



**The Abdus Salam  
International Centre for Theoretical Physics**



**2051-11**

## **Workshop on High Resolution Climate Modelling**

***10 - 14 August 2009***

**Area of interest**

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# AREA OF INTEREST

## Panel Discussion

### Workshop on High-Resolution Climate Modelling (10-14 August 2009)

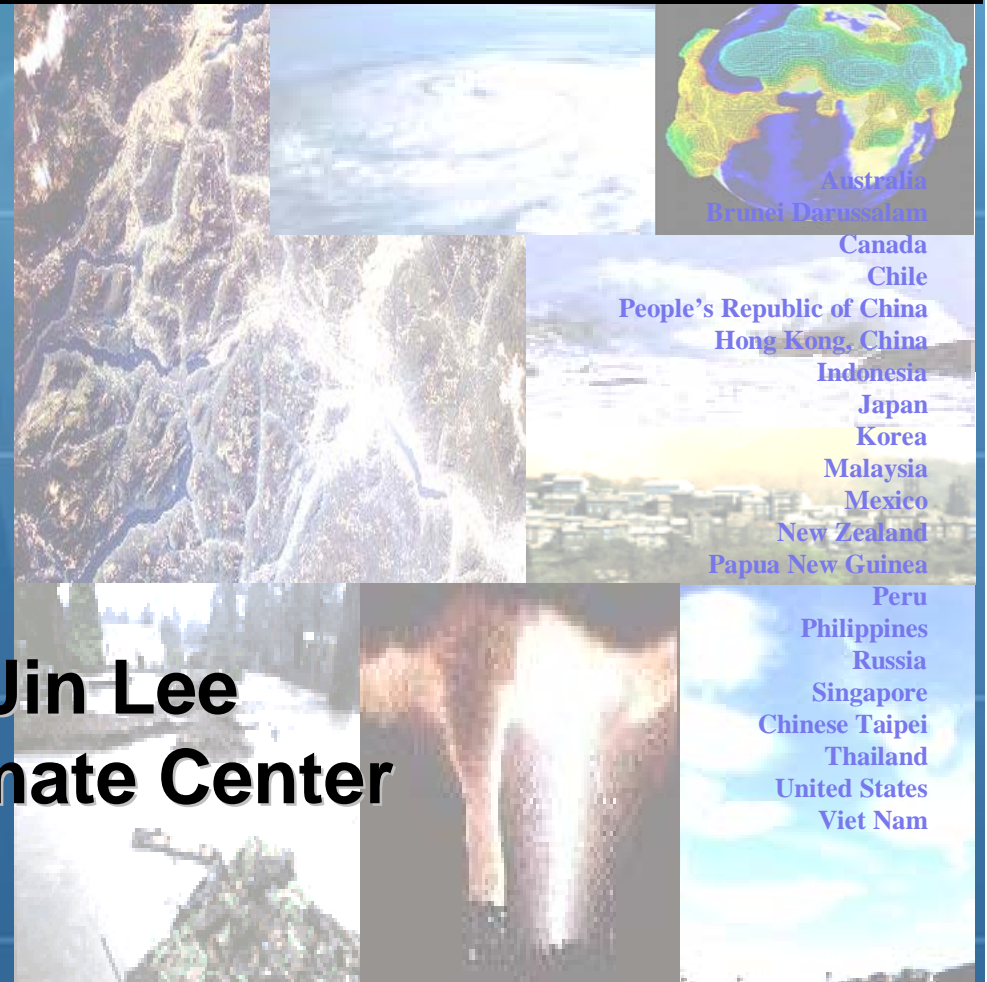
Asia

Pacific  
Economic Cooperation

Climate

Center

Woo-Jin Lee  
APEC Climate Center





# Contents

- Introduction to APCC
- Area of interest
  - Model diagnostics
  - Testbed on extreme climate prediction
  - Data and information sharing
  - Others

