Introduction to CLIK
(http://clik.apc21.net)

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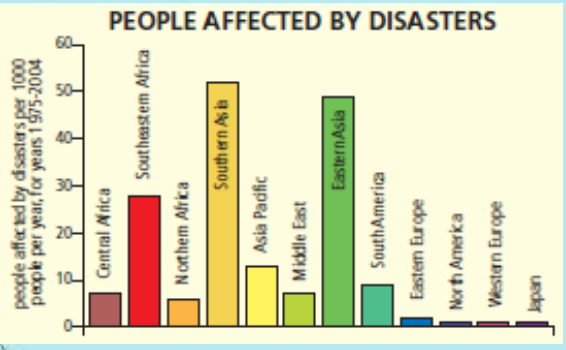
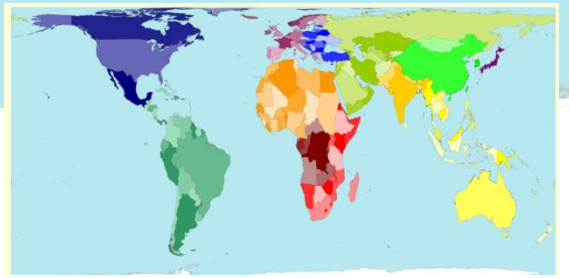
APCC APEC CLIMATE CENTER

Outline

- What is CLIK?
  - Background
  - Introduction to ADSS
  - Introduction to CLIK
  - Configuration of CLIK
- How to use CLIK?
  - CLIK : Getting Started
  - How to use Data Library of CLIK

Affected by Disasters

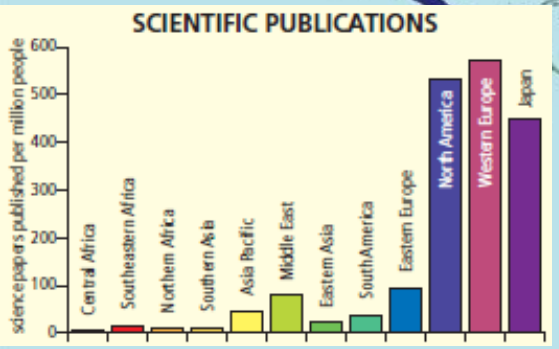




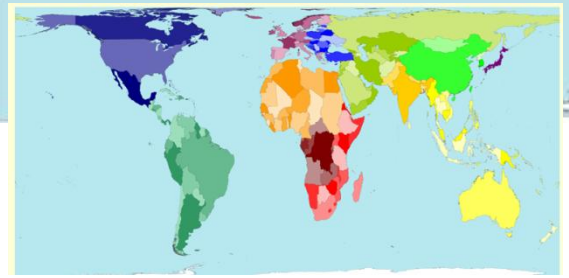
Territory size
= The proportion of all people worldwide affected by disaster

Disasters mostly affect developing economies many of which have poor infrastructure for climate prediction.

Science Research



Territory size
= The proportion of all published scientific papers

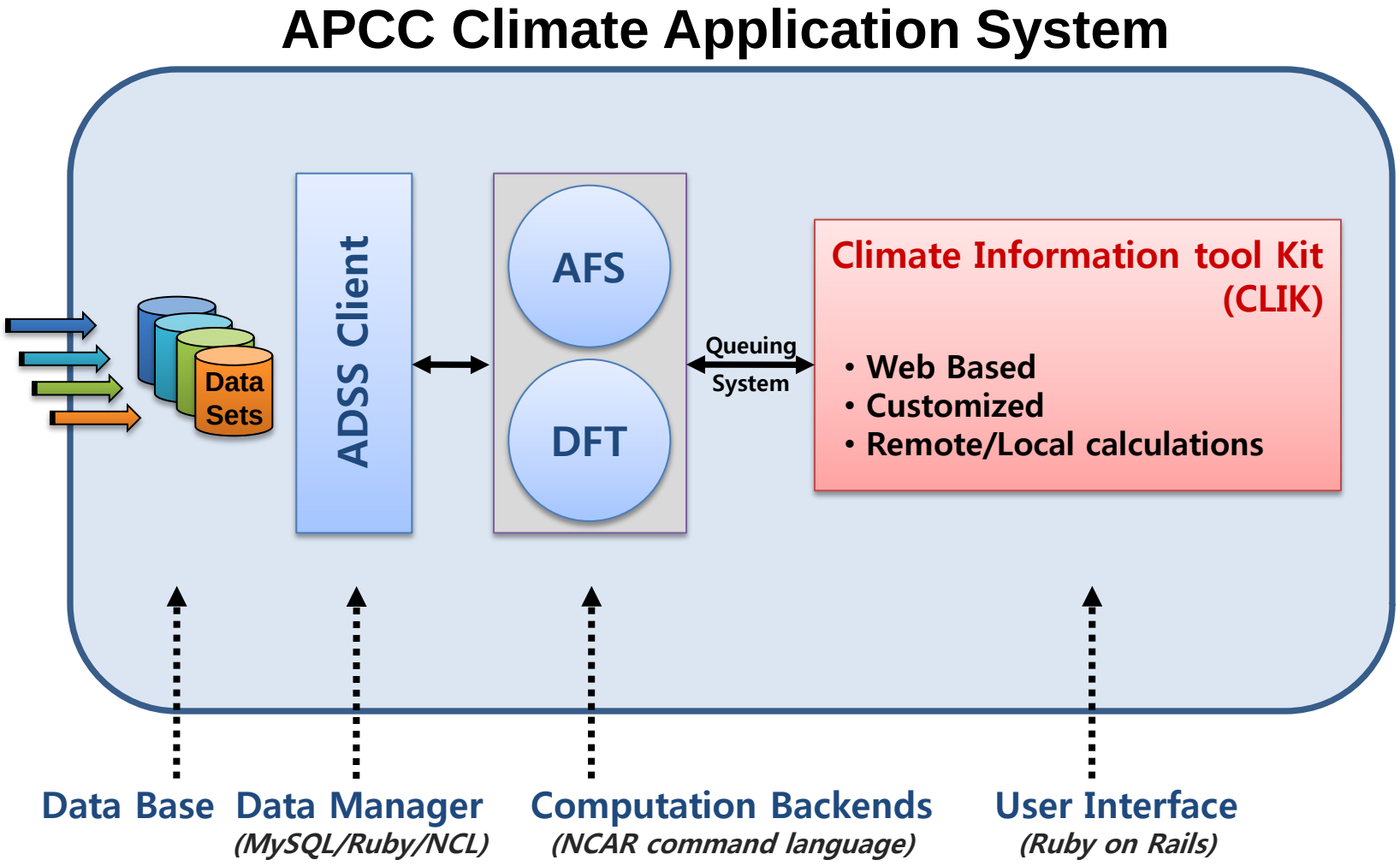


APCC mission

- Facilitating the share of high-cost climate data and information to minimize economic and human losses due to natural disasters

- Capacity building in climate prediction and sustainable social and economic applications of climate information

APCC Climate Application System



AFS: Automated Forecast System
DFT: Downscaling Forecast Tool

APEC Climate Center Data Service System (ADSS)

