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Supplement of

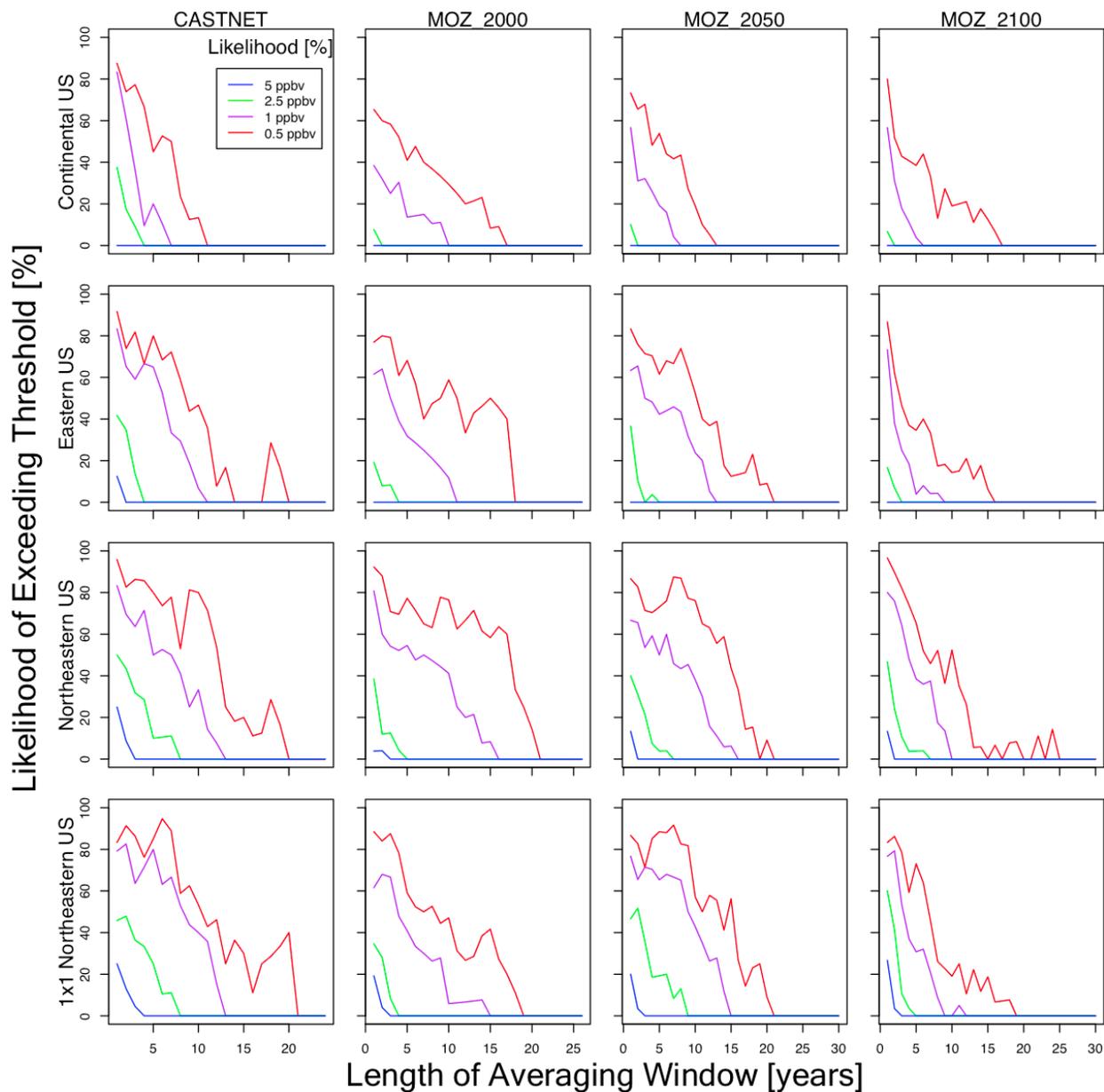
Maximizing ozone signals among chemical, meteorological, and climatological variability

Benjamin Brown-Steiner et al.

