NE Atlantic Ocean Acidification Workshop

Knowledge to Local Action

Meeting Agenda and Proceedings Summary

Date:	**Time**:	**Duration**:
Wednesday, 28 April 2021	1300 UK – 1535 UK 1400 CET- 1635 CET	2 hours and 35 minutes

Workshop Overview:

Communities are already experiencing the negative impacts of climate change to fisheries and aquaculture, food security, economies and livelihoods and cultural practices and traditions. These impacts will worsen in the future without urgent action.

In 2021, it is imperative that governments and civil society continue to advance the suite of science and policy actions that will be needed to support food security and sovereignty, increase resilience of marine ecosystems and build a sustainable ocean economy in the face of future change. This is reflected in commitments to the UNFCCC, UN Sustainable Development Goals (SDGs), and in particular is directly relevant for supporting the target of SDG 14.3 to "Minimize and address the impacts of ocean acidification".

As the science, research and observed impacts of ocean acidification continue to grow, there is a continued need for increased knowledge exchange and expertise on the substance and process for developing local, regional and national responses in the face of cumulative ocean change.

Co-Hosts:

- International Alliance to Combat Ocean Acidification
- Global Ocean Acidification Observing Network NE Atlantic Hub
- Because the Ocean Initiative

Objectives:

The NE Atlantic workshop will bring together policy and decision-makers across the region for presentations and discussion of:

- Domestic and international policy frameworks for advancing ocean acidification knowledge and regional responses.
- Biological impacts to keystone fisheries and aquaculture within the Arctic and North Atlantic.
- Targeted monitoring and regional networks that can help inform government responses and strategies.

Invited Government Participants (*Emphasis on Climate and Environment Policy Leads, Water Quality and Monitoring Programs and Marine Managers*):

Belgium	Finland	Ireland	Portugal
Canada	Germany	Netherlands	Spain
Denmark	Greenland	Norway	Sweden
France	Iceland	Poland	United Kingdom

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(1) Welcome and Overview of Workshop (20 minutes)

Agenda Overview and Outcomes of the Workshop from Facilitators

- Dr. Helen Findlay, NE Atlantic OA Hub Coordinator, Plymouth Marine Laboratory and Ms. Jessie Turner, Secretariat, OA Alliance

Formal Welcome and Opening Remarks: Implementing domestic facing actions that address climate, ocean and biodiversity nexus and support international commitments

- Ambassador Helen Agren, Ministry of Foreign Affairs, Sweden
  - Ocean acidification, warming, and deoxygenation must be taken seriously by living up to the goals set in the Paris Agreement and increasing domestic ambition
  - 2021 presents a major opportunity to deal with many issues surrounding sustainable development and future resilience, and it's encouraging that more domestic commitments have been made.
  - We are now up against a moral imperative to prevent the worst impacts of climate change.
  - Challenges: lack of resources or sustained long-term funding, limited awareness, limited capacity across many countries for OA monitoring and management
  - We have seen positive regional progress in NE Atlantic, but we need increased awareness about both the problems and the solutions to effectively build political momentum

(2) Government Led Responses to Ocean Acidification: National Actions and Implementing International Climate and Ocean Commitments (30 minutes)

Framing of session and introduction of speakers, Ms. Jessie Turner

Assessing Frameworks for Implementing OA Action: Takeaways and recommendations from "European policies and legislation targeting ocean acidification in European waters - Current state"

- Dr. Charles Galdies, Division of Environmental Management and Planning within the Institute of Earth Systems
  - Publication arose from a series of internal working groups on OA and climate change, analyzing the state of affairs of ocean governance relative to ocean change.
  - Wide-ranging study requiring multidisciplinary expertise, ranging from scientific to governance experts, trying to determine geographic and governance disparity between EU countries on a relative scale.
  - At the EU level, national policies and legislation addressing OA remain scarce and uncoordinated. A more comprehensive and integrated set of policies and legislation would be able to more clearly, effectively steer OA mitigation efforts.

National OA Action Plan: The Importance of Domestic Facing Strategies

- Ms. Lillan Henseler, Policy Officer, Netherlands Ministry of Infrastructure and Water Management
  - In 2018, the Netherlands joined the OA Alliance and formed an OA action plan. This was motivated by their commitment to international agreements related to environmental health and ocean acidification, and by the global threat to both marine and human life which OA poses.
  - Primary ambitions: develop dialogue with knowledge partners to build and share knowledge base, improve monitoring and data sharing, reduce GHG emissions by 49% by 2030 (now increased to 55%), and more.
  - Current actions: OA monitoring programme in the North Sea and Caribbean Sea, intersessional correspondence group on OA within the OSPAR framework, and submitting North Sea data to IOC-UNESCO under SDG14.3.1.

