

ALBERTO PIOLA

ANCEFN

Departamento de Ciencias de la Atmósfera y los Océanos (FCEN, UBA)

OCEAN, CLIMATE AND HUMAN WELLBEING

Abstract: The ocean plays a key role in modulating the global climate system, is a significant source of food, oil, gas, bioactive compounds, and a driver of the global economy, thus playing a key role in human wellbeing. Yet, the ocean is under numerous threads posed by climate change, overexploitation, and other natural and anthropogenic stressors. Over 90% of the Earth's warming in the past decades is stored in the ocean. Observations show that the globally averaged sea surface has warmed about 0.7 °C since the early 1980s. However, warming is not uniform, in some regions the temperature has climbed at a much faster rate, creating warming hotspots, while others have cooled. Although on average temperature in the deep ocean has also increased, though at a slower rate than at the surface, quantification of deep ocean warming is still challenging. The differential warming rate enhances the vertical stratification of the ocean, limiting its capacity to contain dissolved gases such as CO₂ and oxygen, and hindering the inflow of nutrients from the deep waters to the illuminated upper layer. Moreover, ocean warming is causing the poleward displacement of species, some of commercial significance, and creating unprecedented conditions in the tropics. Thus, the apparently simple fact that the ocean is warming has physical, biogeochemical and biological impacts of global significance. Knowledge of the ocean temperature distribution and its variability is fundamental to understand the processes that control climate and to improve our ability to predict its evolution in upcoming decades. Arguably, this is among the most important challenges faced by mankind.

About the speaker: Alberto Piola is Professor Emeritus of Oceanography at the Department of Atmospheric and Ocean Sciences, University of Buenos Aires, Argentina. He is a sea-going physical oceanographer, and his main research interests are the large-scale ocean circulation and ocean fronts, and their climatic, geological, and biological impacts. Piola chairs the Executive Committee of the South Atlantic Meridional Overturning initiative, was vice-chair of the Scientific Steering Committee of the Integrated Marine Biosphere Research project, and past member of the Ocean Observation Panel for Climate. Piola has authored and co-authored numerous papers addressing the large-scale circulation, and water masses of the South Atlantic Ocean and the adjacent continental shelves. He is Editor-in-Chief of the Journal of Marine Systems and Associate Editor of Frontiers in Marine Science and Ocean and Coastal Research, among others. Is a member of the Argentine *Academia Nacional de Ciencias Exactas, Físicas y Naturales* and the *Academia del Mar*.
