CLIK hands-on (PART IV):

Multi Model Downscaling Using CLIK

(http://clik.apcc21.org)

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APCC APEC CLIMATE CENTER

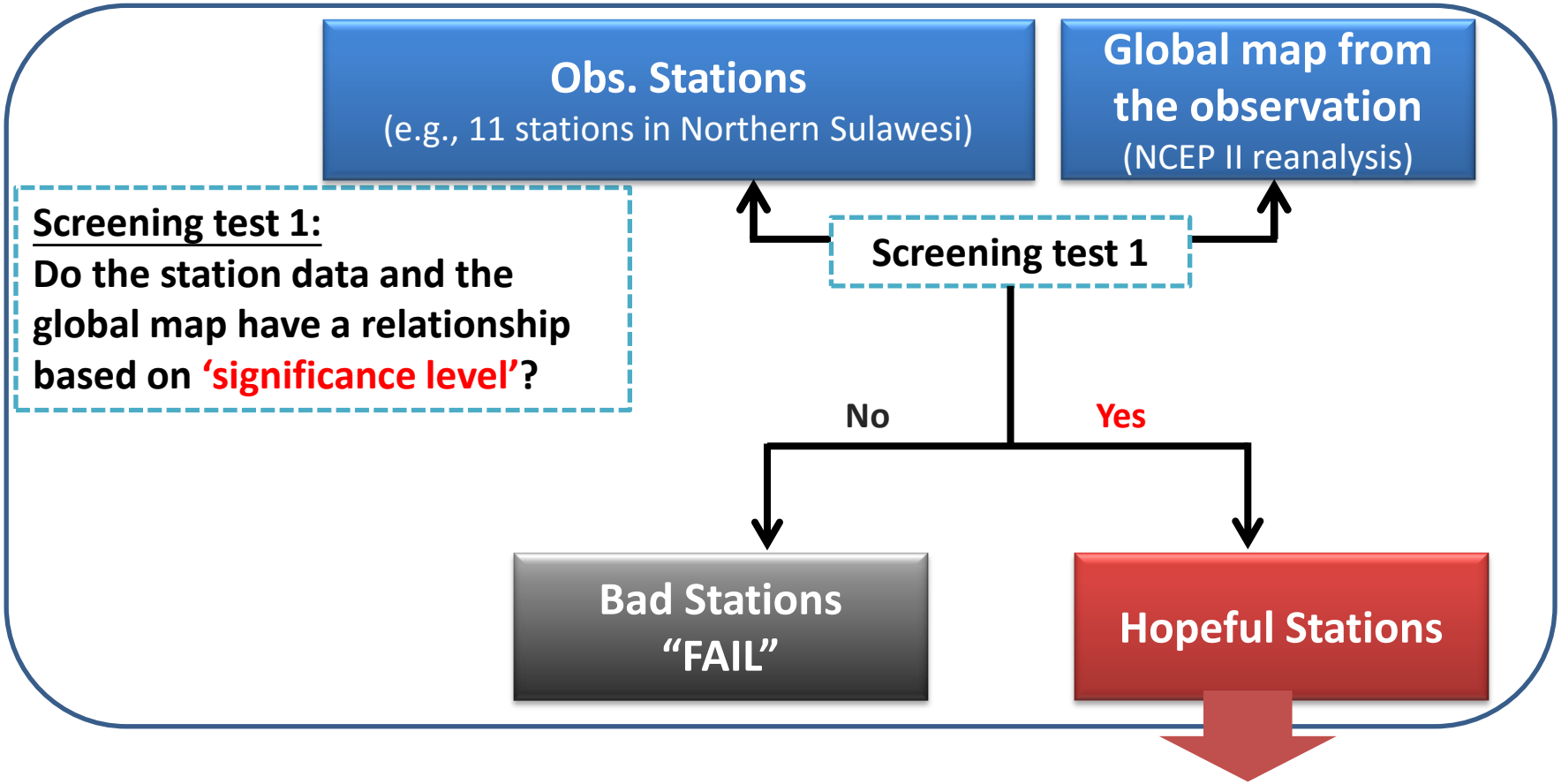
1. **Downscaling using built-in station data (APHRODITE*)**
2. **Downscaling using your station data which was uploaded in the ‘Data Processing Part’**

*AHORODITE
Asian Precipitation – Highly-Resolved Observational Data integration Towards Evaluation of Water Resources
https://climatedataguide.ucar.edu/climate-data/aphrodite-asian-precipitation-highly-resolved-observational-data-integration-towards.#sthash.42mDJsXJ.dpuf

