

Background

The 1st Joint CSM/IAEA International Workshop, organized in November 2010, introduced natural scientists and economists to the varied perspectives on the topic of ocean acidification (OA), and built links between these two communities. Three economic sectors were identified as pathways of impact on human well-being: (1) Natural resources & management (of marine ecosystems and biodiversity), (2) Fisheries and Aquaculture, and (3) Tourism. The format of the workshop was initially symposium style, followed by round-table discussions categorized by topical focus. Recommendations to policymakers were published in a brochure published after the workshop.

The 2nd Joint CSM/IAEA International Workshop in November 2012 aimed at providing policymakers with recommendations to prepare for social and economic impacts of ocean acidification on livelihoods, trade and food supply from ocean resources. This workshop focused on fisheries and aquaculture, and regional aspects of species vulnerability and socio-economic adaptation to ocean acidification to identify regional priorities. The workshop started with talks on four plenary topics: (1) ocean acidification status of knowledge, (2) anticipated biological and ecological effects, (3) status of fisheries and aquaculture and anticipated changes, and (4) economic impacts and human adaptation measures in fisheries and aquaculture. The following sessions were round-table discussions organized in regional groups to identify priorities of ocean acidification impacts on fisheries and aquaculture resources and activities and on marine food security within basin-scale ocean areas. Gaps in knowledge, research priorities and adaptive management recommendations were highlighted in a brochure published after the workshop.

Future [2014] workshop concept – Coastal community impacts and responses

It is proposed to focus the 3rd Joint CSM/IAEA International Workshop on “Ocean Acidification Impacts on Coastal Communities” primarily addressing the economic and social aspects of adaptation by different community types to ocean acidification and marine environmental change. This will require current knowledge of the biological and ecological effects of acidification and knowledge of impact pathways to human activities and dependencies on marine resources. The workshop format will consist of round-table discussions to develop recommendations to policymakers and marine-dependent community members for adaptive socio-economic responses to ocean acidification. Initial plenary presentations in the form of case studies will provide a basis for topical discussion points.

An assumption based on the outcomes of previous workshops is that coastal communities and their economies will be impacted by global ocean acidification and localized coastal acidification events in the future. However communities, ranging from mega-cities to artisanal fishing villages to quiet coastal hamlets, differ significantly in population, maritime activity, sectoral dependence, and reliance on marine natural resources. Furthermore, marine sectoral dependence differs among respective communities, and may be based on tourism, subsistence fisheries, marine resource trade, or a mixture of activities and services. Identifying the pathway and level of acidification impact on communities will become a concern of governments of coastal countries. This workshop will begin to provide options for

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policymakers and managers and for communities through recommendations of possible human actions to adapt to ocean acidification and the changing marine environment.

Adaptability to ocean acidification: Scenario building using case studies

Providing pragmatic and cost effective solutions to the emerging problems associated with global marine environmental change is a current challenge, and should be an underlying theme to the discussions and the outcome of the meeting. Identifying and proposing practical steps to diminish the cause and mitigate the economic and societal impacts of ocean acidification to coastal communities should be a prime objective of the meeting. To do this, greater understanding of the varying scenarios of impact must be developed. A case study approach, giving representative examples of communities, their activities, and the possible responses to ocean acidification, may be a viable way to identify pathways and solutions for the future. Representative cases will have to be identified, described and then presented at the meeting to provide information around which discussion groups can creatively develop applicable recommendations as outputs. Identification of valuable case studies and talented plenary presenters of realistic and balanced scenarios will be one key to success of the group discussions and the meeting. Case studies should draw from a variety of societal examples, such as SIDS (small island developing states), large coastal cities with complex marine-based economies, and smaller coastal towns with subsistence and livelihoods based upon marine harvests or marine-related tourism. Some examples of case study locations are Palau, Tuvalu and Kiribati as SIDS with high tourism and fisheries reliance. Cases may also be drawn from current participants in IAEA research in socio-economic impacts of ocean acidification, such as Kenya, Ghana, Chili, Kuwait and the Philippines, which are developing states currently involved in the IAEA CRP “Ocean Acidification and the Economic Impact on Fisheries and Coastal Society”. Several of these projects involve in the research consideration of coral reefs, which is a marine ecosystem of high vulnerability to ocean acidification with high interest for its tourism attraction. Representative impacts to marine communities with developed economies should not be neglected, and specific areas may be of greater interest as examples due to heavy economic dependence (such as Japan, Iceland and Norway with very high maritime activity) or high importance to world marine food commerce (*e.g.*, China with shellfish).

