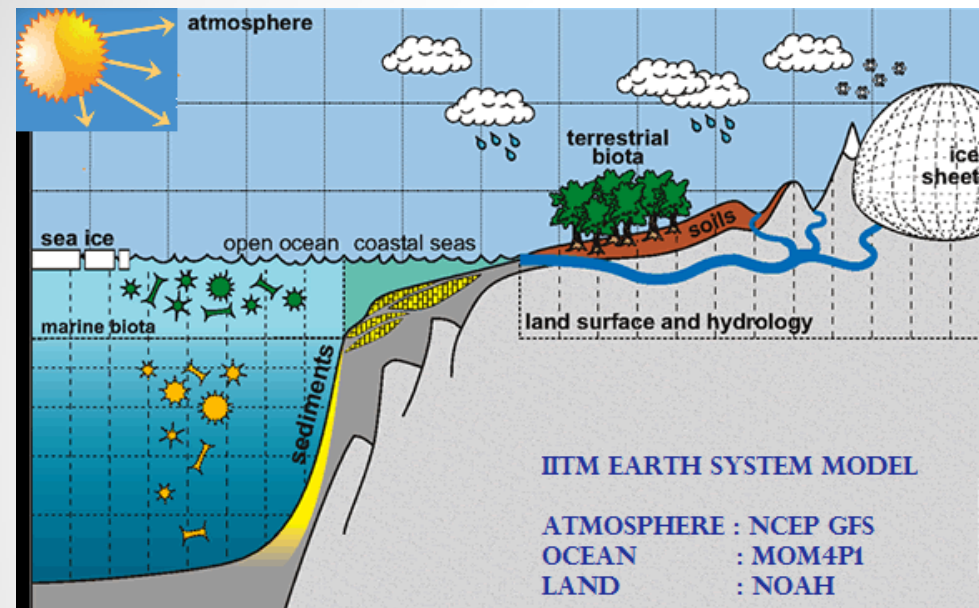


IITM-ESM Contribution to CMIP6 and Future Plans



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WGCM-24, 7-9 December 2021

IITM-ESM CMIP6 Simulations

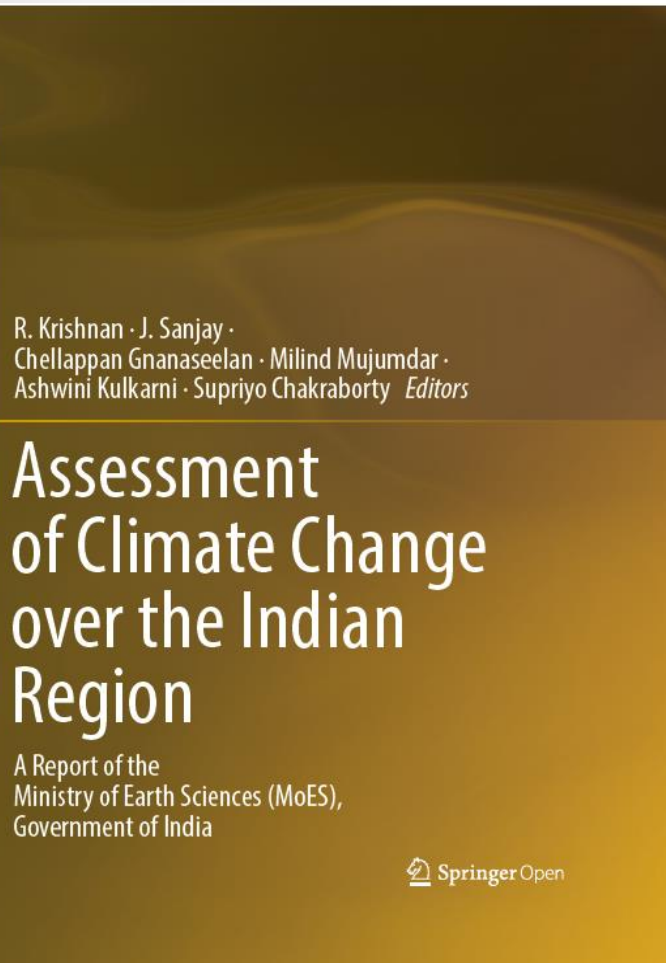
Experiments	Details of Simulation
PI-Control	Pre-industrial control simulation
Transient CO2 runs	1% /Yr increase in CO2 to quadrupling
	Abruptly Quadruple CO2 and fix
CMIP6	Historical
GMMIP & AMIP	AMIP Simulation
DAMIP	GHG only, aerosol only and hist-nat
FAFMIP	Heat and Freshwater exp
ScenarioMIP	Future projections based on scenarios

