

**GLOBAL to LOCAL SUSTAINABILITY**  
**ANTH/BIOL/ECON/NRM 647**  
**FALL 2011**

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**Course Information**

Location: AHRB 183

Meeting Time: TR 11:30-1:00

**Instructors**

- Joshua Greenberg, 372 O'Neill Building, [j.greenberg@alaska.edu](mailto:j.greenberg@alaska.edu), office: 907.474.7189  
office hours TR 1:30-2:30
- Gary Kofinas, 128 AHRB, [gary.kofinas@alaska.edu](mailto:gary.kofinas@alaska.edu); office: 907.474.7078/home:  
907.457.5725

**Course Description**

This course develops the basic principles that govern sustainability, resilience and change of linked ecological-social systems. We explore the roots of these concepts as they have developed in various disciplinary fields and through interdisciplinary inquiry. We then explore the integration of these concepts through student-led classes and projects. Emphasis throughout will be on societal goals, tradeoffs, drivers of stability and change, thresholds, feedbacks and interactions, emergent properties, and temporal and spatial scales. Sustainability science, social-ecological resilience theory, and vulnerability analysis are general frameworks for integration.

One purpose of the course is to explore the problem-solving implications of interdisciplinary thought and practice. Although the study of complex adaptive systems requires interdisciplinary organization, the focus here will be on understanding the problem. Apart from the theoretical frameworks presented and discussed, we hope to explore the opportunity for practical application of course topics and how theory structures observations and informs research and design of "ideal" solutions to real-world problems, and how those solutions face the realities of power and politics. Through all of the discussions we will also look at the way that different disciplines describe people, places, and ecosystems, and stress the common ground that integrates across disciplines.

**Course Goals/Learning Objectives**

- Develop a conceptual framework for exploring sustainability and resilience
- Develop skills applying basic principles to the analysis of real-world issues related to resilience and sustainability
- Apply these principles through student led projects, focusing on integrating social, cultural, economic and ecological dimensions of systems.

**Assignments/Grades/Requirements**

You are expected to complete all of the assigned readings in advance of the class for which they are assigned and to come to every class prepared to discuss these readings. You will be graded on a combination of your

- contributions to class discussion - 20%
- a mid-term exam - 30%
- contributions to the final set of student-led classes - 20%
- individual final paper – 30%

In the final accounting, engagement in discussion and learning of new perspectives counts for much in all areas.

The mid-term exam will consist of several questions that require integration and application of the material presented in class. The exam will be an open-book take-home exam.

The last weeks will be student-led classes that address special topics in sustainability, vulnerability, and resilience. Groups of students will be responsible for organizing and co-presenting material and leading discussion about one of these topics. Each group should select the focal scale of their special topic.

Final research papers will be written individually. Each paper will explore on one aspect of the student's group special topic. The paper will be no more than 15 double-spaced pages in length (plus bibliography). The paper should apply theory and frameworks studies in class, such as sustainability, vulnerability, and or resilience, in the context of the special topic. Students are encouraged to visit with the instructors to discuss the student's paper.

The following grading scale will apply:

- A** - 90 to 100 (A- 90-91; A+ 99-100)
- B** - 80 to 89 (B- 80-81; B+ 88-89)
- C** - 70 to 79 (C- 70-71; C+ 78-79)
- D** - 60 to 69 (D- 60-61; D+ 68-69)
- F** - < 60

The instructors reserve the right to modify the final grade in consideration of notable progress demonstrated by an individual, or unforeseen and extenuating circumstances. In such cases, extra credit assignments and/or makeup work may be used at the discretion of the instructors. Assignments handed in after the due dates will receive reduced credit.

### **Instructional Methods**

The course will use a combination of lectures, student discussions and presentations, and guest speakers. This class is interactive, relying on strong student contribution. We hope to engender a respectful and productive atmosphere that encourages this joint class exploration of course themes. This class will work best if everyone participates.

### **Attendance**

Students are expected to attend all classes. If it is necessary to miss a class, contact the instructors beforehand to inform them of your plans and request guidance on how to make up missed classroom learning.

