Air Quality Modeling Technical Support Document for the 2007 Fine Scale Modeling Platform

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INTRODUCTION

This document describes the air quality modeling performed by EPA to support multiple air quality assessment projects. Air quality was estimated with the Community Multi-scale Air Quality (CMAQ) model using a finer-scale horizontal grid resolution (4 km) than what is often used for national-scale assessments. CMAQ simulates the numerous physical and chemical processes involved in the formation, transport, and destruction of ozone, particulate matter and other air pollutants. In addition to the CMAQ model, the modeling platform includes the emissions, meteorology, and initial and boundary condition data which are inputs to this model.

Photochemical grid models use state of the science numerical algorithms to estimate pollutant formation, transport, and deposition over a variety of spatial scales that range from urban to continental. Emissions of precursor species are injected into the model where they react to form secondary species such as ozone and then transport around the modeling domain before ultimately being removed by deposition or chemical reaction.

The 2007 based CMAQ modeling platform was used as the basis for the air quality modeling. This platform represents a structured system of connected modeling-related tools and data that provide a consistent and transparent basis for assessing the air quality response to projected changes in emissions. The base year of data used to construct this platform includes emissions and meteorology for 2007. The modeling system treats the emissions, transport, and fate of criteria pollutants. This modeling platform and analysis is described below.

METHODS

Photochemical Modeling

The Community Multi-scale Air Quality (CMAQ) model v5.0.1 (www.cmaq-model.org) is a state of the science three-dimensional, Eulerian, “one-atmosphere” photochemical transport model used to estimate air quality (Byun and Schere, 2006; Foley et al., 2010). CMAQ simulates the formation and fate of photochemical oxidants, ozone, primary and secondary PM concentrations, and other pollutants over regional and urban spatial scales for given input sets of meteorological conditions and emissions. CMAQ is applied with the AERO6 aerosol module, which includes the ISORROPIAII inorganic chemistry (Fountoukis and Nenes, 2007) and a secondary organic aerosol module (Carlton et al., 2010). The CMAQ model is applied with sulfur and organic oxidation aqueous phase chemistry (Carlton et al., 2008) and the carbon-bond

gas-phase chemistry module CB05TU (Whitten et al., 2010). All domains were modeled for the entire year of 2007.

Model Domains

The modeling analyses were performed for multiple domains with 4 km sized grid cells as shown in Figure 1. These domains have a parent domain that covers the continental United States with 12 km sized grid cells. The model extends vertically from the surface to 50 millibars (approximately 20 km) using a sigma-pressure coordinate system (Table 1). The 12 km grid was used to establish the incoming air quality concentrations along the boundaries of the 4 km grids.

Figure 1. Photochemical model domains using 4 km sized grid cells shown with blue boxes.

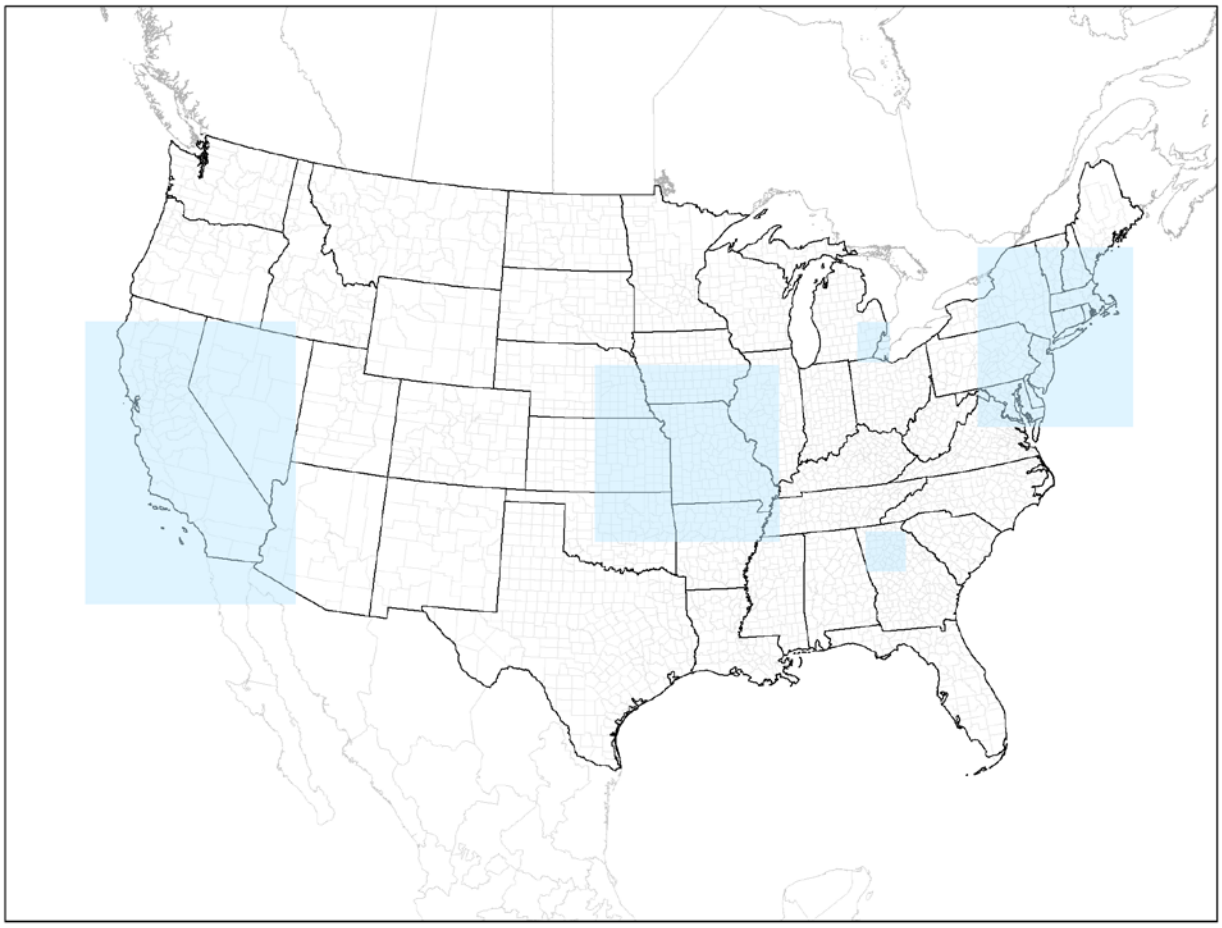

Table 1. Vertical layer structure for the WRF simulation.

Layer	Sigma	Height (m)
0	1.0000	0
1	0.9975	20.6
2	0.9950	41.4
3	0.9900	83.5
4	0.9850	125.5
5	0.9800	167.5
6	0.9700	252.1
7	0.9600	337.3
8	0.9500	422.9
9	0.9400	509.3
10	0.9300	596.2
11	0.9200	683.7
12	0.9100	771.9
13	0.9000	860.9
14	0.8800	1041.2
15	0.8600	1225.2
16	0.8400	1413.1
17	0.8200	1604.8
18	0.8000	1800.5
19	0.7700	2102.1
20	0.7400	2413.6
21	0.7000	2844.8
22	0.6500	3410.8
23	0.6000	4010.3
24	0.5500	4648.1
25	0.5000	5330.6
26	0.4500	6064.1
27	0.4000	6857.6
28	0.3500	7725.2
29	0.3000	8684.3
30	0.2500	9757.8
31	0.2000	10980.3
32	0.1500	12405.1
33	0.1000	14133.2
34	0.0500	16489.9
35	0.0000	20500.6

Initial and Boundary Conditions

The lateral boundary and initial species concentrations are provided by a three-dimensional global atmospheric chemistry model, the GEOS-CHEM model (standard version 8-03-02). The global GEOS-CHEM model simulates atmospheric chemical and physical processes driven by assimilated meteorological observations from the NASA's Goddard Earth Observing System (GEOS) (Yantosca et al., 2012). This model was run for 2007 with a grid resolution of 2.0 degree x 2.5 degree (latitude-longitude) and vertical layers up to approximately 80 km. The predictions were used to provide one-way dynamic boundary conditions at three-hour intervals and an initial concentration field for a 36 km CMAQ simulation covering the United States, northern Mexico, and southern Canada. The 36 km photochemical model simulation is used to supply initial and hourly boundary concentrations to the 12 km domain. The 36 km domain simulation includes 10 days of spin-up before the start of each calendar quarter that are not used in the analysis. The 12 and 4 km domain simulations include 3 days of spin-up before each calendar quarter.

Meteorology

Before initiating the air quality simulations, it is important to identify the biases and errors associated with the meteorological modeling inputs. Meteorological inputs were developed with the Weather and Research Forecasting (WRF) model (Skamarock, 2008). The 2007 WRF model performance evaluations used an approach which included a combination of qualitative and quantitative analyses to assess the adequacy of the WRF simulated fields. Additionally, the evaluations compared spatial patterns of estimated to observed monthly average rainfall and checked maximum planetary boundary layer heights for reasonableness.

Qualitatively, the model fields closely matched the observed synoptic patterns, which is not unexpected given the use of nudging. The operational evaluation included statistical comparisons of model/observed pairs (e.g., mean bias, mean error, fractional bias, fractional error, etc.) for multiple meteorological parameters. For this portion of the evaluation, five meteorological parameters were investigated: temperature, humidity, shortwave downward radiation, wind speed, and wind direction. The individual WRF evaluations are described elsewhere (U.S. Environmental Protection Agency, 2013). It was ultimately determined that the bias and error values associated with all of the 2007 meteorological data were generally within the range of past meteorological modeling results that have been used for air quality applications.

Emissions

The emissions data used for each domain are based on the 2008 National Emissions Inventory version 2. The development of anthropogenic and biogenic emissions for 2007 are described elsewhere (U.S. Environmental Protection Agency, 2012). Non-point anthropogenic emissions information was allocated to each model domain using 4 km resolution spatial surrogates to more finely spatially allocate emissions. Emissions are processed to photochemical model inputs with the SMOKE emissions modeling system (Houyoux et al., 2000).

Other (non-U.S.) North American emissions are based on a 2006 Canadian inventory and 1999 Mexican inventory projected to 2007. Global emissions of criteria pollutants are included in the modeling system through boundary condition inflow. Annual domain total emissions are shown in Tables 1 through 5 for each area.

Table 1. Annual total emissions (tons/year) by sector for the 4 km Detroit domain.

Sector Description	Sector abbr.	VOC	NOX	PM2.5	SO2	NH3	CO
Area fugutive dust	afdust_adj	0	0	4,145	0	0	0
Agricultural ammonia	ag	0	0	0	0	6,275	0
Average fires	avefire	45	13	54	6	10	585
Biogenics	beis	0	5,506	0	0	0	10,897
Class 1 & 2 CMV and locomotives	c1c2rail	277	5,479	168	108	3	858
Class 3 commercial marine vessel (CMV)	c3marine	44	1,303	97	790	0	105
Remaining nonpoint	nonpt	80,378	20,059	7,528	6,396	2,670	50,478
Nonroad mobile	nonroad	36,592	33,220	2,531	1,816	35	358,490
Onroad mobile	onroad	79,081	175,706	7,531	842	2,670	929,601
Onroad refueling	onroad_rfl	6,223	0	0	0	0	0
Other non-NEI nonpoint and nonroad	othar	14,228	7,235	1,910	1,030	1,439	44,047
Other non-NEI onroad	othon	2,294	5,184	96	57	297	42,894
Other non-NEI point	othpt	513	19,761	2,529	72,586	794	58,579
EGU point	ptipm	745	79,093	2,428	256,588	87	7,690
non-EGU point	ptnonipm	17,698	27,900	4,417	29,595	199	51,884

Table 2. Annual total emissions (tons/year) by sector for the 4 km Atlanta domain.

Sector Description	Sector abbr.	VOC	NOX	PM2.5	SO2	NH3	CO
Area fugutive dust	afdust_adj	0	0	3,393	0	0	0
Agricultural ammonia	ag	0	0	0	0	34,225	0
Average fires	avefire	0	1,983	10,141	987	1,877	113,856
Biogenics	beis	0	3,062	0	0	0	38,006
Class 1 & 2 CMV and locomotives	c1c2rail	428	7,808	251	87	4	1,161
Remaining nonpoint	nonpt	91,950	5,345	6,122	191	899	24,897
Nonroad mobile	nonroad	32,473	29,398	2,845	1,791	32	386,177
Onroad mobile	onroad	78,115	200,839	8,101	869	3,127	938,326
Onroad refueling	onroad_rfl	3,613	0	0	0	0	0
EGU point	ptipm	1,342	69,290	5,372	472,907	857	10,068
non-EGU point	ptnonipm	6,541	12,117	971	4,091	107	17,409

Table 3. Annual total emissions (tons/year) by sector for the 4 km Northeast domain.

Sector Description	Sector abbr.	VOC	NOX	PM2.5	SO2	NH3	CO
Area fugutive dust	afdust_adj	0	0	15,014	0	0	0
Agricultural ammonia	ag	0	0	0	0	146,858	0
Average fires	avefire	0	1,261	7,793	687	1,480	90,122
Biogenics	beis	0	29,932	0	0	0	191,051
Class 1 & 2 CMV and locomotives	c1c2rail	5,340	94,615	3,247	7,566	32	15,477
Class 3 commercial marine vessel (CMV)	c3marine	3,282	93,511	7,277	64,569	0	7,745
Remaining nonpoint	nonpt	715,181	206,040	108,339	167,288	12,585	694,328
Nonroad mobile	nonroad	412,570	244,327	23,219	12,686	283	3,103,480
Onroad mobile	onroad	410,264	886,537	36,131	5,421	21,570	4,504,200
Onroad refueling	onroad_rfl	18,168	0	0	0	0	0
Other non-NEI nonpoint and nonroad	othar	22,284	10,259	6,930	1,405	3,840	80,887
Other non-NEI onroad	othon	2,095	4,735	88	52	271	39,175
Other non-NEI point	othpt	0	6,259	306	2,814	1,463	4,566
EGU point	ptipm	2,814	190,859	35,031	872,116	2,941	44,419
non-EGU point	ptnonipm	49,535	151,844	21,347	81,837	3,635	249,421

Table 4. Annual total emissions (tons/year) by sector for the 4 km Missouri domain.

Sector Description	Sector abbr.	VOC	NOX	PM2.5	SO2	NH3	CO
Area fugutive dust	afdust_adj	0	0	164,012	0	0	0
Agricultural ammonia	ag	0	0	0	0	553,780	0
Average fires	avefire	0	29,137	130,321	13,679	23,605	1,426,770
Biogenics	beis	0	208,584	0	0	0	439,474
Class 1 & 2 CMV and locomotives	c1c2rail	8,943	188,530	5,984	4,531	90	29,673
Remaining nonpoint	nonpt	473,028	101,665	60,694	58,468	6,126	409,398
Nonroad mobile	nonroad	172,169	198,486	19,054	12,060	184	1,347,720
Onroad mobile	onroad	288,357	681,309	24,602	4,982	10,895	3,340,040
Onroad refueling	onroad_rfl	23,309	0	0	0	0	0
EGU point	ptipm	5,598	419,673	21,209	816,086	1,510	75,051
non-EGU point	ptnonipm	96,746	196,077	25,926	227,859	7,959	200,482

Table 5. Annual total emissions (tons/year) by sector for the 4 km California domain.

Sector Description	Sector abbr.	VOC	NOX	PM2.5	SO2	NH3	CO
Area fugutive dust	afdust_adj	0	0	53,873	0	0	0
Agricultural ammonia	ag	0	0	0	0	270,444	0
Average fires	avefire	0	19,689	136,010	11,355	26,153	1,595,960
Biogenics	beis	0	84,357	0	0	0	810,354
Class 1 & 2 CMV and locomotives	c1c2rail	7,141	84,796	2,658	2,390	6	18,384
Class 3 commercial marine vessel (CMV)	c3marine	3,905	113,163	8,500	69,652	0	9,654
Remaining nonpoint	nonpt	330,483	72,016	78,924	11,279	64,012	376,791
Nonroad mobile	nonroad	159,566	166,138	12,069	1,434	92	946,532
Onroad mobile	onroad_adj	294,297	610,609	25,572	1,986	16,449	2,743,120
Onroad refueling	onroad_rfl	5,297	0	0	0	0	0
Other non-NEI nonpoint and nonroad	othar	73,046	28,575	5,163	13,264	6,654	59,537
Other non-NEI onroad	othon	12,601	12,249	978	643	407	85,330
Other non-NEI point	othpt	24,883	11,258	4,146	15,333	0	1,641
EGU point	ptipm	795	26,974	1,768	9,601	1,257	9,522
non-EGU point	ptnonipm	44,487	103,604	23,251	28,475	10,666	129,258

RESULTS

Model Performance Evaluation: PM2.5

An operational model performance evaluation for the speciated components of PM2.5 (e.g., sulfate, nitrate, elemental carbon, organic carbon, etc.) was conducted using 2007 state/local monitoring data in order to estimate the ability of the modeling system to replicate base year concentrations. The evaluation of PM2.5 component species includes comparisons of predicted and observed concentrations of sulfate (SO4), nitrate (NO3), ammonium (NH4), elemental carbon (EC), and organic carbon (OC). PM2.5 ambient measurements for 2007 were obtained from the Chemical Speciation Network (CSN) and the Interagency Monitoring of PROtected Visual Environments (IMPROVE). The CSN sites are generally located within urban areas and the IMPROVE sites are typically in rural/remote areas. The measurements at CSN and IMPROVE sites represent 24-hour average concentrations. In calculating the model performance metrics, the modeled hourly species predictions were aggregated to the averaging times of the measurements.

Model performance statistics were calculated for observed/predicted pairs of daily concentrations. Metrics estimated include bias, error, fractional bias, and fractional error (Boylan and Russell, 2006; Simon et al., 2012). The aggregated metrics and number (N) of prediction-observation pairs are shown by chemical specie and quarter in Appendix A. Performance is best when metrics approach zero. The fractional bias and error metrics are bound by 200%, which would represent poor model performance. Model performance was compared to the performance found in recent regional PM2.5 model applications for other, non-EPA studies. Overall, the mean bias (bias) and mean error (error) statistics are within the range or close to that found by other groups in recent applications (Simon et al., 2012). Spatial plots of seasonal average metrics by monitor location are shown in Appendix B. The model performance results give us confidence that our application of CMAQ using this modeling platform provides a scientifically credible approach for assessing PM2.5 concentrations for the purposes of this assessment.

Model Performance Evaluation: Ozone

An operational model performance evaluation for eight-hour daily maximum ozone was conducted in order to estimate the ability of the modeling system to replicate the base year concentrations. Ozone measurements were taken from the 2007 State/local monitoring site data in the Aerometric Information Retrieval System (AIRS).

The ozone metrics covered in this evaluation include eight-hour average daily maximum ozone bias, error, fractional bias, and fractional error (Boylan and Russell, 2006; Simon et al., 2012). The evaluation principally consists of statistical assessments of model versus observed pairs that were paired in time and space. This ozone model performance includes all prediction and observation pairs and additional metrics are estimated where observed ozone exceeded or equaled 60 ppb. This cutoff was applied to evaluate the model on days of elevated ozone which are more policy relevant. Aggregated performance metrics by ozone season month are shown in Appendix A. Model performance is consistent with photochemical modeling published in

literature (Simon et al., 2012). Spatial plots of seasonal average metrics by monitor location are shown in Appendix B.

Model Performance Evaluation: Hourly gas measurements

An operational model performance evaluation for hourly ozone, sulfur dioxide, nitrogen oxides, and carbon monoxide was conducted in order to estimate the ability of the modeling system to replicate the base year concentrations. Measurements were taken from the 2007 State/local monitoring site data in the Aerometric Information Retrieval System (AIRS). Monitors included in the analysis are shown in Figures 2 and 3. Model and prediction pairs are shown with scatter density plots in Figures 4 to 8 for each separate 4 km domain: Atlanta, Detroit, Missouri, Northeast U.S., and California.

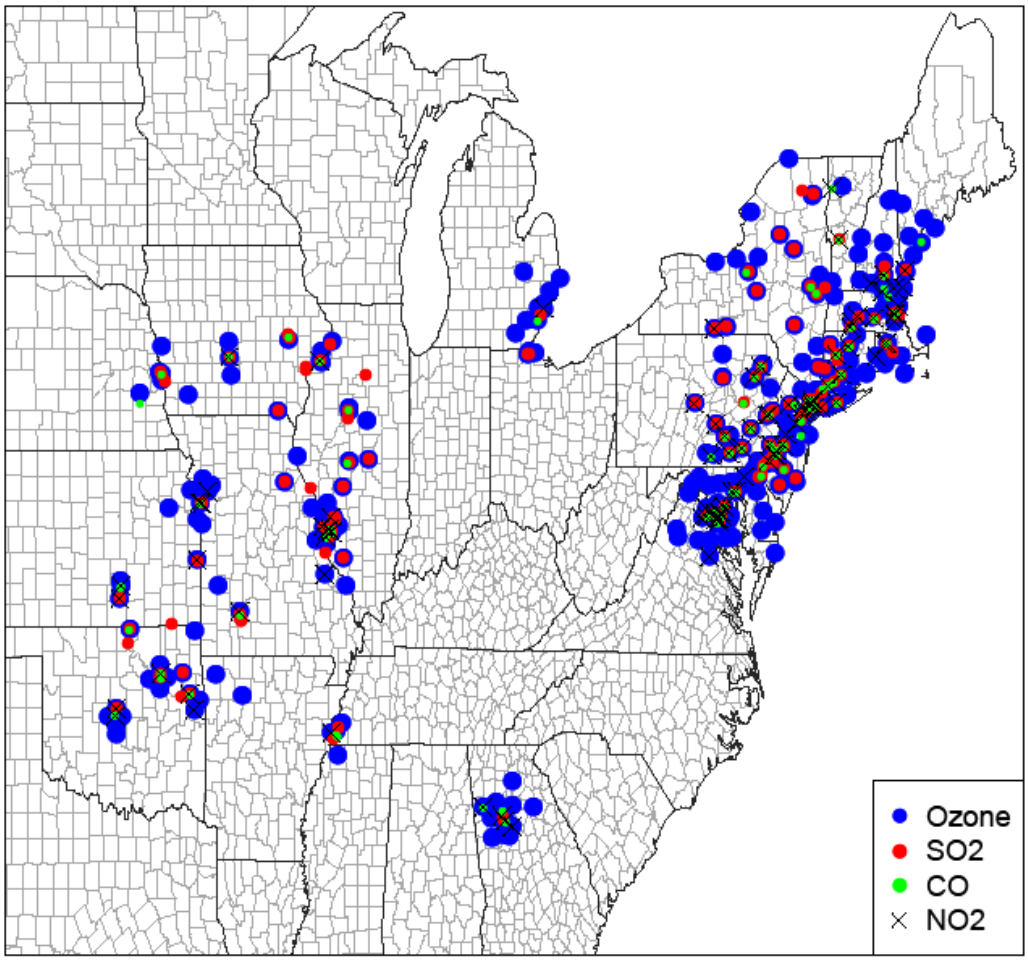

Figure 2. Hourly measurement locations included in scatter density plots for each area of the central and eastern United States.

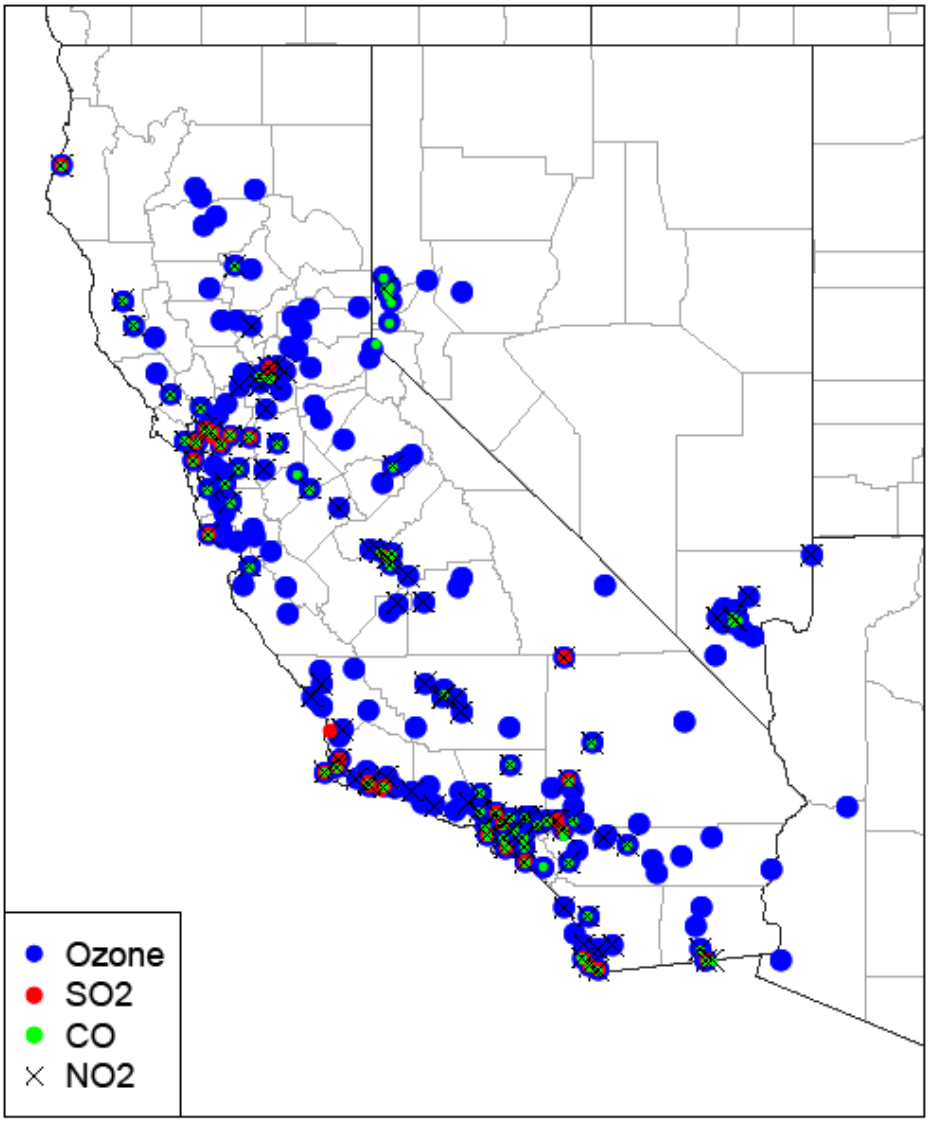

Figure 3. Hourly measurement locations included in scatter density plots for California.

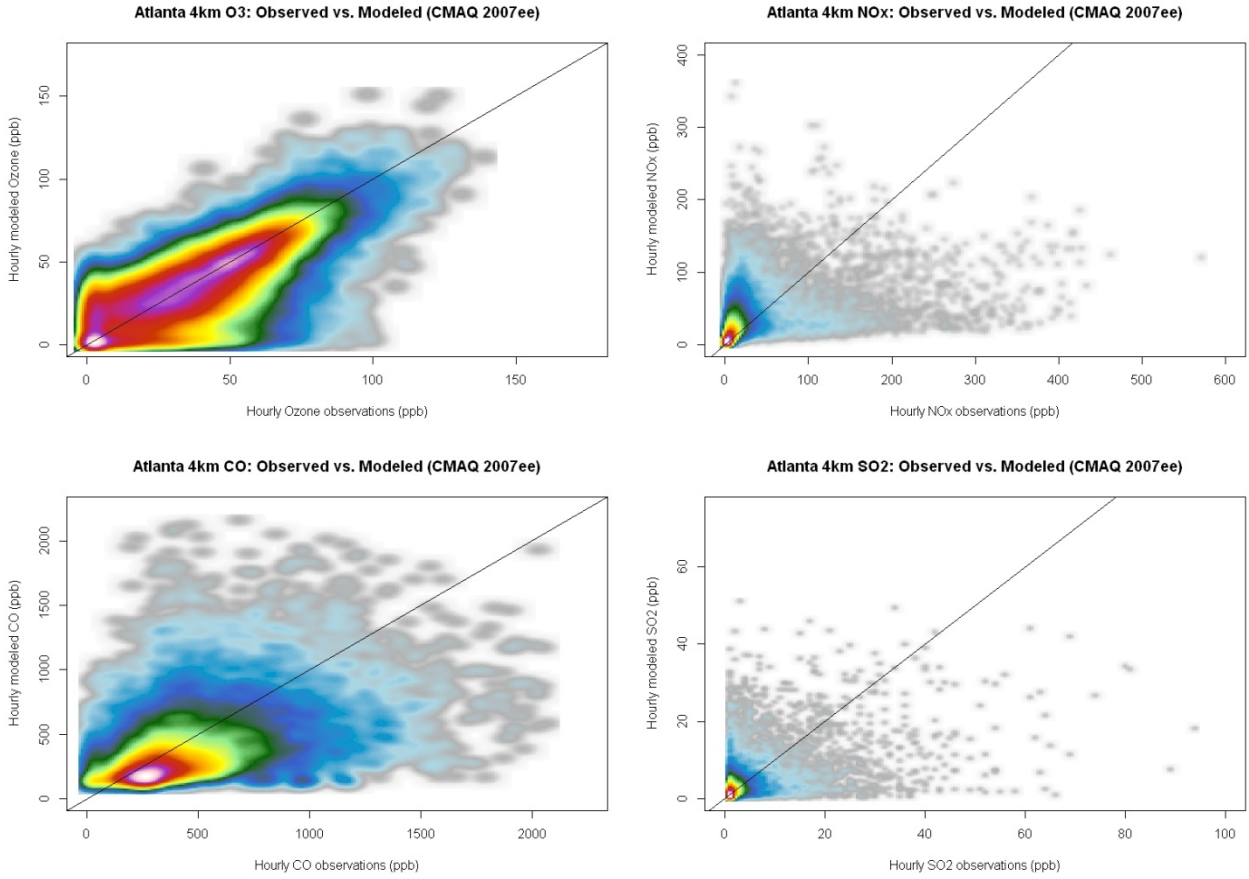

Figure 4. Scatter density plots matching hourly modeled and observed ozone (top left), nitrogen oxides (top right), carbon monoxide (bottom left), and sulfur dioxide (bottom right) for the Atlanta domain.

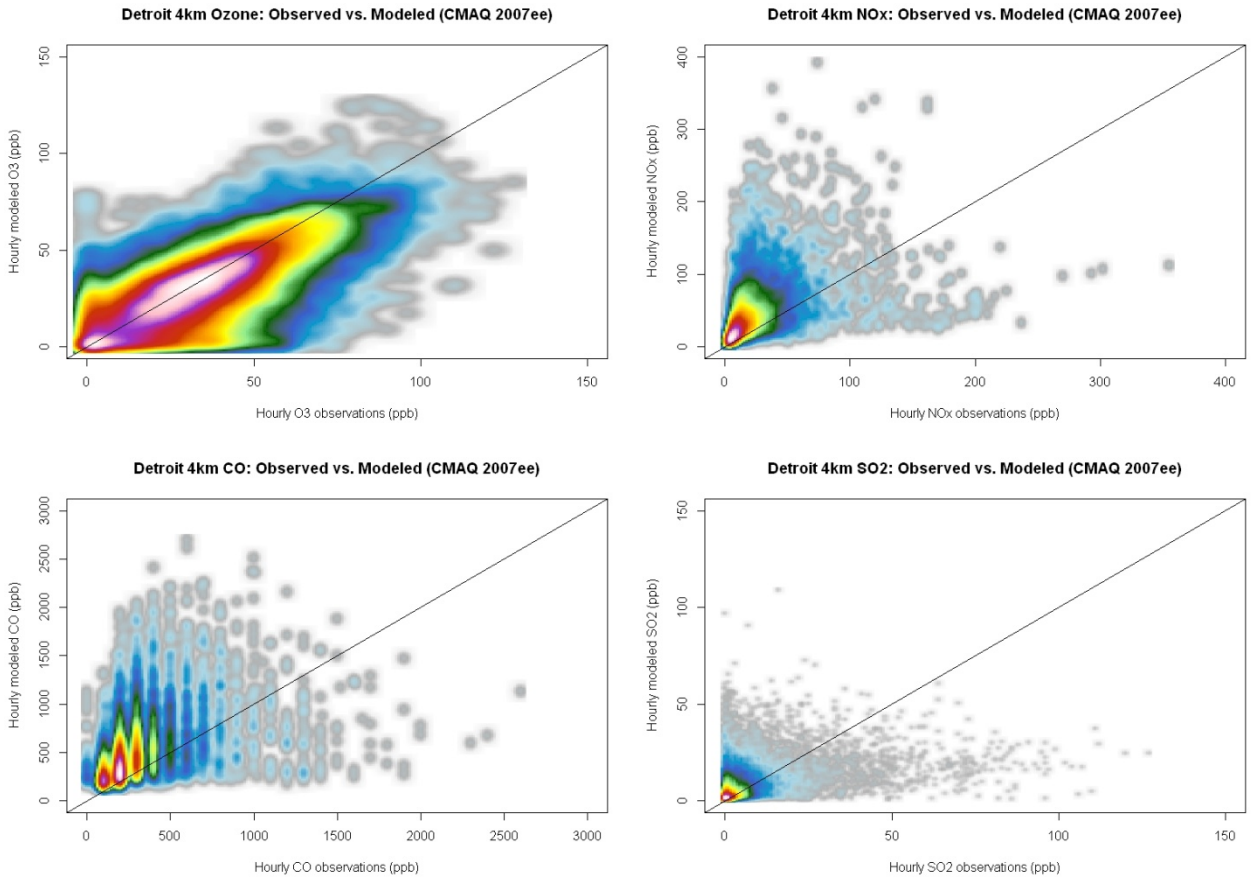

Figure 5. Scatter density plots matching hourly modeled and observed ozone (top left), nitrogen oxides (top right), carbon monoxide (bottom left), and sulfur dioxide (bottom right) for the Detroit domain.

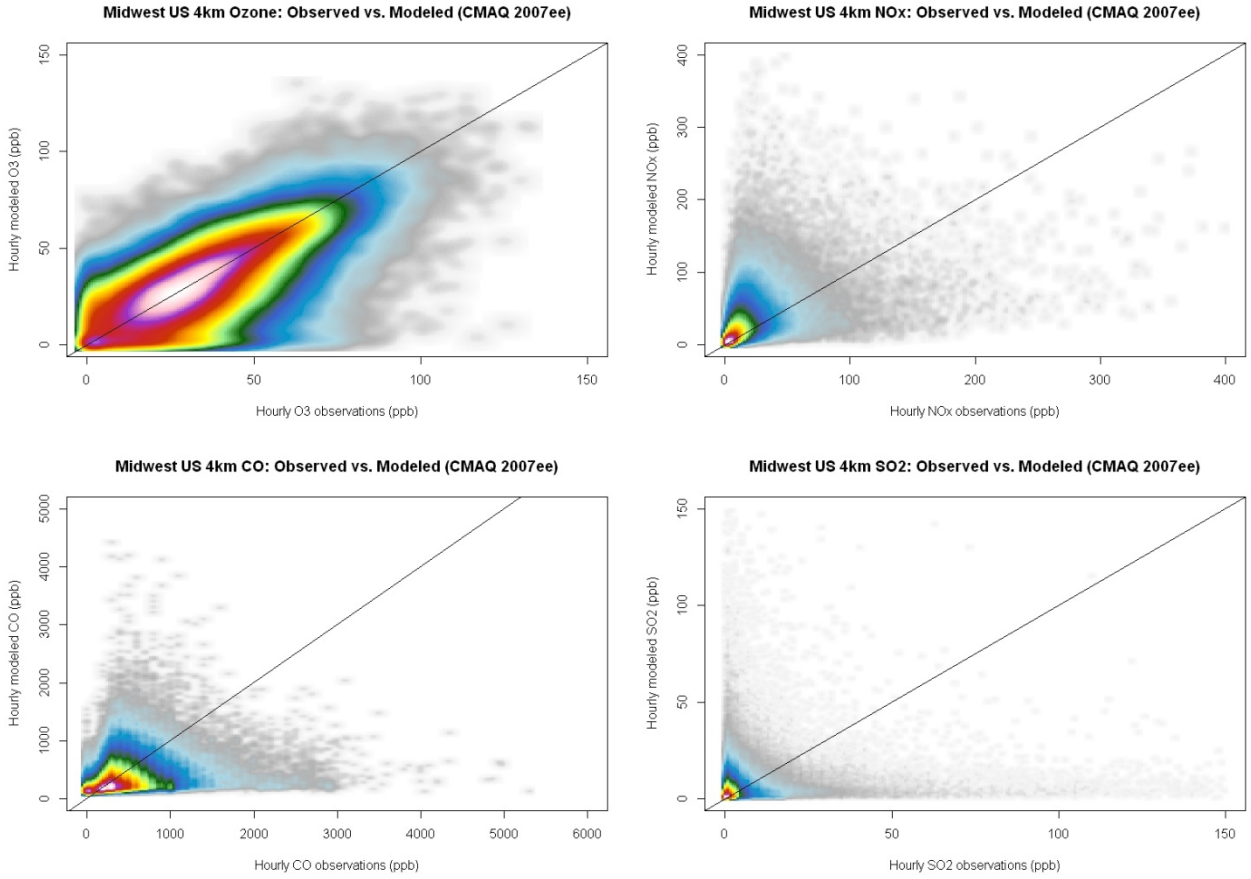

Figure 6. Scatter density plots matching hourly modeled and observed ozone (top left), nitrogen oxides (top right), carbon monoxide (bottom left), and sulfur dioxide (bottom right) for the Missouri domain.

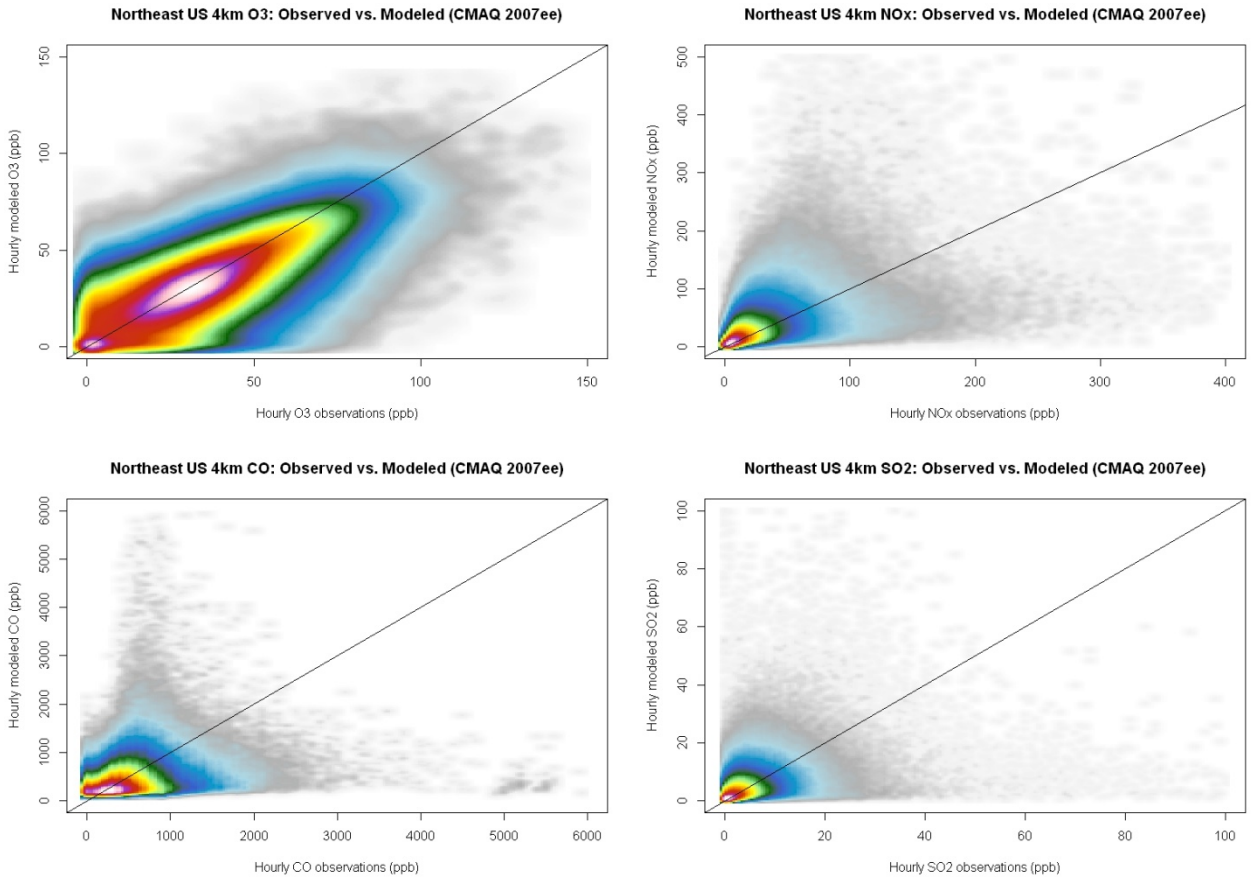

Figure 7. Scatter density plots matching hourly modeled and observed ozone (top left), nitrogen oxides (top right), carbon monoxide (bottom left), and sulfur dioxide (bottom right) for the Northeast domain.

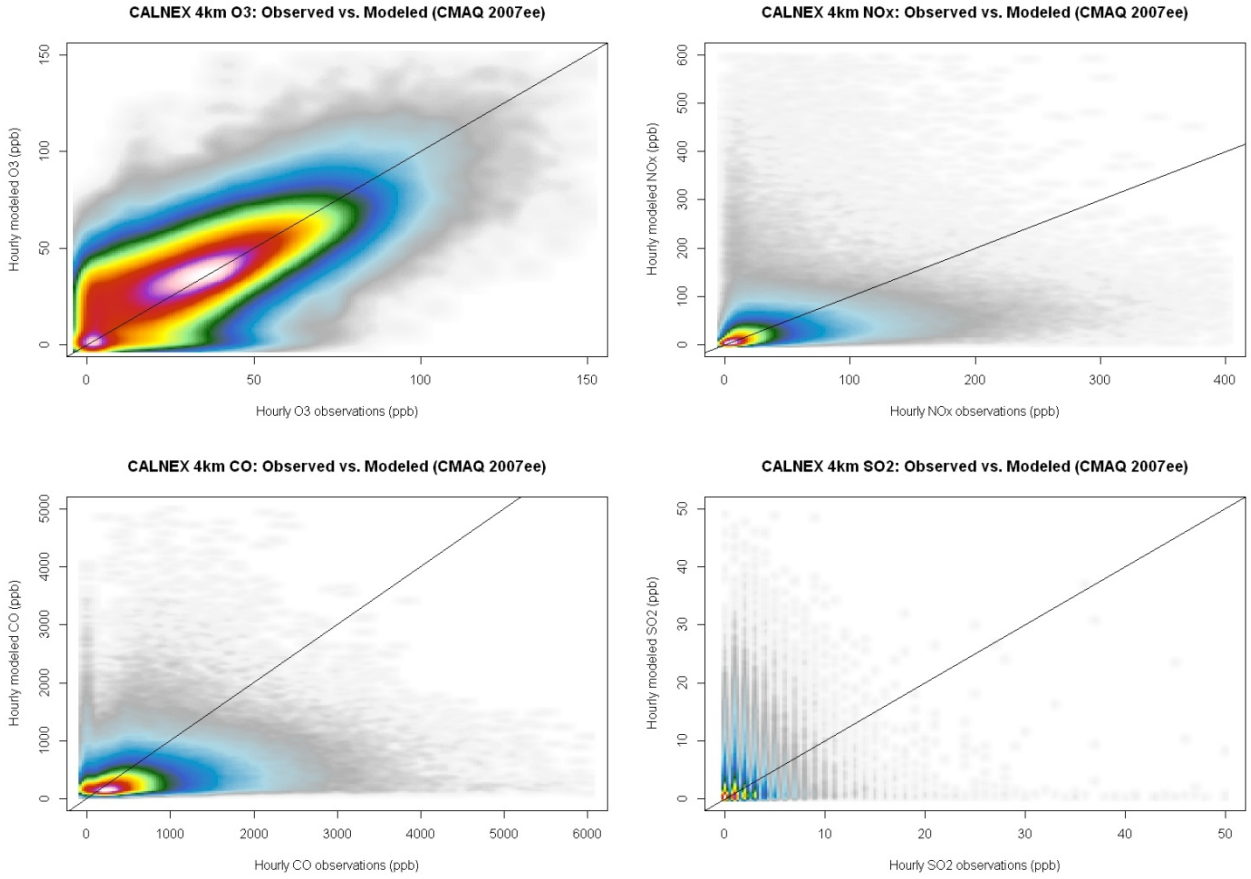

Figure 8. Scatter density plots matching hourly modeled and observed ozone (top left), nitrogen oxides (top right), carbon monoxide (bottom left), and sulfur dioxide (bottom right) for the California domain.

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Appendix A

Aggregate model performance metrics for speciated PM2.5 and 8-hr ozone

Domain	Network	Specie	Month	N	Mean Obs. (ug/m3)	Mean Pred. (ug/m3)	R Square	Mean Bias (ug/m3)	Mean Error (ug/m3)	Fract. Bias (%)	Fract. Error (%)
4ATLANTA1	CASTNET	NH4	January	4	0.70	0.72	0.08	0.02	0.22	7.8	34.9
4ATLANTA1	CASTNET	NH4	February	4	0.80	1.20	0.50	0.40	0.40	38.7	38.7
4ATLANTA1	CASTNET	NH4	March	5	1.25	1.25	0.67	0.00	0.21	4.9	19.7
4ATLANTA1	CASTNET	NH4	April	4	1.11	1.12	0.92	0.01	0.09	-1.4	9.9
4ATLANTA1	CASTNET	NH4	May	4	1.70	1.05	0.11	-0.65	0.65	-45.0	45.0
4ATLANTA1	CASTNET	NH4	June	5	1.66	1.18	0.10	-0.49	0.49	-33.9	33.9
4ATLANTA1	CASTNET	NH4	July	4	1.38	1.17	0.87	-0.21	0.21	-17.5	17.5
4ATLANTA1	CASTNET	NH4	August	4	2.59	1.45	0.96	-1.14	1.14	-54.9	54.9
4ATLANTA1	CASTNET	NH4	September	5	1.64	1.17	0.88	-0.47	0.47	-32.7	32.7
4ATLANTA1	CASTNET	NH4	October	4	0.89	0.76	0.83	-0.13	0.16	-12.6	20.3
4ATLANTA1	CASTNET	NH4	November	4	0.99	1.16	0.71	0.17	0.30	10.9	26.9
4ATLANTA1	CASTNET	NH4	December	4	0.90	0.82	0.12	-0.08	0.24	-11.0	26.8
4ATLANTA1	CASTNET	NO3	January	4	0.59	0.98	0.15	0.38	0.50	49.9	62.4
4ATLANTA1	CASTNET	NO3	February	4	0.76	2.31	0.20	1.56	1.56	96.9	96.9
4ATLANTA1	CASTNET	NO3	March	5	0.82	0.94	0.71	0.12	0.97	11.1	110.0
4ATLANTA1	CASTNET	NO3	April	4	0.63	1.08	0.28	0.45	0.81	38.1	93.9
4ATLANTA1	CASTNET	NO3	May	4	0.59	0.17	0.41	-0.41	0.48	-56.2	92.4
4ATLANTA1	CASTNET	NO3	June	5	0.19	0.07	0.87	-0.12	0.14	-82.2	94.8
4ATLANTA1	CASTNET	NO3	July	4	0.15	0.12	0.44	-0.03	0.10	-23.1	72.9
4ATLANTA1	CASTNET	NO3	August	4	0.08	0.05	0.17	-0.03	0.05	-58.1	77.1
4ATLANTA1	CASTNET	NO3	September	5	0.24	0.10	0.07	-0.14	0.16	-63.1	79.2
4ATLANTA1	CASTNET	NO3	October	4	0.48	0.31	0.03	-0.17	0.27	-63.8	80.6
4ATLANTA1	CASTNET	NO3	November	4	0.81	1.54	0.23	0.73	0.82	46.7	61.9
4ATLANTA1	CASTNET	NO3	December	4	0.54	1.08	0.12	0.55	0.63	59.6	73.1
4ATLANTA1	CASTNET	TNO3	January	4	2.03	2.08	0.76	0.05	0.31	-0.2	14.3
4ATLANTA1	CASTNET	TNO3	February	4	2.90	3.50	1.00	0.60	0.60	17.2	17.2
4ATLANTA1	CASTNET	TNO3	March	5	2.89	2.16	0.06	-0.74	1.00	-35.6	46.9
4ATLANTA1	CASTNET	TNO3	April	4	2.17	2.45	0.12	0.29	0.56	9.1	25.5
4ATLANTA1	CASTNET	TNO3	May	4	2.47	1.42	0.01	-1.05	1.05	-59.1	59.1
4ATLANTA1	CASTNET	TNO3	June	5	2.06	1.02	0.30	-1.05	1.05	-70.8	70.8
4ATLANTA1	CASTNET	TNO3	July	4	1.43	0.92	0.83	-0.51	0.51	-43.5	43.5
4ATLANTA1	CASTNET	TNO3	August	4	2.13	1.32	0.01	-0.81	0.81	-46.8	46.8
4ATLANTA1	CASTNET	TNO3	September	5	1.63	1.21	0.05	-0.42	0.42	-29.1	29.1
4ATLANTA1	CASTNET	TNO3	October	4	1.48	1.66	0.98	0.17	0.60	-11.1	40.0
4ATLANTA1	CASTNET	TNO3	November	4	2.36	3.11	0.81	0.75	0.81	17.3	21.2
4ATLANTA1	CASTNET	TNO3	December	4	2.42	2.64	0.50	0.23	0.38	5.9	13.9
4ATLANTA1	CSN	EC	January	15	0.96	1.95	0.01	0.99	1.17	71.2	84.9
4ATLANTA1	CSN	EC	February	12	0.66	1.77	0.20	1.11	1.11	101.0	101.0
4ATLANTA1	CSN	EC	March	14	1.21	2.17	0.74	0.96	0.97	54.2	56.2
4ATLANTA1	CSN	EC	April	12	1.04	1.61	0.66	0.57	0.58	43.9	46.1
4ATLANTA1	CSN	EC	May	13	0.94	1.49	0.85	0.55	0.55	55.9	55.9
4ATLANTA1	CSN	EC	June	12	0.66	1.37	0.18	0.70	0.87	86.7	95.6
4ATLANTA1	CSN	EC	July	14	0.67	1.46	0.01	0.80	1.01	79.7	95.3
4ATLANTA1	CSN	EC	August	10	1.49	2.17	0.42	0.68	0.68	44.0	44.0
4ATLANTA1	CSN	EC	September	13	1.56	1.93	0.04	0.36	0.91	21.8	49.4
4ATLANTA1	CSN	EC	October	13	0.73	1.69	0.21	0.96	0.96	78.1	78.1
4ATLANTA1	CSN	EC	November	13	2.08	2.78	0.07	0.71	1.70	49.1	75.0
4ATLANTA1	CSN	EC	December	12	1.36	2.62	0.36	1.27	1.32	67.5	69.3
4ATLANTA1	CSN	NH4	January	15	0.96	1.18	0.10	0.22	0.53	22.5	50.8
4ATLANTA1	CSN	NH4	February	12	1.08	1.33	0.37	0.26	0.36	26.3	33.8
4ATLANTA1	CSN	NH4	March	14	1.34	1.44	0.49	0.10	0.32	5.7	24.0
4ATLANTA1	CSN	NH4	April	12	1.08	1.20	0.64	0.12	0.25	12.7	24.7

Domain	Network	Specie	Month	N	Mean Obs. (ug/m3)	Mean Pred. (ug/m3)	R Square	Mean Bias (ug/m3)	Mean Error (ug/m3)	Fract. Bias (%)	Fract. Error (%)
4ATLANTA1	CSN	NH4	May	13	1.93	0.99	0.37	-0.94	0.94	-66.8	66.8
4ATLANTA1	CSN	NH4	June	12	1.98	1.53	0.58	-0.44	0.57	-22.1	31.1
4ATLANTA1	CSN	NH4	July	14	1.80	1.36	0.12	-0.44	0.62	-29.4	41.4
4ATLANTA1	CSN	NH4	August	10	2.26	1.42	0.42	-0.85	0.86	-41.4	42.9
4ATLANTA1	CSN	NH4	September	13	1.78	1.40	0.59	-0.38	0.55	-25.4	38.2
4ATLANTA1	CSN	NH4	October	13	1.10	1.03	0.66	-0.07	0.40	-16.1	49.9
4ATLANTA1	CSN	NH4	November	13	1.55	1.64	0.58	0.09	0.34	6.7	23.5
4ATLANTA1	CSN	NH4	December	12	1.99	1.39	0.79	-0.60	0.74	-17.8	32.3
4ATLANTA1	CSN	NO3	January	15	1.42	2.02	0.27	0.60	0.93	34.3	56.8
4ATLANTA1	CSN	NO3	February	12	1.92	3.12	0.67	1.20	1.20	59.1	59.1
4ATLANTA1	CSN	NO3	March	14	0.75	1.40	0.02	0.65	0.82	34.9	64.3
4ATLANTA1	CSN	NO3	April	12	0.65	1.29	0.55	0.63	0.70	56.7	72.2
4ATLANTA1	CSN	NO3	May	13	0.77	0.32	0.36	-0.45	0.45	-91.9	91.9
4ATLANTA1	CSN	NO3	June	12	0.47	0.22	0.00	-0.25	0.28	-82.7	88.0
4ATLANTA1	CSN	NO3	July	14	0.51	0.20	0.24	-0.31	0.32	-91.7	92.9
4ATLANTA1	CSN	NO3	August	10	0.42	0.17	0.22	-0.26	0.29	-86.0	96.7
4ATLANTA1	CSN	NO3	September	13	0.47	0.34	0.00	-0.13	0.31	-47.7	81.2
4ATLANTA1	CSN	NO3	October	13	0.49	0.97	0.12	0.48	0.78	-8.1	118.0
4ATLANTA1	CSN	NO3	November	13	1.03	2.59	0.31	1.57	1.57	79.5	79.5
4ATLANTA1	CSN	NO3	December	12	2.27	2.68	0.74	0.41	0.99	38.1	52.0
4ATLANTA1	CSN	OC	January	14	2.94	2.60	0.46	-0.34	0.91	-5.7	35.7
4ATLANTA1	CSN	OC	February	11	2.83	3.04	0.50	0.21	0.92	19.2	38.6
4ATLANTA1	CSN	OC	March	14	4.74	4.67	0.48	-0.07	1.13	0.1	28.7
4ATLANTA1	CSN	OC	April	12	2.64	1.89	0.96	-0.75	0.85	-20.7	37.5
4ATLANTA1	CSN	OC	May	13	4.74	2.24	0.41	-2.50	2.52	-50.9	52.3
4ATLANTA1	CSN	OC	June	12	4.31	2.06	0.31	-2.25	2.28	-64.1	66.3
4ATLANTA1	CSN	OC	July	14	3.78	1.85	0.22	-1.93	1.93	-65.8	66.1
4ATLANTA1	CSN	OC	August	10	5.76	4.43	0.41	-1.33	1.37	-24.8	26.0
4ATLANTA1	CSN	OC	September	13	4.52	3.29	0.01	-1.23	2.35	-22.6	52.9
4ATLANTA1	CSN	OC	October	13	2.55	2.56	0.06	0.01	1.04	-7.7	40.6
4ATLANTA1	CSN	OC	November	13	5.90	4.32	0.02	-1.58	2.71	-31.6	50.2
4ATLANTA1	CSN	OC	December	12	4.56	5.06	0.87	0.50	0.81	17.2	23.4
4ATLANTA1	CSN	SO4	January	15	1.91	2.04	0.08	0.13	0.99	-2.0	45.2
4ATLANTA1	CSN	SO4	February	12	1.83	1.48	0.00	-0.35	0.90	-13.7	45.9
4ATLANTA1	CSN	SO4	March	14	3.50	3.37	0.79	-0.13	0.55	-2.4	17.5
4ATLANTA1	CSN	SO4	April	12	2.88	3.02	0.52	0.15	0.83	2.9	27.6
4ATLANTA1	CSN	SO4	May	13	5.13	3.19	0.58	-1.94	1.94	-46.0	46.1
4ATLANTA1	CSN	SO4	June	12	6.01	4.98	0.77	-1.03	1.18	-15.8	20.2
4ATLANTA1	CSN	SO4	July	14	5.40	4.22	0.20	-1.17	2.19	-33.8	46.7
4ATLANTA1	CSN	SO4	August	10	7.77	4.99	0.67	-2.78	2.88	-40.3	42.5
4ATLANTA1	CSN	SO4	September	13	5.59	4.32	0.56	-1.27	1.93	-29.1	41.0
4ATLANTA1	CSN	SO4	October	13	3.00	2.43	0.71	-0.57	0.98	-24.3	43.4
4ATLANTA1	CSN	SO4	November	13	3.68	2.87	0.76	-0.81	0.81	-25.7	25.7
4ATLANTA1	CSN	SO4	December	12	3.30	2.15	0.81	-1.14	1.17	-36.9	38.8

Domain	Network	Specie	Month	N	Mean Obs. (ug/m3)	Mean Pred. (ug/m3)	R Square	Mean Bias (ug/m3)	Mean Error (ug/m3)	Fract. Bias (%)	Fract. Error (%)
4CALNEX1	CASTNET	NH4	January	24	0.21	0.24	0.23	0.03	0.09	22.1	38.3
4CALNEX1	CASTNET	NH4	February	24	0.22	0.20	0.79	-0.02	0.07	5.6	36.4
4CALNEX1	CASTNET	NH4	March	30	0.27	0.27	0.66	0.01	0.09	0.2	37.6
4CALNEX1	CASTNET	NH4	April	24	0.32	0.22	0.50	-0.09	0.14	-35.4	54.9
4CALNEX1	CASTNET	NH4	May	24	0.47	0.16	0.12	-0.32	0.32	-99.1	99.1
4CALNEX1	CASTNET	NH4	June	30	0.40	0.09	0.10	-0.31	0.31	-128.0	128.0
4CALNEX1	CASTNET	NH4	July	23	0.38	0.13	0.26	-0.25	0.25	-93.0	97.2
4CALNEX1	CASTNET	NH4	August	23	0.42	0.23	0.38	-0.19	0.20	-63.4	64.3
4CALNEX1	CASTNET	NH4	September	30	0.37	0.23	0.19	-0.15	0.17	-48.2	55.0
4CALNEX1	CASTNET	NH4	October	22	0.23	0.19	0.58	-0.04	0.08	-14.3	45.5
4CALNEX1	CASTNET	NH4	November	23	0.30	0.27	0.29	-0.03	0.12	-7.3	44.0
4CALNEX1	CASTNET	NH4	December	27	0.18	0.24	0.11	0.06	0.14	40.0	62.3
4CALNEX1	CASTNET	NO3	January	24	0.62	0.39	0.35	-0.23	0.28	-68.6	78.5
4CALNEX1	CASTNET	NO3	February	24	0.62	0.30	0.81	-0.32	0.35	-74.4	86.3
4CALNEX1	CASTNET	NO3	March	30	0.64	0.45	0.53	-0.20	0.40	-62.8	99.7
4CALNEX1	CASTNET	NO3	April	24	1.00	0.42	0.76	-0.58	0.59	-95.4	102.0
4CALNEX1	CASTNET	NO3	May	24	0.91	0.25	0.53	-0.66	0.66	-125.0	125.0
4CALNEX1	CASTNET	NO3	June	30	0.93	0.18	0.40	-0.75	0.76	-136.0	137.0
4CALNEX1	CASTNET	NO3	July	23	0.87	0.11	0.02	-0.76	0.76	-131.0	135.0
4CALNEX1	CASTNET	NO3	August	23	1.03	0.09	0.41	-0.94	0.94	-168.0	168.0
4CALNEX1	CASTNET	NO3	September	30	0.75	0.18	0.46	-0.57	0.57	-143.0	143.0
4CALNEX1	CASTNET	NO3	October	22	0.68	0.35	0.31	-0.34	0.41	-84.8	99.0
4CALNEX1	CASTNET	NO3	November	23	0.41	0.47	0.33	0.06	0.30	-6.6	74.0
4CALNEX1	CASTNET	NO3	December	27	0.57	0.48	0.19	-0.08	0.39	-24.6	79.2
4CALNEX1	CASTNET	SO4	January	24	0.38	0.48	0.03	0.11	0.15	27.9	36.9
4CALNEX1	CASTNET	SO4	February	24	0.44	0.46	0.56	0.02	0.15	18.8	36.6
4CALNEX1	CASTNET	SO4	March	30	0.68	0.64	0.58	-0.04	0.12	-3.7	17.3
4CALNEX1	CASTNET	SO4	April	24	0.93	0.75	0.61	-0.19	0.25	-18.6	29.5
4CALNEX1	CASTNET	SO4	May	24	1.50	0.81	0.61	-0.68	0.68	-56.6	56.6
4CALNEX1	CASTNET	SO4	June	30	1.27	0.77	0.36	-0.50	0.52	-43.6	49.0
4CALNEX1	CASTNET	SO4	July	23	1.24	0.69	0.50	-0.55	0.57	-48.4	51.8
4CALNEX1	CASTNET	SO4	August	23	1.30	0.84	0.21	-0.46	0.54	-35.7	48.0
4CALNEX1	CASTNET	SO4	September	30	1.09	0.72	0.53	-0.38	0.39	-37.6	39.9
4CALNEX1	CASTNET	SO4	October	22	0.62	0.51	0.44	-0.11	0.14	-16.8	23.6
4CALNEX1	CASTNET	SO4	November	23	0.70	0.65	0.55	-0.05	0.24	6.9	36.4
4CALNEX1	CASTNET	SO4	December	27	0.34	0.45	0.12	0.11	0.16	30.9	43.0
4CALNEX1	CASTNET	TNO3	January	24	1.30	1.09	0.59	-0.21	0.36	-11.9	29.9
4CALNEX1	CASTNET	TNO3	February	24	1.50	0.99	0.92	-0.51	0.54	-31.5	40.1
4CALNEX1	CASTNET	TNO3	March	30	1.81	1.64	0.81	-0.17	0.51	-7.5	33.2
4CALNEX1	CASTNET	TNO3	April	24	2.20	1.64	0.90	-0.56	0.58	-25.9	31.9
4CALNEX1	CASTNET	TNO3	May	24	2.60	1.72	0.90	-0.88	0.88	-48.1	48.1
4CALNEX1	CASTNET	TNO3	June	30	2.81	2.02	0.76	-0.79	1.03	-49.6	54.6
4CALNEX1	CASTNET	TNO3	July	23	2.89	2.24	0.92	-0.65	0.71	-43.4	44.5
4CALNEX1	CASTNET	TNO3	August	23	3.06	2.34	0.92	-0.72	0.79	-42.8	45.1
4CALNEX1	CASTNET	TNO3	September	30	2.35	1.77	0.66	-0.58	0.68	-39.4	43.0
4CALNEX1	CASTNET	TNO3	October	22	1.78	1.39	0.79	-0.39	0.53	-29.5	38.2
4CALNEX1	CASTNET	TNO3	November	23	1.63	1.78	0.46	0.14	0.72	4.9	39.6
4CALNEX1	CASTNET	TNO3	December	27	1.19	0.98	0.34	-0.21	0.49	-9.5	41.9
4CALNEX1	CSN	EC	January	91	1.52	2.71	0.27	1.19	1.35	53.9	62.6
4CALNEX1	CSN	EC	February	54	1.07	2.03	0.42	0.97	1.03	58.0	63.4
4CALNEX1	CSN	EC	March	81	0.88	1.50	0.19	0.61	0.70	47.9	54.4
4CALNEX1	CSN	EC	April	72	0.55	1.06	0.22	0.51	0.57	53.3	62.7

Domain	Network	Specie	Month	N	Mean Obs. (ug/m3)	Mean Pred. (ug/m3)	R Square	Mean Bias (ug/m3)	Mean Error (ug/m3)	Fract. Bias (%)	Fract. Error (%)
4CALNEX1	CSN	EC	May	82	0.56	1.09	0.19	0.54	0.59	61.4	67.6
4CALNEX1	CSN	EC	June	90	0.52	1.17	0.20	0.66	0.69	74.4	78.4
4CALNEX1	CSN	EC	July	83	0.58	1.09	0.20	0.51	0.55	62.1	67.1
4CALNEX1	CSN	EC	August	87	0.72	1.30	0.18	0.58	0.64	53.6	58.4
4CALNEX1	CSN	EC	September	87	0.77	1.37	0.18	0.60	0.66	49.9	56.5
4CALNEX1	CSN	EC	October	88	1.14	1.78	0.08	0.64	0.94	48.9	60.7
4CALNEX1	CSN	EC	November	84	1.77	2.31	0.31	0.54	0.87	26.1	42.0
4CALNEX1	CSN	EC	December	88	1.43	1.87	0.26	0.44	0.84	24.5	49.6
4CALNEX1	CSN	NH4	January	125	2.11	1.12	0.67	-0.99	1.15	-41.4	68.8
4CALNEX1	CSN	NH4	February	102	1.54	0.78	0.42	-0.76	1.00	-29.4	73.4
4CALNEX1	CSN	NH4	March	146	1.19	0.67	0.26	-0.52	0.74	-39.5	72.4
4CALNEX1	CSN	NH4	April	126	1.23	0.65	0.55	-0.59	0.81	-38.9	81.5
4CALNEX1	CSN	NH4	May	129	1.41	0.62	0.64	-0.80	0.85	-92.4	99.8
4CALNEX1	CSN	NH4	June	127	1.15	0.53	0.55	-0.62	0.70	-96.2	101.0
4CALNEX1	CSN	NH4	July	124	1.04	0.38	0.61	-0.66	0.69	-95.1	99.6
4CALNEX1	CSN	NH4	August	128	0.99	0.43	0.42	-0.56	0.62	-78.9	86.2
4CALNEX1	CSN	NH4	September	126	0.87	0.45	0.23	-0.42	0.54	-60.0	81.5
4CALNEX1	CSN	NH4	October	133	1.25	0.58	0.40	-0.67	0.84	-56.4	80.7
4CALNEX1	CSN	NH4	November	118	3.45	1.26	0.59	-2.19	2.26	-76.3	93.3
4CALNEX1	CSN	NH4	December	126	1.52	0.80	0.37	-0.72	1.00	-25.5	74.8
4CALNEX1	CSN	NO3	January	126	6.93	3.46	0.69	-3.47	3.65	-58.3	68.6
4CALNEX1	CSN	NO3	February	104	4.94	2.04	0.41	-2.89	3.08	-72.6	83.4
4CALNEX1	CSN	NO3	March	147	3.20	1.73	0.35	-1.47	1.91	-56.3	75.8
4CALNEX1	CSN	NO3	April	127	3.04	1.52	0.59	-1.52	1.72	-60.6	72.3
4CALNEX1	CSN	NO3	May	129	2.79	1.51	0.66	-1.27	1.48	-77.8	89.1
4CALNEX1	CSN	NO3	June	127	2.26	1.41	0.61	-0.85	1.21	-79.4	92.5
4CALNEX1	CSN	NO3	July	125	2.22	0.80	0.59	-1.42	1.54	-108.0	124.0
4CALNEX1	CSN	NO3	August	128	1.74	0.89	0.52	-0.85	1.19	-96.5	115.0
4CALNEX1	CSN	NO3	September	128	2.01	0.97	0.31	-1.04	1.35	-85.8	109.0
4CALNEX1	CSN	NO3	October	132	3.20	1.72	0.34	-1.48	2.13	-59.5	87.5
4CALNEX1	CSN	NO3	November	119	8.55	3.63	0.42	-4.92	5.60	-62.9	87.9
4CALNEX1	CSN	NO3	December	126	4.82	2.31	0.41	-2.51	3.04	-50.2	77.7
4CALNEX1	CSN	OC	January	91	9.40	7.63	0.44	-1.76	3.70	-7.8	49.0
4CALNEX1	CSN	OC	February	53	4.36	4.92	0.76	0.56	1.64	30.4	53.5
4CALNEX1	CSN	OC	March	78	2.63	3.36	0.31	0.73	1.34	33.1	49.1
4CALNEX1	CSN	OC	April	68	1.91	2.29	0.21	0.38	1.02	33.9	57.5
4CALNEX1	CSN	OC	May	81	2.15	2.01	0.04	-0.14	1.05	9.8	49.1
4CALNEX1	CSN	OC	June	90	2.40	2.15	0.31	-0.25	0.80	-1.8	36.1
4CALNEX1	CSN	OC	July	83	2.93	2.24	0.30	-0.69	1.21	-11.7	39.1
4CALNEX1	CSN	OC	August	87	2.86	2.24	0.11	-0.62	1.11	-18.5	42.1
4CALNEX1	CSN	OC	September	87	2.92	2.71	0.05	-0.21	1.42	6.4	41.8
4CALNEX1	CSN	OC	October	88	3.60	3.90	0.07	0.30	2.04	17.5	49.6
4CALNEX1	CSN	OC	November	84	5.61	5.21	0.42	-0.40	1.86	-1.9	33.0
4CALNEX1	CSN	OC	December	88	4.58	5.02	0.36	0.44	2.33	18.7	52.7
4CALNEX1	CSN	SO4	January	126	0.79	0.97	0.37	0.18	0.34	25.8	41.0
4CALNEX1	CSN	SO4	February	104	0.90	0.90	0.45	-0.01	0.38	14.5	41.1
4CALNEX1	CSN	SO4	March	147	1.40	1.14	0.37	-0.26	0.53	-4.7	35.0
4CALNEX1	CSN	SO4	April	127	1.81	1.25	0.59	-0.56	0.79	-11.1	48.2
4CALNEX1	CSN	SO4	May	129	2.39	1.33	0.50	-1.06	1.11	-43.9	48.7
4CALNEX1	CSN	SO4	June	127	2.39	1.40	0.44	-0.99	1.08	-37.0	44.7
4CALNEX1	CSN	SO4	July	125	2.76	1.17	0.19	-1.59	1.65	-52.6	57.2
4CALNEX1	CSN	SO4	August	128	1.98	1.26	0.12	-0.72	1.02	-34.9	48.1

Domain	Network	Specie	Month	N	Mean Obs. (ug/m3)	Mean Pred. (ug/m3)	R Square	Mean Bias (ug/m3)	Mean Error (ug/m3)	Fract. Bias (%)	Fract. Error (%)
4CALNEX1	CSN	SO4	September	128	1.77	1.15	0.42	-0.62	0.73	-28.0	42.2
4CALNEX1	CSN	SO4	October	132	1.33	1.00	0.49	-0.33	0.57	-8.0	42.4
4CALNEX1	CSN	SO4	November	119	2.04	1.41	0.45	-0.64	1.05	-19.1	51.4
4CALNEX1	CSN	SO4	December	126	0.99	0.83	0.10	-0.17	0.62	21.3	53.9
4CALNEX1	IMPROVE	EC	January	153	0.28	0.32	0.81	0.04	0.13	4.1	47.9
4CALNEX1	IMPROVE	EC	February	168	0.18	0.25	0.79	0.08	0.13	12.1	64.7
4CALNEX1	IMPROVE	EC	March	199	0.17	0.23	0.64	0.07	0.12	18.0	54.2
4CALNEX1	IMPROVE	EC	April	169	0.15	0.20	0.56	0.06	0.10	33.6	59.8
4CALNEX1	IMPROVE	EC	May	176	0.20	0.21	0.48	0.02	0.10	0.7	47.3
4CALNEX1	IMPROVE	EC	June	180	0.18	0.32	0.27	0.14	0.17	49.1	65.6
4CALNEX1	IMPROVE	EC	July	179	0.23	0.51	0.01	0.28	0.32	59.6	73.0
4CALNEX1	IMPROVE	EC	August	189	0.31	0.50	0.02	0.19	0.36	54.6	77.5
4CALNEX1	IMPROVE	EC	September	189	0.22	0.47	0.20	0.25	0.30	59.4	72.9
4CALNEX1	IMPROVE	EC	October	159	0.28	0.42	0.20	0.14	0.30	45.9	79.8
4CALNEX1	IMPROVE	EC	November	182	0.29	0.50	0.62	0.22	0.30	49.1	73.0
4CALNEX1	IMPROVE	EC	December	169	0.23	0.31	0.83	0.08	0.15	54.2	80.4
4CALNEX1	IMPROVE	NO3	January	175	1.81	0.97	0.79	-0.83	0.96	-76.3	104.0
4CALNEX1	IMPROVE	NO3	February	160	1.10	0.41	0.52	-0.68	0.73	-113.0	126.0
4CALNEX1	IMPROVE	NO3	March	206	0.78	0.39	0.25	-0.40	0.59	-102.0	123.0
4CALNEX1	IMPROVE	NO3	April	191	0.80	0.28	0.37	-0.52	0.55	-118.0	124.0
4CALNEX1	IMPROVE	NO3	May	191	0.81	0.22	0.36	-0.58	0.62	-133.0	138.0
4CALNEX1	IMPROVE	NO3	June	195	0.62	0.13	0.34	-0.49	0.50	-127.0	133.0
4CALNEX1	IMPROVE	NO3	July	190	0.48	0.09	0.02	-0.39	0.42	-126.0	143.0
4CALNEX1	IMPROVE	NO3	August	204	0.54	0.09	0.03	-0.45	0.48	-133.0	145.0
4CALNEX1	IMPROVE	NO3	September	190	0.63	0.19	0.22	-0.44	0.50	-124.0	133.0
4CALNEX1	IMPROVE	NO3	October	171	0.82	0.35	0.36	-0.47	0.58	-98.1	119.0
4CALNEX1	IMPROVE	NO3	November	185	1.73	0.68	0.42	-1.06	1.36	-56.7	107.0
4CALNEX1	IMPROVE	NO3	December	169	1.24	0.66	0.50	-0.59	0.86	-66.1	103.0
4CALNEX1	IMPROVE	OC	January	152	1.05	0.99	0.88	-0.07	0.39	9.3	51.1
4CALNEX1	IMPROVE	OC	February	166	0.71	0.79	0.64	0.08	0.38	0.2	57.7
4CALNEX1	IMPROVE	OC	March	197	0.68	0.73	0.55	0.05	0.34	11.6	52.2
4CALNEX1	IMPROVE	OC	April	174	0.70	0.66	0.42	-0.04	0.31	0.0	46.8
4CALNEX1	IMPROVE	OC	May	176	1.02	0.72	0.28	-0.30	0.45	-26.6	49.4
4CALNEX1	IMPROVE	OC	June	181	1.02	1.25	0.05	0.23	0.66	16.4	52.8
4CALNEX1	IMPROVE	OC	July	180	1.40	2.37	0.00	0.97	1.54	32.0	61.8
4CALNEX1	IMPROVE	OC	August	190	1.70	2.13	0.01	0.43	1.72	31.2	67.6
4CALNEX1	IMPROVE	OC	September	188	1.32	1.99	0.07	0.67	1.32	35.1	61.1
4CALNEX1	IMPROVE	OC	October	161	1.62	1.60	0.08	-0.02	1.58	24.0	72.9
4CALNEX1	IMPROVE	OC	November	182	1.13	1.82	0.30	0.69	1.09	45.1	69.6
4CALNEX1	IMPROVE	OC	December	168	0.93	1.08	0.61	0.15	0.65	37.3	70.1
4CALNEX1	IMPROVE	SO4	January	175	0.34	0.51	0.50	0.18	0.23	56.1	62.3
4CALNEX1	IMPROVE	SO4	February	160	0.40	0.47	0.46	0.07	0.21	37.0	53.3
4CALNEX1	IMPROVE	SO4	March	206	0.63	0.65	0.30	0.02	0.25	12.1	37.4
4CALNEX1	IMPROVE	SO4	April	191	0.89	0.76	0.56	-0.14	0.31	-4.5	35.9
4CALNEX1	IMPROVE	SO4	May	191	1.44	0.88	0.44	-0.56	0.61	-41.7	47.4
4CALNEX1	IMPROVE	SO4	June	195	1.19	0.83	0.20	-0.36	0.51	-25.9	44.4
4CALNEX1	IMPROVE	SO4	July	190	1.19	0.72	0.03	-0.47	0.60	-32.2	50.0
4CALNEX1	IMPROVE	SO4	August	204	1.12	0.91	0.08	-0.22	0.51	-13.7	47.1
4CALNEX1	IMPROVE	SO4	September	190	0.99	0.75	0.38	-0.24	0.37	-18.2	39.6
4CALNEX1	IMPROVE	SO4	October	171	0.58	0.55	0.41	-0.03	0.22	8.4	40.1
4CALNEX1	IMPROVE	SO4	November	185	0.76	0.71	0.41	-0.05	0.39	17.3	53.7
4CALNEX1	IMPROVE	SO4	December	169	0.34	0.50	0.20	0.17	0.26	54.4	66.0

Domain	Network	Specie	Month	N	Mean Obs. (ug/m3)	Mean Pred. (ug/m3)	R Square	Mean Bias (ug/m3)	Mean Error (ug/m3)	Fract. Bias (%)	Fract. Error (%)
4DET1	CASTNET	NH4	January	4	1.29	1.26	0.87	-0.03	0.09	-2.7	6.7
4DET1	CASTNET	NH4	February	4	1.55	1.45	0.76	-0.10	0.20	-4.7	11.6
4DET1	CASTNET	NH4	March	4	1.30	1.77	0.15	0.47	0.60	24.1	35.3
4DET1	CASTNET	NH4	April	4	0.75	0.83	0.53	0.08	0.16	6.0	18.0
4DET1	CASTNET	NH4	May	4	1.10	0.96	0.96	-0.13	0.13	-14.9	14.9
4DET1	CASTNET	NH4	June	5	1.36	1.22	0.96	-0.14	0.20	-6.6	14.1
4DET1	CASTNET	NH4	July	4	1.07	0.79	0.81	-0.28	0.33	-25.6	33.5
4DET1	CASTNET	NH4	August	4	1.15	0.87	0.46	-0.28	0.28	-30.6	30.6
4DET1	CASTNET	NH4	September	5	1.34	1.49	0.34	0.16	0.36	13.3	26.9
4DET1	CASTNET	NH4	October	4	1.20	1.06	0.88	-0.14	0.19	-14.2	20.6
4DET1	CASTNET	NH4	November	4	1.77	1.72	0.53	-0.05	0.41	2.9	25.6
4DET1	CASTNET	NH4	December	4	1.38	1.95	0.74	0.57	0.57	37.9	37.9
4DET1	CASTNET	NO3	January	4	2.78	3.11	0.74	0.33	0.44	8.5	14.7
4DET1	CASTNET	NO3	February	4	4.13	3.81	0.81	-0.32	0.46	-7.2	10.9
4DET1	CASTNET	NO3	March	4	2.14	3.56	0.50	1.42	1.70	42.5	58.6
4DET1	CASTNET	NO3	April	4	0.70	1.32	0.96	0.62	0.62	54.2	54.2
4DET1	CASTNET	NO3	May	4	0.43	0.92	0.88	0.48	0.50	57.6	60.3
4DET1	CASTNET	NO3	June	5	0.25	0.91	0.40	0.66	0.66	103.0	103.0
4DET1	CASTNET	NO3	July	4	0.20	0.26	0.96	0.06	0.22	33.9	98.3
4DET1	CASTNET	NO3	August	4	0.25	0.31	0.29	0.07	0.27	40.6	98.2
4DET1	CASTNET	NO3	September	5	0.29	1.27	0.00	0.98	0.98	121.0	121.0
4DET1	CASTNET	NO3	October	4	0.84	1.20	0.24	0.36	0.87	23.1	73.7
4DET1	CASTNET	NO3	November	4	3.63	4.04	0.06	0.41	1.17	16.0	34.3
4DET1	CASTNET	NO3	December	4	2.51	4.96	0.61	2.45	2.45	65.0	65.0
4DET1	CASTNET	TNO3	January	4	3.65	3.89	0.79	0.25	0.50	4.8	12.4
4DET1	CASTNET	TNO3	February	4	4.93	4.33	0.81	-0.60	0.60	-12.3	12.3
4DET1	CASTNET	TNO3	March	4	4.11	5.13	0.98	1.03	1.26	15.1	24.6
4DET1	CASTNET	TNO3	April	4	2.04	2.19	0.26	0.15	0.60	3.7	24.5
4DET1	CASTNET	TNO3	May	4	2.71	2.88	0.66	0.18	0.51	3.5	16.9
4DET1	CASTNET	TNO3	June	5	2.32	3.32	0.74	1.00	1.00	34.9	34.9
4DET1	CASTNET	TNO3	July	4	1.76	2.12	0.45	0.36	0.47	17.2	23.1
4DET1	CASTNET	TNO3	August	4	1.97	2.56	0.10	0.59	0.61	24.2	25.4
4DET1	CASTNET	TNO3	September	5	1.95	3.72	0.76	1.76	1.76	61.5	61.5
4DET1	CASTNET	TNO3	October	4	2.57	3.53	0.40	0.96	1.13	22.3	28.7
4DET1	CASTNET	TNO3	November	4	4.38	5.38	0.04	1.00	1.16	22.9	26.2
4DET1	CASTNET	TNO3	December	4	3.91	5.72	0.92	1.81	1.81	38.1	38.1
4DET1	CSN	EC	January	30	0.50	1.93	0.11	1.43	1.43	115.0	115.0
4DET1	CSN	EC	February	24	0.57	1.94	0.14	1.38	1.38	107.0	107.0
4DET1	CSN	EC	March	35	0.66	1.45	0.41	0.79	0.80	67.8	68.1
4DET1	CSN	EC	April	28	0.44	1.24	0.35	0.80	0.81	88.3	95.0
4DET1	CSN	EC	May	31	0.76	1.52	0.67	0.76	0.77	59.3	62.5
4DET1	CSN	EC	June	30	0.63	1.35	0.28	0.72	0.74	65.2	70.7
4DET1	CSN	EC	July	29	0.76	1.75	0.52	0.99	1.00	71.5	73.1
4DET1	CSN	EC	August	31	0.93	2.15	0.28	1.23	1.23	76.6	76.6
4DET1	CSN	EC	September	30	1.03	1.61	0.11	0.59	0.81	30.4	53.6
4DET1	CSN	EC	October	30	0.74	1.71	0.42	0.98	0.99	70.8	71.8
4DET1	CSN	EC	November	30	1.15	2.80	0.21	1.64	1.71	84.3	86.0
4DET1	CSN	EC	December	26	1.00	2.19	0.33	1.20	1.21	68.7	69.4
4DET1	CSN	NH4	January	30	1.86	1.91	0.53	0.05	0.36	4.9	19.6
4DET1	CSN	NH4	February	24	2.18	1.88	0.92	-0.30	0.55	-0.1	27.7
4DET1	CSN	NH4	March	35	2.29	2.25	0.31	-0.04	0.81	1.7	37.1
4DET1	CSN	NH4	April	28	1.09	1.10	0.56	0.01	0.30	1.5	26.9

Domain	Network	Specie	Month	N	Mean Obs. (ug/m3)	Mean Pred. (ug/m3)	R Square	Mean Bias (ug/m3)	Mean Error (ug/m3)	Fract. Bias (%)	Fract. Error (%)
4DET1	CSN	NH4	May	31	2.38	1.71	0.96	-0.67	0.77	-14.4	33.4
4DET1	CSN	NH4	June	30	1.58	0.92	0.77	-0.66	0.67	-54.8	58.0
4DET1	CSN	NH4	July	29	1.25	0.84	0.76	-0.41	0.48	-19.6	40.8
4DET1	CSN	NH4	August	31	2.52	1.73	0.49	-0.79	0.95	-42.7	48.1
4DET1	CSN	NH4	September	30	2.21	1.69	0.87	-0.53	0.58	-23.4	30.1
4DET1	CSN	NH4	October	30	1.51	1.20	0.69	-0.31	0.44	-20.2	26.8
4DET1	CSN	NH4	November	30	2.76	2.52	0.53	-0.24	0.93	-1.4	33.5
4DET1	CSN	NH4	December	29	3.35	2.82	0.36	-0.53	0.99	-15.6	29.6
4DET1	CSN	NO3	January	30	3.98	4.86	0.64	0.88	1.13	19.8	26.9
4DET1	CSN	NO3	February	24	5.23	4.71	0.83	-0.52	1.05	2.5	22.7
4DET1	CSN	NO3	March	35	3.97	4.52	0.19	0.55	2.00	12.1	45.5
4DET1	CSN	NO3	April	28	1.52	1.71	0.40	0.18	0.85	-1.9	47.1
4DET1	CSN	NO3	May	31	1.34	1.46	0.40	0.12	0.80	-19.7	64.8
4DET1	CSN	NO3	June	30	0.72	0.60	0.56	-0.12	0.40	-79.7	100.0
4DET1	CSN	NO3	July	29	0.90	0.40	0.37	-0.51	0.60	-102.0	111.0
4DET1	CSN	NO3	August	31	1.46	0.76	0.04	-0.70	1.00	-76.6	91.2
4DET1	CSN	NO3	September	30	1.34	1.48	0.45	0.14	0.80	-36.4	73.6
4DET1	CSN	NO3	October	30	1.34	1.30	0.72	-0.04	0.56	-24.8	48.6
4DET1	CSN	NO3	November	30	4.91	5.89	0.20	0.97	2.32	21.8	43.5
4DET1	CSN	NO3	December	29	5.83	5.94	0.18	0.12	2.43	7.0	40.4
4DET1	CSN	OC	January	29	1.53	4.25	0.00	2.72	2.87	92.9	97.0
4DET1	CSN	OC	February	24	1.51	5.67	0.01	4.16	4.16	120.0	120.0
4DET1	CSN	OC	March	32	1.75	2.74	0.19	0.99	1.40	49.7	63.2
4DET1	CSN	OC	April	20	1.37	1.81	0.27	0.44	1.17	58.6	79.2
4DET1	CSN	OC	May	30	3.18	2.12	0.83	-1.06	1.53	-5.1	57.7
4DET1	CSN	OC	June	29	2.95	1.51	0.64	-1.44	1.51	-51.6	63.3
4DET1	CSN	OC	July	29	2.92	1.65	0.30	-1.27	1.34	-56.5	60.6
4DET1	CSN	OC	August	31	3.49	2.54	0.28	-0.95	1.10	-30.9	36.6
4DET1	CSN	OC	September	30	2.77	1.85	0.19	-0.92	1.09	-31.8	42.4
4DET1	CSN	OC	October	30	1.94	1.82	0.46	-0.12	0.59	2.7	30.0
4DET1	CSN	OC	November	30	2.67	3.53	0.09	0.86	1.82	38.3	61.0
4DET1	CSN	OC	December	26	3.76	3.88	0.12	0.12	2.44	22.5	64.8
4DET1	CSN	SO4	January	30	2.44	1.57	0.23	-0.88	0.97	-39.7	45.1
4DET1	CSN	SO4	February	24	2.27	1.47	0.45	-0.80	0.97	-37.3	48.9
4DET1	CSN	SO4	March	35	3.44	2.87	0.36	-0.57	1.08	-14.9	34.8
4DET1	CSN	SO4	April	28	2.02	1.85	0.30	-0.17	0.55	-6.9	27.9
4DET1	CSN	SO4	May	31	5.34	4.72	0.92	-0.62	1.23	8.1	29.0
4DET1	CSN	SO4	June	30	4.11	2.76	0.76	-1.34	1.50	-33.4	40.9
4DET1	CSN	SO4	July	29	3.39	2.58	0.77	-0.81	0.99	-15.1	30.5
4DET1	CSN	SO4	August	31	6.05	5.84	0.66	-0.21	1.82	-8.7	31.7
4DET1	CSN	SO4	September	30	5.50	4.04	0.85	-1.45	1.70	-18.3	31.2
4DET1	CSN	SO4	October	30	3.05	2.72	0.67	-0.33	0.67	-10.6	21.6
4DET1	CSN	SO4	November	30	3.39	2.68	0.72	-0.71	0.90	-25.5	28.7
4DET1	CSN	SO4	December	29	3.48	3.31	0.28	-0.18	1.91	-32.2	54.6