Delivering on SDG 14.3.1 and the UN Decade of Ocean Science for Sustainable Development

- Ms. Kirsten Isensee, Intergovernmental Oceanographic Commission of UNESCO
  - The UN Decade of Ocean Science launched this year, aimed at ensuring ocean science can fully support countries to achieve the 2030 Agenda for Sustainable Development.
  - The difficult part: you can't taste or feel OA, so you have to clearly communicate the risk and significance of action.
  - Sometimes the UN Decade goals are easier to grasp than the long-term societal impacts of OA, but OA is materially related to ocean biodiversity, human health, and CO2 emissions.
  - The indicator for UN SDG 14.3 is average pH measured, and implementation includes the adoption of IOC developed methodology, data collection, and reporting to the UN.
  - IOC connecting with international and national databases to try to streamline and incorporate relevant data.
  - Key components: enhancing regional collaborative efforts, coordination of capacity building in science, codesign and implement observation and research to address OA, and – crucially - communication and delivery of the outputs to policymakers and communities.

Questions and Discussion – **10 minutes**

(3) Understanding Biological Impacts to Keystone Fisheries and Aquaculture: Implications for Targeted Science Investments, Mitigation, Adaptation and Resiliency Building Strategies (30 minutes)

Lightening talks: *5 minutes per presentation / 5 slides per presenter*

Framing of session and introduction of speakers, Dr. Helen Findlay

Introduction and overview of biological thresholds and indicators related to OA with an emphasis on food webs

- Dr. Nina Bednarsek, Biogeochemistry Department, Southern California Coastal Water Research Project (SCCWRP)
  - A threshold is a point which there is a statistically significant (negative) change in a response against the stressor.
  - Thresholds can be used as tools for predicting (and modelling) OA impacts across ecosystems and regions.
  - Meta- analyses and expert review are needed to determine agreed thresholds, and these are growing in number
  - Indicators and thresholds should work hand-and-hand to monitor current status of OA and projected changes over time
  - Can be starting point for biological assessment. For example, Pteropods (shelled pelagic snails) can be useful OA indicators because of their extreme sensitivity to ocean conditions. Their shells begin dissolving in more acidic conditions, and the severity of dissolution can indicate level of OA exposure.
  - Negative impacts on such a prevalent and abundant species of zooplankton at high latitudes will likely have ripple effects up the food webs to which it is connected.

Importance of genetic diversity and local adaptation to OA

- Dr. Sam Dupont, University of Gothenburg
  - The goal of UN SDG 14.3 is to "minimize and address the impacts of OA". To do this fully we need to focus on mitigation and adaptation.
  - Assessing adaptation potential includes understanding genetic variability and resilience traits.
  - Different populations of the same species may experience different OA impacts driven by differences in specific conditions and local genetic adaptation to an already variable pH environment.
  - To "address and minimize", monitoring must help determine biological impact which includes accounting for relevant-short-term variability and understanding local adaptation potential.

Arctic Cod: ecological economic sustainability

- Dr. Martin C. Hänsel, Potsdam Institute for Climate Impact Research, Potsdam
  - Scaling up physical responses to the level of a fish population isn't easy, given the many uncertainties on the single species level, but it's essential to inform policy-makers about consequences for food security and appropriate mitigation and adaptation strategies.
  - Based on bioeconomic modeling of arctic cod, study found that OA increases the risk of stock collapse – the stock can sustain only much smaller levels of fishing mortality than without OA.

- While near-term climate change will benefit the fishery, under a business-as-usual scenario of warming and OA this fishery may be at risk of collapse by the end of the century even with the best adaptation efforts being implemented.

Cold-Water Corals emphasis on habitat as fish nursery grounds

- Dr. Sebastian Henninge, University of Edinburgh
  - A slight increase in porosity around the outside of a coral increases the fragility and brittleness of the entire coral structure. While some cold-water corals can still survive below the aragonite saturation point, survival does not mean a healthy habitat. The saturation horizon is increasingly getting shallower, with less complex habitat systems below the saturation level. Dissolution of corals that can't survive increase the fragility of the overall ecosystem.
  - We still need to understand what is the timescale of habitat loss, what a predictor variable might be, what direct impacts to biodiversity and food webs it will have, and what is the risk of habitat and biodiversity loss.

