

FISH 101
Water & Society
Winter 2014

Instructors:

Gordon Holtgrieve

Office: Fisheries Science Bldg., Room 316B

Email: gholt@uw.edu

Office Hours: After lecture or by appointment

Daniel Schindler

Office: Fisheries Science Bldg., Room 320A

Email: deschind@uw.edu

Office Hours: After lecture

Lead TA: Tim Walsworth (tewals@uw.edu). Office hours: W 1-3 pm in FSH 358B.

Section TAs: Daniel Auerbach (dbach15@uw.edu); Jason Guo (jygg91@gmail.com); Genia Hill (gmhill@uw.edu); Alia Karmali (aliak2@uw.edu); Jenna Keeton (jenna.keeton@gmail.com); Emilie Lehman (lehmane@uw.edu); Carrie McCarty (cvmc14@uga.edu); Alex Nanni (nanni012@gmail.com); Jennifer Nathans (nathaj@uw.edu); Kiona Roseburg (kionar@uw.edu).

Lecture location: KNE 110

Lecture hours: MWF 9:30-10:20

Credits: 5

SLN: 14330

Course Canvas web page: <https://canvas.uw.edu/courses/881889>

“Whiskey is for drinking; water is for fighting over” – attributed to Mark Twain

Water will be the Oil of the 21st century and beyond- the invaluable commodity that determines the wealth of nations, and the health of humans and the freshwater ecosystems upon which we depend. We all know too well the importance of clean, fresh water; but do you know the real reasons why water shortages have led to environmental degradation and intense social conflicts throughout the globe? Many of the most dangerous human diseases are water-borne; how are society's actions exacerbating these? Why is the biodiversity of freshwater ecosystems the most imperiled on the planet? Is Seattle really a 'wet' place or are we running out of sustainable water supplies? This course will examine these and many related questions to improve our understanding of human dependencies and effects on freshwater ecosystems.

COURSE IMPETUS

Water, the bloodstream of the biosphere, determines the sustainability of living systems. Despite the abundance of water on the Earth, the small proportion that is fresh is coming under increasing pressure as human populations increase and climate warms. These global changes are generating new conflicts between the needs of humans and the basic requirements of aquatic ecosystems. It is now abundantly clear that there are limits to the amount of water that can be withdrawn from the environment before natural functioning and productivity, native species, and the services and products the environment provides become severely degraded. Water managers and political leaders are becoming increasingly cognizant of these limits as they are being confronted with endangered species or water quality regulations, and changing societal values concerning ecological protection. In the face of prevailing management practices and growing demands for fresh water, will society be able to sustain healthy aquatic and riparian ecosystems capable of benefiting human populations?

COURSE OBJECTIVES

The objective of this course is to provide an understanding of the complex relationships between human societies, water resources, and aquatic ecosystems. We will accomplish this by exploring coupled human and natural systems and their dependence on fresh water. Topics of interest include global change, ecosystem services, fisheries, water pollution, urbanization, land use, climate change, watershed and river basin management, water technology, stakeholder processes, and water policy. Relevant examples will be drawn from the United States and from around the world.

INSTRUCTORS

The instructors endeavor to keep the course content timely and relevant to stimulate student discussion and participation for the most enjoyable and effective learning. Gordon Holtgrieve and Daniel Schindler are professors in the School of Aquatic and Fishery Sciences. Holtgrieve's research focuses on the ecology of freshwater ecosystems, in particular ecosystem functioning in light of hydrologic alteration by dams, freshwater fisheries, and watershed biogeochemistry. Schindler's research focuses on understanding issues such as climate change, fisheries exploitation, watershed development, and nutrient cycling for the integrity of aquatic ecosystems.

LEARNING OUTCOMES

As a result of this course, students will have a strong understanding of the tight linkages between water, the environment, and human society. Specifically, this course aims to i) introduce students to contemporary issues and challenges in freshwater ecology and resource management; ii) develop student's skills to critically evaluate scientific information; iii) develop student's writing skills to effectively communicate issues to a variety of audiences; iv) increase awareness that human existence depends on a supply of clean and abundant water; and v) explore ways that individuals and society can reduce their impacts on water resources.

