Report of the 1st Meeting of the TPOS 2020 Resource Forum

Teleconference Hosted: 10th October, 2014, Korea Institute of Ocean Science and Technology (KIOST), Ansan, Korea.

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Additional Information

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1. Welcoming Remarks and Background (Craig McLean)

The meeting was opened with comments from Interim Chair Craig McLean, Acting Assistant Administrator, Office of Oceanic and Atmospheric Research, National Oceanic and Atmospheric Administration (NOAA) (via remote connection) and Jae Hak Lee thanking all for the participation and welcoming those in attendance to the Korean Institute for Ocean Science and Technology (KIOST). There were 30 members or representatives in attendance, (see Appendix 1 for the complete list and affiliation). The Interim Chair began by emphasizing the rationale of the TPOS 2020 workshop held in January 2014. The subsequent report assisted in the initial determination of project resource needs. As agreed at the workshop, the TPOS 2020 Project is coordinated by a Steering Committee (SC) and supported by a TPOS Resources Forum (TRF) and a project coordinator (see Appendix 2). The TRF-1 teleconference had been preceded by a meeting of the TPOS 2020 SC held at KIOST in Ansan, Korea on October 6-9, 2014. During this meeting the TPOS 2020 SC further articulated the challenges to be faced during the project and the importance of a robust and active TRF. The Interim Chair then noted that he is grateful for the participation of all who are engaged in the TRF, and that he believes through the collective goals and actions of the project, TPOS will be redesigned to address both science and societal needs.

The Interim Chair provided a brief introduction to goals of the Project and governance arrangements. A key function for the TRF will be to help facilitate and coordinate engagement of member institutions, and to advance TPOS-2020 projects in consultation with the SC. (See Appendix 2 for Project, SC, TRF Terms of Reference and a draft Organization Chart.) The objectives for the first meeting of the TRF were to discuss the rationale of the TPOS 2020 Project and to discuss its relevance to members; to have a report from the TPOS SC on its first meeting and agreed short-term and near-term actions; and to clarify future TRF activities. All member input and views are essential in helping to shape and guide the collective efforts and the development of TPOS 2020.

2. Round Table Self-Introductions (All TRF Members)

Round table introductions were provided.

3. Briefing on the first TPOS 2020 Steering Committee Meeting (SC Co-Chairs Neville Smith and Billy Kessler)

The TPOS 2020 (SC) Co-chairs Neville Smith and William “Billy” Kessler provided an overview of the first SC meeting held during the previous four days at KIOST. The SC is composed of individuals representing a broad mix of expertise and affiliations. The SC reviewed the recommendations from the January La Jolla TPOS Workshop. The Co-chairs noted the SC are well positioned to move forward on the majority of the recommendations and indicated that a 6 year project would be an appropriate timeline. During the first session of the SC, 11 substantive action items were agreed to (26 in all) and a number of decisions were taken. (These are listed in the full SC-1 Report located online at: www.tpos2020.org.)The SC will focus on project management practices designed to align workflow with these actions, and to ensure that investments in TPOS 2020 are well directed. There may be a small number of activities that extend beyond 2020, but these should not require changes to the governance arrangements.

Beyond these general introductory remarks, the Co-chairs noted that the tie between the dynamics of the equatorial Pacific and El Nino-Southern Oscillation (ENSO) research and prediction is still a strong driver of the TPOS design. They noted that there is also a strong

interest in more multidisciplinary approaches. The TPOS 2020 Project will be an opportunity to rethink and rebuild the system based on modern technology and system design approaches. It is well understood that the redesign will not just require adjustments to the existing observing system but must benefit from research that informs a more modern, sustainable observing system.

There were several actions discussed during SC-1 that will be addressed over varying periods of time. A brief review of these activities is provided below.

a. Short Term

A Backbone Task Team will be formed to advise the design of the observing system backbone with a focus on reasonableness as it relates to integration and sustainability. The leadership for this task team has been identified.

A small group will be formed to provide advice on time-series, and a Modeling and Data Assimilation Task Team will be developed to address issues in this arena.

b. Longer Term

Task Teams will be developed to address longer term initiatives around the following focus areas:

- Biogeochemistry
- Planetary Boundary Layers (including air-sea interaction)
- Eastern Tropical Pacific Boundary Region

A Western Pacific region drafting group will also be formed to create a project plan for that region, drawing on the major existing and planned activities in the region. The SC believes that this activity will motivate discussions on common science objectives and challenges, and highlight opportunities for collaboration.

In order to build on the highly successful SC-1 meeting it was recognized by the SC members that a successful TPOS 2020 Project will rely on strong involvement from community members and stakeholders.

