Tropical Atlantic Observing System (TAOS)

Review Report

W. Johns, S. Speich et al. (2021)

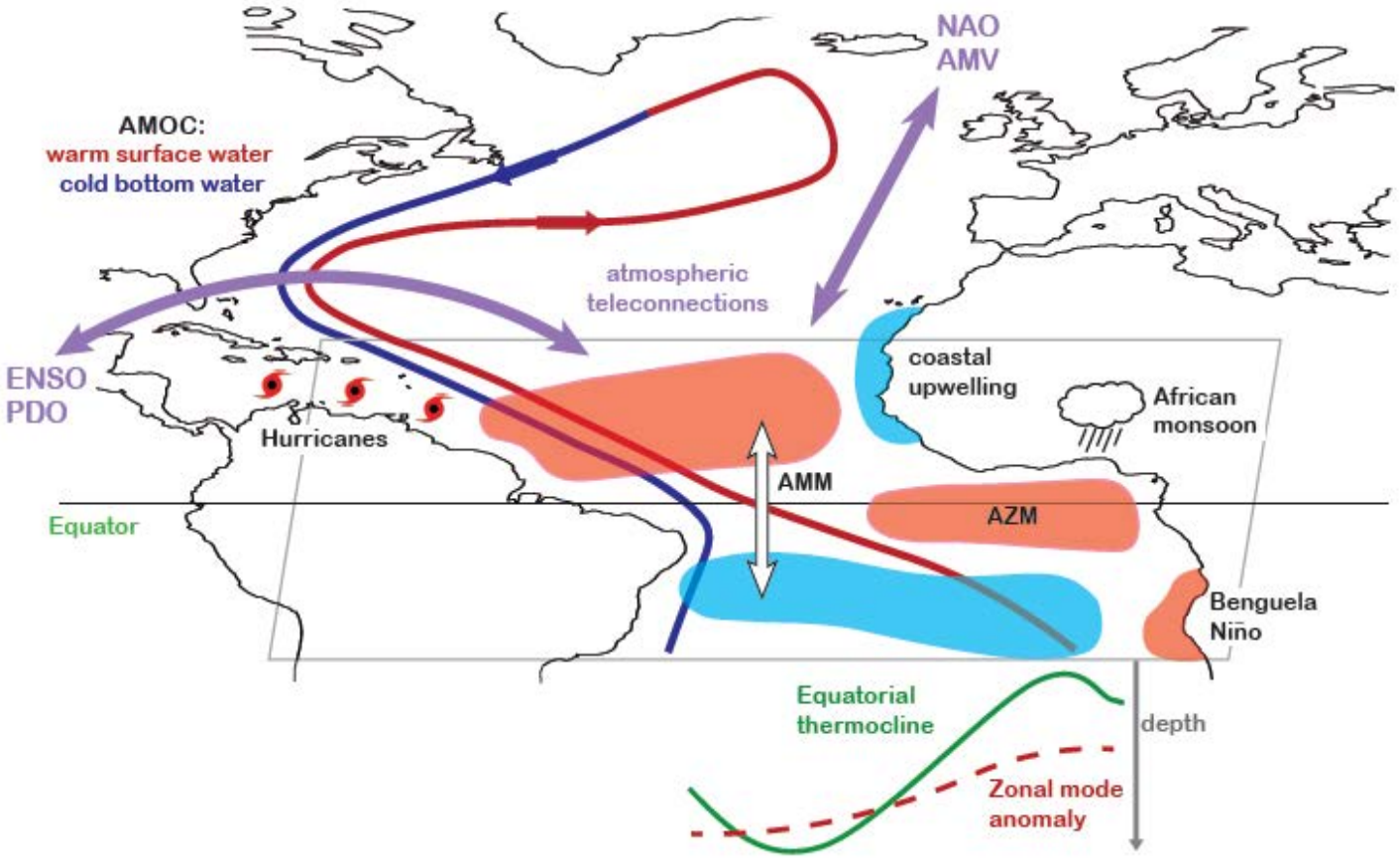
TAOS Review

Implementation

- ✓ Co-Chairs Bill Johns (U. Miami) Sabrina Speich (ENS)
- ✓ Last review in 2006 by CLIVAR and GCOS/GOOS WCRP
- ✓ Review Committee composed of members of the tropical Atlantic observing community and representatives from GOOS/GCOS, with oversight by the CLIVAR ARP

