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Mangroves and the land-ocean aquatic continuum: Seasonal variability in carbon dynamics and fluxes

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Mangroves play an important role in modulating carbon transformation and fluxes in the land-ocean aquatic continuum. To examine these processes, a series of experiments were conducted in the Shark River, an estuary that flows through the largest contiguous mangrove forest in North America, and is one of the major drainages of the heavily altered Everglades wetland system of South Florida. Spatial and temporal variabilities in carbon transformation and fluxes were examined using a combination of tracer release experiments, Lagrangian process studies, and Eulerian time series measurements in the estuary, as well as geochemical measurements of the mangrove sediments. The results show that the effect of mangroves in altering the carbon cycle in the land-ocean aquatic continuum is influenced by seasonal differences in meteorological and hydrodynamic parameters, as well as by upstream water management.