

Climate service as a decision-support tool for winter tourism industry

User-friendly climate information for securing snow

BLUE ACTION 

RUKA!
KUUSAMO



ARCTIC CENTRE
University of Lapland

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www.blue-action.eu
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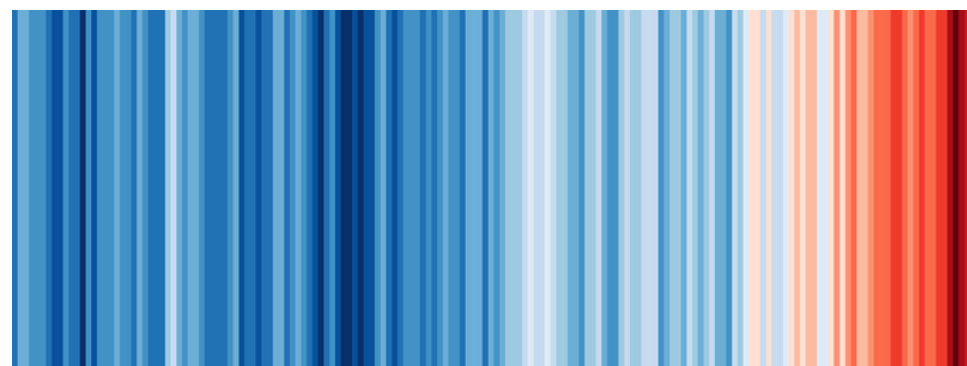
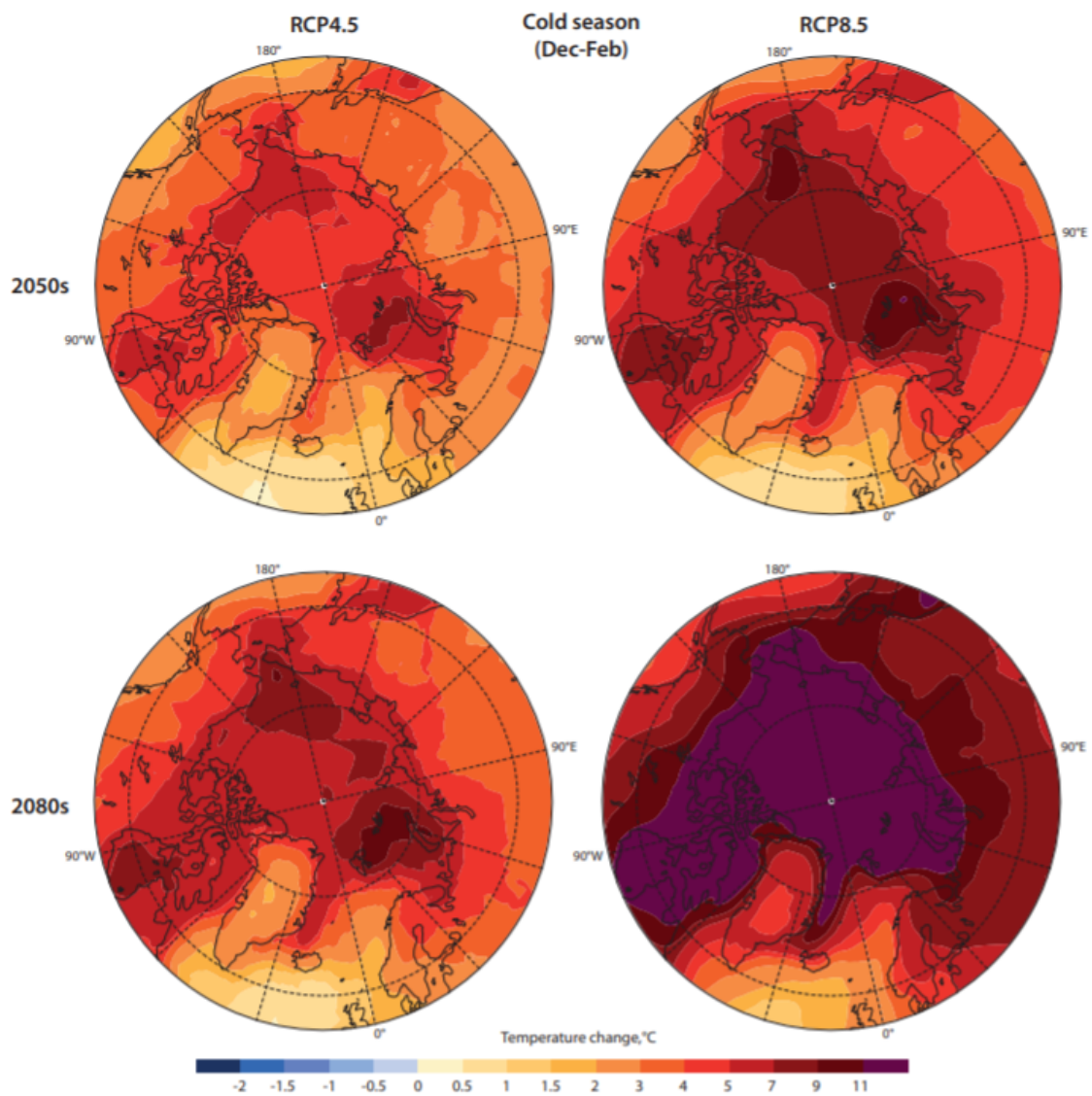
The Blue-Action project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No 727852.



