



TCC/JMA Activities and Seasonal Prediction for Summer 2019



Takuya Komori

*Tokyo Climate Center (TCC)
Japan Meteorological Agency (JMA)*

Introduction of TCC

Tokyo Climate Center of the Japan Meteorological Agency (TCC/JMA)

- TCC serves as a WMO Regional Climate Center in the RA II.
- TCC supports NMHSs through data/information provision and capacity development activities.

Tokyo Climate Center (TCC)

Provision of climate data, information and tools via the Internet

- ❑ Seasonal forecasts
- ❑ El Nino Outlook
- ❑ Report on extreme events
- ❑ Global warming
- ❑ Climate system analysis
- ❑ Reanalysis data

Capacity Development

- ❑ Training seminar
- ❑ Expert visit

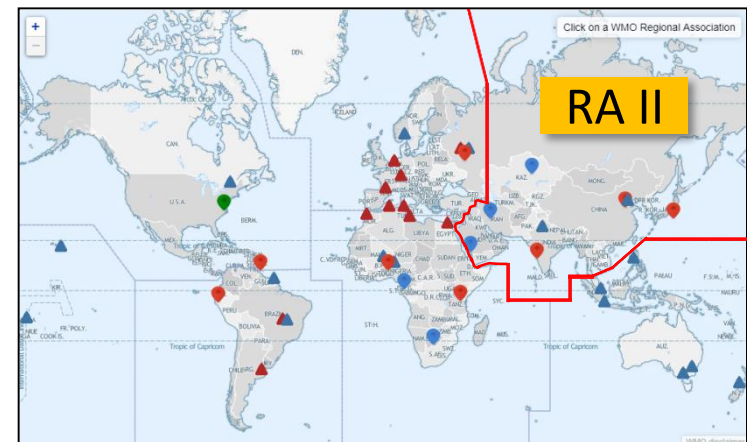
Asia and Pacific region

NMHSs

Provision of climate information using TCC data based on national requirements

Utilization of Climate Information

Disaster risk reduction, Food security, Water resource management etc.



Current status of establishment of RCC

TCC was designated as RCCs in RA II in 2009.

- designated RCC
- ▲ designated RCC-Network
- RCC in demonstration phase
- ▲ RCC-Network in demonstration phase
- RCC proposed
- ▲ RCC-Network proposed

Home	World Climate	Climate System Monitoring	El Niño Monitoring	NWP Model Prediction	Global Warming	Climate in Japan	Training Module	Press release	Links
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HOME

What are WMO RCCs

WMO RCCs are centres of excellence...

RCC Functions

Operational Activities for Long-range Forecasting

Operational Activities for Climate Monitoring

Operational Data Services, to support operational LRF and climate monitoring

Training in the use of operational RCC products and services

Latest Updates

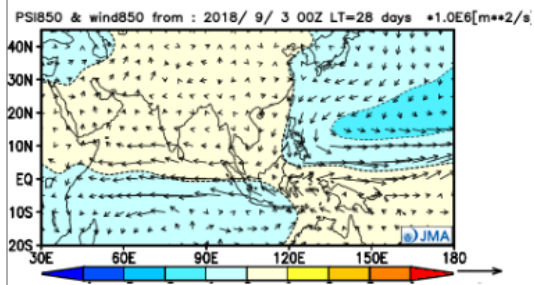
World Climate Updated: 14 September 2018

Climate System Monitoring Updated: 14 September 2018

El Niño Monitoring Updated: 10 September 2018

Monthly Discussion Updated: 25 September 2018

Monthly Discussion on Seasonal Climate Outlook No.55 is issued on 25 September 2018.



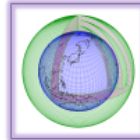
Ensemble forecast for stream function and wind vector at

Main Products



iTacs

iTacs, Interactive Tool for Analysis of the Climate System, is a web-based application to assist NMHSs to analyse extreme climate events and to monitor climate status.



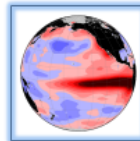
GPC Tokyo

Products of long-range forecast from Global Producing Center (GPC) Tokyo are available. These products are based on JMA's ensemble prediction system.



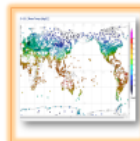
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This is intended to assist NMHSs in the Asia-Pacific region in interpreting GPC Tokyo's three-month prediction and warm/cold season prediction products.



El Niño Monitoring

"El Niño Outlook" consists of a diagnosis of current condition and prediction of El Niño/Southern Oscillation. This is issued every month around 10th.



ClimatView

The ClimatView tool enables viewing and downloading of monthly world climate data, including monthly temperature/precipitation statistics and 30-year climate normals.



