

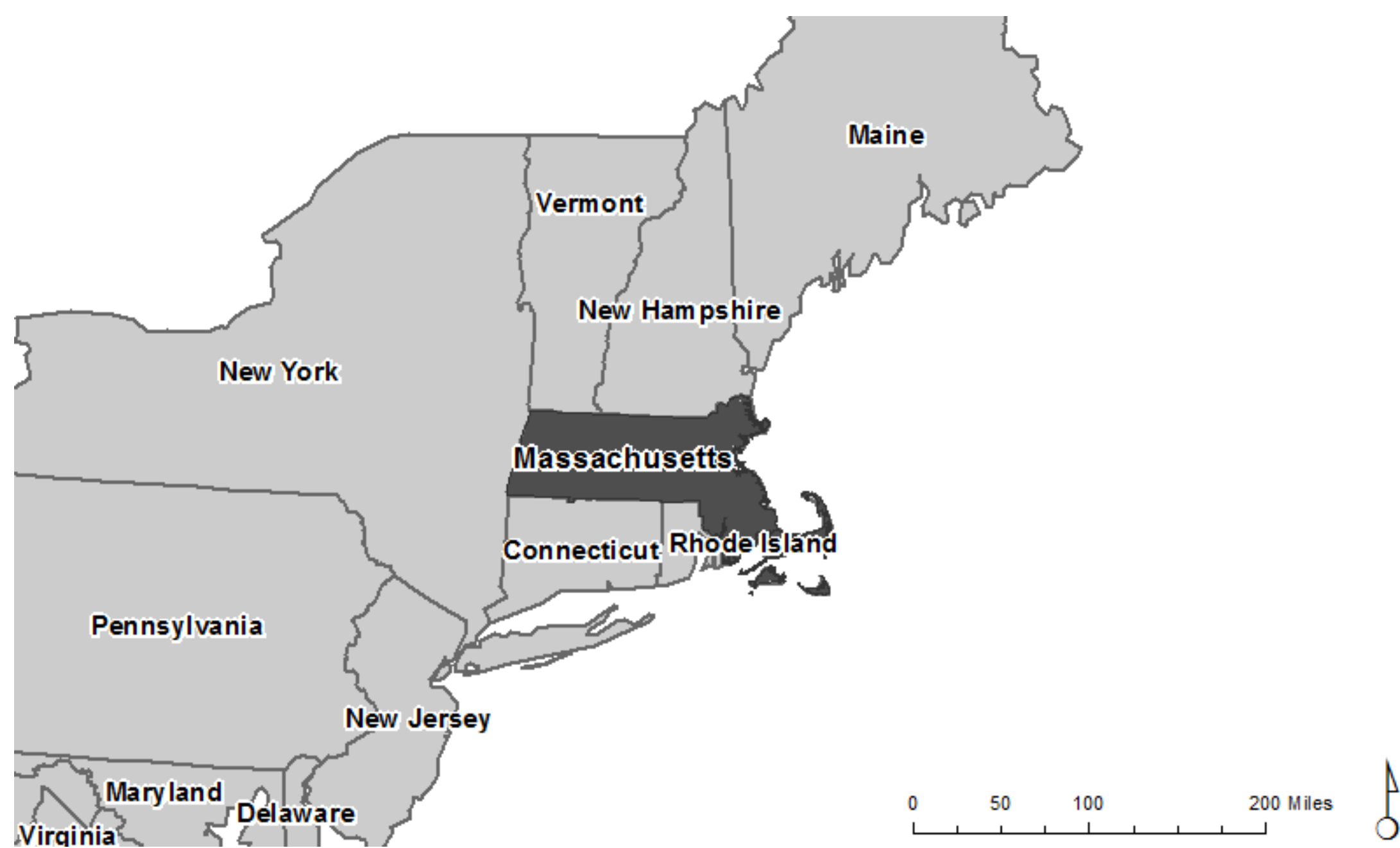
# Composting Capacity in Massachusetts

## Background

As of October 1, 2014, Massachusetts' facilities producing over a ton of organic waste weekly are banned from disposing of their organic waste in landfills. At least 1,700 facilities are affected by this regulation including hospitals, schools, conference facilities, food manufacturers, distributors, restaurants, and supermarkets. Most organizations will need to transport their waste to a facility; available facilities in Massachusetts include: 10 farms that accept food scraps for animal feed, 30 composting facilities and 4 anaerobic digesters.

