

# Presence of marine debris in the stomach contents of the marine mammals stranded in the Santos Basin, southwest Brazil.

**Suelen Goulart<sup>1</sup>**; Marzia Antonelli<sup>1</sup>; Marina Molinas Alcala<sup>1</sup>; Janaina Rocha Lorenzo<sup>1</sup>; Emanuel Ferreira<sup>1</sup>; Carla Beatriz Barbosa<sup>2</sup>; Pedro Castilho<sup>3</sup>; Marta Cremer<sup>4</sup>; Jeferson Luis Dick<sup>5</sup>; Camila Domit<sup>6</sup>; Daniela Ferro Godoy<sup>7</sup>; Karina Groch<sup>8</sup>; Andrea Maranhão<sup>9</sup>; Rodrigo Valle<sup>10</sup>; Andre S. Barreto<sup>5</sup>; Cristiane K. M. Kolesnikovas<sup>1</sup>.

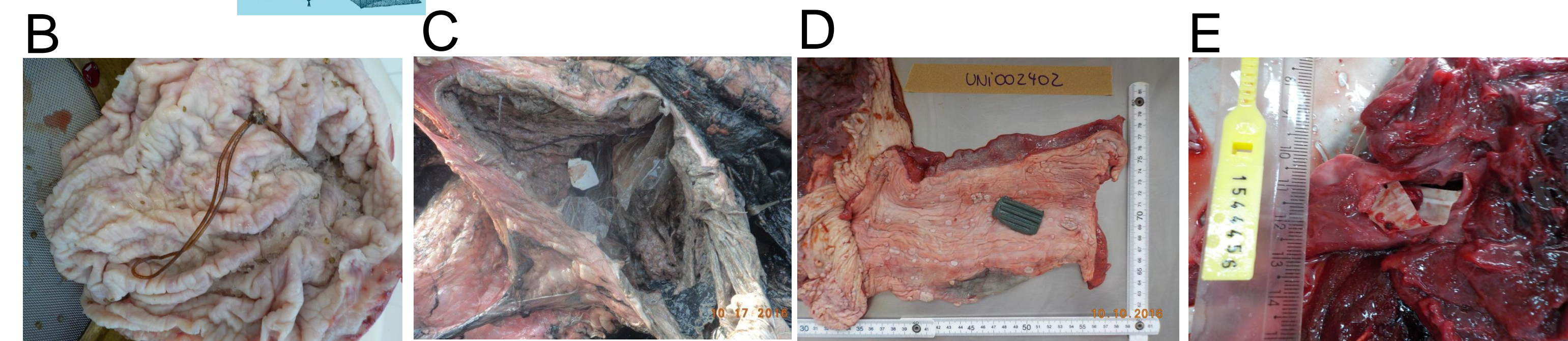
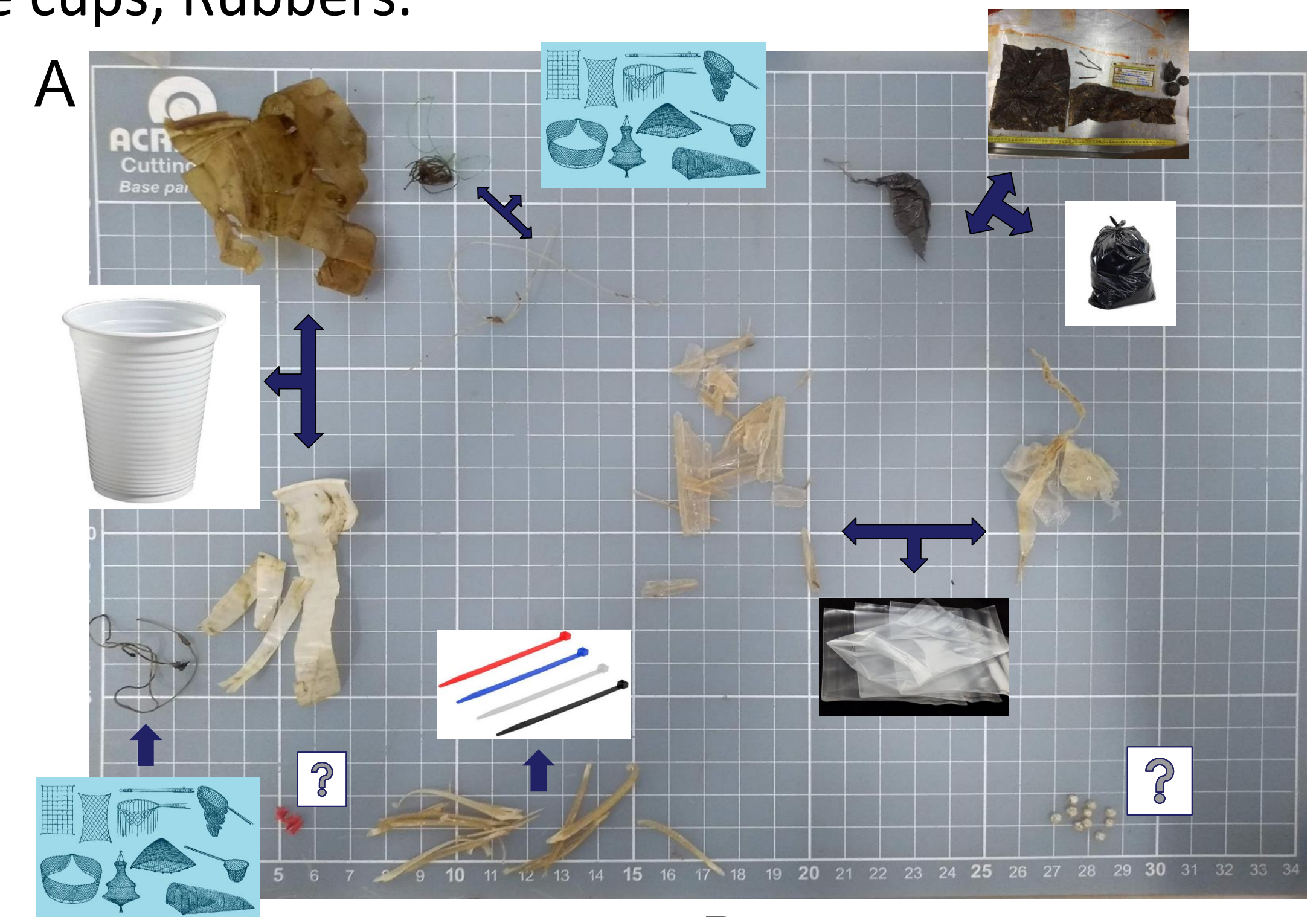
<sup>1</sup>CePRAM - Centro de Pesquisa e Reabilitação de Animais Marinhos - Associação R3 Animal – SC; <sup>2</sup>Instituto Argonauta; <sup>3</sup>Universidade do Estado de Santa Catarina;

