available to predators may lead to a greater dependence on fish, which will fundamentally change the way the whole marine ecosystem functions.'

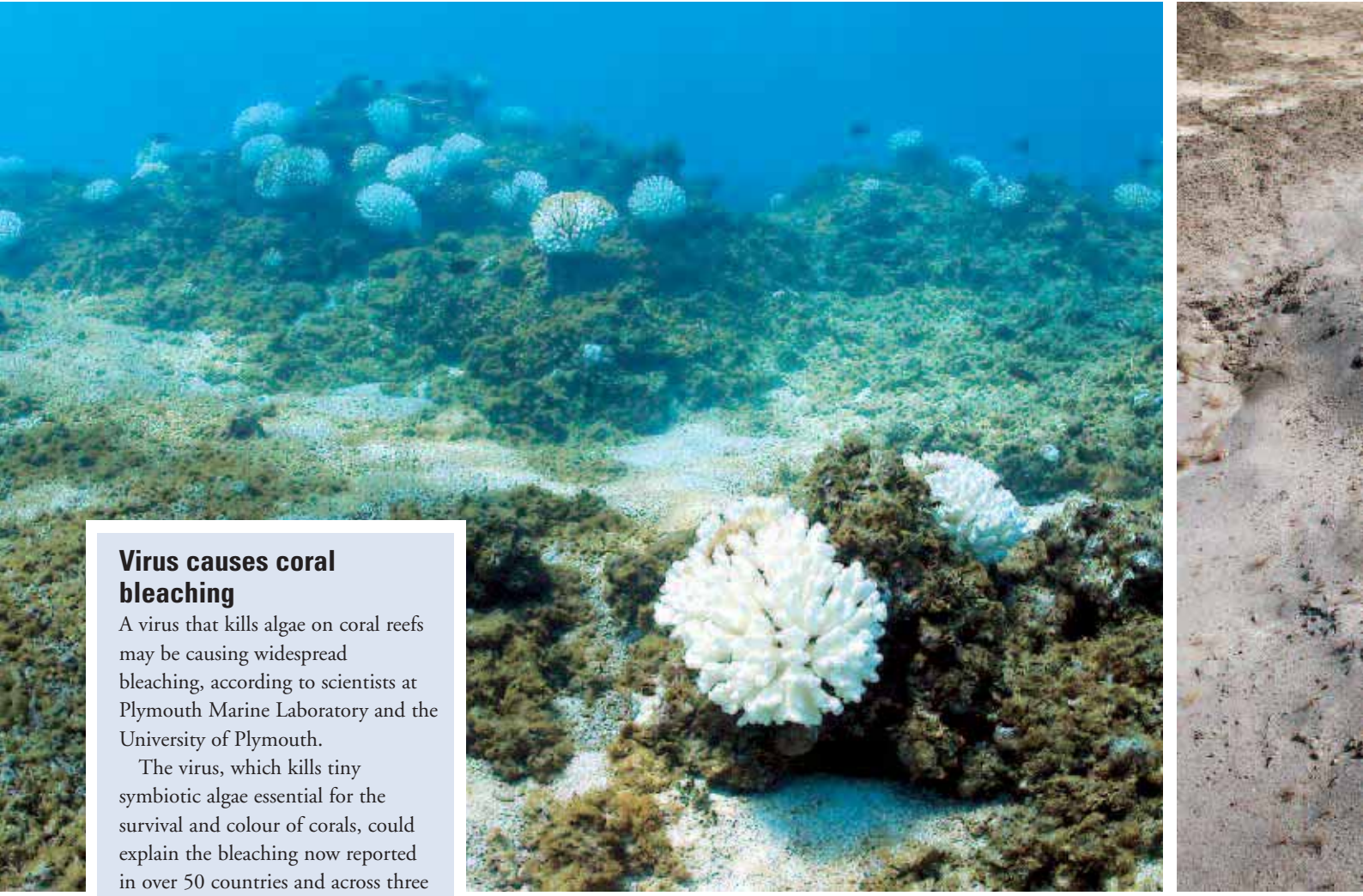
Professor Eugene Murphy
e.murphy@bas.ac.uk

Walking with dinosaurs?

A 'tree of life' tracing the history of all 4500 mammal species on Earth shows that today's mammal diversity was not caused by the extinction of the dinosaurs 65 million years ago.

The research, reported in *Nature*, contradicts the previously accepted theory that the mass extinction of the dinosaurs prompted a rise in mammal species.

The team from the Zoological Society of London, Imperial College London and



Virus causes coral bleaching

A virus that kills algae on coral reefs may be causing widespread bleaching, according to scientists at Plymouth Marine Laboratory and the University of Plymouth.

The virus, which kills tiny symbiotic algae essential for the survival and colour of corals, could explain the bleaching now reported in over 50 countries and across three oceans.

Coral bleaching is usually triggered by warmer waters. But the underlying cause of coral bleaching and the mechanisms involved remained largely unknown until now.

Willie Wilson said, 'The virus is latent in the algae. It starts to infect the symbiotic algae only when the coral is stressed by temperature or UV light. It provides a plausible explanation for some of the rapid bleaching we see in coral reefs.'

The work shows that viruses play an important role in coral reef dynamics.

In a separate study scientists at the Tyndall Centre for Climate Change Research and the University of East Anglia have shown that recent volcanic eruptions, which throw large quantities of small particles into the atmosphere, have protected Caribbean coral reefs from bleaching.

Dr Willie Wilson
whw@pml.ac.uk

Characterisation of a Latent Virus-like Infection of Symbiotic Zooxanthellae.
Applied and Environmental Microbiology, *May 2007.*

the Centre for Population Biology found that modern mammals such as primates, rodents and hoofed animals did not diversify until at least 10 to 15 million years after the mass extinction.

Andy Purvis from Imperial College London explained, 'Our research has shown that, after the dinosaurs were wiped out, present-day mammals kept a very low profile, while other mammals ran the show. It looks like a later bout of global warming may have kick-started today's diversity – not the death of the dinosaurs.'

Professor Andy Purvis
a.purvis@imperial.ac.uk

The delayed rise of present-day mammals.
Nature, *29 March 2007.*

Changing length of day explained

Changes in flows in the Earth's core cause irregular features in the Earth's magnetic field to switch from drifting westward to drifting eastward, say scientists from the University of Leeds. Westward drift was thought to be the default direction. These flow changes can also explain subtle variations in the speed of rotation of the planet and so why the length of the day varies by a few milliseconds every 24 hours.

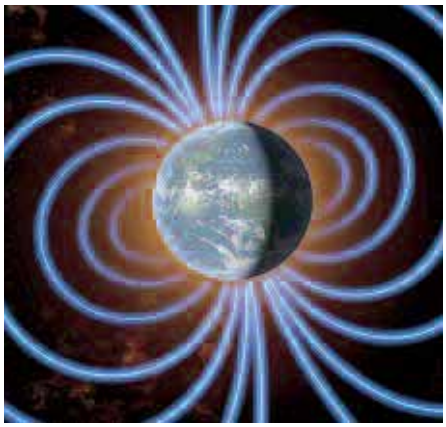
Mathieu Dumberry and Christopher Finlay say the findings also help explain sharp changes in the direction of the Earth's magnetic field that occur every 500-800 years over Europe.

In a separate study Mathieu also found an explanation for the Earth's mysterious wobble. At the poles the planet's rotational axis wobbles around the geographical axis. Scientists can detect a movement of about one metre every 30 years.

'Slight changes over time of the tilt of the inner core with respect to the mantle can cause a large enough change in angular momentum to create this wobble,' said Mathieu.

Dr Mathieu Dumberry
dumberry@earth.leeds.ac.uk

Eastward and westward drift of the Earth's magnetic field in the last three millennia.
Earth and Planetary Science Letters, *15 February 2007.*



From left to right:

Low volcanic activity equals more bleached coral.
© James D. Watt/imagequestmarine.com

This volcanic vent in Ethiopia opened in one day.

Do changes in the Earth's magnetic field explain its wobble?
© Roger Harris/Science Photo Library

Birth of an Ocean

A series of violent earthquakes and volcanic eruptions in the Afar Depression, Ethiopia could mark the birth of a new ocean. At the invitation of Ethiopian scientists, and with the aid of two NERC urgency grants, Cindy Ebinger from the University of Rochester, Tim Wright from the University of Leeds and colleagues used remote sensing and field studies to show that huge volumes of magma were injected along a 60-km-long section of the plate boundary during the seismic activity, forming a vertical 'dyke' at a depth of 2–9km, and allowing the plates to move apart by up to 8m.

The results, reported in *Nature*, suggest that the tectonic processes in the Depression are the same as those that formed the Atlantic Ocean.

Tim said, 'This was a genuine once-in-a-lifetime opportunity to observe these processes directly. They are rare and usually occur under several kilometres of water.'

Professor Cindy Ebinger ebinger@earth.rochester.edu
Dr Tim Wright t.wright@see.leeds.ac.uk

Magma-maintained rift segmentation at continental rupture in the 2005 Afar dyking episode. Nature, *20 July 2006.*

Ocean-wide modelling of zooplankton

Researchers on the Marine Productivity programme have for the first time developed a mathematical model of the abundance on an ocean-wide scale of zooplankton – tiny floating marine creatures. The model takes account of a single species' unique function and behaviour, and also the ocean currents that can move individuals hundreds or even thousands of kilometres over their lifetimes.

Phil Williamson said, 'Holistic can be an over-used expression. However, the Marine Productivity programme fully merits that description – by successfully bringing together expertise in universities, fishery research laboratories and NERC centres, to work out how biology and physics interact in the North Atlantic. Research problems don't get much bigger than that.'

Dr Phil Williamson
p.williamson@uea.ac.uk

Discovery of global patterns in insect diversity

Insect communities across the globe share many similarities in terms of abundance, body-size distribution and species-area relationships – as area increases, the number of species also increases.

Scientists from the Centre for Ecology & Hydrology analysed more than 600,000 insect species on scales from small islands to the entire land surface of planet Earth. The findings, published in *Proceedings of the Royal Society*, provide a useful tool for monitoring the status of insect communities in the face of human disturbance.

Report author Bland Finlay said, 'We can demonstrate that insect diversity reveals patterns which repeat at scales from local to global. Deviations from general patterns, such as unusual distributions of body sizes in an insect community, could provide useful

Left to right:

A young kittiwake surrounded by inedible pipefish.

Measuring the size of Soay sheep on St. Kilda.

Solar panels to power atmospheric research equipment in Africa.

Saharan dust sweeping out over the Atlantic.
© NASA

indicators of local extinctions.'

Professor Bland Finlay FRS, bjf@ceh.ac.uk

Self-similar patterns of nature: insect diversity at local to global scales. Proceedings Royal Society, *2006.*

Snake pipefish explosion

An unexplained population explosion of snake pipefish in seas around northern Britain was reported in the journal *Marine Biology* by a European team led by Centre for Ecology & Hydrology scientists.

Pipefish, once rarely seen in British waters, now often end up in trawler nets. Numbers have risen a hundredfold since 2002 and their range has expanded.

Although eaten by marine predators, the rigid, bony structure makes pipefish poor food for seabirds. Reasons for the population explosion are unclear.

Professor Mike Harris and colleagues
mph@ceh.ac.uk

A major increase in snake pipefish in northern European seas since 2003: potential implications for seabird breeding success. Marine Biology, *2007*

Evidence of climate driving evolution and ecology

Relatively minor environmental influences such as one harsh winter can force evolution in animal populations and rapidly change population sizes.

Scientists studying Soay sheep in the Outer Hebrides noticed that in years with long, cold winters the sheep population grew fastest when there were many large individuals within the population.

Tim Coulson from Imperial College London explained, 'Data shows that in the 1980s big sheep were genetically favoured in this population because big sheep had more chance of surviving the harsh winters. But as the climate changes and the Soay sheep are not subject to such tough winters, there will be reduced natural selection for larger animals. This could significantly affect the population dynamics of the Soay sheep overall.'

The research, reported in *Science*, has shown that population change is affected by body size, and that body size, in turn, is affected by various factors including genetics, climate, and the availability of food. The scientists have for the first time, linked the big ecological picture with the genetic make-up of individual animals.

Dr Tim Coulson
t.coulson@imperial.ac.uk

The evolutionary demography of ecological change: linking trait variation and population growth. Science, *16 March 2007.*

Plant growth and death simulated in climate models

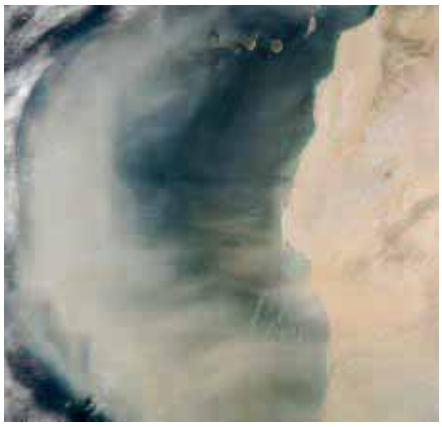
Scientists can now include the growth and death of plants in climate models. The new generation of models can even simulate fires and harvesting.

Researchers from the Quantifying and Understanding the Earth System programme (QUEST) and colleagues at the Met Office and other NERC centres (the Centre for Ecology & Hydrology and the Climate Land Surface Interaction Centre) are working together on the land ecosystem model called JULES (Joint UK Land Environment Simulator). JULES can link atmospheric conditions, for example cloud formation and rainfall, to plant growth, transpiration, vegetation structure and forest fires.

Dr Sarah Cornell
sarah.cornell@bristol.ac.uk

Climate change

This year saw the publication of two major reports, the Intergovernmental Panel on Climate Change Fourth Assessment and the Stern Review on the economics of climate change. NERC-funded scientists made major contributions to both documents.



In 2006-07 we invested £106 million, or 29 percent of our budget, in climate change research.

African Monsoon Multidisciplinary Analysis

A massive international project, the African Monsoon Multidisciplinary Analysis (AMMA), got under way during the summer of 2006 with a huge field campaign in sub-Saharan Africa. Over 1000 people from 60 research institutes and 28 countries joined forces to improve weather forecasting and climate model representations of the region.

AMMA-UK manager Doug Parker from the National Centre for Atmospheric Science said, 'Weather and climate models have systematic errors in representing the climate of West Africa. If we can improve our understanding of this region, this will improve global models.'

The team has already produced significant results. The strength of the link between ground conditions and atmospheric conditions is critical to the African climate. Chris Taylor from the Centre for Ecology & Hydrology and colleagues have shown how moist soils near dry areas can initiate storms. The air over wet soils builds up considerable humidity, while the air over dry soils gets hot and rises. When wet and dry surfaces are close together you have the ingredients for a large thunderstorm. AMMA continues until 2009.

Dr Doug Parker doug@env.leeds.ac.uk
www.env.leeds.ac.uk/research/ias/dynamics/amma
http://classic.nerc.ac.uk/

Quantifying the effect of sand storms on climate

Saharan dust storms can block around one third of sunlight from reaching the surface of the planet in affected regions, according to scientists at NERC's Environmental System Science Centre.

An international team saw visibilities drop from 10 kilometres to 1 kilometre and felt daytime temperatures fall ten degrees Celsius in Niamey, the capital of Niger, during a large Saharan dust storm.

Lead author Tony Slingo said, 'The key point is just how large the effects of the dust storms are – this study is the first time that's been shown so clearly.'

The effect on climate of small particles in the atmosphere is still a major uncertainty in climate change research.

Tony, who is deputy director of the centre added, 'Our models do quite well in simulating the effects of the dust on sunlight. This provides crucial information for reducing uncertainties in our predictions of future climate.'

This work contributed to the African Monsoon Multidisciplinary Analysis.

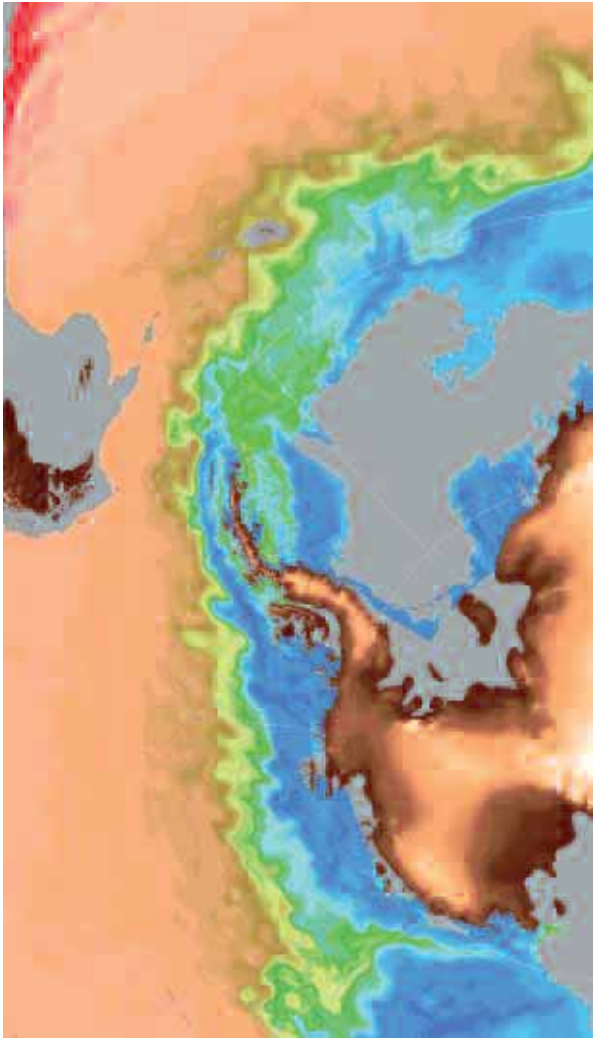
Professor Tony Slingo
as@mail.nerc-essc.ac.uk

Observations of the impact of a major Saharan dust storm on the atmospheric radiation balance. Geophysical Research Letters *30 December 2006.*

North Sea temperatures not linked to Atlantic Ocean

The Atlantic Ocean does not play as big a role in temperature regulation of the shallow North Sea as previously thought.

Scientists at Proudman Oceanographic Laboratory have shown that sea



Spring advances across Europe

Spring arrives six to eight days earlier across Europe on average.

Scientists led by Tim Sparks from the Centre for Ecology & Hydrology and Annette Menzel from the Technical University of Munich examined 125,000 datasets across 27 European countries. The team discovered that 30 percent of leafing, flowering and fruiting had happened significantly earlier while only 3 percent had happened significantly later. Rising temperatures had both advanced spring and delayed autumn.

Tim said, 'We clearly demonstrate change in the timing of seasons, and also show that change is much stronger in countries that have experienced more warming.'

The findings, the first comprehensive analyses on a continental scale, made headlines across the UK and Europe.

Dr Tim Sparks
ths@ceh.ac.uk

'European phenological response to climate change matches the warming pattern'. Global Change Biology, *2006.*

temperatures in the north-western North Sea are mainly driven by local weather, not changes in the inflow of North Atlantic water.

Report author Jonathan Sharples said, 'This is an important result for marine biologists and ecologists who need to understand the mechanisms behind the gradual warming of the North Sea.'

Dr Jonathan Sharples
j.sharples@pol.ac.uk

Inter-annual variability in the timing of stratification and the spring bloom in the north-western North Sea. Continental Shelf Research, *2006.*

Chemical equator discovered

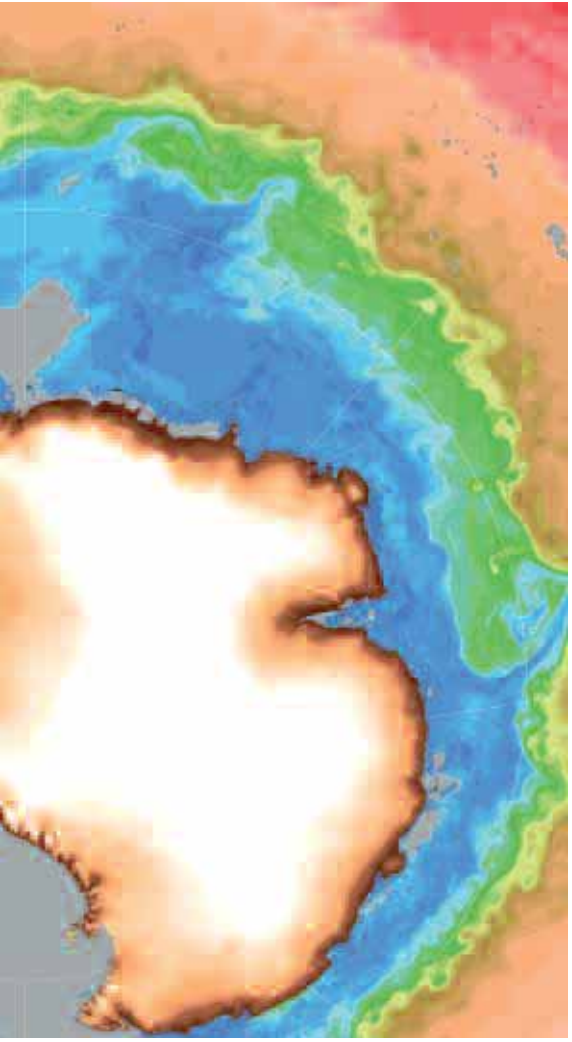
A chemical equator separates polluted air in the northern hemisphere from cleaner air in the southern hemisphere.

Scientists flew north from Darwin, Australia measuring carbon monoxide, ozone and aerosols to test how much chemical mixing occurs between the northern and southern hemispheres: current thinking says very little. Despite being north of the Intertropical Convergence Zone, a band of cloud that circles the globe in the tropics marking where the trade winds meet, the air still showed little sign of pollution.

Geraint Vaughan from the National Centre for Atmospheric Science said, 'Eventually we did fly into distinctly polluted air. What surprised us was that the transition occurred in clear air with no relation to convection, showing that the chemical and meteorological boundaries are not necessarily related.'

The work is part of the ACTIVE consortium (Aerosol and chemical transport in tropical convection).

Professor Geraint Vaughan,
University of Manchester
geraint.vaughan@manchester.ac.uk



Left to right.

Spring now arrives six to eight days earlier.

Ocean temperatures around Antarctica.

The Mount Pinatubo eruption in 1991.

Do stronger winds drive more heat toward Antarctica?

Stronger westerly winds around Antarctica are increasing eddy activity in the Southern Ocean and consequently may be driving more heat southward across the Antarctic Circumpolar Current – the world's largest current.

Winds over the Southern Ocean are strengthening, due at least in part to human-induced change such as ozone depletion and greenhouse gas emissions. Scientists have found that the Antarctic Circumpolar Current only shows a slight acceleration when these winds blow stronger, but that there is a large increase in ocean eddy activity. Eddies are the ocean equivalent of atmospheric weather systems, and in the Southern Ocean they play a key role in moving heat southward toward the Antarctic continent.

Researchers already know that the Southern Ocean is warming rapidly. The findings from the British Antarctic Survey suggest that ocean eddies could be responsible.

Dr Michael Meredith
m.meredith@bas.ac.uk

Circumpolar response of Southern Ocean eddy activity to changes in the Southern Annular Mode. Geophysical Research Letters, *19 August 2006.*

Greenland had ice 34 million years ago

Continental ice existed on Greenland in a world with much higher temperatures and atmospheric carbon dioxide levels than today, scientists from the National Oceanography Centre, Southampton reported in *Nature*.

Sediment retrieved from beneath the Norwegian-Greenland Sea indicated that ice at least partly covered Greenland 20 million years earlier than previously thought.

Co-author Ian Harding explained, 'We have good information on southern hemisphere ice sheets, but essentially we didn't have any information concerning the presence of ice in the northern hemisphere, so this is really the first indication as to exactly what was going on.'

Dr Ian Harding
ich@noc.soton.ac.uk

Continental ice in Greenland during the Eocene and Oligocene. Nature, *8 January 2007.*

Volcanic eruption sheds light on climate uncertainties

The Mount Pinatubo volcanic eruption in 1991 is now providing vital clues as to how water vapour and clouds, two major remaining climate change uncertainties, respond when the climate system is disturbed.

John Harries from Imperial College, London and Joanna Futyan from Columbia University, New York found that the atmosphere reacted quickly to the eruption, which threw large quantities of sulphur dioxide into the sky. These small particles blocked sunlight, so cooling the planet. This cooling rose to a maximum within four months and consequently global humidity dropped – a cooler atmosphere holds less water vapour. Eighteen months later the climate had settled back to equilibrium.

John Harries said, 'This will be a valuable extra test to ensure that climate models predict the correct rates of change of such processes.'

The research also provides a snapshot of how the Earth's radiation balance fluctuates once perturbed.

Professor John Harries
j.harries@imperial.ac.uk

On the stability of the Earth's radiative energy balance: response to the Mt. Pinatubo eruption. Geophysical Research Letters, *15 December 2006.*

Air quality set to worsen

An international study suggests that current emission control measures for low-level ozone will fail to stem a global increase of up to six percent above 2000 levels by 2030.

Ground-level ozone is detrimental to human health and agriculture. Legislation to reduce levels of near-surface ozone exists in most countries.

The research, led by NERC Advanced Fellow David Stevenson from the University of Edinburgh, was the largest coordinated study to date of atmospheric chemistry models. The team also analysed another more optimistic future scenario and demonstrated that applying stringent emission controls, feasible with current technologies, improved global air quality and significantly reduced the effects of ozone and methane on climate.

Dr David Stevenson
dstevens@staffmail.ed.ac.uk

Multimodel ensemble simulations of present-day and near-future tropospheric ozone. Journal of Geophysical Research, *26 April 2006.*

Rapid Climate Change – first results from Atlantic array

For the first time scientists have continuously measured the magnitude and variability of the ocean circulation largely responsible for Europe's temperate climate, the Atlantic Meridional Overturning Circulation. Researchers demonstrated at NERC's Rapid Climate Change international science conference that the array of instruments deployed across the Atlantic Ocean accurately measures all components of the overturning circulation.

The pilot scheme could pave the way for a permanent monitoring system that will help improve predictions of the effect of changes in the ocean on European climate.

The monitoring array has already produced one unexpected result. In November 2004 part of the overturning circulation, the flow of lower North Atlantic deep water, at depths below three kilometres, slowed abruptly and halted for a few days, before starting up again. This flow anomaly remains unexplained.

Dr Meric Srokosz
M.Srokosz@noc.soton.ac.uk

Forest growth from space

A new way of measuring forest growth from space has been developed by researchers at the Centre for Terrestrial Carbon Dynamics. Until now, relating an image from space to key ecological processes on the ground, for example tree growth or leaf expansion, has proved difficult.

Tristan Quaife and Mathew Williams are using a combination of methods to derive information. Mathew said, 'We are adapting techniques developed for tracking rockets to solve the problem. The technique uses a trajectory model, for example for rocket flight, or in our case for forest growth, that we can update using satellite data.'

The key development has been to model how a forest ought to look from

Left to right:

Part of the array of instruments deployed across the Atlantic Ocean.

Scientists use sedimentary cores such as these to build pictures of past climates.

The Amazon rainforest.

space, and compare that with what the satellite sees.

'We can then correct the forest model trajectory accordingly, and get a better estimate of how it is growing and taking up carbon,' added Mathew.

Dr Mathew Williams
mat.williams@ed.ac.uk

Assimilating canopy reflectance data into an ecosystem model with an ensemble kalman filter. Remote Sensing of the Environment, *in press.*

Orbit changes led to ice ages

The most conclusive proof yet that between 23 and 34 million years ago variations in the Earth's orbit around the sun caused ice sheets to wax and wane was reported by scientists working on the Integrated Ocean Drilling Program. The team also linked theses variations to ocean acidity.

Lead author Heiko Pälike said, 'We assembled the first detailed record from this period by analysing marine microfossil carbonate shells. Our records show a clear link between ocean acidity and climatic cycles, both driven substantially by orbital variations, and most likely influencing the global carbon cycle.'

The Earth moves from an elliptical to a circular orbit every 405,000 and 110,000 years.

The scientist from the National Oceanography Centre, Southampton and colleagues from Cardiff, Cambridge and the US used ocean sediment to build a picture of climate conditions during this period, known as the Oligocene.

The team also demonstrated correlations between solar forcing, the global carbon cycle, deep ocean acidity and the production and burial of biomass.

Dr Heiko Pälike
heiko@noc.soton.ac.uk
The heartbeat of the oligocene climate system. Science, *22 December 2006.*

Atmospheric 'bridge' tells tropical Pacific what is happening in Atlantic

Ocean circulation in the North Atlantic can influence weather in the tropical Pacific in a matter of days or weeks, not decades as previously thought.

Researchers at the National Centre for Atmospheric Science wanted to know how changes in the North Atlantic circulation affected El Niño, a disruptive climate phenomenon occurring every three to eight years in the Pacific. They showed that a weakened Atlantic circulation leads to cooler sea-surface temperatures in the North Atlantic and, shortly afterwards, more El Niño activity in the Pacific.

Their research contradicts earlier studies that suggested these kinds of connections happened on a timescale of decades not days. The research offers an explanation for why El Niño was more frequent and intense at the height of the Little Ice Age in the 17th century, a cold period over the North Atlantic caused by a weakened ocean circulation.