APCC APEC CLIMATE CENTER

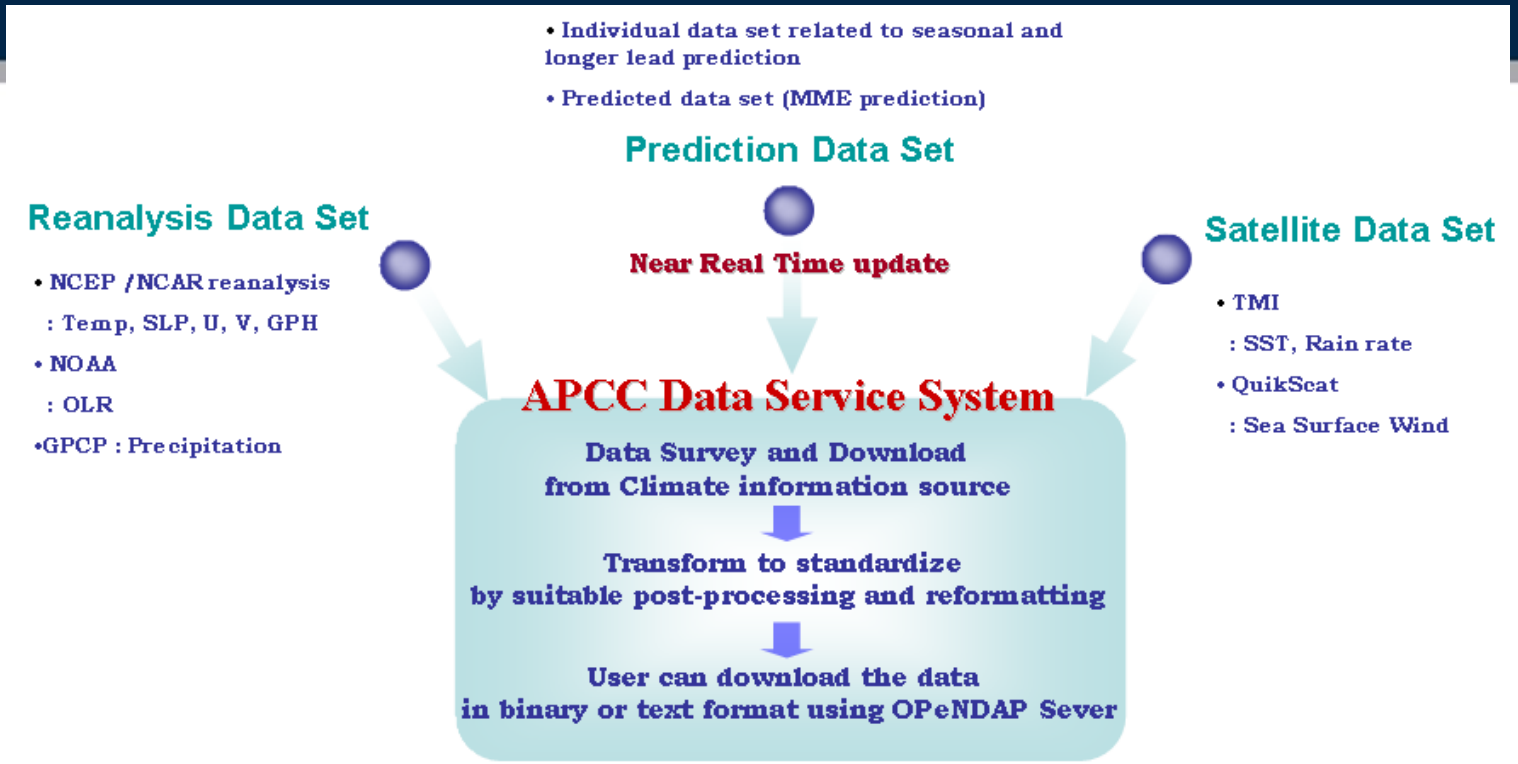
What is ADSS?

ADSS: APCC Data Service System

- Constructed for real time climate monitoring and digital data service to APEC members
- Be of great serve for APCC to play an important role as a hub of data service center

- To provide a comprehensive set of model and observational climate data, in order to establish a scientific basis for climate prediction.
- To monitor climate information using near real-time in situ observation and prediction data interfaces on the webpage for various users.

What is ADSS?



OPeNDAP server enables easy and flexible access to APCC data for users

End User Communities

Provide data

- for near real-time climate monitoring

- to initialize seasonal/subseasonal forecasts

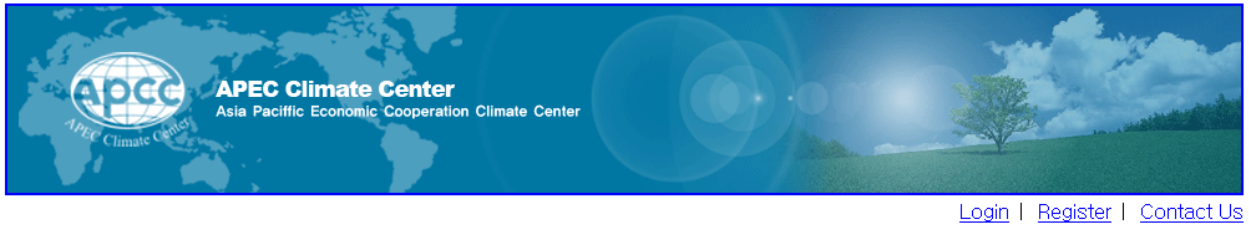
- to facilitate research into seasonal/subseasonal predictability and prediction

List of data served on OPeNDAP

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

How to use ADSS ?

http://cis.apcc21.net



OPeNDAP Service allows user to cut and slice data as needed

Conventional FTP Service is also provided

How to use ADSS ?

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

APEC Climate Center National Pension Corporation Busan Bldg. Yeonsan 2(i)-dong Yeonje-gu Busan 611-705 Korea. Tel.82-51-668-7470~2 Fax.82-51-668-7473 E-mail:cis@apcc21.net Copyright(c) APCC All rights reserved

http://cis.apcc21.net

APEC Climate Center

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 XML — Hyrax development sponsored by NSF, NASA and NOAA

OPeNDAP Hyrax (1.1.0) ServerUUID=e93c3d09-a5d9-49a0-a912-a0ca16430b91-contents
Documentation

Visiting ADSS

APEC Climate Center

Contents of /TMI/

Name	Last modified	Size	Response Links
Parent Directory		-	
Daily/	2007-07-03 07:07:34	-	- - - - -
Monthly/	2007-05-31 08:42:15	-	- - - - -

THREDDS Catalog HTML XML — Hyrax development sponsored by NSF, NASA and NOAA

OPeNDAP Hyrax (1.1.0)
Documentation

APEC Climate Center

Contents of /TMI/Daily/

Name	Last modified	Size	Response Links
Parent Directory		-	
Anomaly/	2007-07-03 07:07:34	-	- - - - -
Backdate/	2007-03-06 03:40:03	-	- - - - -
Climatology/	2006-12-08 10:17:14	-	- - - - -
ISV/	2007-03-05 04:08:29	-	- - - - -
Logser/	2007-09-11 07:06:44	-	- - - - -
Mean/	2007-04-16 02:42:37	-	- - - - -
ano_org/	2007-06-29 07:42:39	-	- - - - -
test/	2007-07-02 10:01:57	-	- - - - -

THREDDS Catalog HTML XML — Hyrax development sponsored by NSF, NASA and NOAA

OPeNDAP Hyrax (1.1.0)
Documentation

APEC Climate Center

Contents of /TMI/Daily/Mean/

Name	Last modified	Size	Response Links
Parent Directory		-	
2006/	2007-03-05 07:12:23	-	- - - - -
2007/	2007-09-10 07:04:03	-	- - - - -

THREDDS Catalog HTML XML — Hyrax development sponsored by NSF, NASA and NOAA

OPeNDAP Hyrax (1.1.0)
Documentation

How to use ADSS ?

