



Coping with rapid and cascading changes in Svalbard: the case of nature-based tourism

BalancingAct

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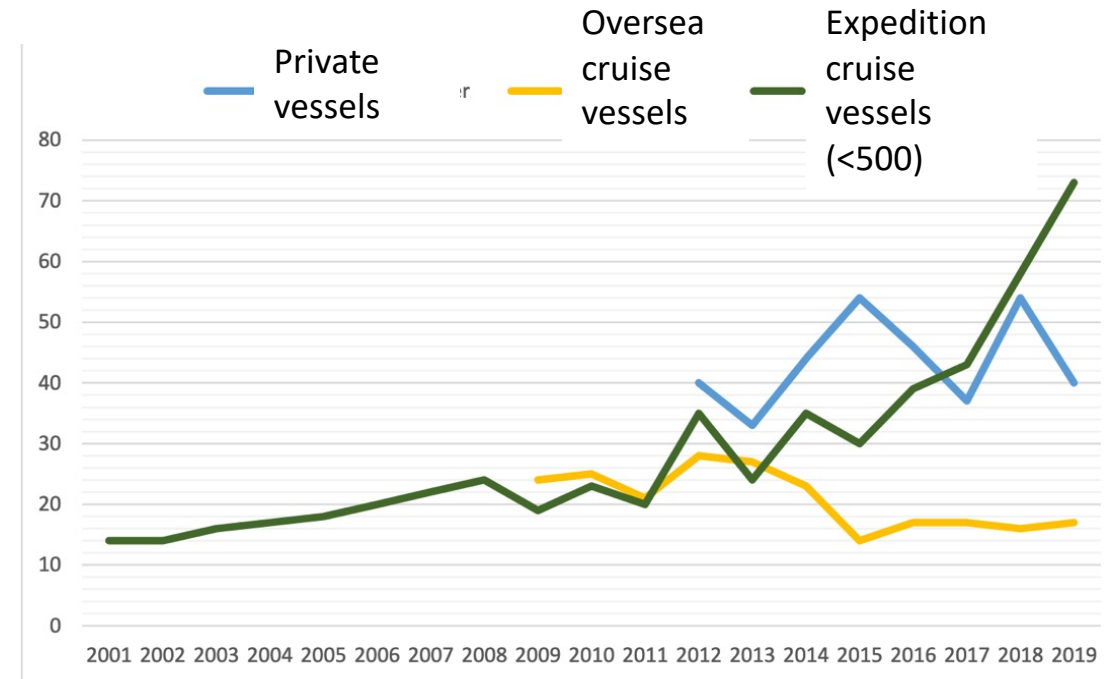
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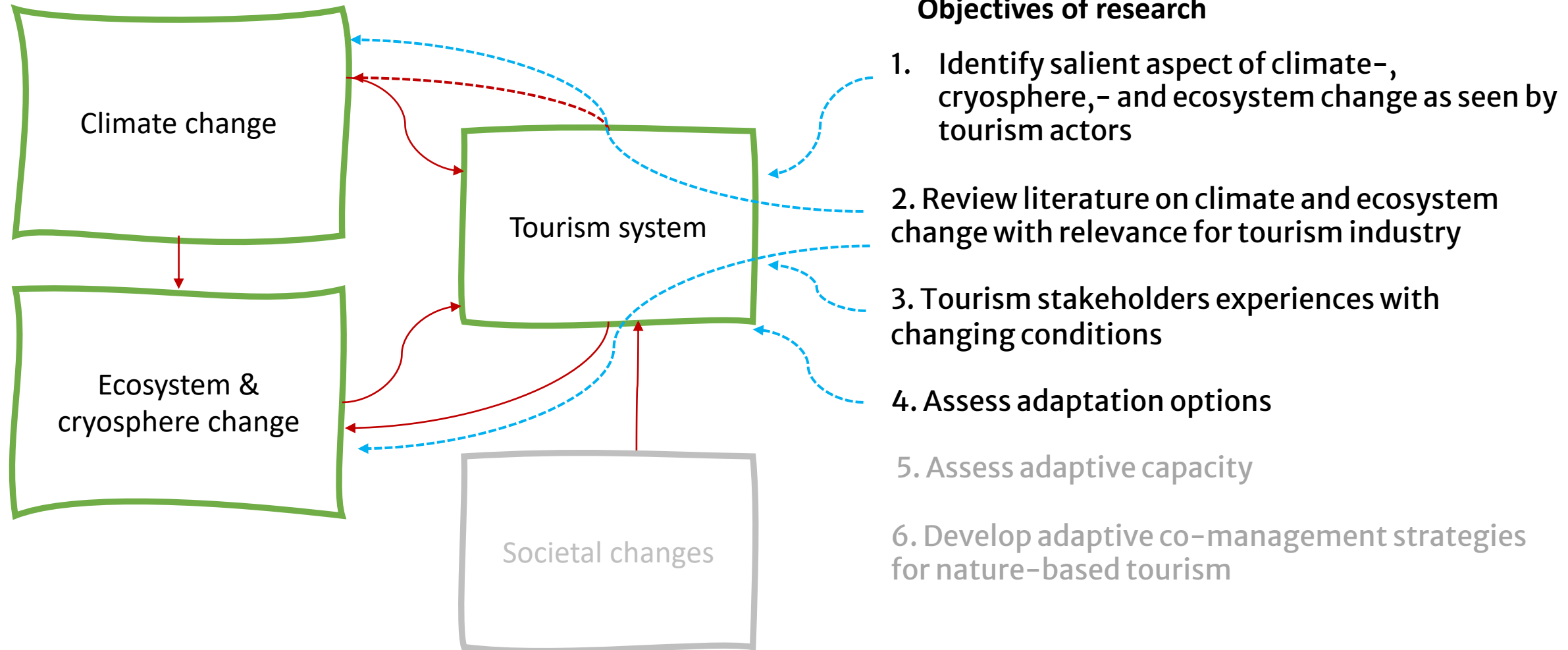
Recent trends in Arctic tourism

