

EGU2020-11738

<https://doi.org/10.5194/egusphere-egu2020-11738>

EGU General Assembly 2020

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Progress towards coupling ice sheet and ocean models

Ben Galton-Fenzi¹, Rupert Gladstone², Chen Zhao³, David Gwyther⁴, John Moore⁵, and Thomas Zwinger⁶

¹Australian Antarctic Division, Hobart, Australia (ben.galton-fenzi@aad.gov.au)

²University of Lapland, Rovaniemi, Finland (rupertgladstone1972@gmail.com)

³Antarctic Gateway Partnership, University of Tasmania, Hobart, Australia (chen.zhao@utas.edu.au)

⁴Antarctic Gateway Partnership, University of Tasmania, Hobart, Australia (david.gwyther@gmail.com)

⁵Beijing Normal University, Beijing, China (john.moore.bnu@gmail.com)

⁶CSC – IT Center for Science, Espoo, Finland (thomas.zwinger@csc.fi)

With recent developments in the modelling of Antarctica and its interactions with the ocean several coupled model frameworks now exist. This talk will focus on presenting the Framework for Ice Sheet - Ocean Coupling (FISOC), developed to provide a flexible platform for performing coupled ice sheet - ocean modelling experiments. We present progress and preliminary results using FISOC to couple the Regional Ocean Modelling System (ROMS) with Elmer/Ice, a full-Stokes ice sheet model. Idealised experiments have been used that also contribute to the WCRP Marine Ice Sheet-Ocean Model Intercomparison Project (MISOMIP). A recent focus is on testing emergent behaviour of the coupled system and the model numerics. The talk will outline future technological applications and developments conducted as part of a broader international consortium effort. These efforts include coupling to sub-glacial hydrology, sea ice and atmospheres to form a complete system-downscaling technology from which to examine the influence of future climate on ice sheet evolution and hence sea level and global climate impacts. Developments to apply the technology to the Greenland Ice Sheet are presently underway.