Department of Anthropology
University of Texas at Austin

ANT 380K (Unique #31422)
Seminar: Interpreting Cultural Environments: Past and Present
Spring 2013

Course Time: Tuesday, 2 – 5 pm
Location: SAC 5.124

Instructor: Dr. Arlene Rosen, Office: SAC 4.132
Email: amrosen@austin.utexas.edu
Office Hours: Tuesday and Wednesday 11:00 am – 12:00 pm, or by appointment.

Course Description: This seminar course is an introduction to some of the major guiding anthropological concepts concerning relationships between past human societies, culture and the 'natural world'. The course will include lectures, readings and discussions on ecological concepts and processes, human ecodynamics, landscape sustainability, landscape heritage, human perceptions and symbolization of their environments, political ecology, human behavioral ecology, the ecology of colonialism, and human impacts on the environment. Throughout the course we will discuss how to generate problem-driven research based on the above concepts using the technical skills of environmental archaeology.

Format: Seminar. Two to four journal articles will be assigned weekly. Students are expected to do all the assigned readings. Each week (beginning in the second class meeting) one student will be responsible for giving a 15 min summary of the articles and getting discussions started by providing a few questions or comments to the group. I will provide general background information and additional comments if necessary.

Grading:

One Research Paper (4000 Words) (80%)
Paper topics will be open, subject to agreement between the student and the instructor. ***The students should have agreed a topic by week six of the class***.

2) A 30-50 minute PowerPoint presentation covering one of the session topics. The student will submit a printout of the PowerPoint slides, plus a bibliography of this topic (20%).

3) For each session students will do all of the required reading for that session, but will be responsible for presenting one of the readings in detail.

Weekly Topics (subject to alteration with advanced notice):

1. Jan 15. Introduction to the Course, Historical Background, Ecological Principles and Environmental Archaeology
2. Jan 22. Culture and Biodiversity in the Past and Present

3. Jan 29. *No Class Meeting: Prepare Bibliography and Powerpoint Presentations*
4. Feb 5. Behavioral Ecology, Optimal Foraging
5. Feb 12. Historical Ecology
6. Feb 19. Political Ecology
7. Feb 26. Nature and Culture, Symbolic Ecology: How Non-Western Societies View Nature
8. Mar 5. Landscape Archaeology and Phenomenology

Mar 12. ***Spring Break: No Class***

9. Mar 19. The 'Anthropocene' and Human Impact on the Environment
10. Mar 26. Ecology of Colonialism and Conquest
11. Apr 2. Adaptive Cycles and Resilience Theory
12. Apr 9. *No Class Meeting: Preparation of Research Papers*
13. Apr 16. Human Adaptations and Niche Construction (social and ecological)
14. Apr 23. Solving Anthropological Research Questions with Environmental Data Sets
15. Apr 30. Student Presentations of paper topics

Session Descriptions and Selected Readings

1. Introduction to the Course, Historical Background, Ecological Principles and Environmental Archaeology

Human societies are situated within and integrated into ecological and environmental systems. One of the goals of Environmental Archaeology is to understand the relationships and interactions between cultural systems and their settings within the litho- and bio-spheres. This goes beyond understanding the procurement of food supplies to sustain life. Nature and environment are an integral part of the way humans structure their societies, political systems and perceptions of the world around them. People are in part shaped by their environment, but also have a multitude of solutions for adapting to their environmental milieu. Humans also in turn alter the natural world in ways un-precedented by other species. In this session we will explore some of these complex interactions.

Suggested Readings

Dincauze, D. F. 2000 *Environmental Archaeology: Principles and Practice*. Cambridge University Press, Cambridge, Chapter 1, pp. 3-19.

O'Connor, T. and J. G. Evans 2005 *Environmental Archaeology: Principles and Methods*. Second ed. Sutton Ltd., Gloucestershire. Pp.10-17.

