

Proposed IPCC Workshop on Impacts of Ocean Acidification on Marine Biology and Ecosystems

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Background

The oceans currently absorb about one-third of fossil fuel CO₂ emitted to the atmosphere and have, as a consequence, been increasing in acidity. Ocean acidification is now recognized as a critical component of global change, potentially responsible for a wide range of impacts on ecosystems, with subsequent consequences on livelihoods and food security. Further, one important aspect is that more CO₂ mitigation may be required to achieve particular stabilization targets, because acidification limits the ability of the oceans to continue to absorb CO₂. Previous IPCC assessment reports considered biogeochemical and temperature effects of anthropogenic carbon on the oceans, but the direct impacts of ocean acidification, its combined effects with ocean warming on marine ecosystems and productivity, and potential feedbacks to the climate system have not been fully assessed.

The Synthesis Report of AR4 concluded: *While the effects of observed ocean acidification on the marine biosphere are as yet undocumented, the progressive acidification of oceans is expected to have negative impacts on marine shell-forming organisms and their dependent species* [IPCC 2007 Synthesis report 3.3.4]. The Technical Summary of AR4 WG2 concluded: *Ocean acidification is an emerging issue with potential for major impacts in coastal areas, but there is little understanding of the details. It is an urgent topic for further research, especially programmes of observation and measurement* [IPCC 2007 WG2 Box TS.5].

Since the publication of the AR4, ocean acidification research, especially experimental studies of the impact of increased concentrations of seawater CO₂ on marine biology in different regions, and modeling studies of future ocean environments, has been advancing rapidly. With this progress and increasing interest from stakeholders in understanding the implications of ocean acidification, it is extremely valuable to have the IPCC sponsor a meeting of the growing scientific community, which would stimulate communication among the scientists, encourage efficient transfer of information to modelers, and encourage the production of peer-reviewed papers that will be assessed in the AR5. The report of the meeting will focus attention on a specific issue highlighted in the AR4 as requiring additional work

Aim of Workshop

The strategic aim of the Workshop will be to update the rapidly advancing scientific findings on ocean acidification and its impacts since the publication of AR4, and to provide comprehensive, timely scientific information as input to AR5.

The specific aims should include:

- Synthesis of observations and projections of ocean CO₂ and seawater pH including geochemical carbon budget studies for open and coastal ocean systems;
- Summary of manipulation experiments up to mesocosm scale focused on assessing

biological and ecosystem impacts of ocean acidification, including the combined effects of ocean acidification and climate change and the implications for livelihoods and food security;

- Discussion of possible ecosystem modeling techniques to study ecological and socioeconomic impacts of future ocean acidification;
- Assembling and assessing emerging scientific findings on ocean acidification to update the AR4 and contribute to the development of the AR5.

Scientific Steering Group

A Scientific Steering Group (SSG) for the planning and execution of the Workshop will be established, taking into account the need for balanced scientific expertise, as well as geographical and developed/developing country representation. The WGII and WGI Co-chairs will jointly lead the SSG selection process and the meeting planning, with WGII taking the operational lead for the meeting.

Product

A workshop report, based on material presented or discussed at the workshop or in the recent literature, will be produced by mid-2011. The workshop report is expected to organize the results of existing research, highlight key issues, identify major unknowns, and stimulate new research, providing an important starting point for the assessment in the AR5.

Timetable and Location

The Workshop is proposed to be held in the first quarter of 2011 in Japan (exact venue to be decided).

Participants

About 100 participants will be invited, including LAs for relevant chapters of the AR5 from all three WGs. The list of invitees will be developed by the SSG in consultation with the Co-Chairs and Vice-Chairs of WGII and WGI.

Financial Resources

The Ministry of the Environment, Japan is exploring financial resources to host the Workshop (not secured yet). The Ministry would like to obtain authorization for financial support from the IPCC Trust Fund budget to support the participation of developing country experts. It is proposed that 40 Trust Fund journeys should be allocated, including those of WG Vice-Chairs.