

# APCC's Future Plan and Data Services

Dr. Chin-Seung Chung  
Director, APEC Climate Center



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# History of the APEC Climate Center (APCC)

## I. History of the APEC Climate Center (APCC)

# History of the APEC Climate Center (APCC)

## **The APEC Climate Center (APCC) was established in November 2005**

- In 1998, the creation of the APEC Climate Network (APCN) was proposed at the 3rd APEC Science and Technology Ministers' Meeting in Mexico
- In 2004, the establishment of the APEC Climate Center was proposed at the 27th APEC Industrial Science and Technology Working Group meeting in Singapore
- In March 2005, all 21 APEC member economies unanimously endorsed the establishment of APCC at the 1st APEC Senior Officials Meeting of 2005 in Korea
- In November 2005, APCC was formally launched during the 13th APEC Economic Leaders' Meeting in Busan, Korea

# History of the APEC Climate Center (APCC)

**The mission of APCC is to mitigate the consequences of current and future climate-related hazards through the provision of climate information and research and technical support across the APEC region**

APCC aims at realizing regional prosperity through the enhancement of economic opportunities, the reduction of economic loss, and the protection of life and property through :

- Producing skillful, real-time climate predictions
- Facilitating the sharing of costly climate data and information
- Enhancing capacity in prediction and social and economic applications of climate information
- Minimizing climate-related damages
- Accelerating and extending socio-economic innovation to mitigate and adapt to climate fluctuations and change



# Development of APCC

## II. Development of APCC

# Development of APCC : Three Stages of Development

1<sup>st</sup> Stage : MME  
Climate Prediction

2<sup>nd</sup> Stage : Climate  
Change and Climate  
Information  
Applications

3<sup>rd</sup> Stage : Korean  
National Climate Data  
Center (K-NCDC) and  
Global Climate  
Research Center



# Development of APCC : 1<sup>st</sup> Stage – MME Climate Prediction

**1<sup>st</sup> Stage : Multi-Model Ensemble Climate Prediction**





# Development of APCC :

## 1<sup>st</sup> Stage – MME Climate Prediction

**APCC has played an important role in providing high quality climate data and information by operating a real-time and well-validated climate prediction system, based on a MME technique, since its establishment in 2005**

- APCC provides real-time climate information to APEC economies through various media, such as internet and direct emailing
- APCC services include:
  - (1) Monthly 3-month MME forecast;
  - (2) 6-month MME forecast; and
  - (3) Subseasonal forecast

# Development of APCC :

## 1<sup>st</sup> Stage – MME Climate Prediction

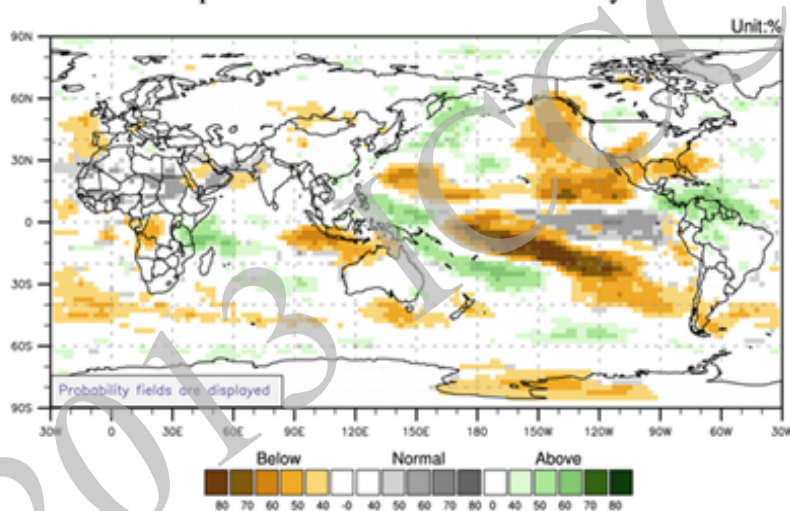
### (1) Monthly 3-month MME forecast

- APCC produces one-month lead, 3-month mean global climate forecasts every month with four deterministic and one probabilistic MME methods
  - Dynamic ensemble seasonal prediction data for these 3-month MME seasonal forecasts are collected from 17 institutions in 9 APEC economies
  - The monthly, 3-month MME forecast covers three variables: precipitation (PREC), temperature at 850hPa (T850) and geopotential height at 500hPa (Z500)
  - In order to ensure the reliability of its climate services, APCC continuously conducts forecast verification against observational data every month

