BRAZIL
DEPARTMENT OF MARINE BIOLOGY
FEDERAL FLUMINENSE UNIVERSITY - UFF

SUSTAINABLE FISHERIES AND CLIMATE CHANGE DATA THROUGH INTERNATIONAL COOPERATION REGIONAL PRIORITIES:

PAST, PRESENT AND FUTURE

Multi-Stakeholder Dialogue And Capacity-Building Partnership Event
Segment 2: Capacity gaps and needs related to the conduct of integrated assessments

Ph.D. Fernanda de Oliveira Lana
Biologist

New York, 2019

KEY ENVIRONMENTAL ISSUES

- Fishery statistics;
- Biodiversity and habitat degradation;
- Marine environmental pollution;
- Exploration and production activities for oil, gas and pre-salt;
- Reduction of fish stocks;
- Predatory fishing;
- Climate changes
  → Variation of temperature, sea level, productivity.

NATIONAL ACTIONS

- Special Secretariat of Aquaculture and Fisheries (SEAP / PR) and Organization of Ibero-American States (OEI)

"Grants to National Fisheries Management".

- Issues such as:

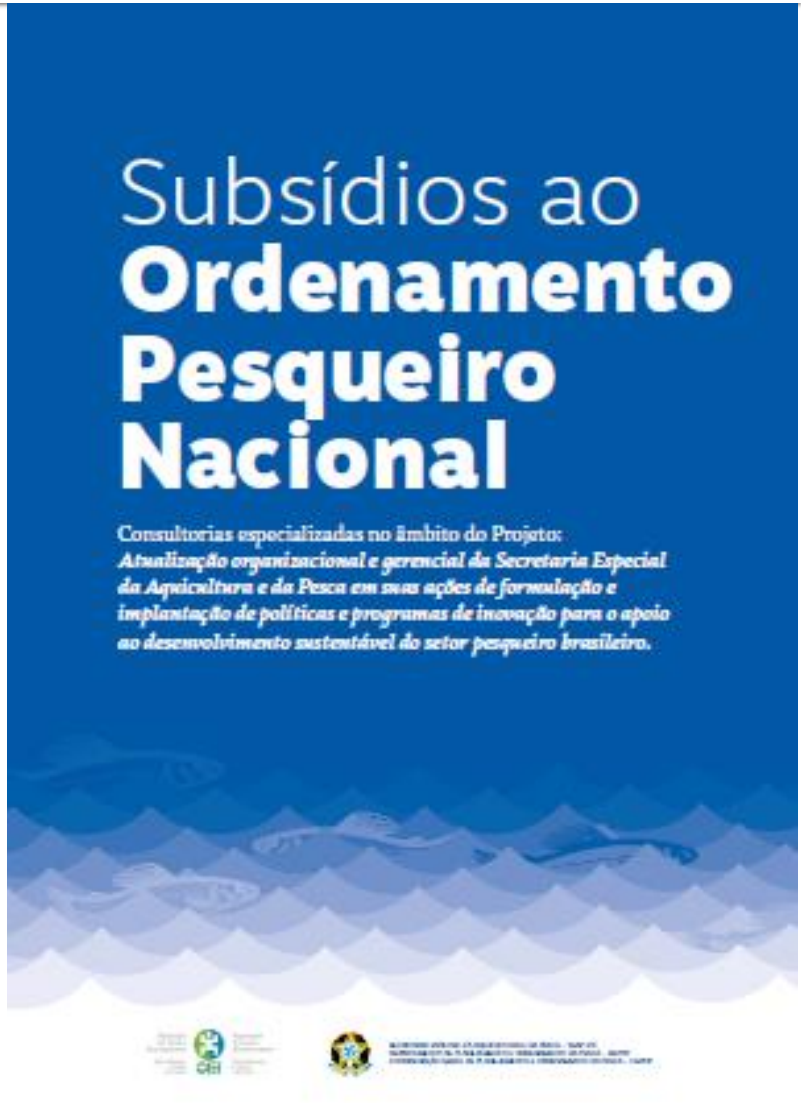
→ Statistics;
→ Quantification of national fishery production;
→ Ways of tracking vessel traffic in Brazilian waters.

- Results → Guide the policies Federal Government;

- Model for other Latin American countries

(since Brazil has an expertise, extensive coastal area, diversity of watersheds).

