500 Cities Project:

Local Data for Better Health

2014

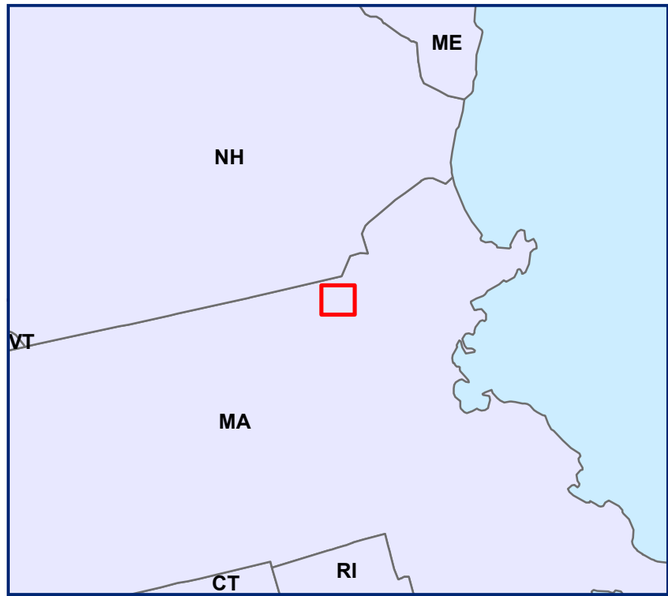
Lowell, MA

Robert Wood Johnson Foundation

CDC FOUNDATION
Helping CDC Do More, Faster

Author: CDC/NCCDPHP/DPH/ESB-GIS

Date: 7/13/2016



Introduction

The 500 Cities Project—Local Data for Better Health—is a collaboration among the Robert Wood Johnson Foundation, the CDC Foundation, and the Centers for Disease Control and Prevention (CDC), whose purpose is to provide high quality small area estimates for behavioral risk factors that influence health status, for health outcomes, and the use of clinical preventive services. These estimates can be used to identify emerging health problems and to develop and implement of effective, targeted public health prevention activities.

Data Sources

Data was obtained from the CDC Behavioral Risk Factor Surveillance System (BRFSS) 2013, 2014, the Census Bureau 2010 census population data, American Community Survey 2009-2013 and 2010-2014 estimates, and Esri ArcGIS Online basemaps.

Methodology

CDC used small area estimation (SAE) methodology called multilevel regression and poststratification (MRP) that links geocoded health surveys and high spatial resolution population demographic and socioeconomic data to produce local level health related estimates. This approach also accounts for the associations between individual health outcomes, individual characteristics, and spatial contexts and factors at multiple levels (e.g., state, county), the approach also predicts individual disease risk and health behaviors in a multilevel modeling framework and estimates the geographic distributions of population disease burden and health behaviors at city and census tract level.

Further information on the small area estimation methodology can be obtained from

- Multilevel Regression and Poststratification for Small-Area Estimation of Population Health Outcomes: A Case Study of Chronic Obstructive Pulmonary Disease Prevalence Using the Behavioral Risk Factor Surveillance System [PDF-5.53MB]
- Validation of Multilevel Regression and Poststratification Methodology for Small Area Estimation of Health Indicators from the Behavioral Risk Factor Surveillance System

Limitations

All data presented in this map book are model-based estimates that reflect the statistically expected prevalence of each measure. These small area estimates tend to have narrow confidence ranges and may underestimate some areas with high prevalence or overestimate some areas with low prevalence. Because the small area model cannot detect effects because of local interventions, users are cautioned against using these estimates for program or policy evaluations.

Project Website

For more information please refer to http://www.cdc.gov/500cities/.

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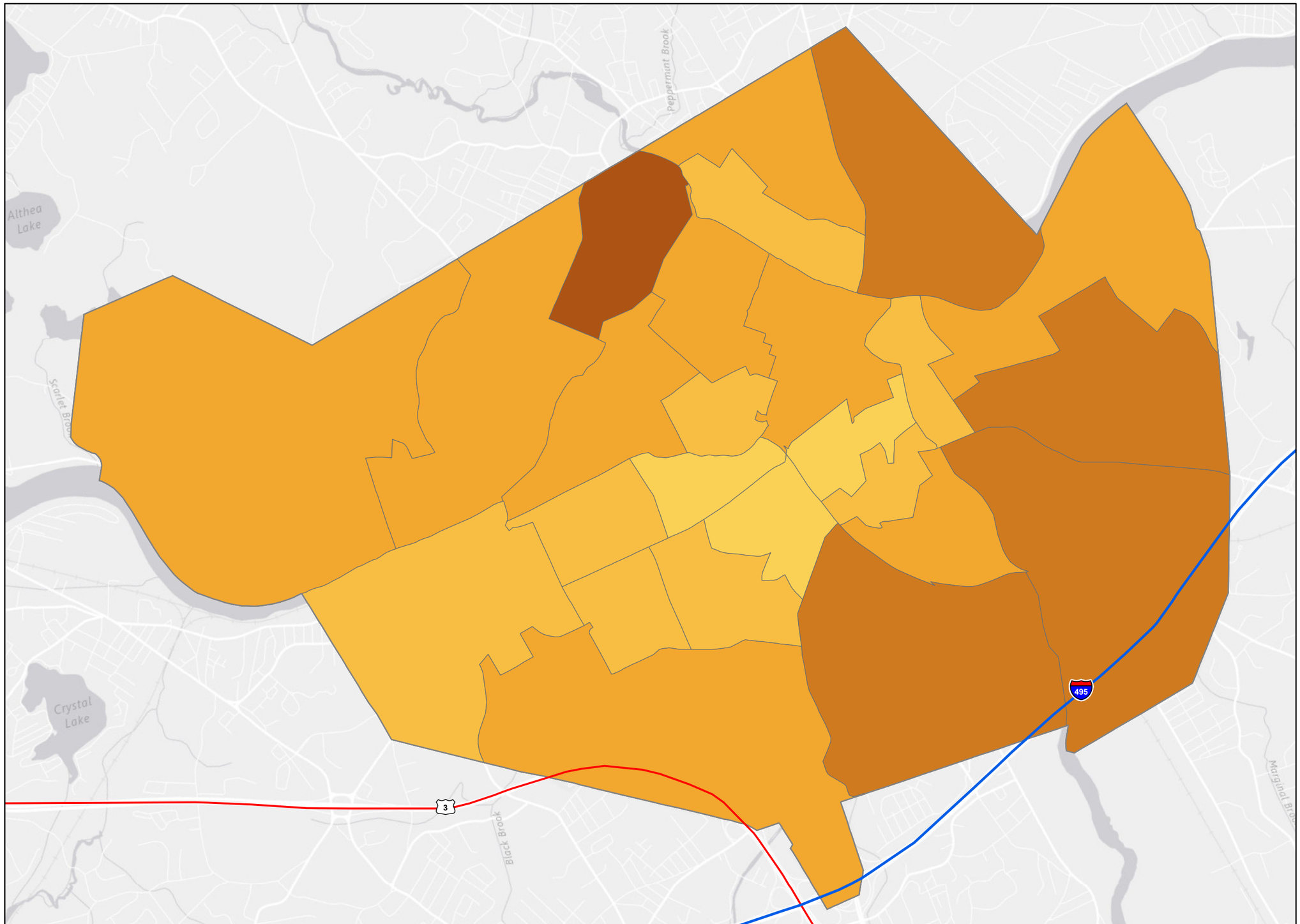
Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Population Health, Epidemiology and Surveillance Branch (CDC/NCCDPHP/DPH/ESB).

October 12, 2016

Measure	Crude			Age-Adjusted			State Age-Adjusted	US Age-Adjusted
	Prevalence	Low 95% CI	High 95% CI	Prevalence	Low 95% CI	High 95% CI	Prevalence	Prevalence
Lowell MA								
Binge drinking prevalence among adults aged >=18 years	**17.1**	17.0	17.2	**16.1**	16.0	16.2	**18.4**	**16.8**
Current smoking among adults aged >=18 years	**20.2**	19.6	20.8	**19.9**	19.3	20.4	**14.9**	**17.7**
No leisure-time physical activity among adults aged >=18 years	**27.1**	26.6	27.6	**27.8**	27.3	28.3	**19.7**	**23.3**
Obesity among adults aged >=18 years	**26.0**	25.7	26.2	**26.7**	26.5	26.9	**23.0**	**28.7**
Sleeping less than 7 hours among adults aged >=18 years	**38.7**	38.4	39.0	**38.6**	38.3	38.9	**34.3**	**35.1**
Arthritis among adults aged >=18 years	**23.5**	23.2	23.7	**25.6**	25.4	25.8	**25.3**	**23.5**
Current asthma prevalence among adults aged >=18 years	**12.2**	12.1	12.4	**12.1**	12.0	12.3	**12.0**	**8.8**
High blood pressure among adults aged >=18 years	**26.4**	26.2	26.6	**28.6**	28.4	28.8	**27.5**	**30.2**
High cholesterol among adults aged >=18 years who have been screened in the past 5 years	**33.3**	33.1	33.6	**32.0**	31.9	32.2	**32.6**	**33.2**
Cancer among adults aged >=18 years	**5.5**	5.5	5.6	**6.3**	6.2	6.3	**6.8**	**5.9**
Diagnosed diabetes among adults aged >=18 years	**9.8**	9.7	9.9	**10.8**	10.6	10.9	**8.9**	**9.4**
Chronic kidney disease among adults aged >=18 years	**2.7**	2.6	2.7	**2.9**	2.8	2.9	**2.9**	**2.6**
Chronic obstructive pulmonary disease among adults aged >=18 years	**7.0**	6.8	7.2	**7.5**	7.3	7.7	**6.1**	**6.1**
Coronary heart disease among adults aged >=18 years	**5.6**	5.5	5.7	**6.3**	6.2	6.4	**5.6**	**6.0**
Stroke among adults aged >=18 years	**2.6**	2.6	2.7	**2.9**	2.8	3.0	**2.4**	**2.8**
Mental health not good for >=14 days among adults aged >=18 years	**14.6**	14.3	14.9	**14.3**	14.0	14.6	**12.1**	**11.5**
Physical health not good for >=14 days among adults aged >=18 years	**13.0**	12.7	13.2	**13.5**	13.3	13.8	**10.2**	**11.6**
All teeth lost among adults aged >=65 years	**23.0**	21.4	24.7	**22.7**	21.0	24.3	**14.7**	**15.4**
Current lack of health insurance among adults aged 18-64 years	**12.7**	12.2	13.1	**11.6**	11.2	11.9	**5.4**	**14.9**
Visits to doctor for routine checkup within the past year among adults aged >=18 years	**73.1**	72.9	73.3	**74.1**	74.0	74.3	**77.2**	**68.7**
Visits to dentist or dental clinic among adults aged >=18 years	**60.0**	59.2	60.7	**60.2**	59.5	60.9	**74.6**	**64.1**
Taking medicine for high blood pressure control among adults aged >=18 years with high blood pressure	**71.6**	71.3	71.8	**57.3**	57.1	57.5	**55.1**	**58.2**
Cholesterol screening among adults aged >=18 years	**77.0**	76.5	77.5	**79.6**	79.2	79.9	**82.6**	**74.8**
Mammography use among women aged 50-74 years	**83.7**	83.2	84.3	**84.0**	83.4	84.5	**87.9**	**75.5**
Papanicolaou smear use among adult women aged 21-65 years	**80.4**	79.9	80.8	**81.0**	80.5	81.4	**87.9**	**81.1**
Fecal occult blood test, sigmoidoscopy, or colonoscopy among adults aged 50-75 years	**63.0**	62.2	63.7	**65.0**	64.3	65.7	**72.5**	**64.0**
Up to date on a core set of clinical preventive services (flu shot past year, pneumococcal shot ever, colorectal cancer screening) among men aged >=65 years	**31.6**	30.5	32.6	**29.5**	28.4	30.6	**29.4**	**32.9**
Up to date on a core set of clinical preventive services (same as men plus mammogram past 2 years) among women aged >=65 years	**32.7**	31.6	33.7	**27.4**	26.4	28.4	**29.8**	**30.7**

Unhealthy Behaviors

Binge drinking prevalence among adults aged ≥18 years by census tract, Lowell, MA, 2014



Percent (%)

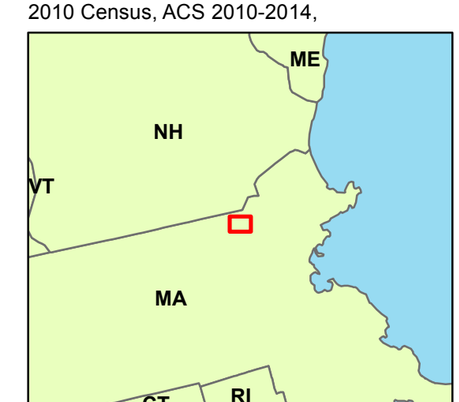
- 12.8 - 14.7
- 14.8 - 16.5
- 16.6 - 18.3
- 18.4 - 20.5
- 20.6 - 24.3
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.

0 0.5 1
Miles

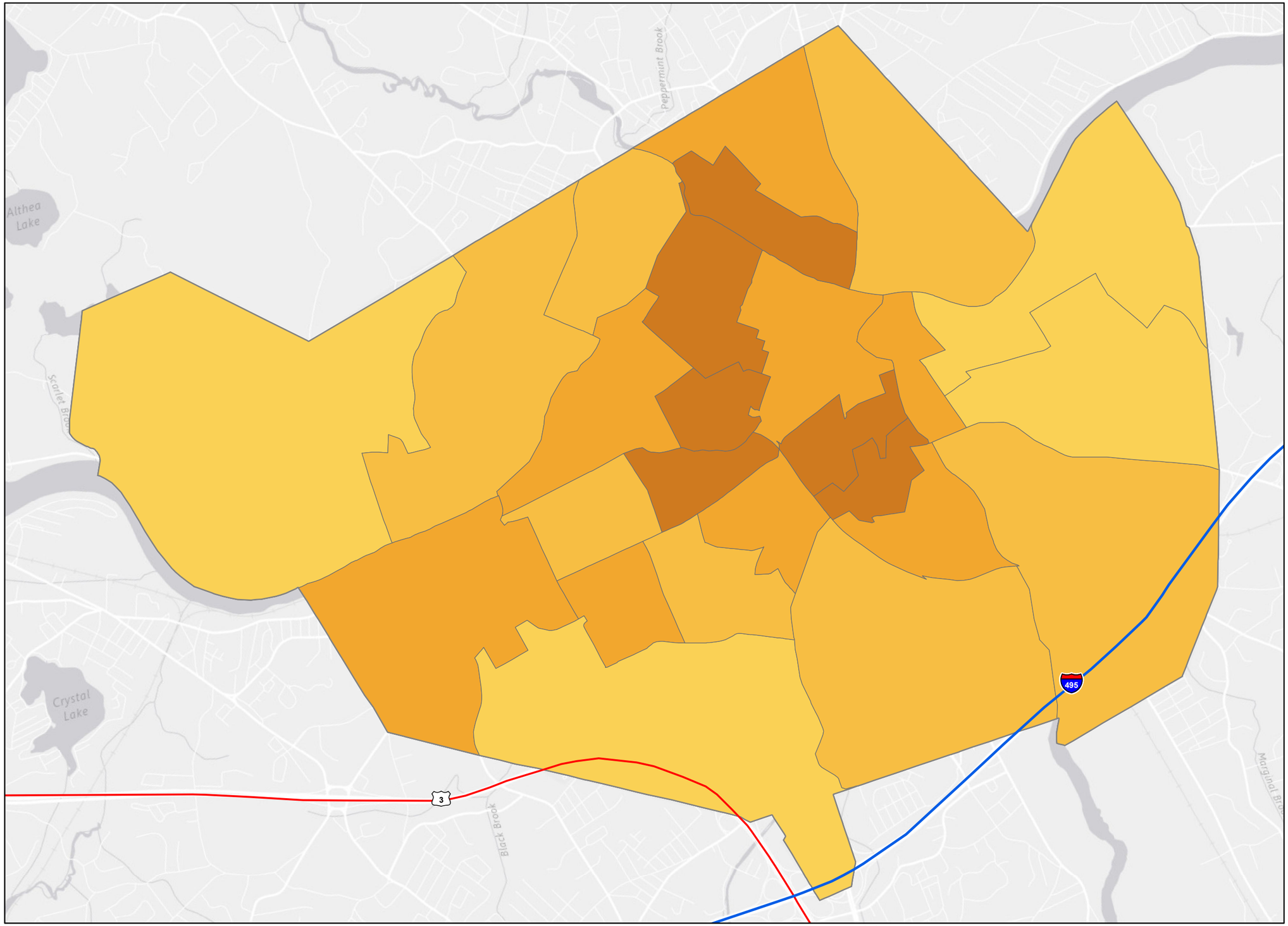
Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,



