

Annual  
report and accounts

2002 – 2003



STATEMENT OF PRESENTATION  
OF ACCOUNTS

CEFAS ANNUAL REPORT AND ACCOUNTS 2002 - 2003

PRESENTED TO PARLIAMENT PURSUANT  
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# Contents

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## *(review)*

<b>4</b>	CHIEF EXECUTIVE'S STATEMENT
<b>6</b>	PURPOSE AND OBJECTIVES
<b>8</b>	100 YEARS OF FISHERIES RESEARCH
<b>10</b>	DELIVERING HIGH QUALITY SCIENCE:
<b>10</b>	Environmental Management
<b>14</b>	Environment and Food Safety
<b>18</b>	Environmental Quality
<b>22</b>	Fisheries Management
<b>26</b>	Fisheries Biology
<b>30</b>	Aquaculture and Fish Health
<b>34</b>	Information Systems
<b>36</b>	NEW RESEARCH VESSEL
<b>38</b>	COMMERCIAL BUSINESS DEVELOPMENT
<b>40</b>	CEFAS CORE VALUES:
<b>41</b>	Integrity
<b>42</b>	Excellence
<b>44</b>	Customer Focus
<b>46</b>	Concern for People
<b>48</b>	Continuous Improvement
<b>50</b>	FUTURE STRATEGY
<b>52</b>	SENIOR MANAGEMENT STRUCTURE
<b>53</b>	FINANCIAL COMMENTARY
<b>54</b>	PERFORMANCE AGAINST KEY MINISTERIAL TARGETS

## *(accounts)*

FOREWORD TO THE ACCOUNTS	<b>56</b>
STATEMENT OF ACCOUNTING OFFICER'S RESPONSIBILITIES	<b>58</b>
STATEMENT ON INTERNAL CONTROL	<b>59</b>
THE CERTIFICATE AND REPORT OF THE COMPTROLLER AND AUDITORS GENERAL	<b>60</b>
FINANCIAL STATEMENTS	<b>61</b>



# Chief Executive's Statement

The past year has been significant for CEFAS for a number of reasons.

Defra completed a review of its science-based Agencies, including CEFAS. The ensuing report, published in December 2002, confirmed the importance of the scientific support we provide, and established that CEFAS will continue to be part of Defra. The review recognised the need for improvements to help the Agencies operate to maximum effectiveness, and work is in hand to provide a better financial framework and new governance arrangements.

Defra also made progress in areas of strategic policy with strong relevance for CEFAS. The launch of the Marine Stewardship Report 'Safeguarding our Seas' in May 2002 outlined the UK's strategy for the marine environment. This important document provides a unified context for much of CEFAS' work, alongside the Department's Science & Innovation Strategy, and sets the scene for new legislation and programmes that will determine our priorities over the coming years. We were pleased to contribute to these approaches, and CEFAS also participated strongly in other national and international planning of marine strategy, for the European Commission, the International Council for the Exploration of the Sea and others.

Thus, at the end of our sixth year as an Agency, we have a stronger and clearer framework to drive the planning of CEFAS' skills, facilities and programmes of work in support of government objectives.



## INVESTOR IN PEOPLE

CEFAS' works not only on behalf of UK government departments. We continued to expand our provision of advice and research to other bodies in the UK and overseas, including a number of projects in Eastern Europe and the Middle East. Three existing joint ventures with private sector partners were further developed, utilising our company CEFAS Technology Ltd to facilitate the commercialisation of our intellectual property.

2002 marked the Centenary of fisheries research by our Laboratories – work which began in 1902 in a context of fears about the effects of over-fishing that are not unfamiliar today. We enjoyed a variety of celebratory events, including lectures from distinguished visitors, a reunion of past members of staff, and an international symposium (see pages 8 & 9). This opportunity to look back on a long history at the heart of international fisheries science is also a springboard for exciting new developments.

Our new research vessel *CEFAS Endeavour* sailed into the port of Lowestoft in March - delivered on schedule and within budget - the successful culmination of several years' planning and construction. The new ship, replacing the 30-year old *Cirolana*, has state-of-the-art technology that gives us important new capability for our research and survey work. We look forward to a ceremony this summer when the ship will be formally named.

Another milestone was passed in 2002, when CEFAS was re-accredited to the revised, more exacting, Investors in People standard, confirming the progress made in establishing good management and staff-related policies. The Agency was particularly commended for a strong corporate culture of continuous improvement. We are building on this by further development of performance appraisal, rewards and career planning. The appointment of a Communications




Dr Peter Greig-Smith  
Chief Executive of CEFAS

Manager in 2003 will allow us to take new steps to enhance public awareness of CEFAS and its science.


CEFAS' success is founded on the expertise and dedication of our people. Throughout the year, the Agency's staff continued to innovate, deliver advice and generate scientific knowledge, with enormous integrity and professionalism. Even when, during December last year, many staff felt strongly enough about the disparity in pay between CEFAS and other units in Defra to take industrial action, their commitment to support the Agency's objectives remained high. It will be a priority for the coming year to ensure that pay and rewards for CEFAS staff keep pace with good practice in other specialist scientific organisations.

This report offers a selection of examples of the exciting activities undertaken by CEFAS in 2002/03. I hope that you enjoy reading it.


# CEFAS' Triangle of Purpose



Applying Science  
to Support the  
Objectives  
of Government  
Departments



Enhancing capability  
through Commercial  
Development of our  
skills and knowledge



Conducting World  
Class Research  
respected by our  
customers  
and scientific peers



Our aim is to be the prime source of high quality science used in:

- Conserving and enhancing the aquatic environment
- Promoting rational management of its natural resources
- Protecting the public from aquatic contaminants

Underpinned by our nine objectives, each of which is championed by a member of the CEFAS Management Board:

## 1 Delivery of Science

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**Mike Waldock**

To deliver outputs according to standards of quality, time and cost, as agreed with customers.

## 2 Public Accountability

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**Peter Greig-Smith**

To conduct CEFAS' activities in accordance with public sector rules and standards, complying fully with codes of practice on accountancy, propriety, health and safety and employer's responsibilities.

## 3 Strong Science

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**Stephen Malcolm**

To maintain and enhance the strength of science in CEFAS, achieving the respect of scientific peers, and playing a leading role in national and international activities within our fields of science.

## 4 Customer Focus

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**Mike Waldock**

To be valued by customers and be the scientific contractor of choice in our fields, as a result of meeting or exceeding customers' expectations, and developing close partnerships to address their needs.

## 5 Reputation

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**Stephen Malcolm**

To increase public awareness of CEFAS as a leading centre of scientific expertise.

## 6 Commercial Business Development

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**Brian Robinson**

To achieve long-term viability for the Agency through business opportunities that contribute to maximum utilisation of skills and facilities, generate funds for investment, and are relevant to governmental objectives including the exploitation of research outputs.

## 7 Concern for People

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**Diane Carter**

To make CEFAS a satisfying place to work by investing in staff development, fair rewards and equal opportunities, and high standards of management, so that staff are content, productive and committed to the organisation.

## 8 Efficiency

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**Mark Farrar**

To run CEFAS as an efficient organisation by developing internal processes that are simple, reliable and provide value for money relative to benchmark standards.

## 9 Business Planning

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**Mark Farrar**

To prepare and achieve realistic annual and strategic plans that optimise the balance between the priorities of science, business and people.

# 100 Years of Fisheries Research

Fisheries research at Lowestoft began in November 1902 with the first research vessel *Huxley* trawling off the Dogger Bank. This exploratory phase produced much of the fundamental knowledge which underpinned subsequent research and management strategies.

“ From its inception 100 years ago as a small fisheries laboratory with a staff of 10, CEFAS now has the four laboratories in Lowestoft, Burnham-on-Crouch, Whitehaven and Weymouth, employing over 550 staff ”

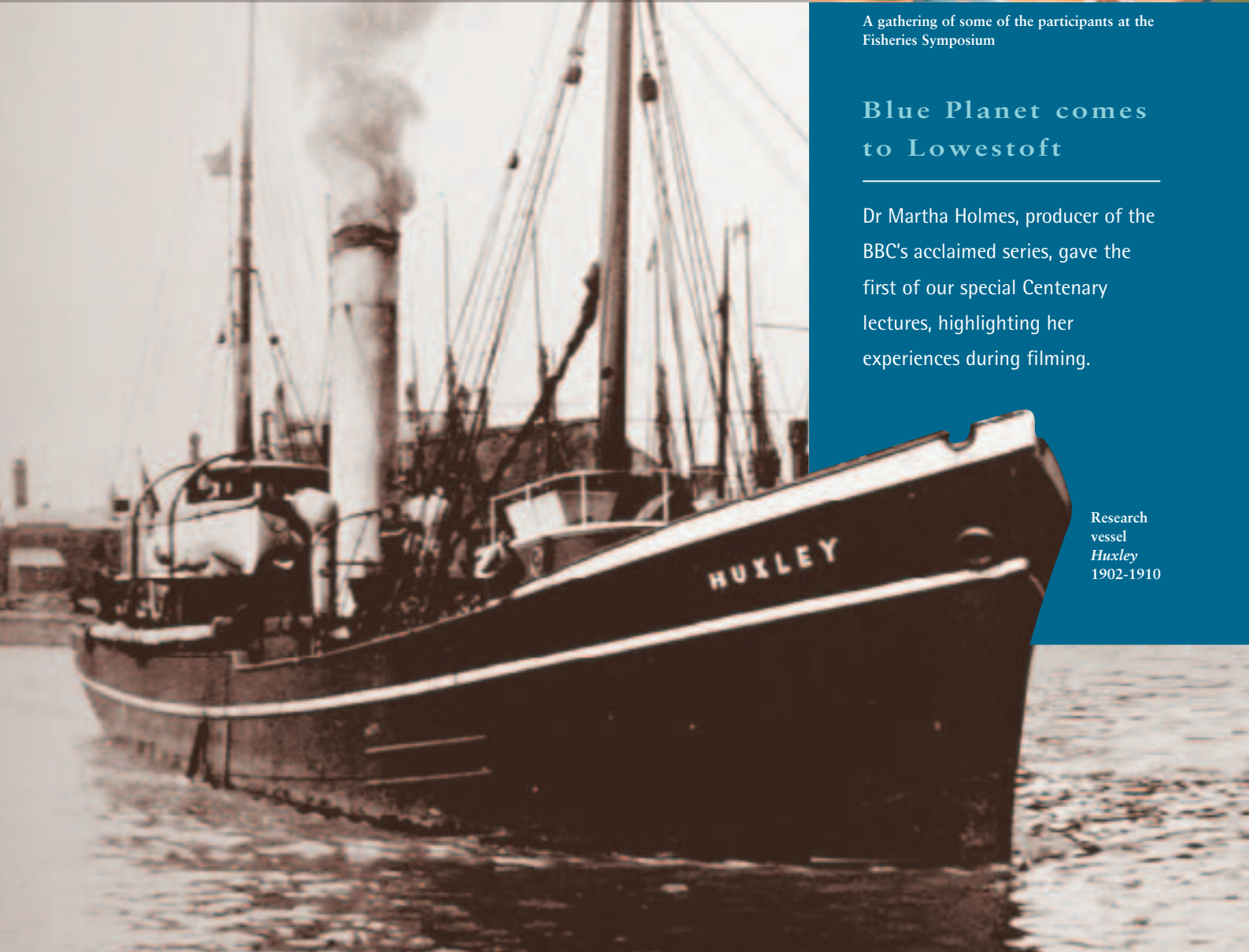


A gathering of some of the participants at the Fisheries Symposium

## Blue Planet comes to Lowestoft

Dr Martha Holmes, producer of the BBC's acclaimed series, gave the first of our special Centenary lectures, highlighting her experiences during filming.

Research vessel  
*Huxley*  
1902-1910



## Elliot Morley MP visits Lowestoft staff

Ahead of opening the Fish Fayre the next day, Fisheries Minister Elliot Morley MP gave a talk to CEFAS staff covering the breadth of his responsibilities. Waveney MP Bob Blizzard accompanied him as he visited staff in support teams of the Laboratory, and saw presentations on new science issues.



Elliot Morley (*Parliamentary Under Secretary, Commons*) and Bob Blizzard (*Waveney MP – left*) visiting the Laboratory at Lowestoft

## The Centenary Fisheries Symposium

In July a highly successful three day International Fisheries Symposium was hosted and organised by CEFAS at the Lowestoft Laboratory. The event brought together fisheries scientists, managers and policy makers from 20 different countries from as far afield as Australia and the Falkland Islands to discuss fisheries management problems of internationally-shared stocks, and to develop innovative solutions. Publication will be in late summer 2003.



The CEFAS Centenary logo was used for events throughout the year

## The Lowestoft Fish Fayre 2002

An estimated 5000 people took advantage of guided tours of research vessel *Corystes*, and the CEFAS display included a 100-year time-line exhibit.

## CEFAS Retirees' Reunion

Over 100 people, some of whom had flown in especially for the occasion, attended the informal gathering at the Wherry Hotel in Oulton Broad. For many it was a trip down memory lane and a chance to be reunited with old colleagues.

## CEFAS hosts Professional Development Day

As part of our ongoing Science and Education Partnership programme with Suffolk Business Education Link, CEFAS scientists gave presentations linked to the national curriculum, and a guided tour of the Laboratory.



Dr Sidney Holt – a guest speaker at the Fisheries Symposium

## Plenty of Fish in the Sea?

Rick Stein, the seafood chef and TV presenter, gave an entertaining and informative lecture at the Lowestoft Laboratory drawn from his personal experiences from around the world.



Rick Stein

Below: *Corystes* open to the public at the Fish Fayre





# Environmental Management

The Environmental Management Science Area provides scientific advisory and technical services related to the assessment of the impacts of human activities on the aquatic environment.

Our core work supports UK Government, advising on regulatory activities. We undertake research and development to underpin this advice and conduct monitoring programmes to assess the effectiveness of controls. Defra's aim of sustainable development provides the context for our work. In March 2002, Defra published a Marine Stewardship Report 'State of the Seas', pointing the way forward for marine environmental management in the UK.

## Marine sand and gravel extraction

During the year CEFAS advised Defra and the Office of the Deputy Prime Minister (ODPM) on the environmental effects of burgeoning applications to extract sand and gravel, and the necessary monitoring and mitigation required should dredging go ahead under the Government View (GV) procedure. Most applications for extraction were within the Eastern English Channel (EEC), an area set to be the focus in future years of new activity in the marine aggregate industry.

CEFAS took part in the 'New Agenda' workshop held in June 2001 to discuss how the development of the Eastern Channel Region should be handled. CEFAS was also involved in a technical workshop held in November 2001 that provided consultants carrying out a Regional Environmental Assessment (REA) of the region with feedback on their initial findings and on their approach to dealing with key issues.

**“ sustainable development provides the context for our work ”**



Lindsay Murray  
EM Science Area Head  
Email: [l.a.murray@cefas.co.uk](mailto:l.a.murray@cefas.co.uk)

## Benthic studies at aggregate dredging sites

CEFAS published guidelines on behalf of the ODPM on the conduct of benthic surveys at commercial aggregate extraction sites. The document is targeted at experienced marine scientists, especially those working on the implementation of environmental assessment and monitoring programmes. See [www.cefas.co.uk/publications](http://www.cefas.co.uk/publications)



Harbour maintenance dredging



Sorting benthos samples at CEFAS, Burnham-on-Crouch

Left page: Saltmarsh on the south coast

## Coastal developments

CEFAS is directly involved in assessing the implications of applications in England & Wales for a wide range of coastal activities, including marine construction, dredged material disposal, navigation dredging, and offshore wind farm proposals.

### “ development of offshore wind farms around the UK is soon to become a reality ”

The development of offshore wind farms around the UK is soon to become a reality, with construction on several sites due to start in 2004. CEFAS scientists have already highlighted limitations in the understanding of the impact of the structures on coastal processes (particularly on changed wave regimes, sediment transport and coastal stability), and CEFAS sedimentologists are now conducting research to redress this limitation.

Wind turbines at the Blyth Offshore wind farm (*photograph courtesy of AMEC*)

## Beneficial use of muddy dredged material

The soft coastlines of various parts of the UK, particularly in the south-east, are slowly eroding. These soft coastlines comprise mudflats and saltmarshes that are not only rare and specialised habitats, but stabilise existing sea defences: they act as efficient wave buffers.

Maintenance dredged material can be used successfully to create and/or improve saltmarshes and mudflats that, in time, are capable of functioning like natural systems. The placement of maintenance dredged material on intertidal areas, or “beneficial use” schemes, is therefore currently viewed as a sustainable way of protecting sea walls.

CEFAS scientists are working on a four-year Defra-funded research project aimed at improving our understanding

### “ dredged material can be used to create or improve saltmarshes and mudflats ”

of the recovery of beneficial use schemes to ensure the best advice is given to UK Government. Results indicate that initial recovery can be relatively rapid, with large numbers of invertebrates inhabiting the recharged sediment within a month. Field experiments conducted as part of the project have indicated that sediments with low organic content promote faster recovery than those with high organic content.

## Polycyclic aromatic hydrocarbons

During a 1999–2000 study at Shoreham, CEFAS established that contamination by polycyclic aromatic hydrocarbons (PAHs) from a derelict gasworks site within the harbour area was evident in mussels sampled along the coast as far as Hove and Brighton.

