Food Systems Science and Policy
University of Vermont: Food Systems Program

Spring Semester 2018, 3 Credits,
Location: 357 Marsh Life Sciences Building
Time: 12:30pm- 3:30pm

Instructor
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Course Overview
The food system contains a complex mix of relationships, stakeholders, and feedbacks that operate across a diversity of goals. For example, farmers and agricultural systems may aim to maximize productivity and minimize costs while consumers seek to purchase food with minimal environmental impacts and maximum health benefits. Vice versa, many consumers lack the capacity to purchase or access food, which may be at odds with farmer goals of accessing high-end, niche markets with specialty products. These complexities are intertwined with sweeping sets of policies that influence the food system across many attributes from food safety to environmental conservation to nutrition. These policies affect the food system across many different scales of government from local to federal to global. To have a clear understanding of the global food system across many sectors it is crucial to also connect these sectors and actors to the policies that influence their decision-making and behaviors and to analyze how food system stakeholders influence and drive the policy process. Simultaneously, it is crucial to understand how science informs these policies and how science can help shape our responses to food system challenges, provide potential solutions to emerging issues and sometimes also create unforeseen consequences.

This is a systems course that will focus on understanding the science and policy interface of food systems. Students will learn through a variety of experiential and hands-on methods and approaches including self-reflection, group work, scientific assessments, policy analysis, direct policy engagement, and case studies. The course is designed so that students will have a clear understanding of both the scientific method and approach to problems as well as the policy process and implementation.

Course Goals and Objectives:
This course will provide students with a systems perspective on food systems science and policy across the entire food system ranging from agricultural science and policy to nutrition science and policy.

Students will achieve the following learning objectives:
1. Be familiar with multidisciplinary frameworks for assessing food system impacts and sustainability across ecological/natural, social/human, economic, and manufactured capitals and assets.

2. Identify key ecological and social challenges and tipping points within the food system from a scientific perspective
3. Understand the interface of science and policy - how science is used in the policy process and how science may conflict with policy goals or values
4. Define the policy process for creating, implementing and enforcing state and national laws, regulations and policies
5. Identify multiple food system stakeholders and how they interact in policy systems to affect the food system

Students will achieve the following professional development objectives:
1. Critically analyze and assess scientific articles and writing
2. Produce scientific analysis, writing, and peer-review assessment regarding food systems
3. Demonstrate through critical policy analysis how policy interventions may affect multiple components of the food system and its actors
4. Participate in the policy process through public comment, regulatory or legislative avenues

Course Reading and Materials:
Specific course readings are listed by the course later in the syllabus. Note that all readings listed are required to be read for that class period PRIOR to class. In addition, the following text will be included as reading during multiple course lectures, which will be particularly helpful if you do not have an existing experience in policy:

Parke Wilde. 2013. Food Policy in the United States. An Introduction. Routledge Publishing.

Food policy and science is happening all the time. For this reason we will start every class with an open discussion of current news in food policy and food systems issues. To stay up to date you may want to browse some blogs on current agriculture and food policy topics. These include:

Food Policy Blogs and Resources:
1. Politico Morning Agriculture (blog of Politico, one of the leading newspapers on Capitol Hill)
2. Marion Nestle's blog Food Politics (she's a nutrition professor)
3. Jason Lusk's blog (he's a food and agriculture economics professor)
4. Park Wilde's US Food Policy blog (he's an economist/food policy professor)
5. Marc Bellemare's blog (he's an agricultural economics professor)

In addition the following resources often cover issues related to food systems from a scientific perspective:

Food Systems Science News and Resources:
1. Science Daily Food and Agriculture:
http://www.sciencedaily.com/news/plants_animals/food_and_agriculture
2. Nature Agriculture publications: http://www.nature.com/subjects/agriculture
3. National Public Radio Food Coverage: http://www.npr.org/sections/food/
4. Discover Magazine Agriculture Coverage: http://discovermagazine.com/tags/agriculture

Course Expectations and Evaluation
In Class Expectations

As a graduate course you are expected to take responsibility for your own learning and participation and come to class ready to engage and discuss the readings and current events. This is an interactive, hands-on and engaged course, which will provide you with both academic and professional opportunities for development. Students are expected to be active learners and will participate in many activities both within and out of class that give you an understanding of food systems science and our policy systems and politics in action. As a result, active engagement in class is required to be a successful learner. Cell phones and laptop computer use for anything other than course work or note taking is not permitted. You will be working in groups frequently and are expected to contribute to your group and in class-discussions.

