

Project # 1: Forest Landowners and Water Quality

Partner: Dr. Elizabeth Doran, environmental engineer and scientist and UVM Gund Postdoctoral Fellow, Vermont EPSCoR

Introduction

A multidisciplinary team of researchers based at the University of Vermont has ongoing VT EPSCoR (Established Program to Stimulate Competitive Research) funding supporting research focused on water quality in the Lake Champlain Basin.¹ The team is conducting environmental monitoring studies and building an integrated model of the watershed to better understand the basin's resilience to harmful algal blooms caused by excessive nutrient loading and exacerbated by increasingly extreme weather events. The modeling effort centers around an integrated assessment model (IAM) that includes downscaled global climate forcing, a land use and land cover change agent based submodel, a governance and policy submodel, watershed scale hydrology, and a dynamic lake model. Using the IAM, the team is able to simulate future scenarios including climatic changes coupled with alternative bottom up and policy approaches to better understand and inform decisions related to land and nutrient management.

Our partner for this project is particularly interested in the role of landowners in affecting downstream water quality – i.e. how do individuals and the decisions they make regarding the management of their lands impact water quality in the Lake Champlain Basin? How do landowner decisions influence long-term land use trends such as land use transitions or parcelization? How can these findings strengthen modeling efforts?

To date, the forested landscape and associated landowner activities has been underrepresented in modeling efforts in comparison to lands in agricultural use. Further, about 75% of Vermont is forested and 80% of the total acreage is privately owned, meaning that private landowner decisions are actually quite influential.² Lastly, within the Lake Champlain Basin, forests cover 66% of the surface area and are responsible for 21% of the average annual nonpoint phosphorus load to the Lake.³ These water quality impacts are closely tied to how forests are managed across a spectrum of forest uses, which range from traditional forest products to more intrinsic forest benefits. Examples of forest uses and services include a) the provisioning of timber, firewood, and maple sap for syrup; b) recreational opportunities such as hunting & trapping, hiking, and wildlife viewing; c) cultural services such as educational, aesthetic, and cultural heritage values; d) sources of habitat and food for a variety of wildlife species; and e) carbon sequestration and storage.^{4,5} Given this context (and the theme of our seminar), your project research will focus on interviewing forest landowners in Addison County as a contribution to these ongoing research efforts.

¹ <https://epscor.w3.uvm.edu/2/>

² <http://www.vermontwoodlands.org/forestry-facts.asp>

³ <https://atlas.lcbp.org/issues-in-the-basin/phosphorus/phosphorus-sources/>

⁴ https://fpr.vermont.gov/forest/vermonts_forests/importance

⁵ <https://www.uvm.edu/femc/indicators/vt/services>

Project Objectives

Interview work (with assistance from MiddKid Mikayla Haefele '20) with forest landowners began in the summer of 2018 in Chittenden, Franklin, and Grand Isle counties and our partner would like to extend this work into Addison County. The overarching goal of these interviews is to identify how land use practices on forested land contribute to downstream water quality. Our partner and her fellow researchers at UVM have already developed an interview protocol for semi-structured interviews that you will need to follow for consistency. However, you will contribute unique work not only through your interviews but also in the form of research design, analysis, and communication of results.

- ***Research design:*** Ideally, your interviews would span a range of forest landowner “types” – e.g. large vs. small parcels, parcels managed for different uses as noted above, and those with or without management plans based on enrollment in Vermont’s Use Value Appraisal (or Current Use) program.⁶ Starting points for identifying potential interviewees include Vermont Family Forests, the Addison County Forester, the Vermont Woodlands Association, and the Vermont Land Trust. Some interview work in the region (following a different protocol for a different project) was conducted as part of the [Spring 2019 ES401 Seminar](#), so you will need to be attentive to not re-interviewing the same people, but, in turn, you can also glean some data from these completed interviews.
- ***Analysis:*** To date, the interview work already completed in northern Vermont has not yet been analyzed. Through your analysis of your interview findings in Addison County, you can help develop a template for the analysis of all interviews moving forward. Time permitting, you will also have access to the interview data from other counties and could therefore make some cross-county comparisons.
- ***Communication:*** An overarching objective of the entire EPSCoR project is the effective communication of science to the “general public”. To this end, our partner is very interested in some form of digital media representation of your findings. This could be anything from an interactive map to a video to a podcast or any other creative idea you might have based on the skills and interests of your team.

