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아경투시도

APCC Report

2007 Member WG Meeting

Chi-Yung Francis Tam



주경투시도



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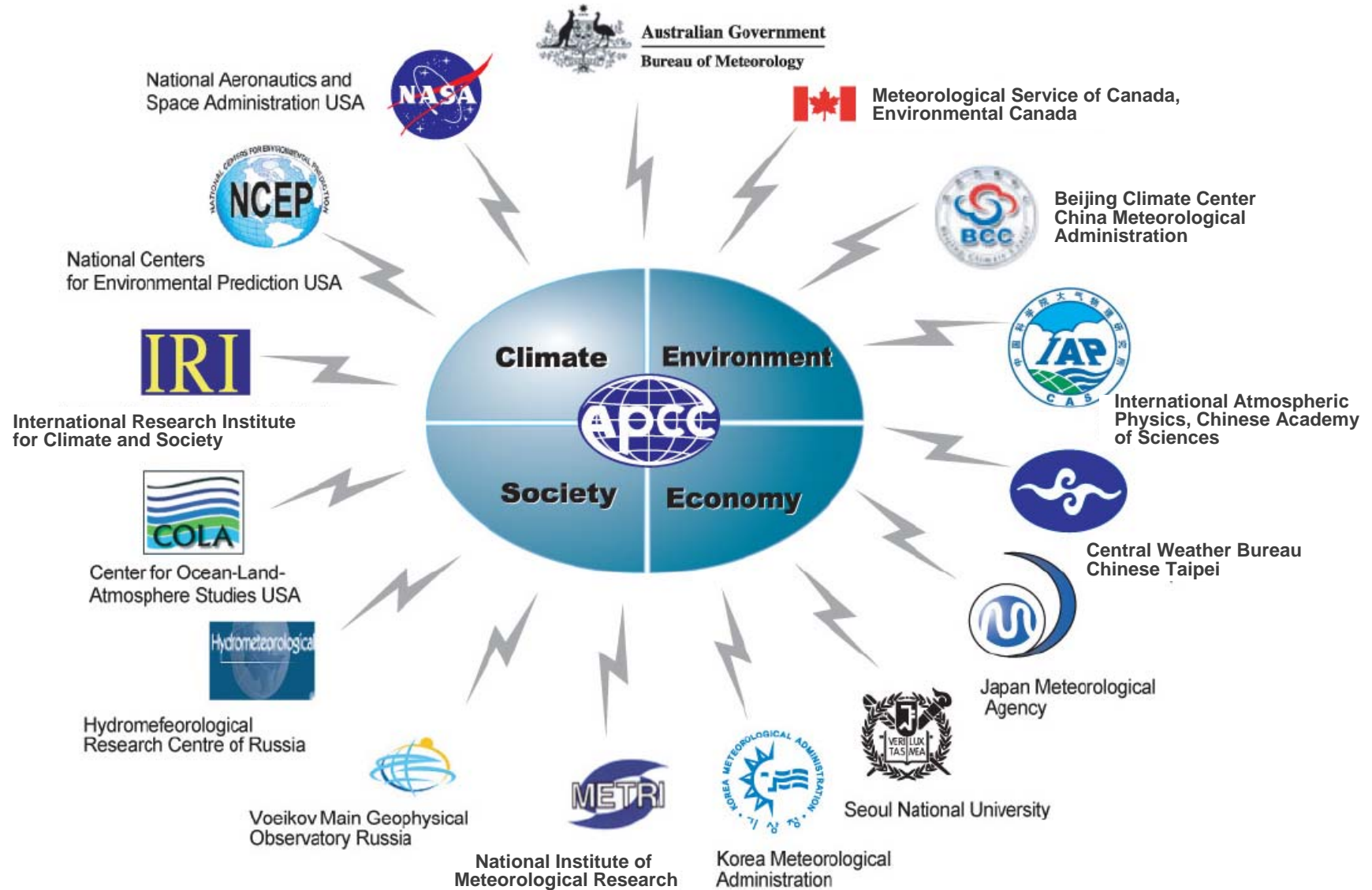
Seasonal Forecast



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MME Seasonal Forecast



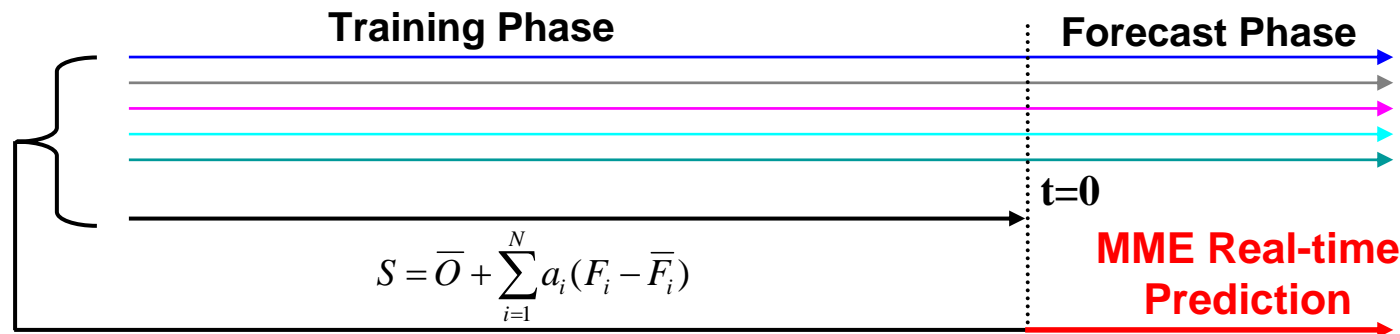
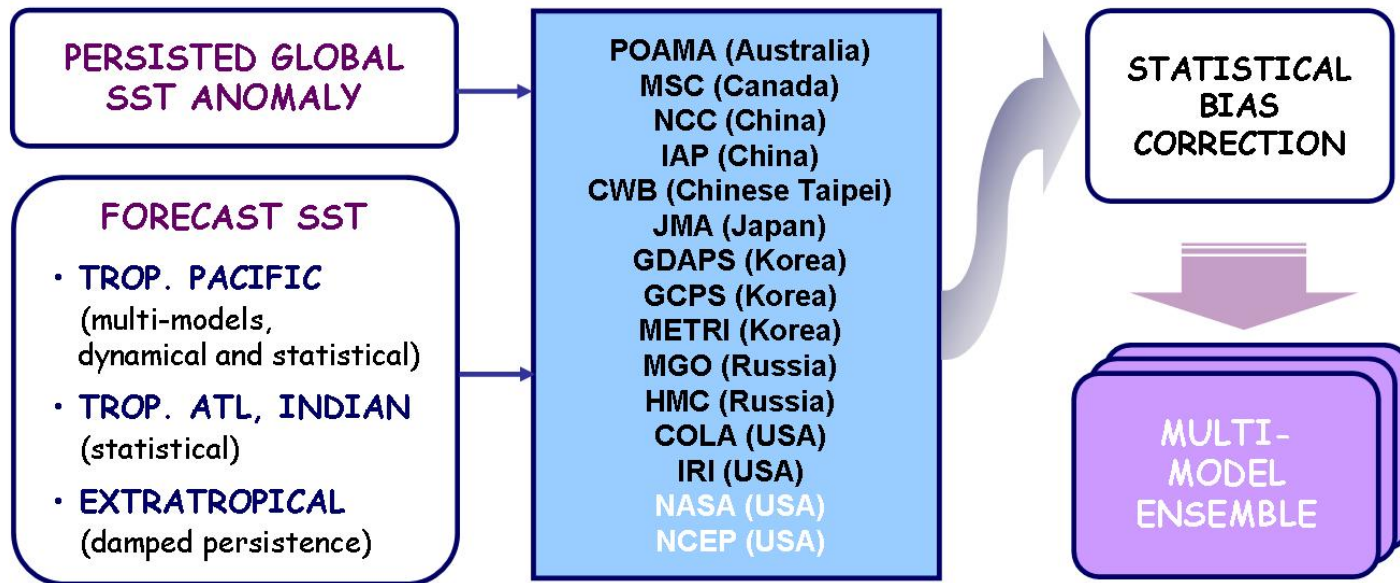


Participating Models

Member Economies	Acronym	Organization
Australia	POAMA	Bureau of Meteorology Research Centre
Canada	MSC	Meteorological Service of Canada
China	BCC	Beijing Climate Center/CMA
	IAP	Institute of Atmospheric Physics
Chinese Taipei	CWB	Central Weather Bureau
Japan	JMA	Japan Meteorological Agency
Korea	GDAPS/KMA	Korea Meteorological Administration
	GCPS/SNU	Seoul National University
	METRI/KMA	Meteorological Research Institute
Russia	MGO	Main Geophysical Observatory
	HMC	Hydrometeorological Centre of Russia
USA	IRI	International Research Institute
	COLA	Center for Ocean-Land-Atmosphere Studies
	NCEP	NCEP Coupled Forecast System
	NASA-GSFC	National Aeronautics and Space Administration