Dr Buwen Dong and Dr Rowan Sutton
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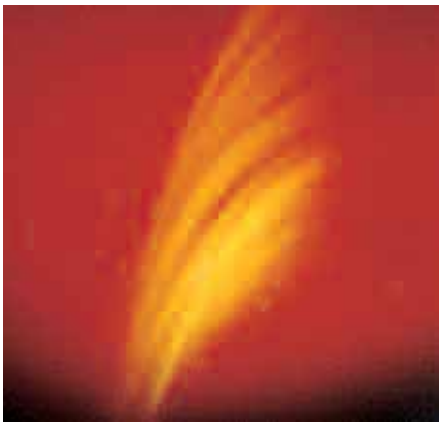
R.Sutton@rdg.ac.uk

Enhancement of ENSO variability by a weakened Atlantic thermohaline circulation in a coupled GCM. Journal of Climate, *in press.*



Sustainable economies

The UK and global economies rely on environmental science to sustain a growing population.

This year we invested £69 million, or 19 percent of our budget, in projects investigating sustainable economies.

US satellite protection scheme could cause global communication blackouts

A proposed US system to protect satellites from solar storms or high-altitude nuclear detonations could cause side-effects that lead to radio communication blackouts, according to British Antarctic Survey scientists and colleagues from New Zealand and Finland.

The US solution involves launching a constellation of ten satellites that would emit VLF (very low frequency) waves in a time of crisis. These waves would flush out harmful electrons injected into the upper atmosphere by solar activity or a nuclear explosion.

British Antarctic Survey scientists say the proposed system would significantly alter the upper atmosphere causing unusually intense high-frequency radio-wave blackouts around most of the world.

Mark Clilverd said, 'Some planes and ships that rely on high frequency communications could lose radio contact, and some remote communities could be isolated for as long as six to seven days. It would also disrupt GPS signals.'

Dr Mark Clilverd
macl@bas.ac.uk

Atmospheric implications of radiation belt remediation. Annales Geophysicae, *August 2006.*

Restoring wild flowers increases hay yield

Growing hay meadows with many wild-flower species boost yields by 40 percent compared with growing just a few types of agricultural grasses.

The research by scientists at the Centre for Ecology & Hydrology shows there need not be conflict between increasing crop yield and attracting more animal and plant species.

James Bullock said, 'We took arable fields and re-created hay meadows with many wild-flower species. We contrasted their agricultural output with plots where we had sown only a few types of grasses. These grasses were those often selected by farmers to increase yields.'

The team found that, as well as increasing hay yield, the wild flowers made the hay more nutritious as cattle fodder than hay from the grass plots, and the effects went on increasing over eight years.

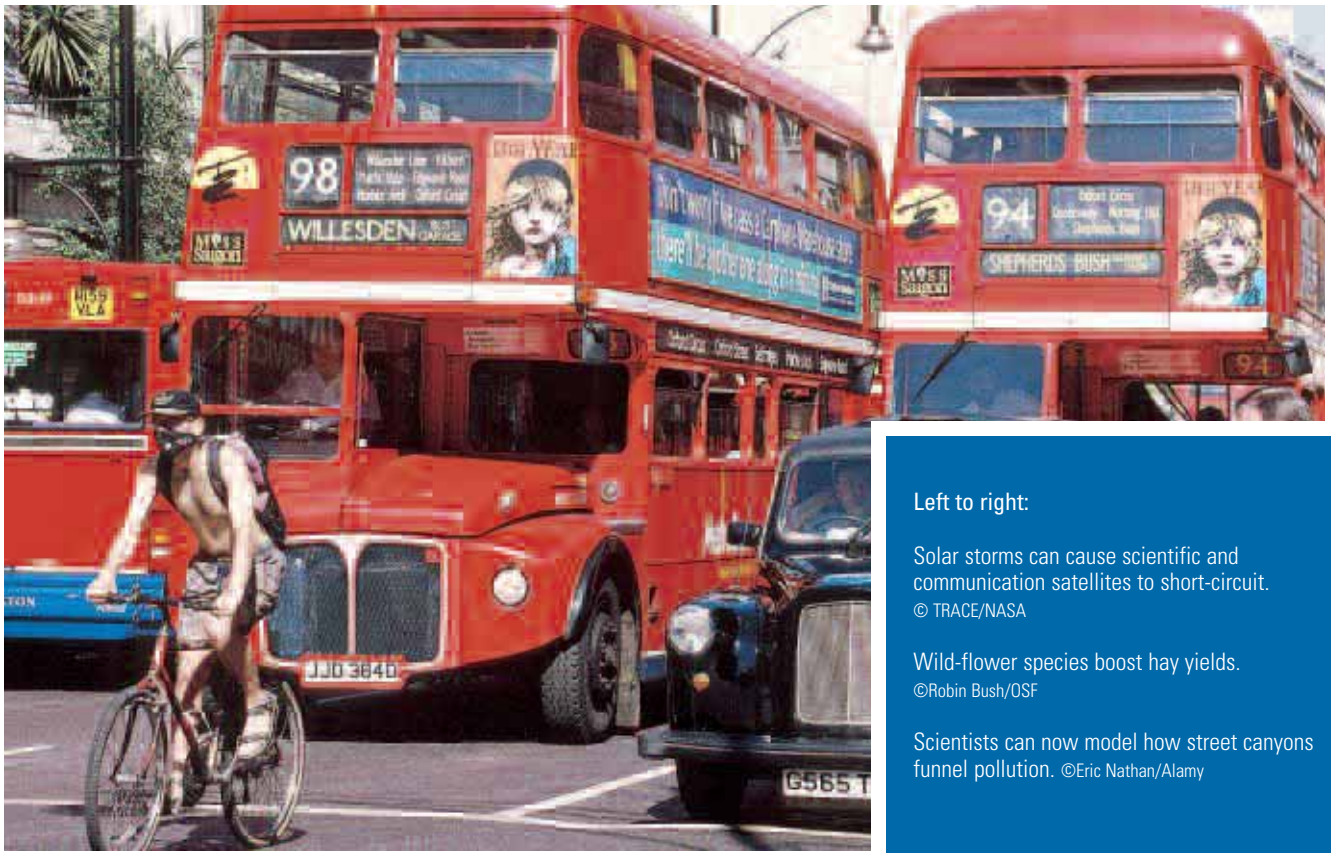
'This suggests that biodiversity has an important economic role for humans and that maintaining and restoring biodiversity can help rural livelihoods,' added James.

Dr James Bullock
jmbul@ceh.ac.uk

Long-term enhancement of agricultural production by restoration of biodiversity. Journal of Applied Ecology, *February 2007.*

City slickers – tracking urban pollution

The complex way exhaust fumes emitted at the bottom of built-up city streets, known as street canyons, make their way to the atmosphere above cities is being unravelled by researchers at the



Left to right:

Solar storms can cause scientific and communication satellites to short-circuit. © TRACE/NASA

Wild-flower species boost hay yields. ©Robin Bush/OSF

Scientists can now model how street canyons funnel pollution. ©Eric Nathan/Alamy

University of Birmingham and the National Centre for Atmospheric Science (NCAS).

Birmingham academic Jennifer Salmond and colleagues from Meteo France found the layout and daytime heating of streets played a crucial role in how much pollution from particulates (airborne particles of dust and chemicals) from the street canyon reached the atmosphere above the city. Their findings help assess people's exposure to particulates and the effect of urban pollution downwind of cities.

In a separate development Stephen Belcher from NCAS, Ian Castro from the University of Southampton and colleagues have formed a business partnership with an engineering solutions company CD-adapco to develop urban-scale weather and air-quality computer models. The researchers found they could use software developed by CD-adapco in air quality models to include the shape and layout of streets and buildings in UK towns and cities, and to successfully simulate air and heat flow.

Stephen said, 'There is a growing need to be able to simulate flows in urban areas for applications ranging from dispersion of traffic pollutants to predicting the spread of terrorist gas releases. This new partnership promises the tools we need to tackle these issues.'

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Dr Jennifer Salmond
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Professor Ian Castro
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60 percent emissions reductions not enough

Researchers at the Tyndall Centre for Climate Change Research announced that the UK's emissions target – a 60 percent reduction by 2050 – is unrealistic. The report, commissioned by Friends of the Earth and the Co-operative Bank, states that if the UK wants to help prevent global temperatures rising above 2°C, it needs to reduce emissions by 90 percent by 2050.

A major government report, the Stern Review on the economics of climate change, drew heavily on the Tyndall centre's pioneering approach to integrated assessments of climate change, and the Economic and Social Research Council (ESRC) funded a year-long secondment from Tyndall to the Treasury team responsible for the document.

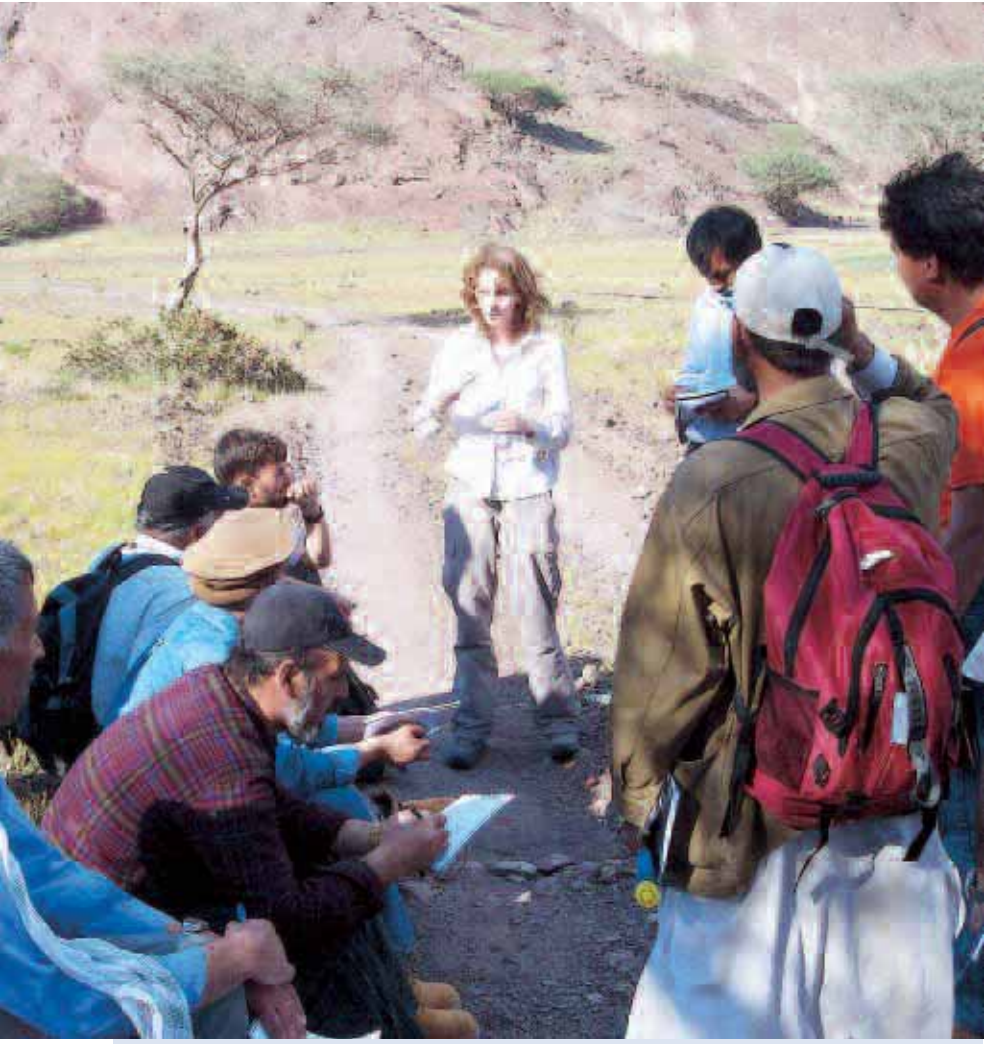
Tyndall, with many other NERC-funded centres, also made a major contribution to the United Nations Intergovernmental Panel on Climate Change Fourth Assessment (IPCC). See page 25.

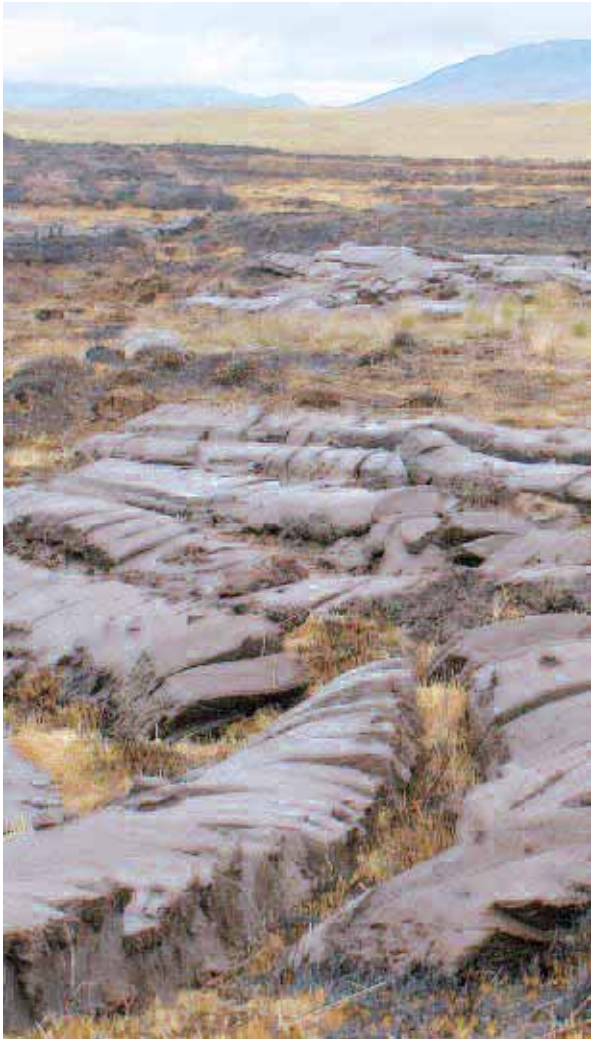
Living within a carbon budget. Report for Friends of the Earth and the Co-operative Bank, *July 2006.*

UK Energy Atlas

The first comprehensive picture of energy research in the UK is now available online.

The UK Energy Research Centre has come up with the Energy Research Atlas which gives users a live view of research and development in this field. The Atlas incorporates a database of energy awards, a series of documents characterising





Rebuilding Afghanistan's economy

Beneath an old al-Qaeda training camp close to the outskirts of Kabul, British Geological Survey (BGS) scientists and colleagues in Afghanistan have identified a vast copper deposit that could be worth $30 billion to the war-torn country's shattered economy. The UK team of geologists has been assisting the Afghanistan Geological Survey over the past two years to interpret geological data. The group, funded by the Department for International Development, has created a detailed three-dimensional model of the deposit.

To help capitalise on this world-class resource, BGS and the World Bank worked with the Afghanistan Ministry of Mines to prepare a new minerals law to enable effective and efficient management of an emerging mining industry.

Decades of war had reduced the Afghanistan Geological Survey to a shadow of its former self. BGS has helped revitalise the organisation. This culminated in the opening of the refurbished building in August 2006.

Richard Ellison
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research activities, and a set of roadmaps showing the sequence of research obstacles preventing new technologies from becoming commercially viable.

The Atlas is open to anyone and is intended to form a major part of the evidence base for prioritising and planning energy research activities. Plans are also underway to incorporate data from the private sector.

www.ukerc.ac.uk

Carbon offsetting could fund peatland regeneration

The peatlands of England and Wales could store up to 41,000 tonnes of carbon per year, if they were in pristine condition. But erosion and damage mean that the peat is actually releasing carbon into the atmosphere at a rate of 381,000 tonnes a year, according to researchers on the Rural Economy and Land Use (RELU) programme.

The cause of the release is the vast system of drainage ditches dug across the uplands during the 1950s. This was an unsuccessful attempt to increase land productivity. Scientists say that if these could be blocked then peat would form again.

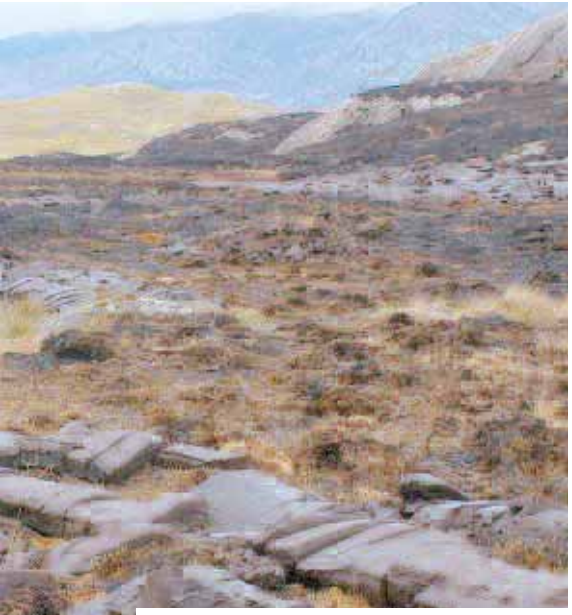
Analysts at Defra suggest that the cost of blocking one hectare of peat drains is about £188. RELU researchers have hit on the idea of working with a carbon-offsetting company that would allow consumers to offset their carbon footprint by paying for upland regeneration.

Anne Liddon
relu@newcastle.ac.uk

Ancient water storage techniques re-examined

For thousands of years people living in semi-arid nations have used various techniques to recharge underground reservoirs to store precious monsoon water. Falling groundwater levels due to over pumping in countries like India and Nepal are forcing authorities to relearn and implement these ancient techniques.

A three-year study, led by Ian Gale of



Left to right:

Training Afghan geologists.

Using peat bogs as carbon stores. © Macana/Alamy

India needs more than just aquifers to manage its water resources.

Pandemic drugs could cause serious environmental pollution. ©Lourens Smak/Alamy

the British Geological Survey, in collaboration with partners in India and Nepal, assessed the effectiveness of managed aquifer recharge.

Ian said, 'Findings confirmed that the techniques are not a panacea for overexploitation and by themselves will not halt or reverse the long-term loss of water resources. Managed aquifer recharge must be used with other water management strategies.'

In recent years massive investment has gone into creating millions of recharge structures, particularly in the Indian sub-continent, but until now little work had been done on understanding the effects on sustainable water use and hence rural economies.

Ian Gale
ing@bgs.ac.uk
www.iah.org/recharge/pdf/assessment.pdf

Potential environmental risk of pandemic drug

More research is needed to assess the human and environmental risks of Tamiflu, the antiviral drug recommended worldwide for the prevention of avian flu in humans, according to a study in *Environmental Health Perspectives*.

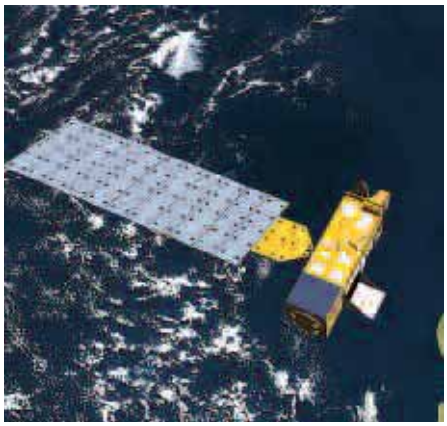
Scientists from the Centre for Ecology & Hydrology modelled Tamiflu concentrations in river water in the UK and the US during a simulated influenza pandemic. Their computer simulations suggest there is a potential risk that an antiviral could cause pollution as well as encourage a new strain of virus to develop if widely used.

Lead researcher Andrew Singer said, 'An antiviral drug has never been widely used before so we need to work out what might happen. During a flu pandemic millions of people will take Tamiflu at the same time. Massive amounts of the drug will be expelled in sewage and find its way to rivers. It could have huge effects on fish and other wildlife.

'Current evidence on the effects of widespread pharmaceutical releases, for example oestrogen in birth-control pills, supports a precautionary approach. It is imperative we make the most of the available time ahead of a pandemic to take those precautions.'

Dr Andrew C. Singer
acsi@ceh.ac.uk

Potential risks associated with the proposed widespread use of Tamiflu. Environmental Health Perspectives, *January 2007.*



Technology

World-class research requires continual investment in new technology. Here are some of this year's achievements.

Overcoming hurdles

Scientists working on a satellite instrument that was at one point almost given up as a lost cause have announced that they are now receiving high-quality data on atmospheric temperatures and chemical composition including ozone.

In July 2004, NASA successfully launched the Earth observation satellite Aura. The success was overshadowed in the UK by the silence from one of Aura's four instruments – the joint NERC/NASA-funded High Resolution Dynamics Limb Sounder (HIRDLS). The instrument was due to measure atmospheric temperatures and composition, including ozone and particulates.

During the launch a piece of protective plastic film tore free and lodged over the instrument's only optical beam, reducing visibility to just 20 percent.

Since the launch, scientists led by John Barnett from the University of Oxford and John Gille of the University of Colorado have painstakingly developed new algorithms to maximise the data retrieved from HIRDLS.

Now, even with 80 percent of the optical beam still blacked out, in one day the team can retrieve data from nearly all the world – a remarkable achievement.

NERC's British Atmospheric Data Centre will distribute data in the UK.

Dr John Barnett
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Robotic sub returns from the freezer

The UK's deep-sea robotic vehicle, Isis, successfully completed its first Antarctic mission in February 2007. Scientists aboard the research ship *James Clark Ross* were thrilled to receive the first images from the craft as it sank like a polished stone 3.5 kilometres to the seafloor.

Julian Dowdeswell from the Scott Polar Research Institute, who led the expedition, said, 'When you are sitting there in the control room surrounded by monitors, you really feel you are on the seabed. You have to pinch yourself to remember you are not.'

The £4.5 million sub made 15 separate dives over three weeks to map shallow waters in Marguerite Bay, the continental shelf edge and the deep continental slope. This was the first time anyone has used a deep-water remotely operated vehicle in the Antarctic.

Peter Mason, the Isis project manager said, 'Isis has the capacity to carry a range of scientific tools, from simple sampling equipment to sophisticated sonar systems.'

Peter Mason
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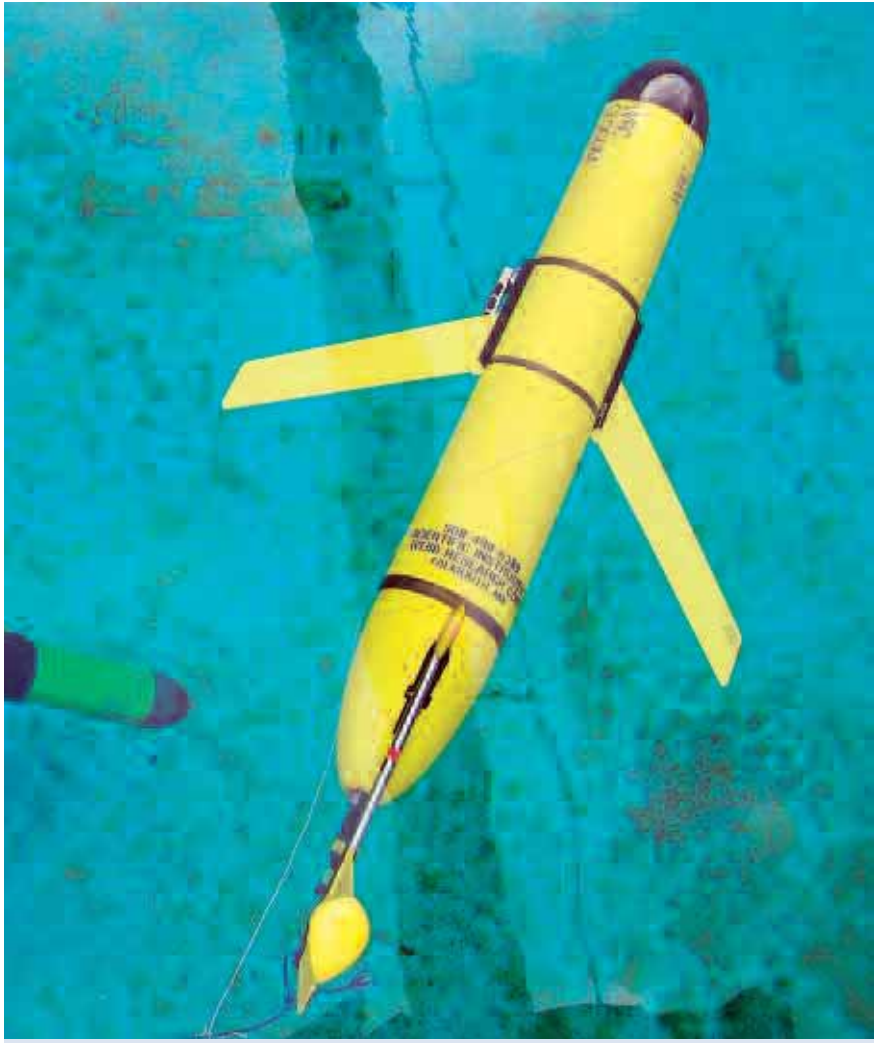
Heavy metal strikes hard rock

A new drill designed to retrieve marine cores in very deep water and extremely hot conditions has successfully completed its inaugural mission.

Scientists took the seabed rock drill, funded by the NERC Infrastructure Programme and designed, built and



Left to right:

NERC funded one of the instruments on board NASA's Aura satellite. © NASA

NERC's robotic sub returns from the icy depths.

These underwater gliders effortlessly cross the Mediterranean.

Scientists oversee the installation of the ice probe.

Still learning from Archimedes – underwater gliders

Graceful, simple, underwater gliders are providing researchers with excellent data on deep convection in the Mediterranean Sea.

Underwater gliders combine high-tech design with buoyancy principles first put forward by Archimedes in 250BC. They sink slowly, but their shape forces them to slip forward through the water as they fall. A change in volume plus a tilt backwards and the machine travels upwards on a gentle incline through the water column. Sea gliders can use these simple manoeuvres to travel great distances, even crossing oceans.

In 2007, the team from the National Oceanography Centre, Southampton deployed three gliders in the Gulf of Lion. They used satellite communications during the three-month project to adapt the glider mission as conditions changed.

David Smeed said, 'We are combining measurements from the gliders with models of convection to gain a better understanding of mixing in the ocean.'

Dr David Smeed
das@noc.soton.ac.uk

operated by engineers at the British Geological Survey, to the Mid-Atlantic Ridge in November 2006 to investigate the geology and microbiology below hydrothermal vents. These 'black smokers' fire steaming water and gases out of the seabed at 350°C.

The team used the drill to take seabed cores in water depths ranging from 2980 to 3050 metres, the first system of its kind to operate in such a deep-water hydrothermally mineralised area. The results have already led to a new understanding of the geology of the Mid-Atlantic Ridge.

This lightweight (less than five tonnes), compact system provides scientists with a more cost-effective method of seabed coring than using a drill ship.

Ali Skinner
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Ice detectives

The Small Ice Detector Probe (SID2) does what it says on the tin: detects micron-sized ice crystals and super-cooled water droplets in clouds. Scientists working on NERC's Clouds, Water Vapour and Climate programme have developed this instrument to provide unique data on the sizes and distributions of these particles.

Paul Kaye from the University of Hertfordshire said, 'This information is vital to understanding cloud dynamics and their role in trapping or reflecting heat from the sun and so global climate.'

The instrument has caught the attention of several organisations around the globe and led to commissions for similar instruments from the US National Centre for Atmospheric Research, Colorado State University, Texas A&M University, the Institute for Meteorology and Climate Research in Karlsruhe, and the Institute for Tropospheric Research in Leipzig.

Professor Paul Kaye
P.H.Kaye@herts.ac.uk
http://strc.herts.ac.uk/cair

Left to right:

The Diamond Synchrotron Light Source facility which opened earlier this year. © Diamond Light Source Ltd

Part of the equipmet used by scientists to measure cosmic rays in Antarctica.

Commercial planes could be used in atmospheric research. © BAA Aviation Photo Library/Anthony Charlton.

Satellite instrument improves climate forecasts

A satellite instrument funded by NERC is now helping the Met Office's global forecast model as well as greatly benefiting researchers investigating clouds and dust in the climate system.

The Geostationary Earth Radiation Budget instrument (GERB) measures the Earth's energy balance from its orbit 36,000 km above Africa. This year it has helped reduce model uncertainties in: the greenhouse effect of small dust particles over the western Sahara; the brightness of marine stratocumulus clouds; and the daytime variation of African deep convective clouds. This is leading to improved climate forecasts.

The instrument, onboard satellites MSG-1 and MSG-2, was developed by Imperial College, Rutherford Appleton Laboratory and Leicester University with contributions from Belgium and Italy.

See also page11, *Quantifying the effect of sand storms on climate.*

Professor John Harries
j.harries@imperial.ac.uk

Revolution in data analysis

Scientists have developed what is being described in the industry as a 'killer application' to automatically manage and evaluate hundreds of complex computer simulations at the same time. The system, developed by the NERC eMinerals Consortium, is set to revolutionise data analysis. It is now running on the Science and Technology Facility Council's Neutron and Laser Facilities as well as the Diamond Synchrotron Light Source, the largest UK-funded scientific facility to be built for over 40 years, which opened its doors earlier this year.

The system tracks hundreds of individual calculations on numerous systems where parameters such as temperature or magnetic field strength are constantly changing.

Although researchers designed the system for geologists, it is an equally powerful tool for particle physicists and climate scientists.

Professor Martin Dove
martin@esc.cam.ac.uk

Linking cosmic rays and electric currents to rain and snow

Extremely sensitive polished metal spheres suspended in mid-air above the Antarctic ice will this year begin measuring the weak electrical currents that flow through the atmosphere.

The instruments, designed by British Antarctic Survey engineers, aim to confirm or disprove the theory that cosmic rays, or other electrical interference in the atmosphere, influence cloud formation, rain and snowfall.

Joan Junyent said, 'The weakness of the currents make measuring them a challenge.'

Through a block of air one metre square flows a current one billionth of a millionth of that used to light a torch bulb.

