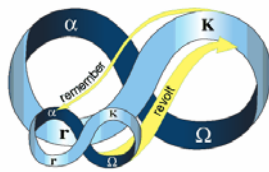


Adaptive governance of social-ecological systems

Carl Folke
Beijer Institute, Stockholm Resilience Centre,
and Resilience Alliance



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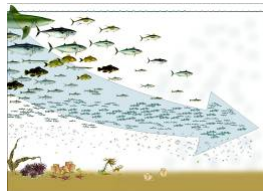


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The rationale for the initiative could be stated
in one sentence:

*The institutional capacities to manage the earth's
ecosystems are evolving more slowly than man's
overuse of the same systems.*



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Perspective

- Integrated economies and societies
- The living resource base as the foundation for the integration
- Environmental issues are development issues



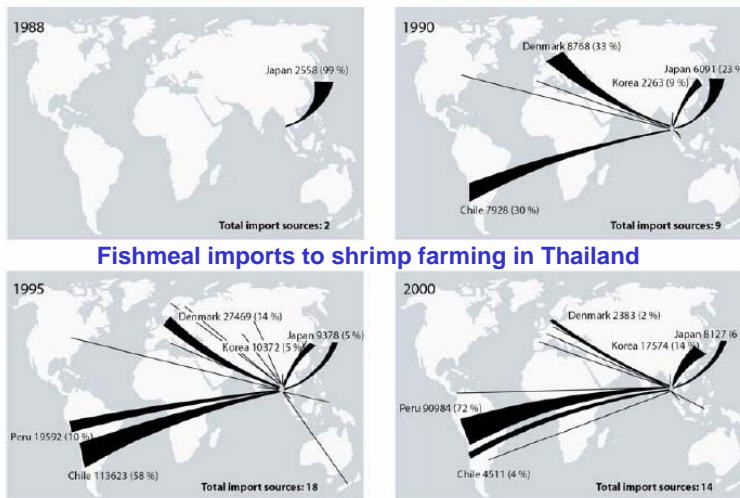
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2007-06-19

Urbanisation, globalisation and seafood production



Deutsch et al. 2007. Global Environmental Change 17:238-249



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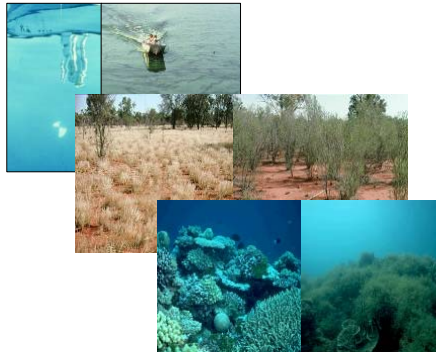


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Erosion of ecosystem resilience

- increases the likelihood for ecosystem shifts
- consequences for livelihood and societal development



from desired to less desired states
in terms of capacity to generate
natural resources and ecosystem services

Scheffer et al. 2001. *Nature*; Folke et al. 2004. *AREES*
Threshold database www.resalliance.org



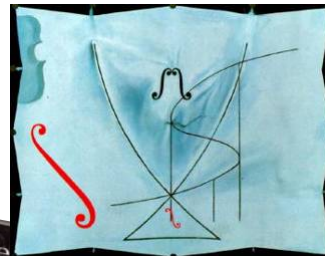
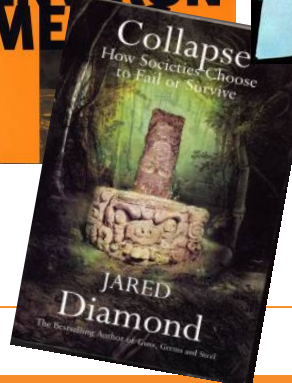
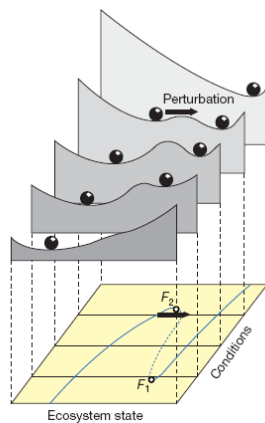
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Critical transitions or regime shifts



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Research Framework



- society and nature represent truly **interdependent social-ecological systems**
- social-ecological systems are **complex adaptive systems**
- **cross scale and dynamic interactions** represent new challenges for governance and management in relation to interdependent social-ecological systems and ecosystem services.