Possible Approach: Vulnerability Assessment and Adaptation Options

One approach to providing options to policymakers and stakeholders alike is to focus on developing statements concerning the specific habitats at risk and the related economic and social vulnerability of various coastal resources and communities to the changing state of ocean chemistry. Adaptation options should be recommended to aid in reducing societal impacts. This may assist decision-making parties in taking actions appropriate for given regional conditions and activities. SIDS are special cases in relation to coastal marine environmental issues due to their high dependence upon the seas and its natural resources. The communities of small island states could benefit greatly from guidance in the development of their strategic plans and policies regarding their use and protection of natural coastal resources in the changing ocean environment.

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Workshop planning

Governance for the planning and conduct of the workshop will be carried out through establishment of (1) a steering committee to provide overall guidance, direction and control of the project, (2) a scientific committee to provide technical development of the content and recommendations for participation in the workshop, and (3) a logistical committee to provide support and points of contact for arrangement of transportation, accommodation, hospitality, social programming, material logistics and staffing for the event.

Practical Issues

The duration of the workshop will be 2.5 days, and the date is dependent upon the availability of HSH Prince Albert II of Monaco for the concluding session of the meeting. The projected period for the workshop is November 2014. The dates of 17-21 November should be avoided as the International Ocean Research Conference in Barcelona, Spain (co-sponsored by UNESCO/ IOC) is planned at that time. The first meeting of the steering committee will be set for mid-September 2013. A multidisciplinary perspective is desired; therefore, the workshop participants will be drawn from leading natural and environmental scientists, sociologists, anthropologists, economists, and policy experts. Keynote speakers will be selected to present case studies about ocean acidification impacts in developed and developing countries. Round-table working groups could be organized according to level of development of the communities and economic characteristics and activities. Other priority items, yet undetermined, include: sponsors and the budget, specific expected outcomes, and possible coordination with a SOLAS-IMBER Ocean Acidification (SIOA) workshop focused on Human Dimensions (HD). An early decision on a combined workshop format will have to be made due to planning and coordination elements that would be required.

The SOLAS-IMBER “Humanities” Workshop [planning in progress]

The SIOA Human Dimensions working group, headed by Jelle Bijma, has approached Denis Allemand and Christopher Kavanagh concerning holding back-to-back or parallel workshops with possible overlap and interaction between the groups. The goal of the SIOA-HD workshop is still being defined, but generally will be to identify social consequences of [CO₂] and policy opportunities at all governance scales (local to international) that will help mitigate the influence of [carbon use and] OA on marine ecosystems. At this point, the SIOA workshop intends to more broadly address CO₂ emission issues than the 3rd International “Bridging the Gap” Workshop on Economics of OA. The organizing committee has expressed that the “humanities” workshop is still in development, and has requested input in terms of topical information of the “Bridging the Gap” workshop to assess the possible fit of the two groups. One suggestion from the SIOA organizing committee was to include the scenario of:

...conflict and violence as an important part of societal response to [environmental] change, which is not just OA but includes global warming, climate change, increasing anoxia, decreasing fresh water availability, and increasing world population. The [common denominator] being increased "carbon hunger" resulting in increasing carbon emissions. The politics and response of society would not look at OA in isolation, and "climate wars" may be the starting point of the [SIOA] workshop.

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