Out of Class Expectations

Both science and policy can be a very formal process with a high degree of professionalism. In this class it is highly likely that you will be engaging with policymakers and other professionals working within the policy system or working to influence the policy system. It is expected that you represent our course and UVM with the highest level of professionalism in these instances. Furthermore, please consider these aspects when interacting with Dr. Niles, your fellow peers and others in email and in-class exchanges.

Citing Appropriate Sources

For your assignments you will be expected to use proper citations and scientific and research sources as appropriate to the assignment. While some aspects of the assignments may provide an opportunity for you to give your opinion on a topic, most assignments require research and sources that should be properly cited. This will be true of both scientific and policy writing exercises. **We will use the APA format for all assignments.**

In Class Participation

You are expected to attend class. In class participation is not limited only to attending class but also to participating in class when we discuss current news events related to science and politics and do in class activities. In some instances it may be necessary to miss class including for religious holidays or because you are sick. These instances require either medical documentation (in the case of your illness) or prior discussion with Dr. Niles. If you have any absences that you know of ahead of time please discuss these with Dr. Niles as soon as possible.

Course Evaluation

Component	Percent of Grade	Assigned	Due
In-Class Participation (including attendance, group work, and discussion of current issues)	20%		
Assignment 1: Scientific article assessment	10%	January 25	January 31st
Assignment 2a: Scientific review/prospective		February 1	February 8
Assignment 2b: Scientific review first draft			March 8
Assignment 2c: Scientific review second draft			April 5
Assignment 2d: Scientific peer-review	5%	April 5	April 19
Assignment 2e: Scientific literature review final paper	25%		May 7
Assignment 3: Direct policy action and reflection	20%	February 8	April 26
Assignment 4: Policy Brief	10%	March 1	March 22
Group Concept Maps	10%		April 26

Detailed Course Topics, Materials and Assignments

Week 1: Course Introduction and Food Systems Challenges Discussion (January 18)
In this class we will introduce ourselves and learn more about each other and our backgrounds. I will discuss the course syllabus and assignments and answer initial questions. Then, we will discuss new challenges in food systems and how to address them with research.

Readings:
1. Haddad. et al. 2016. A new global research agenda for food. Nature. 540: 30-32.
2. Rockstrom, J. 2016. Acting in the Anthropocene: the EAT- Lancet Commission. The Lancet. 387: June 11.

Week 2: Course Frameworks Introduction (January 25)
In this class we will discuss ways in which we can think critically about understanding food systems impacts and sustainability from across multiple contexts (environment, social, human, etc.)

Readings:
1. Hodbod, J. and H. Eakin. 2015. Adapting a social-ecological resilience framework for food systems. Journal of Environmental Sciences and Studies.
2. Liu, et al. 2007. Coupled Human and Natural Systems. Ambio.
3. Matson, P., Clark W., Andersson K. 2016. A framework for sustainability analysis: linking ultimate goals with their underlying determinants (Chapter 2). In Pursuing Sustainability: A guide to the Science and Practice. 1st edition.
4. Steffan et al. 2015. Planetary boundaries: Guiding human development on a changing planet. Science. 347.
5. Behrens et al. 2017. Evaluating the environmental impacts of dietary recommendations. Proceedings of the National Academy of Sciences. 51: 13412-13417

Guest Speaker: Dr. Paul Behrens, University of Leiden

Assignment 1: Scientific article assessment assigned. Due January 31st
Optional (If you need additional guidance on reading scientific literature- particularly helpful for your assessment assignment)
1. How to read a scientific paper: Elsevier: https://www.elsevier.com/connect/infographic-how-to-read-a-scientific-paper
2. Huffington Post: How to read and understand a scientific paper

Week 3: What makes a sustainable diet? Assessing scientific approaches to food systems (February 1)
In this course we will discuss scientific approaches to understand food systems from varying perspectives (modelling, original research, reviews) and work individually and in groups to analyze scientific arguments and research. We will discuss the scientific writing process and the peer-review process. We will focus on the interface of dietary choices and environmental impact and discuss instances in which scientific outcomes may conflict with other scientific outcomes or values.

