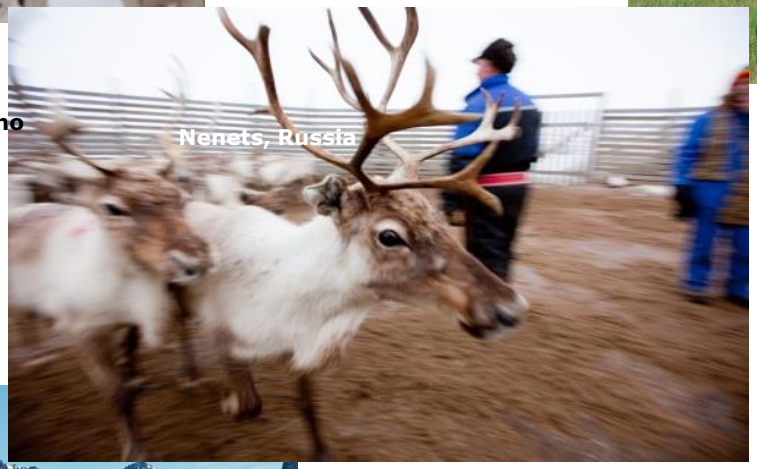
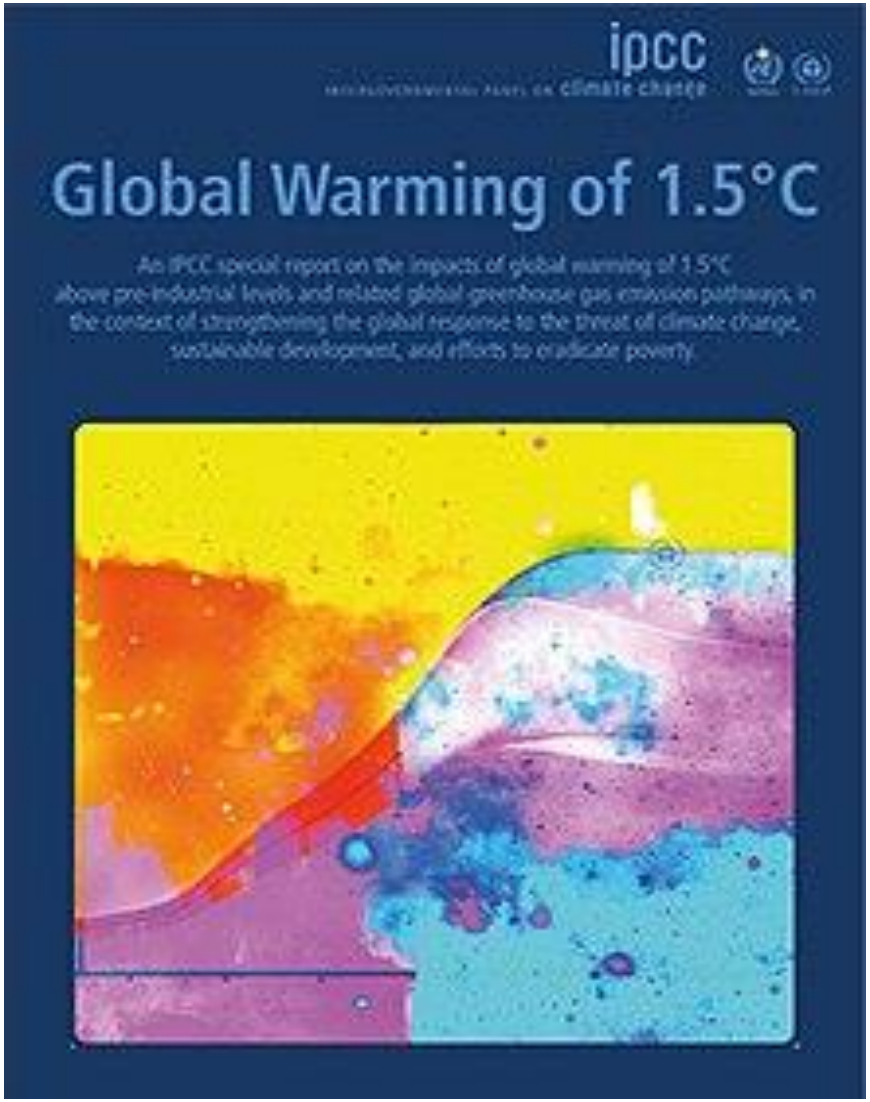
Ecce homo - A healthy ecosystem is a prerequisite for human health

Photos P- Prokosch, www.grida.no



Its key finding is that meeting a 1.5 °C (2.7 °F) target is possible but would require "deep emissions reductions"and "rapid, far-reaching and unprecedented changes in all aspects of society."