### **Student Code of Conduct**

According to the UAF code of conduct “Students will not collaborate on any quizzes, in-class exams, or take-home exams that will contribute to their grade in a course, unless the instructor of the course grants permission.... Students will not represent the work of others as their own. A student will attribute the source of information not original with himself or herself (direct quotes or paraphrases) in compositions, theses, and other reports.... No work submitted for one course may be submitted for credit in another course without the explicit approval of both instructors.....” Students are expected to abide by the ***UAF Student Code of Conduct***.

An explanation of plagiarism and how to properly cite sources are available at the following two sites:

<http://www.uaf.edu/library/instruction/handouts/Plagiarism.html>.

<http://www.uaf.edu/library/instruction/handouts/Citing.html>

Plagiarism is grounds for course failure.

### **UAF Policies Disabilities Services**

The University of Alaska Fairbanks is committed to providing equal access for students with disabilities. The Office of Disability Services implements the Americans with Disabilities Act (ADA) and insures that UAF students have equal access to the campus and course materials. We will work with the Office of Disabilities Services (203 WHIT, 474-5655) to provide reasonable accommodation to students with disabilities. If you have a physical or learning disability, please advise us in writing of any special consideration necessary by the beginning of the second class. We will do everything possible to accommodate you in accordance with the Americans with Disabilities Act. Priority seating close to the board and screen is provided for students who need to be in close proximity to the board.

### **Blackboard & Distance Delivery**

We will use the UAF Blackboard site for this course to send emails and post readings, assignments and other materials. Blackboard can be accessed at <http://classes.uaf.edu>. Email notification through Blackboard will not work for a non-UAF email address. If you principally use a non-UAF email service, (such as yahoo) go to your UAF account and forward your UAF email to that address. You are responsible for all emails sent to your UAF email account. Blackboard resources, links and support information are available at the UAF Blackboard homepage.

Students in the course will be based in Fairbanks, Juneau and other sites. We will connect our classrooms via Video Conferencing Services (<http://www.alaska.edu/oit/vcs/>). If you have any trouble with the video conferencing, please notify the instructors or call the Video Conferencing Office at: 907-474-8390. The Video Conference established for our class can also be accessed via telephone during remote travel. The call-in number is: 1-800-570-3591 and the PIN is: 4379201.

## Course Materials

Textbook: Chapin, F. S., III, G. Kofinas, and C. Folke editors. 2009. Principles of Ecosystem Stewardship. Resilience Based Natural Resource Management in a Changing World. Springer, New York. (noted as “PES” in course outline)

### Additional Readings (available electronically)

- Arrow, Kenneth, Partha Dasgupta, Lawrence Goulder, Gretchen Daily, Paul Ehrlich, Geoffrey Heal, Simon Levin, Karl-Göran Mäler, Stephen Schneider, David Starrett, and Brian Walker. 2004. Are We Consuming Too Much? *Journal of Economic Perspectives* 18(3): 147-172.
- Adger, W.N. 2006. Vulnerability. *Global Environmental Change* 16: 268-281.
- Bennett, E. M., G. D. Peterson, and L. J. Gordon. 2009. Understanding relationships among multiple ecosystem services. *Ecology Letters* 12:1-11.
- Carpenter, S. R. and W. A. Brock. 2008. Adaptive capacity and traps. *Ecology and Society* 13:40. [online] URL: <http://www.ecologyandsociety.org/vol13/iss42/art40/>.
- Chapin, F.S., III, S.R. Carpenter, G.P. Kofinas, C. Folke, N. Abel, W.C. Clark, P. Olsson, D.M. Stafford Smith, B. Walker, O.R. Young, F. Berkes, R. Biggs, J.M. Grove, R.L. Naylor, E. Pinkerton, W. Steffen, and F.J. Swanson. 2010. Ecosystem stewardship: Sustainability strategies for a rapidly changing planet. *Trends in Ecology and Evolution* 25(4):241-249.
- Chapin III, F.S., A.D. McGuire, R.W. Ruess, T.N. Hollingsworth, M.C. Mack, J.F. Johnstone, E.S. Kasischke, E.S. Euskirchen, J.B. Jones, M.T. Jorgenson, K. Kielland, G.P. Kofinas, M.R. Turetsky, J. Yarie, A.H. Lloyd, and D.L. Taylor (2010) *Canadian Journal of Forest Resources*. 40: 1360–1370 (2010)
- Colic, Snjezana. 2007. The Prospect of Sustainability in the Culture of Capitalism, Global Culture, and Globalization: A Diachronic Perspective. Pages 237-248 in *Sustainability and Communities of Place*, Carl A. Maida, editor. Berghahn Books, New York.
- Costanza, Robert, Joshua Farley, and Ida Kubiszewski. 2010. Adapting Institutions for Life in a Full World. Pages 85-90 in 2010 *State of the World: Transforming Cultures: From Consumerism to Sustainability*. The Worldwatch Institute. W.W. Norton & Company, New York.
- Costanza, R, J. Cumberland, H Daly, R. Goodland, R. Norgaard. 1997. *An Introduction to Ecological Economics*. St. Lucie Press.
- Filer, Colin. 2009. A Bridge Too Far: The Knowledge Problem in the Millennium Assessment. Chapter 4 in *Virtualism, Governance, and Practice: Vision and Execution in Environmental Conservation*. James Carrier and Paige West (editors). Berghahn Books, New York.
- Foley, J. A., R. DeFries, G. P. Asner, C. Barford, G. Bonan, S. R. Carpenter, F. S. Chapin, III, M. T. Coe, G. C. Daily, H. K. Gibbs, J. H. Helkowski, T. Holloway, E. A. Howard, C. J. Kucharik, C. Monfreda, J. A. Patz, I. C. Prentice, N. Ramankutty, and P. K. Snyder. 2005. Global consequences of land use. *Science* 309:570-574.
- Kirch, Patrick V. 1997. Microcosmic Histories: Island Perspectives on “Global” Change. *American Anthropologist* 99(1): 30-42.
- Lomborg, B., 2001. *The Skeptical Environmentalist: Measuring the Real State of the World*. Cambridge U. Press, p 327-352.

