

CLIK hands-on (PART IV):  
**Multi Model Downscaling using  
CLIK**  
(<http://clik.apcc21.org>)

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# Downscaling procedure in CLIK

## Station data

- Point (uploaded)

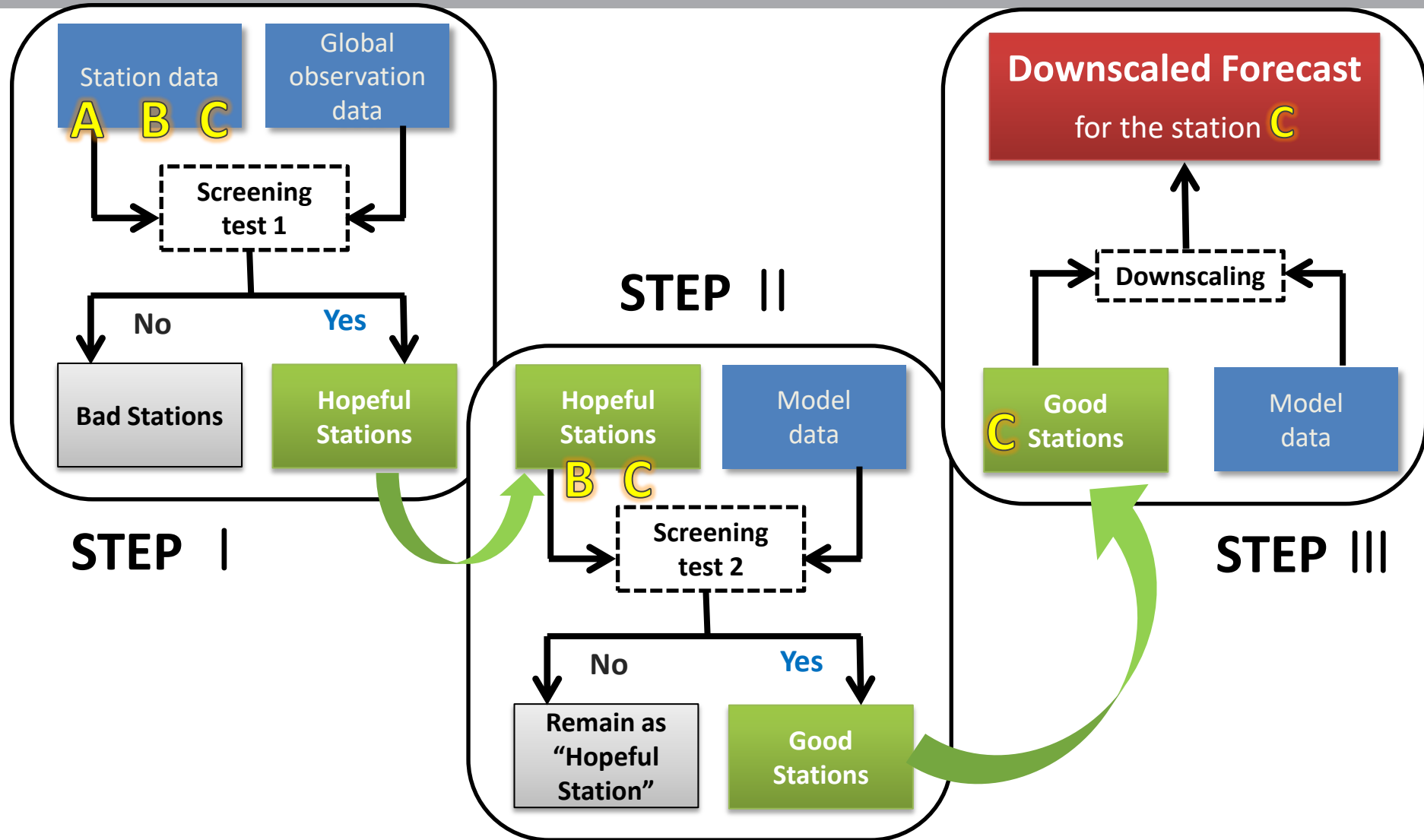
## Global observation data

- Grid (built-in)
- Reanalysis: NCEP2; atmospheric variables
- Satellite: CAMS OPI; precipitation

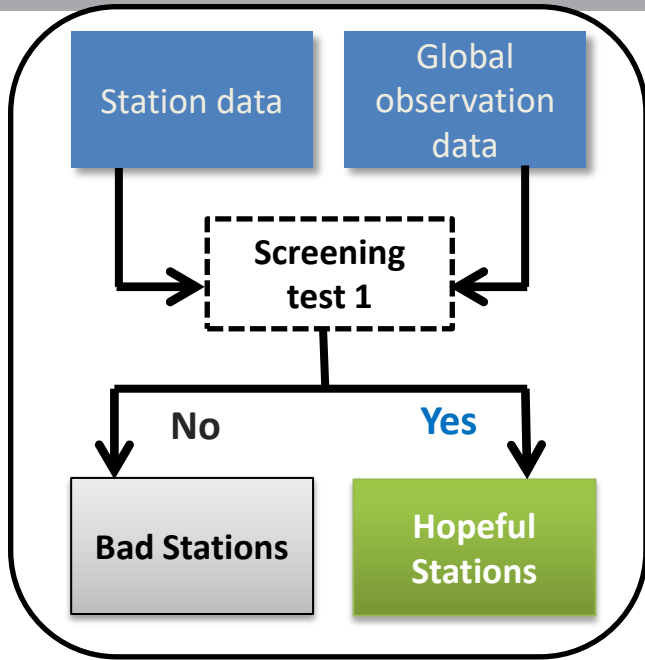
## Model data

- Grid (built-in)
- Hindcast by dynamical models

# Downscaling procedure in CLIK



# Downscaling procedure in CLIK

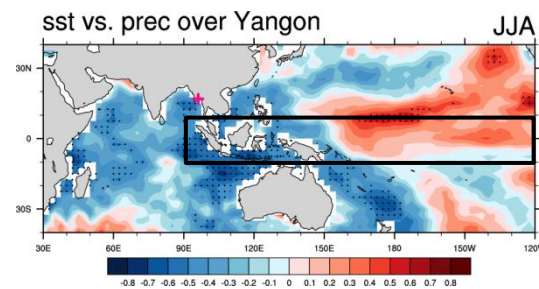
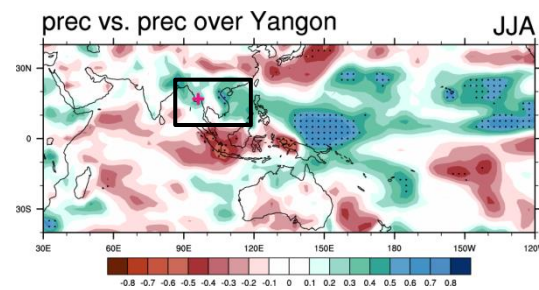


**STEP 1**

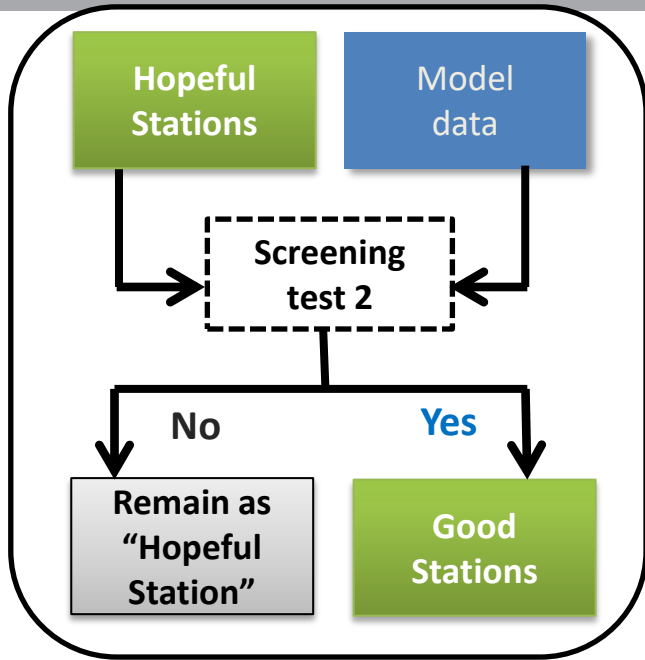
Screening test 1:

- ✓ Do the station data and the global map from observation have a relationship based on “**significance level**”?
- ✓ Do the station data have relationship with the large-scale climate pattern?

