

Carbon Speciation and Anthropogenic Influences in Haitian Rivers and Inland Waters

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Climate, geography, and land use patterns all contribute to the social, economic, and environmental challenges in Haiti. Water quality remains a predominant issue, and the health of freshwater systems has been linked to the cycling and transformation of carbon. A speciation dominated by carbonates and bicarbonates is conducive to higher alkalinity waters, which is part of an environmental signature in which cholera and other bacteria thrive. Numerous human activities such as deforestation, biomass burning, and agricultural practices have radically changed the abundances of carbon on land and rivers in Haiti. In Haitian small mountainous rivers, carbon speciation is also influenced by the weathering of limestone and other carbonate rocks. Additionally, rain events and natural disturbances such as earthquakes have shown to drastically increase the amount of carbon in rivers and coastal waters.

Since 2010, a network of both satellite and autonomous hydrometeorological stations has been deployed to monitor the climate in southwestern Haiti. Various hydrological parameters from river, reservoir, and coastal sites have been measured during field visits. Research will be continued into the wet season, providing temporal analysis needed for quantifying the abundances and transformations of carbon. Together, data from weather stations and field sites can be contextualized with local land use patterns and other human activities to offer unique insights on the carbon system. Findings may offer new perspectives on the relationships between hydrologic cycles, human health, and environmental sustainability in Haiti.