EXCEPTIONAL EVENTS DEMONSTRATION FOR 2022 $PM_{2.5}$ EXCEEDANCES AT ATASCOSA, HIDALGO, NUECES, TARRANT, AND WEBB COUNTIES

August 5, 2025

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
P.O. BOX 13087
AUSTIN, TEXAS 78711-3087

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SECTION 1: INTRODUCTION AND EXCEPTIONAL EVENT CRITERIA

1.1 OVERVIEW

Exceptional events are unusual or naturally occurring events that affect air quality and are not reasonably controllable or preventable. An exceptional event may also be caused by human activity that is unlikely to recur at a particular location. Under §319 of the federal Clean Air Act (FCAA), states are responsible for identifying air quality monitoring data affected by an exceptional event and requesting the United States (U.S.) Environmental Protection Agency (EPA) exclude the data from consideration when determining whether an area is in attainment or nonattainment of a National Ambient Air Quality Standard (NAAQS). EPA has promulgated an exceptional event rule, 40 Code of Federal Regulations (CFR) §50.14, as well as guidance to implement the requirements of the FCAA regarding exceptional events. States are required to identify air quality monitoring data potentially affected by exceptional events by flagging the data submitted into the EPA Air Quality System (AQS) database. If EPA concurs with this demonstration, the flagged data will not be eligible for consideration when making NAAQS compliance determinations.

This document discusses the Texas Commission on Environmental Quality (TCEQ) proposed exceptional event day flags for fine particulate matter ($PM_{2.5}$), occurring on various dates in 2022, in Atascosa County (Von Ormy Highway 16 monitor), Hidalgo County (Edinburg East Freddy Gonzalez Drive monitor), Nueces County (Dona Park monitor), Tarrant County (Haws Athletic Center monitor), and Webb County (World Trade Bridge monitor). This demonstration shows that concentrations of $PM_{2.5}$ at these air monitoring sites were impacted by exceptional events on 34 days in 2022.

The $PM_{2.5}$ measurements on the proposed exceptional event days are listed below in Table 1-1: *Proposed Exceptional Events in 2022*. The event days are also categorized into groups by event type. A map of Texas with the referenced monitors is shown in Figure 1-1: *Map of Texas with Five Monitors Identified for Exceptional Events*, and Table 1-2: *Monitor Details* provides additional information for each monitoring site.

Table 1-1: Proposed Exceptional Events in 2022

EE Group	Date	Monitor Site	Exceedance Concentration (μg/m^3)	Type of Event	Tier
1	5/5/2022	World Trade Bridge	29.0	Fire -Mexico/Central America	2
2	5/8/2022	Von Ormy Highway 16	29.2	Fire -Mexico/Central America	2
2	5/8/2022	World Trade Bridge	32.5	Fire -Mexico/Central America	1
2	5/9/2022	Haws Athletic Center	27.2	Fire -Mexico/Central America	1
2	5/9/2022	World Trade Bridge	29.3	Fire -Mexico/Central America	2
3	5/20/2022	Von Ormy Highway 16	30.0	Fire -Mexico/Central America	2
3	5/20/2022	Haws Athletic Center	26.9	Fire -Mexico/Central America	1

EE Group	Date	Monitor Site	Exceedance Concentration (μg/m³)	Type of Event	Tier
3	5/20/2022	World Trade Bridge	30.4	Fire -Mexico/Central America	2
3	5/21/2022	Von Ormy Highway 16	27.4	Fire -Mexico/Central America	2
3	5/21/2022	World Trade Bridge	30.7	Fire -Mexico/Central America	2
4	6/12/2022	Edinburg East Freddy Gonzalez Drive	40.6	African Dust	1
4	6/12/2022	Dona Park	34.9	African Dust	1
4	6/13/2022	Von Ormy Highway 16	36.5	African Dust	1
4	6/13/2022	Edinburg East Freddy Gonzalez Drive	26.5	African Dust	2
4	6/13/2022	Haws Athletic Center	33.4	African Dust	1
4	6/13/2022	World Trade Bridge	28.8	African Dust	2
4	6/14/2022	Von Ormy Highway 16	31.6	African Dust	2
4	6/14/2022	Haws Athletic Center	34.2	African Dust	1
4	6/15/2022	Edinburg East Freddy Gonzalez Drive	30.9	African Dust	1
4	6/16/2022	Von Ormy Highway 16	41.3	African Dust	1
4	6/16/2022	Dona Park	36.0	African Dust	1
4	6/16/2022	Edinburg East Freddy Gonzalez Drive	40.5	African Dust	1
4	6/16/2022	Haws Athletic Center	36.2	African Dust	1
4	6/16/2022	World Trade Bridge	40.6	African Dust	1
4	6/17/2022	Haws Athletic Center	33.6	African Dust	1
4	6/17/2022	Edinburg East Freddy Gonzalez Drive	23.6	African Dust	2
5	7/16/2022	Edinburg East Freddy Gonzalez Drive	26.5	African Dust	2
5	7/16/2022	World Trade Bridge	30	African Dust	2
5	7/17/2022	Von Ormy Highway 16	29.6	African Dust	2
5	7/17/2022	Edinburg East Freddy Gonzalez Drive	28.7	African Dust	2
5	7/17/2022	Haws Athletic Center	27.9	African Dust	1
5	7/17/2022	World Trade Bridge	31.2	African Dust	1
5	7/18/2022	Haws Athletic Center	29.2	African Dust	1
6	10/3/2022	Haws Athletic Center	30.0	Prescribed Fire	1

(μg/m³) = micrograms per cubic meter

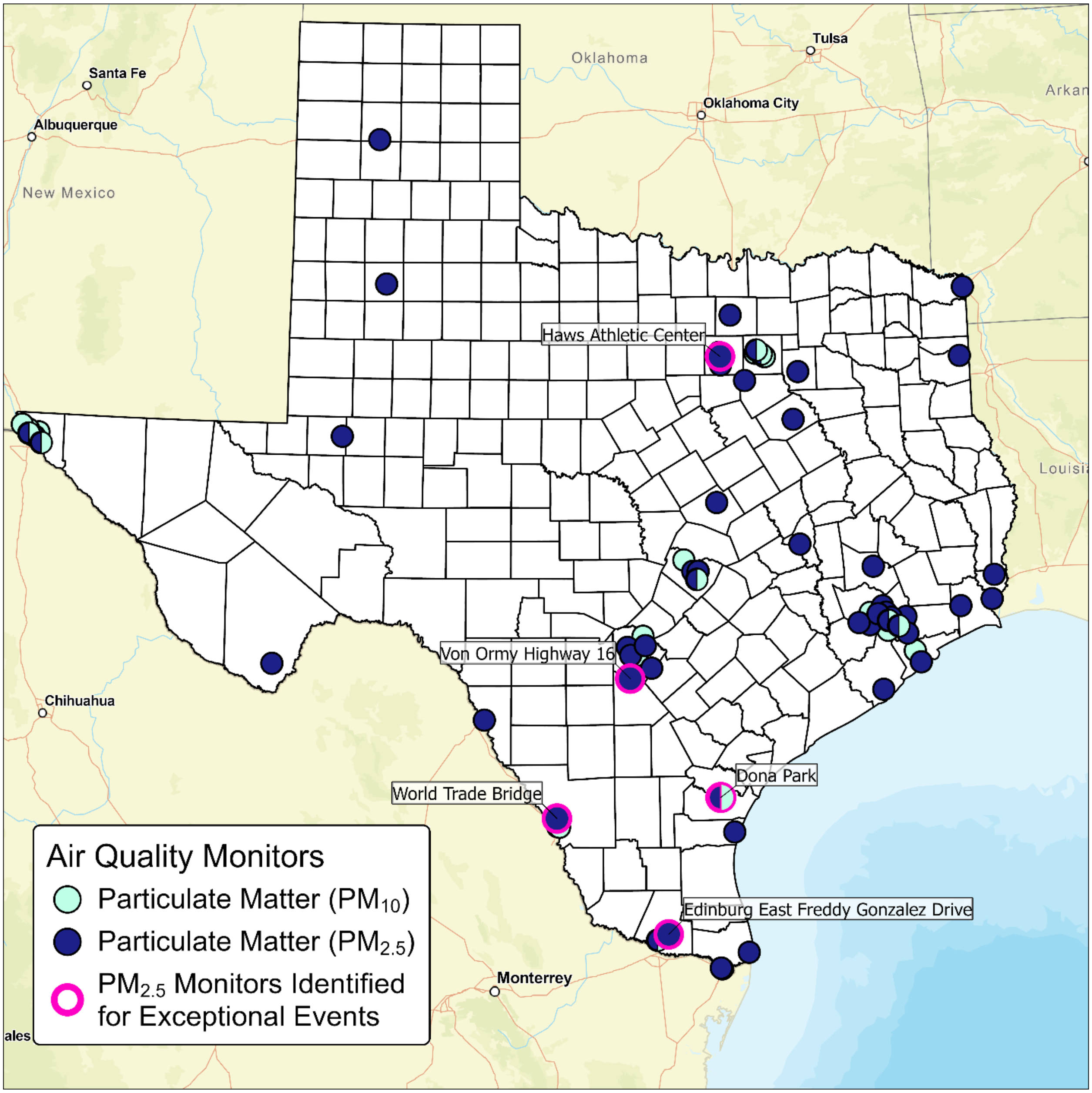

Figure 1-1: Map of Texas with Five Monitors Identified for Exceptional Events

Table 1-2: Monitor Details

Site Name	Von Ormy Highway 16	Edinburg East Freddy Gonzalez Drive	Dona Park	Haws Athletic Center	World Trade Bridge
Air Quality System (AQS) Number	480131090	482151046	483550034	484391006	484790313
Activation Date	5/29/2020	7/8/15	1/31/01	4/1/01	8/13/02
Address	17534 North State Highway 16	1491 East Freddy Gonzalez Drive	5707 Up River Rd	600 1/2 Congress St	Mines Road 11601 FM 1472
County	Atascosa	Hidalgo	Nueces	Tarrant	Webb
Latitude/ Longitude	29.1628698, -98.5891166	26.2884857, -98.1520588	27.8118332, -97.4657062	32.7591555, -97.3422980	27.5996022, -99.5334135
Pollutant Instrumentation	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$
Meteorological Instrumentation	Temperature, Wind	Temperature, Wind	Temperature, Wind	--	--

1.2 CLEAN AIR ACT REQUIREMENTS

In 2024, EPA promulgated a lower primary annual $PM_{2.5}$ of 9.0 µg/m³. The 2024 primary annual $PM_{2.5}$ standard is met when the three-year average of annual weighted quarterly means is less than or equal to 9.0 µg /m³ (40 CFR §50.20).

Texas is submitting this exceptional events demonstration to exclude certain data from the 2022-2024 timeframe.

1.3 EXCEPTIONAL EVENTS RULE REQUIREMENTS

On October 3, 2016, EPA revised its Exceptional Events Rule (EER) (40 Code of Federal Regulations (CFR) §50.14(c)(3)) to specify six fundamental elements that a state's demonstration must contain. Those elements and the parts of this demonstration that fulfill those requirements are shown in Table 1-3: *40 CFR §50.14(c)(3) Exceptional Event Demonstration Requirements.*

Table 1-3: 40 CFR §50.14(c)(3) Exceptional Event Demonstration Requirements

40 CFR §50.14(c)(3) Requirement	Demonstration Section
A narrative conceptual model that describes the event(s) causing the exceedance or violation and a discussion of how emissions from the event(s) led to the exceedance or violation at the affected monitor(s).	Section 2

40 CFR §50.14(c)(3) Requirement	Demonstration Section
A demonstration that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation.	Section 3
Analyses comparing the claimed event-influenced concentration(s) to concentrations at the same monitoring site at other times. The Administrator shall not require a State to prove a specific percentile point in the distribution of data.	Section 3
A demonstration that the event was both not reasonably controllable and not reasonably preventable.	Section 4
A demonstration that the event was caused by human activity that is unlikely to recur at a particular location or was a natural event.	Section 5
Documentation that the submitting air agency followed the public comment process.	Section 7

TCEQ documents compliance with the EER mitigation requirements in 40 CFR §51.930 with respect to public notification, public education, and implementation of appropriate measures to protect health in Table 1-4: *40 CFR §51.930(a) Exceptional Event Demonstration Requirements*.

Table 1-4: 40 CFR §51.930(a) Exceptional Event Demonstration Requirements

40 CFR §51.930(a) Requirement	Demonstration Section
Provide for prompt public notification whenever air quality concentrations exceed or are expected to exceed an applicable ambient air quality standard.	Section 6
Provide for public education concerning actions that individuals may take to reduce exposures to unhealthy levels of air quality during and following an exceptional event.	Section 6
Provide for the implementation of appropriate measures to protect public health from exceedances or violations of ambient air quality standards caused by exceptional events.	Section 6

EPA has provided several documents and tools that address exceptional events demonstration requirements, including those listed below.

- The 2016 revisions to the 2007 Exceptional Events Rule (U.S. EPA, 2016a)[1]
- “Guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events that May Influence Ozone Concentrations” (U.S. EPA, 2016b)[2]
- “2016 Revisions to the Exceptional Events Rule: Update to Frequently Asked Questions” (U.S. EPA, 2020)[3]

[1] https://www.epa.gov/sites/default/files/2018-10/documents/exceptional_events_rule_revisions_2060-as02_final.pdf
[2] https://www.epa.gov/system/files/documents/2023-12/guidance-on-the-preparation-of-ee-wf-ozone.pdf
[3] https://www.epa.gov/sites/default/files/2019-07/documents/updated_faqs_for_exceptional_events_final_2019_july_23.pdf

- "Initial Area Designations for the 2024 Revised Primary Annual Fine Particle National Ambient Air Quality Standard" (U.S. EPA, 2024)[4]
- "$PM_{2.5}$ Wildland Fire Exceptional Events Tiering Document" (U.S. EPA, 2024)[5]
- $PM_{2.5}$ Designations Mapping Tool[6]

1.4 INITIAL NOTIFICATION AND FLAGGING DATA IN AQS

The Exceptional Events Rule at 40 CFR §50.14(c)(2) requires an initial notification by the air agency to EPA of a potential exceptional event for which the agency is considering preparing a demonstration. On July 8, 2025, TCEQ submitted an initial notification to EPA Region 6. A copy of the initial notification letter is provided in Appendix D.

1.5 REGULATORY SIGNIFICANCE

The annual $PM_{2.5}$ design value (DV) is the weighted annual mean concentration averaged over three consecutive years. Removing the days impacted by exceptional events from 2022, 2023, and 2024 has regulatory significance because those days impact the 2024 annual $PM_{2.5}$ DVs.

Table 1-5: *2024 DVs for the 2024 Annual $PM_{2.5}$ NAAQS* shows the 2024 design values at each monitor without EPA concurrence on TCEQ's 2022, 2023, and 2024 exceptional events demonstrations and the potential design value if EPA concurs on the proposed exceptional event days. The relevant 2023 and 2024 days impacted by exceptional events at these monitors and the details of the events are available in TCEQ's *Exceptional Events Demonstration For 2023 $PM_{2.5}$ Exceedances at Atascosa, Hidalgo, Tarrant and Webb Counties* and *Exceptional Event Demonstration for 2024 $PM_{2.5}$ Exceedances at Atascosa, Hidalgo, Nueces, Tarrant and Webb Counties*, respectively.

Table 1-5: 2024 DVs for the 2024 Annual $PM_{2.5}$ NAAQS

Monitoring Site	2022-2024 DV without EPA Concurrence (µg/m³)	2022-2024 DV with EPA Concurrence (µg/m³)
Von Ormy Highway 16 (480131090)	9.5	9.0
Edinburg East Freddy Gonzalez Drive (482151046)	10.3	9.0
Dona Park (483550034)	9.3	9.0
Haws Athletic Center (484391006)	9.4	9.0
World Trade Bridge (484790313)	9.7	9.0

1.6 ACTION REQUESTED

This document meets all EPA documentation standards for exceptional events, and TCEQ requests EPA concurrence that the dates and concentrations shown in Table 1-1 were caused by an exceptional event and should be excluded from regulatory decisions for the 2024 annual $PM_{2.5}$ NAAQS. The data being requested for exclusion have regulatory significance and affect the DVs. This demonstration provides detailed evidence to support concurrence by EPA for the

[4] https://www.epa.gov/system/files/documents/2024-02/pm-naaqs-designations-memo_2.7.2024-_-jg-signed.pdf
[5] https://www.epa.gov/system/files/documents/2024-04/final-pm-fire-tiering-4-30-24.pdf
[6] https://www.epa.gov/air-quality-analysis/pm25-tiering-tool-exceptional-events-analysis

$PM_{2.5}$ exceptional events for the days included in the initial notification letter (Appendix D), which shows “r” flags applied for all types.

SECTION 2: NARRATIVE CONCEPTUAL MODEL

2.1 OVERVIEW

This section satisfies the Exceptional Events Rule Requirement at 40 CFR §50.14(c)(3)(iv)(A): A narrative conceptual model that describes the event(s) causing the exceedance or violation and a discussion of how emissions from the event(s) led to the exceedance or violation at the affected monitor. This section describes the 2022 events and the general meteorological conditions that caused smoke and dust to travel to the five monitoring sites. As identified in Table 1-1, events were categorized into six distinct groups based on single day events or episodes with types of events (Prescribed Fire, African Dust, and Fire (Mexico/Central America). The Fire -Mexico/Central America event type descriptor is used to denote fire related flags in AQS to ensure consistency in the indication of the jurisdictional origin of the fire (Outside of the United States in Mexico and/or Central America). Unless otherwise specified, all the Fire-Mexico/Central America exceptional events represent fires with origin only in Mexico that impacted monitors in Texas in this demonstration.

2.2 ATASCOSA COUNTY BACKGROUND

The Atascosa County area is located in the Rio Grande Plain region of South Texas. The county is part of the San Antonio-New Braunfels metropolitan statistical area (MSA) and has a population of approximately 48,981 people.[7] The area covers 1,221 square miles, and is geographically characterized by plains and rolling hills, with the Atascosa River running through its entirety. Atascosa County experiences a subtropical climate, characterized by hot, humid summers and mild winters. Rainfall is fairly distributed throughout the year, with a peak storm season from March to May.

