

# Brazilian Coastal Monitoring System (SiMCosta)

## Objectives

### Main goal

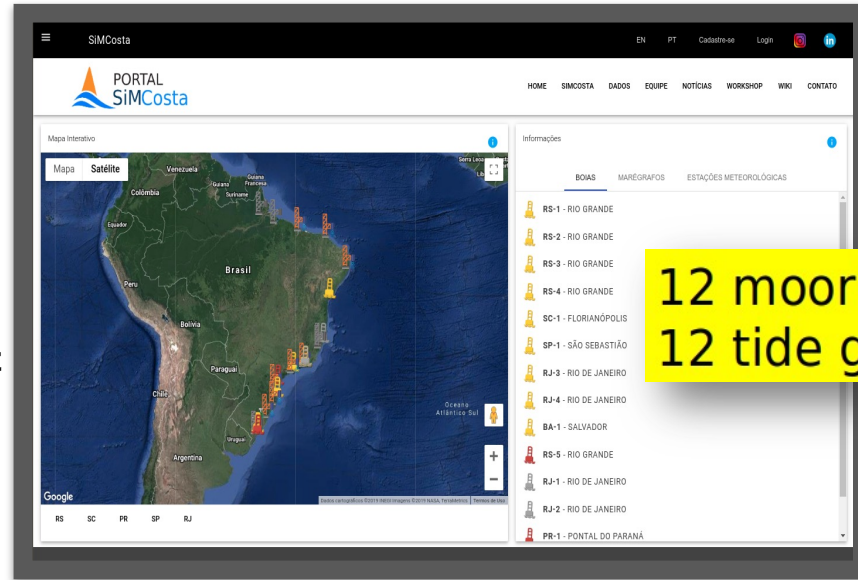
Provide long-term and accurate **Essential Climate Variables (ECVs)** of the Brazilian coastal zone

### Specific goals

- Provide continuous and **free access** to **high-quality data**;
- Develop **tools** and **educational material** to be used by educators and end-users;
- Contribute to the Brazilian government to establish **climate-related policies**.

# SiMCosta Stations

- Standalone ADCP's
- Land-Ocean Biogeochemical Observatory (LOBO) - Seabird Scientific
- Datamar Tide Gauge - Geonica
- Watchkeeper – AXYS Technologies
- SIMA I – NEURON Eletrônica



# Essential Climate Variables

## Atmosphere:

- Precipitation
- Pressure
- Wind Speed and Direction
- Air Humidity
- Solar Radiation
- Temperature
- CO<sub>2</sub> Concentration

## Ocean:

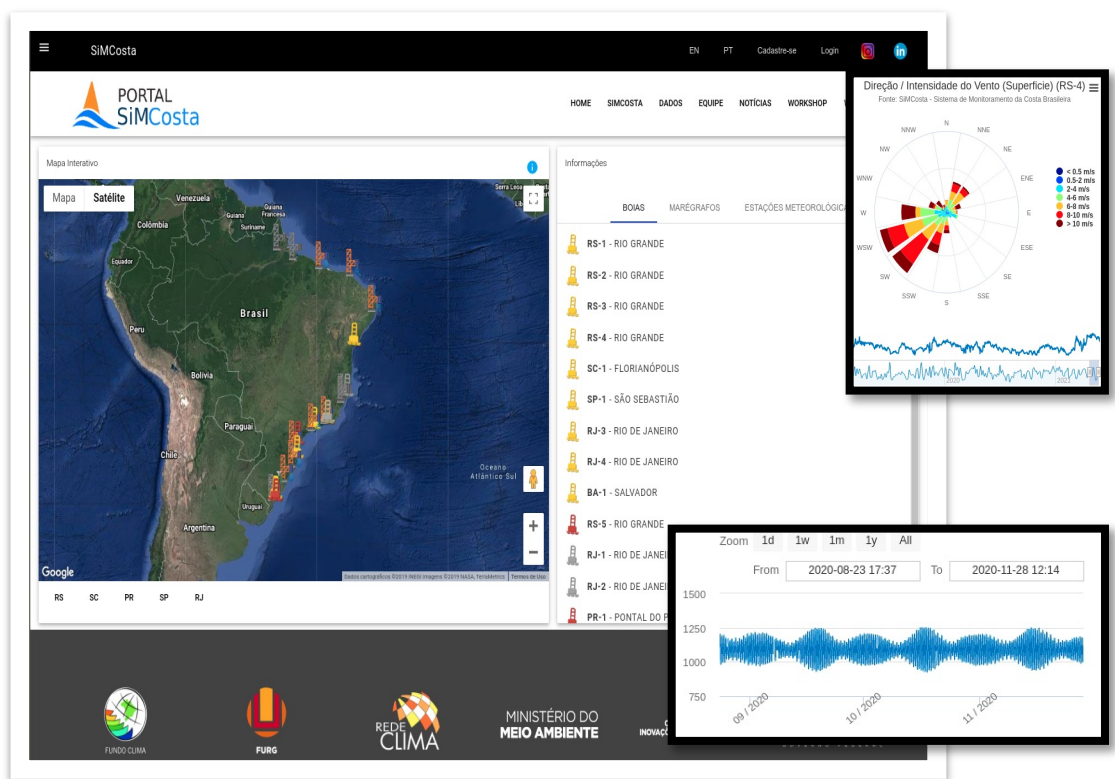
- Turbidity
- Fluorescence (Chlorophyll-a)
- CDOM
- Dissolved Nitrate Concentration
- Dissolved O<sub>2</sub>
- Total pH
- Surface Salinity
- Sea Surface Temperature
- Currents
- Waves
- Sea level



