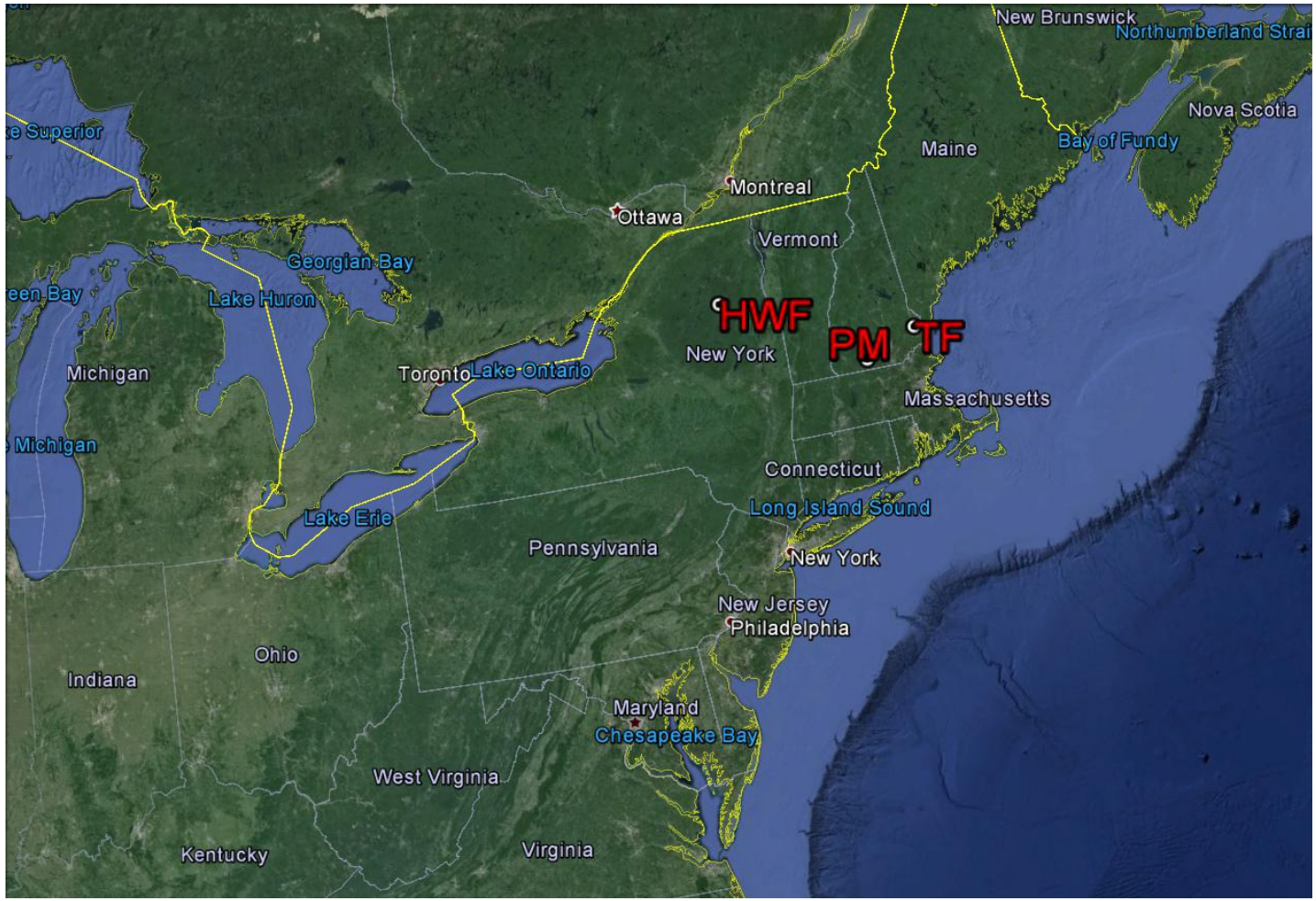
Potential Controls on Trends in Background Concentrations of Hg° in the Northeastern US

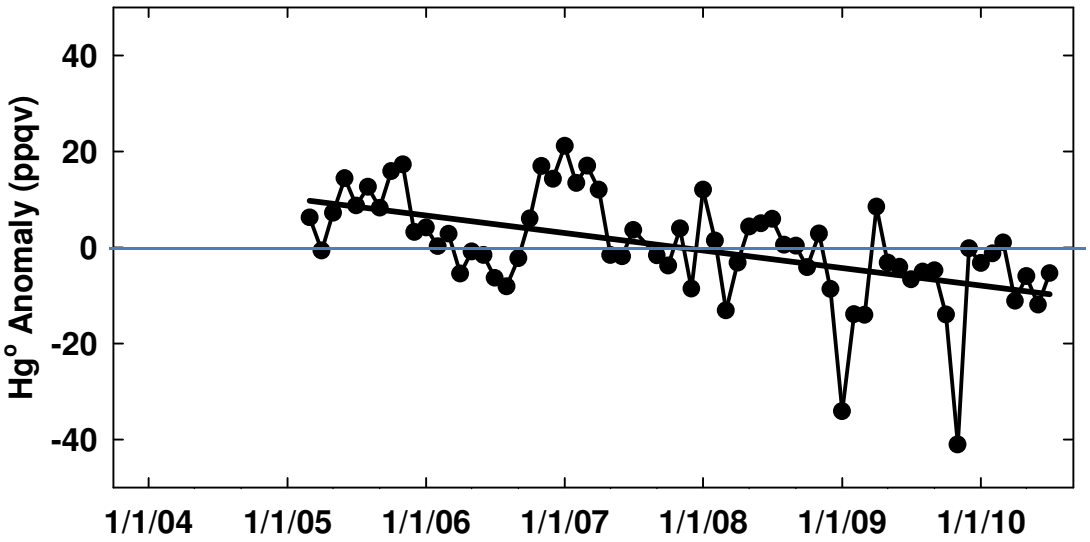
Huiting Mao
Department of Chemistry
State University of New York
College of Environmental Science and Forestry



