Climate Change Impacts’ Studies
Methodology and Uncertainty Cascade

- Emissions
  - Concentrations
    - Radiative Forcing
      - Global Climate Models
        - Regional Details (Downscaling)
          - Impact Models (e.g. Hydrology)

Observations
Methodology

1. Domain Selection & Configuration
2. Coarse Scale GCM Boundary Conditions
3. RCM Downscaling (PRECIS)
4. Fine-Scale Climate (Baseline 1961-1990 & Future 2021-2050)
5. Calculate Delta Change Factors (DCF)
6. Precipitation, Temperature, Evapotranspiration, Runoff
Domain: The Arab Region
QUMP Ensemble

- 17 Perturbed Physics Ensemble Members
- A1B Emissions’ Scenario
- UKMet HadCM3 GCM
- Provide Time Variant Boundary Conditions for PRECIS RCM
- State-of-the-art probabilistic framework as used in UKCIP (2009)
Methodology: Why RCM?

- Higher Resolution: Better Representation of shoreline and terrain
- Physical Model: Consistent Climate Elements
Methodology: Ensemble Selection

Region 1

Region 2

Region 3
Methodology: Ensemble Selection

Region 1

precipitation (mm/mon)

Jan    Feb    Mar    Apr    May    Jun    Jul    Aug    Sep    Oct    Nov    Dec
Methodology: Ensemble Selection

Region 1

Temperature (°C)
First Set of Results

Baseline Precipitation Q0

Mean 2.07228
Max 22.5463
Min 3.77255E-6

Sep  Dec
First Set of Results

Baseline Temperature Q0

Mean 299.279
Max 313.711
Min 274.349
Next Steps

- Complete RCM runs (at least 3)
- Calculate DCFs for Precipitation, PET, AET, and Runoff
- Produce DCFs as digital maps
Future Cooperative Regional Activities

- Development of Climate Change Scenarios Digital Maps of the Arab Region
- Share produced climate change scenarios for the Arab region
- Support joint climate change impacts studies at national level