

ARCTIC MONITORING AND ASSESSMENT PROGRAMME

About AMAP

Rolf Rødven, Executive Secretary

AMAP
Arctic Monitoring and
Assessment Programme

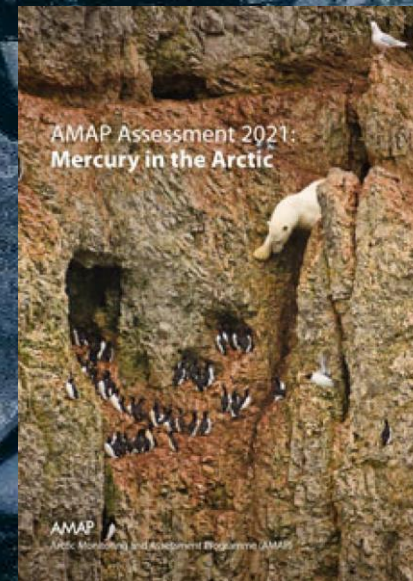
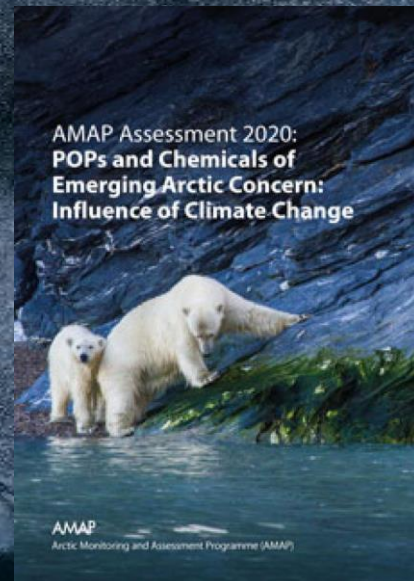
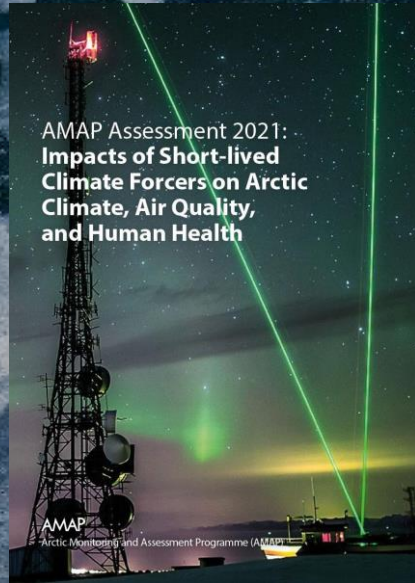
AMAP Mandate:

"to monitor the levels of, and assess the effects of, anthropogenic pollutants in all components of the Arctic environment."

"... assessment of the effects of [...] climate change on Arctic ecosystems."

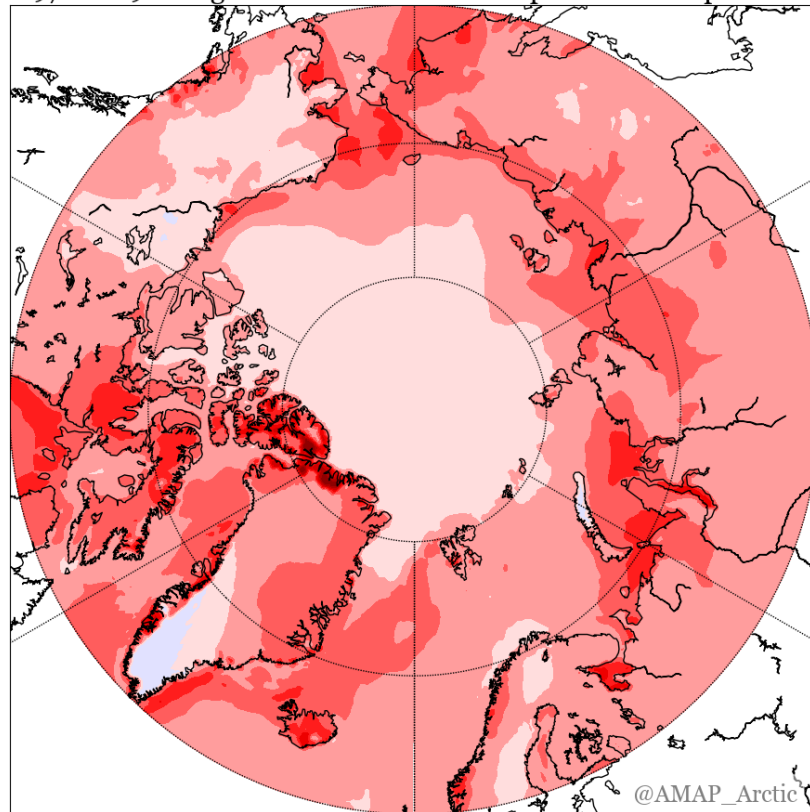
"... human health impacts and the effects of multiple stressors."

