

ENVS 42.01 – Community-Based Natural Resource Management II – Forests, Forestry and Carbon

Timetable title: CBNRM II: forests

Professor: Doug Bolger

In this component of the DSP we will explore the ecological, economic, cultural and climate dimensions of forests. Forests are the dominant ecosystem type of northern New England and forestry and the forest products industry are also one of the most important economic sectors in this region. Increasingly, a vital dimension of forest management is forest land use change and its effect on atmospheric CO₂. We will investigate these issues through our interactions with people who live and work in the forest, our own field work on forest ecology, and research in the academic literature.

Distributive: TAS

Instructor: Doug Bolger

We will be accompanied on this course by Dr. Flora Krivak-Tetley. Flora is a post-doctoral researcher and lecturer in the Department of Environmental Studies at Dartmouth and was a Dartmouth undergrad. Her training is in forest ecology and she has extensive experience conducting research in forests around the world.

Required text : Holmes, R.T. and G.E. Likens. 2016. Hubbard Brook: The Story of a Forest Ecosystem. Yale University Press.

SCHEDULE

Week 1 – During the first week of the course we will survey the variety of approaches to forest management represented in northern New England and the place of forests in the economy and culture of the region. This includes town forests, large commercial holdings for pulp production, small holdings for hardwood, and TIMO's (Timber Investment Management Organization). We will learn about the policy and economic dimensions of forest management. We will visit a variety of forest sites and meet with forest landowners and managers.

We will be accompanied during this period by Dr. Spencer Meyer, Dartmouth '01, Senior Conservationist with Highstead. Highstead is “dedicated to increasing the pace of land protection in New England and beyond through science, sound stewardship and collaboration with diverse partners.” (<https://highstead.net/>)

Reading:

R.P. Chudy, and F.W. Cabbage. 2020. Research trends: Forest investments as a financial asset class. *Forest Policy and Economics*, 119.

Spies, T. 1997. Forest stand structure, composition, and function. Chapter 2 (Pp. 11-30) in *Creating a forestry for the 21st century*, Kohm, K.A. and J.F. Franklin eds. Island Press, Washington D.C.

Holmes and Likens, Chapters 1-4

Week 2 – Forest ecosystem ecology and Carbon sequestration. This unit will take place at the Hubbard Brook Experimental Forest in the White Mountain National Forest, NH.

In phase two we will learning and practicing the methods of ecosystem ecology as applied to assessing the carbon content of forests and estimating the net effect of landuse change on carbon balance. During this period we will be working at the Hubbard Brook Experimental Forest in the White Mountains of New Hampshire. Hubbard Brook, started by Dartmouth faculty in the 1950's, is known as the birth place of modern ecosystem ecology. There is an enormous amount of important, management relevant research that takes place at Hubbard Brook.

<https://hubbardbrook.org/>.

We will spend much of our time in the forest learning and putting into practice the techniques of forest ecology.

See this informative tv news piece on HB:

<https://www.youtube.com/watch?v=q63KgaWjNGc>

Also, this brief video depicts a cool forest warming experiment taking place at HB

<https://www.youtube.com/watch?v=q63KgaWjNGc>

Reading:

Holmes and Likens, Chapters 7, 8, 11, 12

Fiona V. Jevon, Anthony W. D'Amato, Christopher W. Woodall, Kevin Evans, Matthew P. Ayres, Jaclyn Hatala Matthes. 2019. Tree basal area and conifer abundance predict soil carbon stocks and concentrations in an actively managed forest of northern New Hampshire, USA. *Forest Ecology and Management*, 451.

Week 3 – Scientifically based forest management to achieve multiple management objectives. This unit will take place at Dartmouth College's Second College Grant. We will use the forest ecosystem ecology we learned at Hubbard Brook to evaluate actual and potential forest management interventions at the Grant and project their implications for Carbon sequestration, tree harvest, as well as the biodiversity and recreational goals of the Grant.

(see: https://www.dartmouth.edu/press-releases/study_finds_managed_forests_in_new_hampshire_rich_in_carbon.html)

Reading:

Holmes and Likens, Chapters 15-17

Grading

50% - Research Journal. I will meet individually with you each week to discuss your journal and the journal will be submitted at the end of the course. See the guidelines below for the journal.

40% - Group projects at Hubbard Brook and the Second College Grant. This grade will reflect your contributions to the design and conduct of the research project, data analysis, report writing and oral presentation.

10% - Final reflective essay. 2 pages

Guidelines for Research Journal

The purpose of the journal is to reflect upon and synthesize the experiential and empirical dimensions of the course with the academic content (journal articles and other readings/lectures)

The researcher diary can be seen as an integral part of the development of the researcher and the construction of research knowledge. In the same way that diary writing and reflection act as mediators in the development of teaching, researcher diaries mediate the construction of research knowledge. I strongly believe that my experience of keeping a research diary scaffolded my development in several ways. One was as a repository for thoughts and reflections; another was as a written account of my research journey. Not only was the act of writing scaffolding my knowledge through inner dialogue with more expert other, but the opportunity to re-read and interact with my thoughts was also a strong mediator in understanding my role of researcher and the research process.

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We will give you a bound blank journal to use as your research journal. **You should make regular dated entries into this journal, at least three times per week.** You can record here your thoughts, notes on observations, conversations, notes on your reading, etc.

Entries will be of two general types: descriptive and reflective.

Descriptive: Notes on reading, conversations or observations. Data. Sketches. Factual accounts of places you went, things you saw, people you spoke to, articles you read. TO DO lists. Notes on literature searches, keywords.

