



Resilience

– an introduction

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Photo J.P. Macdonald



Resilience:

- What is it?
- Why should we care?
- What does it mean for marine protection?

“It’s not about managing the resource, it’s about managing ourselves within the resource”

“We must plan for a world of change if we wish to conserve arctic ecological systems, including the services they provide to people.”



Resilience thinking

- why should we care?



Resilience thinking focuses on social-ecological systems and a truly intertwined human-environment planet.

Resilience is about cultivating the capacity to sustain development in the face of expected and surprising change and diverse pathways of development and potential thresholds between them.

Resilience thinking about the environment has emerged as a lens of inquiry for interdisciplinary dialogue and collaboration.

What is resilience?



- Systems approach (*complex adaptive system*)
 - Neutral (*system property*)
vs. goal-oriented (*desirable state*)
 - Change as the norm /
sustained development as main goal
 - Focus on feedbacks and thresholds
-

Defining resilience - evolving



Ecological Resilience:



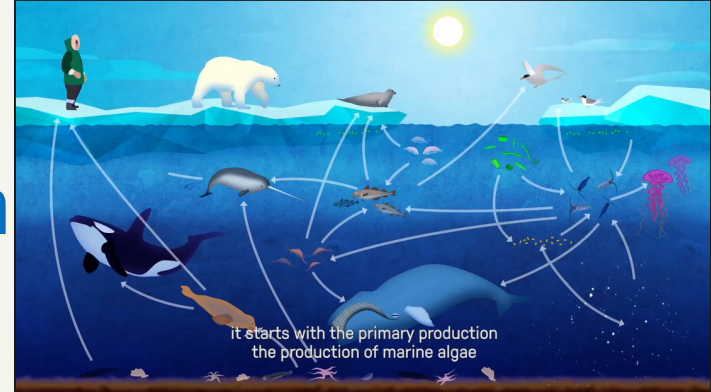
“The capacity of a **system** to experience **shocks** while retaining essentially the same **function**, **structure**, **feedbacks**, and therefore **identity**.”

Added later

..., responding or **reorganizing** in ways that maintain ...

What does resilience mean for marine management?

- *Questions*



- What does change do / what are management options? (altering the stability landscape, altering feedbacks)
- Resilience of what to what?
 - *Of*: species, communities, ecosystems, ecosystem services
 - *To*: disturbance or shocks (specific pressures, change & uncertainty)

Resilient marine....
Resilience of what to what?

Structure &
function

*Biodiversity,
Spatial diversity,
ES processes,
functions,
services*

*Food web structure,
Functional diversity,
Habitat,
Ecosystem services*

*Populations,
Genetic diversity
Demography,
Connectivity,
Ecosystem services*

Ecosystem

Community

Species

Disturbance

*Climate /
environmental change,
Fragmentation,
Pollution,
Biodiversity loss*

*Species loss/ gain
Harvest,
Spatial / timing mismatch,
Physical / chemical
environment*

*Food availability,
Harvest,
Predation,
Desease*

Defining resilience - evolving



For focus on ecosystem services:

Social-ecological resilience

“The capacity of a social-ecological systems to absorb recurrent **disturbances** (...) so as to retain essential **structures, processes and feedbacks.**”

