

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

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8 Jun 2017

Downscaling procedure in CLIK

Station data

- Point (uploaded)

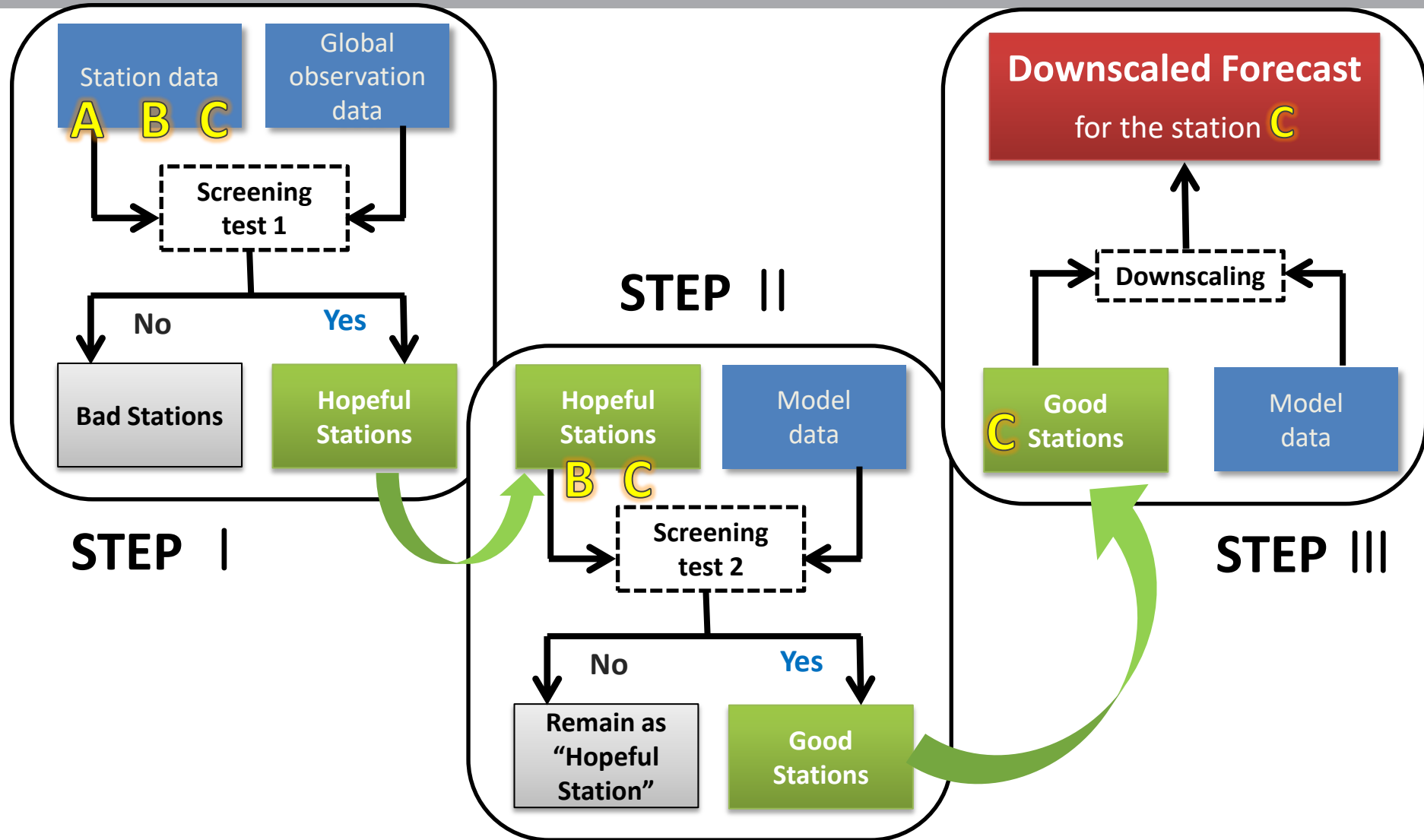
Global observation data

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

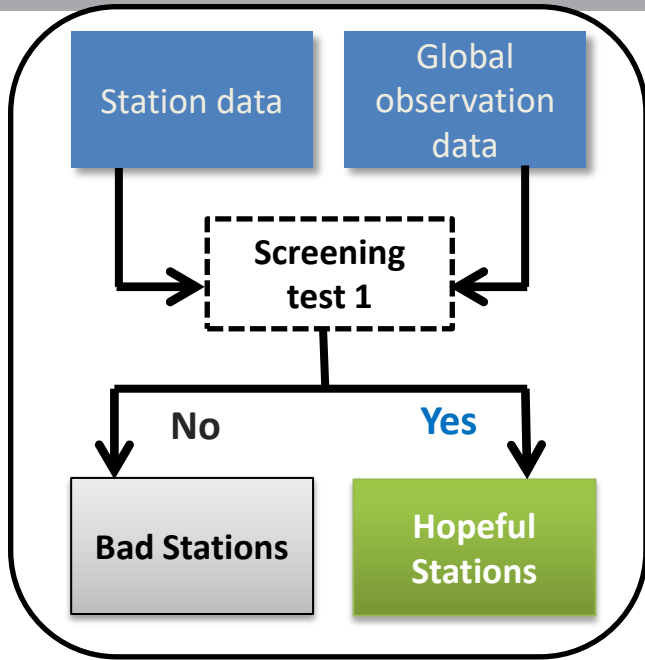
Model data

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

Downscaling procedure in CLIK



Downscaling procedure in CLIK

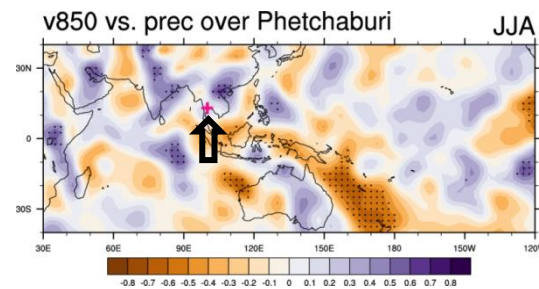
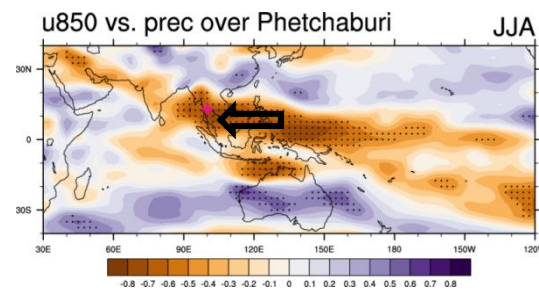


STEP 1

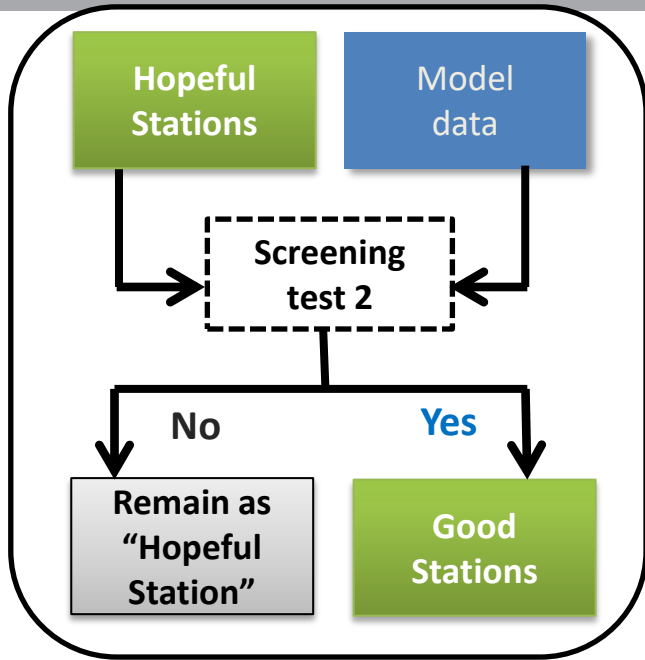
Screening test 1:

- ✓ 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



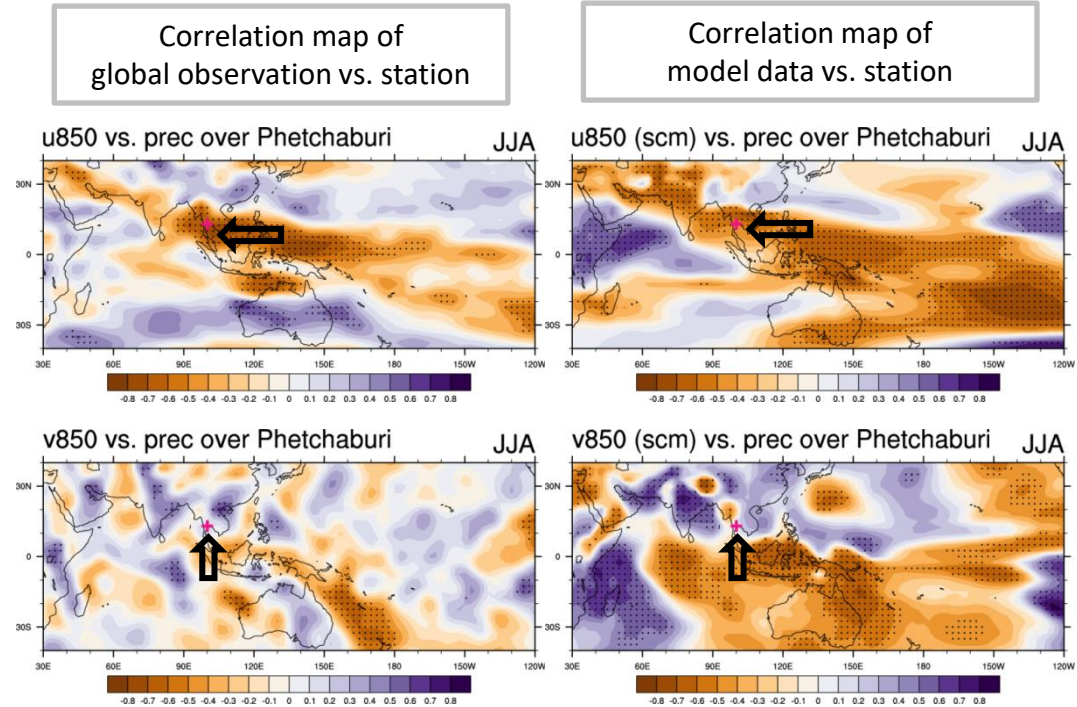
Downscaling procedure in CLIK



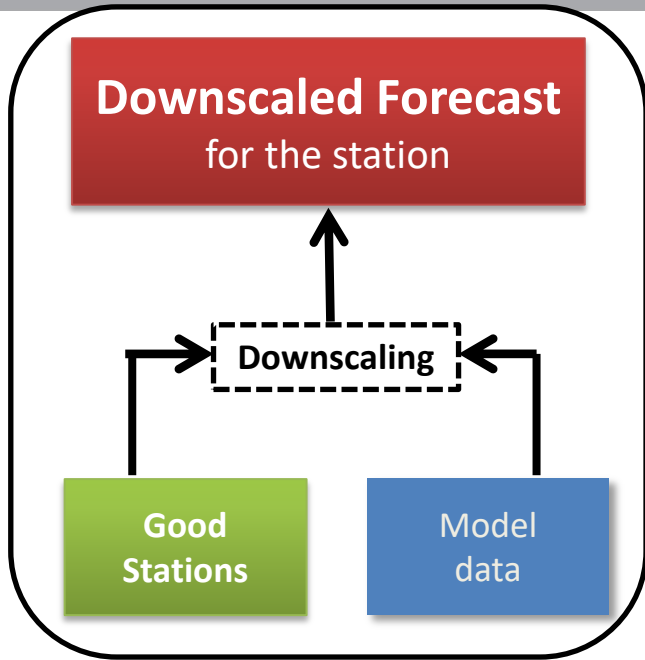
STEP II

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



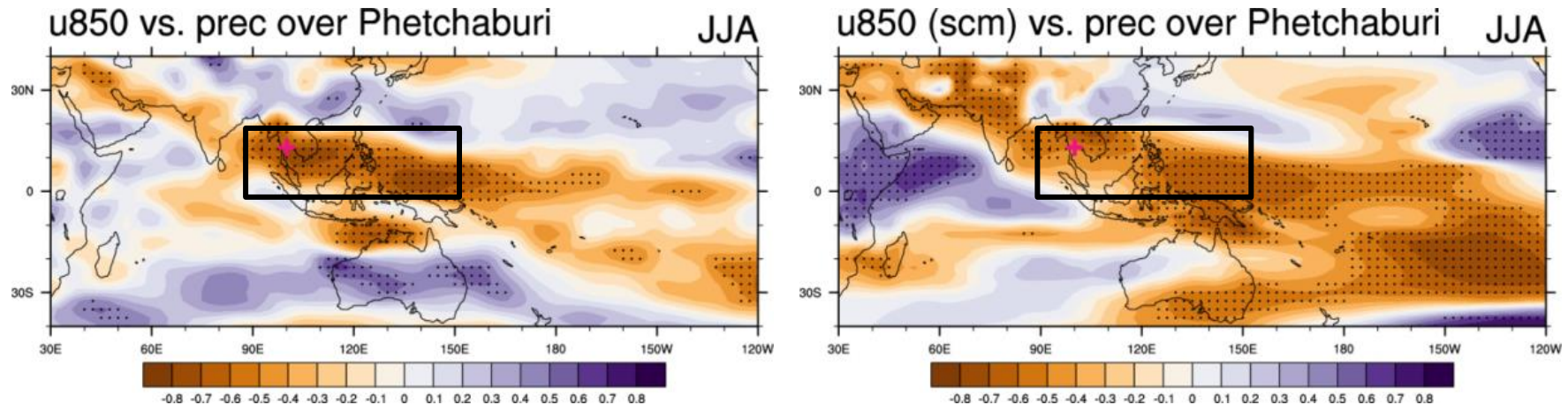
Downscaling process:

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

STEP III

Downscaling procedure in CLIK

Relationship between precipitation over Phetchaburi & ...



- The station data has relationship with the global observational u850 over some areas.
- Dynamical models can reproduce the relationship between observation and station data.
- We hope a successful downscaling by CLIK system...



**Rainfall
over Phetchaburi
in next three month (JJA 2017)?**

Produce a downscaled forecast

Select Dataset / Station

Dataset Name	Countries	Total Stations	Period(prec)	Period(temp)	Public
MCDW(Monthly Climatic Data for...	The World	6463	1998 ~ 2014	1998 ~ 2014	PUBLIC
Thailand	Thailand	3	1982 ~ 2016	N/A	downy
GHCN	GHCN	3707	1982 ~ 2008	N/A	PUBLIC
Aphrodite data interpolated to M... Afghanistan, Bangladesh, Brune...		4918	1982 ~ 2004	N/A	PUBLIC
Korea 60 Stations	Korea, Republic of	60	1982 ~ 2008	1982 ~ 2008	PUBLIC

1 [Hand icon pointing to the Thailand dataset row]

Create Edit Remove

2 [Hand icon pointing to the map]

Shift + drag

3 [Hand icon pointing to the Add button]

Station (3)	Station ID	Name	Precipitation	Temperature
<input type="checkbox"/>	465201	Phetchaburi	1982/1 ~ 2016/12	N/A
<input type="checkbox"/>	532201	Ranong	1982/1 ~ 2016/12	N/A
<input type="checkbox"/>	568501	Songkhla	1982/1 ~ 2016/12	N/A

Common data period of selected stations

Month	1	2	3	4	5	6	7	8	9	10	11	12
Precipitation	1982 ~ 2016	1982 ~ 2016	1982 ~ 2016	1982 ~ 2016	1982 ~ 2016	1982 ~ 2016	1982 ~ 2016	1982 ~ 2016	1982 ~ 2016	1982 ~ 2016	1982 ~ 2016	1982 ~ 2016

4 [Hand icon pointing to the Add button]

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 CWB MSC
 NASA NCEP PNU
 POAMA

Predictand
 Precipitation Temperature

Training Period
From: To:

Method
 Linear Regression

Advanced Options
Significance Level: %
Minimum Pattern Score:

Downscaling Region
Latitude: ~ Longitude: ~

A. Set options

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

Produce a downscaled forecast

Set-up Downscaling

Downscale Description: Precipitation over Phetchaburi in JJA 2017

Prediction Season
Year: 2017 Season: JJA

Downscaling Region
Latitude: 0 ~ 20 Longitude: 90 ~ 150 Apply

Variable
 PREC T850 Z500
 SLP U850 V850
 U200 V200 SST

Models
 APCC CWB MSC
 NASA NCEP PNU
 POAMA

Predictand
 Precipitation Temperature

Training Period
Form: 1983 To: 2005

Method
 Linear Regression

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

Map showing the region of interest (Lat: 0.000000 to 20.000000, Lon: 90.000000 to 150.000000, Area: 5861787.03 sq.mi.)

