Working Group on Open Ocean Aquaculture (WGOOA)

2018/MA2/ASG06 A **Working Group on Open Ocean Aquaculture (WGOOA)**, chaired by Bela H. Buck, Germany, will be established and will work on ToRs and generate deliverables as listed in the table below.

	Meeting dates	Venue	Reporting details	Comments (change in Chair, etc.)
Year 2019	20 - 22 March	Copenhagen	Interim report by 1 July	Constitutive/scoping meeting
Year 2020	26-27 May	By correspondence	Interim report by 7 June	
Year 2021	TBD May	Portland, Maine, USA	Final report by Date	

ToR descriptors

ToR	Description	Background	Science Plan codes	Duration	Expected Deliverables
a	Identify and develop descriptions and guidelines for various types of open ocean aquaculture systems and their characteristics needed to develop an ecosystem approach for sustainable management of open ocean aquaculture including methods for assessing potential interactions and synergies between open ocean aquaculture operations and the wider socio-ecological-system (SES).	The aim of this ToR is to support authorities and/or the work of extension agents who work at the interface between decision-making, research and business, helping investors and agencies understand, structure and articulate types of open ocean aquaculture and develop objective management tools. A description of various types of offshore aquaculture including where these types of aquaculture interact with legal or cultural values associated with the environment is needed to understand where and what types of offshore aquaculture are appropriate in various ICES regions.	5.7 – 5.8	Yr 1 & 2. 2019, 2020	To be reported on as a review paper.
b	Identify risk and mitigation measures for potential interactions between open ocean aquaculture operations and structures and protected species, such as	The aim of this ToR is to calculate risks of entanglement of whales, seals and turtles by offshore aquaculture structures and identify structural (engineering) and management methods to reduce	5.7 – 5.8	Yr 1 & 2. 2019, 2020	Organise and conduct a workshop to develop as an ICES Viewpoint.

	marine mammals and turtles.	potential negative impacts. Mitigation can be of technical (e.g. system design), ecosystem, environment and/or management nature.			
c	Collate existing information relevant for open ocean aquaculture on a regional sea-basin system level to identify site-specific opportunities for different types of open ocean aquaculture in the ICES area.	Using information from ToR a and b, this ToR will help to identify space in the ICES region that will support various types and combinations of offshore aquaculture from an oceanographic and environmental point of view. This ToR will develop a framework to evaluate potential which can be used in different basins. This evaluation will also articulate knowledge gaps, and be designed to provide data that can be inputs to economic impact and optimization models.	5.7 – 5.8	Yr 2-3. 2020-2021	To be reported on as a position paper.
d	Collect and summarize data on large scale open ocean aquaculture.	New systems for large scale offshore aquaculture are now coming on line in Norway and Asia. How these perform environmentally, structurally and economically needs to be documented and evaluated to identify and articulate the potential of these new large systems to significantly increase seafood production globally.	5.7 – 5.8	Yr 1-3. 2020-2021	Annual reports with a position paper in year 3.
f	Describe the effect of OOA related to ecosystem services, carbon footprint, artificial (seasonal) ecosystems (the crop), carrying capacity, and MPAs.	OOA interact with its surrounding ecosystem being influential in supporting ecosystem services, beyond the production of aquatic products by providing provisioning, regulating, habitat, supporting, and cultural services. As the provision of these services will vary over time, season and location interacting with the biotic and abiotic		Yr 3	

	parameters benefits and effects may vary.

Summary of the Work Plan

Year 1	Focus on ToR a and d. Develop descriptions of different types of offshore aquaculture including new large-scale fish systems. Organize workshop for ToR b.
Year 2	Publish review paper from ToR a and turn over Viewpoint from ToR b for external review. Develop framework to analyze basins and apply to a test case. Draft paper.
Year 3	Publish papers on framework for basin development and analysis of large-scale systems.

Supporting information

Priority	Offshore aquaculture has the potential to be highly appropriate to the ICES region and become a significant producer of sustainable seafood. As a new sector, the time for development in accordance with the ICES vision is now. In addition, this is a time of great change and evolution in this field to large scale systems which could fundamentally alter where our seafood comes from and create increased demand for advice.
Resource requirements	There is limited current work in this area in ICES and parts of the ToR are to evaluate the requirements. It is envisaged that an international project will be developed by the working group which could consider how to cooperate on currently funded national research but may need to develop and seek resources to work on specific case study scenarios.
Participants	Scientists and engineers will be key to this working group, with contributions from oceanographers, economists, GIS specialists and marine mammal/turtle experts.
Secretariat facilities	None.
Financial	No financial implications envisaged for ICES.
Linkages to ACOM an groups under ACOM	This project sets the stage for future advice products from ICES as governments need to manage open ocean aquaculture development. The whale and turtle issue are already a management need.
Linkages to other committe or groups	There is a close working relationship with all the groups of the Aquaculture Steering Group. We will seek to form links with the Working Group on Socio-Economic Dimensions of Aquaculture (WGSEDA) Working Group on Pathology and Diseases of Marine Organisms (WGPDMO), Working Group on Application of Genetics in Fisheries and Mariculture (WGAGFM), Working Group on Environmental Interactions of Aquaculture (WGEIA), Working Group on Scenario Planning in Aquaculture (WGSPA) and Working Group on Ecological Carrying Capacity in Aquaculture (WGECCA). There are also likely linkages to other groups not listed.
Linkages to oth organizations	EFARO, EATiP, DGMARE, AORA, EAS (European Aquaculture Society), WAS, NOAA, DFO. Industry – aquaculture businesses and producer groups, marine management organizations.