

PIRATA Project Over the Tropical Atlantic: The Brazilian Experience

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American Geophysical Union

Meeting of the Americas

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PIRATA PROJECT

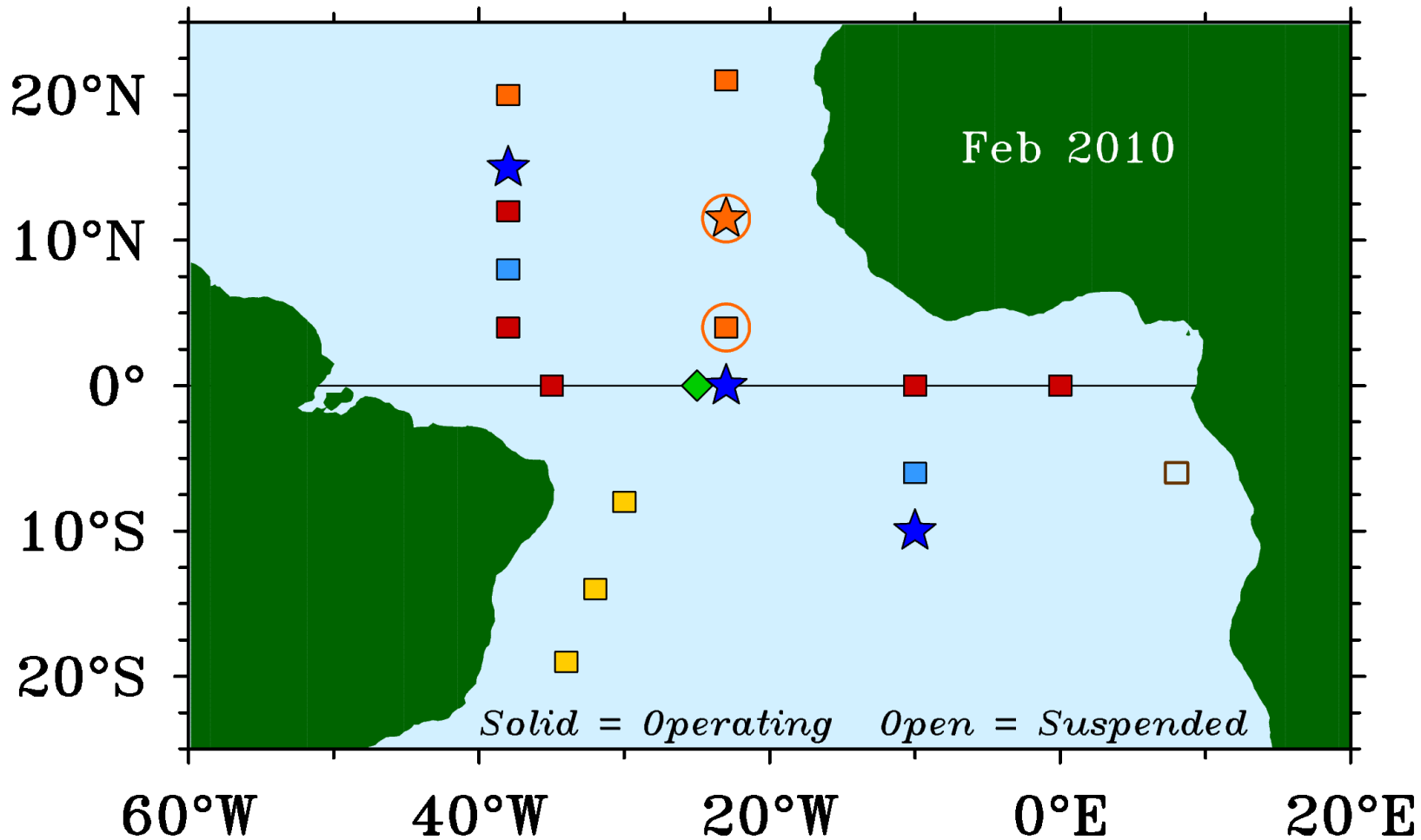
Prediction and Research Moored Array in the Tropical Atlantic