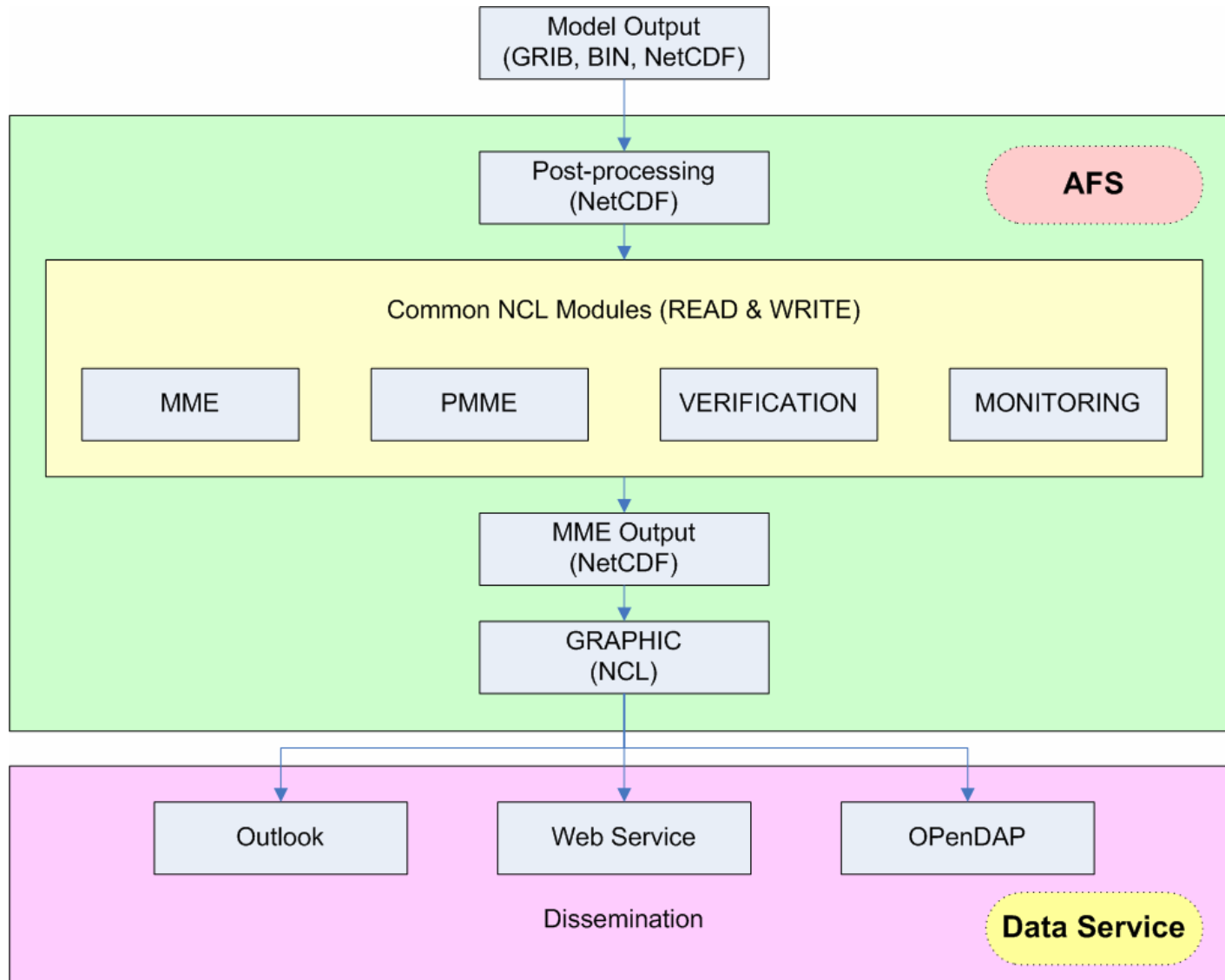
APCC Dynamical Climate Forecast System (Tier2)



The weights are computed at each grid point by minimizing the function: $G = \sum_{t=0}^{train} (S_t - O_t)^2$



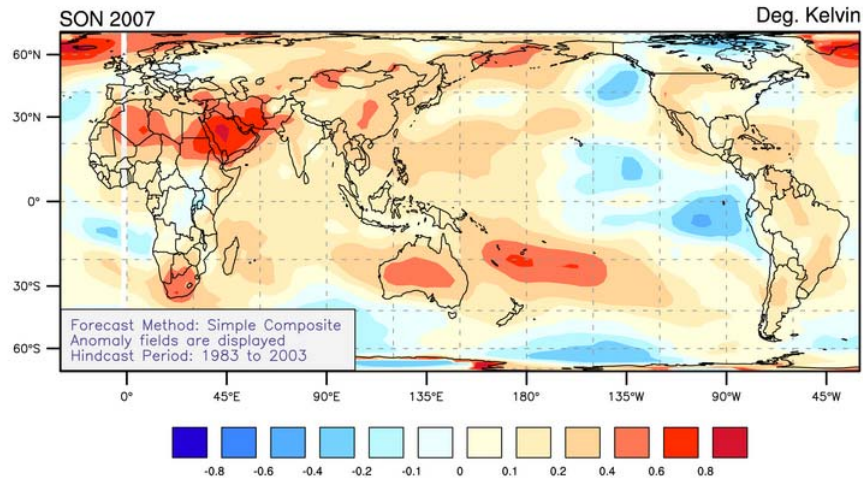
Automatic Forecast System





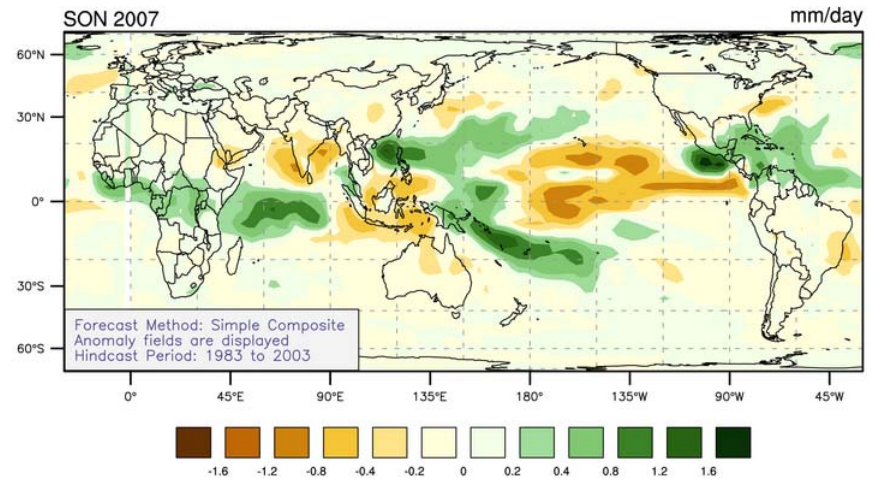
APCC 2007 SON Forecast (DMME)

Multi-Model Deterministic MME for Temperature at 850hPa



© APEC Climate Center created:09/14/07

Multi-Model Deterministic MME for Precipitation

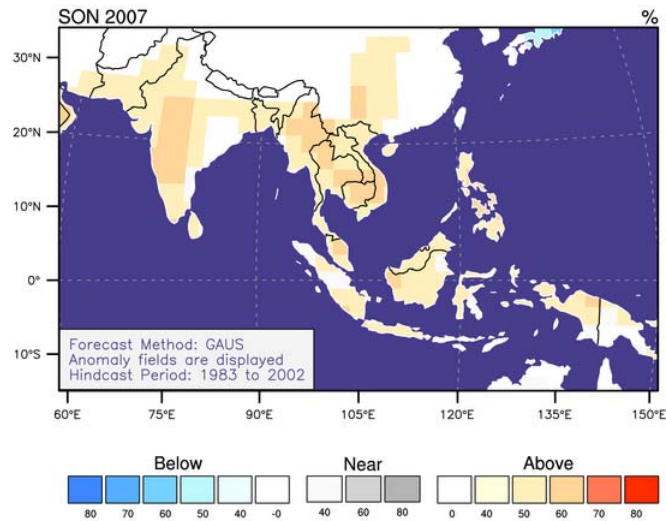


© APEC Climate Center created:09/14/07



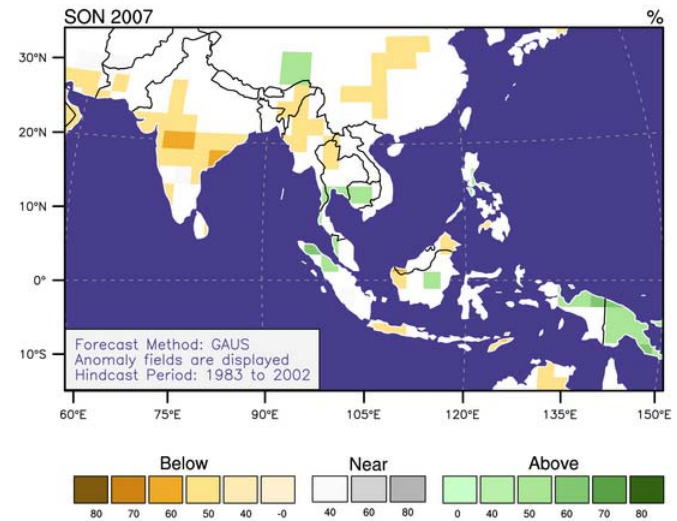
APCC 2007 SON Forecast (PMME)