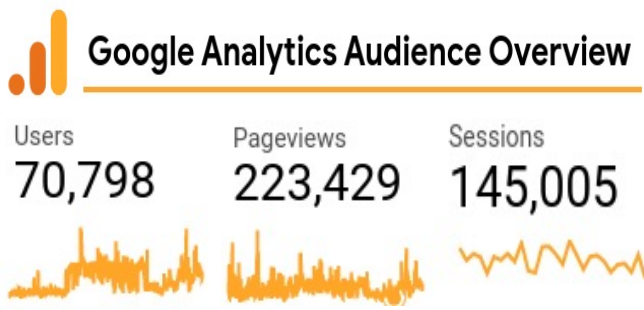
# SiMCosta Web System

- Public data access and visualization
- Automatic Data Quality Control
- Technical Support
- Buoys System Alert

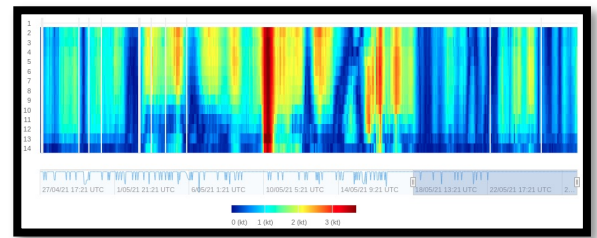
[www.simcosta.furg.br](http://www.simcosta.furg.br)



The screenshot displays the SiMCosta web portal. At the top, there are navigation links for HOME, SIMCOSTA, DADOS, EQUIPE, NOTÍCIAS, and WORKSHOP. The main content area features an interactive map of South America with a satellite view of Brazil. To the right, a list of buoys is shown, including RS-1 through RS-5 in Rio Grande, SC-1 in Florianópolis, SP-1 in São Sebastião, RJ-3 and RJ-4 in Rio de Janeiro, BA-1 in Salvador, and PR-1 in Ponta Delgada. A wind direction chart (Direção / Intensidade do Vento) is overlaid on the right, showing wind patterns with a color-coded legend for wind speed ranges from < 0.5 m/s to > 10 m/s. Below the map, there are logos for FUNDO CLIMA, FURG, REDE CLIMA, and MINISTÉRIO DO MEIO AMBIENTE.



