

# ENVIRON

## MEMORANDUM

**To:** James Red, TCEQ  
**From:** Greg Yarwood  
**Date:** 8 October 2003  
**Subject:** Sensitivity of 2007 ozone levels in Texas to emissions from electrical generating units (EGUs) in Louisiana

---

This memorandum presents results of emissions and photochemical modeling to evaluate the ozone impacts of NO<sub>x</sub> emissions from electrical generating units (EGUs) in Louisiana (LA). Ozone modeling used version 4.02 of the Comprehensive Air Quality Model with extensions (CAMx4) for the August 13-22, 1999 period being modeled for the Dallas/Fort-Worth and Northeast Texas areas. The first two days are considered spin-up days, and so results are presented for the August 15-22 “episode days.” The model has nested 36, 12 and 4 km grids. Results are presented here for the regional 12 km grid that covers most of eastern Texas and Louisiana.

Emissions were developed using the enhanced emissions processing system (EPS2x). The basis for the 2007 emissions inventory was EPA's Heavy Duty Diesel rule making for areas outside of Texas, and TCEQ data inside Texas. The on-road mobile emissions are based on MOBILE5. These emissions are being updated to MOBILE6, but the updated emissions are not yet available. This is not expected to significantly alter the results of this sensitivity analysis to Louisiana EGU emissions. For the sensitivity case, emissions from LA EGU sources were reduced by 50%.

### EMISSIONS CHANGES

Table 1 summarizes the 2007 NO<sub>x</sub> emissions changes resulting from a 50% reduction in all Louisiana EGU sources. The emissions and emissions changes are summarized by County and SCC. The EPA determined which sources to classify as EGUs based on the SIC code (4911). Overall, the 2007 base Louisiana EGU NO<sub>x</sub> emissions were 263.8 Tons/day and so the 50% cut resulted in a 131.9 Tons/day emissions reduction.

**Table 1.** NOx emissions from Louisiana EGU sources for the 2007 base and sensitivity cases.

Parish	FIPS	SIC	SCC	NOx (tons/day)	
				Base	Sensitivity
Caddo	22017	4911	10100604	2.6	1.3
Caddo	22017	4911	20100201	0.1	0.0
Calcasieu	22019	4911	10100601	3.9	2.0
Calcasieu	22019	4911	10100604	3.4	1.7
De Soto	22031	4911	10100301	32.5	16.3
East Baton Rouge	22033	4911	10100601	1.0	0.5
Evangeline	22039	4911	10100601	6.2	3.1
Evangeline	22039	4911	20100201	0.2	0.1
Iberville	22047	4911	10100601	13.3	6.6
Iberville	22047	4911	10100604	7.5	3.8
Jefferson	22051	4911	10100601	2.5	1.3
Jefferson	22051	4911	10100604	32.1	16.1
Jefferson	22051	4911	20100201	0.2	0.1
Lafayette	22055	4911	10100601	2.2	1.1
Lafayette	22055	4911	10100604	0.7	0.4
Lafourche	22057	4911	10100601	0.3	0.2
Lincoln	22061	4911	10100601	0.5	0.3
Natchitoches	22069	4911	10100601	0.4	0.2
Orleans	22071	4911	10100601	13.7	6.8
Orleans	22071	4911	20100201	0.2	0.1
Ouachita	22073	4911	10100601	4.5	2.3
Ouachita	22073	4911	20100201	0.9	0.5
Pointe Coupee	22077	4911	10100202	0.6	0.3
Pointe Coupee	22077	4911	10100222	55.0	27.5
Pointe Coupee	22077	4911	10100601	4.0	2.0
Rapides	22079	4911	10100222	24.8	12.4
Rapides	22079	4911	10100601	17.5	8.8
St. Charles	22089	4911	10100601	27.5	13.7
St. Charles	22089	4911	20100201	0.2	0.1
St. Mary	22101	4911	10100601	4.7	2.3
St. Mary	22101	4911	20100201	0.2	0.1
Terrebonne	22109	4911	10100601	0.1	0.1
Webster	22119	4911	10100601	0.3	0.2
<b>Total</b>				<b>263.8</b>	<b>131.9</b>

## OZONE CHANGES

The changes in 2007 ozone levels due to a 50% reduction in Louisiana (LA) EGU emissions are shown as isopleth plots in Figures 1-4. The isopleth plots are for the 12 km grid and each episode day (August 15-22). The figures included are as follows:



Golden Gate Plaza \$ 101 Rowland Way \$ Novato, California 94945-5010 USA

Tel: (415) 899-0700 \$ Fax: (415) 899-0707 ! www.environcorp.com

Figure 1: Daily maximum 1-hour ozone levels for the 2007 base case.

Figure 2: Daily maximum 8-hour ozone levels for the 2007 base case.

Figure 3: Difference in daily maximum 1-hour ozone levels for a 50% reduction in 2007 LA EGU emissions.

Figure 4: Difference in daily maximum 8-hour ozone levels for a 50% reduction in 2007 LA EGU emissions.

