



Key changes in the Polar Regions that call for European action

Prof Dr Antje Boetius
Director of the Alfred Wegener Institute
Helmholtz Centre for Polar and Marine Research

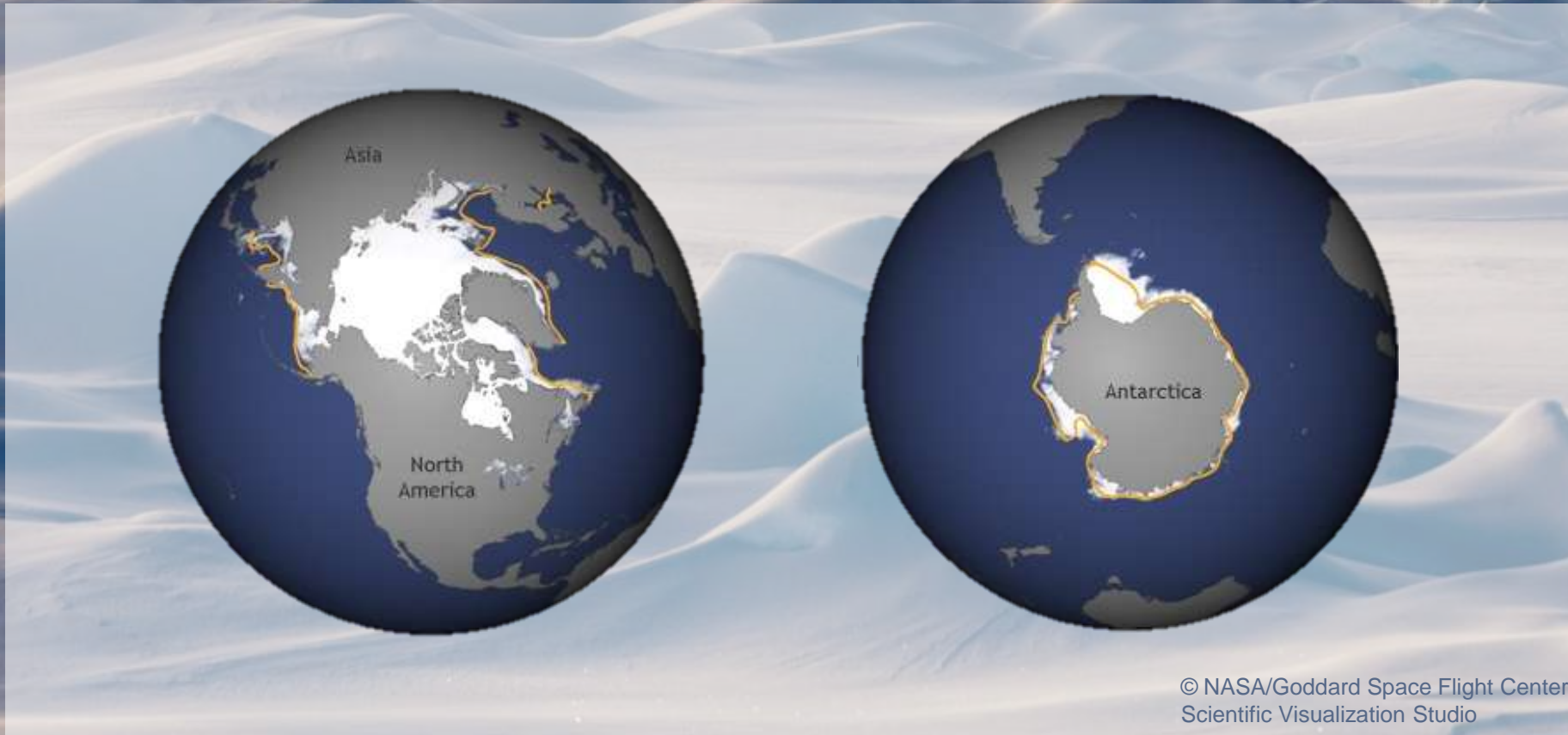
Alfred Wegener-Institut/Mario Hoppmann

„At the frontline of climate change” Science for Policy-Making hosted by
Christel Schaldemose MEP

