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

Spring Semester 2016, 3 Credits,
Location: 357 Marsh Life Sciences Building
Time: 12:30pm- 3:30pm

Instructor
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802-656-4337

Office Hours: Thursdays 3:30-5pm; by appointment
Office Location: 350 Carrigan Wing, Marsh Life Sciences Building

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 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. Demonstrate capacity to assess and produce scientific writing regarding food systems
2. Demonstrate through critical policy analysis how policy interventions may affect multiple components of the food system and its actors
3. 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 read during multiple course lectures:


Food policy 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](http://www.politico.com) (blog of Politico, one of the leading newspapers on Capitol Hill)
2. Marion Nestle’s blog [Food Politics](http://www.foodpolitics.com) (she’s a nutrition professor)
3. Jason Lusk’s blog [](http://www.jasonlusk.com) (he’s a food and agriculture economics professor)
4. Park Wilde’s [US Food Policy blog](http://www.parkewilde.com) (he’s an economist/food policy professor)
5. Marc Bellemare’s blog [](http://www.marcbellemare.com) (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:**
2. Nature Agriculture publications: [http://www.nature.com/subjects/agriculture](http://www.nature.com/subjects/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. Preferred citation methods will be given in class prior to the assignment.

**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.

**Course Evaluation**

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<thead>
<tr>
<th>Component</th>
<th>Percent of Grade</th>
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<tbody>
<tr>
<td>In-Class Participation (including attendance, group work, and discussion of current issues)</td>
<td>20%</td>
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<tr>
<td>Assignment 1: Scientific article assessment</td>
<td>5%</td>
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<td>Assignment 2: Food systems tipping points</td>
<td>5%</td>
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<td>Assignment 3: Scientific review/perspective</td>
<td>15%</td>
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<td>Assignment 4: Direct policy action and reflection</td>
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<tr>
<td>Assignment 5: Policy recommendations and brief</td>
<td>5%</td>
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<tr>
<td>Group Concept Maps</td>
<td>5%</td>
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<tr>
<td>Final Project</td>
<td>30%</td>
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**Overview of Course Topics**

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<thead>
<tr>
<th>Week</th>
<th>Class Topic</th>
<th>Topics Discussed</th>
<th>Assignments</th>
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<tbody>
<tr>
<td>1</td>
<td>Course Introduction</td>
<td>Introduction Frameworks to understand and assess food systems from science and policy</td>
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<tr>
<td>Date</td>
<td>Activity</td>
<td>Notes</td>
<td>Assignment</td>
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<tr>
<td>January 28</td>
<td>Assessing scientific approaches to food systems</td>
<td>Understanding scientific writing and the scientific writing process Assessing a scientific argument</td>
<td>Assignment 1: Scientific paper mark-up</td>
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<td>February 4</td>
<td>Key challenges in food systems: tipping points and planetary boundaries</td>
<td>Ecological and social tipping points Planetary Boundaries Critical tipping points in food systems</td>
<td>Assignment 2: Identify tipping points in food systems</td>
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<td>February 11</td>
<td>Using science to address food system challenges</td>
<td>Understanding food system challenges GMOs rBST and environment</td>
<td>Assignment 3: Scientific review/perspective</td>
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<td>February 18</td>
<td>The food policy process and influence</td>
<td>State and US focus on legislative and regulatory food policy process. Understanding how stakeholders participate and use science in the process.</td>
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<td>February 25</td>
<td>The interface of food system challenges and policy</td>
<td>Addressing food system challenges with science and policy (food waste case study)</td>
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<td>March 3</td>
<td>Field Trip</td>
<td>Note: This may be changed if we need to go another week to attend a hearing</td>
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<td>March 10</td>
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<td>Spring Break, No Class</td>
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<td>March 17</td>
<td>Our biggest food policy: The Farm Bill</td>
<td>The Farm Bill: science and policy focus on environment</td>
<td>Assignment 4: Direct Policy Action and Reflection</td>
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<td>March 24</td>
<td>Our biggest food policy: The Farm Bill</td>
<td>The Farm Bill: science and policy focus on nutrition and hunger</td>
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<td>March 31</td>
<td>Case Study: Assessing the sustainability of dairy systems at multiple scales</td>
<td>Vermont, California and New Zealand assessment Nitrogen primer Dairy overview</td>
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<td>April 7</td>
<td>Case Study: Assessing the sustainability of dairy systems at multiple scales</td>
<td>Concept mapping Group presentations Identifying policy levers</td>
<td>Assignment 5: Policy recommendations and scientific brief on dairy nutrient policies</td>
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<td>April 14</td>
<td>Final Project</td>
<td>Discussion with Claire Benjamin, Executive Director of Food Policy Action</td>
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<td></td>
<td>Final Project</td>
<td>Project with Food Policy Action</td>
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Week 1: Course and Frameworks Introduction (January 21)
In this class we will introduce ourselves and learn more about each other and our backgrounds. We will then discuss ways in which we can think critically about understanding food systems sustainability from across multiple contexts (environment, social, human, etc.)

