GHP Working Group (Project) Reports for the 38th GEWEX SSG Meeting 2026

For note, *the reporting detailed here should focus on the scientific achievements of the project as they relate to the specific goals of GEWEX and specifically, the GHP panel.*

Where activities, including any meetings, reports, publications or other outputs are listed, please include a short statement for each activity list on how the specific activity meets the goals of GEWEX and the panel.

Full Panel Name (Acronym)	: The International Network for Alpine Catchment Hydrology (INARCH), Phase 2
Reporting Period	: 01 January - 31 December 2025
Starting Date	: 2021
End Date (where appropriate)	: N/A
URL	: https://inarch.usask.ca/

Membership

Lead(s) & Contact(s)	: John Pomeroy (Chair) Juan Ignacio López Moreno (Co-Chair) James McPhee (Representative of Scientific Steering Group) Chris DeBeer (Science Manager) https://inarch.usask.ca/org-people/leadership-secretariat.php

Active members during the reporting period:
See https://inarch.usask.ca/org-people/participants.php

Working Group (Project) Objectives, Goals and Accomplishments during Reporting Period

Overall Working Group (Project) Objective(s)

To better:

- measure and understand high mountain atmospheric, hydrological, cryospheric, biological and human-water interaction processes,
- improve their prediction as coupled systems,
- diagnose their sensitivities to climate change and propose how they may be managed to promote water sustainability under global change.

Summary of the main outcomes for the reporting year

Please, provide a comprehensive synthesis of the main outcomes of the activity advances during the reporting year.

INARCH held a workshop to assess the observation phase of its Common Observing Period Experiment (COPE) as a focal activity to collect a high-quality and coherent observational data set of mountain meteorology and hydrology from around the world. This progressed very well and there have been many successful fieldwork, experimental, and remote sensing activities. INARCH is now coordinating data management with the help of Global Water Futures Observatories (GWFO). The diagnostic phase of COPE will use these data to address key INARCH science questions and for a series of hydrological process diagnostic modelling evaluations and analyses.

List of Panel Goals

Adjust yearly

This past year, key goals for INARCH were: i) to complete the field observation phase of COPE, ii) begin to assemble, quality assure and control, document, and share COPE and other historical data, iii) plan and commence diagnostic modelling activities using these data, and iv) meet together as a network and engage with the wider global mountain hydrology community to share new research and findings.

List of 2 to 3 Key Results

Adjust yearly with respect to goals

INARCH achieved several goals this year. The COPE initiative produced an invaluable set of new observational data and insights into the mountain water cycle, which are now being compiled, prepared for publication, and shared amongst the group. Multi-model diagnostic evaluations and process representation comparisons have begun and are being coordinated for common objectives. The network met again for its annual workshop in September and also engaged the broader community through participation and organized sessions at the European Geophysical Union, the International Mountain Conference 2025, COP30, and events in Tajikistan and Paris for the International Year for Glaciers' Preservation - 2025 and the UN Decade of Action for Cryospheric Sciences 2025-2034.

INARCH held its 2025 annual workshop at the [Innsbruck University Center in Obergurgl](), Austria on September 12–14, 2025. Our local hosts were Professors Rainer Prinz, Ulrich Strasser, and Lindsey Nicolson from the University of Innsbruck. (See https://inarch.usask.ca/news-events/inarch-workshop-2025.php)

The workshop was attended by 20 participants who traveled from Innsbruck to Obergurgl on September 12, met together over the course of two days and shared scientific updates (13 talks and 7 posters), discussions, a field excursion to local research sites in the Rofental Catchment and surrounding mountain environments, and socializing. Science topics covered at the workshop included progress on observational and modelling activities, remote sensing initiatives, downscaling, and progress with INARCH's Common Observing Period Experiment (COPE) and advancing science outcomes and use of COPE data. Further discussions focused on addressing key INARCH science questions, completing the COPE diagnostic modelling activities, compiling metadata within the https://gwfnet.net/ system and making data accessible via the Data Centre, publishing data and research papers in INARCH special issues of both Earth System Science Data and Hydrological Processes, potential contributions to the International Year for Glaciers' Preservation (IYGP) and the International Decade of Action for Cryospheric Sciences (DACS), and the renewal and science focus of INARCH as a GEWEX cross-cutting project. This was a fruitful and productive workshop, and the INARCH Statement 2025 below lists our progress and developments.

On September 14 the group returned to Innsbruck where some attended the International Mountain Conference (IMC 2025) and where INARCH held a focus session on High Mountain Hydrology and Cryosphere: Observations, Modelling, Prospects. That session was well attended, with over 100 audience members, 17 talks, and 16 posters.

INARCH Statement 2025

- INARCH met in Austria for the first time, hosted by the University of Innsbruck
- Alpine catchment studies continue. The number of COPE sites is 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 glaciohydrological 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 including slope and elevational dependencies, runoff efficiencies due to snow and ice melt, 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.
- Interinstitutional collaborations including community of practice, workshops, lab exchanges could accelerate collaborations and comparative outputs.
- INARCH will reapply as a GEWEX crosscut project in 2026.

Other Science Highlights

Not part of the 2-3 key results

This past year, the network of researchers and instrumented alpine research catchments continued to grow. We have welcomed new colleagues from the Geophysical Institute, University of Alaska Fairbanks and the Institute of Hydrology, Slovak Academy of Sciences. In Alaska, USA, Prof Pascal Buri is seeking to establish hydrological observatories in the Brooks Range, to expand hydrological research related to arctic mountains. We are bringing in a Svalbard research basin, the Fuglebekken Research Catchment, Norway (facilitated by Dr. Ekaterina Rets, Institute of Geophysics, Polish Academy of Sciences) which complements this as polar maritime high-latitude alpine catchment. We will also add the recently established Tombstone Waters Observatory along the Dempster Highway in the Yukon Territory, Canada (led by Prof Sean Carey, McMaster University), a boreal to alpine tundra headwater area underlain by discontinuous to continuous permafrost.

In Slovakia, Prof Michal Danko is the head of the research base for mountain hydrology, Institute of Hydrology of the Slovak Academy of Sciences, and conducts hydrological research in the experimental Jalovecký Creek catchment in the Western Tatras region, Tatra National Park. This expands INARCH in eastern Europe and the Carpathian Mountains.

We have also identified 10 other existing catchments and research sites that current INARCH researchers work at, including in Australia, Lebanon, Tajikistan, and USA, and we are determining how they might fit into the INARCH classification scheme for Integrated High Mountain Observing and Predicting Systems (IHMOPS). This will certainly bring the total number of observatories above 40, and potentially as many as 50.

Panel Activities during Reporting Period

List of Activities, Scientific Findings and Main Results

The COPE initiative has been our primary coordinated activity as a network and cross-cut project.

List of New Projects and Activities in Place and Main Objective(s)

Currently, we have two major special issues:

- Call for papers in Hydrological Processes special issue, “Improving Measurement, Understanding, and Prediction of Alpine Cold Regions Hydrological Processes and Their Sensitivities to Global Change,” https://onlinelibrary.wiley.com/page/journal/10991085/homepage/call-for-papers/si-2024-001778
- Publish data in Earth System Sciences Data special issue, “Hydrometeorological data from mountain and alpine research catchments,” https://essd.copernicus.org/articles/special_issue871.html

List of New Projects and Activities Being Planned, including Main Objective(s) and Timeline, Lead(s)

For the upcoming year, we plan to advance the diagnostic model evaluation component of the COPE. We will continue to coordinate modelling activities at multiple institutions to make use of the observations. The aim is to better understand why models produce various behaviours and to see if models benchmark various known aspects and regimes of the coupled atmospheric-cryospheric-

hydrological system. Model diagnostic evaluations will emphasize atmospheric, snow, glacier, and water processes in high mountain terrain and include sparse forest, non-needleleaf vegetation, glaciated, and alpine windblown sites.
COPE activities are guided by a Steering Committee, https://inarch.usask.ca/science-basins/cope.php#COPEsteeringcommittee, and COPE involves the full participation of all network members.