European Parliament Brussels, 26th September 2018

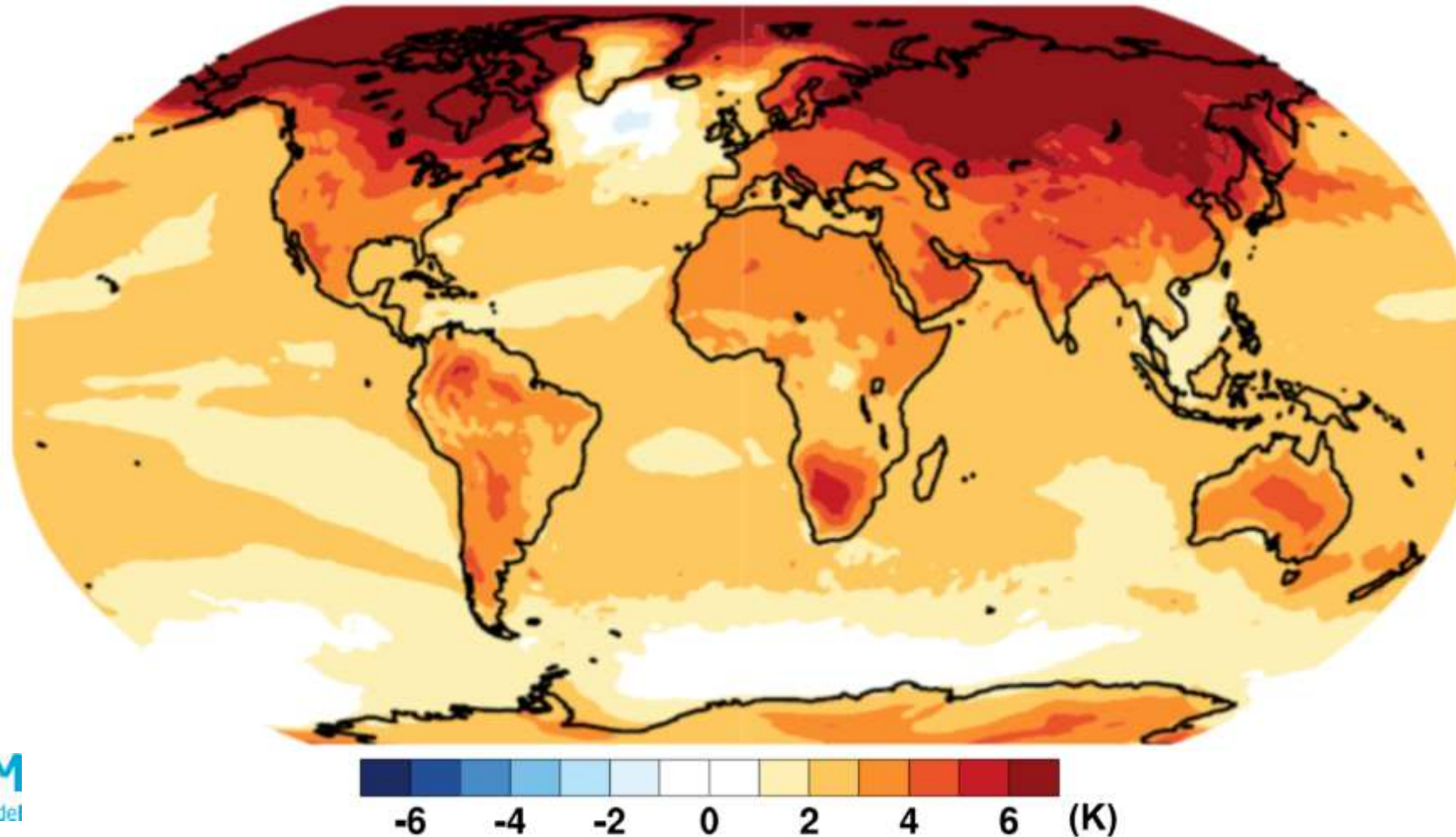


Polar Regions: The Sentinels of Climate Change



Polar Regions: The Sentinels of Climate Change

Temperature change at the end of the 21st century

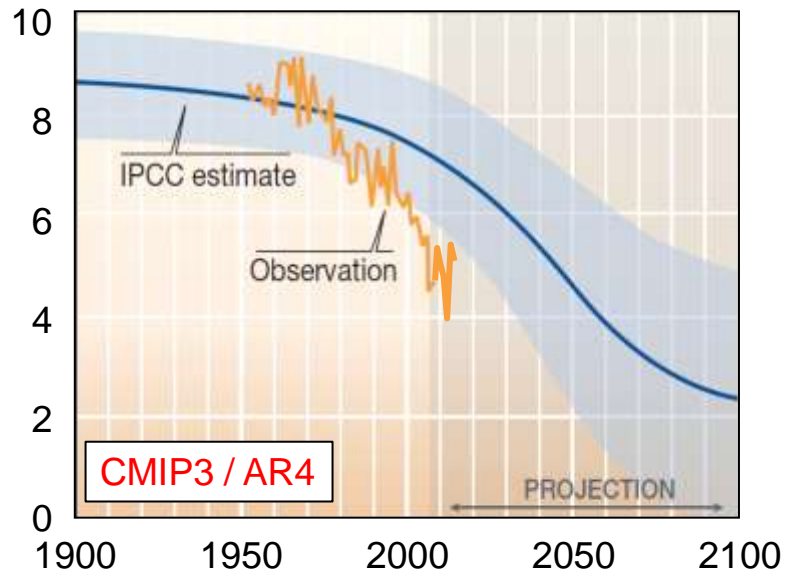


(2070-2099) –
(1976-2005)

