

*The 8th Meeting of the GEOSS/AWCI International Coordination Group and*
*The 1st Climate Change Assessment and Adaptation Workshop*

# *AWCI Activity Reports on Climate Change Working Group*

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**Deg - Hyo Bae (dhbae@sejong.ac.kr)**
**Mafizur Rahman (mafizur@gmail.com)**

# Review of CC Working Group Activities

- **2nd GEOSS/AWCI ICG & 1st AWCI/APN Joint Workshop (Tokyo, April 2008)**
  - Introduced climate change impact assessments & adaptation strategies on Korean water resources
- **3rd GEOSS/AWCI ICG Meeting & 4th APHW-AWCI Symposium (Beijing, Nov. 2008)**
  - Introduced climate change impact assessment on water resources over the AWCI Korean demonstration basin
- **5th Meeting of the GEOSS/AWCI ICG (Tokyo, Dec. 2009)**
  - Issued the importance of local hydrologic data for global climate change on water resources
- **6th Meeting of the GEOSS/AWCI ICG (Bali, Mar. 2010)**
  - Proposed activities focusing on CC impact assessment in flood and drought problems

## Program of the AWCI training course for the Climate Change (Tokyo, 2011)

- Overview of Climate Change Impact Assessment on Water
  - General approaches for climate change impact assessment
  - Uncertainties of climate change impact assessment
  - MME-based climate change impact assessment
- Hydrologic Modeling
  - Review of Hydrologic Model
  - Proposed Hydrologic models for CC Study
  - Hydrologic Impact Assessment Process
- Case Study : SURR Model
  - Outline of model Case Study
  - Description of Input/Output Files
  - Sample Application of SURR Model


# Progress Report on APN Project

## Title of project

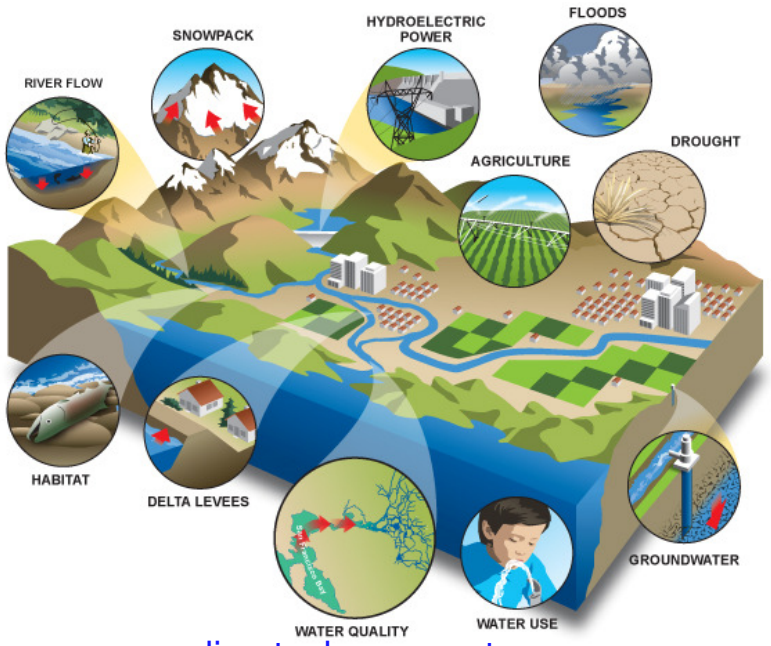
- Climate change impact assessment on the Asia-Pacific water resources under GEOSS/AWCI

## Project period

- 2010.10.15 - 2012.10.14 (2 years)