Multi-Model Probabilistic MME for Air temperature at 850mb



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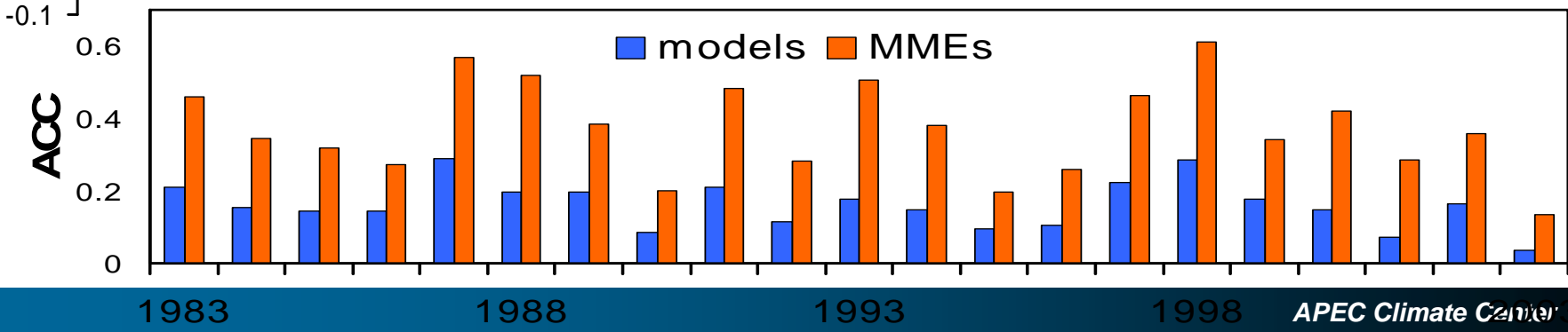
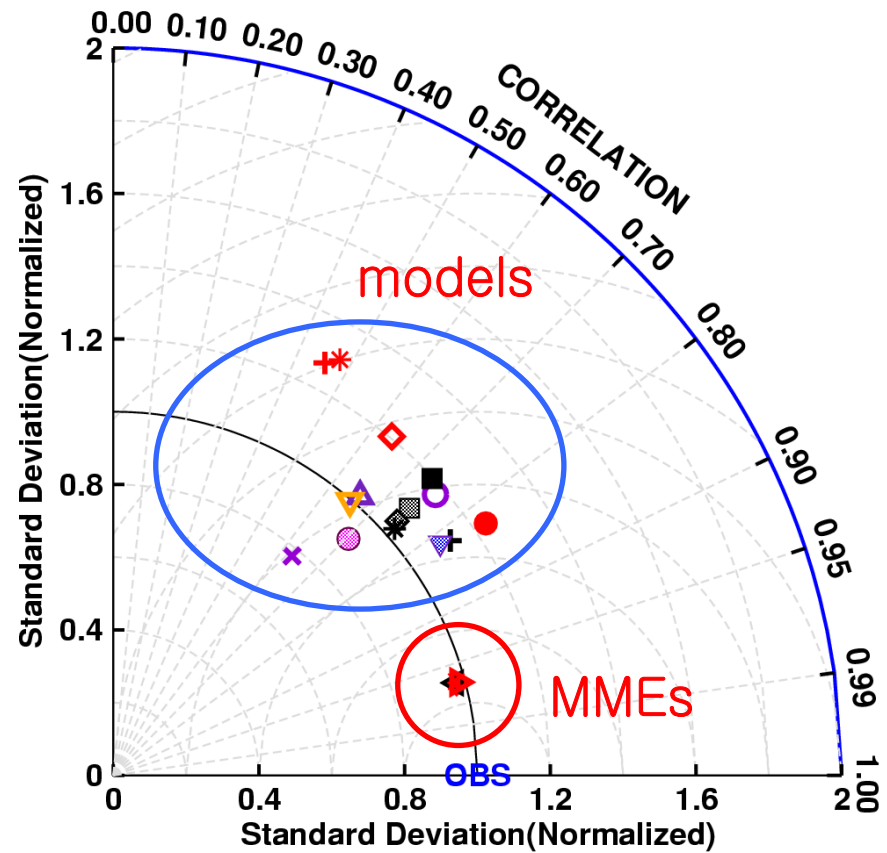
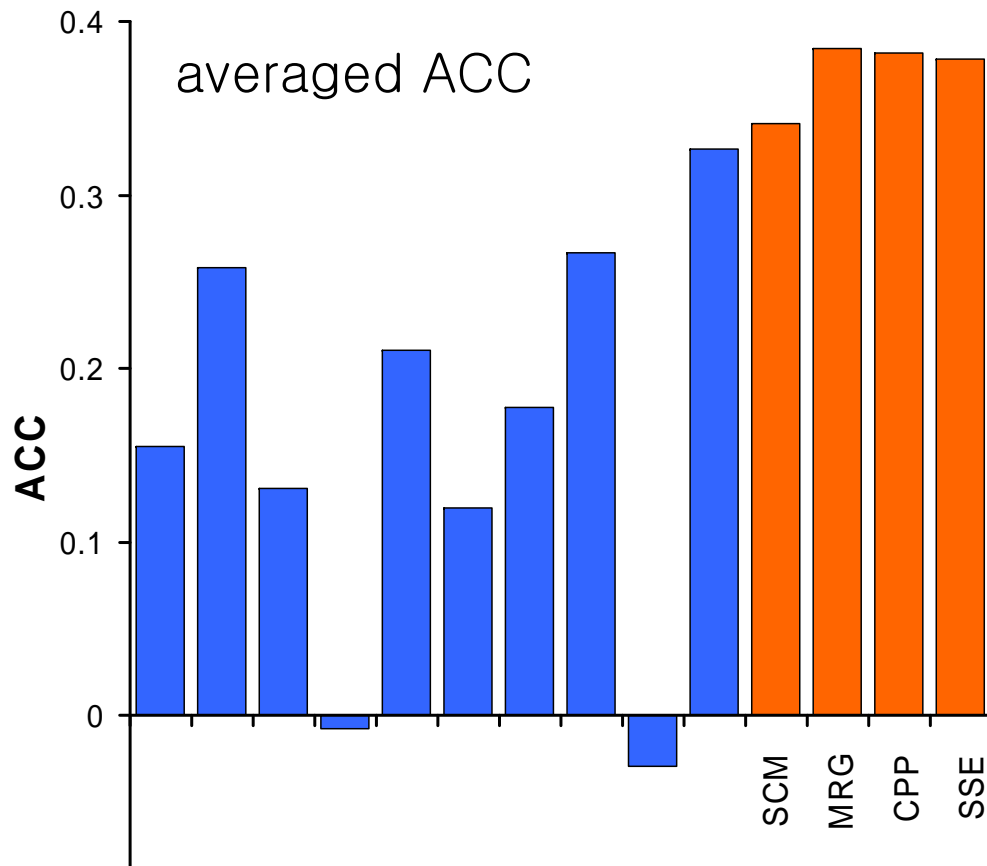
Multi-Model Probabilistic MME for Precipitation



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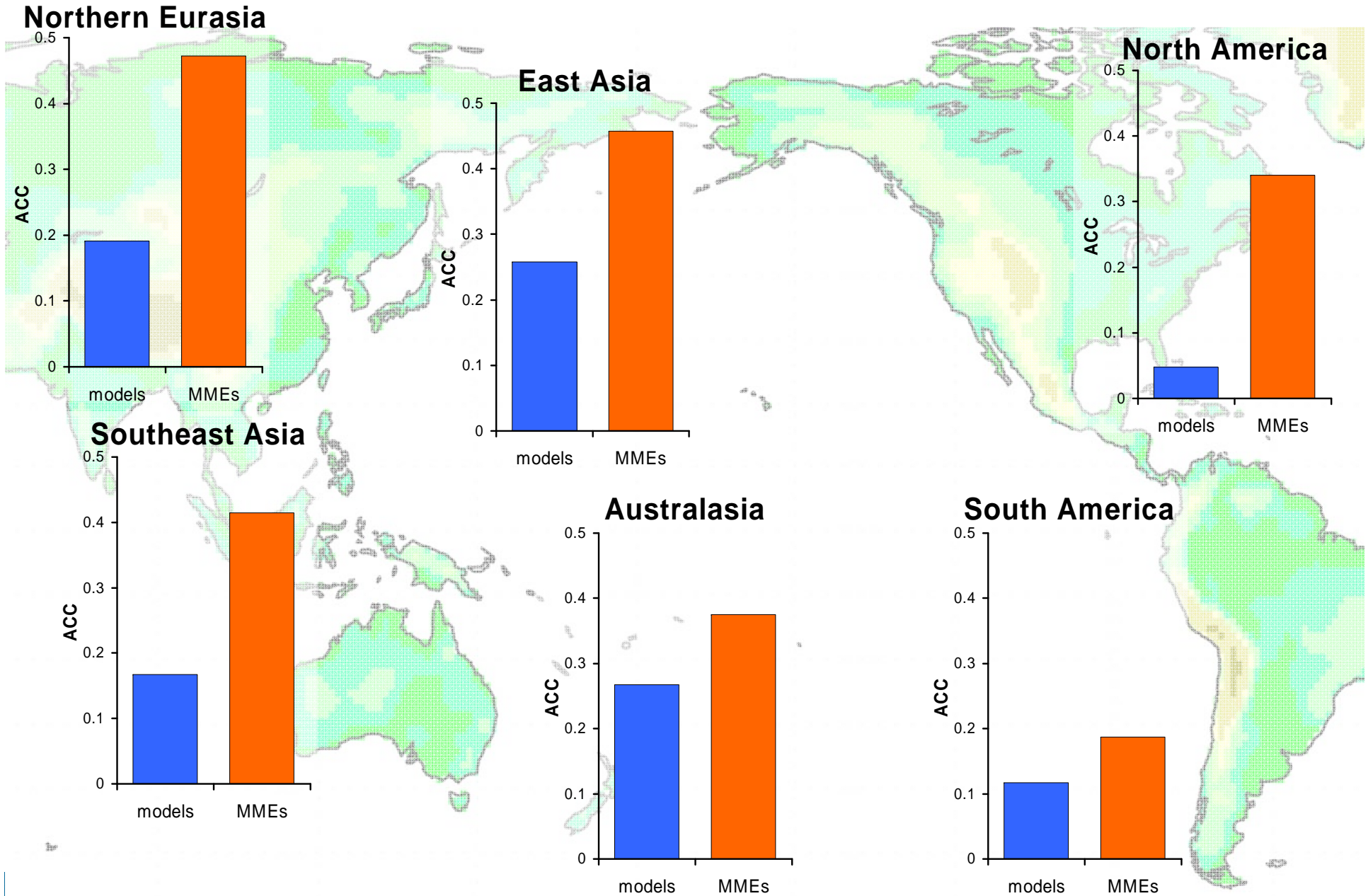