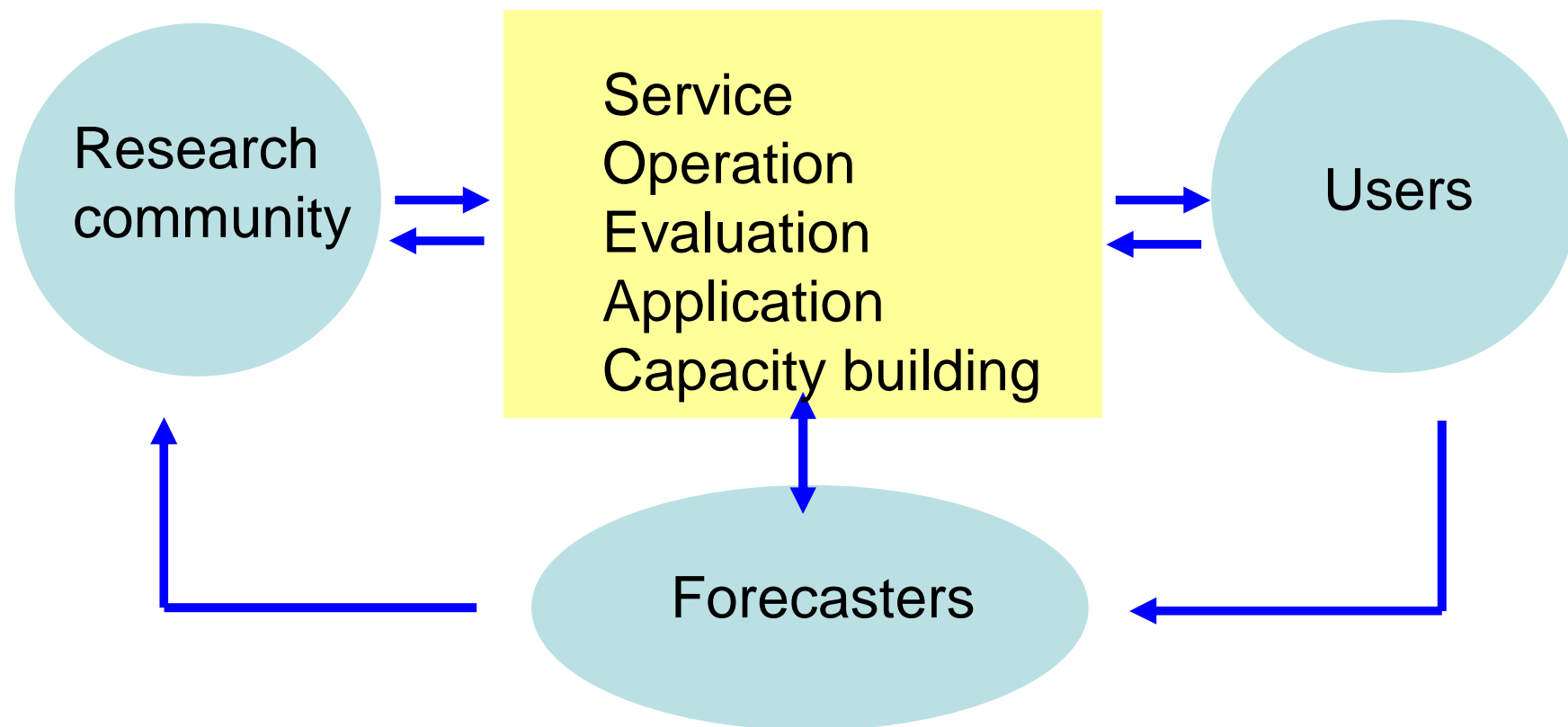


# Science and User Benefit

INNOVATION

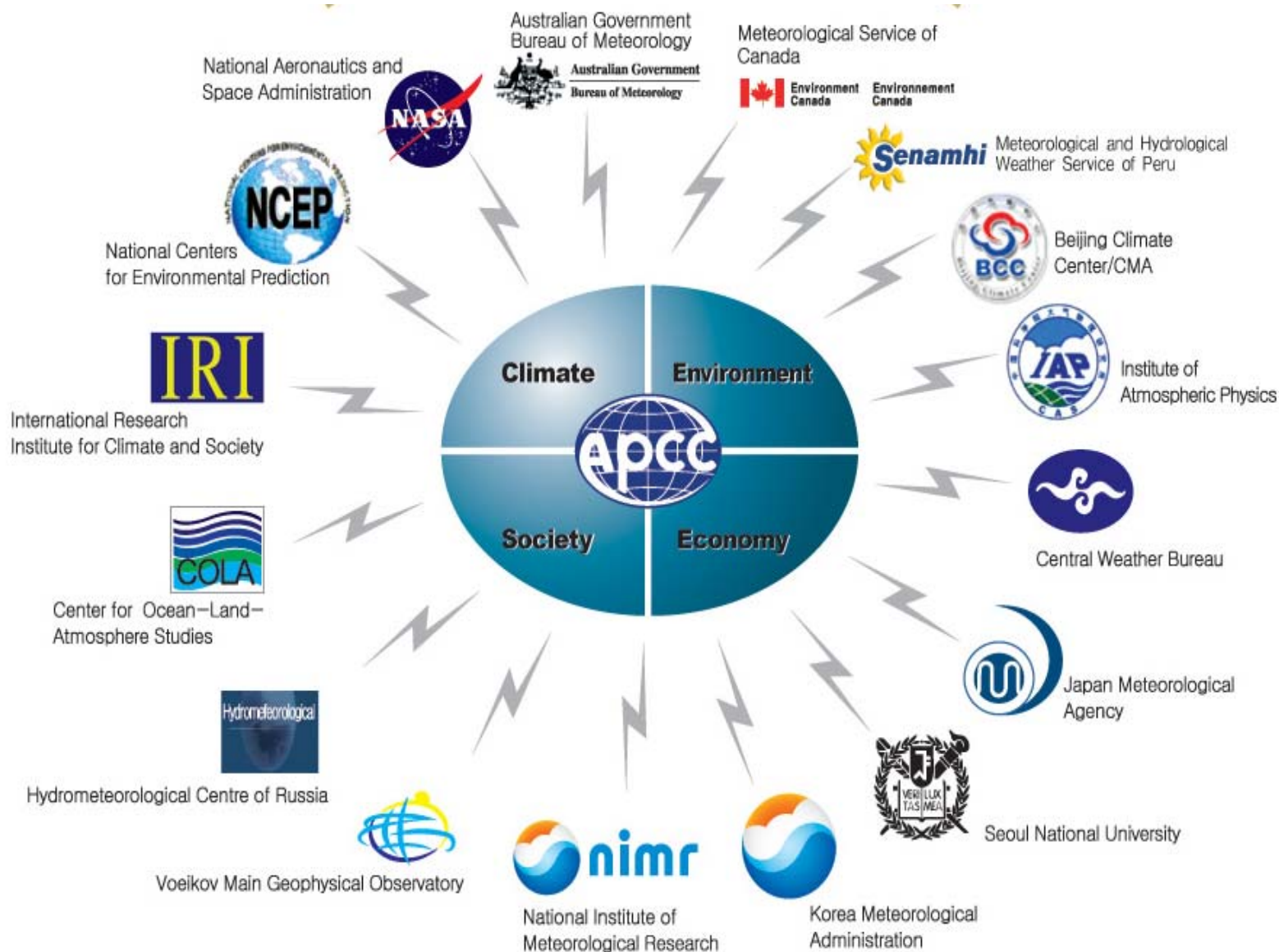
?

