Food-Energy-Water Nexus Seminar:
Bridging Science and Practice

Course Syllabus

Spring 2020 – 1.0 credit
Food-Energy-Water Nexus Seminar
NRSM 542
Monday 3-4:20pm
Charles H. Clapp Building (CHCB) 452

Instructor Information

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Course Description

This 1.0 credit seminar will focus on how science moves into decision-making and how we can work with end-users to make our science more relevant and actionable, especially at the food-energy-water nexus. We will cover public perceptions of science, co-production of knowledge, working with stakeholders and indigenous groups, communicating complexity and uncertainty, and integrating science into policy-making. Course will include short lectures, class discussion, and small group activities, with a few guest speakers throughout the semester.

Learning Objectives

Upon successful completion of the seminar, students will be able to:

- Describe different conceptions and models of practice, science, communication, and the science-practice interface
- Conceptualize and articulate multiple connections and pathways between science and practice
- Describe public perceptions of science and how people use information in decision-making
- List and apply best practices in communicating scientific uncertainty to practitioners
- Sketch a stakeholder engagement strategy to improve research outcomes and public relevance
- Design an effective process for co-production of knowledge between scientists and non-scientists
- Work more effectively with indigenous groups in a research and practice context
- Identify specific best practices and methods for integrating research into the policy-making process

Course Readings and Media

We will occasionally assign a short reading, video, or podcast in preparation for class. All readings or links to media will be available via Moodle at least 5 days prior to class. Students are responsible for reading/listening/watching the assignment prior to the class for which it was assigned.

Course Assessment

Course grading is on a "traditional" scale (i.e. letter grades) based on attendance and participation. The instructors will provide all students with a mid-semester grade prior to March 9, 2020 so students know their standing half-way through the seminar. Students are also welcome to inquire about their standing at any time.

Attendance

Each of the classes in this seminar cover an entire field of study and research. Course content has been carefully curated and designed maximize your learning. For this reason, attendance at each class and engagement with the readings and activities is very important.

Class will begin on Monday, January 13, 2020, will last for 1 hour and 20 minutes, and will meet for 10 weeks following the schedule listed below, with the last class on Monday, April 8, 2020.

We will take attendance each day in class, and attendance will be recorded on Moodle. Students may have one unexcused absence that will not count against their grade. Additional unexcused absences will result in a lower grade. Beyond one absence, instructors will require documentation of any family or medical issues that result in absences. If a student knows of a conflict in advance (e.g., an academic conference they are attending this semester), they should contact the instructors as soon as possible. In the case of an unanticipated conflict (e.g., illness or family emergency), please communicate with instructors as soon as possible. In the case of more than one absence, students will need to meet with instructors to develop a plan for making up missed content. **Students missing three or more classes will fail the course** (unless a serious, documented family or medical emergency prevents them from attending class and an agreement can be reached with instructors regarding make-up work).

Please be on time. If you have a conflict that requires that you arrive late or leave early, please speak with the instructors as soon as possible.

Participation

Since this is a graduate seminar we expect and look forward to engaged participation. Students are expected to carefully and thoroughly read or watch/listen to ALL assigned readings or required media prior to class and come to class prepared to discuss, examine, analyze, and critique each assignment or use the information to engage with lecturers and with the class as a whole. "Engaged participation" does not refer to the number of comments you make during class or your level of expertise, but rather describes the sort of thoughtful, meaningful, prepared (meaning you *actively* read or reviewed the assignments) questions and comments that further your own intellectual development and that of the group. Students will have opportunities for participation during class discussions, small group activities, and report-backs after activities. This will enable participation in different forums so as to accommodate different learning styles. Civility and respect for different views and ideas are also expected, especially when engaging classmates and guest speakers.

Course Guidelines and Policies

Respect, Inclusiveness and Diversity of Thoughts, Ideas and People

In teaching courses, we believe and act upon the idea that all students are entitled to and deserve respect, courtesy and tolerance, regardless of their race, ethnicity, background, religious affiliation, gender, gender identity, sexual preference, disability, or any other perceived difference. Likewise, faculty, staff, guest speakers, and fellow students deserve the same treatment from other students. Therefore, within the bounds of our courses and professional responsibilities as university instructors, we will make every effort to promote and create a safe space for diverse thoughts, regardless of the form of communication. We ask that you do the same.

Given the broad range of speakers and topics presented in this seminar, showing respect for others is paramount and is taken very seriously. We will strive towards an engaging, respectful, and open forum in which numerous opinions related to the course material can be discussed and explored.

Equal Access

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors and Disability Services for Students (DSS). If you have a disability that adversely affects your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or by calling 406.243.2243. We will work with you and Disability Services to provide an appropriate modification.

Student Conduct

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code.

Tentative Course Outline and Schedule

Topics and speakers are subject to change. Please note that the final class session will be on April 20, 2020.

