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Contribution of riverine nutrients to the biogeochemistry of the global ocean.

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Continental shelf seas are known to support a large part of the global primary production. Despite this, continental seas are most of the time ignored and neglected in global models. Indeed, processes that control the transfer of dissolved nutrients to the open ocean remain poorly understood. This applies in particular to the dissolved silicate which drives the growth of diatoms which form a large part of the phytoplankton biomass and important contributor to export production of carbon.

The objective of this work is to improve the representation of the biogeochemical states along continents by coupling a high resolution database of riverine fluxes to the global biogeochemical ocean general circulation model HAMOCC/MPI-OM. The silicon and nitrogen inputs are implemented into the model according to the COSCAT global database of 151 catchments. The catchments connect to the ocean through coastal segments according to three sets of criteria: natural limits, continental shelf topography, and geophysical dynamics.

In addition to silicon and nitrogen inputs the data set is extended to other elements such as carbon and phosphorous. Preliminary results show the largest effect on nutrient concentrations in hot spots such as the Amazon plume, the Arctic, and areas that encounter the largest increase in the human activity, e.g., Southern Asia. We will present results showing the effect of the inclusion of land-ocean nutrient fluxes on

coastal primary production on a global scale.