SOCIAL BENEFIT





# Multi-Institutional Cooperation





# Operation and Service Schedule

The day in the month before the season	1~10	11~15	16~21	22~23
Mission	data collection	Standardization & quality check	MME production	Outlook & upload to website

주소(D) <http://www2.apcc21.net/index.php>

**APEC Climate Center**  
To enhance the socioeconomic well-being of the APEC member economies

[www.apcc21.net](http://www.apcc21.net) | [Home](#) | [Contact Us](#) | [Site Map](#)

**News & Event** MORE >

- Job Opening - APCC for Admin Div. Director **NEW** [05.06.2008]
- New Executive Director of APCC [04.25.2008]
- Newsletter April 2008 (Vol.3 No.1) [04.15.2008]
- Job Opening for Research Scientist and Supporting Scientist [03.31.2008]
- Application Form for APCC Research Scientist and Supporting Scientist [03.31.2008]

**Asia Pacific Economic Cooperation Climate Center**

**Society** **Economy**

**Climate** **Environment**

**About APCC** | **Prediction & Monitoring** | **Activities** | **Link Site**

New Zealand Peru

Papua New Guinea Philippines

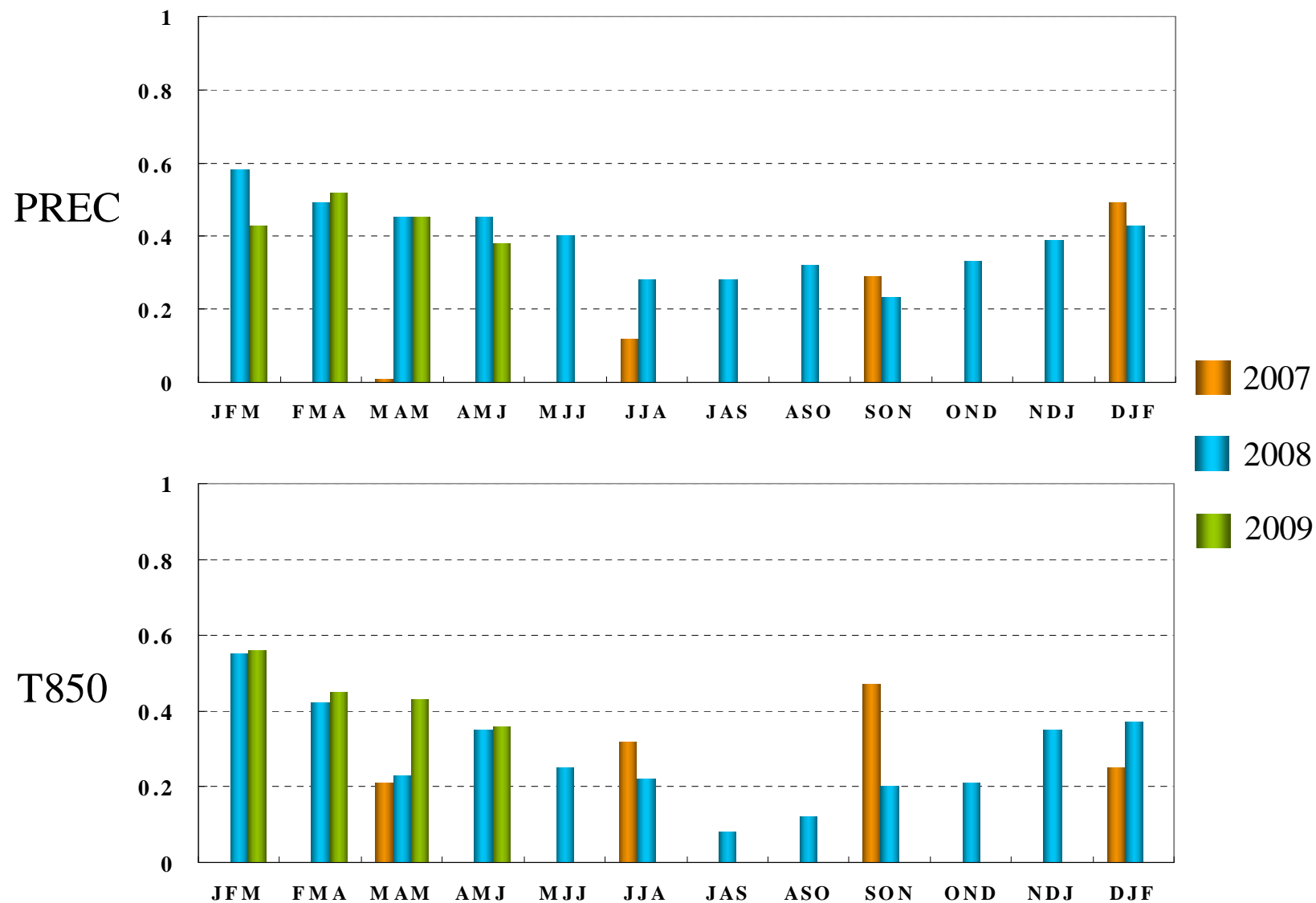
Russia **HCR** | **MGO** | **MET**

[www.apcc21.net](http://www.apcc21.net)