Butzer, Karl 1982. *Archaeology as Human Ecology.* Cambridge University Press. Pp. 3-32, 279-320

Additional Background References

Evans, J. G. 2003 *Environmental Archaeology and the Social Order*. Routledge, London. Pp.1-45

Gee, J. H. R. & P. S. Giller 1991. Contemporary community ecology and environmental archaeology, pp. 1-2, in D. R. Harris and K. D. Thomas (eds) *Modelling Ecological Change.*

Roberts, Neil 1998. *The Holocene,* second edition. Blackwell, Oxford. Pp. 2-54

Lowe, J.J. and Walker, M.J.C. 1997. *Reconstructing Quaternary Environments*. Second edition. London: Longman. Chapters 1 and 6.

Williams, M.A.J., Dunkerley, D.L., De Deckker, P., Kershaw, A.P. and Stokes, T. 1993. *Quaternary Environments*. London: Edward Arnold. Chapters 1 and 3.

Ruddiman, W. J. 2008. *Earth's Climate. Past and Future,* second edition. Freeman & Co, New York. [1st edition, 2000, is also okay].
Chapter 2 can be downloaded from http://bcs.whfreeman.com/ruddiman2e/]

2. Culture and Biodiversity in the Past and Present

According to the UN Convention on Biological Diversity, biodiversity is the variability among living organisms from all sources including, among other things, terrestrial, marine, and other aquatic ecosystems, and the ecological complexes of which they are part. This includes diversity within species (genetic), among species, and of ecosystems. Most of us would agree that biodiversity is a very important characteristic of our planet that should be preserved and encouraged. In this session, we will consider the significance of biodiversity, its relationship to climate change, the effects of human activity, and how archaeology, together with biological, sedimentological and other sciences, can work together to understand biodiversity in the past, present and future.

Suggested Readings

Angold, P.G. et. al. 2006. Biodiversity in urban habitat patches. *Science of the total environment* 360: 196 – 204.

Brncic1, Terry M; Katherine J Willis; David J Harris and Richard Washington. 2007.Culture or climate? The relative influences of past processes on the composition of the lowland Congo rainforest. *Phil. Trans. R. Soc. B* 362: 229 – 242.

Dupouey, J. L., E. Dambrine, J. D. Laffite, and C. Moares. 2002. Irreversible impact of past land use on forest soils and biodiversity. *Ecology* 83:2978–2984.

Hames, Raymond. 2007. The Ecologically Noble Savage Debate. *Annual Review of Anthropology* 36(1):177-190.

Hayashida, Frances M. 2005. Archaeology, Ecological History, and Conservation. *Annual Review of Anthropology* 34(1):43-65.

Heckenberger, Michael J; J Christian Russell; Joshua R Toney and Morgan J Schmidt. 2007. The lecacy of cultural landscapes in the Brazilian Amazon: implications for biodiversity. *Phil. Trans. R. Soc. B* 362: 197-208

McKinney, Michael L. 2002. Urbanization, biodiversity and conservation. *Bioscience* 52(10): 883 – 890.

Rivadeneira, Marcelo M.; Calogero M. Santoro and Pablo A. Marquet. 2010. Reconstructing the history of human impacts on coastal biodiversity in Chile: constraints and opportunities. *Aquatic Conservation: Marine and Freshwater Ecosystems* 20(1): 74 – 82.

Savard, Jean-Pierre; Philippe Clergeau and Gwenaelle Mennechez. 2000. Biodiversity in concepts in urban ecosystems. *Landscape and Urban Planning* 48: 131 – 142.

Stahl, Peter W. 1996. Holocene Biodiversity: An Archaeological Perspective from the Americas. *Annual Review of Anthropology* 25:105-126.

