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NRSM 170.01: International Environmental Change

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NRSM 170: International Environmental Change

Spring 2013
3 credits; grade

T & Th 2:10 – 3:30 PM
Location: FOR 305

Course Description:

This course provides an introduction to natural and anthropogenic environmental change from ancient to contemporary times. Course objectives are to: 1) investigate the nature, role and importance of ecological disturbance in the development and maintenance of terrestrial ecosystems, 2) consider how historic ecological disturbances affect current conservation and development efforts, and 3) explore potential means of addressing contemporary human-caused environmental change.

The issues we consider are multi-faceted and imprecisely known; there are rarely simple answers to complex problems and many things we do not know. I expect you to come to class having read the assigned readings and prepared to discuss them. We will discuss readings in class and I look forward to your informed participation. I would be happy to meet for additional review or discussion during office hours or by appointment.

Instructor:

Steve Siebert, Professor
Clapp Bldg (SC) 406; email: steve.siebert@cfc.umt.edu; phone: 243-4661
Office hours: Tuesday & Thursday 11:30 – 1 PM or by appointment.

Required Readings:

Readings are available in the Mansfield Library through the ERES system:
<http://eres.lib.umt.edu> (password: NRSM170).

Learning Outcomes:

By completing this course students will be able to do the following:

- articulate the meaning, role and importance of ecological disturbance in the development and maintenance of terrestrial ecosystems;
- identify and describe important attributes of ecological disturbances;
- describe the role of historic disturbance regimes in the development and maintenance of plant communities and biological diversity; and
- describe how contemporary anthropogenic disturbances differ from historic disturbance regimes and potential ecological and social effects of these differences.

Grading (+/- grading will be used):

Two short writing assignment @ 15 pts each	30 %
Two quizzes @ 15 pts each	30
In class assignments	15
Final exam	<u>25</u>
Total	100 %

Note: missed quizzes or late assignments will result in lost credit without prior approval. In class assignments (reflections or questions as assigned) are due in class that day; late assignments will not be accepted.

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students (DSS). If you think you may have a disability adversely affecting your academic performance, and you have not already registered with DSS, please contact DSS in Lommasson 154. I will work with you and DSS to provide appropriate accommodation.

SYLLABUS

Week/Date	Topics/Readings
1 1/29	Introduction to course & issues
1/31	Contemporary environmental change Film: "The Great Squeeze" (DVD 03949) Readings: Davis (2007, pp. 1-14), Diamond (2005), McKibben (2012)
2 2/5	Conceptual framework: disturbance, complexity & perspectives Readings: Dove (1993), Uhl, et al. (1990)
2/7	Conceptual framework: resilience, uncertainty & humility Readings: Berkes, et al. (2003), Ludwig, et al. (1993)
3 2/12	Disturbance & change: from ancient to modern Film: "The Great Dance" (available from the Roxy) Readings: Bearak (2010), Mann (2002)
2/14	Disturbance & change in the ancient world: Crete Readings: Grove & Rackham (2001), Marsh (1864)
4 2/19	Agriculture in the ancient world: Mexico Film: "The Chinampas" (Video 02748) Readings: Chapin (1988), Willis, et al. (2004)

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| 4 | 2/21 | The ecological value and historical management of trees
Readings: Brookfield (2007) |
| 5 | 2/26 | Quiz #1 & Writing assignment #1 due
Film: "The Fires of the Amazon" |
| | 2/28 | Agriculture in the modern world:
Readings: Allen (2012), Economist (2010a) |
| 6 | 3/5 | Agriculture: Coffee
Readings: Jaffee (2007) |
| | 3/7 | Driving forces of contemporary anthropogenic disturbance
Film: "Who's Destroying the Forest?" (DVD 03629)
Readings: Economist (2008a), Geist & Lambin (2002) |
| 7 | 3/12 | Contemporary anthropogenic disturbance & possible responses:
Readings: Davis (2007, pp. 183-202), Zencey (2009) |
| | 3/14 | Conservation & protected areas: assumptions & approaches
Readings: Bradshaw et al. (2009), Gillson and Willis (2004) |
| 8 | 3/19 | Forest conservation & management in an Indonesian village
Readings: Pearce (2012), Siebert & Belsky (2002) |
| | 3/21 | Conservation in Bhutan: historic livelihoods and land uses
Readings: Namgyel, et al. (2008), Wangchuk & Siebert (2013) |
| 9 | 3/26 | Quiz #2 and Writing assignment #2 due |
| | 3/28 | open |

Spring Break

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| 10 | 4/9 | Climate change - Film: "6° C. Could Change the World"
(DVD 02947)
Readings: Economist (2012), (2009b), World Bank (2012) |
| | 4/11 | Fire - Film: "Fires of Spring"
Readings: Running (2006), Turner, et al. (2003) |
| 11 | 4/16 | Invasive species & conservation
Readings: Crowl, et al. (2008), Quammen (2012) |

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| 11 | 4/18 | Forest for whom and for what? Natural forest management
Film: "Sustainable Forest Management" (copy, on reserve)
Readings: Economist (2010b), Nijhuis (2012) |
| 12 | 4/23 | Water resources - Film: "Headwaters to a continent: Montana's working watershed groups" (DVD 02031)
Readings: Economist (2011), (2008b), Rogers (2008) |
| | 4/25 | Community-based conservation in Swan Valley
Andrea Stephen, Northwest Connections, Condon, MT |
| 13 | 4/30 | Managing human – wildlife conflicts in the Blackfoot Valley
Dr. Seth Wilson, Program Coordinator, Blackfoot Challenge Wildlife Committee |
| | 5/2 | Global Tourism
Film: "The Golf War" (DVD 10839)
Readings: Rothman (1998) |
| 14 | 5/7 | Alternative paths
Readings: Costanza, et al. (2007), Davidson (2000) |
| | 5/9 | Conclusion & Review
Readings: Nichols (2009), Towe (1990), Wallace (1869) |

Final Exam: Wednesday May 15: 1:10-3:10

Required Readings:

Allen, T. 2012. The new land rush. *Utne Reader* Jan/Feb, pp. 50-53.

