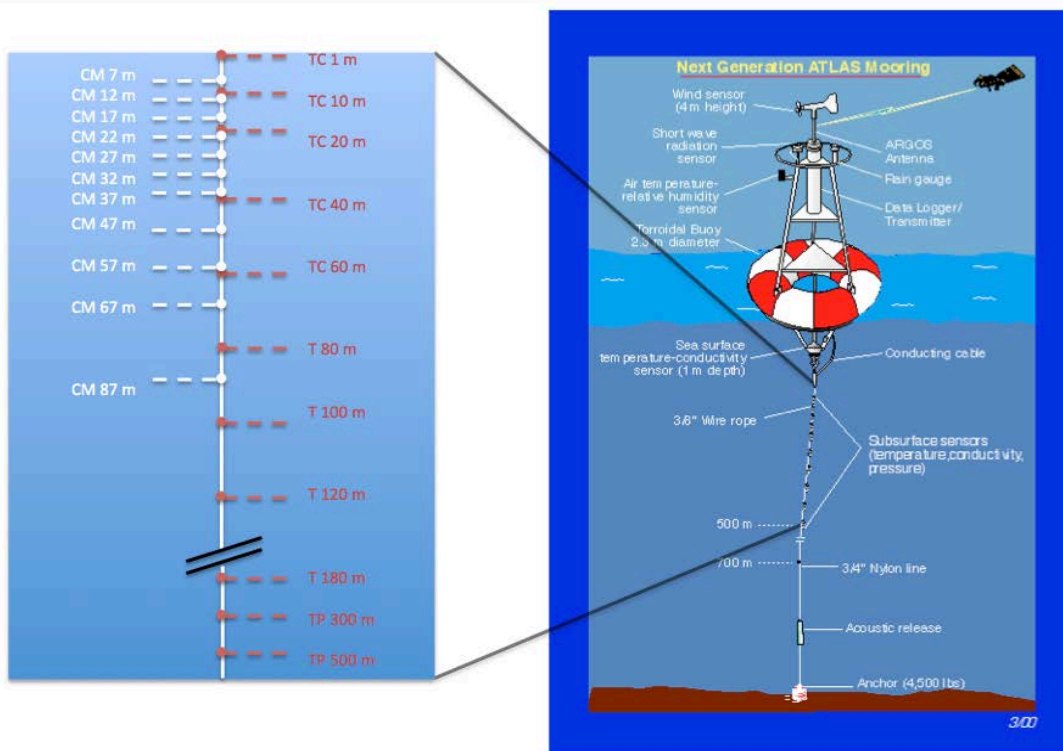


Tropical Atlantic Current Observations Study

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Hurricane activity in the Atlantic Ocean and rainfall over the neighboring continents are strongly impacted by coupled ocean-atmosphere interactions in the tropics. Fine-vertical-scale (less than 10 m) variations in the upper ocean velocity impact sea surface temperature and air-sea fluxes in the tropical North Atlantic through their contributions to vertical turbulent mixing and horizontal advection of heat and salinity. It is therefore critical to understand how the upper ocean velocity is modified by wind forcing events on daily to interannual (year-to-year) timescales, and by ocean phenomena such as tropical instability waves on daily to monthly timescales.

As part of the Tropical Atlantic Current Observations Study (TACOS), the PIRATA Northeast Extension (PNE) mooring at 4°N, 23°W in the tropical Atlantic will be augmented with ten acoustic current meters. The current meters will begin collecting data in February 2017. The instruments will collect velocity measurements at 5 m intervals from the surface to 40 m depth and with larger spacing (10 to 20 m intervals) between 40 m and 100 m depth. With the real-time data collected during this experiment, we will be able to measure for the first time the fine vertical structure and shear of surface mixed layer currents at 4°N, 23°W and examine their connections to local air-sea fluxes and upper-ocean heat and salinity changes, using near-surface meteorological and subsurface temperature and salinity data already collected by the buoy.



Schematic of the depths of the Tropical Atlantic Current Observations Study (TACOS) current meters (CM) relative to the depths of temperature (T), conductivity (C), and pressure (P) measurements made by the standard PNE ATLAS mooring.