TAOS Review

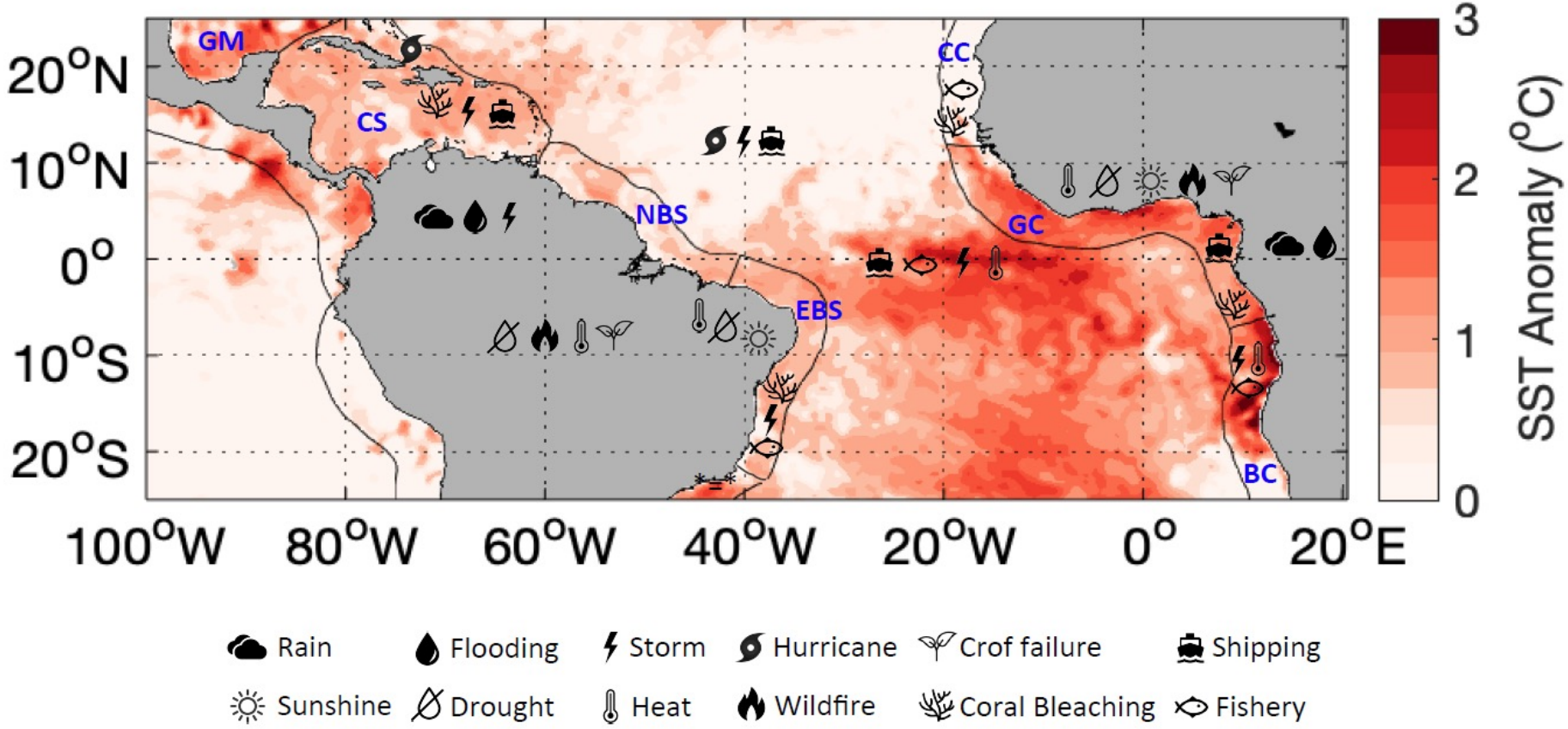
Societal relevance of the Tropical Atlantic



- ✓ Important processes and modes of variability in the tropical Atlantic: Atlantic Meridional Mode, Atlantic Niño, AMOC, ENSO, PDO, NAO, AMV, etc.

