Gathering Open Burning Activity Information and the Limitations of EIIP Methodologies

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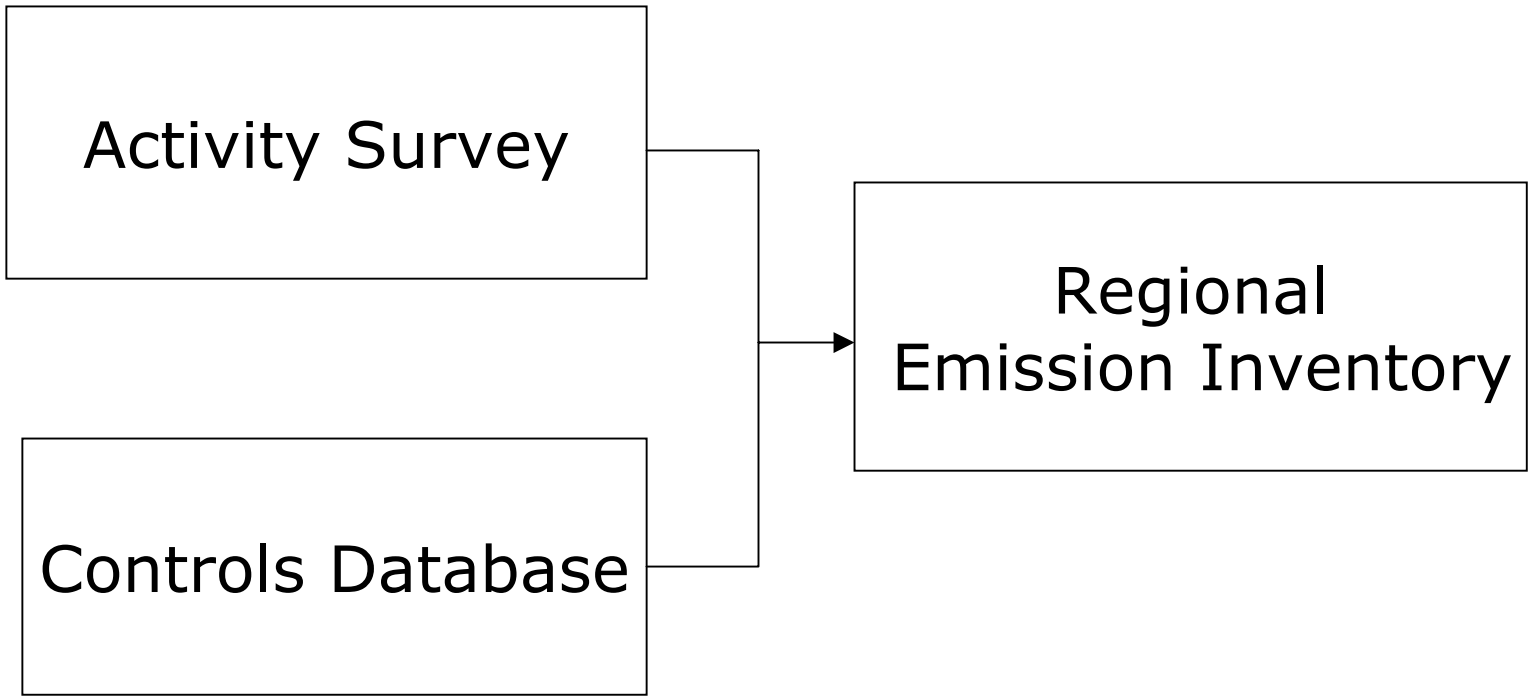
MANE-VU Open Burning EI

- Yard Waste – Household Brush and Leaf Burning;
- MSW or Household Waste Burning; and
- Municipal Yard Waste Burning.