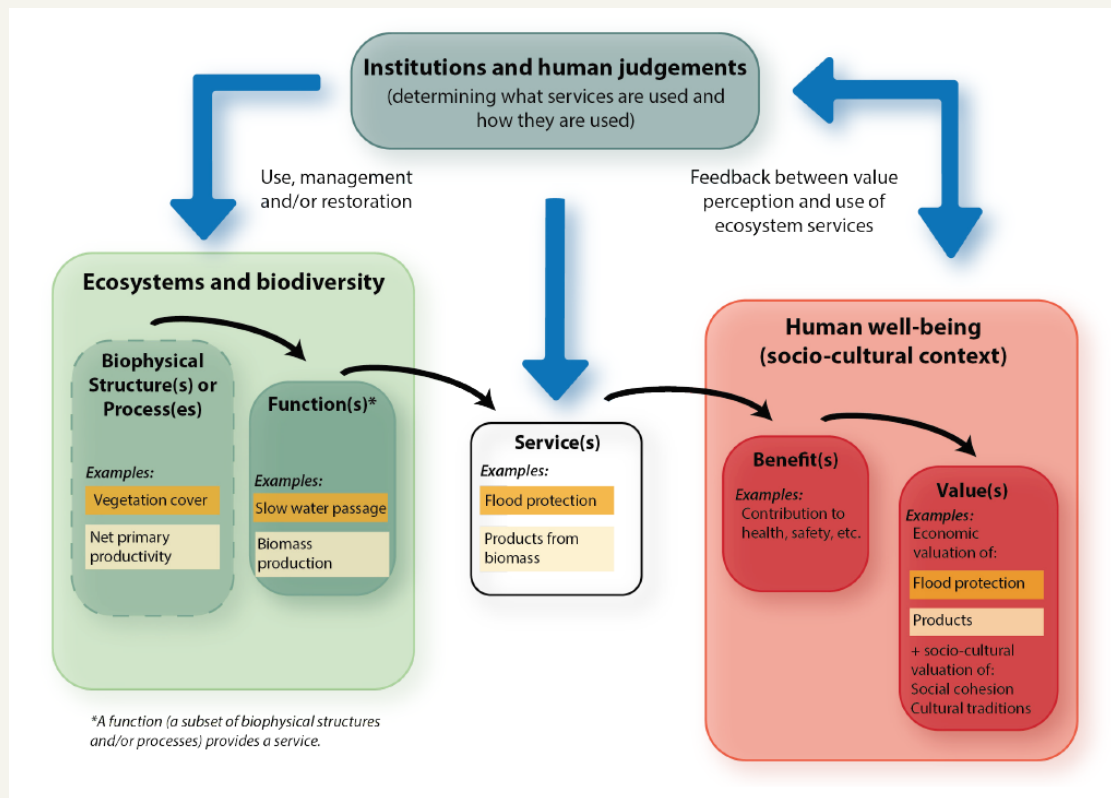
Three criteria:

capacities i) to **absorb** disturbances, ii) for **self-organization**,
and iii) for **learning** and **adaptation**



Resilient ecosystem services

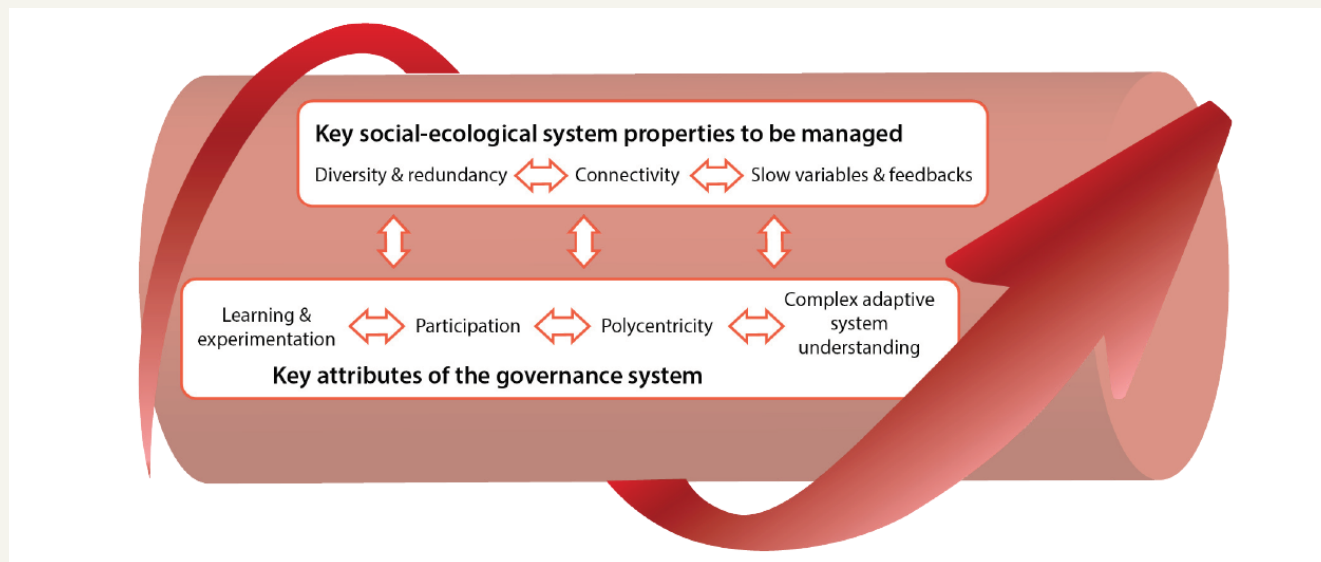
What are ecosystem services?





Resilient ecosystem services

Resilient ecosystem services as an outcome of governance targeting principal properties and attributes of social-ecological systems





Thank you!

Greenlandic children. Photo: Carsten Egevang/ARC-PIC.com