Bearak, B. 2010. For some bushmen, a homeland worth the fight. *NY Times* Nov. 4.

Berkes, F., J. Colding, C. Folke (eds). 2003. Navigating Social-Ecological Systems. Cambridge Univ. Press, Cambridge. pp. 13-21.

Bradshaw, C. et al. 2009. Tropical turmoil: a biodiversity tragedy in progress. *Front Ecol Env* 7:79-87.

Brookfield, H. 2007. Working with and for plants: indigenous fallow management in perspective. In. M. Cairns (ed) Voices from the Forest. Resources for the Future, Washington, D.C. pp. 8-15.

Chapin, M. 1988. The seduction of models. *Grassroots Development* 12(1):8-17.

Costanza, R., et al. 2007. Sustainability or collapse: what can we learn from integrating the history of humans and the rest of nature? *Ambio* 36:522-527 (pp. 522-525).

Crowl, T. et al. 2008. The spread of invasive species and infectious disease as drivers of ecosystem change. *Front Ecol Env* 6:238-246.

Davidson, C. 2000. Economic growth and the environment: alternatives to the limits paradigm. *BioScience* 50:433-440.

Davis, W. 2007. Light at the Edge of the World. Douglas & McIntyre, Vancouver. (pp. 1-14 & 183-202).

Diamond, J. 2005. Collapse. Viking Press, NY. (pp. 1-15).

Dove, M. 1993. A revisionist view of tropical deforestation and development. *Environmental Conservation* 20:17-24.

The Economist. 2012. Banyon/Old king coal. February 25.

The Economist. 2011. Unquenchable thirst. November 19.

The Economist. 2010a. How to feed the world & The Miracle of the Cerrado. August 28.

The Economist. 2010b. Seeing the wood. September 25.

The Economist 2009. A bad climate for development. September 19.

The Economist. 2008. Malthus, the false prophet. May 17.

The Economist. 2008c. Running dry. September 20.

Geist, H. & E. Lambin. 2002. Proximate causes and underlying driving forces of tropical deforestation. *BioScience* 52:143-150.

Gillson, L. and K. Willis. 2004. 'As Earth's testimonies tell': wilderness conservation in a changing world. *Ecology Letters* 7:990-998.

Grove, A. & O. Rackham. 2001. The Nature of Mediterranean Europe: An Ecological History. Yale Univ. Press, New Haven. pp. 8-10.

Jaffee, D. 2007. Brewing Justice. Univ. CA Press, Berkeley. pp. 133-164.

Knight, R. 2009. Food and open spaces: bridging the rural-urban divide. In: R. Knight & C. White (eds). Conservation for a New Generation. Island Press, Washington, D.C. pp. 193-206.

Ludwig, D., et al. 1993. Uncertainty, resource exploitation and conservation: lessons from history. *Science* 260:17-18.

Mann, C. 2002. 1491. *The Atlantic Monthly* March, pp. 41-53.

Marsh, G. 1864. Man and Nature: The Earth as Modified by Human Action. Charles Scribner & Sons, NY. pp. 1-7 & 33-34.

McKibben, B. 2012. A summer of extremes signifies the new normal. *Yale Environment* 360.

Namgyel, U.; Siebert, S.; Wang, S. 2008. Shifting cultivation and biodiversity conservation in Bhutan. *Conservation Biology* 22:1349-1351.

Nichols, S. 2009. Paradise Found: Nature in America at the Time of Discovery. Univ. of Chicago Press, Chicago, pp. 450-459.

Nijhuis, M. 2012. Burn out. *Nature* 489:352-354.

Pearce, F. 2012. Busting the forest myths: people as part of the solution. *Yale Environment* 360.

Quammen, D. 2012. The next pandemic: why it will come from wildlife. *Yale Environment* 360.

Rogers, P. 2008. Facing the freshwater crisis. *Scientific American*, August, pp. 46-53.

Rothman, H. 1998. Devil's Bargain. Univ. Press of Kansas. pp. 10-28.

Running, S. 2006. Is global warming causing more, larger wildfires? *Science* 313:927-928.

Siebert, S.F. & J.M. Belsky. 2002. Livelihood security and protected area management. *International Journal of Wilderness* 8(2):38-42.

Towe, T. 1990. It's time Montana stopped selling itself down the river. Editorial. *The Missoulian*, June 18, 1990.

Turner, M. et al. 2003. Surprises and lessons from the 1988 Yellowstone fires. *Front Ecol Env* 1:351-358.

Uhl, C. et al. 1990. Studies of ecosystem response to natural and anthropogenic disturbances provide guidelines for designing sustainable land-use systems in Amazonia. In: A. Anderson (ed) Alternatives to Deforestation. Columbia Univ. Press, NY. pp. 24-27.

Wallace, A.R. 1869. The Malay Archipelago. Oxford Univ. Press, Oxford (reprint). pp. 596-598.

Wangchuk, S. and S. Siebert. 2013. Government policies, market opportunities and climate change: agricultural transformation in Bumthang, Bhutan. *Society and Natural Resources* (in press).

Willis, K.; L. Gillson; F. Brncic. 2004. How "virgin" is virgin rainforest? *Science* 304:402-403.

World Bank. 2012. Turn Down the Heat. The World Bank, Washington, D.C. (exec summary).

Zencey, E. 2009. G.D.P. R.I.P. NY Times. August 10.

<http://www.youtube.com/watch?v=YqrbrI5NdM0>