Map created by CDC/NCCDPHP/DPH/ESB-GIS

Date: 3/14/2016

Current smoking among adults aged ≥18 years by census tract, Lowell, MA, 2014



Percent (%)

- 14.5 - 17.3
- 17.4 - 20.2
- 20.3 - 23.2
- 23.3 - 26.5
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

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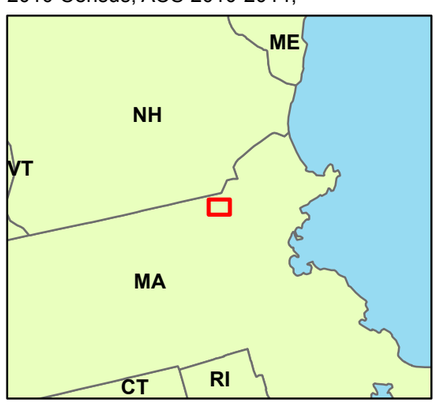
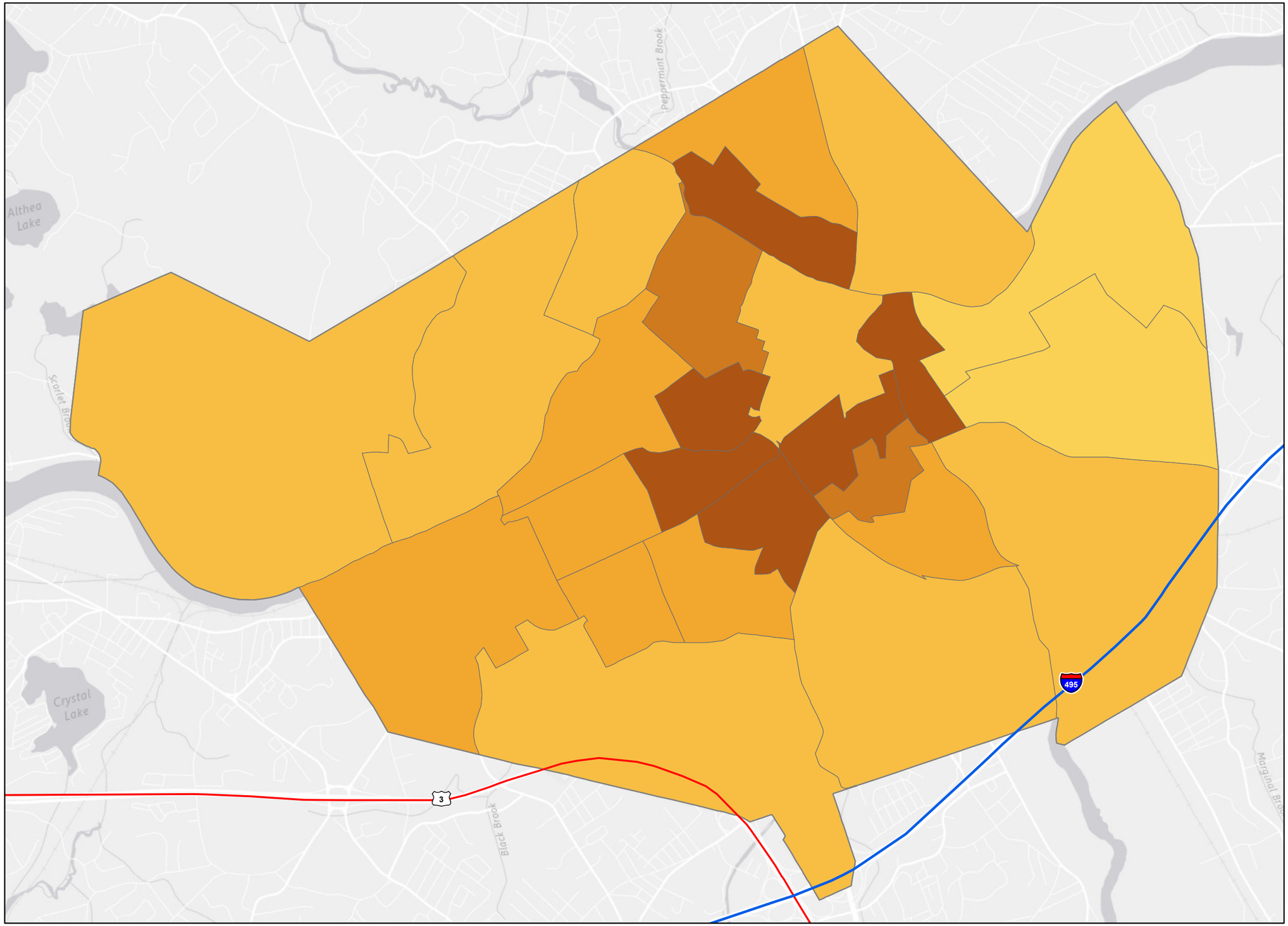
Miles

Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,



No leisure-time physical activity among adults aged ≥18 years by census tract, Lowell, MA, 2014



Percent (%)

- 18.5 - 22.0
- 22.1 - 25.7
- 25.8 - 29.5
- 29.6 - 33.4
- 33.5 - 37.4
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from map.

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Data sources:
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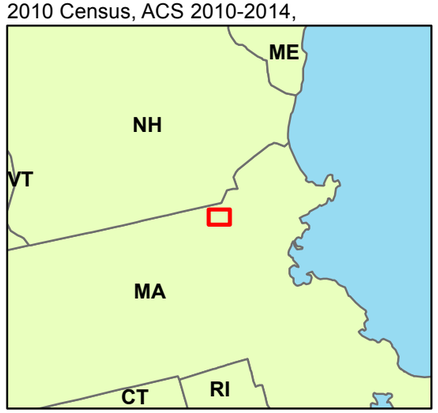
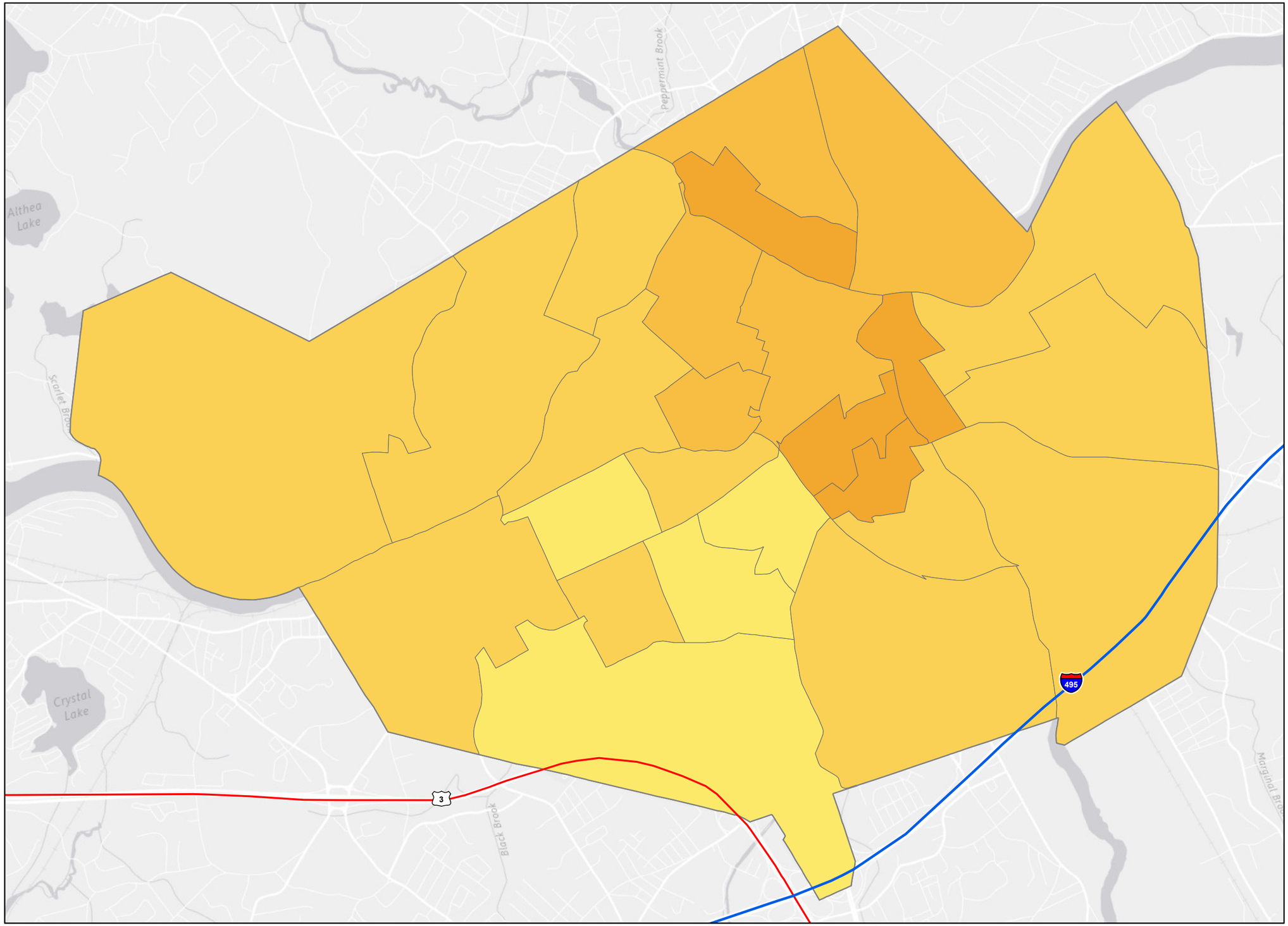


Obesity among adults aged ≥18 years by census tract, Lowell, MA, 2014



Percent (%)

- 19.0 - 22.8
- 22.9 - 26.3
- 26.4 - 29.7
- 29.8 - 33.3
- City boundary

Classification:
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Census tracts with population less than 50 were excluded from map.

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Miles

Data sources:
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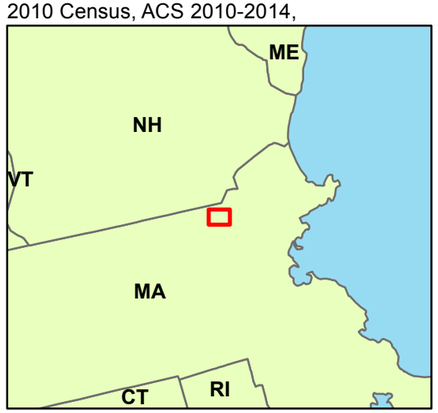
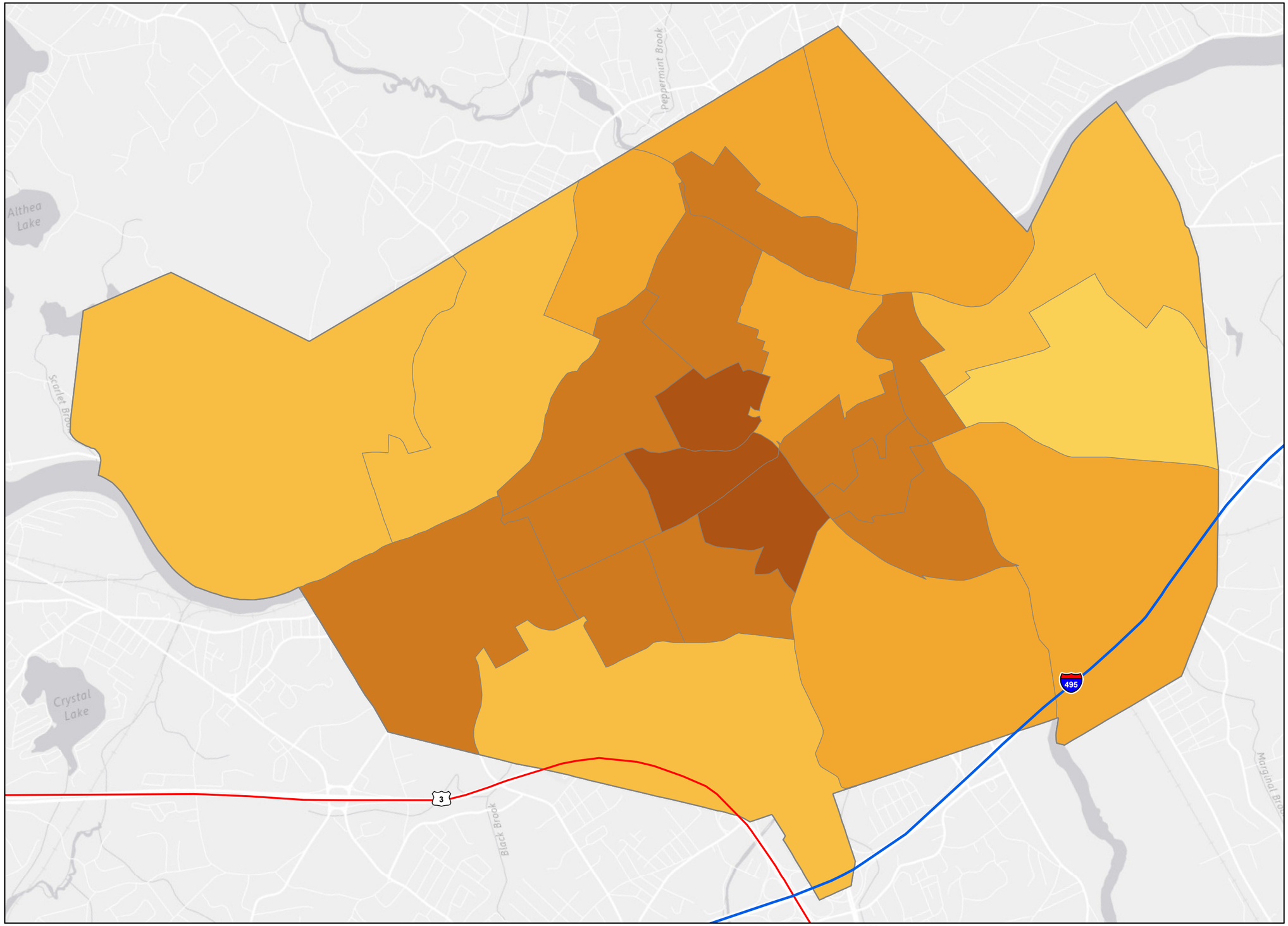


Sleeping less than 7 hours among adults aged ≥18 years by census tract, Lowell, MA, 2014



Percent (%)

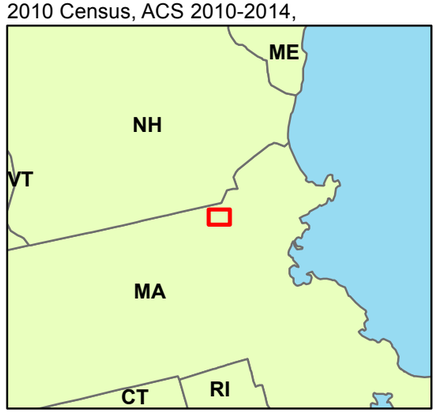
- 30.9 - 33.6
- 33.7 - 36.3
- 36.4 - 39.0
- 39.1 - 42.1
- 42.2 - 45.6
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from map.

