

Perspectives in Human Ecology Syllabus, Fall 2007

Anthropology 450/550-031, Biology 402/502-031; 3 credits

Meeting time: T TH 9:30 am – 10:45 am

Place: Castetter 258

Instructors:

Bill Burnside (bburnsid@unm.edu) & Jordan Okie (jokie@unm.edu), UNM Biology
Oskar Burger (oskar@unm.edu), UNM Anthropology

Office hours:

Tuesday, 2:00 – 4:00

Thursday, 11:00 – 12:00

Location: Marron Hall 233

Class website/blogspot: <http://human-macroecology.blogspot.com/>

email: humanmacroecology@gmail.com

Goals of the course:

This course is intended to give graduate students and senior-level undergraduates a deep understanding of large scale patterns and processes in human ecology. Students will view human ecology from the complementary perspectives of biogeography and macroecology, showing patterns across space and time, and system dynamics, focusing on ways energy, materials, and information are processed and transformed in social systems. The ways in which humans follow and alter broad-scale ecological patterns in time and space will be explored and potential explanations for these patterns will be examined. Participants will get a broad introduction to the associated literature as well as practice interpreting actual datasets through a research project. They will leave with a cutting-edge, interdisciplinary understanding of human ecology and with the intellectual tools to contribute to this blossoming field.

Grading:

Term paper – 30%

Weekly participation – 30%

Notebook and blog questions - 30%

End oral dialogue – 10%

Readings:

The emphasis of the course is in depth discussion of the assigned readings. Please note that there are no exams scheduled for this course. This is done to facilitate time commitment to careful reading of all assigned papers which leads to stimulating and rewarding discussions. The readings will be available on ereserves each week: <http://ereserves.unm.edu> password is 'lobo402'. The readings should be completed before class time on the Tuesday of the week they are assigned.

Required weekly writings: The weekly writing requirement consists of two parts.

1) Annotations: these consist of either a simple summary of the reading material, a reaction to the ideas presented that takes the ideas in new directions, or a critique of the material presented. These categories are intentionally left open and are not exclusive (you may write annotations that are part summary and part critique, etc.). In all cases it must be evident that the student is familiar with the content of the readings beyond what could be gained by only skimming the paper or just reading the abstract. Each

weekly entry should be between ½ and 1 page of standard typewritten text. *The entries should be emailed to humanmacroecology@gmail.com by the beginning of class on Tuesday.* The posting of notebook entries on the class blog are encouraged and will count towards the participation grade.

2) Blogged discussion questions: these can be used to stimulate discussion in class or clarify confusing and/or unfamiliar concepts from the readings. *At least two questions should be posted per week, with at least one question due by 8 pm on Monday and the second question due by 8 pm on Wednesday.*

Weekly participation: Every student is expected to make regular, positive contributions to discussion. Paying close attention to the content of the assigned papers is essential in this class. Thoughtful participation on the class blog in addition to the required weekly discussion questions will be counted as part of the participation grade.

Term Paper: Students will complete an original research project. This can consist of a detailed review, a meta-analysis, or can be a data-driven research project. The paper should be less than 10 pages long. The topic is open but should attempt to identify some large scale pattern relevant to human ecology and address possible mechanisms explaining the pattern. We will help direct students to datasets and discuss important analytical techniques in class.

End oral dialogue: This is an hour long conversation about the content of the course between you and one or more of the instructors. The aim is to give the student an opportunity to experience a low-stress version of an oral examination, as most graduate and undergraduate curricula do not provide opportunities to practice for oral defenses and/or comprehensive exams.

Summary: Your grade consists of participation, notebook entries, a term paper, and an hour long low-stress conversation at the end of the term. You are expected to read the papers carefully and contribute to most discussions. The notebook entry involves a short written piece each week and a minimum of two questions posted on the blog. The paper is due at the end of the semester and should be less than ten pages long..

Note: *the content of this syllabus is subject to change.*

Unit I: Humans as ecological entities

Week 1 (8/21, 8/23): A tutorial in thinking big: laws and macroecology

Lecture 1 (Day 1): Orientation to the topic, why we need a human macroecology?

