Supplemental Material
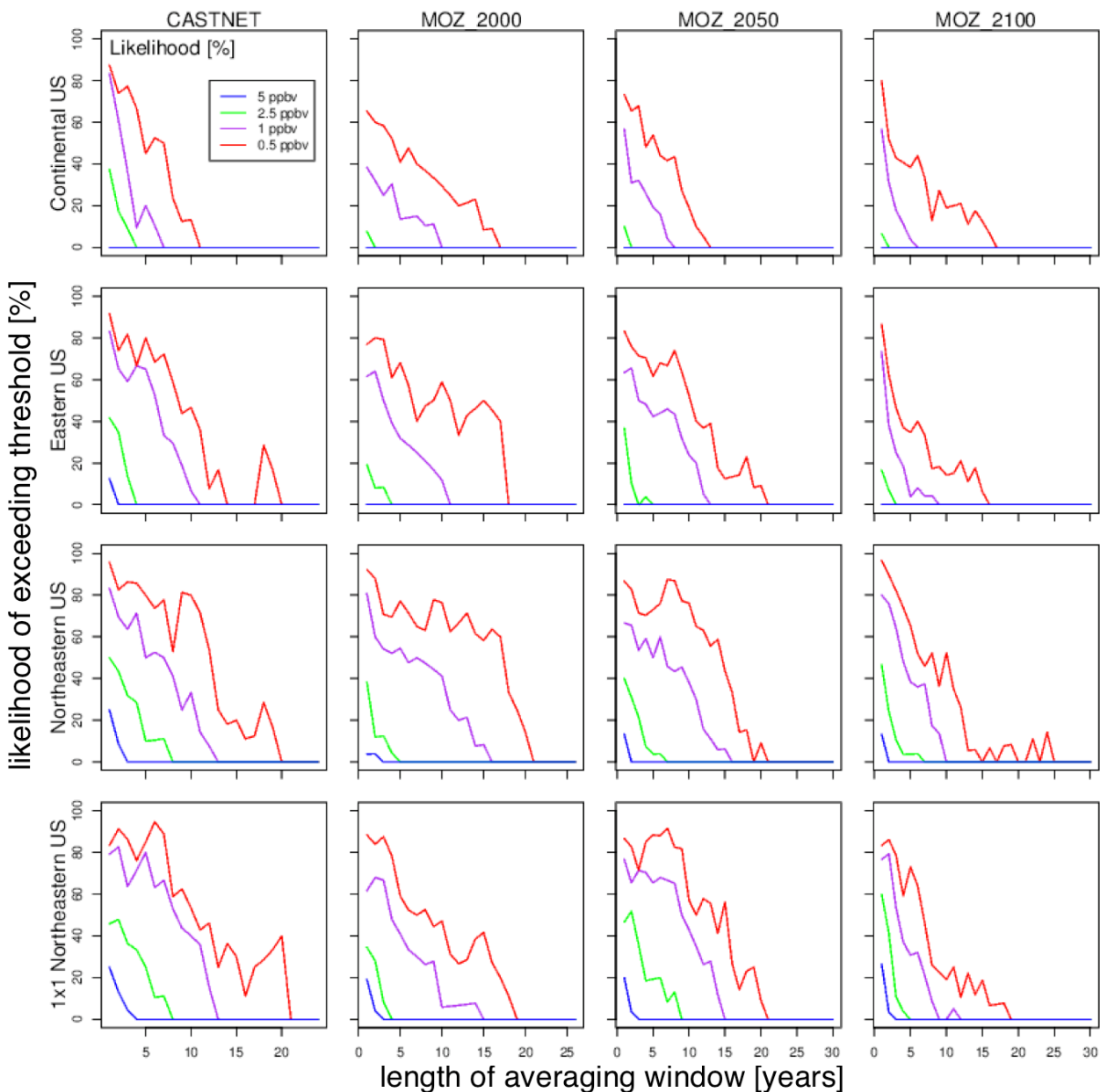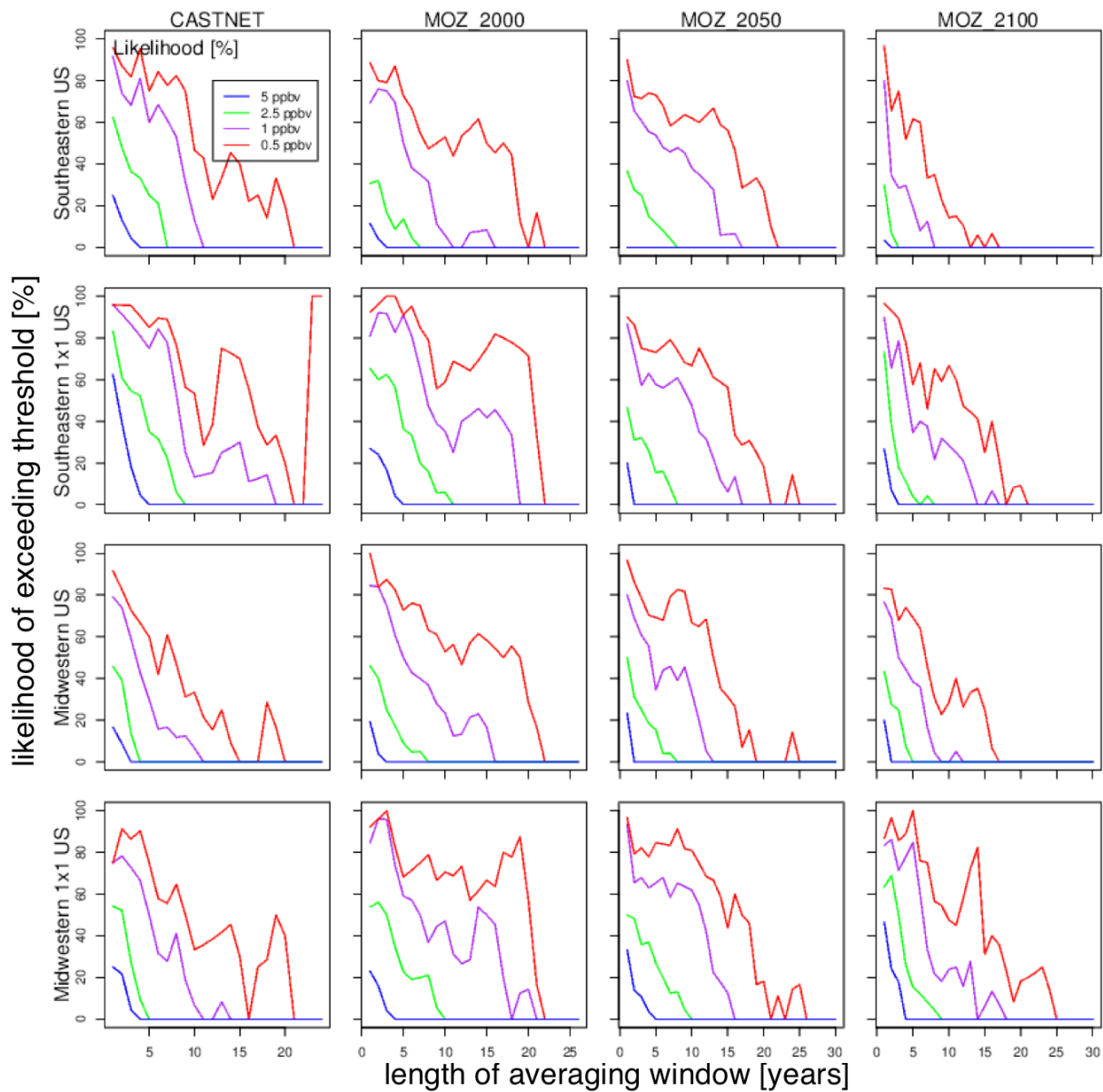