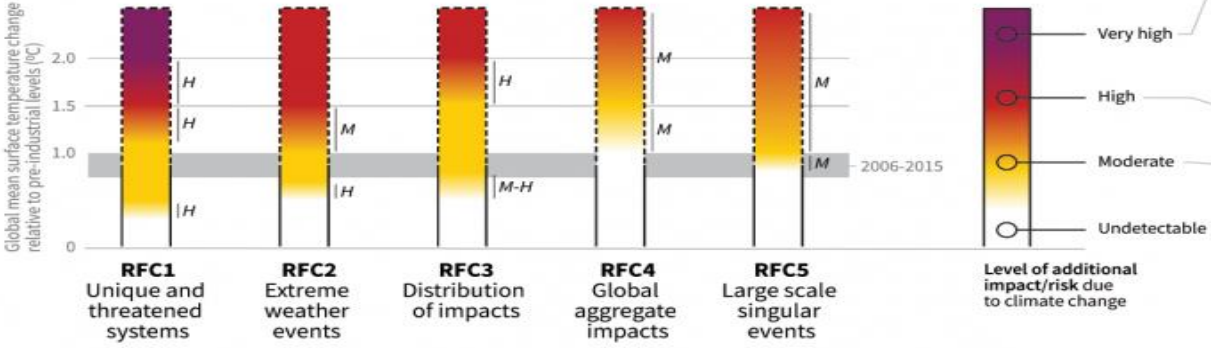


Furthermore, the report finds that "limiting global warming to 1.5 °C compared with 2 °C would reduce challenging impacts on ecosystems, human health and well-being" and that a 2 °C temperature increase would exacerbate extreme weather, rising sea levels and diminishing Arctic sea ice, coral bleaching, and loss of ecosystems, among other impacts.[2] SR15 also has modelling that shows that, for global warming to be limited to 1.5 °C, "Global net human-caused emissions of carbon dioxide (CO2) would need to fall by about 45 percent from 2010 levels by 2030, reaching 'net zero' around 2050."

How the level of global warming affects impacts and/or risks associated with the Reasons for Concern (RFCs) and selected natural, managed and human systems

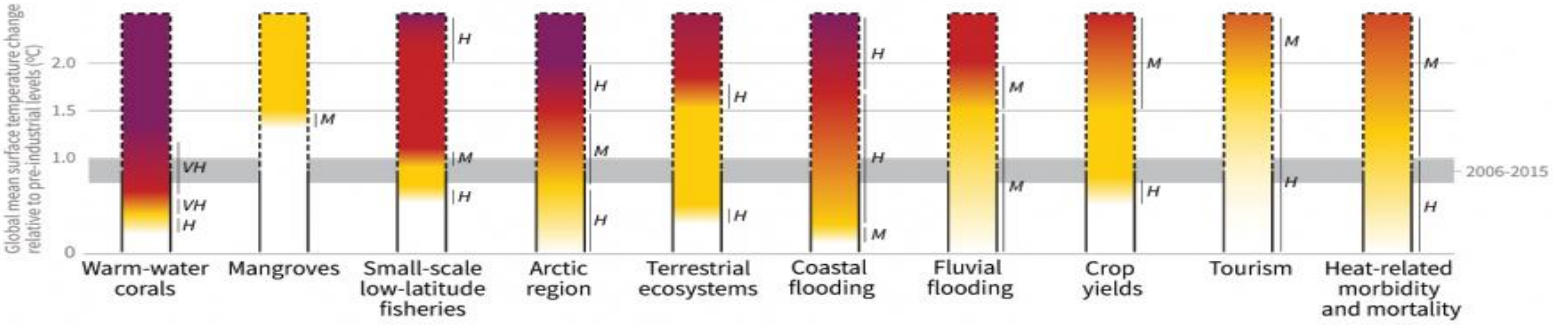
Five Reasons For Concern (RFCs) illustrate the impacts and risks of different levels of global warming for people, economies and ecosystems across sectors and regions.