*Brown, J.H.1995. Chapters 1 – 2 in *Macroecology*. University of Chicago Press.

*Ginzburg, L., and M. Colyvan. 2004. Chapters 1 – 2 in *Ecological Orbits: How Planets Move and Populations Grow*. Oxford, Oxford University Press.

Week 2 (8/28, 8/30): Basic ecology & life history of *Homo sapiens*

*Foley, R.A. 1996. The adaptive legacy of human evolution: A search for the environment of evolutionary adaptedness. *Evolutionary Anthropology* 4: 194 – 203.

*Kim Hill, Hillard Kaplan. 1999. Life History Traits in Humans: Theory and Empirical Studies. *Annual Review of Anthropology* 28: 397-430

Unit II: Humans and biogeography:

Week 3 (9/4, 9/6): Core concepts for human biogeography

*Terrell, J. E. 2006. Human biogeography: evidence of our place in nature. *Journal of Biogeography* 33:2088-2098.

* Lomolino et al. Intro chapter to biogeography text book.

Week 4 (9/11, 9/13): The ecogeography of body form, life-history, and population density, Part 1

* Morwood M.J., Soejono R.P., Roberts R.G., Sutikna T., Turney C.S.M., Westaway K.E., Rink W.J., Zhao J.x., van den Bergh G.D., Due R.A., Hobbs D.R., Moore M.W., Bird M.I. & Fifield L.K. (2004) Archaeology and age of a new hominin from Flores in eastern Indonesia. *Nature*, 431, 1087-1091

*Ruff, C. 2002. Variation in Human Body Size and Shape. *Annual Review of Anthropology* 31:211 - 232.

Week 5 (9/18, 9/20): The ecogeography of body form, life-history, and population density, Part 2

*Walker, R., M. Gurven, K. Hill, A. Migliano, N. Chagnon, R. D. Souza, G. Djurovic, R. Hames, A. M. Hurtado, H. Kaplan, K. Kramer, W. J. Oliver, C. Valeggia, and T. Yamauchi. 2006. Growth rates and life histories in twenty-two small-scale societies. *American Journal of Human Biology* 18:295-311.

*Stiner, M. C., N. D. Munro, T. A. Surovell, and E. Tchernov, Bar-Yosef, Ofer. 1999. Paleolithic population growth pulses evidenced by small animal exploitation. *Science* 283:190 - 194.

*Palkovacs, E. P. 2003. Explaining adaptive shifts in body size on islands: a life history approach. *Oikos* 103:37 - 44.

Week 6 (9/25, 9/27): Cultural, linguistic, and genetic diversity patterns, Part 1

* Moore et al. 2002. The distribution of biological & cultural diversity in Africa

* Collard & Foley. 2002. Latitudinal patterns & environmental determinants of recent human cultural diversity

* Pagel & Mace. 2004. The cultural wealth of nations.

* (Optional) Nettle. 1998. Explaining global patterns of language diversity. [Nettle

* (Optional) Cashdan. 2001. Ethnic diversity and its environmental determinants.

* (Very Optional) Serre & Paabo. 2004. Evidence for gradients of human genetic diversity

Week 7 (10/2, 10/4): Cultural, linguistic, and genetic diversity patterns, Part 2

*[suggested] Reread Pagel & Mace, 2004, starting at “Cultures and gene flow,” p. 276

*Cavalli-Sforza et al., 1988. Reconstruction of human evolution: Bringing together genetic, archaeological, and linguistic data.

*Sherman & Billing. 1999. Darwinian gastronomy: Why we use spices.

*McDade et al., 2007. Ethnobotanical knowledge and child health in Bolivia.

Guest lecture on Tuesday by Keith Hunley – Gene language coevolution.

Week 8 (10/9, Fall Break): How humans alter biogeographic patterns of abundance distribution and extinction among other species

*Evans, K. L., and K. J. Gaston. 2005. RESEARCH PAPER: People, energy and avian species richness. *Global Ecology and Biogeography* 14:187-196.

*Sutherland, W.J. 2003. Parallel extinction risk and global distribution of languages and species. *Nature* 423: 276-279.