2.3 HIDALGO COUNTY BACKGROUND

The Hidalgo County area is located in the Rio Grande Valley region of South Texas. The county is part of both a Metropolitan Statistical Area (MSA) as well as a Combined Statistical Area (CSA) with a population of approximately 870,781 people.[7] The area covers 1,583 square miles and is geographically characterized by predominantly flat terrain with the Rio Grande River forming a natural border. Hidalgo County experiences a subtropical climate with hot, humid summers and mild winters. Rainfall is fairly distributed throughout the year, with a peak storm season from March to May.

2.4 NUECES COUNTY BACKGROUND

The Nueces County area is located in the Coastal Prairies of the South Texas Region. The County is part of the Corpus Christi Metropolitan Statistical Area (MSA) as well as the Corpus Christi-Kingsville-Alice Combined Statistical Area (CSA) and has a population of approximately 353,178 people.[7] The area covers 1,166 square miles and is geographically characterized by flat, coastal prairies, with several waterbodies that make up the Nueces Estuary. Nueces County experiences a humid, subtropical climate with hot, humid summers and mild winters, influenced by prevailing southeast winds. Rainfall typically peaks in May and September.

2.5 TARRANT COUNTY BACKGROUND

The Tarrant County area is located in the North Texas Region. The county is part of the Dallas-Fort Worth-Arlington Metropolitan Statistical Area (MSA) and has a population of approximately

[7] https://www.census.gov/library/stories/state-by-state/texas.html

2,110,640 people.[7] The area covers 902 square miles and is geographically characterized by several lakes, as well as the Trinity River that flows through the county. Tarrant County experiences a subtropical climate with hot, humid summers and mild winters, with two distinct rainy seasons in spring and fall.

2.6 WEBB COUNTY BACKGROUND

The Webb County area is located in the South Texas Plains of the South Texas Region. The county is part of the Laredo Metropolitan Area, a Core Based Statistical Area (CBSA) and has a population of approximately 267,114 people.[7] The area covers 3,376 square miles and is geographically characterized by its flat terrain and the Rio Grande River that acts as a natural border to Mexico. Webb County experiences a semi-arid climate with hot, dry summers and mild winters. Rainfall is low, with a short but intense peak storm season in spring.

2.7 NARRATIVE FOR EACH GROUP OF EVENT DAYS

All weather maps, graphs, and smoke layer maps are included in Appendix A and are referenced in this chapter as Figure A-#. The National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) forecasts are included in Appendix B and are referenced in this chapter as Figure B-#. Imagery and data used for the narrative conceptual model comes from multiple sources:

- Weather maps (surface analysis) were downloaded from NOAA NWS Weather Predication Center: https://www.wpc.ncep.noaa.gov/archives/web_pages/wpc_arch/get_wpc_archives.php
- Weather maps (500 millibar (mb) height) were downloaded from NOAA NWS Storm Predication Center: https://www.spc.noaa.gov/obswx/maps/
- Upper air soundings were downloaded either from the University of Wyoming or Plymouth State University: https://weather.uwyo.edu/upperair/sounding.html and https://vortex.plymouth.edu/myowxp/upa/raobplt-a.html
- As part of its Hazard Mapping System (HMS), NOAA produces daily fire and smoke plume maps depicting the location of fires and smoke plumes detected by satellites (NOAA, 2003). The KML files were downloaded from NOAA and displayed on Google Earth: https://www.ospo.noaa.gov/products/land/hms.html#data
- NWS forecasts were downloaded from: https://mesonet.agron.iastate.edu/wx/afos/list.phtml The NWS Weather Forecasts offices used for each monitoring area include:
  - Austin/San Antonio office: Von Ormy Highway 16 monitors
  - Brownsville office: Edinburg East Freddy Gonzalez Drive monitor
  - Corpus Christi office: Dona Park, and World Trade Bridge
  - Dallas/Fort Worth office: Haws Athletic Center monitors
- Reported fire data from Mexico is archived by the Mexican government and is available at: https://monitor_incendios.cnf.gob.mx/incendios_tarjeta_semanal. The data contains information about fires from each Mexican state, such as the cause of fire and acreage burned.

2.7.1 Group 1 –Summary of May 5, 2022, Fire (Mexico/Central America) $PM_{2.5}$ Event for the World Trade Bridge Monitor.

Wildfire smoke from fires in Mexico affected the World Trade Bridge monitoring site on May 5, 2022. $PM_{2.5}$ concentrations peaked on the morning of May 5 and remained elevated until that afternoon as shown by the red line in Figure 2-1: *Hourly PM2.5 Concentrations on Days around Event (May 5, 2022) for the World Trade Bridge Monitor*. The NWS forecast mentioned light to strong winds (Figure B-1), and TCEQ forecasts mentioned agricultural burning; in Mexico and

Central America (Table C-1 for Group 1). A smoke plume can be seen traveling towards the monitor on NOAA HMS (Figure A-3) on May 5, 2022, with heavy fire points in Mexico. Figure 2-2: *Percentage of Reported Fire Instances by the Mexican Government, on and around May* 5, 2022, shows the causes of reported fires in Mexico, with almost half of the reported instances classified as unlikely to recur.

The surface charts in Figure A-1, on May 5, 2022, show a stationary front located to the north of Webb County with a weak dryline approaching the area. Winds in Webb County were light to moderate primarily out of the west. The 500 mb heights map in Figure A-2 shows high-pressure over the Bay of Campeche. The jet stream can be seen flowing from Mexico towards the northeast into Texas, including Webb County. This flow helped transport smoke from agricultural burning and wildfires in Mexico and Central America.

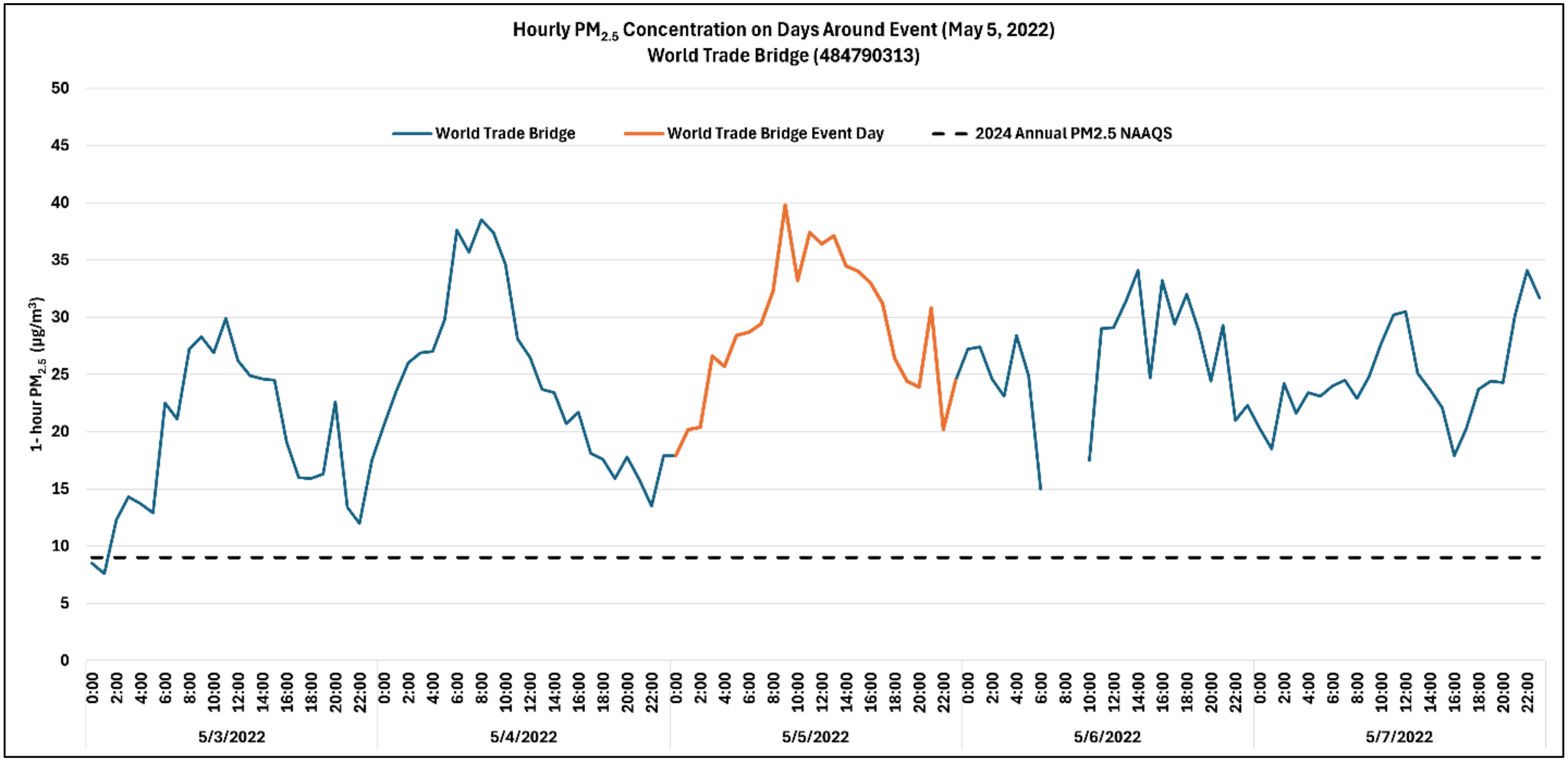

Figure 2-1: Hourly $PM_{2.5}$ Concentrations on Days around Event (May 5, 2022) for the World Trade Bridge Monitor

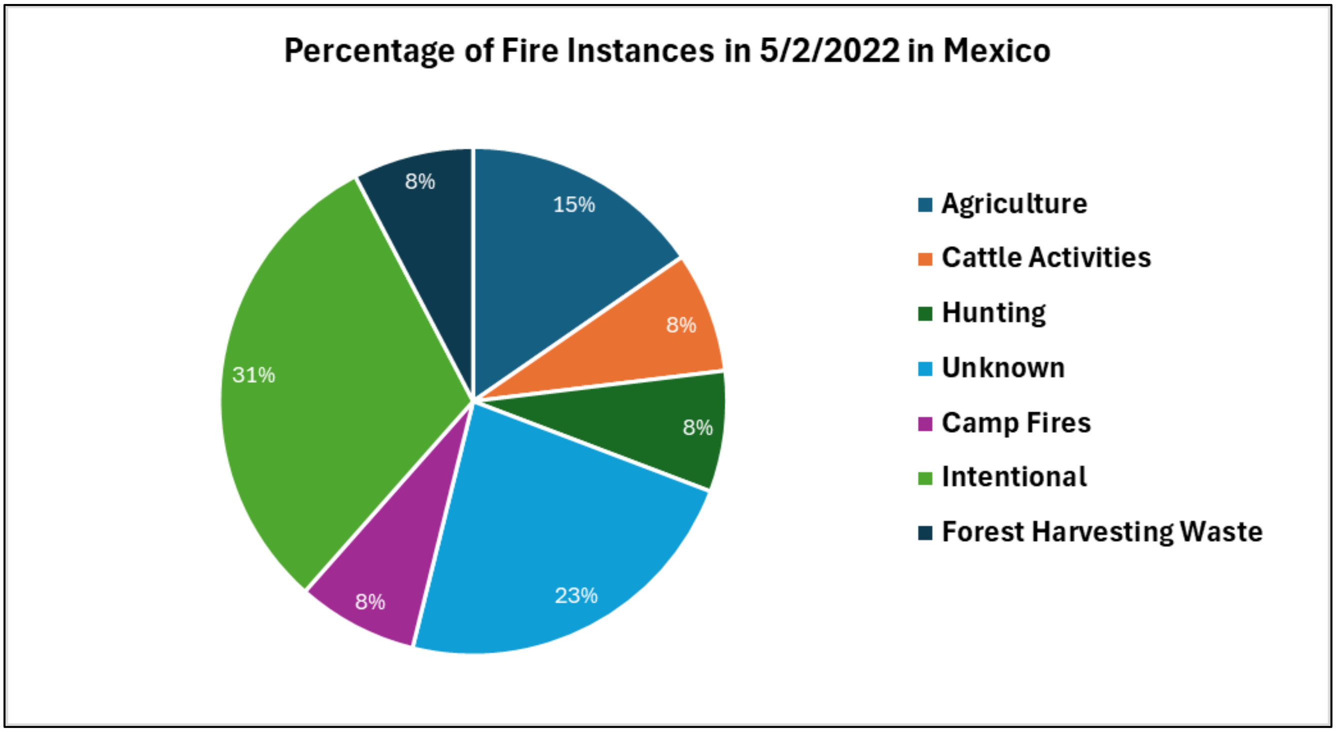

Figure 2-2: Percentage of Reported Fire Instances by the Mexican Government, on and around May 5, 2022

2.7.2 Group 2 – Summary of May 8, and May 9, 2022, Fire (Mexico/Central America) $PM_{2.5}$ Event for the Von Ormy Highway 16 Monitor, World Trade Bridge Monitor, and Haws Athletic Center Monitors

Wildfire smoke from fires in Mexico affected the World Trade Bridge monitoring site, the Von Ormy monitoring site, and Haws Athletic Center monitoring site on the event days as further discussed below. Figure 2-3: *Hourly PM2.5 Concentrations on Days around Event (May 8, 2022 – May 9, 2022) for the World Trade Bridge, Von Ormy Highway 16, and Haws Athletic Center Monitors* shows the hourly $PM_{2.5}$ concentrations on event dates. $PM_{2.5}$ concentrations were elevated on May 8 and May 9, 2022, at the World Trade Bridge site, as shown by the dotted green line, on May 8 at the Von Ormy Highway 16 site, as shown by the dotted magenta line, and on May 9 at the Haws Athletic Center site, as shown by the dotted blue line. Smoke plumes can be seen traveling towards the monitors on NOAA HMS (Figure A-12 and Figure A-13) on May 8 and 9 with heavy fire points in Mexico. Figure 2-4: *Percentage of Reported Fire Instances by the Mexican Government, on and around May 8, 2022, and May* 9, 2022, shows the causes of reported fires in Mexico, with almost sixty percent of the reported instances classified as unlikely to recur. The NWS archives mention variable winds and hazy conditions on May 8 and May 9, 2022 (Figure B-2), and TCEQ forecasts mentioned agricultural burnings in Mexico and Central America (Table C-2, for group 2).

The surface chart in Figure A-4 and A-5 shows southerly winds over Texas on May 8 and May 9, 2022. The 500 mb charts (Figure A-6 and A-7) indicate meridional ridging over East Texas with a high height center over Mexico. This high enabled subsidence over the region. Observed soundings from both Del Rio (Figure A-8 and Figure A-9) and Fort Worth (Figure A-10 and Figure A-11) also show subsidence inversions, indicating the downward movement of air. These soundings also show a dry atmosphere and southerly winds, which are both factors conducive to elevated $PM_{2.5}$ from Mexican wildfires.

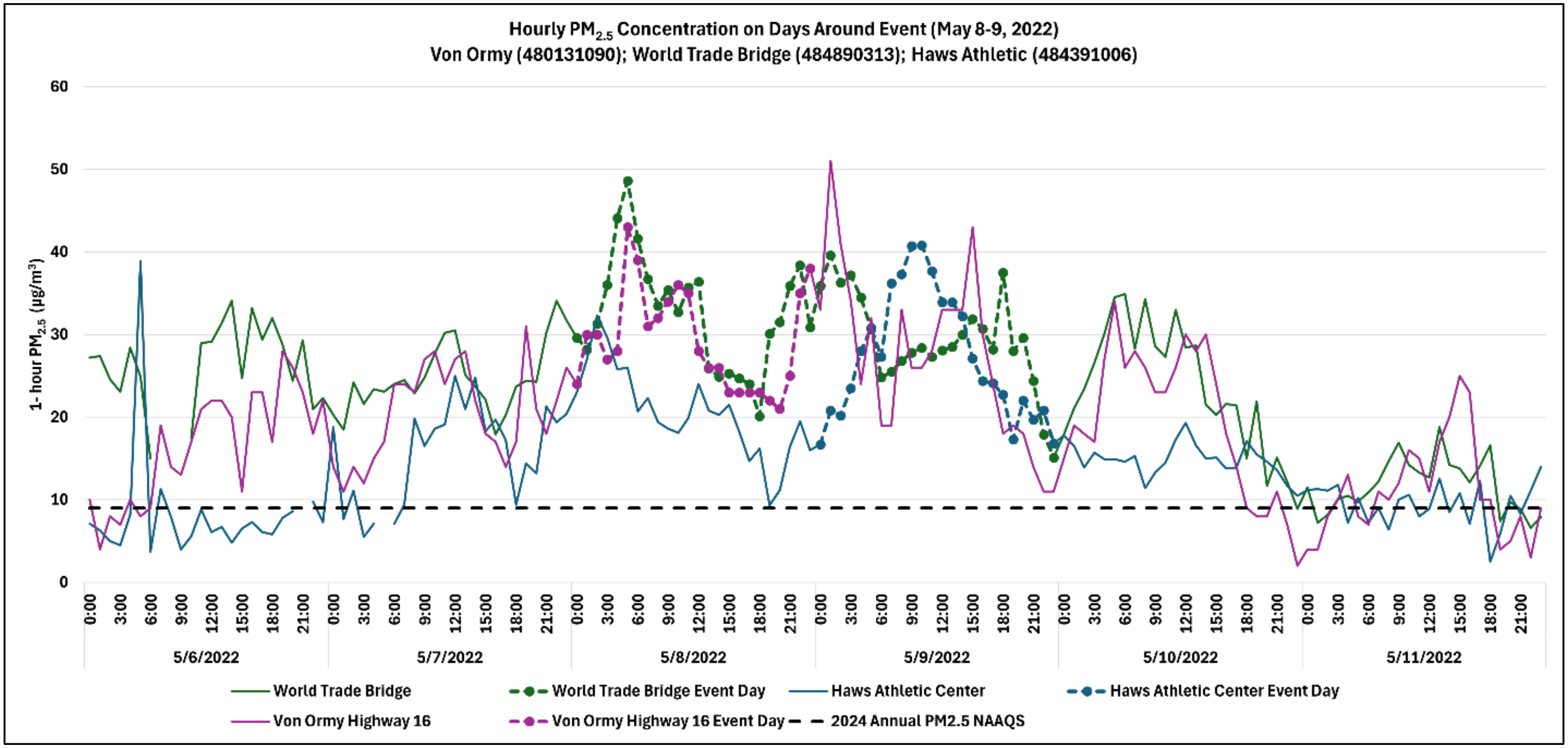

Figure 2-3: Hourly $PM_{2.5}$ Concentrations on Days around Event (May 8, 2022 – May 9, 2022) for the World Trade Bridge, Von Ormy Highway 16, and Haws Athletic Center Monitors