'The best location in the world to measure them is in Antarctica, where it is high and dry, with no electrical interference,' he added.

The instruments will go into service during International Polar Year.

Joan Junyent
jju@bas.ac.uk

Commercial aircraft to help atmospheric researchers

Using commercial aircraft as atmospheric measuring platforms could soon be a reality if researchers on NERC's Upper Troposphere Lower Stratosphere Ozone programme are successful in their negotiations with the airline industry.

While aviation growth has an increasing impact on climate and local air quality, commercial aircraft also offer a unique opportunity to routinely monitor conditions in a critical region of the atmosphere.

Rod Jones at the University of Cambridge and Martin Gallagher at the University of Manchester are developing instruments for commercial aircraft to measure important gases and small particulates. They have already demonstrated that these lightweight instruments, which weigh just a few kilogrammes, are feasible for commercial aircraft use.

British Airways and Airbus are actively involved in the project. British Airways climate change manager Andy Kershaw said, 'BA see this research as an important step in improving the understanding of the climate system to better quantify human impacts.'

Dr Helen Rogers
helen.rogers@atm.ch.cam.ac.uk

New data management system for meteorologists

The Met Office is adopting a new approach to data modelling and management pioneered by the NERC Data Grid. The Norwegian Met Office and the Tasmanian Partnership for Advanced Computing have also implemented software developed by the project.

The NERC Data Grid makes environmental information more easily available to scientists by allowing users to find out what data sets are available and where; explore what is known about the data sets including information about how the data was collected and what it has been used for; and access, manipulate and visualise the data.

Dr Ned Garnett
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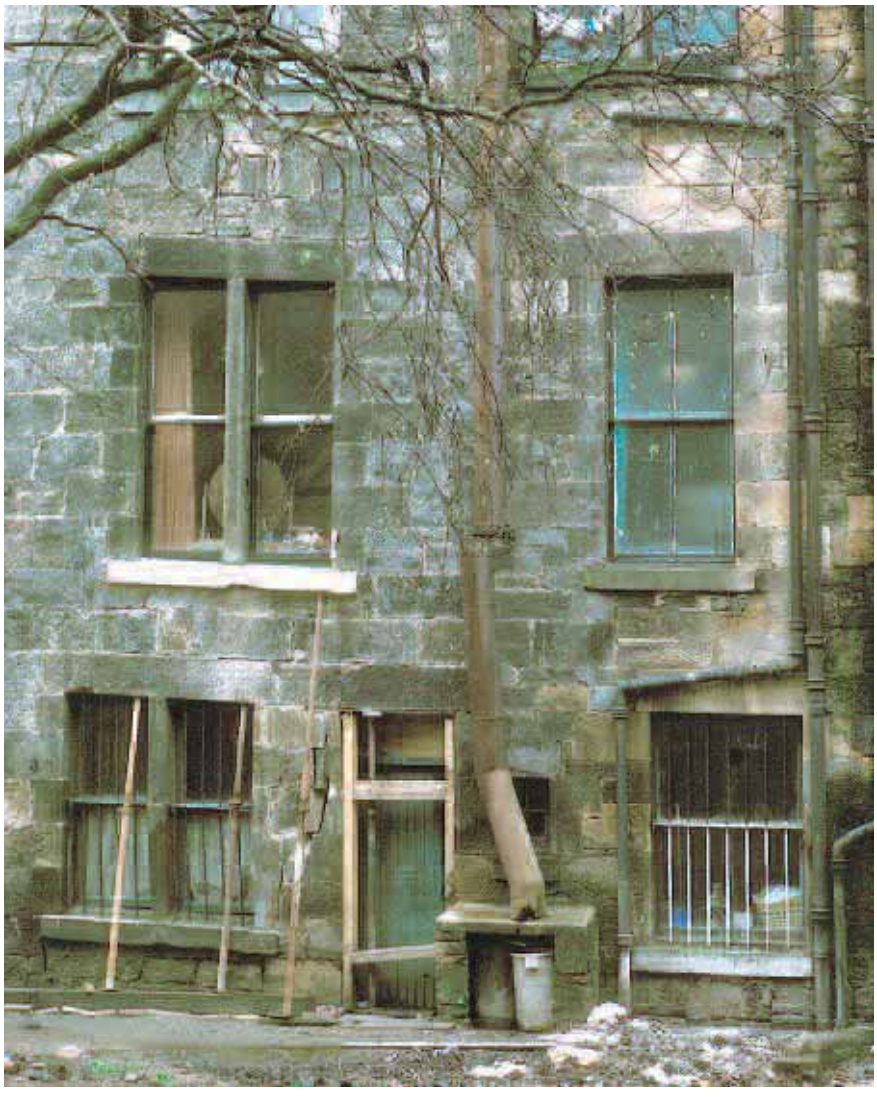
Science for society



Using knowledge

Informing policy and driving economic growth.

Left to right:

Tsunami damage.

Albatross caught on a long-line fishing hook.

Rag worms.

HMS *James Clark Ross* and HMS *Endurance* at the Discover Antarctica! exhibition.

Sir Nicholas Stern. © Alistair Grant/AP/PA Photos

Structural damage due to mining subsidence.

Science into policy: the Intergovernmental Panel on Climate Change and the Stern Review

All NERC's research centres, and many other scientists employed and funded by NERC, made major contributions to two landmark reports published this year: the Intergovernmental Panel on Climate Change Fourth Assessment Report and the Stern Review on the economics of climate change.

These reports, which generated headlines around the world, will form the basis of global climate change policy in the next decade.

Indian Ocean tsunami early warning system

The Indian Ocean tsunami monitoring system became operational in August 2006. Scientists at the Proudman Oceanographic Laboratory played an integral role in designing and installing crucial parts of the system around the coast of Africa and the Arabian Peninsula. Work to complete the warning system, and extend it to the Atlantic and Mediterranean, will continue throughout 2007.

Phil Woodworth said, 'The central part is getting information off the instruments and back to warning centres as quickly as possible. Tsunami travel times in the Indian and Atlantic Oceans are much shorter than in the vast Pacific, so we realised we needed an alert system that would be substantially faster than the Pacific Tsunami Warning System.'

As well as rapidly responding to a tsunami threat, the system will constantly monitor sea-level rise.

Professor Philip Woodworth
plw@pol.ac.uk

Fall in albatross deaths

Policies based on British Antarctic Survey (BAS) research have reduced the numbers of albatrosses killed by long-line fishing around South Georgia to zero in 2006, compared with 6000 deaths in 1997.

Long-term monitoring and extensive tracking programmes using satellite technology clearly showed that foraging trips, particularly those of male albatrosses, overlapped widely with local fisheries. The risk to the birds increased in the mid-1990s when fishermen started long-lining for Patagonian toothfish around South Georgia.

The Commission for the Conservation of Antarctic Marine Living Resources, which regulates fishing in the Southern Ocean, used BAS data to decide on mitigation measures.

Dr Keith Reid
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Dr Richard Phillips
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Marine science provides solution to CO_2 emissions

Marine scientists have announced a viable, natural way of reducing greenhouse gas emissions by using algae to absorb carbon dioxide from power stations.

Plymouth Marine Laboratory scientists have built a piece of equipment – a photobioreactor – to cultivate large quantities of microscopic marine plants known as microalgae. By coupling these instruments with power stations the team are able to use waste carbon dioxide to boost growth of the microalgae.

Biochemist Steve Skill said, 'The system has the potential to absorb all the carbon dioxide coming out of power stations and other industrial processes.'

But what happens to all the excess microalgae?

Marine chemist Carole Llewellyn said 'The beauty of this technology is that once we've grown the microalgae we can harvest them to produce natural products for the healthcare industry.'

The researchers are now looking at several propositions for more large-scale pilot schemes.

Dr Carole Llewellyn
call@pml.ac.uk
www.pml.ac.uk

In search of oil – and illegal steroids

Oil exploration and steroid abuse don't usually appear in the same sentence, but Colin Snape and colleagues at the University of Nottingham have developed a revolutionary technique for oil exploration that can also detect illicit steroid use by athletes and horse trainers.

The Ocean Margins LINK team took a technique called hydropyrolysis, which breaks down samples for analysis, and applied it to geochemical studies. This allowed the team to reconstruct the history of ocean basins to determine where it was worth drilling for oil. With some lateral thinking the team realised you could use the same process for detecting illegal steroids in the bloodstreams of athletes or race horses.

Professor Colin Snape
colin.snape@nottingham.ac.uk

Better predictions of dangerous gusts at airports

After a decade of work, scientists at the National Centre for Atmospheric Science (NCAS) and the Met Office have at last seen the fruits of their labour: a new weather forecast system for airports that can predict turbulence and dangerous gusts. The Met Office have already adopted the system which came into operation in November 2006.

The research centred around one question: what drives the acceleration and increased turbulence of near-surface flow of air in the lee of hills? To find answers to this question NCAS joined forces with the Met Office, the British Antarctic Survey, the Royal Air Force, the Royal Navy, and the Forestry Commission.

The system is in use at four airfields in the UK and the Falkland Islands.

NCAS director Professor Stephen Mobbs
stephen@env.leeds.ac.uk

Monsoon variability targeted by researchers

A UK-India partnership has successfully secured funds for a four-year project to rapidly improve ways of predicting monsoon variability on timescales of weeks to decades. The team based in the UK at the Walker Institute, the University of Reading, and in India at the Institute of Tropical Meteorology in Pune will also establish a firm scientific

Left to right:

A solution to the emissions challenge? Plymouth Marine Laboratory's photobioreactor.

A new system to detect illegal steroids used by the racing community.

Monsoon flood in India.

Ground hazards such as mining can destroy a home.

Managing risk: insurance companies meet atmospheric scientists

One of the world's biggest reinsurance companies, the Willis Group, has hooked up with researchers from the National Centre for Atmospheric Science (NCAS). The scientists will work on the frequency, severity and impact of hurricanes, floods and storms to contribute to the financial evaluation of these events. They will become part of the Willis Research Network, the largest-ever collaboration between academic and financial communities.

This type of knowledge transfer partnership allows investment into academic research and improves atmospheric modelling, while translating the outputs into useful information.

Dr Louisa Watts
NCAScomms@nerc.ac.uk

Ground stability report for all UK homebuyers

Anyone buying a property in the UK will benefit from a new ground stability service launched this year. The report, produced by the British Geological Survey, provides essential information for assembling the new Home Information Packs (HIPs). It gives property-specific information in simple language on the potential hazards related to natural subsidence, the impact of mining and the risk of damage from brine extraction.

Advantages to the homebuying public include a one-stop low-cost electronic report.

Dr Ian Jackson
ij@bgs.ac.uk

foundation for applying those predictions at local and regional levels.

The research, which is one of six awards from the UK-India Education and Research Initiative (UKIERI), will be achieved through a series of exchange visits, workshops and PhD studentships.

The projects, totalling £5 million, involve five institutes in India as well as the University of East Anglia, the European Centre for Medium-Range Weather Forecasts, the Hadley Centre and the University of Reading.

www.reading.ac.uk/about/newsandevents/releases/PR383.asp

Out of the blue

A DVD entitled 'Out of the Blue' which highlights the variety, function and commercial potential of marine and freshwater microbes, was launched in 2006. NERC's BlueMicrobe knowledge transfer network, an offshoot of the Marine and Freshwater Microbial Biodiversity programme, produced the film, which has been distributed to around 1500 policy-makers, businesses and educators. Clips can be downloaded from www.bluemicrobe.com.

Dr Phil Williamson
p.williamson@uea.ac.uk

Trends in research council income from the UK private sector (£m)

	2002-03	2003-04	2004-05	2005-06	2006-07
Private sector	6.4	5.5	8.1	13.3*	9.3
Total at 2006-07 prices	7.1	5.9	8.5	13.6	9.3

** Figure includes Integrated Ocean Drilling Program income to BGS of £4.5m. This is a change of classification on 2004-05.*

Patents filed

2002-03	13
2003-04	13
2004-05	6
2005-06	7
2006-07	6

These patents were filed by NERC research centres and grant holders.

Bird-ringing stresses birds

Bird-ringing techniques used to track wild birds can cause stress and lead to erratic behaviour, according to research at Cardiff University.

Following release, many birds temporarily stopped foraging for food in their usual locations and failed to return to their nests for several hours. During these long absences nest temperature fell, leading to slower embryo development.

NERC Fellow Rob Thomas said, 'It's important to consider these effects in the design of ethical and scientifically rigorous field experiments.'

Rob is now working with the British Trust for Ornithology to develop this research and to revise regulations for bird ringers.

Dr Robert Thomas
thomasrj@cardiff.ac.uk

Rag worms fuel biotech industry in the north-east

Research from NERC's recently completed Environmental Genomics programme is spurring the growth of the biotechnology industry in the north-east of England and has led to licensed production of marine worms globally.

Peter Olive from Newcastle University and colleagues at Leicester University looked at how the tidal and 24-hour clocks function on a genetic level within some marine organisms, in particular rag worms such as *Nereis virens*. In tightly controlled environments these worms and the lugworm *Arenicola marina* can produce many omega three fatty acids and giant haemoglobin molecules, the red protein that transports oxygen.

Seabait Ltd, a spin-out from Newcastle University, is using this biotechnology to generate aquaculture feeds and, in collaboration with the French company Hemarina SAS, to create production systems for a new generation of human blood substitutes and other medical products.

Professor Peter Olive
p.j.w.olive@ncl.ac.uk

Protecting whales and dolphins from seismic surveys

Researchers are developing a new device to locate marine mammals, further protecting them from seismic survey equipment that uses very loud noises to map subsea geology.

Hydrographic surveyor Victor Abbott from the University of Plymouth said, 'The device will aid mammal detection at night, in bad weather and while they are below the surface – a major advance on using human observers.'

Industry partners, Westland GeoProjects, who carry out seismic surveys, want to permanently install the device on their ship, Geolog Dmitri Nalivkin.

The work is funded through the Knowledge Transfer Partnership scheme that NERC supports.

Poppy Leeder
fvl@nerc.ac.uk

Direct income to NERC data centres from the sale of data and software licences (£k)

Data centre income	2003-04	2004-05	2005-06	2006-07
British Oceanographic Data Centre	26	18	23	26
Environmental Information Centre / National Water Archive	311	343	340	500
National Geosciences Data Centre / National Geosciences Information Service	1,642	1,341	2,092	1,278
NERC Earth Observation Data Centre				236
Total	**1,979**	**1,702**	**2,455**	**2,040**

Note: Two of the NERC data centres do not raise income through the licensing of data or software. These are the Antarctic Environmental Data Centre and the British Atmospheric Data Centre.

Trends in publications with industry

	2003			2004			2005			2006		
Funding type	No. ISI® listed papers	No. with private sector co-author	%	No. ISI® listed papers	No. with private sector co-author	%	No. ISI® listed papers	No. with private sector co-author	%	No. ISI® listed papers	No. with private sector co-author	%
Responsive (Blue skies)	903	34	4	833	26	3	1,392	39	3	1,455	37	3
Core strategic	1,314	83	6	1,462	61	4	1,671	75	4	1,713	71	4
Directed	326	18	6	280	13	5	397	25	6	446	22	5
Infrastructure	234	10	4	187	9	5	236	3	1	293	11	4
Unclassified							88			3		
Total	**2,777**	**145**	**5**	**2,762**	**109**	**4**	**3,784**	**142**	**4**	**3910**	**141**	**4**

The number of publications produced from NERC-funded science has been rising for several years. Part of the increase this year reflects a big improvement in reporting, rising from a return rate of 73 percent last year to 98 percent this year.

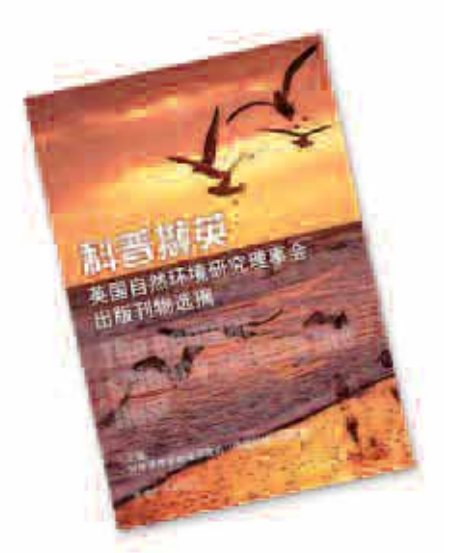
Royalties and licence income by research centres (£k)

Centre	2005-06	2006-07
BAS	10	13
BGS	1,394	1,692
CEH	305	197
POL	42	75
Swindon Office	53	10
Total	**1,804**	**1,987**

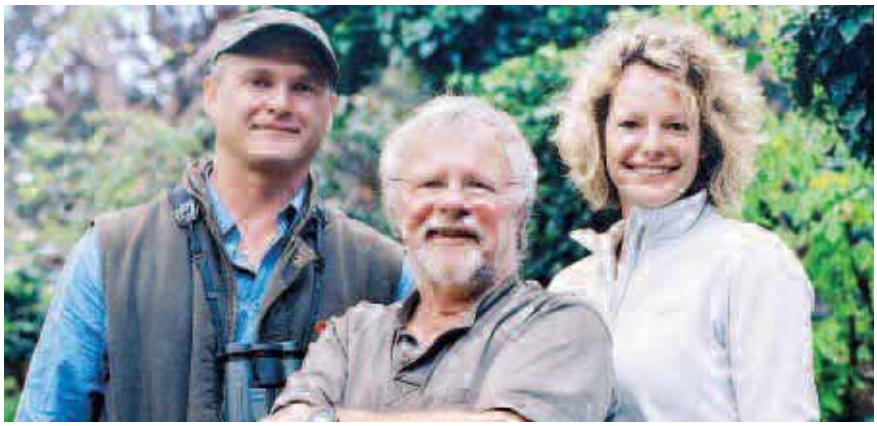
Value of earned income (contract research) by research centres (£k)

Centre	2005-06	2006-07
BAS	738	1,475
BGS	22,521	19,468
CEH	11,400	9,463
NOC	n/a	1,065
POL	1,672	1,346
Swindon Office	796	5,120
Total	**37,127**	**37,937**

NB: In 2005-06 income generated by the Research Ships Unit (now part of NOCS) was included in the Swindon Office total. Due to the interpretation of non grant-in-aid funding where there is no exchange of transactions, income of £5,137k for 2006-07 is now classified as financing. In 2005-06 this figure was £6,446k.



Engaging the public



Left to right:

Planet Earth magazine is now available in Chinese.

The Springwatch team of Simon King, Bill Oddie and Kate Humble. © BBC

Leafcutter ants. © David M Dennis/OSF

Tony Blair meets Laura Williams from the British Geological Survey.

Major BBC documentaries

David Attenborough's high-profile documentaries *Is Planet Earth Changing?* and *Can We Save Planet Earth?* both featured our scientists in action. Viewers watched the veteran broadcaster discuss the evidence with Peter Cox, director of NERC's Climate and Land Surface Interaction Centre, and David Reay from the University of Edinburgh, as well as many other NERC-funded researchers.

David said, 'It was a complete thrill. Ever since I was a child I'd always dreamed of working with David Attenborough.'

The NERC communications team worked with producers to identify the major areas of climate change research.

NERC scientists were also featured on other programmes, including *Coast* and *Real Stories: What Is Under Your Home?* The latter netted four million viewers and resulted in 370,000 hits on the British Geological Survey website within 90 minutes of the broadcast.

Three documentary crews traipsed to the Afar Depression in Ethiopia with NERC-funded scientists (see p9) to film the aftermath of a series of violent earthquakes and what some are describing as the birth of an ocean.

Three more camera crews jostled for space onboard NERC's research aircraft, following Ian Renfrew and colleagues as they embarked on one of the first International Polar Year expeditions – the Greenland Flow Distortion Experiment.

National Science and Engineering Week

The Prime Minister Tony Blair greeted Laura Williams, manager of the British Geological Survey's Cardiff office at a reception in Downing Street for National Science and Engineering Week. The reception celebrated the achievements of Science and Engineering Ambassadors who work with schools to stimulate and inspire children's interest in science.

NERC centres and Swindon Office organised ten events during the week. The events ranged from using giant hornets to explain selfish behaviour to a competition for a school to win a seismometer to measure earthquakes around the globe.

Around 100 NERC staff and students are registered as Science and Engineering Amabassadors.

Springwatch

Centre for Ecology & Hydrology scientist Tim Sparks' enormous contributions to the BBC's *Springwatch* series has helped generate a huge revival of interest in phenology (how climate affects biological cycles) in the UK, and brought into people's homes the impacts of climate change on the natural world.

Discover Antarctica!

A two-week festival to bring life in the freezer to the people of Edinburgh attracted more than 12,000 visitors to over 20 events. Tourists, residents and schoolchildren experienced Antarctica through film, art, performances and hands-on activities at museums, galleries and science centres across Edinburgh. The star attractions were the two ice ships, the British Antarctic Survey's *James Clark Ross* and HMS *Endurance.*

Climate change online debate

Climate change sceptics from around the world participated in NERC's first online debate – the climate change challenge –

Royal Society Summer Exhibition

Three NERC projects featured prominently at the prestigious Royal Society Summer Exhibition, held in London in July. Escaping from the summer heat, thousands of schoolchildren, scientists and policy-makers were wowed by the displays.

The breathing forest

As carbon dioxide in the atmosphere rises, forests under certain conditions start to release more of the greenhouse gas than they absorb. This was the message from Phil Ineson and colleagues from NERC's Centre for Terrestrial Carbon Dynamics, whose infectious enthusiasm for their work captured the hearts and minds of the visitors.

Go to the ant and be wise

Francis Ratnieks from the University of Sheffield and colleagues brought a living, working ant colony to the Royal Society to demonstrate the tropical American leafcutter ants' complex and hygienic waste-disposal system.

Earthquake alert

Following the devastating Boxing Day earthquake in the Indian Ocean in 2004, John McClosky from the University of Ulster and colleagues calculated the likelihood of similar events along two faults on Sumatra.

querying, probing and even dismissing climate research. NERC Chief Executive Alan Thorpe, who initiated the idea, said, 'I believe that it is hugely important that we address the sceptics' views.'

'We need to reflect properly the scientific uncertainties in communicating the outcomes of NERC-funded research,' he added.

www.nerc.ac.uk/about/consult/debate

New websites

NERC and our collaborative centre the National Oceanography Centre, Southampton both launched new websites this year, offering more news, features, imagery and science highlights.

The British Antarctic Survey also launched an online photo library to market its stunning collection of images.

On tour

Global-change scientist Dave Reay juggled a hectic schedule of research and public engagements on climate change. The author of *Climate Change Begins at Home* gave interviews on TV and radio and spoke at the Cheltenham and Bristol science festivals, the Edinburgh Book Festival, the Royal Institution, the Natural History Museum and in ten countries around the world (via climate-friendly video-conferences with the British Council).

Planet Earth scoops award

NERC's magazine *Planet Earth*, which now has a circulation of 18,000, won the 'Best External Magazine 2006' award at a ceremony hosted by Siân Lloyd in London and organised by the Chartered Institute of Public Relations.

Mountain maps

A new set of maps covering Britain's mountain regions features extensive geological information from the British Geological Survey. The outdoor press have enthusiastically reviewed the new maps and they recently won the coveted 'Best Folded Map' award at the International Map Trade Association.

Skilled people

Our commitment to training has led to new technologies, award-winning staff and world-class science.

Where there's muck there's brass

Converting cow manure into electricity is the latest spin on the Midas Touch from a young team from Cranfield University. Their idea for an efficient and original use for slurry won the Environment Young Entrepreneurs Scheme (YES), which is funded by NERC and targeted at environmental researchers.

The YES scheme, based on the successful Biotechnology YES initiative, is a three-day workshop where teams receive training on a range of skills related to commercialising their science. On the final day teams present a business plan based on hypothetical science to a panel of equity investors to secure funding, and win a range of prizes.

Poppy Leeder
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www.nerc.ac.uk/using/schemes/yes

Freezing assets

With 80,000 hits on the British Antarctic Survey's new online recruitment system it is easy to see why they won the award for 'Best Human Resources Practice' in the Recruitment Confederation awards for the East of England. They also won two categories in the national Public Sector People Managers' awards.

Mapping campaign wins national award

The Irish Taoiseach Bertie Ahern handed the Geological Survey of Northern Ireland the award for best public information campaign at a awards ceremony held in Mansion House, Dublin.

The award was for a publicity campaign for a major three-year geological mapping programme, the Tellus Project, covering the whole of Northern Ireland. The project involved a plane flying just 56 metres above ground. The campaign involved 80,000 letters, TV and radio appearances, newspaper articles and dozens of presentations to government departments, farmers, schools and general interest groups.

Marie Cowan
mtc@bgs.ac.uk

Clockwise from left:

The Cranfield University team who won the Environment Young Entrepreneurs Scheme.

The team from the Geological Survey of Northern Ireland receiving their award from Irish Taoiseach Bertie Ahern.

The British Antarctic Survey's new director Professor Nick Owens.

Professor Sir Howard Dalton at the Rothera aquarium in Antarctica.

People and prizes

Plymouth Marine Laboratory director Professor Nick Owens becomes director of the British Antarctic Survey in summer 2007 following Professor Chris Rapley's retirement.

New Year's Honours

NERC Council member and Defra Chief Scientific Advisor, Professor Howard Dalton received a knighthood.

Ed Jenner, chairman of NERC's Science and Innovation Strategy Board, received an MBE.

Former director of the British National Space Centre and former Council member, Dr Colin Hicks, received a CB.

David Highley, now retired from the British Geological Survey, received an MBE.

Dr Nicola De Paola, Durham University won the 'Outstanding Author' award for the best paper published by the Journal of the Geological Society of London by a young author.

Professor Nicholas Barton was awarded the Darwin prize by the Royal Society.

Professor Phil Ineson, Centre for Terrestrial Carbon Dynamics, won the Marsh Award for Ecology presented by the British Ecological Society.

Dr Huw Sheppard, British Geological Survey, was awarded the 'Young Author of the Year' by The Geological Society in February 2007 for the best scientific paper published in the Journal of the Geological Society of London by a researcher under the age of 30.

Dr Joanna Wragg, British Geological Survey, received the Allan Ure Bursary Award, awarded to young scientists in the field of environmental analytical chemistry, by the Royal Society of Chemistry.

Dr Gary Wealthall, British Geological Survey was appointed a Nottingham Ambassador in February 2007.

Professor Sarah Wanless, Centre for Ecology & Hydrology, won the Zoological Society of London Marsh Award for Conservation.

Former Chief Executive Sir John Lawton was awarded Honorary Fellowship of the Zoological Society of London.

Staff, students and fellows

	2003-04	2004-05	2005-06	2006-07
Directly employed staff*	2,600	2,727	2,736	2,659
Staff in HEIs**	773	690	1,216	1,227
Fellows	77	84	98	97
PhD	1,033	1,042	1,032	996
Masters***	330	325	335	383

Notes:

* *Total number of individuals*

** *Staff in higher education institutions employed on research grants.*

*** *This data is based on numbers of students directly funded by NERC. It does not include studentships funded through cross-council programmes, where another research council administers the award.*

Leadership

Providing national and international leadership for the environmental sciences.

INTERNATIONAL 2007 2008 POLAR YEAR

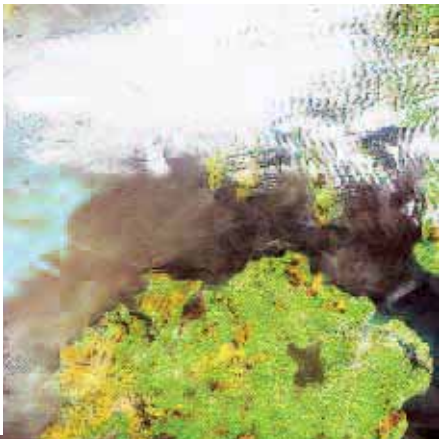
Clockwise from top:

International Polar Year began in March.

Skidoos in the Arctic.

Ian Jackson (left) and organisers of OneGeology: Harvey Thorleifson, Association of American State Geologists, and John Broome, Geological Survey of Canada.

A plankton bloom across Ireland captured by Envisat. © ESA



International Polar Year

International Polar Year (IPY), the largest scientific programme in 50 years, began in March. The international project office, funded by NERC, is coordinating 50,000 projects involving 63 nations. IPY, conceived by British Antarctic Survey director Chris Rapley and based at its office in Cambridge, has approved 170 scientific projects and 57 educational and outreach plans.

Launch events around the world, including London, caught the attention of the media and the public imagination. Well-wishers included veteran broadcaster Sir David Attenborough, who said, 'Today the polar regions are changing faster than any other part of the world. They can provide us with early warnings of what is likely to happen in the near future. I have no doubt that IPY will reveal some very important questions.'

Launch events were followed by a reception in the Houses of Parliament attended by the Science Minister Malcolm Wicks.

British scientists inform new guidelines on ballast water management

New guidelines on ballast water management for all vessels entering Antarctic waters were passed by the Antarctic Treaty nations at their Edinburgh conference. The British Antarctic Survey and the Maritime and Coastguard Agency (MCA) prepared the draft guidelines to address concerns about invasive marine species entering Antarctic waters from ballast tanks.

Kevin Hughes
kehu@bas.ac.uk

OneGeology

The British Geological Survey is leading the geological surveys of more than 55 nations to create the first global digital geological map and make geological data for the Earth more accessible. The project, known as OneGeology, will deliver a searchable website containing geological map data for the entire planet, initially at a scale of 1:1,000,000.