3. Jan 29. ***No Class Meeting: Prepare Bibliography and PowerPoint Presentations***

4. Human Adaptations to Environments: Behavioral Ecology, Optimal Foraging

Human behavioral ecology (HBE) takes as its starting point that humans, like all other species, have evolved a strong predisposition to maximize their individual reproductive fitness. HBE is part of a wider research program, evolutionary ecology, which can be defined as "the application of natural selection theory to the study of adaptation and biological design in an ecological setting" (Winterhalder & Smith 1992: 5). From this premise – often referred to as the 'phenotypic gambit' – stems its focus on the interaction between evolutionary forces and ecological variables in the development of specific adaptations. How can this be done in practice? The key to the effective application of behavioral ecological models is the assigning of costs and benefits to the behaviours under study, no matter whether these behaviors are social or economic. These costs/benefits can then be evaluated with explicit and often mathematically rendered optimization and game theoretical models. These models are directly derived from evolutionary theory and allow specific predictions or hypotheses to be put forward, which can be put to the test using behavioral information.
HBE enjoys a wide field of application in anthropology, where specific issues such as wealth inheritance, birth spacing and migration can be investigated from this angle. In its archaeological manifestation, HBE most commonly focuses on issues of territoriality, subsistence and technological change, but patterning in resource transport, the origin and diffusion of agriculture, the material correlates of social status, early human social organization, the development of social hierarchies, and the evolution of human life history have also been addressed. In this session we will explore the basic premises of HBE as well as some of the models used. On the basis of a range of case studies, we will consider how effectively HBE allows an evaluation of the patterns seen in the archaeological record and how it interacts with other theoretical approaches.

Readings

Bird, D.W. & J.F. O'Connell 2006. Behavioural Ecology and Archaeology. *Journal of Anthropological Research* 14: 143-88. (available on-line)
Broughton, J.M. & J.F. O'Connell 1999. On Evolutionary Ecology, Selectionist Archaeology, and Behavioural Archaeology. *American Antiquity* 61: 153-65. (available on-line)
Borgerhoff-Mulder, M. 1997. Human behavioral ecology, in J.R. Krebs & N.B. Davies (eds.) *Behavioral Ecology: An Evolutionary Approach*. 69-98. Oxford: Blackwell.
Kelly, R.L. 1995. *The Foraging Spectrum: Diversity in Hunter-Gatherer Lifeways*. Washington, D.C.: Smithsonian Institution Press.
O'Connell, J.F. (1995) Ethnoarchaeology needs a general theory of behaviour. *Journal of Archaeological Research* 3(3): 205-255.
Shennan, S.J. 2002. *Genes, Memes and Human History: Darwinian Archaeology and Cultural Evolution*. London: Thames and Hudson. Chapters 2 to 9.
Smith, E.A. & B. Winterhalder (eds.) 1992. *Evolutionary Ecology and Human Behavior*. Hawthorne, N.Y.: Aldine de Grutyer.
Winterhalder, B. & E.A. Smith 2000. Analyzing adaptive strategies: Human behavioral ecology at twenty-five years. *Evolutionary Anthropology* **9:** 51-72. (available on-line)
Winterhalder, B. 2001. The behavioral ecology of hunter-gatherers in C. Panter-Brick, R.H. Layton & P. Rowley-Conwy (eds.) *Hunter-Gatherers: An interdisciplinary perspective*. 12-38. Cambridge: Cambridge University Press.
Zeder, M. A. (2012). "The Broad Spectrum Revolution at 40: Resource diversity, intensification, and an alternative to optimal foraging explanations." *Journal of Anthropological Archaeology*.

