

# **TPOS 2020 2<sup>nd</sup> Report Recommendation for a Routine Inter-comparison of the Operational Sub- seasonal to Seasonal and Interannual Prediction (S2IP) Systems**

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# Tropical Pacific Observing System 2020 (TPOS 2020) Project

- The Tropical Pacific Observing System (TPOS) was designed during the highly successful Tropical Ocean Global Atmosphere (TOGA) experiment, and the implementation of the TAO array was completed in 1994.
- In 2014, the TPOS 2020 project was initiated to provide recommendations for the redesign of TPOS and transition it to a more resilient and integrated observing system in support of observational requirements for operations and research.
- <http://tpos2020.org/>

# TPOS 2020 Project

The goals of the TPOS 2020 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.

# TPOS 2020 Project

- Along with improvements in observational data, efficient utilization of investments in observational systems also requires models and assimilation systems that can make adequate use of the observations
- TPOS 2020 also has interest in reduction of biases in coupled models (leading to a more efficient use of observational data).

# TPOS milestones

- 1<sup>st</sup> Report
  - Seasonal prediction  
<http://tpos2020.org/first-report/>
- 2<sup>nd</sup> Report (in rev.)
  - Subseasonal and seasonal prediction  
Executive summary available online  
<http://tpos2020.org/project-reports/second-report>

# Inter-comparison of S2IP Systems

For TPOS 2020 to plug into model development efforts for S2IP systems (and reduce model biases in the equatorial tropical Pacific), a questionnaire was sent to the operational centers to understand the model development process.

From the questionnaire it became clear that, in general, there are no systematic procedures in place for the development of S2IP systems.

S2IP systems generally leverage model development efforts in the weather and climate projection community.

# Inter-comparison of S2IP Systems

For the S2IP community as a whole, there is no systematic effort in place to quantify progress in S2IP prediction systems on regular basis (similar to what CMIP does for climate projection models).

This realization led to a recommendation in the 2<sup>nd</sup> TPOS 2020 report to develop an effort for a routine and systematic inter-comparison of S2IP systems

<http://tpos2020.org/2nd-report-draft/>

# Inter-comparison of S2IP Systems

The proposal:

Along with routine hindcasts that are done as part of S2IP system upgrades, each operational center will be encouraged to do an agreed upon set of additional model simulations to facilitate periodic assessment of the current state of the S2IP systems.

Given that the typical upgrade cycle of S2IP systems is 4-5 years, the periodic assessments can follow a similar frequency.



# Inter-comparison of S2IP Systems

## The proposal:

The operational centers (unlike to the CMIP exercise) will not be required to follow the periodic assessment time-table and freeze their S2IP systems accordingly but will be free to follow their own model upgrade cycles.

As part of operational upgrades of the S2IP systems, a set of (limited) additional model simulations (e.g., a set of AMIP and free coupled runs) to complement generation of hindcasts will be a key requirement

# What we are seeking from WGSIP?

WGSIP's comments & thoughts on the utility of developing the concept of a systematic and structured evaluation of S2IP systems on a periodic basis will be very helpful.

WGSIP's experience in coordinating projects like CHFP, and experience with CMIP will be valuable in shaping the concept.

Depending on the response from the community, the next steps will be to assess the interest from operational centers for their participation.