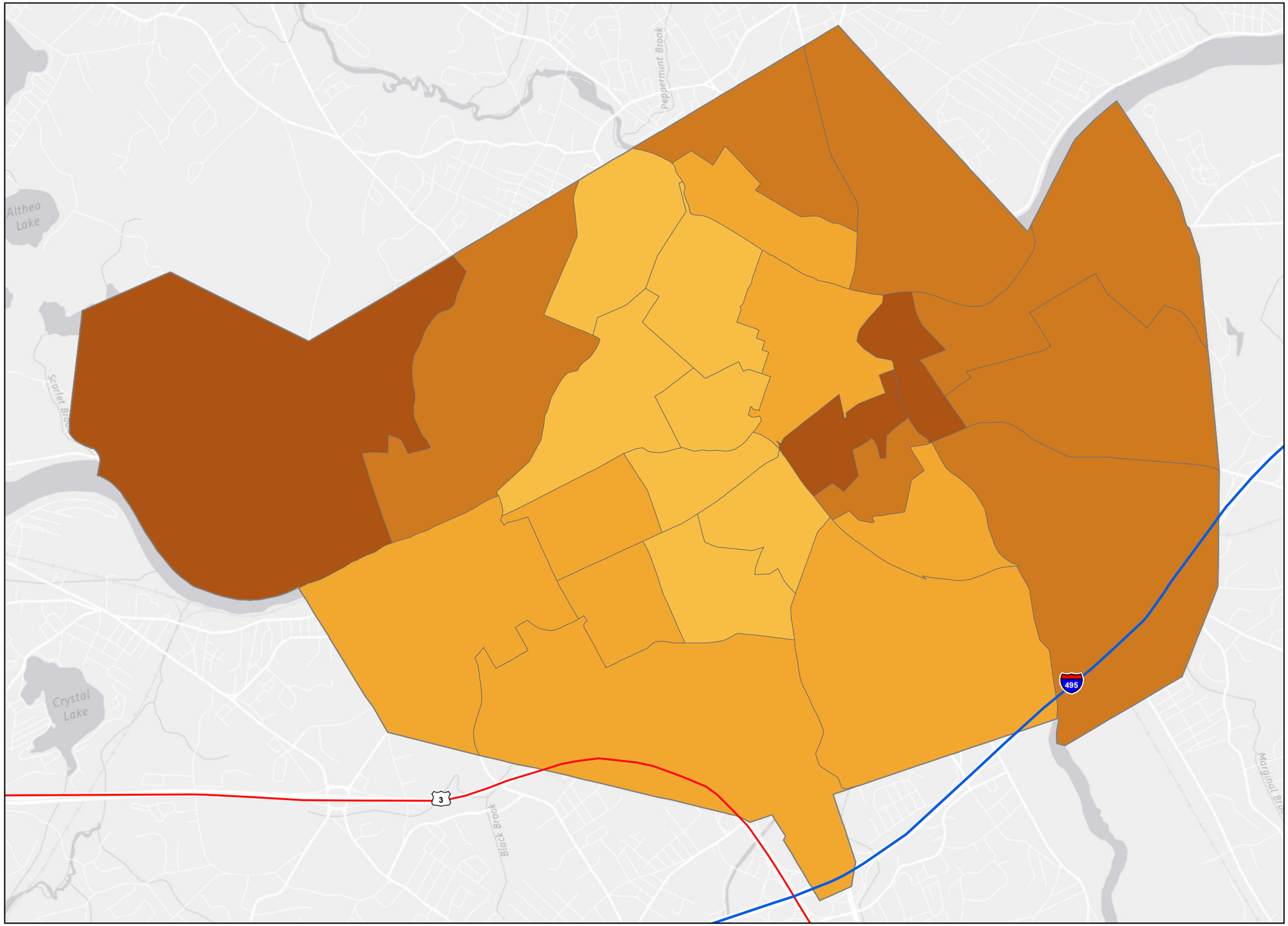
0 0.5 1
Miles

Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,



Health Outcomes

Arthritis among adults aged 18-64 years by census tract, Lowell, MA, 2014



Percent (%)

- 18.5 - 21.2
- 21.3 - 24.2
- 24.3 - 27.8
- 27.9 - 32.6
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.

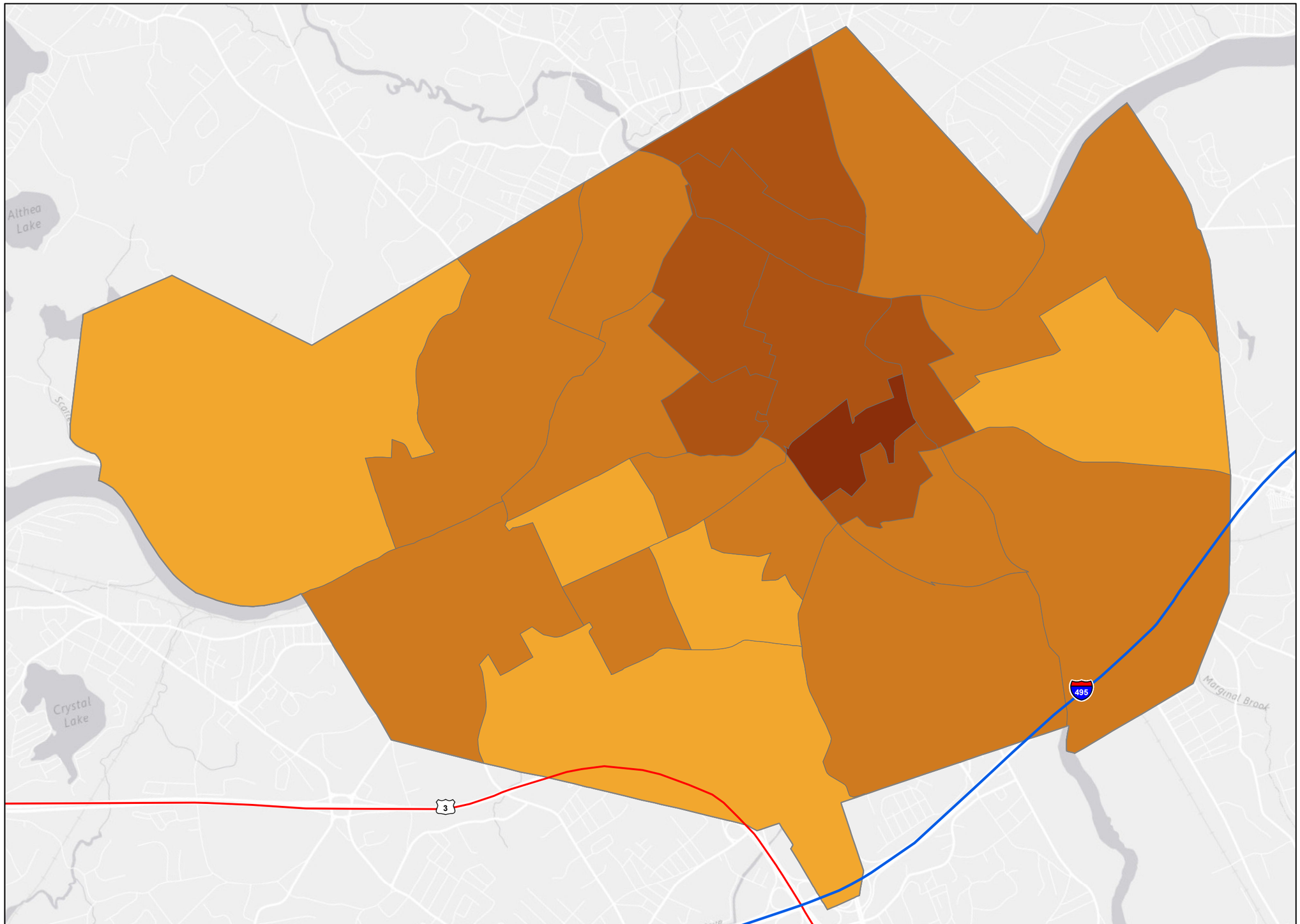
0 0.5 1
Miles

Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,

Map created by CDC/NCCDPHP/DPH/ESB-GIS

Date: 3/15/2016

Current asthma prevalence among adults aged ≥18 years by census tract, Lowell, MA, 2014



Percent (%)

- 10.6 - 11.6
- 11.7 - 12.7
- 12.8 - 13.9
- 14.0 - 15.4
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.

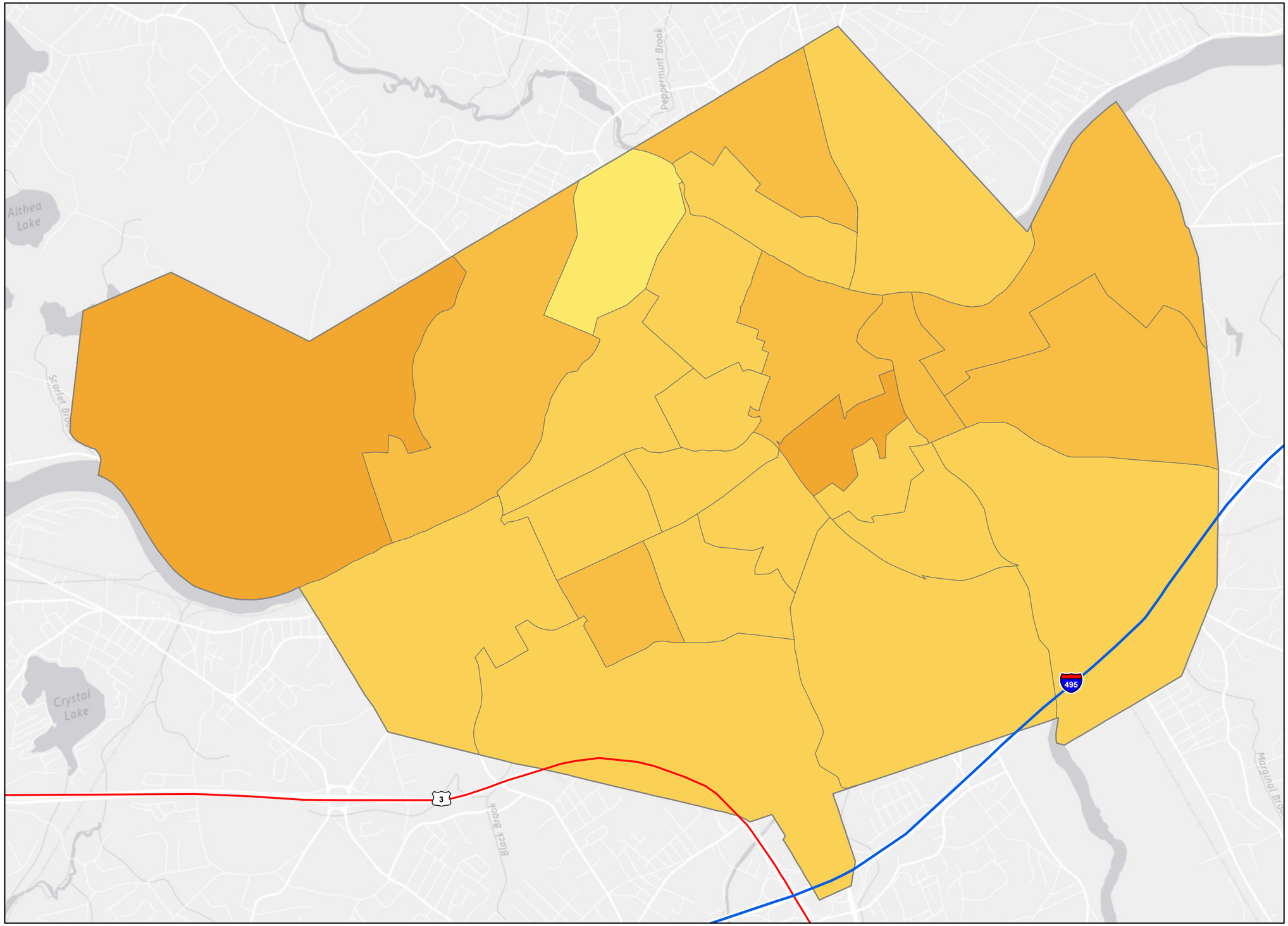
0 0.5 1
Miles

Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,

Map created by CDC/NCCDPHP/DPH/ESB-GIS

Date: 10/14/2016

High blood pressure among adults aged ≥18 years by census tract, Lowell, MA, 2013



Percent (%)

- 17.7 - 23.1
- 23.2 - 26.9
- 27.0 - 30.4
- 30.5 - 34.1
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.

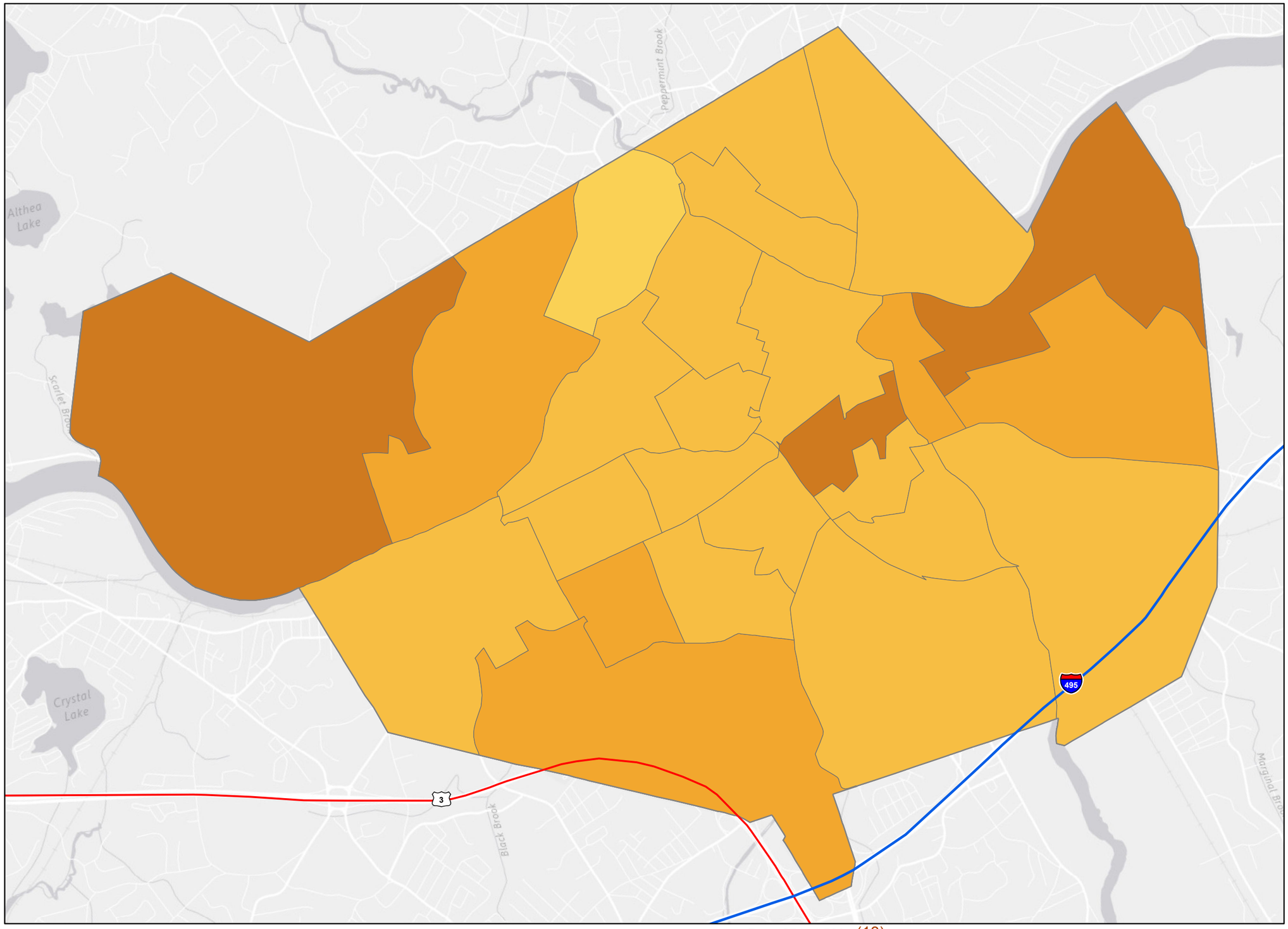
0 0.5 1
Miles

Data sources:
CDC BRFSS 2013, US Census Bureau 2010 Census, ACS 2009-2013.

Map created by CDC/NCCDPHP/DPH/ESB-GIS

Date: 4/1/2016

High cholesterol among adults aged ≥18 years who have been screened in the past five years by census tract, Lowell, MA, 2013



Percent (%)

- 26.8 - 30.8
- 30.9 - 33.7
- 33.8 - 36.2
- 36.3 - 38.6
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.