TCC News

TCC News, a quarterly newsletter from Tokyo Climate Center, acquaints with significant climate disasters and

What's New



30 August 2018 NEW

- ▶ [TCC News No. 53 \(Summer 2018: PDF\)](#)
 - Upgrade of JMA's Supercomputer System
 - Primary Factors behind the Heavy Rain Event of July 2018 and the Subsequent Heatwave in Japan from Mid-July Onward
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22 August 2018 NEW

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1 June 2018

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17 May 2018

- ▶ [Announcement: World Climate Webpage revamp](#)

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WMO Regional Centres of excellence...
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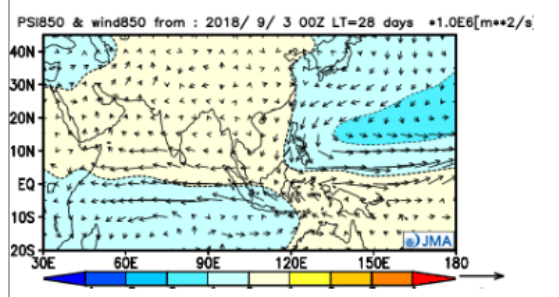
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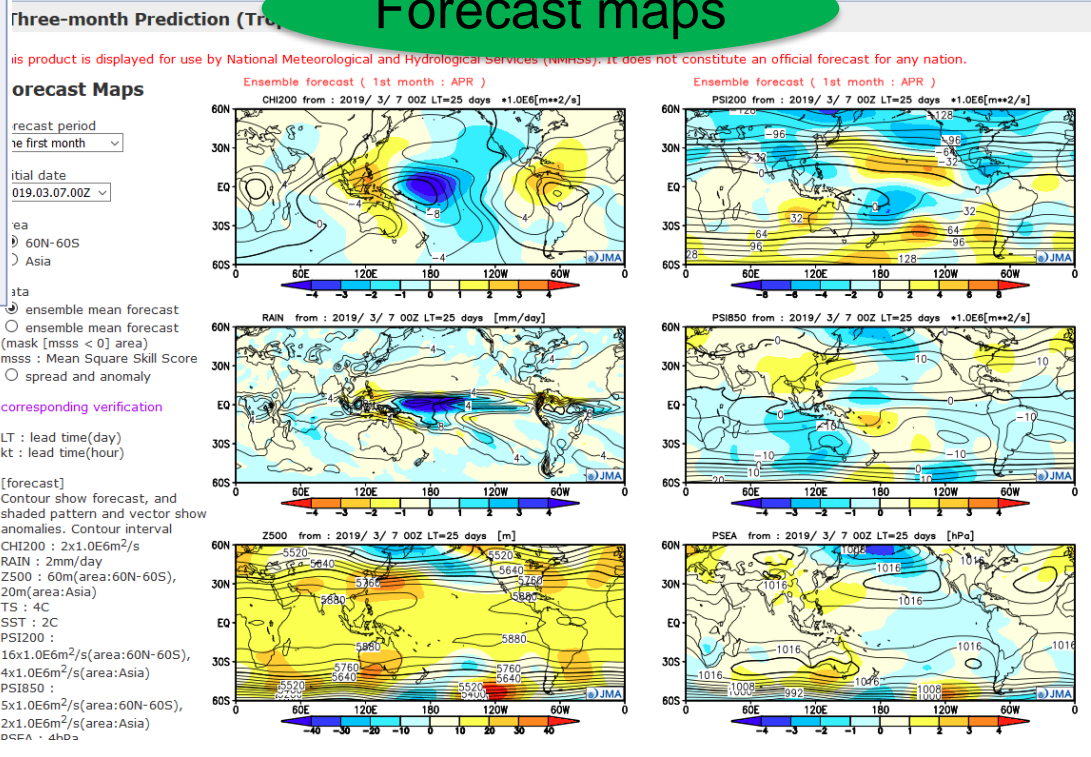
TCC Website

<https://ds.data.jma.go.jp/tcc/tcc/index.html>

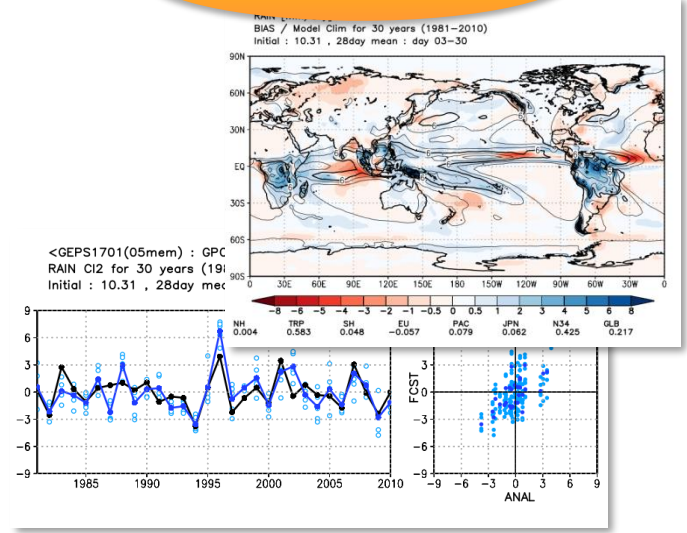
NWP Model Prediction

- Three-month Prediction
 - Three-month Prediction (12 Mar 2019)
 - Z500, T850 & SLP (Northern Hemisphere) (12 Mar 2019)
 - Stream Function, Velocity Potential & Surface Air Temperature (60N-60S) (12 Mar 2019)
 - Verification (06 Apr 2019)
 - Hindcast Verification (JMA/MRI-CPS2)
 - Probabilistic Forecast and Verification (12 Mar 2019)
 - SST Index Time-series Forecast (12 Mar 2019)

Forecast maps



Verification



➤ Various results based on hindcast experiment are also available on this page.

