



Using Web-based Interactive Tools for Air Quality Analyses

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Drowning in static data...

- **Model output**
- **Monitoring Data**
- **Fixed-format plots**
- **Requests**



Interactive Evaluation & Analysis Platform

- **Web service:**
HTML, CSS, Javascript, PHP
- **MySQL database**
- **Python:**
PsuedoNetCDF
- **Javascript libraries:**
HighCharts, Google Maps API



Interactive MPE Tools

- **Performance statistic bar chart and map**
- **Site time series data-based charts:**
 - hourly concentration line plot
 - daily maximum concentration bar plot
 - modeled vs observed scatter plot
 - ...
- **Vertical profile plot**
- **Concentration maps**
- **OSAT/APCA “wavy bacon” plot**



Interactive CAMx MPE Platform

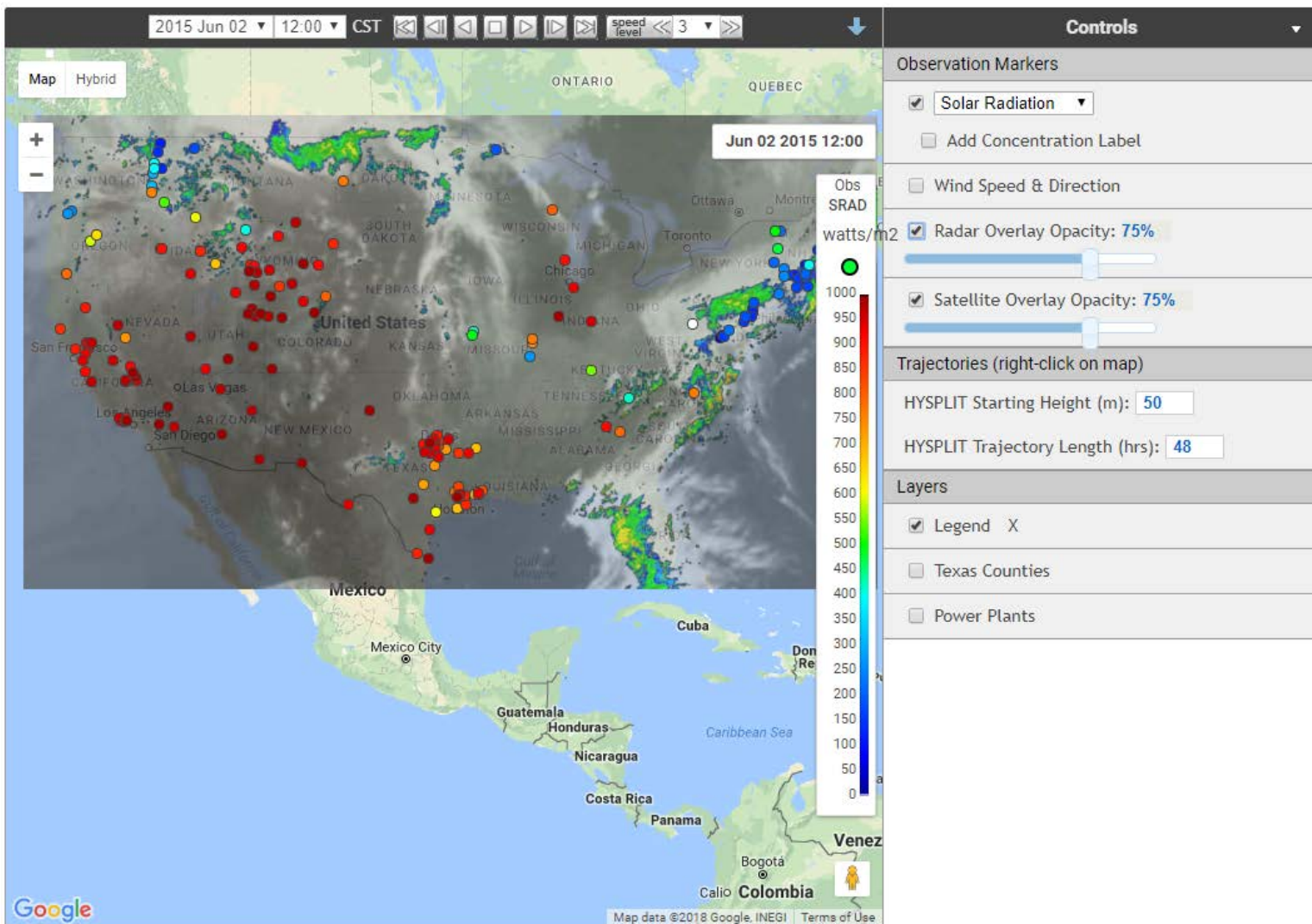
Let's take a look at the MPE tools on our web site.



