Behavior of thermohaline circulation and ocean anoxia in the warm climate

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The Cretaceous deep water is warm and saline, which is considered to originate from the low latitude. Laminated organic carbon-rich sediment found in many sediment cores show that the dissolved oxygen concentration in Cretaceous deep ocean is very low or zero, which is called ocean anoxia.

We show the results of a simulation of cyclic anoxia in the global deep water with use of a coupled simple ocean circulation and carbon cycle model. Three sinking patterns of thermohaline circulation, two steady sinkings and one periodic sinking, are obtained. The oscillation of thermohaline circulation in the periodic sinking case causes cyclic anoxia and changes in biological production and sea level with Milankovitch timescales. These features have in common with those found in the sediments.