CULTURE AND ENVIRONMENT

Geography/EnvSt 537
Spring, 2015

Instructor : Matthew Turner
340 Science Hall
mturner2@wisc.edu

Office Hours: TR 2:30-3:30pm;
or by apt

Course Description This is a course that is broadly concerned with the relationship between society and environment. It both traces evolving ideas about this relationship, particularly in developing world contexts, and explores how these ideas help us understand contemporary conservation and development issues. How do rural societies transform and adapt to their biophysical environments? How do broader political economic, cultural, and biophysical changes affect this interaction at a local level? A number of different analytical approaches have been used to study this complex relationship within a range of disciplines, most notably geography and anthropology. In this course we will evaluate the strengths and weaknesses of these approaches by reading and discussing a combination of theoretical works and case studies. A strong emphasis of this course will be to trace out how these theories have shaped environment/development policy in the Third World, with material impacts on rural peoples. A number of broader themes, relevant to all society-environment contexts, will be explored. The succession of approaches and corresponding themes covered in this course include:

Approaches to Study Culture x Environment	Themes
Environmental Determinism Cultural Ecology	Joint Production of Culture and Nature
Human Systems Ecology Population-Induced Intensification	Material Basis of Environmental Relations
Common Property Theory Political Economy Political Ecology	Political Economy, Institutions, and Environmental Governance
Environmental Narratives and History Landscape Ecology and Questions of Scale Nonequilibrium Ecology	Changing Views of Ecology

It is important to understand how these approaches first developed. The ordering of these approaches corresponds roughly with when they have been introduced in the social sciences. Still this course deviates strongly from a "history of ideas" course in that we will not attempt to exhaustively review society-nature thought. Instead, we only cover those approaches that have had an enduring influence on contemporary understandings. As a result, each week's readings often will be a mix of old classics and more contemporary examples.

Learning Goals Course material is organized for both beginning graduate students and upper division undergraduate students. Among both of these groups, there are students who identify themselves as interested in "theory" and those who are "more applied". In this course, we strive to breakdown this binary – the "theories" that we engage with in this course very much influence how we (scholars, practitioners, policy-makers) understand the relationship of societies/cultures and environments. As a result, they affect how we view the sources of environmental (mis)management and threats to the environment. Therefore, to be an effective conservationist, planner, activist or policy-maker, one needs to be able to understand the mix of

factors that shape current society-nature relations as well as conservation and policy outcomes. In particular, you will:

1. Develop a cross-cultural perspective about environment-society relations
2. Understand how certain conceptual frameworks for understanding culture-environmental relations developed in the social sciences and how these have affected conservation and development practice around the world.
3. Know the strengths and limitations of these frameworks for understanding the effect of human activities on the environment or in turn the effect of environmental change on human societies.
4. Be able to identify the appropriate frameworks for analyzing particular culture-environment contexts and in so doing, be better placed to develop more effective conservation or development initiatives.

Reading There is a heavy emphasis on assigned reading in this course. Given the course content, we will be reading and discussing a wide range of material from humanities, social sciences, to biophysical sciences. Depending on your background, you will have difficulty with some of the reading. PLEASE ask questions in class or come and see me in office hours. "Required Readings (REQ) and "Recommended Readings" (REC) will be journal articles or book sections that are available through our Learn@UW site. Unless otherwise stated in class, required readings need to be read and thought about prior to our class meeting on the date on which they are assigned. Recommended readings are provided to: 1. provide the necessary background that you may lack; 2. present in more depth case material used in lecture; or 3. provide you readings that allow you to explore further certain topics. Our meetings will be composed of a combination+ of lecture, full group discussions and small group discussions. I reserve the right to change readings to respond to the needs and interests of the class – any changes will not significantly increase the amount of material to read.

Writing This course emphasizes the development of your critical reasoning abilities in the realm of nature-society relations through individual and group work. A major vehicle for this development is writing. People-environment relations are complex. No matter what your life course will be, you will likely need to firest analyze such relations and then be able to make convincing arguments about complex relationships and situations. This is especially the case in the conservation, development and conservation-with-development fields. While this is not an English composition class, you will be expected to engage critically with the material and in so doing, make clear and concise arguments about complex relationships.