Downscaling procedure

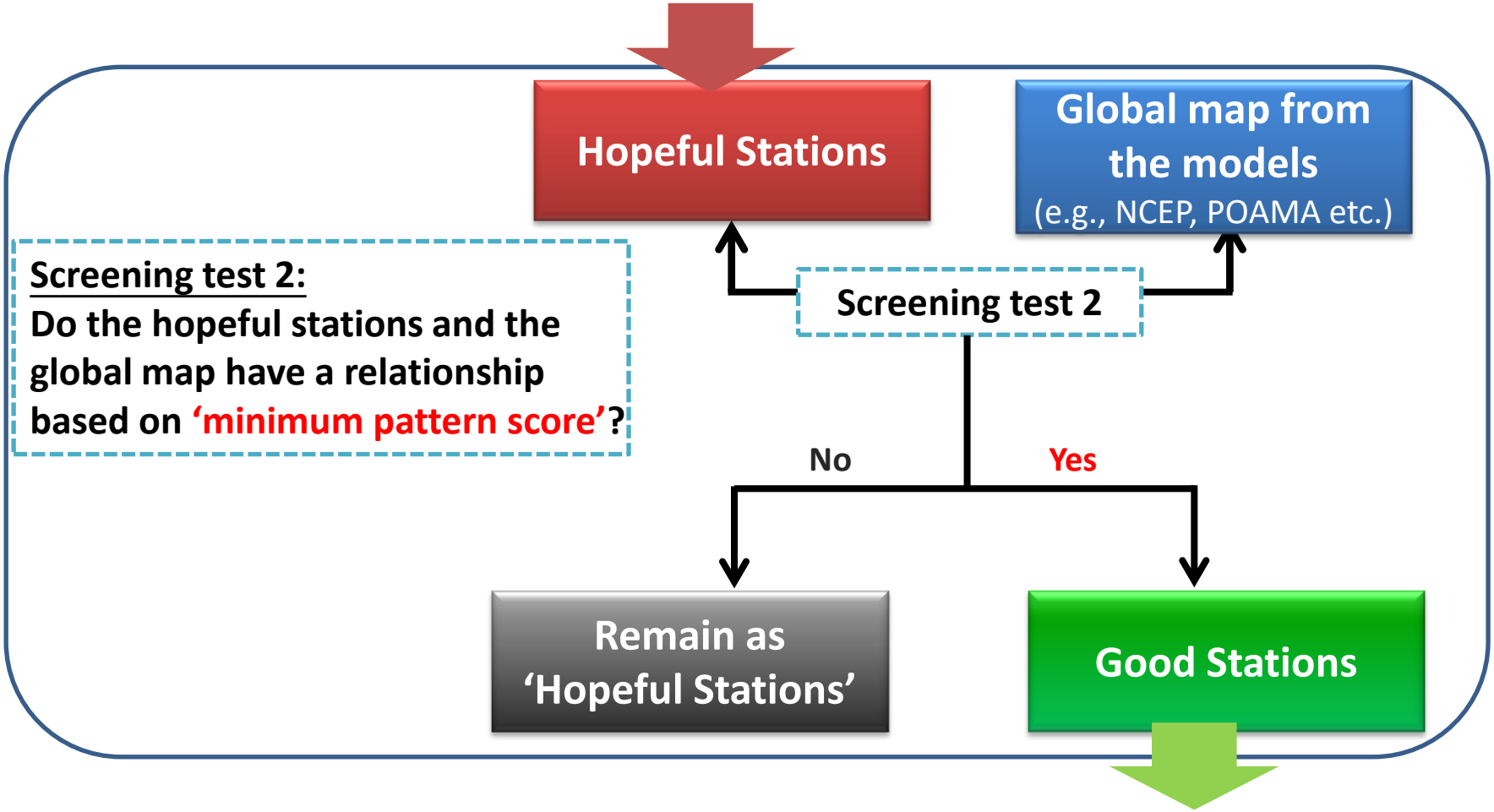
Downscaling procedure in CLIK

- **Step 1. Screening process**



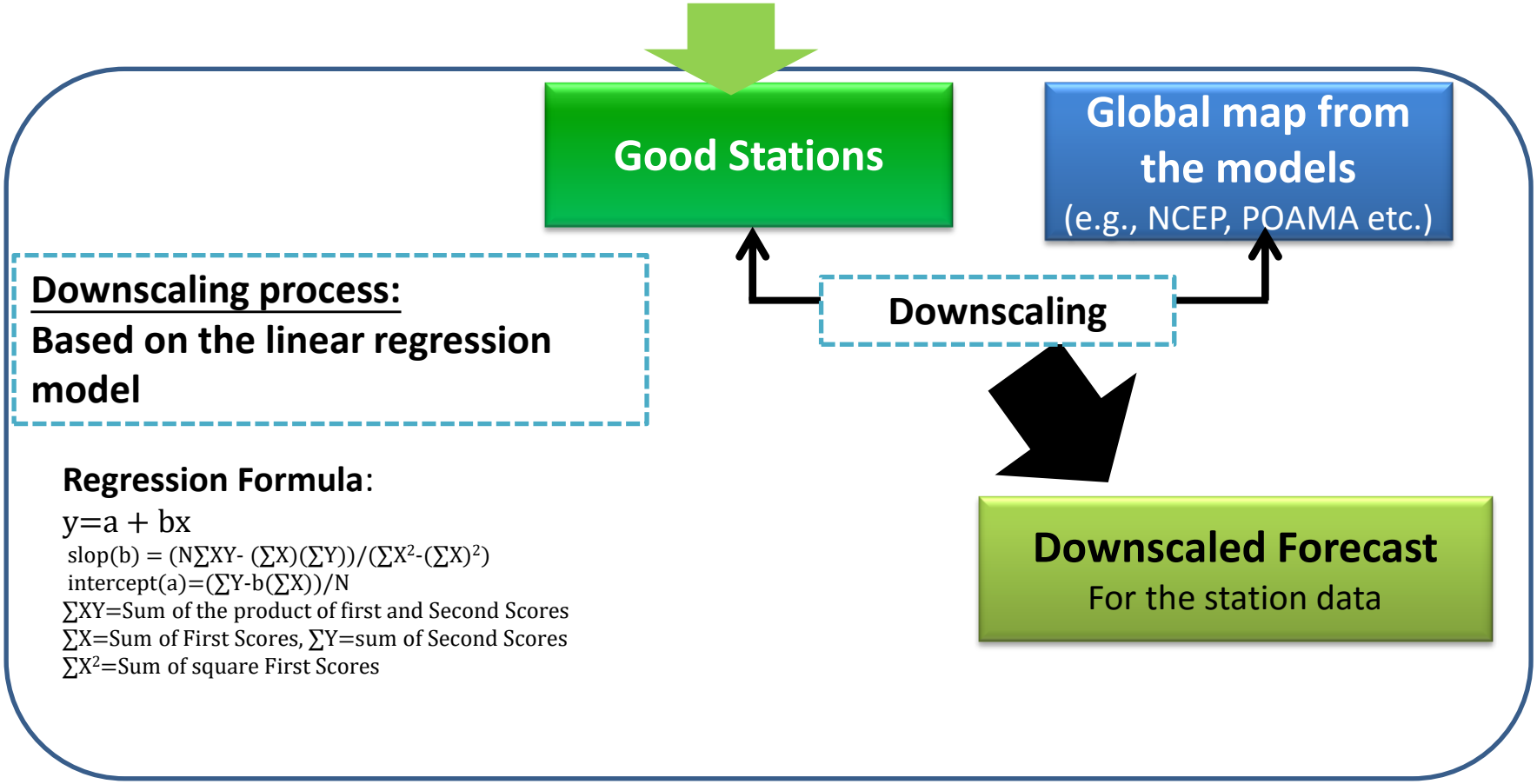
Downscaling procedure in CLIK

- **Step 2. Screening process**



Downscaling procedure in CLIK

- **Step 3. Downscaling**



Downscaling process:
Based on the linear regression model

Regression Formula:

$y=a+bx$

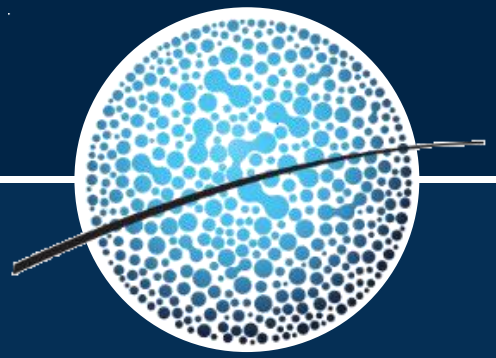
slop(b) = $(N\sum XY - (\sum X)(\sum Y))/(\sum X^2-(\sum X)^2)$

intercept(a)=$(\sum Y-b(\sum X))/N$

$\sum XY$=Sum of the product of first and Second Scores

$\sum X$=Sum of First Scores, $\sum Y$=sum of Second Scores

$\sum X^2$=Sum of square First Scores



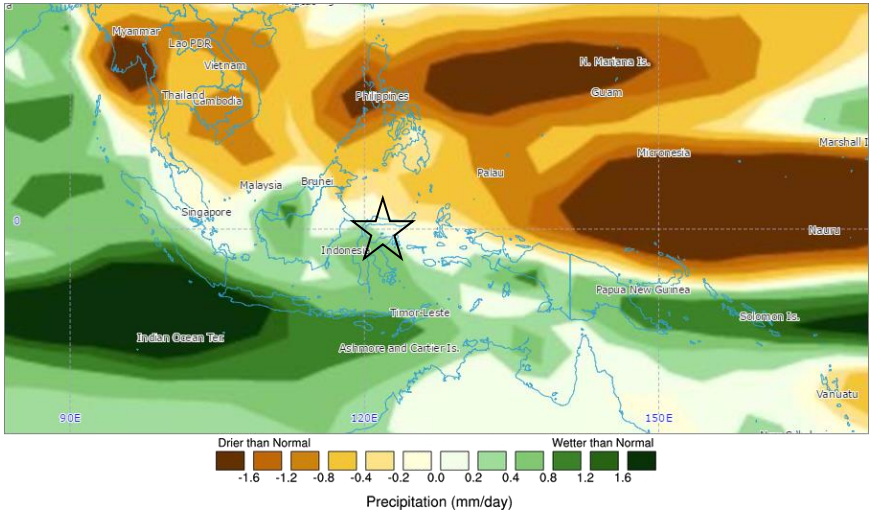
Let’s do it!

