

**NR 351 When Science Escapes the Lab: Science and Resource Management (3 credits)**  
**Spring 2021, TR 12:00 – 1:20 pm (Synchronous)**  
**Course Syllabus**

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Virtual Office Hours: Tuesdays 1:30 - 2:30 pm, Thursdays 1:30 -2:30 pm, or by appointment

**Course Description**

Role of science in solving natural resource problems. Selecting the "best available science." How science is portrayed, filtered, and used by the media and interest groups to affect policy and management.

Analysis of case studies on use of science in natural resource decision making. (Bacc Core Course)

**Course Format**

This course will be delivered via Zoom (synchronous remote delivery). Students will participate through Zoom at the regularly scheduled time. The Canvas website will be used to upload assignments and conduct additional course activities.

**Course Overview**

Over the last 50 years, science has played an increasingly important role in shaping our understanding of natural resource problems and solutions. However, science rarely has a direct influence on policy or management – rather, research is contextualized, filtered and interpreted by the media, interest groups and other social actors. This course fulfills the Baccalaureate Core Synthesis requirement for Science, Technology, and Society, and addresses the role of science in solving natural resource problems, from its creation by scientists to its interpretation and use in society. It will help students find, evaluate and synthesize the latest scientific research related to particular resource problems; explore how the science is portrayed and used by different groups; evaluate the role and impact of science on specific management strategies; and explore how management decisions and technological advances impact scientific institutions and research. This class will be delivered through live Zoom sessions at the scheduled time (Tuesdays & Thursdays 12:00 – 1:20 pm) and will include short lectures, discussions, role plays, and exercises. Students will also work in small groups on case studies that will ultimately be presented to the larger class during week 10.

**Baccalaureate Core Science, Technology, and Society (STS) Learning Outcomes**

1. Analyze relationships among science, technology, and society using critical perspectives or examples from historical, political, or economic disciplines.
2. Analyze the role of science and technology in shaping diverse fields of study over time.
3. Articulate in writing a critical perspective on issues involving science, technology, and society using evidence as support. (Minimum of one >1,250-word written assignment that develops and sustains a critical perspective using evidence and a multidisciplinary approach.)

**Course Specific Measurable Student Learning Outcomes**

1. Recognize the strengths and limitations of science in natural resource problem solving.
2. Recognize and explain the difference between advocacy and analysis.
3. Identify and synthesize the “best available science” related to a natural resource issue.
4. Evaluate and critique the presentation of science in media and interest group communication materials.
5. Demonstrate an understanding of the above concepts through their application to analysis of case studies in solving natural resource problems.

6. Become more effective citizens who are able to understand the state of science related to different natural resources and who can make scientifically informed personal opinions about natural resource management issues.

### Evaluation of Student Performance

#### *Points Assignment*

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| 35 | Term projects: individual paper and group presentation<br>Students will be assigned to small groups and pick one of three issues where a controversial policy or management decision has been made. They will make a determination of what is the best available science on the topic, using key references from the scientific literature. Then they will conduct a critical analysis of how the science has been discussed by scientists, media, interest groups, and policy makers. Students will be required to both submit individual papers (worth 15% of grade) and present as a group in the final week of the course (worth 20% of grade). |
| 21 | Weekly journals (7 entries, 3 points each)<br>Journal entries will investigate and reflect on class material covered during the week and independent investigation of scientific information related to the case study.   |
| 24 | Midterm (Weeks 6-7)<br>The midterm will include short essays on class material.   |
| 20 | Participation in class discussion and small group exercises<br>Please note that virtual attendance is <i>required</i> (although flexibility is allowed due to special circumstances). After two absences, 1 point will be taken off per additional absence unless otherwise cleared with the instructor.  |

**100 Total**

#### Grading scale:

A	95-100	C	73-76
A-	90-94	C-	70-72
B+	87-89	D+	67-69
B	83-86	D	63-66
B-	80-82	D-	60-62
C+	77-79	F	below 60

#### Learning Resources – Available on Canvas

- Selected readings (scientific articles and book chapters)
- PowerPoint presentations
- Prepared case study materials, including websites, blogs, legislative testimony, agency policies, etc.