Assessment of Climate Change over the Indian Region

A Report of the Ministry of Earth Sciences (MoES)
Government of India



- Discusses the influence of human-induced global climate change over the Indian subcontinent
- Presents a synthesis of historical and future projected changes in the global and regional climate over the India subcontinent - based on scientific literature, observations, climate model projections and published IPCC reports
- Serves as a reference resource for researchers, practitioners in academia and industry, and policymakers



Model Development since CMIP6

New Dynamical
Core

CISM –Community
Ice sheet Model

MOM6

High Resolution
Modeling

2021 - 2024

2025

New Dyn.
Core

IITM-ESM -
CISM
coupling

MOM6
coupling

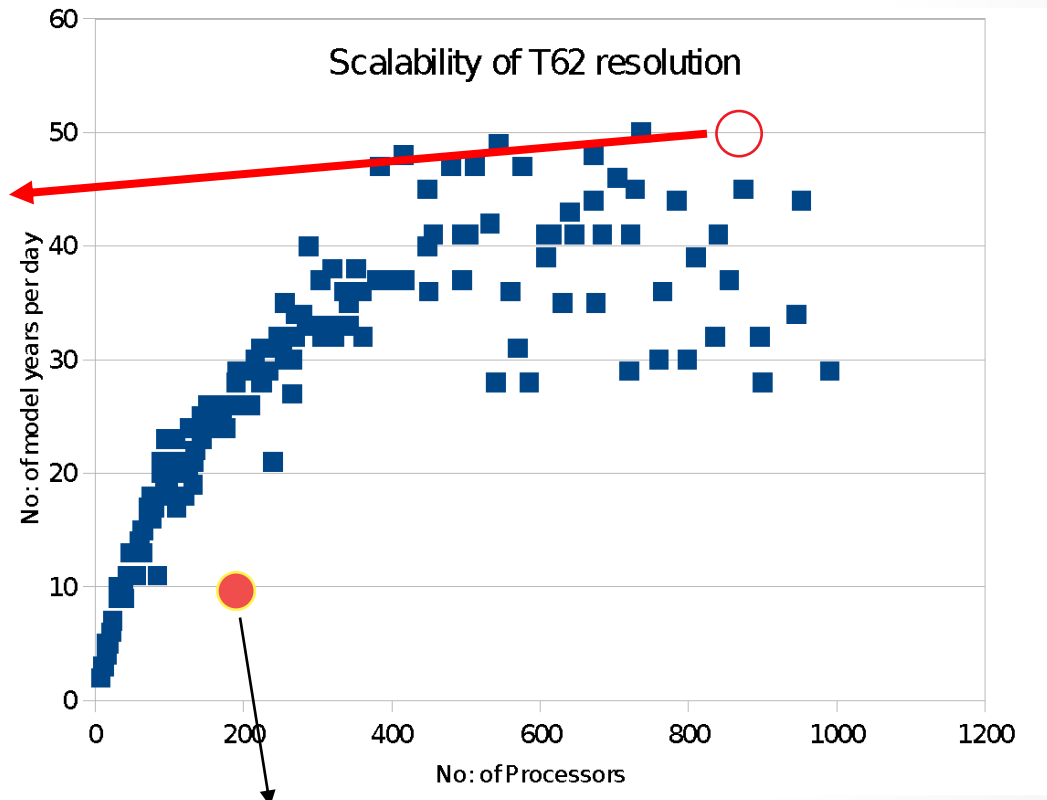
High Res.
IITM-ESM

Testing

Implementation of New Dynamical Core in IITM-ESM

- A highly scalable spectral dynamical core for IITM-ESM atmospheric model

T62 resolution with new dynamical core gives a maximum throughput of 50 model years per day