Proper winter conditions are the key to commercial success for nature-based winter tourism







Above: Ed Hawkins (2019) Warming stripes for 1850-2018 using the WMO annual global temperature dataset.

Figure 2.13 Projected changes in near-surface temperature (50th percentile), relative to 1986–2005, for December–February under the RCP4.5 scenario (left panels) and the RCP8.5 scenario (right panels). Upper panels are for the decade of the 2050s, lower panels are for the 2080s (graphic courtesy of G. Flato, Environment and Climate Change Canada).

Left: AMAP, 2017. Snow, Water, Ice and Permafrost in the Arctic (SWIPA) 2017.

Climate in Northern Finland now

- 180-210 snow cover days / year
- Snow depth 65-100 cm
- Mean temperatures
 - Winter: -11...-14 °C
 - Summer: +10...+15.5 °C

Snow cover days in the Arctic land areas
1998/99 – 2013/14 (SWIPA 2017)

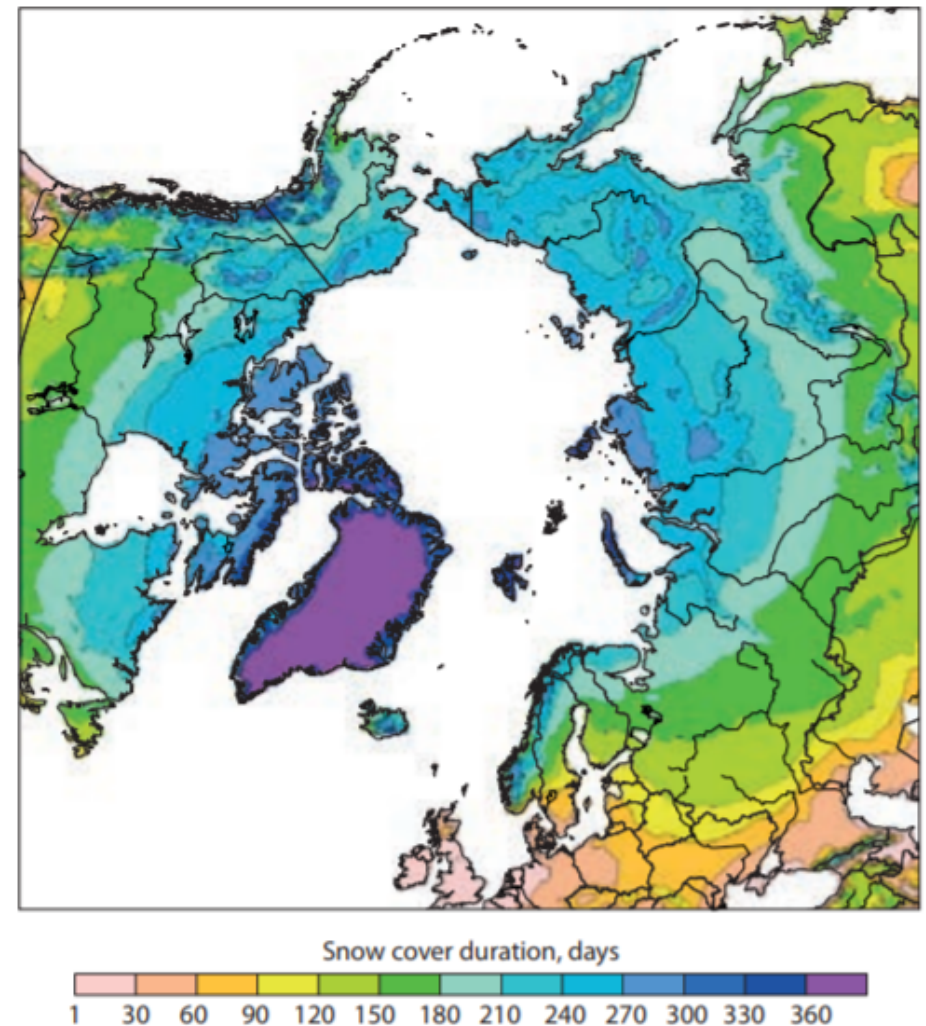
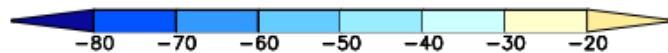
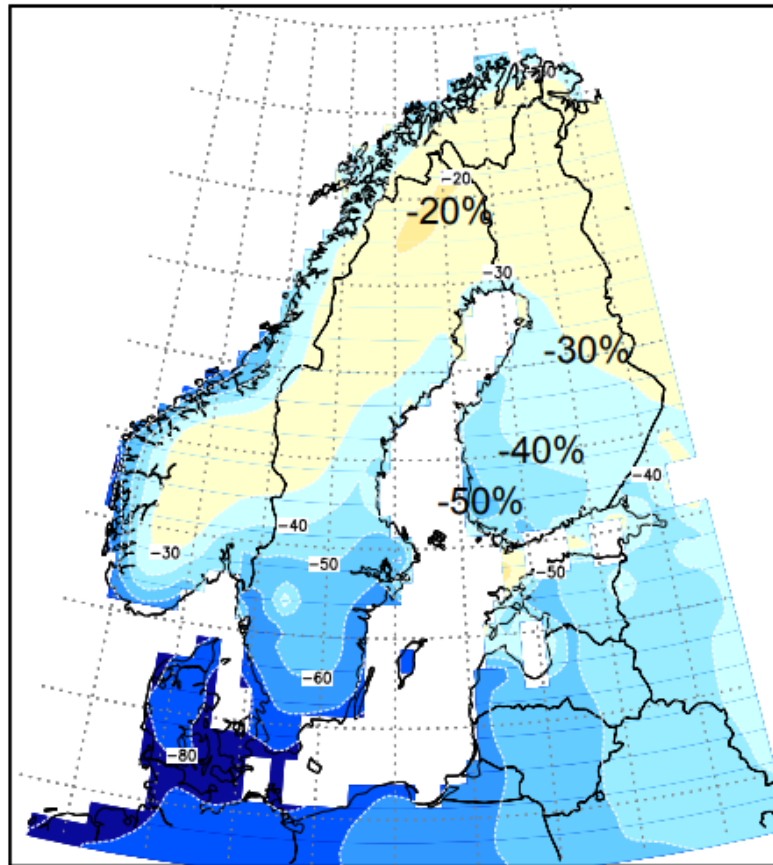


