March 2017
Status Report

Status Report (MSR)
Release Date: April 6, 2017

The Project continued to build momentum this month. The Task Teams have begun meeting, the work of the NOAA Climate Program Office funding is underway, and the second TPOS Resources Forum (TRF-2) planning groups are working diligently toward the success of these sessions. All of these efforts are capitalizing on the work of the SC and Task Teams as well as the content provided in the TPOS 2020 First Report.

NOAA Climate Office Division 2016 Funding:
In July 2016 NOAA's Climate Program Office announced $4.5 M for new observing technologies for ENSO research and predictions. This is an investment of NOAA to the advancement of the Tropical Pacific Observing System (TPOS 2020) Project rethinking the ocean/marine observing system in the tropical Pacific. The benefit of this improved observation system will have a global impact. Below is a brief update on two of the four funded projects.

"Autonomous Surface Vessels as Low-Cost TPOS Platforms for Observing the Planetary Boundary Layer and Surface Biogeochemistry"

- See the First Report of TPOS 2020 at tpos2020.org for details, section 10.2.2

- On March 17, a Saildrone began testing a new boat design with a full suite of meteorological, biogeochemical, and physical sensors along the coastal shelf off San Francisco Bay.
  - This month the project will ground-truth the Saildrone's scientific payload in a 24-hour comparison with NOAA's R/V Shimada.
  - This includes testing the performance of a new PMEL-built Autonomous Surface Vessel pCO2 (ASVCO2) system on the Saildrone in a comparison with the pCO2 system on the Shimada.
  - After this test the Saildrone will transit to the CCE1 buoy off Santa Barbara for an additional inter-comparison with the CCE1 Moored Autonomous pCO2 system (MAPCO2).
- These tests are in preparation for the first OOMD-supported TPOS Saildrone mission planned to begin late summer
  - This mission will include two Saildrones outfitted with a full suite of meteorological, biogeochemical, oceanic, and engineering sensors to estimate the wind stress and air-sea exchange of heat and CO2.
  - Further activities will test data quality through inter-comparisons against the Woods Hole Oceanographic Institute (WHOI) buoy, drifters, gliders, and research vessels deployed at 10°N, 125°W as part of the NASA Salinity Processes in the Upper Ocean Regional Study-2 (SPURS-2).
  - This mission will also involve inter-comparisons against existing TAO moorings along 125°W, including the TAO mooring at 0°, 125°W, which is enhanced with a MAPCO2 system.

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"Enhanced Ocean Boundary Layer Observations On NDBC TAO Moorings"

- See the First Report of TPOS 2020 at tpos2020.org for details, section 10.2.4

- Two operational TAO/TRITON moorings have been reconfigured with additional instrumentation as part of a joint NDBC-PMEL project.
- Deployed in January 2017 they are providing unprecedented resolution of the upper circulation.
    - The mooring at 2S, 165E has additional surface meteorological sensors, and upper-layer temperature and salinity sensors to better resolve mixed layer fluctuations and the response to warm pool precipitation.
    - The mooring at 2S, 140W is the first to also sample upper ocean velocity, using an upward-looking ADCP with a point current meter for verification.
- Temperature and salinity data from these sites is now available on the TAO data site: http://www.pmel.noaa.gov/tao/drupal/disdel/; the velocity data is transmitted in real time but requires decoding.
    - A method to automate velocity data delivery is underway; preliminary data show the instruments are working well

Task Teams:

Western Pacific Task Team (WP-TT) met in March. One focus of the discussion was the launching of the Data Inventory (e.g. link of data web) activity in the western Pacific:

- Primary goal is to take an inventory of what data is collected, where it is collected and made accessible, with a primary focus on whether or not it is publically available
- OceanSITES and JCOMMOPS will be consulted regarding best practices

In addition to a round-table discussion of regional activities and upcoming efforts, the group is undergoing discussions to meet opportunistically at various regional meetings and conferences.

KEY ACCOMPLISHMENTS AND NEAR-TERM PROJECT MILESTONES

Steering Committee

- Co-Chairs: Dr. Neville Smith, Retired / Dr. William "Billy" Kessler, NOAA PMEL

Current Month Activities:

- Prepared plans for activities leading to the generation of the Roadmap supporting the First Report Recommendations and Actions and further development of TT proposed process studies and projects.
- Worked with SC, TT, and TRF members to ensure successful discussions at the TRF-2
- Attended WP-TT session

Upcoming Activities:

- Continue to work with TRF and SC members to take optimal advantage of the upcoming TRF-2
- Conduct engagement and planning activities leading to enhanced dialog during the TRF-2
- Work with the SC to draft a Roadmap document in support of the First Report and its 22 Recommendations and 17 Actions.

