

1 *Supplement of*

2 Estimating background contributions and U.S. anthropogenic  
3 enhancements to maximum ozone concentrations in the northern U.S.

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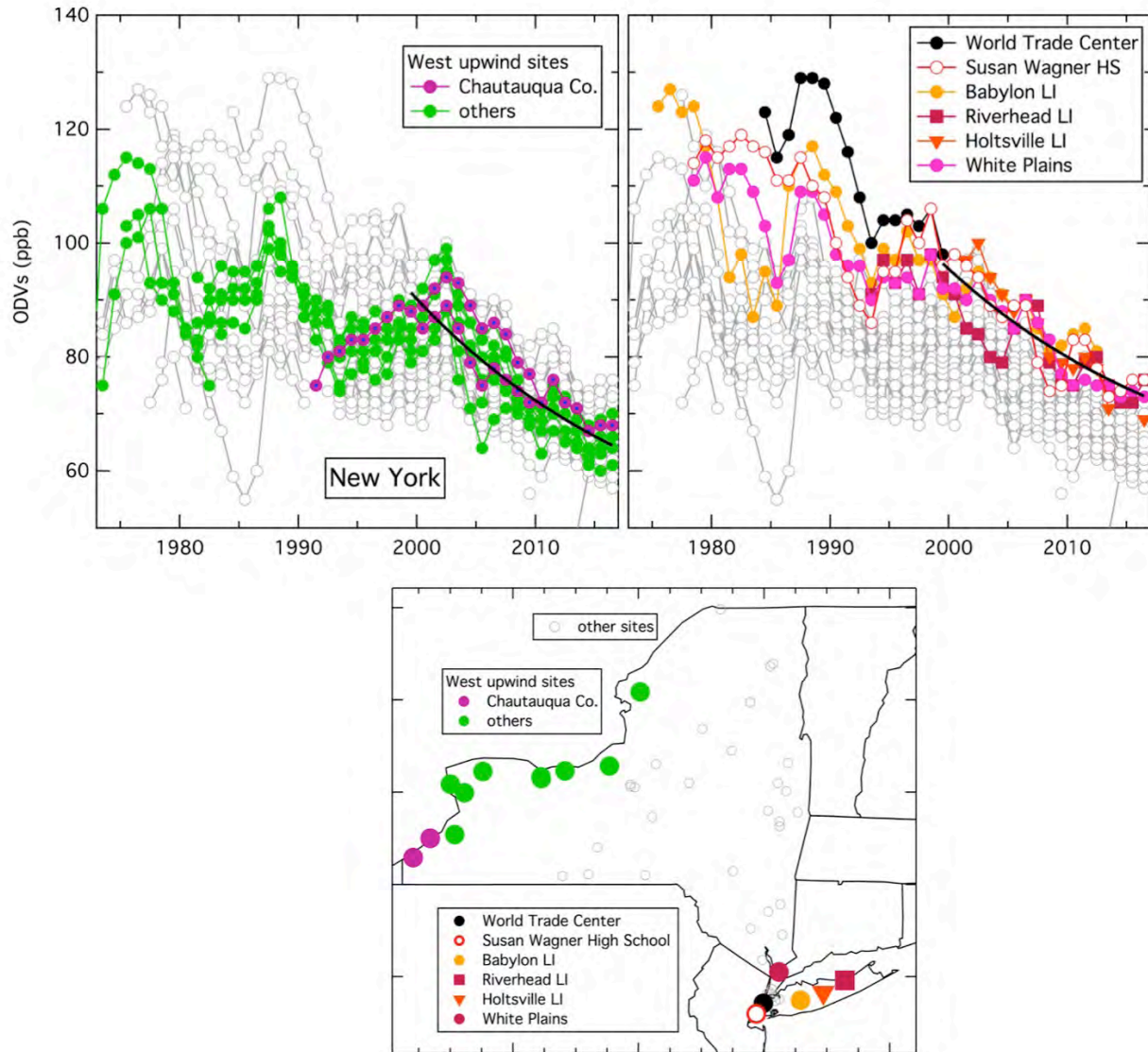
7 **Table S1.** Summary of data set of ODVs for eight northeastern U.S. states.  
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State	sites	years	ODV min (ppb)	ODV max (ppb)
Pacific Northwest States				
Washington	31	1979-2017	41	88
Oregon	16	1976-2017	50	91
Idaho	8	1995-2017	56	77
Rural Western States				
Montana	10	1979-2017	52	64
North Dakota	14	1982-2017	54	70
South Dakota	10	1990-2017	54	70
Midwestern States				
Minnesota	16	1975-2017	55	92
Wisconsin	83	1975-2017	57	135
Michigan	47	1975-2017	57	117
Northeastern States				
Connecticut	20	1976-2017	67	169
Maine	32	1979-2017	50	117
Massachusetts	45	1976-2017	56	121
New Hampshire	31	1975-2017	54	118
New Jersey	26	1975-2017	62	132
New York	59	1973-2017	49	129
Rhode Island	4	1978-2017	66	130
Vermont	5	1978-2017	60	96

