

Aquaculture

The meeting will be invited to review and comment on the revised and updated aquaculture document and the possibility of an ICES dialogue meeting to further refine and strengthen ICES position in this area.

ICES and aquaculture – proposal for a dialogue meeting

The overall aim of a proposed dialogue meeting to be arranged in [xx, on xx.xxx] is to bring together high level government administrators at the national and international level, scientists involved in the process of developing scientific advice in relation to aquaculture (finfish, shellfish, and plants/seaweed), and representatives from a broad spectrum of industries and stakeholders. The aim of a proposed dialogue meeting is to debate and discuss the advisory process in response to aquaculture management science needs in ICES Member Countries, seen in the light of an ecosystem approach. Proposed aspects of the meeting could be:

- 1) Stocktaking of existing legislative frameworks related to aquaculture operations
- 2) Stocktaking of recent ICES aquaculture work (relevant terms of reference in ICES expert groups)
- 3) Dialogue on current and emerging scientific issues related to aquaculture
- 4) A general discussion on matters of mutual importance in relation to the request for and provision of scientific advice

The ICES Strategic Plan – and Aquaculture

With the ICES Strategic Plan, 2014–2018 ICES has charted its course for the next five years. Given the status of many commercial wild stocks and impacts on the wider ecosystem from fishing activity, ICES recognizes the future increased demand for aquaculture in response to a growing global demand for protein. In the plan ICES has made a number of strategic choices, *i.a.* to further develop ICES science, advisory, and data work on aquaculture. As part of the work to produce the information and advice decision-makers need, ICES will respond to the evolving policy context and requests on aquaculture/aquaculture–environment interactions. This shall be seen in the light of the central focus of the Plan: to build a foundation of science around regional integrated ecosystem understanding, which ICES will use in producing integrated ecosystem assessments, as a fundamental link between ecosystem science and the advice required in applying the ecosystem approach.

A key principle for ICES in developing scientific knowledge is addressing information gaps and needs, adding value to on-going processes. For this reason it is important to take into account the changing science and policy landscape, including:

- national legislation in member countries
- the work of International organizations, such as the International Organization for Standardization;
- the recently established trans-Atlantic Research Alliance, and its EU, Canadian, and US Sustainable marine food production (fisheries and aquaculture)¹
- regional organizations, such as
 - the North Atlantic Salmon Conservation Organization (NASCO), Agreements and Guidelines relating to aquaculture, introductions and transfers, and transgenics
 - the European Aquaculture Technology and Innovation Platform (EATiP), the European Aquaculture Society (EAS), the Federation of European Aquaculture Producers (FEAP), EFARO (The European Fisheries and Aquaculture Research Organization), Canada's Sustainable Aquaculture Program and the European Union. EU establishing legislative standards for Aquaculture – environmental interactions through the Water Framework and Marine Strategy Framework Directives, the Strategy for the Sustainable Development of European Aquaculture, and work to develop guidance documents for the sustainable development of aquaculture in Europe.
- current and upcoming projects, cf. funding opportunities, for instance Horizon 2020 and Canadian Program for Aquaculture Regulatory Research.

ICES current work on aquaculture

ICES work on Aquaculture is now focused within WGAQUA², established as a single group in 2012 following the existence of several other ICES expert groups which have, since 1977, contributed to developing science on the environmental dependence and effects of aquaculture. The group's mandate is to focus on aquaculture–environment interactions and to address advisory and science requests related to the sustainability of aquaculture farming practices made by member countries.

WGAQUA works on multi-annual Terms of Reference and is addressing these current work terms in three thematic groups: Ecosystem Interactions, Benthic Effects, and Pest Management. Depending on the nature of the request, collaboration with other ICES working groups (e.g. Working Group on Application of Genetics in Fisheries and Mariculture (WGAGFM), Working Group on Pathology and Diseases of Marine Organisms (WGPDMO), Study Group on Socio-Economic Dimensions of Aquaculture (SGSA) may also bring more flexibility to the tasks WGAQUA will be able to address.

Emerging aquaculture issues are identified in the WGAQUA 2014 report, although some issues are beyond the scope of ICES to contribute. Further action would require an internal discussion on ICES in aquaculture, taking into account the expectations of our partner organizations and stakeholders (e.g. product quality, consumer safety and health, aquatic health and welfare).