Supplemental Figure S1: The likelihood (percent, vertical axis) that an estimation of the mean ozone value for a given length of temporal averaging window (years, horizontal axis) is farther away from the long-term mean value than a given threshold: 5 ppbv (blue), 2.5 ppbv (purple), 1 ppbv (green), and 0.5 ppbv (blue). Individual columns represent the four datasets used in this study: CASTNET, present-day MOZART, and the two future MOZART simulations (2050, 2100). Individual rows are spatially averaging over the telescoping regions seen in Figure 1. Supplemental Figure S2 plots similar results for the Southeastern and Midwestern US.

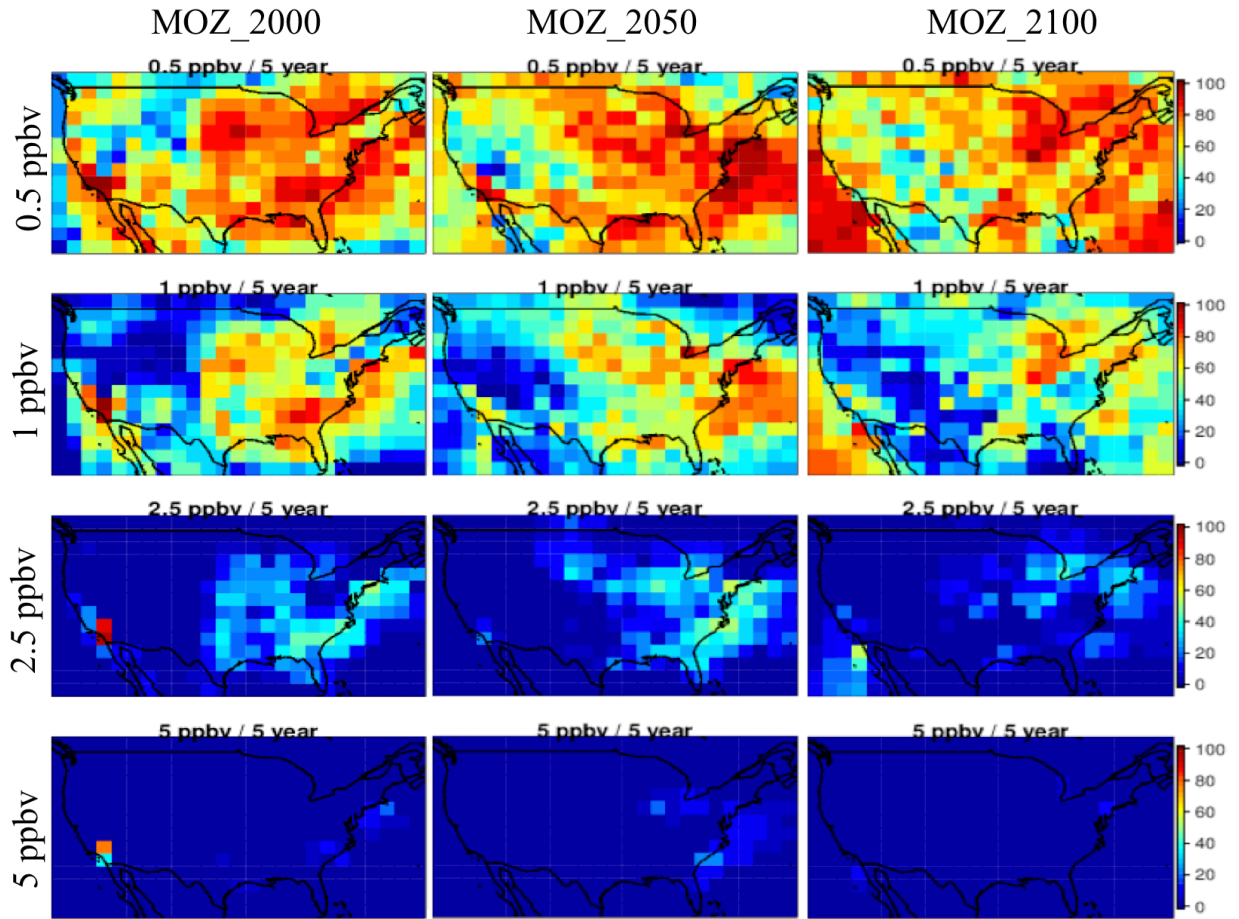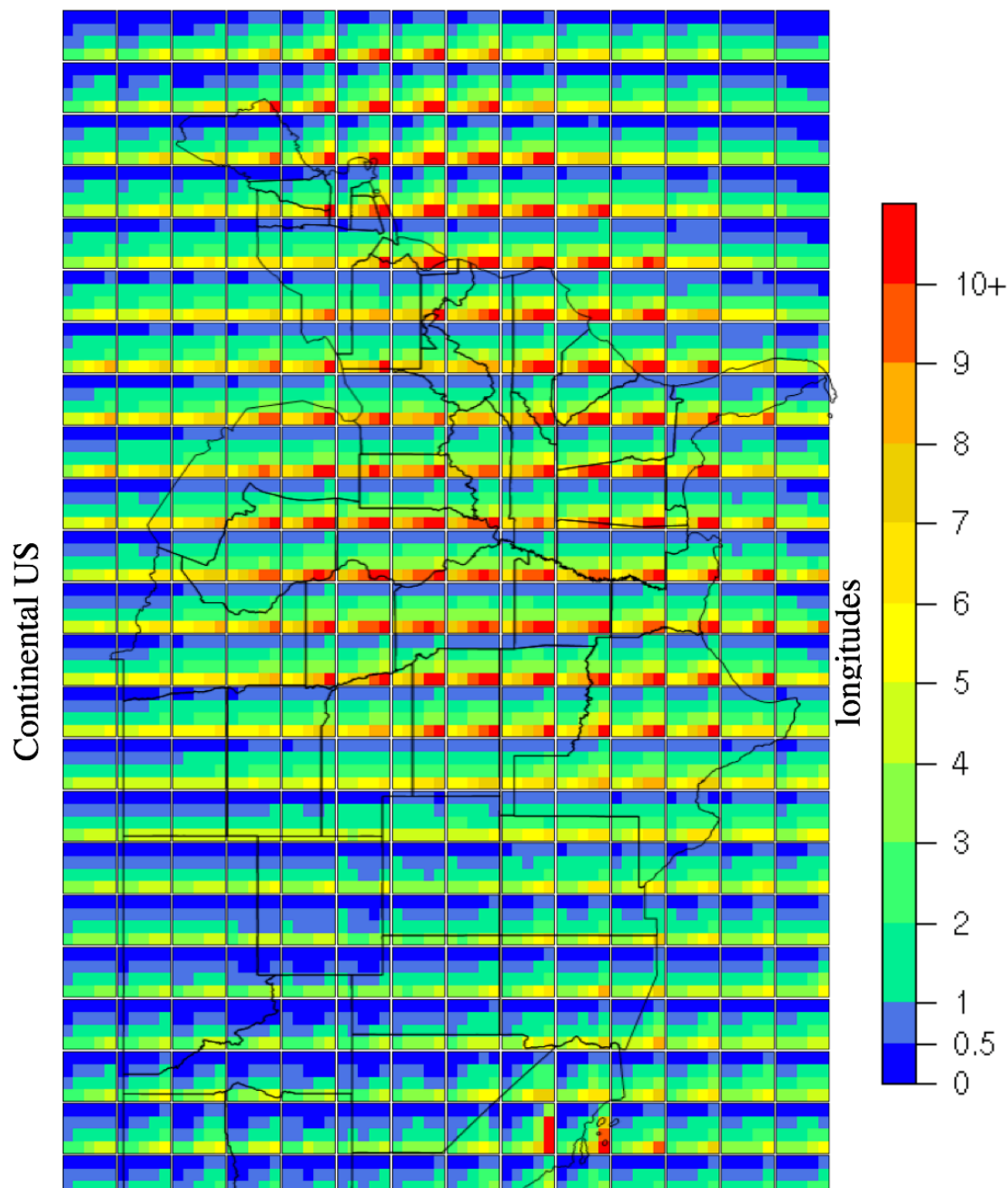**Supplemental Figure S2 (as in Figure S1, but for the Southeastern and Midwestern US)**

