

IPCC Special Report

Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX)

02 - 03 May 2012, New Delhi

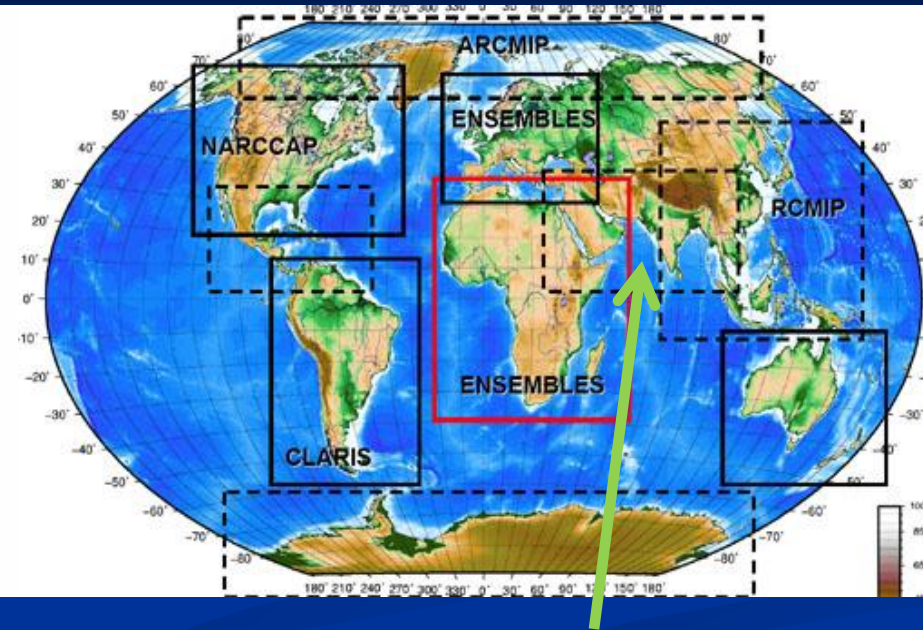
Climate Development Knowledge Network (CKDN), Intergovernmental Panel on Climate Change (IPCC), Overseas Development Institute (ODI), UK, Norwegian Climate and Pollution Agency, Norwegian Ministry of Foreign Affairs

*High resolution modeling for detection, attribution and projection of
the South Asian monsoon climate change*

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Co-ordinated Regional Downscaling Experiment (CORDEX) – South Asia



CORDEX-South Asia Planning Meeting, 25-26 February 2012, Pune, INDIA

Domain: South and West Asia

- High resolution dynamic downscaling of the South Asian regional climate and Monsoons
- High resolution is essential to model processes properly on all ranges of possible statistical outcomes, especially climate extremes and its impacts on major sectors of economy
- Multiple model ensemble simulations
- Quantify and reduce uncertainties in regional climate projections
- CORDEX – South Asia : Co-ordinated by CCCR, IITM