1. From FTP (NC format)

wget ftp://cis.apcc21.net/TMI/Daily/Mean/2008/sst.nc

2. From OPeNDAP (Grads binary format, but need ctl file) – possible to slice

gradsdods -lc 'sdfopen http://cis.apcc21.net:8080/opendap/MME/FORECAST/SCM/OCT/2008/prec.nc'

q file	(file information)
set gxout fwrite	(open fwrite - writing option)
set fwrite prec.gdat	(configure a file name)
set z 1	(configure a dimension)
set x 1 144	(same as set lon 0 360)
set y 1 73	(same as set lat -90 90)
set t 1 3	
d prec	(variable name)
disable fwrite	(close fwrite)

How to use ADSS ?

3. From OPeNDAP (NC format using NCL) – possible to slice

```
ncl
aa
    =addfile("http://cis.apcc21.net:8080/opendap/MME/FORECAST/SCM/OCT/2008/pr
    ec.nc","r")
bb = addfile("prec.nc","c")                    (create file)
printVarSummary(aa)                             (file information)
var = aa->prec                                   (read variable of file aa)
bb->prec=var                                     (write variable in file bb)
```

==========

Ex) For getting a sliced dataset – NCL starts from 0 in dimension unlike Fortran and Grads.

☞ var=aa->prec(:,20:52,:)

Grads : set x 21 53

How to use ADSS ?

4. From OPeNDAP (Grads binary format using NCL) – possible to slice

```
ncl
aa
    =addfile("http://cis.apcc21.net:8080/opendap/MME/FORECAST/SCM/OCT/2008/pr
    ec.nc","r")
printVarSummary(aa)                          (file information)
var = aa->prec                               (read variable of file aa)
fbinrecwrite("prec.gdat", 0, var)            (write variable of grads binary format)
```

==========

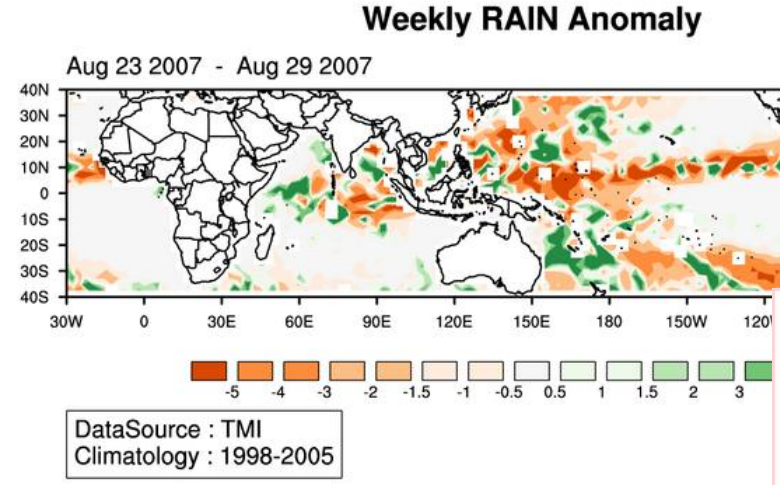
Ex) For getting a sliced dataset – NCL starts from 0 in dimension unlike Fortran and Grads.

☞ var=aa->prec(:,20:52,:)

Grads : set x 21 53

How to use ADSS ?

How to use

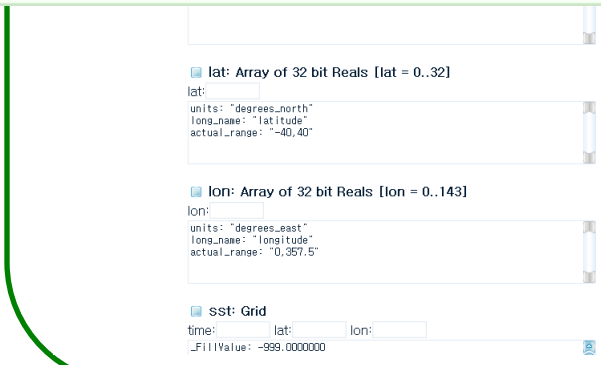


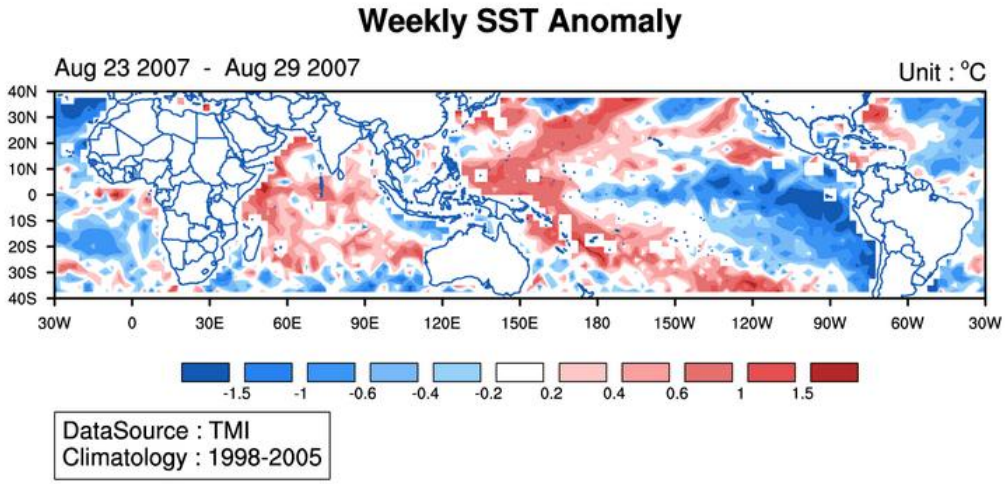
mple 1 :

unch GrADS

t and paste "Data URL" into the rface of the client software :

cis.apcc21.net:8080/opendap/TMI/Daily/Mean/2007/sst.nc





How to use ADSS ?

Useful Tips

ncdump (dncdump) -options filename

-c

Show the values of coordinate variables (variables that are also dimensions) as well as the declarations of all dimensions, variables, and attribute values. Data values of non-coordinate variables are not included in the output.

-h

Show only the header information in the output, that is the declarations of dimensions, variables, and attributes but no data values for any variables.

-v var1,...,varn

The output will include data values for the specified variables, in addition to the declarations of all dimensions, variables, and attributes.

Ex)

dncdump –v time

http://cis.apcc21.net:8080/opendap/QuikScat/Daily/Mean/2008/uwnd.nc

ncdump –h uwnd.nc

How to use ADSS ?

Useful Tips

ut_calendar

In order to check a data time, first you should know time information of NC data using ncdump or dncdump command.

```
ncl                                                    (start ncl)
time = 39713
time@units="days since 1900-01-01"                     (time units in file)
aa=ut_calendar(time,3)                                 (time=variable,
3=option)
print(aa)

(0)     2008092400
```

What is CLIK ?