International Cooperation

BRAZIL – FRANCE- USA



The Flavors of PIRATA



■ Standard ATLAS

◆ ADCP

■ Northeast Extension

■ Southwest Extension

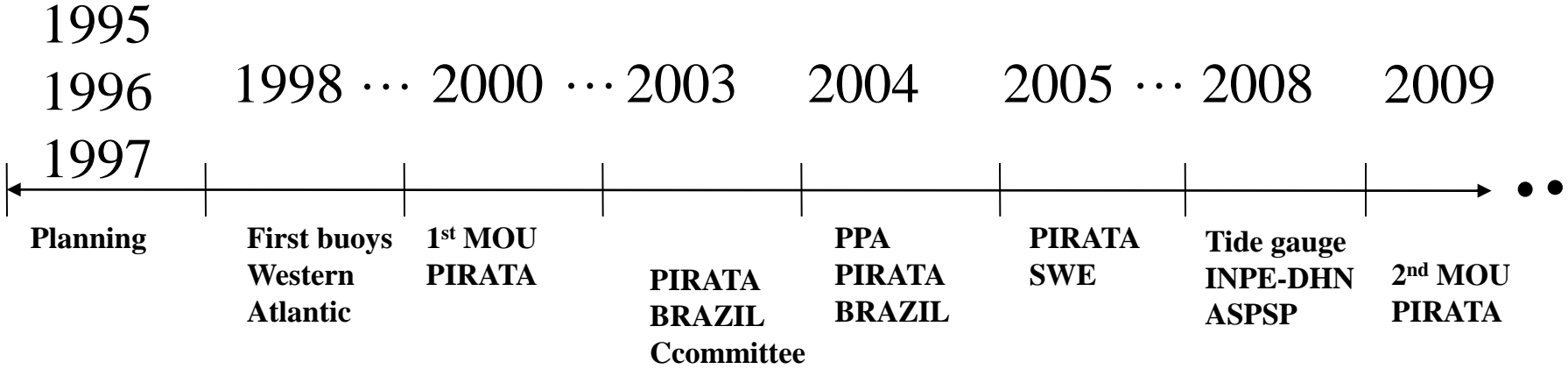
□ Southeast Extension

★ Flux Reference Site

■ CO₂/O₂ Enhanced ATLAS

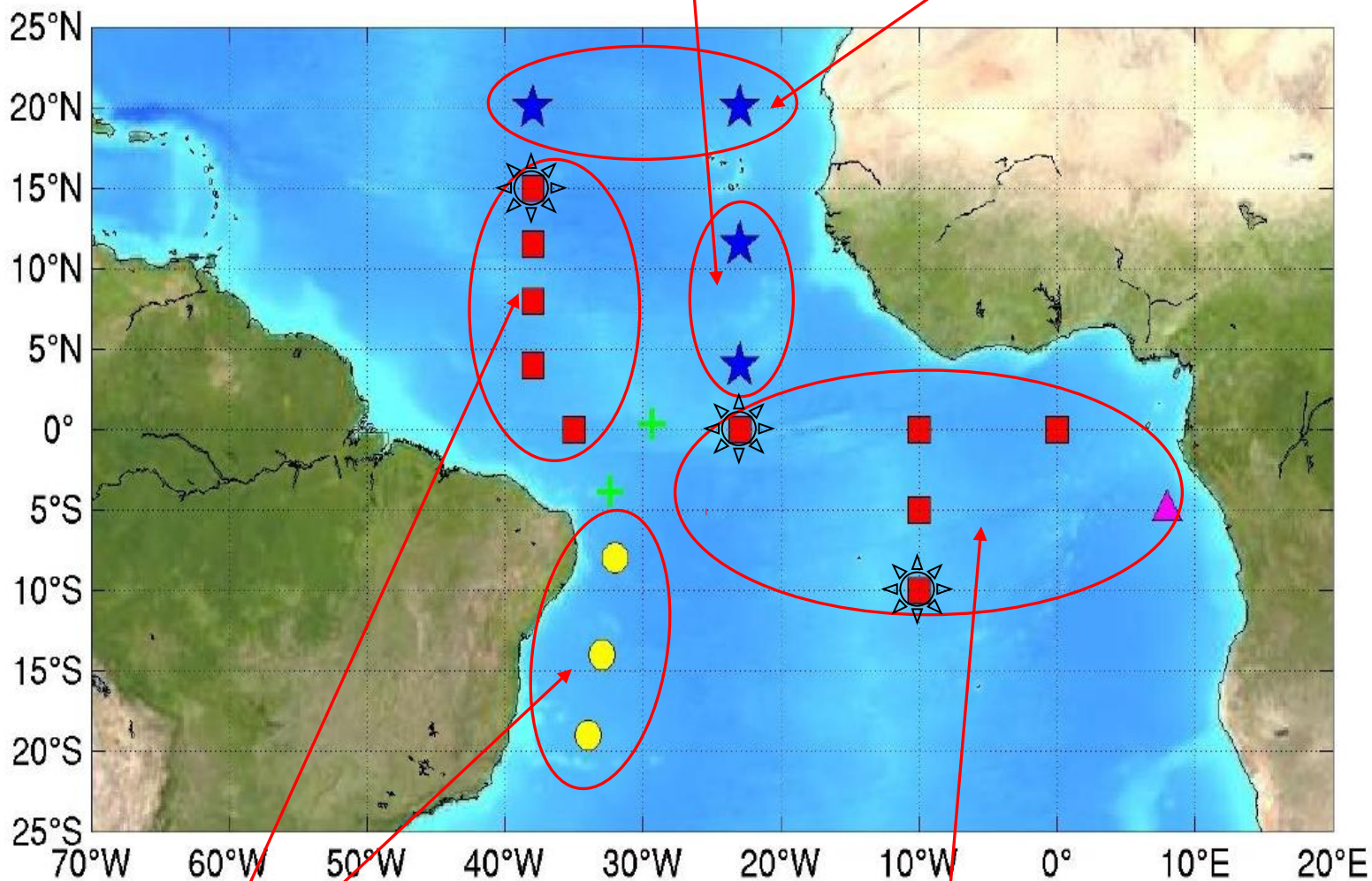
○ O₂ Enhanced ATLAS

PIRATA Chronology



PIRATA network status:

Maintained by USA : 4 Atlas buoys : 2 deployed in 2006, at 4N & 11N/23W, 2 deployed in 2007, at 20N/23W & 38W



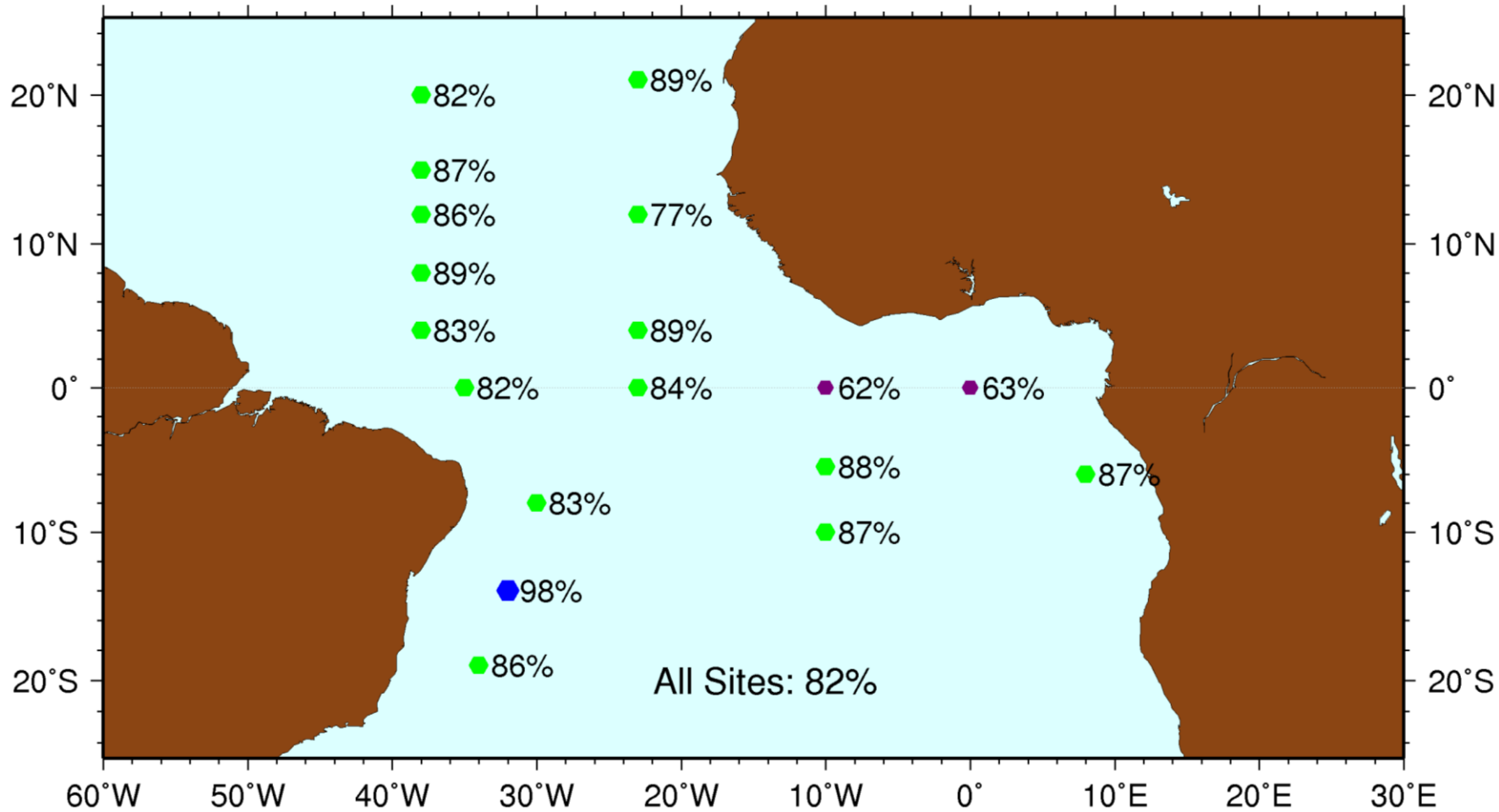
Maintained by Brazil: 8 Atlas buoys

*Maintained by France : 6 Atlas buoys
+ At 23°W-Equator : surface ADCP mooring since 2001*



Ocean Sites reference flux (swr, lwr, rh, air T, SLP).