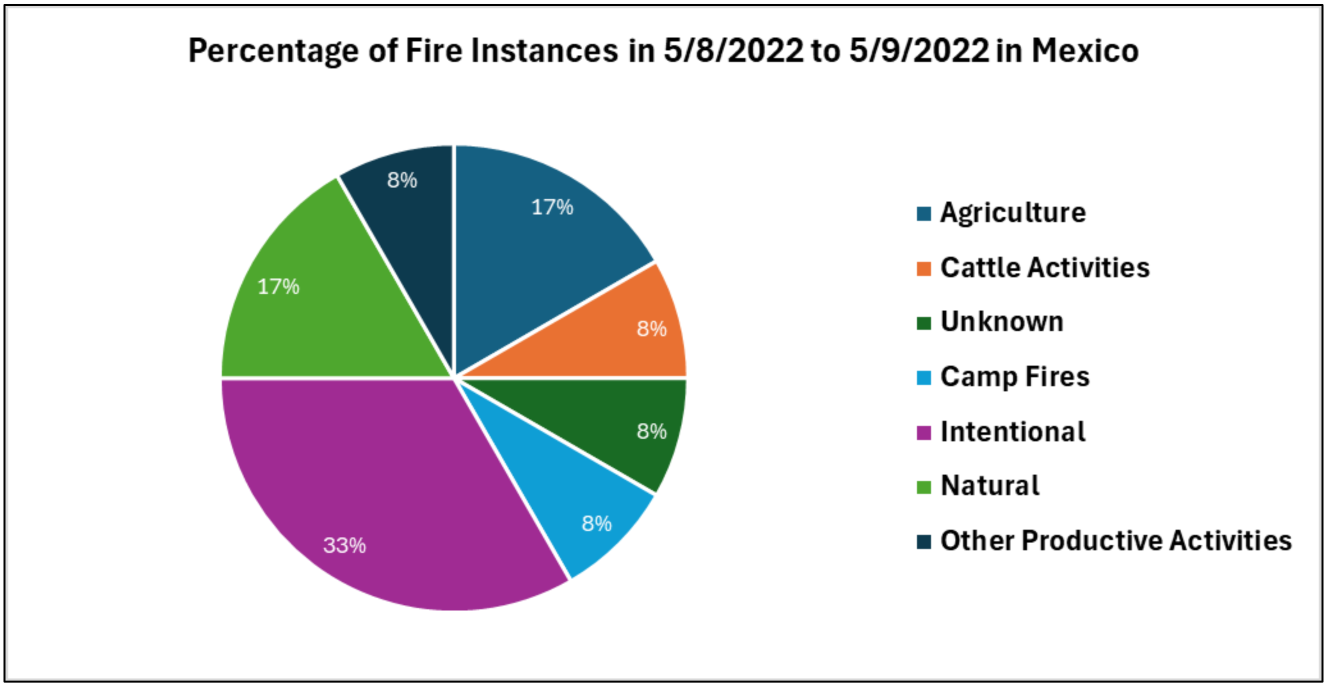

Figure 2-4: Percentage of Reported Fire Instances by the Mexican Government, on and around May 8, 2022, and May 9, 2022

2.7.3 Group 3– Summary of May 20 and May 21, 2022, Fire (Mexico/Central America) $PM_{2.5}$ Event for the Von Ormy Highway 16 Monitor, Haws Athletic Center Monitor, and World Trade Bridge Monitors

Wildfire smoke from fires (Mexico/Central America) affected the Haws Athletic Center monitoring site on May 20, 2022, and the Von Ormy Highway 16 monitoring site and World Trade Bridge monitoring site on May 20 and May 21, 2022. Figure 2-5: *Hourly PM2.5 Concentrations on Days around Event (May 20, 2022 – May 21, 2022) for the World Trade Bridge, Von Ormy Highway 16, and Haws Athletic Center Monitors* shows $PM_{2.5}$ concentrations were elevated on the event dates, as shown by the dotted green line at the World Trade Bridge, the dotted magenta line at the Von Ormy Highway 16, and the dotted blue line at the Haws Athletic Center monitoring sites. Figure 2-6: *Percentage of Reported Fire Instances by the Mexican Government, on and around May 20, 2022, and May 21, 2022*, shows the causes of reported fires in Mexico, with half of the reported instances classified as unlikely to recur.

Moderate heavy smoke can be seen covering monitoring site areas on both days, as seen on NOAA HMS map (Figure A-14 and A-15). The NWS archives mention gusty winds and hazy skies over Texas (Figure B-3 and Figure B-4). The TCEQ forecast (Table C-3) mentions smoke from agricultural burning in Mexico and Central America filtering into Texas and expanding over Southeast and North Central Texas that raised $PM_{2.5}$ levels on these days.

From the analysis of the surface chart for May 20, 2022 (Figure A-16), a dry line associated with a trough stretches over western Texas with surface winds from the south at 10-20 kts. The 500 mb (6:00 a.m. CDT) charts (Figure A-18), on May 20 show a small trough moved the previous day from Arizona to New Mexico. From the analysis of the sounding for Lake Charles for May 20, the surface wind is southerly at 20 kts (Figure A-20), bringing smoke-laden air from the south into Texas.

On the surface chart for May 21, 2022 (Figure A-17), there are southeasterly winds over South Texas, which facilitated the transport of smoke from Mexican and Central American fires to both the Von Ormy Highway 16 and World Trade Bridge monitors after it was pushed over the Gulf of America by upper-level winds. Longwave troughing is seen again at 500 mb (Figure A-19) over central U.S. that is inducing a southwesterly wind flow over Texas. The subsidence inversion at 950 mb on the observed sounding for Brownsville (Figure A-21) also indicates the downward forcing of air that pushed the smoke particles towards the surface at the affected monitor locations.

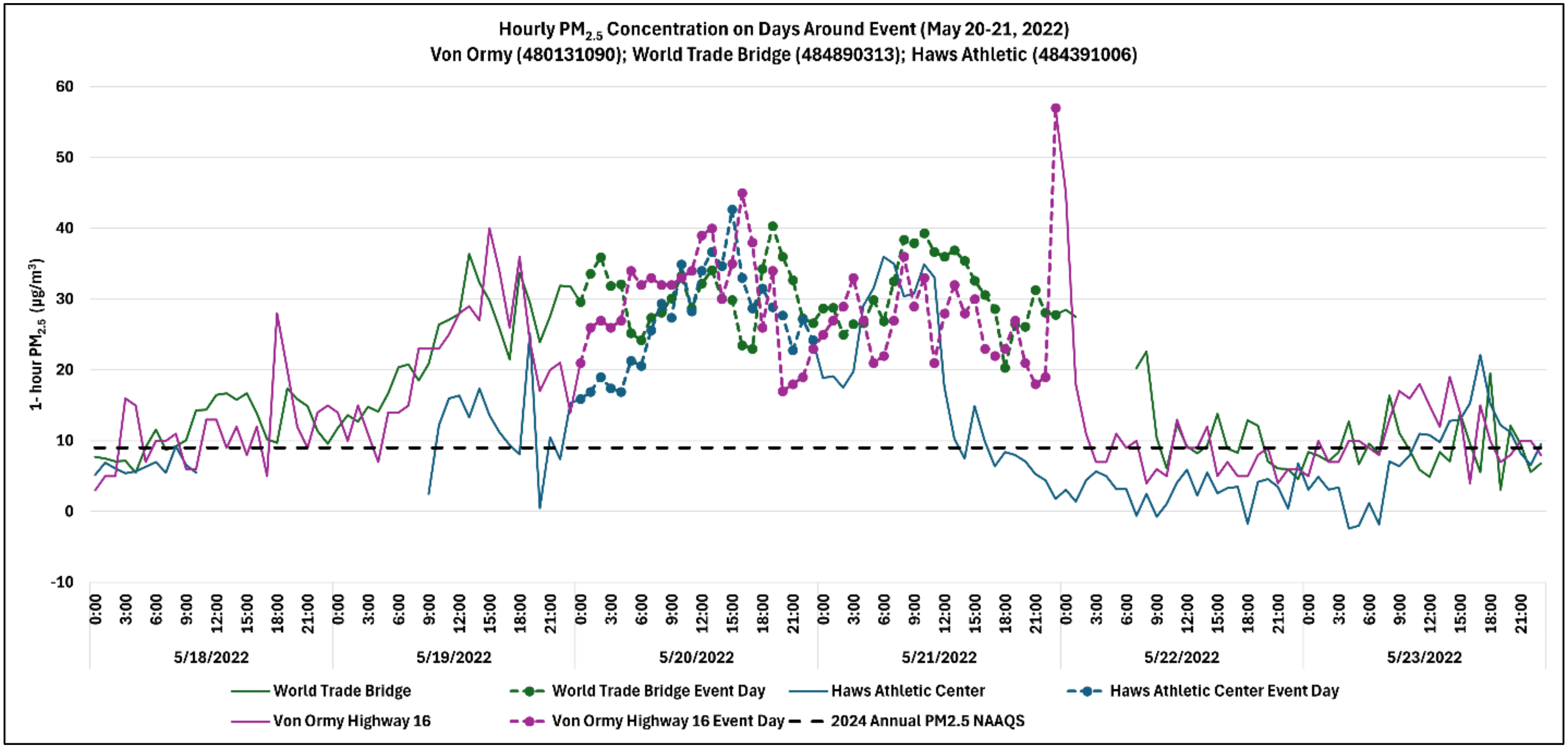

Figure 2-5: Hourly $PM_{2.5}$ Concentrations on Days around Event (May 20, 2022 – May 21, 2022) for the World Trade Bridge, Von Ormy Highway 16, and Haws Athletic Center Monitors

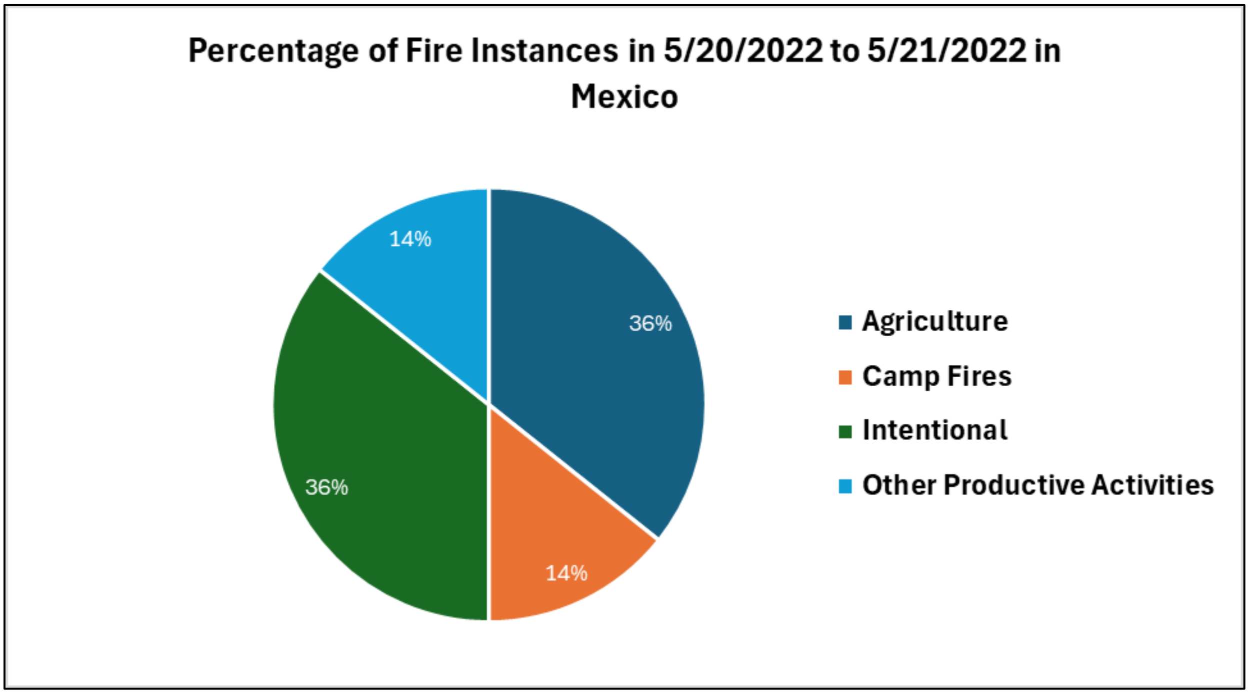

Figure 2-6: Percentage of Reported Fire Instances by the Mexican Government, on and around May 20, 2022, and May 21, 2022

2.7.4 Group 4– Summary of June 12 through June 17, 2022, African Dust $PM_{2.5}$ Event for Edinburg East Freddy Gonzalez Drive Monitor, Von Ormy Highway 16 Monitor, Haws Athletic Center Monitor, World Trade Bridge Monitor, and Dona Park Monitor

All five monitoring sites were impacted by Saharan dust on various days during a regional event from June 12 through June 17, 2022. Figure 2-7: *Hourly PM2.5 Concentrations on Days around Event (June 12, 2022 – June 17, 2022) for the World Trade Bridge, Von Ormy Highway 16, Dona Park, Edinburg East Freddy Gonzalez Drive, and Haws Athletic Center Monitors)* shows the hourly $PM_{2.5}$ concentrations increased substantially on event days as the pulse of dust reached the monitors. Elevated $PM_{2.5}$ concentrations can be seen on

- June 12, June 13, June 15, June 16, and June 17 at the Edinburg East Freddy site, as shown by the dotted orange line;
- June 12 and June 16 at the Dona Park site, as shown by the dotted magenta line;
- June 13, June 14, and June 16 at the Von Ormy Highway 16 site, as shown by the dotted light blue line;
- June 13, June 14, June 16, and June 17 at the Haws Athletic Center site, as shown by the dotted dark blue line; and
- June 13, June 16, and June 17 at the World Trade Bridge site, as shown by the dotted green line.

The NWS forecast (Figure B-5 through B-8) and TCEQ forecast (Table C-4) mention a Saharan dust plume contributing to hazy conditions. A local media outlet reported Saharan dust and hazy conditions over the region (See Appendix C, Figure C-1 through Figure C-5 for Group 4). The Edinburg East Freddy Gonzalez Drive monitor was impacted on June 12, June 13, and June 15 through June 17. The Dona Park monitor was impacted on June 12 and June 16. The Von Ormy Highway 16 monitor was impacted on June 13, June 14, and June 16. The Haws Athletic Center monitor was impacted on June 13, June 14, June 16, and June 17. The World Trade Bridge monitor was impacted on June 13 and June 16. The wind also traveled from the Gulf of

America to the South Texas area. Moderate Resolution Imaging Spectroradiometer (MODIS) combined Terra and Aqua Multi-Angle Implementation of Atmospheric Correction (MAIAC) Land Aerosol Optical Depth (AOD) images (Figure A-22 through A-27) show pulses of Saharan dust reached the Americas and Texas area. The concentration increases significantly at these monitoring sites, and there was a rise and fall in the concentrations at all five monitors with the arrival of these pulses. MODIS Combined Aqua and Terra MAIAC AOD images (Figure A-22 through A-27) corroborate the high concentration of dust seen in these areas with flow from Africa.

The surface charts and 500 mb charts (Figure A-28 through A-39) show coastal winds from the south at 10 kts, which led to the transport of smoke in the lower atmosphere from Mexico. On June 11, the longwave pattern over the continental U.S. was meridional with ridging over the Four Corners area (southwestern corner of Colorado, southeastern corner of Utah, northeastern corner of Arizona, and northwestern corner of New Mexico) and East Texas. The continental-tropical airmass over the southwest (high-height center) provided relative atmospheric stability over Texas through its subsidence (downward movement of air). As the high progressed over Texas on June 12, stability along with dry air from the continental tropical air mass led to a lack of precipitation that could have reduced any particulate matter in the atmosphere.

The surface chart, 500 mb chart, and soundings show that on June 13, a meridional pattern was present over the continental U.S. with ridging over Texas and the southeastern region. Winds at the surface level were from the southeast over the coast of Texas, which aided the transport of African dust in the upper atmosphere coming from the jet stream. The observed soundings (Figure A-40 through A-46) showed backing winds throughout the atmospheric column. Backing winds, which shift counterclockwise with height, are associated with dynamic sinking. This effect likely aided vertical mixing, bringing the upper-level African dust particles downward towards the surface, where they could impact the air monitors.

On June 14, the ridging at 500 mb had progressed over the eastern U.S. with continued southeasterly winds over East Texas. This flow continued to aid the transport of upper-level African dust from the jet stream to Texas. Winds at the surface over East Texas were southerly from 15-20 kts, indicating that gradient-level winds were mixing down to the ground level. The sounding from Corpus Christi showed backing winds, which are associated with downward mixing. The subsidence inversion present on both soundings also indicates sinking air, which likely aided the transport of African dust to the surface.

On June 15, the ridging over the eastern U.S. strengthened and began to resemble a blocking pattern in the form of a sharp amplitude ridge. The high-height center at 500 mb stacks down to the surface high-pressure center over Mississippi, which provided relative high-pressure and atmospheric stability to Texas. This stability led to a lack of any significant precipitation over Texas that might have reduced African dust in the lower atmosphere. Backing winds are seen in the lower atmosphere from the Corpus Christi sounding, which continued the downward mixing of the air mass, aiding the transport of African dust to the surface.

On June 16, the ridging and semi-blocking pattern progressed slightly downstream over the eastern U.S. Similar to June 15, high heights stack down to the surface over Mississippi providing relative high-pressure to Texas. The vertical profile from rawinsonde data at Shreveport shows backing winds in the lower portion of the atmosphere, which are associated with downward mixing. The presence of a deep surface-based layer of static stability also indicates subsidence. These factors likely aided the transportation of African dust in the upper atmosphere to the surface.

