

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 (Enter all institutions with Task Orders for this Project)	The University of Texas at Austin ENVIRON International Corporation	DATE SUBMITTED	2/5/15
REPORTING PERIOD	From: January 1, 2015 To: January 31, 2015	REPORT #	7

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

Final refinements to the next generation of the FINN model are on-going; the team held a conference call on January 12th to define priorities. The model will be used to develop fire emission inventories for TCEQ purposes and for sensitivity runs that focus on land cover and fuel loading products. Much of the work with FINN this month has centered on improvements to the algorithm used for quantification of burned area. We have worked to modify how point fire detections from the MRR product are processed to quantify burned area, to improve the estimation of whether or not multiple point detections constitute the same fire event, and to improve the ability of the algorithm to capture the diversity of land cover over the burned area. We have incorporated the emission factors for croplands developed by Jessica McCarty at Michigan Technological University.

The Visible Infrared Imaging Radiometer Suite (VIIRS) offers a promising future resource for fire detection data. However, further analyses of the active fire and nightfire products are necessary before the VIIRS products could be considered as a replacement to the MODIS Rapid Response (MRR) product in FINN. The VIIRS active fire product was publicly released on October 22nd, 2012 as beta quality back to April 2nd, 2012. It was then declared provisional back to October 16th, 2012. Thus, it does not span the entire year of 2012, which is of primary interest to the TCEQ. Information on the VIIRS sensor and the fire data products will be described in the final project report as it may serve as a future resource.

We identified the European Space Agency (ESA)-led Climate Change Initiative - Land Cover (CCI-LC) project as a possible resource for global land cover data and will investigate this further in the coming month.

We have been talking with the TCEQ Liaison for the project, Jim Mackay, about the availability of the 2012 CAMx episode files. We understand the episode is still under development. We hope to conduct preliminary analysis of the fire emission inventory files currently being used by the TCEQ with our FINN estimates.

Development of a manuscript has also been initiated this month. In addition to describing the updates for the new release of FINN, it will focus on three science questions: (1) how sensitive are fire emission

estimates to input land cover data (considering global, U.S. national, and U.S. regional products)? (2) how important is the inclusion of specific data for agricultural regions? (3) are fuel loadings highly sensitive to assignment of certain land cover categories in the United States? Texas and its neighboring states will serve as the focus of the regional analyses, as an example of a land cover database with high spatial resolution and relatively frequent updates.

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

As described above.

Identify Problems or Issues Encountered and Proposed Solutions or Adjustments

None this period.

Goals and Anticipated Issues for the Succeeding Reporting Period

Priorities for next month include completion, quality assurance, and documentation of the FINN model updates; deciding whether the CCI-LC project data should be considered as an alternative global data resource to the MODIS Land Cover Type (LCT) product; establishing the final suite of land cover products to be used and conducting 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.

The team will consult with AQRP Project Manager, Dave Sullivan, and TCEQ Liaison, Jim MacKay, to review the land cover products under consideration and determine if TCEQ has a request for a particular combination of products, for example, merging data for specific crop types with the Popescu et al. (2011) data that has been used by TCEQ for biogenic emissions modeling.

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