Grading Grades will be determined on: **1.** short responses to questions about weekly readings (graded on a check, check-, check+ basis) usually due on the Tuesday meeting of each week – 18% of grade; **2.** a choice of three of four possible 4-5 page reaction papers corresponding to the four themes of the course submitted by 5pm through assignment dropbox link on February 13, March 6, April 10, and May 5 – 36% of grade; **3.** a final 10-12 page paper on a topic of your choice (proposal due on March 20th – 4%; presentation during week of April 28th or May 5th – 5%; paper due on May 14th through dropbox link– 22%); and **4.** your participation in discussions (including oral presentations) -- 15% of grade. Written assignments are expected to be turned in on time with 10% of the maximum score deducted from scores for every day the assignment is late. Final letter grades for graduate and undergraduate students will be determined using separate curves. The curve will never be harsher than the standard curve (>92% A; 88-92% AB; 82-88% B; 78-82% BC; 68-78% C; <68 D or F).

Graduate Students For computing final grades, a separate curve will be drawn for graduate students. In addition, graduate students will be expected to write a 7-9 page critical review of the literature associated with one of week's topics of particular interest to them (at least 10 references). This review will include required

and recommended readings plus additional readings chosen in consultation with Prof Turner. This additional assignment is worth 20 points and so graduate students' grades will be based on 120 rather than 100 points.

Academic misconduct. In the words of the UW-Madison Student Academic Misconduct Policy[a], academic misconduct is an act in which a student:

* seeks to claim credit for the work or efforts of another without authorization or citation;
* uses unauthorized materials or fabricated data in any academic exercise;
* forges or falsifies academic documents or records;
* intentionally impedes or damages the academic work of others;
* engages in conduct aimed at making false representation of a student's academic performance;
* assists other students in any of these acts.

Therefore, cutting and pasting text from the web without quotation marks and proper citation; paraphrasing from the web without crediting the source; and submitting assignments written by others all are academic misconduct. See Student Assistance and Judicial Affairs at http://students.wisc.edu/saja/index.html for more information, and if you'd like more clarification on proper citation and what constitutes plagiarism, please ask me.

Additional information/resources. I highly recommend the Writing Center's services particularly for your final papers. They can assist you in all stages of writing from initial brainstorming to polishing. You can reach the Writing Center at 263-1992, or on the web at: http://www.wisc.edu/writing.

COURSE OUTLINE AND READINGS

20-January **Sustainable development. What questions remain?**

REC: Williams, R. 1983. Culture. pgs 87-91 In *Keywords: A Vocabulary of Culture and Society*. New York: Oxford University Press.

Williams, R. 1983. Nature. pgs 219-223 In *Keywords: A Vocabulary of Culture and Society*. New York: Oxford University Press.

Hopwood, B., Mellor, M., & O'Brien, G. 2005. Sustainable development: mapping different approaches. *Sustainable Development, 13*(1): 38-52.

Folke, C., S. Carpenter, T. Elmqvist, L. Gunderson, C. S. Holling and B. Walker 2002. Resilience and sustainable development: Building adaptive capacity in a world of transformations. *Ambio* 31(5): 437-44

Broad, R. 1994. The poor and the environment: Friends or foes? World Development 22 (6):811-822.

Lélé, S., and R. B. Norgaard. 2003. Sustainability and the scientist's burden. pgs 158-185 In *Battles over Nature*, eds. V. Saberwal and M. Rangarajan, Delhi, India: Permanent Black.

Brookfield, H. and C. Padoch. 1994. Appreciating agrodiversity: a look at the dynamism and diversity of indigenous farming practices. Environment 36 (5):6-11, 37-45.

Guha, R. 2000. The Southern Challenge. pgs 98-123 In Environmentalism: A Global History. New York: Longman.

Lélé, S. 1991. Sustainable development: a critical review. World Development 19:607-621.

[a]University of Wisconsin System Administrative Code. Chapter UWS 14. Student Academic Disciplinary Procedures http://students.wisc.edu/doso/docs/UWS%2014-2.docx (accessed 8/12/2013)

JOINT PRODUCTION OF CULTURE AND NATURE

27-January **Environmental determinism and origins of cultural ecology**

REQ: Diamond, J. 1998. A natural experiment of history. Pgs 53-66 (chapter 2) and Zebras, unhappy marriages.. 157-175 (chapter 9) in Guns, Germs and Steel: the Fates of Human Societies. NY: W.W.Norton and Company.

Sachs, J. 1997. "The limits of convergence: Nature, nurture and growth." *The Economist* (June, 14): 19-22.

