WCRP CORDEX South Asia Planning Meeting

25 - 26 February 2012

Indian Institute of Tropical Meteorology (IITM), Pune, India

Panel Discussion: Follow up Plans for Implementation of CORDEX South Asia

Co-chairs: (P.V. Joseph, Ola Johannessen, R. Krishnan)

Panelists: (Akio Kitoh, Lasse Petterson, Joakim Langner, S.K. Dash, K. Krishna Kumar, K. Ashok, Michel Rixen, Christine Chan)

Coordinated strategy for resource mobilization and communication

(Expert: Bruce Hewitson, Moderator: Milind Mujumdar, Rapporteurs: Ramesh Vellore and S.S. Sabade)

Regional impact assessment

▪Regional Climate – Monsoons, Extremes (Floods, Droughts, Heat waves, etc) - IITM active role in validation, verification and diagnosis of model outputs and observations

▪ Water Resources - (IITM will collaborate with other Hydrological Research groups)

▪Agriculture – (IITM will share climate model projections with Agriculture Research groups)

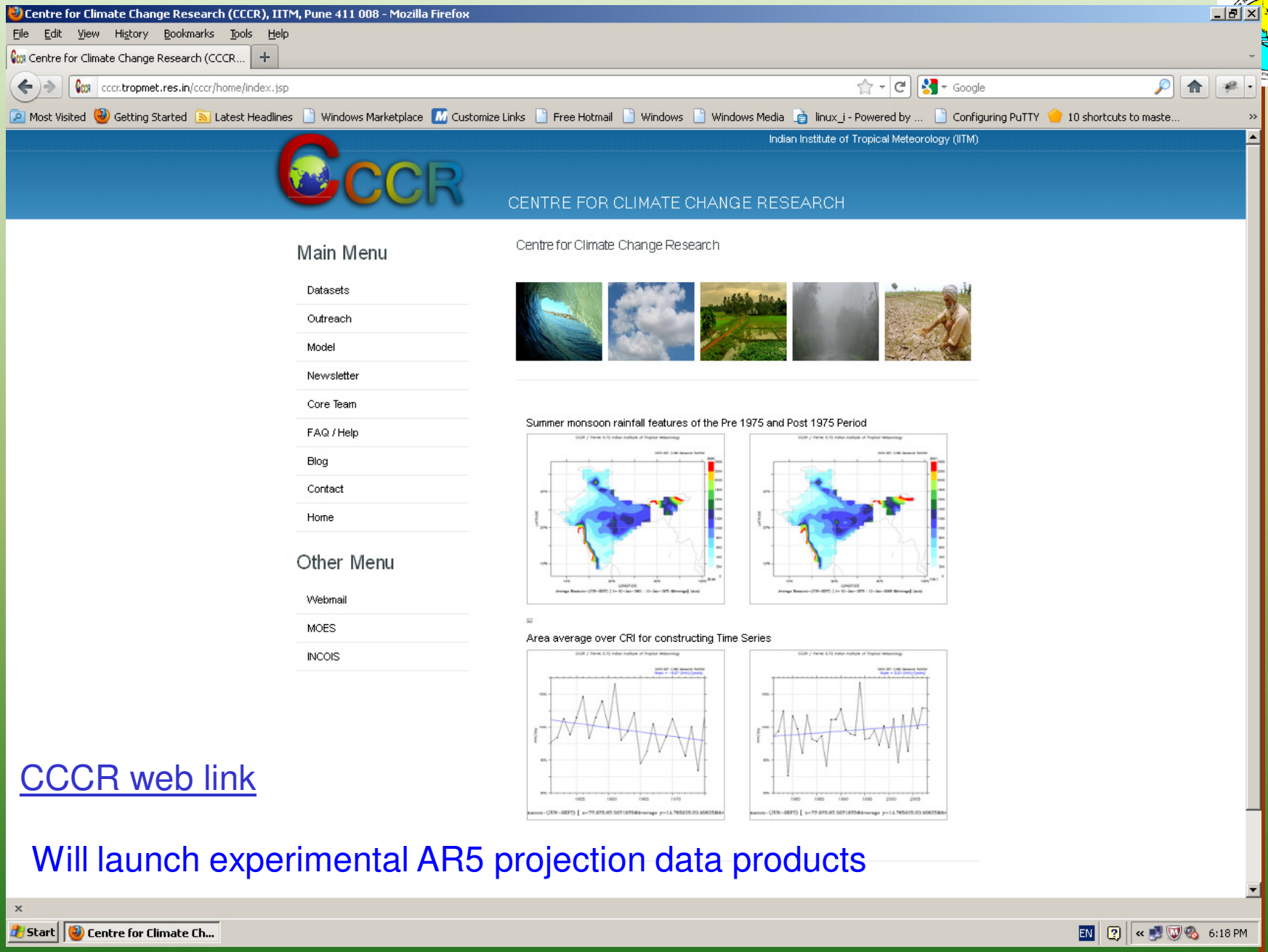
▪Health – (IITM will share climate model projections with Health Research groups)