Last Month's Activities:

- Represented TPOS 2020 during the WIGOS Coordination Group inter-sessional meeting (see page 1)
- Represented TPOS 2020 Transition and Implementation Group plans and ToRs during a JCOMM MAN session (see page 1)
- Prepared plans for activities leading to the generation of the Roadmap supporting the First Report Recommendations and Actions and further development of TT proposed process studies and projects.

Published/Posted Materials:

- December 2016: TPOS 2020 First Report
- December 2016: TPOS 2020 SC-3 Report
- November 2015: TPOS 2020 SC-2 Report
- October 2015: CLIVAR Exchanges Article: *TPOS 2020 Project: The Role of Research and Innovation* http://www.clivar.org/sites/default/files/documents/Exchanges_OceanObs_No67_0.pdf
- June 2015: The Mercator-Ocean Scientific Newsletter: "TPOS2020: TROPICAL PACIFIC OBSERVING SYSTEM FOR 2020" By S. Cravatte, A. Ganachaud, B. Dewitte, F. Hernandez, Newsletter #52 (http://goo.gl/rKbvh6)
- Mar. 2015: Published article in WMO Bulletin: "Progress in Observing and Predicting ENSO", (Vol 64 (1) – 2015)
- Feb. 2015: US CLIVAR Variations: "ENSO observing system: Past, present, and future"
- Dec. 2014: TPOS 2020 Project Prospectus
- Dec. 2014 TPOS 2020 SC-1 Report
- Mar. 2014: Terms of Reference for TTs

Project Function:

The SC will provide scientific and technical oversight for the planning, system design, and implementation of the TPOS. This group will assess the evolving set of requirements through dialogue with relevant users and stakeholders, and coordinate a set of (pilot) projects designed to test and evaluate options. The SC will assess potential technology options for delivering a more effective and efficient TPOS including relevant scientific/expert panels and bodies. Together with the Resources Forum, the SC will manage communication and reporting.

Point of Contact:

Sr. Project Manager, Andrea McCurdy-> mccurdy@ucar.edu

Resources Forum

- Chair: Craig McLean, NOAA Oceanic and Atmospheric Research

Current Month Activities:

- Continued to work with TRF members to create the draft agenda.
- Provided requested documentation to TRF members.
- Conducted a series of planning sessions and briefings to Project leadership in preparation for the sessions.

Upcoming Activities:

- Support needs for travel and lodging requirements of participants
- Confirm logistical needs of the meeting and distribute results to members planning to attend.

Last Month's Activities:

- Created internal planning documents in support of the upcoming TRF-2 and extended invitations to TRF members and lead program mangers.
- Responded to TRF member questions related to the TRF-2.
- Made TRF members aware of the translated versions of the Executive Summary.

Published/Posted Materials:

- July 2015: TRF-1 Report (available on the TPOS 2020 website)
- Mar. 2014: Terms of Reference (available on the TPOS 2020 website)

Project Function:

The TPOS 2020 TRF will facilitate and coordinate the provision of resources by member institutions required to advance TPOS 2020 activities based on recommendations from, and in consultation with, the TPOS SC. It will promote and encourage contributions from institutions, Official Development Assistance agencies, participating and non-participating countries, and expand membership of the TRF as necessary; including the exploration of bilateral and multi-lateral partnerships. The TRF will coordinate resources that may be applied to the TPOS, including necessary observing research, technology development/testing, modeling, scientific analysis, infrastructure (e.g., ship resources and/or deployment of observing assets), along with Project Management and travel support.

Point of Contact:

Sr. Project Manager, Andrea McCurdy-> mccurdy@ucar.edu

Backbone Task Team

- Co-Chairs: Susan Wijffels, CSIRO / Sophie Cravatte (SC Member), Centre IRD

This Month's Activities:

- Continued deliberations on an optimal structure and path forward as the Project moves into the transition and implementation phase.

Upcoming Activities:

- Work with TT membership to generate a timeline and milestones for the upcoming 12 to 18 months.

Last Month's Activities:

- Began deliberations on an optimal structure and path forward as the Project moves into the transition and implementation phase.

Published/Posted Materials:

- Dec. 2014: Terms of Reference (available on the TPOS 2020 website, see: Groups and Outcomes)

Project Function:

Through an integrated approach the Backbone TPOS will achieve its objectives through a combination of in situ and remote sensing approaches, augmented as appropriate with advice from models and data assimilation. Sampling for the Backbone has as its goal to:

(a) Observe and quantify the state of the ocean, on time scales from weekly to interannual/decadal;
(b) Provide data in support of, and to validate and improve, forecasting systems;
(c) Support calibration and validation of satellite measurements;
(d) Advance understanding of the climate system in the tropical Pacific, including through the provision of observing system infrastructure for process studies; and
(e) Maintenance and, as appropriate, extension of the tropical Pacific climate record.