- Arctic tourism is increasing as a response to demand
- Shrinking sea ice enables maritime traffic in new places
- Highest growth in smaller «expedition» cruise tourism vessels (<500 pax).
- Tourism one of the greatest drivers of change in Arctic communities.
- Longyearbyen, Svalbard had close to 50.000 visitors on cruise ships in 2018.
- Market is bouncing back after the pandemic.
- Less ice = more opportunities for boating activities



NEA 2022

Climate and environmental change: Opportunities and challenges for tourism



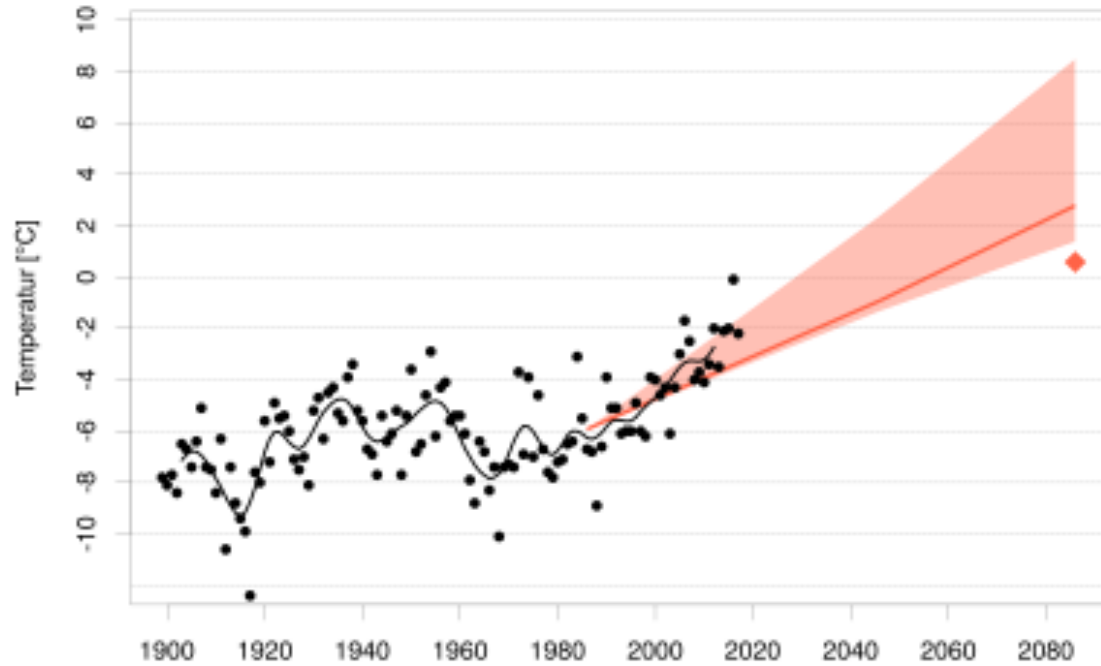
Methods and data – Svalbard case

- **24 interviews & two group interviews**
 - ▶ Tourism actors
 - ▶ Government officials
- **Literature review**
 - ▶ Climate and environmental change in Svalbard
- ▶ **The case – The tourism industry in Svalbard.**
 - ▶ The destination company Visit Svalbard has 80 members, of these 35 offer guided trips
 - ▶ Day tours: snow mobiles, hiking, skiing, dog sledding, glacier walks, boat trips
 - ▶ Multi day tours: skiing, hiking, dog sledding, ski and sail, expedition cruise, kayak trips.
 - ▶ Largest segment are expedition cruises, mostly operated by companies located elsewhere.