AMAP Scientific Assessments 2021



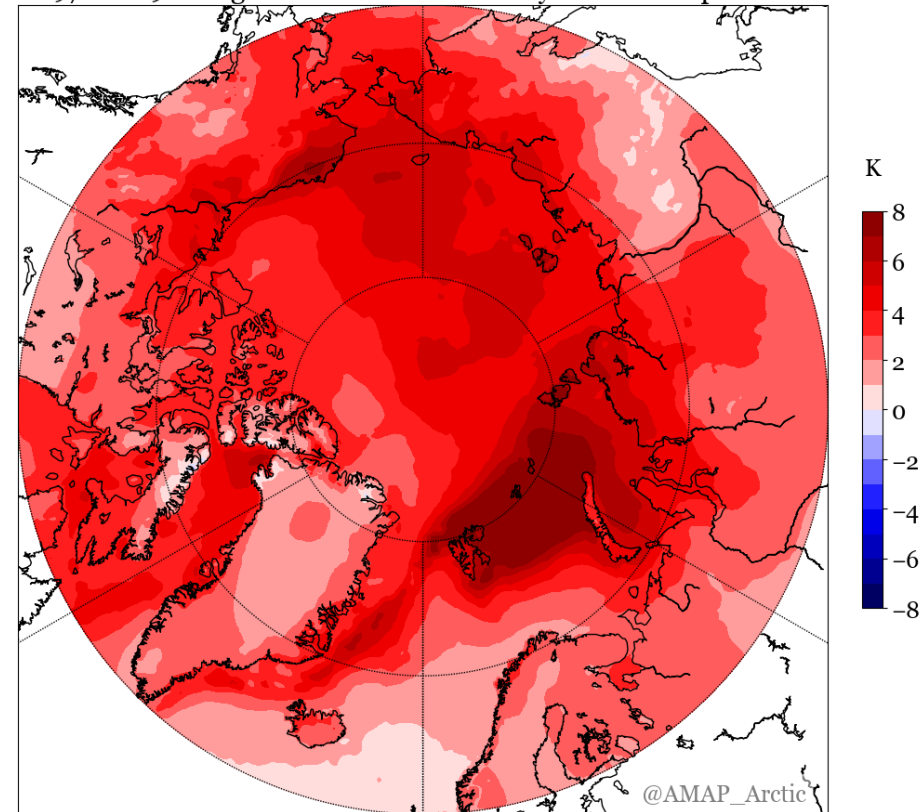
The Arctic is getting warmer during the 'warm' season

1971-2019 change in warm season Jun-Sept 2 m air temperature



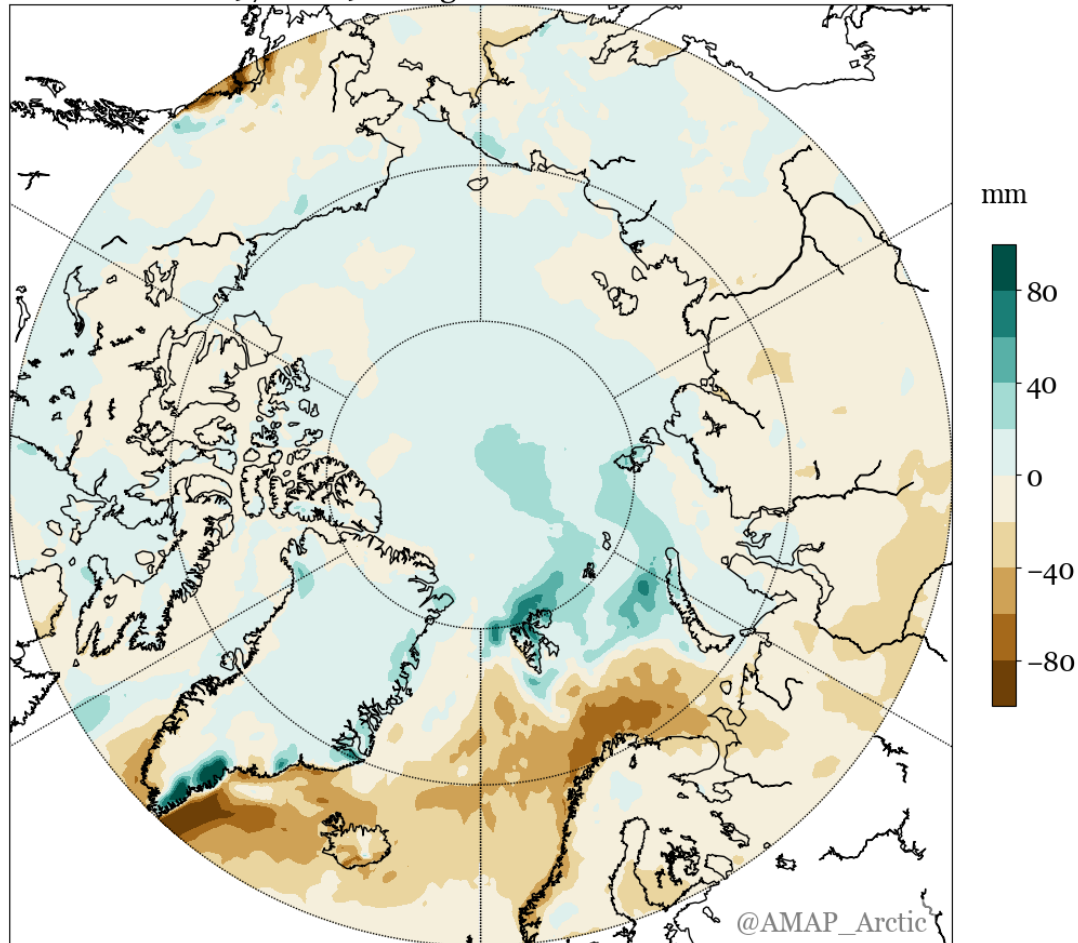
The Arctic freeze-up season is getting warmer even faster