Science Issues and Collaboration during Reporting Period

Contributions to Developing GEWEX Science and the GEWEX Imperatives.

a. Data Sets

Adjust yearly and include key contributors

See our ESSD special issue and other published INARCH data, https://inarch.usask.ca/datasets-outputs/mountain-hydrometeorological-data.php, and also the data available thus far that are specific to COPE, https://inarch.usask.ca/science-basins/cope.php#DataObservationalProductsCOPEoutputs

b. Analysis

Adjust yearly and include key contributors

See list of publications for 2025 below and the fall 2025 INARCH workshop materials. **INARCH Statement 2025**: •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.

c. Processes

Adjust yearly and include key contributors

See list of publications for 2025 below and the fall 2025 INARCH workshop materials. **INARCH Statement 2025**: • INARCH is developing new science questions around downscaling atmospheric forcings, albedo depression from contaminants and bioalbedo, ephemeral snow hydrology including slope and elevational dependencies, runoff efficiencies due to snow and ice melt, 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.

d. Modeling

Adjust yearly and include key contributors

See list of publications for 2025 below and the fall 2025 INARCH workshop materials. **INARCH Statement 2025**: •Coupled glaciohydrological and subsurface hydrological models have been developed and are being applied to diagnose INARCH basins.

e. Application

Adjust yearly and include key contributors

See list of publications for 2025 below and the fall 2025 INARCH workshop materials. **INARCH Statement 2025**: •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.

f. Technology Transfer

Adjust yearly and include key contributors

See list of publications for 2025 below and the fall 2025 INARCH workshop materials. **INARCH Statement 2025**: •Interinstitutional collaborations including community of practice, workshops, lab exchanges could accelerate collaborations and comparative outputs.

g. <u>Capacity Building</u>

Adjust yearly and include key contributors

INARCH Statement 2025: •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.

List contributions to the GEWEX Science Goals and plans to include these.

Goal # 1 (GS1): Determine the extent to which Earth's water cycle can be predicted. This Goal is framed around making quantitative progress on three related areas posed in terms of the following questions:

1. **Reservoirs:**

What is the rate of expansion of the fast reservoirs (atmosphere and land surfaces), what is its spatial character, what factors determine this and to what extent are these changes predictable?

INARCH makes valuable contributions to this goal through its work on mountain snowpacks and glaciers and their changes, and to a lesser extent, mountain groundwater and lakes.

2. **Flux exchanges:**

To what extent are the fluxes of water between Earth's main reservoirs changing and can these changes be predicted and if so on what time/space scale?

INARCH is focused on quantifying the sensitivity and changes in the mountain water cycle, including water vapour fluxes driven by sublimation and evapotranspiration, solid fluxes via blowing snow, snow avalanches and glacier ice dynamics and liquid fluxes from meltwater movement through snow and ice, infiltration to frozen and unfrozen soils and mountain runoff generation and streamflow synthesis. Important progress has been made and many scientific publications have resulted.

3. **Precipitation Extremes*:***

How will local rainfall and its extremes change under climate change across the regions of the world?

This is a fundamental aspect of INARCH with respect to mountain precipitation with a fundamental question being what the phase of precipitation is and how is it changing from snowfall to rainfall and how are rainfall extremes changing in high mountains. This includes rain-on-snow events which can result in extreme flooding in mountain environments.

Goal # 2 (GS2): Quantify the inter-relationships between Earth's energy, water and carbon cycles to advance our understanding of the system and our ability to predict it across scales:

1. **Forcing-feedback understanding:**

How can we improve the understanding of climate forcings and feedbacks formed by energy, water and carbon exchanges?

INARCH contributes through its work at understanding, modelling, and predicting changes in mountain snowcover, glaciers, and landcover, which all have critical importance on surface energy balance and climate feedbacks. Examination of ecosystem fluxes and how they are responding to longer snow-free seasons, declining frozen soils and warmer summers and the upward migration of alpine treelines is fundamental to INARCH.

2. **ABL process representation:**

To what extent are the properties of the atmospheric boundary layer (ABL) defined by sensible and latent energy and water exchanges at the Earth's surface versus within the atmosphere (i.e., horizontal advection and ABL-free atmosphere exchanges)?

INARCH mountain research basins provide exemplary datasets for characterizing mountain boundary layer meteorology in otherwise data-sparse regions of the world.

3. **Understanding Circulation controls:**

To what extent are exchanges between water, energy and carbon determined by the large-scale circulations of the atmosphere and oceans?

Regional and continental-scale atmospheric modelling (i.e. through collaborations with US National Center for Atmospheric Research and Global Water Futures for high-resolution CONUS II WRF simulations) sheds insight on the controls of circulation patterns on mountain hydrometeorology.

4. **Land-atmosphere interactions:**
How can we improve the understanding of the role of land surface-atmospheric interactions in the water, energy and carbon budgets across spatiotemporal scales?

Improved computational capacity, geospatial intelligence and new and improved modelling tools developed in INARCH are helping to bridge scales from field site, to headwater basin, river basin, regional and continental, but there remains a critical need for the mountain research observatories and the INARCH hydrometeorological, hydrological and hydroglaciological process studies that are conducted there.

Goal # 3 (GS3): Quantify anthropogenic influences on the water cycle and our ability to understand and predict changes to Earth's water cycle.

1. **Anthropogenic forcing of continental scale water availability:**
To what extent has the changing greenhouse effect modified the water cycle over different regions and continents?

This is a focus for rivers that have mountain headwaters where snow and ice reserves are directly impacted by rising temperatures - these are about 50% of human water supplies around the world.

2. **Water management influences:**
To what extent do water management practices and land use change (e.g., deforestation) modify the water cycle on regional to global scales?

INARCH focusses on landcover change (i.e. glacier loss, forest and vegetation change) in mountain regions, which impact the mountain water cycle and the management and flow of rivers originating in mountain regions.

3. **Variability and trends of water availability:**
How do water & land use and climate change affect the variability (including extremes) of the regional and continental water cycle?

The coupled water and energy cycle is intrinsic to cold regions hydrology that is the core of INARCH. As climate warms, there is further decoupling of snow and hydrological regimes, resulting in increased variability in streamflow.

Other Key Science Questions
List 1 – 3 suggestion that you anticipate your community would want to tackle in the next 5-10 years within the context of a land-atmosphere project

See our proposal for a second phase of INARCH, 2021-2026, for details.

There will be multiple hypotheses that we want to test with the combination of sites and models that we can work with in COPE. A crucial thing is to look at the INARCH science questions, https://inarch.usask.ca/science-basins/phase-ii-science-plan-goals.php.

- For instance, do our process algorithms have global validity? Are our models sensitive to the way we collect field data?
- Different implementations of process algorithms become interesting, including the ability to falsify, where possible, in various models. A few have modularity or flexibility to be able to test.
- Testing different hypotheses with different algorithms within models, where there are different options or different models that have different approaches to things, e.g., how should albedo decay during melt be approached? Or vegetation emergence from under the snowpack? Or the transition from snow cover to ice cover on glaciers? Or internal energy changes, turbulent transfers, etc.? Or look at model failures—e.g., what happens when you

run a model without glacier components in a glaciated basin? All in different ways with different levels of complexity.

- There are also questions of model forcing. We have good, common field observations everywhere and then a variety of reanalysis and high-resolution atmospheric model data. We can start to evaluate how good are those forcings and what are the uncertainties introduced by forcings of different resolutions. We should look at CMIP-6, the RCMs, and see how these work as that what people generally have available.
- We may want to cluster around different topics such as forest cover, phase change, glacier contributions, permafrost (range from continuous to seasonally frozen soils), etc.

Contributions to WCRP including the WCRP Light House Activities

Briefly list any specific areas of your panel's activities in particular to the WCRP Light House Activities (Digital Earth, Explaining and Predicting Earth System Change, My Climate Risk, Safe Landing Cimates and WCRP Academy) https://www.wcrp-climate.org/lha-overview.

