

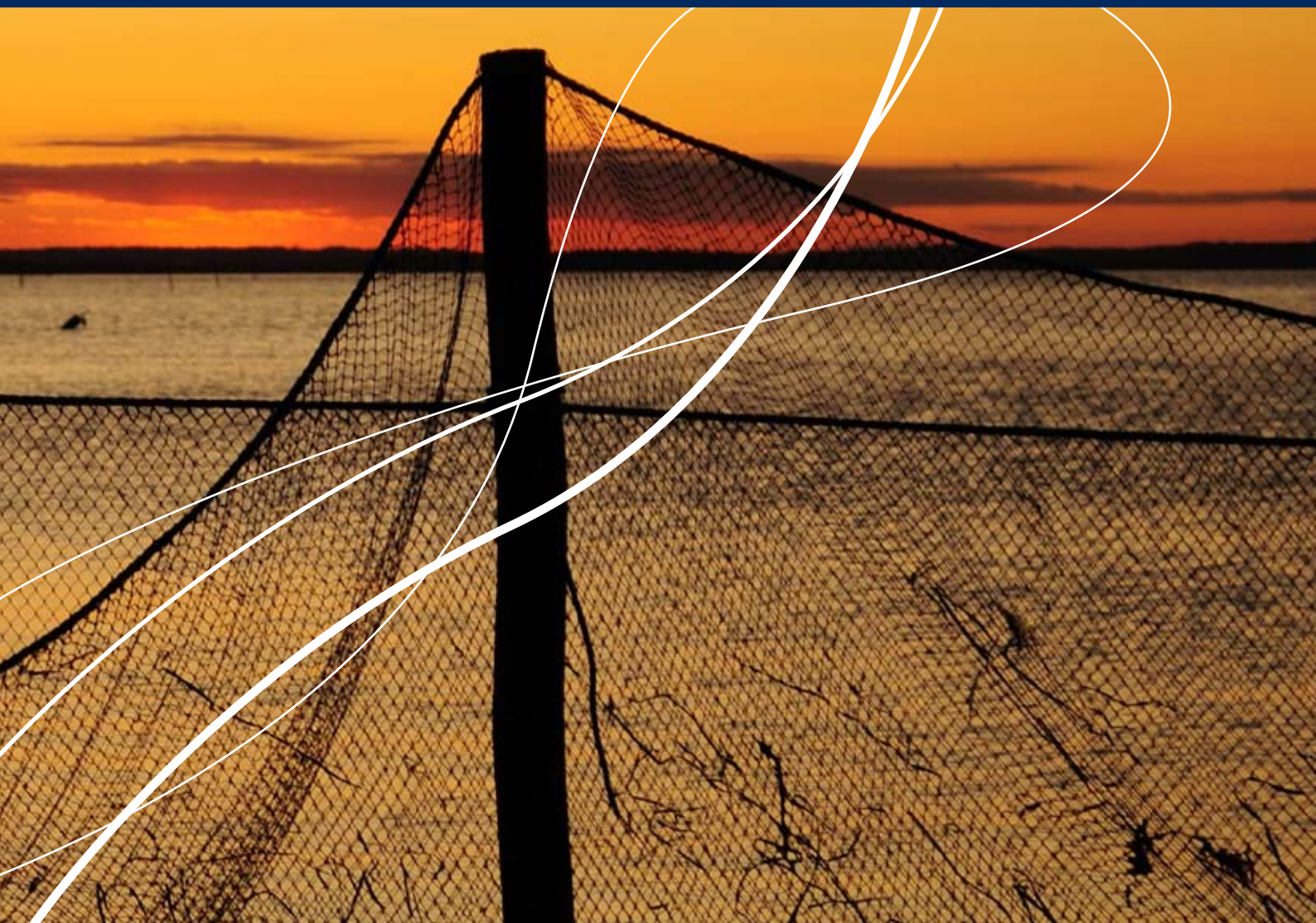


ICES
CIEM

International Council for
the Exploration of the Sea

Conseil International pour
l'Exploration de la Mer

ANNUAL REPORT 2009



ANNUAL REPORT 2009



The RV “Dana”, the largest research vessel belonging to the Technical University of Denmark, National Institute of Aquatic Resources (DTU-Aqua), in Godthåb fjord, West Greenland, 2008.

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WELCOME!

A few words from the General Secretary

Change is difficult. It takes patience and persistence to achieve something new, especially in the face of human nature, which encourages us to maintain the status quo. Change, however, is necessary if an organization wants to improve and grow.

With this in mind, I offer my sincere thanks to all of the members of the ICES family who have worked to achieve the radical transformation of the Advice and Science programmes over the past years. One of ICES greatest strengths is its ability to remain responsive to an ever-changing environment and still maintain its stability and essential purpose.

The new structure and working procedures of the Advisory Committee (ACOM) became fully operational during the year, and despite an increasing workload caused by the new timing of advice and a large number of special requests, the advice was produced and published in due time, and all major goals were achieved. The selection process for the new Head of Advisory Services was successfully concluded, and Poul Degnbol started in his new position on 1 March 2010. The success of the new Advisory structure was confirmed by the positive feedback we have received from DG Mare and other partner organizations.

The Science Committee (SCICOM) developed the new Science structure, which was approved by Council in October. Five Steering Groups and four Business Groups were established to replace the Science Committees that existed formerly under the Consultative Committee. The new Groups had their first business meeting during

the Annual Science Conference (ASC) in September. At this meeting the new SCICOM Chair, Manuel Barange (UK) was elected, and his appointment was confirmed later by Council. Manuel started in his chairmanship on 1 January 2010 for a term of three years.

As usual, the highlight of the Science Programme was the ASC, which took place in Berlin, Germany. The conference was a great success thanks to excellent scientific contributions, an exceptional venue, and the local hosts' extraordinary engagement.

A major initiative anchored in the Science Programme was the further development of ICES involvement in the European marine science coordination structures. The Head of Science and the Professional Secretary for Scientific Cooperation coordinated a pan-European proposal for scientific cooperation and coordination (MARCOM+). With this initiative, ICES is in the driver's seat of the development of new structures for an overarching European marine and maritime science cooperation.

The ICES publications group was active as usual, and some outstanding achievements are worth mentioning: The number of *ICES Cooperative Research Reports* reached another record high, and this series is now continuously in the first line of ICES outreach material, with excellent layout and printing standards, and high-level science from the ICES network. The new online information product called *ICES Inside Out* has established itself and is very positively received by nearly 600 active subscribers.

The Data Centre workplan was restructured and simplified into six core activities. The Centre increased its focus on GIS (geographical information systems), and the first version of the ICES GIS Portal will be available in 2010.

A major task for the Data Centre in 2009 was to ensure greater harmonization, cooperation, and collaboration with a number of large European and international initiatives (EcoSystemData, EurOBIS and OBIS, EMODNET). The Centre contributed to the IOC/ IODE work on standards and, through participation in SeaDataNet, worked closely with a number of our partner institutes to redefine governance procedures for platform (ship). Through OBIS, the Data Centre also came in contact with the Global Biodiversity Information Facility (GBIF).

The structures and procedures that were unknown a few years ago are now familiar, and we look forward to developing and refining them further in the coming years. As always, we hope to hear your comments and suggestions about how we can make the Secretariat and its work even more responsive to the needs of the ICES community.

Dr Gerd Hubold

A bit of coastline at Rockland, Maine, USA.



SECRETARIAT ADMINISTRATION AND SUPPORT ACTIVITIES

During the year, representatives of the Secretariat participated in and contributed to several national and international meetings, and as usual, logistic and secretarial support was provided for many expert group meetings. In 2009, 1472 participants attended 89 in-house meetings for a total of 5878 person days. As a consequence of the large number of meetings in the building, the meeting facilities in the Headquarters were further improved, and repairs were organized during quieter times over the year.

Raising public awareness of ICES science and advisory activities was high on the agenda. Presentations on ICES were given to visitors and at external meetings.

In response to the changes in the ICES programmes and tasks, a business manager was employed to meet the increased demand for financial control caused by external contracts and non-recurring advisory activities. The business manager started to develop new tools for the project administration.

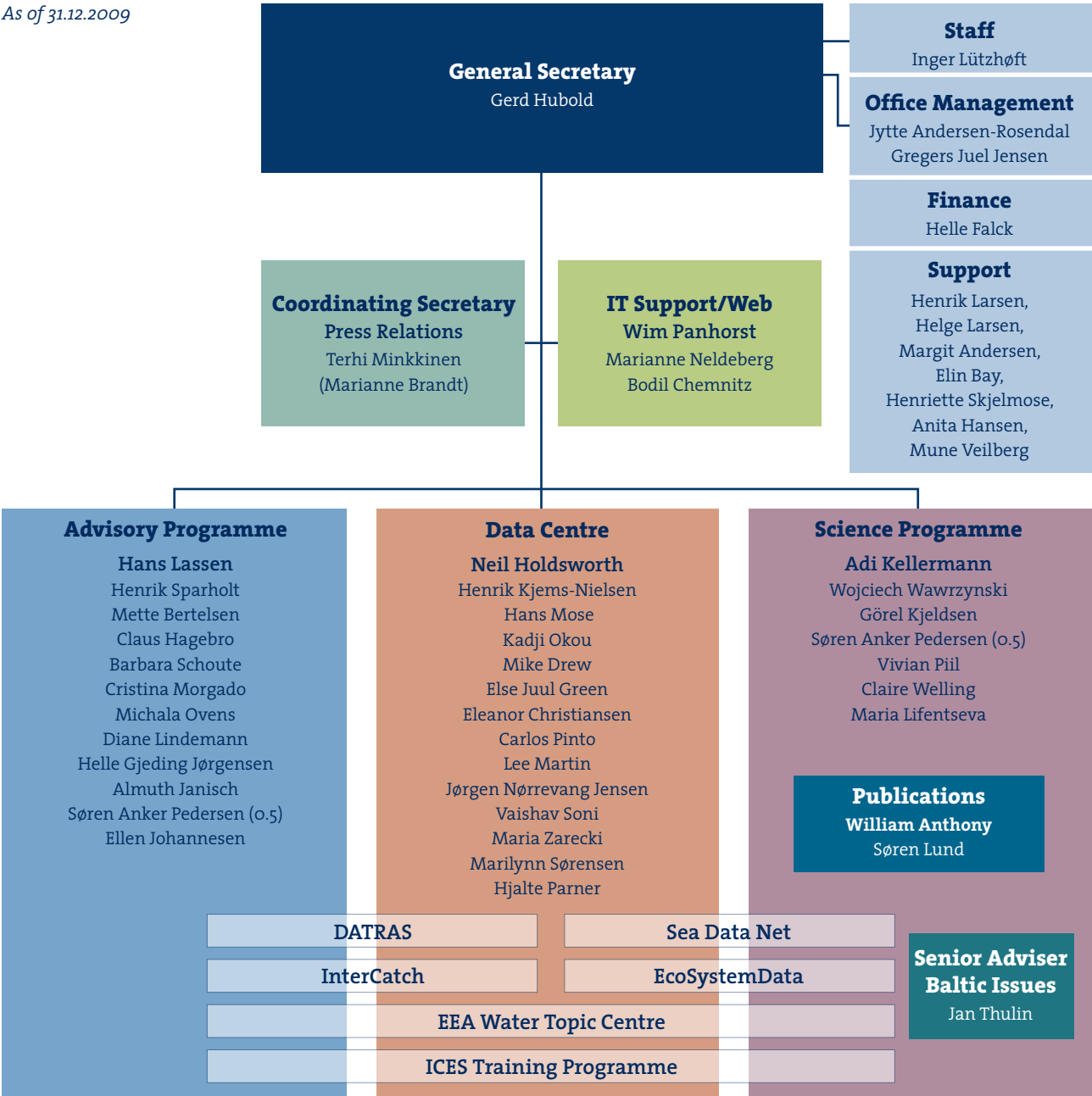
The new Science Committee met in January, May, and September. The Bureau met in February, June, September, and October. The 97th Statutory Meeting of the ICES Council was held in Copenhagen 21 and 22 October. The Finance Committee met in June and October to prepare the budgets. The annual meeting of ACOM, originally scheduled to be held in Copenhagen, was moved to Lisbon to avoid the congestion created by the COP15 meeting in December.

