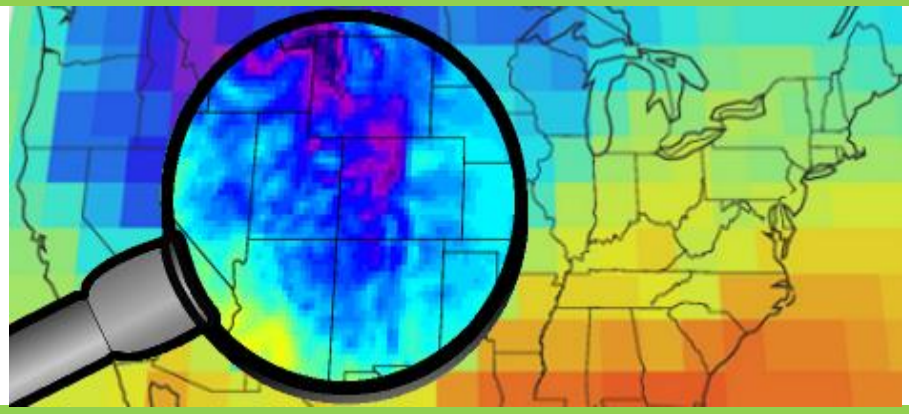
Hands-on Statistical Downscaling Training (III)



Jaepil Cho

2017/10/18

Overview

1. Raw GCM analysis for excluding worst GCMs → Selection of GCMs

2. Analysis of reproducibility and signal changes using climate extreme indices
   - 2.1 Evaluating reproducibility of climate extreme indices for the historical period
   - 2.2 Comparing signal changes in climate extreme indices before and after downscaling

3. Evaluating reproducibility of spatial correlations among stations using variogram

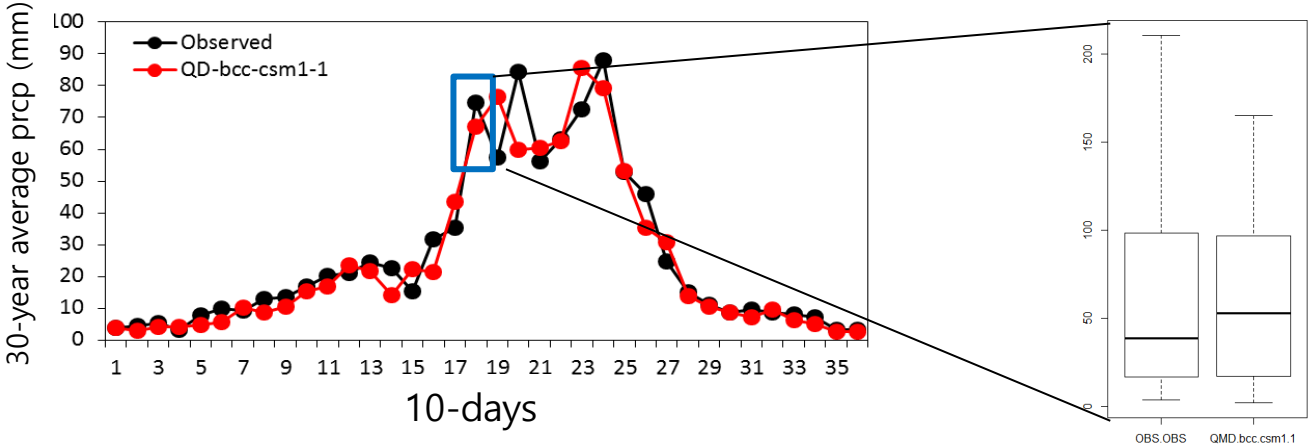
→ Selection of downscaling technique

4. Estimating multi-model ensemble (MME) mean and providing uncertainty ranges according to number of GCMs → User-centered climate change projections

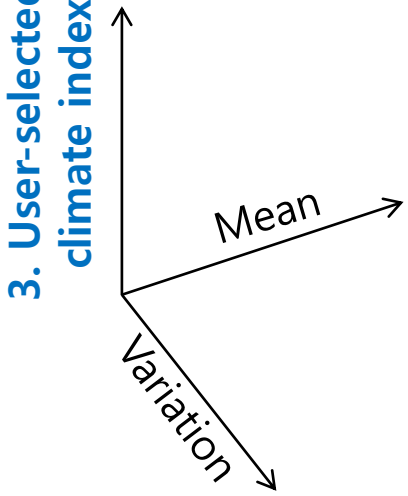
4. Calculating weight factor for GCMs and percent changes in future periods

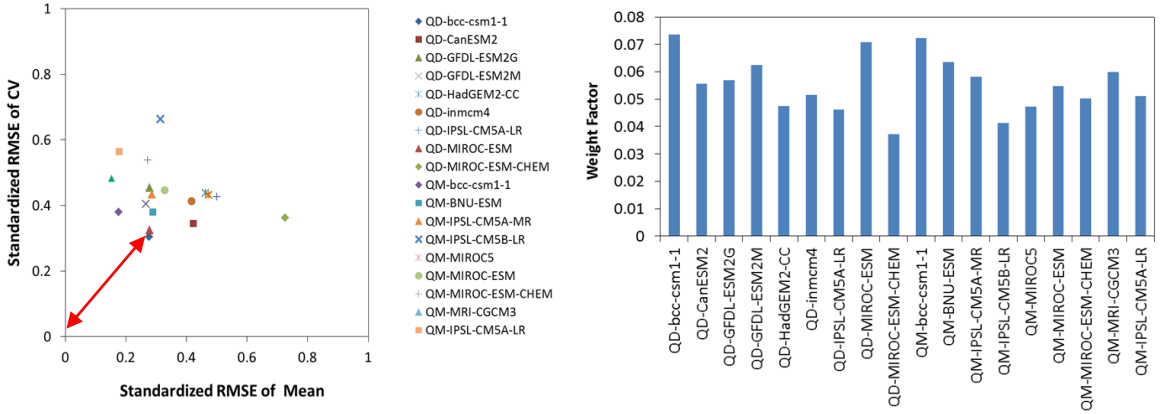
1. Mean difference (default)