Impacts and risks associated with the Reasons for Concern (RFCs)

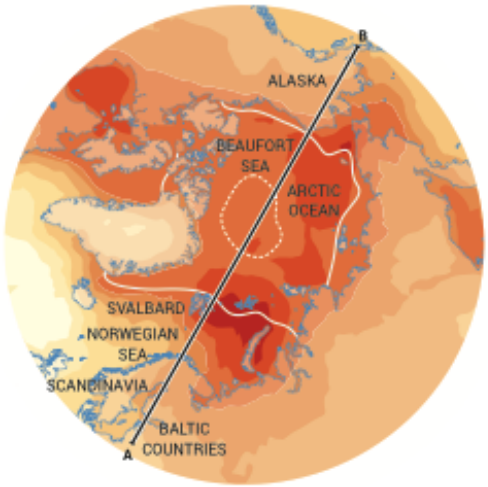


Purple indicates very high risks of severe impacts/risks and the presence of significant irreversibility or the persistence of climate-related hazards, combined with limited ability to adapt due to the nature of the hazard or impacts/risks.
Red indicates severe and widespread impacts/risks.
Yellow indicates that impacts/risks are detectable and attributable to climate change with at least medium confidence.
White indicates that no impacts are detectable and attributable to climate change.

Impacts and risks for selected natural, managed and human systems



Confidence level for transition: *L*=Low, *M*=Medium, *H*=High and *VH*=Very high



Projected changes in near-surface temperature (°C) along the 30° longitude east for the 2080's relative to 1986-2005 according to the RCP4.5 scenario of the IPCC.

... during the cold season (December-February)

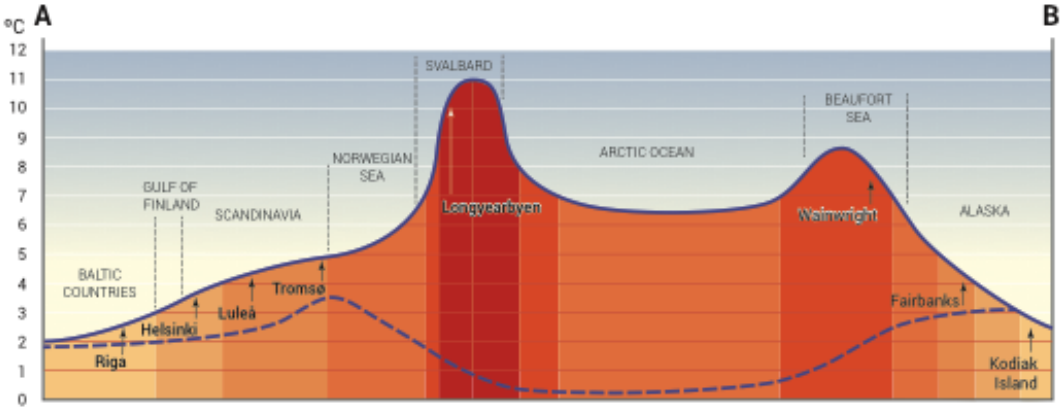
... during the warm season (December-February)

Sea ice extent

In September 1981

Projected in autumn in the 2080s - 2100s

0.5 1 1.5 2 3 4 5 7 9 11°C



Sources: Snow, Water, Ice and Permafrost in the Arctic (SWIPA), AMAP, 2017 (after data and graphic compiled by Gregory M. Flato from the Canadian Centre for Climate Modelling and Analysis - CCCma). IPCC Fourth Assessment Report, Chapter 15, Polar Regions; FifthAssessment Report, Chapter 28, Polar Regions.

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Thawing permafrost

Thawing permafrost

Present permafrost (percentage of the surface)

- Continuous (Between 90 and 100%)
- Discontinuous (Between 50% and 90%)
- Sporadic (Between 10% and 50%)
- Isolated patches (Between 1% and 10%)
- Area where subsea permafrost is known or likely to occur
- Thermokarst

Projected permafrost extent in 2100 according to Representative Concentration Pathway (RCP) scenarios from the IPCC Fifth Assessment Report