Further readings & case studies

Bettinger, R. L., L. Barton, P. J. Richerson, R. Boyd, H. Wang and W. Choi (2007) The transition to agriculture in northwestern China: Implications from the Last Glacial Maximum. In Madsen, D. B., Chen, Fa-Hu and Gao, Xing (eds.) *Late Quaternary Climate Change and Human Adaptation in Arid China.* Amsetrdam: Elsevier. Pp. 83-103
Bird, D.W. and Bliege Bird, R.L. 1997. Contemporary shellfish gathering strategies among the Meriam of the Torres Strait islands, Australia: testing predictions of a central place foraging model. *Journal of Archaeological Science* 24, 39-63.
Bird, D.W. and Bliege Bird, R. 2000. The ethnoarchaeology of juvenile foragers: shellfishing strategies among Meriam children. *Journal of Anthropological Archaeology* 19, 461-76.
Dyson-Hudson, R. and Smith, E. 1978. Human territoriality: an ecological reassessment. *American Anthropologist* 80:21-41.
Cashdan, E. 1984. G//ana territorial organization. *Human Ecology* 12:443-63.
Gerber, L. R., O. J. Reichman and J. Roughgarden. 2004. Food hoarding: future value in optimal foraging decisions. *Ecological Modelling* 175(1): 77-85.
Gurven, M., Kaplan, H., Gutierrez, M. (2006) How long does it take to become a proficient hunter? Implications for the evolution of extended development and long lifespan. *Journal of Human Evolution,* doi 10.1016/j.jhevol.2006.05.003
Henry, D. O. 1991. Foraging, sedentism, and adaptive vigor in the Natufian: Rethinking the linkages. *Perspectives on the Past: Theoretical Biases in*

Mediterranean Hunter-Gatherer Research. G. A. Clark. Philadelphia, University of Pennsylvania**:** 353-370.
Kennett, Douglas J. and Bruce Winterhalder, eds. (2005) *Behavioral Ecology and the Transition to Agriculture.* University of California Press, Berkeley
Slobodkin, L. B. and A. Rapoport. 1974. An optimal strategy of evolution. *The Quarterly Review of Biology* 49: 181-200.
Winterhalder, B. and C. Goland 1997. An Evolutionary Ecology Perspective on Diet Choice, Risk, and Plant Domestication, in *People, Plants, and Landscapes. Studies in Paleoethnobotany* (K. J. Gremillion ed.), pp. 123-160. Tuscaloosa: University of Alabama Press.

5. Historical Ecology

Historical Ecology examines the progressive impact of human societies on landscapes through time. These changes are due to multiple factors that contribute to the ever-changing landscape. Human societies are viewed as an integral part of the landscape's history. The progression of human influence on the landscape, vegetation and water resources through time, represent successive layers of change that build on past human influence which has been continuing over the entire course of human habitation on the planet.

Readings

Crumley, C. L., Ed. 1994. Historical Ecology: A multidimensional ecological orientation. Pp. 1-16 in *Historical Ecology: Cultural Knowledge and Changing Landscapes*. Santa Fe, School of American Research.
Hassan, F. 1994. Population ecology and civilization in Ancient Egypt. Pp. 155-181 in Crumley, C. L. (Ed.) *Historical Ecology: Cultural Knowledge and Changing Landscapes*. Santa Fe, School of American Research.
Arizpe, Lourdes, Fernanda Paz , Margarita Velazquez. 1996 *Culture and Global Change: Social Perceptions of Deforestation and the Lacandona Rain Forest in Mexico*. Ann Arbor: University of Michigan.
Balle, William 1998. Historical Ecology: Premises and Postulates, in *Advances in Historical Ecology*, ed. by William Balle, pp. 13-29. New York: Columbia University Press.
Whitehead, N. 1998. Ecological History and Historical Ecology: Diachronic Modeling vs. Historical Explanation, in *Advances in Historical Ecology*, ed. by William Balle, pp. 43-66. New York: Columbia University Press.

6. Political Ecology

In this session we will investigate how human social, political and economic motivations have impacted their environments through time. How do social inequalities impact environments? How do agro-pastoral economic strategies change between managing elite elements of societies motivated by cash-crop production and external markets versus small-scale subsistence farmers? How do communities make decisions about their environments in the context of their political organization, economies, and social systems? How does this vary with different types of societies in different ecological settings through time?