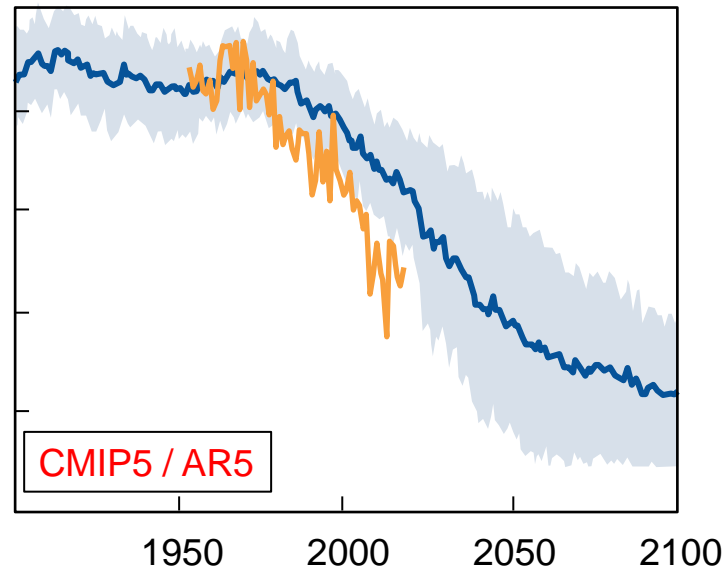
RCP8.5 Szenario
(Representative
Concentration
Pathway)

Polar Regions: The Sentinels of Climate Change

September sea ice extent (10^6 km^2)
Models versus observations



Updated from Stroeve et al., 2007



Update from Stroeve et al., GRL 2012

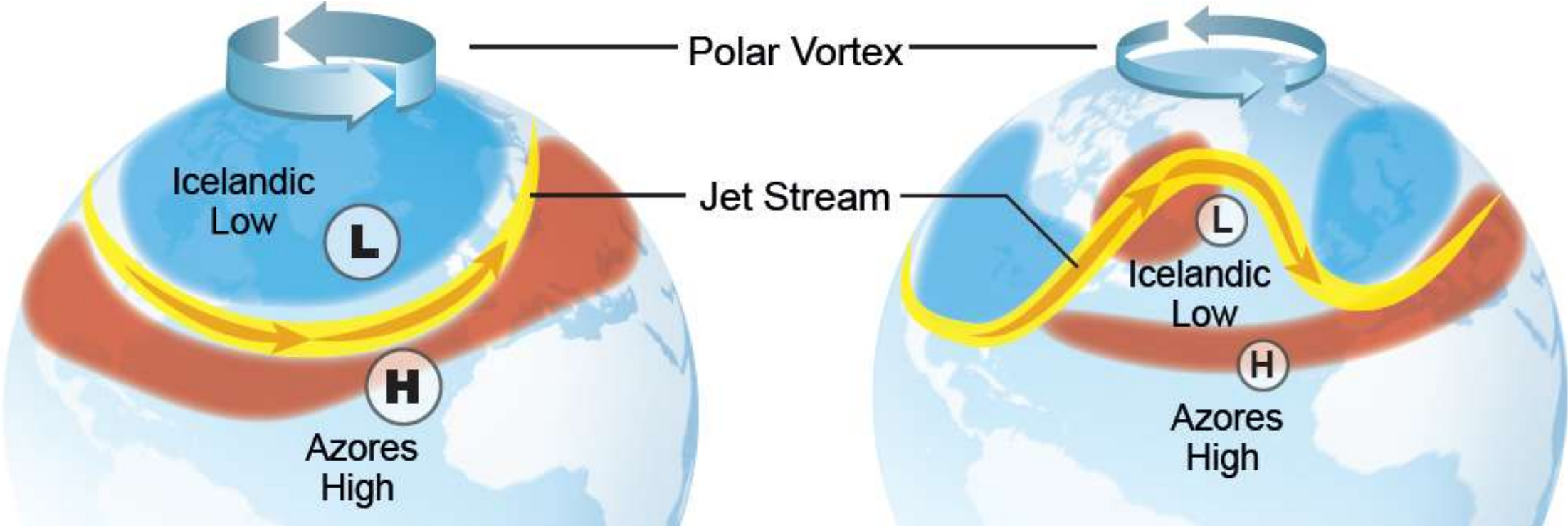
Arctic climate change is
not well represented in
state-of-the-art Earth
System Models