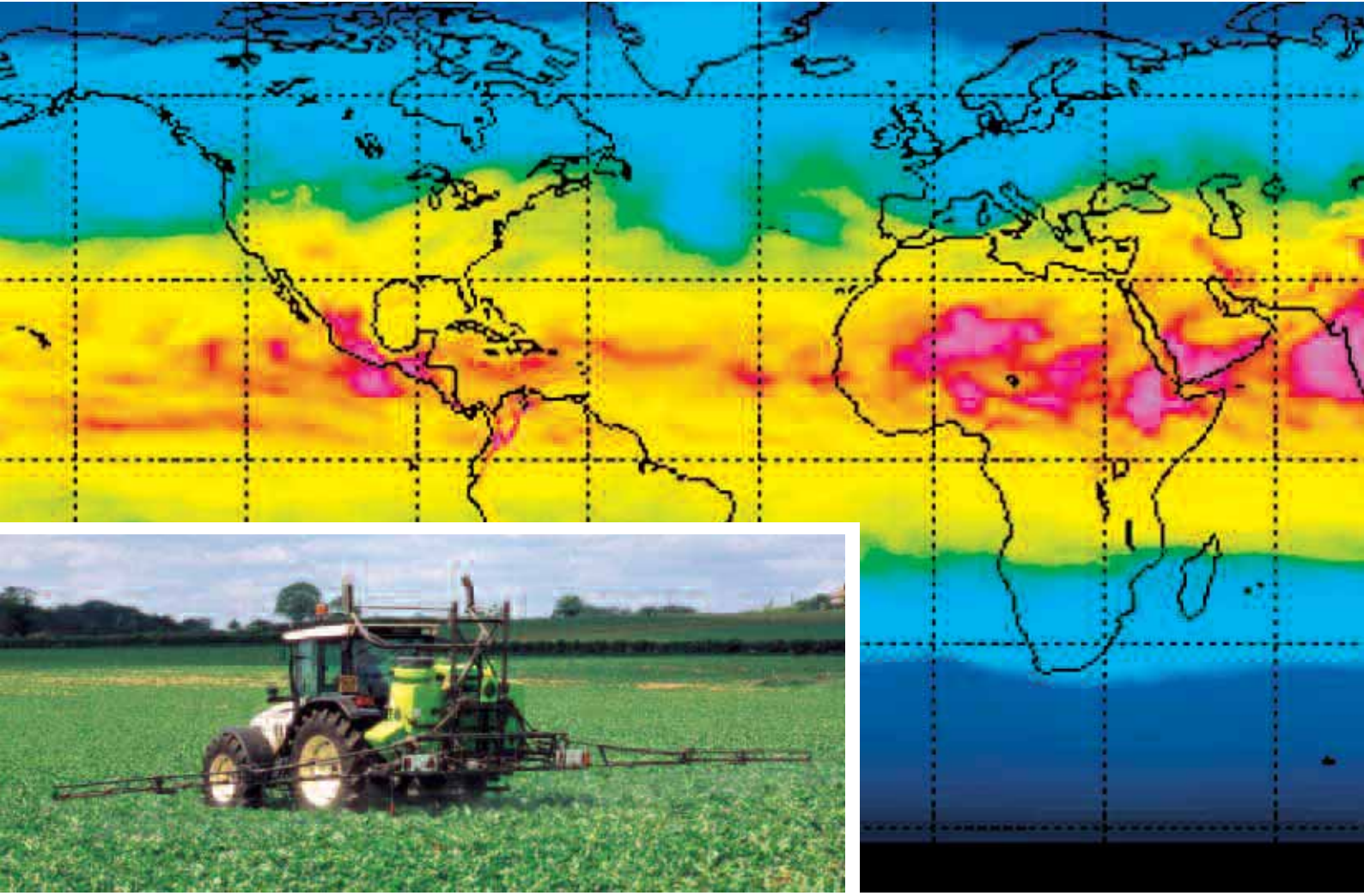
The plan is to make OneGeology available through Google Earth and other dynamic map browsers. The initiative will start producing results by mid-2008 and grow steadily from there as more countries start to pool data.

This landmark achievement will for the first time allow data from one country to be shared with data from others. The initiative will also transfer much-needed know-how and expertise between nations, allowing developing countries to shorten their digital learning curve and make more accessible the information they hold on, for example, mineral resources and environmental hazards such as earthquakes and subsidence.

Dr Ian Jackson
ij@bgs.ac.uk
www.onegeology.org

New project to estimate global water resources

Scientists will directly link a range of hydrological and climate models in a major international project to estimate global water resources for the 21st century. The programme will quantify the changes in mean river flow, floods and droughts as well as assess our



uncertainties in these estimates. The €13 million Water and Global Change (WATCH) project, co-led by the Centre for Ecology & Hydrology and the Wageningen University and Research Centre in Holland, will assess the vulnerability of the global water cycle to societal and economic pressures.

Dr Richard Harding
rjh@nerc.ac.uk

Training scientists from the Geological Survey of Iran

Earthquakes and ground subsidence due to water extraction are two challenges facing the scientific community in Iran. In 2006 the Centre for Observation and Modelling of Earthquakes and Tectonics (COMET) hosted two researchers from the Geological Survey of Iran and trained them to use satellite techniques to address these issues.

Professor Barry Parsons
Barry.Parsons@earth.ox.ac.uk

NitroEurope

The Centre for Ecology & Hydrology is coordinating a major collaborative programme, NitroEurope, to reduce uncertainties about how the nitrogen cycle interacts with greenhouse gases. NitroEurope's main objective is to investigate how 'reactive nitrogen' – nitrogen that is biologically available – affects the production and release of greenhouse gases. It's a five-year EU-funded project involving around 65 institutions across Europe.

Dr Mark Sutton
www.nitroeurope.eu

CarbonFusion

An international effort to quantify the terrestrial carbon cycle, a critical area of uncertainty in global warming predictions, has been set up by two NERC centres, the Centre for Terrestrial Carbon Dynamics (CTCD) and the Data Assimilation Research Centre (DARC).

Soils and vegetation are major carbon stores, currently absorbing around 25 percent of carbon dioxide from burning fossil fuels. It is highly uncertain how soils will behave in a warmer world.

CTCD director Shaun Quegan said, 'The key output we want from CarbonFusion is a global strategy for combining models and data to quantify the Earth's carbon cycle.'

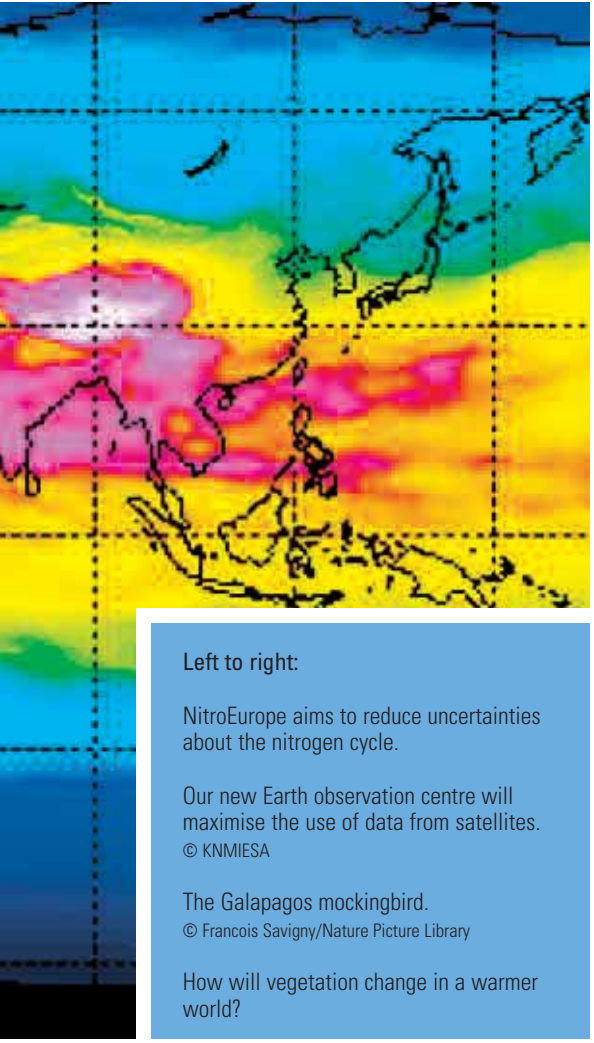
The UK group are working closely with colleagues at NASA and other US and Australian research institutes.

www.carbonfusion.org

The UK's first national centre for Earth observation

NERC announced the launch of the National Centre for Earth Observation in August 2006. The centre will build on NERC's considerable expertise in this area: NERC is already responsible for the UK's subscription to several European Space Agency programmes, including the Earth Observation Envelope Programme – worth around £38m in 2006-07.

The centre will have responsibility for NERC's Earth observation centres of excellence. These centres use satellite data to monitor global and regional changes in the environment, and to develop a detailed understanding of these changes



Left to right:

NitroEurope aims to reduce uncertainties about the nitrogen cycle.

Our new Earth observation centre will maximise the use of data from satellites.
© KNMIESA

The Galapagos mockingbird.
© Francois Savigny/Nature Picture Library

How will vegetation change in a warmer world?

so that we can predict future environmental conditions. The centres have already highlighted significant environmental changes – for instance ozone depletion, atmospheric pollution, and melting sea ice.

Professor Alan O'Neill (director)
Alan@met.rdg.ac.uk

To save a mockingbird

A new scheme to re-introduce the Galapagos mockingbird, which is on the verge of extinction, began in March. The project will use techniques developed from a recent NERC-funded project to reduce inbreeding in the Mauritius kestrel, which has helped bring the species back from the brink of extinction.

Only four species of mockingbird are left on the Galapagos. One species is endangered. It has already gone extinct on the main island and fewer than 200 birds are left on two smaller islands.

Conservation biologists Steve Ewing from the University of Glasgow and Lukas Keller, now at the Zoologisches Museum, Zürich and colleagues want to maximise the genetic diversity of the mockingbird populations to improve survival rates.

Lukas said, 'We started in March with a workshop in the Galapagos. We will begin moving mockingbirds in 2009.

'I am convinced if we had not done the work on kestrel inbreeding we would not have credentials to do the Galapagos project,' he added.

Dr Lukas Keller
l.keller@bio.gla.ac.uk

Organisation

Ensuring that NERC is a flexible fit-for-purpose organisation

Oceans 2025

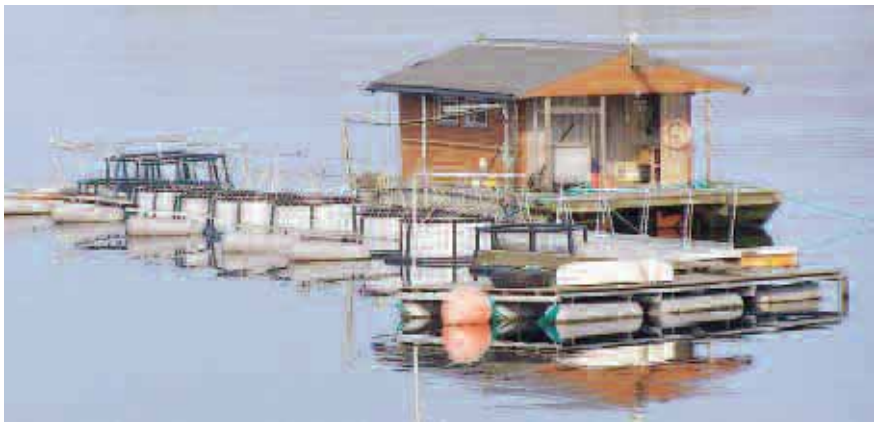
Right:

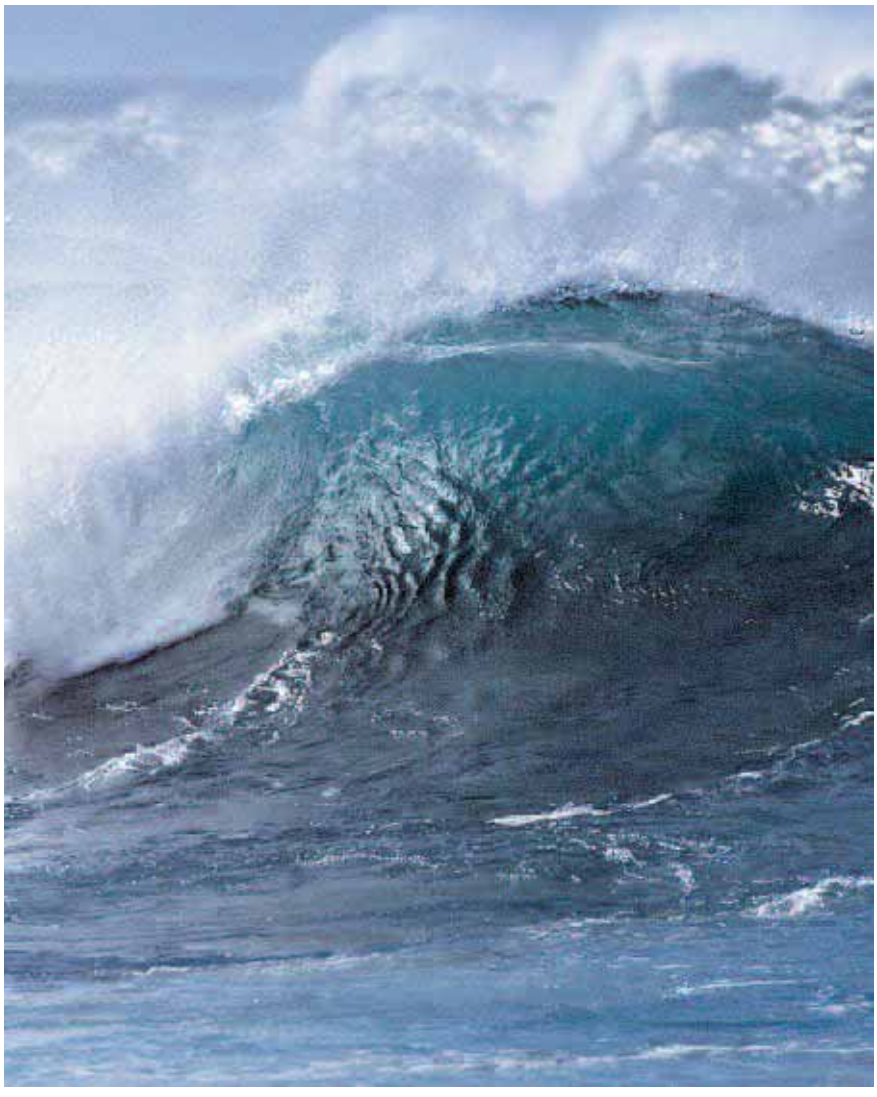
Example of a map available from the Polar View team.

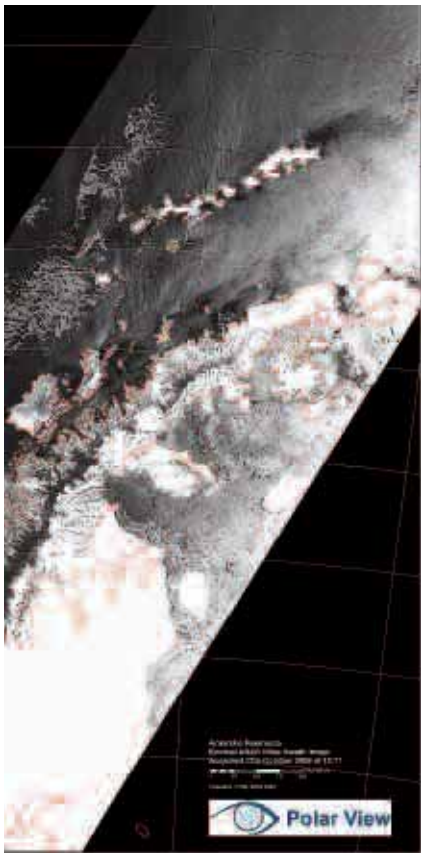
NERC's newest research ship, the RRS *James Cook*, arrives for duty.

Below:

The seawater tanks used to measure acidity in the ocean in Norway.







Polar View – global monitoring

The British Antarctic Survey (BAS) was recently awarded a major contract to manage sea ice monitoring services for research ships, cruise liners and fishing boats in the Southern Ocean. The project is the Southern Ocean component of a new information programme, Polar View, which operates in the Antarctic and Arctic, delivering a range of polar environmental information services as part of the European Commission and European Space Agency's Global Monitoring for Environment and Security programme.

BAS is managing a consortium of organisations from Canada, Denmark, Germany, Italy, Norway and the United Kingdom, which deliver the Antarctic services. In the Antarctic these services will initially focus on near real-time satellite-based information about sea ice conditions to assist shipping. In the current climate of high fuel prices and increasing concerns about operational safety, better information contributes to improved efficiency and safety for vessels navigating in sea ice.

www.polarview.aq.

New research ship

The launch of a new ship is always a big event. In February the Princess Royal joined NERC Chief Executive Alan Thorpe to formally name the latest addition to NERC's research fleet, the Royal Research Ship *James Cook*.

The National Audit Office singled out RRS *James Cook* as an exemplary example of good management of a large project: it was delivered on time and within budget.

Project manager Howard Roe said, 'Her arrival is the culmination of a process that began some six or seven years ago. The result is quite simply the best oceanographic research ship in the world, with unrivalled capacity and versatility.'

The *James Cook's* maiden voyage caused headlines around the world as researchers embarked on an expedition to the Mid-Atlantic Ridge to investigate a large area, covering thousands of square kilometres, where the Earth's crust seems to be missing entirely. Here, the mantle – the deep interior of the Earth, normally covered by crust many kilometres thick – lies exposed on the seafloor.

Oceans 2025

Seven of the UK's leading marine centres have joined forces to implement Oceans 2025, a £120 million five-year programme funded by NERC.

Oceans 2025 is the first time that a single strategic research programme has been presented to NERC by its marine centres. This new 'self-assembly' approach to research planning has been designed to create a coordinated response to the serious scientific challenges of a changing marine environment. The strategic nature of the programme will enhance the research capabilities and facilities available for marine science.

Oceans 2025 will also support several national facilities including the British Oceanographic Data Centre, the Permanent Service for Mean Sea Level and the Culture Collection for Algae and Protozoa.

A key part of Oceans 2025 is the new Strategic Ocean Funding Initiative which will allow universities and other partners to bid for funds.

Dr Phil Williamson, p.williamson@uea.ac.uk
www.oceans2025.org

International collaboration: recovery of intact section of ocean crust

Recovering an intact section of ocean crust has been an elusive goal of scientific ocean drilling for decades. This goal has now been realised by the Integrated Ocean Drilling Program, funded in the UK by NERC. The team published their results in the American journal *Science* in May 2006.

The team aims to keep on drilling towards the base of the crust. They hope the sample will tell them how volcanic activity produces the Earth's crust and how it is cooled by hydrothermal systems.

Damon Teagle, a geochemist from the National Oceanography Centre, Southampton sailed on all three cruises, twice as co-chief scientist. Also working on the project were: petrologists John MacLennan, based in Edinburgh and Cambridge, and Sally Morgan, based at the University of Leeds and wire-line geophysical loggers from the University of Leicester, Samantha Barr and Mark Reichow.

Dr Damon Teagle
dat@noc.soton.ac.uk
www.bgs.ac.uk/iodp

Accreditation to international standards for safety, health and environment

The British Antarctic Survey was awarded the internationally recognised standard for Environmental Management Systems, ISO 14001. The standard requires an organisation to demonstrate its commitment to continuous improvement by identifying its most significant impacts, setting targets to improve environmental performance, and carrying out regular senior management reviews of its environmental performance.

At the same time the survey achieved accreditation to the Occupational Safety and Health Standard, OHSAS 18001.

Neil Wilson and Rod Downie
rhd@bas.ac.uk
nwil@bas.ac.uk

Centre for Ecology & Hydrology restructuring

At its March 2006 meeting, NERC Council approved an investment of £44m for the Centre for Ecology & Hydrology's (CEH) ambitious business plan. The plan focuses CEH's new integrated science programme on four sites. CEH is creating new facilities, enabling staff from the five closing sites to relocate. Staff numbers will fall from about 600 to 440. The first closures begin in mid-2007.

Acid oceans

By the end of the century the oceans will be more acidic than they have been for 25 million years. Researchers from Plymouth Marine Laboratory, the Centre for Ecology & Hydrology and eight UK universities travelled to Bergen in Norway to study this largely ignored consequence of climate change.

Scientists working on the project, which is part of NERC's Post-Genomics and Proteomics programme, are currently analysing results to determine the effects of increased acidity on marine microbial communities.

The team set up a weblog to communicate the work they were doing in Bergen to the outside world.

Dr Ian Joint
i.joint@pml.ac.uk

Left to right:

Damon Teagle (left) and his team with the recovered core.

Sea water tanks used in monitoring acidity in the oceans.

On top of the new observatory on Cape Verde.

Next Generation Science for Planet Earth – the new NERC strategy

NERC's new strategy, *Next Generation Science for Planet Earth*, which defines our priorities from 2007 to 2012, has been developed by NERC's governing Council and the Science and Innovation Strategy Board.

The strategy is split into seven science themes and four organisational themes. The science themes are climate systems, biodiversity, sustainable use of natural resources, Earth system science, natural hazards, technologies, and finally environment, pollution and human health.

The four organisational themes are: knowledge, people, scientific infrastructure and delivery.

Central to the strategy is a major new initiative called 'Living with Environmental Change' which addresses one of the Treasury's five key challenges. 'Living with Environmental Change' will be a partnership across research councils, government departments and industry.

The strategy will be published in Autumn 2007.

Environmental science boosts UK economy

Environmental science is worth hundreds of millions of pounds to the UK economy, according to an independent study commissioned by NERC. The report, *Economic Benefits of Environmental Science*, received widespread support. Chief Scientific Advisor Sir David King said, 'I am very glad this analysis has taken place. One of the most difficult messages to get across at any level is where you have avoided risk or if you have significantly reduced risk.

'The whole issue around global warming is one of preparing our societies for the impacts of climate change and then reducing the impacts by reducing emissions. Now what is the economic value of those impacts? Massive,' he added.

Richard Blackmore
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New atmospheric and ocean observatory on Cape Verde

In January NERC opened a new observatory on the island of Cape Verde to provide continuous, long-term measurements of atmospheric composition above the Atlantic Ocean. The observatory will also investigate how the oceans and the atmosphere interact. The Cape Verdean Minister of Infrastructure, Transport and the Sea, Manuel Inocêncio Sousa, formally opened the centre, which is joint-funded with the Leibniz Institute of Marine Sciences in Germany and other European Union programmes.

Phil Newton, who represented NERC at the launch, said, 'Carbon dioxide measurements on Hawaii show the importance of long-term monitoring. The Cape Verde Observatory will fill a knowledge gap in the tropical Atlantic, with benefits to Africa, the UK and the rest of the world.'

www.york.ac.uk/capeverde

Trends in annual capital investment (£m)

	2003-04	2004-05	2005-06	2006-07
Major projects (>£400k)	10.4	14.9	21.4	27.1
Research Centre Infrastructure Fund	6.0	8.1	0.8	0.0
Minor projects and equipment (<£400k)	8.9	4.9	9.9	9.7
(less capital sales income)	0.0	0.0	-0.2	-0.3
Capital grants to HEIs* (excluding JIF)	0.0	0.0	0.0	13.2
Total	**25.3**	**27.9**	**31.9**	**49.7**

**from 2006-07 classed as Capital HEI: Higher Education Institutions JIF: Joint Infrastructure Fund*

Going green

We have implemented many initiatives this year including: rainwater harvesting at the Centre for Ecology & Hydrology, Edinburgh; a new cycle store at Proudman Oceanographic Laboratory; and we are currently implementing new waste management strategies at the National Oceanography Centre, Southampton. We are planning other initiatives including wind turbines at the British Geological Survey.

During the year the British Antarctic Survey and the British Geological Survey successfully gained ISO 14001 environmental management accreditation.

We are pleased to announce that the Environment Centre for Wales, which opens soon, meets recognised standards for environmentally sustainable design. Construction begins on a new building at the British Geological Survey's site at Keyworth which meets the same criteria.

The NERC Green Team, made up of representatives from all NERC research centres, meet (via video-conference) every three months. During the next twelve months the team aim to formalise NERC policies to cover travel, waste management and energy. These will then provide the basis for all individual site policies.

Directed programmes

Eight of our directed programmes came to a close this year. We held end-of-programme events to highlight their achievements and discuss with policy-makers and industry how their outputs could benefit the UK economy. Much of the work is highlighted throughout this report and previous reports.

- Autosub Under Ice
- Lowland Catchment Research (LOCAR)
- Environmental Factors in the Chronology of Human Evolution and Dispersal programme (EFCHED)
- Upper Troposphere and Lower Stratosphere Ozone (see page 23)
- Polluted Troposphere
- Core-Strategic Measurements for Atmospheric Science (COSMAS)
- Clouds, Water Vapour and Climate (see page 21)
- Ocean Margins Link (see page 26).

House of Lords judgment on the Bangladesh case

In July 2006, the House of Lords dismissed an appeal by Mr Binod Sutradhar against NERC, bringing to an end a court case that had moved through the British legal system for over five years.

Mr Sutradhar had alleged that NERC was negligent because it did not test for arsenic when it conducted a pilot study into the hydrochemistry of groundwater in Bangladesh in 1991. At the time, there was no evidence that arsenic was present in water-soluble form on alluvial plains such as those in Bangladesh. Subsequently, it was found that groundwater in Bangladesh was contaminated with arsenic, and tragically many people have been affected by arsenic.

The House of Lords judgment concluded that there was not a case to answer and that scientists cannot be held responsible for research they decide not to do.

Top: And did these feet in ancient times: scientists demonstrate how they can date a footprint.

Left: Ouch! Phil Harding from the Channel 4 programme *TimeTeam* demonstrates the ancient art of flint making at a NERC end-of-programme event.

Clear links with Defra

Close ties between NERC and government departments such as Defra are essential. In November we held a very successful NERC-Defra awayday to develop stronger links between our two organisations. About 70 people attended including directors of NERC research centres and collaborative centres and Defra institutes. Interactive activities helped to promote understanding of how each organisation works and the role of science in evidence-based policymaking.

Faith Culshaw
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Climate briefing for the Mayor of London

In November 2006, NERC arranged a briefing on climate change for Ken Livingstone and his team of advisers. They heard the latest on predictions of sea-level rise and storm surges; on carbon emissions with a focus on aviation; and an update on climate models, especially the new ensemble models. Three of the issues highlighted for London were cooling the Underground if temperatures rise by two degrees; concerns that some models are based on rural rather than urban parameters; and a need for ever-more accurate forecasts of sea-level rises to predict the life expectancy of the Thames Barrier.

Vital statistics

In this section we present an overview of our expenditure, funding, environmental impacts, grant application success rates, health and safety, and freedom of information requests. These are followed by a management commentary, a financial summary and an outline of organisational changes.

The Vital Statistics chapter may not be sufficient for a full understanding of NERC's financial position and performance. The full financial position is presented in NERC's Annual Accounts. www.nerc.ac.uk.

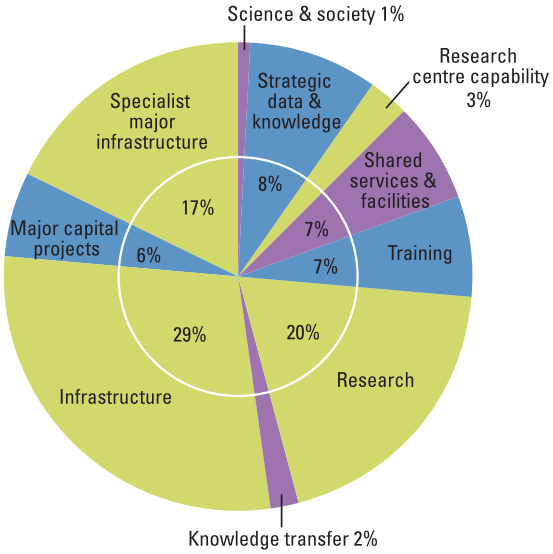
Background

The Natural Environment Research Council (NERC) was established by Royal Charter on 1 June 1965, under the Science and Technology Act 1965. NERC funds and carries out impartial scientific research in the sciences of the environment. We train the next generation of independent environmental scientists. Our mission is to gather and apply knowledge, create understanding and predict the behaviour of the natural environment and its resources, and communicate all aspects of our work.

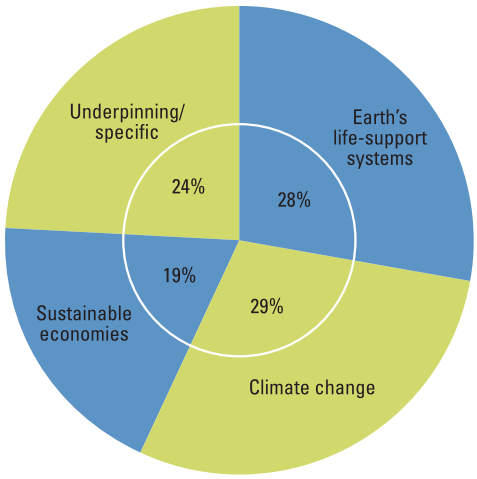
The Council fulfils its mission through:

- pushing forward the frontiers of knowledge through cutting-edge responsive research and innovation;
- proposing sustainable solutions to environmental problems: pollution, climate change, loss of biodiversity;
- advising decision-makers how to predict, avoid or reduce the harmful effects of natural hazards: floods, droughts, earthquakes, volcanoes, landslides, tsunamis;
- collecting, managing and supplying environmental data and providing information to meet the needs of users;
- training, funding and supporting a world-class community of environmental scientists;
- transferring knowledge, products, information and skilled people to benefit UK business, policy and industry;
- improving wealth creation and the quality of life;
- engaging and informing the public, through debate and dialogue about environmental issues that matter to us all;
- directing our budget to achieve the highest quality, impact and relevance from our research;
- building and maintaining a first-class infrastructure for the UK's environmental scientists;
- ensuring openness, accountability and value for money.

