ISSUE NO. 38
DECEMBER 2001

International Council for
the Exploration of the Sea
Conseil International pour
l'Exploration de la Mer

ICESCIEM

NEWSLETTER

INSIDE THIS ISSUE:

President's greeting

The ICES Annual Science Conference and 89th Statutory Meeting took place in Oslo from 23 September to 3 October 2001. Both events were very successful thanks to the hard work and generous hospitality of our Norwegian hosts, high quality presentations during the conference, and the dedicated labours of the ICES Secretariat.

The Statutory Meeting is where the activities for the following year are agreed, budgets are adopted and officers are elected. During the course of the meeting, the Council (that means the national Delegates of ICES) adopted the final draft of the Strategic Plan. This is a major document, which establishes clear goals for ICES in the service of science and society. Beyond the vision of "an international scientific community that is relevant, responsive, sound, and credible, concerning marine ecosystems and their relation to humanity", our mission is "to advance the scientific capacity to give advice on human activities affecting, and affected by, marine ecosystems". The Strategic Plan can be accessed on the ICES website (**www.ices.dk/hl/ices_news.htm**) and it will be widely circulated in the two official languages of ICES, English and French.

Council also endorsed another forward-looking document, the report of the Bureau Working Group on International Programmes. Chaired by former President Scott Parsons, this Working Group made a number of recommendations concerning what I might term "ICES foreign policy". As an intergovernmental body, ICES has many active working relationships with similar organisations throughout the world and we have established formal relationships—through Memoranda of Understanding—with several scientific and regulatory agencies and commissions (for example FAO, IOC, NASCO, OSPAR, HELCOM, EC, to name just some of them). We also have informal working links with many other international scientific organisations. The Bureau Working Group pointed out that some of the formal relationships could be revitalised, while several of the informal connections deserve to be invigorated and possibly upgraded to a more formal status. The report of the Bureau Working Group on International Programmes is available on CD-ROM as Document CM 2001/Del:12 and can be ordered from **info@ices.dk**

ICES can accomplish more through collaboration than it can alone, as we emphasise in our newly adopted Strategic Plan. I am particularly glad, therefore, to draw attention to these policy decisions from the 2001 Statutory Meeting

I wish you all every success and happiness in the coming year.

Pentti Mälkki
ICES President.

ICES CIEM
Newsletter
Issue No 38
December 2001

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KLS Grafisk Hus
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Main picture: Orange roughy - Courtesy of J. Gordon

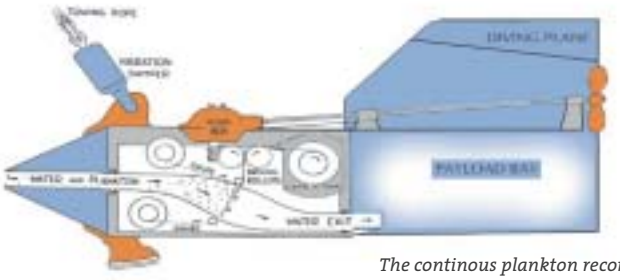
"THE EXPERIMENT I WANT TO MAKE FROM THIS COLLEGE CONSISTS OF RUNNING A NUMBER OF THESE INSTRUMENTS ON DEFINITE STEAMSHIP ROUTES ACROSS THE NORTH SEA...."

Sir Alister Hardy talking at University College, Hull, in 1929, prior to setting up the survey in 1931

Monitoring the oceans using the Continuous Plankton Recorder

By Martin Edwards

The Continuous Plankton Recorder (CPR) survey was set up by Sir Alister Hardy in 1931 and has since evolved into a unique marine monitoring programme that provides the scientific community with its only measure of the state of oceanic plankton for the North Sea and North Atlantic. The self-contained automatic plankton recorders continuously collect plankton from a standard depth of 7 m and are towed at monthly intervals by ships-of-opportunity along a number of routes. Using this simple but highly cost-effective technique, CPRs have been towed by volunteer ships for over four million nautical miles, resulting in the collection of nearly 200 000 plankton samples from all over the North Atlantic. On certain standard routes there now exists a virtually unbroken monthly coverage going back to 1948. The CPR survey is run by the Sir Alister Hardy Foundation for Ocean Science (SAHFOS).



The continous plankton recorder

Unique record

Perhaps the real legacy of Sir Alister Hardy's initial foresight in setting up the survey, is the collection of a unique, biologically diverse dataset (of approximately 400 taxa) that is capable of monitoring and detecting environmental change in a world which has become increasingly affected by man's impact. The long-term time-series of CPR data acts as a baseline against which to measure and distinguish between natural and human related changes.

Using CPR data

Research using CPR data has focused on establishing the existence of large-scale variability across the North Atlantic, which also extends to fish and other marine life. As the CPR record has lengthened, our understanding of natural variability within the marine environment has also increased. Evidence from CPR records suggests that the plankton integrates hydro-climatic signals and responds sensitively to climate change.

In line with current environmental concerns, the CPR data have been increasingly called upon to address such issues as eutrophication and global warming. Other recent applications of CPR data have included providing information on harmful algal blooms, monitoring and documenting the spread of non-indigenous plankton species, and providing information on changes in marine biodiversity.

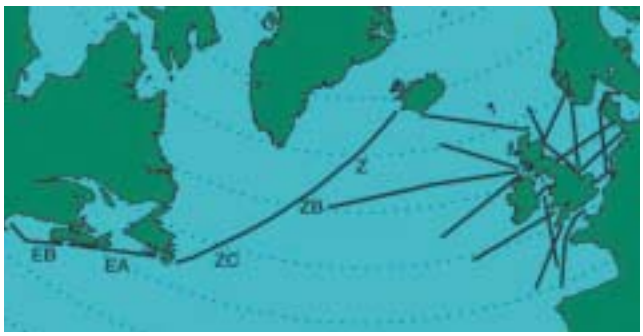
This shows how the CPR survey has adapted to a changing world and continues to provide a valuable contribution to management and science, after seven decades of operation. Without such programmes, there would be no information about changes in ecological health over large areas of the ocean and hence no means of assessing measures designed to protect the marine ecosystem from human impacts.

Free access to data

In 1999, SAHFOS adopted a new open-access data policy, which allows free use of CPR data by the international scientific community. The aim of the new policy is to encourage the widest possible use of CPR data and products, by scientists and environmental managers.

CPR survey becomes global

The scale of change observed in the North Atlantic over the last few decades emphasises the importance of maintaining existing programmes and establishing new, long-term and wide-scale monitoring of the world's oceans. With this view in mind, the CPR survey has been incorporated into the initial Observing System of GOOS[1] **(http://ioc.unesco.org/goos/)** and has recently been deployed in the Mediterranean, Indian Ocean, Baltic, the Gulf of Guinea, the Southern Ocean and, since 2000, in the North Pacific.



Continuous Plankton Recorder tow routes in the North Atlantic and North Sea during the 1990s.

For more information about the CPR please see **www.npm.ac.uk/sahfos/sahfos.html** or contact

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1 Global Ocean Observing System

"LIDAR OPENS UP THE POTENTIAL TO COLLECT REAL-TIME, HIGH-RESOLUTION SNAPSHOTS OF BIOLOGICAL DISTRIBUTION IN THE UPPER LEVEL OF THE OCEAN"

Studying the sea from an aeroplane?

Figure 1.Twin-engine aircraft used for the N. Pacific pilot study. Jim Wilson (left) and Jim Churnside (right) of NOAA ETL are shown relaxing before a survey.

Airborne LIDAR (LIght Detecting And Ranging) is a remote sensing tool that is changing the way we do marine research in pelagic ecosystems. The system allows marine scientists to fly over huge swathes of the ocean and rapidly record surface and subsurface features. This includes zooplankton layers, fish schools, large individual fish, marine mammals, seabirds, oceanic fronts, sea surface temperature and salinity, and chlorophyll blooms.

How does it work?

LIDAR systems work by sending a laser pulse from a carrier aircraft. The light passes through the water and bounces back off any objects or particles it encounters. The strength of the returning pulse can be used to distinguish large and small objects. The time taken to receive the reflected signal indicates the range or depth of the object. The system is used alongside other instruments such as imagers, radiometers, and infrared cameras, so that physical and biological measurements can be recorded at the same time.

How we have used it

During the summer of 2000, the Fish LIDAR Oceanic Experimental system (FLOE), developed by Jim Churnside and James Wilson of the NOAA Environmental Technology Laboratory (see Figure 1), was tested and evaluated as part of a pilot study in the North Pacific. The FLOE system was coupled with a digital imager for the study. The width of the area covered by the LIDAR beam was about 5 m, increasing to 7 m at night.

To record images at the same time the LIDAR was running, we used a high-resolution video camera that covered a swathe of 150 to 200 m and was set to cover the area scanned by the LIDAR. All instruments were mounted on a twin-engine plane and the data collected were stored and processed later with custom software.

The survey required at least three scientific personnel; a survey transect planner and navigator, an image operator, and a LIDAR operator. Flights were coordinated with three shipboard research programs studying upper ocean biology. Surveys were flown in British Columbia, northern southeast Alaska, Prince William Sound, Alaska, and over the continental shelf in the Gulf of Alaska.

Top photo by Paul Kay www.marinewildlife.co.uk

The author, Evelyn Brown, operating the LIDAR during a survey.

"AN AMAZING 222 KM WERE SURVEYED PER HOUR!"

By Evelyn D. Brown

How the system worked

Flying at 1000 ft altitude at 120 knots, we surveyed at an amazing rate of 222 km per hour. The LIDAR captured data on plankton, krill, fish schools (see Figure 2), larger individual predators such as marine mammals, and even seabirds. It also collected data on the biological structure of ocean fronts. LIDAR opened up the potential to collect real-time, high-resolution snapshots of biological distribution in the upper levels of the ocean.

Limitations

The maximum range and sensitivity of LIDAR is highly dependent on the clarity of the water. For this study, the penetration depth was 15–30 m for coastal waters and up to 50 m in offshore waters over the continental shelf. Penetration was much better at night due to an increased field of view and no background light interference.

Future use

We found that airborne remote sensing using LIDAR greatly enhanced our data collection capabilities in the ocean. We were able to obtain a significant increase in the temporal and spatial resolution of assessments in the upper 30–50 m in northern marine waters.

We would recommend LIDAR as a perfect candidate for surveys of pelagic marine life, in particular for fish species that occur near the surface or that form large, near-surface aggregations, such as herring, capelin, or even high-seas migratory salmon. Given the depth limitations, LIDAR is not suitable for surveys of cod, pollock and other demersal species.

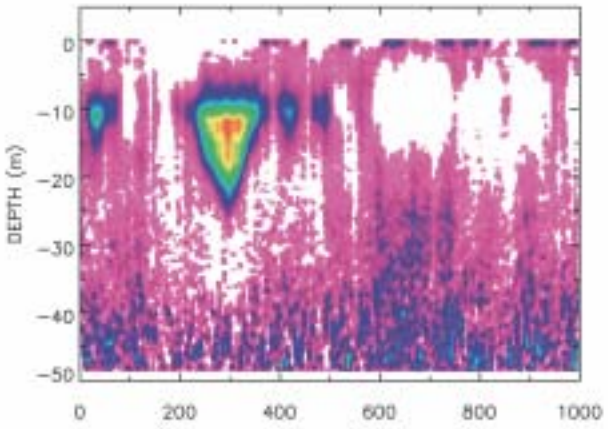

Figure 2. A raw data file output (displayed by shot number or distance with the background signal removed) of fish schools in the Gulf of Alaska (attenuation depth approximately 40 m).

LIDAR in the Barents and Norwegian Seas

Scientists from the Polar Research Institute of Marine Fisheries and Oceanography (PINRO), in Russia, have been using LIDAR to survey pelagic marine life since 1987. They have recently joined forces with Norwegian scientists in a successful survey using LIDAR to collect information on pelagic fish and oceanographic conditions in the Barents Sea and Norwegian Sea.

For more information contact Vladimir Zabavnikov at: **ltei@pinro.murmansk.ru**

We are really just scratching the surface of what we can do with the technology. Ideally, future LIDAR data will be integrated with satellite and ship-born data to create an even better picture of the pelagic realm.

