Session 2: Historical Ecology and Climate Change

Moderator: Samantha Chapman

Mangroves at the Araçá Bay, São Paulo, Brazil: A Historical Ecology approach

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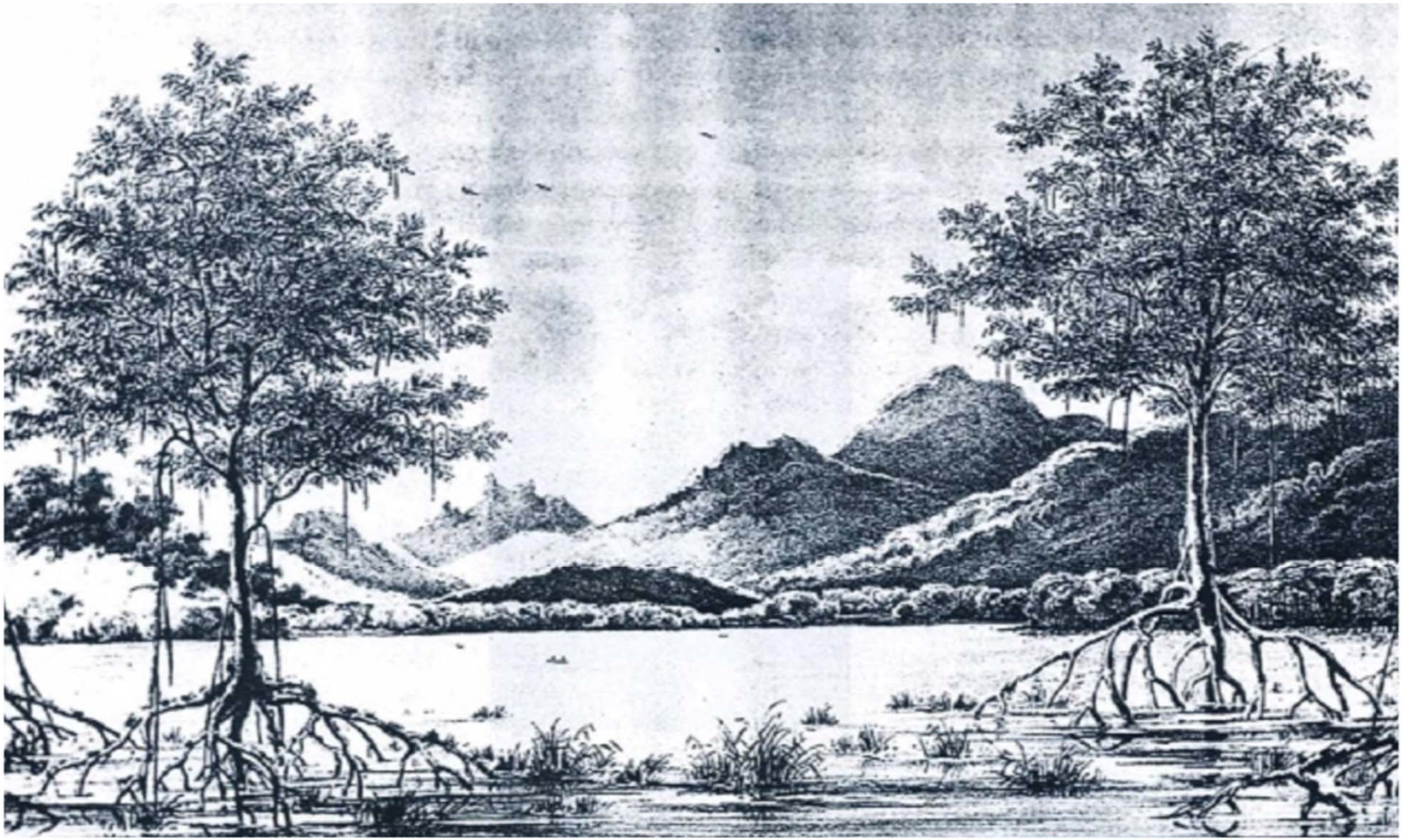
BIOTA/FAPESP-ARAÇÁ

Interdisciplinary Project – Module 4 – Mangrove System

"Biodiversity and functioning of a subtropical coastal ecosystem: support for integrated management at Araçá Bay, São Paulo State, Brazil "



Introduction

Mangroves are tidal forests where native Brazilians have always reached out for food and protection. These Ameridian have developed their way to survive in the coastal area, as we can assume by evidences like “shell middens”. That supported a sambaqui culture for 5,000 years.

By 1500's the indigenous population began to be displaced by Portuguese settlers and their market economy. These included a shift from nomatic "hunter/fisher/foragers culture" to the development of a new system based on European capitalism.

Paisagem com plantação
(O Engenho),
author Frans Post (1668).

From the 17th to the 19th century, the industries of whaling, sugar cane, and coffee have strongly influenced human occupation in the coastal zone of Brazil, promoting cabotage transportation in Southeast region .

With the intensification of industrial activities in the 20th century, the natural heritage has been even more compromised, threatening the way of life of traditional communities.

Objective

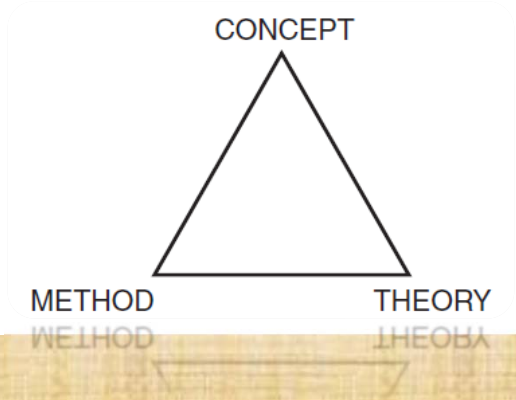
This research aims to describe the evolution of mangroves in Araçá bay (Brazil) from the point-of-view of Historical Ecology.