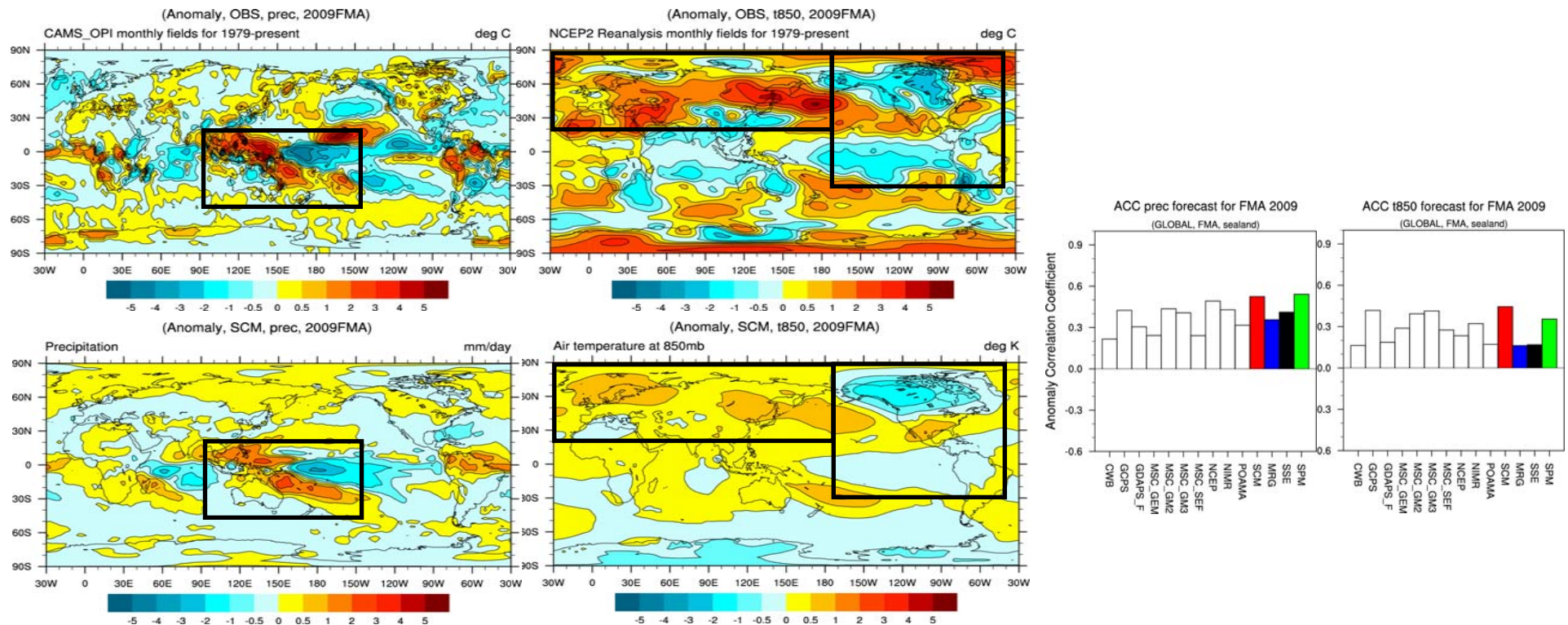
# Anomaly correlation coefficient - global







## Best Case: 2009 FMA



❖ This slide shows the **best** forecast case. For precipitation, SCM totally hit over the maritime continent and SPCZ showing more than normal rainfall. For temperature, Slightly La Nina event was observed over central and eastern tropical Pacific at observation. SCM also predicted slightly below than normal conditions. Over northern hemisphere, especially Europe and Russia, observation shows positive temperature. SCM also forecasted slightly warm condition at the same region. Additionally, SCM well predicted negative PNA pattern as compared with that of observation.







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# Monitoring model performance – example