Domain	Network	Specie	Month	N	Mean Obs. (ug/m3)	Mean Pred. (ug/m3)	R Square	Mean Bias (ug/m3)	Mean Error (ug/m3)	Fract. Bias (%)	Fract. Error (%)
4MO2	CASTNET	NH4	January	9	1.13	0.81	0.40	-0.31	0.35	-29.8	33.5
4MO2	CASTNET	NH4	February	12	1.38	1.28	0.38	-0.10	0.37	-1.7	27.1
4MO2	CASTNET	NH4	March	15	1.21	1.46	0.35	0.25	0.39	20.4	29.3
4MO2	CASTNET	NH4	April	12	1.11	1.26	0.62	0.16	0.27	10.6	19.2
4MO2	CASTNET	NH4	May	12	1.25	1.12	0.45	-0.13	0.34	-9.7	27.4
4MO2	CASTNET	NH4	June	14	1.17	1.14	0.76	-0.03	0.27	-1.8	20.8
4MO2	CASTNET	NH4	July	11	1.15	1.03	0.81	-0.12	0.29	-4.3	27.9
4MO2	CASTNET	NH4	August	12	1.54	1.16	0.85	-0.38	0.49	-17.7	36.8
4MO2	CASTNET	NH4	September	15	1.18	1.06	0.79	-0.12	0.20	-9.7	17.0
4MO2	CASTNET	NH4	October	12	0.66	0.65	0.94	-0.01	0.07	0.4	11.9
4MO2	CASTNET	NH4	November	12	0.95	1.28	0.13	0.32	0.52	30.7	46.4
4MO2	CASTNET	NH4	December	13	1.66	1.42	0.44	-0.24	0.46	-12.8	32.8
4MO2	CASTNET	NO3	January	9	2.72	2.02	0.30	-0.69	0.99	-23.5	39.5
4MO2	CASTNET	NO3	February	12	3.90	3.39	0.71	-0.51	1.09	-4.6	29.1
4MO2	CASTNET	NO3	March	15	2.55	2.39	0.71	-0.16	0.76	-7.9	41.5
4MO2	CASTNET	NO3	April	12	1.30	2.14	0.31	0.84	1.02	43.3	56.1
4MO2	CASTNET	NO3	May	12	1.00	0.93	0.22	-0.06	0.49	-21.9	57.7
4MO2	CASTNET	NO3	June	14	0.62	0.78	0.02	0.16	0.55	11.8	86.2
4MO2	CASTNET	NO3	July	11	0.64	0.55	0.34	-0.09	0.51	-10.5	84.0
4MO2	CASTNET	NO3	August	12	0.63	0.44	0.24	-0.19	0.44	-29.4	78.7
4MO2	CASTNET	NO3	September	15	0.61	0.55	0.01	-0.06	0.39	-14.9	72.5
4MO2	CASTNET	NO3	October	12	1.08	0.57	0.30	-0.51	0.56	-69.1	73.6
4MO2	CASTNET	NO3	November	12	2.41	2.59	0.71	0.18	0.74	-0.2	27.4
4MO2	CASTNET	NO3	December	13	3.78	3.60	0.44	-0.18	1.11	-0.3	32.9
4MO2	CASTNET	SO4	January	9	1.43	0.86	0.69	-0.57	0.57	-47.6	47.6
4MO2	CASTNET	SO4	February	12	1.75	1.06	0.50	-0.68	0.69	-46.5	46.7
4MO2	CASTNET	SO4	March	15	2.95	2.45	0.69	-0.49	0.57	-19.1	21.6
4MO2	CASTNET	SO4	April	12	2.84	2.19	0.88	-0.65	0.65	-25.6	25.6
4MO2	CASTNET	SO4	May	12	3.61	2.81	0.67	-0.80	0.87	-24.8	27.3
4MO2	CASTNET	SO4	June	14	3.86	2.90	0.90	-0.97	0.99	-26.8	27.6
4MO2	CASTNET	SO4	July	11	3.96	2.83	0.92	-1.14	1.14	-30.3	30.3
4MO2	CASTNET	SO4	August	12	5.09	3.38	0.83	-1.71	1.72	-38.4	38.9
4MO2	CASTNET	SO4	September	15	3.70	2.81	0.67	-0.89	0.95	-25.2	26.5
4MO2	CASTNET	SO4	October	12	1.87	1.66	0.92	-0.22	0.34	-6.1	15.9
4MO2	CASTNET	SO4	November	12	2.27	1.85	0.37	-0.42	0.44	-20.4	22.1
4MO2	CASTNET	SO4	December	13	2.01	1.32	0.36	-0.68	0.68	-39.0	39.0
4MO2	CASTNET	TNO3	January	9	3.30	2.61	0.34	-0.69	0.90	-21.1	29.3
4MO2	CASTNET	TNO3	February	12	4.55	3.94	0.77	-0.61	0.93	-9.3	18.8
4MO2	CASTNET	TNO3	March	15	4.04	3.32	0.83	-0.71	0.86	-25.6	30.4
4MO2	CASTNET	TNO3	April	12	2.73	3.09	0.58	0.36	0.77	8.8	24.3
4MO2	CASTNET	TNO3	May	12	2.62	2.31	0.45	-0.32	0.82	-24.5	38.1
4MO2	CASTNET	TNO3	June	14	2.15	2.04	0.74	-0.11	0.48	-10.7	26.4
4MO2	CASTNET	TNO3	July	11	1.98	2.33	0.69	0.35	0.49	14.6	22.5
4MO2	CASTNET	TNO3	August	12	2.22	2.39	0.37	0.17	0.51	3.6	20.5
4MO2	CASTNET	TNO3	September	15	1.97	2.09	0.55	0.12	0.36	4.5	16.1
4MO2	CASTNET	TNO3	October	12	2.02	1.96	0.90	-0.06	0.23	-6.2	13.1
4MO2	CASTNET	TNO3	November	12	3.17	3.49	0.74	0.33	0.68	6.0	18.3
4MO2	CASTNET	TNO3	December	13	4.50	4.45	0.40	-0.05	1.09	0.0	24.8
4MO2	CSN	EC	January	103	0.35	1.01	0.30	0.66	0.68	92.1	94.4
4MO2	CSN	EC	February	78	0.46	1.43	0.14	0.98	0.99	92.6	96.3
4MO2	CSN	EC	March	124	0.56	1.32	0.35	0.76	0.79	71.6	75.8
4MO2	CSN	EC	April	108	0.49	1.10	0.34	0.61	0.63	68.3	75.0

Domain	Network	Specie	Month	N	Mean Obs. (ug/m3)	Mean Pred. (ug/m3)	R Square	Mean Bias (ug/m3)	Mean Error (ug/m3)	Fract. Bias (%)	Fract. Error (%)
4MO2	CSN	EC	May	113	0.56	1.32	0.33	0.76	0.80	72.4	81.8
4MO2	CSN	EC	June	103	0.57	1.57	0.27	1.00	1.05	91.6	95.7
4MO2	CSN	EC	July	99	0.52	1.44	0.31	0.92	0.92	89.2	90.4
4MO2	CSN	EC	August	100	0.57	1.77	0.15	1.20	1.21	96.8	97.4
4MO2	CSN	EC	September	106	0.89	1.44	0.04	0.55	0.89	49.9	71.7
4MO2	CSN	EC	October	98	0.69	1.35	0.17	0.66	0.80	64.5	72.8
4MO2	CSN	EC	November	102	0.72	1.58	0.48	0.86	0.88	71.4	75.0
4MO2	CSN	EC	December	97	0.60	1.47	0.30	0.88	0.94	70.7	80.7
4MO2	CSN	NH4	January	102	1.44	1.10	0.50	-0.34	0.55	-16.7	39.4
4MO2	CSN	NH4	February	78	1.63	1.59	0.58	-0.04	0.40	-1.3	26.6
4MO2	CSN	NH4	March	124	1.95	1.69	0.61	-0.25	0.59	-8.4	30.8
4MO2	CSN	NH4	April	107	1.43	1.34	0.48	-0.08	0.43	-7.8	33.7
4MO2	CSN	NH4	May	113	1.50	1.12	0.18	-0.38	0.67	-26.3	47.2
4MO2	CSN	NH4	June	105	1.56	1.20	0.74	-0.36	0.57	-25.1	45.9
4MO2	CSN	NH4	July	100	1.50	1.15	0.71	-0.35	0.53	-26.0	44.7
4MO2	CSN	NH4	August	103	1.68	1.27	0.45	-0.41	0.73	-31.4	53.5
4MO2	CSN	NH4	September	109	1.44	1.20	0.50	-0.24	0.52	-12.5	37.8
4MO2	CSN	NH4	October	104	0.80	0.87	0.59	0.07	0.35	7.9	43.9
4MO2	CSN	NH4	November	106	1.25	1.30	0.44	0.05	0.49	8.4	39.9
4MO2	CSN	NH4	December	106	2.34	2.10	0.25	-0.24	0.92	-10.9	40.2
4MO2	CSN	NO3	January	115	3.12	2.70	0.50	-0.43	1.28	2.3	43.6
4MO2	CSN	NO3	February	93	3.69	3.83	0.62	0.14	1.07	9.9	34.5
4MO2	CSN	NO3	March	144	3.14	2.79	0.83	-0.36	0.98	-15.9	45.3
4MO2	CSN	NO3	April	127	1.39	2.26	0.46	0.88	1.04	37.0	57.0
4MO2	CSN	NO3	May	130	0.89	0.76	0.05	-0.14	0.70	-38.2	85.7
4MO2	CSN	NO3	June	125	0.56	0.80	0.25	0.24	0.51	-2.2	70.3
4MO2	CSN	NO3	July	120	0.44	0.79	0.19	0.35	0.51	16.6	73.9
4MO2	CSN	NO3	August	121	0.50	0.84	0.10	0.34	0.66	-13.2	96.3
4MO2	CSN	NO3	September	124	0.52	0.72	0.21	0.20	0.48	-12.5	78.1
4MO2	CSN	NO3	October	123	0.72	1.01	0.52	0.29	0.57	-4.3	82.8
4MO2	CSN	NO3	November	126	1.79	2.66	0.58	0.87	1.18	42.5	59.1
4MO2	CSN	NO3	December	122	4.95	4.55	0.46	-0.40	1.92	-4.1	43.0
4MO2	CSN	OC	January	98	1.24	2.22	0.09	0.98	1.35	73.0	82.9
4MO2	CSN	OC	February	72	1.57	3.55	0.23	1.98	2.03	79.8	82.3
4MO2	CSN	OC	March	115	2.35	2.42	0.26	0.07	1.04	15.5	50.4
4MO2	CSN	OC	April	96	1.95	2.07	0.10	0.12	1.04	20.9	55.3
4MO2	CSN	OC	May	110	3.22	1.78	0.38	-1.43	1.75	-35.4	66.3
4MO2	CSN	OC	June	100	3.14	1.94	0.22	-1.19	1.53	-36.4	62.6
4MO2	CSN	OC	July	99	2.88	1.90	0.24	-0.98	1.15	-38.3	50.4
4MO2	CSN	OC	August	100	3.46	2.85	0.28	-0.61	1.30	-18.1	45.3
4MO2	CSN	OC	September	105	3.10	2.50	0.30	-0.60	1.22	-24.2	44.2
4MO2	CSN	OC	October	97	2.07	2.05	0.21	-0.02	0.96	4.9	51.9
4MO2	CSN	OC	November	102	2.50	2.88	0.19	0.37	1.23	19.2	46.5
4MO2	CSN	OC	December	95	1.98	3.06	0.37	1.09	1.44	49.2	63.0
4MO2	CSN	SO4	January	115	1.65	1.05	0.30	-0.60	0.71	-40.2	48.0
4MO2	CSN	SO4	February	93	1.65	1.36	0.18	-0.30	0.59	-21.0	36.9
4MO2	CSN	SO4	March	144	2.98	2.69	0.40	-0.29	0.80	-11.0	27.6
4MO2	CSN	SO4	April	127	2.91	2.46	0.74	-0.45	0.64	-14.5	24.3
4MO2	CSN	SO4	May	130	3.45	3.00	0.31	-0.45	1.08	-11.1	30.7
4MO2	CSN	SO4	June	125	4.00	3.16	0.83	-0.84	1.25	-13.6	31.9
4MO2	CSN	SO4	July	120	4.23	3.09	0.76	-1.14	1.33	-27.1	37.3
4MO2	CSN	SO4	August	121	4.51	3.40	0.50	-1.11	1.66	-24.3	39.9

Domain	Network	Specie	Month	N	Mean Obs. (ug/m3)	Mean Pred. (ug/m3)	R Square	Mean Bias (ug/m3)	Mean Error (ug/m3)	Fract. Bias (%)	Fract. Error (%)
4MO2	CSN	SO4	September	124	3.77	3.19	0.66	-0.58	1.12	-7.5	30.6
4MO2	CSN	SO4	October	123	1.79	1.93	0.59	0.14	0.61	11.8	32.8
4MO2	CSN	SO4	November	126	2.15	2.01	0.50	-0.13	0.74	-1.2	34.5
4MO2	CSN	SO4	December	122	2.18	2.06	0.03	-0.12	1.29	-26.7	51.1
4MO2	IMPROVE	EC	January	75	0.22	0.29	0.58	0.08	0.09	30.6	37.8
4MO2	IMPROVE	EC	February	80	0.25	0.36	0.19	0.12	0.15	38.6	46.8
4MO2	IMPROVE	EC	March	96	0.54	0.53	0.01	0.00	0.35	29.7	50.2
4MO2	IMPROVE	EC	April	94	0.38	0.57	0.27	0.19	0.23	31.1	43.1
4MO2	IMPROVE	EC	May	92	0.37	0.36	0.05	-0.01	0.16	-2.8	39.3
4MO2	IMPROVE	EC	June	88	0.32	0.45	0.41	0.13	0.19	29.2	47.8
4MO2	IMPROVE	EC	July	93	0.33	0.43	0.34	0.10	0.14	25.4	36.4
4MO2	IMPROVE	EC	August	102	0.34	0.55	0.24	0.21	0.23	43.9	48.9
4MO2	IMPROVE	EC	September	94	0.35	0.44	0.64	0.09	0.14	15.4	34.5
4MO2	IMPROVE	EC	October	97	0.27	0.44	0.59	0.17	0.17	36.9	40.8
4MO2	IMPROVE	EC	November	98	0.34	0.59	0.55	0.25	0.27	49.1	55.2
4MO2	IMPROVE	EC	December	81	0.30	0.40	0.49	0.10	0.14	25.2	40.3
4MO2	IMPROVE	NO3	January	72	2.19	2.20	0.58	0.00	0.87	14.0	47.2
4MO2	IMPROVE	NO3	February	73	2.68	3.31	0.53	0.63	1.18	30.4	45.2
4MO2	IMPROVE	NO3	March	91	2.75	2.67	0.83	-0.08	0.82	-15.7	47.4
4MO2	IMPROVE	NO3	April	93	1.23	2.07	0.53	0.84	0.99	33.3	58.6
4MO2	IMPROVE	NO3	May	95	0.75	0.58	0.04	-0.17	0.67	-55.5	97.8
4MO2	IMPROVE	NO3	June	95	0.36	0.53	0.52	0.17	0.36	-21.1	79.9
4MO2	IMPROVE	NO3	July	95	0.27	0.46	0.30	0.19	0.33	-9.1	80.5
4MO2	IMPROVE	NO3	August	103	0.31	0.59	0.16	0.28	0.49	-18.6	98.1
4MO2	IMPROVE	NO3	September	94	0.27	0.36	0.28	0.08	0.25	-33.6	76.7
4MO2	IMPROVE	NO3	October	98	0.43	0.67	0.48	0.25	0.43	-21.2	85.4
4MO2	IMPROVE	NO3	November	97	1.36	2.24	0.45	0.88	1.16	54.3	71.8
4MO2	IMPROVE	NO3	December	84	3.67	2.86	0.42	-0.81	1.67	-16.6	54.6
4MO2	IMPROVE	OC	January	75	0.75	0.89	0.52	0.14	0.28	20.0	35.6
4MO2	IMPROVE	OC	February	80	0.98	1.11	0.22	0.13	0.41	12.6	33.2
4MO2	IMPROVE	OC	March	96	2.76	1.73	0.00	-1.03	1.95	2.8	51.0
4MO2	IMPROVE	OC	April	94	1.51	2.04	0.31	0.52	0.93	15.8	46.5
4MO2	IMPROVE	OC	May	92	1.78	1.04	0.08	-0.74	1.04	-50.7	61.6
4MO2	IMPROVE	OC	June	88	1.59	1.21	0.48	-0.37	0.74	-40.9	55.5
4MO2	IMPROVE	OC	July	93	1.69	1.16	0.35	-0.53	0.65	-39.0	45.6
4MO2	IMPROVE	OC	August	102	1.89	1.68	0.46	-0.21	0.64	-20.0	39.7
4MO2	IMPROVE	OC	September	94	1.81	1.59	0.71	-0.23	0.61	-33.9	46.1
4MO2	IMPROVE	OC	October	97	1.20	1.27	0.55	0.07	0.56	-14.7	48.1
4MO2	IMPROVE	OC	November	98	1.39	1.89	0.59	0.50	0.71	19.2	38.7
4MO2	IMPROVE	OC	December	81	1.11	1.14	0.49	0.03	0.35	1.0	31.7
4MO2	IMPROVE	SO4	January	72	1.18	0.75	0.44	-0.43	0.51	-32.3	47.0
4MO2	IMPROVE	SO4	February	73	1.35	1.08	0.25	-0.27	0.52	-19.7	38.9
4MO2	IMPROVE	SO4	March	91	2.76	2.16	0.49	-0.61	0.81	-20.2	31.5
4MO2	IMPROVE	SO4	April	93	2.85	2.34	0.74	-0.51	0.69	-19.1	25.6
4MO2	IMPROVE	SO4	May	95	2.87	2.20	0.59	-0.66	0.87	-20.9	33.3
4MO2	IMPROVE	SO4	June	95	3.38	2.71	0.85	-0.67	1.04	-14.8	34.1
4MO2	IMPROVE	SO4	July	95	3.80	2.86	0.81	-0.94	1.02	-31.0	34.0
4MO2	IMPROVE	SO4	August	103	3.98	2.78	0.69	-1.20	1.63	-25.6	44.0
4MO2	IMPROVE	SO4	September	94	3.35	2.77	0.81	-0.58	0.96	-10.2	32.1
4MO2	IMPROVE	SO4	October	98	1.38	1.43	0.61	0.05	0.44	10.2	29.7
4MO2	IMPROVE	SO4	November	97	1.90	1.72	0.81	-0.18	0.48	0.1	30.8
4MO2	IMPROVE	SO4	December	84	1.69	1.13	0.24	-0.56	0.77	-33.8	50.6

Domain	Network	Specie	Month	N	Mean Obs. (ug/m3)	Mean Pred. (ug/m3)	R Square	Mean Bias (ug/m3)	Mean Error (ug/m3)	Fract. Bias (%)	Fract. Error (%)
4NE1	CASTNET	NH4	January	41	0.79	0.74	0.53	-0.05	0.18	-3.8	20.2
4NE1	CASTNET	NH4	February	37	1.00	1.07	0.66	0.08	0.24	12.4	22.9
4NE1	CASTNET	NH4	March	50	0.90	1.12	0.62	0.22	0.29	21.1	27.5
4NE1	CASTNET	NH4	April	41	0.93	0.91	0.69	-0.02	0.19	-5.2	21.2
4NE1	CASTNET	NH4	May	41	1.14	0.83	0.81	-0.31	0.36	-24.6	31.1
4NE1	CASTNET	NH4	June	48	1.56	1.10	0.62	-0.46	0.50	-35.8	38.6
4NE1	CASTNET	NH4	July	39	1.63	1.12	0.71	-0.51	0.53	-41.9	42.8
4NE1	CASTNET	NH4	August	42	1.76	1.15	0.72	-0.61	0.64	-44.6	46.6
4NE1	CASTNET	NH4	September	53	1.42	1.00	0.62	-0.42	0.48	-33.3	39.5
4NE1	CASTNET	NH4	October	41	1.13	0.94	0.77	-0.18	0.27	-22.0	29.3
4NE1	CASTNET	NH4	November	40	1.08	1.05	0.52	-0.02	0.27	-4.8	24.4
4NE1	CASTNET	NH4	December	42	1.04	1.00	0.71	-0.03	0.24	3.7	22.5
4NE1	CASTNET	NO3	January	41	0.98	1.33	0.44	0.35	0.50	44.5	55.6
4NE1	CASTNET	NO3	February	37	1.86	2.40	0.50	0.55	0.85	37.5	46.1
4NE1	CASTNET	NO3	March	50	1.05	1.75	0.34	0.69	0.85	47.3	59.8
4NE1	CASTNET	NO3	April	41	0.48	1.16	0.19	0.69	0.74	76.2	82.1
4NE1	CASTNET	NO3	May	41	0.42	0.33	0.29	-0.10	0.23	-44.7	70.7
4NE1	CASTNET	NO3	June	48	0.22	0.36	0.07	0.14	0.28	-9.3	96.1
4NE1	CASTNET	NO3	July	39	0.14	0.20	0.12	0.07	0.12	-4.3	72.7
4NE1	CASTNET	NO3	August	42	0.20	0.27	0.03	0.07	0.22	-5.4	103.0
4NE1	CASTNET	NO3	September	53	0.34	0.41	0.10	0.08	0.30	-25.3	77.9
4NE1	CASTNET	NO3	October	41	0.43	0.52	0.28	0.09	0.31	-14.3	67.9
4NE1	CASTNET	NO3	November	40	1.21	1.77	0.49	0.56	0.68	47.0	54.4
4NE1	CASTNET	NO3	December	42	1.46	2.01	0.61	0.55	0.85	60.8	70.4
4NE1	CASTNET	SO4	January	41	1.86	1.17	0.33	-0.69	0.72	-44.9	46.6
4NE1	CASTNET	SO4	February	37	2.07	1.20	0.62	-0.87	0.87	-50.5	50.5
4NE1	CASTNET	SO4	March	50	2.52	1.89	0.71	-0.62	0.67	-25.5	29.0
4NE1	CASTNET	SO4	April	41	2.60	1.84	0.64	-0.76	0.82	-31.7	35.2
4NE1	CASTNET	SO4	May	41	3.36	2.63	0.94	-0.73	0.84	-15.6	24.8
4NE1	CASTNET	SO4	June	48	4.58	3.40	0.79	-1.18	1.26	-27.5	30.9
4NE1	CASTNET	SO4	July	39	4.99	3.60	0.76	-1.39	1.42	-30.9	31.6
4NE1	CASTNET	SO4	August	42	5.41	3.75	0.67	-1.66	1.77	-32.0	34.7
4NE1	CASTNET	SO4	September	53	4.30	3.06	0.85	-1.24	1.28	-29.9	33.5
4NE1	CASTNET	SO4	October	41	3.56	2.81	0.90	-0.76	0.77	-20.1	21.1
4NE1	CASTNET	SO4	November	40	2.37	1.72	0.41	-0.66	0.73	-30.8	34.1
4NE1	CASTNET	SO4	December	42	2.19	1.38	0.85	-0.81	0.81	-46.4	46.4
4NE1	CASTNET	TNO3	January	41	2.11	2.37	0.58	0.26	0.59	20.0	31.4
4NE1	CASTNET	TNO3	February	37	3.22	3.35	0.69	0.13	0.69	10.3	21.6
4NE1	CASTNET	TNO3	March	50	2.66	2.91	0.67	0.25	0.58	14.4	24.5
4NE1	CASTNET	TNO3	April	41	2.02	2.30	0.79	0.28	0.41	16.6	21.2
4NE1	CASTNET	TNO3	May	41	2.24	1.74	0.76	-0.50	0.59	-17.9	30.5
4NE1	CASTNET	TNO3	June	48	1.95	1.74	0.59	-0.21	0.49	-8.7	28.3
4NE1	CASTNET	TNO3	July	39	1.69	1.67	0.83	-0.02	0.29	4.5	23.1
4NE1	CASTNET	TNO3	August	42	1.88	1.94	0.79	0.06	0.36	7.1	21.6
4NE1	CASTNET	TNO3	September	53	2.07	2.34	0.67	0.27	0.57	15.6	28.8
4NE1	CASTNET	TNO3	October	41	2.05	2.57	0.87	0.52	0.60	26.0	30.0
4NE1	CASTNET	TNO3	November	40	2.36	3.22	0.67	0.86	0.91	36.4	38.0
4NE1	CASTNET	TNO3	December	42	2.63	2.99	0.77	0.36	0.63	22.2	28.6
4NE1	CSN	EC	January	229	0.78	2.13	0.53	1.36	1.37	85.0	89.2
4NE1	CSN	EC	February	178	0.62	1.61	0.69	0.99	1.01	75.1	79.8
4NE1	CSN	EC	March	251	0.78	1.68	0.52	0.90	0.95	63.0	70.0
4NE1	CSN	EC	April	209	0.58	1.48	0.56	0.90	0.93	67.9	78.8

Domain	Network	Specie	Month	N	Mean Obs. (ug/m3)	Mean Pred. (ug/m3)	R Square	Mean Bias (ug/m3)	Mean Error (ug/m3)	Fract. Bias (%)	Fract. Error (%)
4NE1	CSN	EC	May	219	0.63	1.43	0.53	0.79	0.83	62.3	72.1
4NE1	CSN	EC	June	210	0.64	1.52	0.56	0.88	0.90	72.4	76.6
4NE1	CSN	EC	July	198	0.71	1.51	0.42	0.80	0.84	67.1	71.1
4NE1	CSN	EC	August	225	0.88	2.05	0.45	1.17	1.18	71.1	73.0
4NE1	CSN	EC	September	222	0.97	1.58	0.11	0.61	1.04	46.2	76.0
4NE1	CSN	EC	October	213	0.88	2.02	0.30	1.14	1.26	66.8	78.3
4NE1	CSN	EC	November	212	1.10	2.33	0.42	1.23	1.29	62.5	69.4
4NE1	CSN	EC	December	223	1.02	2.50	0.50	1.48	1.51	69.1	73.6
4NE1	CSN	NH4	January	229	1.59	1.49	0.35	-0.10	0.60	3.2	37.3
4NE1	CSN	NH4	February	178	1.52	1.50	0.66	-0.02	0.47	8.4	29.7
4NE1	CSN	NH4	March	252	1.60	1.72	0.61	0.13	0.51	14.7	32.4
4NE1	CSN	NH4	April	207	1.22	1.02	0.53	-0.20	0.47	-7.2	40.0
4NE1	CSN	NH4	May	218	1.29	0.88	0.58	-0.41	0.51	-27.9	44.1
4NE1	CSN	NH4	June	213	1.98	1.28	0.77	-0.70	0.76	-40.2	46.2
4NE1	CSN	NH4	July	203	2.35	1.35	0.58	-1.00	1.07	-46.8	54.7
4NE1	CSN	NH4	August	231	2.25	1.37	0.64	-0.87	0.98	-39.3	52.5
4NE1	CSN	NH4	September	227	1.51	1.08	0.61	-0.43	0.62	-16.3	44.0
4NE1	CSN	NH4	October	219	1.71	1.46	0.61	-0.25	0.64	-4.9	36.7
4NE1	CSN	NH4	November	221	1.57	1.50	0.69	-0.07	0.42	-7.1	26.9
4NE1	CSN	NH4	December	221	2.26	1.97	0.55	-0.30	0.67	-9.3	31.3
4NE1	CSN	NO3	January	257	2.41	2.66	0.44	0.25	1.09	20.8	50.1
4NE1	CSN	NO3	February	205	2.63	3.35	0.55	0.72	1.26	32.1	46.4
4NE1	CSN	NO3	March	284	2.13	3.11	0.49	0.99	1.40	41.3	59.2
4NE1	CSN	NO3	April	237	1.06	1.35	0.35	0.29	0.74	31.8	66.5
4NE1	CSN	NO3	May	248	0.79	0.46	0.14	-0.34	0.47	-59.3	79.7
4NE1	CSN	NO3	June	243	0.86	0.41	0.19	-0.45	0.57	-88.7	102.0
4NE1	CSN	NO3	July	231	0.79	0.36	0.15	-0.43	0.56	-97.3	109.0
4NE1	CSN	NO3	August	264	0.80	0.48	0.27	-0.32	0.58	-79.0	103.0
4NE1	CSN	NO3	September	257	0.86	0.63	0.52	-0.23	0.52	-71.9	91.4
4NE1	CSN	NO3	October	249	1.12	1.18	0.38	0.06	0.70	-12.9	69.7
4NE1	CSN	NO3	November	251	1.94	2.34	0.61	0.40	0.79	23.1	42.8
4NE1	CSN	NO3	December	249	3.28	3.94	0.48	0.66	1.48	25.5	50.2
4NE1	CSN	OC	January	209	2.28	5.10	0.28	2.83	2.95	77.3	81.8
4NE1	CSN	OC	February	160	1.88	5.03	0.61	3.16	3.22	94.5	96.7
4NE1	CSN	OC	March	232	1.79	3.76	0.46	1.97	2.05	75.4	79.7
4NE1	CSN	OC	April	177	1.31	2.55	0.35	1.24	1.46	70.6	86.6
4NE1	CSN	OC	May	207	2.37	2.11	0.26	-0.26	1.14	-0.1	55.0
4NE1	CSN	OC	June	207	3.13	2.01	0.40	-1.12	1.38	-42.7	57.9
4NE1	CSN	OC	July	198	3.32	1.98	0.18	-1.34	1.61	-50.8	62.4
4NE1	CSN	OC	August	224	3.24	2.96	0.24	-0.29	1.44	-3.3	51.7
4NE1	CSN	OC	September	216	2.29	2.30	0.10	0.01	1.22	6.8	50.8
4NE1	CSN	OC	October	210	1.75	2.74	0.24	0.99	1.37	41.4	62.7
4NE1	CSN	OC	November	210	2.25	3.96	0.10	1.71	2.19	52.4	68.9
4NE1	CSN	OC	December	217	2.71	5.82	0.27	3.11	3.28	68.7	75.3
4NE1	CSN	SO4	January	257	2.44	2.20	0.13	-0.25	1.04	-14.0	37.1
4NE1	CSN	SO4	February	205	2.17	1.68	0.50	-0.49	0.69	-26.3	34.7
4NE1	CSN	SO4	March	284	2.74	2.39	0.42	-0.35	0.85	-7.9	32.9
4NE1	CSN	SO4	April	237	2.62	1.92	0.44	-0.70	0.98	-26.6	40.0
4NE1	CSN	SO4	May	248	3.07	2.61	0.74	-0.47	0.85	-7.6	28.9
4NE1	CSN	SO4	June	243	5.12	3.82	0.88	-1.30	1.47	-24.5	32.0
4NE1	CSN	SO4	July	231	6.02	4.02	0.71	-2.00	2.22	-32.0	42.1
4NE1	CSN	SO4	August	264	5.99	4.04	0.71	-1.95	2.29	-26.9	42.5

Domain	Network	Specie	Month	N	Mean Obs. (ug/m3)	Mean Pred. (ug/m3)	R Square	Mean Bias (ug/m3)	Mean Error (ug/m3)	Fract. Bias (%)	Fract. Error (%)
4NE1	CSN	SO4	September	257	3.85	2.86	0.58	-0.99	1.47	-15.2	40.3
4NE1	CSN	SO4	October	249	3.96	3.53	0.67	-0.43	1.22	-3.0	29.8
4NE1	CSN	SO4	November	251	2.70	2.34	0.53	-0.36	0.95	-20.5	34.7
4NE1	CSN	SO4	December	249	3.10	2.28	0.36	-0.82	1.18	-32.7	45.0
4NE1	IMPROVE	EC	January	136	0.48	0.89	0.72	0.41	0.46	30.2	49.3
4NE1	IMPROVE	EC	February	132	0.46	0.87	0.76	0.42	0.44	35.8	47.4
4NE1	IMPROVE	EC	March	164	0.38	0.74	0.62	0.36	0.38	41.4	51.2
4NE1	IMPROVE	EC	April	134	0.33	0.64	0.74	0.31	0.36	30.6	57.3
4NE1	IMPROVE	EC	May	143	0.45	0.63	0.67	0.18	0.32	10.9	53.7
4NE1	IMPROVE	EC	June	144	0.48	0.72	0.71	0.23	0.38	-0.1	50.2
4NE1	IMPROVE	EC	July	144	0.42	0.66	0.71	0.23	0.36	2.9	55.4
4NE1	IMPROVE	EC	August	154	0.49	0.79	0.69	0.31	0.40	15.3	44.2
4NE1	IMPROVE	EC	September	136	0.39	0.72	0.67	0.33	0.38	25.6	51.8
4NE1	IMPROVE	EC	October	145	0.37	0.83	0.79	0.46	0.49	38.8	54.8
4NE1	IMPROVE	EC	November	148	0.43	0.83	0.77	0.40	0.43	41.4	50.1
4NE1	IMPROVE	EC	December	134	0.47	0.97	0.72	0.51	0.54	41.4	50.1
4NE1	IMPROVE	NO3	January	143	0.86	1.29	0.49	0.43	0.64	34.3	72.6
4NE1	IMPROVE	NO3	February	133	1.32	2.36	0.53	1.03	1.13	53.7	62.0
4NE1	IMPROVE	NO3	March	164	0.94	1.56	0.58	0.62	0.85	31.7	76.2
4NE1	IMPROVE	NO3	April	139	0.57	0.78	0.31	0.20	0.51	14.4	79.7
4NE1	IMPROVE	NO3	May	146	0.44	0.26	0.27	-0.18	0.27	-74.8	96.4
4NE1	IMPROVE	NO3	June	137	0.38	0.24	0.20	-0.14	0.29	-96.3	118.0
4NE1	IMPROVE	NO3	July	141	0.29	0.15	0.05	-0.14	0.25	-102.0	126.0
4NE1	IMPROVE	NO3	August	157	0.29	0.22	0.13	-0.07	0.28	-81.1	122.0
4NE1	IMPROVE	NO3	September	141	0.32	0.27	0.28	-0.05	0.30	-88.2	116.0
4NE1	IMPROVE	NO3	October	141	0.43	0.51	0.52	0.08	0.37	-45.3	98.7
4NE1	IMPROVE	NO3	November	149	0.79	1.23	0.69	0.44	0.58	34.3	72.0
4NE1	IMPROVE	NO3	December	136	1.09	1.86	0.58	0.77	1.01	65.3	89.2
4NE1	IMPROVE	OC	January	136	1.09	2.11	0.58	1.02	1.17	36.0	55.7
4NE1	IMPROVE	OC	February	132	1.41	2.51	0.71	1.10	1.22	37.0	50.3
4NE1	IMPROVE	OC	March	163	1.04	1.79	0.55	0.75	0.84	39.1	51.0
4NE1	IMPROVE	OC	April	134	0.79	1.12	0.48	0.33	0.60	13.3	56.7
4NE1	IMPROVE	OC	May	142	1.48	1.16	0.26	-0.32	0.72	-15.7	49.9
4NE1	IMPROVE	OC	June	144	1.86	1.15	0.48	-0.71	0.92	-57.5	66.1
4NE1	IMPROVE	OC	July	144	1.58	1.03	0.34	-0.55	0.85	-58.5	71.7
4NE1	IMPROVE	OC	August	155	1.80	1.59	0.52	-0.21	0.75	-23.7	46.7
4NE1	IMPROVE	OC	September	136	1.26	1.24	0.44	-0.03	0.60	-23.9	48.9
4NE1	IMPROVE	OC	October	145	0.96	1.26	0.55	0.31	0.61	-5.0	48.5
4NE1	IMPROVE	OC	November	148	1.01	1.63	0.58	0.62	0.74	34.9	48.2
4NE1	IMPROVE	OC	December	134	1.14	2.21	0.49	1.07	1.19	43.8	54.7
4NE1	IMPROVE	SO4	January	143	1.52	1.38	0.37	-0.14	0.56	-12.0	30.9
4NE1	IMPROVE	SO4	February	133	1.68	1.25	0.64	-0.44	0.53	-24.4	33.6
4NE1	IMPROVE	SO4	March	164	2.05	1.82	0.77	-0.23	0.52	-3.5	28.8
4NE1	IMPROVE	SO4	April	139	2.02	1.57	0.52	-0.45	0.78	-15.5	38.5
4NE1	IMPROVE	SO4	May	146	2.53	2.25	0.81	-0.28	0.72	0.1	29.1
4NE1	IMPROVE	SO4	June	137	4.50	3.38	0.83	-1.12	1.42	-16.6	35.1
4NE1	IMPROVE	SO4	July	141	4.11	3.07	0.76	-1.04	1.35	-20.0	37.4
4NE1	IMPROVE	SO4	August	157	4.89	3.43	0.69	-1.46	1.97	-17.4	46.6
4NE1	IMPROVE	SO4	September	141	2.87	2.26	0.71	-0.61	1.14	-0.7	40.9
4NE1	IMPROVE	SO4	October	141	2.68	2.44	0.76	-0.25	0.89	6.1	33.1
4NE1	IMPROVE	SO4	November	149	1.70	1.42	0.64	-0.27	0.48	-11.1	29.4
4NE1	IMPROVE	SO4	December	136	1.93	1.41	0.49	-0.52	0.72	-28.5	40.7

Domain	Specie	Threshold	Month	N	Mean Obs. (ppb)	Mean Pred. (ppb)	R Square	Mean Bias (ppb)	Mean Error (ppb)	Fract. Bias (%)	Fract. Error (%)
4ATLANTA1	O3_8hrmax	GE60	January								
4ATLANTA1	O3_8hrmax	GE60	February								
4ATLANTA1	O3_8hrmax	GE60	March	79	65.0	50.6	0.12	-14.4	14.7	-27.6	28.1
4ATLANTA1	O3_8hrmax	GE60	April	75	65.0	57.6	0.44	-7.3	7.9	-12.7	13.6
4ATLANTA1	O3_8hrmax	GE60	May	174	68.7	60.6	0.19	-8.1	9.2	-14.7	16.2
4ATLANTA1	O3_8hrmax	GE60	June	202	71.5	62.9	0.48	-8.6	9.4	-13.7	14.9
4ATLANTA1	O3_8hrmax	GE60	July	75	68.0	60.0	0.16	-8.1	11.9	-15.1	20.3
4ATLANTA1	O3_8hrmax	GE60	August	223	76.2	73.1	0.38	-3.0	9.0	-5.1	12.6
4ATLANTA1	O3_8hrmax	GE60	September	77	68.5	66.7	0.30	-1.8	6.9	-3.3	10.3
4ATLANTA1	O3_8hrmax	GE60	October	15	66.0	61.9	0.40	-4.1	4.6	-6.6	7.5
4ATLANTA1	O3_8hrmax	GE60	November								
4ATLANTA1	O3_8hrmax	GE60	December								
4ATLANTA1	O3_8hrmax	NONE	January								
4ATLANTA1	O3_8hrmax	NONE	February								
4ATLANTA1	O3_8hrmax	NONE	March	370	50.5	42.5	0.24	-8.0	9.4	-17.8	21.4
4ATLANTA1	O3_8hrmax	NONE	April	358	51.2	48.8	0.48	-2.4	6.3	-3.9	13.3
4ATLANTA1	O3_8hrmax	NONE	May	362	59.6	55.0	0.30	-4.6	8.0	-7.9	15.8
4ATLANTA1	O3_8hrmax	NONE	June	350	61.1	57.7	0.53	-3.4	8.6	-4.1	15.7
4ATLANTA1	O3_8hrmax	NONE	July	354	49.7	50.0	0.28	0.3	9.6	0.3	20.4
4ATLANTA1	O3_8hrmax	NONE	August	357	66.0	65.1	0.55	-0.9	9.3	-2.0	15.9
4ATLANTA1	O3_8hrmax	NONE	September	354	50.2	53.4	0.58	3.2	7.6	8.2	16.3
4ATLANTA1	O3_8hrmax	NONE	October	369	36.9	39.4	0.71	2.5	5.6	8.0	16.7
4ATLANTA1	O3_8hrmax	NONE	November								
4ATLANTA1	O3_8hrmax	NONE	December								

Domain	Specie	Threshold	Month	N	Mean Obs. (ppb)	Mean Pred. (ppb)	R Square	Mean Bias (ppb)	Mean Error (ppb)	Fract. Bias (%)	Fract. Error (%)
4CALNEX1	O3_8hrmax	GE60	January								
4CALNEX1	O3_8hrmax	GE60	February	13	79.2	44.0	0.00	-35.2	35.2	-57.2	57.2
4CALNEX1	O3_8hrmax	GE60	March	443	66.4	59.4	0.14	-7.0	9.0	-12.0	15.0
4CALNEX1	O3_8hrmax	GE60	April	717	67.3	61.7	0.25	-5.6	8.0	-9.3	12.6
4CALNEX1	O3_8hrmax	GE60	May	1981	69.2	63.0	0.24	-6.2	8.2	-9.8	12.6
4CALNEX1	O3_8hrmax	GE60	June	1937	72.3	69.3	0.28	-3.0	9.0	-5.0	12.8
4CALNEX1	O3_8hrmax	GE60	July	1755	72.8	71.6	0.35	-1.3	9.6	-2.6	13.4
4CALNEX1	O3_8hrmax	GE60	August	1931	71.2	67.2	0.23	-4.0	10.4	-6.8	15.2
4CALNEX1	O3_8hrmax	GE60	September	1047	70.5	64.3	0.10	-6.2	10.5	-9.5	15.5
4CALNEX1	O3_8hrmax	GE60	October	157	65.6	54.2	0.00	-11.4	12.0	-19.8	20.7
4CALNEX1	O3_8hrmax	GE60	November	34	64.1	60.7	0.00	-3.4	6.8	-5.9	11.1
4CALNEX1	O3_8hrmax	GE60	December	2	63.8	32.3	1.00	-31.5	31.5	-65.5	65.5
4CALNEX1	O3_8hrmax	NONE	January	5369	29.7	33.2	0.42	3.5	5.9	13.3	21.7
4CALNEX1	O3_8hrmax	NONE	February	4854	35.0	36.5	0.37	1.5	5.4	5.6	16.7
4CALNEX1	O3_8hrmax	NONE	March	5426	44.4	44.1	0.50	-0.3	5.9	-0.6	13.8
4CALNEX1	O3_8hrmax	NONE	April	5533	49.2	47.8	0.49	-1.4	6.1	-2.8	12.8
4CALNEX1	O3_8hrmax	NONE	May	5889	55.1	53.9	0.55	-1.2	6.7	-1.6	12.4
4CALNEX1	O3_8hrmax	NONE	June	5689	53.7	55.0	0.64	1.3	8.0	2.8	15.0
4CALNEX1	O3_8hrmax	NONE	July	5827	50.0	54.7	0.61	4.7	10.1	9.8	20.7
4CALNEX1	O3_8hrmax	NONE	August	5751	52.6	55.8	0.48	3.2	10.1	6.6	19.2
4CALNEX1	O3_8hrmax	NONE	September	5681	48.8	51.6	0.44	2.8	8.3	6.3	16.6
4CALNEX1	O3_8hrmax	NONE	October	5781	39.7	42.1	0.35	2.4	6.8	6.3	17.7
4CALNEX1	O3_8hrmax	NONE	November	5266	31.8	38.8	0.42	7.0	9.0	21.5	27.7
4CALNEX1	O3_8hrmax	NONE	December	5108	29.5	31.5	0.42	2.0	5.4	8.7	20.4

Domain	Specie	Threshold	Month	N	Mean Obs. (ppb)	Mean Pred. (ppb)	R Square	Mean Bias (ppb)	Mean Error (ppb)	Fract. Bias (%)	Fract. Error (%)
4DET1	O3_8hrmax	GE60	January								
4DET1	O3_8hrmax	GE60	February								
4DET1	O3_8hrmax	GE60	March								
4DET1	O3_8hrmax	GE60	April	15	68.3	57.9	0.35	-10.3	10.3	-17.0	17.0
4DET1	O3_8hrmax	GE60	May	105	72.7	62.3	0.29	-10.4	12.0	-15.5	17.8
4DET1	O3_8hrmax	GE60	June	128	72.7	59.2	0.21	-13.5	14.0	-21.1	21.8
4DET1	O3_8hrmax	GE60	July	56	68.0	56.2	0.09	-11.8	13.6	-19.9	22.4
4DET1	O3_8hrmax	GE60	August	64	72.2	60.6	0.30	-11.6	14.1	-18.8	22.0
4DET1	O3_8hrmax	GE60	September	55	68.2	52.3	0.16	-15.9	17.0	-27.8	29.3
4DET1	O3_8hrmax	GE60	October								
4DET1	O3_8hrmax	GE60	November								
4DET1	O3_8hrmax	GE60	December								
4DET1	O3_8hrmax	NONE	January								
4DET1	O3_8hrmax	NONE	February								
4DET1	O3_8hrmax	NONE	March	27	31.8	25.2	0.25	-6.6	7.6	-23.8	28.1
4DET1	O3_8hrmax	NONE	April	353	42.0	39.8	0.53	-2.2	5.7	-4.9	14.4
4DET1	O3_8hrmax	NONE	May	366	51.6	47.7	0.71	-4.0	6.9	-7.4	14.0
4DET1	O3_8hrmax	NONE	June	354	55.4	49.5	0.58	-6.0	8.9	-10.3	16.8
4DET1	O3_8hrmax	NONE	July	362	48.2	43.5	0.40	-4.7	8.6	-10.5	19.2
4DET1	O3_8hrmax	NONE	August	368	46.1	43.2	0.52	-2.9	9.5	-8.8	22.5
4DET1	O3_8hrmax	NONE	September	350	43.4	39.6	0.48	-3.9	8.6	-6.1	21.7
4DET1	O3_8hrmax	NONE	October	91	31.5	34.6	0.58	3.1	6.8	9.0	22.8
4DET1	O3_8hrmax	NONE	November								
4DET1	O3_8hrmax	NONE	December								

Domain	Specie	Threshold	Month	N	Mean Obs. (ppb)	Mean Pred. (ppb)	R Square	Mean Bias (ppb)	Mean Error (ppb)	Fract. Bias (%)	Fract. Error (%)
4MO2	O3_8hrmax	GE60	January								
4MO2	O3_8hrmax	GE60	March	37	65.4	54.6	0.56	-10.9	10.9	-18.1	18.1
4MO2	O3_8hrmax	GE60	April	279	65.0	60.3	0.14	-4.7	5.4	-7.5	8.6
4MO2	O3_8hrmax	GE60	May	474	65.9	58.1	0.07	-7.8	8.7	-13.7	15.0
4MO2	O3_8hrmax	GE60	June	498	72.6	61.1	0.21	-11.4	12.3	-18.8	20.0
4MO2	O3_8hrmax	GE60	July	335	68.4	65.1	0.24	-3.3	7.0	-5.5	10.7
4MO2	O3_8hrmax	GE60	August	674	70.6	67.1	0.14	-3.5	8.7	-6.3	13.3
4MO2	O3_8hrmax	GE60	September	444	67.7	60.5	0.22	-7.2	8.8	-11.9	14.1
4MO2	O3_8hrmax	GE60	October	79	63.7	56.7	0.10	-7.0	7.5	-12.6	13.3
4MO2	O3_8hrmax	GE60	November	3	60.7	46.3	0.92	-14.4	14.4	-26.9	26.9
4MO2	O3_8hrmax	GE60	December								
4MO2	O3_8hrmax	NONE	January	1061	27.2	24.8	0.33	-2.4	5.0	-9.0	20.3
4MO2	O3_8hrmax	NONE	February	1017	33.4	31.0	0.49	-2.4	5.2	-7.2	17.4
4MO2	O3_8hrmax	NONE	March	1293	40.7	39.1	0.46	-1.6	5.7	-4.1	15.7
4MO2	O3_8hrmax	NONE	April	2316	47.1	48.4	0.59	1.3	4.9	3.5	11.0
4MO2	O3_8hrmax	NONE	May	2367	49.0	46.1	0.44	-2.8	7.4	-7.2	17.7
4MO2	O3_8hrmax	NONE	June	2287	48.7	48.4	0.44	-0.3	9.1	-0.1	20.5
4MO2	O3_8hrmax	NONE	July	2337	48.8	52.1	0.46	3.3	7.4	6.7	15.3
4MO2	O3_8hrmax	NONE	August	2324	51.7	55.9	0.44	4.2	9.9	8.6	20.1
4MO2	O3_8hrmax	NONE	September	2265	46.0	46.8	0.59	0.8	7.6	3.7	18.9
4MO2	O3_8hrmax	NONE	October	2360	36.4	38.9	0.50	2.5	6.6	8.4	19.8
4MO2	O3_8hrmax	NONE	November	1128	29.7	31.4	0.49	1.7	5.5	7.6	20.3
4MO2	O3_8hrmax	NONE	December	980	24.8	22.4	0.36	-2.4	6.3	-11.3	30.8

Domain	Specie	Threshold	Month	N	Mean Obs. (ppb)	Mean Pred. (ppb)	R Square	Mean Bias (ppb)	Mean Error (ppb)	Fract. Bias (%)	Fract. Error (%)
4NE1	O3_8hrmax	GE60	January								
4NE1	O3_8hrmax	GE60	February								
4NE1	O3_8hrmax	GE60	March	20	63.3	42.8	0.05	-20.5	20.5	-40.6	40.6
4NE1	O3_8hrmax	GE60	April	372	67.2	55.3	0.28	-11.9	12.2	-20.9	21.3
4NE1	O3_8hrmax	GE60	May	1291	70.8	59.0	0.33	-11.8	12.3	-18.9	19.5
4NE1	O3_8hrmax	GE60	June	1334	71.4	61.8	0.28	-9.6	10.8	-15.0	16.7
4NE1	O3_8hrmax	GE60	July	1248	70.1	62.8	0.27	-7.3	9.7	-11.6	14.9
4NE1	O3_8hrmax	GE60	August	1410	71.1	65.0	0.15	-6.1	10.2	-9.8	15.3
4NE1	O3_8hrmax	GE60	September	869	69.0	58.8	0.05	-10.2	11.5	-16.6	18.4
4NE1	O3_8hrmax	GE60	October	110	64.8	52.2	0.02	-12.7	13.0	-23.4	24.0
4NE1	O3_8hrmax	GE60	November								
4NE1	O3_8hrmax	GE60	December								
4NE1	O3_8hrmax	NONE	January	1643	24.8	22.7	0.67	-2.1	4.4	-9.6	22.8
4NE1	O3_8hrmax	NONE	February	1468	31.4	26.3	0.61	-5.1	5.9	-17.1	21.5
4NE1	O3_8hrmax	NONE	March	1703	39.9	33.1	0.44	-6.8	7.4	-19.5	21.6
4NE1	O3_8hrmax	NONE	April	4482	43.9	40.8	0.45	-3.1	6.7	-6.8	16.5
4NE1	O3_8hrmax	NONE	May	4701	52.1	48.4	0.61	-3.7	7.2	-5.8	14.6
4NE1	O3_8hrmax	NONE	June	4563	50.5	47.5	0.69	-3.1	7.2	-5.0	14.8
4NE1	O3_8hrmax	NONE	July	4770	50.8	49.4	0.59	-1.4	7.6	-2.2	15.5
4NE1	O3_8hrmax	NONE	August	4733	49.4	49.0	0.67	-0.3	8.0	-0.6	17.7
4NE1	O3_8hrmax	NONE	September	4692	45.1	44.1	0.59	-1.0	7.3	0.2	17.0
4NE1	O3_8hrmax	NONE	October	3562	35.7	36.9	0.45	1.2	6.7	3.9	20.1
4NE1	O3_8hrmax	NONE	November	1483	26.7	26.9	0.69	0.2	3.7	2.8	17.2
4NE1	O3_8hrmax	NONE	December	1444	25.5	20.8	0.74	-4.7	5.6	-23.7	30.9

Appendix B: Model Performance for the Annual 2007 4 km Domain Simulations

November 15, 2013

This Appendix section presents graphical model performance evaluation.