TAOS Review

Societal relevance of the Tropical Atlantic



✓ Main impacts of tropical Atlantic variability and change

TAOS Review

Societal relevance of the Tropical Atlantic

Operational Services

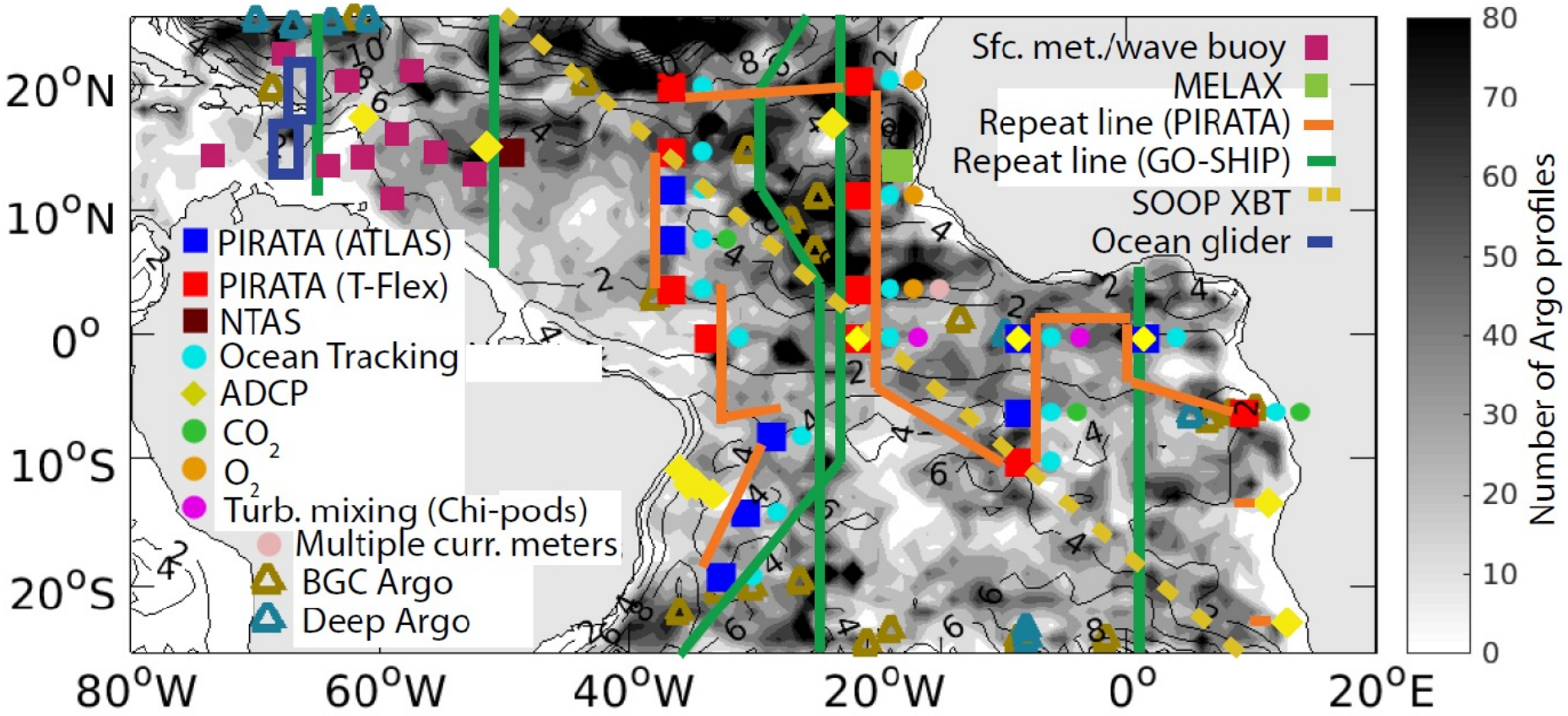
Ocean Health and Fisheries

Climate Variability and Change

Research and Discovery

TAOS Review