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"IT MIGHT EVEN BE OF INTEREST TO TEST OUR OLD, RELIABLE FISHING MORTALITY AND SPAWNING STOCK BIOMASS INDICATORS THIS WAY"

Producing advice on marine ecosystems

Background

ICES produces scientific advice on the status of marine resources, such as fish stocks, by using indicators. Despite the availability of many possible indicators of the state of fish populations, ICES still relies on two key indicators as a basis for advice on individual stocks. These are fishing mortality and spawning stock biomass. Spawning stock biomass is the quantity of a fish stock, measured in tonnes, that is at an age when it is able to reproduce. Fishing mortality is an estimation of the deaths in a fish stock caused by fishing.

Both indicators have many imperfections, and many ways that they could be improved in accuracy and precision. However, they are repeatedly found to function with useful consistency as practical surrogates for how rapidly a fishery is depleting a stock, and how much reproductive potential remains. Use of these two indicators as the basis for single species fisheries advice is not a chance event. It is based on several decades of theoretical explorations and practical experience.

Ecosystem indicators

In recent years, ICES has embarked on the task of providing advice on the status of marine ecosystems and on management actions that will not unduly disturb them. As with the much simpler case of producing advice for individual fish stocks, ICES will need reliable indicators of the status of marine ecosystems.

Large numbers of indicators of ecosystem or community status are available. However, we lack a single well-established theory for how ecosystems are structured and how they function. Therefore, we cannot be guided to a workably small number of indicators as a basis for advice. Unlike the situation with fish stock indicators, we also lack the decades of practical experience with the relative performance of different indicators of ecosystem status. So how do we choose a suite of reliable indicators of the status of marine ecosystems? This is a question the Working Group on the Ecosystem Effects of Fisheries (WGECO) has been investigating over several meetings. At the most recent meeting in 2001, I proposed borrowing a formal approach from communications theory and industrial psychology, called Signal Detection Theory (SDT).

How does Signal Detection Theory work?

Signal Detection Theory provides a structured framework through which we could choose indicators of the status of marine ecosystems. The concept of SDT is simple. It supposes that there is a real world in which, during a given time interval, an event has either happened or has not happened. For an example in the marine ecosystem, think of an invading species affecting the community along a rocky shore.

To understand what is happening on our rocky shore we monitor an indicator, perhaps measuring the species composition of the community living on the shore. We use a signal from the indicator, that is, a drastic change in our measure of species composition, to tell us that an event has either occurred or has not occurred.

A perfect signal always warns us that an event has occurred and never gives a false signal when an event has not taken place. Unfortunately in the marine ecosystem, signals are rarely so perfect or so easily understood. For example, species composition on a rocky shore can change for many different reasons, and the effects of the invasive species may not show up readily in our measure of species composition. Thus, indicators can give both false alarms (saying that an event occurred when one did not) and misses (saying nothing happened when an event really did occur).

Signal Detection Theory is useful as it provides a framework to guide us in the selection and fine tuning of indicators based both on how many times the signal has been wrong, and how errors were distributed between misses and false alarms. The latter is of course important, because the costs of the two types of errors are rarely the same.

So how could SDT be used in practice to choose marine ecosystem indicators?

I proposed that we could use the SDT approach to evaluate the performance of marine ecosystem indicators. To do this we need a time-series of data from which the possible indicators could be selected.

Within the chosen time-series we need to know when events have happened, such as known species invasions. Looking at what actually happened in our time-series we

By Jake Rice

Signal detection theory could help us pick indicators of the status of our marine ecosystems.

could then calculate the error rate, and the distribution of errors among false alarms and misses, for all the indicators that we are considering. Based on our findings we could then choose the indicators with the performance characteristics we desire.

The future

This all sounds nicely structured, and of course the real world is not that orderly. Many different groups, from managers to stakeholders, are interested in ecosystem indicators and are unlikely to have the same goals or the same views on what types of errors are acceptable. Signal Detection Theory does not solve these problems. But it does give a clear and structured way to choose indicators whose error properties relative to specific goals, at least are known. This will allow informed—if at times lively—debate and provide a clear trail as to why particular indicators have been chosen.

It might even be of interest to test our old, reliable fishing mortality and spawning stock biomass indicators this way, and see in retrospect, how effective they were at telling us all what advice should have been given and when.

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To give your opinion on the use of signal detection theory for picking indicators of ecosystem status please visit the ICES Forum at **www.ices.dk/forum**

Photo by Erling Svensen (www.marinbi.com/)

Can Newfoundland cod stocks recover without capelin?

By George Rose

Newfoundland waters, from the Grand Banks to Labrador, were once the most productive cod fishing grounds in the world. But, decades of overfishing coupled with changes in environmental conditions led to the complete collapse of the northern cod stock and closure of the fishery by the Canadian Government in 1992.

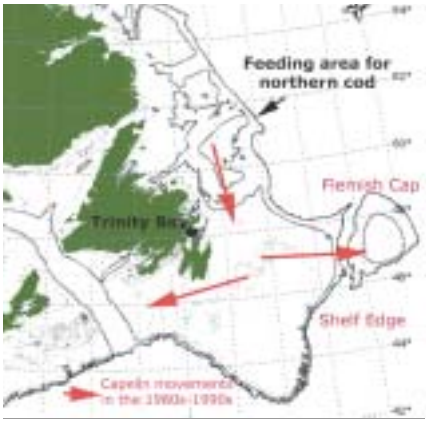

Figure 1. Northwest Atlantic map (centred on the Island of Newfoundland). Map shows movement of capelin, in the 1980s-1990s, away from feeding areas for northern cod.

Today, nearly ten years after the fishery was closed, the surviving pockets of northern cod appear to be recovering but at very different rates. The small coastal population that spawns in Trinity Bay (see Figure 1) has been recruiting well since 1995 and now contains fish of over 10 years of age. In contrast, the formerly dominant populations out on the continental shelf have grown slowly in the past 10 years. They are generally in poor reproductive condition and contain few fish older than age 5.

So why have some groups of cod fared much better than others under the same levels of protection from fishing? The answer could be due to the presence or absence of capelin in their diets.

Since 1995 acoustic/trawl surveys have been conducted for capelin and northern cod in coastal and continental shelf areas off Newfoundland. During these surveys over 20 000 cod and 15 000 cod stomachs have been analysed, and the weights, condition, age, and maturity of the fish recorded. Included in these measures was an index of liver condition, which is thought to be a meaningful indication of overall cod well "being [1]". The spatial association of cod and capelin from the acoustic surveys was assessed using potential contact "statistics [2]."

One of the key findings of this and other research has been that populations of cod on the continental shelf have had virtually no contact with capelin since about 1990. It was at this time that capelin shifted their distribution to more southerly areas[3] outside the main cod feeding grounds (see Figure 1). Out of a total of 5000 stomachs examined from cod caught on the shelf, since 1995, only seven have contained any capelin.

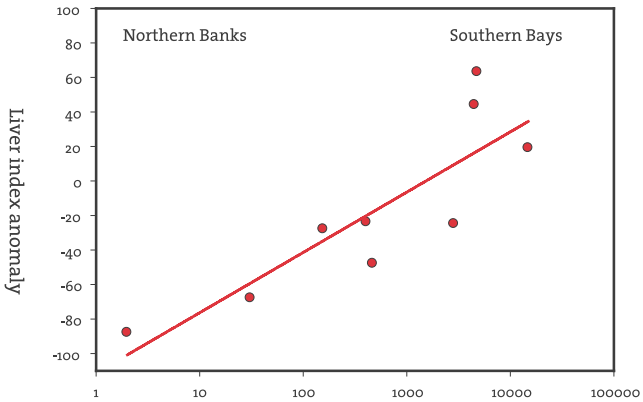

Figure 2. Relationship between capelin availability and cod liver condition. Capelin availability is measured in numbers within 40 km.

In contrast, in the coastal area of Trinity Bay, where cod have made a better recovery, capelin are still present and are a key component of the cod diet.

Capelin is important for cod because it is such a good quality food providing high nutritional value. Of the 20 000 cod that were examined, those with healthier livers had a higher proportion of capelin in surrounding waters and in their diet (see Figure 2). The condition of the liver was also positively related to the gonad size in mature females. This means that female fish with livers in better condition had larger gonads and thus higher reproductive potential.

Cod on the continental shelf that lack capelin in their diets are in poor condition and have had poor reproductive potential. There appears to be no substitute for capelin in the ecosystem and without it, cod populations have not recovered at the rates that were predicted from historical stock-recruitment analyses. In areas where cod are still abundant, such as Trinity Bay, cod populations have rebuilt at the predicted rates. From our research it would appear that a diet high in capelin is likely to be crucial for the recovery of cod stocks in Newfoundland waters.

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Crown Prince Haakon of Norway opens the Annual Science Conference

"YOUR WORK IS CRUCIAL FOR THE PRESENT AND FUTURE LIVELIHOOD AND WELL-BEING OF MANY PEOPLE".

H.R.H. Crown Prince Haakon of Norway talking about the importance of ICES.

ICES Annual Science Conference 2001

The ICES Annual Science Conference took place, in Oslo, from 26 to 29 September 2001. The event was superbly organized by the Norwegian hosts and was attended by over 400 marine scientists. Crown Prince Haakon of Norway officially opened the Conference and he was followed by Pentti Mälkki, the ICES President, who discussed ICES achievements during the past year. Otto Gregussen the Norwegian Fisheries Minister, then discussed the challenges for ICES in the next hundred years and we were further entertained by a thought provoking talk by Ambassador Thorvald Stoltenberg, Norway. His talk focused on the search for a new world order and whether this could be achieved by another world war or the preferred option of better intergovernmental cooperation.

Conference Theme Sessions

The conference was split into five themes.

- Living resources
- Fisheries Management and Stock Assessment
- Ecosystem and Environmental Management
- Oceanography and Marine Ecology
- Coastal zones

Keynote speeches

Keynote speeches were given on the mornings of the 28 and 29 September, before the main Theme Sessions began. The first talk was given by Coleen Moloney (South Africa), who discussed the success of ecosystem management of the Southern Benguela upwelling area, by a partnership of South African government and research institutes. This inspirational talk was followed on the next day by a fascinating talk by Stephen J. Hall (Australia) discussing the challenge of managing fisheries at an ecosystem level.

Quotes from the Annual Science Conference

"ICES IS NOW CELEBRATING ITS FIRST 100 YEARS, AND IS ONE OF THE VERY FEW INTERNATIONAL ORGANISATIONS, WHICH HAS SURVIVED THE TWO WORLD WARS"

Otto Gregussen, Minister of Fisheries of Norway

"ICES AND NATIONAL MARINE RESEARCH INSTITUTES SHOULD BE GIVEN THE NECESSARY RESOURCES TO PERFORM THEIR IMPORTANT TASK...."

Finn Bergesen Jr, Director General, Confederation of Norwegian Business and Industry

"....ICES AIM SHOULD BE TO BE THE BEST MARINE RESEARCH BODY IN THE WORLD"

Finn Bergesen Jr, Director General, Confederation of Norwegian Business and Industry

"LET US FACE THE CHALLENGES OF THE NEW MILLENNIUM"

ICES President Pentti Mälkki.

Awards from the 2001 Annual Science Conference

By John Ramster

The Awards Nominations Group (ANG) was busy again this year judging the best talks and posters at the conference. The group included representatives from the Science Committees (Pierre Pepin, Anders Fernø, Scott Campbell, Cornelius Hammer and Fatima Cardadour) along with John Ramster, the Chair of the Group, and Neil Fletcher the ICES Communications Officer.

Alain Maucorps, the Chair of the Consultative Committee (CCC), presented the winners with a certificate and free entry to next years conference.

BEST PAPER

Effort allocation of the Dutch beam trawl fleet in response to a temporarily closed area in the North Sea
By A.D. Rijnsdorp, G.J. Piet, and J.J. Poos (Netherlands)

Adriaan's paper was delivered very confidently and the illustrations could be seen clearly from the back of the hall. He finished exactly to time and he had a clear conclusion that in future closed areas should not be used without reductions in fishing effort as well. His subject aroused quite a lot of questions which were well handled. It was a really neat piece of "practical" science in that it came out of a situation that developed since the last ASC and he had seen the need for the results of the political act to be assessed scientifically.