## Motivations of this study

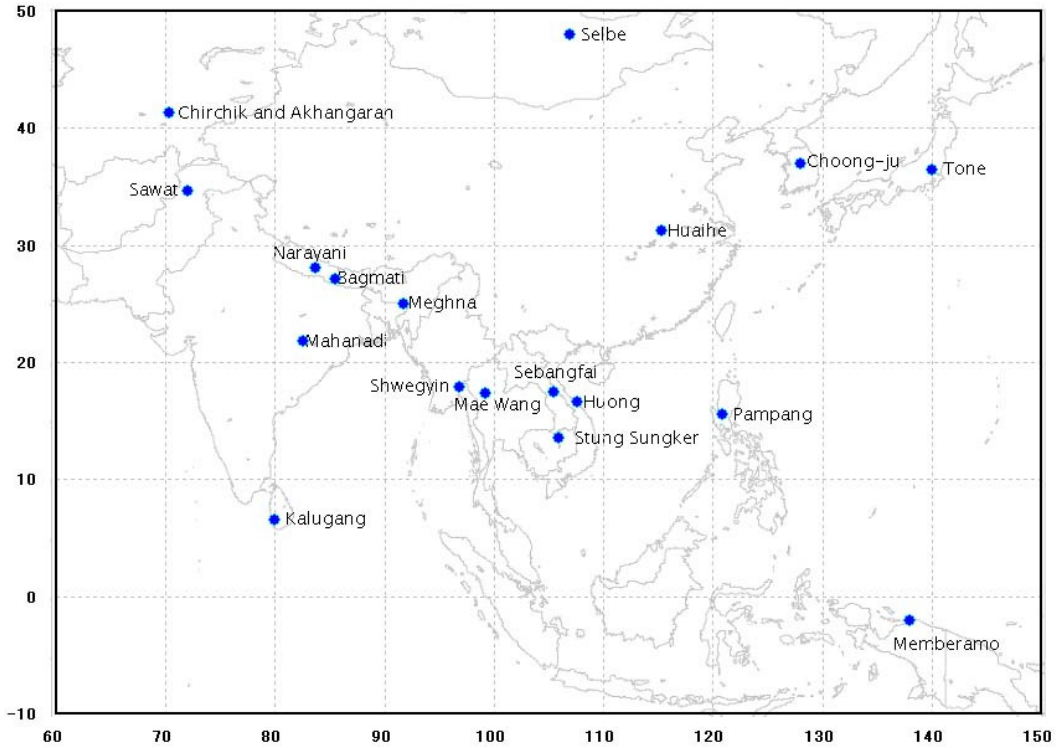
- Asia monsoon plays an important role on global water cycle
  - Provides substantial rainfall and water resources
  - Provides many benefits, but causes serious water-related disasters
- Various reasons for the disasters, but the current climate change makes difficult to manage them