METHOD OF INSTRUCTION AND ASSIGNMENTS

Lectures: This course will consist of three 50-minute lectures per week.

Exams: Mid-term and final exams will consist of multiple choice and short answer questions, requiring both a specific and broad understanding of the lecture and discussion material.

Water Footprint Assignment: Did you know that it takes roughly 20 gallons of water to make a pint of beer, as much as 132 gallons of water to make a 2-liter bottle of soda, and about 500 gallons, including water used to grow, dye and process the cotton, to make a pair of Levi's jeans? Do you know your water footprint? Hang on ... what is a water footprint? The water footprint of an individual, community or business is defined as the total volume of freshwater that is used to produce the goods and services consumed by the individual or community or produced by the business. This assignment will involve the calculation of your personal water footprint and an evaluation of the determining factors.

Article Review Assignment: You are required to write a 2-page review/critique of a scientific paper that addresses a current environmental issue in the freshwater sciences. The goal of this assignment is for you to review a technical (peer-reviewed) 'water science' paper and translate its key message into an interesting and accessible article for the public. You can decide what the outlet for your paper might be (e.g., the local newspaper, a popular magazine, a website) and tailor your essay to coherently and interestingly convey the message of the technical paper.

Media Assignment: For this assignment you must develop an advertisement for a product, corporation, or organization (existing or fictitious) that conveys some of the technical information about water sciences that has been covered in this course and is also compelling (i.e., it sells)!

Debates: You will actively participate in three debates among your peers regarding a current environmental issue. Drop the gloves and prepare for a friendly battle.

GRADING

	Points (% of final grade)
<i>Mid-term exam #1</i>	150 (15%)
<i>Mid-term exam #2</i>	150 (15%)
<i>Water footprint assignment</i>	50 (5%)
<i>Article review assignment</i>	100 (10%)
<i>Media assignment</i>	100 (10%)
<i>Debates (3 total, 5% each)</i>	150 (15%)
<i>Final exam</i>	300 (30%)
Total	1000 (100%)

HONORS SECTION

Please complete the Honors Program form and return to one of the Instructors at the beginning of the quarter (not the University Honors Program). Honors assignment will be distributed by the Instructors.

TEXTBOOK

None. Select readings will be provided by the instructors and TAs and will be tested on the exams when notified.

TOPICS

Date	Lecture	Discussion/Assignments
January		
Week 1		
6 Mo	Water: the bloodstream of the biosphere (S)	Introduction to FISH 101 (class expectations, exploring the Canvas web interface, assignment overview)
7 Tu		
8 We	Water demand: Human society (H)	
9 Th		
10 Fr	Water demand: Freshwater ecosystems (H)	
Week 2		
13 Mo	Water supply: The hydrologic cycle (S)	Introduction to university writing and the water footprint assignment
14 Tu		
15 We	The anatomy of the watershed (S)	Documentary: Blue Gold
16 Th		
17 Fr	Freshwater biodiversity: Patterns and threats (H)	
Week 3		
20 Mo	NO CLASS: Martin Luther King Day	Debate #1: Water wars on the Klamath River
21 Tu		
22 We	Freshwater biodiversity: Conservation (H)	Due: Debate assignment
23 Th		
24 Fr	Freshwater ecosystem services (S)	
Week 4		
27 Mo	Climate change (S)	Documentary: Alaska Gold (PBS Frontline)
28 Tu		
29 We	Water Quality (S)	Due: Water footprint assignment
30 Th		
31 Fr	MID-TERM EXAM #1	Midterm Exam Review
February		
Week 5		
3 Mo	Guest Lecture: Paul Fleming (Seattle Public Utilities) <i>"Planning for Seattle's water security in a warmer future"</i>	Debate #2: Pebble Mining in Alaska Due: Debate assignment
4 Tu		
5 We	Pollution (S)	
6 Th		
7 Fr	Conflicts between energy production and water quality: Hydrofracking and hydropower (S)	
Week 6		
10 Mo	Human land use (H)	Documentary: Gasland
11 Tu		
12 We	Case Study: The Mekong River (H)	Overview of media assignment
13 Th		

