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Advanced prediction in polar regions and beyond

Case studies as a tool to co-develop climate services

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In a nutshell

Develop enhanced predictive capacity for weather and climate in the Arctic and beyond and determine the influence of Arctic climate change on Northern Hemisphere mid-latitudes, **for the benefit of policy makers, businesses and society**.

Participatory framework for climate services

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Empowerment

Tailored knowledge

CASE STUDIES

Engagement

Websites and web tools

Involvement

Interactive group activities

Adapted from Bojovic et al. (under review) and WMO's guidance for good practices for climate services user engagement (2018)

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Case studies

Increasingly used in the climate services field to provide descriptions of **particular extreme weather and climate events of interest for stakeholders** (e.g. affecting their businesses and activities) that occurred in the past over a specific location and time.

Wildfires rage in Arctic Circle as Sweden calls for help

Sweden worst hit as hot, dry summer sparks unusual number of fires, with at least 11 in the far north

▲ Firefighters battle a blaze in a forest in western Sweden, the worst-hit country. Photograph: Mats Andersson/EPA

Starvation deaths of 200 reindeer in Arctic caused by climate crisis, say researchers

Comparable death toll has been recorded only once before, says Norwegian Polar Institute

▲ An annual census of wild reindeer by the Norwegian Polar Institute found 200 had started to death over winter due to climate change. Photograph: Geoffrey Reynaud/Getty Images/iStockphoto

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Case studies

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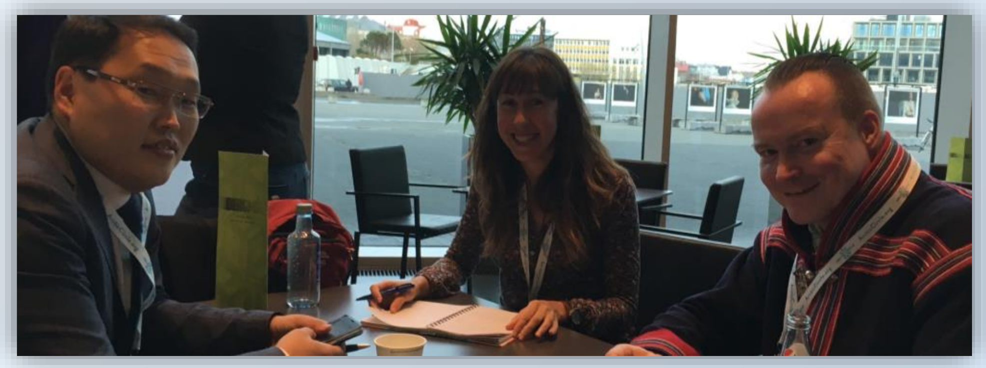
USER GROUP

BLOG POLAR PREDICTION MATTERS

https://blogs.helmholtz.de/polarpredictionmatters/

CASE STUDIES

CONFERENCES



OTHER PROJECTS

EU Polar Cluster

ECS

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Case studies

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Energy case studies

Risk management case studies

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Extreme events in the Arctic