1. Downscaling using built-in station data

Produce a downscaled forecast

Dynamical prediction for 2016 JJA

APCC-MME



Lead Month: 3, Year: 2016, Season: 6, Methods: SCM
Model: APCC, BCC, COLA, CWB, IRIF, IRI_CA, MGO, NASA, NCEP, PNU, POAMA
created by CLIK(2016-05-29)
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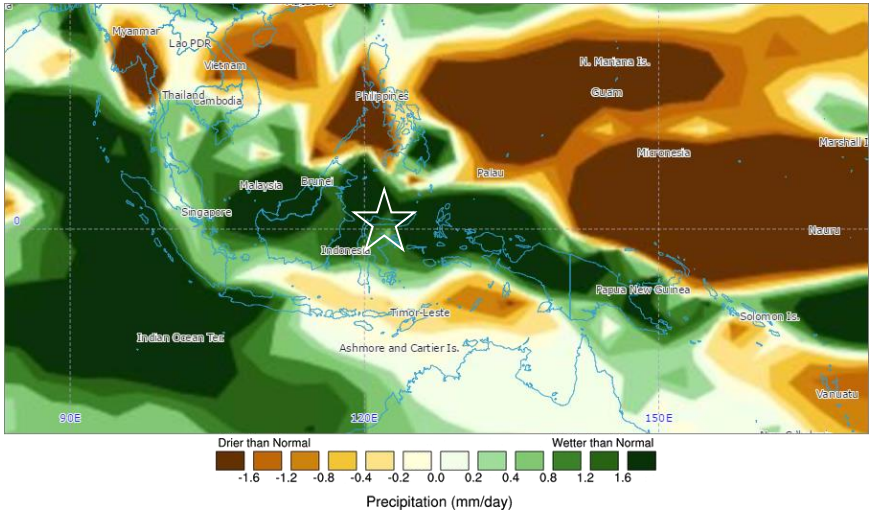
NCEP



Lead Month: 3, Year: 2016, Season: 6, Methods: SCM
Model: NCEP
created by CLIK(2016-05-29)
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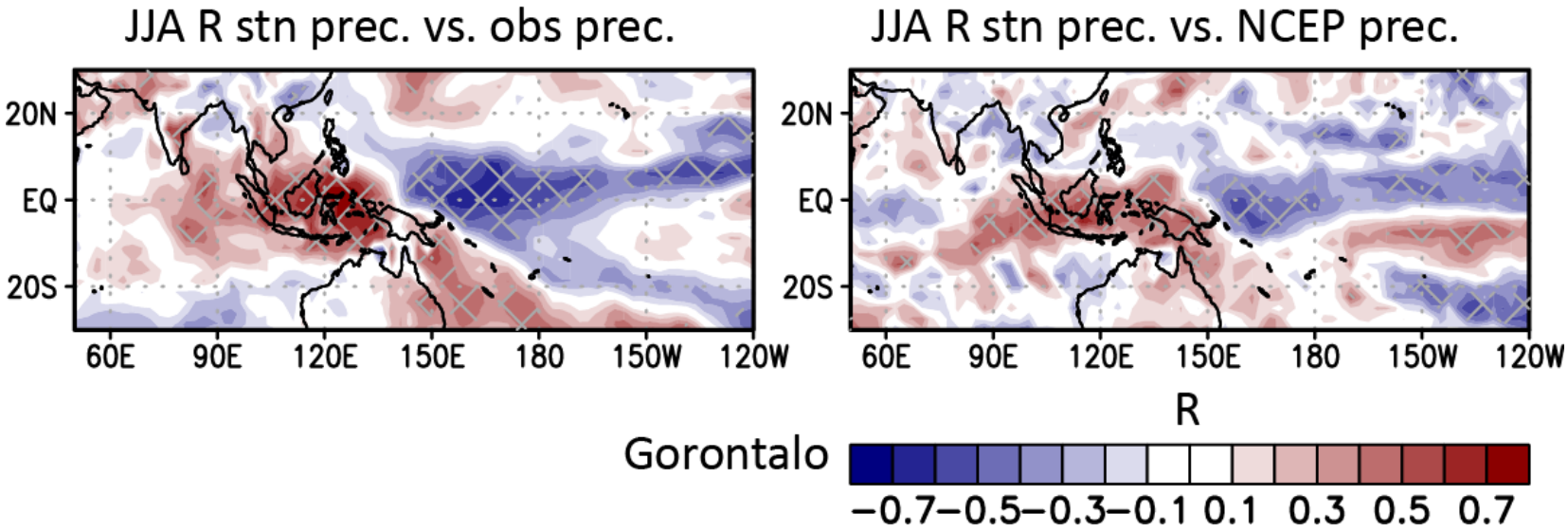
Northern part of Sulawesi