MANE-VU Open Burning EI



Test Survey (Activity)

- For states that allow MSW or yard waste burning, Pechan tested a sample of municipalities within each state
  - Contacted people knowledgeable about residential open burning activity
- Results:
  - Respondents were not able to provide information on land clearing debris
  - Construction and demolition burning permits did not include enough information to develop emission estimates

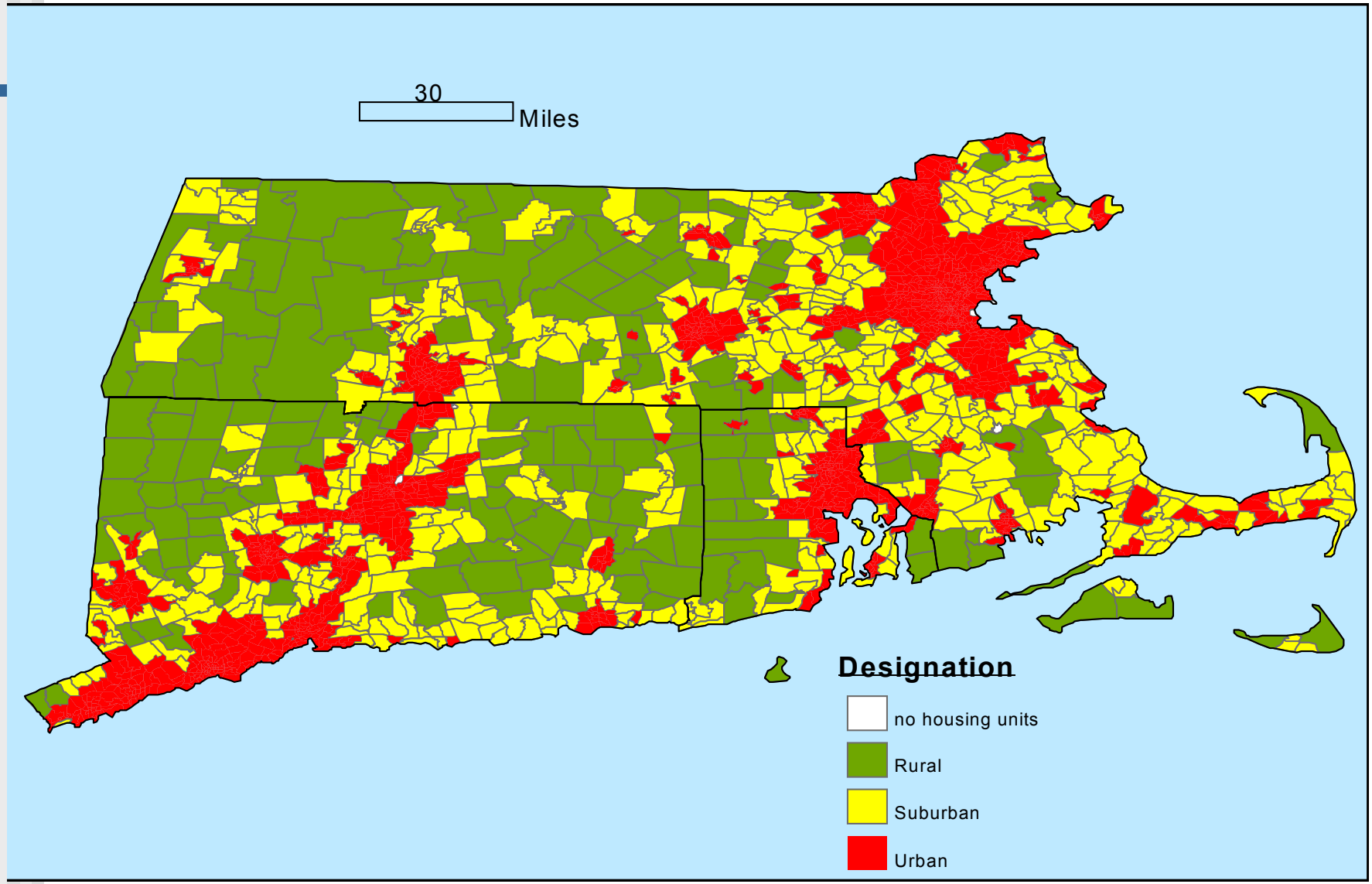
Full Activity Survey

- Pechan classified the census tracts into urban, suburban and rural
- 494 respondents were contacted
- 224 indicated that they were knowledgeable about open burning activity within their jurisdiction

