



Prospecting an Orchard in Shelburne, MA

Joanna Grace Brown
NUTR 231

Methods & Sources:

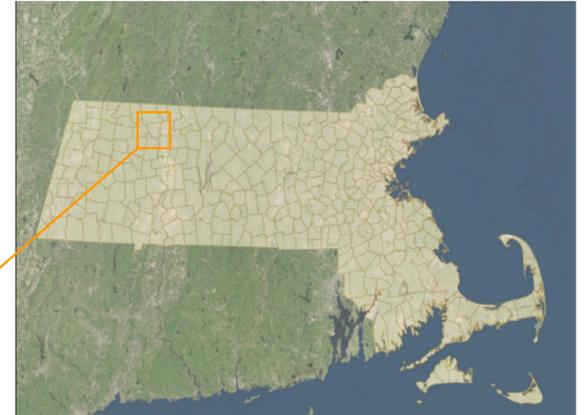
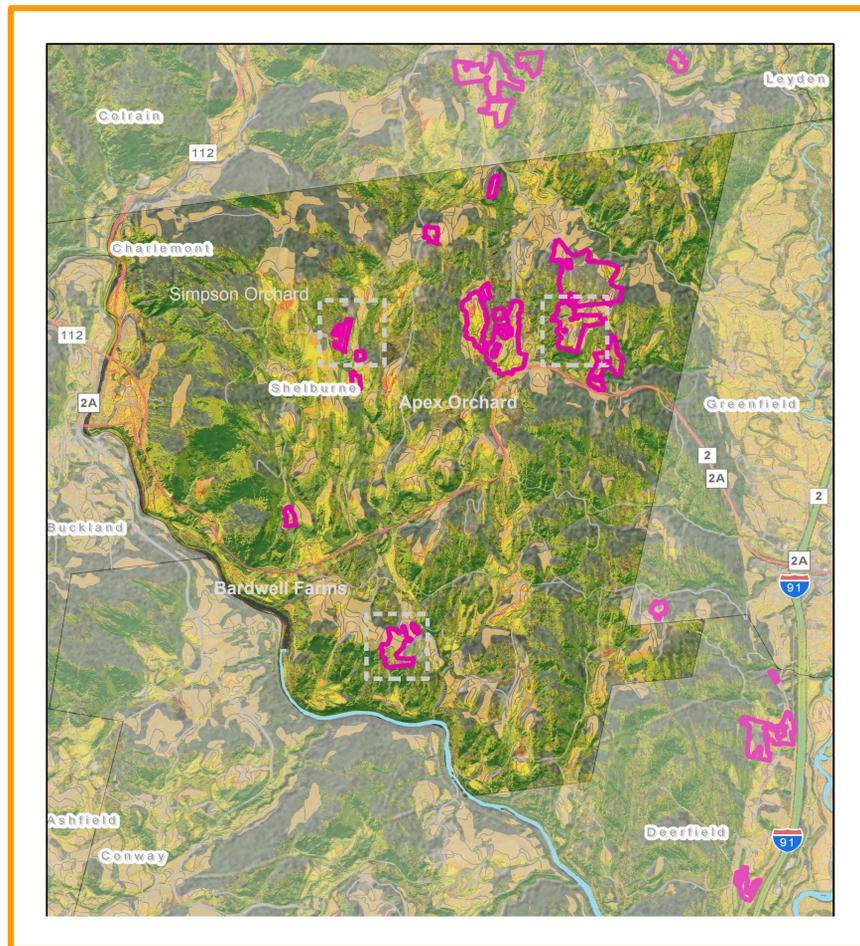
The model extracts data on the slope of the terrain and which direction it faces, called aspect. An area that is optimally propitious for orchards will have a gradual incline that allows cold air to sink to minimize risk of damage to buds and blossoms from late spring frosts. An incline also improves drainage. The slope ideally faces due south to maximize solar window. If this is not available, one should err on the side of east to benefit from earlier thaws from morning light. This will also minimize damage from spring freezes. The model assigns points for the degree of suitability according to these principles, and rules are laid out in the table below:

# Points Assigned	Slope	Aspect (zero=due north)
No Data	45-90%	-1-90 degrees; 270-360 degrees
0	0-5%	240-270 degrees
1	5-10%; 35-45%	90-120 degrees
2	10-35%	120-240 degrees

The locations of orchards were extracted from the 2005 Land Use layer to determine whether successful orchards in Shelburne farm plots of land this model determines to be propitious.