Hindcast Verification (JJA, Prec, Global)





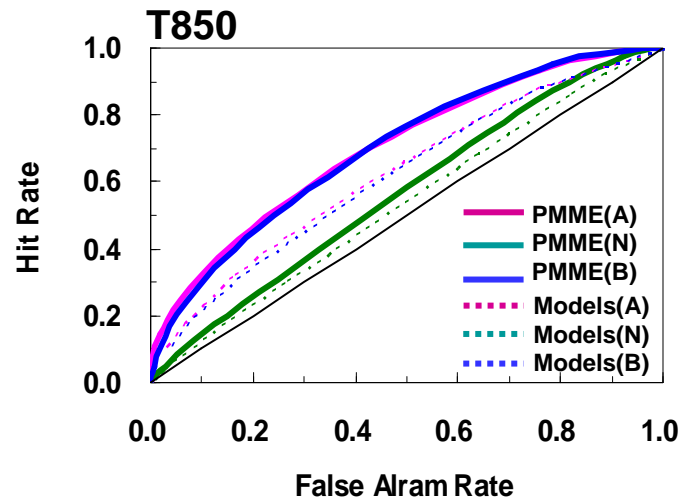
Forecast Verification (2007JJA, T850)



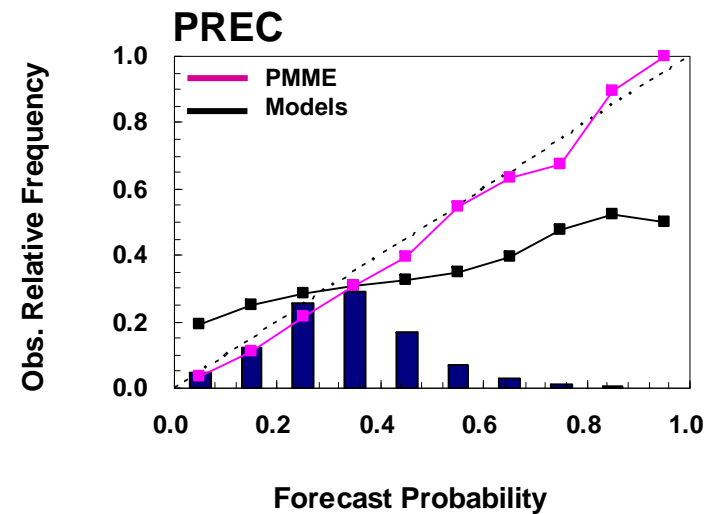
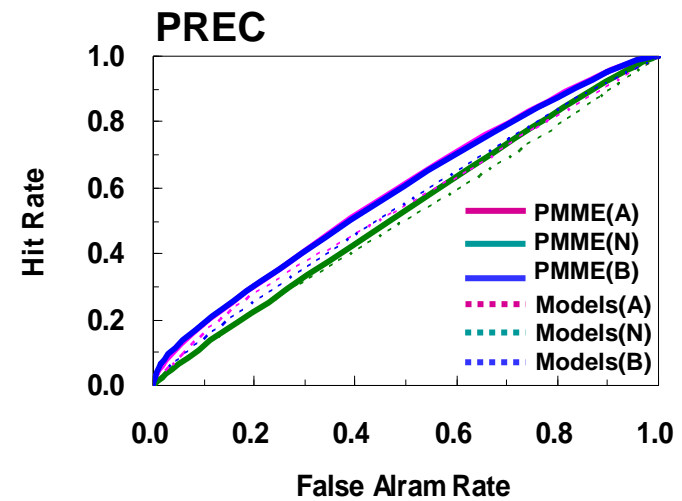
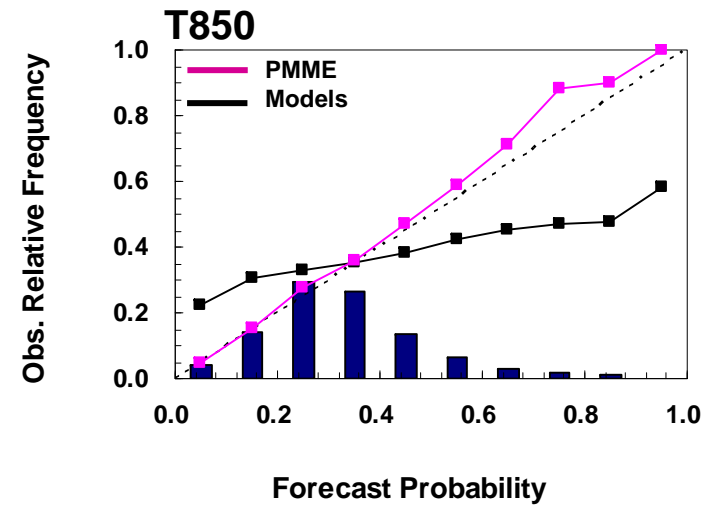


Hindcast Verification (T850, Prec, Global)

ROC Curve



Reliability Diagram

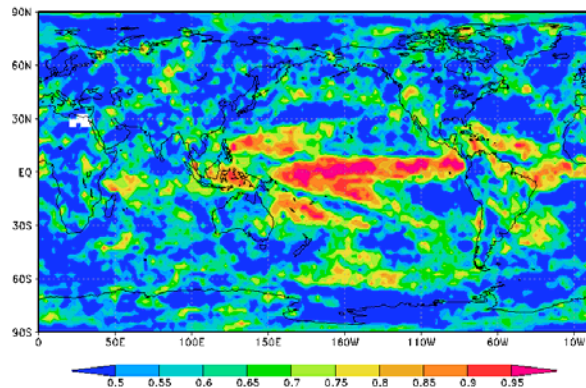




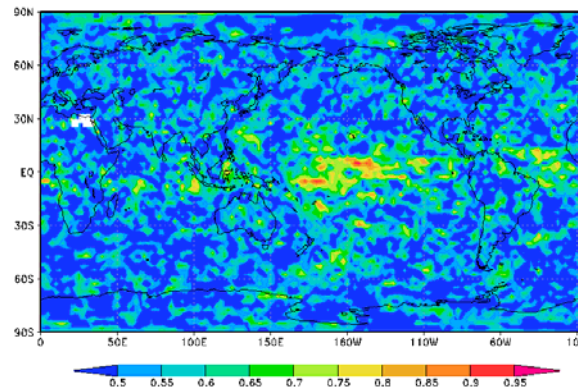
Hindcast Verification (Prec)