The Secretariat contributed an article to the official COP15 conference document summarizing ICES work on climate change, "Investigating Marine Ecosystem Links to Climate Change". It is available online at <http://www.rtcc.org/2010/html/ices.html> along with the entire COP15 document, "RTCC Responding to Climate Change 2010", which was printed in an edition of 15 000 copies and distributed on a CD-ROM to all COP15 participants. ICES was also represented at "Oceans Day", a side event of the main programme, with a poster on "Sustaining the World's Large Marine Ecosystems During Climate Warming", created in cooperation with the National Oceanic and Atmospheric Administration (NOAA).

Memoranda of Understanding with the partner organizations continued in force during 2009, and collaboration with these partners was actively developed, e.g. through the MICC meeting, ICES participation in RAC and European Fisheries and Aquaculture Research Organisation (EFARO) meetings, and bilateral contacts through the new Advisory Services.

The Secretariat was engaged in many projects involving scientific cooperation on an international basis. Work included, among others, participation in the PICES annual conference, strengthening of links with the EurOceans network, meetings of ERANETS, and the MARCOM+ partnership. The European maritime policy processes have called for further contributions from the scientific community for coordination and prioritization of science. ICES took a proactive role in fostering the coordination process by taking the lead in the Aberdeen+ Group and by coordinating the MARCOM+ project proposal submission. The Secretariat cooperated with national and international programmes and projects such as FIMPAS (NL), KNOWSEAS, UNCOVER (FP7 projects), PINRO (Russia), HELCOM MariFish, BONUS EEIG, an EC Twinning Project with Turkey, and others.

As of 31.12.2009



ADVISORY SERVICES

ICES Advisory Services continued to evolve in response to Council decisions made in October 2007 and February 2008. Advisory Services met its objective, and almost all advice was delivered on time.

Four benchmark workshops for fish stock assessments were held. Topics included selected roundfish stocks, selected flatfish stocks, underwater TV surveys for *Nephrops*, and selected short-lived species.

ICES worked with EC DG Environment and EC Joint Research Centre preparing scientific input to implement the EU Marine Strategy Framework Directive. Also, the ICES Secretariat worked with EC DG MARE on evaluating the national eel management plans developed in response to the EU Eel Regulation.

The Advisory Committee (ACOM) conducted two important workshops towards the end of 2009. The first reviewed the form of the ICES fishery advice, and ACOM adopted the proposal from the workshop on a framework to provide advice within the MSY framework. The second workshop concerned the format of the advisory report. The workshop proposed a change in the format, for implementation in 2010 and 2011. ACOM leadership will work further on these two important ACOM decisions.

ACOM discussed three initiatives with SCICOM: spatial planning and coastal-zone management, biodiversity, and fish-stock assessment methodology. These will be taken forwards jointly in 2010.

Many requests for advice were received in addition to the requests identified in the workplan, as approved by ACOM in December 2008. These requests are absorbing

an increasing portion of the time available, particularly because some of the requests are contentious and deadlines are often tight. To cope with the increasing number and diversity of requests, ACOM has created a flexible portfolio of advisory services in addition to the traditional type of advice.

The demand for fishery advice dominates the work of the Advisory Services. Demand for non-fishery related advice is unchanged or decreasing (especially for the Baltic Sea). Little progress has been made integrating advice. At least one major user of Advisory Services seeks advice that integrates economic and social considerations with fishery and ecosystem considerations.

Presentation of the advice (e.g. to commissions, RACs, industry groups, NGOs, and other interest groups) is a significant part of the workload. ICES Advisory Services was represented at approximately 15 meetings with stakeholders in the past year.

An analysis of the workload can be summarized as follows.

- In all, 67 expert groups and approximately 40 review groups and advice drafting groups (ADGs) took part in drafting advice.
- They met for approximately 425 meeting days.
- The estimated cost based on salary, preparation time, and overhead totalled approximately €10 million.

The 2009 workplan was well-developed at the beginning of the year, and the groups carrying out advisory processes (i.e. expert groups, review groups, ADGs, ACOM leadership, and the Secretariat staff members) are becoming comfortable in their new roles. Most ADGs were chaired by ACOM members. A Vice-Chair “shadows” each ADG and chairs web conferences to approve advice. This approach spreads the workload more evenly while helping to maintain consistency, and it provides a backup in case an ACOM member is unable to fulfil the role as ADG chair.

ACOM approved an Advice Plan, under the umbrella of the *ICES Strategic Plan*, designed to address six critical themes. Each theme is associated with a high-level objective. (See the table below.)

THEME	OBJECTIVE
1. Data	Access to more and better data to fulfil advisory needs
2. Human resources	A scientific community with enhanced capability to contribute to advice
3. Integration	Integrated advice based on advances in scientific knowledge and ecosystem considerations
4. User needs	Responsiveness to the evolving needs of advice users
5. Credibility	Advice that has earned and enjoys a high degree of credibility
6. Planning	Expectations for advice harmonized with human and fiscal resource constraints

The objectives focus on accomplishments, but the key to a successful strategy is the priority activities that will actually result in the attainment of the objectives.

Advisory Services faces some important challenges. The workload is tremendous and increasing. It is difficult to manage the workload because no one has authority over all of the resources (most notably human resources) needed to produce advisory services, and clients do not pay the true cost of the services they request.

The political and policy environment in which Advisory Services operates is becoming more complex and contentious. The increasing dominance of competitive funding at the European level undermines ICES tradition of international cooperation, and it impedes the transition of research into advisory processes.

On the ICES Annual Report 2009 Supplementary DVD

The following report related to Advisory Services can be found under the heading Advisory Committee:

• 7–10 December Report 2009

SCIENCE PROGRAMME

It was a good year for the Science Programme (SCIPRO), especially in the ever-growing area of developing ICES relationships with other international organizations. ICES re-entry onto several of the global stages from which it has been absent has led to an improved perception of ICES in an international context. The success of ICES proposal to take a leading role in the MARCOM+ project is a further example of that success.

Also of note are the further development of the ICES Training programme, the record number of publications produced by the ICES publications group, and another successful edition of ICES Annual Science Conference (ASC). The development of the new Science Committee (SCICOM) is considered at length starting on page 16.

International cooperation: a few highlights

A PICES co-sponsored theme session at the ASC 2009 was another instance of the ongoing cooperation between ICES and PICES. In addition, two ICES theme session conveners and three ICES keynote speakers, including the First Vice-President attended the PICES 2009 Annual Meeting. There were four jointly co-sponsored symposia in 2009 (see *ICES Symposia* on page 14). Plans are afoot to establish a joint working group on ICES SCICOM/PICES Science Board level to additionally intensify strategic cooperation.

Cooperation with ESF Marine Board during 2008 and 2009 yielded progress and agreement on the final report of the ESF/EFARO/ICES Working Group on EAM science foundations, which considers the question, What science is required to implement the ecosystem approach?

Cooperation with the Scientific Committee on Oceanic Research (SCOR) was intensified during the “Third SCOR Summit of International Marine Research Projects”. As in earlier years, ICES was invited to review SCOR proposals for working groups, and SCICOM decided to support the SCOR WG 137 “Patterns of Phytoplankton Dynamics in Coastal Ecosystems: Comparative Analysis of Time Series Observation”, resources permitting. As a follow-up, the SCOR President visited ICES Secretariat.

ICES was invited to join the Core User Group (CUG) of MyOcean. The CUG is an advisory body representing MyOcean users at every level of the project. Its role is to express MyOcean users’ views at the board level, organize users’ consultation on strategic issues when necessary (e.g. data policy), and offer recommendations. MyOcean is the (EC-FP7 co-funded) implementation project of the GMES Marine Core Service, aimed at deploying the first concerted and integrated pan-European capacity for ocean monitoring and forecasting. During 2009–2011, MyOcean will lead the establishment of this new European service, built on past investments in R&D, system development, and international collaborations. The project phase and funding is intended to result in a permanent observation system in Europe.

At the invitation of the European Commission, ICES discussed ways and means of intensifying cooperation for identifying and developing priorities in marine science in European waters, especially with DG RTD. The Commission was granted observer status in SCICOM, at their request. As in 2008, ICES and DG RTD organized a joint “brown bag” lunch seminar at the ASC in Berlin about the FP7 and ICES research needs from an advisory perspective.

The EMPAS project has spurred an initiative in the Netherlands to develop a similar approach in Dutch waters (FIMPAS). The Science Programme was instrumental in initiating the project.

ICES participated in the final meeting of the EU-funded “PROFET POLICY”, which was a major ICES activity in 2008. The Commission expressed great satisfaction with the course and outcome of the project.

Annual Science Conference 2009

In all, 721 participants (including 28 spouses) from 35 countries attended ICES Annual Science Conference 2009, which was held in Berlin, Germany. Most participants were from ICES Member Countries, but a number of participants attended from other European countries, as well as Australia, Asia, and South America. Travel funds were granted to 15 early-career scientists from ICES Member Countries. Funds were also available to invite ten young fishermen, also from ICES Member Countries.

The scientific programme included 317 oral presentations and 94 posters of excellent quality. Business meetings and Theme Sessions were well attended. There was some coverage of the conference by local media. The ASC was opened by the German Federal Minister of Food, Agriculture and Consumer Protection Ilse Aigner, and opening addresses were delivered by Joe Borg, the Commissioner for Maritime Affairs and Fisheries, and the German delegate Franciscus Colijn. The ICES Recognition Programme gave the “Outstanding Achievement Award” to Jake Rice, Canada, during the opening ceremony.

On the ICES Annual Report 2009 Supplementary DVD

The following documents can be found under the heading 2009 Annual Science Conference.

- *Conference Handbook*
 - *ASC Brochure with programme*
 - *Opening Session addresses*
 - Franciscus Colijn*
 - Ilse Aigner*
 - Joe Borg*
 - Ed Houde, Outstanding Achievement Award to Jake Rice*
 - *Plenary Lectures*
 - Mojib Latif*
 - Elizabeth W. North*
 - Poul Degnbol*
 - *The Closing Session: Elections and Awards*
 - *Index of Papers and Posters Presented at the ASC*
 - *Index of Theme Session Reports*
 - *List of participants*
 - *Link to the most up to date set of 2009 CM documents*
-



An old Norwegian fishing building in the Norwegian Lofoten archipelago north of the Arctic Circle. Stockfish is known to have been exported from Lofoten for more than 1000 years. Stockfish is unsalted fish, especially cod, dried by sun and wind on wooden racks.

MARCOM+ project

The work that began with the Aberdeen Plus Partnership continued in 2009 with the development of the MARCOM+ project. After successfully leading the application procedure and grant negotiations, and coordinating the project implementation on behalf of the consortium of networks, ICES took the lead in this project whose goal is to develop a mechanism by which European marine and maritime science can speak with one voice in an integrated and coherent manner.

The overall objective of MARCOM+ is to solve the problem of fragmentation in the marine and maritime research sectors of the European research area, which has resulted in the duplication of existing services and unnecessary complexity of stakeholder interactions. Major European marine and maritime research networks and international organizations will develop a new integrated governance and consultancy model that will function as a forum, the European Marine and Maritime Science and Technology Forum.

The result will be a synthesis of the policy scene and a review of existing governance frameworks and partnerships. The consortium will assess the chief collaboration mechanisms and tools for integrated ocean governance and will ensure proper communication of proceedings, results, and recommendations among the stakeholders. Finally, the Forum will help its members to respond to emerging issues, such as prioritization of EU Framework Programmes. Exercises carried out under the MARCOM+ workplan will prepare the group to address, from a scientific viewpoint, questions of research funding and programming organizations in a coordinated way, and to allow two-way communication between marine/maritime science and other key stakeholders.

The project started on 1 January 2010 and will finish in the first quarter of 2012. (The end date will be agreed with the Commission once the date of the combined MARCOM+/EMAR2RES project final conference has been agreed.)

ICES Training

The ICES Training programme was productively initiated in 2009, and the SCICOM Training Group was formed. The first course, Stock Assessment (Introduction), was conducted in August and was so successful that it had to be repeated in January 2010. In addition to developing non-course materials, for example the ICES Training website and the various descriptive materials, five more courses were developed by the SCICOM Training Group and will be offered in 2010 and beyond. Courses will be maintained for a minimum of three years. Additional course offerings are in continual development.