AirNow Interactive Map

North American Monitors:

AirNow Observations: One-hour Solar Radiation Averages

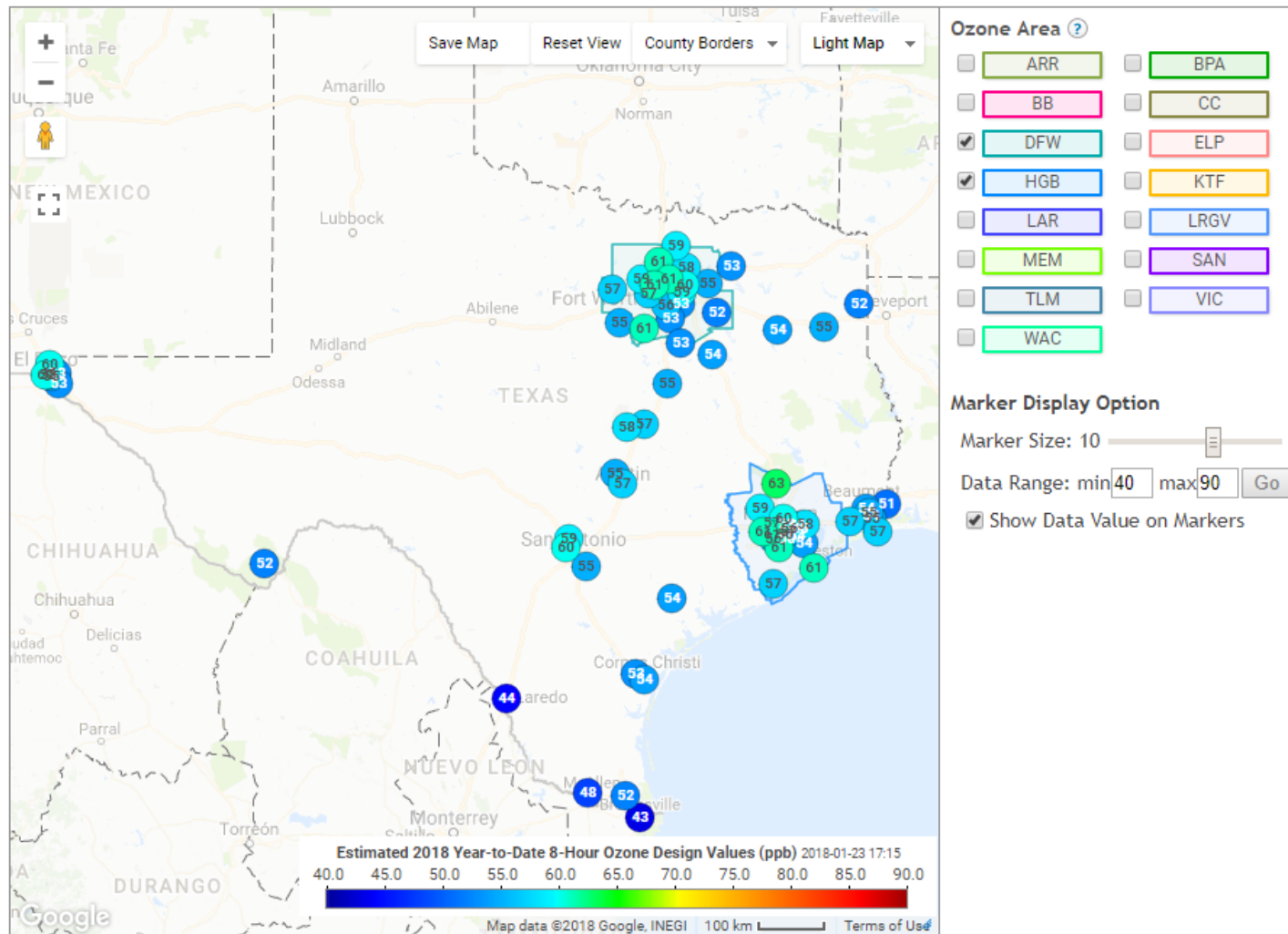




Realtime Design Value Tracker

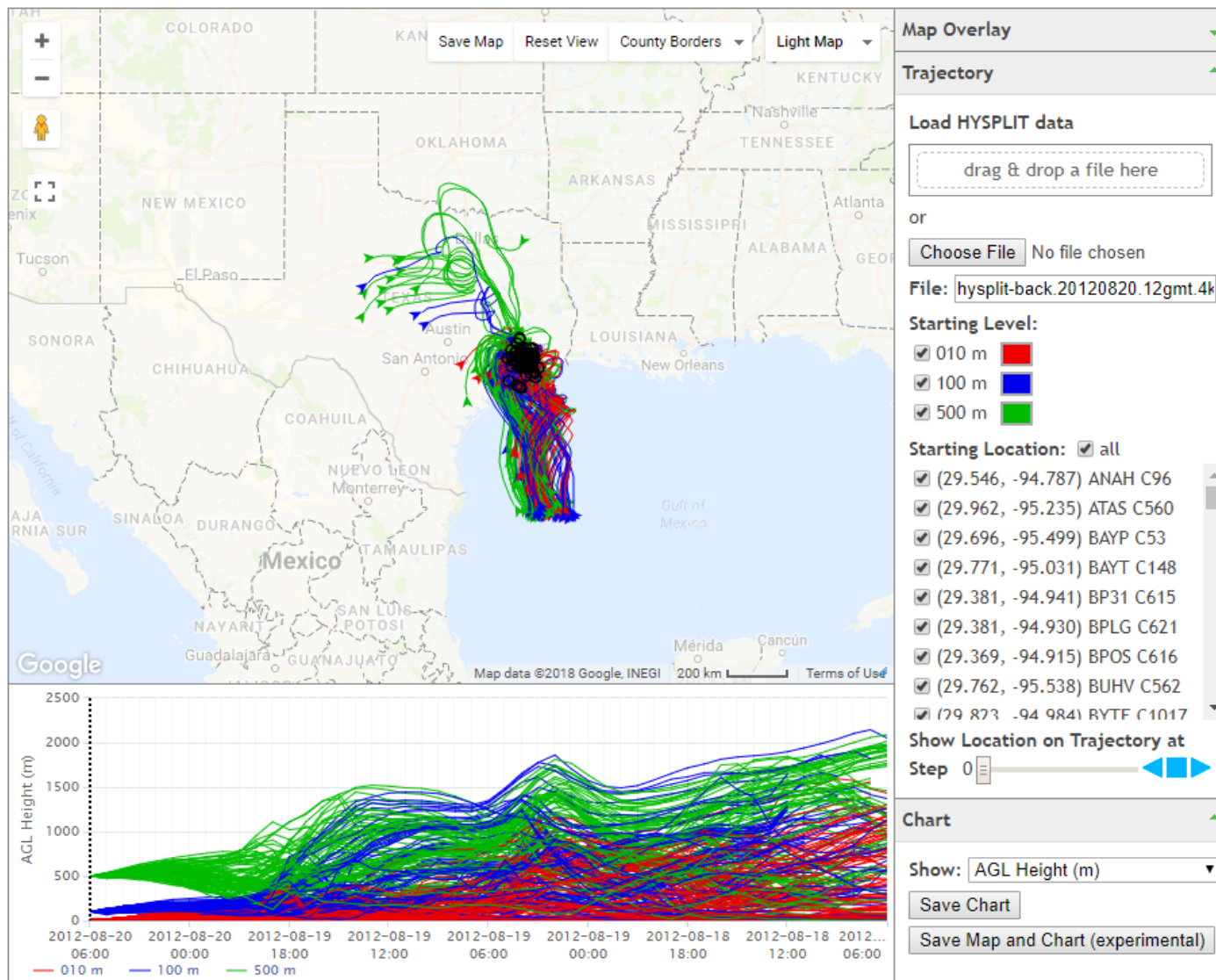
Estimated 2018 Year-to-Date 8-Hour Ozone Design Values

