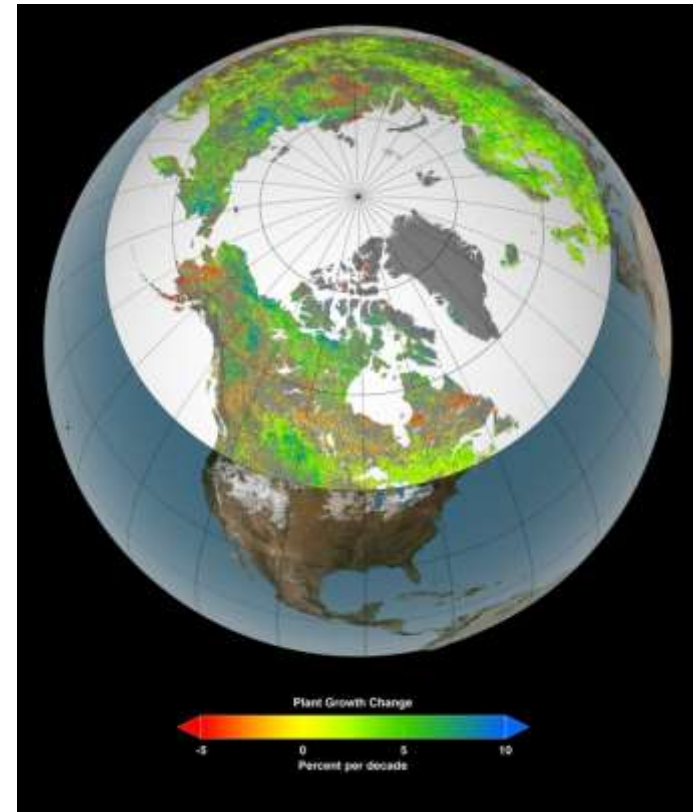
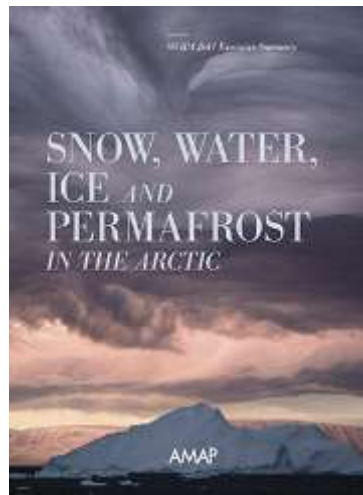
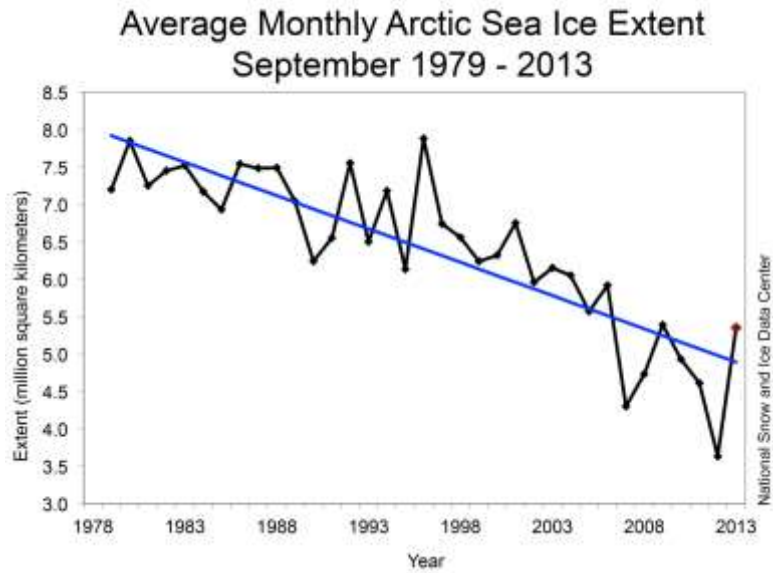