# Development of APCC : 1<sup>st</sup> Stage – MME Climate Prediction

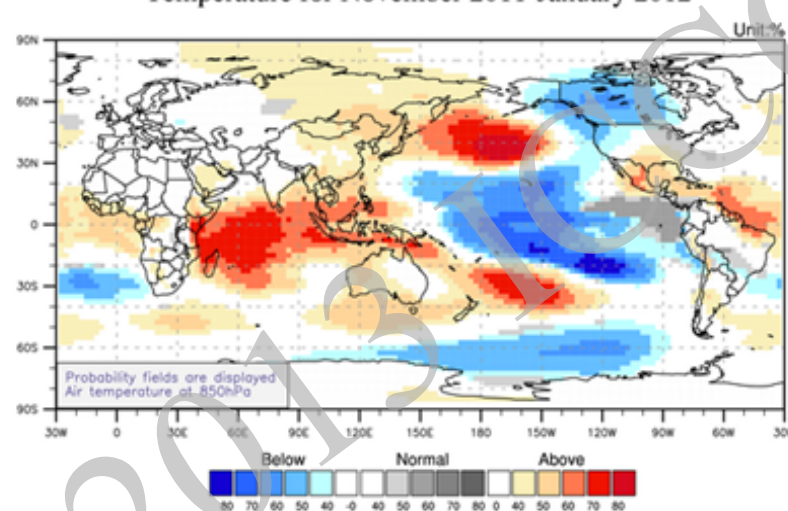
Day of the month	1~10	11~15	16~21	22~23
Activity	Data collection	Standardization & quality check	Analysis and production	Outlook release & upload to website

Precipitation for November 2011-January 2012



© APEC Climate Center

Temperature for November 2011-January 2012



© APEC Climate Center



# Development of APCC :

## 1<sup>st</sup> Stage – MME Climate Prediction

### **(2) 6-month MME forecast**

- Before every season, the 6-month MME climate forecast, including the El Niño–Southern Oscillation(ENSO)/Indian Ocean Dipole(IOD) forecast, is performed

### **(3) Subseasonal forecast**

- APCC is expanding the span of its climate prediction services to include a subseasonal forecast to predict intraseasonal climate volatilities, including Madden-Julian Oscillation(MJO), which causes anomalous rainfall and drought



# Development of APCC :

## 2<sup>nd</sup> Stage – Climate Change and Climate Information Applications

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# Development of APCC :