PIRATA Mooring Data Return 1997 - 2009



All Sites: 82%

All Sensors

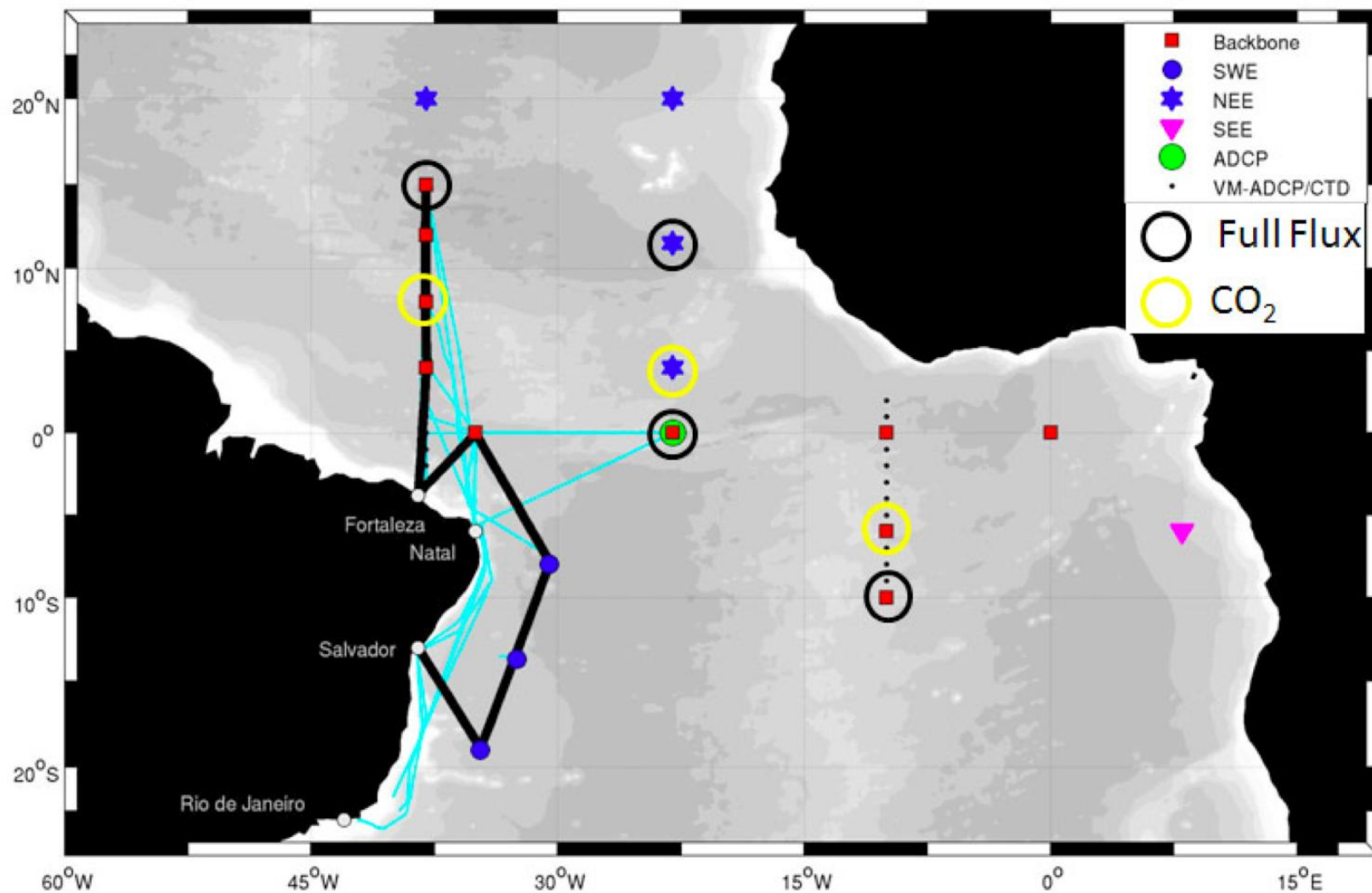
● 0% - 50%

● 50% - 75%

● 75% - 90%

● 90% - 100%

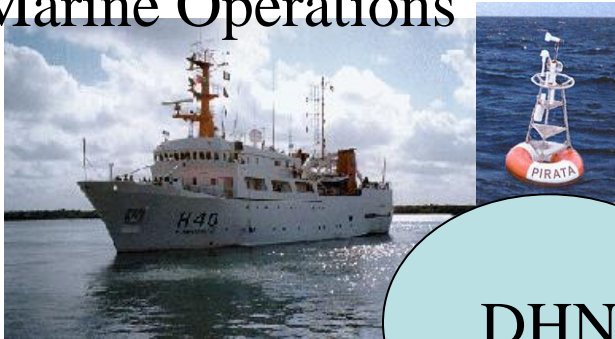
PIRATA Brazil Oceanographic Commissions 1998 - 2009



