

Sensitivity of Biogenic Emission Estimates to Land Covers and Emission Models

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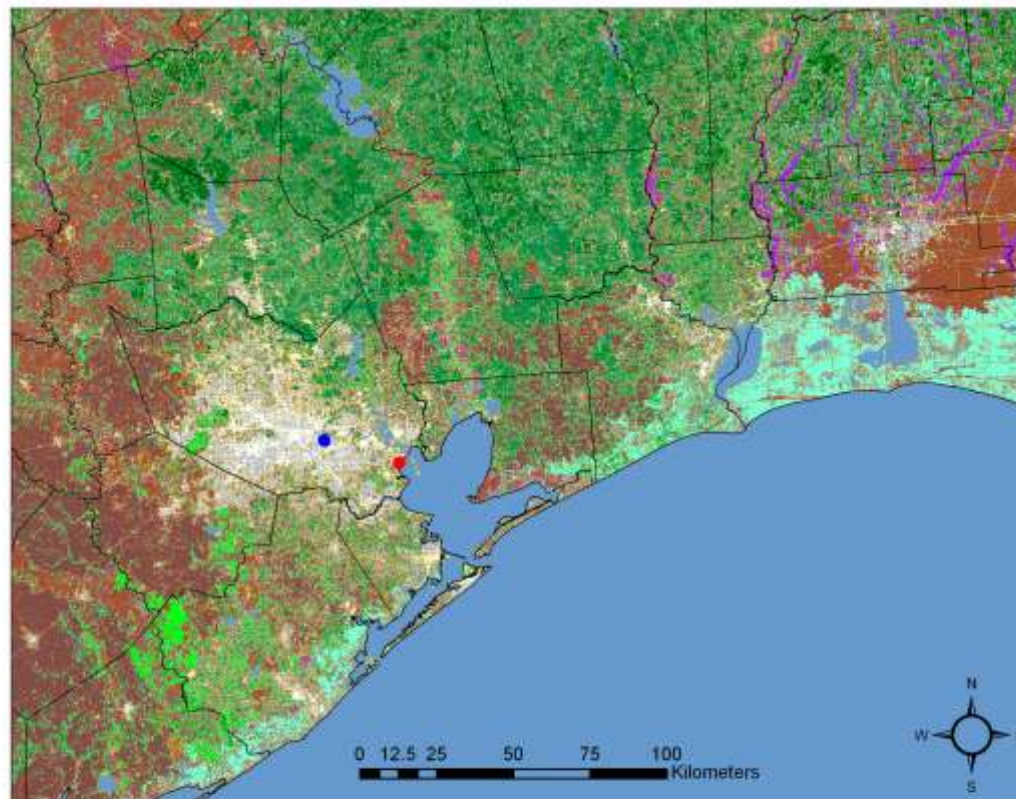
Background

- Biogenic emissions are heterogeneous in Texas and estimates require detailed mapping of land use and land cover (LULC)
- Texas LULC databases
 - Wiedinmyer et al. (2000, 2001)
 - The University of Texas Center for Space Research (CSR; 2007)