1971-2019 change in cold season Oct-May 2 m air temperature



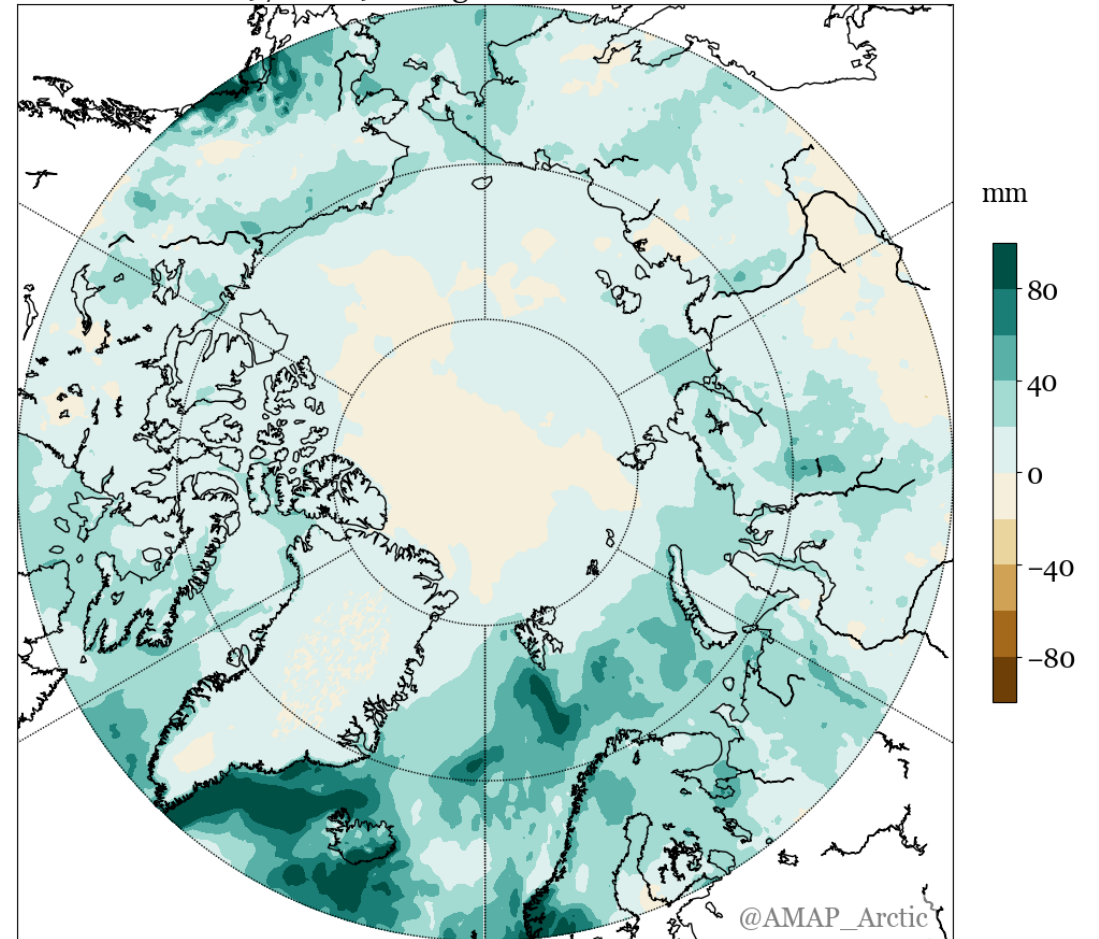
Snowfall patterns are changing

1971-2019 change in annual snowfall



Arctic rainfall is increasing