Climate Information Tool Kit

APCC APEC CLIMATE CENTER

Goals

CLIK: CLimate Information tool Kit

- Towards **better utilization** of climate information
- Facilitate **the cooperation in the exchange of information and services** so that nations are able to cope with climate related disasters
- **Capacity building** in climate prediction and sustainable social and economic applications of climate information
- Encourage innovation in applying climate information for societal needs

Goals

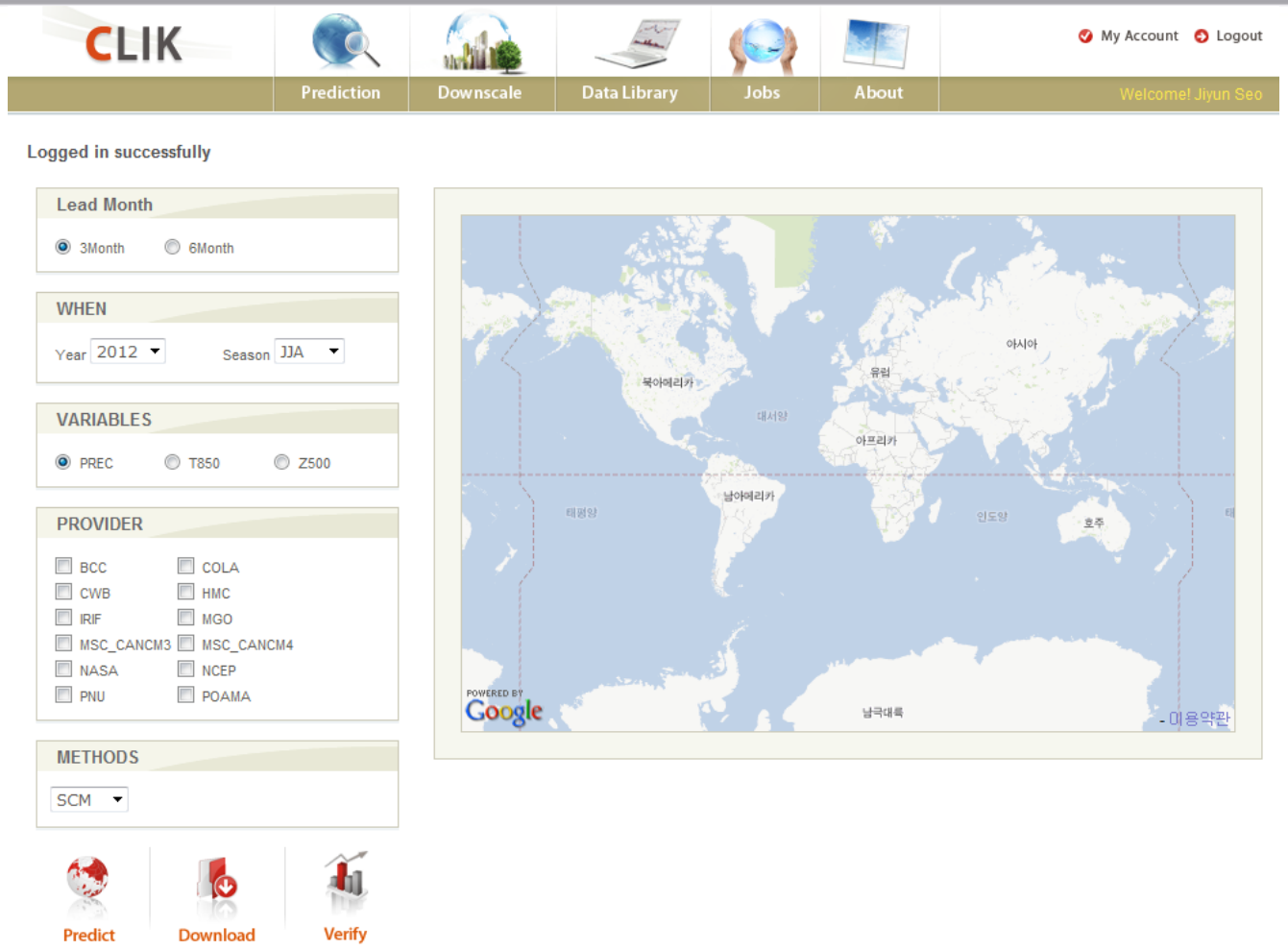
- **Aids users in retrieving and utilizing climate prediction data and information available from APCC data servers in a user friendly manner through web-based format**
- **Provides the customized multi-model ensemble (MME) prediction and the statistical downscaling tool which performs ancillary tasks of predictor variable prescreening, basic diagnostic testing, and graphing of climate data**

CLIK - Internals

- **Based on NCAR Command Language (NCL) and Ruby on Rails**
- **Both powerful frameworks, extensive API, easy to use existing Fortran/C codes**
- **Modular, can extend capabilities by writing Fortran subroutines for example**

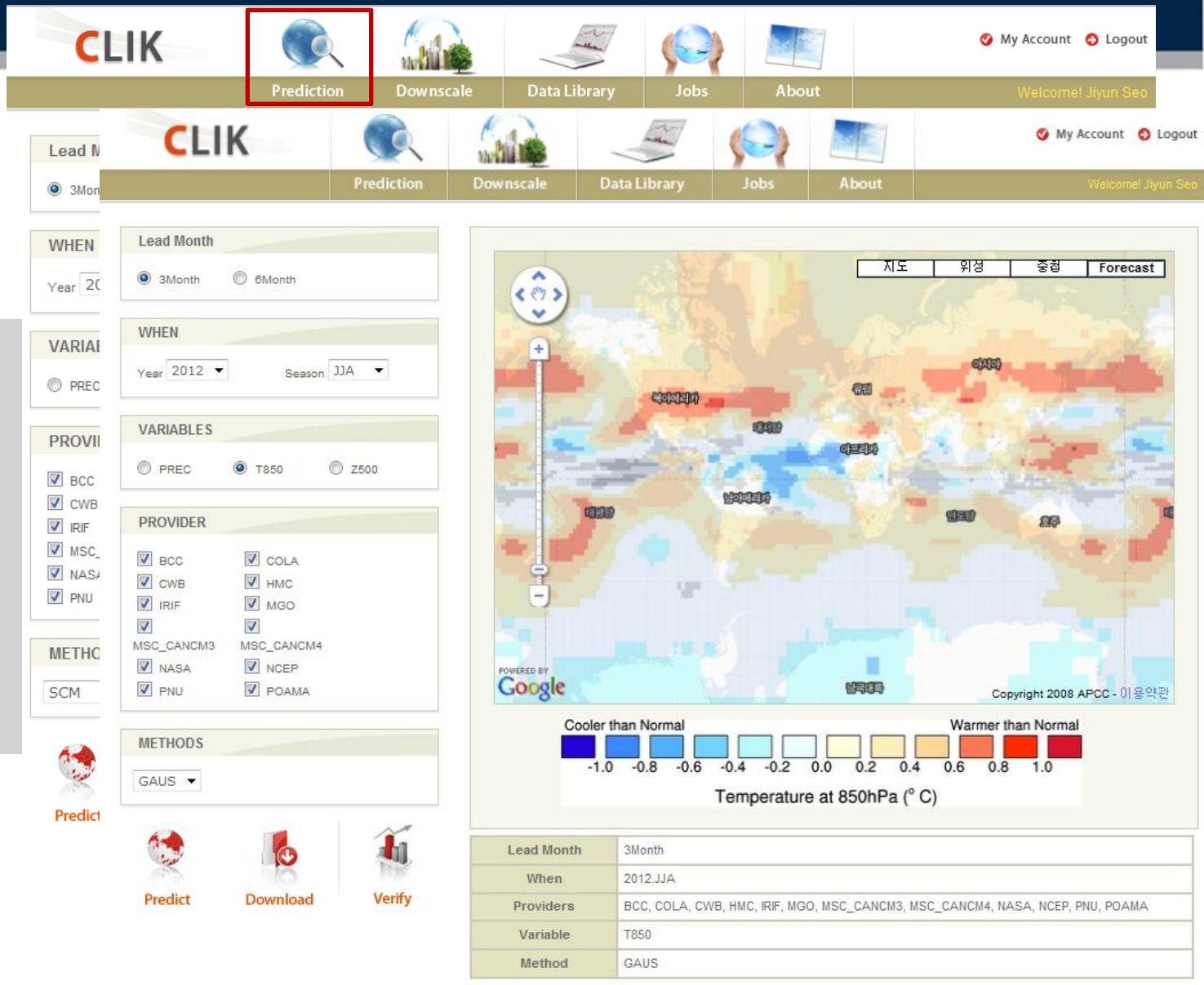
- Sophisticated MME or downscaling schemes can be implemented by user if needed (offline CLIK)

