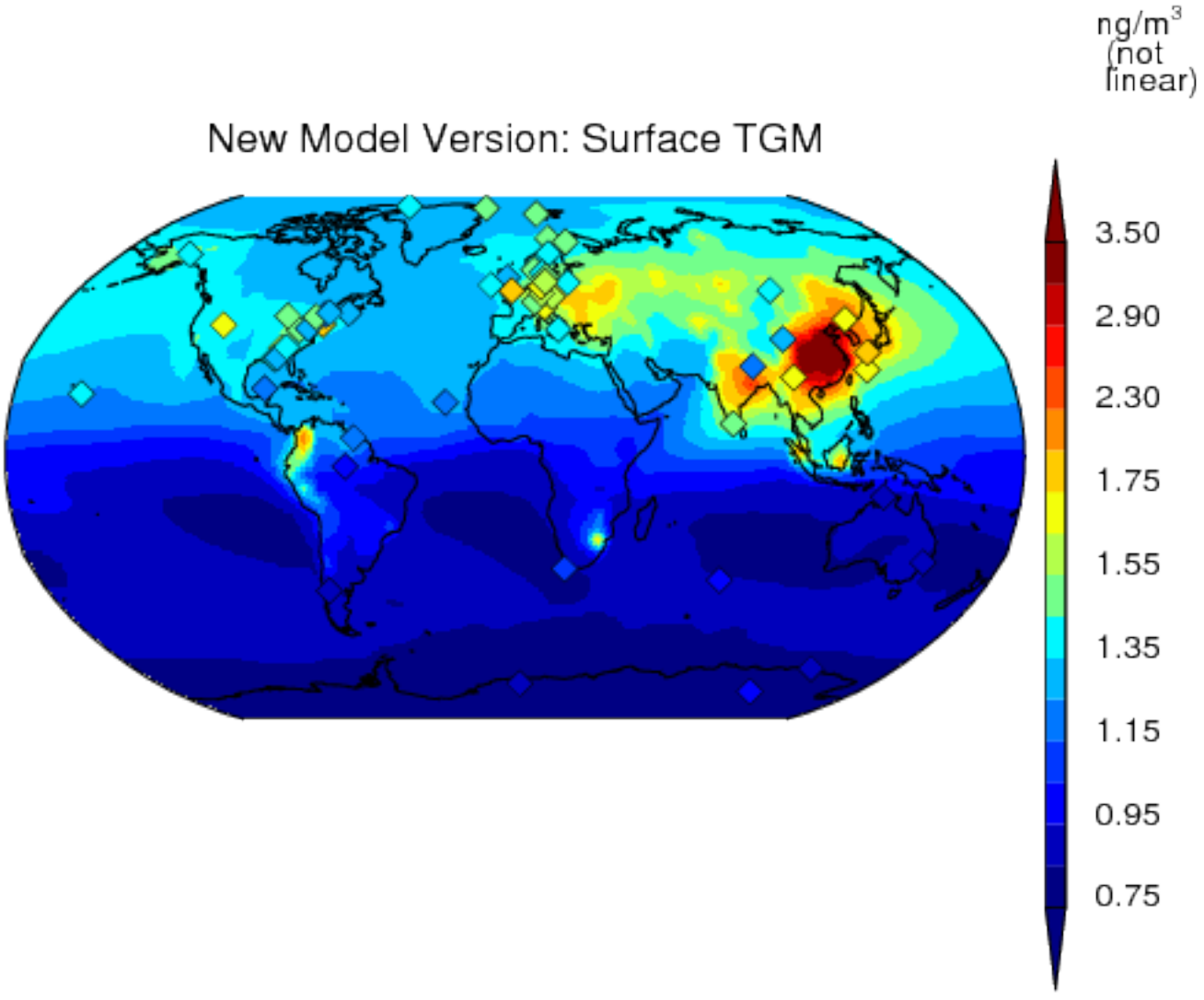
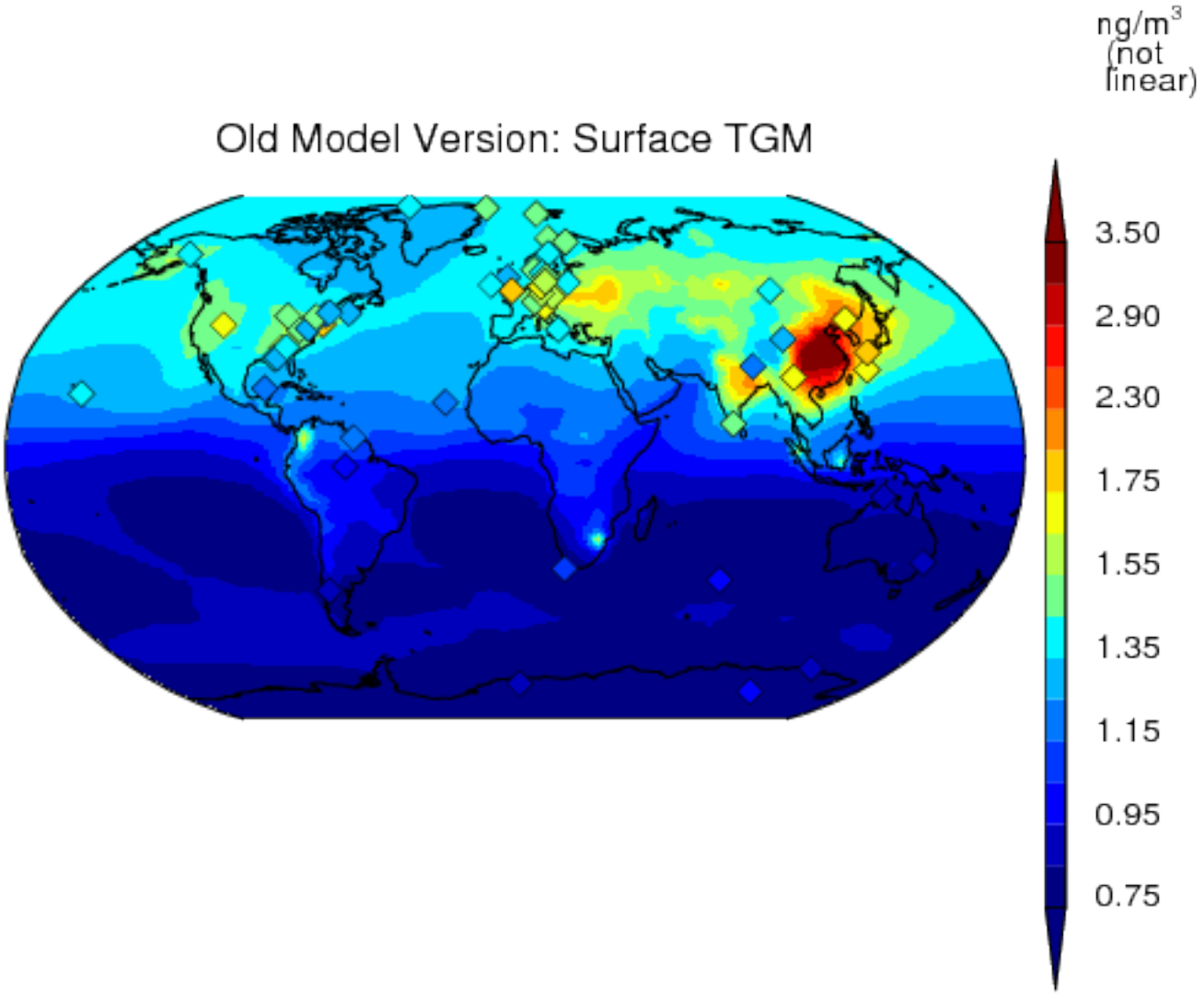