Boosting the sector in Brazil as an international reference



Sustainable fisheries

- Acquisition and collection of data for fisheries statistics:

FISHERIES MONITORING PROJECT (PMAP)

Entrepreneur: PETROBRAS

Licensing Institution: IBAMA MMA

Partners:

FIPERJ Fundação Instituto de Pesca do Estado do Rio de Janeiro

Instituto de PESCA

FUNDEPAG Fundação de Desenvolvimento da Pesquisa do Agronegócio

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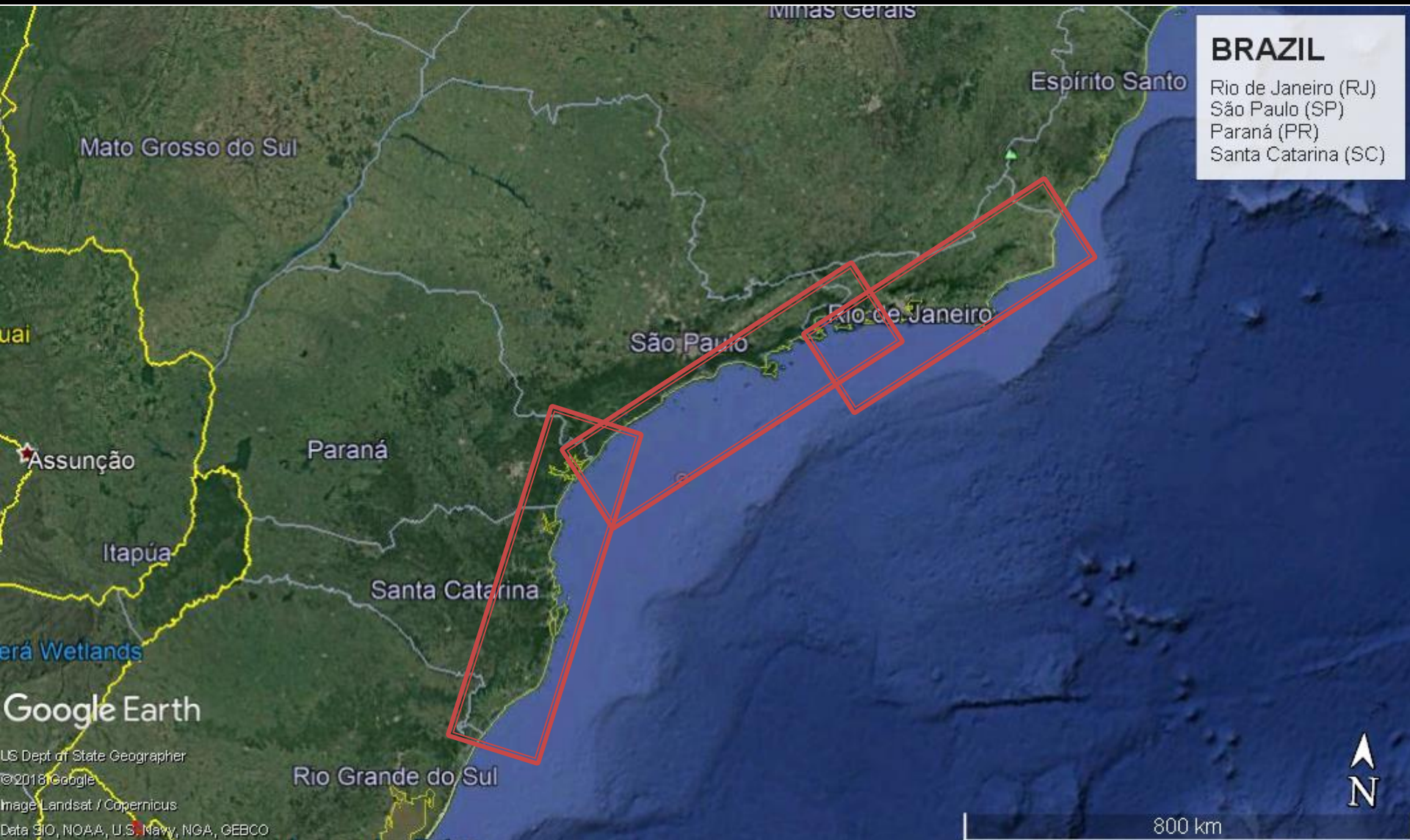
FISHERIES MONITORING PROJECT (PMAP)