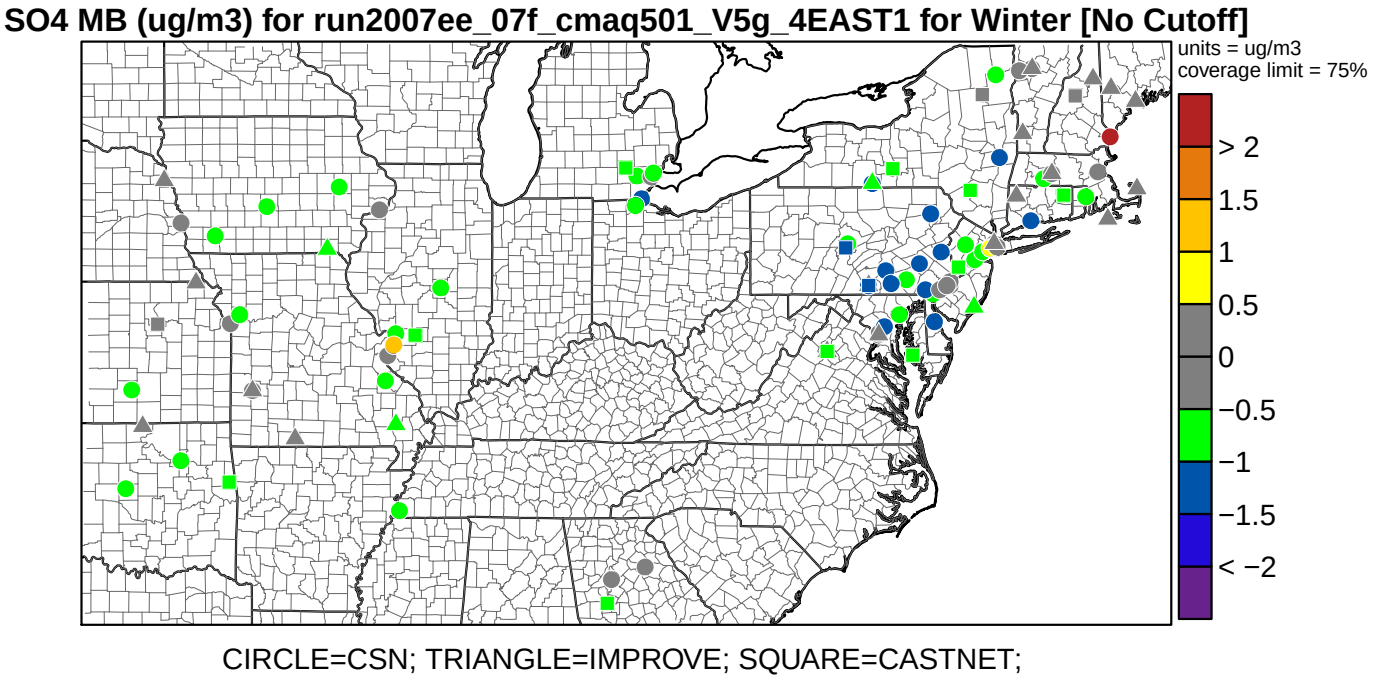

Figure 1: Mean bias for Winter SO4

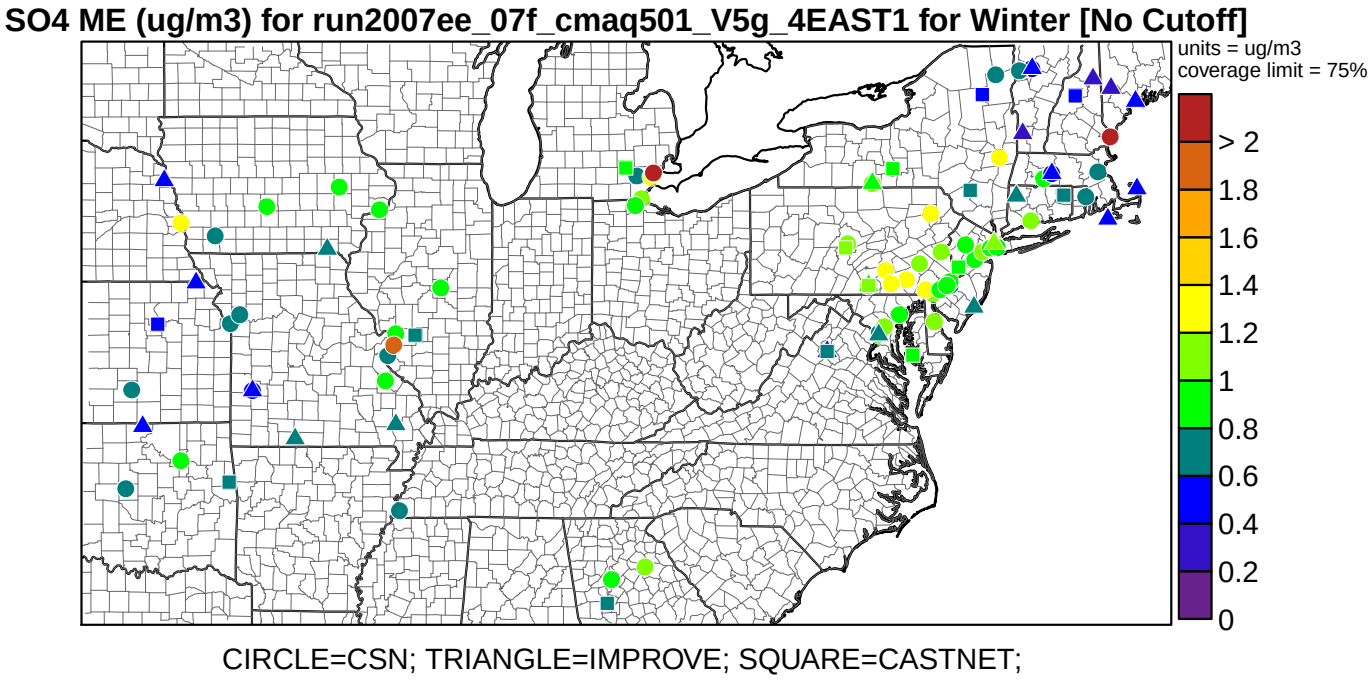

Figure 2: Mean error for Winter SO4

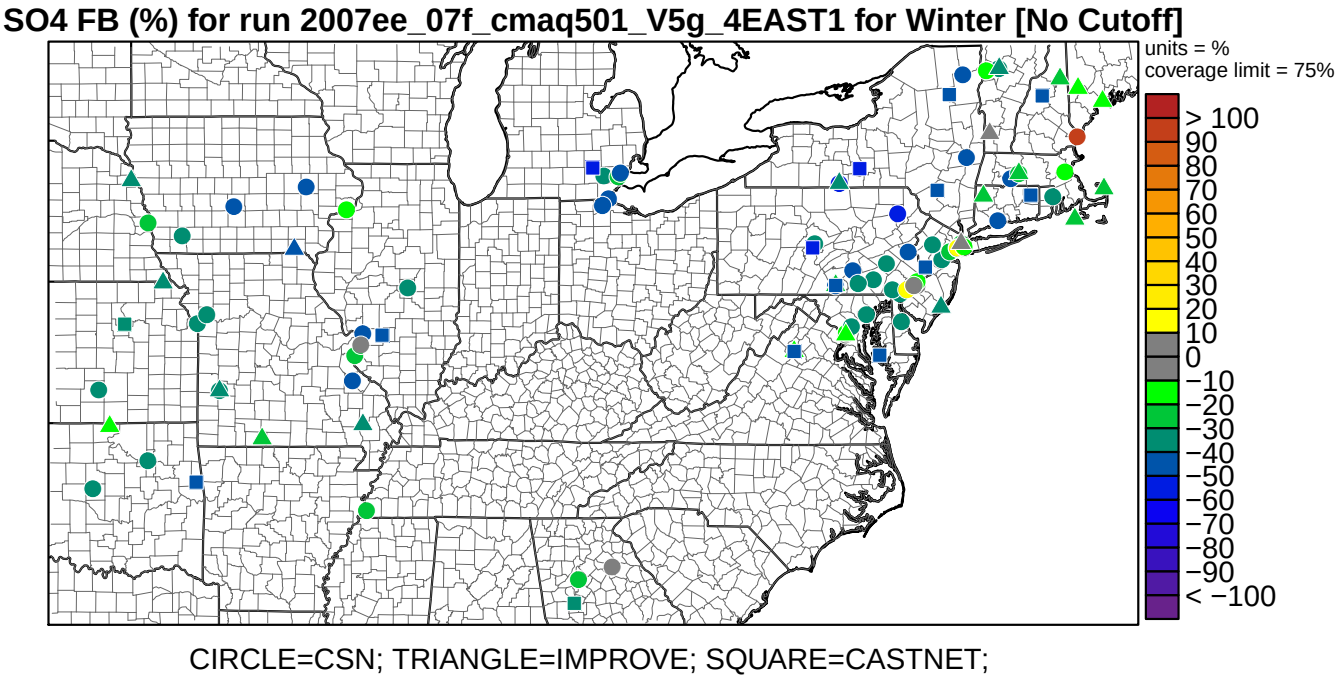

Figure 3: Fractional bias for Winter SO4

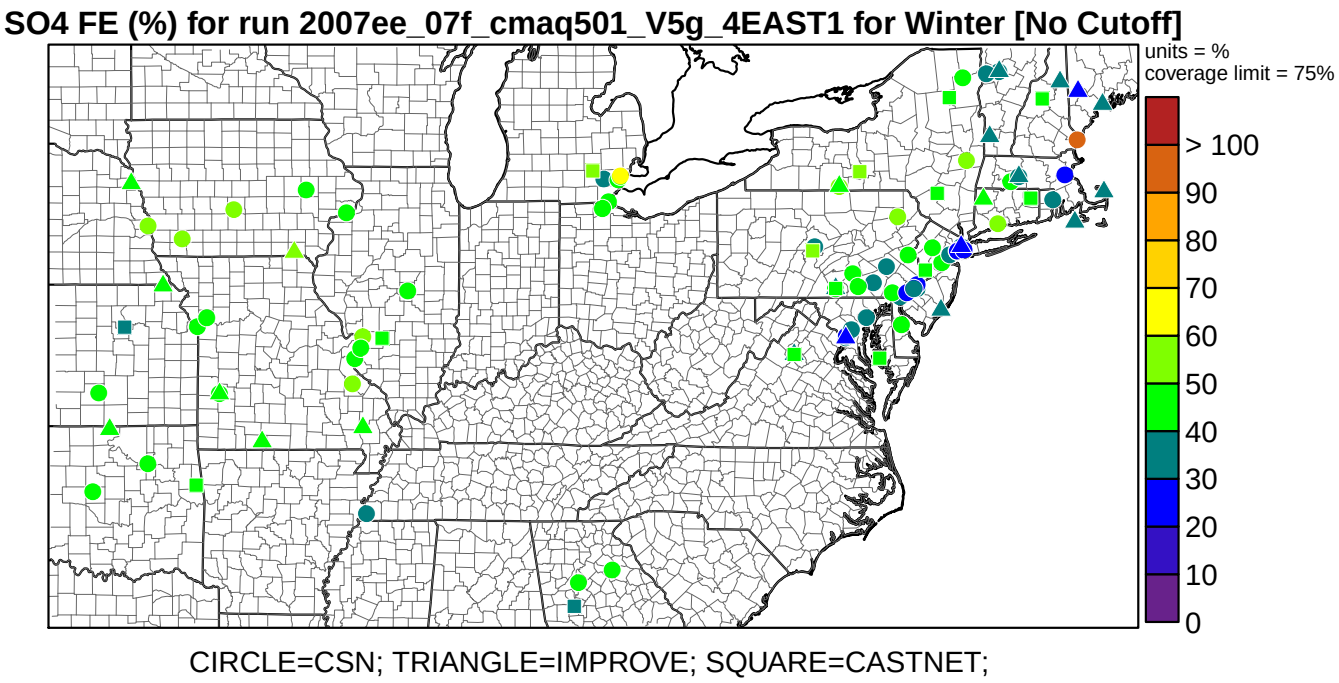

Figure 4: Fractional error for Winter SO4

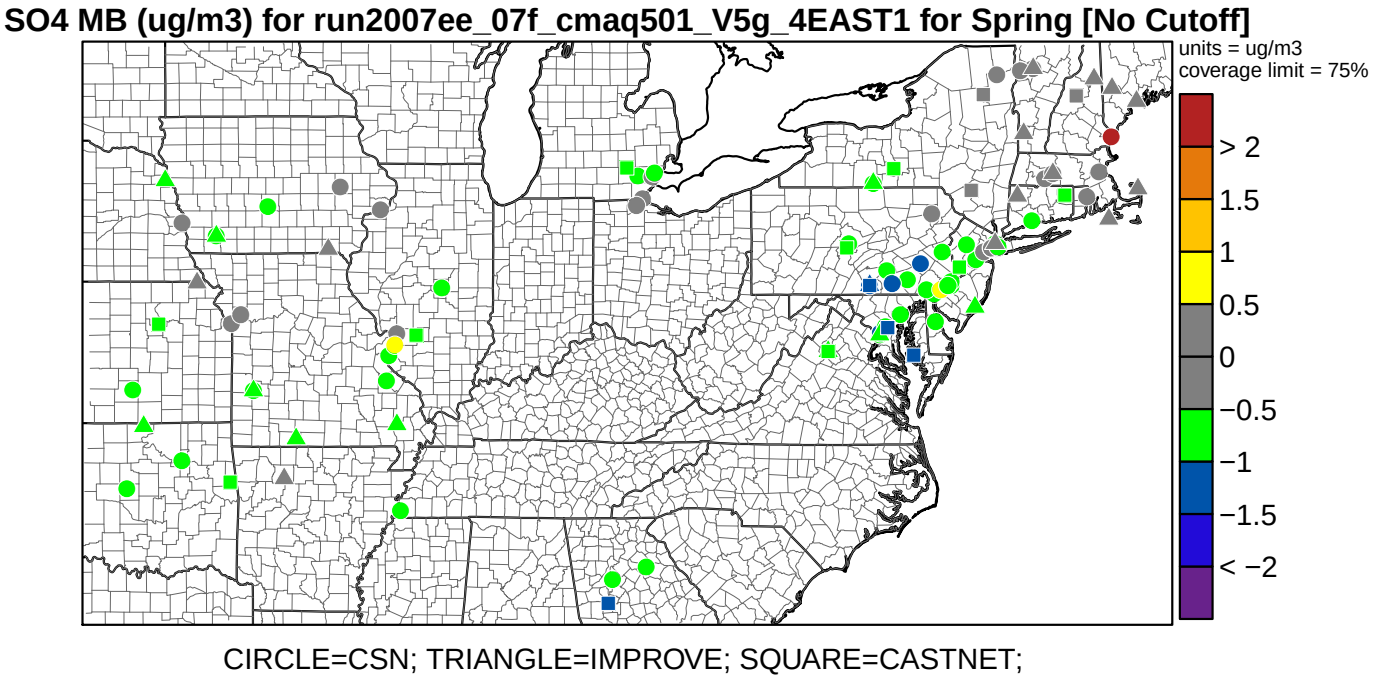

Figure 5: Mean bias for Spring SO4

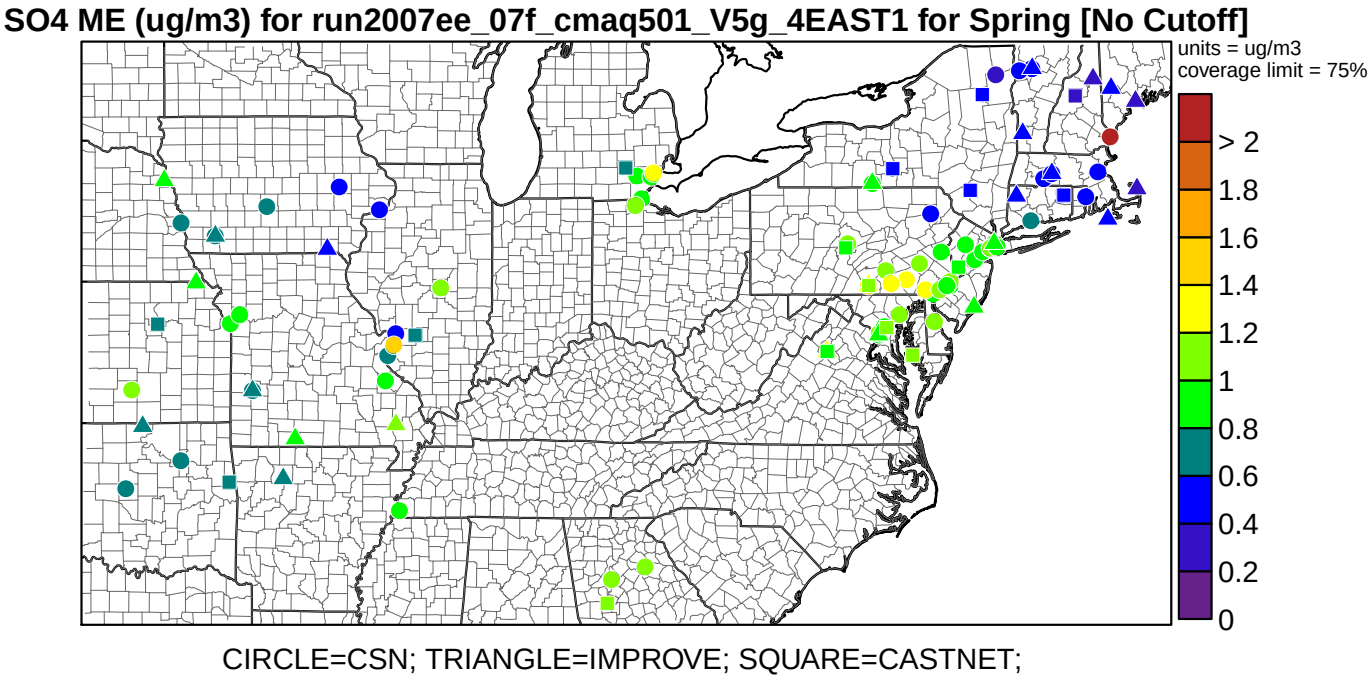

Figure 6: Mean error for Spring SO4

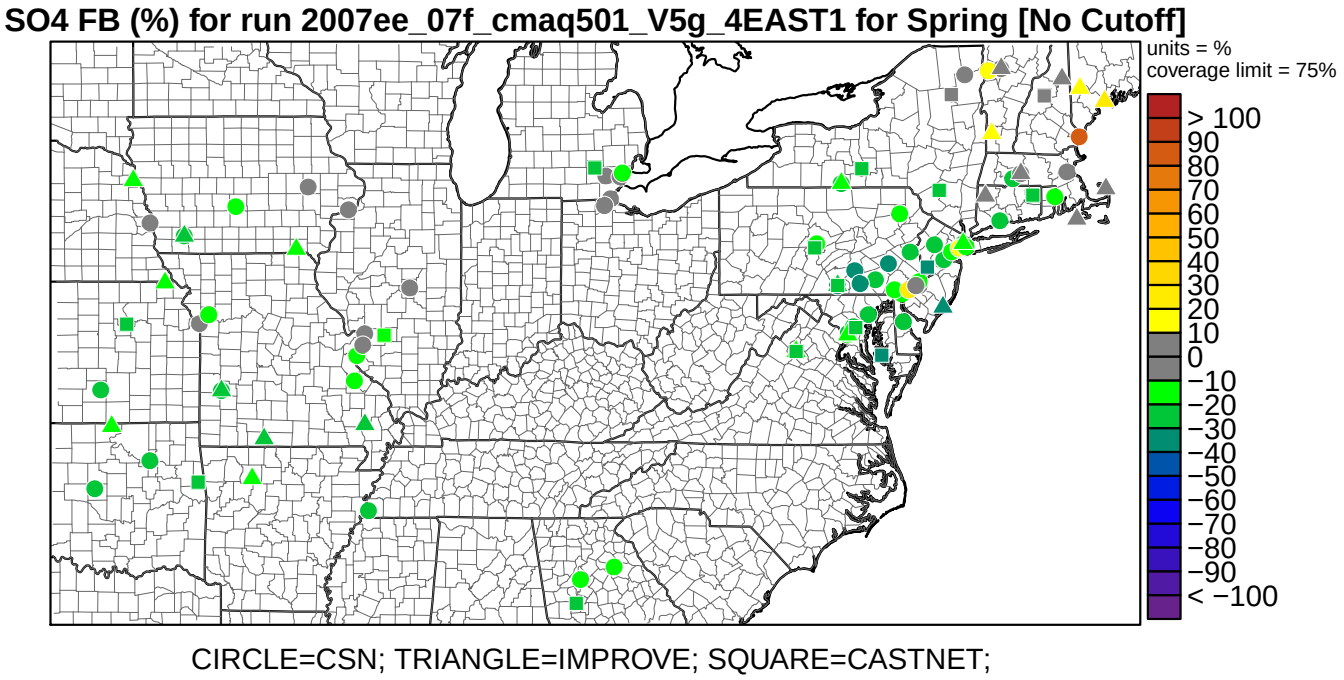

Figure 7: Fractional bias for Spring SO4

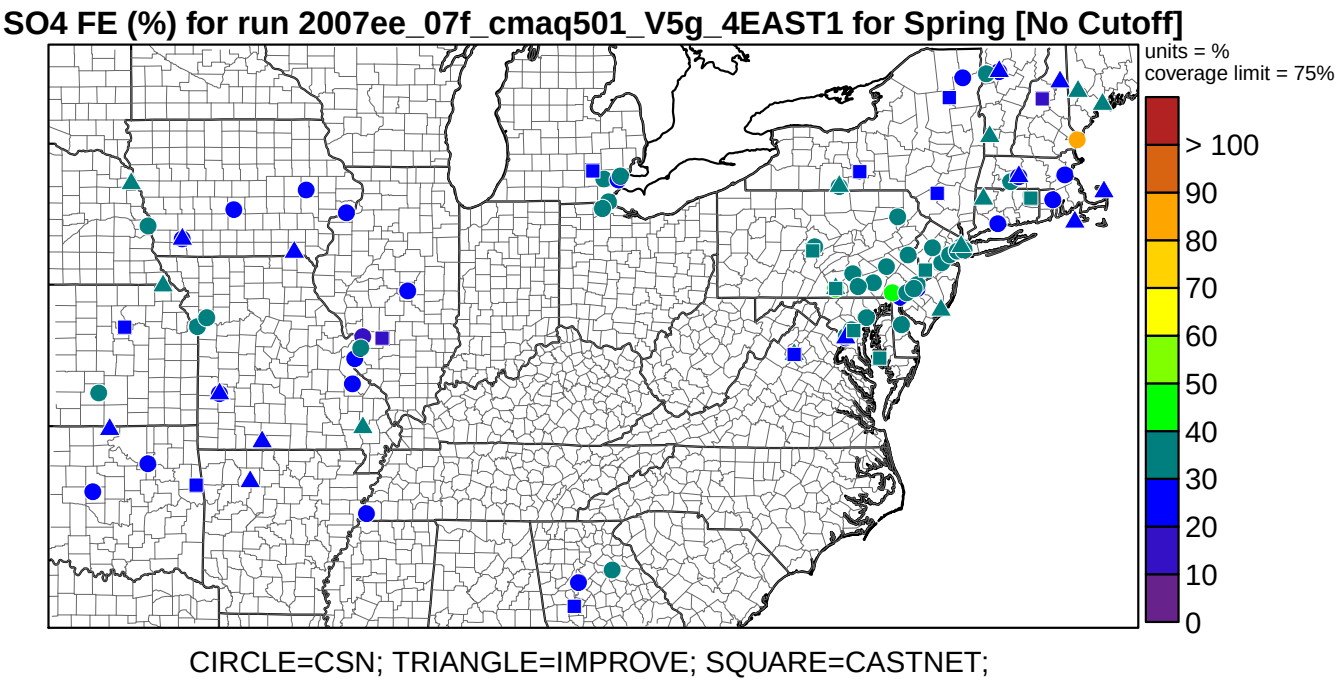

Figure 8: Fractional error for Spring SO4

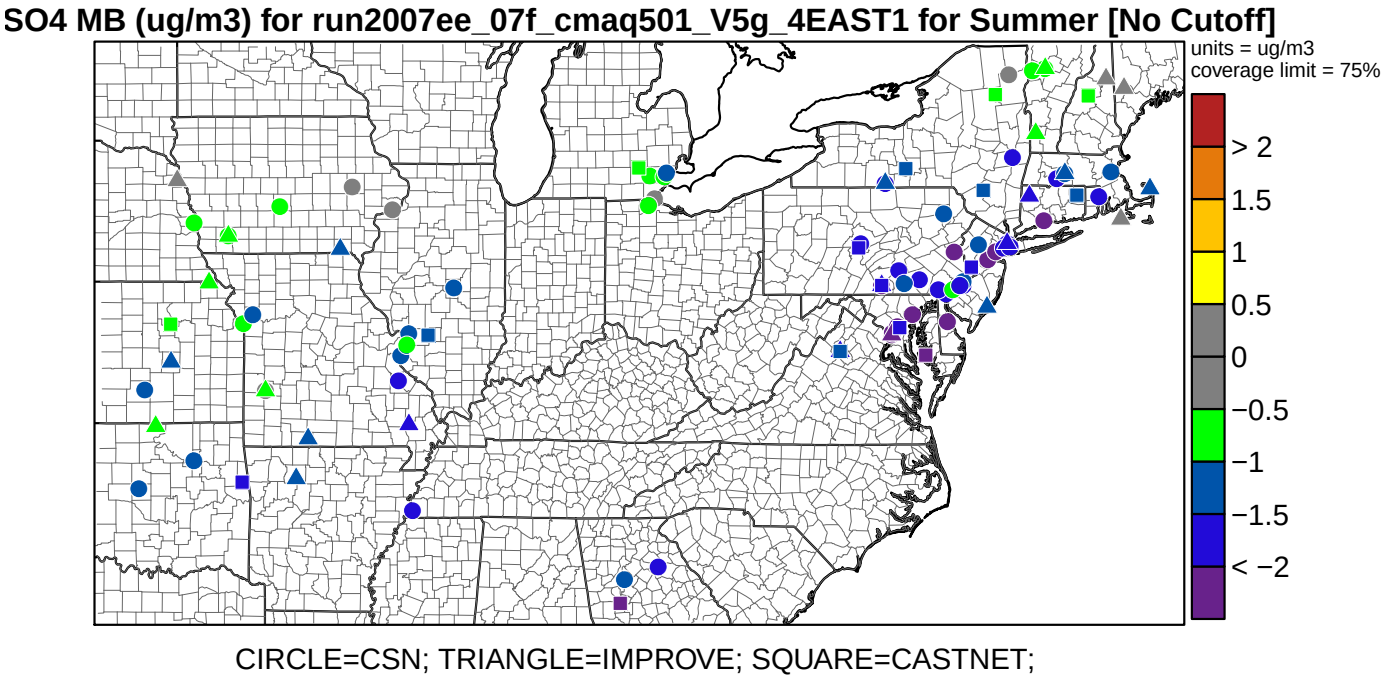

Figure 9: Mean bias for Summer SO4

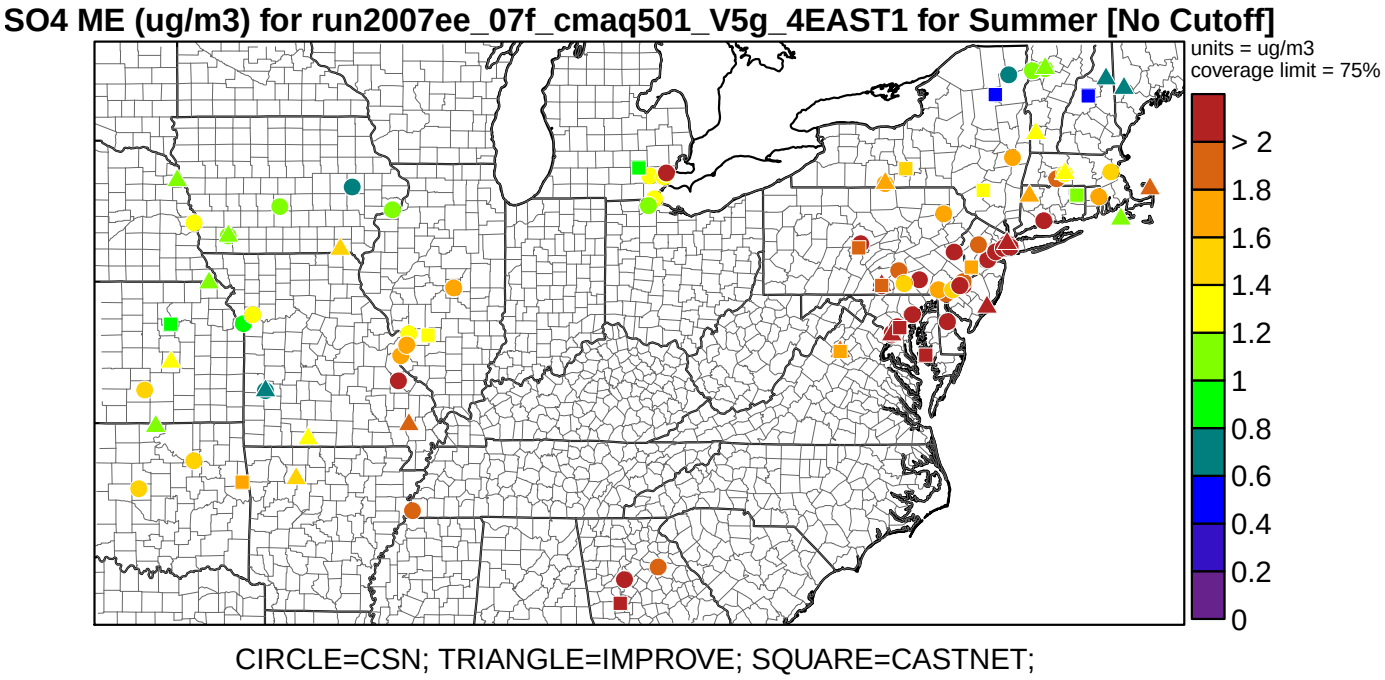

Figure 10: Mean error for Summer SO4

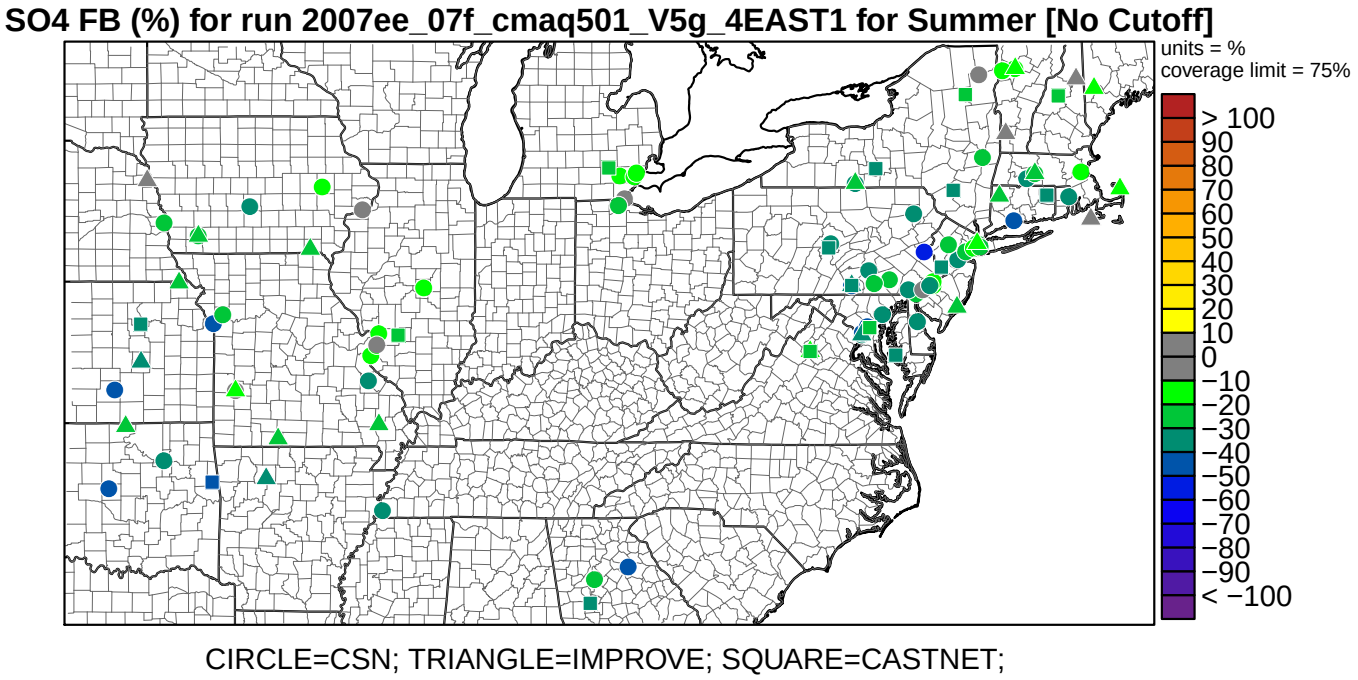

Figure 11: Fractional bias for Summer SO4

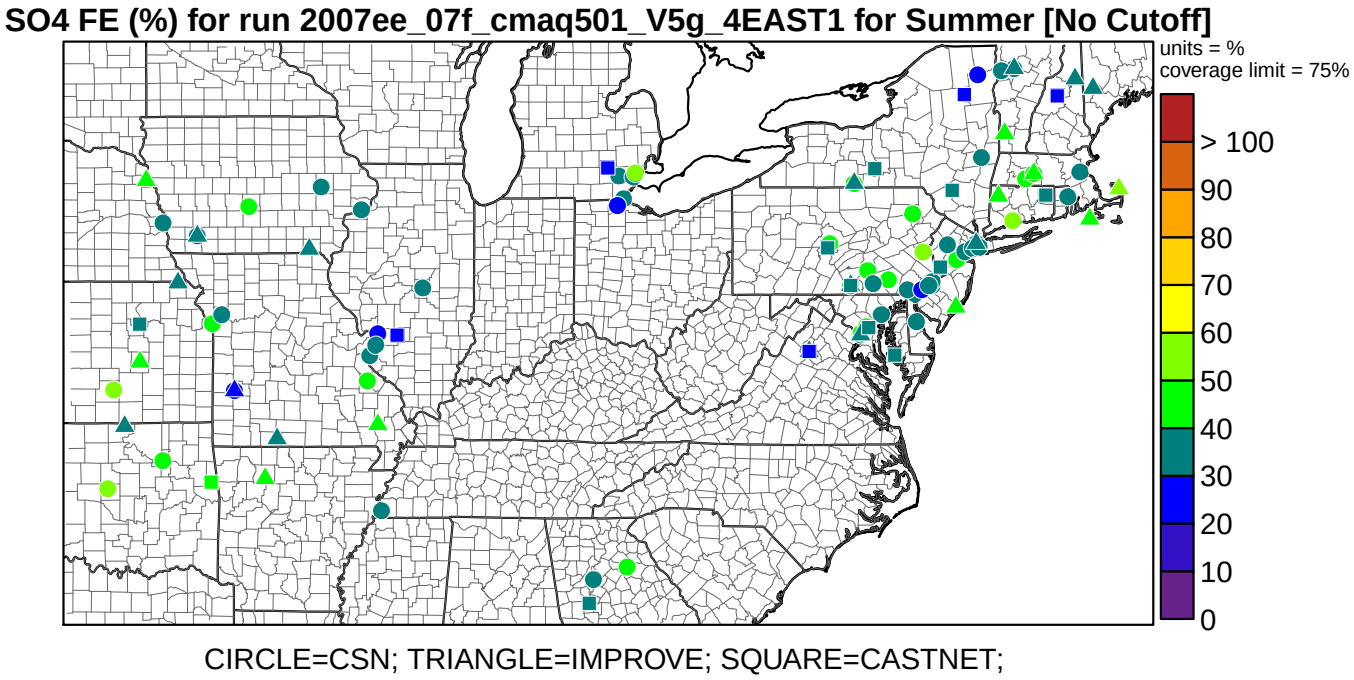

Figure 12: Fractional error for Summer SO4

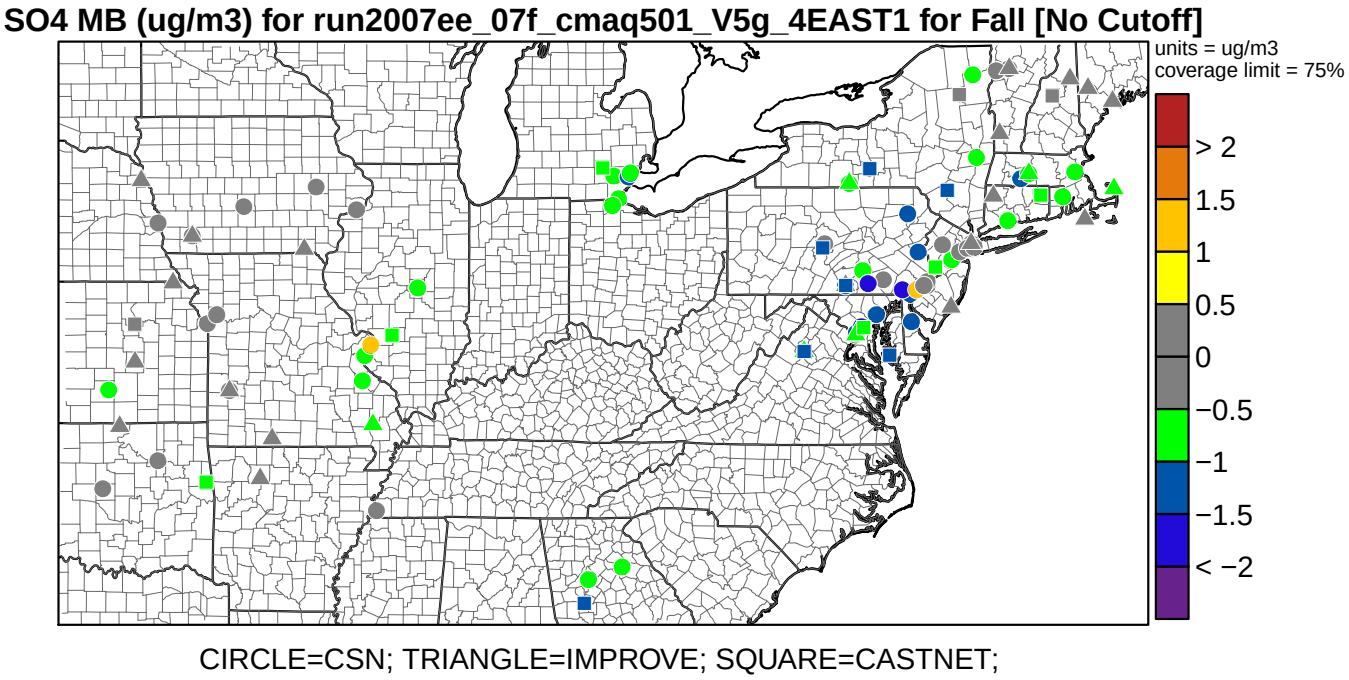

Figure 13: Mean bias for Fall SO4

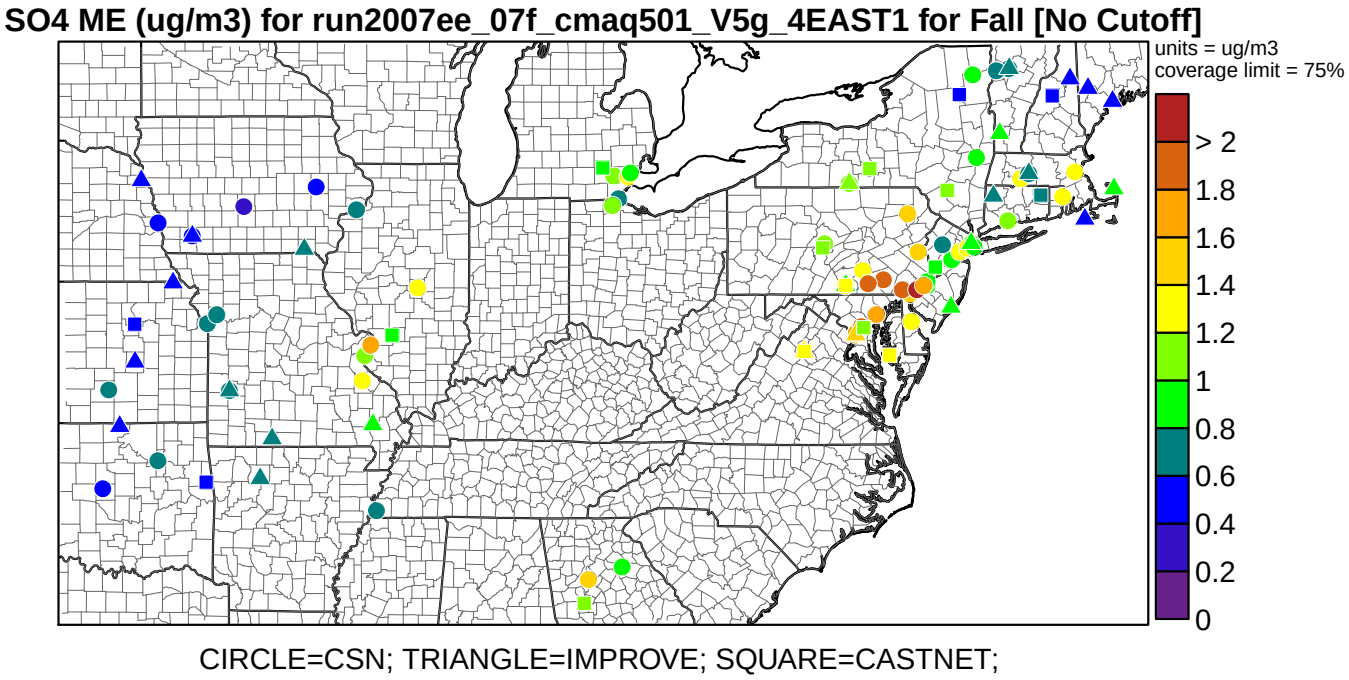

Figure 14: Mean error for Fall SO4

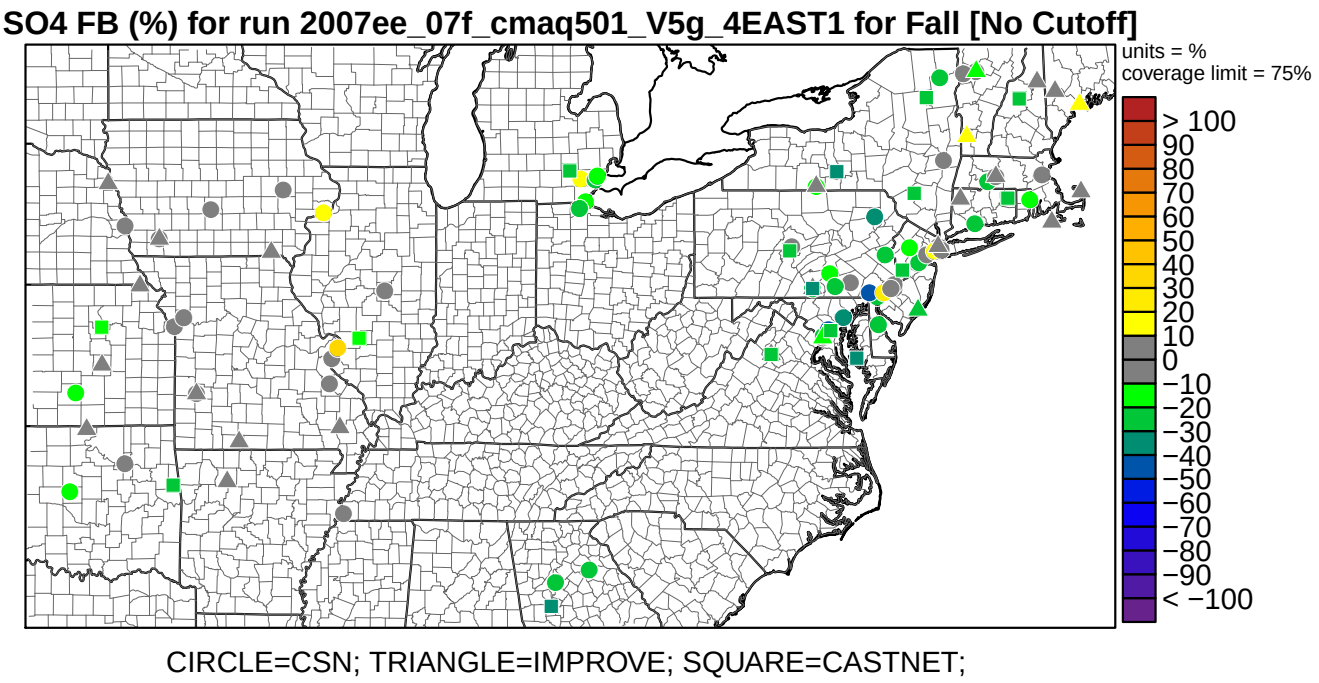

Figure 15: Fractional bias for Fall SO4

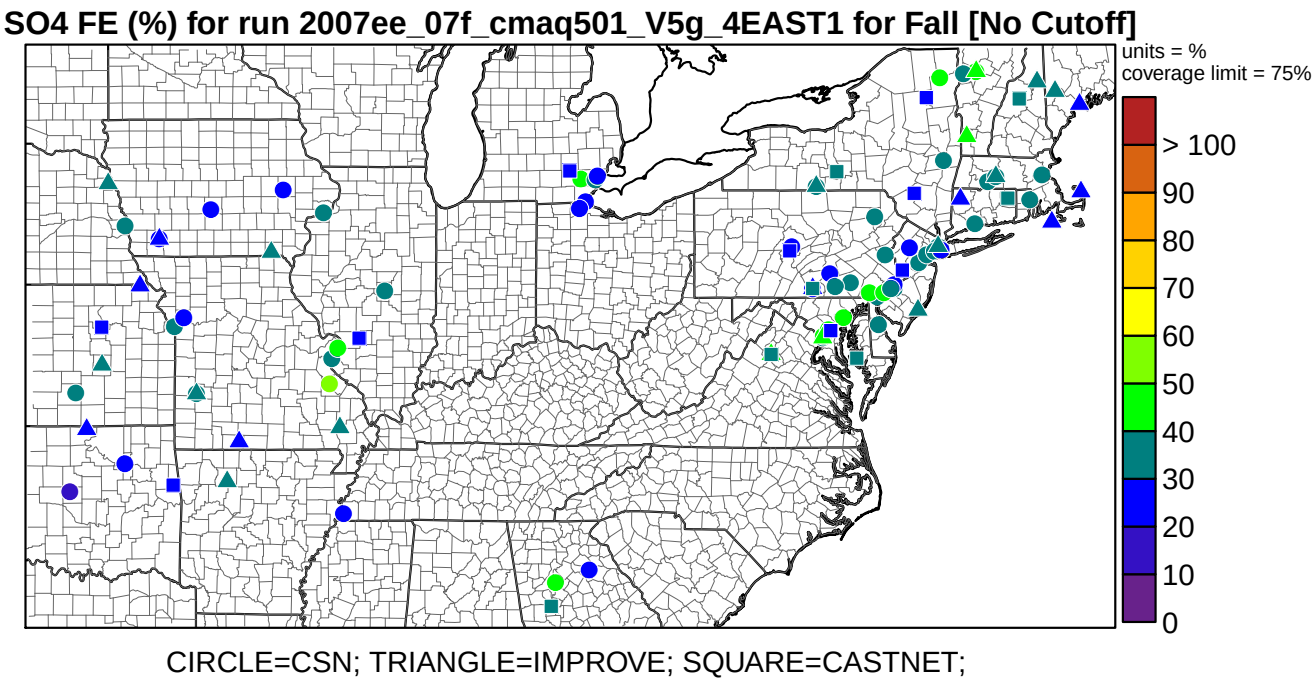

Figure 16: Fractional error for Fall SO4

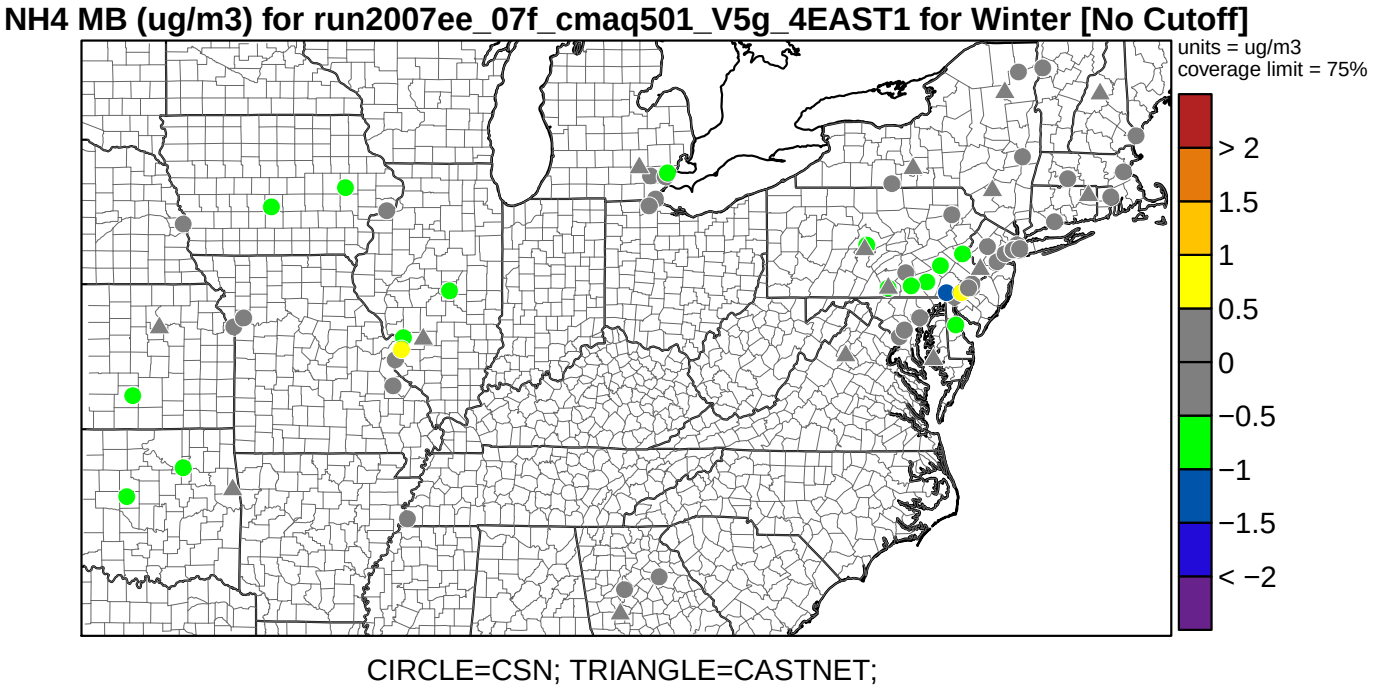

Figure 17: Mean bias for Winter NH4

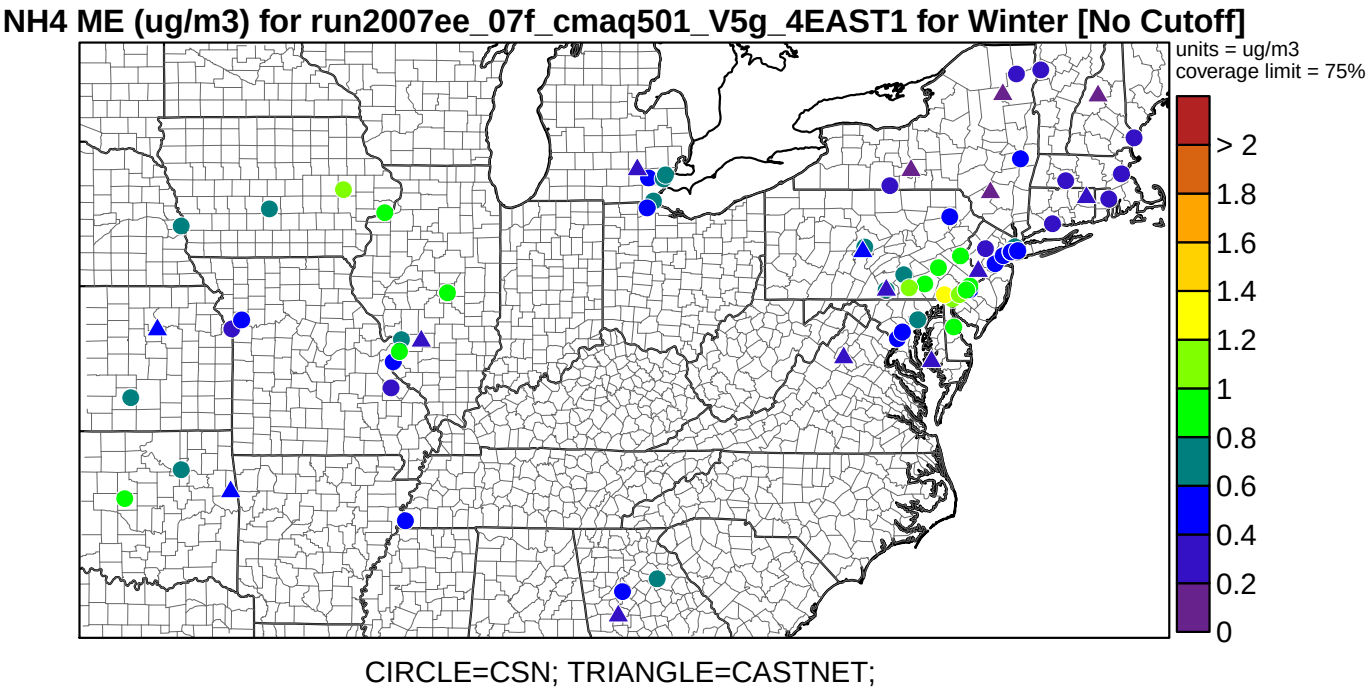

Figure 18: Mean error for Winter NH4

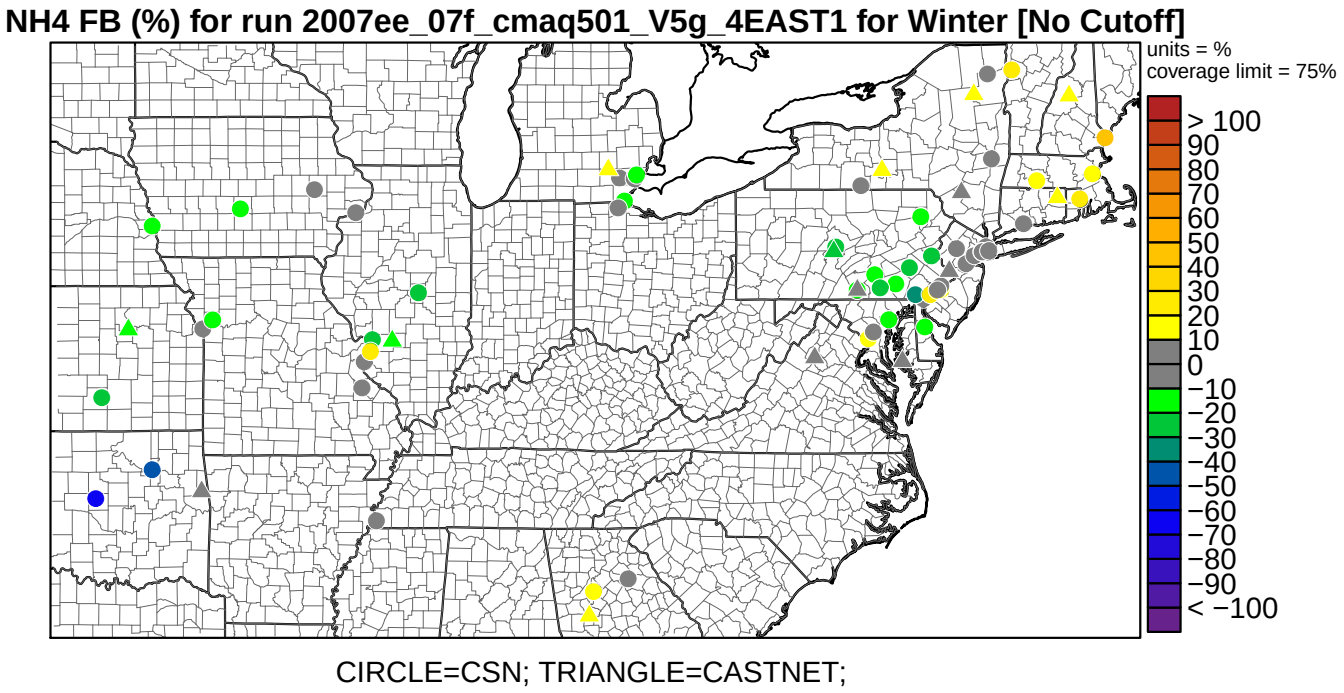

Figure 19: Fractional bias for Winter NH4

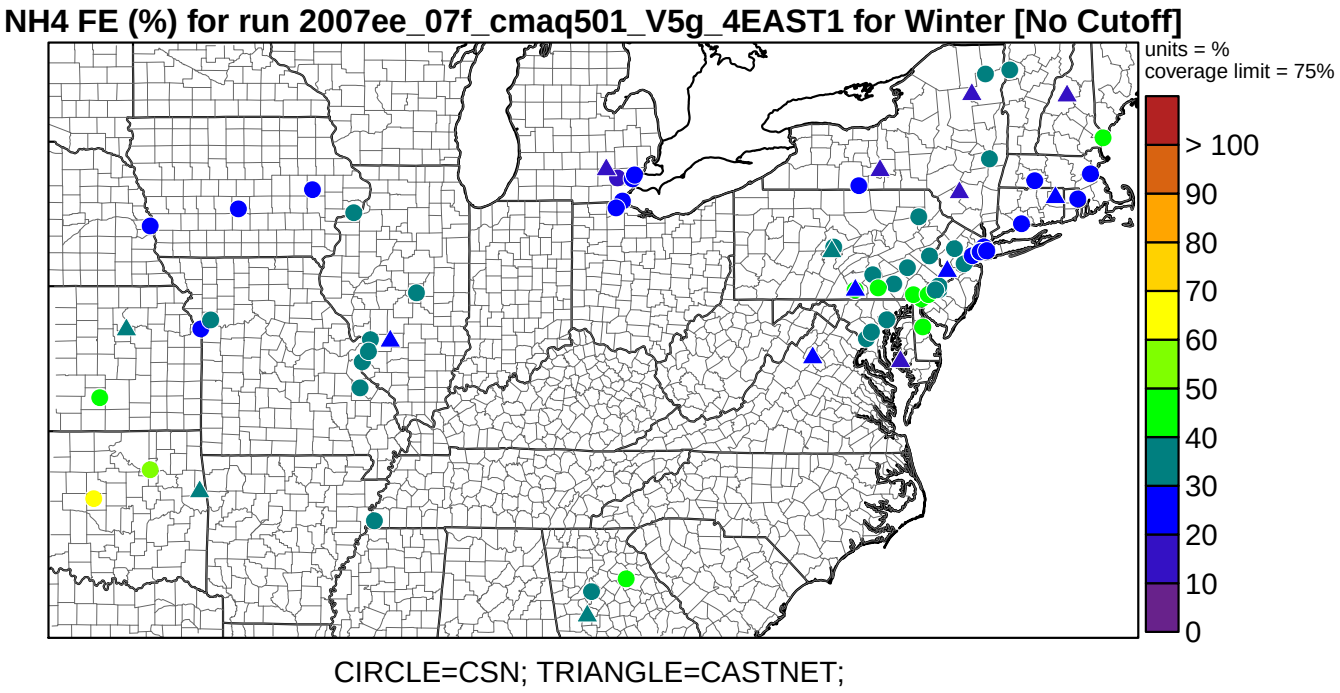

Figure 20: Fractional error for Winter NH4

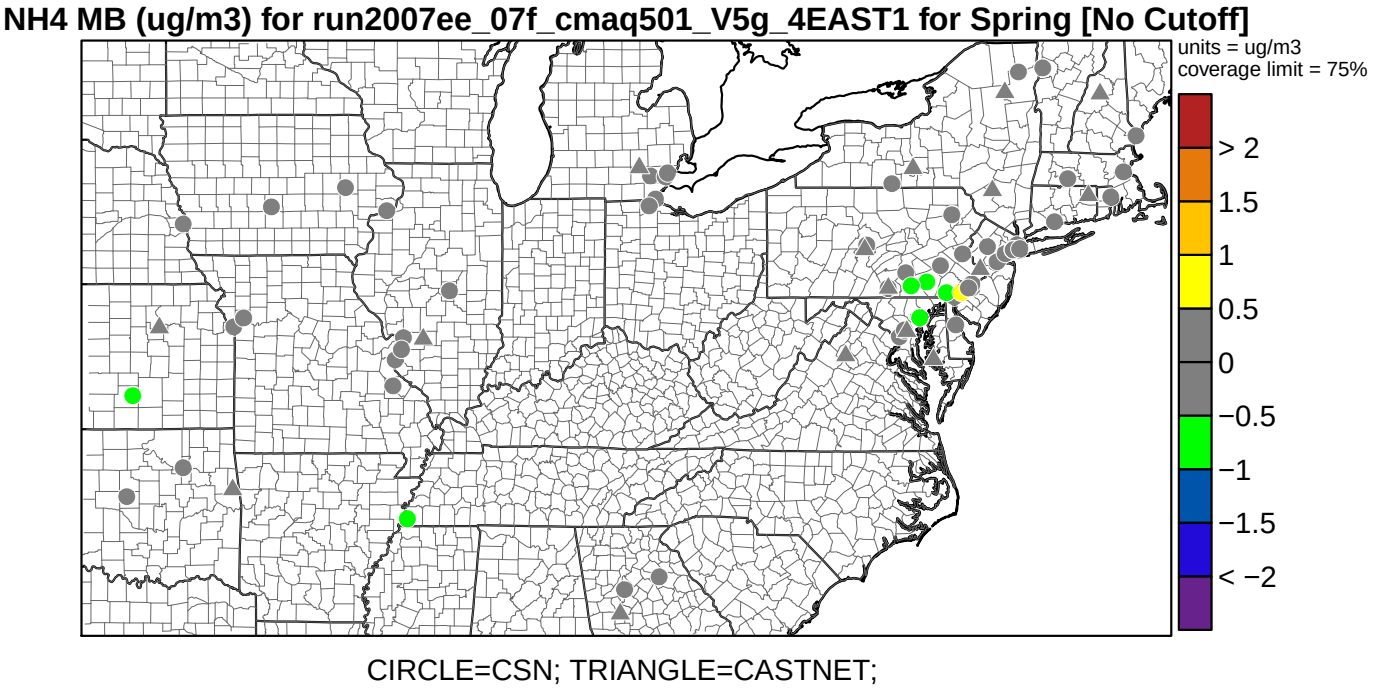

Figure 21: Mean bias for Spring NH4

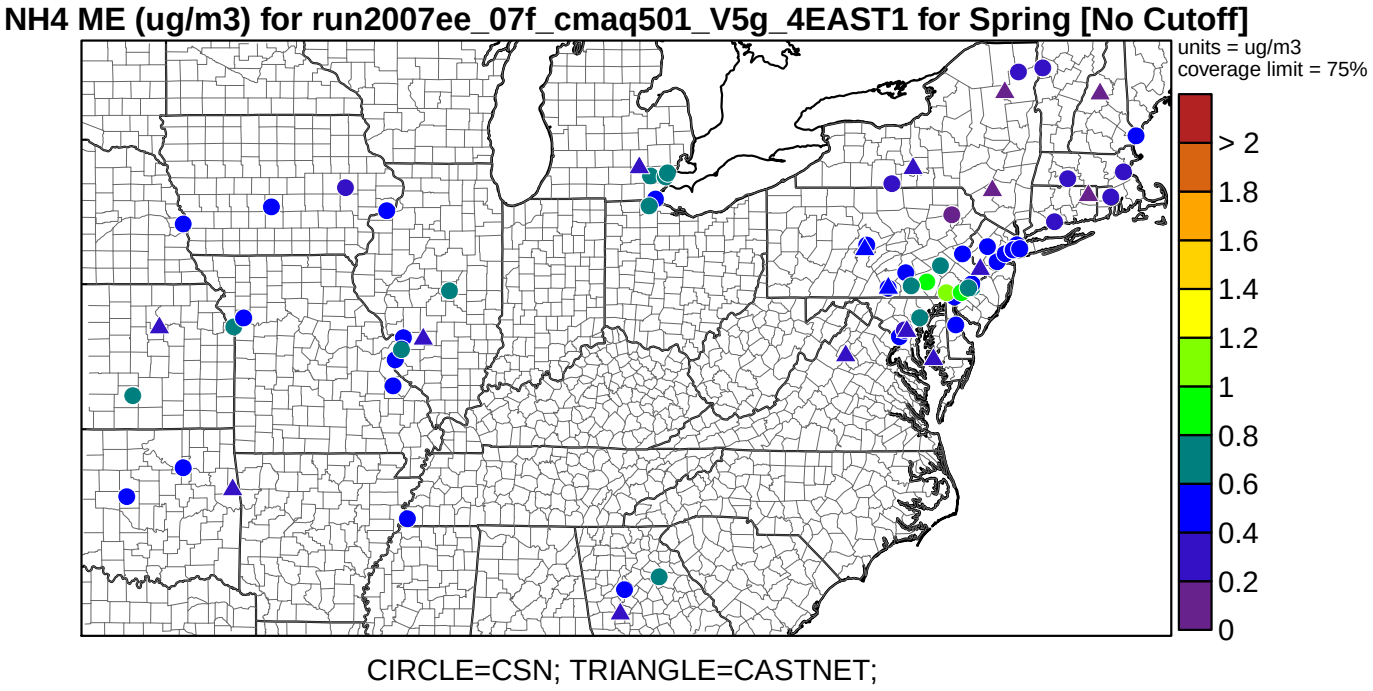

Figure 22: Mean error for Spring NH4

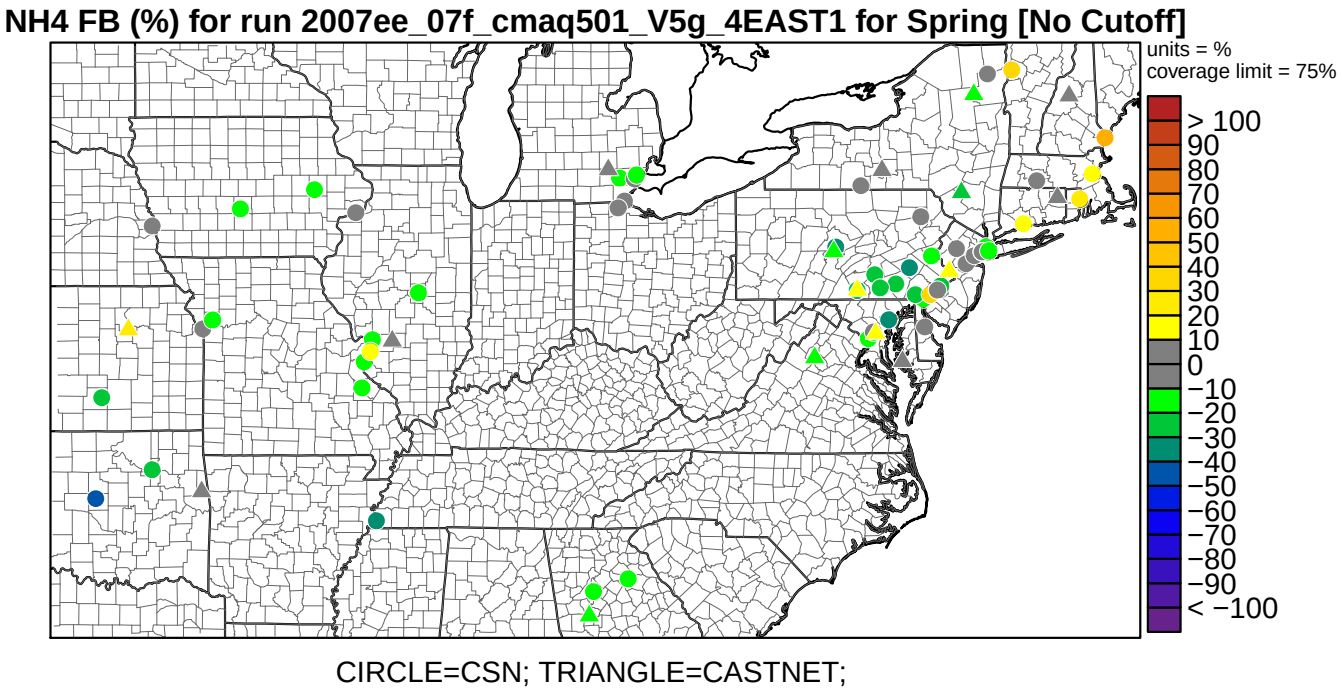

Figure 23: Fractional bias for Spring NH4

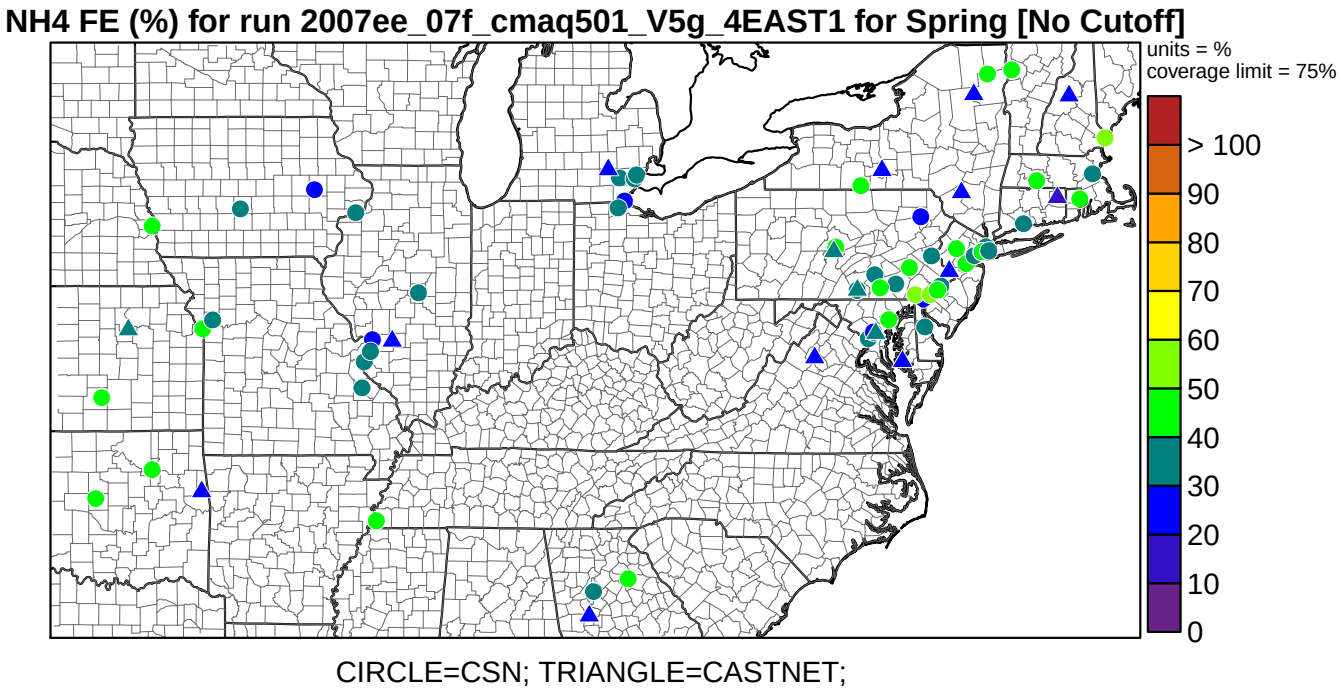

Figure 24: Fractional error for Spring NH4

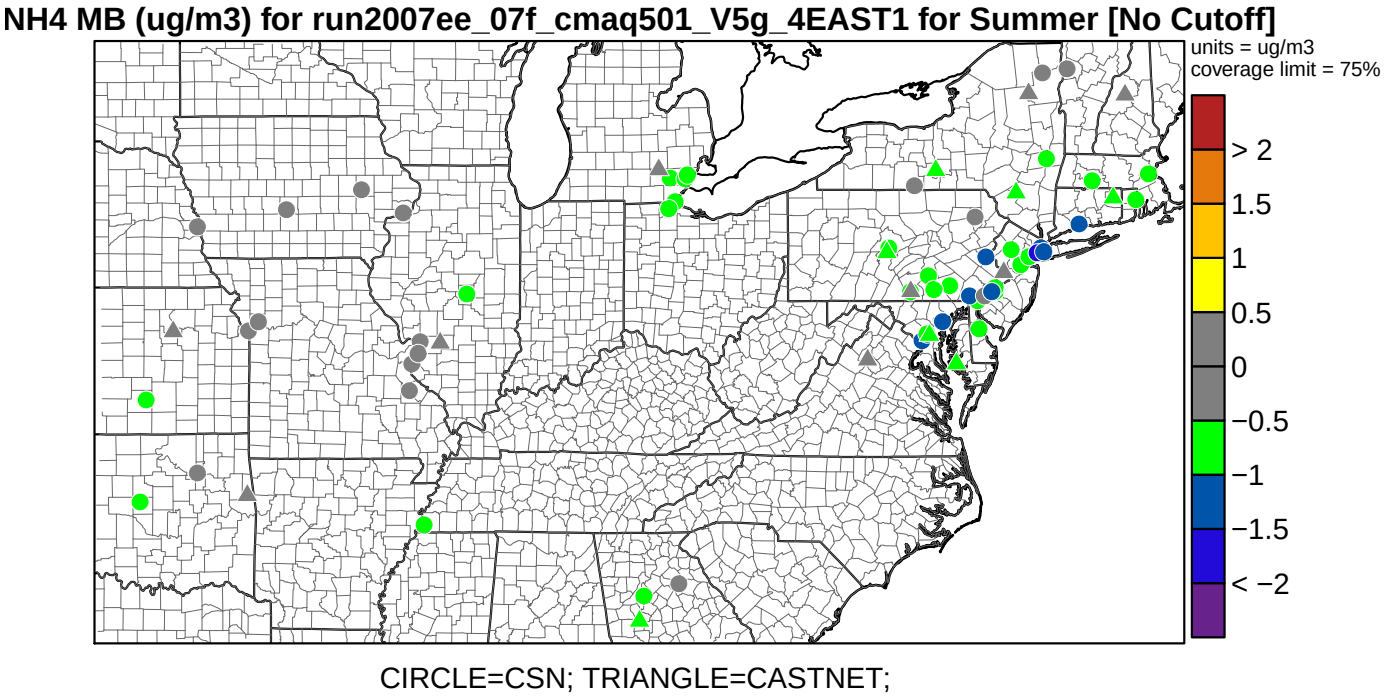

Figure 25: Mean bias for Summer NH4

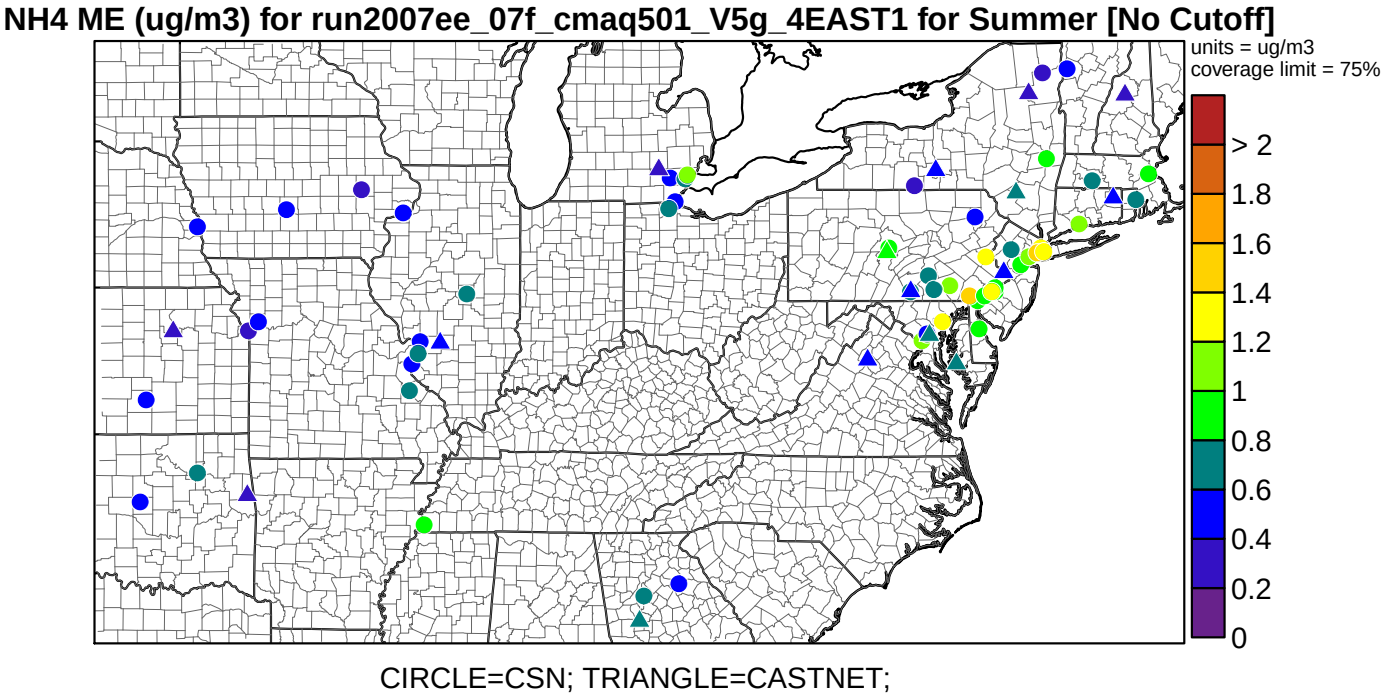

Figure 26: Mean error for Summer NH4

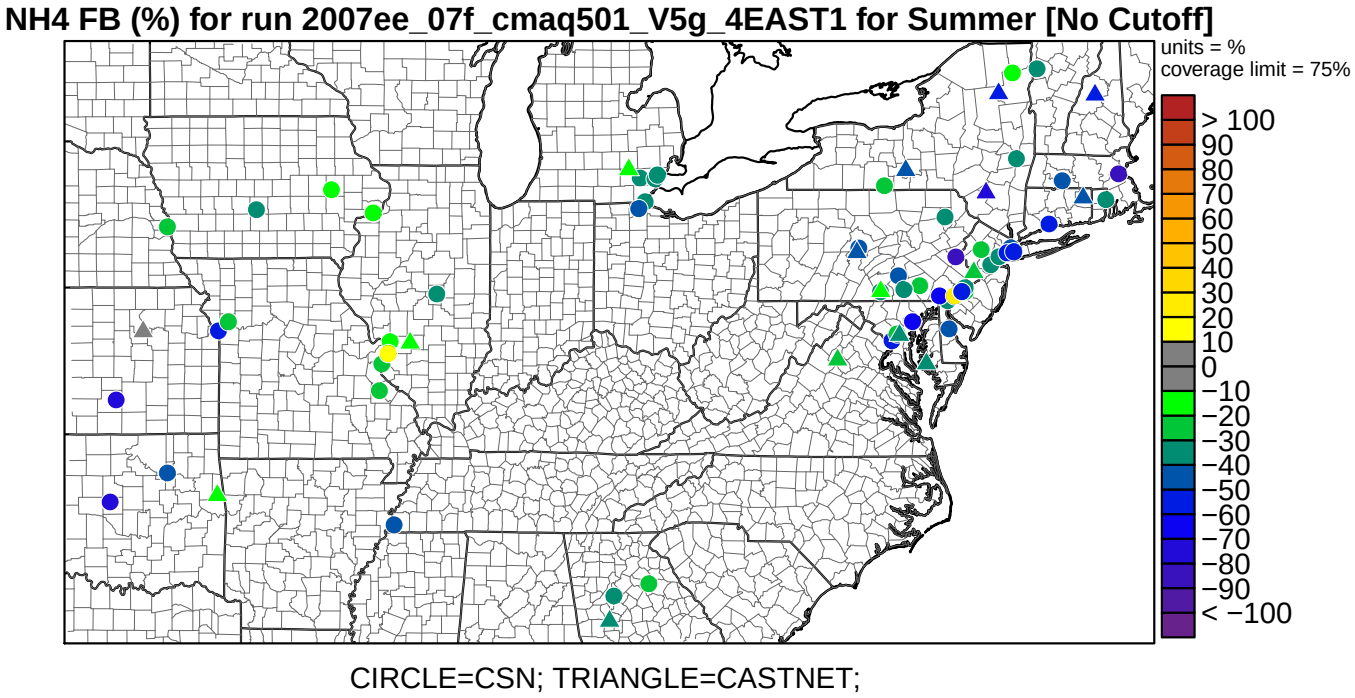

Figure 27: Fractional bias for Summer NH4

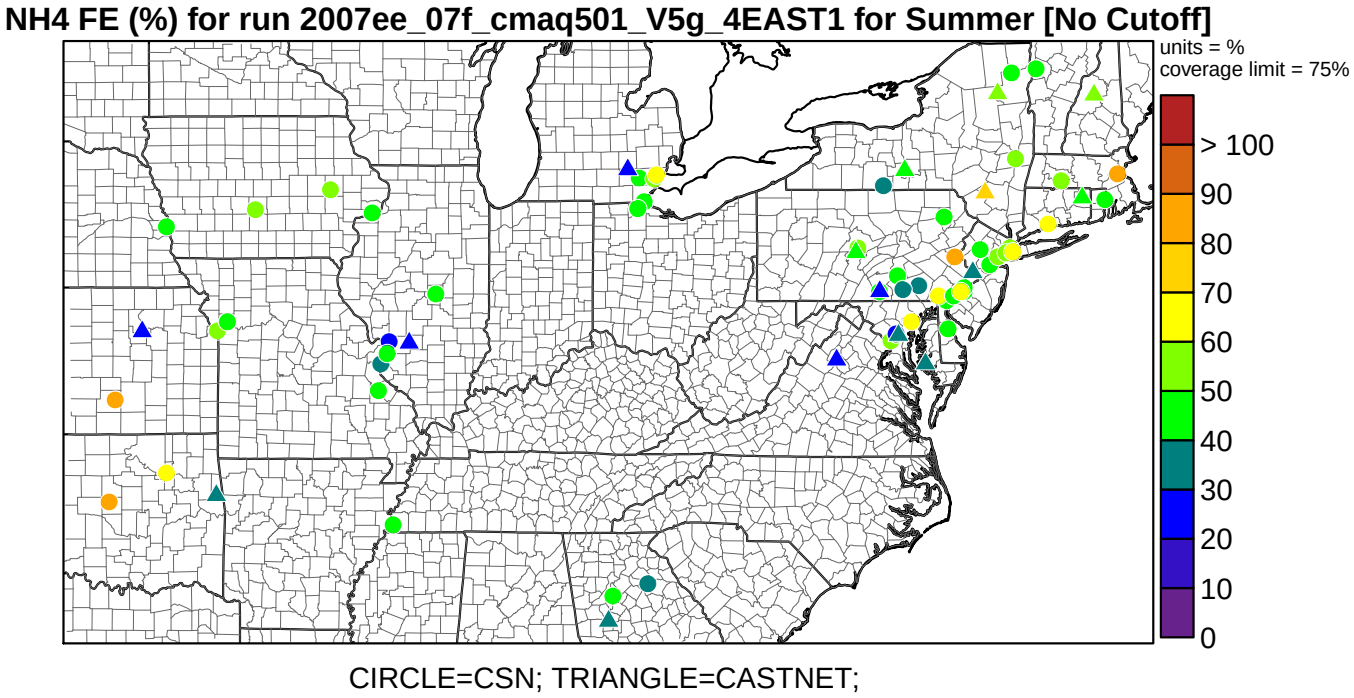

Figure 28: Fractional error for Summer NH4