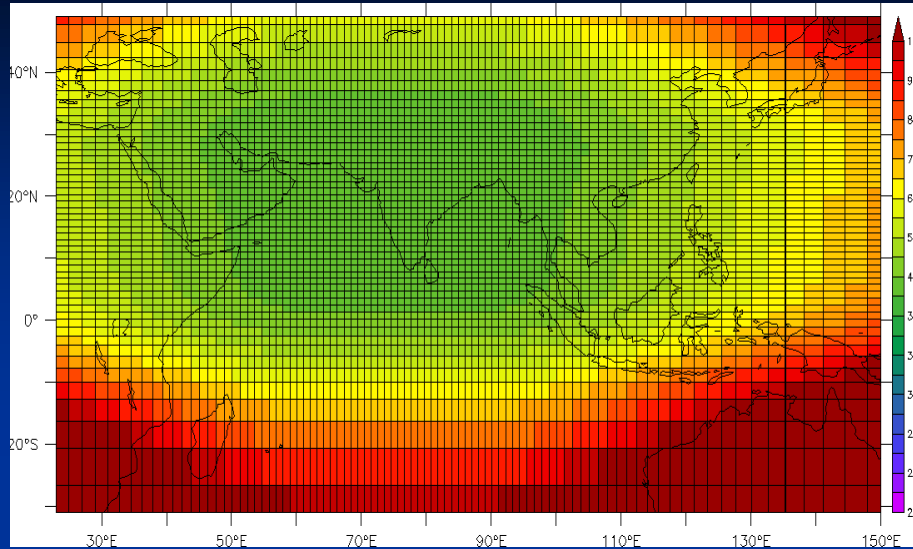
CORDEX: Model Experiments

- Evaluation / Baseline run with ERA – Interim boundary conditions (1989 – 2008)
- Historical run (1950 – 2005)
- Future projection : 2005 - 2100 (eg., RCP 4.5, 6.0, 8.5 Scenario)

Participating Modeling Groups

- LMDZ model (~ 35 km) CCCR (IITM), IPSL
- RegCM model (~ 50 km) CCCR (IITM)
- PRECIS model (~ 50 km) CCCR (IITM), Hadley Centre
- WRF model (~ 50 km) - CCCR (IITM), BCCR and TERI
- MRI model (~ 20 km) global model (MRI, Japan)
- RCA model (~ 50 km) Rossby Centre, Sweden
- REMO model (~ 50 km) Max Planck Inst, Hamburg
- CCAM model (~ 50 km) CSIRO, Australia

LMDZ: High resolution long climate simulations over South Asia



Global atmospheric model with variable resolution

Model set-up at IITM : Zooming over CORDEX South Asia ~ 35 km resolution

➤ Historical (1886– 2005):

Includes natural and anthropogenic (GHG, aerosols, land cover etc) climate forcing during (1886 – 2005) ~ 120 years. About 86 years run completed. Expected to finish by May 2012.

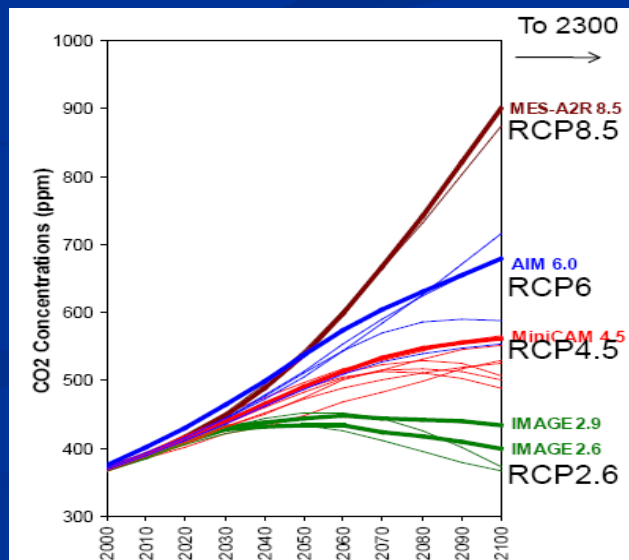
➤ Historical Natural (1886-2005):