Correlation map of global observation vs. station



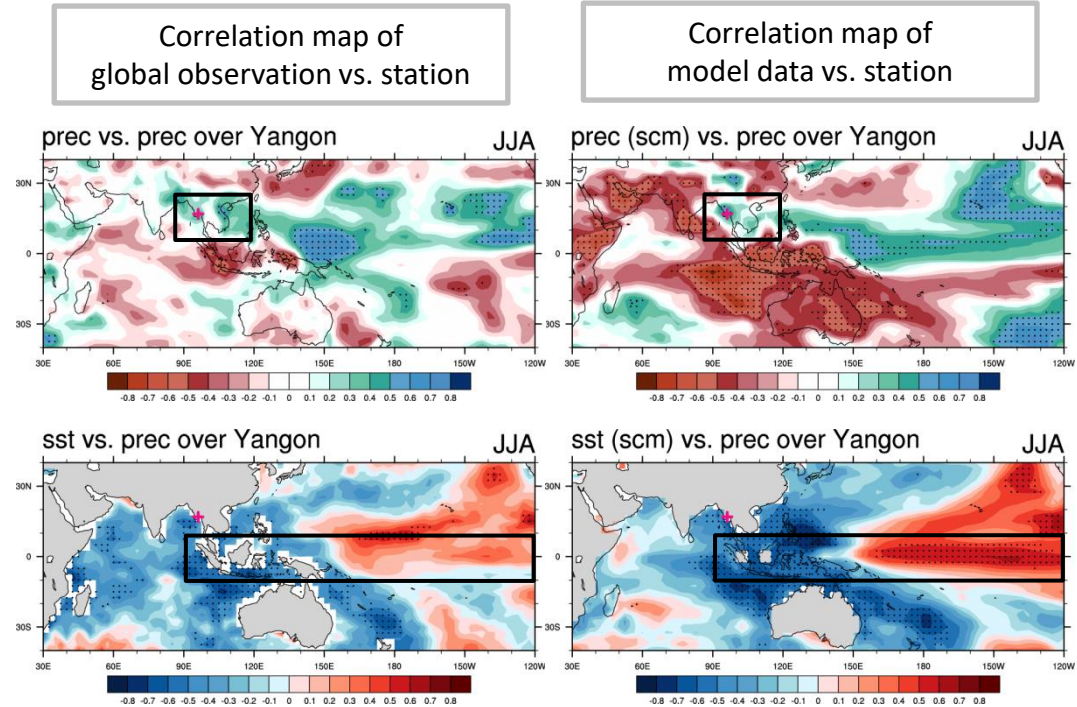
# Downscaling procedure in CLIK



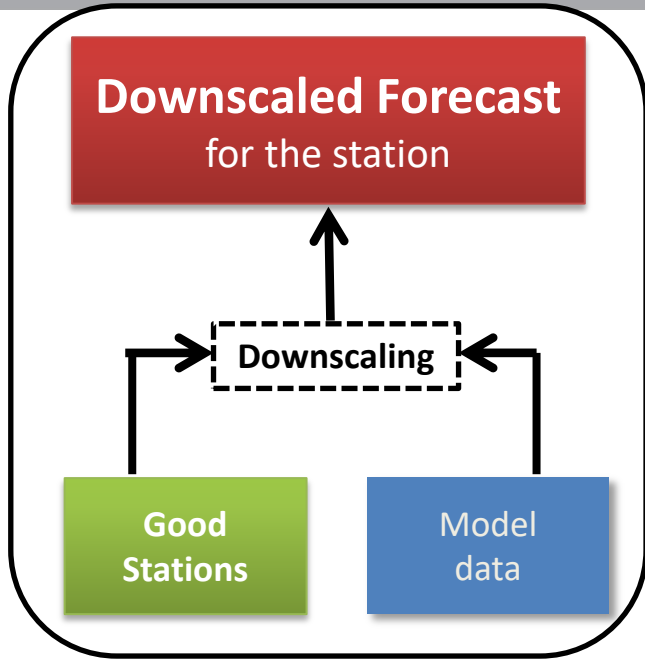
STEP II

Screening test 2:

- ✓ Can the dynamical models reproduce the relationship between the global observation and hopeful stations?
- ✓ Screen based on the “**minimum pattern correlation**”.



# Downscaling procedure in CLIK



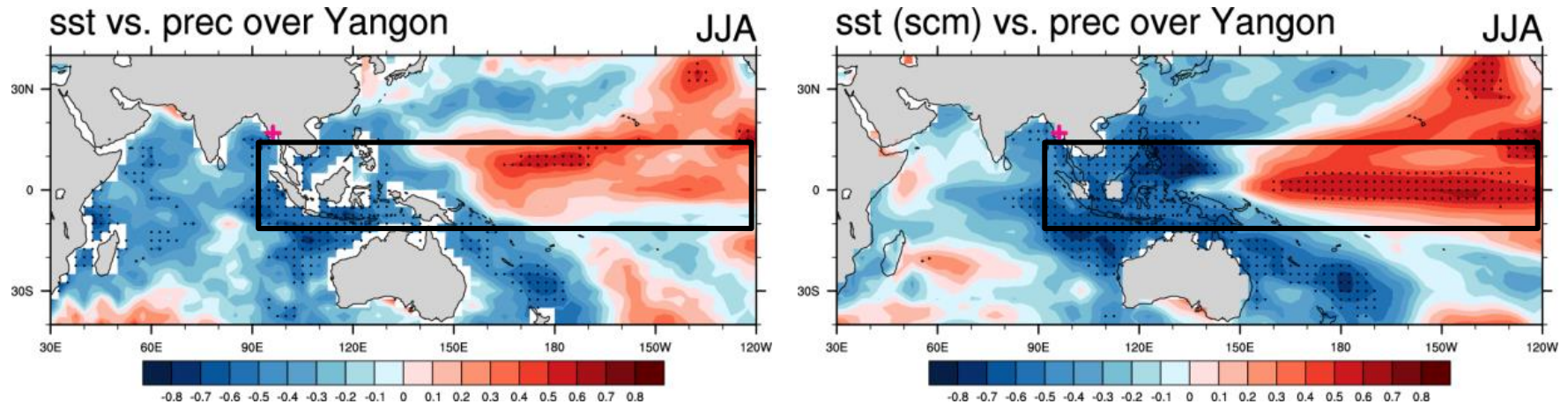
Downscaling process:

- ✓ Based on the **linear regression model**
- ✓  $y = a + bx$

**STEP III**

# Downscaling procedure in CLIK

## Relationship between precipitation over Yangon & ...



- The station data has relationship with the global observational sst over some areas.
- Dynamical models can reproduce the relationship between observation and station data.
- We hope a successful downscaling by CLIK system...



# **Rainfall over Yangon for the next three month (JJA 2017)?**

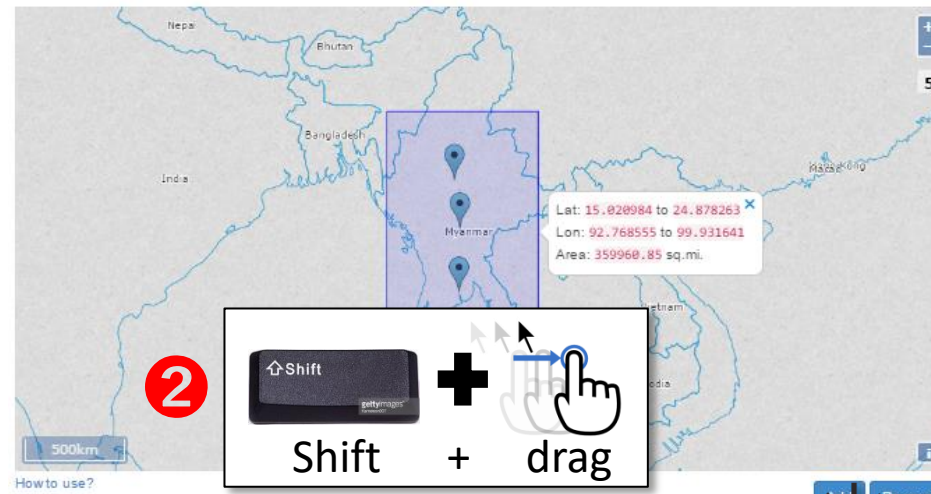
# Produce a downscaled forecast

Select Dataset / Station

Dataset Name	Countries	Total Stations	Period(prec)	Period(temp)	Public
GHCN	GHCN	3707	1950 ~ 2009	N/A	PUBLIC
Aphrodite data interpolated to M...	Afghanistan, Bangladesh, Brune...	4918	1961 ~ 2004	N/A	PUBLIC
Korea 60 Stations	Korea, Republic of	60	1973 ~ 2008	1973 ~ 2006	PUBLIC
Myanmar	Myanmar	3	1987 ~ 2013	N/A	downy