Thompson Farm – TF, Durham, NH, sea level
Pack Monadnock – PM, Pack Monadnock, NH, 700 asl
Huntington Wildlife Forest – HWF, Adirondacks, NY, 510 m asl

Pack Monadnock

3.8±0.9 ppqv yr^{-1}

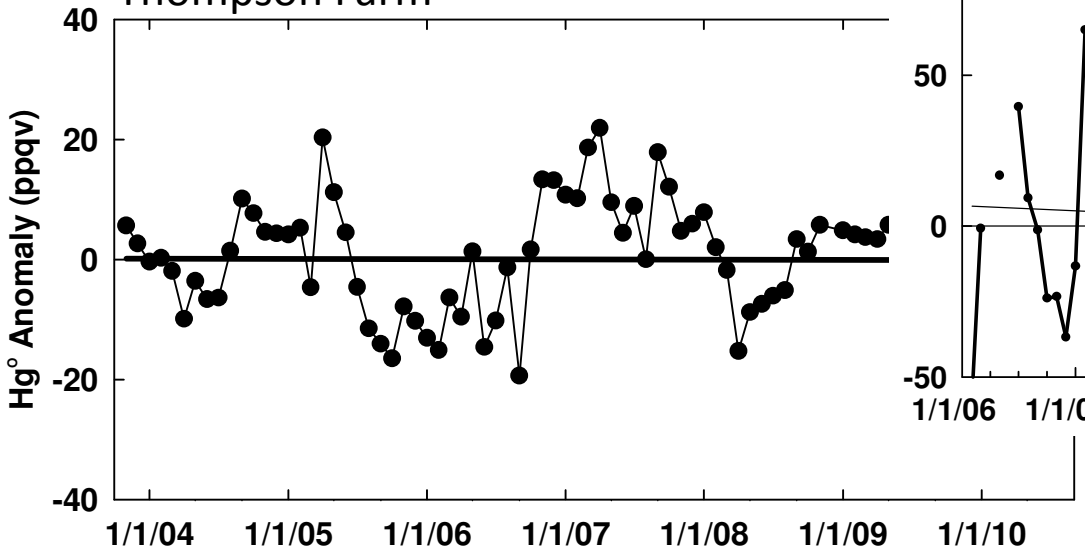


Mace Head: 3.1±1.1 ppqv yr^{-1}
Ebinghaus et al. (2011)

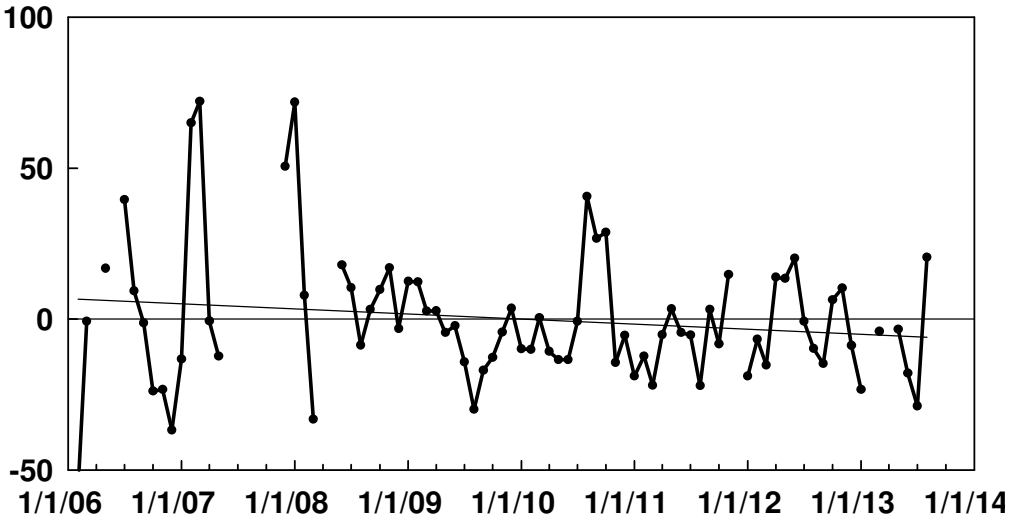
Cape Point South Africa
3.8±0.6 ppqv yr^{-1}, Slemr et al. (2011)

Canadian mid-latitude sites
~2.6 – 3.9 ppqv yr^{-1}
Cole et al. (2013)