Date	***Topic***	***Learning Objectives/Sub-topics***
1/13	Thinking about Science, Practice, and Communication *Co-leads: Sarah and Laurie*	*Learning Objective: Describe different conceptions and models of practice, science, communication, and the science-practice relationship*
	Readings This class will provide an outline of the course, learning objectives and syllabus. The course will begin by stepping back to reflect on what we mean when we talk about science, practice, and communication. By deepening our understanding of these concepts, we will become better prepared to manage them strategically and thoughtfully in our research and practice. The class will end with an activity to explore the interactions between science and practice.	
1/20	No Class Martin Luther King Jr. Day	*Learning Objective: Identify specific best practices and methods for integrating research into the policy-making process*
	Readings: Climate Solutions Council - Purpose & Duties This semester we have the opportunity to observe a real science-practice exercise through the Climate Solutions Council. In July 2019 the Montana Governor issued an Order tasking the Montana Climate Solutions Council with providing recommendations for a climate plan. The council is holding a public meeting at UM on January 27th and 28th. *Activity: Answer questions. Bullet points acceptable. Email to Sarah O'Keefe by 1/21* 1) How do the document and timelines shape the final plan? (50 words) 2) Think about available research in your field. Do you think it meet the needs of the council? Why or why not? (100 words) 3) How is science being communicated to the council? Is it effective? (100 words)	
1/27	No Class Climate Solutions Council	*Learning Objective: Identify specific best practices and methods for integrating research into the policy-making process*
	Attend Climate Solutions Council meeting. Meeting details to follow. *Activity: Reflect on the following. Email to Sarah O'Keefe by 1/30.* 1) What is working about this process of translating science into policy? What isn't? (100 words) 2) How do you think decisions are made on what is in the final plan? (50 words) 3) If you could design this process, how would it be different? (100 words)	

Date	***Topic***	***Learning Objectives/Sub-topics***
2/3	Understanding Public Perceptions of Science *Lead: Laurie*	*Describe public perceptions of science and how people use information in decision-making*
	Readings: Luc Hoffmann Institute - Synthesis Paper, Understanding the science, policy and practice interface This class will cover public perceptions of science; how and why science is politicized; and how science communication can address the challenges of confirmation bias and motivated cognition. *Activity*: This semester you will have the opportunity to give either a community talk to a group of your choosing or pitch your research to a panel of guest policy makers during an organized 'shark tank'. This week submit your plan for either a community talk OR a policy-maker's pitch to Sarah O'Keefe and Laurie Yung via email before end of business day 2/4. See week 3/2 and 3/9 for further details. Email must include: -Format -Draft Materials (Outline acceptable) -Length Those doing a community talk must also include time/date/location, key contact and student who will observe/evaluate your talk.	
2/10	Engaging Stakeholders and Communities *Lead: Laurie*	*Learning Objective: Build skills to engage with a diversity of stakeholders and communities to improve research process and outcomes*
	No reading this week This class will discuss how, when, and why you might engage with stakeholders and communities in your capacity as a scientist. *Activity:* Prior to class, draw a stakeholder map related to your thesis or dissertation research topic. Think about the following questions: Who might use your results in decision-making? Who cares about your research topic (even if they aren't decision-makers)? Who has a stake of some sort in your research project and why? Does thinking about stakeholders change the way you think about your research? Create a conceptual diagram mapping out the key stakeholder groups (these can be organizations, individuals, communities, or social groups) and be prepared to share with the class.	
2/17	No class President's Day	*Learning Objectives: List and apply best practices in communicating scientific uncertainty and complexity to practitioners.*

Date	***Topic***	***Learning Objectives/Sub-topics***
	Explore uncertainty - IPCC Uncertainties Guidance. This week there is no class, but we would ask that you begin to think about the topics of uncertainty and complexity. These are two enormous challenges for scientists to communicate effectively. *Activity:* Brainstorm all of the different sources of uncertainty in your research – everything from the experimental uncertainty (give examples) to the structural uncertainty and beyond. Write them down and come ready to discuss in class.	
2/24	Communicating Complexity and Uncertainty *Lead: Sarah*	*Learning Objectives: List and apply best practices in communicating scientific uncertainty and complexity to practitioners.*
	Readings: Explore complexity This week we will delve into the topics of uncertainty and complexity. What are they and how do we communicate them well. During the class we will play a game which explores how to communicate these two concepts.	
3/2	No Class Community Talk/Panel	*Learning Objective: Gain experience navigating the science-practice nexus.*
3/9	No Class Community Talk/Panel	
	These two weeks there will be no class, however you will be required to prepare, present, and submit the results of either a community talk or a pitch to policy-makers.	
3/16	No Class March Break	
3/23	Debriefing on Community Talk/Panel	*Learning Objective: Reflect on experience navigating the science-practice nexus. Identify strengths and areas for improvement.*
3/30	Co-Producing Science *Guest Speaker: Carina Wyborn, Luc Hoffmann Institute (invited)*	*Learning Objective: Understand the potential benefits of co-production and how to design an effective co-production process*
	Reading: Doing Science Differently: Co-Producing Conservation Outcomes This class you will explore the benefits and challenges of co-production, and how to work towards more effective implementation of co-production in both your research and practice. *Activity:* Come to class with an idea of how you could better co-produce your research. It doesn't have to be something big. Be ready to share your idea with the group.	
4/6	Working with Indigenous Communities	*Learning Objective: Learn how to work with indigenous communities in a research context*

Date	Topic	Learning Objectives/Sub-topics
	Guest Speaker: Chris Filardi, Nia Tero (invited)	
	Readings: Adapting Western Research Methods to Indigenous Ways of Knowing In this class we will explore opportunities and challenges for scientists working with indigenous communities.	
4/13	Integrating Science in the Policy-Making Process *Lead: Sarah*	*Learning Objective: Understand processes for conducting policy-relevant science and integrating research results into the policy-making and policy-enforcement process*
	In the last two classes we will explore the demands of policy makers – how they think, their own methods and mediums, and how these fit (or don't) with science research. We will explore new models that better allow for feedback between research, policy making, and enforcement. There will be an activity in class which allows you to 'step into the shoes' of the policy advisor and see the world from their perspective	
4/8	Wrap-up and Synthesis *Co-leads: Laurie and Sarah*	*Learning Objective: Synthetize and summarize connections between science and practice*