Findings on the impact of Louisiana EGU emissions on daily maximum ozone levels in Texas are as follows:

- A 50% reduction in 2007 LA EGU emissions results in daily maximum 8-hour and 1-hour ozone reductions within Texas of more than 0.5 ppb on all eight episode days (August 15-22).
- A 50% reduction in 2007 LA EGU emissions results in daily maximum 8-hour and 1-hour ozone reductions within Texas of more than 1.5 ppb on six of eight episode days.
- A 50% reduction in 2007 LA EGU emissions results in daily maximum 1-hour ozone reductions within Texas of more than 2.5 ppb on five of eight episode days.
- The largest reductions in Texas peak ozone levels from reducing LA EGU emissions occur close to the Texas/Louisiana border, but reductions extend as far into Texas as Dallas/Fort-Worth and Corpus Christi depending upon meteorological conditions.
- These modeling results suggest that the following Texas nonattainment and near-nonattainment areas that would benefit from reducing LA EGU emissions: Houston/Galveston, Beaumont/Port-Arthur, Northeast Texas, Dallas/Fort-Worth, Corpus Christi and Victoria.



Golden Gate Plaza \$ 101 Rowland Way \$ Novato, California 94945-5010 USA

Tel: (415) 899-0700 \$ Fax: (415) 899-0707 ! [www.vironcorp.com](http://www.vironcorp.com)

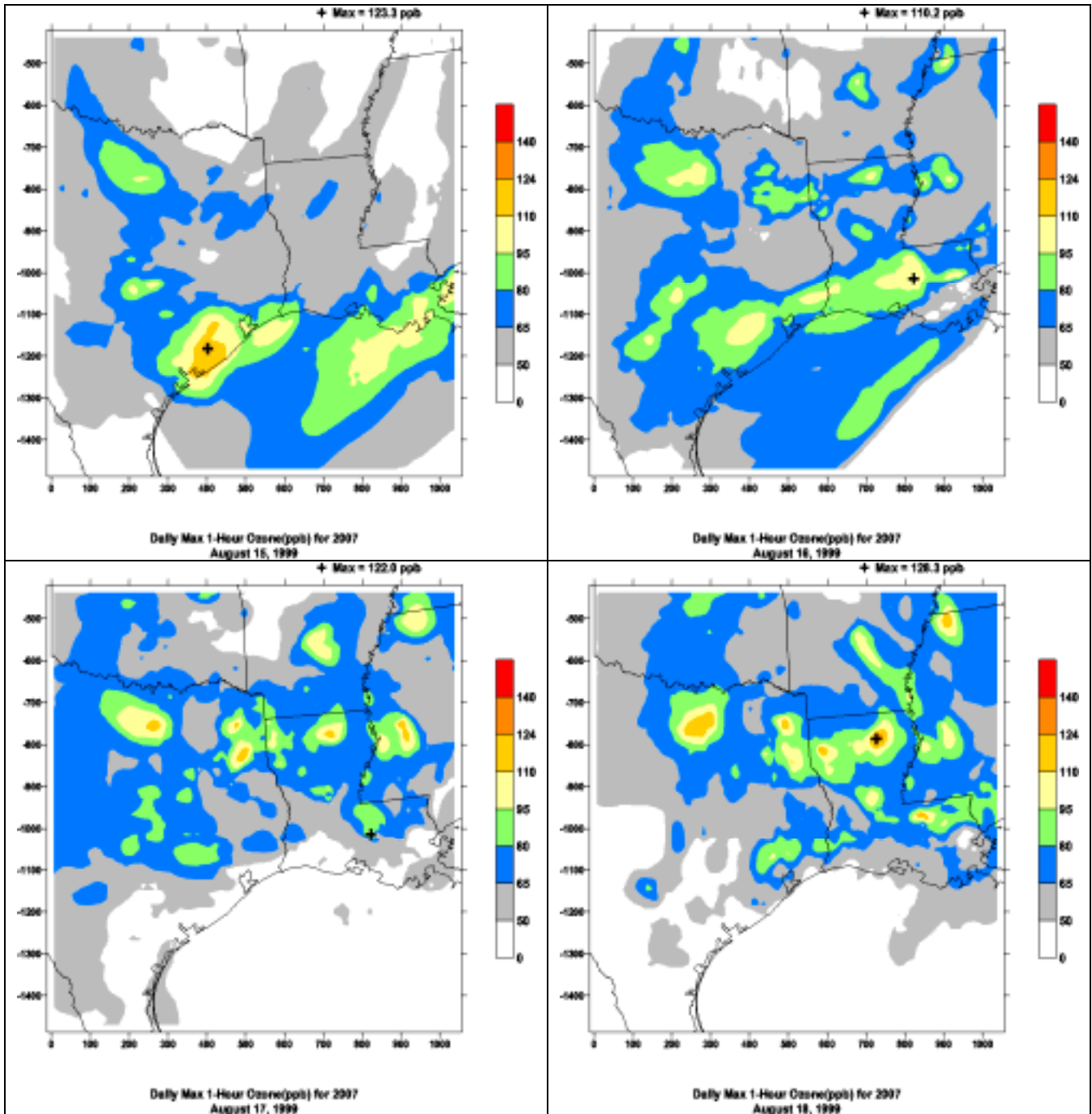


Figure 1. Daily maximum 1-hour ozone levels for the 2007 base case.