Configuration of CLIK



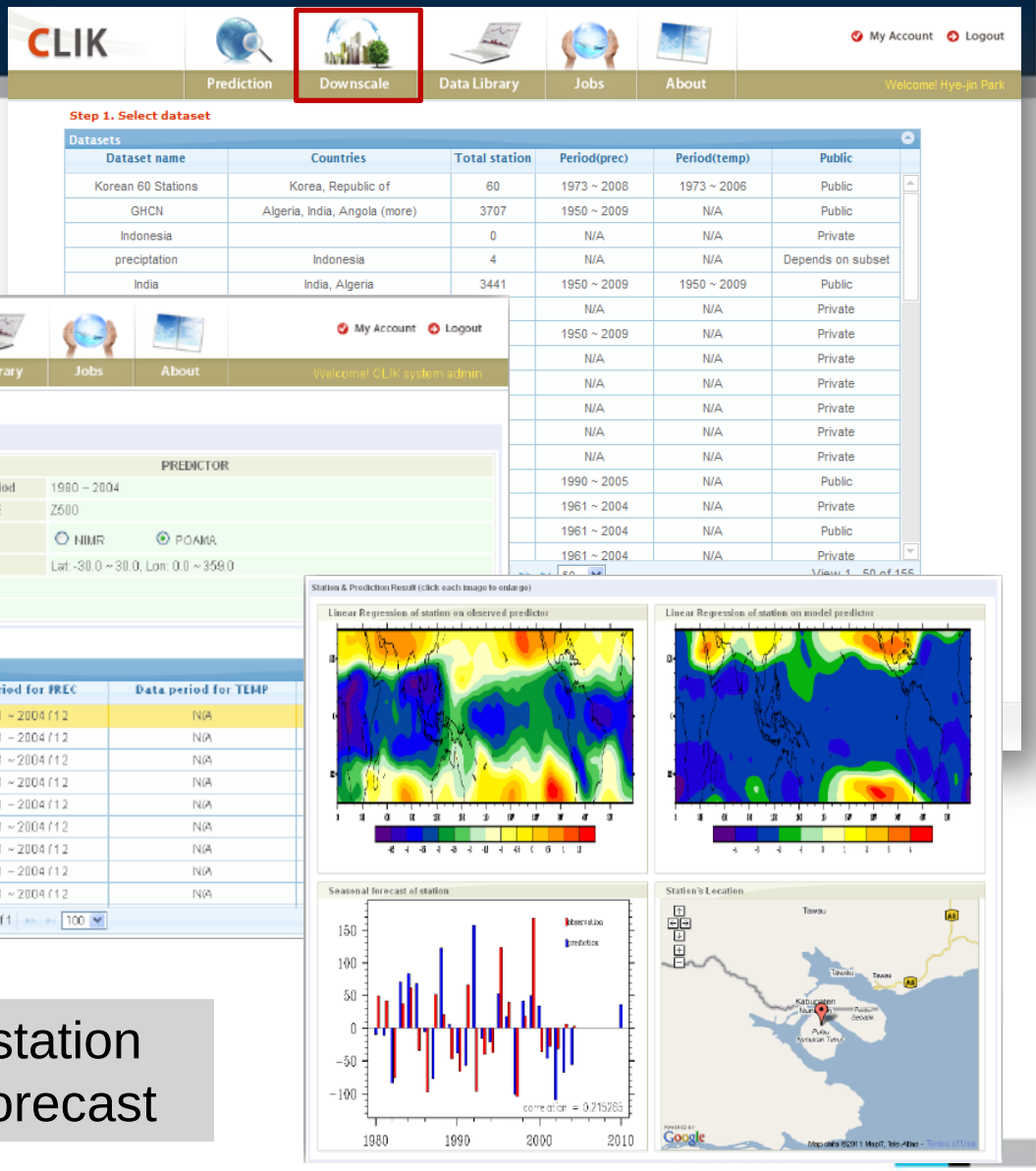
Prediction

- User can produce the customized MME climate forecast and view the result figure with Google map



Lead Month	3Month
When	2012.JJA
Providers	BCC, COLA, CWB, HMC, IRIF, MGO, MSC_CANCM3, MSC_CANCM4, NASA, NCEP, PNU, POAMA
Variable	T850
Method	GAUS

Downscale



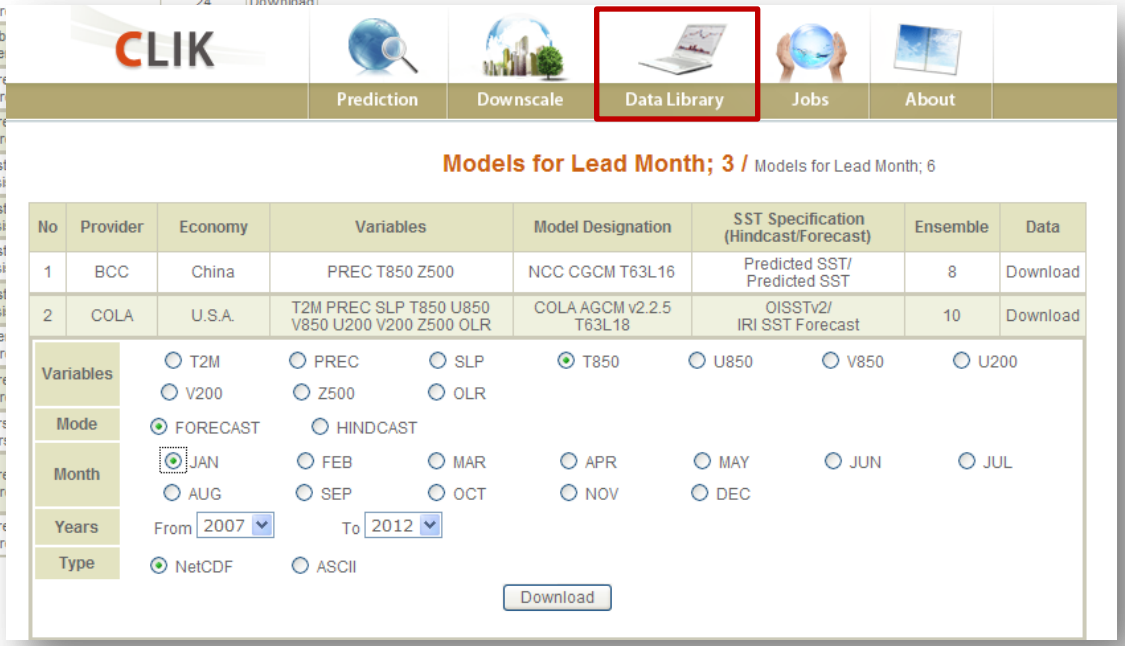
- User can upload their regional station data and make a downscaled forecast