[Design Values by Region Bar Chart](#) | [Design Values on Map](#) |





HYSPLIT Trajectory Viewer



Note: AGL - Above Ground Level.

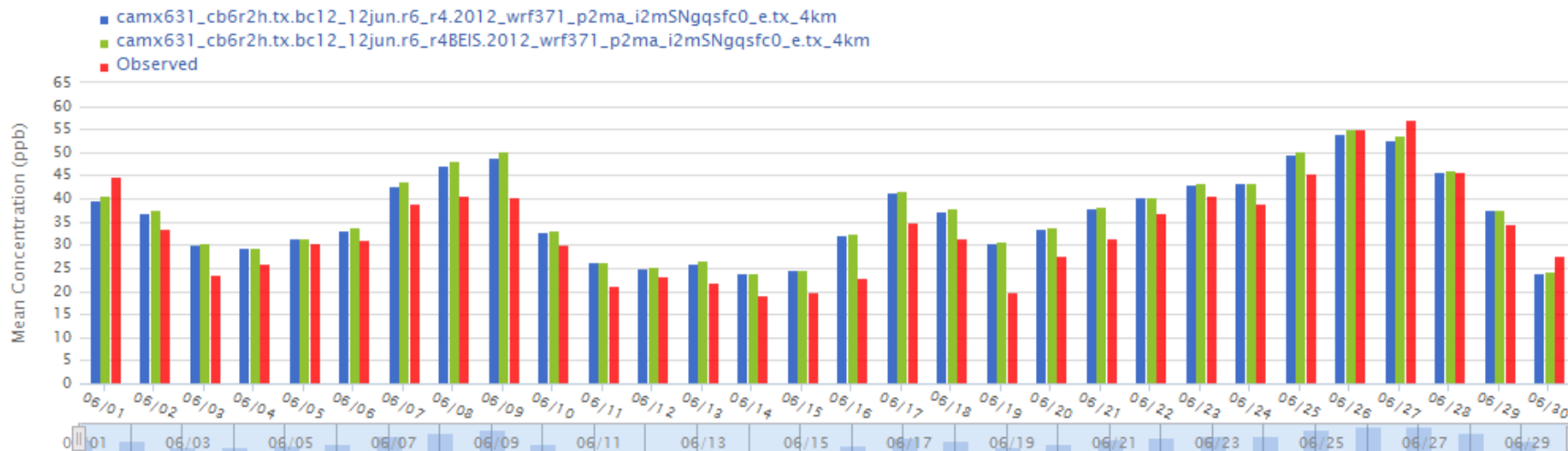


Ozone Performance Statistic Bar Chart

Model Run: 2016-06-27: camx631_cb6r2h.tx.bc12_1 |
 Compare to: 2016-06-21: camx631_cb6r2h.tx.bc12_1 |
 Data Type: All Data |
 Statistic Metric: Mean Modeled |
 Spatial Option: 2x2-cell bi-l |
 Temporal Option: hourly average |
 Area: tx_4k |
 Chemical: O3

Model Performance Statistics of Hourly O3 Concentrations in tx_4km Domain

Mean Modeled (Mm) and Observed (Mo) of All Data (2x2-cell bi-linear interpolated values)



Model Performance Statistics of Hourly O3 Concentrations in tx_4km Domain (2x2-cell bi-linear interpolated values)

camx631_cb6r2h.tx.bc12_12jun.r6_r4.2012_wrf371_p2ma_i2mSNgqsf0_e.tx_4km

Show 10 entries

Search:

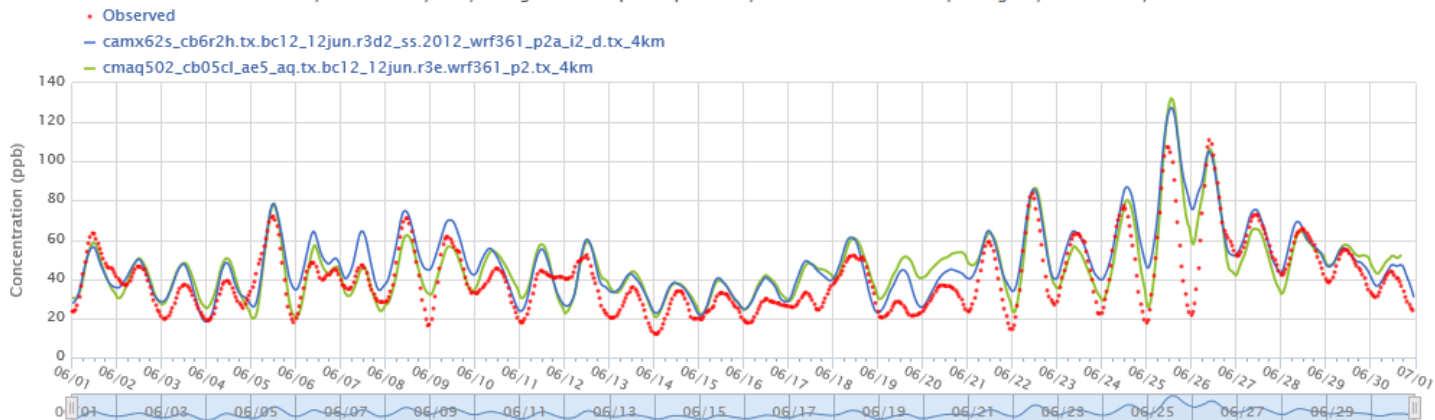
Episode Date	All Data												Data with Observed ≥ 60 ppb								
	Valid Data	Mo ppb	Mm ppb	MB ppb	ME ppb	RMSE ppb	NMB %	NME %	FB %	FE %	R ²	Valid Data	Mo ppb	Mm ppb	MB ppb	ME ppb	RMSE ppb	NMB %	NME %	FB %	
20120601	2604	44.96	39.56	-5.39	10.26	13.4	-11.99	22.83	-5.89	31.06	0.73	671	74	60.1	-13.9	14.24	18.01	-18.78	19.24	-20.61	
20120602	2568	33.68	37.03	3.35	9.8	12.52	9.96	29.1	11.25	30.81	0.437	152	64.91	60.17	-4.74	5.81	7.89	-7.3	8.96	-8	
20120603	2636	23.62	30.18	6.56	9.07	10.94	27.78	38.41	23.37	34.85	0.422	0									
20120604	2620	26.15	29.44	3.28	7.04	8.83	12.56	26.92	8.35	27.64	0.673	33	66.48	69.68	3.2	5.67	7.3	4.81	8.53	4.35	
20120605	2576	30.48	31.5	1.03	8.15	10.42	3.37	26.74	11.22	38.99	0.754	235	71.11	65.9	-5.21	8.74	11.3	-7.32	12.29	-8.03	

Eight-Hour Ozone Time Series

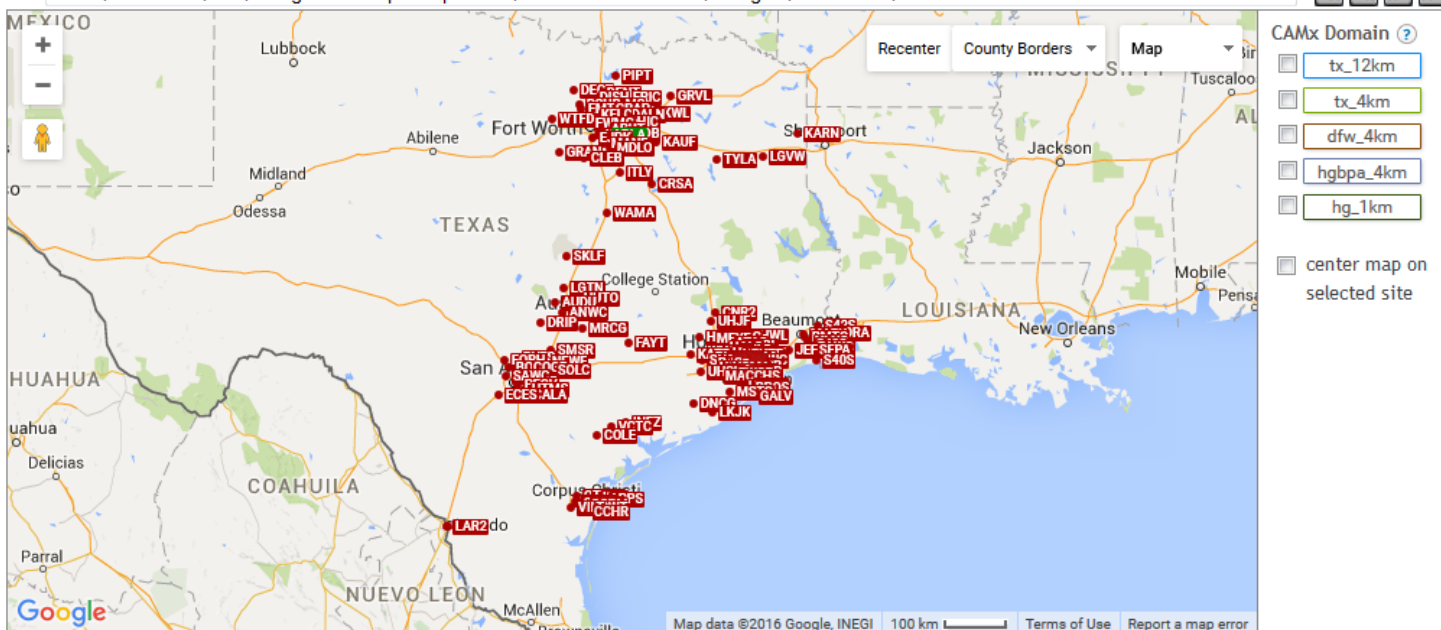
Model Run: 2015-11-20: camx62s_cb6r2h.tx.bc12_12jun.r3c
 Compare to: 2015-11-07: cmaq502_cb05cl_ae5_aq.tx.bc12
 Chemical: O3
 Temporal Option: 8-hour average
 Spatial Option: 2x2-cell bi-linear interpolated

