

Local Foodshed Analysis For the Boston Urban Area

Research Question

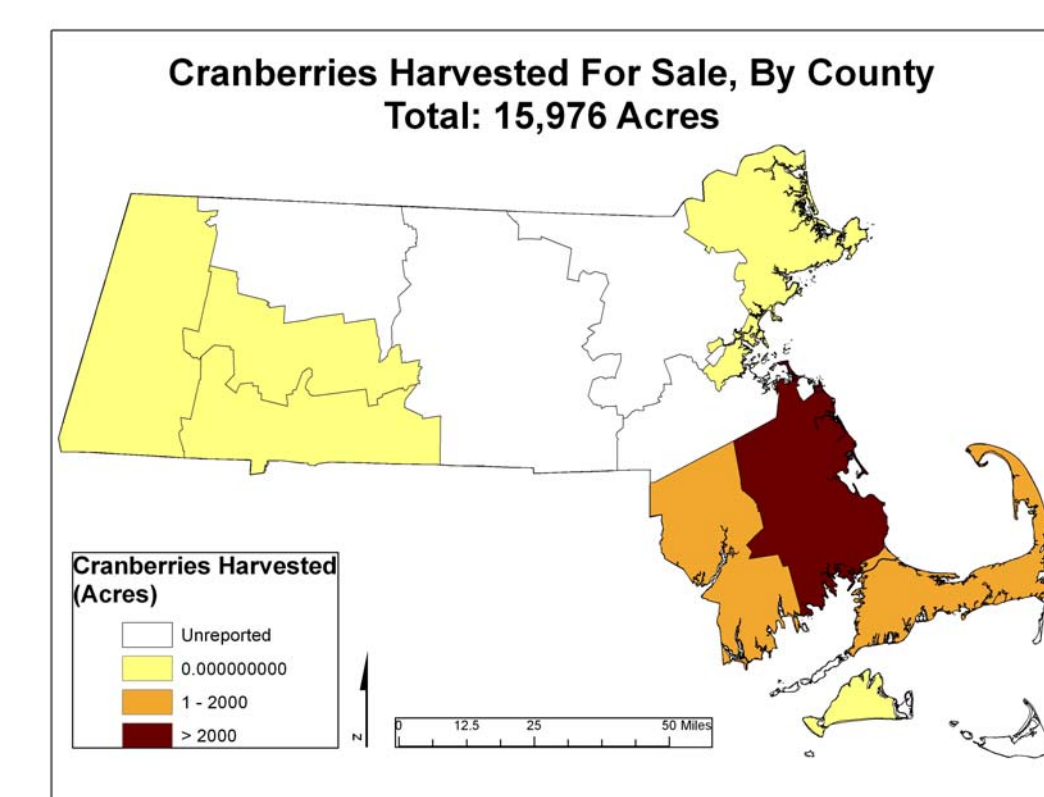
