

TRAINING, WORKSHOP, BRAINSTORMING, AWARENESS PROGRAMMES

- Conduct meetings of Steering Committee & Technical Advisory Committee for Monitoring of Glaciers.
- Organize Trainings, Workshops, Brainstorming on topics related to Cryosphere & Climate Change.
- Publish Bi-annual Newsletter on Glaciers.
- Prepare Spring Census of the country.
- WRF based climate downscaling and issue short-term forecasting at selected locations.
- Organize mass awareness activities related to cryosphere & climate change.

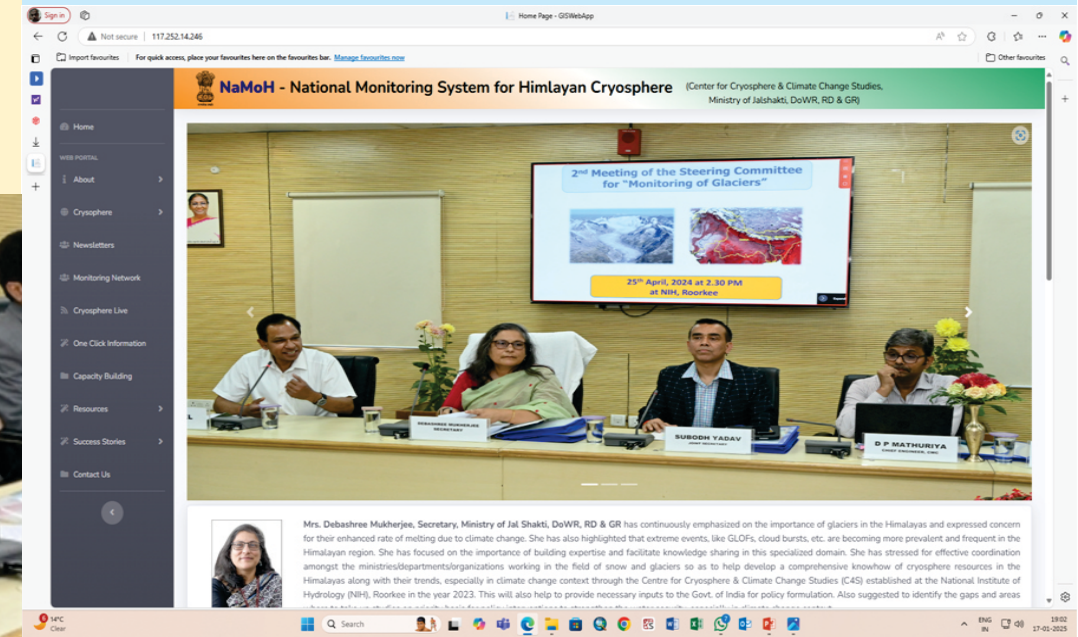


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CENTRE FOR CRYOSPHERE AND CLIMATE CHANGE STUDIES (C4S) NATIONAL INSTITUTE OF HYDROLOGY, ROORKEE

VISION
Provide Leadership in Cryosphere and climate Change Studies through Cutting Edge Research to Facilitate Water Resources Management.



The Himalayan cryosphere including snow, glaciers and permafrost are important components of the hydrology and provides water to billions of people downstream. The Indian Himalayan Region (IHR) has ~9575 glaciers. Scientific studies on Himalayan glaciers and glacial lakes are of foremost importance. Regular monitoring of glaciers and their melt characteristics in current environment of climate change is required to meet the water security in the downstream areas. Due to the global warming and climate change, many glaciers and glacial lakes are being vulnerable. The warming trends of the lower atmosphere have significantly decreased the snow depth, snowpack duration, snowmelt runoff and spring discharge over the IHR. Climate change has a wide range of impacts on water resources, affecting water availability, quality, and reliability. The frequency and intensity of extreme events and glacier-related hazards has increased. To handle and manage these issues of climate change and cryosphere, a Centre for Cryosphere and Climate Change Studies (C4S) has been established at the Institute.

Objectives

- To foster, promote and sustain a scientific culture in the snow & glacier studies including impact of climate change.
- Development of a novel framework for ensemble simulations by integrating different snow-glacio hydrological models to account the overall water balance including snow & glacier melt runoff.
- Assessment of changes in snow-glacier dynamics and their impacts on melt runoff including impact of climate change.
- To collaborate with National and International research organizations; state govt. & universities on snow and glacier research & organize workshops, awareness and trainings.
- To provide support to the users and hydro-electric projects (HEP) implementing agencies/ authorities in safe designing of projects.
- To help research groups, academia, policy makers, and general public to pioneer new approaches.



CURRENT R&D ACTIVITIES

The Centre is carrying out climate change as well as experimental studies in the Himalayan region (Gangotri Glacier, Milam Glacier, Doodhganga Glacier and Triloki Glacier) by establishing state-of-art hydrological field observatories with advanced automated instrumentation such as automatic weather station, automatic water level recorder, etc. Though the Centre is in nascent stage but is carrying out extensive works on snow and glacier contribution and impact of climate change on snow and glacier, glacial lake outburst flood and mass balance, and spring shed management. Application of various models, viz. SNOWMOD, SPHY and VIC, is being done for various hydrologic analysis using RS and GIS tools. The Centre is also participating in the National Hydrology Project (NHP), DST, IIRS, National Mission for Sustaining the Himalayan Eco-system (NMSHE) and National Mission on Himalayan Studies (NMHS) projects. Furthermore, the Centre is also extending the support as technical lead in first census of springs in India. The Centre is actively involved in developing web-based portals for water resource information.

ONGOING R&D STUDIES

- Investigation on occurrences of seasonal extremes across Northwest Himalaya in relation to global atmospheric thermal and circulation changes.
- Climate change scenarios for Andhra Pradesh and its impact on streamflow and groundwater levels in Pennar River basin.
- Glacier recurrence survey, Instrumentation and Modeling to study the Triloki Glacier in part of Western Himalaya, India.
- Monitoring and Modelling of Gangotri (Bhojwasa) watershed under different Climate Scenarios.
- Early Signatures of 21st Century on Snow Cover Dynamics in Zaskar River Basin, Ladakh.
- Comparative Analysis of Fine Scale Satellite & Reanalysis Precipitation Products in Upper Ganga Basin using Multicriterion Decision Making.
- Long term hydrological assessment for the development of water security plan into three sub-basins namely Barak, Minor rivers draining into Bangladesh and Minor rivers draining into Myanmar sub-basins in the state of Mizoram.
- System Studies for Proposed Farakka-Sundarban Link Project.

