

Syllabus – Translational Ecology (ENVS 6410) – Spring 2016

Instructor: Mark Brunson (Phone 797-2458, Mark.Brunson@usu.edu)

Office hours: You can find me in my office (NR 216) on Mondays, 8-9:15 am and 3-4 pm. However, you will probably find it easier just to email me to schedule an appointment.

Course purpose:

Many people believe contemporary science is disconnected from real-world concerns. At a time when public funding for research is becoming scarcer and disenchantment is growing with any and all institutions, the environmental problems we face are increasingly more dire and complex. Scientists need to develop skills to make and keep their work relevant. In 2010, ecologist William Schlesinger described the need for a “translational ecology” that would “connect end-users of environmental science [i.e., policy makers, land managers, advocacy group members, and the general public] to the field research carried out by scientists who study the basis of environmental problems.”

What Schlesinger didn’t discuss was how one might do this. Some see translational ecology as better one-way communication of science to those who might use it. But increasingly proponents of translational science speak of *two-way* communication with stakeholders, of designing studies in better consultation with policy makers or managers, and even of “co-producing knowledge” with the purported beneficiaries of research. A widely agreed-upon definition of “translational ecology” has not yet emerged. In this course we will examine a few definitions, explore reasons why translational science is both necessary and elusive, and spend time honing our translational skills.

Course procedures and expectations

As is typical for graduate seminar courses, class time will be devoted largely to discussion and to reviewing assigned readings. I’ll expect you to have read all of the assigned articles prior to class.

We’ll also discuss the general topic of making socio-ecological science relevant, focusing on theories and practices related to resilience, public understanding of science, and science policy. We will explore options for improving public participation in scientific research, as this has been offered as a way to resolve discontinuities among scientific research, environmental policy, and stewardship behaviors.

We also will devote time to using and honing communications skills - more so than in most graduate courses. There will be one collaborative and three individual assignments. The collaborative assignment will involve identifying a problem in environmental science of mutual interest, and developing an outreach product (pamphlet, web page, video, etc.) that can describe the problem and what science is doing to solve it.

The individual assignments are:

- Prepare and share with the class a “public abstract” of your own research, or another topic of your choosing.
- Prepare and share with the class an “elevator talk” (45 seconds) about an environmental science topic.
- Take charge of a class session, leading discussion of an assigned paper, identifying 1-2 further resources (journal articles, web pages, etc.) that are relevant to the day’s topic and sharing those with the class in whichever fashion you choose.

Evaluation will be based on your steadfast participation in class activities more than on the quality of the work you produce. We come from different disciplinary backgrounds, and are at different stages of our graduate careers, and we’re studying a topic that only recently has begun to attract attention of scholars or environmental professionals. It makes little sense to judge students on their mastery of a subject matter that is still being determined; instead I will be looking at your commitment to the concepts as we discover together what the subject matter might be.

I’ll use Canvas to upload materials that can be accessed by all the others: articles to read, PowerPoint presentations if appropriate, annotated drafts of articles, etc. I’m hoping there’s no cost to you beyond the tuition.

Learning objectives

Here are the learning objectives for the course (and their relation to *USU’s over-arching learning objectives* as defined in the IDEA course evaluation process):

- To gain a basic understanding of theories of socio-ecological system resilience, science policy, and public understanding of science (*learning fundamental principles, generalizations, or theories*)
- To apply theories of society-environment interaction to problems involving discontinuities among environmental science, policy and management (*learning to apply course material to improve thinking, problem solving, and decisions*)
- To collaboratively develop, and share with others through publication, a conceptual overview of “translational ecology” (*learning to apply course concepts; developing skill in expressing oneself orally or in writing; acquiring skills in working with others as a member of a team*)
- To identify and compare approaches that are said to enhance public participation in scientific research (*developing specific skills, competencies, and points of view needed by professionals in the field most closely related to this course*)
- To improve ability to communicate effectively with non-scientific audiences (*developing specific skills, competencies, and points of view needed by professionals; developing skill in expressing oneself orally or in writing*)

Course Calendar and Schedule of Readings/Assignments

- Jan. 11** **Overview: What is “translational” science? Why might we need it?**
- Jan. 18** *No class – Martin Luther King Day holiday*
- Jan. 25** **Gaining context from theory: Resilience as a framework for conceptualizing translational ecology**
Readings: Schlesinger, Walker & Salt (ch. 1 & case study 5), McGreavy et al.
- Feb. 1** *No class – instructor out of town*
- Feb. 8** **When translation fails: Examples from the “real world”**
Readings: Briske et al 2011, Gober et al., Wright
Assignment: Give elevator talk
- Feb. 15→16** **Public understanding of science**
Readings: Eisenhower & Nicholson, Jackson, Nisbet & Markowitz, skim the Pew Research Center report
- Feb. 22** **Communicating science to the public**
Sugimoto and Thelwall, Weinberger et al.
- Feb. 29** **Applying communication research to climate change issues**
Readings: Anderson et al., de Vries et al, Nisbet
- March 7** *No class – Spring Break*
- March 14** **Communicating science through various media**
Gough et al., Parsons et al., Rodríguez Estrada & Davis,
- March 21** **Framing science in an advocacy context**
Gauchat, Parthasarathy, Sarewitz
Assignment: Upload public abstract to Canvas
- March 28** **Understanding the policy-science interface**
Blockstein, Hutchings & Stenseth, Milman, Tyler
- April 4** **The promise and limits of citizen science**
Bonney et al., Cosentino et al., Dickinson et al.
Assignment: Upload translational project plan to Canvas
- April 11** **Engaging beneficiaries in the scientific process**

Ballard & Belsky, Knapp et al, Meadow et al.