Beckerman, S. 1987. Swidden in Amazonia and the Amazon rim. pgs 55-94. In Turner, B.L. and S.B. Brush, eds. *Comparative Farming Systems*. New York: Guilford Press.

REC: Wainwright, J. 2008. The matter of the Maya farm system. pgs 69-98 In *Decolonizing Development: Colonial Power and the Maya*. New York: Blackwell.

Ellen, R. 1982. Chapters 1-3 In *Environment, Subsistence and System*. Cambridge: Cambridge University Press (copies of book in Geography Library).

Steward, J.H. 1977. Chapters 1 and 2. pgs 43-67 In *Evolution and Ecology: Essays on Social Transformation*, edited by J. C. Steward and R. F. Murphy. Urbana: University of Illinois Press.

Hsiang, S. M., Meng, K. C., & Cane, M. A. 2011. Civil conflicts are associated with global climate. *Nature, 476*, 438-441.

3-February **Ecocosmologies and environmental regulation**

REQ: van den Breemer, J. P. M. 1992. Ideas and usage: Environment in Aouan society, Ivory Coast. pgs **:** 97-109 In *Bush base: Forest farm*. Edited by E. Croll and D. Parkin. London, Routledge.

OR

van Beek, W. E. A. and P. M. Banga 1992. pgs 57-75 In The Dogon and their trees. Bush base: Forest farm. E. Croll and D. Parkin. London, Routledge.

Rappaport, R.A. 1969. Ritual regulation of environmental relations among a New Guinea people. pgs 181-201 In Environment and Cultural Behavior, edited by A. P. Vayda. Garden City, New York: The Natural History Press.

Dove, M.R. 1996. Process versus product in Bornean augury: A traditional knowledge system's solution to the problem of knowing. pgs 557-596 In *Redefining Nature: Ecology, Culture and Domestication*, edited by R. Ellen and K. Fukui. Oxford: Berg.

REC: Ingold T. 2000. Hunting and gathering as ways of perceiving the environment. pgs 40-60 In *The Perception of the Environment: Essays on Livelihood, Dwelling and Skill.* London and New York: Routledge.

Peluso, N.L. and M. Watts. 2001. Violent environments. pgs 3-38 In Violent Environments, edited by N. L. Peluso and M. Watts. Ithaca, New York: Cornell University Press.

Rappaport, R.A. 1990. Ecosystems, populations and people. pgs 41-72 In The Ecosystem Approach in Anthropology, edited by E. F. Moran. Ann Arbor: University of Michigan Press.

Wade, N. 2010. Human culture, an evolutionary force. *The New York Times*, March 1, 2010.

10-February **Where is the division between culture and environment?**

REQ: Cronon, W. 1995. The trouble with wilderness; or, Getting back to the wrong nature. In *Uncommon Ground: Toward Reinventing Nature*, edited by W. Cronon. New York: W.W. Norton and Company.

Castree, N. 2005. Strange natures. pgs 1-44 In *Nature*. New York: Routledge.

REC: Waller, D. M. 1998. Getting back to the right nature: A reply to Cronon's 'The trouble with wilderness'. pgs 540-567 In *The Great New Wilderness Debate*. J. B. Callicott and M. P. Nelson. Athens, GA, Univ. of Georgia Press.

Williams, R. 1980. Ideas of Nature. Pages 67-85 in Problems in Materialism and Culture. Verso, London.

MATERIAL BASIS OF ENVIRONMENTAL RELATIONS

17-February **Human systems ecology: systems, energetics and carrying capacity**

REQ: Sayre, N. F. 2008. The genesis, history, and limits of carrying capacity. *Annals of Association of American Geographers* 98:120-134.

Bernard, F.E., D.J. Campbell, and D.J. Thom. 1989. Carrying capacity of the eastern ecological gradient of Kenya. *National Geographic Research* 5 (4):399-421.

Taylor, P. J. 2005. An intersection of domains of action that include MIT, USAID, system dynamics modelers, and nomadic pastoralists. pgs 106-128 In *Unruly Complexity: Ecology, Interpretation, Engagement.* Chicago, University of Chicago Press.

REC: Chapter 4: Energy inputs, outputs, and sustainable systems. Pgs 123-145 IN Netting, R. M. 1993. *Smallholders, Householders: Farm Families and the Ecology of Intensive, Sustainable Agriculture*. Stanford, California: Stanford University Press.

Harvey, D. 1974. Population, resources, and the ideology as science. *Economic Geography* 50: 256-277.

