

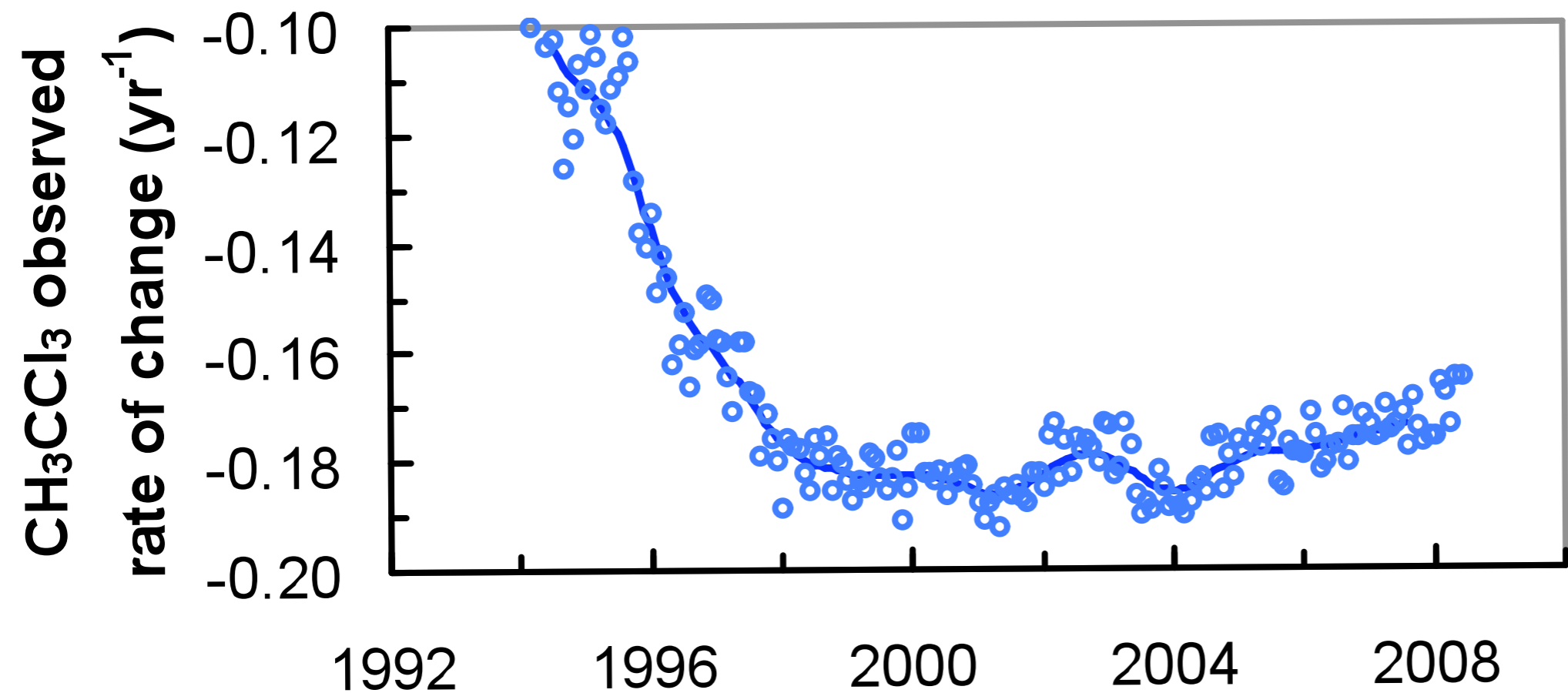
OH derived from MCF

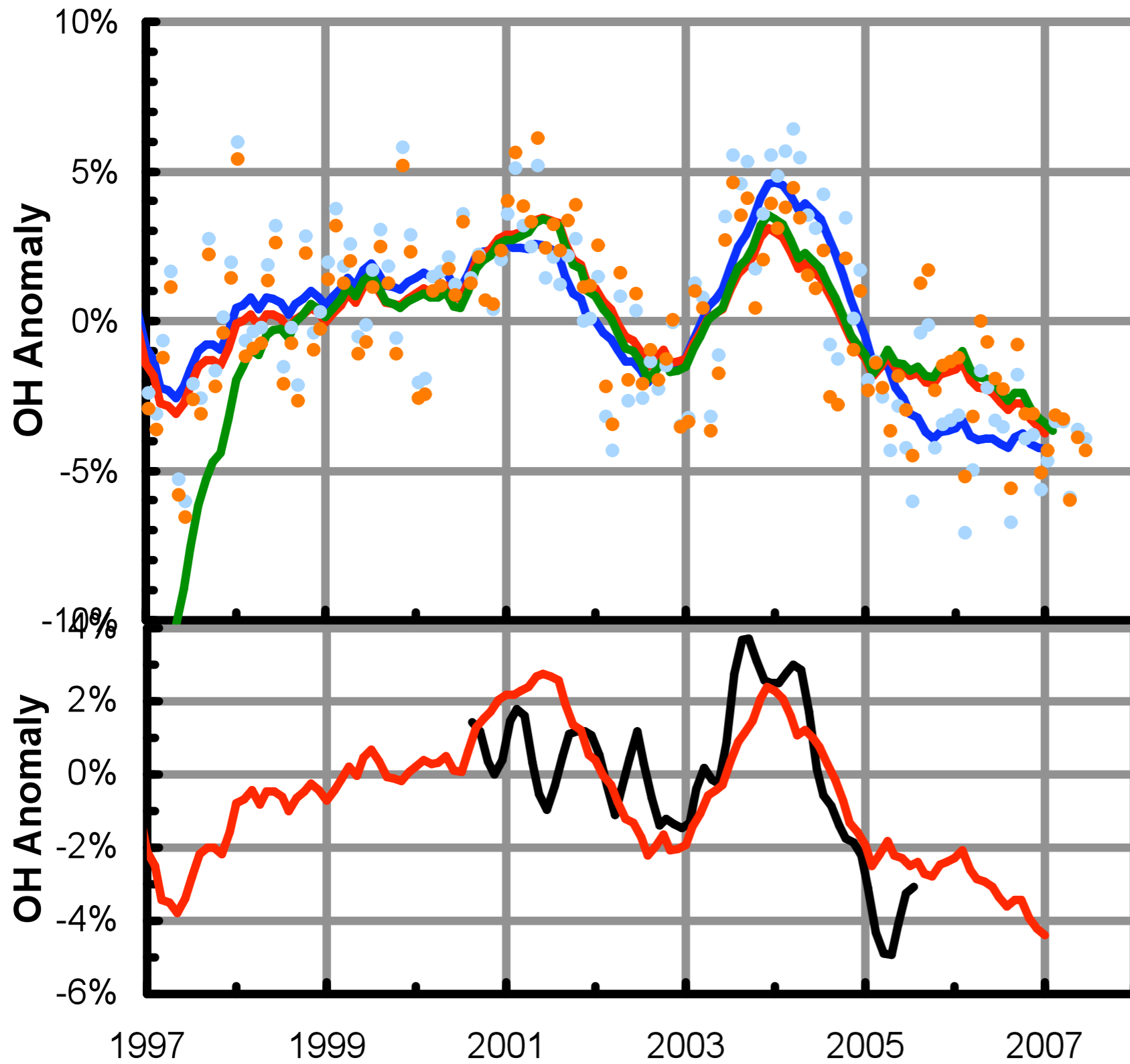
an update

Status

- Steve Montzka is writing a paper (Science)
- Some results from that paper
- I did some supporting calculations with TM5 / 4d-var system
- I performed a preliminary inversion with 2006 / 2007 MCF measurements

The exponential rate of change derived from observed global surface means of CH_3CCl_3 from the NOAA global flask sampling network. Points are independent rates of change derived from 2 monthly means 12 months apart (and are plotted at the midpoint of this time interval); the line is a 12-month running mean of the points.