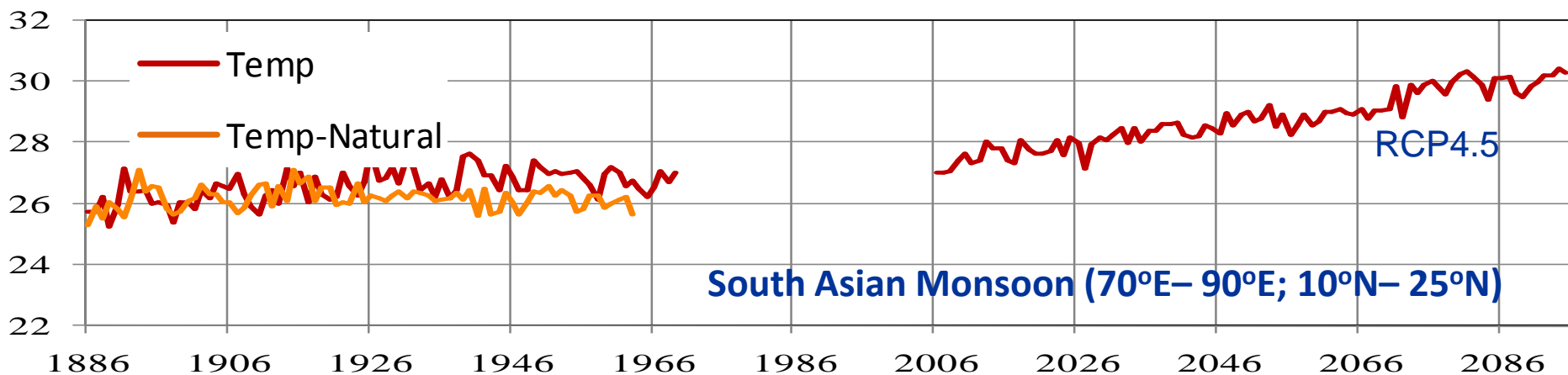
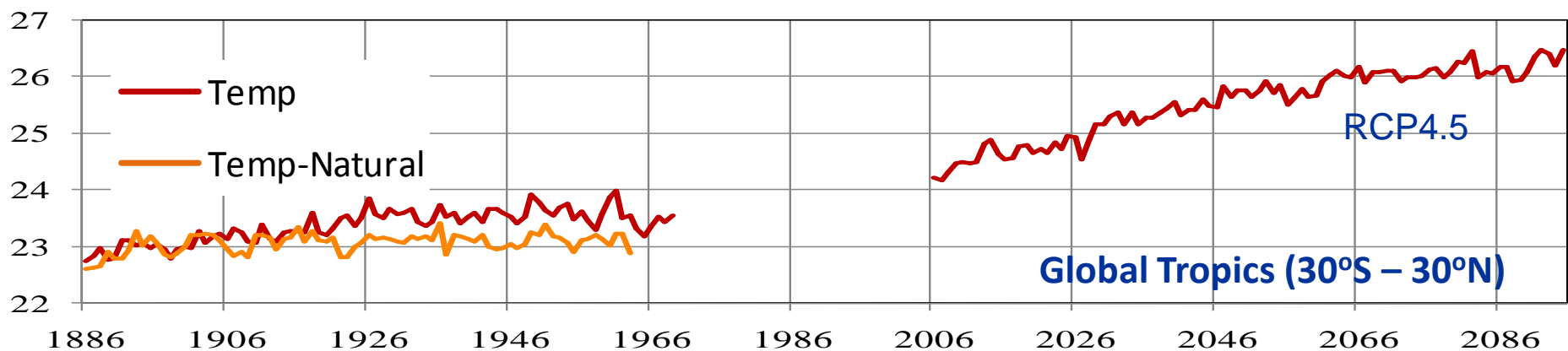
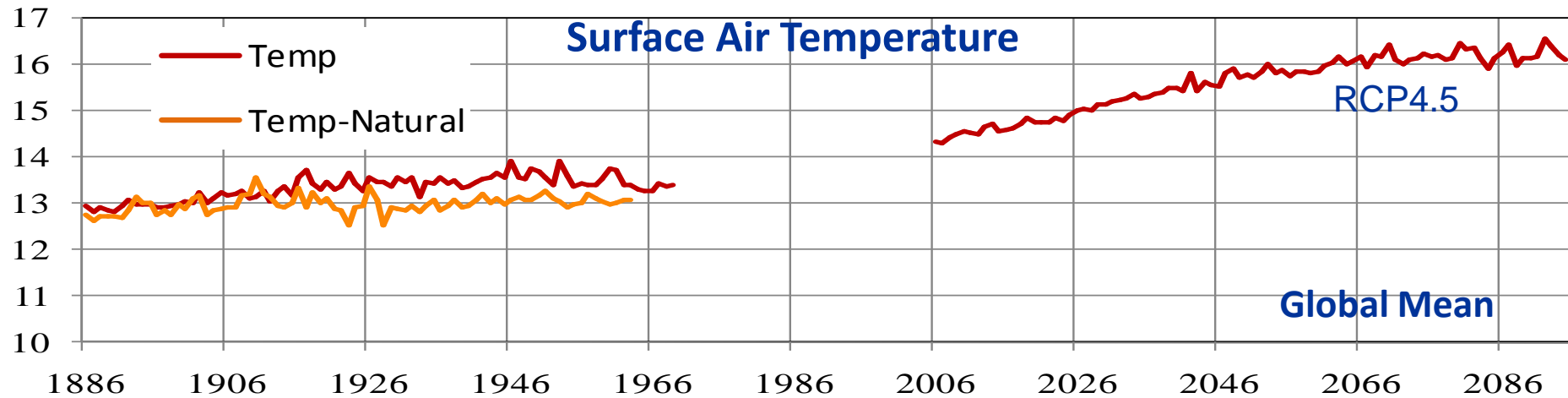
Includes only natural climate forcing during (1886– 2005) ~ 120 yrs. About 75 yrs of run completed. To finish by June 2012