1971-2019 change in annual rainfall



River ice is getting thinner

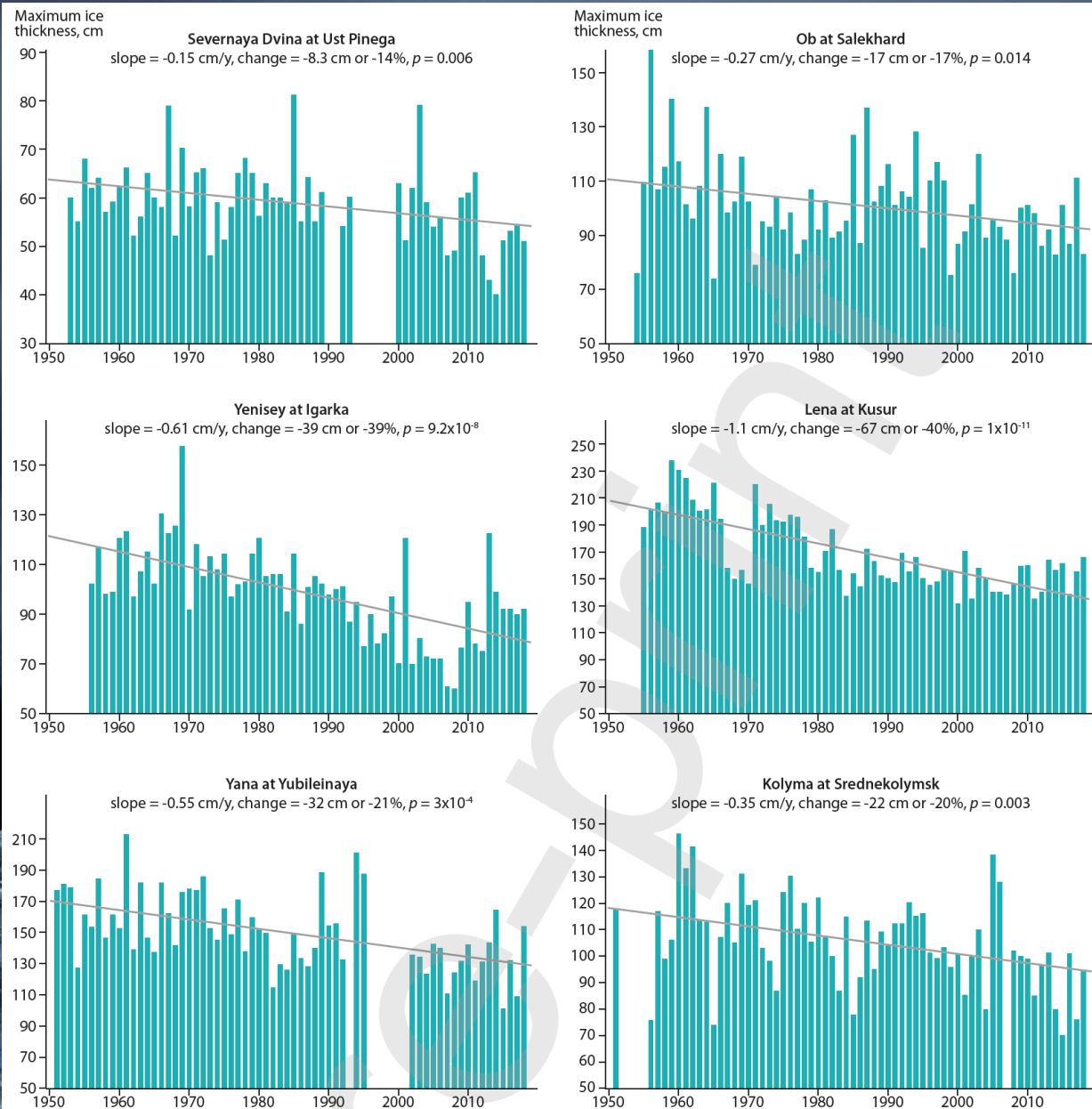
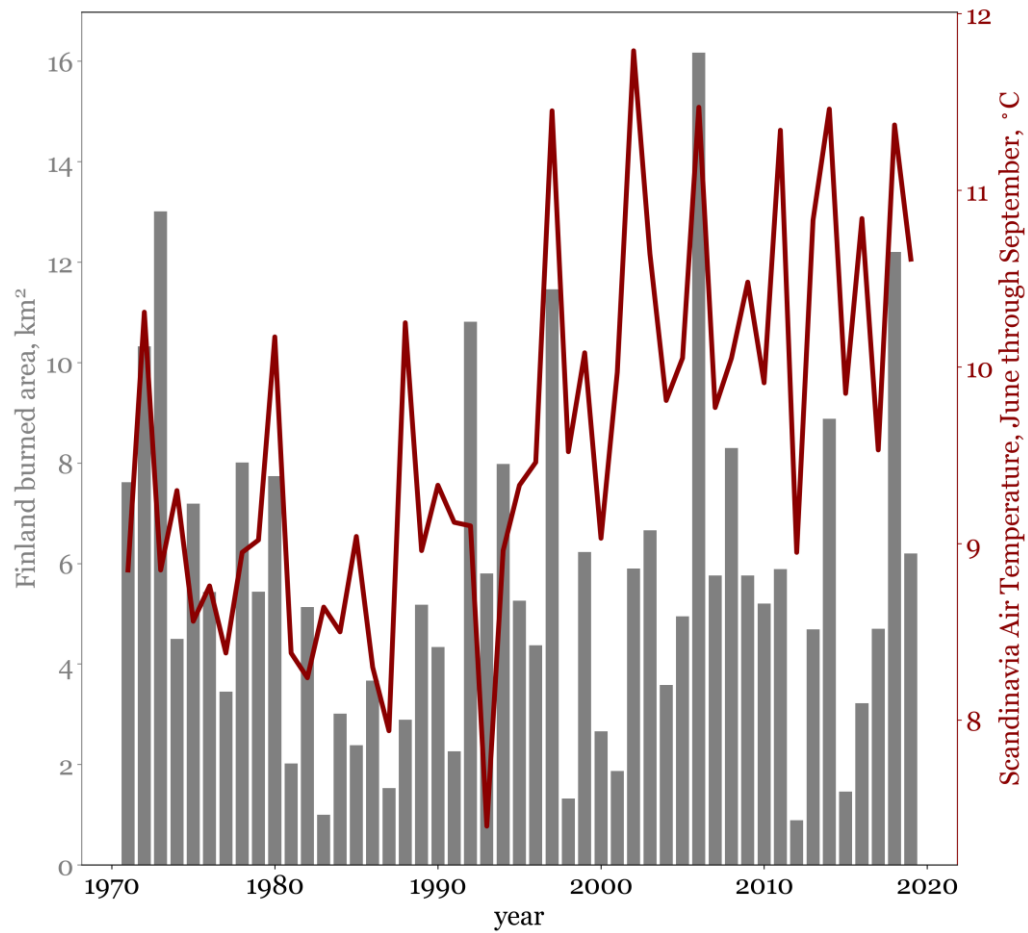
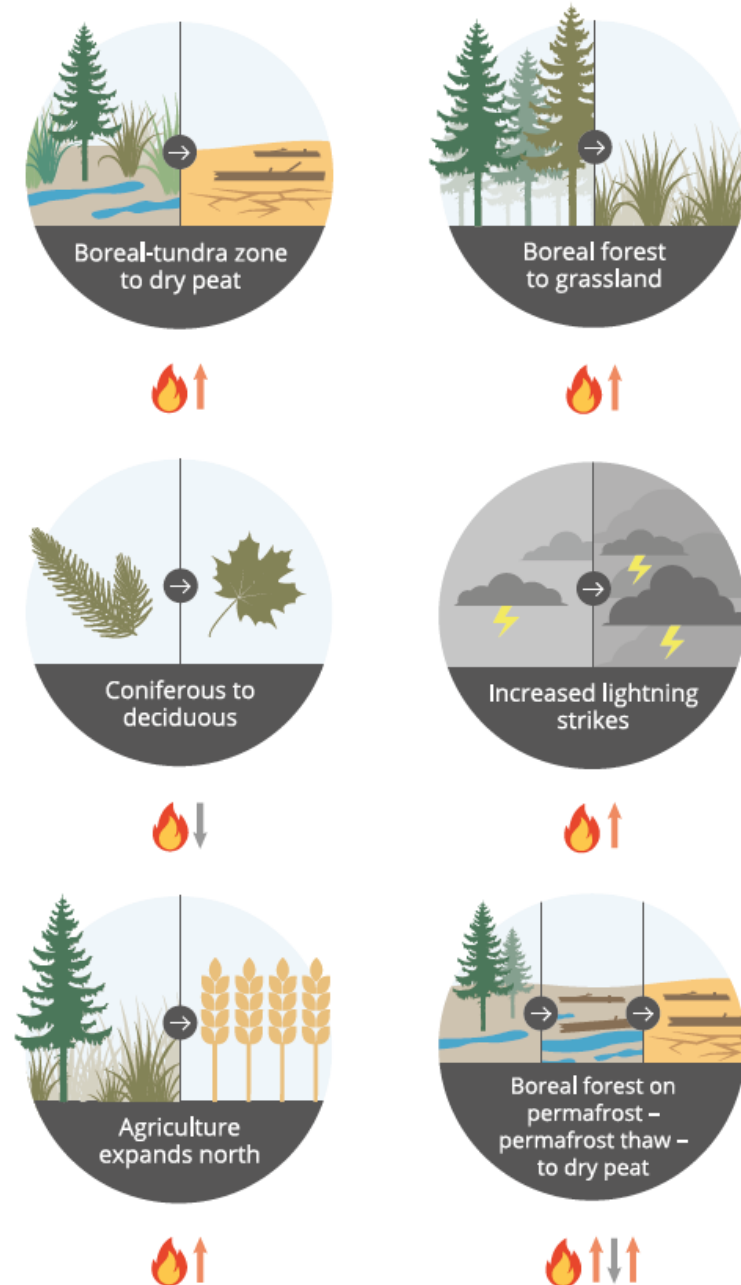