5000km

Previous Downscale

A. Set options

Prediction Season
2017 JJA

Produce a downscaled forecast

Set-up Downscaling

Downscale Description:

Prediction Season
Year: Season:

Variable

<input type="radio"/> PREC	<input type="radio"/> T850	<input type="radio"/> Z500
<input type="radio"/> SLP	<input checked="" type="radio"/> U850	<input type="radio"/> V850
<input type="radio"/> U200	<input type="radio"/> V200	<input type="radio"/> SST

Models

<input checked="" type="checkbox"/> APCC	<input checked="" type="checkbox"/> CWB	<input checked="" type="checkbox"/> MSC
<input checked="" type="checkbox"/> NASA	<input checked="" type="checkbox"/> NCEP	<input checked="" type="checkbox"/> PNU
<input checked="" type="checkbox"/> 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
U850

Produce a downscaled forecast

Set-up Downscaling

Downscale Description:

Prediction Season
Year: Season:

Variable
 PREC T850 Z500
 SLP U850 V850
 U200 V200 SST

Models (highlighted with a red dashed box)
 APCC CWB 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

Models
ALL

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 CWB 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

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 CWB 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 CWB 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: Precipitation over Phetchaburi in JJA 2017

Prediction Season
Year: 2017 Season: JJA

Variable
 PREC T850 Z500
 SLP U850 V850
 U200 V200 SST

Models
 APCC CWB MSC
 NASA NCEP PNU
 POAMA

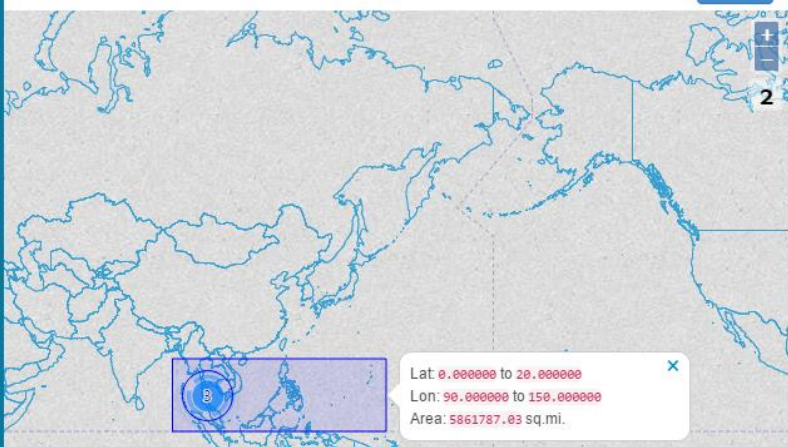
Predictand
 Precipitation Temperature

Training Period
Form: 1983 To: 2005

Method
 Linear Regression

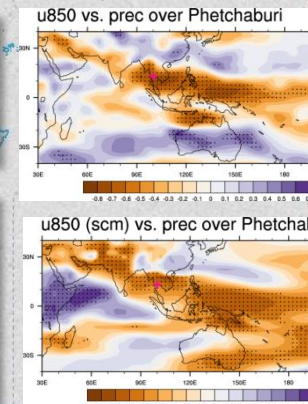
Advanced Options
Significance Level: 5 %
Minimum Pattern Score: 0.1

Downscaling Region
Latitude: 0 ~ 20 Longitude: 90 ~ 150



Relationship between precipitation over Phetchaburi and u850

Resemblance of model pattern (u850) and observation pattern (u850) over the predictor area



A. Set options

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

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 CWB MSC
 NASA NCEP PNU
 POAMA

Predictand
 Precipitation Temperature

Training Period
Form: To:

Method
 Linear Regression

Advanced Options
Significance Level: %
Minimum Pattern Score:

A. Set options

Downscaling Region
Latitude 0~20
Longitude 90~150
(predictor area)

Produce a downscaled forecast

B. Check results



Prediction Downscale **My Page**

Logout Edit

My Page

Jobs				System Status			
JOB ID	TYPE	STATE	RESULT DATA	CREATED	UPDATED	DESCRIPTION	
5561	Downscale	processing		2017-06-01 23:04:24	2017-06-01 23:04:24	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	-	
5546	Downscale	success	download	2017-06-01 09:50:28	2017-06-01 09:51:29	-	
5545	Downscale	success	download	2017-06-01 09:31:36	2017-06-01 09:34:05	-	
5544	Downscale	fail		2017-06-01 09:26:16	2017-06-01 09:26:17	-	
5543	Downscale	success	download	2017-06-01 09:22:59	2017-06-01 09:25:29	-	

Last Updated At : 23:04:23 (auto refresh at about every 60 seconds)

Auto Refresh

10 records per page

Search:

Showing 1 to 10 of 136 entries

Previous 1 2 3 4 5 ... 14 Next

Produce a downscaled forecast

B. Check results



Prediction Downscale **My Page**

Logout Edit

My Page

Jobs				System Status			
JOB ID	TYPE	STATE	RESULT DATA	CREATED	UPDATED	DESCRIPTION	
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	-	
5546	Downscale	success	download	2017-06-01 09:50:28	2017-06-01 09:51:29	-	
5545	Downscale	success	download	2017-06-01 09:31:36	2017-06-01 09:34:05	-	
5544	Downscale	fail		2017-06-01 09:26:16	2017-06-01 09:26:17	-	
5543	Downscale	success	download	2017-06-01 09:22:59	2017-06-01 09:25:29	-	

Last Updated At : 23:06:23 (auto refresh at about every 60 seconds)

Auto Refresh

10 records per page

Search:

Showing 1 to 10 of 136 entries

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

Produce a downscaled forecast

B. Check results

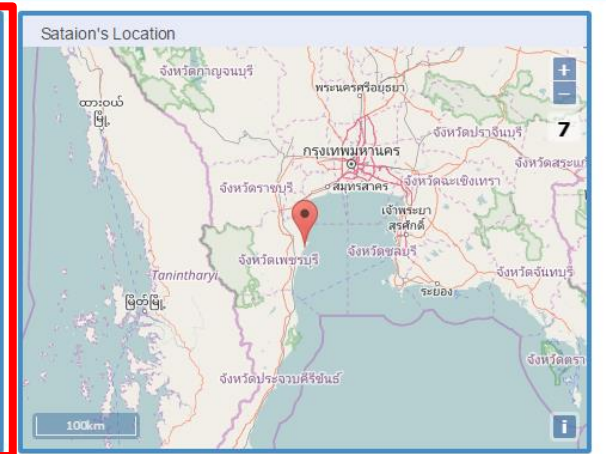
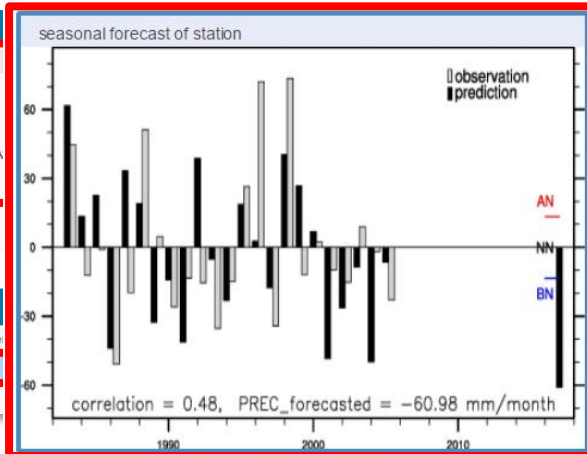
Details

PREDICTAND		PREDICTOR	
YEAR/SEASON	2017 / 6	Training Period	1983 / 2005
PREDICTAND	PREC	VARIABLE	U850
DATA SET	Thailand	MODELS	<input checked="" type="radio"/> APCC <input type="radio"/> CWB <input type="radio"/> MSC <input type="radio"/> NA
REGION	3 Stations	REGION	Lat: 90 Lon: 90 ~ 150
SIGNIFICANCE LEVEL	5%		
MINIMUM PATTERN SCORE	0.1		
<input checked="" type="checkbox"/> List up hopeful & good result stations only			