A number of items were identified for SC-2 including:

- Deep ocean
- Data Assimilation
- Connections to activities in Indian Ocean/Atlantic

The Interim Chair congratulated the SC on progress, including the mobilizing the Backbone Task Team. He also reminded the forum of the activities surrounding biogeochemistry, and the boundary layers. He spoke to the fact that this suite of activities will serve the interests of all members of the TRF and constitutes a call to work for members.

4. Discussion of Institutional Interests in TPOS 2020 (All TRF Members)

A roundtable discussion was led by the Interim Chair to discuss member institutional interests and areas of contribution.

One of the primary needs articulated by the TRF was focused on the need for strong international engagement and enhanced governance and coordination. There are opportunities

for further discussion, such as at the upcoming 3rd ENSO Conference[1] and around efforts associated with the Year of the Maritime Continent. The TPOS 2020 Project is viewed as an opportunity to provide the structure needed to develop a functioning international network for TPOS. Through this development of stronger international participation and commitment the project is in a position to meet the needs of both individual nations and agencies in both the research and operational sectors.

It was further discussed that in order to transform the tropical Pacific observing system, the redesign will need to be based on several key objectives and research priorities. There was an expressed need to ensure that the backbone of the system be comprised of both in situ and remote sensing assets taking full advantage of advanced data delivery and integration technologies and methodologies. In order to improve models, climate prediction and mitigation strategies, many members spoke to the need for enhanced in-country data and information availability. Many members expressed an interest not only in understanding improved observations but also in contributing the necessary vessels, maintenance, support, and training associated with the expanded use of the observing system for both operational and research needs.

As a final note the Forum recognized the need to identify a menu of research priorities and activities early on that can be accomplished in the near-term to help inform the redesign of TPOS.

5. TPOS 2020 RF Actions, e.g. Secretariat Support (Craig McLean)

The Interim Chair expressed his appreciation to those attending the meeting and their strong support of the TPOS 2020 project thus far. The time for action is upon all sponsors and stakeholders.

In order to facilitate the management, coordination, and communications required to make the project a success NOAA and NASA have committed to provide project office support through 2014, and NOAA will continue supporting the secretariat in a distributed project office fashion through 2015. The U.S. will remain committed to developing the distributed format throughout the life of the project and strongly encourages and welcomes additional resources and project office nodes.

The SC Co-Chairs estimated the distributed secretariat will require around three full time equivalent staff which will be utilized to develop and maintain logistical requirements needed to coordinate activities, including project management. These efforts will work towards developing research projects, maintaining regular evaluation of the project, and assisting in the review of existing activities.

Toward this end, it was discussed that there are many needs related to the support of TPOS 2020, and leveraging multiple partner contributions, as the TRF aims to do, will reduce the burden on any one member. The SC leadership also expressed that the TPOS 2020 project structure will involve work occurring regionally in order to leverage and expand long-time experience and expertise.

[1] 3rd ENSO Conference, 12-14th November 2014, Guayaquil, Ecuador, http://www.ciifen.org/index.php?option=com_content&view=category&layout=blog&id=117&Itemid=172&lang=es

6. TRF: Terms of Reference, Mode of Operation, Broader Project Structure and Functioning (Open Discussion- Chair Facilitated)

The terms of reference for the TPOS 2020 RF (see Appendix 2) state that a governance model is required that involves oversight and coordination rather than top-down, unilateral direction. The TPOS 2020 SC will be responsible for oversight and coordination of scientific activities, including panels and task teams. As the sponsors of the project the TRF is responsible for coordinating and leveraging resources among members, within and external to the Forum. An Executive Committee will be populated by the leadership of the SC and the TRF and will also be responsible for coordination efforts.

The Interim Chair and the SC Co-Chairs encouraged all attendees to determine how best to shape the TPOS 2020 project to maximize relevance to their respective institutions. Funding and support of process studies and workshops will be an important avenue for participation in TPOS 2020; this is a valuable and practical form of involvement and engagement.

7. Next TRF Meeting: Topics and Timing (Open Discussion-Chair Facilitated)

When asked what the members would like to see come from TPOS 2020 the group's comments could be categorized as follows:

Governance:
The very idea behind TPOS 2020 speaks to the need for additional international and project coordination. There are several maritime projects underway that are responding to the need for greater information, and dissemination of information and data to the public. As well, TPOS 2020 is challenged to engage groups such as WCRP, CLIVAR, and CEOS and secure their program managers involvement in TPOS goals and outcomes.

Research:
A key aspect of ensuring the success of the redesign is to engage and find funding for research efforts that are forthcoming in the short-term. The SC has identified some early priorities.