Historical Ecology

Past societal processes as ecological driving forces with direct relevance to present ecosystems. (phenomena that lead an event in a specific direction)

The field of ecology assumes people play an active role in ecosystems, either as external factors or as integral elements.

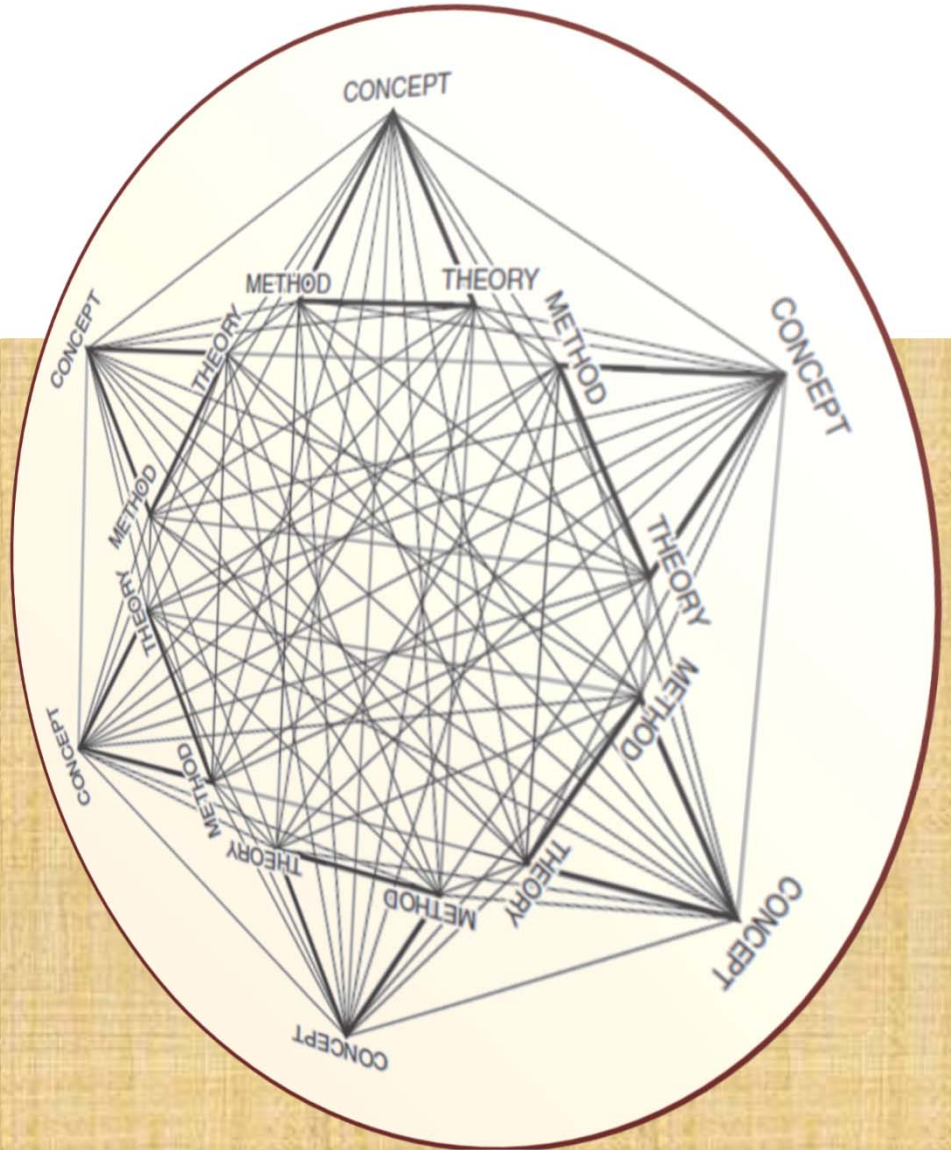