BEST NEWCOMER

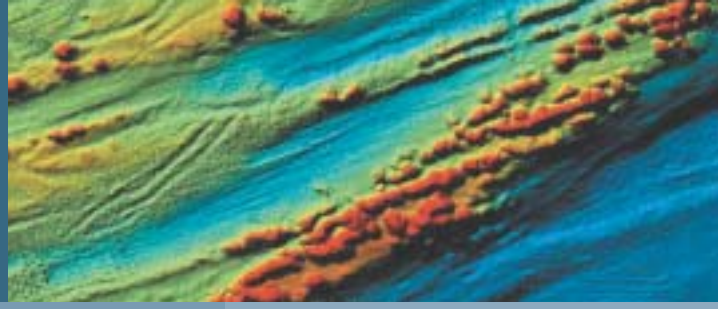
An investigation of population movements in Atlantic herring using LA-ICPMS analysis of larval and juvenile otoliths
By Deirdre Brophy, Brett Danilowicz (Ireland) and Teresa Jeffries (UK)

Deidre was chosen as best newcomer for a confident, efficient presentation on a complex subject. Her talk kept people interested from the start to the finish.

BEST POSTER

A new method for *Lophius* spp., gonad ovacite isolation for fecundity study. Preliminary results on Black Anglerfish total fecundity
By Inaki Quincoces, Marina Santurtun and Paulino Lucio (Spain)

This team were joint-winners of the Best Poster award at the 1999 ASC and so deserve special congratulations for the outright win this year. Their poster had a very clean and striking visual impact and it dealt with a single problem in such a way that non-experts in its field could easily follow the message. This was mainly because the graphics were attractive and the text was short and simple at each stage. Posters should have a clear message and should not just be scientific papers projected onto a large sheet of paper.



Discovering cold-water coral reefs

Lophelia feeds by catching food particles from the surrounding water.

If you overheard somebody talking about coral reefs you would probably think of warm tropical seas with clear blue waters. However, some of the largest coral structures in the world are found in the cold and gloomy waters of the Northeast Atlantic.

Life in the dark

Lophelia is the dominant deepwater colonial coral in the North Atlantic. It is a true hard coral formed by a colony of individual coral polyps, which produce a calcium carbonate skeleton. It feeds by catching food from the surrounding water. Unlike its tropical relatives, *Lophelia* does not need algae and light for survival and it is mainly found in deep water at depths between 200–1000 metres. The record for the deepest reef stands at 3000 m while the shallowest record of a living *Lophelia* reef is at 40 m in Trondheimsfjorden, Norway.

Cold water

Lophelia appears to prefer oceanic waters with temperatures between 4°C and 12°C and is found throughout the world's oceans, except in the polar regions. The highest density of *Lophelia* reefs is found in the ICES Area, within the Northeast Atlantic.

Elderly coral

Lophelia reefs grow at the rate of about 1 mm in height per year. The highest reefs found so far have been measured at an impressive 35 m, at Sula Ridge off the Norwegian coast. Fragments taken from this reef have been dated as being 8500 years old, which is just after the end of the last Ice Age.

Habitat for marine life

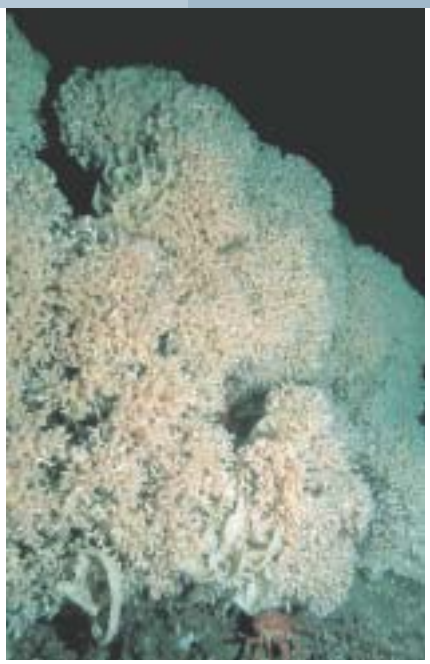
Lophelia reefs provide a shelter for hundreds of marine species. Amongst the coral branches occur fish (redfish, saithe, cod, ling, and tusk), squat lobsters, and other crustaceans, molluscs, starfish, brittlestars, sea pens, and sea urchins. A wide variety of animals grow on the coral itself, including sponges, bryozoans, hydroids, and other coral species.

Studies on four different Norwegian reefs have identified 744 species in total, but with only 15 species in common between the four sites. This indicates that the number of species on the reefs is much higher than described so far. The reefs have also traditionally been rich fishing grounds for longline and gillnet fisheries. Experimental fishing with longlines has shown that catches of redfish, *Sebastes* spp., are higher in coral habitats than in surrounding non-coral habitats.

Photo courtesy of Pål Mortensen.

A section of the Sula reef complex in Norway (3.8 km across the picture). The corals appear as red and grow as single mounds (upper left hand corner) or as fused chains. The picture is produced with data from Multibeam Swath Bathymetry.

By Jan Helge Fosså



".....some individual Lophelia sub-structures are as high as 35 m"

"FRAGMENTS TAKEN FROM THIS REEF HAVE BEEN DATED AS BEING 8500 YEARS OLD"

Large reef at Sula

The largest *Lophelia* reef that we have discovered in the North Atlantic is on the Sula Ridge on the mid-Norwegian shelf at 300 m. The reef has been mapped in great detail using Multibeam Swath Bathymetry. This showed that the structure is more than 13 km long and up to 400 m wide. It consists of about 500 individual mounds, of which some are fused to form chains. The average height is about 15 m, but some individual sub-structures are as high as 35 m.

Threats against the reefs

The Institute of Marine Research in Bergen, Norway (**www.imr.no/**), has documented that Lophelia reefs are very sensitive to fishing activities using bottom trawls. It is estimated that 30–50 % of the *Lophelia* reefs in Norwegian waters have been damaged or impacted by trawling.

In 1999, the Norwegian Ministry of Fisheries issued regulations for the protection of coral reefs. An area of 1000 km^2 at Sula, including the large reef, is now closed to bottom trawling.

Improving our understanding of cold-water corals

ICES has set up a Study Group on Mapping the Occurrence of Cold Water Corals in the Northeast Atlantic [SGCOR]. The group was formed after the European Commission asked ICES "to identify areas where cold-water corals may be affected by fishing." An initial report was delivered to the Commission in October 2001 and a more detailed report will be produced in early 2002.

For further information about deep-sea coral reefs please try the following:

www.ecoserve.ie/projects/coral/biology.html
www.sams.ac.uk/dml/projects/benthic/lophelia.htm

Alternatively please contact the author:
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Norway
E-mail: **jan.helge.fossaa@imr.no**

Photo by Erling Svensen (www.marinbi.com/)

Exploring the ocean's last frontier

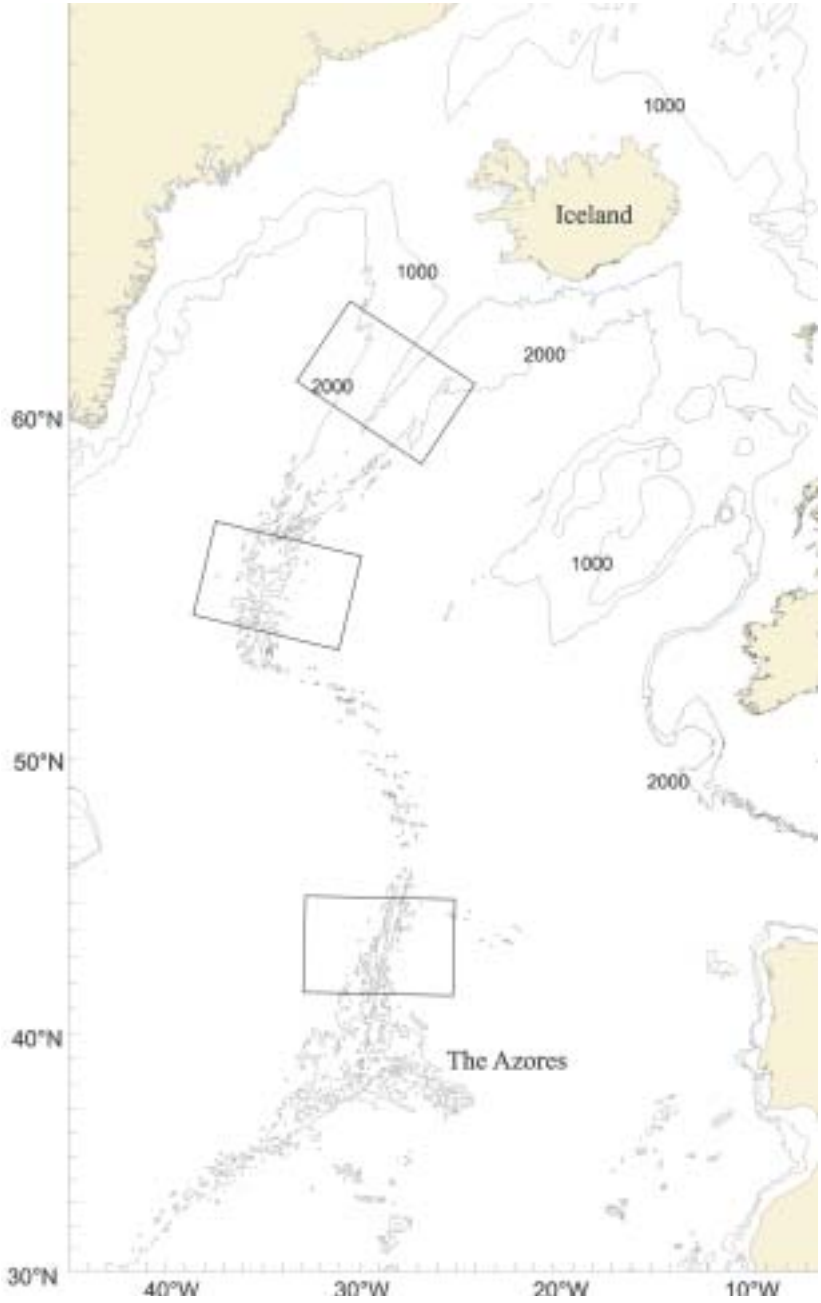

Figure 1. The study area comprises the Mid-Atlantic Ridge and its flanks from Iceland to the Azores. Wide-ranging coverage of the entire area will be combined with more focused studies in selected subareas

The old cliché about knowing more about outer space than we do about the inner space of our oceans is often still true today, particularly in deep-sea areas. However, this looks set to change in the North Atlantic with the start of MAR-ECO, a pioneering new project to explore the marine life living around the Mid-Atlantic Ridge. This deep submerged ridge runs from Iceland down past the Azores through to the South Atlantic Ocean (see Figure 1) and so far has only been lightly studied. Scientists involved with the MAR-ECO project will at last be able to study one of the final frontiers of marine research and an area that is also likely to be a hotspot of undiscovered biodiversity.

What is MAR-ECO?

MAR-ECO will focus on the fish, cephalopods (cuttlefish and squid), gelatinous plankton, and crustaceans that live in the waters around the Mid-Atlantic Ridge. It has three central tasks:

- Mapping of species composition and distribution patterns.
- Identification of trophic interrelationships and modelling of foodweb patterns.
- Analyses of life history strategies.

These aims will be achieved by an interdisciplinary approach involving biologists, oceanographers, gear technologists, and others.

The project will be a truly international effort and is attracting partners from many countries surrounding the study area. It will draw on the region's best available technological and scientific expertise, thereby providing the opportunity for new scientific discoveries, technological innovation, and greater understanding of the mid-ocean ecosystem. To find out more please see the science plan at the Website (**www.efan.no/midatlcensus/**) which provides considerable background information and discussions of aims and strategies.

Planning phase starts on schedule

The Science Plan and planning phase proposal submitted earlier this year to Census of Marine Life (CoML) and to

The roundnose grenadier (Coryphaenoides rupestris), a typical inhabitant of the northern Mid-Atlantic Ridge and a target of deep-sea fisheries. The picture shows a pelagic juvenile.