Readings:

Escobar, A. 1999. After Nature: Steps to an antiessentialist political ecology. *Current Anthropology* 40(1): 1-30.
McIntosh, R. J., J. A. Tainter and S. K. McIntosh (eds.) 2000. *The Way the Wind Blows. Climate, History and Human Action.* Columbia University Press.
Mohamed, J. 2004. The Political Ecology of Colonial Somaliland. *Africa: Journal of the International African Institute* 74(4): 534-566.
Rosen, Arlene 2007. *Civilizing Climate. Social Responses to Climate Change in the Ancient Near East.* Alta Mira Press, Lanham. Chapt. 8

7. Nature and Culture, Symbolic Ecology: How Non-Western Societies View Nature

Are Nature and Culture separate entities? How is nature perceived by other societies both in the present and the past? In this session we explore the many different ways that societies perceive their natural surroundings, contrasting societies with different forms of socio-economic organizations and those living in diverse environments. Discussion topics include a how these perceptions might influence the success or failure of adaptations to particular environmental settings.

Readings:

Callicott, J. B. 1994. *Earth's Insights : a survey of ecological ethics from the Mediterranean basin to the Australian outback*. Berkeley, University of California Press.
Politis, G. 1999. Plant exploitation among the Nukak hunter-gatherers of Amazonia: between ecology and ideology. In, C. Gosden and J. Hather (eds) The Prehistory of Food: appetites for change. Routledge, London:99-125.
Boivin & Owoc (eds) 2004. *Soils, Stones and Symbols. Cultural Perceptions of the Mineral World*. UCL Press
Ingerson, Alice E. 1994. Tracking and Testing the Nature-Culture Dichotomy, in *Historical Ecology: Cultural Knowledge and Changing Landscapes*, ed. by Carole Crumley, pp. 30-41. Santa Fe, NM: School of American Research.
Proctor, James D. 2001. Concepts of nature, environmental/ecological. In *International encyclopedia of the social and behavioral sciences*, edited by N. J. Smelser and P. B. Bates, 10400-10406. Oxford: Elsevier Science Ltd.

Reichel-Dolmatoff, G. (1971). *Amazonian cosmos; the sexual and religious symbolism of the Tukano Indians*. Chicago: University of Chicago Press.
Silberbauer, G. 1994. A sense of place. In, E. Burch and L. Ellanna (eds) Key Issues in Hunter-Gatherer Research. Berg, Oxford:119-43.
Zvelebil, M. and Jordan, P. 1999. Hunter fisher gatherer ritual landscapes - questions of time, space and representation. In, J. Goldhahn (ed.) Rock Art as Social Representation. (BAR International Series 794) British Archaeological Reports, Oxford:101-27.

8. Landscape Archaeology and Phenomenology

This session will address the many ways in which people perceive the landscape around them. Societies classify and organize their surroundings for subsistence, economic, social, political and religious purposes. This structuring of space beyond the settlement is dependent upon the meaning that populations impart upon the landscape. This meaning is a function of symbolic processes, their sense of place, memory, history, legends and the concepts of sacred and profane. In this session we will explore the ways in which archaeology and environmental studies can contribute to our understanding of these social processes.

Readings:

Deetz, James 1990. Landscapes as Cultural Statements, in *Earth Patterns: Essays in Landscape Archaeology*, ed. by William M. Kelso and Rachel Most, pp. 1-4 Charlottesville: University Press of Virginia.

Tilley, C. 1994. Space, Place, Landscape, and Perception: Phenomenological Perspectives, pp. 7-34, in *A Phenomenology of Landscape*. Oxford, Berg.

Tilley, C. 1994. The Social Construction of Landscapes in Small-scale Societies: Structures of Meaning, Structures of Power, pp. 35-69, in *A Phenomenology of Landscape*. Oxford, Berg.