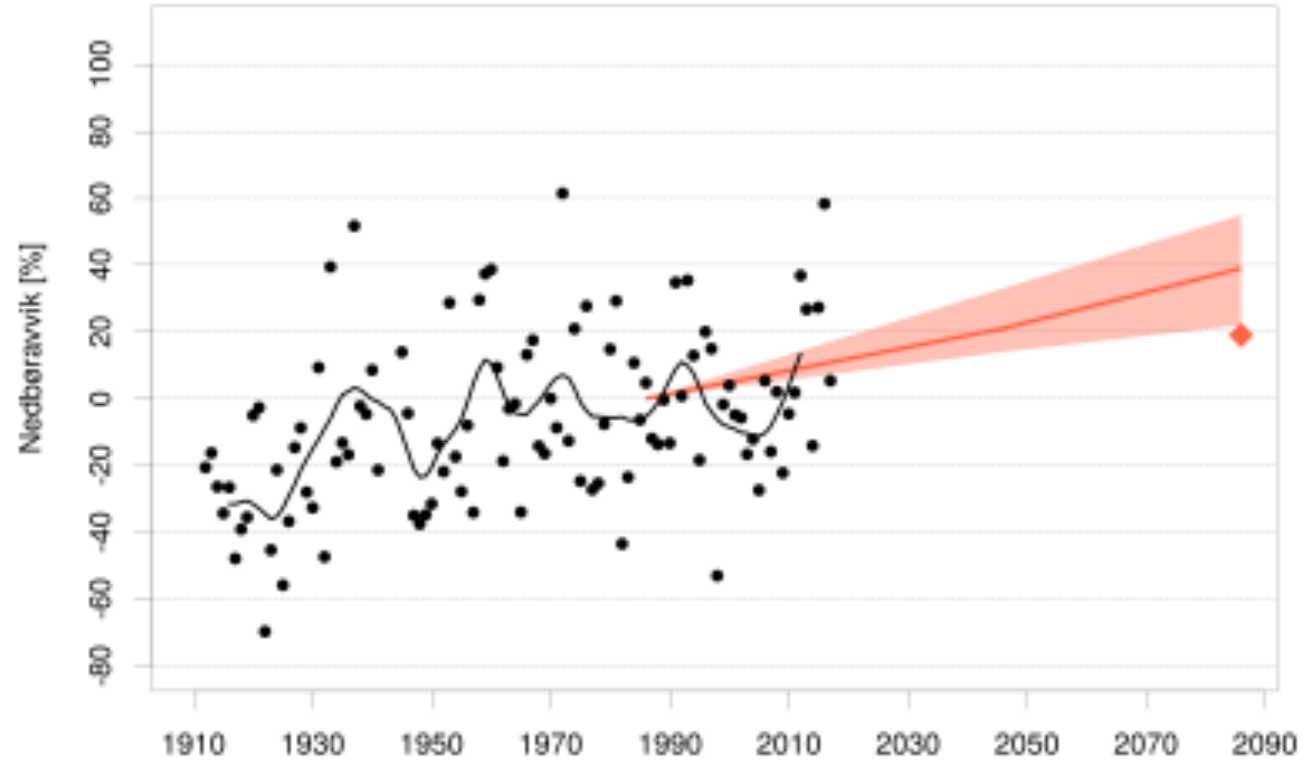


Climate change in Svalbard

Temperature 1900-2100