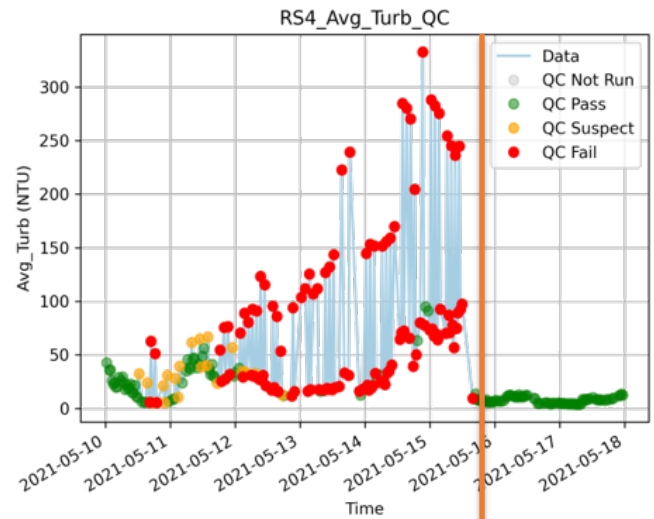
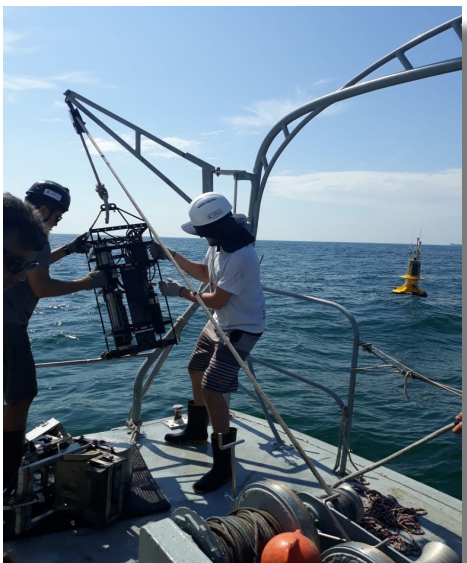
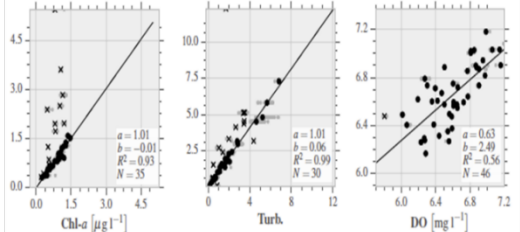
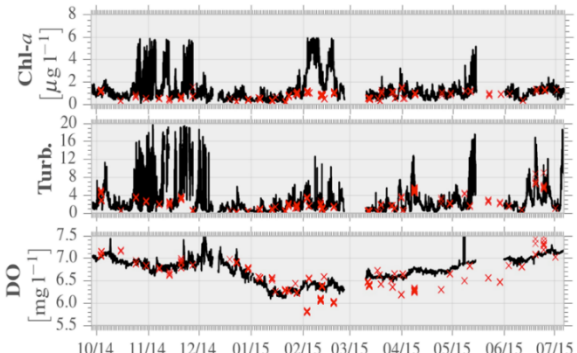
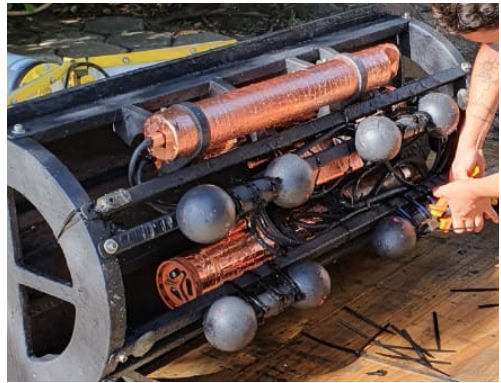
Continent	Users
1. Americas	68,824
2. Europe	1,557
3. Asia	344
4. Africa	71



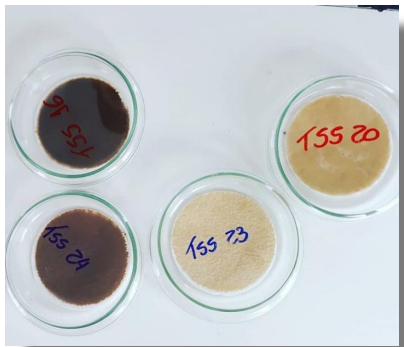
\*jun 2018- jun 2021

# Data Quality Control

- *In situ* Validation
- Sensors Intercomparison
- Calibrations
- Biofouling control techniques
- QARTOD (<https://ioos.noaa.gov/project/qartod/>)

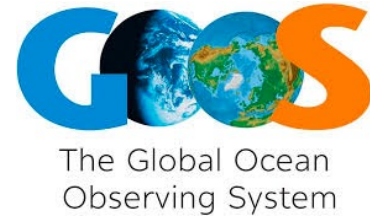


Before Maintenance | After Maintenance





# Monitoring of Regional Variability of heat and volume transport in the surface layer of the South Atlantic Ocean (MOVAR) – NOAA AX97



Fundação Universidade Federal do Rio Grande

## Main goal

Estimate the heat and volume transport of the **Brazil Current (BC)** based on long term high-density XBT transect from Rio de Janeiro to Trindade Island