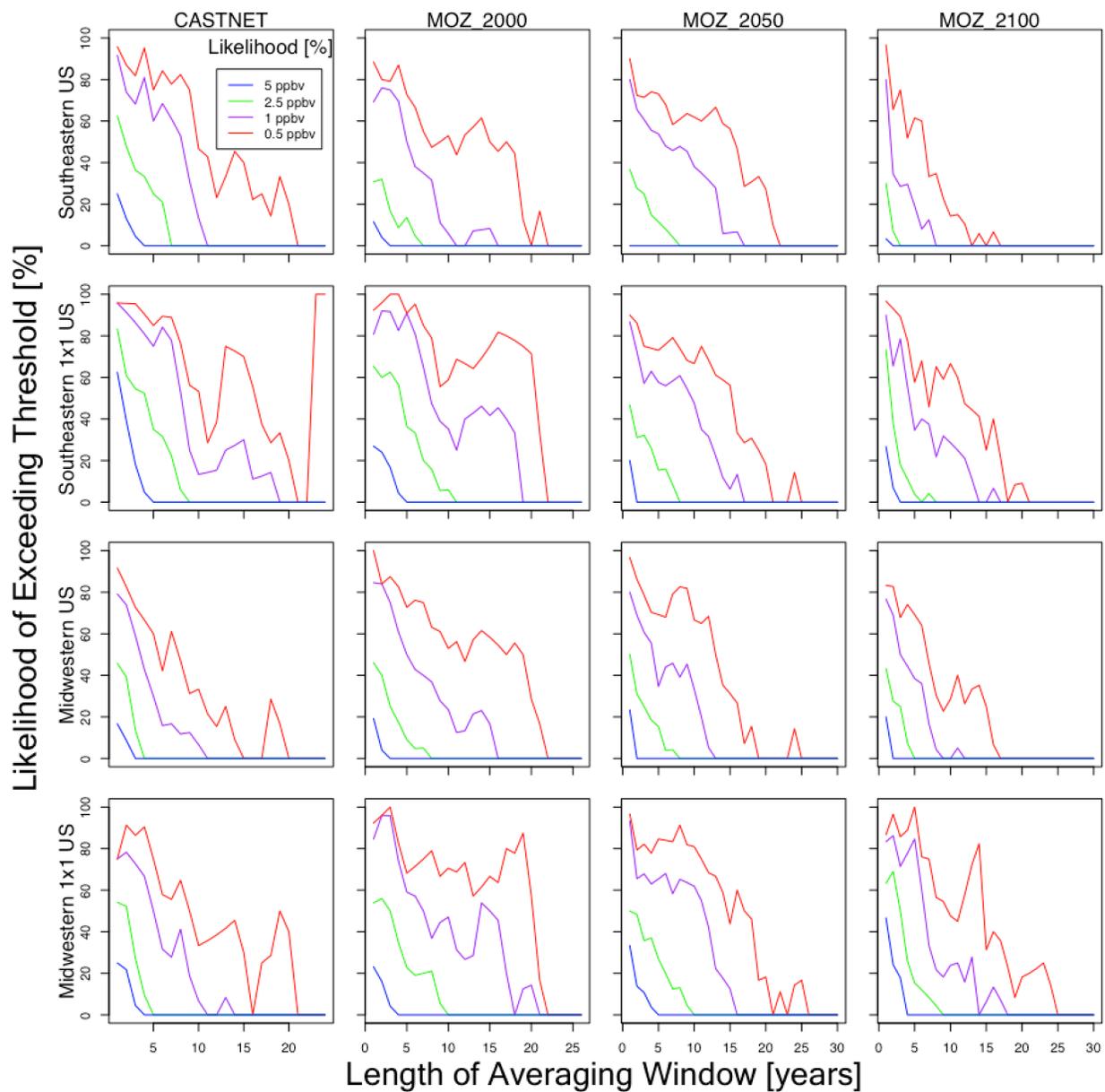
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Supplemental Material



Supplemental Figure S1: The likelihood (percent, vertical axis) that an estimation of the mean MDA8 O₃ value for a given length of temporal averaging window (years, horizontal axis) is farther away from the long-term mean value than a given threshold: 5 ppbv (blue), 2.5 ppbv (purple), 1 ppbv (green), and 0.5 ppbv (blue). Individual columns represent the four datasets used in this study: CASTNET, present-day MOZART (MOZ_2000), and the two future MOZART simulations (MOZ_2050, MOZ_2100). Individual rows are spatially averaging over the telescoping regions seen in Figure 1.