April 18 Transcending the culture of science

Briske 2012, Bammer, Neff

April 25 Completing our project(s), reviewing our discoveries

Final assignment: Groups turn in translational project write-up

Reading List

Anderson, A.A., et al. 2013. If they like you, they learn from you: How a brief weathercaster-delivered climate education segment is moderated by viewer evaluations of the weathercaster. *Weather, Climate & Society* 5:367-377.

Ballard, H.L., and J.M. Belsky. 2010. Participatory action research and environmental learning: implications for resilient forests and communities. *Environmental Education Research* 16:611-627.

Bammer, G. 2005. Integration and implementation sciences: Building a new specialization. *Ecology & Society* 10(2):6.

Blockstein, D.E. 2002. How to lose your political virginity while keeping your scientific credibility. *BioScience* 52:91-96.

Bonney, R., et al. 2009. Citizen science: A developing tool for expanding science knowledge and scientific literacy. *BioScience* 59: 977-984.

Briske, D.D. 2012. Translational science partnerships: Key to environmental stewardship. *BioScience* 62: 449-450.

Briske, D.D. et al. 2011. Origin, persistence, and resolution of the rotational grazing debate: Integrating human dimensions into rangeland research. *Rangeland Ecology & Management* 64:325-334.

Cosentino, B.J., et al. 2014. Citizen science reveals widespread negative effects of roads on amphibian distributions. *Biological Conservation* 180:31-38.

de Vries, G., B.W. Terwel and N. Ellemers. 2015. Perceptions of manipulation and judgments of illegitimacy: Pitfalls in the use of emphasis framing when communicating about CO₂ capture and storage. *Environmental Communication* DOI: 10.1080/17524032.2015.1047884.

Dickinson, J.L. et al. 2010. Citizen science as an ecological research tool: challenges and benefits. *Annual Review of Ecology, Evolution, and Systematics* 41:149-172.

Eisenhauer, B., and B. Nicholson. 2007. Do you see what I see? Diverse perspectives in environmental communications. *Frontiers in Ecology and the Environment* 5:161-162.

Gaucht, G. 2012. Politicization of science in the public sphere: a study of public trust in the United States, 1974-2010. *American Sociological Review* 77:167-187.

Gober, P., et al. 2013. Why land planners and water managers don't talk to one another and why they should! *Society & Natural Resources* 26:356-364.

Gough, P., C.D. Wall, and T. Bednarz. 2014. Affective and effective visualization: communicating science to non-expert users. *Proceedings of the 2014 IEEE Pacific Visualization Symposium* 335-339.

Hutchings, J.A., and L.C. Stenseth. 2016. Communication of science advice to government. *Trends in Ecology & Evolution* 31:7-11.

Jackson, R. 2013. 12 things policy makers and scientists should know about the public. *Guardian* online.

Knapp, C.N., et al. 2011. Using participatory workshops to integrate state-and-transition models created with local knowledge and ecological data. *Rangeland Ecology & Management* 64:158-170.

McGreavy, B., et al. 2015. Communication and sustainability science teams as complex systems. *Ecology and Society* 20(1):article 2.

Meadow, A.M., et al. 2015. Moving toward the deliberate co-production of climate science knowledge. *Weather, Climate & Society* 7:179-191.

Milman, O. 2013. Top 20 things politicians need to know about science. *Guardian.com* Nov. 20, 2013.

Neff, M.W. 2011. What research should be done and why? Four competing visions among ecologists. *Frontiers in Ecology and the Environment* 9:462-469.

Nisbet, M.C. 2010. Communicating climate change: Why frames matter for public engagement. *Environment: Science and Policy Development* 51:12-23.

Nisbet, M.C., and E.M. Markowitz. 2014. Understanding public opinion in debates over biomedical research: looking beyond political partisanship to focus on beliefs about science and society. *PLOS One* 9(2): e88473. doi:10.1371/journal.pone.0088473.

Parsons, E.C.M. et al. 2014. How Twitter literacy can benefit conservation scientists. *Conservation Biology* 28:299-300.

Parthasarathy, S. 2010. Breaking the expertise barrier: understanding activist strategies in science and technology policy domains. *Science and Public Policy* 37(5):355-367.

Rodríguez Estrada, F.C., and L.S. Davis. 2015. Improving visual communication of science through the incorporation of graphic design theories and practices into science communication. *Science Communication* 37:140-148.

Sarewitz, D. 2004. How science makes environmental controversies worse. *Environmental Science and Policy* 7:385-403.

Schlesinger, W.H. 2010. Translational ecology. *Science* 327 (6 Aug): 148.

Sugimoto, C.R., and M. Thelwall. 2013. Scholars on soap boxes: science communication and dissemination in TED videos. *Journal of the American Society for Information Science and Technology* 64:663-674.

Tyler, C. 2013. Top 20 things scientists need to know about policy-making. *Guardian.com*, Dec. 2, 2013.

Walker, B., and D. Salt. 2006. *Resilience Thinking*. (chapter 1 and case study 5). Washington, DC: Island Press.

Weinberger, C.J., J.A. Evans and S. Allesina. 2015. Ten simple (empirical) rules for writing science. *PLOS Computational Biology* 11:e1104205.

Wright, V. 2010. Challenges to Implementing "Best Available Science." *Joint Fire Science Brief*, Issue 124.