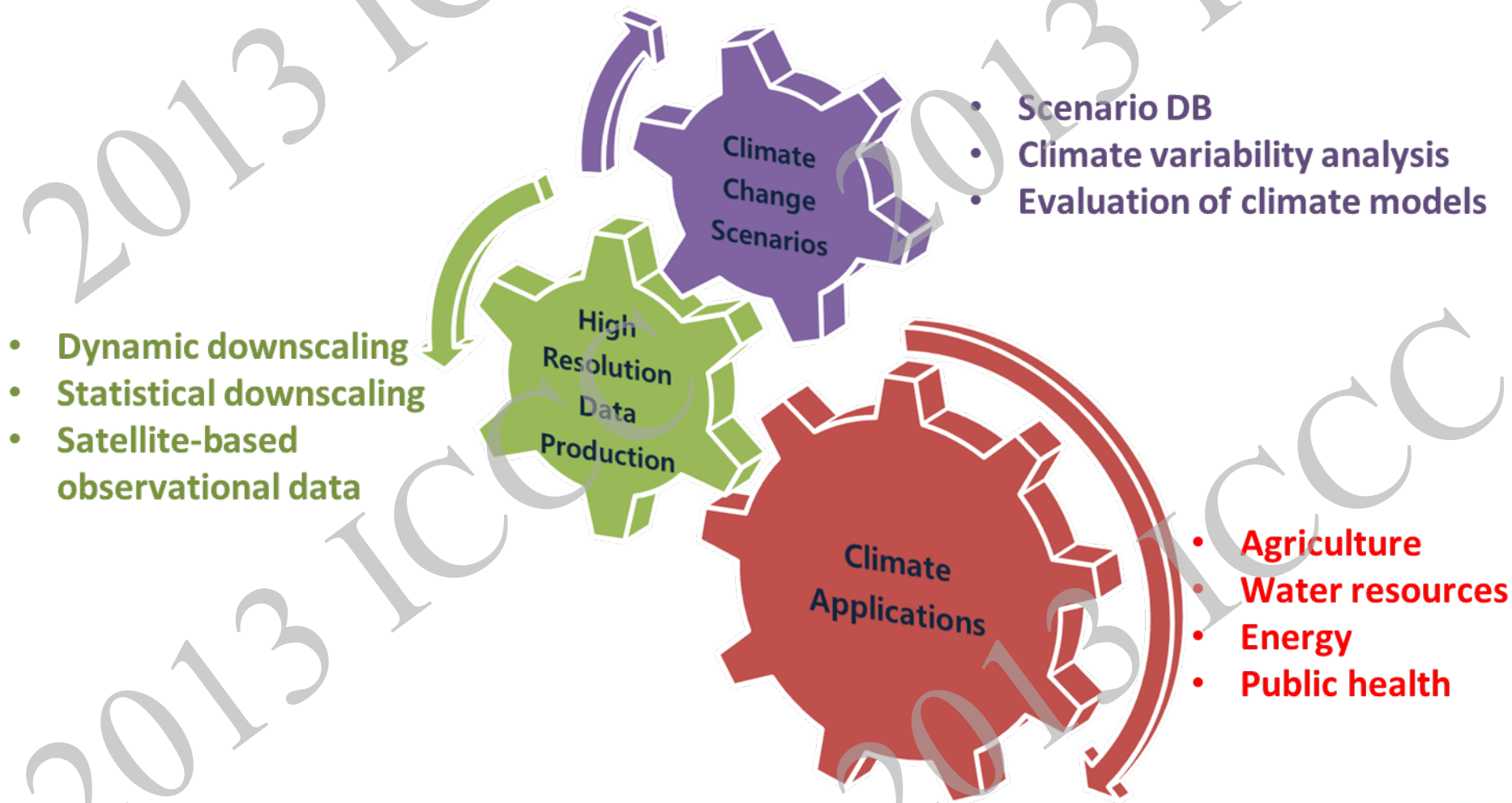
## 2<sup>nd</sup> Stage – Climate Change and Climate Information Applications

**APCC research focuses on providing projections of changes in the future climate, driving forces for these changes, and climate change impacts on social and economic sectors**

- Global warming and climate change have become some of the most critical and pressing issues for mankind
- APCC strives to improve dynamic downscaling, as well as statistical downscaling methods, in order to produce local-scale, high-resolution data
- APCC has a real-time, automated climate monitoring system and large & local-scale climate change data service system (scenario data: CMIP5 DB, observational data: satellite and station data) to underpin its research on applications of climate change information

# Development of APCC :

## 2<sup>nd</sup> Stage – Climate Change and Climate Information Applications





# Development of APCC :

## 2<sup>nd</sup> Stage – Climate Change and Climate Information Applications

**APCC research projects on climate change and variability are as follows;**

- Future projection of extreme climate events (drought, floods, heat waves, typhoons, etc.) over the APEC region
- Decadal (10 to 30 years in the future) time-scale prediction and variability, a time-scale that is of great interest to policymakers and stakeholders
- Climate sensitivity and feedback systems (cloud, aerosol)
- Water balance changes



# Development of APCC :

## 2<sup>nd</sup> Stage – Climate Change and Climate Information Applications

Researches on climate information and its applications in various sectors, such as agriculture, water, energy, and public health, are being carried out