All of the businesses that fall under this new law are expected to generate around 225,000 tons of organic waste per year. Statewide, composting diverters are able to process about 380,000 tons of organic waste per year. This would make it appear as though there is surplus capacity to process organic waste in Massachusetts of around 155,000 tons. However, many of the composting facilities have been processing, and will continue to process, organic waste from organizations other than those that are part of the ban.

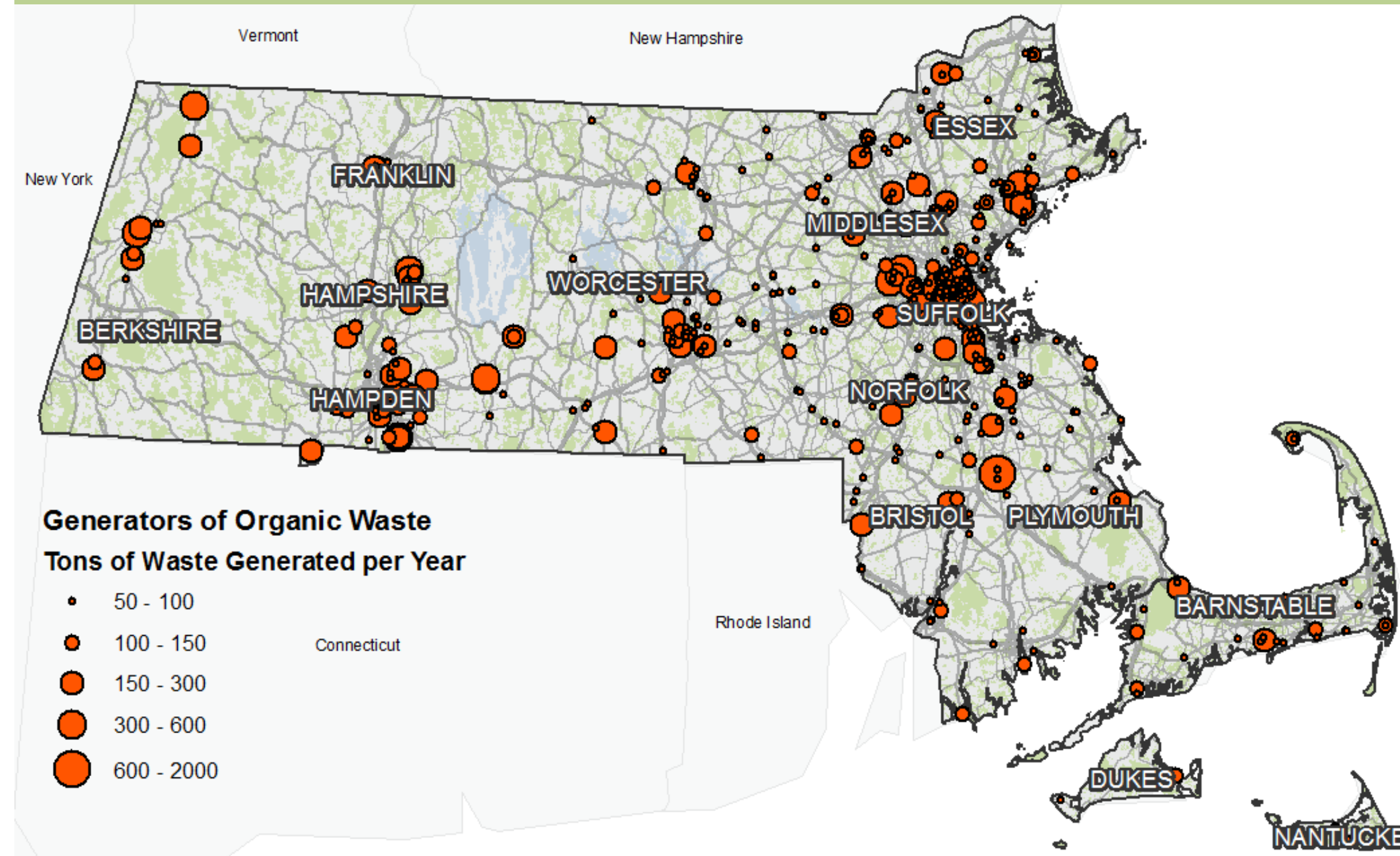
## Massachusetts



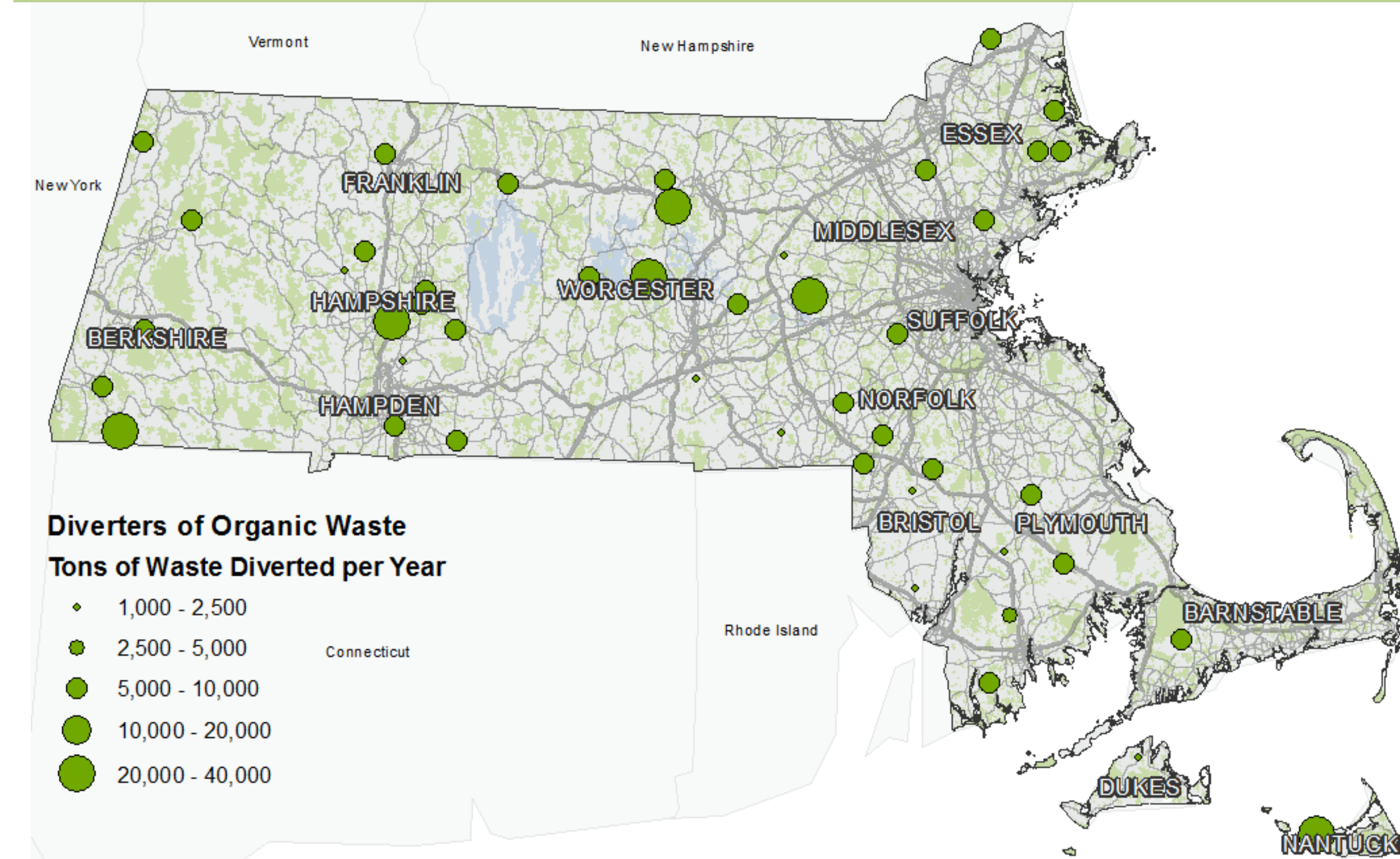
## Methodology

In 2002, the Massachusetts Department of Environmental Protection collected information on the major generators and diverters of organic waste in Massachusetts. A formula was used to determine the expected organic waste amounts created by generators in tons per year. These data do not include waste generation estimates for food and beverage processors, which create significant waste. The amounts of organic waste that could be processed by the diverters was from self-report. The U.S. Environmental Protection Agency updated the study in 2011. After putting the locations of the generators and diverters onto the map of Massachusetts, Thiessen polygons were drawn around each composting facility. There is one polygon around each composting facility (green dots) and any business (red dots) that is within a polygon is closer to the one composting facility within the polygon than to any other composting facility. If every organic waste generator brings their organic waste to the nearest composting facility, it will be possible to estimate the total tons of waste each composting facility can expect to receive.