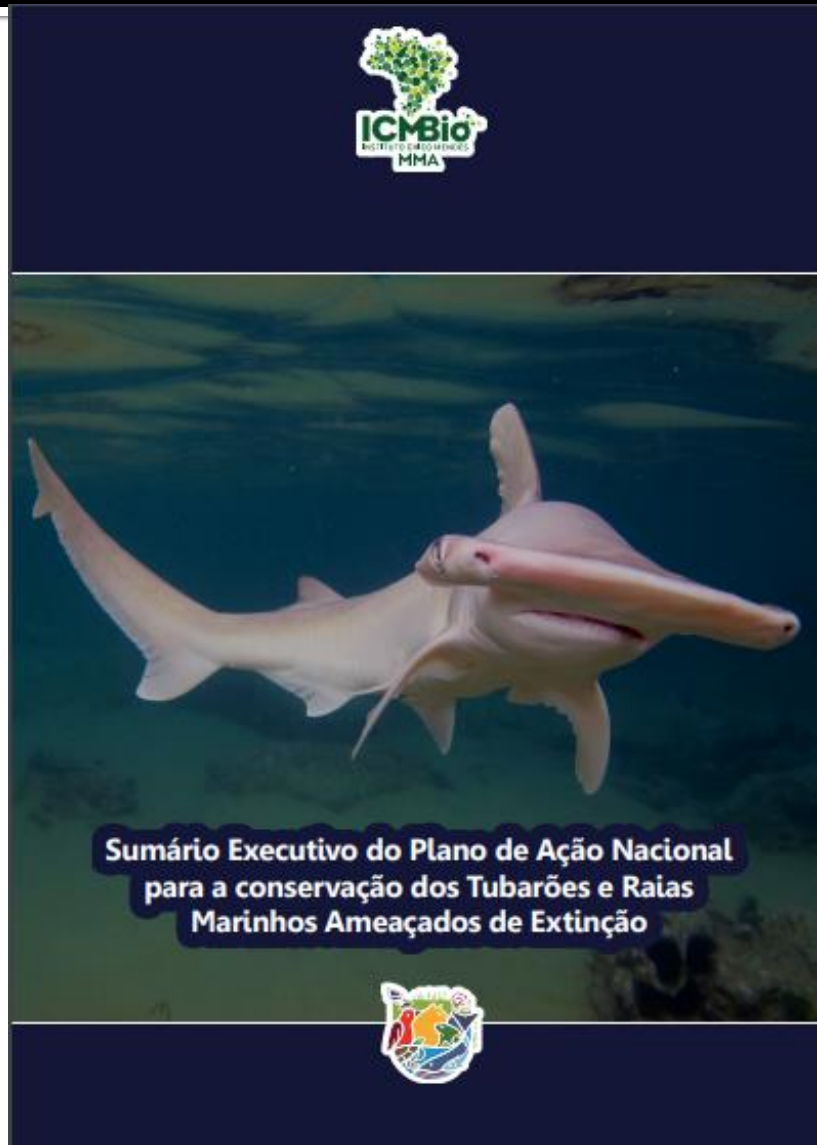
PAN TUBARÕES / SHARKS

Chico Mendes Institute of Conservation of Biodiversity - ICMBio / MMA

- National Action Plan For Conservation Of Sharks And Rays Of Endangered Marine Extinction –
(PAN TUBARÕES / SHARKS)
2014 - 2019

- Mitigate the impacts on endangered marine elasmobranches in Brazil and their environments for short term conservation purposes;

Priority actions for the conservation of species and habitats.



PAN CORAIS / CORALS
Chico Mendes Institute of Conservation of Biodiversity - ICMBio / MMA

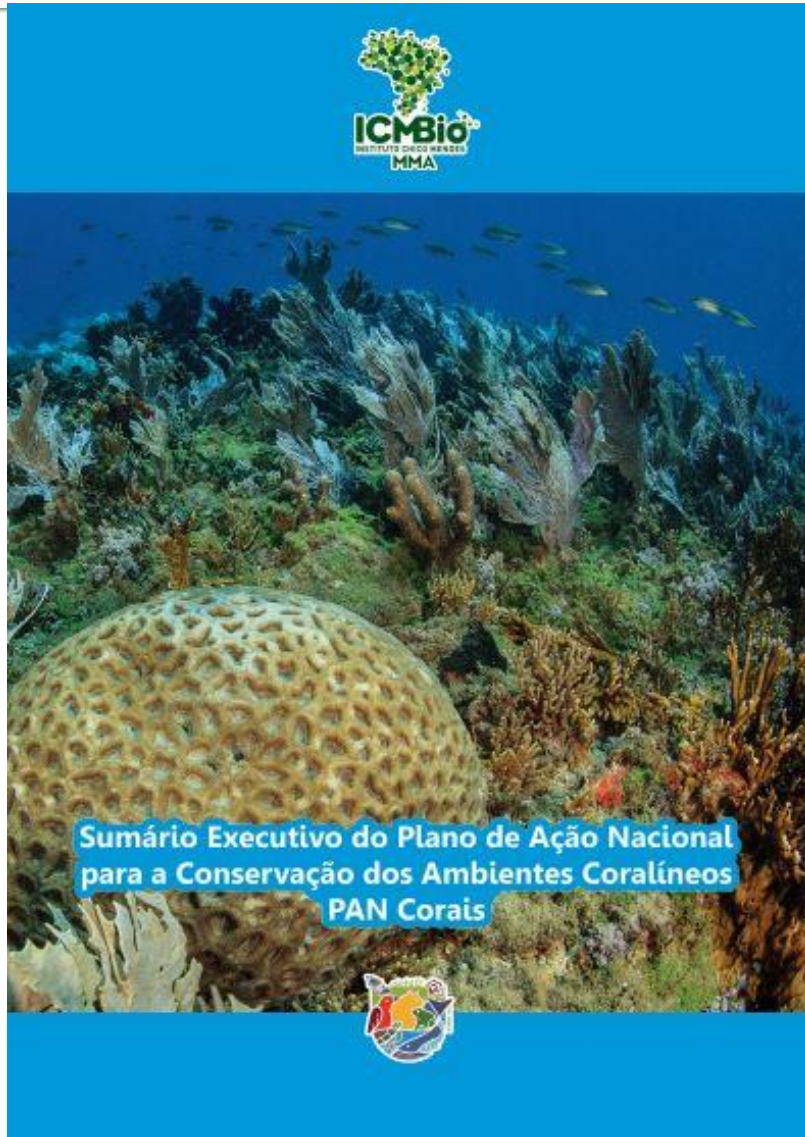
- National Plan of Action for the Conservation of Coral Environments (PAN Corals) – 2016