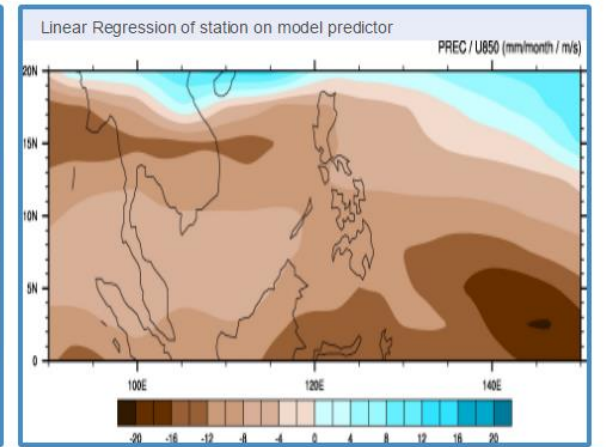
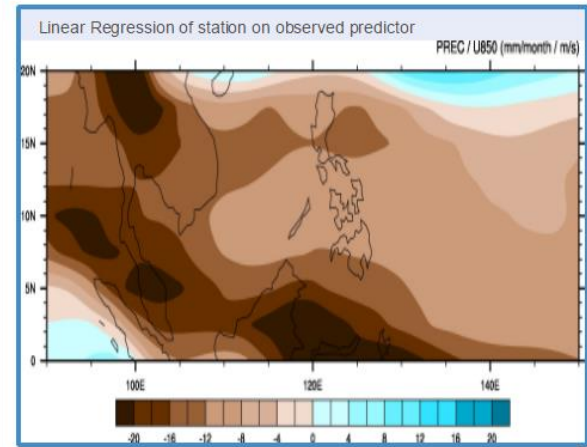
Selected Stations

Station ID	Result	Name	Data period for PREC	Data pe
465201	Good	Phetchaburi	1982/1 ~ 2016/11	
532201	Good	Ranong	1982/1 ~ 2016/12	

Stations & Prediction Result



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

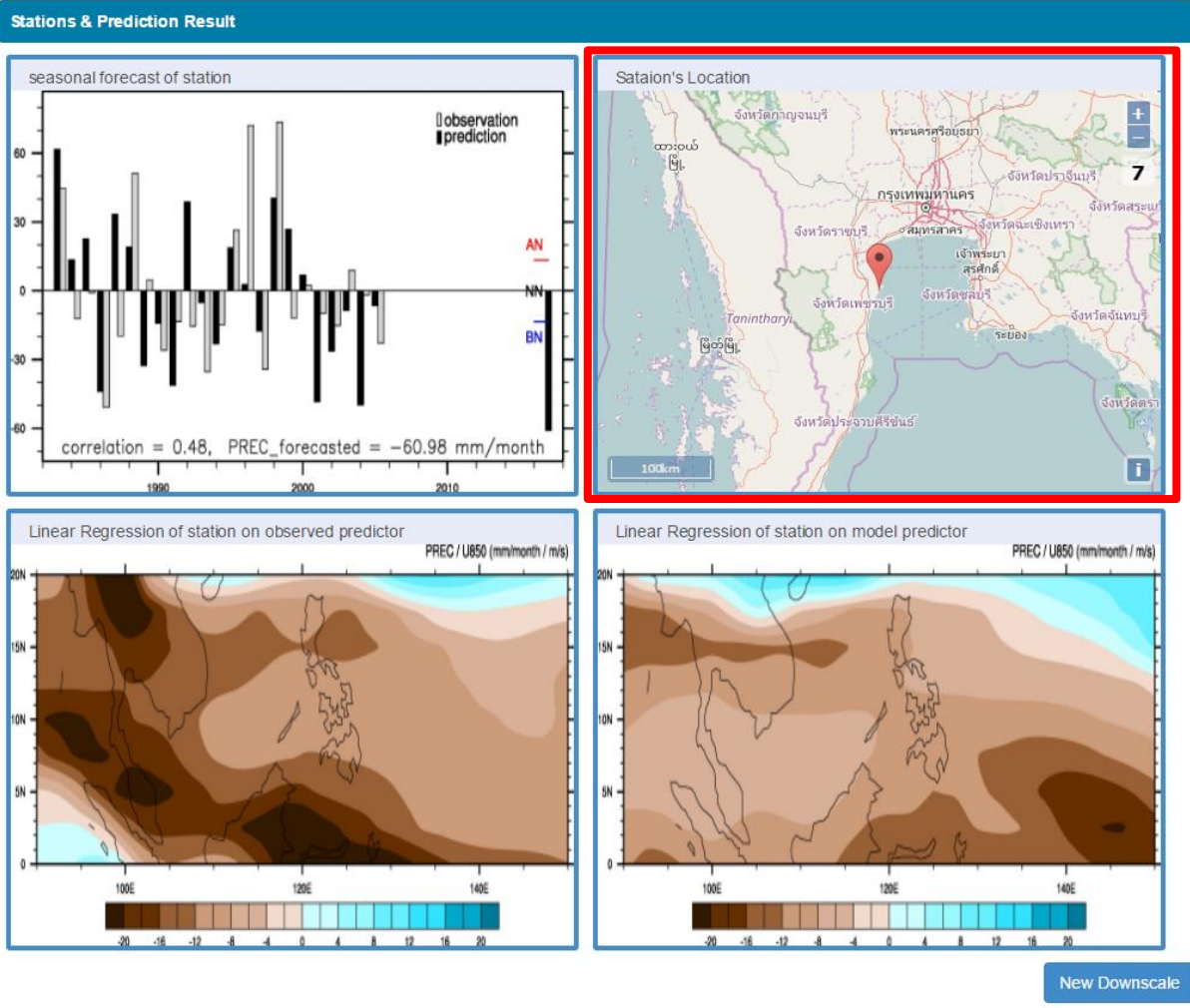


New Downscale

Produce a downscaled forecast

B. Check results

Details				
PREDICTAND		PREDICTOR		
YEAR/SEASON	2017 / 6	Training Period	1983 / 2005	
PREDICTAND	PREC	VARIABLE	U850	
DATA SET	Thailand	MODELS	<input checked="" type="radio"/> APCC <input type="radio"/> CWB <input type="radio"/> MSC <input type="radio"/> NA	
REGION	3 Stations	REGION	Lat : 0 ~ 20 , Lon : 90 ~ 150	
SIGNIFICANCE LEVEL	5%			
MINIMUM PATTERN SCORE	0.1			
<input checked="" type="checkbox"/> List up hopeful & good result stations only				
Selected Stations				
Station ID	Result	Name	Data period for PREC	Data pe
465201	Good	Phetchaburi	1982/1 ~ 2016/11	
532201	Good	Ranong	1982/1 ~ 2016/12	



✓ Location of the station

Produce a downscaled forecast

B. Check results

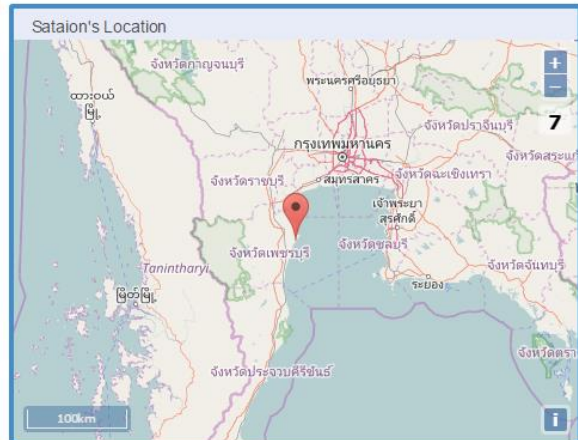
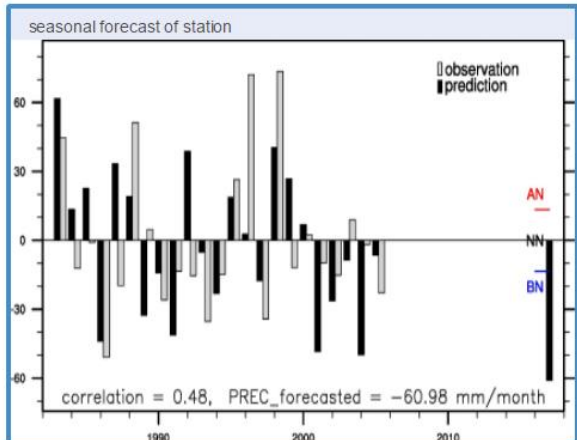
Details

PREDICTAND	PREDICTOR		
YEAR/SEASON	2017 / 6	Training Period	1983 / 2005
PREDICTAND	PREC	VARIABLE	U850
DATA SET	Thailand	MODELS	<input checked="" type="radio"/> APCC <input type="radio"/> CWB <input type="radio"/> MSC <input type="radio"/> NA
REGION	3 Stations	REGION	Lat : 0 ~ 20 , Lon : 90 ~ 150
SIGNIFICANCE LEVEL	5%		
MINIMUM PATTERN SCORE	0.1		
<input checked="" type="checkbox"/> List up hopeful & good result stations only			