Bender, Barbara 1992. Theorizing Landscape and the Prehistoric Landscapes of Stonehenge, *Man* 27: 735-55.

Chappell, Sally 2002. *Cahokia: Mirror of the Cosmos* Chicago: University of Chicago Press.

Denevan, William M. 1992. The Pristine Myth: The Landscapes of the Americas in 1492, *Association of American Geographers* 82(3):369-385.

Edmonds, M. R. (1999). Ancestral geographies of the Neolithic : landscapes, monuments and memory London : Routledge.

Kornfeld, Marcel (2003) Affluent foragers of the North American Plains : landscape archaeology of the Black Hills. Oxford : Archaeopress. BAR international series 1106.

Mar 12. *Spring Break: No Class*

9. The 'Anthropocene' and Human Impact on the Environment

The extinction of large animals ('megafauna') characterises many parts of the world during the Quaternary and early Holocene periods. Climatic change, shifting ecological zones and the impact of human hunting ('overkill') are among the hypotheses proposed to account for these dramatic changes in faunas.

Is human impact on the atmosphere a new phenomenon, or has there already been human modification of global climate in the past (even if much more subtle than recent industrial impacts)? It can be suggested that the mid and late Holocene differs from past interglacial because greenhouse gasses increase instead of decreasing as expected. One candidate to blame is the intensification and spread of rice agriculture in Asia.

Readings:

Goudie, A. 1981(various editions to 2000). *The Human Impact.* Oxford: Blackwell. Pages 97-104, but check pages in other editions by looking up 'Extinctions' in the index).
Redman, C. L. 1999. *Human Impact on Ancient Environments*. University of Arizona Press.
Ruddiman, W. F. 2003. The Anthropogenic Greenhouse Era Began Thousands of Years Ago. *Climatic Change* 61(3): 261-293 [on-line at http://www.springerlink.com/content/h328n0425378u736/]

Additional Readings:

Fire and firing

Huston, M. A. 1994. *Biological Diversity. The coexistence of species on changing landscapes.* Cambridge University Press. *Pp. 413-482.*
Pyne, S.2001. *Fire. A Short History.* The British Museum Press, London. Pp. 1-84
Or
Pyne, S. 1995. *World Fire. The Culture of Fire on Earth.* University of Washington Press, Seattle. Pp. 11-109.
Or
Pyne, S. 1997 *Vestal Fire.* University of Washington Press, Seattle. Pp. 9-48, 81-146

Megafaunal Extinctions

Alcover JA, Seguı´ B, Bover P (1999) Extinctions and local disappearances of vertebrates in the western Mediterranean islands. *Extinctions in Near Time*, ed McPhee RDE (Kluwer, New York), pp 165–188.
Bell, M. and Walker, M.J.C. 1992. *Late Quaternary environmental change*: p*hysical and human perspectives*. Pages 148-154. London: Longman.
Diamond, J.M. 1989. The present, past and future of human-caused extinctions. *Philosophical Transactions of the Royal Society of London*, B 325: 469-477.
Grayson, D.K. 2001. The archaeological record of human impacts on animal populations. *Journal of World Prehistory* 15: 1-68. INST ARCH Teaching Collection No. XXXX. INST ARCH Periodicals.
Blondel J, Vigne J-D (1993) Space, time, and man as determinants of diversity of birds and mammals in the Mediterranean Region. *Species Diversity in Ecological Communities*, eds Ricklefs, RE, SchluterD(Univ Chicago Press, Chicago), pp 135–146.
Vigne J-D (1999) The large ''true'' Mediterranean islands as amodel for the Holocenehumanimpact on the European vertebrate fauna? *The Holocene History of the European Vertebrate Fauna*, ed Benneke N (Deutsches Archa¨ ologisches Institut, Eurasien-Abteilung, Berlin), pp 295–322.

Methane and early rice agriculture: the beginnings of global warming?