Polar Regions and their Global Linkages

Decreasing sea ice



Potential for cold air outbreaks
Result: Cold spells in Europe and US



Polar Change



Polar Change

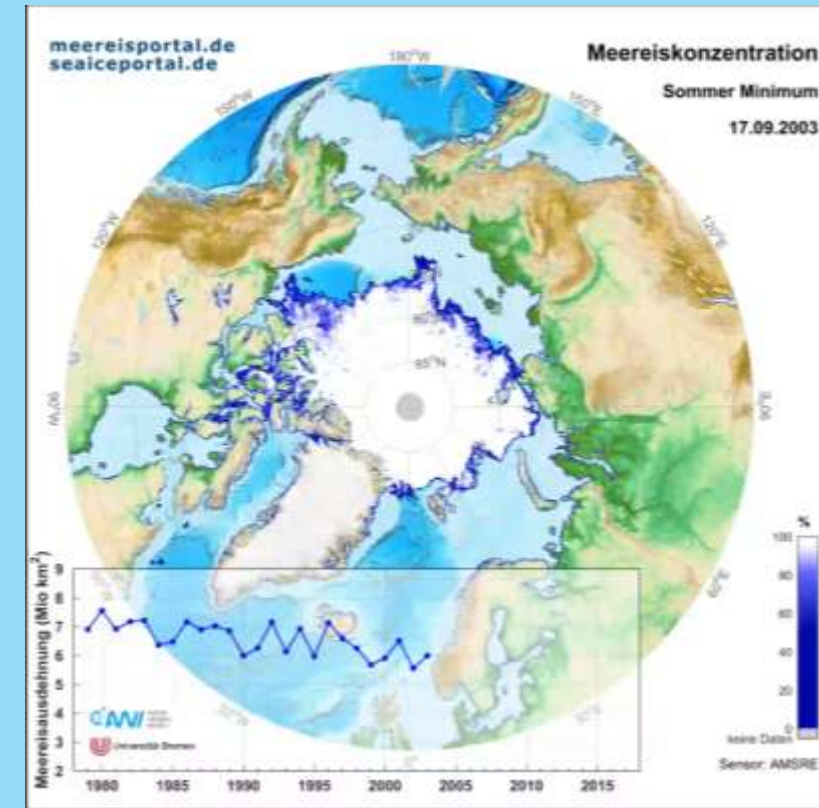
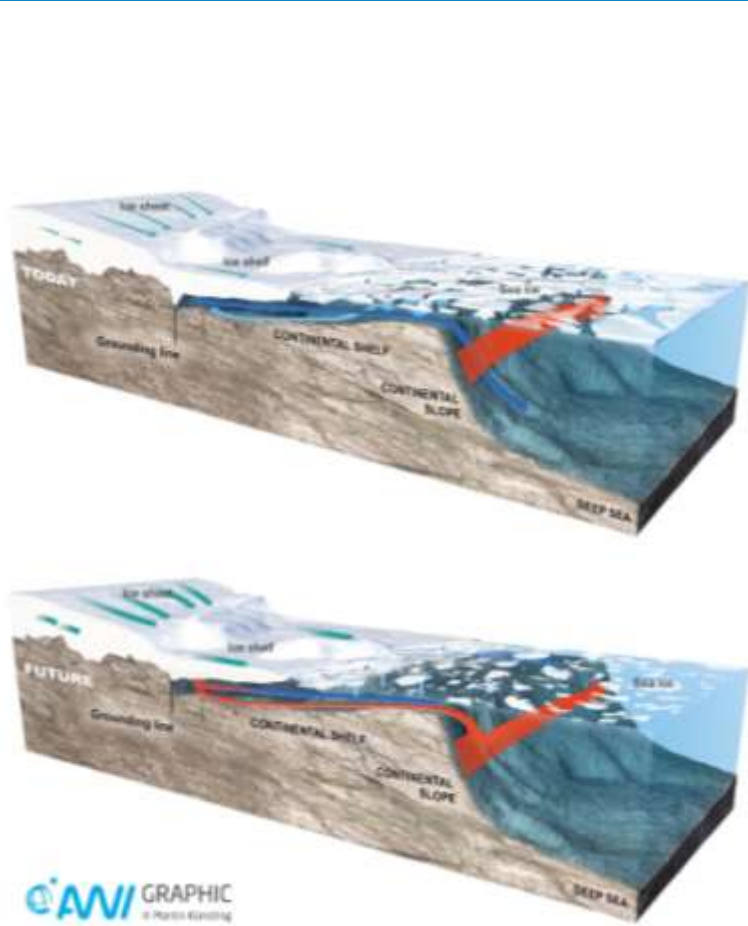
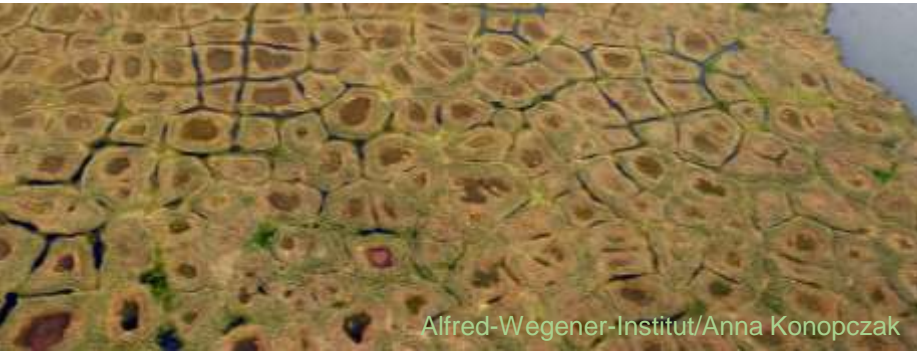