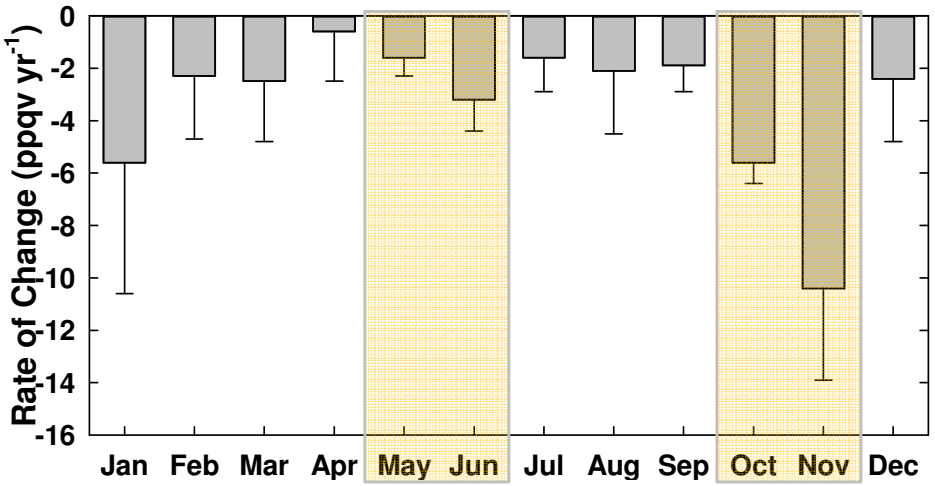
Thompson Farm



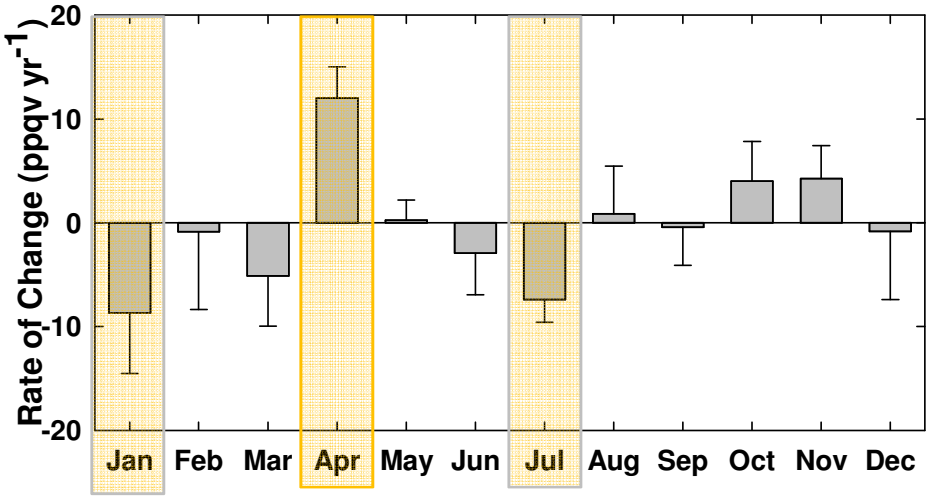
Huntington



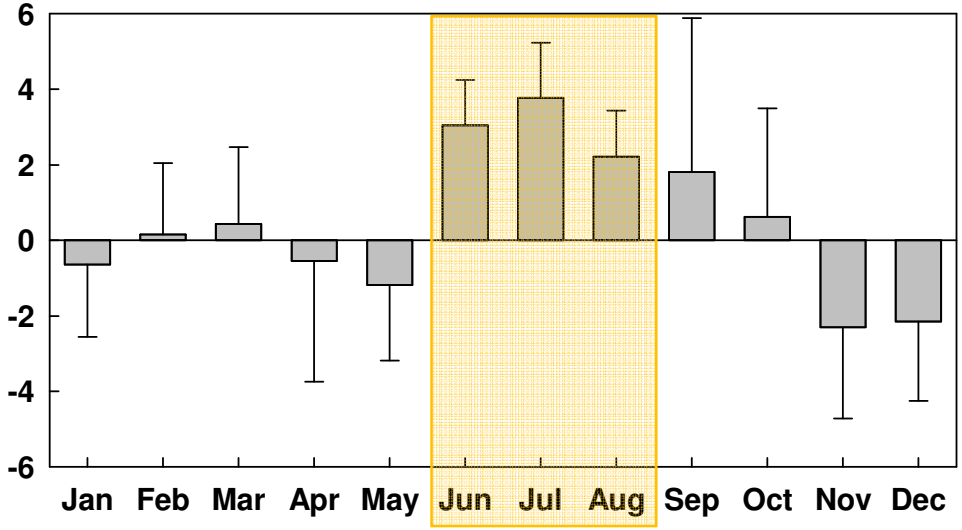
Pack Monadnock



Huntington

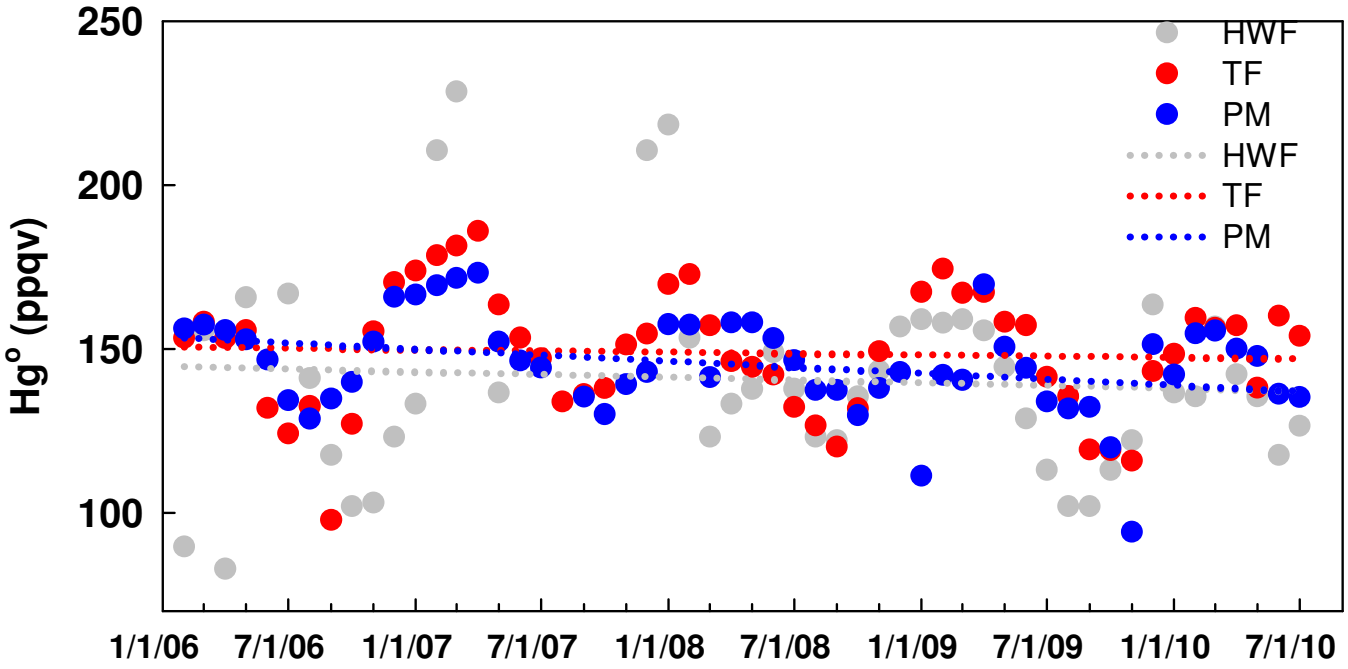


Thompson Farm



- In colder months the trends were more associated with anthropogenic emission reductions;
- In warmer months other sources/sinks and processes became more significant and even predominant.

