



ICES
CIEM

International Council for
the Exploration of the Sea

Conseil International pour
l'Exploration de la Mer

ICES Stocktaking of its Role and Capabilities in Ocean and Coastal Sustainability

In support of the Inter-Agency Report towards the preparation of the UN Conference on Sustainable Development (Rio +20)

http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/interagency_blue_paper_ocean_rioPlus20.pdf

Introduction

In support of the 2011 inter-agency report of IOC/UNESCO, IMO, FAO, and UNDP (titled *A Blueprint for Ocean and Coastal Sustainability for consideration at the RIO+20 Conference*), which has been prepared for discussion at the UN Conference on Sustainable Development (Rio+20) in June 2012, the International Council for the Exploration of the Sea (ICES) has considered how our organization could contribute to the diverse proposals that address the four stated objectives for enhanced sustainability of ocean uses. An overview of the organization is provided, followed by a summary of how ICES could contribute to the diverse putative initiatives. More detail on the relevant ICES activities is provided in an Annex.

Overview of ICES

Objective and deliverables

ICES is an intergovernmental organization whose main objective is to increase the scientific knowledge of the marine environment and its living resources and to use this knowledge to provide advice to competent authorities. ICES Science and Advice considers both how human activities affect marine ecosystems and how ecosystems affect human activities. In this way, ICES ensures that best available science is accessible for decision-makers to make informed choices on the sustainable use of the marine environment and ecosystems.

To achieve this objective ICES prioritizes, organizes, delivers and disseminates research needed to fill gaps in marine knowledge related to issues of ecological, political, societal, and economic importance at the pan-Atlantic and global levels.

The main ICES deliverables are scientific publications, and scientific information and management advice requested by member countries and also international organizations and commissions such as the North East Atlantic Fisheries Commission (NEAFC), the North Atlantic Salmon Conservation Organization (NASCO), the Oslo-Paris Commission (OSPAR), the Helsinki Commission - Baltic Marine Environment Protection Commission (HELCOM), and the European Commission (EC). Importantly, these products are unbiased, non-political in nature, and based on the best available science.

Convention and geographic scope

The International Council for the Exploration of the Sea (ICES) was established in 1902 by exchange of letters between participating countries. In 1964, through an agreed Convention, ICES received a legal foundation and full international status.

The Convention covers the Atlantic Ocean and its adjacent seas, and ICES has focused on the North Atlantic Ocean and the Baltic Sea. Members of the ICES community include all 20 coastal states bordering these two marine areas.

The ICES cooperative network extends far beyond its member states, and encompasses international organizations, non-member countries, and scientific institutes/scientists worldwide.

Member Countries and Secretariat

The 20 member countries of ICES are: Belgium, Canada, Denmark, Estonia, Finland, France, Germany, Iceland, Ireland, Latvia, Lithuania, the Netherlands, Norway, Poland, Portugal, Russia, Spain, Sweden, United Kingdom, and the United States of America. ICES comprises a network of more than 4000 scientists from almost 300 institutes, with 1600 scientists participating in activities annually.

The ICES Secretariat has been based in Copenhagen, Denmark, since 1902. The Secretariat staff (53 individuals) provides secretarial, administrative, scientific, and data handling support to the ICES community.

Potential ICES Contributions to a subset of the “Blue Paper” Proposals

ICES activities, capabilities, and expertise with respect to the four overarching ocean and coastal sustainability objectives for transition to the blue-green economy, as proposed in the Inter-Agency Report *Towards the preparation of the UN Conference on Sustainable Development (Rio +20)*, is summarized in the table below with greater detail provided in the Annex.