## ENSO-related Walker circulation index (EWCI)

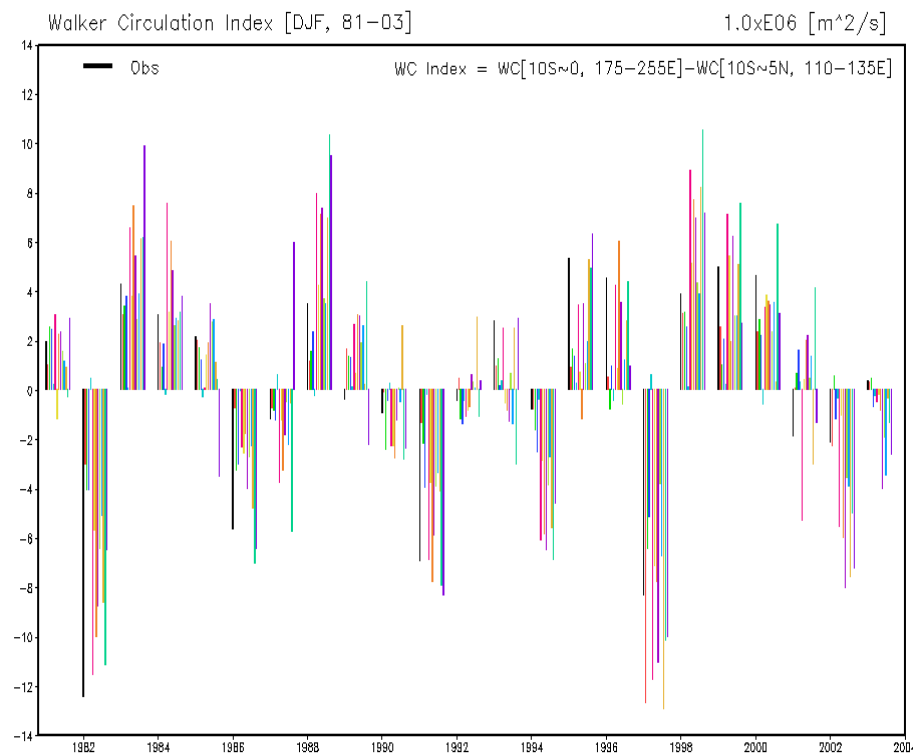


Figure: ENSO-related Walker circulation index for DJF season during the period of 1981-2003. Black bars indicate the EWCI of observation, color bars indicate that of the individual models.

$$EWCI = [WC]_E - [WC]_W$$

The square bracket with a subscript represents the area-mean Walker circulation, averaged over one of the two regions specified as the eastern (E:  $10^\circ\text{S}-0^\circ$ ,  $175^\circ\text{E}-105^\circ\text{W}$ ) and western (W:  $10^\circ\text{S}-5^\circ\text{N}$ ,  $110^\circ-135^\circ\text{E}$ ). The choice of using the two regions to define the EWCI is based on the correlation analysis with Nino 3.4 index during the period of 1981-2003.

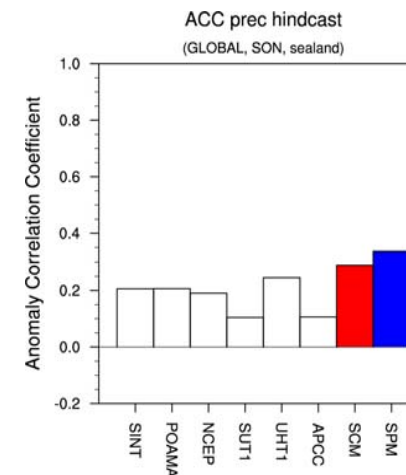
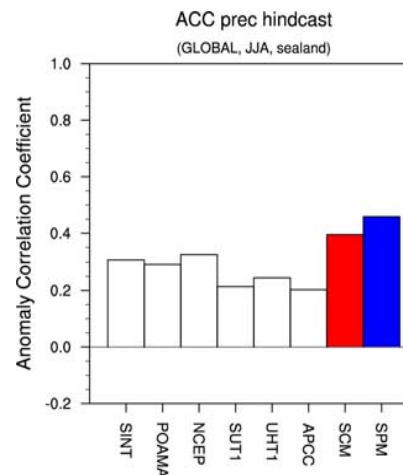
- Future extension to cyclone, Ex-cyclone activity, monsoon, MJO ...



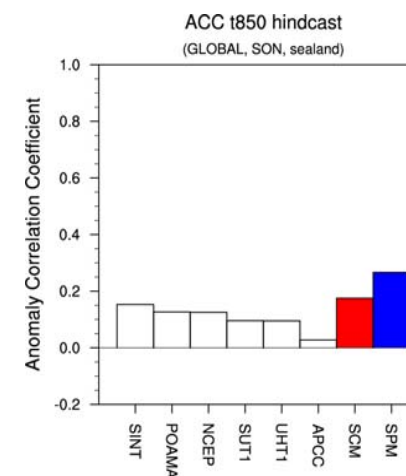
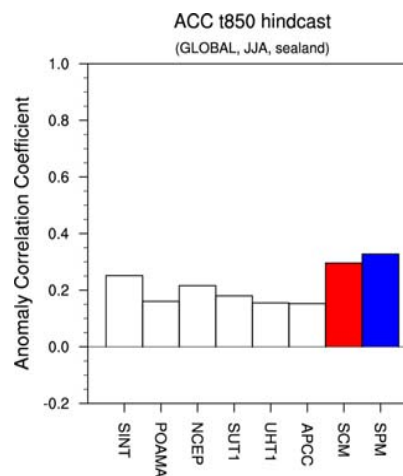
# Testbed for extreme climate events prediction