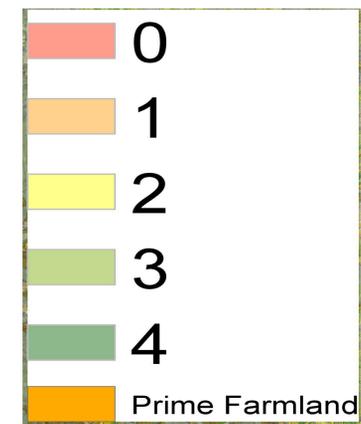
This spatial query surveys Shelburne, MA for propitious places to start an orchard. The 2014 Farm Bill substantially increases funding for the New and Beginning Farmers and Ranchers program, partially as a response to the aging farming population in the US. One major constraint for young agriculturalists is land access.

This model evaluates land for its suitability for planting an orchard. It considers natural elements such as solar window and incline, as well as human factors such as roads for the accessibility for autumn tourists to pick their own harvest.



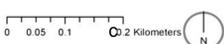
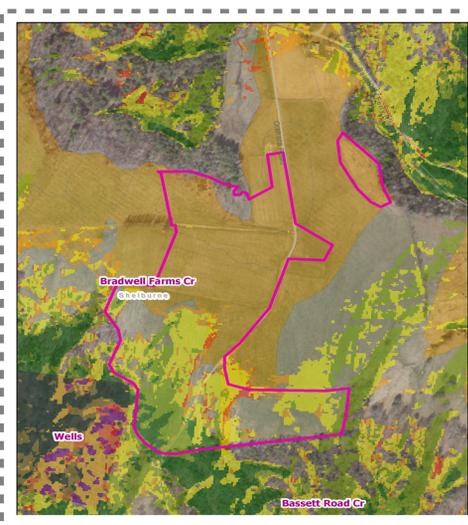
The Prime Farmland Soils layer from the USDA Natural Resources Conservation Services is shown in light brown to inform the viability of general agricultural use. The NRSC defines "prime" as "land that has the best combination of physical and chemical characteristics, (USDA, 2012). This layer will include land without slope as prime, as it is propitious for most crop production. Orchards are also viable, but would be more prone to frost damage during spring freezes.

Scale of Suitability

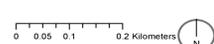
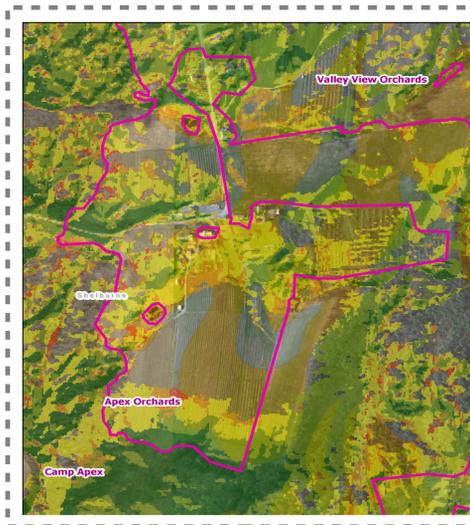


Hydrography (1:25,000): MassGIS, Massachusetts Department of Environmental Protection, 2010
Roads: MassGIS, Massachusetts Department of Transportation, 2014
OpenSpace: MassGIS, updated by EOEEA, 2014
Land Use: MassGIS with help of Sanborn, 2005 (published 2009)
Topography: United States Geological Survey, National Elevation Dataset, 2008
Prime Farmland Soils: MassGIS, United States Department of Agriculture, Natural Resources Conservation Services, 2012