- 1 Alfred-Wegener-Institut/
Mario Hoppmann
- 2 Alfred-Wegener-Institut/
Boris Radosavljevic
- 3 GRIDA /Lawrence
Hislop
- 4 GRIDA / Peter
Prokosch

The changes occurring in the Polar Regions are profound and far reaching.

Key Changes: The Cryosphere

Snow, Ice & Permafrost



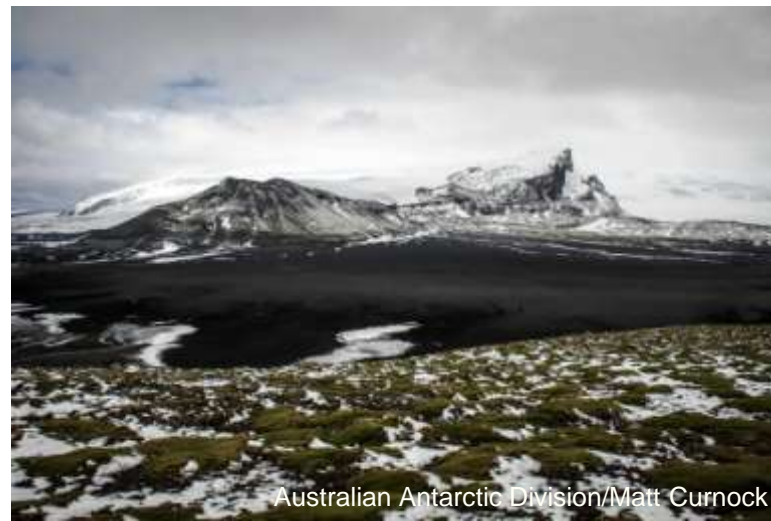
Key Changes: Ecology, Biology & Biodiversity

Warming and increasing human activities alter polar ecosystems on many levels:



U.S. Department of Agriculture

Forrest and tundra fires



Australian Antarctic Division/Matt Curnock

Greening and new species

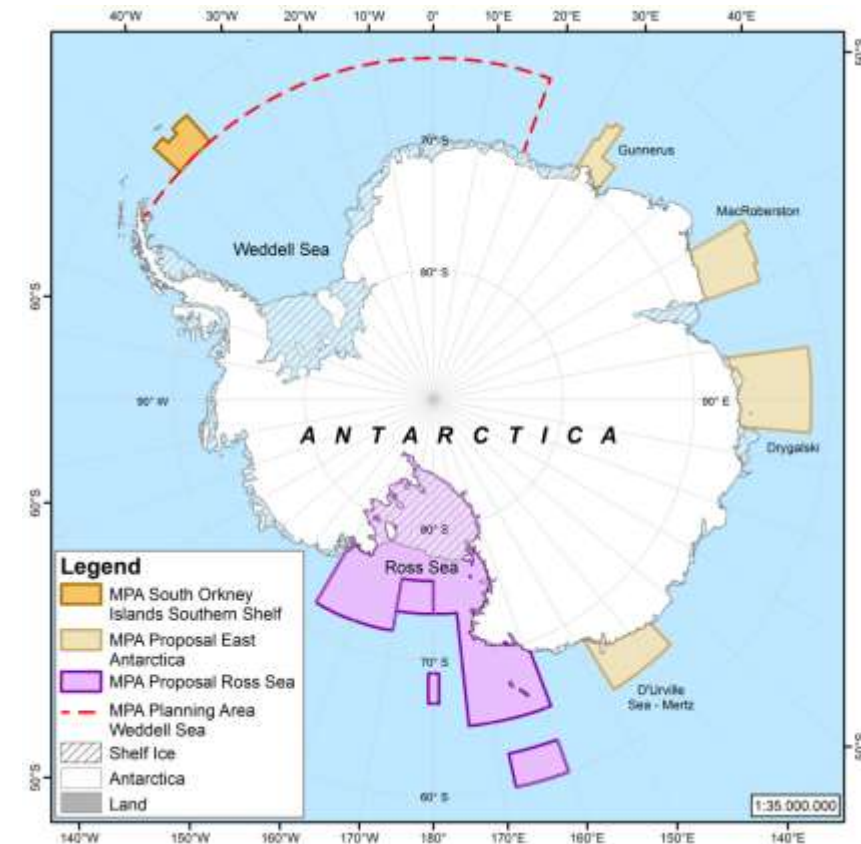
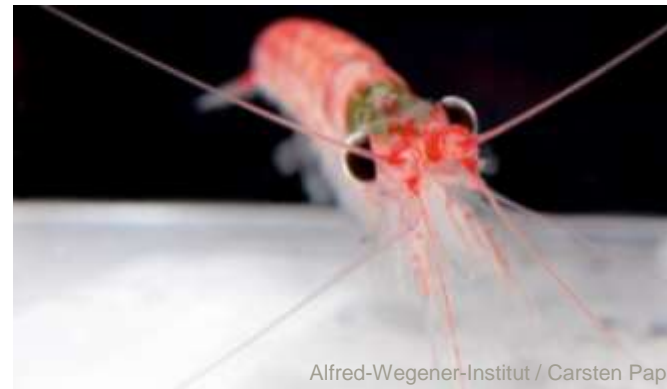
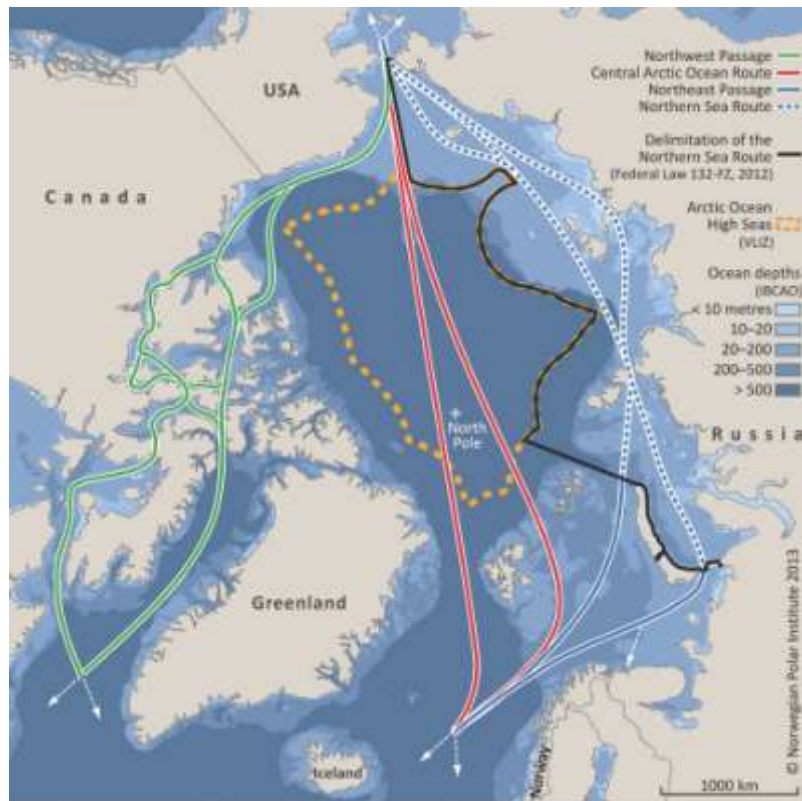


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Changing biodiversity and habitats

Key Changes: Resources & Human Impacts

Improved access to areas and resources arises questions regarding...



...(sustainable) use

and conservation.

Key Changes: People and Societal Issues



Physical changes and globalisation affecting living conditions, traditions, culture and ways of life.