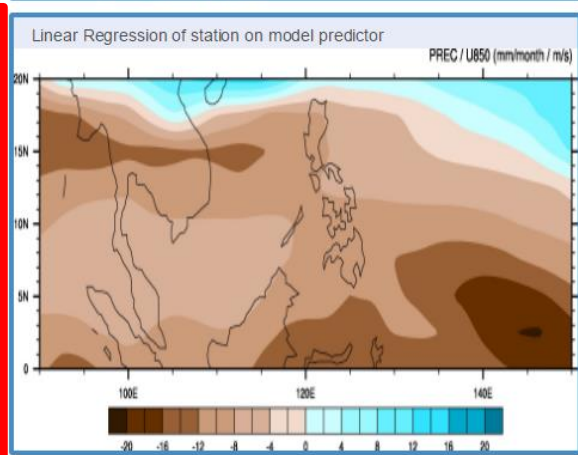
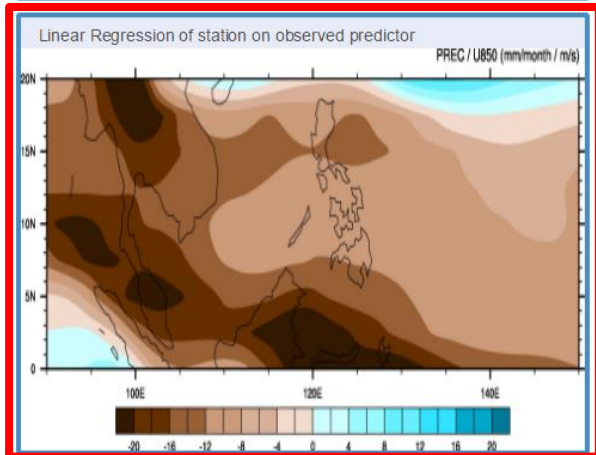
Selected Stations

Station ID	Result	Name	Data period for PREC	Data pe
465201	Good	Phetchaburi	1982/1 ~ 2016/11	
532201	Good	Ranong	1982/1 ~ 2016/12	

Stations & Prediction Result



- ✓ Relationship pattern between the predictor (u850, observation) and the station data (precipitation) over the selected area
- ✓ Screening test 1



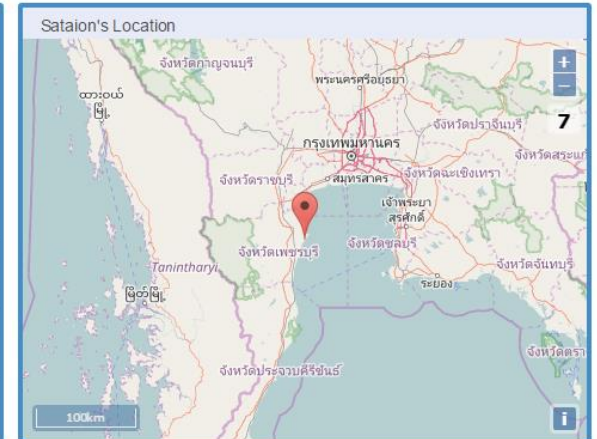
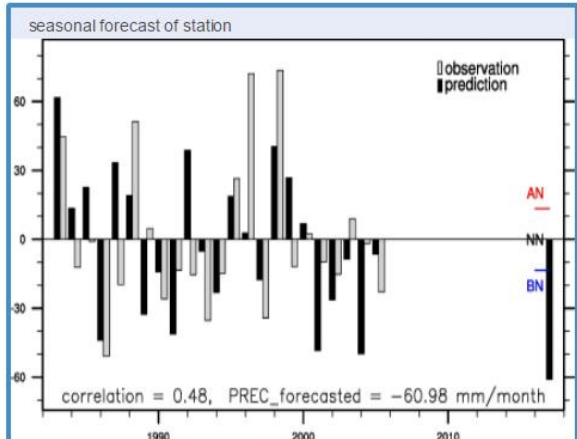
New Downscale

Produce a downscaled forecast

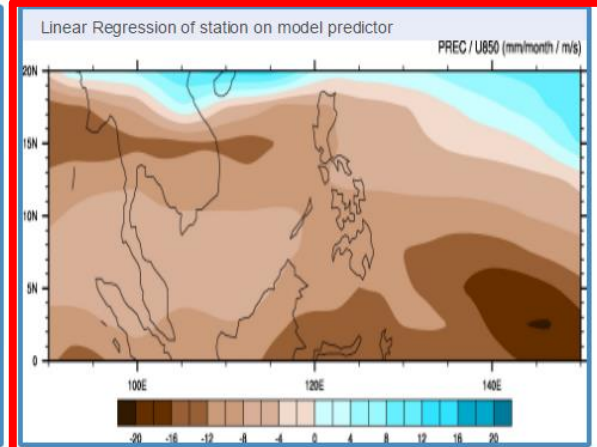
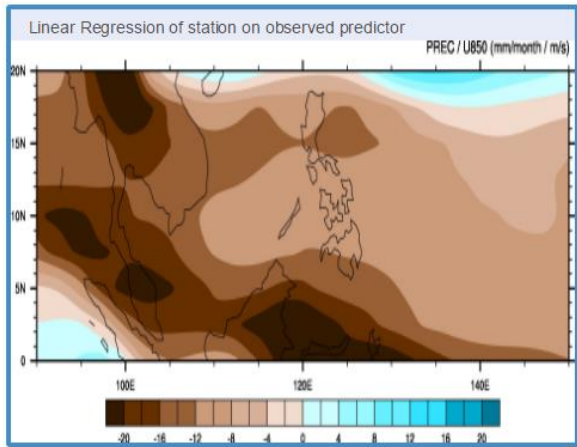
B. Check results

Details				
PREDICTAND		PREDICTOR		
YEAR/SEASON	2017 / 6	Training Period	1983 / 2005	
PREDICTAND	PREC	VARIABLE	U850	
DATA SET	Thailand	MODELS	<input checked="" type="radio"/> APCC <input type="radio"/> CWB <input type="radio"/> MSC <input type="radio"/> NA	
REGION	3 Stations	REGION	Lat : 0 ~ 20 , Lon : 90 ~ 150	
SIGNIFICANCE LEVEL	5%			
MINIMUM PATTERN SCORE	0.1			
<input checked="" type="checkbox"/> List up hopeful & good result stations only				
Selected Stations				
Station ID	Result	Name	Data period for PREC	Data pe
465201	Good	Phetchaburi	1982/1 ~ 2016/11	
532201	Good	Ranong	1982/1 ~ 2016/12	

Stations & Prediction Result



- ✓ Relationship pattern between the predictor (u850, model) and the station data (precipitation) over the selected area
- ✓ Screening test 2



New Downscale

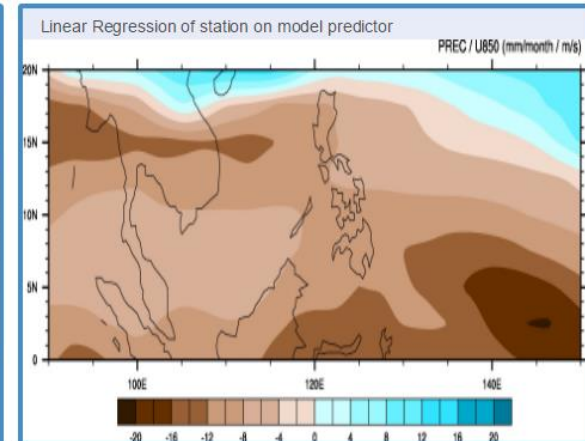
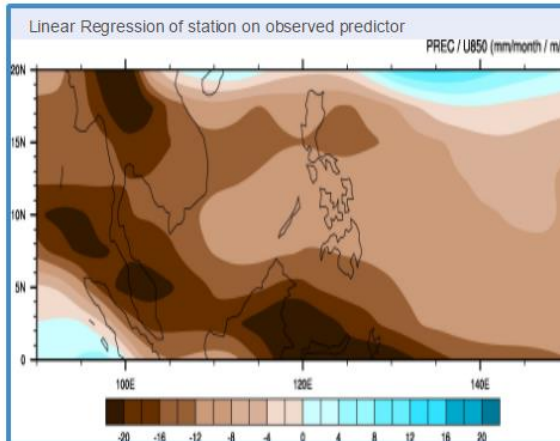
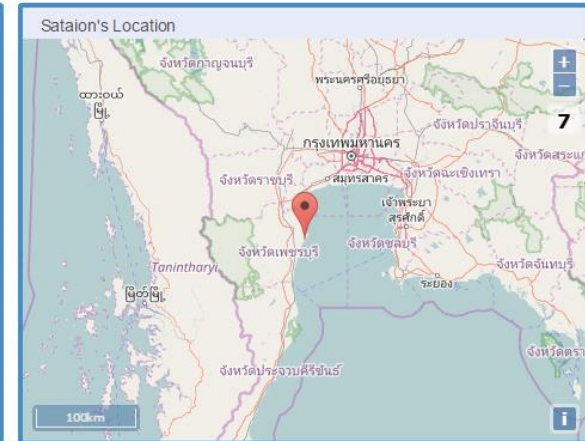
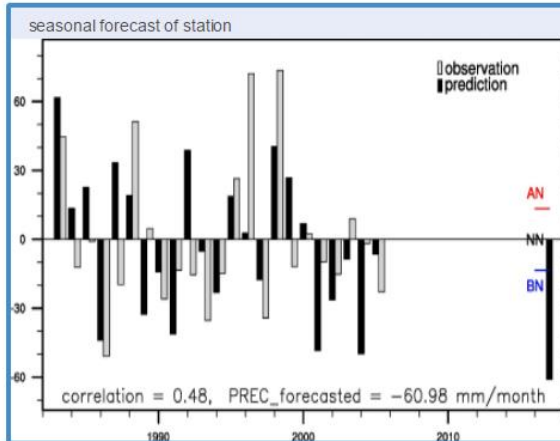
Produce a downscaled forecast