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19 **Table S2.** Estimates of U.S. background ODVs in five regions of the U.S. Units in ppb. The first column of results  
20 are based on observations, including those derived here plus the result of Parrish et al. (2017) for the Los Angeles  
21 urban area. The last three columns are model results as described in the text.  
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Region	Obs. based	Fiore et al. AM3	Fiore et al. GC	Emery et al. GC
Montana	53.7 ± 1.9	55 ± 2	45 ± 3	50 ± 5
North Dakota	57.0 ± 1.5	51 ± 2	44 ± 2	45 ± 5
South Dakota	62.7 ± 5.1	52 ± 2	46 ± 4	47 ± 5
Northeastern U.S.	45.8 ± 1.7	49 ± 2	37 ± 3	35 ± 5
South Coast Air Basin	62.0 ± 1.9	55 ± 2	48 ± 4	57 ± 5

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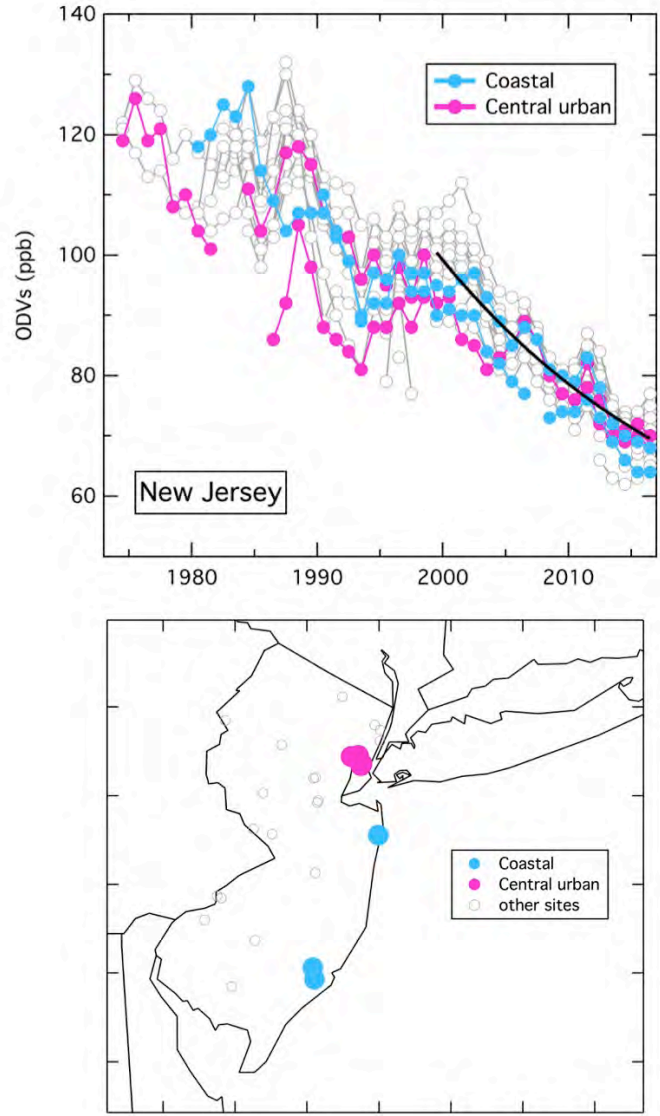
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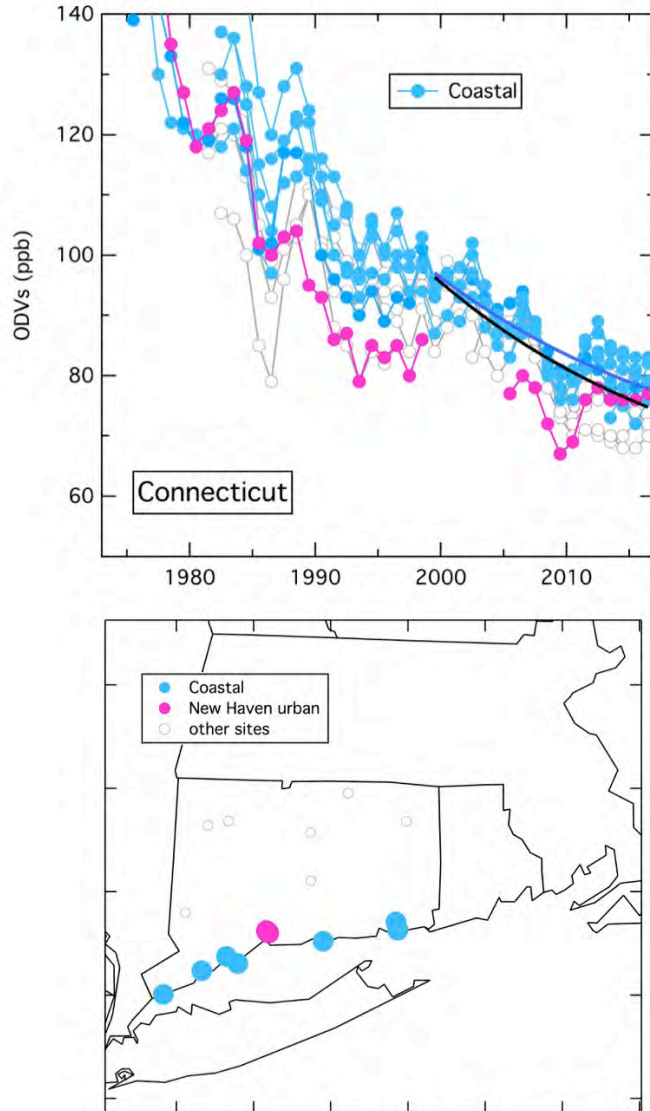
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**Figure S1.** Temporal evolution of the ODVs in New York and map of all monitoring sites reporting ODVs. The upper panels highlight the sites on the western border (left) and the urban New York city area sites with the largest ODVs (right); these sites are also highlighted on the map with corresponding symbols and color-coding. The sites in the Chautauqua Co., NY marginal nonattainment area are highlighted in purple. Black curves show fits of Equation 1 for 2000-2017 to the color-coded points in the upper panels.