- RCP 4.5
- RCP 8.5
- Greenland ice sheet and glaciers
- Main population centres

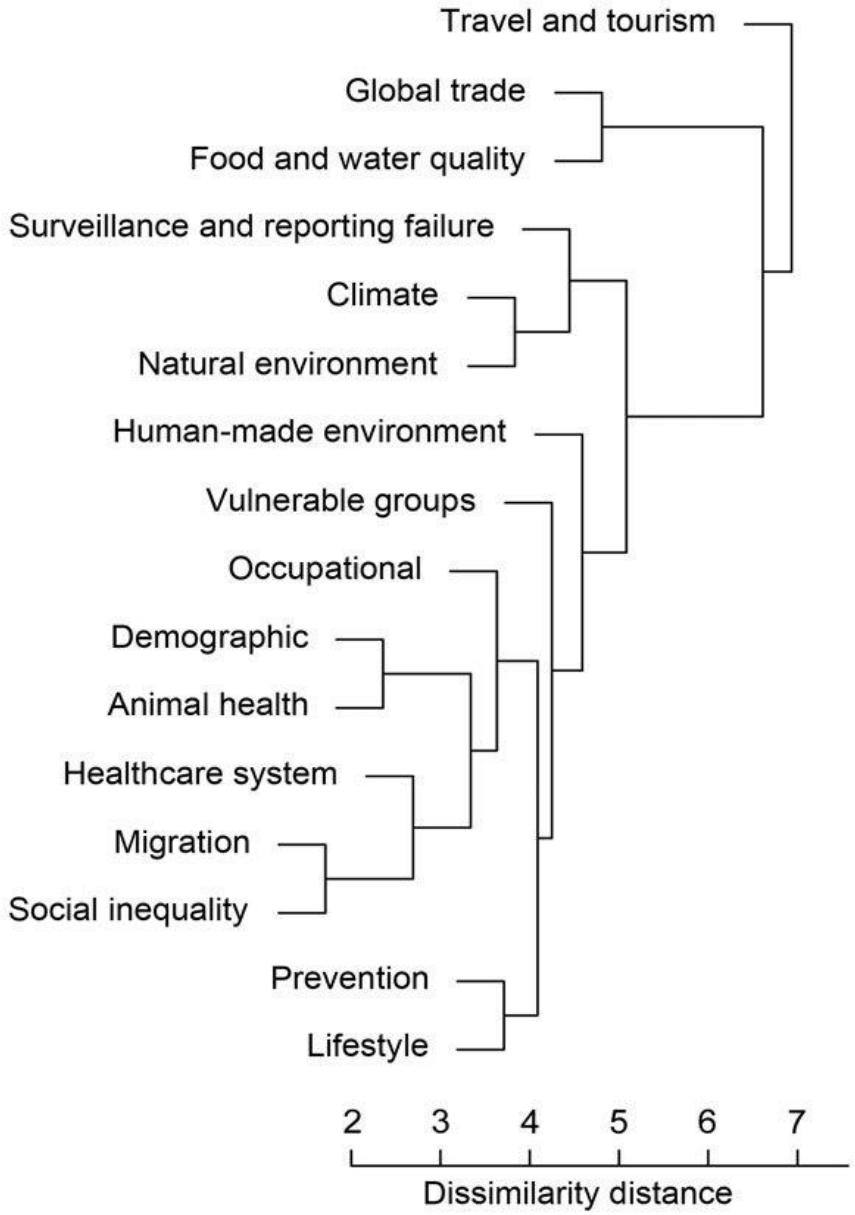
The thawing trend appears irreversible. While compliance with the existing Paris Agreement commitments would stabilize permafrost losses, the extent would still be 45 per cent below current values (AMAP, 2017a). Under a high emissions scenario, stable permafrost will likely only remain in the Canadian Arctic Archipelago, the Russian Arctic coast and the east Siberian uplands (AMAP, 2017a).

