CRITICAL MASS

Land Use Change in Southeastern Massachusetts

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As developers pursue the remaining open spaces of Norfolk, Plymouth, and Bristol Counties, Southeastern Massachusetts is rapidly becoming a region challenged by competing priorities for land.

Adding residential and commercial properties is often seen as evidence that towns are thriving. In reality, development carries significant impacts to communities as conservation opportunities are overlooked, and wildlife retreats into more finely dissected habitats. Study after study illustrates that residential developments cost municipalities more in required services, including schools, police, and roads, than they raise in additional tax revenues. Air and water pollution increase as more homes, vehicles, and businesses move into the area. More land is paved, and all the problems associated with sprawl increase. Southeastern Massachusetts' protected lands, though fragmented, are rich in species diversity, provide valuable open space to local communities, and create a healthier environment.

This poster shows urban development in Southeastern Massachusetts between 1971 and 1999 and highlights two possible scenarios for the future development of this region. These maps provide a general perspective on land cover change — past, present and future — so that citizens and decision-makers can be informed about the impacts of conservation and development.

Pine Barrens

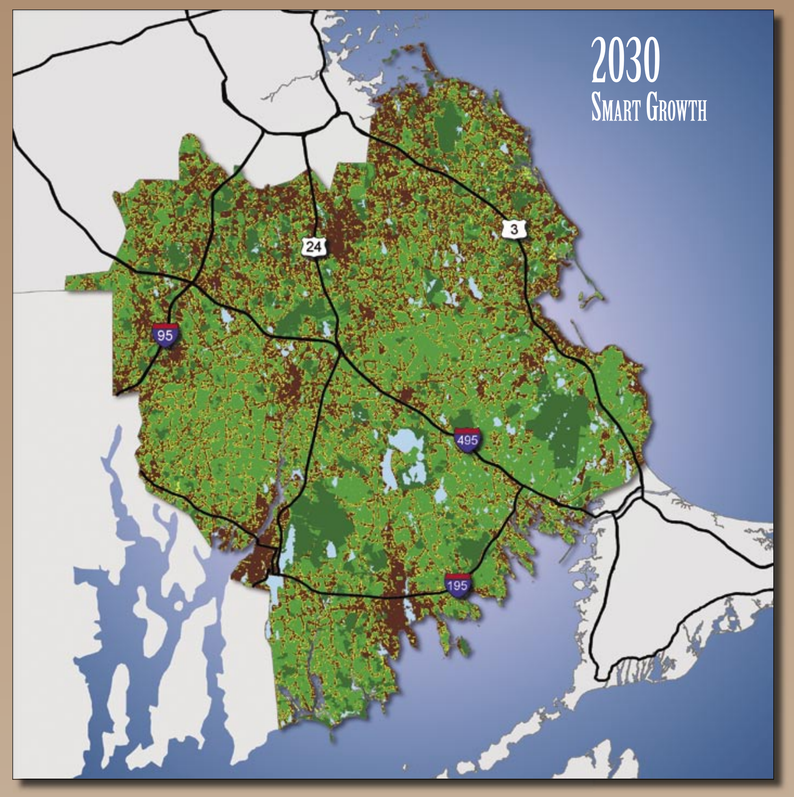
These globally rare and largely intact lands are currently the most significant conservation opportunity in Massachusetts. The pine barrens of this region (mostly in Plymouth, Carver, and Wareham) protect the 500 billion gallon Plymouth-Carver drinking water source. There are no alternatives to this aquifer, and it is easily subject to degradation because of porous soils that can allow contaminants to travel rapidly and widely.