CSR Database

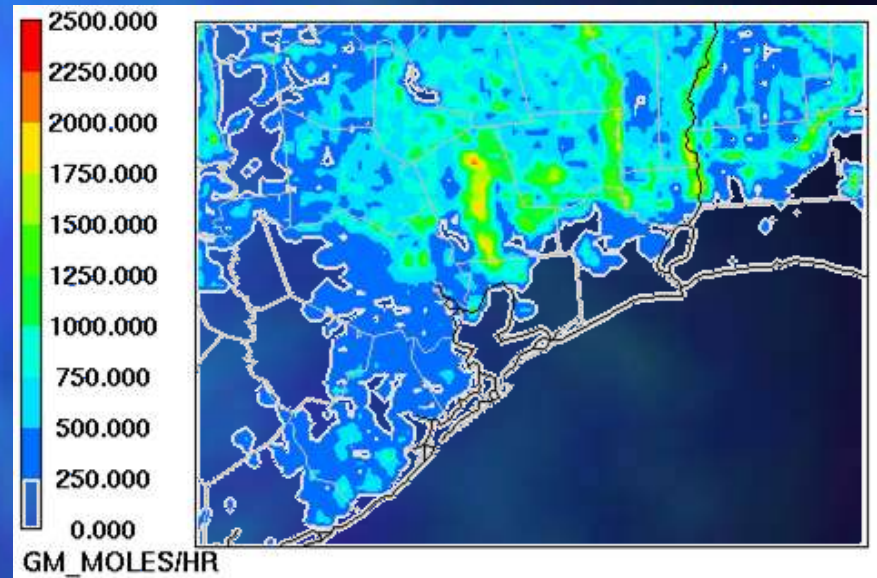
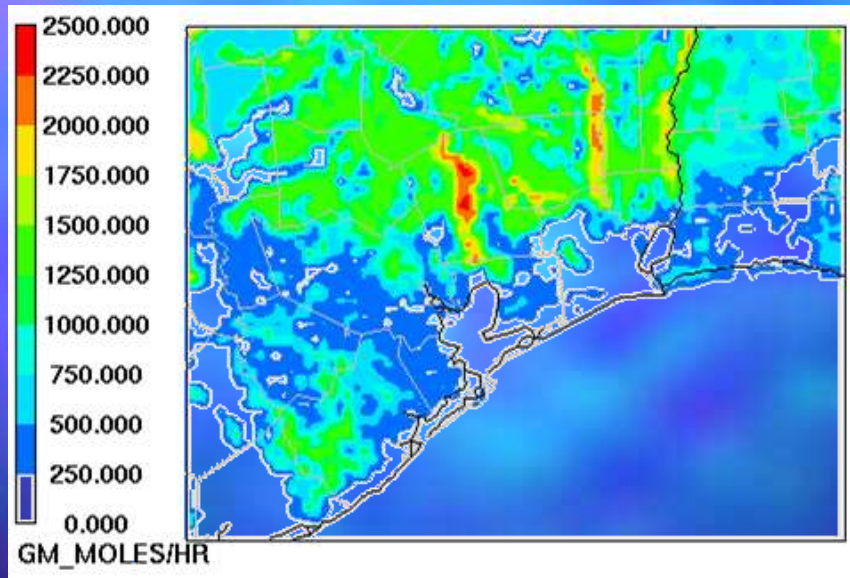
- Data collected between 1999 and 2003 by Landsat 7 Enhanced Thematic Mapper-Plus (ETM+) sensor supplemented with Landsat 5 TM data
- Classified using hybrid unsupervised/supervised technique and field data collected in Harris and surrounding counties by Texas Forest Service
- Biomass densities estimated using the Urban Forest Effects (UFORE) model (Novak and Crane, 2000)
- 18 land cover classes

CSR Land Cover Classes for HGBPA



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| ● Clinton ground-monitoring site | ■ Developed, Medium Intensity |
| ● La Porte ground-monitoring site | ■ Evergreen Needleleaf Forest |
| ■ All Shrub classes | ■ Herbaceous Wetland |
| ■ All Woodland classes | ■ Herbaceous, Cultivated (ecoregion 34a, only) |
| ■ Barren Land/Unconsolidate Shore | ■ Herbaceous, Cultivated (excluding ecoregion 34a) |
| ■ Cold-deciduous Forest (ecoregion 34) | ■ Herbaceous, Natural (ecoregion 34a, only) |
| ■ Cold-deciduous Forest (ecoregion 35) | ■ Herbaceous, Natural (excluding ecoregion 34a) |
| ■ Developed Open Space | ■ Mixed Forest |
| ■ Developed, High Intensity | ■ Open Water |
| ■ Developed, Low Intensity | ■ Woody Wetlands |

Comparison of CSR and Wiedinmyer et al. Databases using GloBEIS and CAMx for August 22-September 6, 2000



Spatial distributions of hourly isoprene emissions are similar. However, emissions for entire domain for CSR dataset are 40% less than those based on Wiedinmyer et al., leading to differences in predicted ozone concentrations of as much as 25 ppb.

Project Objectives and Tasks

- Examine underlying reasons for differences in biogenic emission estimates using CSR and Wiedinmyer et al. databases
 - Leaf biomass densities algorithms
 - Survey areas
 - Land cover classification techniques
- Compare estimates of biogenic emissions from GloBEIS versus NCAR's MEGAN
- Assess impacts of alternative biogenic emission estimates on predicted ozone concentrations using CAMx

Time Frame and Deliverables

- Deliverables:

- Reports covering the evaluation of the biogenics inventory and the results of the photochemical modeling.

- Time Frame

- These reports will be delivered over an 18 month period. We will try to accommodate TCEQ requests for deliverables that may be relevant to SIP initiatives.