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

Contract Number: __26-4255-10_____

Grantee: _____The University of Texas at Austin_____

Date Submitted: ____November 14, 2005_____

Report for the **Monthly** period:

Starting Date __August 1, 2005___ Ending Date ____October 31, 2005____

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.

Several initial accomplishments included preliminary planning meetings and individual research activities conducted in August and September, while the major collaborative efforts of the two research teams began to occur in October.

- The CSR and CEER teams held a project kickoff meeting on August 4 to define the responsibil-ities of each team member for the project tasks and to determine the initial geographic focus areas (Houston and Dallas). A follow-up meeting on August 24 was held to discuss data preparation for the urban- and regional-scale modeling domains for the different episodes to be examined in Tasks 2.1 and 2.2.

- During September, the teams mapped the IGBP MODIS land cover classification to the eleven categories used in the CAMx dry deposition algorithms. Sample datasets were provided by CSR to CEER for testing. The teams worked on strategies for coupling the land cover codes from the Texas Land Cover System (TLCS) with the species-level data required by GloBEIS. Both teams explored the availability of Texas vegetation datasets to determine if more current or more comprehensive species-level data exist that could be used to supplement the database developed by Wiedinmyer et al. (2001).

- On October 20, the teams met with Christine Wiedinmyer from the National Center for Atmospheric Research (NCAR) and Barbara Parmenter from UT's Community and Regional Planning Program to discuss NCAR's new MEGAN model for estimating biogenic emissions, the development of new dry deposition models, and application of the MODIS vegetation continuous fields (VCF) product to improve the allocation of tree cover in East Texas. The group also discussed the use of the U.S. Forest Service's 2002 Forest Inventory and Analysis (FIA) data and 2001 National Land Cover Dataset (NLCD).

- CSR began conversion of land cover classification results to a database suitable for ingestion into GloBEIS. A comparison of the land cover types identified by Wiedinmyer to

classes in the Texas Land Cover System began, as did the acquisition of ancillary GIS databases.

- CSR began the transformation of the different land cover databases into the eleven land cover categories and gridded formats required by CAMx.

- CSR examined new methods to improve the NASA MODIS Aerosol product to examine the spatial extent of pollutant transport from fire activity as part of Task 2.5. Modification of the NASA Aerosol product algorithm permits a more rigorous screening of water-contaminated pixels that can cause inaccurate estimates of the aerosol optical thickness property.

- CSR modified the near real-time satellite data processing system to take advantage of new computer hardware to provide a more efficient distribution of the computational load and to reduce product generation time from direct broadcast data acquisitions.

- Under Task 2.6, CSR began to investigate how to incorporate the results generated by the NASA Aqua Advanced Microwave Scanning Radiometer – EOS (AMSR-E) to estimate soil moisture characteristics in selected areas. The AMSR-E data values are considered experimental. A thorough review of the results published to date by the NASA AMSR-E Science Team will be required before attempting to use the data for routine estimates of soil moisture content.

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 2.1, 2.2, 2.5 and 2.6, with specific subtasks 2.1.1.1, 2.1.1.2, 2.1.1.3, 2..2.1.2, 2.5.1.2 and 2.5.2 receiving the most attention.

Section II: Problems/Solutions

Problem(s) Identified (*Please report anticipated or unanticipated problem(s) encountered and its effect on the progress of the project)*	*The very large file size (>1.2 GB) of the land cover database used as a data source for the GloBEIS model necessitated the development of an alternate data preparation method.* *Field work activities beneficial to the goals of the project, but conducted as part of another funded project, were delayed several weeks by staff requirements at CSR to support the recovery activities associated with Hurricanes Katrina and Rita.* *The initial work due to begin on Task 2.4 was delayed by the same staff requirements to support the Governor's Division of Emergency Management.*

Proposed Solution(s) *(Please report any possible solution(s) to the problem(s) that were considered/encountered)*	*An alternate method for data preparation is in development and will be implemented in November.* *Field work in the Dallas-Fort Worth area was conducted beginning in late-October. This work, which will lead to further refinements during the NTRD project, was funded by TERC.* *Requirements for staff support of emergency operations are diminishing and will allow other project tasks to be undertaken.*
Action(s) Conducted and Results *(Please describe the action(s) taken to resolve the problem(s) and its effect)*	*Data preparation will concentrate on the requirement for data ingestion into CAMx for Task 2.2 until an efficient data conversion solution for Task 2.1 is resolved. As a consequence, CEER will focus on the modeling of dry deposition rates.*

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)*

The primary goal of the CEER team is to obtain processed MODIS land cover products from CSR, to map the MODIS IGBP classifications to the eleven land cover categories of CAMx, and to examine air quality and dry deposition impacts for the Dallas and Houston modeling episodes, respectively.

Once completed by CSR, the CEER team will use the new Landsat-based land cover products developed for the Houston area to obtain estimates of biogenic emissions using GloBEIS to compare with the results obtained with the data from Wiedinmyer et al. (2001).

The primary goal of the CSR team is to provide CEER with the necessary datasets for the initial modeling work described in Task 2.2. In addition, work will continue to prepare the land cover date for the GloBEIS modeling activities of Task 2.1, with an anticipated delivery date in December.

By the end of December with the completion of other related field data collection projects, the CSR team will be able to assess the level of effort required for future field data collection that falls within the scope of the NTRD project.

Time lost during the Katrina and Rita recovery operations will be recovered with a concentration on the development of a procedure to address the drought stress measurements compatible with GloBEIS described in Task 2.4.

Date: *November 14, 2005*

Authorized Project Representative's Signature

NOTE*: Please attach any additional information that you feel should be a part of your report or that may be required to meet the deliverable requirements for tasks completed during this reporting period.*