Point of Contact:

Associate Project Manager, Ana Lara-Lopez-> Ana.Lara@utas.edu.au

Planetary Boundary Layer Task Team

- Co-Chairs: Meghan Cronin, NOAA PMEL / Tom Farrar (SC Member), WHOI

This Month's Activities:

- Continued active engagement with key stakeholders in support of the First Report content

Upcoming Activities:

- Work with TT membership to generate a timeline and milestones for the upcoming 12 to 18 months.

Last Month's Activities:

- Continued active engagement with key stakeholders in support of the First Report content

Published/Posted Materials:

- Dec. 2014: Terms of Reference (available on the TPOS 2020 website, see: Groups and Outcomes)

Project Function:

The observational needs regarding improved monitoring and modelling of ocean surface and near-surface processes are likely to have two components: sustained detailed observations and process studies. It is the role of this Task Team to identify which requirements are best met via a sustained observing effort (> 5 years-11), and which can be addressed with specific short-term process campaigns.

Point of Contact:

Deputy Project Manager, Lucia Upchurch-> lucia.upchurch@noaa.gov

Modelling and Data Assimilation Task Team

- Co-Chairs: Arun Kumar, NOAA / Eric Guilyardi, IRD

This Month's Activities:

- Supported activities promoting the needs articulated in the First Report

Upcoming Activities:

- Work with TT membership to generate a timeline and milestones for the upcoming 12 to 18 months.

Last Month's Activities:

- Supported activities promoting the needs articulated in the First Report

Published/Posted Materials:

- Dec. 2014: Terms of Reference (available on the TPOS 2020 website, see: Groups and Outcomes)

Published/Posted Materials:

- Dec. 2014: Terms of Reference and Members (available on the TPOS 2020 website, see: Task Teams)

Purpose in Project:
A significant fraction of the observational effort will need to be directed towards improved understanding of processes and mechanisms, which in turn should be coordinated with a program of improved model parameterizations and reduced systematic error; an additional benefit is that such data/model studies also contribute to improved design and reduced inefficiencies of the observing system.

Point of Contact:
Associate Project Manager, Lucia Upchurch, interim-> lucia.upchurch@noaa.gov

Biogeochemistry Task Team

- Co-Chairs: Adrienne Sutton, NOAA PMEL / Pete Strutton (SC Member), Univ. of Tasmania

This Month's Activities:

- Continue to support the activities required to promote the BGC TPOS 2020 needs

Upcoming Activities:

- Present TPOS 2020 BGC requirements to the IOCCP Steering Committee during their annual session

Last Month's Activities:

- Continue to support the activities required to promote the BGC TPOS 2020 needs

Published/Posted Materials:

- Dec. 2014: Terms of Reference (available on the TPOS 2020 website, see: Groups and Outcomes)

Project Function:
The role of the Biogeochemistry Task Team (BGCTT) is to evaluate and recommend the most promising focii, and to provide advice on possible solutions. The Biogeochemistry Task Team will begin with carbon biogeochemistry as its core scientific concern. Here will be the consideration of the term biogeochemistry to include primary productivity (noting that the Backbone Observing System likely includes ocean color satellites) but not higher trophic levels (zooplankton to fish).

Point of Contact:
Associate Project Manager, Ana Lara-Lopez-> Ana.Lara@utas.edu.au

Eastern Boundary Task Team

- Co-Chairs: Yolande Serra, University of Washington / Ken Takahashi (SC Member), Instituto Geofísico del Perú

This Month's Activities:

- Supported activities which promote TPOS 2020 needs as articulated in the First Report

Upcoming Activities:

- Work with TT membership to generate a timeline and milestones for the upcoming 12 to 18 months.

Last Month's Activities:

- Supported activities which promote TPOS 2020 needs as articulated in the First Report

Published/Posted Materials:

- Jul. 2015: Terms of Reference (available on the TPOS 2020 website, see: Groups and Outcomes).

Project Function:
Task Team to focus on the eastern Tropical Pacific boundary region; giving priority to engaging regional experts and institutions. In addition to defining needed observations, goals of the TT could include: (a) Capacity building for improved sustained observing capability; and (b) Facilitation of the development of a regional research project, which may contribute guidance toward a sustained observing system.

Point of Contact:
Associate Project Manager, interim -> Lucia Upchurch, lucia.upchurch@noaa.gov

Western Pacific Task Team

- Co-Chairs: Janet Sprintall, Scripps / Kentaro Ando, (SC Member) JAMSTEC

This Month's Activities:
- Conducted initial meeting in 2017 (for further details please see the summary on page 2 of this report)

Upcoming Activities:
- Work with TT membership to generate a timeline and milestones for the upcoming 12 to 18 months.

Last Month's Activities:
- Provided content toward the completion of the First Report.