Gathering Activity Information

- Survey instrument focused on:
  - Number/percentage of households that burn waste
  - Burn frequency
  - Amount per burn
  - Seasonal Activity
- Survey results were used to estimate emissions for each survey jurisdiction
- For non-surveyed areas, default activity data derived from survey responses was applied

Example Census Tract Designations for MA, CT and RI



Controls Database

- Purpose: Estimate emissions where open burning is prohibited or restricted and describe the controls in each jurisdiction
- A control efficiency (CE) of 100% was assigned where a control was in place (i.e. a burn ban)

Rule Effectiveness (RE)

- In areas that have burning prohibitions, Pechan completed 90 RE surveys
- The survey respondents answered questions including the estimated number of households that violated open burning rules

Activity Survey Effectiveness

- Respondents were not as reliable at providing activity information for household waste burning as for yard waste burning
- Respondents in rural areas were best at providing activity information

Activity Survey Effectiveness

- Yard Waste
  - Significant differences between activity in the Northeast and Mid-Atlantic regions
  - No statistical difference between activity in urban, suburban and rural areas
  - In areas that allow both leaf and brush waste, survey respondents generally could not provide estimates for the number of households burning each of these types of waste

Activity Survey Effectiveness

- MSW Burning
  - Significant differences between activity in the Northeast and Mid-Atlantic regions
  - No statistical difference between activity in urban, suburban and rural areas
  - Respondents had difficulty providing information on the mass of waste burned and an estimated amount of waste per burn
  - Many survey respondents indicated that residential MSW burning was not allowed in their municipality, although there were no statewide restrictions

Controls Database Survey Effectiveness

- Yard waste emissions in suburban and rural areas were assumed to be uncontrolled, unless the data indicated otherwise
- Most urban and suburban areas prohibit household waste burning
- 26 respondents included information on the number of violating households
- To estimate default RE values, Pechan statistically analyzed the data which resulted in one value for all areas
- Rule Penetration (RP) was adjusted for areas with seasonal bans to estimate annual emissions

Annual MSW $PM_{2.5}$ Emissions

	$PM_{2.5}$ Emissions, tpy	
State	1999 NEI, v2	MANE-VU, 2002
CT	1,165	3
DC	0	0
DE	528	8
MA	1,894	7
MD	1,420	424
ME	2,046	4
NH	1,731	61
NJ	1,472	36
NY	7,131	2,046
PA	10,369	3,795
RI	194	4
VT	1,182	2
TOTAL	29,133	6,390

Annual Brush Waste $PM_{2.5}$ Emissions

	$PM_{2.5}$ Emissions, tpy	
State	1999 NEI, v2	MANE-VU, 2002
CT	24	432
DC	0	0
DE	6	31
MA	42	823
MD	22	972
ME	30	543
NH	36	400
NJ	24	176
NY	142	534
PA	198	681
RI	2	88
VT	24	230
TOTAL	550	4,913

