

# Current status of operations of Southeast Asia (SEA) RCC-Network in demonstration phase

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**WMO OMM**

World Meteorological Organization  
Organisation météorologique mondiale

**WMO International Workshop on Global  
Review of RCC Operations, Pune, India,  
12 – 14 November 2018**

# SEA RCC-Network Background

WMO RA V Southeast Asia (SEA) RCC-Network

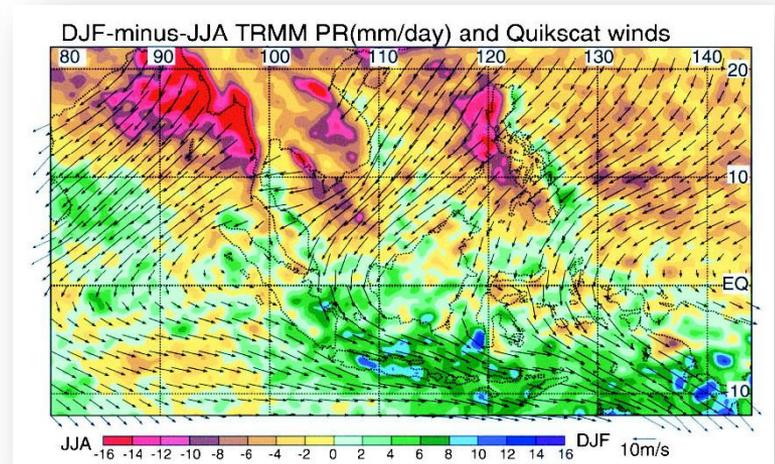
Demonstration Phase



**Demonstration start date  
Nov 2017**



*Map of Southeast Asia*



Chang et al. (2005a)

- Mainly tropical weather, driven by seasonal shift of monsoonal winds (Marching of Inter Tropical Convergence Zone)
- Also influenced by ENSO, IOD and MJO drivers



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# SEA RCC-Network Web Portal



100% A<sup>-</sup> A<sup>+</sup>

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## WMO RA V Southeast Asia (SEA) RCC-Network

Demonstration Phase



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### RCC Functions

#### **Operational Data Services**

- Develop regional climate datasets, gridded where applicable
- Provide climate database and archiving services, at the request of NMHSs

#### **Long-range Forecasting**

- Interpret and assess LRF products from GPCs including exchange of basic forecasts and hindcast data
- Generate regional tailored products, including consensus-based seasonal climate outlooks
- Perform verification of RCC quantitative LRF products, including the exchange of basic

#### **Climate Monitoring**

- Perform climate diagnostics including analysis of climate variability and extremes, at regional and sub-regional scales
- Establish an historical reference climatology for the region and/or sub-regions
- Implement a regional Climate Watch

#### **Training**

- Provide information on methodologies and product specifications for mandatory RCC products, and provide guidance on their use
- Coordinate training for RCC users in interpretation and use of mandatory RCC products

### SEA-RCC Network Functions & Nodes

[Climate Monitoring](#) (Lead: PAGASA, Philippines)

[Long-range Forecasting](#) (Lead: MSS, Singapore)

[Operational Data Services](#) (Lead: BMKG, Indonesia)

**Training** (Shared: BMKG, MSS & PAGASA)

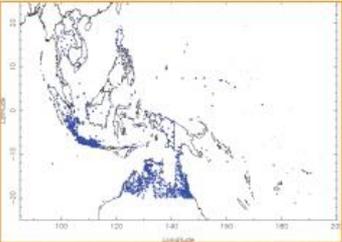
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# RCC Operations: Mandatory Functions

## 1. Operational Data Services



Project	Services
  <p><b>Goal</b> SACA&amp;D offers science-based climate services for assessing observed changes in climate extremes in the Southeast Asian region and aims to serve stakeholders from e.g. the food-security sector. These services rely on high-quality observational data sets provided by the participants.</p> <p><b>Participants</b> 23 National Meteorological and Hydrological Services, observatories and universities mainly from Southeast Asia.</p> <p><b>Coordination</b> Jointly coordinated by the Badan Meteorologi, Klimatologi, dan Geofisika (BMKG, Indonesia) and the Royal Netherlands Meteorological Institute (KNMI, The Netherlands).</p> <p><b>Drivers</b> SACA&amp;D has been initiated to provide a data portal for digitized data generated within the Digitisasi Data Historis (DiDaH) project. DiDaH focusses on the digitization and use of high-resolution historical climate data from Indonesia over the period 1850-present. With the modern meteorological data from the BMKG archives, and from other countries, SACA&amp;D aims to serve as a regional centre for climate data.</p> <p><b>Global embedding</b> SACA&amp;D is part of the International Climate Assessment &amp; Dataset (ICA&amp;D) which is part of a pilot project in the framework of the Global Framework for Climate Services (GFCs). SACA&amp;D has direct ties with its European counterpart ECA&amp;D (<a href="http://www.ecad.eu">www.ecad.eu</a>), its Latin American counterpart LACA&amp;D (<a href="http://lacad.cifden-int.org">lacad.cifden-int.org</a>) and its West African counterpart WACA&amp;D.</p>	 <p><b>SACA&amp;D services comprise:</b></p> <ul style="list-style-type: none"><li>• data gathering (long-term daily observational series from meteorological stations)</li><li>• archiving and storage in a centralized relational database</li><li>• quality control and homogeneity checks</li><li>• analysis (calculation of indices, particularly related to climate extremes)</li></ul> <p><b>SACA&amp;D products include:</b></p> <ul style="list-style-type: none"><li>• daily data set built up from 5914 series of observations for 10 essential climate variables (incl. temperature and precipitation) observed at 4065 meteorological stations in 15 countries (34% publicly available)</li><li>• meta information on stations and time series homogeneity</li><li>• maps and plots for changes in extremes in the form of trends, anomalies and climatologies for 44 indices</li></ul>  <p>SACA&amp;D Station Network</p>

