

O₃ 150 ppbv Tropopause

ARCTIC (60N-90N)

	b (OLS)	b (IRLS)	r ²	Sig at 90%
H ₂ O	5.507	5.453	0.85	YES
J(O ¹ D)	1.127	1.120	0.37	NO
J(O ¹ D)*O ₃	1.543	1.560	0.65	YES
O ₃	0.931	0.927	0.49	YES
Temp	1.058	1.054	0.12	NO
CO/NOx ratio	0.000	0.000	0.41	YES
NOx burden	377.100	373.394	0.09	NO
CO burden	-0.101	-0.101	0.30	NO

Northern Hemisphere (0-90N)

	b (OLS)	b (IRLS)	r ²	Sig at 90%
H ₂ O ⁽¹⁾	0.722	0.720	0.19	NO
J(O ¹ D)	0.123	0.122	0.02	NO
J(O ¹ D)*O ₃	0.371	0.366	0.12	NO
O ₃	0.448	0.418	0.07	NO
Temp	0.712	0.704	0.13	NO
CO/NOx ratio	-0.004	-0.004	0.41	YES
NOx burden	-126.884	-127.551	0.32	NO
CO burden	-0.045	-0.045	0.84	YES

GLOBAL

	b (OLS)	b (IRLS)	r ²	Sig at 90%
H ₂ O ⁽¹⁾	0.812	1.971	0.35	NO
J(O ¹ D)	0.059	0.060	0.01	NO
J(O ¹ D)*O ₃	0.275	0.266	0.09	NO
O ₃	0.462	0.439	0.07	NO
Temp	0.734	0.723	0.28	NO
CO/NOx ratio	-0.002	-0.002	0.29	NO
NOx burden	-22.854	-23.353	0.08	NO
CO burden	-0.022	-0.022	0.89	YES

⁽¹⁾ Remove
MOZART from
H2O:
r2=0.91(Sig at
n)

Climatological Tropopause

ARCTIC (60N-90N)

	b (OLS)	b (IRLS)	r ²	Sig at 90%
H ₂ O ⁽²⁾	4.858	4.419	0.68	YES
J(O ¹ D)	1.139	1.135	0.35	NO
J(O ¹ D)*O ₃	1.650	1.667	0.68	YES
O ₃	0.950	0.945	0.51	YES
Temp	-0.200	-0.128	0.00	NO
CO/NOx ratio	0.000	0.000	0.42	YES
NOx burden	0.000	0.000	0.13	NO
CO burden	-0.112	-0.113	0.33	NO

GLOBAL

	b (OLS)	b (IRLS)	r ²	Sig at 90%
H ₂ O ⁽³⁾	0.729	0.727	0.16	NO
J(O ¹ D)	0.137	0.133	0.02	NO
J(O ¹ D)*O ₃	0.416	0.422	0.17	NO
O ₃	0.589	0.577	0.12	NO
Temp	8.016	6.306	0.28	NO
CO/NOx ratio	-0.005	-0.005	0.36	NO
NOx burden	0.000	0.000	0.15	NO
CO burden	-0.043	-0.043	0.80	YES

GLOBAL

	b (OLS)	b (IRLS)	r ²	Sig at 90%
H ₂ O ⁽³⁾	0.879	2.237	0.32	NO
J(O ¹ D)	0.089	0.090	0.02	NO
J(O ¹ D)*O ₃	0.356	0.347	0.16	NO
O ₃	0.588	0.566	0.12	NO
Temp	6.483	6.306	0.52	YES
CO/NOx ratio	-0.002	-0.002	0.24	NO
NOx burden	0.000	0.000	0.01	NO
CO burden	-0.021	-0.021	0.86	YES

⁽²⁾ Remove
GEOSChem
from H2O:
r2=0.96 (Sig at
n)

⁽³⁾ Remove
MOZART from
H2O: r2=0.91
(Sig at n)

⁽³⁾ Remove
MOZART from
H2O: r2=0.91
(Sig at n)

	Global mean tropospheric OH:	
	O3 trop	Clim trop
Cam4Chem	11.29	11.26
CAM5Chem	12.02	11.97
C-IFS	10.16	10.18
GEOS-Chem	10.09	10.08
GMI	10.67	10.70
MOZART-4	10.87	10.89
TM5	10.53	10.50
TOMCAT	10.59	10.52
mean:	10.78	10.76
stdev:	0.63	0.62

Table S1

Slope coefficients (b) for the ordinary least squares (OLS) and iteratively re-weighted least squares (IRLS) regression lines fitted to the global mean tropospheric OH concentrations against several model variables, and the coefficients of determination (r^2). Air-mass weighting is used to calculate the mean concentrations for the Arctic, Northern Hemisphere and global tropospheric regions. Two methods of diagnosing the tropopause is used, a climatological tropopause based on Lawrence et al., (2001) and the 150 ppbv O₃ contour. Global mean tropospheric OH concentrations for the global models are also shown.