For the overlapping period February 2006 – August 2010

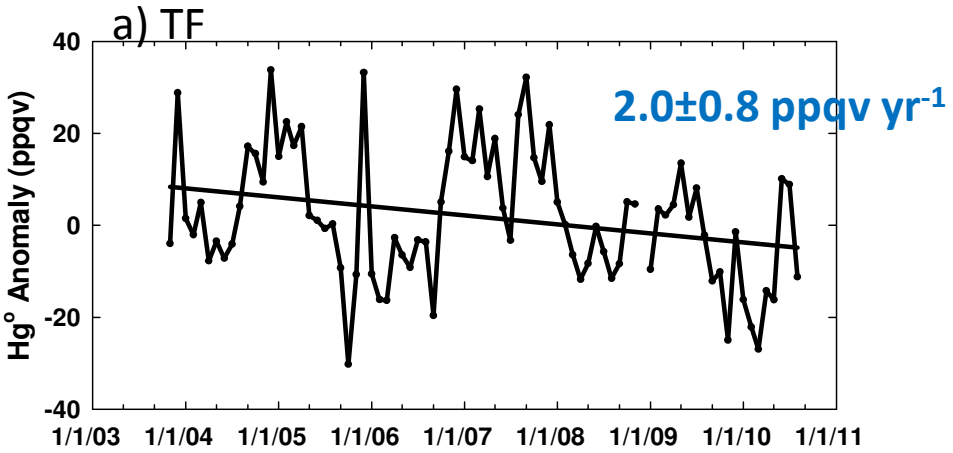


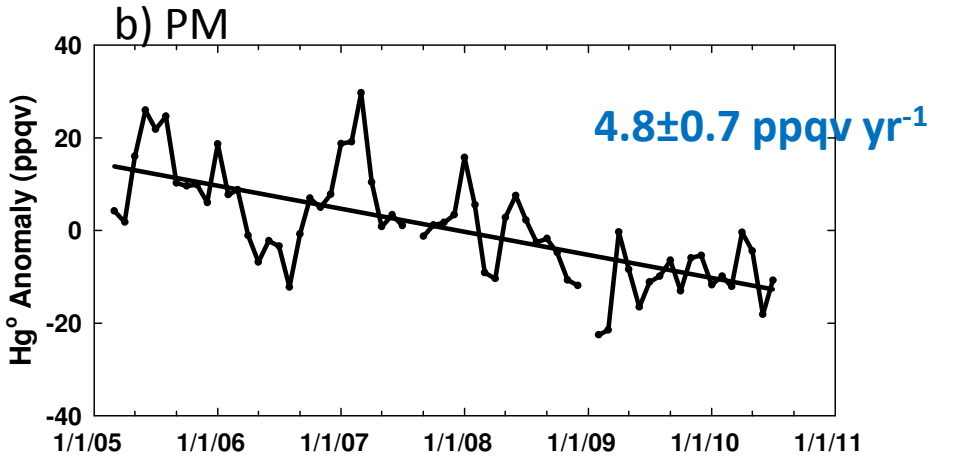
HWF: -1.8 ± 3.4 ppqv yr^{-1}

TF: -0.8 ± 1.9 ppqv yr^{-1}