INTER-AGENCY REPORT OBJECTIVE	ICES PROPOSAL	ICES ROLE
Objective 1. Actions to reduce stressors and maintain or restore the structure and function of marine ecosystems for equitable and sustainable use of marine resources and ecosystems.		
1.a Implement Actions to Adapt to and Mitigate Ocean Acidification.	ICES could contribute to the establishment of a new global programme on ocean acidification risk assessment. ICES capabilities could be applied in assessments of regional forecasts/tipping points/ecosystem impacts.	Support
1.b Develop and Execute a Global Program aimed at Greater Protection and Restoration of Vital Ocean and Coastal Habitats, and develop a Global Blue Carbon Market as a means of Creating Direct Economic Gain through Habitat Protection	ICES is well positioned to contribute to assessments and advice regarding vital ocean and coastal habitats. ICES is willing to work cooperatively with partner commissions on this issue at regional scales in the North Atlantic and adjacent seas.	Support

INTER-AGENCY REPORT OBJECTIVE	ICES PROPOSAL	ICES ROLE
1.c Strengthen the Legal Framework to Effectively Address Aquatic Invasive Species	The ICES network possesses considerable expertise on invasive species. ICES is well equipped to effectively coordinate marine research on invasive species to enhance and strengthen the legal framework dealing with this issue.	Support
Objective 2. Actions that support the Green Economy concept leading to alleviation of poverty and promotion of sustainable ocean sectors and livelihoods including actions to improve implementation at local levels through participatory processes.		
2.b Increase Efforts for Responsible Fisheries and Aquaculture in a Green Economy	ICES could take a lead role in assembling and improving the scientific basis for achieving responsible fisheries and aquaculture.	Lead
2.c Green the Nutrient Economy and Reduce Ocean Hypoxia through Policy, Regulatory and Economic Instruments that Promote Nutrient Efficiency and Recovery	ICES has experience in formulating monitoring guidelines and developing methods standards for eutrophication, and could play a role in this regard.	Support
Objective 3. Actions resulting in Policy, Legal and Institutional Reforms for effective Ocean Governance, including in the High Seas, and strengthening the institutional framework, mandate and coordination of UN bodies with marine competencies.		
3.a Create and Implement an Institutional and Legal Framework to Protect Habitats and Biodiversity Beyond National Jurisdiction	ICES possesses the expertise to assume a leadership role in creating and implementing a framework to identify and protect vulnerable marine habitats in the North Atlantic and Arctic.	Lead
3.b Reform Regional Ocean Management Organizations	ICES mandate to coordinate marine research in the North Atlantic implies that it is ideally positioned to enhance and strengthen the scientific foundations of ocean management.	Lead
Objective 4. Actions supporting marine research, monitoring and evaluation, technology and capacity transfer as a means for improving knowledge, addressing emerging issues, developing capacities in support of sustainable use of the ocean		

INTER-AGENCY REPORT OBJECTIVE	ICES PROPOSAL	ICES ROLE
4.a Increase Institutional and Human Capacity for Sustained Observations, Monitoring, Marine Research, and Progress evaluation of International commitments	ICES core activities focus on this objective. ICES also provides training, as well as scientific input and advice, on integrated observing systems for the Ecosystem Approach to Management (EAM).	Support

Concluding Comments

ICES fully supports the 4 objectives of the inter-agency paper, and is prepared to work with relevant organizations to implement a subset of the marine related actions that have been proposed to enhance “ocean and coastal sustainability”.

Annex providing detail on how ICES could contribute to the proposals of the “Blue Paper”

Objective 1. Actions to reduce stressors and maintain or restore the structure and function of marine ecosystems for equitable and sustainable use of marine resources and ecosystems.

ICES advises competent authorities on marine policy and management issues related to the impacts of human activities on marine ecosystems and the management of the exploitation of living marine resources.

The ICES approach to fisheries advice integrates the precautionary approach, maximum sustainable yield, and the ecosystem approach into a single advisory framework. The aim, in accord with the intent of most international guidelines, is to inform policies for high long-term yields while maintaining productive fish stocks within healthy marine ecosystems.