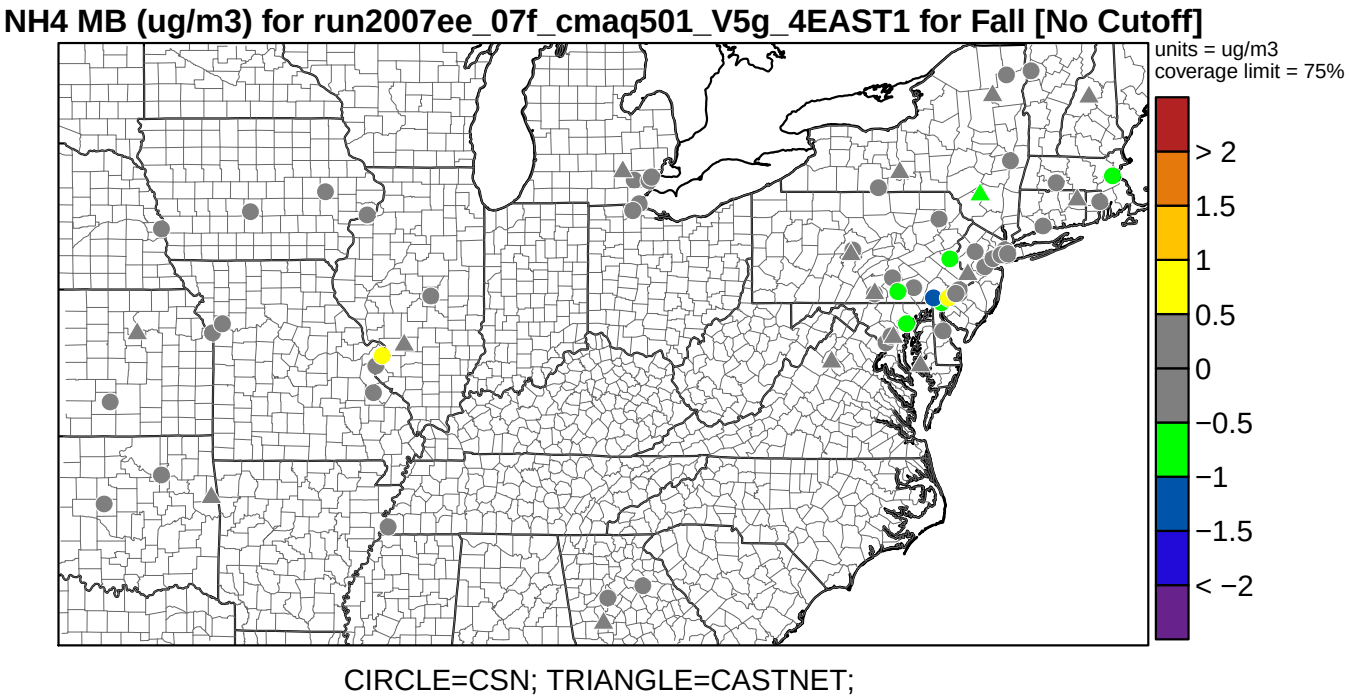

Figure 29: Mean bias for Fall NH4

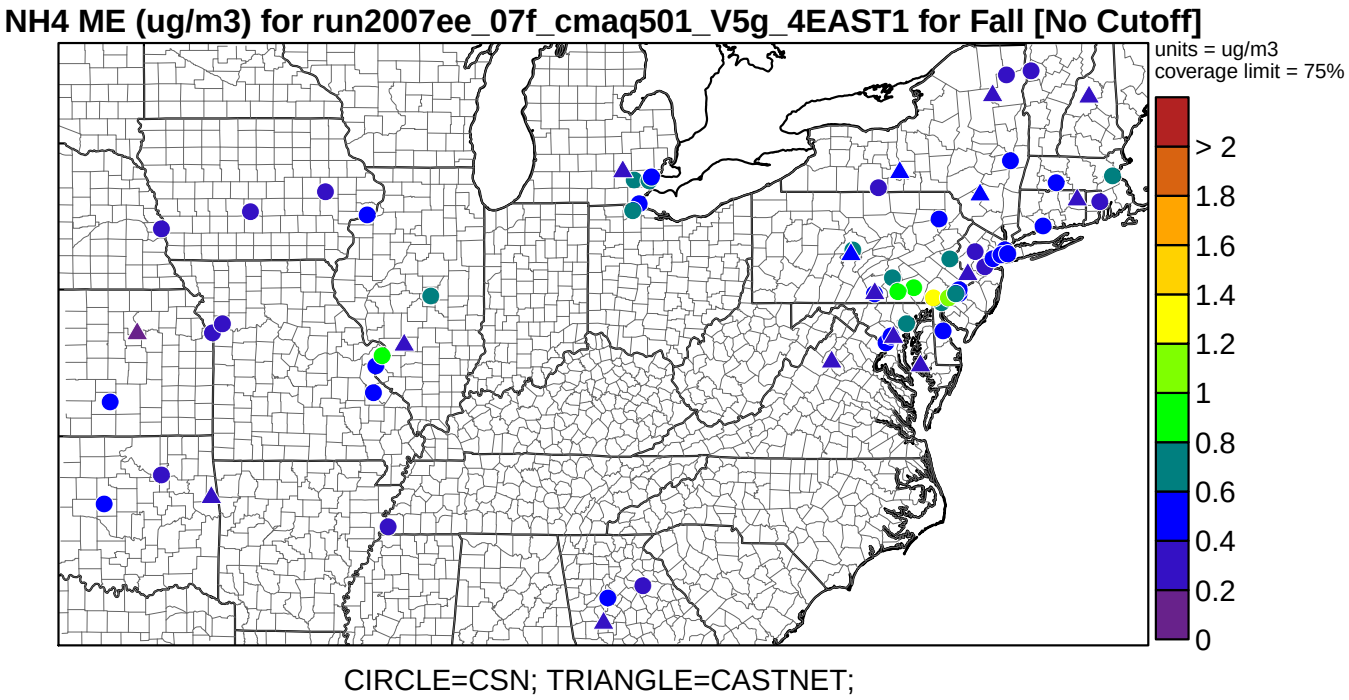

Figure 30: Mean error for Fall NH4

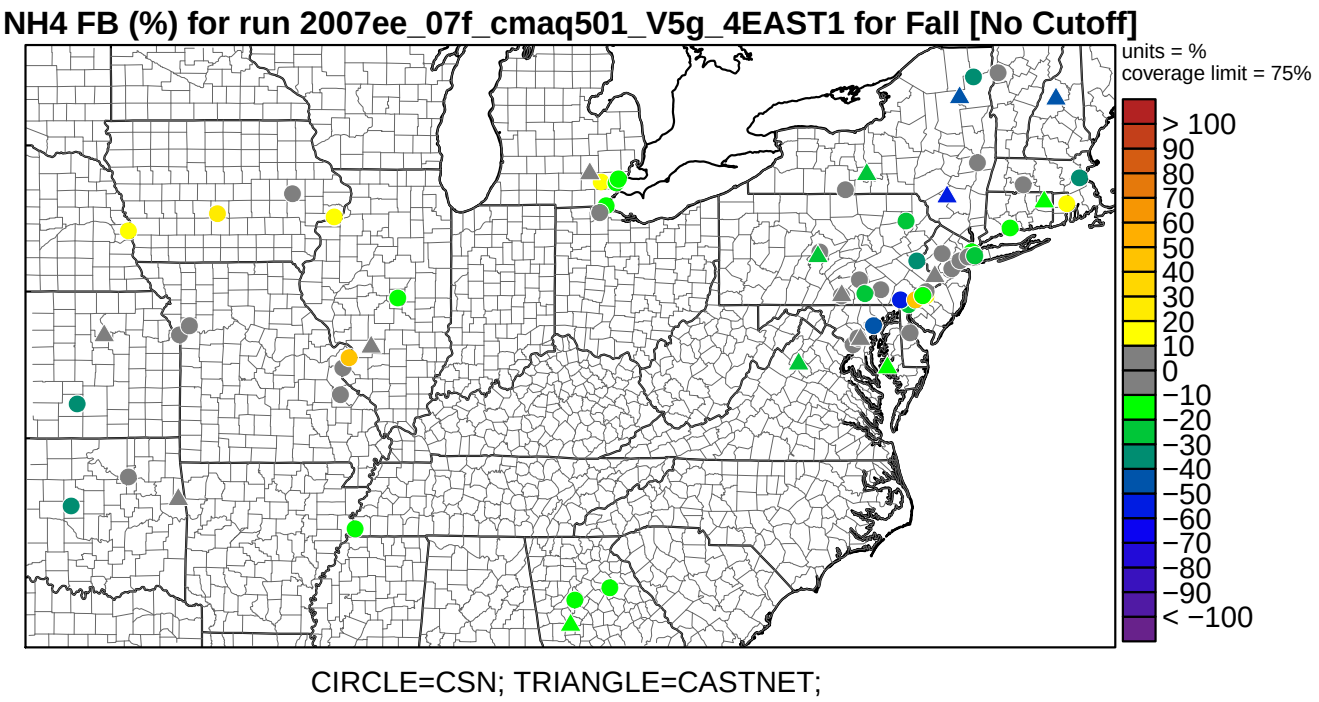

Figure 31: Fractional bias for Fall NH4

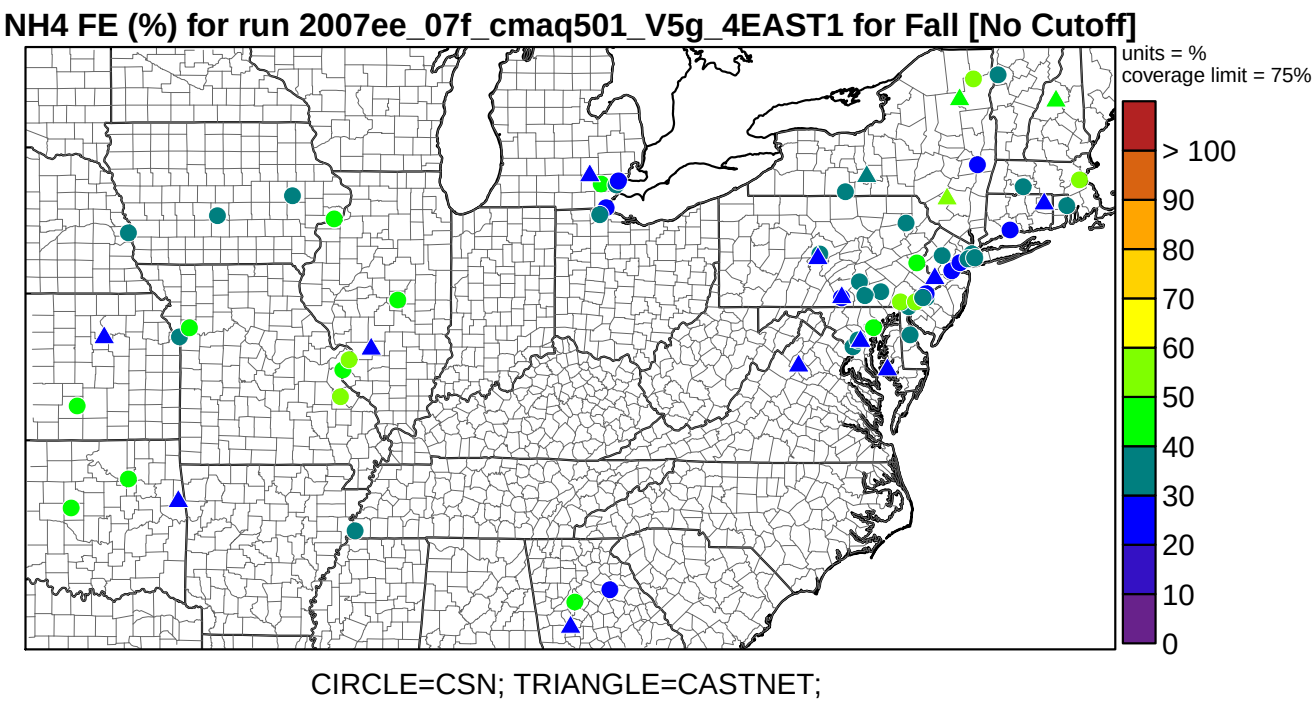

Figure 32: Fractional error for Fall NH4

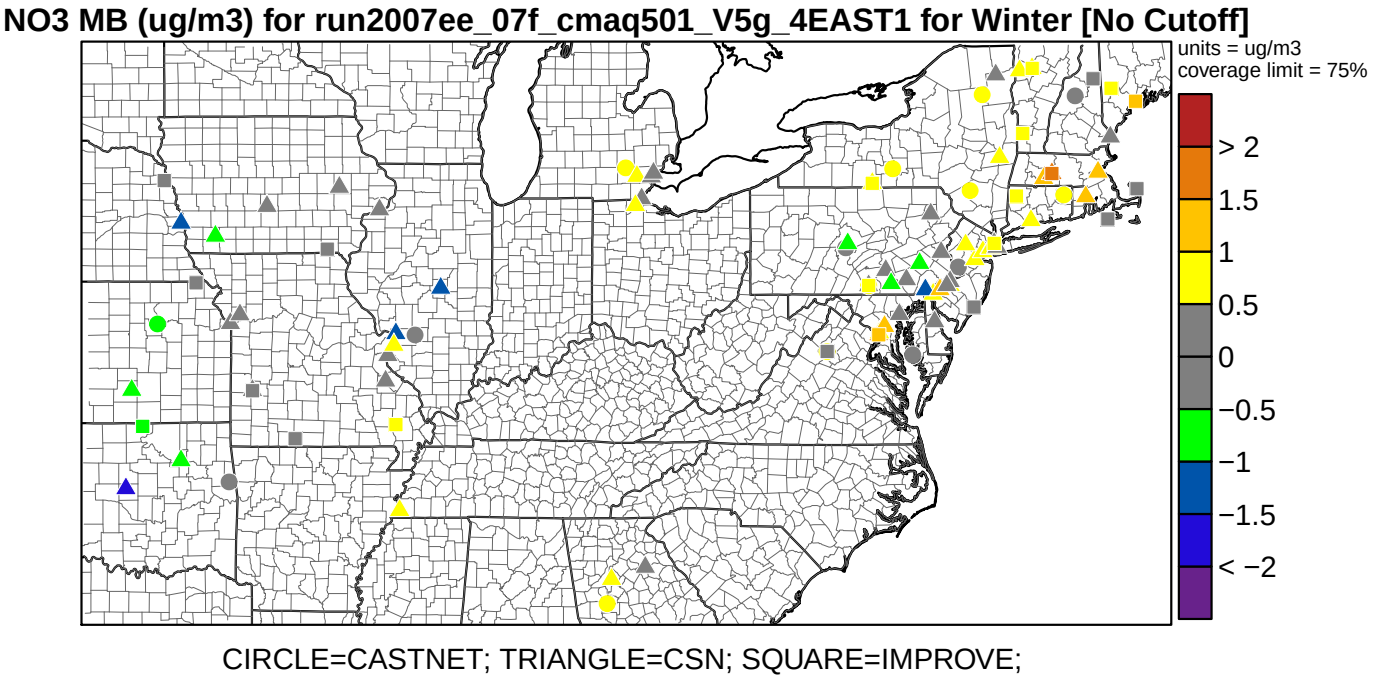

Figure 33: Mean bias for Winter NO3

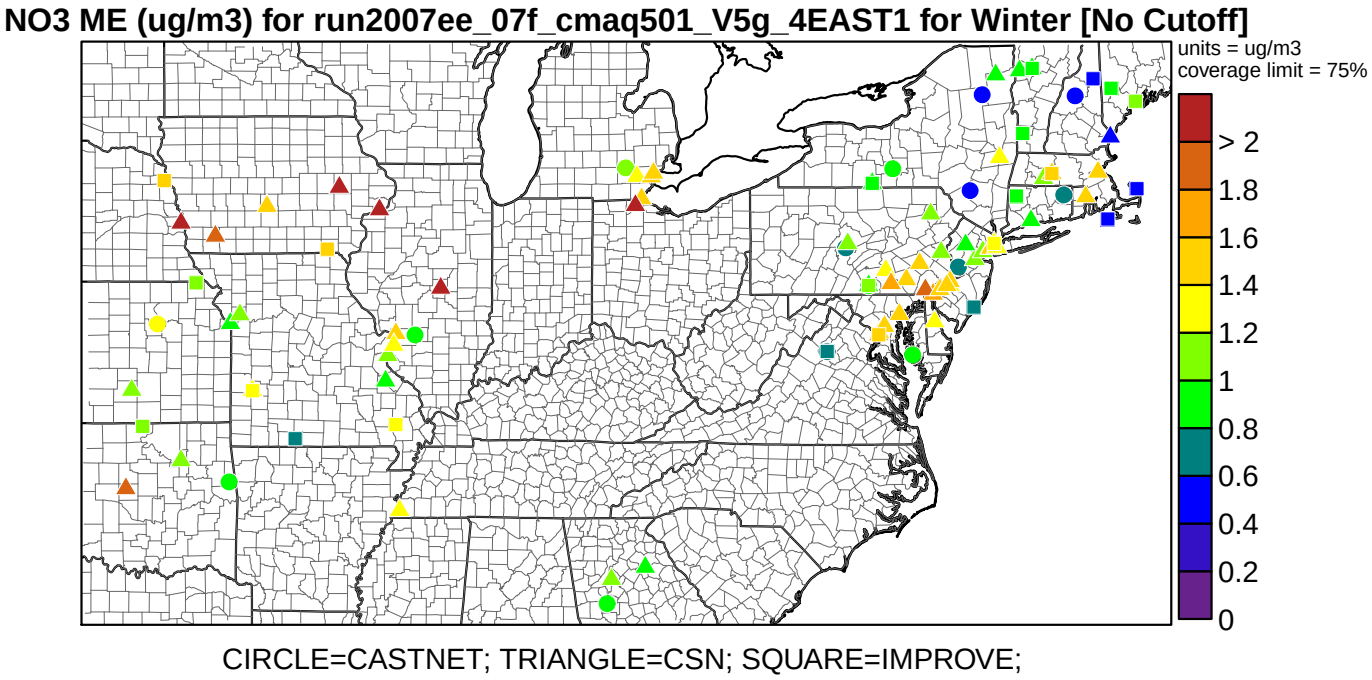

Figure 34: Mean error for Winter NO3

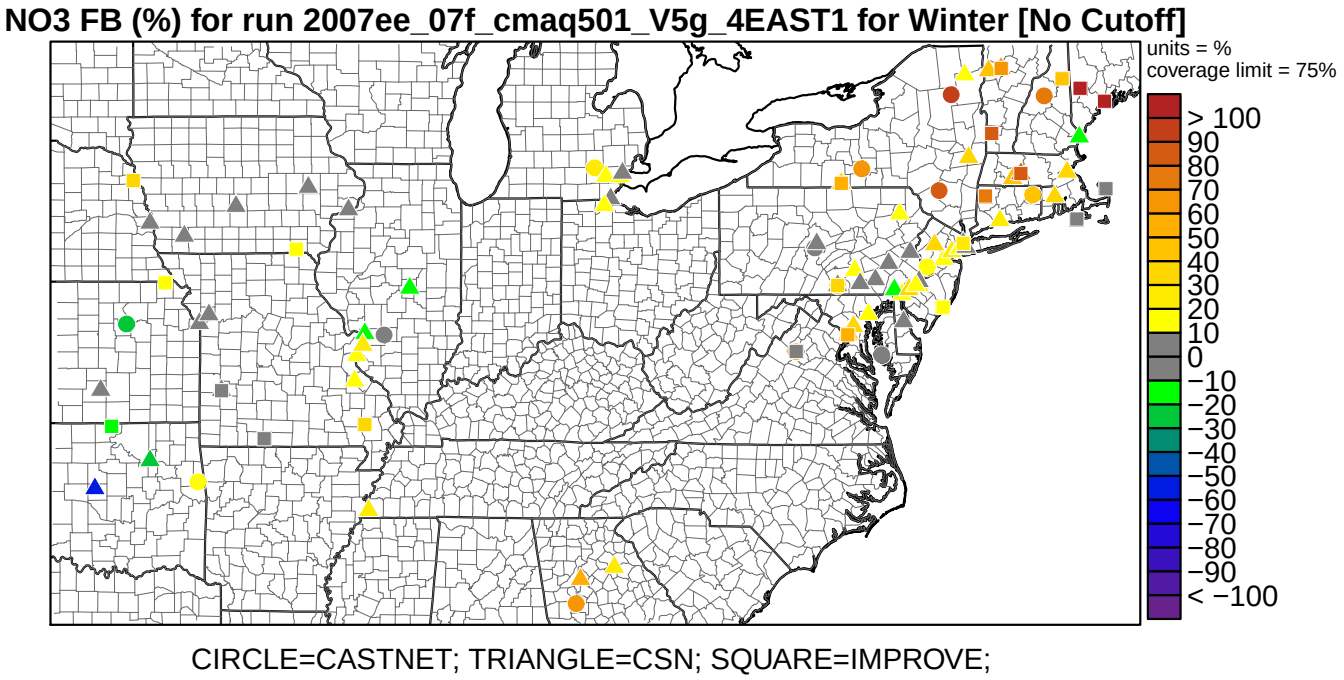

Figure 35: Fractional bias for Winter NO3

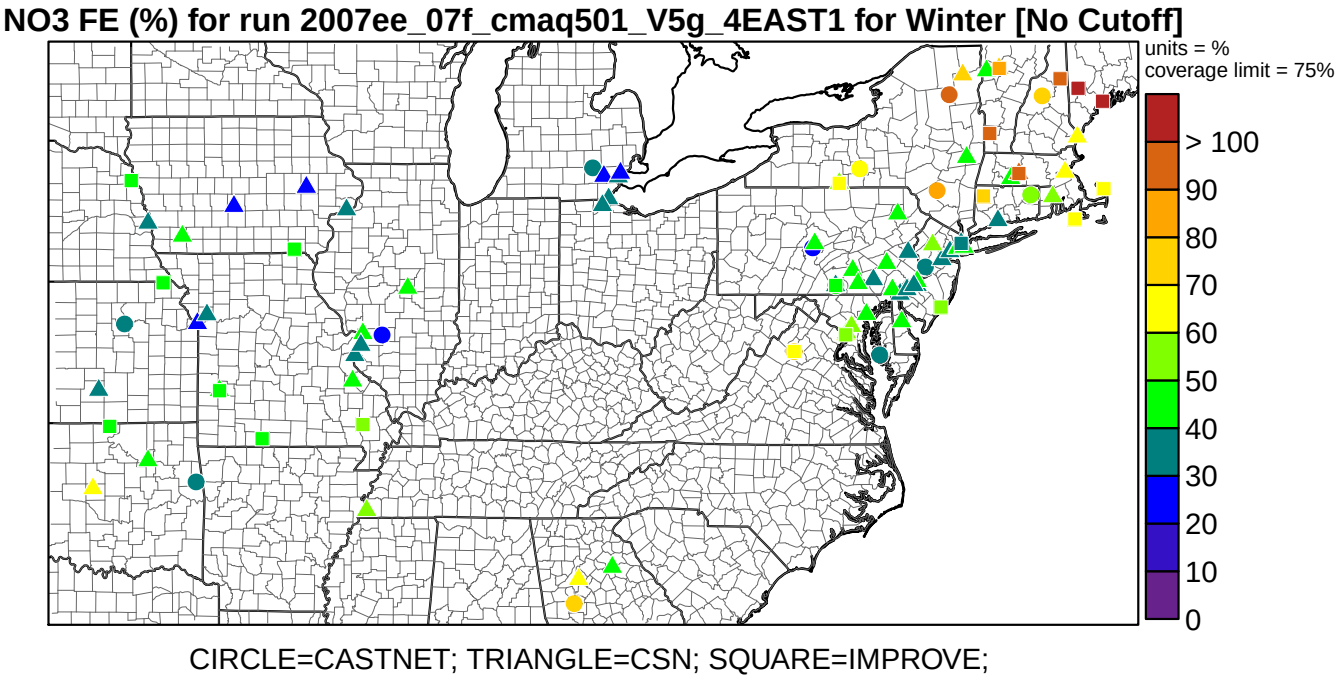

Figure 36: Fractional error for Winter NO3

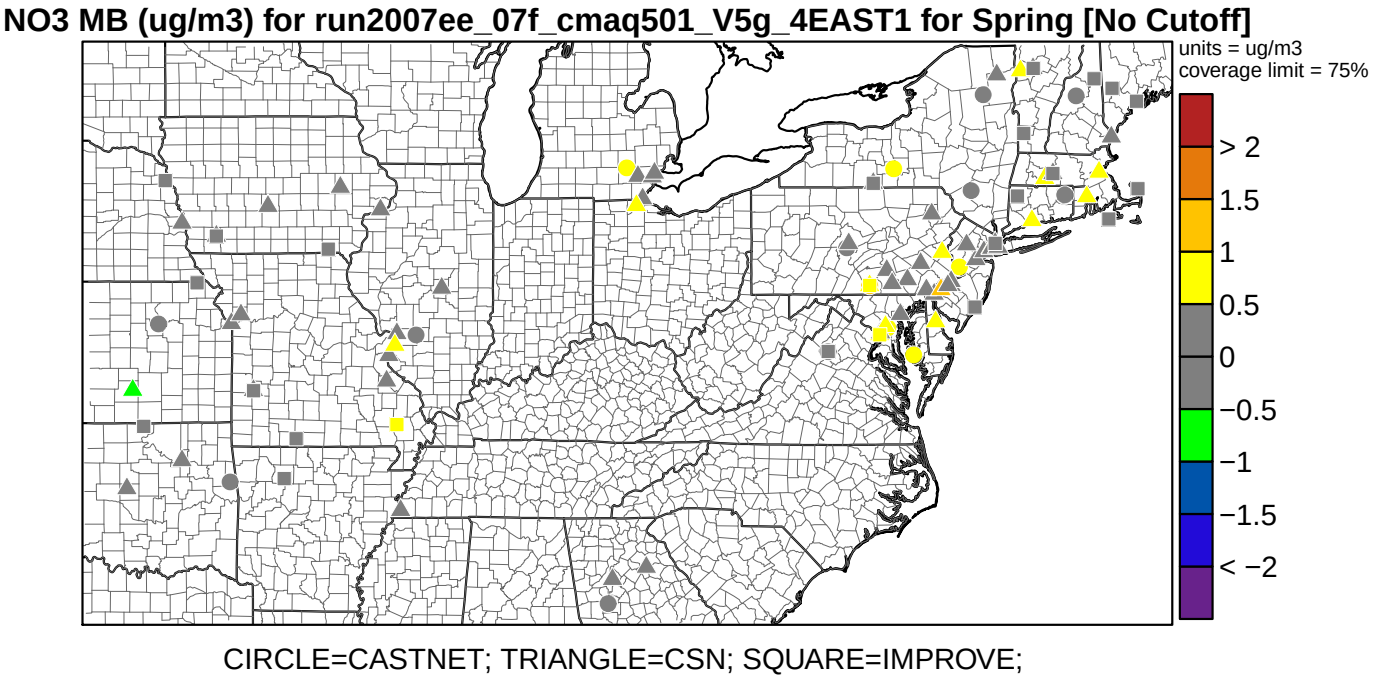

Figure 37: Mean bias for Spring NO3

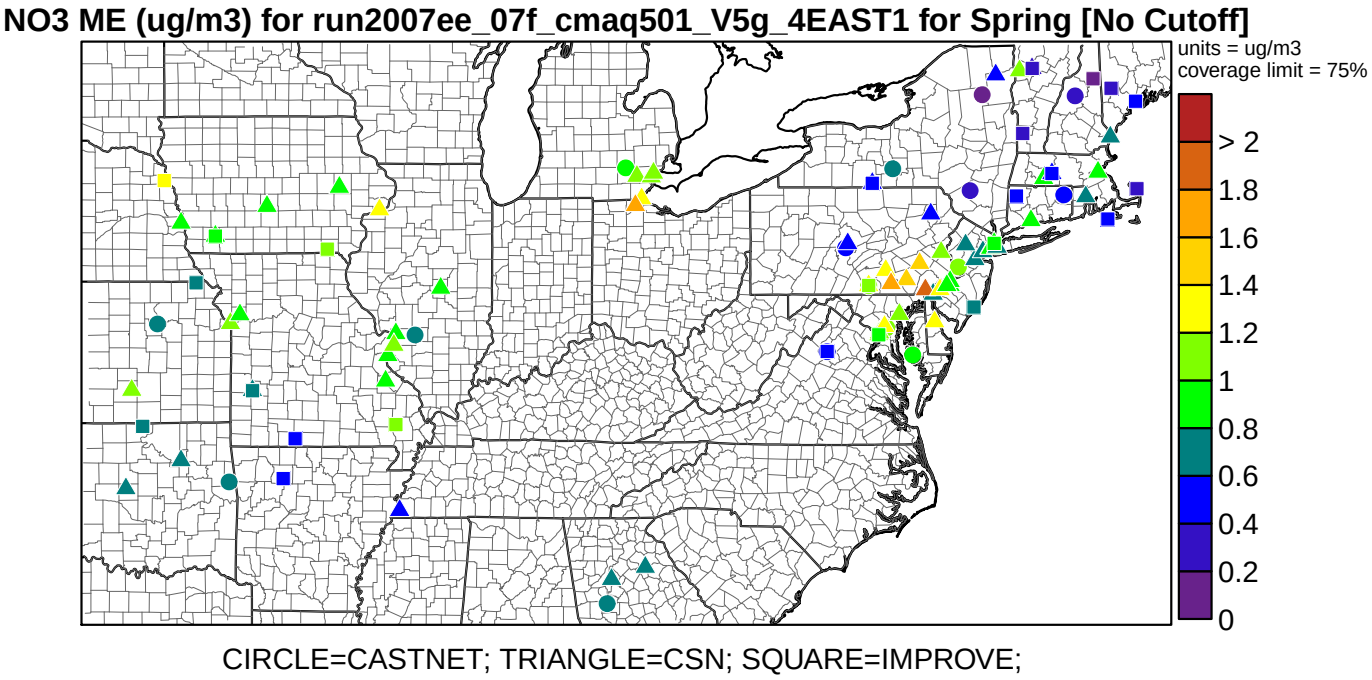

Figure 38: Mean error for Spring NO3

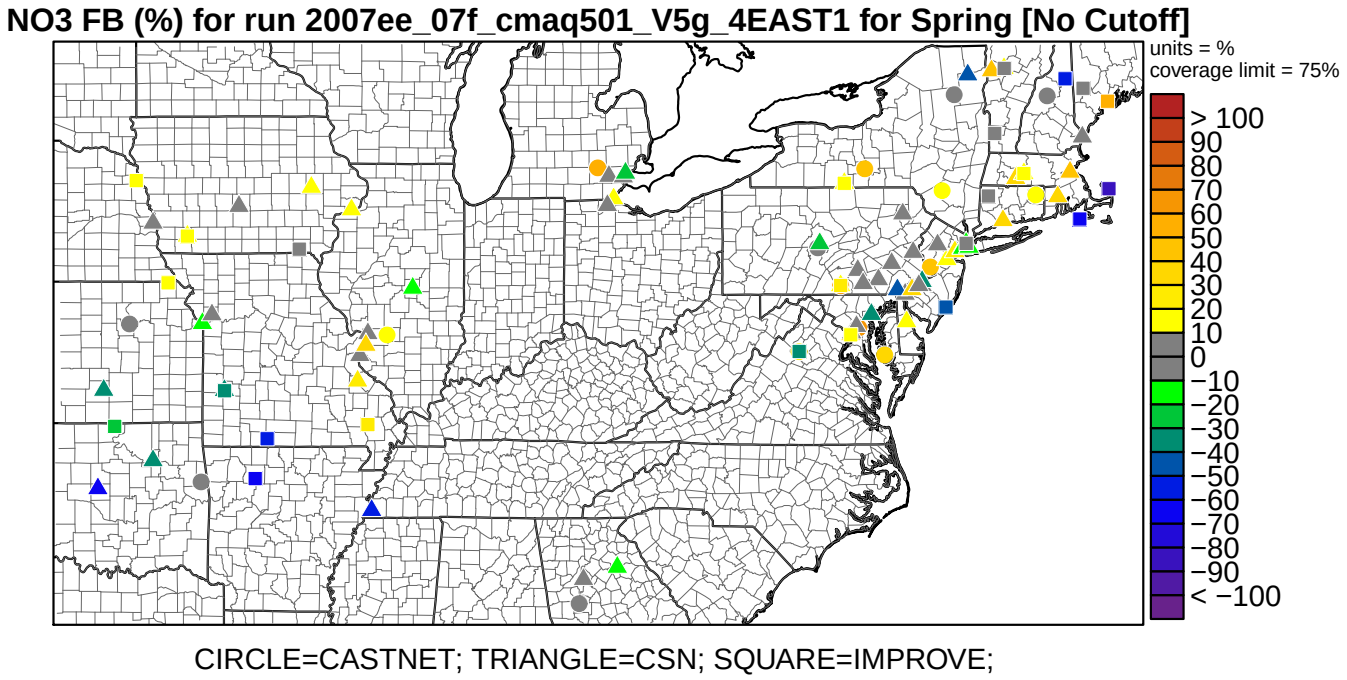

Figure 39: Fractional bias for Spring NO3

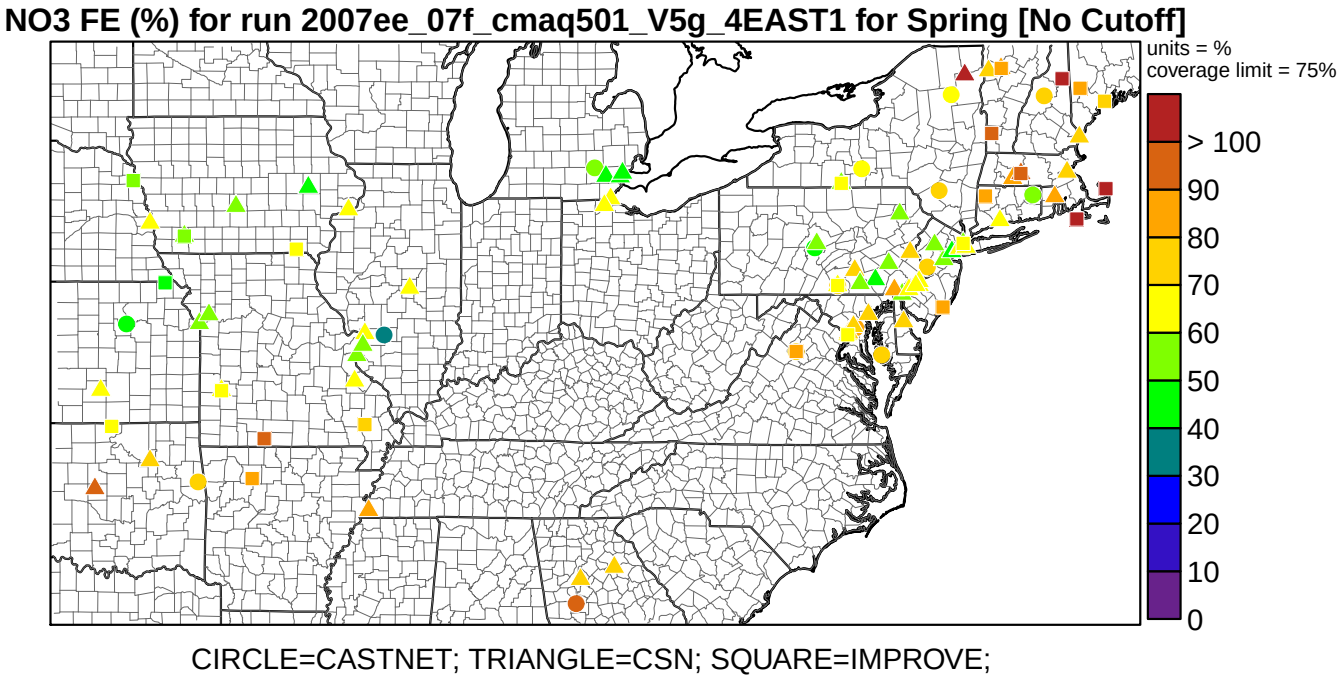

Figure 40: Fractional error for Spring NO3

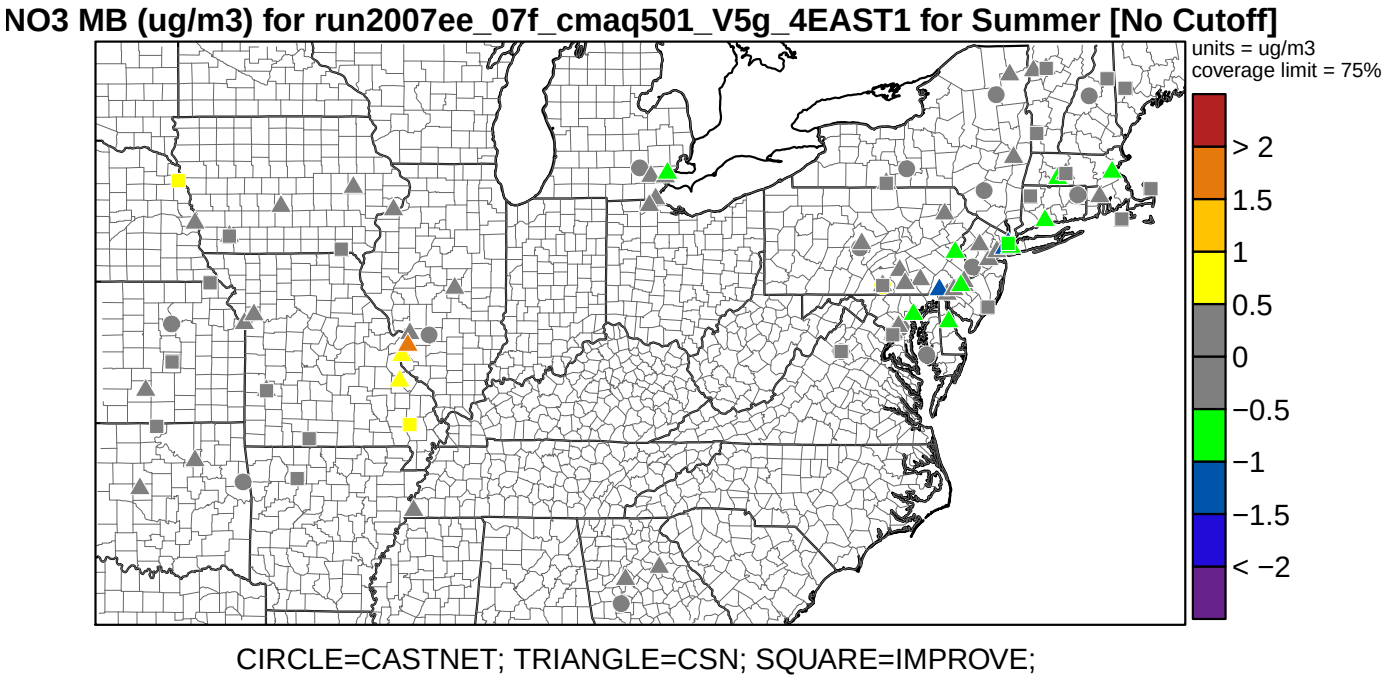

Figure 41: Mean bias for Summer NO3

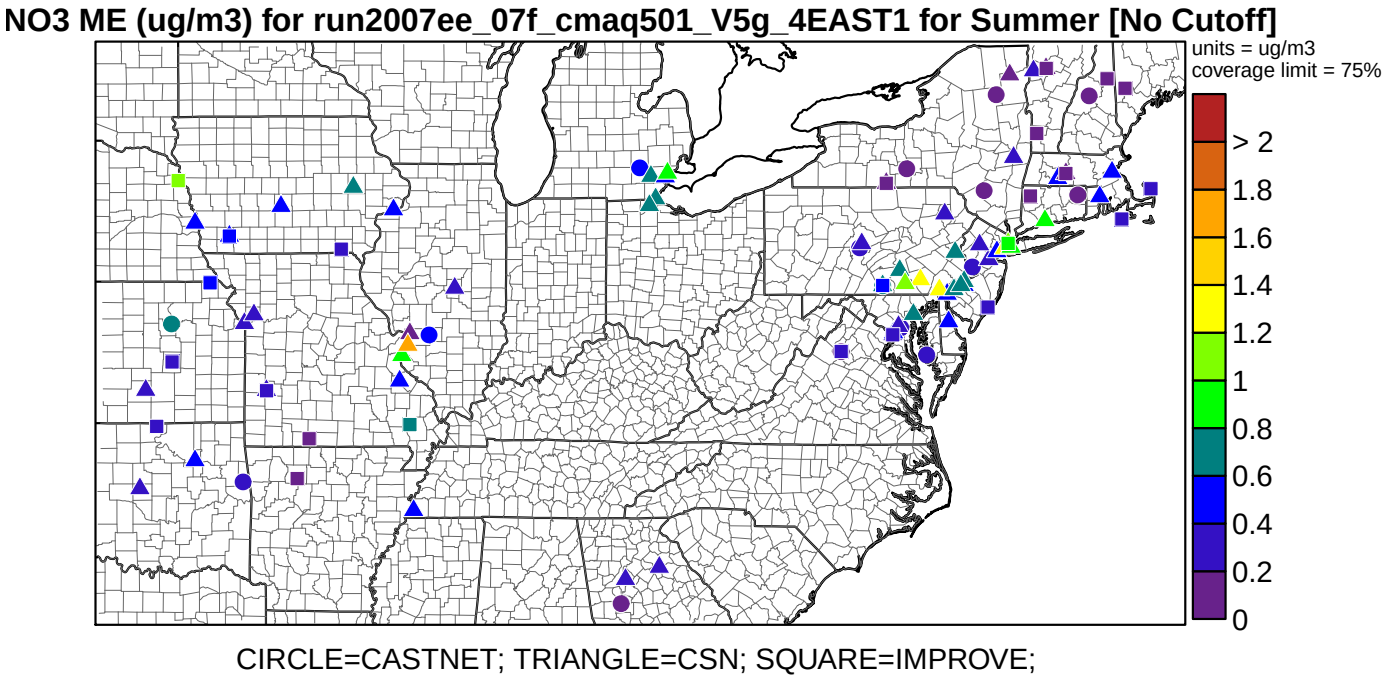

Figure 42: Mean error for Summer NO3

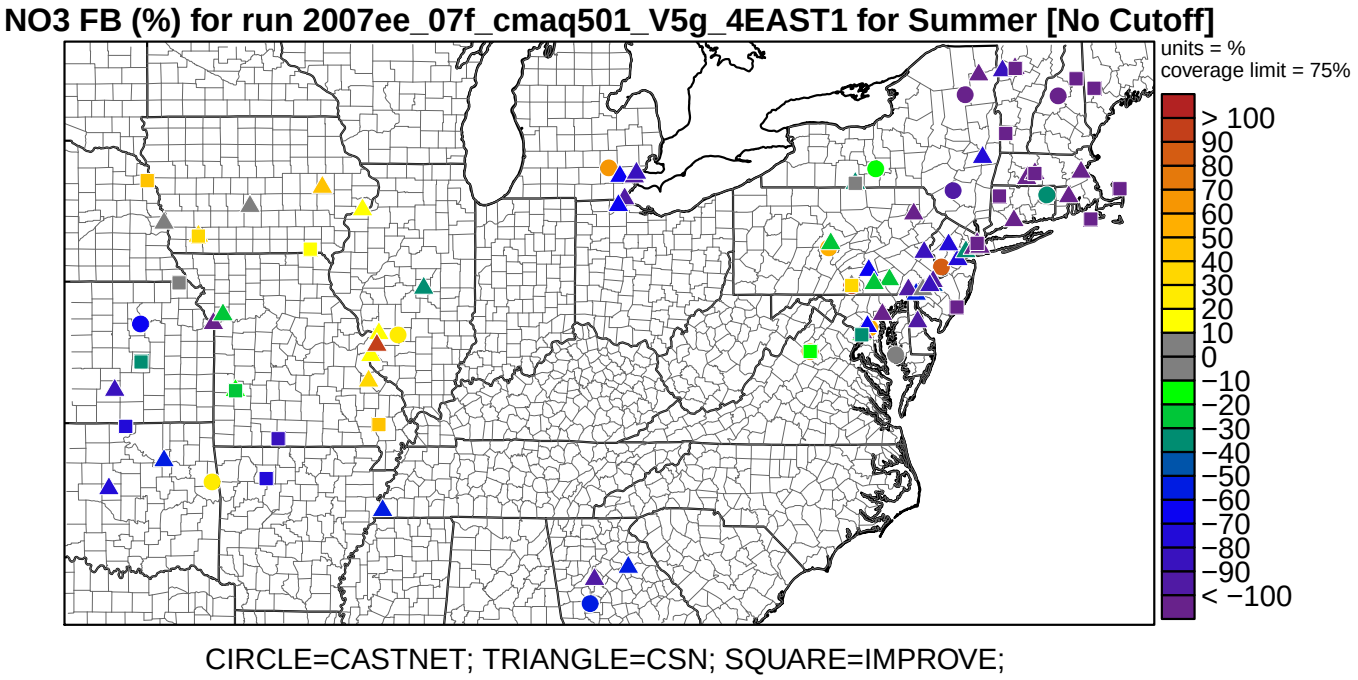

Figure 43: Fractional bias for Summer NO3

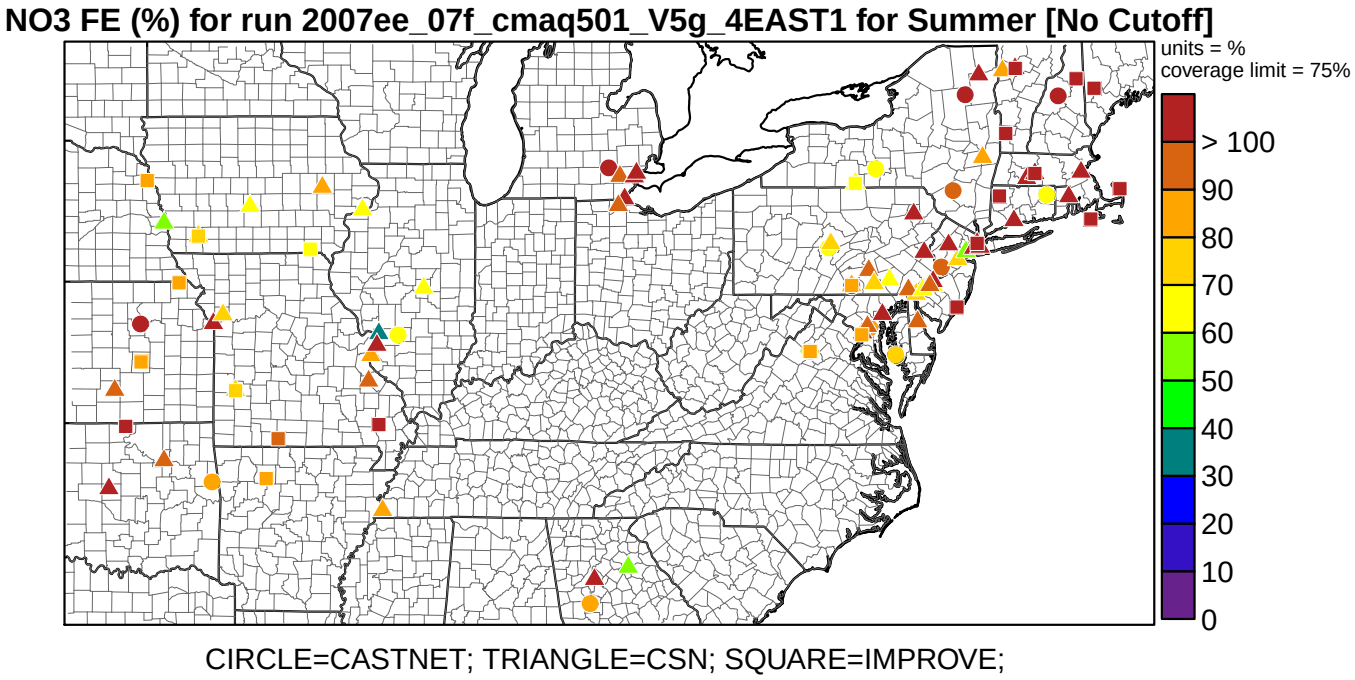

Figure 44: Fractional error for Summer NO3

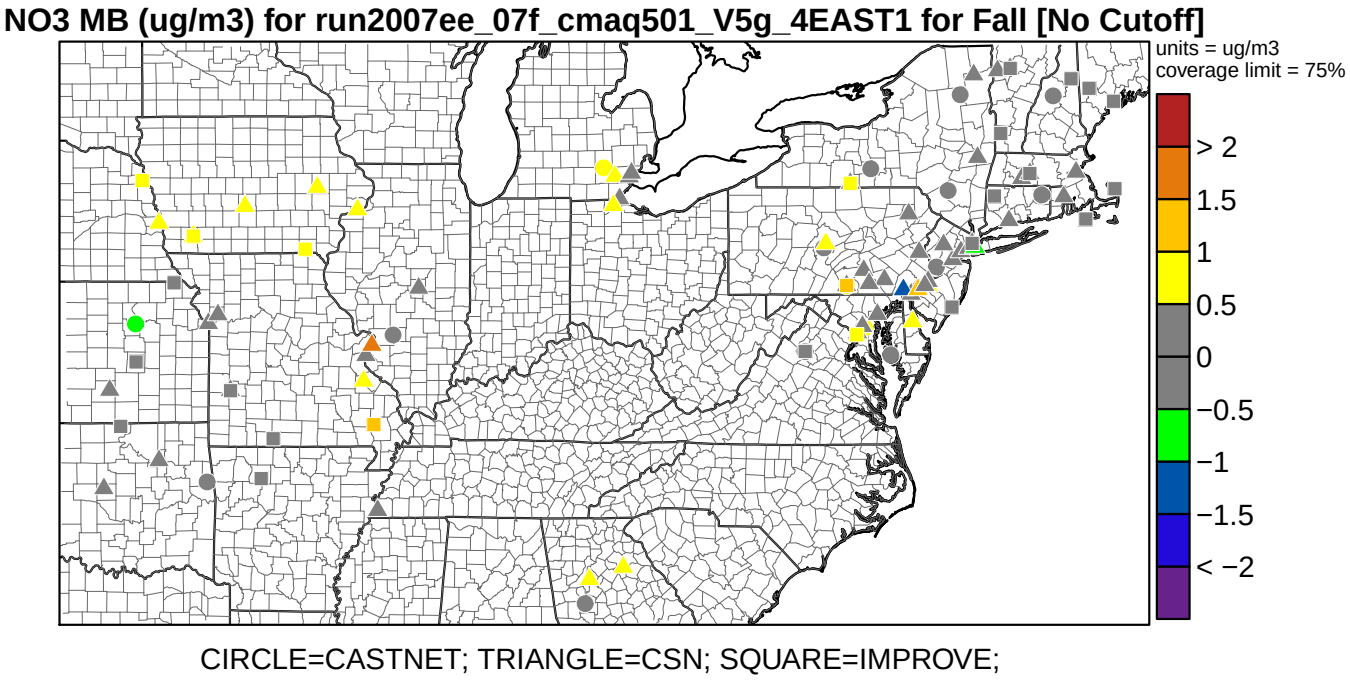

Figure 45: Mean bias for Fall NO3

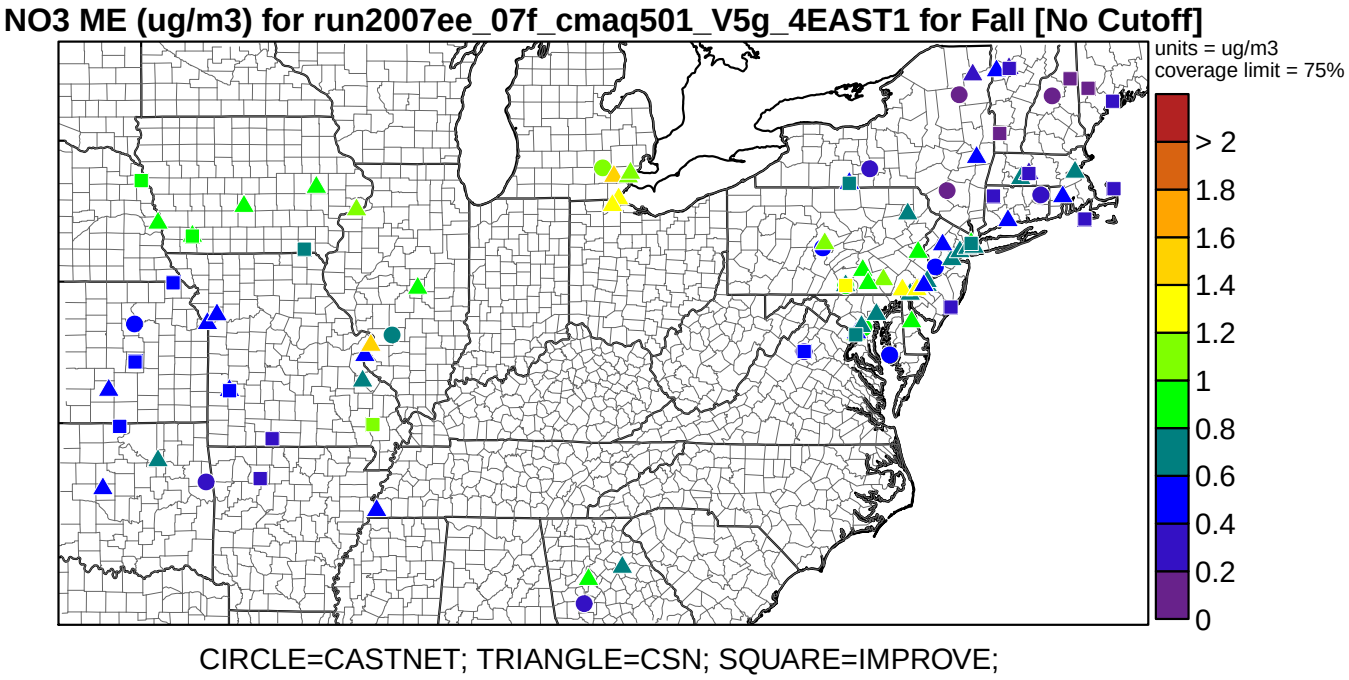

Figure 46: Mean error for Fall NO3

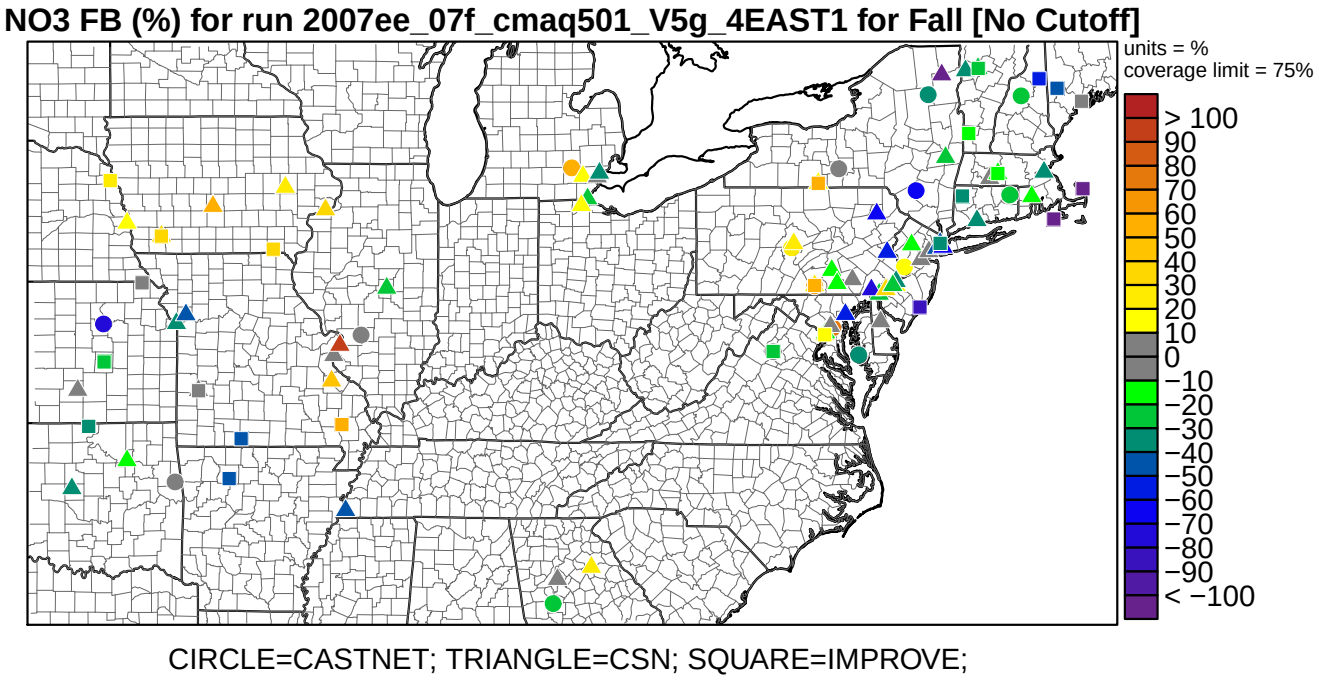

Figure 47: Fractional bias for Fall NO3

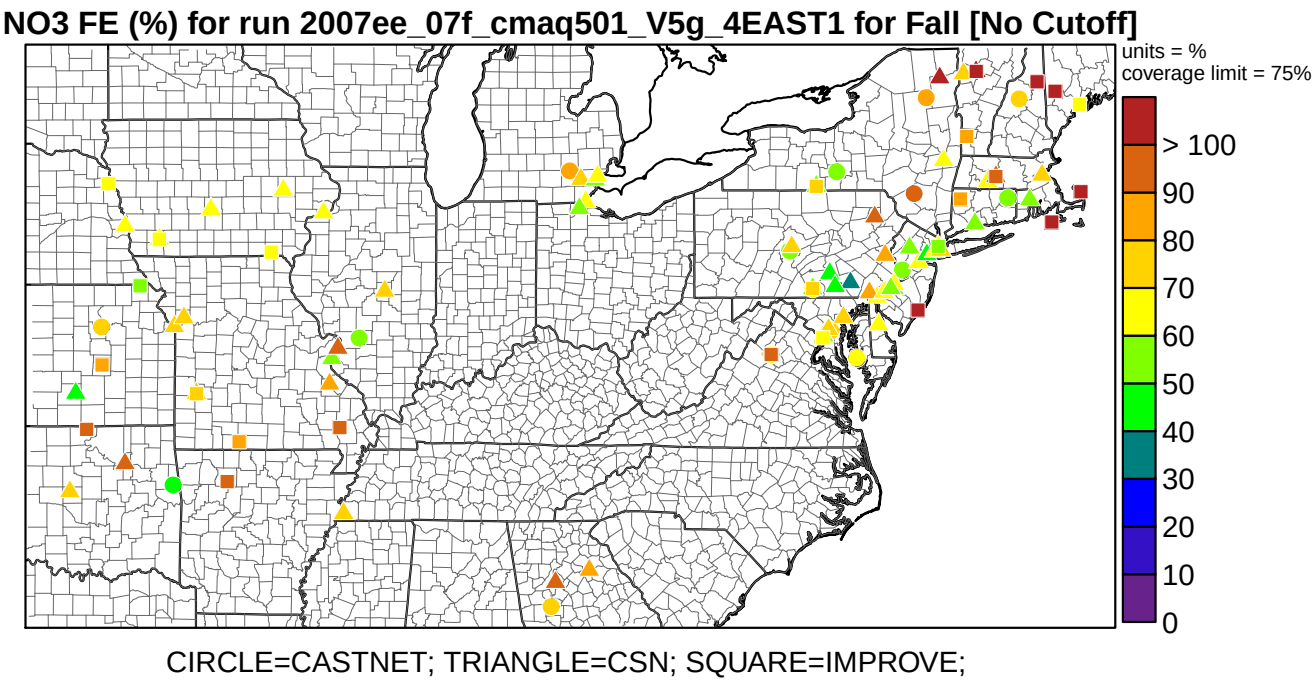

Figure 48: Fractional error for Fall NO3

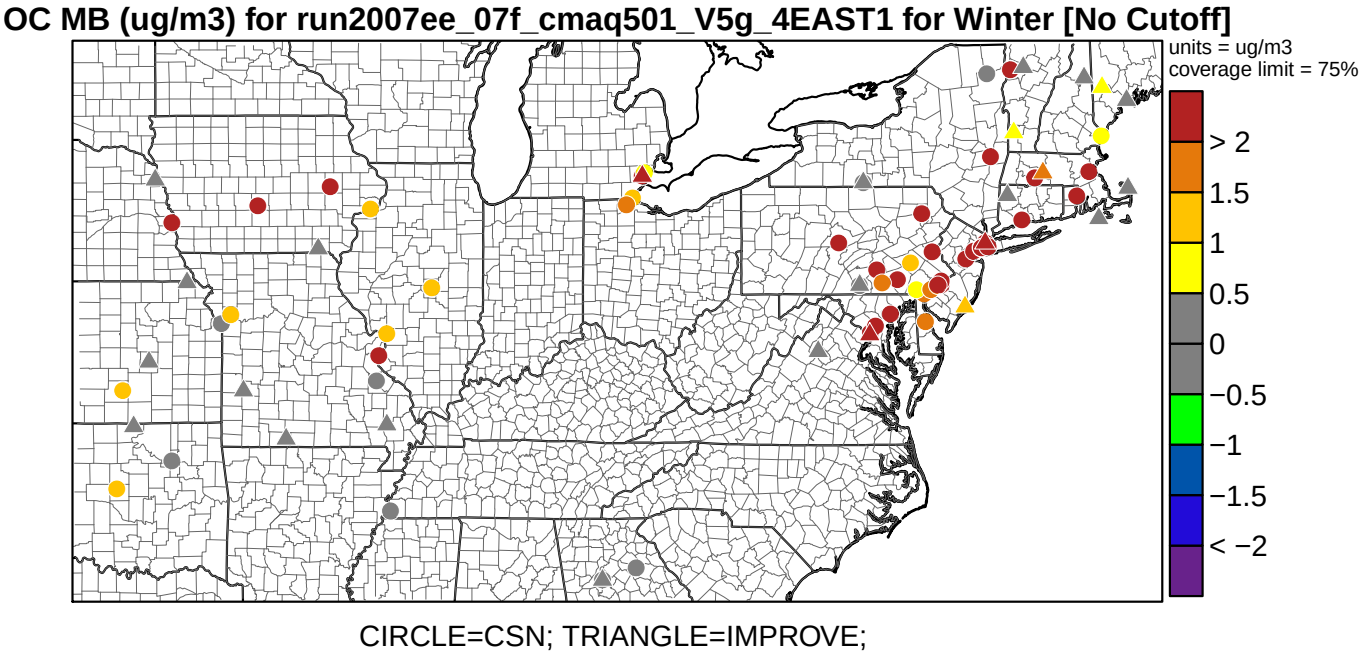

Figure 49: Mean bias for Winter OC

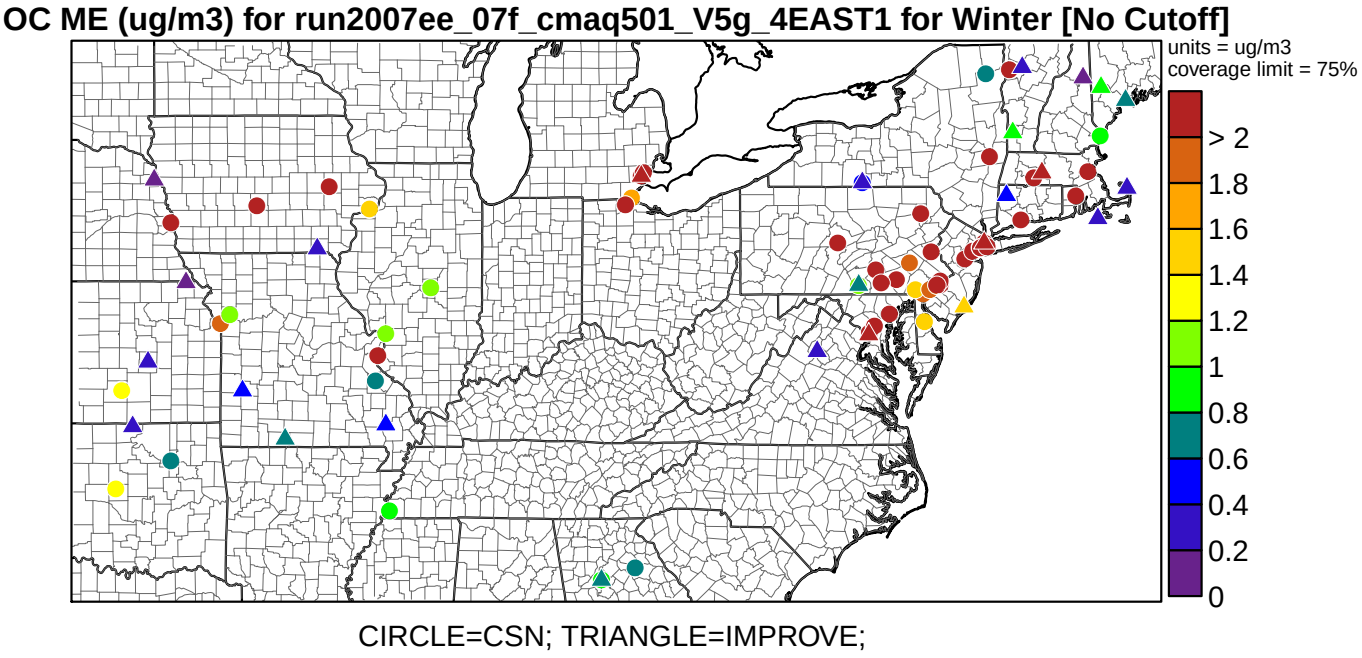

Figure 50: Mean error for Winter OC

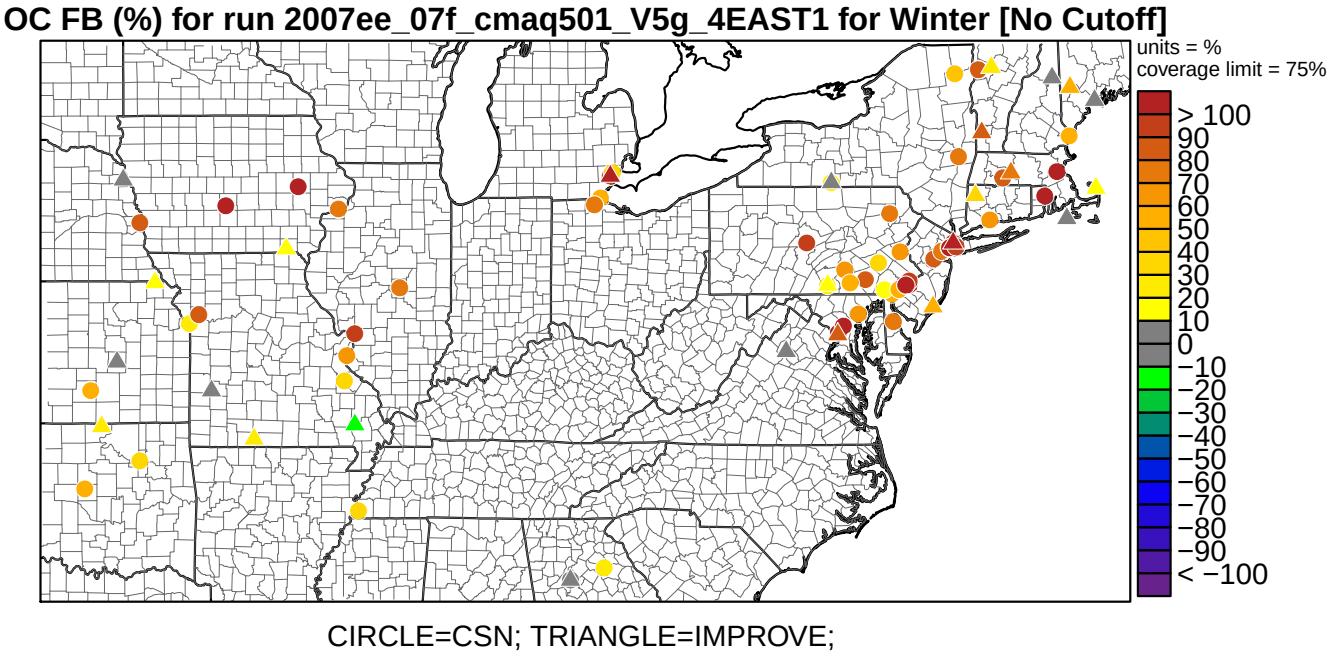

Figure 51: Fractional bias for Winter OC

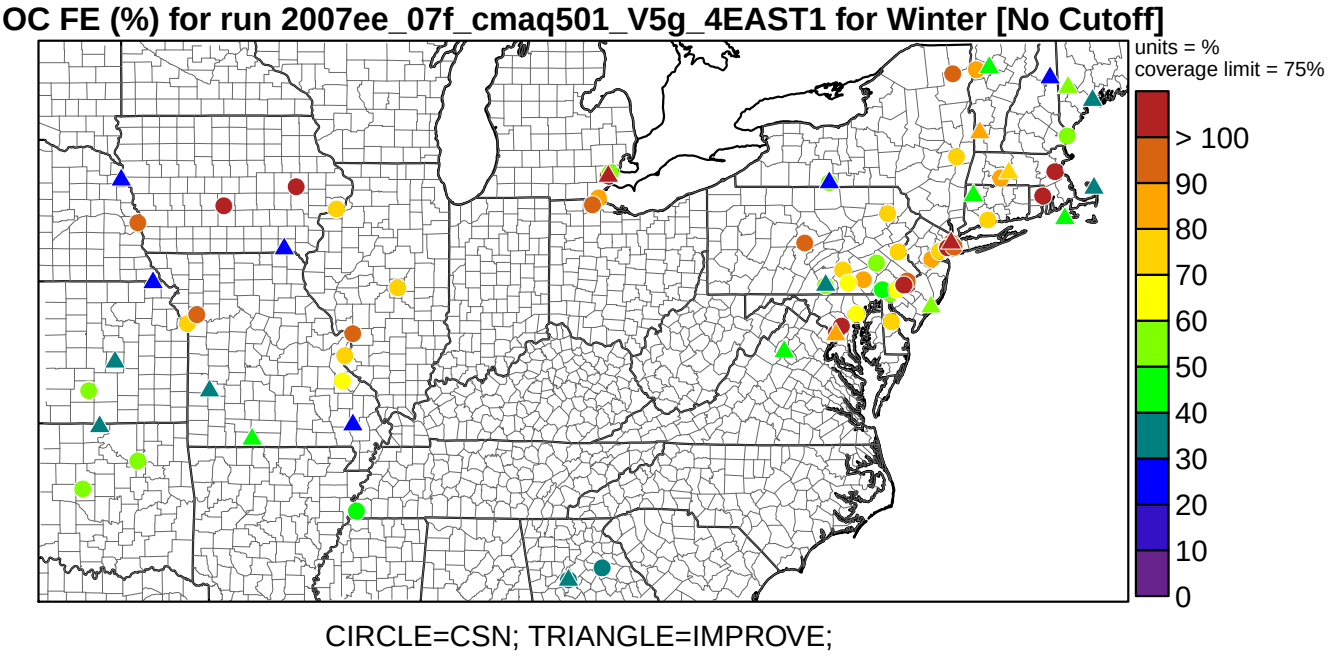

Figure 52: Fractional error for Winter OC

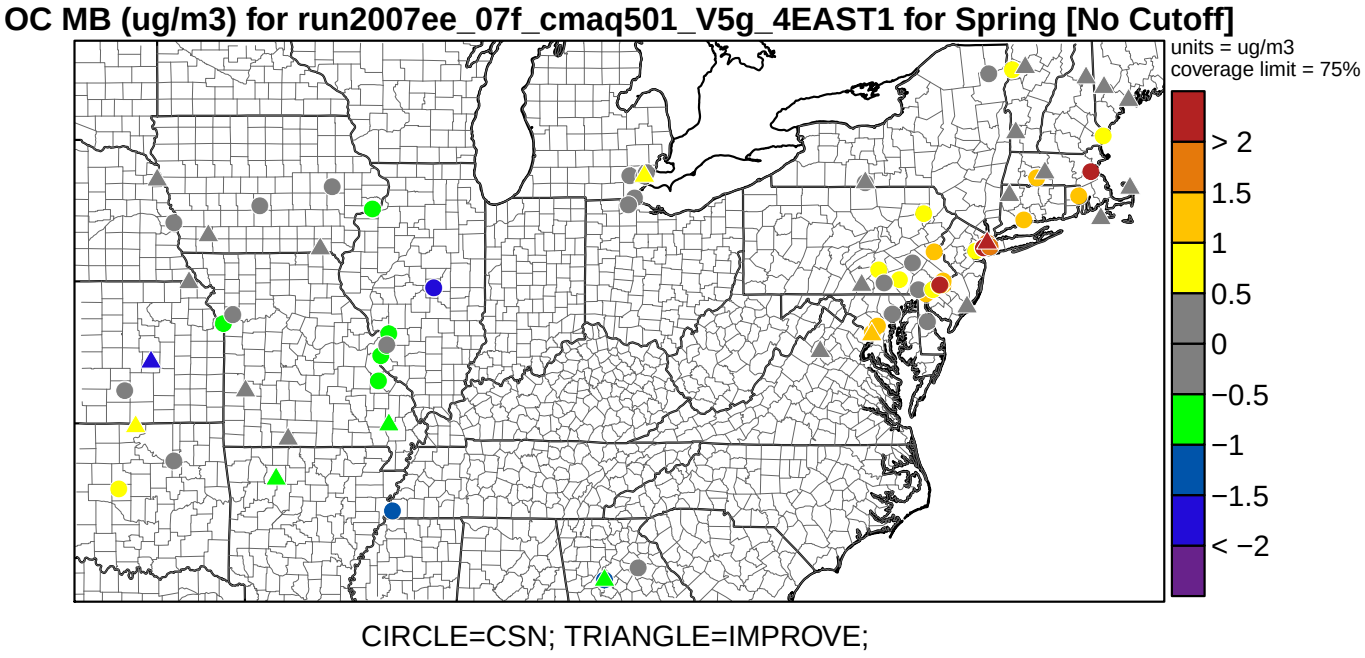

Figure 53: Mean bias for Spring OC

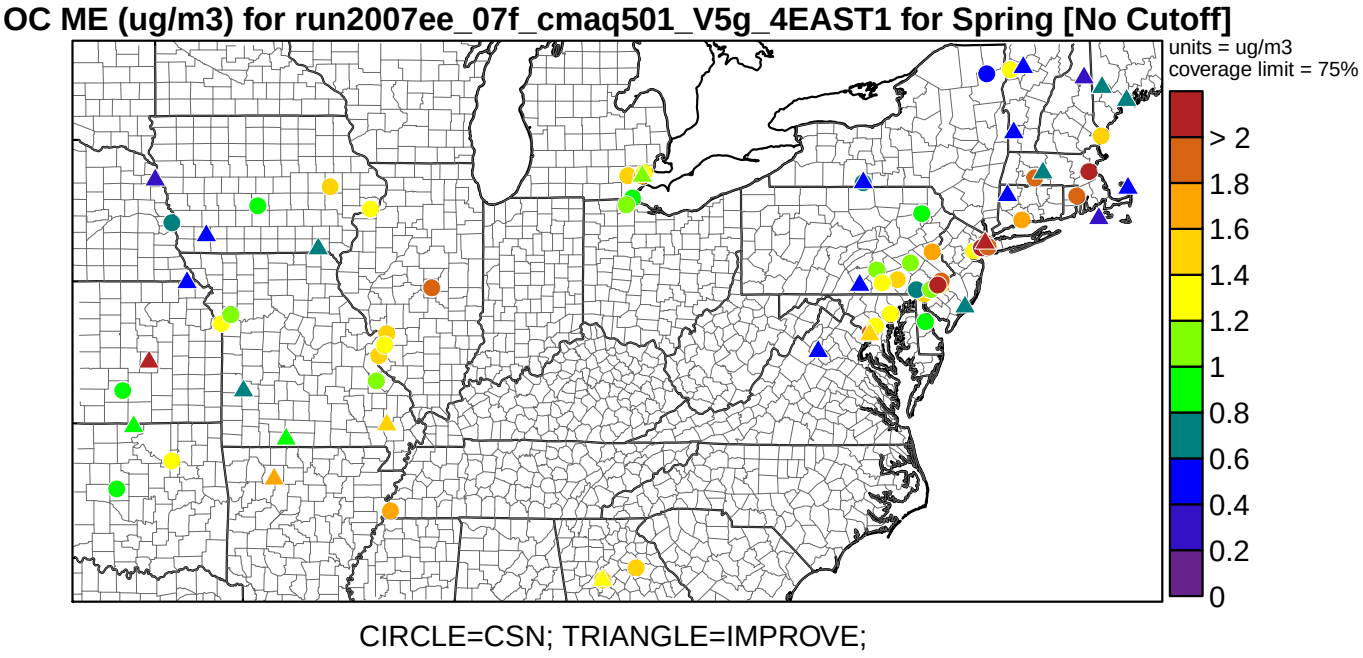

Figure 54: Mean error for Spring OC

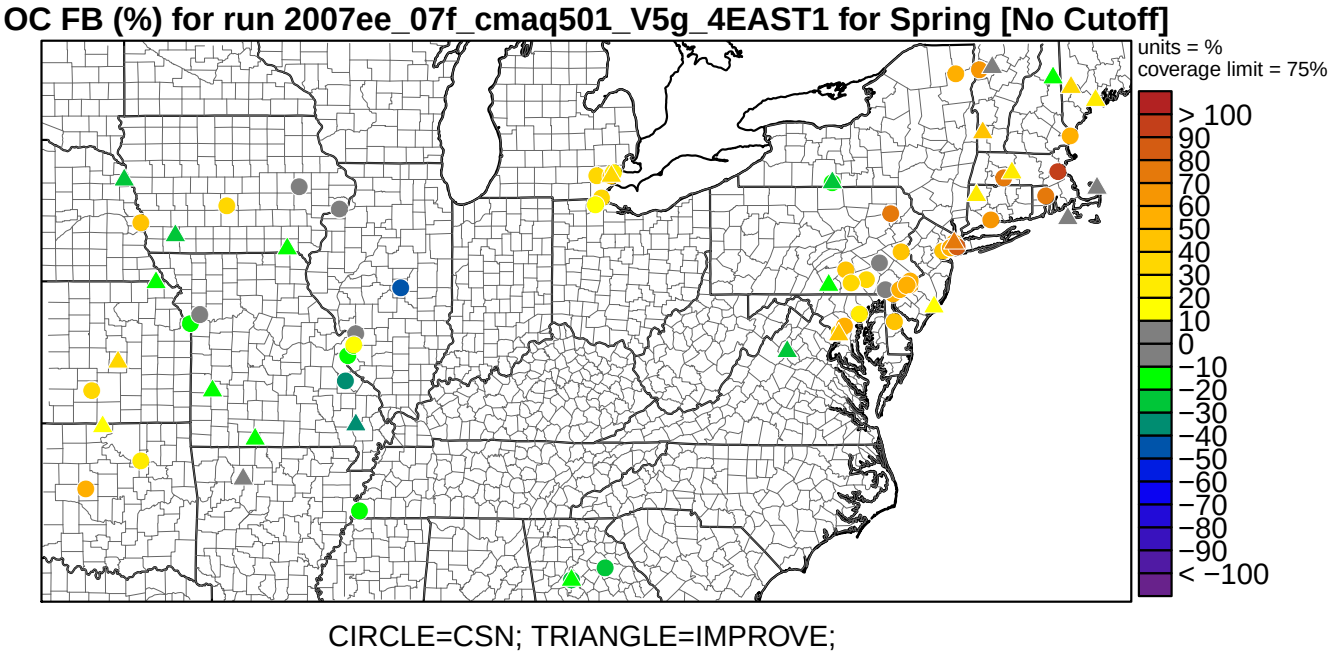

Figure 55: Fractional bias for Spring OC

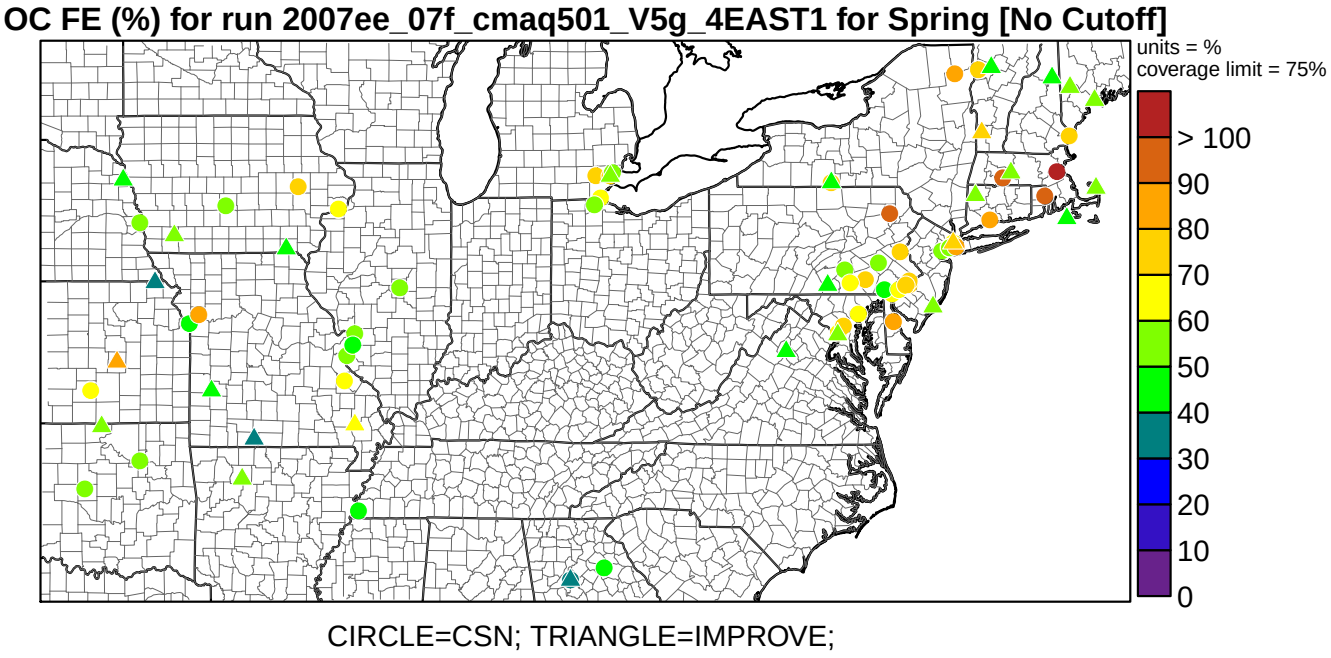

Figure 56: Fractional error for Spring OC

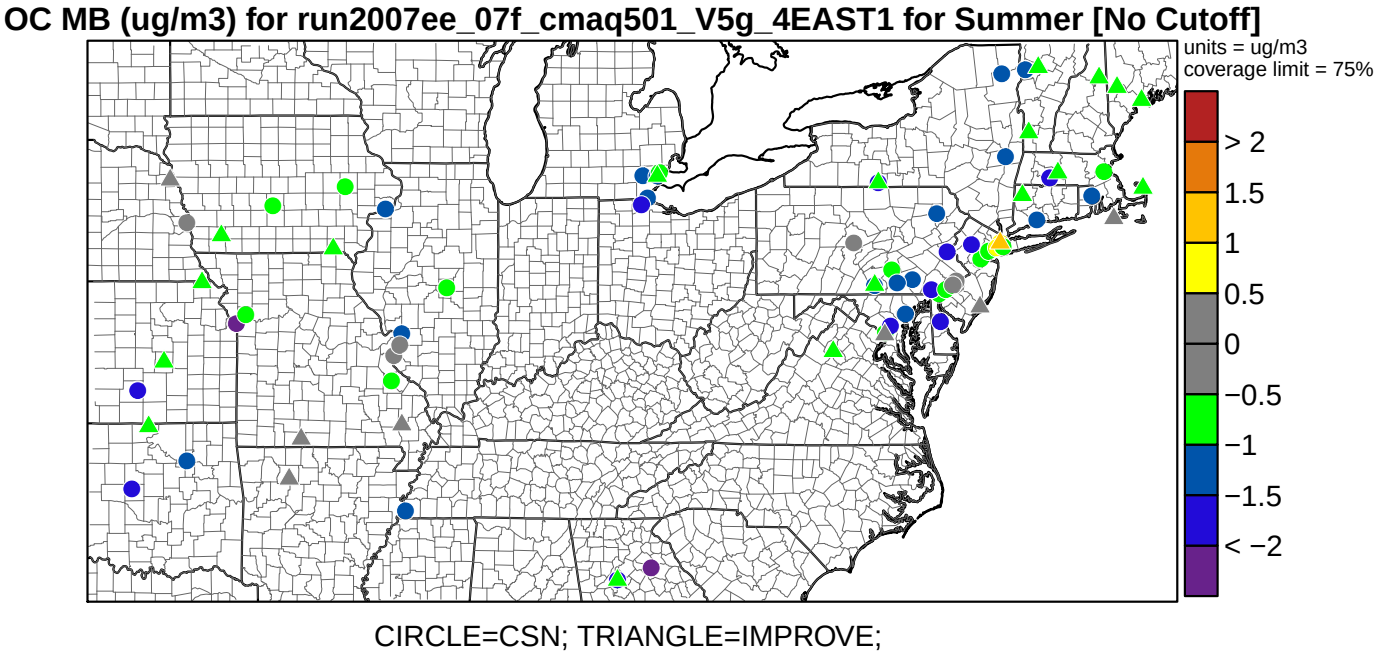

