

## SUMMARY OF DRIVERS, PRESSURES AND ENVIRONMENTAL IMPACTS IN THE JAGUARIBE RIVER ESTUARY, NE BRAZIL

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The Jaguaribe basin covers about 72,000 km<sup>2</sup>, representing almost half of the Ceará State's territory, in Northeastern Brazil. Regional climate is semi-arid, with average annual rainfall increasing from 400 mm inland to about 1,100 mm at the coast. Coastal sandy plains with large aeolian dune fields, driven by the nearly year-round constant winds from the SE characterize the coastline. Maximum tidal amplitude reaches 2.8 m and the generally small freshwater supply results in salinity intrusion for a few km inland. These brackish water tidal flood plains are covered by about 13,000 ha of mangroves. This river is responsible for about 70% of the total freshwater input to the adjacent Atlantic Ocean from the occidental northeastern Brazilian coast. Freshwater discharge has been affected by the building of dams, water withdrawn for urbanization, agriculture and aquaculture. Average water fluxes to 12 hours sampling campaigns were measured and showed that the Jaguaribe estuary is an importer system of marine waters explaining the dominance of marine biogeochemical processes in the estuary. But prior to the building of the first large reservoir and the introduction of large-scale agriculture, discharges to the Atlantic Ocean reached 200 m<sup>3</sup>.s<sup>-1</sup>. The actual discharges to the ocean are highly dependent on the estuarine hydrological dynamics. Similarly, sediment fluxes were also affected. Present estimated sediment load to the ocean from the Jaguaribe River is about 19,000 to 250,000 ton.yr<sup>-1</sup>. This low sediment supply results in a coastal morphology. The behavior of C, N, P and pheoepigments in sediment profiles at the estuarine region are inversely correlated with mineral detritus deposited in the same samples, simultaneously with an increase with phytoplanktonic activity. Apart from water and sediments, agriculture and aquaculture contribute significantly with pollutants and nutrients to the lower basin of the river, as well as the low infrastructure urban areas. The damming of rivers allowed the development of a large system of irrigated agriculture and intensive aquaculture. Conflicts among water users shall increase as well as eutrophication of coastal waters. As a response to these changes, the dynamics of natural ecosystems and their biodiversity will be most affected. The presence of relatively extensive mangrove forest acts as barriers to the transport of pollutants to the sea. The coastal waters off the Jaguaribe River are fairly oligotrophic and since most of the coastal primary production depends on outwelling of river-derived nutrients, sequestering of sediments in dams may significantly decrease this nutrient input to coastal areas, with high impact on fisheries. On the other hand, the emission of non-treated urban effluents and those from shrimp farms together with the high residence time of estuarine waters result in temporary eutrophication of the estuary.