2. Variation difference (default)



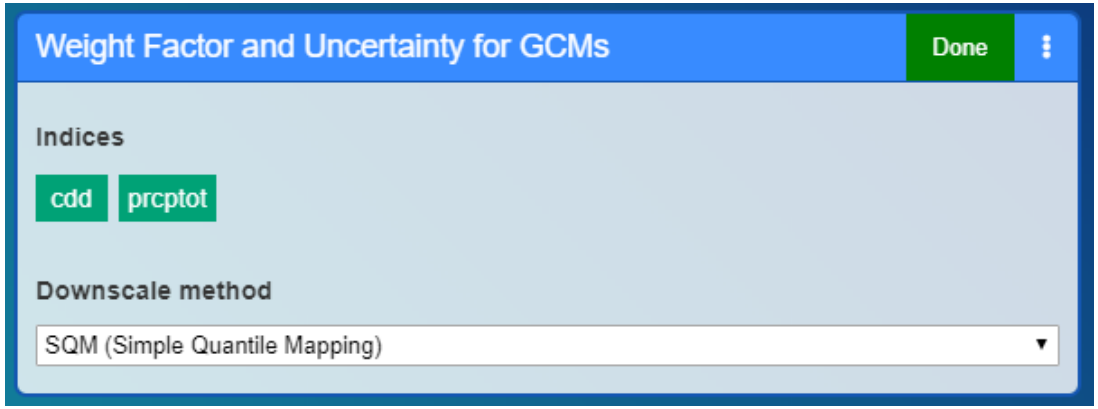
3. User-selected climate index





Calculating weight factor for GCMs

Weight factor for each GCM for calculating multi-model ensemble

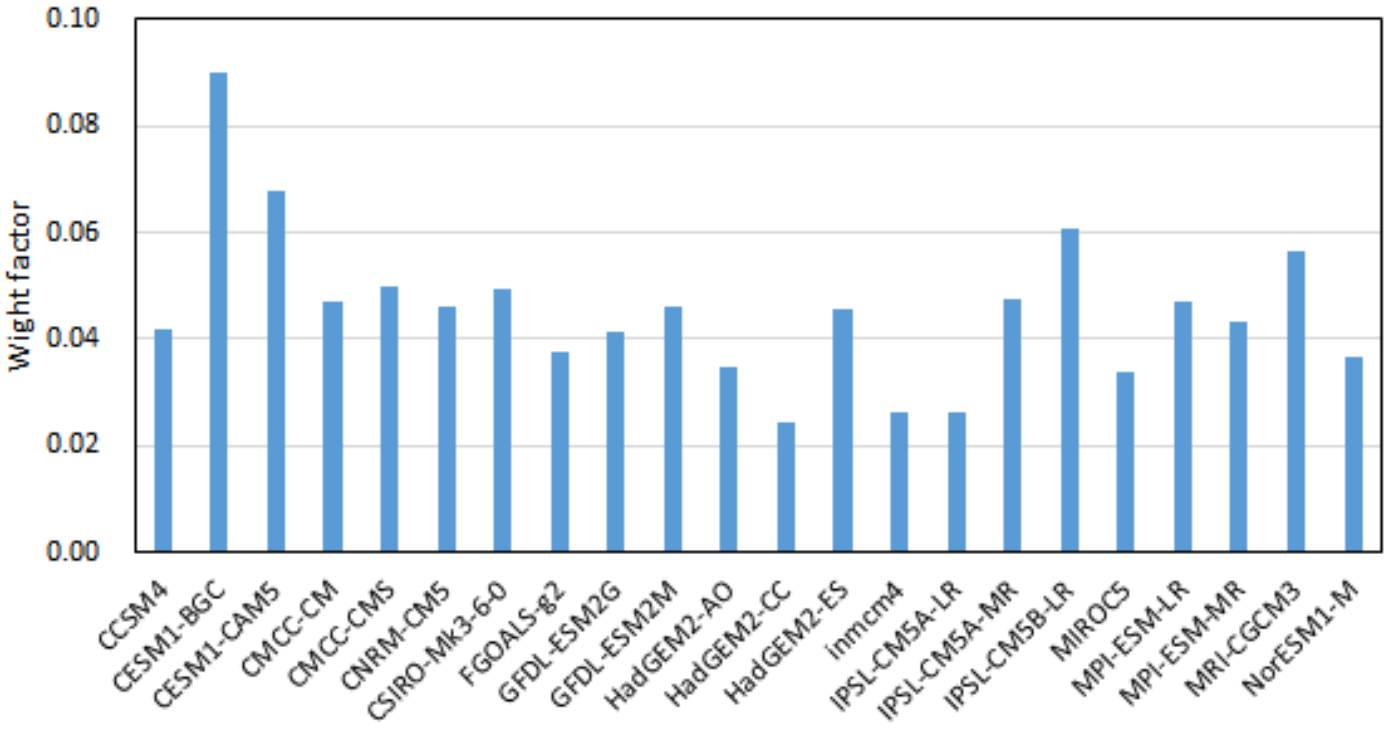


[project folder]/WeightFactorUncertainty

- Individual_distance_output.csv
- sqm_cdd_rcp45_WeightedFutureChange.csv
- sqm_cdd_uncertainty.png
- sqm_Distance_Summary.csv
- sqm_overall_uncertainty.png
- sqm_prcptot_rcp45_WeightedFutureChange.csv
- sqm_prcptot_uncertainty.png