Allocation of science budget by funding category



Allocation of science budget by priority science areas



NERC's strategic priorities are:

SCIENCE – to prioritise and deliver world-class environmental sciences to understand the Earth system;
USING KNOWLEDGE – to use NERC-funded science to identify and provide sustainable solutions to environmental problems;
SKILLED PEOPLE – to train and develop skilled individuals to meet national needs;
LEADERSHIP – to provide effective national and international leadership for the environmental sciences, including our role in promoting the interface between science and society;

and, to deliver these four priorities:

ORGANISATION – to ensure that NERC is a flexible, fit-for-purpose organisation, and to achieve excellence in service delivery and customer focus.

Review of activities

NERC published its strategic and scientific priorities for UK environmental sciences in *Science for a sustainable future 2002-2007* (www.nerc.ac.uk/publications /strategicplan/) in April 2002. NERC's new strategy *Next generation science for planet Earth*, launching in 2007, will replace this strategy. More information on our strategic priorities and science achievements is covered on pages 60-63 of the Annual Report 2006-07.

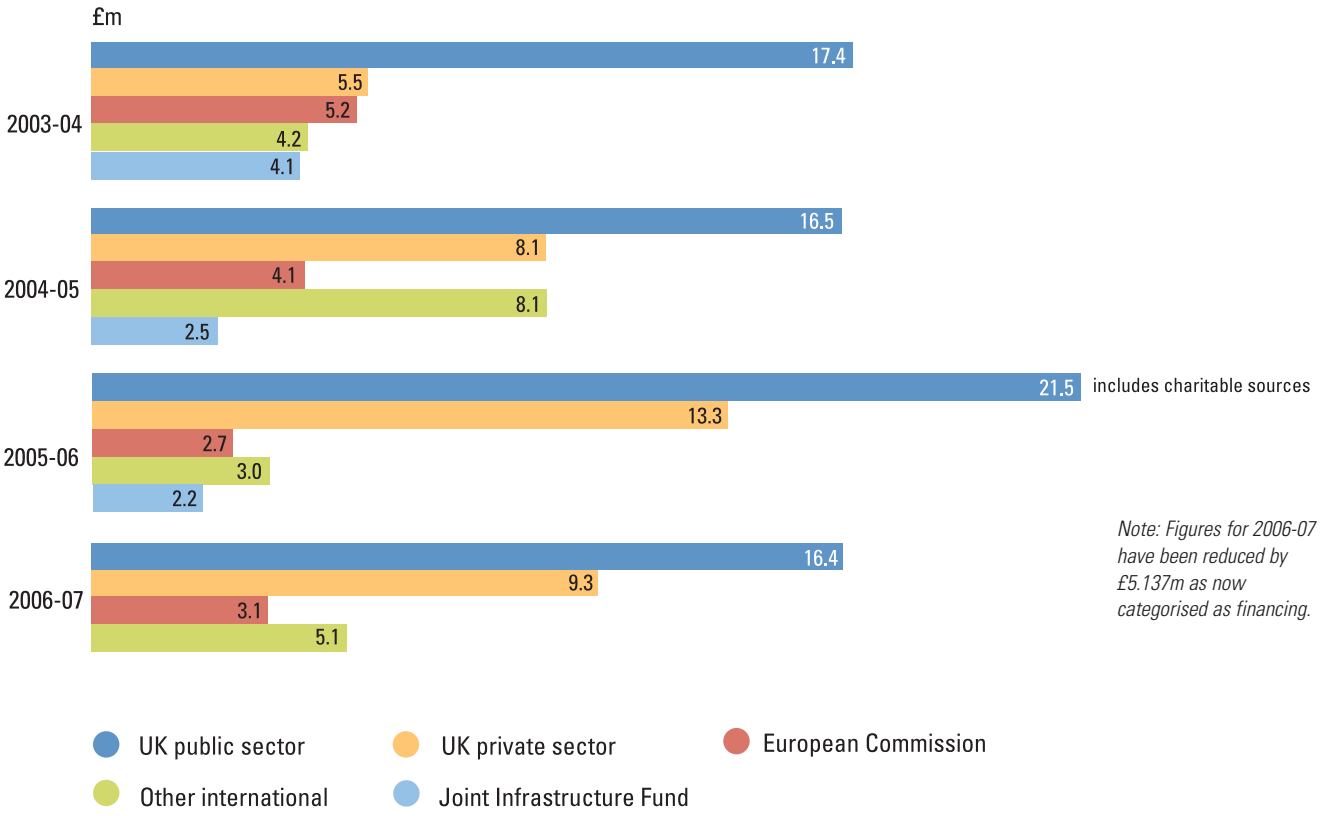
External funding

Funding from outside NERC meets the costs of commissioned and co-funded research carried out by NERC's centres for government departments, other public bodies, industry, the European Commission, and international and overseas organisations. This is a significant funding stream for many of NERC's centres and it is an important means of transferring knowledge to users.

Statement of net expenditure 2006-07 (£m)

	Outturn
Programme expenditure	332.27
Notional charge against capital	7.69
Depreciation	20.61
Provisions	(1.47)
Impairments	0.29
Administration costs	21.70
Income	(47.12)
Net expenditure for the year	333.97

External funding for research (£m)



Note: Figures for 2006-07 have been reduced by £5.137m as now categorised as financing.

Environmental accounts

This is the fourth year that NERC has produced a set of accounts that cost the environmental impact of our operations. NERC provides world-class science whilst ensuring that we limit damage to the environment. The accounts cover areas of NERC over which we have direct operational and financial control, including our bases in the UK and abroad, and our research vessels and aircraft. These are not precise audited financial accounts, but an indicative management tool that encourages thought and action to measure NERC's environmental impacts, and take cost-effective steps to minimise them. This tool has been developed over the years and is now part of our capital purchasing procedures. It should be noted that we updated the figures for years 2006-07 and comparators for 2005-06 to include the impact of the National Oceanographic Centre, Southampton for the first time.

The costs for energy use decreased due to the move to Green tariffs/renewable energy for all NERC owned sites for electricity. Gas costs increased marginally as a result of the prolonged winter. The cost of airplanes has marginally decreased due to a shorter Antarctic season reducing flying time. The cost of ships has increased marginally this year. A new ship, the RRS *James Cook* became operational this year. The ship will carry scientists to some of the Earth's most challenging environments and has been designed as a world-class multi-disciplinary science platform. Every effort has been made to ensure that it is environmentally friendly, including the use of an engine management system.

NERC is continuing to resource a 'Greening Fund' for local initiatives to reduce its environmental footprint and to mitigate some of the restoration costs. Further details can be found on page 42 'Going Green'.

Restoration/avoidance costs

	2005-06 £	2006-07 £
Impacts to air		
Arising from :		
Energy		
Electricity consumption	150,700	147,700
Gas consumption	40,400	41,800
Oil consumption	3,000	2,500
Petrol consumption	400	400
Diesel consumption	11,200	11,200
Total Energy	**205,700**	**203,600**
Transport	109,000	108,800
Commuting	32,000	31,400
NERC ships	520,400	523,300
NERC planes	89,400	74,000
Total Transport	**750,800**	**737,500**
Total Impacts to air	**956,500**	**941,100**
Impacts to land		
Waste disposed to landfill	9,600	9,500
Total impacts to land	**9,600**	**9,500**
Impacts to water		
Water use and sewage	not quantified	not quantified
Total Environmental Costs	**966,100**	**950,600**
Staff costs	106,640,000	107,318,000
Other operating costs	72,684,000	92,712,000
Total operating costs	**179,324,000**	**200,030,000**
Total revised operating costs	**180,290,100**	**200,980,600**

The following table shows the total emissions to air from the impacts included in the accounts above, by category of emission (in tonnes).

	2005-06	2006-07
Carbon dioxide	46,100	46,400
Sulphur dioxide	100	100
Nitrous oxide, particulate matter, carbon monoxide, hydrocarbons	300	300
Methane	10	3

Responsive mode standard and small grant applications and success rates

	2003-04	2004-05	2005-06	2006-07
Number of applications*	860	596	864	825
Number of awards*	252	153	176	190
Total £k	30,582	22,349	27,024	39,699
% success rate	29	26	20	23

**Includes joint applications/awards.*
Shaded figures are based on partial data.

Success rates for fellowships by gender

	2005-06		2006-07	
	Men	Women	Men	Women
Number of applicants	93	50	102	51
Number of successful applicants	17	13	20	10
% success rate by gender	18	26	20	20

Success rates for grants by gender

	2004-05		2005-06		2006-07	
	Men	Women	Men	Women	Men	Women
Number of applications	1,092	193	906	175	827	207
Number of successful applicants	179	20	212	39	207	39
% successful applicants	25	18	23	22	25	19

Shaded figures are based on partial data.

Requests made under the Freedom of Information Act

	2006
Outputs	10
Research policy and operations	3
Funding applications	2
Business policy and operations	2
Personal information	1
Contracts	3
Total	**21**

Openness and transparency

NERC is subject to the Freedom of Information Act 2000, and also the Environmental Information Regulations 2004 which provide broadly similar access rights to the Act but relate specifically to information about the environment. We work with the other research councils to ensure a consistent approach to open access legislation on key issues such as peer review. During 2006 we answered 21 requests for information under the legislation, covering a wide range of subjects from environmental data to personal information. We answered 95 percent of our requests, some of which were complex, within the statutory 20 working-day limit. Much of our information is available without a specific Freedom of Information Act request; for details see foi.nerc.ac.uk.

Colin Pelton, cdp@nerc.ac.uk

Equality matters and success rates

Staff

NERC embraces diversity and equality, and has introduced a wide range of measures to ensure that individuals can contribute their skills, knowledge and experience to the organisation whilst maintaining a work/life balance. We actively encourage parents to return to work by providing child care facilities and flexible working arrangements.

We continue to monitor all recruitment exercises to ensure demographic representation and all promotion rounds are scrutinised for fairness.

In addition, we promote personal development embracing initiatives such as sabbaticals; secondments; further education and a range of short courses. By investing in individuals, we continue to foster potential across the organisation and ensure that NERC has the necessary skills, knowledge and experience to meet future challenges.

Gill Sharpe, gesh@nerc.ac.uk

Grants, fellowships and studentships

We monitor the success rates of grant and fellowship applications to ensure that we do not discriminate against any applicants. Trend data have shown that the proportion of women applying for research grants has been relatively constant and success rates between men and women have been comparable over several years. We will continue to monitor the trend.

For the 2006-07 NERC fellowship round, female candidates made up 33% (51 of 153) of the applicants and were awarded 33% of the fellowships (10 of 30). The percentage of fellowships being offered to female candidates in previous years was; 43% (13 of 30) in 2005; 25% (8 of 32) in 2004 and 32% (11 of 34) in 2003.

For PhD and masters courses, the studentships are awarded to universities and NERC research centres. Students are selected by these institutions (within set eligibility criteria). Therefore NERC has no control over the selection of the individuals and does not have accurate data on success rates.

Racial equality monitoring table – 2006-07

	No. of staff in post	*% of staff in post by ethnic group*	*No. of applicants for employment*	*% of total no. of applicants for employment*	*No. of applicants for promotion*	*% of total no. of applicants for promotion*	*No. of applicants for training*	*% of total no. of applicants for training*
Ethnic group								
Asian/Asian British	17	0.6	213	7.3	1	0.8	37	1.1
Black/Black British	8	0.3	38	1.3	0	0	13	0.4
Chinese	17	0.6	21	0.7	0	0	26	0.7
Mixed	8	0.3	65	2.2	0	0	0	0
Other	15	0.6	248	8.4	0	0	82	2.3
Unknown	232	8.7	158	5.4	13	10.6	909	26.1
White	2,362	88.9	2,196	74.7	109	88.6	2,416	69.4
Totals	**2,659**		**2,939**		**123**		**3,483**	

	Average no. of applications for training per employee	*No. of recipients of training*	*% of total no. of recipients of training*	*Average no. of training interventions per employee*	*No. of staff subject to disciplinary procedures*	*No. of staff who have raised a grievance*	*No. of staff who have left*	*% of total no. of staff who have left*
Ethnic group								
Asian/Asian British	2.2	41	1.0	2.4	1	1	6	2.7
Black/Black British	1.6	15	0.4	1.9	0	0	1	0.5
Chinese	1.5	11	0.3	0.6	0	0	2	0.9
Mixed	0	0	0	0	0	0	0	0
Other	5.5	65	1.7	4.3	0	0	1	0.5
Unknown	3.9	785	20.0	3.4	0	0	18	8.3
White	1.0	3,014	76.7	1.3	27	15	190	87.1
Totals		**3,931**					**218**	

Of the 386 NERC-funded masters students starting in 2006, 48% are female, 49% male and 3% unknown. Of the 321 NERC-funded PhD students starting in 2006, 55% are female and 45% are male. This gives an overall split of 51% female, 47% male and 2% unknown. This is comparable to 2005 where 53% were female and 47% male and is consistent with other previous data where studentship awards were split fairly evenly between male and female candidates.

Fellowships and studentships: Avril Allman, aval@nerc.ac.uk

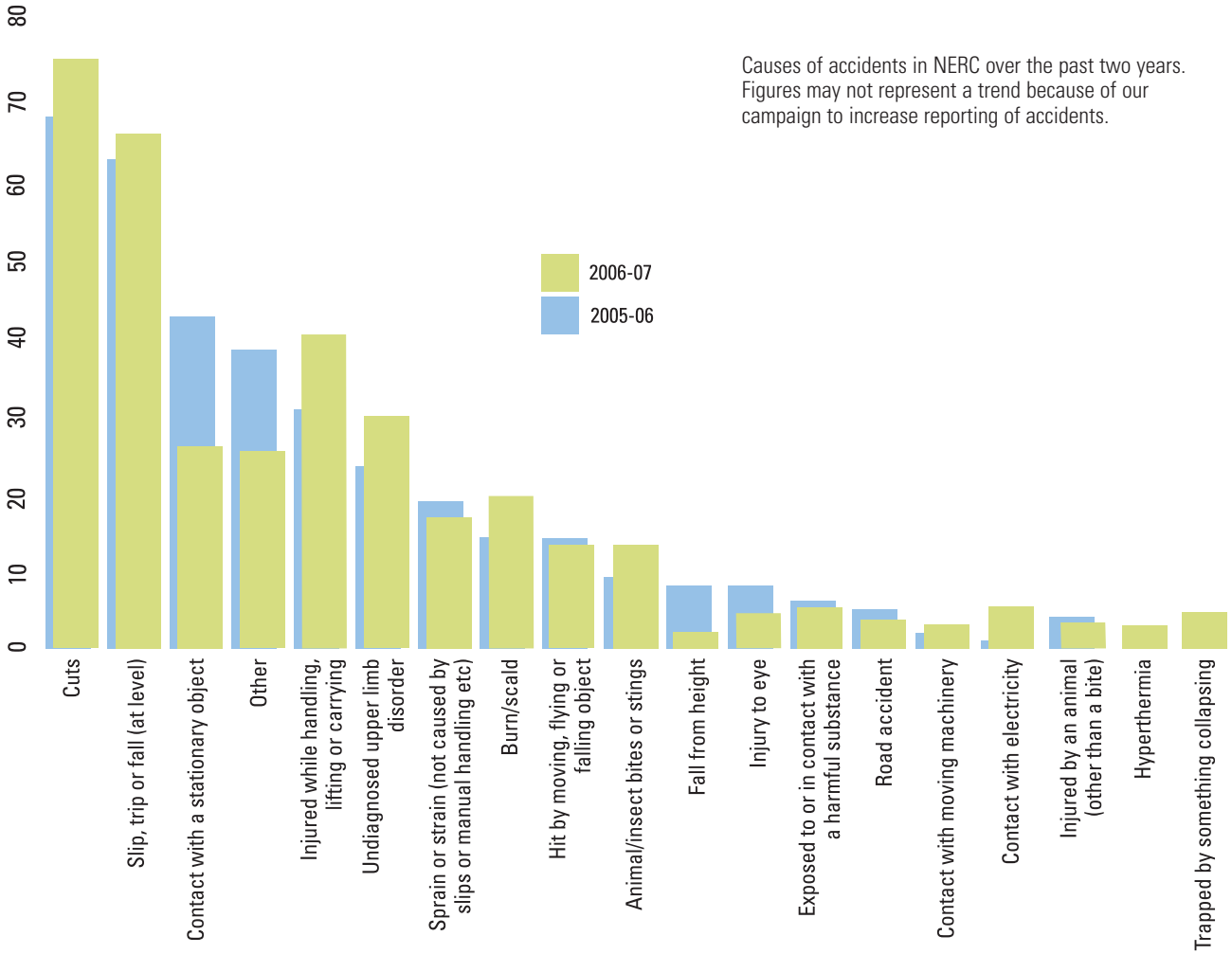
Research grants: Jim Aland, jeal@nerc.ac.uk

Racial equality

Under the Race Relations (Amendment) Act (RRAA), public bodies with more than 150 staff are required to report back their monitoring of specified employment trends. This is to help identify any signs of employment practices or procedures discriminating against people from ethnic minorities. NERC's figures required under the RRAA are set out above.

We do not collect information against one category, namely the number of staff who benefit or suffer as a result of our performance assessment procedures. This is because our appraisal system focuses much more on future development needs than past performance. The system allows people to assess their own performance and to discuss both performance and future development with their manager at a formal meeting at least once a year. Identifying measures of benefit or detriment that are directly attributable to the appraisal process is therefore not possible in NERC.

Accidents



Causes of accidents in NERC over the past two years. Figures may not represent a trend because of our campaign to increase reporting of accidents.

Health and safety

Auditing of all areas of NERC has now started to comply with policies and procedures put in place over the last six years. This completes the planned implementation of HSG65 ('Successful Health & Safety Management') as the chosen safety management system for the organisation. Auditing cannot begin until policies have been in place long enough to assess the success of their inauguration and practice. Audit schemes have been developed against the key procedures which were prioritised according to accident and incident patterns within NERC. The first cycle of audits have covered upper-limb disorder and its management, manual handling of loads (which leads to musculoskeletal injury, a major component of reported accidents in NERC), workshops and the management of chemical hazards ('the Control of Substances Hazardous to Health' COSHH regulations) where use of chemicals in the research environment is very different to the industrial situation which drove HSE guidance.

Initial audits are encouraging and have confirmed health and safety is embedded into all management systems across NERC. Whilst some details of practice could be improved in all of the areas audited, fundamental consideration of safety issues by management is in place across the organisation and most practices fully comply with policy.

Stuart Dobson, sd@nerc.ac.uk

HOW WE SPENT THE SCIENCE BUDGET (£m)

	Summarised Allocation	Final OSI Outturn	Variance
Directed Programmes			
Aerosol Impacts	0.449	0.250	-0.199
Autosub under ice (AUTOSUB)	0.499	0.449	-0.050
Biological Diversity and Ecosystem Function in Soil	0.015	0.014	-0.001
Clouds, Water Vapour and Climate (CWVC)	0.065	0.052	-0.013
Core Strategic Measurements for Atmospheric Science (COSMAS)	0.099	0.045	-0.054
Coupled Ocean-Atmosphere Processes and their Effect on Climate (COAPEC) (joint programme with MST)	0.158	0.073	-0.085
Cross Council Contribution (Flooding)	0.553	0.509	-0.044
Depleted Uranium	0.000	0.119	0.119
eScience	3.020	2.794	-0.226
Environment and Health	0.374	0.073	-0.301
Environmental Diagnostics	0.000	0.249	0.249
Environmental Factors in the Chronology of Human Evolution and Dispersal (EFCHED)	0.298	0.213	-0.085
Environmental Nanotechnology	0.011	-0.035	-0.046
Faraday Partnerships	0.088	0.047	-0.041
Flood Risk in Extreme Events	0.456	0.229	-0.227
Global Nitrogen Enrichment (GANE)	0.006	0.002	-0.004
Integrated Ocean Drilling Program	3.306	2.506	-0.800
International Polar Year - Science Programme	0.507	0.609	0.102
Joint NERC/EPSRC Environmental Maths & Statistics (EMS) programme	0.250	0.382	0.132
Low Carbon Innovation	0.241	0.256	0.015
Lowland Catchment Research	0.623	0.477	-0.146
Marine and Freshwater Microbial Biodiversity	0.015	0.000	-0.015
Marine Productivity: physical controls on ecosystem dynamics	0.015	-0.040	-0.055
Ocean Drilling Programme	0.015	0.042	0.027
Ocean Margins LINK Programme	0.553	0.478	-0.075
Polluted Troposphere	0.586	0.404	-0.182
Post Genomics	4.126	3.890	-0.236
Quantifying the Earth System	3.791	3.086	-0.705
Rapid climate change and the stability of the thermohaline circulation	3.911	3.197	-0.714
Rural Economy & Land Use	2.361	2.898	0.537
Science Programmes Planning Figure	-0.103	0.000	0.103
Study of composition and structure of the lower stratosphere and upper troposphere at middle latitudes (OZONE)	0.230	0.101	-0.129
Surface Ocean Lower Atmosphere Interactions	2.945	2.822	-0.123
Sustainable Energy	2.152	1.718	-0.434
UKPopNet	0.551	0.531	-0.020
Urban Regeneration and the Environment (URGENT)	0.026	0.005	-0.021

HOW WE SPENT THE SCIENCE BUDGET (£m) cont.

	Summarised Allocation	Final OSI Outturn	Variance
Other Programmes			
Commercialisation	0.424	0.984	0.560
Deputy Director of Science & Innovation Small Initiatives Fund	0.115	0.035	-0.080
Eurocores - Biodiversity	0.116	0.058	-0.058
Eurocores - Mineral Sciences	0.150	0.149	-0.001
Grants Admin	0.035	0.057	0.022
International Subscriptions	1.848	1.661	-0.187
Knowledge Transfer	3.681	3.239	-0.442
Minor Initiatives	0.035	0.099	0.064
Short Courses	0.049	0.000	-0.049
NOCS (one-off adjustment re balances brought forward)	0.000	-2.895	-2.895
Collaborative Centres			
Centre for Population Biology (CPB)	1.171	1.078	-0.093
Continuous Plankton Recorder Survey of the North West European Shelf and the North East Atlantic (SAHFOS)	0.195	0.196	0.001
Marine Biological Association	1.211	1.194	-0.017
National Centre for Atmospheric Science	9.129	8.788	-0.341
Oceans 2025 Capital Grants	2.000	2.440	0.440
Plymouth Marine Laboratory	4.552	4.565	0.013
Scottish Association for Marine Science	2.545	2.642	0.097
Sea Mammal Research Unit	0.921	0.940	0.019
Tyndall Centre for Climate Change Research	1.100	0.851	-0.249
Earth Observation (EO) National Programme			
EO Centres of Excellence	4.092	3.337	-0.755
EO Instument Development	0.529	0.440	-0.089
EO Post Launch Support	0.441	0.662	0.221
EO Data Centre (NEODC)	0.050	0.191	0.141
EO Administration	0.500	0.332	-0.168
EO Applications, Science & Mission Support	1.241	0.121	-1.120
European Space Agency	36.930	37.761	0.831
Scientific Facilities & Technology			
Airborne Remote Sensing Facility	0.695	0.626	-0.069
Data Centre Support	0.386	0.291	-0.095
Data Centre Support	0.500	0.000	-0.500
FAAM NCAS Flying Costs	0.750	0.000	-0.750
FAAM Open Access Flying	0.987	1.700	0.713
High Performance Computing	1.398	1.713	0.315

	Summarised Allocation	Final OSI Outturn	Variance
Large Facilities Diamond Synchrotron	0.040	0.000	-0.040
Marine Barter Bank	0.050	0.136	0.086
Services & Facilities	5.283	6.011	0.728
FAAM Capital Refurbishment	*0.150*	*0.097*	*-0.053*
Large Facilities ISIS	*0.050*	*0.000*	*-0.050*
Purchase of Dornier	*1.400*	*1.504*	*0.104*
Services & Facilities Capital	*0.800*	*0.192*	*-0.608*
Responsive Mode Grants			
Standard Grants	29.178	25.505	-3.673
Small Grants	1.880	1.790	-0.090
New Investigator	0.721	1.091	0.370
Antarctic Funding Initiative (AFI)	0.788	1.724	0.936
Consortium grants	5.948	5.262	-0.686
Capital Grants Round	1.857	1.110	-0.747
Responsive Mode Training			
Studentships	21.209	21.594	0.385
Fellowships	4.437	4.828	0.391
British Antarctic Survey			
Core Infrastructure	25.947	25.824	-0.123
Artic Station	0.135	0.135	0.000
RRS Ernest Shackleton	1.700	1.700	0.000
Antarctic Bases Environmental Clean Up (PR)	1.148	0.831	-0.317
BAS for non-BAS use of RRS *James Clark Ross*	0.668	0.668	0.000
Research Centre Science Programme	9.806	9.730	-0.076
Core Capital	*2.863*	*2.848*	*-0.015*
Capital Maintenance (Capital Investment Strategy)	*0.704*	*0.340*	*-0.364*
LF Halley 6 capital	*8.616*	*8.779*	*0.163*
Rothera Redevelopment Phase 1 (RCIF 04/05)	*2.454*	*2.446*	*-0.008*
British Geological Survey			
Core Infrastructure	8.855	8.556	-0.299
Research Centre Science Programme	16.707	16.665	-0.042
Core Capital	*2.021*	*2.169*	*0.148*
Capital Maintenance (Capital Investment Strategy)	*0.094*	*0.052*	*-0.042*
Keyworth Blocks A-F	*0.810*	*0.704*	*-0.106*

HOW WE SPENT THE SCIENCE BUDGET (£m) cont.

