



CARIOCA BUOY

Air-Sea CO₂ fluxes in ocean: Measurement of CO₂ partial pressure, chlorophyll-a, Barometric pressure, Wind speed, Air and Water temperature, Conductivity and Dissolved Oxygen of Seawater

The CO₂ content in the atmosphere is one of the elements responsible for the greenhouse effect. The evolution of its concentration has great consequences on the climate of our planet. It is recognized that the fact that the ocean supplies and draws in turn CO₂ is one of the major elements of the atmosphere evolution.

Considering the variability of dissolved CO₂ in space and time at the surface of the ocean, an experimental approach aiming at making time series measurement from unattended platforms should be contemplated to complete measurements carried out from vessels in movement or from fixed buoys.

CARIOCA is an automatic drifting buoy designed to measure the concentration of pCO₂ at the surface of the ocean, in order to qualify the CO₂ exchange between atmosphere and ocean. It is therefore essential to understand better the process of exchanges at the ocean and atmosphere interface.

CARIOCA is also available for fixed mooring.

Main features

- CO₂ partial pressure in seawater
- One-year operating autonomy with one measurement per hour
- Chlorophyll, Barometric pressure, Wind speed, Air and Water temperature, Dissolved Oxygen (DO)



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CARIOCA BUOY

CARbon Interface Ocean Atmosphere

TECHNICAL SPECIFICATIONS SENSORS

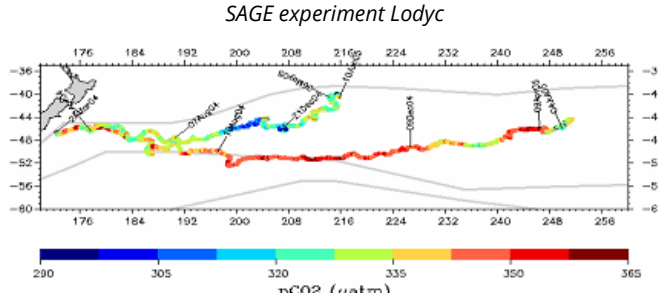
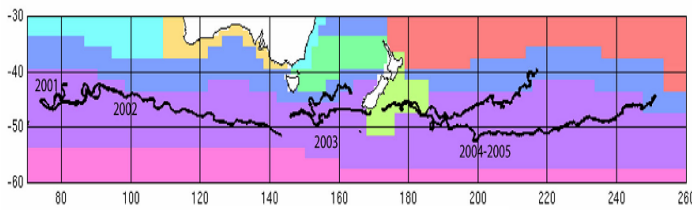
CO ₂ partial pressure (pCO ₂)	Range : Initial accuracy :	250 to 550 µatm ± 3 µatm
Internal temperature	Range : Initial accuracy :	- 2 to + 32 °C ± 0.01 °C
Chlorophyll	Range : Sensitivity :	0.03 to 75 µg/l 0.03 µg/l
Wind Speed	Range : Initial accuracy :	0.01 to 60 m/s ± 3 % 0.01 m/s to 40 m/s ± 5 % 0.01 m/s to 40 m/s
Air temperature	Range : Initial accuracy :	- 40 to 70 °C ± 0.3 °C @ 20 °C
Barometric pressure	Range : Initial accuracy :	300 to 1100 hPa ± 0.5 hPa @ 25°C
Conductivity	Range : Initial accuracy :	0 to 65.5 mS/cm ± 0.003 mS/cm
Temperature	Range : Initial accuracy :	- 5 to + 45°C ± 0.002 (-5 to 35°C) ± 0.01 (35 to 45°C)
Dissolved Oxygen (DO)	Range : Initial accuracy :	0 to 500 µmol/l < 8 µmol/l
Water temperature	Range : Initial accuracy :	0 to 36 °C ± 0.1 °C

BUOY SPECIFICATIONS

Electric autonomy	One-year
Measurement frequency	One measurement per hour
Data transmission	ARGOS system
Water circulation	Electrical pump
Mechanical	
Weight	130 kg (including yellow floating body)
Height	2.5 m
Hull diameter	0.2 m
Float diameter	0.6 m



Fixed and drifting



VARIABILITY OF OCEAN CO₂ PARTIAL PRESSURE AND AIR-SEA CO₂ FLUXES IN THE SUBANTARCTIC ZONE OF THE SOUTHERN OCEAN

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