Data Library

Models for Lead Month; 3 / Models for Lead Month; 6

No	Provider	Economy	Variables	Model Designation	SST Specification (Hindcast/Forecast)	Ensemble	Data
1	BCC	China	PREC T850 Z500	NCC CGCM T63L16	Predicted SST/ Predicted SST	8	Download
2	COLA	U.S.A.	T2M PREC SLP T850 U850 V850 U200 V200 Z500 OLR	COLA AGCM v2.2.5 T63L18	OISSTv2/ IRI SST Forecast	10	Download
3	CWB	Chinese Taipei	T2M PREC SLP T850 U850 V850 U200 V200 Z500	CWB T42L18	OPG SST from CWB/ OPG SST from CWB	10	Download
4	GCPS	Republic of Korea	T2M PREC SLP T850 U850 V850 U200 V200 Z500	GCPS T63T21	KMA/SNU SST Forecast/ KMA/SNU SST Forecast	4	Download
5	GDAPS_F	Repulic of Korea	T2M PREC SLP T850 U850 V850 U200 V200 Z500	GDAPS T106L21	KMA/SNU SST Forecast/ KMA/SNU SST Forecast	20	Download
6	HMC	Russia	T2M PREC SLP T850 Z500	SL-AV 1.125 x 1.406, L28	Persistent SST/ Persistent SST	10	Download
7	IRIF	U.S.A.	T2M SST PREC SLP T850 U850 V850 U200 V200 Z500 OLR	ECHAM4.5 T42L19	Observed SST/ Pr	24	Download
8	MGO	Russia	T2M SST PREC SLP T850 U850 V850 Z500 OLR	MGOAM2 T42L14	Ob Pe		
9	MSC_CANCM3	Canada	PREC T850 Z500 T2M SLP U850 V850 U200 V200	CanCM3 AGCM3(T63L31) OGCM4(1.41x0.94,L40)	Pre Pr		
10	MSC_CANCM4	Canada	PREC T850 Z500 T2M SLP U850 V850 U200 V200	CanCM4 AGCM4(T63L35) OGCM4(1.41x0.94,L40)	Pre Pr		
11	MSC_GEM	Canada	PREC T850 Z500 T2M SLP U850 V850 U200 V200	RPN GEMCLIM v3.2.1 2.0 x 2.0, L50	Persist Persi		
12	MSC_GM2	Canada	PREC T850 Z500 T2M SLP U850 V850 U200 V200	CCCma AGCM2 T32, L10	Persist Persi		
13	MSC_GM3	Canada	PREC T850 Z500 T2M SLP U850 V850 U200 V200	CCCma AGCM2 T63, L32	Persist Persi		
14	MSC_SEF	Canada	PREC T850 Z500 T2M SLP U850 V850 U200 V200	RPN SEF T95, L27	Persist Persi		
15	NASA	U.S.A.	T2M SST PREC SLP T850 U850 V850 U200 V200 Z500 OLR	NASA-GSFC 2.5 x 2.0, L34	Pe Pr		
16	NCEP	U.S.A.	T2M SST PREC SLP T850 U850 V850 U200 V200 Z500 OLR	NCEP CFS T62L64	Pre Pr		
17	NIMR	Repulic of Korea	PREC SLP T850 U850 V850 U200 V200 Z500	METRI AGCM 5.0 x 4.0, L17	Pers Pers		
18	PNU	Repiblic of Korea	PREC T850 Z500 T2M SLP U850 V850 U200 V200 OLR SST	PNU CGCM V1.0 T42L18	Pre Pr		
19	POAMA	Australia	T2M SST PREC SLP T850 U850 V850 U200 V200 Z500 OLR	POAMA 1.5 T47L17	Pre Pr		

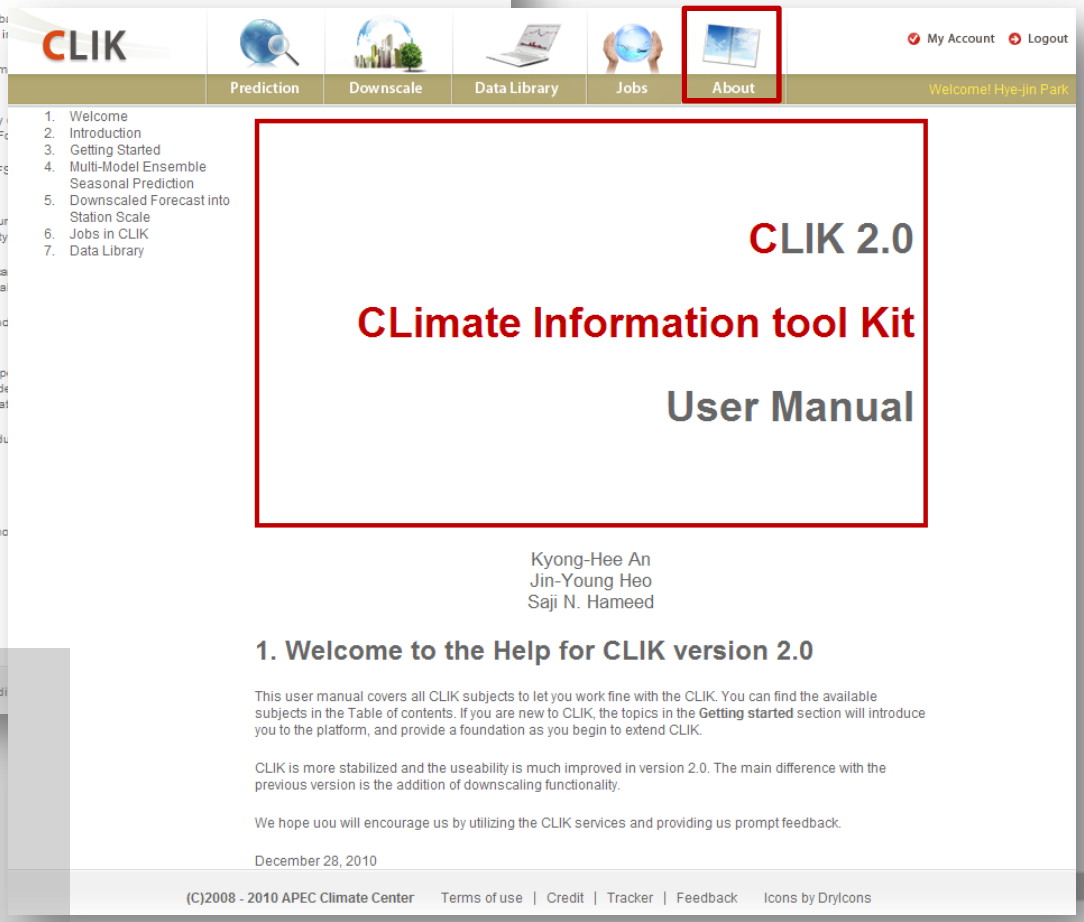
- User can download the forecast and hindcast digital data of the available GCM provided by APCC



Jobs

- Time consuming jobs are off-loaded to backend (Queue system)

About

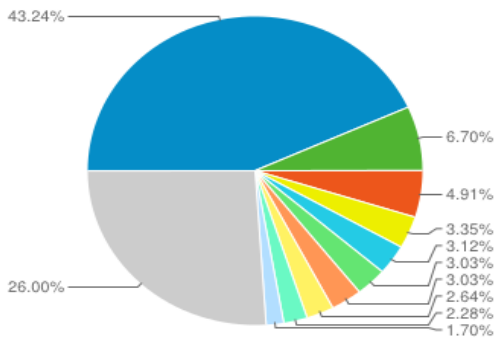


- User can see the information about the CLIK with edition, version and the technical reference