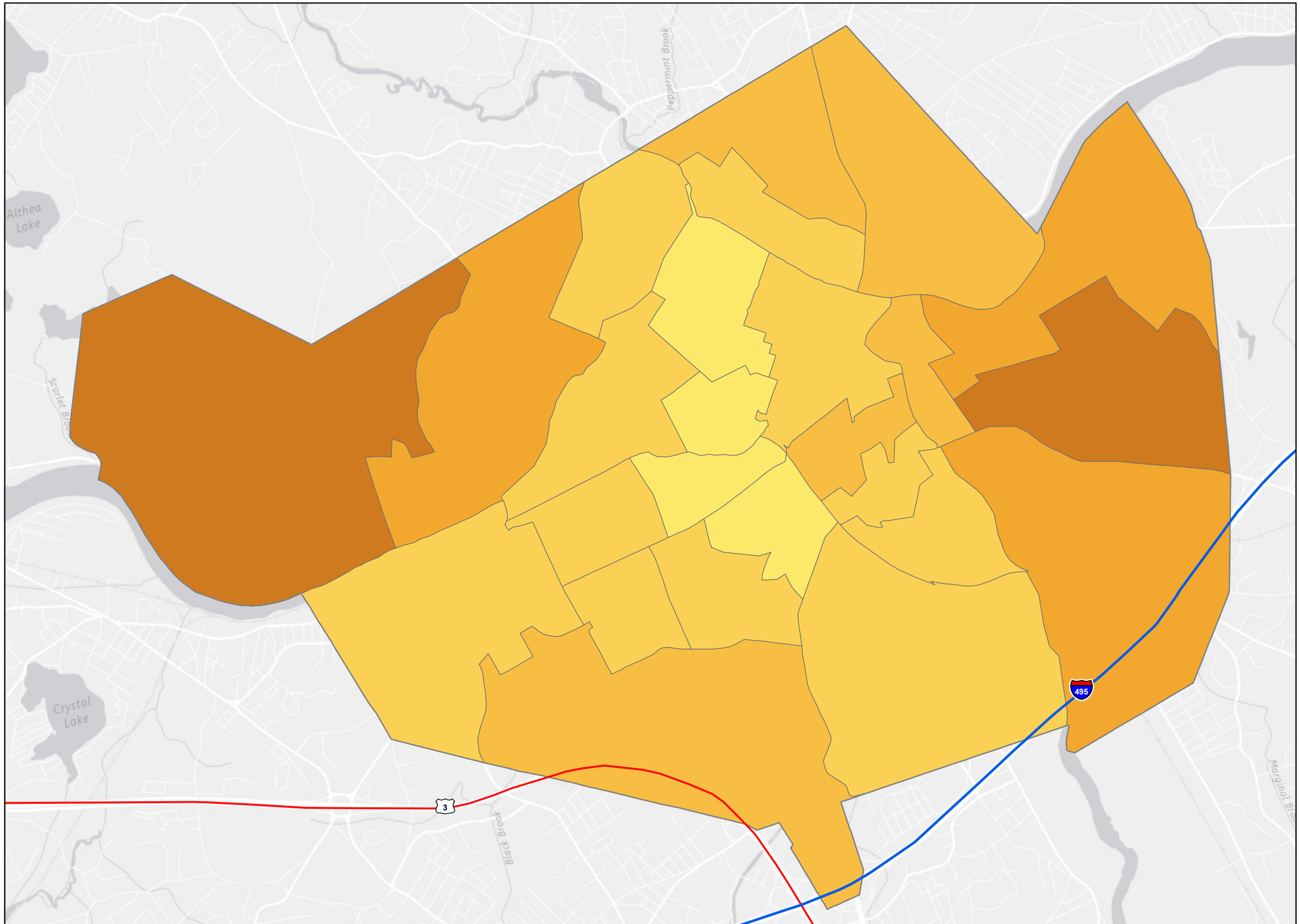
0 0.5 1
Miles

Data sources:
CDC BRFSS 2013, US Census Bureau 2010 Census, ACS 2009-2013.

Map created by CDC/NCCDPHP/DPH/ESB-GIS

Date: 5/2/2016

Cancer among adults aged 18-64 years by census tract, Lowell, MA, 2014



Percent (%)

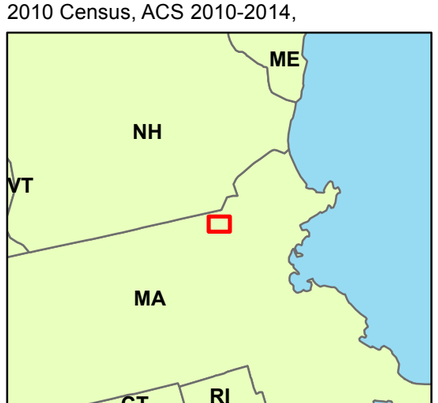
- 3.3 - 4.4
- 4.5 - 5.4
- 5.5 - 6.4
- 6.5 - 7.5
- 7.6 - 8.9
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

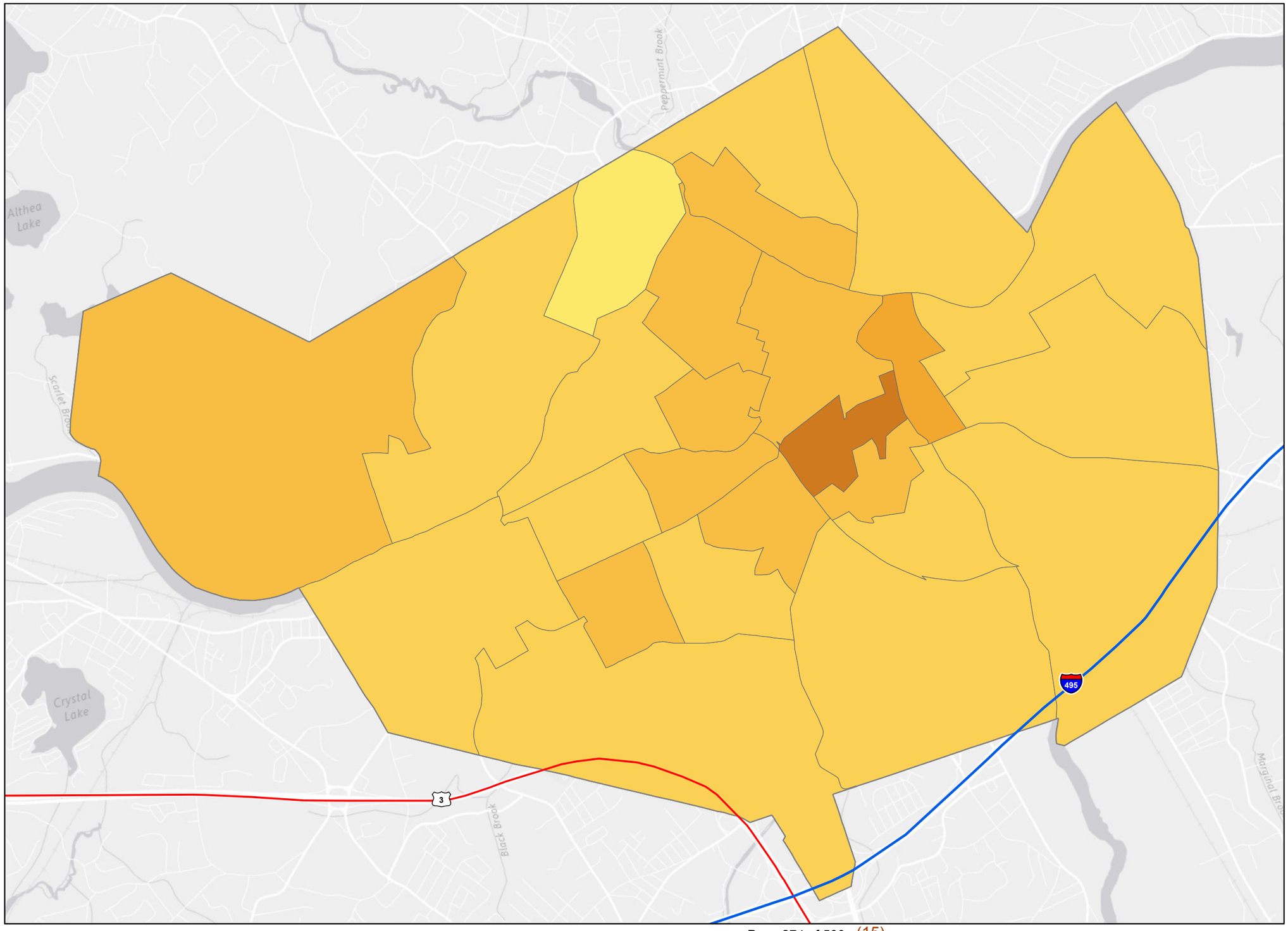
Census tracts with population less than 50 were excluded from the map.

0 0.5 1
Miles

Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,



Diagnosed diabetes among adults aged ≥18 years by census tract, Lowell, MA, 2014



Percent (%)

- 5.7 - 7.9
- 8.0 - 9.9
- 10.0 - 12.0
- 12.1 - 14.3
- 14.4 - 16.9
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.

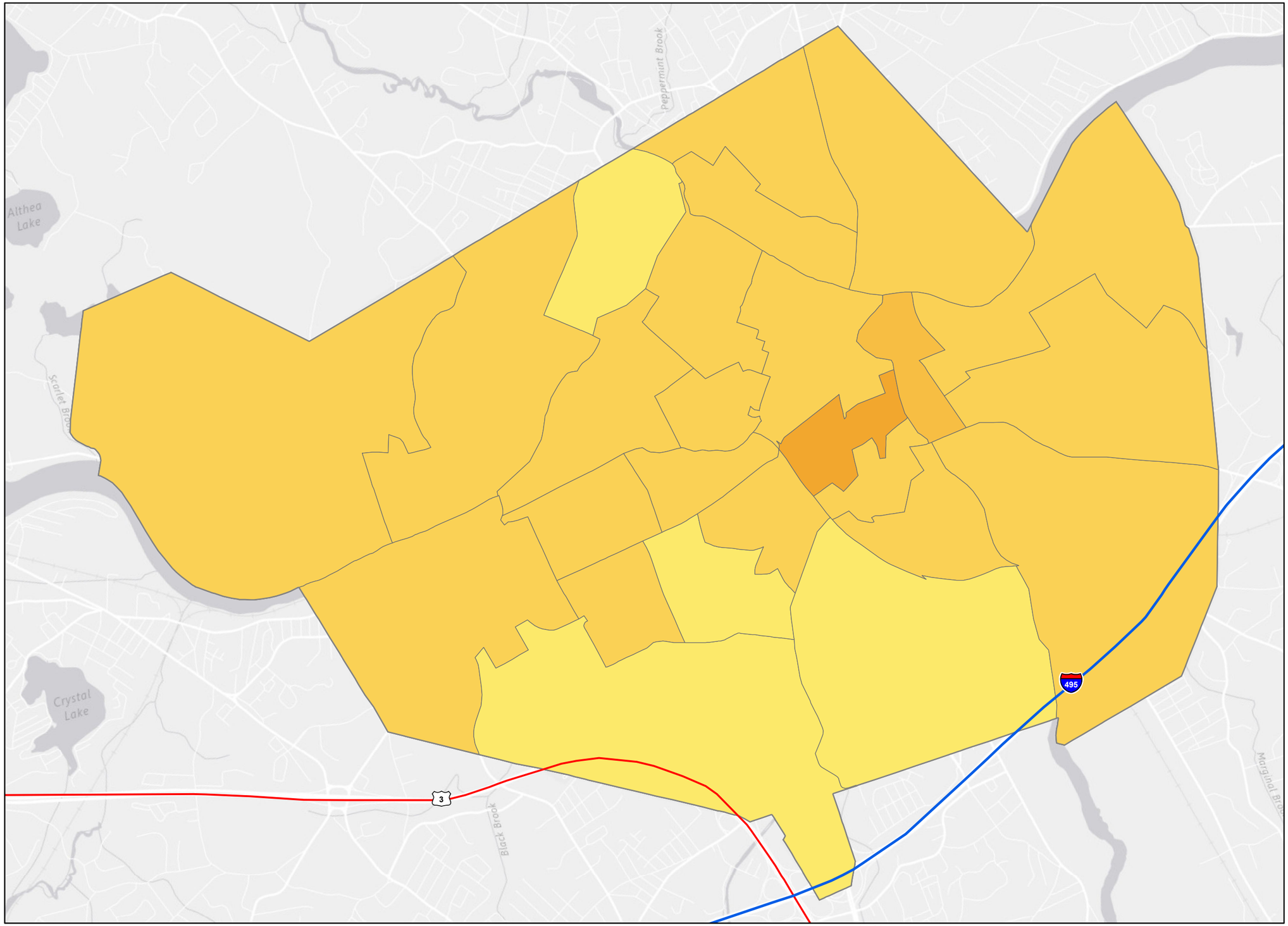
0 0.5 1
Miles

Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,

Map created by CDC/NCCDPHP/DPH/ESB-GIS

Date: 3/24/2016

Chronic kidney disease among adults aged ≥18 years by census tract, Lowell, MA, 2014



Percent (%)

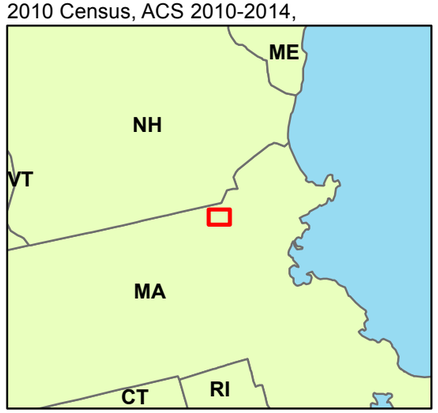
- 1.9 - 2.3
- 2.4 - 2.8
- 2.9 - 3.3
- 3.4 - 3.9
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from map.

0 0.5 1
Miles

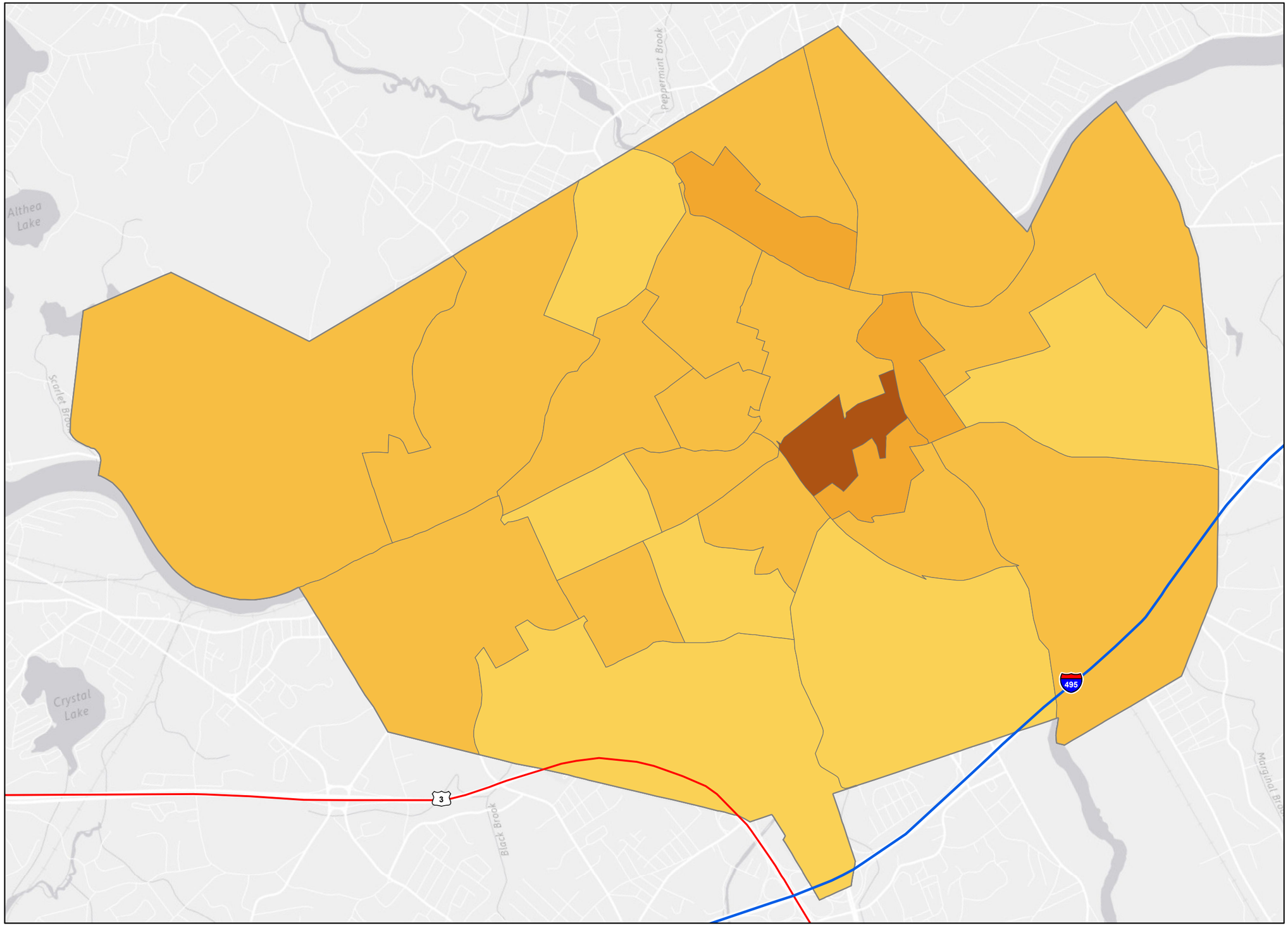
Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,



Map created by CDC/NCCDPHP/DPH/ESB-GIS

Date: 3/24/2016

Chronic obstructive pulmonary disease among adults aged ≥18 years by census tract, Lowell, MA, 2014



Percent (%)

- 5.3 - 6.4
- 6.5 - 7.8
- 7.9 - 9.3
- 11.0 - 12.8
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