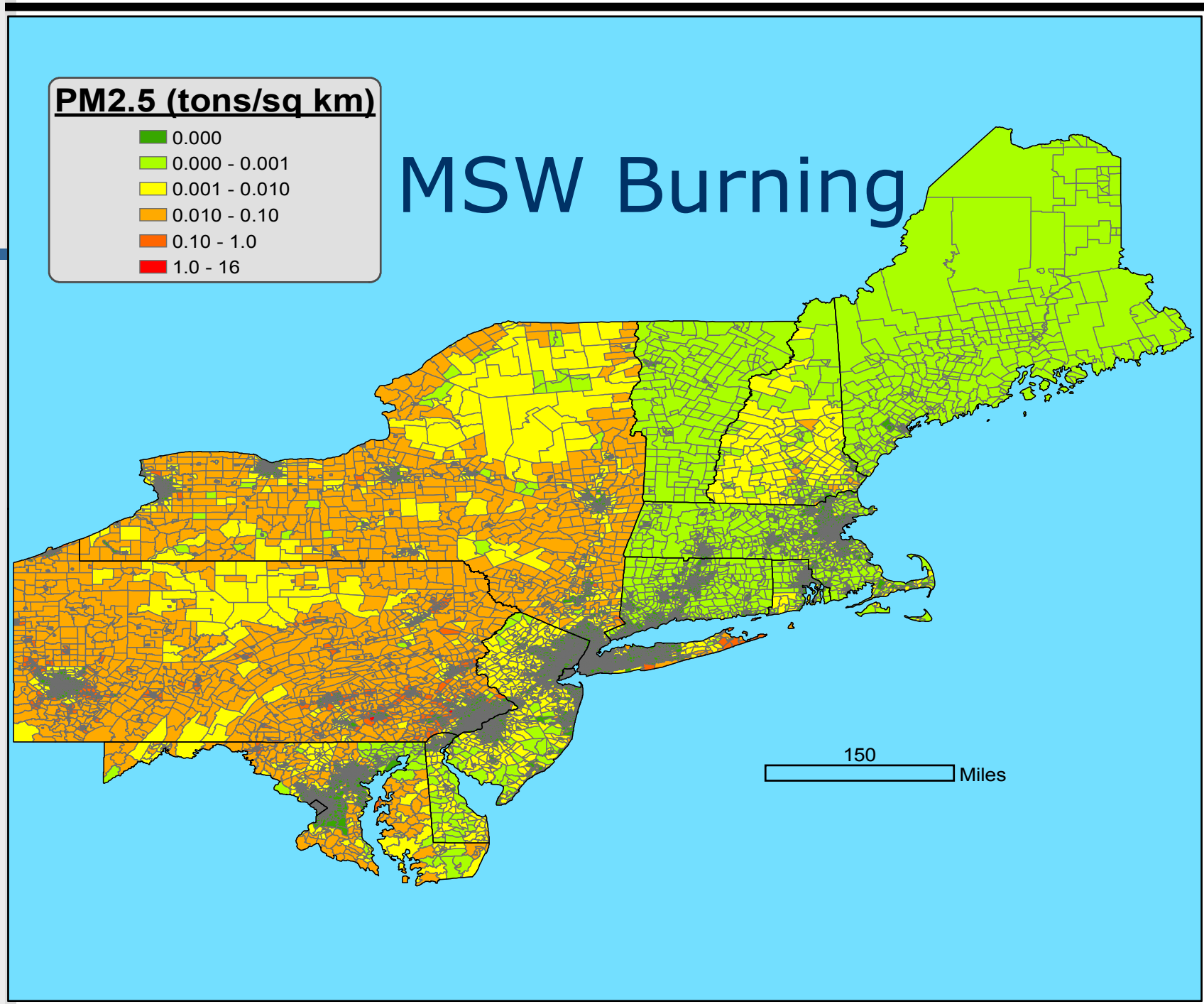
Annual Leaf Waste $PM_{2.5}$ Emissions

	$PM_{2.5}$ Emissions, tpy	
State	1999 NEI, v2	MANE-VU, 2002
CT	54	1
DC	0	0
DE	12	1
MA	93	18
MD	75	115
ME	68	12
NH	80	263
NJ	55	16
NY	319	338
PA	442	457
RI	5	59
VT	54	166
TOTAL	1,255	1,446