Reflective: “Thought” pieces about your evolving understanding of the topic. Critical analysis of an article. “Brainstorming” notes or diagrams. Strategic plans for moving the research forward. Questions you want to answer. Discourse on how you feel about your research.

Obviously, these are not mutually exclusive categories and both are important to the research process. **However, the reflective components add the most to the depth of the research. A lot of descriptive material without sufficient reflective processing won't take you far. So be sure to devote plenty of space and attention to the reflective components.** Keep in mind this quote from Rapely (2007):

Writing is thinking. It is natural to believe that you need to be clear in your mind what you are trying to express first before you can write it down. However, most of the time the opposite is true. You may think you have a clear idea, but it is only when you write it down that you can be certain that you do. (p.25)

Use the journal as a thinking tool. In some of your entries take the time to try to express the kernel of your research topic clearly and concisely. This will help clarify your thinking and this clarity will help move the research forward. In the past we have seen a strong correlation in the seriousness of the use of the journal and the quality of the resulting bibliography.

This is a journal/diary so the point is to use it frequently (i.e. you should be thinking about your research frequently so you should need to make journal entries frequently). *If you find you are always*

behind and have to catch up more than a couple of days with your journal you are missing the point and the value of the journal and will need to adjust your work flow so that you can make more regular entries. Try to keep the journal handy and jot things down as they come up. The entries don't have to be long – although some of them should reflect longer reflections too. *Don't just fill up the journal with writing to satisfy the assignment. Instead, experiment with research journaling as a research and thinking tool. What kind of entries best help you advance the depth of your understanding of your topic?*

Academic Integrity

This course is conducted under the principles of the Dartmouth College Academic Honor Principle. I encourage you to review the Honor Principle.

<https://students.dartmouth.edu/community-standards/policy/academic-honor-principle> You are also responsible for the information concerning plagiarism found in *Sources and Citations at Dartmouth* <https://writing-speech.dartmouth.edu/learning/materials/sources-and-citations-dartmouth>

Religious Observances

Some students may wish to take part in religious observances that occur during this academic term. If you have a religious observance that conflicts with your participation in the course, please meet with me before the end of the first week of the term to discuss appropriate accommodations.

Student Accessibility and Accommodations

Students requesting disability-related accommodations and services for this course are encouraged to schedule a meeting with me as early in the term as possible. This conversation will help to establish what supports are built into my course. In order for accommodations to be authorized, students are required to consult with Student Accessibility Services (SAS; [Getting Started with SAS webpage](#); student.accessibility.services@dartmouth.edu; 603-646-9900) and to request an accommodation email be sent to me. We will then work together with SAS if accommodations need to be modified based on the learning environment. If students have questions about whether they are eligible for accommodations, they should contact the SAS office. All inquiries and discussions will remain confidential.

Mental Health and Wellness

The academic environment on an off-campus program is challenging, our terms are intensive, and classes are not the only demanding part of your life. There are a number of resources available to you on campus to support your wellness, including your undergraduate dean (<https://students.dartmouth.edu/undergraduate-deans/>), Counseling and Human Development (<https://students.dartmouth.edu/health-service/counseling/about>), and the Student Wellness Center (<https://students.dartmouth.edu/wellness-center/>). I encourage you to use these resources to take care of yourself throughout the term, and to come speak to me if you experience any difficulties.

Title IX

At Dartmouth, we value integrity, responsibility, and respect for the rights and interests of others, all central to our Principles of Community. We are dedicated to establishing and maintaining a safe and inclusive campus where all have equal access to the educational and

employment opportunities Dartmouth offers. We strive to promote an environment of sexual respect, safety, and well-being. In its policies and standards, Dartmouth demonstrates unequivocally that sexual assault, gender-based harassment, domestic violence, dating violence, and stalking are not tolerated in our community.

The Sexual Respect Website (<https://sexual-respect.dartmouth.edu>) at Dartmouth provides a wealth of information on your rights with regard to sexual respect and resources that are available to all in our community.

Please note that, as a faculty member, I am obligated to share disclosures regarding conduct under Title IX with Dartmouth's Title IX Coordinator. Confidential resources are also available, and include licensed medical or counseling professionals (e.g., a licensed psychologist), staff members of organizations recognized as rape crisis centers under state law (such as WISE), and ordained clergy (see https://dartgo.org/titleix_resources).

Should you have any questions, please feel free to contact Dartmouth's Title IX Coordinator or the Deputy Title IX Coordinator for the Guarini School. Their contact information can be found on the sexual respect website at: <https://sexual-respect.dartmouth.edu>.

Diversity & Inclusion

I would like to create a learning environment for my students that supports a diversity of thoughts, perspectives and experiences, and honors 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 college records, please let me know.

If you feel like your performance in the class is being impacted by your experiences outside of class, please don't hesitate to come and talk with me. I want to be a resource for you.

Remember that you can also submit anonymous feedback (which will lead to me making a general announcement to the class, if necessary to address your concerns). If you prefer to speak with someone outside of the course, the Associate Dean of the College for Diversity Programs is an excellent resource.

I (like many people) am still in the process of learning about diverse perspectives and identities. If something was said in class (by anyone) that made you feel uncomfortable, please talk to me about it. (Again, anonymous feedback is always an option.)

As a participant in course discussions, you should also strive to honor the diversity of your classmates.

Socioeconomic Differences and Financial Difficulty

If you encounter financial challenges related to this class, please let me know.