On June 17, the former ridge progressed downstream away from the continental U.S., while a second ridge strengthened over Texas, creating a large area of high heights at 500 mb. This stacks down to high-pressure over Texas at the surface, which is associated with atmospheric stability and a lack of rain. The African dust that had been present for the prior 5 days over Texas was still likely being pushed downward by the backing winds throughout the vertical column of the airmass. This effect likely aided vertical mixing, bringing the upper-level African dust particles downward towards the surface, where they could impact the air monitors.

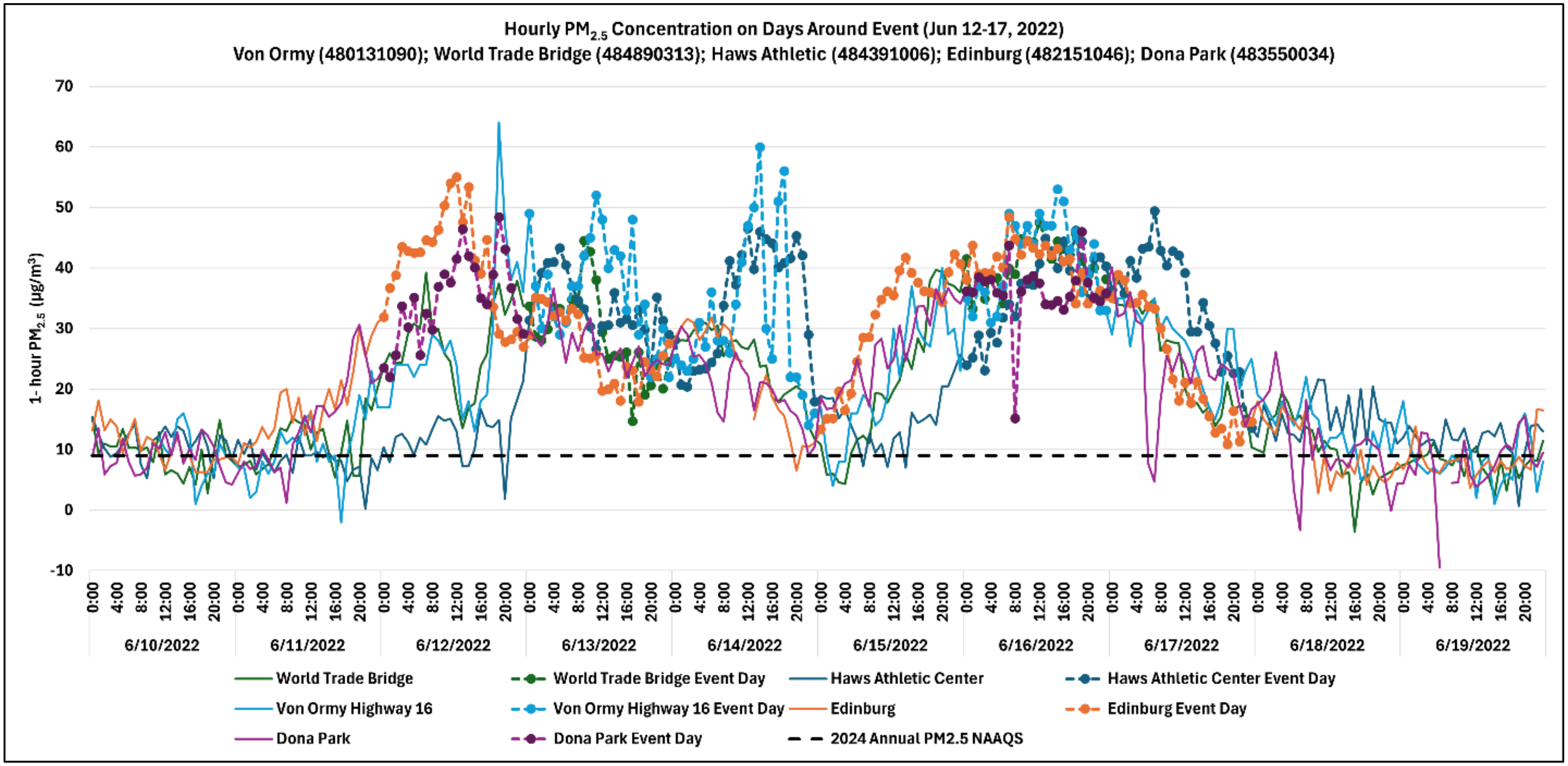

Figure 2-7: Hourly $PM_{2.5}$ Concentrations on Days around Event (June 12, 2022 – June 17, 2022) for the World Trade Bridge, Von Ormy Highway 16, Dona Park, Edinburg East Freddy Gonzalez Drive, and Haws Athletic Center Monitors

2.7.5 Group 5– Summary of July 16 through July 18, 2022, African Dust $PM_{2.5}$ Event for the Edinburg East Freddy Monitor, Haws Athletic Center Monitor, Von Ormy Highway 16 Monitor, and World Trade Bridge Monitors

Saharan dust affected the Edinburg East Freddy Gonzalez Drive and World Trade Bridge monitoring sites on July 16, 2022; the Von Ormy, Haws Athletic Center, Edinburg East Freddy Gonzalez Drive, and World Trade Bridge monitoring sites on July 17, 2022; and the Haws Athletic Center monitoring site on July 18, 2022. Figure 2-8: *Hourly PM2.5 Concentrations on Days around Event (July 16, 2022 – July 18, 2022) for the World Trade Bridge, Von Ormy Highway 16, Edinburg East Freddy Gonzalez Drive, and Haws Athletic Center Monitors* shows that $PM_{2.5}$ concentrations increased substantially on event days as the pulses of dust reached these monitors. The elevated concentrations are highlighted at the Edinburg East Freddy Gonzalez Drive site by the dotted magenta line; the World Trade Bridge site by the dotted green line; the Von Ormy Highway 16 site by the dotted blue line; and the Haws Athletic Center site by the dotted orange line. The NWS forecast (Figure B-9 and Figure B-10) mentions Saharan dust is expected in the region and expected to contribute to hazy conditions. The TCEQ forecast (Table C-5) and a local news station also reported Saharan dust impacting the area (Figure C-6 and Figure C-7 for Group 5). MODIS Combined Aqua and Terra MAIAC AOD images (Figure A-47 through A-49) corroborate the high concentration of dust seen in these areas with flow from Africa.

The surface chart and 500 mb chart, and soundings from Corpus Christi and Shreveport (Figures A-50 through A-59**)** show that on July 16, 2022, a longwave ridge was in place over central Continental United States (CONUS). There is a large high center over the four-corner states and North Texas at the mid-level of the atmosphere. There is evidence of a shortwave trough moving just downstream of the ridge peak. The dominant feature over the South Texas Coast is high-pressure and subsidence. This led to a lack of precipitation that day that might have reduced atmospheric PM. Additionally, light variable winds are seen along the coast of Texas. The sounding at 12Z (6:00 a.m. CDT) showed veering winds in the lower atmosphere from the surface up to 750 mb, then backing winds from 750 mb up to the tropopause. There was a radiation inversion at 12Z (6:00 a.m. CDT) which is typical during morning hours. This inversion, or cap, likely broke around 7:00 a.m. CDT or 8:00 a.m. CDT as the surface temperature reached 28˚C, allowing for winds to mix down and bring Saharan dust to the surface.

The longwave pattern over the U.S. on July 17, 2022, was similar to the previous day, and the major short-wave trough had progressed downstream by roughly 1-2 degrees. Ridging, high - pressure, and subsidence were the major features over Texas. The surface chart shows light variable winds over Texas. Both soundings from Corpus Christi and Shreveport show radiation inversions and backing winds in the lower atmosphere. These inversions likely broke when daytime heating occurred, and Saharan dust from the upper atmosphere was able to be mixed down to the surface. Backing winds and subsidence from the high-pressure and ridging contributed to this downward mixing. At 500 mb there is a sharp amplitude ridge over the central U.S. with a high height center over Texas. This high height center stacked down to high-pressure at the surface. The 500 mb winds in South Texas were from the east, which continued to facilitate the transport of Saharan dust to the region. High-pressure and subsidence over the Edinburg East Freddy Gonzalez Drive monitor pushed this dust to the surface, resulting in a $PM_{2.5}$ exceedance event.

On July 18, 2022, the 500 mb chart shows that the longwave ridge and high height center remained in place over the central U.S. The previously mentioned major short-wave trough had progressed downstream roughly 1-2 degrees from July 17. This trough stacks down to a low-pressure center, seen on the surface chart over Oklahoma and North Texas. The rawinsonde sounding from Shreveport shows a subsidence inversion at roughly 950 mb, indicating sinking air. This likely aided the movement of Saharan dust in the upper atmosphere towards the surface.

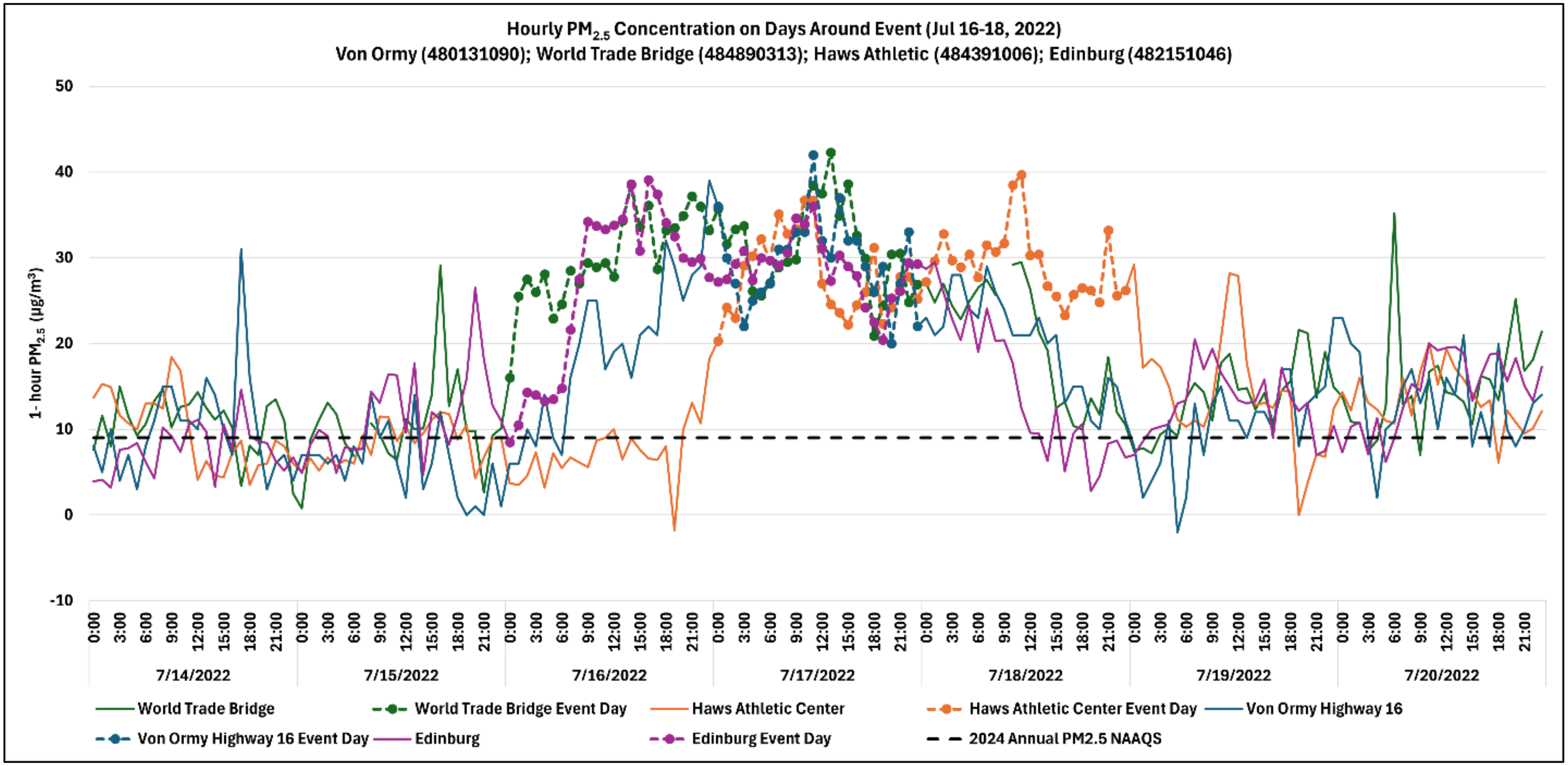

Figure 2-8: Hourly $PM_{2.5}$ Concentrations on Days around Event (July 16, 2022 – July 18, 2022) for the World Trade Bridge, Von Ormy Highway 16, Edinburg East Freddy Gonzalez Drive, and Haws Athletic Center Monitors

2.7.6 Group 6– Summary of October 3, 2022, Prescribed Fire $PM_{2.5}$ Event for the Haws Athletic Center Monitor

The Haws Athletic Center monitor was impacted by prescribed fire smoke on October 3, 2022. Elevated $PM_{2.5}$ concentrations on this day are shown in Figure 2-9: *Hourly PM2.5 Concentrations on Days around Event (October 3, 2022) for the Haws Athletic Center Monitor*, highlighted by the orange line. TCEQ forecasts mention seasonal fires in East Texas/Southern U.S. (Table C-6).

High-pressure was present over North Texas on October 3, 2022, as seen in the surface weather map below (Figure A-60 and Figure A-61). As a result, winds were light and variable over Tarrant County. This area of high-pressure is also present at the mid-levels of the atmosphere with light transport from the northeast into the area, which aided transport of smoke from agricultural fires in the Mississippi River valley to move into the Tarrant County area (Figure A-62).

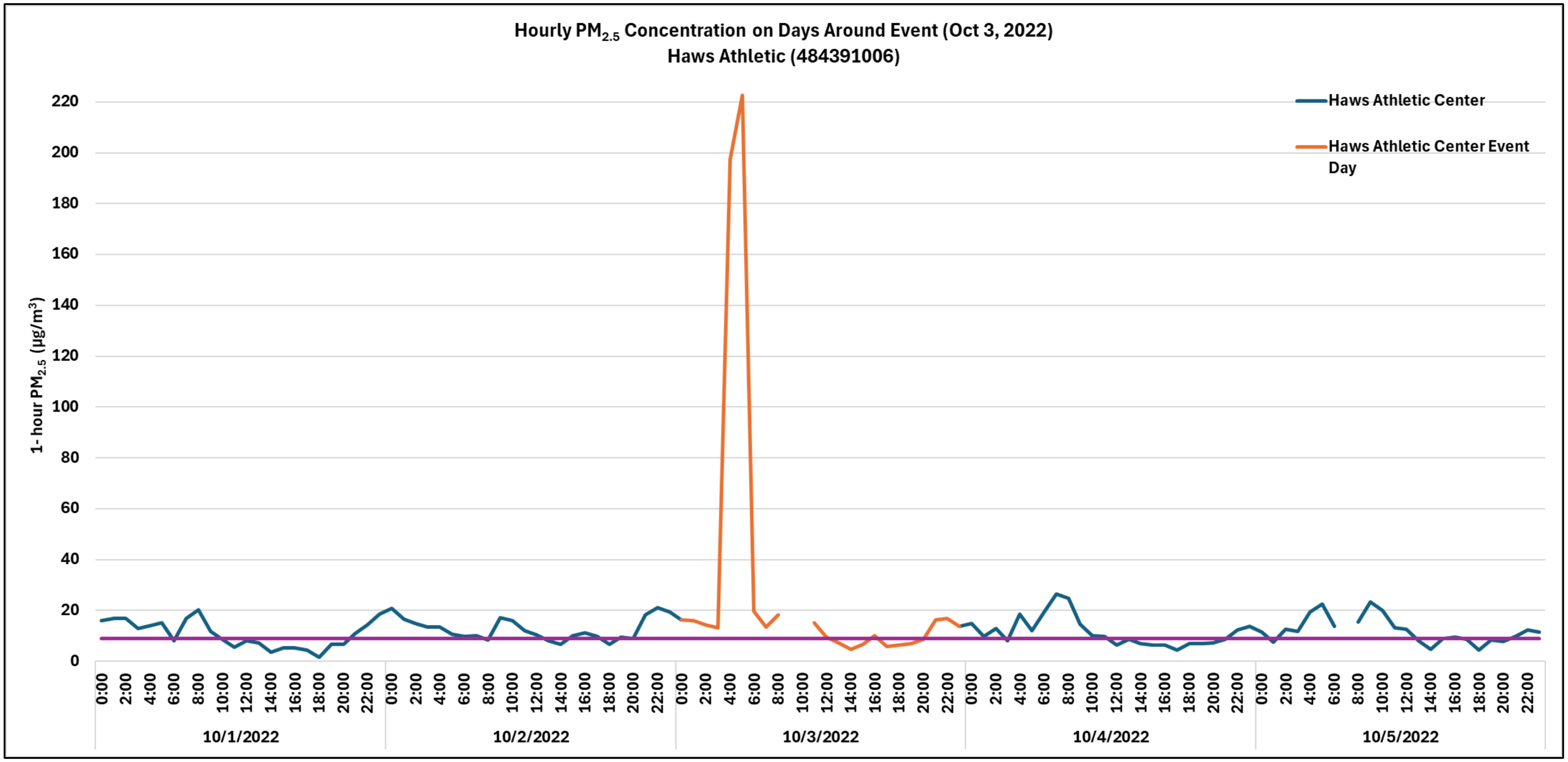

Figure 2-9: Hourly $PM_{2.5}$ Concentrations on Days around Event (October 3, 2022) for the Haws Athletic Center Monitor

SECTION 3: CLEAR CAUSAL RELATIONSHIP

3.1 OVERVIEW

This section satisfies the Exceptional Events Rule Requirements at 40 CFR §50.14(c)(3)(iv)(B) and 40 CFR §50.14(c)(3)(iv)(C): The event affected air quality in such a way that there exists a clear, causal relationship between the specific event and the monitored exceedance(s) or violations(s); including support from analyses comparing the claimed event-influenced concentrations to concentrations at the same monitoring site(s) at other times.