14 Fr	Invasive species (H)	
Week 7		
17 Mo	NO CLASS: Presidents Day	Debate #3: Hydrologic Fracking
18 Tu		
19 We	Dams: The good, the bad and the ugly (H)	Due: Article review assignment
20 Th		
21 Fr	River restoration efforts (H)	
Week 8		
24 Mo	Aquaculture (S)	Midterm exam review
25 Tu		
26 We	Fisheries Exploitation (S)	
27 Th		
28 Fr	MID-TERM EXAM #2	
March		
Week 9		
3 Mo	TBD	Presentation of media assignments
4 Tu		
5 We	Water conflicts and resolution (H)	
6 Th		
7 Fr	Guest lecture: Kari Vigerstol (The Nature Conservancy) " <i>Corporate Water Stewardship</i> "	
Week 10		
10 Mo	Water-borne diseases (S)	Final exam review
11 Tu		
12 We	Technologies for water sustainability (H)	
13 Th		
14 Fr	Water in the era of global change (S)	
19 We	FINAL EXAM (8:30-10:20 am)	

*** Lectures by Holtgrieve (H) and Schindler (S)

ACADEMIC INTEGRITY

Plagiarism, cheating, and other misconduct are serious violations of your contract as a student. We expect that you will know and follow the University's policies on cheating and plagiarism. Any suspected cases of academic misconduct will be handled according to University regulations. More information can be found at: <http://depts.washington.edu/grading/issue1/honesty.htm>. Be advised, the instructors of this course have the right and responsibility to notify University Conduct committees about ANY suspected student misconduct. Exam cheating might come immediately to your mind when you hear this, but by FAR the most prominent form of cheating at UW is plagiarism.

It is YOUR responsibility to inform yourself of what plagiarism means. Students will receive NO credit for an assignment which contains plagiarized portions.

Typical plagiarism "oversights" are:

- (1) Copying an assignment from a friend with whom you study, OR working so closely with this friend that both your assignments LOOK copied (same words and ideas in the same order).
- (2) Copying whole sentences from a web site without restating in student's words or without quotation/citation.
- (3) Paraphrasing ideas of another author without attempting to write an "original" sentence.

LATE AND RE-GRADE POLICY

Discussion Section Assignments

You must turn-in all your assignments by the noted deadline. Assignments received after the deadline will receive a zero grade unless otherwise arranged with your TA.

Exams

We will only schedule a make-up exam if absolutely necessary. As soon as you foresee a conflict, please talk with us and provide a compelling, documented reason. If you miss an exam without contacting the instructors ahead of time, the instructor's will decide if you can re-schedule the exam.

Re-grades

If you feel that an exam or assignment has been graded unfairly or that a mistake has been made, you may submit a re-grade request WITHIN ONE WEEK of being handed back the assignment or exam. Requests must be submitted in writing and must be handed in at lecture. Requests should be stapled to the original assignment. E-mails and conversations cannot substitute for a written request.

EMAIL AND COMPUTER USE

All students are expected to have an email address and you will receive email relevant to this course on a regular basis. We will have an electronic discussion group (blog) that will facilitate the discussion of the documentaries.

DISABILITY ACCOMMODATIONS

To request academic accommodations due to a disability, please contact Disabled Student Services, 448 Schmitz, (206)543-8924 (V/TTY). If you have a letter from Disabled Student Services indicating that you have a disability that requires academic accommodations, please present the letter to the instructor so we can discuss the accommodations needed for this class.

Assignment Descriptions

Debates

Due Date

Upload your assignment (Microsoft Word format) on Canvas by 5 pm the night BEFORE your Discussion section.

Topics

- Water Wars
- Pebble Mining
- Hydrologic Fracking

Objective

The purpose of the topic debates (coupled with the documentary films) is to introduce you to new perspectives and broaden your thinking about water-related issues. During the discussion section we urge you to integrate concepts in the readings, lecture and documentary content to develop your point-of-view and craft a well-articulated argument.