INARCH's science goals are directly aligned with the Light House Activity, Explaining and Predicting Earth System Change and its overarching objective to design, and take major steps toward delivery of, an integrated capability for quantitative observation, explanation, early warning, and prediction of Earth System change on global and regional scales, with a focus on multi-annual to decadal timescales. Our focus is on high mountain regions as headwaters for major river systems of the world.

Cooperation with other WCRP Projects, Outside Bodies and links to applications

e.g. CLIVAR, CliC, SPARC, Future Earth, etc.

- INARCH is closely connected to the Global Water Futures Observatory (GWFO) facility in Canada, which provides financial and logistical support as well as leadership of INARCH. INARCH functions as an international arm of GWFO and GWFO-supported science.
- United Nations Educational, Scientific, and Cultural Organization (UNESCO)
    - Intergovernmental Hydrological Programme (IHP): GWFO and INARCH contribute to IHP, providing leadership (through the Canadian National Committee for IHP (CNC-IHP)), guidance (design of IHP's water security and climate change strategy, IHP IX), and scientific contributions.
    - 2025 International Year of Glaciers' Preservation (IYGP2025): A GWFO/INARCH proposal for an international year for snow and ice developed into a resolution to the UN General Assembly from Tajikistan for 2025 to be the International Year for Glaciers' Preservation and each March 21st to be International Glacier Day. GWF provides leadership and direction on awareness efforts and science for 2025.
    - UN Decade of Action for Cryospheric Sciences, 2025–2034: GWFO/INARCH helped guide a resolution to expand the glacier year to a decade and focusing on science rather than geographical regions, https://www.wcrp-climate.org/news/wcrp-news/2201-un-resolution. UNESCO is the lead agency and INARCH provides support and scientific contribution.
    - UNESCO Chair in Mountain Water Sustainability: This Chair includes senior leadership representatives from INARCH (Pomeroy, McPhee, Pradhananga) and is an important mechanism to convey GWF science, data, and results to the global community (https://research.ucalgary.ca/unesco-chair-mountain-water-sustainability).
- World Meteorological Organization (WMO)
    - GWFO/INARCH has formal linkages to WMO through the Study Group on WMO Cryosphere Crosscutting Functions: Global Cryosphere Watch (SG-CRYO), and GWF co-organized and co-chaired the High Mountain Summit at WMO headquarters in Geneva, Switzerland in October 2019. The Summit outcomes were a call for integrated observation-prediction and services systems in high mountains around the world – something GWFO/INARCH is helping to implement in Canada and globally with the

INARCH Common Observing Period Experiment (COPE) of 38 high mountain basins around the world.

- Institute of Tibetan Plateau Research (ITPR) and Northwest Institute of Eco-Environment and Resources (http://english.nieer.cas.cn/), Chinese Academy of Sciences (CAS) | Third Pole Environment (TPE) Program
  - GWFO/INARCH has strong connections with the Chinese Academy of Sciences and the TPE program, with collaborative activities including joint experimental and field programs, student and faculty exchanges, and other connections. TPE is another GEWEX RHP in the Himalayas and Tibetan Plateau and has close links with GWF and a formal memorandum of understanding signed in 2018.
  - The INARCH Chair, Distinguished Professor John Pomeroy, was awarded a prestigious CAS Presidents International Fellowship, approved for three years. This will support collaboration and exchanges between GWF and the Institute of Tibetan Plateau Research of the CAS.
- Future Earth Sustainable Water Futures Programme (SWFP)
  - Contributions include leadership of important Canadian and international research initiatives focusing on water resources and climate change in cold regions, and with linkage to INARCH, a working group on Climate Impacts on Global Mountain Water Security has been formed.

Workshops and Meetings

List of Workshops and Meetings Held in 2025

Meeting title, dates and location.

INARCH Workshop, Innsbruck University Center in Obergurgl, Austria, September 12–14, 2025.
https://inarch.usask.ca/news-events/inarch-workshop-2025.php

List of Workshops and Meetings Planned in 2026 and 2027

Meeting title, dates and location and anticipated travel support needs.

The next annual INARCH workshop will be held September 7-9, 2026, at the Barrier Lake field station in Kananaskis, AB, Canada within the Front Ranges of the Canadian Rockies. This is the location of the inaugural INARCH workshop in 2015.
https://inarch.usask.ca/news-events/events.php

Other Meetings Attended On Behalf of GEWEX or Panel in 2025

- February 22-24, 2025: Pomeroy attended *Water Management and Climate Change: Bridging Knowledge to Action* conference in Bhutan, representing INARCH and discussing major initiatives such as the Glacier Year and Decade of Action for Cryospheric Sciences.
- March 19-22, 2025: Pomeroy was at the UNESCO headquarters in Paris for the UN International Year for Glaciers' Preservation – 2025, and the First World Glacier Day, March 21, 2025.
- INARCH @ EGU 2025, Session HS2.1.3, Improving Measurement, Understanding, and Prediction of the Mountain Cryosphere and Hydrological Cycle through Alpine Research Catchments, April 30–May 1, 2025
- May 26-June 1, 2025: Pomeroy presented and chaired sessions at the high level conference on the International Year for Glaciers' Preservation in Tajikistan.
- DeBeer attended the GEWEX Hydroclimatology Panel meeting, July 9-11, in Montreal, Canada. Pomeroy joined remotely on Zoom for part of the meeting.
- August 7-13, 2025: Pomeroy presented at the World Federation of Scientists Seminar on Planetary Emergencies in Italy.
- August 26-29, 2025: Pomeroy attended RGS-IBG Annual International Conference 2025 in Birmingham, UK. He presented *Visual Art Enhancing the Communication of Science with*

Positive Impact at Community, Municipal, and Intergovernmental Levels, showcasing the new Great Thaw art–science collaboration.

- INARCH @ IMC 2025, Session FS3.116, High mountain hydrology and cryosphere: observations, modelling, prospects, September 15, 2025
- November 11, 2025: Pomeroy contributed a keynote presentation on the importance of the Cryospheric Decade to the Cryosphere Pavilion at COP30 (presentation delivered by Dr. Anil Mishra).
- December 9 - 10, 2025: Pomeroy chaired the planning meeting for the Decade of Action for Cryospheric Science at UNESCO Headquarters in Paris, France

Publications during Reporting Period

List of Key Publications

See, https://inarch.usask.ca/datasets-outputs/key-publications.php
Noteworthy papers and datasets published by INARCH participants in 2025 (115 in total, but not an exhaustive list) are:

Adhikary, S., **Pradhananga, D.** and Marahatta, S., 2025. Glacial Lake Outburst Floods (GLOFs) in the Nepal Himalayas: Recent events, urgent response, and global actions for cryospheric science. *Journal of Tourism and Himalayan Adventures*, *7*(1), pp.88-92, https://doi.org/10.3126/jtha.v7i1.80915.

Akor, S., Flores, A.N., Rudisill, W., Bergstrom, A. and **McNamara, J.**, 2025. Impact of cloud microphysics schemes and boundary conditions on modeled snowpack in the Central Idaho Rocky Mountains, USA. Water Resources Research, 61(12), p.e2025WR040710, https://doi.org/10.1029/2025WR040710.

Alonso-González, E., **Harpold, A.**, Lundquist, J. D., Piske, C., Sourp, L., Aalstad, K., and **Gascoin, S.**: Ensemble-based data assimilation improves hyperresolution snowpack simulations in forests, EGUsphere [preprint], https://doi.org/10.5194/egusphere-2025-2347, 2025.

Aparicio-Ibáñez, J., Pimentel, R., Bonet-García, F.J. and **Polo, M.J.**, 2025. Using NDVI-derived vegetation vigour as a proxy for soil water content in Mediterranean-mountain traditional water management systems: Seasonal variability and restoration impacts. Ecological Indicators, 174, p.113468, https://doi.org/10.1016/j.ecolind.2025.113468.

Aryal, K., **Pradhananga, D.** and Aryal, D., 2025. Impact of Floods and Droughts on Food Security in Nepal: A Systematic Review, https://media.sciltp.com/articles/2506000811/2506000811.pdf.