AROC and Statistical Significance Maps for JJA Precipitation

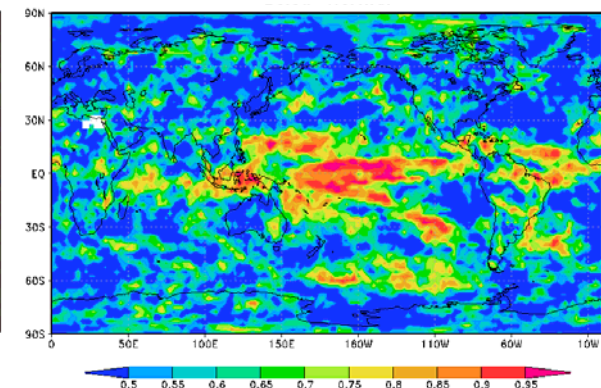
(a) AROC : Above-Normal



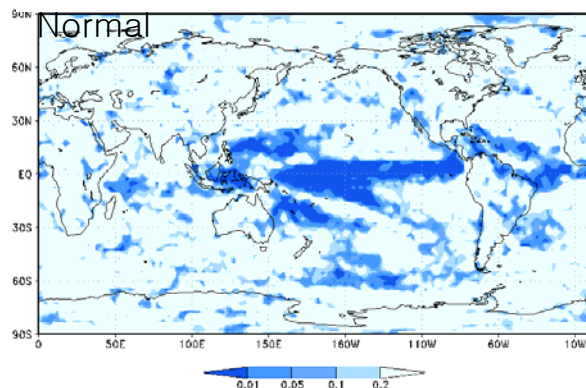
(b) AROC : Near-Normal



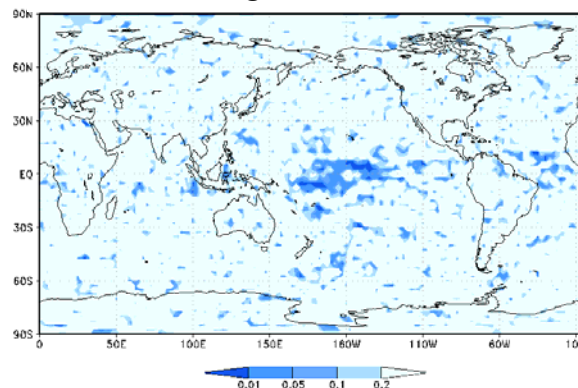
(c) AROC : Below-Normal



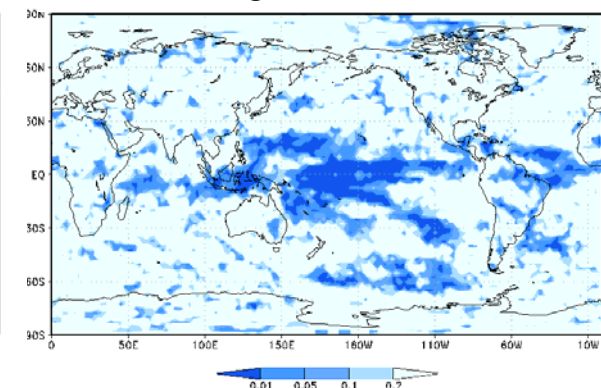
(d) AROC Sig. : Above-Normal



(e) AROC Sig. : Near-Normal



(f) AROC Sig. : Below-Normal

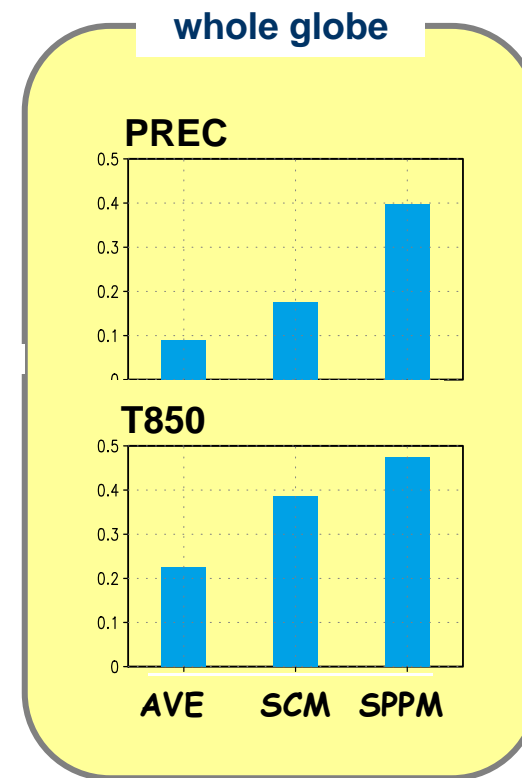
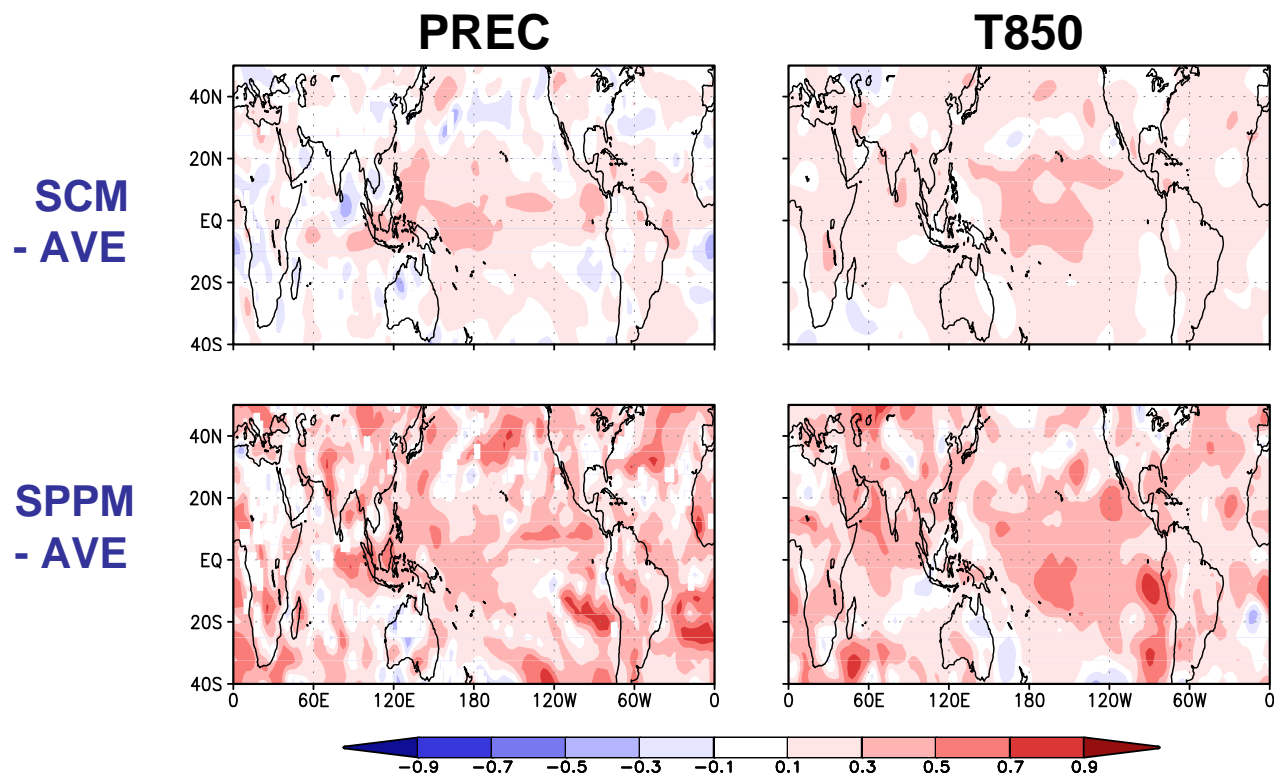




APCC International Research Project

Improvement of MME: SPPM Verification

Correlation Skill Difference: AVE/SCM/SPPM

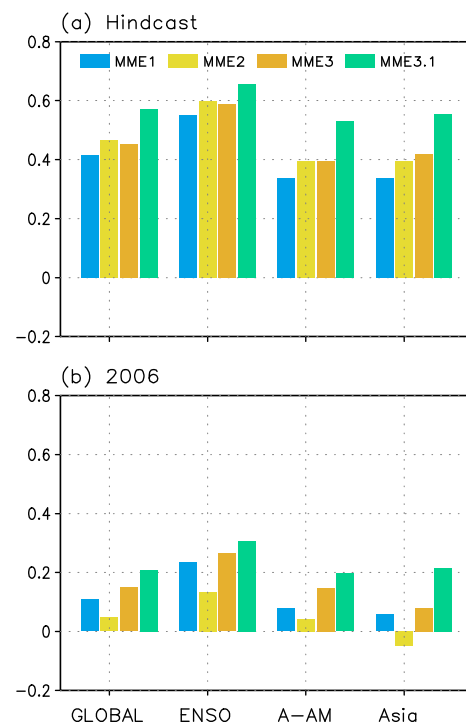




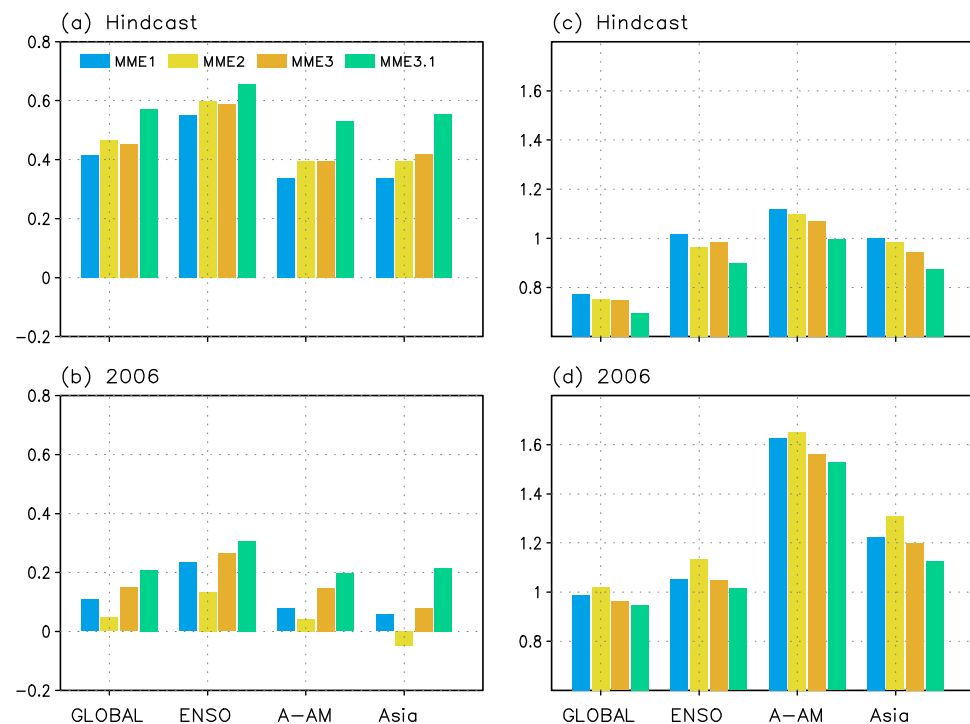
APCC International Research Project

- SPPM was tested on prediction of 850 hPa temperature precipitation using **APCC hindcast data** for the period 1983-2003 and **operational forecast data for 2006**. The results showed much improved skill against the other methods, especially over the East Asian land region.
- SPPM code was transferred to APCC and is now part of the **Automated Forecast System**.