<https://ds.data.jma.go.jp/tcc/tcc/products/model/index.html>

Probabilistic Forecast for JJA 2019

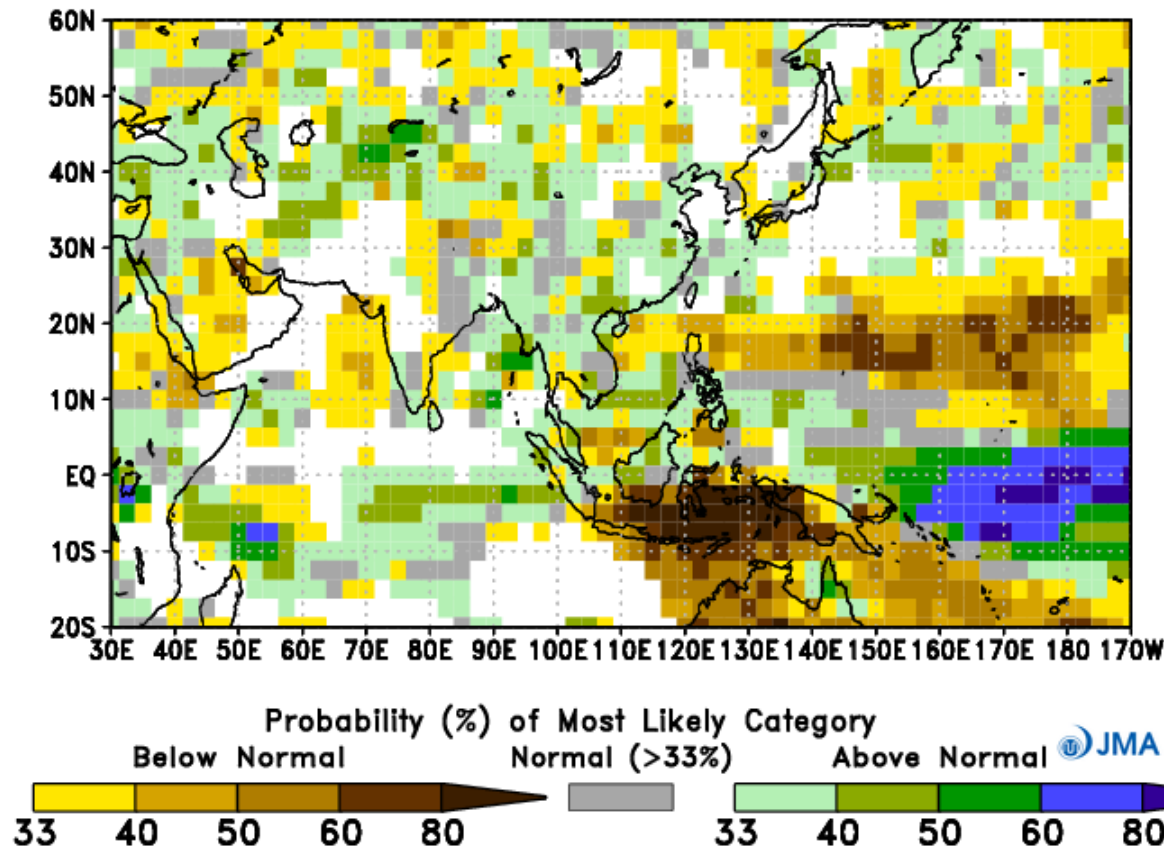
Initial Month: Apr 2019

JMA Seasonal Forecast (Forecast initial month is 04 2019)
Most likely category of Precipitation for JJA 2019

51 ensemble members

Model Output Statistics (MOS) technique based on the 30 years hindcast is used.

Masked grids denote insufficient prediction skill (ROC area score < 0.5).



- Most likely category is **below normal** in north countries of South Asia, and **above normal** in Sri Lanka and South India.