Environmental challenges: Learning to live with rapid change

Annika E Nilsson

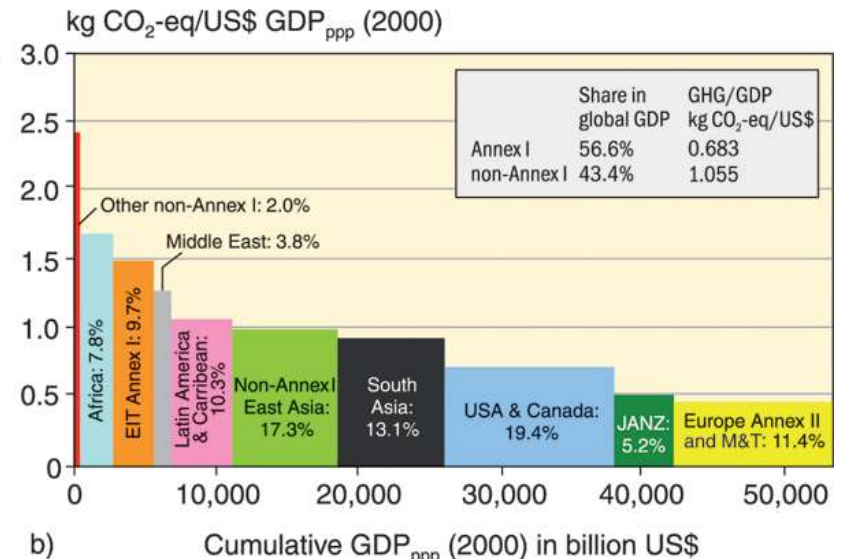
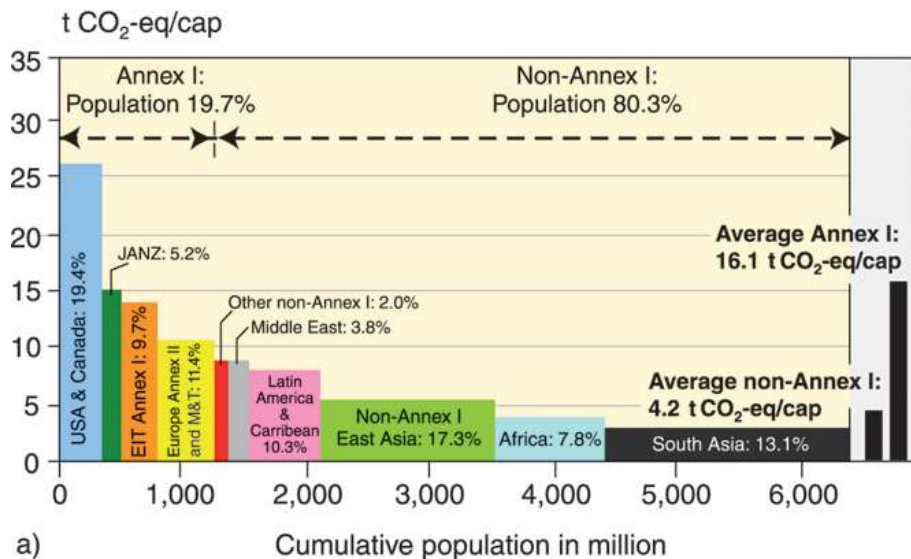
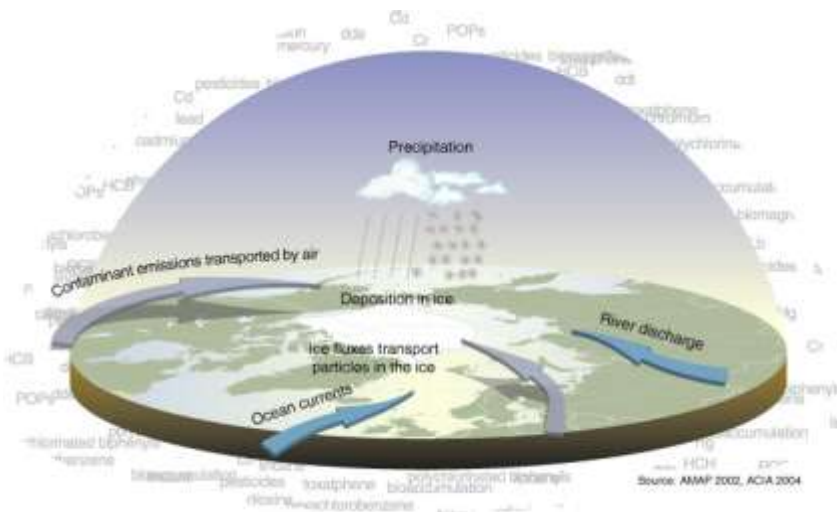
Presentation at the 11th Conference of Parliamentarians of the Arctic Region,
Whitehorse, Canada, 10 September 2014