Methodology



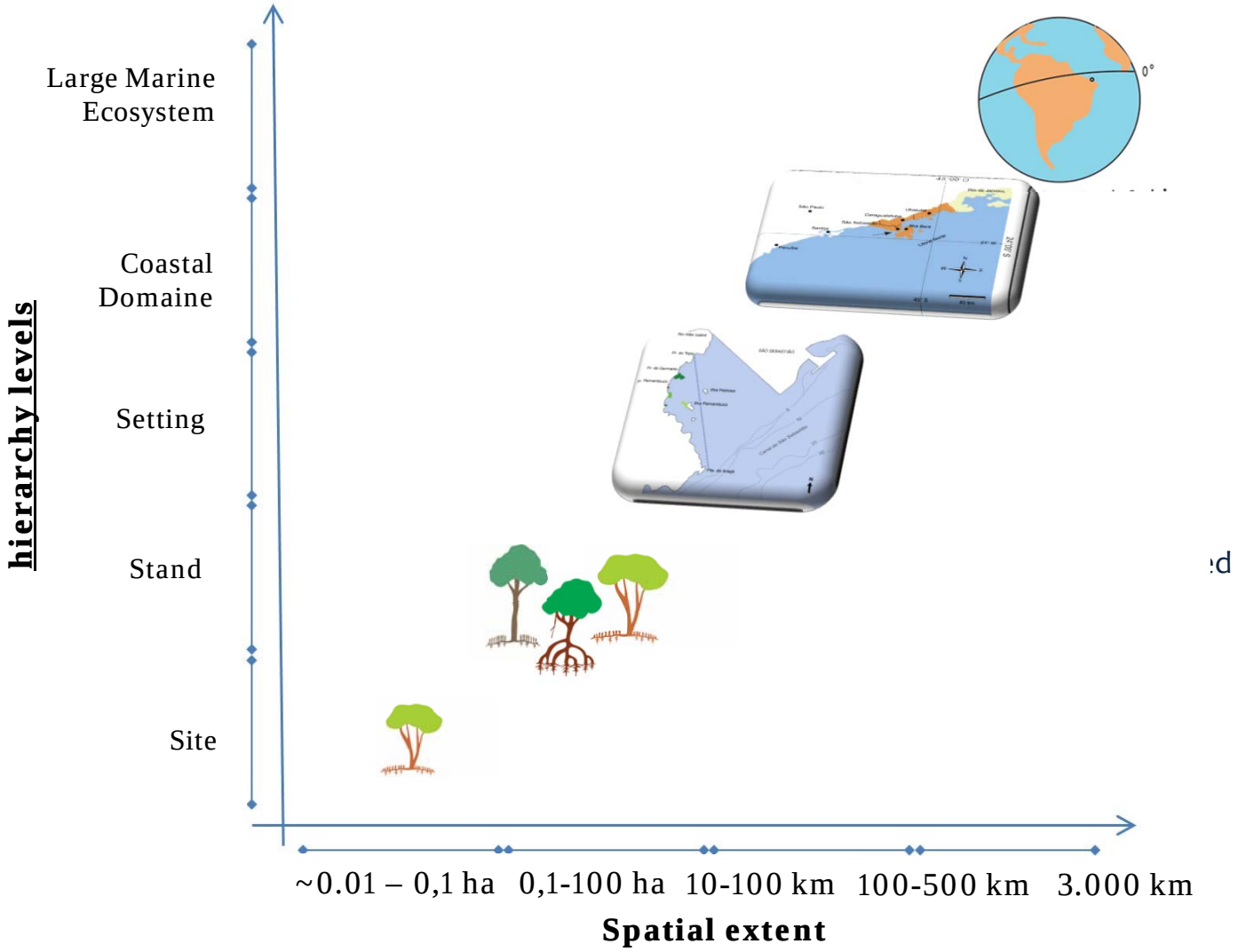
Non concept exists separatly.

All **CONCEPTS** are flexibles to the study´s object, that way, we use interconected **Method** and **Theory** to explain it.

The triad **concept-method-teory** can be visualized in a web of interdependent relations