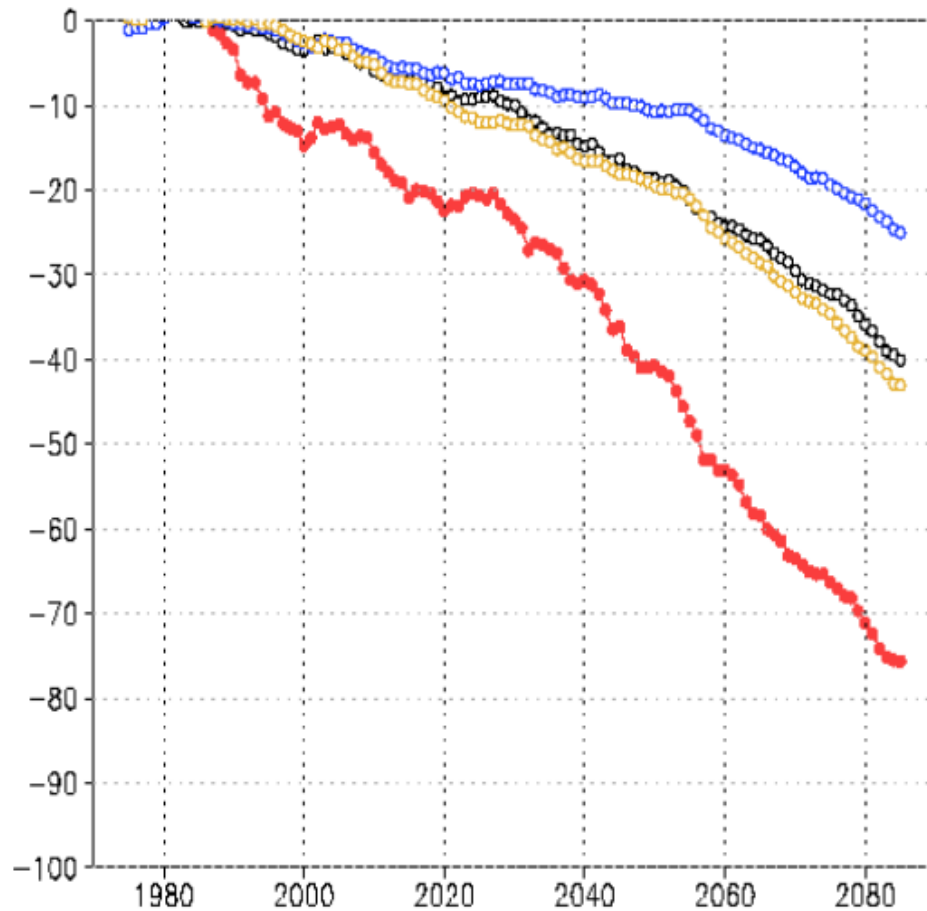
Figure 3.1 Mean annual snow cover duration over Arctic land areas from the NOAA IMS-24 daily snow cover analysis for the snow seasons 1998/99 to 2013/14.

Thinner snow cover and decrease of snow cover days expected



- *Decrease in snow cover days (%)
1961-1990 → 2071-2100, according to
A2 scenario*
- *Ilmasto-opas.fi:
If nothing is done on climate change, by
the end of the century snow depth will
decrease by 48 % in Sodankylä and by
78% at the Helsinki-Vantaa airport*

The decrease of snow cover days (%) in Northern Finland (appr. 67°N), according to the A2 scenario



- Red: October
- Black: December
- Blue: February
- Yellow: April

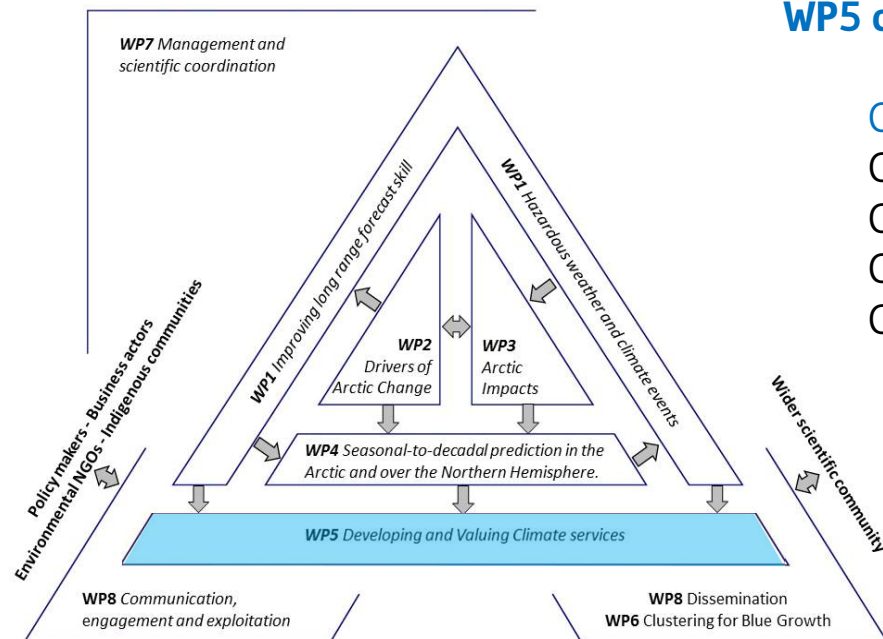
Downhill skiing as the “canary in the coalmine”

