Using GIS to Estimate Sites of Potential Vernal Pool Occurrence in Barnstable, Massachusetts

Cartographer: Chloe Starr
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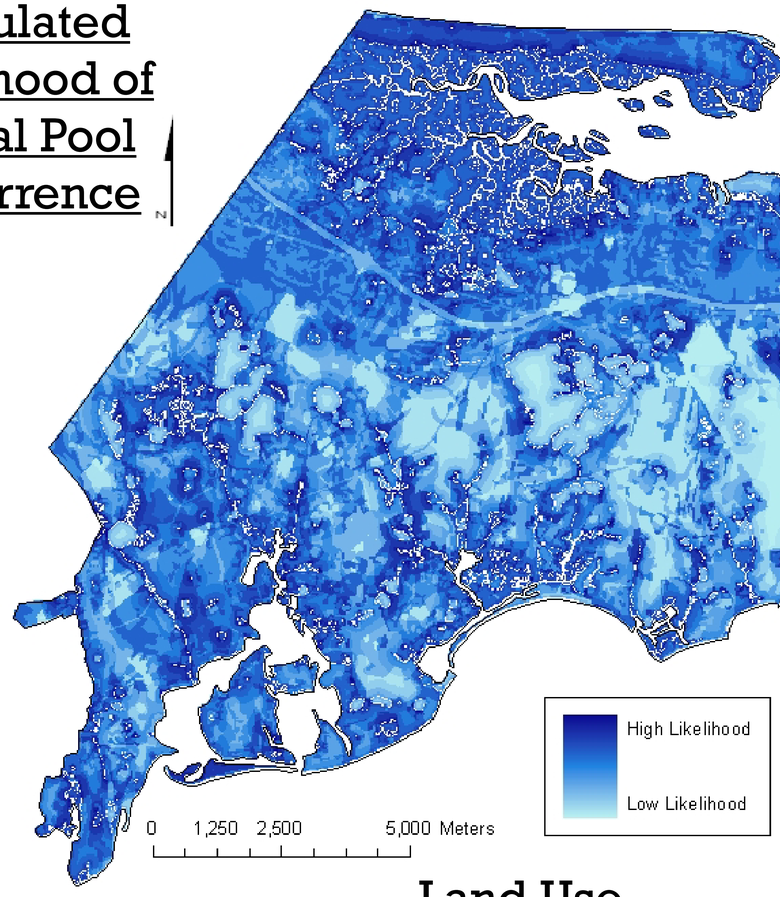
Data Source: MassGIS
Projection: NAD83 Massachusetts

Purpose

The purpose of this project is to utilize GIS to determine potential vernal pool locations. This will be helpful in establishing areas in which to search for vernal pools. Vernal pools are seasonal pools that provide breeding habitat for frogs and salamanders, many of which are endangered. As such, certified pools are afforded comprehensive state protection. Since they are seasonal and do not connect to a permanent water source, they are not mapped on classic maps, and must located and identified to receive protection. By identifying potential locations for these pools, the search for them can be more defined and may result in more pools being identified and protected.

Calculated Likelihood of Vernal Pool Occurrence



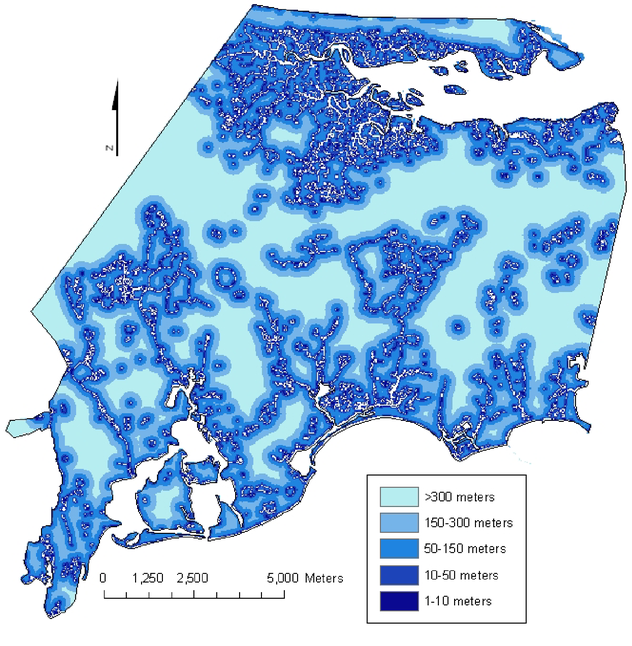
Methods & Analysis

Using data from the 26 vernal pools previously certified in the Town of Barnstable, criteria for estimating potential vernal pool locations were established. It was found that 18 of the pools were located on soil with a slope of 3-15%. It was also found that 8 of the pools were within 50 meters of water, with an additional 10 being within 150 meters of water. Land use data was divided up into three categories: industrial and commercial use, residential and recreation use, and open land and forest. It was found that 22 of the 26 pools were located in the open land and forest land-use category.

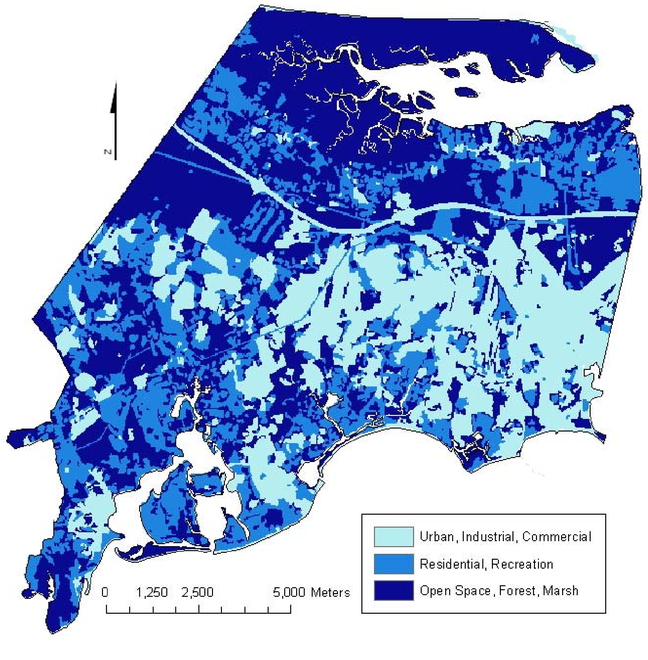
The soil slope, distance to water, and land use data were reclassified to reflect the trends shown in the previous vernal pool data with sites more likely to contain vernal pools receiving a higher reclassification number (shown as darker blue on the maps). The reclassifications were then weighted and summed based on their perceived correlation. The land use data was weighted twice as much as the slope and distance to water data as it showed the most correlation to vernal pool location.

The result is the map to the left, which shows locations most likely to contain vernal pools in the darkest blue. This map could be used as a guide to direct future searches for vernal pool occurrences.

Distance from Water



Land Use



Slope of Landscape