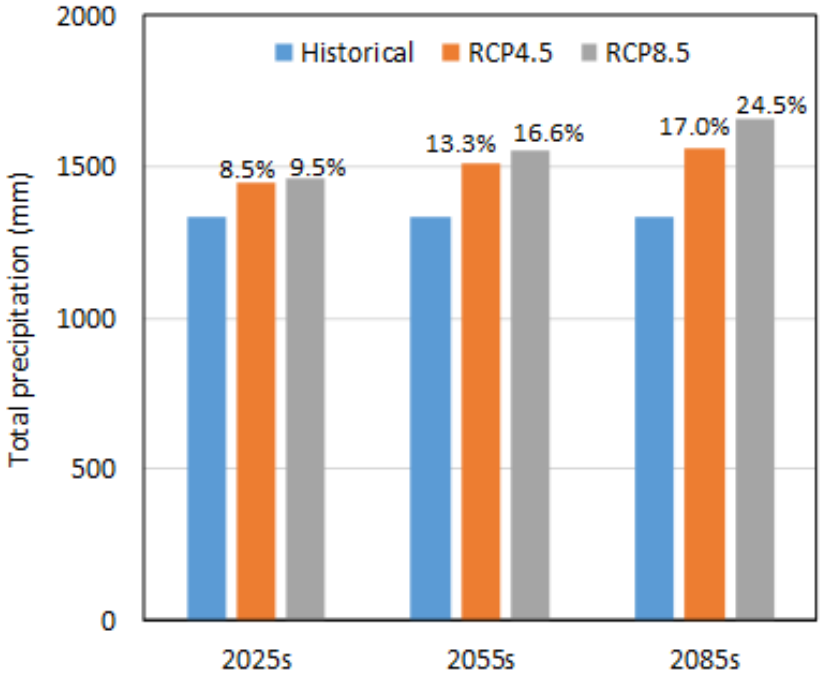
Calculating weight factor for GCMs

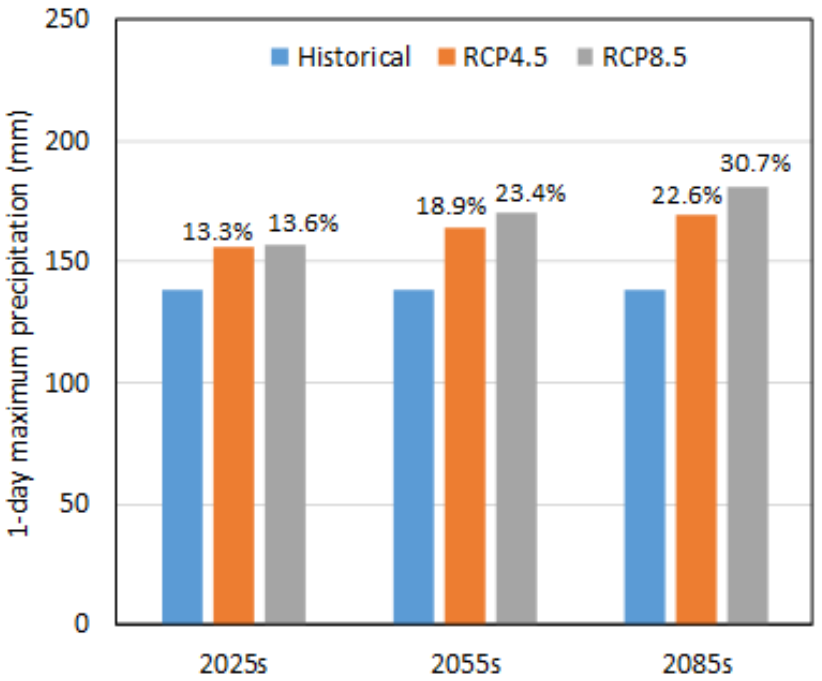
Weight factor for each GCM for calculating multi-model ensemble



Overall summary (not included)