New courses include:

- Stock Assessment (Advanced)
- Ecosystem Modelling for Fisheries Management (Ecopath–Ecosim–Ecospace)
- Management Strategy Evaluation (including FLR)
- Bayesian Techniques for Stock Assessment (including Communication of Results)
- Opening the box: Stock Assessment and Fishery Advice for Stakeholders, NGOs, and Policy-makers

The diverse background of the trainees presented a considerable challenge to the instructors in setting the appropriate level of the courses, i.e. challenging the more experienced trainees while not losing the less experienced.

More details and guidance to potential applicants regarding the level of familiarity or experience will be provided. An effort will be made to prepare the course materials and the exercises well in advance and to match the level of applicants to the course level.

Further information is available on the ICES Training web page www.ices.dk/iceswork/training/training.asp, including summary reports of the Training courses.

ICES Publications Group

As usual, the *ICES Cooperative Research Report* (CRR) series and *ICES Techniques in Marine Environmental Sciences* (TIMES) series took the lion's share of the ICES Publications Group's resources, while work continued on ICES many other publishing projects. Six CRRs and five TIMES were published in the course of the year. The titles are below. They are freely available on the Publications page of ICES website.

Extraordinarily, ten issues of *ICES Journal of Marine Science* (IJMS) were published in 2009 in Volume 66, rather than the usual nine, owing to the addition of a fourth symposium issue, "Effects of Climate Change on the World's Oceans". Six volumes contained articles on mixed topics, and four carried ICES symposia proceedings, "European Symposium on Marine Protected Areas as a Tool for Fisheries Management and Ecosystem Conservation", "The Ecosystem Approach with Fisheries Acoustics and Complementary Technologies", "Effects of Climate Change on the World's Oceans", and "Herring: Linking Biology, Ecology, and Status of Populations in the Context of Changing Environments". For a preview of upcoming IJMS symposia issues, see *ICES Symposia* on page 14.

The number of regular-issue manuscripts submitted to the *Journal* in 2009 reached an all-time high of 317. To handle this increase, when IJMS editor Yiota Apostolaki resigned, two editors, Rochelle Seitz and William Turrell, were added to the IJMS editorial team.

In January 2009, IJMS implemented Manuscript Central (MC), a web-based facility for the administration of all IJMS manuscripts, bringing it in line with the expectations of authors for online manuscript submission.

Issue 46 of *ICES Insight* appeared at the beginning of September and was further distributed at ICES 2009 Annual Science Conference. The issue contains 52 pages, up from 44 pages in the 2008 issue, and ten articles.

ICES Inside Out continues to be well received. ICES electronic newsletter reaches almost 600 active subscribers and appears six times annually. A special issue was devoted to the activities surrounding the ICES ASC.

It has been decided to phase out the *ICES Identification Leaflets for Plankton*. The series as it now stands will remain available to the public through the ICES website, but no new numbers will be added.

The following numbers in the *ICES Cooperative Research Report* series were published in 2009.

- **No. 299** – Alien species alert: *Crassostrea gigas* (Pacific oyster)
- **No. 298** – ICES report on ocean climate 2008

- **No. 297** – Effects of extraction of marine sediments on the marine environment 1998–2004
- **No. 296** – Definition of standard data-exchange format for sampling, landings, and effort data from commercial fisheries
- **No. 295** – Manual of recommended practices for modelling physical – biological interactions during fish early life
- **No. 294** – Hake age estimation: state of the art and progress towards a solution

The following numbers in the *ICES Techniques in Marine Environmental Sciences* series were published in 2009.

- **No. 46** – Determination of polybrominated diphenyl ethers (PBDEs) in sediment and biota
- **No. 45** – Determination of parent and alkylated polycyclic aromatic hydrocarbons (PAHs) in biota and sediment
- **No. 44** – Determination of Hexabromocyclododecane (HBCD) in sediment and biota
- **No. 43** – Soft-bottom macrofauna: collection, treatment, and quality assurance of samples
- **No. 42** – Guidelines for the study of the epibenthos of subtidal environments

New versions of the following *ICES Identification Leaflets for Diseases* have been drafted for the following leaflets and will be submitted to ICES.

- **No. 7** – *Pseudoterranova larvae* (codworm; Nematoda) in fish. M. Longshaw
- **No. 8** – *Anisakis larvae* (herringworm; Nematoda) in fish. M. Longshaw
- **No. 11** – Haematopoietic neoplasm in the blue mussel. T. Renault
- **No. 12** – Haematopoietic neoplasm in the flat oyster. T. Renault
- **No. 30** – *Perkinsus marinus* parasitism, a sporozoan disease of oysters. S. Ford
- **No. 38** – MSX disease of oysters caused by *Haplosporidium nelsoni*. S. Ford
- **No. 39** – SSO disease of eastern oysters caused by *Haplosporidium costale*. S. Ford

In addition, four new leaflets have been proposed, the first two of which already exist in draft form.

- **No. 57** – Gonadal neoplasia in bivalves. T. Renault
- **No. 59** – Brown ring disease in clams. C. Paillard
- **No. 60** – Juvenile oyster disease. S. Ford
- **No. 61** – Liver neoplasia in flatfish. S. Feist

ICES Symposia

Seven ICES Symposia or ICES co-sponsored symposia took place in 2009.

The European Marine Sand and Gravel Group (EMSAGG) Conference was held on 7 and 8 May 2009, in Rome, Italy.

The 2009 International Nutrients Scale System (INSS) Workshop was held between 10 and 12 February 2009, at the UNESCO Headquarters in Paris, France. A spin-off product was the establishment of an IOC/ICES Study Group on the topic of the conference (SGONS).

The ICES Symposium on Issues Confronting the Deep Oceans was held in the Azores between 27 and 30 April 2009. The proceedings will be published in the *ICES Journal of Marine Science*.

The ICES–GLOBEC Symposium “Marine Ecosystems: from Function to Prediction” was held between 22 and 26 June 2009, at Victoria, British Columbia, Canada.

The Sixth International Conference on Marine Bioinvasions was held between 24 and 27 August 2009, in Portland, Oregon.

The Cephalopod International Advisory Council, CIAC 2009 symposium “The Effects of Environmental Variability on Cephalopod Populations” was held between 3 and 11 September 2009, in Vigo, Spain. The proceedings will be published in the *ICES Journal of Marine Science*.

The ICES/PICES Symposium “Rebuilding Depleted Fish Stocks – Biology, Ecology, Social Science, and Management Strategies” was held between 3 and 6 November 2009, in Warnemünde/Rostock, Germany. The proceedings will be published in the *ICES Journal of Marine Science*.

On the ICES Annual Report 2009 Supplementary DVD

The following reports related to the Science Programme can be found under the heading Science Committee.

- *19–27 September Report 2009*
 - *Index of Steering Group Meeting Reports*
 - *Symposium Reports 2009*
-

Boats in the harbour of the Atlantic fishing port of Getaria, northern Spain.



The birth of the Science Committee

The continuing reform of the Science Programme came to fruition with the establishment of the Science Committee (SCICOM), which met for the first time in January. SCICOM, which assumed the role of the Consultative Committee, has complete national representation. One of the leading tasks facing SCICOM was to develop a new structure and a “home” for the work of ICES expert groups, in order to deliver the *ICES Science Plan’s* top 16 priorities (see Figure 1 on page 18).

SCICOM set up the temporary Science Leadership Working Group with a mandate to identify the fields and responsibilities of an unspecified number of steering groups that would become the working level between SCICOM and the expert groups.

At the midterm meeting in May, the structure proposed by the Science Leadership Working Group was agreed, and five SCICOM Steering Groups (SSGs) were established, to which the expert groups in the Science Programme were allocated. The structure allows expert/working groups to report to more than one parent committee, even to the Advisory Committee (ACOM). Chairs were appointed, and SCICOM members joined the SSGs with a view to providing parentage to the EGs.

In addition to the five steering groups, four operational groups were established to deal with activities related to data, publications and communications, ICES Training programme, and the ASC theme sessions. To these groups is added the Awards Committee under Council. In order to strengthen the implementation of the *Science Plan*, SCICOM set up a temporary working group to elaborate strategic initiatives to cover new grounds for ICES and raise its profile (see Figure 2 on page 19).

At the ASC meeting in Berlin, SCICOM continued to define the topics of the strategic initiatives. The former Steering Group on Climate Change Science in ICES became one of these strategic initiatives. The other two, coastal issues and marine spatial planning, and biodiversity science issues, were developed into joint ventures with ACOM. SCICOM and ACOM met jointly. Manuel Barange (UK) was elected as new Chair.

According to Adi Kellermann, Head of Science, “The reform of the Science Programme offers two significant advantages. First, it gives more responsibility and authority to the decision-making Science Committee. Second, it is a system offering new dynamics that will lead to new stimulus and new momentum”.

Manuel Barange, Director of Science at the Plymouth Marine Laboratory (UK), took over the role as SCICOM Chair from Serge Labonté (Canada) in January 2010. Here he supplies important background to the story.

“When the restructuring began, it was recognized that ICES needed to beef up the scientific side of ICES and give it more muscle. Before that, the science was managed through the Consultative Committee, which advised Council, and Council made decisions on science – and indeed all – matters. With the restructuring, it was agreed that ICES needed a structure that was empowered to develop and implement the science of the organization. Thus, SCICOM was created, having not only an advisory role to the Council but also a delegated responsibility on all science matters.

“To implement this delegated responsibility, national representation was needed, because otherwise the intergovernmental nature of ICES is bypassed, which is why SCICOM has a representative from each Member Country. In addition, the committee can elect up to five additional members to add flexibility and capability.

“In the first year, the committee created an internal structure to implement the *ICES Science Plan*, based on five steering groups. These steering groups ensure that the 80-plus ICES Science expert groups deliver the *ICES Science Plan* and provide a direct connection between the bottom-up science development through the expert groups and the science leadership of ICES. Each steering group has a Chair, and if the Chair is not a national representative at SCICOM then they automatically become members of SCICOM, given the importance of their task. In addition, there are four operational groups: Data and Information Management, Training, Publications/Communication, and ASC theme sessions. The Chairs of the Publication/Communication and Training groups also sit in SCICOM. The Awards Committee reports to SCICOM, but the Chair does not sit in the committee.

“The General Secretary, the Head of the Science Programme, and the Chair of the Advisory Committee are also *ex officio* members. Members of Council can attend as observers, and of course, we welcome members of the ICES Secretariat, who play such a crucial role in the organization.

“In a way, this is a male-brain-oriented structure, with everything in boxes, which works wonderfully for PowerPoint presentations. Unfortunately, it’s very rigid, and science doesn’t really work well in a straitjacket. Increasingly, we will try to identify areas that are scientifically relevant to the organization and to society, and if they cut across these structures, we’ll activate them as “strategic initiatives”. These can take a number of forms, to give them the dynamism and independence that they may need to focus on specific topics in novel ways. Strategic initiatives will focus on areas that ICES has not paid enough attention to, or where coordination of diverse efforts is needed. Their time frame may be limited, and they may create and/or coordinate expert groups, deliver specific outcomes like position papers or science/advisory facilities, etc. Science expert groups and strategic initiatives are the tools that we have to identify and plug gaps in our science, and bring scientific strategic thinking into SCICOM”.

Figure 1. Sixteen research topics are organized under three thematic areas.

THEME 1 Understanding Ecosystem Functioning	THEME 2 Understanding Interactions of Human Activities with Ecosystems	THEME 3 Development of Options for Sustainable Use of Ecosystems
Climate change processes and predictions of impacts	Impacts of fishing with marine ecosystems	Marine living resource management tools
Fish life-history information in support of Ecosystem Approach to Management (EAM)	Carrying capacity and ecosystem interactions associated with mariculture	Operational modelling combining oceanographic, ecosystem, and population processes
Biodiversity and the health of marine ecosystems	Influence of development of renewable energy resources (e.g. wind, hydropower, tidal, and waves) on marine habitat and biota	Marine spatial planning, including the effectiveness of management practices (e.g. Marine Protected Areas (MPAs)), and its role in the conservation of biodiversity
The role of coastal-zone habitat in population dynamics of commercially exploited species	Population and community level impacts of contaminants, eutrophication, and habitat changes in the coastal zone	Contributions to socio-economic understanding of ecosystem goods and services, and forecasting of the impact of human activities
Top predators (marine mammals, seabirds, and large pelagics) in marine ecosystems	Introduced and invasive species, their impacts on ecosystems and interactions with climate change processes	
Sensitive ecosystems (deep-sea corals, seamounts, Arctic areas), as well as rare and data-poor species		
Integration of surveys in support of EAM		

Figure 2. SCICOM's Steering and Operational Groups.

