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Permafrost thermal dynamics in periglacial landforms in Svalbard during the last decade

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The permafrost in Svalbard has warmed during the last decade, as the air temperature has increased. Warming has been largest in bedrock sites in western Svalbard at sea level and in a blockfield in the mountains in central Svalbard, typically around 0.1°C/year at 10 m depth. Warming rates of up to 0.2°C/yr has been recorded in ice-wedges in the sedimentary Adventdalen valley lowland. The active layer increased on average by 0.6 cm/yr from 2000 to 2018 in the UNISCALM monitoring site, and seems more controlled by winter air temperatures than summer air temperatures. Future direct online permafrost data availability both for research, education and societal geohazard use is being developed, when the existing permafrost observation boreholes are being extended to 20 m depth and the instrumentation upgraded in several of the periglacial landforms in central Svalbard as part of the ongoing Svalbard Integrated Arctic Earth Observing System, SIOS activities.