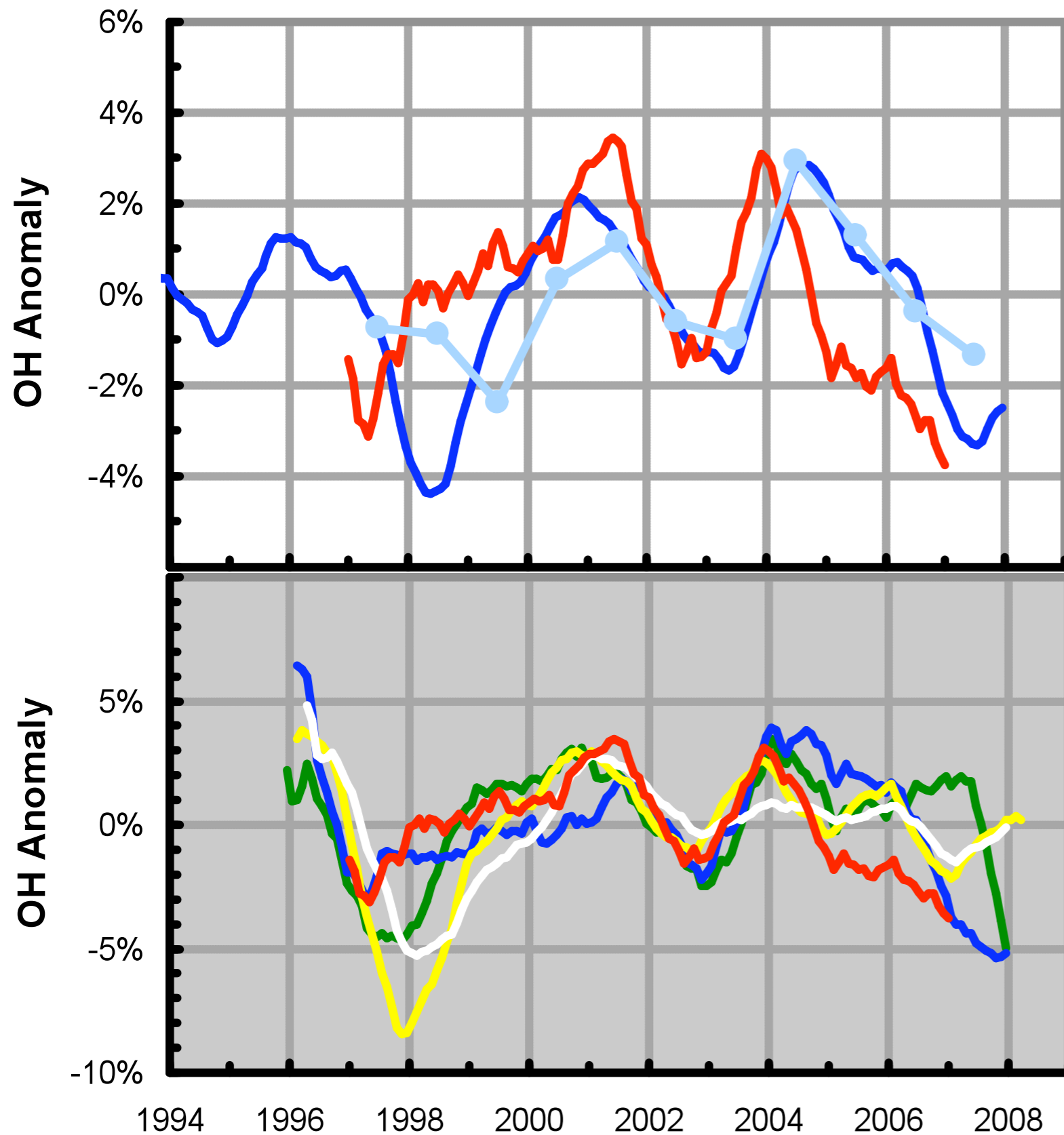


Prinn emissions-2000
-20%/yr since since then

Prinn emissions-2000
Rigby since then

Zero emissions

4D-Var, -20%/year



Prinn emissions-2000
 -20%/yr since since then

Derived from CH₄
 measurements with E_{ch4}=C

Derived from CH₄ measurements
 with varying E_{ch4} (wetland/
 Biomass Burning)