Figure 2.11 Maximum winter ice thickness for six major Arctic Russian rivers for the period 1955 to 2018. Multiple trend metrics are presented: the annual linear regression-derived slope, the change equal to the slope multiplied by the number of years, the percentage equal to the change divided by the number of years, expressed as a percentage and the p -statistic which describes the probability that the trend is a false-positive. Linear trend in river-ice thickness is shown as a solid line (updated from Shiklomanov and Lammers, 2014).



Most of the years with large areas of maximum wildfire burns correspond with extremely high near-surface air temperatures during the melt season



Indigenous access to and quality of traditional food has declined

1. **Travelling** has become less safe for wildlife hunting and fishing



Increased need for search and rescue operations

2. **Shorter season** for hunting, fishing and dog sledding on frozen land and water



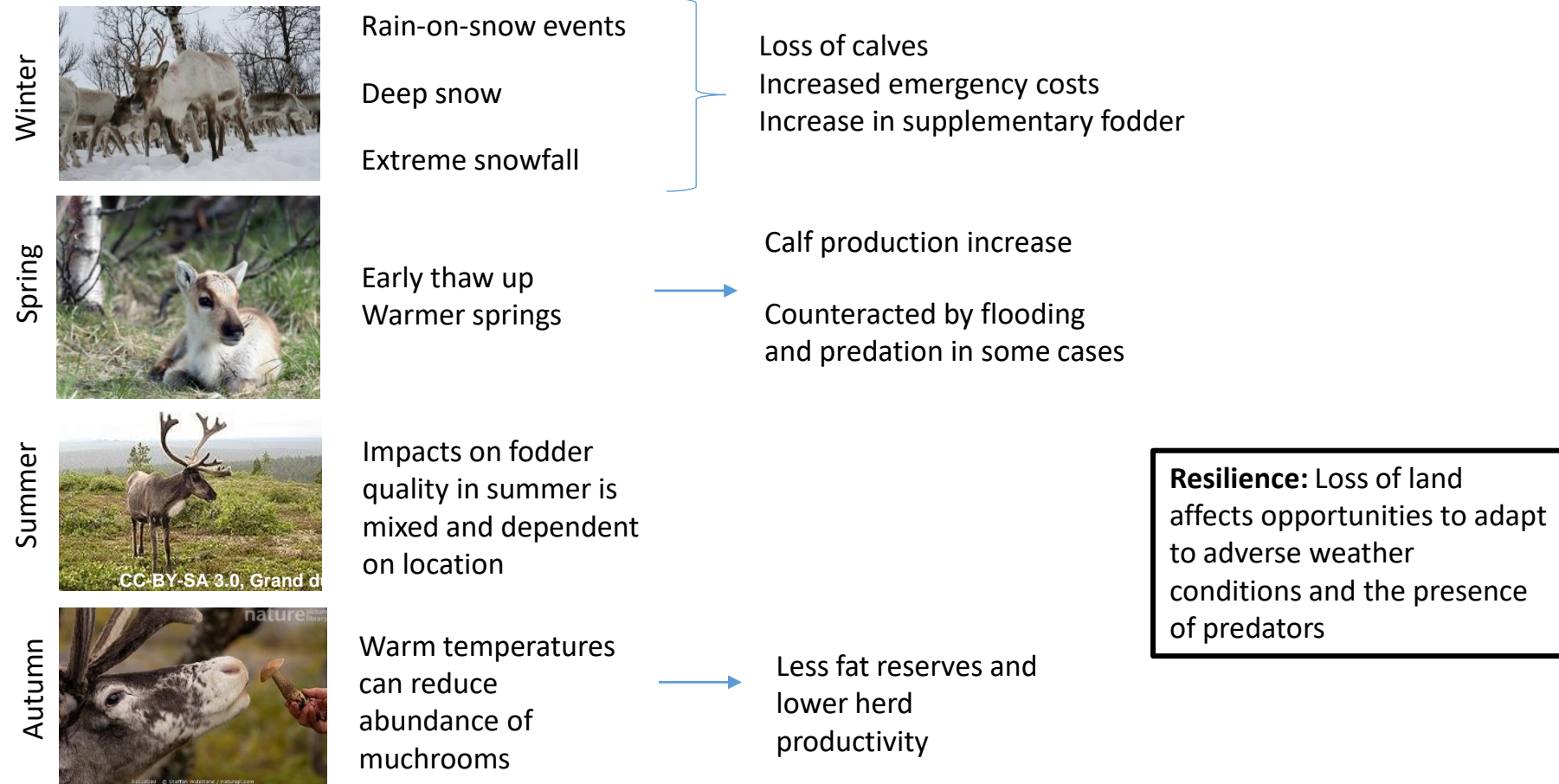
3. **Wildlife availability and timing of migrations** has changed