## ■ Experimental 6-M coupled-model MME

Prec



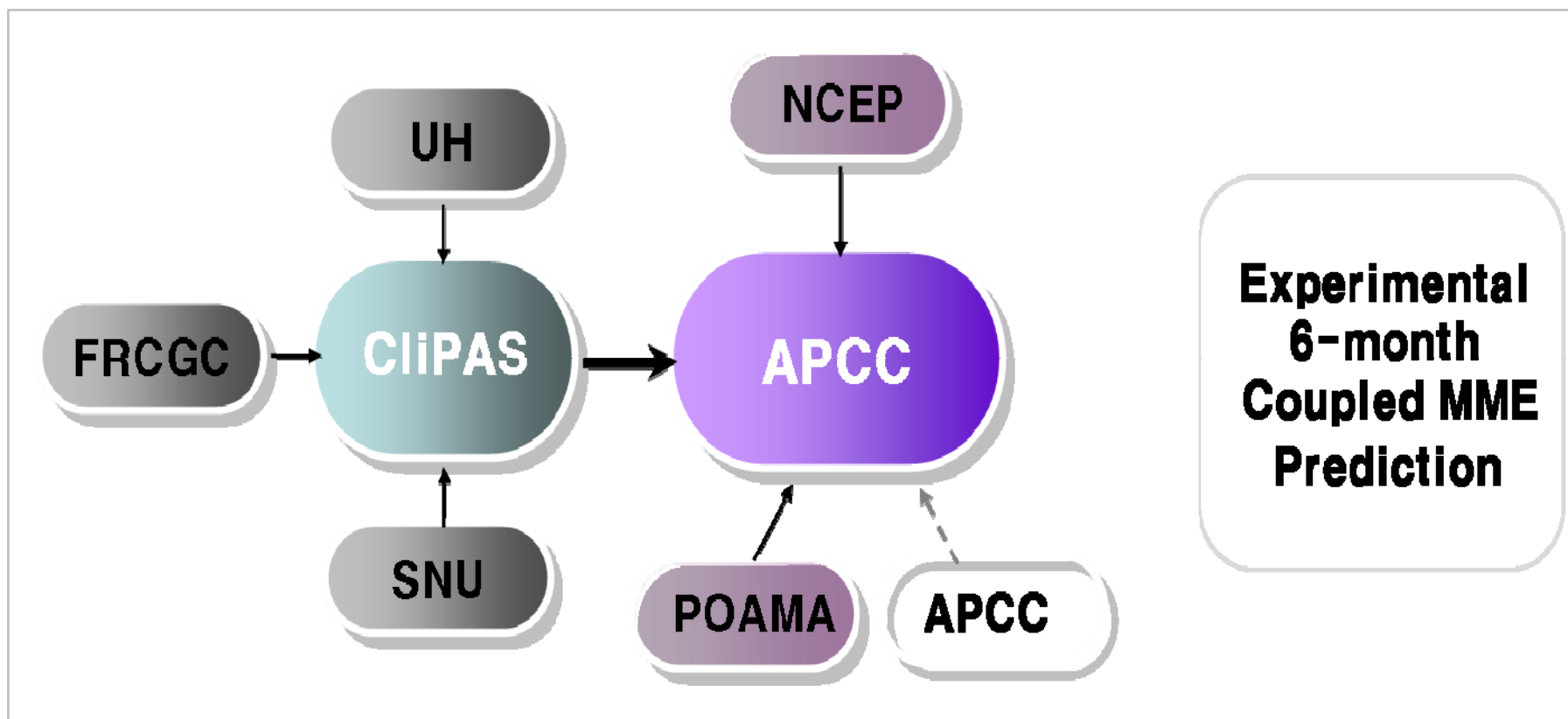
T850



## ■ Future extention to ISO, tropical cyclone ...



# Potential Application of Coupled Models

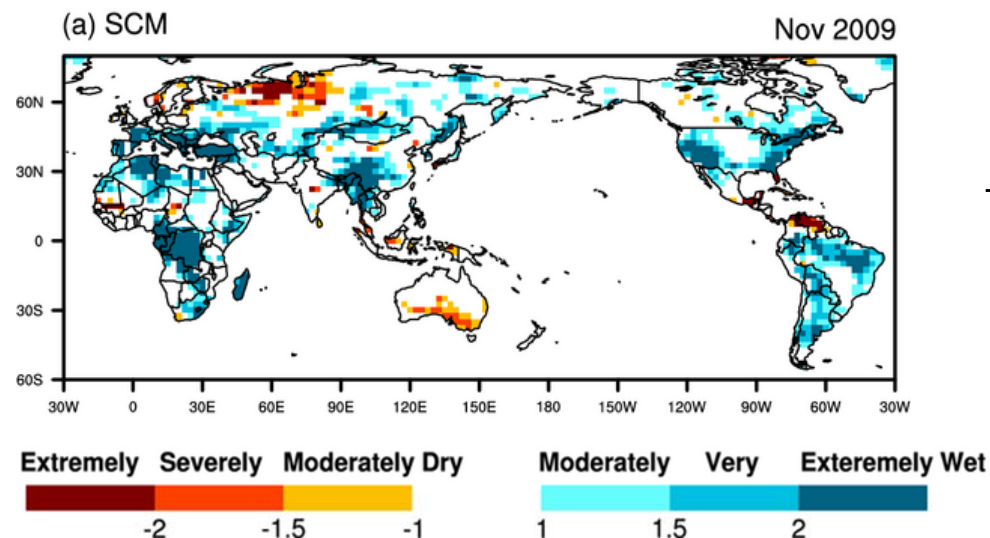


- **Diagnosis of various climate indices in real-time basis**
  - Monsoon and Indian Ocean Dipole
  - Rainfall and Drought Index
  - ISV index (MJO)
- **Interpretation for extreme climate events**
  - Application Dyn./Stat. MME downscaling
  - Analysis of daily output



# Supporting Emergency Preparedness: global hydrological extreme forecast

- Experimental monthly 3-month experimental drought/flood prediction is been carried out since January, 2009.
- 7-month lead drought/flood prediction is been carried out since January, 2009



From a 6-month time scale (hydrologic)\* view

→ prediction indicates that most of inlands around the globe are likely to very wet conditions, while maritime continent, southern Australia, equatorial Latin America, and northern Europe may experience drought condition.