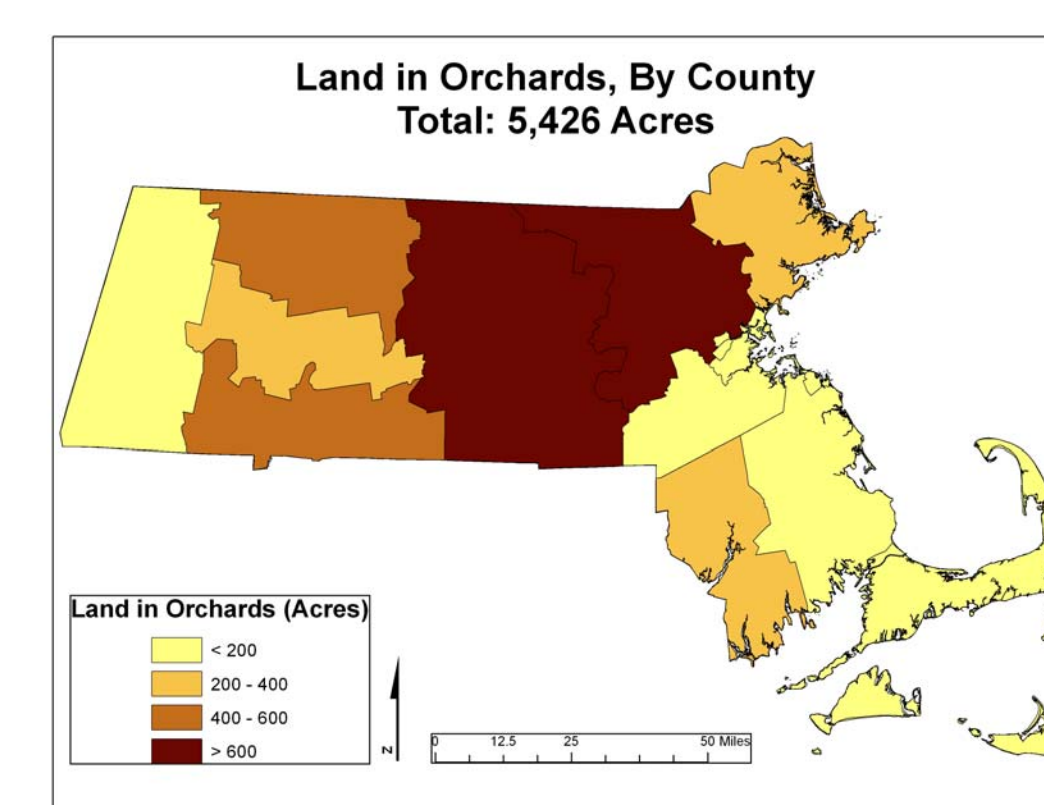
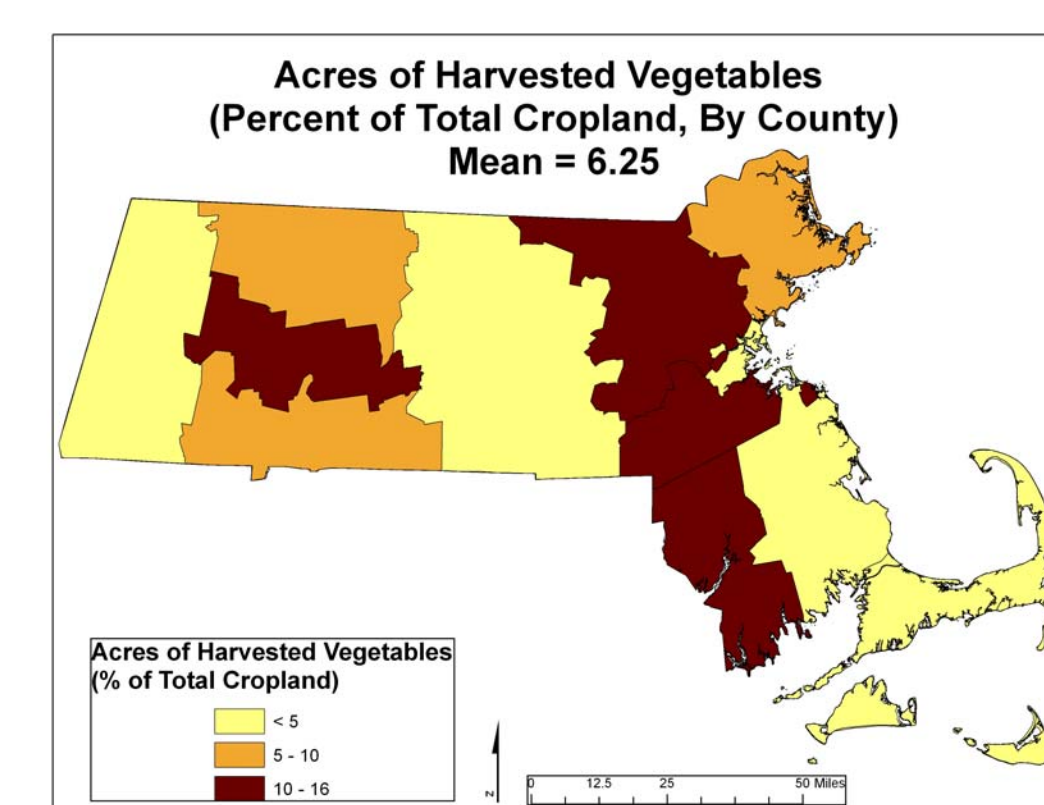