4. **Food quality and storage** in ice cellars has suffered from warmer winters, heavy rainfall, and rapid snowmelt

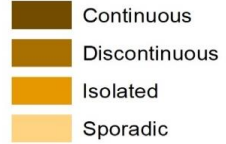


Climate change impacts on reindeer pastoralism on the different seasonal pastures

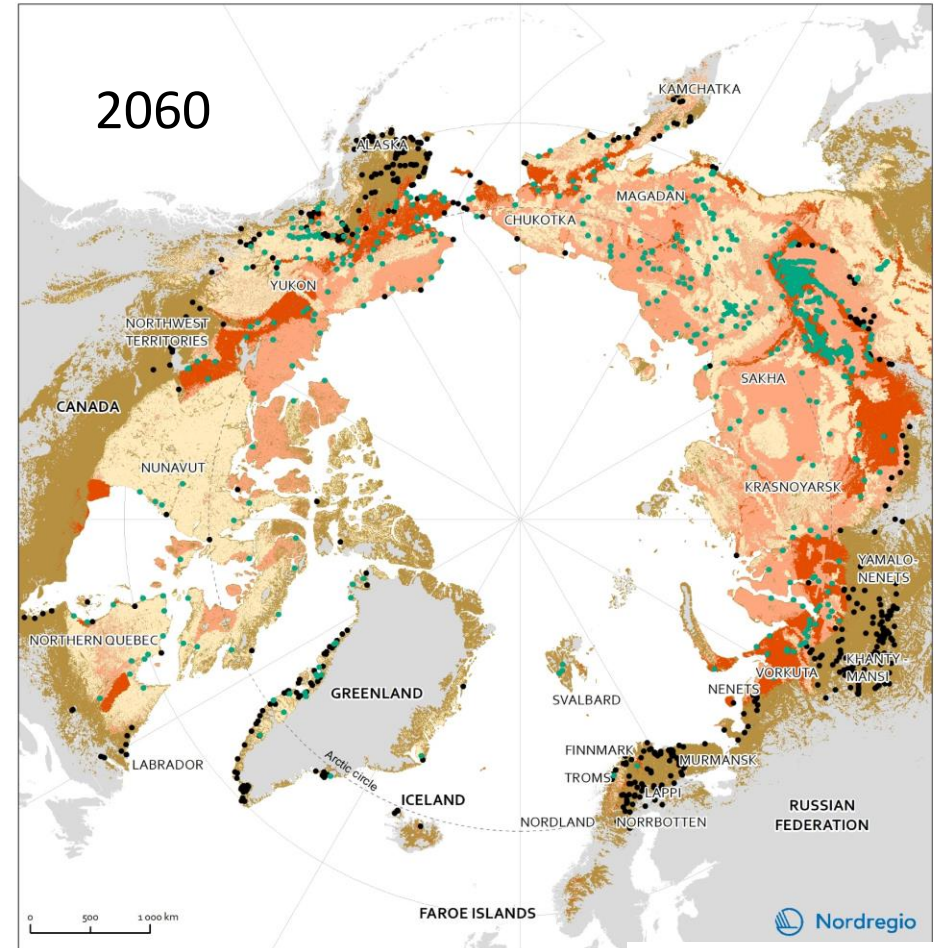
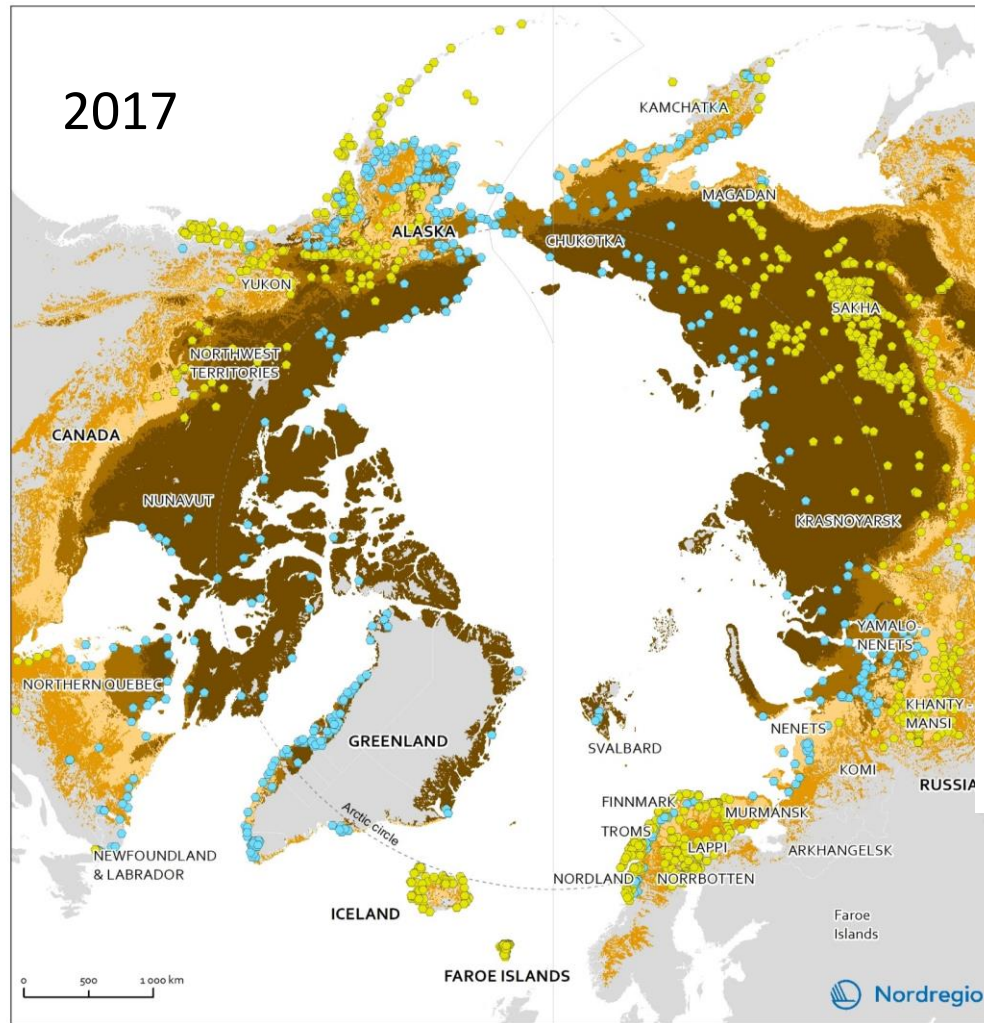
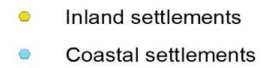


