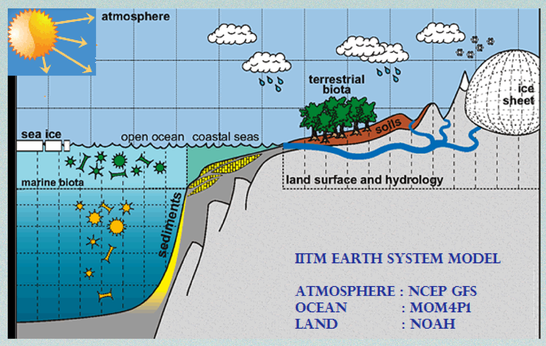
CLIMATE CHANGE IN INDIA: WHAT DO WE KNOW AND HOW?

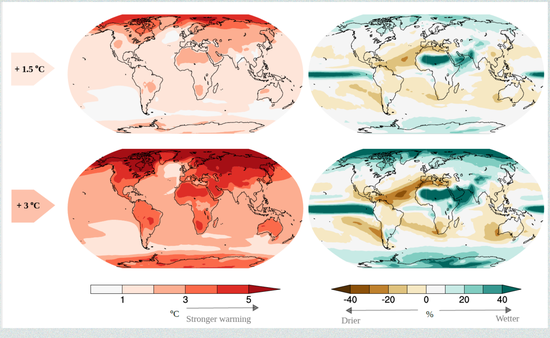
EARTH SYSTEM MODELS FOR LONG-TERM CLIMATE CHANGE PROJECTIONS

Earth System Models (ESMs) are computer models of the complex processes that influence the Earth's climate. These simulate various phenomena, including the atmosphere, ocean, land, cryosphere, biosphere as well as effects of human activities. ESMs are important tools to understand the interaction between these subsystems and to predict the variability of the Earth's climate.



At the Indian Institute of Tropical Meteorology (IITM) the Centre for Climate Change Research (CCCR) is working on an Earth System Model (IITM-ESM) to detect, attribute causes and predict global climate. This helps us understand the impacts of climate change in the Indian region. Our model is the first, and as yet only ESM to be developed in India. It is a part of international efforts that informs the Intergovernmental Panel on Climate Change Sixth Assessment Report (IPCC AR6).

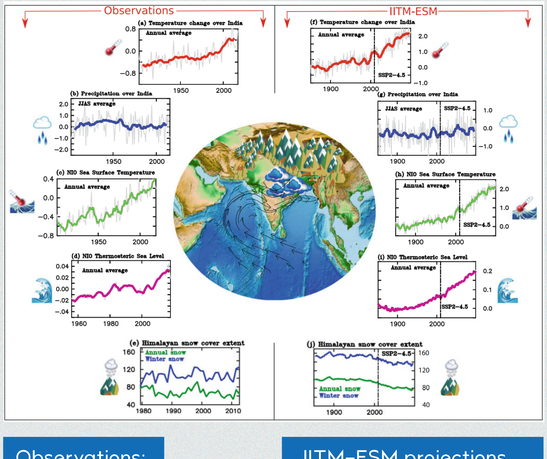
Climate change is not uniform: warming will be stronger in the Arctic, the Northern Hemisphere and on land.



IITM-ESM projections

The Indian region will receive more summer monsoon rainfall by the mid and end of the 21st century.

Based on ESMs from around the world, including the IITM-ESM, the IPCC predicts that, in the next 10 years, the average global temperature will increase to 1.5 degrees Celsius more than the pre-industrial era (1850-1900). By 2100, this projected rise in temperature in India is around 4.5 degrees Celsius for a high emission scenario and 2.7 degrees Celsius for a medium emission scenario.



Observations: changes with respect to 1976-2005

IITM-ESM projections based on the SSP2-4.5 scenario: changes with respect to 1976-2005

CONTRIBUTORS

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