O3 8-Hour Concentration (2x2 bi-linear interpolated value)

ARLA, 484393011, C61, Arlington Municipal Airport C61, 5504 South Collins St., Arlington, Tarrant Co., TX

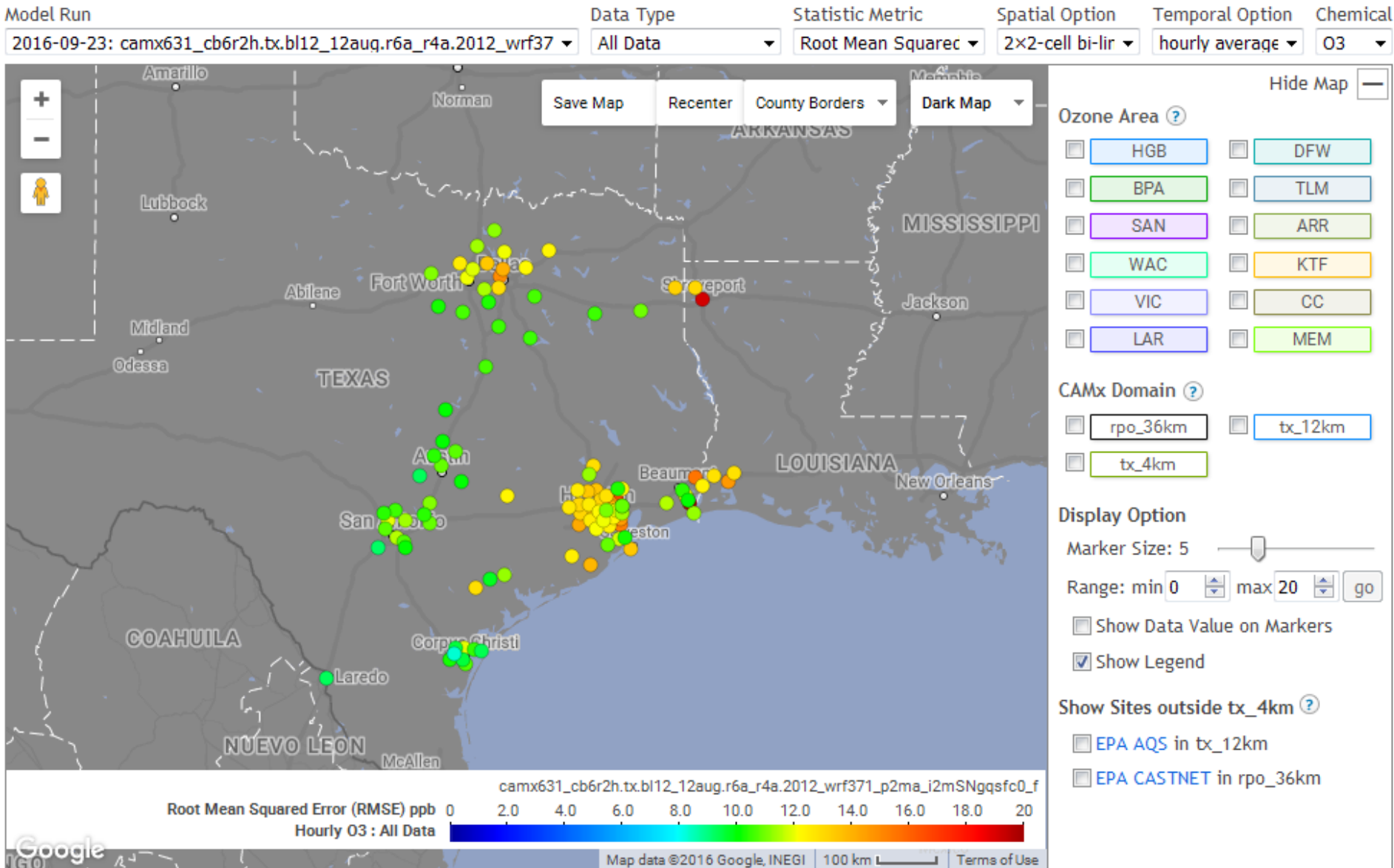


Site: ARLA, 484393011, C61, Arlington Municipal Airport C61, 5504 South Collins St., Arlington, Tarrant Co., TX