<sup>4</sup>Universidade da Região de Joinville; <sup>5</sup>EMCT – UNIVALI; <sup>6</sup>Centro de Estudos do Mar/UFPR; <sup>7</sup>Instituto de Pesquisas Cananéia – IPeC; <sup>8</sup>Instituto Australis - Right Whale Project;

<sup>9</sup>Instituto GREMAR; <sup>10</sup>Biopesca Institute - Paulista University;

Marine debris, mainly plastic, are important threat to different habitats and marine biodiversity. Fauna can be heavily impacted through the ingestion of residues and also by the entanglement and potential injuries, compromising their lives. In this context, the present study aims to investigate the presence of anthropogenic residues in the stomach contents of marine mammals along the coast of south and southeast of Brazil, from 2015 to 2019. The samples were collected through the records generated from the Santos Basin Beach Monitoring Project (PMP-BS), one of the monitoring programs required by Brazil's federal environmental agency, IBAMA, for the environmental licensing process of the oil production and transport by Petrobras at the Santos Basin pre-salt province.

The main plastic fragments founded in cetacean and pinniped stomachs were: Nylon; Bags; Plastic seal; Microplastics; Straws; Disposable cups; Rubbers.



**Figure 2:** (A) Some plastics and their sources founded in marine mammals stranded in southwest Brazil; (B) Nylon fragment in *Stenella frontalis* stomach; (C) Bags and other plastics in *Megaptera novaeangliae* stomach; (D) Rubber in *Kogia breviceps* stomach; (E) Disposable cup in *Pontoporia blainvillei* stomach. Pictures: (A) Suelen Goulart/ R3 Animal; (B, C, D, and E) All the pictures are from SIMBA, the online dataset of Santos Basin Beach Monitoring Project.

***Pontoporia blainvillei* was the species that had greatest interaction with marine debris, plastic was present in 63 animals showing large scale impact in this endangered species.**