Terrestrial R^2 = 0.54

Mean Obs. = 1.38 +/– 0.26 ng/m^3

Mean Mod. = 1.42 +/– 0.38 ng/m^3

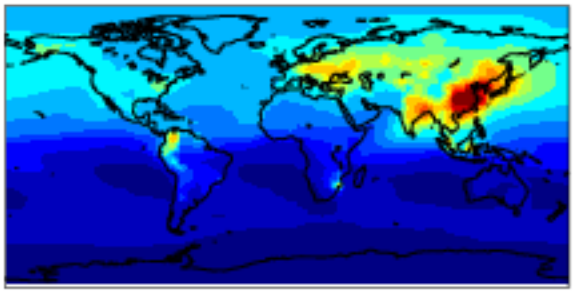


Terrestrial $R^2 = 0.64$

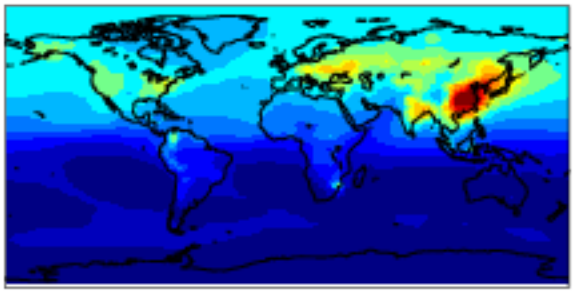
Mean Obs. = 1.38 +/– 0.26 ng/m^3

Mean Mod. = 1.40 +/– 0.33 ng/m^3

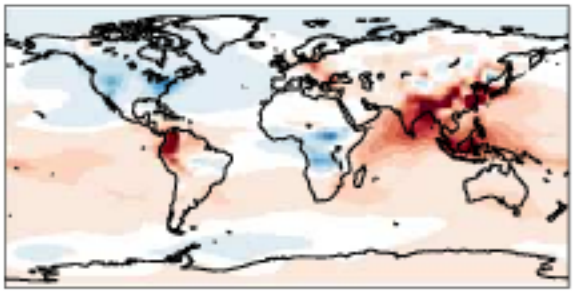
New Model Version: Surface TGM



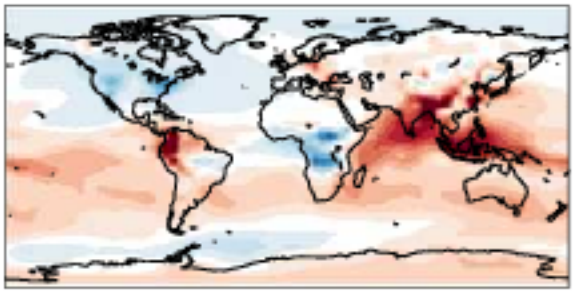
Reference Model Version: Surface TGM

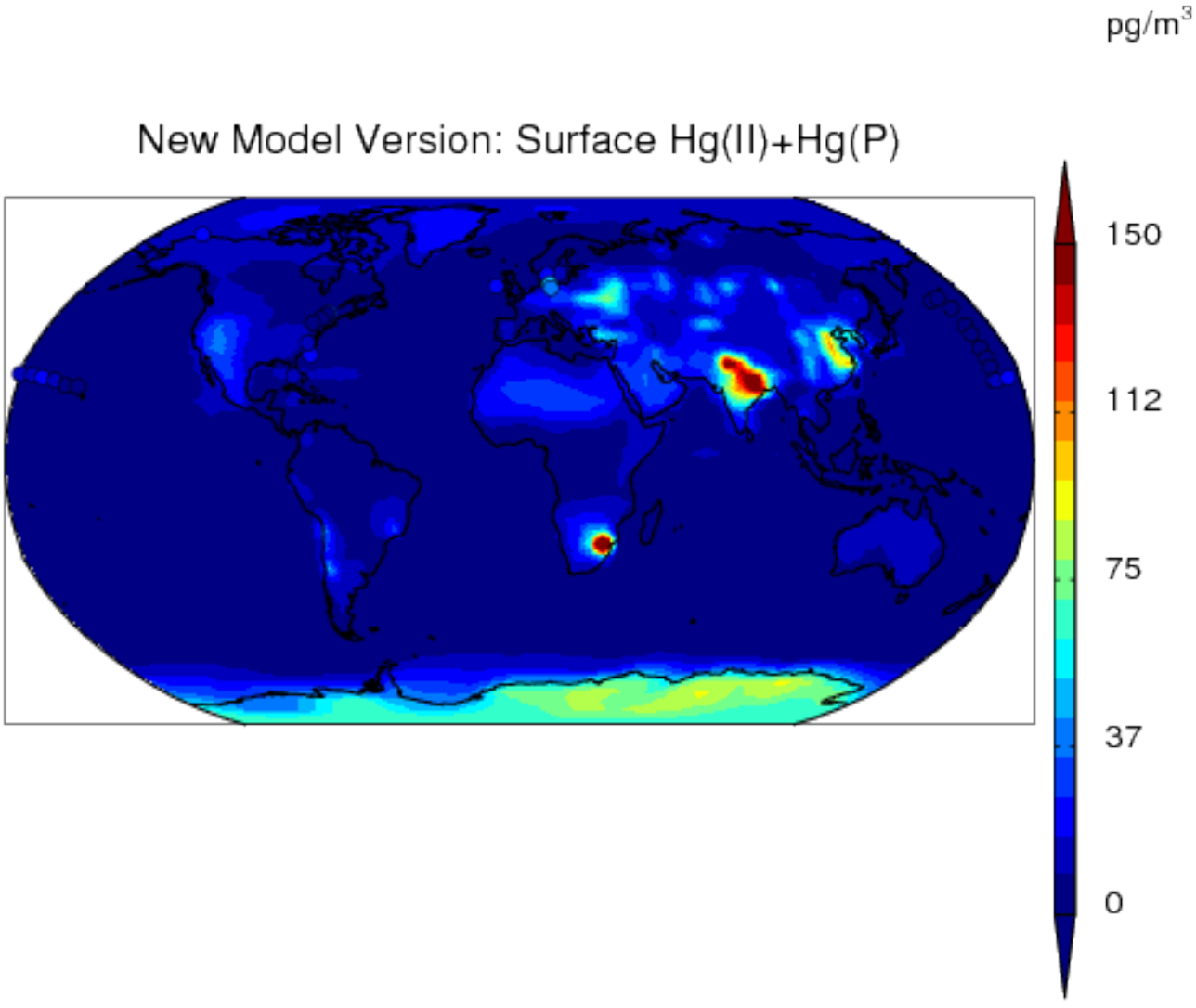


Absolute Difference

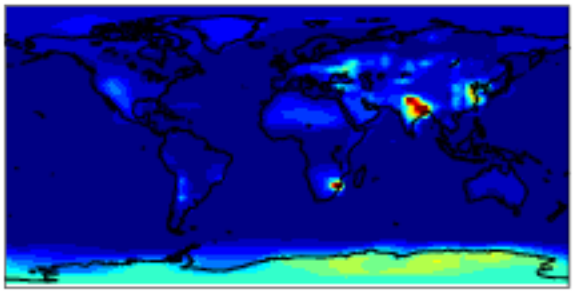


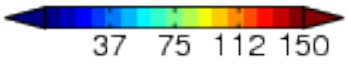
Percent Difference



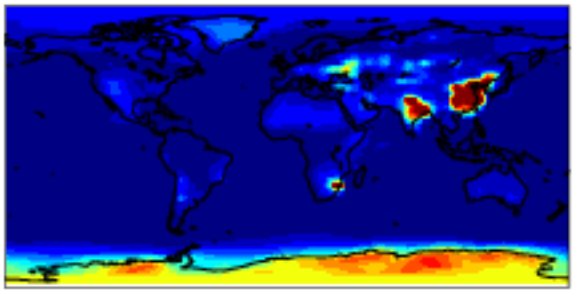

pg/m3
New Model Version: Surface Hg(II)+Hg(P)
150
112
75
37
0

New Model Version: Surface Hg(II)+Hg(P)

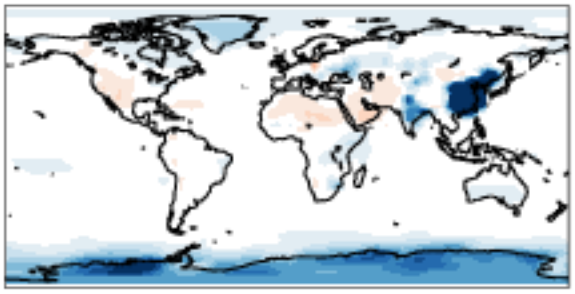


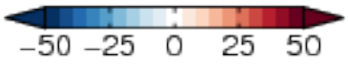


Old Model Version: Surface Hg(II)+Hg(P)