In 2002, we considered an application to dredge the approaches to Shoreham Harbour and to dispose of the dredged material to sea. Because of our earlier findings we conducted a major study in conjunction with the harbour authority which established that, although there were high levels of contamination within the closed harbour itself, the approach channels to be dredged were relatively lightly contaminated. Dredging and disposal were, therefore, allowed.



Tanker *Prestige* off north-west coast of Spain  
(reproduced with permission of the Maritime and Coastguard Agency)

## Emergency response

An emergency response team at CEFAS provides advice to Defra and other Government Departments on how to deal with marine oil and chemical spillages. During the year, a number of incidents at sea required action from the team.

In August there was a spill of TBT (tributyltin) in Coggeshall, Essex, that eventually reached the River Blackwater. For food safety reasons, CEFAS monitored oysters held towards the mouth of the estuary for a number of weeks. TBT concentrations in their flesh were not elevated as a result of the spill, and a temporary prohibition order was revoked at the beginning of September.

In November, the product tanker *Prestige* broke up and sank off the north-west coast of Spain. CEFAS advised scientists at both the Hydrographic Institute in Lisbon and the Oceanography Laboratory in Vigo.

CEFAS also gave advice in December after a car carrier, the *Tricolor*, collided with the container ship *Kariba* and sank in shallow water within the busy Dover Strait. During the next three weeks two other vessels collided with the wreck.

Right: CEFAS GIS system in use

Eventually oil leaked from the vessel, causing some pollution of the Belgian coast. Later, tarballs appeared on the Kent and Essex coasts. CEFAS advised that this did not represent any threat of contamination to the foodchain.

## Access to marine data and information

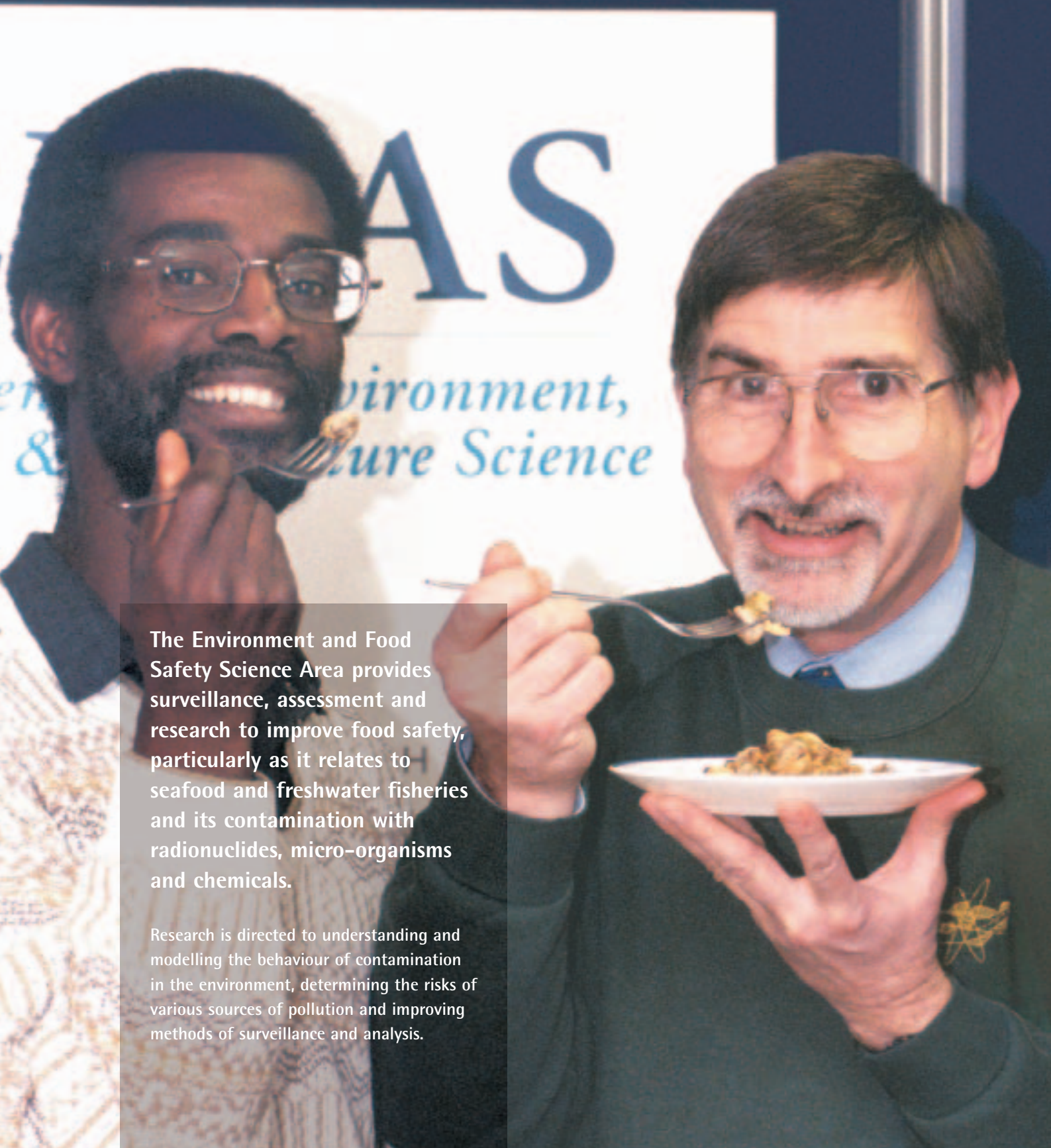
CEFAS continues to play a key role in initiatives aimed at improving access to data and information about the marine and coastal environment. This year our efforts included:

- organisation of a Defra-funded workshop, "Delivering Integrated Marine Mapping for the UK", aimed at developing a strategy for delivering a harmonised approach to seabed mapping – one of Defra's commitments in the first Marine Stewardship Report
- appointment of a new National Coastal Data Co-ordinator to fulfil a role identified by the Inter-Agency Committee for Marine Science and Technology
- development of a prototype CEFAS-wide Geographic Information System
- establishing links to OneCoast – a global coastal knowledge network launched at the 2002 World Summit in Johannesburg

**“ CEFAS continues to play a key role improving access to information about the marine and coastal environment ”**



# Environment and Food Safety



The Environment and Food Safety Science Area provides surveillance, assessment and research to improve food safety, particularly as it relates to seafood and freshwater fisheries and its contamination with radionuclides, micro-organisms and chemicals.

Research is directed to understanding and modelling the behaviour of contamination in the environment, determining the risks of various sources of pollution and improving methods of surveillance and analysis.

## Risk assessment and consumers

---

CEFAS scientists survey farmed and wild fish and shellfish in UK waters to allow us to advise on risks from consumption of these foods in their raw or cooked forms.

For surveillance of radionuclides in seafood, our research investigates how much polonium-210 crosses the gut into the body. Current estimates suggest that polonium-210 is responsible for some of the highest radiation doses to consumers from radioactivity in diet in the UK. For a high-rate shellfish consumer, these doses could double the dose received from natural background radiation.

Largely polonium-210 is naturally present in the environment at levels determined by distributions of uranium-series radionuclides. However, some industries discharge it, so there are strict controls in place. This year's experiment relied upon human volunteers eating mussels containing natural levels of polonium-210.

The Food Standards Agency (FSA) is required to estimate the risks from nuclear industry releases of radionuclides into the environment, in terms of their potential effects on the food supply. To help the FSA prioritise its research, we developed a probabilistic assessment scheme for radioactive releases to the marine environment and produced the first quantitative estimates of uncertainty.

## Science in court

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The Republic of Ireland submitted a 'memorial' within the terms of the United Nations Convention of the Law of the Sea (UNCLOS) that identifies a dispute with the UK concerning operations at Sellafield and the protection of the marine environment of the Irish Sea. In legal terms the dispute is considered by an 'arbitral tribunal' within the Convention.

CEFAS evidence to the tribunal included detailed statements from senior scientists, drawing on the results of several years of research undertaken at our laboratories and funded by Defra, the environment agencies and the FSA. The crux of the scientific evidence concerned whether discharges from Sellafield were impacting marine life in the Irish Sea. Our evidence suggests that they are not. The tribunal is scheduled to make its judgement in The Hague in June 2003.

Left page: CEFAS staff take part in polonium-210 experiment. Winston Hendrickson (*left*) and John Hunt

**“ this year's experiment relied upon human volunteers eating mussels containing natural levels of polonium-210 ”**

**“ CEFAS provided evidence drawing on the results of several years of research ”**



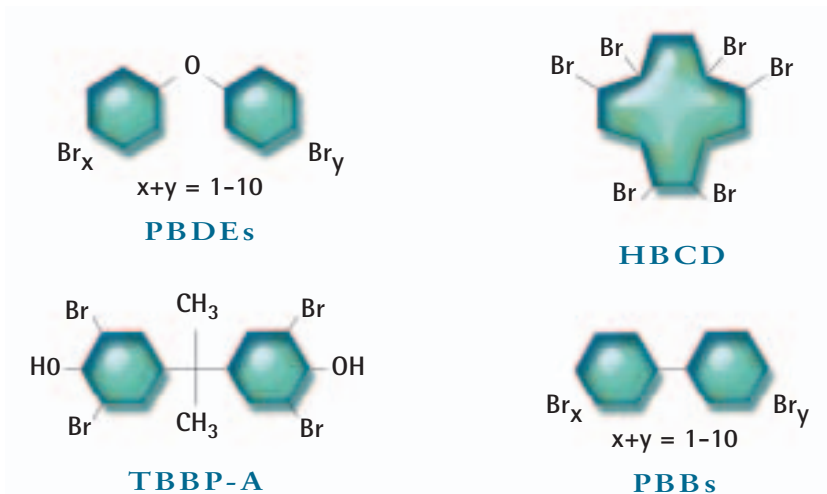
Bill Camplin  
EFS Science Area Head  
Email: [w.c.camplin@cefass.co.uk](mailto:w.c.camplin@cefass.co.uk)

## Collaboration for human health protection

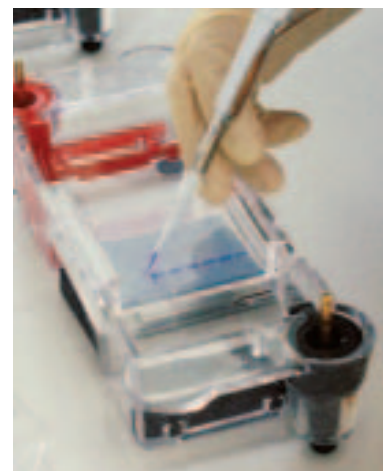
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Protection of human health from radiation is a multi-agency responsibility in the UK. This year CEFAS embarked on a five-year collaborative agreement with the Environment Agency (EA), the FSA and the Health & Safety Executive (HSE) to study the environment and the human populations around each of the major nuclear sites in England & Wales. We operate a similar programme in Scotland on behalf of the Scottish Environment Protection Agency.

The first year of the agreement began with surveys at Drigg, Hartlepool, Aldermaston and Burghfield. Each site has its own environmental characteristics, and each has a large human population working and living near it. We investigated agriculture, horticulture, fisheries, wildfowling and even bee-keeping. The databases created will be used by regulators to identify those most at risk and to determine whether the operations at each site could and should be made safer.



Brominated flame retardants structures



Loading a gel for virus detection

## Food contaminants

Food contaminants are the subject of several studies. Work continued on brominated flame retardants (BFRs), a diverse group of chemicals made up of several different chemical classes and used to reduce flammability in products in industrial and domestic applications. The FSA requested analysis of polybrominated diphenyl ether congeners (BDEs) and hexabromocyclododecane isomers (HBCDs) in samples taken during

its 2001 Total Diet Study, and also commissioned a survey of edible fish in the Rivers Skerne and Tees in north-east England. This work will generate data on current levels of selected BDEs and HBCDs in samples, allow consideration of dietary intake, provide evidence of current trends in residue levels and contrast these with those in fish caught in non-contaminated rivers.

Molecular biology techniques have also been developed for use in food authenticity studies of fish species. The methods involve identifying regions of the DNA sequence that are highly specific to a particular species. Work has been carried out to demonstrate the reliability and reproducibility of the method, which initially necessitated compiling DNA databases for sequence information, evaluating DNA sequences to identify mitochondrial sequences, and developing DNA extraction procedures.

**“ techniques have been developed for use in food authenticity ”**

Left: FRNA bacteriophage testing

The methodology has been tested on a variety of fish species using known and blind trials (including adulterated species) and field tests, and is currently being tested to determine whether it is suitable for use on mixed species and processed foods (including smoked, canned, cooked/frozen and cooked/processed species).

## European Community Reference Laboratory

Filter-feeding shellfish such as oysters, mussels, clams and cockles may become contaminated with human bacteria and viruses if grown in sewage-polluted waters, causing outbreaks of infectious disease when consumed raw or lightly cooked.

Control requirements for production of bivalve molluscs are stipulated by an EU Directive, under which Reference Laboratories monitor bacteriological and viral contamination of bivalves. CEFAS Weymouth Laboratory is designated the European Community Reference Laboratory (CRL) and the UK National Reference Laboratory (NRL).





National Reference Laboratory workshop held at CEFAS Weymouth

As CRL we are actively involved in helping the European Commission review food hygiene legislation relating to shellfish, and we have also run a number of training courses and workshops for NRLs and others. Quality control is increasingly important, and we developed pilot ring trials/external quality assurance programmes for FRNA bacteriophage and hepatitis A virus, and (in collaboration with the Public Health Laboratory service) for *E. coli* and salmonella ([www.crlcefafas.org](http://www.crlcefafas.org)).

**“ CEFAS Weymouth Laboratory is designated the European Community Reference Laboratory ”**

As NRL we actively work with UK testing laboratories to ensure a standardised approach to laboratory testing of bivalves, and to improve quality assurance for laboratory testing. In addition to meetings and training sessions, we undertook a survey of the testing methods used in UK laboratories ([www.nrlcefafas.org](http://www.nrlcefafas.org)).

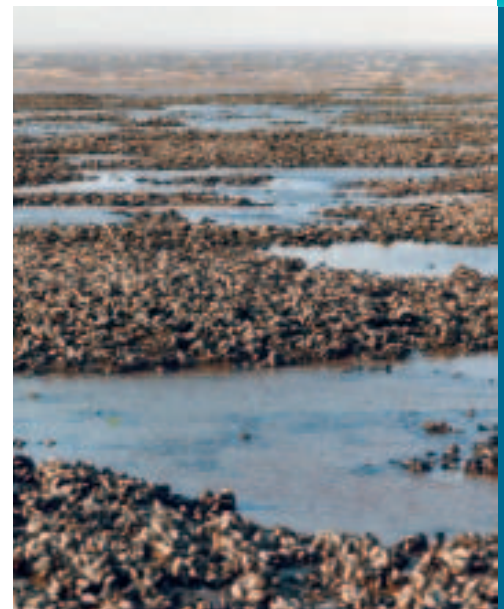
## Algal biotoxin monitoring programme

Some species of marine algae produce biotoxins that build up in the environment and accumulate in bivalve shellfish. There can be adverse health effects in people consuming such bivalves. EU member states are required to monitor bivalve relaying and production areas, and CEFAS is responsible for identifying the sampling areas, co-ordinating the programme for England & Wales, carrying out tests on shellfish flesh, and performing algal cell counts on water samples. CEFAS works with the FSA and local authorities to protect consumers by ensuring corrective action if toxins are detected in shellfish.



Preparing oyster samples for microbiological analysis

During 2002, a total of 981 shellfish samples was extracted and tested for Paralytic Shellfish Poisoning (PSP), 1342 for Diarrhetic Shellfish Poisoning (DSP), and 902 for Amnesic Shellfish Poisoning (ASP). UKAS accreditation has recently been awarded to CEFAS for the ASP test, and we will take part in a forthcoming international quality assurance scheme for ASP.



Mussel beds in The Wash

# Environmental Quality

The Environmental Quality Science Area provides scientific advice for the conservation of ecosystems and surveillance of human and natural disturbance of the aquatic environment.

Our focus is on research into the behaviour and effects of nutrients and hazardous substances to predict likely impacts on ecosystems and to monitor the effectiveness of environmental management systems.



## Monitoring the health of our seas

Monitoring and assessing hazardous substances in the environment was the subject of much attention in 2002 following the publication of priority lists of substances in the



Above and left page: Collecting Sea Surface Microlayer Samples around the Statfjord oil field

Water Framework Directive and by the OSPAR Commission. CEFAS, working in partnership with the Centre for Ecology and Hydrology, prepared a report for the Royal Commission on Environmental Pollution on "The Study of the Long-term Effects of Chemicals in the Environment", and concluded that there was a need to better balance the present effort allocated to risk assessment in the laboratory and to monitoring chemicals and their effects in the environment.

CEFAS is currently helping to establish a coastal environmental quality monitoring and information system for the Black Sea coast of Georgia. This will contribute towards compliance with the requirements of the Black Sea Commission and to achieve Blue Flag status for their bathing waters.

## Monitoring wave conditions

Much of the coastline around the UK is mobile, comprising sediments that may be moved by waves and currents. Accurate and accessible wave data are invaluable for a range of purposes, including flood and coastal defence management, shoreline management planning, flood forecasting, in studies of coastal erosion and flood defence, and in assessing potential impacts of climate change.