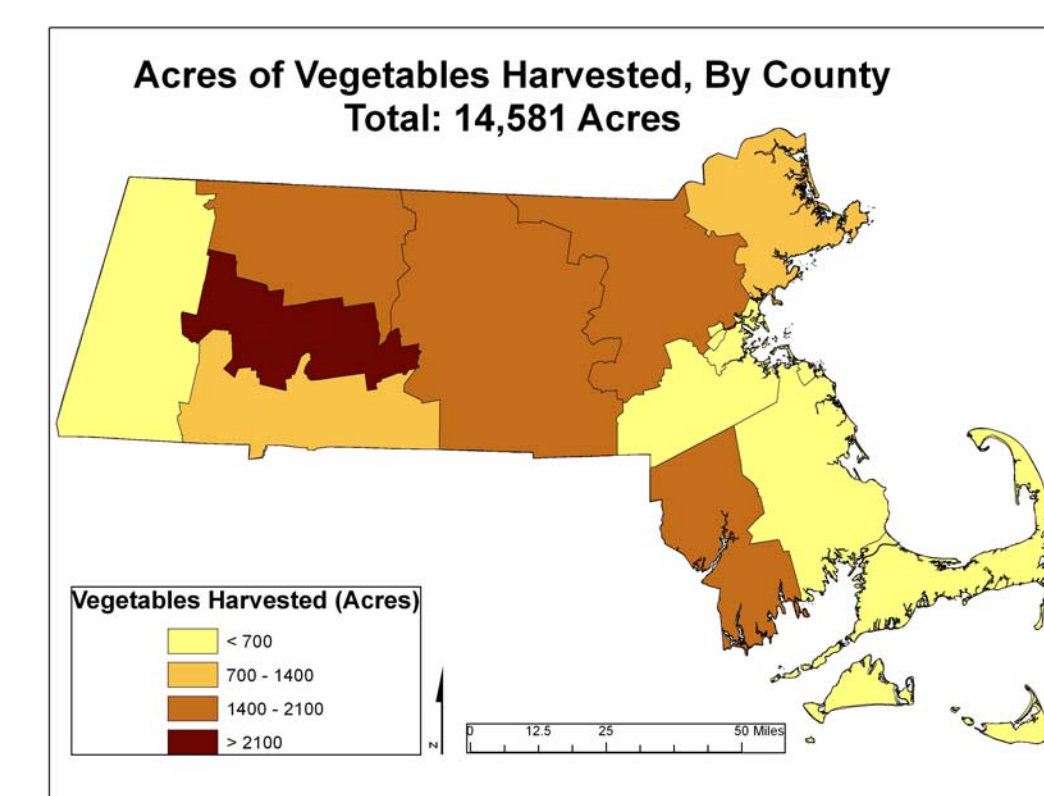
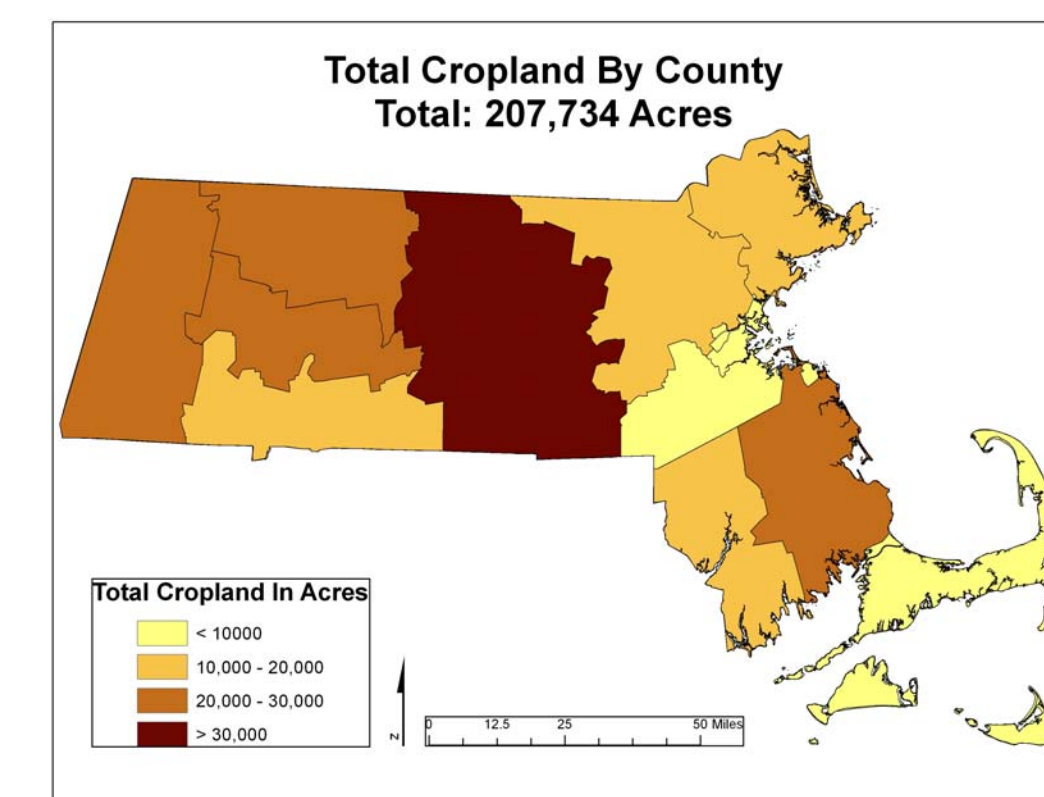
What proportion of the Boston urban area's fruit and vegetable needs can be met through local production, given current consumption and land use?