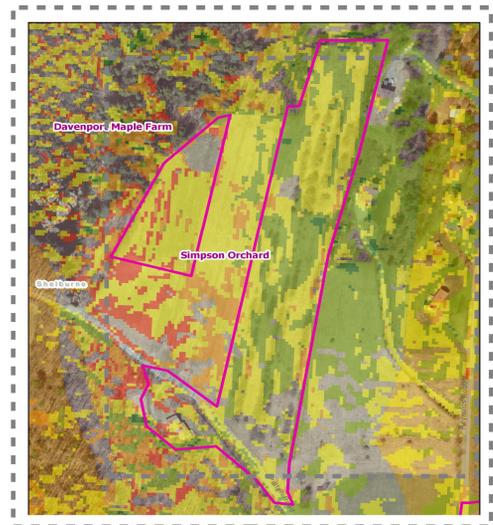
Bradwell Farms



Apex Orchard

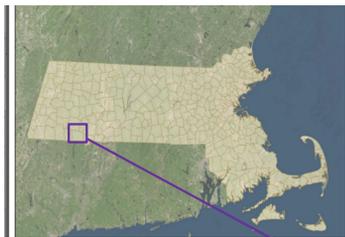


Simpson Orchard



These three plots represent three successful orchards in Shelburne, and offer valuable insights into developing this model to identify plots of land that are propitious for orchards specifically and agricultural use generally. Each plot does contain land that is optimally propitious (in dark green) but this makes up a minority of the land area. Simpsons Orchard has the greatest amount of its area ranked as some degree of propitious, with Apex as a close second. Bardwells Farms is not as specifically propitious for orchards, but a large portion of the plot is classified as prime farmland by the NRCS. This shows that successful orchards and farms do not necessarily have to be on optimally propitious plots to establish a viable business. A more sophisticated analysis would consider diversified agricultural uses to improve the model's use for matching plots of lands to potential farmers, ranchers, and orchardists.

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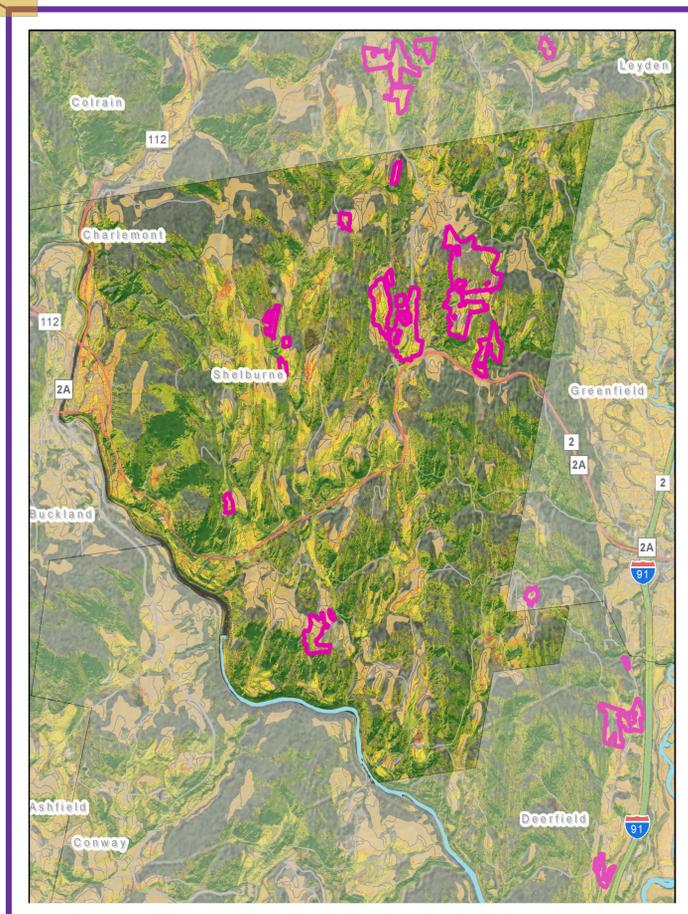
This model evaluates land for its suitability for planting an orchard. It considers natural elements such as solar window and incline, as well as human factors such as the location of land trusts and accessibility for tourists.

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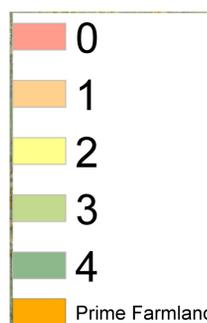
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