By Odd Aksel Bergstad

"... A PIONEERING NEW PROJECT TO EXPLORE THE MARINE LIFE LIVING AROUND THE MID-ATLANTIC RIDGE"

The new Norwegian research vessel G.O. Sars has been committed for an extensive MAR-ECO cruise in 2004.

the Alfred P. Sloan Foundation of New York (**www.sloan.org**) was approved, and a generous grant was recently awarded for the eighteen month planning phase that started in November 2001. The planning phase will include formulation of component project proposals for the subsequent field phase in 2003 and 2004, literature studies and data mining, adaptation of technology and vessels, and promotional activity.

Proposals required

Norway has taken the lead with the project and the responsible institution will be the Institute of Marine Research (IMR) in collaboration with the University of Bergen. Project planning is being undertaken within the current activity plan of IMR, but it is open to multi-institutional and international participation. MAR-ECO will be an umbrella project so sub-groups are currently being formed to develop component projects, and new participants are welcome to join the process of formulating proposals.

Organisation

An International Steering Group organises and oversees the planning, finance, and implementation of the pilot project. Members of the group are:

Odd Aksel Bergstad, IMR, Norway (Chair)
Peter Boyle, University of Aberdeen, UK
Ólafur S. Ástthórsson, MRI, Iceland
Ricardo S. Santos, University of the Azores, Portugal
Uwe Piatkowski, Univèrsity. Kiel, Germany
Michael Vecchione, NOAA, NMFS, USA
Eugene M. Burreson, Virginia Institute of Marine Science (VIMS), USA
Ulf Båmstedt, University of Bergen, Norway
Pascal Lorance, IFREMER, France

For further information please see :
www.efan.no/midatlcensus/ or **www.coml.org/contact** or contact:

Odd Aksel Bergstad
Institute of Marine Research
Flødevigen Marine Research Station
N-4817 His, Norway
E-mail: **oddaksel@imr.no**

The project is a part of the Census of Marine Life (CoML) Programme, which is a ten year program to assess and explain the diversity, distribution and abundance of marine organisms in the world's oceans (**www.CoML.org**)

ICES HAS OVER 100 WORKING AND STUDY GROUPS THAT COVER JUST ABOUT EVERY CONCEIVABLE TOPIC IN THE MARINE ECOSYSTEM. BELOW IS INFORMATION ABOUT A SELECTION OF REPORTS PRODUCED BY THE WORKING GROUPS IN 2001.

Latest research on the marine ecosystem

Benthic habitats

For information about life on the seabed and latest mapping work check out the Benthos Ecology Working Group (17–21 April 2001) at **www.ices.dk/reports/mhc/2001/E0801.pdf** and the Working Group on Marine Habitat Mapping (3–6 April 2001) at **www.ices.dk/reports/mhc/2001/E0701.pdf**

Whales and dolphins

For information on marine mammal populations check the following report from the Working Group on Marine Mammal Population Dynamics (23–27 April 2001) at **www.ices.dk/reports/ACE/2001/ACE0101.pdf**

Contains information on marine mammal populations in the North Sea, ecological quality objectives for marine mammal populations, impacts of fisheries on marine mammals and other information.

Seabirds

ICES isn't just about life under the waves. Seabirds are a key component of marine ecosystems and for more information on seabird research in the ICES community see the following report from the Working Group on Seabird Ecology (16–19 March 2001) at **www.ices.dk/reports/occ/2001/wgse01.pdf**

The report contains information on seabirds in the North Sea, ecological quality objectives for seabirds, impacts of aquaculture on seabirds and other information.

Squid and cuttlefish

For information on cephalopods see the report from the Working Group on Cephalopod Fisheries and Life History (28–30 March 2001) at **www.ices.dk/reports/lrc/2001/wgceph01.pdf**

The report contains information on identification of cephalopod stocks and estimating population sizes including a review of current knowledge of fished cephalopod stocks in the NE Atlantic

Marine ecosystems

For information about research on marine ecosystems see the following reports:

- Study Group on Ecosystem Assessment and Monitoring (30 April–3 May 2001) at **www.ices.dk/reports/mhc/2001/E0901.pdf**
- Working Group on Ecosystem Effects of Fishing Activities (23 April–2 May 2001) at **www.ices.dk/reports/ACME/2001/acme0901.pdf**

Introduction of non-native species

If you are interested in the problem of introduced species see the following reports:

- ICES/IOC/IMO Study Group on Ballast and Other Ship Vectors (19–20 March 2001) at **www.ices.dk/reports/ACME/2001/acme0701.pdf**
- Working Group on the Introduction and Transfers of Marine Organisms (21–23 March 2001) at **www.ices.dk/reports/ACME/2001/Acme0701.pdf**

Oceanography

See reports from the following:

- Working Group on Oceanic Hydrography (19–21 March 2001) at **www.ices.dk/reports/occ/2001/WGOH01.pdf**
- Study Group on Modelling of Physical/Biological Interaction (5–7 March 2001) at **www.ices.dk/reports/occ/2001/sgpbi01.pdf**

Or for a summary of all the information arising from the oceanography groups see **www.ices.dk/reports/occ/2001/summaries-C-2001.pdf**

Fisheries

For information about individual fish stocks see the report of the Advisory Committee on Fisheries Management at **www.ices.dk/committe/acfm/acfm.htm** and go to "Reports".
Also see reports from the following:

- Study Group on the Further Development of the Precautionary Approach to Fishery Management (2–5 April 2001) at **www.ices.dk/reports/acfm/2001/sgpa/sgpa01.pdf**
- Study Group on Discard and By-catch Information (26–29 March 2001) at **www.ices.dk/reports/acfm/2001/sgdbi/SGDBI01.pdf**
- Working Group on Fishery Systems (12–15 June 2001) at **www.ices.dk/reports/rmc/2001/wgfs01.pdf**
- Study Group to Evaluate the Effects of Multispecies Interactions (20–23 March 2001) at **www.ices.dk/reports/rmc/2001/sgeemi01.pdf**
- Working Group on Fishing Technology and Fishing Behaviour (23–27 April 2001) at **www.ices.dk/reports/ftc/2001/WGFTFB01.pdf**

Mariculture

For information on mariculture see Working Group on Marine Fish Culture **www.ices.dk/reports/marc/2001/F0401.pdf**

Baltic Sea

For information on the Baltic please see the Study Group on Multispecies Predictions in the Baltic (7–11 May 2001) at **www.ices.dk/reports/btc/2001/sgmpb01.pdf**

Photo: Oxford Scientific Films

ICES Working and Study Groups cover most aspects of the marine ecosystem, from oceanography to seabirds.

Photo by Paul Kay www.marinewildlife.co.uk

PICES celebrates a decade of marine research

Respectful references to ICES were frequent at the PICES 10th Anniversary celebrations in Victoria, Canada, in October 2001 as we reflected on our scientific ancestry and recalled our growth and development since the first tentative meeting of distant cultures in Victoria in 1992. The North Pacific Marine Science Organization (the "Pacific ICES") was created by international convention to promote and to coordinate marine ecosystem research in the North Pacific Ocean. The six member countries of PICES include Canada, Japan, the People's Republic of China, the Republic of Korea, the Russian Federation, and the United States of America. The Secretariat is located at the Institute of Ocean Sciences, a Fisheries & Oceans Canada laboratory, about 1 km from the Victoria International Airport in Sidney, British Columbia.

Almost 500 scientists, including the first attendance by a group of Mexican scientists, kept the Annual Meeting hosts, Alexander Bychkov (PICES Executive Secretary) and his staff of three, juggling a diversity of scientific, business, and social activities throughout the nine day event. When the dust settled, the North Pacific Marine Science Organization was a strengthened community of scientists embarking on its second decade of scientific exploration under the leadership of its newly elected Science Board Chair, Dr R. Ian Perry of the Pacific Biological Station in Nanaimo, British Columbia.

PICES work

Much of the scientific energy of PICES is focused on understanding the interaction between climate variation and marine ecosystems. In the early 1990s, Dick Beamish and his colleagues noticed that low-frequency variability in total Pacific salmon catches was approximately in phase with low-frequency variability in the North Pacific winter climate pattern. Ideas about climate and marine ecosystem covariability were reinforced by Richard Brodeur and Dan Ware. They found a similar phasing of low-frequency variation in zooplankton biomass in the Gulf of Alaska. Anne Hollowed and Warren Wooster found similar evidence in fisheries production. These results and others like them contributed to the idea that climate may be regulating biological productivity in the North Pacific. This theme emerged in the 1990s as the first major PICES Science Program, Climate Change and Carrying Capacity (CCCC), co-sponsored with GLOBEC. Topics of common interest between PICES/GLOBEC/CCCC and the ICES/GLOBEC/Working Group on Cod and Climate Change will be explored at the ICES/CCC workshop in April 2002.

Publications

Although PICES does not publish its own journal, we have collaborated with *Progress in Oceanography* to produce three special issues since 1999. Of 12 scientific sessions convened at the recent PICES Conference, four will appear as special issues in the *Canadian Journal of Fisheries and Aquatic Sciences, Journal of Oceanography*, and *Progress in Oceanography.*

To mark our 10th anniversary, PICES commissioned historian Derek Hayes to write *An Historical Atlas of the North Pacific Ocean* (ISBN: 1570613117), which contains an abundance of antique maps and accompanying text about the historical and the scientific exploration of the North Pacific Ocean from 1500 to 2000. The book is published in Europe by the British Museum. Annual Reports, the semi-annual *PICES Press* newsletter, and the Scientific Report Series round off the published products of PICES.

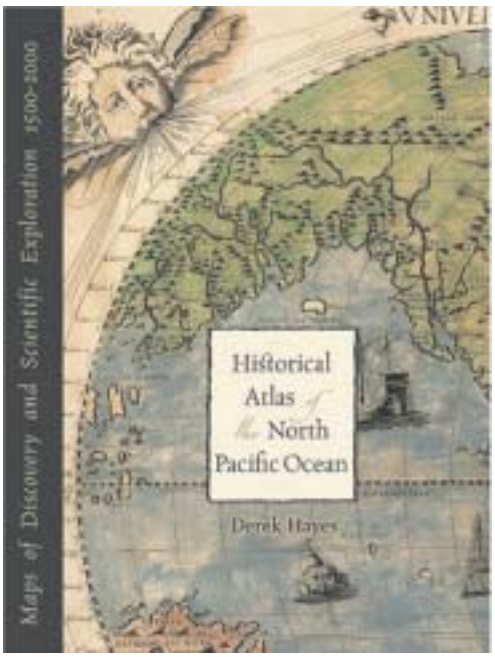

Photo by Paul Kay www.marinewildlife.co.uk

By Skip McKinnell

"MUCH OF THE SCIENTIFIC ENERGY OF PICES IS FOCUSED ON UNDERSTANDING THE INTERACTION BETWEEN CLIMATE VARIATION AND MARINE ECOSYSTEMS"

The North Pacific Marine Science Organization (PICES) celebrates its first decade. ICES President Pentti Mälkki with representatives of PICES: Assistant Executive Secretary Skip McKinnell (author), Chair Hyung-Tack Huh, and Executive Secretary Alexander Bychkov at the PICES 10th Anniversary Meeting.

Workshops

PICES, the Census of Marine Life (CoML), and the International Pacific Research Center of the University of Honolulu co-sponsored a workshop in March 2001 to examine time-series data that may be useful for understanding current and future states of marine ecosystems in the North Pacific. The results of the workshop were published as PICES *Scientific Report No. 18*. This information will be used to create the first *North Pacific Ecosystem Status Report*, a pilot project scheduled for completion in 2003. The report will provide as comprehensive a summary of variability in marine ecosystems as is possible with the available data.

A theme that has emerged from the various working groups is that the PICES region lacks many systematic observations of the North Pacific Ocean, particularly beyond the narrow coastal region. Project Argo (**www.argo.ucsd.edu/**) is expected to fill some of this void. This project has set up a global array of free-drifting floats that will measure the temperature and salinity of the upper 2000 m of the world's oceans. This will fill some of the gaps for physical oceanographers by allowing continuous monitoring of the state of the ocean. Chemical, biological, and fisheries oceanographers are also anticipating the arrival of new tools to advance their science.

The future

Looking forward to 2002 and beyond, five organizations including NPAFC[1], NASCO[2], IBSFC[3], ICES and PICES will be reviewing new information on marine mortality of salmon at a joint meeting in Vancouver, Canada, in March. PICES will be in La Paz, Mexico, in April for a symposium on oceanic transition regions. Both the GLOBEC Open Science Meeting and the PICES 11th Annual Meeting will be held in Qingdao, China, in October 2002, so the two organizations are coordinating activities to get the maximum benefit from this opportunity.