Snowmaking and snow storage are increasingly used as adaptive strategies in ski resorts



Photo: Ilona Mettiäinen 2017

Five case studies on climate services in the Blue-Action project (EU Horizon2020)



WP5 case studies co-design climate services for different fields:

- CS1 Winter tourism centers in Northern Finland
- CS2 Temperature-related human mortality in European regions
- CS3 Extreme weather risks to maritime activities
- CS4 Climate services for marine fisheries
- CS5 Yamal 2040: Scenarios for the Russian Arctic

More information: www.blue-action.eu

Climate services

The European Commission's Roadmap to Climate Services 2015:

"[T]he transformation of ***climate-related data*** — together with ***other relevant information*** — into ***customised products*** such as projections, forecasts, information, trends, economic analysis, assessments (including technology assessment), counselling on best practices, development and evaluation of solutions and any other service in relation to climate that ***may be of use for the society at large***. As such, these services include data, information and knowledge that ***support adaptation, mitigation and disaster risk management (DRM)***." (EC 2015)

- In short: **the provision of relevant climate related information in a way that is meaningful for the end-user and assists its decision-making**

“Given the societal and economic challenges generated by climate change, it becomes **increasingly important to include climate information in every day decision making.**

Climate services (CS) are helping organizations and companies to mitigate, adapt to, and become more resilient to climate change.”

“The market for climate services, however, is still in the early stages of development, with presumed gaps existing between supply and demand.”

Damm et al. 2019

Climate service for winter tourism industry

- Co-designed by a multidisciplinary team at the Arctic Centre, University of Lapland and Rukakeskus Ltd.
- Climate data: GCFS2 (DWD, UniHamburg)
- 6-month forecast on snowmaking conditions for the skiing season; other uses, too
- Piloting with Ruka with replicability in other resorts in mind after the project phase