➤ RCP4.5 (2006-2100):

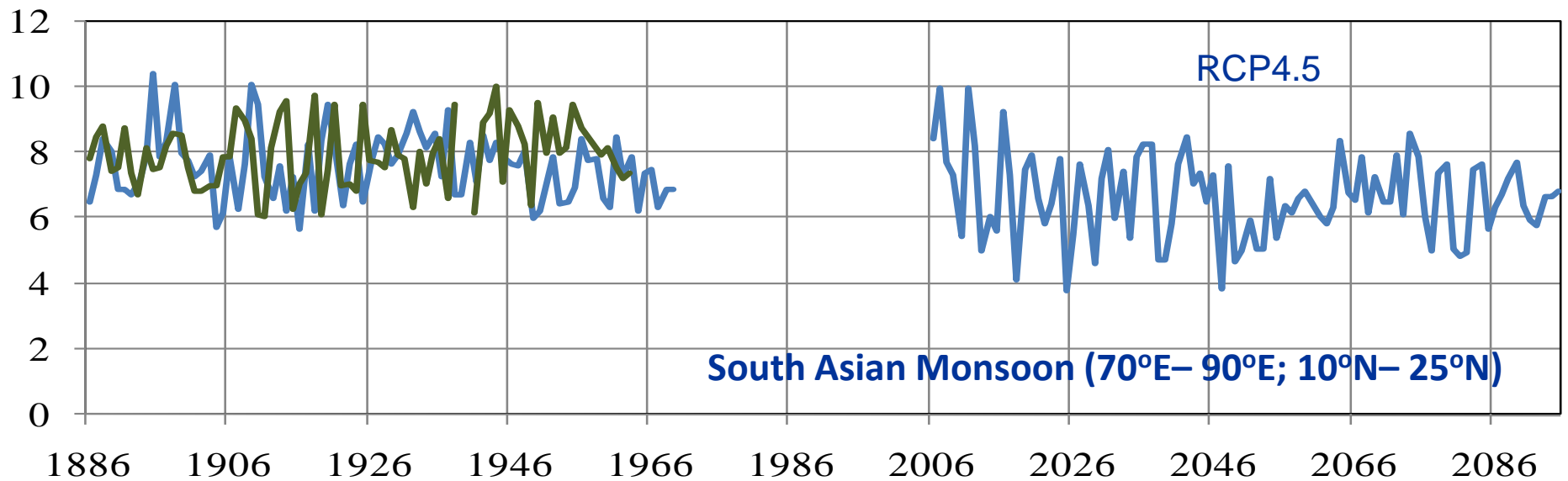
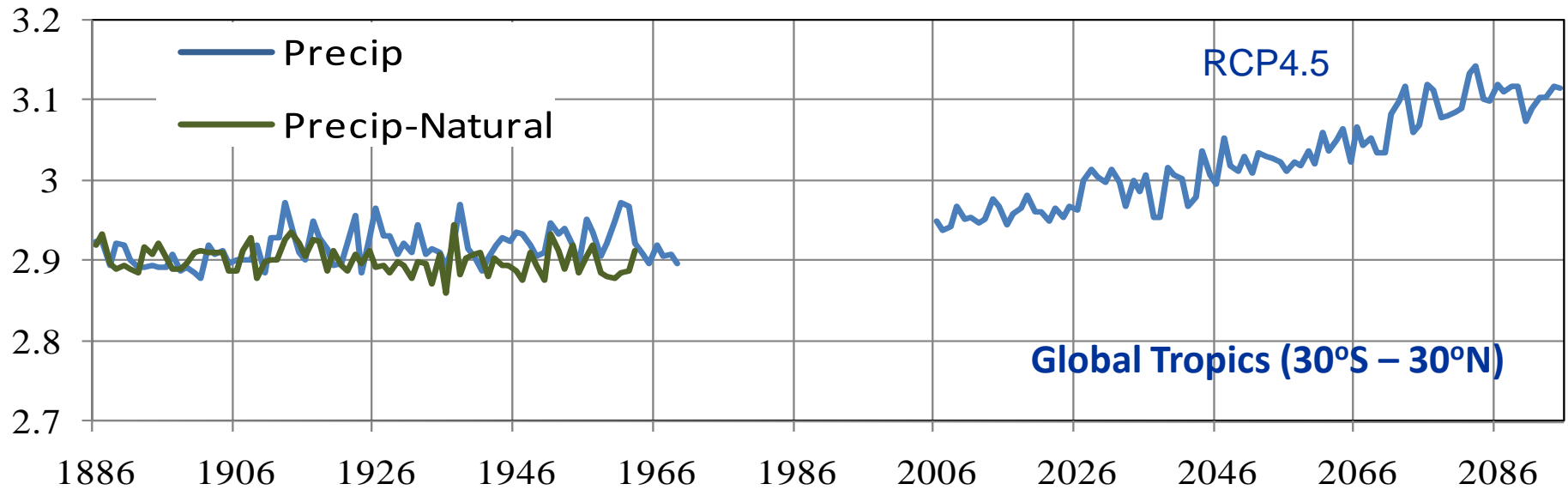
Future projection including both natural and anthropogenic forcing based on the IPCC AR5 RCP 4.5 climate scenario . The evolution of GHG and anthropogenic aerosols in RCP 4.5 scenario produces a global radiative forcing of $+4.5 \text{ W m}^{-2}$ by 2100 . Model run is completed

