



## **Late Cretaceous changes in continental configuration: toward a better-ventilated ocean?**

Yannick Donnadiou (1), Emmanuelle Pucéat (2), François Guillocheau (3), and Jean-François Deconinck (2)

(1) CEREGE, CNRS-AMU, Aix en Provence, France (donnadiou@cerege.fr), (2) Biogéosciences, Université de Bourgogne, Dijon, France, (3) Géosciences, Université de Rennes, Rennes, France

Oceanic anoxic events (OAEs) are large-scale events of oxygen depletion in the deep ocean that happened during pre-Cenozoic periods of extreme warmth. Last global OAE occurred at the Cenomanian-Turonian boundary (OAE2) prior to the Late Cretaceous long term cooling. Ever since, and despite the occurrence of warming events, Earth no more experienced such large-scale anoxic conditions. Here we explore the role of major continental configuration changes occurring during the Late Cretaceous on oceanic circulation modes through numerical simulations using a General Circulation Model (GCM), that we confront to existing neodymium isotope data ( $\epsilon\text{Nd}$ ). Except from a continuous deep-water production in the North Pacific, the simulations at 95 Ma and 70 Ma reveal major differences marked by a shift in the southern deep-water production sites from South Pacific at 95Ma to South Atlantic and Indian oceans at 70Ma. Our modelling results support an intensification of southern Atlantic deep-water production as well as a reversal of the deep-water fluxes through the Caribbean Seaway as the main causes of the decrease in  $\epsilon\text{Nd}$  values recorded in the Atlantic and Indian deep waters during the Late Cretaceous. We conclude that the change from a sluggish to a much more active circulation depicted by the model in the Atlantic from 95Ma to 70Ma may have driven the disappearance of OAEs after the Late Cretaceous.