Readings:
1. de Vries, M., C.E. van Middelaar, I.J.M. de Boer. 2015. Comparing environmental impacts of beef production systems: A review of life cycle assessments. Livestock Science. 178: 279-288.
2. Merrigan et al. 2015. Designing a Sustainable Diet. Science (Policy Forum). 350: 165-166.

3. Tom et al. 2015. Energy use, blue water footprint, and greenhouse gas emissions for current food consumption patterns and dietary recommendations in the US. Environment Systems and Decisions.

Assignment 2 Scientific Review Perspective Assigned. Prospective due February 8th. Final draft due May 7th.

Week 4: Using technical, natural and biological science to address food system challenges (February 8)
How is science helping to address food system challenges? Is science always the answer? Does science create unintended consequences? Are those consequences sometimes worth it? Do scientific advancements conflict with other values? In this class we will spend the first part of this course discussing how to write scientific literature, in preparation for your scientific review assignment. Then, we will discuss environment and agriculture challenges in food systems and how technical, natural and biological science can assist in solving these problems, and the potential unforeseen consequences they may have.

1) Bonny, S. 2016. Genetically modified herbicide-tolerant crops, weeds, and herbicides: Overview and impact. Environmental Management. 57: 31-48.
2) Capper, J.L., E. Castaneda-Gutierrez, R.A. Cady, D.E. Bauman. 2008. The environmental impact of recombinant bovine somatotropin (rbST) use in dairy production. Proceedings of the National Academy of Sciences of the United States of America. 28: 9668-9673.
3) Hall, S. March 2016. Editing the Mushroom: Scientific American.
Background reading: Chapter 3: Food Production and the Environment. Parke Wilde. Food Policy in the United States.

Guest speaker: Christie Silkotch, UVM library.

Assignment 3: Policy action and reflection

Week 5: Using Human and Social Science to address food system challenges (February 15)
How is science helping to address food system challenges? Is science always the answer? Does science create unintended consequences? Are those consequences sometimes worth it? Do scientific advancements conflict with other values? In this class we will focus on agriculture and food security challenges in food systems and how human and social science can assist in solving these problems, and the potential unforeseen consequences they may have.

1) Baumgart-Getz, A., L.S. Prokopy., K. Floress. 2012. Why farmers adopt best management practice in the United States: A meta-analysis of the adoption literature. Journal of Environmental Management. 96: 17-25.
2) Connolly-Boutin, L. and B. Smit. 2016. Climate change, food security and livelihoods in sub-Saharan Africa. 16: 385-399.
3) Niles, M.T., M. Lubell. V.R. Haden. 2012. Perceptions and responses to climate policy risks among California farmers. Global Environmental Change. 1752-1760.

Week 6: Systems-level strategies to address food system challenges (February 22)
We've explored how biophysical, natural and social sciences are all working towards solutions in our food system independently and sometimes in concert with other disciplines. In this class, we will look at

systems-level analyses and proposed solutions to addressing food system challenges across the food system.

1) Niles, M.T. et al. 2017. Climate change and food systems: Assessing impacts and opportunities. Meridian Institute Report. Executive Summary, Introduction, Key Messages, Section 5: Applying a food systems perspective to climate change.

Week 7: The Food Policy Process and Influence (March 1)
What are the legislative processes to creating, writing and enforcing laws at the state and US federal level? Who are the multiple stakeholders in the food policy process? How do stakeholders use science (or not)? How do stakeholders communicate to policymakers? What is the role for scientists in the food policy process and how are scientists involved in political issues?

Readings:
1) Chapter 1: Making Food Policy in the United States. Parke Wilde. Food Policy in the United States.
2) Chapter 2: Agriculture. Parke Wilde. Food Policy in the United States.
3) Chapter 4: Food and Agricultural Trade. Parke Wilde. Food Policy in the United States.

Assignment 4- policy brief assigned. Due March 19th

Week 8: Influencing the food policy process. (March 8)
How do people influence the policy process? What is the role of science, among other factors, in affecting the food policy process? Can science always be trusted to be used in the policy process? In this class we will discuss how individuals, organizations and corporations can influence the food policy process. We will also discuss how science can be co-opted and influence the policy process.

1) Nestle, M. 2013. Chapter 4: Influencing Government: Food Lobbies and Lobbyists. in Food Politics.
2) Nestle, M. 2013. Chapter 7: Playing Hardball: Legal and Not
3) Arnsdorf, I. The lobbying reform that enriched Congress. Politico investigation.
https://www.politico.com/story/2016/06/the-lobbying-reform-that-enriched-congress-224849

Guest Speaker: Colin O'Neil, Agriculture Policy Director, Environmental Working Group (Pending)

March 15: Spring break week- no class!