In May 2003, ICES, PICES, and GLOBEC are co-sponsoring the 3rd Zooplankton Ecology Symposium in Gijón, Spain. This will be the first formal opportunity for ICES and PICES to cooperate in the planning and implementation of a world symposium. Preliminary registrations are being accepted on the PICES Website at **www.pices.int**

Footnotes

1 North Pacific Anadromous Fish Commission **www.npafc.org**

2 North Atlantic Salmon Conservation Organization **www.nasco.org.uk**

3 International Baltic Sea Fishery Commission **www.ibsfc.org**

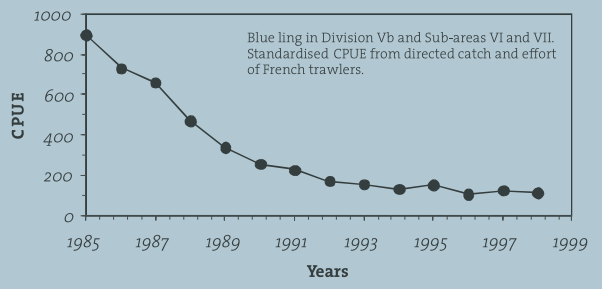

Figure 3. The steady decline in the blue ling fishery off the north and west coasts of the British Isles.

Is time running out for deep-sea fish?

Figure 1. Orange roughy is one of the slowest growing of all deep water fish and can live to be a staggering 125 years old. The stock to the west of the British Isles has decreased to very low levels.

Fisheries carried out in waters deeper than about 400 m are generally considered to be deep-sea fisheries. In recent years fishing in deep waters has increased as traditional stocks, such as cod, have declined. The target fish are often long-lived, late maturing, slow-breeding species such as the roundnose grenadier and the orange roughy (Figures 1+2). Although we still have a lot to learn about these species we know that they are particularly vulnerable to overfishing because of their slow ability to reproduce. ICES has warned that several deep-sea stocks are now heavily exploited and in some cases severely depleted. This raises the question as to whether deep-sea fisheries, at their present levels, are sustainable.

The growth of deep-sea fisheries

Some deep-sea fisheries in the ICES Area are long established, and they tend to be traditional and on a small scale, using mainly static gear such as longlines. Fisheries by factory trawlers and modern longliner fleets started in the late 1960s and early 1970s and gradually expanded the deep-sea fisheries. In the 1980s and 1990s, lost fishing opportunities in shelf waters provided further stimulus for several fleets to turn to deep-sea species to make a living.

Assessing deep-sea fish stocks

As deep-sea fisheries have increased, scientists have tried to estimate the size of deep-sea stocks and the level of fishing effort that they can support. The task of providing assessments of the state of deep-sea stocks in the ICES Area falls to the Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources (WGDEEP).

Deep-sea stocks in decline

Analysis of several of the most important deep-sea fisheries, using catch per unit effort statistics, highlights a clear declining trend. Catch per unit effort (cpue) is the fish catch taken for a given amount of fishing effort, such as tonnes per fishing day or tonnes per 1000 hooks.

- Since the 1970s, the cpue for ling and tusk has fallen by 70% in ICES Areas north and west of the British Isles.

- There is evidence of a drop in blue ling stocks. The French cpue data (Figure 3) show a decline to a low level during the period 1985–1998.

Photo: Courtesy of J. Gordon

Figure2. Roundnose grenadier, a widespread fish exploited in many ICES Subareas. The decline in cpue west of the British Isles suggests a pronounced reduction in stock size.

By Odd Aksel Bergstad, John D. M. Gordon, and Philip Large

Difficulties assessing fish stocks in the deep sea

Assessing the status of fish populations is never easy, but it is particularly difficult for deep-sea stocks. One of the major problems is the quality of the data that is available. Data on the ages of the fish that reach fish markets are normally a basic necessity for assessing fish populations. Unfortunately, age determination is difficult with many species of deep-sea fish, so this sort of data is rare. In fact, even accurate species identification may be lacking. This is particularly true for deep-sea sharks, where there are still problems caused by catches being recorded by species groups rather than as individual species. An additional concern is that reporting and information on the level of discarding of fish are poor. It is also probable that a high proportion of fish entering trawls and escaping through the meshes will subsequently die.

These problems are compounded by the fact that our understanding of deep-sea fish is still far from complete. Knowledge of aspects of their basic biology such as migration, stock identity, recruitment, growth, feeding, maturation, and reproductive capacity of most deep-sea species still lags considerably behind that of species such as cod and mackerel. All of these factors affect the quality of stock assessments, and restrict our ability to evaluate the impacts of fishing on the deep-sea ecosystem.

The need for better data

To improve the accuracy of assessments of deep-sea stocks we need to have more high-quality time-series data on catch, fishing effort, and biological characteristics on relevant spatial scales. More research on stock identity of all the target species is also of great importance. Alternative assessment strategies will also be explored, but the scope for improvement is currently limited by the lack of good time-series of data. Independent data from dedicated surveys may also become useful in the future, but at present survey data are scarce.

- The most valuable but also most vulnerable deep-sea fish considered by WGDEEP is the orange roughy. In deep water areas northwest of the UK (ICES Area VI), the cpue for this species declined quite quickly after the fishery commenced in 1991, and by 1994 it was 25% of initial catch rates. In recent years cpue has increased slightly and has stabilised. The apparent stabilisation may simply reflect the discovery and subsequent fishing of previously unexploited aggregations of fish.

- Roundnose grenadier is fished in many ICES Subareas. Assessments have only been made for areas near the Faroes and west of the British Isles (ICES Subareas Vb, VI, and VII) combined, and these suggest a strong decline in the stock size to a level below the precautionary level set by the ICES Advisory Committee on Fishery Management (ACFM).

These examples suggest that many deep-sea fish stocks are in decline and can only sustain very limited fishing pressure. In light of these concerns, ICES has suggested that there should be an immediate reduction of fishing pressure on fully exploited or overexploited deep-sea stocks. For the advice in the October 2001 ACFM report see **www.ices.dk/committe/acfm/acfm.htm** section 3.12.6.

As a final point, it is worth mentioning that not all deep-sea fisheries are unsustainable and cases of sustainable deep-sea fisheries can be found around the world. But these have tended to be either relatively minor operations or fisheries where the effort is restricted by market demand or licensing systems.

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"BY COMBINING 'LIVE' DATA WITH COMPLEX FISH AND ENVIRONMENTAL MODELS THEY ARE ABLE TO MAP FISH DISTRIBUTION IN REAL TIME IN THE GULF OF MAINE / GEORGES BANK".

Nowhere to hide – Managing fisheries in real time

Managing fish stocks in real time with forecast maps of fish distributions may sound like science fiction, but this is exactly what scientists on the east coast of the United States are developing the means to do. "Live" data are being combined with complex fish and environmental models to make experimental maps of fish distributions in near real time in the Gulf of Maine / Georges Bank area. The "live" data come from fishing boats, and in return both the fishermen and fisheries managers hope that more accurate estimates of stock abundances can be made. They believe that this will provide more opportunities to catch fish.

The system has been named Advanced Fishery Management Information System (AFMIS). It has been developed on two main principles. The first is that the distribution of fish stocks is closely related to variability in the ocean environment. The second is that forecasts of fish abundance and distribution, on time scales of days to weeks, can aid the management of multispecies fisheries. A major goal of AFMIS is to provide information for short-term management strategies such as localized area closures during spawning and/or recruitment events. The idea is that with shorter-term forecasts, fisheries management will be able to react more swiftly and effectively to major events in the fisheries. The more information we have about a fishery the better we can manage it.

What is AFMIS?

The present AFMIS system is a combination of:

(1) A pair of coupled mathematical models of the physical environment and fish distributions in the Gulf of Maine / Georges Bank region.

(2) Near real time fish and environmental data from a commercial groundfishing fleet.

(3) Information from the Regional Fisheries Application Center Data and Information System.

"A crucial part of the AFMIS system are the data provided from fishing boats".

Photo by Samfotos

How the system works

Using a composite of the previous week's satellite-derived sea surface temperature (SST) images, a Gulfstream Ring and Front Analysis (GSRFA) is produced. The GSRFA provides valuable information about deep-ocean forcing of the Georges Bank / Gulf of Maine region. This is then combined with recent bottom temperature data from the fishing fleet and integrated into a set of complex numerical models to produce a suite of nowcasts and 3-day forecasts of water circulation and property fields. As fish species are strongly dependent on environmental conditions, the resulting physical forecast fields are then used with the fish model to forecast fish distributions.

As fish do not just stay in one place, the fish model is made as realistic as possible by incorporating predictions of their movements towards their preferred environmental conditions. For example the farther fish are from their favoured temperature, the faster they swim towards it. The model also incorporates an allowance for the random searching behaviour of fish, which among other things, prevents unrealistically high concentrations of fish in the model.

Data from the fishermen

A crucial part of the AFMIS system are the data provided from fishing boats. Since November 2000, fishermen on twenty trawlers have documented fish catch and associated environmental conditions, including bottom temperature, from 4468 trawls. The fishermen are working in a partnership with SMAST[1] researchers, the New Bedford area Trawler Survival Fund, the Massachusetts Fisheries Recovery Commission, and the Massachusetts Division of Marine Fisheries to conduct a high-resolution, industry-conducted survey of the regional ground fisheries. The partnership is currently funded by NOAAs[2] National Marine Fisheries Service.

How is AFMIS being used?

A prototype AFMIS fish model currently forecasts the distributions of Atlantic cod (*Gadus morhua*) and haddock (*Melanogrammus aeglefinus*) based on forecasted distributions of model bottom temperature, sediment type, and water depth. Figure 1 shows an example of a 3-day forecast for cod (presented in terms of catch per unit effort, cpue, in pounds/day) based on model bottom temperature distribution only. Although the full Gulf of Maine / Georges Bank fish model is still being tested,