Permafrost thaw, settlements

Permafrost zones



Permafrost settlements



Hazard zones (2060, RCP 4.5)



Permafrost settlements

- Permafrost settlements by 2060
- Permafrost settlements in 2017

Coastal erosion, permafrost thaw and land collapse have damaged housing and infrastructure.



Two-thirds of all Arctic settlements are located in permafrost regions

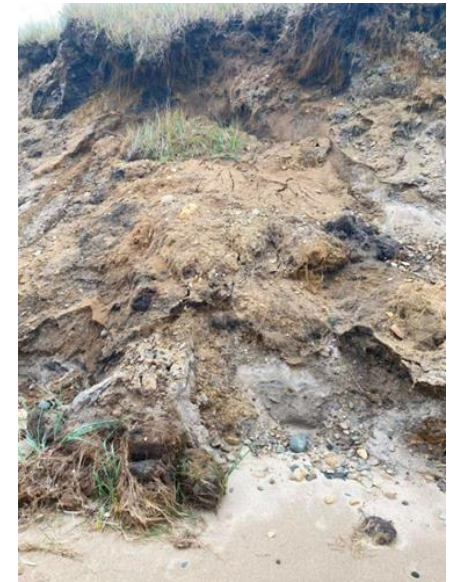
Stability of permafrost support for buildings and infrastructure has declined by about 17%



Svalbard: About 250 homes, traditionally built on wooden beams resting on permafrost, are to be demolished and housing relocated