Readings:

Week 2: Assessing scientific approaches to food systems (Dietary choices and environmental impact as a case study) (January 28)
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 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:

Optional (If you need additional guidance on reading scientific literature)
5. How to read a scientific paper: Elsevier: https://www.elsevier.com/connect/infographic-how-to-read-a-scientific-paper
6. Huffington Post: How to read and understand a scientific paper

Assignment 1: Scientific article assessment.

Week 3: Key Challenges in Food Systems: ecological/social tipping points and planetary boundaries (February 4)
We will discuss tipping points and planetary boundaries and how these may relate to our food system. What are the key challenges facing our food system? What ecological and social tipping points may we experience? What planetary boundaries are we approaching? Our in class discussion will focus on...
together discussing what are the 5 critical tipping points and boundaries for our food system? What are the scientific and potential policy strategies to avoid such tipping points?

Readings:

Assignment 2: Using the tipping points article and our in class discussion as a guide, identify and give scientific evidence for what you believe are the major tipping points in the food system and how planetary boundaries may influence food systems.

**Week 4: Using Science to address food system challenges (February 11)**
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?

Readings: (note: additional readings may be assigned based on our tipping points discussion)
Additional articles will be assigned based on our determination of food system tipping points

Assignment 3: Write a scientific review of a food system issue providing scientific evidence for the challenge and potential solutions.

**Week 5: The Food Policy Process and Influence (February 18)**
What are the legislative and regulatory 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:
3) Chapter 4: Food and Agricultural Trade. Parke Wilde. Food Policy in the United States.
4) Chapter 23: Lobbying, the Revolving Door, Campaign Contributions and Lawsuits. Marion Nestle. Soda Politics
Week 6: The Interface of Food System Challenges and Policy (February 25)
Understanding how to address a food system challenge requires understanding both the scientific components (biological, natural, social, and economic) as well as the current systems in place and their potential failures. In this class we will examine food waste as a case study to understand what the current problem is, what potential solutions may exist and brainstorm strategies for addressing such issues.

3) Public Law 104-210 104th Congress.

Week 7: FIELD TRIP TO MONTPELIER (March 3)
We will travel to Montpelier to meet with legislators and government regulators and hopefully attend a hearing.

Week 8: Spring Break no class (March 10)

Week 9: Science and Environment in our Biggest Food Policy: The Farm Bill (March 17)
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 National School Lunch 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:

Assignment 4: Direct policy action and reflection

Week 10: Science and Health in our Biggest Food Policy: The Farm Bill (and associated nutrition policies) (March 24)
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 National School Lunch 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 related to nutrition and hunger.

Readings:

**Week 11: Case Study: Assessing the sustainability of dairy systems at multiple scales and policy interventions (March 31)**

Vermont, California, New Zealand. In the next two classes we will use a case study approach to dig deep into understanding dairy systems at multiple scales and their potential sustainability across environmental, economic, health and social indicators. Each class member will be assigned a region and a stakeholder perspective within this region, which will dictate your perspective in the group exercise and perspective.

Readings:
1) Niles, M.T. and Garrett, R. Balancing economic and environmental tradeoffs for dairy production in California and New Zealand. Case study developed for the National Socio-Environmental Synthesis Center.

Additional readings on Vermont, New Zealand and California will be posted. You may also seek additional resources as necessary for you to understand your position in the exercise.

**Week 12: Case Study: Assessing the sustainability of dairy systems at multiple scales and policy interventions - Group concept mapping and sustainability hotspots (April 7)**

In this class we will divide into groups and map out the systems and their feedbacks and identify sustainability hotspots across Vermont, California and New Zealand dairy systems. Teams will present to each other and then we will identify key overlaps and differences and discuss potential policy solutions to challenges identified.

Readings:
Readings in the case study background materials as well as additional readings that you find on your own

Assignment 5:
Policy brief (Congressional staffer viewpoint) considering multiple perspectives from your state or region as assigned.

**Week 13: Food Policy Project (April 14)**

Discussion with Claire Benjamin, Executive Director, Food Policy Action

Readings:
Background materials from [www.foodpolicyaction.org](http://www.foodpolicyaction.org)

**Week 14: Food Policy Project (April 21)**

In class analysis, discussion and group work
Details will be distributed.

**Week 15: Food Policy Project (April 28)**

Group work and presentations
Details will be distributed.

**Additional UVM Policies and Resources**
**Academic Integrity**
The policy addresses plagiarism, fabrication, collusion, and cheating.  
www.uvm.edu/~uvmpg/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/~uvmpg/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