"Resilience of social and ecological systems: Theory, Concepts, and Practice"

PLB 809 - Section 402 (1 cr)
Spring 2019: WK Kellogg Biological Station, Hickory Corners, MI

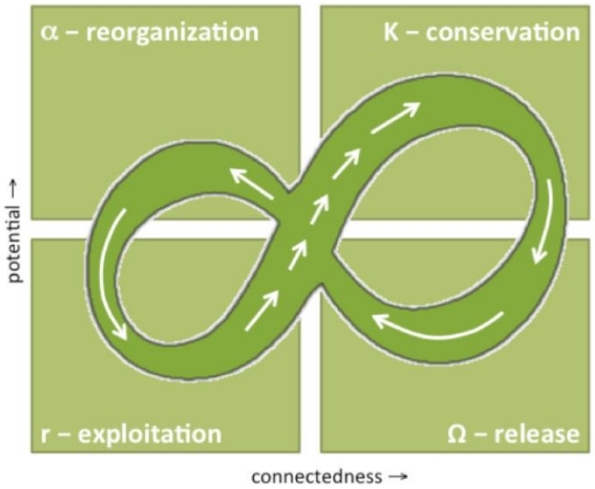
Instructors: Dr Adam Reimer, Research Associate, KBS
Dr. Julie Doll, Outreach Specialist, KBS LTER
Dr. Kay Gross, University Distinguished Professor, KBS and Plant Biology

Meetings: Fridays, 1:30-3:00*
327 Conference Room at KBS (students can also participate remotely via video)

Synopsis: The goal of this seminar is to explore how social and ecological systems interact and how this affects their resilience to global change drivers. Through readings and discussions, students will gain a solid foundation in resilience theory and sustainability analysis frameworks. We will use the framework of resilience presented by Dr. Laura Lengnick (Cultivating Resilience, LLC) in her recent book "*Resilient Agriculture: Cultivating Food Systems for a Changing Climate*." We will explore how this resilience framework can be applied to socio-ecological systems other than agriculture. Dr. Lengnick will be a seminar speaker at KBS on Friday, April 19 and the class will meet with her to discuss resilience of socio-ecological systems.

During this course students will read and discuss selected foundational readings from the primary literature and research from the KBS Long Term Ecological Research (LTER) project. Readings will pull especially from the work of Carl Folke and others in The Resilience Alliance, an interdisciplinary network of scientists and practitioners. In addition to leading and contributing to weekly discussions, participants will develop a short grant proposal motivated by the topics discussed in this seminar. The course instructors will help identify funding sources for students wishing to pursue their projects after completion of the course. The KBS LTER will consider proposals to fund collaborations to pursue projects that are relevant to its research.

For more information contact: Dr. Adam Reimer, seminar coordinator (apreimer@msu.edu)



*Tentative Schedule and Readings

Week	Date	Topic	Reading(s)
1	January 11	Foundations of Resilience Theory 1	Folke 2006; Holling 2001
2	January 18	No class	
3	January 25	Foundations of Resilience Theory 2	Walker et al. 2004; Folke et al. 2010
4	February 1	Sustainability Analysis Frameworks	Binder et al. 2013; Ostrom 2009
5	February 8	Resilience Analysis Frameworks	Walker et al. 2006
6	February 15	No class	
7	February 22	Coupled Human Natural Systems	Liu et al. 2007
8	March 1	Resilience and Social Change	Cote and Nightingale 2012
9	March 8	No class (Spring Break)	
10	March 15	Applications of Theory	KBS LTER proposal
11	March 22	Applications to Agroecosystems 1	Lengnick 2014
12	March 29	Applications to Agroecosystems 2	Lengnick 2014
13	April 5	Applications to Agroecosystems 3	Lengnick 2014
14	April 12	Applications to other systems	TBD
15	April 19	Meet with Laura Lengnick	
16	April 26	Proposal Presentations	

Bibliography

Binder CR, J Hinkel, PWG Bots, and C Pahl-Wostl. 2013. Comparison of frameworks for analyzing social-ecological systems. *Ecology and Society* 18(4): 26.

Cote M and AJ Nightingale. 2012. Resilience thinking meets social theory: situating social change in socio-ecological systems (SES) research. *Progress in Human Geography* 36(4): 475-489.

Folke C. 2006. Resilience: The emergence of a perspective for social-ecological systems analyses. *Global Environmental Change* 16: 253-267.

Folke C, SR Carpenter, B Walker, M Scheffer, T Chapin, and J Rockstrom. 2010. Resilience thinking: Integrating resilience, adaptability and transformability. *Ecology and Society* 15(4): 20.

Holling CS. 2001. Understanding the complexity of economic, ecological, and social systems. *Ecosystems* 4: 390-405.

Lengnick L. 2014. *Resilient agriculture: Cultivating food systems for a changing climate*. New Society Publishers: British Columbia, BC.

Liu J, T Dietz, SR Carpenter, M Alberti, C Folke, E Moran, AN Pell, P Deadman, T Kratz, J Lubchenko, E Ostrom, Z Ouyang, W Provencher, CL Redman, SH Schneider, and WW Taylor. 2007. Complexity of coupled human and natural systems. *Science* 317: 1513-1516.

Ostrom E. 2009. A general framework for analyzing sustainability of social-ecological systems. *Science* 325: 419-422.

Walker B, CS Holling, SR Carpenter, and A Kinzig. 2004. Resilience, adaptability and transformability in social-ecological systems. *Ecology and Society* 9(2): 5.

Walker B, L Gunderson, A Kinzig, C Folke, S Carpenter, and L Schultz. 2006. A handful of heuristics and some propositions for understanding resilience in social-ecological systems. *Ecology and Society* 11(1): 13.