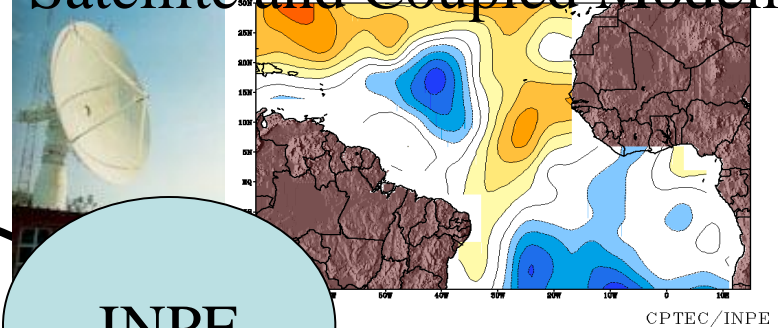
PIRATA BRAZIL

Institutional Framework

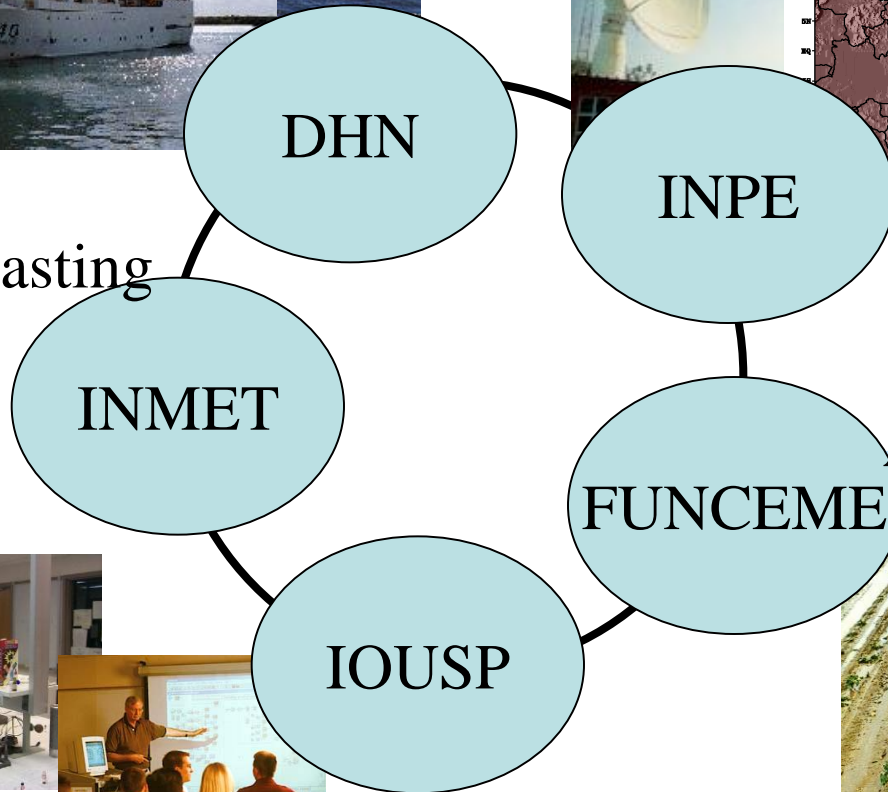
Marine Operations



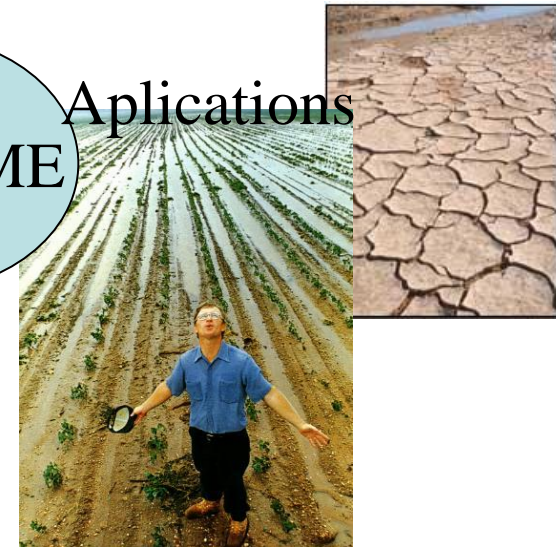
Satellite and Coupled Modeling



Weather Forecasting



Applications

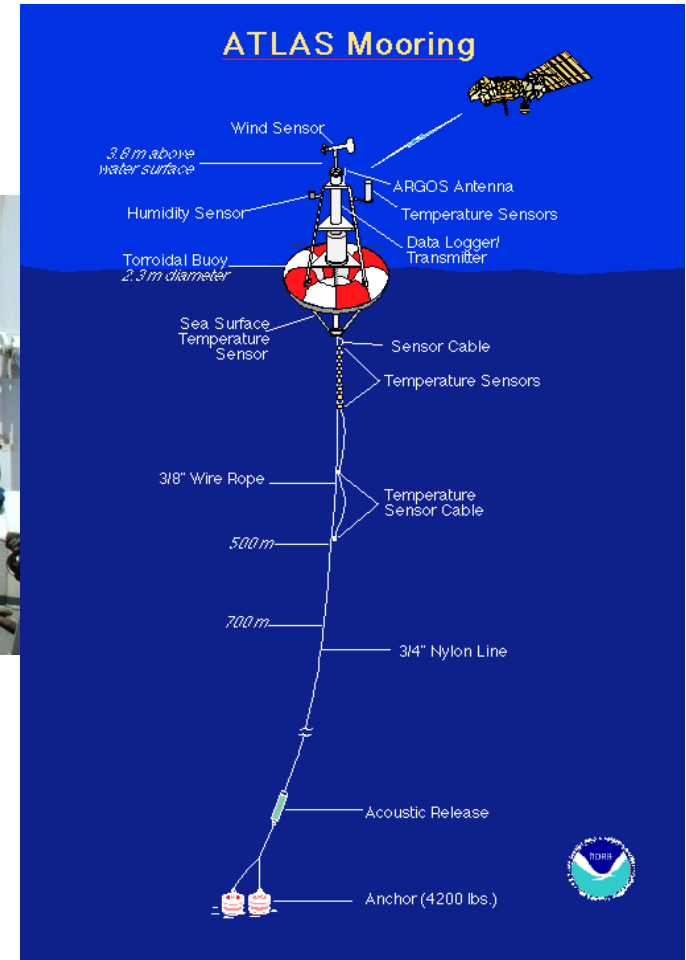


Education & Training

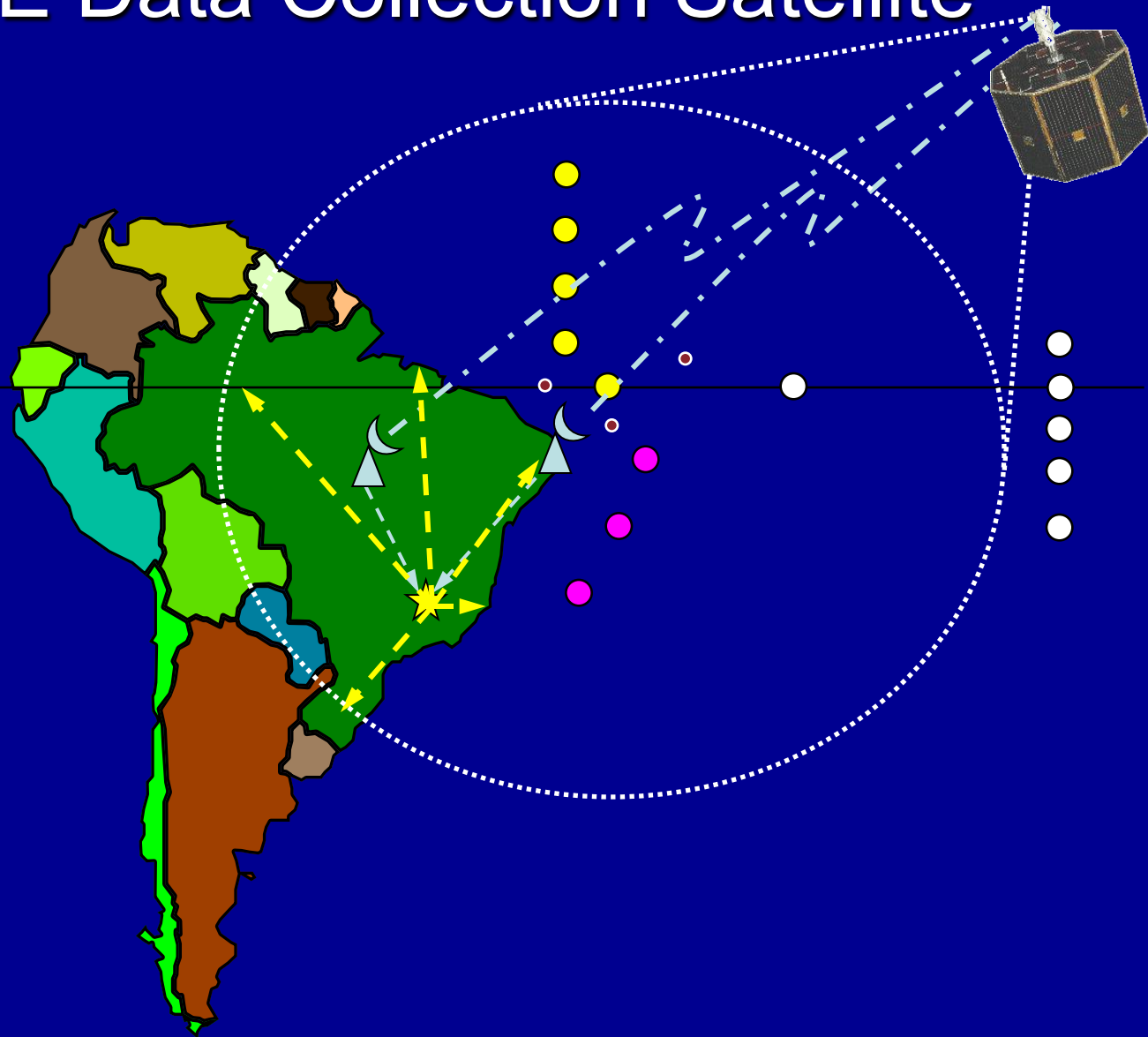


Ocean Operations

N. Oc. ANTARES



SCD/INPE Data Collection Satellite



INPE satellites ground station



Cuiabá and Alcantara