The analyses presented in this section vary depending on the event type (Prescribed Fire, Wildland Fire, and African Dust) as well the tier level, based on observed concentrations, associated with each event day. The analyses include a comparison of the event-related concentration to historical concentrations, evidence that the emissions from the events were transported to the monitor, and evidence that the events related emissions affected the monitor.

TCEQ determined the tier levels for the event days using EPA's *$PM_{2.5}$ Tiering Tool - for Exceptional Events Analysis*.[8] Tiering thresholds, established for each site, are used to classify event days as Tier 1 or Tier 2 or Tier 3 days. All 2022 event days are Tier 1 or Tier 2 days.

- Tier 1 event days are those when monitored $PM_{2.5}$ exceedances or violations are clearly influenced by causal events. Tier 1 event days require fewer pieces of evidence to establish the clear causal relationship. This tier is associated with a $PM_{2.5}$ concentration that is greater than or equal to 1.5x the tiering threshold.
- Tier 2 event days are those with $PM_{2.5}$ concentrations that are less extreme than Tier 1 days but still higher than concentrations on most non-event related concentrations, typically between 1 to 1.5x the tiering threshold. Tier 2 event days require more evidence than Tier 1 days to establish the clear causal relationship.

The determination of the appropriate tiering level began with an analysis of the measured $PM_{2.5}$ air quality associated with the candidate event in relation to historical concentrations. TCEQ compared the concentration of each event day to the lesser value with all "Request Exclusion" (R) qualifiers excluded of either: (a) the most recent 5-year month-specific 98th percentile for 24-hour $PM_{2.5}$ data, or (b) the minimum annual 98th percentile for 24-hour $PM_{2.5}$ data for the most recent 5-year period.

Figure 3-1: *24-Hour $PM_{2.5}$ Concentrations, 2022 Event Days and Tier 1 and Tier 2 Thresholds for the Von Ormy Highway 16 Monitor*, *Figure 3-2: 24-Hour $PM_{2.5}$ Concentrations, 2022 Event Days and Tier 1 and Tier 2 Thresholds for the Edinburg East Freddy Gonzalez Drive Monitor*, Figure 3-3: *24-Hour $PM_{2.5}$ Concentrations, 2022 Event Days and Tier 1 and Tier 2 Thresholds for the Dona Park Monitor*, *Figure 3-4: 24-Hour $PM_{2.5}$ Concentrations, 2022 Event Days and Tier 1 and Tier 2 Thresholds for the World Trade Bridge Monitor*, *Figure 3-5: 24-Hour $PM_{2.5}$ Concentrations, 2022 Event Days and Tier 1 and Tier 2 Thresholds for the Haws Athletic Center Monitor*, show 24-hour $PM_{2.5}$ concentrations on 2022 event days compared to non-event days relative to the Tier levels for each monitor.

[8] https://www.epa.gov/air-quality-analysis/pm25-tiering-tool-exceptional-events-analysis

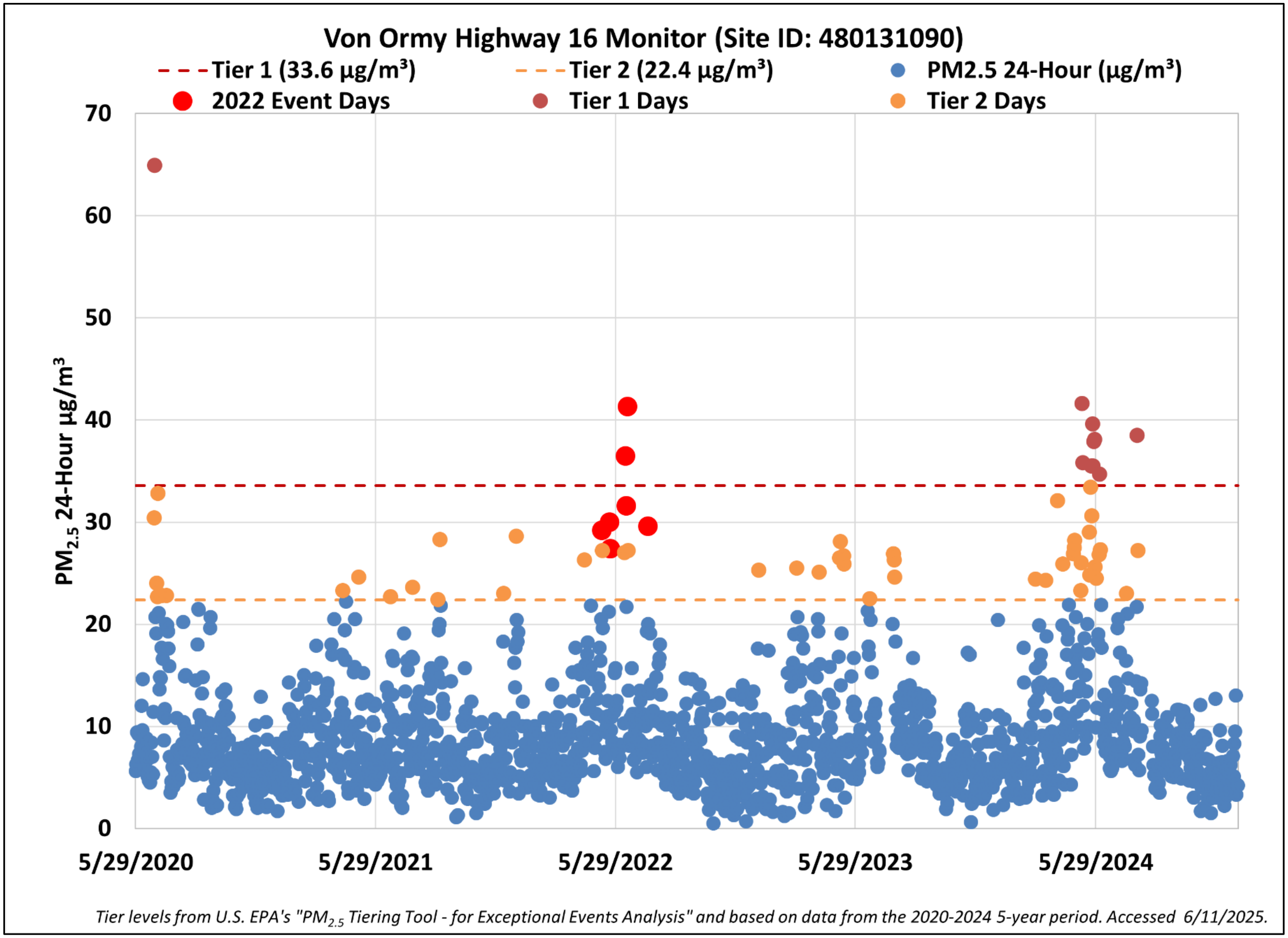

Figure 3-1: 24-Hour $PM_{2.5}$ Concentrations, 2022 Event Days and Tier 1 and Tier 2 Thresholds for the Von Ormy Highway 16 Monitor

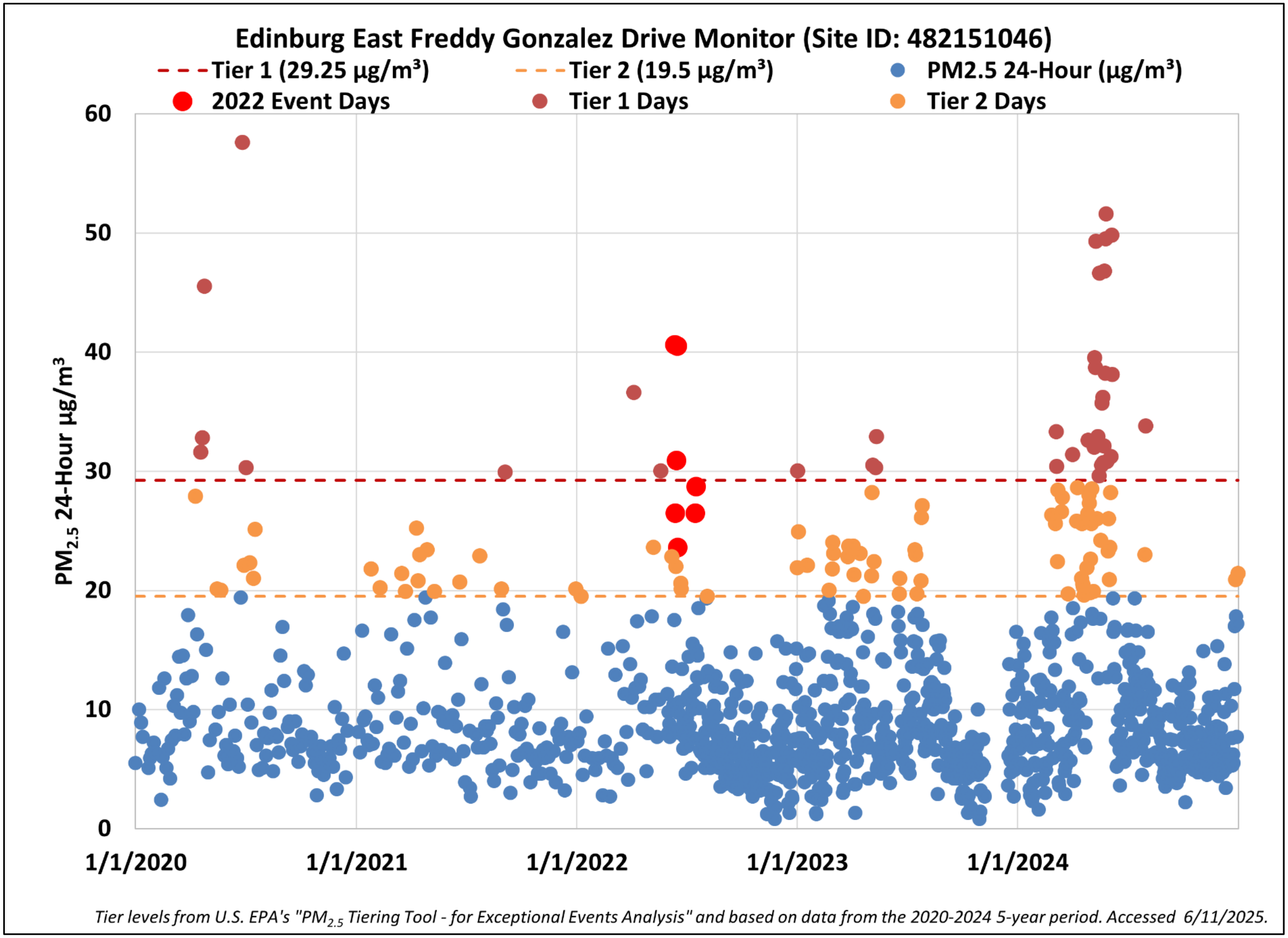

Figure 3-2: 24-Hour $PM_{2.5}$ Concentrations, 2022 Event Days and Tier 1 and Tier 2 Thresholds for the Edinburg East Freddy Gonzalez Drive Monitor

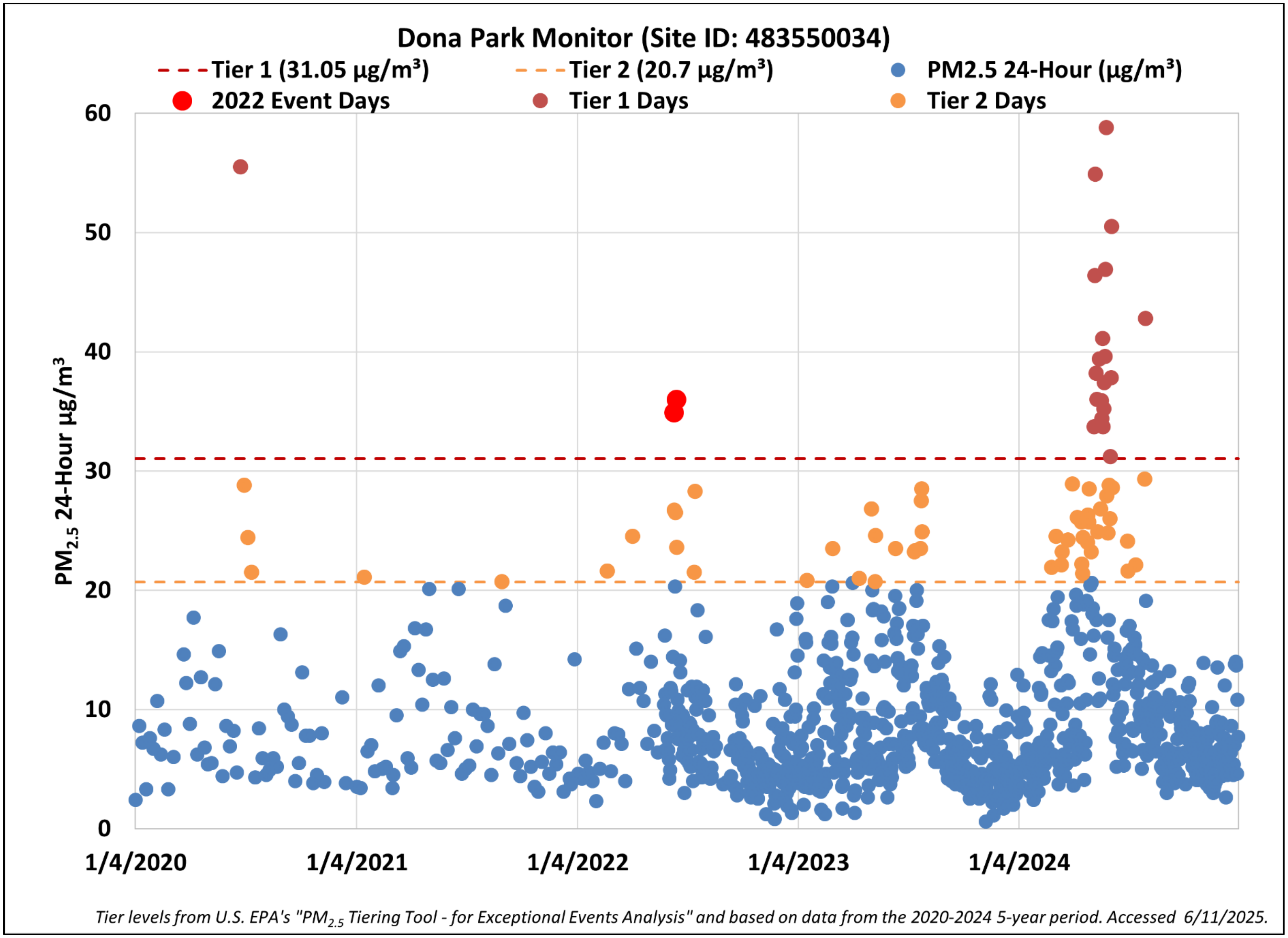

Figure 3-3: 24-Hour $PM_{2.5}$ Concentrations, 2022 Event Days and Tier 1 and Tier 2 Thresholds for the Dona Park Monitor

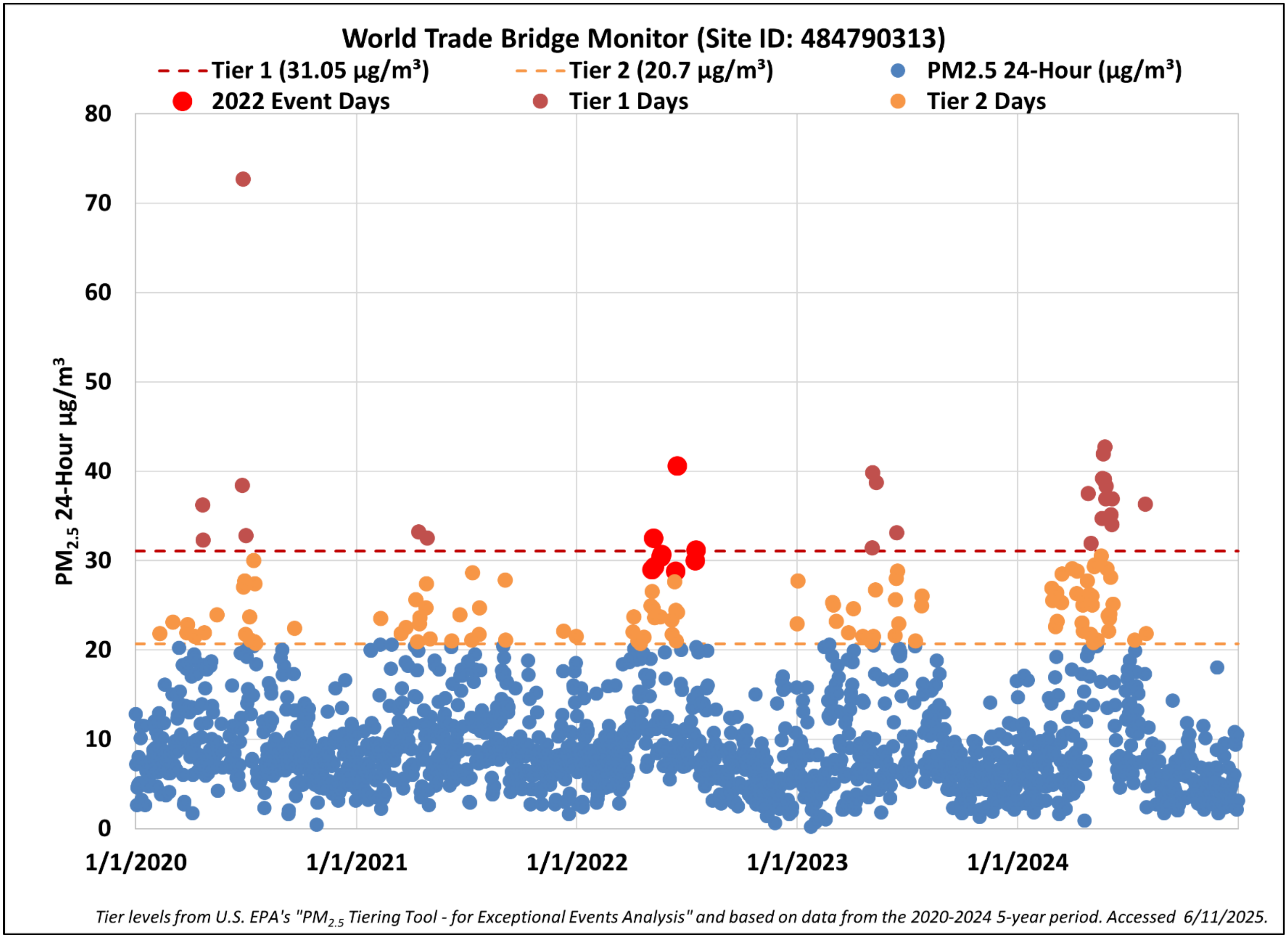

Figure 3-4: 24-Hour $PM_{2.5}$ Concentrations, 2022 Event Days and Tier 1 and Tier 2 Thresholds for the World Trade Bridge Monitor