Web Statistics of CLIK service

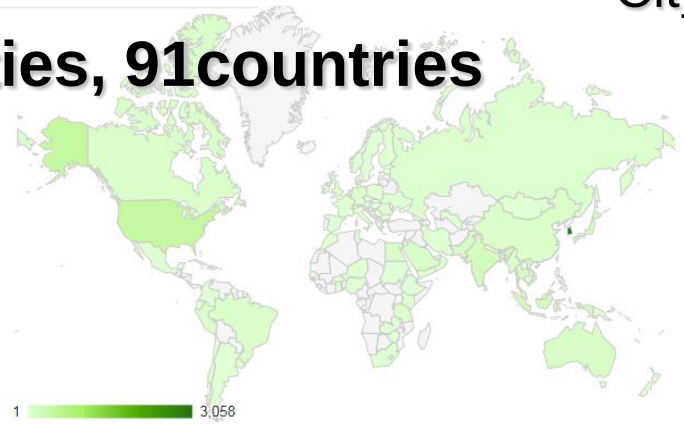
Country/Territory

	Country/Territory	Visits ↓	Visits	Contribution to total: Visits
1.	South Korea	3,058	43.24%	
2.	United States	474	6.70%	
3.	Singapore	347	4.91%	
4.	Vietnam	237	3.35%	
5.	Indonesia	221	3.12%	
6.	India	214	3.03%	
7.	Japan	214	3.03%	
8.	Thailand	187	2.64%	
9.	Malaysia	161	2.28%	
10.	Australia	120	1.70%	



City

- **Visits of total 7,072 times in 539 cities, 91countries**



How to use CLIK ?

http://clik.apcc21.net

APCC APEC CLIMATE CENTER

CLIK – Getting Started

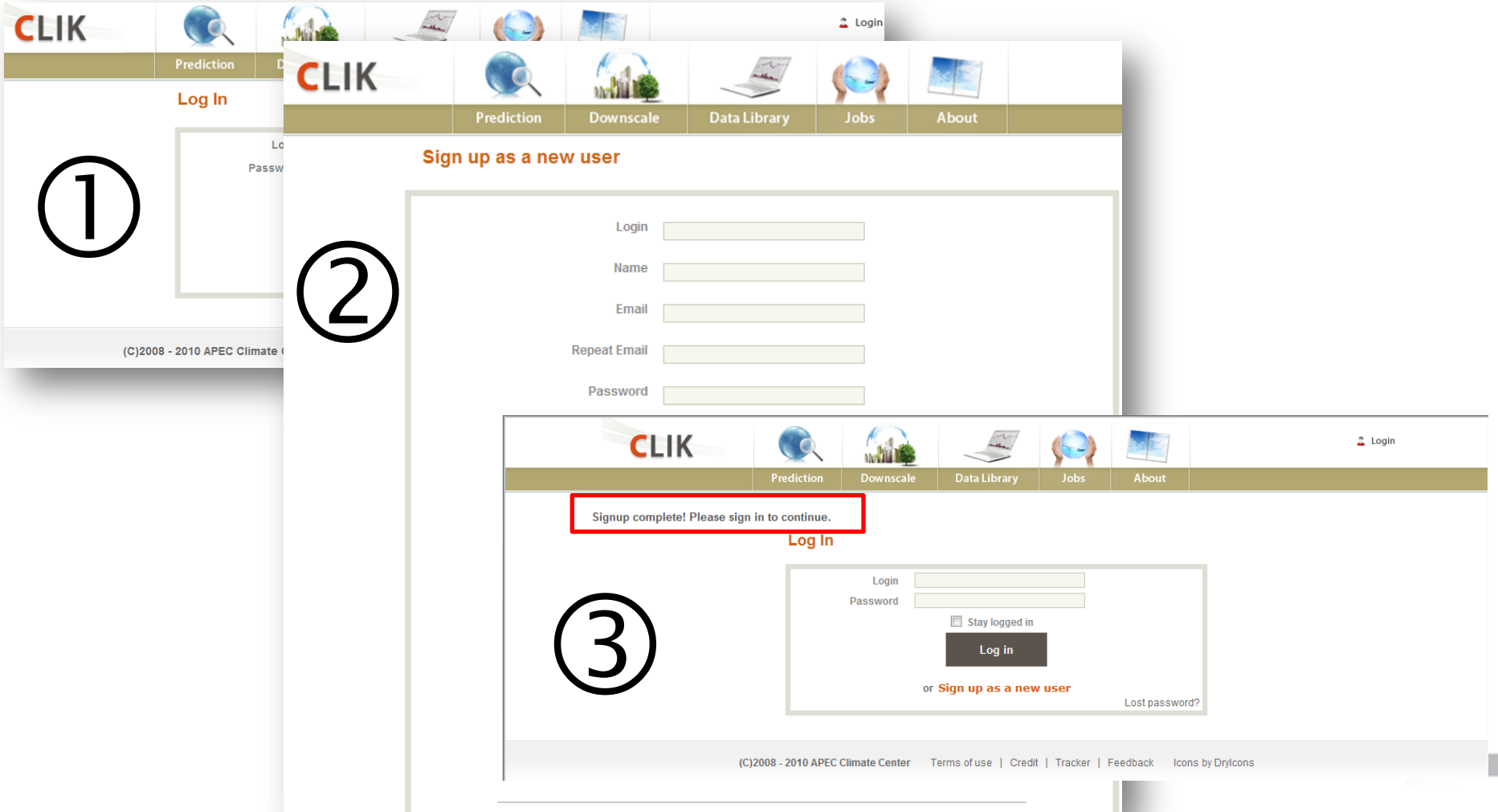
- **Creating your account** ***http://clik.apcc21.net or 210.98.49.68***

1. Click on “Sign up as a new user”. This brings a page for your registration.
2. Fill in the form and write a purpose of use.
3. Agree with “Terms of Data Use” and then you can see the “Sign Up” button.
4. You can see the below message and follow the instruction.

   We just sent an email to “YOUR E-MAIL ADRESS” to verify your email address. you must visit the link in that email to finish sighing up.
5. Log in with your ID and password.

