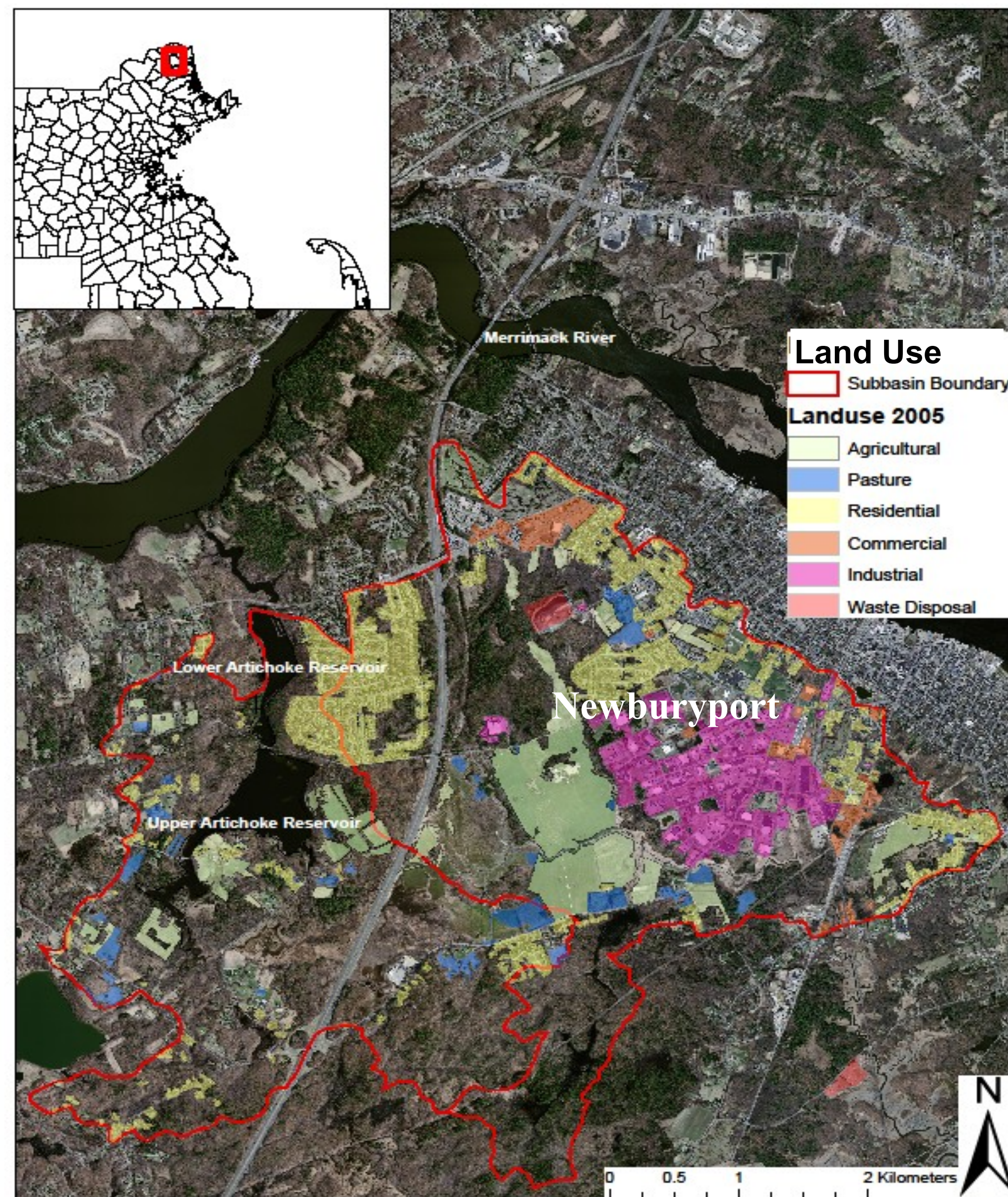


Monitoring Urban Land Use In The Sub Basins Of The Merrimack and Parker Watershed



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 Course: Intro To GIS
 Data Source: Mass GIS
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Merrimack and Parker Sub-Basin Land Use 2005 Superimposed Onto Ortho Imagery



Objective

Over the century, anthropogenic change on our earth's surface has been accelerating at an unprecedented rate. Increasingly, geographic information systems are being used to map and visualize these changes. The purpose of this project is to accomplish a similar objective but on a smaller region of focus: the Merrimack and Parker sub basins near the town of Newburyport, situated at the border of the Northeastern section of the Merrimack watershed and the northern sector of the Parker watershed. In recent years the town of Newburyport has boasted tremendous growth in its industrial and urban development, while similarly implementing a policy of environmental development meant to preserve the area around the Artichoke reservoir. We shall therefore quantify the change in surface land use for the two sub basins in term of their urban, and ecological development.

Methodology

The primary task consisted of joining the data table from the Mass GIS Land Use 2005 layer with that of the Mass GIS Land Use layer, in which all land use description for the previous years are available. This was done using the intersect tool. The tool 'select by attribute' was then used in order to calculate the changes in surface area that the different land uses underwent over the years. Finally, I intersected the 1klm buffer layer I had created with the Mass GIS 2005 land use layer in order to determine how much residential land resided in close proximity to toxic air emitting facilities.

Results

We found that there has been significant increase in urban land use and that 132.6 acres of land, which in 1971 were for agricultural, are now used for industrial, commercial, and residential purposes. In addition, 46 acres

of pastoral land now have new urban purposes. Despite Western-ward encroachment of the city of Newburyport, there has been a drastic expansion of the forest near lake Artichoke.

Land Use Description	1971 (Acres)	2005 (Acres)	%Change
Agriculture	1177.3	510	-56.7
Pasture	385	139.9	-63.7
Residential	321.9	680.4	111.3
Commercial	67.3	110	63.4
Industrial	73.4	363.1	394.6
Total Developed Land	2024.9	1803.4	-10.9
Forest	716.4	2054.9	186.3

On the other hand, the increase industrial activity means larger waste emitting facilities, and the limited space has put 204 acres of residential land within 1klm of toxic air emitting facilities, some of which produce volatile organic compounds (VOC). VOCs are associated with respiratory tract illnesses such as asthma. They can also damage other vital organs, and some VOC's have been associated with cancer in animal studies. Having these toxic compounds so close to residential areas is the result of poor urban planning.