Local Foods: A Growing Movement

Growing public awareness about the environmental impacts of food production and transport, interest in supporting local economies, and concern about the means of food production have given rise to efforts to build local food systems to minimize the distance that food travels. At the same time, rising incidences of diet-related health conditions, such as obesity and diabetes, reinforce the importance of fruit and vegetable consumption. The goal of this project is to map potential local foodsheds for the Boston area, focusing on fresh

Data

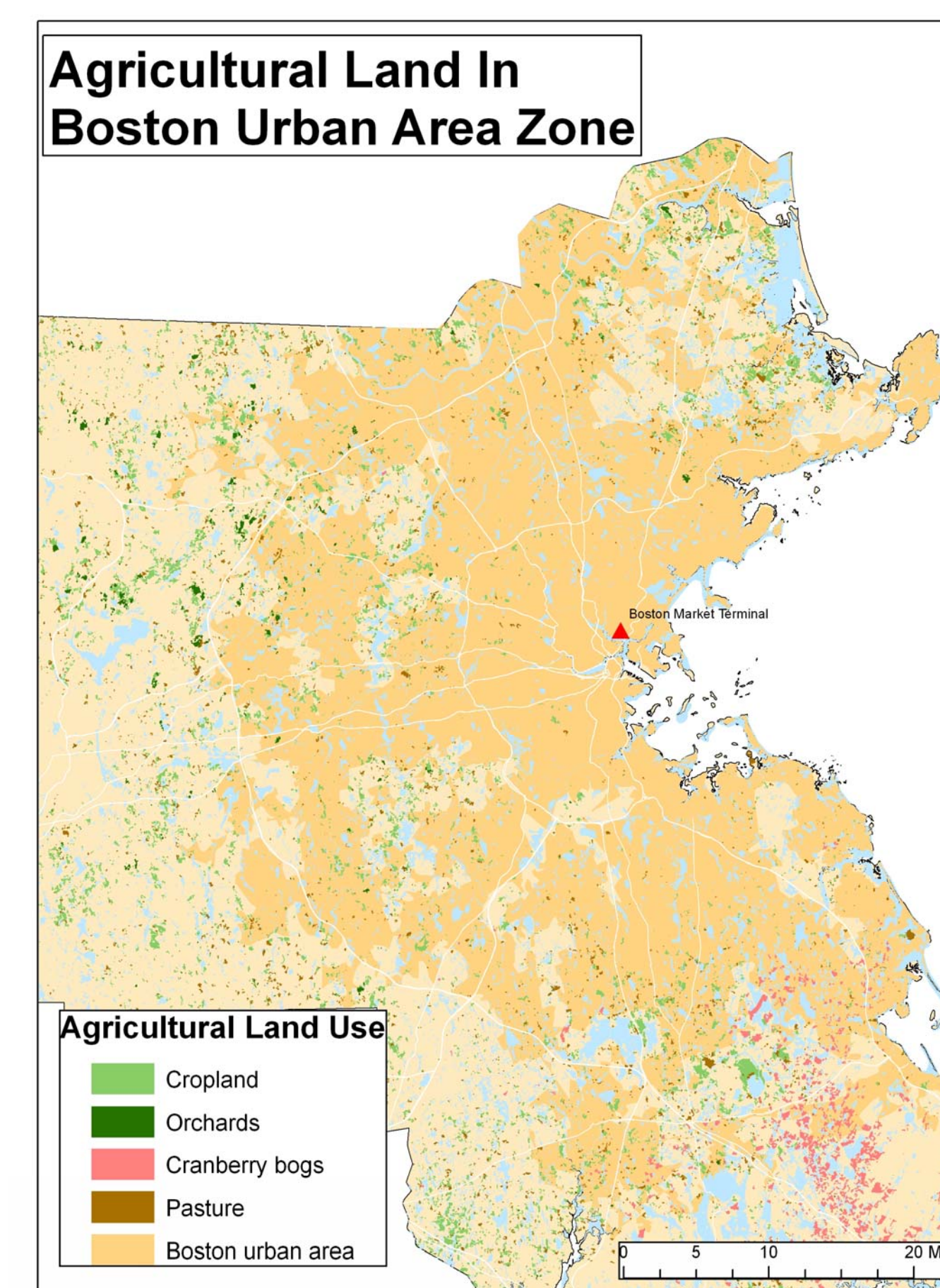
This project integrates cropland acreage and yield data from the 2002 US Census of Agriculture and New England Agricultural Statistics, MassGIS's 1999 37-class land use data layer, population data for the 2000 US Census's defined Boston "urban area", major highway routes from the Executive Office of Transportation, and per capita fruit and vegetable consumption data from Iowa State University.