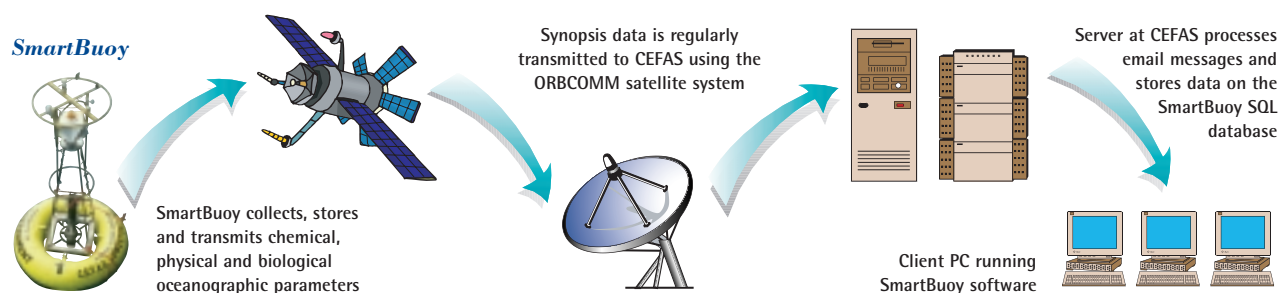
WaveNet is a major new initiative sponsored by Defra and launched in 2002 to deliver accurate, standard-format wave data in real-time for flood and coastal defence purposes. To gather the data in real-time, CEFAS worked closely with Neptune Sciences Inc (NSI) to develop a directional wave-monitoring system, mounted on a standard SmartBuoy. Data from these wave monitors around England & Wales are transferred to a data logger and



Dr David Morris  
EQ Science Area Head  
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**“ there is a need to balance the effort on risk assessment in the laboratory with monitoring chemicals in the environment ”**

transmitted to a base station via satellite every hour. The CEFAS system was developed to ensure that data would be available to all, using the web site [www.cefas.co.uk/wavenet/](http://www.cefas.co.uk/wavenet/), but it also has the advantage of simultaneously collecting valuable environmental data. The wave data are exchanged with the Meteorological Office and fed into its 6-hourly wave predictions, which are available to the Environment Agency and others.



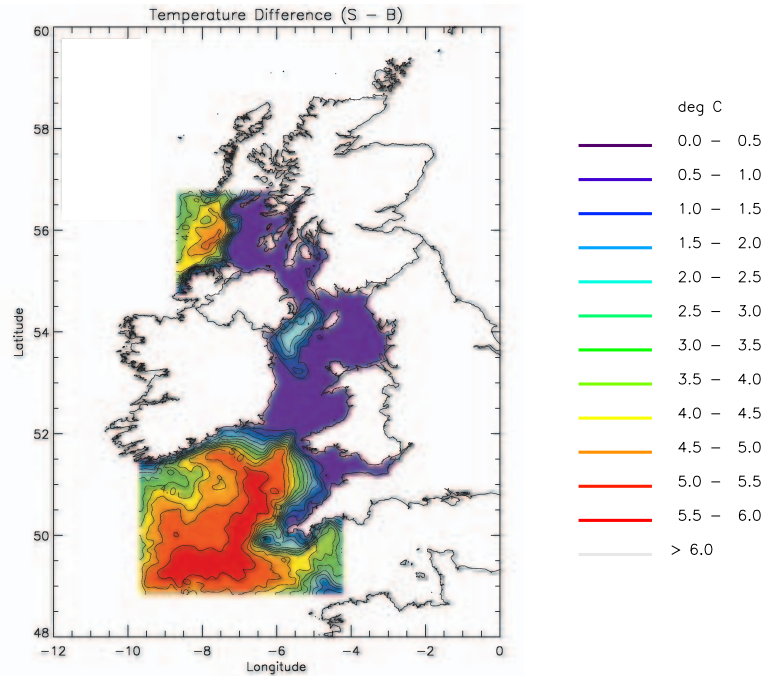
CEFAS Marine Monitoring Network of operational SmartBuoys

## Oceans around the UK

CEFAS oceanographers have developed a computer model that employs new methods to assess the flow and structure of the oceans around the UK. This model can be used to predict movement of oil or other substances in an emergency response situation, and forms an important part of a number of major research projects assessing the influence of ocean currents as a carrier of nutrients and biological material such as plankton. In a significant step, the model is now being run as a research tool incorporating 36-hourly wind forecasts supplied by the Meteorological Office four times daily, which will further develop its capabilities.

## Deep sea oceanography

The descent of cold, dense water from the water off Denmark into the North Atlantic Ocean is a key part of the global ocean circulation, which greatly influences earth's climate. Through



Results for the Irish/Celtic Seas of computer models that predict the sea-surface temperature difference of the water column. Red indicates areas where seasonal thermal stratification has developed (ie, a large temperature difference), matching well with oceanographic observations

detailed measurement of the water column, combined with constructing and analysing long hydrographic records, CEFAS oceanographers, in collaboration with the Woods Hole Oceanographic Institute, USA, and the Bedford Institute of Oceanography, Canada, have demonstrated a sustained and

widespread freshening of the deep North Atlantic Ocean over the past four decades. There is evidence of a direct link from the Arctic ice melting to the deep ocean, and of changes in the salinity of the North Atlantic reaching out to the global ocean circulation.

**“ CEFAS oceanographers helped to demonstrate a sustained and widespread freshening of the deep North Atlantic Ocean ”**

Iceberg off the coast of Greenland

## Biological effects of contaminants in pelagic ecosystems (BECPELAG)

The International Council for the Exploration of the Sea (ICES) BECPELAG workshop was an international two-year initiative aimed at assessing the ability of selected methods to detect biological effects of contaminants in pelagic systems. Scientists from 12 countries visited study sites in the Statfjord oil field and German Bight areas of the North Sea during seven separate research cruises. The programme of work was organised by a scientific steering committee, including scientists from CEFAS. The programme involved the *in situ* deployment of integrated samplers for fish and mussels, the collection of wild organisms and water samples and an assessment of numerous biological and chemical techniques. Several CEFAS scientists made important scientific contributions to the final recommendations of the programme, which were made to industrial and government bodies at a wrap-up conference in Copenhagen during 2002. Further information on BECPELAG and its publications can be found at [www.niva.no/pelagic/web/](http://www.niva.no/pelagic/web/)



Bioassays – whole sediment test

Below left: Fish cages used in BECPELAG



## Remotrans

CEFAS staff took part in the international Remotrans expedition to Cumbria and the Irish Sea, to conduct research on the processes that regulate **remo**obilisation, bioavailability and **trans**port in marine sediments. This topic is important, for example, in assessing the potential for ongoing impacts of radionuclides on the water column and biosphere. Based at the CEFAS Laboratory at Whitehaven, and using the French research vessel *Côtes*

*de la Manche* for offshore sampling, staff from research institutes and universities in France, Ireland and the UK investigated issues as varied as geo-chemistry, sedimentology, radiochemistry, physics, biology and soil science.

Preliminary results indicate the persistence of high concentrations of radionuclides in the Esk Estuary, and that the complex dynamics of such estuaries have a significant influence on the spatial and temporal distribution of contaminants.



# Fisheries Management

The Fisheries Management Science Area takes the lead in providing support for Government in key areas of fisheries management, including: monitoring and assessment of fish and shellfish stocks and their associated environment and interacting species, mathematical modelling and research, and the provision of advice.

Capabilities and skills are increased through engaging in research for other clients, notably for other governments and the EU.

## Changes in the abundance of fish stocks

The UK has a quota for many fish stocks for which the EU sets an annual Total Allowable Catch (TAC) in response to independent scientific advice based on the work of national laboratories and the International Council for the Exploration of the Sea (ICES). CEFAS monitors and assesses the principal stocks and fisheries and provides high-level advice to Defra and the fishing industry.



On board a commercial trawler

Priority now is the state of our cod stocks, which are at serious risk from overfishing and increased seawater temperature. Assessment data show how rapidly the number of one-year-old North Sea cod has fallen since the mature stock declined below 150 000 tonnes, the benchmark set by ICES as the minimum "biological safe limit" for the stock.

**“ CEFAS provides high-level advice to Defra and the fishing industry ”**

### Common Fisheries Policy

*This year has seen major developments in EU and UK fisheries management, in particular a new Common Fisheries Policy (CFP), recovery plans for much-depleted stocks of cod, the introduction of a days-at-sea regime of effort control and the start of a shellfish licensing scheme.*

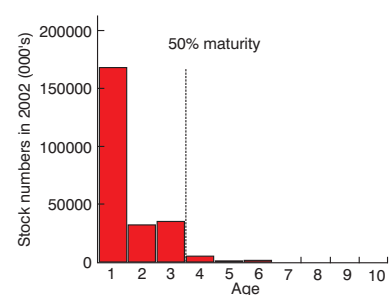
*The new CFP introduces, inter alia, recovery plans for depleted stocks, multi-annual plans for others, quicker responses for fish stocks and the environment, and a greater engagement with stakeholders through Regional Advisory Councils.*

Left page: Herring (*Clupea harengus*)



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CEFAS scientists contribute in several ways. First, we sample the age and size structure of stocks by regularly sampling at fishing ports. Second, we carry out research vessel surveys of fish abundance independent of the fishery and so consistent over a long time, the results confirming the decline in the abundance of each age group of North Sea cod. Finally, CEFAS gives ongoing advice about stock status and the development of EU recovery plans that, for North Sea cod, aims to restore it to 150 000 tonnes by severely cutting the TAC and increasing the legal mesh size.



Graph showing just how few mature cod are left

**“ research vessel surveys confirm decline in the abundance of North Sea cod ”**



Sorting a catch sample on board our research vessel

## Management by multi-annual TACs

Most EU fisheries are managed by setting an annual TAC equivalent to a prescribed proportion of the fishable stock, the TAC then varying year-on-year depending on natural variation in the stock or changes in the fishing rate. However, because the revised CFP aims to adopt multi-annual TACs for all stocks as a means of stabilising output, there is interest in setting TACs for longer periods, provided the risks of overfishing do not increase.

CEFAS leads efforts to develop simulation models for this approach. In 2002, we used such a model in a case study of a local spring-spawning herring stock in the Thames Estuary, a stock currently above the threshold designated as biologically safe. The model projects the stock forward for 20 years under various harvesting regimes to measure the risk of falling below the threshold. Cumulative yield is highest and the risk of overfishing least when, as now, the TAC is adjusted every year, but it should be possible to set a constant, but on

Right: Sandeel dredge

average slightly lower, TAC for three years or longer without unduly increasing the risk of overfishing or sacrificing yield, provided TAC adjustments do not exceed 40%.

**“ CEFAS leads efforts to develop simulation models ”**

## Fishery stock structure

Plaice stocks in the North Sea and the eastern English Channel are currently assessed separately, but some plaice leave the North Sea seasonally to spawn in the Channel and then return. CEFAS scientists have examined the implications of this interchange using a computer model that simulates a proportion of fish from the North Sea migrating into and out of the Channel, with catches being reported by area of capture rather than area of origin. The data are then assessed using standard ICES assessment protocols.

Results suggest that the North Sea plaice stock is unlikely to be affected by management measures imposed in the Channel, whereas the stock in the

eastern Channel could be affected by management actions covering the North Sea stock. When the number of young plaice recruiting in the North Sea is high, recruitment in the eastern Channel could be over-estimated, so any increase in fishing mortality in the eastern Channel might go undetected. Evaluation of the results of this behaviour-based work is continuing.

## North Sea sandeel fishery

Although rarely seen (except as bait), sandeels are the most abundant fish in the North Sea, a large industrial sandeel fishery for meal and oil having developed over the past five decades. Annual landings of all participating countries have averaged 830 000 tonnes for 15 years, but have exceeded one million tonnes (1% of the world's total fish catch) three times. Sandeels emerge from the sand in which they live only during daylight between March and July, so catches are limited to the intervening months and to sandy seabed hotspots such as the western edge of the Dogger Bank and the Fisher Bank.

There are three main areas of concern regarding the fishery. First, is such a large fishery sustainable?





Spurdog (*Squalus acanthias*)

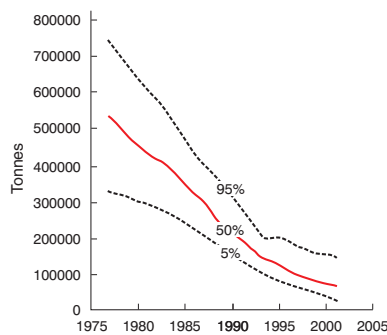
Current indications are that the stock is above the precautionary biomass reference point and showing no sign of decline. Second, given that other species may be taken in such a large harvest by small-mesh sandeel nets, what is the potential to damage stocks of other commercially valuable species? CEFAS scientific observers placed on board Danish sandeel vessels support official records that the small permitted by-catch limits are generally being adhered to. Finally, does harvesting sandeels deprive natural predators of a food source? Few predators depend solely on sandeels, most taking a wide range of food, but many do feed on sandeels. Where direct links have been shown between the abundance of predator species, eg, kittiwakes around Shetland, and sandeel fisheries, management measures have been implemented to minimise the impact of the fishery on the seabird population.

**“ Research at CEFAS is advising on the impact of industrial fisheries ”**

Research at CEFAS is directed at sandeel populations and their predators in other areas of the North Sea, advising on the impact of industrial fisheries on predator populations.

## Research and advice on elasmobranchs

Fisheries research has traditionally focused on commercially important bony fish and shellfish, whereas elasmobranchs (sharks, dogfish, rays, skates) receive less attention. CEFAS was instrumental in helping initiate an EU-funded multi-national programme aimed at improving the scientific basis for managing elasmobranch fisheries. The project raised the profile of elasmobranch fisheries management and was successfully completed in December 2002. It made provisional assessments of the status of several species, sometimes using new methodology, eg, CEFAS' Bayesian approach to assessment of spurdog, and contributed to knowledge of both stock identity and fisheries. Future research will refine and build on these initial assessments.



Estimated biomass (tonnes) of spurdog in the north-east Atlantic indicating high probability (95%) of decline

Right: A typical catch in a scallop dredge

## Management of scallops

Scallops support one of the most valuable fisheries in England & Wales, but the use of heavy metal dredges does raise concern about the effect of fishing on the seabed and associated fauna. CEFAS scientists and their collaborators have been looking at whether closing areas to scallop fishing creates refuges for other seabed organisms that may benefit all fisheries. On the basis of a spatial simulation model of a scallop stock and its exploitation, an increased spawning stock seems to be the principal benefit of spatial management, but it is not yet clear what this means for future recruitment. Increased average catch rates are also possible, but only at the expense of greater year-on-year variability.



**“ does closing areas to scallop fishing create refuges for other seabed organisms ”**

A close-up photograph of a crab on a piece of seaweed. The crab is positioned in the center, facing right, with its legs and antennae visible. To the left of the crab is a small, light-colored, ribbed shell. The seaweed is a mix of green and brown, with some purple and red algae visible in the background. The overall scene is a natural, underwater or intertidal environment.

# Fisheries Biology

The Fisheries Biology Science Area performs the science necessary to assess the impact of human activities and natural factors on freshwater and marine fauna and ecosystems. The results support advice given on the management and regulation of marine and freshwater fisheries.

## Gaining insights into marine food webs

New methods for assessing the effects of fishing on marine food webs are needed urgently, both to test the sustainability of existing fishing practices and to predict how the fishing impacts will change following different types of management action. New work at CEFAS has shown that it is possible to validate conventional size-based analyses with nitrogen stable isotopes, which measure the proportion of production at one trophic level converted to production at the next. The results have enabled our scientists to estimate trophic transfer efficiencies in the North Sea food web.

**“ new work at CEFAS has estimated trophic transfer efficiencies in the North Sea food web ”**

This novel research is a first step towards the development of new methods to assess the ecosystem effects of fishing and to predict the state of the North Sea food web prior to intensive fisheries exploitation.

## Understanding the recovery of cod stocks

The current record low levels of the cod spawning stock and poor recruitment of young fish in recent years has led to a Cod Recovery Plan for the North Sea. However, there are still many aspects of cod biology that are poorly understood and there is therefore a need to improve the scientific basis of the assessment and management of cod stocks. Consequently, it is timely that 2002 saw the launch of CODYSSEY, a four-year multi-million euro research project funded by the EU.



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The project will increase our understanding of the environmental and biological factors that determine the distribution and abundance of cod in the north-east Atlantic, and the consequences for management of vulnerable cod stocks. Co-ordinated by CEFAS, the project brings nine research institutes and more than 30 marine scientists across Europe together in a multi-disciplinary work programme that will involve tagging more than 1600 cod with electronic data storage tags (DSTs) over the next two years. The project is one of the largest ever programmes for electronic tagging of a single marine species.

**“ the CODYSSEY project will involve tagging more than 1600 cod ”**

Left: Juvenile cod (*Gadus morhua*)

Left page: *Pentapora foliacea* provides a suitable habitat for many small invertebrates



## Technical solutions for fisheries and environmental research

In addition to using DSTs to study cod movements and behaviour, CEFAS has been developing systems for monitoring the timing and patterns of residency of cod on feeding grounds in the North Sea. Several years of development work culminated this year with the first high-seas deployment of CEFAS' new Acoustic Telemetry Buoy (ATB). Cod that have been tagged with coded acoustic 'pingers' are detected when they come within a 400 metre range of the ATB, which then relays the information back to Lowestoft each day via satellite. The ATB has been used successfully at sea over the past year and can operate, unattended, for up to eight months.