www.climatechange.water.ca.gov

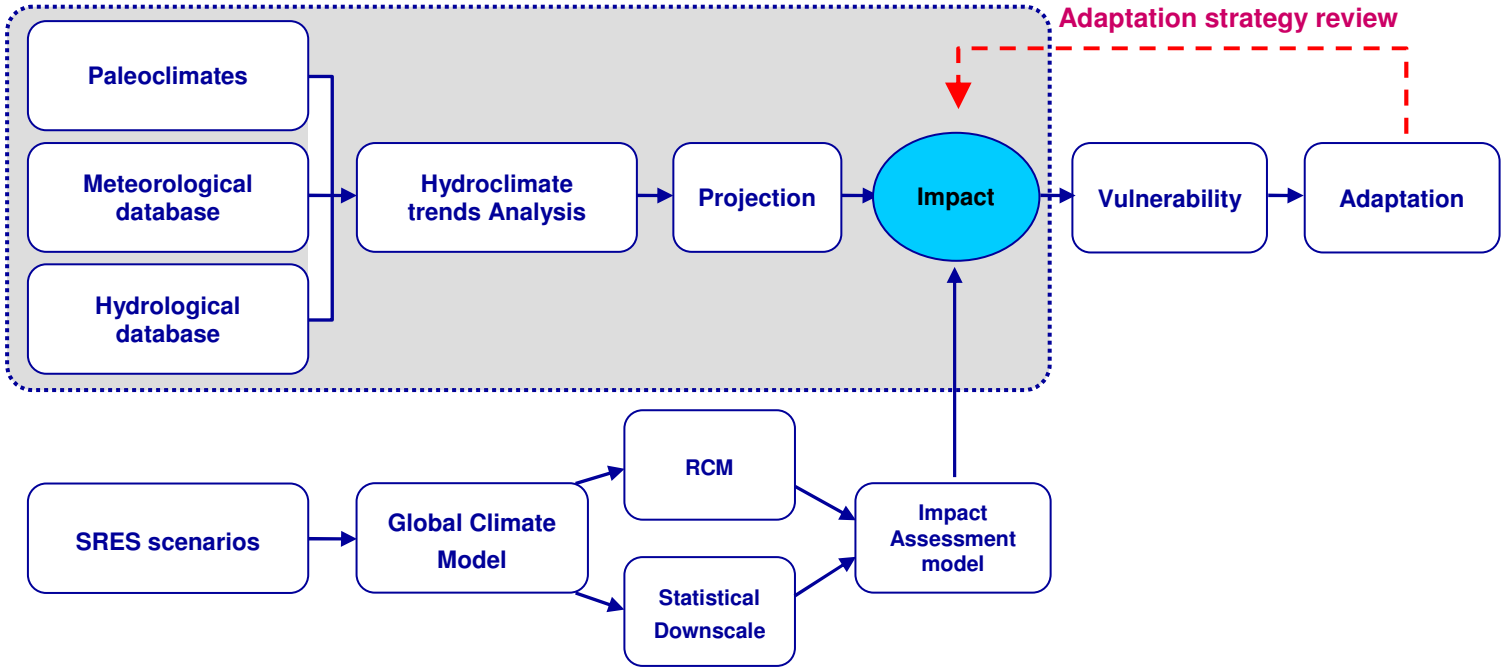
# The objectives

- **To evaluate the climate change impact assessments on water resources over the Asia-pacific regions joining GEOSS/AWCI**
- **To promote the capacity building for climate change impact assessment technology**



# Approaching methods

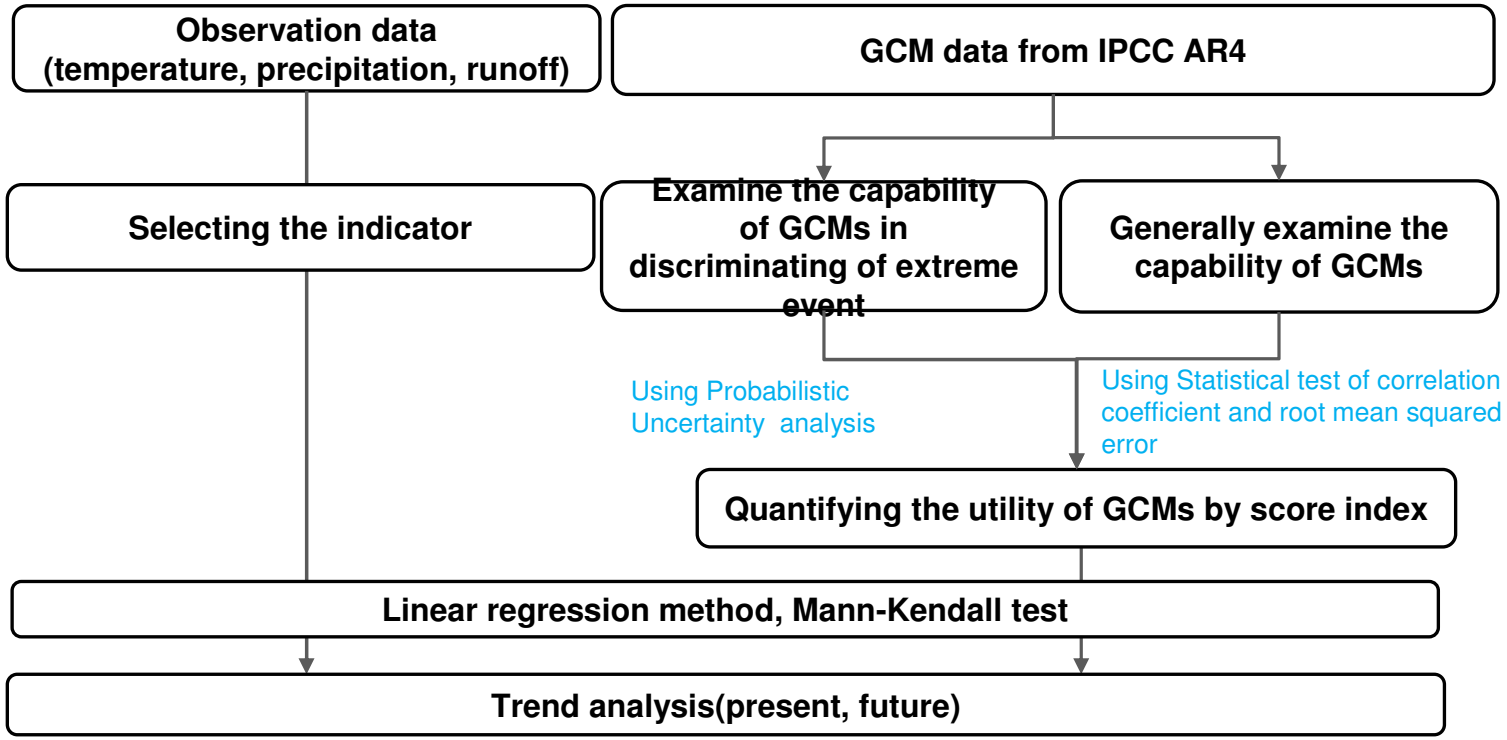
- The analysis of past historical hydrologic and meteorological observation data to detect some climate change trends (1st year Project )
- The use of GCM outputs with downscaling and hydrologic models under the future greenhouse gas emission scenarios (2nd year Project)