Steering Groups

SSGEF

Ecosystem Functions

SSGHIE

Human Interactions on Ecosystems

SSGSUE

Sustainable Use of Ecosystems

SSGRSP

Regional Sea Programmes

SSGESST

Ecosystem Surveys Science and Technology

Operational Groups

WGDIM

Working Group on Data and Information Management

PUBCOM

ICES Publications and Communications Group

ICES Training Group

ASC Group

Awards Committee

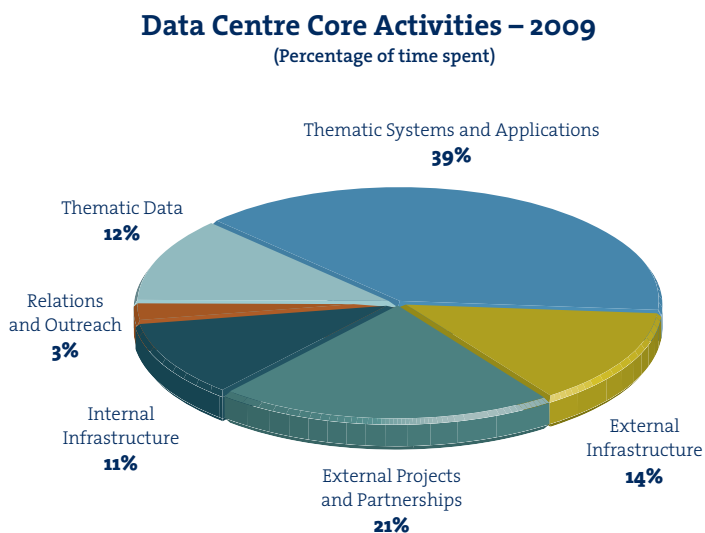


Fishing boats tied to the wharf in Douarnenez, France, on the Brittany Coast.

DATA CENTRE

In 2009, the Data Centre's six core activities were restructured and simplified to make its work more comprehensible to the ICES community and to define more clearly the split between internal and external projects, in view of the fact that one of the Data Centre's strategic aims is to secure 20–25% of its funding from external projects.

The diagram below illustrates the Data Centre's current workplan.



The Data Centre increased its focus on GIS (geographical information systems) at the outset of the year by stepping up its activities related to GIS applications and standards with its partners, as well as further improving the Centre's own GIS capabilities. A number of working groups (WGHOME, WGMHM) worked closely with the Data Centre to define what services the Centre can provide to the ICES community. The first version of the ICES GIS Portal will be available in 2010 and will include ICES areas, ICES EcoRegions, HELCOM, OSPAR stations, and with the consent of OSPAR Secretariat, the OSPAR regions.

Neil Holdsworth, Head of Data Centre, explains, "GIS is important because almost all marine data are collected with a reference to a location. This offers a multitude of possibilities for displaying, analysing, and creating new insights into the data. A popular example of GIS in action would be Google Earth, with which you can visualize marine data on a virtual globe and add extra information, such as the contours of the seabed. As marine and maritime spatial planning becomes more important, GIS allows users to visualize the many different types of activities in an area with just a few clicks on a map".

The second major task in 2009 was the greater harmonization, cooperation, and collaboration with a number of large European and international initiatives. In February, the EcoSystemData data warehouse initiated a feed of biological information into the ocean biodiversity catalogue (EurOBIS and OBIS). Later, Fish Trawl Survey data (DATRAS data) were also incorporated into the EcoSystemData data warehouse, bringing the Data Centre closer to its goal of providing cross-discipline data through one online interface. In June, the Data Centre started work with the European

Marine Observation Data Network (EMODNET) consortia on biology and chemistry. These pilot projects will run for the next two years and involve a number of institutes in the ICES network.

The Centre's third key focus was on marine standards, both governance and technical capabilities. To this end, the Data Centre contributed to the IOC/IODE work on standards through participation in thematic workshops as well as discussing and advocating for proposed standards. The resulting document is available online at <http://www.oceandatastandards.org/>.

Through its participation in SeaDataNet, the Data Centre worked closely with a number of its partner institutes to redefine governance procedures for platform (ship) codes and released a new online code management system for the use of the ICES and SeaDataNet community. Through OBIS, the Data Centre also encountered the Global Biodiversity Information Facility (GBIF), which promotes open standards and tools for data centres of all kinds.

Here are brief descriptions of the programmes mentioned.

ICES EcoSystemData is a data warehouse that contains marine environmental data from the ICES databases, featuring (i) coverage of Northeast Atlantic Ocean and the Greenland, Baltic, and Norwegian seas; (ii) contaminants in biota, sediment and water, fish disease; (iii) biological communities and aggregated fish trawl survey data; (iv) oceanographic measurements, such as temperature and salinity; (v) data spanning the years 1877–2009. Further information can be found at <http://ecosystemdata.ices.dk/>.

EurOBIS and OBIS. The European Ocean Biogeographic Information System (EurOBIS) is the European node of OBIS, the worldwide ocean biogeographic information system. It is a distributed system that allows users to search multiple datasets simultaneously for biogeographic information on marine organisms. It integrates individual datasets on marine organisms into a large, consolidated database and offers rapid, free access to data on marine species distributions and ocean environmental data.

DATRAS is the ICES area database of research fish trawl survey data. The data are provided by Member States under the Data Collection Framework regulation of the EC and are used in Advisory stock assessment working groups to determine fish stock status. Further information can be found at <http://datras.ices.dk/Home/Default.aspx>.

EMODNET. The European Commission, in its EU Maritime Policy Blue Book (2007), implemented EMODNET to improve the availability of high-quality data. Further information can be found at <http://www.ices.dk/projects/projects.asp#emodnet>.

ICES COUNCIL

At its October 2009 meeting at ICES headquarters in Copenhagen, Council approved the new structure of the Science Committee, and new Bureau members were elected by the Delegates from ICES Member Countries.

Mike Sinclair, from the Department of Fisheries and Oceans at Bedford Institute of Oceanography in Canada, was elected ICES President. He has been a dedicated ICES participant since the early 1980s.

Paul Connolly, from the Marine Environment and Health Services Division at the Marine Institute in Ireland, was elected ICES First Vice-President.

Three newly elected Vice-Presidents also joined the Bureau: Eero Aro, Robin M. Cook, and Steve Murawski.

During the meeting, Council was invited to a reception held by the Swedish Ambassador.

Council accepted the reports of the Finance Committee. ICES Budgets 2009–2010 can be found on pages 24 and 25.

On the ICES Annual Report 2009 Supplementary DVD


The following reports of the ICES Council can be found under the heading ICES Statutory Meeting.

- Meeting – 21–22 October
- Index of Council Resolutions

The following reports of the Finance Committee can be found under the heading ICES Statutory Meeting.

- June Report
 - October Report
 - Final Accounts
-

The Cliffs of Moher, County Clare, Ireland. These cliffs are home to many nesting seabirds, including the Atlantic puffin, razorbill, chough, and common gull. The area was designated a Refuge for Fauna in 1988 and a Special Protection Area for Birds under the EU Birds Directive in 1989.



CONTENTS OF THE ICES ANNUAL REPORT 2009 SUPPLEMENTARY DVD

Documents relating to ICES work are collected on the *ICES Annual Report 2009 Supplementary DVD*, found on the inside back cover. The Index has two sections, ICES Statutory Meeting and Annual Science Conference 2009.

Insert the disc in your DVD player. The Index should appear automatically. If it doesn't, right click the icon representing your DVD drive and choose "Explore". Double click the file named "Index.htm".

The Index provides links, in green, either directly to the document or to a further index. Click the ICES logo to go to the ICES website.

ICES Statutory Meeting

Secretariat – ICES Progress Report; Secretariat Project Review 2009.

Advisory Committee – 7–10 December Report 2009.

Science Committee – 19–27 September Report 2009; Index of Steering Group Meeting Reports; Symposium Reports 2009.

Council – Meeting 21–22 October; Index of Council Resolutions. **Finance Committee** – June Report; October Report; Final Accounts.

Annual Science Conference 2009

Conference Handbook – In addition to abstracts of papers presented at the ASC, the Handbook includes general information about the Conference, abstracts of plenary lectures, a list of expert group reports for 2009, agendas and orders of the day, and a list of exhibitors and sponsors.

ASC Brochure with programme – The original ASC brochure with the complete programme of theme sessions and social events.

Opening Session Addresses – Addresses by Franciscus Colijn, President of the German Scientific Commission; Ilse Aigner, Minister of the German Ministry of Food, Agriculture, and Consumer Protection; Joe Borg, Commissioner Responsible for Fisheries and Maritime Affairs; Ed Houde, presenting Outstanding Achievement Award to Jake Rice.

Plenary Addresses – Addresses by Mojib Latif; Elizabeth W. North; Poul Degnbol.

The Closing Session – Results of elections and the Awards Committee.

Index of Papers and Posters Presented at the ASC – An index of papers presented at the Annual Science Conference 2009, arranged numerically by Theme Session. Click the Theme Session at the top of the Index to jump to the papers from that session. Links to the papers are in green.

Index of Theme Session Reports – An index of Theme Session final reports.

List of participants – A list of all ASC participants.

ICES BUDGETS 2009–2010

(All amounts in Danish Kroner)

	Budget 2009	Budget 2010
INCOME		
Price for one share	402,000	402,000
1. National Contributions		
Belgium	804,000	804,000
Canada	1,206,000	1,206,000
Denmark	1,206,000	1,206,000
Estonia	402,000	402,000
Finland	603,000	603,000
France	1,608,000	1,608,000
Germany	1,608,000	1,608,000
Iceland	1,206,000	1,206,000
Ireland	804,000	804,000
Latvia	402,000	402,000
Lithuania	402,000	402,000
The Netherlands	1,206,000	1,206,000
Norway	1,608,000	1,608,000
Poland	1,206,000	1,206,000
Portugal	804,000	804,000
Russia	1,206,000	1,206,000
Spain	1,206,000	1,206,000
Sweden	1,206,000	1,206,000
United Kingdom	1,608,000	1,608,000
USA	1,206,000	1,206,000
Total National Contributions	21,507,000	21,507,000
Contributions from Affiliates	150,000	180,000
Contributions from Faroe Islands and Greenland	402,000	402,000
Total Contributions	22,059,000	22,089,000
2. Income from Commissions		
Contribution from NEAFC	2,056,817	2,118,521
Contribution from Russia for Baltic Sea Advice	71,728	73,880
Contribution from OSPAR (Advice)	626,505	645,300
Contribution from OSPAR (Datahandling)	469,879	483,975
Contribution from HELCOM (Advice)	149,108	153,581
Contribution from HELCOM (Datahandling)	466,120	480,103
Contribution from NASCO	480,721	495,143
Contribution from EC	5,874,566	6,050,803
Total Income from Commissions	10,195,444	10,501,306

	Budget 2009	Budget 2010
3. Other Income		
Once off advice	500,000	1,500,000
Income from <i>ICES Journal of Marine Science</i>	250,000	250,000
Sale of Publications	25,000	25,000
ASC Income (Fees)	325,000	400,000
Total Other Income	1,100,000	2,175,000
Total Income	33,354,444	34,765,306

EXPENDITURE

Secretariat and Advisory and Science Staff Cost	24,739,441	26,351,569
Office Expenses excl. Projects	2,121,150	2,365,292
IT Expenses excl. Projects	2,099,998	2,555,429
Expenses for ASC & Statutory Meetings	1,208,950	1,273,000
Travel and meetings	5,505,607	5,256,123
Publications	1,002,701	1,032,500
Expenditure total	36,677,847	38,833,913
Transfer from SIF for stable National Contribution		645,210
Transfer from SIF for Advisory Reform	1,910,719	1,939,081
Transfer from SIF for Science Reform	984,723	1,484,316
Transfer from Projects	427,961	
Balance for the year	0	0

INTEREST RECEIVABLES

Interest	400,000	400,000
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ICES INTERVIEWS

Poul Degnbol



In his plenary lecture “Future Fishery Management in Europe – What Are Our Options?”, Poul Degnbol considered the reform of the European Union’s Common Fisheries Policy and the changing role of research and scientific advice in light of the proposed reforms. At the time of the lecture, he was an Adviser for Scientific Matters in the Directorate General for Maritime Affairs and Fisheries of the European Commission. Since March 2010, he has been working in the ICES Secretariat in preparation for his new role as Head of ICES Advisory Services, upon the retirement of Hans Lassen.