Climate Data	Climate Change and Variability	Applications
Observation DB (daily, monthly / incl. satellite, station, radar data, etc.)	<ul style="list-style-type: none"><li>○ Surface Climate<ul style="list-style-type: none"><li>- Temperature, precipitation, drought, surface hydrology</li></ul></li><li>○ Free Atmosphere<ul style="list-style-type: none"><li>- Air temperature, water vapour, cloud, radiation</li></ul></li><li>○ Atmospheric circulation variability<ul style="list-style-type: none"><li>- ENSO, PDO, NAO, IOD</li></ul></li><li>○ Monsoons</li><li>○ Extreme events<ul style="list-style-type: none"><li>- Heat waves, drought, floods, typhoons</li></ul></li><li>○ Climate Sensitivity and Feedbacks<ul style="list-style-type: none"><li>- Cloud, aerosol, water vapour</li></ul></li></ul>	<ul style="list-style-type: none"><li>- Agriculture</li><li>- Water resources</li><li>- Energy</li><li>- Industries</li><li>- Health</li><li>- Forestry</li><li>- Etc.</li></ul>
Scenario DB (daily, monthly)		

# Development of APCC :

**3<sup>rd</sup> Stage – Korean National Climate Data Center (K-NCDC) and  
Global Climate Research Center**

**3<sup>rd</sup> Stage : APCC as the Korean National Climate  
Data Center (K-NCDC) and Global  
Climate Research Center**

# Development of APCC :

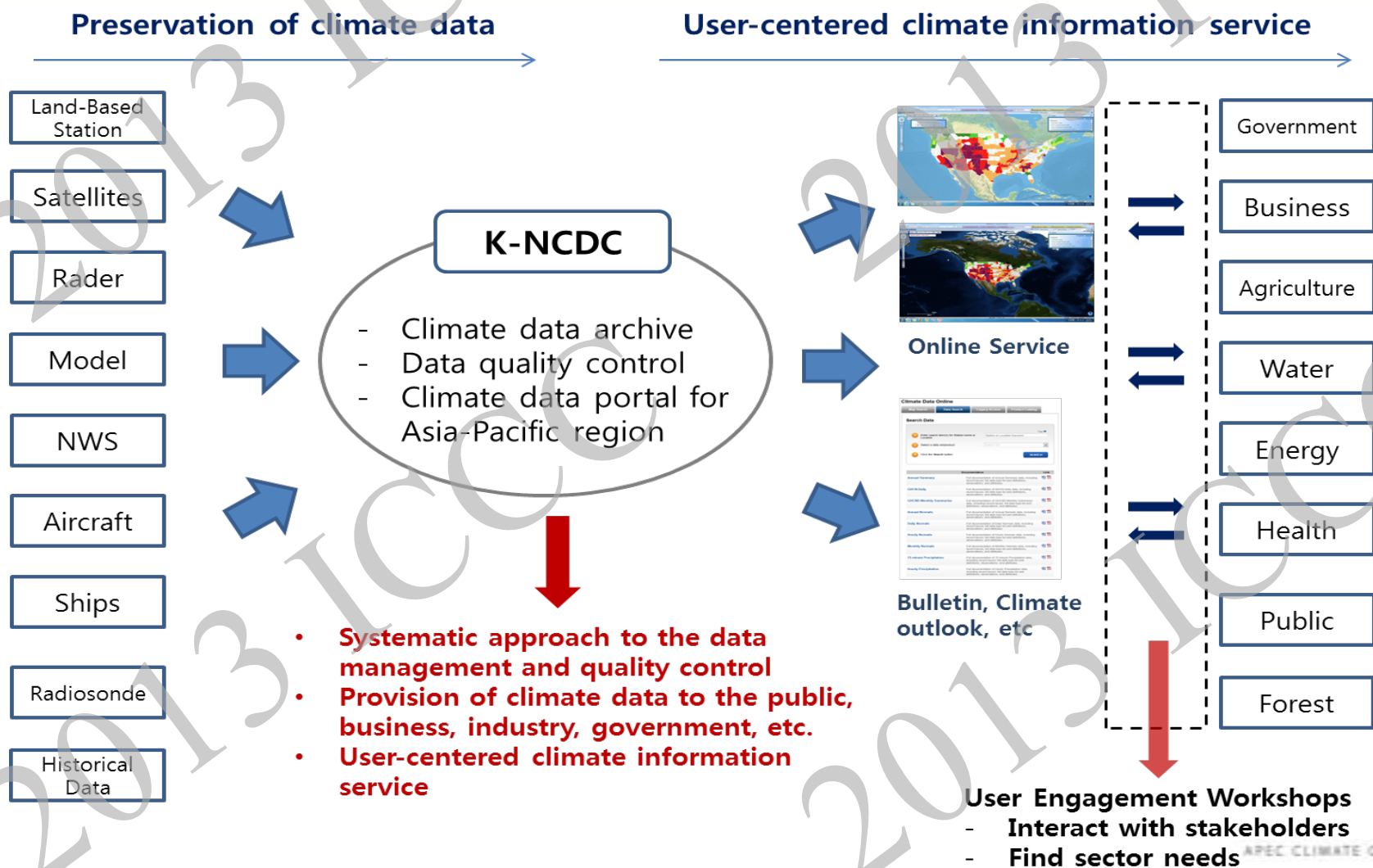
## 3<sup>rd</sup> Stage – Korean National Climate Data Center (K-NCDC) and Global Climate Research Center