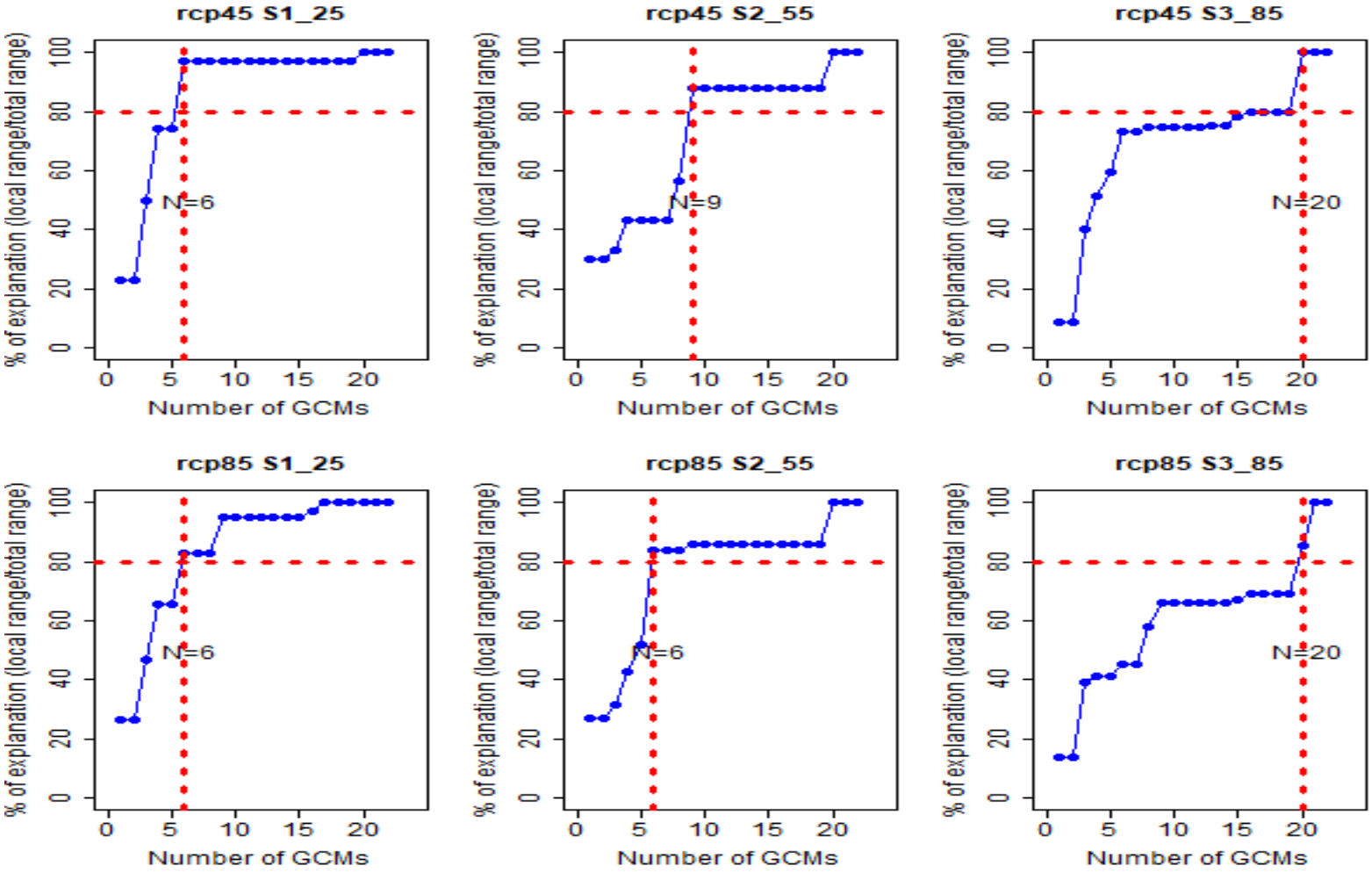
Weighted average of changes in prcptot and rx1day based on the downscaled data using 22GCM and SQM method



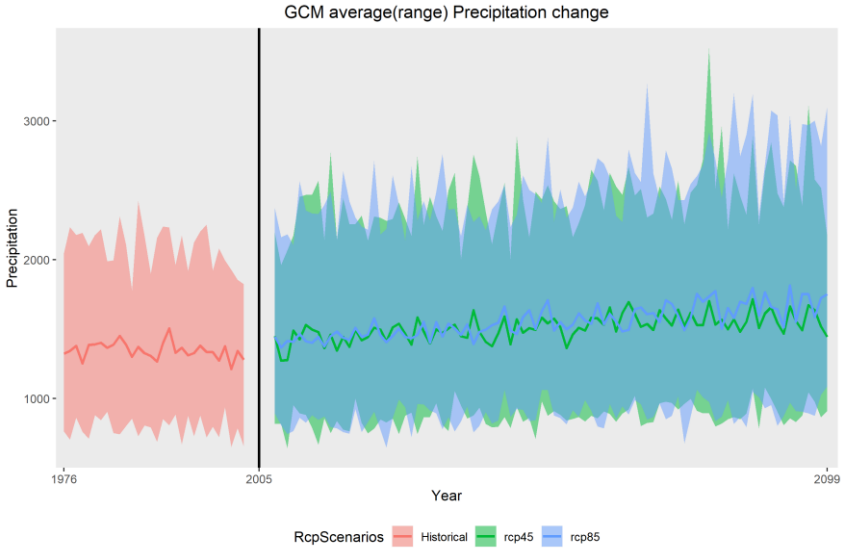


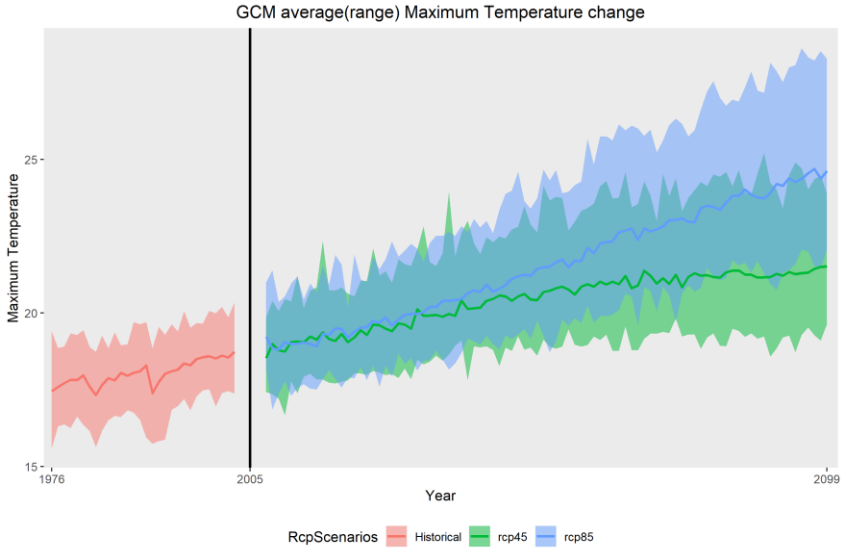
Uncertainty range covered according to the number of selected GCMs