⁶ <https://fpr.vermont.gov/forest/managing-your-woodlands/use-value-appraisal>

Project #2 – Abenaki Land Access for Cultural Use

Partners: David Brynn, Executive Director and Conservation Forester, and Sandra Murphy, Forest Community Outreach and Rewilding, Vermont Family Forests

Introduction

A range of indigenous Native American peoples, now referred to as the Western Abenaki tribes, originally inhabited all of Vermont and New Hampshire, as well as parts of western Maine, southern Quebec, and upstate New York hundreds of years before the arrival of Europeans. In fact, the earliest Vermonters arrived around 11,000 years ago, and continued a seasonally nomadic farming, gathering and hunting lifestyle until the first contact with Europeans in the 1600s. After this contact, their way of life was severely altered—at first through disease and land loss, and then through systematic displacement and oppression that continued through the 19th and 20th centuries.^{7,8}

Vermont has been slowly coming to terms with its atrocities—which included state-funded eugenics surveys beginning in the mid-1920s and a state approved sterilization program in 1931. Through concerted efforts on the part of the Abenaki, the Nulhegan Abenaki Tribe was officially recognized by Vermont in April 2011. More recently, the state legislature in May of this year changed the name of the then-Columbus Day holiday to Indigenous Peoples Day and in June of this year, the president of UVM issued a formal apology for the eugenic survey work of the 20s and 30s.^{9,10}

Beyond these positive steps, the Nulhegan Band, under the leadership of Chief Don Stevens, has committed to “achieving economic self-sufficiency and stability for our people which means controlling our own destinies. With energy, determination, vision, and a commitment to the larger community, our sights are set upon utilizing our own resources and abilities to grow in the realm of economic development...The revitalization, preservation, and protection of our cultural, historic, and physical values and resources is the foundation upon which we stand”¹¹

Today, Vermont’s Abenaki community continues to value land as a shared resource and tribal citizenship, cultural awareness, and participation continue to expand. The Nulhegan Band recently acquired 68 acres of land in Barton, Vermont which represents the first Abenaki tribal land ownership since their lands were stripped from them. This land is utilized for community gardens, cultural celebrations, gatherings, and medicine foraging. There is significant interest in expanding traditional land use practices in other parts of the state, particularly because the Barton property is distant and inaccessible for much of the tribe.¹²

⁷ <https://abenakitribe.org/state-recognition>

⁸ Reflections on Abenaki Heritage, ENVSO401 Spring 2019 pamphlet

⁹ <https://legislature.vermont.gov/Documents/2020/Docs/BILLS/S-0068/S-0068%20As%20Passed%20by%20Both%20House%20and%20Senate%20Official.pdf>

¹⁰ <https://www.sevendaysvt.com/OffMessage/archives/2019/06/21/uvm-apologizes-for-a-eugenics-survey-that-ended-in-1936>

¹¹ <https://abenakitribe.org/culture>

¹² Reflections on Abenaki Heritage, ENVSO401 Spring 2019 pamphlet

In recent years, the State of Vermont, the Green Mountain National Forest, the TransCanada Corporation, and FirstLight Power Resources have negotiated permissions for the Nulhegan Band to gather edible and medicinal plants on their properties. For the full list of approved negotiations to date, see: <https://abenakitribe.org/partnerships>. These permissions represent huge steps in assisting the resurgence of Abenaki culture in Vermont, but to date have been focused on public lands. Given the fact that almost 80% of the forests in Vermont are privately owned, there is definitely untapped potential.

Project Objectives

Through our collaboration with Vermont Family Forests (VFF) in Spring 2019, students developed materials that aimed to, “convey the close physical relationship that Vermont Family Forests lands share with important Abenaki landscape features as well as underscore the continued Abenaki presence in the region. We hope that with the help of this story, Vermont landowners will begin to see their land as part of a living history.” This was the first step towards the possibility that private VFF landowners would develop some form of an agreement / permission structure for tribal citizens to access and utilize their lands. Your efforts this semester help move this work to the next level by addressing the below questions and research needs.