Figure 57: Mean bias for Summer OC

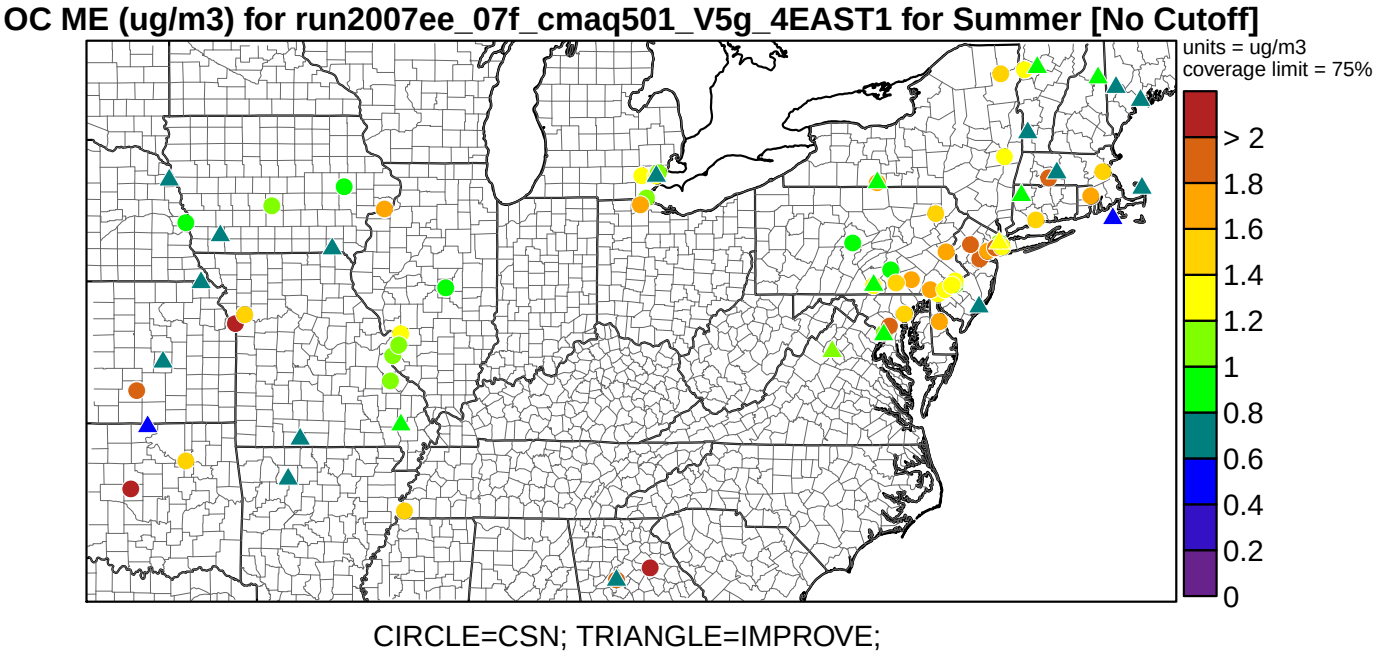

Figure 58: Mean error for Summer OC

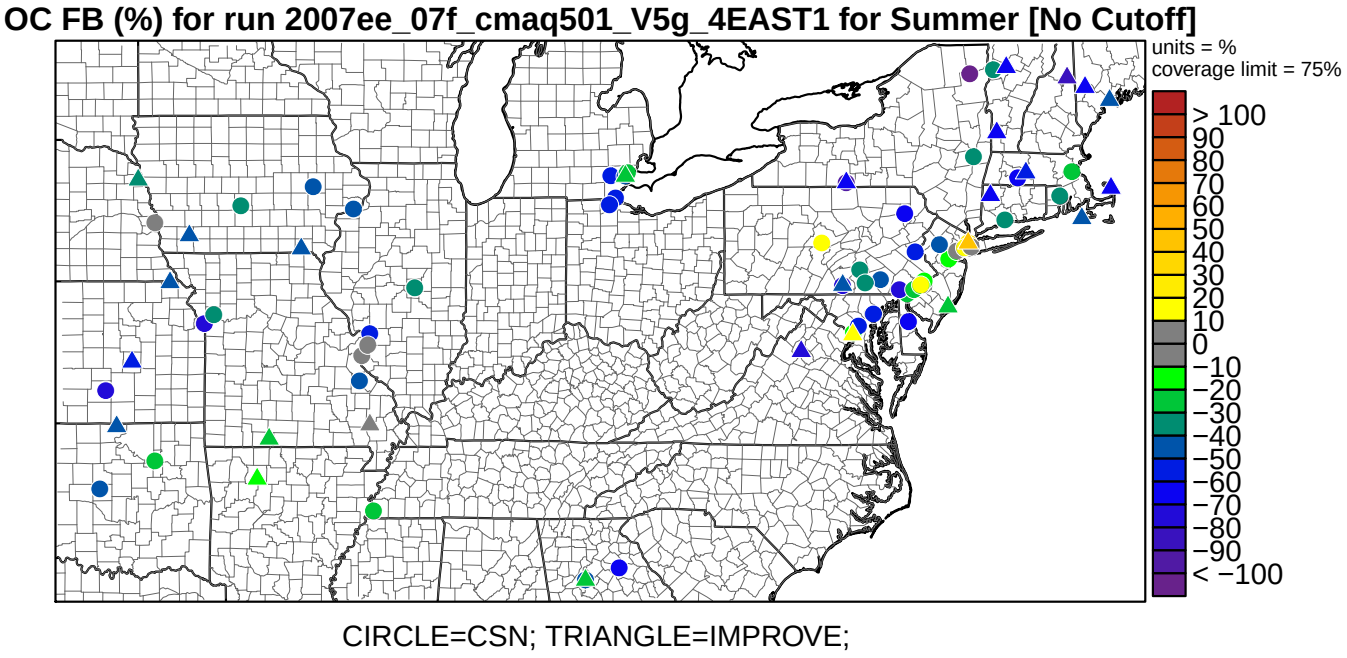

Figure 59: Fractional bias for Summer OC

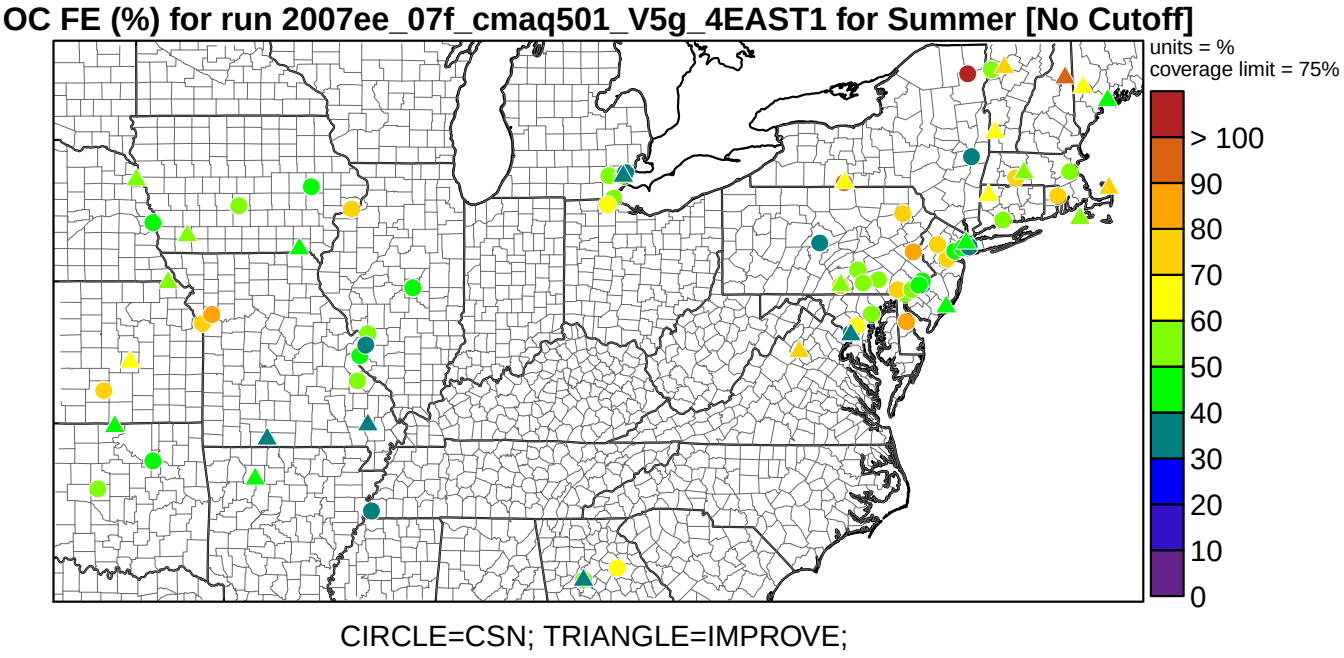

Figure 60: Fractional error for Summer OC

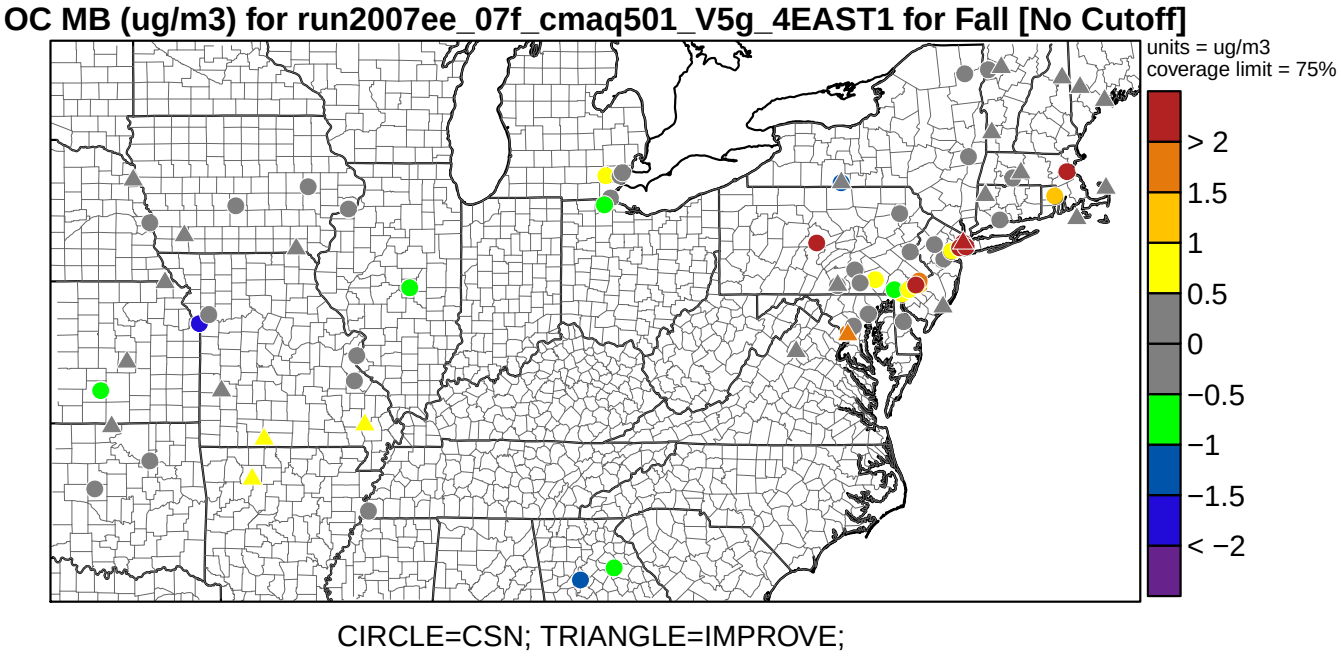

Figure 61: Mean bias for Fall OC

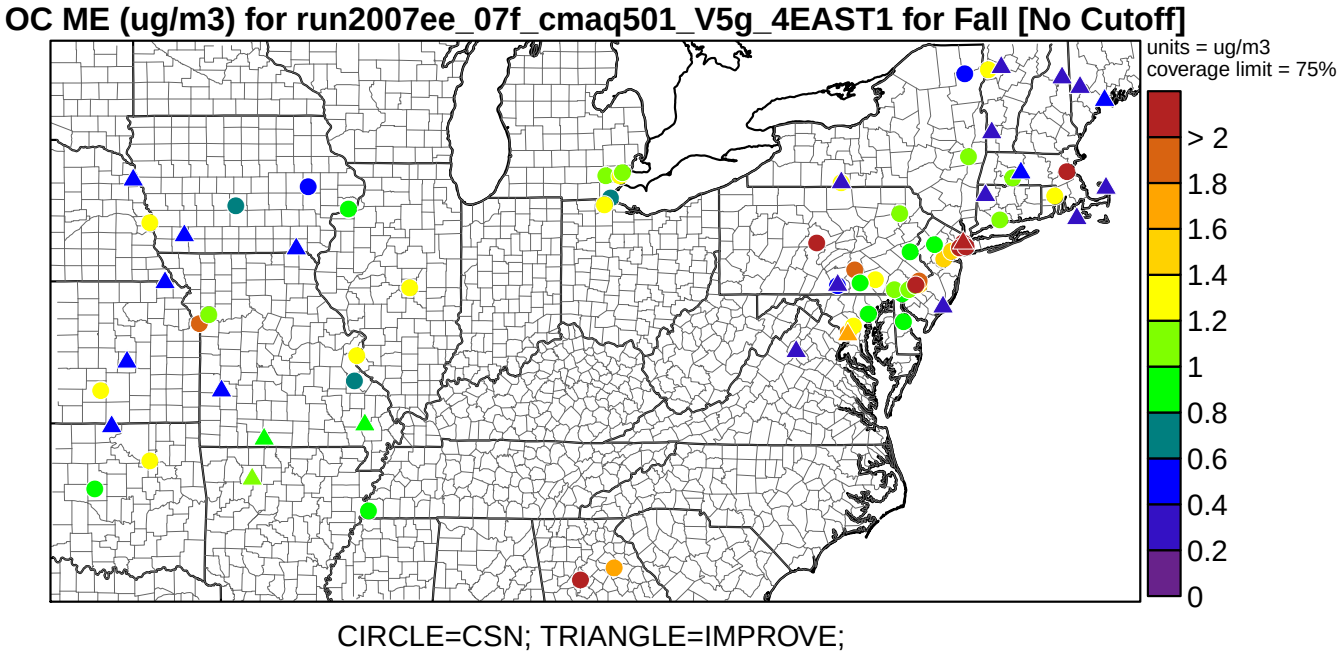

Figure 62: Mean error for Fall OC

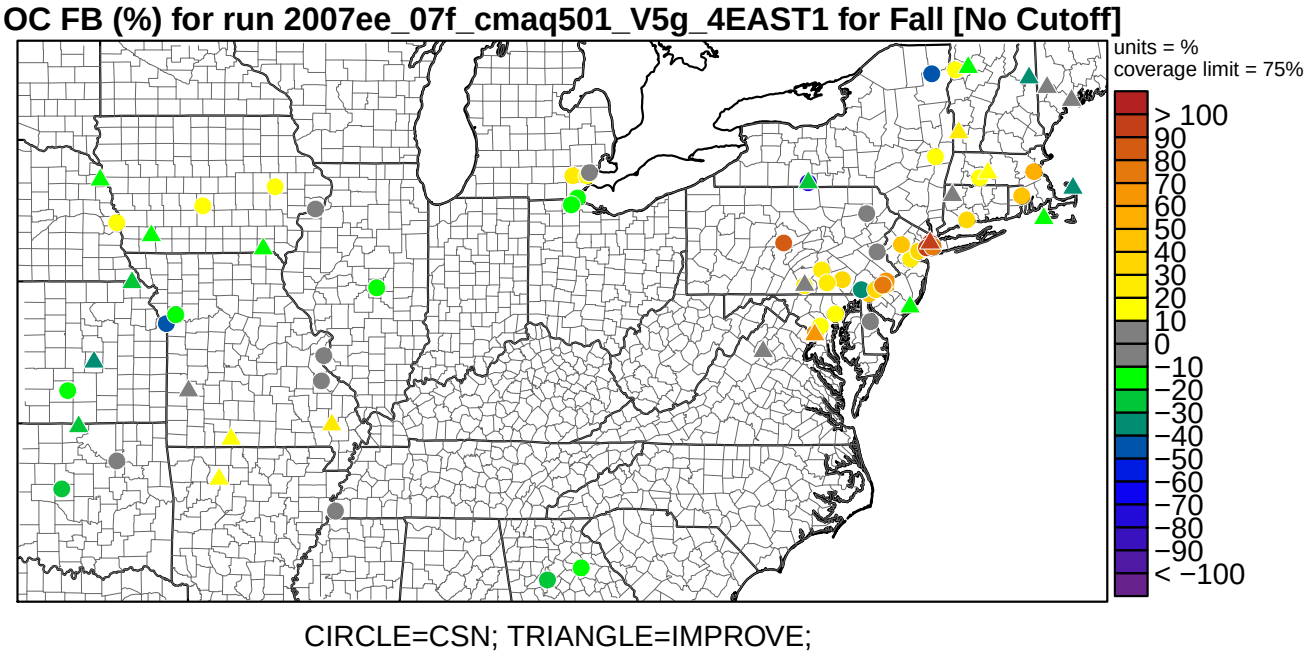

Figure 63: Fractional bias for Fall OC

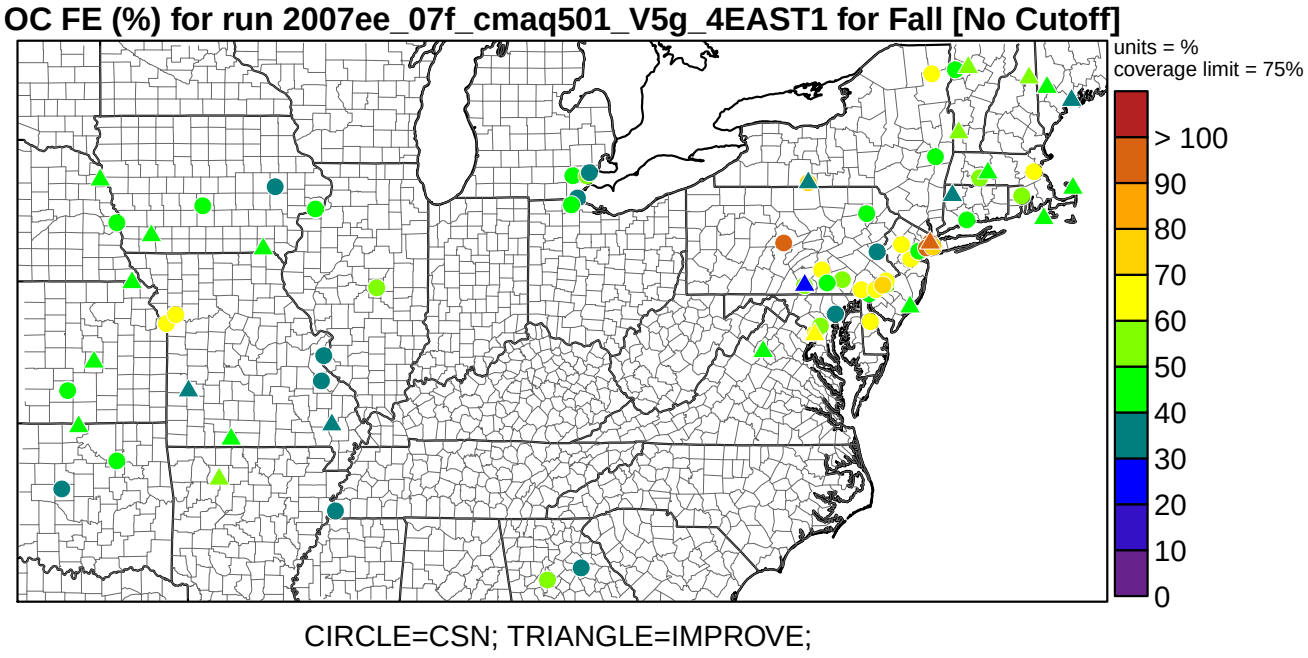

Figure 64: Fractional error for Fall OC

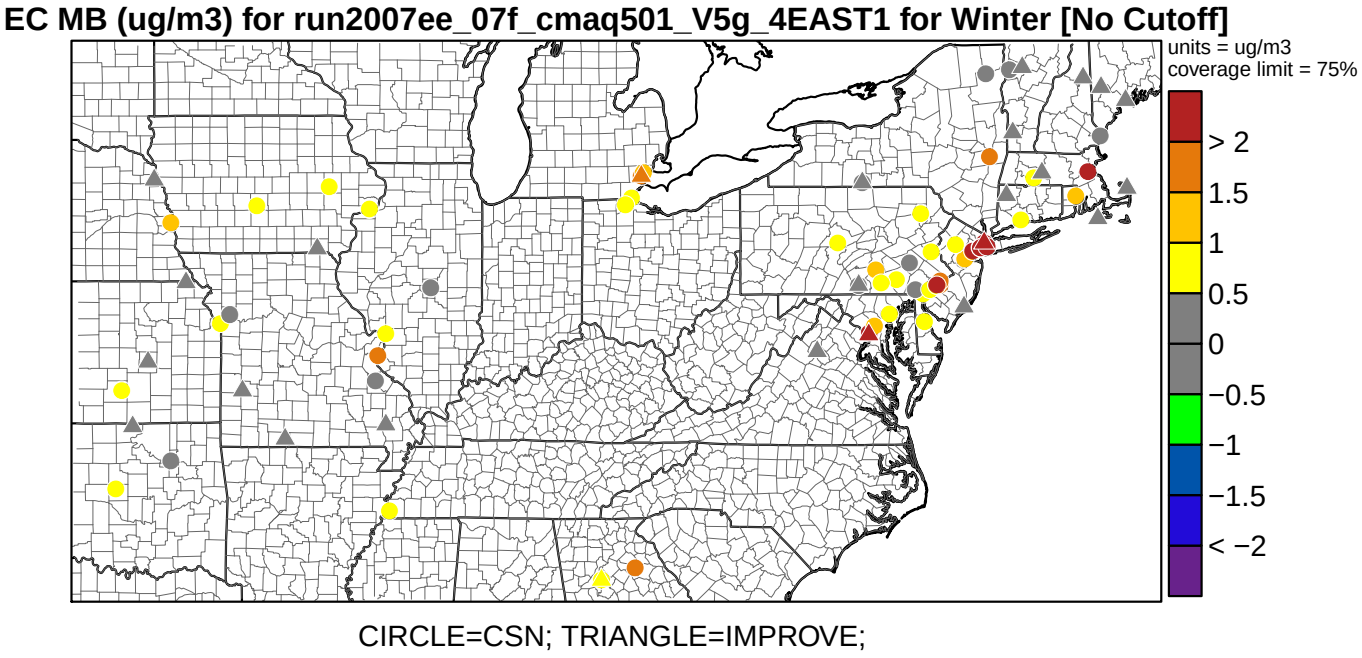

Figure 65: Mean bias for Winter EC

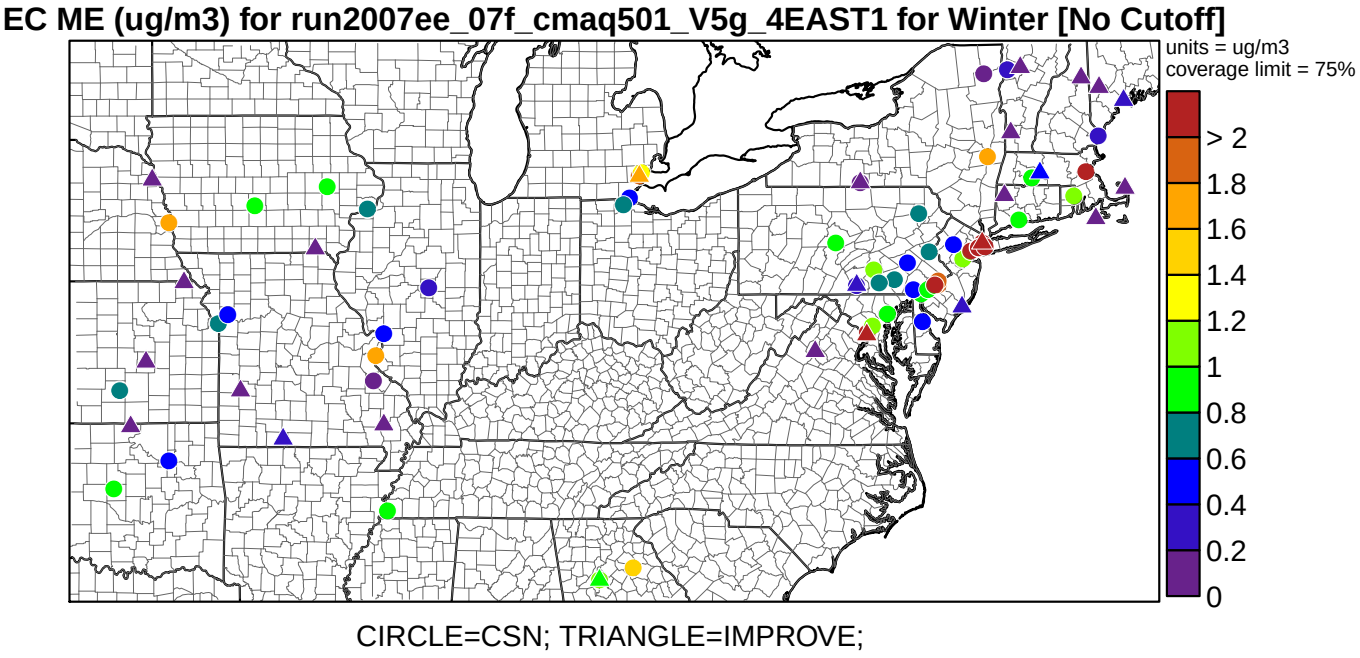

Figure 66: Mean error for Winter EC

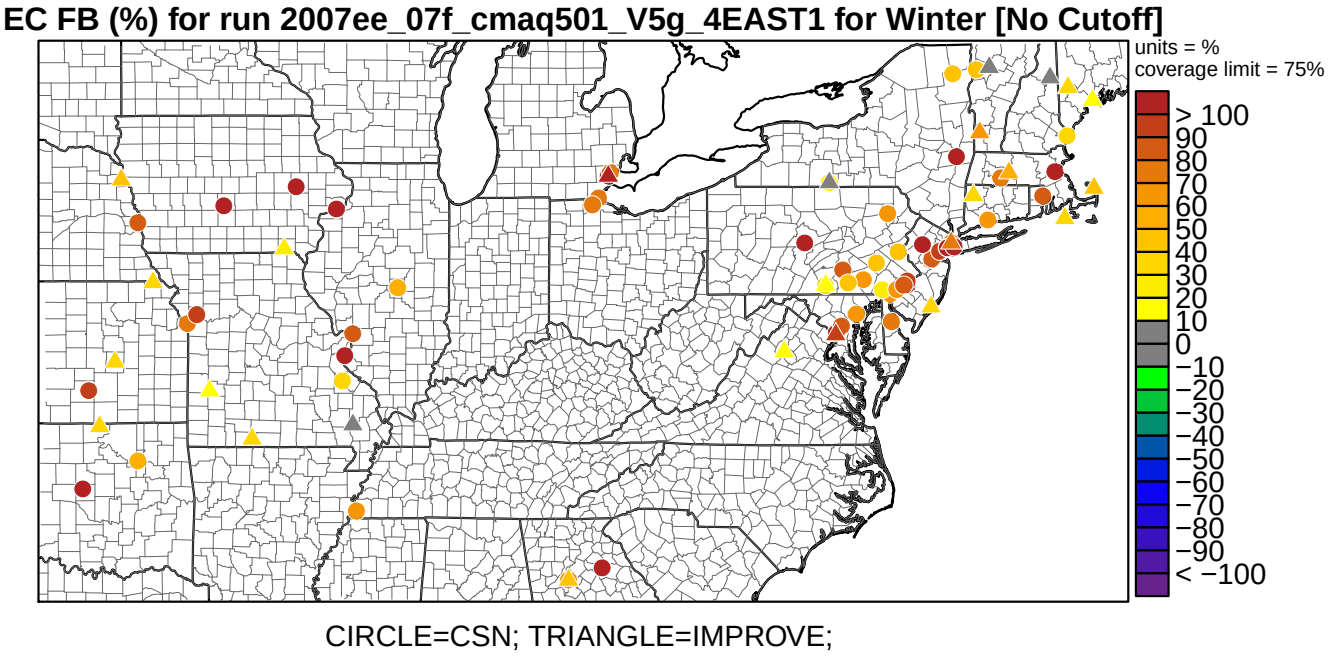

Figure 67: Fractional bias for Winter EC

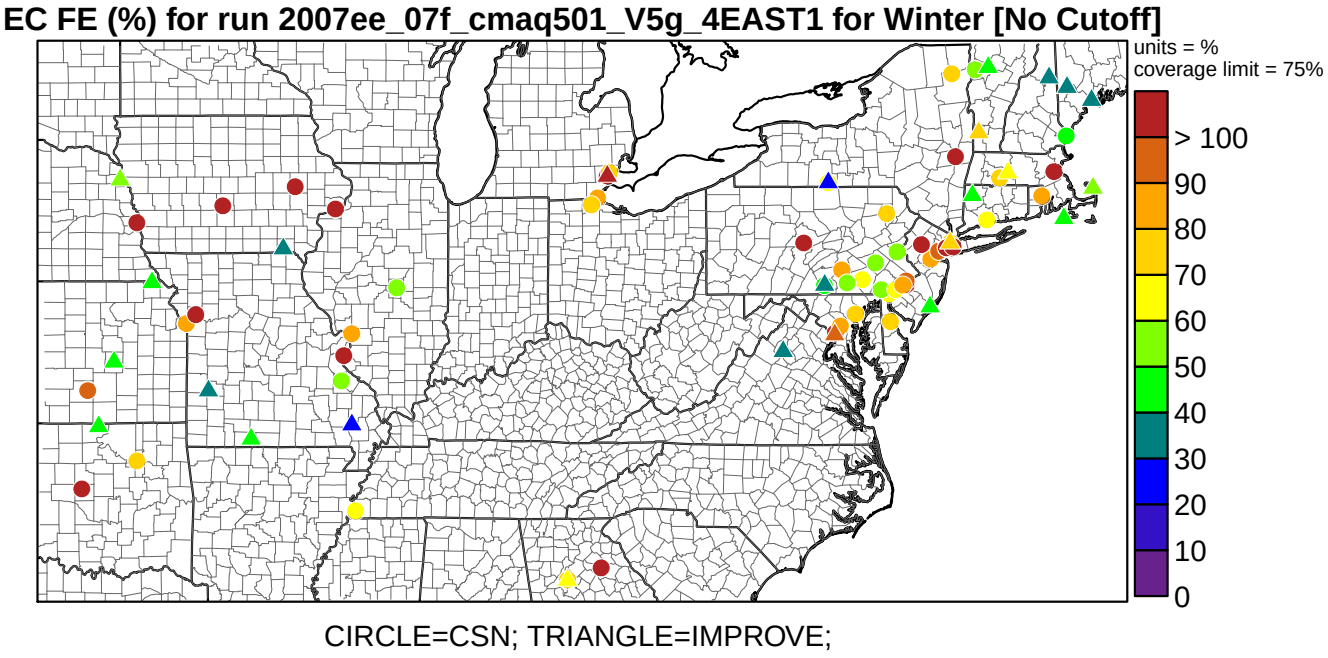

Figure 68: Fractional error for Winter EC

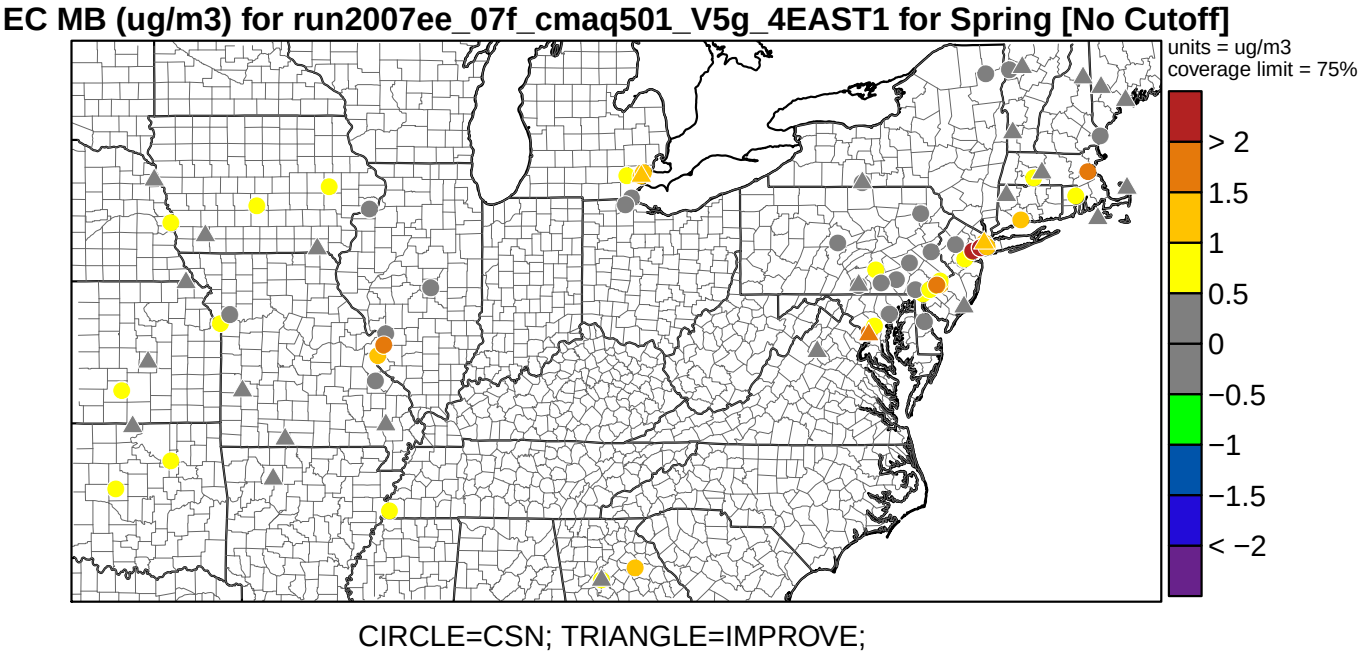

Figure 69: Mean bias for Spring EC

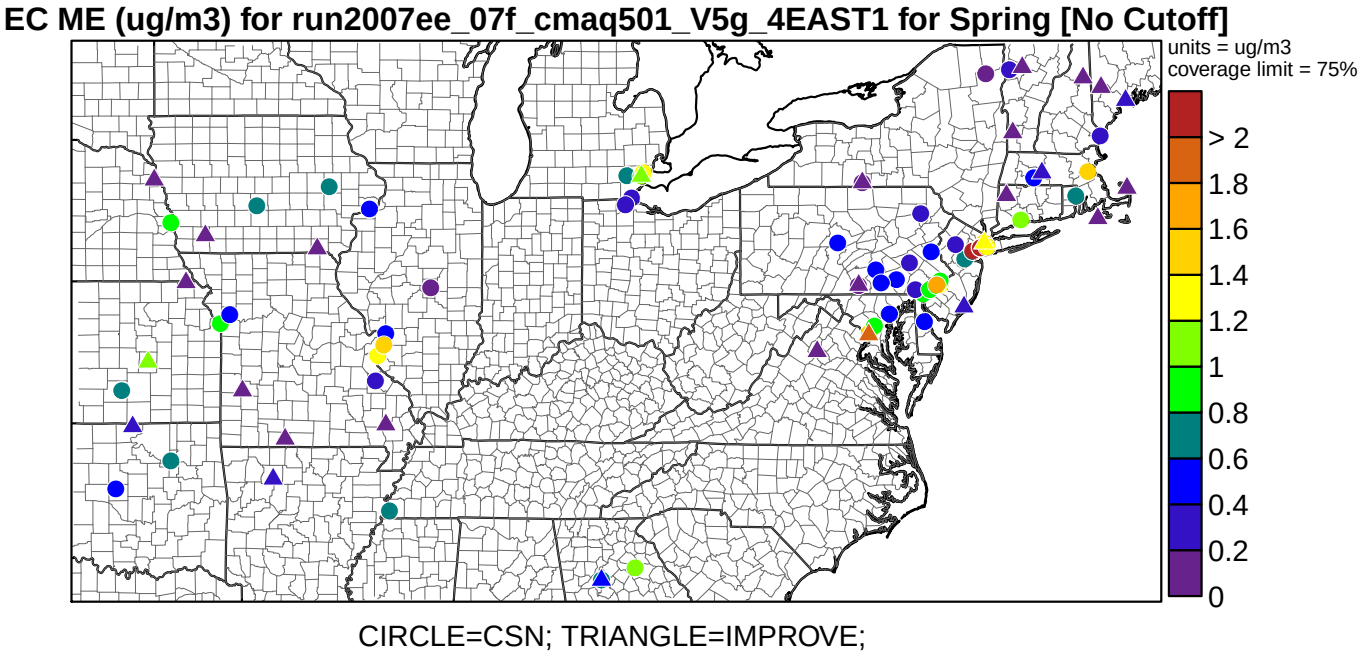

Figure 70: Mean error for Spring EC

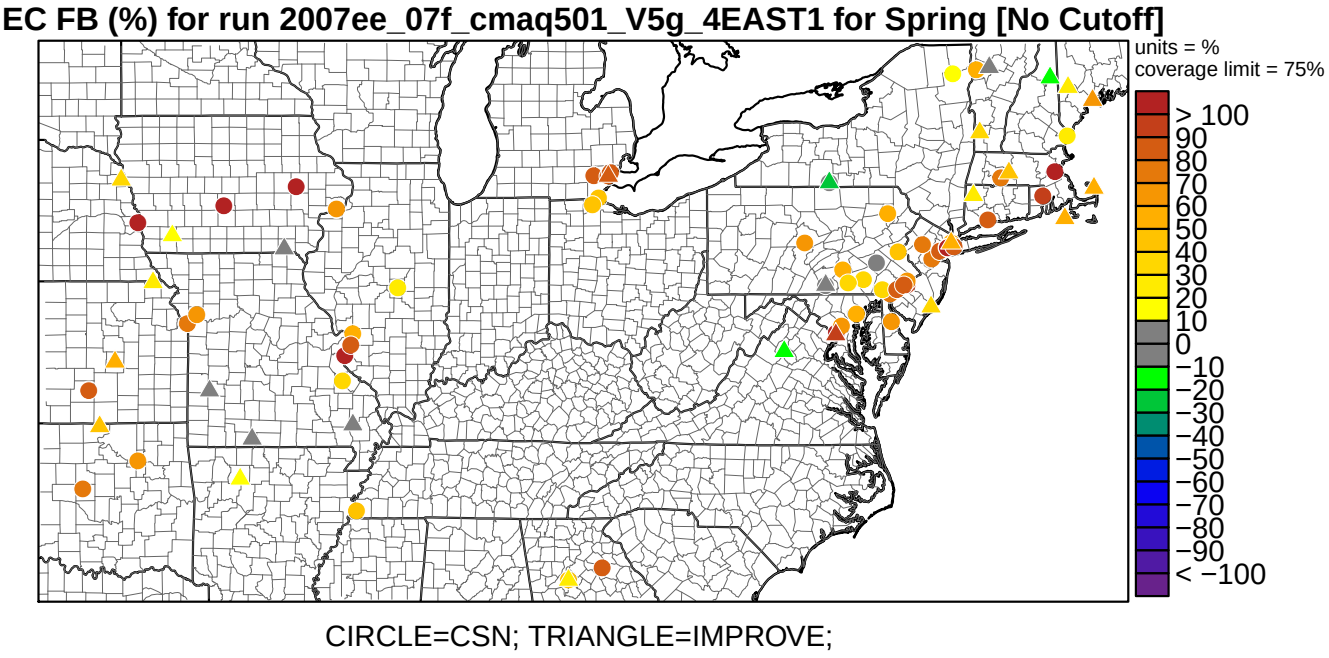

Figure 71: Fractional bias for Spring EC

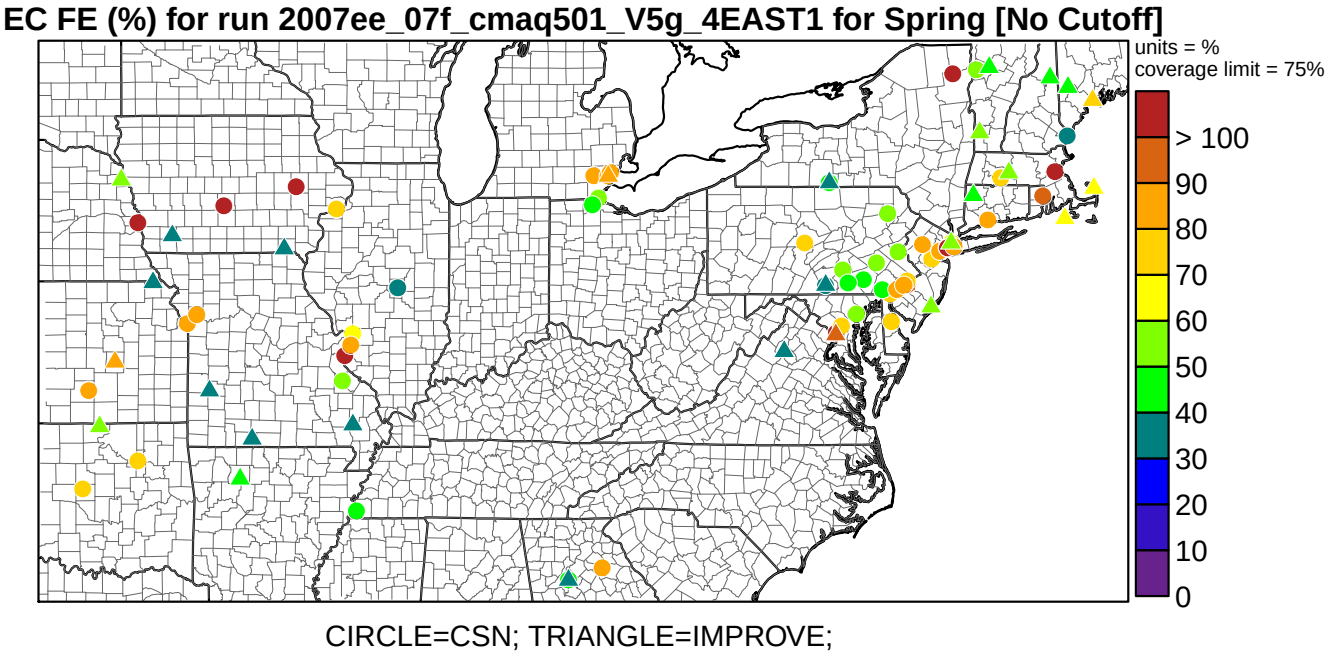

Figure 72: Fractional error for Spring EC

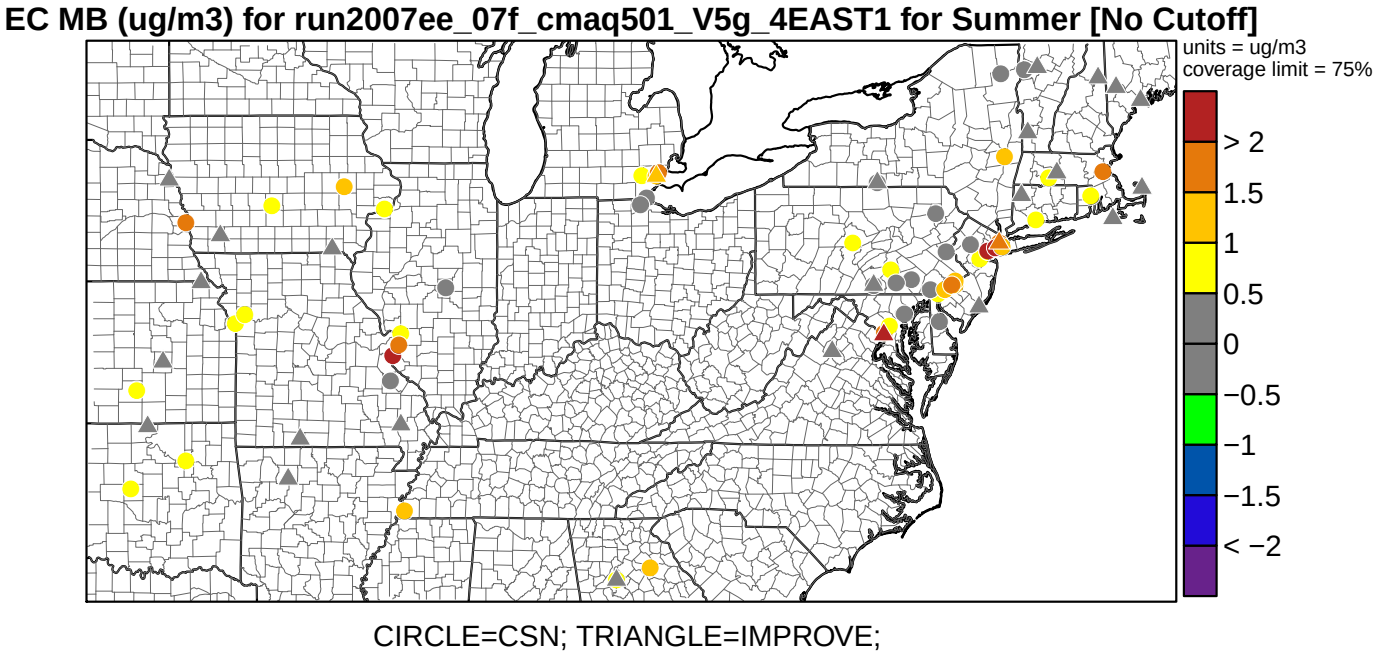

Figure 73: Mean bias for Summer EC

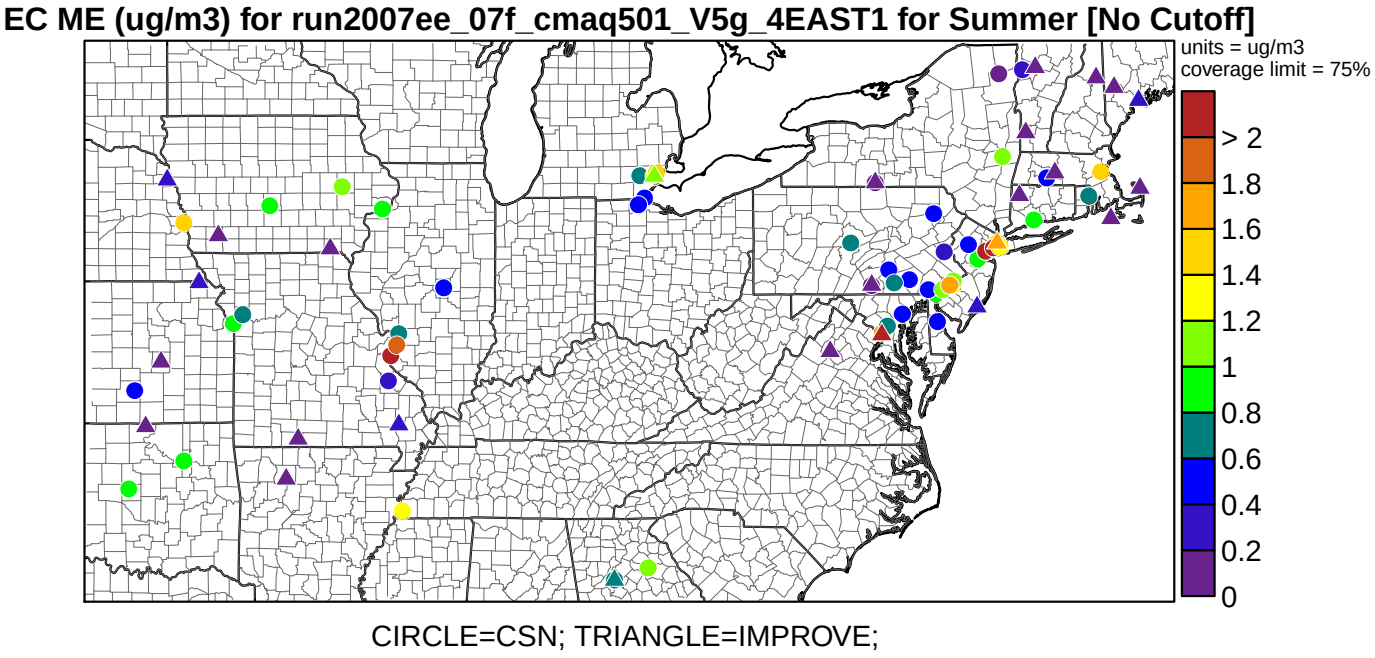

Figure 74: Mean error for Summer EC

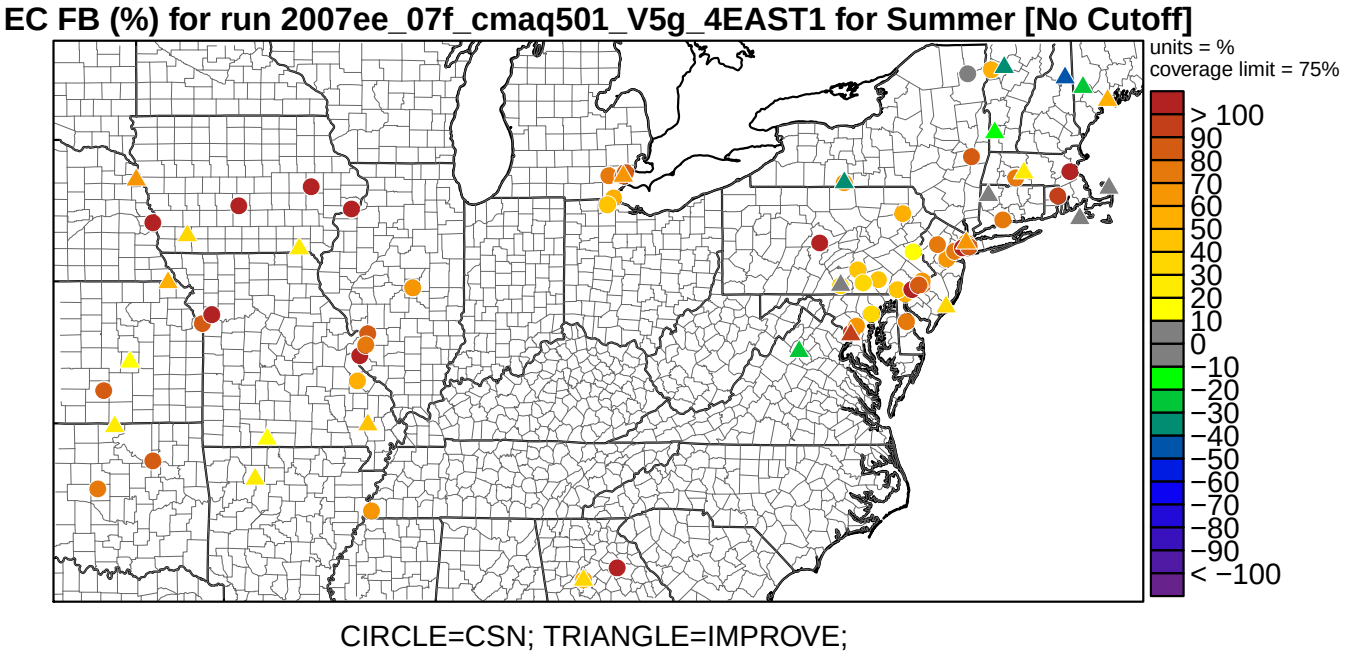

Figure 75: Fractional bias for Summer EC

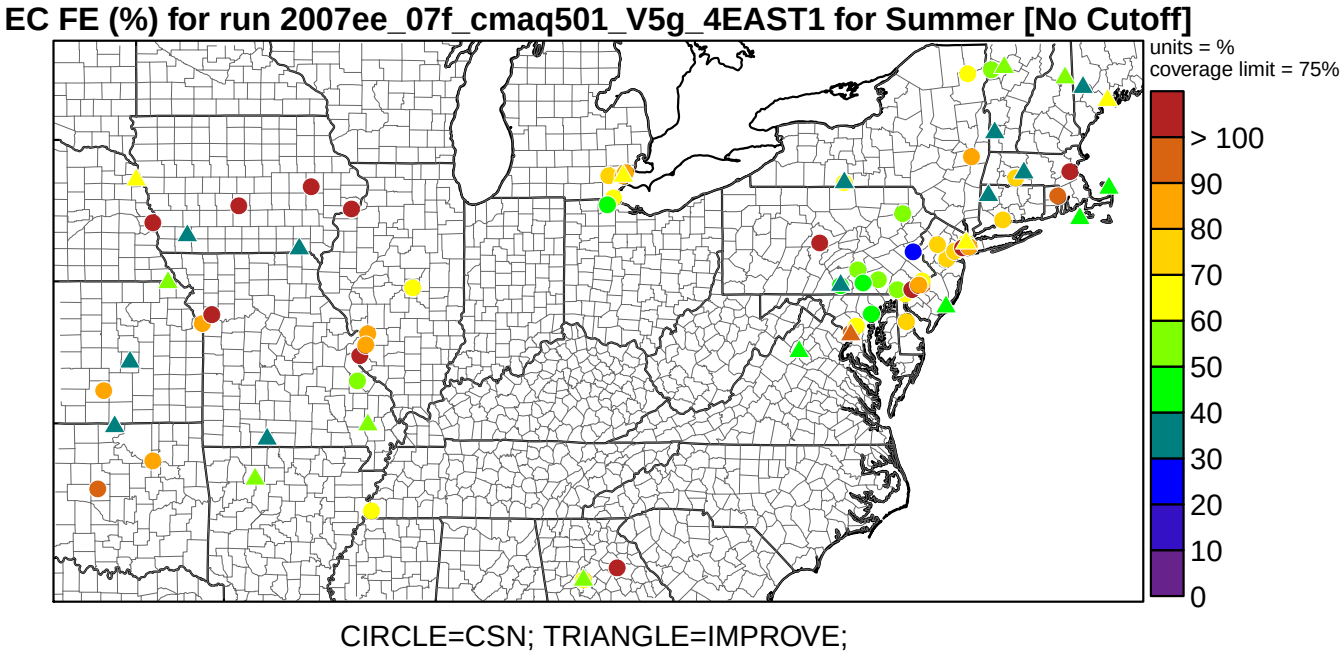

Figure 76: Fractional error for Summer EC

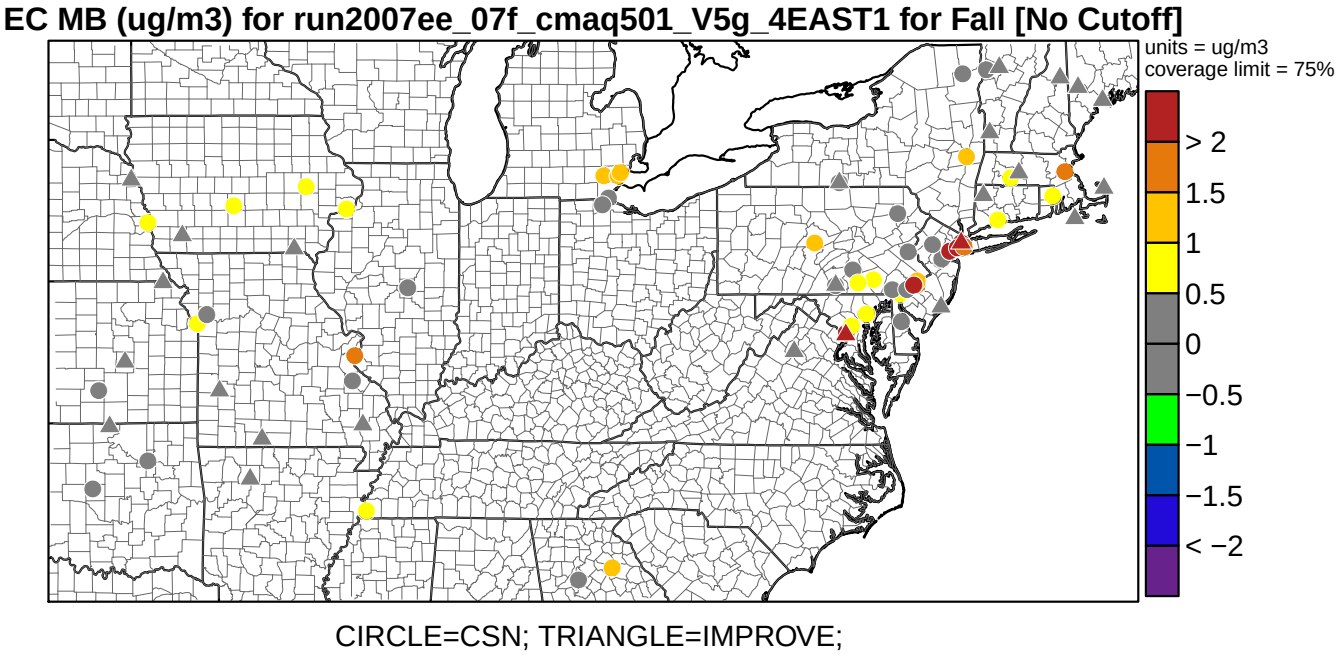

Figure 77: Mean bias for Fall EC

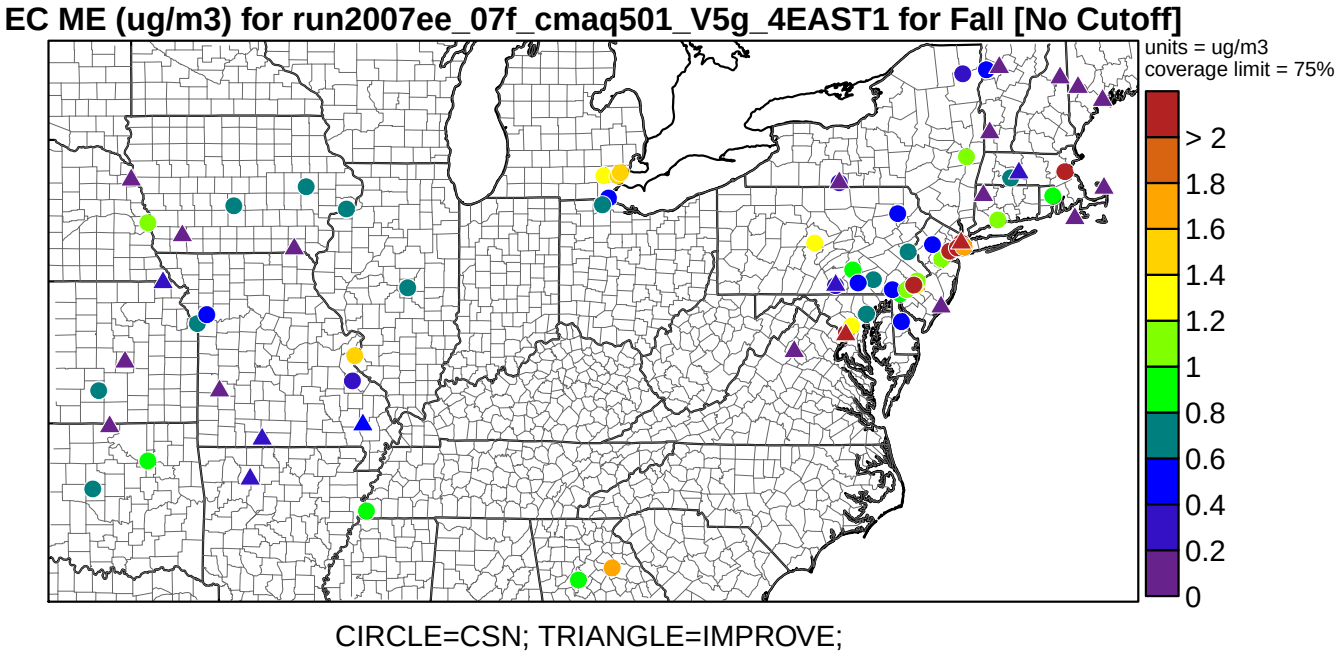

Figure 78: Mean error for Fall EC

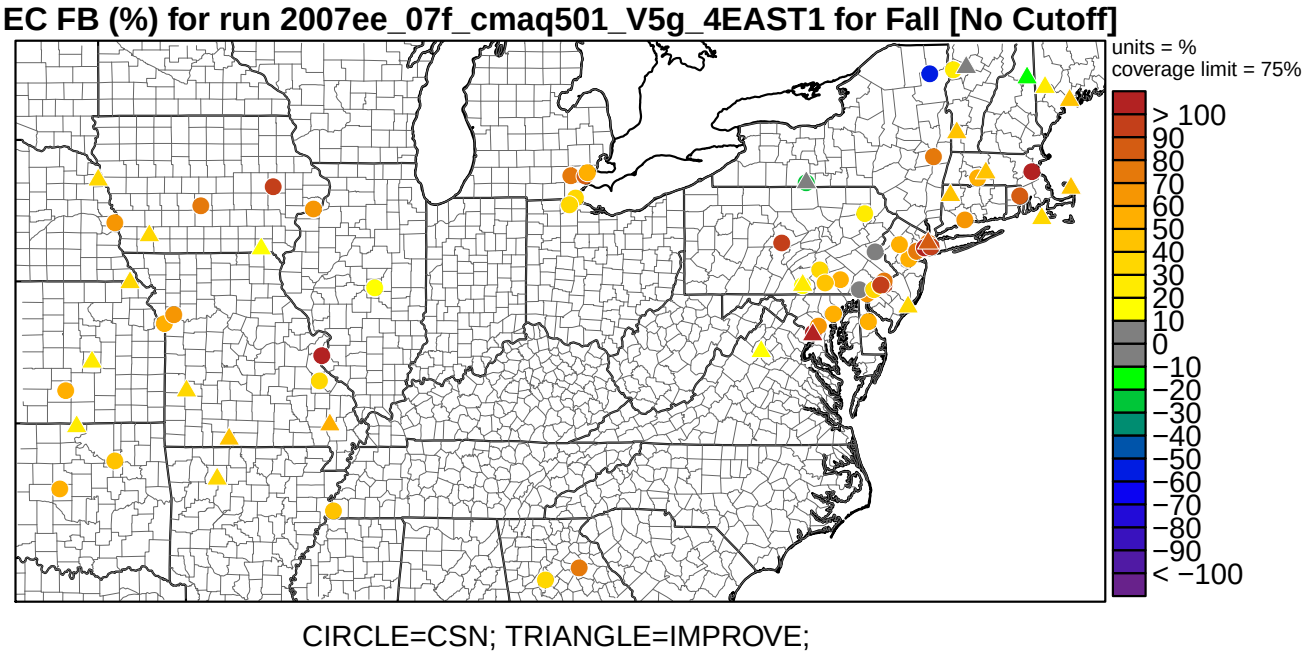

Figure 79: Fractional bias for Fall EC

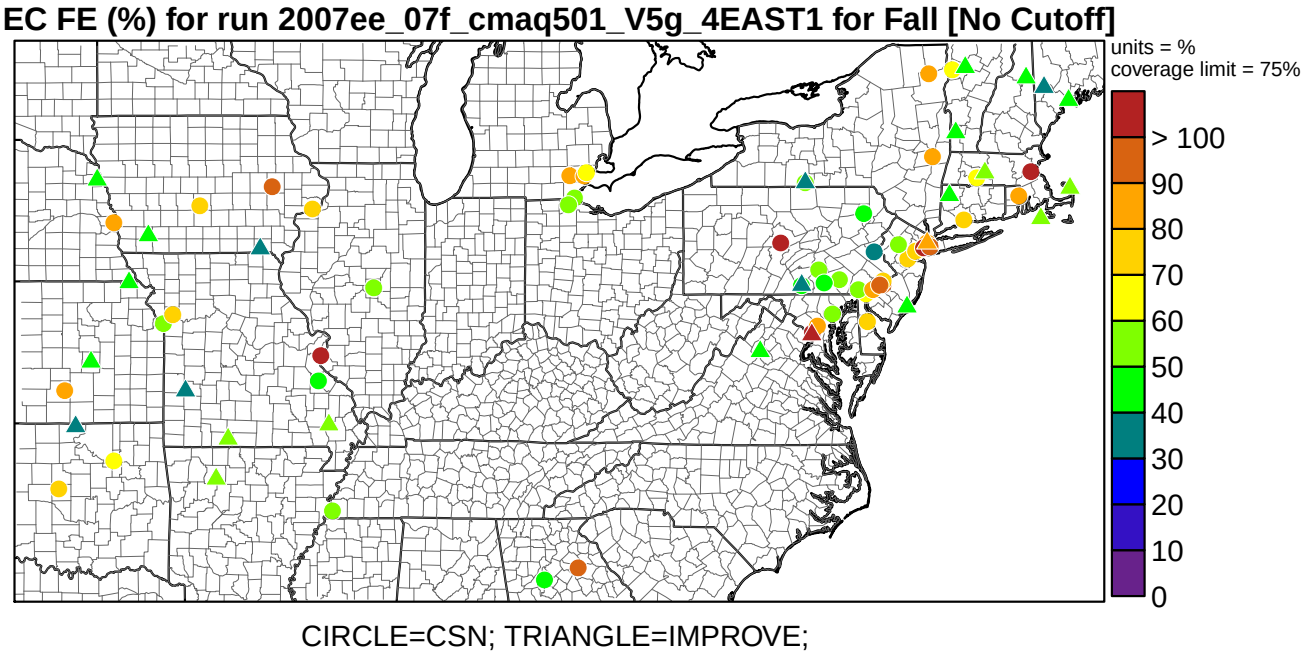

Figure 80: Fractional error for Fall EC

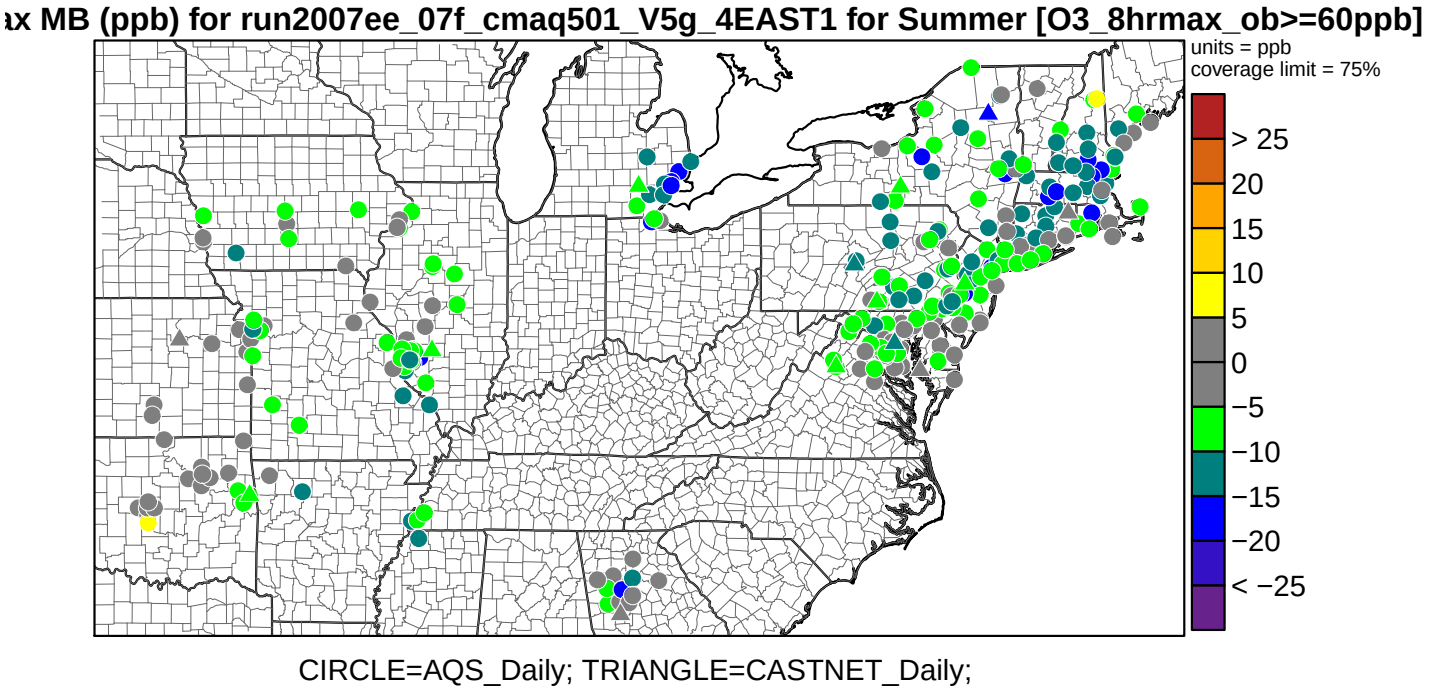

Figure 81: Mean bias for Summer 8hr Max Ozone

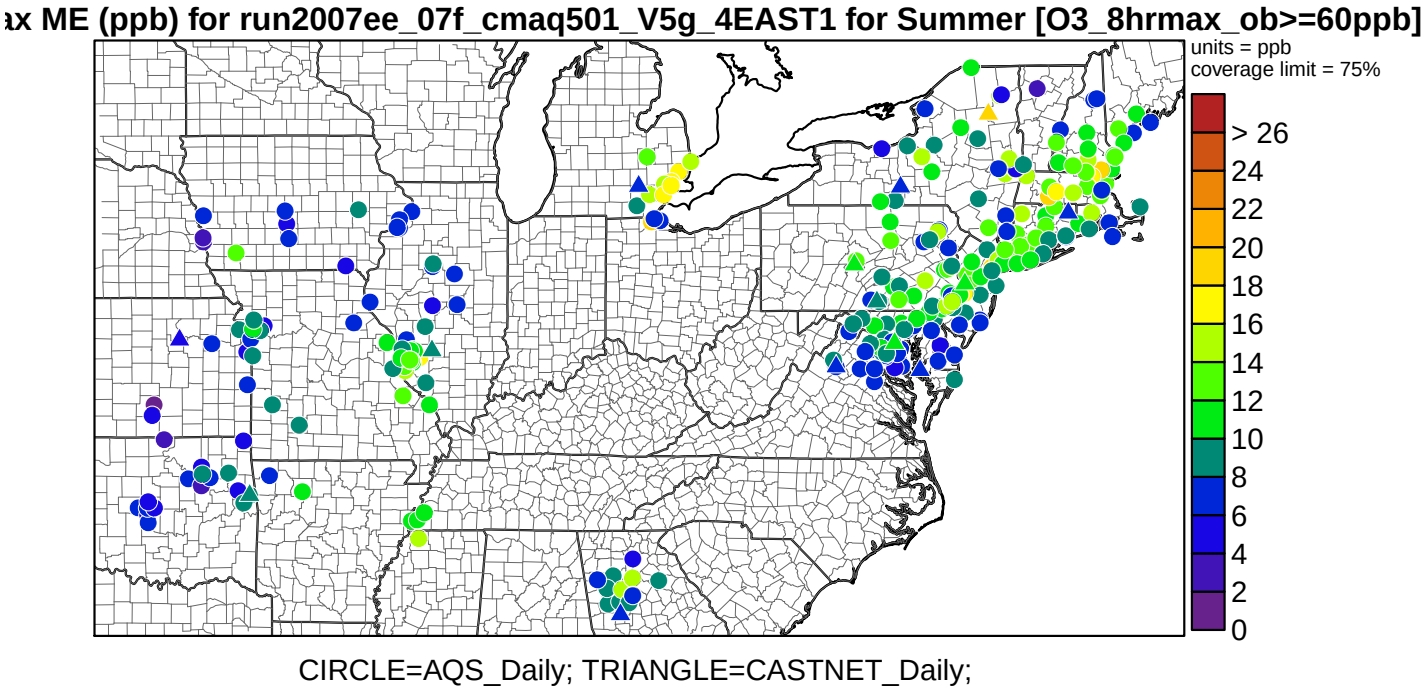

Figure 82: Mean error for Summer 8hr Max Ozone

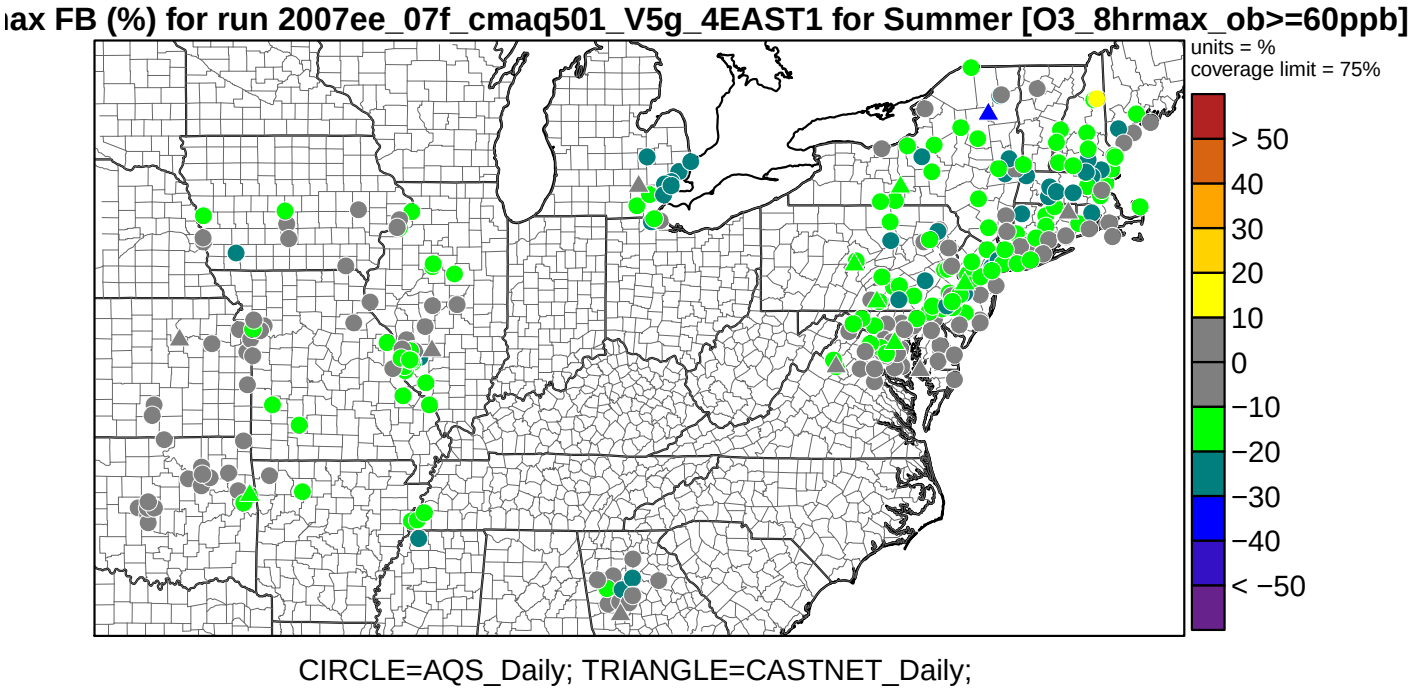

Figure 83: Fractional bias for Summer 8hr Max Ozone

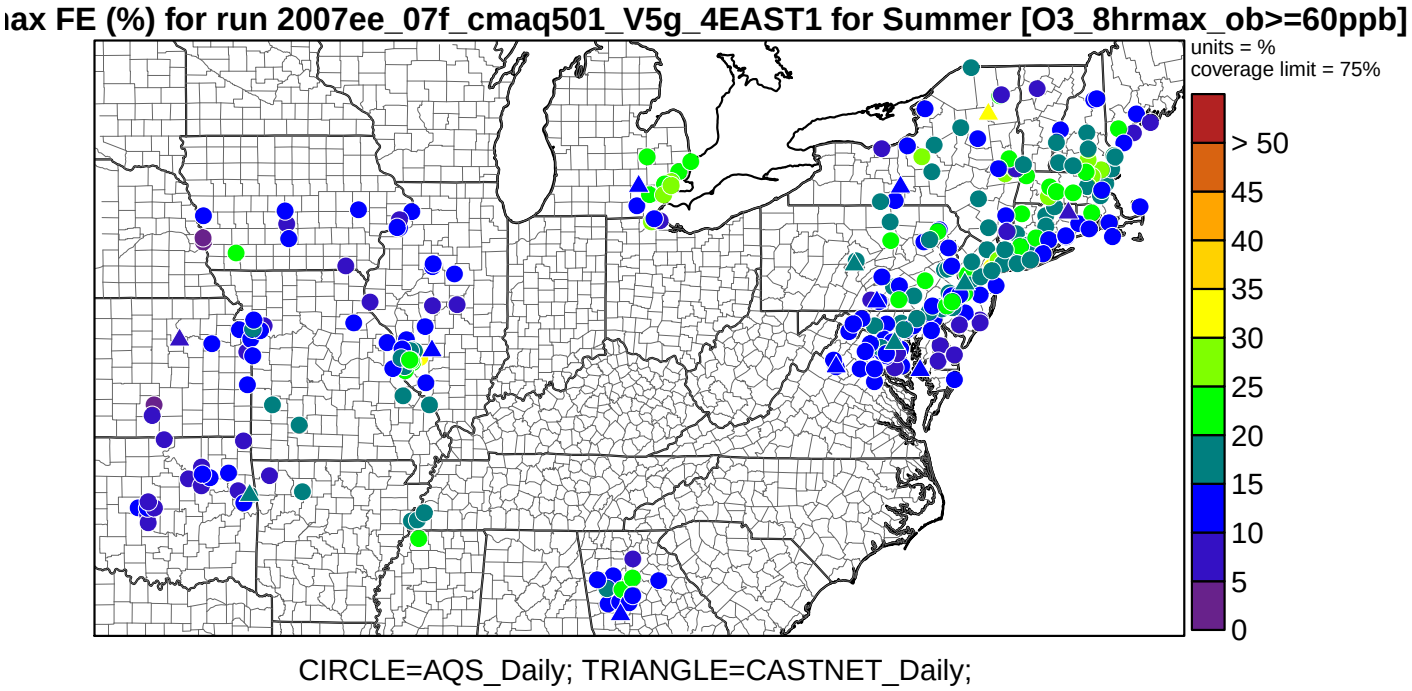

Figure 84: Fractional error for Summer 8hr Max Ozone

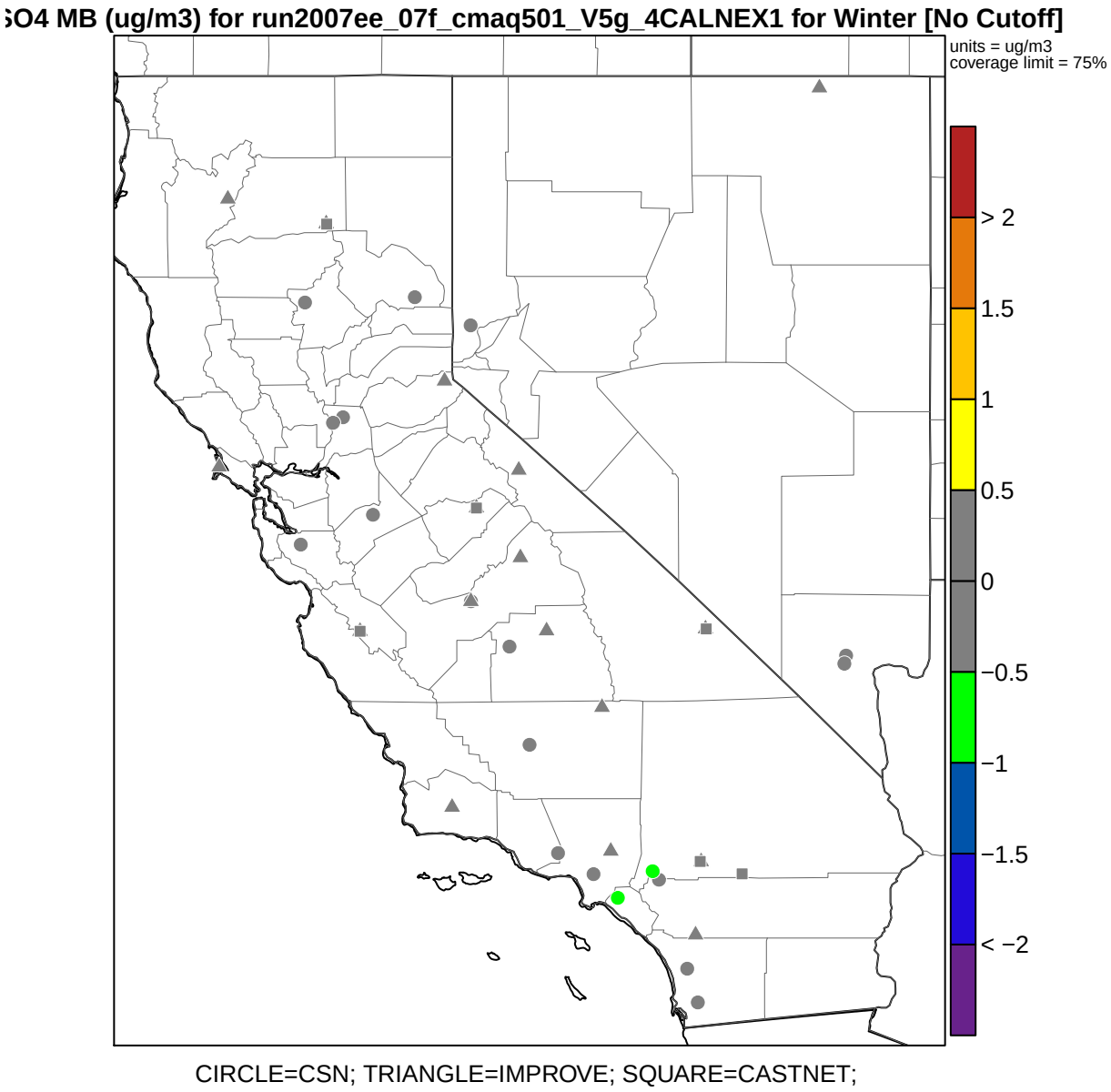

