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**Texas Commission on Environmental Quality
New Technology Research & Development (NTRD) Program
Monthly Project Status Report**

Contract Number: 582-5-70807-0009

Grantee: The University of Texas at Austin

Date Submitted: September 17, 2006

Report for the **Monthly** period:

Starting Date August 1, 2006 Ending Date August 31, 2006

Section I. Accomplishments *(Please provide a bulleted list of project accomplishments as well as a description of their importance to the project.)*

The project involves the collaboration of two University of Texas at Austin research centers: the Center for Space Research (CSR) and the Center for Energy and Environmental Resources (CEER). The CSR team is led by Melba Crawford (Co-PI), Gordon Wells (Co-PI) and Teresa Howard. The CEER team is led by Elena McDonald-Buller and David Allen.

Accomplishments in August by the two research teams included the following:

- Work funded by a separate HARC contract, but related to Task 2.1, continued in August. The Texas Forest Service generated provisional leaf biomass statistics for 43 East Texas counties. Data tables prepared from fieldwork conducted in four counties in the Dallas-Fort Worth Metroplex were sent to the U.S. Forest Service for processing in the UFORE model. An accuracy assessment of land cover classification in Angelina County was also performed.
- As part of Task 2.1, CSR began to prepare a field work strategy to collect land cover information in areas that are not well-characterized by the FIA database.
- As part of Task 2.2, the first draft of a journal submission on the dry deposition in East Texas research was completed and is under internal review. The report discusses the effect of changes in land use/land cover on dry deposition modeling in East Texas, primarily in the Houston-Galveston region and examines possible information sources for updated land cover data sets. CSR-prepared land cover data from the MODIS, AVHRR and Landsat satellite sensors were used as inputs into the CAMx model runs for the August 22-September 6, 2000, modeling episode. Land cover and predicted dry deposition velocities and ozone concentrations using each data set were compared.
- Work continued on Task 2.3 at both CSR and CEER. At CSR, the Leaf Area Index (LAI) time series for the August 22-September 6, 2000, modeling episode was constructed based upon the following rule: If the QA/QC flag for a pixel at a particular time was determined to be of poor quality, the LAI value for that pixel was then retrieved from the previous date LAI. If both dates had a poor QA/QC flag for a given pixel, then the LAI for that pixel was coded as the average LAI value for the composite time series. Urban areas are coded as 255 in accordance with the NASA standard reporting value. Water values are coded as 0. Six subsequent LAI raster products were up-sampled to 4 km spatial resolution. Next, the 4 km LAI products were reprojected into the Lambert

- spheroid projection required by the GloBEIS model. The raster data were converted to an ASCII format compatible with the GloBEIS input standards.
- As part of Task 2.3, the LAI data for a few days of the August 22-September 6, 2000, modeling episode were input into GloBEIS and used to estimate biogenic emissions for the TCEQ-Wiedinmyer LULC set and the CSR LULC data set.
 - The July project report stated that close relations existed between the AVHRR NDVI statistical deviations from the median and related PDSI values in the July through September data from 1995 through 1999 and in 2001, but that the 2000 data appeared to be much less correlated. Errors in processing the 2000 PDSI data that would explain the problem were discovered. The 2000 data have not yet been reanalyzed under Task 2.4.2. Based on the observed relationships in other years, it appears that a PDSI value may be approximated by scaling the NDVI deviations from the median by a factor of 100. This relationship will be used to support a higher resolution PDSI product for the testing with GloBEIS.
 - Efforts are also underway to generate of burn extents under Task 2.5.1. The empirical technique referenced in the project proposal is being tested. While the algorithm does extract fire scars, it may also generate false positive detections from areas of turbid surface water and cloud shadows. Screening techniques to remove these artifacts are being tested.
 - For Task 2.6, CSR completed a draft section for inclusion in the final report of the soil moisture detection results using AMSR-E data.

Indicate which part of the Grant Activities as defined in the grant agreement, the above accomplishments are related to:

As noted, the accomplishments are primarily related to Tasks 2.2, 2.3, 2.4, 2.5 and 2.6, with Task 2.2, Subtask 2.4.1 and Subtask 2.5.1 receiving particular attention.

Section II: **Problems/Solutions**

We note that the comparison with the Level 3 MODIS burned area product as described in Subtask 2.5.1.2 will not be feasible during the project because NASA has failed to produce the required MODIS product.

Unforeseen delays at the University of Houston have precluded performing the planned meteorological simulations of soil moisture for comparison with the remote sensing measurements from AMSR-E as part of Task 2.6. Results from the simulations will not be completed in time to include them in the final report.

Section III. **Goals and Issues for Succeeding Period:** *(Please provide a brief description of the goal(s) you hope to realize in the coming period and identify any notable challenges that can be foreseen)*

CSR will refine and extend land cover data for the project area in September. CSR will provide biomass data compiled by the Texas Forest Service as it becomes available.

CEER is currently comparing results and investigating the sensitivity of the model to LAI input.

CEER will continue to examine the sensitivity of the model to drought conditions as that data becomes available.