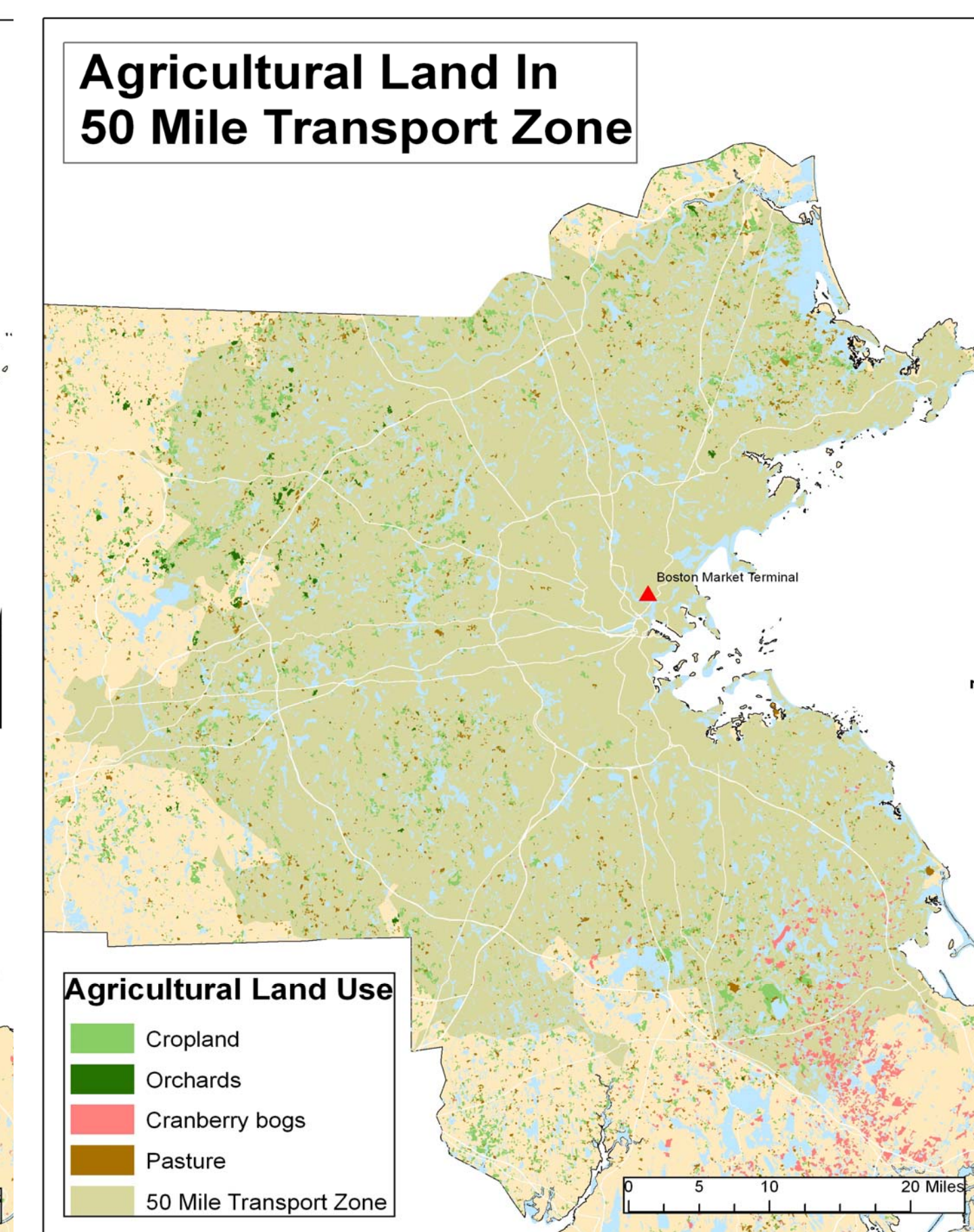
Cartography: Sabrina Wu, 2009
Data source: MassGIS 2008 and 2002 US Census of Agriculture
Coordinate System: NAD 1983 State Plane Massachusetts Mainland