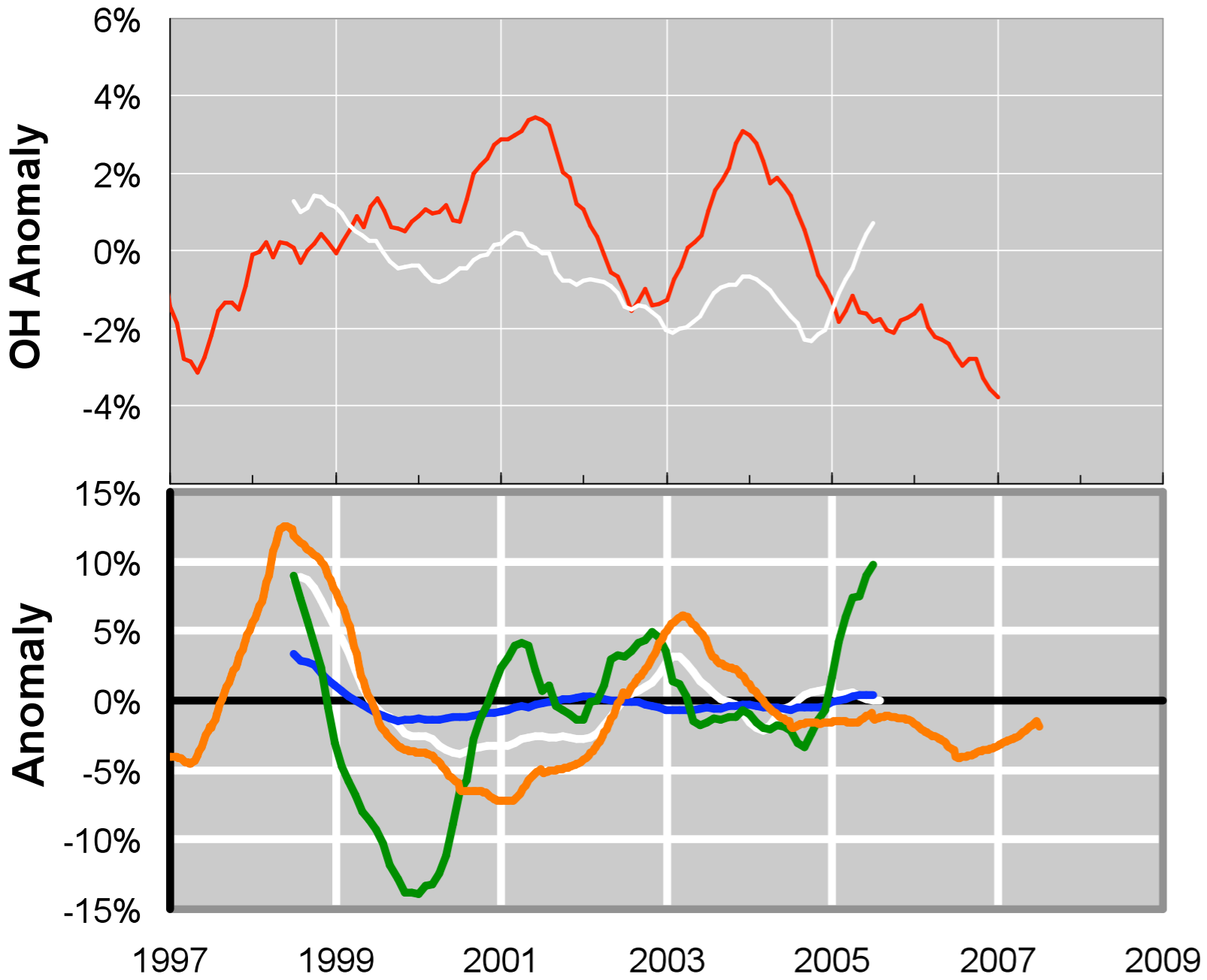
CH₃Cl

CH₃Br

C₂Cl₄

CH₂Cl₂

CH₃CCl₃



ECHAM-Messy

CH₃CCl₃

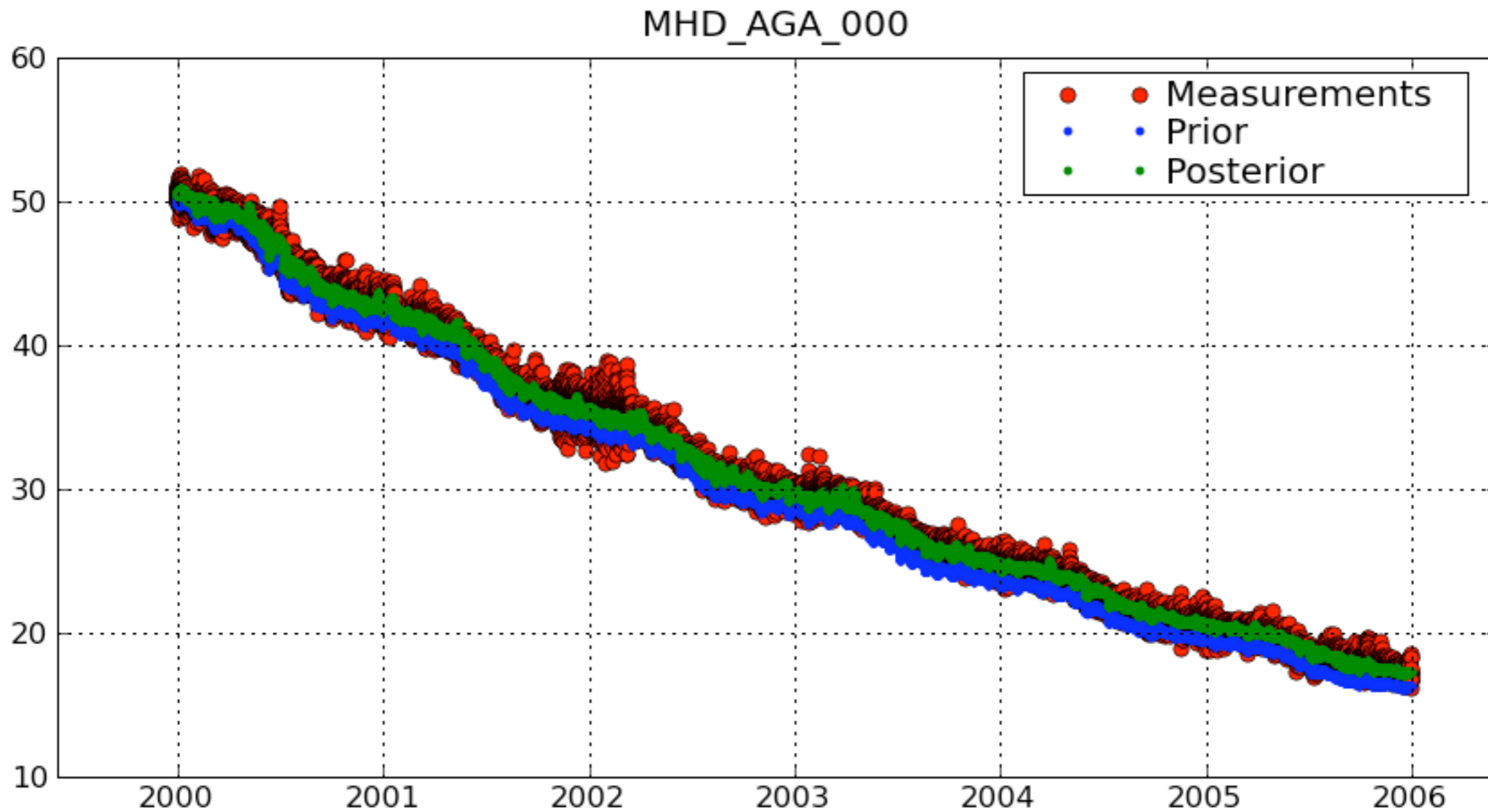
NOAA-CO anomaly

ECHAM-H₂O-anomaly

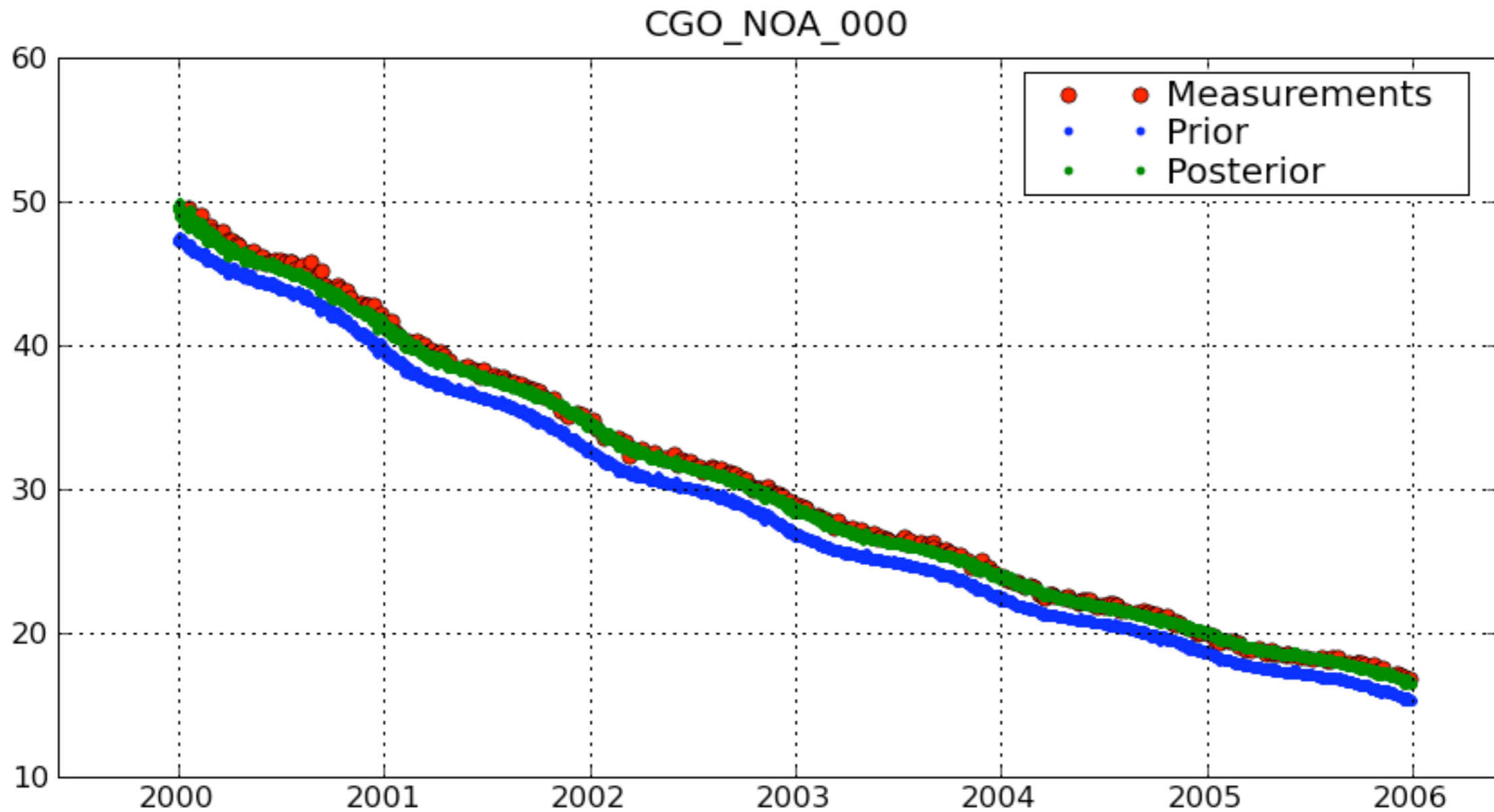
ECHAM-JO₃-anomaly

ECHAM-CO-anomaly

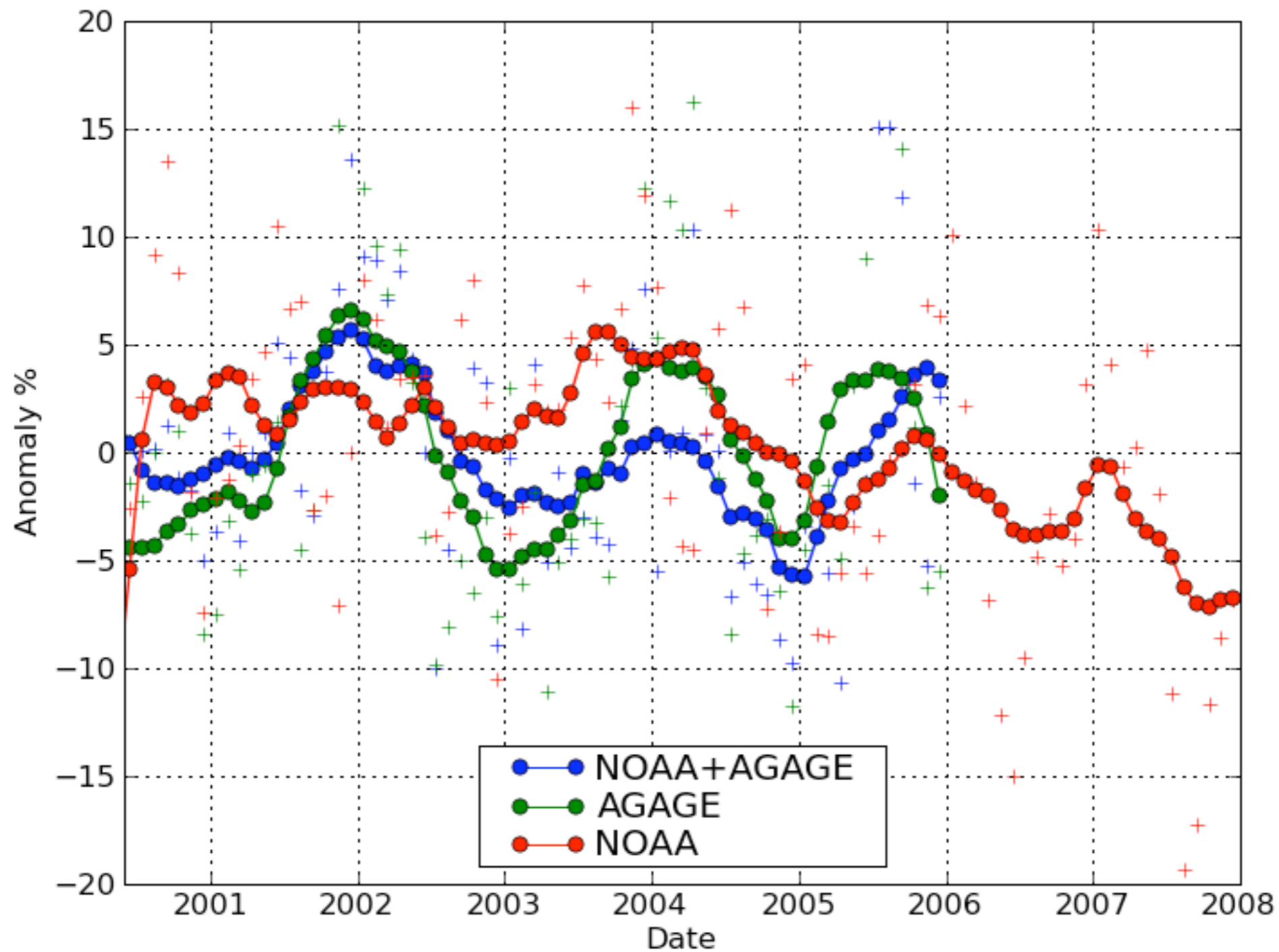
OH optimization



OH optimization



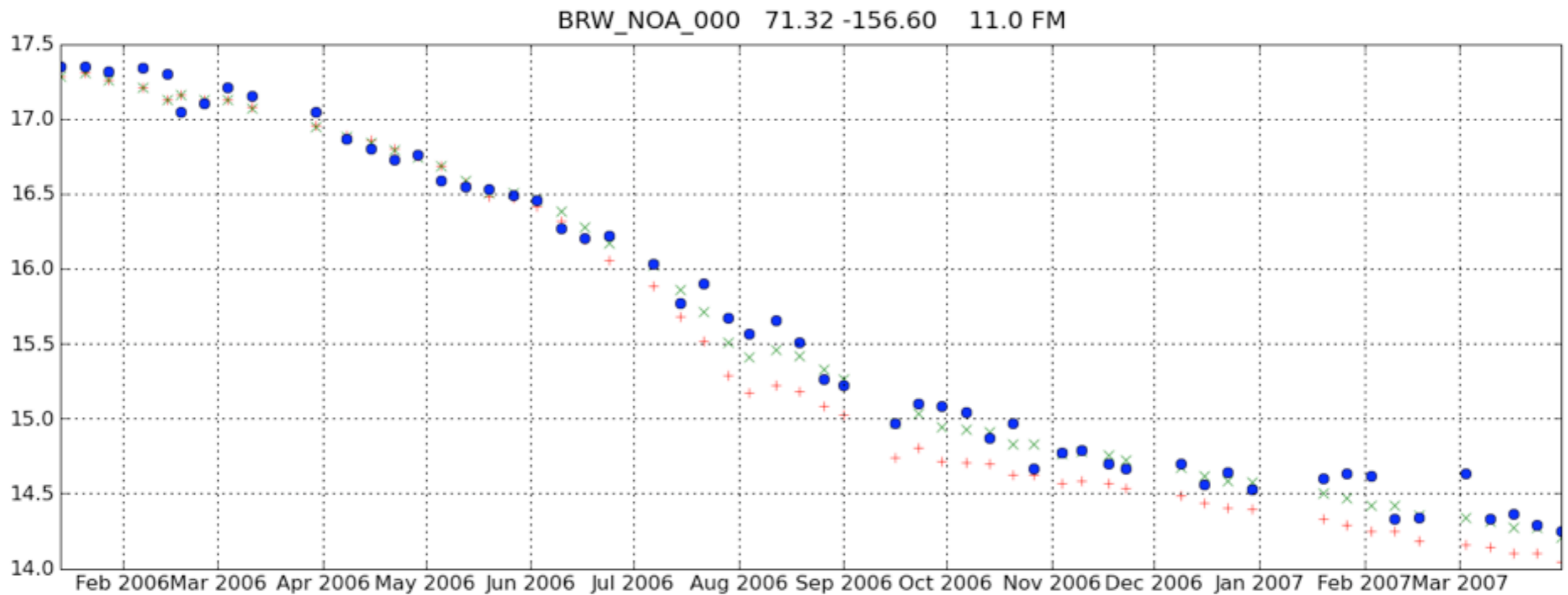