Golden Gate Plaza \$ 101 Rowland Way \$ Novato, California 94945-5010 USA  
Tel: (415) 899-0700 \$ Fax: (415) 899-0707 ! www.environcorp.com

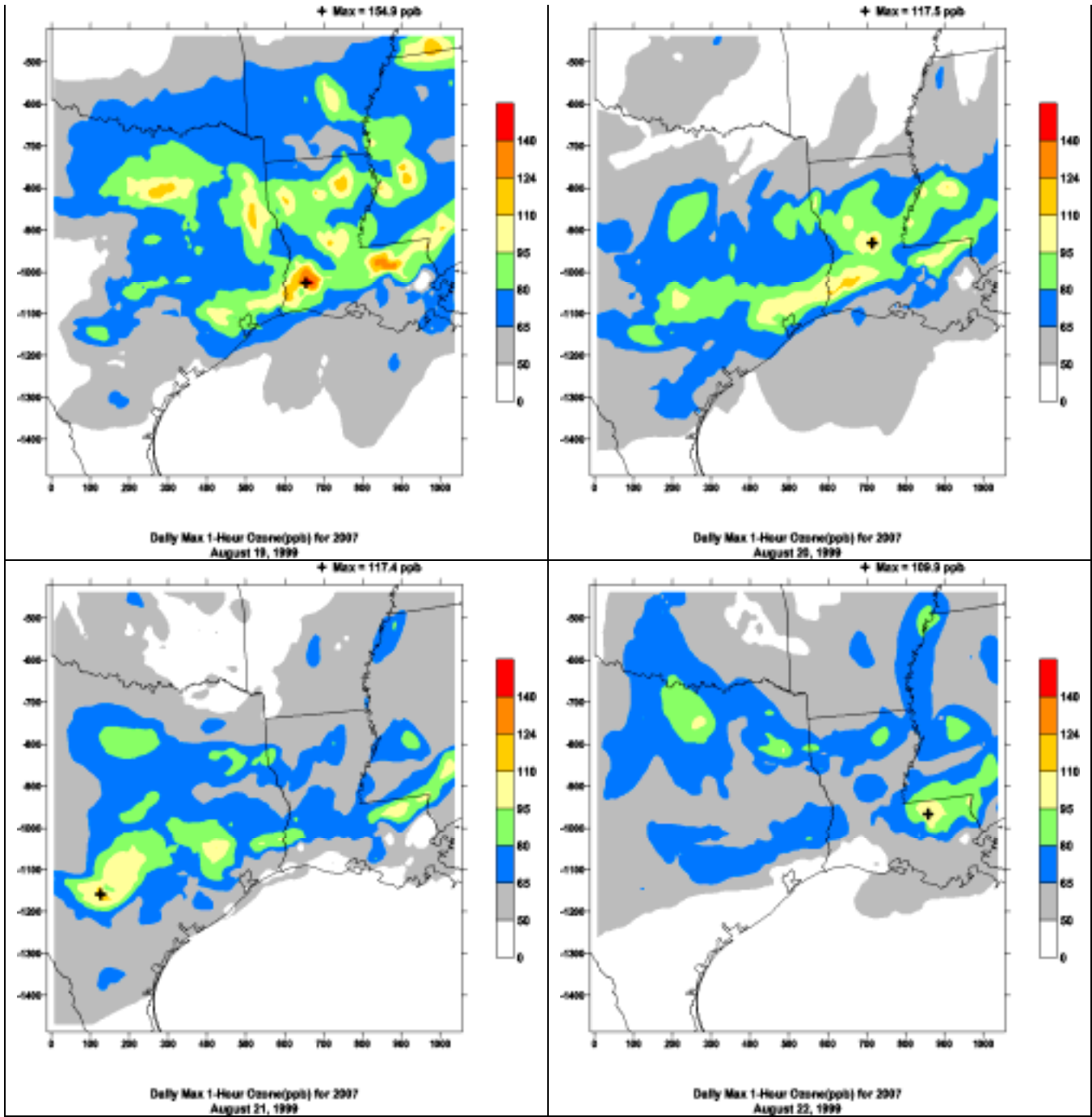


Figure 1. Concluded. Daily maximum 1-hour ozone levels for the 2007 base case.