Ayala, Á., Muñoz-Castro, E., Farinotti, D., Farías-Barahona, D., Mendoza, P.A., MacDonell, S., **McPhee, J.**, Vargas, X. and **Pellicciotti, F.**, 2025. Less water from glaciers during future megadroughts in the Southern Andes. Communications Earth & Environment, 6(1), p.860, https://doi.org/10.1038/s43247-025-02845-6.

Aygün, O., He, Z., **Pietroniro, A.** and **Pomeroy, J.W.**, 2025. Diagnosis of the Past, Present and Future Hydrology of a Glaciated High Mountain Headwater Basin in Central Asia. Hydrological Processes, 39(10), p.e70283, https://doi.org/10.1002/hyp.70283.

Bandrés, Javier and **López-Moreno, Juan Ignacio** and Salvador, Pedro and Pey, Jorge, Chemistry and sources of atmospheric aerosols deposited in the Central Pyrenees in the period 2016-2023, with a focus on African dust events occurred during cold season. Available at SSRN: https://ssrn.com/abstract=5546980 or http://dx.doi.org/10.2139/ssrn.5546980

Barrou Dumont, Z., **Gascoin, S.**, Inglada, J., Dietz, A., Köhler, J., Lafaysse, M., Monteiro, D., Carmagnola, C., Bayle, A., Dedieu, J.-P., Hagolle, O., and Choler, P.: Trends in the annual snow melt-out day over the French Alps and Pyrenees from 38 years of high-resolution satellite data (1986–2023), The Cryosphere, 19, 2407–2429, https://doi.org/10.5194/tc-19-2407-2025, 2025.

Bayle, A., **Gascoin, S.**, Corona, C., Stoffel, M. and Choler, P., 2025. Snow melt-out date (SMOD) change spanning four decades in European temperate mountains at 30 m from Landsat time series. Scientific Data, 12(1), p.706, https://doi.org/10.1038/s41597-025-05044-2.

Bertoncini, A. and **Pomeroy, J. W.**: Quantifying spatiotemporal and elevational precipitation gauge network uncertainty in the Canadian Rockies, Hydrol. Earth Syst. Sci., 29, 983–1000, https://doi.org/10.5194/hess-29-983-2025, 2025.

Bertoncini, A., **Thériault, J.M.** and **Pomeroy, J.W.**, 2025. A new GPM-DPR algorithm to estimate snowfall in mountain regions. Journal of Geophysical Research: Atmospheres, 130(5), p.e2024JD041481, https://doi.org/10.1029/2024JD041481.

Bhattarai, S., **Pradhananga, D., Pomeroy, J.**, Dhakal, B. and Adhikary, S., 2025. Impacts of climate change on precipitation phase trends in the Upper Langtang glacier river basin, Authorea. April 18, 2025. DOI: 10.22541/au.174495816.67306277/v1.

Biget, T., Brun, F., **Immerzeel, W.**, Martin, L., Pritchard, H., Collier, E., Lei, Y., and Yao, T.: Brief communication: Sharp precipitation gradient on the southern edge of the Tibetan Plateau during cold season, The Cryosphere, 19, 5863–5870, https://doi.org/10.5194/tc-19-5863-2025, 2025.

Bulovic, N., Johnson, F., Lievens, H., Shaw, T.E., **McPhee, J.**, **Gascoin, S.**, Demuzere, M. and McIntyre, N., 2025. Evaluating the performance of Sentinel-1 SAR derived snow depth retrievals over the extratropical Andes Cordillera. Water Resources Research, 61(2), p.e2024WR037766, https://doi.org/10.1029/2024WR037766.

Burns, S. P., Humphrey, V., **Gutmann, E. D.**, Raleigh, M. S., Bowling, D. R., and Blanken, P. D.: Using GNSS-based vegetation optical depth, tree sway motion, and eddy covariance to examine evaporation of canopy-intercepted rainfall in a subalpine forest, Biogeosciences, 22, 5741–5769, https://doi.org/10.5194/bg-22-5741-2025, 2025.

Cebulski, A.C. and **Pomeroy, J.W.**, 2025. Snow Interception Relationships With Meteorology and Canopy Density. Hydrological Processes, 39(4), p.e70135, https://doi.org/10.1002/hyp.70135.

Cebulski, A.C. and **Pomeroy, J.W.**, 2025. Theoretical Underpinnings of Snow Interception and Canopy Snow Ablation Parameterisations. Wiley Interdisciplinary Reviews: Water, 12(1), p.e70010, https://doi.org/10.1002/wat2.70010.

Choler, P., Bayle, A., Fort, N. and **Gascoin, S.**, 2025. Waning snowfields have transformed into hotspots of greening within the alpine zone. Nature Climate Change, 15(1), pp.80-85, https://doi.org/10.1038/s41558-024-02177-x.

Choler, P., Bonfanti, N., Reverdy, A., Bayle, A., Nicoud, B., Liger, L., Clément, J.C., Cohard, J.M., Corona, C., **Gascoin, S.** and Voisin, D., 2025. Legacy of snow cover on alpine landscapes. Communications Earth & Environment, 6(1), p.758. https://doi.org/10.1038/s43247-025-02702-6

Cholette, M., Milbrandt, J.A., Morrison, H., **Thériault, J.M.**, Lim, K.S., Chang, W.Y., Kim, K. and Lee, G., 2025. Simulation of wet snow during winter orographic precipitation using the Predicted Particle Properties (P3) microphysics scheme. Monthly Weather Review, 153(11), pp.2491-2512, https://doi.org/10.1175/MWR-D-25-0017.1.

Currier, W.R., McCrary, R., Abel, M.R., Eidhammer, T., Kruyt, B., Smith, A., Enzminger, T., Mahoney, K., Cifelli, R. and **Gutmann, E.D.**, 2025. End-of-century changes in orographic precipitation with the Intermediate Complexity Atmospheric Research Model over the western United States. Journal of Hydrometeorology, 26(5), pp.577-595, https://doi.org/10.1175/JHM-D-24-0071.1.

Deschamps-Berger, C., **López-Moreno, J.I.**, **Gascoin, S**., Mazzotti, G. and Boone, A., 2025. Where snow and forest meet: A global atlas. Geophysical Research Letters, 52(10), p.e2024GL113684, https://doi.org/10.1029/2024GL113684.

Desroches-Lapointe, A., Mariani, Z., **Thériault, J.M.** and Leroux, N.R., 2026. Case studies characterizing fine-scale flow fields prior to precipitation events in the Canadian rockies using Doppler lidars. Atmospheric Research, 327, p.108330, https://doi.org/10.1016/j.atmosres.2025.108330.

Ding, K., Jiang, P., Ni, J., Shen, T., Yang, B., Zhang, R. and **Yu, Z.**, 2025. Machine learning uncovers a multi-year climate memory in permafrost degradation on the Qinghai–Tibet Plateau: the critical roles of precipitation and lagged temperature. Journal of Hydrology, p.134272, https://doi.org/10.1016/j.jhydrol.2025.134272.

Dobre, M., Srivastava, A., Elliot, W.J., Elder, K.J., **Link, T.E.** and Brooks, E.S., 2025. Hydrology of Cold-region Montane Forested Watersheds. In Forest Hydrology: Processes, Management and Assessment (pp. 109-123). GB: CABI, https://doi.org/10.1079/9781800625310.0007.

Dumont, Marie; Diego Monteiro; Simon Filhol; **Simon Gascoin**; Christoph Marty; Pascal Hagenmuller; **Samuel Morin**; Philippe Choler; Wilfried Thuiller. The European Alps in a changing climate: physical trends and impacts. Comptes Rendus. Géoscience, Volume 357 (2025), pp. 25-42. doi: 10.5802/crgeos.288

Elagina, N., **Rets, E.**, Korneva, I., Toropov, P. and Lavrentiev, I., 2025. Simulation of mass balance and glacial runoff of Mount Elbrus from 1984 to 2022. Hydrological Sciences Journal, https://doi.org/10.1080/02626667.2025.2516080.