# RCC Operations: Mandatory Functions

## 2. Climate Monitoring



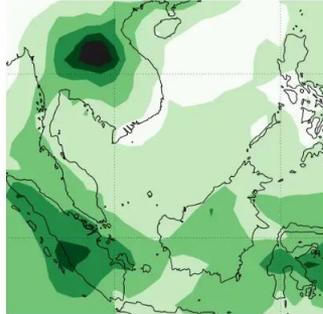
SEA Climate Monitor   Rainfall   Temperature   Wind/SLP   SST   Typhoon Tracks

About

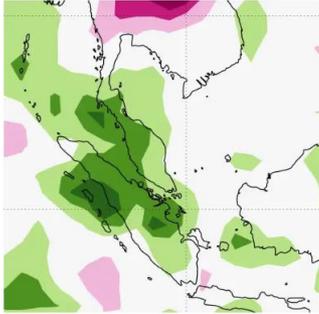
Welcome to the **Southeast Asia Climate Monitor**, a web application developed by PAGASA that provides operational and regularly updated information to help monitor the climate in fulfillment of its mandate as a Regional Climate Center for Monitoring - ASEAN region.



Rainfall



Temperature



Wind/SLP   SST   Typhoon Tracks

**URL:** <http://seacm.pagasa.dost.gov.ph/>

### - *Regional climate watch advisories*

The Climate Watch System is currently under development. Also will use near-real time satellite-derived information (CMORPH from NOAA and GSMap from JAXA)

# RCC Operations: Mandatory Functions

## 3. Long Range Forecasting



- *Input from GPCs-LRF/LC-LRFMME, other RCCs, use of their real-time products, indicate if there are challenges in accessing/using their products*
  - The monthly and seasonal LRF products (**2m mean temperature and total precipitation**) are generated in-house and checked with the respective GPCs and LC-LRFMME for closeness (**anomaly, tercile and quintile**).
- *Evaluation of model skills, and identification of specific models with relatively better performance for the region of interest*
  - A qualitative description of the monthly/seasonal rainfall/temperature outlooks is also provided by comparing three models (ECMWF SEA5, UKMO GloSEA5 and NCEP CFSv2).
  - ECMWF SEA5 and UKMO GloSEA5 models are generated from **Copernicus C3S database**, while NCEP CFSv2 is from **NOAA/NCDC**.
- *Any consensus statements (including RCOF coordination)*
  - *Prepared via the ASEANCOF, twice a year (Dec-Jan-Feb and Jun-Jul-Aug)*
- *Major constraints*
  - Before Copernicus, we felt unable to make some model data available via the RCC. It is also an unresolved issue for the future S2S products.



# RCC Operations: Mandatory Functions

## 3. Long Range Forecasting



### WMO RA V SEA RCC-Network

#### Long-range Forecasting Node

Demonstration Phase  
(Updated 31 October 2018; next update last week of November 2018)

Monthly Rainfall Outlook – November 2018

For November 2018, below-normal is favoured over much of southern ASEAN region and the Philippines. Elsewhere, climatological probabilities are predicted.

For November's rainfall, all three models – NCEP CFSv2, ECMWF, and the UK Met Office (Figures 1a-c) predict below-normal conditions for much the southern ASEAN region and the Philippines. NCEP CFSv2 predicts the largest spatial extent of below-normal conditions, including most of Borneo and parts of Peninsular Malaysia, while ECMWF and the UK Met Office restrict the drier conditions to the Philippines and those regions south of the equator.

For the rest of the northern ASEAN region, there is no dominant tercile among the models, indicating climatological probabilities, apart from northern Myanmar. Here, all three models predict an increase likelihood of below-normal rainfall, although the skill is low for this region in all models.

Overall, the models' skill for rainfall are very good south of the equator, the Philippines, and parts of the South China Sea (see the respective sections of 'Model products and verification: [NCEP](#), [ECMWF](#), [UK Met Office](#)').