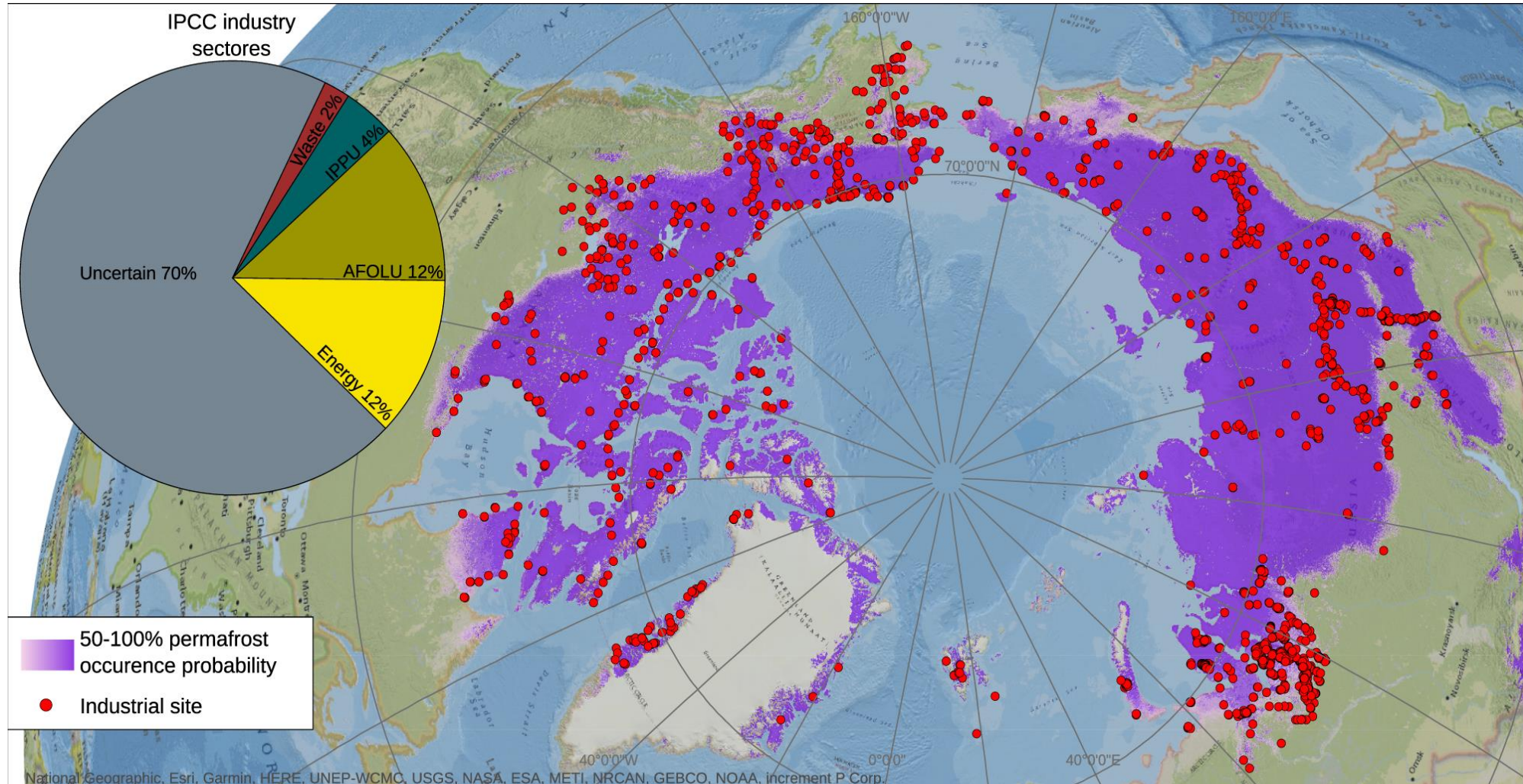
Eurasia: Warmer winters have co-occurred with extreme snowfall or heavy rainfall, increasing the risks of avalanches, road destruction, spring flooding, and landslides



Release of pathogens and pollutants resulting from permafrost thaw



Permafrost thaw, contaminated sites



Langer et al., Thawing permafrost poses environmental threat to thousands of sites with legacy industrial contamination, *Nature Communications*, 2023, 14:1721, <https://doi.org/10.1038/s41467-023-37276>.

CHANGES IN CLIMATE



Rising global temperatures



Extreme weather & disasters



Changes in seasons



Precipitation extremes



Sea-level rise

EFFECTS OF CLIMATE CHANGE



Extreme heat



Local species & ecosystems



Food and water quality



Pathogen distribution & ecology



Air quality & allergens

HEALTH OUTCOMES



Heat-related illness



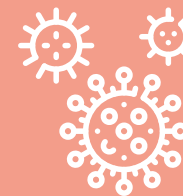
Injuries & death



Mental & psychosocial health



Noncommunicable diseases



Infectious disease

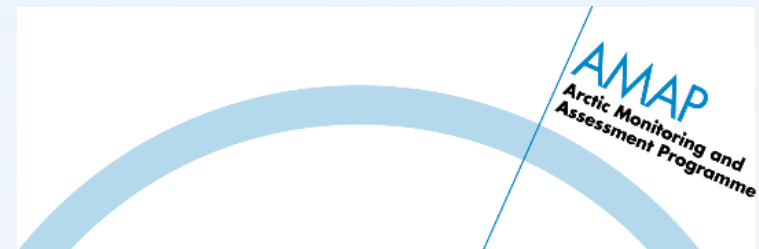
CITE – Climate Impacts on Terrestrial Environments



Create a digital tool for herding communities for systematic documentation of herders' observations and experiences related to observed changes on their land; and to facilitate the collection, sharing and communication of environmental data;



S Á M I R Á Ð Ð I
SAAMELAISNEUVOSTO
SAMERÁDET
COHO3 CAAMOB
SAAMI COUNCIL



An aerial photograph of several icebergs of various sizes floating in a dark blue ocean. In the upper center, a satellite is visible against the black background of space. The text 'THANK YOU' is centered in the middle of the image in a large, white, sans-serif font.

THANK YOU

www.amap.no

A light blue curved graphic element at the bottom of the page, partially overlapping the AMAP logo. The logo consists of the acronym 'AMAP' in a large, bold, blue font, with the full name 'Arctic Monitoring and Assessment Programme' written in a smaller, black font below it.

AMAP
Arctic Monitoring and
Assessment Programme