Probabilistic Forecast for **JJA** 2019

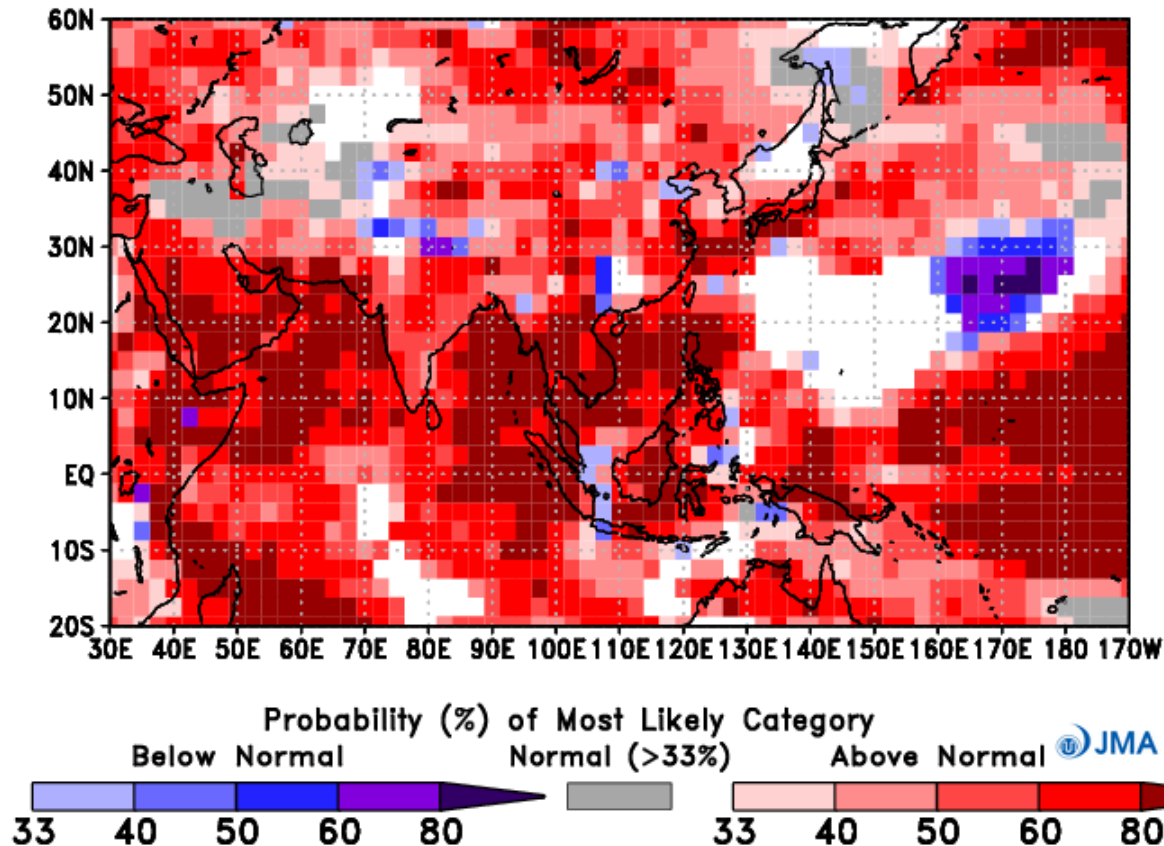
Initial Month: Apr 2019

JMA Seasonal Forecast (Forecast initial month is 04 2019)
Most likely category of Surface Temperature for JJA 2019

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- Temperature is expected to be **above normal** in the most part of South Asia.

Monthly Discussion on Seasonal Climate Outlook

'Monthly Discussion on Seasonal Climate Outlook' is intended to assist NMHSs in the Asia-Pacific region in interpreting GPC-LRF Tokyo's three-month prediction and warm/cold season prediction products. This is issued every month around 25th.

Monthly Discussion on Seasonal Climate Outlooks (No. 1)
(25 March 2014)

Tokyo Climate Center (TCC)
Japan Meteorological Agency (JMA)

Asian Circulation

GPCP predicts cyclonic circulation anomalies over the North Indian Ocean with moderate of weaker-than-normal monsoon circulation.

Top-left: 850 hPa stream function ($10^6 \text{ m}^2/\text{s}$) and wind vector anomalies; Top-right: rainfall amounts (mm/day), Bottom-left: sea level pressure (hPa); Bottom-right: surface air temperature ($^{\circ}\text{C}$)
Contour: three-month average; Shading: anomalies

Verification based on hindcast <http://ds.data.jma.go.jp/tcc/tcc/products/model/hindcast/4mE/index.html>

- For March, enhanced over troposphere, and northern China Sea.
- High probability of near-normal rainfall is predicted around the Indochina Peninsula.
- High probability of above-normal temperature is predicted in South Asia.



TCC
producing materials

NMHSs
making seasonal outlooks





Tokyo Climate Center

Main products

WMO Regional Climate Center in RA II (Asia)

Latest news of TCC's activities



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Home World Climate Climate System Monitoring El Niño Monitoring NWP Model Prediction Global Warming Climate in Japan Training Module Press release Links

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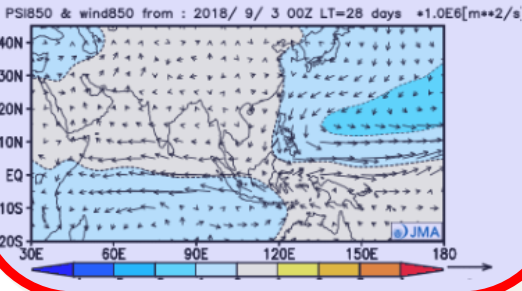
Update information on TCC products