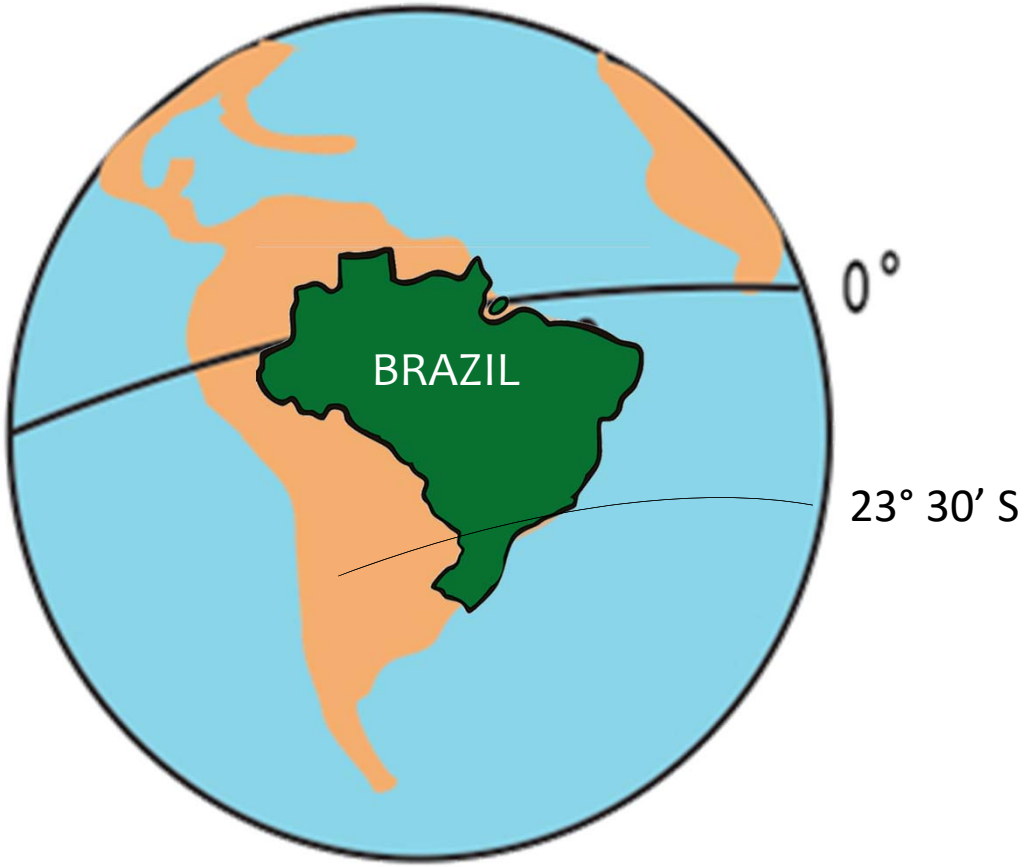


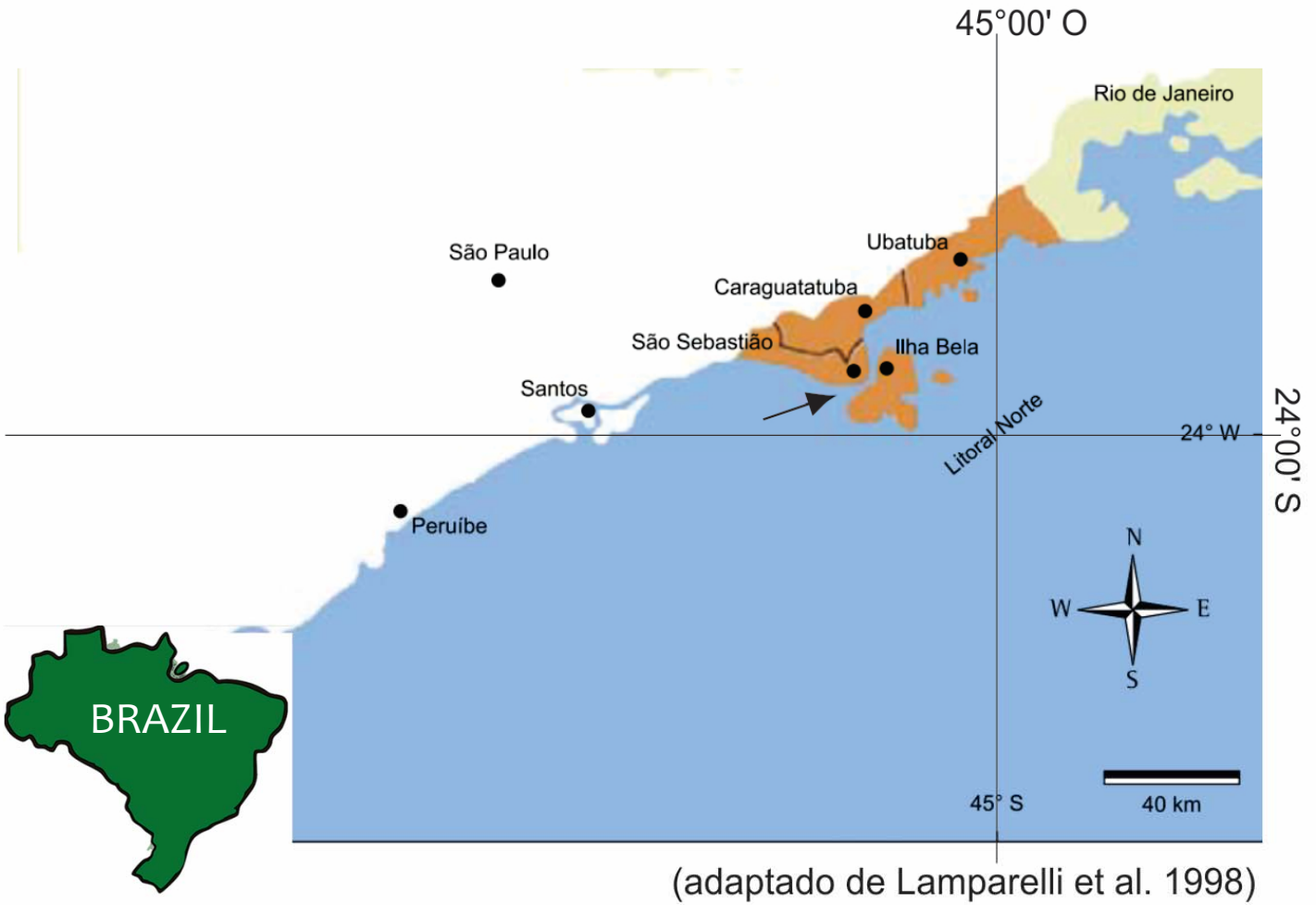
SCALE x PRECISON



Adapt from: Schaeffer-Novelli *et al* 2000

Study area

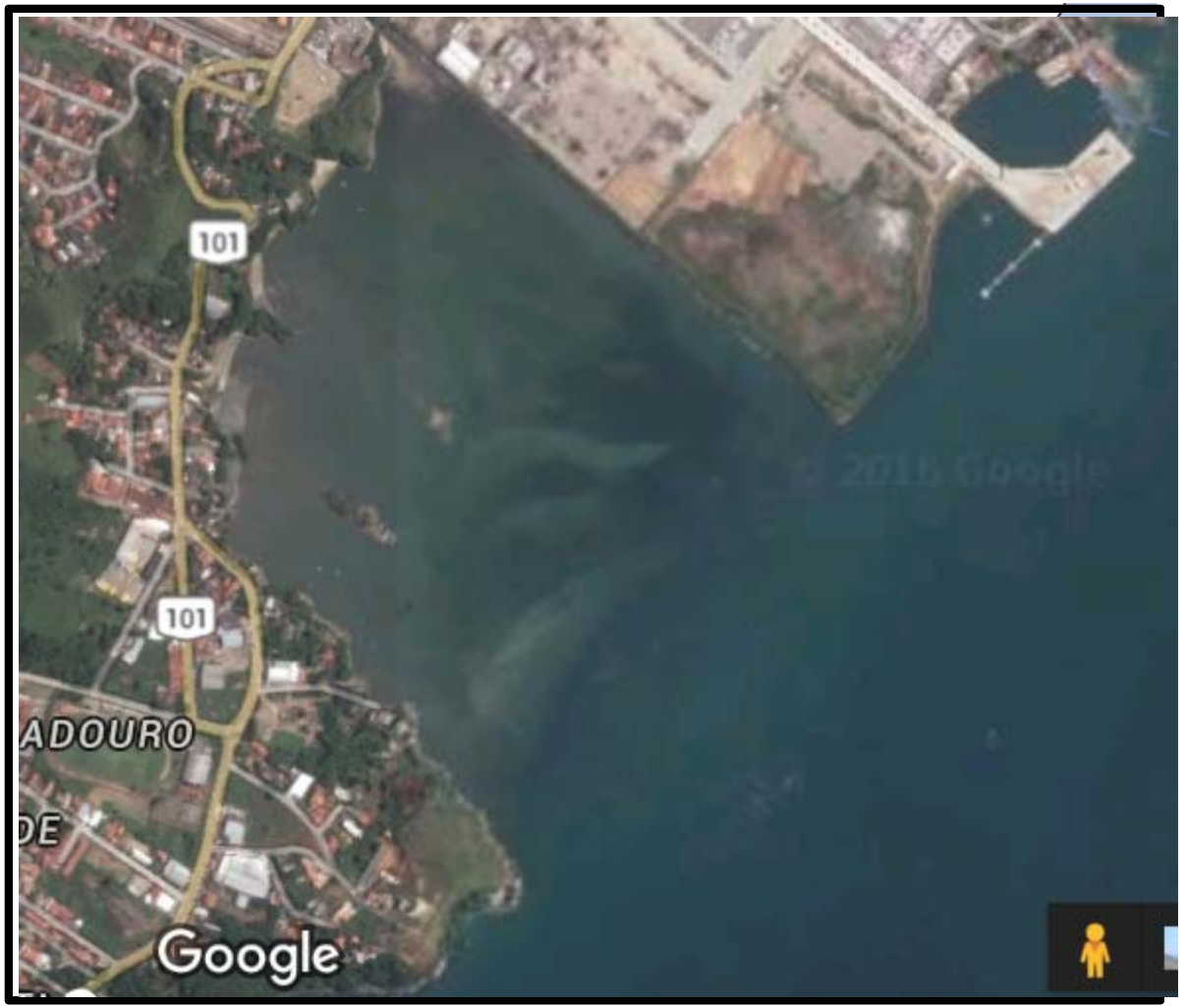




(adaptado de Lamparelli et al. 1998)

More precisely located in the Northest coast of São Paulo State.

Study area



The Araçá bay has currently an area of ± 500,000 m^2,