Elshamy, M., Loukili, Y., **Pomeroy, J.W., Pietroniro, A.**, Richard, D. and Princz, D., 2025. Physically based cold regions river flood prediction in data-sparse regions: The Yukon River Basin flow forecasting system. Journal of Flood Risk Management, 18(1), p.e12835, https://doi.org/10.1111/jfr3.12835.

Essery, R., Mazzotti, G., Barr, S., **Jonas, T.**, Quaife, T., and **Rutter, N.**: A Flexible Snow Model (FSM 2.1.1) including a forest canopy, Geosci. Model Dev., 18, 3583–3605, https://doi.org/10.5194/gmd-18-3583-2025, 2025.

Ferrarin, L., **Schulz, K.**, Bocchiola, D. and **Koch, F.**, 2025. Enhancing snow depth estimation with snow cover geometrical descriptors. Frontiers in Earth Science, 13, p.1672558, https://doi.org/10.3389/feart.2025.1672558.

Flynn, H., Camarero, J. J., Sanmiguel-Vallelado, A., Rojas Heredia, F., Domínguez Aguilar, P., Revuelto, J., and **López-Moreno, J. I.**: A shift in circadian stem increment patterns in a Pyrenean alpine treeline precedes spring growth after snow melting, Biogeosciences, 22, 1135–1147, https://doi.org/10.5194/bg-22-1135-2025, 2025.

Gaillard, M., **Vionnet, V.**, Lafaysse, M., **Dumont, M.**, and Ginoux, P.: Improving large-scale snow albedo modeling using a climatology of light-absorbing particle deposition, The Cryosphere, 19, 769–792, https://doi.org/10.5194/tc-19-769-2025, 2025.

Gao, Y., Zhou, M., **Yu, Z**., Ju, Q., Wen, L., Jin, J. and Zhang, D., 2025. Elevation dependency of snowfall changes under climate change over the Tibetan Plateau: Evidence from CMIP6 GCMs. Atmospheric Research, 315, p.107832, https://doi.org/10.1016/j.atmosres.2024.107832.

Goutard, A., Réveillet, M., Brun, F., **Six, D.**, Fourteau, K., Amory, C., Fettweis, X., Fructus, M., Khadka, A., and Lafaysse, M.: Explicit representation of liquid water retention over bare ice using the SURFEX/ISBA-Crocus model: implications for mass balance at Mera glacier (Nepal), EGUsphere [preprint], https://doi.org/10.5194/egusphere-2025-2947, 2025.

Graup, L., Tague, C., **Harpold, A.A.**, Wolf, S., Kirchner, J.W. and Manley, P., 2025. Ecohydrological dynamics of managed upslope and riparian forests: Insights from virtual fuel reduction treatments in the Sierra Nevada, CA. Authorea Preprints, DOI: 10.22541/essoar.175684335.56474725/v1.

Groff, Terava, and **John W. Pomeroy**. 2025. "Snowmelt Infiltration and Runoff From Seasonally Frozen Hillslopes in a High Mountain Basin." Hydrological Processes 39, no. 1 (2025): e70048, https://doi.org/10.1002/hyp.70048.

Guede, K.G., **Yu, Z.**, Simonovic, S.P., Gu, H., Emani, G.F., Badji, O., Chen, X., Sika, B. and Adiaffi, B., 2025. Combined effect of landuse/landcover and climate change projection on the spatiotemporal streamflow response in cryosphere catchment in the Tibetan Plateau. *Journal of Environmental Management*, *376*, p.124353, https://doi.org/10.1016/j.jenvman.2025.124353.

Guo, L., Li, J., Charrier, L., Dehecq, A., Beraud, L., Li, Z., **Li, X.**, Zhu, J., Li, L. and Wang, Y., 2025. Surging processes and mechanisms at small glaciers in the Qilian mountains, northwestern China, revealed by long-term, temporally dense remote sensing observations. Journal of Geophysical Research: Earth Surface, 130(6), p.e2024JF008157, https://doi.org/10.1029/2024JF008157.

Haagmans, V., Mazzotti, G., Webster, C., and **Jonas, T.**: How montane forests shape snow cover dynamics across the central European Alps, EGUsphere [preprint], https://doi.org/10.5194/egusphere-2025-3843, 2025.

Han, C., **Ma, Y.**, Ma, W., Sun, F., Zhang, Y., Hu, W., Xu, H., Duan, C., and Xi, Z.: Full-scale spectra of 15-year time series of near-surface horizontal wind speed on the north slope of Mt. Everest, EGUsphere [preprint], https://doi.org/10.5194/egusphere-2025-4642, 2025.

Jiang, Y., Tang, W., Yang, K., He, J., Shao, C., Zhou, X., Lu, H., Chen, Y., **Li, X.** and Shi, J., 2025. Development of a high-resolution near-surface meteorological forcing dataset for the Third Pole region. Science China Earth Sciences, 68(4), pp.1274-1290, https://doi.org/10.1007/s11430-024-1507-6.

Jouberton, A., Shaw, T.E., Miles, E., Kneib, M., Fugger, S., Buri, P., McCarthy, M., Kayumov, A., Navruzshoev, H., Halimov, A., Kabutov, K.,… and **Pellicciotti, F.**, 2025. Snowfall decrease in recent

years undermines glacier health and meltwater resources in the Northwestern Pamirs. Communications Earth & Environment, 6(1), p.691, https://doi.org/10.1038/s43247-025-02611-8.
Kraaijenbrink, P.D.A. and **Immerzeel, W.W.**, 2025. Spatial and temporal variability of the surface mass balance of debris-covered glacier tongues. Journal of Geophysical Research: Earth Surface, 130(3), p.e2024JF007935, https://doi.org/10.1029/2024JF007935.
Krogh, S.A., Graup, L., Tague, C., Broxton, P., Boisrame, G., Scaff, L. and **Harpold, A.**, 2025. Forest regrowth impacts on high-resolution snowpack modeling: A proof-of-concept in a Mediterranean montane catchment. Journal of Hydrology, p.133426, https://doi.org/10.1016/j.jhydrol.2025.133426.
Lafaysse, M., **Dumont, M.**, De Fleurian, B., Fructus, M., Nheili, R., Viallon-Galinier, L., Baron, M., Boone, A., Bouchet, A., Brondex, J., Carmagnola, C., Cluzet, B., Fourteau, K., Haddjeri, A., Hagenmuller, P., Mazzotti, G., Minvielle, M., Morin, S., Quéno, L., Roussel, L., Spandre, P., Tuzet, F., and **Vionnet, V.**: Version 3.0 of the Crocus snowpack model, EGUsphere [preprint], https://doi.org/10.5194/egusphere-2025-4540, 2025.
Lang, O.I., Naple, P., Mallia, D., Hosler, T., Adams, B. and **McKenzie Skiles, S.**, 2025. Two decades of dust radiative forcing on snow cover across the Great Salt Lake basin. Journal of Geophysical Research: Earth Surface, 130(2), p.e2024JF007957, https://doi.org/10.1029/2024JF007957.
Li, P., Zhong, L., **Ma, Y.**, Qi, Y. and Wang, Z., 2025. Estimation of all-sky downwelling longwave radiation over the Tibetan Plateau using an improved parameterization scheme. Atmospheric Research, 321, p.108107, https://doi.org/10.1016/j.atmosres.2025.108107.
Lian, L.I.U., ZHANG, X.Z. and **Yao-Ming, M.A.**, 2025. Review of WRF for weather and climate change over the Tibetan Plateau. Advances in Climate Change Research, https://doi.org/10.1016/j.accre.2025.10.001.
Lindenbergh, R., Anders, K., Campos, M., Czerwonka-Schröder, D., Höfle, B., Kuschnerus, M., Puttonen, E., **Prinz, R.**, Rutzinger, M., Voordendag, A. and Vos, S., 2025. Permanent terrestrial laser scanning for near-continuous environmental observations: Systems, methods, challenges and applications. ISPRS Open Journal of Photogrammetry and Remote Sensing, p.100094, https://doi.org/10.1016/j.ophoto.2025.100094.
Liu, C., Ikeda, K., Prein, A., Scaff, L., Dominguez, F., **Rasmussen, R.**, Huang, Y., Dudhia, J., Wang, W., Chen, F. and Xue, L., 2025. Convection-permitting climate simulations over South America: Experimentation during different phases of ENSO. Atmospheric Research, 316, p.107936, https://doi.org/10.1016/j.atmosres.2025.107936.
López-Moreno, J.I., Revuelto, J., Izagirre, E., Alonso-González, E., Vidaller, I. and Bonsoms, J., 2025. No hope for Pyrenean glaciers. Annals of Glaciology, 66, p.e17, https://doi.org/10.1017/aog.2025.10015.
Ma, B., **Ma, Y.** and Ma, W., 2025. Estimation of All-Weather Daily Surface Net Radiation over the Tibetan Plateau Using an Optimized CNN Model. Remote Sensing, 17(23), p.3894, https://doi.org/10.3390/rs17233894.
Ma, W., Ma, W., Xie, Z., Wang, B., Shi, H., Woolway, R.I. and **Ma, Y.**, 2025. Unique Atmospheric Boundary Layer Structures Driven by Lake Effects, [preprint], https://doi.org/10.21203/rs.3.rs-6907222/v1.
Ma, Weiqiang, Weiyao Ma, Zhipeng Xie, Rongmingzhu Su, Ling Bai, Yixi Fan, Yizhe Han, Wei Hu, Jianan He, Longtengfei Ma, Lele Shi, Xingdong Shi, Tingwei Chen, Binbin Wang, Junbo Wang, R. Iestyn Woolway, and **Yaoming Ma**, 2025. Establishment of Integrated Hydrometeorological Observation Platforms in Lakes across Three Distinct Climatic Zones on the Tibetan Plateau. Bulletin of the American Meteorological Society, 106(10), pp.E2052-E2072, https://doi.org/10.1175/BAMS-D-24-0294.1.
Ma, Y., Yao, N., Wang, B. and Ma, W., 2026. The radiation energy distribution over the Tibetan plateau: A review and perspective. Advances in Atmospheric Sciences, 43(2), pp.265-280, https://doi.org/10.1007/s00376-025-5065-6.
Mackay, J. D., Barrand, N. E., Hannah, D. M., Potter, E., Montoya, N., and **Buytaert, W.**: Physically based modelling of glacier evolution under climate change in the tropical Andes, The Cryosphere, 19, 685–712, https://doi.org/10.5194/tc-19-685-2025, 2025.