In your lecture, you implied that things, as they stand now, are complicated enough. How do you define the kind of simplicity that you are promoting, and how can we achieve it?

Simplification is not a choice, it’s a necessity. The situation has become overwhelmingly complex, and we don’t have the capacity to handle it. Moreover, the complexity also reflects a democratic deficit in the policy because it is a result of a top-down, centralized governance model.

There are two ways to improve the situation. First, we need to get very detailed micromanagement out of the central body of European decision-making and implementation, because the system is simply not manageable at that level. In most other policies in Europe, we have eliminated micromanagement. In other policy areas, we define the general policy as guiding principles and standards, and then we leave implementation detail to the local level.

By separating the guiding principle from the microregulation, we also hardwire responsibility into the system. When a principle is determined on a higher level, it is binding on the lower levels. For example, if we establish the principle that, based on the Johannesburg Declaration, we must now have a maximum sustainable yield (MSY) policy by 2015, then, if the regional level comes up with a management plan that doesn’t achieve that, then it’s simply not legal. This is how we can hardwire responsibility into the system.

The second way is that, instead of micromanaging the industry in a top-down approach with more and more detail, we should demand that the industry takes responsibility for itself. For example, take the discard issue. It’s high on the political agenda and for good reason: It’s a wasteful practice that should be minimized.

If we impose a comprehensive discard ban in Europe, we probably couldn't enforce it. We don't have sufficient inspection vessels at sea, like the Norwegians do. So how could we get around this?

Perhaps we could use a carrot-and-stick approach. We would ask the industry to come up with solutions to the problem and make them responsible for documenting it. If the industry were able to demonstrate that it had reduced discards considerably, it would gain from this because stocks would be in better shape and fishing opportunities would improve. That's the carrot. It would also be in their self-interest to prove that there are no discards because documentation of that could be a condition for access to the fishery. That's the stick.

There could also be another carrot through the market if certification schemes would include criteria of low or no discards. We probably need carrots and sticks, but we should set up a system that offers strong motivation for the industry to prove that it's a low discard fishery. And if it happens to be a high-discard fishery, they would have to reduce discards.

Instead of having lots of mesh-size regulations, the industry would simply determine which fishing gears they would use and where they would fish to avoid catching undersized fish. That would reverse the circumstances from being a control problem to a motivational solution.

This is results-based management, which specifies the results rather than how to achieve them. It reverses the burden of proof. This would be an immense simplification, eliminating page after page of detailed regulations about how each and every fishing gear in Europe should be constructed. We would provide a shortlist of the required outcomes.

Then, it's no longer a top-down, paternalistic thing, but a situation where the industry is actually seen as responsible actors who take these problems into their own hands and find solutions – along the lines of what we are seeing for most other economic sectors. There are several initiatives in Europe where the fishing industry is starting to pick up on this and find ways to demonstrate that they are responsible.

How would the industry demonstrate no bycatch or low bycatch?

The classical method is to have observers on board. It's extremely expensive and something you could only consider for large-scale European fleets.

Today, there are electronic means of doing this. In Canada, they have developed systems that use a combination of on-board cameras and sensors coupled with GPS and detection of activity on the winches. Experiments are now being made with such systems on a voluntary basis in Europe, where both Denmark and the UK are exploring this option.

There are also voluntary, real-time closure schemes, which are being practised by Scottish fishers, where they avoid certain areas that contain a lot of juveniles. In this case, they don't prove that they don't have discards, but that it is likely that they have less. If you link that to some kind of monitoring scheme, with observers or an electronic system, then of course you are in a position to say that discards are really reduced.

Clearly, society needs real documentation. There have been proposals to add the discards to the quotas fishers are allowed to land, based on the notion that they have reduced discards in the process. This will only work if we have full documentation that discards are actually reduced by at least the amount by which you increase the quota. Otherwise, we risk increasing the overall pressure on the system instead.

How close are we to achieving this?

Our ambition is to introduce the reforms by 1 January 2013. There are many models to accomplish this, but there should be a facility in the new Common Fisheries Policy after 2012 that will allow this to be set up. There will be a preparatory period during which the industry will organize itself to take on this responsibility, and EU Member States will organize themselves to take on the regional responsibility. It's similar to the regional advisory councils (RAC). They were introduced in the 2002 reform, and only last year [2008] was the last RAC actually established.

What is ICES role in this?

I am reminded of how ICES functioned 15 or 20 years ago. It was what I call the Vatican model: When the Pope is elected, the deliberation is absolutely closed. After the new Pope is chosen, white smoke pours from the chimney of the Sistine Chapel. It is a very, very opaque process that is built on authority. I remember ACFM meetings where people would stop talking if somebody entered the room because they were afraid that messages might get out.

Over the last several years, ICES has been a pioneer in introducing transparency by opening up the process to observation and interacting much more with stakeholders. In formulating management plans, ICES has tried proactively to engage the stakeholders. The EU should look at a delivery model for scientific advice that is based on dialogue, on asking "what if". This is what Socrates did. As he walked around Athens, he didn't have solutions, he asked questions. The basic principle for that kind of advice delivery is not authority. It's transparency. It's based on evidence, argument, and analysis.

By moving towards this kind of transparency, we achieve several things: We get better advice because it will be more relevant to decision-makers and stakeholders; we develop mutual respect between scientists and stakeholders; we prepare the ground for an approach where the industry will take more responsibility for the outcomes of the policy.

Will this have any effect on the way ICES gives advice and on the structure of that advice?

If, looking into the future, we assume that we will be dealing with results-based management, then advice will be required for setting the basic principles of these community standards. For example, what concepts could be operationalized? Can we develop indicators to measure against? And what would be the reference levels for those?

On the local level, those with regional responsibility will need advice on developing regional management plans, similar to the kind of advice that ICES delivers now but for more regional entities. ICES will be well positioned to provide such regional advice. There will also be a difference in the substance, because if we move towards results-based management, there would be less demand

from public authorities for advice relating to detailed regulations, such as mesh size.

Industry would be asking these kinds of questions. There would be a role for scientific services to help the industry meet the outcomes, set up their own fishing plans within the award-management plans, and develop technical measures to meet the outcomes. Such advice must be given by independent bodies.

Public authorities will define what outcomes must be achieved, and they will audit the documentation, but the industry must work with independent sources of scientific advice to find ways to achieve these outcomes and to document them.

Parablennius gattorugine, common name Tompot blenny is found on the Northeast Atlantic coast from Ireland to Morocco, as well as in the Mediterranean Sea and the Sea of Marmora.



Gerd Hubold



The following interview with ICES General Secretary Gerd Hubold appeared in the May 2010 issue of *International Innovation*. The magazine is available online at www.researchmedia.eu.

Please describe ICES history and its overall aims and objectives.

Back in 1902, scientists and administrators from eight northern European countries (Denmark, Finland, Germany, the Netherlands, Norway, Russia, Sweden, and UK) agreed on a permanent structure for cooperation in applied marine science in the North Atlantic and adjacent seas. Primarily, this initiative was undertaken based on the recognition that living resources of the seas are not unlimited, and that better knowledge and coordinated sea-going expeditions were needed for a better understanding of the vast marine systems.

Perhaps surprisingly, two societal issues at the time (1899 to 1902) were the importance of climate variability on fisheries and the concern for overfishing in the southern North Sea. The cooperation was developed continuously and persisted despite the adversities of war and the resulting political ice age. In 1964, the Convention of the International Council for the Exploration of the Sea was signed by the governments of 16 (now all 20) North Atlantic countries, and the cooperation was formally established as an intergovernmental science organization with headquarters in Copenhagen, Denmark.

The ICES vision is to maintain a relevant, responsive, sound, and credible international scientific community. Given the recent issues concerning the IPCC and the lack of agreement at the Copenhagen summit, how do you believe that credibility is becoming an increasingly important part of your remit?

ICES has been providing scientific advice for more than a century, and as such, the issue of “credibility” has been addressed on an ongoing basis. Through the past decades, we have developed a sophisticated peer-review process that addresses credibility to the greatest degree possible. That said, there are considerable uncertainties in knowledge, and this aspect is given a lot of attention during the drafting of advice. We also work with the Regional Advisory Committees (RACs), and other client groups, on the form of the advice to help with the issue of credibility.

The ICES community is made up of more than 2000 scientists from 200 institutes in the 20 Member Countries and 15 additional countries. The scientific work is directed by a Science Plan, which reflects the scientific priorities of ICES Member Countries. Scientists are nominated by

national delegates from within the national science communities, mostly from public research institutions, and Chairs can invite additional recognized experts to their meetings. All scientific work is open to external observers; the expert group reports are peer reviewed and relevant results published in international journals. We abstain from sensationalist presentation of results, and we do not accept funding from private sources or interest groups. The translation of scientific findings into practical advice for managers undergoes an elaborate process of data analysis, external review, stakeholder input, and advice drafting, and a final approval procedure by consensus of highly skilled national experts from all Member States. With this approval, we create credibility and facilitate national agreement on management decisions, because national positions have already been considered during the advice drafting processes.

How do you ensure that a high level of communication is maintained between the working groups and ICES Council? Is this the key to fast and efficient progress?

In the new structure that was approved by our Council in 2009, the Science Committee (SCICOM) takes the role of directing and coordinating the work of the more than 100 expert groups and communicating this to Council. The Advisory Committee (ACOM) directs Advisory Services and also reports to Council. Both SCICOM and ACOM are composed of nationally nominated, high-level scientists who are authorized to decide on scientific and advisory matters on behalf of the Council. Given that the members of these two committees are nominated by the Member States, it is to be expected that there is ongoing dialogue with Council members on topical issues that are being addressed.

Do you believe that humans are having an increasingly negative effect on the marine ecosystems around them? What are the most pressing concerns in relation to anthropological impact on marine life?

Humans do have negative effects on the ecosystems around them. The immediate threat is to terrestrial and freshwater ecosystems. Marine systems are also being increasingly affected, however to a much lesser extent. A number of ICES publications have summarized the impacts of anthropogenic influences on marine ecosystems in the North Atlantic. These studies do indeed imply an increasing impact during recent decades. In particular within coastal and enclosed seas, pollution, litter and waste deposition, maritime traffic, military use, extraction of mineral resources, tourism, maritime constructions, and fisheries are affecting marine life. All of these impacts have to be considered in a holistic view regarding their accumulated effects on marine ecosystems and food chains. One of the emerging challenges for ICES is to address the cumulative effects of multiple uses of ocean resources and the nature of so-called ecosystem services.

International collaboration is an important aspect of scientific research. Who are ICES most important partners and what do they bring to your studies?

ICES is a network of dedicated scientists who collaborate on topics under a wide and ambitious science plan. As a regional organization, ICES focuses on the North Atlantic and adjacent seas (North and Baltic seas). Many marine science topics are of a global nature, and therefore external collaboration is sought by our groups and initiatives. Obvious partners for such cooperation are therefore other regional organizations such as the North Pacific Science Organization (PICES), the Mediterranean Science Organization (CIESM), and European initiatives

and networks such as the Marine Board of the European Science Foundation (ESFMB) and European Research Area (ERA) networks, as well as global initiatives related to IOC or FAO. ICES maintains Memoranda of Understanding and Letters of Agreement with such organizations and organizes joint research projects, symposia, and publications, and coordinates on behalf of the EC a European marine and maritime stakeholders network called MARCOM+.

Technological advances offer increasingly greater potential for marine studies. What are the most valuable tools at your disposal? How can these help to protect endangered or threatened marine creatures?

A main challenge for marine science is the enormous extension of the oceans in which manifold individual ecosystems are embedded. Data and information management is an essential “technological tool”, for which ICES is state of the art. The new capacity for accessibility of layers of data allows for synthesis and generation of new understanding. Satellite technology has provided a wealth of new data on an ocean-wide scale, mostly limited to the upper few centimetres of the sea, and to selected parameters (physical, chemical, and a few biological). Such data are now collected on a routine basis from space and support the study of oceanic structures and processes. Individual marine ecosystems still need to be investigated on a smaller scale and throughout the depth of the water column from surface to bottom, with research vessels carrying the latest technology available (e.g. low-noise engines), and from coastal stations. High-tech sampling devices have been developed (water sampler, nets, traps, cameras, etc.) for the purpose. Modern technologies involve water and plankton sampling that even allow the automatic recognition of biological species. Electronic tagging of larger animals (fish,

mammals) has recently made it possible to identify their individual behaviour and migration patterns. Analysing marine ecosystems and their biological function remains, however, a very time-consuming and labour-intensive endeavour for scientists with profound taxonomic and ecological knowledge and the will and ability to work under the most adverse conditions at sea.