Anomaly Pattern Correlation Skill



Root Mean Square Error





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Climate Monitoring



주경투시도



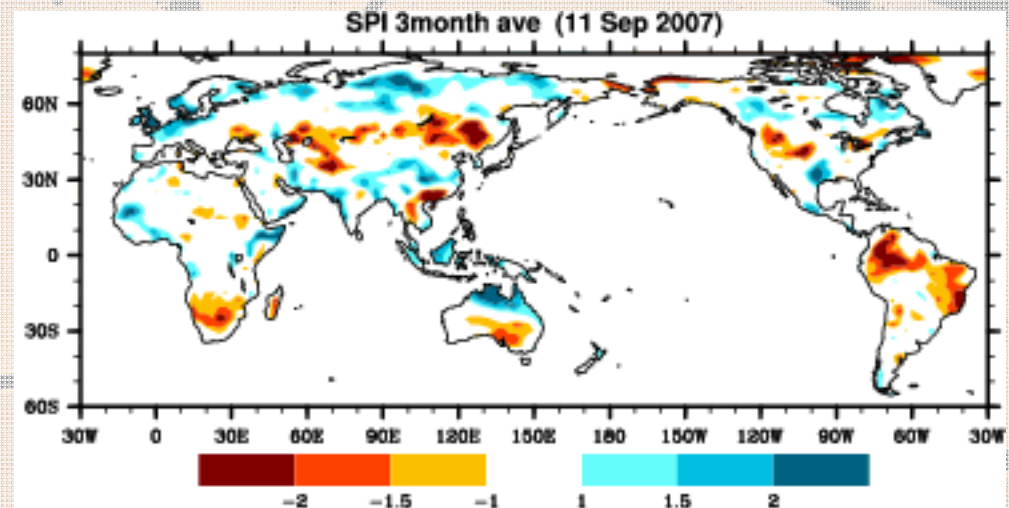
Drought Monitoring

Standardized Precipitation Index (SPI)

Drought monitoring system based on SPI was developed by McKee et al. (1993). The SPI was designed to quantify the precipitation deficit standardized by Gamma distribution for multiple time scales.

Drought category based on SPI

SPI Values	Category
20+	extremely wet
1.5 to 1.99	very wet
1.0 to 1.49	moderately wet
-0.99 to 0.99	near normal
-1.0 to -1.49	moderately dry
-1.5 to -1.99	severely dry
-2.0 and less	extremely dry

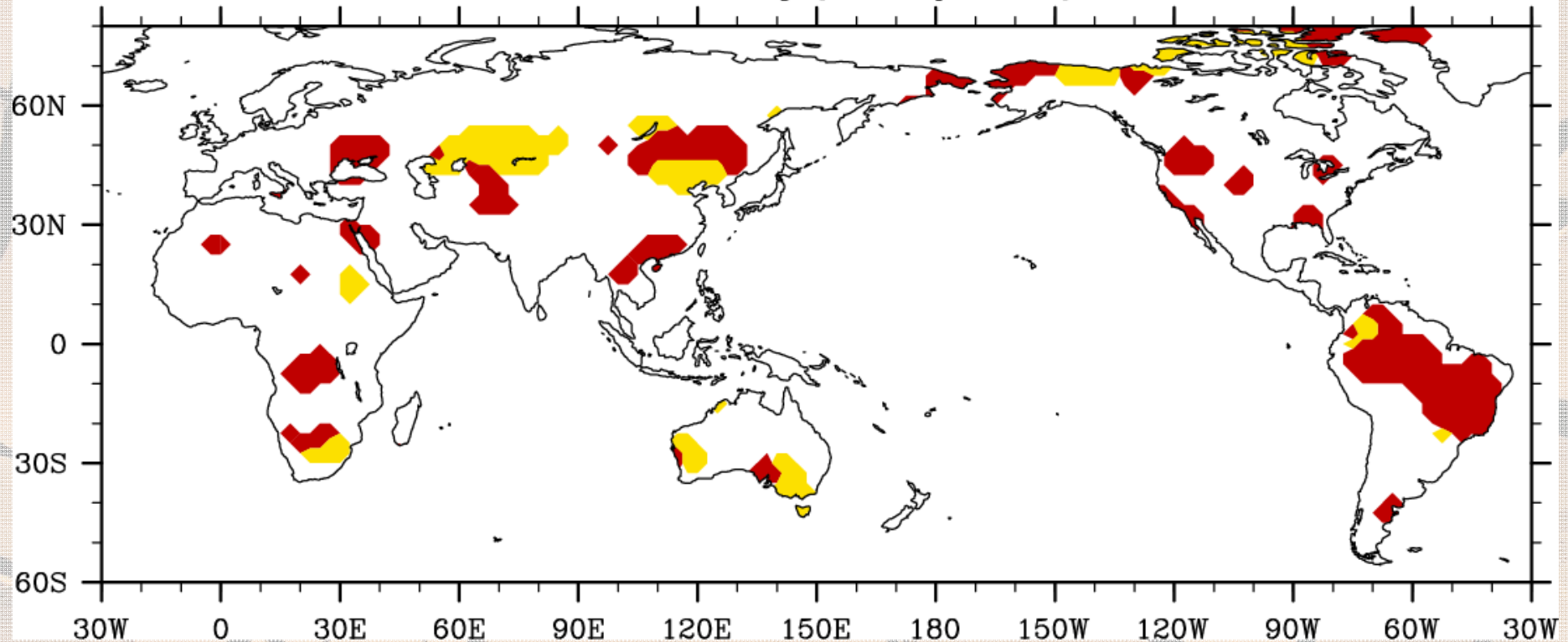


Drought distribution based on SPI



Drought Monitoring

SPI summary (11 Sep 2007)

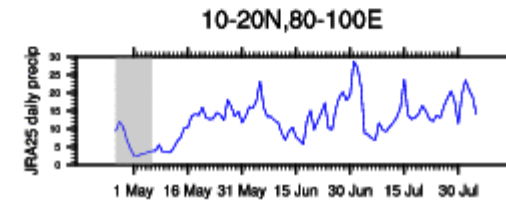
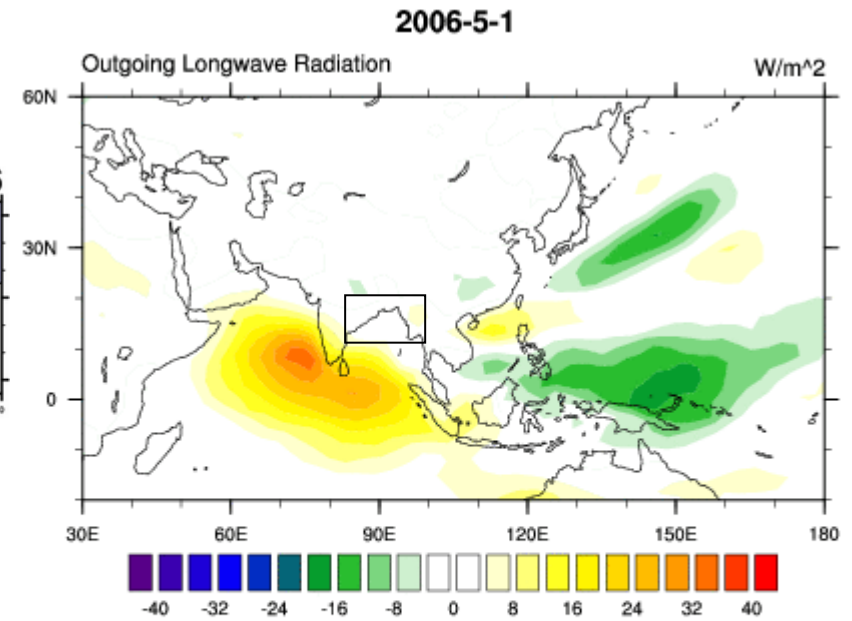
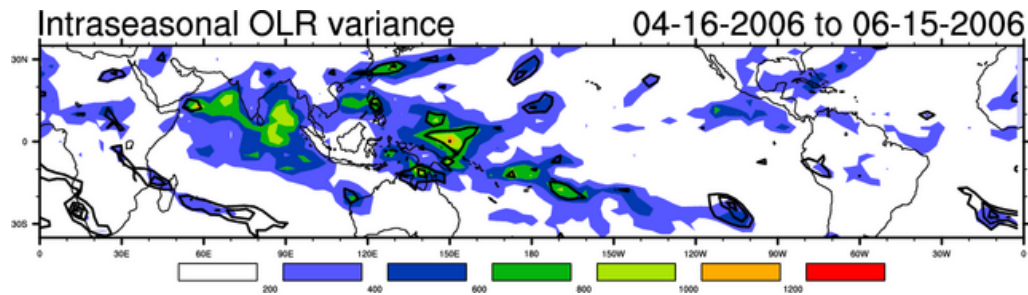


- East Asia :** Severe drought occurred in south China, Mongolia, and basin of Amur river. During last 1 month, conditions shift to drought in northeast China.
- Southeast Asia:** Severe drought occurred in Thailand, Myanmar, and Laos.
- Australasia:** During last 1 month, conditions shift to drought in northeast China. Severe drought from last year in Australia almost recovered.
- North America:** Severe drought from last year in Australia almost recovered.
- South America:** Severe drought is still persisting in basin of Amazon river. But the conditions are getting better.