Magnusson, J., Bühler, Y., Quéno, L., Cluzet, B., Mazzotti, G., Webster, C., Mott, R., and **Jonas, T**.: High-resolution hydrometeorological and snow data for the Dischma catchment in Switzerland, Earth Syst. Sci. Data, 17, 703–717, https://doi.org/10.5194/essd-17-703-2025, 2025.

Magnusson, J., Cluzet, B., Queno, L., Mott, R., Oberrauch, M., Mazzotti, G., Marty, C. and **Jonas, T.**, 2025. Evaluating methods to estimate the water equivalent of new snow from daily snow depth recordings. Cold Regions Science and Technology, 233, p.104435, https://doi.org/10.1016/j.coldregions.2025.104435.

Manning, A., Csank, A., Allen, S. and **Harpold, A.**, 2025. Differential snow depth in warm edges versus cold edges of forest gaps, and its potential implications for tree growth in a Sierra Nevada conifer forest. Forest Ecology and Management, 597, p.123119, https://doi.org/10.1016/j.foreco.2025.123119.

Marty, C., Michel, A., **Jonas, T.**, Steijn, C., Muelchi, R., and Kotlarski, S.: SPASS – new gridded climatological snow datasets for Switzerland: potential and limitations, The Cryosphere, 19, 4391–4407, https://doi.org/10.5194/tc-19-4391-2025, 2025.

Mejías, A., **McPhee, J.**, Mahmoud, H., Farías-Barahona, D., Kinnard, C., MacDonell, S., Montserrat, S., Somos-Valenzuela, M. and Fernandez, A., 2025. Multidecadal estimation of hydrological contribution and glacier mass balance in the semi-arid Andes based on physically based modeling and geodetic mass balance. Frontiers in Earth Science, 13, p.1517081, https://doi.org/10.3389/feart.2025.1517081.

Menounos, B., Huss, M., Marshall, S., Ednie, M., Florentine, C. and Hartl, L., 2025. Glaciers in Western Canada-conterminous US and Switzerland experience unprecedented mass loss over the last four years (2021–2024). Geophysical Research Letters, 52(12), p.e2025GL115235, https://doi.org/10.1029/2025GL115235.

Moreno, J.I.L., Deschamps-Berger, C., Revuelto, J., Alonso-GonzÁlez, E., Rojas-Heredia, F. and Callow, N., 2025. The response of marginal snowpacks to climate warming. Advances in Climate Change Research, https://doi.org/10.1016/j.accre.2025.04.014.

Naple, P., **Skiles, S.M**., Lang, O.I., Rittger, K., Lenard, S.J., Burgess, A. and Painter, T.H., 2025. Dust on snow radiative forcing and contribution to melt in the Colorado River Basin. *Geophysical Research Letters*, *52*(5), p.e2024GL112757, https://doi.org/10.1029/2024GL112757.

Newcomb, S.K., Godsey, S.E. and **McNamara, J.P.**, 2025. Complex Riparian Interactions Mediate Groundwater Storage and Runoff During Snow Drought. Hydrological Processes, 39(7), p.e70183, https://doi.org/10.1002/hyp.70183.

Nicholson, L., Stiperski, I., Nitti, G., **Prinz, R.**, Georgi, A., Groos, A.R., Shaw, T.E., Sauter, T., Haugeneder, M., Mott, R. and **Sicart, J.E.**, 2025. The Second Hintereisferner Experiment (HEFEX II): Initial Insights into Boundary Layer Structure and Surface–Atmosphere Exchange Processes from Intensive Observations at a Valley Glacier. Bulletin of the American Meteorological Society, 106(10), pp.E2143-E2169, https://doi.org/10.1175/BAMS-D-24-0010.1.

Oberrauch, M., Cluzet, B., **Magnusson, J.** and **Jonas, T.**, 2025. The performance gains of assimilating limited information into a fully distributed snowpack model depend on model complexity and input data quality. Water Resources Research, 61(11), p.e2025WR040681, https://doi.org/10.1029/2025WR040681.

Olson, M., Robledano, A., Meyer, J., Hu, J.M., Leemann, M. and **Skiles, S.M.**, 2025. Downscaling HRRR Radiation for Distributed Snow Modeling: Part 1-Incoming Shortwave Partitioning and Topographic Correction. Authorea Preprints, https://doi.org/10.22541/essoar.176442430.00909959/v1.

Pavlyukevich, E.D., Krylenko, I.N., Motovilov, Y.G., **Rets, E.P.**, Korneva, I.A., Postnikova, T.N. and Rybak, O.O., 2025. How Do Climate Change and Deglaciation Affect Runoff Formation Mechanisms in the High-Mountain River Basin of the North Caucasus?. Glacies, 2(3), p.10, https://doi.org/10.3390/glacies2030010.

Pellicciotti, F., Fontrodona-Bach, A., Rounce, D. R., Fyffe, C. L., Anderson, L. S., Ayala, Á., Brock, B. W., **Buri, P.**, Fugger, S., Fujita, K., Gantayat, P., Groos, A. R., **Immerzeel, W.**, Kneib, M., Mayer, C., MacDonell, S., McCarthy, M., **McPhee, J.**, Miles, E., Purdie, H., **Rets, E.**, Sakai, A., Shaw, T. E., Steiner, J., Wagnon, P., and Winter-Billington, A.: DCG-MIP: The Debris-Covered Glacier melt Model Intercomparison exPeriment, EGUsphere [preprint], https://doi.org/10.5194/egusphere-2025-3837, 2025.