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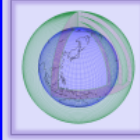
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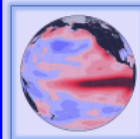
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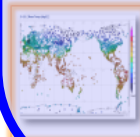
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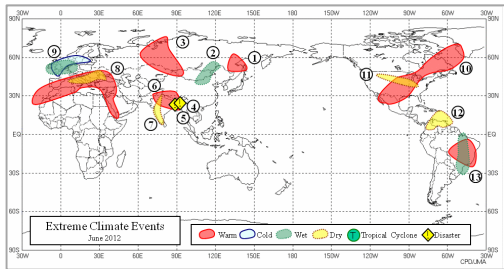
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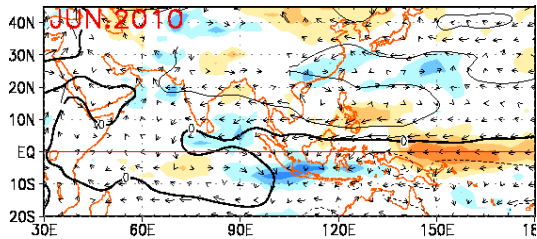
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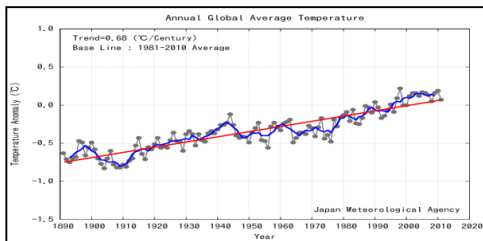
Examples of climate information, data, tool and products



Monitoring of Extreme Climate Events



Asian Monsoon Monitoring

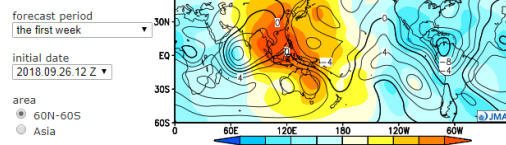


Global Average Surface Temperature Anomalies

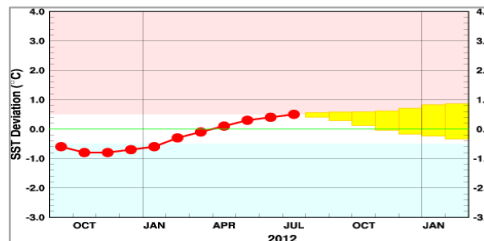
One-month Prediction (Tropics and Asia)

This product is displayed for use by National Meteorological and Hydrological Services (NMHSs).

Forecast Maps

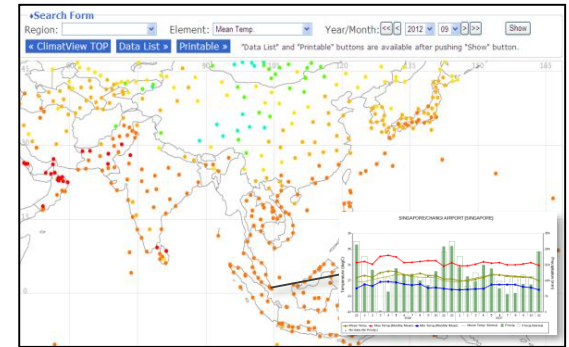


One-month Forecast maps



El Niño outlook

Gridded Data(1-month, 3-month, Seasonal forecast)