**“ the ATB can operate, unattended, for up to eight months ”**



Data Storage Tag attached to cod

## Protecting marine habitats and biodiversity

CEFAS has been proactive in using contemporary and historical datasets to examine spatial and temporal trends in the diversity of marine organisms, including both marine invertebrates and fish. During 2002, CEFAS co-ordinated a collaborative project to investigate the role of climate and fishing on the structure, diversity and composition of demersal fish

assemblages.

Results indicate that several non-target fish species in the south and some fish species in the north have moved northwards, and that such changes may be

linked to environmental conditions, eg, sea temperature and the North Atlantic Oscillation (NAO). However, studies in the north-western North Sea indicate that fishing has also caused significant changes in the diversity and life history characteristics of the demersal fish assemblage, and work to evaluate the comparative role of climate, fishing and biological interactions is ongoing.

CEFAS has continued to develop expertise in habitat and biodiversity mapping, and in the innovative use of Geographic Information Systems (GIS). There is increased international interest in mapping the distribution of sensitive and threatened species and habitats and, as a contribution to the development of this topic, CEFAS and the Joint Nature Conservation Committee (JNCC) organised an international Defra-funded workshop. The working document from the meeting was submitted to the OSPAR Biodiversity Committee in 2003 and contributed to their discussions on appropriate protection measures, such as Marine Protected Areas (MPAs).

Left: Final adjustments being made to the Acoustic Telemetry Buoy

Right: River Itchen



## Modelling multiple sub-lethal impacts of contaminants on salmon

CEFAS continued to examine the effects of environmental levels of aquatic contaminants on sensitive stages in the life cycle of Atlantic salmon. Work on how sub-lethal levels of pesticides impair the ability of salmon to detect reproductive pheromones has been expanded. We are now looking at fertilisation and embryo development, the emergence of newly hatched fish from the gravel, the emigration of smolts to sea and their subsequent survival in the marine environment. The research has demonstrated that environmental levels of sheep dip pesticides reduce fertilisation rates and modify the development of the embryos.

Mixtures of the pesticides may also have a synergistic effect delaying the



Agricultural spraying

emergence of salmon fry from the spawning gravels. Exposure of the smolts in freshwater to the common herbicide atrazine also delays their seaward migration and may reduce the survival of smolts once they enter the marine environment. All these effects are being built into a life history model to predict the impact of low levels of contaminants on Atlantic salmon stocks and populations.

**“ research has demonstrated that environmental levels of sheep dip pesticides reduce salmon fertilisation rates ”**

# Aquaculture and Fish Health

A photograph of a female scientist with blonde hair tied back, wearing a white lab coat, looking through a microscope. The microscope is a light-colored Olympus model with 'OLYMPUS' and '808MIC001' printed on it. The background shows a laboratory with various pieces of equipment, including a blue container and a red bag. The overall scene is brightly lit.

The Aquaculture and Fish Health Science Area provides scientific advice and services related to the development of sustainable aquaculture practices and the protection of wild and cultivated stocks from disease.

## Fish health inspectorate and illegal fish imports

The Fish Health Inspectorate acts on behalf of Defra and the Welsh Assembly in undertaking the statutory annual programme of investigation, monitoring and enforcement on fish and shellfish health on farms in England & Wales. Monitoring in



2002 revealed an increase in reported mortalities of Koi carp, often caused by Koi herpes virus. This increase reflects an increased prevalence of the disease plus a raised awareness coupled with improved methods of detection of the virus.

Our investigations in 2002 also unfortunately identified spring viraemia of carp (SVC) at five sites in England. Genetic sequence data of the virus indicated that the outbreaks resulted from imported fish, highlighting the role of fish imports in the spread of disease.

Left: Recovering lantern nets to assess growth of king scallops (*Pecten maximus*)

Efforts made by the CEFAS Inspectorate to prevent the spread of serious fish disease through illegal imports of live fish resulted in record seizures and substantially increased penalties for those responsible during the year. Three cases of illegal importation resulted in court cases with fines of up to £10 500 with £19 808 costs. The efforts to prevent illegal imports have attracted significant support from the popular fishing press and particularly the English Carp Heritage Organisation (amongst others) who wish to eradicate the illegal movements of live fish.

## Hormonal effects in the environment

Work on the endocrine-disrupting effects of environmental pollutants has benefited from the development of immuno-assays for fish egg yolk proteins (vitellogenins). The presence of vitellogenin in the plasma of a male fish is a strong indication of the presence in the environment of man-made oestrogens (female hormone-mimicking compounds). Successful immuno-assays

Left page: Bacteriology laboratory at CEFAS Weymouth

have been developed for vitellogenin from stickleback and cod. The stickleback assay will be employed to investigate the effects of mixtures of endocrine-disrupting compounds. The cod assay is already used to investigate whether oestrogenic contaminants are present in the open sea. The long-term standardisation of assays is now possible with the production of stable freeze-dried preparations of cod vitellogenin, which had previously been impossible to produce.

Right: Stickleback tanks at CEFAS Weymouth



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AFH Science Area Head  
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“ cases of illegal importation resulted in court cases with fines of up to £10 500 ”





Lamprey attached to a lake trout (*Salvelinus namaycush*)  
(photograph courtesy of the Great Lakes Fishery Commission, USA)

## Sex pheromone of the lamprey

It has long been suspected that male lampreys, when they build their nest in streams, send out a seductive chemical signal (pheromone) to females. CEFAS was instrumental in devising a strategy to isolate and purify this pheromone from seawater. This is the first fish pheromone to be identified this way; all others having been identified by trial-and-error testing of already known compounds. It is also the first bile acid to be identified as a sex pheromone and the first fish pheromone to be produced in such large quantities (which, coupled with its high potency, extends the communication range of the pheromone for many hundreds of metres downstream). It was subsequently discovered that the pheromone is not released via the urine, but by specialised cells in the gills of the male lamprey. The results of this ground-breaking collaborative work were published in *Science* in April 2002.

**“ the first bile acid to be identified as a sex pheromone ”**

## Testing of medicinal products

Any increase in aquaculture is dependent on the provision of new products to ensure sustainable production, and 2002 saw another increase in our product testing for pharmaceutical and feed companies. The ongoing programme of vaccine testing has resulted in the release of numerous batches of commercial vaccines destined for the salmonid and sea bass farming industries. Dose response, shelf-life testing, stability, duration of immunity and depletion, and safety and efficacy testing, are now tests commonly carried out by CEFAS. We also increased our capabilities in chemotherapeutant and feed additive safety and efficacy testing. All testing was underpinned by CEFAS' GLP-accredited aquarium facilities.

Research into new disease models is focusing on the development of reliable and reproducible challenges for

**“ testing was underpinned by CEFAS' GLP-accredited aquarium facilities ”**

infectious pancreatic necrosis virus and *Piscirickettsia salmonis* in salmon, lactococcosis and bacterial kidney disease in trout and salmon, nodavirus in sea bass, spring viraemia of carp virus and Koi herpes virus in cyprinids. These will add to the pool of challenge models already available at CEFAS, which will help in the search for new products and healthier farmed fish.



Carp infected with SVC

## Spring viraemia of carp (SVC) virus in the USA

The serious viral fish disease SVC was isolated and identified by CEFAS staff for the first time in the USA following massive mortalities in Koi and common carp in North Carolina and Wisconsin. The Weymouth Laboratory is the Office International des Epizooties (OIE) reference laboratory for SVC. The viruses were identified by serological methods, with confirmation by polymerase chain reaction-based methods developed in-house. The viruses were further investigated by partial genome sequencing and comparison with sequences of a large number of other SVC virus isolates from a wide geographic range held in a database produced by CEFAS. The analysis revealed that the viruses from the two states were similar and closely related to SVC virus isolates originating from Asia.

**“ SVC virus had been present in the USA since at least 1989 ”**

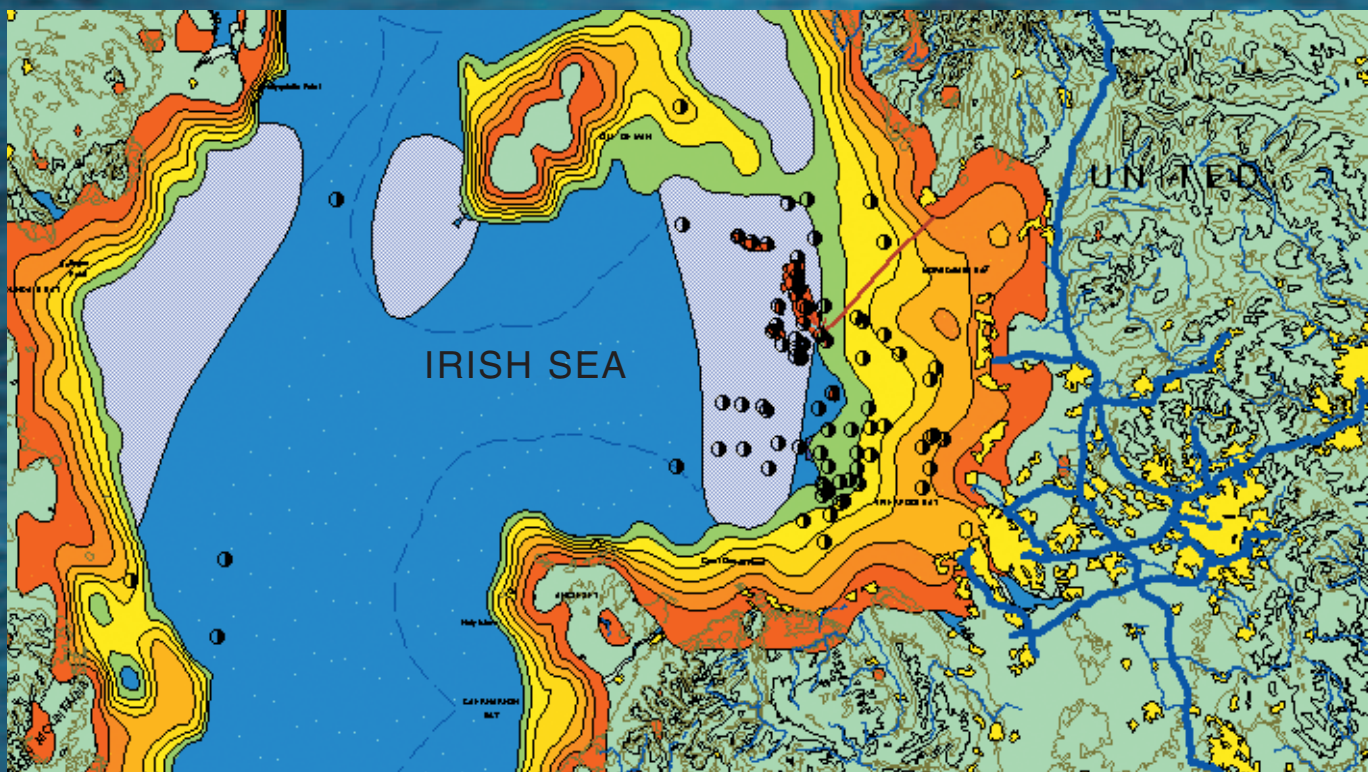
A key breakthrough was the elucidation of new methods to analyse archive wax-embedded tissues for the presence of SVC virus nucleic acid. Analysis of previous mortality episodes in carp showed that the SVC virus (although of a different genetic type from that in the current outbreak) had been present in the USA since at least 1989. That finding led American scientists and policy administrators to re-evaluate their proposed control measures for the disease. CEFAS continues to collaborate with workers in the USA, providing information and expertise to help them manage the disease.

### **Bacilliform virus in brown shrimp**

Work on the pathology of estuarine fish and shellfish has discovered a previously unrecorded and prevalent virus infection in the commercially important brown shrimp (*Crangon crangon*). This intranuclear bacilliform virus (IBV) appears to be similar to described viruses that infect crab and commercial shrimp species. Infection of the epithelial cells of the midgut and hepatopancreas, causes progressive necrosis. The ubiquitous distribution of this shrimp species in estuarine and coastal waters will allow continuing research on disease development. The virus may well act as a population modulator in this commercially important shrimp species.

Brown shrimp (*Crangon crangon*)

# Information Systems



The Information Systems Science Area provides all the IT infrastructure for CEFAS and develops specialist software applications for CEFAS and its customers, and for organisations working in areas of mutual interest.

Over the past two years the infrastructure within the Agency has been upgraded to provide the essential basis for the Agency's needs for information and the use of large datasets. It also provides a platform for the sharing of data with other organisations. Information Services Applications currently serves more than 800 individuals, including CEFAS' internal customers, Defra, and external customers.

A particular area of expertise is in the development of systems that link users in different organisations working on common subjects. Hosted applications at Lowestoft are accessed by users in seven Government Departments and public sector bodies and 13 other organisations in Europe. In the UK our systems are used to manage the Common Fisheries Policy (CFP), issue consents for activities in the marine environment, and enable the implementation of the EU fish health policy.

**“ Information Services Applications currently serves more than 800 individuals ”**



Emptying the net on board a commercial trawler

## Sea fisheries management systems

The systems used by Defra and other fisheries departments in the UK for managing the CFP have been the subject

Right: Further enhancements were made to the live fish movements database

Left page: CEFAS web-based GIS

of a major upgrade over the past year and will go live shortly.

The new systems hold information on fish catch and effort for all recorded commercial landings into England, Wales and Northern Ireland, and provide information needed by Defra to allocate, monitor and control uptake of fishing quotas.



Trawlers moored in Whitby harbour

## Vessel monitoring systems

These systems are an essential part of any monitoring, control and surveillance system, and Information Services is working on projects with Absolute Communications Ltd of New Zealand on the provision of Vessel Monitoring Systems using their SmartTrac product.



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Head of ISU  
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## Geographical Information System

During the year, a corporate geographical information system (GIS) was developed for use within CEFAS using web-based techniques. This will put a sophisticated GIS solution onto every desktop in CEFAS, enabling scientists to browse and query across a wide range of CEFAS marine data, and to study the relationships between different datasets on a spatial basis. The technology will also support the same type of systems on the Internet.

**“ will put a sophisticated GIS solution onto every desktop in CEFAS ”**





# New Research Vessel

CEFAS ENDEAVOUR  
2003

**CEFAS' capability was boosted this year with the entry into service of the *CEFAS Endeavour*: our new purpose-designed research and survey vessel.**

The *CEFAS Endeavour* is 73 metres long, 16 metres wide and has a displacement of 3000 tonnes. To avoid driving away the fish being studied, and maximise the efficiency of sonar equipment, the vessel's underwater noise signature is whisper-quiet.

As well as a comprehensive set of fishing and hydrographic winches and purpose-designed A-frames capable of the deployment of a wide variety of sampling and measuring instruments, the vessel boasts a suite of the latest fisheries and hydrographic echo-sounders and sonars.



Dynamic positioning will be used to control the vessel's position with precision during research operations, and computer networks will gather and distribute the data collected.

Built to exacting commercial standards whilst optimising safety and minimising environmental impact, the ship represents a major commitment to research of the marine environment.

The *CEFAS Endeavour* was delivered to schedule in March 2003, and within budget.





# Commercial Business Development

CEFAS won contracts from a wide variety of public and private sector customers both in the UK and abroad, meeting our income target, including 8% from the private sector, foreign governments or international agencies.

## Commercialisation of intellectual property

CEFAS has three joint ventures with private sector partners, through which to commercialise our intellectual property in support of the Government's Wider Markets policy:

- Kiotech to promote fish attractant technology
- Development of data storage tags for Lotek
- Development of environmental monitoring technology with Eco-Sense Ltd

CEFAS Technology Limited (CTL) holds shares in all three of these joint ventures.

## Developing business with foreign governments and international agencies

The demand for CEFAS services abroad continues to expand, and promises good growth prospects for the future. Two consultancy projects within a World Bank-funded programme in The Republic of Georgia were won by CEFAS-led consortia, containing organisations from the UK and Georgia. A two-year project designing an environmental and biodiversity monitoring programme will assist the Georgian Government in the integrated coastal zone management of its Black Sea coastline. The second project will provide advisory support to the Georgian Government in reviewing an environmental impact assessment of a proposed oil terminal.

In a project conducted by the Saudi Arabian Meteorology and Environmental Protection Agency, CEFAS provided

consultancy services to assist in the environmental assessment of damage arising from the 1992 Gulf War oil spills. Elsewhere in the Gulf CEFAS scientists visited the Kuwait Environment Public Authority to identify training needs in environmental sampling, analysis and information systems. In an effort to build upon these and other regional projects CEFAS exhibited at the Abu Dhabi Energy and Environment Conference and Exhibition, and was subsequently invited to participate in a Fish Resources Assessment Survey Workshop.

CEFAS continued to experience success in placing scientists on international fisheries review panels, reinforcing the high standing in which CEFAS and its staff are held internationally. These included a CEFAS fisheries expert joining an international three-man team to evaluate the sustainability of the South African commercial hake trawl fishery against the criteria of the Marine Stewardship Council (MSC) and a number of reviews for the US National Marine Fisheries Service.



Proposed oil terminal site, Georgia

## Information for our customers

An exciting new addition to the ever-expanding CEFAS website ([www.cefas.co.uk](http://www.cefas.co.uk)) is the WaveNet (page 19).

2002 was a busy year for business exhibitions: as well as exhibiting in Abu Dhabi, CEFAS attended Offshore Northern Seas in Stavanger (Norway) and GeoSolutions, Oceanology International 2002, River and Coastal Engineers Conference, and the International Conference for Coastal Engineers in the UK.