2006-2007 OH



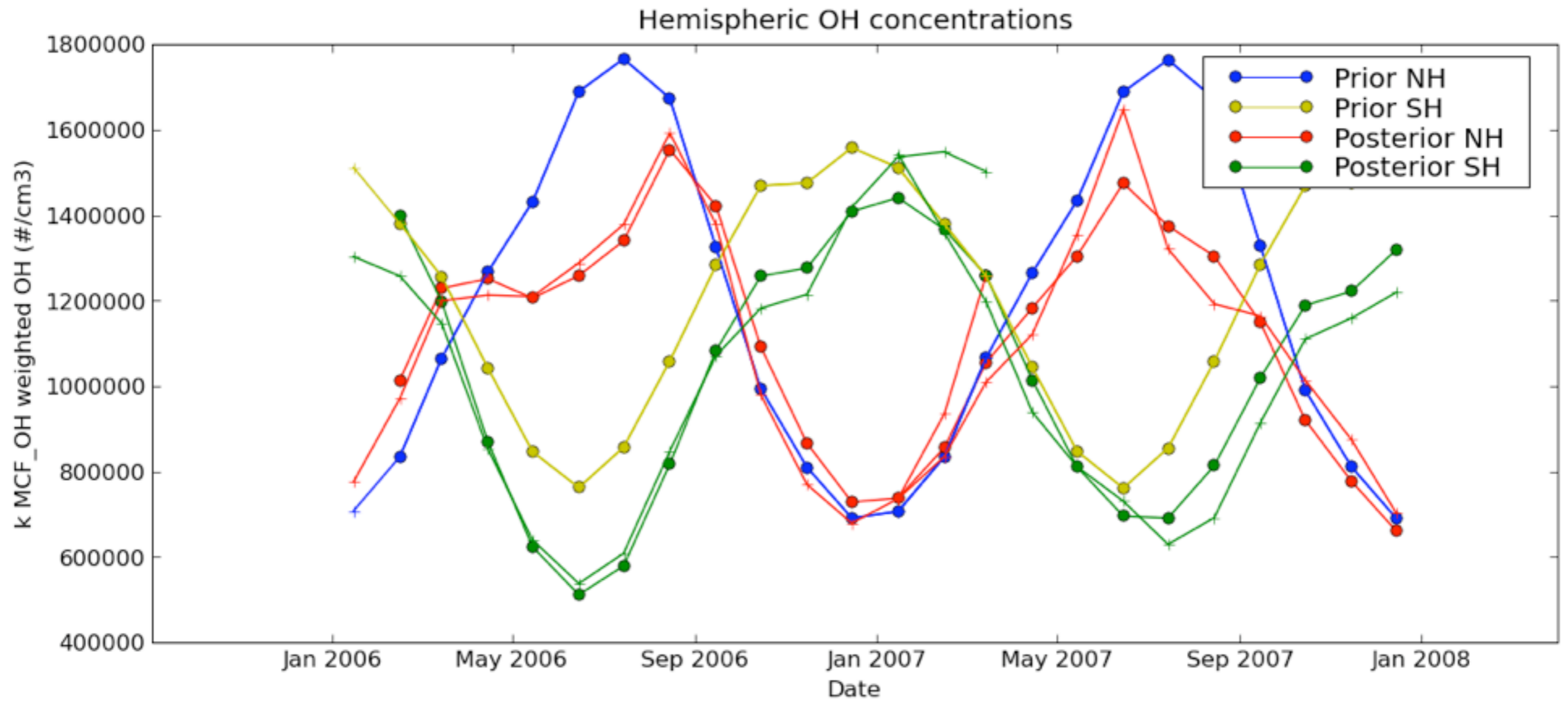
Results for 2006

2006Y	ALT_NOA_000	82.45	-62.52	210.0	FM	-0.13	-0.01	0.76	0.39	55	0
2006Y	BRW_NOA_000	71.32	-156.60	11.0	FM	-0.16	-0.03	0.86	0.39	56	0
2006Y	LEF_NOA_000	45.93	-90.27	868.0	FM	-0.14	-0.02	0.82	0.46	57	0
2006Y	NWR_NOA_000	40.05	-105.58	3476.0	FM	-0.06	0.04	0.63	0.51	52	0
2006Y	KUM_NOA_000	19.52	-154.82	3.0	FM	-0.10	0.01	0.71	0.49	64	0