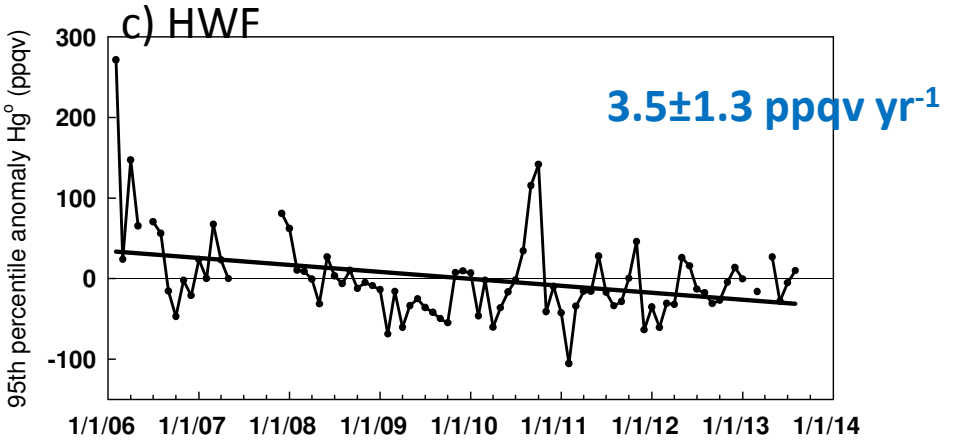
PM: -3.6 ± 1.4 ppqv mon^{-1}

Hg^0 MMAs corresponding to 75th percentile CO mixing ratios at TF and PM

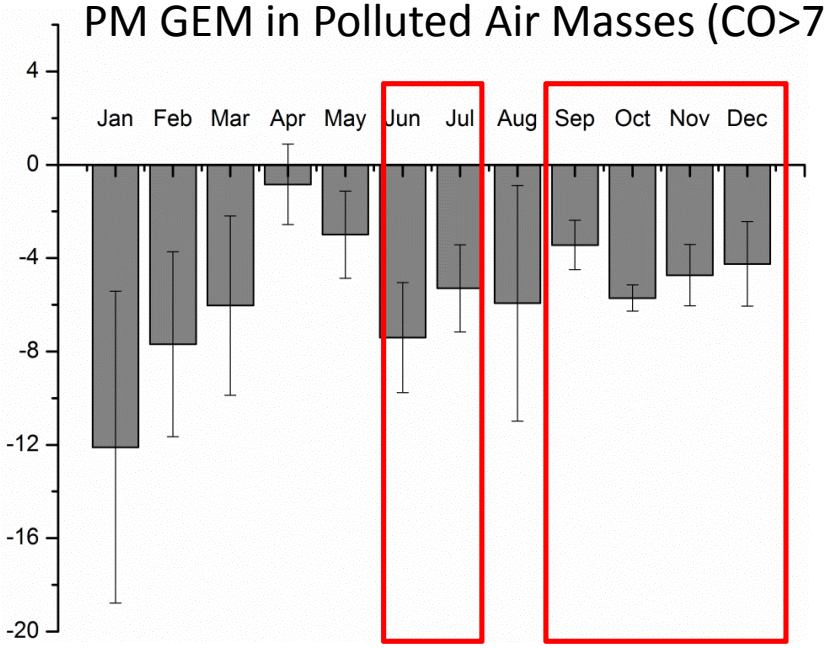




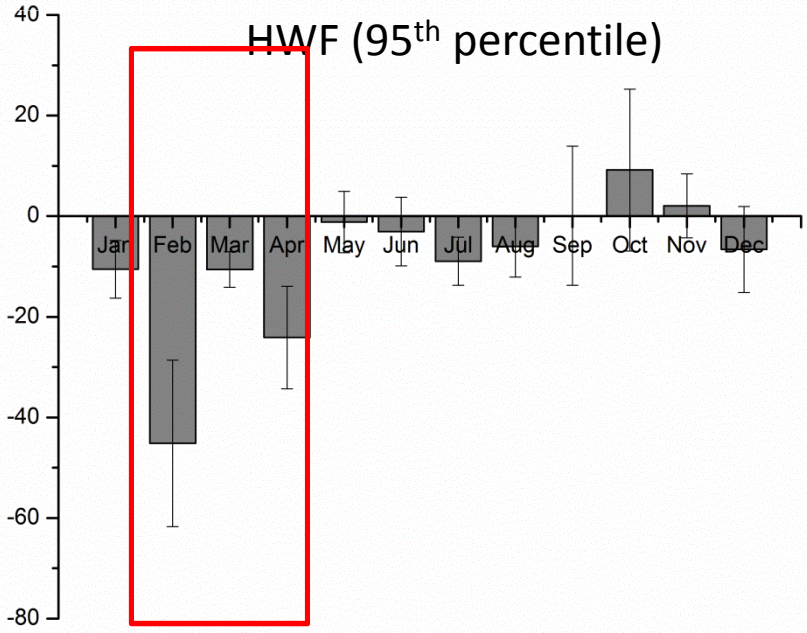
