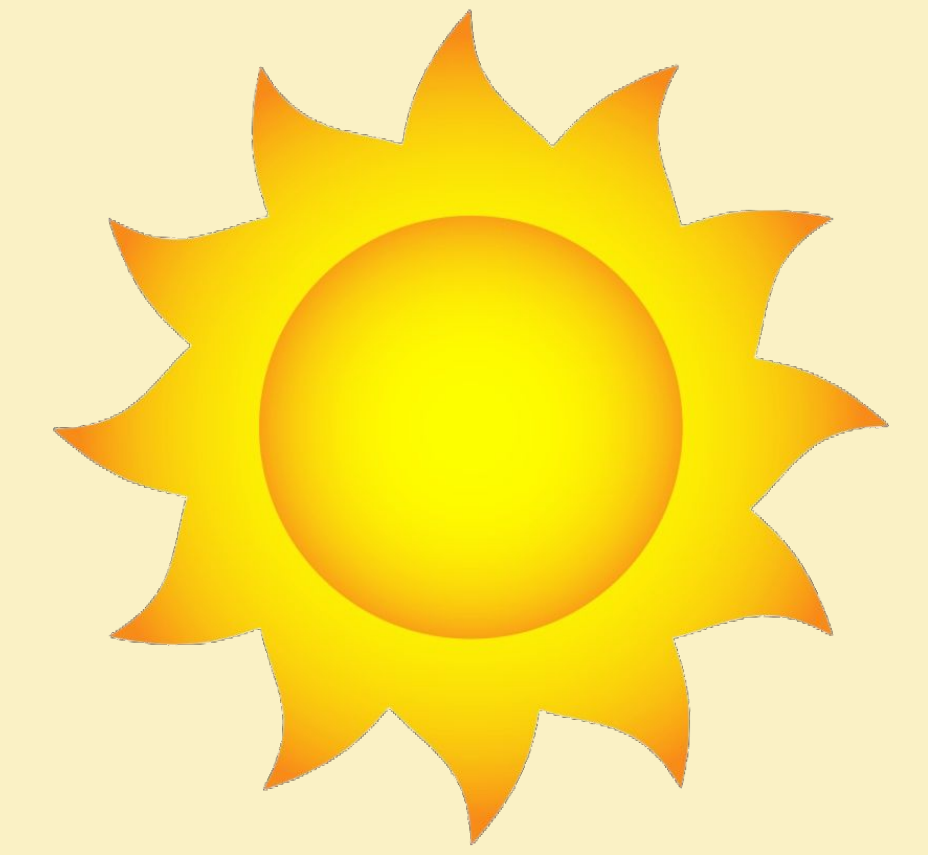




# Solar Siting Study of West River Valley

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## Introduction

West River Valley 100% Renewable is dedicated to meeting the energy needs of the West River Valley with renewable sources by 2025. Part of the effort is to increase solar production. This siting study was done to identify landowners who might be interesting in leasing their land for construction of solar arrays. A good potential site for solar construction has a gentle, southern facing slope and is clear of nearby trees. Under these conditions, the rows of panels can work most efficiently by avoiding far shading and row-to-row near shading. The site must also avoid certain sensitivities such as prime agricultural soil, conservation areas, water obstructions, and floodplains.

## Data and Methods

The data used for this study came from three places. From the USGS EarthExplorer tool, I got a Digital Elevation map. From the VT ANR Natural Resource Atlas, I got River Corridors and Flood Hazard areas. And from the Vermont Open Geodata portal, I got a Town Boundaries map, a Land Cover map, an Agricultural Soil map, and Statewide Standardized Parcel data. To make my selection, I first created a point grid across all of the towns, where each point represented a 2 acre plot of land. By extracting values from the data above to my points, I could follow a process of elimination to get the map that you see on the right.

