

# SWS 4245/5246 WATER RESOURCE SUSTAINABILITY

3 credits/Spring Semester

## COURSE MOTIVATION AND DESCRIPTION

This course is about the global water crisis: the challenge of providing sufficient and equitable water supply for all people while also supporting ecosystem functions. Four key themes are maintained: hydrology, ecological protection, social justice, and economic opportunity.

Global demand for freshwater resources grows continuously, while at the same time there is increasing emphasis on preventing pollution and leaving enough water for natural ecosystem functions. These combined pressures define the need for sustainable water resource management. This course describes the effects of human impacts on hydrologic ecosystems (aquifers, watersheds, coastal zones, lakes, and wetlands) with quantitative measures of impacts and mitigation/attenuation efforts. Case studies from around the world are used to illustrate both the detrimental effects of unsustainable resource utilization and the benefits of implementing sustainable resource management strategies.

This course is intended for graduate and advanced undergraduate students interested in the interactions between human civilization and hydrologic systems and should be of interest to environmental and agricultural scientists and engineers, and natural resource managers.

### Instructor

James W. Jawitz, Professor  
2191 McCarty Hall  
352-294-3141

✉ [jawitz@ufl.edu](mailto:jawitz@ufl.edu)  
🏠 [www.landscapehydrology.org](http://www.landscapehydrology.org)  
🐦 @jimjawitz

Office hours will be following class lecture or by appointment.

## BRIEF OUTLINE

Topic	Weeks
<b>Sustainability</b>	<b>1</b>
<b>Historical importance of water to humans</b>	<b>2-3</b>
<b>Equitable water allocation (meeting present and future minimum water needs)</b>	<b>3-4</b>
<b>Groundwater sustainability</b>	<b>5-6</b>
<b>Water quality (groundwater and surface water)</b>	<b>7-8</b>
<b>Rivers and humans</b>	<b>9</b>
<b>Urban water services</b>	<b>10</b>
<b>Water transfers</b>	<b>11</b>
<b>Dams and flood control infrastructure</b>	<b>12-13</b>
<b>Water institutions (including large-scale management)</b>	<b>14-15</b>

## INDIVIDUAL/~~GROUP~~ ASSIGNMENTS

Your success as a professional will be based, in large part, on your ability to effectively communicate your ideas in both written and verbal forms. We all need practice to develop and improve these technical communication skills.

1. All students: Weekly readings from scholarly research articles, news analyses, and commentaries are assigned for each module, with a required corresponding written response of approximately **500 words**. These should be a critical evaluation and brief synthesis of the week's readings, including

discussion of assigned questions related to the readings. You are likely to be *called upon in class* to share your comments. Typed assignments are due following the discussion period (usually Fridays).

2. All students: Reports on site visits to hydrologic/hydraulic features related to concepts and topics discussed in class. Important: Credit can only be received through coordination with the instructor. Due by the end of Week 13.
3. Graduate students: Independently researched reports about global water resources.

## GRADING SYSTEM

To reflect the different skills required for professional success, the final grade in this course is based on analytical reading/writing assignments, thoughtful and consistent participation, formal essay exams, and interesting individual and group projects.

Course components	Points for grade	
	SWS4245	SWS5246
11 weekly one-page assignments (4 points each)	44	44
Exam 1	100	100
Exam 2	100	100
Individual <del>Group</del> project	26 <del>52</del>	20 <del>37</del>
Grad student project	--	20
Class participation	30	16
Total points	<b>300</b>	<b>300</b>

Exams are primarily essay questions linking concepts with specific information from case studies. Exam grades are historically highly correlated to class attendance. Exam dates and times are fixed FIRMLY. Late assignments will be penalized in proportion to the time since the due date, with zero credit after two weeks. Class participation entails regular, on-time attendance and engagement, and active interaction in periodic small-group discussions in rotating roles (discussion leader, reporter) in person and on-line. Class participation points will be assigned separately for each half of the semester.

### Grade Scale

A ≥ 92 > A- ≥ 89 > B+ ≥ 86 > B ≥ 83 > B- ≥ 80 > C+ ≥ 77 > C ≥ 74 > C- ≥ 71 > D+ ≥ 68 > D ≥ 65 > D- ≥ 62 > E

“The mind does not require filling like a bottle, but rather, like wood, it only requires kindling to create in it an impulse to think independently.”

- Plutarch, c. 100 AD *Moralia, On Listening to Lectures* 48C (Loeb Classic Library 1.259)

“The greatest obstacle to discovery is not ignorance - it is the illusion of knowledge.”

- Daniel J. Boorstin, 1983 *The Discoverers*

## COURSE SCHEDULE (writing assignments are due on the last date for each module)

<b>Topic 1 Getting serious about sustainability</b>	<b>12,14,15,19 January</b>
<b>2,3 Water history: Timescales of variability</b>	<b>21,22,26,28,29 January</b>
<b>4 Water availability: Uneven distribution in space and time</b>	<b>2,4,5 February</b>
<b>5 Water for people: Progress and remaining gaps</b>	<b>9,11,12 February</b>