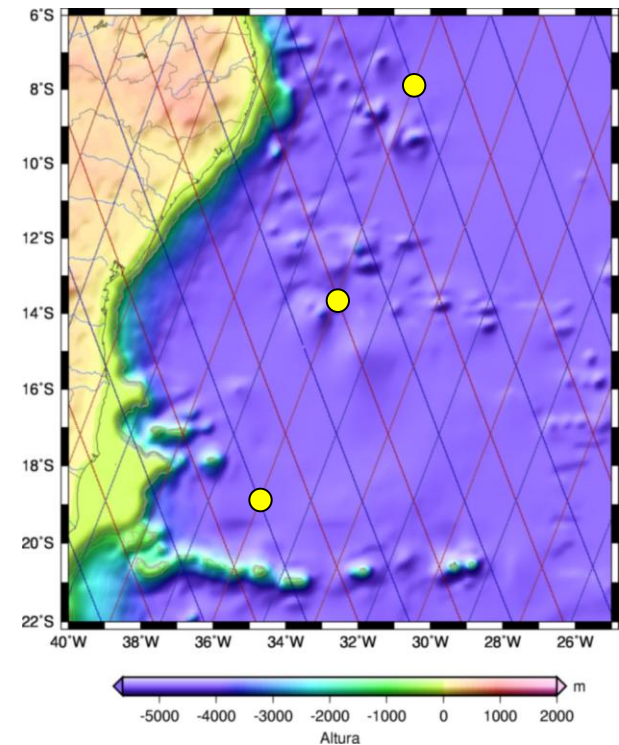
**Control Center
São José dos Campos**

PIRATA SWE

Área de cobertura do satélite
Brasileiro de coleta de dados -
SCD



JASON/TOPEX-POSEIDON
rotas em superfície

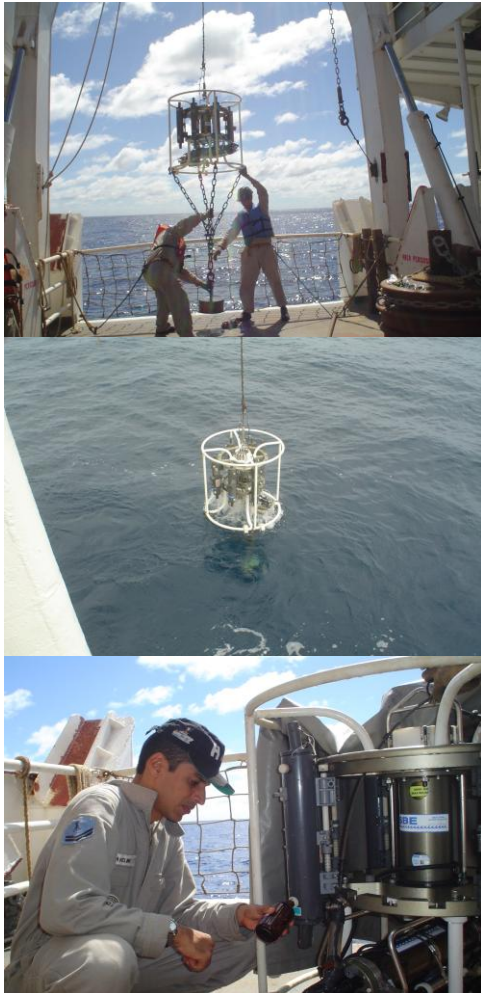


New Laboratory facilities for sensor calibration in progress at INPE and IOUSP



PIRATA Brazil Hydrography

CTD



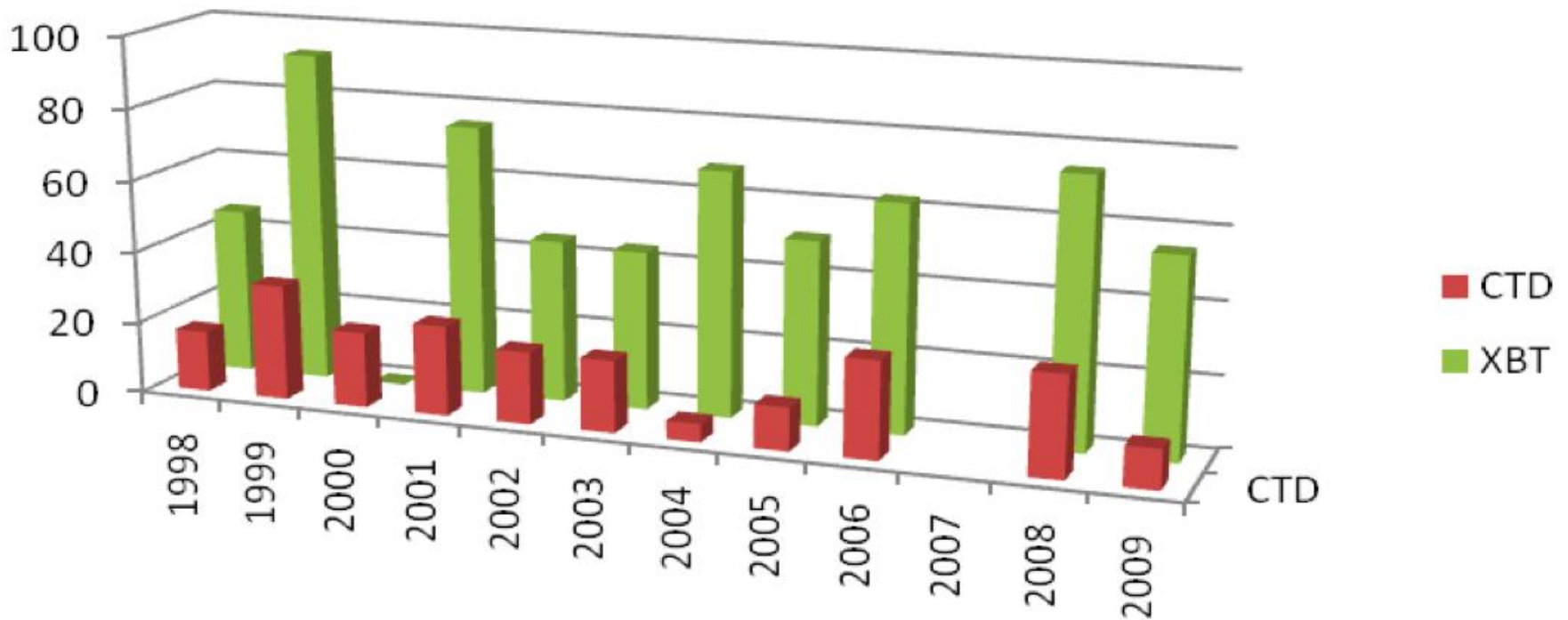
XBT



Radiosonde

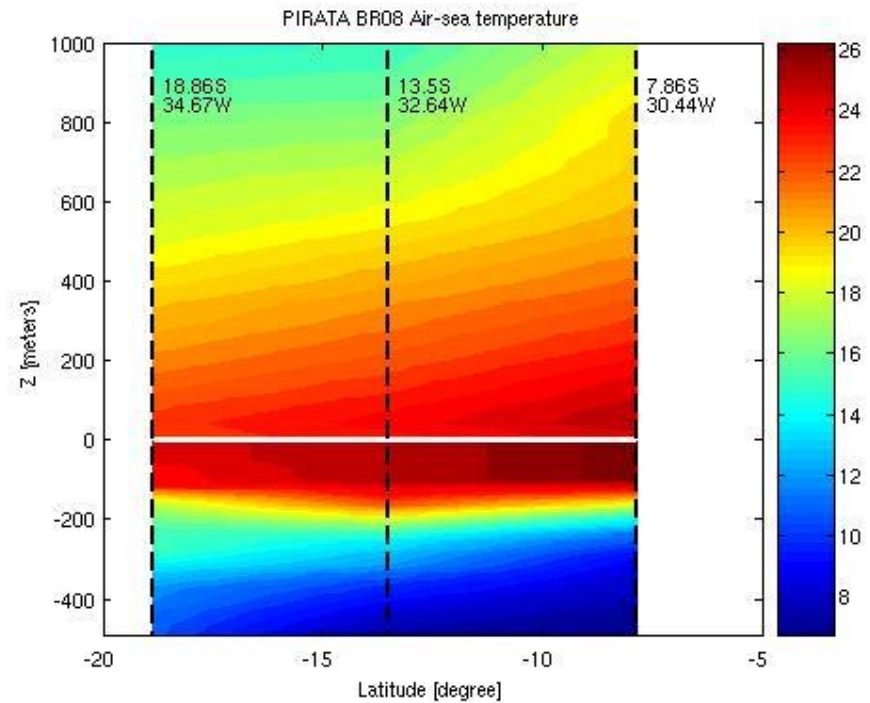
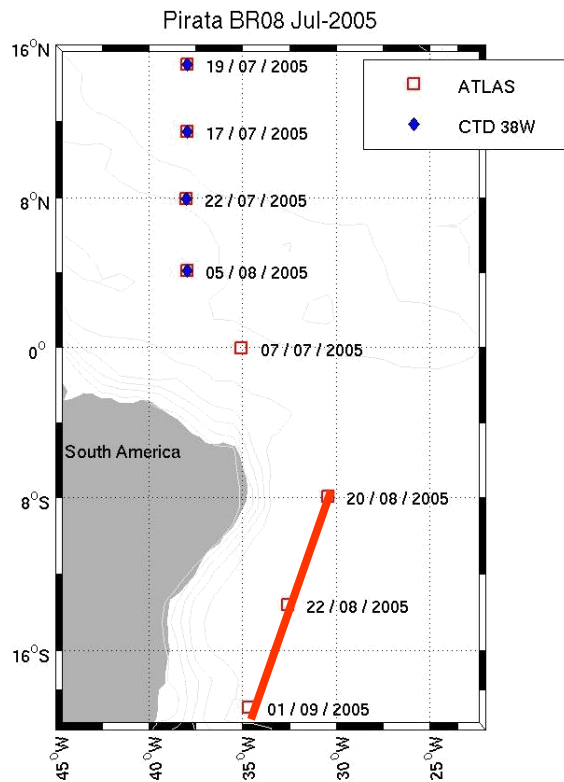


