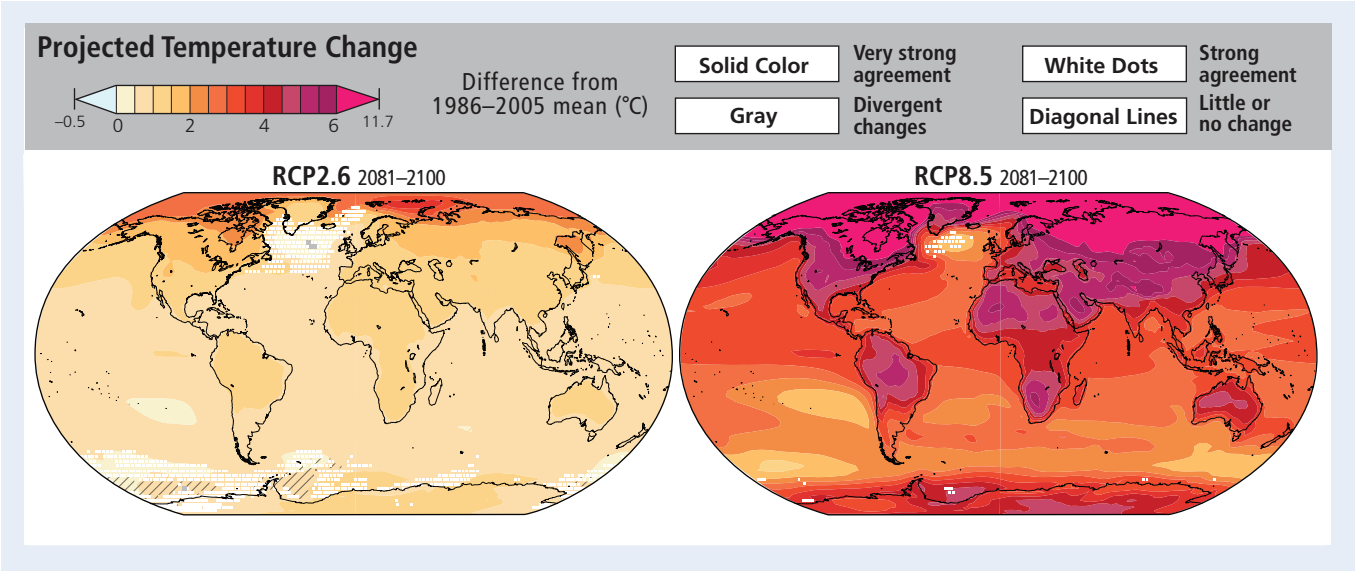
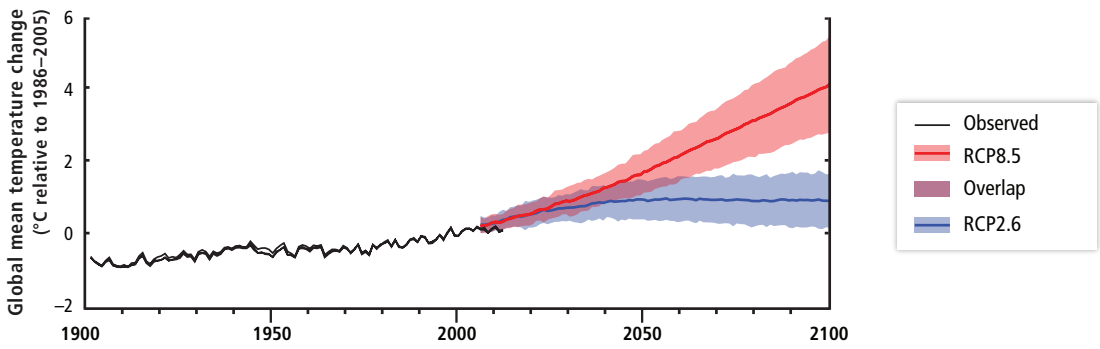
CLIMATE CHANGE 2014