Methods

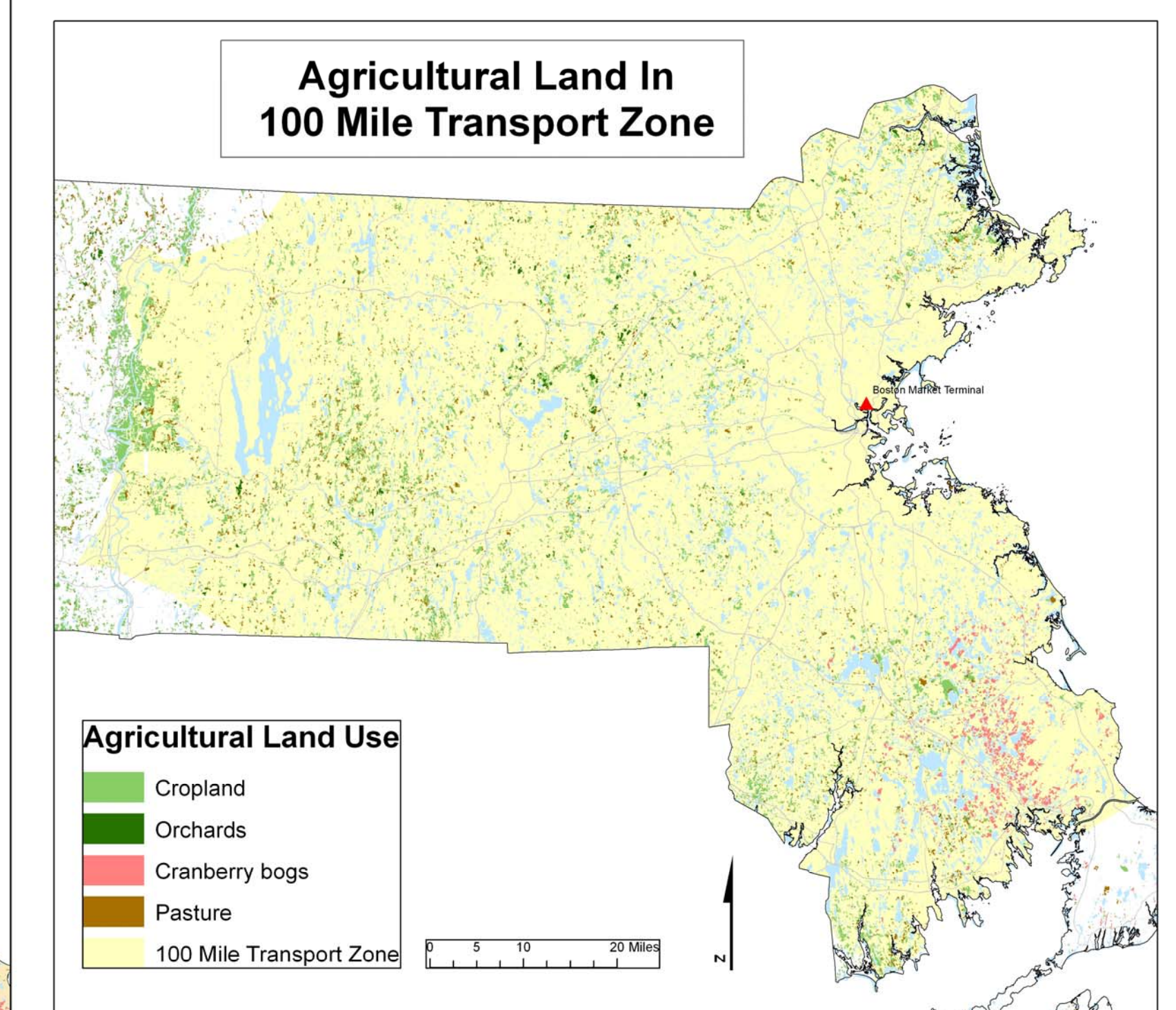
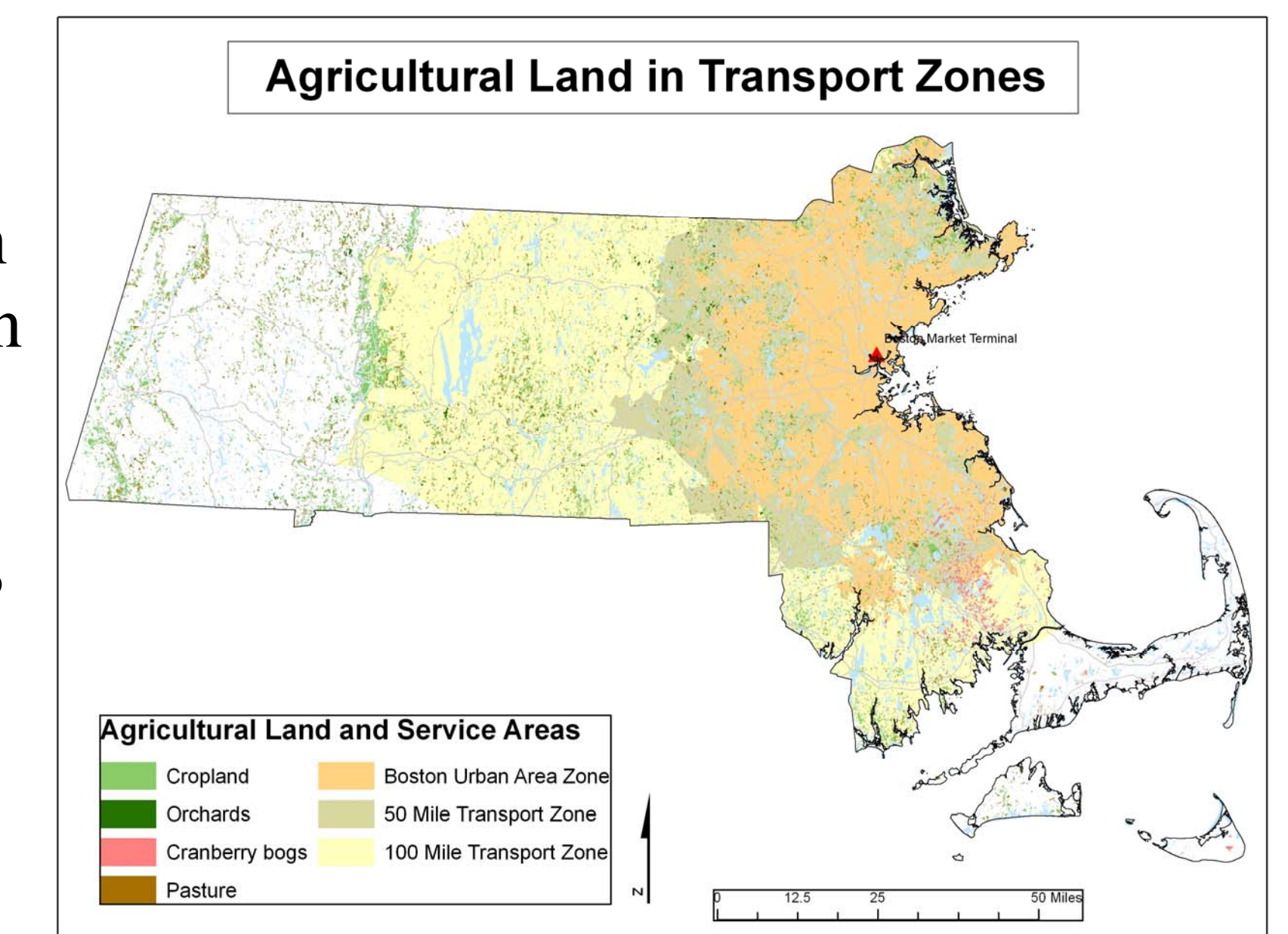
Network Analyst was used to define 50 and 100 mile transport zones (service areas) from a geocoded point—Boston Market Terminal in Everett, MA, the primary fruit and vegetable wholesale market in New England. The transport zones were clipped to Massachusetts' boundary in keeping with a goal of local food systems—supporting local economies, in this case, Massachusetts agriculture. Acreage of cropland, orchard, and cranberry bogs were calculated within three transport zones—Boston urban area, 50 miles, and 100 miles. Acreage was compared to the 2002 US Census of Agriculture to verify accuracy. Because cropland is not disaggregated by crop type, US Census of Agriculture data were used to calculate acres of vegetables harvested as proportion of total cropland for each county; the mean—6.25%—was multiplied by total cropland acreage in each transport zone to estimate acreage of vegetables harvested.



Consumption needs met:
100% Cranberry
6% Fruits
84% Fresh Vegetables



Consumption needs met:
100% Cranberry
41% Fruits
100% Fresh Vegetables



Consumption needs met:
100% Cranberry
19% Fruits
100% Fresh Vegetables

5 year yield averages (2004-2008) for major MA crops were calculated and summed within 3 categories: 1. Cranberries, 2. Orchard fruits, and 3. Vegetables and melons. For each category, land requirements were estimated: $\text{Per Capita Consumption}_c \times \text{Population} / \text{Yield per acre}$. Population is the total population of Boston urban area (4,014,685). Due to seasonal constraints, only a fraction of fruits and vegetables consumed in Massachusetts can be grown in the state. I used crop-specific consumption data to estimate the P_c , the percentage of each category consumed that are grown in Massachusetts. The proportion of the Boston urban area's fruit and vegetable needs that are met by agricultural production in each transport zone was estimated: $P_c \times (\text{Acreage}_{cz} / \text{Land requirements}_c)$, where c=category and z=transport zone.

Tufts