**APCC aims to play an expanded role as the Korean National Climate Data Center (K-NCDC) to maintain a climate data archive and provide climatological services and data to every sector of the Korean economy and to users worldwide, similar to the NCDC in the U.S.**

- Data come to APCC from, not only land-based stations, but also from ships, buoys, weather balloons, radars, satellites, and even sophisticated weather and climate models
- APCC develops national and global datasets, which can be used to maximize the use of climatic resources, while also minimizing the risks caused by climate variability and weather extremes
- As a trusted authority on climate information, APCC provides customer-focused climate data and services
  - APCC develops climate data for use in a variety of application areas, including agriculture, air quality, construction, education, energy, engineering, forestry, health, insurance, landscape design, livestock management, manufacturing, national security, recreation and tourism, retail, transportation, and water resources management

# Development of APCC :

## 3<sup>rd</sup> Stage – Korean National Climate Data Center (K-NCDC) and Global Climate Research Center





# Climate Information and User Services

## III. Climate Information and User Services

# Climate Information and User Services

**APCC develops system and tools to efficiently distribute climate data and information produced by APCC to various researchers and users in APEC member economies and the global community**

- One of APCC's goals is to act as a center for climate data and related information with open access to APEC member economies
- APCC also helps build the capacity of member economies in producing and using reliable climate predictions
- The main systems and tools for providing climate data and information produced by APCC include:
  - (1) APCC Data Service System (ADSS)
  - (2) CLimate Information tooKit (CLIK); and
  - (3) TRACKing Center and Environmental changes (TRACE)

# Climate Information and User Services : APCC Data Service System (ADSS)

## (1) APCC Data Service System (ADSS)

**ADSS provides a variety of climate information, from real-time climate monitoring data to climate forecasts, to stakeholders in APEC member economies and other interested institutes**

- ADSS is a climate data provision service using FTP and OpENDAP protocol
- Climate information comes from a variety of sources, including forecast models, in situ observation platforms, satellites, and climate re-analyses, which are a blend of observational and model data

# Climate Information and User Services : CLimate Information toolKit (CLIK)

## (2) CLimate Information toolKit (CLIK)

**CLIK is a web-based tool for data retrieval and climate prediction which allows users to authenticate and produce customized MME (Multi-Model Ensemble) seasonal predictions and downscale a forecast for a specific region**

- Climate forecasters, disaster planners and researchers can log in to this online service to create customized climate predictions for their region of interest
  - ❖ CLIK won the Grand Prix Award at the 2009 Fukuoka Ruby Award Competition, among 78 entries from 8 countries, for its technical merit and potential contribution to society