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Research frontier

Particularly interested in

- *The interplay between periods of gradual change and periods of abrupt, sudden change and reorganisation following change*
- vulnerability, adaptation, resilience, transformation

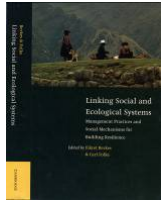


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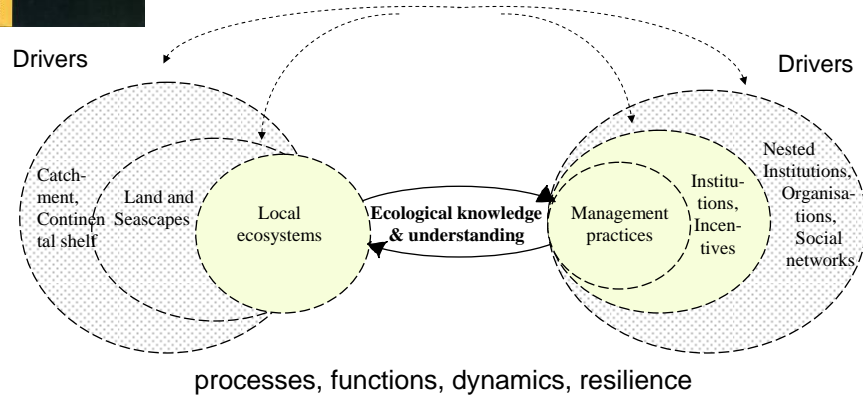


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Linking Social-Ecological Systems



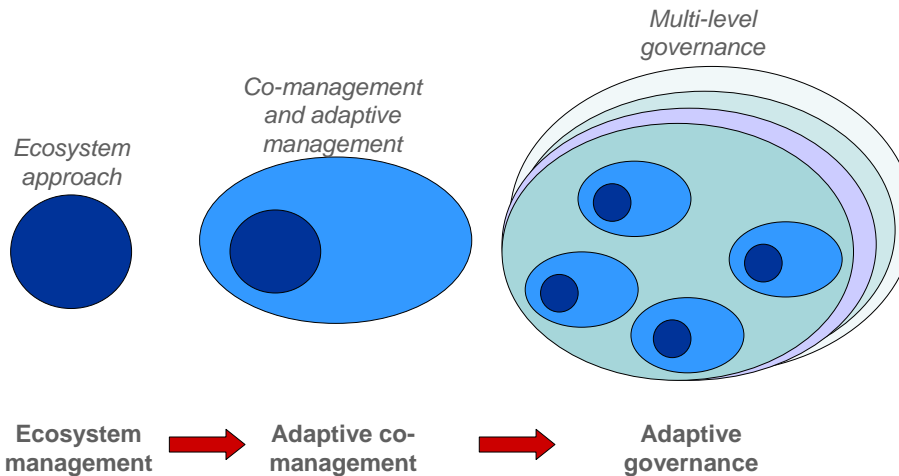
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Adaptive Governance for dealing with change



Dietz et al. 2003. Science; Folke et al. 2005. Ann. Rev. Env. Res.