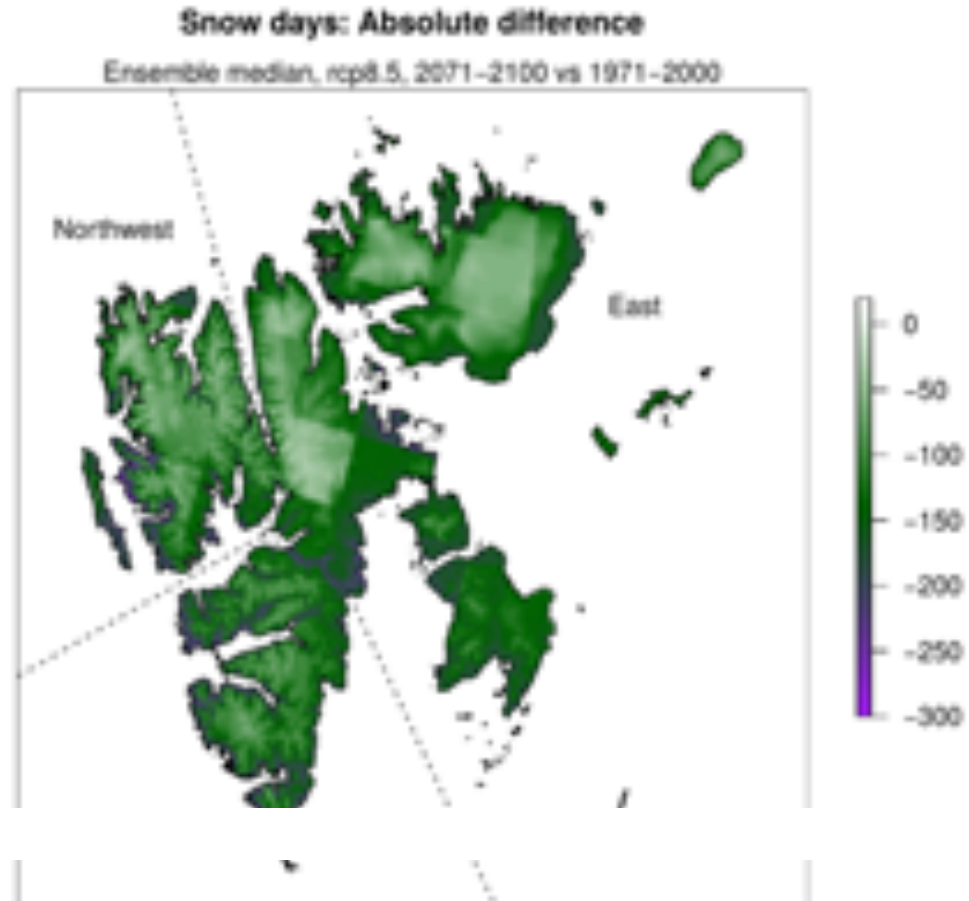
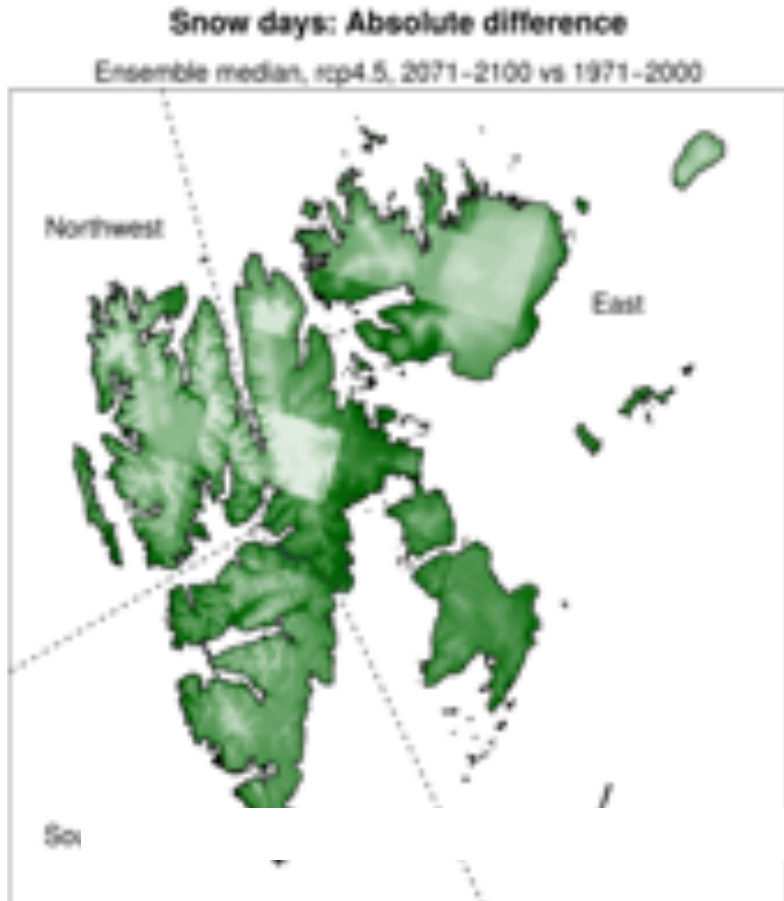
Precipitation 1900-2100