RUKA Ski Resort in Northern Finland



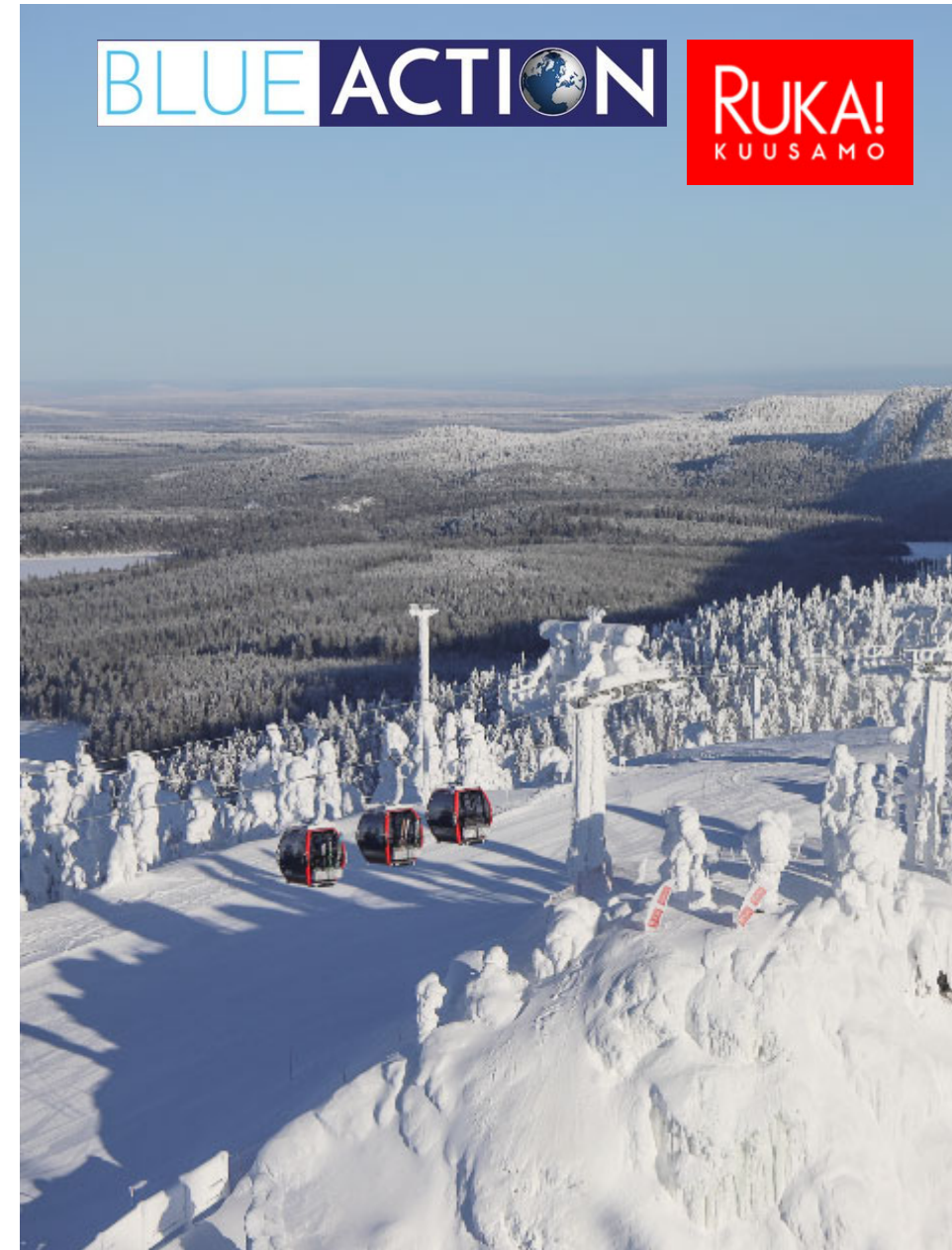
200 ski days per year

34 slopes

