Wednesday 18 January 2006
3rd class meeting
(Miller Chapter 1, Speth Chapter 4)

Environmental Biology
ECOL 206
University of Arizona
spring 2006

Kevin Bonine, Ph.D.
Alice Boyle, Kristen Potter, Graduate TAs

Speaker Series Tomorrow!
Please join us at the kick off of our Speaker Series with Peter Warshall
"The Sky Island Legacy: An Introduction to the Region and Its Major Conservation Issues"

Sky Island Alliance is hosting a speaker series that will run from January-May 2006 with a speaker event each month. Our first event will be held on

Wednesday, January 18th
at the University of Arizona Rogers College of Law,
1201 E. Speedway Blvd. Room 140
(Please note the room change)

The presentation will begin at 6 p.m. with an opportunity to ask questions and interact with our speaker afterward. Free. Call Sky Island Alliance 624-7080 x209 for more information.

With an academic background in biology and anthropology, Warshall works globally with highly diverse people and ecosystems. His expertise includes natural history, natural resource management (especially watersheds, wastewater, and wildlife), conservation biology, biodiversity assessments, environmental impact analysis, and conflict resolution and consensus building between divergent economic and cultural special interest groups. He has worked in Africa for various organizations and in Arizona for several Native American tribes and as an adjunct research scientist with the Office of Arid Lands Studies (University of Arizona). Warshall has a special interest in producers of commodities (loggers, farmers, ranchers, fishermen, miners) as they are the link between the materials flows of our economy and the natural world.

In addition to his role as Editor-At-Large with Whole Earth, he is Sky Island Alliance’s newest board member and is the founder of Peter Warshall and Associates, a consulting firm specializing in complex economic/ecological systems, especially those that impact water resources and wildlife populations. He has written two major articles on Sky Island ecology and biogeography and is an expert on the Mt. Graham Red Squirrel. He is also the current Research Director on Pinaleno Inventory.

We hope to see you there!

Our next speaker event will be on February 15th, with speaker Guy McPherson from the University of Arizona discussing Land Use and Ecology in the Sky Islands.
EVOLUTION: A Series of Seven Lectures Exploring our World and Ourselves

Location: Center for Creative Photography Auditorium, 1030 North Olive Road
Parking is available in the Park Avenue Garage
Time: All lectures begin at 7:00 pm

All the sciences, from astronomy to biology, have worked together to discover the processes that create the current state of our universe, our world and ourselves. These evolutionary processes define the origin of the atoms that make up all matter, the origin of stars and planets, and the development of life itself.

The University of Arizona College of Science is proud to present these seven lectures. Each will illustrate this vision of evolution and demonstrate how we know that evolution represents reality.

Tuesday, February 21. Biological Evolution: What It Is and What It Isn't (Joanna Masel, Assistant Professor, EEB)
Tuesday, March 7. Cosmic Evolution: From Big Bang to Biology (Chris Impey, Distinguished Professor, Astronomy)
Tuesday, March 21. Earth Evolution: The Formation of Our Planet (Joaquin Ruiz, Dean of COS and Professor, Geosciences)
Tuesday, March 28. Social Evolution: Cooperation and Conflict From Molecules to Society (Rick Michod, Professor, EEB)
Tuesday, April 11. Animal Evolution: Recycling Ancient Genes For New Uses (Lisa Nagy, Associate Professor, MCB)
Tuesday, April 18. Human Evolution: Tracking Our Origins with DNA (Michael Hammer, Research Scientist, ARL/EEB)
Tuesday, April 25. Disease Evolution: The Example of HIV (Michael Worobey, Assistant Professor, EEB)

Call 520.621.4090 or go to cos.arizona.edu for more information.
Environmental Biology 206

1. Organism of the day
2. Introductory Topics
3. Short History of the Environmental Movement
4. Continue Reading Ishmael
5. 206 Lab Website for handouts and assignments for labs
   (bring your small notebook and three-ring binder to lab as well)
6. Turn in your first current events assignment on Friday. Be ready to share with the class.

National Park Service

Everglades

South Florida National Parks

Crocodile or Alligator?
Economic Growth
-increase in capacity to provide goods and services
-accomplish with more people and/or more consumption

-measured as GNP (gross national product)
  -also known as GNI (gross national income)
-value of goods and services in a country
-can also compare the purchasing power of different countries for a common set of goods and services
  -(GNI PPP; gross national income in purchasing power parity)

-Can examine on a per capita basis as well
Economic Growth...