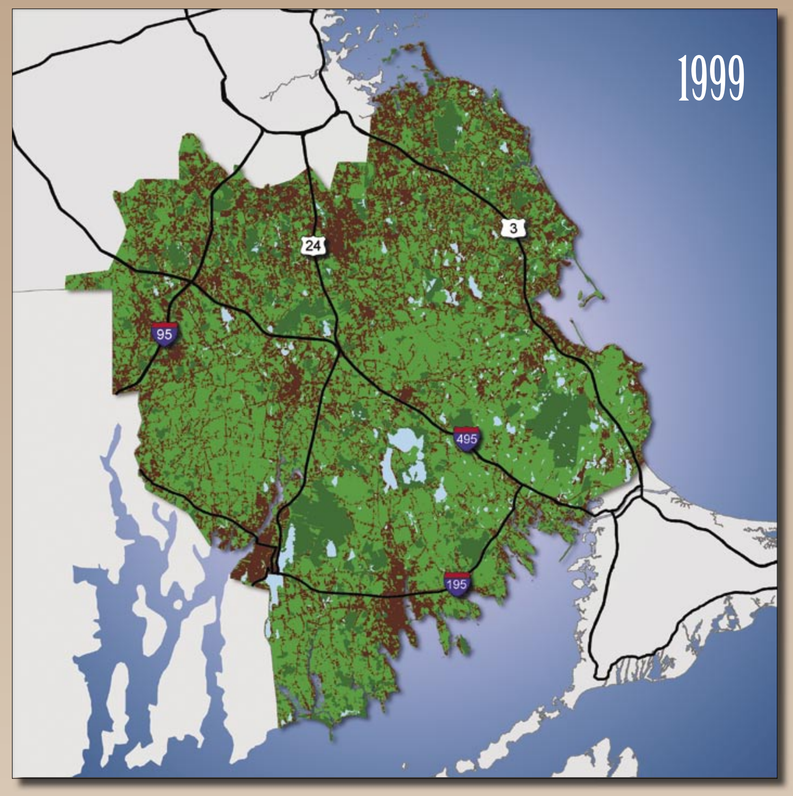
Watersheds

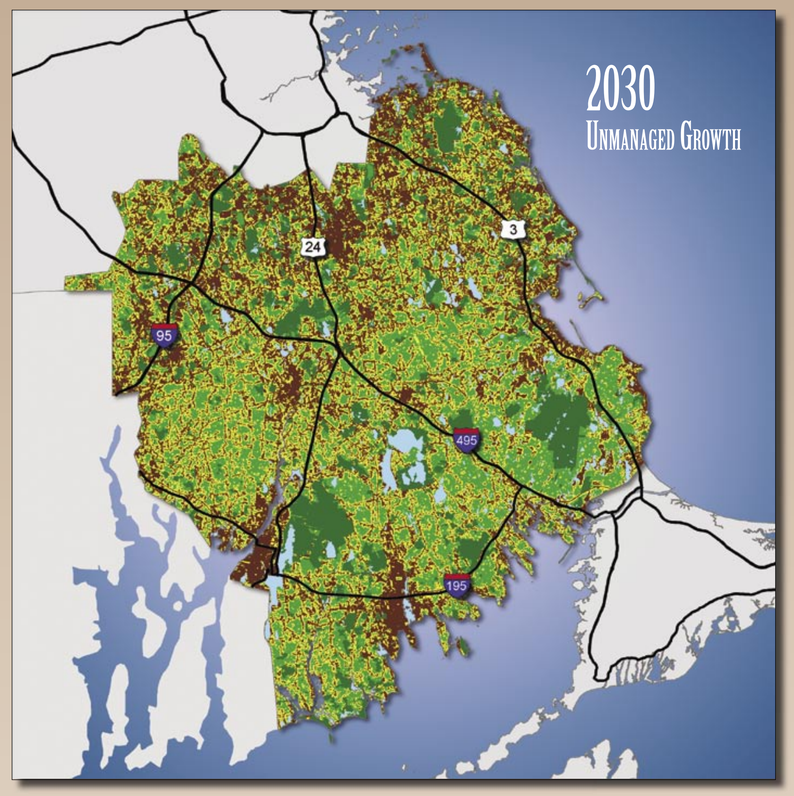
The five major watersheds of the region should provide the basis for development planning. The largest watersheds are the Taunton River watershed, in 38 cities and towns, and the Buzzards Bay watershed, in 17 towns including parts of Cape Cod.

Cranberry Bogs

Cranberry growers own about 60,000 acres of land in Massachusetts, almost all of which is in the southeastern region. Cranberry production increased steadily from 1970 to 1999, but then fell due to much lower prices for berries. Since then, prices have rebounded somewhat but poor yields have kept profits low. Decisions by growers about continuing or selling their adjacent lands for development could significantly impact the future of Bristol, Plymouth and Norfolk counties. Cranberry production is a very large consumer of local water resources. Growers own 20 percent of surface water in Southeastern Massachusetts.







The 1971 and 1999 maps, which show the change in developed land between those years, were created using publicly available land cover data from the State of Massachusetts. The amount of developed land in Southeastern Massachusetts increased from 20 percent in 1971 to 29 percent in 1999. This region also lost nearly 9 percent of its forested land during that time period. Although the percentage of land lost to development in Southeastern Massachusetts is relatively low, with respect to Cape Cod and other rapidly changing portions of the country, the potential of losing large tracts of yet undeveloped land in the upcoming decades is great.