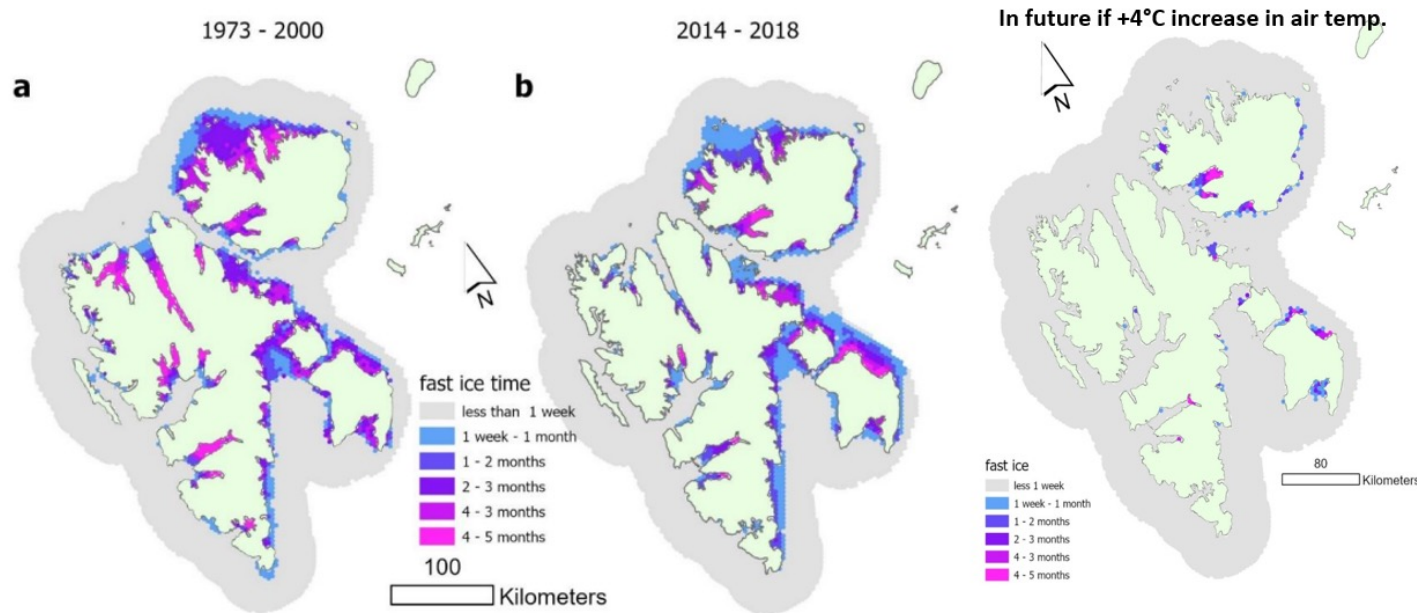
Changes in snow days

RCP 4.5

RCP 8.5



Projected future sea ice changes



Strong decline in sea ice. Half the sea ice extent today compared to 1973-2000 (Urbanski and Litwicka, 2021)

Changes in marine ecosystems and coastal systems

- Increased coastal erosion with implication for ecosystems and cultural heritage (e.g. Nicu et al. 2021)
- Coastal darkening – increased sediment load and pollutants due to increased river run-off and melting permafrost (McGovern et al. 2019)
- Atlantification of the flora and fauna and larger risk for invasive species to establish themselves in the high-Arctic (Ingvaldsen et al. 2021)
- Increased exposure to new pathogens due to increased ocean temperatures and new species introduced.



