

## Water Resource Assessment

Lectures: Harvill 111, Tues. & Thur. 12:30 – 1:45

**Instructor** Dr. Christopher Scott <[cascott@email.arizona.edu](mailto:cascott@email.arizona.edu)>  
Office hours - Harvill 410, Tuesdays 2:00 – 3:00 or by appointment.

### Course summary

Focuses on watersheds, aquifers, and river basins as sources of water to meet human and environmental demands. Techniques include watershed delineation, water budget calculation, safe yield estimation, water quality assessment (total maximum daily load). MODSIM, MODFLOW, and WEAP decision support systems are reviewed.

### Course instructional objectives

By the end of the course, students will be able to identify all major components of the hydrological cycle, access online and published data for each, work with common units of measure, and determine errors and uncertainties. Based on this, students will be able to compute a water budget for a geographical area (watershed, aquifer, river basin). Finally, students will be able to link the water budget to decision-making, including the roles of important agencies, laws, and policies.

### Course materials

Environmental Hydrology, 2nd Edition, Andy Ward and Stanley Trimble. 2004. Lewis Publishers. ISBN: 9781566706162. **BRING THE TEXTBOOK TO CLASS**  
Additional reading materials will be posted on the course website at [www.d2l.arizona.edu](http://www.d2l.arizona.edu).

### Grading policy

Grades are based on regular homework and quizzes (15% total), class participation including the **Saturday March 8<sup>th</sup> field trip** (10% total), two midterm exams (15% each), a group project including presenting it in class (25% total), and a final comprehensive exam (20%). Each assignment, project, or exam will be graded according to specific rubrics based strictly on the standard model (A=100-90, B=89-80, ... E < 59). An 'I' (incomplete) requires that a majority of the course work has been passed successfully. All exams are in-class, and combine multiple-choice questions, problem-solving including calculations (a calculator is required), and a written component. Students who have to miss an exam due to illness or other extraordinary event must contact the instructor in advance of the start of the exam to schedule a makeup.

### Requirements

Students are expected to have completed an introductory physical geography class (eg, NATS101, GEOG220, or GEOG240), but may register for the class with permission of the instructor after satisfactory completion of a readiness assessment. Regular class attendance is expected from every student. The calculator is the only electronic device allowed to be on. Please turn off cell phones, MP3 players or other music, and be quiet in the classroom. Sites that you are responsible to know:

Threatening behavior: <http://policy.web.arizona.edu/~policy/threaten.shtml>

Academic integrity: <http://w3.arizona.edu/~studpubs/policies/cacaint.htm>

Religious holidays: <http://www.registrar.arizona.edu/religiousholidays/calendar.htm>

Students with disabilities: <http://drc.arizona.edu/learn/index.html>

**CLASS SCHEDULE** (subject to revision as announced in class)

<b>Date</b>	<b>Topic</b>	<b>Reading</b>
1/17	1.a. Introduction; course overview; readiness assessment 1.b. Water resources and society; management and decision-making	<i>Ward &amp; Trimble pages:</i>
1/22	2.a. The hydrologic cycle	pp. 1 – 11
1/24	2.b. Data analysis and statistics; measurement units	11 – 23
1/29	3.a. Remote sensing and GIS applications; watershed delineation	373 – 377
1/31	3.b. Precipitation	29 – 51
2/5	4.a. Storm flow and flooding	132 – 159
2/7	4.b. Runoff processes	119 – 131
2/12	5.a. Evapotranspiration	83 – 94
2/14	5.b. Weather data; estimating ET	95 – 117
2/19	6. Infiltration and soils	55-70, 74-80
2/21	<b>Exam 1</b>	
2/26	7.a. Hydrogeology	321 – 337
2/28	7.b. MODFLOW overview	
3/4	8.a. Coupled surface and groundwater systems	
3/6	8.b. Water budget estimation	
3/8	<b>Saturday field trip</b> (8:30 – 4:00) to Santa Cruz Active Management Area	
3/11	9.a. Decision support models; MODSIM overview	
3/13	9.b. Urban impacts on the hydrological cycle	339 – 354
	<b>Spring Break</b> (no class 3/18 or 3/20)	
3/25	10.a. Water quality	354 – 372
3/27	10.b. TMDLs; monitoring; compliance	
4/1	<b>Exam 2</b>	
4/3	11. River basin systems; WEAP overview	
4/8	12. Group projects on hydrologic studies (choose precipitation, evaporation, runoff, flow duration, storm runoff, etc.)	389 – 412
4/10		
4/15		
4/17	13. Work on group projects	
4/22	14.a. Group project presentations in class	
4/24	14.b. Group project presentations in class – continued	
4/29	15.a. Soil conservation; sediment yield and budgets	255 – 269
5/1	15.b. Environmental sustainability, policy and planning	269 – 289 & 308 – 314
5/6	16. Course review and evaluation	
5/15	<b>Final Exam:</b> Thurs. 5/15, 2008, 11:00 a.m. to 1:00 p.m.	

**Final note**

All information contained in this syllabus (other than the grading policy portion) may be subject to change with reasonable advance notice, as deemed appropriate by the instructor. For any issues, problems or concerns, please contact the instructor.