*Lyons, K. S., F. A. Smith, and J. H. Brown. 2004. Of mice, mastodons, and men: human-mediated

extinctions on four continents. *Evolutionary Ecology Research* 6:339-358.

*Surovell - a first proof of his entry entitled "Inter-regional studies/Big game extinctions" for the upcoming Encyclopedia of Archaeology.

Guest Lecture: Alison Boyer – bird extinctions

Week 9 (10/16, 10/18): Geography of wealth and resource use

*Hibbs, D. Jr., and O. Olsson. 2004. Geography, biogeography, and why some countries are rich and others are poor. *PNAS* 101: 3715-3720.

*Liu, J., G. C. Daily, P. R. Ehrlich, and G. W. Luck. 2003. Effects of household dynamics on resource consumption and biodiversity. *Nature* 421:530-533.

*Bounoua, L., T. Ricketts, C. Loucks, R. Harriss, and W. T. Lawrence. 2004. Global patterns in human consumption of net primary production. *Nature* 429:870-873.

*Wackernagel, M., N. B. Schulz, D. Deumling, A. C. Linares, M. Jenkins, V. Kapos, C. Monfreda, J. Loh, N. Myers, and R. Norgaard. 2002. Tracking the ecological overshoot of the human economy. *Proceedings of the National Academy of Sciences* 99:9266-9271.

Unit III: System Dynamics: Scaling, Energetics, and Complexity Theory

Week 10: (10/23, 10/25): Complex systems and feedbacks

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

*Lansing, J.S. 2003. Complex adaptive systems. *Annual Rev of Anthropology* 32: 183-204.

*Arquitt et al. 2005. A systems dynamics analysis of boom & bust in the shrimp aquaculture industry

Week 11 (10/30, 11/1): Energetics, culture, and society

*White, L., A. 1943. Energy and the Evolution of Culture. *American Anthropologist* 45:335 - 355.

*Tainter, J. A., T. F. H. Allen, A. Little, and T. W. Hoekstra. 2003. Resource Transitions and Energy Gain: Contexts of Organization. *Conservation Ecology* 7:4.

*Odum, H.T. 1988. Self-organization, transformity, and information. *Science* 242: 1132-1139.

Week 12 (11/6, 11/8): Scaling, part 1

*Brown, J. H. 2002. The fractal nature of nature: power laws, ecological complexity and biodiversity. *Philosophical Transactions: Biological Sciences* 357:619-626.

*Gibson, C. C., E. Ostrom, and T. K. Ahn. 2000. The concept of scale and the human dimensions of global change: a survey. *Ecological Economics* 32:217-239.

*Brown, J. H., J. F. Gillooly, A. P. Allen, V. M. Savage, and G. B. West. 2004. Toward a Metabolic Theory of Ecology. *Ecology* 85:1771-1789. (only pages 1771-1777 are required.)

*(Optional) Schneider, D. C. 2001. The Rise of the Concept of Scale in Ecology. *BioScience* 51:545 – 553.

Week 13 (11/13, 11/15): Scaling, part 2

*Hamilton M. et al. 2007. The complex structure of hunter-gatherer social networks. *Proceedings of the Royal Society of London, Series B*.

* Bettencourt, L. M. A., J. Lobo, D. Helbing, C. Kuhnert, and G. B. West. 2007. Growth, innovation, scaling, and the pace of life in cities. *Proceedings of the National Academy of Sciences* **104**:7301.

*Moses, M. E., and J. H. Brown. 2003. Allometry of human fertility and energy use. *Ecology Letters* **6**:295-300.

Week 14 (11/20, Thanksgiving): Ecology and economics of energy.

*Hall et al. 2001. The need to reintegrate the natural sciences with economics. *Bioscience* **51**: 663-673.

*(Optional) Smil, V. 2000. Energy in the twentieth century: Resources, conversions, costs, uses, and consequences. *Annual Review of Energy & Environment* **25**: 21-51.

Week 15: Human macroecology and historical dynamics/course wrap-up.

*Turchin, P. 2006. *War and Peace and War*. Plume publishing. Chapter 12 – War and Peace and Particles.

Week 16: Term Paper Presentations