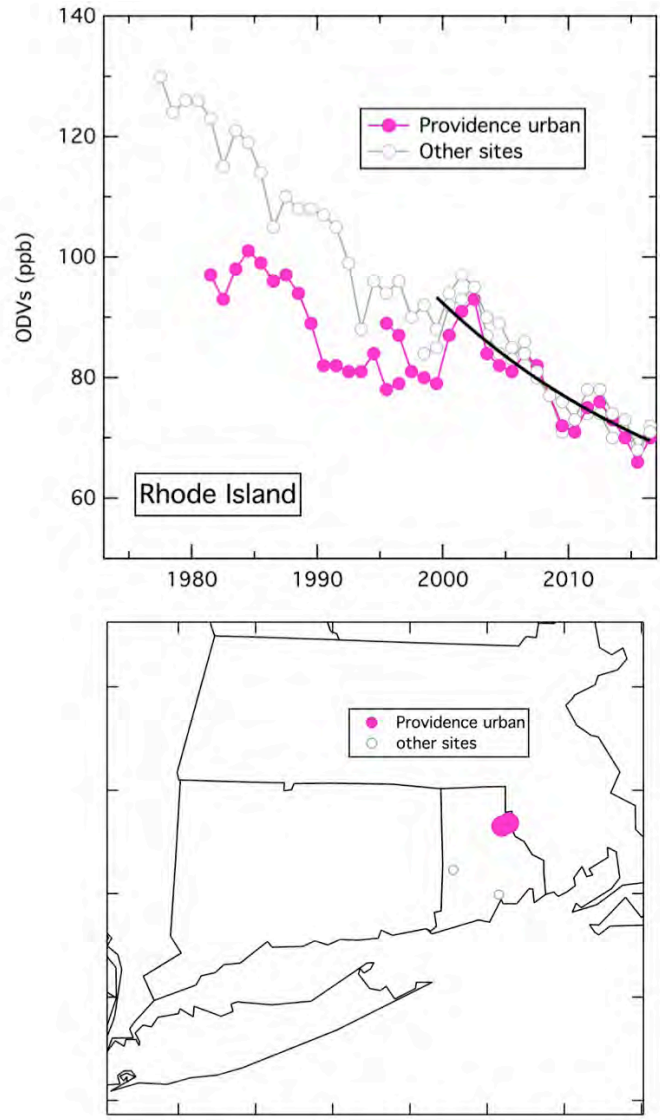
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32 **Figure S2.** Temporal evolution of the ODVs in New Jersey and map of all monitoring sites reporting  
 33 ODVs. The two panels highlight the coastal and central urban sites with corresponding symbols and color-  
 34 coding. A fit of Equation 1 to ODVs from all sites is shown for 2000-2017.



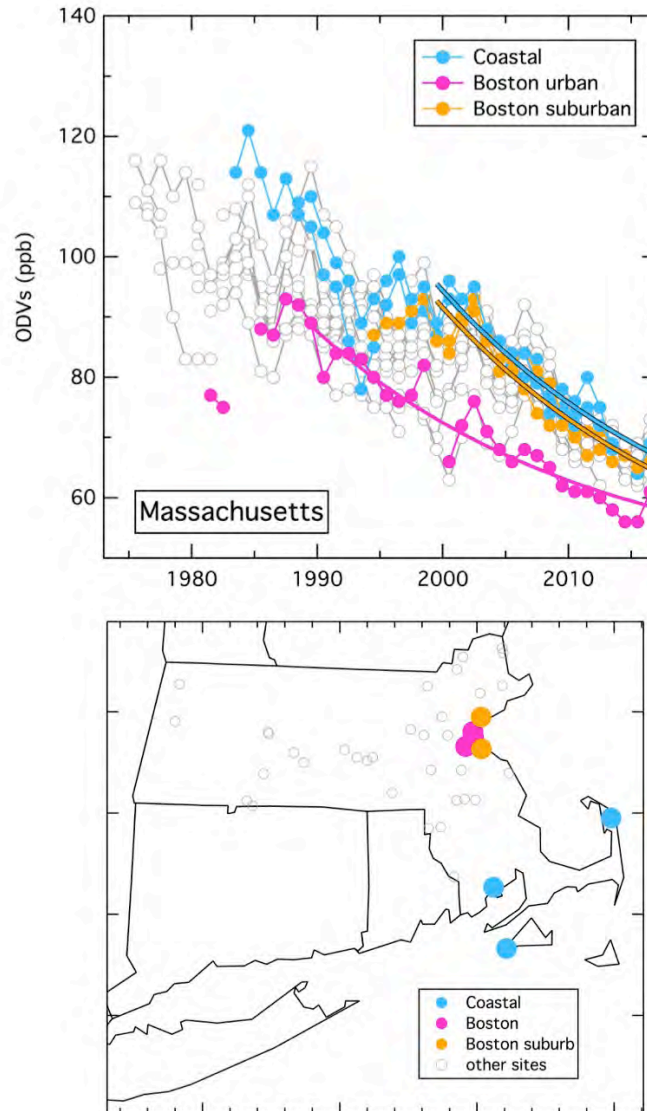
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36 **Figure S3.** Temporal evolution of the ODVs in Connecticut and map of all monitoring sites reporting  
 37 ODVs. The two panels highlight the coastal and New Haven urban sites with corresponding symbols and  
 38 color-coding. Fit of Equation 1 to all ODVs (black curve) and to the coastal sites (colored curve) are shown  
 39 for 2000-2017.