Robbins, P. 2004. Chapter 2: A tree with deep roots. Pgs 17-40 in *Political Ecology: A Critical Introduction*. Malden, MA: Blackwell Pub.

Brush, S.B. 1975. The concept of carrying capacity for systems of shifting cultivation. *American Anthropologist* 77:799-811.

Little, M. A. *et al.* 1990. Ecosystem approaches in human biology: Their history and a case study of the South Turkana Ecosystem Project. pgs 389-434 In *The Ecosystem Approach in Anthropology*. edited by E. F. Moran. Ann Arbor, University of Michigan Press.

24-February **Adding temporal depth to the adaptation framework: Demographic-technical change within rural communities**

REQ: Chapter 3: Labor-time allocation and Chapter 9: Intensive agriculture, population density, markets and the smallholder adaptation. pgs 102-122 and 261-294 In Netting, R. M. 1993. *Smallholders, Householders: Farm Families and the Ecology of Intensive, Sustainable Agriculture*. Stanford, California: Stanford University Press.

Zimmerer, K. 1993. Soil erosion and labor shortages in the Andes with special reference to Bolivia, 1953-91: Implication for "conservation-with-development". *World Development* 21 (10):1659-1675.

REC: Boserup, E. 1965. *The Conditions of Agricultural Growth: The Economics of Agrarian Change under Population Pressure*. London: Allen and Unwin. (pgs 15-55)

Turner, B.L. and M. Fischer-Kowalski. 2010. Ester Boserup: An interdisciplinary visionary relevant for sustainability. *Proceedings of the National Academy of Sciences* 107: 21963-21965.

Tiffen, M. and M. Mortimore. 1994. Malthus controverted: The role of capital and technology in growth and environmental recovery in Kenya. *World Development* 22 (7):997-1010.

Murton, J. 1999. Population growth and poverty in Machakos District, Kenya. *Geographical Journal* 165 (1):37-46.

Diamond, J. 1995. Easter's end. *Discover* 16(8): 62-69.

Hunt, T. L. 2006. Rethinking the fall of Easter Island. American Scientist 94: 412-419.

POLITICAL ECONOMY, INSTITUTIONS AND GOVERNANCE

3-March **Territoriality and customary institutions: Is there a tragedy in the commons?**

REQ: Ostrom, E. 1990. Reflections on the commons. pgs 1-28, 88-102 In *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press.

Cleaver, F. 2000. Moral ecological rationality, institutions, and the management of common property resources. *Development and Change, 31*, 361-383.

REC: Turner, M. D. 1999. The role of social networks, indefinite boundaries and political bargaining in maintaining the ecological and economic resiliency of the transhumance systems of Sudano-Sahelian West Africa. pgs 97-123 In *Managing Mobility in African Rangelands: the Legitimization of Transhumance*. M. Niamir-Fuller. London, Intermediate Technology Publications.

Goldman, M. 1998. Inventing the commons: Theories and practices of the commons' professional. pgs 20-53 In *Privatizing Nature: Political Struggles for the Global Commons*. New Brunswick, NJ, Rutgers University Press.

Peters, P. 1987. Embedded systems and rooted models: The grazing lands of Botswana and the commons debate. pgs 171-194 In *The Question of the Commons: The Culture and Ecology of Communal Resources*, edited by B. J. McCay and J. M. Acheson. Tucson: The University of Arizona Press.

10-March **Introduction to Political Ecology**

REQ: Blaikie, P. 1985. Chapters 5-7. pages 79-88, 107-137 In *The Political Economy of Soil Erosion in Developing Countries*. London and New York: Longman.

Chapter 1: The hatchet and the seed. Pgs 3-16. in Robbins, P. 2004. *Political Ecology: A Critical Introduction.* Malden, MA: Blackwell Pub.

REC: Deere, D. D. and A. de Janvry 1979. A conceptual framework for the empirical analysis of peasants. Giannini Foundation Paper No. 535

Heynig, K. 1982. The principal schools of thought on the peasant economy. *CEPAL Review* (April, 1982): 113-139.

Watts, M. 1983. On the poverty of theory: natural hazards research in context. pgs 231-262 In K. Hewitt ed. *Interpretations of calamity*. Risk and Hazards Series #1. London: Allen Unwin.

Bassett, T.J. and C. Fogelman. 2013. Déjà vu or something new? The adaptation concept in the climate change literature. *Geoforum* 48: 42-53.