Week 9: Regulating the food policy process. (March 22)
Making laws is just one part of the food policy process- the executive branch of government and its agencies write regulations and code for implementing and enforcing law. The regulatory process is another key way that affects food policy, and can be influenced by consumers and other stakeholders.

1) The Uncertain Hour Podcast: Season 2, Episode 1. The peanut butter grandma goes to Washington.
2) The Uncertain Hour Podcast: Season 2, Episode 2. The Peanut butter wars
3) The Uncertain Hour Podcast: Season 2, Episode 3. The Peanut butter verdict.

Guest Speaker : Former Secretary of Agriculture Chuck Ross, Director of UVM Extension (pending)

Week 10: A visit to Montpelier (March 29)

Week 11: Science and Environment in our Biggest Food Policy: The Farm Bill (April 5)

The Farm Bill is the United States largest piece of legislation related to food and agriculture. It is typically renewed every 5 years and contains policies regulating everything from the Supplemental Food Assistance Program to Crop Insurance to food and agriculture research. We will explore the complexity of the food system, the extent to which science influences the process and how the bill is passed. In this class we will focus on Farm Bill policies and how they influence the environment.

Readings:
1) Congressional Research Service: What Is the Farm Bill? July 23, 2014;
2) McGranahan, D.A. et al. 2013. A historical primer on the US farm bill: Supply management and conservation policy. Journal of Soil and Water Conservation
3) Reimer, A. 2015. Ecological modernization in U.S. agri-environmental programs: Trends in the 2014 Farm Bill. Land Use Policy. 47: 209-217.

Assignment 2d: Scientific peer-review

Week 12: Science and Health in our Biggest Food Policy: The Farm Bill (and associated nutrition policies) (April 12)

The Farm Bill is the United States largest piece of legislation related to food and agriculture. We will explore the complexity of the food system, the extent to which science influences the process and how the bill is passed. In this class we will focus on Farm Bill policies related to nutrition and hunger as well as other nutrition and hunger policies related to the Child Nutrition Reauthorization Act.

Readings:
1) Chapter 10: Hunger and Food Insecurity. Parke Wilde. Food Policy in the United States.
2) Chapter 11: Nutrition Assistance Programs for Children. Parke Wilde. Food Policy in the United States.
3) Steele-Adjognon, M and D. Weatherspoon. 2017. Double up food bucks program effects on SNAP recipients' fruit and vegetable purchases. BMC Public Health. 17: 946.
4) Park et al. 2017. The Supplemental Nutrition Assistance Program and frequency of sugar-sweetened soft drink consumption among low-income adults in the US. Nutrition and Health 23: 3.

Week 13: Mapping the Farm Bill as a System (April 19)

The final project will involve a concept map of the farm bill and its programs across the food system. This will include the actors involved in the programs, their relationship to each other, and the potential levers within the farm bill to influence food system change. Further, students will assess the scientific basis/grounding for existing programs and what additional research or scientific information might be needed.

Week 14: Mapping the Farm Bill as a System (April 26)

Week 15: Mapping the Farm Bill as a System (May 3)

The class will present and then we will identify key overlaps and differences and discuss potential policy solutions to challenges identified.

Readings:
Readings will be forthcoming

Additional UVM Policies and Resources

Academic Integrity
The policy addresses plagiarism, fabrication, collusion, and cheating.
www.uvm.edu/~uvmppg/ppg/student/acadintegrity.pdf

Grade Appeals
If you would like to contest a grade, please follow the procedures outlined in this policy:
www.uvm.edu/~uvmppg/ppg/student/gradeappeals.pdf

University Grading Policy
For information on grading and GPA calculation, go to www.uvm.edu/academics/catalogue and click on Policies for an A-Z listing.

UVM Writing Center
The University provides a Writing Center in 105 Bailey/Howe Library. The center can help make writing less stressful by providing students with a tutor and writing resources, though it is heavily undergraduate focused.
Make an appointment:
http://www.uvm.edu/wid/writingcenter/?Page=tutorsandschedule.html&SM=submenu5.html
Resources for writing: http://www.uvm.edu/wid/writingcenter/tutortips/scienceproftips.html