

**Course: Resilience and the study of social-ecological interactions
(1,5 hp)**

4 – 7 November 2013

Course leaders: Maja Schlüter and Albert Norström

Course outline

Brief description of course content

This course is intended to deepen students' understanding of the concepts of resilience and social-ecological systems. The course has two primary objectives:

- The first objective of the course is to highlight the broad range of heuristic models and conceptual frameworks in resilience research and how they can be used to guide the development of research questions and methodologies when studying resilience-related questions. Students will explore these issues through a written assignment and a facilitated group discussion.
- The second objective is to guide students in the exploration of how the concepts of social-ecological systems and resilience compare to other scientific approaches to studying human-environment interactions. This comparison will be based on reading of assigned literature, student-led presentations and a facilitated group discussion.

This course assumes basic familiarity with resilience and related concepts. Students are welcome to take the course without this background, but are expected to do additional supplementary reading. Those students who are part of the Resilience Research School, and as such required to take this course, are expected to do background reading before the course if deemed necessary after consulting with their supervisors.

Theory, method and applications to be used in the course

Concepts	Methods	Applications
Resilience thinking & Social-Ecological system frameworks	Conceptualizations of social-ecological systems Comparison of different approaches to analyse human – environment systems	Development of research questions and methodologies

Course schedule - all lectures/seminars are in Room 248 (the Library) unless otherwise noted:

	Date	Time	Activity
Day 1 (PART I)	2013-11-04	Full day	Independent work by students
Day 2	2013-11-05	10.00-15.00	Class seminar (group discussions)
Day 3 (PART II)	2013-11-06	Full day	Independent work by students
Day 4	2013-11-07	10.00-15.00	Class seminar (presentations and group discussions)

The course consists of four full days, two days of independent work, and two days with class seminars (see schedule). We will be in Room 248 (i.e. the Library) both days.

For the days of independent work you are expected to read and prepare a written assignment/oral presentation (see below for details) that will form the basis of discussions for the following days of class seminars. Detailed instructions for each day's assignment are outlined below.

Learning outcomes

Upon completion of this course students should:

1. Have an understanding of the wide range of concepts and models that together underlie resilience thinking
2. Have a deeper understanding of how these different concepts and models can guide the development of research questions and methodologies when studying social-ecological systems.
3. Reflect and understand on how resilience thinking relates to and contrasts with other disciplinary and interdisciplinary approaches to understanding human-environment relations,
4. Explain in which contexts each approach to studying human-environment relations is most commonly used, as well as its strengths and weaknesses,

Assessment and grading criteria

Relative grading weight	Type of assessment	Learning outcome		
		1	2	3
50%	Seminars	x	x	x
50%	Written assignments/Presentation	x	x	x

Participation in all seminars is compulsory. Participation does not only mean attendance, the participant must take an active role in the seminar. Failure to attend a seminar will result in a grade of Fail.

Criteria for assessment:

The following grades are issued, the lower limits for each grade is expressed as a percentage of the maximum points available:

- P Pass – student shows proficiency in stipulated goals, and has full attendance
- F Fail - Below 50% Poor or insufficient conduct

Course Literature:

Day 1:

- Folke et al (2010) Resilience thinking: integrating resilience, adaptability and transformability. *Ecology and Society* 15(4): 20
- Biggs et al (2012) Towards principles for enhancing the resilience of ecosystem services. *Annual Review of Environment and Resources* 37: 421-448
- Cinner (2011) Social-ecological traps in reef fisheries. *Global Environmental Change* 21(3): 835-839
- Westley et al (2011) Tipping toward sustainability: emerging pathways of transformation. *AMBIO* 40: 762-780
- Hughes et al (2013) Multiscale regime shifts and planetary boundaries. *Trends in Ecology & Evolution* 28(7): 389-395
- Levin, S.A. et al. (2013). Social-ecological systems as complex adaptive systems. Modeling and policy implications. *Environment and Development Economics* 18(2): 111-132
- Reyers et al. (2013). Getting the measure of ecosystem services: a social–ecological approach. *Frontiers in Ecology and the Environment*. 11: 268–273.
- Galaz, V. with A. Duit (2008). “Governing Complexity – Insights and Emerging Challenges”, *Governance*, 21(3): pp. 311-335.

Day 3:

Landscape ecology approach:

- Ellis and Ramankutty (2008) Putting people in the map: anthropogenic biomes of the world. *Frontiers in Ecology and the Environment* 6(8): 439-447
- Vaclavik et al (in press) Mapping global land system archetypes. *Global Environmental Change* (attached in email to participants)



- Cumming (2011) Spatial resilience: integrating landscape ecology, resilience and sustainability

Ecological economics approach:

- Fischer, J. et. Al. (2009) Integrating resilience thinking and optimisation for conservation. Trends in ecology & evolution, 24, 549-54.
- Costanza, R., 1989. What is ecological economics? Ecological Economics, 1: 1-7
- Jeroen C.J.M. van den Bergh (2001). "Ecological Economics: Themes, Approaches, and Differences with Environmental Economics," Regional Environmental Change, 2(1), pp. 13-23

Institutional economics approach/Ostrom’s SES framework:

- Ostrom, E., 2007. A diagnostic approach for going beyond panaceas. Proceedings of the National Academy of Sciences 104(39):15181.
- Ostrom, E. 2011. Background on the Institutional Analysis and Development Framework The Policy Studies Journal 39, 7-27
- Basurto, X., et al., (2013). The social–ecological system framework as a knowledge classificatory system for benthic small-scale fisheries. Global Environ. Change (2013), <http://dx.doi.org/10.1016/j.gloenvcha.2013.08.001>
- Gibson et al. (2005). Local enforcement and better forests. World Development 33, 273-284

Ecosystem-based management:

- Österblom et al (2011) Incentives, social-ecological feedbacks and European fisheries. Marine Policy 35: 568-574
- Österblom et al (2010) Making the ecosystem approach operational – can regime shifts in ecological and governance systems facilitate the transition? Marine Policy 34(6): 1290-1299

Suggested additional background readings:

The following readings are suggested for students who have little prior exposure to resilience literature. You should discuss with your supervisor the amount of background reading you need before the course. We expect that you will be conversant with most of the concepts used and discussed in the resilience literature. These concepts include: resilience, adaptive cycle, alternative stable states, regime shifts, slow and fast variables, feedbacks, ecosystem services, ecological vs engineering resilience, functional diversity and redundancy, complex adaptive systems (CAS), adaptive capacity, co-management/adaptive co-management.

- Walker, B. and Salt, D. 2006. *Resilience Thinking. Sustainable ecosystems and people in a changing world.* Island Press.
- Carpenter et al (2001) From metaphor to measurement. Resilience of what to what? Ecosystems 4(8):765-781
- Berkes, F. and C. Folke, 1998. Linking social and ecological systems for resilience and sustainability. In Linking social and ecological systems: Management practices and social mechanisms for building resilience, pages 1–24. Cambridge University Press.



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- Navigating Social-Ecological Systems: Building resilience for complexity and change. Eds. Berkes, F., Colding, J., Folke, C. Cambridge University Press.

Suggested background videos:

Marten Scheffer “Resilience Revisited” from Resilience 2011 conference
<http://csid.asu.edu/resilience-2011/invited-speakers/videos/marten-scheffer/>

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