Climate database

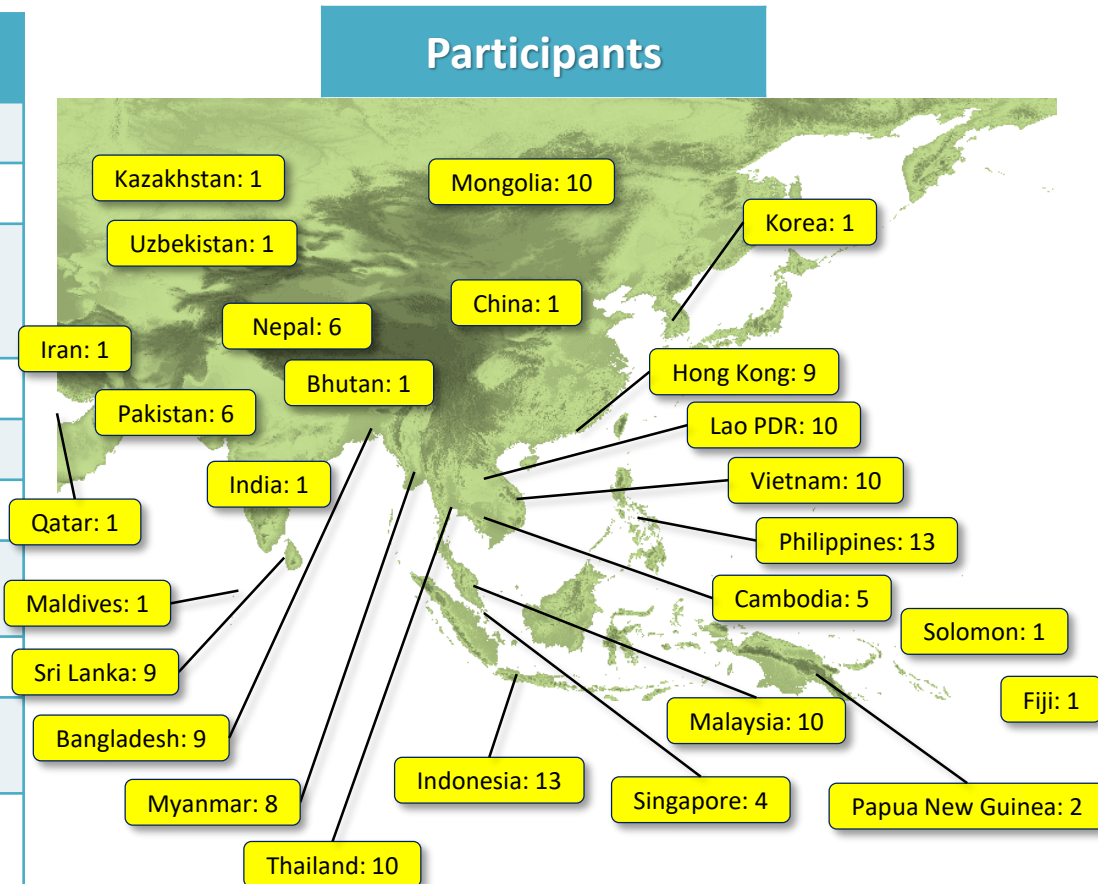
iTacs

Interactive Tool for Analysis of the Climate System (iTacs)

TCC training seminar

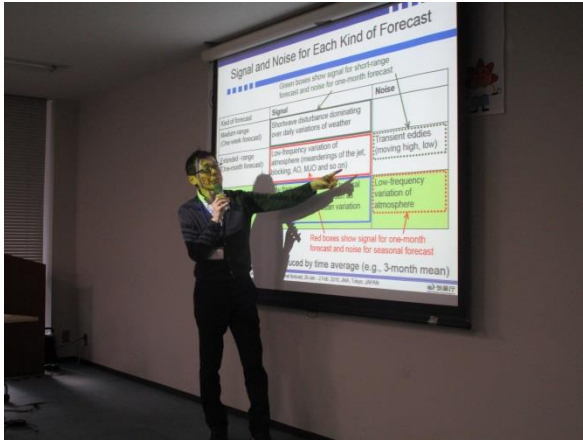
- TCC has organized an annual one-week training seminar since 2008 attended by a dozen of invited experts from NMHSs in Asia-Pacific region.
- Each seminar deals with a different theme from climate analysis, long-range forecast and global warming projection.

Theme		
1	Nov. 2008	Climate Information and Forecasting
2	Dec. 2009	Climate Analysis using Reanalysis Data
3	Jan. 2011	Application of Seasonal Forecast Gridded Data to Seasonal Forecast Products
4	Nov. 2011	One month Forecast Products
5	Nov. 2012	Climate Analysis Information
6	Nov. 2013	Seasonal Forecast Products
7	Jan. 2015	Global Warming Projection Information
8	Nov. 2015	One-month Forecast
9	Nov. 2016	Primary Modes of Global Climate Variability and Regional Climate
10	Jan. – Feb. 2018	Seasonal Forecast
11	Nov. 2018	One-month Forecast

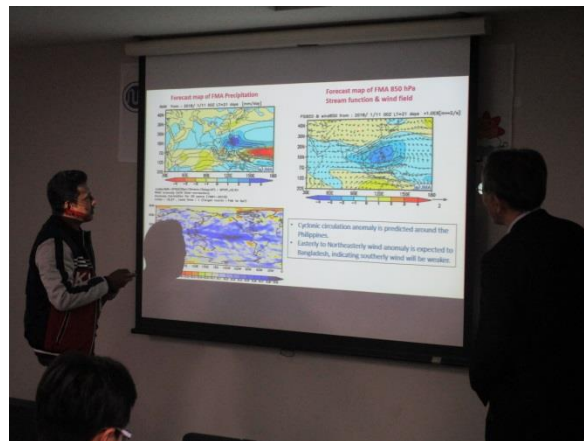
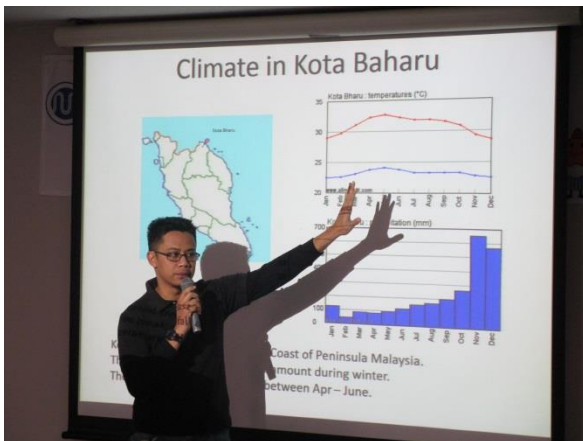


TCC training seminar

Lecture and Exercise session



Presentation on results of the exercise



Thank you for your kind attention.