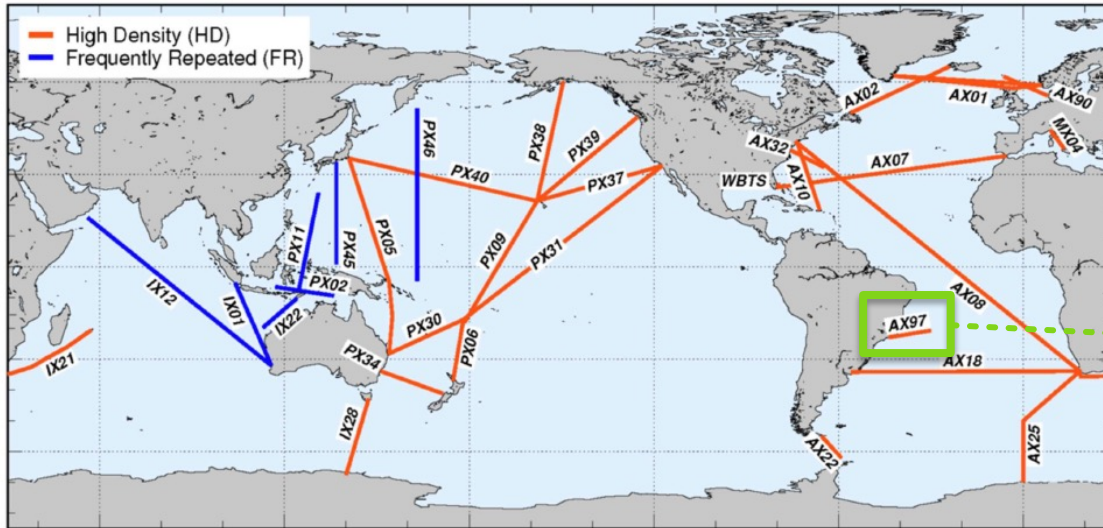
## Specific goals

- Increase our knowledge of the **variability of the Brazil Current** and the large-scale circulation of the **South Atlantic Subtropical Gyre**;
- Allow **comparison with other ocean basins**;
- Assist in the **evaluation of models** (high-resolution and climate) and **satellite products** in this region



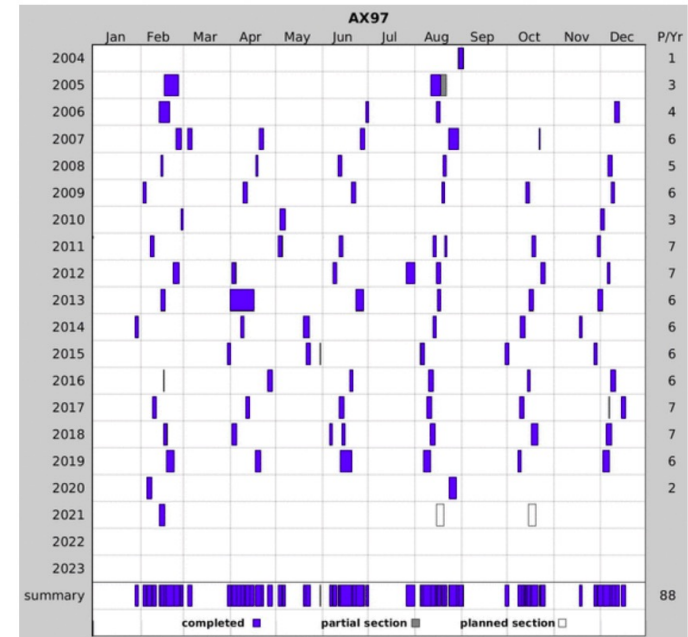
UNIVERSIDADE FEDERAL DO RIO DE JANEIRO





- It is the **longest continuous monitoring program of the Brazil Current**, with data being successfully collected along the NOAA AX97 high density XBT transect since 2004

- A total of 84 cruises
- 3976 XTBs launched
- 87 different riders (students and researchers)