The bay literally can be taken as a roofless laboratory.

Human Landscape

some questions that the study of

Mangrove Historical Ecology at Araçá Bay

will try to respond...

How has Araçá mangrove evolved?

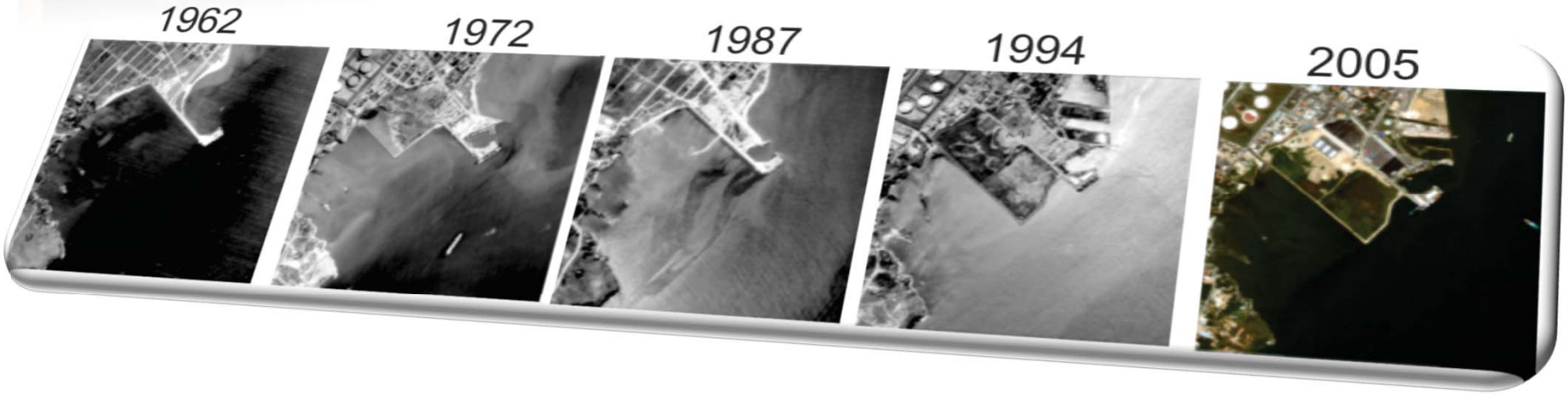
Which enviromental impact has influenced mangroves through time?

How does humans interacted with Araçá Bay mangrove ecosystem: past and present.?