Stand at Energy and Environment 2003, Abu Dhabi. Geoff Tingley meeting Mohamed Ahmed Al Bowardi, Managing Director (centre), Majid Al Mansouri (right) General Secretary, of Erwda, and Rahat Siddiqi, British Embassy, (left)

# Demonstrating our Core Values

The CEFAS core values of integrity, excellence, customer focus, concern for people and continuous improvement are integral to the way we work, providing a standard for our actions, decisions and behaviour. The following pages outline some of our achievements this year, which demonstrate our commitment to these values.



# Integrity

## Animal welfare and ethical review

CEFAS uses animals, mainly larval and adult fish, in various scientific studies where there is no practical alternative. We continually strive to avoid the use of live animals wherever possible. But where the use of animals is unavoidable, we seek to ensure that the numbers used are kept to the minimum and that methods are refined to minimise suffering.

To ensure acceptable standards of welfare and to promote a 'culture of care' CEFAS has two Animal Welfare and Ethical Review Committees, which comprise not only scientific staff, but also lay members from CEFAS and the local community. The Committees review all proposed and on-going work to ensure that aims are being achieved and that the use of animals is appropriate and effective.

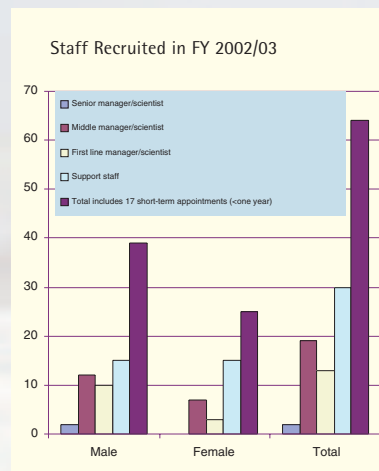
### SVC Carp Seizure

*One enforcement case involved the illegal importation of 1.8 tonnes of large carp from Belgium (the largest ever UK seizure of smuggled live fish). Tests revealed the carp to be infected with SVC.*



Fish Health Inspectors intercept illegally imported roach and bream at Dover

## Fair and open recruitment



CEFAS ensures recruitment is based upon fair and open competition with selection on merit.

Ethnic origin questionnaires were returned by 67% of new staff (excluding short-term appointments), comprising 97% white origin and 3% minority origin.

**“ CEFAS recruitment is based on fair and open competition ”**

## CEFAS Charter

The CEFAS Charter specifies our standards of service, and we abide by the provisions of the central and local government Enforcement Concordat.

During 2002/03, the following standards were achieved: 99% of letters were replied to within 15 working days of receipt and 99.6% of visitors were seen within 10 minutes of the appointment time at CEFAS Laboratories.

No complaints were received under the Charter.

No requests were received under the Code of Practice on Access to Government Information and the Environmental Information Regulations for the period 1 January to 31 December 2002.

# Excellence

## Representation

CEFAS scientists participate in a large number of expert groups. They also represent the UK in national and international fora, and provide science support to national delegations. Some examples are listed below.

### Internationally

- ⊙ CEFAS represents the UK at the **International Council for the Exploration of the Sea (ICES)** on its Council, three Advisory Committees, and providing the Chair of the Resource Management Committee.
- ⊙ CEFAS has a significant role in the development of the Ecosystem Based Approach to Management of the Marine Environment that has been adopted by the **European Union**, the **North Sea Conference of Ministers** and the **OSPAR Convention**.
- ⊙ CEFAS represents the UK on the **EU Scientific, Technical and Economic Committee for Fisheries (STECF)**, and Chairs the sub-group on review of stocks and the Expert Working Group on Fleet Dynamics.
- ⊙ **OSPAR** is an inter-governmental organisation responsible for management of the marine environment in the north-east Atlantic and adjacent Seas. CEFAS takes several key roles, including, the Head of Delegation to the Environmental Assessment and Monitoring Committee; vice-Chair of the Eutrophication Committee; Chair of



Computer analysis of data

the Seabed Working Group, as well as providing delegates to various OSPAR committees.

- ⊙ CEFAS participates in the **Article-37 Group of Experts**, established under the Euratom Treaty, advising the European Commission on proposals for new nuclear plant and modifications to existing facilities. CEFAS represents the UK on the Scientific Group of the **London Convention**, an international agreement regulating disposal of wastes at sea.
- ⊙ CEFAS provides science support for the UK at the **International Whaling Commission** and also the **North Atlantic Salmon Conservation Organisation**.
- ⊙ CEFAS currently holds the post of Secretary General of the **Fish Diseases Commission (FDC)** in the world organisation for animal health (OIE), setting standards for health assurance for international trade in aquatic animals.
- ⊙ CEFAS scientists participate in working groups of PIANC, the **Permanent International Association of Navigation**

**Congresses**, providing authoritative guidance and best practice documents on matters relating to navigation (eg, disposal of dredged material).

- ⊙ The European Commission is developing a **European Marine Strategy**, and CEFAS participated, as part of the UK delegation, in a seminal workshop seeking consensus on the way forward for better stewardship of the seas.

### Nationally

- ⊙ CEFAS scientists take significant roles within national fora connected with activities such as the **National Marine Monitoring Programme** and implementing the Water Framework Directive.
- ⊙ CEFAS has supported Defra in the development of the Department's new **Science and Innovation Strategy**. This is an important national initiative that will ensure that there is continuous improvement in the use and availability of science to deliver Government's needs.

## Scientific communications

In 2002 CEFAS scientists published 108 articles in the peer-reviewed scientific press - a 23% increase over last year. CEFAS scientists also participated in a large number of UK and international conferences to present papers and posters describing aspects of our work.

CEFAS has been involved in organising several conferences and training workshops, and produced a variety of publications in printed and electronic format including Trout News and Shellfish News, which are available on the CEFAS website: [www.cefasc.co.uk](http://www.cefasc.co.uk)



John Craven from BBC's Countryfile

© CEFAS' scientific break-through on the application of fish pheromones was featured in BBC's Countryfile in November 2002. CEFAS has developed a pheromone-based feed additive which triggers feeding behaviour in fish. This technology can be applied in the aquaculture industry to make farmed fish eat a more environmentally-friendly diet, so making the industry more sustainable (see page 32).

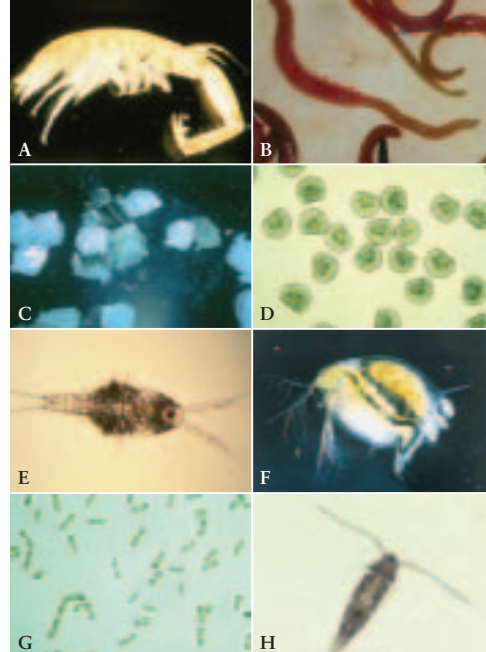
## Quality management

Following assessment by inspectors from the Department of Health and the United Kingdom Accreditation Service (UKAS) we maintained our accredited laboratory status for scientific operations related to:

- safety testing of veterinary medicines at our Weymouth Laboratory under the **Good Laboratory Practice Regulations 1999**
- radioanalytical testing on environmental samples to **ISO 17025** at Lowestoft
- algal biotoxin and microbiological test on fish and shellfish to **ISO 17025** at our Weymouth Laboratory, which also functions as a **European Community Reference Laboratory** (see page 16).

As part of the European BEQUALM programme, scientists at our Burnham-on-Crouch Laboratory continued to work on development of quality assured methodologies for biological effects monitoring in marine organisms.

CEFAS also successfully retained its **Investors in People** accredited status, following an external review in December 2002.



Whole organism bioassays used in the BEQUALM project

- A - Corophium
- B - Arenicola
- C - Juvenile turbot
- D - Oyster larvae
- E - Tisbe
- F - Daphnia
- G - Algae
- H - Acartia

## Records and Information Unit (RIU)

CEFAS library facilities were established in the 1920s and have become one of the world's most extensive collections of publications on fisheries, the marine environment and aquaculture science. Driven by electronic initiatives, staff at CEFAS benefit from full text access to hundreds of e-journals and databases, whilst desk-top alerting services keep staff up-to-date with cutting edge developments.

As well as the traditional services, RIU provides expertise and is central to initiatives on: CEFAS Data Protection compliance; Freedom of Information (FOI), including the CEFAS Publications Scheme; Electronic Records Management (ERM) and Intranet development and authoring.

Left: Ashing of environmental samples

# Customer Focus

## Assessing customer satisfaction

We ensure regular contact with customers during a contract, and an on-going survey of customer satisfaction is maintained. On completion of each contract, and annually for longer-term projects, formal feedback is sought on, for example, delivery, communication, and value for money.

In addition to providing important practical feedback, the survey results are the basis for a measure of our performance against Ministerial targets (see page 54).

## Events with the general public

CEFAS is committed to developing its reputation for world class science with the general public, and particularly with



One of the winning paintings at the Lowestoft Fish Fayre 2002  
Artist – Clare Gower

our local communities. This is achieved by our regular commitment to local events, and participation in a number of one-off events both locally and nationally.

### Some of this year's highlights:

#### Lowestoft Fish Fayre

CEFAS again sponsored this major local event, officially opened by Fisheries Minister Elliot Morley MP. Our display included a children's painting competition and guess the sea creature quiz, and a tour of our research vessel *Corystes* attracted an estimated 5,000 people.

#### Golden Jubilee "Best of Suffolk" Exhibition

CEFAS represented fisheries and the fishing industry with an historical display at an exhibition in Bury St Edmunds when HM The Queen and HRH Duke of Edinburgh visited Suffolk in July 2002.



Presenting a cheque to the Fish Fayre organisers

Right: CEFAS scientist at the Lowestoft Fish Fayre explaining how to age fish



## Weymouth Fish Festival

CEFAS' participation in the annual festival in June aimed to attract and involve children in our science displays as much as possible, with live display of Dover sole, microscopes and a touch tank with crabs, rag and lug worms.

## Cherrybyte.org

CEFAS became a member of the Cherrybyte consortium in summer 2002, which aims to improve public understanding of biosciences through its website at [www.cherrybyte.org](http://www.cherrybyte.org). The site contains several articles about CEFAS' research.

## Links with education

Improving our working relationship with education professionals is an important aspect of enhancing our reputation, and we were pleased to support a number of events including:

### National Science Week

CEFAS staff at all sites provided and manned stands at annual science fairs at high schools in their local communities in March 2003. Pupils from a number of local schools were involved in science activities including demonstrations of otolith extraction.

### Supporting Teachers' Professional Development

In May 2002 we hosted a Professional Development day for 20 members of the Suffolk Science Teachers' Forum. The visit included a tour of the Lowestoft Laboratory and a number of talks by CEFAS scientists, emphasising the multi-disciplinary aspect of our work.



Dr Peter Greig-Smith (CEFAS) with HRH Duke of Edinburgh at Bury St Edmunds

## Work Experience

CEFAS aims to encourage young people to pursue careers in science by supporting local high school work experience schemes. In 2002, we were also pleased to mentor a team CREativity in Science and Technology (CREST) Gold Award for two 'A'-level science students. CREST awards are administered by the British Association for the Advancement of Science and regional Business Education Partnerships.

CEFAS Burnham-on-Crouch Laboratory offers a range of work experience places under Project Trident. In May/June 2002,

four students from local secondary schools spent three weeks working at the Burnham-on-Crouch Laboratory.

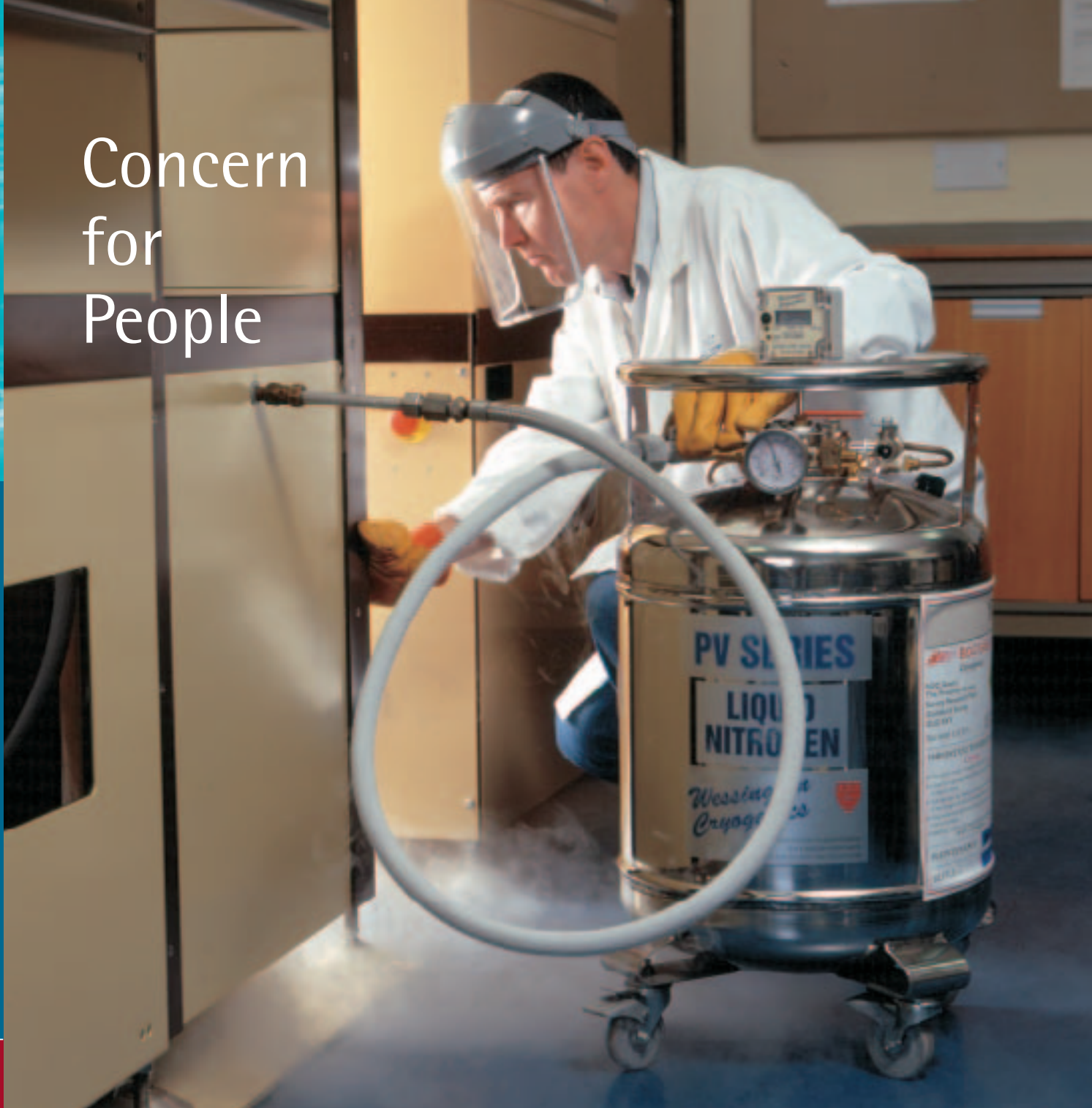
## Careers

Helping to raise the profile of careers in science, scientists from our Burnham-on-Crouch Laboratory visited Writtle College to inform careers advisors across Essex and Suffolk about CEFAS, its work and staff.

Below:  
CEFAS stand at Weymouth Fish Fayre



# Concern for People



Liquid nitrogen filling of Gamma detection system

## Health and safety

Our Health and Safety Policy was reviewed during the year, and our Health and Safety Committee and Laboratory Health and Safety Panels continued to review safety performance including accidents to staff, contractors and visitors. Most accidents were of a minor nature, but three necessitating time off work were reported to the Health and Safety Executive.

## Pay and reward

We are committed to ensuring that all our staff are treated fairly and that CEFAS is a satisfying place to work for all. During 2002, there was a particular strength of feeling among staff on the discrepancy in pay between CEFAS and parts of Defra. CEFAS' Management Board recognises this, and is striving to improve rewards which can be

afforded as part of the total CEFAS reward package. As well as financial benefits, working for CEFAS provides numerous non-pay benefits and opportunities, for example, our flexible working hours arrangements are highly valued by many staff as a means of maintaining a good work/life balance, and our commitment to the training and development of all staff is cemented by our IIP award.

## Valuing diversity

CEFAS is committed to building and maintaining a truly diverse workforce. Our policies are designed to ensure equality of opportunity in all aspects of personnel management, career development, and the working environment, and to prevent

discrimination and harassment (including bullying) at work.

Job applications are welcomed from people of all backgrounds and cultures, and those seeking part-time or job share working. Vacancies are advertised on our website ([www.cefasc.co.uk/vacancies](http://www.cefasc.co.uk/vacancies)) and we are also happy to receive CVs

from people wishing to join CEFAS in the future.