CTD & XBT auxiliary data collected during PIRATA BR cruises

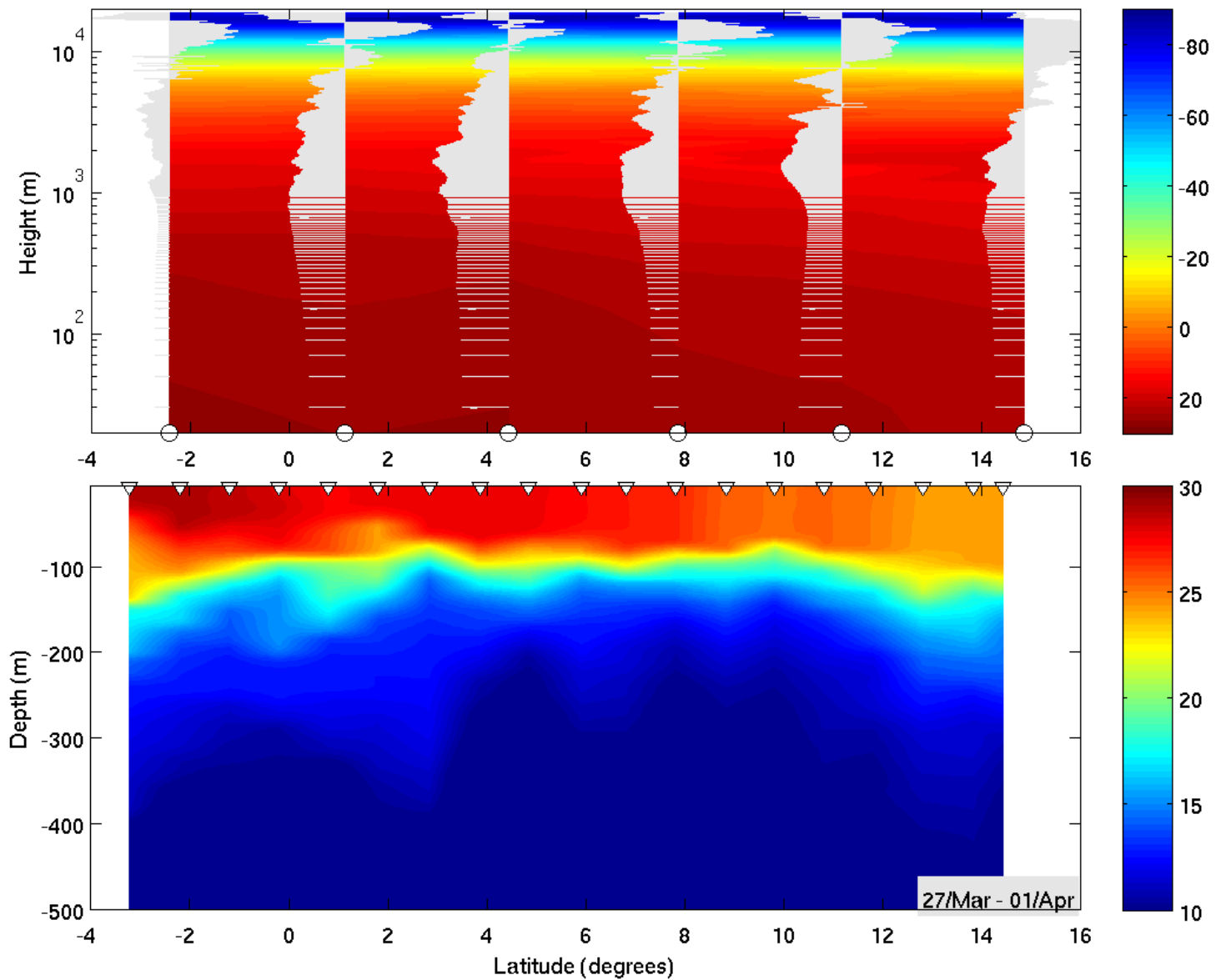


Simultaneous ocean-atmos temperature profiling

PIRATA SWE (2005-2010)



Air-sea Temperature ($^{\circ}\text{C}$)

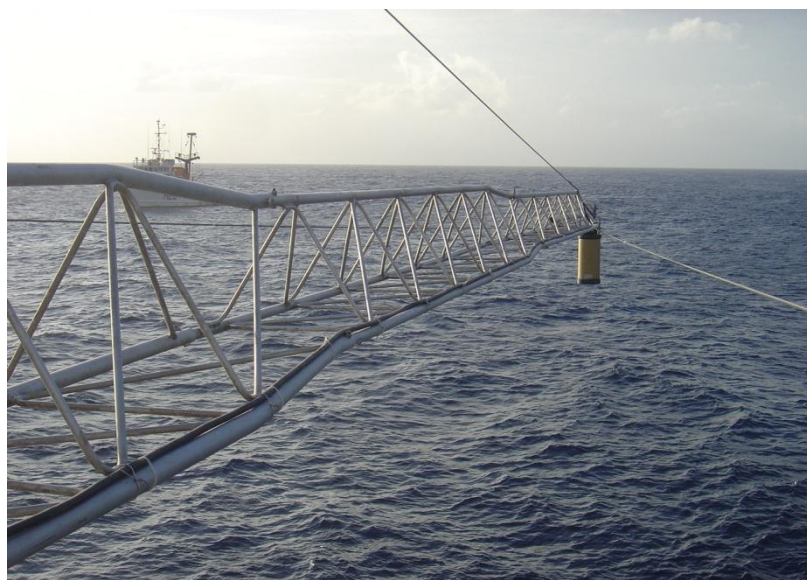
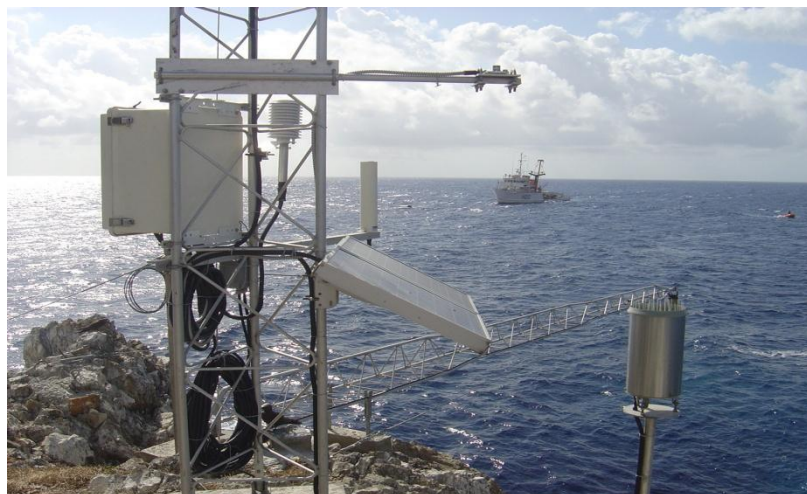


