Exercise 6 Solution

July 20, 2014

A negative salt perturbation will lead to a decrease in the overturning, causing less heat transport from the equatorial latitudes to the high latitudes. Therefore, we expect a cooling as the deep circulation breaks down, a possible relative warming if the circulation overshoots its initial state, and an eventual recovery to the initial state. These sort of cooling events typically last between 50-100 years, depending on the strength of the perturbation, and are often seen in geological records (so-called Heinrich events).

The reason behind these cooling eventus during a circulation breakdown is the high heat capacity of water compared to air. Since the majority of heat is transported via the ocean, not the atmosphere, any change in global ocean circulation patterns will also lead to a redistrubtion of temperature patterns.

Notes on submission form of the exercises: *Students can work together, but each is required to submit his or her own solutions. The answers to the questions shall be send to paul.gierz@awi.de.*