Interactive Photochemical Model Evaluation using Google Maps

with GRIMREAPr (Geo-Referenced Interactive Model Results Evaluation and Analysis Program)

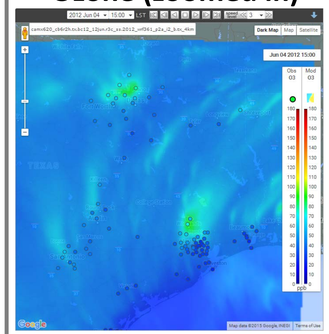
Doug Boyer and Weining Zhao – Texas Commission on Environmental Quality, Air Modeling and Data Analysis

A unique, interactive, and intuitive web-based model performance evaluation and analysis tool is presented using Google Maps with photochemical modeling output and surface observations. A user interface dynamically changes the modeled/observed overlays and controls the date/time of interest.

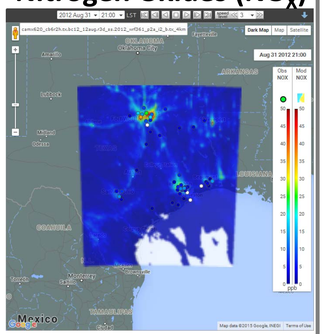
Parameters

Modeled and observed pollutants are changed quickly without re-running a program or resetting other options.

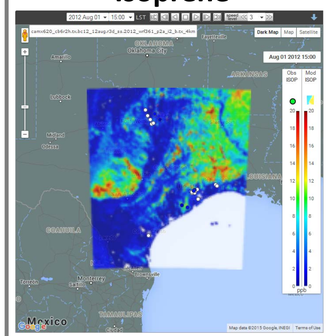
Ozone (zoomed in)



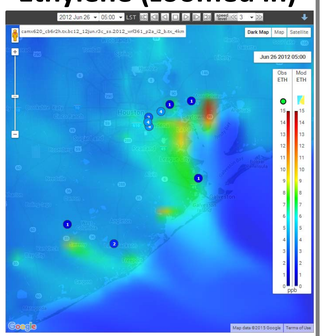
Nitrogen Oxides (NO_X)



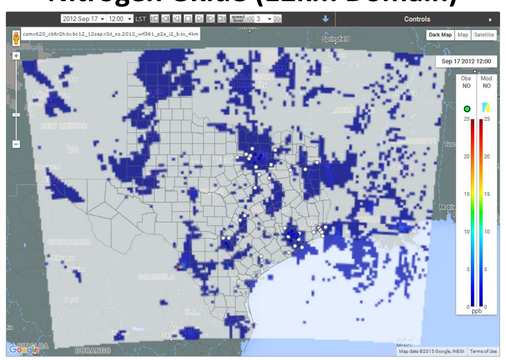
Isoprene



Ethylene (zoomed in)

