



INARCH Closing 2026

Field Visit to Fortress Mountain Research Basin







INARCH Statement 2025

- INARCH met in Austria for the first time, hosted by the University of Innsbruck
- Alpine catchment studies continue, # of COPE sites are expanding and many are ready to apply for INARCH Research Catchment status. INARCH basins provide essential reduction in uncertainty in precipitation at high elevations and their lapse rates.
- Coupled glacio-hydrological and subsurface hydrological models have been developed and are being applied to diagnose INARCH basins.
- Advanced remote sensing products, surface observing techniques and multi-scale models are being applied to INARCH basins over the COPE period and compared to datasets. More needs to be done and more datasets made available in the GWFNet system. COPE questions need to be addressed. A selection of INARCH catchments will be used to validate new remote sensing products.
- INARCH is delivering new research and novel prediction and monitoring capabilities for IYGP and DACS, including global prediction products through improvement in land surface schemes, microphysics, wind flow and downscaling.
- INARCH is developing new science questions around **downscaling atmospheric forcings, albedo depression from contaminants and bioalbedo, ephemeral snow hydrology, influence of snow and ice on runoff efficiencies, transient vegetation, glacier, surface and subsurface water storage changes with climate, and coupling physically based models with flowpath understanding from isotopes**. This could lead to globally coordinated studies comparing cryospheric-hydrological responses in mountains around the world.
- Inter-institutional collaborations including community of practice, workshops, lab exchanges could accelerate collaborations and comparative outputs.
- INARCH will reapply as a GEWEX crosscut project in 2026.

INARCH Statement 2026

- INARCH returned to Kananaskis, Canada (2015, 2026).
- There are substantial and sometimes **catastrophic changes in basin function** due to declining cryosphere – we have seen **regime change in some basins**. **Identifying** these is urgent.
- **Promising advances in mountain observations and remote sensing** are providing unprecedented information on snowfall, snow cover, glaciers, groundwater, ecosystems and hydrological processes, while innovative approaches are expanding observations into previously data-sparse high mountains.
- **The Nepal–China flood highlighted rapidly increasing mountain hazards**, demonstrating the need for integrated cryosphere–hydrology observations, prediction, transboundary data sharing, and improved early-warning systems.
- **Mountain modelling is becoming higher-resolution, more physically complete, more fully coupled and more predictive**, with advances in snow redistribution, data assimilation, AI, hydrological process representation, and coupled snow–soil-vegetation–groundwater–runoff-water resource modelling. Uncertainties in forcing data are more evident in impacting these models and need to be reduced.
- Researchers can use INARCH basins and models with AI to improve and incorporate forcing data, and accelerate model development, complex system interpretation, intercomparison, basin-chemistry-ecology-human interactions
- **Snow drought, declining snowpacks and the transition from snow to rain are changing mountain hydrology**, with important consequences for runoff generation, water availability, ecosystems and downstream users.
- **INARCH is using COPE to integrate observation and prediction systems**, using WaterNet to archive sites, datasets and models. COPE enables coordinated multi-basin model diagnosis, comparison and prediction as a contribution to the **Decade of Action for Cryospheric Sciences**.
- **INARCH will continue** and reapply as a GEWEX crosscut project

Next INARCH Meeting?

Next INARCH Meeting

- Nepal!
- Host Dr. Dhiraj Pradhananga, Tribhuvan University, The Small Earth Nepal, UNESCO Chair, Lead – DACS Prediction Working Group



Himalayas



Kathmandu



Pokhara



HiM-DATA –

<https://smallearth.org.np/project/himdata/>



Adventures are Possible!