1

Create Edit Remove



Station (3)

Station ID	Name	Precipitation	Temperature
1	Pyinmana	1987/1 ~ 2010/12	N/A
2	Kabaaye	1987/1 ~ 2013/12	N/A
3	Sagaing	1987/1 ~ 2010/11	N/A

3

Common data period of selected stations

Month	1	2	3	4	5	6	7	8	9	10	11	12
Precipitation	1987 ~ 2013	1987 ~ 2013	1987 ~ 2013	1987 ~ 2013	1987 ~ 2013	1987 ~ 2013	1987 ~ 2013	1987 ~ 2013	1987 ~ 2013	1987 ~ 2013	1987 ~ 2013	1987 ~ 2013

4

BT

# Produce a downscaled forecast

**Set-up Downscaling**

Downscale Description:

**Prediction Season**

Year:  Season:

**Variable**

PREC     T850     Z500  
 SLP     U850     V850  
 U200     V200     SST

**Models**

APCC     MSC     NASA  
 NCEP     PNU     POAMA

**Predictand**

Precipitation     Temperature

**Training Period**

Form:  To:

**Method**

Linear Regression

**Advanced Options**

Significance Level:  %  
 Minimum Pattern Score:

**Downscaling Region**

Latitude:  ~  Longitude:  ~

Lat: -10.000000 to 15.000000  
 Lon: 90.000000 to 240.000000  
 Area: 18104050.00 Sq

5000km

## A. Set options

**Set-up Downscaling**  
**Precipitation over**  
**Phetchaburi for JJA 2017**  
 (up to you)

# Produce a downscaled forecast

**Set-up Downscaling**

Downscale Description: Precipitation over Yangon in JJA 2017

**Prediction Season**  
Year: 2017 Season: JJA

**Downscaling Region**  
Latitude: -10 ~ 15 Longitude: 90 ~ 240 Apply

**Variable**  
 PREC  T850  Z500  
 SLP  U850  V850  
 U200  V200  SST

**Models**  
 APCC  MSC  NASA  
 NCEP  PNU  POAMA

**Predictand**  
 Precipitation  Temperature

**Training Period**  
Form: 1987 To: 2010

**Method**  
 Linear Regression

**Advanced Options**  
Significance Level: 5 %  
Minimum Pattern Score: 0.1

Map showing the downscaling region (Lat: -10.000000 to 15.000000, Lon: 90.000000 to 240.000000, Area: 18104050.00 sq km) over Southeast Asia.

5000km

Previous Downscale

## A. Set options

Prediction Season  
**2017 JJA**

# Produce a downscaled forecast

**Set-up Downscaling**

Downscale Description:

**Prediction Season**  
Year:  Season:

**Variable** (highlighted with a red dashed box)  
 PREC     T850     Z500  
 SLP     U850     V850  
 U200     V200     SST

**Models**  
 APCC     MSC     NASA  
 NCEP     PNU     POAMA

**Predictand**  
 Precipitation     Temperature

**Training Period**  
Form:  To:

**Method**  
 Linear Regression

**Advanced Options**  
Significance Level:  %  
Minimum Pattern Score:

**Downscaling Region**  
Latitude:  ~  Longitude:  ~

## A. Set options

Variable  
**SST**

# Produce a downscaled forecast

**Set-up Downscaling**

Downscale Description: Precipitation over Yangon in JJA 2017

**Prediction Season**  
Year: 2017 Season: JJA

**Variable**  
 PREC  T850  Z500  
 SLP  U850  V850  
 U200  V200  SST

**Models**  
 APCC  MSC  NASA  
 NCEP  PNU  POAMA

**Predictand**  
 Precipitation  Temperature

**Training Period**  
Form: 1987 To: 2010

**Method**  
 Linear Regression

**Advanced Options**  
Significance Level: 5 %  
Minimum Pattern Score: 0.1

**Downscaling Region**  
Latitude: -10 ~ 15 Longitude: 90 ~ 240

## A. Set options

Models  
**ALL**

# Produce a downscaled forecast

**Set-up Downscaling**

Downscale Description:

**Prediction Season**  
Year:  Season:

**Downscaling Region**  
Latitude:  ~  Longitude:  ~

**Variable**  
 PREC  T850  Z500  
 SLP  U850  V850  
 U200  V200  SST

**Models**  
 APCC  MSC  NASA  
 NCEP  PNU  POAMA

**Predictand**  
 Precipitation  Temperature

**Training Period**  
Form:  To:

**Method**  
 Linear Regression

**Advanced Options**  
Significance Level:  %  
Minimum Pattern Score:

**Map**  
A map of Southeast Asia with a blue box highlighting a region around Yangon, Myanmar. The box is labeled with coordinates: Lat: -10.000000 to 15.000000, Lon: 90.000000 to 240.000000, Area: 18104050.00 sq. A scale bar for 5000km and an information icon are also present.

## A. Set options

Predictand  
**Precipitation**

# Produce a downscaled forecast

**Set-up Downscaling**

Downscale Description:

**Prediction Season**  
Year:  Season:

**Variable**  
 PREC  T850  Z500  
 SLP  U850  V850  
 U200  V200  SST

**Models**  
 APCC  MSC  NASA  
 NCEP  PNU  POAMA

**Predictand**  
 Precipitation  Temperature

**Training Period**  
Form:  To:

**Method**  
 Linear Regression

**Advanced Options**  
Significance Level:  %  
Minimum Pattern Score:

**Downscaling Region**  
Latitude:  ~  Longitude:  ~

## A. Set options

**Training Period**  
**Common period**  
(default)

# Produce a downscaled forecast

**Set-up Downscaling**

Downscale Description:

**Prediction Season**  
Year:  Season:

**Variable**  
 PREC  T850  Z500  
 SLP  U850  V850  
 U200  V200  SST

**Models**  
 APCC  MSC  NASA  
 NCEP  PNU  POAMA

**Predictand**  
 Precipitation  Temperature

**Training Period**  
Form:  To:

**Method**  
 Linear Regression

**Advanced Options**  
Significance Level:  %  
Minimum Pattern Score:

**Downscaling Region**  
Latitude:  ~  Longitude:  ~

## A. Set options

**Method**  
**Linear Regression**

# Produce a downscaled forecast

### Set-up Downscaling


Downscale Description:

#### Prediction Season

Year:  Season:

#### Downscaling Region

Latitude:  ~  Longitude:  ~



#### Variable

PREC  T850  Z500  
 SLP  U850  V850  
 U200  V200  SST

#### Models

APCC  MSC  NASA  
 NCEP  PNU  POAMA

#### Predictand

Precipitation  Temperature

#### Training Period

Form:  To:

#### Method

Linear Regression

#### Advanced Options

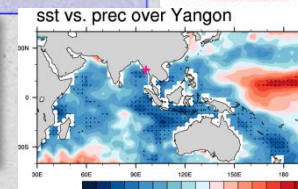
Significance Level:  %  
Minimum Pattern Score:

Relationship between precipitation over Yangon and sst

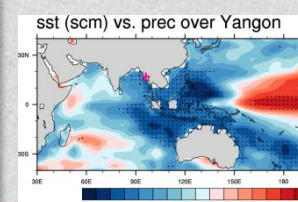
Resemblance of model pattern (sst) and observation pattern (sst over the predictor area)