Also shown on the 1999 map are protected lands. These areas are those tracts of land set aside and protected from human development. Protected lands are more than just recreation areas. They are vital cleansing engines for improving air and water quality, and they are the sanctuaries for our biological heritage, giving protection to locally, nationally and globally rare plant and animal species.

- 1999 Protected Lands
- Developed Land
- Open Space
- 2030 Developed Land
- Water

Because the conversion of natural lands to developed lands poses significant threats to watersheds and other resources, predicting urban and suburban land use change provides a basis for understanding what incremental changes may mean over time. The two possible scenarios presented here for the year 2030 were created from a modeling approach based on the pattern and the rate and extent of change of developed areas between 1971 and 1999. The model also considers changes in the road network between the two time periods and protected lands.

Smart Growth *(Top)*: This modeling scenario shows an increase of only 20 percent in the area of developed land over the 30-year period for an increment of less than 1 percent per year. Of all land (and water) in the region almost 50 percent would be developed whereas currently about 29 percent is now developed. To grow at this rate would require, of course, significant changes in the way we grow and higher density in almost all areas currently developed. To accomplish this we need to keep the growth in the area developed at the same rate as the growth of population, which has been about 1.4 percent per year since 1950. This can be accomplished by increasing the density of town and city centers while reducing building density in the more rural areas of a municipality.

Unmanaged Growth *(Bottom)*: In this model scenario, we predict an increase in the developed land of 34 percent over the next 30 years or, a rate of about 1.1 percent increase in developed area per year. Of all land (and water) in the region, some 63 percent would be developed, whereas currently about 29 percent is developed.

How We Live

The history of Southeastern Massachusetts encompasses many types of development and industry. From pre-Colonial to present times, the daily lives of the people of this region are closely tied with the ecosystems in which we live:

In the 1700s and early 1800s Southeastern Massachusetts was an agrarian and marine economy. By 1840, whaling became a dominating influence on the economy, and New Bedford was the national epicenter. *Photo: Whaleships and oil casks, Central Wharf, New Bedford, ca. 1870. Courtesy of Spinner Publications.*

In the mid-1800s, capital raised from whaling was invested into the early factories of Southeastern Massachusetts. Mills that took advantage of local waterpower at the beginnings of the industrial revolution and manufacturing were a more predictable investment than the risks of the sea. *Photo: Gosnold Mills, New Bedford, date unknown. Courtesy of Spinner Publications.*

Industrialization took a quantum leap with the introduction of the railroads in the mid-1800s. Now cotton from the South could be brought efficiently into the mills of Southeastern Massachusetts; cities distant from the sea, like Brockton, and Taunton, became competitive manufacturing centers. *Photo: Pearl St. Depot, New Bedford, 1917. Courtesy of Spinner Publications.*

The industrialization of Southeastern Massachusetts in the late 1800s and early 1900s created an enormous demand for labor, sparking an influx of immigrants from England, Ireland, Italy, France, Poland, Portugal and Cape Verde. This continues today with recent Brazilian immigration. *Photo: Cape Verdean Immigrants on the "Savoie", 1914, New Bedford. Courtesy of the New Bedford Whaling Museum.*

The period of industrial decline in Massachusetts started in the late 1920s as industries moved south to take advantage of cheaper wages. In this photo, some of the 35,000 strikers in 1928 in New Bedford and Fall River protest a 10 percent wage cut. *Photo: Textile Strike of 1928, New Bedford. Courtesy of Spinner Publications.*

In the early 1900s, traditional farming began to decline in Southeastern Massachusetts with the opening of the west and suburbanization. The last large farms were large-scale dairy farms. *Photo: A vegetable farmer in Taunton looks over fields from his front porch in 1941. Credit: Library of Congress.*

Cranberries are the most important crop in Southeastern Massachusetts, covering tens of thousands of acres, but recently have suffered from low prices. Pine Barrens near cranberry bogs are among the most important conservation opportunities in all Massachusetts. *Photo 2005, Courtesy of Nadine Laporte.*

Development pressures on Southeastern Massachusetts are growing as transportation improves and as the value of land rises. Currently, the amount of developed land is increasing at three times the rate of population growth. *Photo 2004, New commercial development off Rte. 495, Middleborough, Courtesy of Thomas Stone.*

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What Can I Do?