95th percentile Hg^0 MMAs at HWF



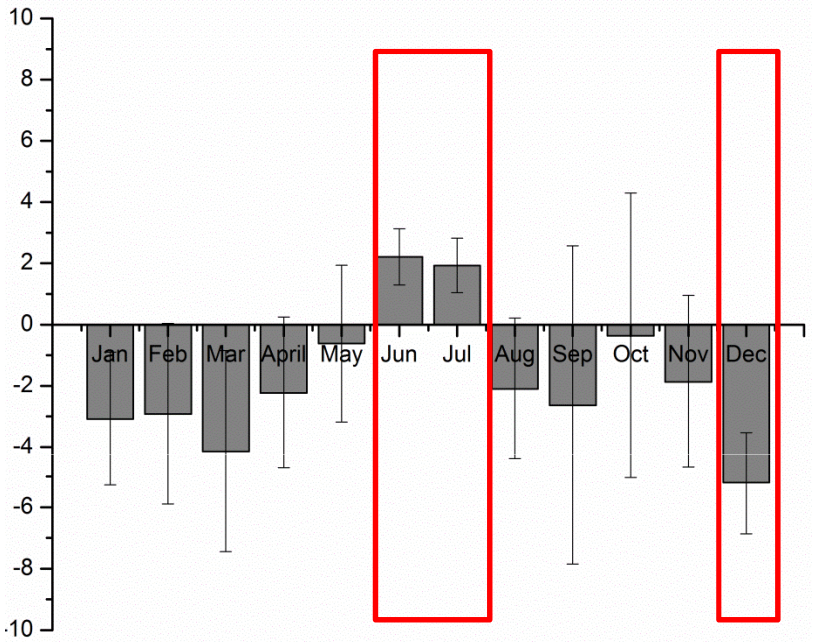
PM GEM in Polluted Air Masses (CO>75th percentile)



HWF (95th percentile)

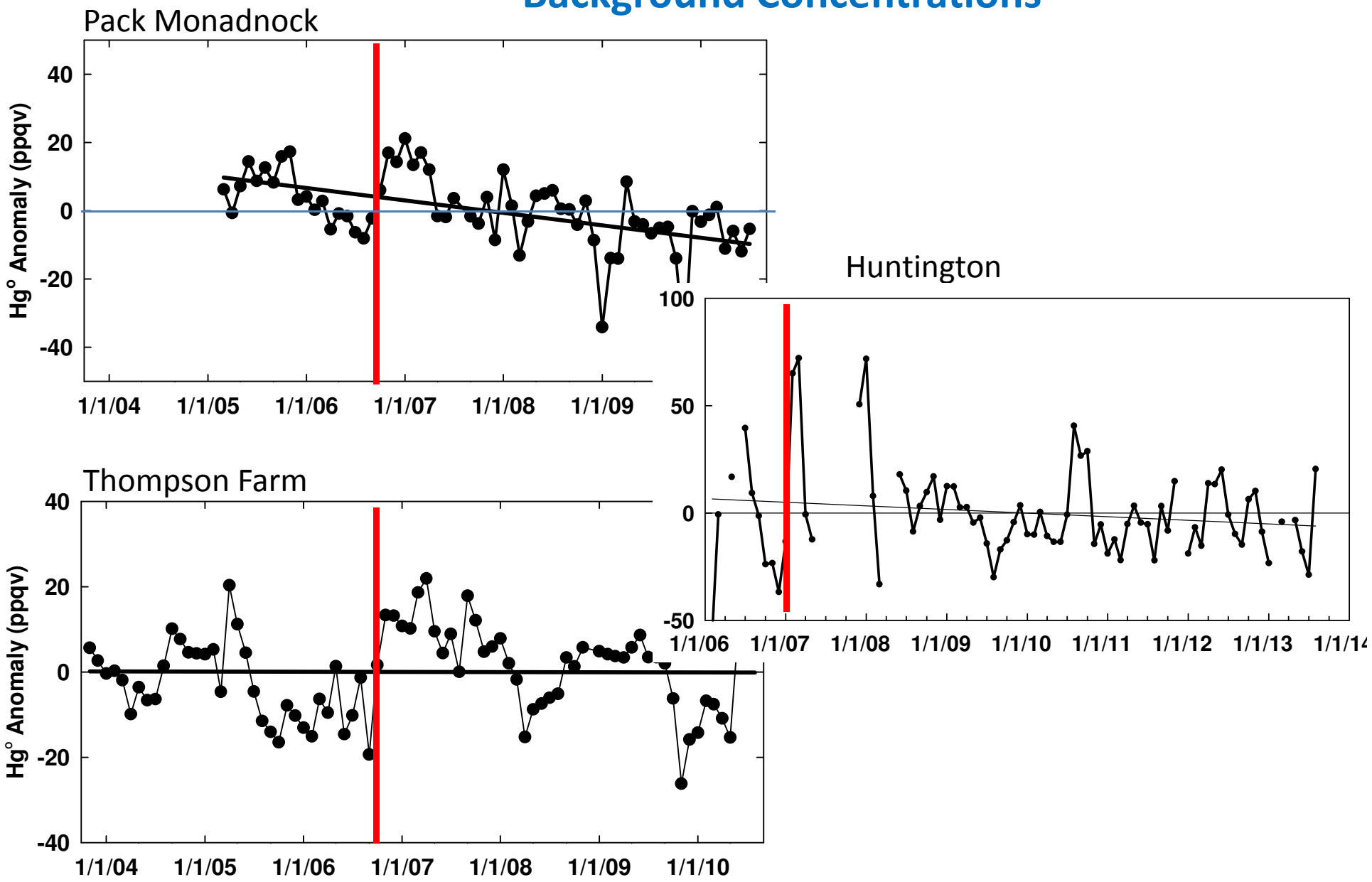


TF (CO> 75th percentile)