	Summarised Allocation	Final OSI Outturn	Variance
Centre for Ecology & Hydrology			
Research Centre Science Programme	12.192	12.094	-0.098
Core Infrastructure	11.068	11.683	0.615
CEH Lancaster Development	0.296	0.000	-0.296
Environmental Centre for Wales	1.527	1.245	-0.282
GECAFS International Subscription	0.085	0.146	0.061
Core Capital	*1.238*	*1.346*	*0.108*
Capital Maintenance (Capital Investment Strategy)	*0.802*	*0.684*	*-0.118*
Environmental Centre for Wales	*0.549*	*0.711*	*0.162*
CEH Transition and Integration	2.000	1.805	-0.195
CEH Transition and Integration	0.500	0.383	-0.117
National Oceanography Centre, Southampton			
National Oceanography Centre, Southampton	6.292	7.010	0.718
National Marine Facilities Division	11.900	11.500	-0.400
National Oceanography Centre, Southampton	*0.243*	*0.010*	*-0.233*
National Marine Facilities Division	*1.007*	*0.726*	*-0.281*
Proudman Oceanographic Laboratory (POL)			
POL Science	1.576	1.593	0.017
POL PSMSL	0.088	0.088	0.000
Core Infrastructure	1.754	1.879	0.125
British Oceanographic Data Centre	1.111	1.098	-0.013
Core Infrastructure	*0.713*	*0.274*	*-0.439*
Capital Maintenance (Capital Investment Strategy)	*0.070*	*0.008*	*-0.062*
Other infrastructure			
Swindon Office	14.162	13.546	-0.616
Vacated Sites	0.285	0.418	0.133
Merchant Navy Pension Fund Deficit (PR)	1.709	0.720	-0.989
Evolutech	-0.100	0.000	0.100
Senior Staff Development & Recruitment	0.180	0.088	-0.092
Contingent Liabilities (PR)	0.197	0.000	-0.197
Electronic Records Management System	0.398	0.398	0.000
Resource Management System (RMS)	0.170	0.127	-0.043
Corporate Systems Development (CSD)	1.950	1.424	-0.526
GRID Highband Width Connection	0.918	0.947	0.029
VAT Refund	-0.777	-0.960	-0.183
Shared Service Centre Implementation Costs	0.589	0.589	0.000

	Summarised Allocation	Final OSI Outturn	Variance
James Cook Research Vessel	0.010	0.000	-0.010
James Cook Research Vessel	*13.099*	*12.930*	*-0.169*
LF Replacement for the Discovery	*0.100*	*0.000*	*-0.100*
Capital Maintenance (Capital Investment Strategy)	*0.738*	*0.000*	*-0.738*
Corporate Systems Development (CSD)	*0.481*	*0.469*	*-0.012*
Core Capital	*0.078*	*0.000*	*-0.078*
Greening	*0.250*	*0.100*	*-0.150*
Restructuring	1.746	2.141	0.395
Public Funding Initiative Scored Outside DEL	-0.933	-0.933	0.000
Unrealised Risks	1.361	0.000	-1.361
Balance Sheet Provisions	-3.124	-0.089	3.035
Cost of Capital	8.719	7.686	-1.033
Depreciation	20.600	20.358	-0.242
Asset Disposals	-2.467	-2.629	-0.162
Asset Disposals	*-0.553*	*-0.301*	*0.252*
Overcommitment against Science Budget	-5.575	0.000	5.575
Overcommitment against Science Budget	*-0.136*	*0.000*	*0.136*
TOTAL NERC EXPENDITURE	**375.374**	**365.303**	**-10.071**
Comprises:			
Resource *	**336.233**	**328.832**	**-7.401**
Capital	**39.141**	**36.471**	**-2.670**

Capital Expenditure in italics

** This differs from the Statement of Net Expenditure by £5.137m which is recorded in Table 14 in the Annual Accounts as funding received from other bodies.*

SCIENCE BUDGET EXPENDITURE IN RESEARCH ORGANISATIONS

Expenditure £k	REPONSIVE AWARDS												
	Grants	PhD students	Masters	Masters Training Grant	Fellowships	JIF grants	Knowledge transfer	Directed grants	Directed PhD students	Directed fellowships	Research contracts/ progs	Collaborative Centres	TOTAL
Birkbeck College	77								34				111
Brunel University	96	23							8				127
Cardiff University	271	504			57			294	28		31		1,185
Cranfield University	29			44				54	94		20		241
Durham University	506	233			65		128	153		6	2		1,093
Glasgow Caledonian University								76					76
Heriot-Watt University		22	28	55				30					135
Imperial College London	1,200	866	96	274	258		5	477		10	271	1,054	4,511
Keele University	13	71						23	20		10		137
King's College London	107	99	19	107				18	16				366
Kingston University	16								3		202		221
Lancaster University	247	372	31	74			152	79			29		984
Liverpool John Moores University	153							12					165
London School of Economics & Political Science							73		8				81
Loughborough University	84	15							3				102
Manchester Metropolitan University	1										8		9
Newcastle University	325	481	91	205	133	74	16	311	29				1,665
Open University	357	233			27	8		50			179		854
Oxford Brookes University	-6	21		26					72				113
Queen Mary, University of London	433	208			100		20	20	9				790
Queen's University of Belfast	158								16		1		175
Roehampton University	38								30				68
Royal Holloway, University of London	220	253	54	168	47			99			79		920
University College London	1,277	751	19	146	65			600	60		902		3,820
University of Aberdeen	461	438	67	84	178	-9	83	338	23		24		1,687
University of Bath	179	32							59	11			281
University of Birmingham	959	397	73	163	56		139	320	142		3		2,252
University of Bradford	2	43	27	52	11								135
University of Bristol	1,762	989	17		207			751	8		894		4,628
University of Cambridge	1,940	1,343		30	203	176	81	1,027	2	5	694		5,501
University of Dundee	73	25	10								300		408
University of East Anglia	1,742	826	30	128	158	474	31	1,022		18	187	2,477	7,093
University of Edinburgh	2,094	1,146	64	135	463	-27	186	400	13		845		5,319
University of Essex	459	139			90		8	99					795
University of Exeter	599	370	24	49	50			164	38	10	1		1,305
University of Glamorgan								58					58
University of Glasgow	349	151			183		40	68	43				834
University of Greenwich		15											15
University of Hertfordshire	61	58											119
University of Hull	146	143			50				1,382				1,721
University of Kent	40	36						3					79
University of Leeds	2,526	894	110	279	210	25	88	567			1,355	6,459	12,513
University of Leicester	316	276		34	58		85	29			411		1,209
University Of Lincoln	17												17
University of Liverpool	1,279	631			110		73	335			334		2,762
University of Nottingham	157	120	16	26	49			69			93		530
University of Manchester	2,091	618		28	200	-129	-5	650			259		3,712
University of Oxford	1,494	1,135		43	238		136	421			563		4,030
University of Plymouth	388	166	21	27									602

Expenditure £k	REPONSIVE AWARDS												
	Grants	PhD students	Masters	Masters Training Grant	Fellowships	JIF grants	Knowledge transfer	Directed grants	Directed PhD students	Directed fellowships	Research contracts/ progs	Collaborative Centres	TOTAL
University of Portsmouth	12	19											31
University of Reading	1,024	847	71	253	223		57	985			2,339		5,799
University of Salford	4	21					2				139		166
University of Sheffield	1,448	515		26	157		8	724			659		3,537
University of Southampton	1,224	805	23		141	-206	85	1,740			1,051		4,863
University of St Andrews	674	388	11	35	19		71	137		12	4	939	2,290
University of Stirling		221		36			102	236					595
University of Strathclyde		81			60			-40					101
University of Surrey	21	4						75					100
University of Sussex	66	59											125
University of Ulster	20												20
University of Wales Swansea	348	253			106		82	77			297		1,163
University of Wales, Aberystwyth	199	188			52			13			1		453
University of Wales, Bangor	514	303	38	82	54		135						1,126
University of Warwick	476	155			42			190					863
University of Worcester							6						6
University of York	793	294	63	109				143			775		2,177
Zoological Society of London	62	151			35								248
Agri-Food & Bio-Sciences Institute											3		3
BBSRC John Innes Centre	71							112					183
Central Laboratory of the Research Councils											4,309		4,309
Centre for Environment, Fisheries and Aquaculture Science (CEFAS)								23	17				40
College of Exploration											6		6
Diamond Light Source Ltd	1												1
Fisheries Research Services Marine Laboratory								32	38				70
Macaulay Land Use Research Institute								3	28				31
Marine Biological Association	176						51					909	1,136
Medical Research Council (MRC)								-4					-4
National Institute of Agricultural Botany	75								26				101
Natural History Museum	-231						14	67	22				-128
Plymouth Marine Laboratory	419	170					2	773	104		595	1,035	3,098
Policy Studies Institute								2,684					2,684
Rothamsted Research								102	7		8		117
Royal Botanic Gardens - Edinburgh					42								42
Royal Botanic Gardens Kew	69							61	9				139
Scottish Agricultural College		18						7	15				40
Scottish Association For Marine Science	91	131						57	71		109	1,316	1,775
Scottish Universities Environmental Research and Reactor Centre	147	45						55	42		1,493		1,782
Sir Alister Hardy Foundation for Ocean Sciences	9						5		42				56
Rutherford Appleton Laboratory	156						7	421	4				588
The Institute for European Environment Policy								53	65				118
TOTAL	**32,604**	**18,811**	**1,003**	**2,718**	**4,197**	**386**	**1,966**	**17,343**	**2,630**	**72**	**19,485**	**14,189**	**115,404**

GRANTS AWARDED IN 2006-07

	RESEARCH GRANTS									
	RESPONSIVE								DIRECTED	
	Small Grant		Standard Grant		Antarctic Funding Initiative		Consortium Grant		Directed	
	Value £k	Number	Value £k	Number	Value £k	Number	Value £k	Number	Value £k	Number
Birkbeck College	51	1								
Cardiff University	26	1							77	1
CCLRC			9	1			207	1		
Central Science Laboratory									64	2
Centre for Environment Fisheries Aquaculture Sci ence									109	1
Cranfield University	34	1	177	1						
Diamond Light Source Ltd			19	1						
Durham University	143	2	357	3						
Edge Hill University									97	1
Fisheries Research Services									7	1
H R Wallingford Ltd									184	1
Heriot-Watt University										
Imperial College London	204	3	977	5			409	1	372	2
Kings College London									494	2
Lancaster University	48	1	973	3					267	4
London School Hygiene & Tropical Medicine									157	2
Loughborough University			289	1						
Marine Biological Association	69	1								
Natural History Museum	60	1								
NERC British Antarctic Survey					600	2	575	1	406	1
NERC British Geological Survey									147	1
NERC Centre for Ecology and Hydrology			1,331	5					884	6
Newcastle University	98	2	969	4	342	1	305	1	204	1
Northumbria University	64	1			79	1				
Open University	48	1							234	2
Oxford Brookes University										
Plymouth Marine Laboratory										
Proudman Oceanographic Laboratory			248	3					469	2
Queen Mary, University of London			993	4						
Royal Botanic Gardens Kew	70	1								
Royal Holloway, University of London	62	1								
Scottish Association For Marine Science	69	1	384	1					28	1
Scottish Universities Environmental Research and Reactor Centre										
University College London	28	1	900	2			396	1	180	2
University of Aberdeen	47	1	1,814	5					101	1
University of Bath			334	1						
University of Birmingham			1,126	5					280	3
University of Bradford										
University of Bristol	319	7	3,052	12	343	1	981	2	1,010	5
University of Cambridge	119	2	817	4			369	2	175	2
University of Dundee									33	1
University of East Anglia	188	4	1,084	4			236	1	596	4
University of Edinburgh	70	1	2,171	8	259	1	201	1	246	3
University of Essex			294	1					11	1
University of Exeter	135	2	1,388	6					121	2
University of Glasgow			606	4					8	1
University of Hertfordshire										
University of Hull										
University of Kent										
University of Leeds	254	5	3,056	10			1,765	2	172	2
University of Leicester	27	1	369	1	373	1	126	1		
University of Lincoln			101	1						
University of Liverpool	45	1	966	6					134	3
University of Nottingham			711	2						
University of Manchester			1,633	6						
University of Oxford	40	1	2,953	10			125	1	247	2
University of Plymouth	85	2	920	4					696	2
University of Reading			1,615	6			2,758	2	1,365	7
University of Sheffield			1,836	8					110	2
University of Southampton	207	5	251	3			773	1	465	2
University of St Andrews	24	1	893	5						
University of Stirling					392	1			48	1
University of Strathclyde			228	1						
University of Sussex			306	1					29	1
University of the West of England									174	2
University of Ulster	34	1								
University of Wales Swansea										
University of Wales, Aberystwyth			342	1						
University of Wales, Bangor	218	3	520	2						
University of Warwick			614	2						
University of Worcester									13	1
University of York	132	3	1,921	7						
Zoological Society of London			566	3			125	1		
TOTAL	3,018	59	40,113	163	2,388	8	9,351	19	10,414	81

** Masters Training Grants were awarded in 2006 to fund three years of masters studentships starting in 2006, 2007 and 2008. There will therefore be no new grants awarded in 2007/08 or 2008/09.*

		RESEARCH FELLOWS			RESEARCH STUDENTSHIPS						MASTERS	
					RESPONSIVE			DIRECTED				
Knowledge Transfer		Post-doc Fellow	Advanced Fellow	Senior Fellow	Responsive PhD	Responsive Project PhD	Responsive PhD Case	Directed PhD	Directed PhD Case	Directed Project PhD	Masters Training Grant*	
Value £k	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Value £k	Number
					7	1				1		
29	1											
											180	1
					3	1	1		1			
											226	2
			1	1	8	3			1		1,131	5
157	1				1						442	2
					4		1				304	2
					1							
		1			2							
					1							
					9							
		1			5						845	5
					2	1						
											108	1
193	1				2							
173	2				1							
					3	1	1					
					1		4		1	1	694	3
					1							
					1							
		1			8		2				602	4
188	1		2		4		1	3			346	2
129	1				5	2			1		671	3
											216	2
219	1	2	1		13	2	1		2			
113	2	3	1		17					1	125	1
294	2				12					1	530	3
		3	2		15	2	1				557	3
					2	1			1			
					4				1	1	204	1
		1			1	1			1			
141	1				1							
					3							
					1							
585	3	2			11	3	1	1	2	1	1,143	7
					2	1					141	1
					6	3	1					
					1		1				108	1
		1			11	1					118	1
		1			16	3					175	1
					1				1		113	1
73	1	1			11	3	2			1	1,044	6
116	1	2			9		1		1		108	1
					9	1				3		
					6						144	1
					2						150	1
					1							
					1	1	1					
166	2				3							
					4		1					
					5						339	2
					2							
					4	1		3	1		451	2
		2			3							
2,576	**20**	**21**	**7**	**1**	**246**	**32**	**20**	**7**	**14**	**10**	**11,215**	**65**

Statutory basis

These accounts have been prepared in accordance with the Financial Reporting Manual and the Accounts Direction, issued by the Secretary of State for Trade and Industry pursuant to Section 2(2) of the Science and Technology Act 1965, which is available from NERC Corporate Finance, Polaris House, North Star Avenue, Swindon SN2 1EU. The 2006-07 accounts have been prepared on an accruals basis, whereby income and expenditure is credited or charged to the Statement of Net Expenditure when the goods or services have been provided. The balance sheet shows the assets and liabilities at the year-end.

Financial summary

In addition to the Science Budget of £340,630,000 in 2006-07, NERC won external support from government departments, other UK and overseas public sector bodies, the European Union and industry. In 2006-07 this totalled £47,119,000 a reduction of 2% on other income from last year.

The accounts report a prior year adjustment to reflect the change in reporting for grant-in-aid and certain other income which is now taken to the Income and Expenditure Reserve directly and the restating of comparators for 2005-06.

The Statement of Net Expenditure records a total income of £47,119,000 and a total expenditure of £373,333,000 resulting in net operating expenditure in the year of £326,214,000. The total net book value of the fixed assets is £297,431,000. The Government Funds at 31 March 2007 amounted to £247,128,000.

Following the necessary accounting policies, the accounts show net expenditure for the year. Whilst accurate this is calculated on a different basis from the figures used by NERC and the Office of Science and Innovation/Department of Trade and Industry to monitor its performance. On this basis, NERC showed a surplus for the year that will be carried forward into the 2007-08 financial year.

Reconciliations can be found in Table 1. A significant proportion of capital expenditure related to the building of the new research vessel, the RRS *James Cook* (c£13m) which was launched this year, Halley VI costs of £8m, Rothera Base of £2.3m and the purchase of an aircraft for £1.5m. NERC made a resource surplus of £7.2m however, excluding the integration of NOCS in resource this year, would have resulted in a surplus of 1% of total budget. The surplus was due to a number of factors such as the integration this year of NOCS and balance transfers from Southampton University part way through the financial year.

Developments during the year

Oceans 2025

NERC has agreed funding for a new multi-million pound marine strategic research programme called Oceans 2025, which started in April 2007. See page 39.

International Polar Year (IPY)

NERC is the UK's largest supporter of polar science, particularly through the funding of our research centre, the British Antarctic Survey (BAS). We have provided £1 million to run the International Programme Offices for IPY, based at BAS in Cambridge.

In total, we are funding polar research at over 30 UK universities and research centres. Scientists employed or grant-funded by NERC are involved in almost all of the UK's IPY-endorsed science projects, which together account for over half of the world total of 170.

The Leadership for NERC programme

We have developed the *Leadership for NERC* programme to address capacity in the areas of strategic capability; leadership; change orientation and personal/professional impact. Some 60 senior managers from across the organisation are taking part in the programme. The initiative is helping to develop a learning culture and fostering collaboration between the various research centres across the organisation.

NERC Centres for Atmospheric Science

In September 2006, the NERC Centres for Atmospheric Science was officially renamed the National Centre for Atmospheric Science (NCAS). The name change reflects the increasing degree to which NCAS now acts as a single organisation, with one coordinated science plan and one management structure in place, despite being distributed geographically across many different sites. This enables a rapid response to new external (and internal) opportunities, and promotes cross-cutting initiatives involving multidisciplinary science. It also reflects the national role that NCAS plays in coordinating climate, weather and atmospheric composition research across the UK academic communities.

Long-term maintenance plan

NERC has completed the first year of its long-term maintenance plan. These works totalled £1.4million and included prioritised projects across all centres, including the National Oceanography Centre, Southampton.

Second-year funding has been approved totalling £1.8million across all centres. It is expected that in the future, the plan will be linked to NERC's Capital Investment Strategy.

Halley VI

Preparation for construction of Halley VI, the Antarctic base which will replace Halley V, began during the 2006-07 Antarctic season with buildings and science commissioning scheduled for the 2009-10 season. Combining the construction of Halley VI with decommissioning Halley V as a joint project will save money, so the cost of decommissioning will fall by £5.8m, this was reflected in last years accounts. Total costs of the joint projects Halley V and Halley VI are expected to be £38m.

Table 1

Reconciliation between annual accounts 2006-07 and OSI final outturn

	Resource £000	Capital £000
Net expenditure for the year (i)	333,969	
Funding from other bodies	(5,137)	
Treatment of capital grants	(13,219)	13,219
Capital (ii)		36,772
Net book value on the disposal of fixed assets (ii)		(301)
OSI Outturn (resource and capital)	**315,613**	**49,690**
OSI Science budget	322,863	52,510
Surplus reported to OSI (iii)/(iv)	**7,250**	**2,820**

Notes:
(i) taken from the Statement of Net Expenditure for the year ended 31 March 2007
(ii) taken from Note 9a – Tangible Fixed Assets
(iii) resource surplus comprises £8,275k near-cash surplus and £1,025k non-cash deficit.
(iv) capital surplus comprises £2,670k capital surplus and £150k capital grant surplus. Capital grant funding is for the purchase of equipment by third parties including Universities and are not included as NERC assets.

Launch of the RRS *James Cook*
The Princess Royal formally named the RRS *James Cook* at a ceremony at the National Oceanography Centre, Southampton, on 5 February 2007. The £39 million research ship is the latest addition to NERC's fleet and replaces the ageing RRS *Charles Darwin.*

National Oceanography Centre, Southampton (NOCS)
In 2006 NERC signed a new agreement, a Memorandum of Understanding (MOU), with the University of Southampton for funding and managing the National Oceanography Centre, Southampton. The MOU sets out the organisational framework within which NOCS will operate in the future. This is complemented by several annexes that set out in detail how specific issues will be addressed – delegated authorities for finance, people management, intellectual property, insurances, the running of the estate, provision of library services, and so forth. The goal is to support NOCS in achieving the international standing that is worthy of a centre of excellence. The impact of negotiating balances from the University of Southampton resulted in a transfer to NERC of assets with a market value of £3.7m and an amount of £2.5m to be refunded to NERC from previous years funding for contracts and grant awards.

Centre for Ecology & Hydrology (CEH)
In 2006, NERC Council decided that a major re-structuring of CEH was essential to maintain its position as a world-leading centre that is sustainable both from a scientific and financial viewpoint. The CEH Transition and Integration project has been set up to support the restructuring process, using PRINCE 2 methodology. The project has completed the first year of a four year programme which will have a total cost of £43.7m. In the accounts this year provisions of £17.8m have been reported for areas such as redundancy, decommissioning and removal costs for staff and equipment (see Note 12 of the Annual Accounts).

Council members
A list of NERC Council members in 2006-07 is given in the Remuneration report (page 67). The Council consists of the Chairman, the Chief Executive (and Deputy Chairman) and 18 other members. Council members are appointed by the Secretary of State for Trade and Industry and are drawn from both academic and industrial communities. Two of the members are

also appointed from government departments. In addition to the listed members, a representative of the Secretary of State for Trade and Industry, Mr Paul Williams, attends Council meetings.

The Council is NERC's top-level decision making body. Council decides on all issues of major importance, including corporate strategy, key strategic objectives and targets and major resource decisions. It is accountable for its stewardship of NERC's budget and the extent to which key performance objectives and targets have been met.

The Council Secretariat holds a Register of Interests, which can be viewed on the NERC website at: www.nerc.ac.uk/about/work/boards/council/interests.asp

Forward look

Issues or projects that will affect us or that we will deliver from 2007 include the following:

- **NERC Strategy:** NERC is preparing its new strategy, due to be published in autumn 2007 (see page 41). We will translate the strategy into action at a management level and will establish the framework for setting strategic objectives and managing performance. This framework will be a vital tool for informing decision-making at Council level.

  We will also change our strategy delivery process to improve the way we target resources. This will give us flexibility to adapt to changing priorities. We are redefining our funding streams into *national capability, research programmes* and *responsive research*.

  NERC aims to start implementing these new processes from mid-2007 onwards.

  In support of the strategy, work is well advanced in developing new internal and external communications strategies and a people strategy. The external communications strategy will incorporate a revision of our existing policy on science and society. The people strategy will announce significant initiatives to ensure that NERC is helping to develop a community that is flexible, responsive and able to adapt to changing priorities. NERC will continue to devote substantial resources to improving the wider skills of its staff. Our employment policies and practices will recognise the value of expert researchers, of people who can apply their research to stakeholder needs, and of people who are capable of building capacity and of leading and managing effectively. We will establish clear and realistic career expectations in our staff and provide the opportunities to enable these expectations to be realised.

- **Rapid climate change directed programme:** NERC will evaluate, redesign and redeploy the trans-Atlantic observing system, in collaboration with international funders, as part of the RAPID programme by the end of April 2008.

- **Living with environmental change (LWEC) partnership:** with the Economic and Social Research Council, NERC will jointly fund 20 new interdisciplinary studentships per year during 2007-08 to 2009-10. At least half of these will be relevant to this programme.

- **Rural economy and land use (RELU) directed programme:** NERC will continue to work with other councils to deliver the objectives of the Rural Economy and Land Use Programme.

- **Centre for Earth Observation Instrumentation:** in partnership with the Department of Trade and Industry, the centre was established in April 2007.

- **eScience:** NERC will develop and begin executing a plan to implement its eScience strategy by the end of June 2007.

- **Ecosystem services and poverty alleviation (ESPA) programme:** NERC will work with the Department for International Development on this programme. Specifically, NERC will contribute the cost of programme management and announce awards for regional assessment exercises by summer 2007.

- **Economic impacts:** by the end of September 2007 the research councils will publish a report on our implementation of recommendations 1-4 of the Warry Report on 'Increasing the Economic Impact of Research Councils'.

- **Shared Service Centre:** by the end of March 2008, the piloting of the new Shared Service Centre processes will have commenced.

2007 Spring Supplementary Estimates and Budget announcement

The Spring Supplementary Estimates published by HM Treasury on 20 February 2007 showed significant revisions to Department for Trade and Industry budgets, including £9.7 million from NERC's budget. Rather than take immediate action NERC will, over the next three years, make small savings across our research centres, directed programmes and grants. This will be done in a balanced way to reduce the impact in any one area of our activities.

Communications

NERC is committed to engaging with staff and with its main stakeholders as effectively as possible. The Chief Executive has started a series of regular meetings with all staff in Swindon Office to cascade information and listen to views on key issues. The NERC

Executive Board (NEB) team briefings which were started last year are continuing throughout NERC.

We made major improvements to the NERC website in 2006 with a redesign and a complete overhaul of the content. Our commitment to plain language in all our electronic and paper publications continues.

NERC is shifting the emphasis of its work in science in society to more shared working with other councils through the RCUK Science in Society Unit. Many of our existing schemes such as Researchers in Residence, CREST and creating schools materials, are done through the unit, and new projects, such as continuous professional development for science teachers, are working well. Late in 2006, Alan Thorpe became the RCUK champion for science in society, supporting and encouraging efforts to implement the science in society strategy agreed in March 2006.

NERC is also increasing its engagement with major stakeholders with a particular aim of enhancing our emphasis on knowledge transfer. We held a successful meeting in January 2007, which focused on progress on the new NERC strategy and on strengthening our work in making our science useful to users.

Equal opportunities

It is NERC policy that everyone has an equal opportunity for employment and advancement within the council on the basis of their abilities, qualifications and fitness for work. We do not tolerate discrimination against anyone on grounds of sex, age, race, religion, religious beliefs or sexual orientation; this applies in recruitment, training, promotion and to all aspects of employment within NERC. Nor do we unlawfully discriminate on the basis of disability, but prefer to offer each candidate or member of staff the opportunity to demonstrate their ability to carry out the work required. NERC is committed to the Two Ticks scheme as approved by the Employment Service.

Payment policy

NERC observes the Confederation of British Industry Code of Practice regarding prompt payment, making payments when due in accordance with the contract or within 30 days of receipt of goods or services or the presentation of a valid demand for payment. During 2006-07 83% of payments were made within 30 days of the invoice date (2005-06: 86%). In accordance with the guidance given in Statutory Instrument 1997/571 the figure for creditor days is 21 (2005-06: 23 days).

Risk

NERC has adopted a risk management strategy that conforms with the principles of the HM Treasury guidance.

A description of NERC's capacity to handle risk and its control framework can be found in the Statement of Internal Control (SIC).

Going concern

The Accumulated Income and Expenditure Reserve carried forward at the 31 March 2007 shows a surplus of £170,600,000.

Grant-in-aid for 2007-08, taking into account the amounts required to meet the NERC's liabilities falling due in that year, has already been included in the department's estimates for that year, which have been approved by Parliament, and there is no reason to believe that the department's future sponsorship and future parliamentary approval will not be forthcoming. It has accordingly been considered appropriate to adopt a going concern basis for the preparation of these financial statements.

Internal Audit and Audit Committee

The Research Councils' Internal Audit Service undertakes an agreed programme of internal audits for NERC. Council's Audit Committee has three Council members, and is attended by the Chief Executive. The Committee meets four times a year to review internal and external audit and establishment matters, and the Council's accounts. The membership of the committee can be found at the NERC website www.nerc.ac.uk/about/work/boards/audit/members.asp

Auditors

NERC's accounts are audited by the Comptroller and Auditor General in accordance with paragraph 3(3) of Schedule 1 to the Science and Technology Act 1965. The charge for the year is £58,000. All of this cost related to audit services. There was no auditor remuneration for non audit work.

So far as the Accounting Officer is aware, there is no relevant audit information of which the NERC's auditors are unaware. The Accounting Officer has taken all the steps that he ought to have taken to make himself aware of any relevant audit information and to establish that NERC's auditors are aware of that information.

Events since the end of the financial year

There have been no events between the Balance Sheet date and 17 July 2007, the date when the accounting officer despatched the accounts to the Office of Science and Innovation. The financial statements do not reflect events after this date.

Professor Alan Thorpe
Chief Executive & Accounting Officer
Date: 29 June 2007

Remuneration report

Remuneration Policy

The Remuneration Committee is responsible for agreeing the pay and allowances of senior managers, i.e. Directors. The Committee members are listed below:-

Mr E Wallis, Chairman NERC as of 1 January 2007 (previously Mr R Margetts)
Mr E Jenner, Council Member
Professor A Halliday, Council Member
Professor A Thorpe, Chief Executive
Mrs J Timberlake, Director, People Skills and Communication who attends in an Advisory capacity only

The Remuneration Committee works in accordance with its policy on Senior Staff pay which is designed to reward senior staff on the basis of individual skills, experience and performance set against the market median for their role. A market related pay point is determined by survey evidence obtained from relevant comparator organisations in the public, higher education and voluntary sectors and is up rated annually.

In accordance with NERC's appraisal system, performance is assessed against pre-set objectives for individual roles with input in the assessment process from individual reviewees, reviewers and the Chief Executive.

From 1 April 2006 all pay movement for senior employees is performance related. Prior to that date the non-consolidated element of senior pay was performance related.

It should be noted that no senior managers are on a service contract. No significant awards have been made to senior staff this year.

More information about the remuneration committee can be found at the following website:
www.nerc.ac.uk/about/work/boards/intro/#remuneration

Employment Contracts

NERC staff are not Civil Servants but the organisation makes its appointments in accordance with the broad principles set out in the Civil Service Commissioners' Recruitment Code, which requires appointments to be on merit on the basis of fair and open competition but also includes the circumstances when appointments may otherwise be made.

All Senior Officers covered by this report, apart from the Chief Executive, hold appointments, which are open-ended. Senior Staff appointed before October 2006 may work until age 65, provided their performance remains satisfactory and there is a continuing need for them; they may also request retention beyond age 65, although there is no entitlement to this. Senior staff appointed after October 2006 have a contractual retirement age of 65, although they may also seek retention beyond that age. All staff may retire after age 50 and draw their pensions on an actuarially reduced basis. Staff appointed before October 2006 may draw full pensions from age 60. Staff who leave during a formal redundancy exercise will be eligible for compulsory early retirement/severance terms, as defined under the rules of the Research Council's Superannuation Scheme. These payments are in line with those due under the Civil Service Compensation Scheme.

The notice period for all Senior Employees is three months.

Remuneration of the Chief Executive

Professor Thorpe started his tenure on the 1st April 2005. His initial contract is for a period of four years.

The emoluments of the Chief Executive, including taxable benefits, were £107,106 (2006: £94,618). This included basic salary of £102,375 (2006: £94,618) and performance related bonus of £4,731 (2006: nil). A charge of £21,805 (2006: £20,154) was also incurred in respect of employer's pension contributions. This was assessed as 21.3% of basic salary (2006: 21.3%). The Cash Equivalent Transfer Value for the Chief Executive at the 31 March 2007 was £843,993. The real increase in the cash equivalent transfer value for the period was £60,289. The Chief Executive is an ordinary member of the Research Councils' Pension Scheme.

Audited Information

Remuneration of Senior Employees

Other members of the council's senior management team received emoluments during the year, including taxable benefits as below, these individuals are all ordinary members of the Research Councils' Pension Scheme.

Table 1: Remuneration of Senior Employees (2006-07)

Name	Note ref.	Total emoluments 2006-07	Total emoluments 2005-06	Pension increase in real terms	Accrued pension at 31/03/07	Lump sum at 31/03/07	Cash equivalent Transfer value as at 1/04/06	Cash equivalent Transfer value as at 31/03/07	Cash Equiv. transfer value increase in real terms
		£000	£000	£000	£000	£000	£000	£000	£000
A Thorpe		105 - 110	90 - 95	0 - 2.5	0 - 5	-	754	844	60
D Falvey	1	55 - 60	100 - 105	-	5 - 10	31	231	244	10
C G Rapley		105 - 110	100 - 105	0 - 2.5	10 - 15	123	882	986	26
P Nuttall		105 - 110	80 - 85	7.5 - 10	35 - 40	108	676	738	32
A Willmott		65 - 70	45 - 50	0 - 2.5	0 - 5	-	398	430	17
J Hansford		85 - 90	75 - 80	2.5 - 5	30 - 35	119	868	921	12
A E Hill		95 - 100	90 - 95	0 - 2.5	5 - 10	76	382	406	18
D Bloomer		80 - 85	80 - 85	0 - 2.5	5 - 10	-	76	89	11
J Timberlake		80 - 85	70 - 75	0 - 2.5	0 - 5	-	35	64	27
S Wilson		80 - 85	80 - 85	0 - 2.5	5 - 10	36	117	143	8
J Ludden	2	65 - 70	-	0 - 2.5	0 - 5	-	-	19	17

Notes
1 Dr Falvey left NERC on 9 October 2006.
2 Dr Ludden became Director of British Geological Survey with effect from 1 July 2006.
3 The average annual earnings increase for senior employees (excluding Chief Executive) was 5%.
4 No senior employee has received any other benefit during the year.