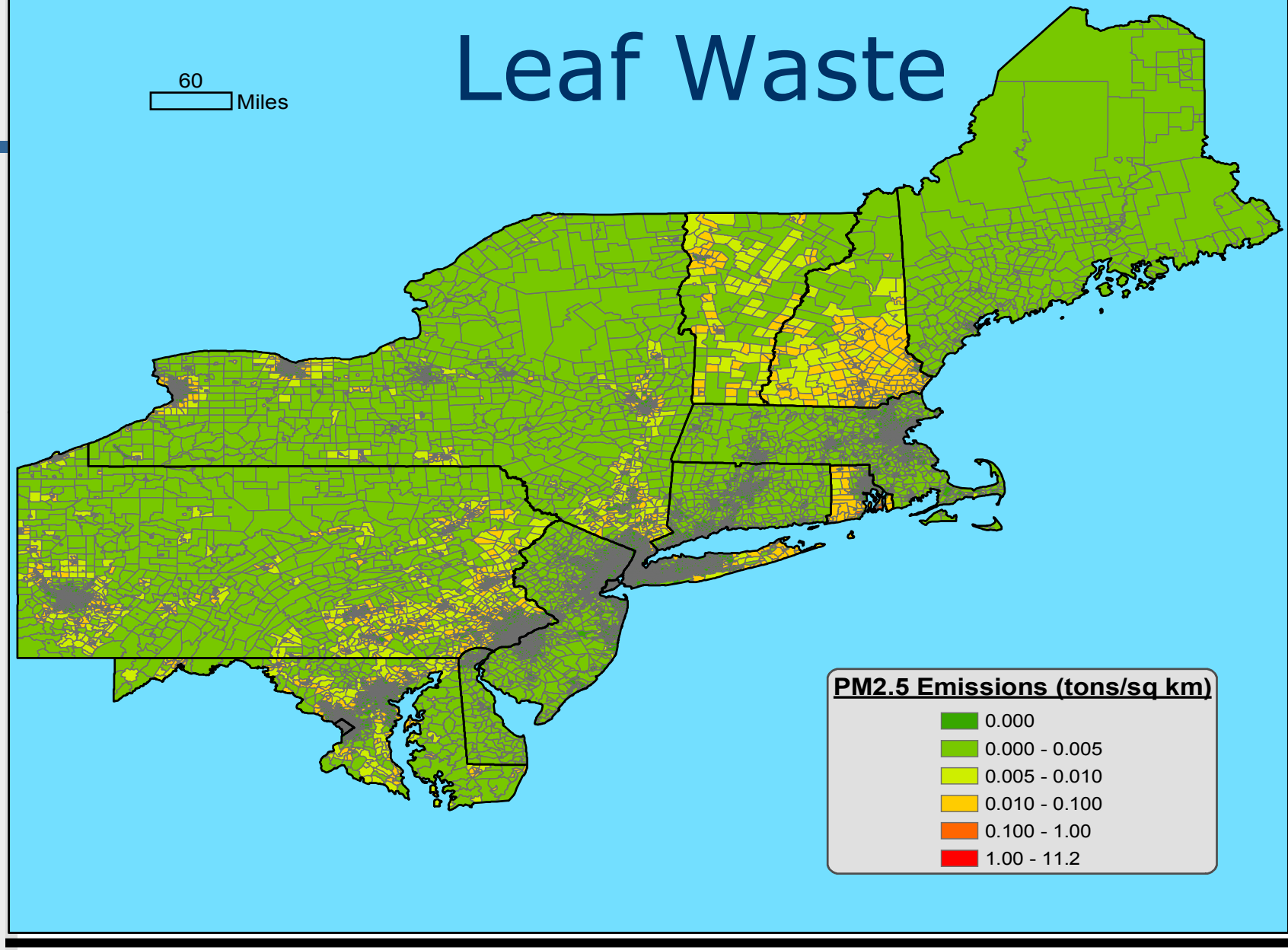
Annual Municipal Yard Waste $PM_{2.5}$ Emissions

	$PM_{2.5}$ Emissions, tpy	
State	1999 NEI, v2	MANE-VU, 2002
CT	Emission Estimates for this SCC are not included in the 199 NEI, v2	149
DC		0
DE		0
MA		170
MD		0
ME		228
NH		107
NJ		0
NY		0
PA		0
RI		27
VT		78
TOTAL		759