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0 0.5 1
Miles

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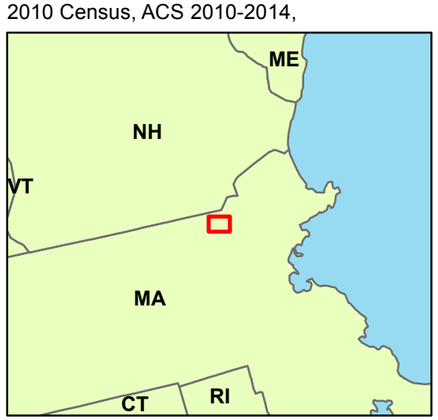
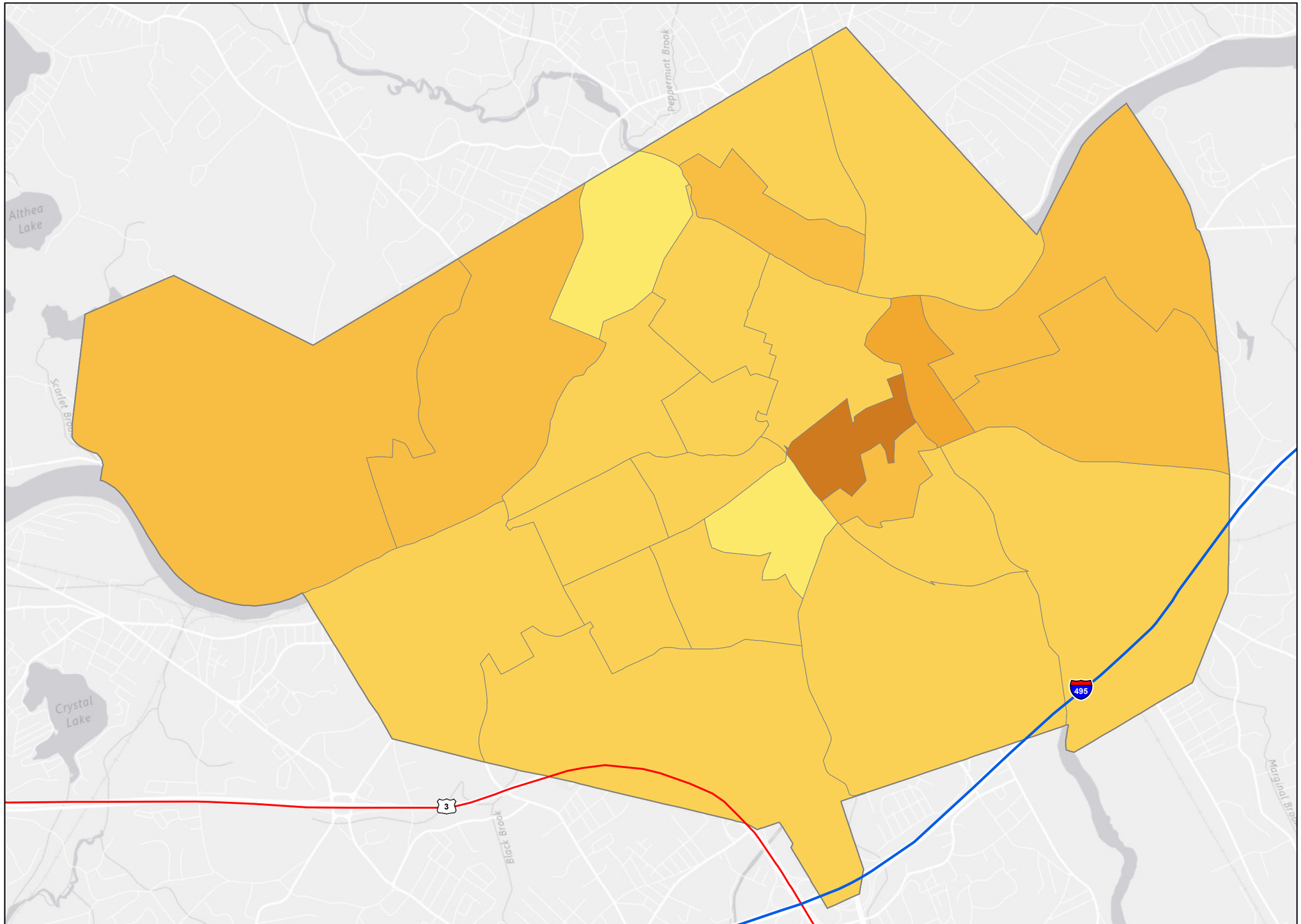


Coronary heart disease among adults aged 18-64 years by census tract, Lowell, MA, 2014



Percent (%)

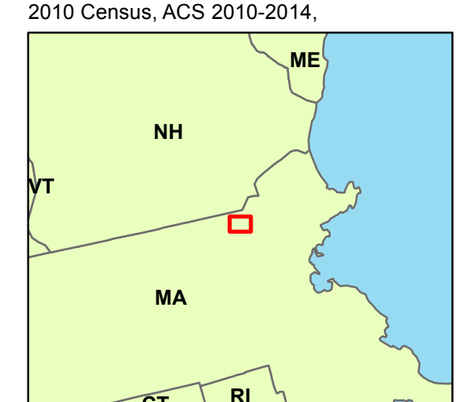
- 3.2 - 4.5
- 4.6 - 5.7
- 5.8 - 6.9
- 7.0 - 8.2
- 8.3 - 9.8
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.

0 0.5 1
Miles

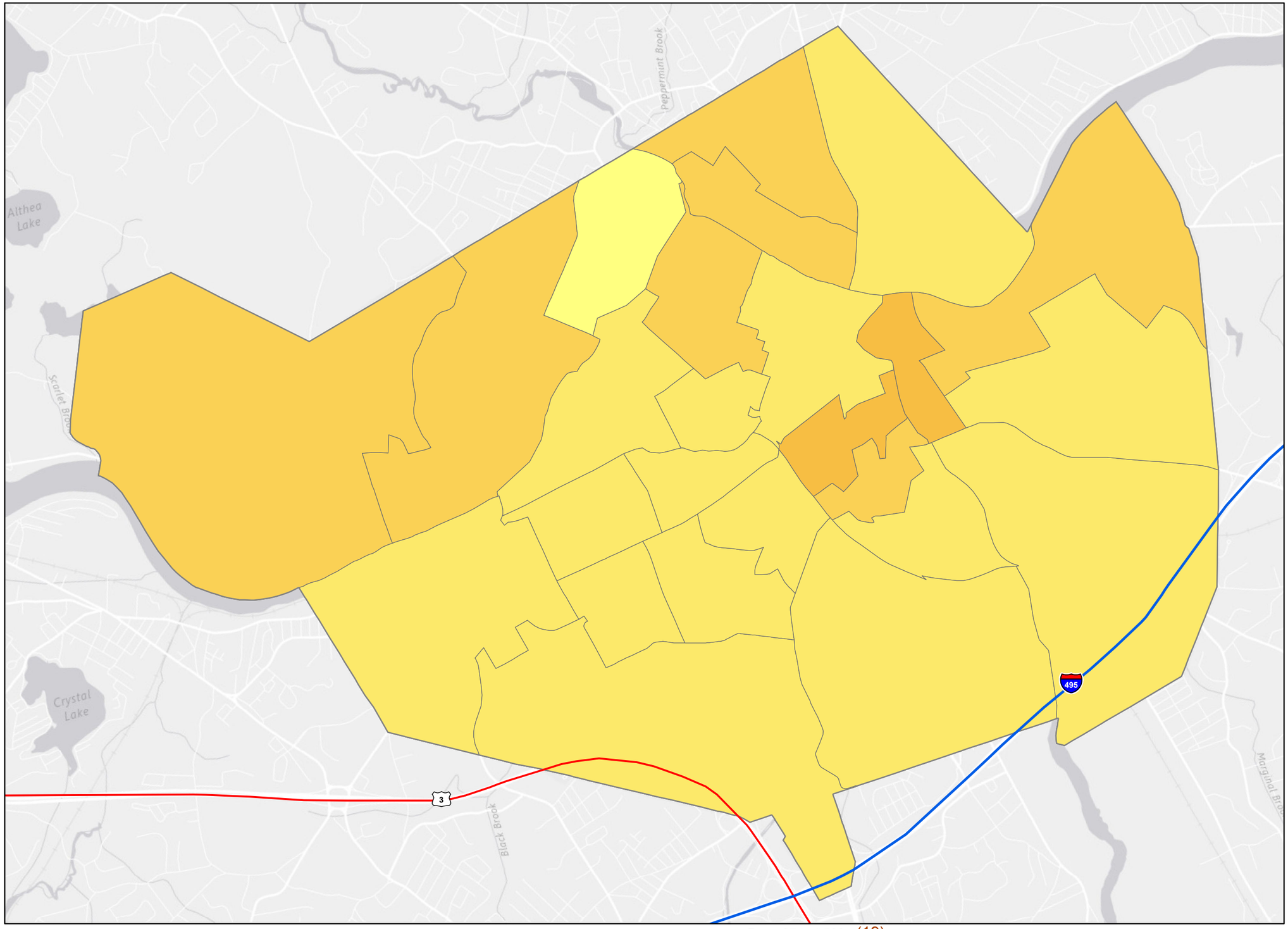
Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,



Map created by CDC/NCCDPHP/DPH/ESB-GIS

Date: 3/17/2016

Stroke among adults aged ≥18 years by census tract, Lowell, MA, 2014



Percent (%)

- 0.3 - 1.9
- 2.0 - 2.6
- 2.7 - 3.4
- 3.5 - 4.3
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from map.

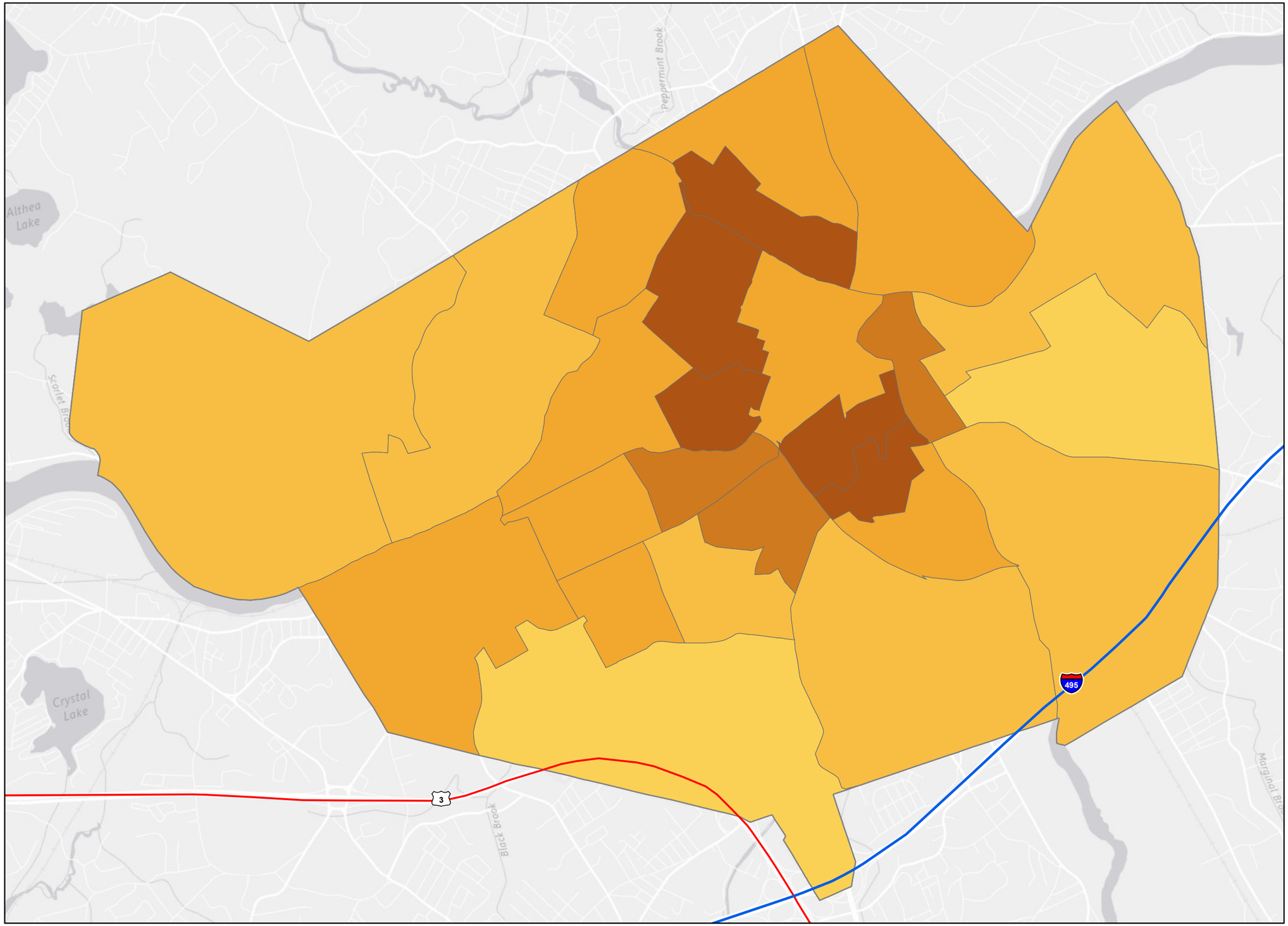
0 0.5 1
Miles

Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,

Map created by CDC/NCCDPHP/DPH/ESB-GIS

Date: 3/29/2016

Mental health not good for ≥14 days among adults aged ≥18 years by census tract, Lowell, MA, 2014



Percent (%)

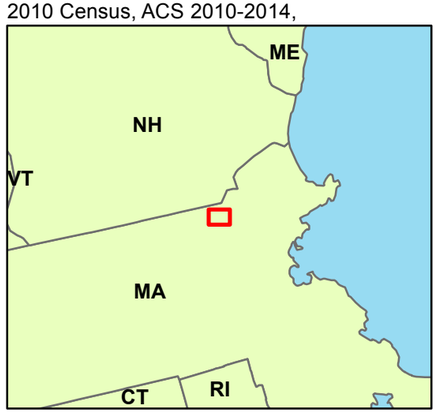
- 10.2 - 11.8
- 11.9 - 13.6
- 13.7 - 15.4
- 15.5 - 17.2
- 17.3 - 19.1
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from map.

0 0.5 1
Miles

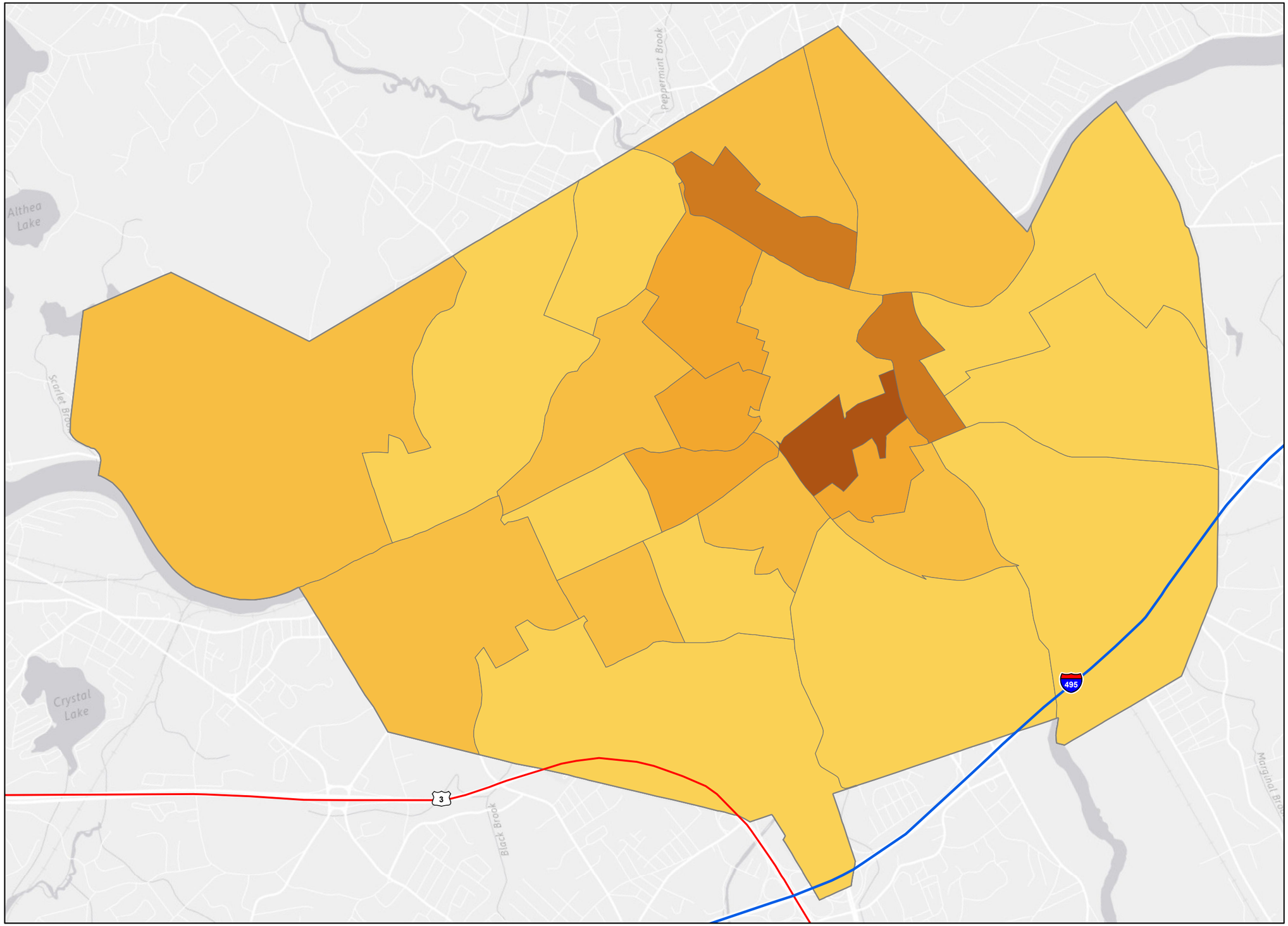
Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,