A combination of >2 drivers was responsible for most IDTEs. The driver category globalization and environment contributed to 61% of individual IDTEs, and the top 5 individual drivers of all IDTEs were travel and tourism, food and water quality, natural environment, global trade, and climate

Determinants and Drivers of Infectious Disease Threat Events in Europe

Jan C. Semenza, Elisabet Lindgren, Laszlo Balkanyi, Laura Espinosa, My S. Almqvist, Pasi Penttinen, Joacim Rocklöv

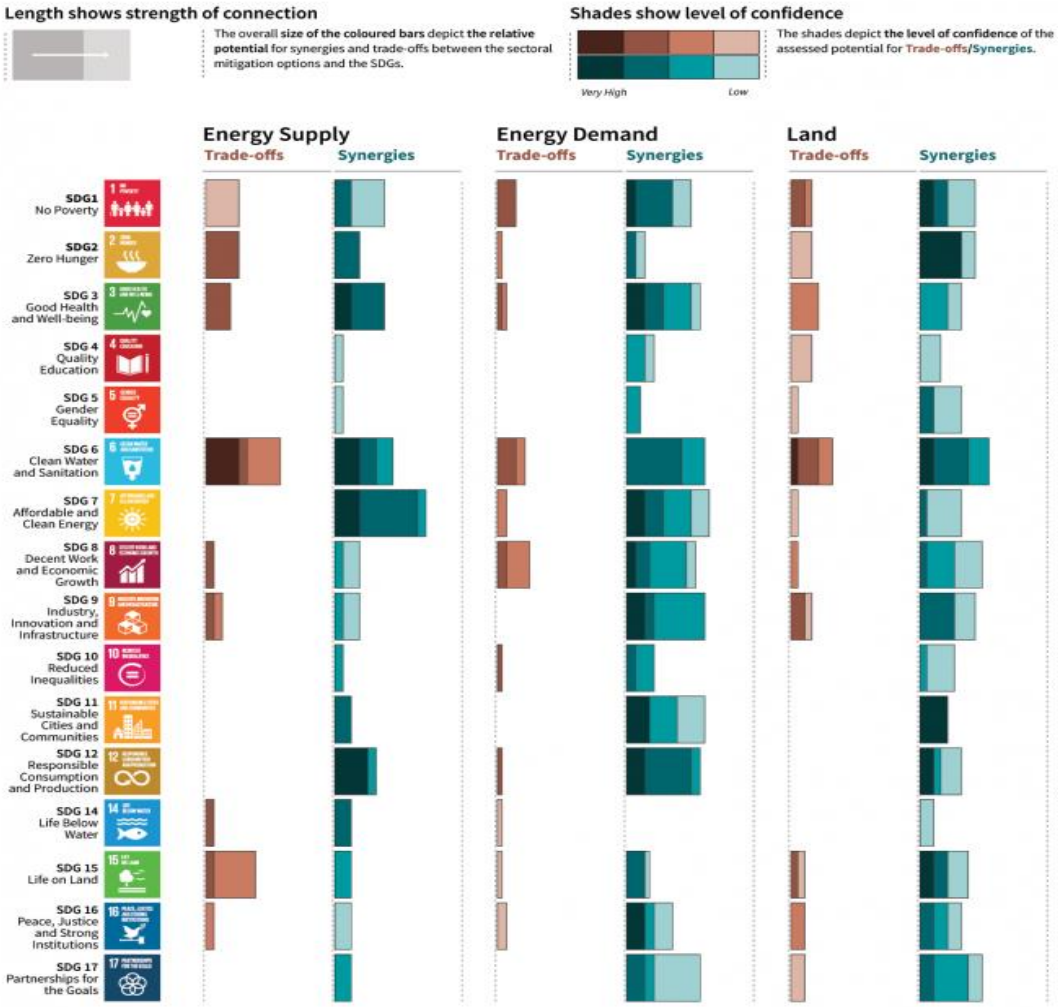
Emerg Infect Dis. 2016 Apr; 22(4): 581–589



Cluster dendrogram from hierarchical cluster analysis of drivers contributing to observed infectious disease threat events (IDTEs), Europe, 2008–2013. Individual segments (leaves) on the lower part of the tree are more related to each other, as indicated by distances between the branches.
Drivers below travel and tourism also occurred less often as underlying drivers of IDTEs and tended to be more contextual in nature. Scale bar indicates dissimilarity distance for drivers, as measured by frequency of pairwise co-occurrence in clusters. Similar drivers (e.g., that co-occurred in outbreaks) are at a close distance, and those that were more independent of other drivers show higher dissimilarity.

Indicative linkages between mitigation options and sustainable development using SDGs (The linkages do not show costs and benefits)

Mitigation options deployed in each sector can be associated with potential positive effects (synergies) or negative effects (trade-offs) with the Sustainable Development Goals (SDGs). The degree to which this potential is realized will depend on the selected portfolio of mitigation options, mitigation policy design, and local circumstances and context. Particularly in the energy-demand sector, the potential for synergies is larger than for trade-offs. The bars group individually assessed options by level of confidence and take into account the relative strength of the assessed mitigation-SDG connections.