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[Long-range Forecasting Node](#)

[Rainfall Outlook](#)

[NCEP Model products and verification](#)

[ECMWF Model products and verification](#)

[UKMO Model products and verification](#)

[Temperature Outlook](#)

[NCEP Model products and verification](#)

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[Quarterly Bulletin](#)

[Monthly El Niño/La Niña status](#)

[Notes on model configuration](#)

[Tropical Cyclones Outlook \(coming soon\)](#)

[Latest ASEAN/COP Consensus](#)

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#### Retrieve Past Outlooks

Rainfall Outlooks for Year 2018

- November 2018 and NDJ 2018-2019
- October 2018 and OGD 2018
- September 2018 and SON 2018
- August 2018 and ASO 2018
- July 2018 and JJA 2018
- June 2018 and JJJ 2018
- May 2018 and MAM 2018
- April 2018 and AMM 2018
- March 2018 and MAM 2018
- February 2018 and FFM 2018
- January 2018 and JFM 2018

### WMO RA V SEA RCC-Network

#### Long-range Forecasting Node

Demonstration Phase  
(Updated 31 October 2018; next update last week of November 2018)

ECMWF SEAS model's Rainfall Products and Verification

Monthly Products
Seasonal Products

#### Monthly Products

The model outlook products below are provided for the region. For specific assessment on the national scale, the relevant ASEAN National Meteorological and Hydrological Services should be consulted. Refer to [Notes on Model Configuration](#) for details on how the forecasts are generated.

The products are generated using modified Copernicus Climate Change Service (C3S) information.

Anomaly Forecasts
Tercile Forecasts
Selected Quintile Forecasts

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#### Selected Quintile Forecasts

November 2018 May (Asian Normal Rainfall) (quintile), ECMWF

#### Relative Operating Characteristic (ROC) Scores

November Rainfall May (Asian Normal Rainfall) ROC scores against ERA-Interim, 0.5 days

November 2018 May (Asian Normal Rainfall) (quintile), ECMWF

November Rainfall May (Asian Normal Rainfall) ROC scores against ERA-Interim, 0.5 days

# RCC Operations: Mandatory Functions

## 4. Training/Guidance in the use of RCC products

Training function is shared between 3 nodes

**Next up...**  
 ASEAN Regional Climate Datasets and Extremes Workshop (ARC-DEX)  
 25 - 29 March 2019  
 Singapore

Subject	Participants: target audience, number	Duration and venue
S2S-SEA Capability Building Workshop I (2017) and II (2018)	NHMSs, IRI, RIMES, AHA (~32 participants)	Both were 5-day workshops, held in Singapore
Best Practice Workshop on Climate Change Projections and their applications in ASEAN countries	Experts from UK Met Office, CSIRO, BoM, CORDEX-SEA, TMSI, EOS, NHMSs and regional end-users (~36 participants)	4-day workshop, Singapore

# Role in RCOF Activities

ASEAN Specialised Meteorological Centre (ASMC) is the coordinator of ASEANCOF

- *Technical guidance for RCOF outputs*
  - Providing probabilistic model products at longer lead times when necessary
- *Training activities*
  - Introductory presentations on the RCC developments in the region
  - Scoping exercises for functions in RCC (eg Climate Watch)
- *Resource mobilization for RCOFs*
  - Managed by ASMC



# User Engagement

Received feedback via the various workshops (S2S Workshop Series) we conducted locally, ASEANCOFs and also from the Mekong River Commission workshop we attended.

- There were discussions on more tailored products such as **monsoon onset times/breaks**, e.g. agricultural sector requirements (theme of ASEANCOF-9) and water resource management (Mekong River Commission International Conference, 2018) and **extreme indices** (ASEANCOF-11)
- We tested the skill of S2S model in predicting monsoon breaks (**number of dry days**) in the last S2S workshop and we are looking to test other products in future S2S workshops.



NMHSs participants, trainers, and end-users of the S2S-SEA II Workshop.



Participants discussing on the requirements of end users and the challenges and opportunities of using the S2S model output in applications.

# SWOT analysis

## *Strengths and Opportunities*

- Good predictive skill for our region in the sub-seasonal/seasonal timescale.

## *Weaknesses*

- Seem to be difficult to coordinate among different RCCs and RCC-Networks (to share resources/best practices).

## *Threats*

- Manpower constraints affecting long-term sustainability of products.
- Lack of current interest (inertia?) across different stakeholders may lead to the fizzling out of the RCC initiative.



# Way Forward

- To include **sub-seasonal predictions** (research where there is skill that is relevant for the various sectors). The list of variables is being reviewed and scoped through the S2S Workshop activities.
- To develop for the region a reference **MME seasonal forecast** (one that has been assessed to be skilful for the region).
- On the **climate change timescale**, the products/services extended by the RCC need to be carefully deliberated in view of resource constraints and other existing initiatives in the region (e.g. CORDEX-SEA). *Is the RCC the best mechanism?*



# Thank you

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