Tasks

1. READ - For each debate topic you are required to read the overview paper and research multiple additional sources. Visit the course Canvas website for the paper and list of resources.
2. WRITE - Complete a 1.5-page fact finding assignment based on the questions below. Use 12-point font (Times New Roman) and 1-inch (72 pt) margins.
3. DEBATE - Attend your discussion section (you must attend to receive any points) and prepare to debate. Debates will occur between groups of students, each sharing a different viewpoint. Be sure to bring your fact page and get ready to participate! Full details provided in Discussion class.

Grading

One-page fact assignment	2.5
Active participation in debate	2.5
Total Points	5

Fact Finding Assignment

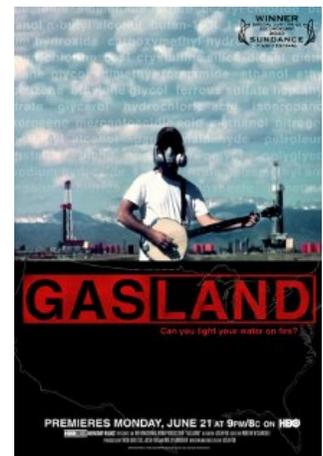
Address the following questions in your 1.5-page assignment by using information from the collection of articles and your own research. Include each question in your assignment.

1. State your viewpoint. Are you for or against the action? Write down three well-developed reasons.
2. What is your opinion about the environmental risks associated with the action?
3. Which of the other interest groups might disagree with your position on the action? Why? How will you respond to their arguments?
4. Write down two open-ended questions (i.e., cannot be answered with a simple yes or no) that you think is essential to the debate.
5. Write down any other relevant information that you would like to use in the debate.

THE WAR OVER YOUR WATER IS ABOUT TO BEGIN



A FILM BY SAM BOZZO
BLUE GOLD
WORLD WATER WARS
NARRATED BY MALCOLM MCDOWELL



Water Footprint Assignment

Due Date

Upload your assignment (Microsoft Word format) on Canvas by January 29, 2013.

Objective

The water footprint of an individual is defined as the total amount of freshwater that is used to produce the goods and services consumed. This assignment is designed to introduce you to the water footprint concept and enlighten you of your impact on water resources.

Tasks

1. Go to the www.waterfootprint.org website, and click on “Your footprint calculator” (extended calculator section). Read over the survey and then spend 30-45 minutes researching average American intake of various food products to give you a frame of reference for your own consumption values.

2. Take the survey and report the details of your total water footprint (i.e., total and components of your footprint) in your 1-page essay. Identify the elements of your water footprint that are the most significant sources of water use and find online materials relating how water use is associated with that component of your water footprint (i.e. food, domestic, or industry). This is the only assignment where you are permitted to use web references as sources of information. You must include external resources in your essay.

3. Write an essay on your personal water footprint approximately 1 page (single-spaced) in length with 12-point font (Times New Roman) and 1-inch (72 pt) margins. You should include the results of your footprint, general information about the components of water footprints, and a review of how your lifestyle influences your water use. Assess how you might reduce your water footprint by 25% to 50%. This is a challenging task but try to think creatively and realistically about actions you could take to reduce your water use (i.e., not just “I’ll eat less meat”!). You have flexibility with regards to the focus of this essay but it should be clearly written, edited, and display a synthesis of information sources.

Grading

Reporting personal water footprint statistics	1
Explanation of water footprint components and water involvement	2
Background on significant area of personal water use	1
Writing clarity	1
Total Points	5

Note

This assignment may (should!) change your life. Check out the website below (from another university) detailing how a college student changed her life after calculating her water footprint. It is inspiring!

<http://waterpaths.wordpress.com/category/assignments/my-water-footprint/>

Quiz how much you know: <http://kids.nationalgeographic.com/kids/games/puzzlesquizzes/water-wiz/>



Article Review Assignment

Due Date

1. Topic approved by February 10, 2013.
2. Upload your assignment (Microsoft Word format) on Canvas by February 19, 2013.