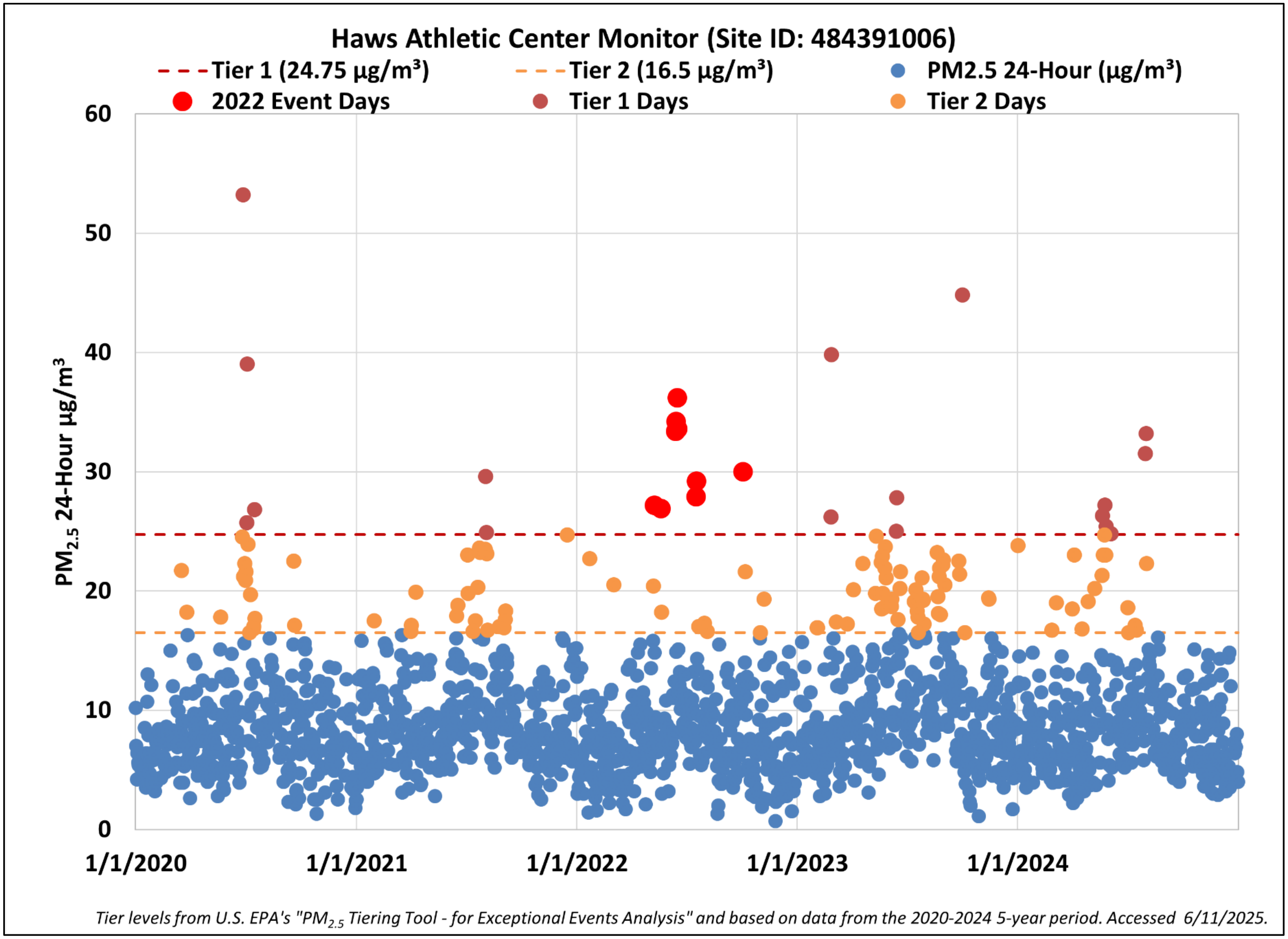

Figure 3-5: 24-Hour $PM_{2.5}$ Concentrations, 2022 Event Days and Tier 1 and Tier 2 Thresholds for the Haws Athletic Center Monitor

3.2 CLEAR CAUSAL EVIDENCE

In addition to Figure 3-1, Figure 3-2, Figure 3-3, Figure 3-4, and Figure 3-5, which show 24-hour $PM_{2.5}$ concentrations on event and non-event days at each monitor, additional data are used to demonstrate a clear causal relationship between the $PM_{2.5}$ concentrations observed on an event day and the identified exceptional event day. Imagery and data used for the clear causal evidence come from multiple sources:

- Air parcel trajectories were produced using the National Oceanic and Atmospheric Administration (NOAA) Applied Research Laboratory (ARL) HYSPLIT model available on the ARL HYSPLIT webpage: https://www.arl.noaa.gov/hysplit/. HYSPLIT models simulate the dispersion and trajectory of substances transported and dispersed through the atmosphere over local to global scales. The backward trajectory analyses presented in this document were used to determine the origin of air masses and establish source-receptor relationships.
    - For the combined trajectory and fire maps, these trajectories show the modeled path of the air mass from 72 hours arriving at different heights (100 meters, 500 meters, and 800 meters above ground level (AGL)) to the monitor and arriving at the hour with the highest concentration on the relevant date. The meteorological data input used for these trajectories comes from the Global Data Assimilation System (GDAS) run by the National Weather's Service Centers for Environmental Prediction (NCEP). Additional information is available at: https://www.ready.noaa.gov/gdas1.php.
    - For the dust trajectories from Africa, forward trajectories started from a matrix that was placed over western Africa. With the matrix utility, the user specifies the southwest and northeast point of a four-sided polygon as well as the time at which trajectories are to be generated. When the matrix utility is run, trajectories for all points within the polygon are simultaneously initiated. In this application, there were approximately 200 trajectory starting points. The duration of each trajectory was 240 to 360 hours (10 to 15 days) depending on how long it took for the air parcels to reach Texas. The meteorological data input used is also GDAS.
    - For forward trajectories on days impacted by fires in Mexico/Central America, trajectories were started 72 hours ahead of the event day at 500 meters AGL using the GDAS meteorological data.
- Hourly $PM_{2.5}$ event concentrations were compared with typical concentrations (Tier 3 median) for each hour. A "typical" concentration is defined as the median hourly $PM_{2.5}$ concentration at a particular monitor for all Tier 3 dates that had available data from 2020 through 2024. Tier 1 and Tier 2 dates were not included in this dataset because these two classifications are commonly associated with exceptional events and were therefore not considered as "typical." Tiering classifications were based on 2020 through 2024 data available via the EPA's tiering tool: https://www.epa.gov/air-quality-analysis/pm25-tiering-tool-exceptional-events-analysis. Data are from Texas Air Monitoring System (TAMIS) files sourced from EPA's Air Quality System (AQS) Raw Data Report: https://www.epa.gov/outdoor-air-quality-data. Data were downloaded on May 23, 2025.
- Smoke plume maps are from the AirNow Fire and Smoke Map: https://fire.airnow.gov/.[9] This map also shows the Air Quality Index (AQI) for each monitor. Additional information about AQI is available on the AirNow website: https://www.airnow.gov/aqi/aqi-basics/.
- Media reports and TCEQ forecast discussions are provided in Appendix C. Media report links are referenced with the figure. TCEQ forecasts for event days are archived and available at: https://amdaftp.tceq.texas.gov/exceptional_events/.

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[9] AirNow is a partnership of the U.S. Environmental Protection Agency, National Oceanic and Atmospheric Administration (NOAA), National Park Service, NASA, Centers for Disease Control, and tribal, state, and local air quality agencies.

- Speciation data, when available, from TAMIS.
  Satellite imagery from NASA Worldview: https://worldview.earthdata.nasa.gov/ was captured using Corrected Reflectance (True Color) layers from the MODIS (Moderate Resolution Imaging Spectroradiometer) instrument on either Aqua or Terra satellites. The Terra satellite travel north to south across the equator in the late morning where the Aqua satellite travels south to north across the equator in the early afternoon. The satellites used for each event date were chosen based on the best representation of potential evidence.

3.2.1 Group 1: Evidence for May 5, 2022, Fire (Mexico/Central America) $PM_{2.5}$ Event for the World Trade Bridge Monitor

May 5, 2022, was identified as a Tier 2 day at the World Trade Bridge Monitor with a 24-hour concentration of 29 µg/m³. Changes in the hourly temporal pattern with elevated concentrations of $PM_{2.5}$ sustained through the day is seen in Figure 3-6: *Hourly $PM_{2.5}$ Concentrations on May 5, 2022, Compared to Typical Concentrations at the World Trade Bridge Monitor* during the event, compared to typical non-event data (Tier 3 Median). Figure 3-7: *AirNow HMS Smoke Plume for May 5, 2022*, shows an HMS smoke plume over the World Trade Bridge monitor, with the yellow dot denoting air quality in the moderate category. The HYSPLIT backward trajectory at 500 m and 800 m AGL passes through the fires in Mexico, as shown in Figure 3-8: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the World Trade Bridge Monitor on May 5, 2022*. Additionally, HYSPLIT forward trajectories starting at 72 hours before the event day in Mexico arrived at Texas, as shown in Figure 3-9: *NOAA HYSPLIT 72-Hour Forward Trajectories Originating from Areas in Mexico with Fires, Starting on May 2, 2022*. The evidence provided meets requirements for Tier 2 demonstrations for the World Trade Bridge monitor impacted by fires in Mexico.

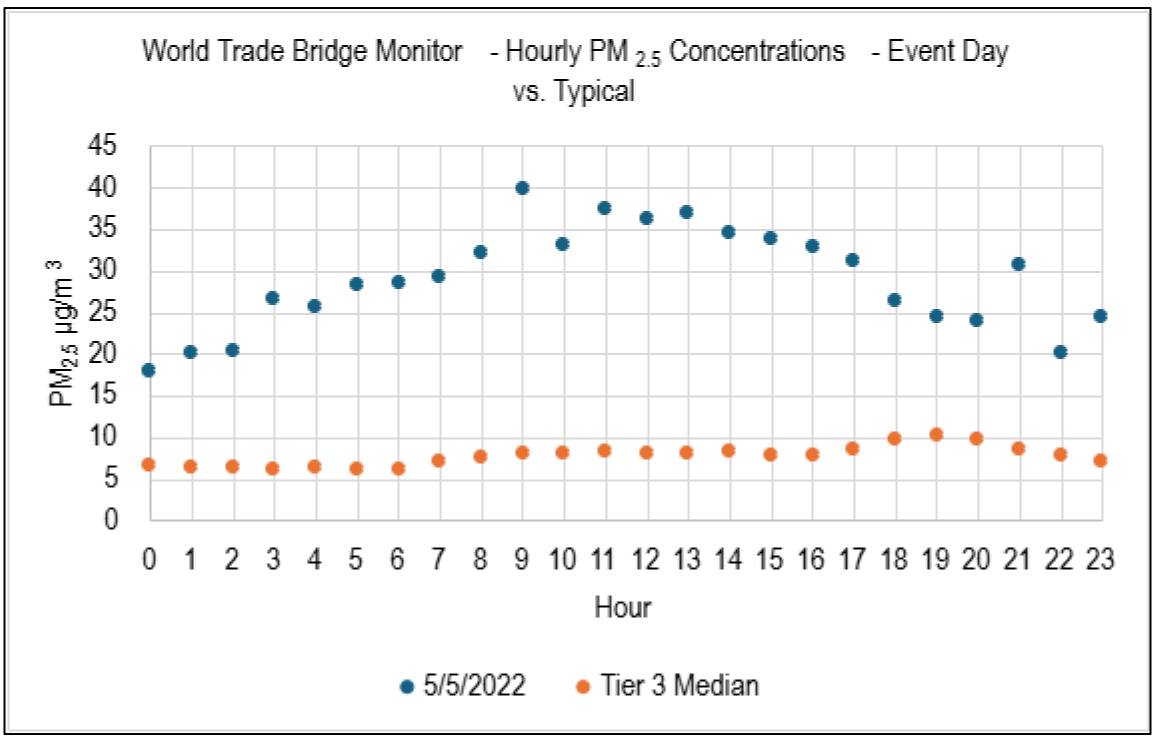

Figure 3-6: Hourly $PM_{2.5}$ Concentrations on May 5, 2022, Compared to Typical Concentrations at the World Trade Bridge Monitor

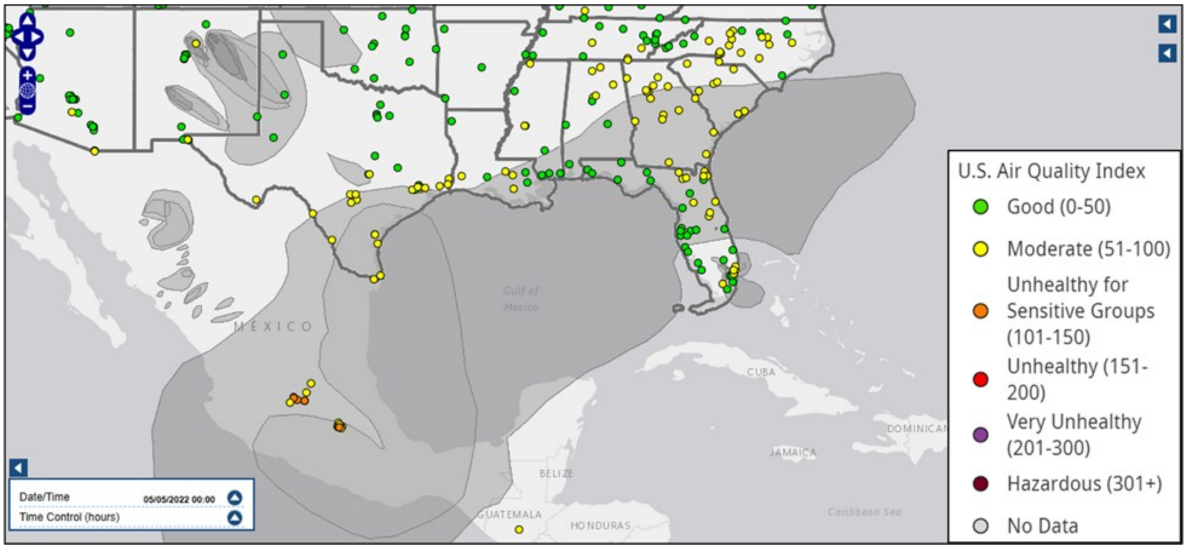

Figure 3-7: AirNow HMS Smoke Plume for May 5, 2022

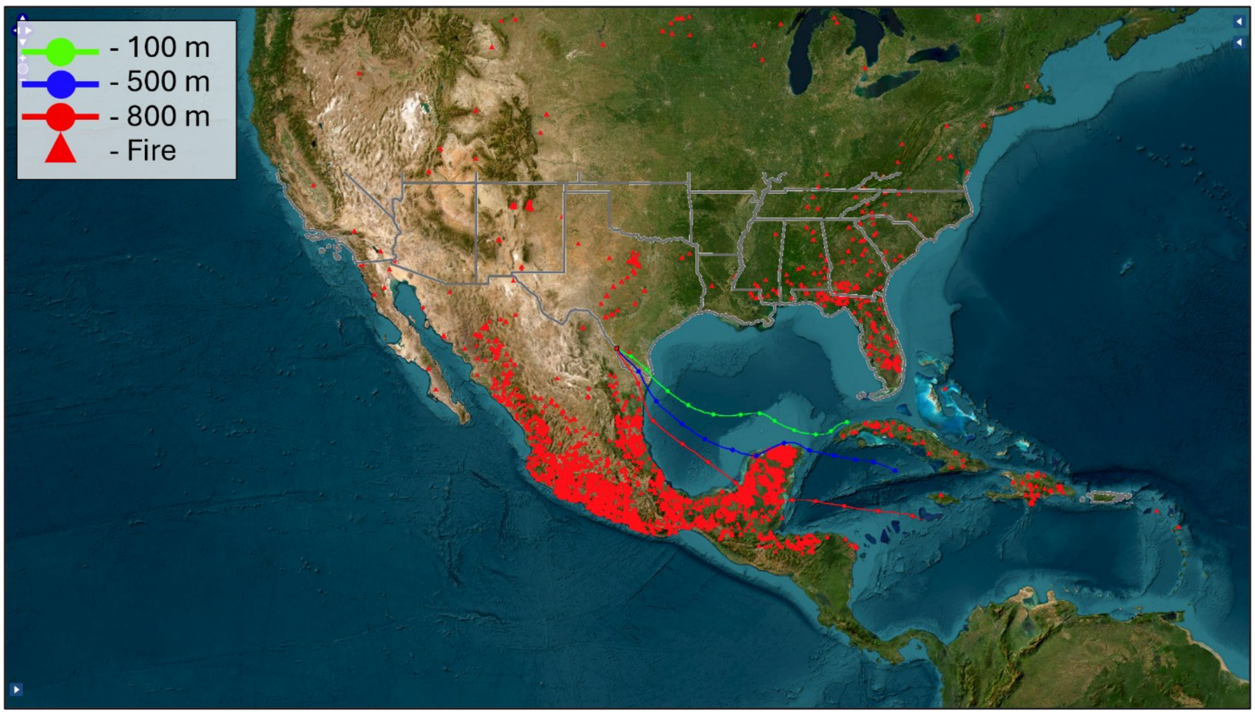

Figure 3-8: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the World Trade Bridge Monitor on May 5, 2022

