

Summary of Current Air Quality Projects (Update)

Dick Karp

**Southeast Texas Photochemical
Modeling Technical Committee Meeting**

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TCEQ 2010 Planned Air Quality Projects Relevant to Southeast Texas

- Air Quality Monitoring Projects
- Air Quality Emission Projects
- Air Quality Modeling Projects



Air Quality Monitoring Projects

TCEQ Project Numbers	Project Description	Principal Investigator
TCEQ-2010-08 TCEQ-2010-10	Launching ozonesondes in eastern Texas during the 2010 ozone season for the primary purpose of obtaining vertical profiles of ozone	Valparaiso University
TCEQ-2010-23	Enhanced data analysis using SHARP (April/March 2009) data sets	University of Houston
TCEQ-2010-27	Ozone, NO _x , meteorology monitoring on the Moody, Texas, broadcast tower	NOAA
TCEQ-2010-32	Development of a cloud cover analysis procedure using satellite imagery data	NOAA
TCEQ-2010-36	Aerometric data collection and analysis at the UH Moody Tower.	University of Houston
TCEQ-2010-44	Ozone monitoring in HGB perimeter counties ,e.g., Fort Bend	University of Houston



Air Quality Monitoring Projects

TCEQ Project Numbers	Project Description	Principal Investigator
TCEQ-2010-66	Identification of transport events into Texas, in particular across the Gulf of Mexico, using satellite data (TES, OMI, AIRS, MISR, MODIS)	NOAA
TCEQ-2010-73	Enhanced data analysis for nighttime VOC and nitrate chemistry using TexAQS II data sets	NOAA
TCEQ-2010-74	Enhanced data analysis for peroxy radical cycles using TexAQS II data sets	NOAA
TCEQ-2010-76	Enhanced data analysis for shear-induced vertical mixing between the boundary layer and the free troposphere by gravity waves using TexAQS II data sets	NOAA



Air Quality Emission Projects

TCEQ Project Numbers	Project Description	Principal Investigator
TCEQ-2009-41	Update biogenic emissions using ground surveys and airborne LIDAR of vegetative species to develop bio-mass densities for input to GloBEIS	TAMU
TCEQ-2009-42	Develop a cross reference of new Texas-specific land-use/land-cover (LU/LC) categories to the National Land Cover data set	TAMU
TCEQ-2010-03	Update on-road emissions development processing to use EPA's new MOVES emissions factor model	TTI
TCEQ-2010-04	Identify, observe, and measure HRVOC emissions from flares in a laboratory and a field setting, using remote sensing technology to improve flare VOC emissions estimates	UT
TCEQ-2010-09	Update biogenic emissions using HyperSpectral Imaging of vegetative species to develop bio-mass densities for input to GloBEIS	TAMU
TCEQ-2010-11	Update HGB marine vessel emissions using Port of Houston's current emissions inventory and harmonize the remaining 8-county marine vessel emissions inventory	ENVIRON



Air Quality Emission Projects

TCEQ Project Numbers	Project Description	Principal Investigator
TCEQ-2009-12	Evaluate the effect of fuel prices on VMT using the most recent quality-assured VMT data (2008)	TTI
TCEQ-2009-13	HRVOC and NO _x emissions reconciliation for HGB and BPA nonattainment area (revised PSCF application)	Lamar University
TCEQ-2010-14	Develop 2005, 2006, and 2018 Summer Weekday HGB on-road emissions using updated on-road emissions development processing with MOVES and compare to current on-road emissions developed with MOBILE6.2	TTI
TCEQ-2010-16	Estimated emissions from barges while in transit for the HGB, BPA and Corpus Christi industrial waterways using the Louisiana study protocol	ERG
TCEQ-2010-17	Evaluate existing methods and models for estimating oil and gas production emissions for multiple area source categories (e.g., heater-treater, dehydrator)	ERG
TCEQ-2010-18	Update emissions from oil and gas platforms in Texas state waters	ERG



Air Quality Emission Projects

TCEQ Project Numbers	Project Description	Principal Investigator
TCEQ-2009-21	Develop county-level growth factors from 2005 to 2035 at the SIC/NAICS and SCC level for stationary source emissions	ERG
TCEQ-2009-29	Collect samples for VOC analysis from produced water/saltwater storage tanks to develop an activity-based emissions factor	ENVIRON
TCEQ-2010-30	Evaluate emissions, activity and equipment population data collected on drayage trucks operating at the Port of Houston to refine NO _x and PM emissions	H-GAC
TCEQ-2010-33	Locate and quantify HRVOC emissions loss from pipelines	ERG
TCEQ-2010-39	Collect samples from 10 to 20 upstream oil and gas tanks to refine emission factors	ENVIRON
TCEQ-2010-42	Conduct aerial surveys in the HGB area using IR-camera technology to identify potentially under-reported VOC emissions	Leak Survey