General procedure for CC impact and vulnerability assessment on water resources

## Tasks for the First Year (2010-2011)

- **Analyze the past historical observation data to detect some climate change trends over GEOSS/AWCI**
- **Use Linear regression method, Mann-Kendall Test, Moran's I Spatial Autocorrelation method**




**Evaluating the utility of IPCC AR4 GCMs**

## Trend analysis

- **Linear regression method were used to characterize the existence of a linear trend**
- **Mann-Kendall test is a non-parametric test for detecting trends in time series data**

$$S = \sum_{i=1}^{n-1} \sum_{k=i+1}^{n} \mathrm{sgn}(x_k - x_i)$$

$$Var(S) = \frac{n(n-1)(2n+5) - \sum_{i=1}^{m} e_i(e_i-1)(2e_i+5)}{18}$$

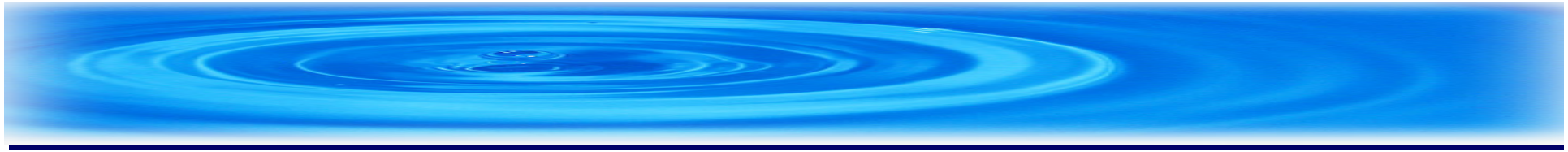
$$Z_c = \frac{S-1}{\sqrt{\mathrm{var}(S)}} \quad S > 0$$

$$Z_c = 0 \quad S = 0$$

$$Z_c = \frac{S+1}{\sqrt{\mathrm{var}(S)}} \quad S > 0$$

  - **If $-Z_{1-\alpha/2} \le Z_c \le Z_{1-\alpha/2}$, $Z_c$ is not statistically significant or no significant trend.**

- **Indices of temperature, precipitation and runoff**
  - **Temperature : TANU(Annual average temperature), TMON(Monthly average temperature) etc.**
  - **Precipitation : PANU(Annual precipitation), PMON(Monthly precipitation), PSEA(Seasonal precipitation), PN80(Number of days(daily precipitation ≥ 80mm) etc.**
  - **Runoff : FANU(Annual average runoff), FMON(Monthly average runoff), MXFM(Maximum daily runoff each month), MNFM(Minimum daily runoff each month) etc.**



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