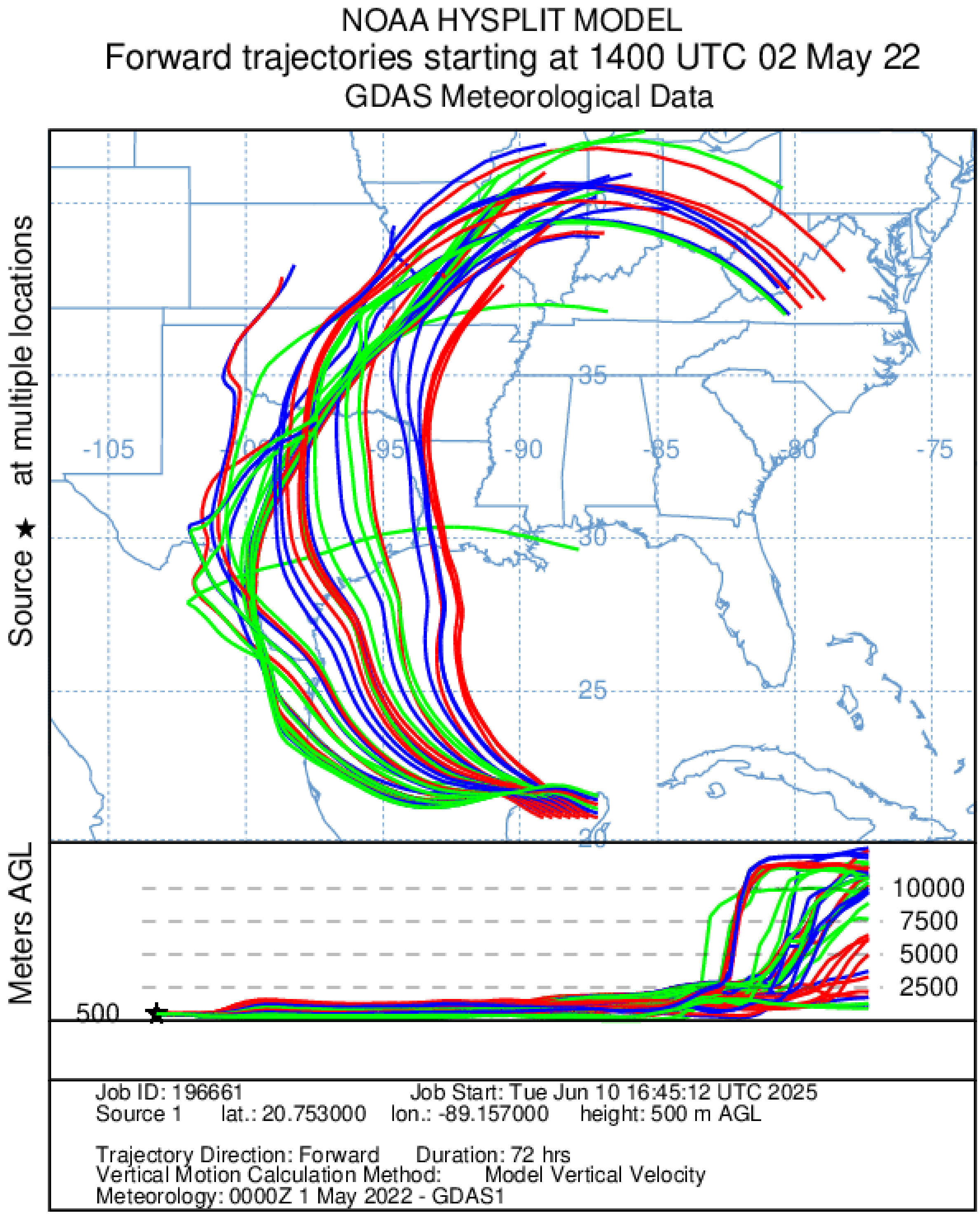

Figure 3-9: NOAA HYSPLIT 72-Hour Forward Trajectories Originating from Areas in Mexico with Fires, Starting on May 2, 2022

3.2.2 Group 2: Evidence for May 8, and May 9, 2022, Fire (Mexico/Central America) $PM_{2.5}$ Event for the Von Ormy Highway 16 Monitor, the World Trade Bridge Monitor, and the Haws Athletic Center Monitors

Event days May 8 and May 9, 2022, are classified in different tiers depending on the monitor and the date, as noted below:

- The World Trade Bridge monitor event on May 8, 2022, is classified as a Tier 1 day with a 24-hour concentration of 32.5 $\mu g/m^3$;
- The World Trade Bridge monitor event on May 9, 2022, is classified as a Tier 2 day with a 24-hour concentration of 29.3 $\mu g/m^3$;
- The Von Ormy Highway 16 monitor event on May 8, 2022, is classified as a Tier 2 day with a 24-hour concentration of 29.2 $\mu g/m^3$; and
- The Haws Athletic Center monitor event on May 9, 2022. is classified as a Tier 1 day with a 24-hour concentration of 27.2 $\mu g/m^3$.

At the World Trade Bridge, and the Von Ormy Highway 16 monitors, hourly $PM_{2.5}$ graphs show evidence of changes in hourly temporal patterns of $PM_{2.5}$ due to smoke from fires in Mexico on May 8 (Figure 3-10: *Hourly $PM_{2.5}$ Concentrations on May 8, 2022, Compared to Typical Concentrations at the World Trade Bridge Monitor*, and Figure 3-11: *Hourly $PM_{2.5}$ Concentrations on May 8, 2022, Compared to Typical Concentrations at the Von Ormy Highway 16 Monitor*, compared to typical non-event concentrations (Tier 3 Median). Figure 3-12: *AirNow HMS Smoke Plume for May 8, 2022*, shows the HMS smoke plume over both monitors, with the yellow dot denoting air quality in the moderate category. The HYSPLIT backward trajectory at 100 m, 500 m, and 800 m AGL passes through the area in Mexico with fires, as shown in Figure 3-13: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the World Trade Bridge Monitor on May 8, 2022*, and Figure 3-14: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Von Ormy Highway 16 Monitor on May 8, 2022*. The HYSPLIT forward trajectories starting from areas in Mexico with fires at 72 hours before the event day arrived at Texas as shown in Figure 3-15: *NOAA HYSPLIT 72-Hour Forward Trajectories Originating from Areas in Mexico with Fires, Starting on May 5, 2022*.

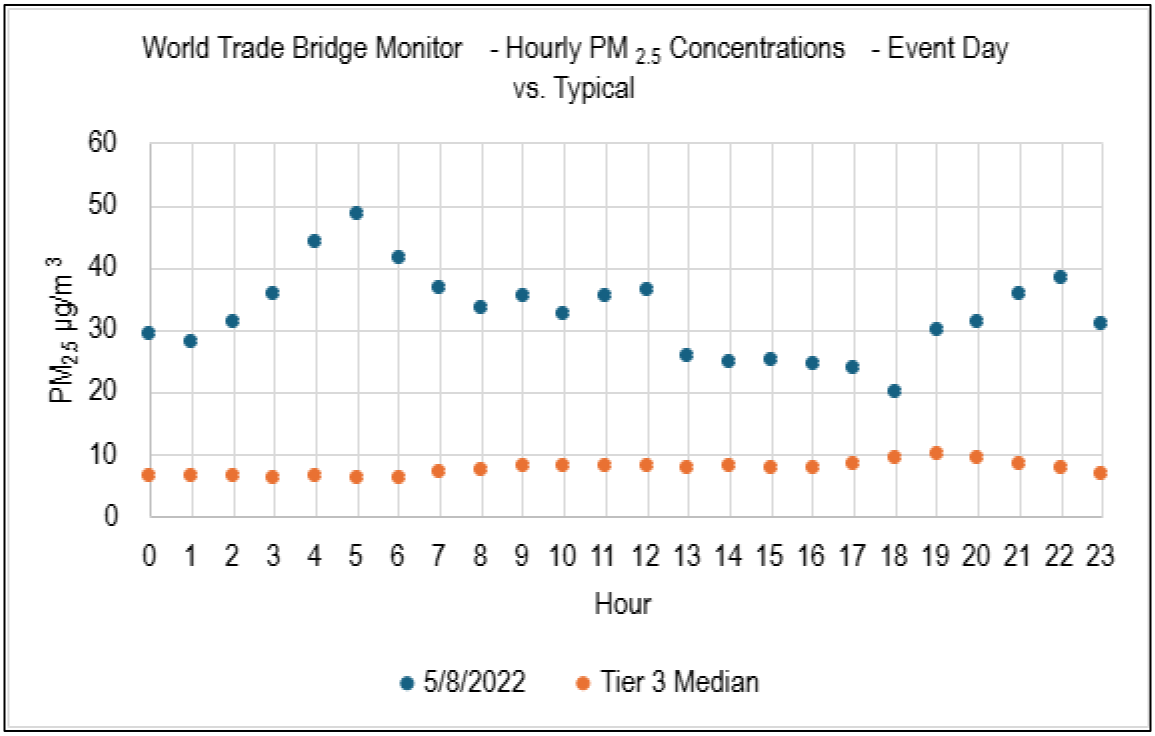

Figure 3-10: Hourly $PM_{2.5}$ Concentrations on May 8, 2022, Compared to Typical Concentrations at the World Trade Bridge Monitor

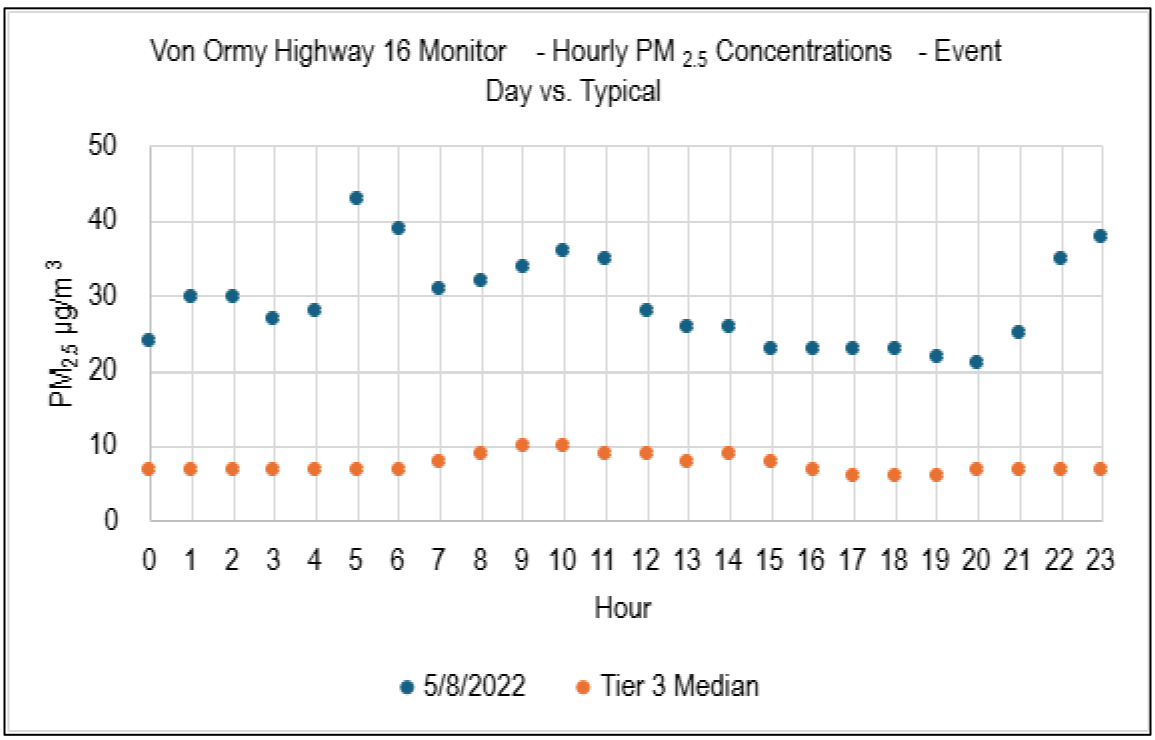

Figure 3-11: Hourly $PM_{2.5}$ Concentrations on May 8, 2022, Compared to Typical Concentrations at the Von Ormy Highway 16 Monitor

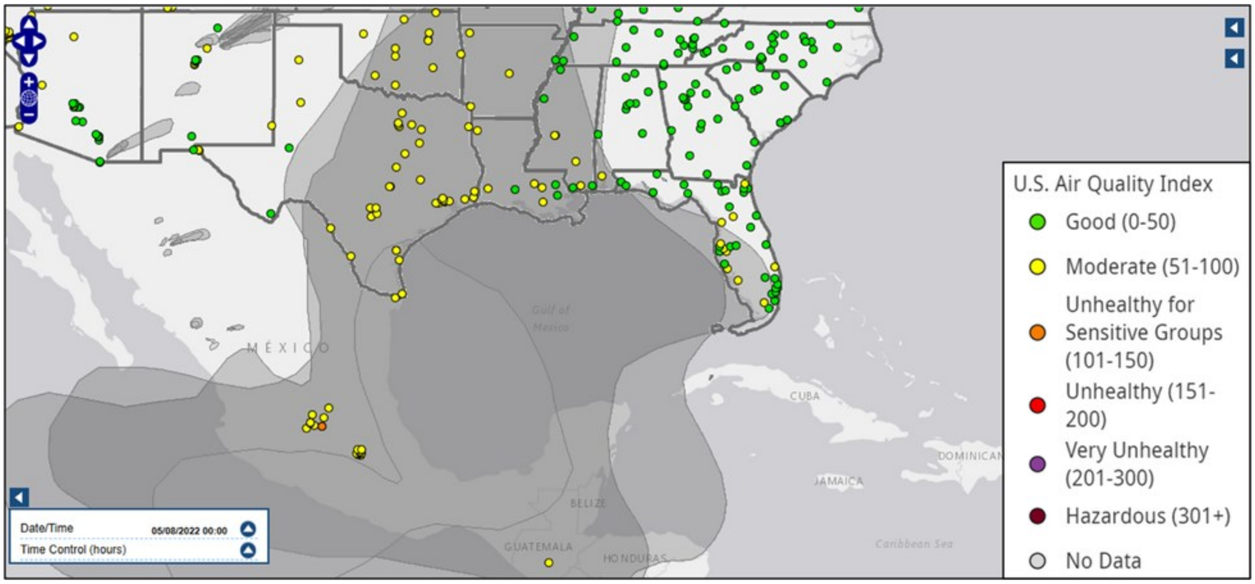

Figure 3-12: AirNow HMS Smoke Plume for May 8, 2022

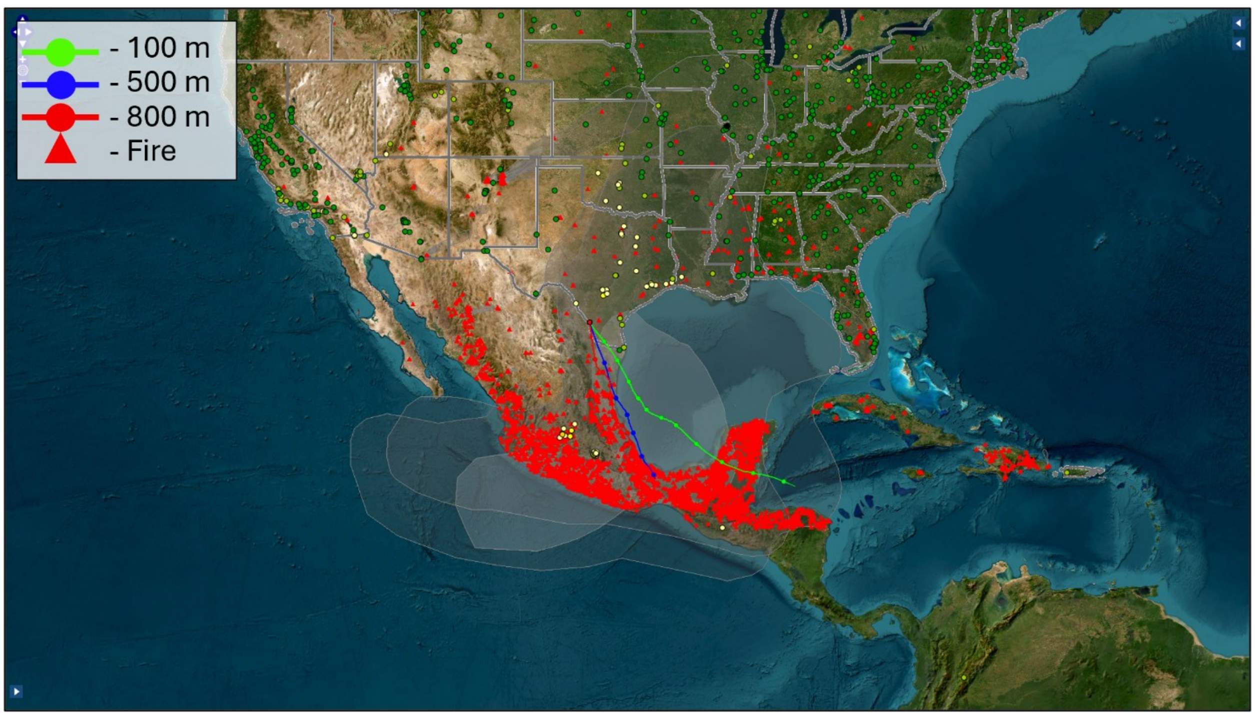

Figure 3-13: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the World Trade Bridge Monitor on May 8, 2022