Air Quality Emission Projects

TCEQ Project Numbers	Project Description	Principal Investigator
TCEQ-2009-43	Conduct a survey of tank flash emissions to quantify the VOC emission reductions achieved by the 2007 rule (30 TAC, Chapter 115), including the HGB and BPA areas	ENVIRON
TCEQ-2010-48	Update GloBEIS model to estimate other VOCs (e.g., sesquiterpene)	ENVIRON
TCEQ-2010-56	Use GIS software to verify current oil and gas point and area source emission estimates	TAMU
TCEQ-2010-61	Updated emissions from locomotive and commercial marine sources, including growth factors	Pechan
TCEQ-2010-64	Update TexN for 2008 CERR, including new EPA rules	ERG



Air Quality Emission Projects

TCEQ Project Numbers	Project Description	Principal Investigator
TCEQ-2009-69	Evaluate the difference between Isoprene estimates using the GloBEIS and MEGAN biogenic emission models	ENVIRON
TCEQ-2009-71	Collect samples for VOC analysis from brine ponds in facilities that have degassing drums to develop an activity-based emissions factor	UT



Air Quality Modeling Projects

TCEQ Project Numbers	Project Description	Principal Investigator
TCEQ-2009-21 TCEQ-2010-05	Update the Carbon-Bond chemical mechanism with new aromatic, isoprene, and inorganic reactions (CB6)	ENVIRON
TCEQ-2010-06	Develop and test an alternative isoprene reaction mechanism for CB06 using recent TAMU laboratory experimental results	ENVIRON TAMU
TCEQ-2010-22	Investigate the 2006 TexAQS II modeling episodes for accuracy and precision in quantifying ozone and precursor transport into and inside Texas	ENVIRON
TCEQ-2010-24	Update EPS3 software to provide parallel processing	ENVIRON
TCEQ-2010-25	Update the HDDM assessment in CAMx to add data and input/output options for calculating the sensitivities of radical species, e.g., OH	ENVIRON
TCEQ-2010-26	Develop an alternate plume-rise algorithm in CAMx that distributes emissions to multiple layers and perform sensitivity tests	ENVIRON



Air Quality Modeling Projects

TCEQ Project Numbers	Project Description	Principal Investigator
TCEQ-2010-37	Cloud assimilation into WRF, adding functionality to allow WRF to integrate satellite cloud data	LAMAR (UAH)
TCEQ-2010-38	Enhance WRF to assimilate locally-specific wind, temperature and moisture data from radar profilers and NEXRAD	TAMU
TCEQ-2010-40	Model impacts of clouds on photolysis within CAMx using an embedded efficient radiative transfer model and perform a photolysis attenuation calculation for each cloudy column	ENVIRON
TCEQ-2009-40 TCEQ-2010-46	Compare MM5 and WRF meteorological modeling results using integrated satellite-derived soil moisture data	NOAA
TCEQ-2010-67	Development of enhanced future boundary conditions using the 2006 GEOS-Chem global model with the 2018 projected regional modeling (CENRAP)	ENVIRON
TCEQ-2010-70	Remodeling of TexAQS II episodes with the HDDM tool	ENVIRON



Air Quality Modeling Projects

TCEQ Project Numbers	Project Description	Principal Investigator
TCEQ-2010-75	Box modeling with the MCM chemistry mechanism using TexAQS II data sets to evaluate nighttime VOC and nitrate measurements	NOAA



Current HGB Modeling Activities for 2013 MCR/SIP

- Emission Modeling Activities
- Meteorological Modeling Activities
- CAMx Modeling Activities



Emission Modeling Activities

- Update 2005/2006 base case emissions with EPA Speciate4.0, including chemical speciation profiles containing ethane
- Run GloBEIS with revised vegetative species mix by LULC and kriged temperature inputs
- Revise emissions reconciliation (PSCF) with emissions adjustment limited to the flares