#### Late work policy

Late work will be penalized 10% for each day an assignment is late. Extensions will only be granted for extenuating circumstances (e.g. major personal illness, family emergency) – please contact the instructor as soon as possible.

### **Guidelines for a Productive and Effective Class**

In order to create an environment in which students are comfortable expressing their opinions and perspectives, I ask that students please approach the readings and others' contributions with both an open mind and a willingness to question one's own assumptions and biases.

Active interaction with peers and your instructor is essential to success in this course - please pay particular attention to the following:

- Students should treat each other and the instructor with the professional courtesy and respect expected in a workplace.
- All communications relating to this course and all work turned in for this course should reflect professional standards in tone, presentation, formatting, and spelling.
- The Zoom classroom is a place of focused learning. This requires that students arrive on time, stay until the end of the class period, and refrain from non-learning activities.
- Come prepared and effectively participate in class discussions. Realize that you will be a better participant if you have read the course materials thoroughly as well as previous weeks' instructional materials.
- Adhere to all OSU policies governing academic honesty as outlined at the Office of Student Conduct and Community Standards website: <http://studentlife.oregonstate.edu/studentconduct>
- Be respectful of others and their opinions, valuing diversity in backgrounds, abilities, and experiences. Students are expected to conduct themselves in the course in compliance with the university's regulations regarding civility.

### **Expectations for Student Conduct**

All students will be expected to follow the [student conduct and community standards](#) of Oregon State University. Cheating or plagiarism by students is subject to the disciplinary process outlined in the Student Conduct Regulations. Students are expected to be honest and ethical in their academic work. Academic dishonesty is defined as an intentional act of deception in one of the following areas:

- CHEATING - use or attempted use of unauthorized materials, information or study aids or an act of deceit by which a student attempts to misrepresent mastery of academic effort or information. This includes unauthorized copying or collaboration on a test or assignment or using prohibited materials and texts.
- FABRICATION - falsification or invention of any information (including falsifying research, inventing or exaggerating data and listing incorrect or fictitious references).
- ASSISTING - helping another commit an act of academic dishonesty. This includes paying or bribing someone to acquire a test or assignment, changing someone's grades or academic records, or taking a test/doing an assignment for someone else (or allowing someone to do these things for you). It is a violation of Oregon state law to create and offer to sell part or all of an education assignment to another person (ORS 165.114).
- TAMPERING - altering or interfering with evaluation instruments and documents.
- PLAGIARISM - representing the word or ideas of another person as one's own OR presenting someone else's words, ideas, artistry or data as one's own. This includes copying another person's work (including unpublished material) without appropriate referencing, presenting someone else's opinions and theories as one's own, or working jointly on a project, then submitting it as one's own.

Behaviors disruptive to the learning environment will not be tolerated and will be referred to the Office of Student Conduct for disciplinary action.

### **Reach Out for Success:**

University students encounter setbacks from time to time. If you encounter difficulties and need assistance, it's important to reach out. Consider discussing the situation with an instructor or academic advisor. Learn about resources that assist with wellness and academic success at [oregonstate.edu/ReachOut](http://oregonstate.edu/ReachOut). If you are in immediate crisis, please contact the Crisis Text Line by texting OREGON to 741-741 or call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255).

