



High-Level International
Conference on Glaciers'
Preservation

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Keynote Remarks High Level Roundtable – IYGP Dushanbe 30 May 2025

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Dear Excellencies, ladies and gentlemen. I am a hydrologist, glaciologist and climate scientist from Canada with research in the beautiful Canadian Rocky Mountains that are famous for their blue skies, snow-clad peaks, turquoise glacier-fed lakes, green forests and shining glaciers. The G7 leaders will be coming to this region next month, but they will not be greeted by this scene. Instead, after 10 years of record heat and drought they will find bare grey mountains, burnt forests, dark receding glaciers and smoky skies from wildfires.

How did we get here and how do we get out of this situation? In the 30 years since global leaders first gathered to discuss how to limit climate change under the United Nations framework convention on climate change, Earth has lost close to eight trillion tonnes of ice and the atmospheric concentration of carbon dioxide has risen from 350 to 430 parts per million – a level last experienced about 2.5 million years ago at the beginning of the Pleistocene Epoch in which humans later evolved.

As a result, temperatures are rising quickly and our weather is becoming more extreme. We now stand on the cusp of major losses to Earth's major polar icesheets, in Greenland, and Antarctica. These changes are happening much sooner than our previous worst-case scenarios. They could spell the end for both low-lying nations and coastal ecosystems, as maps of coastlines are re-drawn by rising seas.

But they are also set to strike all of us, much closer to most of our homes. Mountain deglaciation and loss of seasonal snowcover is a disaster that is already well underway – upstream of where many of us live.

Global snow and ice provide freshwater for about two billion people on the planet in some form. We've lost nine trillion tonnes of ice from mountains in the last 50 years, a mass equivalent to a 62-metre-thick block of ice the size of Tajikistan.

Mountains are losing their frozen water stores. Just this century, the Alps have lost 39% of glacier mass, Canada's Rockies have lost one-quarter, the Himalayas 1/5th, the Caucasus over 1/3rd. A long-studied glacier that I monitor, Peyto Glacier in the Canadian Rocky Mountains UNESCO World Heritage Site, retreated over 430 m and melted downwards more than 35 m in the last 5 years alone!

Global temperature rise is also diminishing snow covers: we've lost 15 days of this cover per year in many mountains worldwide between 1972 and 2022, and this is of particular importance in high mountains as the seasonal snowmelt is the single greatest contributor to our freshwater supplies.

Further loss of this 'ecosystem service' will make some of our agriculture, energy supplies and our communities unviable and unlivable.

Further loss of mountain glaciers and snow will occur as the earth warms. At present melt rates, most glaciers in Western Canada, Europe, the Caucasus, Central Asia and the Tropics will not survive the 21st century. If we cannot restrain warming below 1.5 C globally, we will lose more than half of our glaciers. If we cannot restrain warming below 2 C globally, we could lose more than 85% of ice in Europe and North America and 70-75% in Central Asia and the Hindu Kush Himalaya. These losses of snow and ice will hit downstream irrigation, downstream hydroelectricity, and downstream water supplies both in the short-term, with rising numbers of floods, and in the medium term, as water supplies start to wane from mid-century on.

In the short and medium term, we need deeper scientific understanding, expanded cryospheric monitoring, improved prediction and better cooperation at scales from communities to countries to river basins to adapt and reduce the impacts of these changes on ecosystems and humanity.

The full implications of the loss of mountain snow and ice are dire. Glacier destruction is the harbinger of global ecosystem and human destruction. The climate conditions responsible for the loss of our glaciers also result in heatwaves that we cannot live through, fatal water shortages, wildfires that burn our forests and communities, floods that destroy our cities and homes, sea level rise that inundates our coastal settlements and cities. Where will the billions displaced by these events find homes and livelihoods?

Its time to change course – rapidly. This is the year, the tipping point, as countries draft new Nationally Determined Contributions for COP 30 in Belem, Brazil, that we have to turn this around. I hope that in the future we can look back, and can note that at Dushanbe in 2025, some fundamental decisions were made where we started to create a future where some of our glaciers and humanity itself can still survive. Perhaps this will be humanity's grandest achievement. By deciding in Dushanbe to take the climate mitigation actions preserve the worlds glaciers, we can preserve ourselves and our civilisation. I encourage you to act now and act decisively. Science supports you.