Golden Gate Plaza \$ 101 Rowland Way \$ Novato, California 94945-5010 USA  
Tel: (415) 899-0700 \$ Fax: (415) 899-0707 ! www.environcorp.com

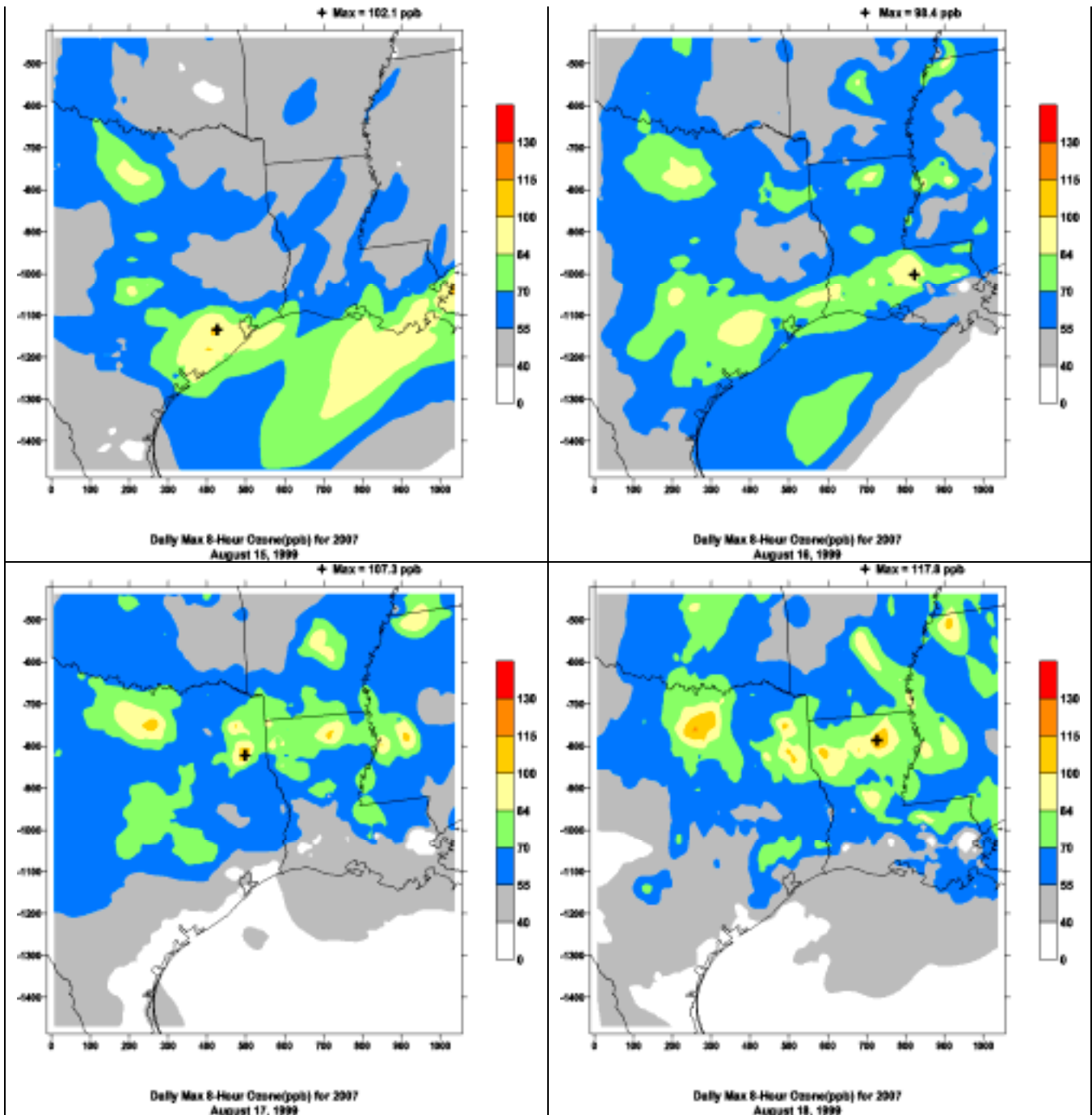


Figure 2. Daily maximum 8-hour ozone levels for the 2007 base case.



Golden Gate Plaza \$ 101 Rowland Way \$ Novato, California 94945-5010 USA  
Tel: (415) 899-0700 \$ Fax: (415) 899-0707 ! www.environcorp.com

