



SOUTHEAST ASIAN SUBSEASONAL-TO-SEASONAL (SEA-S2S) PROJECT

CONCEPT NOTE FOR SEA-S2S FIRST WORKSHOP

Feb 27 – 3 Mar 2017

CENTRE FOR CLIMATE RESEARCH SINGAPORE (CCRS)

METEOROLOGICAL SERVICE SINGAPORE (MSS)

Background

The Subseasonal-to-Seasonal (S2S) Project was jointly set up by the World Meteorological Organization's (WMO) WWRP¹/THORPEX²-WCRP³ in 2013 to promote research in the subseasonal to seasonal timescale and with a focus on high impact weather events. The objectives of S2S are to improve forecast skill and understanding on this timescale, and to promote uptake of the initiative by operational centres and the applications community. These are achieved by making the most of the expertise of the weather and climate research communities to address issues raised by the Global Framework of Climate Services (GFCS) pertaining to this timescale (Vitart, et al., 2012).

Motivation

Seamless weather-to-climate forecasts have the potential to be significantly beneficial to society. As part of the Southeast Asian Regional Climate Outlook Forum (RCOF) process, ASEANCOF, a survey of all National Meteorological and Hydrological Services (NMHSs) in the ASEAN region showed that the development of a regional capability in the use of sub-seasonal forecasts was a particularly high priority. Weeks' ahead is a particularly important planning timescale and, if some indication of the likelihood of extreme weather conditions can be provided, this can be especially useful in contingency planning. Planning and management activities in the agricultural and food, disaster-risk reduction, health and water resources often require lead-time that fall into this subseasonal to seasonal time range. These include anticipating hazards arising from early or late onsets of rainy seasons that may lead to major droughts and floods, or hazards from extreme hot and cold conditions impacting local population. Being ready for such contingencies, through judicious use of the forecasts by operational centres, can potentially minimise the losses from weather and climate-related disasters.

WMO initiatives have provided an excellent database of S2S forecasts for use in research applications. Real time forecasts will also be made available in the near future. Although such forecasts have been used extensively in most developed countries for some time, there is little expertise in either the accessing or interpretation of such forecasts in many parts of Southeast Asia. For the region as a whole, to make best use of what is now becoming available, a pilot programme focused on the understanding and regional application of S2S forecasts is required.

Objectives of SEA-S2S

¹ WWRP: World Weather Research Programme

² THORPEX: THE Observing system Research and Predictability EXperiment (THORPEX)

³ WCRP: World Climate Research Programme

A S2S Multi-model Ensemble Prediction System (MEPS) database was set up to host the model outputs from the WMO's Global Producing Centres (GPCs), which consist of ensembles of subseasonal forecasts up to 60 days. The MEPS also provides an extensive set of reforecasts (hindcasts) dataset from the different modelling centres. The forecast products, at the moment, lag by 3 weeks, and hence cannot yet be used operationally, but access to the reforecasts dataset would allow operational centres to preview and assess their potential benefits and limitations.

In preparation for a possible release of operational products from the S2S, this SEA-S2S demonstration project aims to **familiarise the participants with the database, improve their understanding on the mechanisms of subseasonal-to-seasonal predictability, and equip the participants with the knowledge to investigate the skill and usefulness of the subseasonal forecasts in applications.**

The Southeast Asian region, in particular the Maritime Continent, has the potential to benefit substantially from this database more than other parts of the world as the model skill over this region has been found to be relatively good (Li & Robertson, 2015). SEA-S2S activities aim to build capacity and enhance collaboration among the NMHSs in the region.

First SEA-S2S Workshop

This proposal relates to the First SEA-S2S Workshop planned for early 2017.

1. The first set of activities proposed is to introduce the S2S database to the participants, accompanied by hands-on sessions to download the data and process them for analyses. Given the varying configurations of models that contribute to the MEPS database, this activity in itself covers a broad range of skill sets.
2. The second set of activities is to get the participants to conduct a common set of *core analyses*, assessing model performance on weekly means or extremes of temperature and rainfall for example; either using their own countries' station data or suitable gridded observation data.

