

Researchers describe global sea level event during the hot greenhouse climate of the dinosaur age

January 16 2017

Global sea level change has generally been considered to be a consequence of the growth and decay of continental ice sheets, which would explain large, rapid changes in sea level, even during extensive periods of global climatic warmth that prevailed during the age of the dinosaurs.

However, such a mechanism is difficult to envision during times of the most extreme global warmth, such as the Turonian (93.9-89.8 million years ago), when the equator-to-pole temperature gradient was very low and the presence of polar ice was unlikely. Several [sea level](#) events previously considered as global in extent during this time are shown to have age uncertainties that are too great to determine whether they were globally synchronous.

The amplitude of the largest and most widespread sea level fall within the peak period of Cretaceous global warmth, centered at ~91.8 Ma (± 0.4 million years), varies at different locations depending on the influence of regional tectonics and climatic conditions.

The only way to envision ice volume variation as a mechanism that caused sea level fall at this time is if ephemeral ice sheets accumulated on land areas at high elevations in Antarctica. Detailed tomographic imaging of Antarctica followed by geodynamic modeling are needed to determine the likelihood of such a scenario.

Other mechanisms for [sea level change](#), such as transference between ground water (a small amplitude shorter time scale effect) and the ocean and entrainment and release of water from the mantle to the oceanic reservoir (a potentially large amplitude and longer time scale process), are intriguing and need to be explored further to prove their efficacy at multi-thousand-year time scales.

More information: Bilal U. Haq et al, Anatomy of a eustatic event during the Turonian (Late Cretaceous) hot greenhouse climate, *Science China Earth Sciences* (2016). [DOI: 10.1007/s11430-016-0166-y](https://doi.org/10.1007/s11430-016-0166-y)

Provided by Science China Press

Citation: Researchers describe global sea level event during the hot greenhouse climate of the dinosaur age (2017, January 16) retrieved 19 April 2024 from <https://phys.org/news/2017-01-global-sea-event-hot-greenhouse.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.