#### Results

sst vs. prec over Yangon JJA



sst (scm) vs. prec over Yangon JJA



## A. Set options

**Advanced Options**  
**Significance Level: 5%**  
**Minimum Pattern Score: 0.1**

# Produce a downscaled forecast

**Set-up Downscaling**

Downscale Description: Precipitation over Yangon in JJA 2017

**Prediction Season**  
Year: 2017 Season: JJA

**Downscaling Region**  
Latitude: -10 ~ 15 Longitude: 90 ~ 240

**Variable**  
 PREC  T850  Z500  
 SLP  U850  V850  
 U200  V200  SST

**Models**  
 APCC  MSC  NASA  
 NCEP  PNU  POAMA

**Predictand**  
 Precipitation  Temperature

**Training Period**  
Form: 1987 To: 2010

**Method**  
 Linear Regression

**Advanced Options**  
Significance Level: 5 %  
Minimum Pattern Score: 0.1

5000km

## A. Set options

**Downscaling Region**  
Latitude -10~15  
Longitude 90~240  
(predictor area)

# Produce a downscaled forecast

## B. Check results

### My Page

Jobs				System Status			
Last Updated At: 23:22:41 (auto refresh at about every 60 seconds)						Auto Refresh <input checked="" type="checkbox"/>	
10 records per page		Search: <input type="text"/>					
JOB ID	TYPE	STATE	RESULT DATA	CREATED	UPDATED	DESCRIPTION	
5565	Downscale	processing		2017-06-01 23:22:42	2017-06-01 23:22:42	Precipitation over Yangon in JJA 2017	
5564	Downscale	success	download	2017-06-01 23:19:02	2017-06-01 23:21:34	Precipitation over Yangon in JJA 2017	
5563	Downscale	success	download	2017-06-01 23:13:02	2017-06-01 23:13:18	Q1) Phetchaburi, 2017JJA, SST, APCC, POAMA	
5562	Downscale	success	download	2017-06-01 23:09:51	2017-06-01 23:10:35	Q1) Phetchaburi, 2017JJA, SST	
5561	Downscale	success	download	2017-06-01 23:04:24	2017-06-01 23:05:14	Precipitation over Phetchaburi in JJA 2017	
5559	Downscale	success	download	2017-06-01 21:34:57	2017-06-01 21:35:34	ranong t850	
5557	Downscale	success	download	2017-06-01 21:32:54	2017-06-01 21:33:35	phetchaburi	
5553	Downscale	fail		2017-06-01 20:49:24	2017-06-01 20:49:29	-	
5548	Downscale	fail		2017-06-01 20:01:57	2017-06-01 20:02:01	-	
5547	Downscale	success	download	2017-06-01 19:36:02	2017-06-01 19:36:30	-	

Showing 1 to 10 of 140 entries

Previous **1** 2 3 4 5 ... 14 Next

# Produce a downscaled forecast

## B. Check results

### My Page

Jobs				System Status			
Last Updated At: 23:28:40 (auto refresh at about every 60 seconds)				Auto Refresh <input checked="" type="checkbox"/>			
10 records per page				Search: <input type="text"/>			
JOB ID	TYPE	STATE	RESULT DATA	CREATED	UPDATED	DESCRIPTION	
5565	Downscale	success	<a href="#">download</a>	2017-06-01 23:22:42	2017-06-01 23:25:10	Precipitation over Yangon in JJA 2017	
5564	Downscale	success	<a href="#">download</a>	2017-06-01 23:19:02	2017-06-01 23:21:34	Precipitation over Yangon in JJA 2017	
5563	Downscale	success	<a href="#">download</a>	2017-06-01 23:13:02	2017-06-01 23:13:18	Q1) Phetchaburi, 2017JJA, SST, APCC, POAMA	
5562	Downscale	success	<a href="#">download</a>	2017-06-01 23:09:51	2017-06-01 23:10:35	Q1) Phetchaburi, 2017JJA, SST	
5561	Downscale	success	<a href="#">download</a>	2017-06-01 23:04:24	2017-06-01 23:05:14	Precipitation over Phetchaburi in JJA 2017	
5559	Downscale	success	<a href="#">download</a>	2017-06-01 21:34:57	2017-06-01 21:35:34	ranong t850	
5557	Downscale	success	<a href="#">download</a>	2017-06-01 21:32:54	2017-06-01 21:33:35	phetchaburi	
5553	Downscale	fail		2017-06-01 20:49:24	2017-06-01 20:49:29	-	
5548	Downscale	fail		2017-06-01 20:01:57	2017-06-01 20:02:01	-	
5547	Downscale	success	<a href="#">download</a>	2017-06-01 19:36:02	2017-06-01 19:36:30	-	

Showing 1 to 10 of 140 entries

Previous **1** 2 3 4 5 ... 14 Next

# Produce a downscaled forecast

## B. Check results

Details			
JOB ID	5545	CREATE At	2017-06-01 09:31:36
DOWNSCALE ID	4748	UPDATE At	2017-06-01 09:34:05
PREDICTAND		PREDICTOR	
YEAR/SEASON	2017 / 6	Training Period	1987 / 2010
PREDICTAND	PREC	VARIABLE	SST
DATA SET	Myanmar [ID:8276]	MODELS	APCC,MSC,NASA,NCEP,PNU,POAMA
STATION	3 Stations	REGION	Lat -10~15/ Lon 90~240
SIGNIFICANCE LEVEL	5%		
MINIMUM PATTERN SCORE	0.1		
FEEDBACK			
<a href="#">ViewResult</a> <a href="#">Edit</a>			



# Produce a downscaled forecast

## B. Check results

**Details**

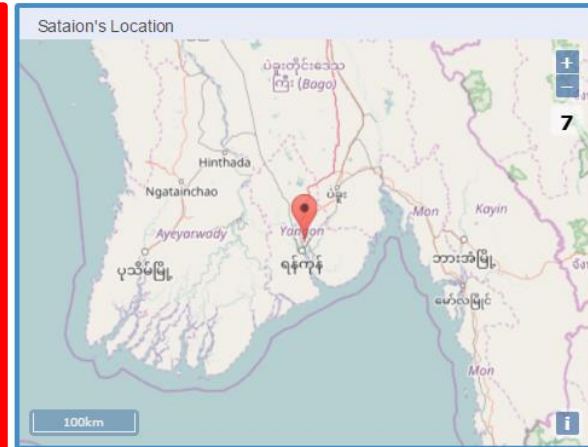
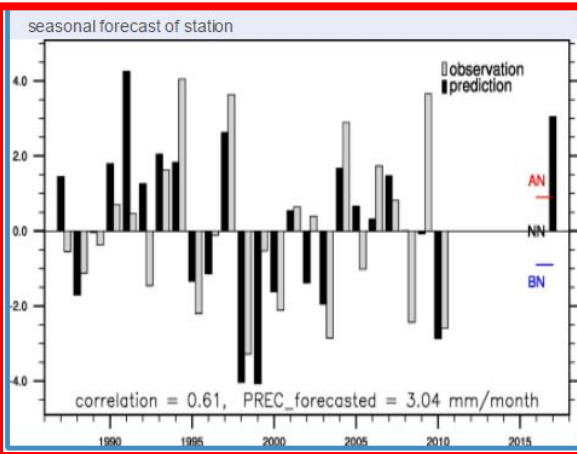
<b>PREDICTAND</b>	<b>PREDICTOR</b>
YEAR/SEASON: 2017 / 6	Training Period: 1987 / 2010
PREDICTAND: PREC	VARIABLE: SST
DATASET: Myanmar	MODELS: <input checked="" type="radio"/> APCC <input type="radio"/> MSC <input type="radio"/> NASA <input type="radio"/> NCEP <input type="radio"/> PNL
REGION: 3 Stations	REGION: Lat: 10 - 240
SIGNIFICANCE LEVEL: 5%	MINIMUM PATTERN SCORE: 0.1

List up hopeful & good result stations only

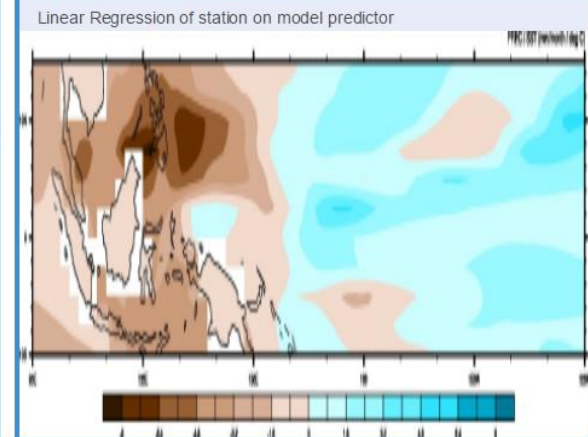
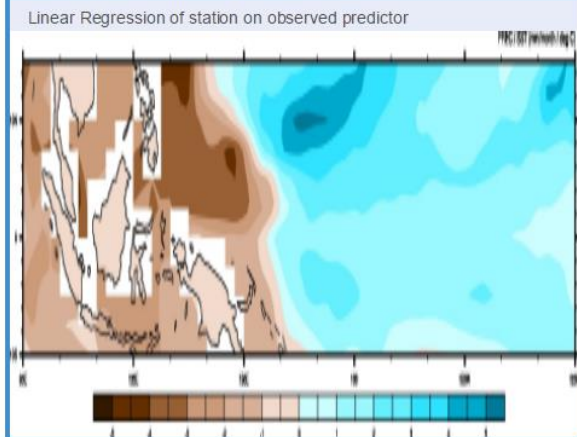
**Selected Stations**