Total Emoluments

Total emoluments include gross salaries and performance related bonuses. From 1 April 2004 basic pay rates for senior staff incorporate all existing allowances including a supervisory and responsibility allowance and any contribution awards.

Pension benefits

All Senior Employees are ordinary members of the Research Councils' Pension Scheme (RCPS) which is a defined benefit scheme funded from annual grant-in-aid on a pay-as-you-go basis.

Further details about the RCPS can be found in Note 4(d) of the Annual Accounts.

The Cash Equivalent Transfer Value (CETV)

A Cash Equivalent Transfer Value (CETV) is the actuarially assessed capitalised value of the pension scheme benefits accrued by a member at a particular point in time. The benefits valued are the member's accrued benefits and any contingent spouse's pension payable from the scheme. A CETV is a payment made by a pension scheme or arrangement when the member leaves a scheme and chooses to transfer the benefits accrued in their former scheme. The pension figures shown relate to the benefits that the individual has accrued as a consequence of their total membership of the pension scheme, not just their service in a senior capacity to which disclosure applies. The CETV figures include the value of any pension benefit in another scheme or arrangement which the individual has transferred to the Research Councils' pension arrangements and for which the Civil Service (CS) Vote has received a transfer payment commensurate with the additional pension liabilities being assumed. They also include any additional pension benefit accrued to the member as a result of their purchasing additional years of pension service in the scheme at their own cost.

The real increase in the value of the CETV

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

Remuneration of Council Members

Members of Council receive an Honorarium of £6,410 per annum to cover all work for the Council including membership of Council's Boards and Science Management Audits. The Chairman of the Council, Mr Margetts left the Council on 31 December 2006 and received a salary of £11,403. The incoming chairman, Mr Wallis, joined the Council on 1 January 2007 and received a salary of £3,853. These rates are effective from 1 October 2006 and are formulated by the Department of Trade and Industry.

Council members are normally employed on fixed term contracts not exceeding 4 years.

Honoraria are not payable to members who are:

- Civil Servants
- Employees of NERC
- Full time employees of organisations whose funds are derived from Votes of Parliament (eg Government Departments, UK Atomic Energy Authority, British Broadcasting Corporation and other Research Councils)

Members of Council may not receive fees in addition to honoraria. University academic staff and retired Civil Servants are eligible to receive honoraria or fees.

Table 2: Membership of the NERC Council (2006-07)

Name	Affiliation	Period of appointment	Total Emoluments £'000 2006-07	2005-06	Note Ref
Mr E Wallis	Chairman	01 Jan 2007 – 31 Dec 2010	0 - 5	n/a	1
Mr R Margetts	Previous Chairman	01 Jan 2001 – 31 Dec 2006	10 - 15	10 - 15	1
Professor A Thorpe	Chief Executive and Deputy Chairman	01 Apr 2005 – 31 Mar 2009	0	0	2
Professor M Anderson	Professor of Physical Geography and Assistant Director, Institute for Advanced Studies, University of Bristol	01 Aug 2001 – 31 Jul 2007	5 - 10	5 - 10	
Professor H Dalton	Chief Scientific Adviser (CSA), Department for the Environment, Food and Rural Affairs (Defra)	01 Apr 2002 – 31 Mar 2006	0	0	2
Professor H Davies	Institute of Atmospheric & Climate Science, EHT	01 Aug 2005 – 31 Jul 2008	5 -10	0 -5	
Professor T Davies	School of Environmental Sciences, University of East Anglia	01 Nov 2001 – 31 Jul 2008	5 - 10	5 - 10	
Professor A Fitter	Department of Biology, University of York	01 Aug 2005 – 31 Jul 2008	5 - 10	0 - 5	
Professor A Glover	School of Medical Science, University of Aberdeen, Chief Scientific Advisor for Scotland	01 Aug 2001 – 31 Jul 2007	5 - 10	5 - 10	
Professor A Halliday	Department of Earth Sciences, University of Oxford	22 Nov 2004 – 31 Jul 2008	5 - 10	5 - 10	
Mr P Hazell	Chairman of the Argent Group, Non-executive Director of UK Coal Plc, BRIT Insurance Plc, and Smith & Williamson, Member of the Competition Commission and Chair of Audit Committee	22 Nov 2004 – 31 Jul 2008	10 - 15	5 - 10	4
Mr E Jenner	Technology and business consultant, formerly of AstraZeneca Plc, Chair of the Science and Innovation Strategy Board (SISB)	01 Apr 2002 – 31 Jul 2008	10 - 15	10 - 15	3
Mrs K Morgan	Vice Chairman of the Royal Agricultural College, Pro Chancellor of the University of West of England, Deputy Chairman of WaterAid	01 Aug 2002 – 31 Jul 2008	5 - 10	5 - 10	
Mrs S Parkin	Programme Director at Forum for the Future	01 Aug 2003 – 31 Jul 2006	5 - 10	5 - 10	
Professor P Curran	Vice Chancellor and Professor of Physical Geography, Bournemouth University	08 Aug 2006 – 31 Jul 2010	0 - 5	n/a	
Professor J Mitchell	Chief Scientist, Met Office	10 Oct 2006 – 30 Sept 2010	0	n/a	2
Professor M Lockwood	Professor at the University of Southampton, Chief Scientist at the Rutherford Appleton Laboratory's Space Science Department	01 Mar 2007 – 31 Jul 2010	-	n/a	
Professor M Wilson	Pro-Dean for Research in the Faculty of Environment, University of Leeds	01 Mar 2007 – 31 Jul 2010	0 - 5	n/a	
Mr C Paynter	Chief Executive Officer of EADS Astrium Ltd	01 Mar 2007 – 31 Jul 2010	-	n/a	
Professor J Beddington	Department of Environmental Science & Technology, Imperial College	01 Aug 2000 – 31 Jul 2006	0 - 5	5 -10	
Professor M Depledge	Head of Science for Environment Agency	15 Sep 2003 – 30 Jun 2006	0	0	2
Dr C Hicks	Director General of the British National Space Centre and Director-Space in the Department of Trade and Industry	04 Dec 2002 – 30 Apr 2006	0	0	2
Professor J Petts	Head of School, School of Geography, Earth & Environmental Sciences, The University of Birmingham	01 Aug 2000 – 31 Jul 2006	0 -5	5 - 10	
Professor D Roberts	Distinguished Advisor at BP Explorations	01 Aug 2003 – 31 Jul 2006	0 - 5	5 - 10	

Notes

1 Mr Wallis became the Chairman of Council with effect from 1 January 2007. Mr Margetts left the Council on 31 December 2006.

2 Honoraria are not payable to members who are civil servants, employees of NERC or full time employees of organisations whose funds are derived from Votes of Parliament.

3 Mr Jenner received standard Council member rate and additional remuneration in respect of activities undertaken as the Chair of the Science and Innovation Board.

4 Mr Hazell received standard Council member rate and additional remuneration in respect of activities undertaken as the Chair of the Audit Committee.

More information about the NERC Council and its membership can be found at the following website:
www.nerc.ac.uk/about/work/boards/council/

Professor Alan Thorpe
Chief Executive & Accounting Officer
Date: 29 June 2007

Annual accounts 2006-07

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

Under Paragraph 3 of Schedule 1 to the Science and Technology Act 1965 the Council is required to prepare a statement of accounts for each financial year in the form and on the basis directed by the Secretary of State for Trade and Industry, with approval of HM Treasury. The accounts are prepared on an accruals basis and must show a true and fair view of the Council's state of affairs at the year end and of its statement of net expenditure, recognised gains and losses and cash flows for the financial year.

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

- observe the accounts direction issued by the Secretary of State for Trade and Industry, including the relevant accounting and disclosure requirements, and apply suitable accounting policies on a consistent basis
- make judgements and estimates on a reasonable basis
- state whether applicable accounting standards as set out in the Government Financial Reporting Manual have been followed, and disclose and explain any material departures in the financial statements and
- prepare the financial statements on the going concern basis.

The Secretary of State for Trade and Industry has appointed the Chief Executive as Accounting Officer of the Natural Environment Research Council. The responsibilities of an Accounting Officer, including responsibility for the propriety and regularity of the public finances for which the Accounting Officer is answerable, for the keeping of proper records and for safeguarding the Natural Environment Research Council's assets are set out in the Non-Departmental Public Bodies' Accounting Officers' Memorandum, issued by HM Treasury and published in "Government Accounting" (The Stationery Office).

Statement on Internal Control

1. Scope of responsibility

As Accounting Officer, I have responsibility for maintaining a sound system of internal control that supports the achievement of the Natural Environment Research Council's policies, aims and objectives, whilst safeguarding the public funds and departmental assets for which I am personally responsible, in accordance with the responsibilities assigned to me in Government Accounting.

The powers, roles, responsibilities and membership of Council are defined in its Royal Charter. The nature of its relationship with its sponsor department, the Office of Science and Innovation of the Department of Trade and Industry, is defined in the OSI/NERC Management Statement and Financial Memorandum (2005), available on the NERC website.

Council has established three bodies to support it in discharging its responsibilities:

i. the Audit Committee;
ii. the Science & Innovation Strategy Board (SISB); and
iii. the NERC Investment Committee (NIC).

The responsibilities of the Chief Executive, who is also the Accounting Officer of the Council, are set out in the OSI/NERC Management Statement and Financial Memorandum. I may delegate the administration of these responsibilities to Council's employees but may not assign any of the responsibilities absolutely to any other person. I have established the NERC Executive Board (NEB) to support me in discharging these responsibilities.

2. The purpose of the system of internal control

The system of internal control is designed to manage risk to a reasonable level rather than to eliminate all risk of failure to achieve policies, aims and objectives; it can therefore only provide reasonable and not absolute assurance of effectiveness. The system of internal control is based on an ongoing process designed to identify and prioritise the risks to the achievement of departmental policies, aims and objectives, to evaluate the likelihood of those risks being realised and the impact should they be realised, and to manage them efficiently, effectively and economically. The system of internal control has been in place in NERC for the year ended 31 March 2007 and up to the date of approval of the annual report and accounts, and accords with Treasury guidance.

3. Capacity to handle risk

Overall responsibility for risk management in NERC lies with the Chief Executive, who as the NERC Accounting Officer signs this annual Statement of Internal Control as part of the audited Annual Accounts. Currently I delegate the task of implementing and maintaining the risk management policy and strategy to the Director Finance and Information Systems who fulfils the role of Director Responsible for Risk. The Director Responsible for Risk's responsibilities include overseeing the activities of the Risk Management Network (see para 5) and reporting on risk management to the NERC Executive Board (NEB). NERC Directors have a responsibility to ensure the effective application of NERC's risk management strategy and policy. These arrangements ensure risk management is an integral part of NERC's management style and is tied to core activities and Delivery Plan targets.

NEB is the owner of the NERC Risk Management Strategy and is responsible for reporting issues relating to risks and their management to Council, and for receiving assurance from NERC staff that risks are managed appropriately and passing this assurance to Council.

In executing these responsibilities the role of NEB can be characterised as follows:

Monitor:	i	overseeing the process
	ii	noting business critical risks
	iii	noting mitigation strategies
	iv	reviewing audit output
	v	carry out an annual review of risk and the risk management systems in place
Decide:	i	setting and communicating the NERC level risk appetite
Direct:	i	setting delegated authority levels
	ii	solving risk management dilemmas (when asked to do so)

The NEB will review specific, high risk, matters on a monthly basis together with issues relating to any risks that are referred upwards by Research Centre Directors and others via the agreed escalation procedures.

NEB encourages sound properly managed risk taking and recognises that effective risk management, rather than risk avoidance, is an essential ingredient for successful business operations.

NEB Directors appoint "owners" for all risk threats as they emerge. These risk owners are most likely to be middle / senior managers within NERC Swindon Office and the Research Centres / Laboratories. Risk owners have responsibility for the practical day to day management of risks and are responsible for ensuring that appropriate management plans are prepared and that risk response actions are carried out effectively. Responsibility for managing key business risks are retained at a senior level.

Risks are managed by trained and experienced people. All staff in NERC participate in an annual appraisal, where individual training needs and personal development requirements including in relation to risk are identified and assessed. Specific risk management training is provided in response to ad hoc requests.

The NERC Risk Management Network, which currently meets twice each year, helps promote best practice in risk management across NERC by sharing lessons learnt and monitoring compliance with (and continued relevance of) the NERC Risk Management Strategy and Policy (which are available to all staff via the NERC extranet).

4. The risk and control framework

The purpose of the NERC Risk Management Strategy is to describe at a high level how NERC will implement its Risk Management Policy, setting out the necessary organisation, roles and responsibilities, along with the framework and underlying principles of the control system.

NERC Directors have a responsibility to ensure the effective application of NERC's risk management strategy and policy. Directors must satisfy themselves that the following issues have been adequately addressed within their areas of responsibility:

- the requirements of corporate governance – these include developing more focused and open ways of managing risk and ensuring that all NEB decisions on managing risk are implemented
- the need to identify appropriate 'risk owners' at a sufficiently senior level for all identified risks
- the adequacy of reporting arrangements that ensure the timely escalation of major risk issues internally within their area of responsibility; and, where appropriate externally to NEB. And that these arrangements are in line with delegated authority levels and the provisions of Research Centre Management Statements (where these apply)
- the need to ensure a shared understanding of risk management principles, thereby ensuring a consistent approach to the treatment of risks at all levels
- deciding the overall risk tolerance level, or "risk appetite" for areas that they have a responsibility for (mindful of the NERC level risk appetite determined by NEB).

NERC has a web-based database to host the NERC risk register. The system is known as STAR (System for Targets and Risks).

STAR is the cornerstone of NERC risk management and provides a single system for recording Business Risks, Business Critical Projects and Delivery Plan Targets / Milestones. In addition to attaching scores to risks and identifying mitigation tactics, STAR also records information concerning quarterly progress against plan by way of a "traffic light system". Reports from STAR are considered by NEB (Delivery Plan Targets/Milestones progress report) and the NERC Audit Committee (Business Critical Projects status report). STAR also provides the quarterly report to OSI that details progress towards achieving NERC Delivery Plan Targets and Milestones.

5. Review of effectiveness

As Accounting Officer, I have responsibility for reviewing the effectiveness of the system of internal control operating within NERC. My review of the effectiveness of the system of internal control is informed by:

- Director's Annual Statements on Internal Control (DASIC)
- the advice of the Audit Committee
- the advice of the Risk Management Network
- the work of the internal auditors
- comments made by the external auditors in their management letter and other reports
- feedback from other consultancy and review activities.

The DASIC exercise provides the main evidence informing the nature of my own assurance on internal controls as these assurances come from senior managers responsible for the development and maintenance of the NERC internal controls framework.

The Audit Committee has a duty to monitor NERC's internal control systems. The Audit Committee receives reports, directly and through internal audit and may refer any matter within its terms of reference to the NEB or Council and make recommendations concerning actions to be taken.

A network of managers responsible for the practical implementation of the NERC Risk Management Strategy in each of NERC's business units has been established and is known as "the Risk Management Network". The Network also includes members with special relevant expertise, for example the NERC Health and Safety Adviser and Security Adviser. The Network is chaired by the NERC Head of Finance on behalf of the Director Responsible for Risk and meets at least twice a year, ad hoc meetings may be convened to discuss and prepare advice on issues of urgency.

As part of its governance responsibilities, the NERC Executive Board (NEB) undertakes an annual review of the risks to which NERC is exposed. To help discharge this responsibility, NEB has approved a Risk Management Policy and Risk Management Strategy; agreed to the creation of a Risk Management Network; and to the appointment of a Risk Management Co-ordinator. The purpose of this post is to support the Director Responsible for Risk and Chair of the Risk Management Network in carrying out their responsibilities; and to focus management attention to risk management and provide a central reference point for risk management issues within NERC.

I have been advised on the implications of the result of my review of the effectiveness of the system of internal control by the NERC Executive Board, the Audit Committee and the Director Responsible for Risk.

6. Significant internal control problems

My review did not identify any significant internal control weaknesses.

Professor Alan J. Thorpe
Chief Executive & Accounting Officer
Date: 29 June 2007

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

I certify that I have audited the financial statements of the Natural Environment Research Council for the year ended 31 March 2007 under the Science and Technology Act 1965. These comprise the Statement of Net Expenditure, the Balance Sheet, the Cashflow Statement and Statement of Total Recognised Gains and Losses and the related notes. These financial statements have been prepared under the accounting policies set out within them. I have also audited the information in the Remuneration report that is described in that report as having being audited.

Respective Responsibilities of the Council, Chief Executive and Auditor

The Council and Chief Executive are responsible for preparing the Annual Report, the Remuneration Report and the financial statements in accordance with the Science and Technology Act 1965 and Secretary of State for Trade and Industry directions made thereunder and for ensuring the regularity of financial transactions. These responsibilities are set out in the Statement of Council and Chief Executive's Responsibilities.

My responsibility is to audit the financial statements and the part of the Remuneration Report to be audited in accordance with relevant legal and regulatory requirements, and with International Standards on Auditing (UK and Ireland).

I report to you my opinion as to whether the financial statements give a true and fair view and whether the financial statements and the part of the Remuneration Report to be audited have been properly prepared in accordance with the Science and Technology Act 1965 and Secretary of State for Trade and Industry directions made thereunder. I also report to you whether, in my opinion, certain information given in the Annual Report, which comprises Vital Statistics and Management Commentary, is consistent with the financial statements. I also report whether in all material respects the expenditure and income have been applied to the purposes intended by Parliament and the financial transactions conform to the authorities which govern them.

In addition, I report to you if the Natural Environment Research Council has not kept proper accounting records, if I have not received all the information and explanations I require for my audit, or if information specified by HM Treasury regarding remuneration and other transactions is not disclosed.

I review whether the Statement on Internal control reflects the Natural Environment Research Council compliance with HM Treasury's guidance, and I report if it does not. I am not required to consider whether this statement covers all risks and controls, or form an opinion on the effectiveness of the Natural Environment Research Council's corporate governance procedures or its risk and control procedures.

I read the other information contained in the Annual Report and consider whether it is consistent with the audited financial statements. I consider the implications for my report if I become aware of any apparent misstatements or material inconsistencies with the financial statements. My responsibilities do not extend to any other information.

Basis of audit opinion

I conducted my audit in accordance with International Standards on Auditing (UK and Ireland) issued by the Auditing Practices Board. My audit includes examination, on a test basis, of evidence relevant to the amounts, disclosures and regularity of financial transactions included in the financial statements and the part of the Remuneration Report to be audited. It also includes an assessment of the significant estimates and judgments made by the Council and Chief Executive in the preparation of the financial statements, and of whether the accounting policies are most appropriate to the Natural Environment Research Council's circumstances, consistently applied and adequately disclosed.

I planned and performed my audit so as to obtain all the information and explanations which I considered necessary in order to provide me with sufficient evidence to give reasonable assurance that the financial statements and the part of the Remuneration Report to be audited are free from material misstatement, whether caused by fraud or error and that in all material respects the expenditure and income have been applied to the purposes intended by Parliament and the financial transactions conform to the authorities which govern them. In forming my opinion I also evaluated the overall adequacy of the presentation of information in the financial statements and the part of the Remuneration Report to be audited.

Opinions

In my opinion:

- the financial statements give a true and fair view, in accordance with the Science and Technology Act 1965 and directions made thereunder by the Secretary of State for Trade and Industry, of the state of the Natural Environment Research Council's affairs as at 31 March 2007 and of its net expenditure for the year then ended;
- the financial statements and the part of the Remuneration Report to be audited have been properly prepared in accordance with the Science and Technology Act 1965 and Secretary of State for Trade and Industry directions made thereunder; and
- information given within the Annual report, which comprises Vital Statistics and Management Commentary is consistent with the financial statements.

Audit Opinion on Regularity

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

Report

I have no observations to make on these financial statements.

John Bourn
Comptroller and Auditor General
Date: 4 July 2007

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

Statement of net expenditure for the year ended 31 March 2007

	Note	**2007 £000**	2006 £000 Restated - note 2
Expenditure			
Staff costs	4(b)	107,318	106,640
Staff early retirements	5	1,577	1,767
Grants and Training	6	113,068	116,235
Other operating costs	7	130,473	120,149
Depreciation	9 (a)	20,611	18,840
Impairment of fixed assets	9(a)	286	592
Total Expenditure		**373,333**	364,223
Income	3	**(47,119)**	(48,254)
Net Operating Costs Before Financing		**326,214**	315,969
Notional Cost of Capital	13	7,686	7,272
CEH Restructuring	12	958	21,379
Financing Lease Interest		1,401	1,475
Interest receivable	8	(137)	(22)
Unwinding of Discount	12	476	462
Change in Discount Rate	12	-	855
(Profit)/Loss on disposal of fixed assets		(2,629)	146
Net Expenditure for the Year	14	**333,969**	347,536

Accumulated Income and Expenditure reserves are shown at note 14.

All activities are continuing.

Balance sheet as at 31 March 2007

	Note		**31 March 2007**	Restated - note 2	31 March 2006 Restated - note 2
		£000	**£000**	£000	£000
Fixed Assets					
Tangible assets	9	297,387		264,349	
Investments	9 (c)	44		362	
			297,431		264,711
Current Assets					
Debtors	10	36,436		32,914	
Cash at bank and in hand		16,214		10,640	
		52,650		43,554	
Current Liabilities					
Creditors falling due within one year	11 (a)	(52,744)		(45,274)	
Net current liabilities			**(94)**		(1,720)
Total assets less current liabilities			**297,337**		262,991
Creditors falling due after more than one year	11 (b)		(16,078)		(16,322)
Provisions for liabilities and charges	12		(34,131)		(35,598)
Total Assets Less Liabilities			**247,128**		**211,071**
Capital and Reserves					
Government Grant Reserve	14		3,059		-
Revaluation Reserve	14		73,111		62,301
Accumulated Income and Expenditure Reserve	14		170,600		148,358
Donated Asset Reserve	14		358		412
Total Government Funds	14		**247,128**		211,071

Professor Alan Thorpe
Chief Executive & Accounting Officer
Date: 29 June 2007

Cash flow statement for the year ended 31 March 2007

	Note	£000	2007 £000	Restated £000	2006 Restated £000
Net cash outflow from operating activities	15		(304,123)		(284,643)
Returns on investments and servicing of finance					
Interest Received	8	137		22	
Interest Element of Finance Lease Payments		(1,401)		(1,475)	
			(1,264)		(1,453)
Capital Expenditure					
Payments to acquire tangible fixed assets	9(a)	(36,772)		(32,040)	
Receipts from disposal of tangible fixed assets		2,898		52	
			(33,874)		(31,988)
Net cash outflow before financing			**(339,261)**		(318,084)
Financing					
Grant-in-Aid Received	14	340,630		295,977	
Funding Received from Other Bodies	14	5,137		6,446	
Capital Element of Finance Lease Payments		(932)		(861)	
			344,835		301,562
Increase/(Decrease) in Cash	16		**5,574**		(16,522)

Statement of total recognised gains and losses for the year ended 31 March 2007

	2007 £000	2006 Restated £000
Net Expenditure for the Year	(333,969)	(347,536)
Grant in aid received	340,630	295,977
Funding Received from Other Bodies	5,137	6,446
Impairment of assets recorded through Revaluation Reserve	(26)	(2,681)
Assets donated to NERC in year	-	412
Release of donated asset reserve	(54)	-
Gain on revaluation of fixed assets	17,193	15,308
Release of Government Grant Reserve	(540)	-
Reversal of Notional Cost of Capital	7,686	7,272
Total recognised gains and losses during the year	**36,057**	(24,802)

Notes to the Accounts

1. Accounting Policies

a. Basis of Accounting

(i) The accounts have been prepared under the historical cost convention, modified to include revaluation of fixed assets. The accounts have been prepared in accordance with the Financial Reporting Manual (FReM) and the Accounts Direction given by the Secretary of State for Trade and Industry, with the approval of HM Treasury, in pursuance of Section 2(2) of the Science and Technology Act 1965.

(ii) The accounts meet the accounting and disclosure requirements of the Companies Act 1985 and accounting standards issued or adopted by the Accounting Standards Board in as far as these requirements are appropriate. The Council is exempted from producing a note of historical cost profits and losses normally required by Financial Reporting Standard Number 3.

(iii) The accounting policies have been applied consistently except for the change in the treatment of the receipt of grant in aid for revenue and general capital purchases and certain other income where there is no exchange transaction which is now treated as a financing inflow and credited directly to reserves rather than being recognised in income for the year (see note 2). The accounts have been restated accordingly.

(iv) The accounts of all NERC owned establishments have been incorporated into these accounts.

b. Fixed Assets and Depreciation

Tangible Fixed Assets

Expenditure on fixed assets includes the purchase of land and buildings, construction and services projects, and equipment valued at £5,000 or more.

Tangible fixed assets are stated at the lower of depreciated historical cost or valuation. Costs of acquisition, comprising only those costs that are directly attributable to bringing the asset into working condition for its intended use, are capitalised. Land, buildings, ships and aircraft are independently and professionally revalued every five years. These assets are subject to annual indexation when a full revaluation is not completed.

Polaris House, which is jointly owned by the Research Councils, was revalued in 2005/06 by Powis Hughes Associates. All other land and buildings were valued by Powis Hughes Associates during 2002/03 in accordance with SAVP and RICS guidance notes. The basis of valuation was open market value for either existing or alternative use where this could be established or depreciated replacement cost in the case of specialised scientific buildings. The Antarctic Buildings that had a nil net book value were revalued by Ms Jill Thompson, MRICS in 2006/07.

RRS James Clark Ross and RRS Ernest Shackleton were revalued in 2006/07 by Mr Bruce Buchan M.A., F.C.I.Arb. and the aircraft was also valued in 2006/07 by the International Bureau of Aviation Group Limited. RRS Charles Darwin and RRS Discovery were independently and professionally revalued by Mr Bruce Buchan M.A., F.C.I.Arb in 2005/06.

Plant and Equipment and Motor Vehicles are revalued using relevant indices.

Surplus or deficit on revaluation is taken to a Revaluation Reserve, except that any permanent diminution in value is charged to the Statement of Net Expenditure in the year in which it is recognised.

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

Freehold land is not depreciated. All other tangible fixed assets are depreciated in order to write off the value of the asset less its estimated residual value over their estimated useful economic lives using straight-line depreciation methodology. These lie within the following ranges :-

Leasehold land	-	over the terms of the lease
Freehold buildings	-	up to 50 years or valuer's estimates of economic life
Long leasehold buildings	-	up to 50 years (or the length of the lease if less)
Short leasehold buildings	-	over the length of the lease
Plant and machinery	-	10 to 15 years
Ships and aircraft	-	minimum of 20 years for ships, 15 years for aircraft
Scientific equipment	-	5 to 10 years
Office and major computing equipment	-	5 to 10 years
Personal computers	-	3 years
Motor vehicles	-	3 to 7 years
Assets under construction	-	not depreciated until brought into use

Fixed assets are not depreciated in the month of acquisition and are depreciated by a full month in the month of disposal.

In accordance with the provisions of FRS 15 paragraph 83, the components of assets with substantially different economic lives are accounted for separately for depreciation purposes and depreciated over their individual useful economic lives.

Donated Assets
Assets which are gifted by third parties are classified as donated assets. These are shown at the lower of current value on receipt or the value of the service provided where the asset is overspecified for its intended use. Donated assets are revalued, depreciated and subject to impairment reviews in the same way as other assets. The amount capitalised is credited to the donated asset reserve. Each year, an amount equal to the depreciation charge on the asset and any impairment will be released from the donated asset reserve to the Statement of Net Expenditure. No cost of capital charge is imposed.

Investments
Investments are shown at market value. Any surplus or temporary deficit on revaluation is taken to the revaluation reserve. Any permanent impairment in value is charged to the Statement of Net Expenditure in the year that its arises.

c. Ownership of Equipment Purchased with NERC Research Grants
Equipment purchased by an Institution with research grant funds supplied by the NERC belong to the Institution and are not included in NERC's tangible fixed assets. Through the Conditions of Grant applied to funded Institutions, NERC reserves the right to determine the disposal of such equipment and how any disposal proceeds are to be utilised.

d. Government grants receivable and other income
Grant-in-Aid for revenue and general capital purposes is credited to the Income and Expenditure Reserve and grant-in-aid for the purchase of specific assets is credited to the Government Grant Reserve and released to the Statement of Net Expenditure over the useful life of the asset in amounts equal to the annual depreciation charge (see note 2 and 14). Where other income is received and there is no exchange transaction, this is also treated as financing and credited to the Income and Expenditure Reserve.

e. Research and Development
As an organisation wholly engaged in research, NERC does not classify research and development expenditure separately in the accounts. It is reported under operating costs in the Statement of Net Expenditure.