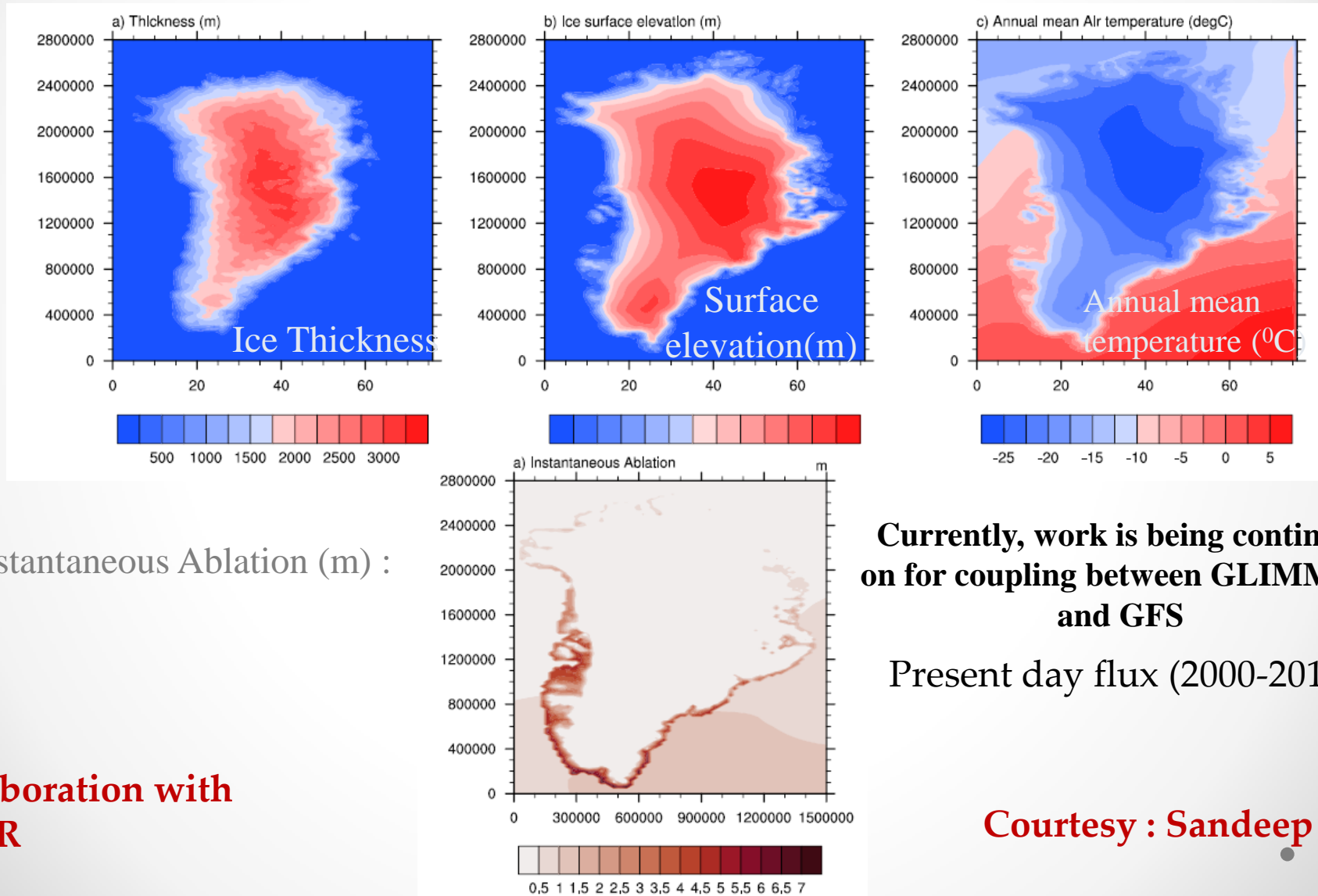


T62 resolution of current model gives a maximum throughput of 8 model years per day

Courtesy : Prajeesh

Implementation of Land-Ice model in IITM-ESM

- Preliminary results:
- Stand-alone version of CISM forced with NCEP surface fluxes.



