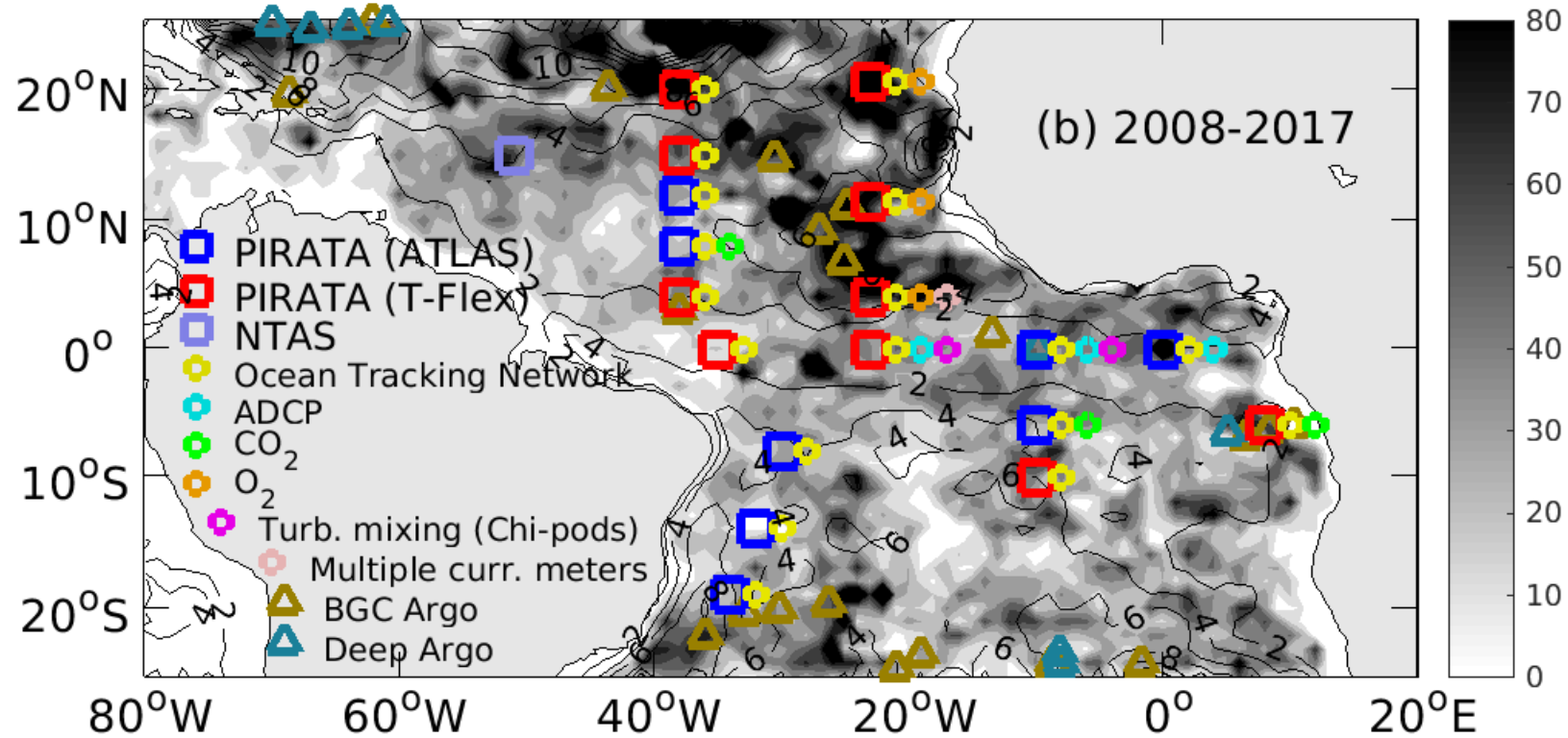


OceanObs19 recommendations for future TAOS



1 Maintain observing systems that have proven their long-term value for scientific research, monitoring, and operational forecasts and analyses. These long records in the tropical Atlantic are extremely important for observing ocean-atmosphere variability on interannual to multidecadal timescales and changes in response to global warming. Continuity of satellites

2 Improve vertical sampling of PIRATA moorings in the mixed layer and immediately below. Presently, the sensor spacing is too coarse to accurately calculate mixed layer depth, stratification beneath the mixed layer, and the vertical structure of the diurnal cycle of temperature near the surface. It is also recommended that every mooring have at least one single-point current meter and a downwelling longwave radiation sensor. These measurements are needed to compute temperature and salinity advection and the net surface heat flux, important components of the mixed layer heat and salinity budgets. Augmenting moorings with barometers will aid numerical weather prediction and data assimilation. New satellite meas and improvements sfc vel

3 Sustained measurements of upper-ocean mixing are needed, together with the processes that drive them, such as current shear and surface waves. This could be achieved through moored microstructure, ocean velocity, and surface wave measurements at one or two PIRATA locations on the equator and one or two locations off the equator.

4 Increased monitoring of deep ocean temperature and salinity will provide many benefits. These measurements are critical for assessing long-term changes in the ocean's heat storage and mass balance and the earth's energy imbalance. They also help to monitor and understand the AMOC. Deep Argo must continue.

5 Sampling of biogeochemical and biological parameters from floats, research vessels, ships of opportunity, and moorings must be continued and expanded, especially in the tropical South Atlantic. These measurements are required for monitoring and understanding the carbon cycle and OMZ dynamics.

6 The moored observing system should be extended to the northwestern tropical Atlantic warm pool. This is a region through which a high percentage of land-falling hurricanes pass. There is strong upper-ocean salinity stratification, and there are energetic mesoscale fronts and eddies that affect air-sea fluxes and mixing yet are poorly understood.

7 Augmenting the in-situ observing system in the equatorial and southeastern tropical Atlantic is recommended in order to improve understanding of the Atlantic Zonal Mode, Benguela Niños, and coupled model biases. This could be achieved through a denser network of Argo floats and PIRATA moorings near the equator and additional PIRATA moorings and glider surveys in the southeastern tropical Atlantic. Enhanced meas in s atl subtrop gyre

8 More widespread use of autonomous platforms such as gliders is recommended, especially in western and eastern boundary regions with strong currents and eddy activity and in the western tropical North Atlantic, where the impacts of ocean temperature and salinity stratification on tropical cyclone activity are not well known. Augmenting surface drifters with additional meteorological measurements, such as atmospheric pressure, winds, air temperature, and relative humidity, would be very beneficial for improving weather forecasts and air-sea flux calculations.

9 Extensions of oceanographic surveys for commercial and endangered species are needed. In many cases this will require additional capacity-building in African nations. Another requirement is the integration of individual surveys into a larger observation system that considers the requirements of different user groups, including society, the private sector, and the scientific community. Communicating value of obs to society

10 The measurements of micronekton collected during the regular maintenance cruises of the PIRATA network are a key piece of a growing acoustic network to estimate the global mesopelagic biomass, one on the less known components of the ocean ecosystem. These measurements must be continued and expanded to other platforms when feasible.

Process studies needed in addition to sustained obs mention in main text

Improve model parameterizations

Data availability sharing

Discussion

- What additional measurements are most needed to **improve models** (air-sea fluxes, mixing, etc.), **cal./val. satellites, improve data assimilation and ocean state estimates?**