Climate change impacts on glaciers

- Accelerated glacier melting and calving (Schuler et al. 2022, Geyman et al. 2022).
- Doubling of mass balance loss of glaciers by 2100 (Geyman et al. 2022)

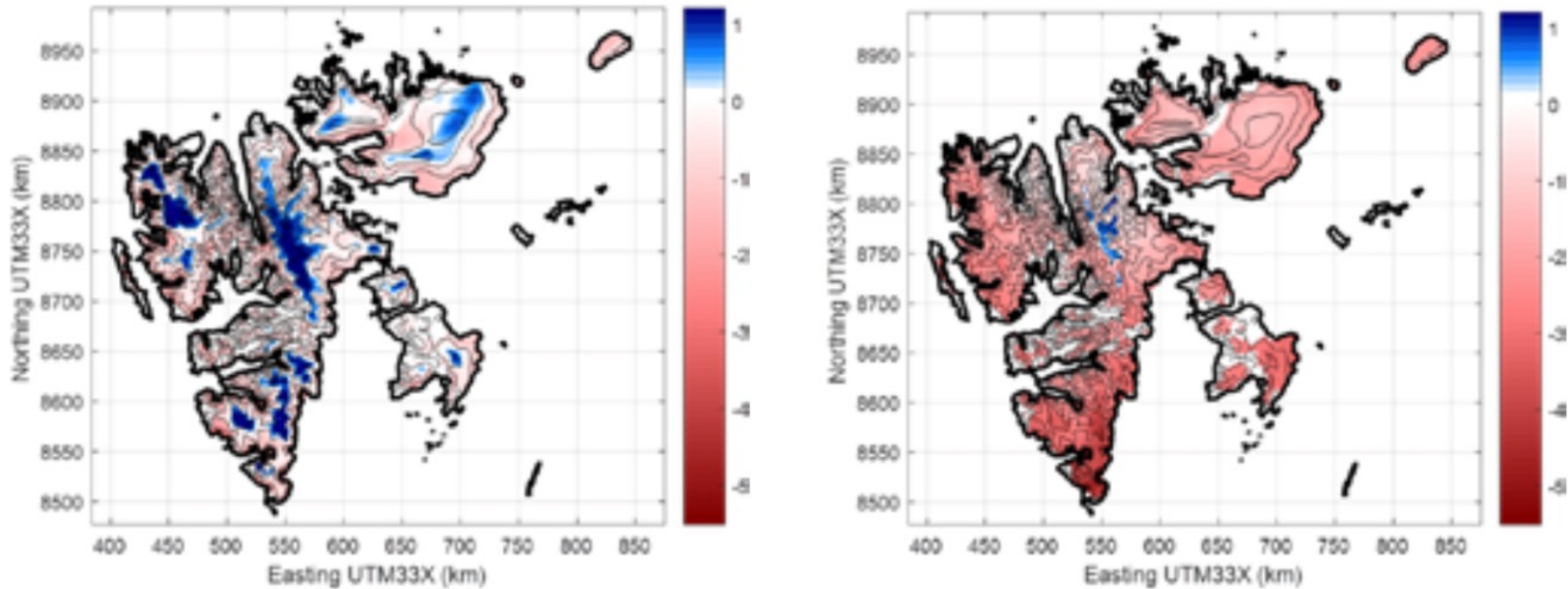
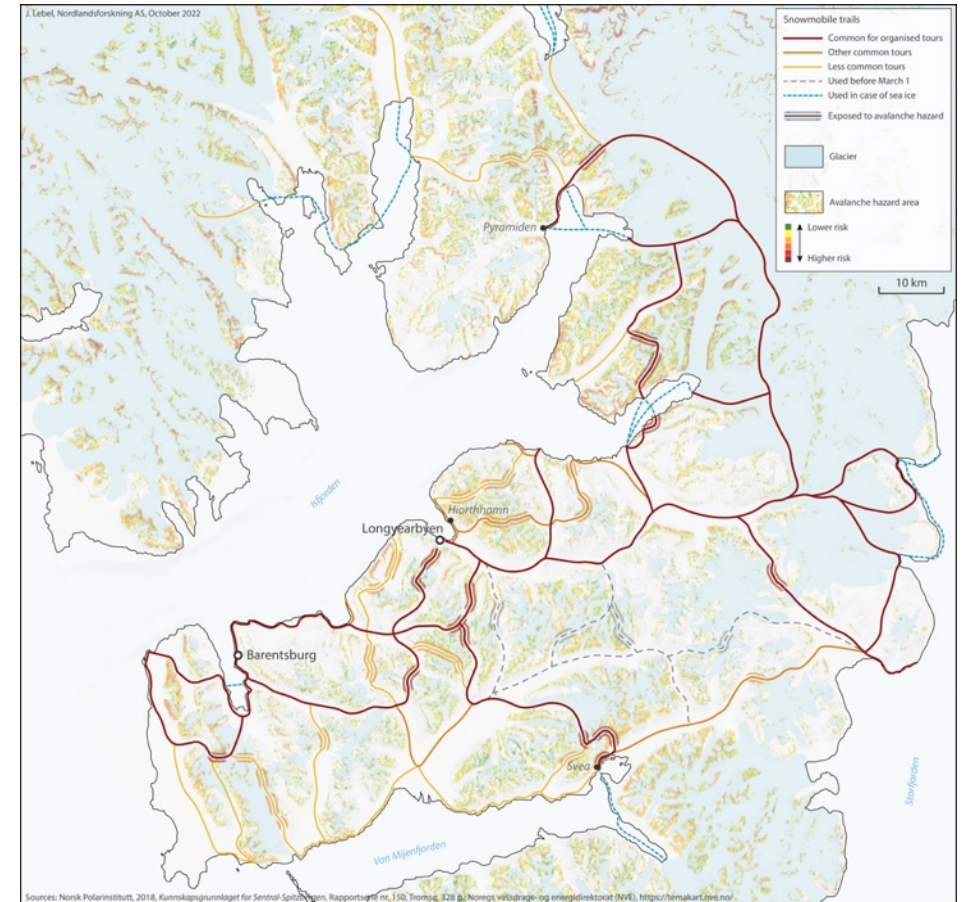