Figure 85: Mean bias for Winter SO4

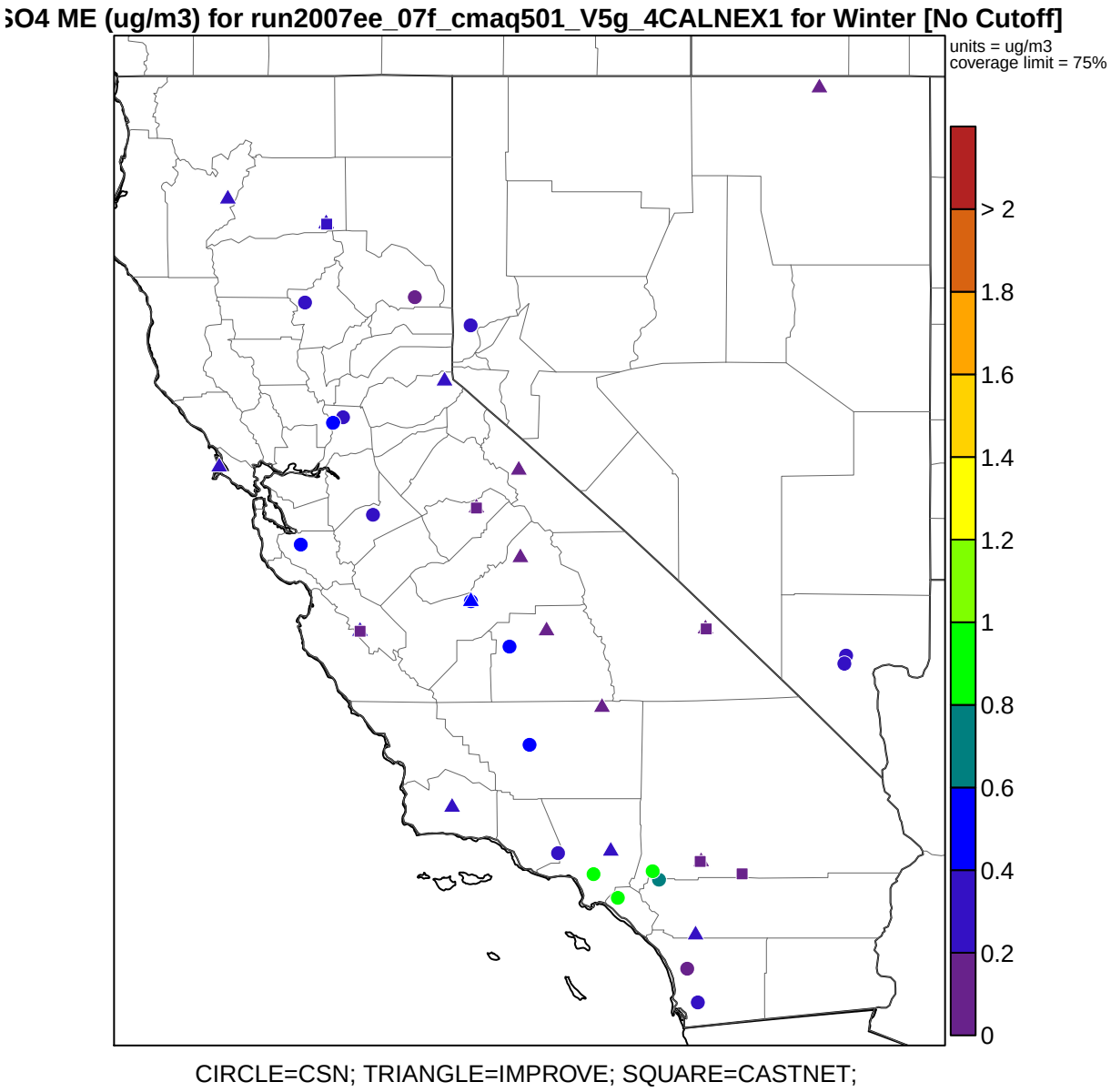

Figure 86: Mean error for Winter SO4

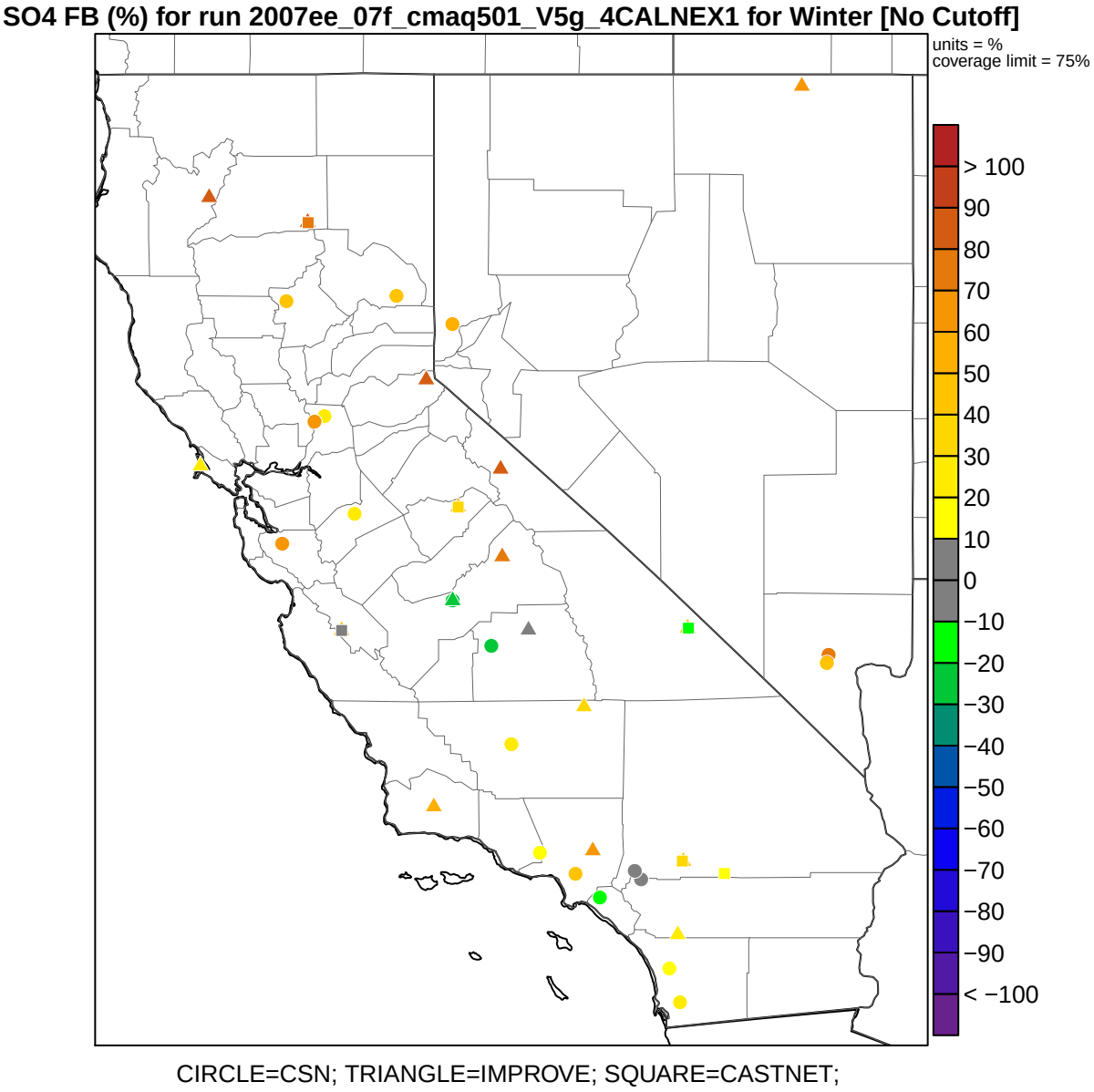

Figure 87: Fractional bias for Winter SO4

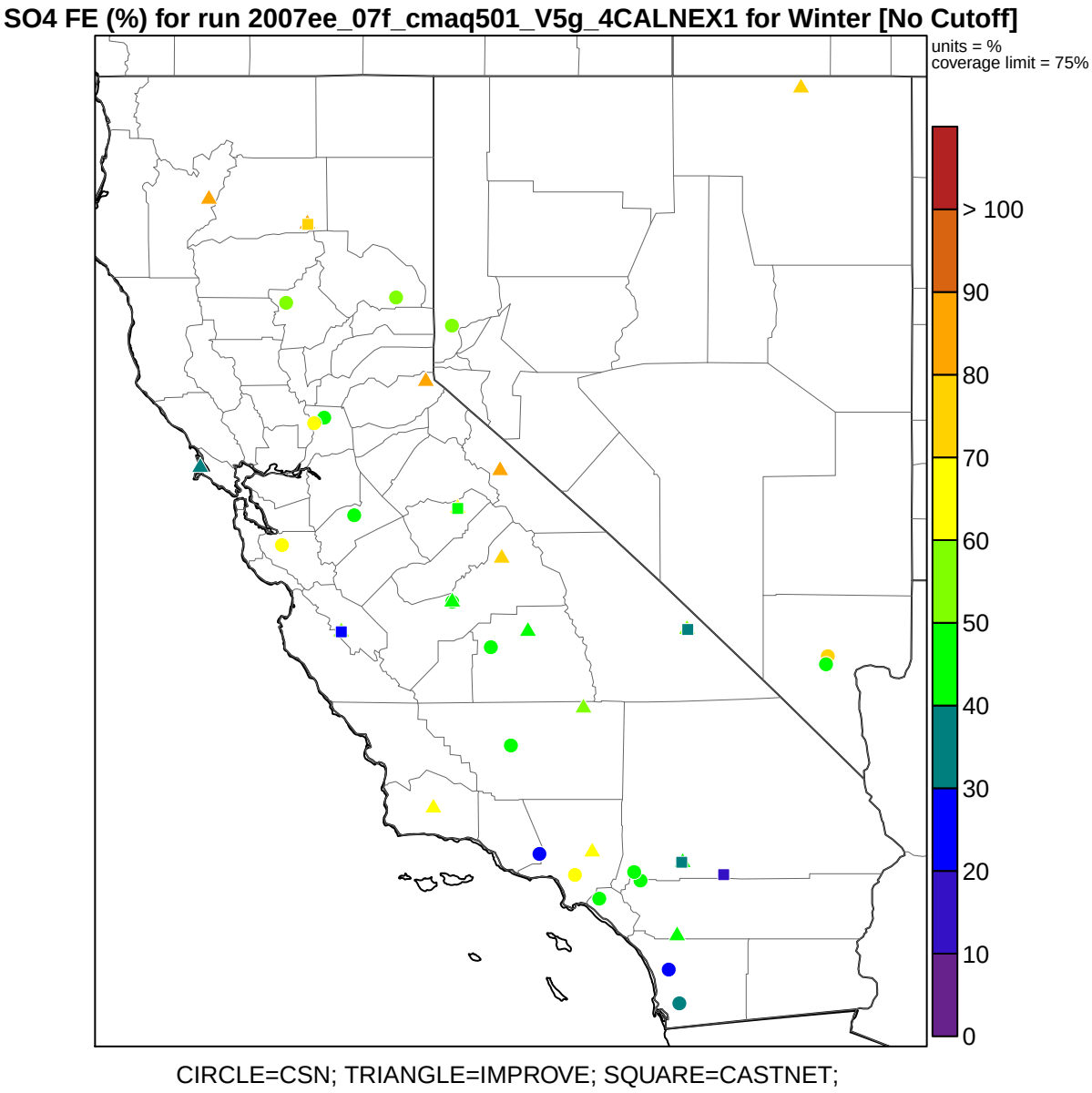

Figure 88: Fractional error for Winter SO4

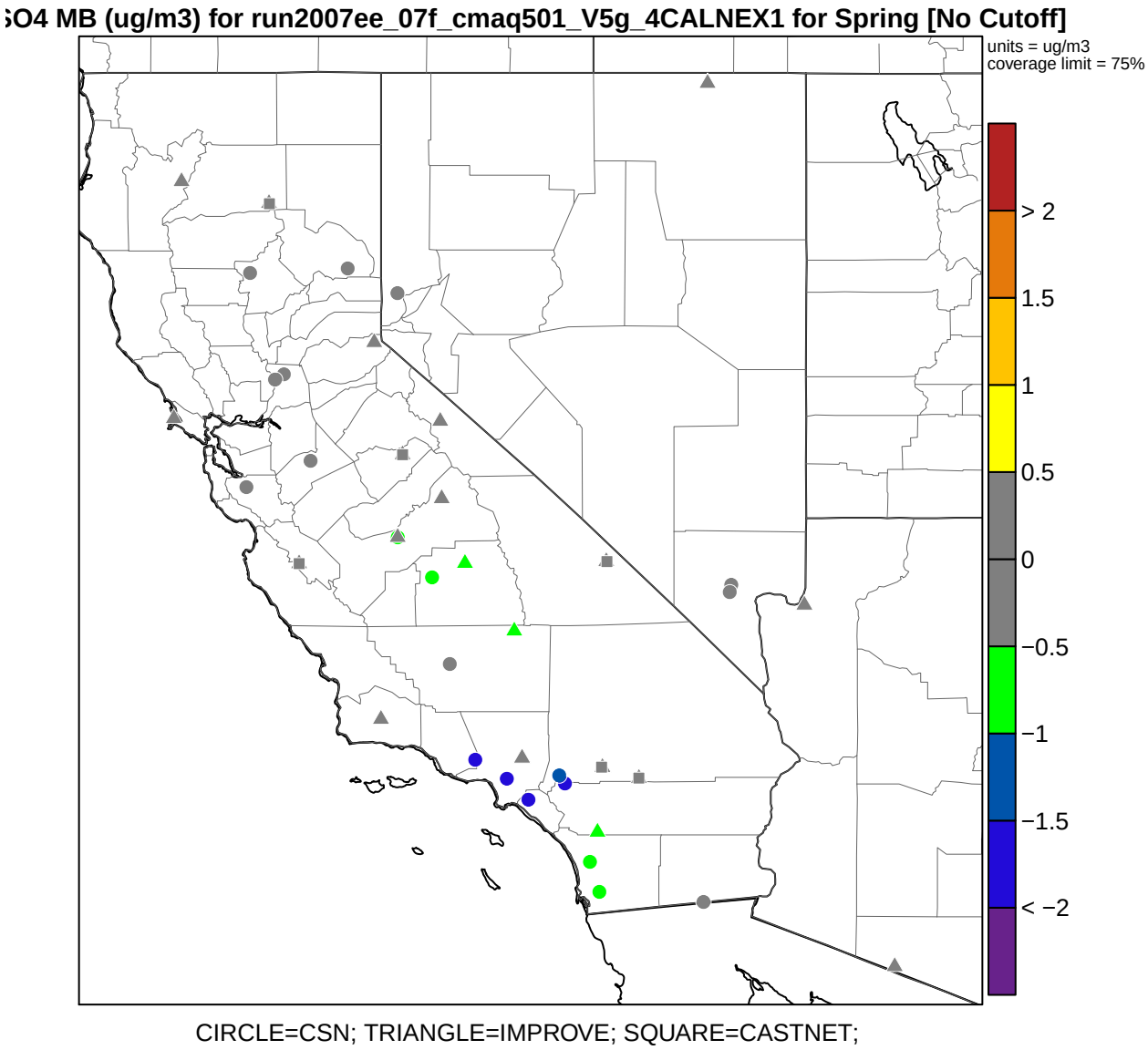

Figure 89: Mean bias for Spring SO4

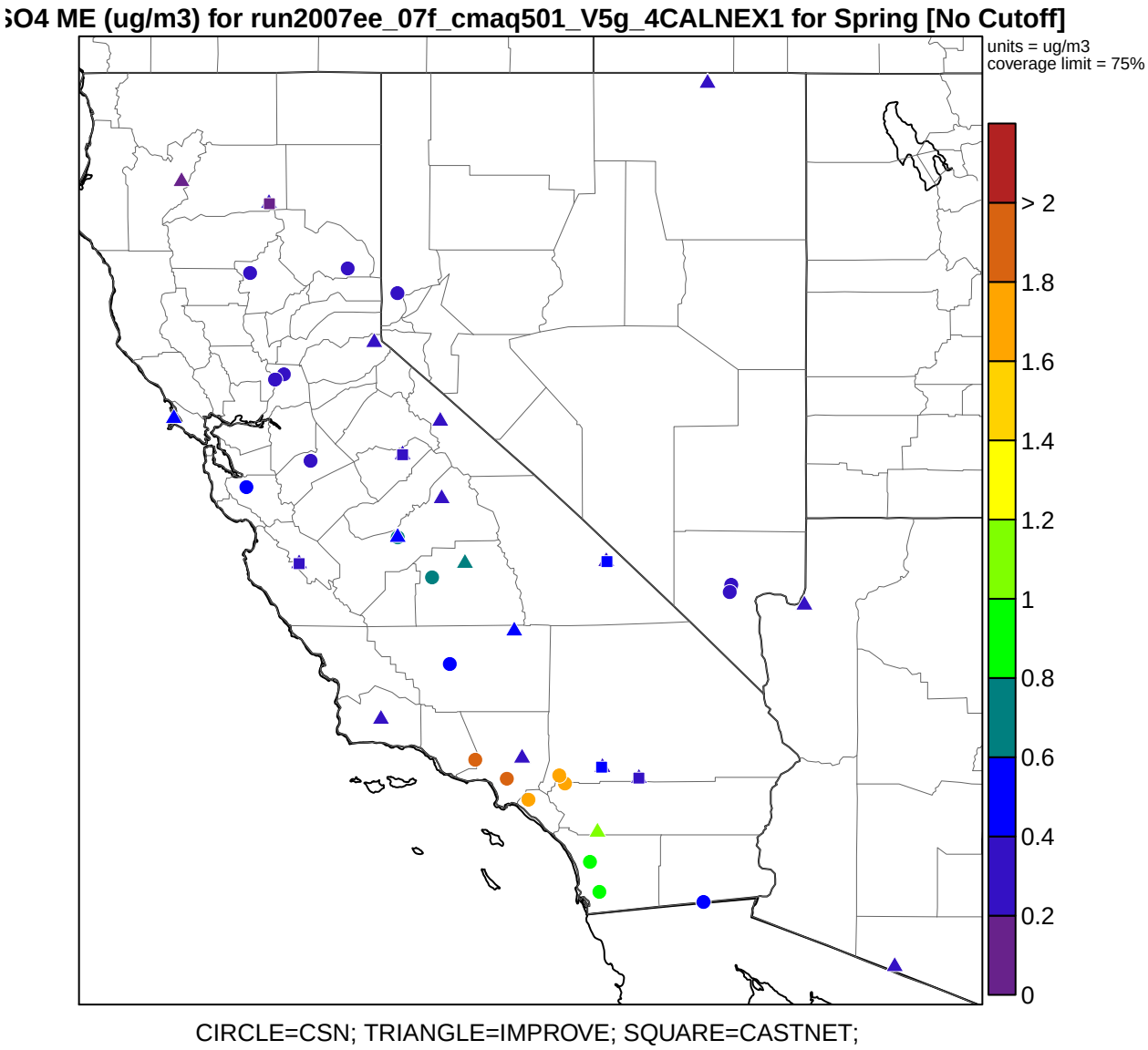

Figure 90: Mean error for Spring SO4

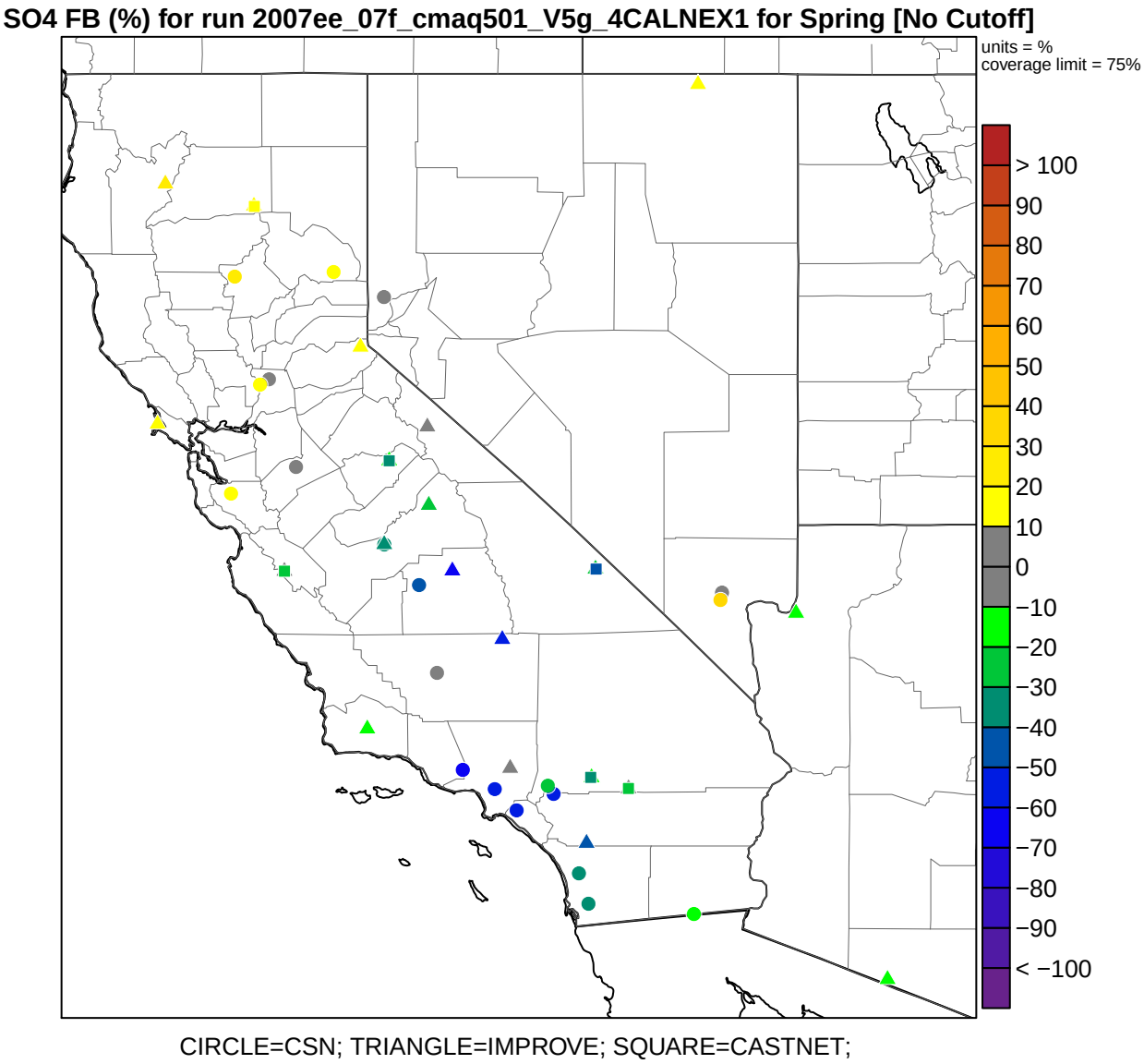

Figure 91: Fractional bias for Spring SO4

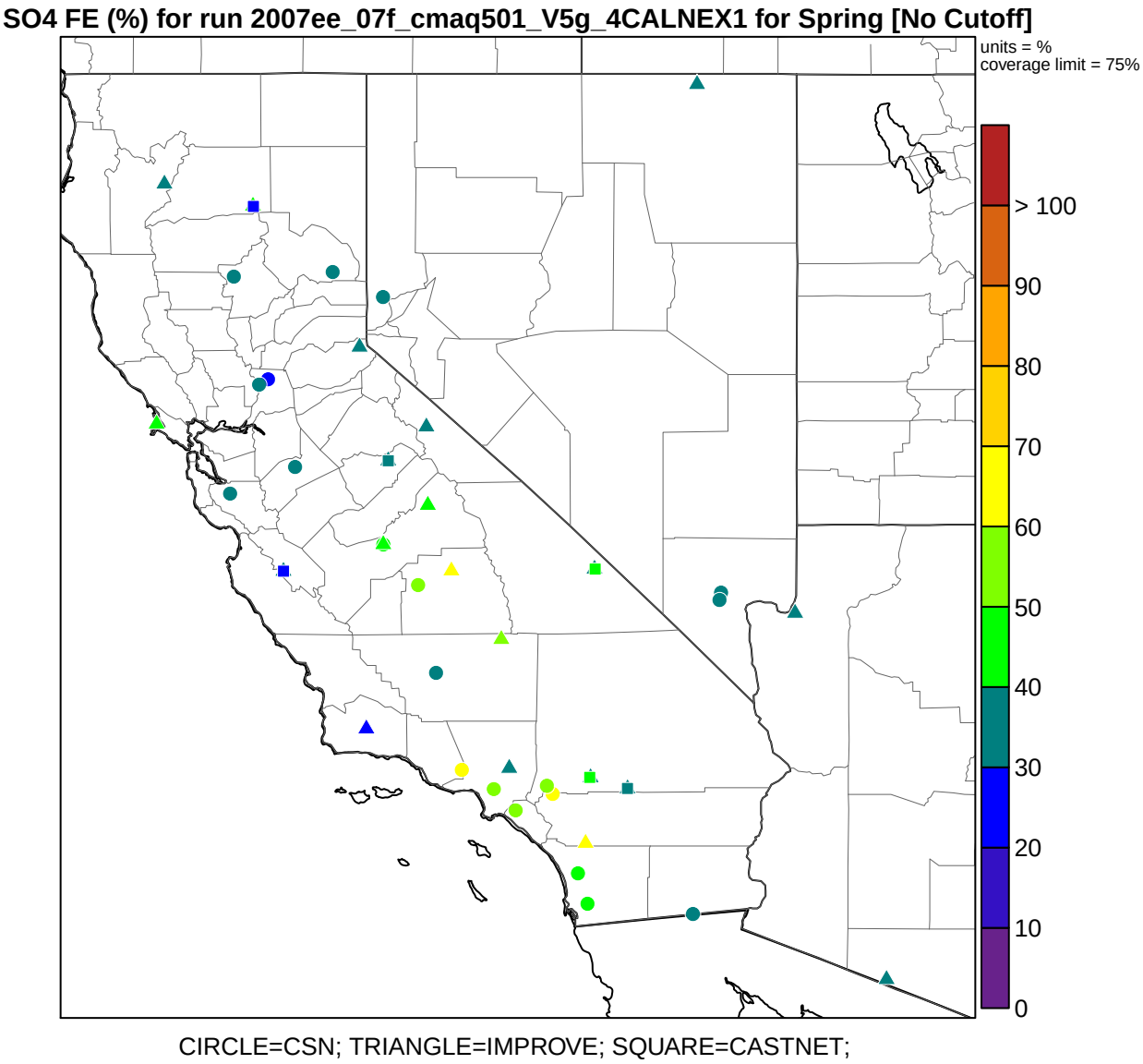

Figure 92: Fractional error for Spring SO4

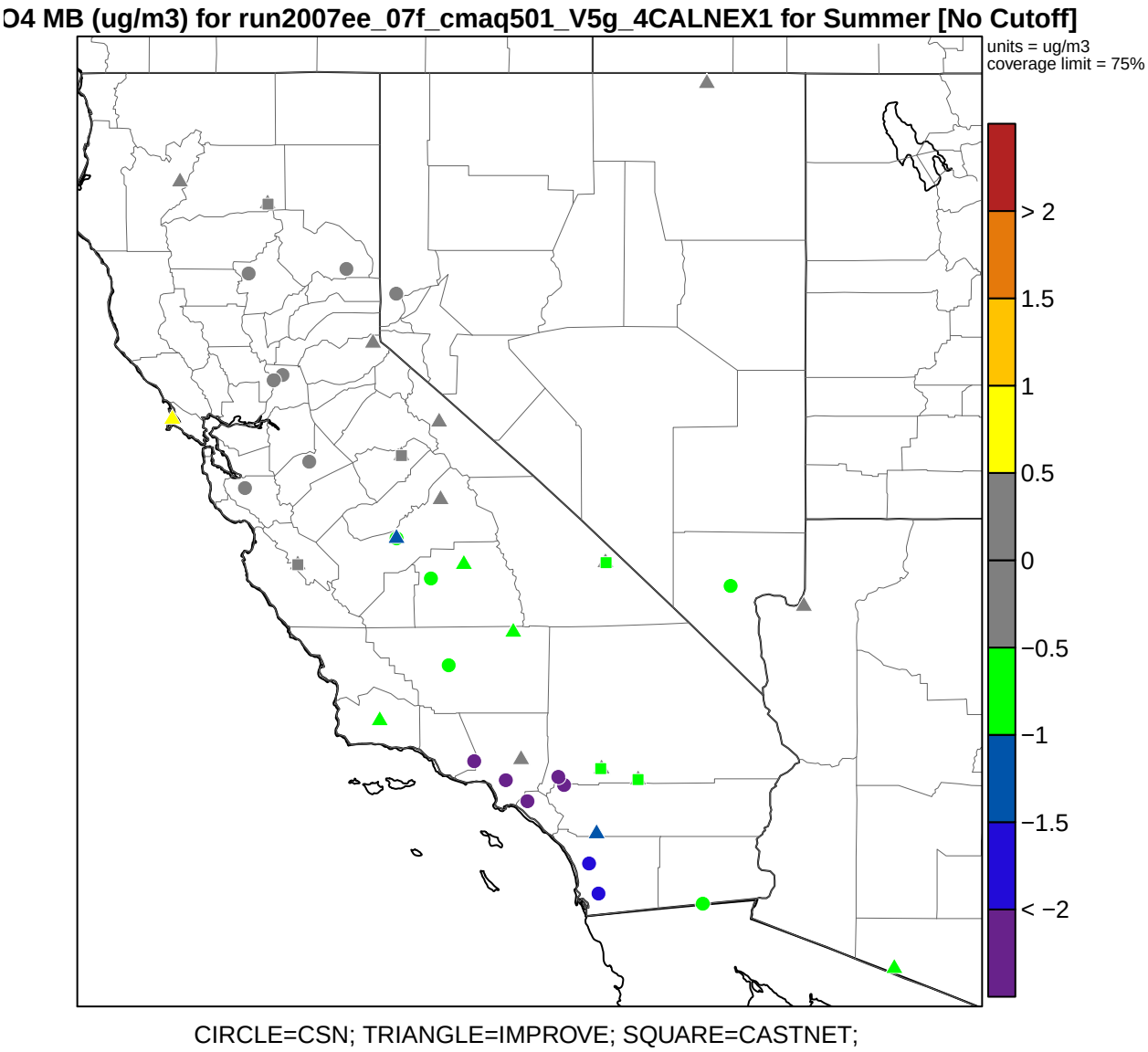

Figure 93: Mean bias for Summer SO4

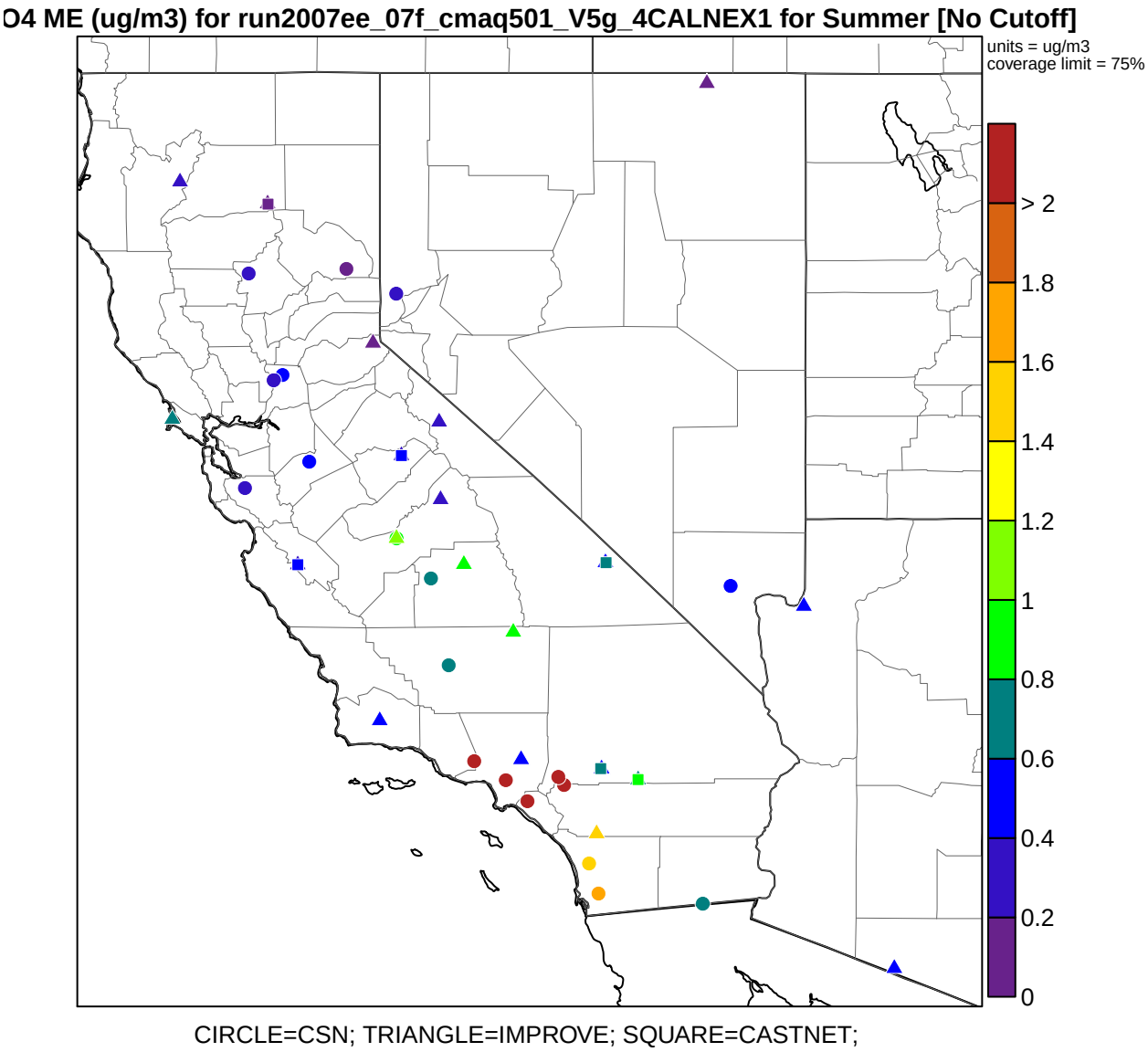

Figure 94: Mean error for Summer SO4

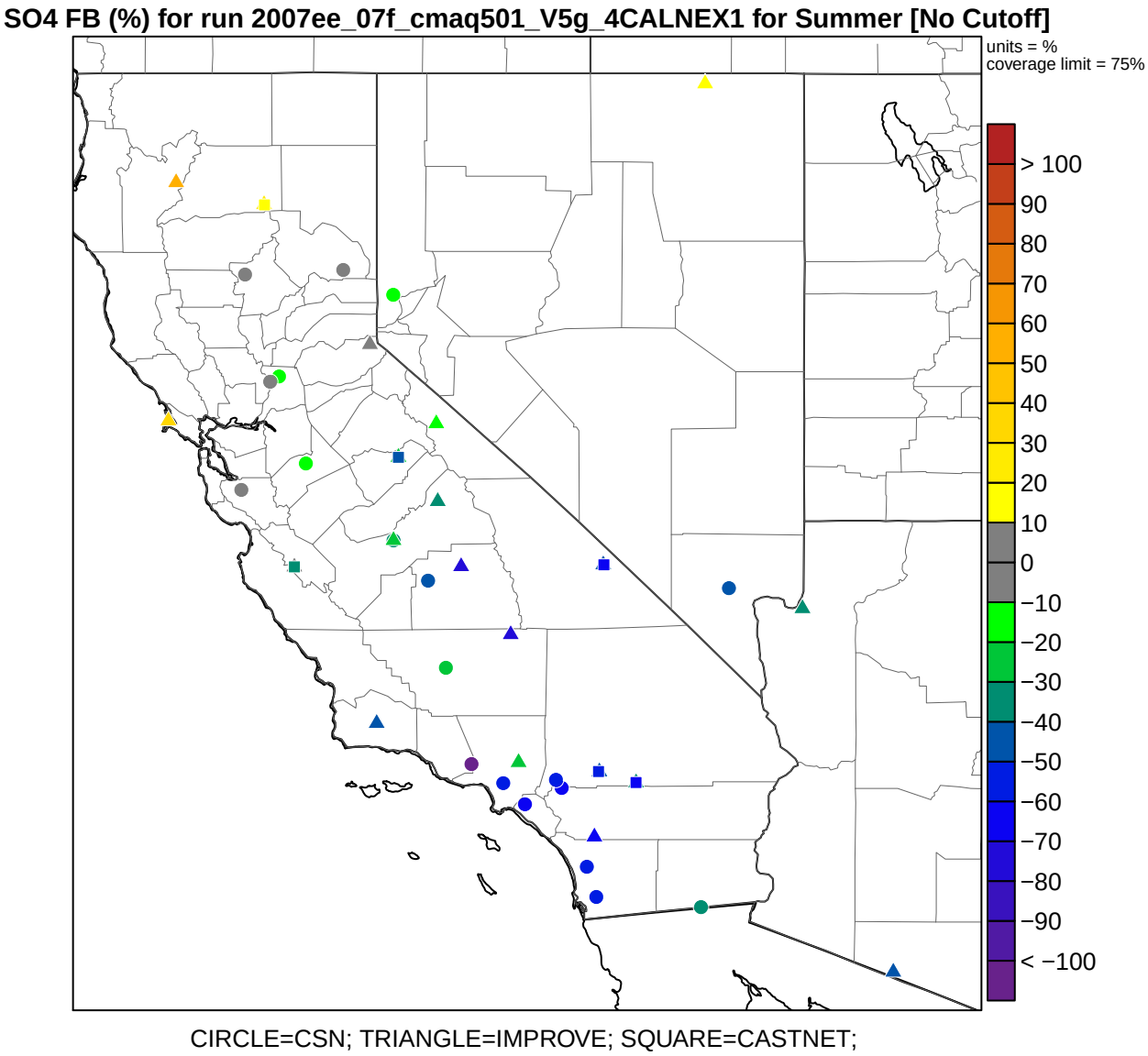

Figure 95: Fractional bias for Summer SO4

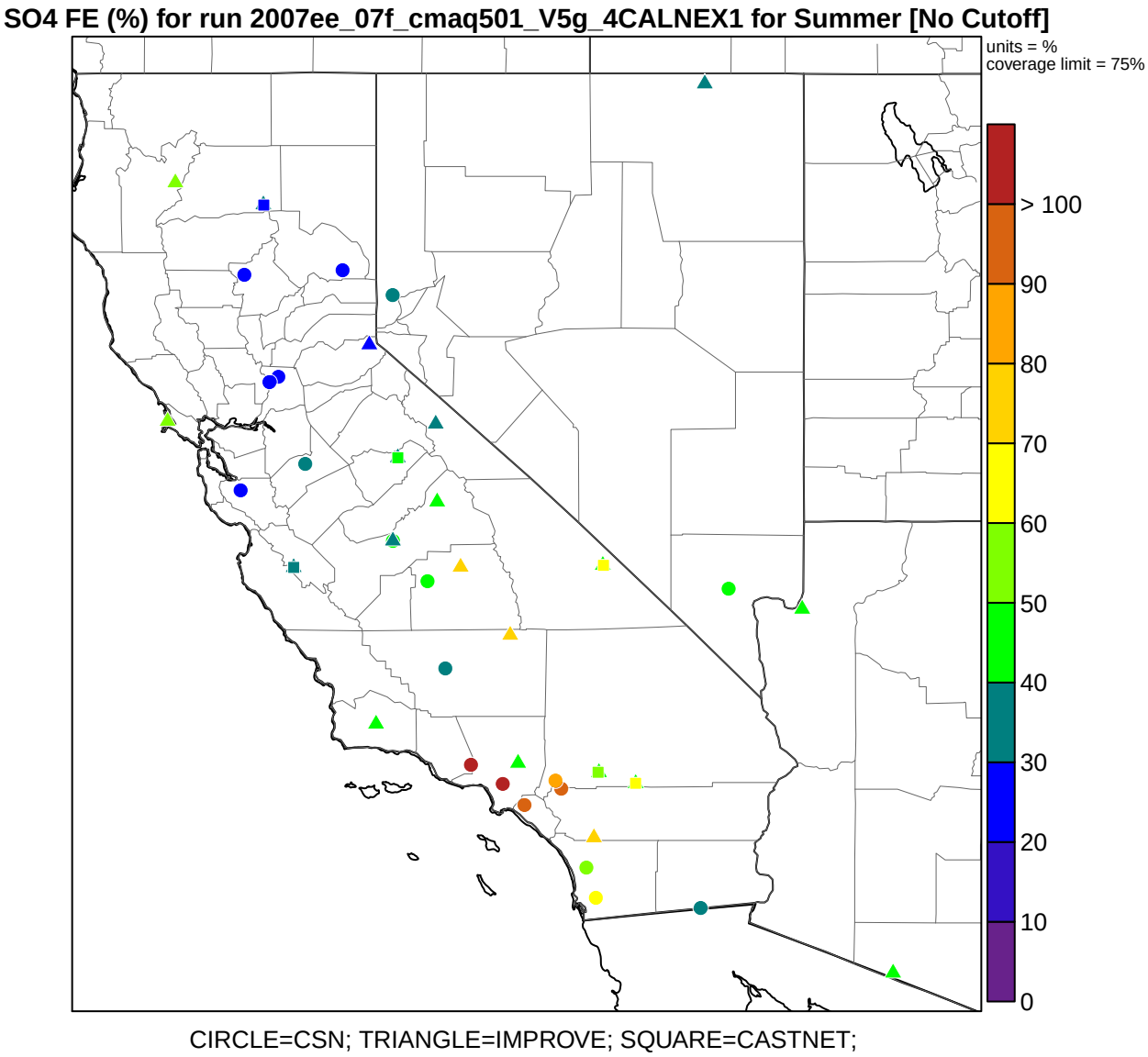

Figure 96: Fractional error for Summer SO4

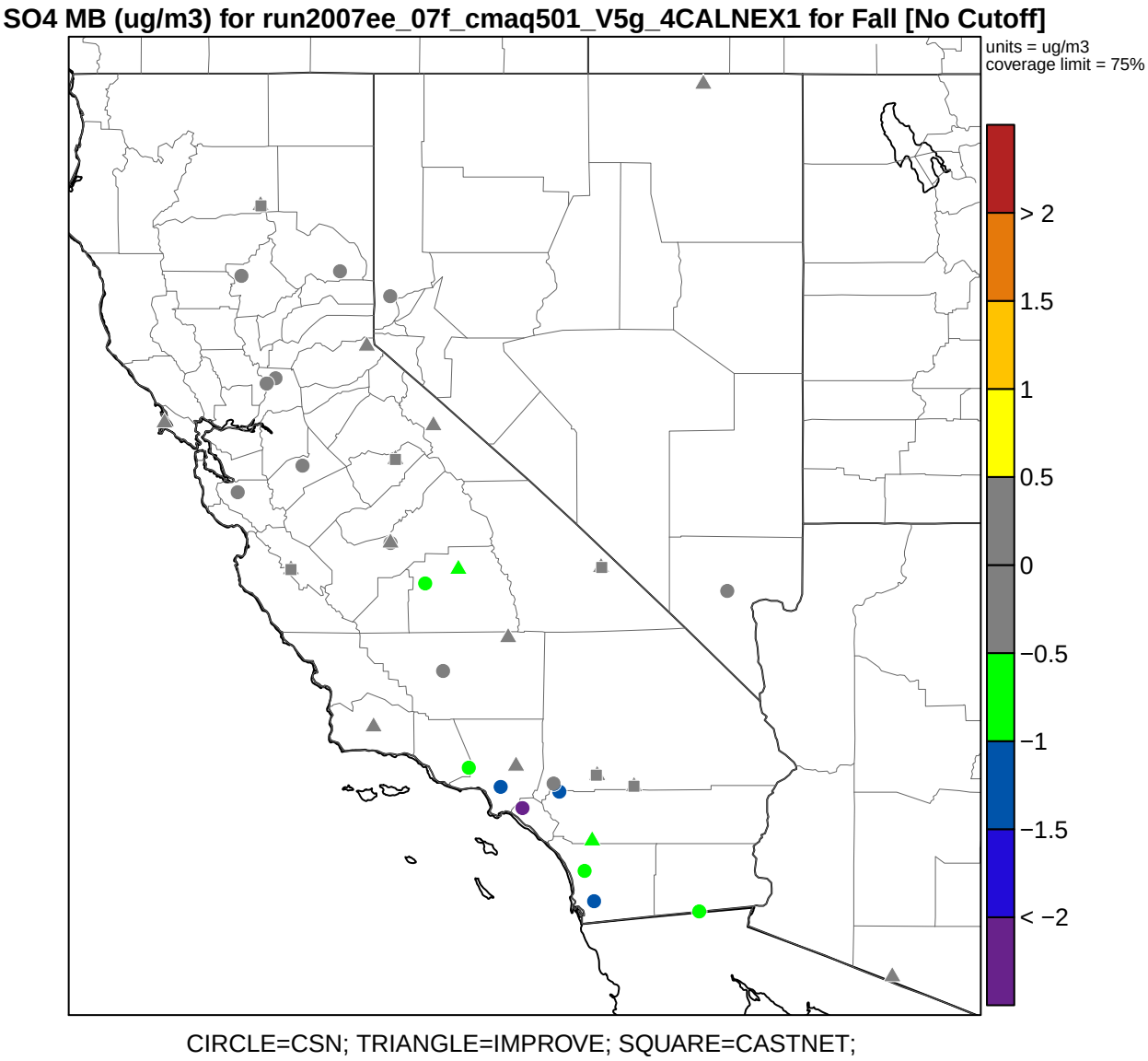

Figure 97: Mean bias for Fall SO4

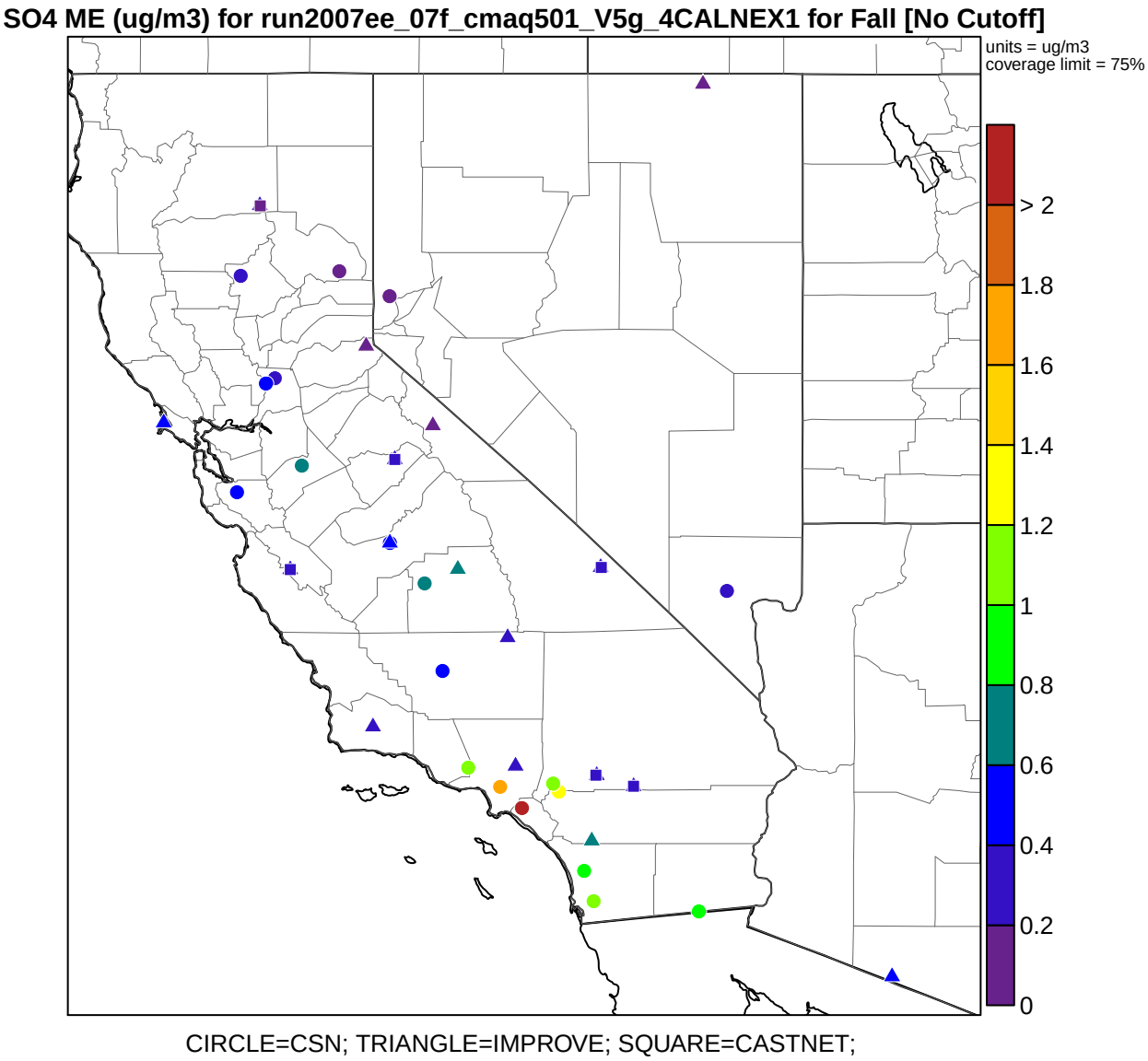

Figure 98: Mean error for Fall SO4

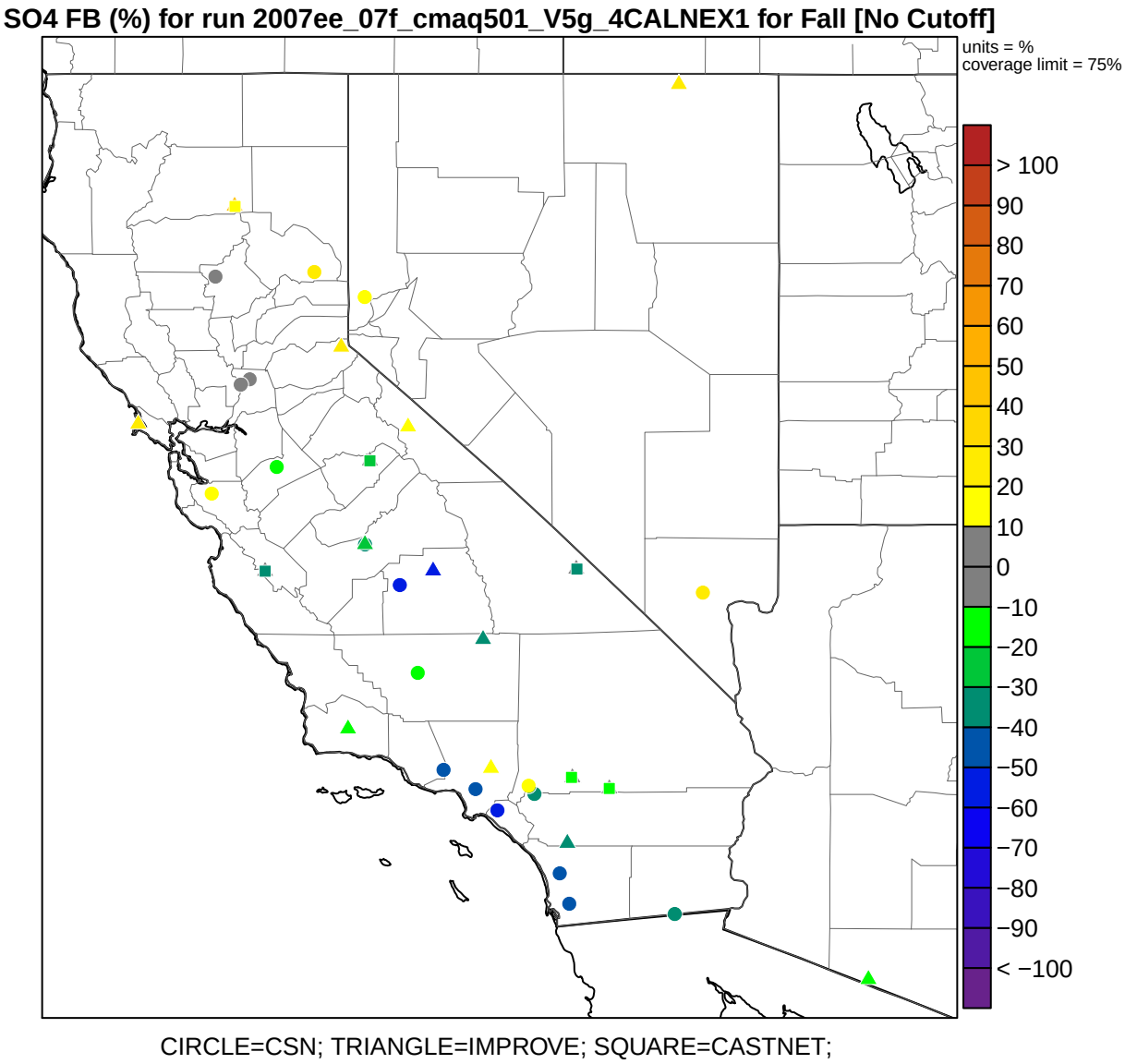

Figure 99: Fractional bias for Fall SO4

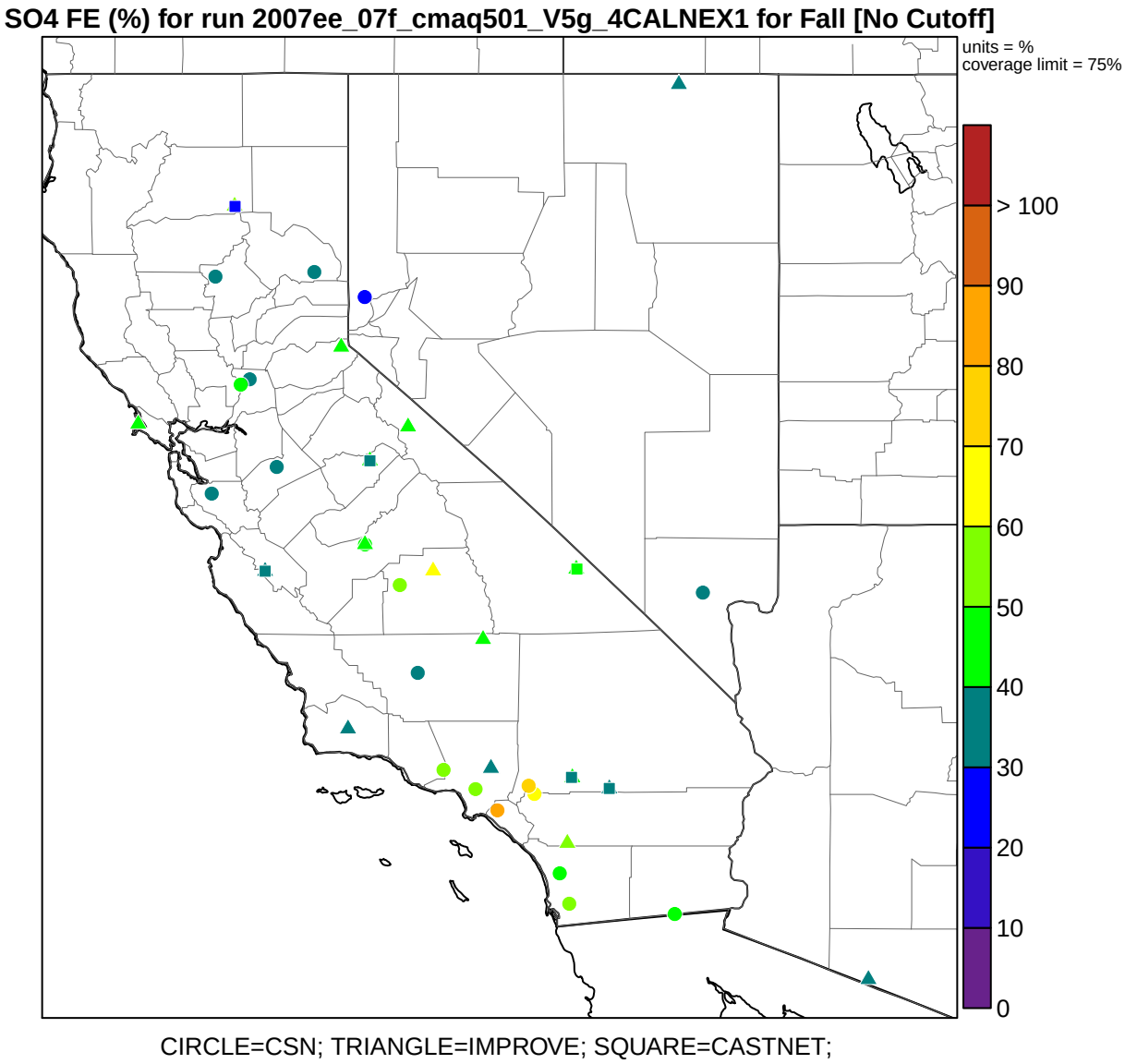

Figure 100: Fractional error for Fall SO4

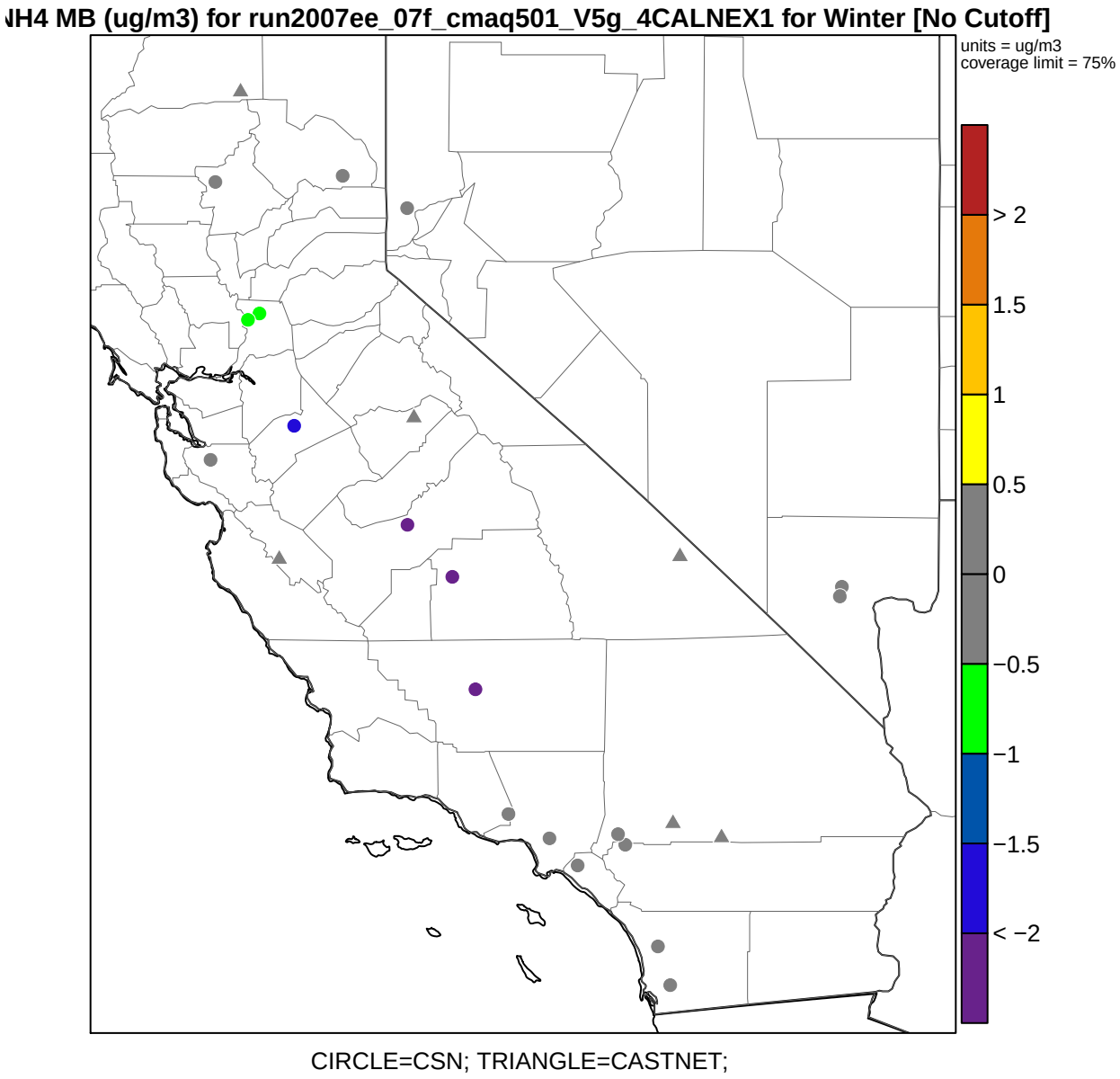

Figure 101: Mean bias for Winter NH4

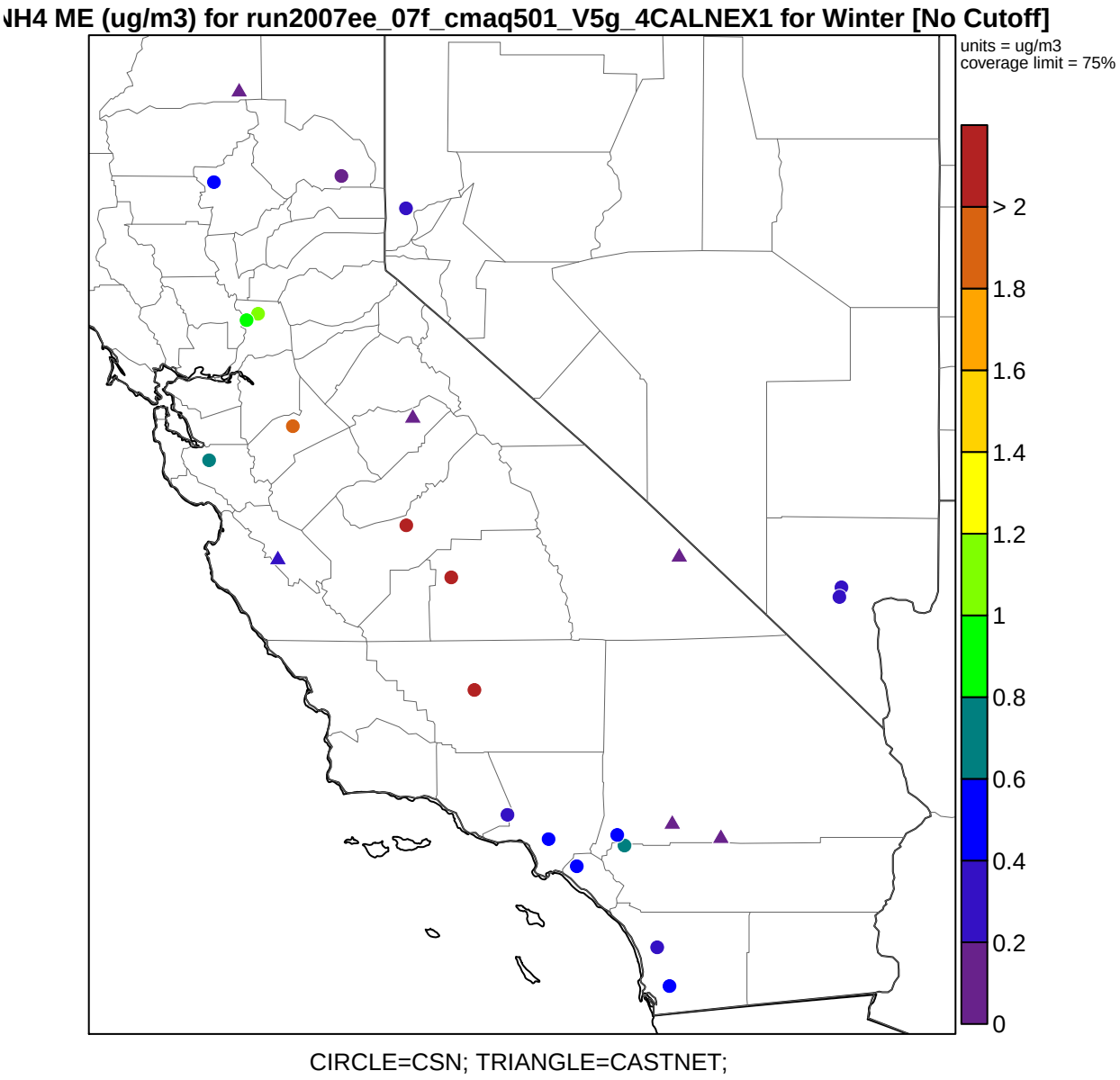

Figure 102: Mean error for Winter NH4

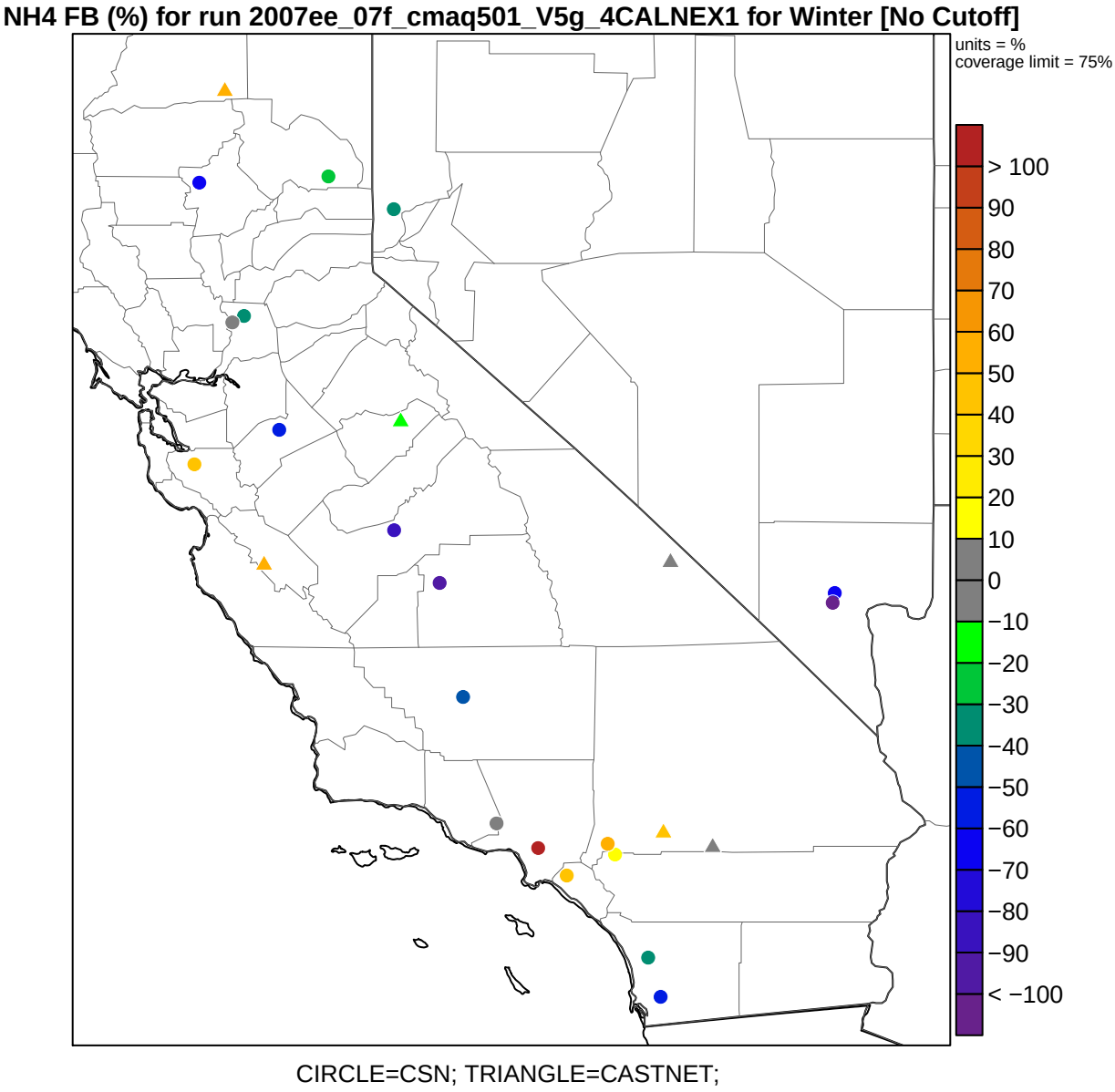

Figure 103: Fractional bias for Winter NH4

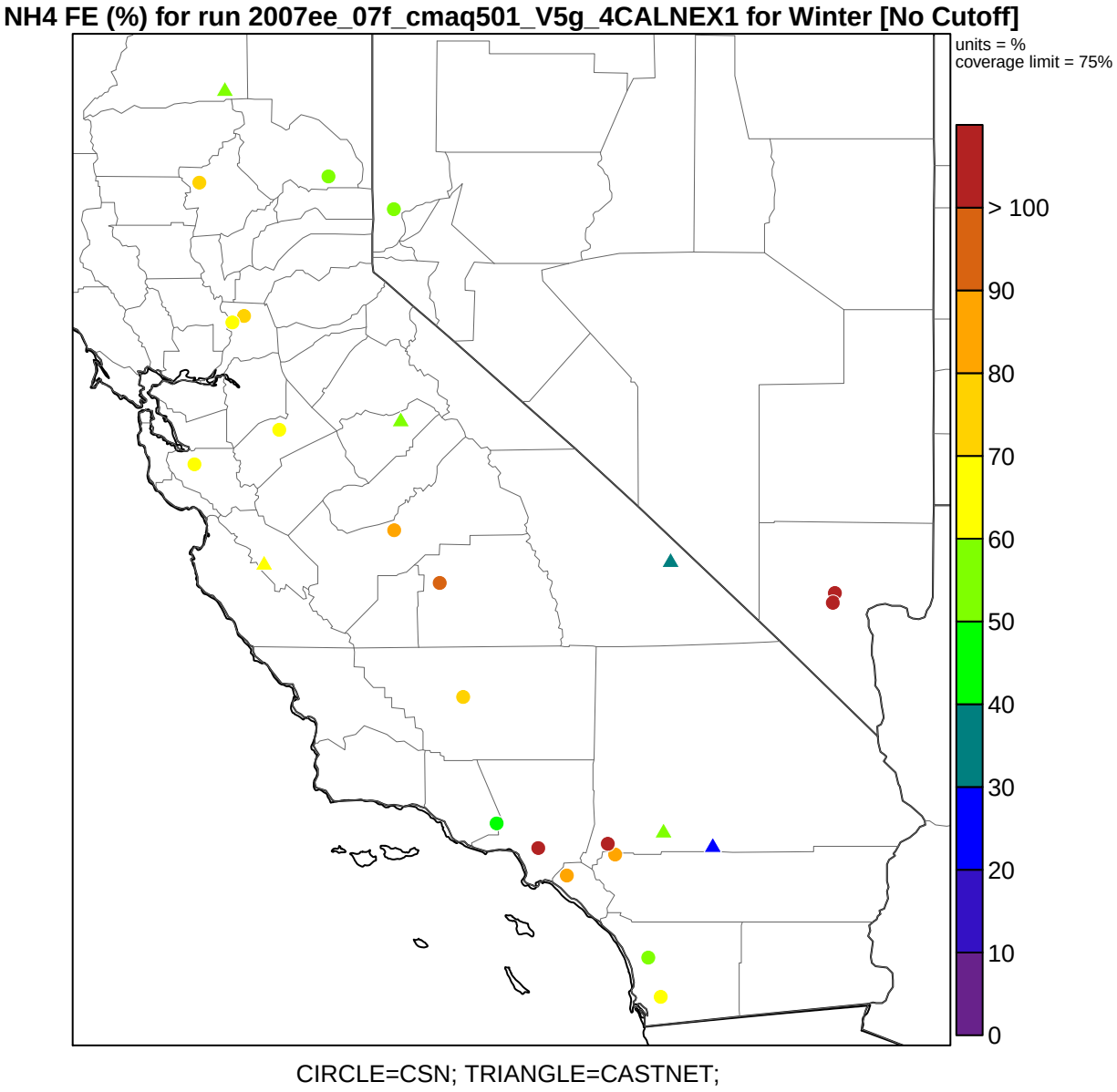

Figure 104: Fractional error for Winter NH4

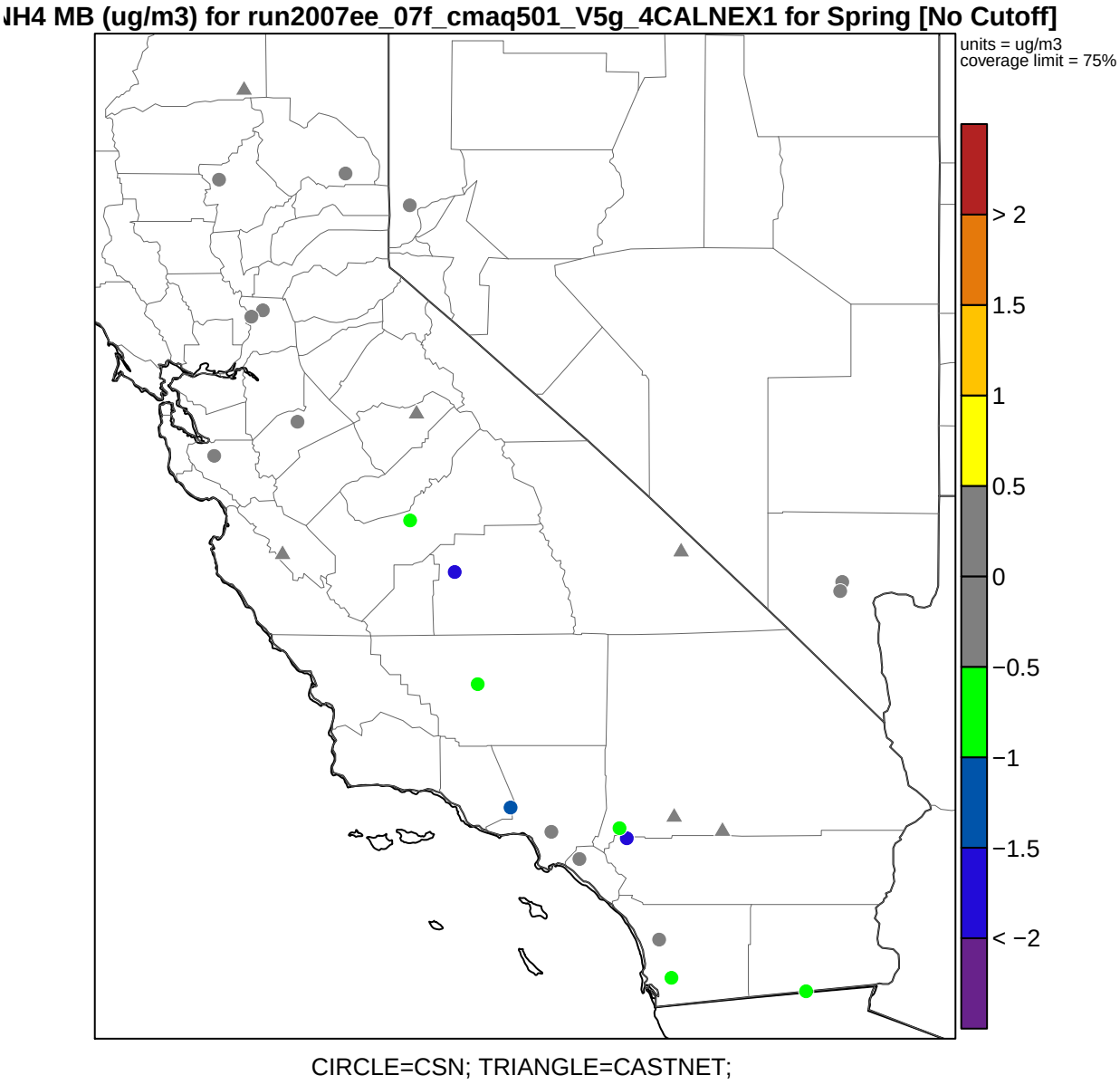

Figure 105: Mean bias for Spring NH4

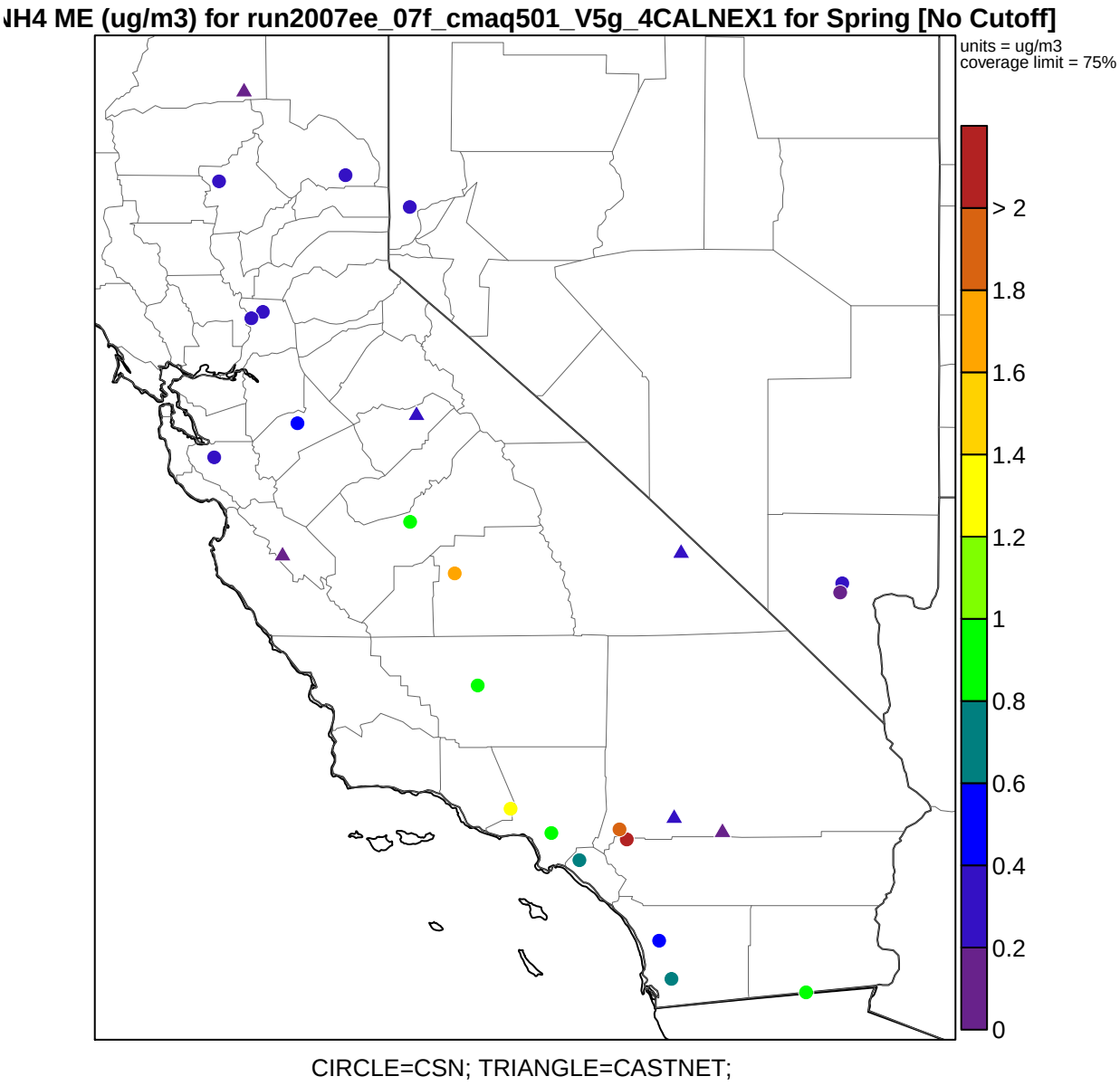

Figure 106: Mean error for Spring NH4

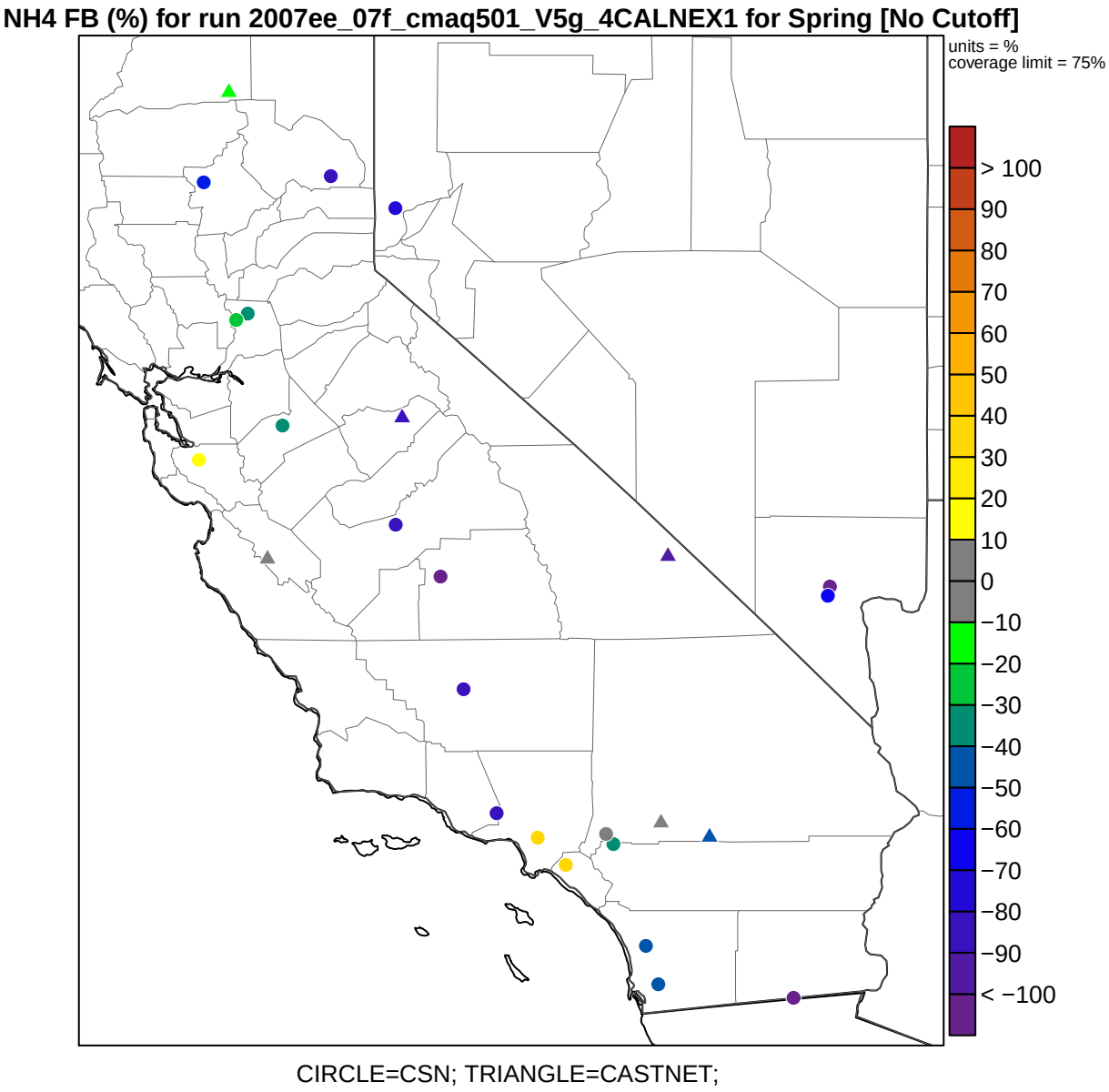

Figure 107: Fractional bias for Spring NH4

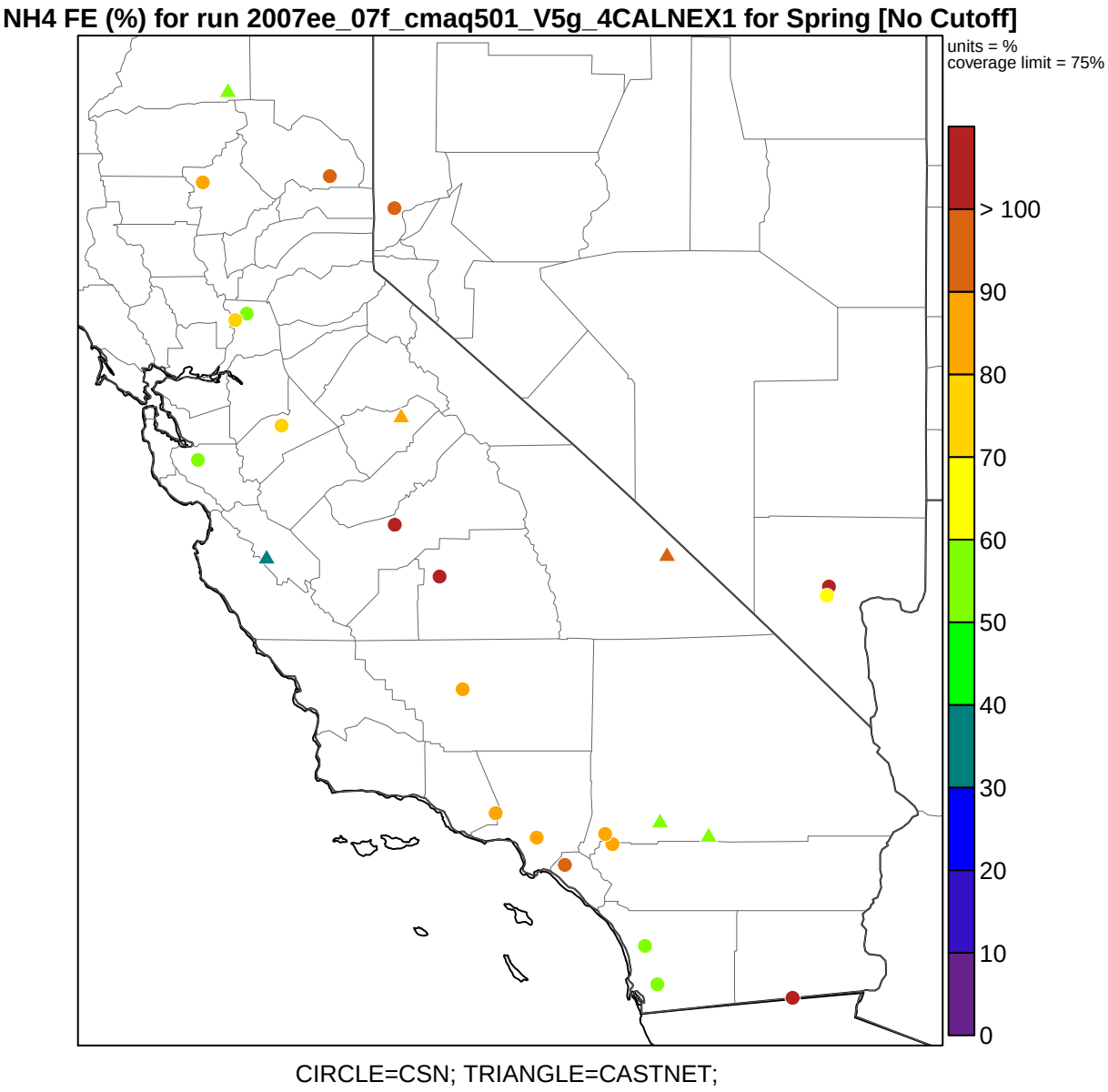

Figure 108: Fractional error for Spring NH4

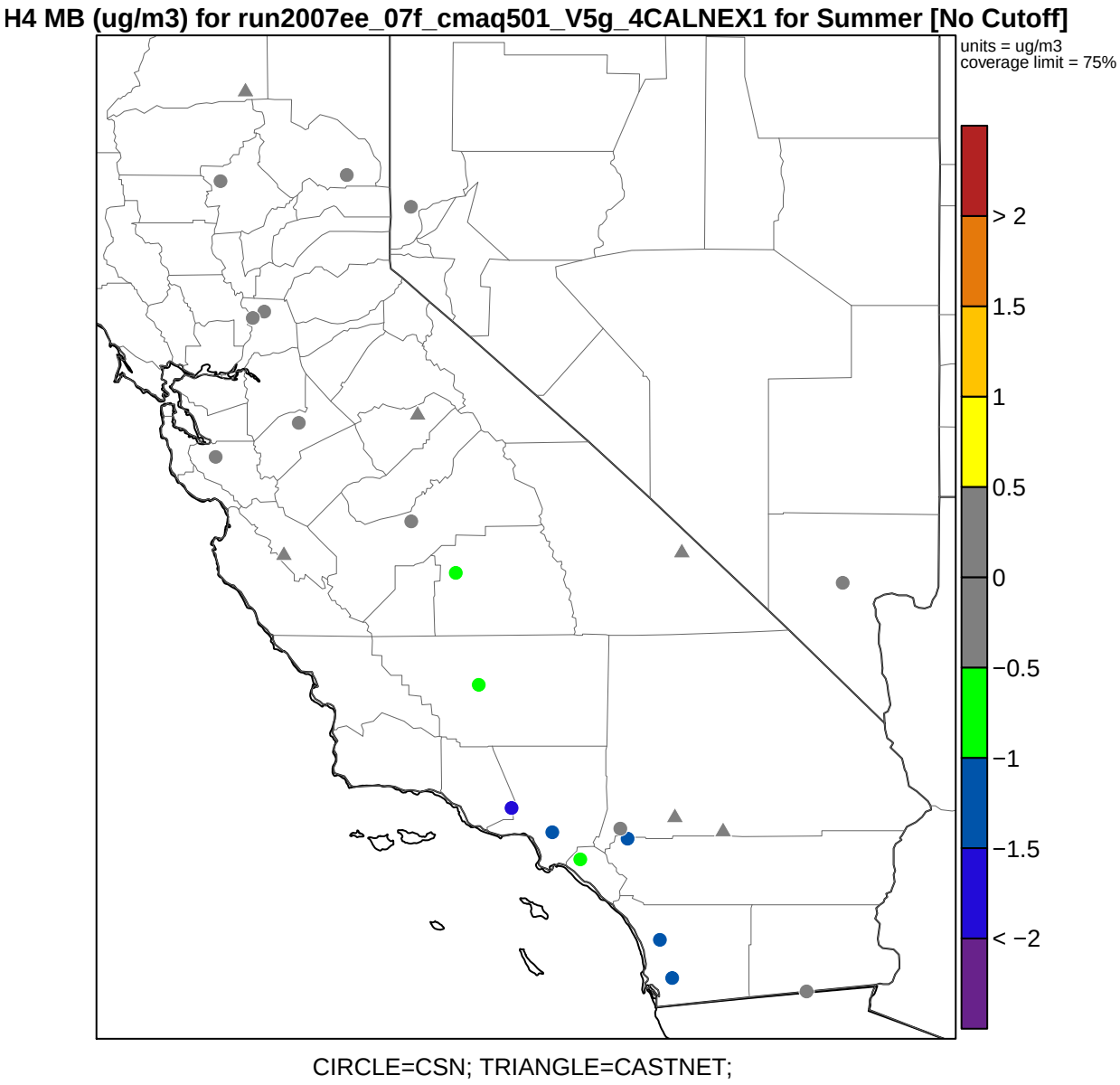

Figure 109: Mean bias for Summer NH4

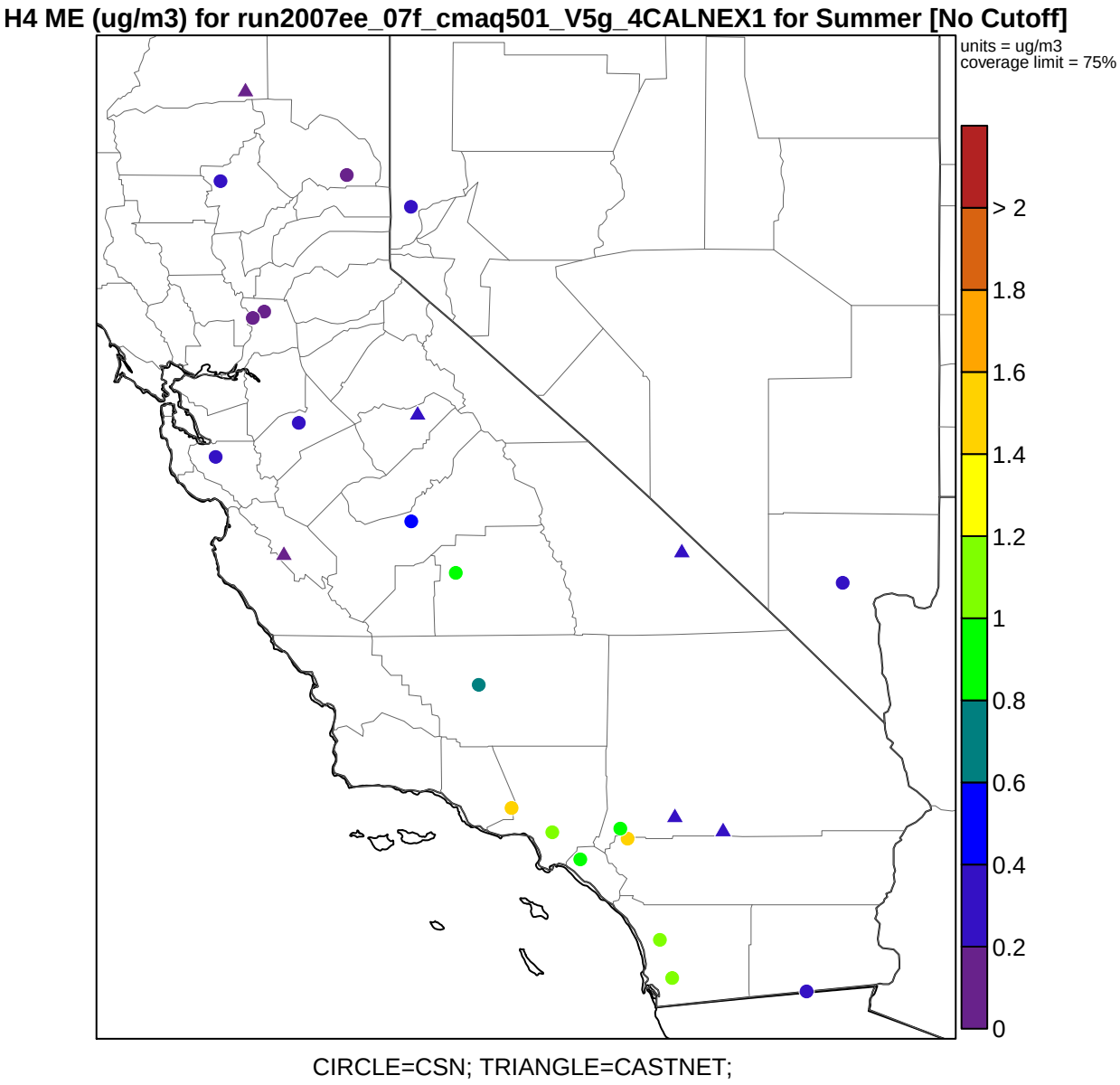

Figure 110: Mean error for Summer NH4

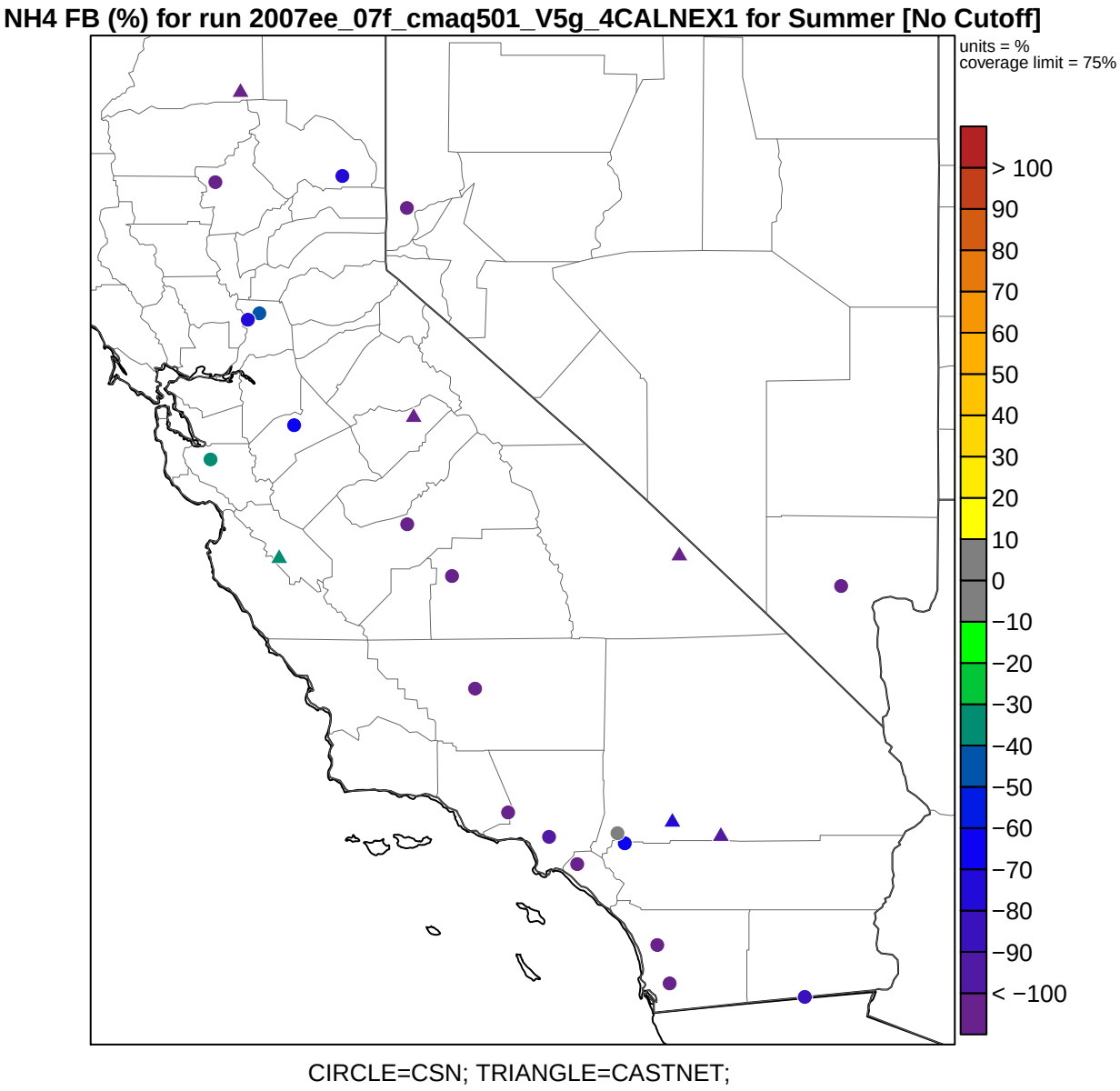

Figure 111: Fractional bias for Summer NH4

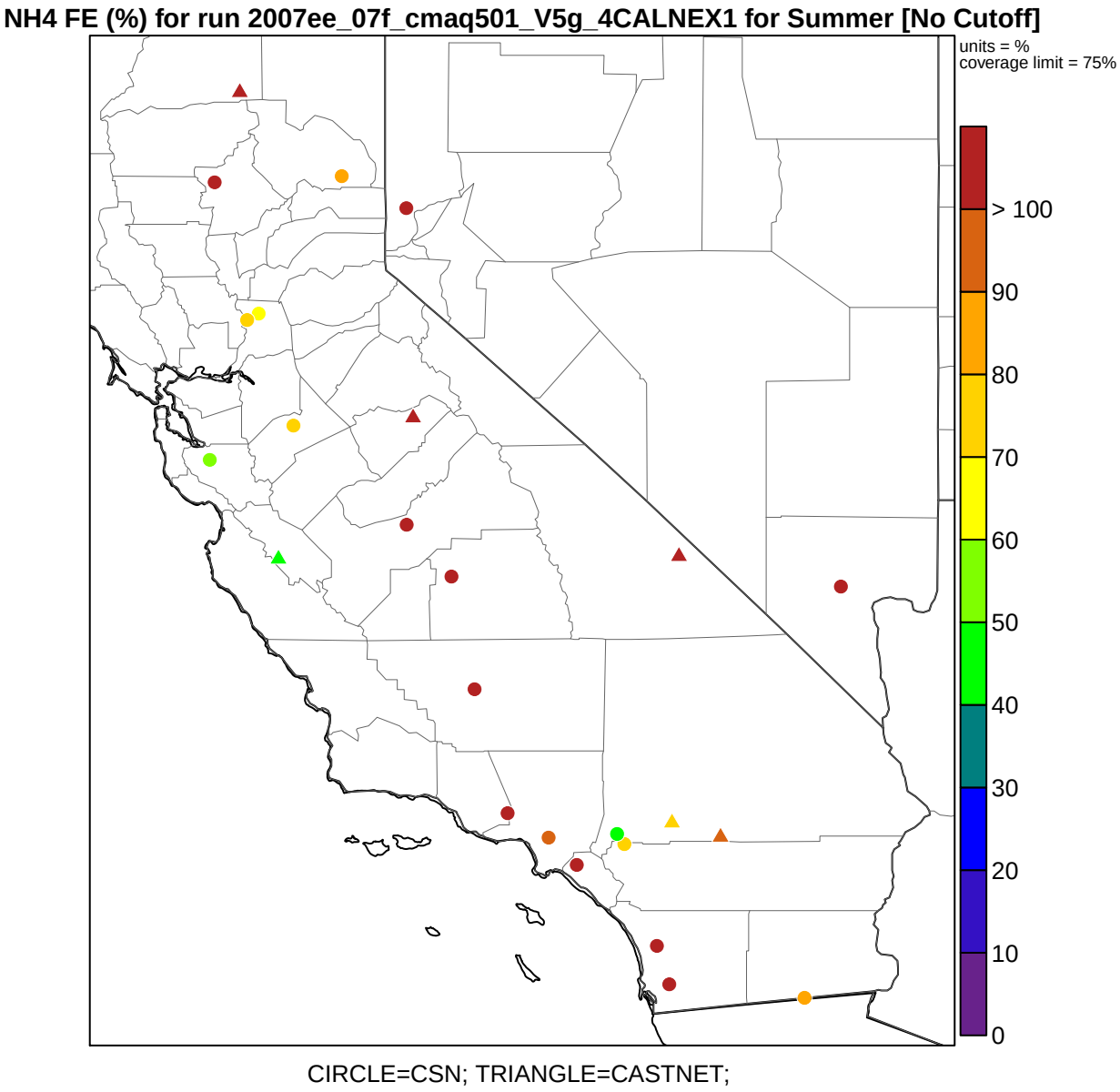

Figure 112: Fractional error for Summer NH4

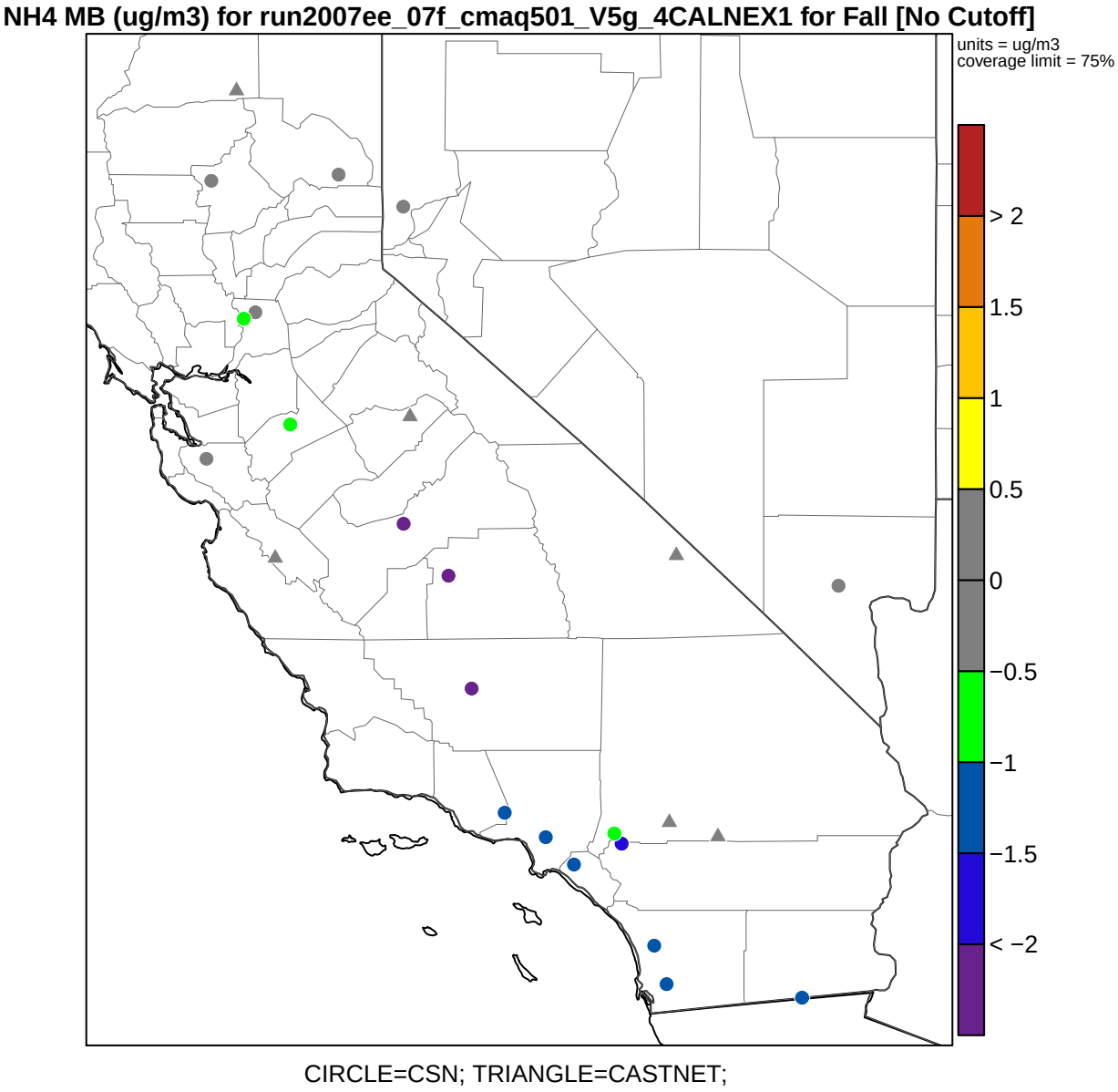

