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# Self-inhibiting growth of the Greenland Ice Sheet

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The build-up of the Greenland Ice Sheet from ice free conditions is studied in an ice sheet model (ISM) driven by fields from an atmospheric general circulation model (GCM). Experiments where the two are coupled offline are performed and augmented by one where an intermediate ice sheet configuration, taken as a snap shot during the regrowth in the ISM, is coupled back to the GCM. It is found that several open questions regarding reversibility or irreversibility of a disintegration of the Greenland Ice Sheet may be reconciled with these experiments. Running the ISM with GCM fields corresponding to a present day ice sheet configuration leads to regrowth, while considerations of the GCM's snow accumulation in an ice free run point to irreversibility. Forcing the ISM with the GCM fields corresponding to the ice free state leads to extensive regrowth which, however, is halted when an intermediate recoupling step is included. This inhibition of further growth is believed to be due to a Föhn effect of moist air parcels being lifted over the intermediate ice sheet and arriving in the Greenland interior with high temperatures.