Choose environmentally friendly products. • Recycle. • Be a responsible consumer by reducing your use of water and automobiles. • Understand the effects of lawn fertilizing and the additional pollution it introduces to water bodies. • Learn more about the role ecosystems play in sustaining communities. • Organize outings to explore protected lands in your area • With that knowledge and firsthand experience, be an informed advocate for protected lands and conservation opportunities in your area. • Attend local hearings on these issues and participate in the discussion. • Respond to television and newspaper coverage of these issues. • Investigate whether the Community Preservation Act is appropriate for your community as a way to save land. • Support environmental organizations, conservation initiatives and land trusts with your time and financial support.

Three Corridors

- 1999 Protected Lands
- Developed Land
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- Water

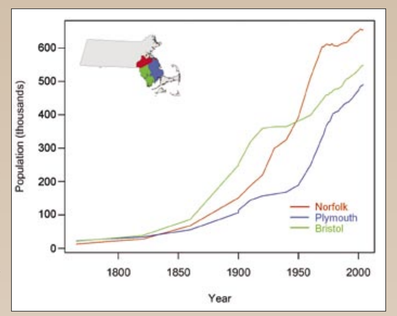
Since 1971, about 40 percent of the agricultural lands in the region have been lost, and the area of residential, industrial, and commercial properties have increased by more than 60 percent. Research indicates that these trends will continue as land is developed typically at three times the rate of population growth. Hot spots of new development and changes in traditional land use practices over the past 30 years have been focused around popular coastal areas, highway corridors, and major transportation nodes. Many of these regions in Southeastern Massachusetts may, in fact, become completely developed within the next few decades.

The three areas in Southeastern Massachusetts illustrated here do not demarcate any specific boundaries, but merely focus on three general areas of interest with similar characteristics.

Population Changes

This graph shows population trends for Norfolk, Bristol and Plymouth counties. A simple measure of how the character of the land is changing is population density, or how many people, on average, live per unit of land. Not only does the character of the land change when population density increases, it is well documented that water quality and natural ecosystems suffer greatly with increased human presence.

The average population density for Massachusetts is about 250 persons/km^2. Currently, the population density of Bristol, Plymouth, and Norfolk counties are about 375, 280, and 620 persons/km^2 respectively. Some define rural as towns with less than 100 persons/km^2. If so, most of the towns of Southeastern Massachusetts that were rural are now gone. Others define urban to be towns with more than 300 persons/km^2. Consequently, the number of urban areas in Southeastern Massachusetts has grown while the largest change is an increase in suburban towns (100 to 300 persons/km^2). Former urban areas are being outpaced in terms of growth by former rural and suburban towns.

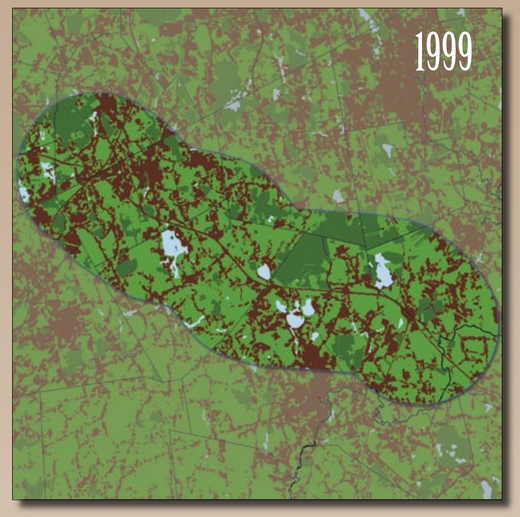


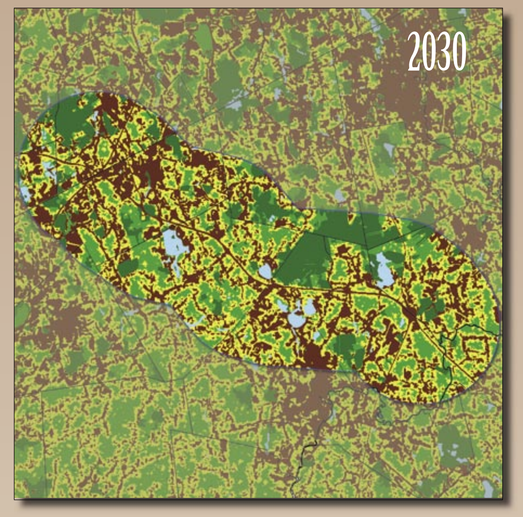
The South Shore

The communities of the South Shore face east towards Cape Cod Bay, and, traditionally, a large portion of the population works in greater Boston. As roads and rail links improve, more and more commuters from further south in the region will commute to Boston. This is also an area of expensive coastal homes and is projected to be an area of high growth, threatening remaining pine barrens and coastal pond ecosystems. Plymouth, for instance, is expected to double its current population of about 50,000 to 100,000. Some of the typical towns of the region are Scituate, Marshfield, Duxbury, Kingston, Plymouth, Norwell and Pembroke.

