Understanding the Impacts of Climate Change on Land and Water Use

WG – CLIMATE
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The Impacts

1. Water Supply
2. Water Demand
3. Sea Levels
4. Crop Growth
5. Other Impacts

1. Water Supply

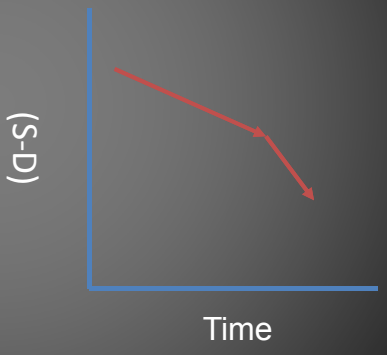
- Rainfall (often lower, more intense)
- River flow
- Reservoir storage (inflow, evaporation, sedimentation)
- Snowpack storage
- Groundwater recharge
- Floods
- (Droughts)

2. Water Demand

- Evapotranspiration
  - Temperature
  - CO_2
  - Dew point
  - Wind speed
- Evaporation (wet soil)

CC in a Dynamic Environment

- Expanding demand (population, urbanization, lifestyles)
- CC changes superimposed on existing trends



3. Sea Levels

- One meter by end of century
  - Coastal riceland innundation
  - Coastal aquifer salinization
  - Tidal bore penetration

4. Crop Growth

- Temperature impacts
- CO_2 impacts (C3, C4)
- Pests and diseases
- Soil erosion (higher rainfall intensity)

Other Impacts

- Changes in land use
- Bio-energy crops
- Energy and irrigation
- Future emission regulations on irrigated agriculture ?

Adaptation (1)

- Engineering Solutions
  - More surface storage (raise dams, new dams)
  - More GW recharge
  - More wells
  - Wastewater treatment and reuse
  - Desalination

Adaptation (2)

- Agronomic Solutions
  - Change cropping calendar
  - New crop varieties (traits, changes in response functions)
  - Different crops
  - Landscape manipulation
    - Tied furrows
    - Contour ridges
    - Terracing

Adaptation (3)

- Management Solutions (we've been here before)
  - Canal loss reduction
  - Precision water application
  - Management loss reduction
  - Long term weather forecasting
  - Water pricing
  - Water trading and sales