**“ CEFAS is committed to developing its staff ”**

### CEFAS Staff Achievements

CEFAS is committed to developing its staff – a snapshot of just a few of many achievements

#### Bob Dickson

*recently appointed by the USA's National Science Foundation to Chair their Arctic and Sub-Arctic Ocean Flux (ASOF) Panel for the next few years.*

#### Nicola Hawkes

*achieved the Chartered Institute of Personnel & Development Certificate in Personnel Practice.*

#### Ross Jolliffe

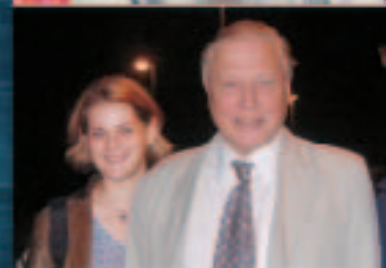
*gained an MBA with Distinction from the University of East Anglia.*

#### Nicola Lower

*successfully completed a British Association Media Fellowship aimed at professional scientists and engineers to improve their understanding of the workings of the media (photographed with Sir David Attenborough).*

#### Caroline Whalley

*attained the Open University Professional Certificate in Management.*



# Continuous Improvement

Feedback from the external Investors In People assessor in the December 2002 review said that "CEFAS' culture continues to strongly reflect one of continuous improvement for all its people". We were pleased to retain our IIP accreditation, which demonstrates our commitment to make further progress in developing all of our people.

## Environmental policy

CEFAS monitors energy usage compared to monthly external benchmarks for water, electricity and fossil fuels at each of our sites. In 2002/03 CEFAS kept within the benchmarks. To further increase energy efficiency, CEFAS is negotiating a partnership for Total Energy Management for electricity and gas at Lowestoft and Burnham-on-Crouch. This will reduce both costs and carbon dioxide emissions.

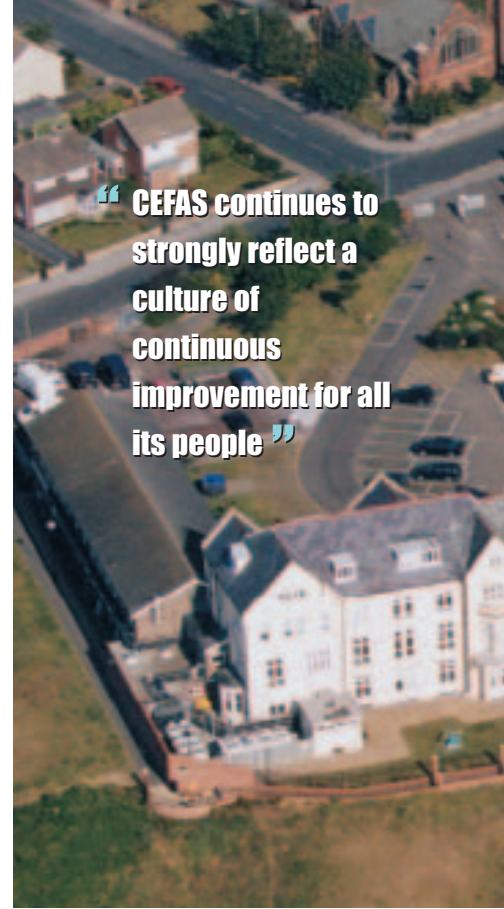
In order to achieve the travel related targets set by Defra, baselines have been calculated for carbon dioxide emissions this year for business travel by road. These will enable year-on-year comparisons to be made.

CEFAS is committed to improving environmental performance and is planning to become accredited to the Environmental Management System ISO14001 in 2003/04.

## Efficiency

As part of a drive for improved efficiency across the Agency we began a review of CEFAS' supplier base to improve value for money from procurement and to reduce administration costs. Early results have been achieved for telecommunications, vehicle and stationery expenditure.

**“ CEFAS continues to strongly reflect a culture of continuous improvement for all its people ”**



CEFAS Lowestoft

The Government procurement card continues to support purchasing in advance of planned e-commerce developments.

A new outsourced payroll provider was identified by CEFAS as part of a wider Government consortium and payment routines successfully transferred by March. CEFAS was the first Government user of a "semi-managed service" to transfer to the new supplier and has secured more stable pricing and much improved access to management information as a result.

PricewaterhouseCoopers continues to manage a wide-ranging programme of internal audit work. During the year activity has widened to include topics such as pay strategy, business development and estates management, highlighting areas where more efficient procedures can be embedded within the organisation.

CEFAS Weymouth





(© M. Page)

## Staff feedback

Our annual survey of staff attitudes seeks the views of staff, and provides everyone with an opportunity to bring about changes to benefit both staff and the business as a whole.

The 2002 survey had a 75% response rate, and indicated overall improvements in the key categories of communication, management effectiveness, training and development, and staff morale. The major improvements were in internal communication and effectiveness of team meetings.

Particularly pleasing is that almost 85% of respondents rate communications between themselves and their immediate manager as good or better and almost 80% of staff believe that communications are good or better within their team. CEFAS is actively encouraging individual innovation and initiative and it is pleasing to find that almost 70% of staff feel supported when they initiate changes in their working practices.

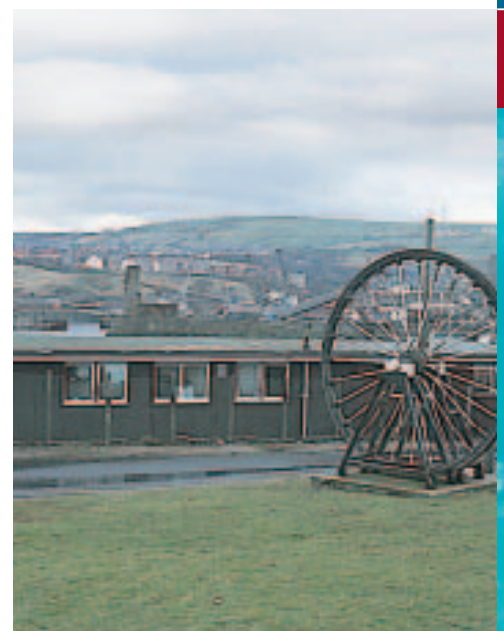


CEFAS Burnham-on-Crouch

## Training and development activities

We have introduced a new Staff Development and Performance Appraisal process based around a competence framework designed specifically to meet the needs of CEFAS now and in the future. The process is forward-looking, with an emphasis on development, and training to support its implementation has been widespread.

A major addition to our corporate training portfolio has been a suite of People Management training, attended by 20% of staff to date. Newly-introduced Stress Awareness Workshops were attended by 15% of staff. Our bespoke induction programme was further refined following participant feedback. Project Management and Equality and Diversity Awareness training remained high on our list of priorities, with expansion to include refresher courses.



CEFAS Whitehaven



# Future Strategy

CEFAS' purpose ensures that our primary focus will continue to be on the requirements for science to influence and implement UK Government policies, whilst also taking the opportunities available to apply our specialist expertise on behalf of others. We will therefore respond during the coming year to developments in UK and international strategies for the marine environment, particularly in relation to fisheries management, protection from pollution, and sustainable development in the coastal zone. We will also actively seek markets where we can undertake work for non-government bodies to complement and enhance our core activities.

The start of the Sixth Framework Programme of research funded by the European Commission is an opportunity that opens many possibilities for international collaboration, sometimes beyond our traditional alliances. CEFAS is actively involved in a broad range of proposed projects and networks.

Last year we analysed opportunities for expansion of our work in new and existing sectors where our skills and expertise are particularly well fitted. This allows identification of needs for investment, which we will be pursuing during 2003/04 in a selection of priority areas, including the testing of aquaculture vaccines and other products, development of information systems, and the use of automated technology for coastal and offshore monitoring programmes.

Our longer-term future will be heavily dependent on the implementation of recommendations arising from last year's review of its Agencies by Defra. New arrangements will be planned and introduced during 2003, to give an improved financial framework based on a mix of core funding, competition for Government funds, and commercial income. The details of this model will determine how our strategic plans evolve.

It is already clear, however, that CEFAS' science will continue to cover a broad range of disciplines and applications, while increasingly being directed at cross-cutting issues. The growth of the 'ecosystem approach' to the marine environment, for example, requires our science to cross traditional boundaries and to build connections between separate areas of expertise. We will continue this year to explore new possibilities within the following science themes that bring together our diverse current programmes.

**Understanding the physical environment** and the interplay with living resources, including issues such as climate change that will pervade all aspects of the advice we provide to policy makers.

**The health and viability of organisms**, as they respond to stressors, disturbance, chemical insults and pathogens in the aquatic environment. Our aim is to link early signs of change at sub-cellular levels to impacts for populations.

**Ecosystem interactions**, such as the effects of removal of sensitive or exploited species from communities. Assessment of the full impacts of human activity on the environment, through combined effects of multiple pressures, requires better understanding of how ecosystems function.

**Predictive science for the management of resources** must be continuously improved and extended to provide more accurate assessments, greater transparency and more sophisticated management tools.

Development of these areas will require investment. We will continue to generate scope for investment by building up a fund that can be used to sponsor research projects, enable technological development, and bring in new skills.

In all our activities, CEFAS will pursue a partnership approach, whether it be for involvement of stakeholders, optimum exploitation of intellectual property, sharing of specialist facilities, or complementing skills that are better developed outside the Agency.

Following last year's Centenary of fisheries research, 2003 is the fiftieth anniversary of the establishment of the Burnham-on-Crouch Laboratory. We will have a range of events to mark this occasion, including social, scientific and local community activities.

# Senior Management



CEFAS Management Board. Left to right  
Standing: Brian Robinson, Peter Greig-Smith, Michael Waldoock, Ross Jolliffe  
Seated: Joe Horwood, Diane Carter, Stephen Malcolm, Mark Farrar

## **Dr Peter Greig-Smith**

(Chair) Chief Executive

## **Dr Joe Horwood**

Deputy to the Chief Executive, and Defra  
Chief Fisheries Science Adviser

## **Dr Michael Waldoock**

Science Director

## **Dr Stephen Malcolm**

Science Director

## **Mr Mark Farrar**

Finance & Resources Director

## **Mr Brian Robinson**

Commercial Director

## **Mrs Diane Carter**

Staff Development Director

## **Capt Ross Jolliffe**

Head of Corporate Affairs  
(Secretary to the Management Board)

The Review of Defra's Agencies was published in December 2002, recommending new governance arrangements involving the creation of a Laboratories Strategy Committee with responsibility for the three Defra Agencies.

Anna Walker (Defra Director-General, Land Use and Rural Affairs) continued to be responsible for overseeing the Agency's activities until the introduction of the new arrangements.

NOTE: Dr Victor Bye, Director of Support Services until 29 Oct 2002

# Financial Commentary

For the financial year ending 31 March 2003, CEFAS successfully achieved the key Ministerial targets it was set for financial performance. Total cost recovery of 101% was achieved and a separate financial target to improve efficiency was also exceeded.

Turnover for the year of £32,700,000 was 7% above 2001/02. Income from Defra of £25,998,000 accounted for 80% of turnover (2001/02: 77%) with a further 12% (2001/02: 13%) sourced from other UK Government Departments and Agencies. Funding charges associated with capital construction contributed to increased notional interest payable of £2,972,000 (2001/02: £2,416,000) but tight financial management of overheads resulted in an overall surplus in 2002/03 of £286,000.

Construction of the new Fisheries Research Vessel was completed at a total cost of £24,845,962 and it was accepted into service on 31 March 2003. However, capital expenditure on scientific and other assets was restricted to an historically low level of £1,179,000 following restrictions in Defra's funding allocations.

Capital charges relating to Land and Buildings increased by £174,000 (7%) during the year, primarily as a result of higher indexation factors derived from



Salmon netting on the River Fowey

national building cost statistics. The indexation cost is forecast to increase by a further 12% in 2003/04, but will be mitigated by HM Treasury reducing the interest cost of capital to 3.5% (previously 6%) effective from 1 April 2003.

Prompt payment of suppliers is the subject of a separate Government target requiring CEFAS to ensure that settlement is made within 30 days of

receipt of goods and services. During the year 98% (2001/02: 95%) of supplier invoices were paid within the stipulated time frame.

# Performance against key Ministerial targets and milestones

## 1) Throughput:

To give satisfaction to customers in the way that outputs are provided, taking account of the relevance, timeliness and value for money of outputs and the achievements of ROAME milestones.

1998 - 1999	Target achieved
1999 - 2000	Target achieved
2000 - 2001	Target achieved
2001 - 2002	Target achieved

### 2002 - 2003

**Target:** To give satisfaction to customers in the way that outputs are provided, as measured by the CEFAS Customer Satisfaction Survey.

**Outturn:** Target achieved. Responses to the customer satisfaction survey were received from 40 customers on 191 contracts, representing 90% by value of CEFAS' programme. The weighted average score, based on seven aspects of service quality, was 83 out of a maximum of 100.

## 2) Quality:

To maintain a high standard of excellence, based on indicators of scientific and technical quality.

1998 - 1999	Target achieved
1999 - 2000	Target achieved
2000 - 2001	Target achieved
2001 - 2002	Target achieved

### 2002 - 2003

**Target:** To make satisfactory progress with the Action Plan resulting from the 1999/2000 Science Audit.

**Outturn:** Target achieved. Good progress was made in 9 out of 10 areas in the Agency's Action Plan.

### 3) Efficiency:

To achieve the savings forecast in the Efficiency Plan.

1998 - 1999	Target achieved
1999 - 2000	Target achieved
2000 - 2001	Target achieved
2001 - 2002	Target achieved

**2002 - 2003** **Target:** Percentage increases in support function costs to be no greater than the percentage increase in revenue.

**Outturn:** Target achieved.

### 4) Financial Performance:

To recover from Government Departments and Agencies and external customers the full economic costs of the Agency's services.

1998 - 1999	Target achieved
1999 - 2000	Target achieved
2000 - 2001	Target achieved
2001 - 2002	Target achieved

**2002 - 2003** **Target:** Achieve full cost recovery of 100%. Fully achieved if cost recovery is 100% or greater, and partially achieved for recovery between 98% and 100%.

**Outturn:** Target achieved.

### 5) Effective Management:

(new target in 2001 - 2002)

2001 - 2002	Target achieved
-------------	-----------------

**2002 - 2003** **Target:** To manage the Agency in an effective manner including pursuit of commercial exploitation of research outputs.

**Outturn:** Target achieved.

# CEFAS Accounts



## Foreword to the Accounts

for the Year Ending 31 March 2003

CEFAS was established on 1 April 1997 as an Executive Agency of MAFF (now Defra). It is fully accountable to Parliament through Ministers. CEFAS currently operates from four sites; Lowestoft, Weymouth, Burnham-on-Crouch and Whitehaven.

## Aims and Objectives

CEFAS aims and objectives are given on pages 6 and 7 of the Annual Report.

## Principal Activities

The Agency's principal activities are to deliver an efficient service of specialist scientific and technical support, consultancy and advice in the fields of fisheries management, environment protection and aquaculture. The Chief Executive's Statement on pages 4 to 5 of the Annual Report, and the sections on delivering science on pages 10 to 35 of the Annual Report, contain further information on the business activities of CEFAS.

## Pension Liabilities

Pension liabilities arising from early retirement or other enhancements are accrued in total in the year in which the liability arises.

Pension benefits are provided through the Civil Service pension arrangements. From 1 October 2002, civil servants may be in one of three statutory based "final salary" defined benefit schemes (Classic, Premium and Classic Plus). New entrants after 1 October 2002 may choose between membership of Premium or joining a good quality "money purchase" stakeholder-based arrangement with a significant employer contribution (the Partnership Pension Account). Details are provided in Note 4 of the accounts.

## Accounts Direction

The accounts have been prepared under a direction issued by the Treasury in accordance with section 7(2) of the Government Resources and Accounts Act 2000.

## Result for the Year

The net surplus for the year is £286,000.

Left page: Royal Norfolk and Suffolk Yacht Club marina (RNSYC), Lowestoft

## CEFAS History and Statutory Background

CEFAS is an Executive Agency of Defra that was created on 1 April 1997 from the former Directorate of Fisheries Research (DFR) under the Next Steps programme. The status and legal framework is laid out in the CEFAS Framework Document. Its origins date from 1902 when a research station was established to investigate declining fish stocks as part of the UK contribution to the newly-created International Council for the Exploration of the Sea (ICES).

## Management

For the period ending 6 September 2002, the Minister of State (Environment) with overall responsibility for CEFAS was The Right Honourable Michael Meacher MP. From that date, The Right Honourable Elliot Morley MP (Parliamentary Under-Secretary (Commons) (Fisheries, Water and Nature Protection)) has assumed responsibility.

Anna Walker (Defra Director-General, Land Use and Rural Affairs) was responsible for overseeing the Agency's operational activities.

The Chief Executive of CEFAS is Dr Peter Greig-Smith. The composition of the CEFAS Management Board is shown on page 52 of the Annual Report. The Chief Executive was appointed by the Minister for Agriculture, Fisheries and Food (now Secretary of State for Defra) via open competition, for a five-year term, extended for two years from March 2002. Members of the Management Board are appointed directly by the Chief Executive on an open-ended basis.

The salaries of the Management Board are determined by the CEFAS Performance Related Pay Scheme. The salary of the

Chief Executive is performance related and reviewed against the key Ministerial targets and milestones as agreed at the beginning of the year. Details of the remuneration are provided in Note 4 to the accounts.