On the final day of the workshop, participants will present preliminary results to consolidate the first workshop outcomes. Participants will follow up with the analyses in their home countries and submit the findings for consolidation into a preliminary technical report. Subject to the availability of funds and interest from participants, a follow-up workshop shall be organised within a year to discuss the findings in detail, refine the report and conduct further analyses of extreme events as a supplement to the core analyses in the technical report.

Participation

Each of the 10 Southeast Asian NMHSs will each be represented by 2 participants who are involved in the operational/research activities of their centres related to seasonal and subseasonal timescales. The meeting will be facilitated by 3 to 4 experts from the S2S project who will provide lectures and conduct hands-on training sessions.

Funding

MSS will cover local organisation costs of the workshop. The remaining costs (flight, accommodation, and daily allowances) will be sourced from interested funding agencies. The Appendix provides a breakdown of the estimated funding required for the first workshop only (approx. **USD 70K**), if advance commitment to the second workshop can be made by the funding agencies, the amount required for the second workshop is estimated to be the same as the first.

Proposed Workshop Structure

<p>Day 1 S2S Concepts and Database</p>	<ul style="list-style-type: none"> • Basics of subseasonal-to-seasonal prediction (predictability sources). • Predictability potential and limits • Introduction to S2S modelling system and configuration • <i>Hands-on: Prepare participants' laptops for the Linux-environment</i> • Introduction to S2S MEPS database (e.g. data convention and structure, ECMWF GRIB API) • <i>Hands-on: Downloading data from S2S MEPS</i>
<p>Day 2 Observation Data</p>	<ul style="list-style-type: none"> • IRI Data Library • Gridded data sources for verification • Downloading data from IRI Data Library and other sources • Processing station/gridded observation data for verification and visualisation (code run-through) • <i>Hands-on: Downloading and processing gridded data from IRI Data Library</i> • <i>Hands-on: Preparing local station data for verification</i>
<p>Day 3 Model Verification</p>	<ul style="list-style-type: none"> • Deterministic and probabilistic model verification techniques • Verification of means and/or extremes • Processing S2S model data for verification and visualisation (code run-through) • <i>Hands-on: Downloading data from S2S MEPS (continued)</i> • <i>Hands-on: Running model data through code (verification)</i>
<p>Day 4 Verification Exercises</p>	<ul style="list-style-type: none"> • Review and consolidation of Day 1-3 activities • <i>Hands-on: Verification exercises (continued)</i>
<p>Day 5 Results Consolidation and Presentation</p>	<ul style="list-style-type: none"> • <i>Hands-on: Verification exercises (continued)</i> • Country presentation of results

References

Li, S. & Robertson, A. W., 2015. Evaluation of Submonthly Precipitation Forecast Skill from Global Ensemble Prediction Systems. *Monthly Weather Review*, Volume 143, pp. 2871-2889.

Vitart, F., Robertson, A. W. & Anderson, D. L., 2012. Subseasonal to Seasonal Prediction Project: Bridging the Gap Between Weather and Climate. *WMO Bulletin 61 (2)*, pp. 23-28.

**Southeast Asian Subseasonal-To-Seasonal (SEA-S2S) Project
First Workshop
Centre for Climate Research Singapore, Feb 27 – 3 Mar 2017**

BUDGET

S/No	Description	Budget (SGD)	Remarks
1	Air Travel		
	Return economy airfare - ASEAN participants	\$ 14,937	18 participants; SGD811 + 1.5% travel agency fee for each
	Return economy airfare - International experts	\$ 9,053	4 experts; SGD2297 + 1.5% travel agency fee for each
2	Accommodation		
	6-nights stay at hotel	\$ 49,054	22 participants
3	Per Diem		
	6 days (USD50) + one off terminal expenses (USD150) - ASEAN participants	\$ 12,041	18 participants; SGD611 for each
	6 days (USD50) + one off terminal expenses (USD150) - International experts	\$ 3,211	4 experts; SGD611 + 20% withholding tax for each
	Total	\$ 88,295	
		\$ 65,338	USD

* All items have been included with 10% contingencies