Statistic by Monitor on Google Maps





Hourly NO_x Scatter Plot

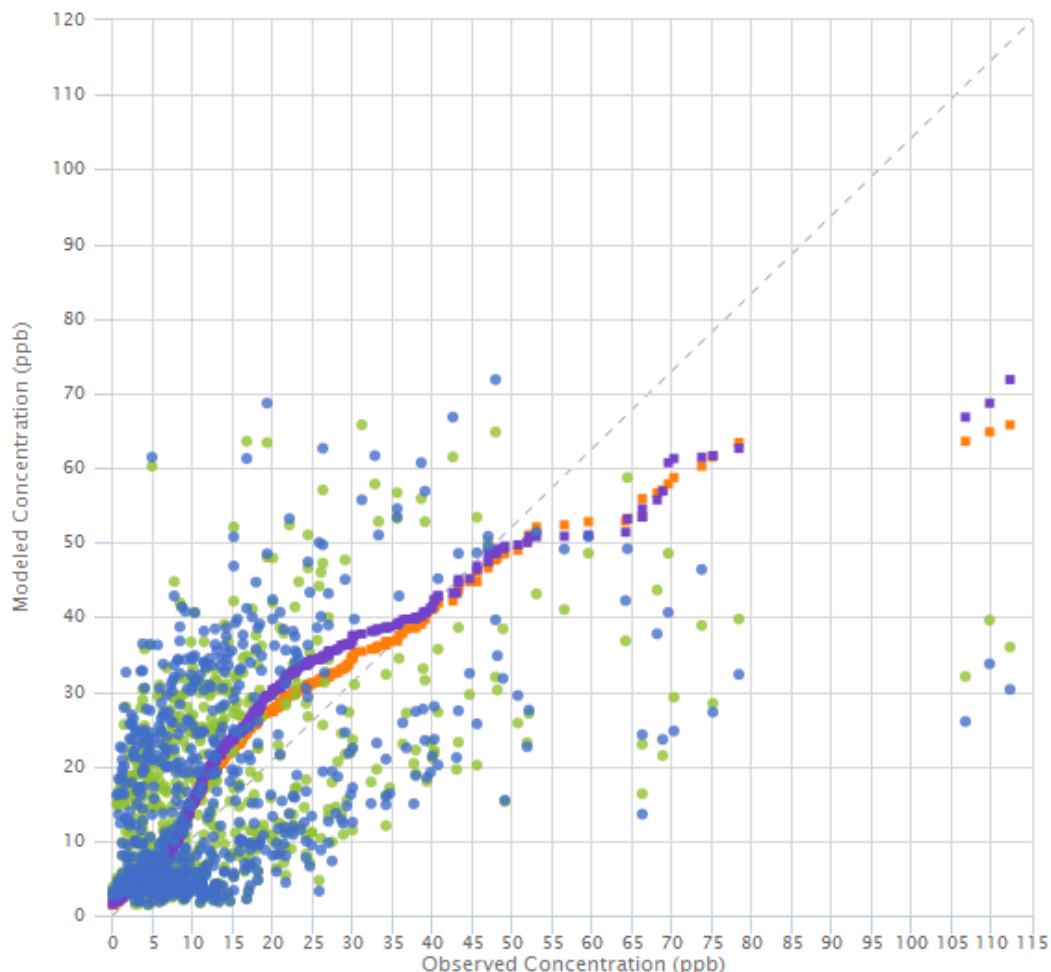
modeled vs observed

variable vs variable

modeled vs modeled

Hourly Concentration: NO_x (20120601-20120630 0:00-23:00)

HOEA, 482011034, C1, Houston East C1/G316, 1262 1/2 Mae Drive, Houston, Harris Co., TX



Model run

2015-11-20: camx62s_cb6r2h.tx.bc12_12jun.r3d

Compare to

2016-02-26: cmaq502_cb05cl_ae5_aq.tx.bc12_1

Chemical

NO_x

Temporal Option

hourly values

Spatial Option

2x2-cell bi-linear interpolated value

Date range

06/01 06/30

Hour range

invert hour range ?