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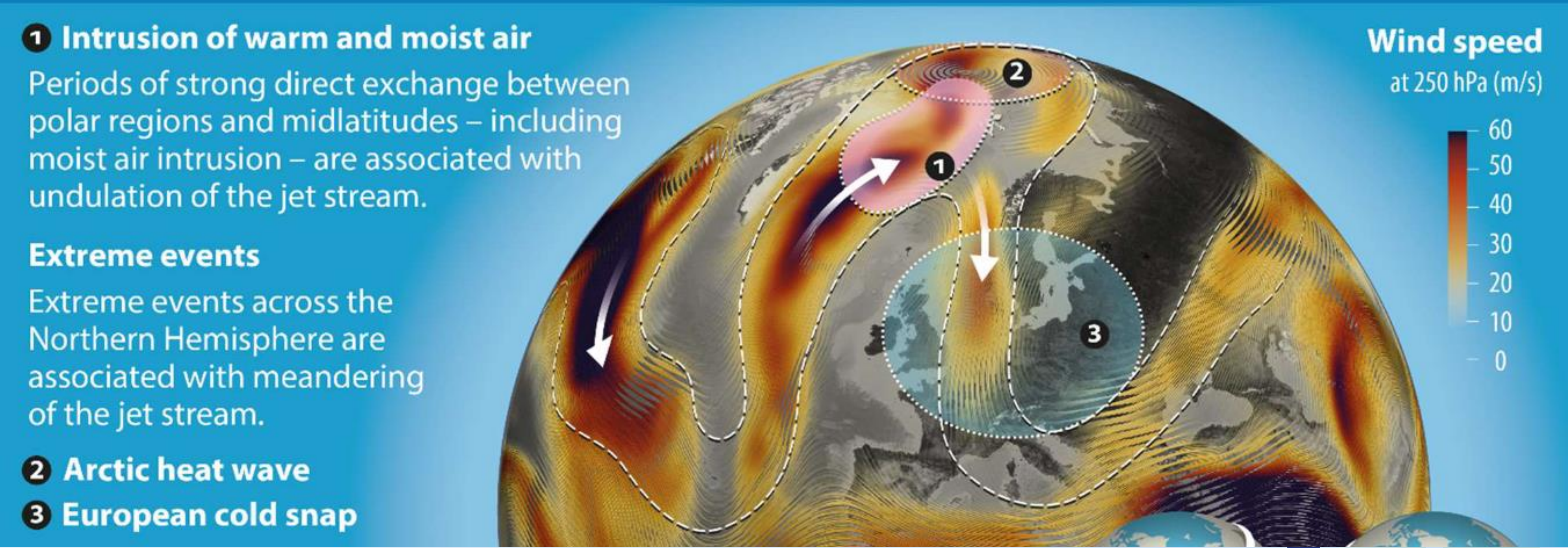

Source: *Alfred-Wegener Institute (AWI)*

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Case study: Extreme rainfall in Svalbard

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Learning from the past

1 Warm and moist air moving northwards

Large-scale flow pattern leading to extreme temperatures over Europe and the Arctic

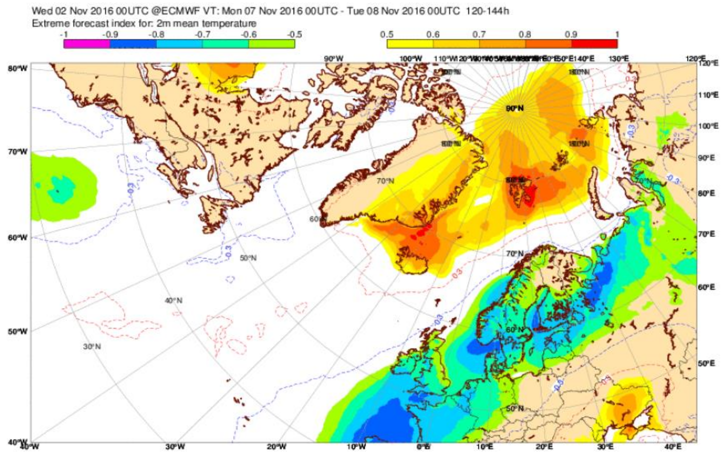
2 Extreme rainfall

Extreme precipitation in form of rainfall in Svalbard (rain-on-frozen ground event)