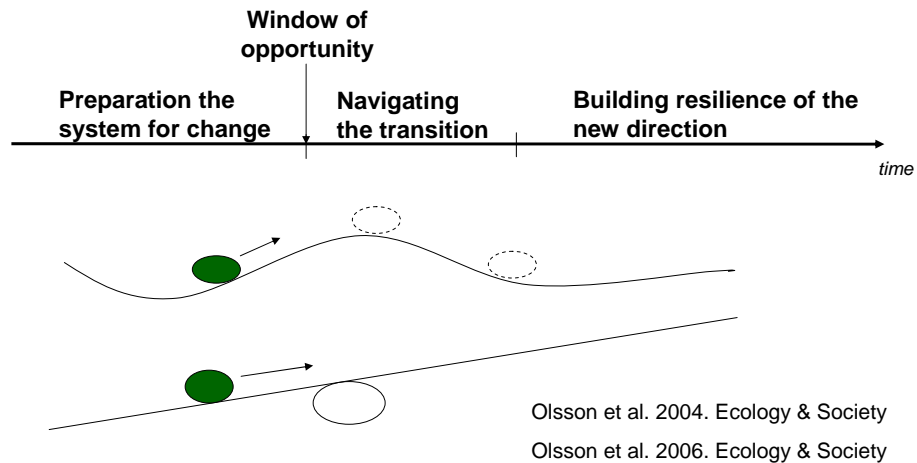
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Observed phases of SES transformations



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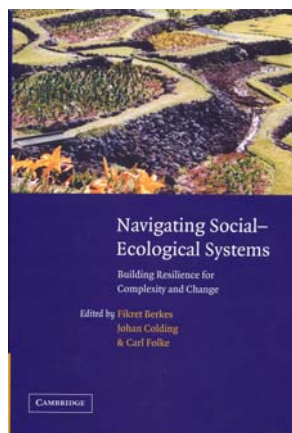
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Actors and actor groups that take part in navigating transitions and help develop and retain a social/collective memory of ecosystem management in the face of change



- Leaders and stewards
- Knowledge carriers and retainers
- Interpreters and sense makers
- Networkers and facilitators
- Visionaries and inspirers
- Innovators and experimenters
- Followers and reinforcers

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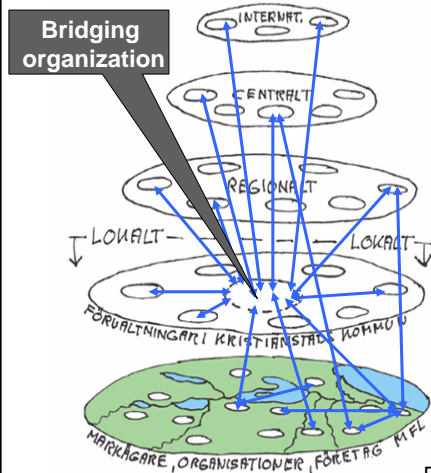
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Bridging organizations



- Performing essential functions in crafting effective responses to change in social-ecological systems
- Linking groups and organizations across levels, creating the right links, at the right time, around the right issues
- Accessing and combining multiple sources of knowledge and interests
- Enhancing vertical and horizontal integration and social learning

Folke et al. 2005, Hahn et al. 2006, Olsson et al. 2007



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Capacity to deal with change



- Crisis and space/arenas for reorganization and renewal
- Sources of resilience, social-ecological memory
- Social learning, diverse knowledge systems, world views
- Social capital, trust, vision, meaning, perceptions
- Social networks, agents, leadership, teams, actor groups
- Institutional interplay, organisational dynamics and fit-responses
- Self-emergence, collective action, conflict resolution
- Adaptive co-management, polycentric institutions (cross-level interactions), adaptive governance



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RESILIENCE 2008

RESILIENCE, ADAPTATION AND TRANSFORMATION IN TURBULENT TIMES
INTERNATIONAL SCIENCE AND POLICY CONFERENCE, STOCKHOLM, SWEDEN, APRIL 14-16 2008

Dates:

Resilience and Art: April 11-13 and
throughout the conference and policy forum.

Resilience Science Conference: April 14-16

Resilience Policy Forum: April 17

www.resilience2008.org



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Ecology and Society

A journal of integrative science for resilience and sustainability
Formerly Conservation Ecology

www.ecologyandsociety.org

Special features

Anthropology and ecology

Traditional ecological knowledge in social-ecological systems

Strengthening adaptive capacity (MA issue)

Restoration of riverine landscapes

Cross-level institutions

Resilience, networks, governance

Scenarios (MA issue)

Agent-based modeling of social-ecological systems



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Sustainable supply of ecosystem services (incl. food production, freshwater), from local to global scales, requires resilient ecosystems and associated governance systems