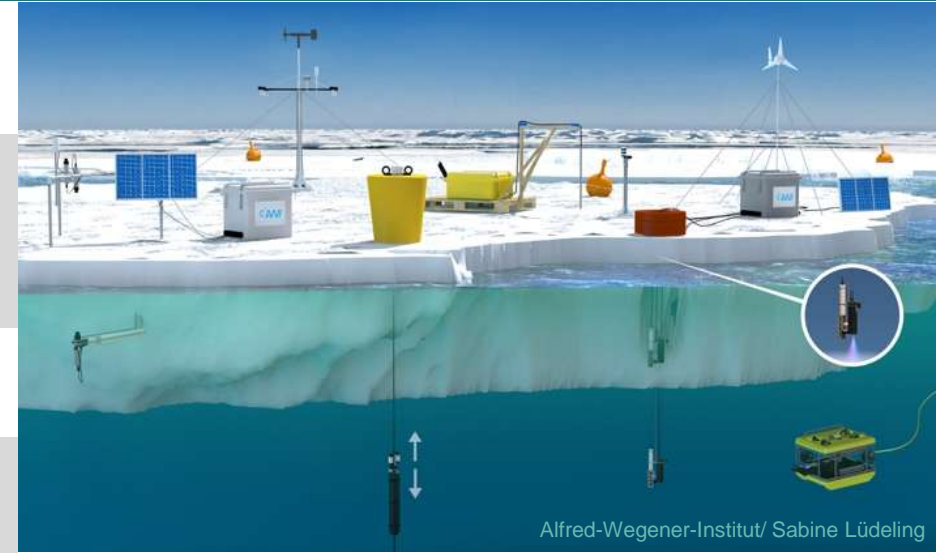
Key Changes: New technologies



Better connectivity

Safer operations

Sustained observation



Understanding the Polar Regions

Finding answers through large-scale, multidisciplinary, collaborative research efforts – like the Multidisciplinary drifting Observatory for the study of Arctic Climate (MOSAiC).

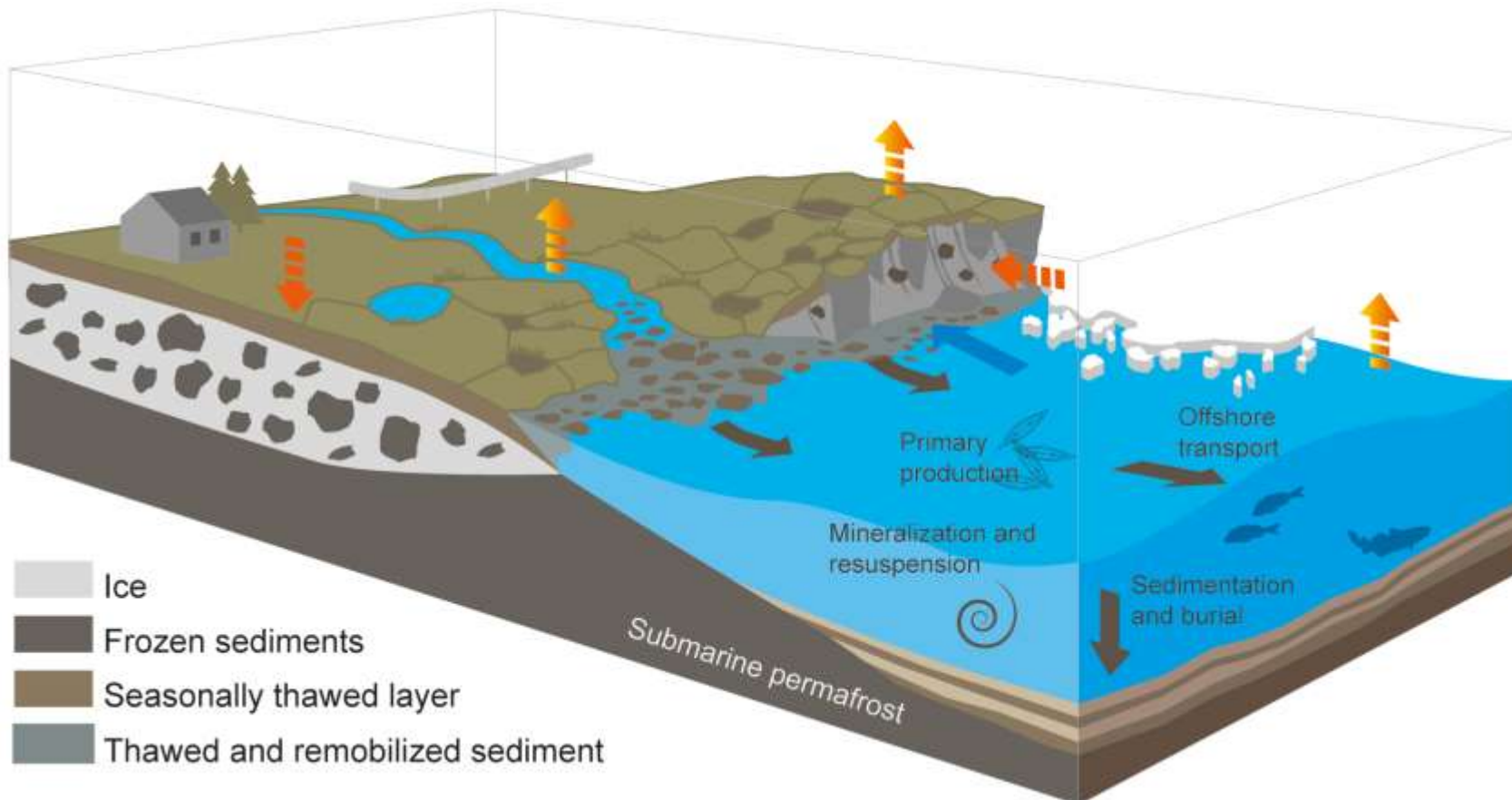


Understanding the Polar Regions



Looking into the past to predict future changes by unlocking climate history from ice cores.