- Covers 52 endangered species;
- Improving the conservation status of coral environments → reducing:
- Anthropic impacts;
- Enhancing protection and knowledge;
- Promoting sustainable use and social and environmental justice.

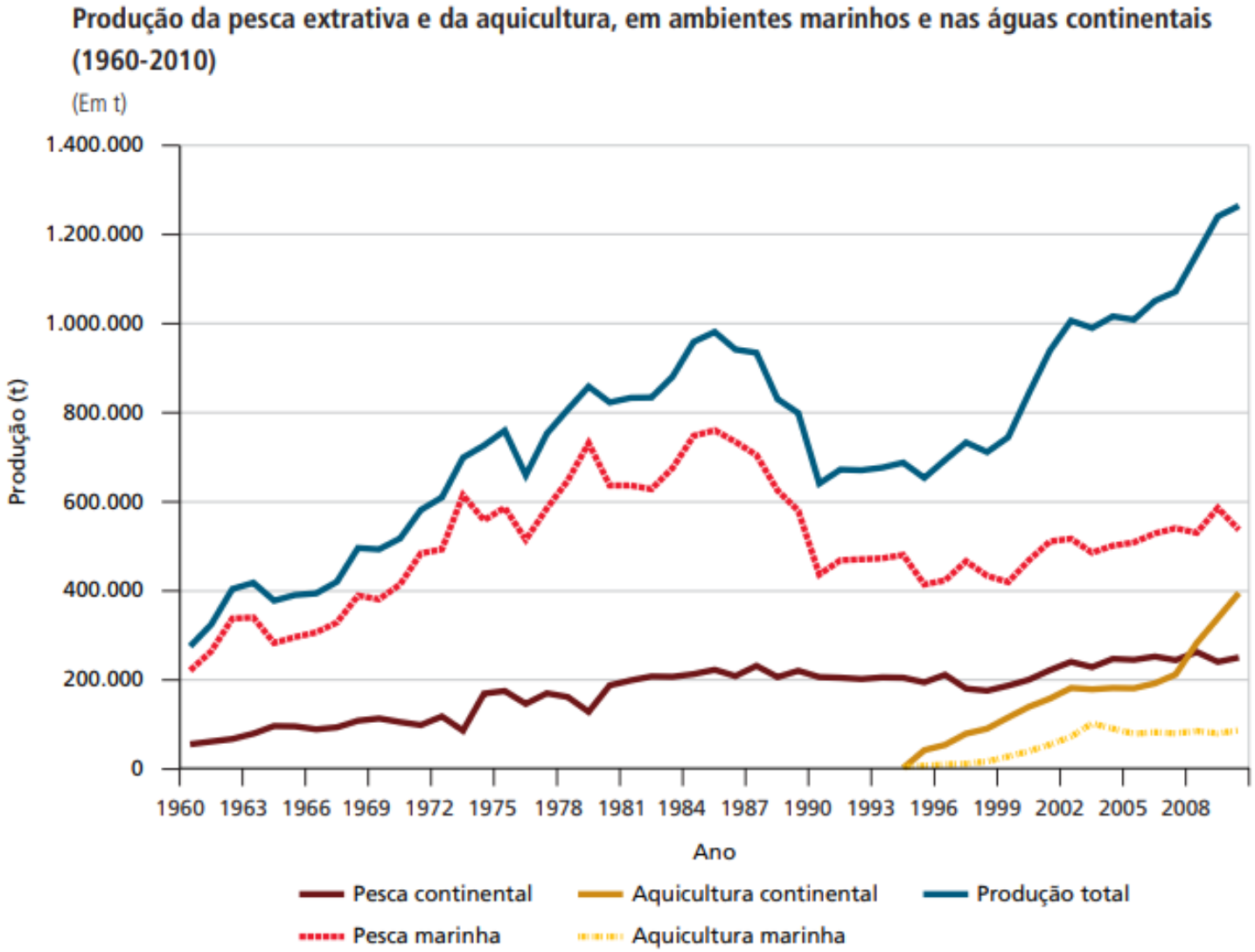
Expected to be implemented: 2021

OTHERS

National Plan of Action for the Conservation of:
- Seabirds;
- Sirenia (*Caribbean Manatee*);
- Sea turtles;
- Cetaceans.



