



Impact of Ocean Acidification on Fluxes of non-CO₂ Climate-Active Species: Report from the GESAMP WG38 workshop

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Most investigations of the impact of ocean acidification (OA) have focused on changes in oceanic uptake of anthropogenic CO₂, the resulting shifts in carbonate chemical equilibria, and the consequences for marine calcifying organisms. Little attention has been paid to the direct impacts of OA on the ocean sources of a range of other gaseous and aerosol species that are influential in regulating radiative forcing, atmospheric oxidising capacity and atmospheric chemistry. The oceanic processes governing emissions of these species are frequently sensitive to the changes in pH and ocean pCO₂ accompanying ocean acidification. Such processes include, for example, metabolic rates of microbial activity, levels of surface primary production, ecosystem composition, and photo-chemical and microbially mediated production/loss pathways for individual species. The direct and indirect influences of these factors on oceanic fluxes of non-CO₂ trace-gases and aerosols, and the subsequent feedbacks to climate remain highly uncertain.

To address these issues UN/GESAMP Working Group 38, The Atmospheric Input of Chemicals to the Ocean, convened a workshop on this topic at the University of East Anglia in February, 2017. The goals of this workshop are to review and synthesize the current science on the direct impacts of ocean acidification on marine emissions to the atmosphere of key species important for climate, and atmospheric chemistry; and to identify the primary needs for new research to improve process understanding and to quantify the impact of ocean acidification on these marine fluxes (i.e. provide recommendations on the specific laboratory process studies, field measurements and model analyses needed to support targeted research activities on this topic). The results, conclusions, and recommendations of this workshop will be presented.