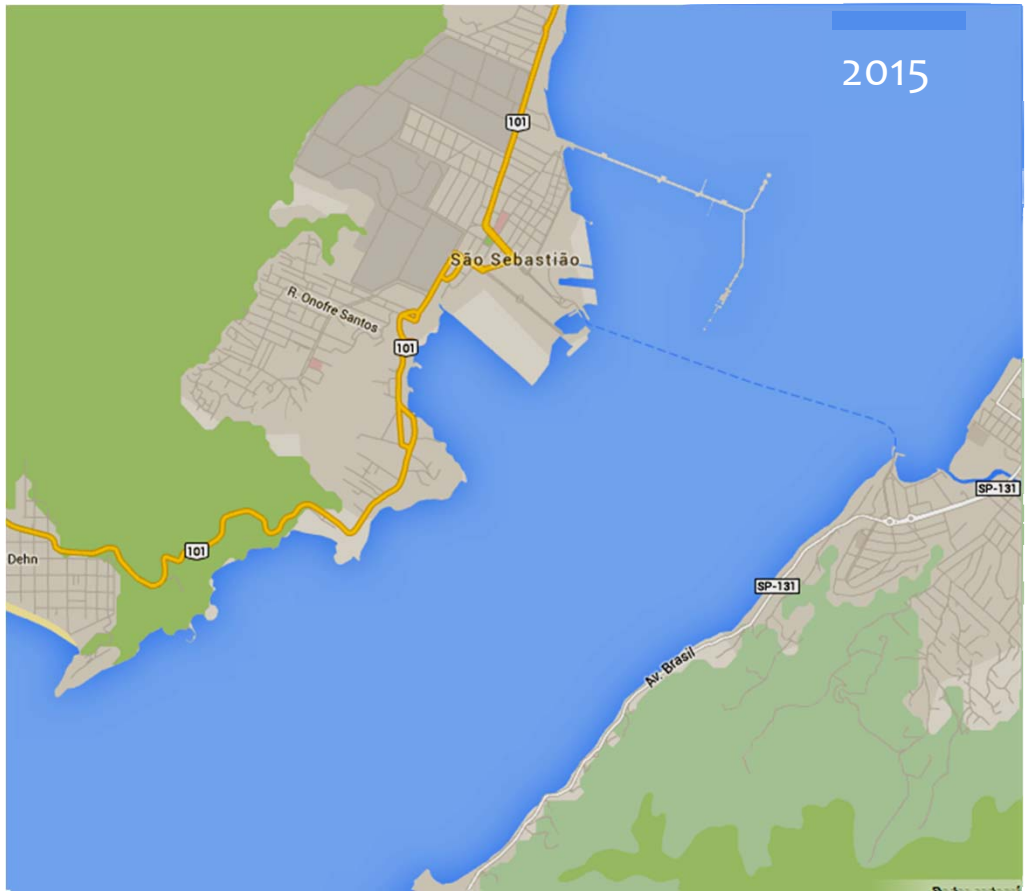
The port of São Sebastião

SÃO SEBASTIÃO PIER 1919

SÃO SEBASTIÃO PORT 1930



Human landscape: Araçá Bay



Rip rap view 2015

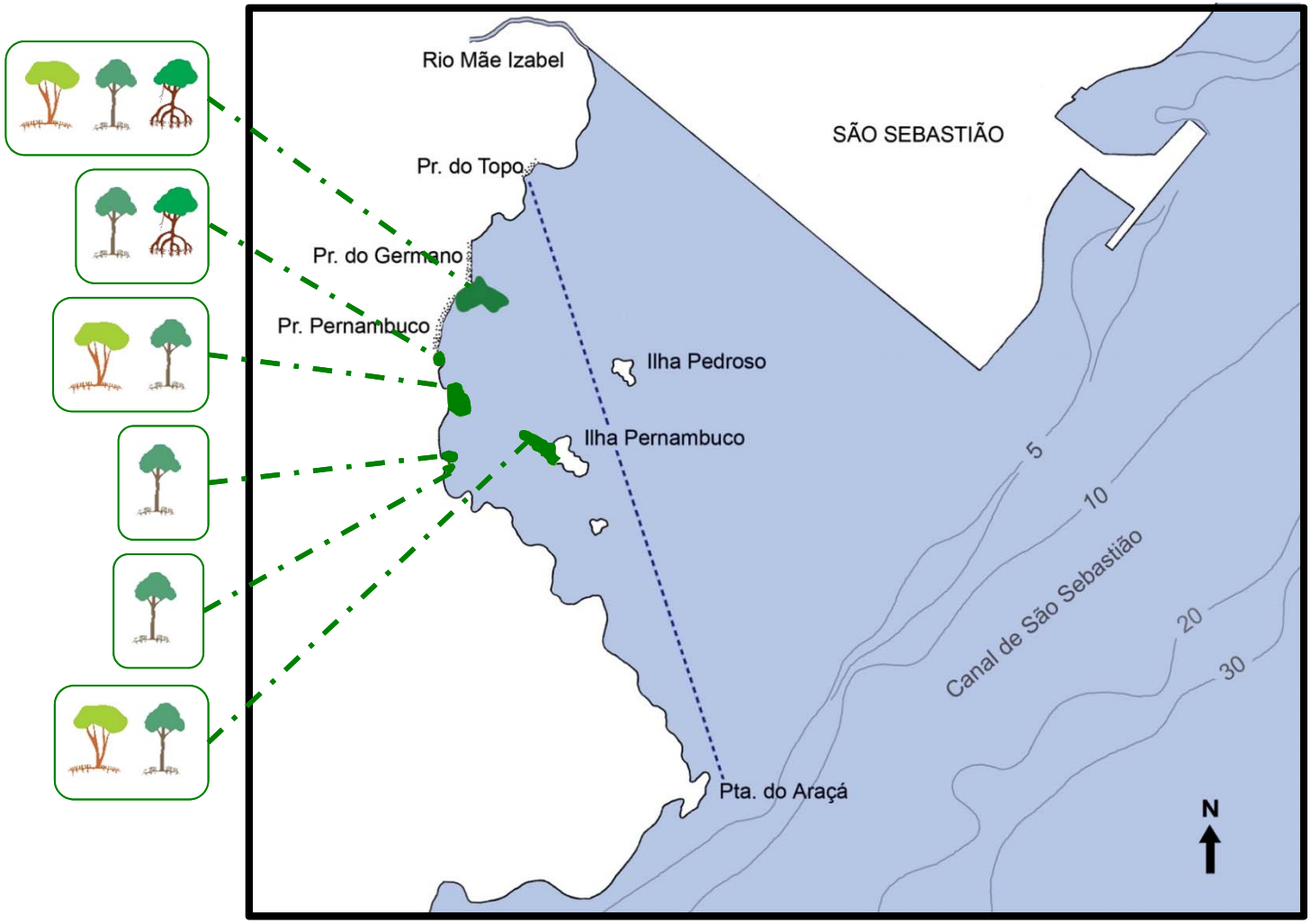
red mangrove view 2015

Panoramic view mangrove at Araçá Bay, 2015 @Abuchahla

source: satélite image by Google Earth® 2015