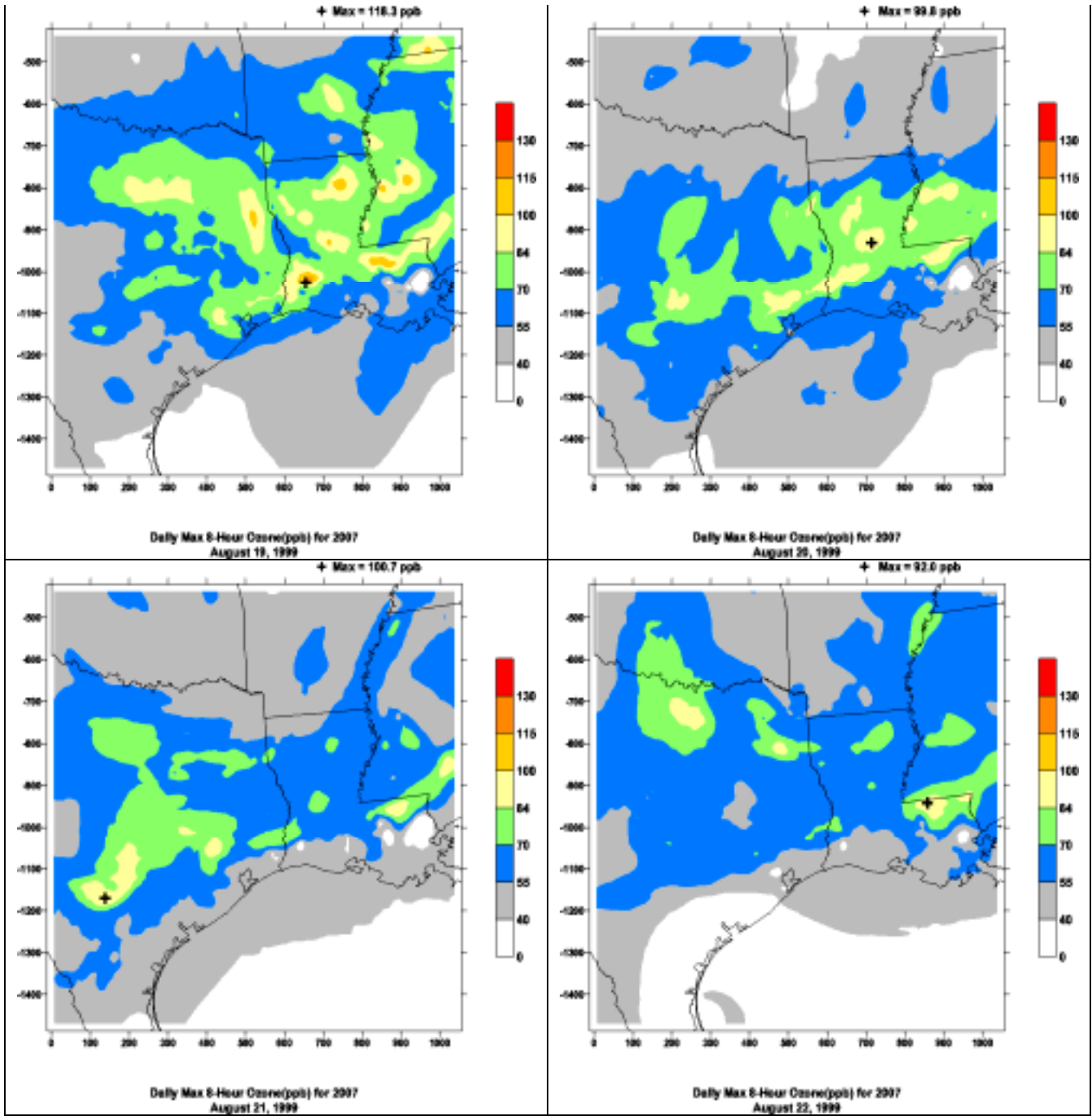
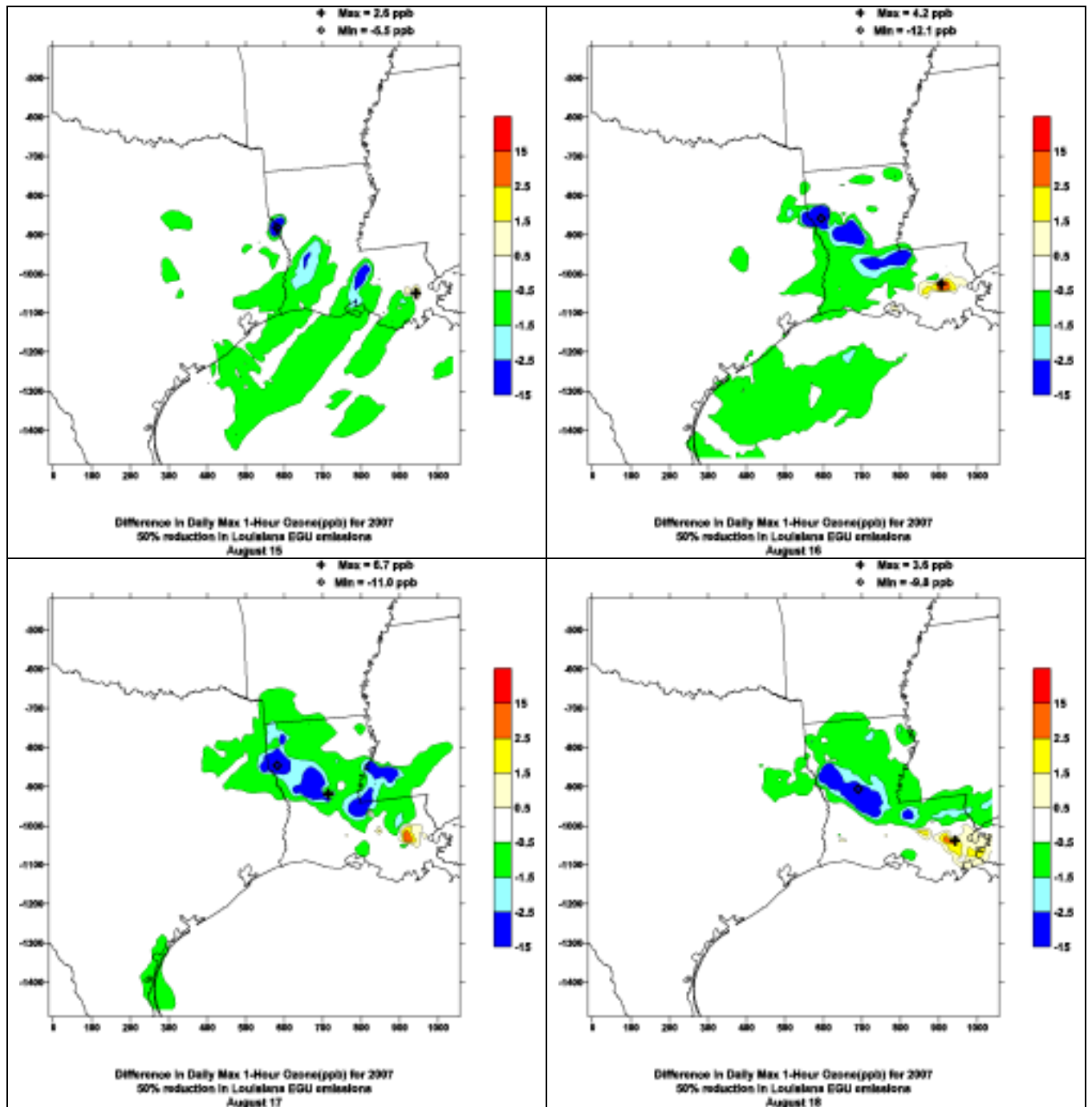


