

**FOREST WATER RESOURCES**  
**FNR 4343C (3 credits)**  
**Spring 2012**

**GENERAL COURSE OVERVIEW**

This course explores the hydrologic cycle in forested ecosystems and watersheds with an emphasis on the impacts of forest management on that cycle. By midway through the semester students will be able to describe and construct a water budget for a forest and/or watershed, and explain how the various components of that budget are measured. Students will also be able to describe how forests differ from other land uses with respect to their influence on regional hydrologic systems, and how these differences vary with forest management practices. An emphasis on the role of forests in mitigating the effects of extreme events (e.g. hurricanes, droughts) will help students highlight the ecosystem services provided by healthy forests, and understand their value to our watersheds.

By the end of the semester, students will be familiar with various aspects of water quality and how forests and forest management affect them. Key processes such as erosion and sedimentation, eutrophication, anoxia, and autoperification will be understood, as well as the context within which these processes are regulated by government. In particular, students will understand the role and mechanisms of phosphorus, nitrogen, and carbon enrichment on the dynamics in aquatic ecosystems, with an emphasis on Florida. Throughout our discussion of the implications of impaired water quality on lakes, wetlands, and streams will be addressing associated forest Best Management Practices (BMPs) that have been developed to reduce negative environmental consequences. Experts from forest industry, Florida’s Division of Forestry, engineering/environmental science firms, state Water Management Districts and conservation organizations will help explore current issues in forest water resources.

**HOURS AND LOCATION**

**Class Time:** Mon./Wed. (9:35-10:25 a.m.)

**Location:** Newins-Ziegler Hall 222

**Lab Time:** Monday (2:00- 5:00 p.m.)

**Location:** Newins-Ziegler Hall 219

**INSTRUCTOR**

Matthew Cohen (Associate Professor)

[mjc@ufl.edu](mailto:mjc@ufl.edu)

328 Newins-Ziegler Hall

(352) 846-3490

Class Website – <http://sfrc.ufl.edu/ecohydrology/fwr.html>

**RECOMMENDED TEXT(S)**

- *Forest Hydrology: An Introduction to Water and Forests*. 2005. M. Chang (2<sup>nd</sup> Edition)

**ADDITIONAL REFERENCE MATERIALS** (available at course reserve in Marston Science Library)

- *Hydrology and the Management of Watersheds*. 2003. Brooks, K. et al. (3<sup>rd</sup> Edition)

- *Principles of Forest Hydrology*. 1982. J. Hewlett

- *Water in Environmental Planning*. 1978. T. Dunne et al.

## PERFORMANCE EVALUATION

### *Grading Scale:*

A	= 100-90	C	= 75-70
B+	= 89-86	D+	= 69-66
B	= 85-80	D	= 65-60
C+	= 79-76	E	<60

### *Quizzes*

Three (3) during the semester (unannounced) 9%

### *Tests and Assignments*

Midterm	18%
Final Exam	23%
Term paper	20%

### *Lab Section Grades*

6 laboratory reports (5 pts each) 30%

### **Notes:**

- Class attendance is required. To ensure your participation, 4 unannounced quizzes will be given during the semester, each worth 2.5% of your grade.
- Your term paper is due **Friday April 20<sup>th</sup>**. An assignment outline is provided below; more detailed instructions for writing a term paper are provided at the class website. Penalty for a late term paper is one letter grade per day.
- The midterm will be during lab Monday after spring break (**March 12<sup>th</sup>**). The take-home final exam will be available **Monday April 23<sup>rd</sup>** and due via email by **5:00 pm April 27<sup>th</sup>**.
- Lab attendance is required. Reports are due at the beginning of the following lab. Penalty for late labs is one letter grade per day. If you miss one lab (with prior notification), a replacement assignment will be provided at the discretion of the instructor. Additional absences are given a zero. Most labs will be in the field - dress appropriately. We will depart promptly at 2 pm. We will return to campus well before 5 pm for most of the labs, but may run over on a couple of long distance labs. **Plan accordingly!** For labs scheduled for the classroom (see schedule), *bring a laptop computer* if at all possible.
- **Graduate students** enrolled in the course (FOR6934) will be expected to fulfill all of the undergraduate requirements in addition to delivering a more thorough and synthetic research paper (see below), and expanded lab reports.

## TERM PAPER

Choose from among the listed topics in forestry and/or water resources. Start thinking about this early – submit a 1 paragraph description of the specific topic by the **30<sup>th</sup> of January**. Select at least 5 peer-reviewed research journal articles (a list of potential sources is given below), and write a review article. Your objectives are to 1) understand the issues in greater detail than when you started, 2) identify knowledge gaps (what questions remain), 3) contrast the articles, and 4) present a well written summary.

**Topic Areas:**

- 1) Swamp Logging
  - 2) Payments for Ecosystem Services
  - 3) Water Yield and Forest Management
  - 4) Nutrient Loading from Forest Lands
  - 5) Southeastern Coastal Plain Streams
  - 6) Riparian Buffer Zones.
- The final report is due Friday April 27<sup>th</sup> (no exceptions). It should be 10 pages long (double-spaced). The class website has examples of effective term papers for your reference.
    - *Graduate student* papers are expected to be ~20 pages long on a topic relevant to their research. They are expected to provide a more thorough synthesis of current literature.