- Define the scope/scale/type of use that would come with an access agreement to inform potential private landowners. How many Abenaki citizens are interested? There is a desire for access for more lands, but exactly for what use? Why are these uses important?
- Research existing Vermont permission agreements as well as innovative models from other states to see what type of agreement would make sense for private landowners in VT. How should we best define landowner approval (i.e. legal agreement, informal verbal agreement, or something in between)? Some starting models to explore include:
 - VT contracts / permissions for state lands: <https://abenakitribe.org/partnerships>
 - Maine work of Peter Forbes: [First-Light Learning Journey](#)
 - California [Cultural Easement Agreements](#)
 - The Vermont Land Trust has initiated conversations around Abenaki access to black ash wetlands & black ash/red maple swamps and other conservation organizations like the Northeast Wilderness Trust have been starting to receive individual landowner inquiries.
- Who are the players – both the species involved and those that would need to make such agreements a reality?
- Could there be a legislative incentive for private landowners to grant access? What would a recommendation to the legislature look like in terms of cultural access becoming an approved use as part of the current use / use value appraisal program?

Project #3: Regional Coordination for Landscape-Level Challenges

Partners: David Brynn, Executive Director and Conservation Forester, and Sandra Murphy, Forest Community Outreach and Rewilding, Vermont Family Forests

Introduction

Vermont has a substantial number of public and private land management and land conservation agencies and organizations, all working on important themes such as water quality, connectivity, climate resilience, and carbon sequestration. Each entity has its own set of goals, visions, and strategic plans that guide its work. While there is certainly informal collaboration across these entities (i.e. the Vermont Forestry Roundtable and the Vermont Conservation Design report we will read as a class), there is little explicit landscape level coordination, strategic prioritization, or, perhaps most importantly, monitoring of efforts. Further, within the networks that do exist, there tends to be a limited scope of who participates and a lack of emphasis on empowering an active citizenry.

Looking at some examples from around our region, NGOs have played an important role in bringing together networks of institutions to guide landscape-level initiatives. For example, the Rensselaer Plateau Alliance, “a coalition of [over 30] organizations and individuals, recognizes that the Plateau is greater than the sum of its parts. Our members will foster communication about the value of natural resources and other common values held by the communities of the region and, in concert, help to advance those values on a regional scale. Our vision will be realized when each of the wide range of human activities that occurs on the Plateau leaves the Plateau in better harmony with the ecological whole.”¹³ Another example is Cold Hollow to Canada, which leads a robust landowner support program and “citizen science” monitoring program to help achieve their vision of “a healthy and intact forested landscape that supports a strong and sustainable local economy through stewardship, with permanent protection of core wildlife habitat and connectivity across the entire Northern Forest.”¹⁴

Project Objectives

Our partners at Vermont Family Forests (VFF) are interested in learning from these above innovative models and others you uncover to help design what such an initiative might look like in Vermont’s Center-West Ecoregion (CWE). The following words from Gary Snyder’s 1975 book Revisiting Turtle Island have inspired VFF: “*Find your place on the planet. Dig in and take responsibility from there.*” VFF has defined their place on the planet as what they are calling Vermont’s Center-West Ecoregion, roughly bounded to the west by Lake Champlain, to the north by the Winooski River, to the east by the Mad River, and to the south by the Middlebury River and Rte. 125. This region comprises 4 different biophysical regions, represents an important part of the Western Abenaki’s ancestral lands, and is marked today by 3 distinct patterns of land ownership or management – privately held forests (individual to industrial),

¹³ <https://www.rensselaerplateau.org/about-rpa-cjg9>

¹⁴ <https://www.coldhollowtocanada.org/>

publicly held forests (state & federal), and conserved lands (e.g. those held by a land trust or equivalent).

VFF's vision for collaborative conservation in Vermont's Center-West Ecoregion shifts focus from a homocentric to ecocentric orientation toward the land community.¹⁵ This shift moves the conversation away from "natural resources" towards commons, and from humans as "stewards" to humans as community members and commoners. In such a "Commons Conservation Collaborative", members will identify, celebrate, and help protect and rewild key ecosystem functions and values of Vermont's Center-West Ecoregion, especially as they relate to the water, wildlife, and air commons.