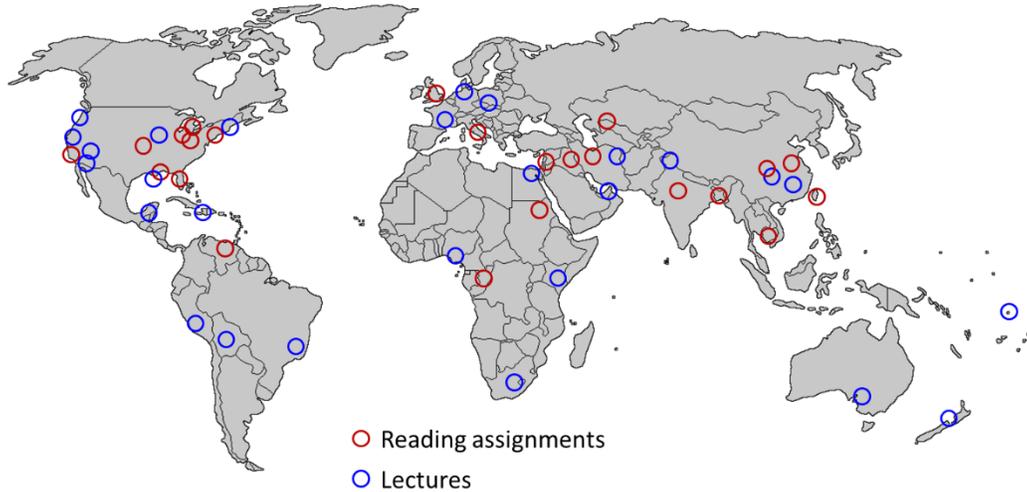
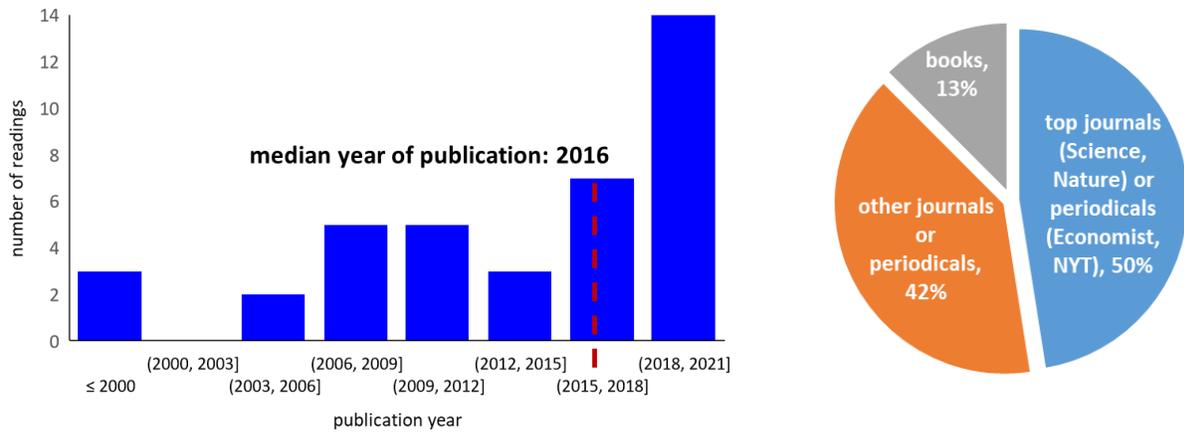
<b>6 Groundwater: The shouting present vs the whispering future</b>	<b>16,18,19,23 February</b>
<b>7 Water quality: Impacts and societal response</b>	<b>[25],26,21,2,9,11,12 Feb/March</b>
<b>8 Rivers as transport corridors</b>	<b>16,18,19 March</b>
<b>9 Urban water services</b>	<b>23,25,26 March</b>
<b>10 Water transfer: Local consumption, distant impacts</b>	<b>30,1,2 March/April</b>
<b>11 Infrastructure: Dams and flood protection structures</b>	<b>6,8,9 April</b>
<b>12 Institutions: Spatiotemporal scales of water management</b>	<b>13,15,16,20 April</b>

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**FINAL EXAM 28 APRIL 7:30-9:30 AM (sorry, this date is firm)**

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**SOURCE MATERIAL RELEVANCE, RELIABILITY, REPRESENTATIVENESS (3Rs)**



### ***UF Policies (Updated August 2020)***

**Grades and Grade Points:** For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>.

**Attendance and Make-Up Work:** Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>.

**COVID Response Statements:** We will have face-to-face instructional sessions to accomplish the student learning objectives of this course. In response to COVID-19, the following policies and requirements are in place to maintain your learning environment and to enhance the safety of our in-classroom interactions. You are required to wear approved face coverings at all times during class and within buildings. Following and enforcing these policies and requirements are all of our responsibility. Failure to do so will lead to a report to the Office of Student Conduct and Conflict Resolution. This course has been assigned a physical classroom with enough capacity to maintain physical distancing (6 feet between individuals) requirements. Please utilize designated seats and maintain appropriate spacing between students. Please do not move desks or stations. Sanitizing supplies are available in the classroom if you wish to wipe down your desks prior to sitting down and at the end of the class. Follow your instructor's guidance on how to enter and exit the classroom. Practice physical distancing to the extent possible when entering and exiting the classroom. If you are experiencing COVID-19 symptoms, please use the UF Health screening system and follow the instructions on whether you are able to attend class. Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work.

**Online Course Evaluation Process:** Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at: <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at: <https://gatorevals.aa.ufl.edu/public-results/>.

**Academic Honesty:** As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity." You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, 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 assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>.

**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.

**Services for Students with Disabilities:** The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation: 0001 Reid Hall, 352-392-8565, <https://disability.ufl.edu/>

**Campus Helping Resources:** Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, [www.counseling.ufl.edu](http://www.counseling.ufl.edu), Counseling Services, Groups and Workshops, Outreach and Consultation, Self-Help Library, Wellness Coaching
- U Matter We Care, [www.umatter.ufl.edu/](http://www.umatter.ufl.edu/)
- Career Connections Center, First Floor JWRU, 392-1601, <https://career.ufl.edu/>.
- Student Success Initiative, <http://studentsuccess.ufl.edu>.

**Student Complaints:** <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>.