Mangroves covers 6% of Araçá Bay total area, in which 3,644 m² are occupied by resilient mangrove stands.

Study area

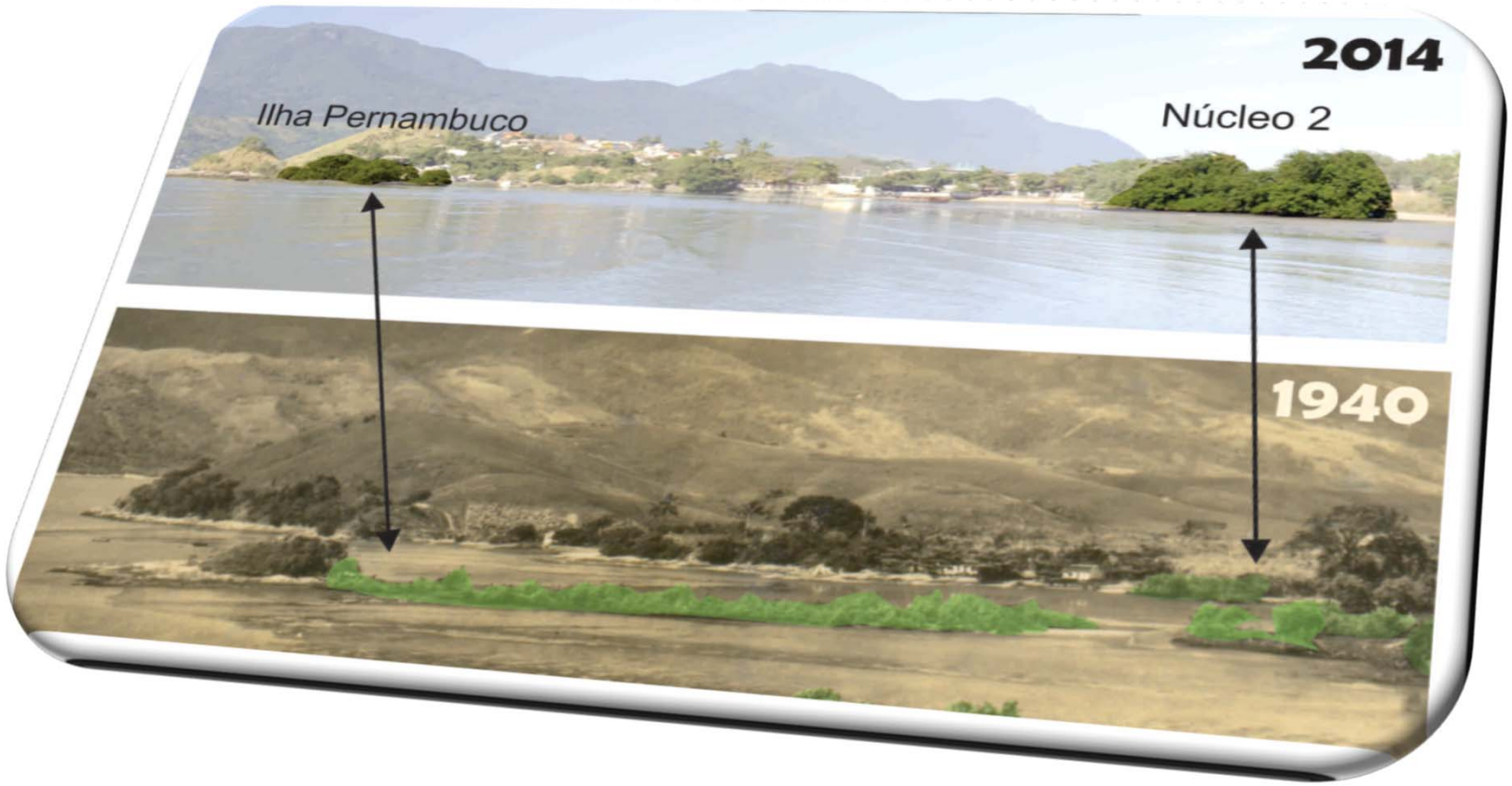


MANGUEZAL:	ÁREA DA COBERTURA VEGETAL:
Núcleo 1	2.380 m²
Núcleo 2	459 m²
Ilha Pernambuco	456 m²
Núcleo 3	150 m²
Núcleo 4	64 m²
Rhizophoretum	135 m²
TOTAL	3.644 m²