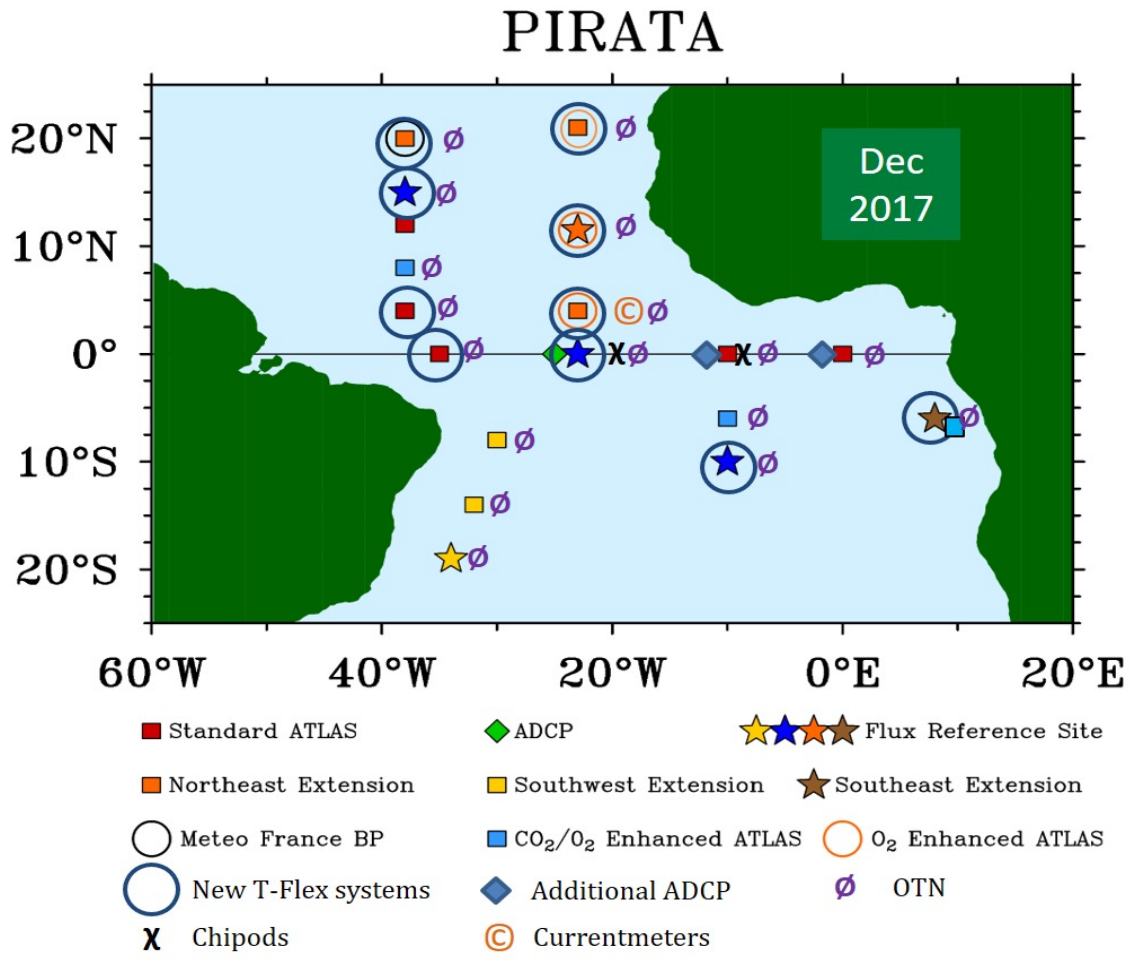
Value of the TAOS



✓ Key elements of the tropical Atlantic in situ observing system

TAOS Review

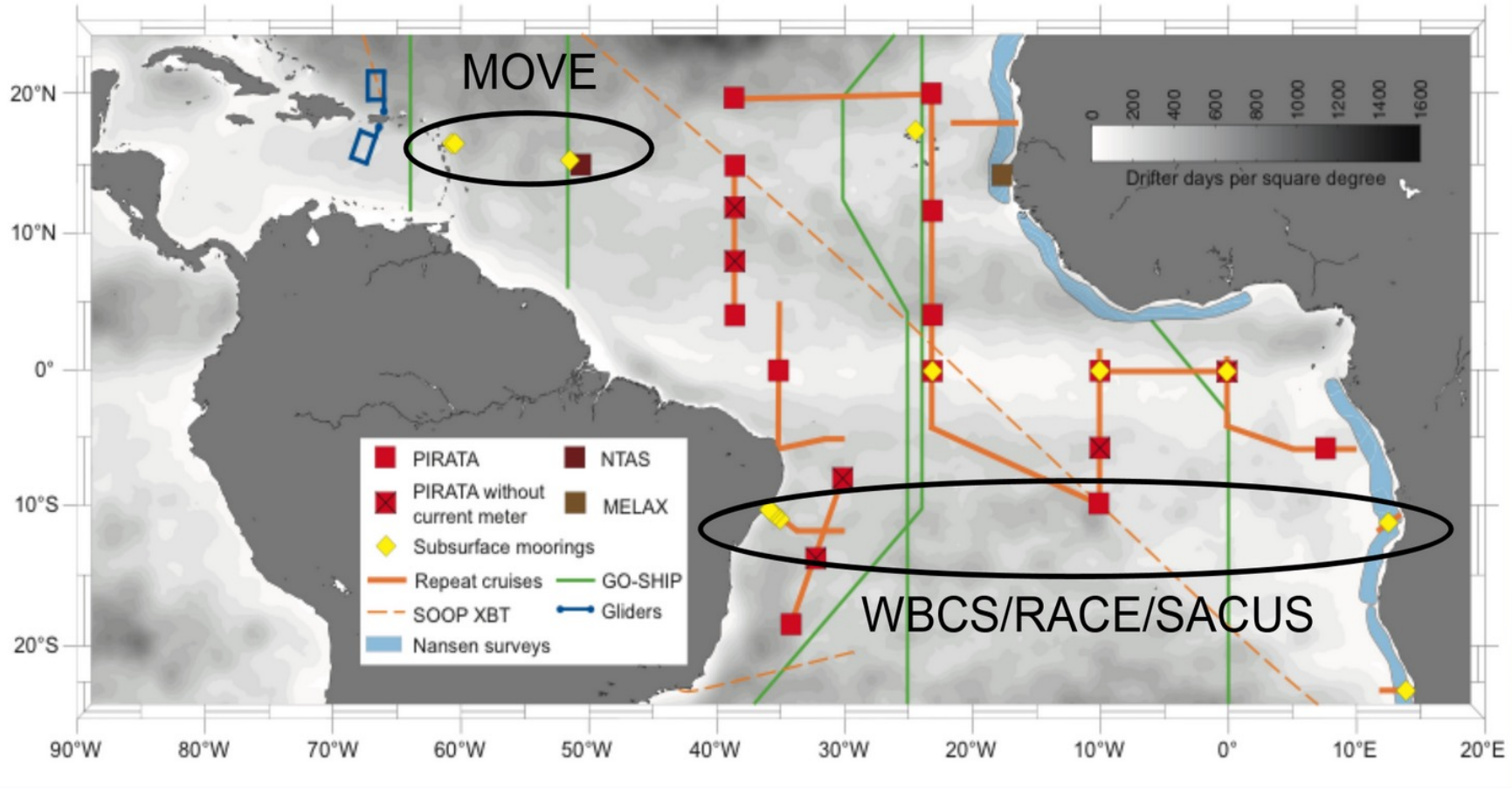
The present TAOS – Mooring Network



- ✓ The PIRATA array in December 2019, indicating the mooring types and enhanced instrumentation that is deployed at specific sites