Figure 113: Mean bias for Fall NH4

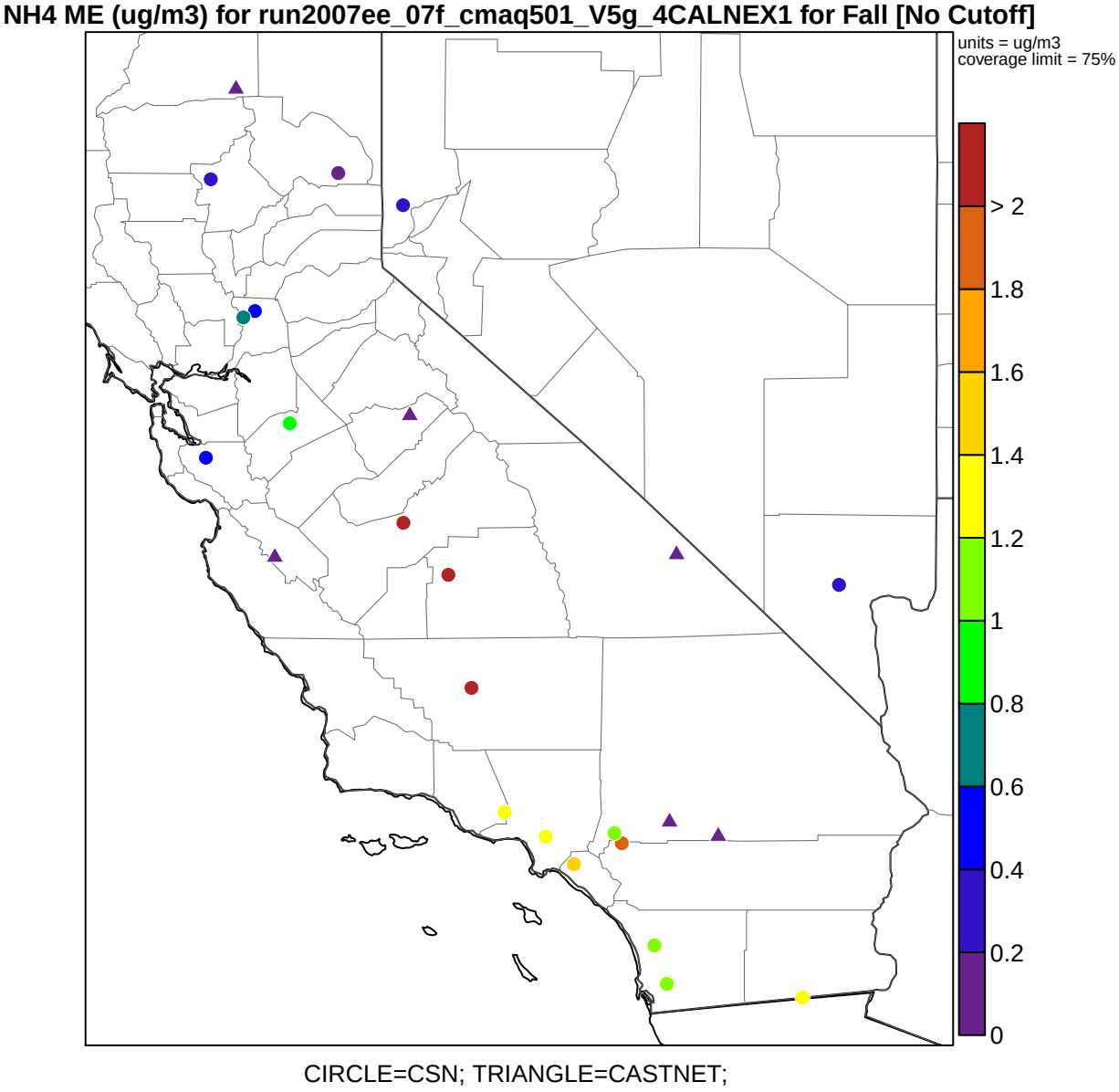

Figure 114: Mean error for Fall NH4

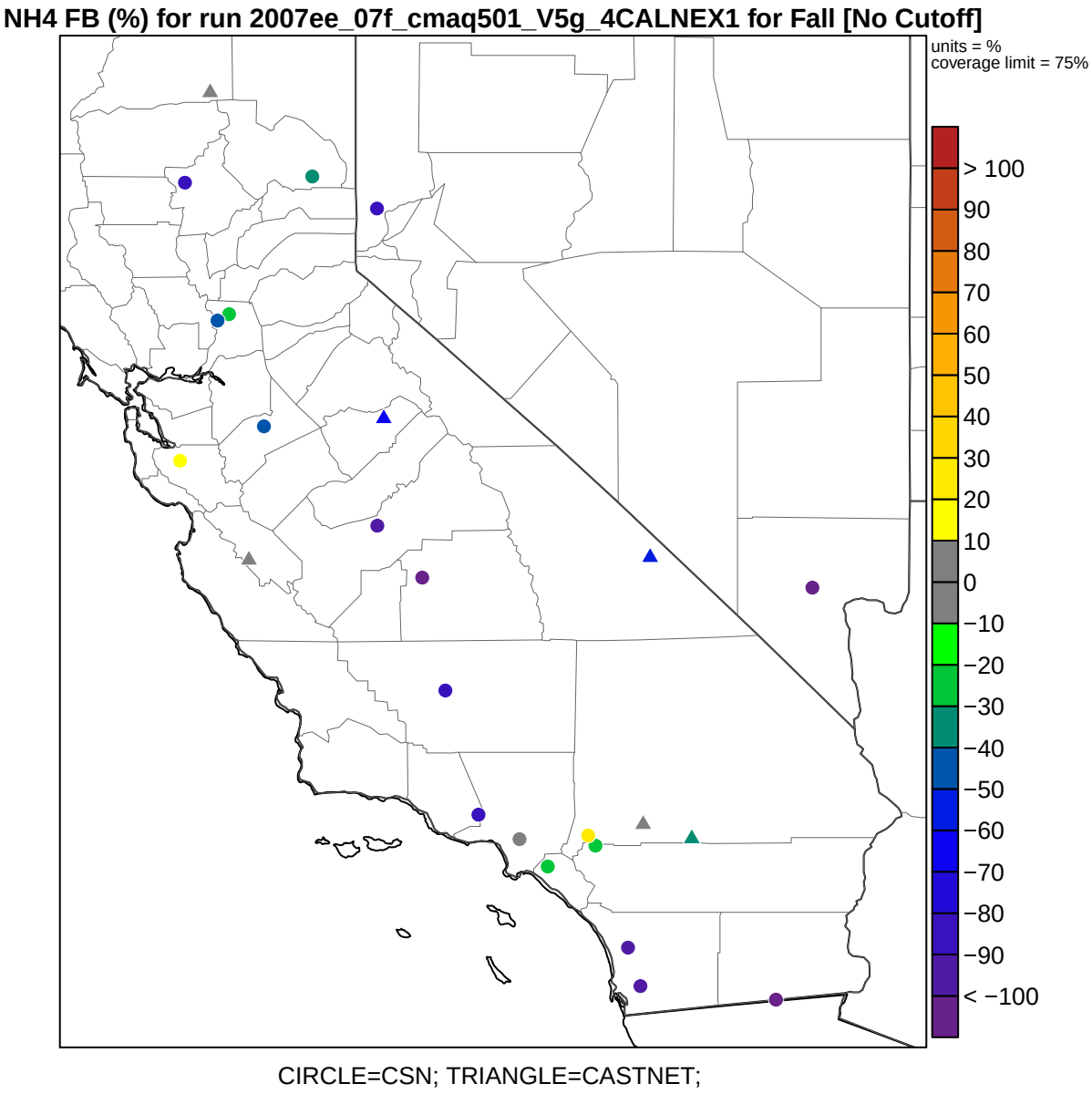

Figure 115: Fractional bias for Fall NH4

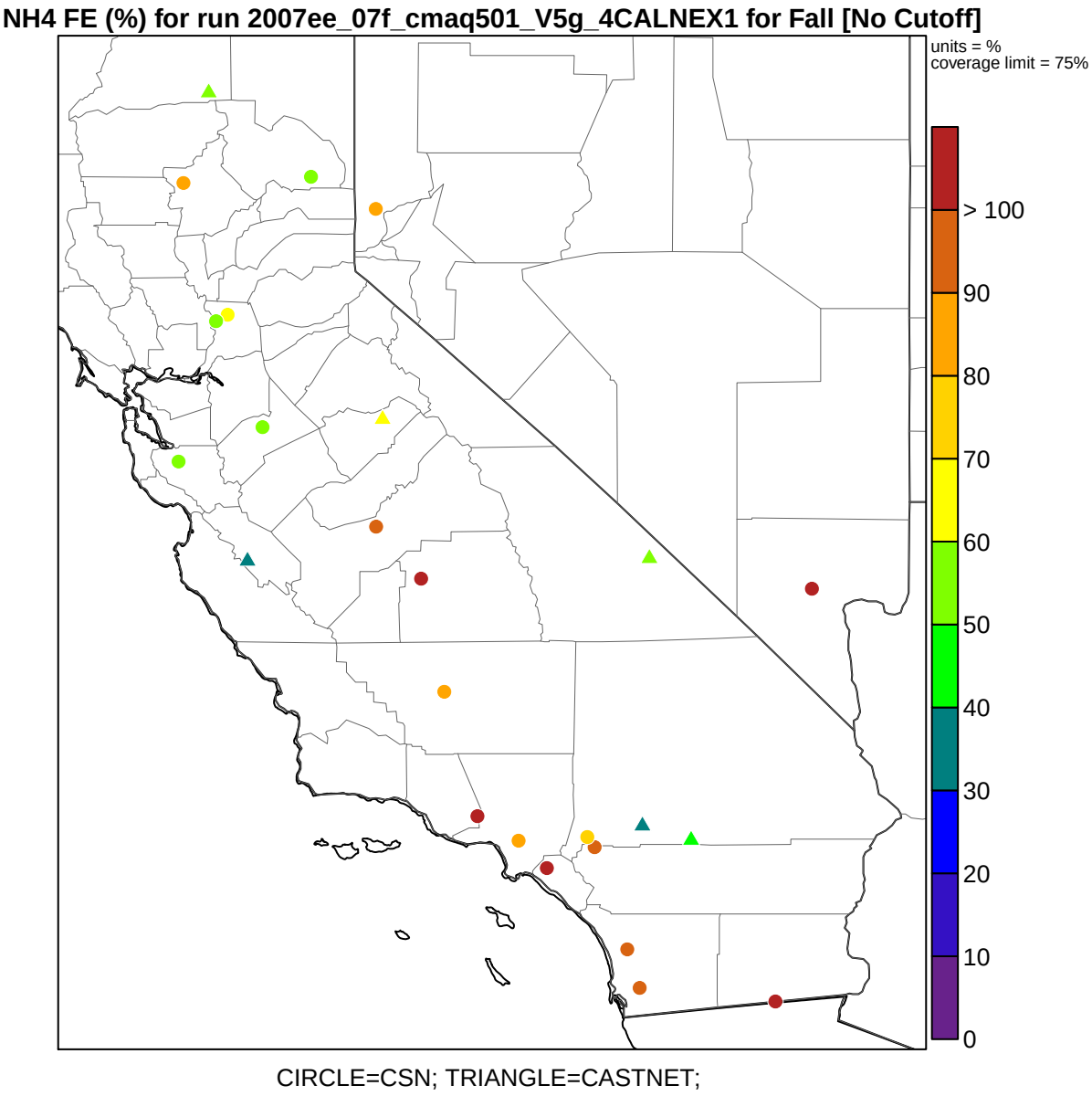

Figure 116: Fractional error for Fall NH4

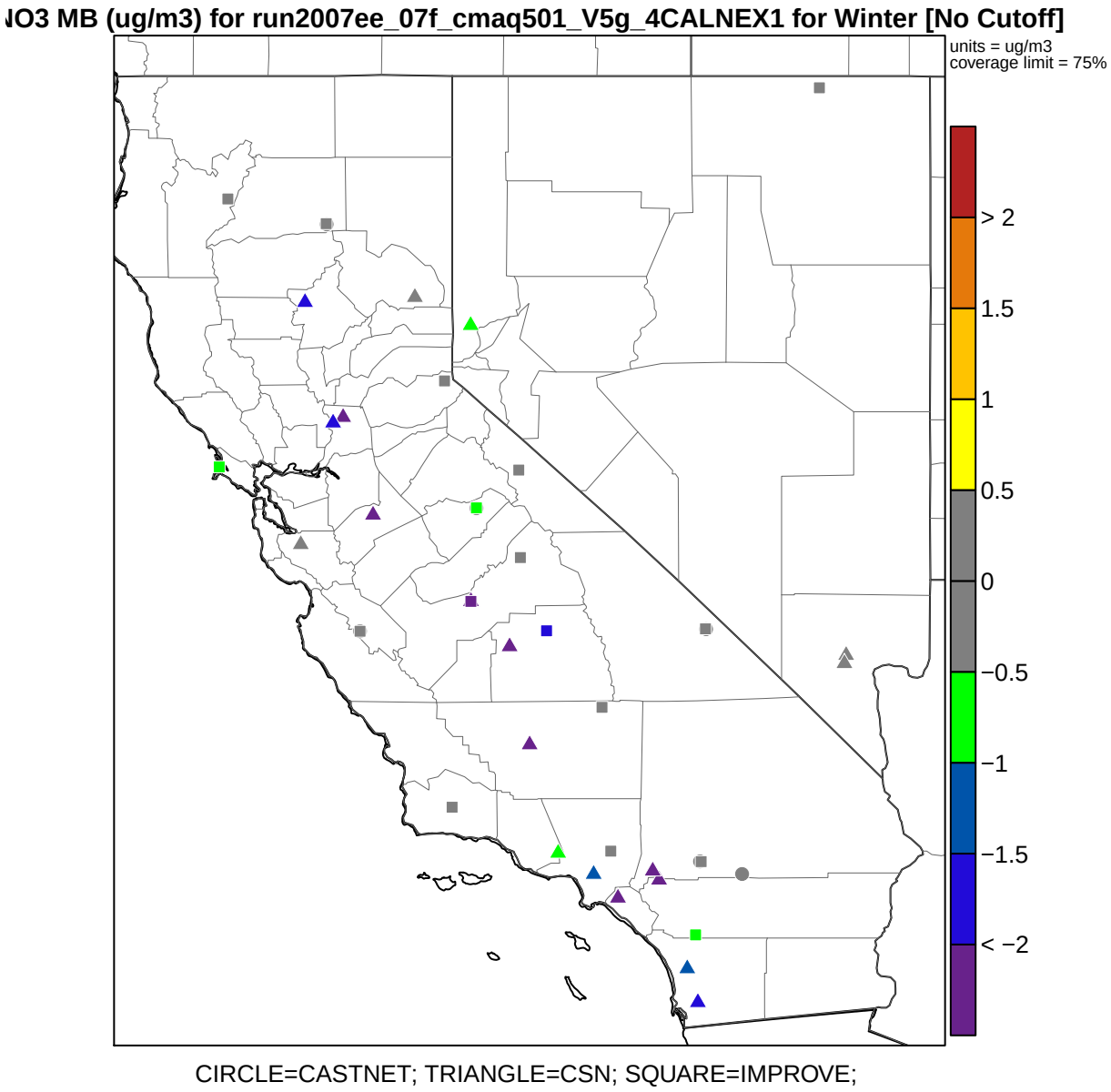

Figure 117: Mean bias for Winter NO3

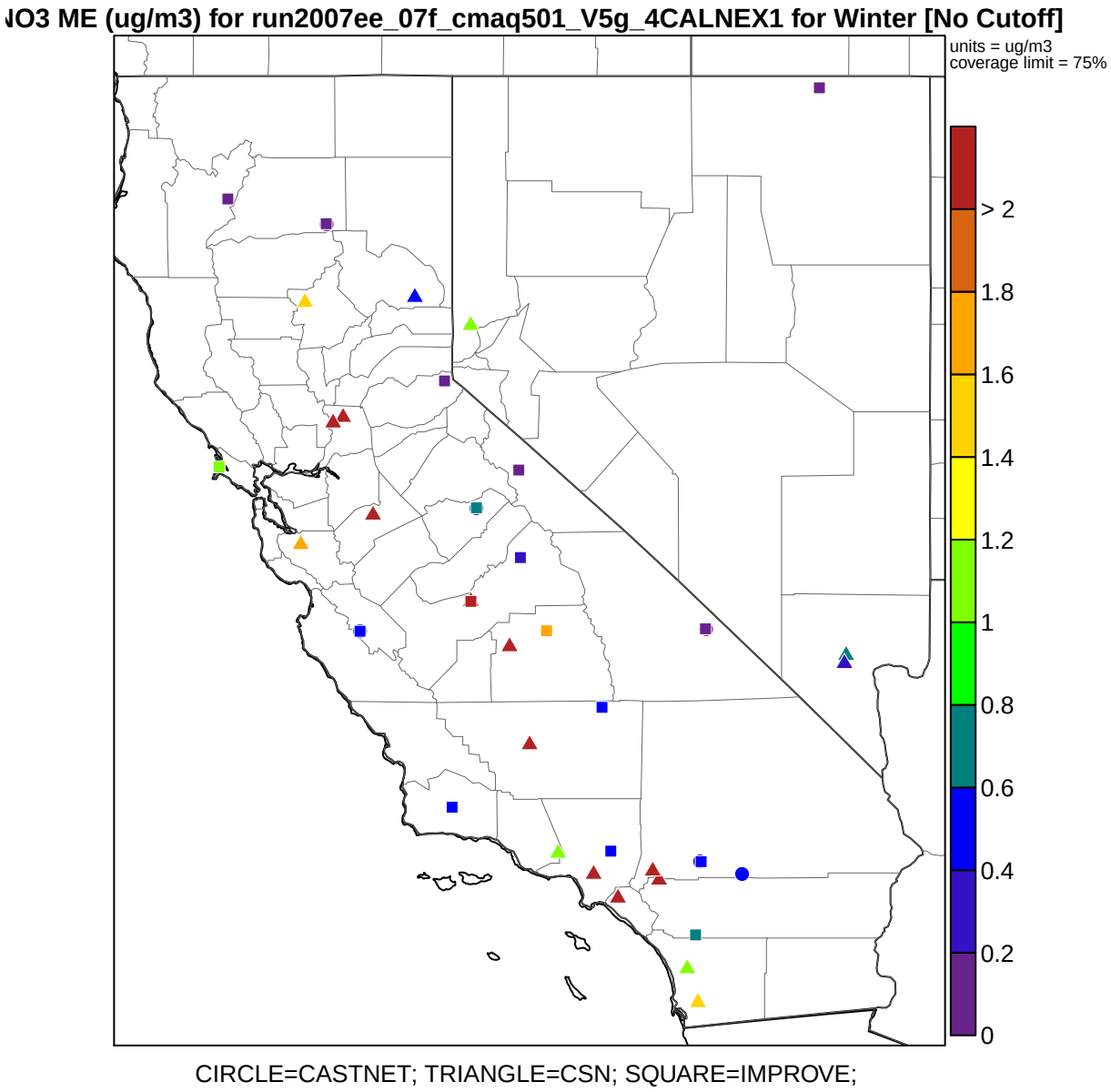

Figure 118: Mean error for Winter NO3

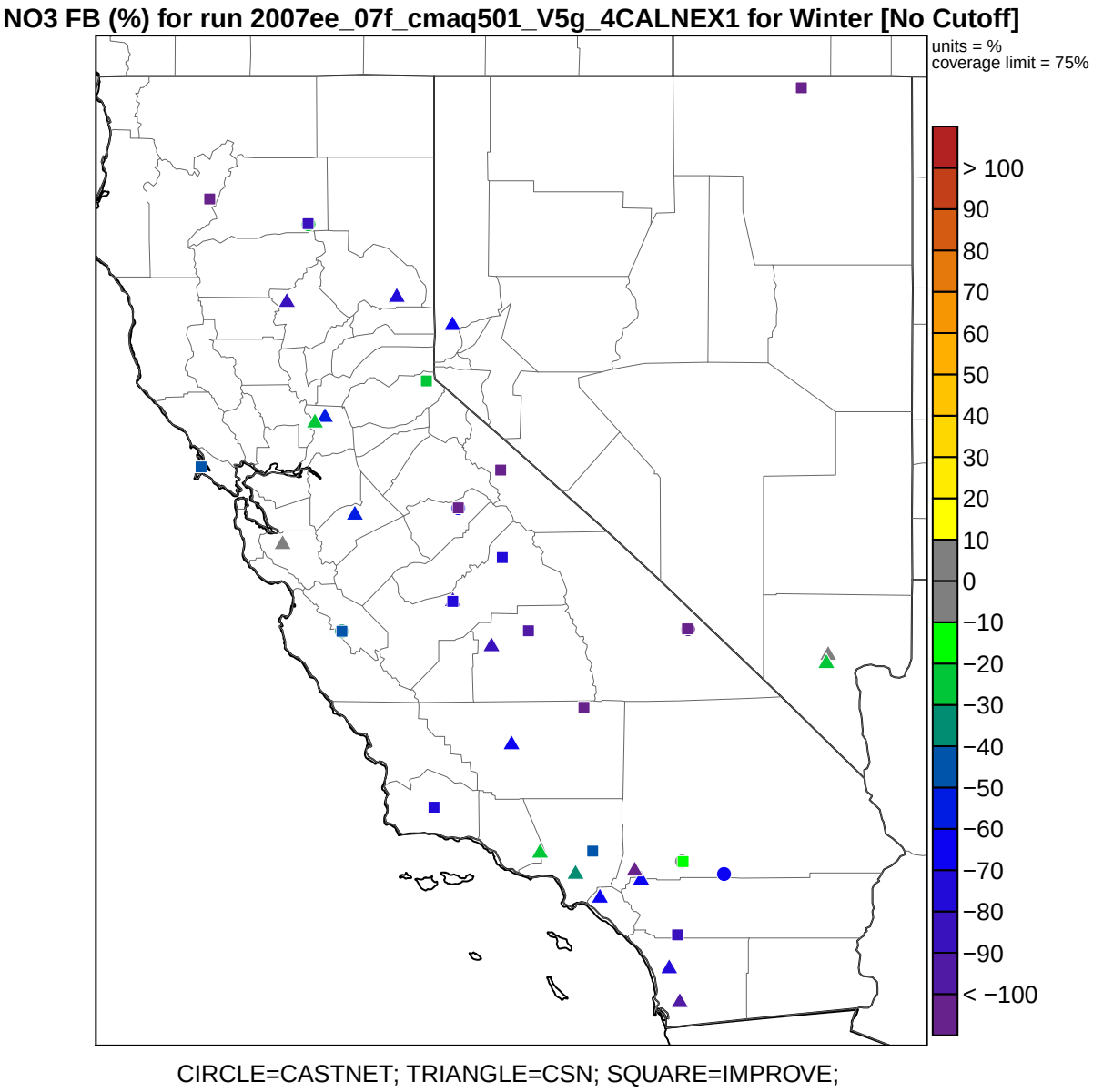

Figure 119: Fractional bias for Winter NO3

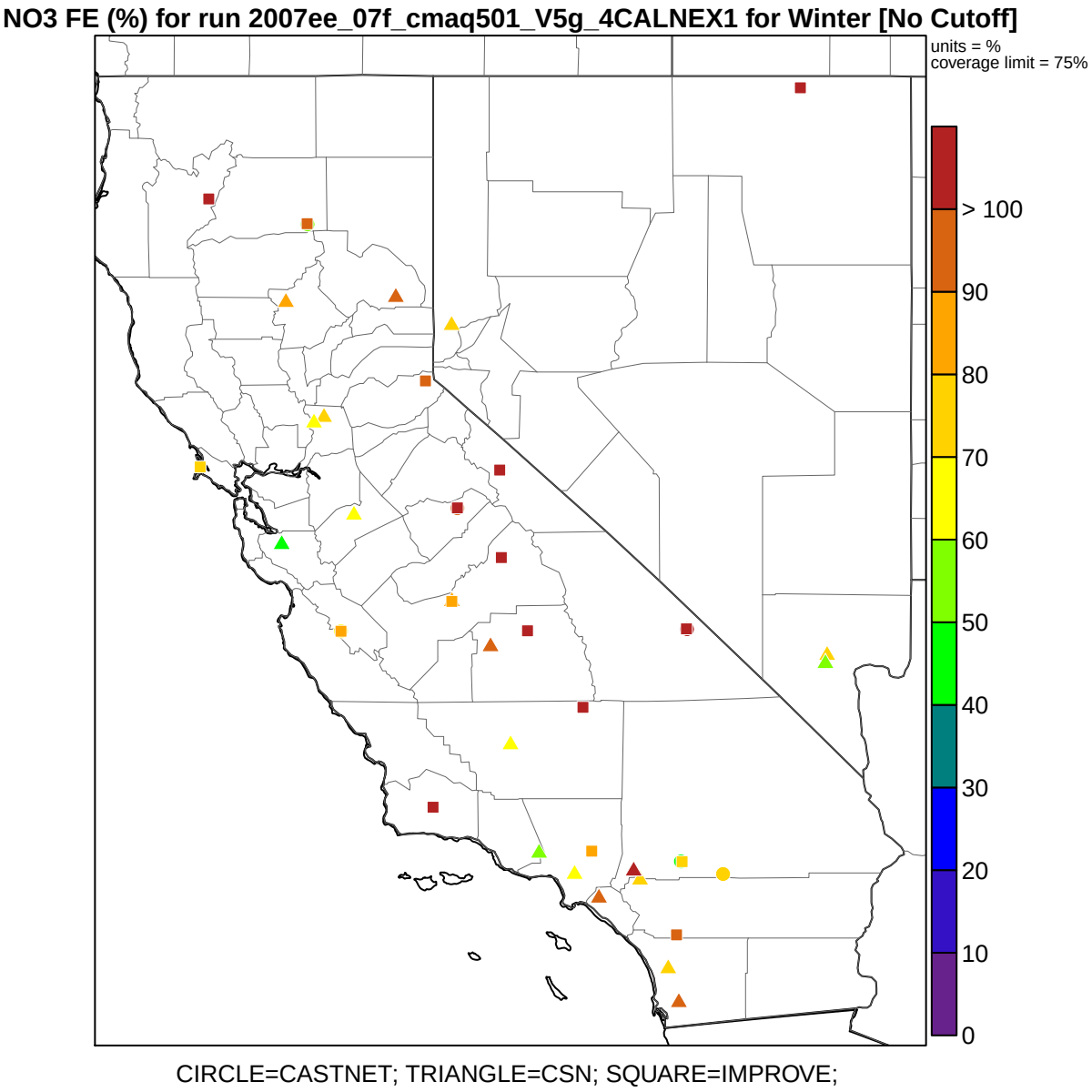

Figure 120: Fractional error for Winter NO3

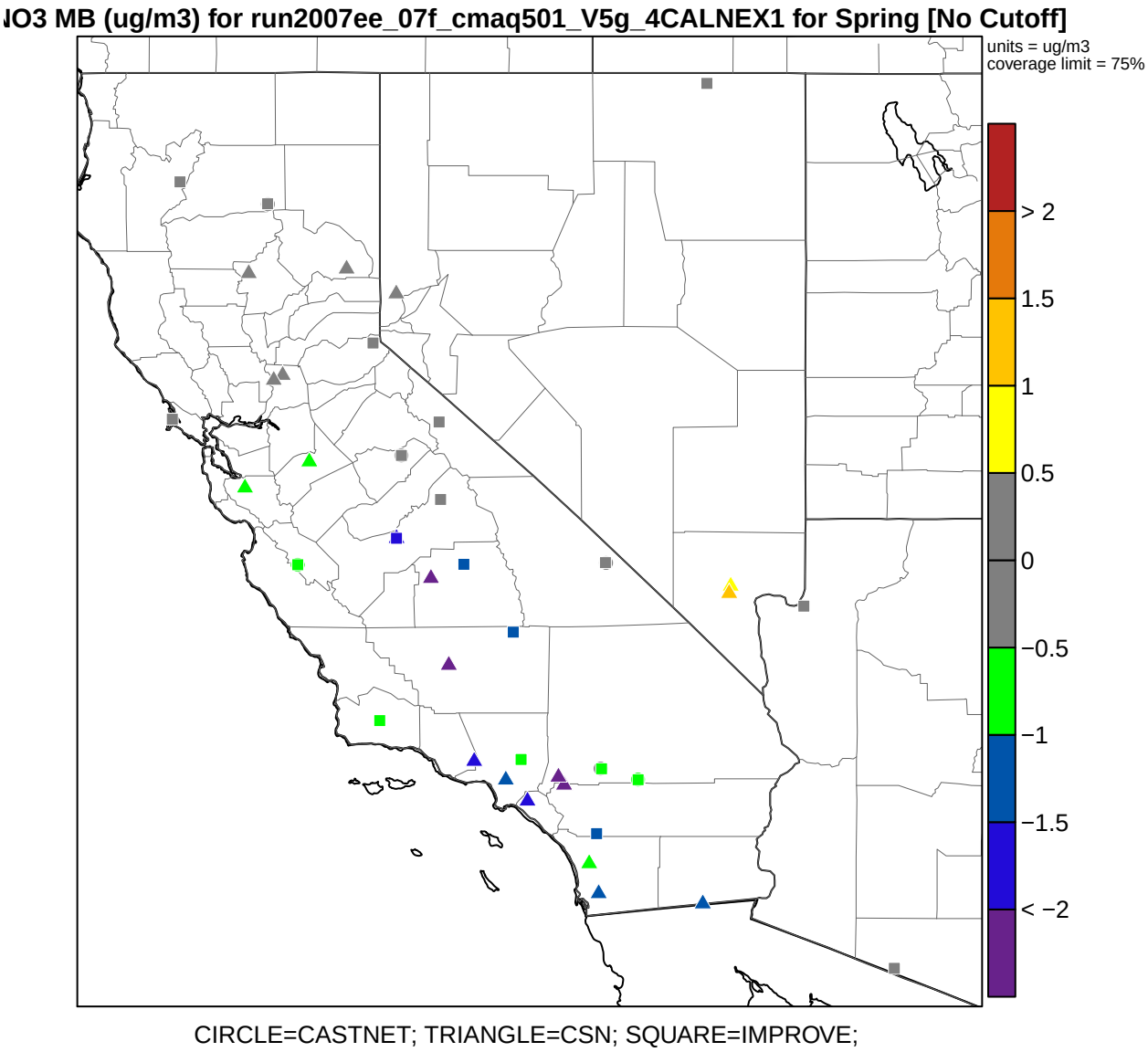

Figure 121: Mean bias for Spring NO3

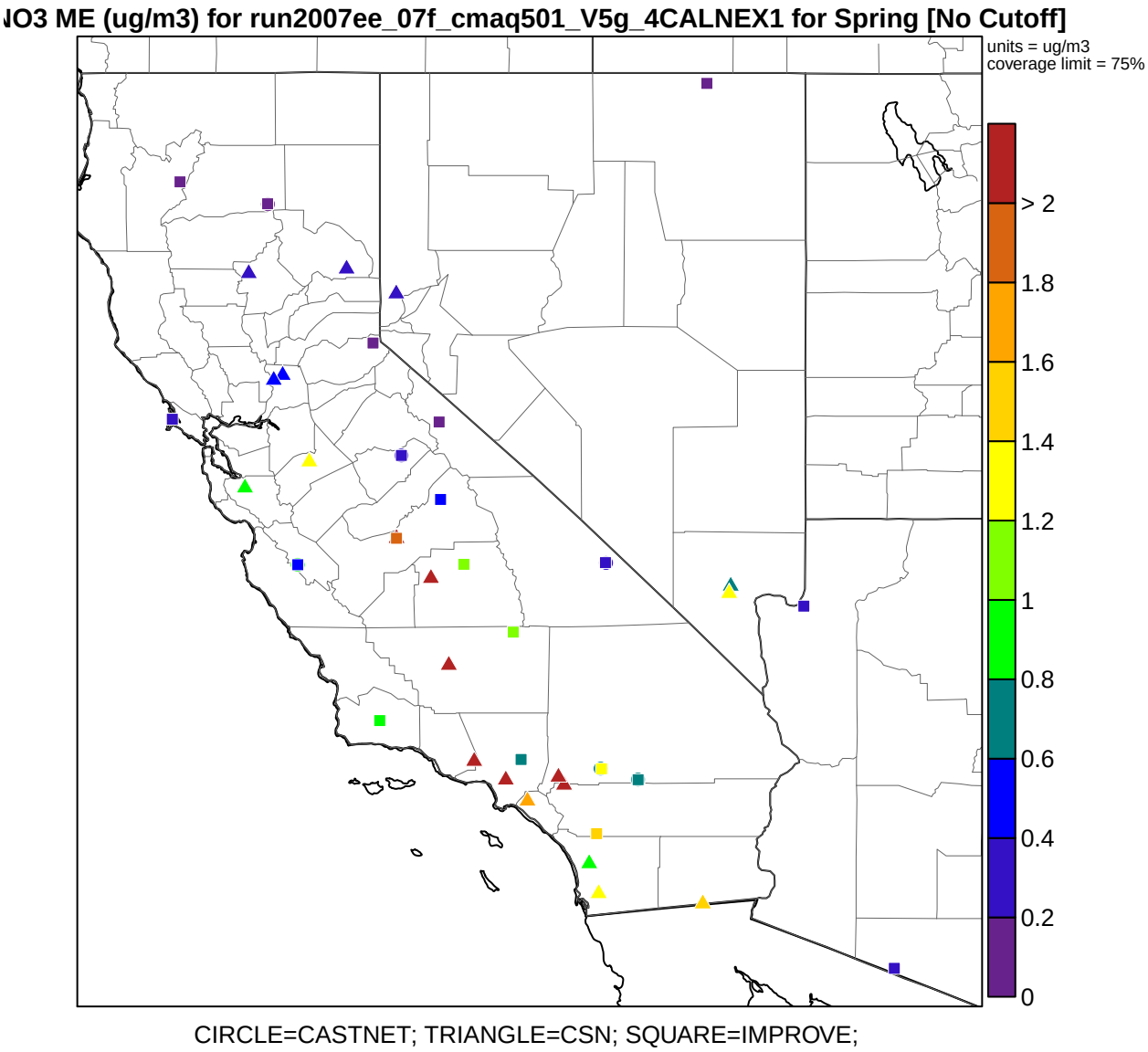

Figure 122: Mean error for Spring NO3

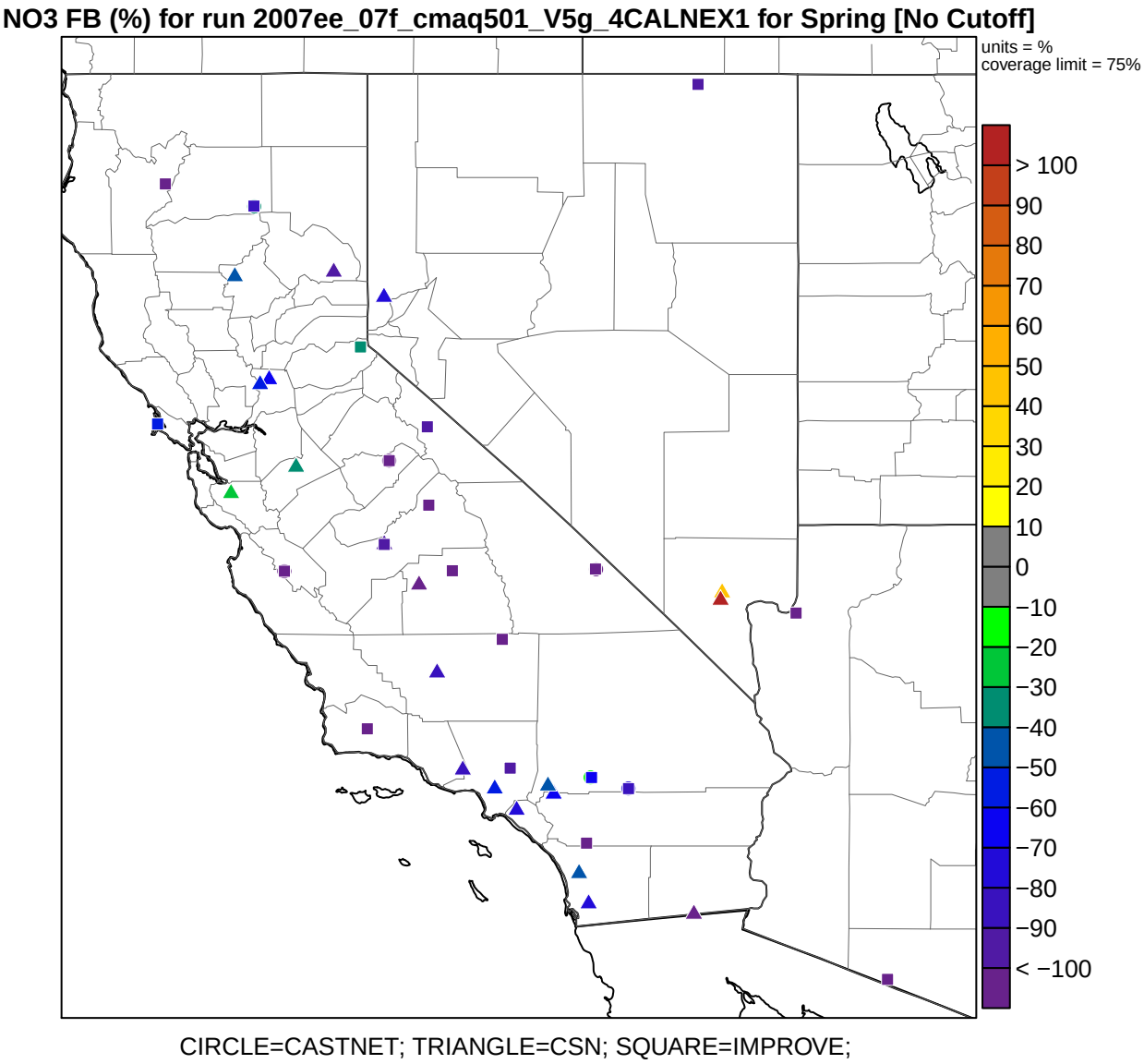

Figure 123: Fractional bias for Spring NO3

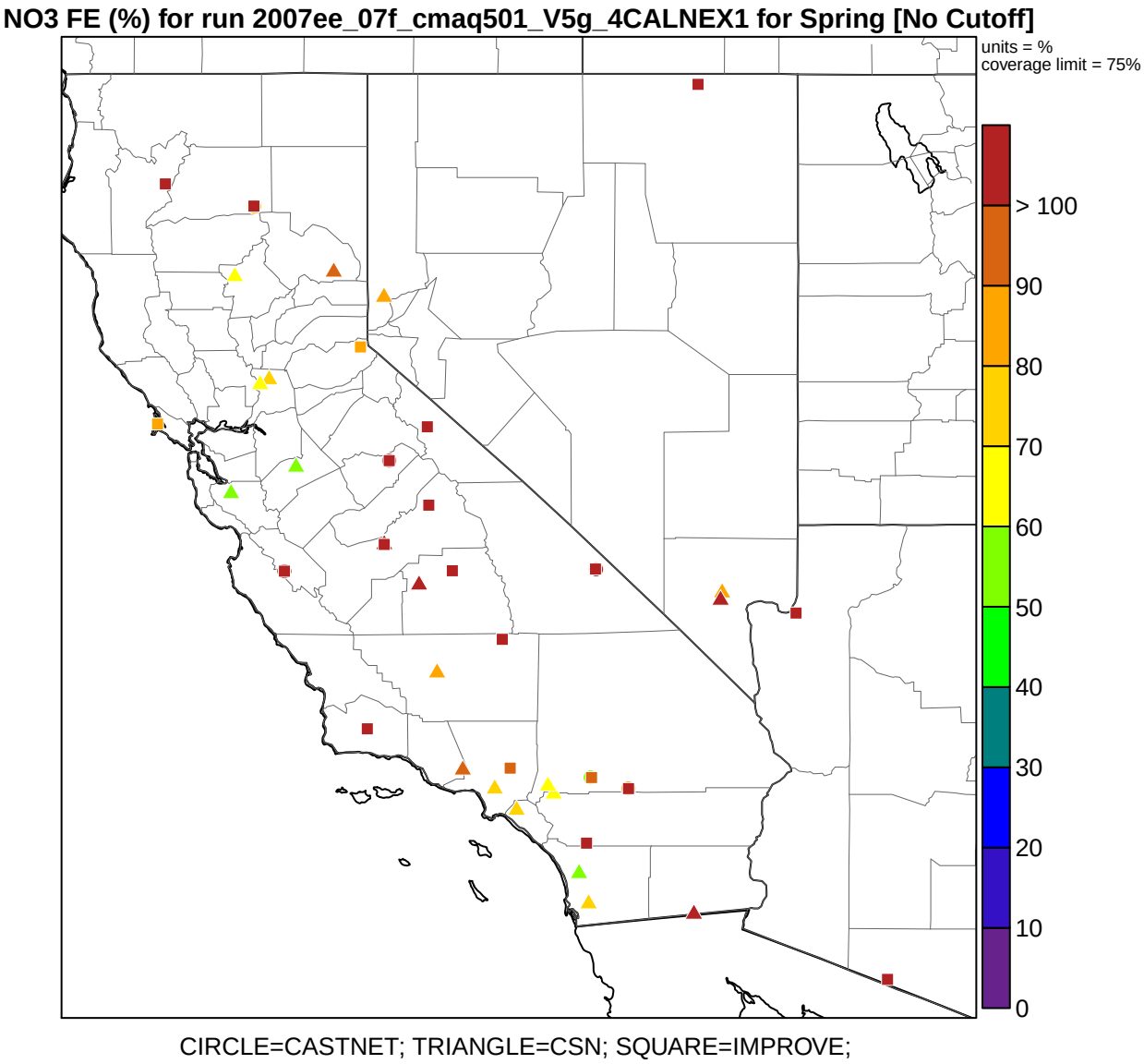

Figure 124: Fractional error for Spring NO3

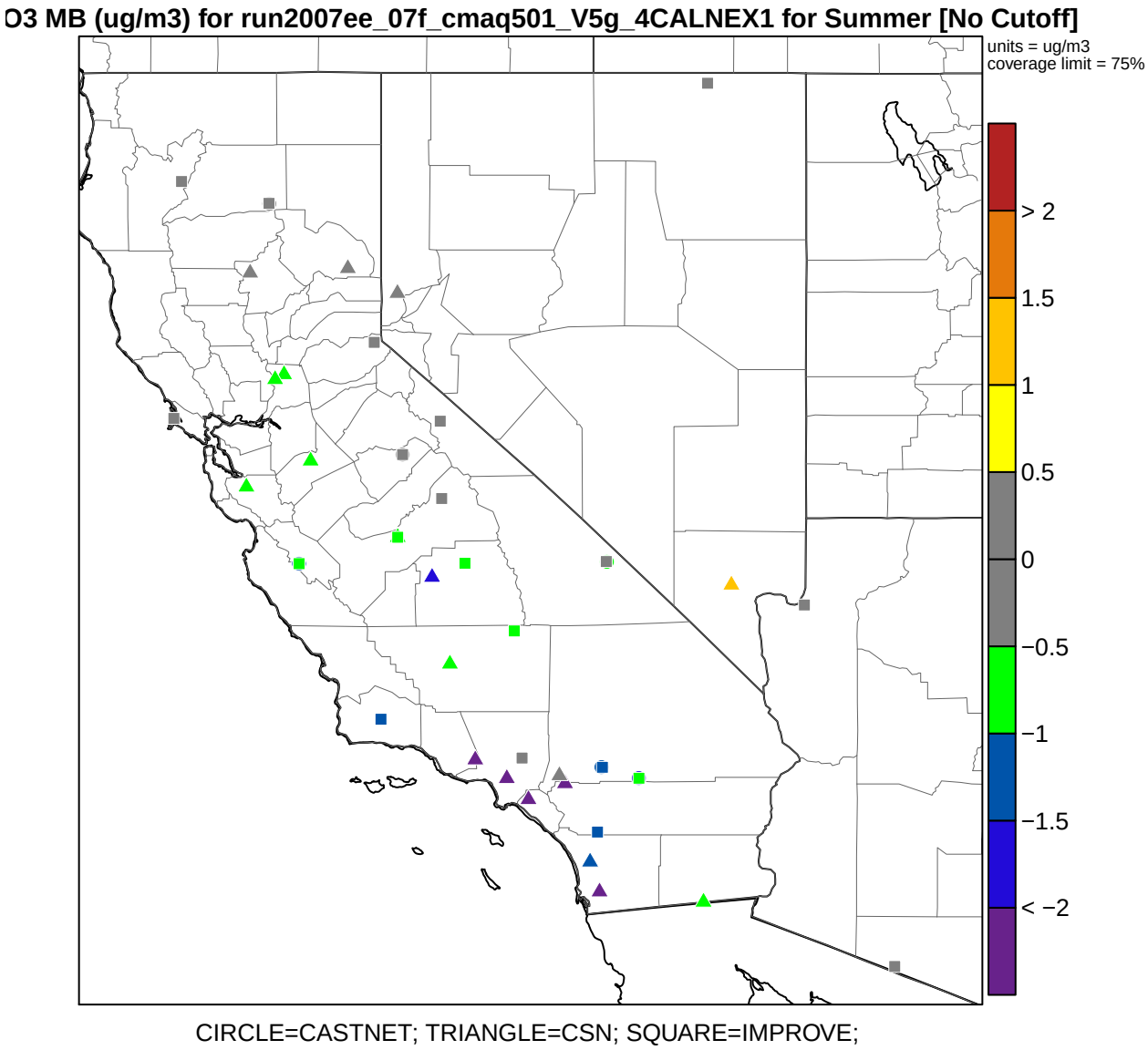

Figure 125: Mean bias for Summer NO3

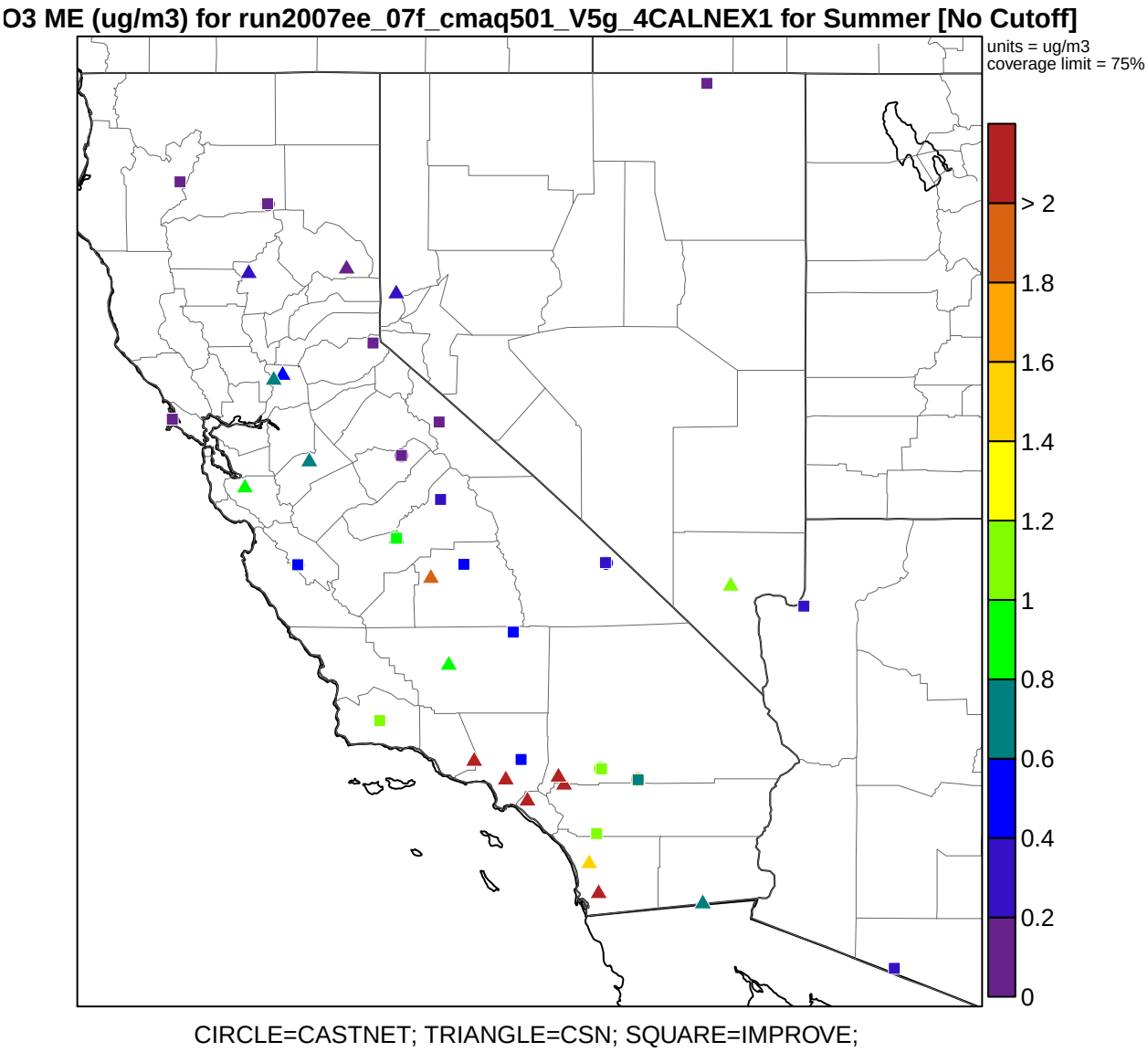

Figure 126: Mean error for Summer NO3

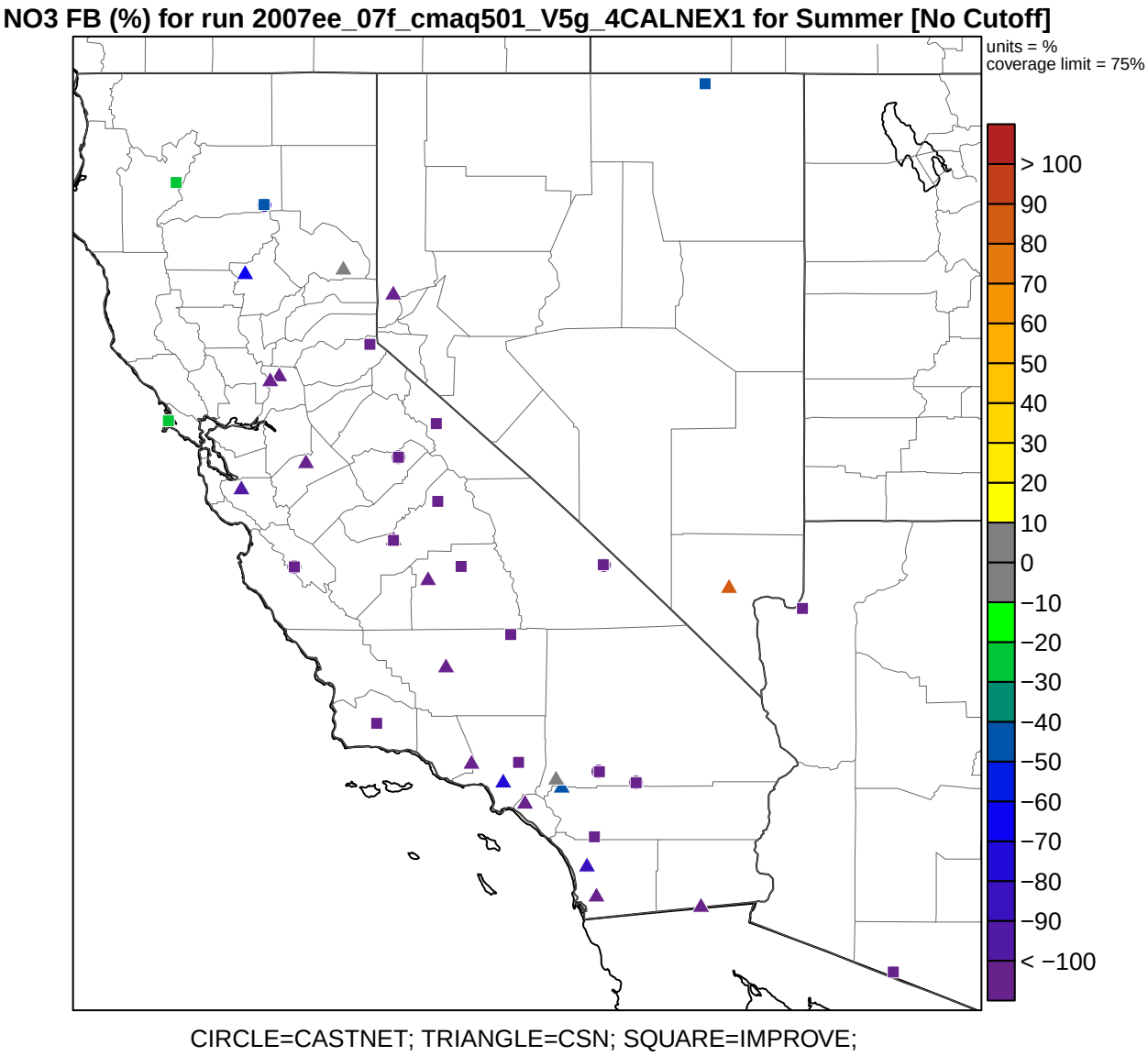

Figure 127: Fractional bias for Summer NO3

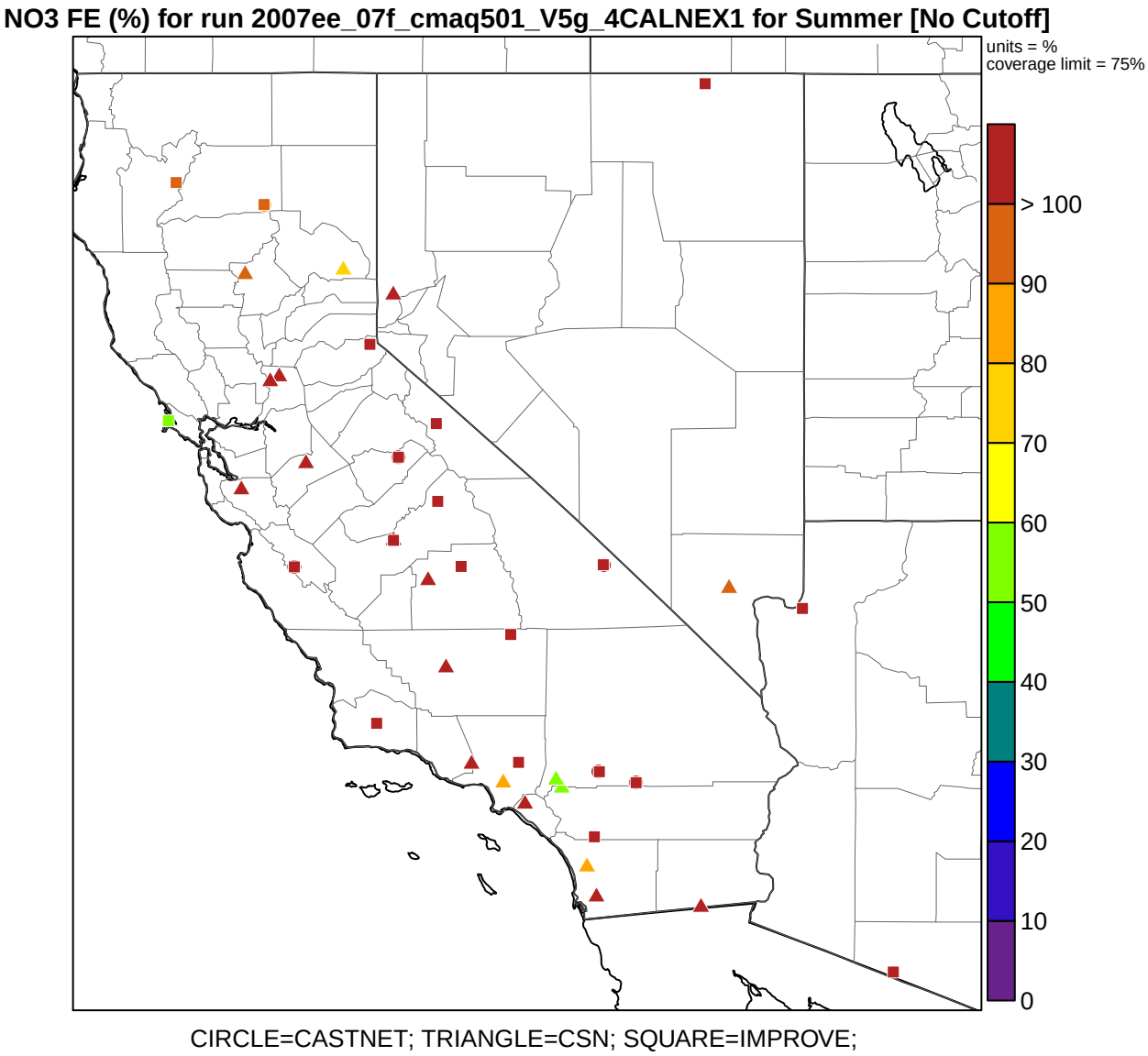

Figure 128: Fractional error for Summer NO3

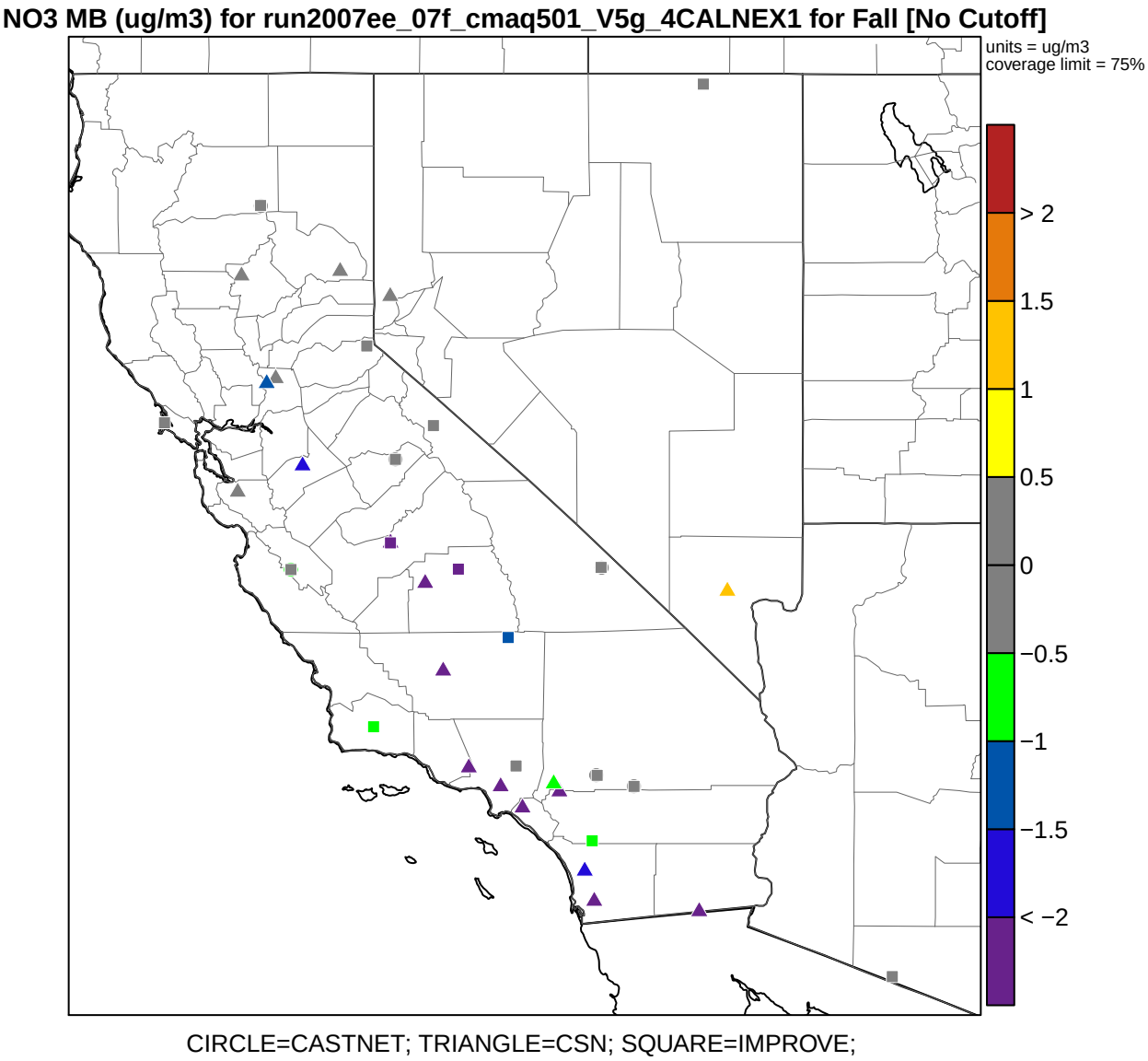

Figure 129: Mean bias for Fall NO3

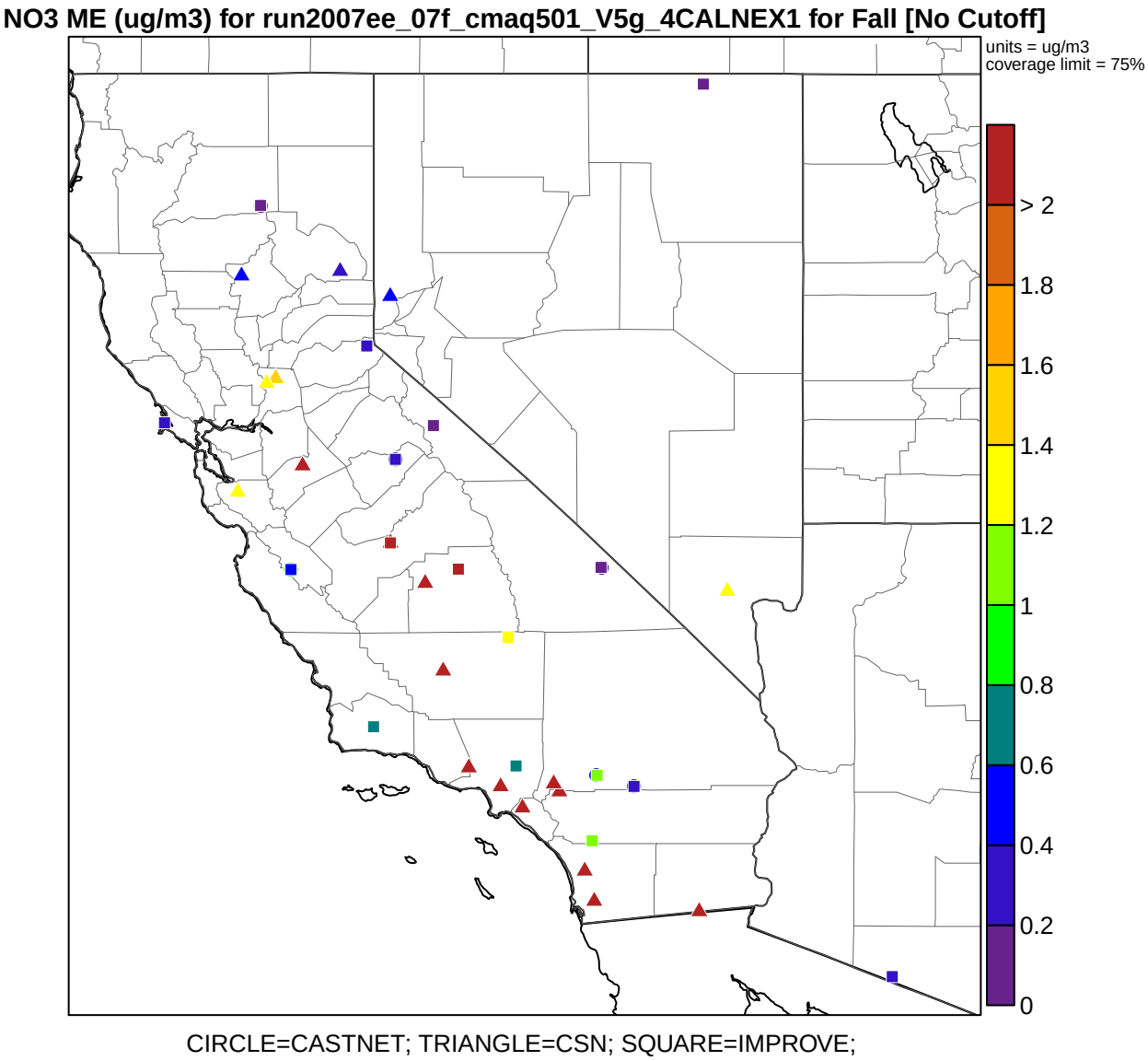

Figure 130: Mean error for Fall NO3

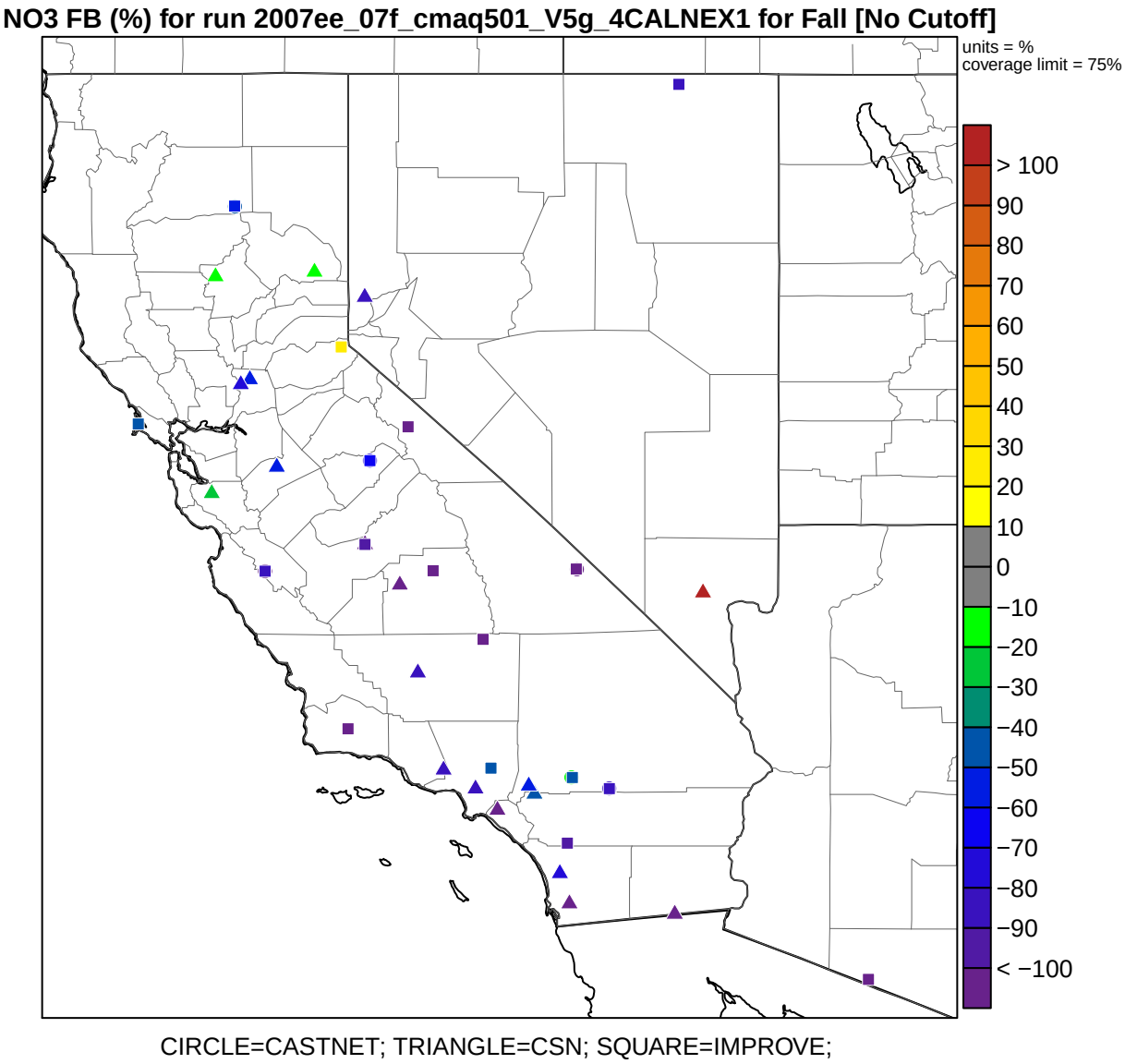

Figure 131: Fractional bias for Fall NO3

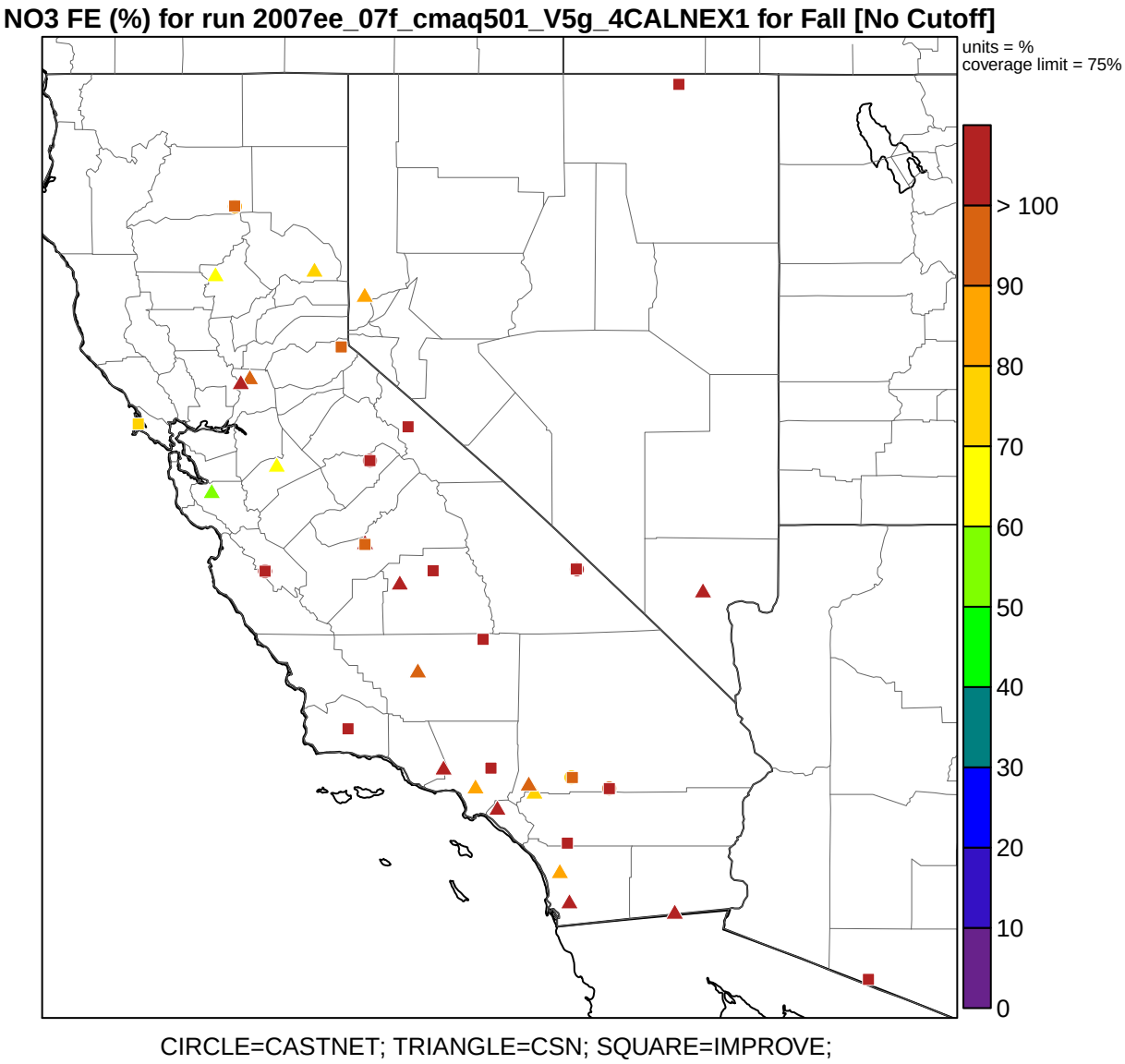

Figure 132: Fractional error for Fall NO3

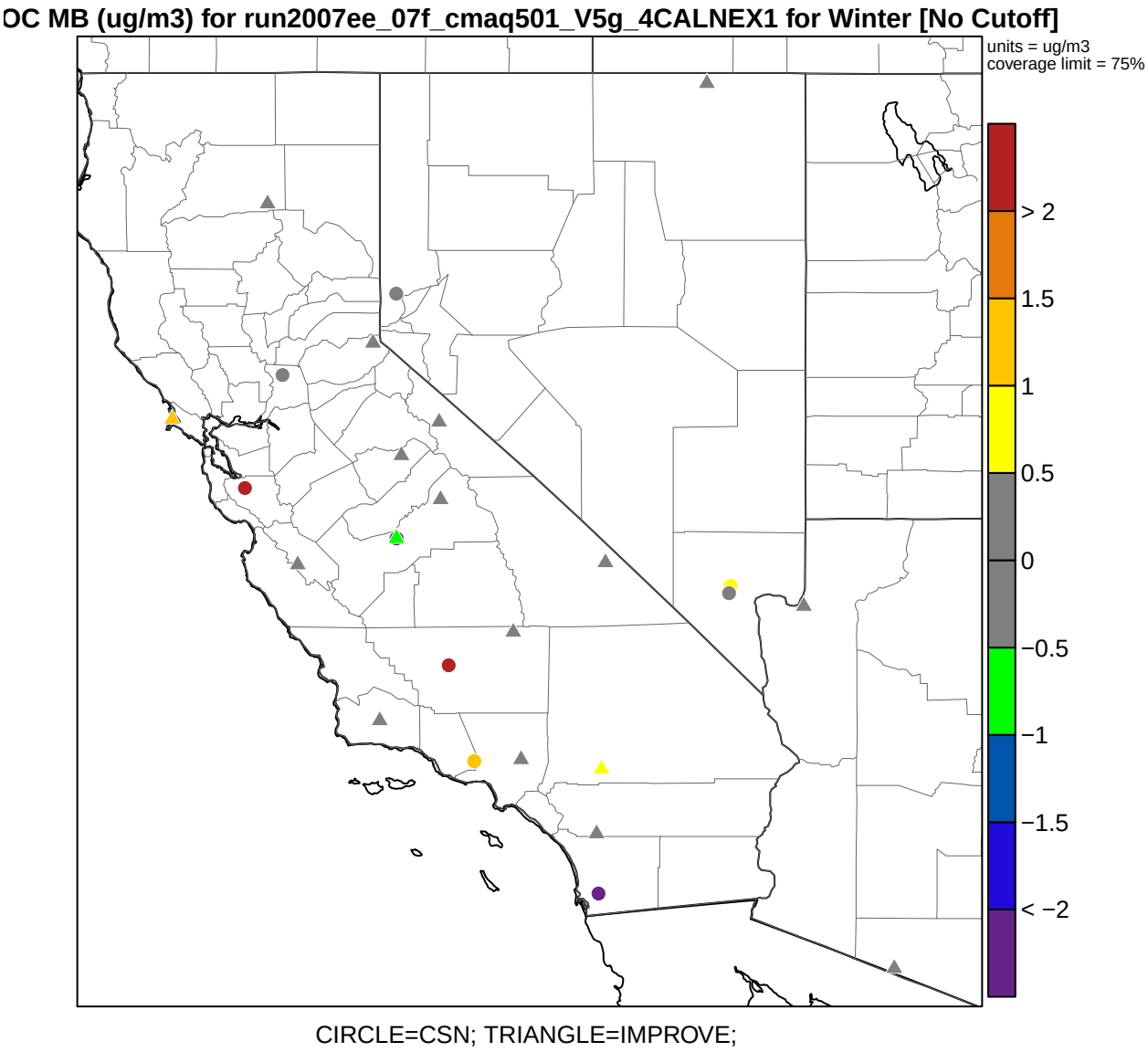

Figure 133: Mean bias for Winter OC

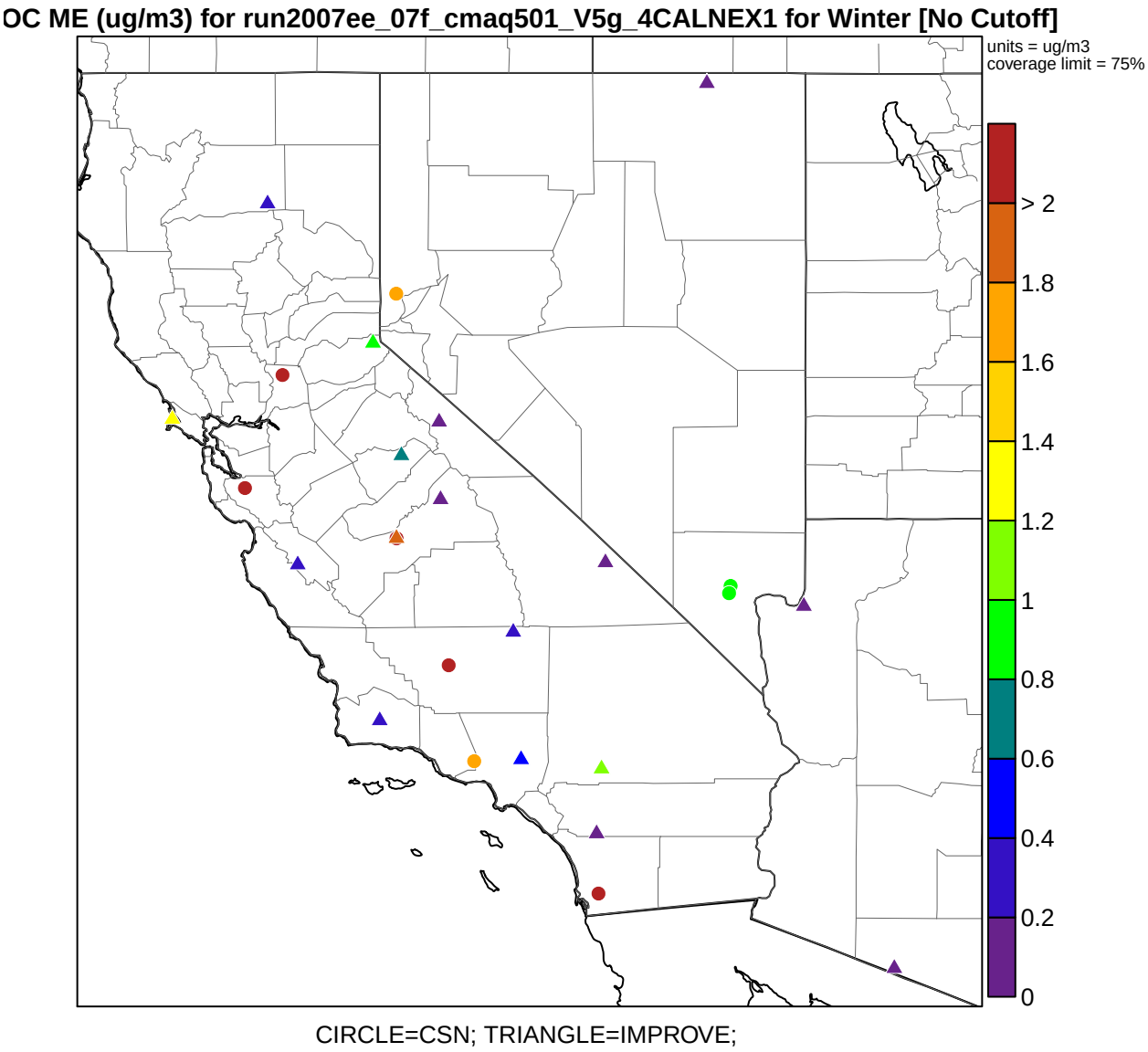

Figure 134: Mean error for Winter OC

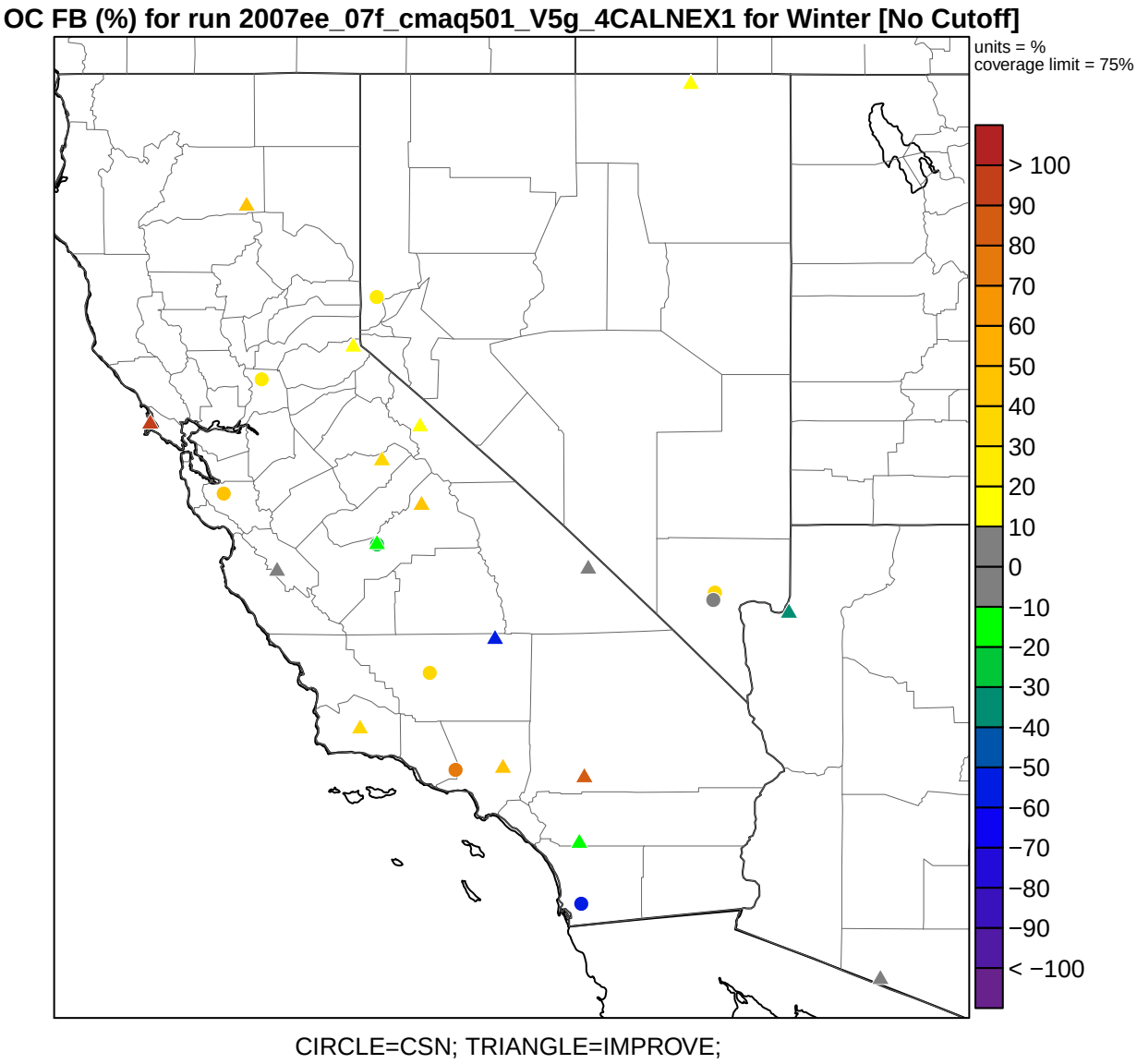

Figure 135: Fractional bias for Winter OC

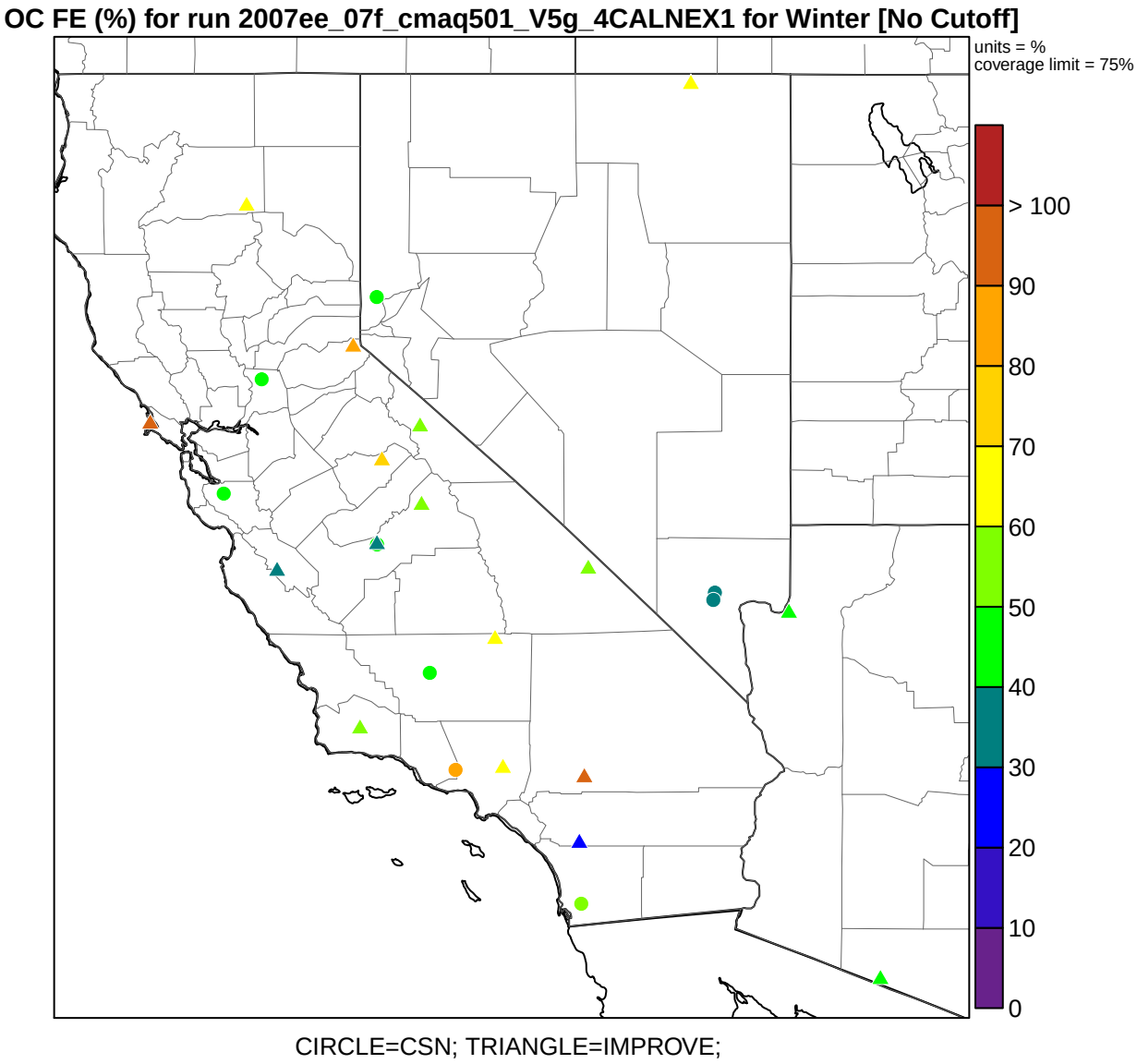

Figure 136: Fractional error for Winter OC

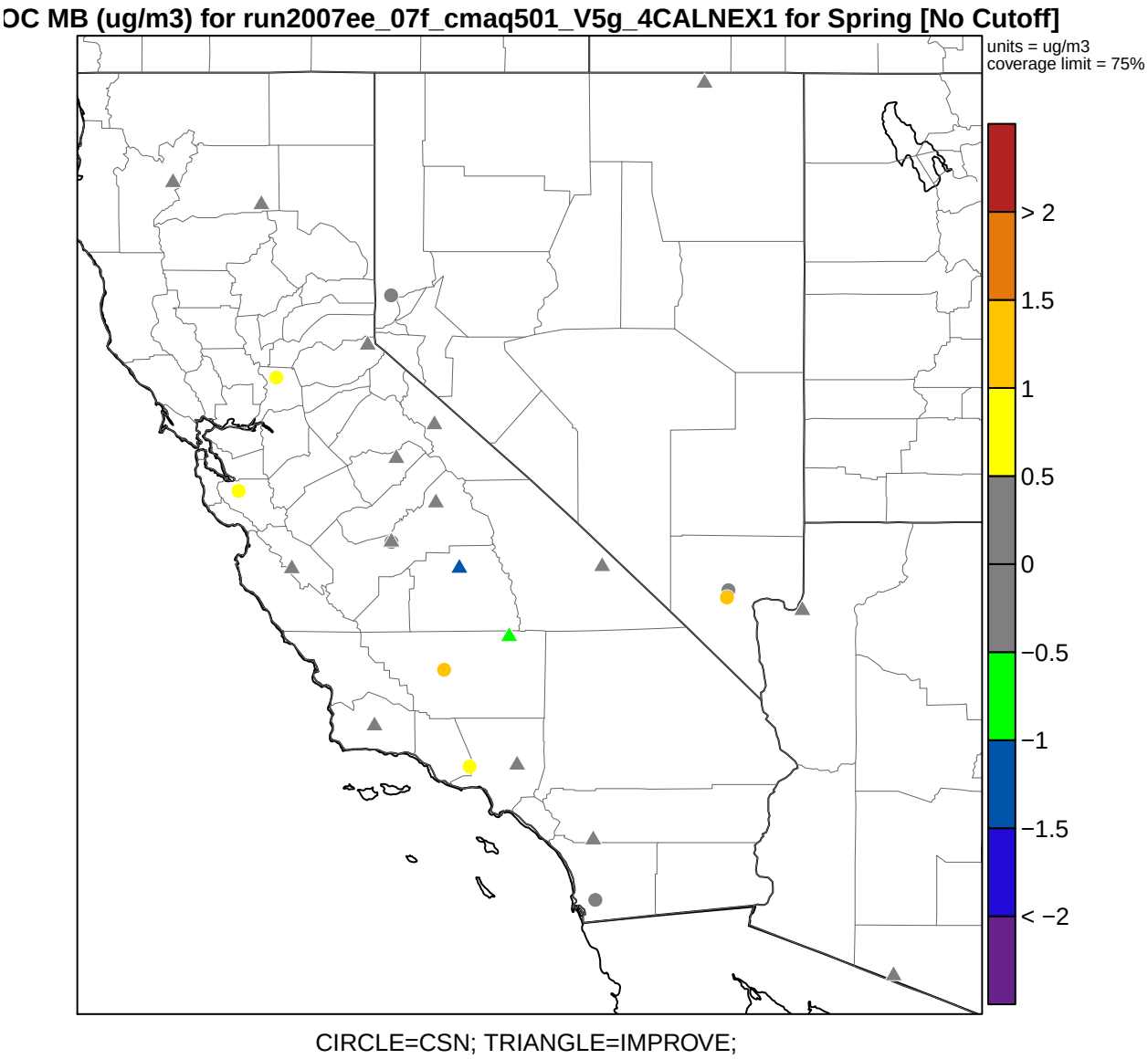

Figure 137: Mean bias for Spring OC

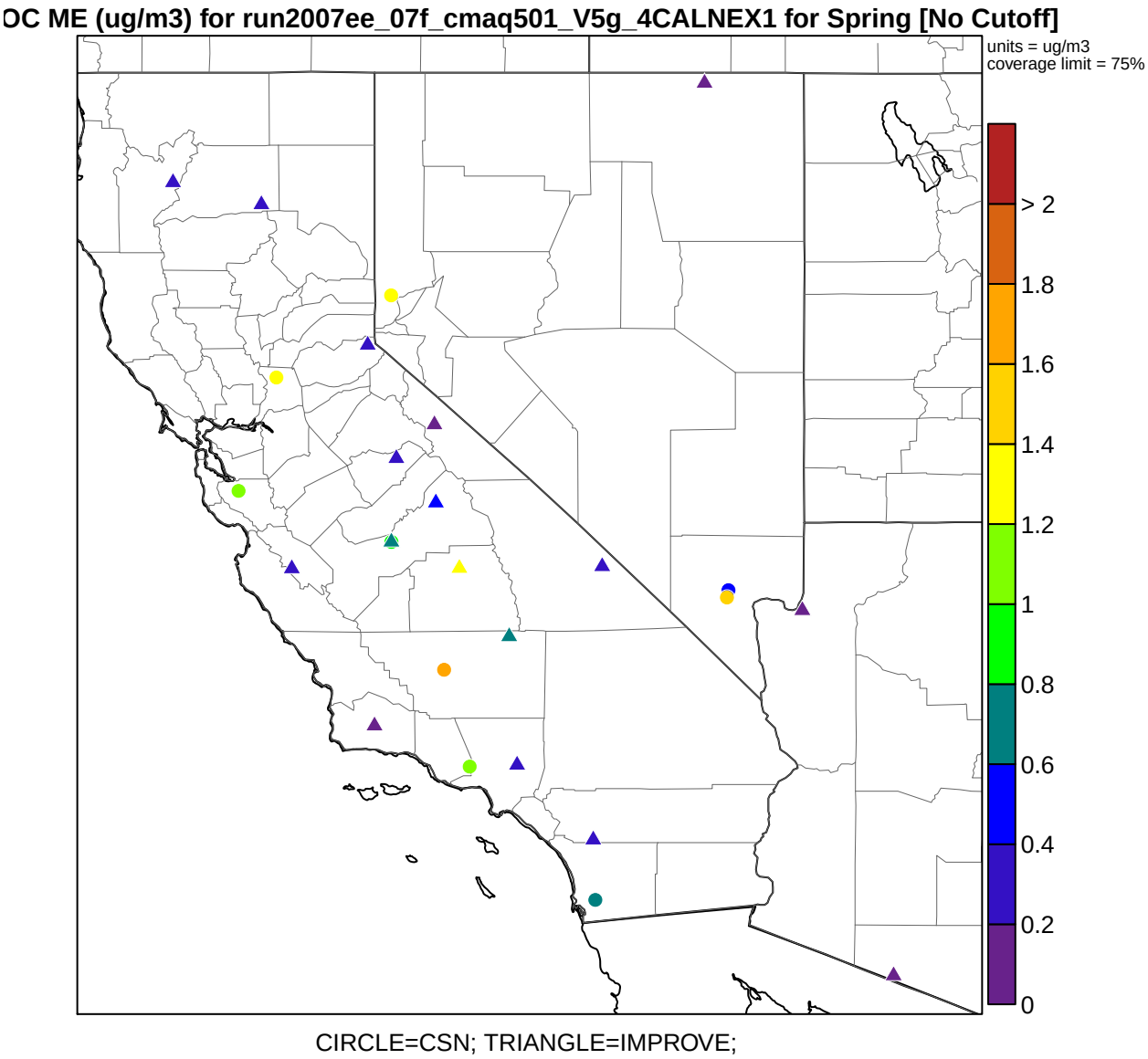

Figure 138: Mean error for Spring OC

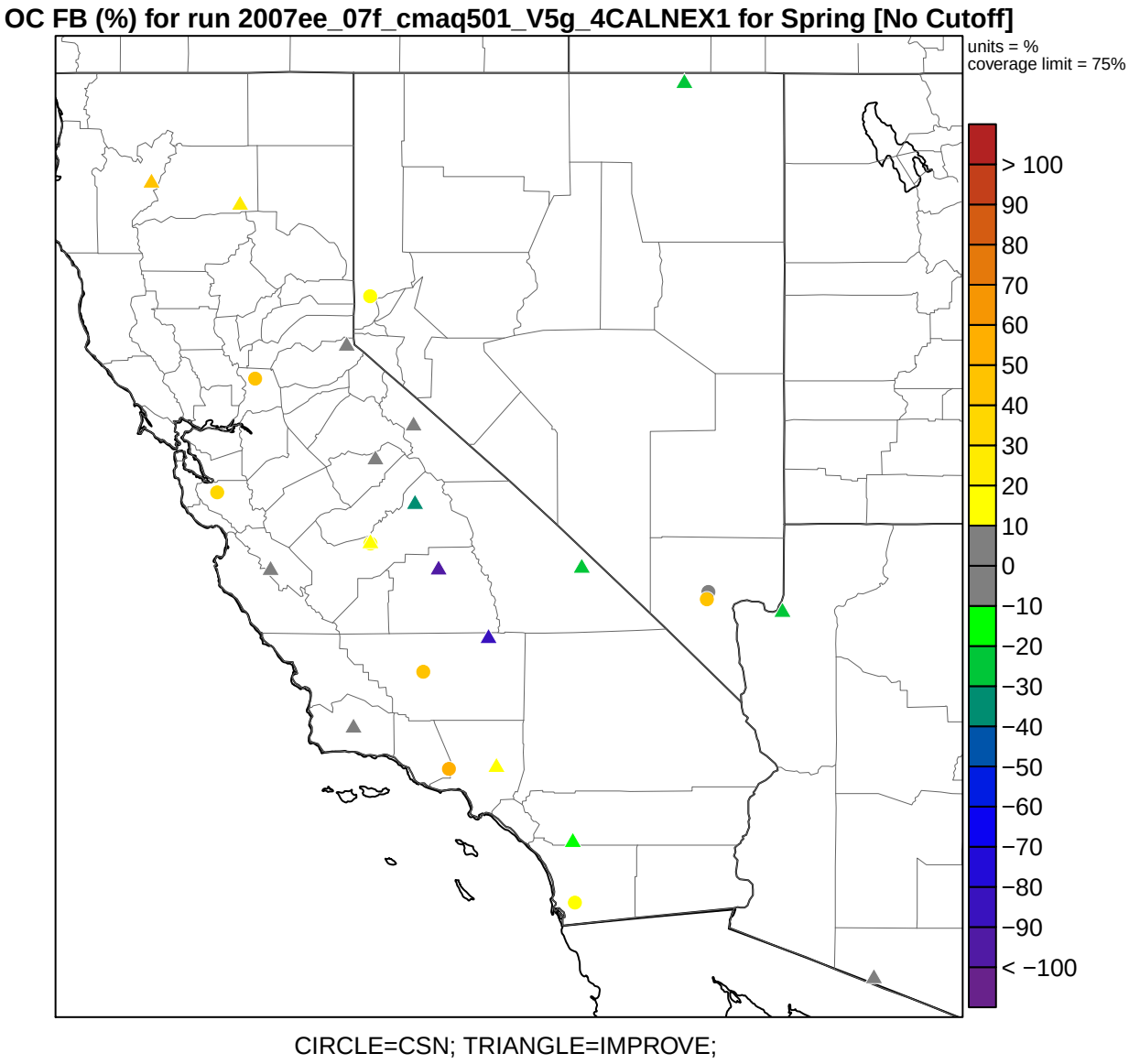

Figure 139: Fractional bias for Spring OC

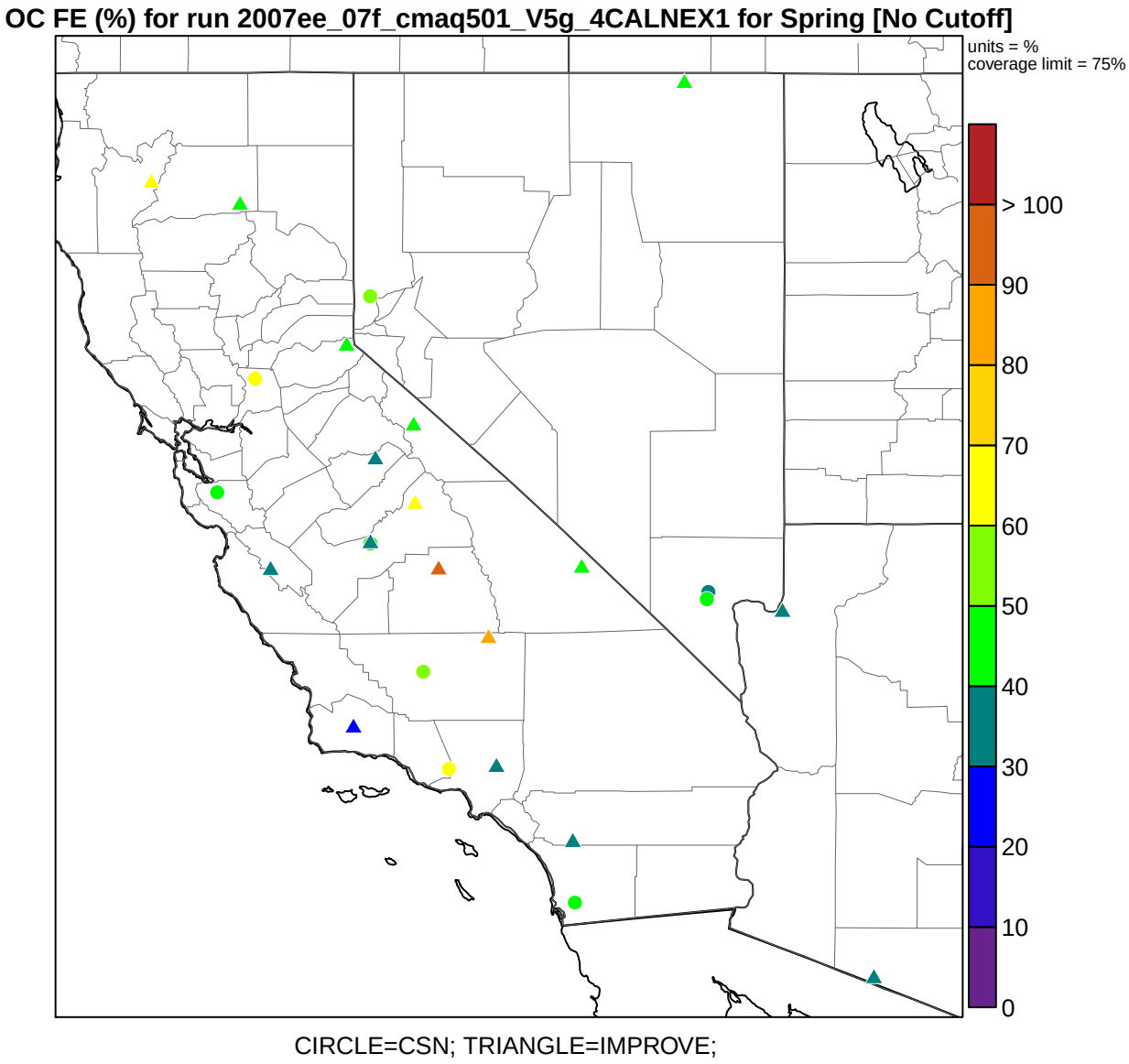

Figure 140: Fractional error for Spring OC

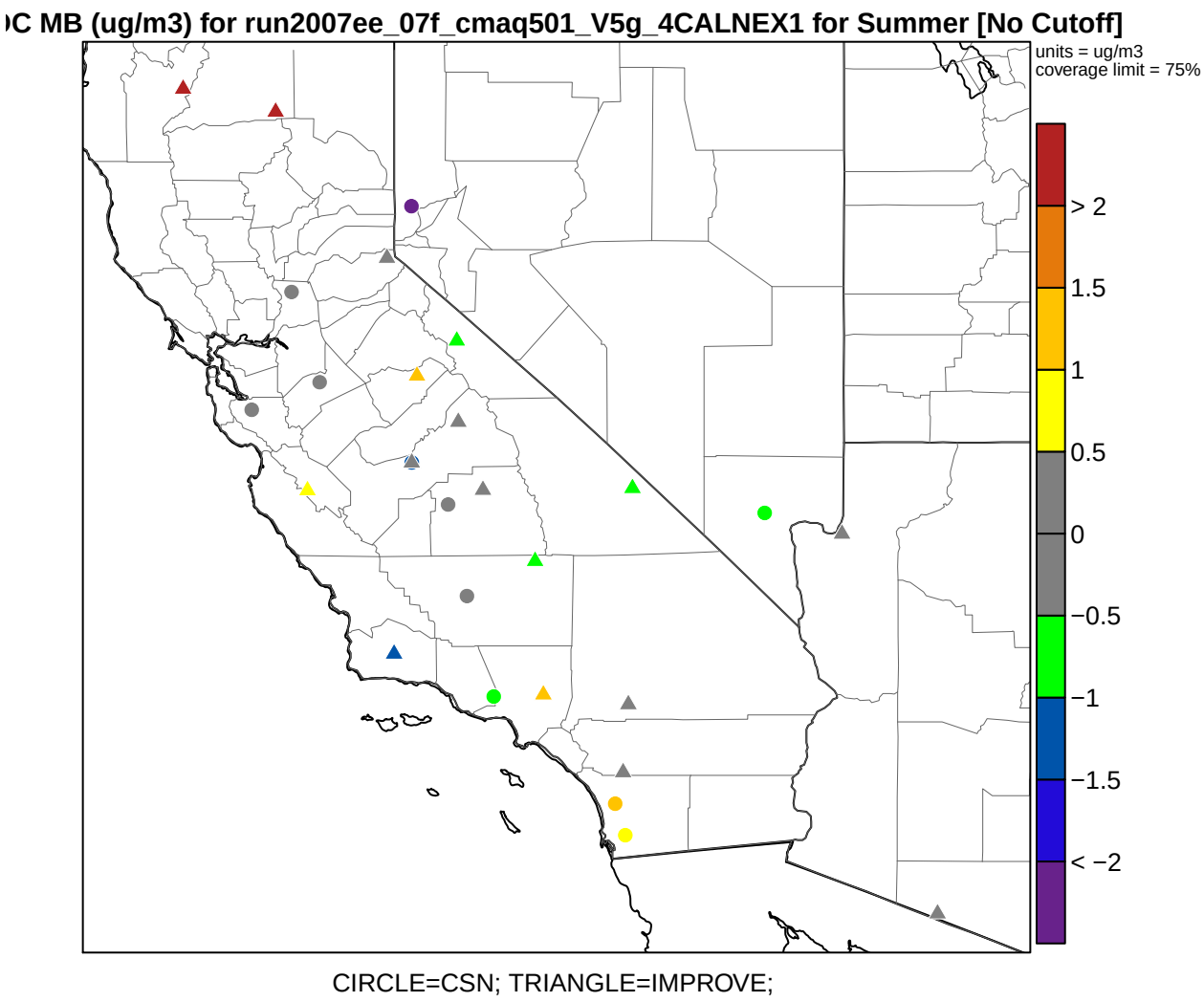

