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Investigation of processes controlling summertime gaseous elemental mercury oxidation at midlatitudinal marine, coastal, and inland sites

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Table S1. Aqueous phase reactions and equilibriums of Hg in the box model.

No.	REACTIONS	KINETIC (L mol^{-1} s^{-1}) or EQUILIBRIUM CONSTANT	REFERENCE
A1	Hg^0 (aq) + O_3 (aq) → HgO (aq) + O_2 (aq)	2.4×10^9	Munthe et al., 1992
A2	Hg^0 (aq) + OH (aq) → HgOH (aq)	2.4×10^9	Gardfeldt et al., 2001
A3	HgOH (aq) + OH (aq) → $Hg(OH)_2$ (aq)	1.0×10^{10}	Nazhat and Asmus, 1973
A4	HgOH (aq) + O_2 (aq) + H_2O (aq) → $Hg(OH)_2$ (aq) + H^+ + O_2^-	1.0×10^9	Nazhat and Asmus, 1973
A5	Hg^0 (aq) + OH (aq) → Hg^+ + OH^-	2.0×10^9	Lin and Pehkonen, 1997
A6	HgO (aq) + H^+ → Hg^{2+} + OH^-	1.0×10^{10}	Pleijel and Munthe, 1995
A7	HOCl (aq) + Hg^0 (aq) → Hg^{2+} + Cl^- + OH^-	2.09×10^6	Lin and Pehkonen, 1997
A8	ClO^- + Hg^0 (aq) → Hg^{2+} + Cl^- + OH^-	1.99×10^6	Lin and Pehkonen, 1997
A9	$HgSO_3$ (aq) → Hg^0 (aq) + S(VI)	0.6	Munthe et al., 1991
A10	$Hg(OH)_2$ (aq) → Hg^0 (aq) + products	3.0×10^7	Pleijel and Munthe, 1995
A11	Hg^+ + HO_2 (aq) → Hg^0 (aq) + O_2 (aq) + H^+	1.0×10^{10}	Xie et al., 2008
A12	Hg^{2+} + HO_2 (aq) → Hg^+ + O_2 (aq) + H^+	1.7×10^4	Pehkonen and Lin, 1998
AE1	Hg^{2+} + SO_3^{2-} ↔ $HgSO_3$ (aq)	2.0×10^{13}	van Loon et al., 2001
AE2	$HgSO_3$ (aq) + SO_3^{2-} ↔ $Hg(SO_3)_2^{2-}$	1.0×10^{10}	van Loon et al., 2001
AE3	Hg^{2+} + OH^- ↔ $HgOH^+$	3.98×10^{10}	Smith and Martell, 2004
AE4	$HgOH^+$ + OH^- ↔ $Hg(OH)_2$ (aq)	1.58×10^{11}	Smith and Martell, 2004
AE5	$HgOH^+$ + Cl^- ↔ HgOHCl (aq)	2.7×10^7	Xiao, 1994
AE6	Hg^{2+} + Cl^- ↔ $HgCl^+$	2.0×10^7	Smith and Martell, 2004
AE7	$HgCl^+$ + Cl^- ↔ $HgCl_2$ (aq)	5.0×10^6	Smith and Martell, 2004
AE8	$HgCl_2$ (aq) + Cl^- ↔ $HgCl_3^-$	6.7	Smith and Martell, 2004
AE9	$HgCl_3^-$ + Cl^- ↔ $HgCl_4^{2-}$	13.0	Smith and Martell, 2004
AE10	Hg^{2+} + Br^- ↔ $HgBr^+$	1.10×10^9	Smith and Martell, 2004
AE11	$HgBr^+$ + Br^- ↔ $HgBr_2$ (aq)	2.50×10^8	Smith and Martell, 2004
AE12	$HgBr_2$ (aq) + Br^- ↔ $HgBr_3^-$	1.50×10^2	Smith and Martell, 2004
AE13	$HgBr_3^-$ + Br^- ↔ $HgBr_4^{2-}$	23.0	Smith and Martell, 2004

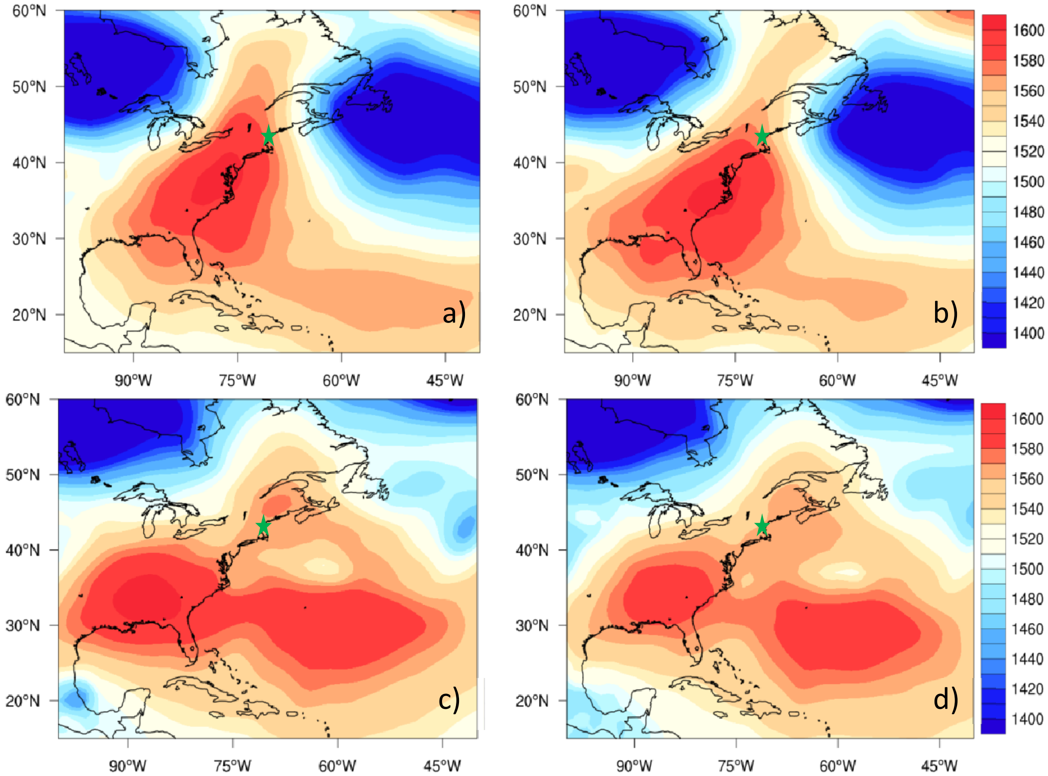

Figure S1. Geopotential height for a) 06/13/2008 08:00 EDT, b) 06/13/2008 14:00 EDT, c) 08/22/2007 14:00 EDT, and d) 08/22/2007 20:00 EDT at 850 hPa, the green star shows the location of TF site.