Produce a downscaled forecast

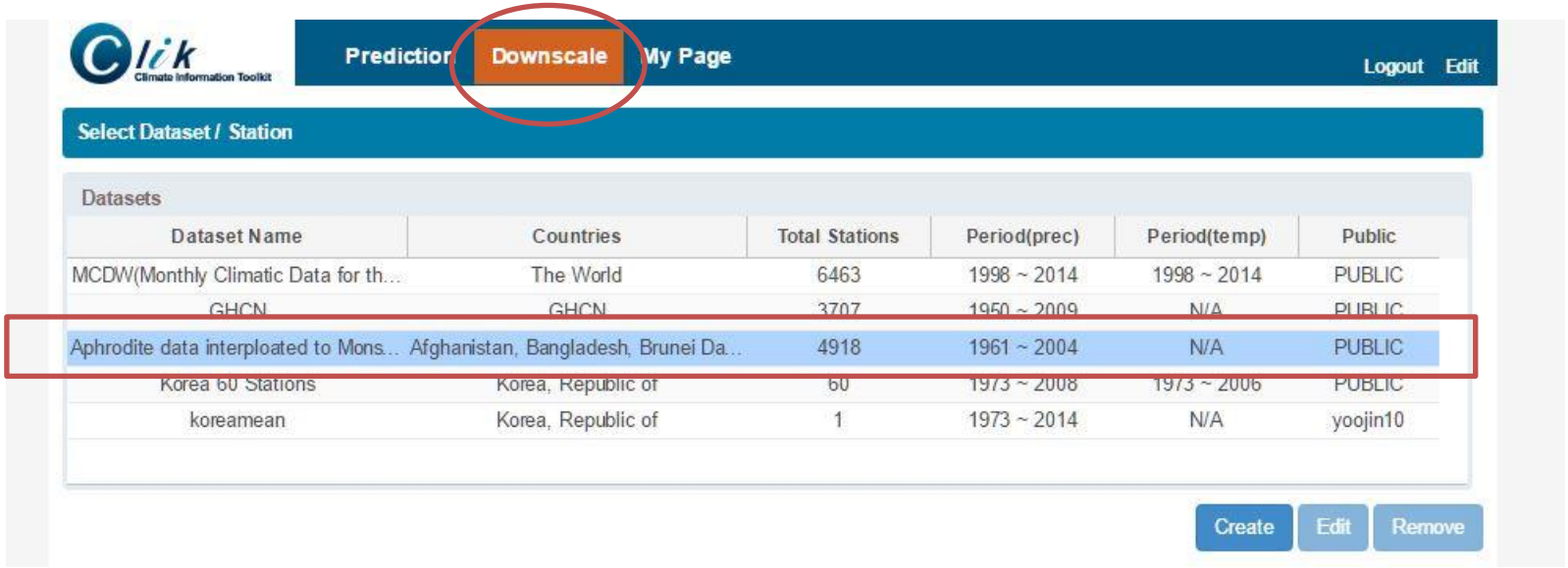
Relationship between Gorontalo station prcp. & …



Produce a downscaled forecast

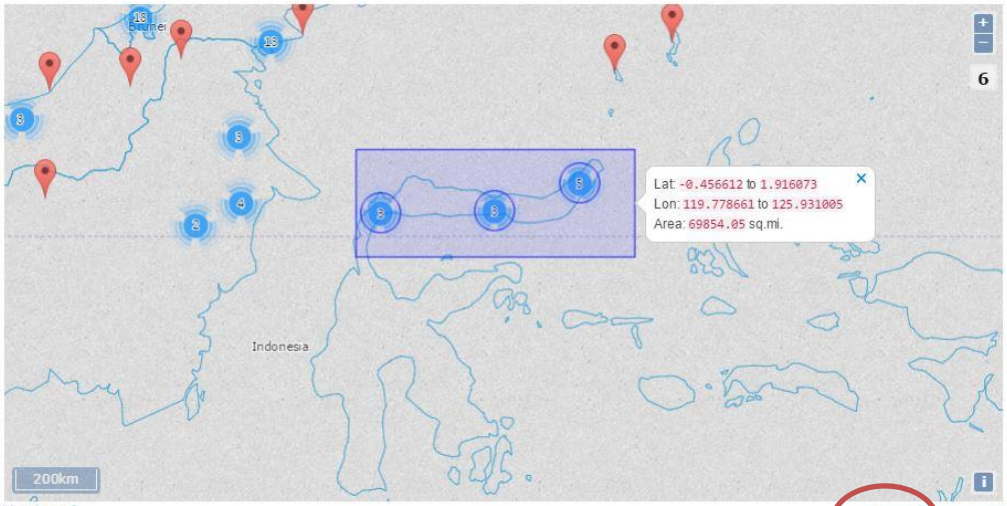
A. Click ‘Downscale’ tab.