TAOS Review

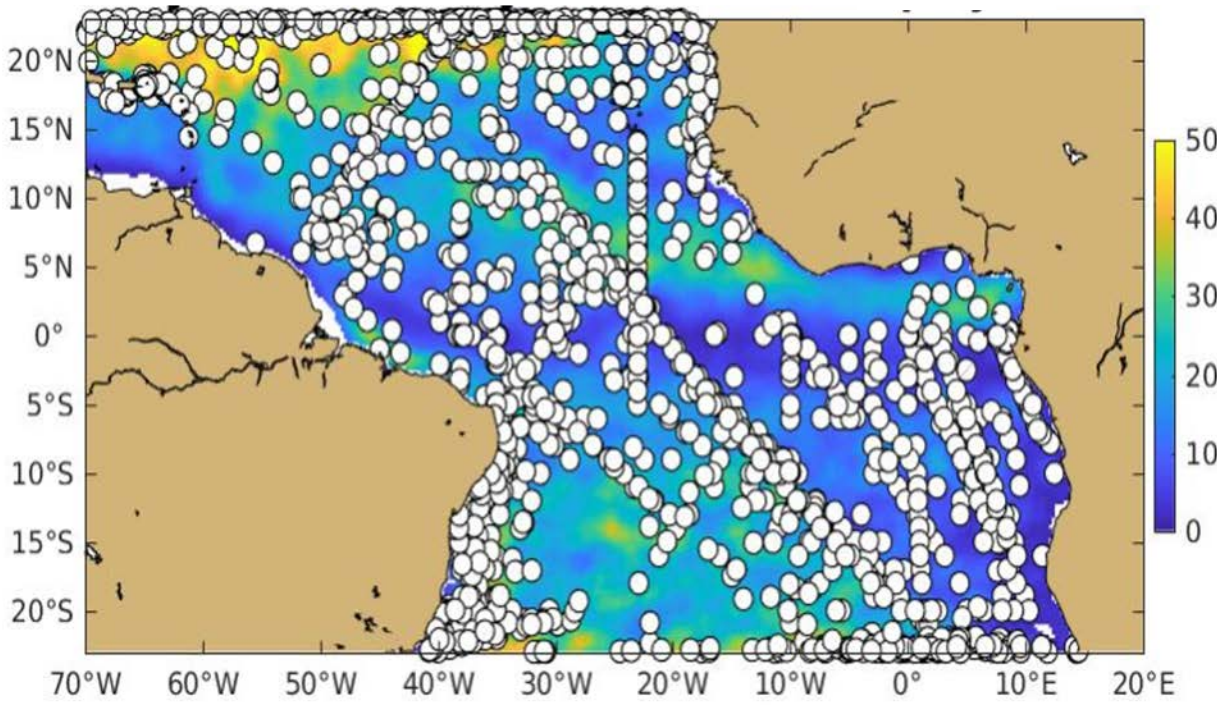
The present TAOS – Mooring Network



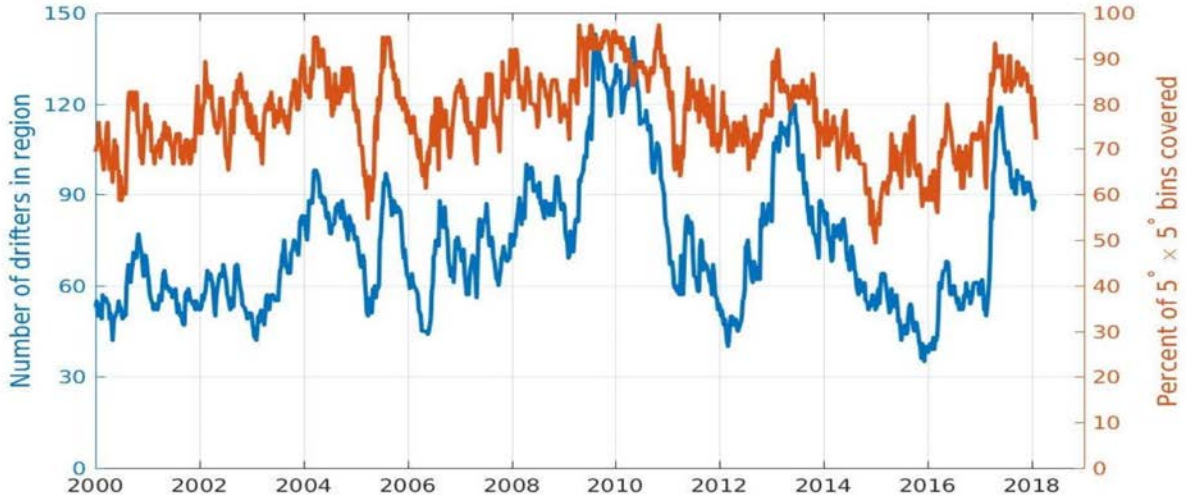
✓ Elements of the tropical Atlantic observing system

TAOS Review

The present TAOS – Drifters



✓ Density of all GDP observations in drifter days per square degree. Dots indicate deployments



✓ Number of active surface drifters in the tropical Atlantic region (blue), and the percentage of 5° x 5° spatial bins occupied by drifters

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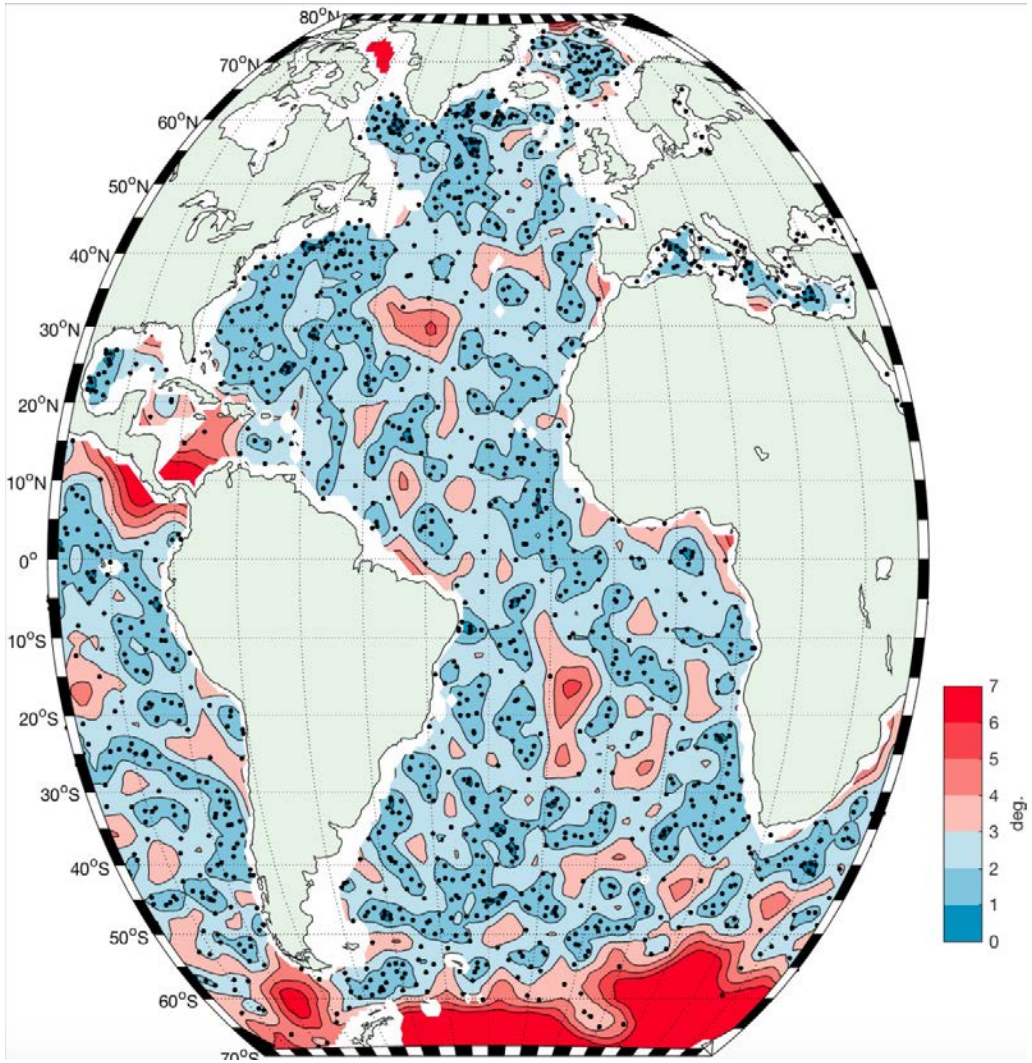
The present TAOS – Argo



- ✓ Snapshot of Argo float locations in the Atlantic from January 2018
- ✓ Color shading indicates the mean distance to the nearest 4 Argo floats; blue shaded areas indicate coverage at or above the nominal 3° x 3° density, red areas indicate below nominal coverage

