

Agenda – ice2ice workshop

Paleoclimate states as future climate analogues

Location: "Nordlys room", DMI, Lyngbyvej 100, Copenhagen

NB. The sessions lengths are flexible as the topics – by design – overlap. We may choose to shorten/lengthen sessions based on the progress (while keeping start and ending times fixed).

Wednesday, May 2nd

9:00 Kick-off

9-12 Topic I: Rate of warming and sea ice loss
(incl. coffee break)

12-13 Lunch (DMI canteen)

13-17 Topic II: Nordic Seas vs central Arctic Ocean

18+: Dinner (venue: Madklubben Østerbro, Østerbrogade 79)

Thursday, May 3rd

9-12 Topic III: Different drivers
(incl. coffee break)

12-13 Lunch (DMI canteen)

13-16 Summary, conclusions and planning
(incl. coffee break)

Workshop description

Can our combined knowledge of past abrupt changes provide lessons for the future?

One of the key themes in ice2ice is to what extent past abrupt changes have relevance for future climate change. Inspired by potentially similar warming trends in past (stadial-interstadial and glacial-interglacial) climates and future scenarios, we will discuss the applicability of paleoclimate states as analogues for future warming.

This workshop aims to intercompare proxy data reconstructions, paleoclimate modelling efforts, and future model projections with a particular focus on sea ice related warming in the Arctic (especially Greenland and the Nordic Seas region).

We aim to discuss these specific topics during the workshop:

- **Topic 1: Rate of warming and sea ice loss**

Are the rates of warming and sea ice loss in the past, eg. MIS3 stadial-interstadials or the deglaciation (proxy + model), and future scenarios (model) comparable? When we talk of past and current/future change in the Arctic, how good is the analogue in terms of abruptness?

- **Topic 2: Nordic Seas vs central Arctic Ocean**

Comparison of past sea ice changes in the Nordic Seas (proxy + model) to future changes in the Arctic Ocean (model). If changes in the Nordic Seas during MIS3 should be used as a parallel for potential changes in the Arctic Ocean in a warmer climate (interglacial or future), two questions arise: how do the two oceans compare (e.g. vertical structure) and how would SST/sea ice changes in the two regions affect the atmosphere/Greenland. Specifically, can we use our collective model and proxy data to answer: (1) Is the impact of sea ice loss/SST increase similar for Nordic Seas (MIS3) and Arctic Ocean (interglacial), and (2) could the same mechanism lead to abrupt changes?

- **Topic 3: Different drivers**

When comparing current-to-future climate change with preindustrial-to-last-interglacial changes, or when comparing current-to-future with stadial-to-interstadial changes, we need to consider the different driving mechanisms. Compared to the “apparently unforced” stadial-to-interstadial changes, the two former changes are forced by variations in GHG concentrations and insolation, respectively. To what extent can the different signatures of insolation and GHG changes be disregarded? There are indications that the resulting SST state is dominant for many atmospheric impacts, such that the driver is of less importance, but this needs to be addressed carefully when making past vs future analogues.