Figure 2. Concluded. Daily maximum 8-hour ozone levels for the 2007 base case.



Golden Gate Plaza \$ 101 Rowland Way \$ Novato, California 94945-5010 USA  
Tel: (415) 899-0700 \$ Fax: (415) 899-0707 ! www.environcorp.com

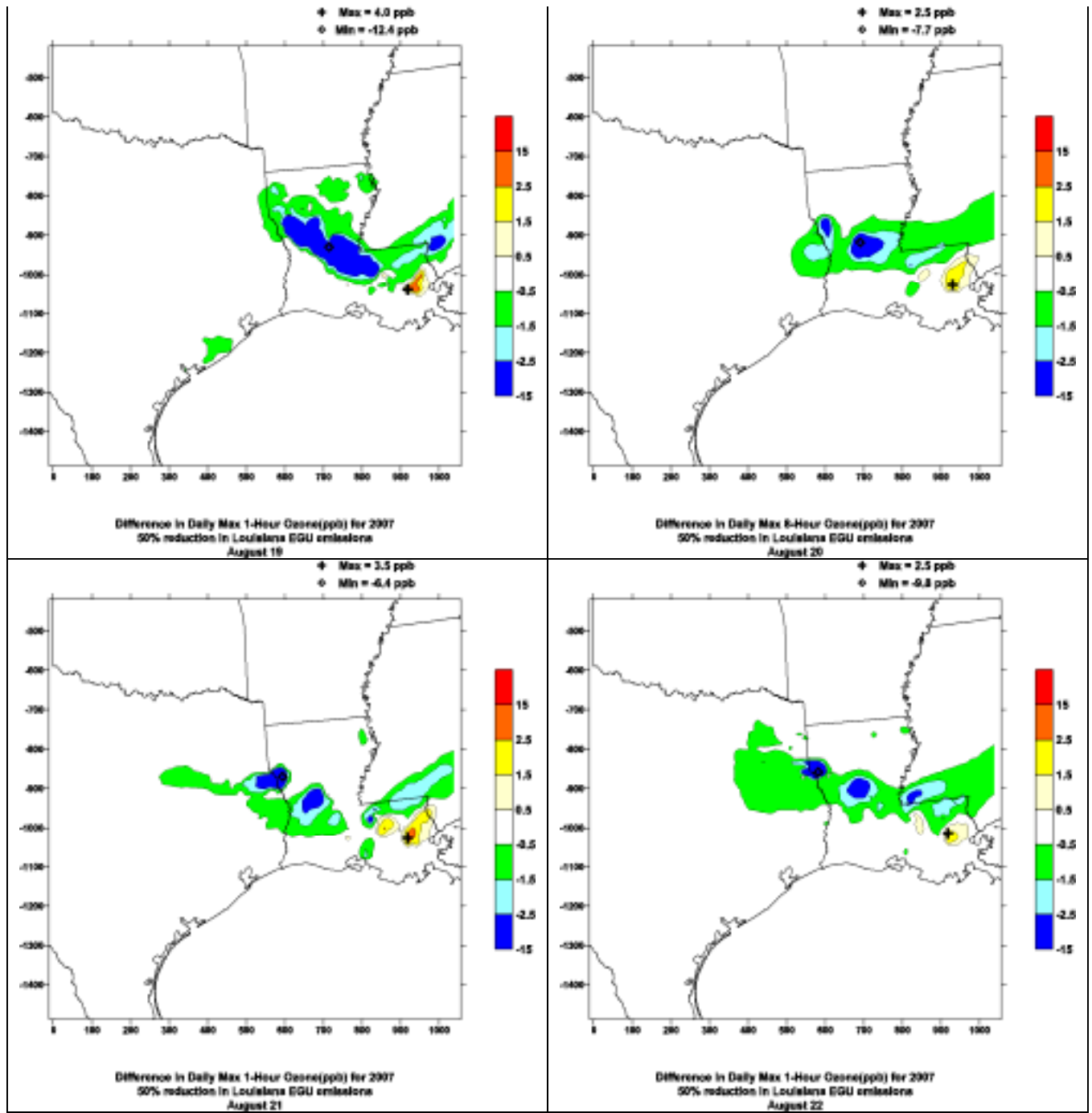


**Figure 3.** Difference in daily maximum 1-hour ozone levels for a 50% reduction in 2007 LA EGU emissions.



Golden Gate Plaza \$ 101 Rowland Way \$ Novato, California 94945-5010 USA