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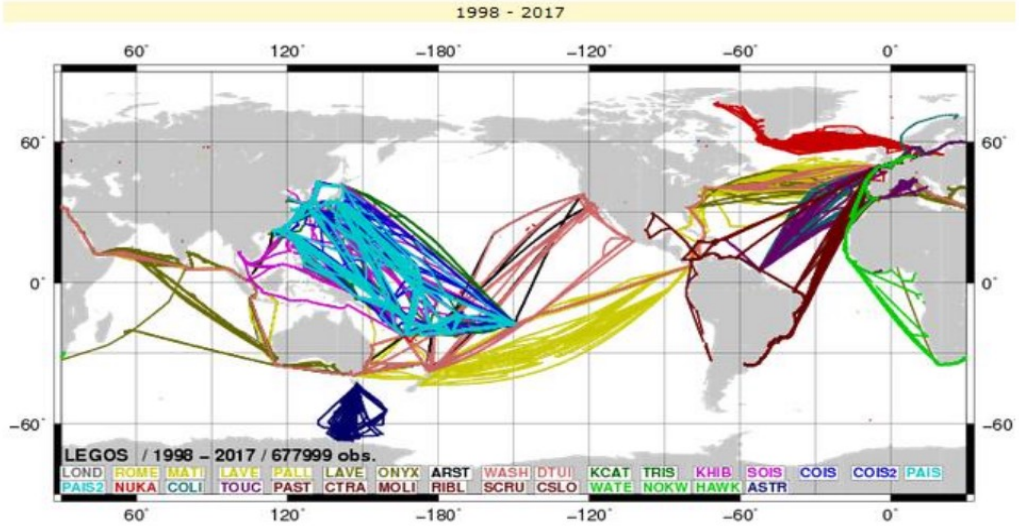
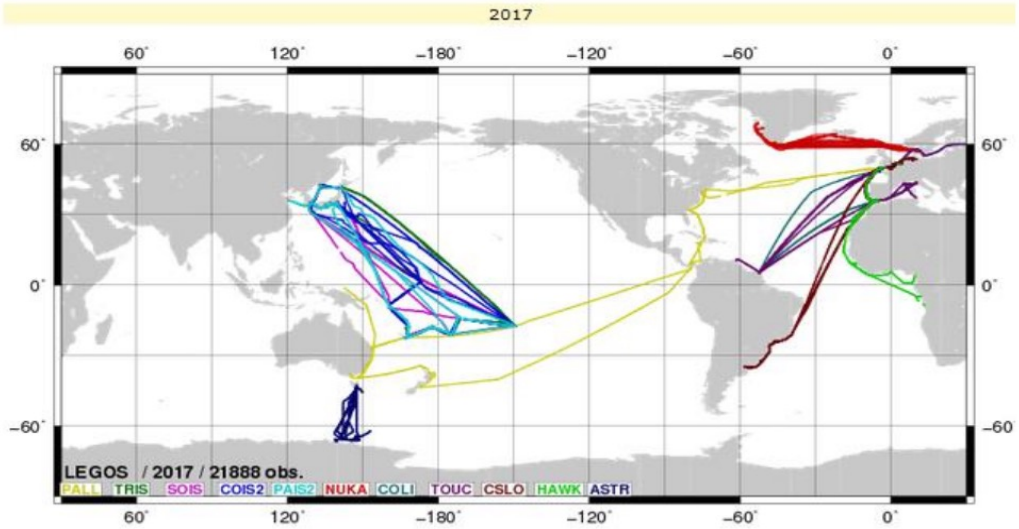
The present TAOS – Vessel based Observations



✓ Global GOSUD transects, 1998-2017



✓ Active transects during 2017

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The present TAOS – Satellite Observations

- ✓ Wind, Precipitation, near-surface temperature, humidity, clouds and aerosols, surface radiative fluxes, surface turbulent fluxes