0 23

Daily max values

redraw

Show Q-Q plot

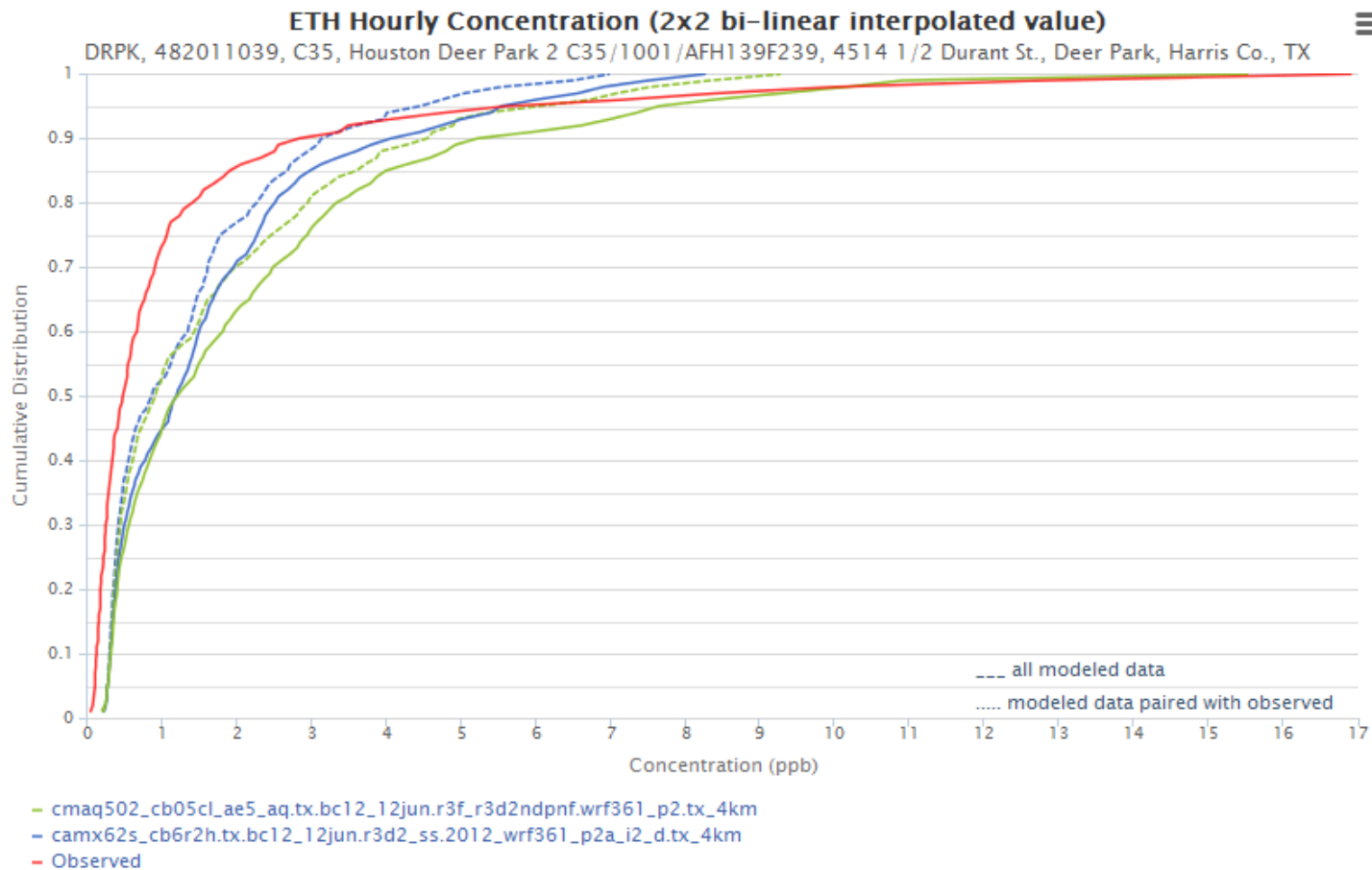
- cmaq502_cb05cl_ae5_aq.tx.bc12_12jun.r3f_r3d2ndpnf.wrf361_p2.tx_4km (Q-Q)
- camx62s_cb6r2h.tx.bc12_12jun.r3d2_ss.2012_wrf361_p2a_i2_d.tx_4km (Q-Q)