1 University of Massachusetts Dartmouth School for Marine Science and Technology (SMAST)

2 National Oceanographic and Atmospheric Administration

By Miles A. Sundermeyer

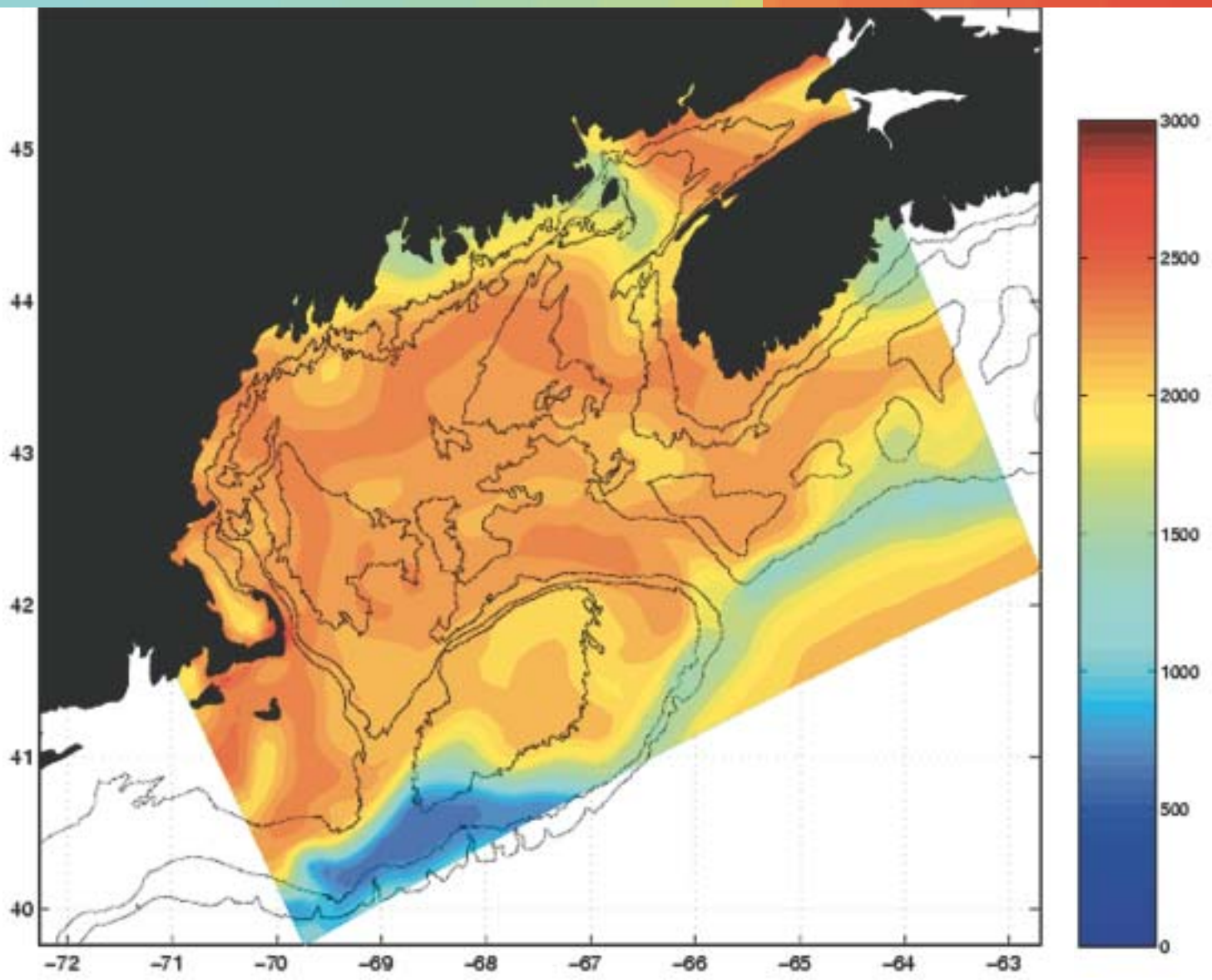

Figure 1. Fish forecasts: A 3-day model forecast of cod cpue (pounds/day) distributions in the Gulfmarine / Georges Bank based on model bottom temperature for 10 September, 2001. Red areas indicate the best spots for catching cod.

initial model runs for Georges Bank indicate that bottom temperature alone can account for up to 20% of the observed distributions of both cod and haddock.

AFMIS has been developed by scientists at the University of Massachusetts Dartmouth School for Marine Science and Technology (SMAST) and Harvard University. They have been supported by the National Aeronautics and Space Administration and the Office of Naval Research.

For further information about AFMIS please try **http://rfac.smast.umassd.edu** or contact the author:

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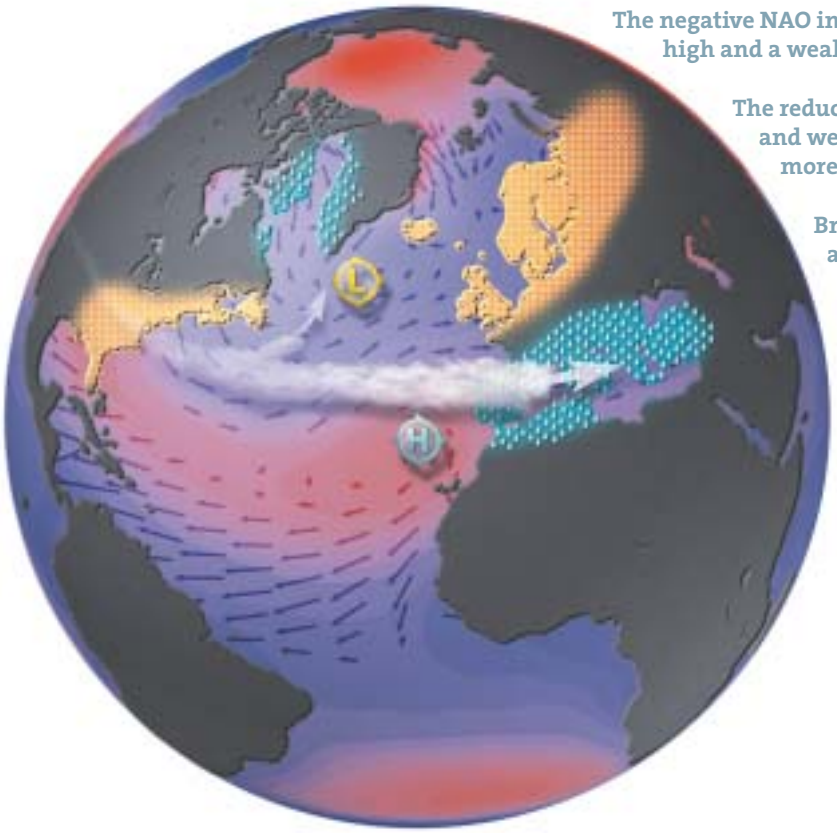
Hydrobiological changes in the ICES Area (1990-1999)

Negative NAO Index



The negative NAO index phase shows a weak subtropical high and a weak Icelandic low.

The reduced pressure gradient results in fewer and weaker winter storms crossing on a more west–eastpathway.

Brings moist air into the Mediterranean and cold air to northern Europe.

The US east coast experiences more cold air outbreaks and hence snowy weather conditions.

Greenland, however, will have milder winter temperatures.

NAO Images. Courtesy of Martin Visbeck

The ICES Symposium "Hydrobiological Variability in the ICES Area, 1990–1999" was held at the Royal College of Physicians, Edinburgh, from 8 to 10 August 2001. The Symposium attracted a full programme of 42 selected talks and 55 posters describing the variability of the plankton, fish, ocean, and atmosphere of the ICES Area during the 1990s. It was held in partnership with a one-day "Achievements Symposium" on 7 August celebrating 70 years of the Continuous Plankton Recorder Survey. Around 180 individuals participated overall, with 155 attending the Decadal meeting.

What happened in the North Atlantic in the 1990s?

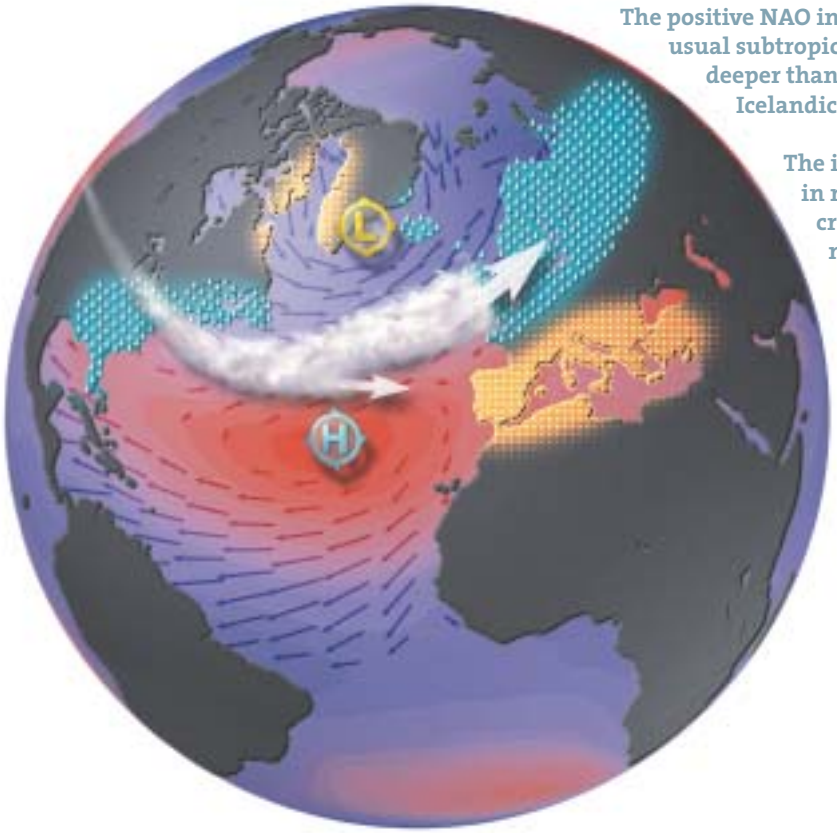
The Decade of the 1990s was a most unusual one in the climatic history of the North Atlantic owing to changes in the North Atlantic Oscillation (NAO). The NAO is the dominant mode of winter climate variability in the North Atlantic region. It is a large-scale seesaw in atmospheric mass between the subtropical high over the Azores and the polar low over Iceland.

- When the NAO is in positive phase the subtropical high-pressure centre is stronger and the Icelandic low pressure deeper. This results in warm and wet winters in Europe and in cold and dry winters in northern Canada and Greenland.
- When the NAO is in negative phase both the subtropical high and the Icelandic low are weak. This results in colder, drier winters in Europe, milder winter temperatures in Greenland, and colder conditions and more snow on the US east coast.

"DURING THE EARLY 1990S, THE NAO EVOLVED TO POSITIVE VALUES UNPRECEDENTED IN THE INSTRUMENTAL RECORD"

Co-Conveners: Bob Dickson and Jens Meincke

Positive NAO Index



The positive NAO index phase shows a stronger than usual subtropical high-pressure centre and a deeper than normal Icelandic low.

The increased pressure difference results in more and stronger winter storms crossing the Atlantic Ocean on a more northerly track.

This results in warm and wet winters in Europe and in cold and dry winters in northern Canada and Greenland.

The eastern US experiences mild and wet winter conditions.

During the early 1990s, the NAO evolved to positive values unprecedented in the instrumental record. Phil Jones of the Climate Research Unit, University of East Anglia, suggested that the recent amplification of the NAO from the 1960s to the 1990s may be unique even in proxy records of 500 years duration.

The latter part of the decade was hardly less spectacular. Following a rapid drop to extreme low-index values in the winter of 1996 (again, one of the largest year-on-year changes of record), the Azores high and Icelandic low showed a marked tendency to shift eastwards in the last winters of the decade. Such extreme patterns of NAO behaviour were associated with changes of large amplitude throughout the ocean-atmosphere system of the Atlantic. As might be expected, the ecosystem of ocean and shelf responded to these changes, as one presentation after another revealed.

It is intended that publication of the papers resulting from the Symposium will take place as soon as possible. During its meeting of January 2001, the Bureau approved the use of the *ICES Marine Science Symposia* series for this purpose.

Bob Dickson (CEFAS, Lowestoft) and Jens Meincke (IFMH, Hamburg).

For more information about the NAO please see the following Website: **www.ldeo.columbia.edu/NAO/**

Comparing the North Sea with the Caribbean?

There is widespread agreement that modern fisheries management needs to work with the marine ecosystem as a whole, rather than focusing only on species of commercial interest.

We have tried to improve our understanding of Large Marine Ecosystems (LMEs) by comparing the number of fish, birds, marine mammals, and cephalopods at each level in the food chain (or trophic level) in five different LMEs.

Large Marine Ecosystems are distinct marine areas such as the Baltic Sea or North Sea and for the study we chose the following:

- The Baltic and the Black Sea—as presumably similar brackish, temperate, and species-poor ecosystems.
- The Caribbean and the South China Sea—as examples of tropical, species-rich ecosystems.
- The North Sea—as an example of an intermediate ecosystem in the sense that it is marine, temperate, and more species-rich than the Baltic or the Black Sea.

Calculating the number of species at each level in the food chain enabled us to produce a foodweb "signature" for each group of animals. The position of each species in the food chain was worked out using either diet composition data or from reported food items using a Monte-Carlo routine (statistical simulation technique) to estimate the trophic level. If food information was not available for a given species, the average trophic level of other species in the same genus or family was assumed. Diet, food, and trophic-level data for fish can be seen in FishBase (**www.fishbase.org**).

What is a trophic level?

The trophic level indicates where the organism is in the foodweb. Primary producers such as seaweed, and other photosynthetic organisms are on the first trophic level. Organisms that consume the primary producers belong to the second trophic level; organisms that eat second trophic level organisms are considered to be third trophic level and so on. Each trophic level has approximately 10 times less biomass than the trophic level directly below it. This means that there are more fish at lower trophic levels than higher ones. However, lower trophic level fish tend to be smaller. At the top of the marine food web, i.e. trophic level 5, are predators such as killer whales and sharks.