Intellectual property rights arising from the Council's research and development have not been included in these accounts as their market value cannot be readily estimated. The anticipated annual income generated from such rights is not material in value and is credited to the Statement of Net Expenditure on receipt.

f. Insurance
In line with Government policy, NERC carries its own risks in respect of employment of staff, buildings, equipment, stocks, etc except where there exists a statutory requirement to insure or where commercial insurance represents better value for money.

g. Foreign Currencies
Assets and liabilities denominated in foreign currencies are expressed in pounds sterling at the rate(s) of exchange ruling at the balance sheet date. Transactions in foreign currencies are recorded at the rate ruling at the time of the transaction. All exchange differences are taken to the Statement of Net Expenditure.

h. Value Added Tax
As NERC is partially exempt for VAT purposes, irrecoverable VAT is charged to the relevant expenditure category or included in the capitalised purchase cost of fixed assets. Where output tax is charged or input tax is recoverable the amounts are stated net of VAT.

i. Stocks, work-in-progress and long term contracts
The net realisable value of stocks is minimal and the costs of additions to stock are charged to the Statement of Net Expenditure in the year of purchase. Amounts recoverable on long term contracts are stated at cost plus attributable profits less provision for any known or anticipated losses and payments on account.

j. Pension and Early Retirement Costs
Payments are made to the Research Councils' Pension Scheme in respect of superannuation benefits for Council staff. The cost of early retirements are charged to NERC's accounts in the year in which the decision is taken to release staff and a provision for early retirement cost created. This provision is released to fund early retirement costs when they are paid.

The provision for these costs is discounted at the HM Treasury rate of 2.8% (2005/06: 2.8%). The unwinding of the discount is charged to the Statement of Net Expenditure.

Payments by the Council of early retirement lump sums are recoverable from the Research Councils' Pension Scheme when recipients achieve normal retirement age. Recoverable amounts are recognised as debtors in these accounts and offset against annual staff restructuring costs.

k. Notional Costs

In line with HM Treasury requirements, a notional interest charge is included in the accounts to reflect a charge for the use of capital in the business in the year, as the Council has no specific interest bearing debt. In accordance with Treasury guidance, the calculation is based on a 3.5% rate of return on average net assets employed (2005/06: 3.5%) less amounts held with Paymaster General and donated asset reserve.

l. Provisions

Provisions are recognised when it is probable that NERC will be required to settle a present obligation and a reliable estimate can be made of that obligation. The obligation is normally the amount that NERC would rationally pay to settle the obligation at the balance sheet date or to transfer it to a third party at that time.

This may require estimating the future cash flows in current-year prices (i.e. at the price level prevailing in the year covered by the accounts) and, where the time value of money is material, discounting them at the standard public sector real rate set by HM Treasury- currently 2.8% for pension provisions and 2.2% for all other provisions.

m. Finance Lease

NERC has the use of a ship for which substantially all risks and rewards of the asset are transferred to the Council. The asset is capitalised and is subject to the same revaluation policy as other tangible fixed assets and is depreciated over the shorter of its estimated useful economic life or the lease period with the outstanding lease obligations (net of interest) shown in creditors. Finance charges are charged to the Statement of Net Expenditure over the period of the agreement in accordance with the interest rate within the contract.

n. Operating Leases

Operating lease rentals are charged to the Statement of Net Expenditure on a straight line basis over the period of the lease.

2. Restatement of Accounts

Prior Year Adjustment

In 2006/07, the accounting treatment for grant-in-aid has changed such that the NDPBs should regard grants and grant-in-aid received for revenue purposes as contributions from controlling parties giving rise to a financial interest in the body. As a result, grant -in-aid received for revenue purposes is credited to the Income and Expenditure Reserve rather than being recognised as income in the Income and Expenditure Account for the year. As a result the Income and Expenditure Account now shows net expenditure for the year rather than a surplus or deficit and has subsequently been renamed "Statement of Net Expenditure". Grant-in-aid for capital purposes is only credited to the Government Grant Reserve if it is for the purchase of a specific asset with all other capital grant-in-aid credited to the Income and Expenditure reserve. Where other income is received and there is no exchange transaction, this is also treated as financing and credited to the Income and Expenditure Reserve.

The table below shows the movement of grant-in-aid income from the old Income and Expenditure Account. Note 14 provides further details of the movement and the amalgamation of the Government Grant Reserve with the Income and Expenditure Reserve.

	Income and Expenditure as reported in 05/06 accounts	**Statement of Net Expenditure**	**Acc. Income and Expenditure Reserve**
	£000	**£000**	**£000**
Income			
Revenue Grant in Aid	263,937	-	263,937
Release of Government Grant Reserve	17,720	-	17,720
Other income	54,700	48,254	6,446
	336,357	48,254	288,103
Expenditure for year	(364,223)	(364,223)	
Notional interest	(7,272)	(7,272)	
CEH Restructuring	(21,379)	(21,379)	
Financing Lease Interest	(1,475)	(1,475)	
Interest receivable	22	22	
Unwinding of discount	(462)	(462)	
Change in Discount Rate	(855)	(855)	
Loss on disposal of fixed assets	(146)	(146)	
	(395,790)	(395,790)	
Deficit for the year/Net Expenditure for the Year	**(59,433)**	**(347,536)**	

The presentation of the comparative figures has been restated as a result and a prior year adjustment made to transfer capital grant-in-aid for general purposes from the Government Grant Reserve to the Income and Expenditure Reserve (see note 14).

3. Income

	2007	2006 Restated
	£000	£000
(a) Income from Government Departments		
Department for Environment Food and Rural Affairs	3,067	4,319
Department of Trade and Industry	644	641
Ministry of Defence	-	288
Department for International Development	1,617	1,532
Environment Agency	2,783	2,713
Department of Enterprise,Trade and Investment Northern Ireland	2,959	2,536
Other Departments	691	17
Total Income from Government Departments	**11,761**	12,046
(b) Income from Other Bodies		
European Community	3,108	2,686
Other Research Councils	1,872	2,140
Other Public Sector	2,693	3,065
Private Sector	14,471	16,251
Total Income from Other Bodies	**22,144**	24,142
(c) Other Operating Income		
Software and data sales	2,624	1,694
Scientific publications	458	522
Library and administrative services	1,108	1,021
Property and equipment rentals	1,034	1,251
Sales of products	80	77
Lecture fees, seminars and training courses	267	118
Promotional items	296	173
Royalties and licence fees from intellectual property	1,987	1,804
Reimbursement of expenditure	3,088	2,827
Other income	1,732	2,579
Total Other Operating Income	**12,674**	12,066
(d) Release of Government Grant Reserve	540	-
Total Income	**47,119**	48,254

4. Salaries and Wages

(a) Staff Numbers

Staff numbers that have been capitalised during the year have been estimated as 16 full-time equivalents for those staff employed by NERC that are adding value to assets such as NERC Estates and those engaged in project managing or building of assets. In addition, the total amount capitalised for staff costs in 2006/07 is £707,000 (2005/06: £697,837).

The average number FTE's (Full time equivalent) staff employed during the year was made up as follows:

	2007	2006
	No.	No.
Administrative	648	647
Scientific	1,299	1,324
Professional and Technical	371	372
Marine and Antarctic Contract	266	275
Staff on inward secondment/loan	4	5
Agency/temporary and contract staff	101	87
	2,689	2,710

Note: The total number of staff reported in the Annual Report on page 33 is calculated based on a head count as at the 31 March 2007, whereas the above figures are average FTE's for the year.

(b) Staff Costs

In 2006/07 staff on secondment/loan/temporary and contract staff totals £4,164,000 (2005/06: £4,000,000) and are included in the figures below. Agency costs of £851,000 (2005/06: £1,118,000) have been included in operating costs.

	2007	2006
	£000	£000
Salaries and wages	84,273	82,259
Social Security costs	6,840	6,713
Other pension costs (note 4d)	16,205	17,668
	107,318	106,640

(c) Remuneration to Council and Committee Members/Peer Review College

The following are included in Staff Costs, note 4(b), Other Operating Costs, note 7 and Staff Costs, note 4(d) (pensions):

	2007	2006
	£000	£000
Council Members' fees	103	103
Committee Members'/Peer Review	289	335
Other emoluments	78	114
Pensions	-	2
	470	554

Committee members may receive £160 (2006: £160) per day.

Committee Chairman may receive £215 (2006: £215) per day.

British Geological Survey Programme Board members receive £3,000 per annum (2006: £3,000).

British Geological Survey Programme Board Chairman receives £4,000 per annum (2006: £4,000).

British Antarctic Survey Independent Board members receive £5,000 per annum (2006 : £5,000)

Chairmen of Boards of Council receive £8,370, £8,540 with effect from 1/10/06 (2006: £8,370).

All emoluments are non-pensionable.

Peer Review College members receive honoraria of £1,000 per annum. The Peer Review College Associate members receive honoraria of £500 per annum.

Peer Review College Members are initially employed for 1 year commencing 1 June.

Average number of Council, Committee and Board Members

	2007	2006
	No.	No.
Council Members*	16	18
Committee/Peer Review College and Board Members	305	267
	321	285

** includes Chief Executive and Chairman*

Council/Committee and Peer Review College Members' emoluments fell into the following bands:

	2007	2006
	No.	No.
£0 to £5,000	311	273
£5,001 to £10,000	8	10
£10,001 to £15,000	2	2
	321	285

(d) Superannuation

Pension scheme payments

	2007	2006
	£000	£000
Payments in respect of the Research Councils' Pension Scheme (RCPS)	16,175	15,963
Payments to pension schemes other than the RCPS:		
Merchant Navy Officers' Pension Fund	115	143
Merchant Navy Officers' Pension Plan	6	6
Merchant Navy Ratings' Pension Fund	(207)	1,476
Merchant Navy Ratings' Pension Plan	5	5
Partnership Pensions	111	75
	16,205	17,668

Most employees of NERC are members of the Research Councils' Pension Scheme (RCPS) which is a defined benefit scheme funded from annual grant-in-aid on a pay-as-you-go basis. The pension scheme is non-contributory and the benefits are analogous to the Principal Civil Service Pension Scheme, except that while the scheme provides retirement and related benefits based on final emoluments, redundancy and injury benefits are administered and funded by the Council. The pension scheme is administered by the Research Councils' Joint Superannuation Services, and the finances administered by the Biotechnology and Biological Sciences Research Council (BBSRC). The scheme is a multi-employer scheme, for which a separate Research Councils' Pension Scheme Account is published. The Council is unable to identify their share of the underlying assets and liabilities.

From 1 April 1996 the Council has paid employer's contributions to the Research Councils' Pension Scheme, at a percentage of scheme members' pensionable pay as assessed by the Government Actuary's Department on a periodical basis. The current contribution rate is based on an assessment for the year ending 1997/98. An actuarial valuation for the scheme was carried out on 31 March 2002 and reported a required increase from 10.1% to 21.3% effective from 1 April 2005. NERC paid costs in the year of £16,174,870.

With effect from 1 October 2002, in line with arrangements throughout the Civil Service, a new RCPS sub-scheme was introduced. Employees were given the option of remaining in the existing 'Classic' scheme with an employee contribution of 1.5% of pensionable pay; joining the new 'Premium' scheme with their existing pension entitlement converted into the new scheme with an employee contribution of 3.5%; or joining the 'Classic Plus' scheme for future service only, with an employee contribution of 3.5% of pensionable pay, with existing pension benefits prior to 1 October 2002 being broadly calculated on the 'Classic' scheme.

All new employees with effect from 1 October 2002 were given the option of joining the Premium scheme or alternatively a Partnership Pension Account. This is a stakeholder-type defined contributions scheme where the employer pays a basic contribution of between 3% and 12.5% (depending on the age of the member) into a stakeholder pension product. The employee does not have to contribute but where they do make contributions, these will be matched by the employer up to a limit of 3% (in addition to the employer's basic contribution). NERC also contributes a further 0.8% of pensionable salary to cover the cost of risk benefit cover (death in service and ill health retirement).

The Council also paid contributions during the year to a number of other multi-employer Pension Schemes for specific groups of employees, details of these schemes are shown below:

Scheme	**Rate of Contribution**	**Year of Last Valuation**
Falkland Island's Government Service Pension#	£34 per week	N/A
Merchant Navy Officers' Pension Fund^	11.9%	2004
Merchant Navy Officers' Pension Plan	5.1%	2000
Merchant Navy Ratings' Pension Fund*	8% /2%	2002
Merchant Navy Ratings' Pension Plan	5.1%	2000

 # The Falkland Island's Government Service Pension is a coin of the realm scheme, for which contributions are set at defined levels rather than as a percentage of pensionable emoluments.

^ The Merchant Navy Officers' Pension Fund was subject to an actuarial valuation in 2004/05 and was showing a deficit overall. NERC made a payment last year in full settlement of £497,733, and currently has no liability outstanding.

** The Merchant Navy Ratings' Pension Fund closed on 31st May 2001. This Fund has a deficit, the liability for which is shared between members' employing organisations, we currently hold a provision for our share amounting to £694,000. This is a decrease from £1,579,000 as at 31 March 2006, which had arisen from the requirement to fund the deficit identified by the 2005 actuarial valuation of the pension scheme, and from one of the voluntary employers declining to extend their contributions beyond 2005/06. A one off payment of £720,000 was made this year in full settlement of the NERC element, with the closing balance on the provision relating to the additional liability arising from the withdrawal of one of the voluntary contributors. A legal challenge has been made by one of the compulsory employers contesting the legality of the voluntary contributor withdrawing from the scheme, and payment of the additional liability is therefore dependant upon the ruling on the case. On closure of the fund members transferred to the RCPS or the new Merchant Navy Ratings' Pension plan which is a money purchase scheme. 2% of the residual employers contributions are still paid to the closed scheme for members who opted for section 148 revaluation of accrued pension.*

5. Staff Restructuring/Early Retirements

	2007 £000	2006 £000
Annual Compensation Payments	844	39
Redundancy Compensation Payments	229	399
Early Retirement Lump Sums	461	563
Provision for Early Retirement Liability	687	1,353
Recoverable Early Retirement Lump Sums	(644)	(587)
	1,577	1,767

6. Grants and Training

	2007 £000	2006 £000
(a) Research Grants - Analysis by Scientific Area		
Atmospheric Science	12,923	15,064
Earth Science	8,787	8,754
Marine Science	10,405	12,041
Terrestrial and Freshwater Science	19,125	17,112
	51,240	52,971
(b) Research Contracts - Analysis by Scientific Area		
Atmospheric Science	9,578	8,148
Earth Science	2,544	1,847
Earth Observation Science	3,947	4,215
Marine Science	6,019	11,217
Terrestrial and Freshwater Science	1,318	2,898
Scientific Services	8,207	6,309
	31,613	34,634
(c) Post Graduate Training Awards		
Research Masters	3,740	3,518
Research Studentships	21,550	20,623
Research Fellowships	4,925	4,489
	30,215	28,630
Total Grants and Training Awards	**113,068**	116,235

7. Other Operating Costs

	Note	2007 £000	2006 £000
Rent and Rates		3,086	3,330
Maintenance, Cleaning, Heating and Lighting	(i)	8,802	(539)
Office Supplies, Printing and Stationery		2,922	3,018
Laboratory Supplies, Computing and Field Equipment		13,465	13,312
Postage, Telephone and Other Telecommunications		1,467	1,549
Hospitality		680	731
Audit Fee		58	50
Travel and Subsistence		8,422	7,777
Ships and Aircraft Operations		10,298	9,208
External Training		1,285	966
Professional and Research Services by Outside Bodies	(ii)	79,934	80,744
Operating Leases		119	153
(Decrease) in provision for bad debt		(65)	(150)
		130,473	120,149

Note:

(i) In 2005/06 the balance included a write back of BAS Decommissioning provision of £5,838,000.

(ii) The cost for Professional and Research Services by outside Bodies includes international subscriptions of £49m, bought in services of £18m and other services including consultancy, advertising, waste disposal and medical/legal fees. NERC was the host Council for the Joint Training Section and also host to the Research Councils' Procurement Organisation. The total operating expenses for these services are included within the Other Operating Costs above. The contributions from other Councils, which exclude any RCPO and JTS staff costs met directly by each Council, were £764,159 (2006:£753,354). These receipts are included under Other Operating income at note 3c.

8. Interest Receivable

	2007 £000	2006 £000
Interest on bank balances	**137**	22

9(a). Tangible Fixed Assets

Cost or Valuation	Land and Buildings[i] & [vi] £000	Plant and Equipment [v] £000	Ships and Aircraft [iii] & [iv] £000	Motor Vehicles [ii] £000	Total £000
At 1 April 2006	254,704	85,206	162,481	5,940	508,331
Additions	12,034	8,435	14,523	1,780	36,772
Revaluation	13,548	4,834	(778)	57	17,661
Disposals	(182)	(2,083)	(14,355)	(325)	(16,945)
Impairment	-	-	(318)	-	(318)
At 31 March 2007	280,104	96,392	161,553	7,452	545,501
Depreciation					
At 1 April 2006	99,969	52,878	86,493	4,642	243,982
Charge for the year	4,658	10,558	4,695	700	20,611
Revaluation	-	162	-	9	171
Disposals	(211)	(1,970)	(14,152)	(311)	(16,644)
Impairment	-	-	(6)	-	(6)
At 31 March 2007	104,416	61,628	77,030	5,040	248,114
Net Book Value At 31 March 2007	**175,688**	**34,764**	**84,523**	**2,412**	**297,387**
At 1 April 2006	154,735	32,328	75,988	1,298	264,349

Notes:
(i) Cost / Valuation includes £14,278,252 in respect of Freehold Land which is not depreciated (2006: £13,083,146)
(ii) Including specialised Antarctic Vehicles.
(iii) The NBV of the leased ship is £23,286,947 following revaluation (2006: £26,252,498). The annual depreciation charge on this asset held under the finance lease was £1,882,045 for the year (2006: £2,125,840). In addition the RRS Charles Darwin was disposed of with a NBV gain of £2,578,900.
(iv) The impairment cost of £286,000 in the Statement of Net Expenditure relates to the impairment following a professional revalution of a BGS airplane. In accordance with FRS11 the balance of £26,000 has been debited to the revaluation reserve and has been included in the Statement of Total Recognised Gains and Losses.
(v) Includes donated assets with a value of £ 358,941 and is offset by a donated asset reserve.There is no restriction on the use of these assets.
(vi) Includes assets transferred to NERC from Southampton University with a NBV of £3,059,000.

9(b). The net book value of land and buildings comprises:

	2007 £000
Freehold	40,283
Long leasehold	99,982
Short leasehold	1,798
Antarctic buildings	11,603
Under Construction	22,022
Total Net Book Value	**175,688**

9(c). Fixed Asset Investments

	2007 £000
Valuation as at 1 April 2006	362
Revaluation	(318)
Valuation as at 31 March 2007	**44**

Notes :
The Council holds 252,000 shares in Evolutec Group PLC, a company engaged in the commercial development of NERC inventions and know-how. This equity provision was received in return for company access to NERC intellectual property. The shares are publicly traded on the Alternative Investment Market of the London Stock exchange and had a current open market value of 17.5 pence per share at 31 March 2007. NERC's shareholding represented 1.07% of the issued capital of Evolutec Group PLC at 31 March 2007. The sharp fall in the share price is attributable to the failure of drugs trials.

10. Debtors

	£000	2007 £000	£000	2006 £000
(a) Amounts falling due within one year:				
Trade debtors		5,103		4,607
Intra Government				
Central Government bodies	4,426		4,745	
Local Authorities	102		114	
		4,528		4,859
Other debtors		4,730		588
Early retirement lump sum repayments		1,444		1,231
Pre-payments		10,747		11,950
Accrued income		6,092		5,570
Provision for bad debts		(148)		(213)
		32,496		28,592
(b) Amounts falling due after one year:				
Early retirement costs in respect of former employees due from Pension Fund on normal retirement date.		**3,940**		4,322
Total Debtors		**36,436**		32,914

11. Creditors

	£000	2007 £000	£000	2,006 £000
(a) Amounts falling due within one year:				
Trade Creditors		5,028		7,451
Intra Government				
Central Government bodies	458		1,640	
Local Authorities	1,036		585	
		1,494		2,225
Other Creditors		19,367		20,115
Early Retirements		1,604		1,869
Accruals & Deferred Income		21,916		10,477
Obligation under finance leases		1,013		933
Monies held on behalf of EC Programme Collaborators		2,322		2,204
		52,744		45,274
(b) Amounts falling due after more than one year:				
Obligation under finance leases	15,310		16,322	
CEH Early Retirements	768		-	
		16,078		16,322
Total Creditors		**68,822**		61,596

12. Provisions for Liabilities and Charges

	Note	Antarctic Treaty Costs [2] £000	Early Retirements £000	Other Liabilities [3] £000	CEH Restructuring [4] £000	Total £000
At 1 April 2006	1	7,245	3,953	5,043	19,358	35,599
Write back of provisions not required		-	-	(653)	(2,100)	(2,753)
Amounts provided in year		1,831	1,602	649	3,058	7,140
Unwinding of discount		159	111	109	97	476
Provision utilised in year		(831)	(1,631)	(1,240)	(2,629)	(6,331)
Provision at 31 March 2007		8,404	4,035	3,908	17,784	34,131

Notes :

1. *The discount rate used is 2.8% for pension provisions and 2.2% for all other provisions.*
2. *Antarctic Treaty Costs represents the Council's Liability to remove the items no longer used from the Antarctic.*
3. *Other liabilities includes claims made against NERC and commitments to onerous operating lease payments, these have been estimated on the likelihood of the leases being assigned during the remainder of their term.*
4. *CEH Restructuring provision movements this year and new provisions are reported in the Management Commentary in the Annual Report in detail. The opening balances for CEH provisions have been separated in order to aid understanding of the provision.*

13. Notional Cost of Capital

	2007 £000	2006 £000
Notional cost of capital	7,686	7,272

In accordance with Treasury guidance the reversal of the cost of capital charge has been written back to the Income and Expenditure reserve (note 1k refers).

14. Government Funds

	Government Grant Reserve [2] £000	Accumulated Income & Expenditure £000	Revaluation Reserve £000	Capital Land Reserve £000	Donated Asset Reserves [1] £000	Total Government Funds £000
Balance at 1 April 2006	183,313	(39,030)	62,301	4,075	412	211,071
Prior Yr Adj - see note 2	(183,313)	187,388	-	(4,075)	-	-
Revised balance as at 1 April 2006	-	148,358	62,301	-	412	211,071
Grant-in-aid received	-	340,630	-	-	-	340,630
Funding Received from Other Bodies	-	5,137	-	-	-	5,137
Revaluation in year	-	-	17,193	-	(54)	17,139
Transfer of assets	3,599	-	(3,599)	-	-	-
Impairment of fixed assets	-	-	(26)	-	-	(26)
Reversal of notional cost of capital	-	7,686	-	-	-	7,686
Expenditure for year	-	(333,969)	-	-	-	(333,969)
Release to Net Expenditure	(540)	-	-	-	-	(540)
Transfer between reserves	-	2,758	(2,758)	-	-	-
Balance at 31 March 2007	3,059	170,600	73,111	-	358	247,128

Notes:

1. *The Donated Asset Reserve relates to assets which were donated as at 31 March 2006 and were valued at current value on receipt and included in note 9. All capital grant-in-aid received in previous periods and credited to the Government Grant Reserve was received for general capital purchases and has therefore been transferred to the Income and Expenditure Reserve via a prior year adjustment.*
2. *The Government Grant Reserve addition in year relates to the inclusion of four assets that had previously been funded from NERC and have been transferred to NOCS from Southampton University. The reserve will be released to the Statement of Net Expenditure over the asset lives to match depreciation.*

15. Reconciliation of the operating costs before financing to net cash outflow from operating activities

	2007 £000	2006 £000 Restated
Net Operating Costs Before Financing	(326,214)	(315,969)
Depreciation charge	20,611	18,840
Transfers from Government Grant Reserve	(540)	-
Impairment	286	592
(Decrease) in provisions	(2,902)	(3,843)
(Increase)/Decrease in debtors	(3,522)	1,191
Increase in creditors	8,158	14,546
Net cash outflow from operating activities	(304,123)	(284,643)

16. Reconciliation of movements in cash to movements in net funds/(debt)

	2007 £000	2006 £000
Increase/(Decrease) in cash	5,574	(16,522)
Capital element of finance lease payment	932	861
Change in net debt resulting from cash flows	6,506	(15,661)
Net (debt)/funds at 1 April	(6,615)	9,046
Net debt at 31 March	(109)	(6,615)

Analysis of net debt

	At 1 April 2006 £000	Cash Flows £000	At 31 March 2007 £000
Cash at bank	10,640	5,574	16,214*
Finance Lease	(17,255)	932	(16,323)
	(6,615)	6,506	(109)

Note Figure includes £11,325,000 which relates to balance held at Office of Paymaster General as at 31 March 2007 (£6,895,000 : 2006).*

17. Forward Commitments on Approved Research Grants ,Research Contracts and Studentships

	£000
2007-2008	111,202
2008-2009	73,175
2009-2010	37,161
2010-2011	8,167
2011-2012	4,844
2012-2013	392
	234,941

18. Amounts Payable under Finance Lease Obligations

	2007 £000	2006 £000
Within one year	1,013	933
Within two to five years	5,011	4,611
Greater than five years	10,299	11,711
	16,323	17,255

19. Related Party Transactions

The Natural Environment Research Council (NERC) is a Non-Departmental Public Body (NDPB) sponsored by the Department of Trade and Industry (DTI).

The DTI is regarded as a related party. During the year, NERC has had various material transactions with the DTI and with other entities for which the DTI is regarded as the parent Department, viz: Engineering and Physical Sciences Research Council, Biotechnology and Biological Sciences Research Council, Particle Physics and Astronomy Research Council, Council for the Central Laboratory of the Research Councils, Medical Research Council, Economic and Social Research Council and the Arts and Humanities Research Council.

In August 2005, DTI transferred to NERC the responsibility for the National Core Store (located at Gilmerton, Edinburgh). There is a minimum 5 year lease agreement in place where NERC lease the property in Edinburgh from the DTI at an annual peppercorn rent. The property remains on DTI's balance sheet. NERC are responsible for maintaining and running the Core Store and have received full year funding of £420,000 from the DTI. In addition NERC has had various material transactions with other Government departments and other central Government bodies.

During the year, NERC entered into the following material transactions with a Council member in respect of payments under awards or contracts funded by NERC.

Council Member	Number of Awards or Contracts	Amount £
Professor A Fitter	1	22,838

None of the above mentioned related parties were involved in the approval of awards to the Institution where he/she is a senior member of the staff.

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

Related Party	Institution	Number of Awards or Contracts	Amount £000
Mrs K Morgan	Plymouth Marine Laboratory	29	1,153
Professor A Glover	University of Aberdeen	26	1,034
Professor M Anderson	University of Bristol	67	2,502
Professor T Davies	University of East Anglia	73	2,723
Professor A Halliday	University of Oxford	74	2,194
Professor A Thorpe	University of Reading	60	2,229
Professor A Fitter	University of York	32	1,046
Professor M Lockwood	University of Southampton	75	2,656
	CCLRC	18	566
Professor M Wilson	University of Leeds	79	3,160

20. Losses and Special Payments

During the year there were 33 losses totalling £36,084, including a compensation payment of £14,693.

21. Shareholdings

Other than shareholdings shown in note 9(c), the council holds 249 shares in Wallingford Hydrosolutions Ltd, a specialist technology transfer company. Wallingford Hydrosolutions Ltd is a leading research centre in the area of hydrology, water resources and environmental modelling. The shares are not publicly traded and currently have no open market value. At 31 March 2007 NERC's shareholding represented 24.9% of the issued share capital of Wallingford Hydrosolutions Ltd.

The council holds 1,000 shares in Cybersense Biosystems Ltd, a biosensor company based at Oxford's Centre of Ecology & Hydrology, which is adapting the latest bioluminescent biosensor technology for industrial applications. The shares are not publicly traded and currently have no open market value. At 31 March 2007 NERC's shareholding represented 0.25% of the issued share capital of Cybersense Biosystems Ltd.

22. Capital and Lease Commitments

Capital Commitments

As at the date of these accounts, NERC is committed to a sum of £17,750,000 in respect of capital contracts. This includes the building of the Antarctic base Halley VI for £17,200,000 due to be completed in 2010/11, the Environmental Centre for Wales for £166,000 due to be completed in 2007/08 and A-F blocks in BGS Keyworth for £318,000 due to be completed in 2008/09. It is anticipated that the remaining capital contracts will be completed in 2007/08.

Lease Commitments

NERC have an operating lease for the hire of an aircraft and for hire of scientific equipment. The annual commitments under non-cancellable operating leases are as follows :-

	2007 **£'000**	2006 £'000
Operating leases which expire		
- in under one year	21	119
- in two to five years	24	43

23. Contingent Liabilities

There are no outstanding contingent liabilities at this time.

24. Post Balance Sheet Events

There have been no events between the Balance Sheet date and 17 July 2007, the date when the accounting officer despatched the accounts to the Office of Science and Innovation. The financial statements do not reflect events after this date.

25. Financial Instruments

Financial Reporting Standard Number 13, Derivatives and Other Financial Instruments, requires disclosure of the role which financial instruments have had during the period in creating or changing the risks an entity faces in undertaking its activities. Because of the largely non-trading nature of its activities and the way it is financed, the Council is not exposed to the degree of financial risk faced by business entities. Moreover, financial instruments play a much more limited role in creating or changing risk than would be typical of the listed companies to which FRS 13 mainly applies. The Council has limited powers to borrow or invest funds and except for the finance lease contract (details of which are given in notes 1(m), 9(a) and 20) and relatively insignificant forward purchases of foreign currency, financial assets and liabilities are generated by day-to-day operational activities and are not held to change the risks facing the Council in undertaking its activities.

Liquidity risk

The Council's net revenue resource requirements are largely financed by grant-in-aid from its sponsor department. The capital expenditure, with the exception of the ship financed under the Finance Lease referred to above, is also financed through grant-in-aid. The Council is not therefore exposed to significant liquidity risks.

Interest rate risk

The Council is not exposed to any interest rate risk.

Foreign currency risk

The Council's exposure to foreign currency risk is not currently significant.

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