Henderson, G. 2009. Marxist political economy and the environment. In *A Companion to Environmental Geography*, eds. N. Castree, D. Demeritt, D. Liverman and B. Rhoads, 266-293. Chichester, West Sussex (United Kingdom): Wiley-Blackwell.

Vayda, A.P. and B.B. Walters. 1999. Against political ecology. *Human Ecology* 27 (1):167-179.

Escobar, A. 1999. After nature: Steps to an antiessentialist political ecology. Current Anthro. 40 :1-30.

17-March **Political Ecologies (read three cases)**

REQ: Bassett, T.J. 1988. The political ecology of peasant-herder conflicts in the northern Ivory Coast. *Annals of the Association of American Geographers* 78 (3):453-472.

Moore, D.S. 1993. Contesting terrain in Zimbabwe's eastern highlands: political ecology, ethnography, and peasant resource struggles. *Economic Geography* 69 (4):380-401

Turner, M.D. 2003. Environmental science and social causation in the analysis of Sahelian pastoralism. pp. 159-178 In Zimmerer, K. S., and T. J. Bassett eds. *Political Ecology: An Integrative Approach to Geography and Environment-Development Studies*. New York: Guilford Press.

McCarthy, J. 2002. First World political ecology: lessons from the Wise Use movement. *Environment and Planning* A 34(7): 1281-1302.

Neumann, R.P. 2004. Nature-state-territory: Toward a critical theorization of conservation enclosures. in *Liberation Ecologies: Environment, Development, Social Movements*. R. Peet and M. Watts. London: Routledge.

Robbins, P., and J. Sharp. 2004. The lawn-chemical economy and its discontents. *Antipode* 35 (5):955-979.

Mutersbaugh, T. 2006. Certifying biodiversity: Conservation networks, landscape connectivity, and certified agriculture in southern Mexico. pgs 49-70 In *Globalization and the New Geographies of Conservation*, ed. K. S. Zimmerer. Chicago: University of Chicago Press.

REC: Walker, P. A. 2005. Political ecology: where is the ecology? *Progress in Human Geography* 29 (1):72-83.

Walker, P. A. 2006. Political ecology: Where is the policy? *Progress in Human Geography* 30 (3):382-395.

Walker, P. A. 2007. Political ecology: Where is the politics? *Progress in Human Geography* 31 (3):363-369.

24-March **Decentralization, participation, and privatization in development/conservation**

REQ: Carney, J. 2004. Gender conflict in Gambian wetlands. In *Liberation Ecologies: Environment, Development and Social Movements*, eds. R. Peet and M. Watts, 316-335. New York: Routledge.

Agrawal, A. and Ribot, J. 1999. Accountability in decentralization: A framework with South Asian and West African cases. Journal of Developing Areas 33, 473-502.

Robertson, M.M. 2007. The neoliberalization of ecosystem services. Wetland mitigation banking and the problem of measurement. In *Neoliberal Environments: False Promises and Unnatural Consequences*, edited by N. Heynen, P. Robbins, J. McCarthy and S. Prudham. New York: Routledge.

REC: Agarwal, B. 2001. Participatory exclusions, community forestry, and gender: an analysis for South Asia and a conceptual framework. *World Development* **29**: 1623 - 1648.

Prudham, S. 2009. Commodification. In *A Companion to Environmental Geography*, eds. N. Castree, D. Demeritt, D. Liverman and B. Rhoads, 123-142. Chichester, West Sussex (United Kingdom): Wiley-Blackwell.

Liverman, D. M. and S. Vilas. 2006. Neoliberalism and the Environment in Latin America. *Annual Review of Environment and Resources* 31:327-363.

Sundberg, J. Strategies for authenticity and space in the Maya Biosphere Reserve, Petén, Guatemala. pp. 50-69 in Zimmerer, K. S., and T. J. Bassett eds. 2003. *Political Ecology: An Integrative Approach to Geography and Environment-Development Studies*. New York: Guilford Press.

Mansfield, B. 2004. Neoliberalism in the oceans: "rationalization," property rights and the commons question. *Geoforum* 35: 313-326.

CHANGING VIEWS OF ECOLOGY

7-April **Environmental history and development narratives (read Hughes + two)**

REQ: Hughes, J. D. 2006. Defining environmental history. pgs 1-17 In *What is Environmental History?*, Cambridge, UK: Polity Press.