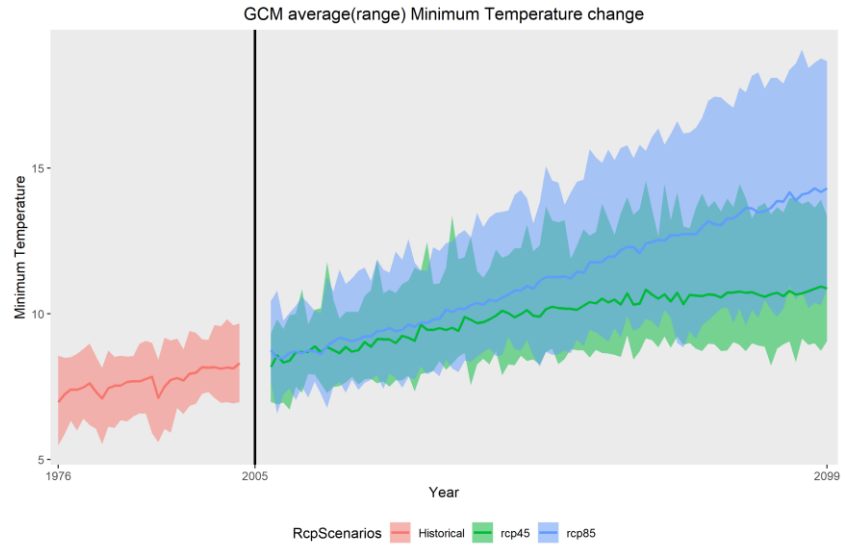
Evaluation result of uncertainty explanation power due to increase of GCM number by SQM downscaling method (Overall)



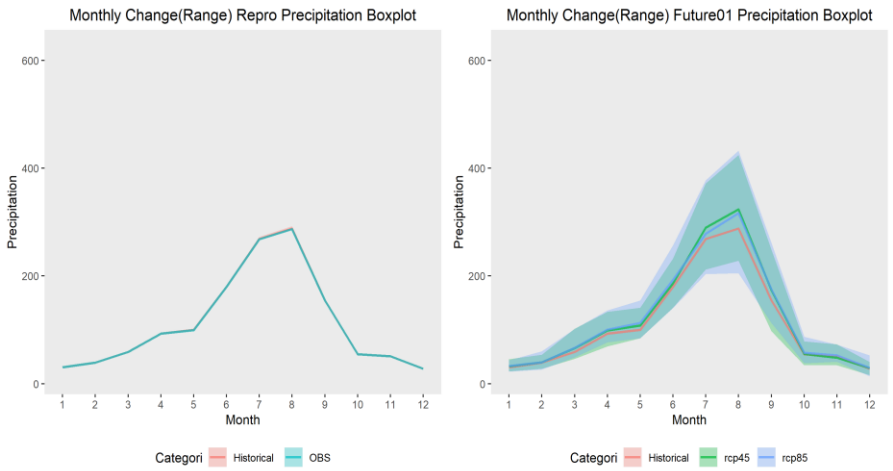
Annual changes (not included)