Key goals of a collaborative initiative in the CWE would be to:

- Create the capacity for integrative, landscape level conservation
- Initiate and sustain comprehensive monitoring efforts
- Motivate and empower the citizenry
- Collectively identify challenges
- Develop principles that would inspire and guide actions
- Shift focus from economic development as the end goal towards eco-regional health, connectivity, and resilience.
- Increase power of less well-resourced groups
- Influence grant funding priorities

Your key research questions include:

- Research and develop case studies of successful models (US and abroad) where NGOs have brought a diversity of entities together to successfully address landscape level challenges. How would you translate these models to VT and the CWE?
- Why we should create a new entity – what is missing and what role / purpose would a new organization play? Could this be a project of an existing entity?
- How can you redefine public involvement and combat the "professionalization" of public participation?
- Who should be involved and what part of the CWE do they occupy? How do you define who to include while at the same time moving away from the "stakeholder" mindset?
- VFF has a list of entities that they are inviting to their Conservation Congress and this will be a good starting point, but be as comprehensive as possible, including everything from high school science clubs to the natural resources themselves.
- What resources—financial, personnel, organizational—would be required to create such a group or network?
- Provide recommendations based on your research for what would help VFF and others in the CWE advance against the region's most pressing challenges and make a measurable difference.

¹⁵ See A Manifesto for Earth, by Ted Mosquin and Stan Rowe,
https://www.researchgate.net/publication/228454357_A_Manifesto_for_Earth

Project #4: Act 250 and the Next 50 Years

Partner: State Representative Amy Sheldon, Chair House Natural Resources, Fish and Wildlife Committee.

Introduction

Act 250, Vermont's landmark Land Use regulation turns 50 in 2020. Visionary in 1970, it still provides the only holistic review of larger developments in Vermont. In 2018, the Commission on Act 250: The Next 50 years, completed an in-depth review and public outreach process on the current status of Act 250 and whether Vermont is meeting the land use goals articulated in statute. The Commission also assessed the current level of public support for Act 250 and addressed issues like climate change and forest fragmentation.

In 2019, the House Natural Resources and Fish and Wildlife Committee (HNRC) took up the report and draft legislation from the Commission on Act 250. In addition to the concerns brought up by the Commission, HNR also took testimony on environmental justice and how to include it in the statutory changes and has made changes to the language that attempt to do this.

The goals of HNRC updates to Act 250 are:

- To address issues that were not in the original statute, like climate change, forest fragmentation and environmental justice;
- Improve the efficacy of meeting the fundamental land use goals of densely settled areas surrounded by working farms and forest lands and healthy natural areas that Vermonters almost universally support; and
- Where jurisdiction is changed, have clear pathways that are easy to understand.

Project Objectives

The goals of this project are for you to 1) learn about the history and function of Act 250, 2) to envision what a functional and resilient landscape would look like in VT 50 years from now, and to 3) provide HNRC with meaningful data and information on what needs to be done now to achieve this future vision as they prepare to pass updates to Act 250 in the coming 2020 legislative session.

In terms of specific objectives, your team will:

- *Apply your creativity, aspirations, and research to envision future interactions of human habitats and natural systems in Vermont.* What is your hope for the future of the VT landscape? How do you / how have others defined a functional and sustainable landscape (e.g. One that contributes to climate change adaptation? One that maintains biodiversity? Other?)?
- *Address some outstanding GIS work* that is crucial to informing decisions and recommendations. Currently, all properties with Act 250 permits (30,000 permits and amendments) exist only as point data. Therefore, there is no way to contextualize what acreage of VT is covered by Act 250 criteria. Further, there is ongoing work to lower the

jurisdictional threshold for Act 250 from 2500' down to 2000' (or even 1500') in elevation. Your combination of statewide parcel data with Act 250 permit point data and elevation thresholds would be of great use.

- Research examples of development in Vermont and other parts of the country / world that support, rather than degrade, your definition of a functional landscape and which address climate change. Develop case studies of outstanding models including a) what it would look like to transfer them to VT (for non-VT examples), b) how this form of development was incentivized, and c) a consideration of possible unintended consequences.
- Make specific recommendations to the HNRC for what needs to be in place now to achieve this future vision in 50 years (e.g. different criteria for development over 2500', requirement for cluster development in intact forest-blocks, different approaches for critical resource areas like floodplains, how to factor climate change into the permit process, etc.).