Visible trends

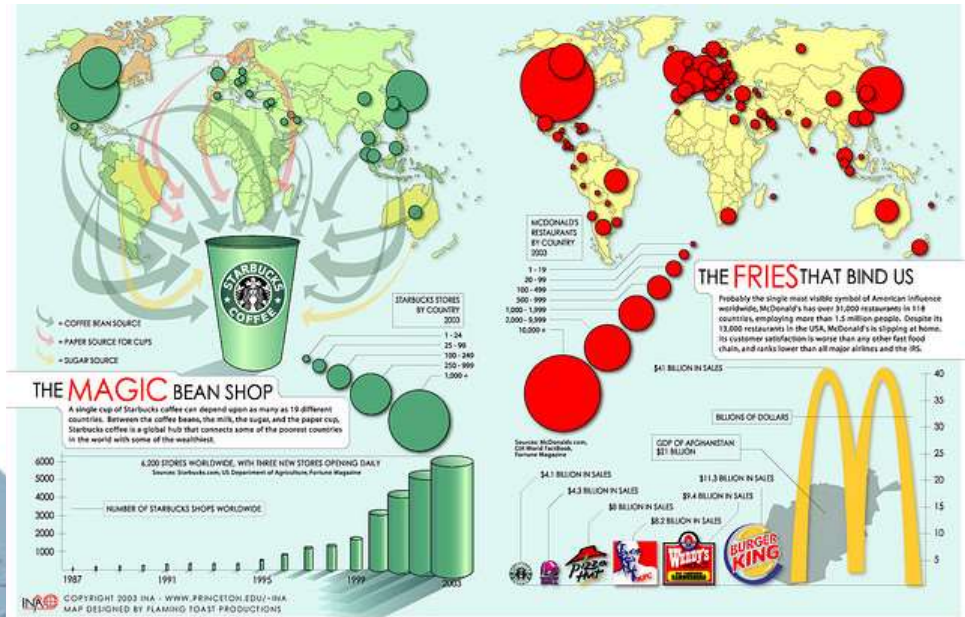


NASA's Goddard Space Flight Center Scientific
Visualization Studio/

Global sources



Globalization



Marc van der Chijs/Flickr

The great acceleration

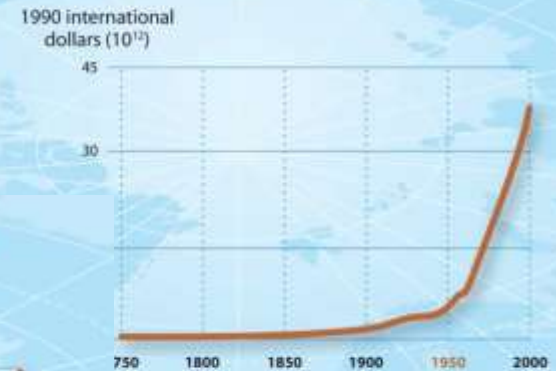
Water use



Shiklomanov (1990) Global Water Resources

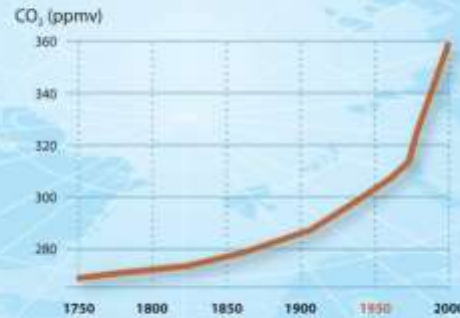
IGBP synthesis: Global Change and the Earth System, Steffen et al 2004

Total real GDP



Northaus (1997) The economics of new goods. University of Chicago Press
: Global Change and the Earth System, Steffen et al 2004

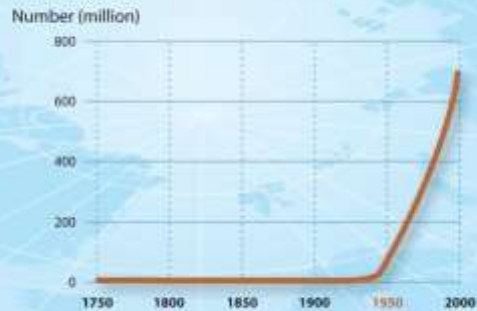
Atmospheric CO₂ concentration



Etheridge et al. Geophys Res 101: 4115-4128

IGBP synthesis: Global Change and the Earth System, Steffen et al 2004

Motor vehicles



Global environmental outlook (2000)

