

Ocean Hiccups and Heinrich Events

Katrin Meissner

University of New South Wales

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Between 20 and 80 thousand years ago several cooling cycles occurred in the Northern Hemisphere, which culminated in a discharge of icebergs into the North Atlantic. Most of these so-called “Heinrich Events” were synchronous with a substantial increase in atmospheric carbon dioxide. A similar pattern can be observed during the last deglaciation, when atmospheric carbon dioxide increased and atmospheric radiocarbon decreased during large meltwater events. I will discuss possible mechanisms that can lead to the ventilation of “old” oceanic carbon when the Atlantic Meridional Circulation (AMOC) is weakened or shut down. I will show that a weakening of the AMOC can result in either higher or lower atmospheric carbon dioxide, and therefore reconcile previous modeling studies that have shown conflicting results. I will also explore a new hypothesis by which Heinrich Events might be triggered by internal dynamics in the Southern Ocean.