- MEA (Millennium Ecosystem Assessment). 2005. Ecosystems and Human Well-being: Synthesis. Island Press, Washington. (Summary: pp1-24)
- Moran, Emilio. 2010. Theories and Concepts from the Social Sciences. Chapter 2 in Environmental Social Science: Human-Environment Interactions and Sustainability. Wiley-Blackwell, Malden, MA.
- Oliver-Smith, Anthony. 2004. Theorizing Vulnerability in a Globalized World: A Political Ecological Perspective. Chapter 1 in Mapping Vulnerability, Greg Bankoff, Georg Frerks, and Dorothea Hilhorst (editors). Earthscan, Sterling, VA.
- Robards, Martin D. and Joshua A. Greenberg. 2007. Global Constraints on Rural Fishing Communities: Whose Resilience is it Anyway? *Fish and Fisheries* 8: 14-30.
- Robbins, Paul. 2004. Chapters 1-4 in Political Ecology: A Critical Introduction. Blackwell Publishing, Malden, MA.
- Raudsepp-Hearne, Ciara, Garry D. Peterson, Maria Tengö, Elena M. Bennett, Tim Holland, Karina Benessaiah, Graham K. MacDonald, and Laura Pfeifer (2010) Untangling the Environmentalist's Paradox: Why Is Human Well-being Increasing as Ecosystem Services Degrade? *BioScience* 60: 576–589
- Sachs, J.D. 2008. Economics for a Crowded Planet, Common Wealth. Penguin Press.,
- Smit, B. and J. Wandel. 2006. Adaptation, adaptive capacity and vulnerability. *Global Environmental Change* 16:282-292.
- Solow, R. 1991. Sustainability an Economist's Perspective. MPC, Woods Hole Oceanographic Ins., Woods Hole, Mass.
- Thorton, Thomas. 2007. Alaska Native Corporations and Subsistence: Paradoxical Forces in the Making of Sustainable Communities. Pages 41-62 in Sustainability and Communities of Place, Carl A. Maida, editor. Berghahn Books, New York.
- Turner, B.L. II and Paul Robbins. 2008. Land-Change Science and Political Ecology: Similarities, Differences, and Implications for Sustainability Science. *Annual Review of Environment and Resources* 33: 295-316.