CLINF

Climate change effects on the epidemiology of infectious diseases and the impacts on Northern societies

- **Nordic Centre of Excellence**
- **Funded by NordForsk programme *"Responsible Development in the Arctic: Opportunities and Challenges – Pathways to Action"*.**
- **53 MNOK, of which 33 MNOK from NordForsk**
- **> 40 senior scientists**
- **8 Cooperating partners + 15 affiliated parties in 8 countries**

Photos: Carl-Johan Utsi

What do we want?

Objectives:

- To clarify the impact of climate change on humans and animals among animal husbandry households
- To turn this new understanding into practical tools for decision-makers

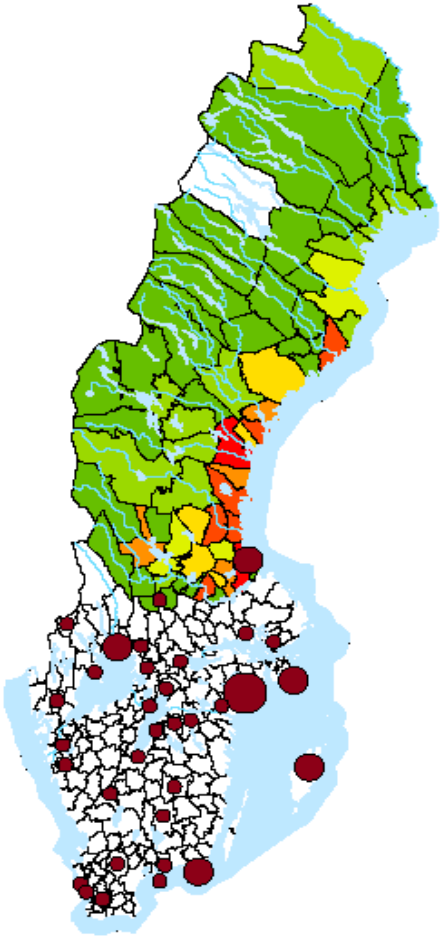
Table 1. Comparison of registered data regarding eight communicable diseases across Sweden, Finland, Norway, Iceland and Greenland. Data were obtained from the Public Health Agency of Sweden, the Norwegian Institute of Public Health, the National Institute for Health and Welfare in Finland, the Directorate of Health in Iceland and the Greenlandic Board of Health in Greenland.

		Disease								
		Anthrax	Borreliosis	Brucellosis	Cryptosporidiosis	Leptospirosis	Nephropathia epidemica	Q-fever	Tick-borne encephalitis	Tularaemia
Data obtained from year	Sweden	1965	n/a[a]	2010	2004	2008	1997	2007	2004	1997
	Finland	1995[b]	1995	1995	1995	1995	1995	1995	1995	1995
	Norway	1967	1990[e]	2004	2012	n/a[a]	1991	2016	1998	1985
	Iceland	1997[b]	n/a[a]	2005	2013	2014	1997	2005	n/a[a]	2005
	Greenland	1996[b]	n/a[b, f]	n/a[a]	n/a[a]	n/a[b]	n/a[a]	n/a[a]	n/a[a]	n/a[a]
Disease notifiable from year	Sweden	n/a[a]	n/a[a]	2004	2004	2004	1985	2004	2004	1969
	Finland	1995	1995	1995	1995	1995	1995	1995	1995	1995
	Norway	1991	1991	1977	2012	n/a[a]	1991	2012	1975	1977
	Iceland	n/a[a]	n/a[a]	2005	2013	2014	1997	2005	n/a[a]	2005
	Greenland	1996[e]	1996[e]	n/a[a]	n/a[a]	1996	n/a[a]	n/a[a]	n/a[a]	n/a[a]
Information regarding sex and age/age group from year	Sweden	n/a[b]	n/a[a]	n/a[c]	2004	n/a[c]	1997	n/a[c]	2004	1997
	Finland	n/a[b]	1995	1995	1995	1995	1995	1995	1995	1995
	Norway	n/a[b]	1990[d]	2004	2012	n/a[a]	1991	n/a[d]	1998	1985
	Iceland	n/a[b]	n/a[a]	n/a[b]	n/a[c]	n/a[b]	n/a[b]	n/a[b]	n/a[a]	n/a[b]
	Greenland	n/a[b]	n/a[e]	n/a[a]	n/a[a]	n/a[a]	n/a[a]	n/a[a]	n/a[a]	n/a[a]