Creating the account

- **Creating your account**



APCC data collection using CLIK data library

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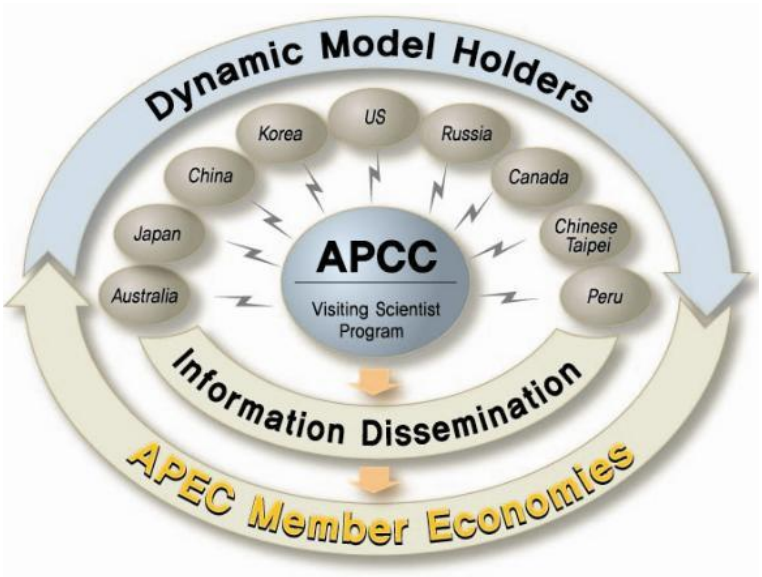
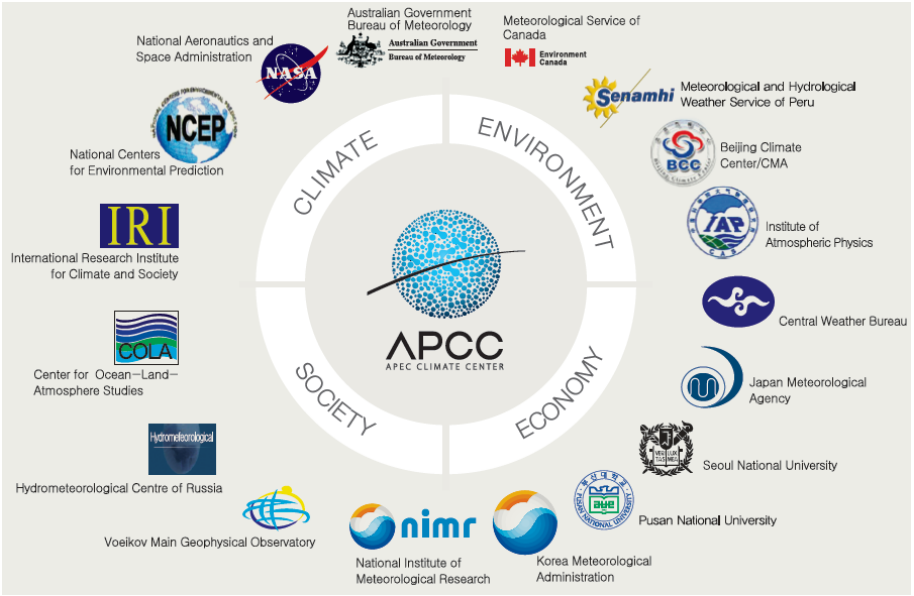
APCC data collection





- Collection of Dynamic ensemble seasonal prediction data from NMHS and research institutes
  (17 operations/institutions from 9 APEC member economies)

List of available models

Models for Lead Month; 3 / Models for Lead Month; 6

No	Provider	Economy	Variables	Model Designation	SST Specification (Hindcast/Forecast)	Ensemble	Data
1	BCC	China	PREC T850 Z500	NCC CGCM T63L16	Predicted SST/ Predicted SST	8	Download
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3	CWB	Chinese Taipei	T2M PREC SLP T850 U850 V850 U200 V200 Z500	CWB T42L18	OPG SST from CWB/ OPG SST from CWB	10	Download
4	GCPS	Republic of Korea	T2M PREC SLP T850 U850 V850 U200 V200 Z500	GCPS T63T21	KMA/SNU SST Forecast/ KMA/SNU SST Forecast	4	Download
5	GDAPS_F	Repulic of Korea	T2M PREC SLP T850 U850 V850 U200 V200 Z500	GDAPS T106L21	KMA/SNU SST Forecast/ KMA/SNU SST Forecast	20	Download
6	HMC	Russia	T2M PREC SLP T850 Z500	SL-AV 1.125 x 1.406, L28	Persistent SST/ Persistent SST	10	Download
7	IRIF	U.S.A.	T2M SST PREC SLP T850 U850 V850 U200 V200 Z500 OLR	ECHAM4.5 T42L19	Observed SST/ Predicted SST	24	Download
8	MGO	Russia	T2M SST PREC SLP T850 U850 V850 Z500 OLR	MGOAM2 T42L14	Observed SST/ Persistent SST	10	Download
9	MSC_CANCM3	Canada	PREC T850 Z500 T2M SLP U850 V850 U200 V200	CanCM3 AGCM3(T63L31) OGCM4(1.41x0.94,L40)	Predicted SST/ Predicted SST	10	Download
10	MSC_CANCM4	Canada	PREC T850 Z500 T2M SLP U850 V850 U200 V200	CanCM4 AGCM4(T63L35) OGCM4(1.41x0.94,L40)	Predicted SST/ Predicted SST	10	Download
11	MSC_GEM	Canada	PREC T850 Z500 T2M SLP U850 V850 U200 V200	RPN GEMCLIM v3.2.1 2.0 x 2.0, L50	Persistent ERA40 SST/ Persistent CMC SST	10	Download
12	MSC_GM2	Canada	PREC T850 Z500 T2M SLP U850 V850 U200 V200	CCCma AGCM2 T32, L10	Persistent ERA40 SST/ Persistent CMC SST	10	Download
13	MSC_GM3	Canada	PREC T850 Z500 T2M SLP U850 V850 U200 V200	CCCma AGCM2 T63, L32	Persistent ERA40 SST/ Persistent CMC SST	10	Download
14	MSC_SEF	Canada	PREC T850 Z500 T2M SLP U850 V850 U200 V200	RPN SEF T95, L27	Persistent ERA40 SST/ Persistent CMC SST	10	Download
15	NASA	U.S.A.	T2M SST PREC SLP T850 U850 V850 U200 V200 Z500 OLR	NASA-GSFC 2.5 x 2.0, L34	Perdicted SST/ Predicted SST	8	Download
16	NCEP	U.S.A.	T2M SST PREC SLP T850 U850 V850 U200 V200 Z500 OLR	NCEP CFS T62L64	Predicted SST/ Predicted SST	15	Download
17	NIMR	Repulic of Korea	PREC SLP T850 U850 V850 U200 V200 Z500	METRI AGCM 5.0 x 4.0, L17	Persistent OISST/ Persistent OISST	10	Download
18	PNU	Repiblic of Korea	PREC T850 Z500 T2M SLP U850 V850 U200 V200 OLR SST	PNU CGCM V1.0 T42L18	Predicted SST/ Predicted SST	5	Download
19	POAMA	Australia	T2M SST PREC SLP T850 U850 V850 U200 V200 Z500 OLR	POAMA 1.5 T47L17	Predicted SST/ Predicted SST	15	Download

How to download the data from CLIK?

19	POAMA	Australia	T2M SST PREC SLP T850 U850 V850 U200 V200 Z500 OLR	POAMA 1.5 T47L17	Predicted SST/ Predicted SST	15	Download

Variables	(•) T2M	( ) SST	( ) PREC	( ) SLP	( ) T850	( ) U850	( ) V850
	( ) U200	( ) V200	( ) Z500	( ) OLR			
Mode	(•) FORECAST	( ) HINDCAST					
Month	( ) JAN	( ) FEB	( ) MAR	( ) APR	( ) MAY	(•) JUN	( ) JUL
	( ) AUG	( ) SEP	( ) OCT	( ) NOV	( ) DEC		
Years	From 2012 ▾	To 2012 ▾					
Type	( ) NetCDF	(•) ASCII					

Download

Data downloaded as ASCII type

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Information of longitude

Information of time, ensemble member and latitude

Value of Variable(T2m) at each longitude

APCC data collection

- **Download the precipitation forecast data of Jun, 2012 of POAMA model**

1. Click on “Data Library”. You can see a page listing currently available data sets.
2. Press “Download” at most right and below column (POAMA).
3. Now you can choose “*PREC*” as a variable and the “Mode” is “*Forecast*”.
4. Select “*Jun*” as month and “Years” should be from *2012* to *2012*.
5. Choose “*ASCII*” as a data type and click the “Download” button. Then you can check the data in your PC’s file store.

Exercise1

APCC data collection

- **Download the 850hPa temperature hindcast data of Jan, 1983~2002 of NCEP model as ASCII type.**

- Q: What is the value of 850hPa temperature at the grid point 10°N of latitude and 0°E of longitude in Jan, 2000?

A: 293.11


Thank you.