Meteorological Modeling Activities

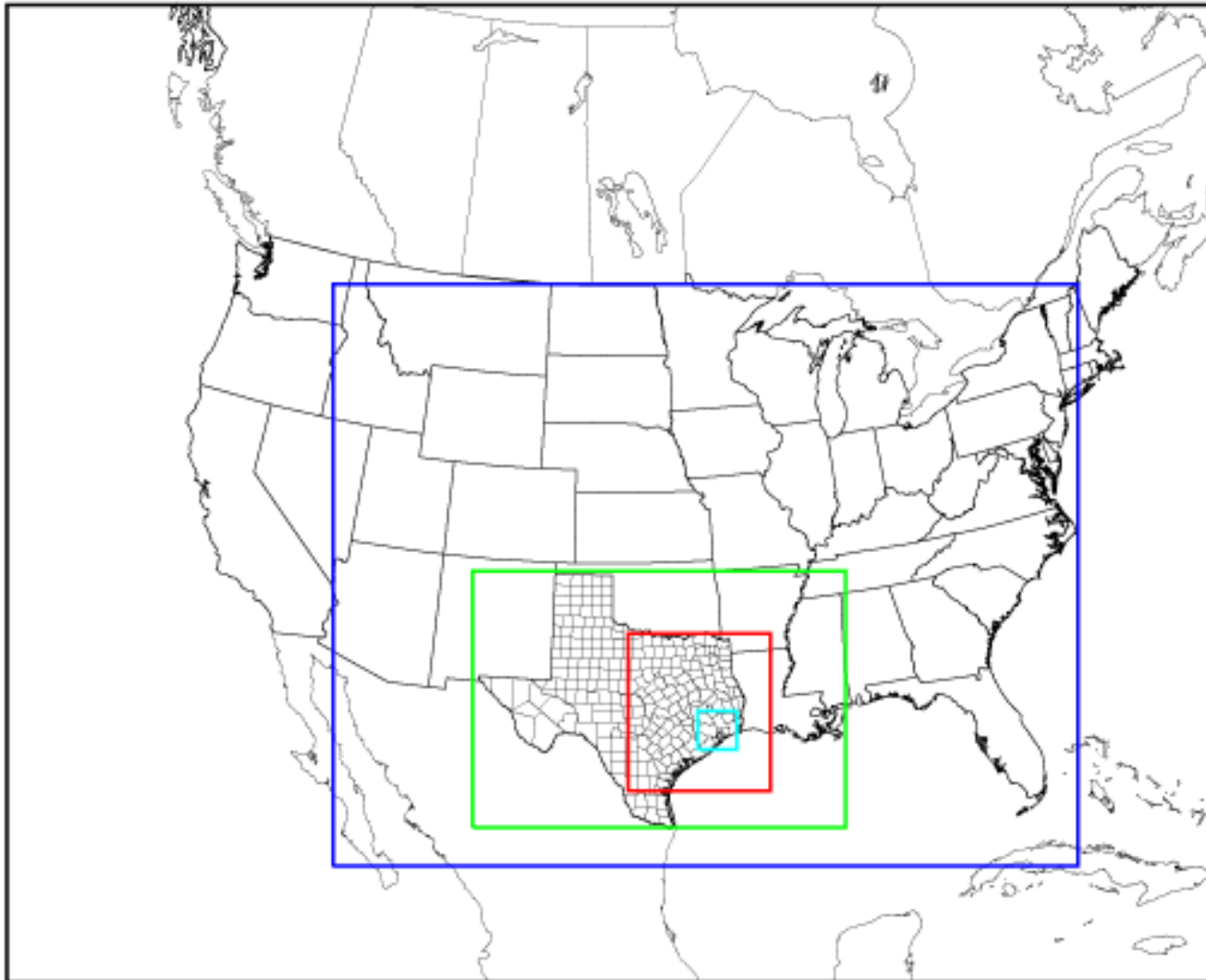
- Configure WRF for FDDA (observational data nudging), SST and LULC
- Run WRF for 2005/2006 base cases (2013 MCR/SIP expected to use WRF)
- Test WRF sub-regional parameterizations (e.g., PBL schemes) – within 4 km domain; different portions may be run with different parameterizations
- Revise met domains to include all of Texas in 12 km domain; 36 km will also be expanded to current 108 km domain, and 108 km domain will no longer exist
- Run WRF for 2005/2006 base cases with revised met domains



CAMx Modeling Activities

- Run OSAT/APCA for 2005/2006 base cases to explore overestimation of eight-hour ozone; use to evaluate whether all six episodes should be retained
- Run CAMx with alternative plume-rise algorithms – using results of on-going research project
- Run CAMx with revised biogenic emissions – using results of ongoing research project
- Run CAMx with revised chemical speciation profiles using EPA's new Speciate4.0 program
- Run CAMx with revised PSCF (flares)
- Run CAMx with WRF-generated met inputs
- Run CAMx with revised domains described under Met Modeling

