# AQRP Monthly Technical Report

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| **PROJECT TITLE** | **Use of Satellite Data to Improve Specifications of Land Surface Parameters** | **PROJECT #** | **17-039** |
| **PROJECT PARTICIPANTS** | Richard McNider, Arastoo Pour –Biazar, Kevin Doty, Yuling Wu | **DATE SUBMITTED** | May 31, 2017 |
| **REPORTING PERIOD** | **From:** May 1, 2017<br>**To:** May 31, 2017 | **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.

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**Detailed Accomplishments by Task**

Case et al. (2014) has developed a MODIS-derived 1-km CONUS Green Vegetation Fraction (GVF) dataset which extends back to June 2011.

**Task 4 - Vegetative Fraction** Case with the NASA Sport Center has developed a MODIS-derived 1-km CONUS Green Vegetation Fraction (GVF) dataset which extends back to 2012. This data has been processed for use in the September 2013 case. It was originally thought that this data extended back to 2011. However, in processing the 2013 data and preparing to process the data for the 2012 case, it was found that the data only extended back to September 2012. Thus, we are preparing to use the standard NASA MODIS greenness product for the 2012 case.

**Task 6 - Satellite Derived Insolation and Albedo –** The 2013 Discover AQ case that was run during the project last year was run with satellite insolation but not satellite albedo. As part of rerunning the 2013 Discovery AQ a consistent set of satellite insolation and cloud albedo was developed. The new insolation and albedo data have been processed and incorporated in the WRF system. The rerun of the 2013 case has employed this new data has been employed.

**Task 7 - Additional Model Evaluation Period: *:*** As noted in the proposal for this project, the Discover AQ period was not a particularly representative period for air quality concerns. Many active fronts and pervasive cloudiness dominated the period. Thus, as part of this year's effort an additional modeling period was to be chosen in conjunction with TCEQ. After discussion with TCEQ it was decided that the period July 1, 2012 – August 31, 2012 would be the new period. The drier 2012 year is a contrast to the 2013 Discover AQ period. This period may coincide with potential SIP work in in Texas.

**Preliminary Analysis**

Two model runs were made for the 2013 case using the new insolation and albedo data. The preliminary analysis indicates that the performance statistics against NWS data were improved. A new 2013 case has been started with new nudging protocols. Analysis of the control case has been started and will be reported in June.

**Data Collected**

As mentioned above satellite greenness data has been collected and processed for the 2013 period.

**Identify Problems or Issues Encountered and Proposed Solutions or Adjustments**

We have had some delays in making some model runs in part because of some issues we have found with the analysis nudging. In the past for Texas we have used wind nudging in the boundary layer. However, we feel that nudging in the boundary layer should only be used as a last resort to improve performance. Thus, our new reruns are not nudging within the boundary layer or below 2km.

**Goals and Anticipated Issues for the Succeeding Reporting Period**

We anticipate have initial model runs for the 2012 and 2013 cases in June.

**Detailed Analysis of the Progress of the Task Order to Date**

**Do you have any publications related to this project currently under development? If so, please provide a working title, and the journals you plan to submit to.**

**__X_Yes ___No**

Toward the use of Satellite Skin Temperature Data to Improve Land Surface Parameters in Air Quality Studies, to be submitted to Journal of Applied Meteorology.

**Do you have any publications related to this project currently under review by a journal? If so, what is the working title and the journal name? Have you sent a copy of the article to your AQRP Project Manager and your TCEQ Liaison?**

**___Yes __X_No**

**Do you have any bibliographic publications related to this project that have been published? If so, please list the reference information. List all items for the lifetime of the project.**

**___Yes __X_No**

**Do you have any presentations related to this project currently under development? If so, please provide working title, and the conference you plan to present it (this does not include presentations for the AQRP Workshop).**

**___X Yes ___No**

We are submitting a presentation to the Meteorology and Air Quality Conference at UC Davis in September 2017. Toward the use of Satellite Skin Temperature Data to Improve Land Surface Parameters in Air Quality Studies, to be submitted to Journal of Applied Meteorology.

**Do you have any presentations related to this project that have been published? If so, please list reference information. List all items for the lifetime of the project.**

**___Yes __X_No**

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Submitted to AQRP by

Principal Investigator

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