Forecast: global hydrological extremes based on 6-month SPI

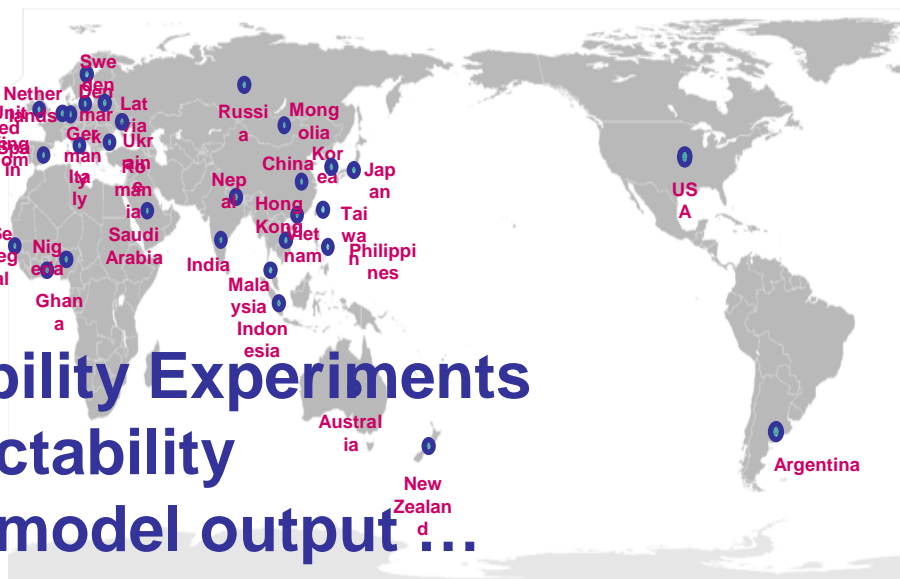
- A global hydrological extreme drought/flood monitoring service has been launched since January 2009 ([http://www.apcc21.net/climate/climate03\\_11.php](http://www.apcc21.net/climate/climate03_11.php))





# Sharing model data

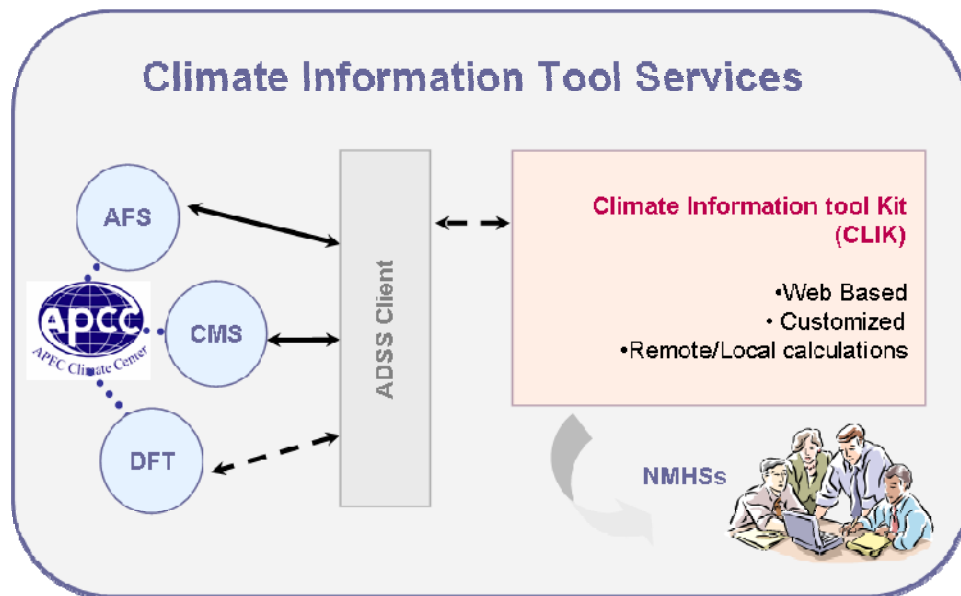
- APCC service to redistribute the data
  - Web based openDAP/http/ftp service
  - Climate Information Tool Kit
  - Command line client, DEX
- Support of Climate Historical Forecast Project (CHFP)
  - APCC participates CHFP as a distributed data center



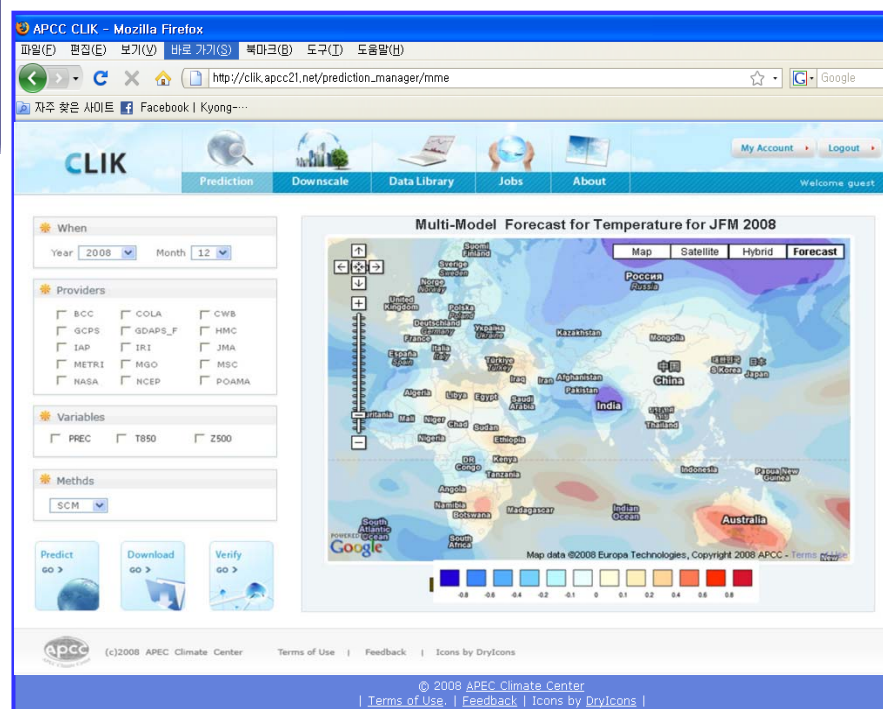
- Future extension to:
  - Extreme Event Predictability Experiments
  - Long lead and ISV predictability
  - High-resolution climate model output ...
  - Observation and derived indices ...