Station ID	Result	Name	Data period for PREC	Data period for TEM
1	Bad	ngurahrai	1951/1 ~ 2016/12	
2	Good	pondokbetung	1951/1 ~ 2016/1	
3	Bad	kemayoran	1971/1 ~ 2016/8	

Stations & Prediction Result



- ✓ Historical time series of station data and hindcast data
- ✓ Correlation coefficient
- ✓ Deterministic forecast
- ✓ Tercile category of the forecast



# Produce a downscaled forecast

## B. Check results

**Details**

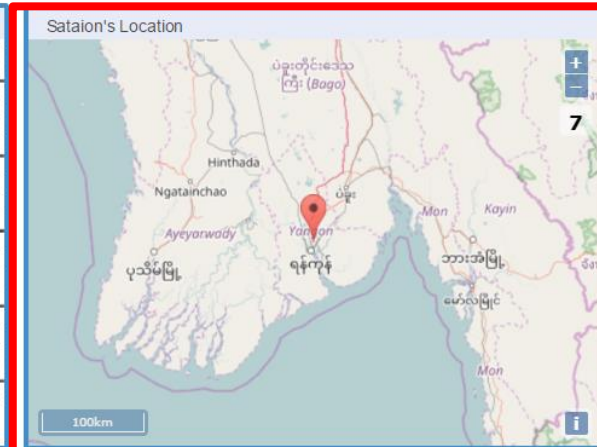
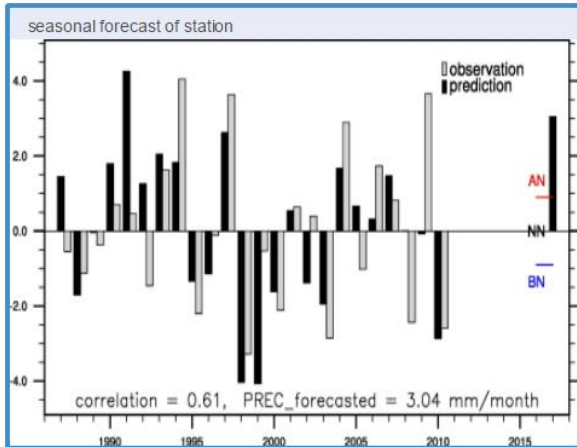
PREDICTAND		PREDICTOR	
YEAR/SEASON	2017 / 6	Training Period	1987 / 2010
PREDICTAND	PREC	VARIABLE	SST
DATASET	Myanmar	MODELS	● APCC ● MSC ● NASA ● NCEP ● PNL
REGION	3 Stations	REGION	Lat : -10 ~ 15 , Lon : 90 ~ 240
SIGNIFICANCE LEVEL			5%
MINIMUM PATTERN SCORE			0.1

List up hopeful & good result stations only

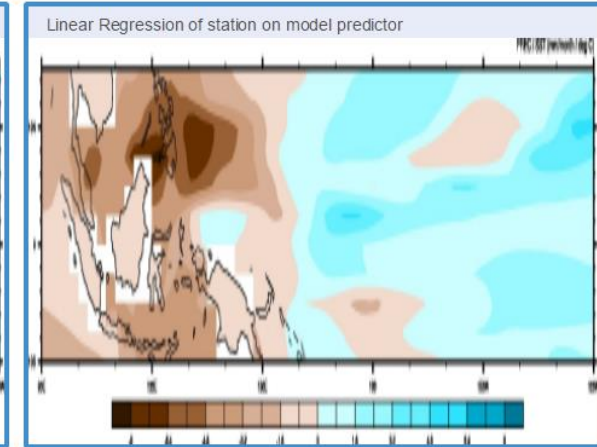
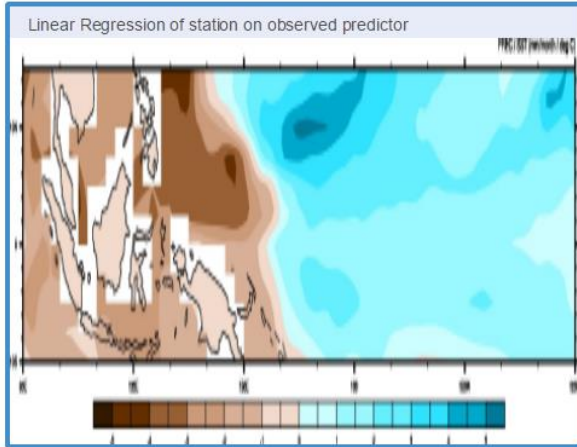
**Selected Stations**

Station ID	Result	Name	Data period for PREC	Data period for TEM
1	Bad	ngurahrai	1951/1 ~ 2016/12	
2	Good	pondokbetung	1951/1 ~ 2016/1	
3	Bad	kemayoran	1971/1 ~ 2016/8	

Stations & Prediction Result



✓ Location of the station



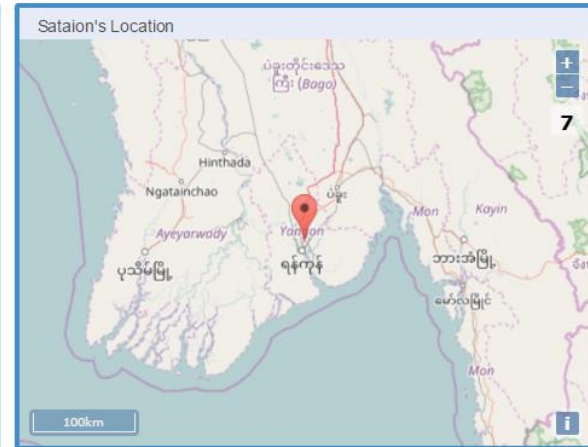
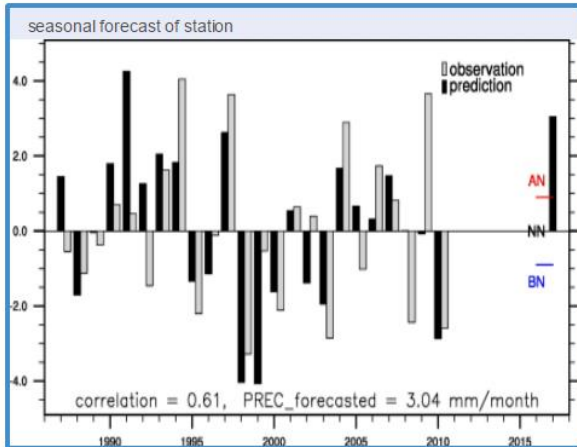
New Downscale

# Produce a downscaled forecast

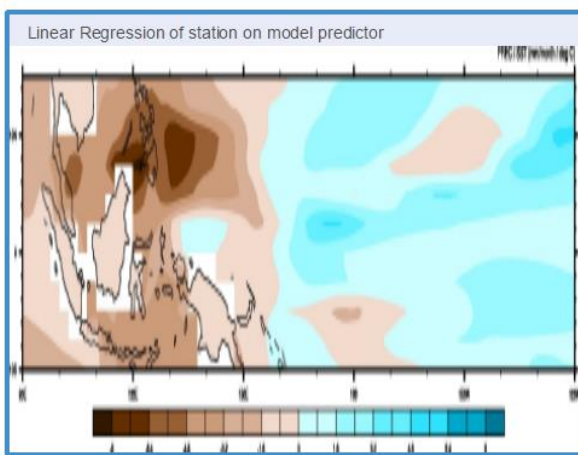
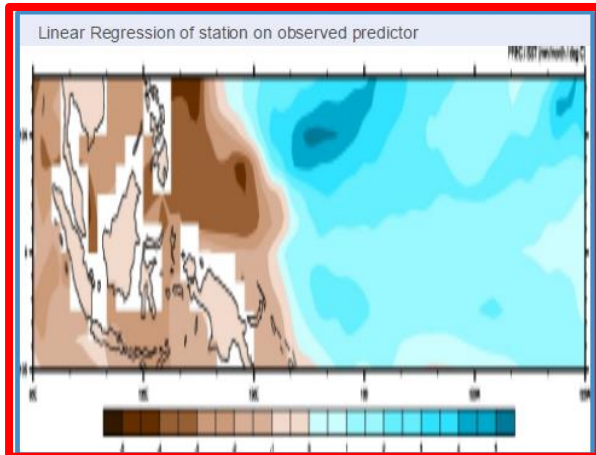
## B. Check results

