

## AtlantOS Program Contributions to GOOS

### **How can GOOS support AtlantOS?**

Communication and coordination are key to the success of AtlantOS and connections with the GOOS national representatives is very important to the AtlantOS program. Another important connection would be with the global networks, such as Argo, Ocean Sites, GO-SHIP, Ocean Gliders and others. It would be very helpful if GOOS would encourage communication between regional efforts such as AtlantOS and these networks to support the regional implementation and opportunities in working together.

GOOS should clearly and openly endorse regional programs so as to enhance awareness of their value and to encourage national participation and engagement. In addition, it would be beneficial to work with GOOS in the development of guidelines on how regional programs and GRAs can best work together to support complementary goals.

### **What is missing in the current structures?**

The gaps in the existing activities run all the way from the ocean observing activities, the data analysis and interpretation, the data sharing and finally the connections with the user communities.

On the observing side, there is a need to work on optimised observing system designs taking into account the complementary strengths of networks and regional perspectives. The regional scale might be an optimal scale to have these discussions and observing-system design activities.

Moreover, there is at times limited coordination between programs already within GOOS and those activities at the basin scale that sit outside the GOOS program. Several of them can only engage at the regional scale and have no capacity of patience to be part of the global discussions.

On the data analysis and data sharing side, GOOS and AtlantOS can continue to push for more integration, interoperability and FAIR systems. Often this tends to be siloed within particular communities and not integrated to develop multi-disciplinary or multi-sectoral perspectives.

On the connections to user communities, AtlantOS can contribute to that regionally by focussing on particular thematic issues that are regional priorities and making connections to key interested user groups. One approach to filling these gaps, we believe, lies in taking a regionally targeted approach paying particular attention to the concerns, issues and needs of relevant user groups.

Hello GOOS -

Thanks for asking TPOS 2020 to speak to our experience working with GOOS over the past few years.

To briefly review: The TPOS 2020 project was formed in 2014 as a quasi-independent and self-organized regional project with a dashed-line connection to GOOS/OOPC. We gave roughly annual presentations to the GOOS SC, whose questions and comments were often valuable. An important outcome of the links that TPOS2020 kept with the intergovernmental system, GOOS SC, WMO/WIGOS, was the engagement of the Met Services .

We are now concluding the TPOS 2020 project, regarding our work as finished with the publication of our final report (<https://tropicalpacific.org/about/publications/>). We have a design that is now being implemented. The arrays will continue to evolve but for the next few years those will be refinements, not the major redesign on the scale of TPOS 2020.

Nevertheless, as our recommended enhancements and changes are implemented, our sponsoring agencies will continue to need scientific advice and evaluation of the changes, deployments and other at-sea work will require coordination, and data standards and best practices will continue to occupy our attention. To this end, we are reorganizing, not as a "project" tasked with a redesign, but as an ongoing "system" with a Scientific Advisory Committee (SAC) and an Implementation and Coordination Group (ICG). Those are now being formed. The name of the organization will probably be simply "TPOS".

We look forward to your comments and suggestions, and suggest three specific ways that the international structures including GOOS can contribute to our success:

- 1) Continue to promote and support data interoperability, discovery, and transparency standards. With TPOS part of a global enterprise, clear data standards are part of the "glue" that connects the regional networks together.  
A related issue would be to work towards common and well-understood sampling specifications for the global tropical moored buoy network, perhaps comparable to those for GO-Ship.
- 2) Work with WMO/GOOS Expert Panels to: (a) further develop TPOS multidisciplinary products; and (b) strengthen systematic connections between the modeling/data assimilation (DA) and observing communities. Skillful DA is crucial to integrate the diverse measurements into a coherent product that can be widely used.
- 3) Take advantage of GOOS's intergovernmental mechanisms to advance international observing cooperation, which is critical for TPOS' success.  
The global governance structures can open doorways for effective international partnerships; one way to do this might be to strengthen the GRAs to build their voices and influence within their regions. We need help to entrain partners and the GOOS (et al) international mechanisms can be an effective way to do this.

Behind (3) is that we regard the two biggest gaps in TPOS 2020's outcomes to be our inability to generate coordinated action in either the eastern Pacific (upwelling system) or the western Pacific (low-latitude western boundary currents).

Since the beginning of TPOS 2020 we had argued that both boundary regions needed to be integrated into a complete observing system, both for their large societal impacts and also because they are fundamental parts of the basin-scale circulation. Unfortunately we found significant barriers on both sides of the ocean.

There are several specific reasons behind this, but one common reason was the difficulty of organizing collective and collaborative action between the different national interests and agencies. Despite the great potential and strong interest among the scientific communities, engagement in the eastern Pacific was challenging across the spectrum of needed activities from data sharing, EEZ issues, to resourcing major initiatives. Similarly, we see great opportunity for improved scientific understanding of ENSO through systematic observation of the western boundary currents that form the main oceanic connection between the subtropics and the equator, but international coordination on sampling and EEZ questions has been very weak in the west.

TPOS post-2020 needs to build onto our earlier attempts and find commitment on feasible and practical steps toward implementation. Perhaps the UN Decade of Ocean Science for Sustainable Development will be a path to inspire change and improved capacity.

The international structure (WMO/IOC/GOOS) can be a motivator and connector to speak to the agencies and add its weight to help us (and similar regional projects) break through these barriers that, in the end, reduced the value of the TPOS 2020 redesign.

Regards, Billy Kessler, Weidong Yu and Sophie Cravatte