Ethylene

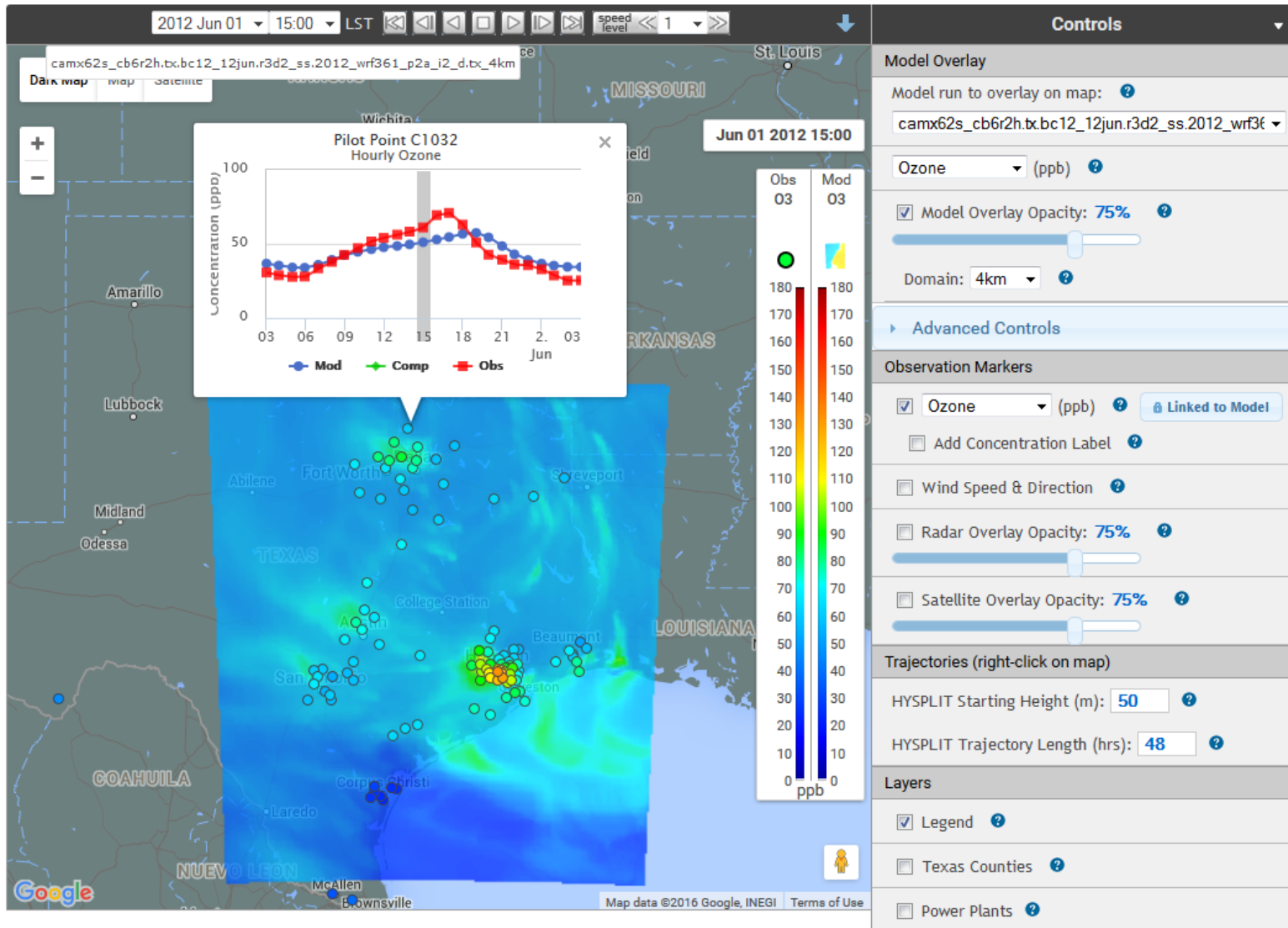
Cumulative Distribution Function Plot

Model Run: 2015-11-20: camx62s_cb6r2h.tx.bc12_12jun.r3
Compare to: 2016-02-26: cmaq502_cb05cl_ae5_aq.tx.bc12_
Chemical: ETH
Temporal Option: hourly average
Spatial Option: 2x2-cell bi-linear interpolated



Concentration Map on Google Maps

Modeled Ozone Overlay with Observed Ozone Markers: One-hour Averages



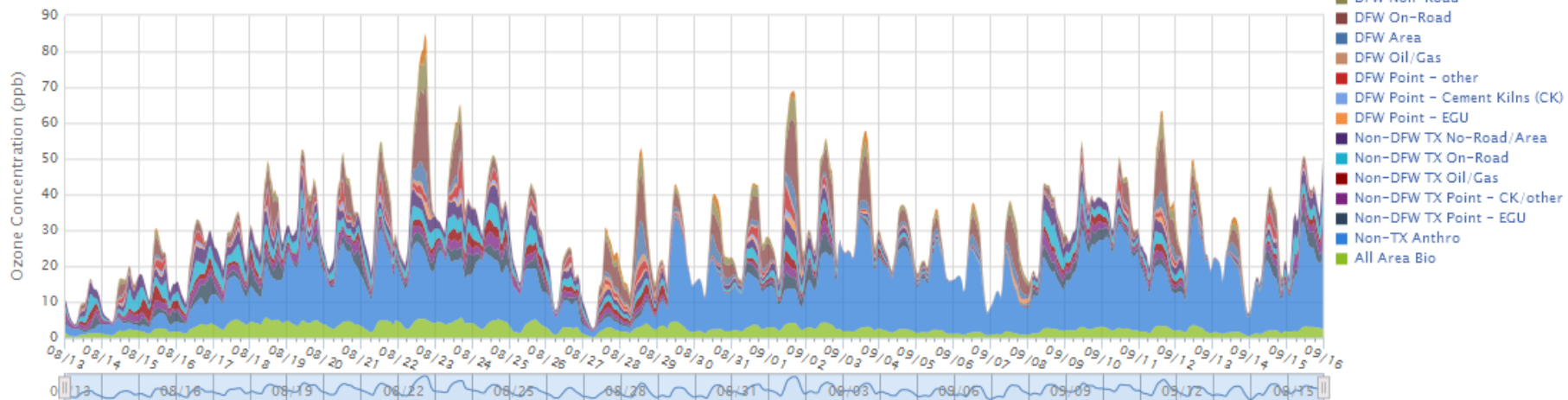


Source Apportionment

Model Run: 2015-09-04: camx620APCA_cb6r2.tx.fy17_06ac
 Temporal Option: hourly average
 Spatial Option: 3x3-cell mean
 Layer Stacking Option: stacked concentrations
 Show Total Concentration Line
 line color: line style: •••• dots

Hourly Ozone Source Apportionment: APCA (3x3-cell mean)

camx620APCA_cb6r2.tx.fy17_06aqs1.c0j.2006_5layer_YSU_WSM6_3dsfc1h_fddats_gq_sfc_0.tx_4km



OSAT/APCA category grouping options

category code info group builder instruction [export group definition](#) [redraw chart](#) [search](#) [clear](#)

Load predefined groups into the group definition table:

drag and drop a group definition file here (FireFox, Chrome, or IE10/11)

sa.group.2006.0.txt

Group definition table:

#	Color ?	Group Label ?	Category List ?	
15		DFW Off-Road	NOx DFW Off-Road VOC DFW Off-Road	+
14		DFW Non-Road	NOx DFW Non-Road VOC DFW Non-Road	-
13		DFW On-Road	NOx DFW On-Road VOC DFW On-Road	-



TCEQ Modeling Web Sites

- Interactive Modeling Statistics
https://www.tceq.texas.gov/airquality/airmod/data/stats_area?eps=20120501-20120531
- Interactive Modeling Map Results
<https://www.tceq.texas.gov/airquality/airmod/data/results?year=2012>
- Interactive Modeling Time Series
<https://www.tceq.texas.gov/airquality/airmod/data/ts?eps=20120501-20120531>
- Current Modeling File FTP Site
<ftp://amdaftp.tceq.texas.gov/pub/TX/>



Questions?

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The Air Modeling & Data Analysis Section
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