Science with and for Society



Alfred-Wegener-Institut / Michael Fritz/Yves Nowak

Multi-disciplinary hazard mapping for coastal infrastructure

Socio-economic and health atlas of Arctic coastal communities

Risks assessment of permafrost-thaw related release of contaminants and pollutants

Science with and for Society

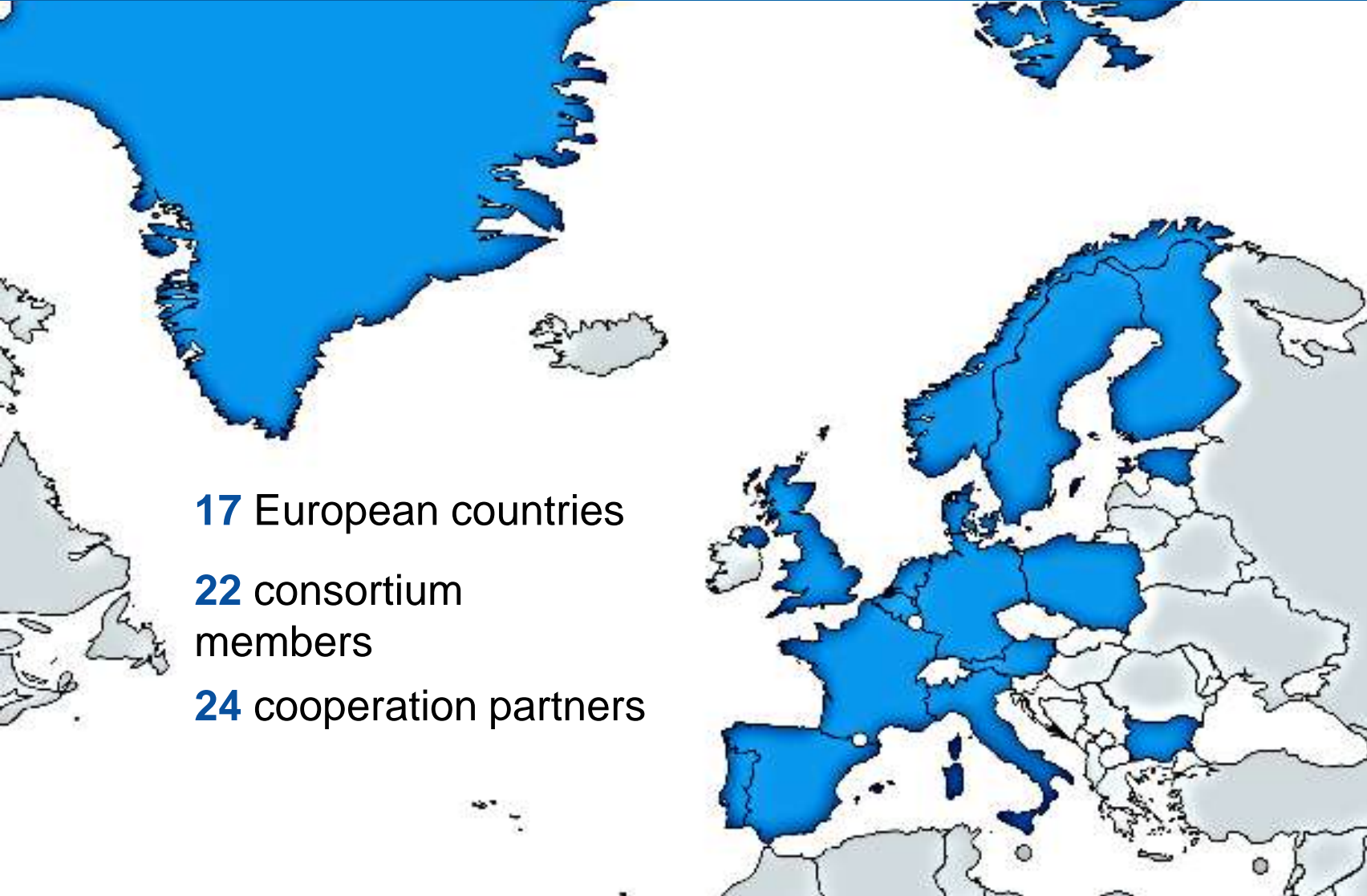


Thawing Arctic permafrost and melting sea ice could cause up to \$130 trillion worth of economic losses globally.

If global warming is limited to 1.5°C, the additional cost will be reduced to under \$10 trillion.

Inuit observations indicate that sea ice tends to form later and break up earlier than they have known during their lifetimes.

Introducing EU-PolarNet



17 European countries

22 consortium members

24 cooperation partners



EU-PolarNet
connecting science with society

On-going dialogue with the European Commission

Integrated European polar research programme

Infrastructure access and usage plan

International cooperation
Transatlantic Research Alliance