

# **Limnology – Conservation of Aquatic Resources**

## **Zoology and Environmental Studies 315**

### **\*Sample Syllabus\***

#### **Course objectives:**

Limnology is the study of inland waters. This course integrates aspects of chemistry, physics, hydrology, and ecology to create a holistic perspective on lakes and other freshwater ecosystems. Emphasis will be on human impacts and interactions with aquatic systems, and the synthesis of ideas.

#### **Course resources:**

*Text:* There is no required textbook. Many lectures have additional reading assignments, which are posted on the Learn@UW page (see below for sample reading list)

*Reserves:* Copies of several useful Limnology texts will be on reserve at the Steenbock Memorial Library.

*Website:* The course website is on *learn@UW*. In addition to the course syllabus, it includes pdfs of readings, lecture handouts, and course assignments.

#### **Grades (Exams are cumulative):**

Exam 1: 20%

Exam 2: 20%

Final Exam: 25%

Book Report: 15%

Assignment: 15%

Mendota field trip: 5% - Sept. 12<sup>th</sup> (students enrolled in 316 may not attend)

#### **Examples of lecture topics:**

1. Introduction/history of Limnology
2. Lake origins and classification
3. Characteristics of water and light
4. Stratification and mixing
5. Water movements
6. Oxygen, CO<sub>2</sub>, photosynthesis
7. Overview of water chemistry
8. Phosphorus
9. Nitrogen
10. Carbon
11. Eutrophication
12. Algae and macrophytes
13. Zooplankton
14. Microbes
15. Benthos
16. Fish
17. Food webs I
18. Food webs II
19. Wetlands
20. Streams and rivers
21. Reservoirs
22. Hydroscape Ecology
23. Land use effects
24. Climate effects
25. Lake management
26. Exotic species
27. Global warming issues

## Sample Class Schedule:

Topic	Lecturer
Introduction/history of Limnology	Vander Zanden
Lake origins and classification	Vander Zanden
Characteristics of water and light	Vander Zanden
Stratification and mixing	Vander Zanden
<b>Madison lake field trip!</b>	
Water movements	Vander Zanden
Oxygen, CO <sub>2</sub> , photosynthesis	Stanley
Overview of water chemistry	Guest
Phosphorus	Guest
Nitrogen	Stanley
<b>EXAM I (lectures 1-9)</b>	
Eutrophication	Stanley
Algae and macrophytes	Stanley
Zooplankton	Vander Zanden
Microbes	McMahon
Benthos	Vander Zanden
Fish	Vander Zanden
Food web I	Vander Zanden
Food webs II	Vander Zanden
TBA	Stanley
<b>EXAM II (lectures 10-18)</b>	
Wetlands	Stanley
Streams and rivers	Stanley
Reservoirs	Stanley
Hydroscape ecology	Stanley
Land use effects	Stanley
<b>Thanksgiving break</b>	
Climate	Magnuson/JVZ
Lake management	Lathrop
Exotic species	Vander Zanden
Global water issues	Vander Zanden
<b>FINAL EXAM</b>	

## Sample Limno Readings:

Each student is required to write a book report for 'Limnology'. This report comprises 15% of your final grade. The books listed below are all appropriate. Other related books could also be read, although they must first be approved by Prof. Vander Zanden or Prof. Stanley.

**Required format** - The book reports are expected to be well-written. Length should be 3-4 pages, double spaced. **You MUST arrange the report into the following three sections. Please clearly label each of the three sections.**

1. What was the major message that the author was trying to convey with the book. Was the author effective at conveying his/her message?
2. Did the book change your perceptions and understanding of the relationship between water resources (in terms of quality and/or quantity), and human demands for these resources? Explain.
3. Based on what you've read, come up with three of your own 'management recommendations' that you think can improve the current human-water situation.

## READING LIST

- Pillar of Sand: Can the Irrigation Miracle Last? 1999. Sandra Postel. W.W. Norton and Co., New York
- Last Oasis: Facing Water Scarcity. 1997. Sandra Postel. W.W. Norton and Co., New York.

- Blue Gold. 2002. Maude Barlow and Tony Clarke. W.W. Norton and Co., New York.
- Water Wars: Drought, Flood, Folly, and the Politics of Thirst. 2002. D.R. Ward. Riverhead Books.
- Discovering the Unknown Landscape. 1999. Ann Vileisis. Island Press, Washington, D.C.
- Turning the Tide: Saving the Chesapeake Bay. Tom Horton. Island Press, Washington, D.C.
- Rivers for Life. 2003. Sandra Postel and Brian Richter. Island Press, Washington, D.C.
- Living Downstream. 1997. Sandra Steingraber. Addison Wesley Publishing Co., Reading Mass.
- Overtapped Oasis. 1990. Marc Reisner and Sarah Bates. Island Press, Washington, D.C.
- \*Cadillac Desert: The American West and its Disappearing Water. 1993 Marc Reisner. Penguin Books. New York
- Water: The Fate of our Most Precious Resource. 2000. Marq De Villiers. Stoddart Publishing Co., Toronto.
- Water Wars: Privatization, Pollution, and Profit. 2002. Vandana Shiva. South End Press. Cambridge, MA
- Rivers of Empire: Water, Aridity, and the Growth of the American West. 1985. Donald Worster. Oxford University Press, Oxford, UK
- Water Follies. 2002. Robert Glennon. Island Press, Washington, D.C.
- Unquenchable. 2009. Robert Glennon. Island Press, Washington, D.C.
- Water: A Natural History. 1996. Alice Outwater. Basic Books, New York.
- Water in Palestine: Problems, Politics, and Prospects. 2003 Edited by, Fadia Daibes et al. PASSIA Publications
- When the Rivers Run Dry: Water – the defining crisis of the twenty-first century. 2006. Fred Pearce. Beacon Press, Boston, Mass.
- Not a Drop to Drink: America’s Water Crisis (and what you can do). 2007. Ken Midkiff. New World Library, Novato, California
- \*Great Lakes Water Wars. 2006. Peter Annin. Island Press, Washington D.C.
- Blue Covenant: The Global Water Crisis and the Coming Battle for the Right to Water. 2007. Maude Barlow. The New Press
- Blue Death: Disease, Disaster, and the Water We Drink. 2007. Robert Morris. Harper Collins, New York, New York.
- \*Water: The Epic struggle for Wealth, Power, and Civilization. 2011. Steven Solomon. Harper Perennial.
- Water. 2012. David Lewis Feldman. Polity Press.
- Blue Revolution: Unmaking America’s Water Crisis. 2011. Cynthia Barnett. Beacon Press, Boston.
- \*Elixir: A History of Water and Humankind. 2012. Brian Fagan. Bloomsbury Press.
- \*The Big Thirst: The Secret Life and Turbulent Future of Water. 2012. Charles Fishman. Bloomsbury Press.

**\*highly recommended!**