The 495 Corridor

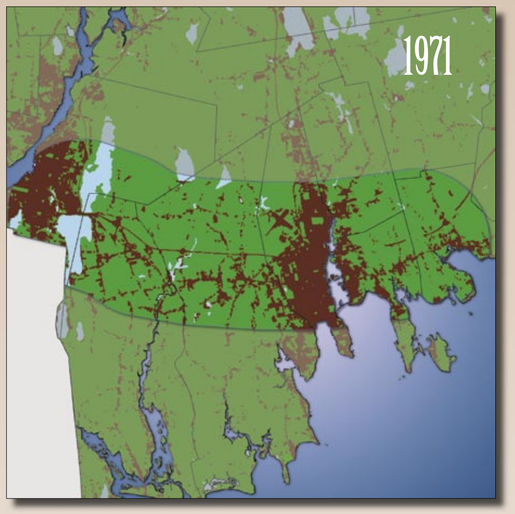
This part of Southeastern Massachusetts includes most of the interior towns and cities in the northern portion of the region. Many of these communities have been bisected by Routes I-495 and 24. Some cities, including Taunton and Brockton, have a long manufacturing history but are only recently experiencing high growth, due largely to the construction of I-495, the renovation and expansion of commuter rail lines into the region, and their relatively close proximity to Boston. Typical towns of this region include Attleboro, Norton, Taunton, Raynham, Middleboro and the Bridgewaters.

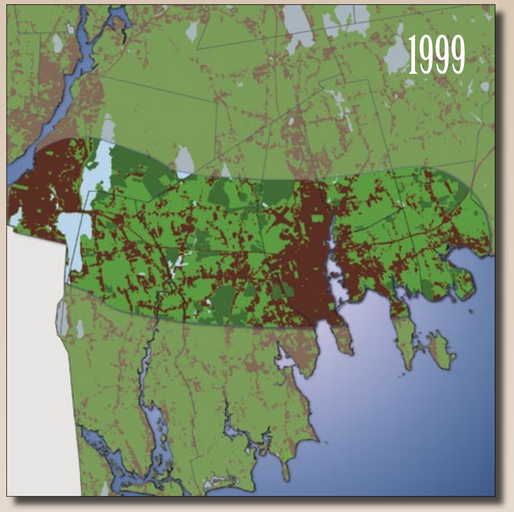


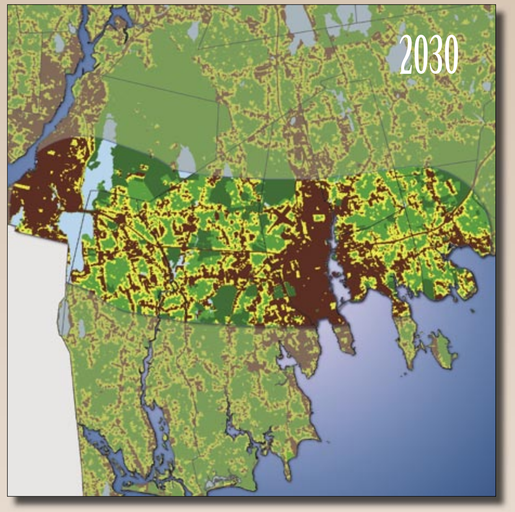


The South Coast

A relatively new term, "South Coast" refers to the region along the I-195 corridor that connects Providence, Fall River, and New Bedford to Cape Cod. Historically, the region has been highly industrial with fishing playing a large part in its economy. Even today, the city of New Bedford has over 300 fishing vessels and, in terms of dollar value landed, is the top port on the East Coast. The region has a widespread and impressive Portuguese heritage, and more recently is attracting immigrants from Cape Verde and Brazil. Other smaller towns in the region include Wareham, Marion, Mattapoisett, Freetown, Acushnet, Dartmouth, Westport, Swansea, and Seekonk.







Acknowledgments and References

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Modeling:

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Land Cover Data:

MacConnell Land Use / Land Cover data. Developed at MassGIS by the Massachusetts Executive Office of Environmental Affairs. Available online at: http://www.state.ma.us/mgis/massgis.htm

Ancillary GIS data:

Massachusetts Geographic Information System http://www.mass.gov/mgis/massgis.htm

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