## Employment of Disabled Persons

CEFAS follows the Civil Service Code of Practice on the Employment of Disabled People. The Agency's policy is to recruit, train and provide career development facilities for disabled persons on the same basis as for other staff and to make every effort to retrain and assist any individuals disabled in the course of their employment.

## Equal Opportunities and Employee Involvement

CEFAS follows an equal opportunities policy for fair and open recruitment of permanent staff. Regular exchanges of information with staff take place through formal and informal consultative arrangements at Agency and local level. Such exchanges include Agency objectives, plans, progress and matters relating to the interests of staff.

## Payment of Suppliers

CEFAS prompt payment policy is described in Note 22 to the accounts.

## Auditors

Comptroller and Auditor General,  
National Audit Office,  
157-197 Buckingham Palace Road,  
Victoria, London SW1W 9SP

Signed:



**Peter Greig-Smith**  
Chief Executive

Date:

19 June 2003

# Statement of Accounting Officer's Responsibilities

1. Under the Government Resources and Accounts Act 2000 the Agency is required to prepare resource accounts for each financial year, in conformity with a Treasury direction, detailing the resources acquired, held, or disposed of during the year and the use of resources by the Agency during the year.
2. The resource accounts are prepared on an accruals basis and must give a true and fair view of the state of affairs of the Agency, the net resource outturn, resources applied to objectives, recognised gains and losses and cash flows for the financial year.
3. The Department for Environment, Food and Rural Affairs has appointed the Permanent Head of the Agency as Accounting Officer of the Agency with overall responsibility for preparing the Agency's accounts and for transmitting them to the Comptroller and Auditor General.
4. In preparing the accounts the principal Accounting Officer is required to comply with the Resource Accounting Manual prepared by HM Treasury, and in particular to:
  - ⊙ observe 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 Resource Accounting Manual, have been followed and disclose and explain any material departures in the accounts;
  - ⊙ prepare the accounts on a going concern basis.
5. The responsibilities of an Accounting Officer, including responsibility for the propriety and regularity of the public finances for which an Accounting Officer is answerable, for keeping proper accounting records and for safeguarding the Agency's assets, are set out in the Accounting Officers' Memorandum issued by HM Treasury and published in Government Accounting.
6. The maintenance and integrity of the CEFAS website is the responsibility of the Accounting Officer.

# Statement on Internal Control

As Accounting Officer, I have responsibility for maintaining a sound system of internal control which supports the achievement of departmental policies, aims and objectives, as set by the Department's Ministers, 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 system of internal control is designed to manage rather than eliminate the 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 the principal risks to the achievement of departmental policies, aims and objectives, to evaluate the nature and extent of those risks and to manage them efficiently, effectively and economically. This process has been in place for the year ended 31 March 2003 and up to the date of approval of the annual report and accounts and it accords with Treasury guidance.

As Accounting Officer, I also have responsibility for reviewing the effectiveness of the system of internal control. In pursuit of this the Centre for Environment, Fisheries & Aquaculture Science (CEFAS) has established the following processes:

- ⊙ A Management Board which meets bi-monthly to consider the plans and strategic direction of the Agency.

⊙ An Audit Committee which is a formally constituted committee of the Management Board which first met in July 2001. The Committee is chaired by an external member and includes one further external independent member together with three members of the management team. The purpose of the Audit Committee is to give advice on the adequacy of internal and external audit arrangements, and on the implications of the assurances provided in respect of internal control and risk management within CEFAS.

⊙ Regular reports by internal audit, to Government Internal Audit Standards, which include the Head of Internal Audit's independent opinion on the adequacy and effectiveness of the Agency's system of internal control, together with recommendations for improvement. Since April 2001, the internal audit service has been provided by PricewaterhouseCoopers, operating under contract to CEFAS. The work of internal audit is informed by an analysis of the risk to which CEFAS is exposed and annual audit plans are based on this analysis.

⊙ Regular risk reviews undertaken by the Management Board to identify and update the risks facing CEFAS.

⊙ A documented risk management plan containing the register of top CEFAS risks assigned to and managed by individual Management Board members together with summaries of risk management by local operational managers. CEFAS reports its top risks to Defra for inclusion in the Department's risk register.

⊙ Written statements from managers on the steps they are taking to manage risk in their areas of responsibility.

⊙ A system of internal financial control based on a framework of regular management information, administrative procedures, management supervision and a system of delegation and accountability.

⊙ Regular review of alliances and partnership ventures by a sub-committee of the Management Board.

⊙ Documented risk assessment procedures in support of tender activity for new business. Further enhancements to procedures were approved in January 2003, and implementation commenced in May 2003.

My review of the effectiveness of the system of internal control is informed by the work of the internal auditors and the executive managers within the Agency who have responsibility for the development and maintenance of the internal control framework, and by comments made by the external auditors in their management letter and other reports.

I will ensure that the systems of internal control continue to develop, particularly those relating to the management of commercial contracts, in the light of CEFAS' growing involvement in this type of activity.

In the coming year I intend to appoint at least two external members to the Management Board to further strengthen governance arrangements and aid the ongoing development of internal control systems.

Signed:



**Peter Greig-Smith**  
Chief Executive

Date: 19 June 2003

# The Certificate and Report of the Comptroller and Auditor General to the House of Commons

I certify that I have audited the financial statements on pages 61-77 under the Government Resources and Accounts Act 2000. These financial statements have been prepared under the historical cost convention as modified by the revaluation of certain fixed assets and the accounting policies set out on pages 64-65.

## Respective responsibilities of the Agency, the Chief Executive and Auditor

As described on page 58, the Agency and the Chief Executive are responsible for the preparation of the financial statements and for ensuring the regularity of financial transactions. The Agency and the Chief Executive are also responsible for the preparation of the other contents of the Annual Report. My responsibilities, as independent auditor, are established by statute and guided by the Auditing Practices Board and the auditing professions ethical guidance.

I report my opinion as to whether the financial statements give a true and fair view and are properly prepared in accordance with the Government Resource and Accounts Act 2000 and Treasury directions made thereunder, and 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. I also report if, in my opinion, the Foreword is not consistent with the financial statements, if the Agency has not kept proper accounting records or if I have not received all the information and explanations I require for my audit.

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 certificate if I become aware of any apparent mis-statements or material inconsistencies with the financial statements.

I review whether the statement on pages 58-59 reflects the Agency's compliance with Treasury's guidance entitled Corporate Governance: Statement on Internal Control. I report if it does not meet the requirements specified by the Treasury, or if the statement is misleading or inconsistent with other information I am aware of from my audit of the financial statements.

## Basis of opinion

I conducted my audit in accordance with United Kingdom Auditing Standards issued by the Auditing Practices Board. An audit includes examination, on a test basis, of evidence relevant to the amounts, disclosures and regularity of financial transactions included in the financial statements. It also includes an assessment of the significant estimates and judgements made by the Agency and Chief Executive in the preparation of the financial statements, and of whether the accounting policies are appropriate to the Agency'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 are free from material mis-statement, whether caused by error or by fraud or other irregularity, 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 have also evaluated the overall adequacy of the presentation of information in the financial statements.

## In my opinion:

- ⊙ The financial statements give a true and fair view of the state of affairs of CEFAS at 31 March 2003 and of the surplus, recognised gains and losses and cash flows for the year then ended and have been properly prepared in accordance with the Government Resources and Accounts Act 2000 and directions made thereunder by the Treasury;
- ⊙ 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.

I have no observations to make on these financial statements.

## John Bourn

Comptroller and Auditor General

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

Date: 26 June 2003

## Income and Expenditure Account

For the year ended 31 March 2003

	Notes	2002/03 £'000	2001/02 £'000
Turnover	2 & 3	32,700	30,632
Cost of sales	4 & 5	(29,420)	(28,151)
<b>Operating Surplus</b>		<u>3,280</u>	<u>2,481</u>
Loss on Disposal of Fixed Assets		(22)	(40)
Notional Interest Payable	23	(2,972)	(2,416)
<b>Net Surplus</b>		<u>286</u>	<u>25</u>
Percentage Total Cost Recovery		<u>101</u>	<u>100</u>

## Statement of Recognised Gains and Losses

For the year ended 31 March 2003

	2002/03 £'000	2001/02 £'000
Surplus for the Year	286	25
Net Gain/(Loss) on Revaluation of Fixed Assets	704	(423)
<b>Total Gains and (Losses) Recognised in Year</b>	<u>990</u>	<u>(398)</u>

# Balance Sheet

As at 31 March 2003

	Notes	£'000	2002/03 £'000	2001/02 £'000
<b>Fixed Assets</b>				
Tangible Fixed Assets	7		55,639	45,968
Investments	8		150	150
<b>Total Fixed Assets</b>			<b>55,789</b>	<b>46,118</b>
<b>Current Assets</b>				
Stock		55		86
Work in Progress	9	901		803
Debtors	10	5,764		7,035
Cash at bank and in hand	16	5,916		3,935
<b>Total Current Assets</b>		<b>12,636</b>		<b>11,859</b>
<b>Creditors:</b>				
Amounts falling due within one year	11	(4,254)		(4,019)
<b>Net Current Assets</b>			<b>8,382</b>	<b>7,840</b>
<b>Total Assets Less Current Liabilities</b>			<b>64,171</b>	<b>53,958</b>
<b>Creditors:</b>				
Amounts falling due after one year	11		(381)	(32)
<b>Provisions for liabilities &amp; charges</b>	12		(905)	(836)
<b>TOTAL ASSETS LESS LIABILITIES</b>			<b>62,885</b>	<b>53,090</b>
<b>RESERVES</b>				
General Fund			56,552	47,722
Revaluation Reserve			6,047	5,343
Income & Expenditure Account			286	25
<b>Total Reserves as at 31 March 2003</b>	13		<b>62,885</b>	<b>53,090</b>

Signed:

**Peter Greig-Smith**

Chief Executive and Agency Accounting Officer

Date: 19 June 2003

# Cash Flow Statement

For the year ended 31 March 2003

	Notes	2002/03		2001/02	
		£'000	£'000	£'000	£'000
<b>Cash Flow</b>					
Net cash inflow from operating activity	14		12,236		12,575
Net capital expenditure & financial investment		(10,255)		(13,131)	
			(10,255)		(13,131)
<b>Increase/(decrease) in cash</b>			<b>1,981</b>		<b>(556)</b>
<b>Reconciliation of Operating Costs to Operating Cash Flows</b>					
Net Operating Surplus			286		25
Adjustments to working capital other than cash		6,095		6,757	
Adjustment for non cash transactions		5,855		5,793	
			11,950		12,550
<b>Net cash inflow from Operating Activities</b>			<b>12,236</b>		<b>12,575</b>
<b>Analysis of Capital Expenditure and Financial Investment</b>					
Purchase of tangible fixed assets		(10,257)		(13,135)	
Proceeds of disposal of tangible fixed assets		2		4	
<b>Net cash (outflow) from investing activities</b>			<b>(10,255)</b>		<b>(13,131)</b>
<b>Net cash inflow/(outflow)</b>	15		<b>1,981</b>		<b>(556)</b>

# Notes to the Accounts

## Note 1. Statement of Accounting Policies

### 1.1 Statement of Accounting Policies

These financial statements have been prepared in accordance with the Resource Accounting Manual issued by HM Treasury. The particular accounting policies adopted by CEFAS are described below. They have been applied consistently in dealing with items that are considered material in relation to the accounts.

### 1.2 Accounting Convention

These accounts have been prepared under the historical cost convention, modified to include the revaluation of fixed assets at their value to CEFAS by reference to their current costs.

### 1.3 Tangible Fixed Assets

Asset values are modified annually by the use of indices for current cost accounting as supplied by the Office for National Statistics.

#### 1.3.1 Land and Buildings

Land and buildings are professionally valued at intervals of no greater than 5 years. The lives given to the buildings fall in the range of 4 - 41 years.

The title to the freehold land and buildings occupied by CEFAS is held by Defra.

#### 1.3.2 Other Fixed Assets

The capitalisation threshold for fixed assets is £3,000. Asset pools exist for items of IT equipment with individual values ranging from £500 to £3,000.

#### 1.3.3 Depreciation of Tangible Fixed Assets

Depreciation is provided on all fixed assets, with the exception of land, at rates calculated to write off the valuation of each asset evenly over its expected useful life.

Asset lives are as follows:

<b>Buildings</b>	<b>4 – 41 Years</b>
<b>Information Technology</b>	<b>3 – 6 Years</b>
<b>Scientific and</b>	
<b>General Equipment</b>	<b>5 – 10 Years</b>
<b>Vessels</b>	<b>1 – 30 Years</b>
<b>Vehicles</b>	<b>6 – 8 Years</b>

#### 1.3.4 Donated Assets

CEFAS holds no donated assets.

### 1.4 Investments

Investments are reported at market value or at cost where market value cannot be readily ascertained. In accordance with the Resource Accounting Manual, the fixed asset investment has not been consolidated as it is outside the departmental boundary.

### 1.5. Stocks and Work in Progress

Stocks and work in progress are valued at the lower of cost or net realisable value.

### 1.6 Research and Development

Expenditure on research and development (Seedcorn Projects) is treated as an operating cost in the year in which it is incurred and taken to the Income and Expenditure Account. Fixed assets, which are acquired for use in research and development, are depreciated over their useful economic life.

### 1.7 Government Grants

Grants are recognised in the same period as their related expenditure. Grants towards fixed asset purchases are treated as a deferred creditor and recognised as income over the useful life of the asset.

## 2. Operating Income

Operating income is shown net of value added tax and comprises fees and charges for services provided to Core Defra, external customers, other government agencies and public sector repayment work receipts from the European Union.

## 3. Capital Charge

A notional charge, reflecting the cost of capital used by CEFAS, is included in the Income and Expenditure Account. The charge for 2002/03 is calculated at the government standard rate of 6% on the average value of all assets, excluding cash held at the Office of Paymaster General, less liabilities and excluding donated assets.

## 4. Taxation

No taxation is payable on the surplus generated by CEFAS.

CEFAS is included under the VAT registration of Defra. Irrecoverable VAT, excluding that on capital purchases, is charged to the Income and Expenditure Account in the year in which it is incurred.

## 5. Foreign Exchange

Monetary assets and liabilities denominated in foreign currencies are translated at the rate of exchange ruling at the balance sheet date. Transactions in foreign currencies are recorded at the rate ruling at the date of the transaction, all differences being taken to the Income and Expenditure Account.

## 6. Notional Charges

In addition to the capital charge, the following notional costs borne on the Income and Expenditure Account are charged to the General Fund:

**Defra Maintenance Charges**  
**Defra Central Overhead Charges**  
**Redundancy and Early Retirement Interest**

## 7. Insurance

CEFAS, in common with other Government bodies, does not insure the majority of its assets. Losses and compensations are charged to the Income and Expenditure Account.

## 8. Pensions

Pension benefits are provided through the Civil Service pension arrangements. From 1 October 2002, civil servants may be in one of three statutory based "final salary" defined benefit schemes (Classic, Premium and Classic Plus). The provisions of the Principal Civil Service Pension Scheme (PCSPS) cover present and past employees; which is non-contributory and unfunded. Although the scheme is a defined benefit scheme, liability for payment of future benefits is a liability of the PCSPS. CEFAS meets the cost of pension cover provided for the staff they employ by payment of charges calculated on an accruing basis. There is a separate scheme statement for the PCSPS as a whole.

New entrants after 1 October 2002 may choose between membership of the Premium defined benefit scheme or joining a good quality "money purchase" stakeholder-based arrangement with a significant employer contribution (the Partnership Pension Account).

## 9. Provisions

### 9.1 Early Departure Costs

CEFAS is required to meet the additional cost of benefits beyond the normal PCSPS benefits in respect of employees who retire early. CEFAS provides in full for this cost when the early retirement programme has been announced and is binding on CEFAS. CEFAS may, in certain circumstances, settle some or all of its liability in advance by making a payment to the Paymaster General's Account at the Bank of England for the credit of the Civil Superannuation Vote. The amount provided is shown net of any such payments.

### 9.2 Pay Award and Legal Claims

CEFAS also provides for an employee corporate bonus earned in the year and for any outstanding or expected litigation.

## 10. Leases

CEFAS holds no leases where substantially all the risks and rewards of the leased asset are borne by CEFAS. Other leases are regarded as operating leases and the rentals are charged to the Income and Expenditure Account on a straight-line basis over the terms of the lease.

## 11. Going Concern

These accounts have been prepared on the basis that CEFAS is a going concern.