- ✓ SST, SSS, SSH, ocean mass/bottom pressure

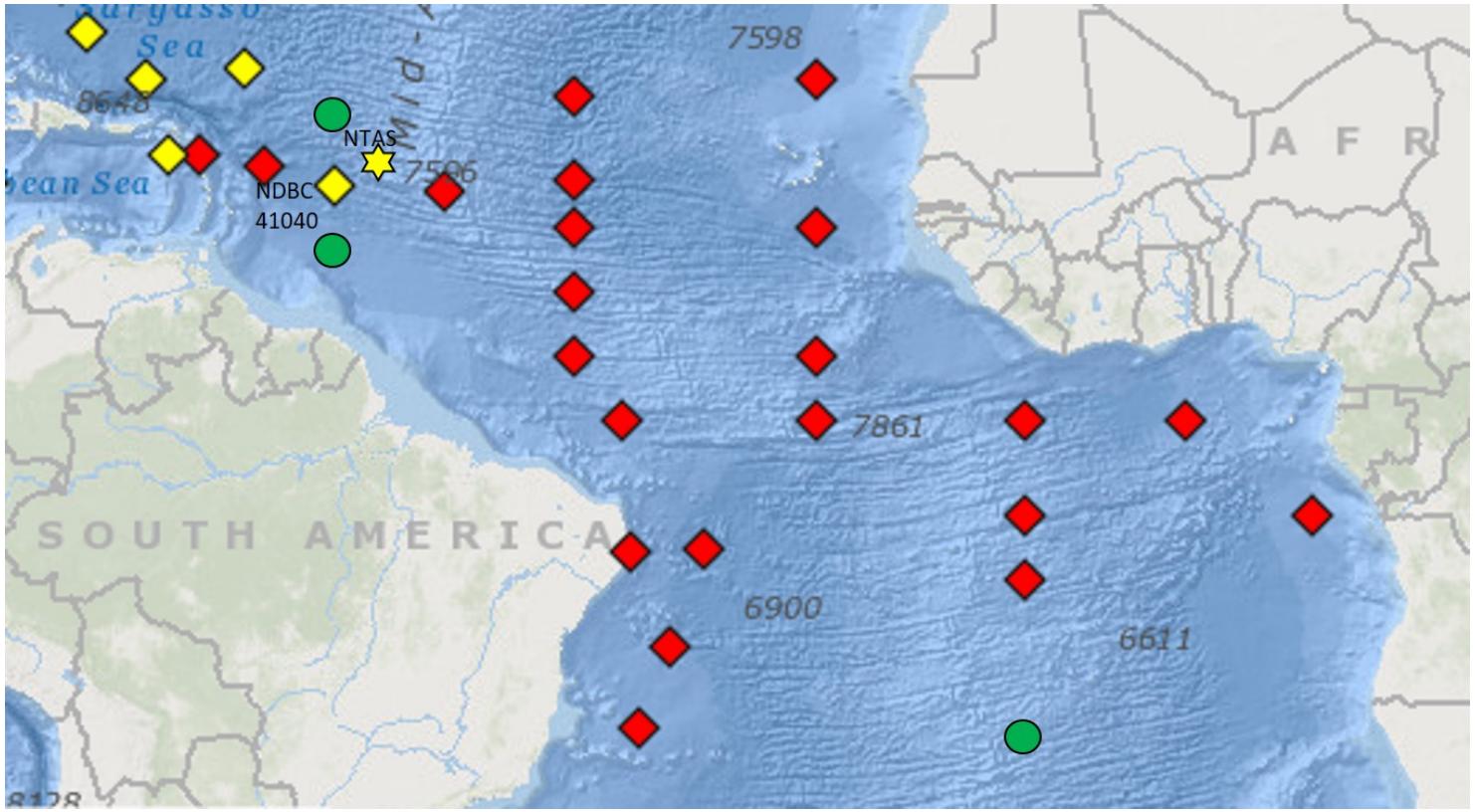
TAOS Review

Operational Drivers for the TAOS

- Dynamics of Tropical Atlantic Variability
- Climate Impacts
- Improved Predictions in different time scales
- The AMOC in the Tropical Atlantic
- Ocean Heat Content & Sea Level Rise
- Long-term climate change
- The Carbon System
- Biogeochemical Processes
- Ecosystem Dynamics and Fisheries

TAOS Review

Key Recommendations



- ✓ Green symbols show recommended new PIRATA sites to combine with the NTAS/NDBC buoys to establish a new buoy line along ~53°W, and the recommended new PIRATA buoy at 20°S, 10°W

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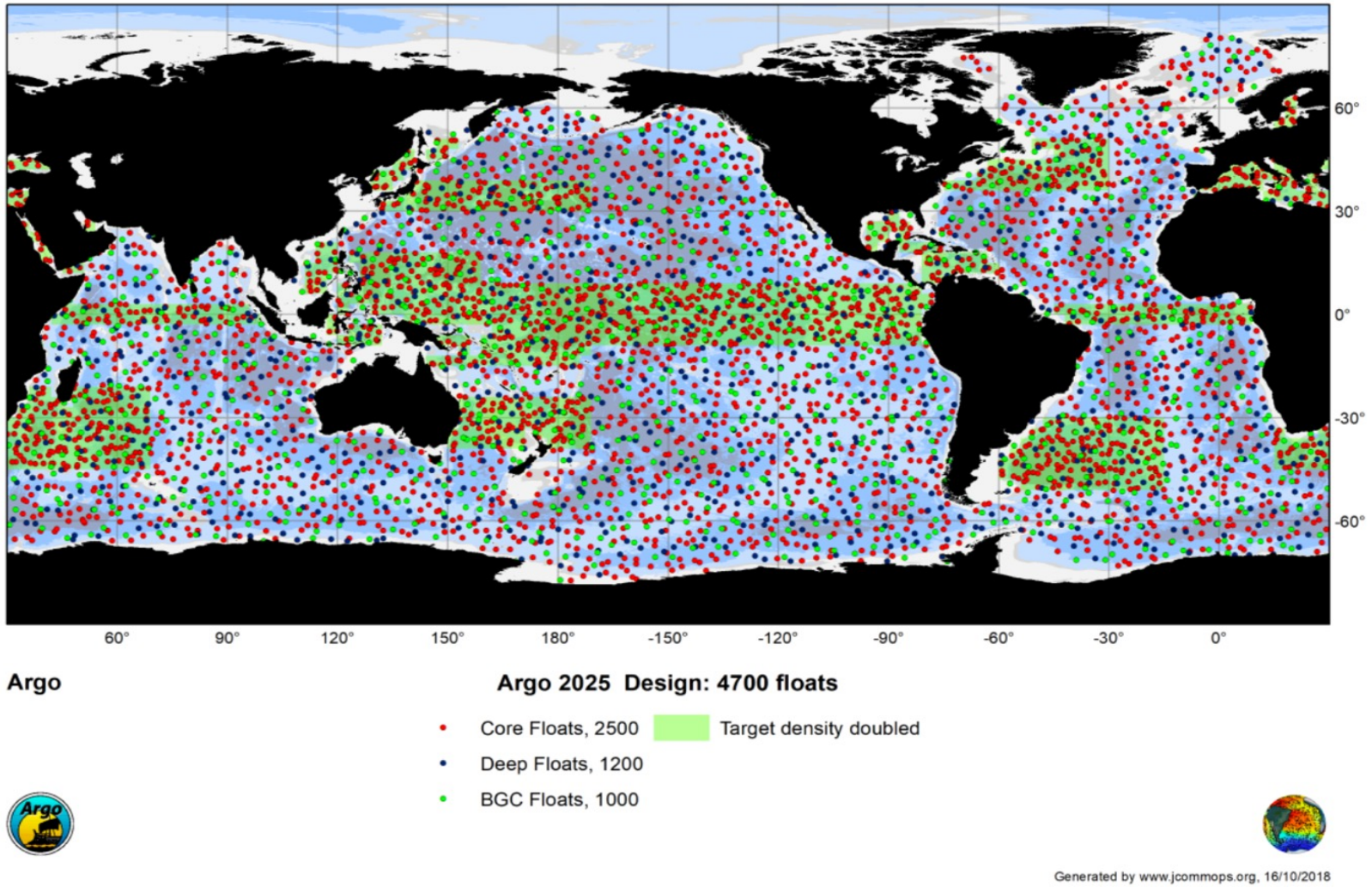
Key Recommendations



- ✓ The "Argo 2025 Design" sampling vision for the global oceans, indicating regions of higher resolution Argo sampling (green shading) and the approximate distribution of core Argo, BGC-Argo, and deep-Argo floats