Ruddiman, W. F. and J. S. Thomson 2001. The case for human causes of increased atmospheric CH4 over the last 5000 years. *Quaternary Science Reviews* 20: 1760-1777 [on-line at Sciencedirect.com; also IoA periodicals]

Betsy Mason 2004. Climate change: The hot hand of history [News Feature]. *Nature* 427, 582-583 (12 February 2004) | doi:10.1038/427582a. [http://www.nature.com/nature/journal/v427/n6975/full/427582a.html]
Glover, I. C. and C. F. W. Higham 1996. New evidence for early rice cultivation in South, Southeast and East Asia. In D. R. Harris (ed.) *The Origins and Spread of Agriculture and Pastoralism in Eurasia.* London: UCL Press. Pp. 413-441.
Joos, F., Gerber, S., Prentice, I. C., Otto-Bleisner, B. L., and Valdes, P.: 2004, 'Transient simulations of Holocene atmospheric carbon dioxide and terrestrial carbon since the last glacial maximum', *Glob. Biogeochem. Cycles* **18**, GB2002 10.1029/2003GB002156.
Ruddiman, W. F. 2005. The Early Anthropgenic hypothesis a year later. *Climatic Change* 69: 427-434 [on-line at: http://www.springerlink.com/content/u705g012155kxw80/].
Ruddiman, W. F., Guo, Z., Zhou, X., Wu, H., Yu, Y. 2008. Early rice farming and anomalous methane trends. *Quaternary Science Reviews,* 27: 1291-1295.

10. Ecology of Colonialism and Conquest

With conquest and colonialism, the controlling social entity brings with it ecological and economic concepts that it applies to new regions and new environments. In this session we will explore how this has impacted native ecologies and agro-pastoral strategies. We will look at the successes and failures of these intrusive environmental strategies and the motivations behind them.

Readings:

Butzer, K. W. 1996. Ecology in the long view: settlement histories, agrosystemic strategies, and ecological performance. *Journal of Field Archaeology* 23: 141-150.
Butzer, K. W. 2002. French Wetland Agriculture in Atlantic Canada and Its European Roots: Different Avenues to Historical Diffusion. *Annals of the Association of American Geographers* 92(3): 451-470.
Larson, D. O., J. R. Johnson, et al. 1994. Missionization among the coastal Chumash of central California: A study of risk minimization strategies. *American Anthropologist* 96(2): 263-299.
Cronon, William 1983. *Changes in the land : Indians, colonists, and the ecology of New England*. New York : Hill and Wang , c1983.

11. Apr 2. Adaptive Cycles and Resilience Theory

Resilience Theory provides a model for describing how social and ecological systems change and restructure through time. The premises are that most systems are not static but rather they are dynamic and change over time. While not entirely predictable, these changes often follow a pattern in which four phases of change are commonly observed:
• "During the growth phase when resources are plentiful, fast-growing entities that can take advantage of these resources tend to dominate the system.
• As the system matures, it enters a conservation phase where resources become 'locked up' in longer-lived entities, (e.g., nutrients in the soil are absorbed by trees)

and are no longer available for new colonizers. As a few species or organizations come to dominate in the conservation phase, the system tends to become less flexible which increases the likelihood of collapse.
• A release phase is often viewed as a disturbance to the system. Disturbances can destroy structure and other forms of capital, whether it is natural capital, such as accumulated biomass in a forest, or social capital such as policies or relationships, as suggested by the history of the telephone industry.
• The release phase is quickly followed by the reorganization phase during which new entities and innovations may enter the system but only a few will survive through to the start of the next growth phase.
• Often the new adaptive cycle will be very similar to the old; at other times, it will be very different. Forests may re-colonize with similar species and assemblages."
http://wiki.resalliance.org/index.php/3.1_Cycles_of_Change:_The_Adaptive_Cycle

Dearing, J. A. (2008). "Landscape change and resilience theory: a palaeoenvironmental assessment from Yunnan, SW China." *The Holocene* 18(1): 117-127.