[a] Not notifiable, sometimes voluntarily reported.
[b] No cases reported.
[c] Information was not given due to the possibility to retrace individual cases and violate patient integrity.
[d] Between 1983-1990, borreliosis was sporadically reported in Norway.
[e] In Greenland, only neuroborreliosis is notifiable.

Collection of ticks north of river Dalälven 2018

with genus Hyalomma assessed across the entire nation



Legend

Lakes and seas

Rivers

Hyalomma ticks

Number per municipality

1

2

3

Common ticks

Number per municipality

0

1 - 8

9 - 19

20 - 37

38 - 66

67 - 104

105 - 240

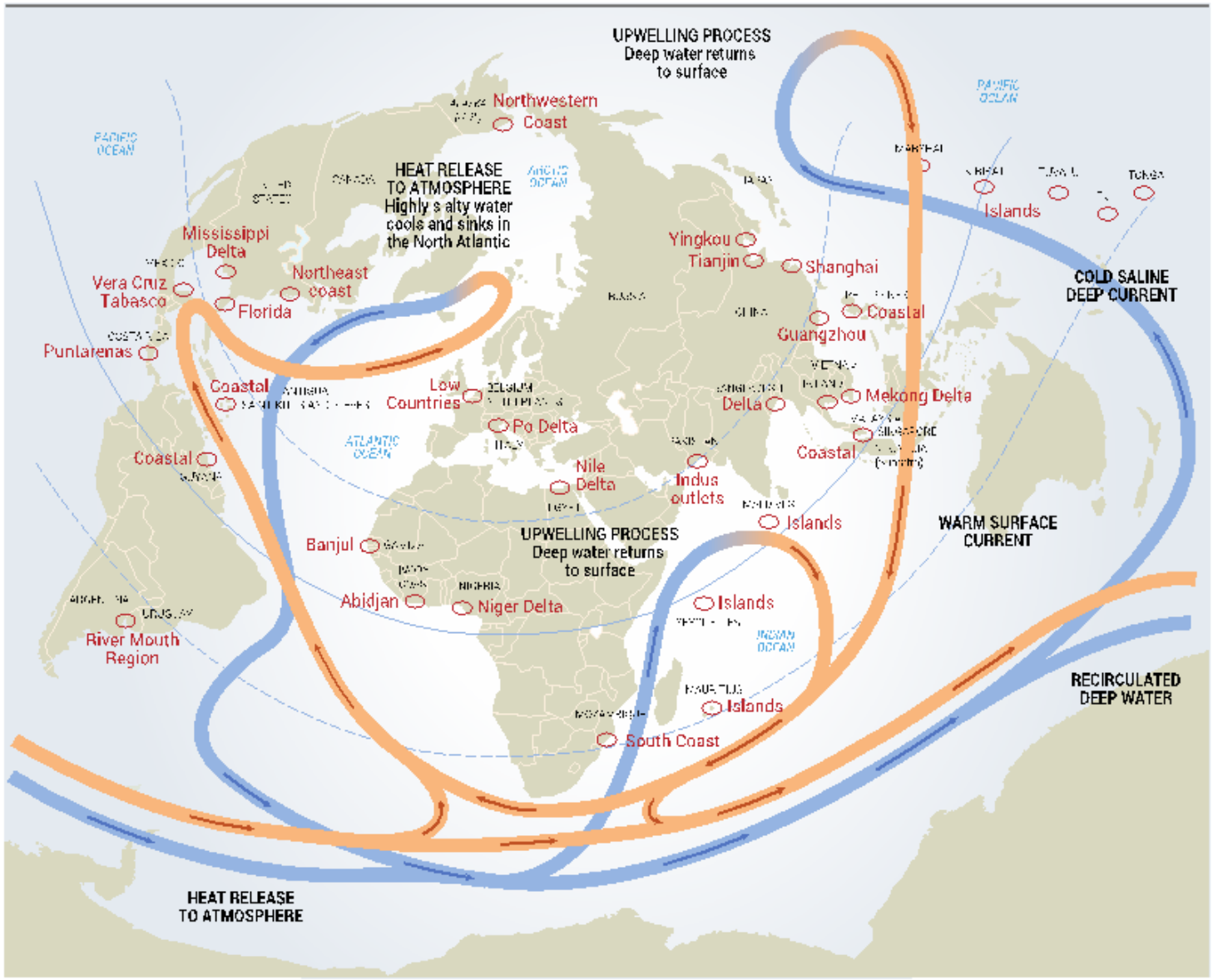
241 - 421

N W E S

The zero value denotes municipalities where no common ticks were collected.

Principal investigator: Anna Omazic, SVA
Cartographer: Tomas Thierfelder, SLU
Source: Sverige 1000 Plus, Lantmäteriet

Climate change and sea level rise



Sources: National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS); Intergovernmental Panel on Climate Change (IPCC); Millenium Ecosystem Assessment; World Resources Institute (WRI); United Nations Environment Programme (UNEP); The Guardian; The Worldhang; World Meteorological Organization (WMO); The Balance; R. J. Nicholls and Anny Cazenave, Sea-Level Rise and Its Impact on Coastal Zones, Science, 2010;