IGBP synthesis: Global Change and the Earth System, Steffen et al 2004

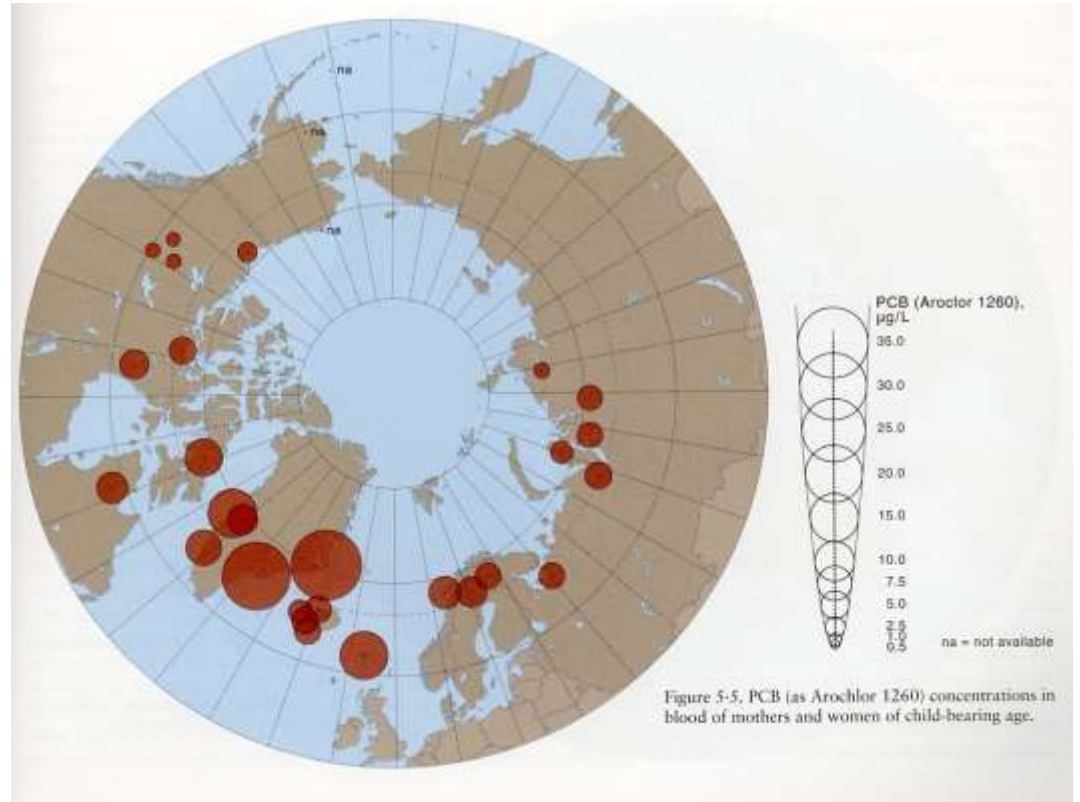
Species extinctions



Wilson, The Diversity of Life

IGBP synthesis: Global Change and the Earth System, Steffen et al 2004

Chemicals: Unwelcome choices



Land as a scarce resource



Photo: B. Forbes



Photo:
A.Nilsson



Photo:SVT

Photo:Kolonierna.se

New images of the Arctic



Event can trigger transformation



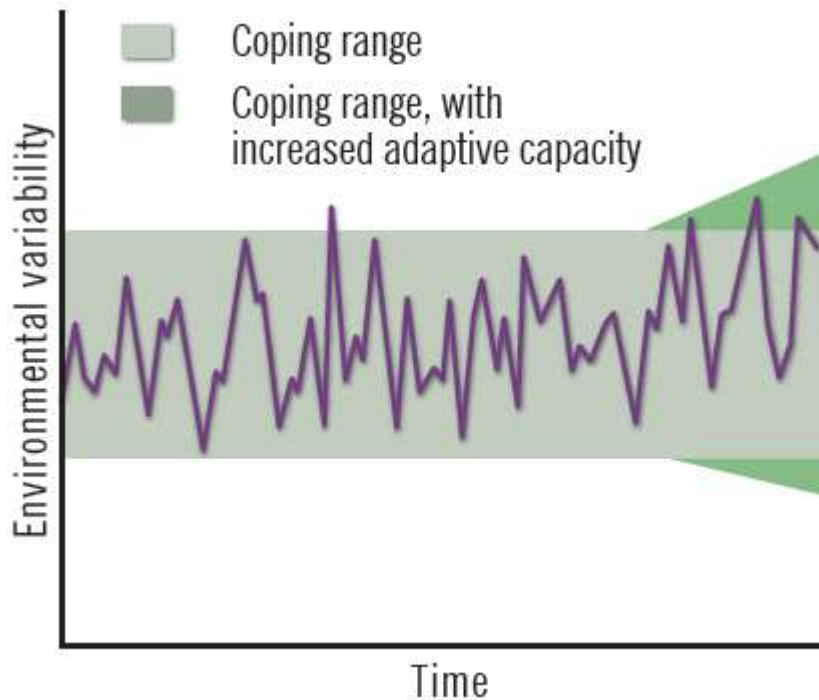
Photo:NASA



Photo: George Kling, Univ of Michingan



Safeguarding and expanding capacities to adapt



From Smith and Wandel (2006)

1. Natural capital
2. Social capital
3. Human capital
4. Knowledge assets
5. Cultural capital
6. Infrastructure
7. Financial capital