Impact Assessment Groups:

India: (eg. IISc, IITB, IITD, NIH, CWPRS, IARI, Universities, Research Institutes etc)
Nepal:
Bhutan:
Pakistan:
Bangladesh:
Sri Lanka :
Maldives :

•Training aspects – Introduction to regional climate models, Analysis of model outputs, Application tools: GrAds, Ferret, CDO , etc IITM active role

•Climate Data Web Portal



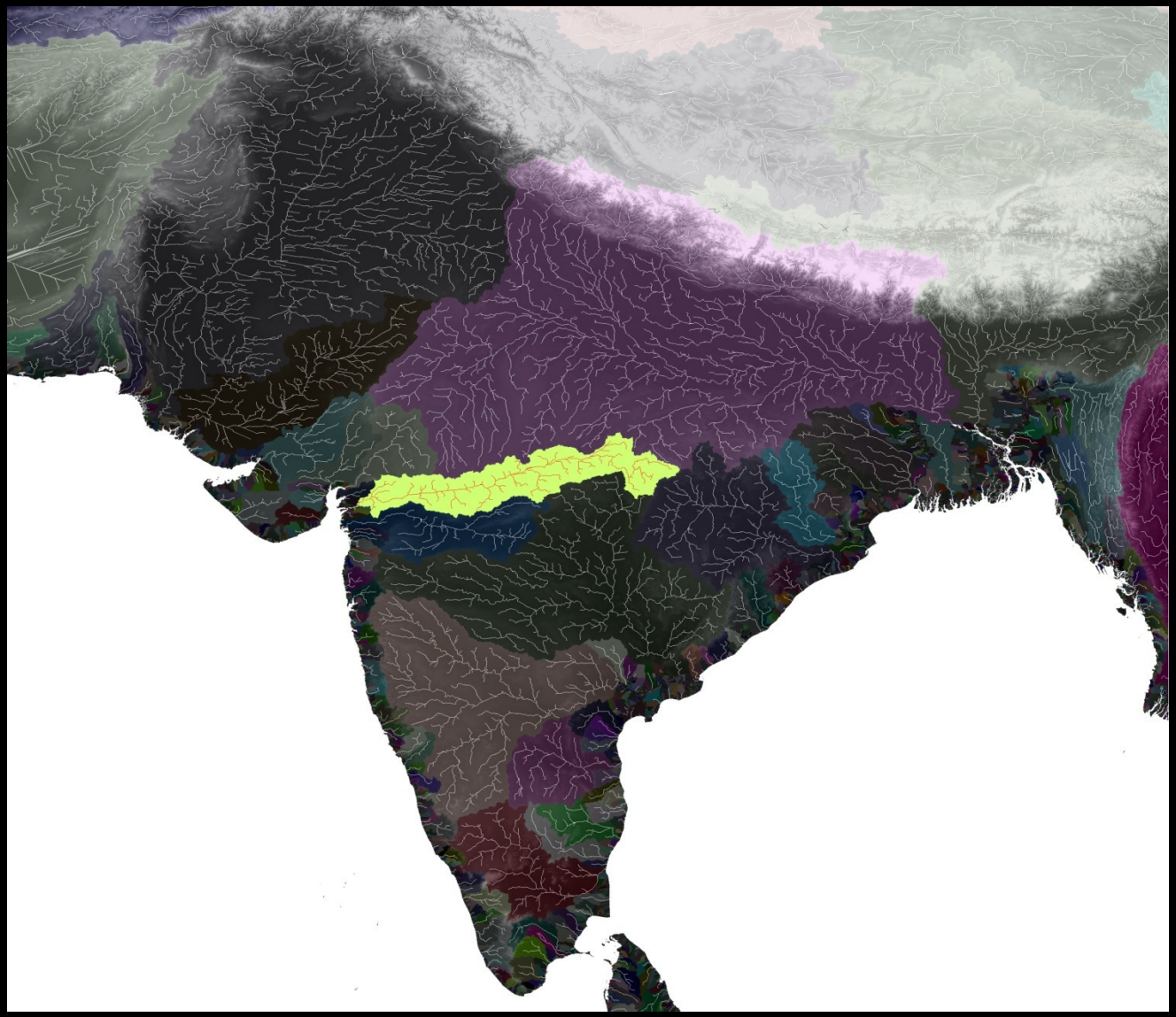
[CCCR web link]