Figure 6.6.2: Mean mass balance (m w.eq. yr⁻¹) simulated for the time periods a) 1971-2000 and b) 2071-2100.

Natural hazards

- **Avalanches** will increase as a consequence of increased precipitation and warmer weather (Hanssen-Bauer et al. 2019). Avalanches is regularly causing accidents in Svalbard.
- **Landslide and flood** risks is also increasing, but its mostly a threat to infrastructure.
- **Storms/strong wind:** The warming of the Barents sea region is expected to cause an increase in strong winds (>10m/s) nort and east of Svalbard (+10%), and a reduction in south west due to shrinking sea ice

(Hanssen-Bauer 2019 et al.)



Snow mobile routes around Isfjorden and avalanche risk

Julien Lebel, Nordland Research Institute.
. Map layers from Norsk Polarinstitutt and NVE

Observed changes and impacts

- Winter is coming later – *<<before, snow that fell in september would not melt until the spring>>*.
- Autumns lasts longer, before winter could start in september. *<<Now we have summer season products in september.>>*
- Loss of landfast fjord ice in Western Svalbard has enabled a new cruise tourism season (March–May)



Photo: Ken Pettersen/Breogfjell Mountain Guides

Observed changes cont.

- «*More pleasant to be outside in winter, its nice*». But also rainfalls in winter, «never» happened before.
- More snow – but shorter season
- More avalanche risk (but also more awareness due to forecasting and training). Increased frequency in cancelled trips between Longyearbyen and Barentsburg
- Shorter snow season – snow mobiles forced to travel on glaciers – exposure to crevasses and harsher weather.



Ecosystem change, wildlife and tourists

- More polarbear sightings in Isfjorden
- More wildlife: *"My impression is that the wildlife in Svalbard has become extremely more rich the last 20 years". "Before we did not see whale in the Isfjorden, now you cant go on a boat trip without seeing one". "Four-fold increase in reindeer".*
- Increased boat traffic carries risk of collision with sea mammals and birds.



Photo: H. Dannevig

Summarizing impacts and adaptations

- Longer summer season – less fjord ice and later onset of winter allows for a longer boating season from april to september, driven by increased demand.
- Less sea and fjord ice enables increase in boat based tourism and new products.

General impressions from interviews:

- Changes is not having any major negative impact
- Industry can adjust and adapt to the current and projected changes.
- The industry is more vulnerable to changes in legislation.

Next step

- Understanding adaptive capacity + indicators for local sustainability
- Develop adaptive co-management strategies





VESTLANDSFORSKING



Photo: Endre F. Gjermundsen

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Thank you for listening!

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with

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