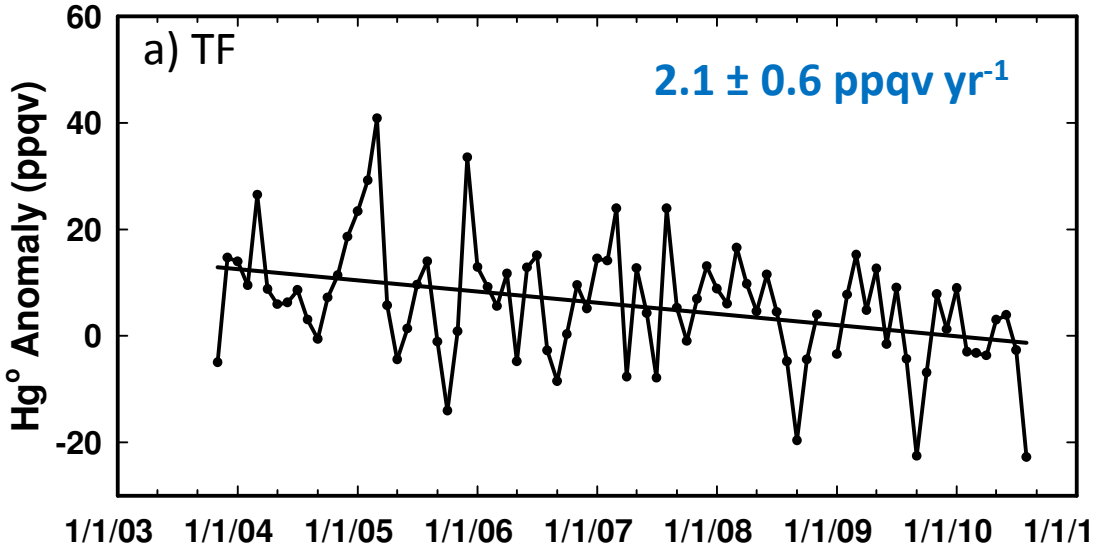


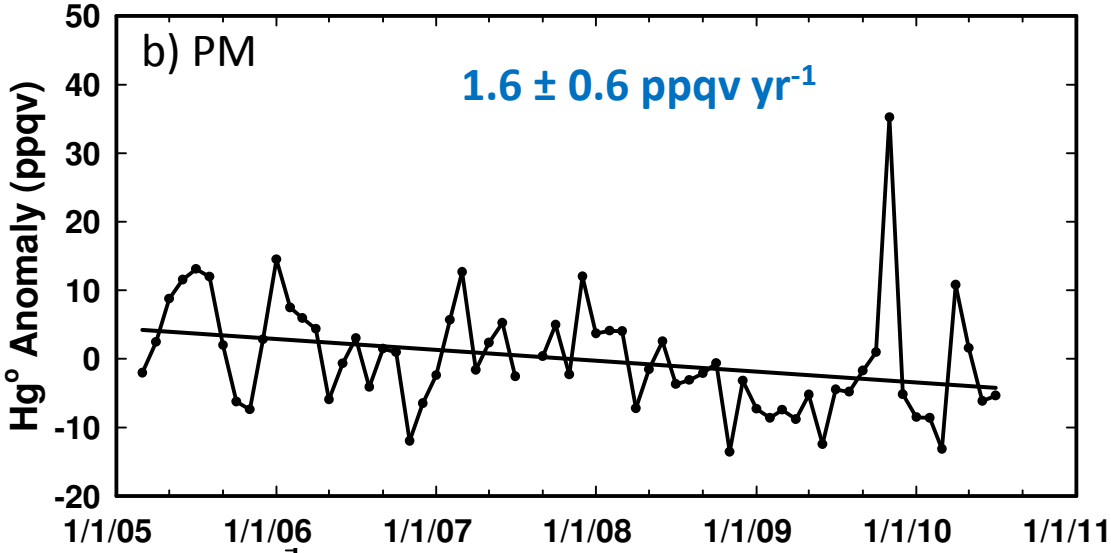
For TF, other sources/processes in warmer months could overtake anthropogenic influence.