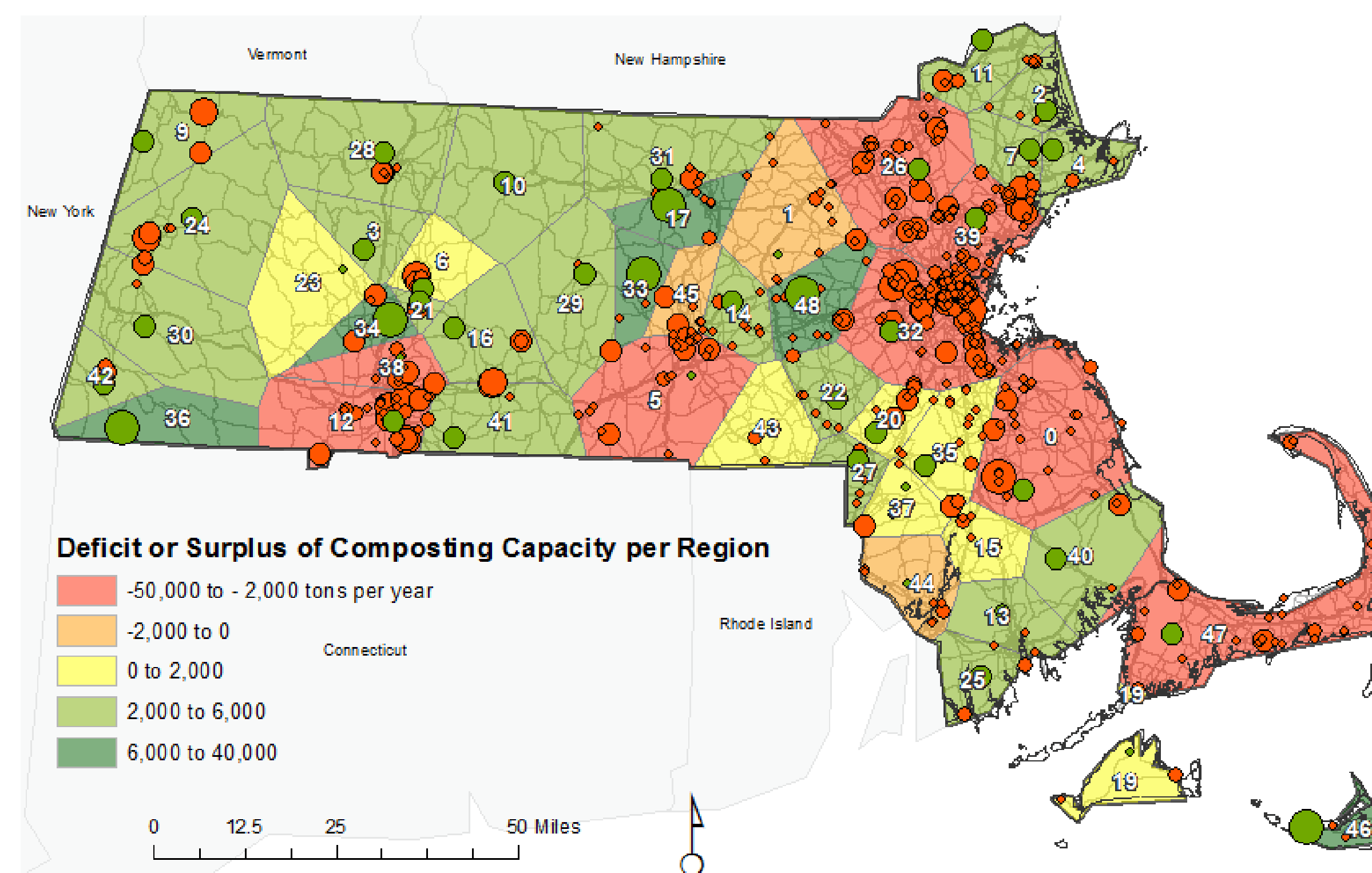
## Businesses that Generate more than a Ton of Organic Waste per Week



## Facilities that Divert Organic Waste



## Estimated Deficit or Surplus of Composting Capacity Per Region



## Results

The Thiessen polygon analysis enables a comparison of the amount of organic waste that generators create with the amount that each composting facility is able to process. If the composting facilities are not able to process all of the waste that will be brought to them, there will be a deficit. If there is more capacity, there will be a surplus.