B. Select the dataset (Aphrodite) in CLIK



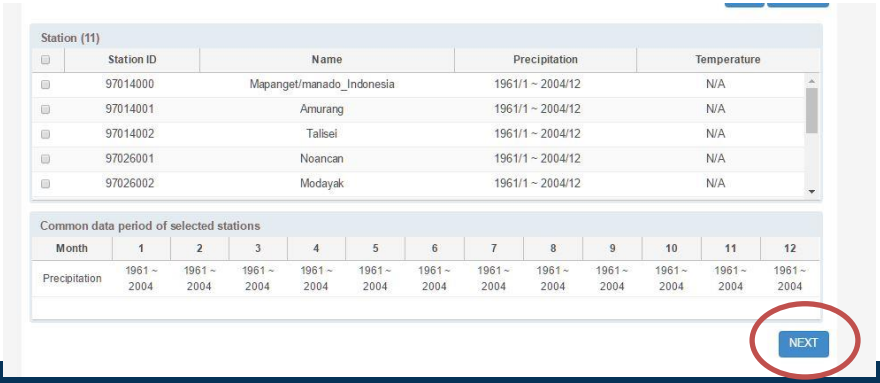
Produce a downscaled forecast

C. Select stations on the map



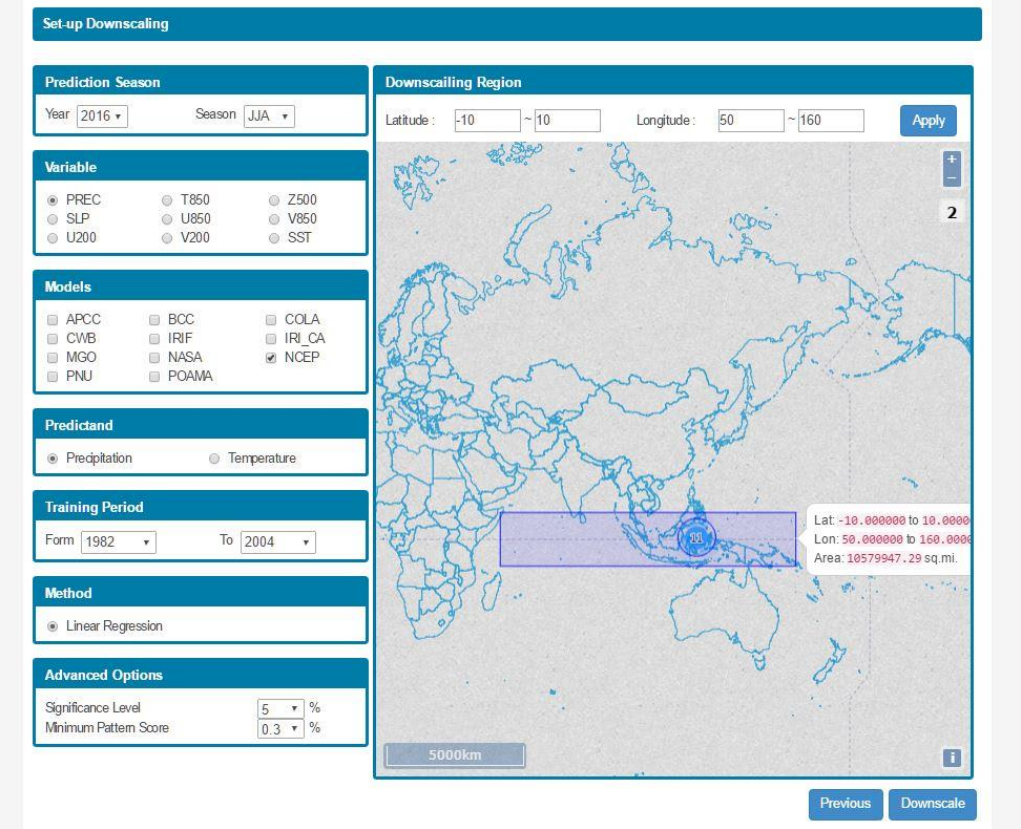
1. On the map, you can choose stations where you are interested in. Press shift + left mouse button and drag to select stations.
2. Click ‘Add’. Then you will see station’s list and common data period.
3. Click ‘Next’.

- 11 stations among Aphrodite dataset in Sulawesi island.