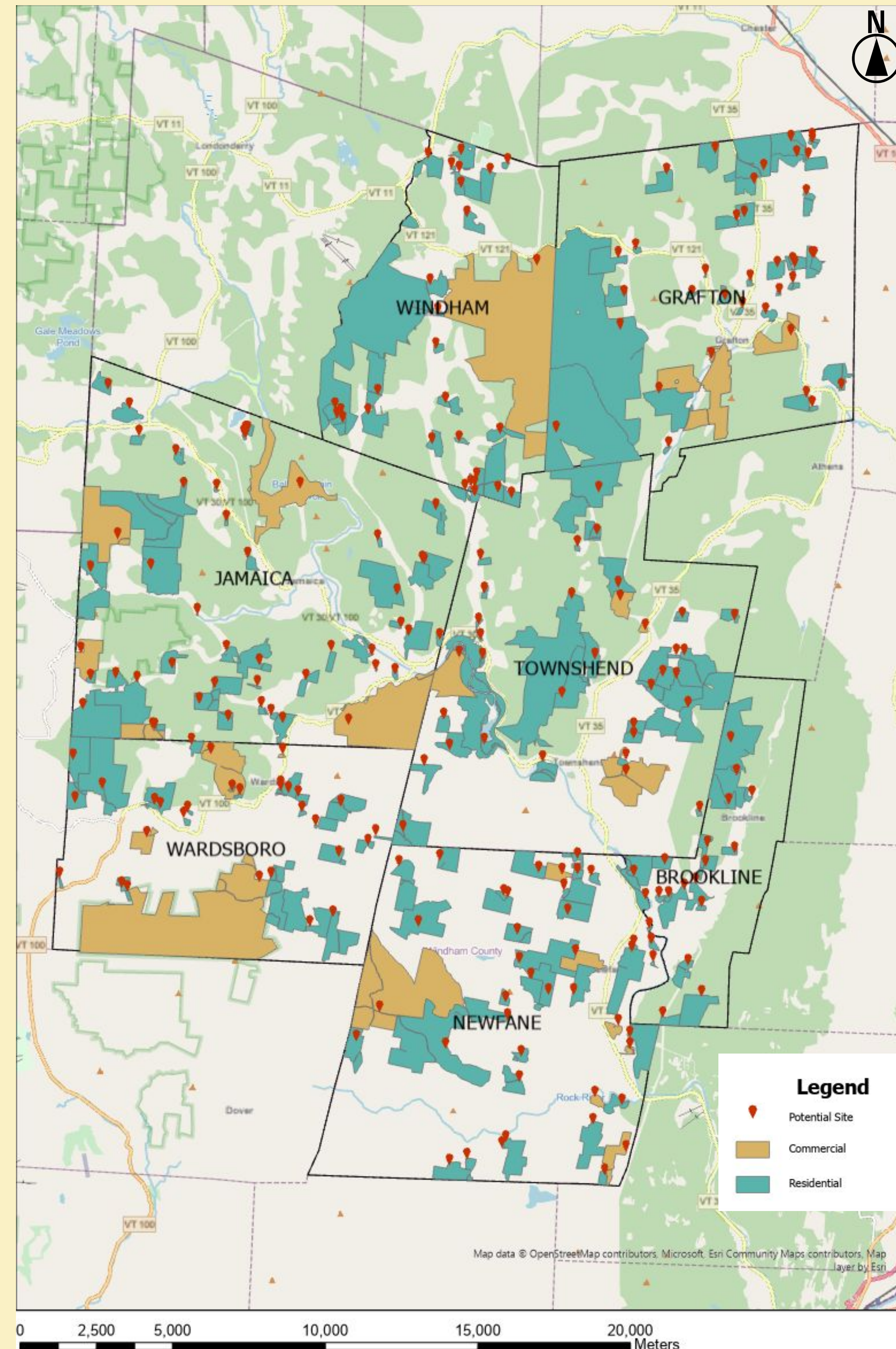
From the elevation data I could derive the slope and aspect of the land. My first selection was southern facing slopes and a slope <math>< 5^\circ</math>.

From the land cover data I was able to eliminate any points that lay in developed land, open water, or forests. Points were excluded that lay on prime agricultural land or agricultural land of state importance. Points were excluded that lay on flood hazard areas. Some manual review was done as well to eliminate a few strange circumstances, and to merge multiple points that lay within the same parcel of land.

What remained after this process was approximately 600 acres of gently southern sloping open fields that were ideal for the development of solar. I joined the parcel data to my points and classified parcels of interest as being residential or commercial.

## Results

238 potential sites were identified, 214 of which are classified as being residential. These sites contain the information regarding the landowner, and have been exported as a more readable spreadsheet so that West River Valley 100% Renewable can contact the site landowners.



## Discussion and Future Plans

In this study, I only considered plots of land which I thought would provide the most benefit for solar production efficiency. Many more potential sites could be identified if we adjust our criteria for topography to be more inclusive. Land that differs slightly in orientation is still viable for solar. Forest land cover could also be examined more closely as it was stated in the company's solar siting criteria that land with good orientation which is not cleared may be considered with the added work of clearing the land before construction. This adds another step to the process so I chose to exclude it.

If more sites can be included, and I think it would be beneficial to do so, I would like to implement a system to classify which spots are more efficient than others and to assess the sites' interconnectivity with the physical infrastructure i.e. it's more cost-effective if a site is close to town.

I wish for the information in this map to be interactive for people other than myself who do not have an ArcGIS license. I have loaded the coordinates of these potential site points to google maps so that anyone can view the locations and zoom in to get a rough assessment of the land.

In my conversations with people in the solar industry I have heard complaints about the current solar siting tools that are publicly available. In the future I think that this project could be applied to other regions seeking to implement solar production.



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