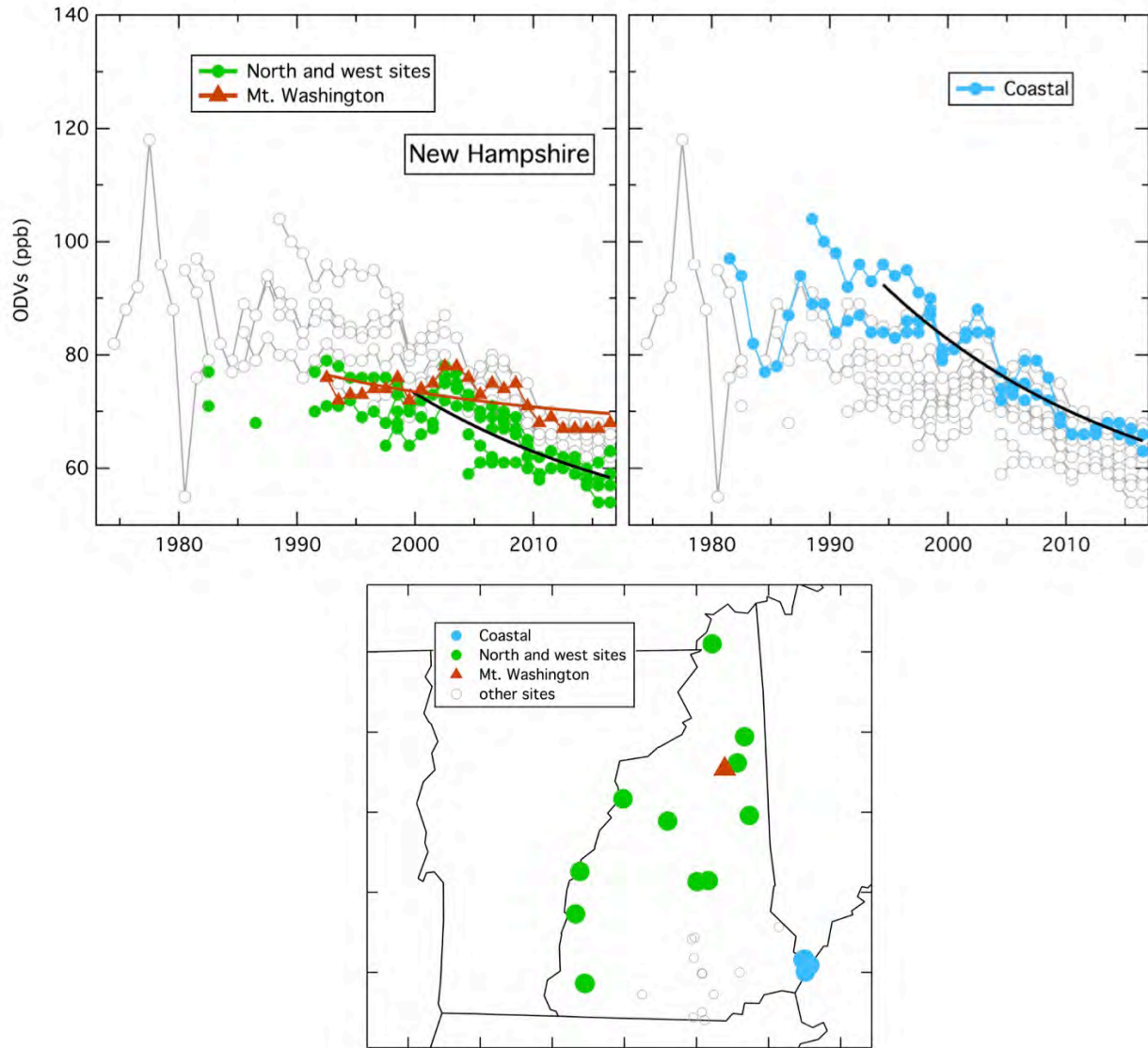
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41 **Figure S4.** Temporal evolution of the ODVs in Rhode Island and map of all monitoring sites reporting  
 42 ODVs. The two panels highlight the rural and urban Providence sites with corresponding symbols and  
 43 color-coding. A fit of Equation 1 to all ODVs is shown for 2000-2017.