At the 2014 ICES Annual Science Conference Theme Session K *The application of science for ecosystem-based management of aquaculture* is intended to promote interaction between the main groups involved within the aquaculture sector, namely; Scientists who develop the

¹ <http://ec.europa.eu/research/iscp/index.cfm?lg=en&pg=transatlantic-alliance>

² <http://www.ices.dk/community/groups/Pages/WGAQUA.aspx>

evidence and knowledge base, regulators and policy-makers who set the management and regulatory frameworks, and those in the aquaculture industry who work within the regulatory framework and depend on the development of an appropriate knowledge base to enhance and improve production of aquaculture products. The session will open with key note papers on relevant case studies demonstrating the needs and solutions from both a governance and development perspective.

ICES advice on aquaculture

ICES responds to requests for advice on aquaculture. In 2010 and 2014, ICES responded to OSPAR requests on effects of mariculture on populations of wild fish³, and interactions between wild and captive fish stocks⁴. Informal interest on aquaculture advice has been expressed by Member Countries, but to date no formal request has been received. Evaluating the sustainability of aquaculture is a debate that is underway in other countries with significant aquaculture production and it is likely that they too will seek advice from ICES on aquaculture – environment interactions.

Background

The aquaculture industry is the fastest growing food production sector in the world, with the FAO estimating annual growth in fish, shellfish and aquatic plant production increasing globally at a rate of 8.4%. As aquaculture has potential to develop into a significant component of world food security in the 21st Century, there is a continuing need for a strong science and knowledge base informing management practices and guiding the development of a sustainable aquaculture industry. This may facilitate increased food production both for direct human consumption and as feed and raw materials for the human food chain.

Aquaculture in the ICES area has showed rapid growth over the last three decades. In the beginning of this period science was mostly focused on developing the biological basis for aquaculture (developing species and mariculture systems). Over the past two decades the focus has shifted to the environmental effects of aquaculture on wild stocks of the cultured species and on the ecosystem as a whole. Spread of disease, parasites, introduction of pharmaceuticals used in aquaculture, and genetic interactions between wild and cultured populations may have negative impacts on the marine environment and associated economies. Other effects may include the release of nutrients and organic material, the excessive depletion of forage resources⁵ by cultured fish and shellfish, as well as the potential spread of non-indigenous species. In addition, there can also be positive effects of aquaculture (e.g. eutrophication control by shellfish filtration). Understanding, stimulating, reducing, or avoiding these effects requires further assessment and study.

ICES holds a key position in the future of aquaculture around the North Atlantic for three fundamental reasons.

- 1) Today, more than 50% of all consumer seafood is supplied by aquaculture and this proportion is expected to continue to rise. This represents a major activity that impacts, both directly and indirectly, marine resources in the ICES area and around the world. ICES is a natural contributor to both the science and the advice on aquaculture's interactions with the marine environment given its previous work in

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<http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2010/Special%20Requests/OSPAR%20effects%20of%20mariculture%20on%20wild%20fish.pdf>

4

http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2014/Special%20Requests/OSPAR_%20Interactions_of_wild_and_captive_fish_stocks.pdf

5 Harvested components of fish feed or plankton consumed by unfed shellfish culture

the area and our geographical scope, covering marine science institutions in our 20 member countries and beyond.

- 2) National governments and the European Commission are actively encouraging growth in this industry (e.g. CFP 2013) on the one hand, and on the other hand many regulatory frameworks in the ICES area are stalled in the face of scientific uncertainty regarding the interactions between aquaculture and the marine environment.
- 3) Aquaculture funding institutions require regulatory certainty and demonstrated market demand before supporting business ventures, both large and small.

ICES holds the scientific capacity in aquaculture practices, environment interactions and impact mitigation, if requested by clients, to facilitate the sustainable growth of this industry through the resolution of the regulatory certainty issues. ICES is unique in its structure and is in an ideal position to address these issues. A core ICES competence is transferring science from the laboratory and into society through the advisory process. ICES marine science and advice, in combination with our data resources, will provide an unprecedented opportunity to playing an instrumental role in a prosperous blue economy that is supported by a healthy marine environment with robust fishing and aquaculture industries.