

Monthly Technical Report

(Due to AQRP Project Manager on the 8th day of the month following the last day of the reporting period.)

PROJECT TITLE	Targeted Improvements in the Fire INventory from NCAR (FINN) Model for Texas Air Quality Planning	PROJECT #	14-011
PROJECT PARTICIPANTS	The University of Texas at Austin ENVIRON International Corporation	DATE SUBMITTED	4/8/15
REPORTING PERIOD	From: March 1, 2015 To: March 31, 2015	REPORT #	9

A Financial Status Report (FSR) and Invoice will be submitted separately from each of the Project Participants reflecting charges for this Reporting Period. I understand that the FSR and Invoice are due to the AQRP by the 15th of the month following the reporting period shown above.

Detailed Accomplishments by Task

Task 1. Regional Land Cover Characterization

Processing of the ArcGIS raster files for the land cover datasets in the WGS84 coordinate system has been completed. As described previously, in addition to the MODIS Land Cover Type Product, these datasets include the Global Land Cover (GLC) - SHARE product from the United Nations Food and Agriculture Organization (FAO), the European Space Agency's (ESA's) Climate Change Initiative Land Cover (CCI-LC) product released in 2014, the Fuel Characteristic Classification System (FCCS) database and National Agricultural Statistical Service (NASS) Cropland Data Layer (CDL) both of which are available for the continental United States, and a high resolution regional land use/land cover database for Texas and surrounding states developed by Popescu et al. (2011). Sensitivity studies with FINN using these land cover products alone or in combination will include: (1) MODIS LCT; (2) ESA CCI-LC; (3) GLC-SHARE; (4) FCCS in the continental United States; (5) FCCS with croplands characterized by the CDL in the continental United States; (6) as in (5) but with the high resolution TCEQ land cover data as a replacement for the FCCS in Texas and surrounding states.

Updates were also made to the FCCS-CDL combined data that included accounting for croplands growing sorghum and modifying the land cover crosswalk used for the merging process.

Development of the next generation FINN processor has been completed. Input files are being run with the updated FINN code to explore the impacts of the changes and to understand different model parameters/processes to determine the "default" configuration. FINN simulations will then be conducted for the different land cover scenarios.

Task 2. Mapping of Croplands Data

Cropland data processing has been completed as described above; crop-specific emission factors have been incorporated in FINN.

Task 3. Estimation of Burned Area

Development of the algorithms and ArcGIS tools used for processing of the MODIS Rapid Response fire detection records, quantifying burned area, and characterizing the underlying land cover has been completed.

Task 4. Sub-grid scale Partitioning of NO_x Emissions to NO_z in Fire Plumes

ENVIRON is beginning to develop the approach to partition NO_x during EPS3 processing of the FINN emission estimates and awaiting the results of the FINN sensitivity study simulations.

Task 5. Comprehensive Air Quality Model with Extensions (CAMx) Sensitivity Studies

The TCEQ has provided the 2012 CAMx air quality modeling episode in its entirety. The basecase simulation has been run at the Texas Advanced Computing Center (TACC). Once we have our FINN simulations completed, we will compare our emission estimates with those from the TCEQ's current inventory.

Data Collected *(Include raw and refine data.)*

As described above.

Identify Problems or Issues Encountered and Proposed Solutions or Adjustments

We requested and received from AQRP a no-cost extension for the project until September 30, 2015. This will allow us more time to conduct and analyze CAMx simulations for the FINN scenarios as well as work with ENVIRON on the partitioning of NO_x emissions to NO_z in fire plumes.

Goals and Anticipated Issues for the Succeeding Reporting Period

Priorities for next month include completing sensitivity analyses in FINN to produce fire emission estimates; conducting comparisons to fire emissions estimates currently being used by the TCEQ in their 2012 CAMx episode to the extent possible; and continuing work on the manuscript.

Detailed Analysis of the Progress of the Task Order to Date *(Discuss the Task Order schedule, progress being made toward goals of the Work Plan, explanation for any delays in completing tasks and/or project goals. Provide justification for any milestones completed more than one (1) month later than projected.)*

Ongoing.

Submitted to AQRP by:

Principal Investigator: Elena McDonald-Buller