Will launch experimental AR5 projection data products

Sandeep, Sabin, Revadekar and Mujumdar

Macroscale Hydrologic Modeling

Applications to Indian river basins



Source: Priya, CCCR, IITM

Macroscale Hydrologic Modeling

Hydrologic Impacts of Climate Change

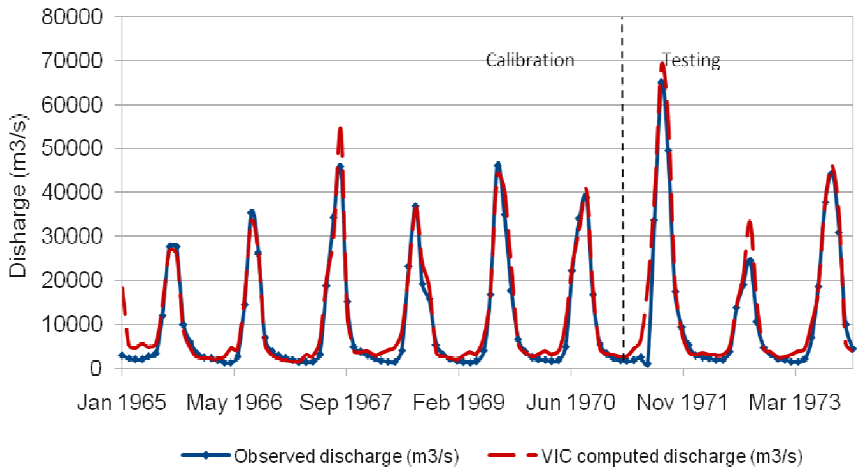
- Variable Infiltration Capacity (VIC) macroscale model (Liang et al., 1994) over Indian region
  - *Subgrid variability in land surface vegetation classes*
  - *Subgrid variability in the soil moisture storage capacity, which is represented as a spatial probability distribution*
  - *Subgrid variability in topography through the use of elevation bands*
  - *Spatial subgrid variability in precipitation*
- Simulation of water balances
- Inputs are time series of daily or sub-daily meteorological drivers (e.g. precipitation, air temperature, wind speed)
- Land-atmosphere fluxes, and the water and energy balances at the land surface, are simulated at a daily or sub-daily time step
- Daily runoff and baseflow routed using independent routing model (Lohmann et al., 1996)
- Calibration and validation of model using current meteorologic forcings and observed discharge data in three river basins (Narmada, Ganga, Krishna)

