Spring 2017
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Designing a Model Landscape for Achieving Multiple Values
Spring 2017 Environmental Studies Senior Seminar (ENVS 0401B)

Background/Context

All the land- and water-scapes of Earth perform many functions and are home to many beings. We humans—the great modifiers of lands, waters, and air—have been learning for many, many generations about various capabilities, ecological functions, and uses of different kinds of places, as well as the different demands and expectations we people have for them. Societal values are strongly portrayed in the patterns and practices of land use, and also in the laws and regulations that guide some of those uses. The Champlain Valley of Vermont is an excellent landscape for examining the values, functions, demands and expectations we have for the lands and waters of a discrete region.

Scientists have developed many ways of assessing and categorizing lands for their uses, suitabilities, capabilities, capacities, and societal priorities. (For our purposes, the real-estate term "highest and best use" will take on a very different meaning from the market-driven approach of who is willing to pay the most for the land and "develop" it in some way.) There are many approaches and many tools and analyses available. For instance, in the U.S., for many decades county soils surveys have rated every soil type for their agricultural, engineering, and woodland suitabilities (https://websoilsurvey.nrcs.usda.gov/app/). The Food and Agriculture Organization (FAO) of the United Nations published "A Framework for Land Evaluation" in 1976 (http://www.fao.org/docrep/X5310E/ x5310e00.htm). Much more recently, and along the lines of biodiversity conservation, The Nature Conservancy has modeled large landscapes for their resilience to climate change (https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/edc/reportsdata/terrestrial/resilience/Pages/default.aspx). Even closer to home on a smaller scale, the State of Vermont has developed models such as the statewide conservation design (http://www.vtfishandwildlife.com/get_involved/partner_in_conservation/vermont_conservation_design) and the Otter Creek Basin Water Quality Management Plan (http://dec.vermont.gov/sites/dec/files/wsm/mapp/docs/mp_ottercreekplan.pdf).

The Champlain Valley, as with other fertile landscapes, has been called "the land of milk and honey." And, as you know, cows, goats, bees and people do work hard to produce and gather a whole lot of milk and honey here. This landscape is also one of the most biologically diverse parts of the Northern New England-New York region. To name just a few elements, it has wetland complexes with both "northern" and "southern" flavor, a diversity of stream and lake types, numerous species that thrive in the fertility of the calcium-rich soils and bedrock exposures,

and an "amenable" warmish climate. Additionally, the landscape is very scenic and attracts many thousands of visitors for gawking and for outdoor recreation. The lands also are integral to the conditions of the aquatic ecosystems and there are mounting pressures to enhance the water-protective and –enhancing functions of these lands.

All of you have some understanding of the importance of place, and you may have heard me verbalizing one of my pet phrases that comes out when I hear people getting rather theoretical and vague at the expense of *placing* their analyses in space (and time)—"everything occurs some*place* on Earth." Yet, not *every*thing can or does occur *everyplace*. But, oh, we demand and desire so much from this planet home. Hence, our task will be to make well-supported arguments for choosing certain land uses and land-management practices on specific places here in Addison County.

Projects and Project Partner

Middlebury College owns approximately 3,000 acres of lands adjacent and near to our main campus. These lands are quite representative of the different land types and land uses common to western Addison County. There are, for instance, farm fields, woods, wetlands, streams, recreational trails, and many good views. This semester we will plan, for these 3,000 acres, an idealized, demonstration landscape to achieve many objectives that are of value to life.

Our community partner for this work is Middlebury College Office of Sustainability Integration, under the leadership of Dean of Environmental Affairs Nan Jenks-Jay and Director of Sustainability Integration Jack Byrne.

Students will work in pairs or small groups to research and develop ideas for where and "why" (supporting rationale is important) the following land-use objectives "should" ideally be prioritized (and you may decide to add others as you learn more about the landscape and the Champlain Valley socio-ecological system):

- Water quality protection, maintenance and enhancement;
- Biodiversity conservation, including species, natural community, and habitat features, as well as connectivity;
- Food production and agriculture;
- Forest management and products, and
- Energy generation.

We envision considering "climate-change resilience" as an overlay, such that resilience thinking and analyses will need to inform all of the decisions. Similarly, aesthetics and recreation will likely be overlays with implications that are somewhat over-arching all of the categories. We will be looking at this landscape from a socio-ecological systems perspective, which explicitly acknowledges the importance of the

interconnections of the non-human/natural world with human economies, political institutions, and cultural customs.

In Week 5 of the semester you will work hard to bring together the thinking of the different small groups, for the task is to come up with one model that incorporates all of the themes, not separate, potentially competing models.

There are many resources available that are specific to Vermont and our target landscape in particular. There are also many other larger-scale analyses and tools that can help guide your thinking. We will be introducing those that we know about to help each group get a start on their thinking and analysis. There will be more that you will discover yourselves and will teach us about.

The final products will include GIS layers, map(s), and a report with recommendations for land uses and management. It will be important to enumerate:

- Goals
- Theory
- Recommendations
- Rationales for recommendations, and
- Implications, including
    - Triple E lens of ecology, economy, equity, and
    - Evaluation of tradeoffs.

So, let's get to work…