Objective

You are required to write a 2-page overview of a scientific paper that addresses a current issue or recent discovery in the freshwater sciences. The goal of this assignment is for you to review a technical (peer-reviewed) 'water science' paper and translate its key message into an interesting and accessible article for the PUBLIC. You can decide what the outlet for your article might be (e.g., the local newspaper, a popular magazine, a website) but we expect that you will tailor your essay to appropriately and accurately convey the technical content of the original paper to a lay person. Alternatively, you can write a 2-page letter-to-the-editor for a major publication.

Tasks

From a peer-reviewed scientific journal (e.g., *Science*, *Nature*, *Ecology*, *BioScience*, etc.) choose a recent research article that 1) you find interesting and 2) reports on a recent discovery or current issue in freshwater sciences. **This CANNOT include the debate topics.** Read the article and convince yourself that you can write a short essay for the public that conveys the central message of the technical paper. **By February 10th you must have your paper approved by one of the instructors or teaching assistants before you submit your essay for grading.**

Write a catchy, interesting, and technically accurate article summarizing the key message of the technical paper you have chosen. Your article should be 2-pages long (single spaced, 12 point font). Your article should be written with appropriate paragraph structure and proper grammar. You do not need to list your references for this assignment. **However, you must submit a copy of the first page of your technical article (including the author list, the appropriate bibliographic information, and the Abstract) with your own article.** Your instructors will show you how to extract specific pages from an electronic copy of a journal paper to include in your assignment.

Your TA's are available to provide feedback to you on a draft of your article if you send it to them at least one full week before it is due.

Grading

Instructor Approval of Article by Feb 10th deadline	1
Scientific accuracy of article	3
Article was interesting, accessible, and connected to the broader themes examined in this course	3
Writing clarity, spelling and grammar	3
Total Points	10



Media Assignment

Due Date

Submit your assignment before Discussion section during the week of March 3, 2013.

Objective

Achieving the goals of sustainability and biodiversity conservation will require convincing the public and corporations to 'buy' (literally and figuratively) the argument that their own self-interests benefit from actions that minimize their impact on ecosystems. For this assignment you must develop an advertisement for a product, corporation, or organization (existing or fictitious) that conveys some of the technical information about water sciences that has been covered in this course and is also compelling (i.e., it sells)! Your grade will be based on a combination of the technical accuracy of your ad and your creative use of the media to convey a message. We have provided a few examples of previous year's media assignments in Canvas. You can use any media you wish to produce your ad (e.g., newspaper, TV, internet, radio, billboard, etc).

Tasks

This assignment should be done in groups of 2-3 students. You will each receive the same grade for the assignment. If you produce an advertisement for a newspaper, magazine or billboard, you should submit a hard copy of your assignment for grading. Attached to your advertisement should be a 1-page cover sheet that includes a title for your ad, the names and student ID number of all students who contributed to the assignment, and 2-3 sentence description of how each student contributed to the project. Your ad should be viewable on a single page.

If you produce an ad for radio or television, then your ad should be posted to YouTube and you should submit the link so that we can view or listen to your assignment. The link should be provided to the instructors on a 1-page document that also includes a title for your ad, the names and student ID number of all students who contributed to the assignment, and 2-3 sentence description of how each student contributed to the project. Your advertisement should be no longer than two minutes in duration!

Grading

A scientifically accurate message was conveyed by the advertisement	5
Advertisement was creative and compelling	5
Total Points	10

COMMON THREADS INITIATIVE

REDUCE
WE make useful gear that lasts a long time
YOU don't buy what you don't need

REPAIR
WE help you repair your Patagonia gear
YOU pledge to fix what's broken

REUSE
WE help find a home for Patagonia gear you no longer need
YOU sell or pass it on*

RECYCLE
WE will take back your Patagonia gear that is worn out
YOU pledge to keep your stuff out of the landfill and incinerator

REIMAGINE
TOGETHER we reimagine a world where we take only what nature can replace

patagonia
patagonia.com

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