New product for drought monitoring by SPI

TCC has started providing drought monitoring information via the TCC's ClimatView tool from 19 March 2019. On the webpage, TCC provides SPI value from June 1982 to present with the following formats;

Geographical distribution map

ClimatView - a tool for viewing monthly climate data

The ClimatView tool enables viewing and downloading of monthly world climate data, inc Data are available for the period since June 1982, when JMA started receiving CLIMAT me

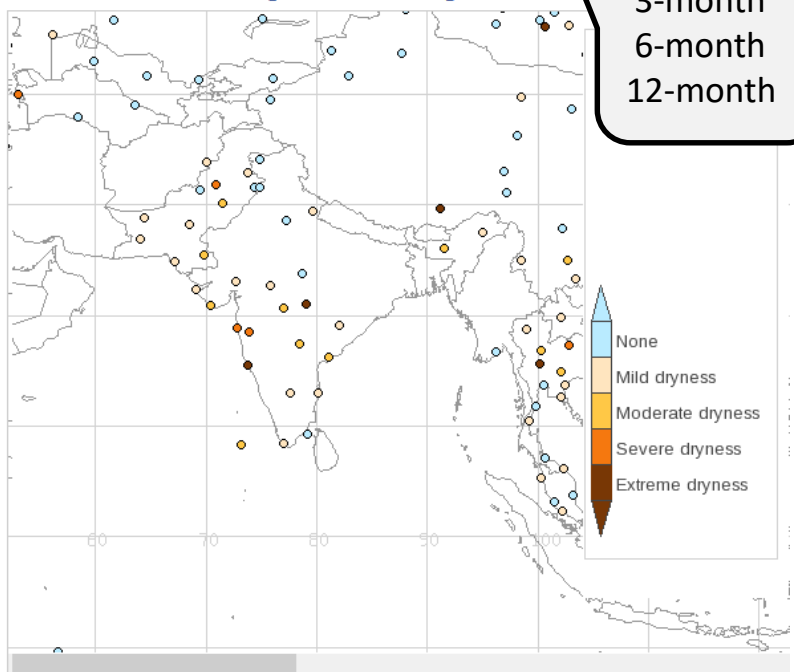
[Outline of ClimatView](#) [Commentary on SPI](#)

Search Form

Region: Element: Year

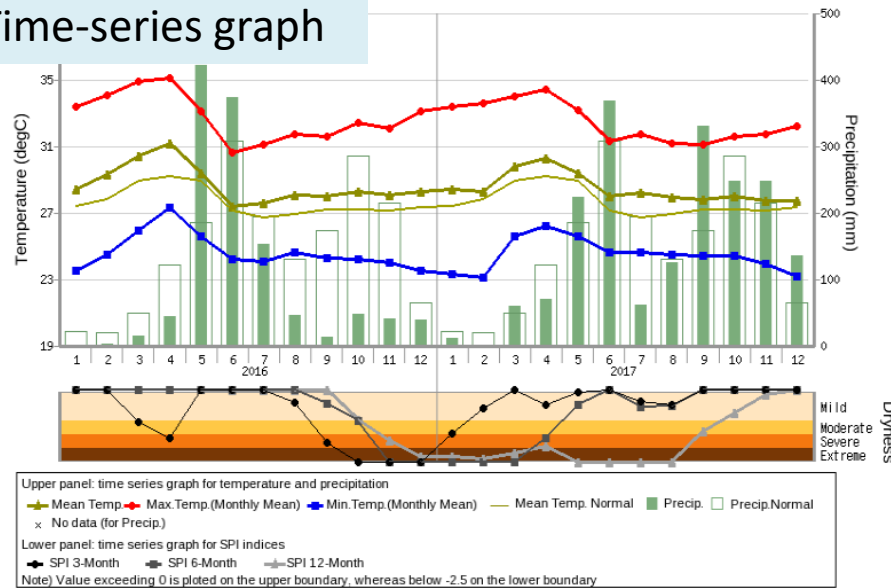
[Data List >](#) [Printable >](#) Click the "Show" button to reflect elements selected via the

2018-09 - 2018-11: [SPI 3-month]



3-month
6-month
12-month

Time-series graph



THIRUVANANTHAPURAM -INDIA (STATIONS SOUTH OF LATITUDE 20~N)
Lat.: 8.48 °N / Lon.: 76.95°E Height: 59(m)

[download](#) ----download in csv file

Digitarized data and its download

	SPI		
	3-Month	6-Month	12-Month
2016-08	-0.39	0.10	0.94
2016-09	-1.85	-0.42	0.17
2016-10	-4.10	-1.08	-1.04
2016-11	-4.07	-2.88	-1.77
2016-12	-3.05	-3.70	-2.34

New tool for statistical guidance at station points (one-month forecast)

TCC has started providing new interactive tool for generating statistical guidance at station points in support of operational seasonal forecast for one-month or less.