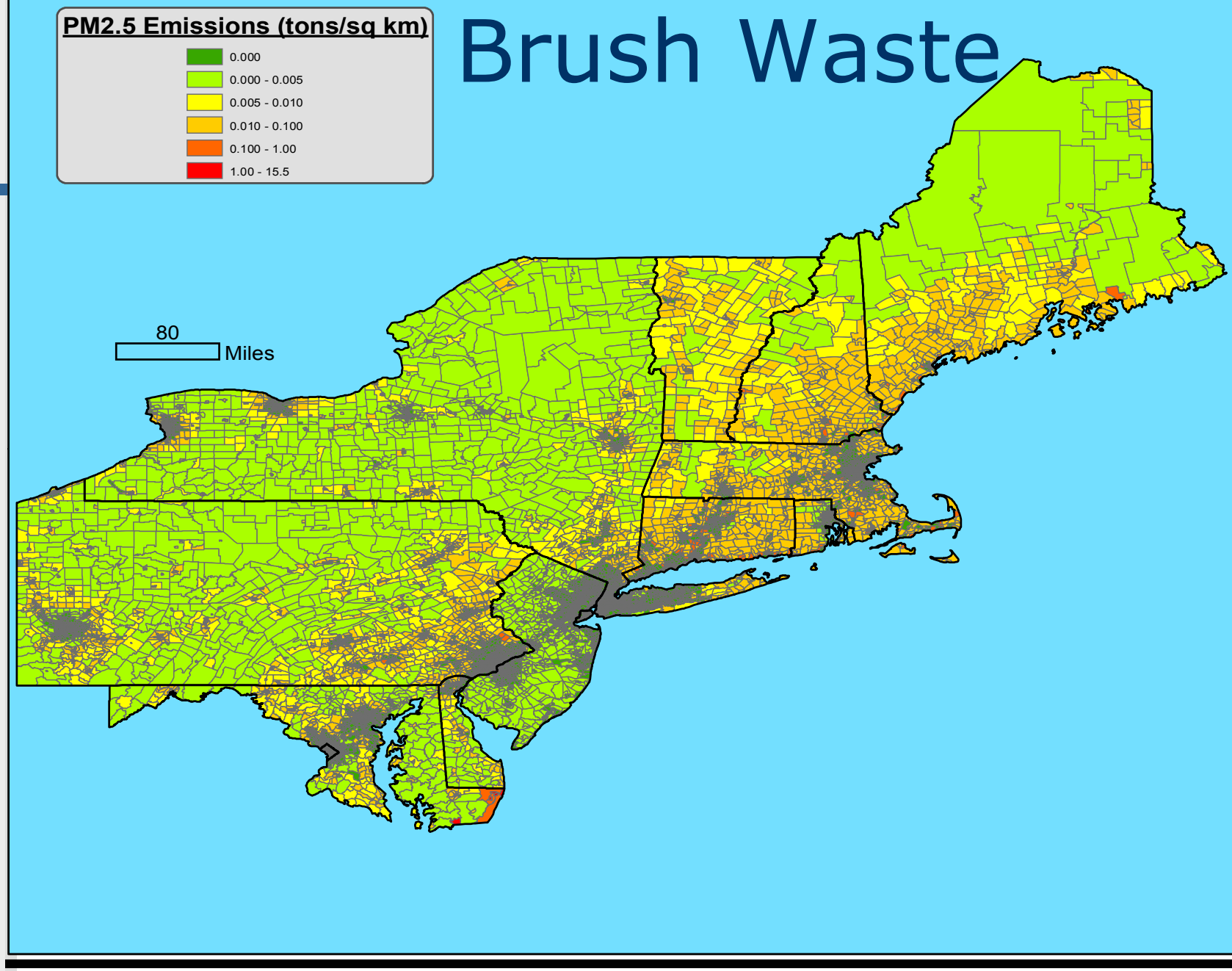
MSW Burning


PM2.5 (tons/sq km)
0.000
0.000 - 0.001
0.001 - 0.010
0.010 - 0.10
0.10 - 1.0
1.0 - 16
150
Miles