2006Y	MLO_NOA_000	19.53	-155.58	3397.0	FM	-0.05	0.04	0.55	0.43	62	0
2006Y	SMO_NOA_000	-14.24	-170.57	42.0	FM	-0.08	0.07	0.74	0.50	67	0
2006Y	CGO_NOA_000	-40.68	144.68	94.0	FM	-0.20	-0.03	1.05	0.45	54	0
2006Y	PSA_NOA_000	-64.92	-64.00	10.0	FM	-0.34	-0.18	1.70	0.93	27	0
2006Y	SPO_NOA_000	-89.98	-24.80	2810.0	FM	-0.09	0.06	0.77	0.63	35	0
2006Y	HFM_NOA_000	42.50	-72.20	340.0	FM	-0.22	-0.07	0.86	0.57	58	1
2006Y	MHD_NOA_000	53.33	-9.90	25.0	FM	-0.13	-0.01	0.81	0.45	31	0
2006Y	THD_NOA_000	41.05	-124.15	107.0	FM	-0.16	-0.03	0.93	0.57	58	1
2006Y	TDF_NOA_000	-54.87	-68.47	20.0	FM	-0.21	-0.07	1.09	0.64	11	0
2006Y	SUM_NOA_000	72.58	-38.48	3238.0	FM	-0.12	-0.04	0.95	0.71	20	1
2006Y						-0.14	-0.01	0.83	0.51	707	3

Before and after..



Sanity Check on method



Conclusions

- OH from MCF relatively stable (2000-2006), variations $\sim 2\%$
- CH₄ and other gases show variations in line with MCF...thus driven by OH?
- CO seems to explain 2003 OH-anomaly
- OH drop in 2006-2007...?

Plans and Issues

- Error estimate (M1QN3, sensitivities)
- ERA-interim reanalysis (2006 transition)
- 1980s vs. 2000s