McCann, J. C. 1999. A tale of two forests: Narratives of deforestation in Ethiopia, 1840-1996. In *Greenland, Brownland, Blackland: An Environmental History of Africa, 1800-1990*, 79-107. Oxford: James Currey.

Bassett, T.J. and Zuéli, K.B. The Ivorian savanna: Global narratives and local knowledge of environmental change. pp. 115-136. in Zimmerer, K. S., and T. J. Bassett eds. 2003. *Political Ecology: An Integrative Approach to Geography and Environment-Development Studies*. New York: Guilford Press.

Fairhead, J. and M. Leach. 1996. Rethinking the forest savanna mosaic: Colonial science and its relics in West Africa. pgs 105-121 in Leach, M., and R. Mearns eds. *The Lie of the Land: Challenging Received Wisdom on the African Environment*. Portsmouth, N.H.: Heinemann.

Robbins, P. 1998. Paper forests: Imagining and deploying exogenous ecologies in arid India. *Geoforum* 29(1): 69-86.

REC: Hoben, A. The cultural construction of environmental policy: Paradigms and politics in Ethiopia. pgs 186-208 in in Leach, M., and R. Mearns eds. *The Lie of the Land: Challenging Received Wisdom on the African Environment*. Portsmouth, N.H.: Heinemann.

Zerner, C. 1996. Telling stories about biological diversity. pgs 68-101 In *Valuing Local Knowledge*, edited by S. B. Brush and D. Stabinsky. Washington, D.C.: Island Press.

14-April **Implications of changing views of ecology for people-environment research**

REQ: Hobbs, R. J. 1998. Managing ecological systems and processes. In *Ecological Scale: Theory and Applications*, eds. D. L. Peterson and V. H. Parker, 459-484. New York: Columbia University Press.

Ellis, J.E. and D.M. Swift. 1988. Stability of African pastoral ecosystems: alternate paradigms and implications for development. *Journal of Range Management* 41:450-459.

Forsyth, T. 1998. Mountain myths revisited: integrating natural and social environmental science. *Mountain Research and Development* 18:107-116.

REC: Forsyth, T. 2003. pgs 24-51 in *Critical Political Ecology: The Politics of Environmental Science*. London ; New York: Routledge.

Behnke, R. and I. Scoones. 1993. Rethinking range ecology: implications for rangeland management in Africa. pgs 1-30 In *Range Ecology at Disequilibrium*, edited by R. Behnke, I. Scoones and C. Kervan. London: Overseas Development Institute.

Turner, M.D. 1998. The interaction of grazing history with rainfall and its influence on annual rangeland dynamics in the Sahel. pp. 237-261 In Nature's Geography: New Lessons for Conservation in Developing Countries ed., K. Zimmerer and K. Young, Madison: University of Wisconsin Press.

Zimmerer, K.S. 1994. Human geography and the "new ecology": The prospect and promise of integration. *Annals of the Association of American Geographers* 84: 108-125.

Allen, T. F. H. 1998. The landscape "level" is dead: Persuading the family to take it off the respirator. In *Ecological Scale: Theory and Applications*, eds. D. L. Peterson and V. H. Parker, 35-54. New York: Columbia University Press.

Sayre, N. F. 2009. Scale. In *A Companion to Environmental Geography*, eds. N. Castree, D. Demeritt, D. Liverman and B. Rhoads, 95-108. Chichester, West Sussex (United Kingdom): Wiley-Blackwell.

21-April **Different knowledge systems and environmental management**

REQ: Acheson, J.M., J.A. Wilson, and R.S. Steneck. 1998. Managing chaotic fisheries. pgs 390-413 In *Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience*, edited by F. Berkes and C. Folke. Cambridge: Cambridge University Press.

Agrawal, A. 1995. Dismantling the divide between indigenous and scientific knowledge. *Development and Change* 26 (3):413-439.

Nadasdy, P. 1999. The politics of TEK: Power and the "integration" of knowledge. *Artic Anthropology* 36 (1-2):1-18.

REC: Scoones, I. 1997. The dynamics of soil fertility change: Historical perspectives on environmental transformation from Zimbabwe. *The Geographical Journal* 163 (2):161-169.

Richards, P. 1995. The versatility of the poor: Indigenous wetland management systems in Sierra Leone. *GeoJournal* 35 (2):197-203.

28-April **Final project presentations**

5-May **Synthesis, integration and application across theme**s

REQ: On-line module