Project Management:
It was commented that the project structure was sound and that the management approach of a distributed model is important; this was also seen as a key component of the creation and fine-tuning of target messages to engage sponsors, stakeholders, and the public. Progress and enhanced support was encouraged on this basis.

8. Closing Remarks (Craig McLean)

In closing it was proposed that the TRF meet annually after the annual SC meetings in order to consider their outcomes and needs. It was also suggested that the Forum may benefit from a quarterly teleconference. The next session will be coordinated in February in order to fully accommodate the holiday season. For more information members were invited to send an email to: info@tpos2020.org

The Interim Chair again expressed how grateful he was to KIOST, for the members in attendance, and for the support of all representatives who were able to listen-in and contribute their thoughts and perspectives to the first meeting of the TPOS 2020 RF.

Appendix 1: TPOS 2020 Resource Forum-1 Members and Attendees Tables

TPOS 2020 Resource Forum Members and Representatives:

Name	Institute	Title	Country
Jae Hak Lee	Korean Institute for Ocean Science and Technology (KIOST)	Representative, Host	**Korea**
Tim Moltmann	Integrated Marine Observing System (IMOS)	Director	**Australia**
Fernando Mingram	Chile Comité Oceanográfico Nacional (CONA)	Executive Director	**Chile**
Capt Patricio Carrasco	IOC representative for Chile, SHOA	Director	**Chile**
Jiabao Li	State Oceanographic Administration (SOA)	Director General	**China**
Chen Lianzeng	SOA	Vice- Administrator	**China**
Lianchun Song	China Meteorological Administration (CMA)	Director General, CMA National Climate Centre	**China**
Jullian Reyna	CPPS		**Ecuador**
Daniel Pabon	CIIFEN	Director	**Ecuador**
Commander Manuel Gomez	INOCAR	Director	**Ecuador**
Hans Bonekamp	Organisation for the Exploitation of Meteorological Satellites	Ocean Mission Scientist	**European Union**
Alan Thorpe	European Centre for Medium-Range Weather Forecasts	Director General	**European Union**
Mark Drinkwater	European Space Agency	Head, Mission Science Division	**European Union**
Robert Arfi	Institut de Recherche pour le Développement (IRD)		**France**
Patrick Vincent	French Research Institute for Exploitation of the Sea (Ifremer)	Directeur Générale Délégué	**France**
Philippe Dandin	Meteo France	Direction de la Climatologie	**France**
Andi Sakya	Indonesian Meteorological, Climatological and Geophysical Agency (BMKG)	Director General	**Indonesia**

Ridwan Djamaluddin	Agency for the Assessment and Application of Technology (BPPT)	Deputy Chairman	**Indonesia**
Yoshihisa Shirayama	JAMSTEC	Executive Director for Research	**Japan**
Noritake Nishide	Japan Meteorological Agency (JMA)	Director General	**Japan**
Gi-Hoon Hong	Korea Institute for Ocean Science and Technology	President	**Korea**
Dr Jae-Cheol Nam	Korea Meteorological Administration (KMA)	Deputy Chairman	**Korea**
Tommy Moore	Pacific-Island GOOS	Coordinator	**Pacific Islands**
Dr. Andres Chipollini M.	IMARPE	Executive Director	**Peru**
Laura Furgione	NOAA National Weather Service	Deputy Assistant Administrator	**United States**
Dr. Louis Uccellini	NOAA National Weather Service	Director	**United States**
Craig Mclean (Interim Chair)	NOAA Oceanic and Atmospheric Research	Assistant Administrator	**United States**
Chris Sabine	NOAA PMEL	Program Scientist	**United States**
Eric Lindstrom	NASA Earth Sciences	Executive Secretary	**United States**
Dr. Wendy Watson-Wright	Intergovernmental Oceanographic Commission	Director, Obs department	**IOC-UNESCO**
Wenjian Zhang	World Meteorological Organisation	Director	**WMO**

TPOS 2020 Steering Committee Co-Chairs:

Name	**Institute**	**Title**	**Country**
Billy Kessler	NOAA/Pacific Marine Environmental Laboratory	SC Co-chair	**USA**
Neville Smith	Retired	SC Co-chair	**Australia**

TPOS 2020 Support Staff:

Name	Institute	Title	Country
Katherine Hill	World Meteorological Organization	Programme Officer	**WMO**
Andrea McCurdy	Consortium for Ocean Leadership	Sr. Program Manager	**USA**
Nick Rome	Consortium for Ocean Leadership	Program Associate	**USA**
Hannah Dean	Consortium for Ocean Leadership	Program Specialist	**USA**

TRF-1 Attendees List:

Albert Fischer	IOC
Andres Chipolini	IMARPE
Andi Eka Sakya	BKMG
Erik Anderssen	ECMWF
Fernando Mingram	SHOA, Chile
John Murphy	NOAA NWS
Ken Ando	JAMSTEC
Jae Hak Lee	KIOST
Craig McLean + staff	NOAA OAR
Tim Moltmann	IMOS
Marcos Almenger	
Daniel Pabon	CIIFEN
Wahyu Pandoe	BPPT
Eric Lindstrom	NASA
Additional NOAA	
Helmut Portman	NOAA NDBC
Sid THurston	NOAA
Terry Schaefer	NOAA
Chris Sabine	NOAA PMEL
In KIOST	
Neville Smith	
Billy Kessler	
David Legler	
Kathy Tedesco	
Katy Hill	
Andrea McCurdy	

Appendix 2: TPOS 2020 Project, SC and RF Draft Terms of Reference

TPOS 2020 Project Terms of Reference (DRAFT)

The TPOS 2020 Workshop and Review has recommended the creation of a TPOS 2020 Project to achieve the major change from a loosely coordinated set of ocean observing activities in the tropical Pacific to a systematic, sustained TPOS by 2020.

The Project will:

- Achieve a significant change for sustained observing and leave a legacy for GOOS of a robust, efficient and effective contribution in the tropical Pacific.
- Focus on the tropical Pacific Ocean but embrace partnerships with the meteorological and adjacent coastal/regional ocean communities, as appropriate.
- Embrace contributions from multiple agencies and countries through a coordinated portfolio of resources and high-level oversight of the scientific and technical design, sub-projects and interfaces to the user community.
- Operate within the context of the Framework for Ocean Observation and build on existing activities while at the same leading needed change.

The TPOS 2020 Project will be autonomous and self-supporting but will coordinate with relevant existing intergovernmental bodies through the GOOS Steering Committee.

The overarching goals of the Project are:

- To refine and adjust the TPOS to monitor, observe and predict the state of ENSO and advance scientific understanding of its causes.

- To determine the most efficient and effective method for sustained observations to support prediction systems for ocean, weather and climate services of high societal and economic utility, including underpinning research.

- To advance and refine the knowledge of the predictability horizon of the tropical Pacific variability (physical and biogeochemical), as well as its impacts in global climate.

- To determine how interannual to multidecadal variability and human activities impact the relation between marine biogeochemistry and biology to carbon budgets, food security and biodiversity.

A Resources Forum broadly representative of the sponsors of TPOS 2020 will be responsible for coordinating the variety of resources needed for the Project to succeed and support a TPOS 2020 Project.

TPOS 2020 Steering Committee Terms of Reference

The Steering Committee will:

- Provide scientific and technical oversight for the planning, system design, and implementation of the TPOS,
- Assess the evolving set of requirements through dialogue with relevant users and stakeholders,
- Coordinate a set of (pilot) projects designed to test and evaluate options, which initially may include:
    - Studies of potential broad-scale sampling strategies,
    - Investigation of potential sustained requirements for air-sea interaction and circulations and interactions in the upper ocean,
    - Studies of potential approaches in the tropical Pacific boundary current regions and the equatorial wave guide,

- Assess potential technology options for delivering a more effective and efficient TPOS; Coordinate with other relevant scientific/expert panels and bodies, including those responsible for GOOS information systems and services,
- Together with the Resources Forum, manage communication and reporting. The TPOS 2020 Project will report to the GOOS SC.

It will meet at least once per year but may meet more frequently if required.

The membership of the Steering Committee shall not exceed 10 (or 12) and should include expertise broadly representative of the scientific and technical elements of the observing system, as well as expertise in the use and application of TPOS products.

TPOS-2020 Resources Forum Terms of Reference

The TPOS Resources Forum will:

1. 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 Steering Committee (Figure 1),

2. Promote and encourage contributions from institutions in non-participating countries and expand membership of the TRF as necessary,

3. Facilitate and coordinate resources that may be applied to the TPOS, including necessary research involving observing, observing technology development/testing, modelling, and scientific analysis; observing infrastructure (e.g., ship resources and/or deployment of observing assets); , as well as Secretariat and travel support,

4. Explore the potential for international resources from Official Development Assistance (ODA) agencies to develop and sustain the TPOS,

5. Explore bilateral and multi-lateral partnerships (e.g., JCOMM PANGEA Framework resource sharing) as a means to complement national resources,

6. Coordinate with the CLIVAR Pacific Panel, Indian Ocean Observing System (IndOOS) Resources Forum (IRF), Pacific Islands GOOS, DBCP TAO Implementation Panel (TIP), PIRATA Resources Board and other relevant resourcing bodies.