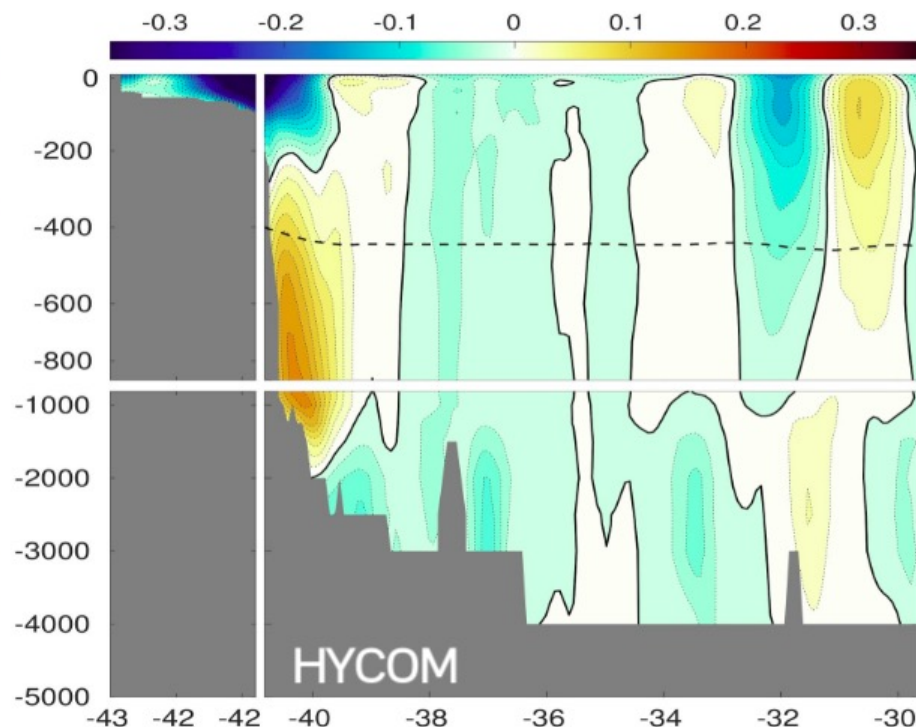
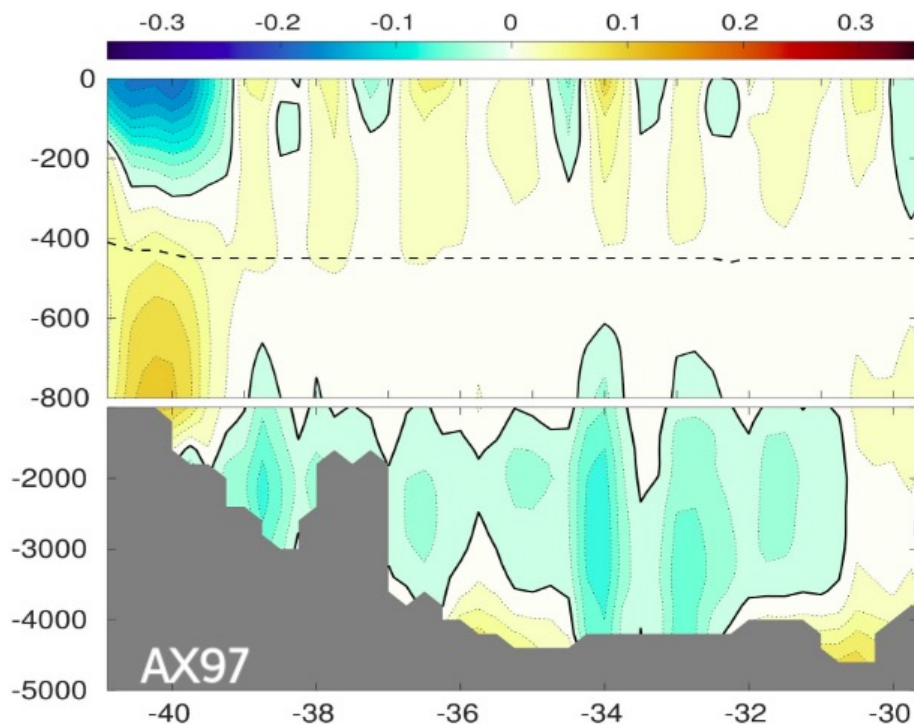


- Among other purposes, the data is used in the assessment of Ocean Forecast Analysis Systems (OFAS), such as:



The Global Ocean  
Observing System

- GLORYS12v1C (1/12)- Mercator Ocean
- **GOFS3.1 (1/12) - HYCOM/NCODA**
- GLORYS2v4 (1/4) - Mercator Ocean
- GloSea5 (1/4) - UK MetOffice
- C-GLORSv5 (1/4) - CMCC
- ORAS5 (1/4) - ECMWF
- ECCO2 (1/4) - JPL/NASA
- SODA3 (1/4) - AOSC U. Maryland



Mean geostrophic velocity for the AX97 High Density XBT transect with WOA13 climatology (left) and the mean geostrophic velocity for the HYCOM/NCODA reanalysis product (right).