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:
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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

Lecture: Introduction to the ecological importance of body size: allometry, the bsd, and insular dwarfism.

* 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.
*Crimmins, E. M., and C. E. Finch. 2006. Infection, inflammation, height, and longevity. Proceedings of the National Academy of Sciences **103**:498-503.

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

*Pagel, M., and R. Mace. 2004. The cultural wealth of nations. *Nature* 428: 275-278.
*Moore, J.L, Manne, T.M., Brooks, N., Burgess, R., and Davis, L.A. 2002. The distribution of biological and cultural diversity in Africa - *Proc. R. Soc. Biol. Sci., Ser. B* 269: 1645-1653.
*Collard, I.F., and I.A. Foley. 2002. Latitudinal patterns and environmental determinants of recent human cultural diversity: do humans follow biogeographic rules? Evolutionary Ecology Research.

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

*Rosser, ZH et al. 2000. Y-Chromosomal Diversity in Europe Is Clinal and Influenced Primarily by Geography, Rather than by Language . *Am. J. Hum. Genet.*, 67:1526-1543, 2000
*Barbujani, G. and R.R. Sokal. 1990. Zones of sharp genetic change in Europe are also linguistic boundaries. *Proc of the Nat Acad of Sciences* 87: 1816-1819.
*Serre, D., and S. Paabo. 2004. Evidence for gradients of human genetic diversity within and among continents. *Genome Research* 14(9): 1679 - 1685.

Lecture (Day 4 of these two weeks): how do we link these patterns to macroecological process?

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.

Lecture/Special Discussion Topic: How do we explain why the human imprint on the environment tends to be especially robust compared to other mammals? Where did this tendency come from?

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.
*Kruse, J. et al 2004. Modeling sustainability of Arctic Communities: an Interdisciplinary Collaboration of Researchers and Local Knowledge Holders. *Ecosystems* 7: 815-828.

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

*Schneider, D. C. 2001. The Rise of the Concept of Scale in Ecology. *BioScience* 51:545 – 553.
*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.
*Moses, M. E., and J. H. Brown. 2003. Allometry of human fertility and energy use. Ecology Letters **6**:295-300.

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.

Week 14 (11/20, Thanksgiving): Urban Ecology: Footprints and Community Metabolism

*Smil, V. 2000. Energy in the twentieth century: Resources, conversions, costs, uses, and consequences. ANNUAL REVIEW OF ENERGY AND THE ENVIRONMENT 25:21-51.
*Rees, W. E. 1996. Revisiting Carrying Capacity: Area-Based Indicators of Sustainability. Population and Environment 17:195 - 215.
* Decker, E. H., S. Elliot, F. A. Smith, D. R. Blake, and F. S. Rowland. 2000. Energy and Material Flow Through the Urban Ecosystem. Annual Review of Energy and the Environment 25:685 - 740.

Weeks 15, 16: Term Paper Presentations, Concluding remarks.