OVERVIEW

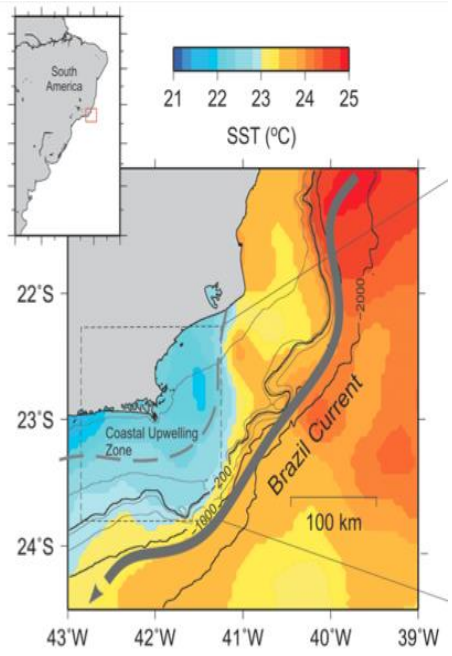


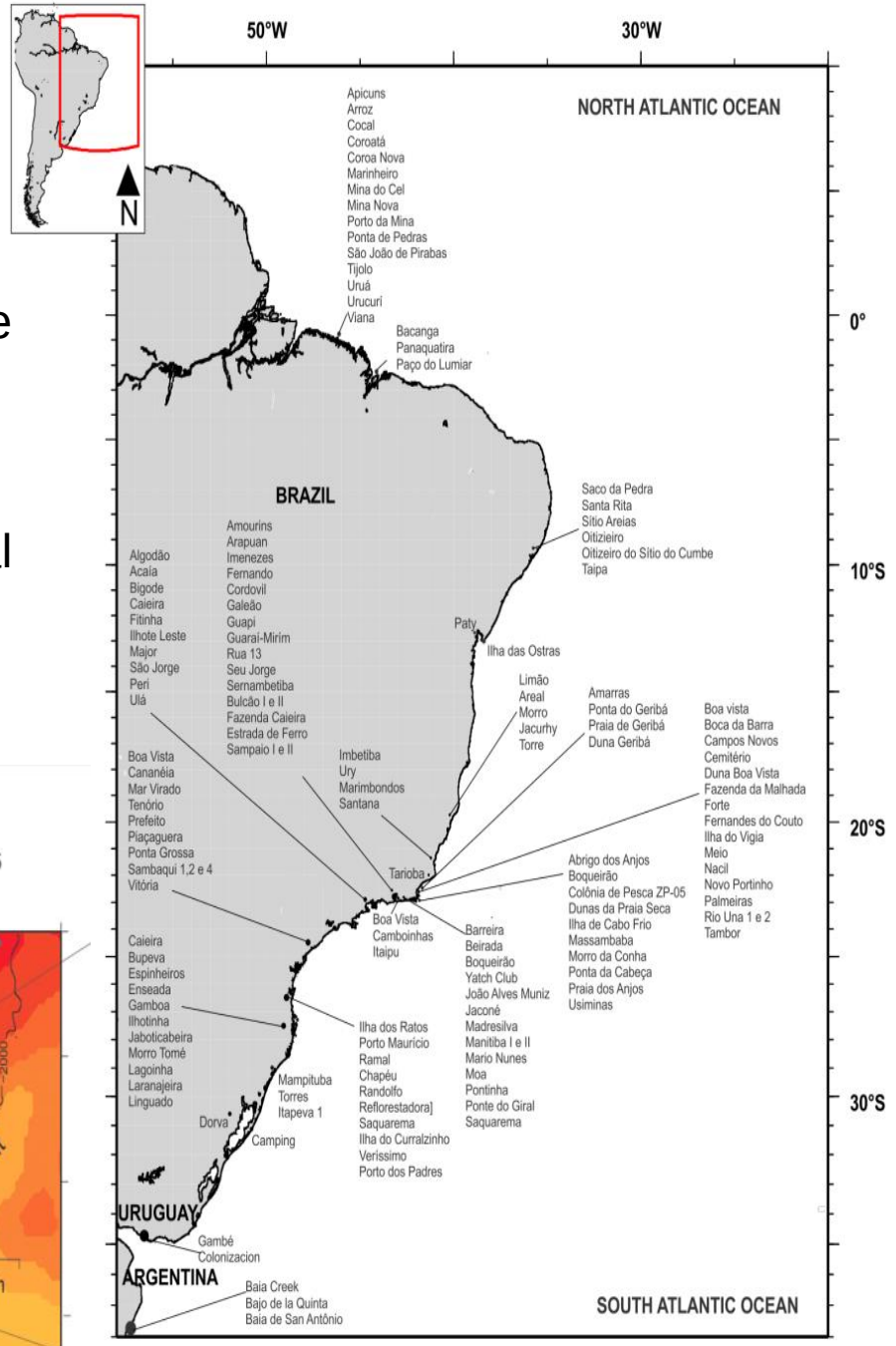
Production of extractive and aquaculture fisheries in marine environments and in continental waters (1960-2010)

Source: Dias Neto (2003), Ibama (2007) e MPA (2012a).