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45 **Figure S5.** Temporal evolution of the ODVs in Massachusetts and map of all monitoring sites reporting  
 46 ODVs. The two panels highlight the coastal and Boston urban and suburban sites with corresponding  
 47 symbols and color-coding. Fits of Equation 1 to the selected ODVs are shown for 2000-2017 for the coastal  
 48 and suburban sites, and for 1990-2017 for the Boston urban sites.



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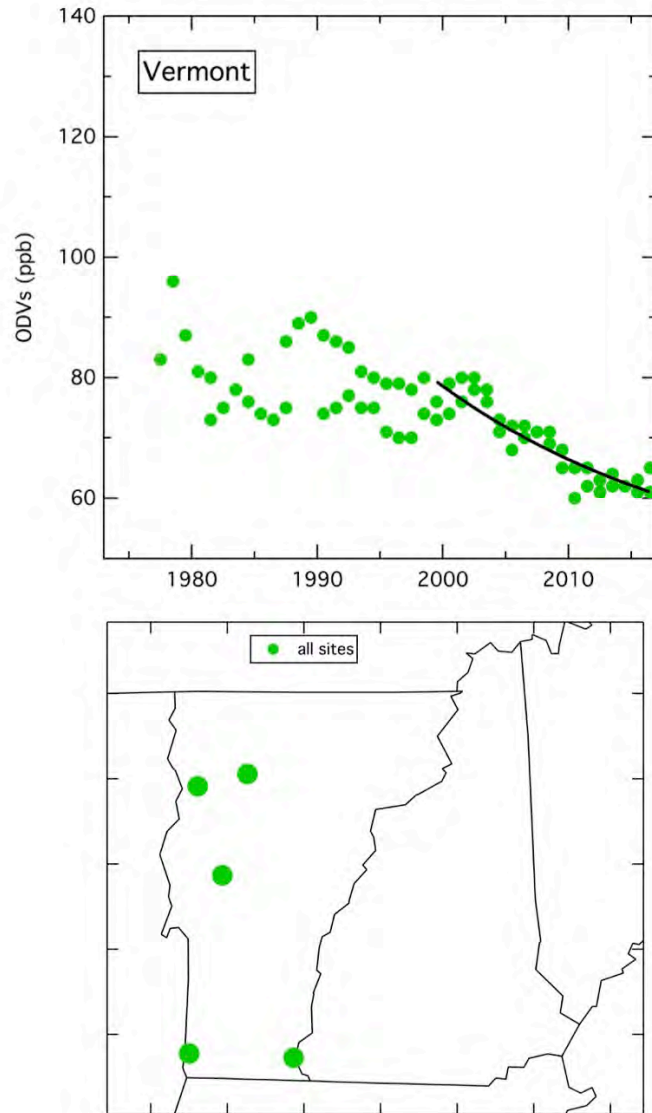
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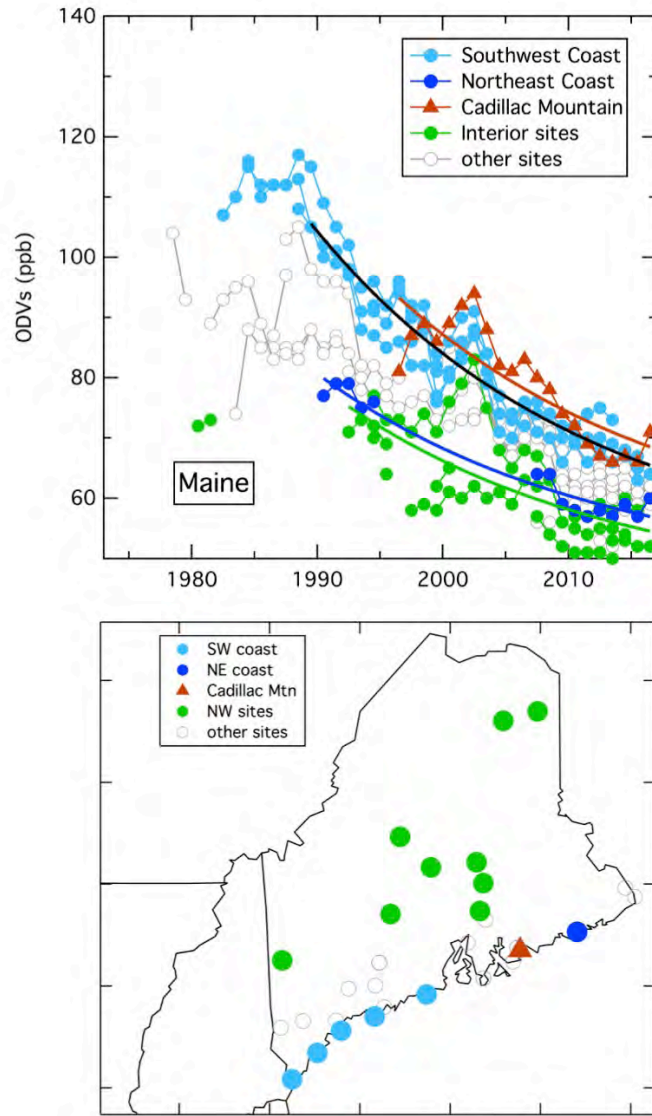
**Figure S6.** Temporal evolution of the ODVs in New Hampshire and map of all monitoring sites reporting ODVs. The two upper panels highlight the coastal (including Kittery, ME) and the rural north and west sites, including Mt. Washington. The lower panel shows all sites with corresponding symbols and color-coding. Fits of Equation 1 to the selected ODVs are shown for 1995-2017 for the coastal sites, 2000-2017 for the north and west sites, and the full data range (1993-2017) for Mt. Washington.





