

# **THOT (TaHitian Ocean Time series): a new kind of long-lasting deep-sea oceanographic station in the central South Pacific**

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Through various physical, chemical and biological processes as well as their synergetic interactions, oceans play a key-role in the modulation of climate system, carbon cycle and marine ecosystems. In the central South Pacific, including the 47 % of the French maritime domain of French Polynesia, ocean dynamic plays a key-role in the El Niño Southern Oscillation (ENSO). ENSO is the dominant mode of interannual variability in the Pacific with strong effects at global scales. It also modulates the decadal oscillations of the Pacific Ocean and longer-term trends. Furthermore, being part of the South Pacific subtropical gyre, variability of the French Polynesia waters is representative of those in the subtropical gyres of the global ocean. To observe and characterize climate changes in this region, the deployment of long-lasting oceanographic survey stations is necessary to follow the evolution of oceanographic key parameters (e.g., temperature, salinity, oxygen, phytoplankton biomass). However, presently there is no deep-sea monitoring observatory in the central South Pacific.

The objective of the TaHitian Ocean Time-series (THOT) project is to set up a deep-sea oceanographic station to observe and improve the understanding of climate changes in the French Polynesia waters as representative of subtropical gyre and Pacific scales. This project will be part of existing international programs on climate and ocean observations (Bio-ARGO, CLIVAR). It will provide a synergy and complementarity to long-term observations for global ocean

Implementation of a mooring station, such as those already existing, is complex in French Polynesia due to its geographical, scientific, logistical and technological remote context. Thus the originality of THOT is to set up a long-lasting station to observe climate changes based on 1) a regular deployment of physical-biogeochemical profiling floats in the area of interest over the next two/three years; 2) then to deploy the next generation of biogeochemical profiling floats capable of horizontal displacement to replace in their initial position.