Cultivating Opportunity: A Suitability Analysis for Beginning Farmers in Middlesex County, Massachusetts

The View From the Field
Beginning farmers in Middlesex County face significant challenges. Access to suitable parcels is hindered by fragmentation from residential development as well as some of the highest farmland prices in the nation. One recent study found that among young farmers, access to land ranks among the largest obstacles to overcome. Middlesex County data reveals the barriers. In 2007, the average age of a principal operator was over 56 years old.

A Holistic Approach to Enhancing Land Access
By providing spatial data and holding informational meetings throughout the region, New Entry continues to build relationships with municipalities and landowners. This farmland suitability approach attempts to address accessibility issues that are commonly encountered. 2005 land use data was divided between agricultural uses, and suitable, non-agricultural uses to reflect the growing interest in "SPIN" (small plot intensive) farming practices. Any land use overlapping with wetlands was then removed to create "suitable agricultural units." Using the intersect tool, this data was combined with open space, prime farmland and level 0, 1 and 2 parcel data to assist New Entry with outreach to landowners with suitable acreage.

Town of Pepperell, Massachusetts
Aggregated suitable parcel units from Middlesex County can be clipped to individual towns, such as Pepperell, shown below. The agricultural units can then be analyzed according to their proximity to various features and their overlap with areas of local significance. The local analysis may assist both New Entry and the Town of Pepperell in exploring the town’s potential for increased agriculture.

Findings
This suitability analysis suggests Middlesex County offers substantial agricultural potential. Although data on existing agricultural lands is important, the analysis shows there are over 3000 acres in non-agricultural uses. Information on the location and suitability of these arable parcels will allow for better outreach to landowners, and new options for beginning farmers. Similarly, there are many localized opportunities available in certain municipalities. A closer look at Pepperell reveals the agricultural options for overlapping town lands, as well as some of the ways farmland access can be addressed through proximity analysis. Further research may include the addition of geocoded points of agricultural activities or the development of a GIS model that can increase the pace of analysis. Despite improvements, this current research may be another tool to grow local agricultural options.

Challenges and Limitations
Both municipalities and researchers looking to replicate this process for their region or locality should make note of a few challenges and limitations.

- Overlap
- Accessibility
- Fragmentation
- Proximity
- Suitability
- GIS Model

Table: Middlesex County’s Suitable Agriculture Units

<table>
<thead>
<tr>
<th>Suitable Agricultural Units</th>
<th>Acres</th>
<th>Number of Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units in Agricultural Use</td>
<td>6875.33</td>
<td>863</td>
</tr>
<tr>
<td>Units in Non-Agricultural Use</td>
<td>3016.29</td>
<td>819</td>
</tr>
<tr>
<td>Total</td>
<td>9891.62</td>
<td>1682</td>
</tr>
</tbody>
</table>

Assessing the distance from water features can be a cumbersome process as the data contains many measurable features, such as marshes, that may assist municipalities, landowners and beginning farmers in assessing site compatibility with different agricultural practices.

Distance to Water Sources
Accessibility to a reliable water source can determine necessary irrigation methods at a site. Hydrographic data, including reservoirs, lakes, ponds, rivers, streams and ditches were joined to the parcel unit data for an accurate depiction of surface water proximity. The data may assist municipalities, landowners and beginning farmers in assessing site compatibility with different agricultural practices.

Distance from Roads
Vehicular access can be a significant factor when determining the appropriate site for an agricultural enterprise. Road frontage can also be an important component to a successful business as some towns in Middlesex County allow farm stands for growers to sell their produce. In this map, the agricultural units were converted to points before using the Membership function to gauge their proximity to roads of various sizes.