

SUPPLEMENTARY MATERIAL

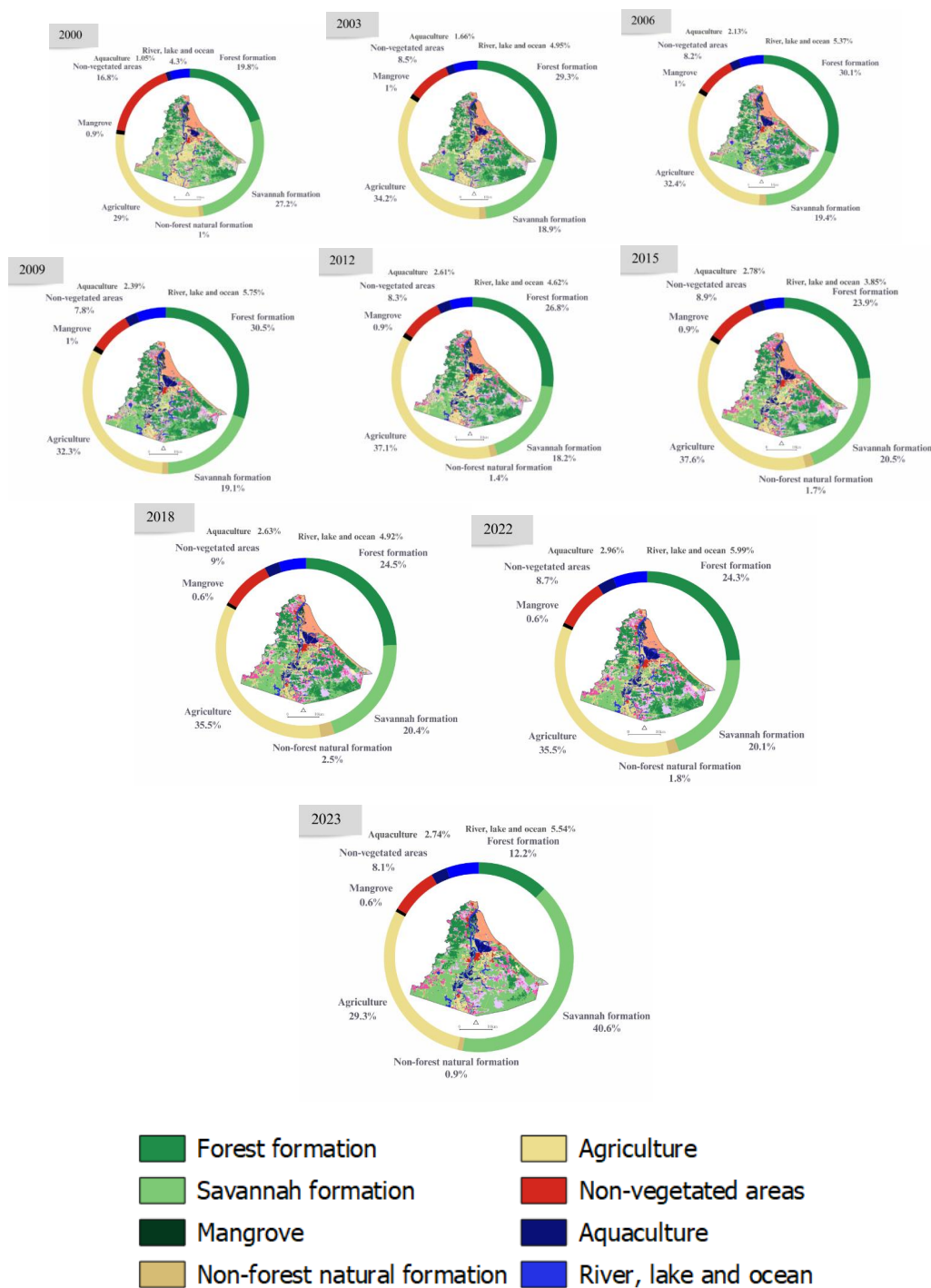


Figure S1. Historical series of maps showing changes in different land use cover during the 2000-2023 period, based on images from the Landsat 5 (period 2000-2012) and Landsat 8 (period 2013-2023) satellites, with a spatial resolution of 30 m and processed in the Semi-Automatic Classification Plugin (SCP Dock) of QGIS.3.28.15. All selected images were subjected to radiometric and atmospheric corrections, employing FLAASH or DOS1 models to minimize interference and ensure data consistency.