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**Figure S7.** Temporal evolution of the ODVs in Vermont and map of all monitoring sites reporting ODVs. Fit of Equation 1 to all sites is shown for 2000-2017.



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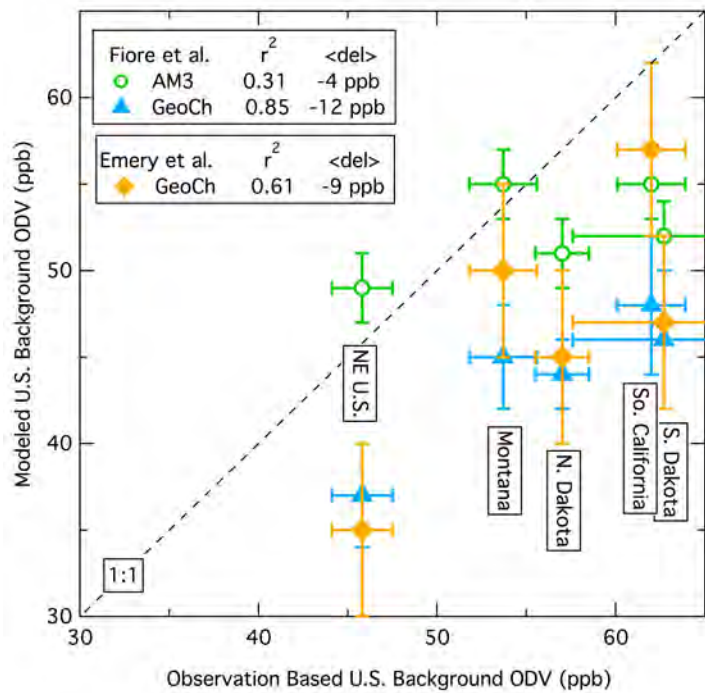
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**Figure S8.** Temporal evolution of the ODVs in Maine and map of all monitoring sites reporting ODVs. Fits of Equation 1 to four sets of sites are shown.



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**Figure S9.** Comparison of U.S. Background ODV estimates from model calculations with those derived from observations.