



TPOS 2020 Status Report

Status Report Release Date: 13 October 2017

The Project continues to take advantage of the progress supported through the completion of the First Report. In September the Western Pacific Workshop was hosted by the SOA, First Institute of Oceanography (FIO) in Qingdao, China. (See 'Highlighted Activity' below)

In October the fourth session of the Steering Committee will be convened and hosted by NOAA PMEL in Seattle, Washington, USA. (See 'Upcoming Activity' below)

HIGHLIGHTED ACTIVITY: WESTERN PACIFIC WORKSHOP SUMMARY

The TPOS 2020 Western Pacific Workshop was hosted by the FIO in Qingdao, China on 4-6 September 2017. (A full Summary Report including attendees and agenda can be found on the TPOS 2020 website.)

The sessions opened with a discussion of the TPOS 2020 1st Report and implementation. Participants were provided with a brief introduction to the TPOS 2020 Project, including conclusions from the TPOS 2020 1st Report released in late 2016 along with the outcomes from a successful second meeting of the TPOS 2020 Resources Forum in May 2017.

It was noted that the desired outcomes for the WP Workshop included the establishment of a positive dialogue on TPOS WP activities, gaining clarity on the steps for implementation of the WP actions from the 1st Report, a better understanding of the next steps for the LLWBC Pilot (scope, purpose, likely activities, etc.), and an improved understanding of the potential to support process studies. The discussion also highlighted the importance of modelling for all topics on the agenda.

Current Activities in the Western Pacific

A key point that was highlighted during the discussion was the importance of an effective and efficient data management process for TPOS. For the TPOS Backbone, the standard is real-time communication (or as close to real-time as is practical) and open exchange of data, provided through the information systems of the WMO and/or through dedicated data and product services such as provided by PMEL for TAO/TRITON and the Argo data centres for Argo.

The presentations allowed for optimism that TPOS 2020 may achieve significant steps towards its goal to double Argo in the region. These discussions also drew attention to the significant effort in technology development (communications, floats, buoys). The desire for flexibility in the operating cycle of the floats, so as to address specific Western Pacific process studies also emerged as a theme.

The discussion further highlighted the importance of standards and standard operating procedures for contributions to the TPOS Backbone.

Potential Additions to the TPOS 2020 Backbone

Western Pacific Sustained Networks: The workshop noted that there are many activities relevant to the TPOS 2020 recommended Tropical Moored Buoy Array (TMA), and that there is the potential for Backbone extensions motivated by specific interests in the western Pacific region. The TPOS 2020 WP Task Team has provided a valuable mechanism for gathering information about the purpose and achievements of these efforts.

Modelling: This discussion highlighted the many areas where modeling could facilitate understanding, improve design, and enhance the impact of observations. Such activities are relevant to both the sustained Backbone development and implementation and to pilot projects and process studies; it was noted that modeling and data assimilation will be a focus of the TPOS 2020 2nd Report.

Biogeochemistry/Ecosystems: This discussion encouraged development of further advice relevant to the western Pacific, such as scale studies focused on western Pacific pCO₂ data, development of initial guidance for BGC-Argo, and western Pacific mooring “super site” development. For floats, there exists strong interest in the community providing an opportunity to bring focus to the western Pacific region; the development of any such activity would take into account the end-to-end requirements of such a study, including data management capability.

Western Pacific Pilots and Process Studies

WP TT Projects (Northern Edge, Eastern Edge, etc.): The Workshop confirmed there is support for such studies and discussed several opportunities for additional supportive/complementary studies, including those in the modelling arena. There exists evidence of strong support for the scientific efforts, with potential participation among multiple players and partners of TPOS 2020.

The Low Latitude Western (Pacific) Boundary Current (LLWBC) Pilot: Four presentations were given and provided background to this discussion (Section 6.1.1 of the 1st Report). The workshop concluded that the level of interest and investment of this effort is sufficient to move toward a coordinated LLWBC Pilot. Further implementation details were discussed later in the workshop, (see LLWBC Strategic Implementation Plan below).

In addition to the studies mentioned above, there were discussions of other opportunities for system improvement:

CLIVAR Cooperation: The Workshop and TPOS 2020 appreciate the many links between CLIVAR and TPOS. There is a strong desire to continue coordination and strengthen communications with CLIVAR as TPOS 2020 progresses.

New Technology Options: The Workshop agreed that opportunities to test and trial new technologies should be promoted throughout all layers of TPOS activity- from process studies and pilots, through to the development and evolution of the Backbone.

The Western Pacific Sampling Strategy and Implementation

There are several options for meeting the requirements for the western Pacific Backbone of TPOS; floats and TMA were the focus of most of the discussion but it was recognized that satellites, GO-SHIP, SOOP, drifters etc. all play important roles. The Workshop agreed that the different activities supporting implementation should be drawn together as a single pilot/demonstration project (WP Backbone Implementation Pilot Project).

This project would be part of the TPOS 2020-led Transition and Implementation effort. Ideally the project would have a 3-4 year time-line, be open to all that wish to contribute to the WP Backbone, have a focus on TMA and Argo, include new and maturing technology, and to document and distribute lessons learned for benefit to other regions and TPOS in the future.

Technical Issues Around the TMA

The workshop also acknowledged the need to elaborate on the required flux variable observations and associated technical specifications (Section 7.4.4 of the 1st Report), to consider possible BGC extensions, (particularly pCO₂), the need for further refinement of the likely TMA sites, the need to integrate underway measurements into a plan, the need to develop TMA standards (TMA equivalent of Argo core), and to agree on data management protocols and standards.

Additional Backbone follow-up: *The upcoming SC-4 will provide an opportunity to refine the western Pacific backbone implementation design. The Project will seek additional SOA and JAMSTEC advice on NW Pacific extensions and SC advice on southern sampling and extensions.*

LLWBC Strategic Implementation Plan

The Workshop noted the significant past, present, and planned activities relevant to the LLWBC and concluded that TPOS 2020 should progress toward the implementation of a Pilot Project. This activity has been targeted as part of the SPICE LLWBC community and is also the focus of two sessions at Ocean Sciences 2018 meeting in February.

Initial Planning Phase: Initially Pilot Project activities will focus on the review and assessment of status (stocktake) of observations, establish context within TPOS (why monitoring the LLWBC is important and relevant), assess literature and knowledge as a whole using a diversity of

expertise, including experts not directly involved with current activities, gain clarity on what are the EOVs for the LLWBC and associated requirements, use existing LLWBC observations to assess gaps in the system, incorporate modelling expertise to assess the potential for an integrated whole-of-LLWBC approach; the process will utilize independent review to assure credibility.

UPCOMING ACTIVITY: TPOS 2020 STEERING COMMITTEE-4 MEETING

The TPOS 2020 Project will convene its fourth meeting of its Steering Committee (SC-4) on 17-19 October 2017. The meetings will take place at NOAA PMEL in Seattle, Washington.

Meeting outcomes will be focused on the creation of an annotated outline of the TPOS 2020 2nd Report. The Report will focus on coupled weather prediction and sub- seasonal; BGC/ecosystem enhancements; model evaluation, and TPOS 2020 1st Report implementation.

Sessions will also review Task Team progress, as identified at SC-3/1st Report and the identification of new actions or tasks for the upcoming Project year. Discussion will also identify how the SC, the TTs, including the newly formed Transition & Implementation TT, will coordinate activities in the 2018-2020 timeframe. And importantly how the Project can continue to further identify opportunities to engage TPOS stakeholders.