Arctic Resilience Report

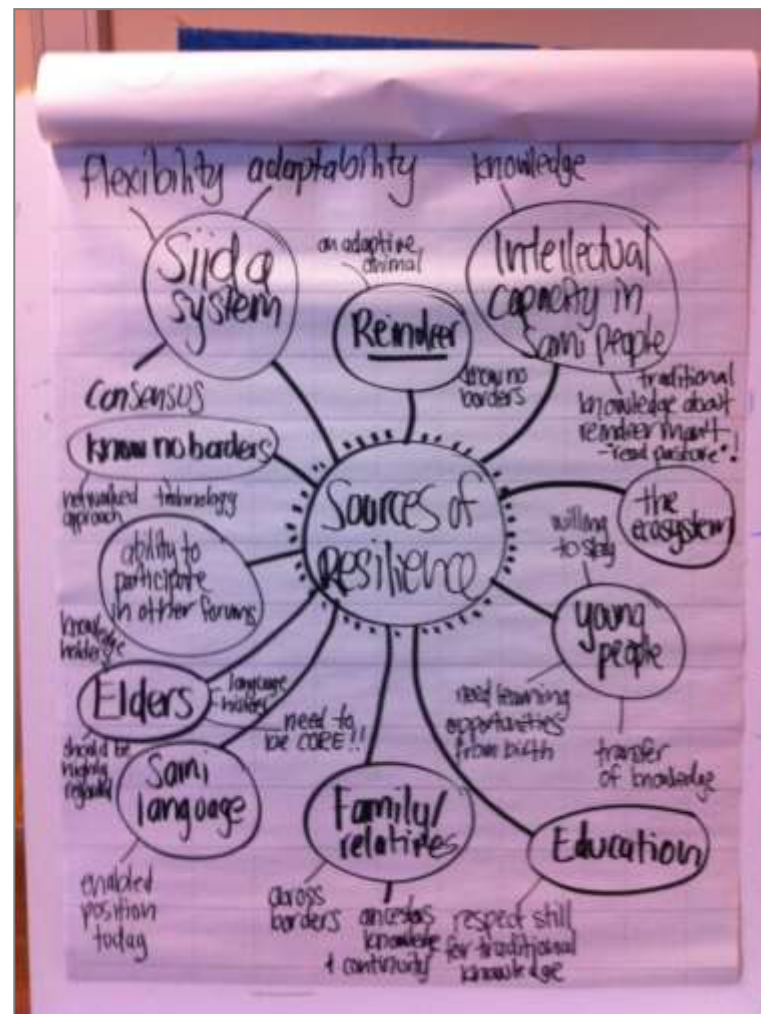


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Key finding 5

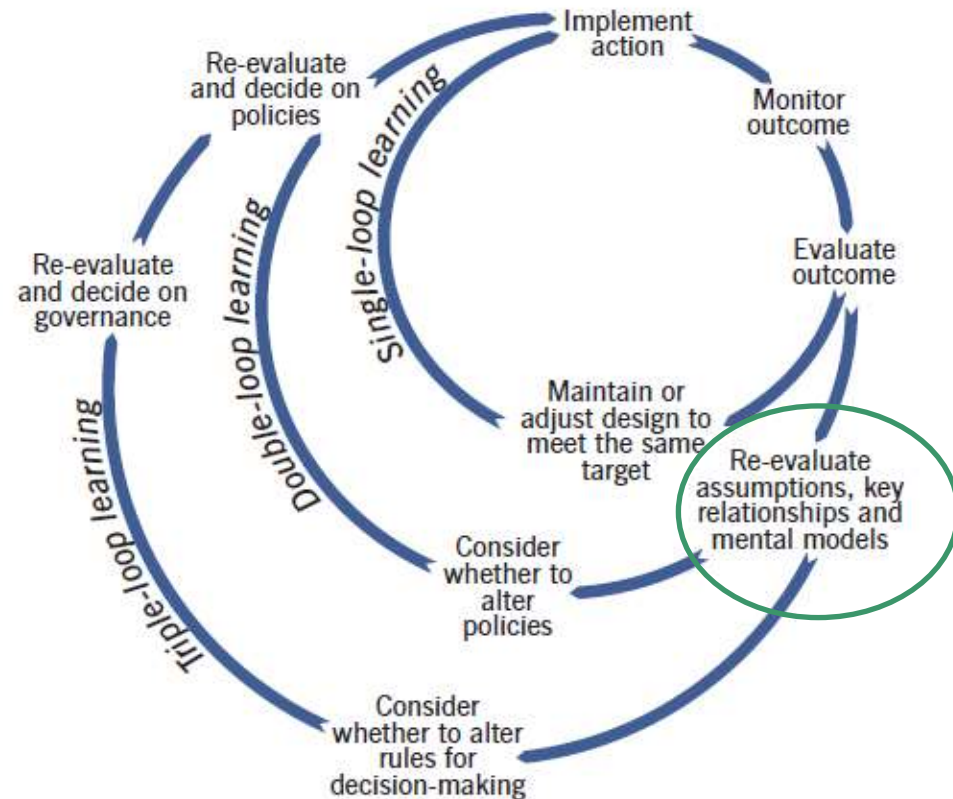
Options for responding to change may be compromised by past **decisions** and interventions, particularly those that have eroded **traditional safeguards of resilience**.





Key finding 6

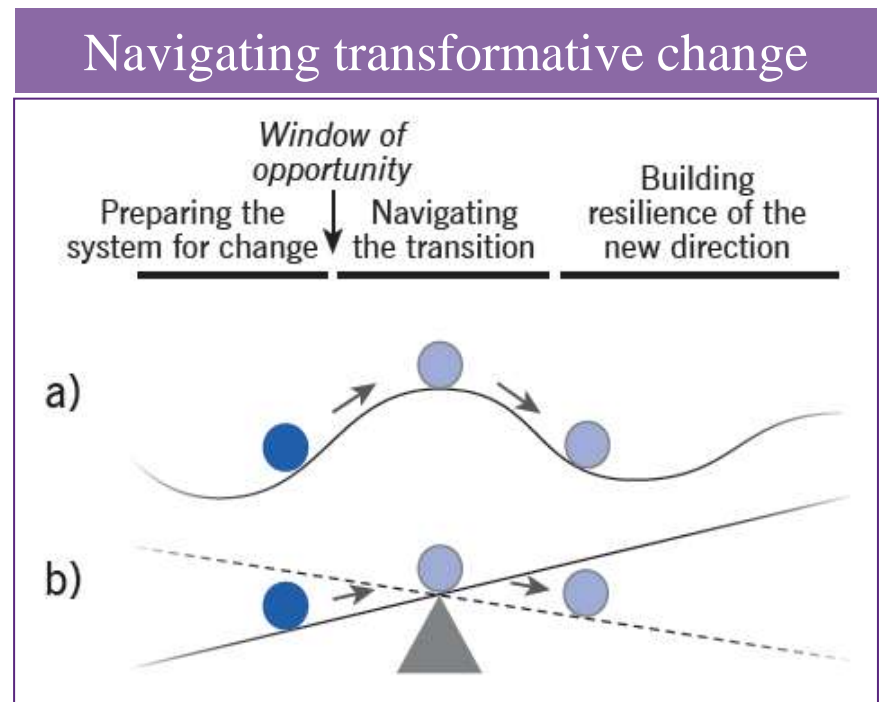
Rapid Arctic change is likely to produce surprises, so **strategies for adaptation** and, if necessary, transformation must be **responsive, flexible** and **appropriate** for a broad range of conditions.





The normative dimension

- Resilience for whom?
- Resilience of what?
- Transformation to what?
- What is a desirable future?



Arctic Resilience Report



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Thank you for
your attention!