First to open slopes; opening of season in 2019 on 4th Oct

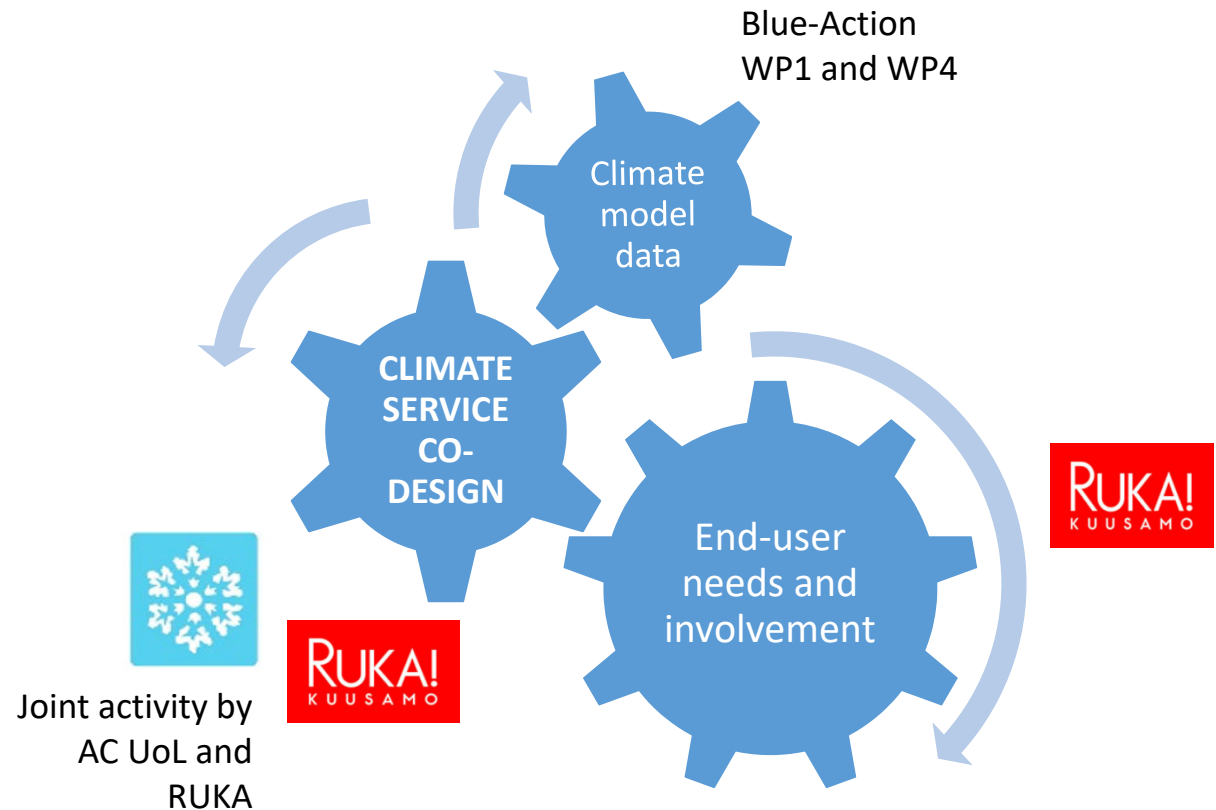
Family company with two resorts: Ruka and Pyhä