Details				
PREDICTAND	PRECIPITATION		PREDICTOR	
YEAR/SEASON	2017 / 6	Training Period	1987 / 2010	
PREDICTAND	PREC	VARIABLE	SST	
DATASET	Myanmar	MODELS	<input checked="" type="radio"/> APCC <input type="radio"/> MSC <input type="radio"/> NASA <input type="radio"/> NCEP <input type="radio"/> PNL	
REGION	3 Stations	REGION	Lat: -10 ~ 15, Lon: 90 ~ 240	
SIGNIFICANCE LEVEL	5%			
MINIMUM PATTERN SCORE	0.1			
<input type="checkbox"/> List up hopeful & good result stations only				
Selected Stations				
Station ID	Result	Name	Data period for PREC	Data period for TEM
1	Bad	ngurahrai	1951/1 ~ 2016/12	
2	Good	pondokbetung	1951/1 ~ 2016/1	
3	Bad	kemayoran	1971/1 ~ 2016/8	

Stations & Prediction Result



- ✓ Relationship pattern between the predictor (sst, observation) and the station data (precipitation) over the selected area
- ✓ Screening test 1

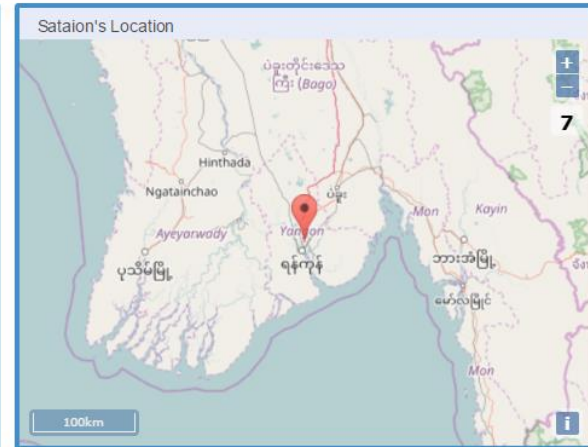
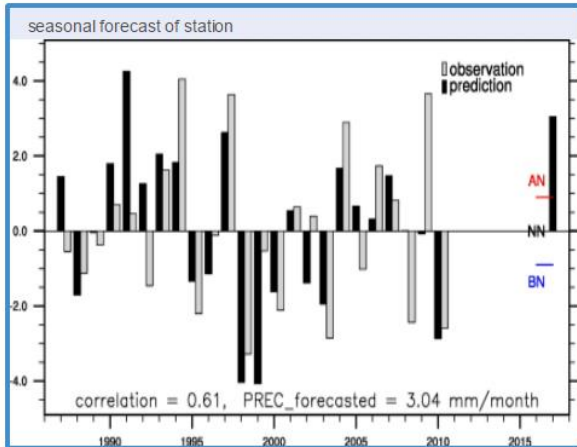


# Produce a downscaled forecast

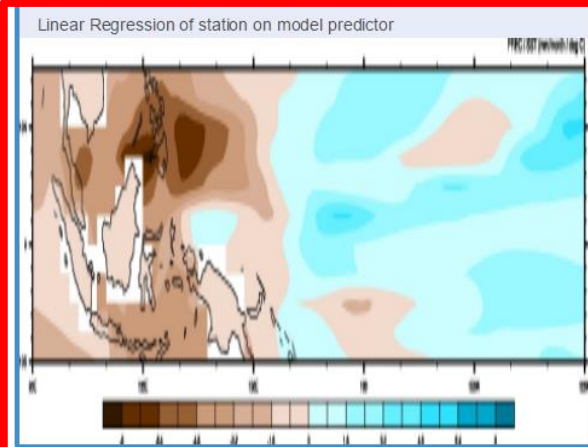
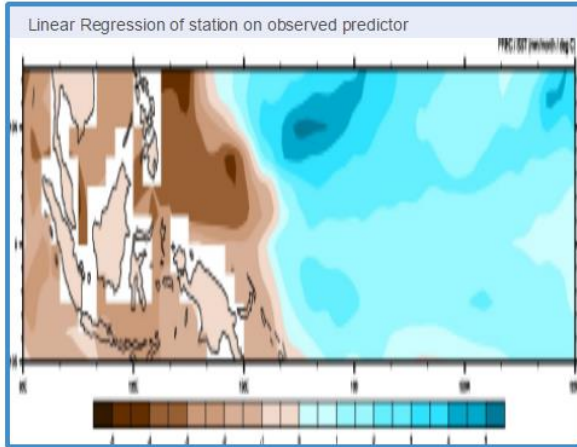
## B. Check results

Details				
PREDICTAND	PREDICTOR			
YEAR/SEASON	2017 / 6	Training Period	1987 / 2010	
PREDICTAND	PREC	VARIABLE	SST	
DATASET	Myanmar	MODELS	<input checked="" type="radio"/> APCC <input type="radio"/> MSC <input type="radio"/> NASA <input type="radio"/> NCEP <input type="radio"/> PNL	
REGION	3 Stations	REGION	Lat: -10 ~ 15, Lon: 90 ~ 240	
SIGNIFICANCE LEVEL	5%			
MINIMUM PATTERN SCORE	0.1			
<input type="checkbox"/> List up hopeful & good result stations only				
Selected Stations				
Station ID	Result	Name	Data period for PREC	Data period for TEM
1	Bad	ngurahrai	1951/1 ~ 2016/12	
2	Good	pondokbetung	1951/1 ~ 2016/1	
3	Bad	kemayoran	1971/1 ~ 2016/8	

Stations & Prediction Result



- ✓ Relationship pattern between the predictor (sst, model) and the station data (precipitation) over the selected area
- ✓ Screening test 2



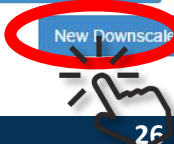
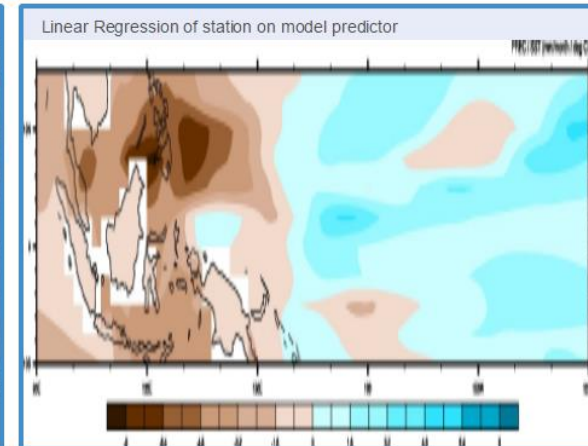
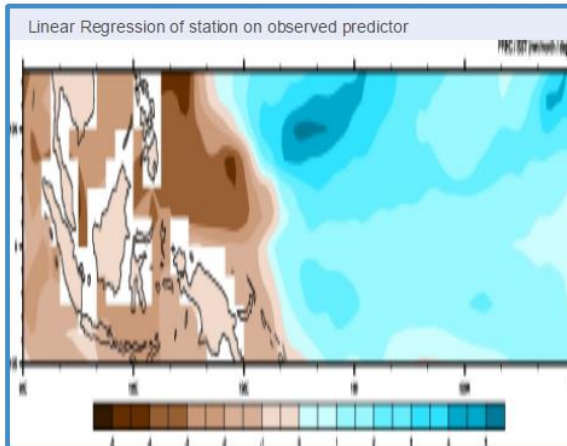
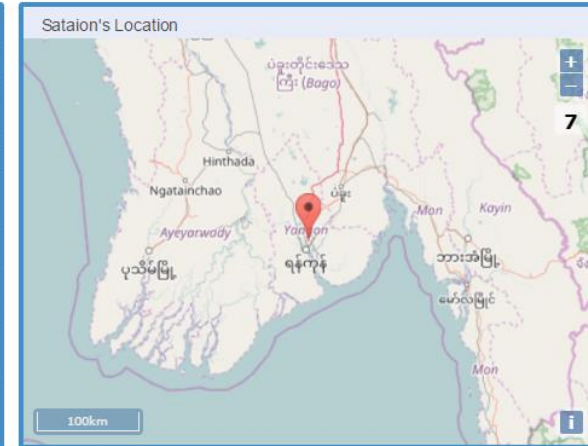
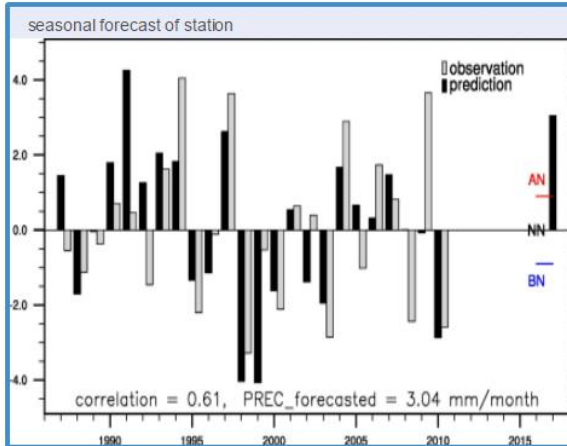
# Produce a downscaled forecast