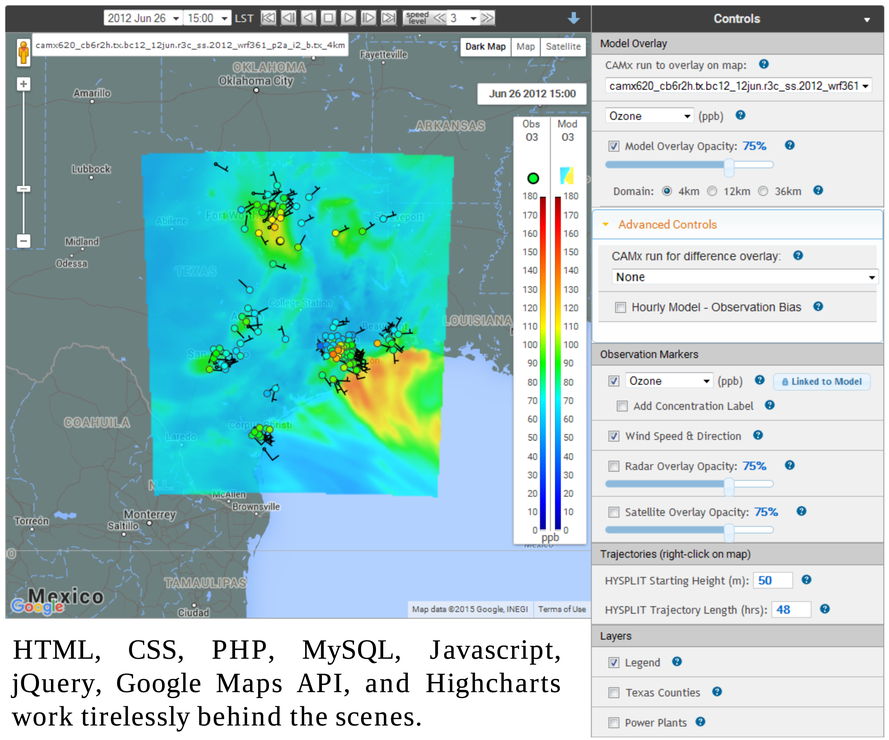


Nitrogen Oxide (12km Domain)



Interface

A control panel built on top of Google Maps interactively changes model concentration plots with observed parameters. Modeling episode day/hour controls along with Google Maps' intuitive zooming and panning offer dynamic spatial and temporal analyses.

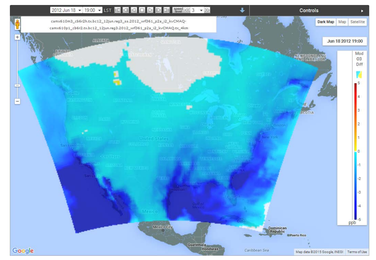


HTML, CSS, PHP, MySQL, Javascript, jQuery, Google Maps API, and Highcharts work tirelessly behind the scenes.

Evaluation and Analysis

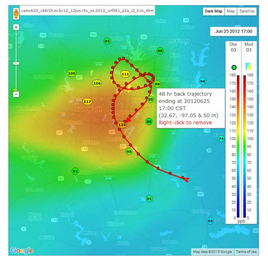
Features such as model-to-model comparisons, on-demand HYSPLIT trajectories, radar/satellite overlays, domain choices, and animations allow for unique and informative model analyses.

Model-to-Model Comparison (36km Domain Difference Plot)



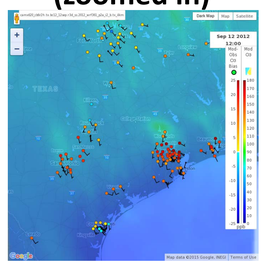
Change in ozone concentrations from using sea salt chemistry in CAMx (deeper blues indicate less ozone)

On-Demand HYSPLIT Trajectories (zoomed in)



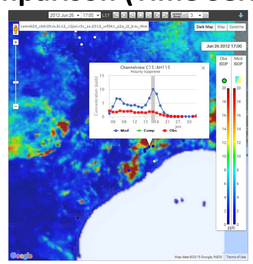
48-hour back trajectory shows recirculating flow or local ozone production on June 25, 2012

Hourly Bias (zoomed in)



Higher ozone bias near coast under southerly flow

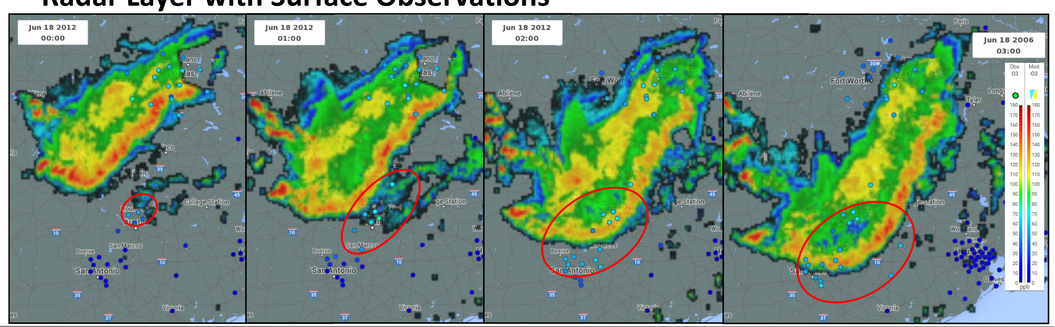
Model-to-Observed Comparison (Time Series)



Time series shows model over-prediction of isoprene at Channelview on June 26, 2012

Central Texas ozone monitors jump 20-50 ppb just after midnight on June 18, 2006 as an outflow boundary from a large thunderstorm moving to the southeast re-gifts elevated ozone from the previous day.

Radar Layer with Surface Observations



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Contact

doug.boyer@tceq.texas.gov