B. Check results

Details				
PREDICTAND		PREDICTOR		
YEAR/SEASON	2017 / 6	Training Period	1983 / 2005	
PREDICTAND	PREC	VARIABLE	U850	
DATA SET	Thailand	MODELS	<input checked="" type="radio"/> APCC <input type="radio"/> CWB <input type="radio"/> MSC <input type="radio"/> NA	
REGION	3 Stations	REGION	Lat : 0 ~ 20 , Lon : 90 ~ 150	
SIGNIFICANCE LEVEL	5%			
MINIMUM PATTERN SCORE	0.1			
<input checked="" type="checkbox"/> List up hopeful & good result stations only				

Selected Stations				
Station ID	Result	Name	Data period for PREC	Data pe
465201	Good	Phetchaburi	1982/1 ~ 2016/11	
532201	Good	Ranong	1982/1 ~ 2016/12	

Stations & Prediction Result



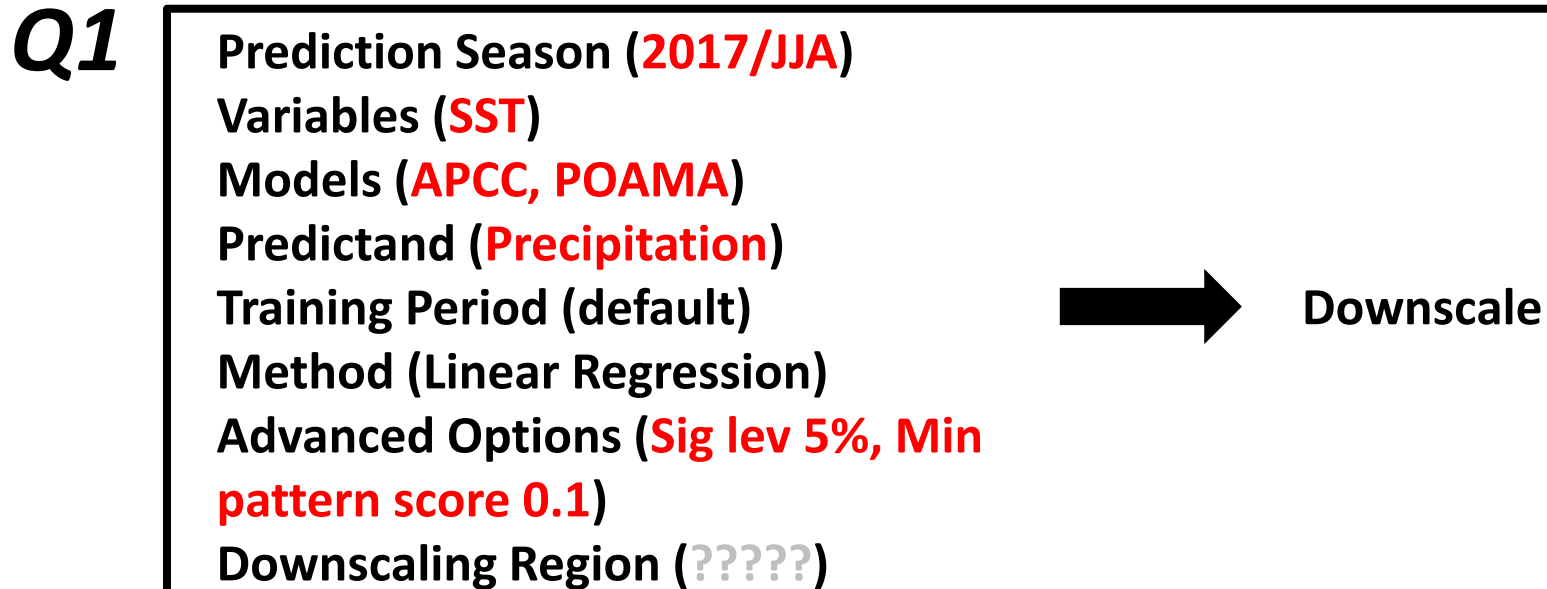
New Downscale



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 Phetchaburi in JJA 2017



Precipitation over Phetchaburi in JJA 2017

A1

Prediction Season (**2017/JJA**)

Variables (**SST**)

Models (**APCC, POAMA**)

Predictand (**Precipitation**)

Training Period (default)

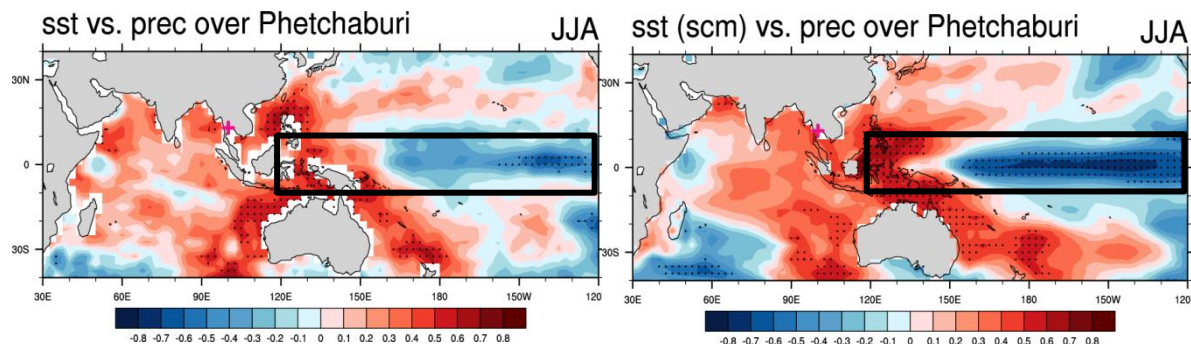
Method (Linear Regression)

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

Downscaling Region (**lat -10~10, lon 120~240**)