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

Gotts, N. M. (2007). "Resilience, Panarchy, and World-Systems Analysis." *Ecology and Society* 12(1): 24.

Gunderson, L. H. (2000). "Ecological Resilience in Theory and Application." *Annual Review of Ecology and Systematics* 31: 425-439.

Holling, C. S. (2001). "Understanding the Complexity of Economic, Ecological, and Social Systems " *Ecosystems* 4(5): 390-405.

Redman, C. L. (2005). "Resilience Theory in Archaeology." *American Anthropologist* 107(1): 70-77.

Redman, C. L. and A. P. Kinzig (2003). "Resilience of past landscapes: resilience theory, society, and the *longue durée*." *Conservation Ecology* 7(1): 14-33.

Rosen, A. M. and I. Rivera-Collazo (2012). "Climate change, adaptive cycles, and the persistence of foraging economies during the late Pleistocene/Holocene transition in the Levant." *PNAS* 109(10): 3640-3645.

Thompson, V. D. and J. A. Turck (2009). "Adaptive Cycles of Coastal Hunter-Gatherers." *American Antiquity* 74(2): 255 - 278.

12. Apr 9. *No Class Meeting: Preparation of Research Papers*

13. Apr 16. Human Adaptations and Niche Construction (social and ecological)

Niche construction is the process in which an organism alters its own (or other species') environment, often but not always in a manner that increases its chances of survival. This concept has been used in anthropology to examine how humans surround themselves with "survival-friendly" plants, animals and geomorphological settings creating a kind of feedback system. Social niche construction is a concept used to describe a kind of 'ecology' of human social structures and family organization.

Readings to be selected

14. Solving Anthropological Research Questions with Environmental Data

This session explores some of the ways in which environmental studies are used to answer anthropological questions about human behaviors, social systems, and lifeways in the past.

Readings (Required Readings to be confirmed)

General & bones

Binford, Lewis Roberts, 1930-: Nunamiut ethnoarchaeology / [by] Lewis R. Binford. New York [etc.] ; London : Academic Press , 1978.

Wylie, Alison. (1985) The reaction against analogy. *Advances in archaeological method and theory* 8: 63-111.

Lyman, R. Lee.: Vertebrate taphonomy / R. Lee Lyman. New York : Cambridge University Press , 1994.

Sediments

Rainville, L. (2000). Microdebris analysis in Early Bronze Age Mesopotamian households. *Antiquity* 74: 291-292.

Rosen, A. M. (2007). The role of environmental change in the development of complex societies in China: a study from the Huizui site. *Indo-Pacific Prehistory Association Bulletin* 27: 39-48.

Shahack-Gross, Ruth, Fiona Marshall, Kathleen Ryan and Steve Weiner 2004. Reconstruction of spatial organization in abandoned Maasai settlements: implications for site structure in the Pastoral Neolithic of East Africa *Journal of Archaeological Science,* Volume 31, Issue 10, Pages 1395-1411

Archaeobotany

Charles, Michael 1998. Fodder from Dung: the Recognition and Interpretation of Dung-Derived Plant Material from Archaeological Sites, *Environmental Archaeology* 1: 111-122.

Hillman, G. C. 1984. Interpretation of archaeological plant remains: The application of ethnographic models from Turkey, in *Plants and Ancient Man - Studies in Paleoethnobotany* (W. Van Zist and W. A. Casparie eds.), pp. 1-41. Rotterdam: A.A. Balkema.

Jones, G. E. M. 1987. A statistical approach to the archaeological identification of crop processing, *Journal of Archaeological Science* 14: 311-323.

Miller, N. and T. L. Smart 1984. Intentional burning of dung as fuel: a mechanism for the incorporation of charred seeds into the archaeological record, *Journal of Ethnobiology* 4: 15-28.

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15. Apr 30. Student Presentations of paper topics