Press Release

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Svalbard's Winter Warming Reaches New Extremes

Heatwaves are increasingly hitting the high Arctic, in deep winter.

Recent direct observations from scientists active in fieldwork in the Arctic indicate that the Svalbard archipelago (sovereign territory of Norway under the Svalbard Treaty) is experiencing unprecedented winter warming, marking a significant and alarming shift in the Arctic climate. As reported in the current issue of Nature Communications, in February 2025, the region faced exceptionally high air temperatures alongside rainfall, leading to widespread snowmelt and pooling of meltwater. This phenomenon showcases the severe impacts of climate change on Arctic landscapes and ecosystems.

The Svalbard archipelago is warming at a rate six to seven times faster than the global average, with winter temperatures rising nearly twice the annual average. Over the last 40 years, rain-on-snow events have surged significantly. Projections suggest that rain may become the dominant form of precipitation in the Arctic by the century's end.

February 2025 recorded an average air temperature of -3.3 °C in Ny-Ålesund, markedly higher than the historical average of -15 °C (1961-2001). The highest temperature recorded in Ny-Ålesund in February 2025 was 4.7 °C, with air temperatures higher than 0 °C on 14 of the 28 days in February 2025.

Scientists gathering there aiming to study snow processes faced pooling meltwater where they would normally encounter solid ice or snow. The combination of warm temperatures and rainfall transformed Ny-Ålesund's landscape, creating conditions likened to a "melting ice rink." This disruption impacted ecological research and influenced plant and soil dynamics.

"We stood in pools of water at the snout of the glacier, or on bare, green tundra. A thick snowpack usually covers the winter landscape. It was shocking to witness it vanish within days.", said James Bradley, geomicrobiologist at the Mediterranean Institute of Oceanography, in Marseille, France.

In particular, the warming event prompted premature plant growth and soil thawing, with implications for soil temperature and microbial activity as protective snow cover diminished.

"We are still unaware of the consequences that these recurring events are bringing to Arctic ecosystems, especially during the winter period, where conditions are more complex and data is scarce", said Donato Giovannelli, an geomicrobiologist at the University of Naples Federico II in Italy and one of the senior authors on the paper. "We might have been too cautious with our messages. Irreversible changes to the Arctic climate are happening in front of our own eyes".

The emerging pattern of winter thaw events signifies not just anomalies, but is indicative of a rapidly evolving Arctic ecosystem influenced by human-induced climate change. This calls for urgent scientific inquiry and environmental policy action to mitigate these changes and their potential effects on both Arctic ecosystems and global climate patterns.

"The Arctic winter is no longer reliably frozen. Winter warming is no longer an exception - it's now a recurring feature of a profoundly altered Arctic climate system." added James Bradley.

[Check this >] "Bradley, J. A., Molares Moncayo, L., Gallo, G., Brusca, J., Viglezio, T., Pasotti, J., & Giovannelli, D. (2025). Svalbard winter warming is reaching melting point. Nature Communications. https://doi.org/10.1038/s41467-025-60926-8."

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