Forerunner in environmental programs; carbon neutral



Co-designing the climate service

- Close collaboration within the team
 - For understanding the knowledge needs and decision-making processes of Ruka
 - Iterative development of the service, constant feedback on user-friendliness and content



The Snow App (v 0.038)

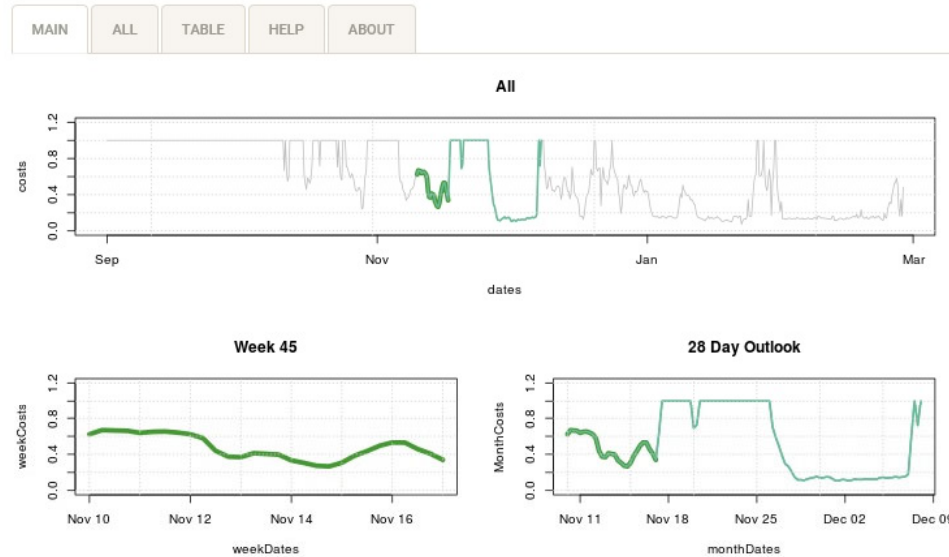