As might be expected, this map shows that areas close to cities often have a composting capacity deficit, meaning that businesses in their area produce more tons of organic waste per year than the composting facilities have the capacity to process. More rural areas typically have a surplus of composting capability.

The table to the right represents the numbered polygons, the total generation of organic waste in tons per year by businesses located within the polygon, the total amount of tons per year that the composting facility can process, and the composting capacity deficit or surplus in the region.

Deficit or Surplus of Composting Capacity Per Region

Polygon Number	Total Generated (In Tons Per Year)	Total Diverted (In Tons Per Year)	Deficit / Surplus of Composting Capacity (In Tons Per Year)
0	10,608	5,475	-5,133
1	3,504	1,825	-1,679
2	1,680	5,475	3,795
3	0	5,475	5,475
4	660	5,475	4,815
5	10,524	1,825	-8,699
6	3,780	5,475	1,695
7	3,164	5,475	2,311
9	2,112	5,475	3,363
10	0	5,475	5,475
11	1,896	5,475	3,579
12	16,356	5,475	-10,881
13	632	4,380	3,748
14	2,736	5,475	2,739
15	1,420	1,825	405
16	2,608	5,475	2,867
17	1,824	25,550	23,726
19	1,532	1,825	293
20	4,120	5,475	1,355
21	900	5,475	4,575
22	2,472	5,475	3,003
23	0	1,825	1,825
24	3,288	5,475	2,187
25	952	5,475	4,523
26	16,560	5,475	-11,085
27	1,464	5,475	4,011
28	3,264	5,475	2,211
29	1,224	5,475	4,251
30	436	5,475	5,039
31	2,588	5,475	2,887
32	53,332	5,475	-47,857
33	36,536	36,500	36,964
34	2,812	36,500	33,688
35	5,148	5,475	327
36	0	36,500	36,500
37	1,424	1,825	401
38	4,928	1,825	-3,103
39	29,004	5,475	-23,529
40	1,664	5,475	3,811
41	2,280	5,475	3,195
42	1,620	5,475	3,855
43	840	1,825	985
44	2,816	1,825	-991
45	3,048	1,825	-1,223
46	300	21,900	21,600
47	8,704	5,475	-3,229
48	4,304	36,500	32,196
TOTAL	225,064	380,330	155,266

## Conclusion

There are several improvements that could be made to this model which would help improve the accuracy of the results. The data could be improved through asking businesses to accurately report how much organic waste they create now. It would also be important to know how much additional capacity the diverters have, beyond the capacity that is being used by current customers, to process this new influx of organic waste.

There are several reasons for which the Thiessen polygon analysis may not accurately represent where a new composting facility should be built. It is possible that organic waste generators do not bring their waste to the nearest composting facility, as assumed in this model. This may be the case if there are reasons other than shortest distance by which generators choose to transport their waste, such as price or convenience. Since Thiessen polygons are created by assuming the shortest distance between a generator and composting facility and waste is usually delivered via trucks, it is important to note the distance to the nearest composting facility on roads, not simply 'as the crow flies' distance.

It is also important to think of alternative ways to ensure that there is adequate space to process the organic waste that is generated. Locating a new facility in a region where there are high levels of production may not be practical. Instead, it may make more sense to consolidate waste from several businesses and ship or truck the waste to other parts of the state.

Data Sources:

Generators and Diverters of Organic Waste: Mass DEP, 2002 | Roads: Mass DOT, June 17, 2014 | Hydrography: Mass DEP, March 2010 | Open Spaces: Executive Office of Energy and Environmental Affairs, Sept 19, 2014 | Counties: Mass Highway Department, November 2012 | States: ESRI, Sept 3, 2013

Massachusetts State Plane Projection

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