Map created by CDC/NCCDPHP/DPH/ESB-GIS

Date: 3/25/2016

Physical health not good for ≥14 days among adults aged ≥18 years by census tract, Lowell, MA, 2014



Percent (%)

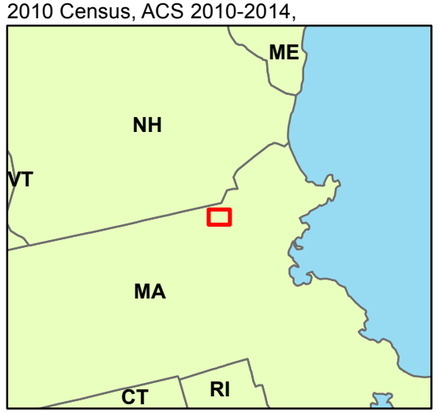
- 10.0 - 11.9
- 12.0 - 14.0
- 14.1 - 16.2
- 16.3 - 18.5
- 18.6 - 21.0
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

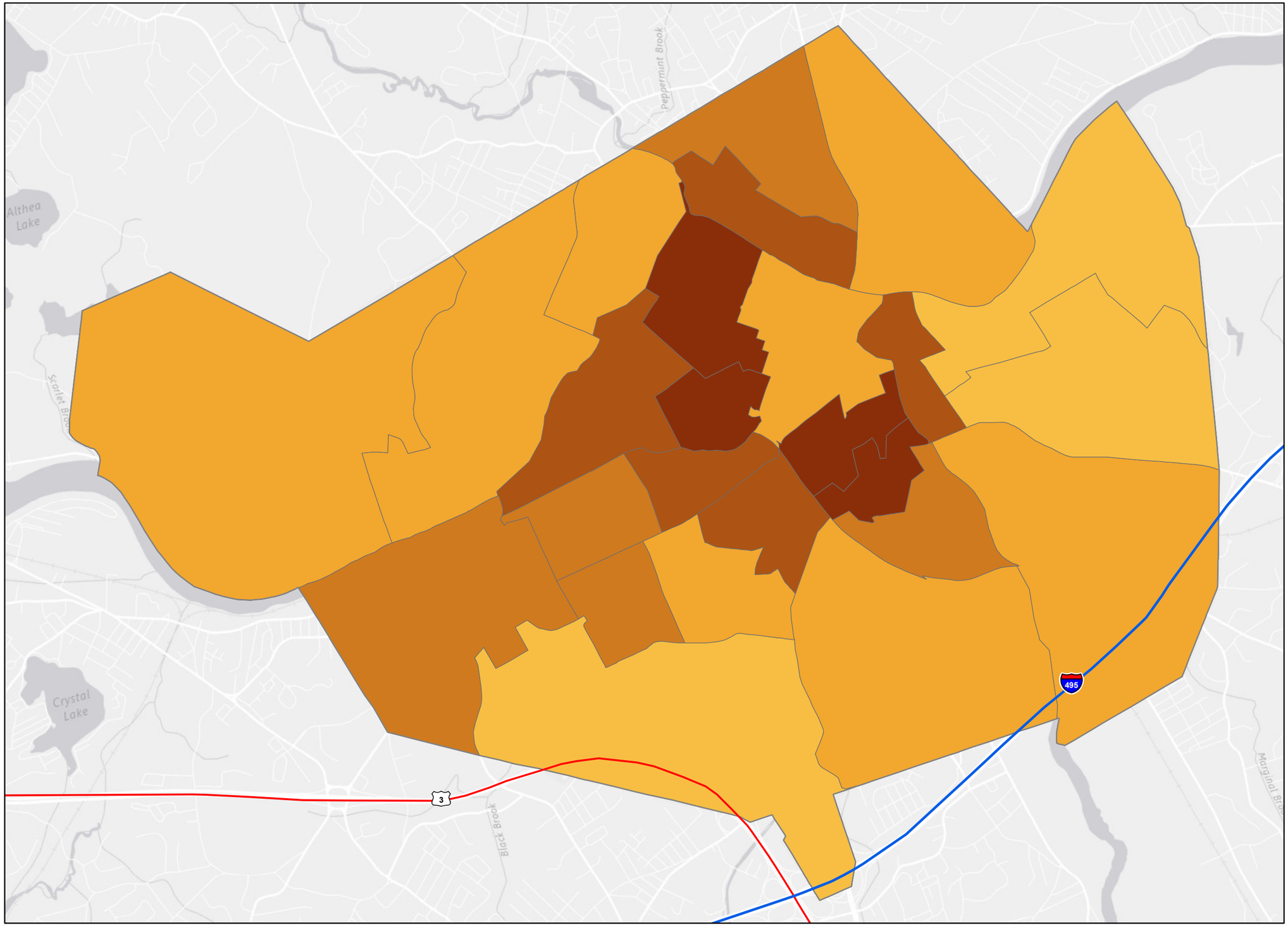
Census tracts with population less than 50 were excluded from map.

0 0.5 1
Miles

Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,



All teeth lost among adults aged ≥65 years by census tract, Lowell, MA, 2014



Percent (%)

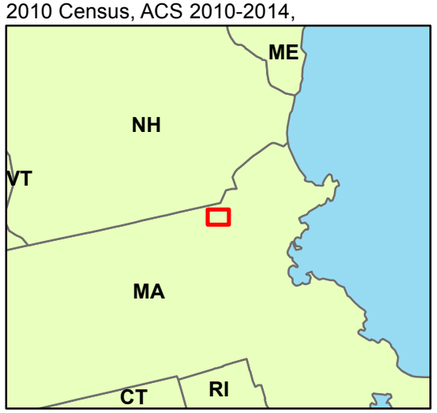
- 15.1 - 18.7
- 18.8 - 22.7
- 22.8 - 27.0
- 27.1 - 31.9
- 32.0 - 38.2
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from map.

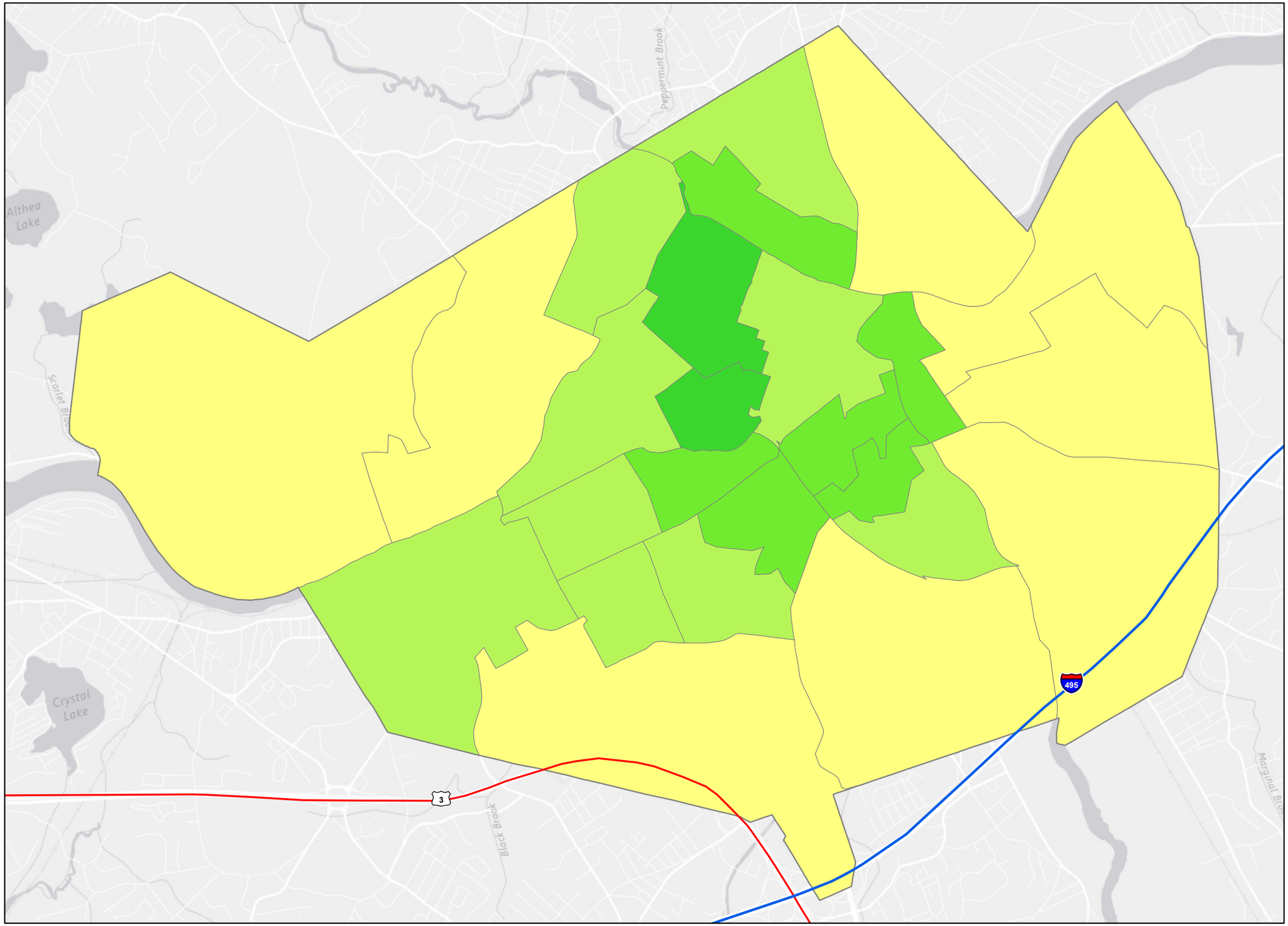
0 0.5 1
Miles

Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,



Use of Preventive Services

Current lack of health insurance among adults aged 18-64 years by census tract, Lowell, MA, 2014



Percent (%)

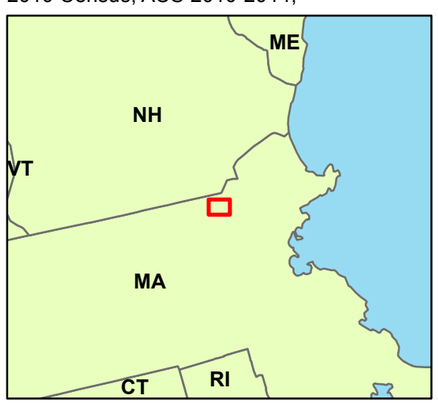
- 2.5 - 10.2
- 10.3 - 15.0
- 15.1 - 19.9
- 20.0 - 25.1
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

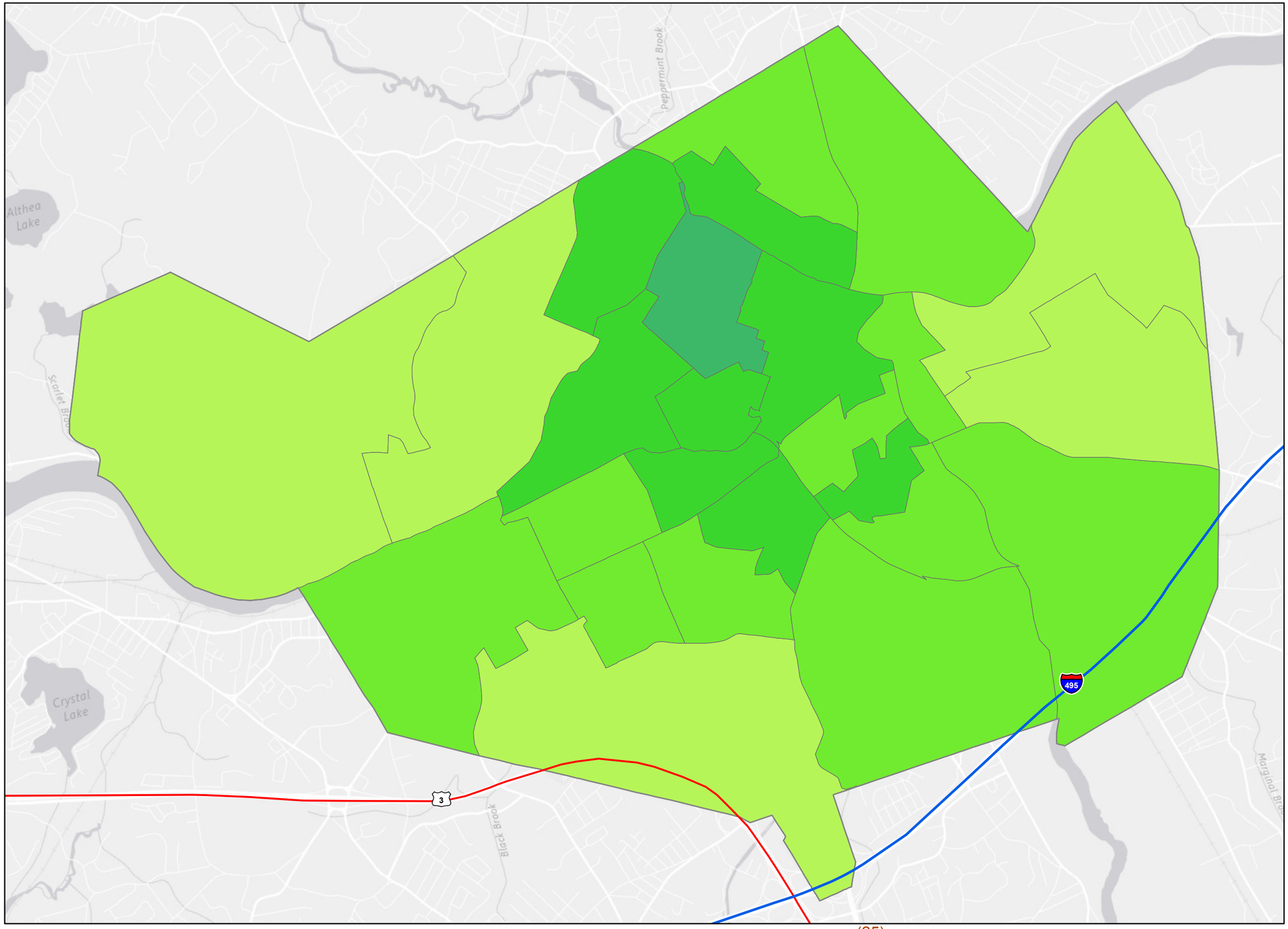
Census tracts with population less than 50 were excluded from the map.

