**Basin-wide Impacts of Climate Change on Ecosystem Services in the Lower Mekong Basin**

**Ecological Research**

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## EMS1: Pattern downscaling technique

The steps of the pattern scaling technique used by SimCLIM to simulate the three selected GCMs for the LMB is summarized as follows:

***Step 1: Define the 'master pattern'***

This step maximizes signal-to-noise ratio, which is achieved by using model projections that are forced with the greatest (most extreme) emissions scenario. The amount of change, relative to a baseline (1986-2005), can then be calculated for temperature and precipitation for each model grid cell (minimum, maximum, and mean). This is the 'master pattern'.

***Step 2: Normalize the master pattern***

The master pattern is normalized by dividing the value in each grid cell, for each GCM scenario and climate variable, by the mean global (or hemispheric) value. This global mean is derived from the climate model MAGICC (Model for the Assessment of Greenhouse Gas Induced Climate Change).

***Step 3: Obtain scalars***

Scalars are also obtained from the climate model MAGICC. Scalars provide a mean global or hemispheric estimate of future temperature and precipitation change for the selected emissions scenarios and climate sensitivities.

***Step 4: Scale the normalized master pattern***

Each normalized master pattern from Step 2 is multiplied by the scalar obtained in Step 3. This generates the final change factor for a particular grid cell and climate variable.

Source: CCAI (2015)