Supplemental Figure S2 (as in Figure S1, but for the Southeastern and Midwestern US)

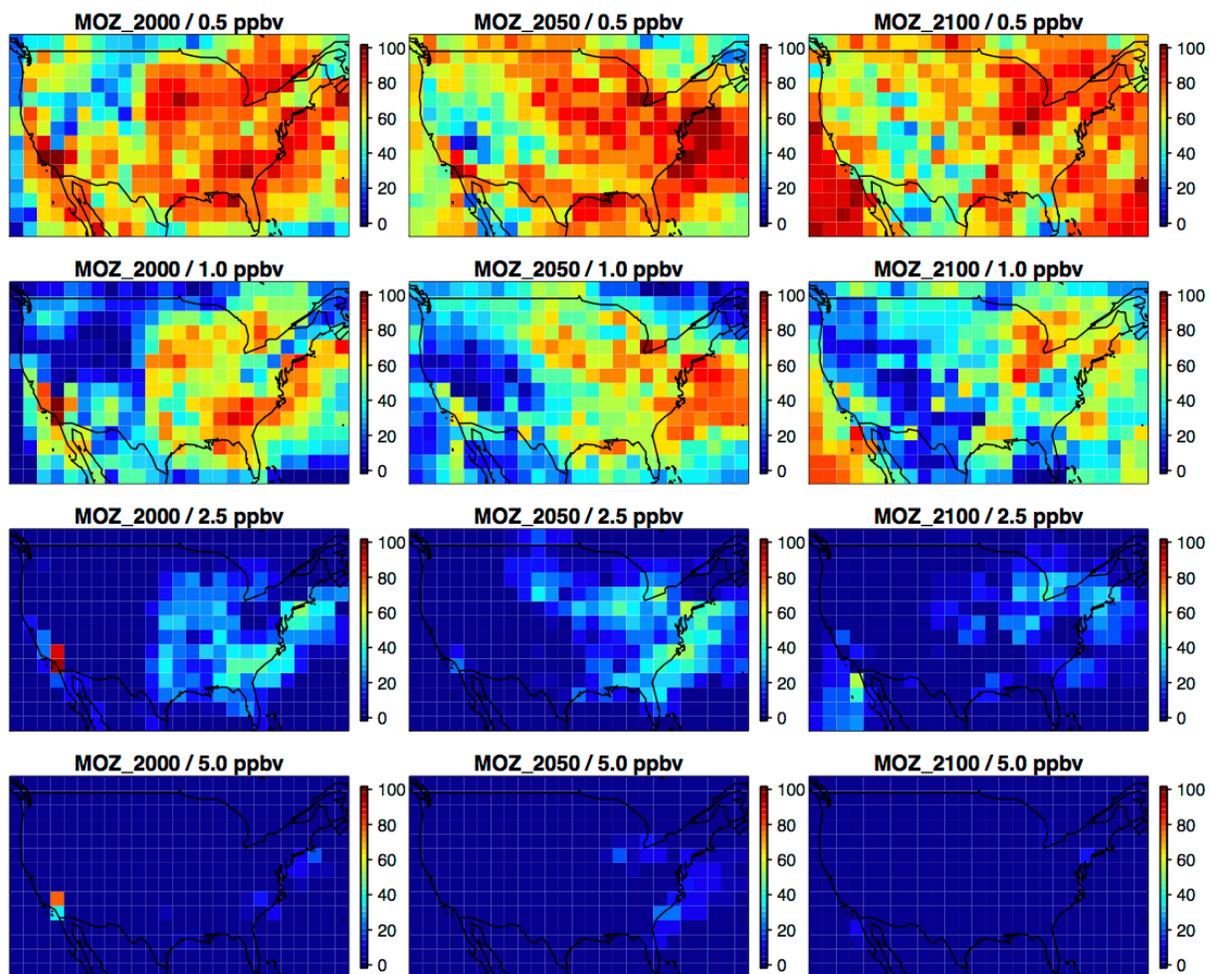
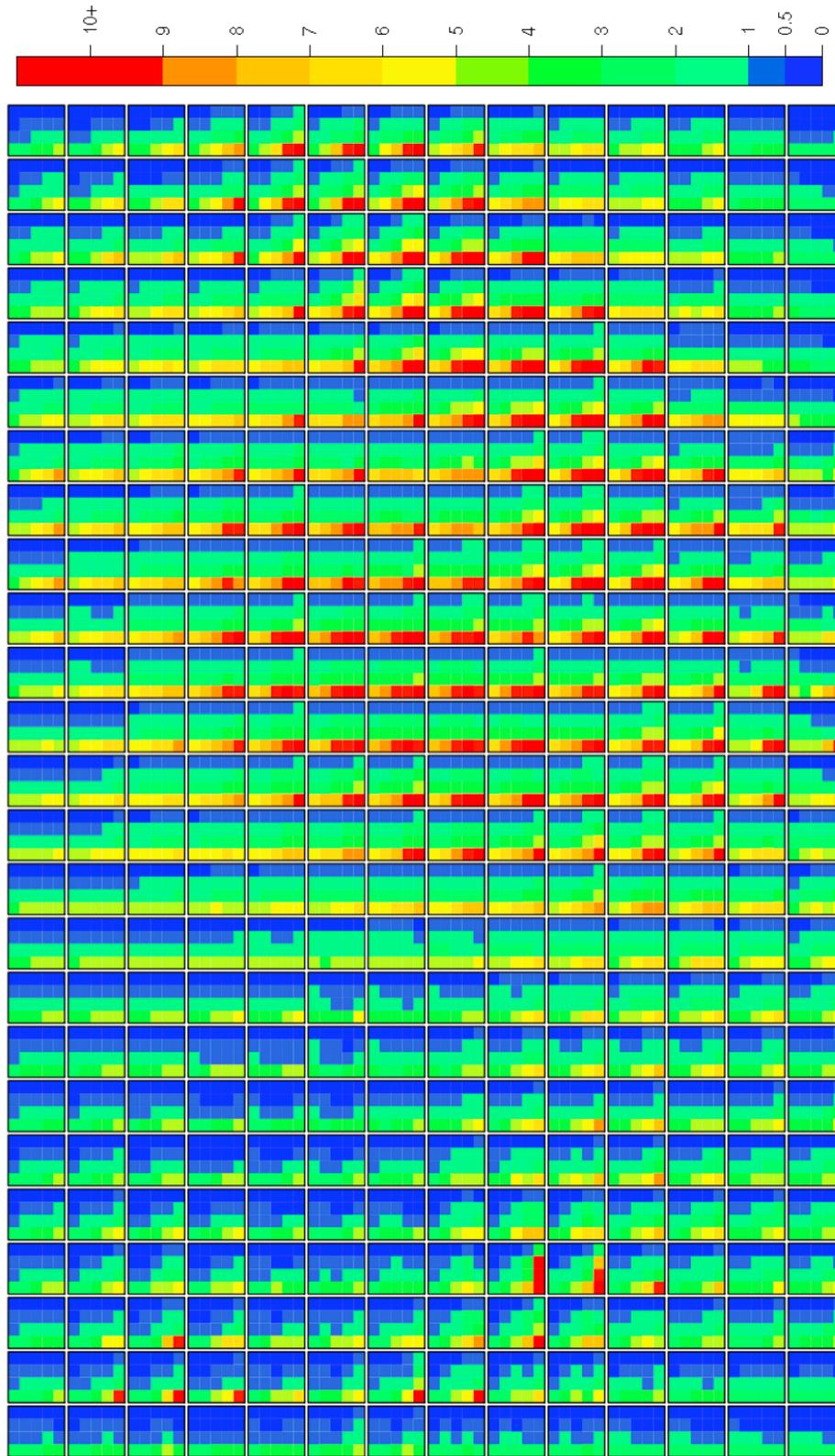


Figure S3: As in Figure 5, but only the second column (5-year averaging window), for present-day CAM-chem (MOZ_2000), future CAM-chem 2050 (MOZ_2050), and future CAM-chem 2100 (MOZ_2100).