Evolution of CO2 concentration for different IPCC AR5 scenarios



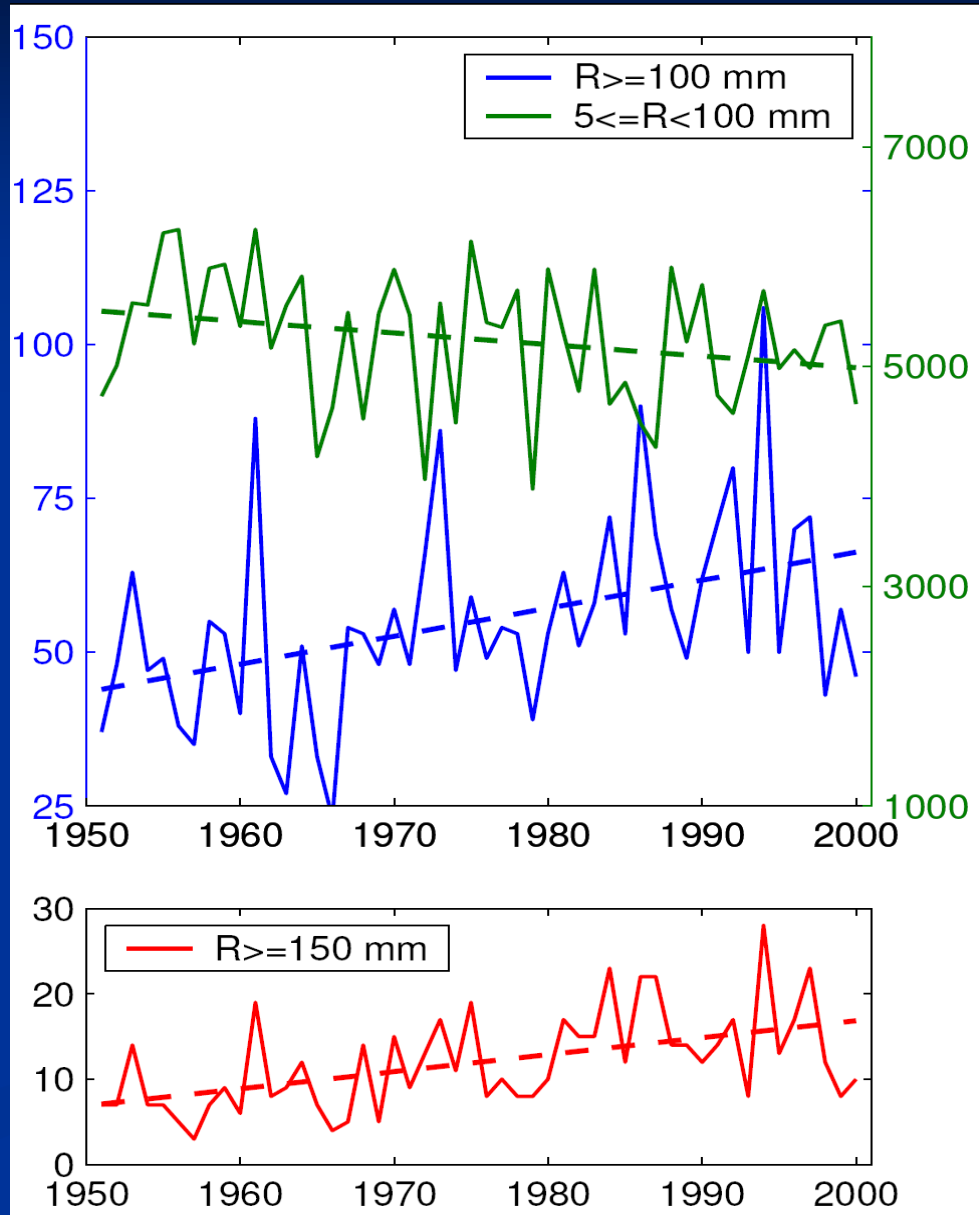
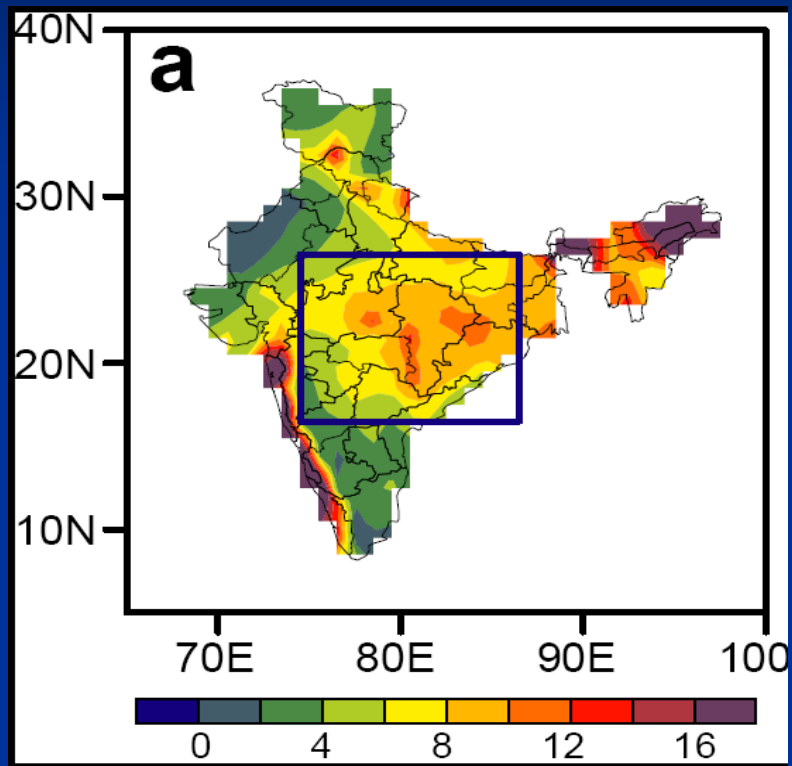


Precipitation



Time series of count over Central India

Observed trends in the monsoon Precipitation over Central India



Goswami et al., Science, 2006