VIEW ABSTRACT

NUTRIENT REGIME CHANGES IN THE COASTAL OCEAN DRIVEN BY LAND DERIVED FLUXES IN A GLOBAL MODEL

The coastal ocean is widely viewed as a hotspot for oceanic primary production, partly due to the supply of nutrients by river at these sites. River inputs are however lacking or poorly represented in many global earth system models. By implementing riverine nutrient and carbon fluxes into the MPI-ESM, we aim to better represent these fluxes from land to the ocean, as well as investigate their effects on the ocean's biogeochemistry. We use a first order weathering model (Hartmann et al., 2013) to estimate fluxes of dissolved phosphate, silicate, inorganic carbon as well as alkalinity. The state of art NEWS database (Mayorga et al., 2010) is used to derive the natural fluxes of nutrients and carbon with non-weathering sources as well as anthropogenic riverine fluxes. The fluxes are routed to the ocean through hydrological catchments. Our preliminary results show weathering hotspots, more specifically Southeast Asia, the Amazon, Northern Europe and Siberia, areas with large weathering yields of nutrients and carbon where large rivers also deliver these fluxes to the coastal ocean. Furthermore, the global primary production is only slightly affected by these fluxes, whereas regional changes are more pronounced. We also observe a nutrient regime switch in several coastal regions.
Mayorga, E. et al. (2010), Global Nutrient Export from WaterSheds 2 (NEWS 2): Model development and implementation. Environmental Modelling and Software 25(7):837-853. Hartmann J. et al. (2013), Global chemical weathering and associated P-release – The role of lithology, temperature and soil properties. Chemical Geology (363): 145-163.

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DETAILS

Poster presentation

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Presentation is given by student: Yes

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