The precautionary approach framework was implemented by ICES in 1997. Since 2010, the basis for the ICES advice has been complemented by the maximum sustainable yield (MSY) concept. In 2011, ICES provided advice on more than 200 fish stocks.

ICES also provides environmental advice on a wide range of ecosystem issues. Recent examples include advice on bycatch of marine mammals, integrated monitoring and assessment of chemicals and biological effects, Atmospheric monitoring of PFOS (Perfluorooctane sulfonate), effects of mariculture on populations of wild fish, and monitoring methodologies for ocean acidification.

ICES Advice is responsive and constantly evolving to accommodate the demands of important legal frameworks such as the global commitments outlined in the Johannesburg Plan of Implementation adopted by the World Summit on Sustainable Development, and regional commitments such as the European Commission fisheries policy. The current evolution of ICES Advice includes a transition process to attain full implementation of the MSY approach by 2015.

1.a Implement Actions to Adapt to and Mitigate Ocean Acidification.

ICES has provided assessments and advice regarding North Atlantic climate change and acidification, and this experience and expertise could contribute to the establishment of a new global programme on ocean acidification risk assessment. ICES capabilities could be applied in assessments of regional forecasts/tipping points/ecosystem impacts.

Acidification and its effects on marine ecosystems have been assessed in ICES research activities on climate change in the North Atlantic. ICES has also provided advice on methodologies for monitoring ocean acidification. The ICES–PICES Strategic Initiative on Climate Change Impacts on Marine Ecosystems (SICCME), is a collaboration created to respond to the need for credible, objective, and innovative science advice on the impacts of climate change on marine ecosystems. The recently published Cooperative Research Report *ICES status report on climate change in the North Atlantic* delivers new insights into the ways in which climate change and variability are affecting the North Atlantic and provide a baseline synthesis for future comparisons. The report also outlines research needs and future scientific challenges of climate change in both the North Atlantic and other oceans and seas. A special issue of *ICES Journal of Marine Science* was published with the scientific results from the 2010 PICES/ICES/FAO international symposium “Climate Change Effects on Fish and Fisheries: Forecasting Impacts, Assessing Ecosystem Responses and Evaluating Management Strategies” held in Sendai, Japan.

1.b Develop and Execute a Global Program aimed at Greater Protection and Restoration of Vital Ocean and Coastal Habitats, and develop a Global Blue Carbon Market as a means of Creating Direct Economic Gain through Habitat Protection.

ICES has provided evaluations of critical ocean and coastal-zone habitats, and is well positioned to contribute to assessments and advice regarding vital ocean and coastal habitats. ICES is willing to work cooperatively with partner commissions on this issue at regional scales in the North Atlantic and adjacent seas.

ICES is actively involved in marine spatial planning, and the ICES Working Group for Marine Planning and Coastal Zone Management has the expertise and experience to contribute at a regional level. ICES has crafted and implemented two Strategic Initiatives of relevance: a Strategic Initiative on Biodiversity to further develop and enhance ICES capabilities in assessing and protecting biodiversity; and a Strategic Initiative on Marine Spatial Planning which builds on the concept of blue economy.

1.c Strengthen the Legal Framework to Effectively Address Aquatic Invasive Species.

The ICES network possesses considerable expertise on invasive species. ICES is well equipped to effectively coordinate marine research on invasive species to enhance and strengthen the legal framework dealing with this issue.

Within ICES, two working groups explicitly focus on aquatic invasive species; one of these groups is a joint endeavour with the International Oceanographic Commission (IOC) and the International Maritime Organization (IMO). This collaborative work has forged closer links between science and policy needs through scientific/technical inputs to the IMO’s work related to the International Convention for the Control and Management of Ships Ballast Water and Sediments.

Selected invasive species topics addressed by ICES include:

- issues relating to the transport of non-native species via shipping, including the status of shipping vector research, methodologies relating to ballast water treatment facilities, and matters relating to the sampling strategies under consideration by the International Maritime Organization (IMO);
- development of management methods to reduce risk, identification of species likely to be transported, and evaluation of the sensitivity of marine areas to determine the risks associated with the vectors;
- non-indigenous species issues related to the European Union Marine Strategy Framework Directive (EU MSFD).