Produce a downscaled forecast

C. Select variables, models, training period, downscaling region

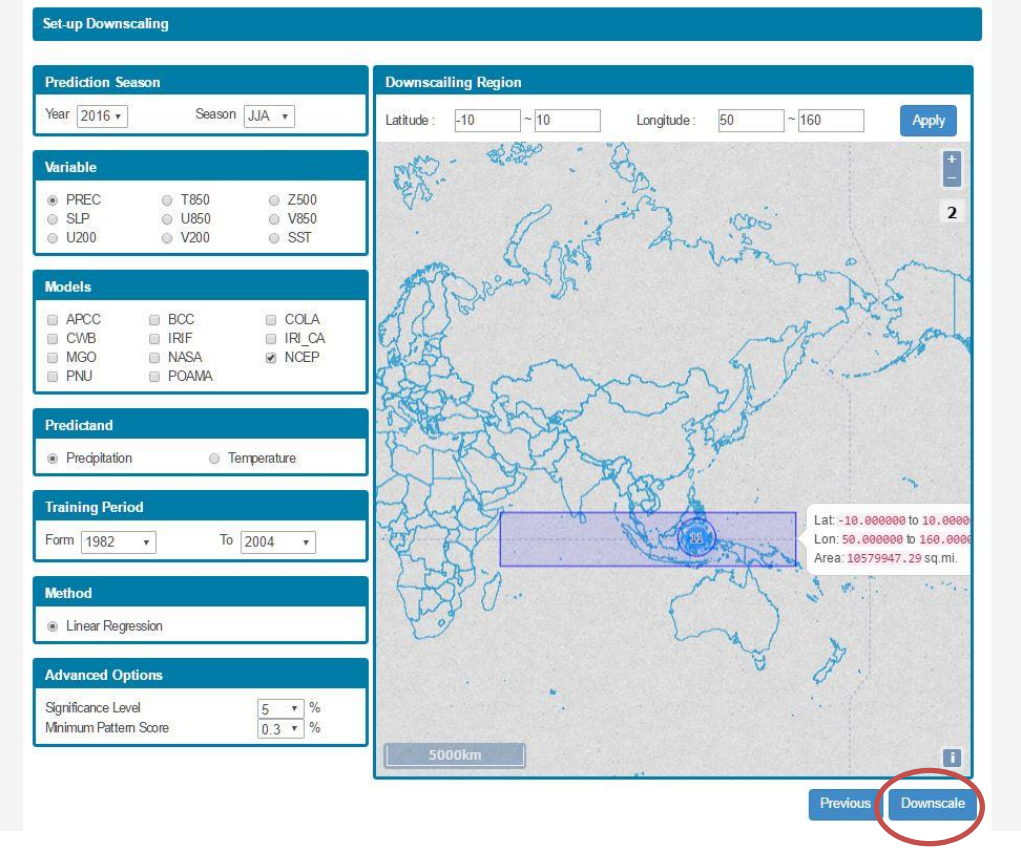


1. Select prediction season.
2. Select variable (predictor) for the downscaling.
3. Select models for the downscaling.
4. Select target variable (predictand) among precipitation and temperature.
5. Select training period.
6. Select method (currently we only provide linear regression).

- 2016 JJA
- PREC
- NCEP
- Precipitation
- From 1982-2004
- Linear Regression

Produce a downscaled forecast

C. Select variables, models, training period, downscaling region

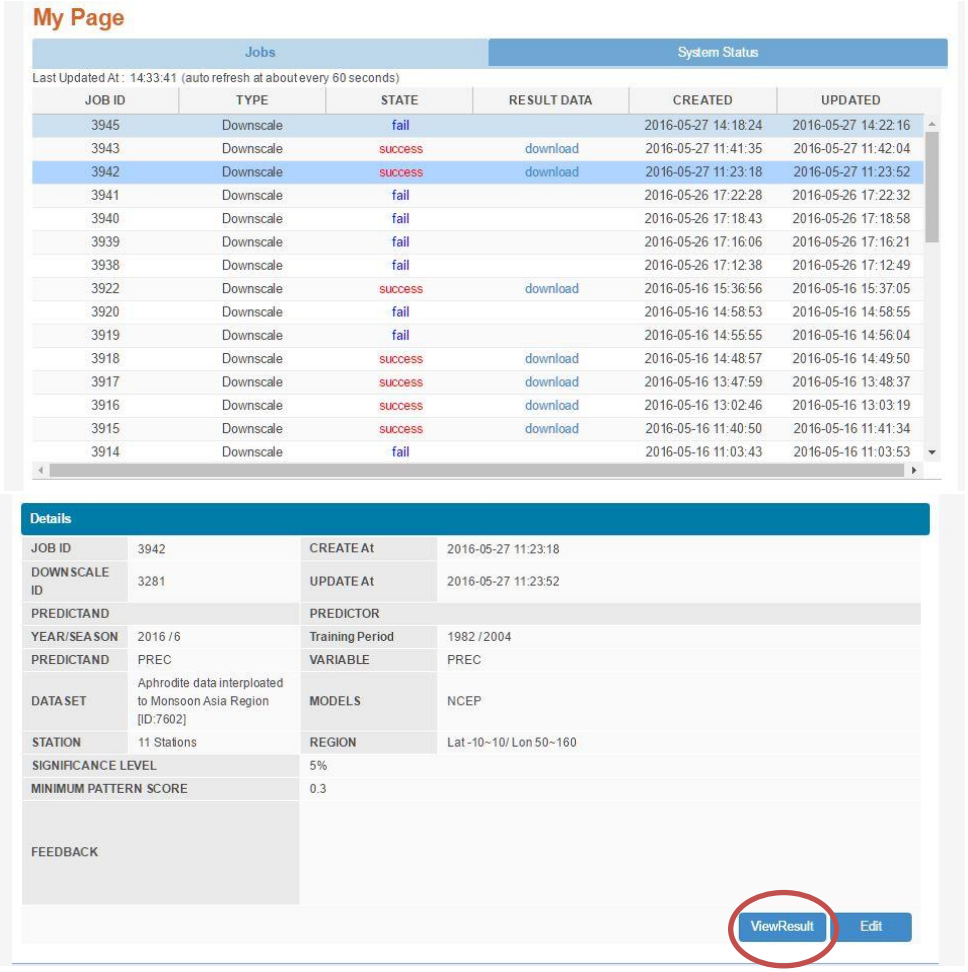


7. Select advanced options for significance level and minimum pattern scores for screening.
   - The significance level is to find the relationship between station data and observation (NCEP reanalysis).
   - The pattern score is a screening value to find out the model pattern is similar to the observation or not.
8. Select the downscaling region: spatial range of the predictor's area. Or you can drag area in the map.
9. Click 'Downscale'.