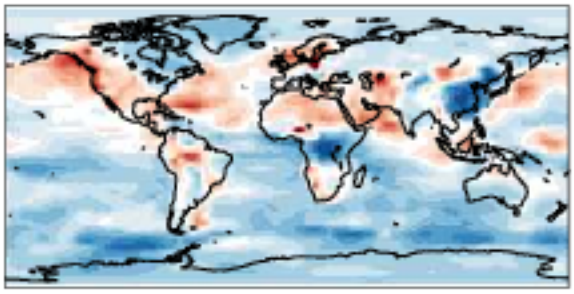


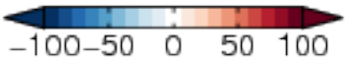
Absolute Difference

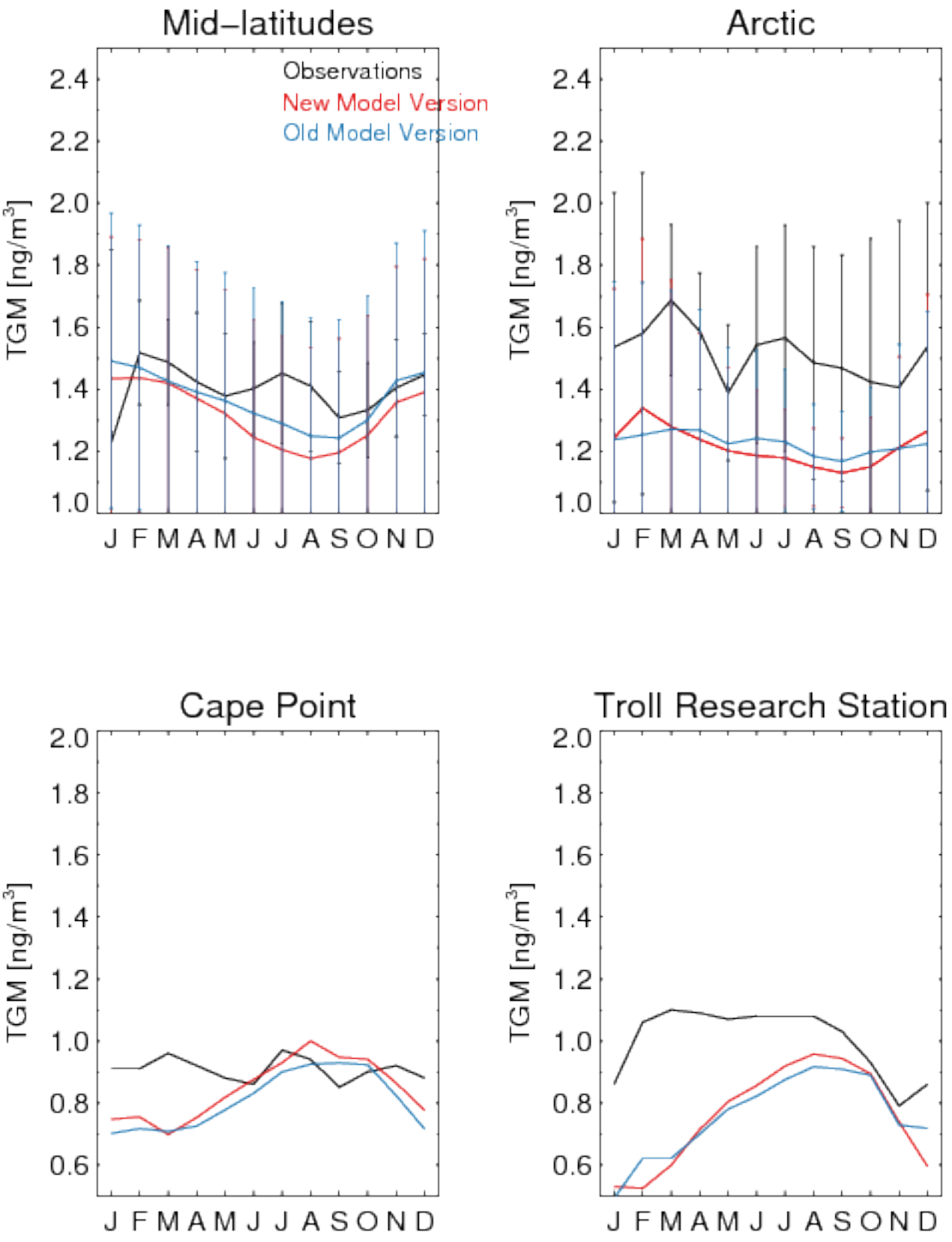


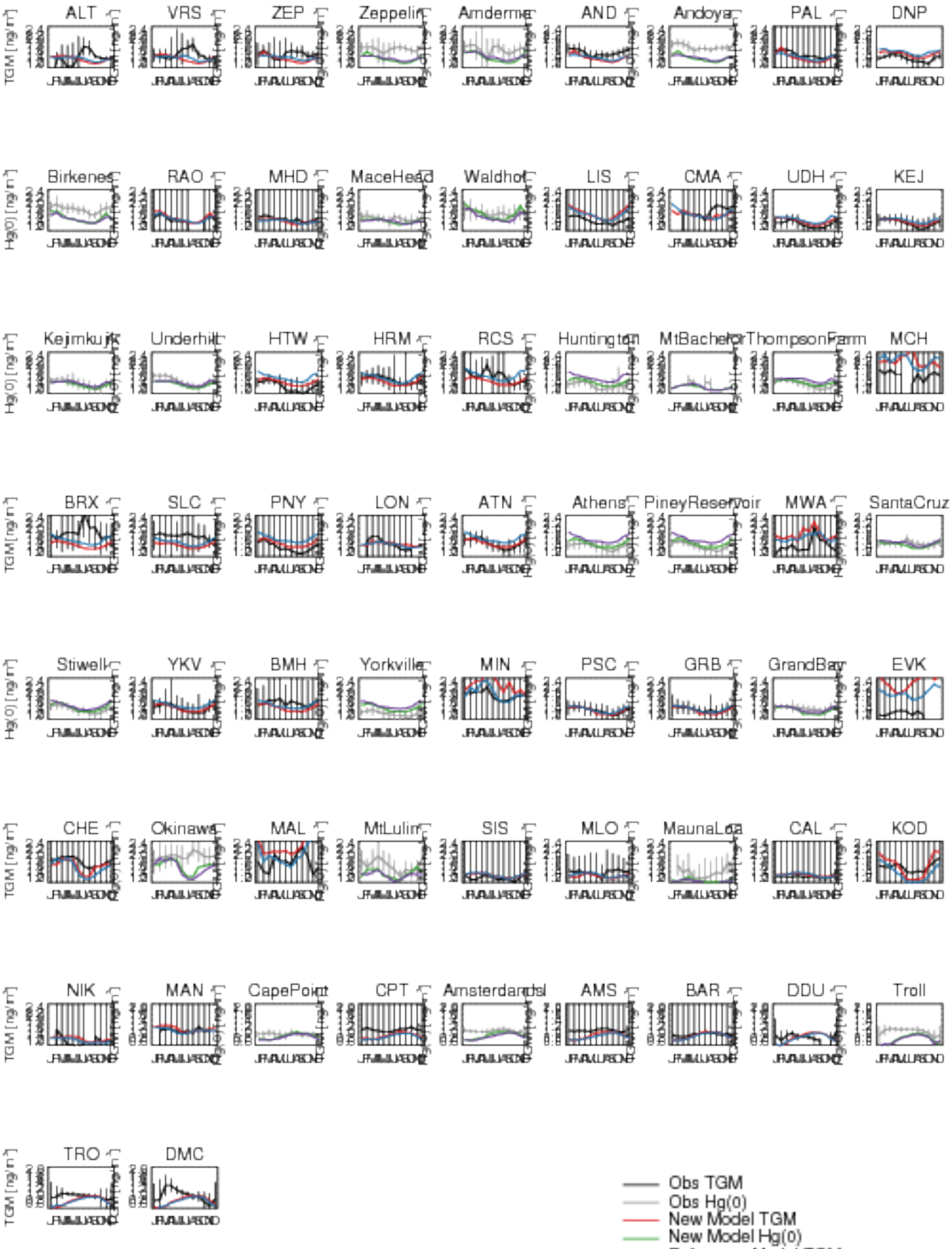