Carpenter and Folke. 2006. Trends Ecol. Evol. 21: 309-315

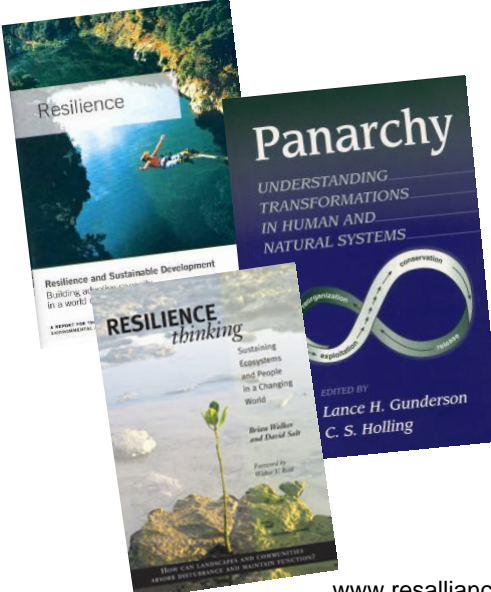
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Resilience


- provides capacity to absorb shocks while maintaining function
- provides components for renewal and reorganisation following disturbance
- sustains capacity for adaptation and learning

Holling 1973, *Ann.Rev.Ecol.Syst.*; 1986, *IIASA volume*; 2001, *Ecosystems*
 Carpenter et al. 2001, *Ecosystems*
 Folke 2006. *Global Environmental Change*


www.resalliance.org



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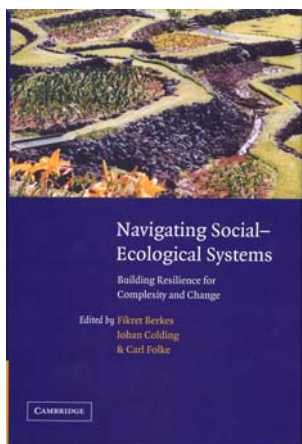
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Navigating volume




- learning to live with change and uncertainty
- nurturing diversity for reorganization and renewal
- combining different types of knowledge for learning
- creating opportunity for self-organization towards social-ecological sustainability



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Green-area user groups in urban ecosystem management

Table 3. Potential ecosystem services provided by analyzed green areas.

	Allotment areas	Domestic gardens	Golf courses
Provisioning services			
Fire wood		X*	
Food (fruits and vegetables)	X*	X*	
Ornamental resources (flowers)	X*	X*	
Cultural services			
Aesthetic values	X	X	X
Inspiration	X*	X*	X*
Nature education	X*	X*	X
Recreation	X*	X*	X*
Social relations	X*	X	X*
Regulating services			
Air filtration	X	X	X
Erosion regulation	X	X	X
Noise reduction	X	X	X
Nutrient retention (in ponds)			X
Pest regulation	X	X	X
Regulation of microclimate	X	X	X
Surface water drainage			X*
Supporting services			
Habitat for flora and fauna			X
Soil formation			X
Seed dispersal			X
Pollination			X
Water cycling			X



Golding et al. 2006
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Adaptive co-management of ecosystems

- collaboration of a diverse set of actors and actor groups operating at different organizational levels
- sharing of management power and responsibility involve multiple institutional linkages among communities, government agencies, and non-governmental organizations

Olsson, Folke, Berkes 2004. *Environmental Management* 34:75-90
 Armitage, Berkes, Doubleday (eds.). 2007. *Adaptive Co-Management: Collaboration, Learning and Multi-Level Governance*. University of British Columbia Press

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Governance

- Creating the conditions for ordered rule and collective action or institutions of social coordination
- the structures and processes by which people in societies make decisions and share power



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Mission:

Stockholm Resilience Centre will work to advance the understanding of complex social-ecological systems, and generate new and elaborated insights and means for the development of management and governance practices,

- through internationally recognized inter- and transdisciplinary research that integrates social science, the humanities and natural sciences
- by fostering an international arena of science, practice and policy dialogue,
- and through strategic communication for improved policy and decision support,

with the aim of securing ecosystem services for human wellbeing and building resilience for long-term sustainability.



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