**Potential Sources of Water Resources articles**

Water Research

Journal of Hydrology

Journal of the American Water Resources Association

Water Resources Research

Hydrological Processes

Water Environment Research

Water Science and Technology

**Potential Sources of Additional Water Related Information**

[UF's Water Institute](#)

[Alachua County DEP](#)

[Florida Division of Forestry](#) - General

[Florida Division of Forestry – Forest Hydrology](#)

[Wetland Restoration on State Forests](#)

[Silviculture Best Management Practices](#)

[Water Management Districts](#) - General

[St. Johns River](#)

[Suwannee River](#)

[South Florida](#)

[Southwest Florida](#)

[Northwest Florida](#)

[Florida Department of Environmental Protection](#) - General

[Water Resources](#)

[Wetlands](#)

[US Environmental Protection Agency](#) - General

[Office of Water](#)

[Surf Your Watershed](#)

[US Geological Survey](#)

[Pacific Institute – The World's Water](#)

[UNESCO Water Portal](#)

### FOREST WATER RESOURCES COURSE SCHEDULE (SPRING 2008)

Week of...	Monday Lecture	Wednesday Lecture	Monday Lab	Due Dates
9-Jan	Why Water?	Watersheds and the Hydrologic Cycle	<b>NO LAB</b>	
16-Jan	<b>NO CLASS – MLK Day</b>	Precipitation I	<b>NO LAB – MLK Day</b>	
23-Jan	Precipitation II	Evapotranspiration I	<b>Rainfall Lab</b> (classroom)	
30-Jan	Evapotranspiration II	Evapotranspiration III	ET Part I (ACMF, no report)	<i>Rainfall Lab Report Due</i>
6-Feb	Interception	Water at the Surface	<b>ET Part II</b> (classroom)	
13-Feb	Streamflow	Forests and Flooding	<b>Streamflow Lab</b> (ACMF)	<i>ET Part II Lab Report Due</i>
20-Feb	Soil Water	Water in the Vadose Zone	Hydrogeogr Field Trip (O’Leno SP)	<i>Streamflow Lab Due</i>
27-Feb	Florida’s Hydrogeology	Groundwater Stores & Fluxes	<b>Groundwater Lab</b> (ACMF)	
5-Mar	<b>SPRING BREAK</b>			
12-Mar	Water Quality - Overview	Water Quality - Overview	<b>MID TERM EXAM</b>	
19-Mar	Water Quality – Oxygen	Water Quality – pH and Sediments	Stream Biology Lab (Hogtown Creek)	<i>Groundwater Lab Report Due</i>
26-Mar	Water Quality – Nutrients	Water Quality – Nutrients	<b>Nutrient Budget Lab</b> (classroom)	
2-Apr	Water Regulations – MFLs	Water Regulations – TMDLs	<b>Aquatic Metabolism Lab</b> (Sweetwater Branch)	<i>Nutrient Budget Lab Due</i>
9-Apr	Best Management Practices	Best Management Practices	BMP Workshop (Robin Holland)	<i>Aquatic Metabolism Lab Due</i>
16-Apr	Wetland Logging BMPs	Wetlands and Forestry	Swamp Logging Tour (tentative)	
23-Apr	Forestry and Ecosystem Services	The Future of Water	<b>NO LAB</b>	<i>Term Paper Due (April 27<sup>th</sup>)</i>
30-Apr	<b>FINAL EXAM – Take Home</b>			

## ADDITIONAL INFORMATION

### *Academic Honesty:*

The University of Florida requires all members of its community to be honest in all endeavors. Cheating, plagiarism, and other acts diminish the process of learning. When students enroll at UF they commit themselves to honesty and integrity. Your instructor fully expects you to adhere to the academic honesty guidelines you signed when you were admitted to UF. As a result of completing the registration form at the University of Florida, every student has signed the following statement: *“I understand the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University.”* Furthermore, on work submitted for credit by UF students, the following pledge is either required or implied: *“On my honor, I have neither given nor received unauthorized aid in doing this assignment.”* It is to be assumed all work will be completed independently unless the assignment is defined as group project, in writing by the professor. This policy will be vigorously upheld at all times in this course.

### *Software Use:*

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate.

### *Campus Helping Resources:*

Students experiencing crisis or personal problems that interfere with their general wellbeing are encouraged to utilize the university’s counseling resources. Both the Counseling Center and Student Mental Health provide confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal or lacking clear career and academic goals, which interfere with their academic performance. The Counseling Center is located at 301 Peabody Hall (next to Criser Hall). Student Mental Health is located on the second floor of the Student Health Services in the Infirmary.

1. *University Counseling Center*, 301 Peabody Hall, 392-1575; personal and career counseling: [www.counsel.ufl.edu](http://www.counsel.ufl.edu)
2. *Student Mental Health*, Student Health Care Center, 392-1171, personal counseling: [www.hsc.ufl.edu/shcc/smhs.htm](http://www.hsc.ufl.edu/shcc/smhs.htm)
3. *Sexual Assault Recovery Services (SARS)*, Student Health Care Center, 392-1161, sexual assault counseling; and
4. *Career Resource Center*, Reitz Union, 392-1601, career assistance and counseling.

### *Students with Disabilities Act:*

The Dean of Students Office coordinates the needed accommodations of students with disabilities. This includes the registration of disabilities, academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services, and mediating faulty-student disability related issues. *Dean of Students Office*, 202 Peabody Hall, 392-7066, [www.dso.ufl.edu](http://www.dso.ufl.edu).