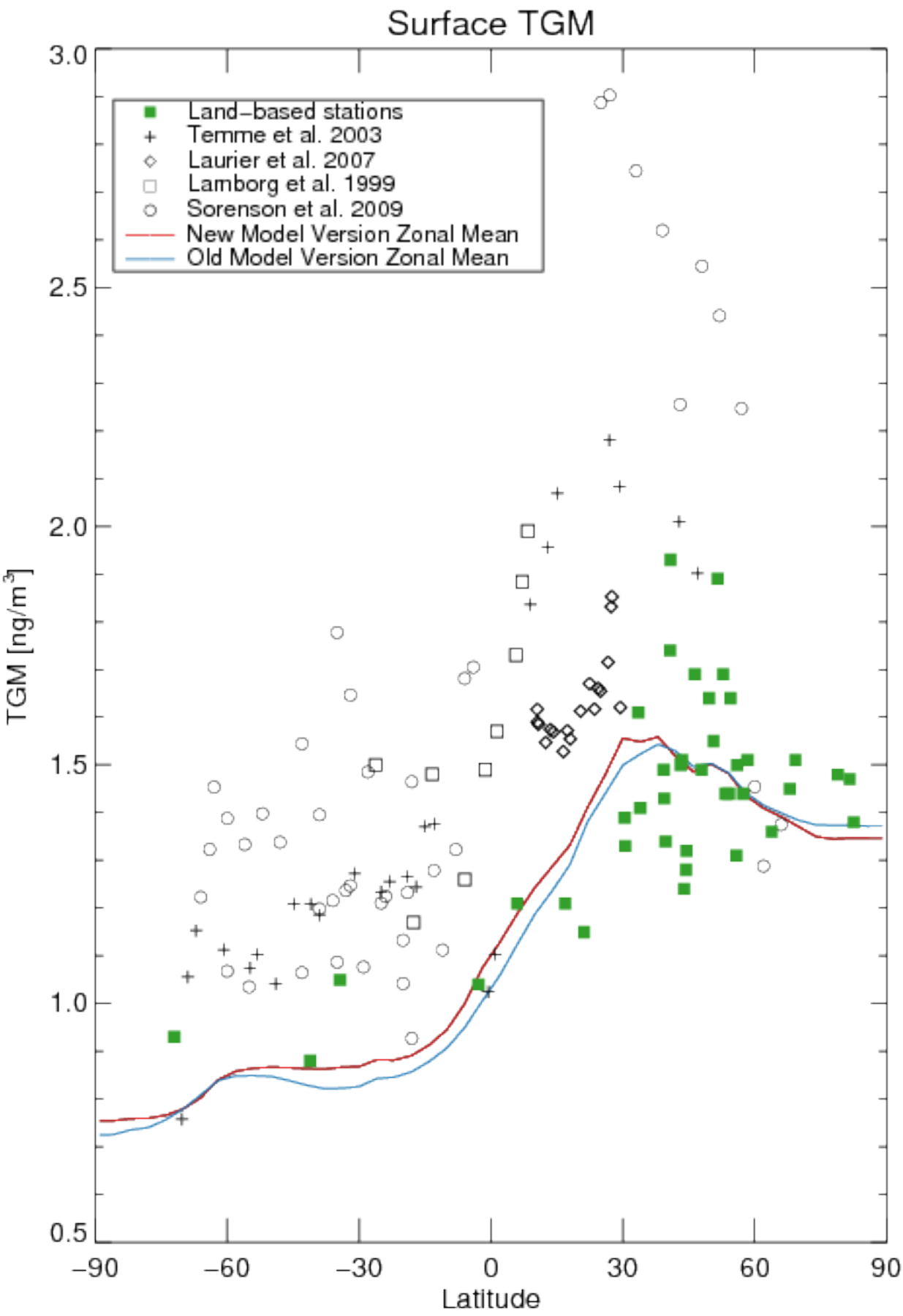
Percent Difference

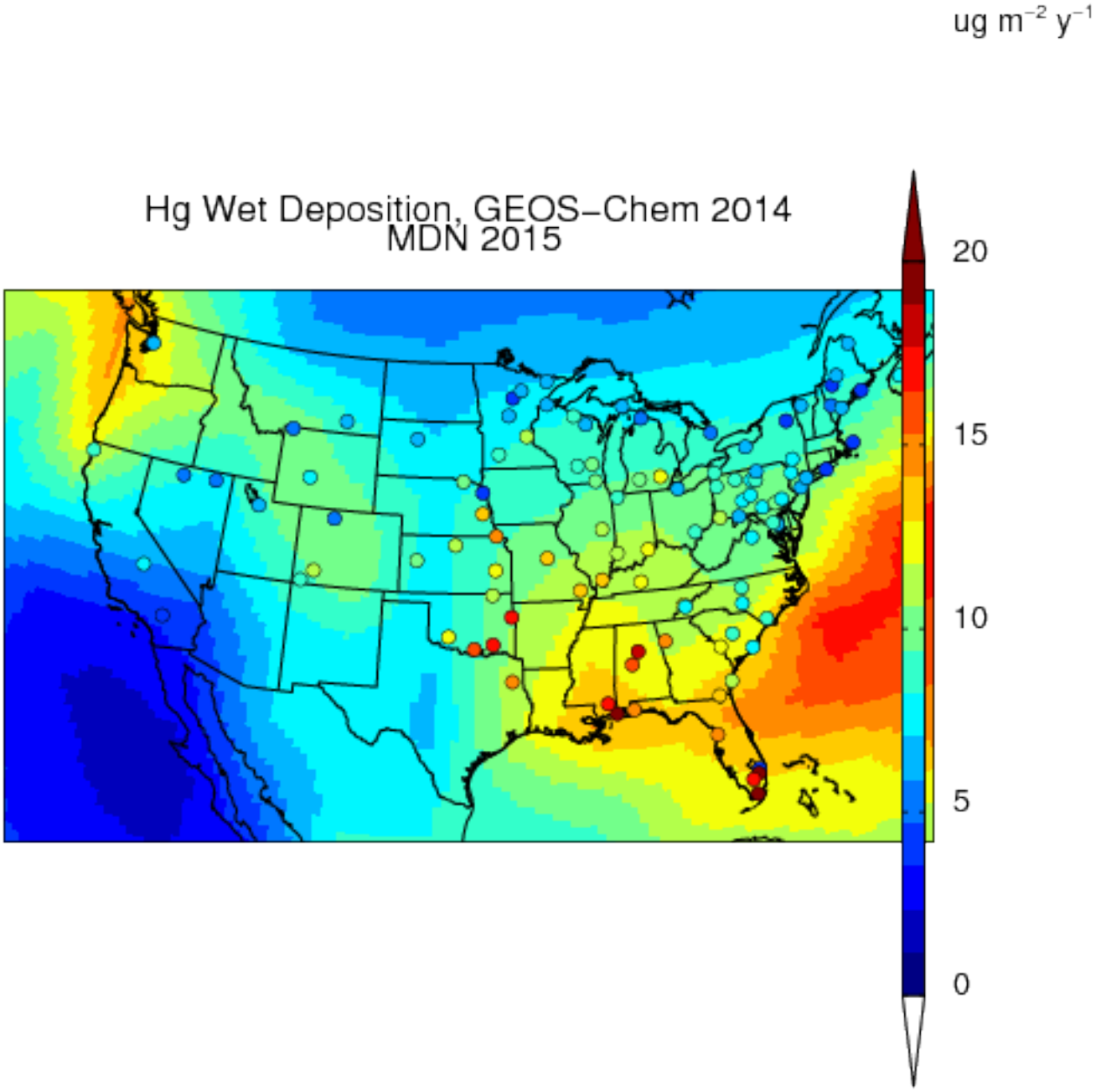




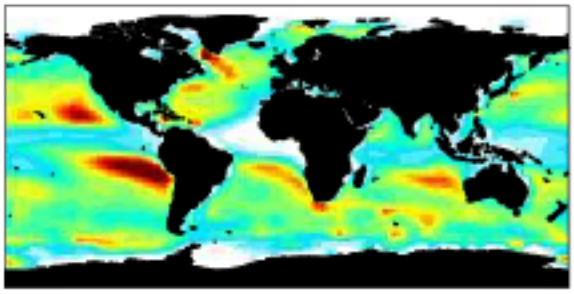

Mid–latitudes
Arctic
Cape Point
Troll Research Station
Observations
New Model Version
Old Model Version
TGM [ng/m³]
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
J F M A M J J A S O N D