pCO₂ sensor

At 8N 38W



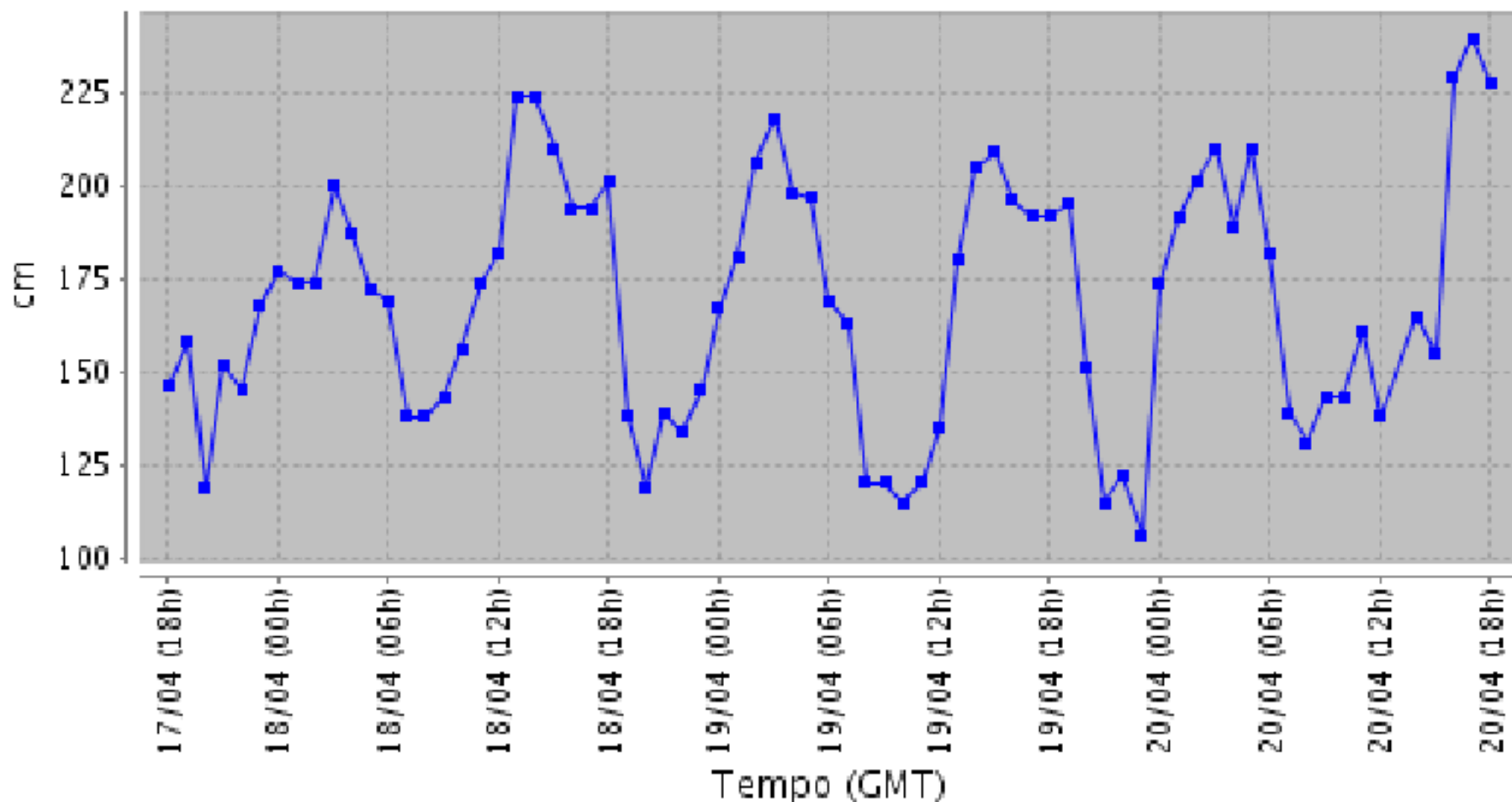
INPE-DHN Meteorological-Tidegauge Automatic Station at Saint Peter and Saint Paul Archipelago Oct/2008-present



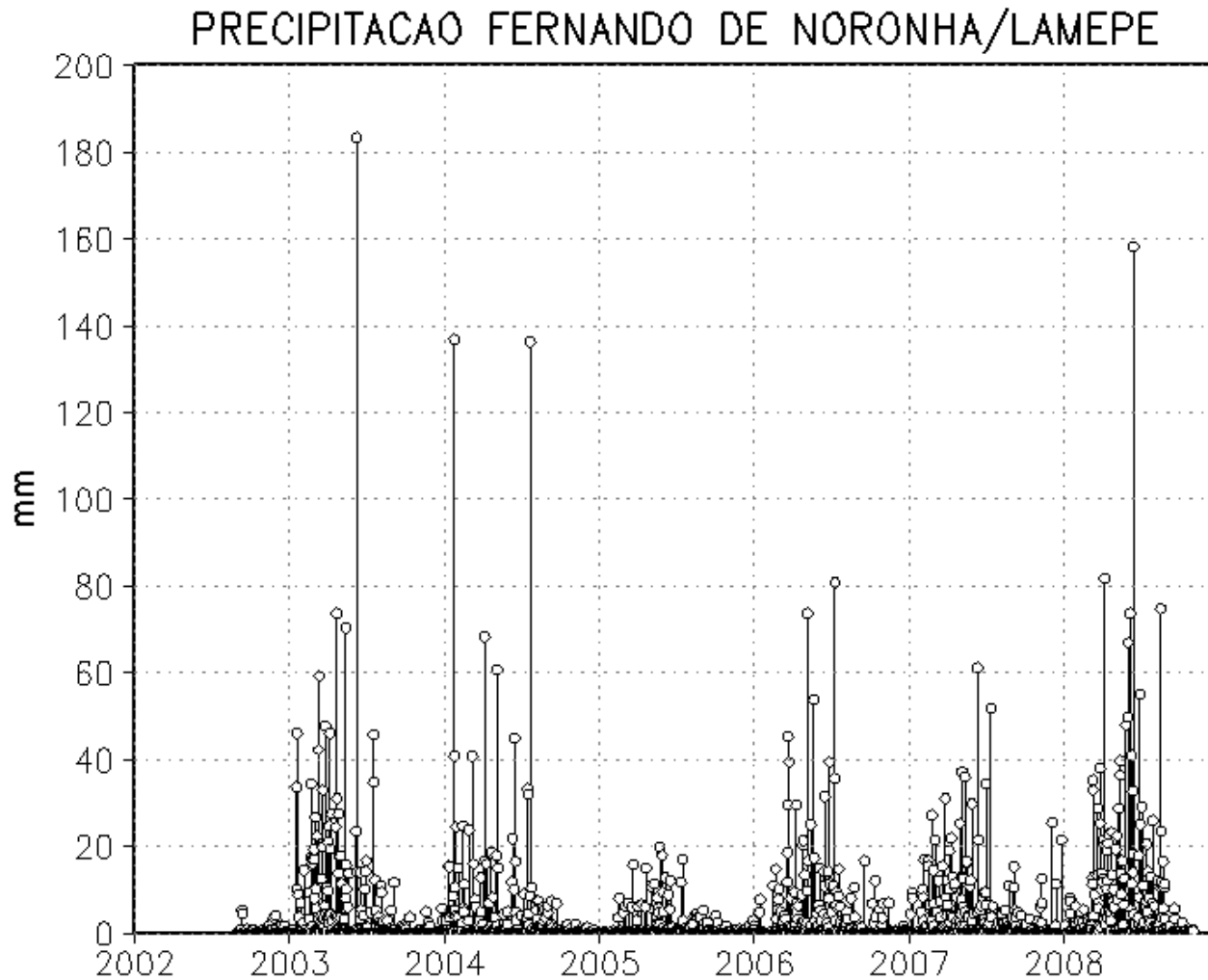
SPSP data available on real time at the web

