



Controls on the Flux, Age, and Composition of Terrestrial Organic Carbon Exported by Rivers to the Ocean

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Export of organic carbon, alkalinity and silicate-derived Ca and Mg ions to the ocean exerts critical controls on the sequestration of atmospheric carbon. As this export is mediated to a significant extent by river systems, understanding processes that control transport of land-derived matter to the coastal ocean is of fundamental importance to successful models of past and future climates. Scientists from the Woods Hole Oceanographic Institution, the Woods Hole Research Center and the University of New Hampshire have formed a river research consortium that aims at investigating large river systems with a holistic approach. The National Science Foundation is funding this initiative through its Emerging Topics in Biogeochemical Cycles (ETBC) program. Our project focuses on the biogeochemistries of the Lena and Kolyma rivers in the Russian Arctic, the Yangtze river in China, the Ganges and Brahmaputra rivers in India and Bangladesh, the Congo river in central Africa as well as the Fraser river basin in western Canada. Campaign-style sampling using a uniform sampling strategy is complemented by time-series sampling that is accomplished through collaborations with scientists at local institutions such as the East China Normal University in Shanghai (Yangtze), the University of the Fraser Valley in Abbotsford (Fraser), schools and research institutions in eastern Russia (Lena and Kolyma) and the University of Nancy, France (Ganges, Brahmaputra). We combine a standardized sampling approach for organic and inorganic constituents with spatial analyses of digital, mostly satellite-based data products with the aim of obtaining an integrated understanding of the response of river ecosystems to past, ongoing and future environmental changes. We will present first results with a special emphasis on the age of terrestrial organic carbon exported by the Ganges-Brahmaputra river system.