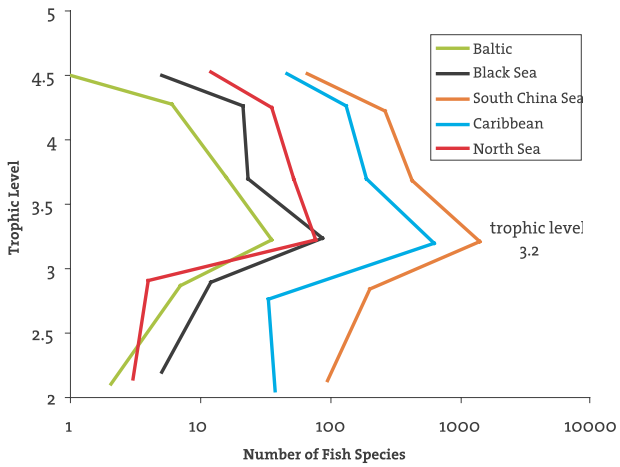


Figure 1. Foodweb signatures of fishes in five Large Marine Ecosystems. Note that all signatures have similar shapes and a maximum around trophic level 3.2.

This shows the number of fish species at each level in the food chain in the Baltic, the Black Sea, the North Sea, the Caribbean and the South China Sea, with total number of species increasing in this sequence. Despite the considerable difference between these ecosystems in terms of salinity, size, temperature, and species numbers, the signatures are strikingly similar: in all ecosystems fishes cover the whole range of levels in the food chain, from herbivores near 2.0 to top predators at above 4.5.

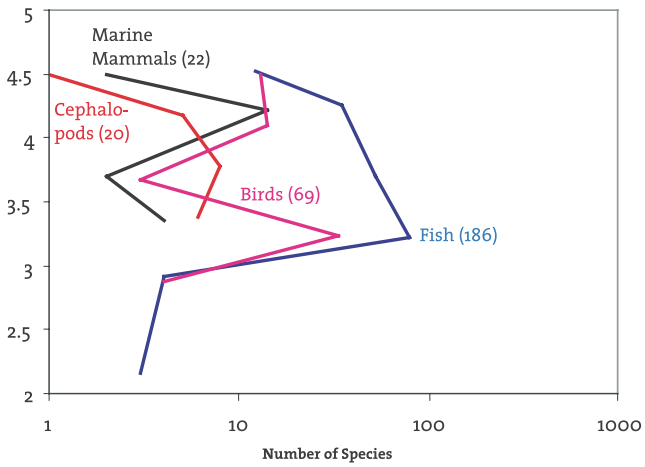
Highest species numbers are always present around the level 3.2, i.e., which is where first-level predators are feeding mainly on herbivorous organisms.

The signatures of the brackish, species-poor Baltic and Black Sea are more similar to each other than to the marine, more species-rich North Sea. The North Sea has more top predators and fewer lower-level species, thus resembling more the structure of the tropical systems.

The Caribbean signature is the only one where the lower leg is bent to the right, indicating a relatively higher number of herbivorous fishes than in the other systems.

Photo by Paul Kay www.marinewildlife.co.uk

By Rainer Froese, Uwe Piatkowski, Stefan Garthe, and Daniel Pauly



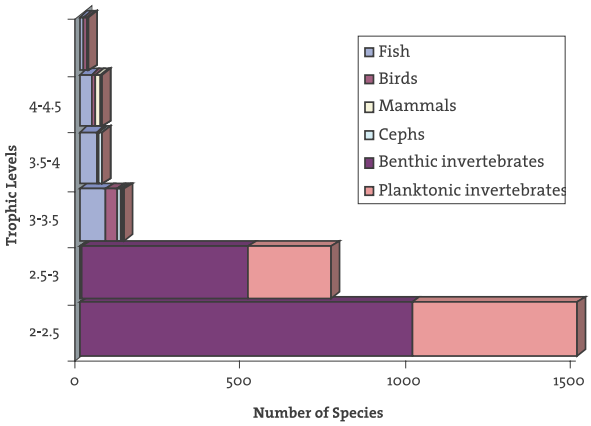


Figure 2. Number of species at each level in the food chain: for four groups of organisms in the North Sea.

This shows a comparison of the foodweb signatures of cephalopods, marine mammals, birds, and fish in the North Sea. Only birds and fish species occupy all levels of the food chain. At the higher levels, birds and fish provide similar numbers of top predators, but birds have strikingly few species of second-order predators at levels between 3.5 and 4.0, a result that needs confirmation from other ecosystems.

Cephalopods and marine mammals are restricted to the higher levels of the food chain between 3 and 5. The peak at 4.2 for marine mammals confirms their role as top predators in the North Sea. Fish clearly contribute the highest number of species above trophic level 3.

Figure 3. Numbers of North Sea species per trophic level. About 1500 benthic invertebrates and 1000 planktonic invertebrates are assumed, with most being mainly herbivores, fewer being omnivores, and very few being first-level predators.

This chart shows the total species numbers at each trophic level for the North Sea, resulting in the typical pyramid structure that is well known from biomass studies. Looking at the chart from an evolutionary perspective it becomes evident that the four groups (fish, birds, marine mammals, cephalopods) that together dominate the upper levels of the food chain are absent or exceptions at the lower trophic levels (< 3), which are dominated by large numbers of invertebrate species.

In conclusion, trophic signatures appear to be a useful tool for better understanding of the role different groups of organisms play in different ecosystems. The nearly exclusive domination of higher trophic levels by vertebrates and lower trophic levels by invertebrates is nicely shown by this approach. Trophic signatures represent long-term characteristics of ecosystems and thus cannot be used directly for year-to-year management purposes. However, we believe that they can be used to create a classification of Large Marine Ecosystems, which could then form a basis for applying similar management regimes in similar ecosystems. We are looking for partners to improve the data on the lower trophic levels, including using other methods such as isotope ratios.

For more information on Large Marine Ecosystems please see **www.edc.uri.edu/lme/data.htm** or contact:

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Photo by Paul Kay www.marinewildlife.co.uk

"CLOSER COOPERATION BETWEEN OCEANOGRAPHERS AND CAPELIN BIOLOGISTS SHOULD BE ENCOURAGED"

Capelin Symposium in Iceland

Co-Conveners Hjálmar Vilhjálmsson and James E. Carscadden

The ICES Symposium entitled "Capelin-What Are They Good For? Biology, Management, and the Ecological Role of Capelin", was held in Reykjavik, Iceland from 23 to 27 July 2001. A total of 50 scientists from Canada, Denmark, Finland, Greenland, Iceland, Norway, Russia, the United Kingdom, and the United States attended the Symposium.

In total, 44 papers were presented, distributed among the five theme sessions on Abundance Estimation, Capelin Biology and Ecology, Multispecies Interactions, Management, and Capelin as an Experimental Animal. There was also a special session, during one afternoon, to discuss the possible research approaches that might be taken in the Gulf of Alaska, using the experiences of capelin researchers from other parts of the world.

The following observations and recommendations were made:

Improving international coordination

There were several areas of future research that would benefit from better international coordination.

- All of the papers at the Symposium presented results on capelin from particular regions. It is obvious that there are both similarities and differences that would be useful to compare among capelin stocks.
- It is recommended that an ageing workshop be organized to standardize ageing of capelin. Comparative studies among regions have not been undertaken for at least 30 years and with the increase in research on Alaskan capelin, now would be a good time to hold a workshop.
- Before directed research on Alaskan capelin is initiated, a workshop should be convened to examine the capelin data available from that area. In addition, other information such as oceanographic data for the area should also be examined. It is recommended that capelin experts from other regions participate in this workshop to offer advice on survey planning.

These three activities could be convened in workshop settings under the joint auspices of ICES and PICES (North Pacific Marine Science Organization).

Capelin in the Atlantic and Pacific a separate species?

Data presented at the Symposium suggest that capelin in the Pacific and Atlantic may be separate species (the paper has not yet been published). It is recommended that a study of capelin genetics be completed to clarify relationships among stocks. Capelin have been examined from most major stocks but they also occur between major stocks (e.g., Canadian and Russian Arctic) and the genetics of these capelin should be examined.

".....THESE LITTLE FISH WHICH ARE SO IMPORTANT FOR MARINE ECOSYSTEMS"

Greater cooperation between oceanographers and biologists

Overviews of climate in each region were missing from the Symposium. Closer cooperation between oceanographers and capelin biologists should be encouraged.

Capelin study areas

Because capelin are so important in the ecosystem it might be useful to consider setting up several small study areas where the role of capelin could be studied on a comparative basis. Areas such as the Laurentian Channel and around bird-breeding islands might be considered.

Finally

All the participants felt that the Symposium was especially useful for building up contacts with fellow capelin researchers. The ties formed will no doubt be a very important stepping stone for cooperation in future studies of these little fish which are so important for marine ecosystems.

For more information please contact Hjálmar Vilhjálmsson at:

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Top photo: Sten I. Siikavuopio, Norwegian Institute of Fisheries and Aquaculture Ltd.
Capelin photo: Norwegian Seafood Export Council. www.seafood.no

Future Symposia

2002

ICES Symposium on "Acoustics in Fisheries and Aquatic Ecology": Montpellier, France, 10–14 June 2002. Co-Conveners: Dr F. Gerlotto (France) and Dr J. Massé (France). Co-sponsors: Acoustical Society of America (ASA), UK Institute of Acoustics (IOA), National Marine Fisheries Service (NMFS), Société Française d'Acoustique (SFA)
www.ifremer.fr/sympafae/

NAFO/CSIRO Symposium on "Elasmobranch Fisheries: Managing for Sustainable Use and Biodiversity Conservation" (co-sponsored by ICES): Spain (venue to be announced by NAFO), 11–13 September 2002. Co-Conveners: David Kulka (NAFO, Canada) as Organiser, and Mike Pawson (for Paddy Walker, Chair SGEF, ICES), Jack Musick (VIMS, USA), and Terry Walker (MFRI, Australia)
www.ices.dk/symposia/

A Joint meeting on "Causes of Marine Mortality of Salmon in the North Pacific and North Atlantic Oceans and in the Baltic Sea": Vancouver, Canada, 14-15 March 2002. Co-sponsors: IBSFC, ICES, NASCO, NPAFC and PICES.
www.npafc.org/

2003

ICES Symposium on "Fish Behaviour in Exploited Ecosystem Operations": Bergen, Norway, June 2003. Co-Conveners: Å. Bjordal (Norway) and S. Walsh (Canada).

ICES/PICES/GLOBEC Symposium on "The Role of Zooplankton in Global Ecosystem Dynamics: Comparative Studies from World Oceans": Gijon, Spain, 21–23 May 2003. Co-Conveners: Roger Harris (GLOBEC-UK), Tsutomu Ikeda (PICES-Japan), and Luis Valdés (ICES-Spain).

Finding out about fish with FishBase

FishBase is a large database with key information on all fishes of the world, available on the Internet at **www.fishbase.org**. The Website attracts over 2 million hits per month, demonstrating the huge public interest in fish.

FishBase data are updated monthly, and new features are added frequently. For example, attached to every species summary page is a "Key Facts" page that estimates a variety of life history parameters from "best" values drawn from the database.

Users can change these default values and recalculate, e.g., growth, generation time, or mortality, thus using the Key Facts page as a kind of "population dynamics pocket calculator". Other new features can be found in the "Information by Topic" section of the search page, such as fish sounds, short videos, or the Top 100 species most viewed in FishBase. Not surprisingly, cod, carp, and rainbow trout hold the first three places in the Top 100.

FishBase is supported by a consortium of seven institutions including IfM, Kiel; FAO, Rome; ICLARM, Penang; MRAC, Tervuren; NRM, Stockholm; MNHN, Paris and FC-UBC, Vancouver. FishBase coordinator Rainer Froese encourages colleagues to send relevant reprints, photos, and comments to FishBase to help keep it up to date.

Latest ICES publications

For a quick guide and ordering information for ICES publications, including the *ICES Journal of Marine Science*, ICES ASC papers, occasional monographs, and other series, including some issued in electronic formats, please see: **www.ices.dk/pubs/pubs.htm**. Orders may be posted or faxed to the ICES Secretariat or placed by e-mail: **info@ices.dk.** (Prices in Danish kroner, DKK, plus postage and handling).

The most recent publications and those scheduled for release in early 2002 include:

ICES Identification Leaflets for Plankton (DKK 75 per number)
No. 186. Decapoda: Larvae. II. Dendrobranchiata;
No. 187. Numerical and Taxonomic Index of ICES Plankton Identification Leaflets, 1939–2001.