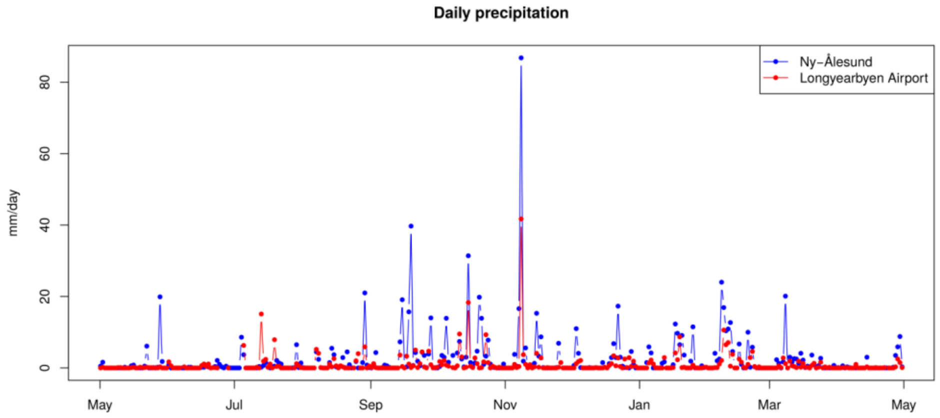
3 Landslides/ slush avalanches

- Ground ice production
- Landslides
- Slush avalanches

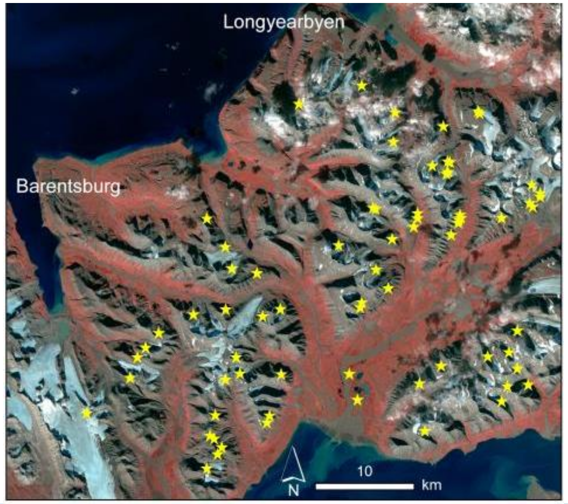
Extreme temperatures over the Arctic



Observed daily precipitation, 7 November 2016



Landslides and slush avalanches identified by satellite images



Case study: Extreme rainfall in Svalbard

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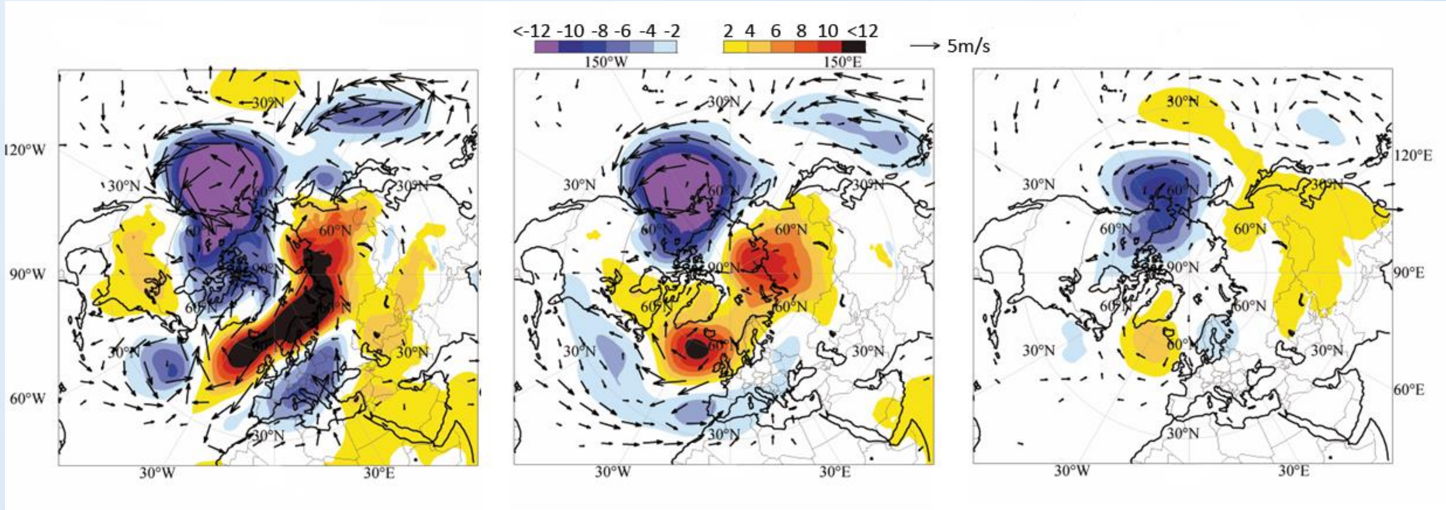
Preparing for the future

- Understand linkages between the Arctic and mid-latitudes
- Enhanced weather and climate information can support preparedness of local populations to deal with events that can be catastrophic
- Next: explore how these type of events will look like in the future.

Sub-seasonal predictions 1, 2 and 3 weeks in advance
(potential occurrence of rain-on-frozen ground)



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Lessons learned

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Learning from the past

- Event **identified by stakeholders**. Ask stakeholders to provide feedback and help in the dissemination
- **Physical processes** and underlying causes of the event
- **Impact on society** and the economy
- Explore **event attribution**
- Identify **research gaps**

Preparing for the future

- Assess the **predictability** of the event
- Assess the **added value of climate services** for the affected/benefitted stakeholders
- **Build narratives** of how the event will look like in the future

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Thank You!

You can find the APPLICATE projects case studies here: https://applicate.eu/outreach/case-studies

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