New Hampshire Land Compatibility: Renewable Energy and Farmland

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Introduction
In recent years, solar development has increased significantly in New England. Large arrays create land use conflicts between solar development, farmland, forests, and open spaces. Officials are concerned that working farms will be targeted for development. This project seeks to find a balance between expanding renewable energy and protecting cultural and natural resources.

Objectives
• Create a regional base map of Southeastern New Hampshire to understand the overall potential for large solar development given current land use and electrical infrastructure
• Create an example town map that details prime locations for solar development to inform decision makers, farmers, and the public, allowing for the establishment of a balanced regulatory response

WinterGreens Farm
A farm located in North Strafford, NH that has been 100% solar powered since 2016 [1]

Methods
• Interviewed key stakeholders including solar developers, farmers, utility employees, and a land use attorney to identify criteria considered during solar development
• Criteria selected and used to create maps in ArcGIS: wetlands, aspect, slope, existing land use, conservation status, and proximity to electrical infrastructure
• A parcel by parcel analysis was conducted with the selected criteria to create a model map of Durham highlighting parcels with solar potential

Discussion & Next Steps
The maps created for this project were designed to provide guidance to regional planners and other local officials so they can conduct an analysis of potential solar development within their own municipalities. Conducting this type of analysis will allow for stakeholders to learn about solar development opportunities that avoid land use conflicts and greenfield development. For example, as the analysis of Durham shows, viable parcels for solar often overlap with farmland; however, stakeholders need to be made aware that co-siting solar and agriculture is possible, which will prevent a restrictive regulatory response. Through this project, I learned about the complex process of siting solar arrays and that incorporating arrays within existing landscapes is feasible with adequate communication between everyone involved.

References
5. Michael Boehlau (Geospatial Science Center GIS), GIS Lab, RIN, Stone Hall, UNH

Regional Base Map:
Rockingham & Strafford Planning Commissions

Results
Durham, NH:
Parcel Analysis

First, all parcels larger than 8 acres were identified. Out of the 8 acre parcels, parcels with a minimal amount of wetlands were selected.

Next, parcels were selected based on their proximity to 3 phase power lines. Parcels more than 2500 feet from the lines were eliminated as constructing new electrical infrastructure makes a solar project financially difficult.

This map shows the existing conditions of parcels within 1000 feet and 2500 feet of the 3 phase power lines.

This map shows the percentage of the area of each parcel that has a favorable aspect (faces south, east, or west). This map also highlights portions of the viable parcels with slopes greater than 20 degrees that will require further evaluation to see if solar development is possible.
[2, 3, 4, 5]