Downscale



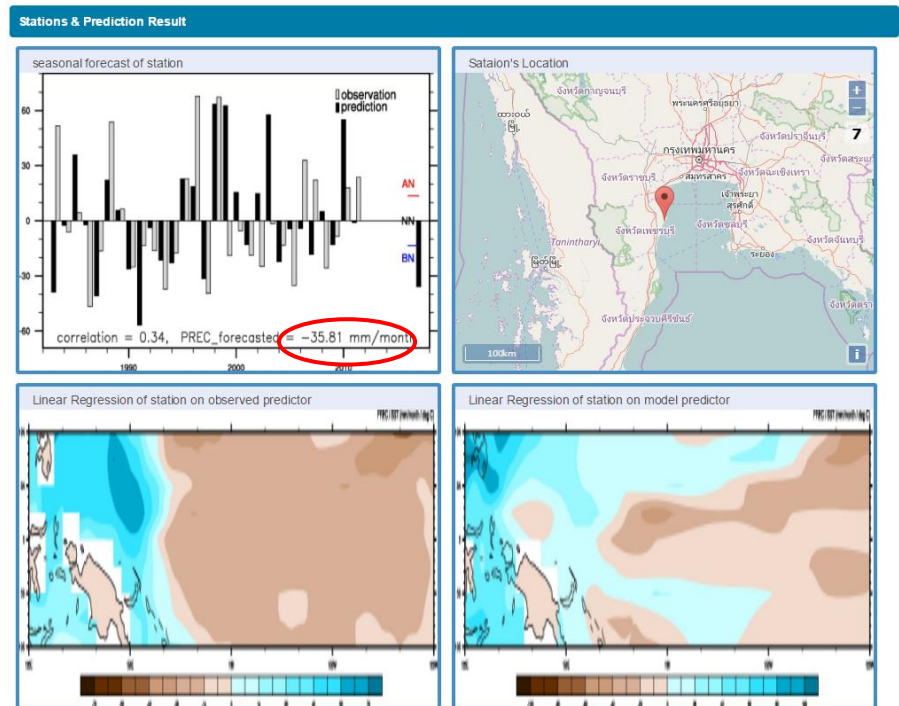
Exercise 1

Precipitation over Phetchaburi in JJA 2017

A1

Details					
PREDICTAND	PREDICTOR				
YEAR/SEASON	2017 / 6	Training Period	1983 / 2011		
PREDICTAND	PREC	VARIABLE	SST		
DATASET	Thailand	MODELS	APCC POAMA		
REGION	3 Stations	REGION	Lat: -10 ~ 10 , Lon: 120 ~ 240		
SIGNIFICANCE LEVEL	5%				
MINIMUM PATTERN SCORE	0.1				
<input checked="" type="checkbox"/> List up hopeful & good result stations only					
Selected Stations					
Station ID	Result	Name	Data period for PREC	Data period for TEMP	Correlation
465201	Good	Phetchaburi	1982/1 ~ 2016/11		0.342185
568501	Hopeful	Songkhla	1982/1 ~ 2016/12		-0.264909

- ✓ APCC
- ✓ Good
- ✓ Below normal



New Downscale

Exercise 1

Precipitation over Phetchaburi in JJA 2017

A1

Details					
PREDICTAND	PREDICTOR				
YEAR/SEASON	2017 / 6	Training Period	1983 / 2011		
PREDICTAND	PREC	VARIABLE	SST		
DATASET	Thailand	MODELS	<input type="radio"/> APCC <input checked="" type="radio"/> POAMA		
REGION	3 Stations	REGION	Lat: -10 ~ 10 , Lon: 120 ~ 240		
SIGNIFICANCE LEVEL	5%				
MINIMUM PATTERN SCORE	0.1				
<input checked="" type="checkbox"/> List up hopeful & good result stations only					
Selected Stations					
Station ID	Result	Name	Data period for PREC	Data period for TEMP	Correlation
465201	Good	Phetchaburi	1982/1 ~ 2016/11		0.515427
568501	Hopeful	Songkhla	1982/1 ~ 2016/12		-0.0447096

- ✓ POAMA
- ✓ Good
- ✓ Below normal

Stations & Prediction Result	
<p>seasonal forecast of station</p> <p>correlation = 0.52, PREC_forecasted = -14.76 mm/month</p>	<p>Satalon'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 Pochentong in JJA 2017

Q2

Prediction Season (**2017/JJA**)

Variables (?????)

Models (**ALL**)

Predictand (**Precipitation**)

Training Period (default)

Method (Linear Regression)

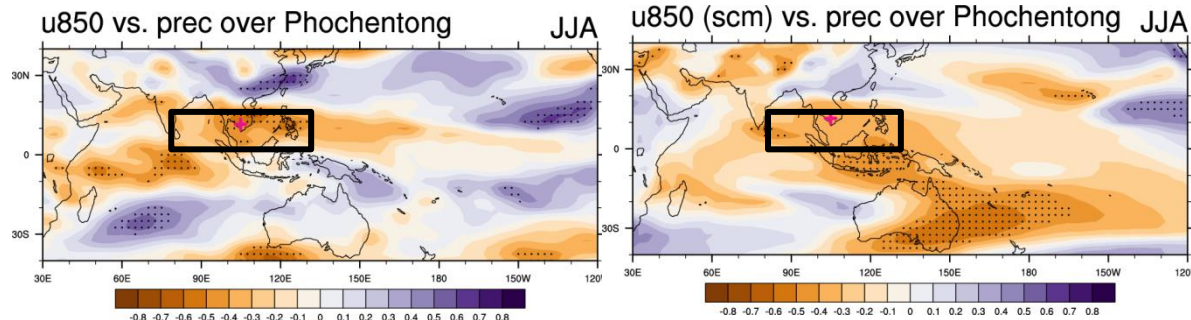
Advanced Options (**Sig lev 5%, Min
pattern score 0.1**)

Downscaling Region (?????)



Downscale

Precipitation over Pochentong in JJA 2017

A2**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 80~130)****Downscale**

Exercise 2

Precipitation over Pochentong in JJA 2017

A2

Details					
PREDICTAND	PREDICTOR				
YEAR/SEASON	2017 / 6	Training Period	1983 / 2005		
PREDICTAND	PREC	VARIABLE	U850		
DATASET	Cambodia	MODELS	<input checked="" type="radio"/> APCC <input type="radio"/> WMB <input type="radio"/> MSC <input type="radio"/> NASA <input type="radio"/> NCEP <input type="radio"/> POAMA		
REGION	1 Stations	REGION	Lat : 13 - Lon : 80 - 130		
SIGNIFICANCE LEVEL	5%				
MINIMUM PATTERN SCORE	0.1				
<input checked="" type="checkbox"/> List up hopeful & good result stations only ↻ Reload					
Selected Stations					
Station ID	Result	Name	Data period for PREC	Data period for TEMP	Correlation
110425	Hopeful	Pochentong	1982/1 ~ 2015/11		0.0847383

- ✓ APCC
- ✓ Hopeful
- ✓ Below normal

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

Exercise 2

Precipitation over Pochentong in JJA 2017

A2

Details					
PREDICTAND	PREDICTOR				
YEAR/SEASON	2017 / 6	Training Period	1983 / 2005		
PREDICTAND	PREC	VARIABLE	U850		
DATASET	Cambodia	MODELS	<input type="radio"/> APCC <input type="radio"/> CWB <input type="radio"/> MSC <input type="radio"/> NASA <input type="radio"/> NCEP <input checked="" type="radio"/> POAMA		
REGION	1 Stations	REGION	Lat : 0 - 15 , Lon : 80 - 130		
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
110425	Good	Pochentong	1982/1 ~ 2015/11		0.432118

- ✓ PNU
- ✓ Good
- ✓ Below normal

Stations & Prediction Result	
<p>seasonal forecast of station</p> <p>correlation = 0.48, PREC_forecasted = -156.76 mm/month</p>	<p>Sataion's Location</p>
<p>Linear Regression of station on observed predictor</p> <p>PREC / T850 (mm/month / deg C)</p>	<p>Linear Regression of station on model predictor</p> <p>PREC / T850 (mm/month / deg C)</p>
<input type="button" value="New Downscale"/>	



Thank you.

Precipitation over Ranong in JJA 2017

Q2

Prediction Season (**2017/JJA**)

Variables (?????)

Models (**ALL**)

Predictand (**Precipitation**)

Training Period (default)

Method (Linear Regression)

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

Downscaling Region (?????)



Downscale

Precipitation over Ranong in JJA 2017

A2-1

Prediction Season (**2017/JJA**)

Variables (**t850**)

Models (**ALL**)

Predictand (**Precipitation**)

Training Period (default)

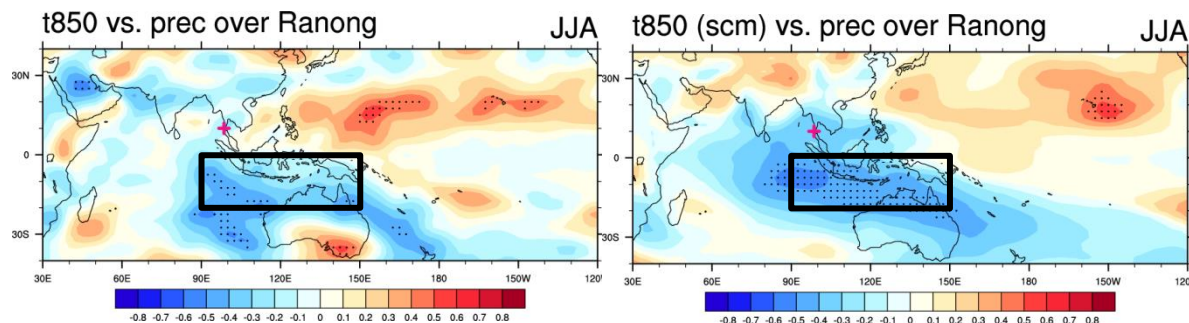
Method (Linear Regression)

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

Downscaling Region (**lat -20~0, lon 90~150**)