0 0.5 1
Miles

Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,



Visits to doctor for routine checkup within the past year among adults aged ≥18 years by census tract, Lowell, MA, 2014



Percent (%)

- 66.0 - 68.8
- 68.9 - 71.8
- 71.9 - 75.0
- 75.1 - 78.6
- City boundary

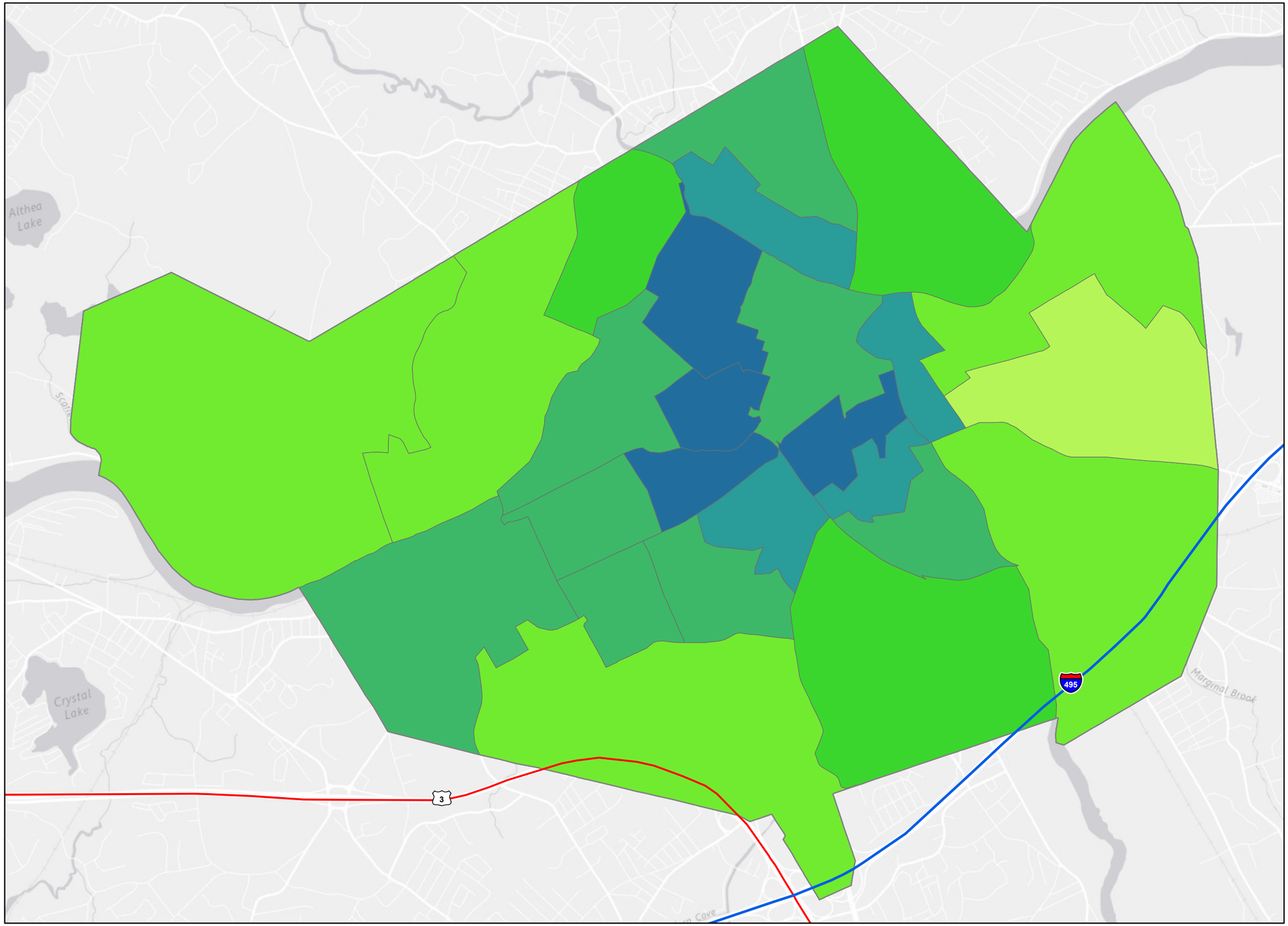
Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.

0 0.5 1
Miles

Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,

Visits to dentist or dental clinic among adults aged ≥18 years by census tract, Lowell, MA, 2014



Percent (%)

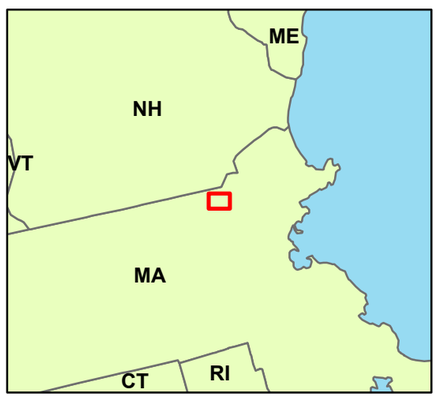
- 43.1 - 49.0
- 49.1 - 54.8
- 54.9 - 60.4
- 60.5 - 65.8
- 65.9 - 71.0
- 71.1 - 76.5
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.

0 0.5 1
Miles

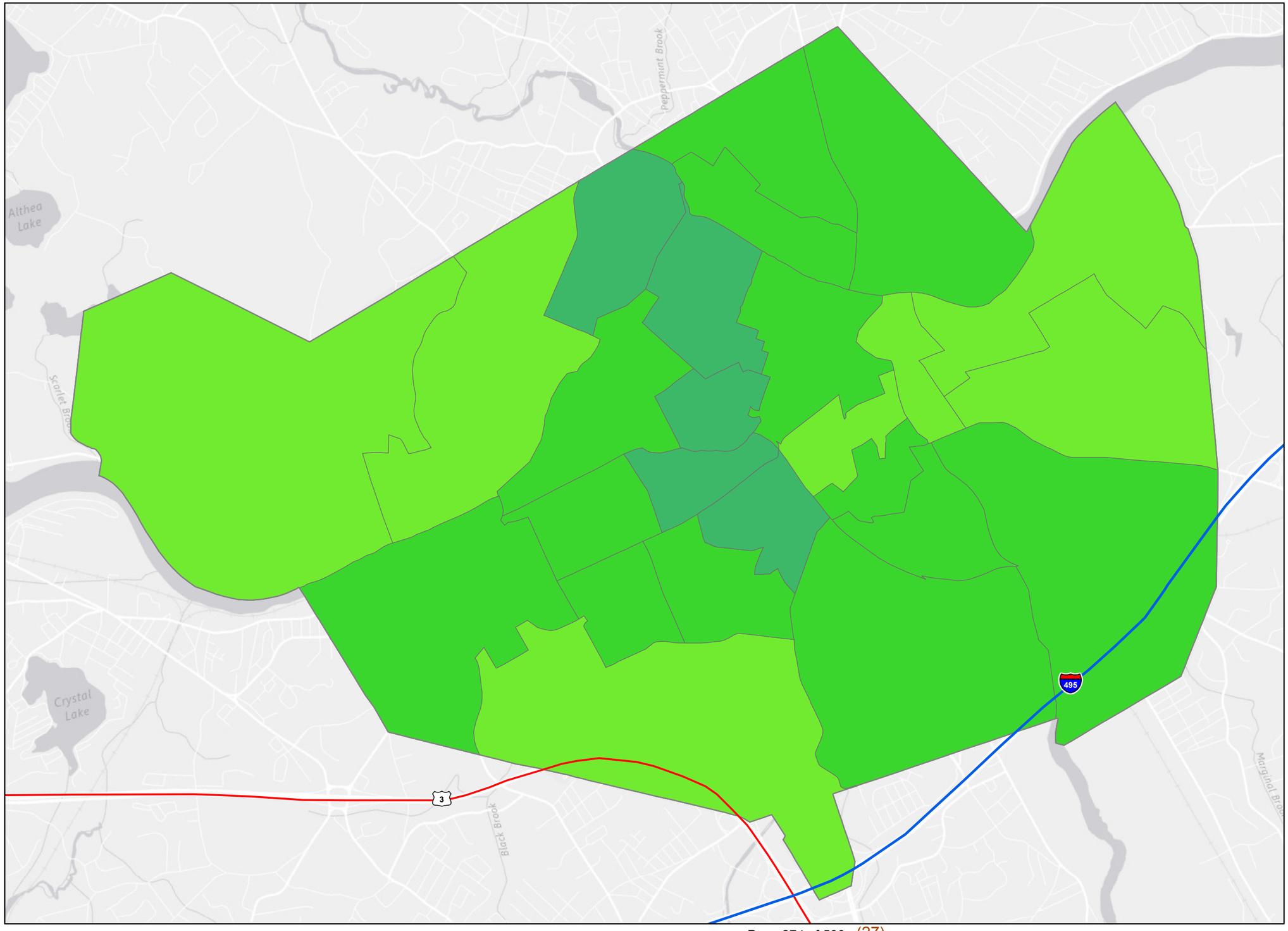
Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,



Map created by CDC/NCCDPHP/DPH/ESB-GIS

Date: 10/15/2016

Taking medicine for high blood pressure control among adults aged ≥18 years with high blood pressure by census tract, Lowell, MA, 2013



Percent (%)

- 65.0 - 69.1
- 69.2 - 73.0
- 73.1 - 76.8
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.

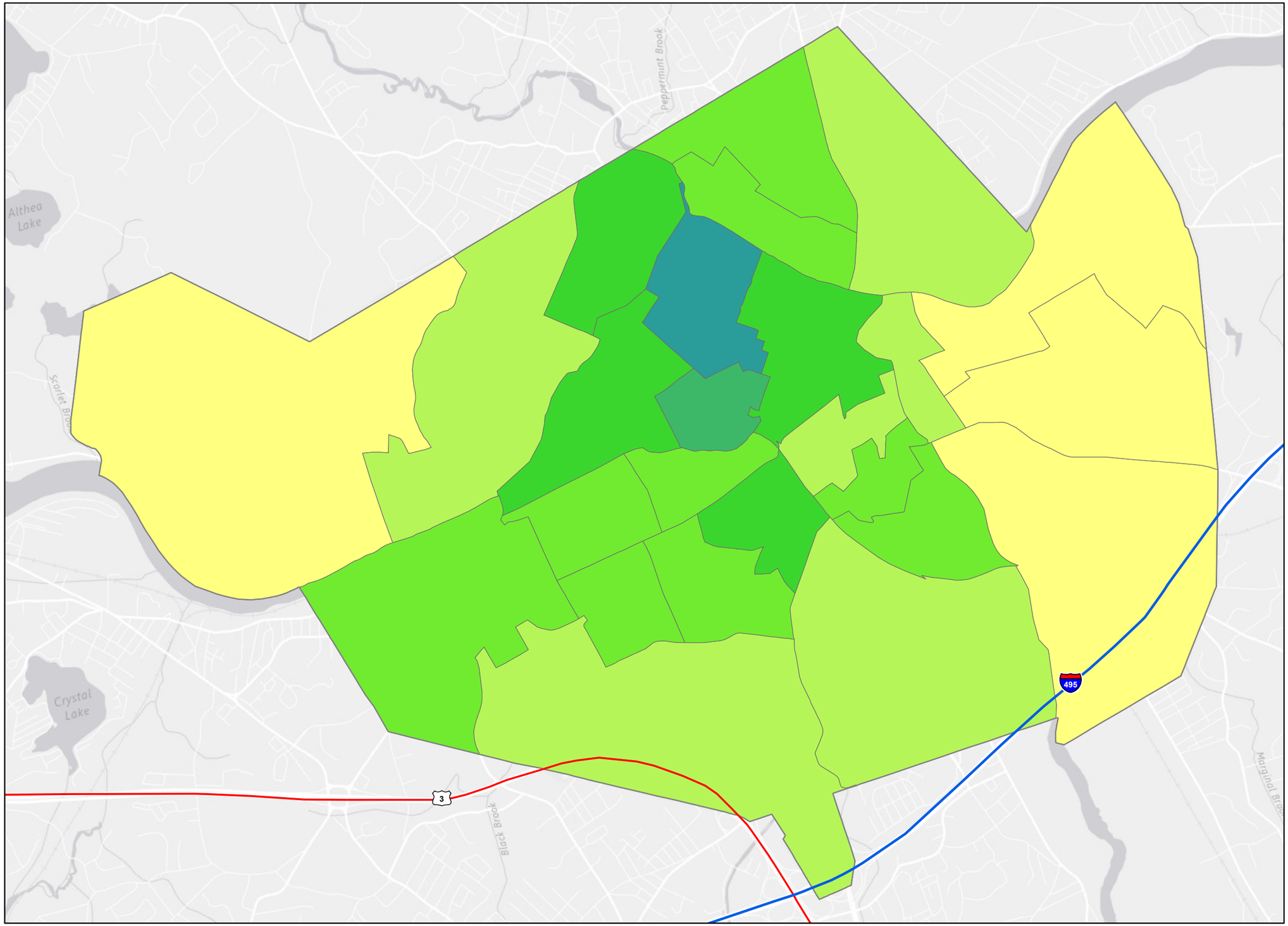
0 0.5 1
Miles

Data sources:
CDC BRFSS 2013, US Census Bureau 2010 Census, ACS 2009-2013.

Map created by CDC/NCCDPHP/DPH/ESB-GIS

Date: 5/3/2016

Cholesterol screening among adults aged ≥18 years by census tract, Lowell, MA, 2013



Percent (%)
- 61.8 - 66.4
- 66.5 - 70.3
- 70.4 - 73.9
- 74.0 - 77.6
- 77.7 - 81.9
- 82.0 - 95.3
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.

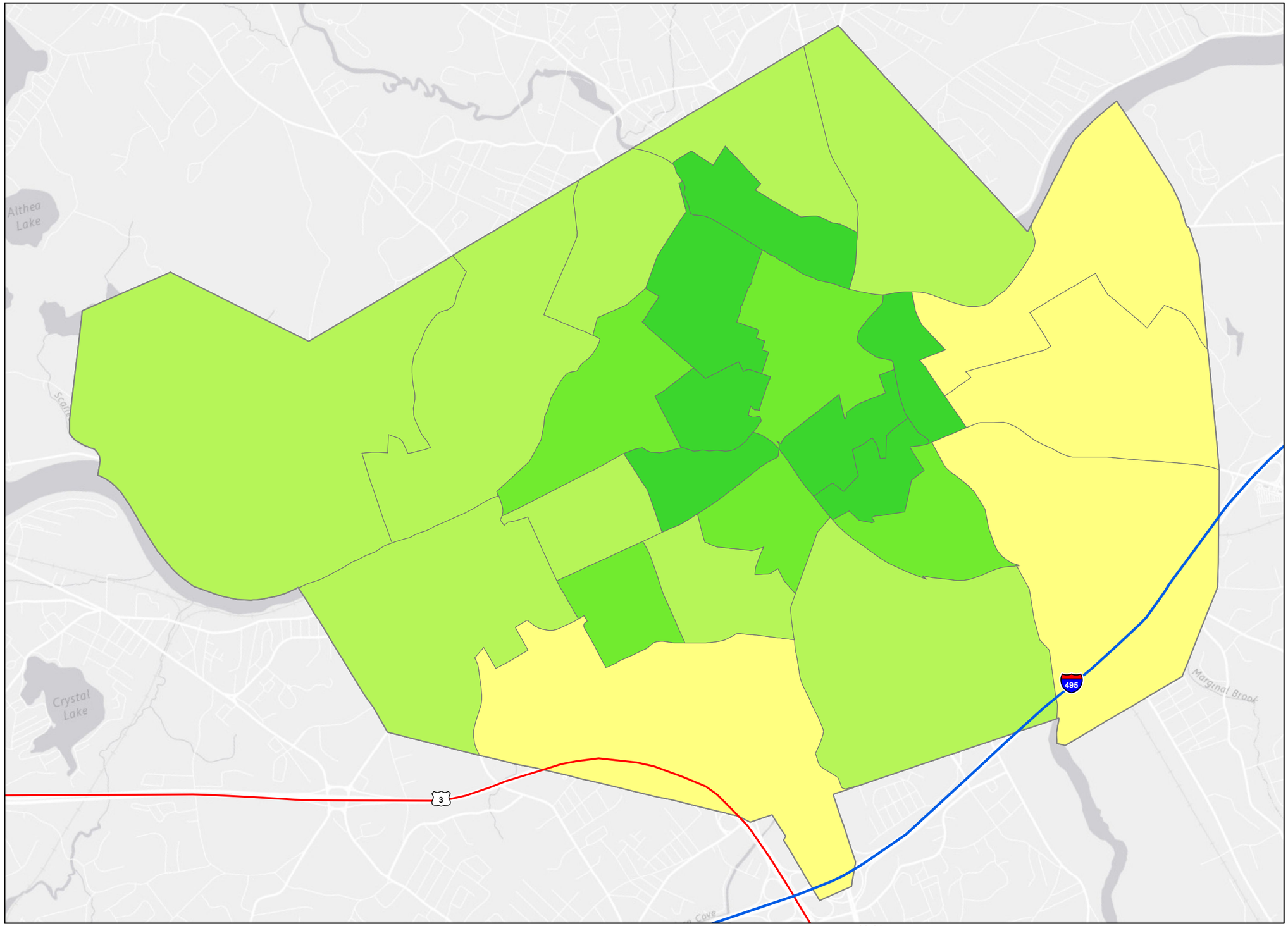
0 0.5 1
Miles

Data sources:
CDC BRFSS 2013, US Census Bureau 2010 Census, ACS 2009-2013.

Map created by CDC/NCCDPHP/DPH/ESB-GIS

Date: 5/3/2016

Mammography use among women aged 50-74 years by census tract, Lowell, MA, 2014



Percent (%)

- 73.8 - 76.1
- 76.2 - 78.5
- 78.6 - 81.0
- 81.1 - 87.1
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.