Source: Deepashree Raje

VIC-simulated and observed discharges

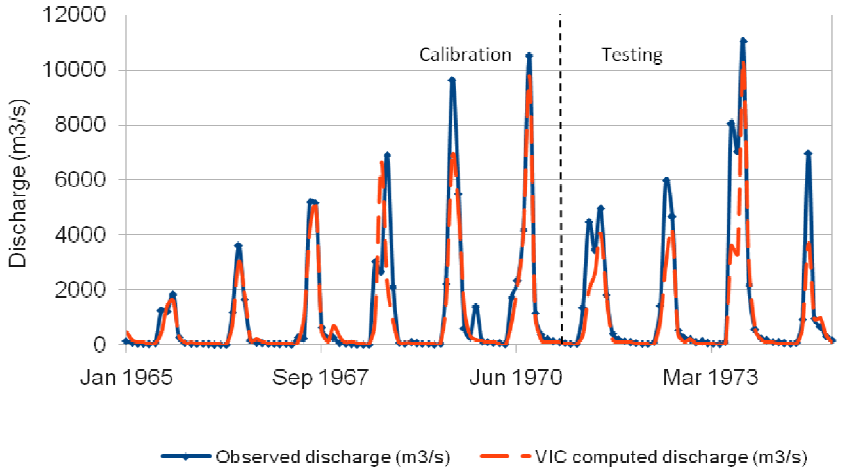
Ganga river discharge at Farakka

Ganga



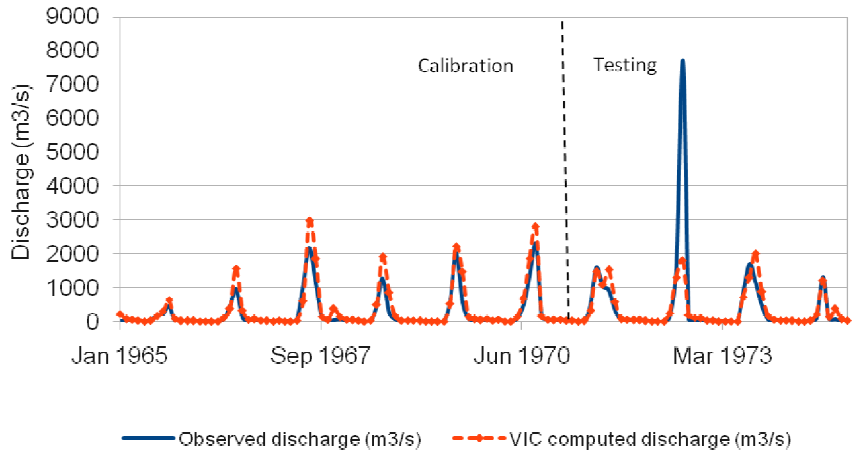
Narmada river discharge at Garudeshwar