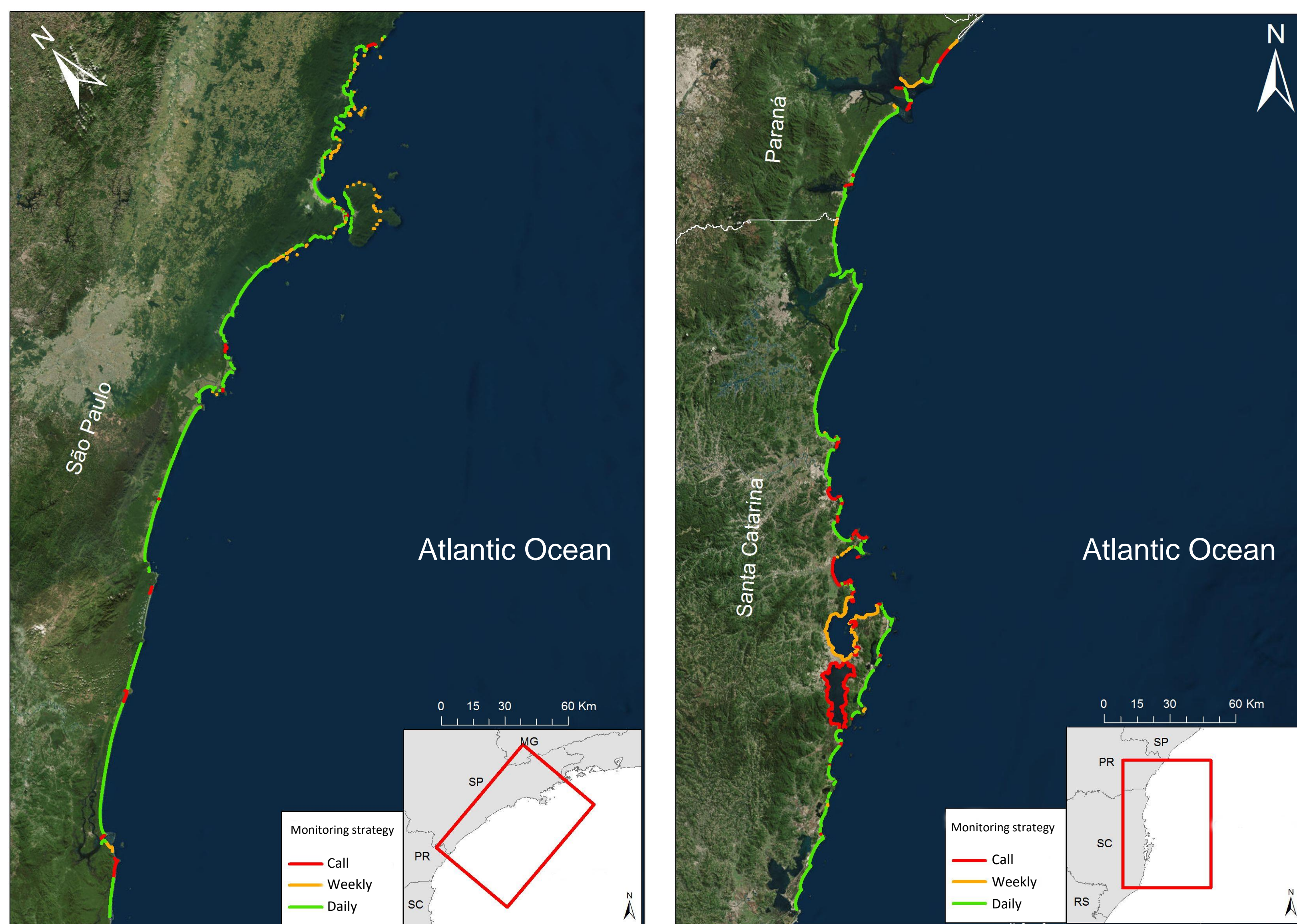
The Franciscana Dolphin inhabits coastal zones and also interacts strongly with other anthropic activities such as fishing. Other species with a substantial number of individuals affected by plastic were *Arctocephalus australis* and *Sotalia guianensis*. Therefore, it is important to investigate the occurrence of anthropogenic residues in the stomach contents of marine mammals in order to occurrence of anthropogenic residues in the stomach contents of marine mammals in order to demonstrate the extent of their damage.



**Figure 3:** Franciscana Dolphin, the most endangered cetacean in Brazil. Picture: Toninha's Project.

## ACKNOWLEDGEMENT

We are grateful to the Beaches Monitoring Project of Santos Basin (PMP-BS, from “Projeto de Monitoramento de Praias da Bacia de Santos”), which aims to evaluate the potential impacts from oil and gas production at the oceanic Pre-Salt province on Brazil’s Santos Basin. This project was required by the federal environmental agency in Brazil (IBAMA), as part of the environmental licensing of PETROBRAS’ activities in the area, together with other monitoring programs (further information can be obtained at <http://www.comunicabaciadesantos.com.br>). The PMP-BS focuses on beached seabirds, sea turtles and marine mammals, as requested by the environmental agency. We are also very grateful to the entire R3 Animal Association group that makes this work possible.



**Figure 1:** Area monitored by the Santos Basin Beaches Monitoring Project – Phase 1 in São Paulo, Paraná and Santa Catarina states. Picture: Annual report of Santos Basin Beaches Monitoring Project

The carcasses that had been found were sent to necropsy and analysis of stomach contents, a total of 2476 stomachs were evaluated and a total of ten species of marine mammals showed interactions with marine debris. The waste was present in **91 individuals**.