Europe is facing a crisis as a result of the overexploitation of fish stocks. Can ICES help to provide a sustainable equilibrium between human demands and the needs of the marine environment?

The biological assessment of marine fish stocks by the ICES expert system and the resulting advice on Total Allowable Catches from these stocks is based on the precautionary approach principle, which allows for sustainable, long-term yields of fish without impairing the populations, species, or ecosystems. In addition to accurate advice on the status of stocks, there is a need for conceptual improvements in the management approach. The priority is to establish management systems that engage the industry in a participatory manner. ICES is contributing to these emerging policy approaches, such as the use of “management strategy evaluations”.

ICES has an advisory role that encourages the increased sustainability of fisheries. Would you describe the role that ICES plays, and can you highlight specific examples of success?

One of the most important tasks for ICES is the regular analysis of more than 130 European and North Atlantic marine fish stocks and the provision of advice to DG Mare, NEAFC, and NASCO on the sustainable exploitation of these stocks. ICES Advice is biological in nature and reflects the questions posed by the marine managers,

e.g. on rebuilding depleted stocks, long-term maximum yield possibilities, and short-term implications of catch levels. ICES Advice is thoroughly reviewed and agreed by top scientists from all ICES Member Countries before it is presented to the partner commissions and Member Countries. The recommendations are taken into account when annual catch levels and management plans are decided by the European Council of Ministers, and between EC and non-EC countries.

One example of successful management based on scientific advice is the North Sea herring. In this case, management succeeded in recovering a stock that collapsed completely in the late 1970s and was successfully rebuilt thereafter. Recent management has been effective in preventing a repeat of the 1970s situation by maintaining the stock at a reasonable level. Fishing pressure was reduced through a period of low recruitment, and such action is crucial to avoid collapse.

Would you elaborate on how ICES is working to meet the stipulations of the UN Convention on the Law of the Sea to ensure the conservation of straddling fish stocks and highly migratory fish?

ICES fish stock assessments are based on biological stocks and, as such, always consider the entire range of distribution of one single stock across political boundaries. In our area, Atlantic mackerel is such a widely distributed and highly migratory stock. We are not involved, however, in long-range migratory stocks, such as tuna or oceanic sharks.

Climate change poses a great threat to marine ecosystems and resources. How can ICES help to lessen the impact of this and, if nothing is done, how soon could we see irreversible changes in our oceans?

There is no doubt that climate change is taking place and that it will affect the seas. A major role for ICES is to forecast the impacts of climate change and variability on marine ecosystems in the North Atlantic. A key role is monitoring and data management as well as “state-of-the-ocean” reporting. This theme is a priority within the strategic Science Plan, and we are currently evaluating our particular niche within this high-profile research and advisory topic. ICES is working closely with PICES to ensure that a global perspective and approach to our research programme is sustained.

In contrast to tropical, e.g. coral reef, systems, many of our northern marine ecosystems have undergone extreme climatic change in the past 10 000 years (from the ice age to present time), and as such, boreal species and systems may possess a higher plasticity in adapting their mode of life to changing conditions. There will be considerable changes in distribution and productivity of fish species, which may lead to local and regional changes in ecosystems. These changes have to be considered when advising on sustainable long-term yield of marine species.

Which methods have proven most successful in the dissemination of your research? Is there a need for greater public awareness of the demands that we are placing on our limited marine resources?

ICES research results are published in our own series (ICES Techniques in Marine Environmental Sciences and ICES Cooperative Research Reports), and a scholarly journal, ICES Journal of Marine Science, published by Oxford University Press. All scientific publications and reports are also available on the ICES website. We organize a major annual science conference with up to 800 participants from approximately 35 countries and co-sponsor up to five international marine symposia each year. Our

advice products are delivered to Member Countries and partner commissions, and they are freely available on our website. We have a magazine targeted at a wider public (ICES Insight) and an e-newsletter (ICES Inside Out), which presents us to a wider international audience. We issue press releases about our main events and respond to requests from journalists, parliamentarians, students, and the informed public in general. We support our national member institutes in their endeavours to inform national audiences about their relevant marine resources and activities in the national languages. In spite of these multiple approaches to “getting the message out”, there is still a need to enhance the flow of “balanced information” to the general public. We are currently seeking ways on how best to meet this challenge.

It is often said that we know more about space than our own oceans. Is there a need for greater exploration of the seas?

After more than a hundred years of efficient international cooperation in marine science, we know a lot about our seas and marine ecosystems, but we are still far from understanding some basic ecosystem functions, such as biodiversity and resilience to change. We have quite comprehensive monitoring of shelf seas and the coastal zone, but the observations of the deep ocean are scarce. The new technologies are some help, and initiatives such as the recent study of the North Atlantic mid-Atlantic Ridge under CoML illustrate emerging capacity to study the deep sea and how much there is yet to discover.

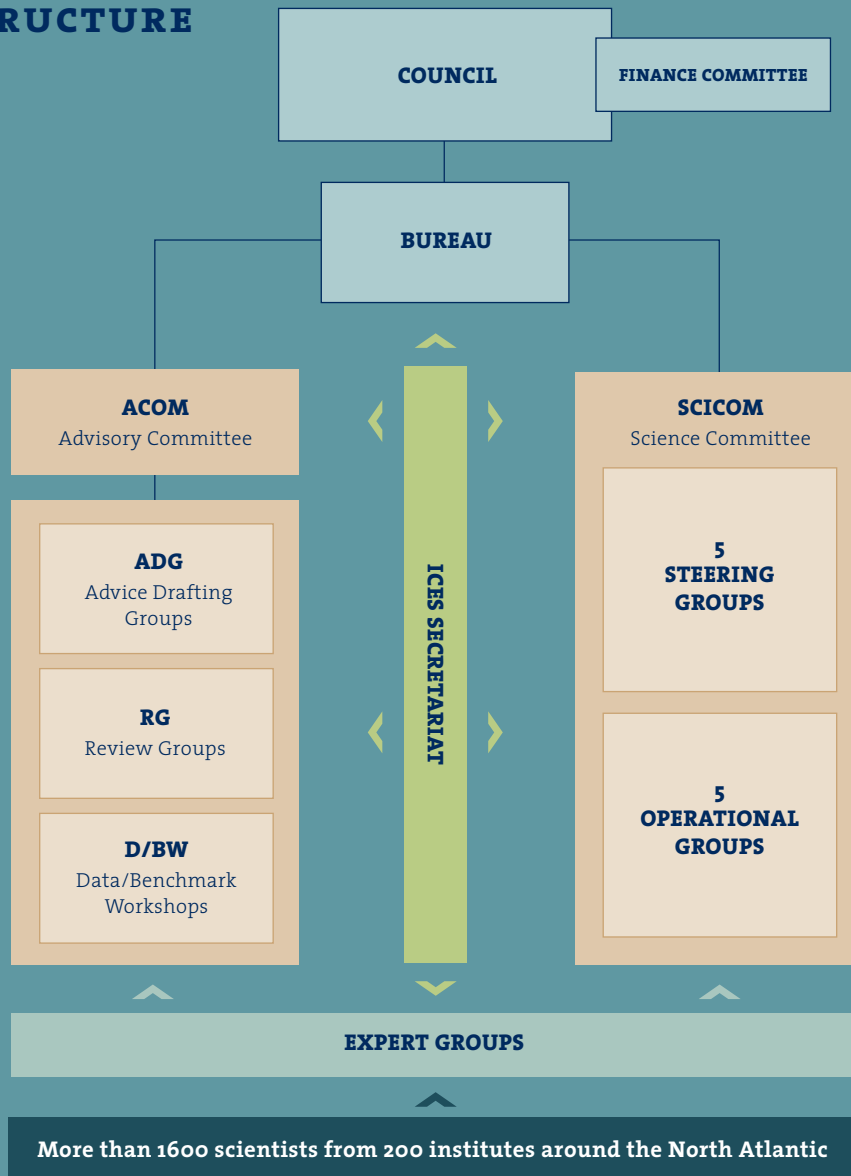
We are terrestrial animals ourselves and reach our limits when we try to manage marine systems, which are so alien to us. We need to achieve better insight into those systems, because they are the stronghold for global life support, such as oxygen production, climate balance, and last but not least, food production in times of continuing uncontrolled human population growth.



*A view from the beach in Bleik on the island Andøya, Norway.
The distant island is Bleiksøya, a protected seabird nesting area.*



ICES STRUCTURE



ICES DIRECTORY

Overview of ICES membership and organization

The diagram on the left illustrates ICES structure.

The **Council** is the principal decision and policy-making body of ICES, consisting of a President and two Delegates from each of ICES 20 Member Countries. Delegates elect the President, First Vice-President, and five additional Vice-Presidents to form the Bureau, which is the Council's executive committee. The **Bureau** is responsible for carrying out the Council's decisions, preparing and convening Council meetings, formulating Council budgets, appointing key Secretariat staff, and performing other tasks as assigned by the Council. A **Finance Committee** consisting of five Delegates from Council provides oversight to the Council's fiscal matters. Delegates also appoint a General Secretary, who serves as the Council's chief executive officer and is charged with managing the ICES Secretariat facilities and staff, finances, meetings, reports, publications, and communications.

ICES work is accomplished by various committees, expert groups, and workshops. During ICES long history, the structure has changed periodically to reflect the needs of the time. Currently, there is an Advisory Committee (ACOM) that provides advice to clients on fisheries and marine ecosystem issues and a Science Committee (SCICOM; formerly the Consultative Committee as established in the ICES Convention) that oversees all aspects of the scientific work.

Working under ACOM are Advice Drafting Groups, Review Groups, Expert Groups, and Data/Benchmark workshops.

SCICOM is made up of five steering groups: Ecosystem Functions (SSGEF), Human Interactions on Ecosystems (SSGHIE), Sustainable Use of Ecosystems (SSGSUE), Regional Sea Programmes (SSGRSP), and Ecosystem Surveys Science and Technology (SSGESST); and five operational groups: Working Group on Data and Information Management (WGDIM), ICES Publications and Communications Group (PUBCOM), ICES Training Group, Annual Science Conference Group, and the Awards Committee.

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Trebarwith Strand at sunset on the north Cornwall coast, UK.



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Workshop on Anglerfish and Megrim (WKAGME)	84 Paul Fernandes (United Kingdom) Marine Scotland, FRS Marine Laboratory, Aberdeen <i>fernandespg@marlab.ac.uk</i> 43 Norman Graham (Ireland) Marine Institute, Oranmore <i>norman.graham@marine.ie</i>
Workshop on Crustaceans Maturity Stages (WKMSC)	48 Fabio Fiorentino (Italy) National Research Council, Institute for Coastal Marine Environment (IAMC), Mazara del Vallo <i>fabio.fiorentino@irma.pa.cnr.it</i>
Workshop on Evaluation of the Potential for Extinction for Fish Species in the North Sea, Norwegian Sea and in the Barents Sea (WKPOOR2)	60 Dankert Skagen (Norway) Institute of Marine Research, Bergen <i>dankert.skagen@imr.no</i>

Workshop on Methods to Evaluate and Estimate the Precision of Fisheries Data for Assessment (WKPRECISE)

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Workshop on Mixed Fisheries Advice for the North Sea (WKMIXFISH)

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Workshop on Multi-Annual Management of Pelagic Stocks in the Baltic (WKMAMPEL)

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Workshop on Redfish Stock Structure (WKREDS)

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Workshop on Sampling Methods for Recreational Fisheries (WKSMRF)

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Sand dunes on Skallingen in Jutland, Denmark.

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Ted Potter, UK, was replaced by Niall Ó Maoiléidigh, Ireland, in September 2009.

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ASC Group

Composed of the five SCICOM Steering Group Chairs and the local host Delegate (Maurice Héral, France) tasked to review and recommend to SCICOM the ASC Theme Sessions for 2010.