Questions and Discussion (***10 minutes)***

Tea and Health Break (***5-10 minutes***)

(4) Ocean and Climate Change: State of Monitoring and Regional Networks that Can Help Inform Government Response and Investments (30 minutes)

Framing of session and introduction of speakers, Dr. Helen Findlay ***(2 minutes***)

Regional Monitoring Networks: Global Ocean Acidification Observing Network (GOA-ON) NE Atlantic Hub and OSPAR (***8 minutes)***

- Prof. Stephen Widdicombe, GOA-ON Co-Chair, Plymouth Marine Laboratory
  - GOA-ON formed in 2012 to help: 1) document the status and of progress of OA in open-ocean, coastal, estuarine and coral reef environments; 2) understand the impacts of OA on marine ecosystems and societies; 3) support forecasts of OA conditions.
  - 8 regional hubs, 105 countries and 800 scientists; NE Atlantic HUB coordinated by Dr. Findlay at Plymouth Marine Laboratory and supported in part by UK government. GOA-ON has a Peir2Peer mentorship program and offers direct assistance (trainings, sensor kit provision.)
  - Collaborates with international frameworks like UN SDG 14.3.1; World Meteorological Organization; Commonwealth Blue Charter; UN Decade.
  - OSPAR Quality Status Report in 2023 (periodic integrated assessment of the state of the NE Atlantic Ocean) will include an OA assessment.
  - Governments can support by: support monitoring networks and observing activities; Invest in R&D; stipulate that all data are effectively integrated and made available; utilize knowledge to underpin policy decisions.
  - Transparency of data is key.

Targeting monitoring efforts to increase relevance for decision and policy making

- Prof. Richard Bellerby, Norwegian Institute for Water Research (***8 min***)
  - Complex interactions control OA along Norwegian coast.
  - NFR Acid Coast project was designed to developed relevant, targeted OA and climate change science products for coastal services. Multi-stakeholder project included governments at national, local levels, social scientists, industry partners, and NGOs. Partners outlined scope of project, desired outcomes to assemble local stressor database, establish baseline and model ecosystem response to different scenarios.
  - Targeted sites and education/ outreach around hospital waste, ag. nutrients and wetlands, abattoir runoff, cod nursery; salmon aquaculture, seaweed harvesting, seafood restaurants.
  - New Norwegian studies of OA closely integrated with European and wider international research efforts.
  - Inclusion of stakeholders from proposal stage and project-long, promotes greater utilisation of OA observations and models.
  - Science products are targeted, relevant and understood.

Fisheries and Oceans Canada, OA Activities

- Mr. Keith Lennon, Director, Ocean Sciences Branch, Fisheries and Oceans Canada (***8 min)***
  - DFO and NOAA OA collaboration to Improve internal coordination of OA activities on national level; progress and integrate multidisciplinary science efforts; promote collaboration and networking to advance research on species and areas of common concern; facilitate effective resource management in a changing ocean; and raise the profile of OA as an international issue.
  - Marine Environmental Observation, Prediction and Response Network (MEOPAR) created the Ocean Acidification Canadian Community of Practice (COP) to help mobilize knowledge, enrich research, and encourage collaboration.
  - Public awareness efforts have included an OA infographic, animated video and social media campaign.
  - Part of GOA-ON North American Hub, conducted Arctic cruises to characterize carbon uptake, OA and hydrography, annually reports to UN SDG 14.3.1.

Ocean and Climate Science in Application: From the IPCC Special Report on Ocean and Cryosphere in a Changing Climate to opportunities for informed action
(***8 minutes***)

- Dr. Carol Turley, Plymouth Marine Laboratory
  - Overview of high emissions scenario (3-4 degrees C) v. low emissions scenario (1.5 degrees C) current status and projected impacts per IPCC Special Report on Ocean and Cryosphere in a Changing Climate emphasis on ocean and coastal ecosystems.
  - Consequences for nature and humanity are sweeping and severe.

▪ Key actions we can take: take urgent action to reduce greenhouse gas emissions, include the ocean in implementation of Paris Agreement NDCs, preserve and restore blue carbon, reduce local sources of acidification from land, observe local OA conditions but collaborate and share information internationally. ▪ Why do observations matters? They help us: evaluate domestic policy decisions, identify where to deploy limited resources, identify which interventions are having a positive impact, future proof domestic decisions (like fisheries management and MPAs.) ▪ Additionally, national government observations can help inform international frameworks like UNFCCC, UN Sustainable Development Goals, GOA-ON, GOOS and UN Decade Programs.
Questions and Discussion **(10 minutes**)
Closing Remarks and Appreciation (**5 minutes)**