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## Evolution of the Antarctic Ice Sheet from green- to icehouse conditions: Using unique data for advancing numerical model simulations

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Most ice sheet models indicate that the Antarctic Ice Sheet (AIS) will lose considerable amounts of ice over the coming decades and centuries. This mass loss will mainly be caused by warm deep waters increasingly reaching the AIS’ margins and, with many upstream parts of ice-sheet sectors being grounded far below modern sea level, this will lead to accelerating and irreversible retreat. Are we therefore currently witnessing the initiation of runaway retreat of large parts of the ice sheet that will result in rapid sea level rise resulting in severe consequences for global coastal communities? Finding more reliable answers to this question requires robust multi-proxy data evidence from AIS-proximal records spanning times that were warmer and CO<sub>2</sub>-richer than today. Such sediment records are rare and challenging to obtain, requiring drilling campaigns that are only feasible within large multinational consortiums. Some extensive Antarctic field campaigns, however, were recently realized, are about to be accomplished, or at the planning stage. This presentation will introduce these campaigns and highlight how their results combined with novel coupled modeling techniques will eventually provide significant new insights into the AIS’ long-term evolution. This information will allow for better predictions of its response to conditions anticipated for the foreseeable future.