Figure 141: Mean bias for Summer OC

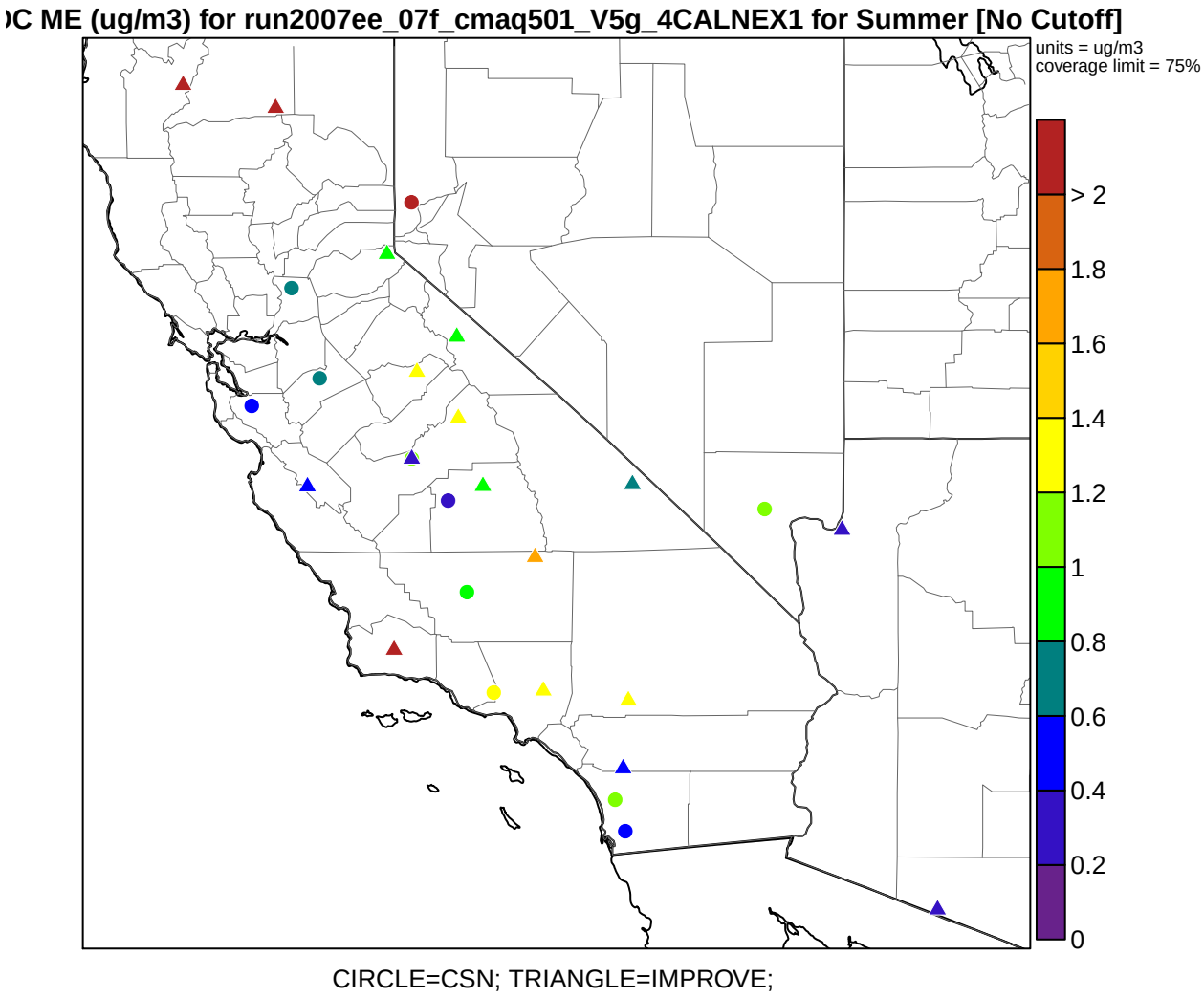

Figure 142: Mean error for Summer OC

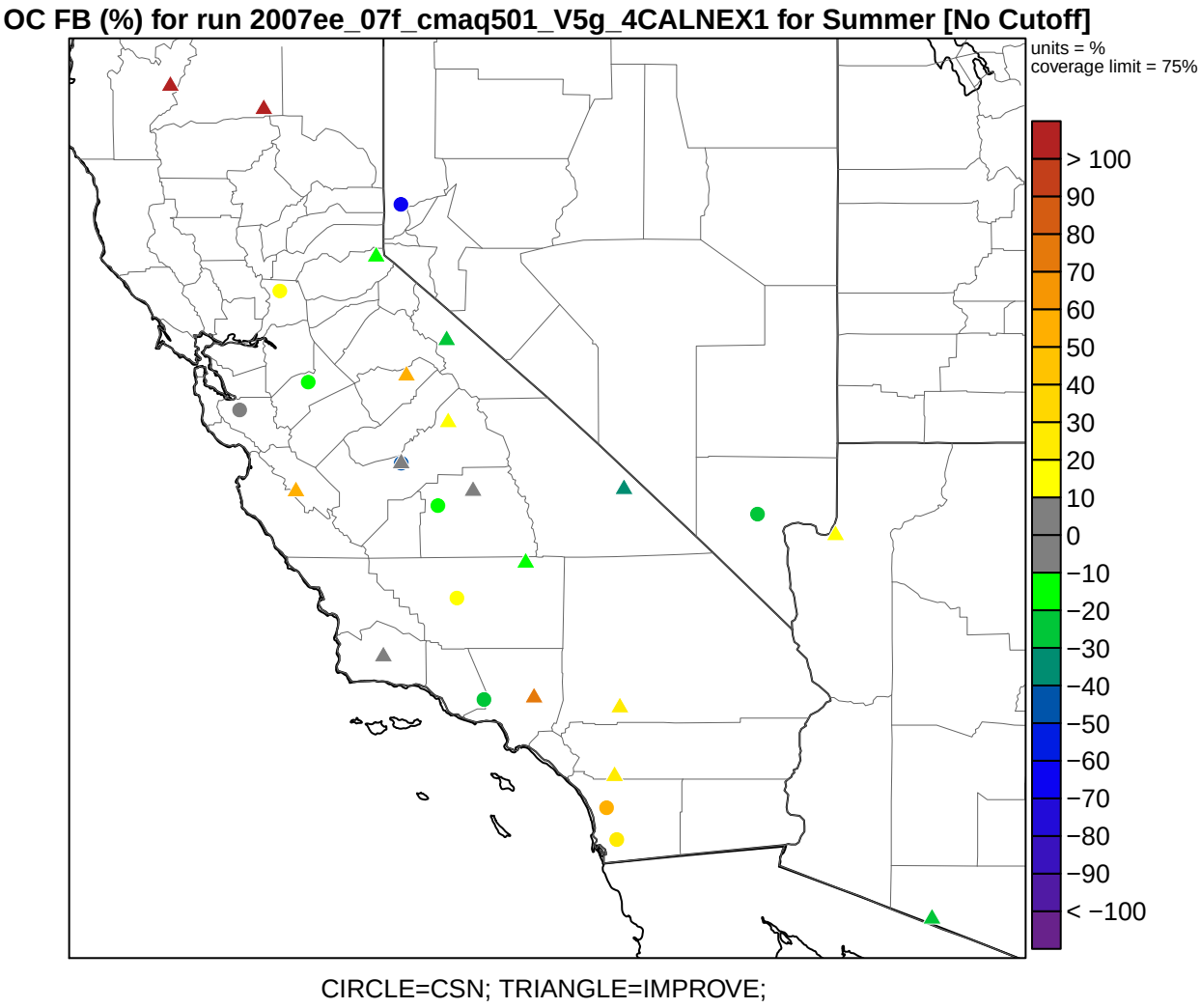

Figure 143: Fractional bias for Summer OC

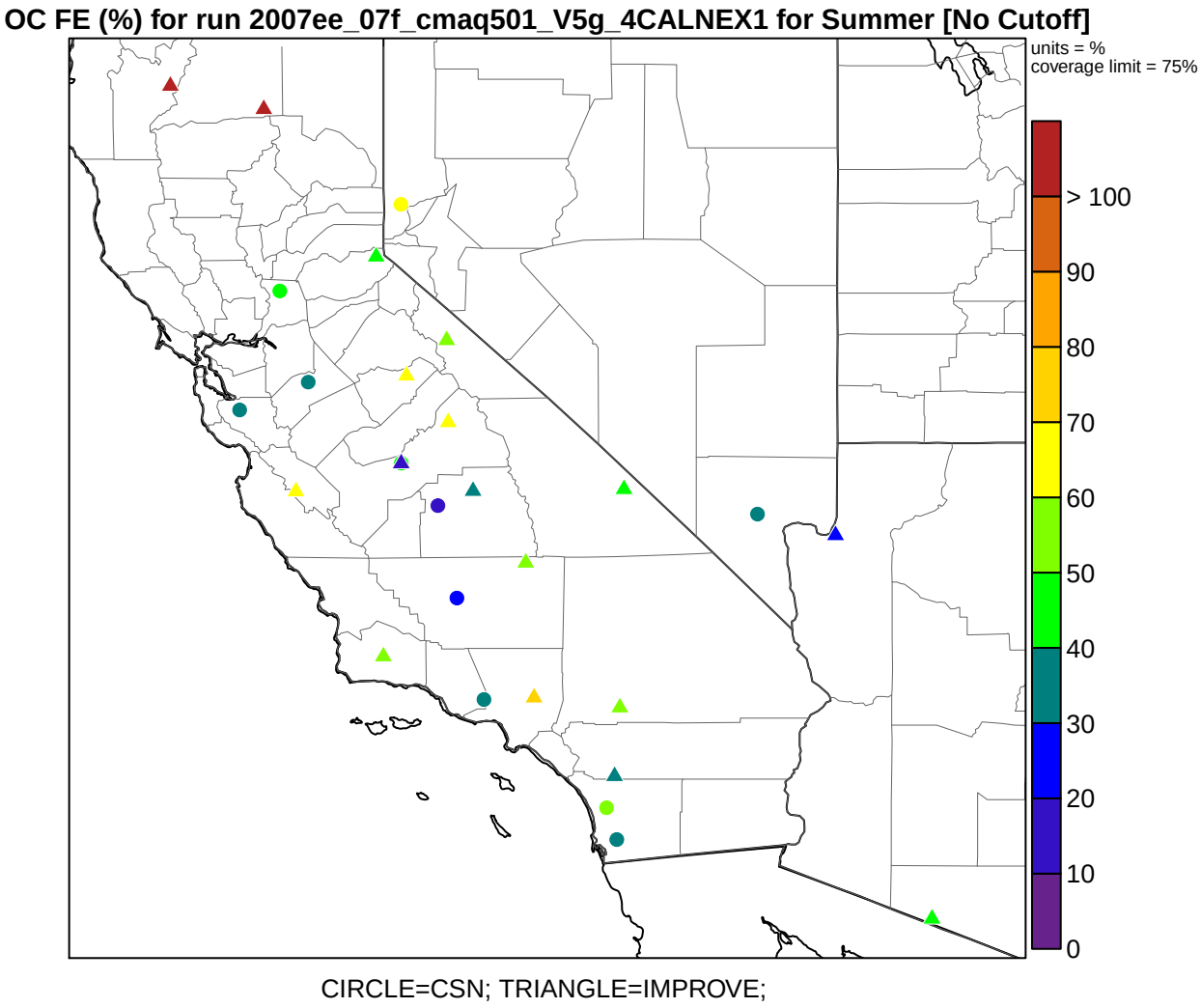

Figure 144: Fractional error for Summer OC

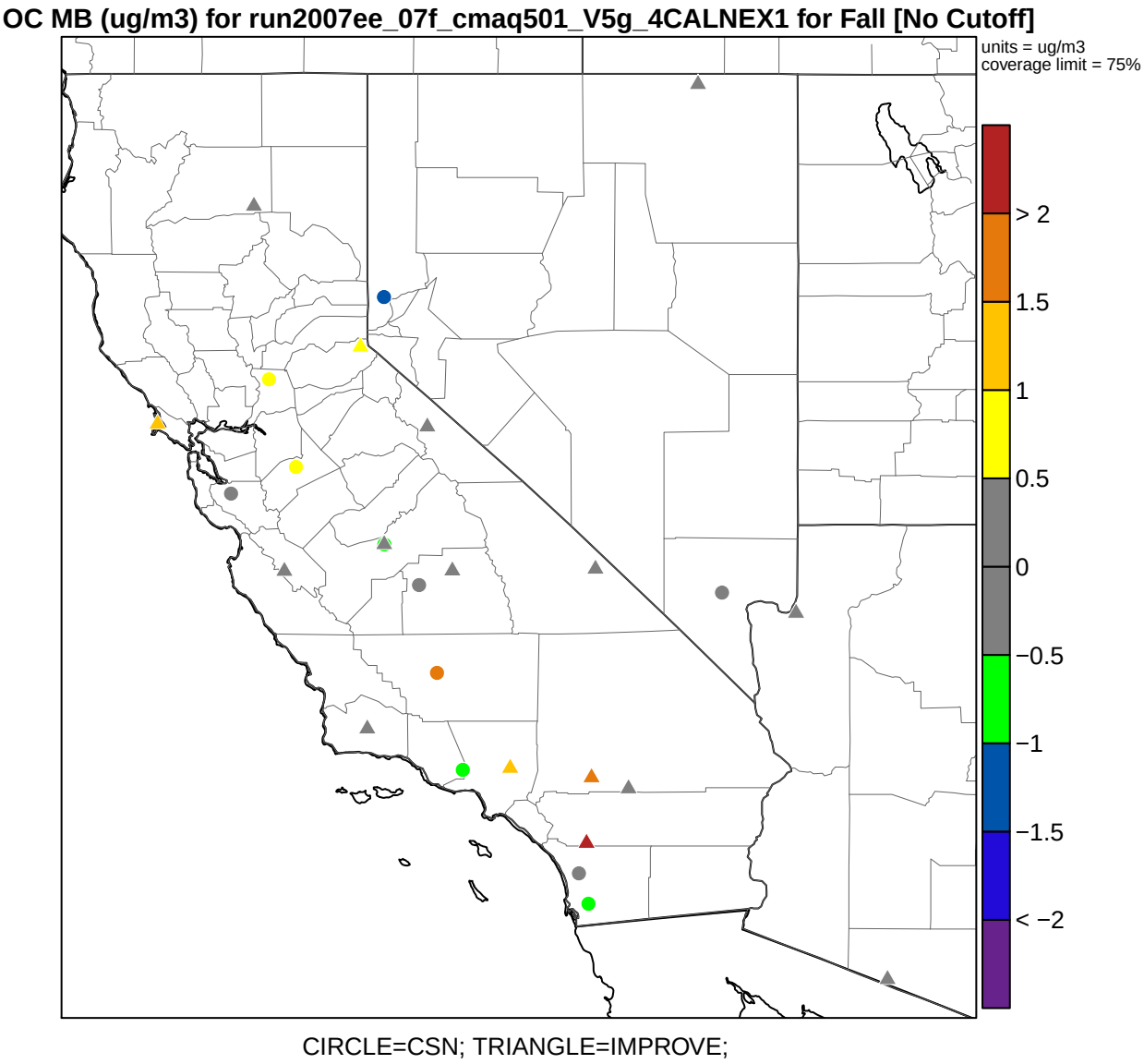

Figure 145: Mean bias for Fall OC

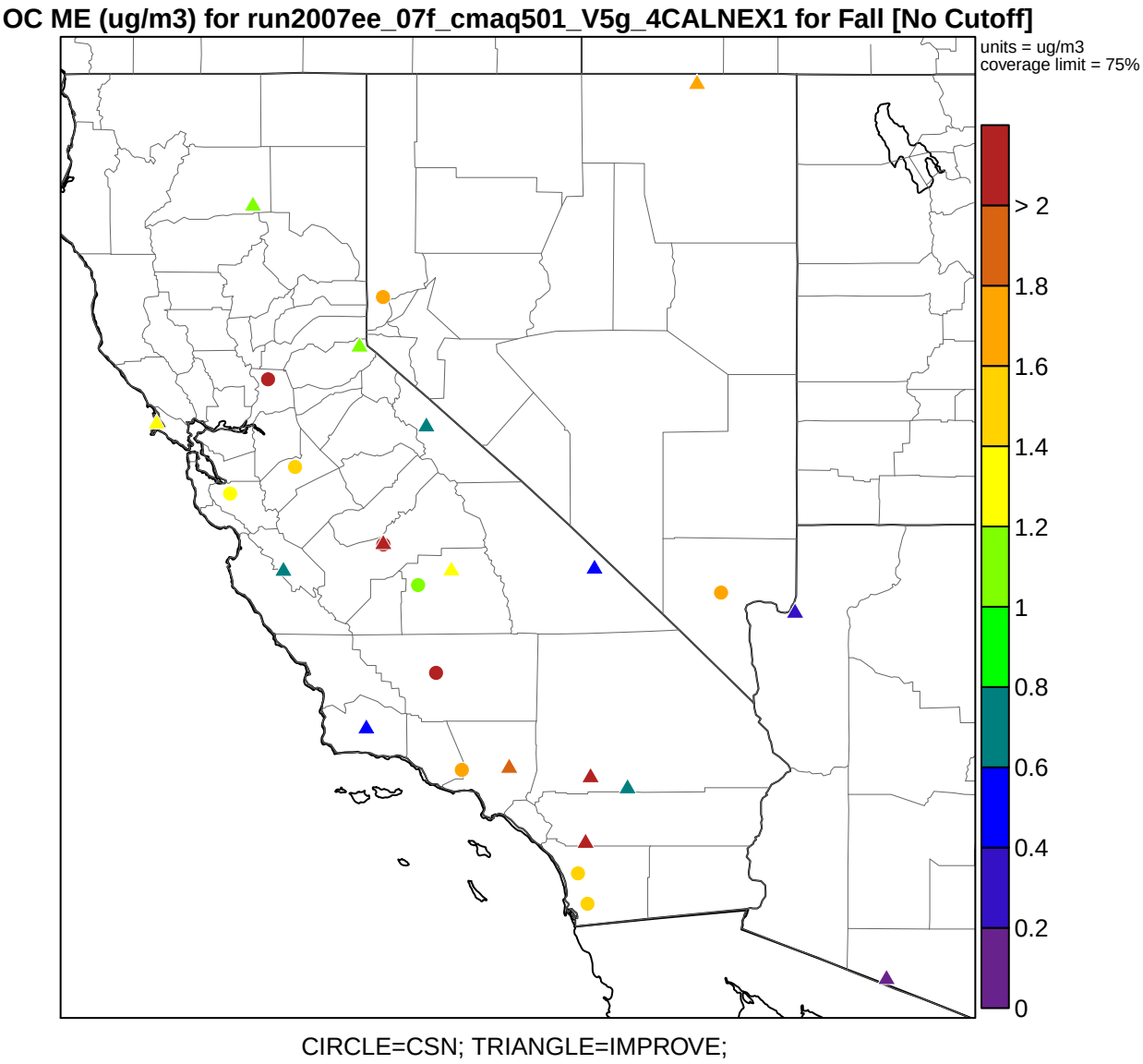

Figure 146: Mean error for Fall OC

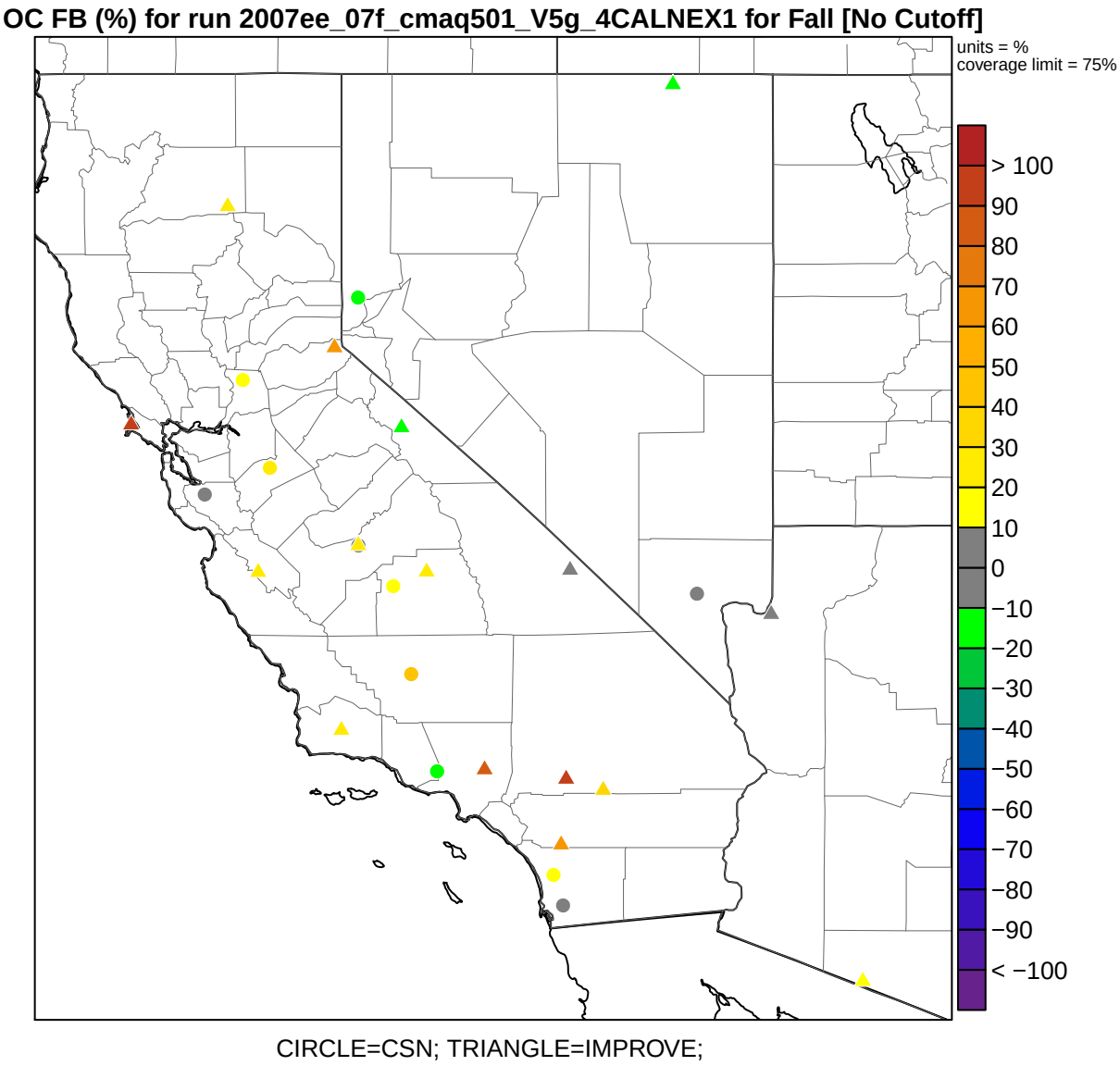

Figure 147: Fractional bias for Fall OC

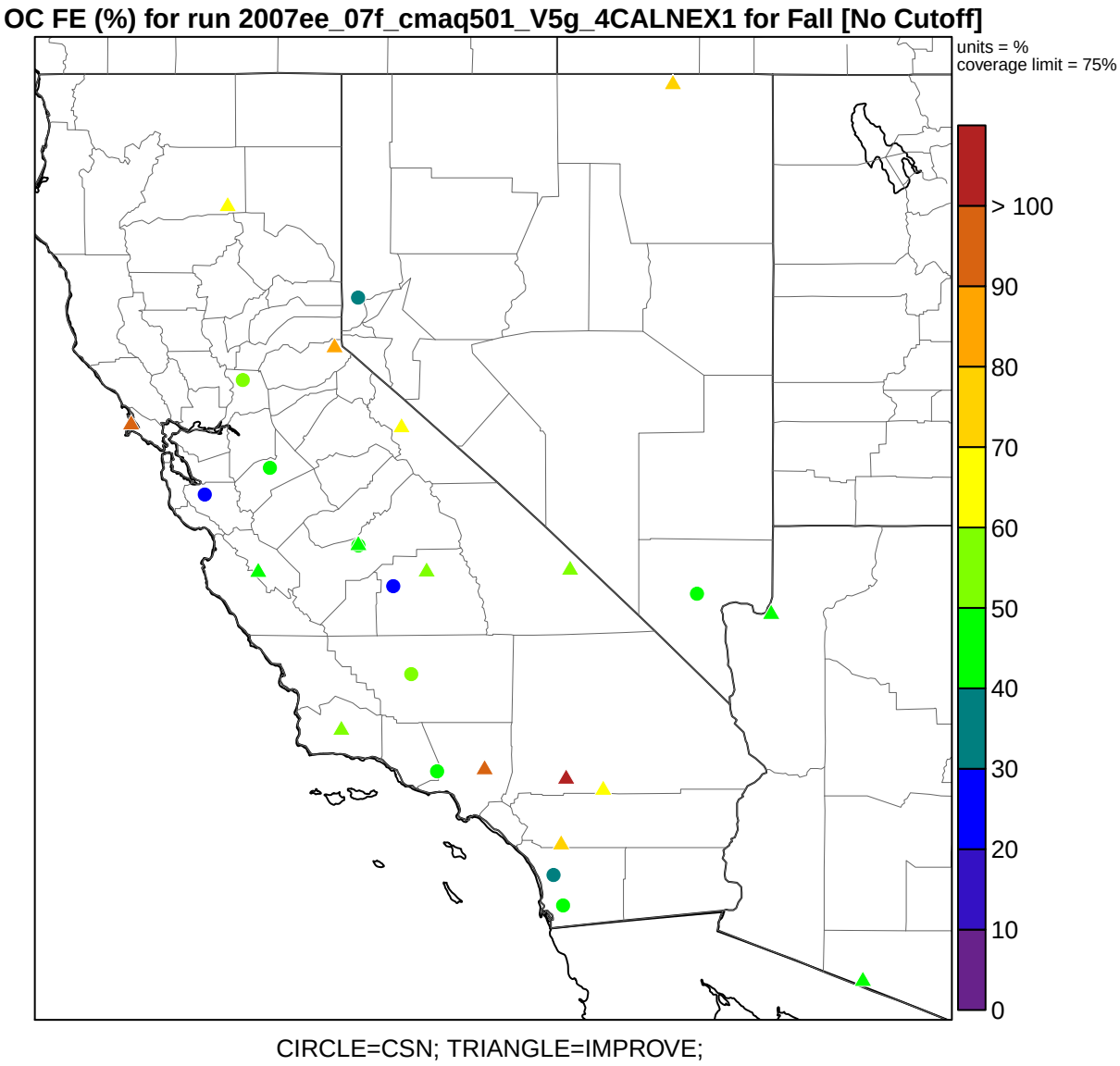

Figure 148: Fractional error for Fall OC

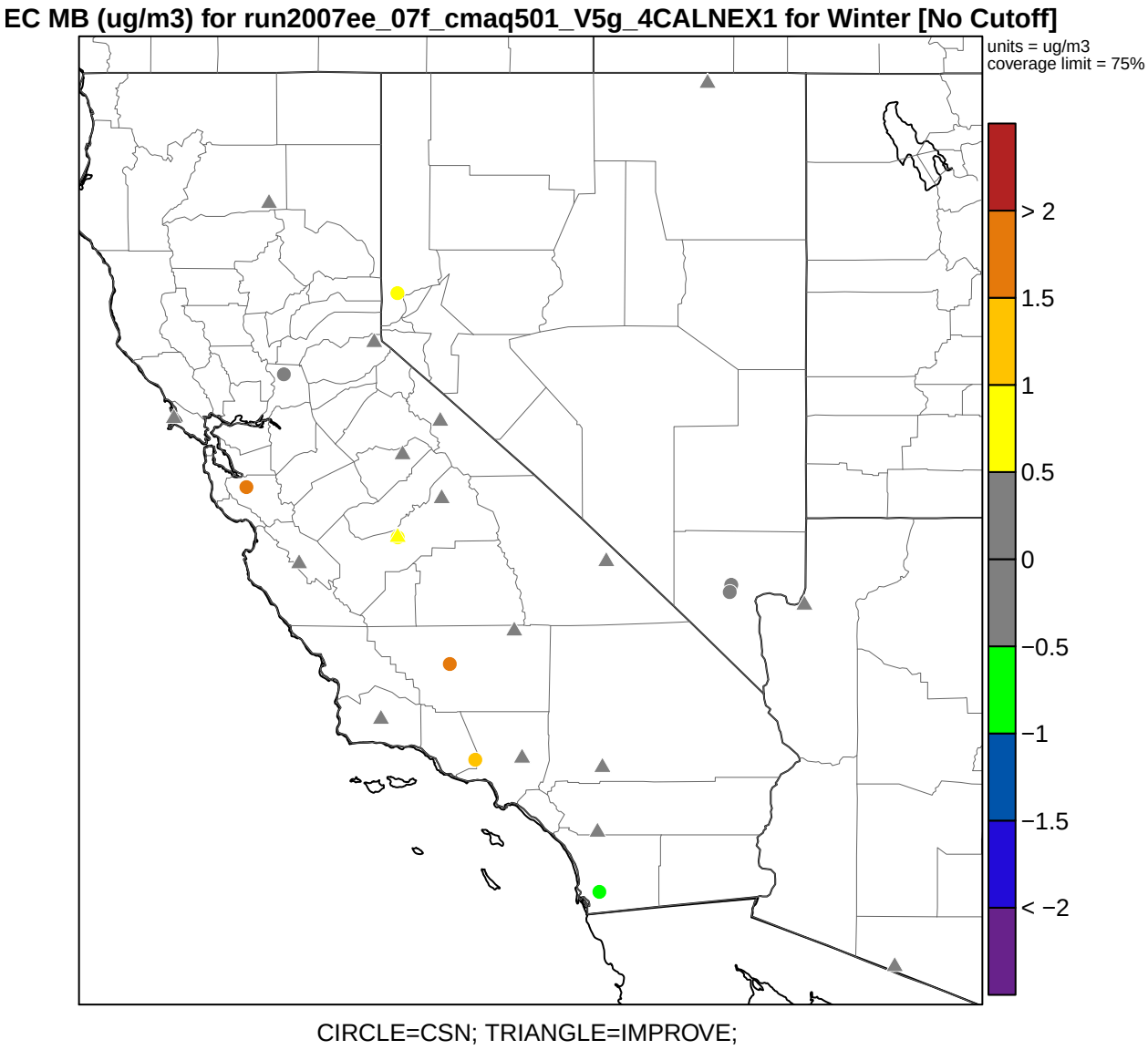

Figure 149: Mean bias for Winter EC

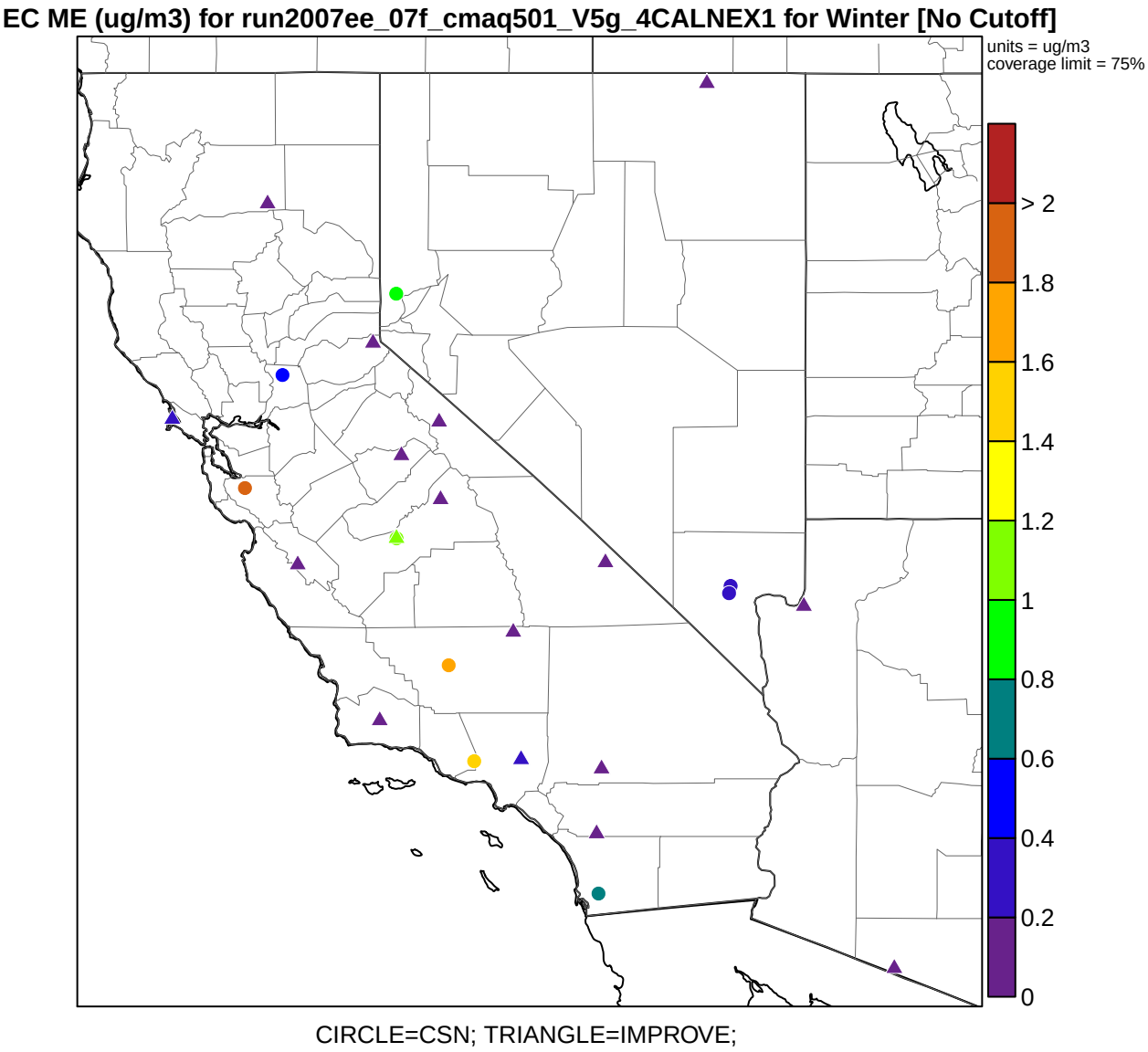

Figure 150: Mean error for Winter EC

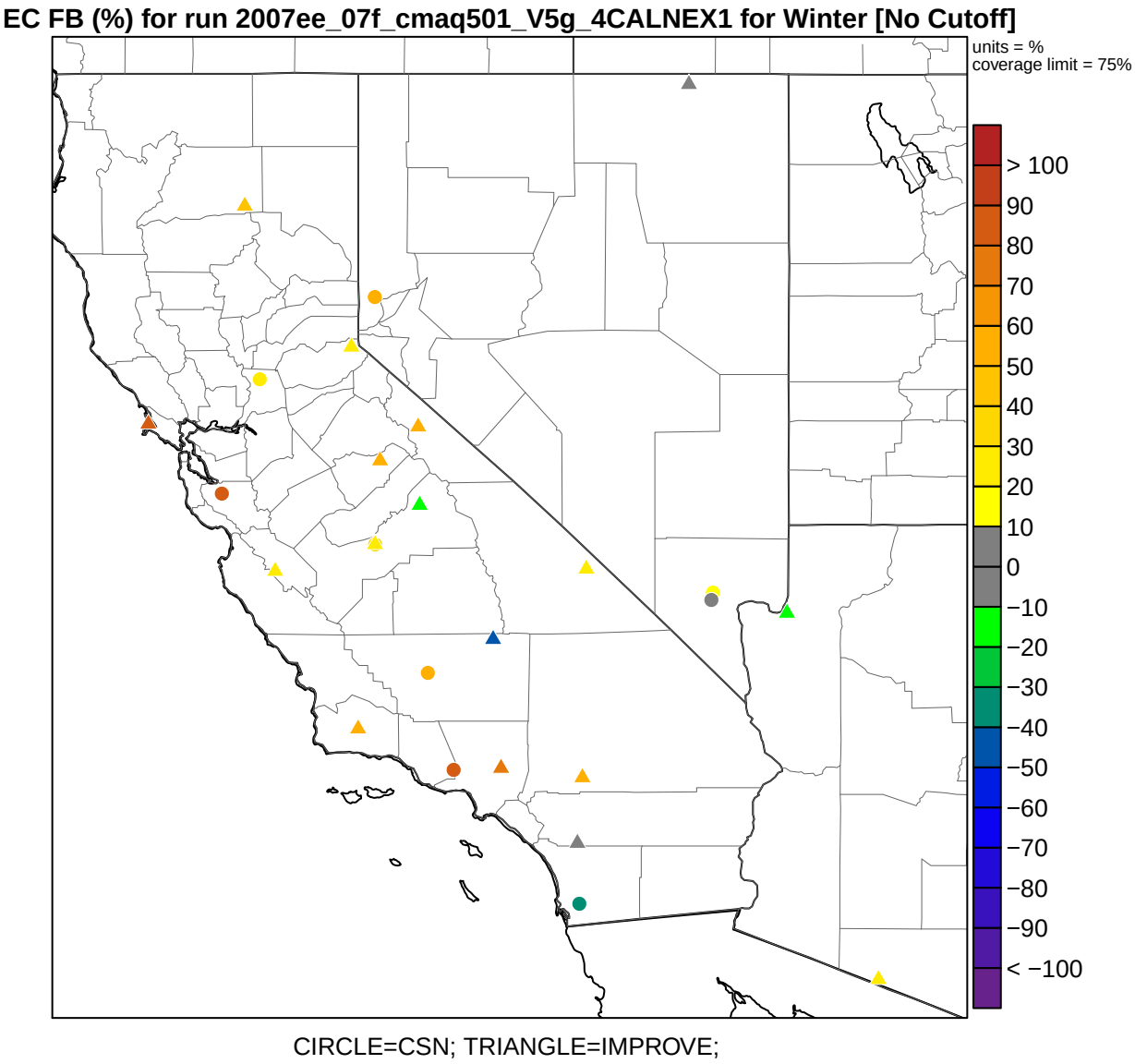

Figure 151: Fractional bias for Winter EC

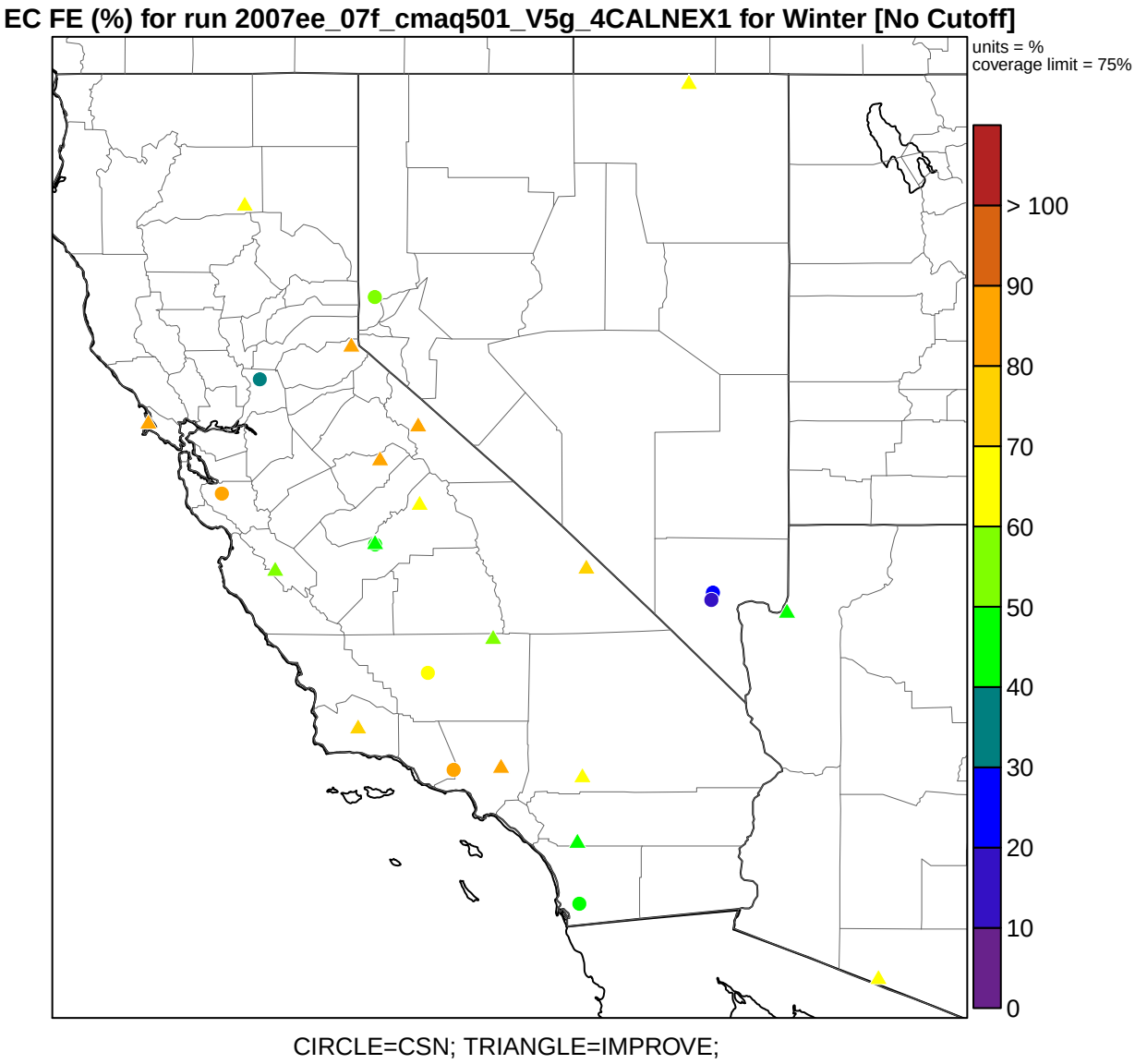

Figure 152: Fractional error for Winter EC

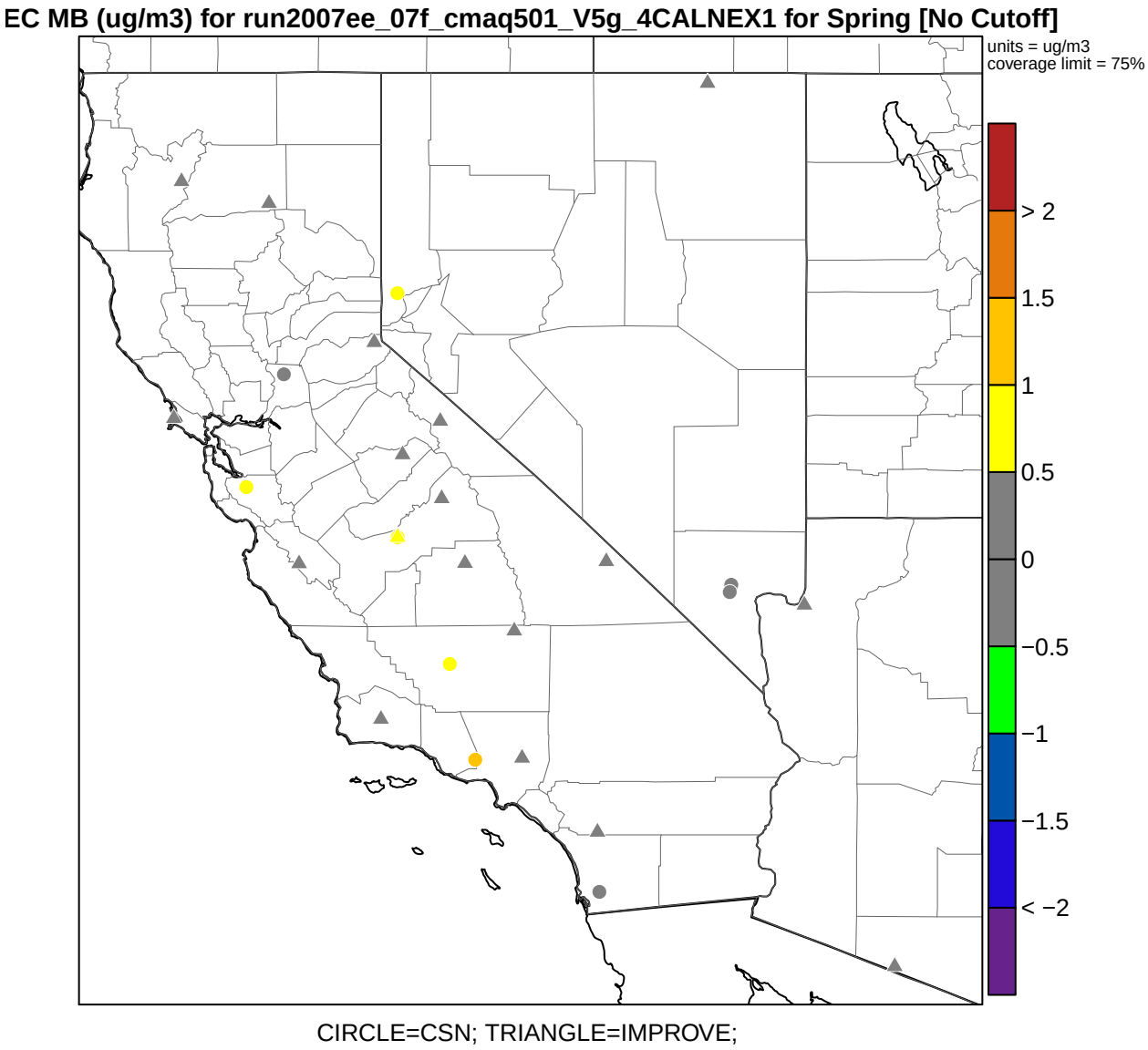

Figure 153: Mean bias for Spring EC

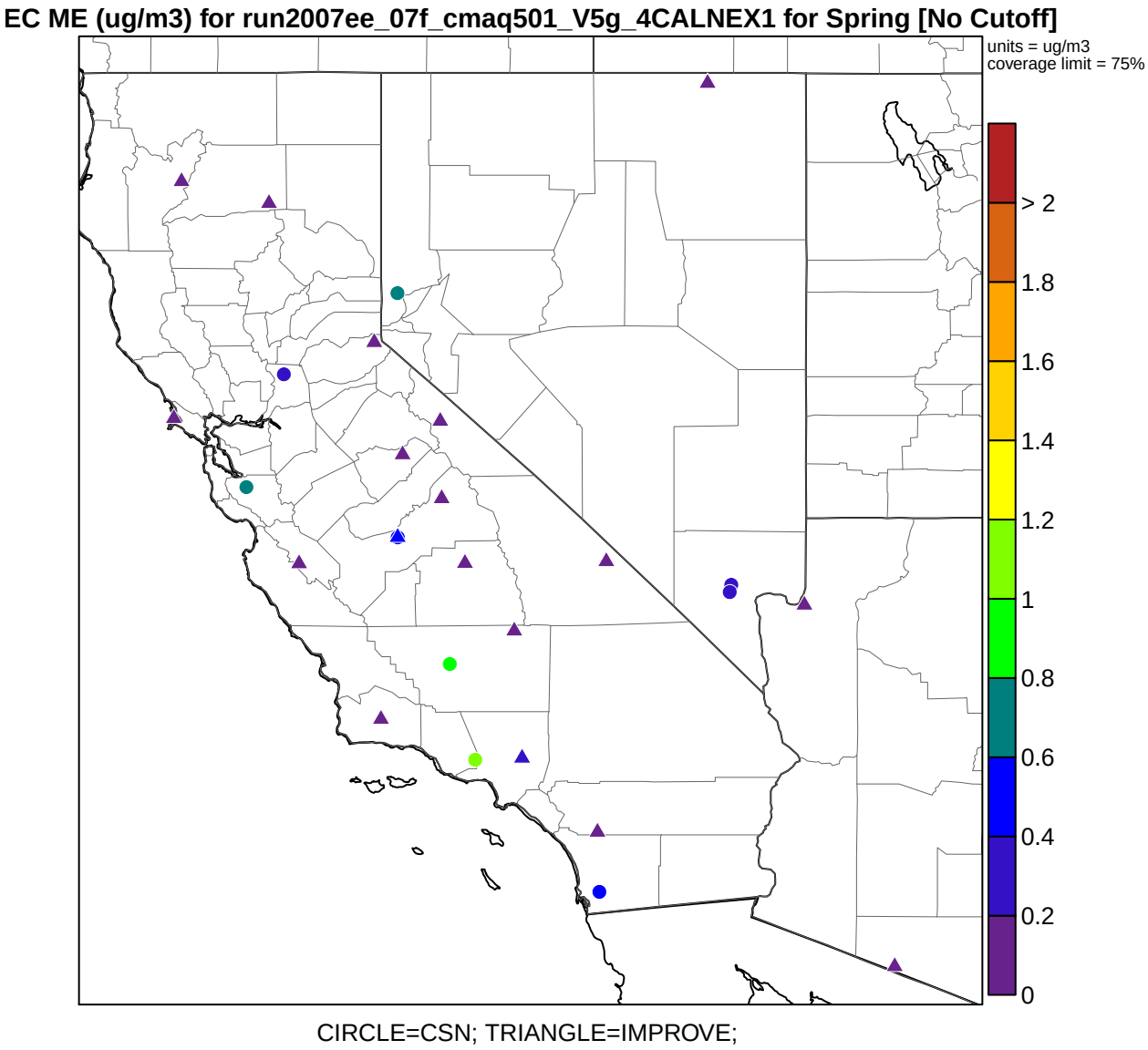

Figure 154: Mean error for Spring EC

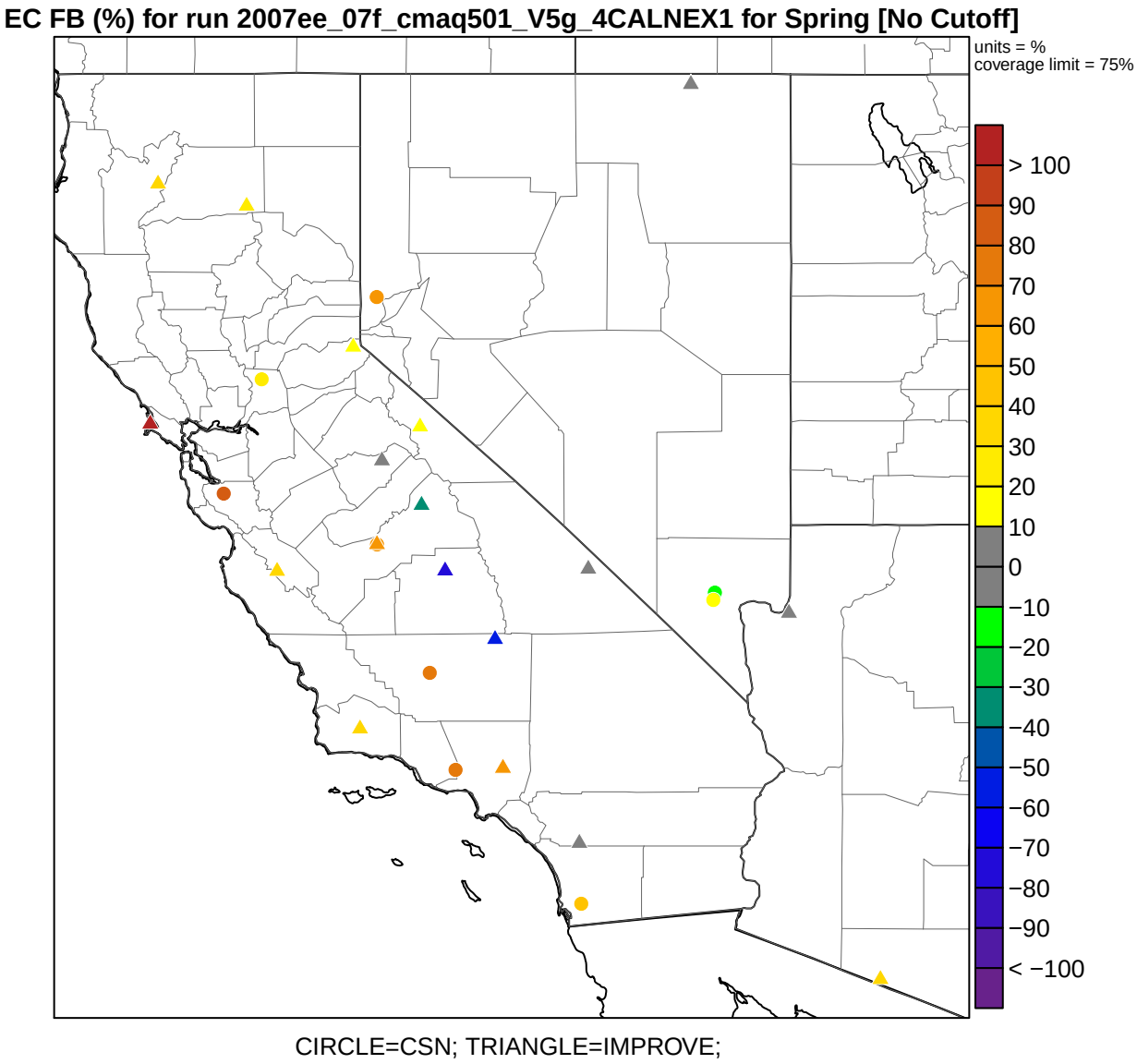

Figure 155: Fractional bias for Spring EC

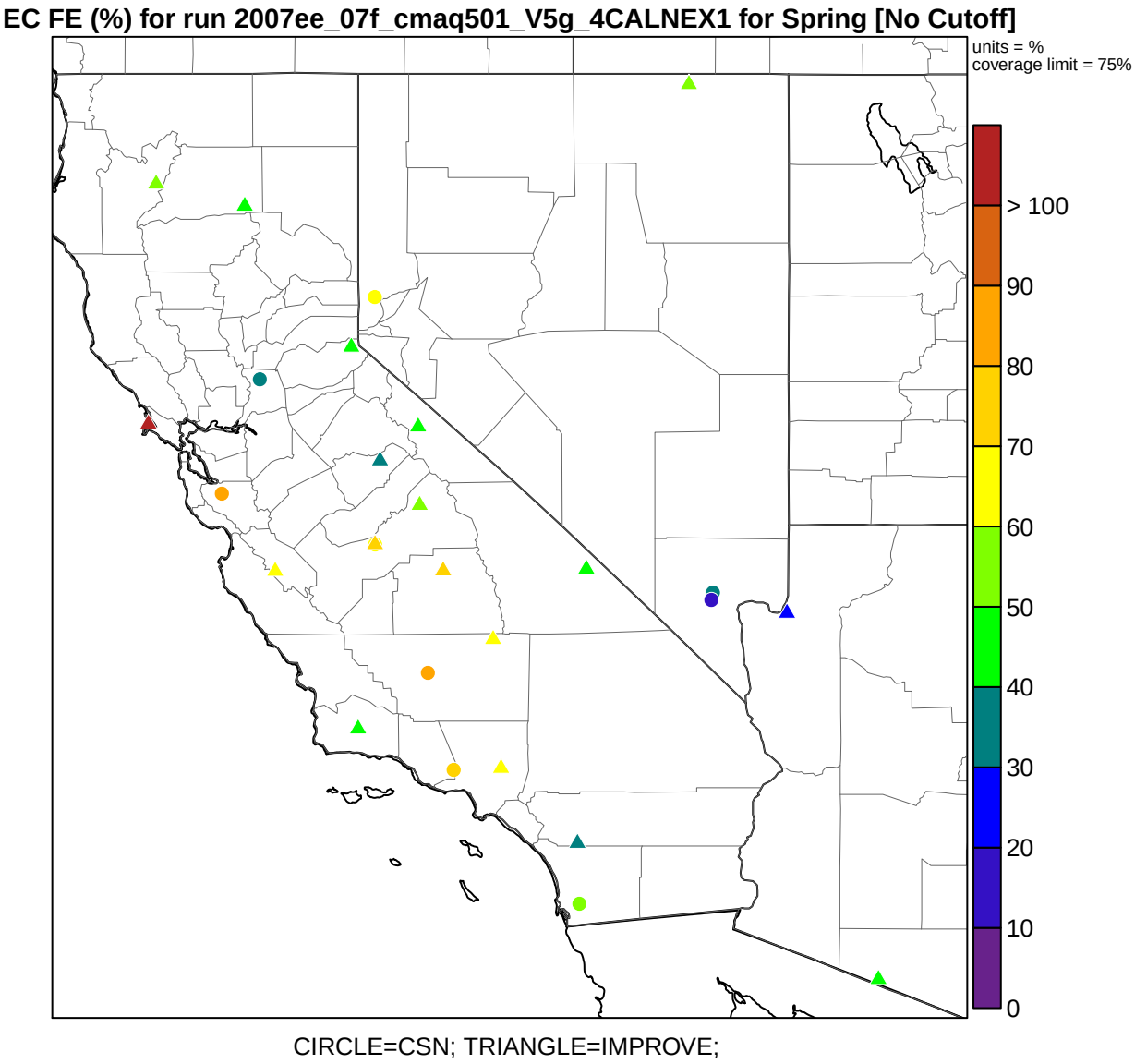

Figure 156: Fractional error for Spring EC

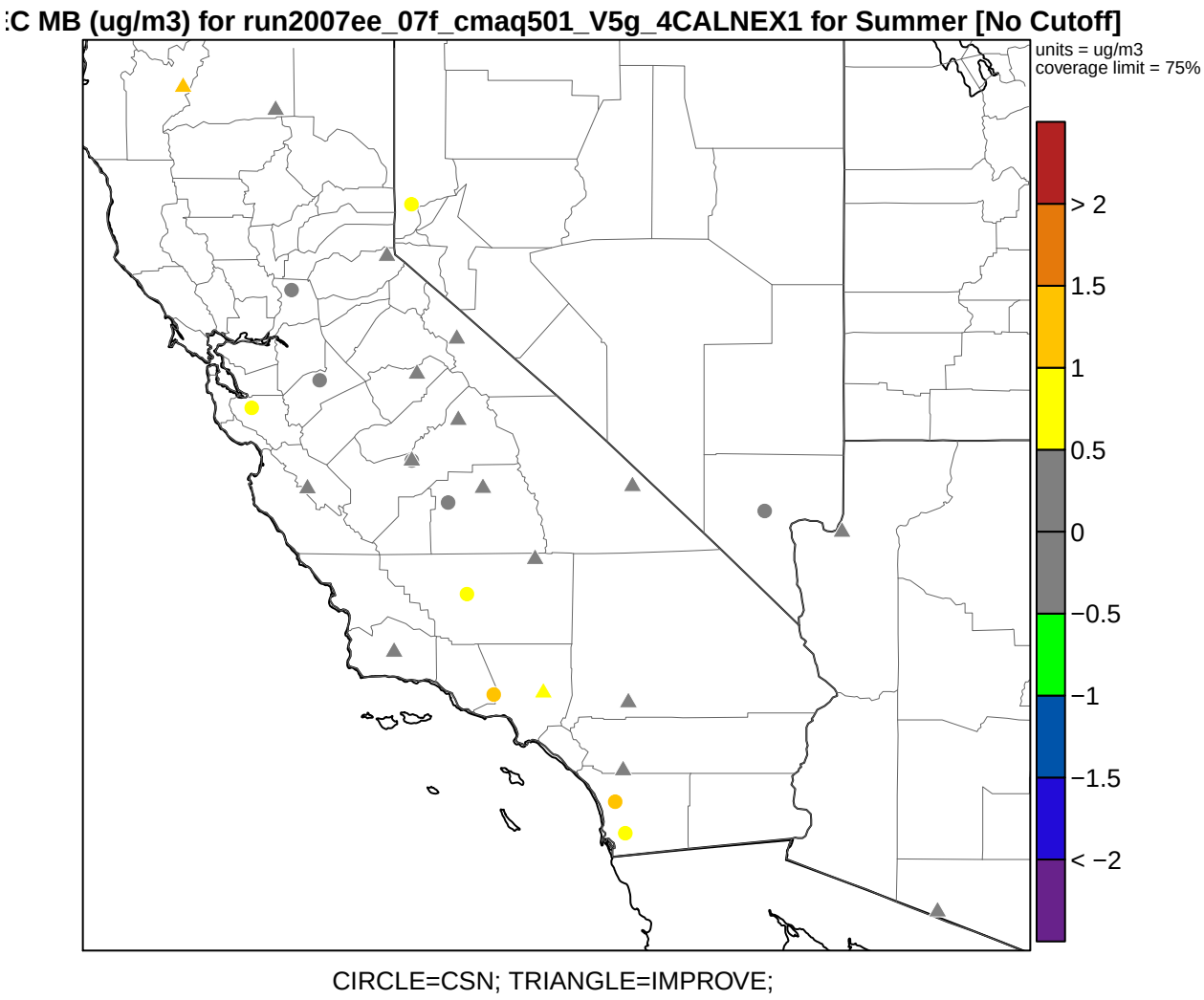

Figure 157: Mean bias for Summer EC

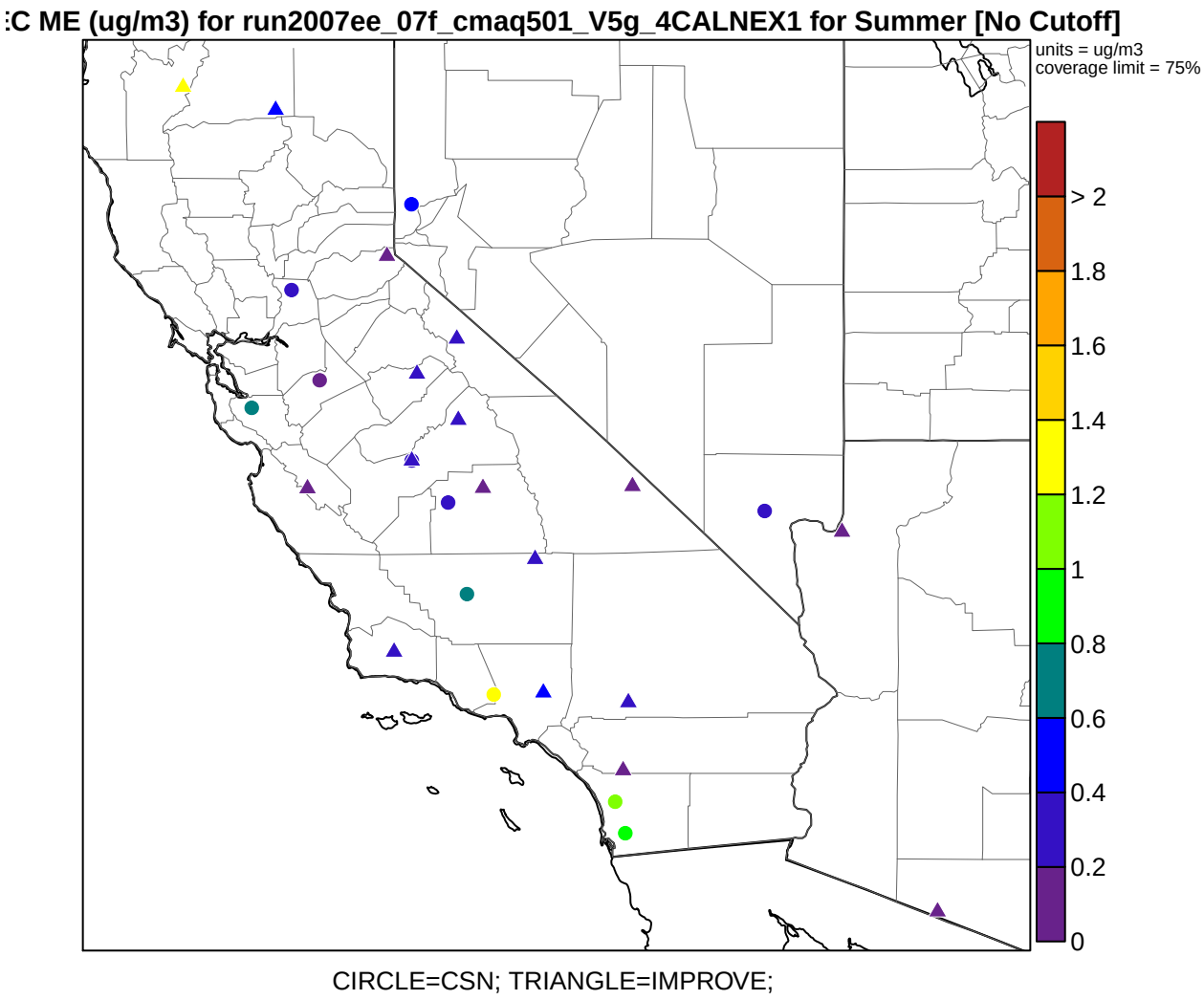

Figure 158: Mean error for Summer EC

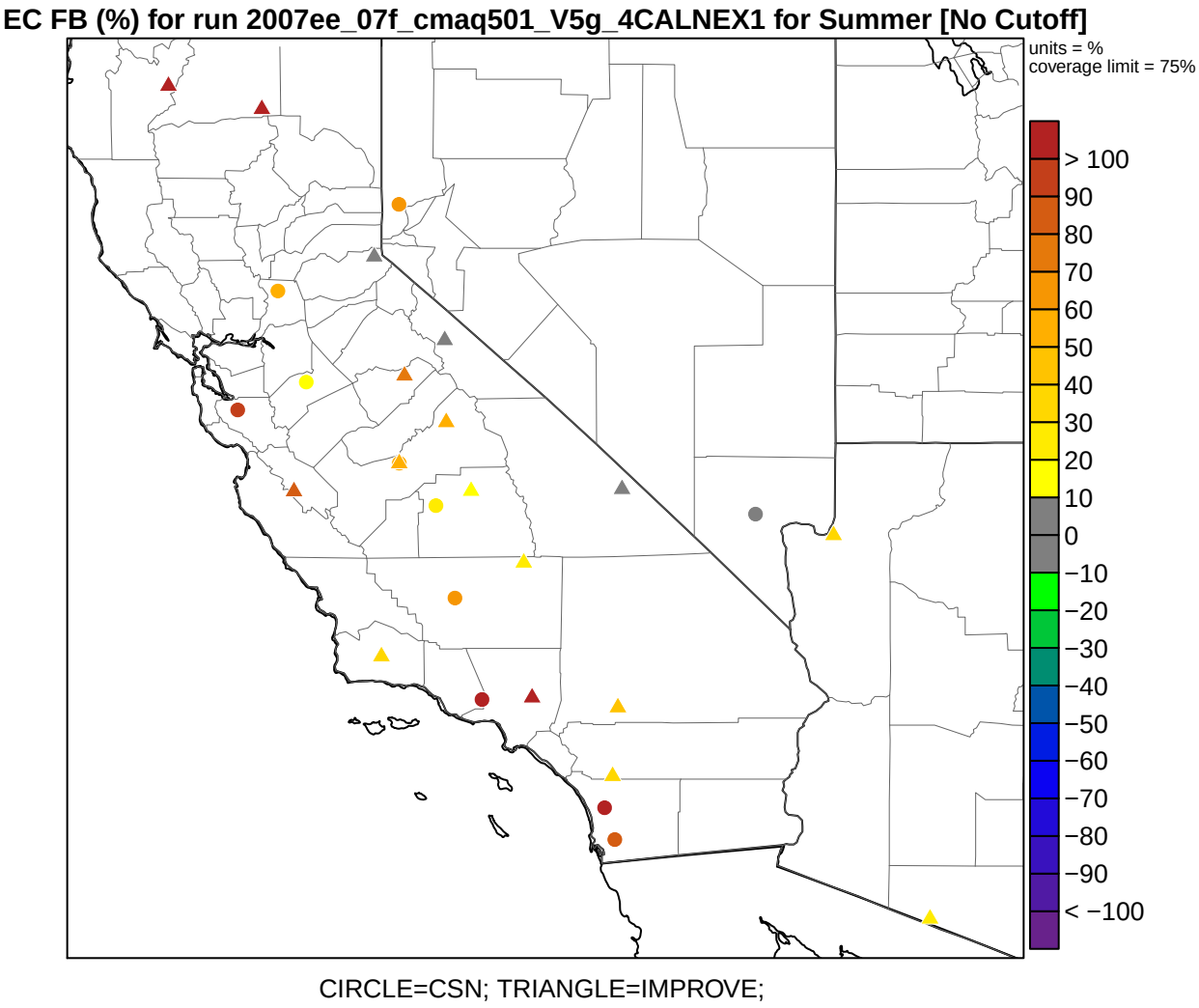

Figure 159: Fractional bias for Summer EC

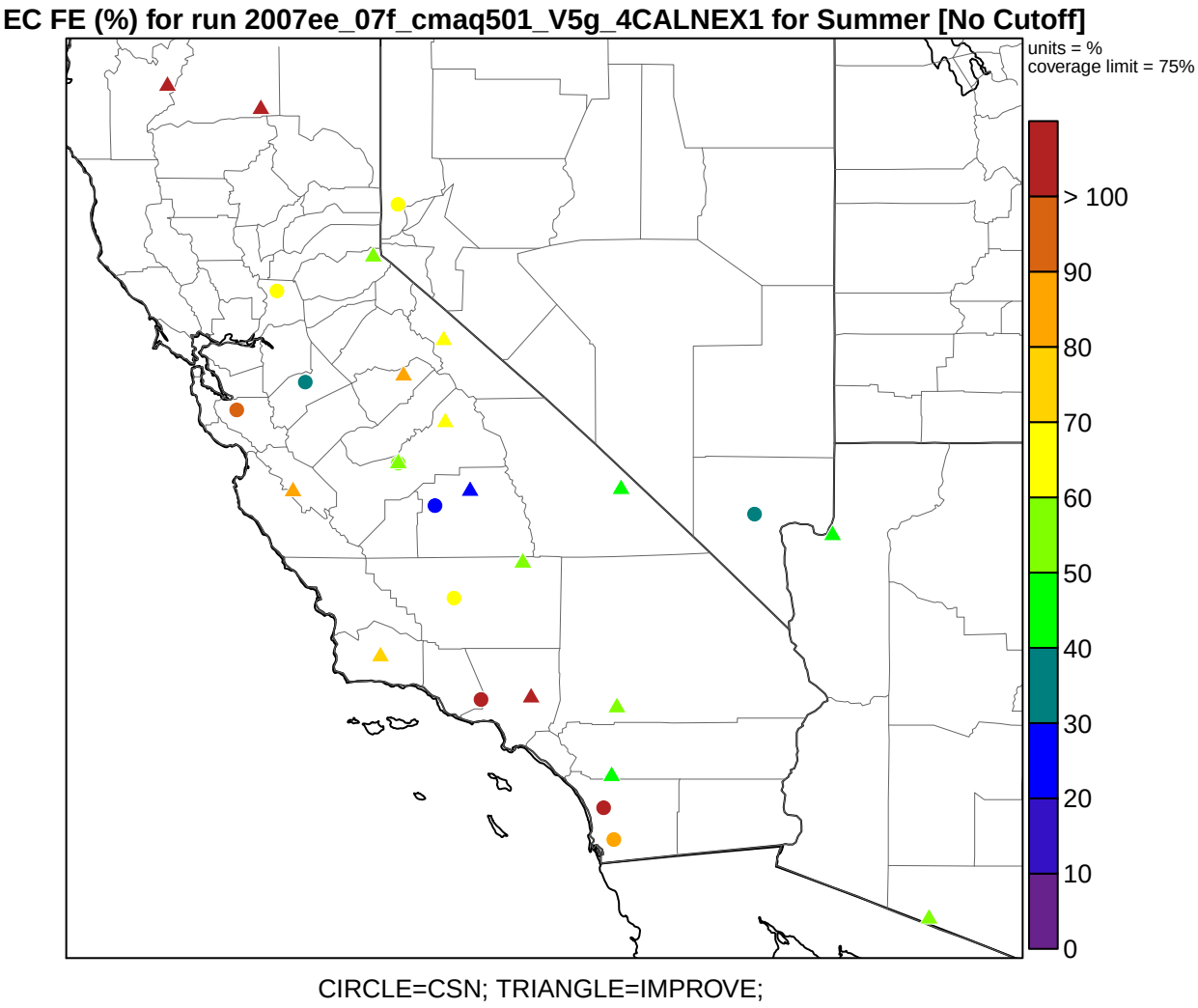

Figure 160: Fractional error for Summer EC

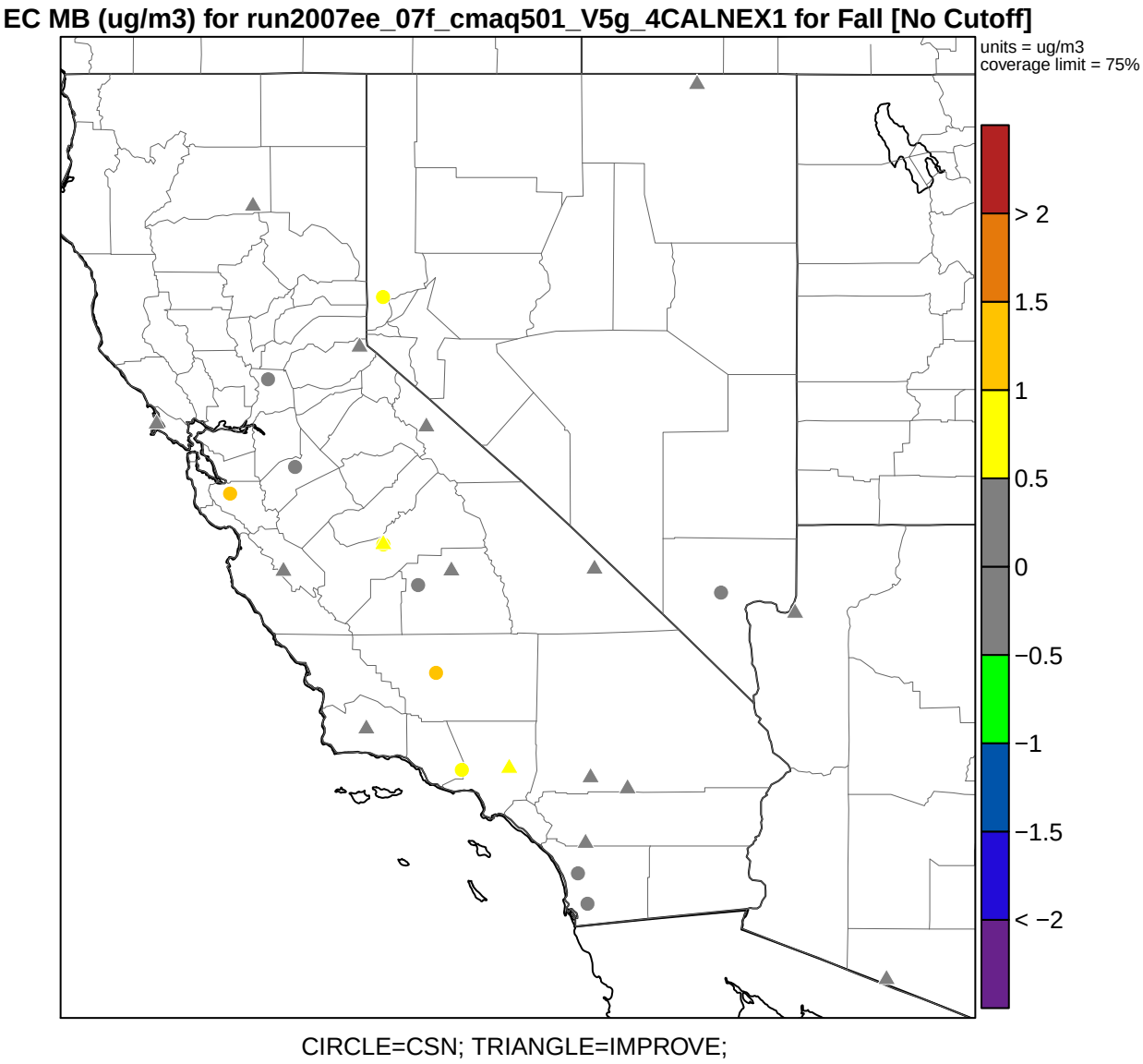

Figure 161: Mean bias for Fall EC

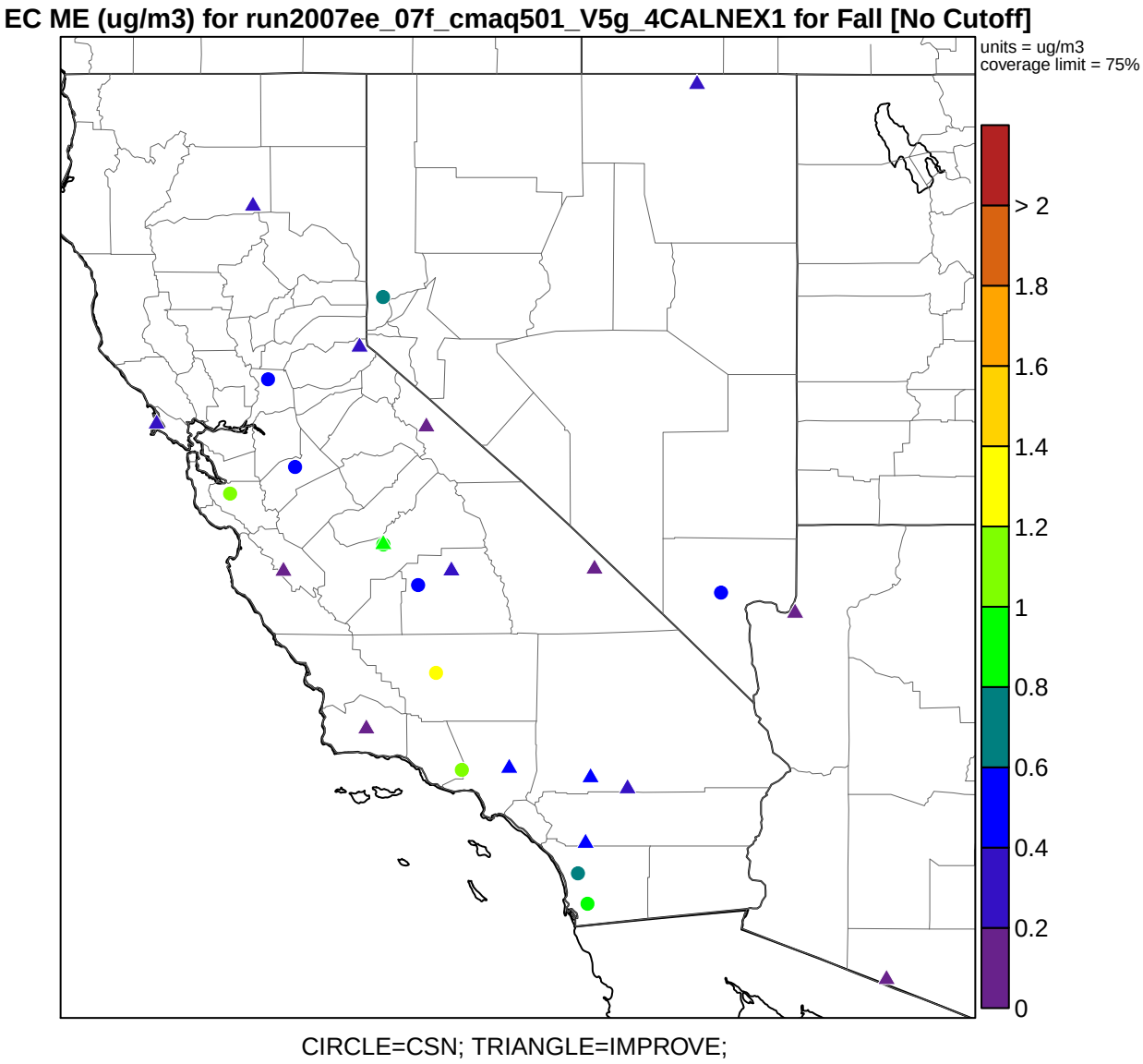

Figure 162: Mean error for Fall EC

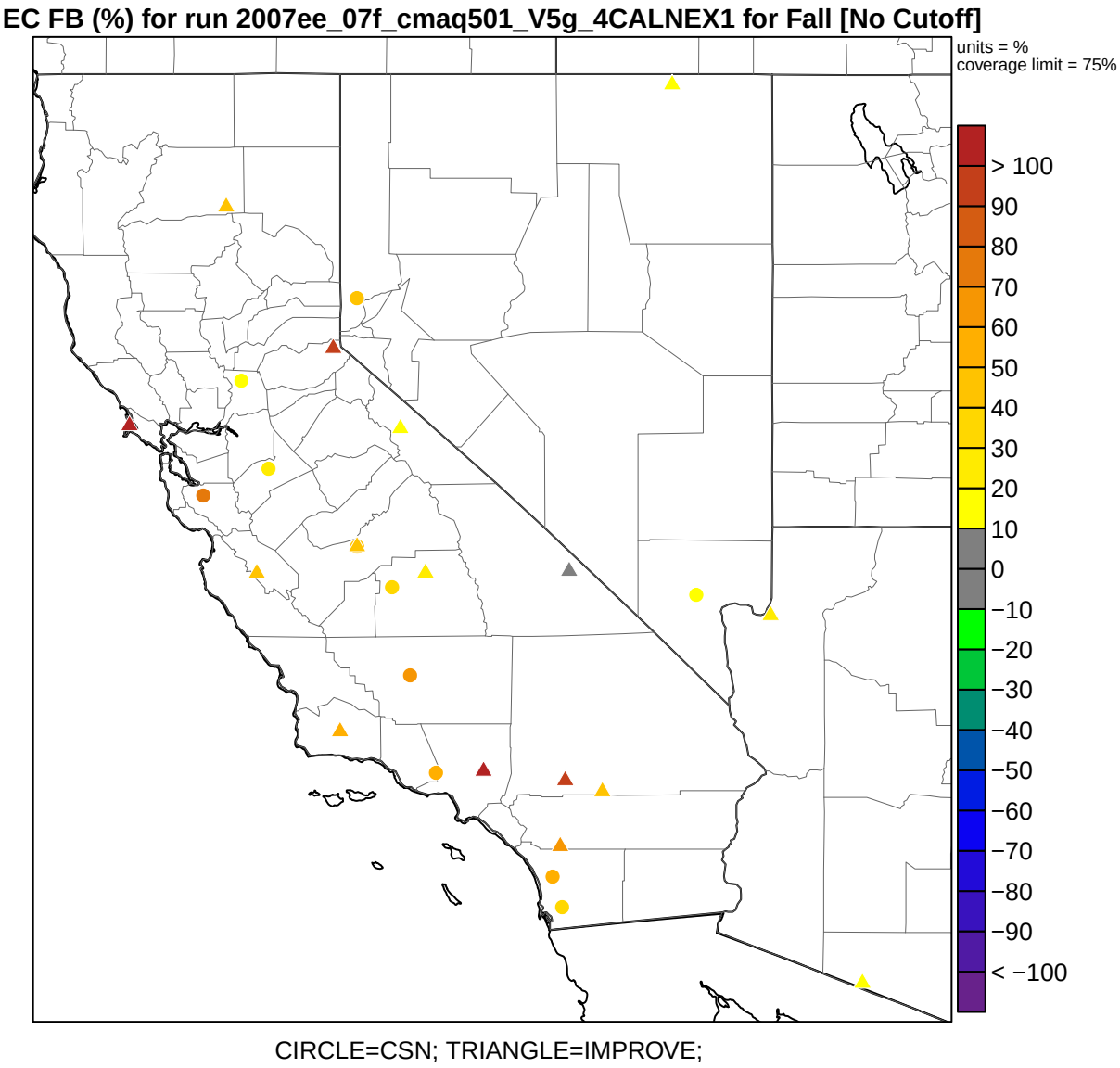

Figure 163: Fractional bias for Fall EC

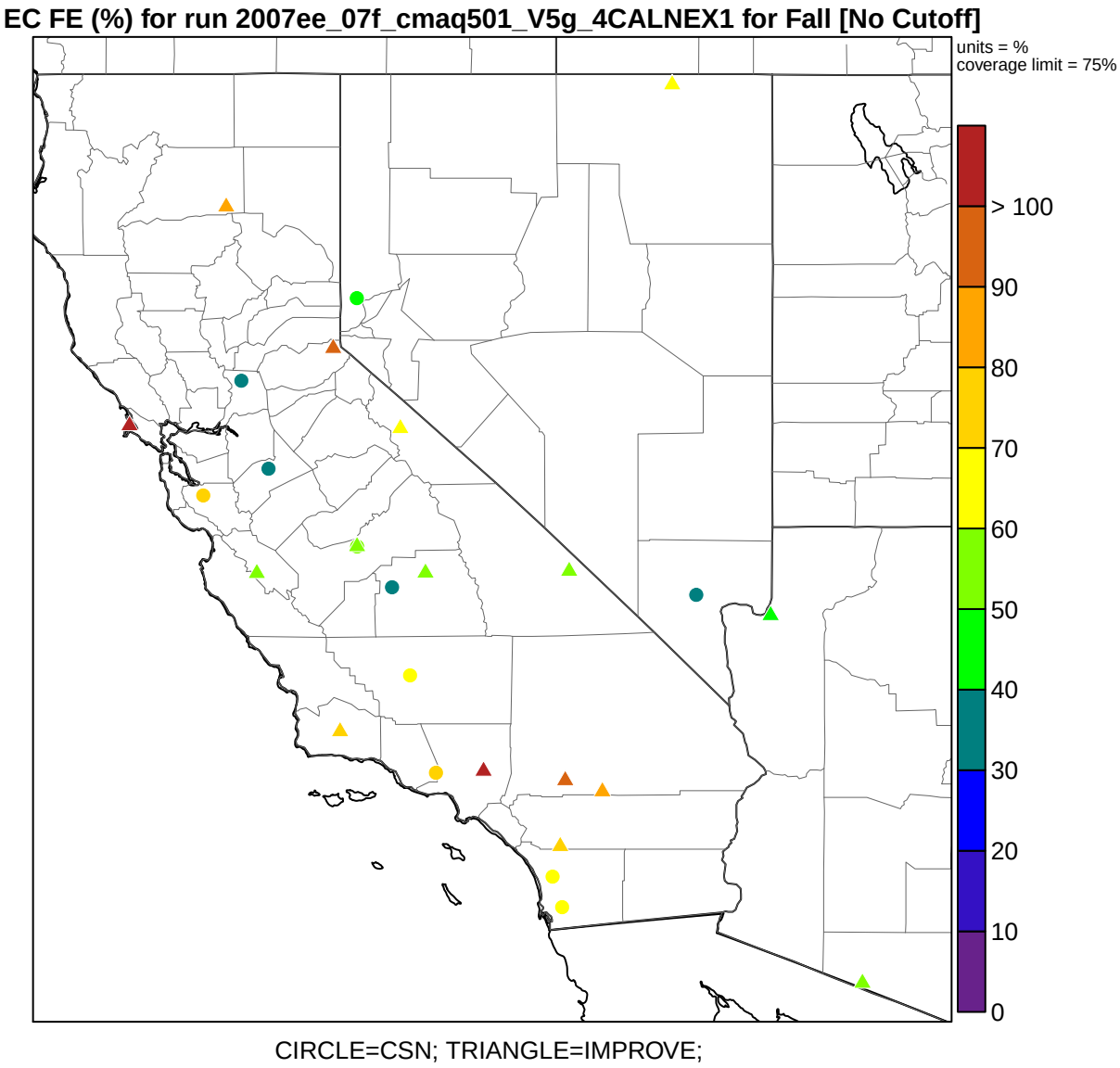

Figure 164: Fractional error for Fall EC

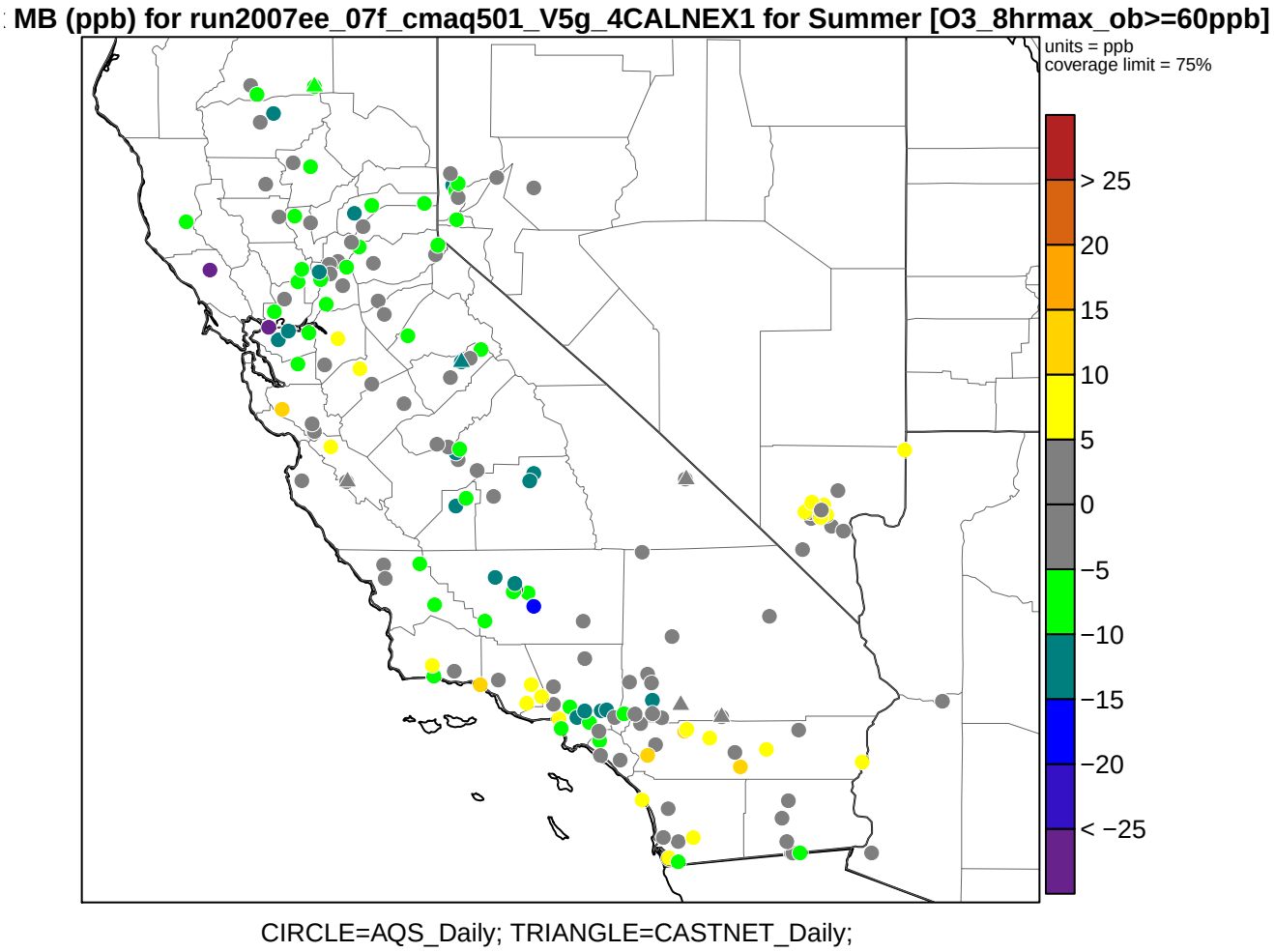

Figure 165: Mean bias for Summer 8hr Max Ozone

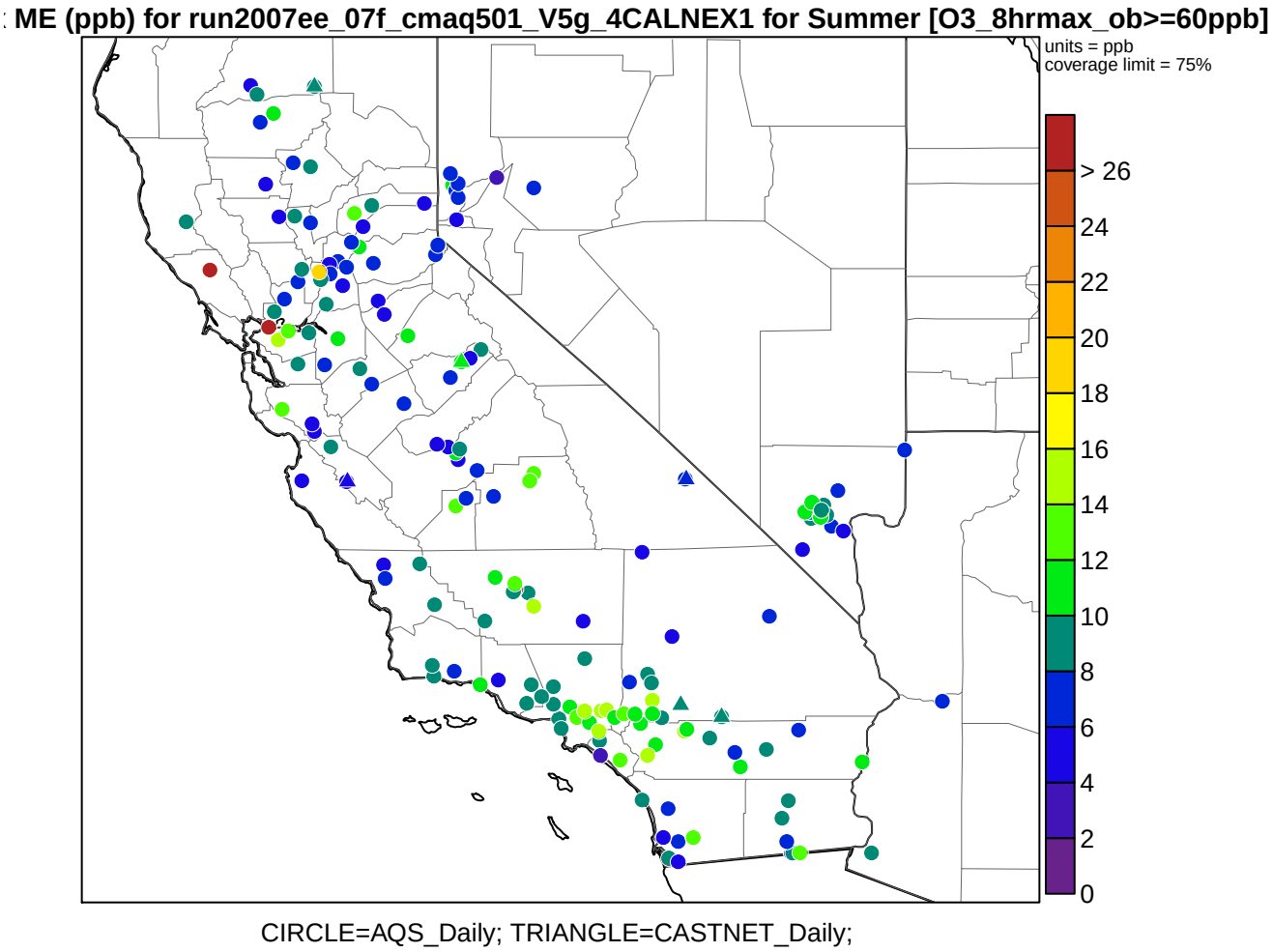

Figure 166: Mean error for Summer 8hr Max Ozone

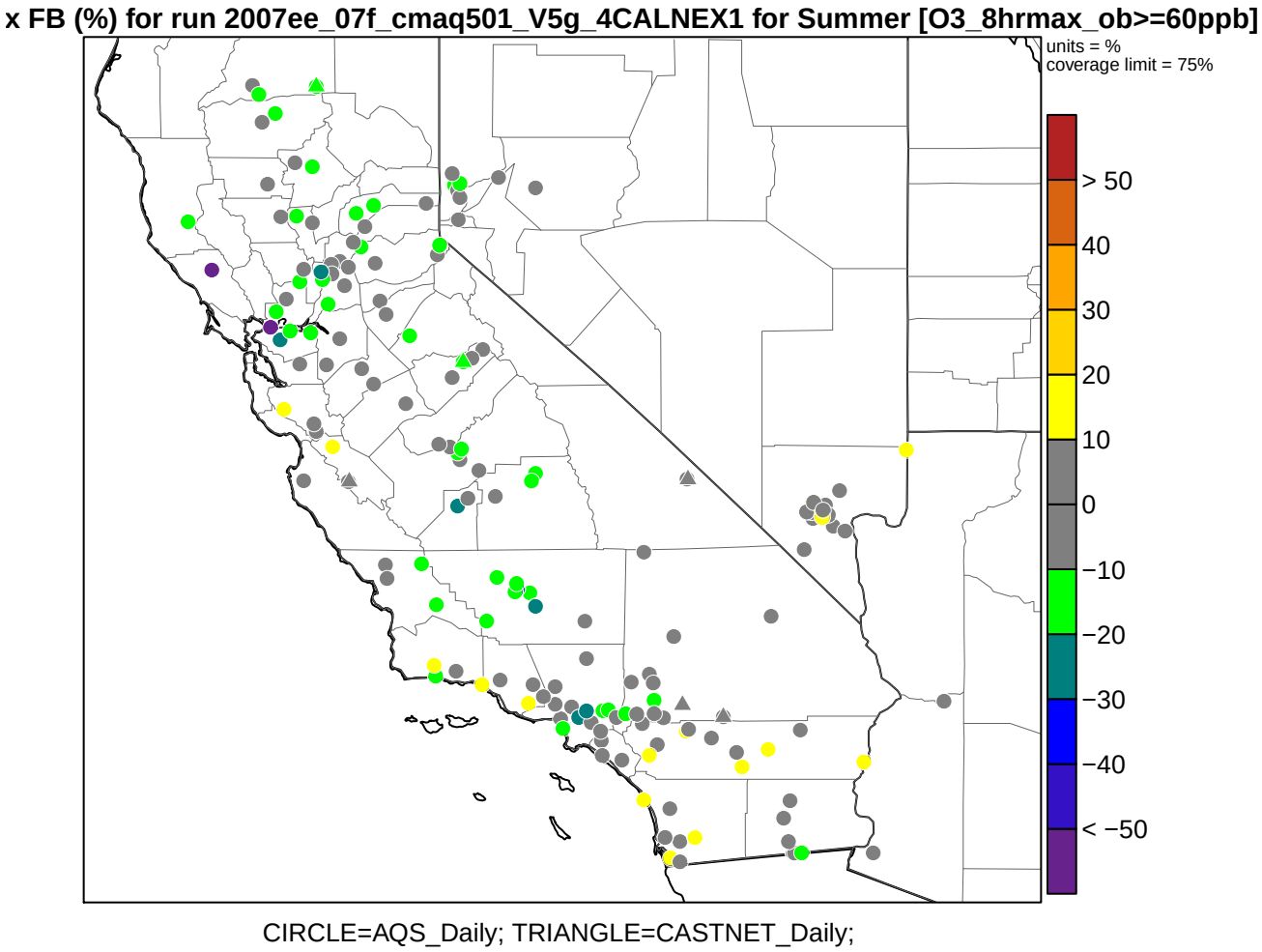

Figure 167: Fractional bias for Summer 8hr Max Ozone

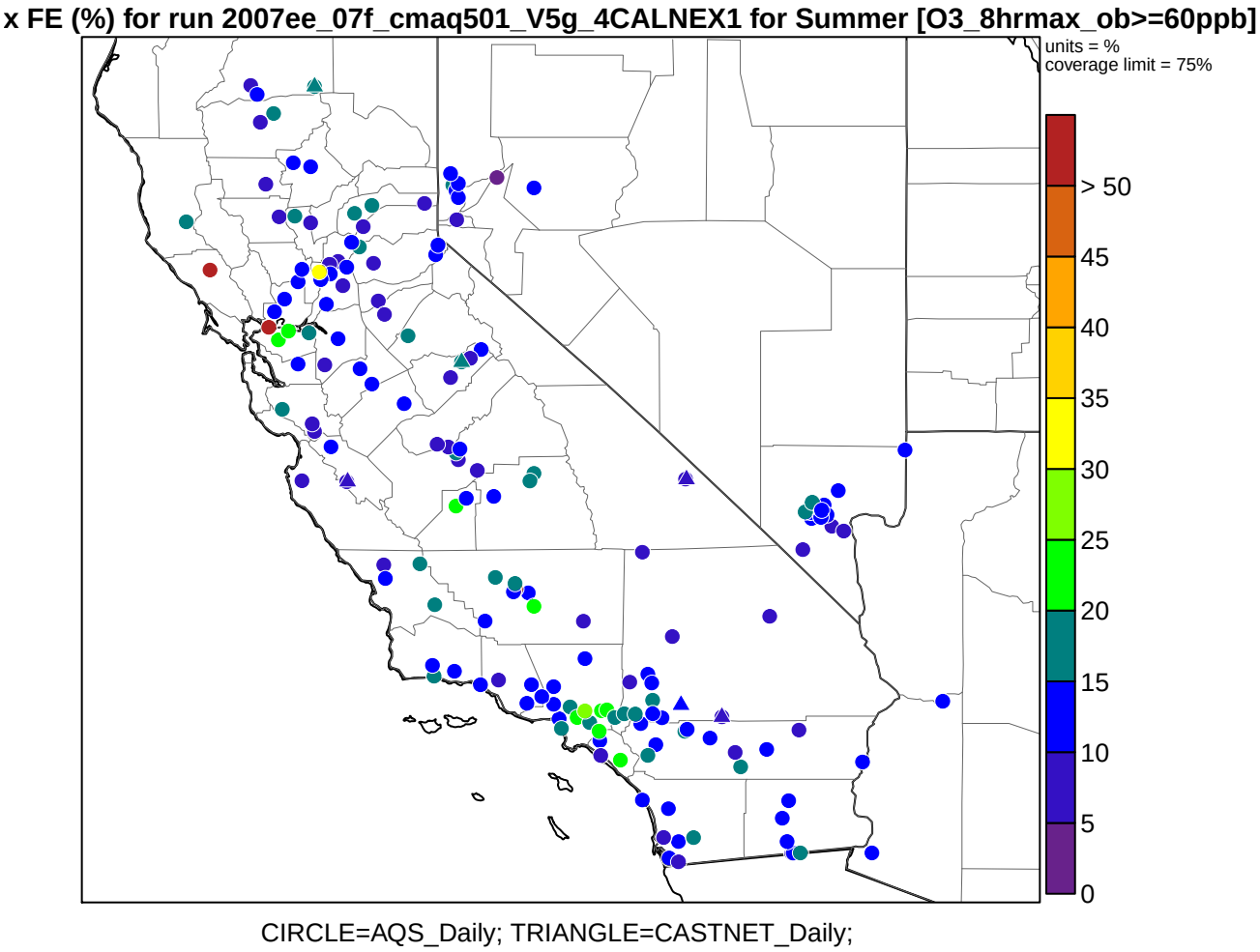

Figure 168: Fractional error for Summer 8hr Max Ozone