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Maurice Héral (Chair)
William Karp (SSGESST Chair)
Thomas Noji (SSGHIE Chair, Ending 30 September)
Erik Olsen (SSGHIE Chair, Starting 1 October 2009)
Pierre Petitgas (SSGEF Chair)
Yvonne Walther (SSGRSP Chair)

Thousands of semi-transparent jellyfish floating in the Baltic. Aurelia aurita (moon jellyfish, moon jelly, common jellyfish, saucer jelly) is one of a suite of more than ten morphologically nearly identical jellyfish species in the genus Aurelia.

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A view of the North Atlantic from Cape Breton, Nova Scotia, Canada.



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Transition Group on ICES Publications (TGIP)	6 Pierre Pepin (Canada) Fisheries and Oceans Canada, Northwest Atlantic Fisheries Center, St John's <i>pierre.pepin@dfo-mpo.gc.ca</i>
Transition Group on Integrating Surveys for the Ecosystem Approach (TGISUR)	43 David Reid (Ireland) Marine Institute, Oranmore <i>david.reid@marine.ie</i>
Transition Group on the Science Requirements to Support Conservation, Restoration and Management of Diadromous Species (TGRECORDS)	81 Ted Potter (United Kingdom) Centre for Environment, Fisheries and Aquaculture Science (Cefas), Lowestoft <i>ted.potter@cefas.co.uk</i>
Working Group on Acoustic and Egg Surveys for Sardine and Anchovy in ICES areas VIII and IX (WGACEGG)	69 Andrés Uriarte (Spain) AZTI-Tecnalia, Pasaia (Gipuzkoa) <i>auriarte@pas.azti.es</i>
Working Group on Application of Genetics in Fisheries and Mariculture (WGAGFM)	60 Geir Dahle (Norway) Institute of Marine Research, Bergen <i>Geir.Dahle@imr.no</i>
Working Group on Beam Trawl Surveys (WGBEAM)	55 Ingeborg de Boois (The Netherlands) Wageningen IMARES, IJmuiden <i>ingeborg.deboois@wur.nl</i>

Working Group on Biological Effects of Contaminants (WGBEC)	80 John Thain (United Kingdom) Centre for Environment, Fisheries and Aquaculture Science (Cefas), Weymouth Laboratory, Weymouth john.thain@cefas.co.uk
Working Group on Cephalopod Fisheries and Life History (WGCEPH)	70 Graham Pierce (Spain) Instituto Español de Oceanografía, Centro Oceanográfico de Vigo graham.pierce@vi.ieo.es
Working Group on Crangon Fisheries and Life History (2001 C.Res: WGCran)	55 Ingrid Tulp (The Netherlands) Wageningen IMARES, IJmuiden Ingrid.Tulp@wur.nl
Working Group on Data and Information Management (WGDIM)	81 Richard Ayers (United Kingdom) Centre for Environment, Fisheries and Aquaculture Science (Cefas), Lowestoft r.a.ayers@cefas.co.uk 60 Helge Sagen (Norway) Institute of Marine Research, Bergen helge.sagen@imr.no
Working Group on Environmental Interactions of Mariculture (WGEIM)	7 Chris McKindsey (Canada) Fisheries and Oceans Canada, Institut Maurice-Lamontagne, Mont-Joli Chris.Mckindsey@dfo-mpo.gc.ca
Working Group on Fish Ecology (WGFE)	6 Dave Kulka (Canada) Fisheries and Oceans Canada, Northwest Atlantic Fisheries Center, St John's KulkaD@dfo-mpo.gc.ca
Working Group on Fisheries Acoustic Science & Technology (WGFASST)	1 Rudy Kloser (Australia) CSIRO Marine and Atmospheric Research, Hobart rudy.kloser@csiro.au
Working Group on Fishery Systems (WGFS)	60 Kjellrun Hiis Hauge (Norway) Institute of Marine Research, Bergen kjellrun.hiis.hauge@imr.no

Working Group on Holistic Assessments of Regional Marine Ecosystems (WGHAME)	<p>81 Andrew Kenny (United Kingdom) Centre for Environment, Fisheries and Aquaculture Science (Cefas), Lowestoft <i>andrew.kenny@cefas.co.uk</i></p> <p>60 Hein Rune Skjoldal (Norway) Institute of Marine Research, Bergen <i>hein.rune.skjoldal@imr.no</i></p>
Working Group on Integrated Coastal Zone Management (WGICZM)	<p>73 Beatriz Morales-Nin (Spain) Mediterranean Institute for Advanced Studies (IMEDEA), Esporles, Mallorca <i>beatriz@imedea.uib-csic.es</i></p>
Working Group on Mackerel and Horse Mackerel Egg Surveys (WMEGS)	<p>36 Jens Ulleweit (Germany) Johann Heinrich von Thünen-Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries, Institute for Sea Fisheries, Hamburg <i>jens.ulleweit@vti.bund.de</i></p>
Working Group on Marine Habitat Mapping (WGMHM)	<p>31 Jacques Populus (France) IFREMER, Centre de Brest, Plouzané <i>jpopulus@ifremer.fr</i></p>
Working Group on Marine Sediments in Relation to Pollution (WGMS)	<p>5 Patrick Roose (Belgium) Royal Belgian Institute of Natural Sciences, Management Unit of the North Sea Mathematical Models (MUMM), Oostende <i>patrick.roose@mumm.ac.be</i></p> <p>70 Lucia Viñas (Spain) Instituto Español de Oceanografía, Centro Oceanográfico de Vigo <i>lucia.vinas@vi.ieo.es</i></p>
Working Group on Marine Shellfish Culture (WGMASC)	<p>56 Pauline Kamermans (The Netherlands) Wageningen IMARES, Vestiging Yerseke, AB Yerseke <i>pauline.kamermans@wur.nl</i></p>
Working Group on Methods of Fish Stock Assessments (WGMG)	<p>84 Coby Needle (United Kingdom) Marine Scotland, FRS Marine Laboratory, Aberdeen <i>c.needle@marlab.ac.uk</i></p>

Working Group on Modelling of Physical/Biological Interactions (WGPBI)	<p>11 Charles G. Hannah (Canada) Fisheries and Oceans Canada, Bedford Institute of Oceanography, Dartmouth <hannahc@dfo-mpo.gc.ca< h1=""> <p>15 Uffe Thygesen (Denmark) National Institute of Aquatic Resources, Section for Fisheries Advice, Charlottenlund uht@aqu.dtu.dk </p></hannahc@dfo-mpo.gc.ca<></p>
Working Group on Multispecies Assessment Methods (WGSAM)	<p>60 Bjarte Bogstad (Norway) Institute of Marine Research, Bergen bjarte.bogstad@imr.no <p>81 John K. Pinnegar (United Kingdom) Centre for Environment, Fisheries and Aquaculture Science (Cefas), Lowestoft john.pinnegar@cefas.co.uk </p></p>
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Working Group on Operational Oceanographic Products for Fisheries and Environment (WGOOFE)	<p>55 Mark Dickey-Collas (The Netherlands) Wageningen IMARES, IJmuiden mark.dickeycollas@wur.nl <p>60 Morten D. Skogen (Norway) Institute of Marine Research, Bergen morten.skogen@imr.no </p></p>
Working Group on Pathology and Diseases of Marine Organisms (WGPDMO)	<p>93 Sharon MacLean (United States) National Marine Fisheries Services, Narragansett Laboratory, Narragansett sharon.maclea@noaa.gov </p>
Working Group on Quantifying All Fishing Mortality (WGQAF)	<p>82 Philip MacMullen (United Kingdom) Fishgate, Hull p_macmullen@seafish.co.uk </p>

Working Group on Recruitment Processes (WGRP)	87 Tom Miller (United States) Chesapeake Biological Laboratory, Solomons <i>miller@cbl.umces.edu</i> 60 Richard Nash (Norway) Institute of Marine Research, Bergen <i>Richard.Nash@imr.no</i>
Working Group on Seabird Ecology (WGSE)	83 Jim Reid (United Kingdom) Joint Nature Conservation Committee (JNCC), Aberdeen <i>jim.reid@jncc.gov.uk</i>
Working Group on Zooplankton Ecology (WGZE)	88 Mark Benfield (United States) Louisiana State University, Coastal Fisheries Institute, Baton Rouge <i>mbenfie@lsu.edu</i>
Working Group on the Biology and Life History of Crabs (WGCRAb)	81 Julian Addison (United Kingdom) Centre for Environment, Fisheries and Aquaculture Science (Cefas), Lowestoft <i>julian.addison@cefas.co.uk</i>
Working Group on the Effects of Extraction of Marine Sediments on the Marine Ecosystem (WGEXT)	41 Gerry Sutton (Ireland) Coastal and Marine Resources Centre (CMRC), University College Cork, Cobh <i>gerry.sutton@ucc.ie</i>
Workshop on Blue Whiting Recruitment (WKBLUR)	15 Mark Payne (Denmark) National Institute of Aquatic Resources, Section for Fisheries Advice, Charlottenlund <i>mpa@aqua.dtu.dk</i>
Workshop on Climate-related Benthic Processes in the North Sea (WKCBS)	35 Henning Reiss (Germany) DZMB-Forschungsinstitut Senckenberg, Department of Marine Research, Wilhelmshaven <i>henning.reiss@senckenberg.de</i>
Workshop on Combining Climatic Scenarios and Medium-Term Predictions for Baltic Herring and Sprat Stocks (WKCSPB)	74 Max Cardinale (Sweden) Swedish Board of Fisheries, Institute of Marine Research, Lysekil <i>massimiliano.cardinale@fiskeriverket.se</i>

(WKCSMPB continued)	65 Piotr Margonski (Poland) Sea Fisheries Institute in Gdynia <i>pmargon@mir.gdynia.pl</i>
Workshop on Edge Effects in <i>Nephrops</i> Surveys (WKNepEdge)	81 Ewen D. Bell (United Kingdom) Centre for Environment, Fisheries and Aquaculture Science (Cefas), Lowestoft <i>ewen.bell@cefas.co.uk</i>
Workshop on Learning from Salmon Tagging Records (WKLUSTRE)	63 Lars Petter Hansen (Norway) Norwegian Institute for Nature Research, NINA, Oslo <i>l.p.hansen@nina.no</i>
Workshop on Mackerel and Horse Mackerel Egg Staging and Identification (WKMHMES)	55 Cindy van Damme (The Netherlands) Wageningen IMARES, IJmuiden <i>cindy.vandamme@wur.nl</i>
Workshop on Understanding and Quantifying Mortality in Fish Early-Life Stages: Experiments, Observations, and Models (WKMOR)	84 Alejandro Gallego (United Kingdom) Marine Scotland, FRS Marine Laboratory, Aberdeen <i>a.gallego@marlab.ac.uk</i> 87 Edward D. Houde (United States) Chesapeake Biological Laboratory, Solomons <i>ehoude@cbl.umces.edu</i> 96 Elizabeth North (United States) University of Maryland, Horns Point Laboratory, Cambridge <i>enorth@hpl.umces.edu</i>
Workshop on the Identification of Ichthyoplankton, especially Clupeid Larvae (WKIDCL)	36 Norbert Rohlf (Germany) Johann Heinrich von Thünen-Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries, Institute for Sea Fisheries, Hamburg <i>norbert.rohlf@vti.bund.de</i>

Icebergs from the Breiðamerkurjökull glacier floating towards the North Atlantic Ocean in the glacial lagoon Jökulsárlón in Iceland. The lagoon first appeared in the 1930s and has more than doubled in size since the 1970s.



Institutes

Names in the preceding directory are associated with the specific address of an institute through the numbers that are cross-referenced below.

These are the addresses of scientists involved in the work of ICES expert groups, so the list does not represent a complete list of all institutes associated with ICES.

