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The PIRATA observing system in the Tropical Atlantic: Accomplishments and perspectives

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PIRATA (Prediction and Research Moored Array in the tropical Atlantic) is a multinational program established to improve our knowledge and understanding of ocean-atmosphere variability in the tropical Atlantic, a region that strongly influences the regional hydro-climates and, consequently, the economies of the adjacent land masses (e.g. West Africa, North-Eastern Brazil, the West Indies and the United States). PIRATA is motivated by fundamental scientific issues but also by societal needs for improved prediction of climatic variability and its impacts on countries surrounding the basin. PIRATA, initiated in 1997, is based around an array of ATLAS meteorological and oceanic buoys. In addition to the ATLAS buoys, PIRATA also includes acoustic Doppler current profiler moorings, tide-gauges and meteorological stations. Yearly dedicated cruises for mooring maintenance allow for the acquisition of a large number of measurements along repeated ship track lines and also provide platforms for several kinds of operations carried out in collaboration with other international programs. PIRATA provides invaluable data for numerous and varied applications, among which are analyses of climate variability on seasonal-to-interannual timescales, equatorial dynamics, mixed-layer temperature and salinity budgets, air-sea fluxes, data assimilation, weather and climate forecasts. Recent major accomplishments in terms of air-sea exchanges and climate predictability will be highlighted in this presentation. Despite real challenges such as acquiring sufficient ship time and fishing vandalism, PIRATA is now well established and recognized as the backbone of the tropical Atlantic observing system. Future perspectives for the network are discussed in the framework of a sustainable tropical Atlantic observing system.