

## **A better-ventilated ocean triggered by Late Cretaceous changes in continental configuration**

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Cretaceous oceanic anoxic events (OAEs) are large-scale events of oxygen depletion in the deep ocean associated with widespread burial of organic carbon. The respective contributions of nutrient loading and ocean ventilation during these events remain hard to disentangle, feeding the debate over the 'enhanced productivity' as opposed to the 'enhanced preservation' model for black shale deposition. Here we use an ocean-atmosphere general circulation model to show that the continental configuration made the mid-Cretaceous ocean (Cenomanian-Turonian, 94 Ma, OAE2) more prone to anoxia than the Late Cretaceous ocean (Maastrichtian, 71 Ma). Changes in ocean dynamics between the two time slices further explain the previously enigmatic decrease in  $\epsilon_{\text{Nd}}$  values recorded in the Atlantic and Indian deep waters during the Late Cretaceous (DONNADIEU et al., 2016). Additional simulations conducted using an up-to-date ocean model with biogeochemical capabilities (MITgcm), explicitly accounting for oxygen cycling in the ocean, confirm these patterns. Our results demonstrate that the continental configuration, through its impact on ocean circulation and thus oxygen concentration, significantly affected the threshold required to trigger anoxia throughout the Cretaceous.

DONNADIEU, Y. et al., 2016. Nat. Commun., **7**, 10316.