Objective 2. Actions that support the Green Economy concept leading to alleviation of poverty and promotion of sustainable ocean sectors and livelihoods including actions to improve implementation at local levels through participatory processes.

2.b Increase Efforts for Responsible Fisheries and Aquaculture in a Green Economy

ICES has a long history and well established practice of assessing and advising on "responsible fisheries in marine ecosystems". ICES could take a lead role in assembling and improving the scientific basis for achieving responsible fisheries and aquaculture.

As noted previously (under Objective 1), the ICES approach to fisheries advice integrates the precautionary approach, maximum sustainable yield, and the ecosystem approach into a single advisory framework.

The scientific advice is incrementally implementing the ecosystem approach to management of human activities affecting the marine environment. ICES *Advice* is now organized according to ecoregions to facilitate the integration of an ecosystem perspective. Increasingly, ICES is called on to take account of ecosystems in fisheries advice, and to provide advice on other ecosystem aspects. Examples of these requests include provision of multispecies (biological interactions) advice, identification of vulnerable marine habitats, and quantification of bycatches of protected species such as marine mammals, sea turtles, and seabirds.

The multispecies nature of fisheries and ecosystems is important. Currently, ICES provides single-stock advice, but beginning in 2012 will provide mixed fisheries advice for the demersal fisheries in the North Sea in the form of catch options that incorporate technical interactions. Another type of interaction results from "biological interactions" (predator-prey; competition for food or habitat) between species. In 2012, ICES will provide advice for Baltic fish stocks in the form of catch options that incorporates biological interactions between herring, sprat, and cod.

Recovery plans and long-term management plans have been enacted for a number of fish stocks/fisheries within the ICES area, and additional plans are proposed. ICES has evaluated such management plans with regard to their conformity with the precautionary approach, and now evaluates them relative to their congruity with the MSY approach.

During the past decade, ICES advice has become much more transparent, and stakeholder involvement in the advisory process has markedly increased. Some

management plans have even been developed in a collaborative process involving stakeholders and ICES scientists.

ICES has long dealt with aquaculture and related issues including (a) environmental interactions; (b) introduction and transfers of marine organisms, (c) effects of aquaculture activities on wild populations; (d) pathogens and diseases; and (e) the application of genetics. While ICES has provided advice on several of these aspects, a broader review is underway to assess the potential capacity and future role of ICES with regard to aquaculture. The goal of this evaluation to determine whether ICES needs to augment its capabilities if it was to establish an advisory framework programme for aquaculture.

2.c Green the Nutrient Economy and Reduce Ocean Hypoxia through Policy, Regulatory and Economic Instruments that Promote Nutrient Efficiency and Recovery.

ICES has experience in formulating monitoring guidelines and developing methods standards for eutrophication, and could play a role in this regard.

ICES has also provided support to a policy document highlighting this important issue, the recent OCEANA document “*Hot, Sour & Breathless – Ocean under stress*”.

Objective 3. Actions resulting in Policy, Legal and Institutional Reforms for effective Ocean Governance, including in the High Seas, and strengthening the institutional framework, mandate and coordination of UN bodies with marine competencies.

3.a Create and Implement an Institutional and Legal Framework to Protect Habitats and Biodiversity Beyond National Jurisdiction.

ICES has developed and provided scientific information and advice on deep-sea habitats in need of protection, and on related regulatory measures. ICES possesses the expertise to assume a leadership role in creating and implementing a framework to identify and protect vulnerable marine habitats in the North Atlantic and Arctic.

ICES has helped identify Vulnerable Marine Ecosystems (VMEs) in the Northeast Atlantic, and provided its expertise in reviewing a report on Ecologically and Biologically Significant Marine Areas (EBSAs) in the North Atlantic in relation to the Convention on Biological Diversity.