Currently, work is being continued on for coupling between GLIMMER and GFS

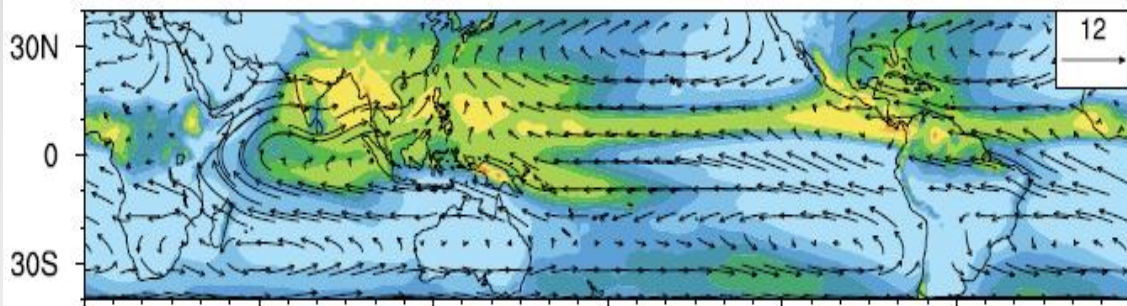
Present day flux (2000-2010)

Collaboration with
NCAR

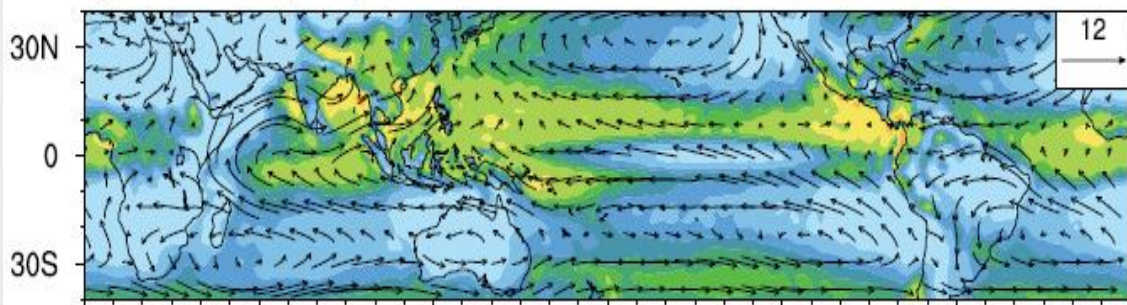
Courtesy : Sandeep

IITM-ESM : High resolution modeling (T574)