## B. Check results

Details			
PREDICTAND		PREDICTOR	
YEAR/SEASON	2017 / 6	Training Period	1987 / 2010
PREDICTAND	PREC	VARIABLE	SST
DATASET	Myanmar	MODELS	<input checked="" type="radio"/> APCC <input type="radio"/> MSC <input type="radio"/> NASA <input type="radio"/> NCEP <input type="radio"/> PNL
REGION	3 Stations	REGION	Lat : -10 ~ 15 , Lon : 90 ~ 240
SIGNIFICANCE LEVEL	5%		
MINIMUM PATTERN SCORE	0.1		
<input type="checkbox"/> List up hopeful & good result stations only			

Selected Stations				
Station ID	Result	Name	Data period for PREC	Data period for TEM
1	Bad	ngurahrai	1951/1 ~ 2016/12	
2	Good	pondokbetung	1951/1 ~ 2016/1	
3	Bad	kemayoran	1971/1 ~ 2016/8	

Stations & Prediction Result



# Produce a downscaled forecast

- **If the downscaling fails, be patient and try again!**
  - ✓ Find the large scale climate system (predictor) that affects local climate.
  - ✓ Tropical area can be a good choice where dynamical models have good skill.
  - ✓ Check correlation maps that we give you.

# Precipitation over Yangon for JJA 2017

**Q1**

Prediction Season (**2017/JJA**)

Variables (**U850**)

Models (**ALL**)

Predictand (**Precipitation**)

Training Period (default)

Method (Linear Regression)

Advanced Options (**Sig lev 5%, Min  
pattern score 0.1**)

Downscaling Region (?????)



Downscale



CHECK  
CORRELATION  
MAPS!

Data for hands-on > cor map

# Precipitation over Yangon for JJA 2017

## A1

Prediction Season (**2017/JJA**)

Variables (**U850**)

Models (**ALL**)

Predictand (**Precipitation**)

Training Period (default)

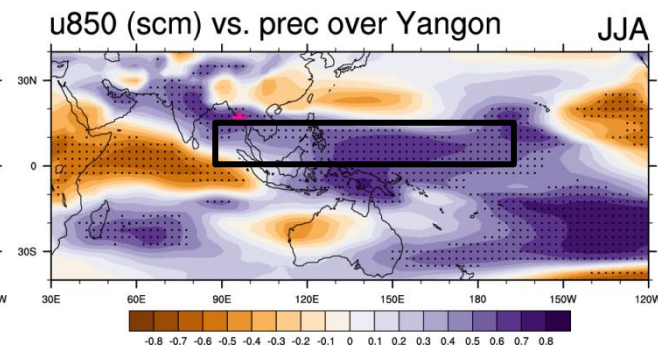
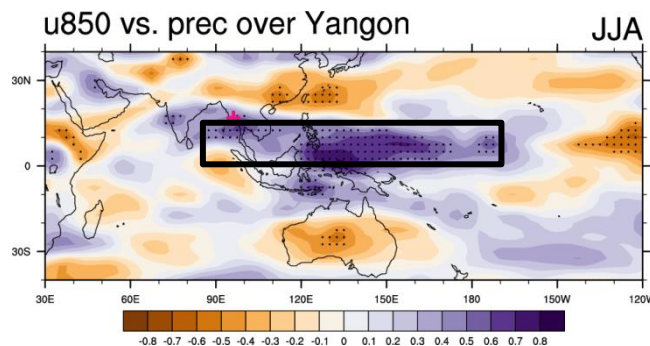
Method (Linear Regression)

Advanced Options (**Sig lev 5%, Min pattern score 0.1**)

Downscaling Region (**lat 0~15, lon 85~190**)



Downscale



Exercise 1

# Precipitation over Yangon for JJA 2017

## A1

**Details**

PREDICTAND		PREDICTOR	
YEAR/SEASON	2017 / 6	Training Period	1987 / 2005
PREDICTAND	PREC	VARIABLE	U850
DATA SET	Myanmar	MODELS	<input type="radio"/> AFRC <input checked="" type="radio"/> CWB <input type="radio"/> MSU <input type="radio"/> NASA <input type="radio"/> NCEP <input type="radio"/> PNU <input type="radio"/> POAMA
REGION	3 Stations	REGION	Lat: 0 ~ 15, Lon: 95 ~ 100
SIGNIFICANCE LEVEL	5%		
MINIMUM PATTERN SCORE	0.1		

List up hopeful & good result stations only

**Selected Stations**

Station ID	Result	Name	Data period for PREC	Data period for TEMP	Correlation
1	Good	ngurahrai	1951/1 ~ 2016/12		0.479006
2	Hopeful	pondokbetung	1951/1 ~ 2016/1		0.230007
3	Bad	kemayoran	1971/1 ~ 2016/8		-0.990

- ✓ CWB
- ✓ Hopeful
- ✓ Above normal

**Stations & Prediction Result**

seasonal forecast of station

correlation = 0.23, PREC\_forecast = 1.13 mm/month

Sataion's Location

Linear Regression of station on observed predictor

Linear Regression of station on model predictor

New Downscale

Exercise 1

# Precipitation over Yangon for JJA 2017

## A1

Details					
PREDICTAND	PREDICTOR				
YEAR/SEASON	2017 / 6	Training Period	1987 / 2005		
PREDICTAND	PREC	VARIABLE	U850		
DATASET	Myanmar	MODELS	<input type="radio"/> APCC <input type="radio"/> CWB <input type="radio"/> MSC <input type="radio"/> NASA <input type="radio"/> NCEP <input type="radio"/> NU <input checked="" type="radio"/> POAMA		
REGION	3 Stations	REGION	Lat: 0 ~ 15, Lon: 85 ~ 100		
SIGNIFICANCE LEVEL	5%				
MINIMUM PATTERN SCORE	0.1				
<input type="checkbox"/> List up hopeful & good result stations only					
Selected Stations					
Station ID	Result	Name	Data period for PREC	Data period for TEMP	Correlation
1	Good	ngurahrai	1951/1 ~ 2016/12		0.291052
2	Good	pondokbetung	1951/1 ~ 2016/1		0.61684
3	Bad	kemayoran	1971/1 ~ 2016/8		-0.99.0



- ✓ POAMA
- ✓ Good
- ✓ Above normal

Stations & Prediction Result	
<p>seasonal forecast of station</p>	<p>Sataion's Location</p>
<p>Linear Regression of station on observed predictor</p>	<p>Linear Regression of station on model predictor</p>

New Downscale

# Precipitation over YOUR CITY for JJA 2017

Q2

Prediction Season (**2017/JJA**)  
Variables (?????)  
Models (**ALL**)  
Predictand (**Precipitation**)  
Training Period (default)  Downscale  
Method (Linear Regression)  
Advanced Options (**Sig lev 5%, Min pattern score 0.1**)  
Downscaling Region (?????) 