Intraseasonal Variability (ISV) Monitoring

ISV mode reconstruction





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Data Service System



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Data served on OPeNDAP server

List	Explanation	Variables	Resolution	Periods
TMI	TRMM (Tropical Rainfall Measuring Mission satellite) Microwave Imager	Sea Surface Temperature Rain rate	All images cover a global region extending from 40S to 40N at a pixel resolution of 0.25 deg (~25 km).	Jun. 2006 ~ present
QuikScat	The microwave scatterometer SeaWinds was launched on the QuikBird satellite in June 1999. We refer to this instrument as QuikScat (or QSCAT) to distinguish it from the nearly identical SeaWinds scatterometer on Midori-II (ADEOS-II), launched December, 2002.	Sea Surface Wind	3-day time averaged files are byte arrays of size 1440 x 720 x 3 (longitude, latitude, parameter)	Jan. 2006 ~
NCEP	The NCEP/NCAR Reanalysis 1 project is using a state-of-the-art analysis/forecast system to perform data assimilation using past data from 1948 to the present.	Air temperature Sea level pressure Winds Geopotential heights	2.5 degree x 2.5 degree global grids 17 Level (144x73x17) T62 Gaussian grid with 192x94 points	Jan. 1979 ~
NOAA	Daily, non-interpolated Outgoing Longwave Radiation (OLR) data from NCAR archives	Outgoing Longwave Radiation	2.5 degree latitude x 2.5 degree longitude global grid (144x73).	Jan. 1986 ~
MME	Climate prediction and hindcast datasets from APCC participating models	850 hPa Temperature Precipitation 500 hPa Geopotential height	2.5 degree x 2.5 degree global grids	Each season



APCC Data Service System

Visiting ADSS



APCC Data Service System (ADSS)

Data Service System was constructed for real time climate monitoring and digital data service to APEC members. This system will be of great serve for APCC to play an important role as a hub of data service center. The major goal of setting up of data service system is to provide a comprehensive set of model and observational climate data, in order to establish a scientific basis for climate prediction. The second is to monitor climate information using near real-time in situ observation and prediction data interfaces on the webpage for various users.

Currently Available Data Set

NCEP	Info	OPeNDAP	FTP
NCEP_SFC	Info	OPeNDAP	FTP
NOAA_OLR	Info	OPeNDAP	FTP
TMI	Info	OPeNDAP	FTP
QuikScat	Info	OPeNDAP	FTP
AVISO	Info	OPeNDAP	FTP

Today 2 Total 21

APCC APEC Climate Center National Premium Corporation Bureau (NPP)
No. 201, Zhongxing Road, Xinyi District, Taipei 101, Taiwan, R.O.C. Tel: 886-2-2723-5151 Fax: 886-2-2723-5152 E-mail: cis@apcc21.net Copyright APCC All rights reserved.

<http://cis.apcc21.net:8080/opepdap>



Contents of /

Name	Last modified	Size	Response Links
NCEP/	2007-05-11 02:54:16	-	- - - - -
NCEP_SFC/	2007-03-18 09:42:59	-	- - - - -
NOAA_OLR/	2006-12-04 10:05:24	-	- - - - -
QuikScat/	2006-12-03 10:57:29	-	- - - - -
TMI/	2006-12-03 10:57:29	-	- - - - -

THREDDS Catalog HTML HTML

Hyrax development sponsored by NSF, NASA and NOAA

OPeNDAP Hyrax (1.1.0) [Server:0010-4930309-4549-4940-4912-40ca16430891-contents](#)
Documentation

Visiting ADSS



Contents of / TMI/

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Monthly/	2007-05-31 08:42:15	-	- - - - -

THREDDS Catalog HTML HTML

Hyrax development sponsored by NSF, NASA and NOAA

OPeNDAP Hyrax (1.1.0)
Documentation



Contents of / TMI/ Daily/

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Access/	2007-07-03 07:07:34	-	- - - - -
Backdate/	2007-03-06 03:40:03	-	- - - - -
Climatology/	2006-12-08 10:17:14	-	- - - - -
CSV/	2007-03-05 04:08:29	-	- - - - -
Logger/	2007-09-11 07:06:44	-	- - - - -
Mean/	2007-04-16 02:42:37	-	- - - - -
Info_ftp/	2007-06-29 07:42:39	-	- - - - -
test/	2007-07-02 10:01:57	-	- - - - -

THREDDS Catalog HTML HTML

Hyrax development sponsored by NSF, NASA and NOAA

OPeNDAP Hyrax (1.1.0)
Documentation



Contents of / TMI/ Daily/ Mean/

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2007/	2007-09-10 07:04:03	-	- - - - -

THREDDS Catalog HTML HTML

Hyrax development sponsored by NSF, NASA and NOAA

OPeNDAP Hyrax (1.1.0)
Documentation





APCC Data Service System

How to use

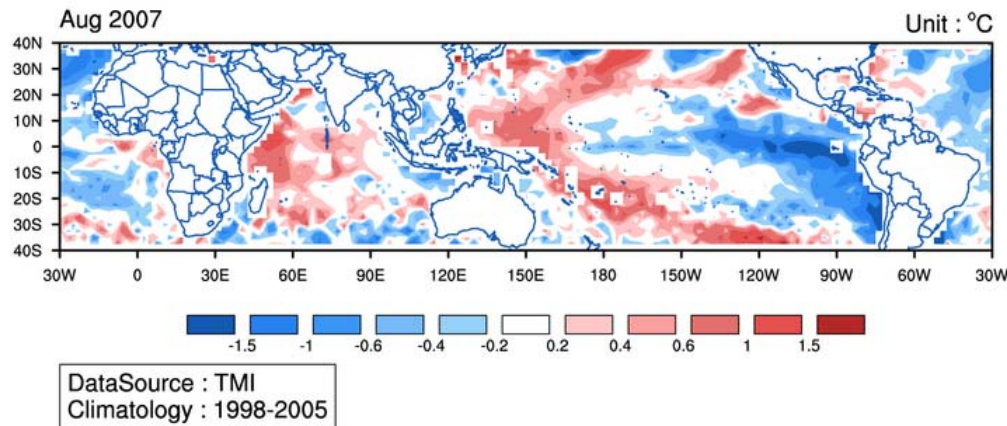
Example 1 :

Launch GrADS

Click and paste "Data URL" into the interface of the client software :

<http://cis.apcc21.net:8080/pendap/TMI/Daily/Mean/2007/sst.nc>

Monthly SST Anomaly



©APEC Climate Center created:09/14/07

```

[icis@cnode01 Plotting]$ backdate_plot.rb
Wed Aug 01 00:00:00 UTC 2007
Fri Sep 14 00:00:00 UTC 2007
1
Wed Aug 01 00:00:00 UTC 2007
Wed Aug 01 00:00:00 UTC 2007
/apcc01/CIS/CMS/Codes/Plotting/CMS_Plotter.rb:35: warning: Insecure world writab
le dir /apcc01, mode 040777
Copyright (C) 1995-2007 - All Rights Reserved
University Corporation for Atmospheric Research
NCAR Command Language Version 4.3.0
The use of this software is governed by a License Agreement.
See http://www.ncl.ucar.edu/ for more details.

```

```

lat: Array of 32 bit Reals [lat = 0..32]
lat:
units: "degrees_north"
long_name: "latitude"
actual_range: "-40,40"

lon: Array of 32 bit Reals [lon = 0..143]
lon:
units: "degrees_east"
long_name: "longitude"
actual_range: "0,357.5"

sst: Grid
time: lat: lon:
FillValue: -999.0000000

```



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Connection to NMHSs



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APCC Forecast Product Survey

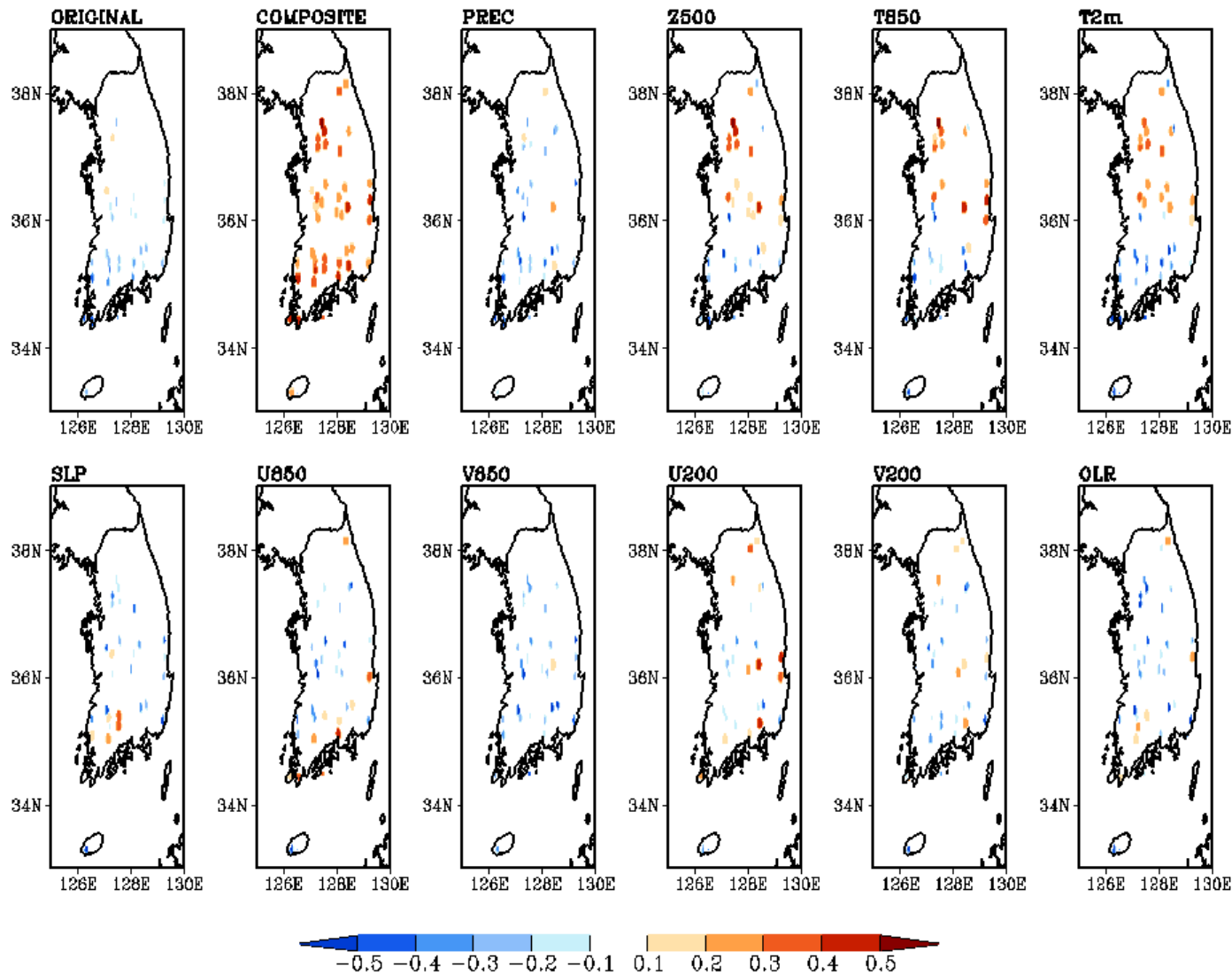
- No. of replies: 12
- Replied model providers: 8 (**BoM Australia, CMC, IAP, BCC, KMA, METRI, HMC, CWB**)
- Other NMHSs: 4 (**Hong Kong, China; Malaysia; Thailand; Vietnam**)