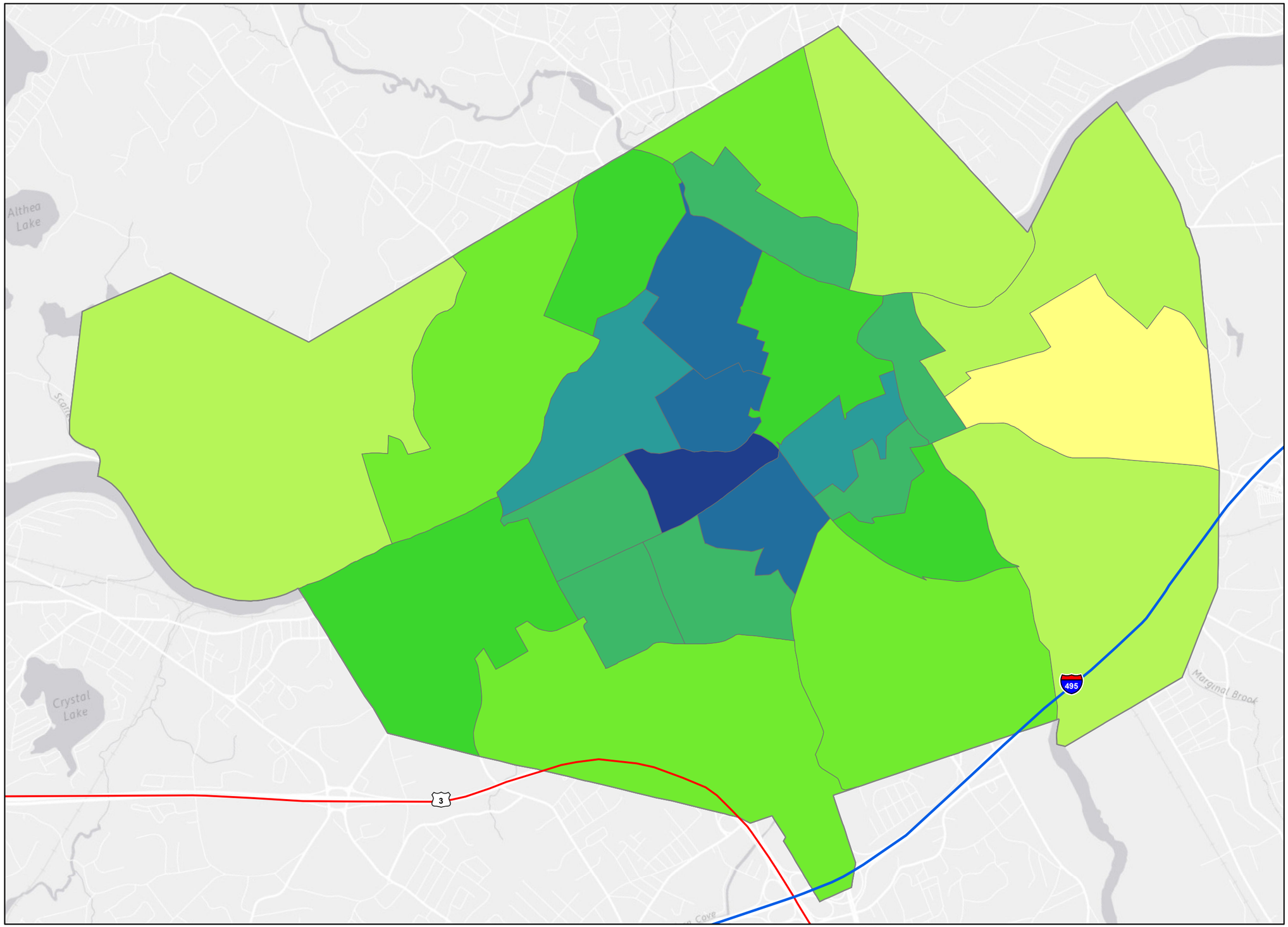
0 0.5 1
Miles

Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,

Map created by CDC/NCCDPHP/DPH/ESB-GIS

Date: 7/1/2016

Papanicolaou smear use among adult women aged 21-65 years by census tract, Lowell, MA, 2014



Percent (%)

- 58.1 - 65.4
- 65.5 - 69.7
- 69.8 - 73.2
- 73.3 - 76.4
- 76.5 - 79.4
- 79.5 - 82.4
- 82.5 - 85.5
- 85.6 - 91.5
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.

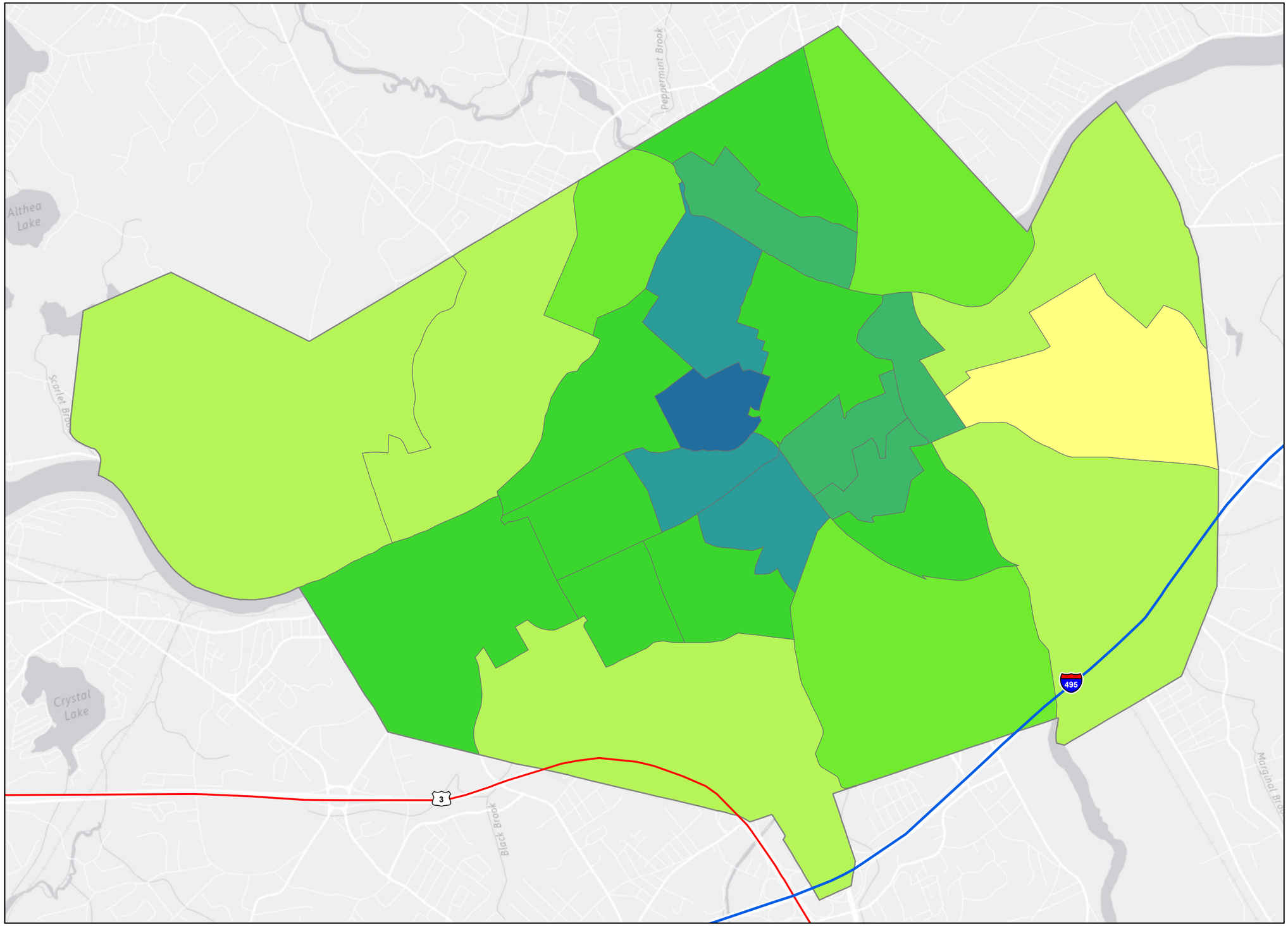
0 0.5 1
Miles

Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,

Map created by CDC/NCCDPHP/DPH/ESB-GIS

Date: 7/5/2016

Fecal occult blood test, sigmoidoscopy, or colonoscopy among adults aged 50-75 years by census tract, Lowell, MA, 2014



Percent (%)

- 45.2 - 49.8
- 49.9 - 54.2
- 54.3 - 58.6
- 58.7 - 62.8
- 62.9 - 66.8
- 66.9 - 71.1
- 71.2 - 81.5
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.

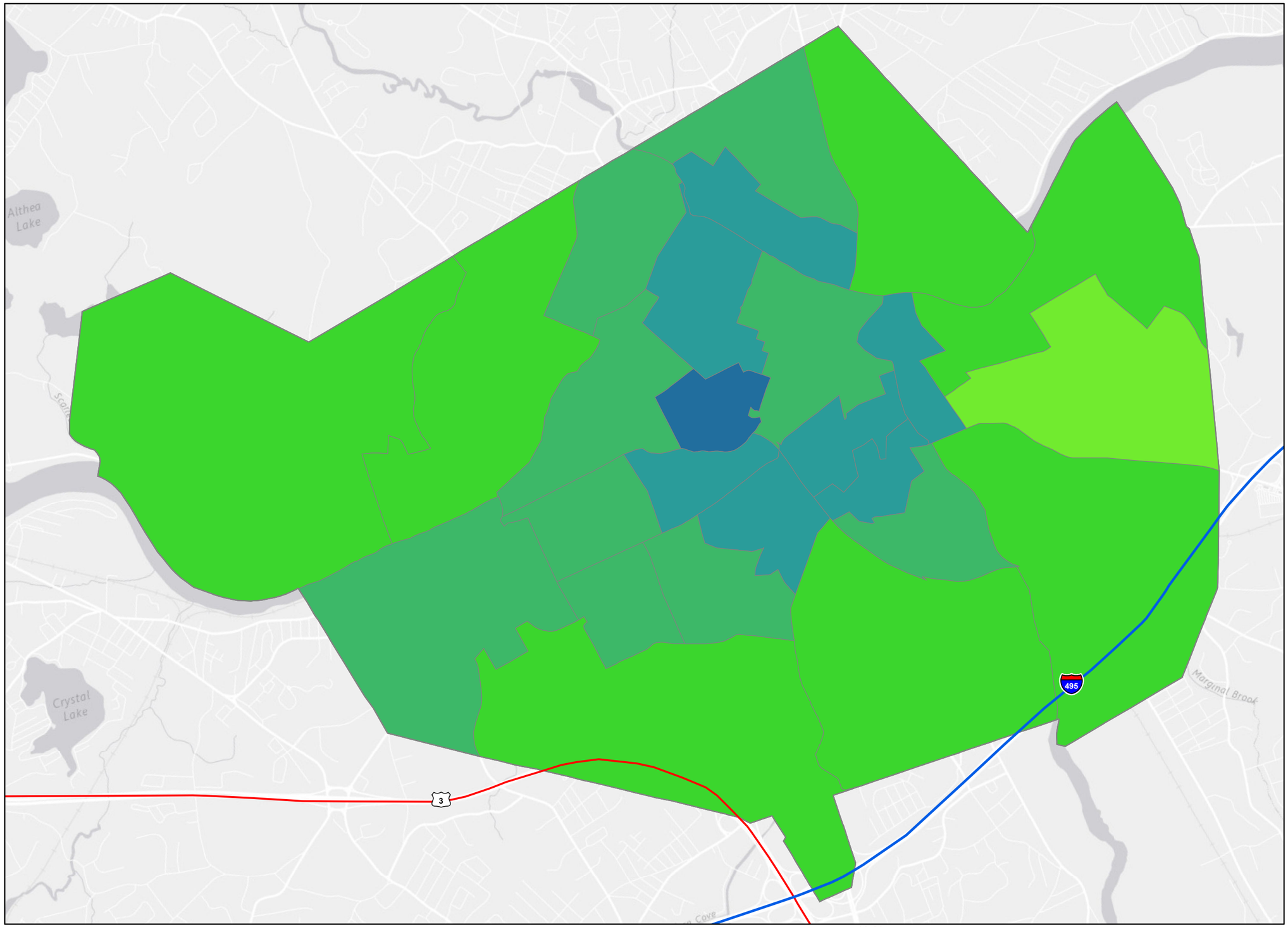
0 0.5 1
Miles

Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,

Map created by CDC/NCCDPHP/DPH/ESB-GIS

Date: 5/4/2016

Up to date on a core set of clinical preventive services (flu shot past year, pneumococcal shot ever, colorectal cancer screening) among men aged ≥65 years by census tract, Lowell, MA, 2014



Percent (%)

- 20.4 - 24.0
- 24.1 - 27.4
- 27.5 - 30.7
- 30.8 - 33.9
- 34.0 - 37.4
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.

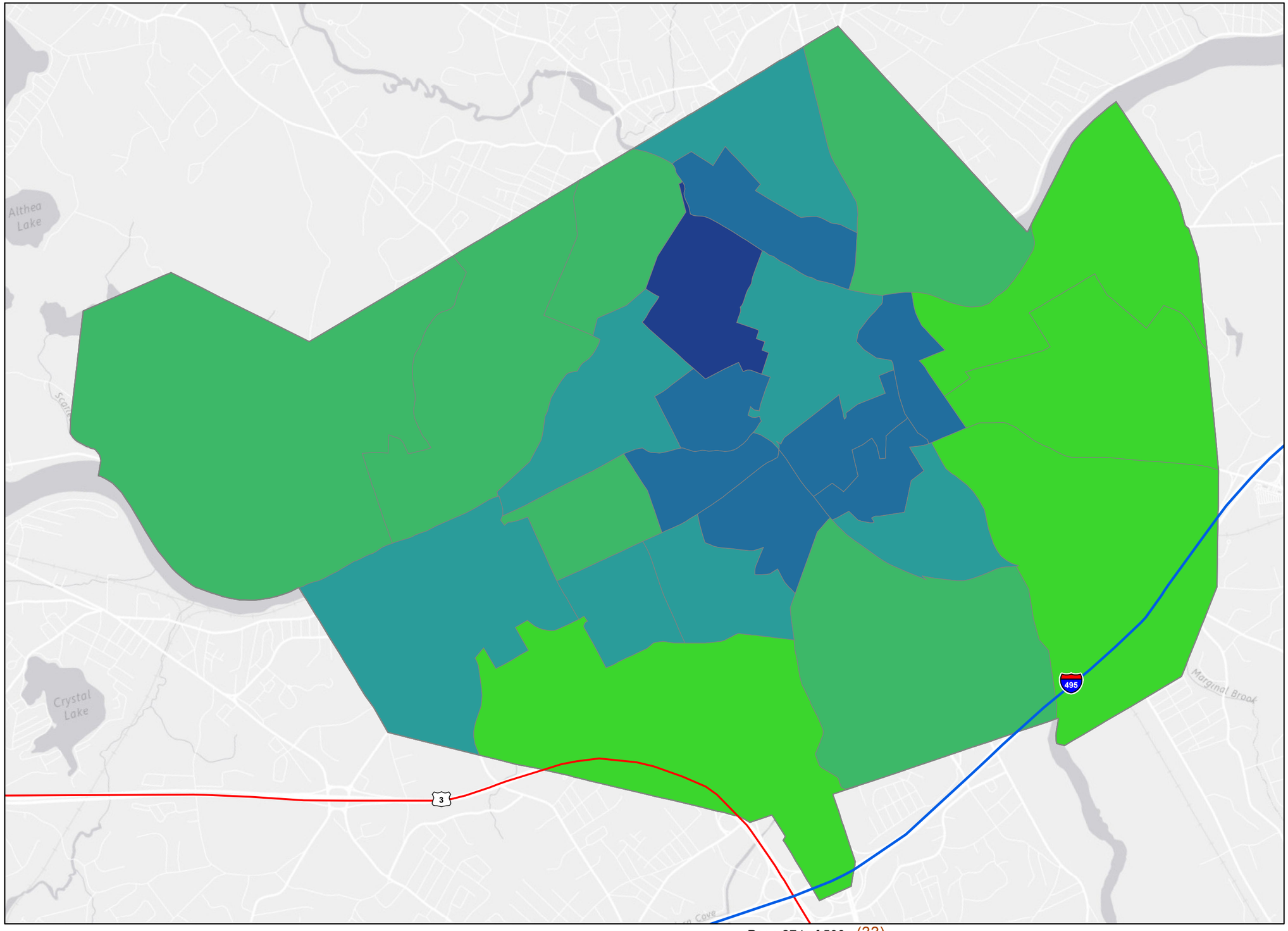
0 0.5 1
Miles

Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,

Map created by CDC/NCCDPHP/DPH/ESB-GIS

Date: 7/1/2016

Up to date on a core set of clinical preventive services (same as men plus mammogram past 2 years) among women aged ≥65 years by census tract, Lowell, MA, 2014



Percent (%)

- 15.2 - 19.5
- 19.6 - 23.2
- 23.3 - 26.9
- 27.0 - 30.5
- 30.6 - 34.1
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.

0 0.5 1
Miles

Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,

Map created by CDC/NCCDPHP/DPH/ESB-GIS

Date: 6/30/2016