- Significance level: 5%
- Minimum pattern score: 0.3
- Region: 10S~10N, 50E-160E

Produce a downscaled forecast

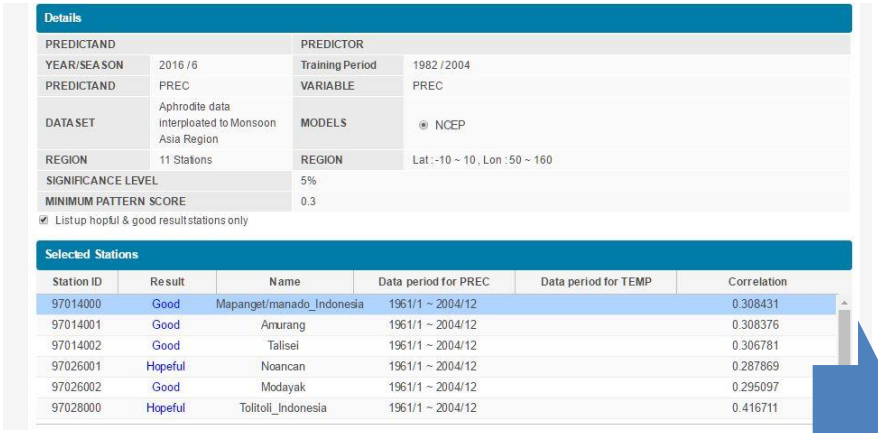
D. Results

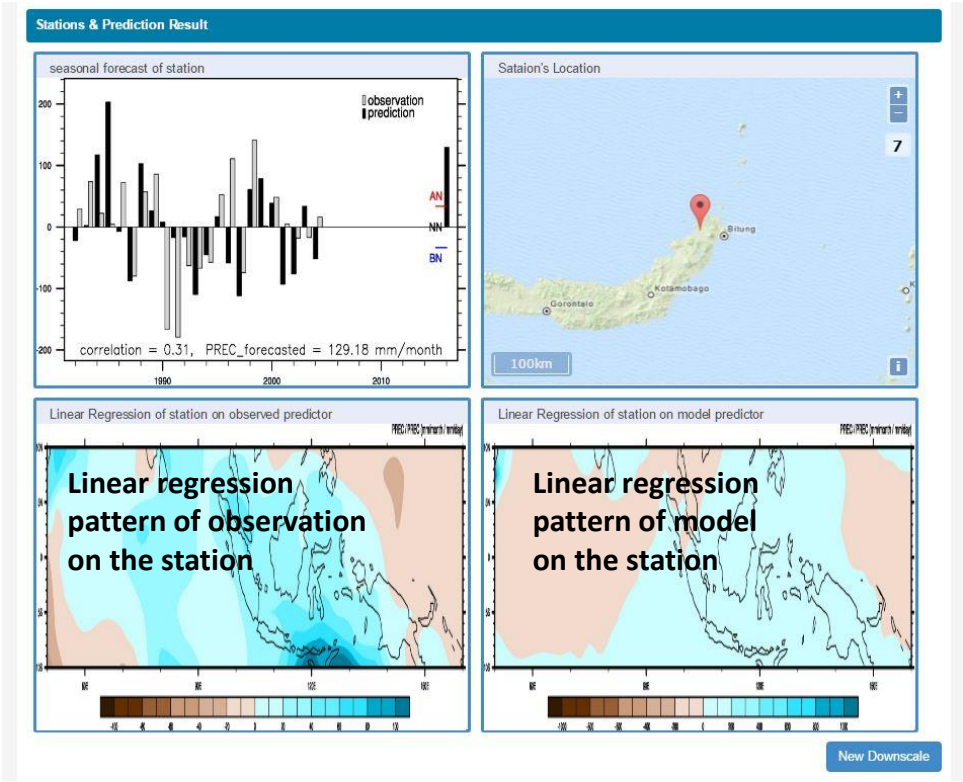


1. You will see the ‘state’ of the process. After the process is done, you will see ‘fail’ or ‘success’. Then you can see the results by clicking the job line.
2. Click ‘ViewResults’ button to see the results of downscaling.

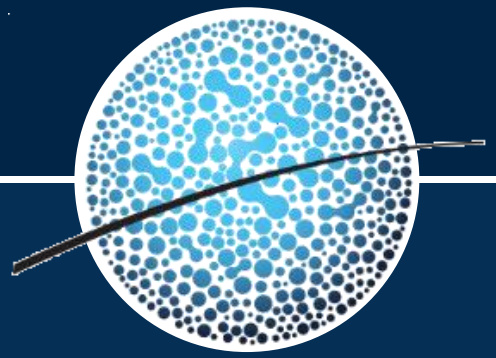
Produce a downscaled forecast

D. Results





3. Select ‘MODELS’.
4. Click the station ID where you are interested in. Then you can see the prediction results, forecast skill, station’s location, linear regression pattern of observed predictor and model predictor.
5. Enjoy the downscaled forecast. You can download the graphic information also.



2. Downscaling using your station data

Produce a downscaled forecast

- **Same procedure with the built-in data, but with your station data which was uploaded in the previous part.**

- **If the downscaling fails,,,, be patient and try more!**

  Find the large scale climate system that affects local climate.


Thank you.