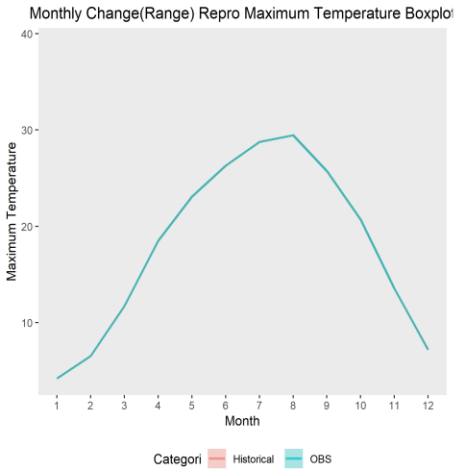


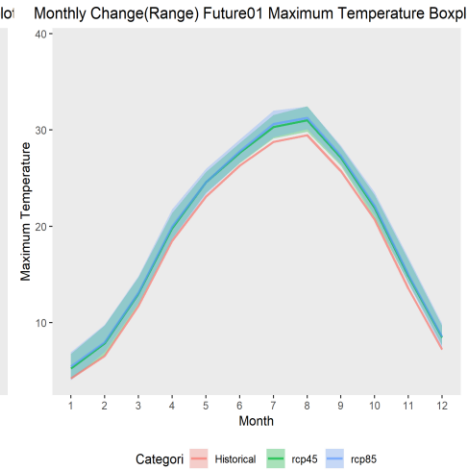


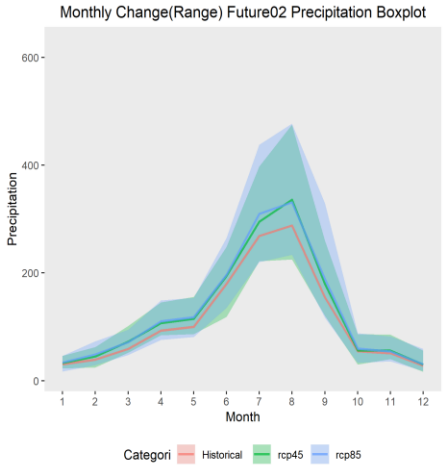


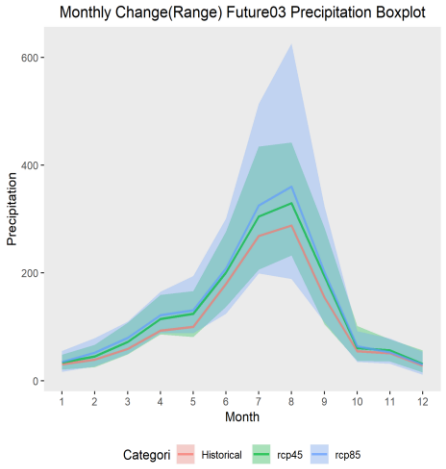
Monthly change (not included)

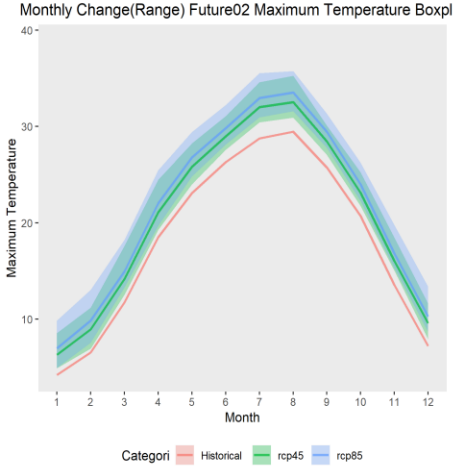


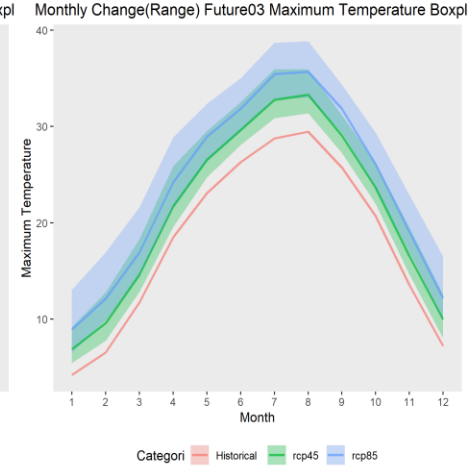




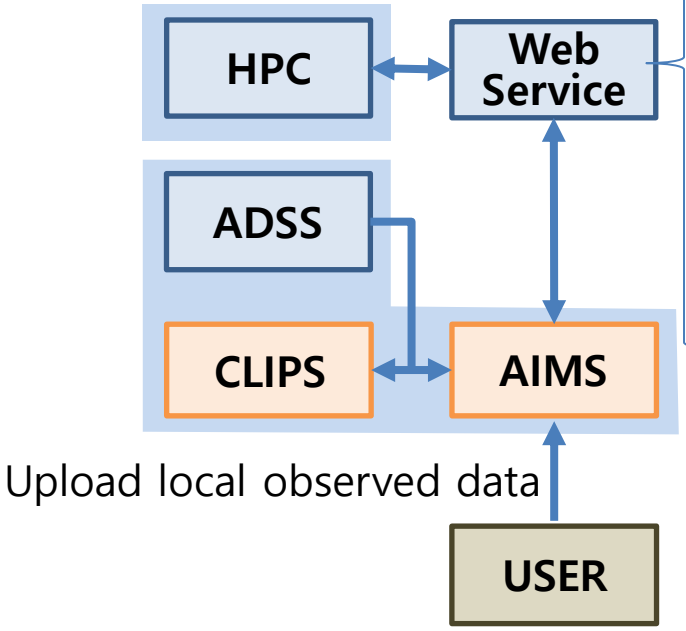




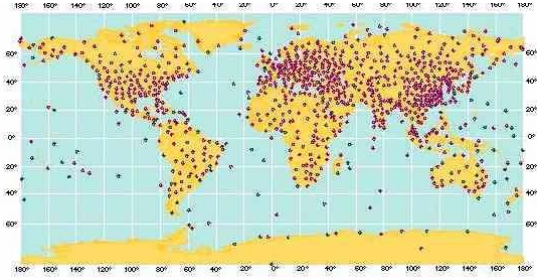




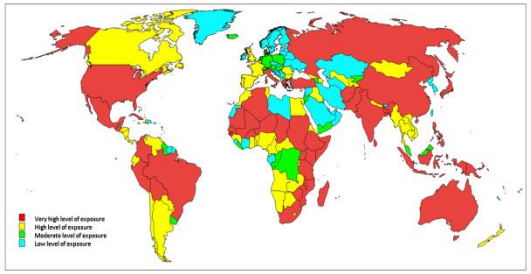
Web-based service



❶ Sharing adaptation related information



❷ Providing climate exposure related information



Sharing adaptation related information (User interface)