White mangrove *Black mangrove* *Red mangrove*

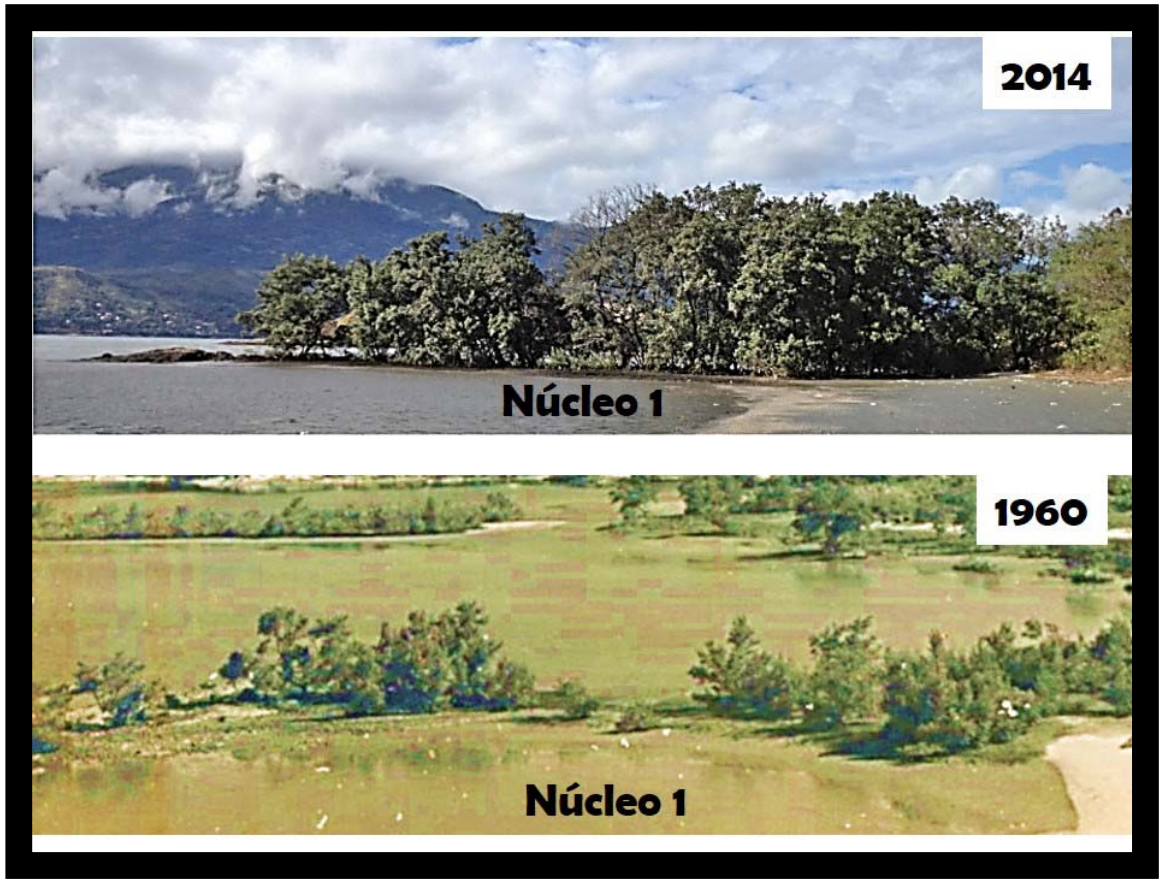
Environmental Dynamics fluxes

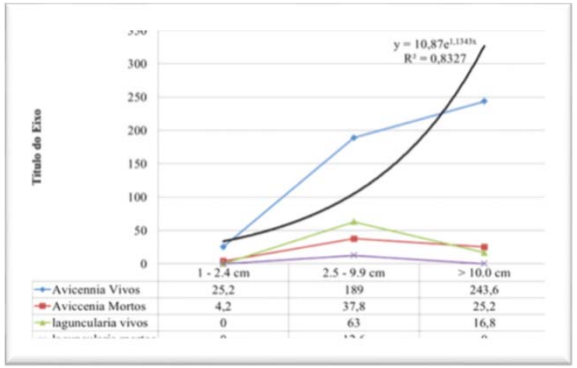
Seasonal sediment dynamic



Mangrove respond to human tensors

The structure of each stand (live and dead trees and branches) was described measuring DBH (cm) and height (m) (Cintron, Schaeffer-Novelli, 1984; Schaeffer-Novelli, Cintron-Molero, 1986)





Graphic: DBH (cm) values represented by exponencial tendency (R2 = 0,8327) forming a " J ".

The port of São Sebastião now handles a fourth of all of Brazil's liquid cargoes. It is expected that in the comming years there will be further expansion.

The plans of port expansion (EIA/RIMA, 2009) would compromise up to 75% of the bay's area in 20 years, causing heavy social and environmentalist protests. For now it is in a stand by position.

Due to the social unrest caused by plans of port expansion, the relatively small area of mangroves (6% of the whole bay) has played a big role in conservationist efforts. Mangroves are considered areas of permanent protection (APP) by the Brazilian environmental legislation.

2030?

The Araçá bay has one of the last remaining mangroves in the northern state of São Paulo, and its conservation is crucial to human communities and to the environment itself, especially in the context of uncertainties brought by an alarming sea level rise scenario.

Thanks for your attention

ACKNOWLEDGEMENTS

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