BLUE ACTION

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SnowApp climate service for winter tourism centres

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Climate change as a challenge for winter tourism

Winter tourism is an economically important sector, with ski destinations experiencing over 300 million skier visits annually. It is also considered one of the most vulnerable industries to climate change, as it relies on predictable cold weather conditions to ensure the safety and enjoyment of the visitors welcomed each year.

The global rise in temperature causes warmer early season conditions and delayed onset of winter and hence shorter seasons. Changing weather patterns can also lead to unreliable snow cover and changes in useable slopes. Climate adaptation in winter tourism companies all over the world is important to minimise these challenges. Snowmaking and snow storage are increasingly used for adapting to the increased uncertainty on snow conditions. Successful and sustainable climate change adaptation in winter tourism resorts is important also for communities where winter sports and tourism are an important livelihood.

To address this challenge, Blue-Action's winter tourism case study co-designed a climate service for winter tourism industry in Northern Finland, with potential transferability to winter tourism destinations such as ski resorts and other winter sports centres all over the world.

Climate services can support sustainable climate adaptation by providing relevant climate information in user-friendly ways.

Ruka Ski Resort as the pilot company

In the Blue-Action project, a climate service for winter tourism industry has been co-designed by a team of researchers at the Arctic Centre of the University of Lapland and winter tourism professionals at the Ruka Ski Resort in Northern Finland, at 66° N. Ruka ski resort welcomes around 400,000 skiers annually. The resort aims to be the most snow-secure resort in Europe, and it regularly offers 200 skiing days from October to May. Ruka has been carbon neutral since 2018.

Besides plentiful natural snowfall, typically 70-75 cm in mid-winter, Ruka also uses machine-made and stored snow to ensure the slopes can be opened early and maintained through the winter. Ruka make their snow using carbon-neutral energy sources and readily available Finnish lake water, which is returned- without contamination- to the lakes when the snow melts.

The efficiency and cost of making snow is heavily dependent on temperature, wind, and (to a lesser extent) humidity. Snow management is labour intensive, and the timing and hiring of labour, and many other considerations including decisions about when to make snow and how much to make. Ruka's experts currently use their extensive experience alongside weather forecasts to predict the optimum days to make snow each season.

Reliable 4-week forecast from the SnowApp climate service

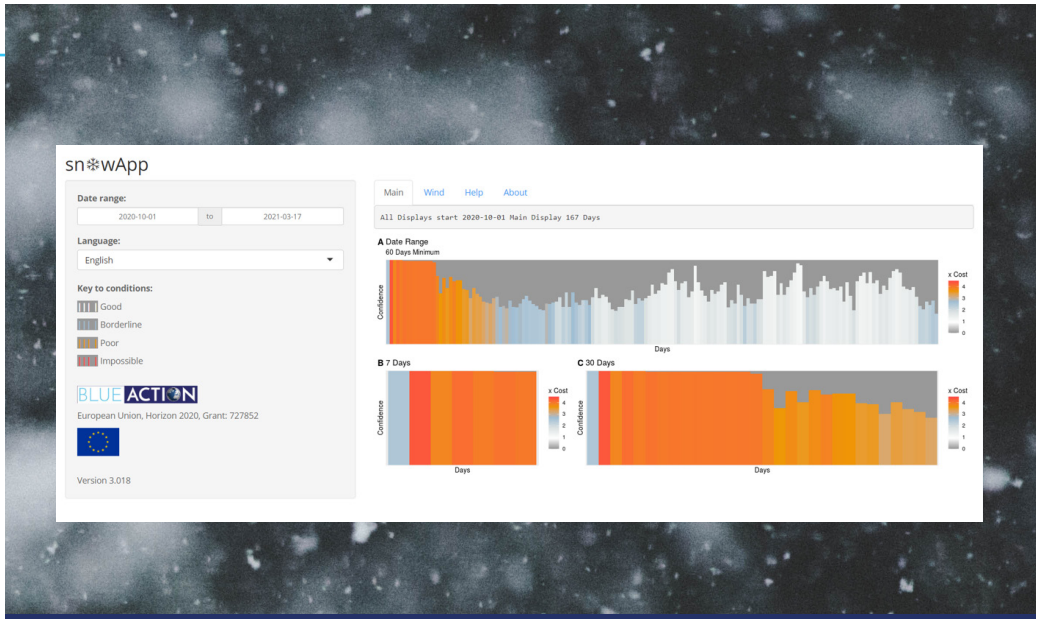
Our case study focused on exploring how short- and medium-term predictions of weather and climate could be made available to partners in a form that would support critical decision-making on snowmaking.

Over the last three years, we have built a tool that encapsulates six months of model prediction data from the GCFS2.0 by DWD and University of Hamburg and makes it available to professional users in the winter tourism industry on a single screen. This takes the form of an 'app' that can be delivered directly to mobile phones and tablets inside a browser window.

The SnowApp provides reliable 4-week predictions on snowmaking conditions as a function of costs. These results are tailored to ski resorts in Northern Finland, but the app can be localized to other geographical areas as well. The forecasts from the SnowApp support management level decision-making in ski resorts by translating complex prediction model data into useable information on relevant timescales.

We have established, by analysing data from previous seasons, that the SnowApp could provide useful insight into the likely snowmaking conditions at least 4 weeks in advance. This would make it a key aid to taking these complex and financially important decisions by ski resort management. Through the management and knowledge distribution system in the ski resort, also other departments can benefit from information from SnowApp in their operations. The app is currently not meant for customer interface.

Optimizing snowmaking to the favourable conditions can, besides lowering costs, also help reduce greenhouse gas emissions and hence keep snowmaking as a sustainable practice in those ski resorts that don't yet rely on green energy.



Next steps

The demand for climate services in climate and weather sensitive industries like winter tourism is growing, and will continue to require the development of strong links between climate researchers and the communities they serve.

The SnowApp establishes the usefulness of prediction data for winter sports centres in Northern Finland. The innovation can be localized also to ski resorts in other geographical areas all over the world, and more functions can be added to the prototype at later development stages and commercialisation.

Please get in touch if you are interested in having SnowApp available for your ski resort or other winter sports centre!

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