Australia

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CSIRO Marine and
Atmospheric Research
PO Box 1538
7001 Hobart TAS
www.cmar.csiro.au

Austria

2
International Institute for
Applied Systems Analysis
Schlossplatz 1
2361 Laxenburg
www.iiasa.ac.at

Belgium

3
Institute for Agricultural and
Fisheries Research (ILVO)
Ankerstraat 1
8400 Oostende
www.ilvo.vlaanderen.be

4
Royal Belgian Institute of
Natural Sciences
Management Unit of the
North Sea Mathematical
Models (MUMM)
Gulledelle 100
1200 Brussels
www.mumm.ac.be

5
Royal Belgian Institute of
Natural Sciences
Management Unit of the
North Sea Mathematical
Models (MUMM), Oostende
Department
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Linierregimentsplein
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www.mumm.ac.be

Canada

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Fisheries and Oceans Canada
Northwest Atlantic Fisheries
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80 East White Hills Road
PO Box 5667
St John's, NL A1C 5X1
www.nfl.dfo-mpo.gc.ca

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Fisheries and Oceans Canada
Institut Maurice-Lamontagne
850 route de la Mer
PO Box 1000
Mont-Joli, QC G5H 3Z4
www.qc.dfo-mpo.gc.ca/iml-mli/institut-institute/index-eng.asp

8
Fisheries and Oceans Canada
DFO Moncton
343 Université Avenue
PO Box 5030
Moncton, NB E1C 9B6
www.glf.dfo-mpo.gc.ca/index-e.php

9
Fisheries and Oceans Canada
Department of Fisheries
and Oceans
PO Box 1236
Charlottetown,
Prince Edward Island
C1A 7M8
www.dfo-mpo.gc.ca/oceans-habitat/habitat/modernizing-moderniser/epmp-pmpe/pei/index_e.asp

10
Fisheries and Oceans Canada
Canadian Science Advisory
Secretariat (CSAS)
200 Kent Street, Station 8W135
Ottawa, ON K1A 0E6
www.dfo-mpo.gc.ca/csas/Csas/Home-Accueil_e.htm

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Fisheries and Oceans Canada
Bedford Institute of
Oceanography
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PO Box 1006
Dartmouth, NS B2Y 4A2
www.bio.gc.ca

12
Memorial University of
Newfoundland
Marine Institute
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St John's, NF A1C 5R3
www.mi.mun.ca

13
Queen's University
Department of Biology
2406 Biosciences Complex
116 Barrie Street
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Denmark

14
National Institute of Aquatic
Resources
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9850 Hirtshals
www.aqua.dtu.dk

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National Institute of
Aquatic Resources
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2920 Charlottenlund
www.aqua.dtu.dk

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National Institute of Aquatic
Resources
Department of Inland
Fisheries
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8600 Silkeborg
www.aqua.dtu.dk

17
Roskilde University
Institute for History and
Social Theory
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PO Box 260
4000 Roskilde
http://magenta.ruc.dk/cuid_en/

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University of Copenhagen
Marine Biological Laboratory
Strandpromenaden 5
3000 Helsingør
www.mbl.ku.dk

Estonia

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Estonian Marine Institute
University of Tartu
10a Mäealuse Street
12618 Tallinn
www.ut.ee

20
Estonian Marine Institute
University of Tartu
2a Lootsi
80012 Pärnu
www.pc.ut.ee

Faroe Islands

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Faroe Marine Research
Institute
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110 Tórshavn
www.hav.fo/default.asp

Finland

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Finnish Environment Institute (SYKE)
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Finnish Environment Institute (SYKE)
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Finnish Game and Fisheries Research Institute
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PO Box 2
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Finnish Game and Fisheries Research Institute
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20520 Turku
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Finnish Game and Fisheries Research Institute
Oulu Game and Fisheries Research
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90570 Oulu
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France

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Cemagref
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Ifremer
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92138 Issy-les-Moulineaux
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Ifremer
Nantes Centre
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PO Box 21105
44311 Nantes Cédex 03
www.ifremer.fr/nantes/

30

Ifremer
Lorient Station
8, rue François Toullec
56100 Lorient
www.ifremer.fr/sth/station_lorient.htm

31

Ifremer
Centre de Brest
Technopole de Brest-Iroise
PO Box 70
29280 Plouzané
www.ifremer.fr/brest/index.html

32

Ifremer
Boulogne-sur-Mer Centre
150, Quai Gambetta
PO Box 699
62321 Boulogne Cédex
www.ifremer.fr/anglais/implant/boulogne.htm

33

Intergovernmental Oceanographic Commission (IOC)
1, rue Miollis
75732 Paris Cédex 15
<http://ioc-unesco.org>

34

L'Institut de Recherche pour le Développement (IRD)
Centre de recherche halieutique méditerranéenne et tropicale
Avenue Jean Monnet
BP 171
34203 Sète Cédex
www.crh-sete.org/centre/umr.htm

Germany

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DZMB-Forschungsinstitut Senckenberg
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26382 Wilhelmshaven
www.senckenberg.de

36

Johann Heinrich von Thünen-Institute
Federal Research Institute for Rural Areas, Forestry and Fisheries
Institute for Sea Fisheries
Palmaille 9
22767 Hamburg
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Johann Heinrich von Thünen-Institute
Federal Research Institute for Rural Areas, Forestry and Fisheries
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Alter Hafen Süd 2
18069 Rostock
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University of Hamburg
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Greece

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Hellenic Centre for Marine Research
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16777 Athens
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Iceland

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Marine Research Institute
Skúlagata 4
PO Box 1390
121 Reykjavík
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Ireland

41

Coastal and Marine Resources Centre (CMRC)
University College Cork
Irish Naval Base
Haulbowline
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Co. Cork
www.cmrc.ucc.ie

42

Irish Sea Fisheries Board
Crofton Road
PO Box 12
Dun Laoghaire
Co. Dublin
www.bim.ie

43

Marine Institute
Rinville
Oranmore
Co. Galway
www.marine.ie

44

Marine Institute
Marine Spatial Planning
80 Harcourt Street
Dublin 2
www.marine.ie

45

Marine Institute
Aquaculture & Catchment
Research Management Facility
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46

UCD Research
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Italy

47

CNR - National Research
Council
Institute of Marine Science
Largo Fiera della Pesca, 2
60125 Ancona
www.ismaran.it/ismaran/Default.aspx

48

CNR - National Research
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Institute for Coastal Marine
Environment (IAMC)
via L. Vaccara 61
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www.cnr.it/istituti/DatiGenerali_eng.html?cds=002

Korea

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608-737 Nam-gu. Busa
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Latvia

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1048 Riga
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Russian Federation

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Environment Building
Baton Rouge, LA 70803
www.cfi.lsu.edu

89

MIT Sea Grant College Program
Massachusetts Institute
of Technology
77 Massachusetts Avenue
E38-300
Cambridge, MA 02139
<http://seagrants.mit.edu/>

90

National Marine Fisheries
Services
1315 East West Highway
Silver Spring, MD 20910-6233
www.nmfs.noaa.gov

91

National Marine Fisheries
Services, Northeast Fisheries
Science Center
Woods Hole Laboratory
166 Water Street
Woods Hole, MA 02543-1026
www.nefsc.noaa.gov

92

National Marine Fisheries
Services, Northeast Fisheries
Science Center
Sandy Hook Laboratory
74 Magruder Road
Sandy Hook Highlands,
NJ 07732
<http://sh.nefsc.noaa.gov/>

93

National Marine Fisheries
Services
Narragansett Laboratory
28 Tarzwell Drive
Narragansett, RI 02882-1199
<http://na.nefsc.noaa.gov/>

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National Marine
Fisheries Services
NMFS RTR Unit at
Virginia Tech
114 Cheatham Hall
Blacksburg, VA 24061-0321
www.nmfs.vt.edu/

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National Marine
Fisheries Services
Alaska Fisheries
Science Center
7600 Sand Point Way N.E.,
Building 4
Seattle, WA 98115
www.afsc.noaa.gov

96

University of Massachusetts
Dartmouth
School for Marine Science
and Technology
200 Mill Road
Fairhaven, MA 02719
www.smast.umassd.edu

97

University of Maryland
Horns Point Laboratory
2020 Horns Point Rd.
PO Box 775
Cambridge, MD 21613
www.hpl.umces.edu

98

University of Massachusetts
Dartmouth
School for Marine Science and
Technology
838 South Rodney French Blvd.
New Bedford, MA 02744-1221
www.smast.umassd.edu

99

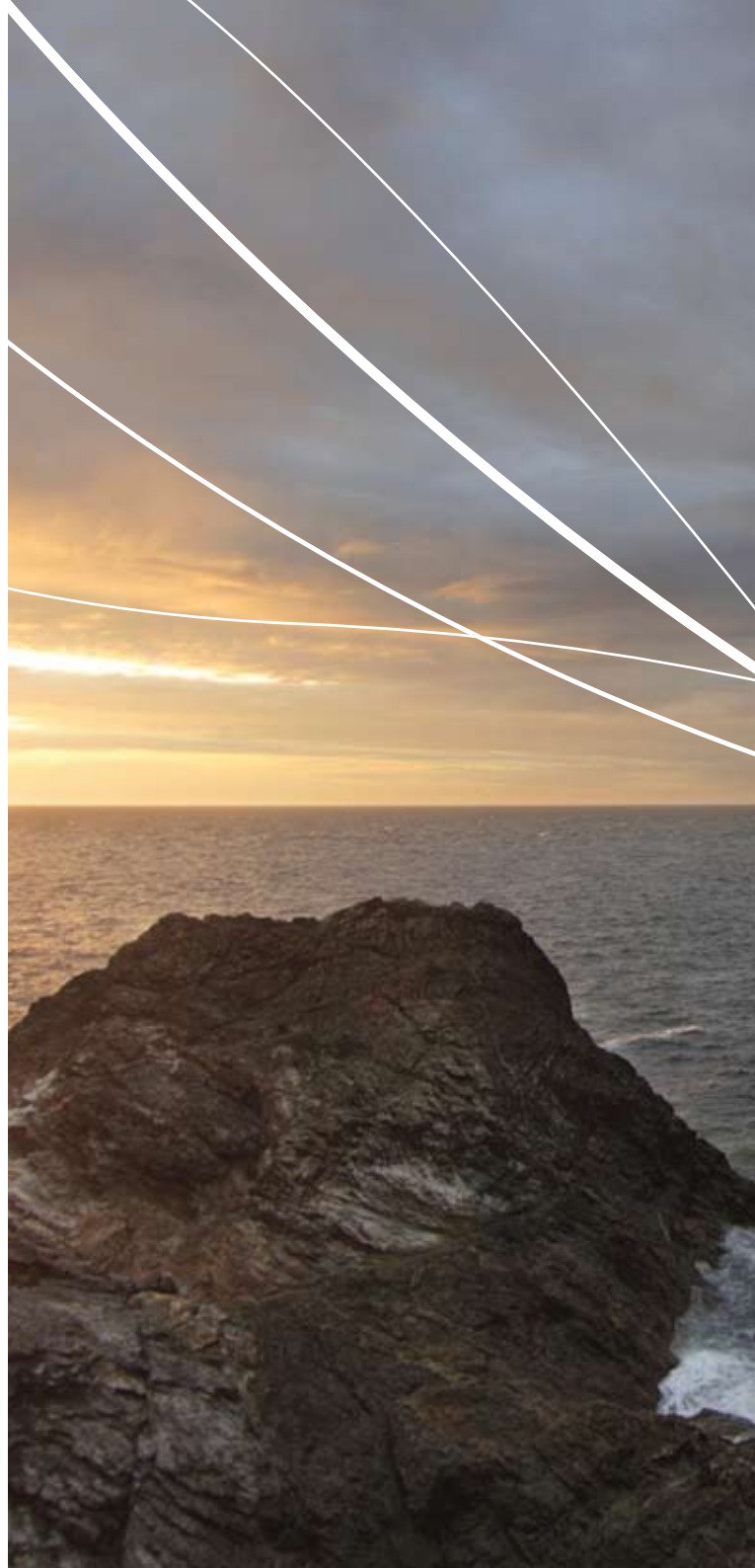
University of New Hampshire
Ocean Process Analysis
Laboratory
142 Morse Hall,
39 College Rd.
Durham, NH 03824
[http://marine.unh.edu/
research/opal.html](http://marine.unh.edu/research/opal.html)

100

University of Washington
School of Aquatic & Fisheries
Sciences (SAFS), Biology
Department
PO Box 355020
Seattle, WA 98195-5020
[www.fish.washington.edu/
index.html](http://www.fish.washington.edu/index.html)

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Woods Hole Oceanographic
Institution (WHOI)
PO Box 2228
Teaticket, MA 01753
www.whoi.edu/



Trevose Head lighthouse on the north Cornish coast, UK. Built in 1847 to guide ships through the Bristol Channel, the lighthouse became automated in 1995.





ICES

International Council for
the Exploration of the Sea

CIEM

Conseil International pour
l'Exploration de la Mer

