

The Tropical Atlantic Observing System: A Review



Sabrina Speich for the
Atlantic CLIVAR Panel



Why a review ?

- Last review in **2006** by **CLIVAR** and **OOPC**
- Primary focus was on **PIRATA** (now **PIRATA** is 20 years old)
- Since the **CLIVAR TACE & PREFACE** have been completed.
- Evolution of scientific priorities and observational technologies (Argo, new sensors, new moorings)
- PIRATA has also expanded (new sites, higher vertical resolution in ML, new variables implemented -CO₂ and O₂)

The sociopolitical background

- Climate is changing rapidly, positive trend in extreme events in the Tropical Atlantic
- Evolution and anthropogenic pressure on fisheries, pollution, ...
- In phase with TPOS 2020 and INDOOS
- A favorable and rapidly evolving political framework (OO'09 & FOO, Galway and Bélem Accords, AtlantOS)



A favorable time for a new TAOS Review

- To systematically review the requirements for sustained observations in the tropical Atlantic
- To critically review the design of the sustained observing system by learning from the past and the neighborhood activities
- To collectively identify new opportunities to consolidate and to explore the possibility for expanded initiatives with other communities (countries, disciplines) and contribute to the Atlantic Observing Blue Print

Who ?

- Organised by the ARP in close cooperation with the PIRATA consortium.
- ARP will seek OOPC's endorsement for the review, and will try to involve the IOCCP, IMBeR, SOLAS, among others
- The review will complement other reviews of the Atlantic observing system (RAPID-AMOC, OSNAP).
- It will benefit TPOS 2020 and IndOOS reviews.
- Results of the TAOS review could also feed into the AtlantOS design strategy & OceanObs'19 conference.

Who ?

Review Committee Members

William	Johns	RSMAS, Miami, FL, USA
Sabrina	Speich	LMD-IPSL, ENS, Fr – Clivar ARP
Jeff	Knight	Met Office Hadley Centre, UK
Moacyr	Araujo	LOFEC, Br
Mike	McPhaden	NOAA, PMEL, USA
Katherin	Hill	WCRP, GOOS
Martin	Visbeck	GEOMAR, D
Toste	Tanhua	GEOMAR, D
Carol	Robinson	UEA, UK
Neville	Smith	CSIR, Au
Yochanan	Kushnir	LDEO, USA
Magdalena	Balmaseda	ECMWF, UK
Scott	Stripling	NOAA, USA
Abderrahim	Bentamy	Ifremer, Fr
Ping	Chang	Texas AM, USA
Philippe	Dandin	MétéoFrance, Fr
Noel	Keenlyside	Univ. Bergen, Norway

Mrs Jing Li, ICPO Clivar office

To achieve what ?

- A **forward looking** and **strategic review** focussing on the observing system in the next decade
- Need to consider **new observing technologies, observing system requirements from a wider user community** and observational products that will be delivered.
- Guided by the **framework for ocean observing** and make recommendations toward an adequate **governing mechanism**.
- **Comprehensive across all relevant observing system** networks but with the focus primarily on the *in situ* **integrated observing system**.

Terms of Reference

- 1. Review and articulate the existing and anticipated future drivers for TAOS**, encompassing research, operational, and societal applications. Key applications to be considered include: research on tropical Atlantic circulation and variability, coupled atmosphere-ocean variability and change, climate monitoring, modelling and forecasting (climate, ocean, seasonal to decadal and weather prediction), biogeochemistry, and fisheries.
- 2. Evaluate (review/assess/prioritize) existing and potential requirements for sustained observations of essential ocean variables (EOVs)** in the tropical Atlantic Ocean (extending from 25°N to 25°S) - in connection with TPOS and INDOOS - and update them to reflect new knowledge and identified needs for scientific and societal applications.

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3. **Evaluate the adequacy of existing observing strategies to deliver requirements for variables, and characterize their impacts.**
Characterize how in situ (e.g., PIRATA, Argo, drifters, and other data) and remote sensing observing systems are contributing to meet these scientific and functional requirements, and identify gaps, inefficiencies, and vulnerabilities.
4. **Provide recommendations on the current suite and configuration of observing systems to enhance their resilience and robustness in order to produce data in the most cost-efficient and sustainable manner** within the anticipated envelope of capability and resources.
5. **Identify potential enhancement or reconfiguration of the sustained observing system suite to address gaps and new requirements.**

TOR continued

6. **Evaluate requirements for delivery of data, and derived products and information, in real time and delayed mode** (e.g., availability, quality, latency, integration/interoperability); evaluate the existing data systems for fitness for purpose.
7. **Assess readiness of new technologies, their potential impact and feasibility in addressing requirements, and their potential to contribute towards addressing gaps, improving robustness/resilience, and/or lowering costs per observation** in the tropical Atlantic Ocean region; recommend new technologies with greatest potential to meet critical requirements and suggest approaches to improve the readiness for inclusion in the sustained observing system.
8. **Highlight the impacts of TAOS on the delivery of information/services of societal importance and relevance.**
Develop a report of the first TAOS Workshop, with recommendations on the development of a process for the ongoing evaluation of the observing system.
 - TAOS Review – Kickoff Workshop – Portland, Feb. 8 & 9 2018



Anticipated deliverables

- **A white paper for OO'19** that will document the main outcomes of the TAOS Review.
- It should provide the scientific guidelines on TAOS future development, (setting priorities as well as mindful resource trade-offs).
- Synthetic reports specified for AtlantOS or other potential contributors to TAOS could also be provided upon request.
- **Articles to highlight the major outcomes of the review** could be prepared for Eos, Bulletin of the American Meteorological Society, CLIVAR Exchanges, and/or US CLIVAR Variations, etc.

Timelines

- **Feb. 2018** Kick-off workshop
- **15 Mar 2018** Deadline for Abstract submission to OO'19
- **Jun. 2018** First Draft of white paper
- **Oct. 2018** Second workshop
- **Apr. 2019** White paper submission to International OO'19 Journal