Published/Posted Materials:
- Feb. 2016: Terms of Reference (available on the TPOS 2020 website, see: Task Teams).

Project Function:
This group will take advice on a project to be conducted in the Western Pacific. Once underway they will advise on mechanism for the project's development and oversight.

Point of Contact: Guang Yang-> gyang@fio.org.cn

Distributed Project Office

This Month's Activities:
- Supported TRF Secretariat requirements for the invitation and confirmation of TRF-2 attendees and associated member needs.
- Began early planning for the shifting role of the DPO during the next phase of the Project.
- Created draft Annual Work Plan based on SC-3 Tracked Actions.

Upcoming Activities:
- Support the generation of key messages of TPOS 2020 post-SC-3 and a slide deck reflecting the content of the First Report and associated Recommendations and Actions
- Support TT Co-chair activities related to the drafting of TT 12-18 month milestones and plans.
- Ongoing planning and member-related activities in support of the TRF-2.
- Coordinate and launch engagement activities related to the TRF-2 and SC-3 Tracked Actions.

Last Month's Activities:
- Supported TRF Secretariat requirements for the invitation and confirmation of TRF-2 attendees and associated member needs.

Published/Posted Materials:
- Released: Engagement Plan V2
- Released: Project Management Plan V1
- Released: Project Execution Plan V1

Project Function:
The DPO will develop communications, and coordination tools that will facilitate integrated decision-making, and provide access to relevant deployment and observing asset decision making tools. The DPO will support the suite of tools and activities required to track the commitments to all aspects of TPOS 2020 and to facilitate integrated decision making across networks, groups, agencies, and nations; during the project and throughout the lifecycle of the observing system beyond TPOS 2020.

Point of Contact:
Senior Project Manager -> Andrea McCurdy, mccurdy@ucar.edu

CROSS-PROJECT DEPENDENCIES AND OPPORTUNITIES

The Roadmap responding to the Recommendations and Actions articulated in the TPOS 2020 First Report will be drafted and reviewed in April 2017 in preparation for the TRF-2 meeting in May.

PROJECT SCHEDULE

- The TPOS 2020 First Report was released in December 2016. It is posted online at: tpos2020.org
- The Task Teams are now creating 12-18 month timelines and deliverables.
- The TRF-2 meeting scheduled to be conducted in Honolulu, Hawaii on 16-17 May 2017.
- The SC-4 meeting planed to be conducted in Seattle, Washington in October 2017.

SPONSOR CONTRIBUTIONS

In addition to the in-kind self-support agreed to during the January TPOS Workshop, the following explicit sponsorships have been recorded thus far:

- January 2017: Several SC members and their supporting agencies contributed to the translation of the TPOS 2020 First Report Executive summery, among them were SOA, KIOST, JAMSTEC, IGP, IRD, and the GOOS Program Office office within the IOC.
- October 2016: Dirección de Hidrografía y Navegación and Instituto Geofísico del Perú hosting of SC-3 in Lima, Peru
- June 2016: NOAA announced $4.5M in funding for new observing technologies for ENSO research and predictions: http://cpo.noaa.gov/AboutCPO/AllNews/TabId/315/ArtMID/668/ArticleID/537981/NOAA-announces-45M-in-funding-for-new-observing-technologies-for-ENSO-research-and-predictions.aspx
- February 2016: The project welcomed Dr. Guang Yang as Associated Project Manager sponsored by the First Institute of Oceanography and hosted by the International CLIVAR office in Qingdao, China.
- October 2015: SC-2, CSIRO as host, IMOS and IMAS providing event support in Hobart, Tasmania, Australia
- October 2015: SC-2 and Backbone TT participant travel assistance provided by NOAA, NASA, and IOC
- August 2015: PACE-NET PLUS is supporting expert speaker and participant travel, and local costs at the Backbone Task Team face to face meeting at IRD in Noumea, New Caledonia.
- August 2015: NOAA COD and NASA providing travel support for Backbone Task Team member travel and DPO support of the face to face meeting in New Caledonia.
- April 2015: Launched DPO Node negotiations with the First Institute of Oceanography (FIO) of China, for possible initiation in late 2015
- Mar. 2015: Integrated Marine Observing System (IMOS), DPO Node (Associate Project Manager and SC-2 Support)
- Dec. 2014: NOAA Climate Office, DPO Support (0.5 FTE DPO Project Manager)
- October 2014: KIOST, SC-1 Hosting
- October 2014: GOOS support for SC-1; GCOS for WMO and IOC briefings
- Aug. 2014: NOAA PMEL – Project Management Support (0.2FTE DPO Deputy Project Manager)
- Aug. 2014: NASA - Interim Project Management Support (0.30 FTE in 2014)
- Jul. 2013: OOPC Project Management and Coordination (Secretariat)