### **Diversity, Equity, and Inclusion:**

As a course focused on natural resources, this class addresses many issues of diversity, equity, and inclusion. In all course interactions, respect for each other and for our occasionally differing viewpoints is essential. While people may disagree, an absolute requirement in this course is to treat each other with empathy, dignity and respect. It is important that we create a learning environment in which everyone feels safe and respected (which in-turn increases everyone's potential to learn). As a community, we are still in the process of learning about diverse perspectives and identities. I will work to be as forthright and respectful as possible in considering a diversity of perspectives and identities, and ask that you do so as well. We will work together to create an inclusive learning environment. This means holding each other accountable to this commitment. If something is said in class (by anyone) that makes you feel uncomfortable, please talk to me about it. I believe the learning environment should honor your identities (including race, gender, class, sexuality, religion, ability, etc.). To help accomplish this, if you have a name and/or set of pronouns that differ from those that appear in your official OSU records, please let me know.

### **Students with Disabilities**

Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at <http://ds.oregonstate.edu> DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

*Note: This syllabus may be updated during the term.*

### **Weekly Structure**

**Week 1:** How can science help solve natural resource problems? What aspects of these problem lie beyond the realm of science? What is the difference between advocacy and analysis?

- What is "science"?
- Case study: scientists' engagement in policy.
- Is not taking a side a form of taking a side?

**Week 2:** What is "best available science?" How do you know when you have it?

- Requirements for "best available science" in law and policy.
- Types of outlets for science (gray literature, peer-reviewed publications, white papers); judging quality of science.
- Case study: federal government interpretation of BAS.
- *Journaling 1:* Students reflect on course materials and critically review scientific literature related to their selected case study.

**Week 3:** How do interest groups use science in support of alternative management actions? How do interest groups influence the media's reporting on science?

- Types of interest groups and tactics they use.
- Case study: interest group presentation of science about the effects of wolf reintroduction.
- *Journaling 2:* Students review and evaluate science as presented by interest groups.

**Week 4:** Why are policy arguments, and diverse interpretations of science, often so polarized and deep? How do values influence these arguments? How do attitudes toward risk and uncertainty influence these interpretations?

- Definitions: values, attitudes, and vested interests.
- How do people process persuasive messages and scientific information (psychology of cognitive processing)?
- Case study: stakeholder values and attitudes about the potential removal of four Lower Snake River dams.
- *Journaling 3:* Students reflect on class materials and assess how values impact policy debates for their topic.

**Week 5:** How do the media report science? What effect does media presentation (mass media and social media) have on public opinion?

- Norms of science reporting.
- Synthesis of findings on media effects.
- Case study: media coverage of Bears Ears National Monument designation.
- *Journaling 4:* Students reflect on class materials and review the science as presented in the media for their case study.
- *Case Study Presentation Practice Sessions*

**Week 6:** Science in the courts

- How do courts evaluate the use of science and scientists in lawsuits about natural resources?
- Judicial deference.
- How do courts deal with uncertainty or mixed science?
- Case study: court interpretation of science and the wolverine listing under the ESA.
- *Journaling 5:* Students reflect on course materials and review how the judicial branch has or could weigh in on their case study topic.
- *Midterm Available.*

**Week 7:** What role does science play in natural resource decisions?

- The role of science in the context of other influences on policy and management.
- Policy makers as actors – what influences their decisions?
- Case study: changing policies and snowmobiling in Yellowstone National Park.
- *Journaling 6:* Students reflect on course materials and assess how the science around their topic, as well as other factors, has influenced the decisions of policymakers and managers.
- *Midterm Due May 13, 2021 at 12:00 pm.*

**Week 8:** Feedbacks: How do policy, management, and political influence drive science?

- Science funding priorities – historical changes in natural resource research. What do we fund and what do we not fund? (social justice implications)
- How have technological advances in society shaped the type of science we do?
- Case study: funding of scientific research.

- *Journaling 7*: Students reflect on course materials and examine how science related to their case study has been influenced by policy, management, and other social factors.

**Week 9:** Applying the concepts of weeks one through eight to natural resource problems. Students utilize the knowledge gained through their case study analysis to reflect on, examine, and work as a team to ultimately prepare their final presentations, delivered in week 10.

**Week 10:** Student synthesis and reflection on case studies and final presentations. Groups present their work on their case study as their final term project.