ICES Techniques in Marine Environmental Sciences (DKK 70 per number)
No. 28. Biological effects of contaminants: Sediment bioassay with *Corophium volutator;*
No. 29. Biological effects of contaminants: Sediment bioassay with *Arenicola marina;*
No. 30. Chlorophyll a: Measurement in seawater samples, and Spectrophoscopic determination;
No. 31. Biological effects of contaminants: Radioimmunoassay (RIA) and enzyme-linked (ELISA) techniques for the measurement of marine fish vitellogenins.

ICES Marine Science Symposia (proceedings published in the *ICES Journal of Marine Science*)
No. 213. Environmental Effects of Mariculture. IJMS Vol. 58(2). (DKK 340);
No. 214. Recruitment Dynamics of Exploited Marine Populations: Physical–Biological Interactions. Part 2. IJMS Vol. 58(5). (DKK 360).

Latest ICES publications continued....

ICES Cooperative Research Report(s)
(prices to be announced)
No. 245. The Annual ICES Ocean Climate Status Summary 2000/2001;
No. 246. Report of the ICES Advisory Committee on Fishery Management, 2001;
No. 247. Effects of Extraction of Marine Sediments on the Marine Ecosystem.

In addition to the series above, *The ICES Strategic Plan*, in the final version approved by national Delegates in October 2001, has just been issued as a bilingual English/French publication. A limited number of copies are available. To request one please write to the ICES Secretariat or e-mail: info@ices.dk

Celebrating of eighty years of marine fishery research in Poland

Poland's biggest marine laboratory recently celebrated its 80th Anniversary in June 2001. The Sea Fisheries Institute (MIR), in Gdynia, was originally founded on 21 June 1921. It has a large complement of 77 scientists and technicians who work in four key areas: fishery biology and oceanography, marine ecology, fish processing technologies, and fishery economics. The Institute's varied practical programme is undertaken using a 41 m stern trawler, the RV "Baltica".

To celebrate the 80th Anniversary, a special Symposium entitled "Variability of the Baltic Sea Environment and Living Resources: Responses to Climate Change and Anthropogenic Pressure" was held in Gdynia, 22–23 June 2001. **www.mir.gdynia.pl**

Over 80 scientists from 11 countries participated in the Symposium and selected papers will be published in the MIR journal, the Bulletin of the Sea Fisheries Institute.

For further information about publications from the Symposium please contact:
Tomasz Linkowski
Managing Director
Sea Fisheries Institute
Kollataja Str 1
81-332 Gdynia
Poland
E-mail: **tlink@mir.gdynia.pl**

ICES workshops in 2002

Workshop on the Transport of Cod Larvae.

Co-Chairs: J. Quinlan (USA), B. Aadlandsvik (Norway) and M. St. John (Germany). This will be held in Hillerød, Denmark from 14–17 April 2002. The aims of the workshop will be to:

- Couple circulation models with early life history models to determine the physical and biological processes responsible for the transport or retention of cod larvae;
- Develop, if possible, interannual transport indices based on physical variables that reflect the magnitude of the larvae drift or retention;
- Attempt to incorporate these indices into the cod assessment process;
- Collate and synthesize existing direct and indirect observational information about egg and larval transport for all stocks and years. Direct information is egg and larvae surveys while indirect information includes unusual distribution and migration in later life, elemental analysis of otoliths, genetic identification, and meristic characters; and
- Evaluate the effects of variations in transport during early life on subsequent recruitment.

Workshop on Multispecies Virtual Population Analysis

(MSVPA) in the North Sea. Co-Chairs: M. Vinther, (Denmark) and C.M. O'Brien, (UK). This will be held in Charlottenlund, Denmark from 8–12 April 2002. The aims of the workshop will be to:

- Update the MSVPA quarterly database to include data up to 2000;
- Produce a new key run of MSVPA for the North Sea using the updated data; and
- Define a programme of work and Terms of Reference for two meetings of a study group on the future direction of multispecies work in the North Sea in order to maintain ICES' capability to give multi-species advice.

Workshop on New Perspectives in Understanding and Predicting Eutrophication

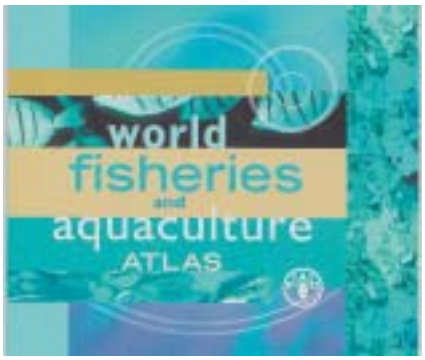
Chair: T Smayda, (USA), R. G. Jak, (Netherlands) and D. Mills, (UK). This will be held in The Hague, Netherlands from 11–13 March 2002. The aims of the workshop will be to:

- Identify the underlying mechanisms that limit understanding and hinder robust predictions of the ecosystem response to nutrient inputs;
- Review the sources of anthro pogenic nutrient inputs, their nature and characteristics of their mode of delivery;
- Consider selected case studies from around the world to illustrate the range of responses exhibited by the pelagic community to nutrient inputs; and

- Evaluate the potential importance of cellular level mediated responses to nutrient input as opposed to population or community level responses.

For further information about these workshops please contact **info@ices.dk**

All the world's fisheries and aquaculture on a single CD-ROM!



FAO has recently produced a CD-ROM containing a comprehensive review of both capture and aquaculture fisheries around the world. It covers all aspects of fisheries, with information on development, ecosystems, governance, research, resources, statistics, technology, trade, and utilization. It also identifies the broad range of policy and other strategic issues affecting fisheries, describing actions required or already taken and the outlook for the future.

The CD contains links to other documents and Websites, providing a network of easily accessible and updated material. It will be updated and published every two years for distribution at the biennial meeting of the FAO Committee on Fisheries. If you would like to get a copy, please see **www.fao.org/fi/**

Free copies of the ICES Journal of Marine Science!

Academic Press are giving away free sample copies of the ICES Journal of Marine Science. If you would like a copy please contact them at **sample_issues@harcourt.com**

The *ICES Journal of Marine Science* publishes articles, short communications, and critical reviews that contribute to our scientific understanding of marine systems and the impact of human activities. The Journal serves as a foundation for scientific advice across the broad spectrum of management and conservation issues related to the marine environment. Oceanography, marine habitats, living resources, and related management topics constitute the key elements of papers eligible for publication. Integrated studies that bridge gaps between traditional disciplines are particularly welcome.

For more information about the *ICES Journal of Marine Science* please see: **www.academicpress.com/icesjms** or **www.ices.dk/pubs/**

FAO sets up new global forum on aquaculture

FAO has recently established a new Sub-Committee on Aquaculture, which will report to the Committee on Fisheries. The main aims for the Sub-Committee are to:

- Provide a forum for consultation and discussion of aquaculture;
- Identify and discuss major issues and trends in global aquaculture development;
- Determine those issues and trends of international importance requiring action to increase the sustainable contribution of aquaculture to food security, economic development and reducing poverty;
- Recommend international action to address aquaculture development needs;
- Advise on preparation of technical reviews and issues and trends of international significance; and
- Advise on specific matters relating to aquaculture.

The first session of the Aquaculture Committee will take place in Beijing, 18–22 April 2002. For further information please see **www.fao.org/fi/**

ICES Conference documents now on CD-ROM

By Harry Dooley

Past participants at ICES Statutory Meetings and Annual Science Conferences (ASC) will remember the famed "Documents' Room" which was the collection point for the 1000 or more documents that were the foundation of ICES meetings. Some of these documents exceeded 1000 pages and with two hundred copies of each of them, the "Documents' Room" was large, to say the least.

→

BULLETIN BOARD 3

ICES Conference...continued

→ However, at this year's Annual Science Conference in Oslo, the "Documents' Room" shrank significantly because participants received all the necessary information on two CD-ROMS. One was a complete version of all of the 2000 CM documents, including all Working Group Reports, ASC documents and the 2000 *ICES Annual Report*.

The other CD-ROM was a preliminary version of the 2001 CM documents, which includes most of the 2001 Working Group reports and the 2001 ASC documents. The final version of this CD-ROM will be published next year after the completion of the 2001 *ICES Annual Report*. It will be available free of charge and will be distributed to all libraries at marine institutes in the ICES Member Countries. If you would like to register for a copy please contact **info@ices.dk**

Bluefin Tuna Symposium

The international Symposium **"Domestication of the Bluefin Tuna,** *Thunnus thynnus;* **Strategies for European Development in the Context of a Global Market"** will be held on the 3–8 of February 2002, at the Campus of the University of Cartagena, Murcia, Spain. The Symposium will include topics such as fisheries and aquaculture biology, socio-economic development and environmental issues. There will also be field trips to bluefin tuna farms and packing plants in the Murcia coastal area.

The meeting is organized under the framework of the FP5 Quality of Life Program as an Accompanying Measures Event. Other sponsoring organizations are: The Spanish Institute of Oceanography (IEO), the Polytechnic University of Cartagena, The Marine Policy Center (MPC), Woods Hole Oceanographic Institution (WHOI) USA, IFREMER France, Spanish BFT Farmers Association (ASETUN) and others.

Registration will be limited to 200–250 participants. For more information and registration, please visit the Symposium web page **http://193.146.187.190/thunnus/** or write to the E-mail address: **congreso.atun@mu.ieo.es**

A warm welcome to Peru!

Peru is the latest country to officially join ICES as a scientific observer. Scientific observer countries are non-member countries of ICES who receive observer rights in accordance with established procedures. There are now six countries with scientific observer status. These are Australia, Chile, Greece, New Zealand, South Africa and Peru. The observer status is implemented through a named institute in each of these countries.

ICES Centenary in Copenhagen 2002

Next years Annual Science Conference will be in Copenhagen (1–5 October 2002) and will be a celebration of 100 years of ICES. The format of the conference will be the same as in recent years with an Open Lecture, two Invited Lectures and 16 Theme Sessions, which have been grouped into four main themes. These are as follows:

1. Ocean Observation (including research vessel use, acoustic and optical survey techniques, Census of Marine Life, and seamount ecology);

2. Ocean Processes and their Influence on Living Marine Resources (including trophic interactions, responses to climate variability, shelf sea processed, and ocean-shelf interactions);

3. Aquaculture: New Trends and Developments (including juvenile fish cultivation, salmon/mariculture interactions, and genetics); and

4. Interactions of Humans with Marine Ecosystems (including unaccounted mortality, fishery and environmental management, biological effects of contaminants, and genetic composition).

In addition, there will be a special Centenary day (Friday 4 October), which will be devoted to celebrating one hundred years of ICES. There will also be a workshop on research vessels, which will be held close to Copenhagen harbour where a flotilla of research vessels from ICES Member Countries will be berthed for the Centenary celebrations.

Further information will shortly be available at **www.ices.dk/asc/2002**

Katherine Richardson becomes Pro-Rector at the University of Aarhus

Katherine Richardson has a long history of involvement with ICES and was Chair of ACME (Advisory Committee on the Marine Environment) from 1992 to 1995. She left the Danish Institute for Fisheries Research in 1998 to become Professor in Biological Oceanography at the University of Aarhus, Denmark. She has now been elected Pro-Rector (Vice President) of the University starting 1 February 2002. She continues, through her research, to have many contacts with the ICES scientific community and has participated in several ICES Symposia and a Council Working Group in recent years.

By Inger Lützhøft

Retirement

Since the June issue of this newsletter the ICES Secretariat has said farewell to Gill Post, who has retired after having worked in the Secretariat since January 1982. We are all going to miss her smiling face!

Baby boom

This year we have had a baby boom. Else Juul Green (Assistant, SCRAP): gave birth to a girl (Ellen) on 27 April, and our Receptionist, Marie Behn, had her baby-boy (Anders) on 14 September. During her maternity leave the ICES Reception is being run by cheerful Myung Fernando. And finally on 5 October, Henrik Larsen, Office Assistant, became the proud father of a son (Søren).

25 years at ICES

On 1 November Janet Pawlak, Environment Adviser, celebrated her 25th jubilee with ICES. A month later on 1 December, Wim Panhorst, IT Manager, also celebrated his 25th jubilee with ICES. Last but by no means least, is Maria Zarecki, Senior Assistant, Fisheries, celebrating her 25th jubilee with ICES in January 2001.

Photo by Erling Svensen (www.marinbi.com)