CPTEC/INPE

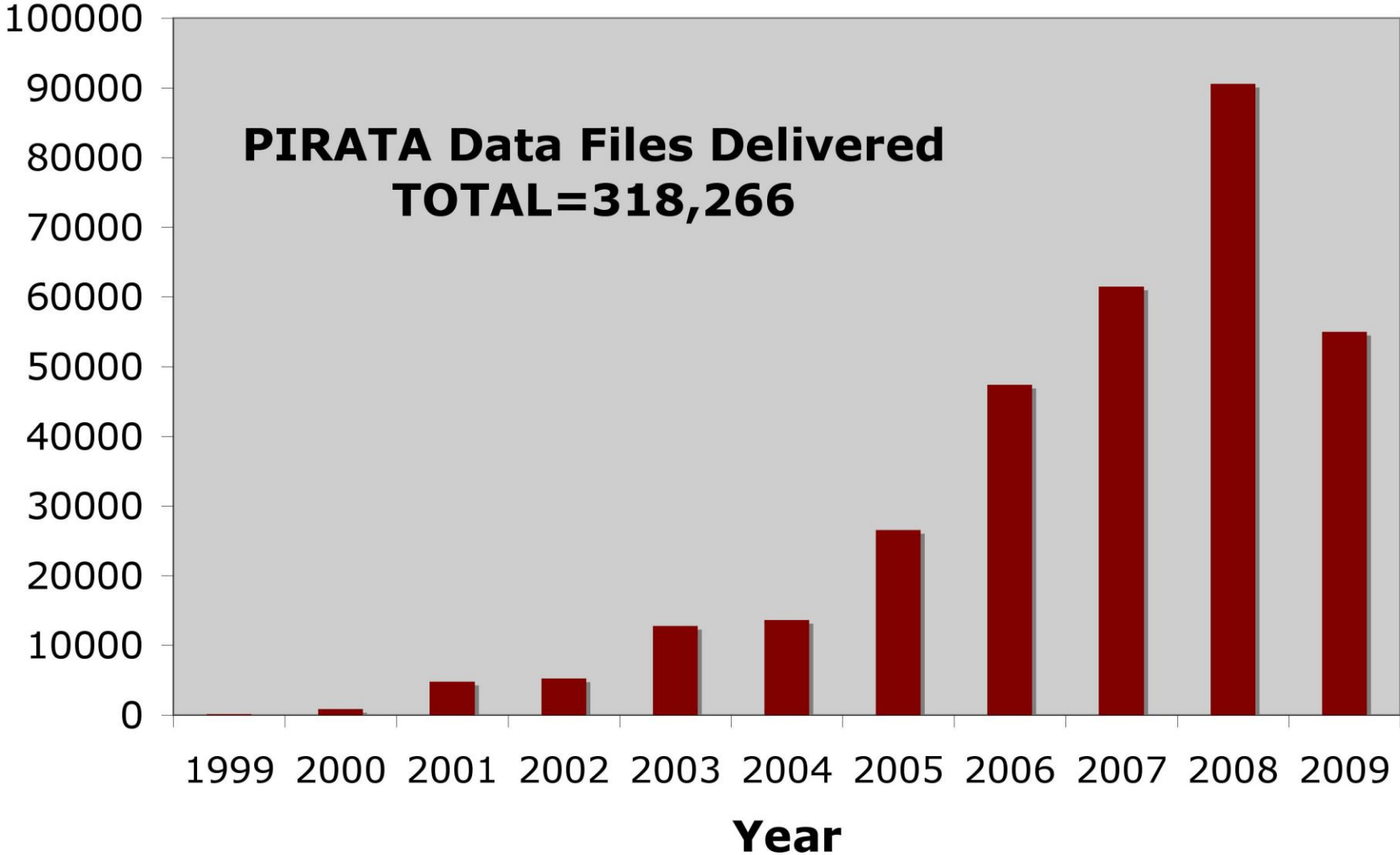
Estação: Arquipelago Sao Pedro e Sao Paulo (31877) Tipo: MET



Fernando de Noronha Precip

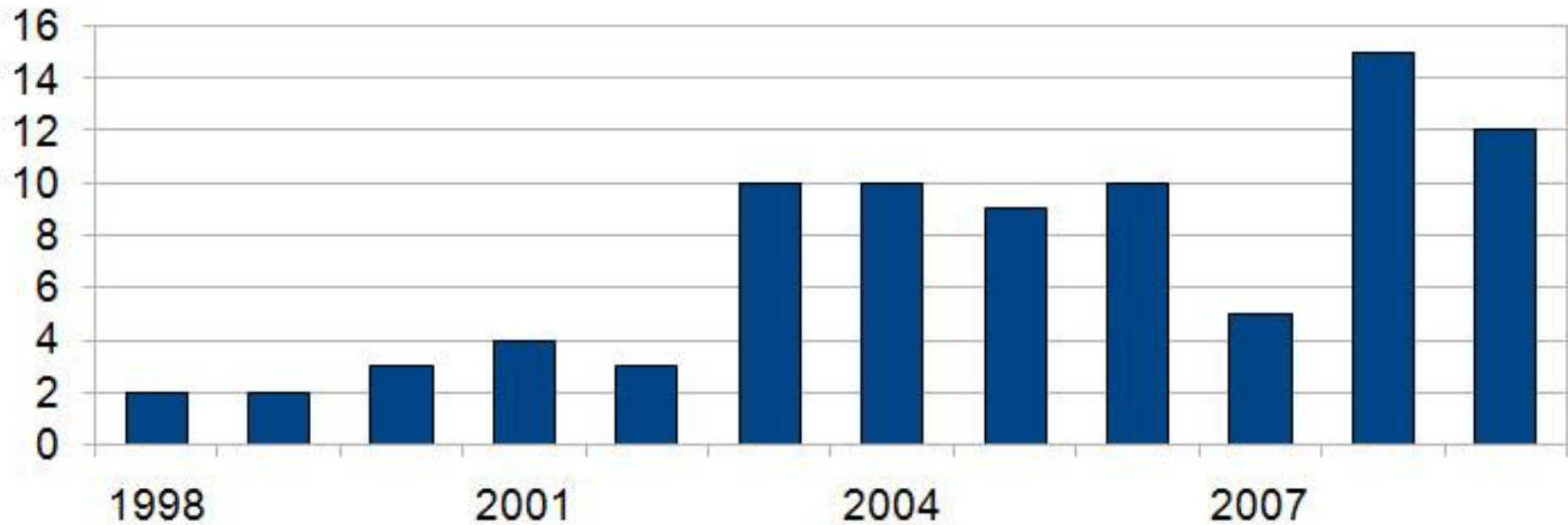


5612 user requests → 55008 data files delivered FY 09



IMPACT ON RESEARCH

Refereed papers with PIRATA data sets



PIRATA-related

Research Projects funded in 2009 in Brazil

- Research Array over the tropical Atlantic
 - Upper ocean and atmosphere profiling
- Development of the ATLAS-B system
 - Prototype being constructed based on PMEL-ATLAS buoy concept
- Ocean circulation and sea level research
 - Islands (SPSPA & FNA) sea level stations
 - Velocity and T-S profiles during PIRATA cruises
- TAV Biogeochemistry
 - modeling

Thank You.