Narmada



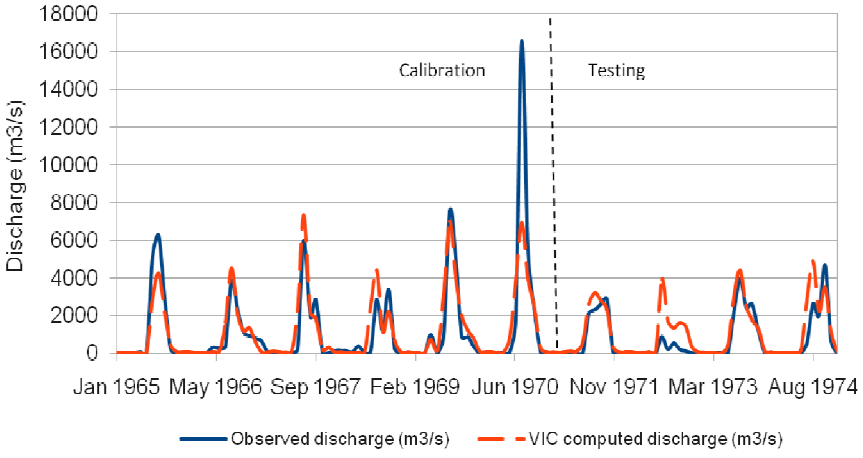
Narmada river discharge at Jamtara

Narmada

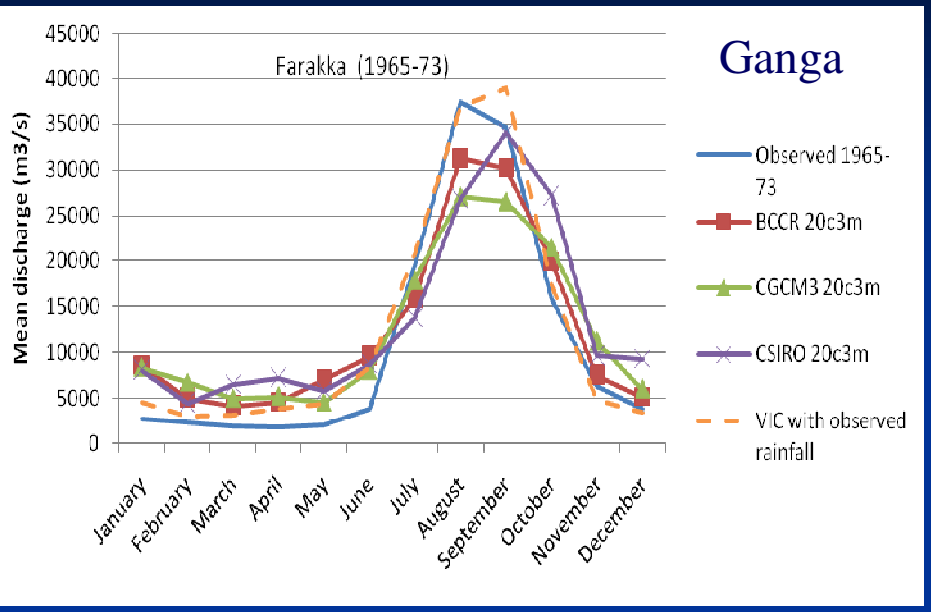


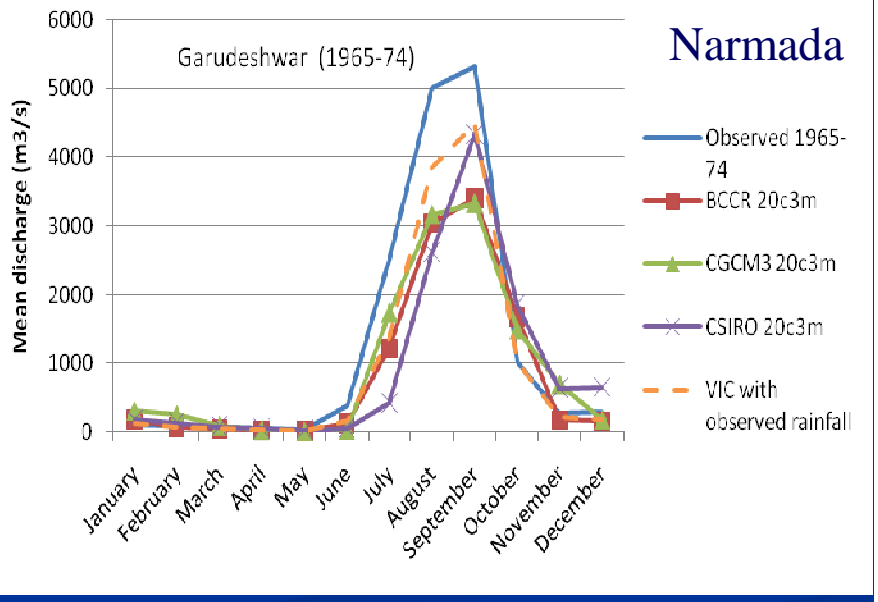
Krishna river discharge at Vijayawada