CLIMATE CHANGE / SHELL MOUNDS

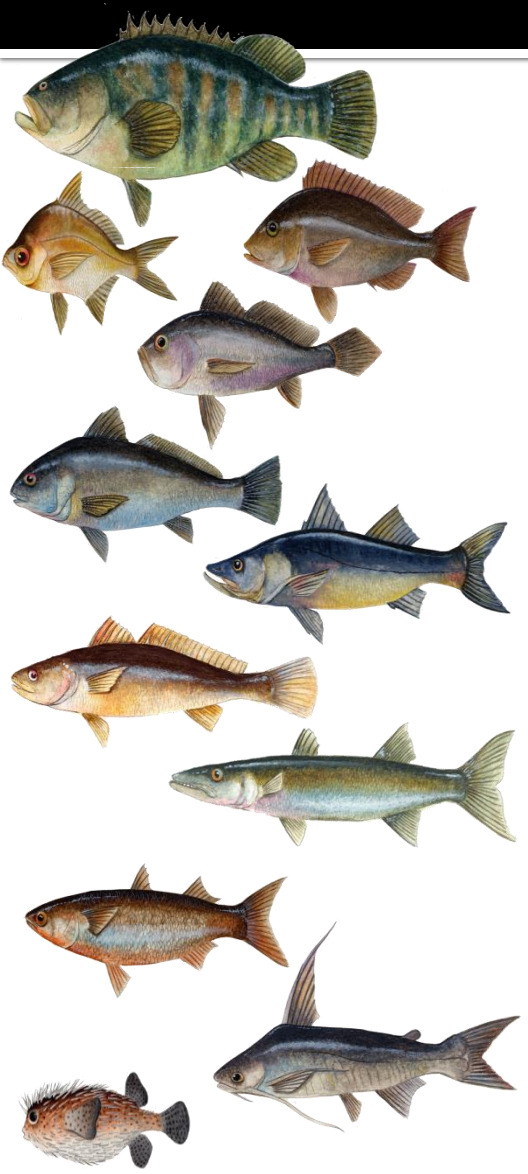
- Main effect for the coastal zone → increase in the relative mean sea level;
- Intensification of storms and hangovers;
- Changes in precipitation and fresh water;
- Increase in salt water intrusion in coastal soils and aquifers;
- Acidification of the oceans;
- Changes in the behavior of marine currents.





