Hands-on Statistical Downscaling Training (III)

Jaepil Cho

2017/10/18
Overview

1. Raw GCM analysis for excluding worst 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

4. Estimating multi-model ensemble (MME) mean and providing uncertainty ranges according to number of GCMs

Selection of GCMs

Selection of downscaling technique

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

30-year average prcp (mm)

10-days
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)

![Graphs showing uncertainty range covered according to the number of selected GCMs for different scenarios.](image-url)
Annual changes (not included)
Monthly change (not included)
Web-based service

1. Sharing adaptation related information
2. Providing climate exposure related information

Upload local observed data
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

Right Panel:
Shows the project related information

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

Vulnerability Analysis:
Provides vulnerability analysis details and related information

Year Range Selection Tool

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

---

**Components**

<table>
<thead>
<tr>
<th>Components</th>
<th>Case I</th>
<th>Case II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure</td>
<td>100 mm/d</td>
<td>800 mm/d</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>800 mm/d</td>
<td>800 mm/d</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>10 million citizens</td>
<td>60 thousand citizens</td>
</tr>
<tr>
<td>Adaptive Capacity</td>
<td>Lots of money &amp; experts</td>
<td>No money &amp; experts</td>
</tr>
</tbody>
</table>

(www.sciencedirect.com)
Thank You!