Question	Summary of feedbacks
2. Right now APCC issues MME predictions four times a year for the DJF, MAM, JJA and SON seasons. Is there any other additional period for prediction that you would like to suggest?	<input type="radio"/> Monthly issued forecast will be most useful
3. Do you think that monthly issued 3-month MME forecast products will improve the seasonal outlook or other related services of your organization?	<input type="radio"/> Monthly issued forecast will be most useful <input type="radio"/> Depending on prediction skill
4. Would you find it useful to have extended seasonal predictions (say with 6-month lead time)? If so, then for which season or period?	<input type="radio"/> 4-month lead forecast <input type="radio"/> 6-month lead forecast <input type="radio"/> 9-month lead forecast <input type="radio"/> Extended forecast for northern spring & summer <input type="radio"/> Extended northern summer season/Typhoon season (June-Oct) <input type="radio"/> Nov-April <input type="radio"/> All seasons <input type="radio"/> Eventually- if more skillful than statistical model
5. Would you like to see more frequent seasonal predictions during climate events such as El Ninos, heat waves and prolonged drought conditions?	<input type="radio"/> No <input type="radio"/> Yes- during ENSO, drought and floods



Statistical Downscaling- Korea

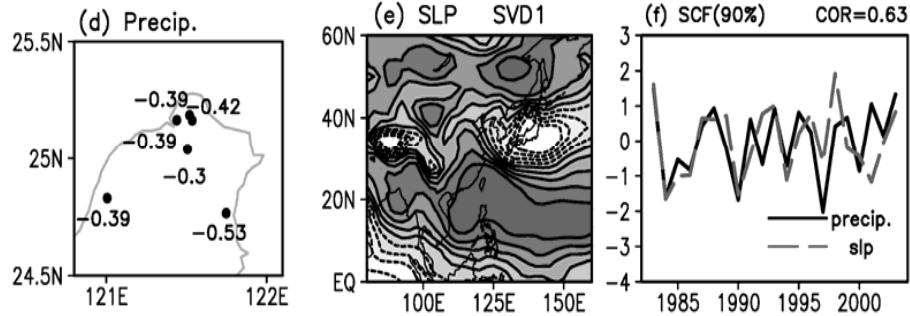
JJA: Correlation Coefficient



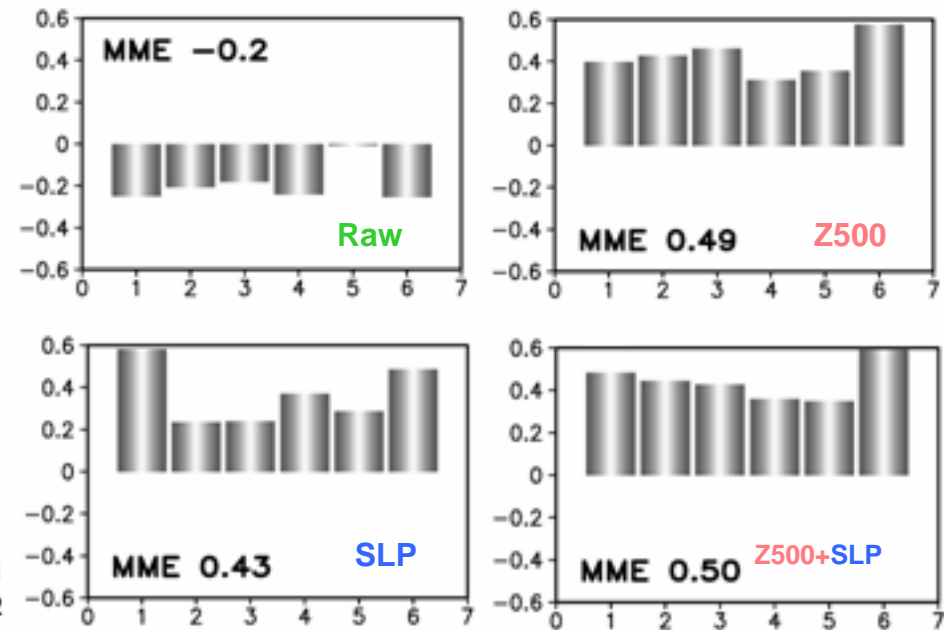


Statistical Downscaling- Taiwan

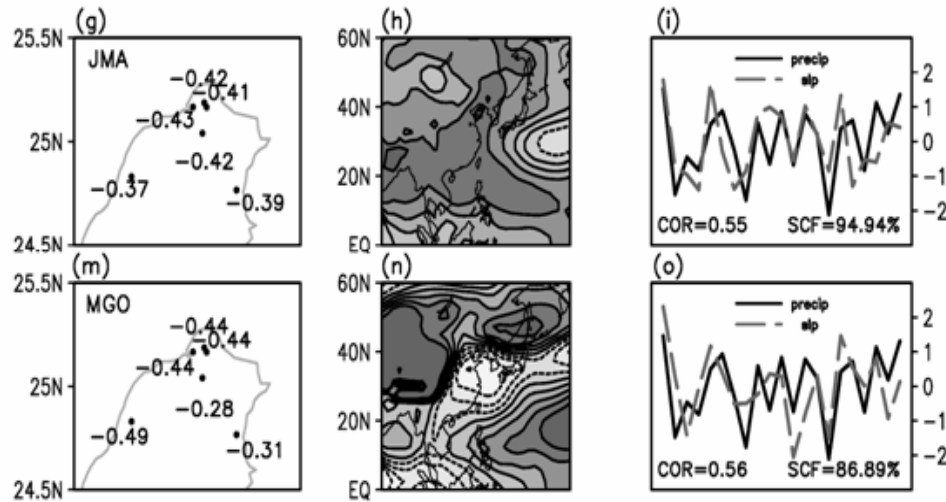
Observation SVD 1



Skill of Downscaling



Model SVD 1





New Homepage

Visit: <http://210.98.49.34:3000/>

The screenshot shows the APEC Climate Center homepage with the following sections:

- Navigation:** PREDICTION, MONITORING, DATA, NEWS, VERIFICATION, NEWSLETTER
- In the News:** STORMS, DROUGHT, WILDFIRE, FLOODS
- Climate Highlights JJA 2007:** The results from our MME forecasts provide a hint of weak La Nina-like tropical Pacific conditions. Polynesian islands in the southwestern Pacific may experience conditions warmer and wetter than normal. Similar conditions are also expected in the Equatorial Americas. Southern parts of the maritime continent and the northern portion of the Continental Australia may receive slightly less than normal rainfall while the temperatures in these regions may be slightly warmer than normal. Peninsular Indian region may also experience similar conditions.
- Current level of climate indices:** Nino3, SOI, DMI, NAO, PNA
- Projected level of climate indices:** Nino3, SOI, DMI, NAO, PNA
- Severe drought persists over Northern China and Mongolia:** ASIA: Severe drought in north of China to Mongolia is persisting. In northeast China and southeast Siberia, drought is expected in next season. Australia: Severe drought in most of Australia is persisting.
- Forecasts for SON 2007:** The results from our MME forecast show a weak La Nina-like tropical Pacific condition. Similar conditions are also expected in the Equatorial Americas. Southern parts of the maritime continent and the northern portion of the Continental Australia may receive slightly less than normal rainfall while the temperatures in these regions may be slightly warmer than normal. Peninsular Indian region may also experience similar conditions.

The screenshot shows the APEC Climate Center homepage with a large map overlay titled "Multi-Model Probabilistic MME for Precipitation".

Multi-Model Probabilistic MME for Precipitation

SON 2007

Forecast Method: GAUS
Anomaly fields are displayed
Hindcast Period: 1983 to 2002

© APEC Climate Center created:09/14/07

The map displays precipitation anomalies for SON 2007. The legend indicates: Below (80, 70, 60, 50, 40, 0), Near (40, 80), and Above (0, 40, 60, 70, 80). The map shows a mix of green (above) and yellow/orange (below) areas, indicating a weak La Nina-like condition.

Thank You !