Downscale



Exercise 2

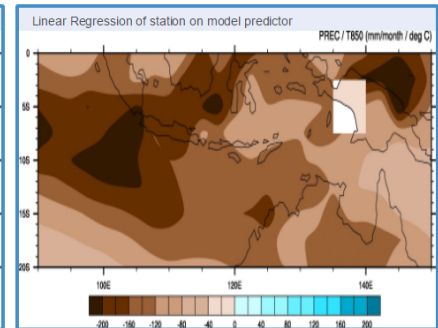
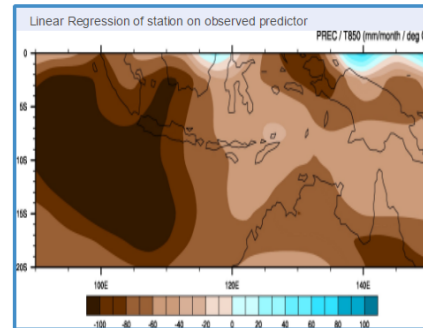
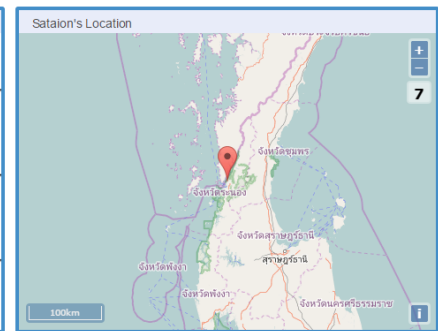
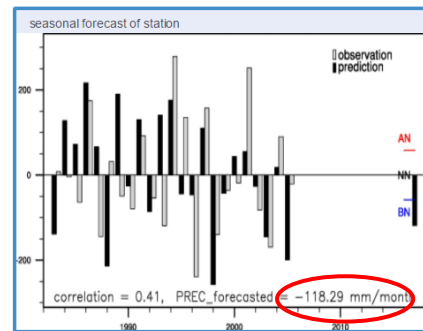
Precipitation over Ranong in JJA 2017

A2-1

Details					
PREDICTAND	PREDICTOR				
YEAR/SEASON	2017 / 6	Training Period	1983 / 2005		
PREDICTAND	PREC	VARIABLE	T850		
DATA SET	Thailand	MODELS	<input type="radio"/> APCC <input type="radio"/> CWB <input type="radio"/> I SC <input checked="" type="radio"/> NASA <input type="radio"/> JCEP <input type="radio"/> PNU <input type="radio"/> POAMA		
REGION	3 Stations	REGION	Lat: -20 ~ 0 , Lon : 90 ~ 150		
SIGNIFICANCE LEVEL	5%				
MINIMUM PATTERN SCORE	0.1				
<input checked="" type="checkbox"/> List up hopeful & good result stations only					
Selected Stations					
Station ID	Result	Name	Data period for PREC	Data period for TEMP	Correlation
465201	Hopeful	Phetchaburi	1982/1 ~ 2016/11		0.601625
532201	Good	Ranong	1982/1 ~ 2016/12		0.40745

- ✓ NASA
- ✓ Good
- ✓ Below normal

Stations & Prediction Result



New Downscale

Exercise 2

Precipitation over Ranong in JJA 2017

A2-1

Details					
PREDICTAND	PREDICTOR				
YEAR/SEASON	2017 / 6	Training Period	1983 / 2005		
PREDICTAND	PREC	VARIABLE	T850		
DATASET	Thailand	MODELS	<input type="radio"/> APCC <input type="radio"/> CMB <input type="radio"/> MSC <input type="radio"/> NASA <input type="radio"/> NCEP <input checked="" type="radio"/> PNU <input type="radio"/> PCMA		
REGION	3 Stations	REGION	Lat : -20 ~ 0 , Lon : 90 ~ 150		
SIGNIFICANCE LEVEL	5%				
MINIMUM PATTERN SCORE	0.1				
<input checked="" type="checkbox"/> List up hopeful & good result stations only					
Selected Stations					
Station ID	Result	Name	Data period for PREC	Data period for TEMP	Correlation
465201	Good	Phetchaburi	1982/1 ~ 2016/11		0.429626
532201	Good	Ranong	1982/1 ~ 2016/12		0.476115

- ✓ PNU
- ✓ Good
- ✓ Below normal

Stations & Prediction Result

seasonal forecast of station

correlation = 0.48, PREC_forecasted = -156.76 mm/month

Sataion's Location

Sataion's Location

Linear Regression of station on observed predictor

Linear Regression of station on observed predictor

PREC / T850 (mm/month / deg C)

Linear Regression of station on model predictor

Linear Regression of station on model predictor

PREC / T850 (mm/month / deg C)

[New Downscale](#)

Precipitation over Ranong in JJA 2017

A2-2

Prediction Season (**2017/JJA**)

Variables (**u850**)

Models (**ALL**)

Predictand (**Precipitation**)

Training Period (default)

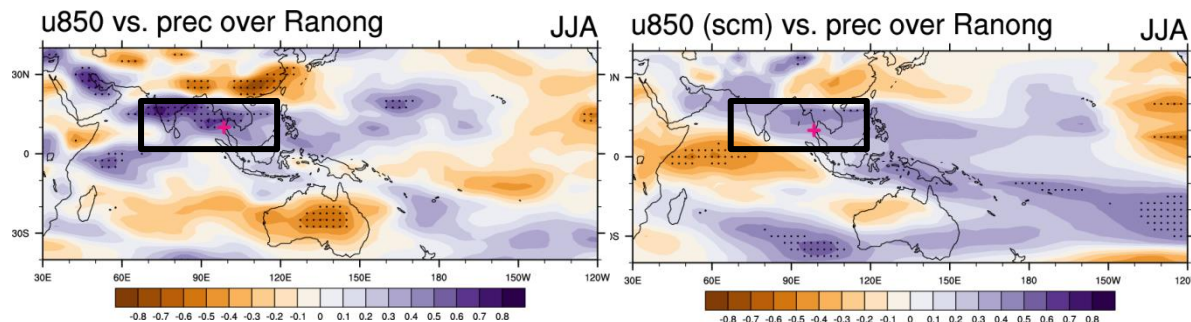
Method (Linear Regression)

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

Downscaling Region (**lat 0~20, lon 65~120**)



Downscale



Exercise 2

Precipitation over Ranong in JJA 2017

A2-2

Details					
PREDICTAND	PREDICTOR				
YEAR/SEASON	2017 / 6	Training Period	1983 / 2005		
PREDICTAND	PREC	VARIABLE	U850		
DATASET	Thailand	MODELS	<input checked="" type="radio"/> APCC <input type="radio"/> JMB <input type="radio"/> MSC <input type="radio"/> NASA <input type="radio"/> NCEP <input type="radio"/> PNU <input type="radio"/> POAMA		
REGION	3 Stations	REGION	Lat: 0 ~ 20 , Lon: 65 ~ 120		
SIGNIFICANCE LEVEL	5%				
MINIMUM PATTERN SCORE	0.1				
<input checked="" type="checkbox"/> List up hopeful & good result stations only					
Selected Stations					
Station ID	Result	Name	Data period for PREC	Data period for TEMP	Correlation
465201	Good	Phetchaburi	1982/1 ~ 2016/11		0.398956
532201	Good	Ranong	1982/1 ~ 2016/12		0.273946

- ✓ APCC
- ✓ Good
- ✓ Above normal

seasonal forecast of station

correlation = 0.27, PREC_forecasted = 218.62 mm/month

Sataion's Location

Linear Regression of station on observed predictor

Linear Regression of station on model predictor

[New Downscale](#)

Exercise 2

Precipitation over Ranong in JJA 2017

A2-2

Details					
PREDICTAND	PREDICTOR				
YEAR/SEASON	2017 / 6	Training Period	1983 / 2005		
PREDICTAND	PREC	VARIABLE	U850		
DATASET	Thailand	MODELS	<input type="radio"/> APCC <input checked="" type="radio"/> CWB <input type="radio"/> JSC <input type="radio"/> NASA <input type="radio"/> NCEP <input type="radio"/> PNU <input type="radio"/> POAMA		
REGION	3 Stations	REGION	Lat: 0 ~ 20 , Lon: 65 ~ 120		
SIGNIFICANCE LEVEL	5%				
MINIMUM PATTERN SCORE	0.1				
<input checked="" type="checkbox"/> List up hopeful & good result stations only					
Selected Stations					
Station ID	Result	Name	Data period for PREC	Data period for TEMP	Correlation
465201	Good	Phetchaburi	1982/1 ~ 2016/11		0.394176
532201	Hopeful	Ranong	1982/1 ~ 2016/12		0.00139723

- ✓ CWB
- ✓ Hopeful
- ✓ Near 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