Modelling Tools

Steven Fassnacht
Watershed Science
Colorado State University

- Data Analysis
  - Trend identification
  - Projections
- Computer Models
  - Process representations
  - Data

Trend Identification
- Data Compilation
- Data Assessment – Quality Control
- Technique Selection
  - Linear / Non-Linear Trends
  - Trend Statistics
    - Mann-Kendall, Sen’s Slope

Projections
- From Trend Analysis
- Intergovernmental Panel on Climate Change (IPCC) Scenarios
- Climate Model Output
  - Ensemble Analysis

The Hydrological System

- Precipitation
- Evaporation
- Transpiration
- Surface runoff
- Infiltration
- Groundwater flow
- Streamflow (R)

Modelling Systems
Climate Models

Hydrologic Models

also Land Surface Schemes (LSSs) or Soil-Vegetative-Atmospheric Transfer Schemes (SVATs)

Groundwater Models

Hydrological Changes

• Due to
  – Climate Change
  – Land Cover / Land Use Change
  – Interaction of Climate and Land Cover Change

• Resolution
  – Space
  – Time

Hydrologic Model Schematic
Modelling Scenario: More Rain

Modelling Scenario: Warming

Requirements and Outcomes

- Understand Data and Limitations
- Understand Models
- Use Models to Simulate Possible Futures