Integrated modelling of lakes in the climate system – a summary

Klaus D. Joehnk, Victor Stepanenko, Thomas Bueche, Gideon Gal, Stéphane Goyette, Annette Janssen, Elisa Lindgren, Sally MacIntyre, Marjorie Perroud, Wim Thiery, Marco Toffolon, Koji Tominaga, Lijuan Wen

CSIRO Land and Water Flagship

Lakes act as sensors in the landscape, responding to events in their surrounding catchments and to climate processes. They integrate signals and respond by changes in thermal stratification, water level, ice cover, evaporation, heat exchange with, and gas emission to the atmosphere. Lakes also serve as moderators for local and regional climate due to radiative and thermal processes. Integration of hydrodynamic lake models in comprehensive model systems, such as regional climate, earth system or ecosystem models, allows the study of these interactions. In-depth comparisons of model capabilities in determining thermal stratification and heat exchange with the atmosphere have been conducted. But there is still need in closing knowledge gaps, e.g. surface boundary processes, generalizing lake specific functional relations, and scaling up to regional and continental processes. This session welcomes contributions dealing with lake modelling in the context of climate processes, including - but not limited to - the presentation of new lake models and improvement of existing ones, data assimilation from e.g. earth observation, model validation and intercomparison (e.g. LakeMIP), and their coupling to comprehensive model systems (including applications). Contributions on novel modelling approaches of climate-related aquatic processes, especially greenhouse gas dynamics and emission are stimulated.

This presentation wraps up the contributions at the ASLO conference in Granada, Spain in February 2015 in the session on "Integrated modelling of lakes in the climate system".