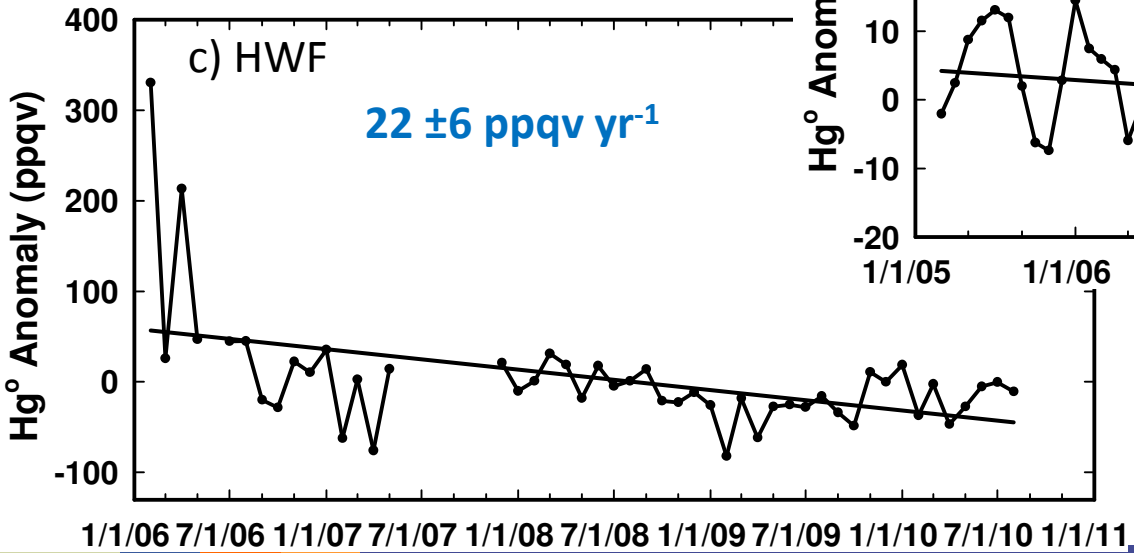
Background Concentrations



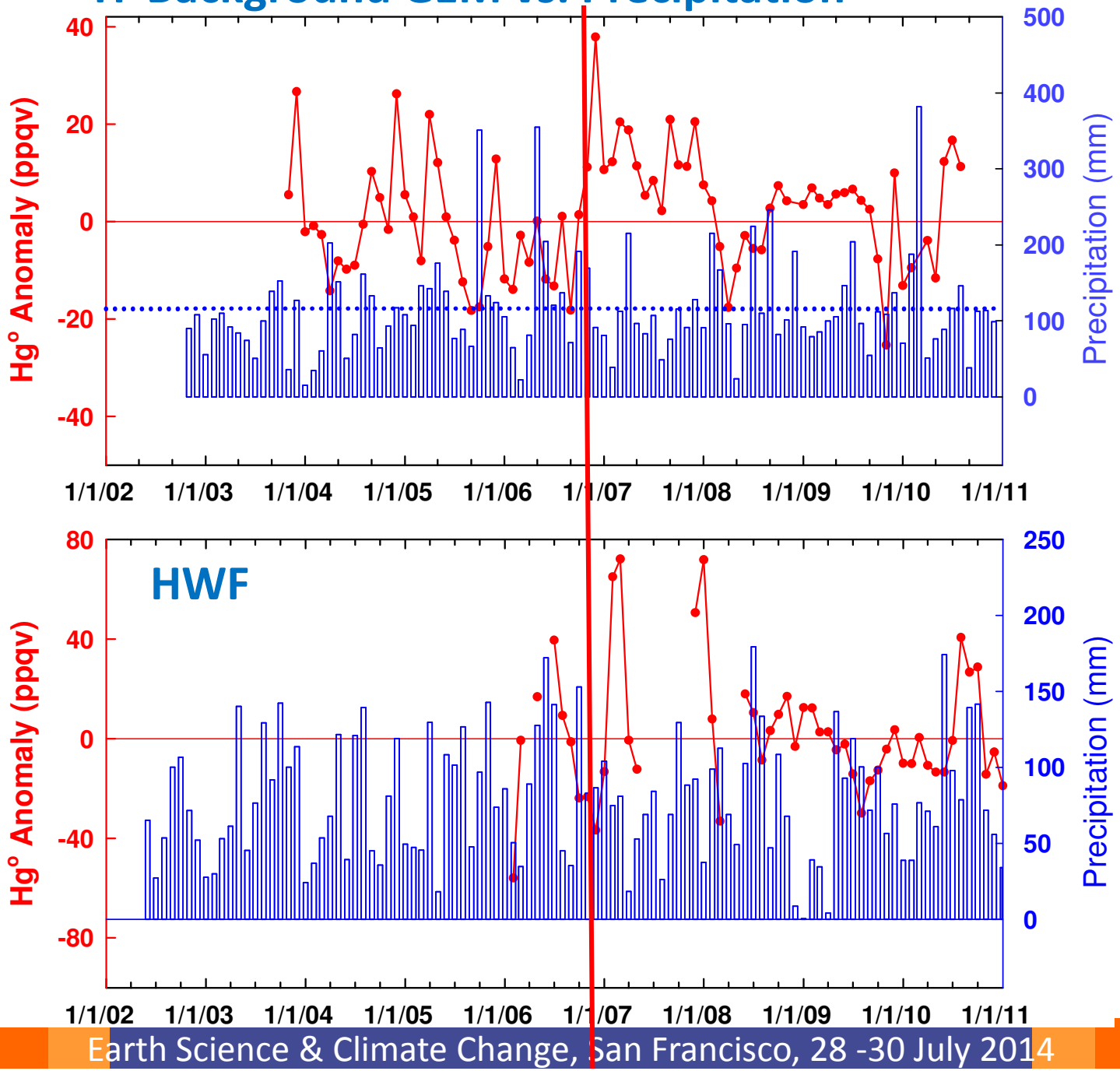
Anthropogenic Contribution







TF Background GEM vs. Precipitation



TF Wet Deposition

Season	Precipitation total (cm)	Deposition ($\mu g\, m^{-2}$)			
		Total	Mean	Median	Range
21 Jul 2006 to 20 Sep 2006	22.46	1.16	0.116	0.089	0.027–0.263
Fall 2006	42.02	2.85	0.190	0.139	0.058–0.600
Winter 2006–2007	24.58	1.12	0.125	0.121	0.016–0.274
Spring 2007	40.13	3.39	0.339	0.379	0.030–0.561
Summer 2007	20.59	3.02	0.275	0.234	0.090–0.548
Fall 2007	30.26	0.99	0.083	0.061	0.023–0.231
Winter 2007–2008	47.53	2.17	0.135	0.117	0.055–0.399
Spring 2008	19.97	1.79	0.162	0.107	0.066–0.553
Summer 2008	52.52	6.37	0.354	0.112	0.015–1.737
Fall 2008	37.00	1.76	0.125	0.114	0.039–0.256
Winter 2008–2009	29.86	1.49	0.149	0.133	0.050–0.339
Spring 2009	27.37	2.23	0.172	0.137	0.020–0.452

Lombard et al., 2011, acp

Acknowledgments

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