Lopes et al. 2016

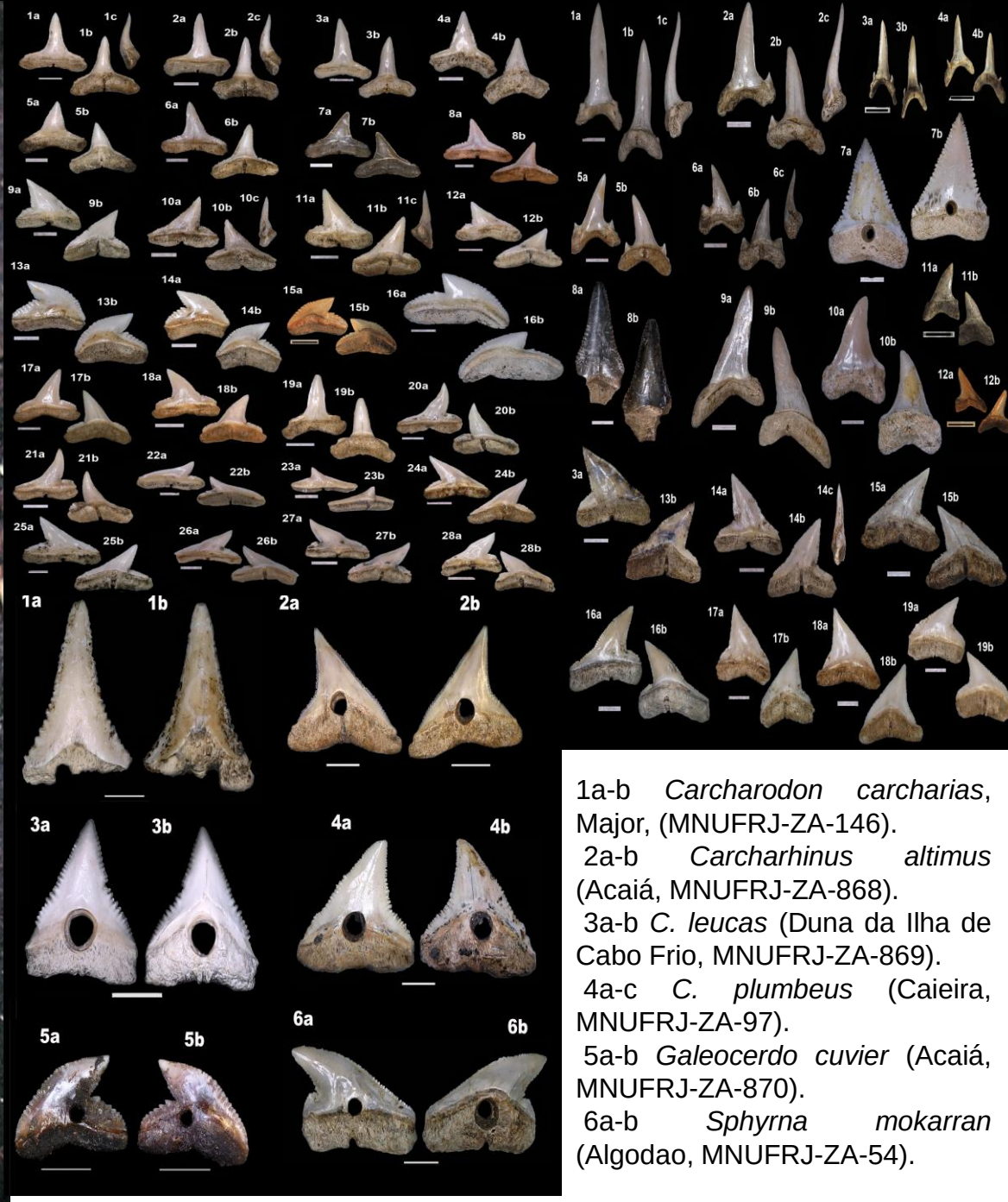
PALEOCEANOGRAPHY



Lopes et al. 2016

Region		RIO DAS OSTRAS	SAQUAREMA			NITEROI	ANGRA DOS REIS				ARRAIAL DO CABO
Shell mounds		Tarioba	Beirada	Saquarema	Manitiba	Camboinha	Algodão	Bigode	Caieira	Major Peri	Usiminas
Geomorphology		Sandy coastal plain	Sandy coastal plain and coastal laggons				Rocky botton and rocky island				
Age cal BP		3,818 to 3,160	5,300 to 3,300	4,052 to 3,505	4,600 to 3,600	3,826 to 3,4 / 4,000	3,700 to 2,200				2203±36 / 1702±36
Carangidae	*Caranx crysos*			2		3					
	Caranx hippos		1	2	2	3	4	4	4	4 4	
	Caranx sp.										5
	Oligoplites saurus			2							
	Oligoplites sp.		1								
Lutjanidae	*Lutjanus synagris*						5	5	5	5 5	
	Lutjanus sp.	x					5	5	5		
	Ocyurus chrysurus										5
	Rhomboplites aurorubens					3					
	gen., sp. Ind.									5	
Gerreidae	*Diapterus auratus*						5			5	
	Diapterus olisthostomus						5				
	Diapterus rhombeus						5			5 5	
	gen., sp. Ind.	5, 6							5	5	
Haemulidae	*Anisostremus virginicus*						5	5	5	5 5	
	Anisostremus sp.									5	5
	Haemulon aurolineatus						5				5
	Haemulon sp.	x					4	4	4	4, 5 4	
	Haemulon scirius						5				
	Haemulon steindachneri	x					5		5		5
	Orthopristis ruber					3	4	4	4, 5	4, 5 4	
	Pomadasys sp.						4	4	4	4 4	
	gen. sp. Ind.							4	4, 5	4 4, 5	
Sparidae	*Archosargus probatocephalus*									1	
	Archosargus rhomboidalis		1	2	2		5			5	
	Archosargus sp.					3					
	Pagrus pagrus		1	2							
	Pagrus sp.	x									5
Sciaenidae	*Bairdiella ronchus*	5, 6					4, 5	4, 5	4, 5	4 4	
	Cynoscion acoupa			2	2		4	4	4	4 4	
	Cynoscion jamaicensis	5, 6				5	4, 5	4, 5	4, 5	4, 5 4, 5	
	Cynoscion leiarchus	x									
	Cynoscion sp.				5	5					
	Cynoscion striatus			2	2						
	Larimus breviceps	5, 6					4, 5		4, 5	4 4	
	Menticirrhus littoralis	x					4		4	4 4	
	Micropogonias furnieri	5, 6	1, 5	2, 5	2, 5	5 3, 5	4, 5	4, 5	4, 5	4, 5 4, 5	
	Pogonias cromis	5, 6	1	2	2, 5	5 3	4		4	4 4	
	Umbrina canosai			2			4		4	4 4	
Mugilidae	Mugilidae						4		4	4 4	
	Mugil lisa						5		5	5 5	
	Mugil sp.	5, 6					4		4		
Belonidae	*Strongylura* marina										5
Labridae	*Labrisomus nuchipinnis*						4		4		
Balistidae	*Balistes vetula*						4		4	4	
Scaridae	*Scarus* sp.						4	4		4	5
	Sparisoma radians										
	Sparisoma sp.	x				3					
Ephippidae	*Chaetodipterus faber*	x		2		3	4	4	4	4 4	
Sphyraena	*Sphyraena guachancho*						5			5	
	Sphyraena sp.								5	5	5
Batrachoididae	Porichthys porossisimus									5	
Trichiuridae	*Trichiurus lepturus*					3					
Hyporhampidae	*Hyporhamphus unifasciatus*						5		5		
	Hyporhamphus sp.								5		
Tetraodontidae	*Lagocephalus laevigatus*	5, 6	1	2	2	3	5				
	Sphoeroides spengleri						4	4	4	4 4	
	Sphoeroides testudineus						4	4	4	4 4	
Diodontidae	*Diodon hystrix*						4			4	5
	Chilomycterus spinosus	5, 6					4, 5		4	4 4	5
Total species		25	18	25	10	4 19	74	31	49	53 44	24