How is Economic Development Different?

Takes quality of life into account:
- life span, infant mortality
- education
- health care
- environmental quality
- pollution
- clean air and water
- percent of population below poverty line
- etc.
Genuine Progress Indicator

Index of Sustainable Economic Welfare
Externalities...

What is an externality?
Positive vs. Negative?
Can you give several examples?
Why are they important to discuss in this class?

Figure 2.13 An Indonesian boy wading in a polluted river suffers external costs. External costs are costs not borne by the buyer or seller; they may include water pollution, aesthetic harm, human health problems, property damage, harm to aquatic life, aesthetic degradation, declining real estate values, and other problems.

Brennan and Withgott 2005
Far enough into the future, everything valued at ZERO in our economy because of inflation
(do you want $10 from me now or in 3 years?)
Differentiate the Terms:

1. Environmental Biology
2. Environmental Science
3. Environmentalist
4. Ecology
5. Ecologist

Working Definitions:

Environment - combination of biotic and abiotic factors external to the organism (or population) in question

Environmental Science - branch of science concerned with environmental issues
- how the earth works
- how humans have affected the earth
- how we can solve environmental problems

Ecology - study of how organisms interact with each other and the environment

Ecosystem - a biotic community and its interaction with the abiotic environment

Preservation - setting aside natural areas to protect from destructive human activities

Conservation - utilize natural areas and organisms in a sustainable way
A Brief History of the Environmental Movement:
Table 2.1 Early Environmental Organizations Formed in 19th-Century Great Britain

<table>
<thead>
<tr>
<th>Organization</th>
<th>Year established</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scottish Rights of Way Society</td>
<td>1843</td>
<td>Protect walking paths in and near cities</td>
</tr>
<tr>
<td>Commons Preservation Society</td>
<td>1865</td>
<td>Preserve forests and other landscapes</td>
</tr>
<tr>
<td>Society for the Protection of Ancient Buildings</td>
<td>1877</td>
<td>Protect the built environment, especially historic buildings</td>
</tr>
<tr>
<td>Selborne League</td>
<td>1885</td>
<td>Protect rare birds, plants, and landscapes</td>
</tr>
<tr>
<td>Coal Smoke Abatement Society</td>
<td>1898</td>
<td>Improve urban air quality</td>
</tr>
</tbody>
</table>

Figure 3.12 In the 19th and early 20th centuries, harbors around the country, including that of New York City (shown here), were badly polluted. The Rivers and Harbors Act of 1879 was the first attempt to address such environmental problems.
~Romantic-Transcendentalist Ethic:

Ralph Waldo Emerson
Henry David Thoreau
John Muir
  - Sierra Club 1892
  - NGO
  - Education, Lobby, Law/Politics

Yellowstone National Park 1872
Yosemite National Park 1890

ESA 1917 --> Nature Conservancy 1950

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A Successful life

"To laugh often and much; to win the respect of intelligent people and the affection of children; to earn the appreciation of honest critics and endure the betrayal of false friends; to appreciate beauty; to find the best in others; to leave the world a bit better, whether by a healthy child, a garden patch, or a redeemed social condition; to know even one life has breathed easier because you have lived."

- Ralph Waldo Emerson -
Henry David Thoreau  
(1817-1862)

"Many go fishing all their lives without knowing that it is not fish they are after."

“Beware of all enterprises that require new clothes. “

“It is not worthwhile to go around the world to count the cats in Zanzibar. “

“Wherever a man goes, men will pursue him and paw him with their dirty institutions, and, if they can, constrain him to belong to their desperate oddfellow society. “

"poetico-trampo-geologist-botanist and ornithologist-naturalist etc. etc. !!!!!"

John Muir  
(1838-1914)
Teddy Roosevelt (president 1901-1909)

“To Roosevelt, it was clear that a handful of individuals and their companies were reaping most of the profits from natural resources that rightfully belonged to all citizens.” Van Dyke 2003, p. 10
Aldo Leopold

Game Management 1932

A Sand County Almanac (1949)
-evolution/ecology land ethic

1887-1948

http://www.aldoleopold.org/Biography/Biography.htm
Aldo Leopold Foundation
Rachel Carson
Silent Spring 1962

-Bioaccumulation

-Pesticide Threats

-Environmental degradation related to human health

-Increased Public Awareness