ALT
VRS
ZEP
Zeppelin
Amderma
AND
Andoya
PAL
DNP
Birkenes
RAO
MHD
MaceHead
Waldhof
LIS
CMA
UDH
KEJ
Kejimkujik
Underhill
HTW
HRM
RCS
Huntington
MtBachelor
ThompsonFarm
MCH
BRX
SLC
PNY
LON
ATN
Athens
PineyReservoir
MWA
SantaCruz
Stilwell
YKV
BMH
Yorkville
MIN
PSC
GRB
GrandBay
EVK
CHE
Okinawa
MAL
MtLulin
SIS
MLO
MaunaLoa
CAL
KOD
NIK
MAN
CapePoint
CPT
Amsterdamdsl
AMS
BAR
DDU
Troll
TRO
DMC
TGM [ng/m³]
Hg(0) [ng/m³]
Obs TGM
Obs Hg(0)
New Model TGM
New Model Hg(0)
Reference Model TGM
Reference Model Hg(0)


Surface TGM
Land−based stations
Temme et al. 2003
Laurier et al. 2007
Lamborg et al. 1999
Sorenson et al. 2009
New Model Version Zonal Mean
Old Model Version Zonal Mean
TGM [ng/m3]
3.0
2.5
2.0
1.5
1.0
0.5
−90
−60
−30
0
30
60
90
Latitude

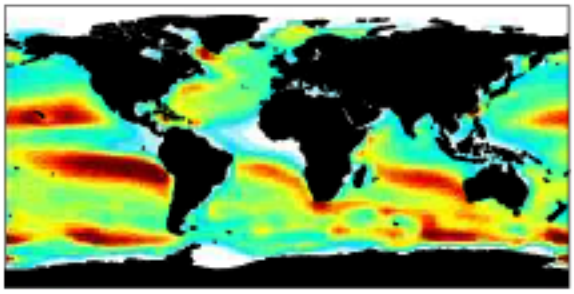

Hg Wet Deposition, GEOS−Chem 2014
MDN 2015
ug m^{-2} y^{-1}
20
15
10
5
0

New Model Version: Sea Salt Uptake



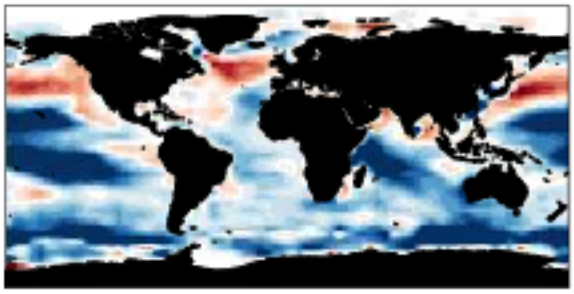
ug/m^2/y

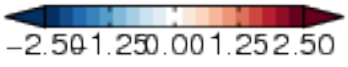
Old Model Version: Sea Salt Uptake



ug/m^2/y

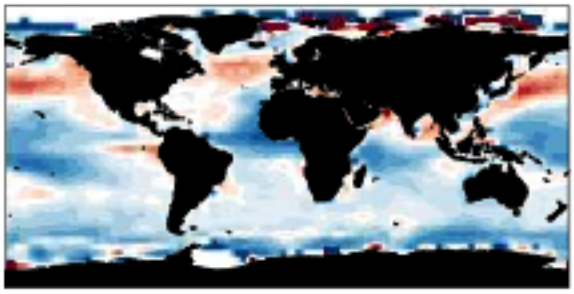
Absolute Difference

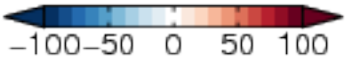




ug/m^2/y

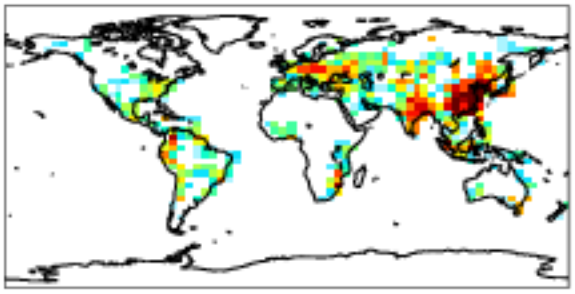
Percent Difference

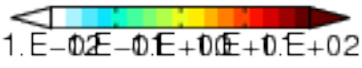




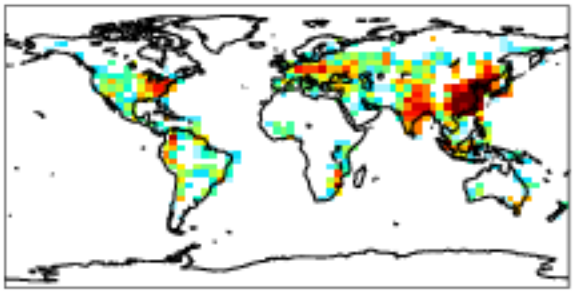
%

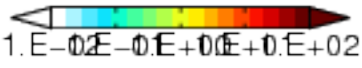
New Model Version: Anthro Emissions – Hg(0)



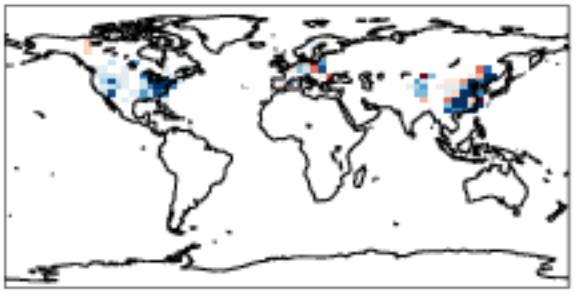


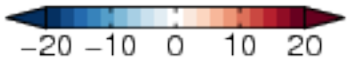
Old Model Version: Anthro Emissions – Hg(0)