Input observation data

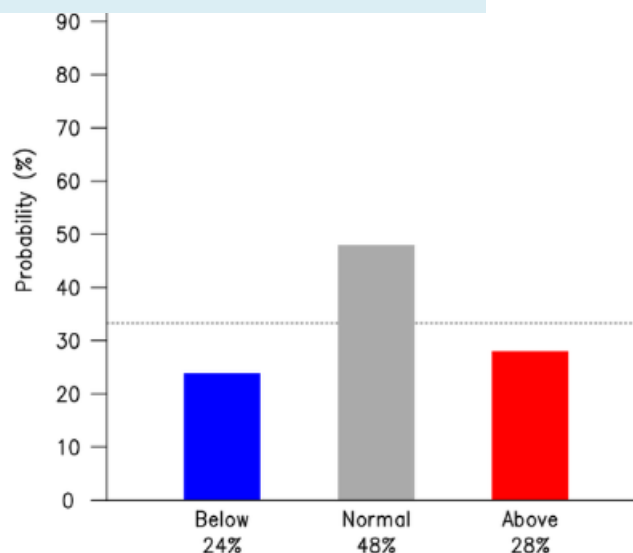
JMA's One-month Guidance Tool ([Online Help](#))

Initial date: 20171122 → The beginning and ending date of the valid time will be automatically set on the next pull-down
Forecast period: 2017 / 11 / 23 - 2017 / 12 / 24
Predictor: Surface temperature -- No.2 -- -- No.3 --
Station and observation data: (Sample text data: [Temperature](#), [Precipitation](#))

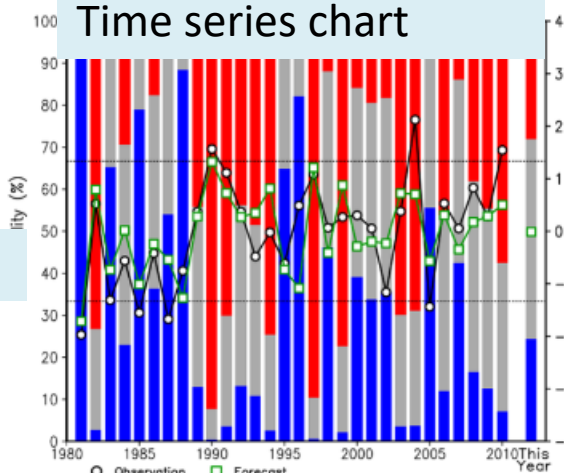
```
#elname=temperature,,,,,,,,,,,,,  
#undef=-9999,,,,,,,,,,,,,  
#station=,, TOKYO, NIIGATA, SENDAI, NAC  
#lon=,, , 139.75, 139, 140.8, 137, 135.5, 3  
#lat=,, , 35.691, 38, 38.25, 35.2, 34.6, 4:  
1981, 1, 1, 5, 2.2, 1.8, 3.4, 4.6, -3.3, 2.7,  
1981, 1, 2, 4.6, 4.3, 2.9, 3.5, 5, -2.2, 2.9,  
1981, 1, 3, 5.1, 4.3, 1.1, 2.2, 3, -0.3, 1.2,  
1981, 1, 4, 4.4, 4.7, 1.9, 1.7, 2.9, -2.4, 1.  
1981, 1, 5, 4.1, 1.9, 0, 1.8, 2.7, -6.7, 2.2,
```

station = TOKYO init time = 20171122(period:20171123-20171224)

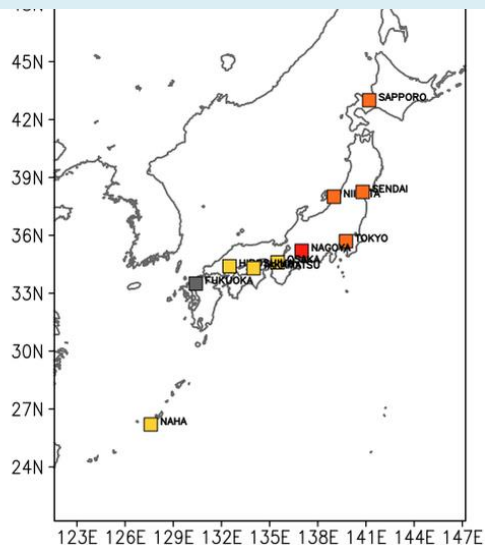
Tercile probabilities



Time series chart



Geographical forecast map



users need to provide only past observation data to create guidance forecasts.

Following figures and data are automatically calculated and appear;

- Figure on a tercile probability map
- Figure(s) on tercile probability (color bars) at station(s)
- Figure on an inter-annual time-series representation of tercile probability for the verification period
- Figure(s) on a reliability diagram with reliability and forecast frequency(ies)
- CSV-format data file used to create said figures

https://extreme.kishou.go.jp/tool/simple_guidance/help/