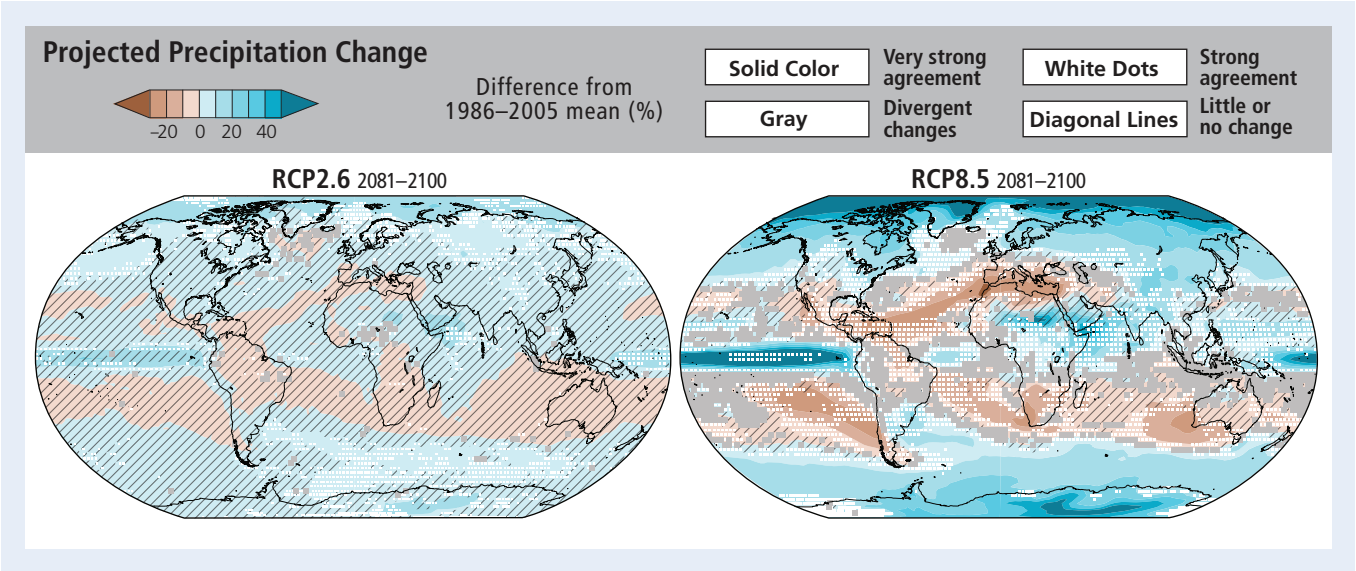
Impacts, Adaptation, and Vulnerability

Climate Change and Key Risks in Polar Regions
From The Working Group II Fifth Assessment Report

ipcc
INTERGOVERNMENTAL PANEL ON climate change







Changes in annual average temperature and precipitation. (Top panel) Projected temperature changes for 2081–2100 under RCP2.6 and 8.5, relative to 1986–2005. (Middle panel) Observed and projected global annual average temperature relative to 1986–2005. (Bottom panel) Projected precipitation changes for 2081–2100 under RCP2.6 and 8.5, relative to 1986–2005. [WGII AR5 Figure SPM.4 and Figure TS.5]

Key regional risks from climate change in Polar Regions and the potential for reducing risk through mitigation and adaptation. Key risks result from high hazard, high vulnerability, and/or high exposure. They are identified based on assessment of the literature and expert judgments. Risk levels are estimated through the 21st century for the current state of adaptation and for a hypothetical highly adapted state. [WGII AR5 Table 28-2]

Climate-related drivers of impacts

Warming trend | Snow cover | Ocean acidification

Level of risk & potential for adaptation

Potential for additional adaptation to reduce risk

Risk level with **high** adaptation | Risk level with **current** adaptation

Key risk	Adaptation issues & prospects	Climatic drivers	Timeframe	Risk & potential for adaptation (Very low – Medium – Very high)
Risks for freshwater and terrestrial ecosystems (*high confidence*) and marine ecosystems (*medium confidence*), due to changes in ice, snow cover, permafrost, and freshwater/ocean conditions, affecting species´ habitat quality, ranges, phenology, and productivity, as well as dependent economies [28.2-4]	• Improved understanding through scientific and indigenous knowledge, producing more effective solutions and/or technological innovations • Enhanced monitoring, regulation, and warning systems that achieve safe and sustainable use of ecosystem resources • Hunting or fishing for different species, if possible, and diversifying income sources		Present Near term (2030–2040) Long term (2080–2100) 2°C 4°C	
Risks for the health and well-being of Arctic residents, resulting from injuries and illness from the changing physical environment, food insecurity, lack of reliable and safe drinking water, and damage to infrastructure, including infrastructure in permafrost regions (*high confidence*) [28.2-4]	• Co-production of more robust solutions that combine science and technology with indigenous knowledge • Enhanced observation, monitoring, and warning systems • Improved communications, education, and training • Shifting resource bases, land use, and/or settlement areas		Present Near term (2030–2040) Long term (2080–2100) 2°C 4°C	
Unprecedented challenges for northern communities due to complex inter-linkages between climate-related hazards and societal factors, particularly if rate of change is faster than social systems can adapt (*high confidence*) [28.2-4]	• Co-production of more robust solutions that combine science and technology with indigenous knowledge • Enhanced observation, monitoring, and warning systems • Improved communications, education, and training • Adaptive co-management responses developed through the settlement of land claims		Present Near term (2030–2040) Long term (2080–2100) 2°C 4°C	

photo: Maeslant storm surge barrier in Rotterdam, Netherlands. © Asahi Shimbun / Getty Images