3.b Reform Regional Ocean Management Organizations.

ICES mandate to coordinate marine research in the North Atlantic implies that it is ideally positioned to enhance and strengthen the scientific foundations of ocean management.

ICES active leadership and research coordination responsibilities in the MARCOM+ Initiative (a partnership of ten leading European marine/maritime research organizations whose goal is to identify/advise on EU research priorities –including management and governance approaches – in support of sustainable use of the oceans and seas) and its interface with Technological Platforms, such as the European Aquaculture Technological Platform (EATP) signifies that ICES has a key role in establishing future research priorities.

ICES experience providing advice to Regional Fishery Management Organizations and working with Regional Sea Conventions could be drawn on to help advise on such a reform.

Objective 4. Actions supporting marine research, monitoring and evaluation, technology and capacity transfer as a means for improving knowledge, addressing emerging issues, developing capacities in support of sustainable use of the ocean.

4.a Increase Institutional and Human Capacity for Sustained Observations, Monitoring, Marine Research, and Progress evaluation of International commitments.

ICES core activities focus on increasing institutional and human capacity for sustained observations, monitoring, and marine research, and providing scientifically based advice to inform international ocean commitments. ICES also provides training, as well as scientific input and advice, on integrated observing systems for the Ecosystem Approach to Management (EAM).

A main thrust of ICES work is to coordinate and support collective and joint research activities (including marine surveys) to address scientific knowledge gaps and better understand crucial interactions in the marine environment. For this reason, the ICES mandate promotes and increases human capacity and, at the same time, strives to enact this mandate with regard to sustainable use of resources.

ICES holds, quality assures, administers, and provides access to users for several important marine thematic datasets (such as physical oceanography, contaminants and biological effects, and fisheries), and provides access to users of these data. New ICES database initiatives include the fully implemented ICES Spatial Facility (GIS application suite), and the development of a European regional fisheries database. ICES also actively contributes and reviews the EU Data Collection Framework, which provides commercial fisheries sampling data.

Symposia are also an important part of the ICES work programme, particularly because they foster the broadening of the diversity of scientists who participate in ICES activities. The largest symposium, the Annual Science Conference (ASC), is a forum at which the international community of marine scientists, professionals, stakeholders, and students gather to communicate and share their work. The annual conference, hosted by one of the 20 Member Countries, attracts between 600 and 900 scientists whose expertise spans a wide variety of disciplines.

To promote capacity building for the next generation of scientists working on human activities affecting marine ecosystems, ICES has developed and implemented a successful Training Programme. The Programme, initiated in 2009, offers training courses by high-profile scientists and instructors. During the past three years, 14 courses have been offered covering a wide diversity of topics (e.g. stock assessment (introductory and advanced); ecosystem modelling; model building; management strategy evaluation; Bayesian inference; fisheries advice; trawl survey design and evaluation; and integrated ecosystem assessment). Each course is taught within the context of the ICES science and advisory system to demonstrate best practices, as well as state-of-the-art technical skills. Nearly 400 students from 30 countries have attended these courses. As most of the training courses address global issues, ICES plans to expand their scope to better involve non-member countries, international and intergovernmental organizations, and conventions. Future training courses will further engage the global marine science community, and include a wider range of experts from universities and ministries.

ICES is also working to strengthen and advance research productivity through use of advanced technology. ICES has several expert groups actively involved with Ecosystem Surveys, Science, and Technology. Collectively, the aim of these groups is

to develop, maintain, standardize, consolidate, and advance assessment surveys, and to develop, foster, and implement advanced technologies for observing, monitoring, and surveying marine ecosystems. The overall ICES goal is to advance existing survey capabilities to develop and implement integrated surveys and monitoring systems in support of the Ecosystem Approach. Other ICES groups are working to develop, refine, and benchmark integrated ecosystem assessments for application in regional seas.