Week

1 11 24

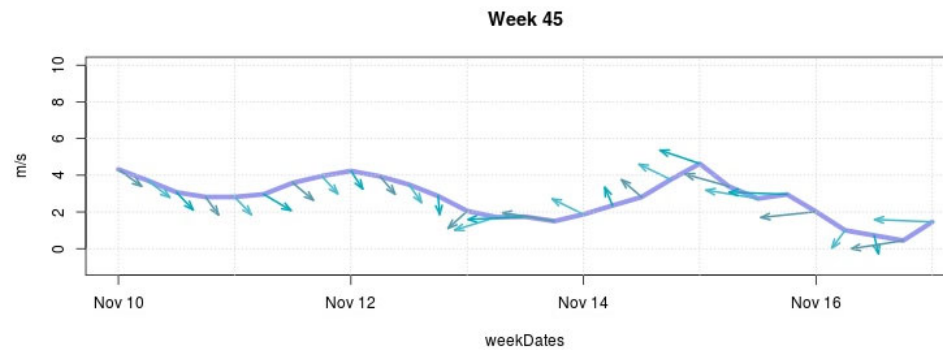
Centre weighting

Additional information

- None
- Windspeed
- Uncertainty
- Correction



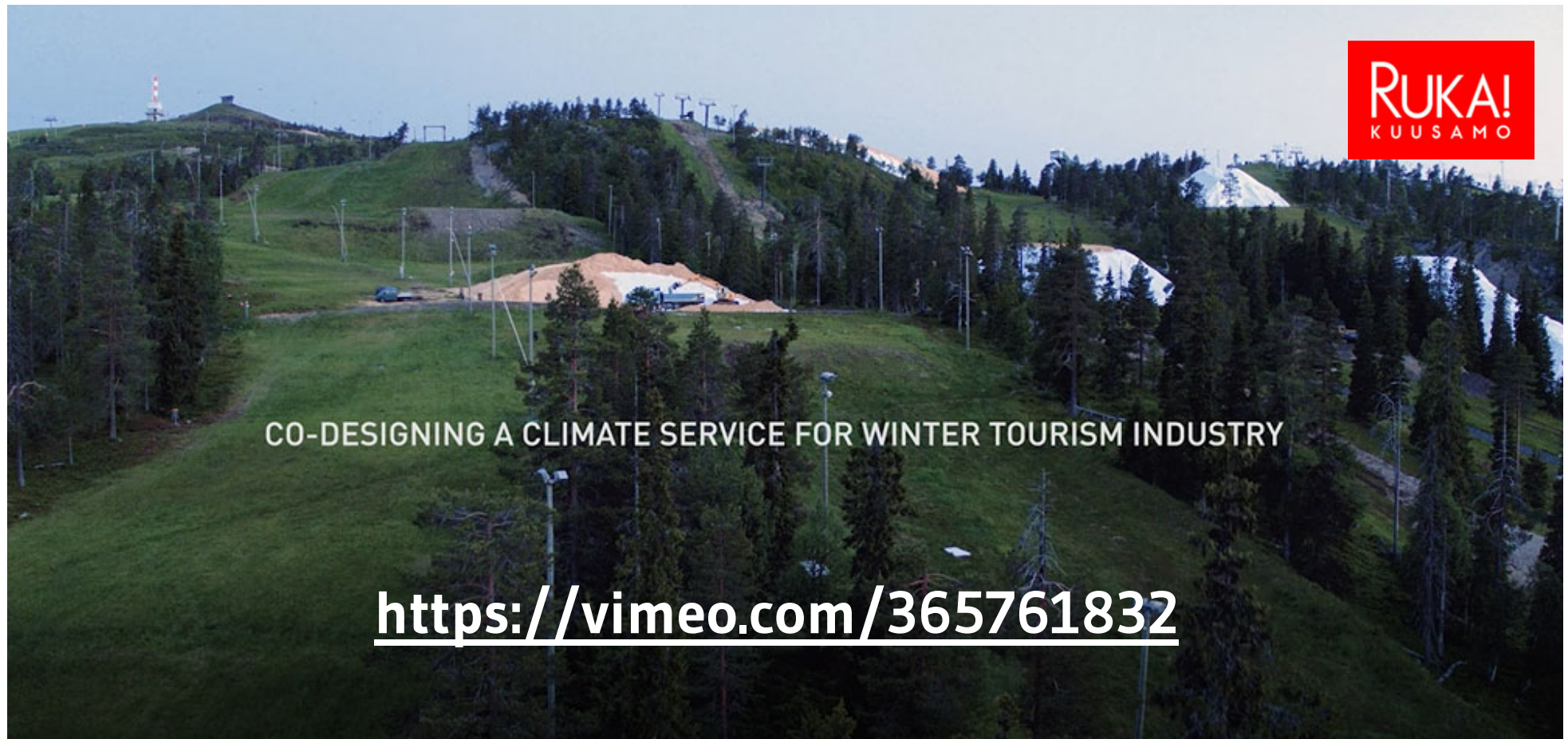
Additional



The App

Developed in R (Shiny)

Video on the climate service and the project





Thank you for your attention!

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