AQRP Monthly Technical Report

PROJECT TITLE	Longterm trends in dust sources in West Texas	**PROJECT #**	26-001
PROJECT PARTICIPANTS	Rebecca Sheesley, Gannet Hallar, Elisabeth Andrews, Erin Boedicker	**DATE SUBMITTED**	October 8, 2026
REPORTING PERIOD	**From:** Sep 1, 2026 **To:** **Sep 30, 2026**	**REPORT #**	2

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 for reporting period

- Kickoff meeting on Sept 3
- Started PMF data preparation
- Received partial 5 min PM, meteorology and CO data sets from TCEQ for relevant El Paso sites (9/22/26; see table below). We are working with TCEQ to gather the remaining data for 2000-2025.
    - Skyline Park (CAMS #72), Ascarate Park SE (CAMS #0037, #0159, #0172), Ojo De Agua (CAMS #1021), Van Buren (CAMS #693), El Paso Chamizal (CAMS #0041, #0126, #3001), Ivanhoe (CAMS #414), Socorro Hueco (CAMS #49), El Paso UTEP (CAMS #16)

Table 1 Data requested from TCEQ 9/22/2026 to enable high time resolution analysis of dust events.

Method	Parameter	Skyline Park (CAMS #72)	Ascarate Park SE (CAMS #0037. #0159, #0172)	Ojo De Agua (CAMS #1021)	Van Buren (CAMS #693)	El Paso Chamizal (CAMS #0041, #0126, #3001)	Ivanhoe (CAMS #414)	Socorro Hueco (CAMS #49)	El Paso UTEP (CAMS #16)
42101	CO			x		x			x
88101	PM2.5 (Beta)	x	x					x	x
81102	PM Coarse (0-10 µm)			x	x	x	x	x	x
86101	Pm10-2.5 - Local Conditions					x			
88101	Pm2.5 - Local Conditions					x			
61101	Wind Speed - Scalar	x	x	x	x	x	x	x	x
61102	Wind Direction - Scalar	x	x	x	x	x	x	x	x
61103	Wind Speed - Resultant	x	x	x	x	x	x	x	x
61104	Wind Direction - Resultant	x	x	x	x	x	x	x	x
61105	Peak Wind Gust	x	x	x	x	x	x	x	x
61106	Std Dev Hz Wind Direction	x	x	x	x	x	x	x	x
62101	Outdoor Temperature	x	x	x		x	x	x	x
64101	Barometric Pressure		x			x			x
62103	Dew Point		x			x			x
62201	Relative Humidity (%RH)		x			x	x		x
63301	Solar Radiation		x			x			x
63101	Visibility		x						x

Preliminary Analysis

- NASA's Moderate Resolution Imaging Spectroradiometer (MODIS) instruments aboard the Terra and Aqua satellites have been providing aerosol information since 2000. One retrieved quality is aerosol optical depth (AOD), which represents how much light is scattered and absorbed within an atmospheric column and is a common indicator of aerosol loading.

  A preliminary evaluation was conducted for the El Paso region using all Terra and Aqua observations from 2010, specifically the MODIS/Terra+Aqua Land Aerosol Optical Depth Daily L2G Global 1km SIN Grid V06. The MCD19A2 Version 6.1 data product is a Moderate Resolution Imaging Spectroradiometer (MODIS) Terra and Aqua combined Multi-angle Implementation of Atmospheric Correction (MAIAC) Land Aerosol Optical Depth (AOD) gridded Level 2 product produced daily at 1 kilometer (km) pixel resolution. Native 1 km observations from MODIS tiles h08v05 and h09v05 were quality screened using the best quality AOD over land and aggregated into 0.01 degree netCDF files for easy analysis. Currently, the bounding box used is 30-33.5 N, 104.5-108.5 W. 0.47 um and 0.55 um AOD variables were kept, as well as MAIAC's dust identifier. MAIAC captured a known blowing dust event on March 26th, 2010, which has been used as the control for the data. However, due to strict quality control and screening, MAIAC identified only three dust days in 2010: March 26th, April 29th, and November 28th, as shown in **Figure 1**. This is not conducive for a trend analysis or climatology, as it seems that the MAIAC algorithm is severely underestimating dust. Following the methodology of Lambert et al. (2020), MODIS Collection 6.1 Level-2 aerosol retrievals, with a nominal spatial resolution of approximately 10 km, will be quality screened and regridded to a 0.1° × 0.1° latitude–longitude grid to evaluate aerosol climatology and long-term trends over the El Paso region. The MAIAC dataset will be retained for potential Stochastic Time-Inverted Lagrangian Transport (STILT) back trajectories, as its spatial resolution is 10x higher than Level-2 MODIS products, and all scripts have been written to successfully download all 20 years, if needed.