First Page

Search Box:
Search locations by its country name, or keywords

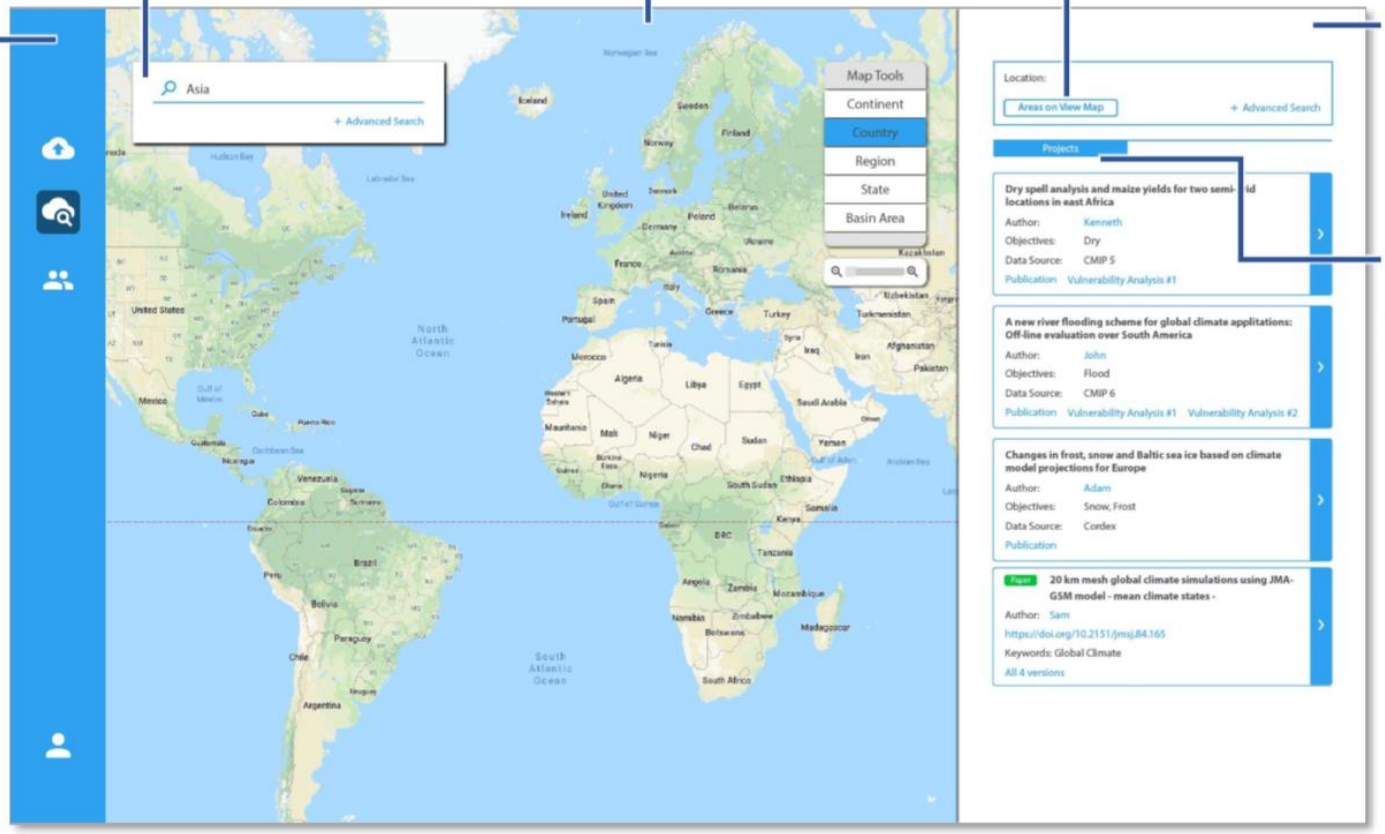
Map

Location Tag:
Matches location shown on the View Map

Main Feature Tab

Right Panel:
Shows the project related information

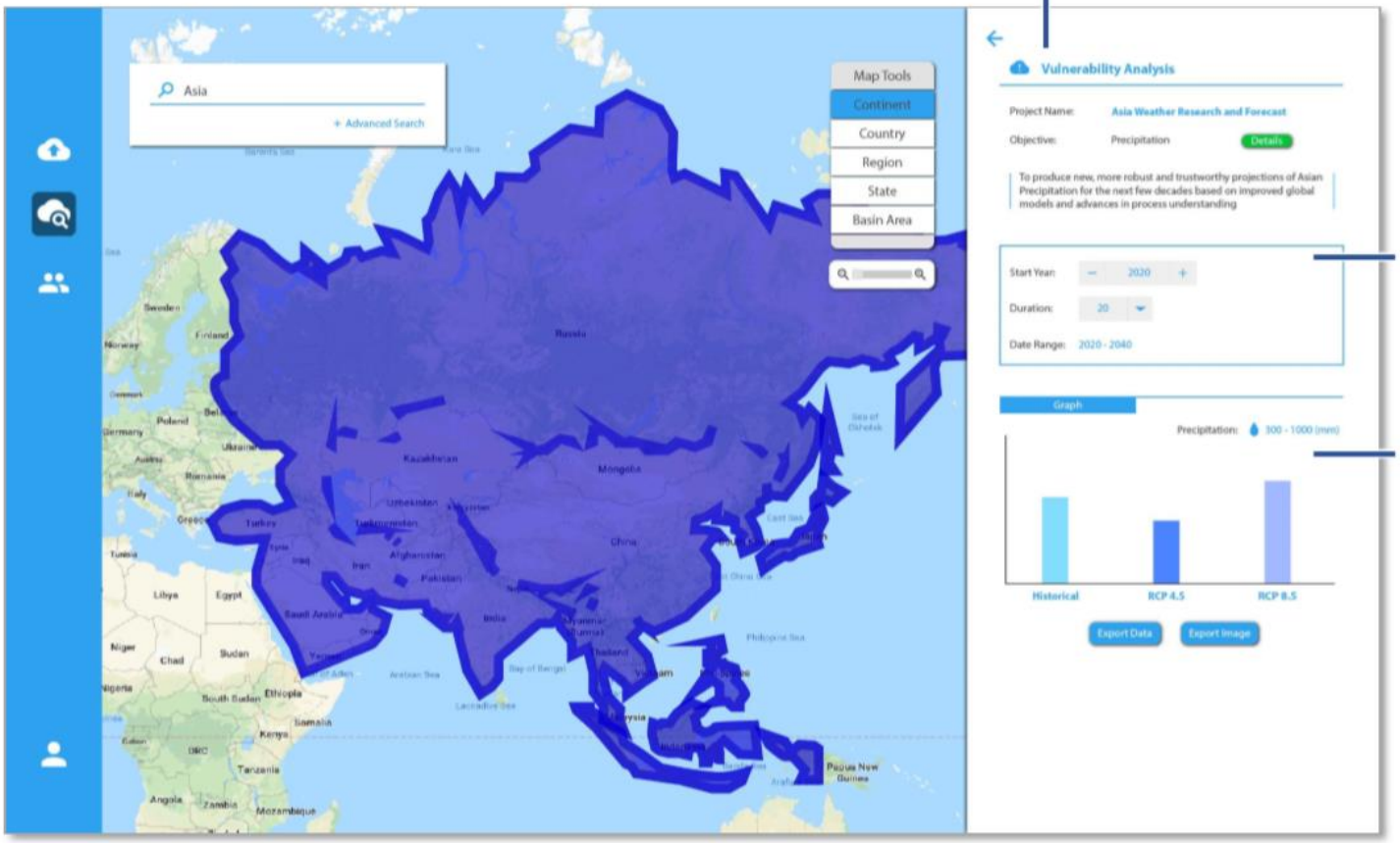
Project Result:
Projects based on the selected location are listed.



Sharing climate exposure related information (user interface)

Vulnerability Analysis

Vulnerability Analysis:
Provides vulnerability analysis details and related information

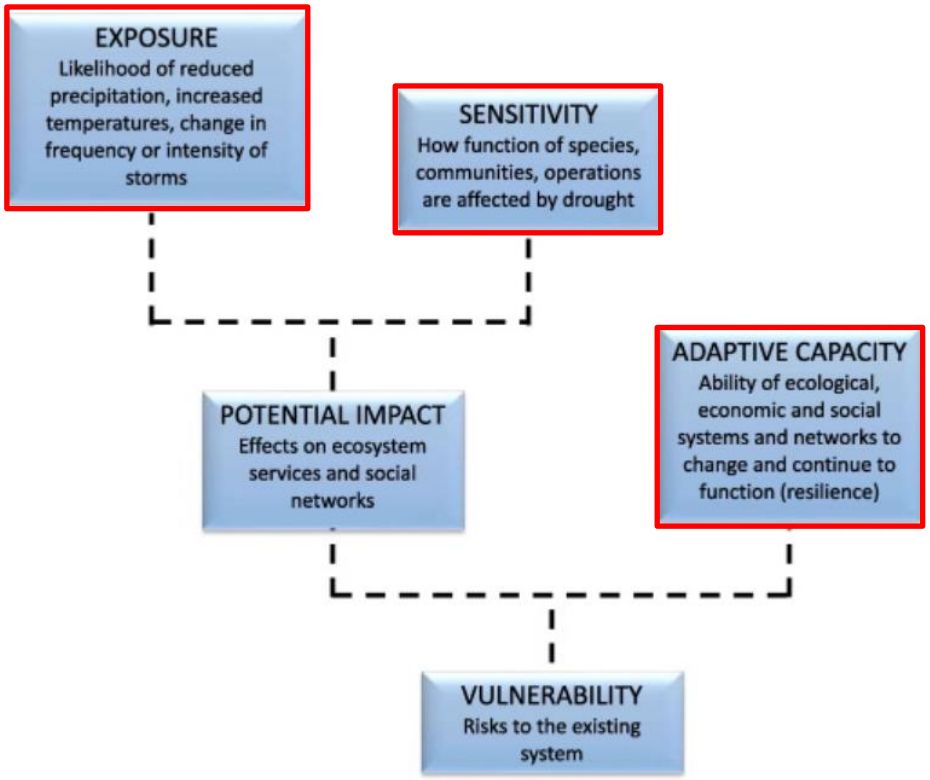


Year Range Selection Tool

Vulnerability Analysis Result

Exposure, Sensitivity, Impact, Vulnerability

Vulnerability: The quality or state of being exposed to the possibility of being attacked or harmed, either physically or emotionally.



(www.sciencedirect.com)

Components	Case I	Case II
Exposure	100 mm/d	800 mm/d

Components	Case I	Case II
Exposure	800 mm/d	800 mm/d
Sensitivity	10 million citizens	60 thousand citizens

Components	Case I	Case II
Exposure	800 mm/d	800 mm/d
Sensitivity	10 million citizens	10 million citizens
Adaptive Capacity	Lots of money & experts	No money & experts

Thank You!