Supplemental Figure S4: As in Figure 8, plotting maximum potential calculated DM8H O₃ anomaly [ppbv] from the long-term (1990 – 2014) mean, but for every grid cell in the Continental US. Covers the same Continental US extent as in Figures 5, 6, 7, and S3.

			CASTNET	MOZ_2000	MOZ_2050	MOZ_2100
Southeastern US	Mean	ppbv	52.8	60.2	56.2	56.5
	Standard Deviation	ppbv	7.39	9.22	8.14	8.56
	Variability	%	14%	15%	14%	15%
	Bias	ppbv		7.39		
1x1 Southeastern US	Mean	ppbv	-	83.4	78.0	82.4
	Standard Deviation	ppbv	-	19.1	18.9	20.8
	Variability	%	-	23%	24%	25%
	Bias	ppbv		-		
Midwestern US	Mean	ppbv	53.4	71.0	74.4	79.0
	Standard Deviation	ppbv	6.81	11.0	12.1	13.5
	Variability	%	13%	16%	16%	17%
	Bias	ppbv		17.6		
1x1 Midwestern US	Mean	ppbv	-	84.6	98.2	109
	Standard Deviation	ppbv	-	16.2	22.9	26.1
	Variability	%	-	19%	23%	24%
	Bias	ppbv		-		

Supplemental Table S1: Statistical Summary of MDA8 O₃ for the CASTNET observations and the three CAM-chem simulations for the Southeastern and Midwestern US. Variability is defined as the standard deviation divided by the mean value (in percent). Biases are only included for the present-day CAM-chem simulation compared to the CASTNET data. Note that there were no CASTNET sites at the 1x1 grid cell regions.

Ozone Threshold		Length of Averaging Window												% Likelihood
		5 years				10 years				15 years				
		CNT_2000	MOZ_2000	FGM_2050	FGM_2100	CNT_2000	MOZ_2000	FGM_2050	FGM_2100	CNT_2000	MOZ_2000	FGM_2050	FGM_2100	
2.5 ppbv	CUS	0	0	0	0	0	0	0	0	0	0	0	0	0
	EUS	0	0	0	0	0	0	0	0	0	0	0	0	0
	NEUS	0	0	3.8	3.8	0	0	0	0	0	0	0	0	0
	NE1x1	10	0	19	0	0	0	0	0	0	0	0	0	0
1.0 ppbv	CUS	20	14	19	3.8	0	0	0	0	0	0	0	0	0
	EUS	25	32	42	3.8	0	12	24	0	0	0	0	0	0
	NEUS	30	55	50	38	0	41	38	0	0	8.3	6.3	0	0
	NE1x1	55	41	65	31	13	5.9	43	0	10	0	0	0	0
0.5 ppbv	CUS	35	41	54	38	6.7	29	19	19	0	8.3	0	13	13
	EUS	65	68	62	35	13	59	52	14	0	50	13	6	6
	NEUS	65	77	73	65	33	76	76	52	0	58	44	0	0
	NE1x1	70	59	88	73	67	47	57	19	30	42	56	19	19

Table S2: Summary of the likelihood (%) of the ozone variability exceeding a given threshold (2.5, 1.0, 0.5 ppbv, rows) away from the long-term mean for a given an averaging window length (5, 10, 15 years, columns). We excluded the 5 ppbv threshold and the 1-year and 20-year averaging windows as they have very high or very low likelihoods, respectfully. Within each block, the Percentage Likelihood is further subdivided into the telescoping regions (CUS, EUS, NEUS, NE1x1, sub-rows) and the MDA8 O3 dataset (CASTNET, MOZ_2000, MOZ_2050, MOZ_2100, sub-columns).