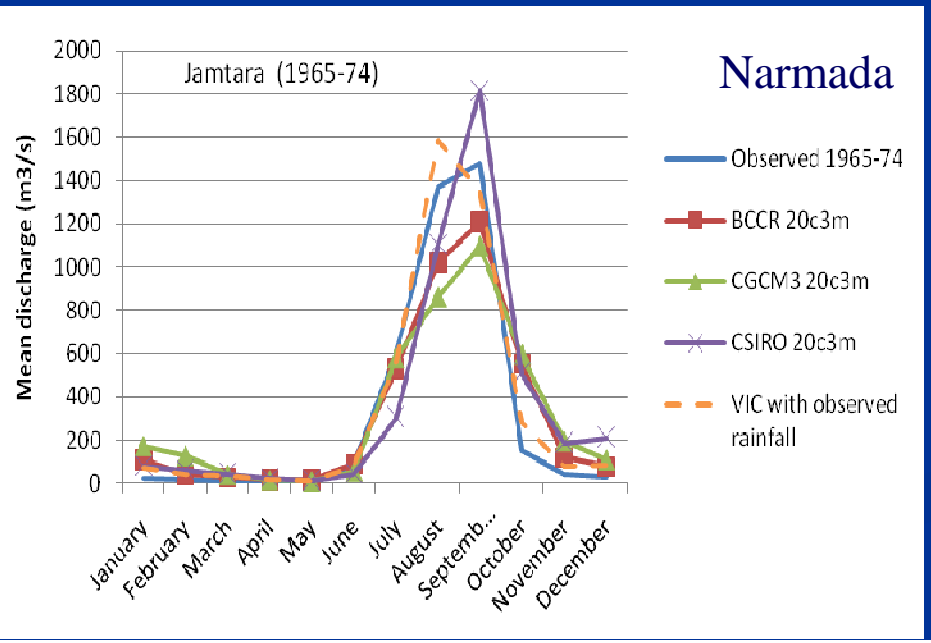
Krishna

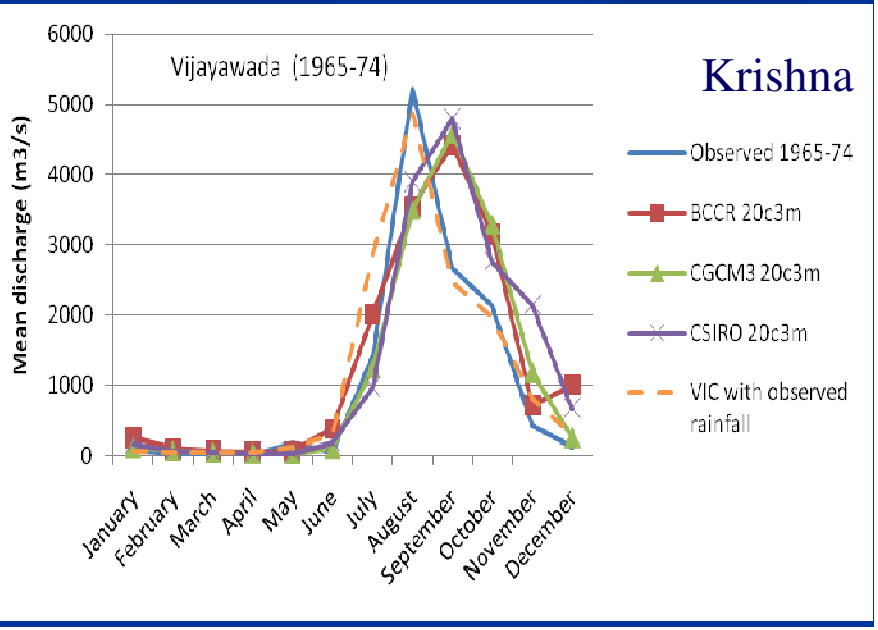


GCM performances for 20C3M: Annual hydrographs





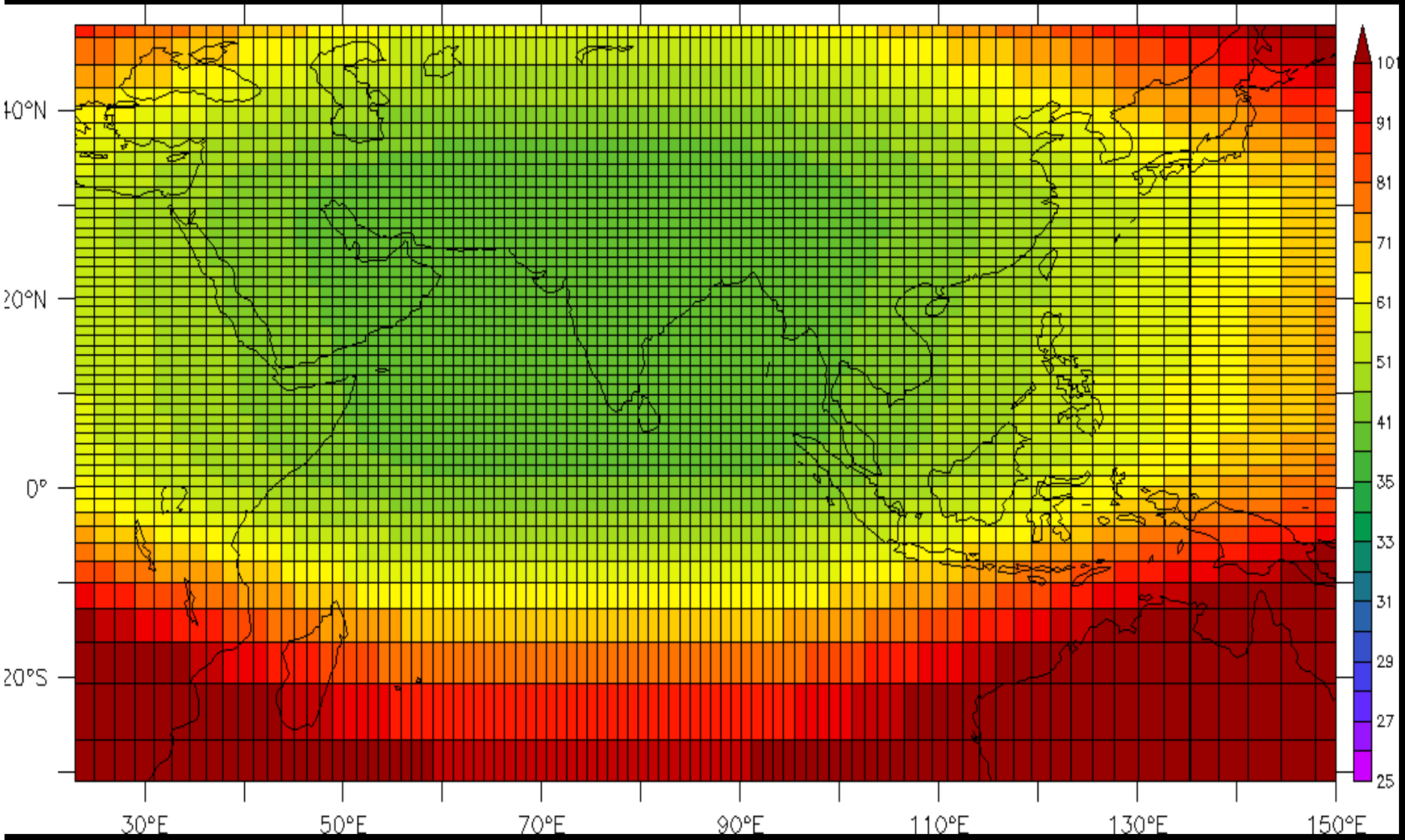


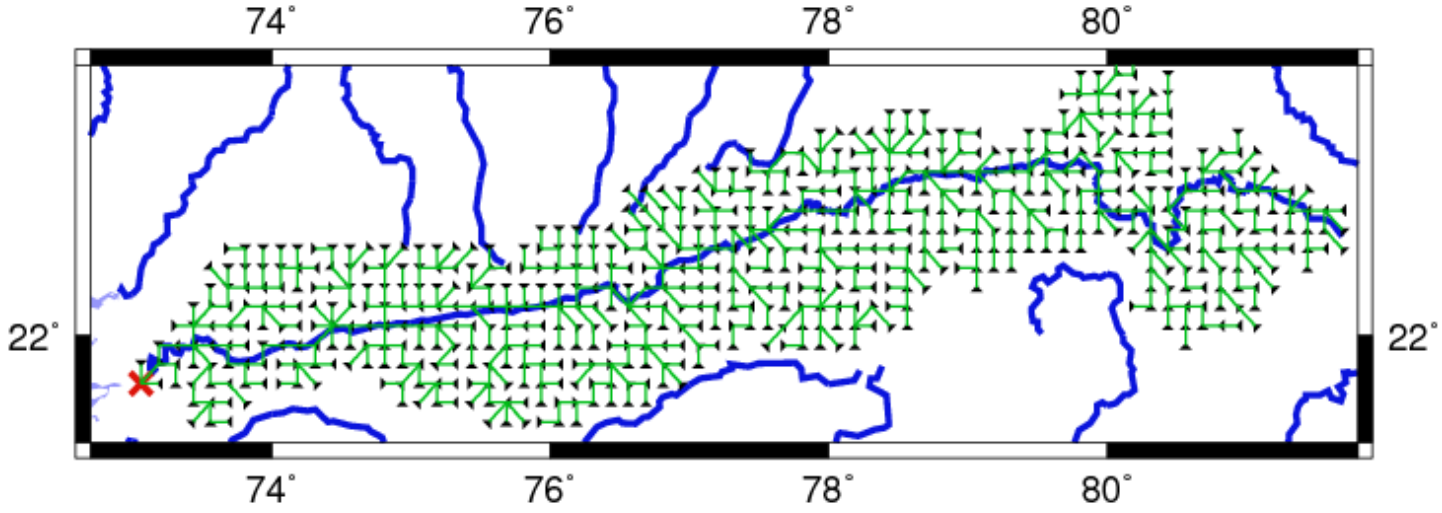


Narmada Basin River Flow

Data Used : LMDZ Historical Natural
1886 - 1915

Variable resolution configuration
(eg., LMDZ runs at IITM; 35 km zooming over South Asia)
Coarser resolution near borders