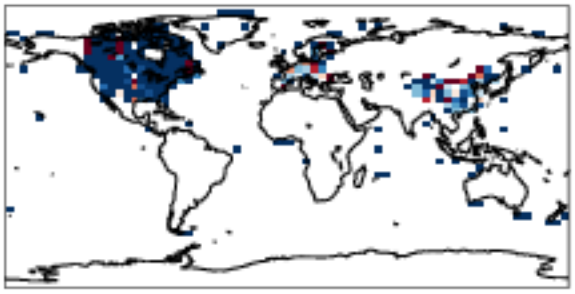


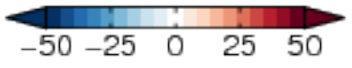
Absolute Difference



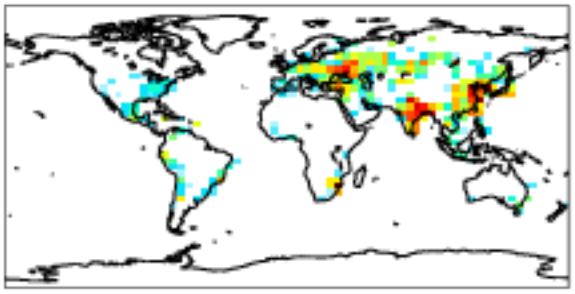


Percent Difference



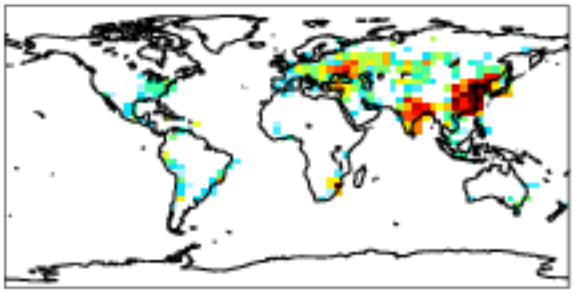


New Model Version: Anthro Emissions – Hg(II)+Hg(P)



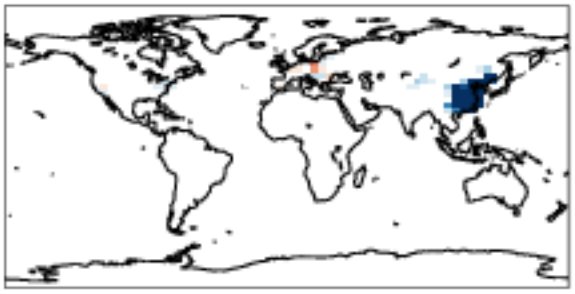
1.E−02 2.E−02 1.E−01 5.E−01 1.E+00 5.E+00 1.E+01 5.E+01 1.E+02 kg/y

Old Model Version: Anthro Emissions – Hg(II)+Hg(P)



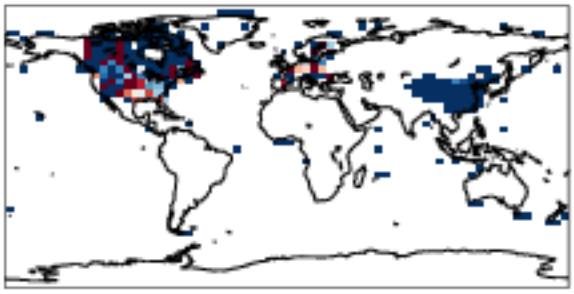
1.E−02 2.E−02 1.E−01 5.E−01 1.E+00 5.E+00 1.E+01 5.E+01 1.E+02 kg/y