Peven, G., Eitel, J.U., **Link, T.E.**, Estey, E.W. and Engels, M., 2025. The Role of Spring Ecosystems as Climate Refugia in a Semi-Arid Environment. Ecohydrology, 18(5), p.e70066, https://doi.org/10.1002/eco.70066.

Peven, G., **Link, T.E.**, Hare, D., Liston, G.E. and Eitel, J.U., 2025. Climate controls on seasonal groundwater–stream connectivity in snow-dominated semi-arid headwaters. Journal of Hydrology, p.134575, https://doi.org/10.1016/j.jhydrol.2025.134575.

Pflug, J.M., Kumar, S.V., Livneh, B., **Gutmann, E.D.**, Gangrade, S. and Kao, S.C., 2025. Comparisons of montane snow water equivalent projections: calculating total snow mass in regions with projection agreement and divergence in the western United States. Journal of Climate, 38(3), pp.855-874, https://doi.org/10.1175/JCLI-D-24-0128.1.

Piske, C.R., Carroll, R.W., Boisrame, G.F., **Krogh, S.A.**, Manning, A.L., Underwood, K.L., Lewis, G. and **Harpold, A.A.**, 2025. Lidar-Derived Forest Metrics Predict Snow Accumulation in the Central Sierra Nevada, USA. Ecohydrology, 18(6), p.e70109, https://doi.org/10.1002/eco.70109.

Polo, M.J., 2025, October. Opportunities and challenges of high-resolution satellites for hydrology applications: insights from snow-influenced regions. In Sensors, Systems, and Next-Generation Satellites XXIX (Vol. 13667, p. 1366702). SPIE, https://doi.org/10.1117/12.3087267.

Pomarol Moya, O., Nussbaum, M., Mehrkanoon, S., Kraaijenbrink, P. D. A., Gouttevin, I., Karssenberg, D., and **Immerzeel, W. W.**: Improving forecasts of snow water equivalent with hybrid machine learning, EGUsphere [preprint], https://doi.org/10.5194/egusphere-2025-1845, 2025.

Pradhananga, D., Adhikary, S., Dhakal, B.N., Dhakal, A., Ghimire, A., Dhital, S. and Manandhar, S., 2025. Cryosphere change in the warming Himalaya: Snow cover and snowline trends in Nepal's Langtang Basin (1988-2024). Journal of Tourism and Himalayan Adventures, 7(1), pp.14-26, https://doi.org/10.3126/jtha.v7i1.80875.

Préaux, D., Dombrowski-Etchevers, I., **Gouttevin, I.**, and Seity, Y.: On the proper use of screen-level temperature measurements in weather forecasting models over mountains, Geosci. Model Dev., 18, 8723–8749, https://doi.org/10.5194/gmd-18-8723-2025, 2025.

Pritchard, H., 2025. Will our mountains lose their snow and ice? And does it matter if they do?. Glaciers and Ice Sheets in a Warming World: Impacts and Outcomes, https://nora.nerc.ac.uk/id/eprint/540572/1/uknc_glaciers_and_ice_sheets_report_digital-aw.pdf.

Ren, W., Qian, H., Zhou, S., Gao, Y., **Ma, Y**., Su, Z., Ma, W., Cao, Z., Zhao, W. and Li, K., 2025. Hydrological imbalance in Nam Co Lake, the third-largest lake on the Tibetan Plateau. Journal of Hydrology, p.133956, https://doi.org/10.1016/j.jhydrol.2025.133956.

Revuelto, J., Alonso-González, E., Deschamps-Berger, C., **Gutmann, E.D.** and **López-Moreno, J.I.**, 2025. Recent Advances in Snow Monitoring from Local to Global Scales. Current Climate Change Reports, 11(1), p.10, https://doi.org/10.1007/s40641-025-00207-0.

Robledano, A., Olson, M., Meyer, J., Hu, J.M. and **Skiles, S.M.**, 2025. Downscaling HRRR Radiation for Distributed Snow Modeling: Part 2-Topographic Correction of Incoming Longwave and Evaluation of Combined Radiation Updates. Authorea Preprints, https://doi.org/10.22541/essoar.176442422.28003281/v1.

Rohanizadegan, M., Petrone, R.M., **Pomeroy, J.W.** and Kosovic, B., 2025. Analysis of turbulence and turbulence kinetic energy dynamics in complex terrain. Journal of Geophysical Research: Atmospheres, 130(5), p.e2023JD040558, https://doi.org/10.1029/2023JD040558.

Rottler, E., Storebakken, B., Warscher, M., Hanzer, F., Bertazza, E., and **Strasser, U.**: Assessment of snow model uncertainty in relation to the effect of a 1 °C warming using the snow modelling framework openAMUNDSEN, EGUsphere [preprint], https://doi.org/10.5194/egusphere-2025-3707, 2025.

Roussel, L**., Dumont, M.**, Réveillet, M., **Six, D.**, Kneib, M., Nabat, P., Fourteau, K., Monteiro, D., **Gascoin, S.**, Thibert, E., Rabatel, A., **Sicart, J.-E.**, Bonnefoy, M., Piard, L., Laarman, O., Jourdain, B., Fructus, M., Vernay, M., and Lafaysse, M.: Saharan dust impacts on the surface mass balance of Argentière Glacier (French Alps), The Cryosphere, 19, 5201–5230, https://doi.org/10.5194/tc-19-5201-2025, 2025.

Sauter, T., Brock, B.W., Collier, E., Georgi, A., Goger, B., Groos, A.R., Haualand, K.F., Haugeneder, M., Mandal, A., Mott, R. **Nicholson, L., Prinz, R.**, et al., 2025. Glacier-Atmosphere Interactions and

Feedbacks in High-Mountain Regions-A Review. Authorea Preprints, https://doi.org/10.22541/essoar.174164160.03475851/v1.

Schaffer, N., **Gascoin, S.**, MacDonell, S., Schauwecker, S. and **Immerzeel, W.W.**, 2025. Water and hazards in mountainous regions in a changing climate. Frontiers in Water, 7, p.1637903, https://doi.org/10.3389/frwa.2025.1637903.

Scheidt, K.T., Pimentel, R., Premier, V., Marin, C., **Polo, M.J.** and Notarnicola, C., 2025. Assessing the impact of terrestrial photography-derived roughness lengths on evaposublimation from seasonal snow in the Mediterranean mountains of Sierra Nevada (Spain). Journal of Hydrology: Regional Studies, 60, p.102431, https://doi.org/10.1016/j.ejrh.2025.102431.

Schwat, E., Hogan, D., Paw U, K.T., Cox, C.J., Butterworth, B.J., **Gutmann, E.**, Vano, J.A. and Lundquist, J.D., 2025. Estimating snow sublimation in complex terrain: a season of intensive field measurements and the role of vertical water vapor flux divergence. Journal of Hydrometeorology, 26(10), pp.1455-1473, https://doi.org/10.1175/JHM-D-25-0022.1.

Serrano, E., Sanjosé, J.J.D., Río, M.D., Martínez Fernández, A., Rico, I., **López Moreno, J.I.** and Pisabarro Pérez, A., 2025. The Pyrenees without glaciers? The disappearance of the La Paül Glacier at the Posets massif, https://cir.cenieh.es/handle/20.500.12136/3513.

Shaw, T.E., Miles, E.S., McCarthy, M., Buri, P., Guyennon, N., Salerno, F., Carturan, L., Brock, B. and **Pellicciotti, F.**, 2025. Mountain glaciers recouple to atmospheric warming over the twenty-first century. Nature Climate Change, pp.1-7, https://doi.org/10.1038/s41558-025-02449-0.

Skierszkan, Elliott K., Andras J. Szeitz, Matthew Lindsay, and **Sean Carey**. "Stream acidification and metal mobilization linked to permafrost degradation." Preprint at https://eartharxiv.org/repository/view/10206/, 2025.