# Online Tool and Technology Support



<http://clik.apcc21.net>

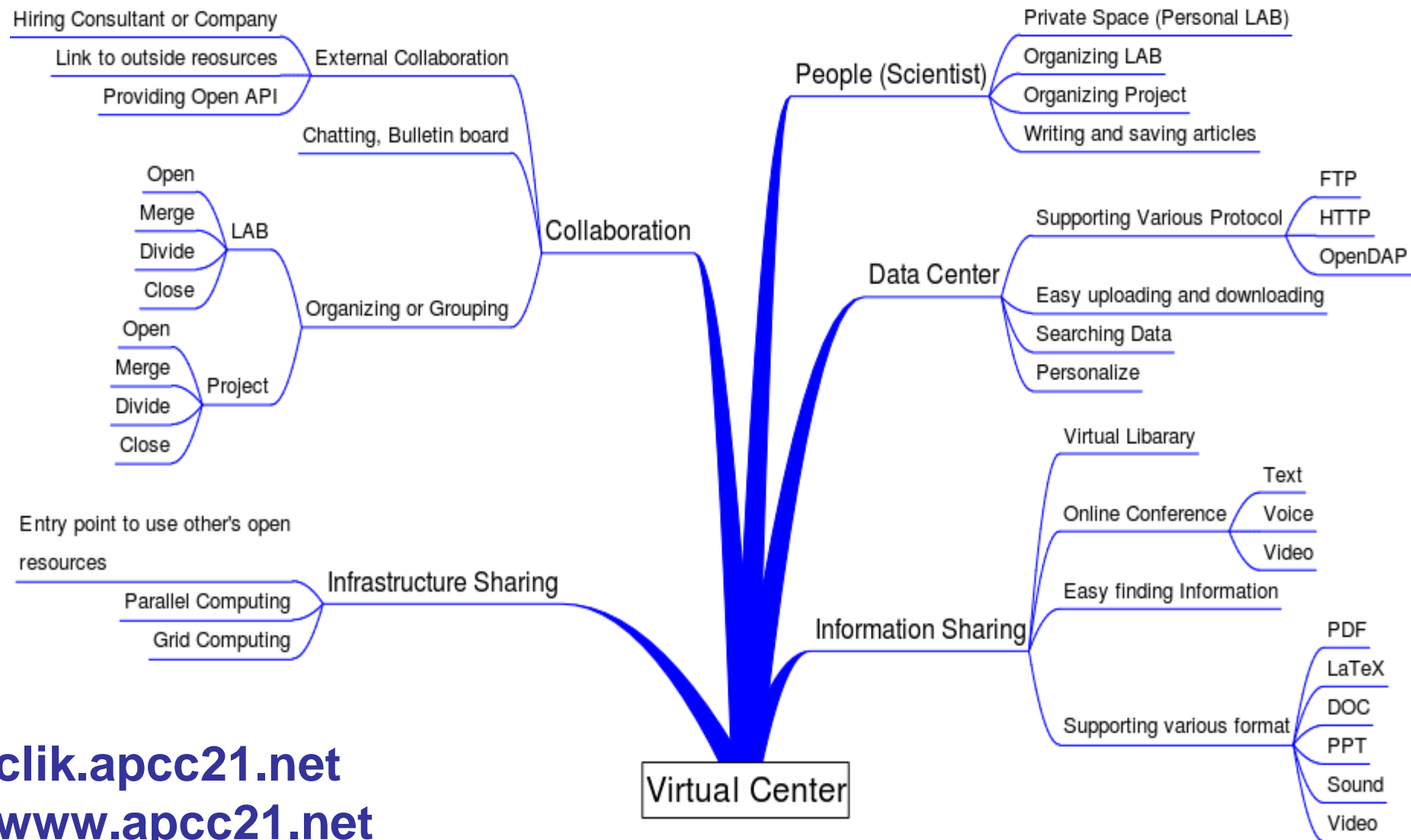


\* AFS : Automated Forecast System/ CMS : Climate Monitoring System/ DFT: Downscale Forecast Tool





# Facilitating information flow to users



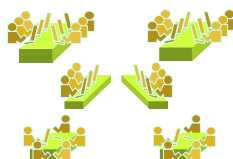
[klik.apcc21.net](http://klik.apcc21.net)  
[www.apcc21.net](http://www.apcc21.net)



# Opportunity for research and capacity building



**International Conference Hall**  
90 seats



**Five seminar Rooms**



**Share computing resources**  
( 1Peta flops)

**APCC Busan office**

**Intl. Symposium,  
Workshop, ...**

**MME  
Climate Forecast**

**Statistical  
Downscaling**

**Extreme  
Climate Prediction**

**Climate Change**





Thank You