Table 1. Fish records from the Rio de Janeiro shell mound. Refernces number: 1. Kneip et al., 1994; 2. Magalhães et al., 2001; 3. dos Santos, 1995; 4. Lima, 1991; 5. present work; 6. Tuna, in p



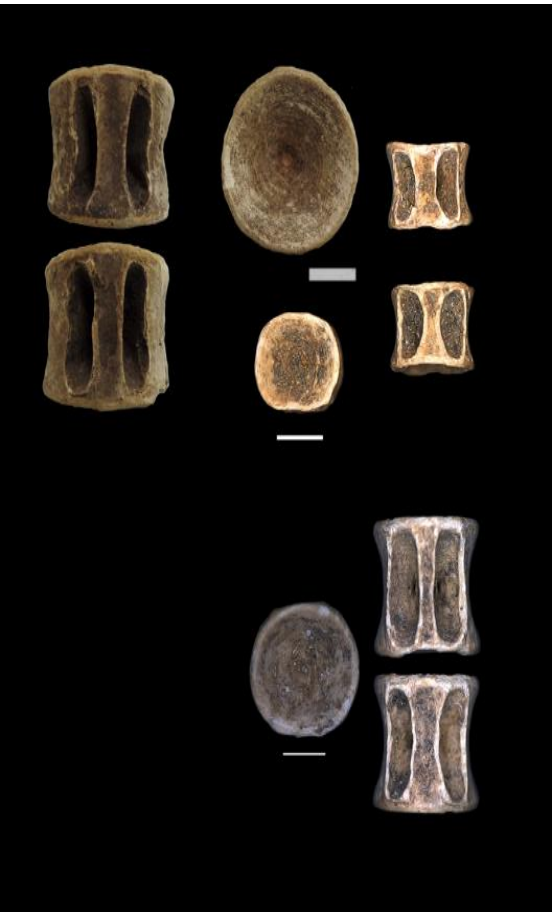
1a-b *Carcharodon carcharias*, Major, (MNUFRJ-ZA-146).
2a-b *Carcharhinus altimus* (Acaiá, MNUFRJ-ZA-868).
3a-b *C. leucas* (Duna da Ilha de Cabo Frio, MNUFRJ-ZA-869).
4a-c *C. plumbeus* (Caieira, MNUFRJ-ZA-97).
5a-b *Galeocerdo cuvier* (Acaiá, MNUFRJ-ZA-870).
6a-b *Sphyrna mokarran* (Algodao, MNUFRJ-ZA-54).

Photo: Documentação do Museu de Arqueologia da USP

Lopes et al. 2016

PALEOCEANOGRAPHY

- These shell mounds areas may be associated with nursery or feeding ground of sharks.



A) Charcharhinidae

B) Sphyrnidae

C) Lamnidae – *C. carcharias*

D) Lamnidae – *I. oxyrinchus*

Hammerhead shark (*S. mokarran*)

PALEOC

- These shel
  associated
  ground of s

C) Lamnidae – *C. carcharias*

D) Lamnidae – *I. oxyrinchus*

Hammerhead shark (*S. mokarran*)

FINAL CONSIDERATIONS

- ✓ Fishery statistics (PMAP): information to assess the potential and actual interactions of fishing with activities related to the oil and gas production chain;

- ✓ To guide the strategic decision making by the sector and the elaboration of public policies that aim at the improvement in the coastal and marine fisheries of Brazil;

- ✓ Determine geochemical signs in past environments and to estimate the dominant conditions of paleotemperature and paleosalinity, over a radiological series of 6 thousand years;

- ✓ An unprecedented contribution for the evaluation of the pristine conditions of the fauna and its later comparison with the current situation of the resource;

- ✓ Providing a more accurate view of the prevailing oceanographic climate and conditions in the past, understanding the present, and shaping the future.

THANK YOU !!!



Ph.D. Fernanda Lana

fe_lana@hotmail.com

+55 21 99931- 4364