Tel: (415) 899-0700 \$ Fax: (415) 899-0707 ! www.environcorp.com

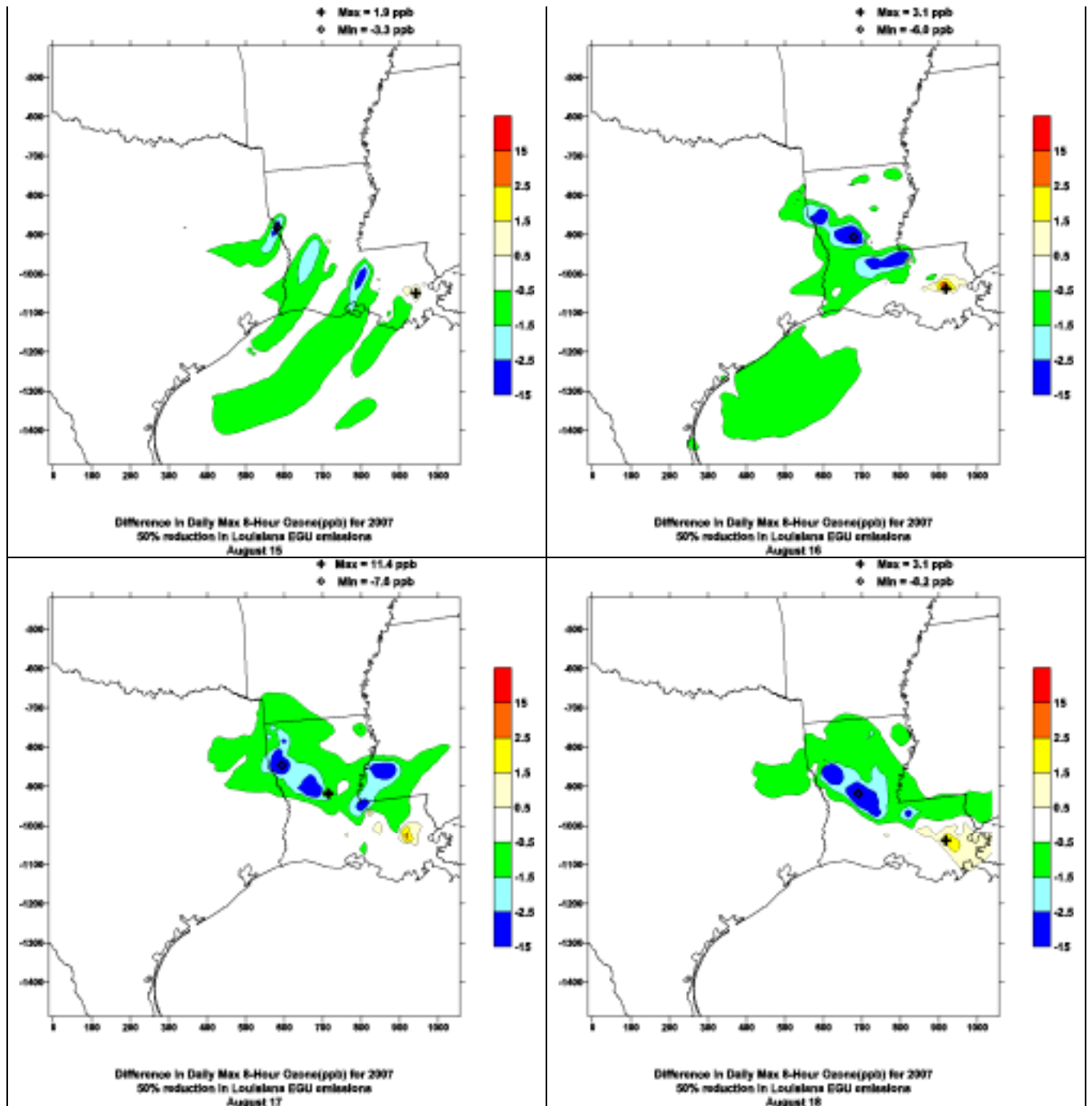


**Figure 3.** Concluded. Difference in daily maximum 1-hour ozone levels for a 50% reduction in 2007 LA EGU emissions.



Golden Gate Plaza \$ 101 Rowland Way \$ Novato, California 94945-5010 USA

Tel: (415) 899-0700 \$ Fax: (415) 899-0707 ! www.environcorp.com

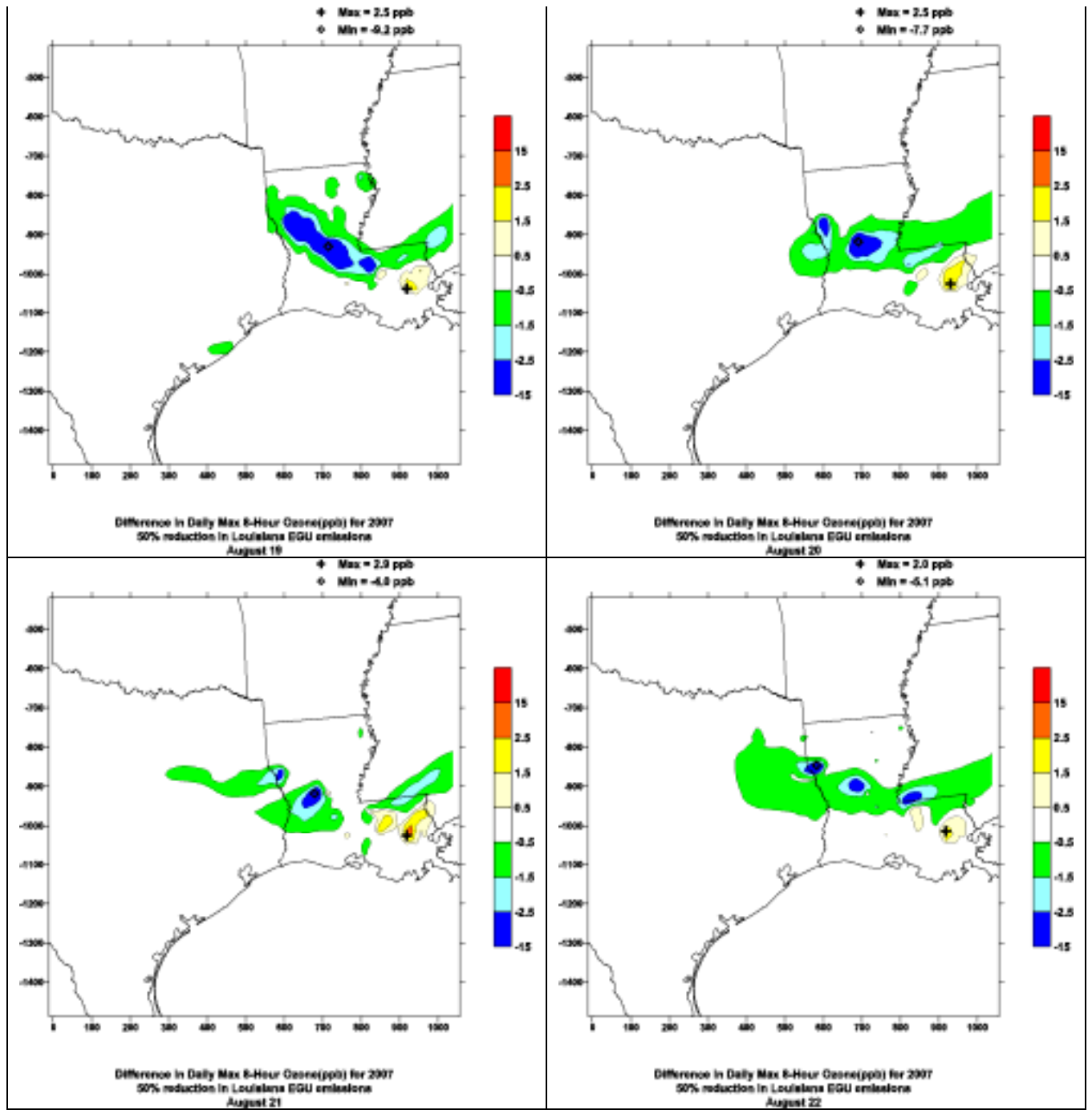


**Figure 4.** Difference in daily maximum 8-hour ozone levels for a 50% reduction in 2007 LA EGU emissions.



Golden Gate Plaza \$ 101 Rowland Way \$ Novato, California 94945-5010 USA

Tel: (415) 899-0700 \$ Fax: (415) 899-0707 ! www.environcorp.com



**Figure 4.** Concluded. Difference in daily maximum 8-hour ozone levels for a 50% reduction in 2007 LA EGU emissions.



Golden Gate Plaza \$ 101 Rowland Way \$ Novato, California 94945-5010 USA

Tel: (415) 899-0700 \$ Fax: (415) 899-0707 ! www.environcorp.com