Song, Y., Xu, S., Lettenmaier, D.P., Beck, H.E., Chen, X., **Yu, Z.**, Dong, N., Cao, Q., Fu, X., Yang, Z. and Zhang, Y., 2025. Intensification of extreme precipitation across the Tibetan Plateau and its climatic drivers (1982–2020). Global and Planetary Change, p.105182, https://doi.org/10.1016/j.gloplacha.2025.105182.

Sourp, L., **Gascoin, S.**, Jarlan, L., Pedinotti, V., Bormann, K. J., and Baba, M. W.: Evaluation of high-resolution snowpack simulations from global datasets and comparison with Sentinel-1 snow depth retrievals in the Sierra Nevada, USA, Hydrol. Earth Syst. Sci., 29, 597–611, https://doi.org/10.5194/hess-29-597-2025, 2025.

Sourp, L., V. Pedinotti, Esteban Alonso González, L. Jarlan, **Simon Gascoin**. Assessment of snow cover fraction parameterizations for high resolution snowpack reanalyses. *Authorea.* October 28, 2025. DOI: 10.22541/au.176165496.63059460/v1

Storebakken, B., Rottler, E., Warscher, M. and **Strasser, U.**, 2025. Modelling of the Seasonal Snow Cover Dynamics for Open and Forested Areas in the Berchtesgaden National Park (Germany) Using the openAMUNDSEN Mountain Snow Cover Model. Hydrological Processes, 39(7), p.e70197, https://doi.org/10.1002/hyp.70197.

Taucare, M., Viguier, B., Maza, S., Treskow, V., Casado, I., **Mcphee, J.**, Morata, D., Delgado, A. and Daniele, L., 2025. High-mountain groundwater quality affected by natural acid drainage. Journal of Hydrology, 656, p.133021, https://doi.org/10.1016/j.jhydrol.2025.133021.

Trujillo, E., **Hedrick, A.**, and **Marks, D.**: Spatial and temporal features of snow water equivalent across a headwater catchment in the Sierra Nevada, USA, EGUsphere [preprint], https://doi.org/10.5194/egusphere-2025-3736, 2025.

Valdivielso, S., **López-Moreno, J.I.**, Custodio Gimena, E., Criollo, R., **Pomeroy, J.W.**, Hassanzadeh, A., **Krogh, S.A.** and Vázquez-Suñé, E., 2025. Dataset of Snowmelt and Groundwater Recharge in an Arid Andean Basin: the case of the Salar de Atacama, Chile, http://doi.org/10.17632/XCTZ7RXSDK.1.

van Tiel, M., Huss, M., Zappa, M., **Jonas, T.**, and Farinotti, D.: Swiss glacier mass loss during the 2022 drought: persistent streamflow contributions amid declining melt water volumes, EGUsphere [preprint], https://doi.org/10.5194/egusphere-2025-404, 2025.

Wang, B., **Ma, Y**., Hu, Z., Ma, W., Chen, X., Han, C., Xie, Z., Wang, Y., Li, M., Ma, B., Shi, X., Li, W., and Cai, Z.: Quantifying the spatial-temporal patterns of land-atmosphere water, heat and CO_2 flux exchange over the Tibetan Plateau from an observational perspective, Earth Syst. Sci. Data Discuss. [preprint], https://doi.org/10.5194/essd-2025-195, in review, 2025.

Wang, B., Zhu, G.F., Zhong, J.T., Ma, C.F., Zhang, L., Tan, M.B. and **Li, X.**, 2025. Uncertainty analysis and parameter optimization of a water yield ecosystem service model: A case study of the Qilian Mountains, China. Science of The Total Environment, 966, p.178772, https://doi.org/10.1016/j.scitotenv.2025.178772.

Wang, F., Zhao, Q. and **Ma, Y.**, 2025. Impact of Climate and Landscape on the Spatial Patterns of Soil Moisture Variation on the Tibetan Plateau. Water, 17(17), p.2625, https://doi.org/10.3390/w17172625.

Wang, Tonghong, Xufeng Wang, Qiang Zhang, Songlin Zhang, Junlei Tan, Yang Zhang, Zhiguo Ren, Yanpeng Yang, and **Tao Che**. "Effects of extreme temperature events on carbon fluxes in different ecosystems in the Heihe River Basin, China." Agricultural and Forest Meteorology 362 (2025): 110380, https://doi.org/10.1016/j.agrformet.2024.110380.

Wang, X., Che, T., Xiao, J., Wang, T., Tan, J., Zhang, Y., Ren, Z., Geng, L., Wang, H., Xu, Z., Liu, S., and **Li, X.**: A post-processed carbon flux dataset for 34 eddy covariance flux sites across the Heihe River basin, China, Earth Syst. Sci. Data, 17, 1329–1346, https://doi.org/10.5194/essd-17-1329-2025, 2025.

Wang, Y., Zheng, D., Zhang, G., Carrivick, J.L., Bolch, T., Ren, W., Guo, L., Su, J., Yuan, S. and **Li, X.**, 2025. Patterns and change rates of glacial lake water levels across High Mountain Asia. National Science Review, 12(3), p.nwaf041, https://doi.org/10.1093/nsr/nwaf041.

Whitfield, P.H. and **Pomeroy, J.W.**, 2025. Disparity in low-flow trends found in snowmelt-dominated mountain rivers of western Canada. Journal of Hydrology: Regional Studies, 57, p.102144, https://doi.org/10.1016/j.ejrh.2024.102144.

Woolley, G. J., **Rutter, N.**, Wake, L., **Vionnet, V**., Derksen, C., Meloche, J., Montpetit, B., Leroux, N. R., **Essery, R**., Hould Gosselin, G., and Marsh, P.: Simulating snow properties and Ku-band backscatter across the forest-tundra ecotone, EGUsphere [preprint], https://doi.org/10.5194/egusphere-2025-1498, 2025.

Xing, Z., Zhao, L., Fan, L., De Lannoy, G., Bai, X., Liu, X., Peng, J., Frappart, F., Yang, K., **Li, X.** and Zhou, Z., 2025. Retrieval of 1 km surface soil moisture from Sentinel-1 over bare soil and grassland on the Qinghai-Tibetan Plateau. Remote Sensing of Environment, 318, p.114563, https://doi.org/10.1016/j.rse.2024.114563.

Xu, S., Lettenmaier, D.P., McVicar, T.R., Gentine, P., Beck, H.E., Fisher, J.B., **Yu, Z.**, Dong, N., Koppa, A. and McCabe, M.F., 2025. Increasing atmospheric evaporative demand across the Tibetan plateau and implications for surface water resources. iScience, 28(2), https://doi.org/10.1016/j.isci.2024.111623.

Yu, H., Lu, F., Hu, Z., **Ma, Y.**, Li, M., Gu, L., Sun, F., Wang, S., Ma, W., Xie, Z. and Sun, G., 2025. A Comprehensive Climate and Environment Observation Network over the Central Tibetan Plateau. Bulletin of the American Meteorological Society, 106(11), pp.E2384-E2410, https://doi.org/10.1175/BAMS-D-24-0074.1.

Yu, H., Wang, G., Hu, Z., **Ma, Y.**, Li, M., Ma, W., Gu, L., Sun, F., Gao, H., Wang, S., and Lu, F.: Long-term land–atmosphere energy and water exchange observational dataset over central Tibetan Plateau, Earth Syst. Sci. Data, 17, 6871–6888, https://doi.org/10.5194/essd-17-6871-2025, 2025.

Zhang, Y., Zhao, P., **Li, X.**, Yang, B., Zhao, J., Hu, J., Wei, Q., Li, K. and He, M., 2025. Retrieval of terrain surface elevation in mountainous areas with ICESat-2/ATLAS. Remote Sensing of Environment, 327, p.114823, https://doi.org/10.1016/j.rse.2025.114823.

Zhao, Y., Yao, Y., Jin, H., **Li, X.**, Cao, B., Ran, Y., Kuang, X. and Zheng, C., 2025. TTOP model simulation of long-term (1981–2100) permafrost dynamics of the Tibetan Plateau. Geoderma, 457, p.117287, https://doi.org/10.1016/j.geoderma.2025.117287.