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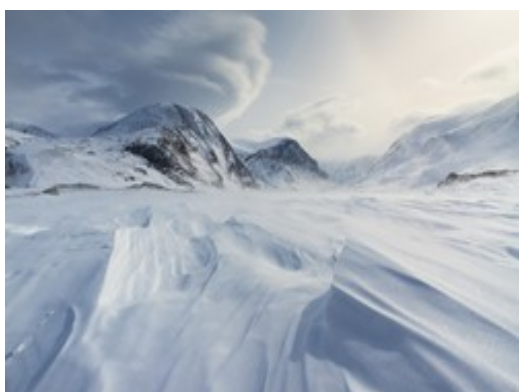


High Impact Weather in the Arctic, fundamental understanding and future projections (HIMWARC)

Results in Brief

Causes of extreme Arctic weather

Researchers have gained greater knowledge of weather patterns associated with polar lows in the Arctic and improved our understanding for better extreme weather predictions.



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Weather in the Arctic features several severe types of extremes such as polar lows and strong low-level winds. These extremes impact on the socioeconomic structure of the surrounding regions and communities by causing extensive damage and loss of life.

Current understanding of how these weather phenomena form and grow is still poor. This limits forecasting capabilities and creates challenges to adequately adapt and mitigate

with respect to these phenomena.

The EU-funded HIMWARC (High impact weather in the Arctic, fundamental understanding and future projections (HIMWARC)) project worked to improve fundamental knowledge of high-impact weather in the Arctic. The aim was to enhance our understanding to improve prediction of changes in the distribution,

frequency and intensity of severe Arctic weather events.

Project researchers found that most polar low developments can be described with the diabatic Rossby vortex paradigm. They discovered that the horizontal and vertical scales of the system are reduced compared to mid-latitudes, which greatly increases the efficiency of energy conversion via diabatic processes.

The researchers also determined that some previous conclusions about the link between polar lows and large-scale weather patterns as well as the sea ice edge might not hold. These linkages were primarily used to also infer information about polar lows in future climates. This means that there remains a greater uncertainty if there will be fewer or more and weaker or stronger polar lows in the future.

Overall, project results have helped improve scientists' knowledge of the dynamics and related uncertainties in high-impact weather in the Arctic. In particular, HIMWARC enhanced our understanding of polar lows and provided insights into sensitivities of the development of these phenomena and thereby aids improvements for future forecasting.

Keywords

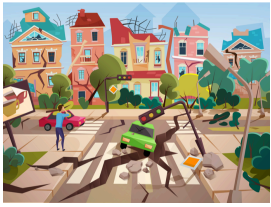
Arctic, polar lows, extreme weather, HIMWARC, diabatic Rossby vortex

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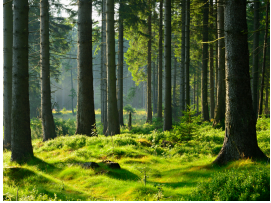


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Project Information

HIMWARC

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Project closed

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30 June 2016

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