74°
76°
78°
80°
22°
22°
74°
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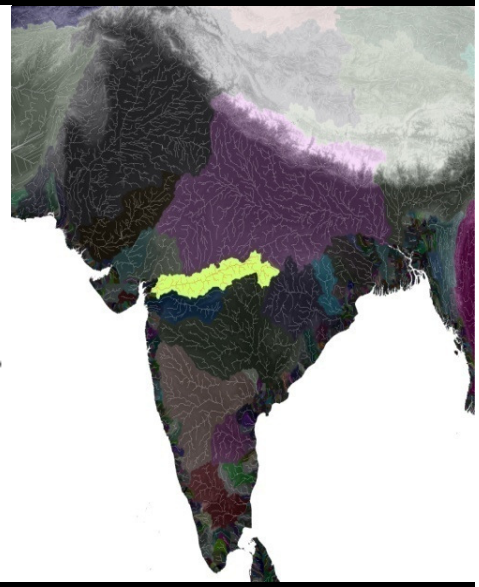

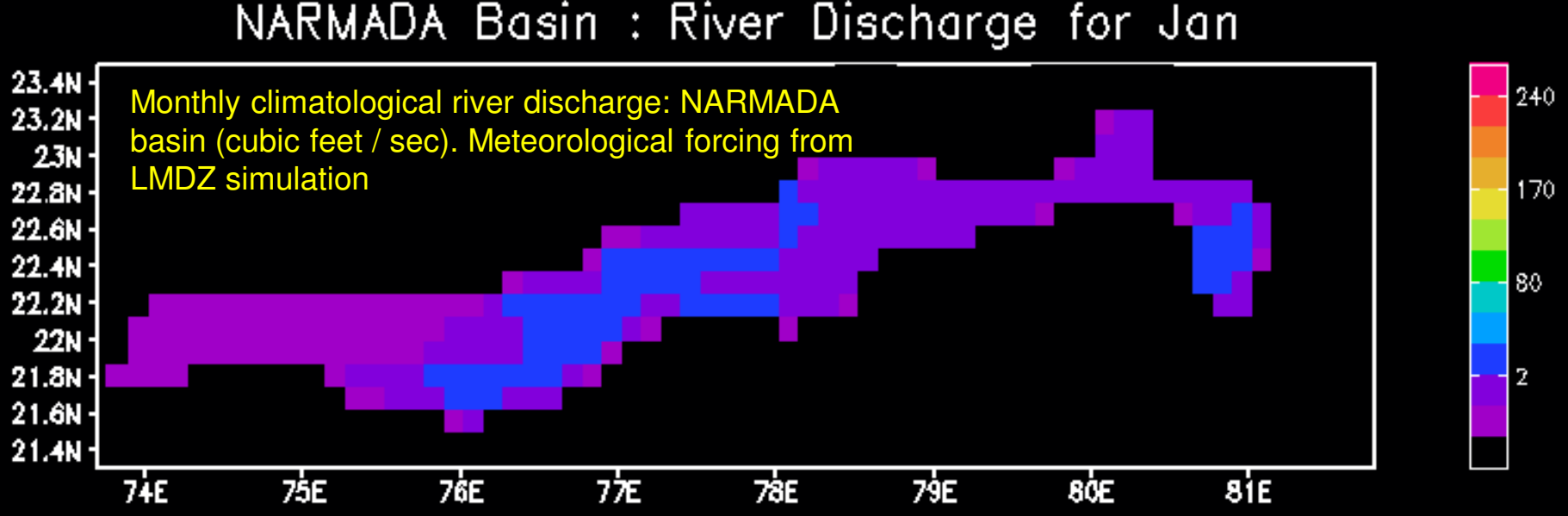
NARMADA Basin : River Discharge for Jan
Monthly climatological river discharge: NARMADA basin (cubic feet / sec). Meteorological forcing from LMDZ simulation
23.4N
23.2N
23N
22.8N
22.6N
22.4N
22.2N
22N
21.8N
21.6N
21.4N
74E
75E
76E
77E
78E
79E
80E
81E
240
170
80
2