Figure S3: As in Figure 5, but only the second column, for present-day MOZART, future MOZART 2050, and future MOZART 2100.

Supplemental Figure S4: As in Figure 8, plotting maximum potential calculated DM8H O$_3$ anomaly [ppbv] from the long-term (1990 – 2014) mean, but for every grid cell in the Continental US.

			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		

			CASTNET	MOZ_2000	MOZ_2050	MOZ_2100
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**		-		

			CASTNET	MOZ_2000	MOZ_2050	MOZ_2100
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		

			CASTNET	MOZ_2000	MOZ_2050	MOZ_2100
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 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. Similar tables for the other regions in this study are included in the Supplemental Material. Note that there were no CASTNET sites at the 1x1 grid cell regions.

Length of Averaging Window

Ozone Threshold		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
	EUS	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
	NE1x1	10	0	19	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
	EUS	25	32	42	3.8	0	12	24	0	0	0	0	0
	NEUS	30	55	50	38	0	41	38	0	0	8.3	6.3	0
	NE1x1	55	41	65	31	13	5.9	43	0	10	0	0	0
0.5 ppbv	CUS	35	41	54	38	6.7	29	19	19	0	8.3	0	13
	EUS	65	68	62	35	13	59	52	14	0	50	13	6
	NEUS	65	77	73	65	33	76	76	52	0	58	44	0
	NE1x1	70	59	88	73	67	47	57	19	30	42	56	19

% Likelihood

- 0
- 1-10
- 11-20
- 21-30
- 31-40
- 41-50
- 51-60
- 61-70
- 71-80
- 81-90

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 DM8H O3 dataset (CASTNET, MOZ_2000, MOZ_2050, MOZ_2100, sub-columns).