Meteorological Modeling Domains



Continental
108 KM

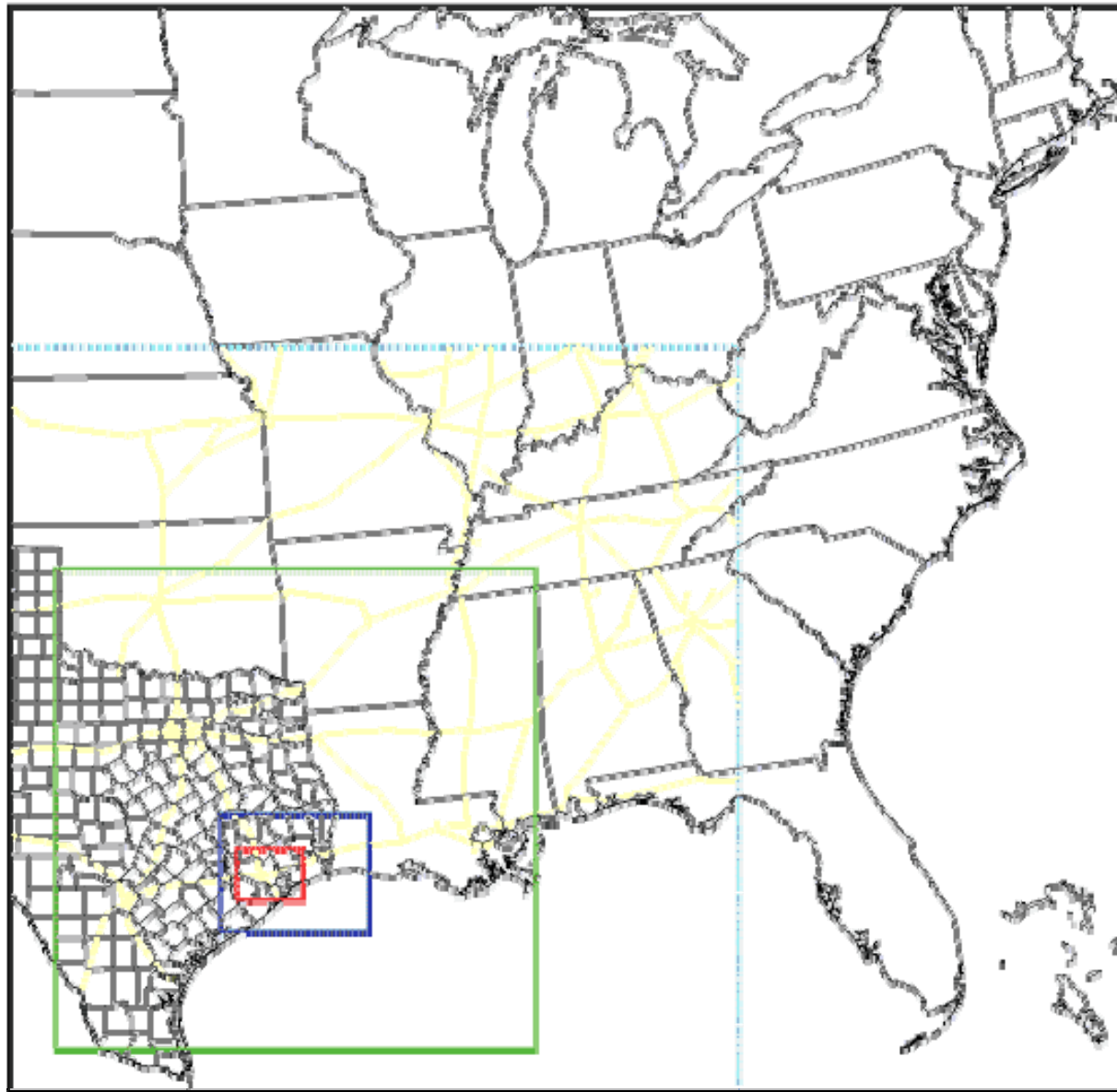
US
36 KM

South US
12 KM

East Texas
4 KM

HGB
2 KM

CAMx Modeling Domains



Regional (1-Hour SIP)	East US (8-Hour)	East Texas	HQB/EPA	HQ
36 KM	36 KM	12 KM	4 KM	2 KM