Absolute Difference



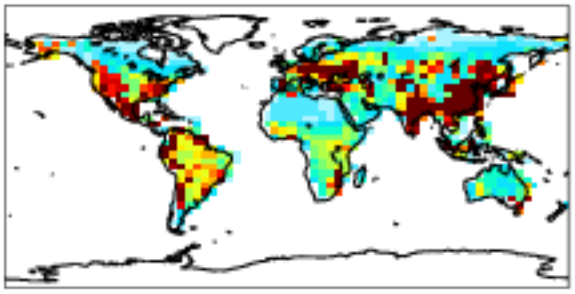
−20 −10 0 10 20 kg/y

Percent Difference



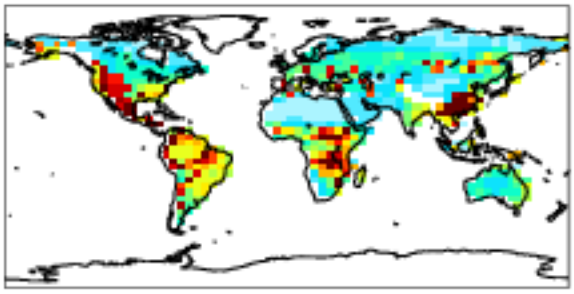
−50 −25 0 25 50 %

New Model Version: Direct Terrestrial – Geo, BB, & Soil



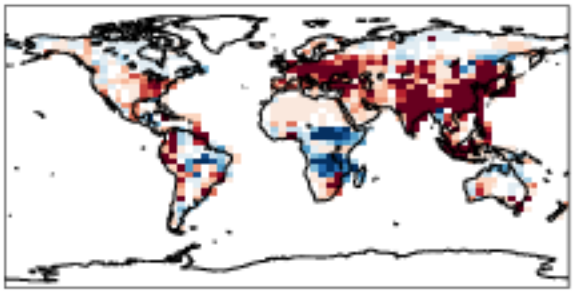
6 12 18 25 kg/y

New Model Version: Direct Terrestrial – Geo, BB, & Soil



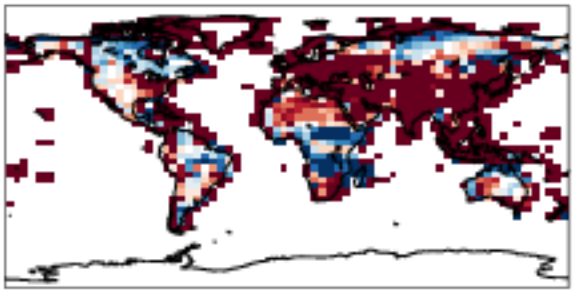
6 12 18 25 kg/y

Absolute Difference



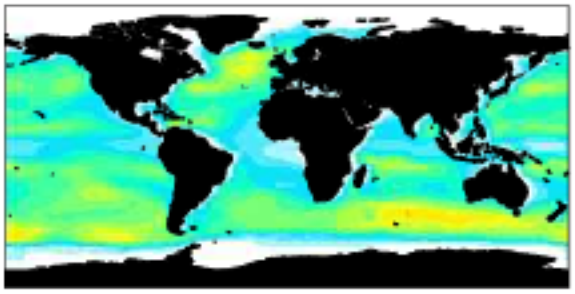
−10 −5 0 5 10 kg/y

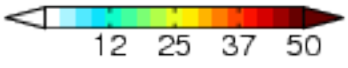
Percent Difference



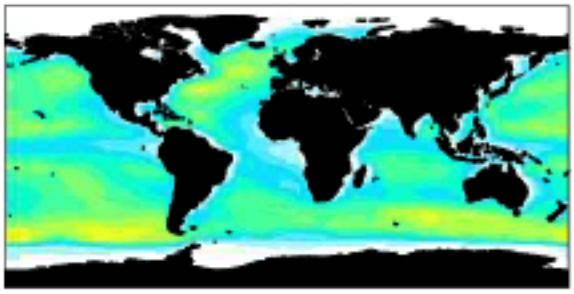
−50 −25 0 25 50 %

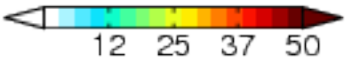
New Model Version: Gross Ocean Evasion



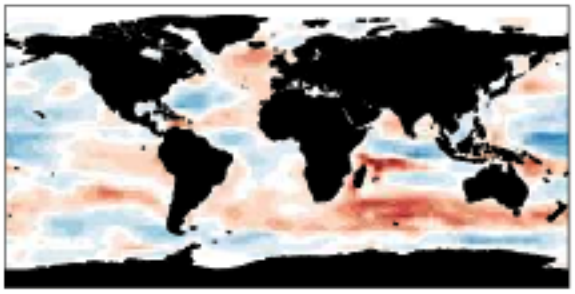


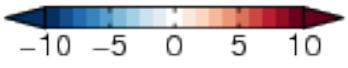
Old Model Version: Gross Ocean Evasion



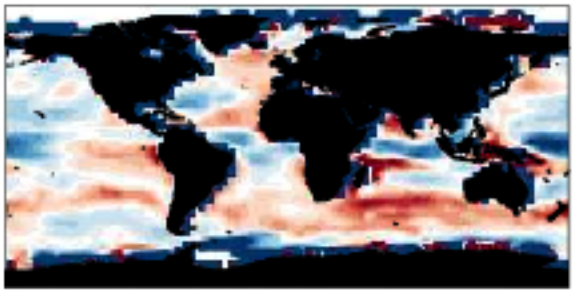


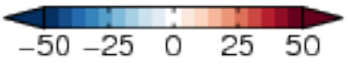
Absolute Difference



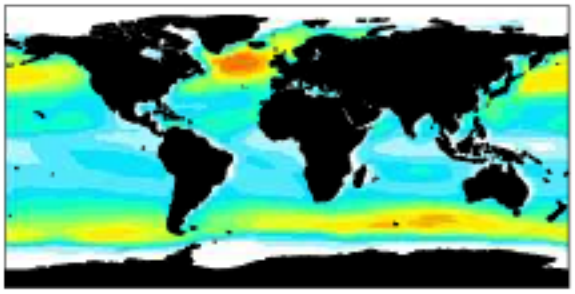


Percent Difference

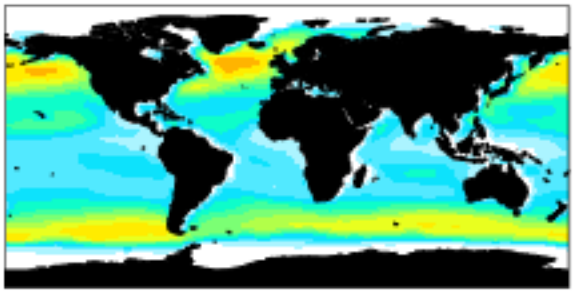




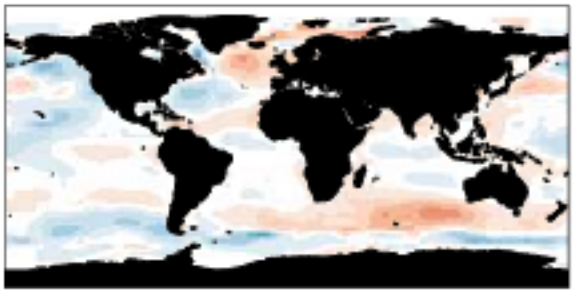
New Model Version: Gross Ocean Hg(0) Uptake



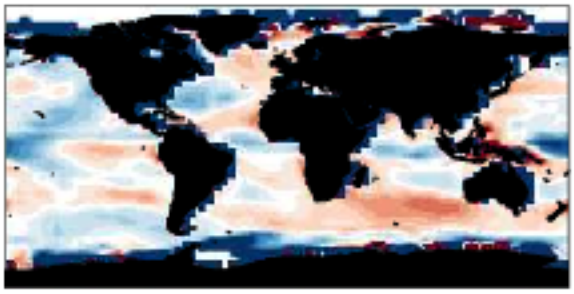
Old Model Version: Gross Ocean Hg(0) Uptake

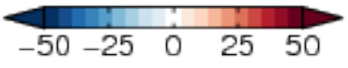


Absolute Difference



Percent Difference





OLD MODEL VERSION NEW MODEL VERSION

TROPOSPHERIC MASS			DEPOSITION		
Hg^0:	3424	3473 Mg	Hg^0 dd:	1233	1189 Mg/y
Hg^2:	264	208 Mg	Hg^2 dd:	771	619 Mg/y
Hg^P:	120	75 Mg	Hg^P dd:	28	16 Mg/y
			Hg^2 wd:	3134	4202 Mg/y
SURFACE OCEAN MASS			Hg^P wd:	210	146 Mg/y
Hg^0:		Mg	Hg^0 oc uptake:	1705	1738 Mg/y
Hg^2:		Mg	Hg^2 seasalt:	1493	1213 Mg/y
Hg^P:		Mg	TOTAL DEPOSITION:	8576	9126 Mg/y
EMISSIONS			REDOX		
Hg^0 anthro:	1473	1275 Mg/y	Gross Ox:	15200	16155 Mg/y
Hg^2 anthro:	806	546 Mg/y	Gross Reduction:	10500	10520 Mg/y
Hg^P anthro:		Mg/y	Net Oxidation	4829	5635 Mg/y
Hg^0 geo:	249	250 Mg/y			
Hg^0 soil:	911	837 Mg/y			
Hg^0 bb:	223	1275 Mg/y			
Hg^0 land re:	185	74 Mg/y			
Hg^0 snow:	93	51 Mg/y			
Hg^0 oc evasion:	4606	4767 Mg/y			
TOTAL EMISSIONS:	8550	9078 Mg/y			