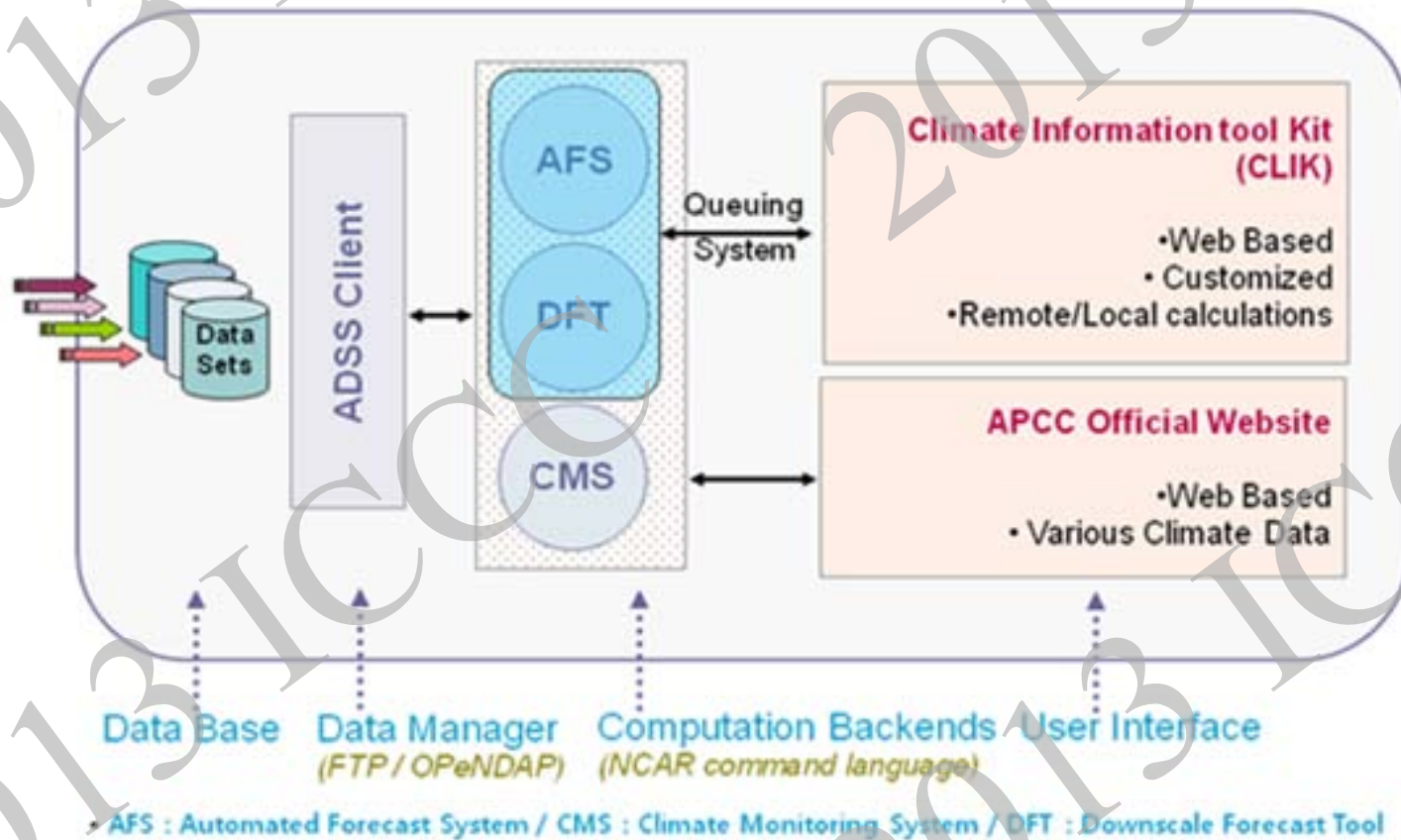
# Climate Information and User Services : TRACKing Center and Environmental changes (TRACE)

## **(3) TRACKing Center and Environmental changes (TRACE)**

**The TRACE web portal aims to create a virtual platform for scientists and policy makers to convene and discuss various climate change adaptation issues**

- TRACE provides an online forum to discuss current climate events and keep users abreast of the latest climate news and events around the globe

# Climate Information and User Services : APCC Data Services





**Thank You.**