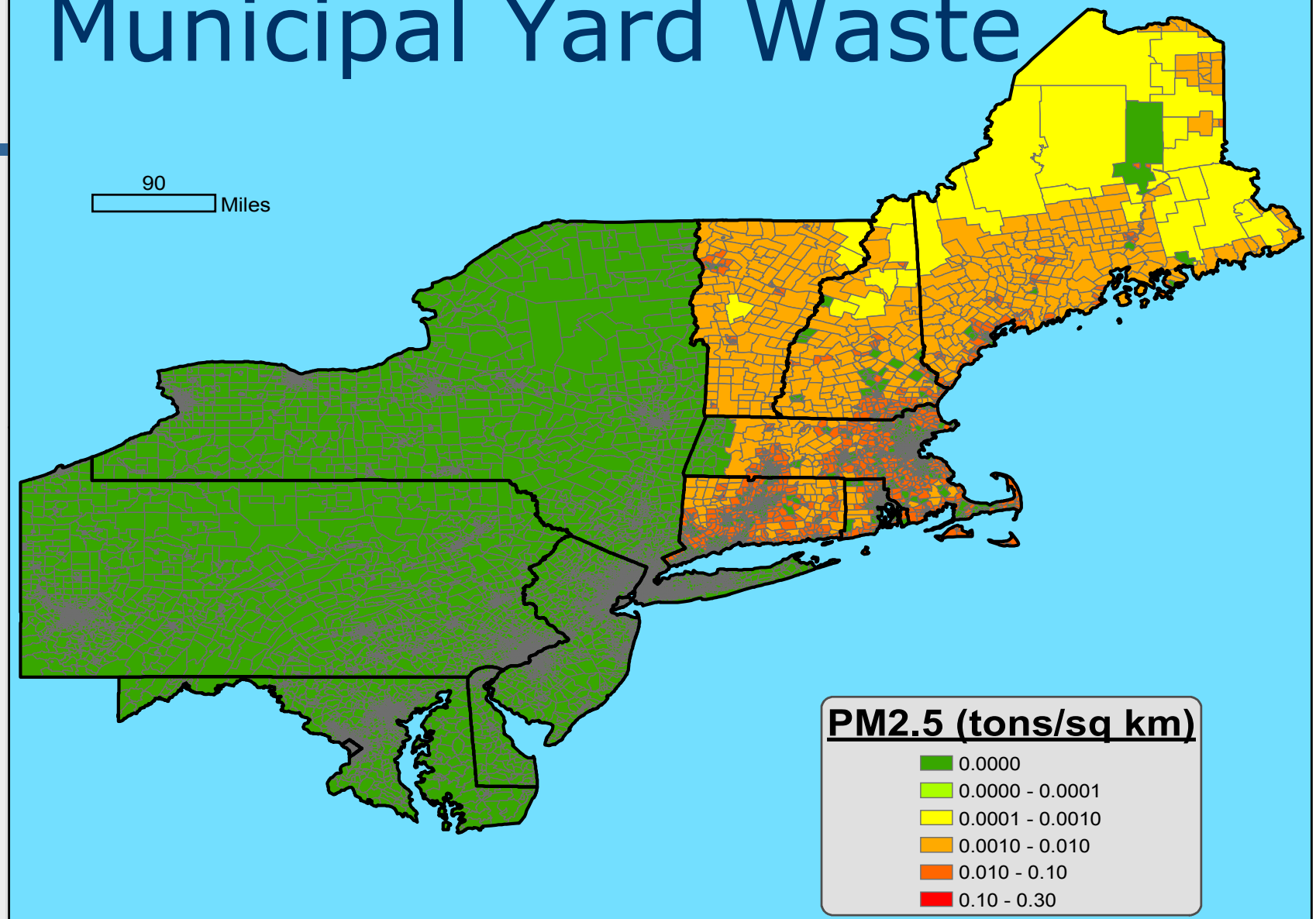
Leaf Waste


60
Miles
PM2.5 Emissions (tons/sq km)
0.000
0.000 - 0.005
0.005 - 0.010
0.010 - 0.100
0.100 - 1.00
1.00 - 11.2

Brush Waste


PM2.5 Emissions (tons/sq km)
0.000
0.000 - 0.005
0.005 - 0.010
0.010 - 0.100
0.100 - 1.00
1.00 - 15.5
80
Miles

Municipal Yard Waste



Areas of Additional Consideration

- Other disposal options (i.e. composting) for yard waste was not accounted for in non-surveyed areas
- Yard waste burning may be over estimated in certain areas
- May consider having separate MSW and yard waste surveys
- A larger sample may have allowed for greater geographic distinction

Conclusions

- Sub-county emissions estimates serve as the basis for a more spatially refined inventory
- Regional survey provides greater consistency
- State or local agencies could provide more detail to further improve activity by coordinating with local fire departments

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