### **Additional References**

- Gregory, D. R. Johnston, G. Pratt, M. Watts, and S. Whatmore. 2009. The dictionary of human geography. 5<sup>th</sup> Edition. Wiley-Blackwell, Malden, MA.
- Millenium Assessment Reports: "The Millennium Ecosystem Assessment assessed the consequences of ecosystem change for human well-being. From 2001 to 2005, the MA involved the work of more than 1,360 experts worldwide. Their findings provide a state-of-the-art scientific appraisal of the condition and trends in the world's ecosystems and the services they provide, as well as the scientific basis for action to conserve and use them sustainably."  
<http://www.millenniumassessment.org/en/index.aspx>

**Course Outline and Schedule** (amended 8/31/2011)

Rather than viewing this course as rigidly organized, consider the outline below to be fluid and responsive to student interests and to ideas that develop during class discussions.

Week	Date	Topic	Reading/ Assignment	Lead
1	Thurs 9/1	<b>Introduction to course</b>	Review syllabus	JG & GK
2	Tues 9/6	<b>In search of definitions and meaning for sustainability.</b>	Raudsepp 2010, Solow 1991	JG
	Thurs 9/8	<b>Key Concepts; Exploring sustainability in the context of global change</b>	PES Ch 1 PES Ch 14 <i>Recommended:</i> MEA 2005	GK
<b>FRAMEWORKS</b>				
3	Tues 9/13	<b>Ecological Dimensions (part 1)</b>	PES Ch 2 Raudsepp- Hearne et al 2010 Chapin et al 2010	TC
	Thurs 9/15	<b>Ecological Dimensions (part 2)</b>		TC
4	Tues 9/20	<b>Economic Dimensions (part 1)</b>	Arrow et al. 2004 Costanza 1997 Lomborg 2001 <i>Recommended:</i> Robards & Greenberg 2007 Sachs 2008 PES Ch 10	JG
	Thurs 9/22	<b>Economic Dimensions (part 2)</b>		JG

5	Tues 9/27	<b>Social &amp; Cultural Dimensions (part 1)</b>	Kirch 1997 Moran 2010	TBA
	Thurs 9/29		PES Ch 3 & 11	GK
6	Tues 10/4	<b>Institutional Dimensions</b>	PES Ch 4	GK
	Thurs 10/6		Young 2002 Folke 2009	GK
7	Tues 10/11	<b>Assessing and Reducing vulnerability (dimensions[ of risk])</b>	Adger 2006; Oliver-Smith 2004 Loring & Gerlach 2010	Invited guest: Gerlach & Phil Loring
	Thurs 10/13	<b>Sustaining cultural pluralism</b>	PES Ch 6; Thorton 2007; Colic 2007	Invited guest: Shauna Burnsilver
8	Tues 10/18	TBA	<u>Group Lesson Plan Due;</u>	TBA
	Thurs 10/20	<b>Resilience &amp; adaptation</b>	Smit & Wandel 2006 <u>Individual paper plan due</u>	GK
9	Tues 10/25	<b>Transformation</b>	PES Ch 5; Chapin et al. 2010 Costanza et al. 2010	
	Thurs 10/27	<b>Rigidity Traps</b>	Carpenter & Brock 2008	

<b>10</b>	Tues 11/1	<b>The Problem of Scale</b>	TBA	
	Thurs 11/3	<b>Psychosocial dimensions</b>	<u>Mid-term take-home exam distributed</u>	
<b>Special Topics in Local-to-Global Sustainability (guest lectures and student-led classes)</b>				
<b>11</b>	Tues 11/8	<b>Energy</b>	<i>Invited guest:</i> <b>Gwen Holdmann</b>	
	Thurs 11/10	<b>Infrastructure</b>	<i>Invited guest:</i> <b>Jack Hébert</b>	
<b>12</b>	Tues 11/15	<b>Food Production and Food Systems</b>		
	Thurs 11/17	<b>Climate Change</b>		
<b>13</b>	Tues 11/22	<b>Markets &amp; Consumption</b>		
	Thurs 11/24	<i>Thanksgiving Holiday, No Class</i>		
<b>14</b>	Tues 11/29	<b>Land-use change</b>		
	Thurs 12/1	<b>Sustaining Rural Alaska</b>		
<b>15</b>	Tues 12/6	<b>Globalization and poverty</b>		
	Thurs 12/8	Class Evaluation		
<b>Final (exam) period</b>	Thurs 12/15	Speed Talk Presentations on individuals' projects; 5 minutes ; with 5 of Q & A		