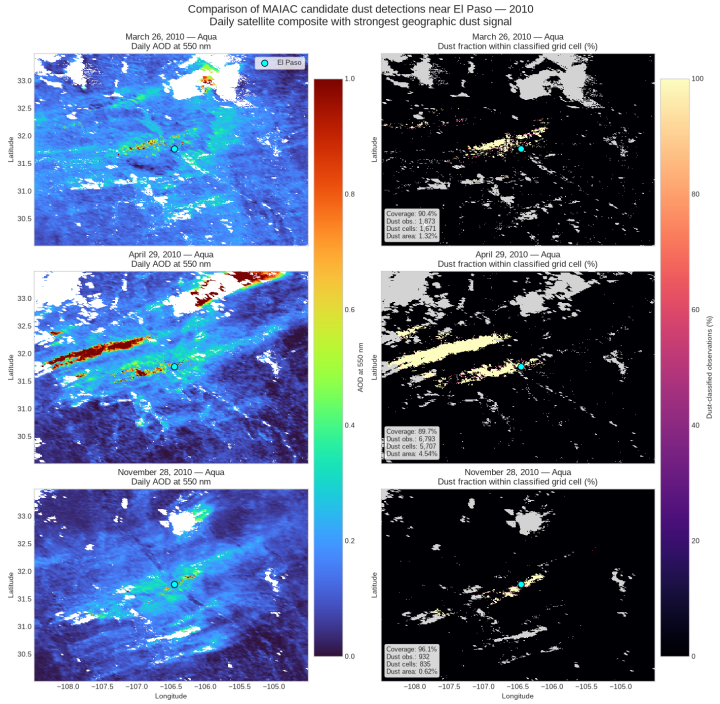


Figure 1: Three dust events identified by the MAIAC aerosol classification identifier from the Aqua satellite. Shown on the left is background AOD, with El Paso represented by the light blue dot. Overlaid on the right is the amount of dust captured in each grid cell, with 100% shown in bright yellow. A white (left)/ light gray (right) background indicates data that did not pass the quality control filters.

Data Collected

- MCD19A2 Collection 6.1, year 2010
- METAR for NM, TX, and Mexico
- PM2.5 speciation for El Paso Chamizal
- MOD04_L2 & MYD04_L2 Collection 6.1
- Partial data for PM2.5, PM10, CO and meteorology data for all El Paso sites

Identify Any Problems or Issues Encountered and Proposed Solutions or Adjustments

- MAIAC algorithm identifies too few dust days for the proposed time period for a climatology/trend analysis
- Level 2 Deep Blue algorithm data will be used to substitute above analysis, and the MAIAC dataset will be kept for individual dust days due to higher resolution

Goals and Anticipated Issues for the Succeeding Reporting Period

- Finalize PMF data preparation for El Paso Chamizal site
- Complete preliminary runs of PMF for El Paso Chamizal site
- Start processing of 5 min PM, CO and met data for El Paso TCEQ sites

Detailed Analysis of the Progress of the Task Order to Date

- We are working on the first task - conducting dust identification using three different methods. We are also working on the fourth task - PMF of speciated PM.

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.

☐Yes xNo

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 ☒ No

Do you have any bibliographic publications (ie: publications that cite the project) 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 ☒ 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).

☒ **Yes** ☐ **No**

Title: Source Apportionment of $PM_{2.5}$ in El Paso, Texas: A Long-Term Study from 2000 to 2025
Conference: A Symposium on Dust Impacts on Climate, the Environment and Human Health, UC Davis, Nov 16-17, 2026.

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** ☒ **No**

Have any personnel changes occurred that were not listed in the original proposal? If so, please include a detailed description of the personnel change(s) below.

☐ **Yes** x**No**

Are any delays expected in the progress of the research? If so, please include a detailed description of the potential delay below.

☒ **Yes** ☐ **No**

Describe any possible concerns/issues (technical or non-technical) that AQRP should be made aware of.

University of Colorado is still negotiating subaward terms & conditions with AQRP and work will commence as soon as CU has a fully executed subaward.

Are you anticipating using all the available funds allocated to this project by the end date? If not, why and approximately what is the amount to be returned?

☒ **Yes** ☐ **No**

Submitted to AQRP by
[Principal Investigator Name]