# Notes to the Accounts

## Note 2. UK Government Income

	2002/03 £'000	2001/02 £'000
Defra	25,998	23,692
Defra Agencies	8	39
Other Government Depts	3,791	4,009
<b>Total UK Government Income</b>	<b>29,797</b>	<b>27,740</b>

## Note 3. Non UK Government Income

	2002/03 £'000	2001/02 £'000
UK Public Sector	157	237
UK Private Sector	653	940
European Union	1,048	1,034
Other	1,045	681
<b>Total Non UK Government Income</b>	<b>2,903</b>	<b>2,892</b>

## Note 4. Staff Related Expenditure

### (a) Staff Costs

	2002/03 £'000	2001/02 £'000
Wages and Salaries	12,076	11,394
Social Security Costs	789	806
Superannuation	1,538	1,459
<b>Total Staff Expenditure</b>	<b>14,403</b>	<b>13,659</b>

### (b) The average number of persons employed by CEFAS during the year was:

	2002/03 No.	2001/02 No.
Scientific Research & Development	395	384
Management/Administration	128	131
Marketing	6	5
<b>Total</b>	<b>529</b>	<b>520</b>

## Note 4. Staff Related Expenditure (continued)

### (c) Board Remuneration

The salary and pension entitlements of the most senior managers of the Agency were as follows:

Management Board Member	Age	Salary banding including performance pay £'000	Real increase in pension at 60 £'000	Total accrued pension at 60 £'000
Chief Executive <b>Dr P Greig-Smith</b>	49	75-80	2.5-5	25-30
Deputy to the Chief Executive <b>Dr J Horwood</b>	54	60-65	0-2.5	30-35
Director of Support Services <b>Dr V Bye (retired on 29 October 2002)</b>	60	35-40	0-2.5	25-30
Science Director <b>Dr M Waldock</b>	49	45-50	0-2.5	20-25
Science Director <b>Dr S Malcolm</b>	48	40-45	0-2.5	15-20
Finance and Resources Director <b>M Farrar</b>	41	50-55	0-2.5	10-15
Commercial Director <b>B Robinson</b>	50	50-55	0-2.5	20-25
Director of Staff Development <b>D Carter</b>	43	30-35	0-2.5	10-15

Salaries include gross salaries, performance bonuses payable, overtime, reserved rights to London weighting or London allowances, recruitment and retention allowances and private office allowances and any other allowance to the extent that it is subject to UK taxation. It does not include the estimated monetary value of benefits in kind.

Pension benefits are provided through the Civil Service pension arrangements. See part (d) of note 4 below.

No board members were in receipt of any benefits in kind.

# Notes to the Accounts

## Note 4. Staff Related Expenditure (continued)

### (d) Pension benefits

Pension benefits are provided through the Civil Service pension arrangements. From 1 October 2002, civil servants may be in one of three statutory based "final salary" defined benefit schemes (Classic, Premium and Classic Plus). New entrants after 1 October 2002 may choose between membership of Premium or joining a good quality "money purchase" stakeholder-based arrangement with a significant employer contribution (the Partnership Pension Account).

#### i) Classic Scheme

Benefits accrue at the rate of 1/80th of pensionable salary for each year of service. In addition, a lump sum equivalent to three years' pension is payable on retirement. Members pay contributions of 1.5 per cent of pensionable earnings. On death, pensions are payable to the surviving spouse at a rate of half the member's pension. On death in service, the scheme pays a lump sum benefit of twice pensionable pay and also provides a service enhancement on computing the spouse's pension. The enhancement depends on length of service and cannot exceed 10 years. Medical retirement is possible in the event of serious ill health. In this case, pensions are brought into payment immediately without actuarial reduction and with service enhanced as for widow(er) pensions.

#### ii) Premium Scheme

Benefits accrue at the rate of 1/60th of final pensionable earnings for each year of service. Unlike Classic, there is no automatic lump sum, but members may commute some of their pension to provide a lump sum up to a maximum of 3/80ths of final pensionable earnings for each year of service or 2.25 times pension if greater (the commutation rate is £12 of lump sum for each £1 of pension given up). For the purposes of pension disclosure, the tables assume maximum commutation. Members pay contributions of 3.5 per cent of pensionable earnings. On death, pensions are payable to the surviving spouse or eligible partner at a rate of 3/8ths the member's pension (before any commutation). On death in service, the scheme pays a lump-sum benefit of three times pensionable earnings and also provides a service enhancement on computing the spouse's pension. The enhancement depends on length of service and cannot exceed 10 years. Medical retirement is possible in the event of serious ill health. In this case, pensions are brought into payment immediately without actuarial reduction. Where the member's ill health is such that it permanently prevents them undertaking any gainful employment, service is enhanced to what they would have accrued at age 60.

#### iii) Classic Plus Scheme

This is essentially a variation of Premium but with benefits in respect of service before 1 October 2002 calculated broadly as per Classic. Pensions payable under Classic, Premium and Classic Plus are increased in line with the Retail Prices Index.

#### iv) Partnership Pension Account

This is a stakeholder-type arrangement where the employer pays a basic contribution of between 3 per cent and 12.5 per cent (depending on 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 per cent (in addition to the employer's basic contribution). Employers also contribute a further 0.8 per cent of pensionable salary to cover the cost of risk benefit cover (death in service and ill health retirement). The member may retire at any time between the ages of 50 and 75 and use the accumulated fund to purchase a pension. The member may choose to take up 25 per cent of the fund as a lump sum.

### (e) Early departure costs

Early departure costs in 2002/03 amounted to £159,623 (2001/02: £183,342), exclusive of employer's contributions to national insurance and superannuation, for lieu of notice and compensation for loss of pension.

## Note 5. Other Expenditure

	2002/03	2001/02
	£'000	£'000
Laboratory Consumables	3,529	3,185
Depreciation	2,428	2,513
Vessels & Charters	2,470	2,317
Accommodation	2,677	2,245
Rent & Rates	277	296
Vehicles	181	179
Audit	27	27
External Auditors Other Payments	1	3
Hospitality	14	22
Travel & Subsistence	924	836
Training	317	375
IT Costs	617	617
Lease Charges – IT	171	92
Lease Charges – Other	157	154
Insurance/Losses	54	31
Defra Management Overheads	219	245
Defra Estates Overhead	0	290
Telecommunications	149	130
Bad Debt Provision	0	58
Losses on Revaluation	0	86
Exchange (Gains)/Losses	(11)	25
Early Departure Costs	160	183
Other Expenditure	656	583
<b>Total Expenditure</b>	<b>15,017</b>	<b>14,492</b>

During 2002/03, CEFAS took on responsibility for estates management work previously undertaken by Defra.

# Notes to the Accounts

## Note 6. Segmental Report

	2002/03			2001/02		
	Governmental		Total £'000	Governmental		Total £'000
	Bodies £'000	Other £'000		Bodies £'000	Other £'000	
Turnover	29,797	2,903	32,700	27,740	2,892	30,632
Cost Of Sales	(26,926)	(2,494)	(29,420)	(25,949)	(2,202)	(28,151)
<b>Surplus for the Year</b>	<b>2,871</b>	<b>409</b>	<b>3,280</b>	<b>1,791</b>	<b>690</b>	<b>2,481</b>
<b>Return on capital employed</b>	<b>6%</b>	<b>9%</b>	<b>6%</b>	<b>4%</b>	<b>14%</b>	<b>5%</b>

CEFAS is required to make a 6% return on all Government income as part of its financial performance targets.

These figures are produced in accordance with HM Treasury Fees and Charges Guidance.

## Note 7. Tangible Fixed Assets

	Land	Buildings	Vessels	Information Technology	Scientific Equipment	General Equipment	Vehicles	Assets in course of Construction	Total
Cost or Valuation	£'000	£'000	£'000	£'000	£'000	£'000	£'000	£'000	£'000
As at 1 April 2002	1,064	27,529	939	2,904	7,173	332	307	14,903	55,151
Revaluation	0	0	0	0	49	0	1	0	50
Indexation	56	551	41	15	61	2	(1)	0	725
Additions	0	113	0	372	602	0	0	10,332	11,419
Transfers	0	0	24,846	0	0	0	0	(24,846)	0
Disposals	0	0	0	(69)	(74)	(27)	(19)	0	(189)
<b>As at 31 March 2003</b>	<b>1,120</b>	<b>28,193</b>	<b>25,826</b>	<b>3,222</b>	<b>7,811</b>	<b>307</b>	<b>288</b>	<b>389</b>	<b>67,156</b>
<b>Depreciation</b>									
As at 1 April 2002	0	(2,317)	(40)	(2,223)	(4,174)	(212)	(217)	0	(9,183)
Indexation	0	(46)	(2)	(2)	(21)	0	0	0	(71)
Disposals	0	0	0	64	56	26	19	0	165
Provided in Year	0	(1,352)	(159)	(216)	(638)	(35)	(28)	0	(2,428)
<b>As at 31 March 2003</b>	<b>0</b>	<b>(3,715)</b>	<b>(201)</b>	<b>(2,377)</b>	<b>(4,777)</b>	<b>(221)</b>	<b>(226)</b>	<b>0</b>	<b>(11,517)</b>
<b>Net Book Value</b>									
At 31 March 2002	1,064	25,212	899	681	2,999	120	90	14,903	45,968
At 31 March 2003	1,120	24,478	25,625	845	3,034	86	62	389	55,639

The new research vessel was brought into service on 31 March 2003. The cost of the vessel is £24,845,962. This amount has been transferred from assets in the course of construction to vessels as at 31 March 2003.

The existing research vessels were subject to an impairment review and professionally valued on 30 November 2001 by E A Gibson Shipbrokers Ltd, PO Box 278, Audrey House, 16-20 Ely Place, London EC1P 1HP.

Land and buildings were revalued on 30 June 2000 by the Valuation Office Agency, 50 Frederick Street, Edinburgh. The assets were revalued on an existing use basis.

# Notes to the Accounts

## Note 8. Fixed Asset Investments

<b>Cost</b>	<b>£'000</b>
As at 1 April 2002	150
Additions	0
Disposals	0
As at 31 March 2003	<u>150</u>
<b>Provisions</b>	
As at 1 April 2002	0
Movement	0
As at 31 March 2003	<u>0</u>
<b>Net Book Value</b>	
At 31 March 2002	<u>150</u>
At 31 March 2003	<u><u>150</u></u>

In 2001, CEFAS purchased the entire share capital of CEFAS Technology Limited for £150,000.

Details of the investment are as follows:

Name of Company	Country of Origin	Percentage of Ordinary Share Capital held	Nature of Business	Unaudited Net Assets at 31 March 2003 £'000	Unaudited Pre Tax Profit for the year £'000
CEFAS Technology Ltd	United Kingdom	100	Trading	278	129

The company holds investments in several private companies in order to support the commercialisation of CEFAS's intellectual property. During the year, CEFAS Technology Ltd commenced trading.

The Management Board has considered the value of the investment and have recorded the investment at cost. This will be reviewed on a regular basis and provision made for any impairment in value.

## Note 9. Work In Progress

	2002/03	2001/02
	£'000	£'000
United Kingdom	698	423
European Union	168	350
Other	35	30
<b>Total Work In Progress</b>	<b>901</b>	<b>803</b>

## Note 10. Debtors

	2002/03	2001/02
	£'000	£'000
<b>Amounts falling due within one year:</b>		
Trade Debtors	1,588	1,316
Provision for Bad Debts	(122)	(122)
VAT	304	231
Defra	3,638	5,359
Prepayments	329	237
Sundry Debtors	27	14
<b>Total Debtors</b>	<b>5,764</b>	<b>7,035</b>

## Note 11. Creditors

	2002/03	2001/02
	£'000	£'000
<b>Amounts falling due within one year:</b>		
Trade Creditors	1,037	1,345
Wages control	445	0
Accruals	1,200	227
Defra	92	1,350
Other Creditors	254	257
Deferred Income	1,226	840
<b>Total under one year creditors</b>	<b>4,254</b>	<b>4,019</b>
<b>Amounts falling due after more than one year:</b>		
Grants not yet credited to income	19	32
Deferred income	131	0
Accruals	231	0
<b>Total Creditors</b>	<b>4,635</b>	<b>4,051</b>

# Notes to the Accounts

## Note 12. Provisions for Liabilities and Charges

	Early Retirement and pension commitments	Pay Award	Legal Claims	Total
	£'000	£'000	£'000	£'000
Balance as at 1 April 2002	585	187	64	836
Provided in the year	212	308	19	539
Utilised in the year	(169)	(187)	(62)	(418)
Revalued in year	(52)	0	0	(52)
<b>Balance as at 31 March 2003</b>	<b>576</b>	<b>308</b>	<b>21</b>	<b>905</b>

The early retirement and pension commitment provision is to provide for the cost of future pension payments to staff who have retired before their 60th birthday. The timing and amounts payable are reviewed annually by Defra Pensions Section, Exeter.

The pay award is to provide for a corporate staff bonus based on the successful performance in 2002/03.

The legal claims provision relates to claims made against CEFAS. The amounts provided are all expected to be settled in 2003/04.

No reimbursement is expected in relation to any of the amounts provided for.

## Note 13. Movement on Reserves

	General Fund	Revaluation Reserve	Total
	£'000	£'000	£'000
As at 1 April 2002	47,747	5,343	53,090
Notional Charges	264	0	264
Notional Interest	2,972	0	2,972
Revaluation	0	704	704
Income & Expenditure Account	286	0	286
Provision for Early Departure costs	169	0	169
Capital introduced by Defra	5,400	0	5,400
<b>Balance as at 31 March 2003</b>	<b>56,838</b>	<b>6,047</b>	<b>62,885</b>

## Note 14. Reconciliation of Net Operating Cost to Net Cash Flow from Operating Activities

	2002/03	2001/02
	£'000	£'000
Net Operating Cost for the year	286	25
<b>Adjustment for non cash transactions</b>		
Depreciation	2,428	2,513
Notional Charges	3,236	2,977
Loss on disposal of fixed assets	22	40
Revaluation losses	0	86
Payments against provisions	169	177
<b>Total</b>	<b>5,855</b>	<b>5,793</b>
<b>Adjustments for movements in working capital other than cash</b>		
(Increase) in Stocks/Work in Progress	(67)	(184)
Decrease/(increase) in Debtors	1,271	(4,713)
Increase in Liabilities	69	89
Increase/(Decrease) in Creditors	(578)	1,154
Capital introduced by Defra	5,400	10,411
<b>Total</b>	<b>6,095</b>	<b>6,757</b>
<b>Net Cash Inflow</b>	<b>12,236</b>	<b>12,575</b>

## Note 15. Analysis of changes in cash during the year

	2002/03	2001/02
	£'000	£'000
Balance as at 1 April 2002	3,935	4,491
Net Cash Flow	1,981	(556)
<b>Balance as at 31 March 2003</b>	<b>5,916</b>	<b>3,935</b>

# Notes to the Accounts

## Note 16. Cash at bank and in hand

	2002/03 £'000	2001/02 £'000
Barclays	178	456
Office of Paymaster General	5,716	3,456
Cash in Hand	22	23
<b>Total Cash at bank and in hand</b>	<b>5,916</b>	<b>3,935</b>

## Note 17. Capital Commitments

CEFAS has capital commitments totalling £10,841 (2001/02: £10,170,000).

Of this, £1,601 (2001/02: £10,144,000) relates to the purchase of a new research vessel.

## Note 18. Post Balance Sheet Events

There are no post balance sheet events to report.

## Note 19. Contingent Liabilities

There are no material contingent liabilities.

## Note 20. Operating Leases

Rentals under operating leases are charged to the Income and Expenditure Account on a straight line basis over the terms of the lease.

At 31 March 2003, the Agency was committed to making the following payments during the next financial year in respect of operating leases:

	2002/03 £'000	2002/03 £'000	2002/03 £'000	2001/02 £'000	2001/02 £'000	2001/02 £'000
	Vehicles	Land	IT Equipment	Vehicles	Land	IT Equipment
<b>Operating Leases which expire:</b>						
Within 1 Year	0	4	35	6	1	92
Between 2 to 5 Years	36	73	139	0	2	362
After 5 Years	0	15	0	0	79	0
<b>Total</b>	<b>36</b>	<b>92</b>	<b>174</b>	<b>6</b>	<b>82</b>	<b>454</b>

## Note 21. Related Party Transactions

CEFAS has dealings with the Department for Environment, Food and Rural Affairs and its sponsored bodies, notably the Veterinary Medicine Directorate and the Central Science Laboratory.

CEFAS Technology Limited is a fixed asset investment (see note 8). The shares are held by Dr P W Greig-Smith as nominee of and trustee for CEFAS.

No Board Member, members of key management staff or other related parties have undertaken any material transactions with CEFAS, CEFAS Technology Limited or other related parties during the year.

## Note 22. Prompt Payment Policy

CEFAS has a duty to meet the CBI 30 day payment policy. During the year, the percentage of invoices that met the policy is as below:

	2002/03	2001/02
	%	%
Quarter 1	98	96
Quarter 2	97	97
Quarter 3	98	97
Quarter 4	97	91
<b>Average percentage of invoices paid within 30 days</b>	<b>98</b>	<b>95</b>

No interest was paid in respect of late payment of commercial debt (2001/02: £NIL).

## Note 23. Notional Interest

	2002/03	2001/02
	£'000	£'000
Fixed Assets	2,972	2,405
Working Capital	0	11
<b>Total Notional Interest</b>	<b>2,972</b>	<b>2,416</b>

## Photography Credits

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## Sharing Marine Data and Information

CEFAS is a key player in a number of initiatives aimed at improving access to marine and coastal data and information, including the UK Marine Information Council (UK MIC) and the Inter-Agency Committee for Marine Science and Technology (IACMST) Marine Environment Data Advisory Group (MED AG).



## Coast Map News

Coast Map News is a newsletter about marine and coastal data and information. By providing an overview of current issues and latest developments in this area, the newsletter aims to promote better integration of initiatives and avoid duplication of effort.

[www.cefasc.co.uk/coastmap](http://www.cefasc.co.uk/coastmap)



## Information for our customers

CEFAS Insight, a regular business-to-business newsletter, informing customers and collaborators about the latest developments at CEFAS, is distributed to clients and collaborators around the world.

[www.cefasc.co.uk/news/insight](http://www.cefasc.co.uk/news/insight)





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