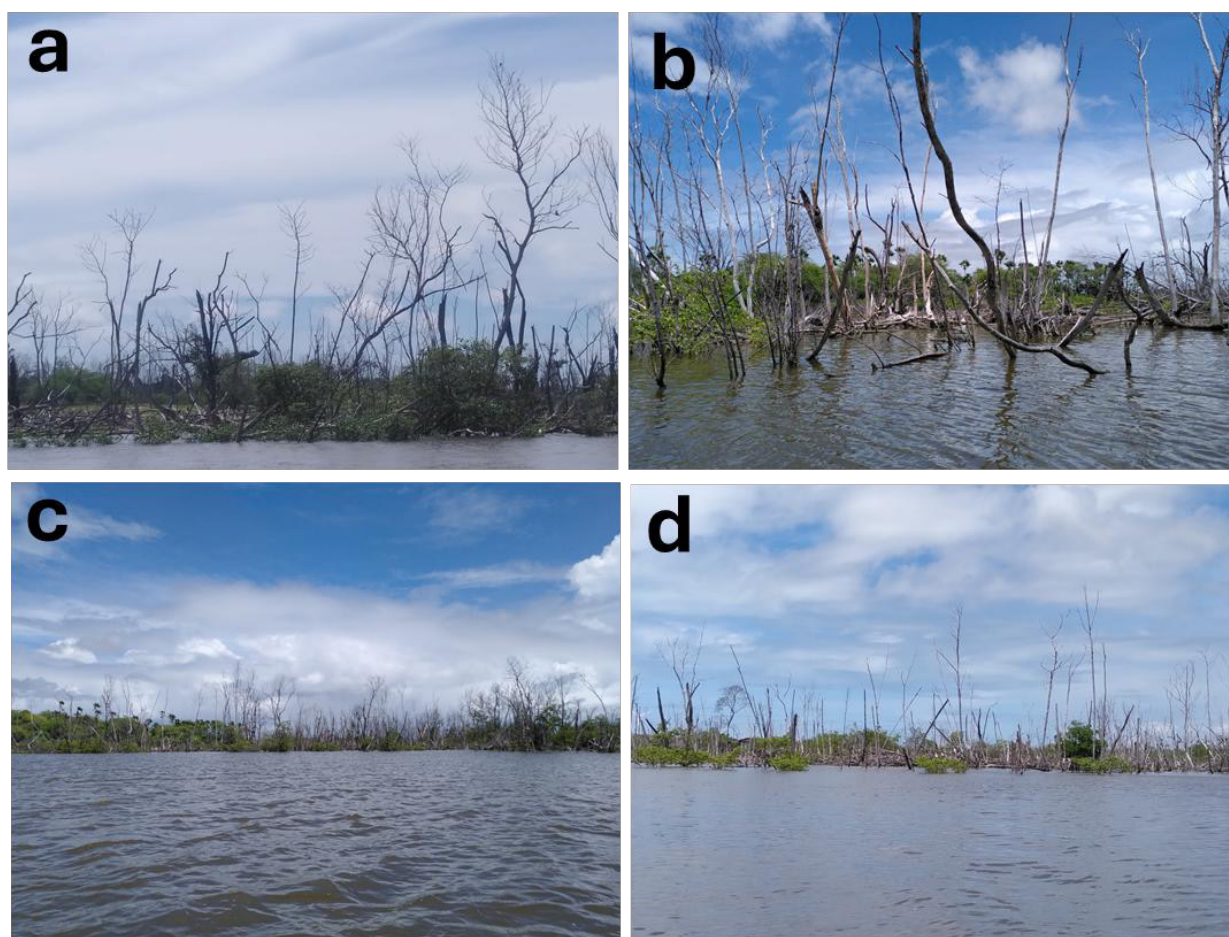


Figure S2. Dieback of mangroves along tidal creeks receiving effluents from the largest shrimp farming area in the Jaguaribe Estuary (a and b) and along the major Jaguaribe river (c and d).

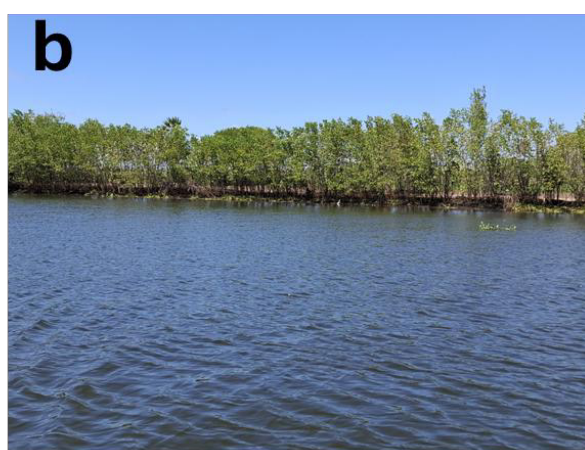


Figure S3. Engineering works (roads, bridges, electrification and housing) associated with the development of wind power fields. Dead mangroves bordering road and bridge crossing a tidal creek are visible (a). Water intake canal construction for aquaculture farms at the main Jaguaribe river. Note remaining mangrove trees to the right behind the dredged material deposition site (b).

Figure S4. Dam crossing the Jaguaribe river at Itaiçaba village, in the upper estuarine basin causes sediment trapping due to reducing river flow (a). A fringe of *Laguncularia racemosa* colonizing recent enlarged river beaches (b) and newly formed river islands (c).