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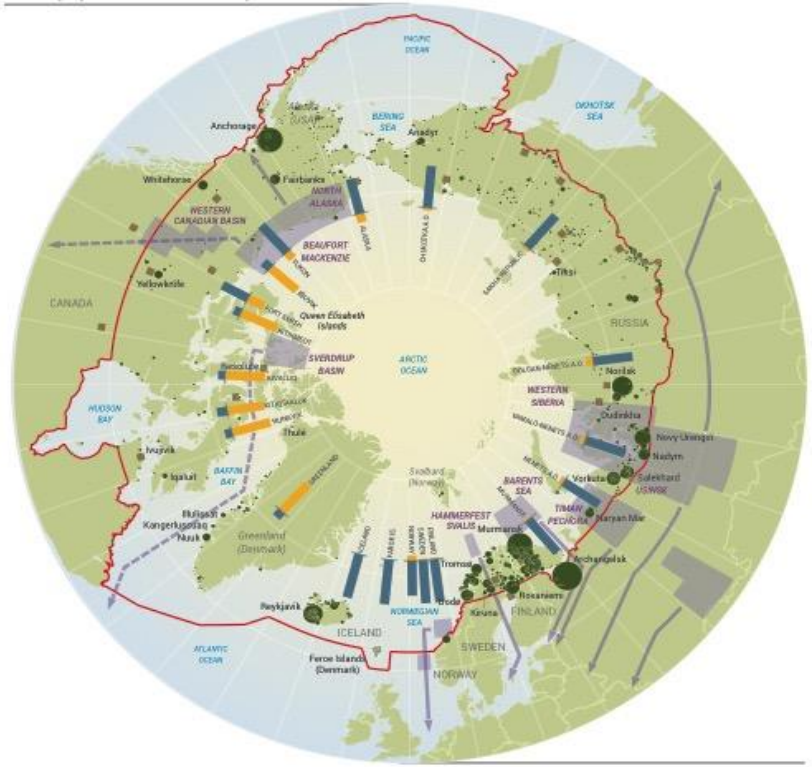
Coastal zones vulnerable to rising sea levels and floods

Warm shallow current

Cold an salty deepwater current

Arctic population and development



AMAP boundary

Population centres

300,000 170,000 60,000 30,000 3,000 and less

Population distribution: composition by main regions

100 % 50 % 0 % 50 % 100 %

Indigenous

Non-indigenous

Oil and gas fields

Mines

Main transport routes for raw materials

Sources: US Census Bureau, and United States department of commerce; Statistics Canada; Statistics Greenland; Faroe Islands Statistics; Statistics Iceland; Statistics Norway; Statistics Sweden; Statistics Finland; State committee of the Russian Federation for statistics; United States Geological Survey (USGS); AMAP; CAFF; United States Energy Information Administration (EIA); International Energy Agency (IEA); Barents Euro-Arctic Council (BEAC); Comité professionnel du pétrole (CPDP), Paris; Institut français du pétrole (IFP), Paris; Openstreet Map (OSM); United Nations Population Information Network (POPIN); Petroleum-Economist.

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