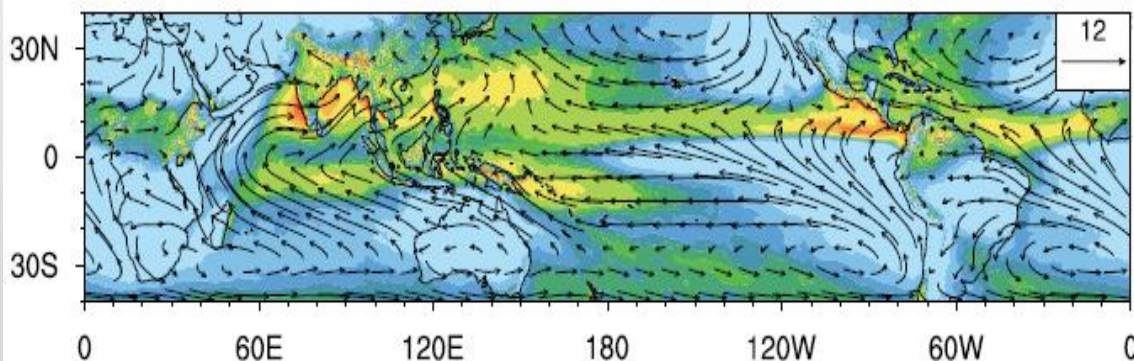
a) MERRA



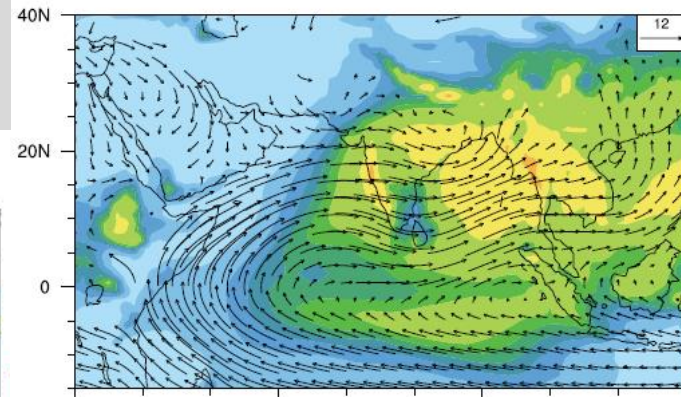
b) IITM-ESM (T62)



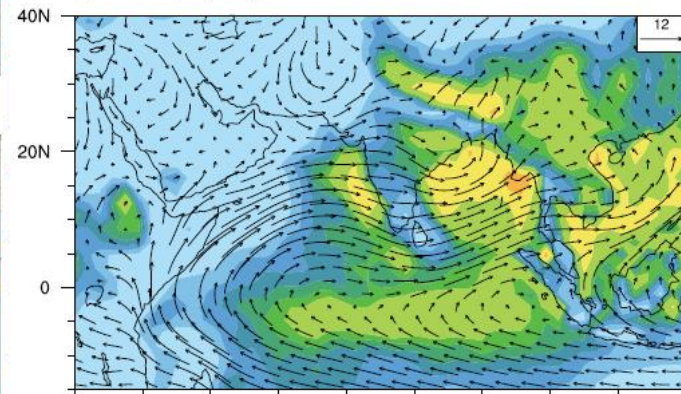
c) IITM-GFS (T574)



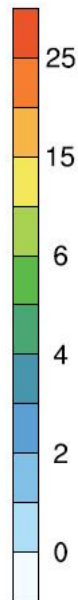
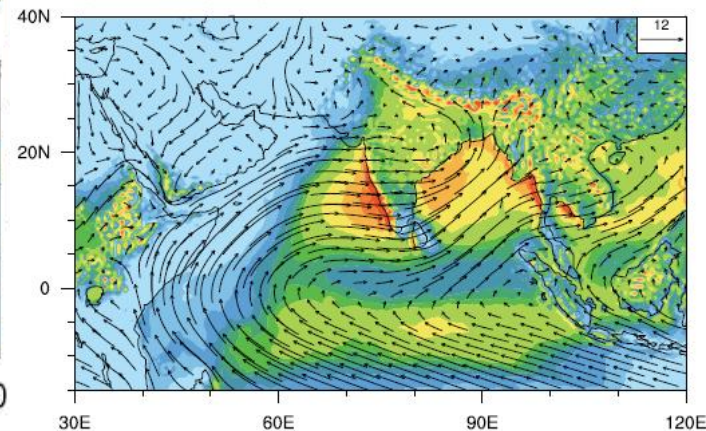
a) MERRA



b) IITM-ESM (T62)



c) IITM-GFS (T574)



New Science Directions

- **Extreme events**
- **Mean Sea Level Rise and Extreme Sea Level (ESL) events**
- **Changing Monsoon Water Cycle under Warming Climate**
- **Reducing the model biases**

Suggestions for CMIP7

- **Less data volume**
- **Prioritize the outputs variables including daily ocean variables**
- **Timelines ...**

**THANK
YOU!**