CHECK  
CORRELATION  
MAPS!  
Data for hands-on > cor map



**Thank you.**

# Precipitation over Simtokha for JJA 2017

## Q2

Prediction Season (**2017/JJA**)

Variables (**SST**)

Models (**ALL**)

Predictand (**Precipitation**)

Training Period (default)

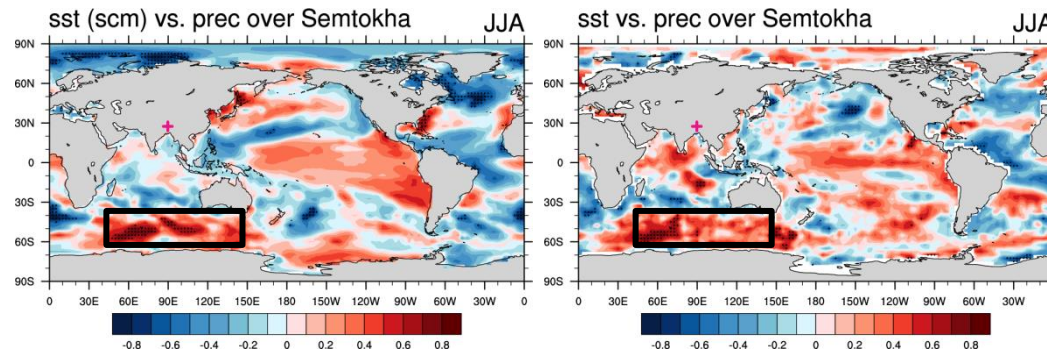
Method (Linear Regression)

Advanced Options (**Sig lev 5%, Min  
pattern score 0.1**)

Downscaling Region (**lat -60~-40, lon 40~150**)



Downscale



Exercise 2

# Precipitation over Simtokha for JJA 2017

## A2

Details					
PREDICTAND	PREDICTOR				
YEAR/SEASON	2017 / 6	Training Period	1996 / 2005		
PREDICTAND	PREC	VARIABLE	SST		
DATASET	Bhutan	MODELS	<input type="radio"/> IPCC <input checked="" type="radio"/> MSC <input type="radio"/> NASA <input type="radio"/> NCEP <input type="radio"/> PNU <input type="radio"/> POAMA		
REGION	1 Stations	REGION	Lat: -60 ~ -40, Lon: -40 ~ 150		
SIGNIFICANCE LEVEL	5%				
MINIMUM PATTERN SCORE	0.1				
<input checked="" type="checkbox"/> List up hopeful & good result stations only					
<input type="button" value="Reload"/>					
Selected Stations					
Station ID	Result	Name	Data period for PREC	Data period for TEMP	Correlation
12700046	Good	Simtokha	1996/1 ~ 2016/12		0.358176

- ✓ MSC
- ✓ Good
- ✓ Below normal

Stations & Prediction Result	
<p>seasonal forecast of station</p> <p>correlation = 0.36, PREC_forecast = -0.71 mm/month</p>	<p>Sataion's Location</p>
<p>Linear Regression of station on observed predictor</p>	<p>Linear Regression of station on model predictor</p>
<input type="button" value="New Downscale"/>	

Exercise 2

# Precipitation over Simtokha for JJA 2017

## A2

Details					
PREDICTAND	PREDICTOR				
YEAR/SEASON	2017 / 6	Training Period	1996 / 2005		
PREDICTAND	PREC	VARIABLE	SST		
DATASET	Bhutan	MODELS	<input type="radio"/> APCC <input type="radio"/> MOC <input checked="" type="radio"/> NASA <input type="radio"/> NCEP <input type="radio"/> PNU <input type="radio"/> POAMA		
REGION	1 Stations	REGION	Lat: -60 ~ -40, Lon: 40 ~ 100		
SIGNIFICANCE LEVEL	5%				
MINIMUM PATTERN SCORE	0.1				
<input checked="" type="checkbox"/> List up hopeful & good result stations only <span style="float: right;">↻ Reload</span>					

Selected Stations					
Station ID	Result	Name	Data period for PREC	Data period for TEMP	Correlation
12700046	Hopeful	Simtokha	1996/1 ~ 2016/12		-0.0971739

- ✓ NASA
- ✓ Hopeful
- ✓ Above normal

Stations & Prediction Result	
<p>seasonal forecast of station</p>	<p>Station's Location</p>
<p>Linear Regression of station on observed predictor</p>	<p>Linear Regression of station on model predictor</p>

[New Downscale](#)

# Precipitation over Pyinmana for JJA 2017

## Q2

Prediction Season (**2017/JJA**)

Variables (**SLP**)

Models (**ALL**)

Predictand (**Precipitation**)

Training Period (default)

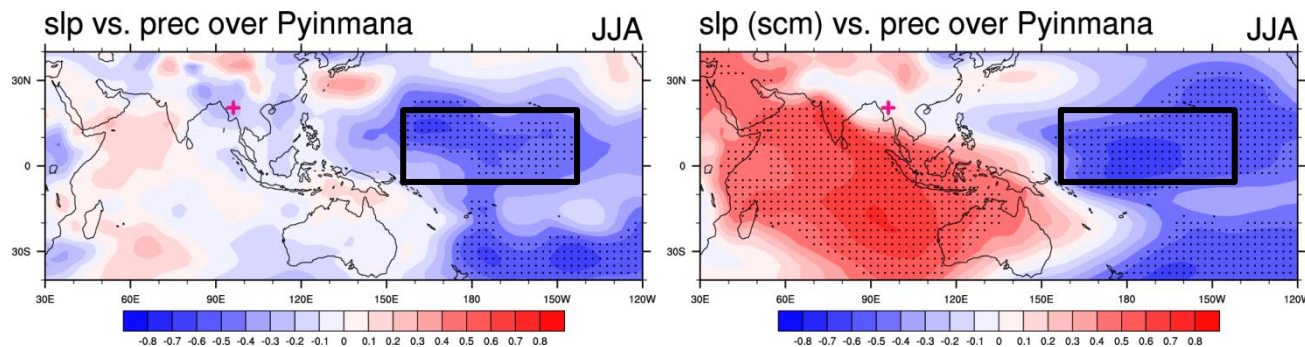
Method (Linear Regression)

Advanced Options (**Sig lev 5%, Min  
pattern score 0.1**)

Downscaling Region (**lat -5~10, lon 155~215**)



Downscale



Exercise 2

# Precipitation over Pyinmana for JJA 2017

## A2

**Details**

PREDICTAND		PREDICTOR	
YEAR/SEASON	2017 / 6	Training Period	1987 / 2005
PREDICTAND	PREC	VARIABLE	SLP
DATA SET	Myanmar	MODELS	<input checked="" type="radio"/> APCC <input checked="" type="radio"/> GMB <input type="radio"/> MSC <input type="radio"/> NASA <input type="radio"/> NCEP <input type="radio"/> PNU <input type="radio"/> FOAMA
REGION	3 Stations	REGION	Lat: 15 - 20, Lon: 155 - 215
SIGNIFICANCE LEVEL	5%		
MINIMUM PATTERN SCORE	0.1		

List up hopeful & good result stations only

**Selected Stations**

Station ID	Region	Name	Data period for PREC	Data period for TEMP	Correlation
1	Good	ngurahrai	1951/1 ~ 2016/12		0.323752
2	Hopetani	pondokbetung	1951/1 ~ 2016/1		0.531852
3	Bad	kemayoran	1971/1 ~ 2016/8		-999.0

- ✓ APCC
- ✓ Good
- ✓ Above normal

**Stations & Prediction Result**

seasonal forecast of station

correlation = 0.32, PREC\_forecasted = 70.08 mm/month

Sataon's Location

Linear Regression of station on observed predictor

Linear Regression of station on model predictor

New Downscale

Exercise 2

# Precipitation over Pyinmana for JJA 2017

## A2

Details

PREDICTAND		PREDICTOR	
YEAR/SEASON	2017 / 6	Training Period	1987 / 2005
PREDICTAND	PREC	VARIABLE	SLP
DATA SET	Myanmar	MODELS	<input type="radio"/> APCC <input type="radio"/> CWB <input type="radio"/> MCS <input checked="" type="radio"/> NASA <input type="radio"/> NCEP <input type="radio"/> PNU <input type="radio"/> FOAMA
REGION	3 Stations	REGION	Lat: -5 - 20, Lon : 155 - 215
SIGNIFICANCE LEVEL	5%		
MINIMUM PATTERN SCORE	0.1		

List up hopeful & good result stations only

Selected Stations

Station ID	Station	Name	Data period for PREC	Data period for TEMP	Correlation
1	Hopeful	ngurahrai	1951/1 ~ 2016/12		0.553539
2	Hopeful	pondokbetung	1951/1 ~ 2016/1		0.53668
3	Bad	kemayoran	1971/1 ~ 2016/8		-999.0

- ✓ NASA
- ✓ Hopeful
- ✓ Near normal

Stations & Prediction Result

seasonal forecast of station

correlation = 0.55, PREC\_forecasted = 14.82 mm/month

Sataon's Location

Linear Regression of station on observed predictor

PREC / SLP (mm/month / hPa)

Linear Regression of station on model predictor

PREC / SLP (mm/month / hPa)

New Downscale