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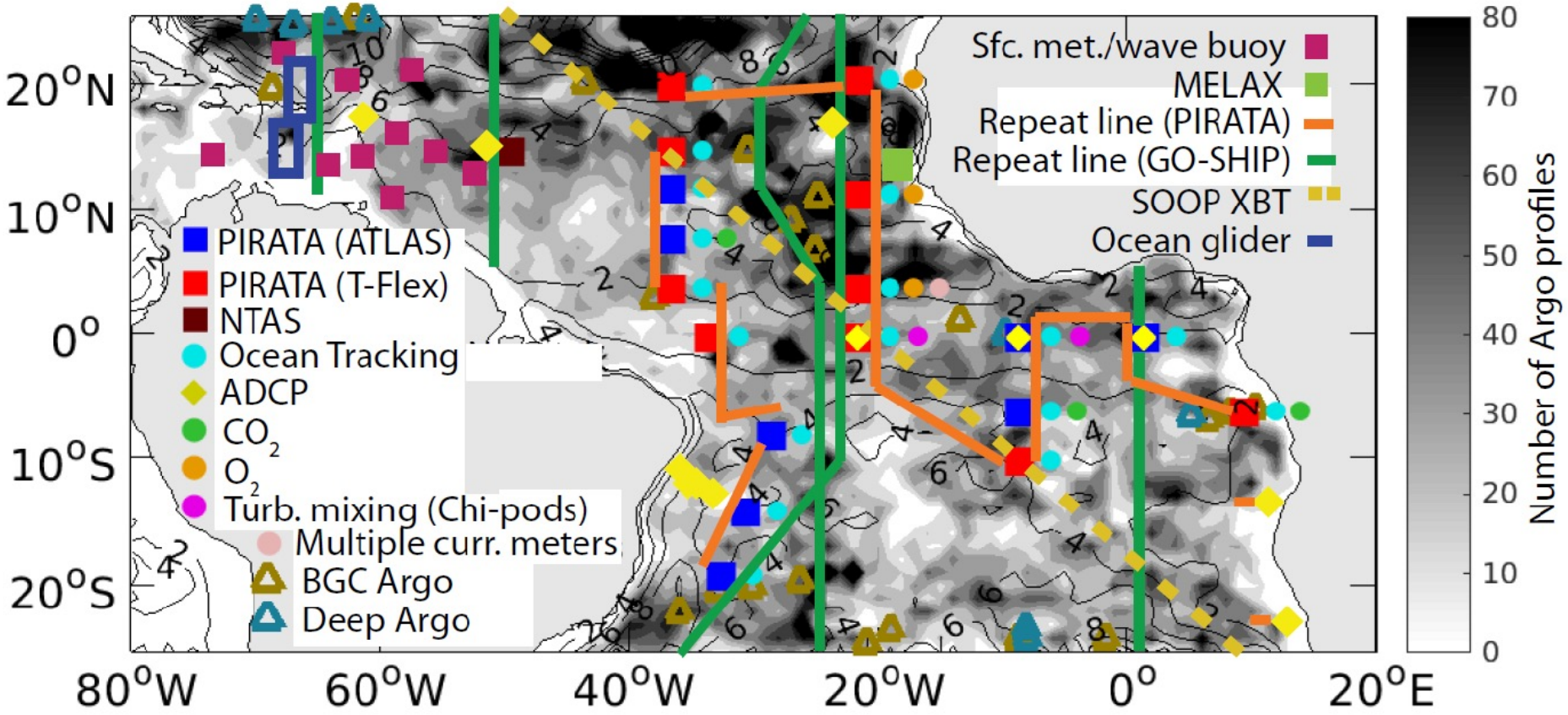
Key Recommendations

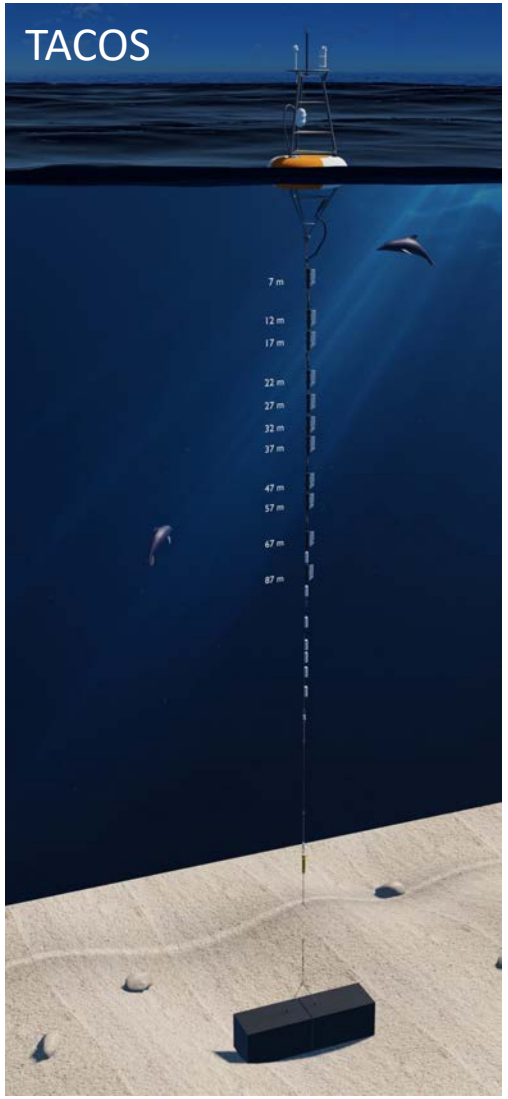


✓ Key elements of the tropical Atlantic in situ observing system

TAOS Review

Key Recommendations

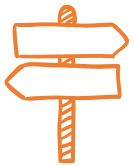
- ✓ New technologies



TAOS Review

Key recommendations

Data Flow and information products



TAOS Governance

Resourcing structure for TAOS

Periodic TAOS Review

✓ Essential Ocean Variables & Essential Climate Variables listed by TAOS identified phenomena

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