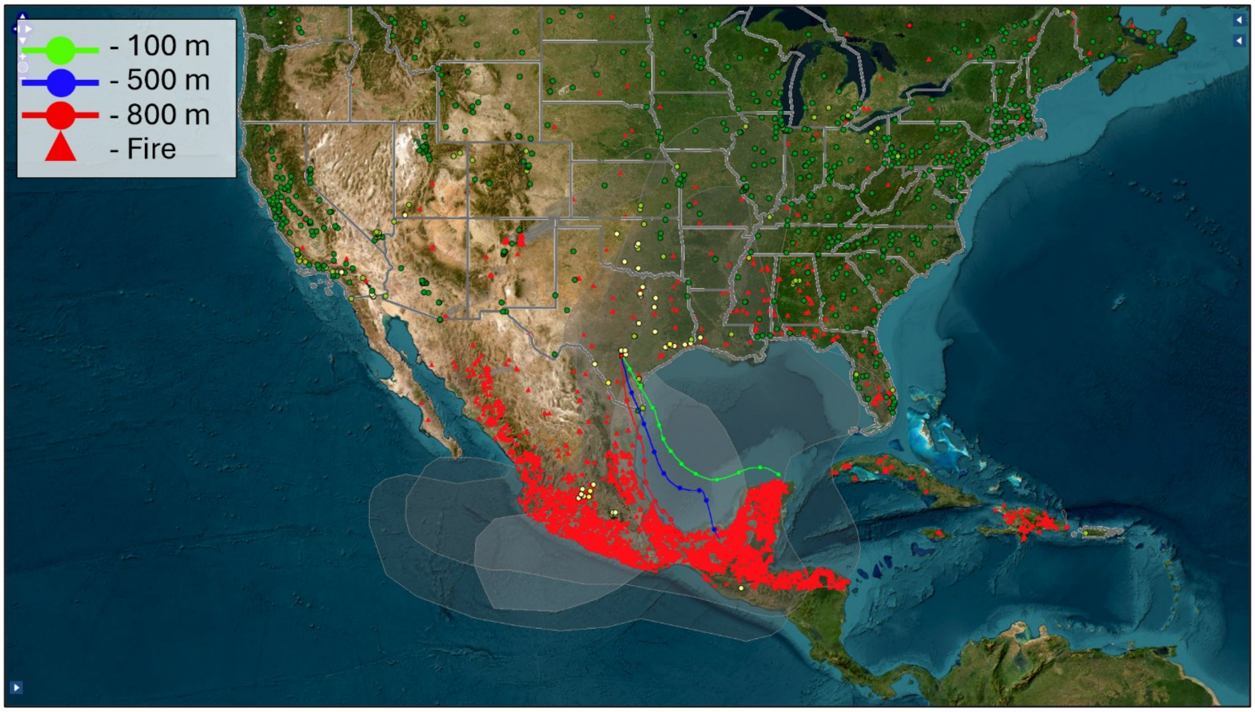

Figure 3-14: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Von Ormy Highway 16 Monitor on May 8, 2022

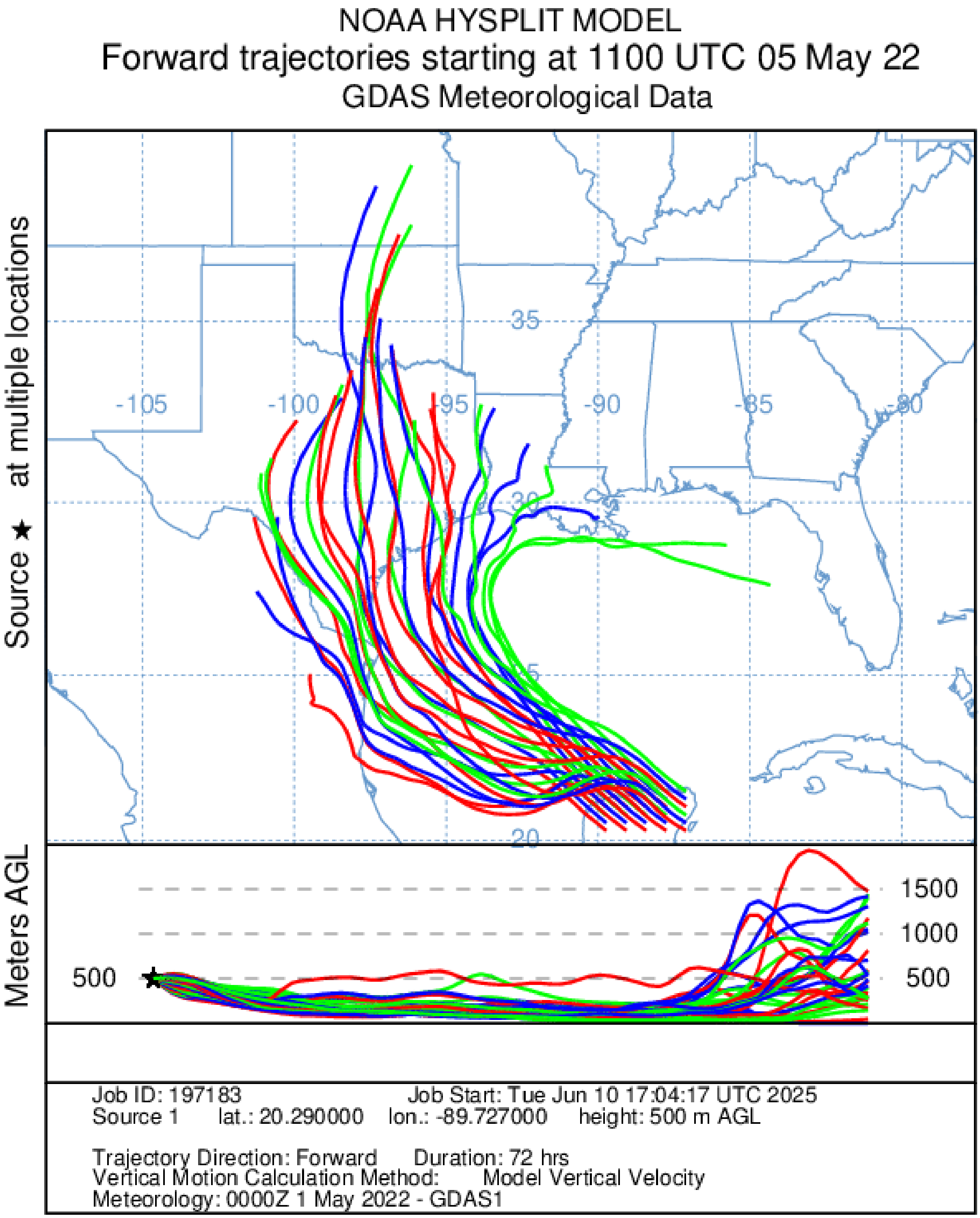

Figure 3-15: NOAA HYSPLIT 72-Hour Forward Trajectories Originating from Areas in Mexico with Fires, Starting on May 5, 2022

At the World Trade Bridge and the Haws Athletic Center monitors, hourly $PM_{2.5}$ graphs show evidence of changes in hourly temporal patterns of $PM_{2.5}$ due to smoke from fires in Mexico on May 9th (Figure 3-16: *Hourly $PM_{2.5}$ Concentrations on May 9, 2022, Compared to Typical Concentrations at the World Trade Bridge Monitor*, and Figure 3-17: *Hourly $PM_{2.5}$ Concentrations* *on May 9, 2022, Compared to Typical Concentrations at the Haws Athletic Center Monitor*), compared to typical non-event concentrations (Tier 3 Median). *Figure 3-18: AirNow HMS Smoke Plume for May 9, 2022*, show the HMS smoke plume over both monitors, with the yellow dot denoting air quality in the moderate category. The HYSPLIT backward trajectory at 500 m, and 800 m AGL passes through the area in Mexico with fires, as shown in Figure 3-19: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the World Trade Bridge Monitor on May 9, 2022*, and Figure 3-20: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Haws Athletic Center Monitor on May 9, 2022*. The HYSPLIT forward trajectories starting from areas in Mexico with fires at 72 hours before the event day arrived at Texas as shown in Figure 3-21: *NOAA HYSPLIT 72-Hour Forward Trajectories Originating from Areas in Mexico with Fires, Starting on May 6, 2022*. The evidence provided meets requirements for Tier 1 and Tier 2 demonstrations for the monitors impacted by fires in Mexico.

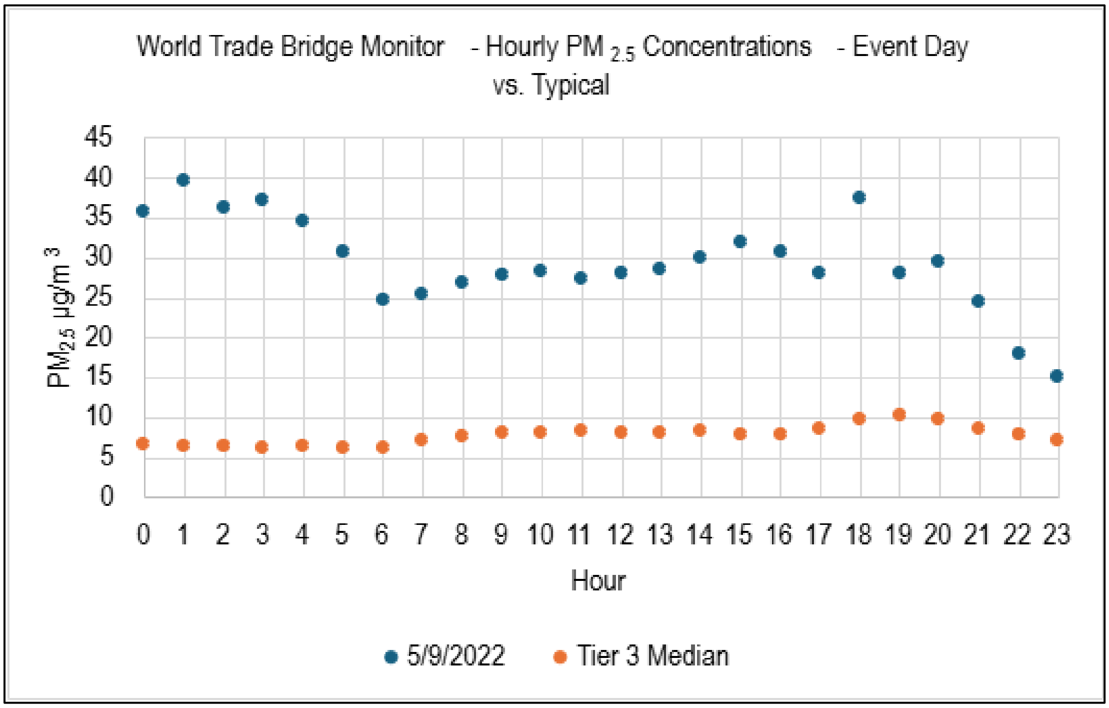

Figure 3-16: Hourly $PM_{2.5}$ Concentrations on May 9, 2022, Compared to Typical Concentrations at the World Trade Bridge Monitor

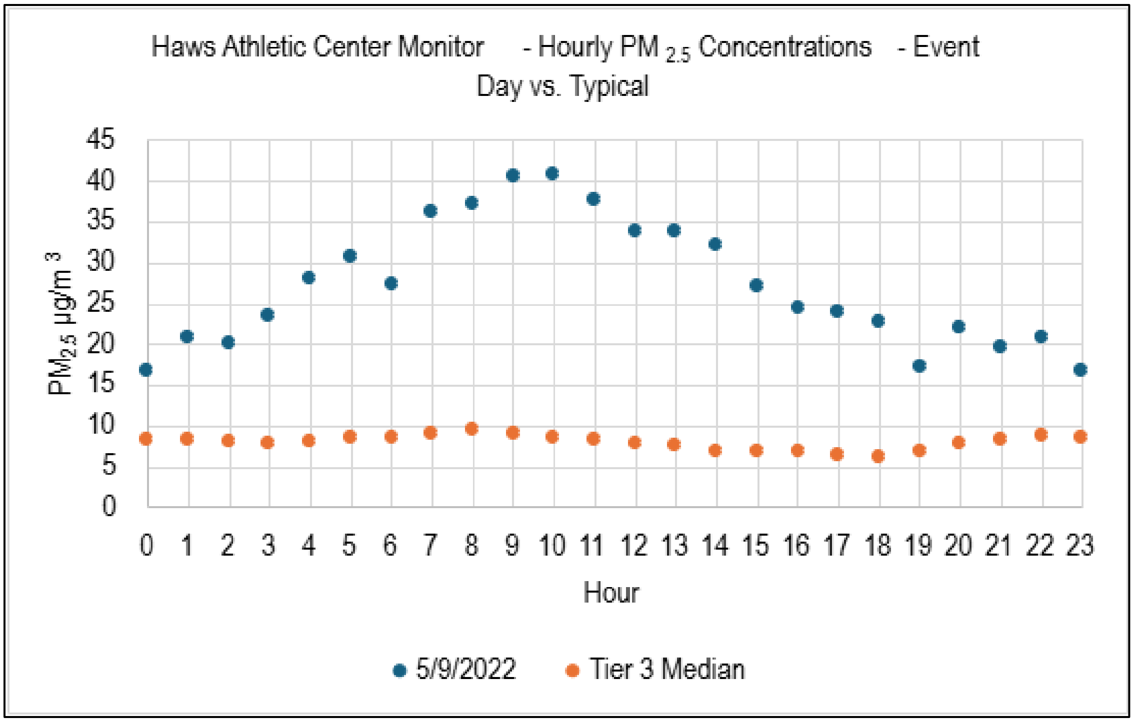

Figure 3-17: Hourly $PM_{2.5}$ Concentrations on May 9, 2022, Compared to Typical Concentrations at the Haws Athletic Center Monitor

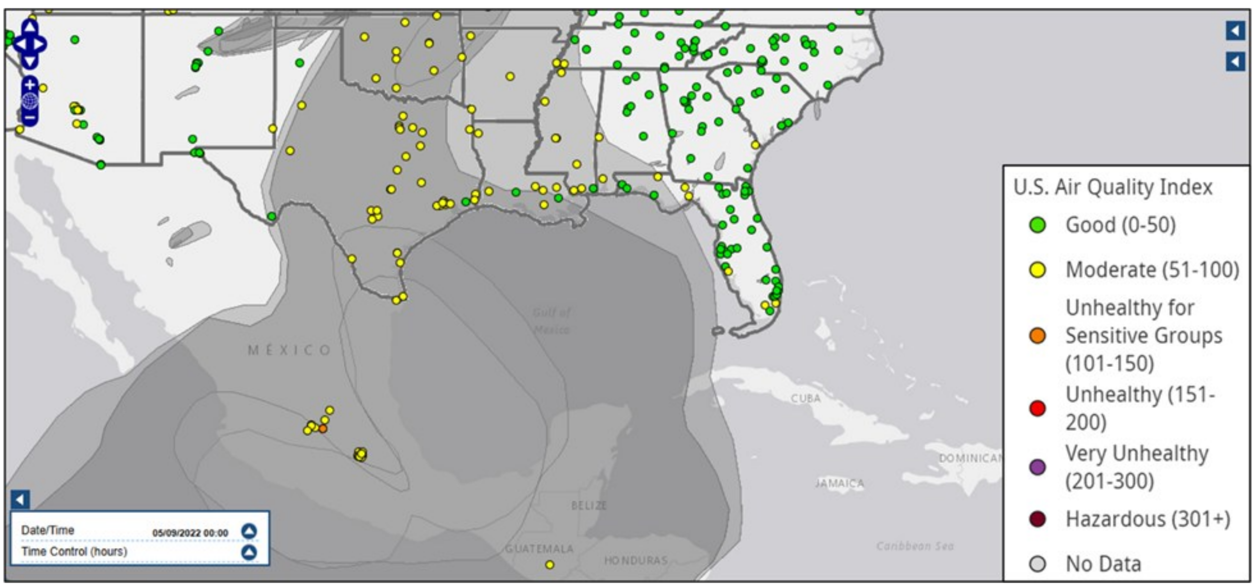

Figure 3-18: AirNow HMS Smoke Plume for May 9, 2022

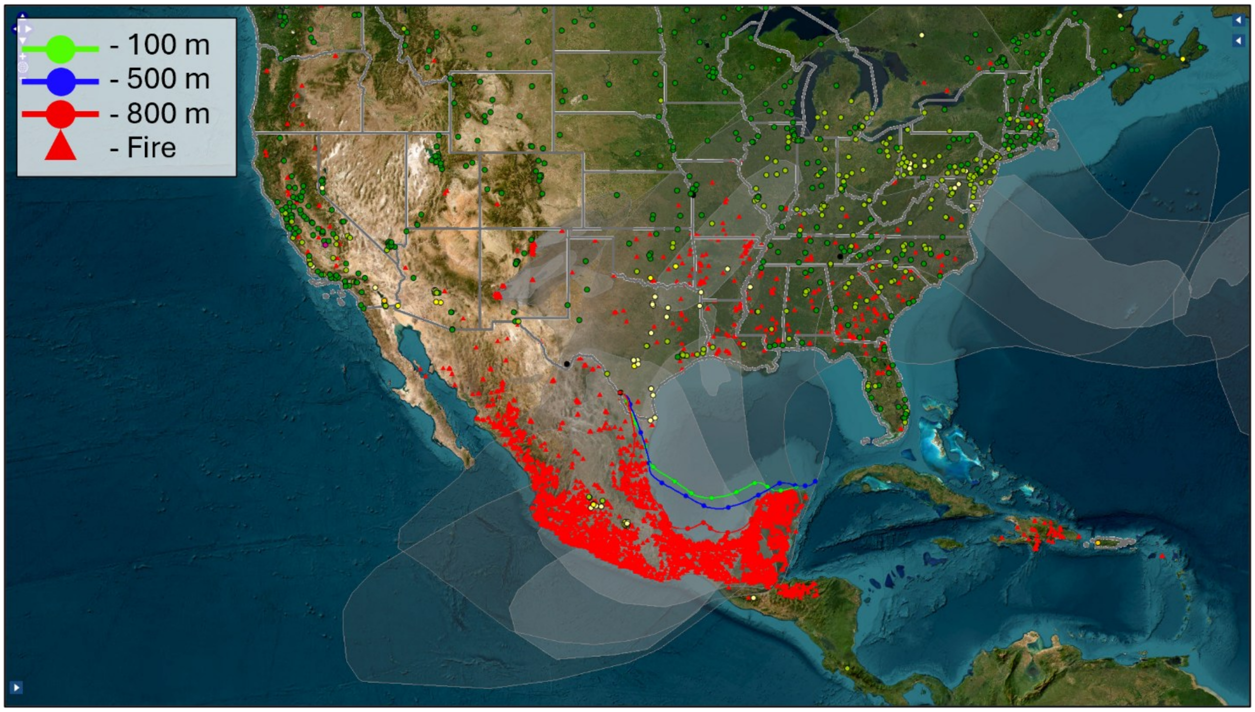

Figure 3-19: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the World Trade Bridge Monitor on May 9, 2022

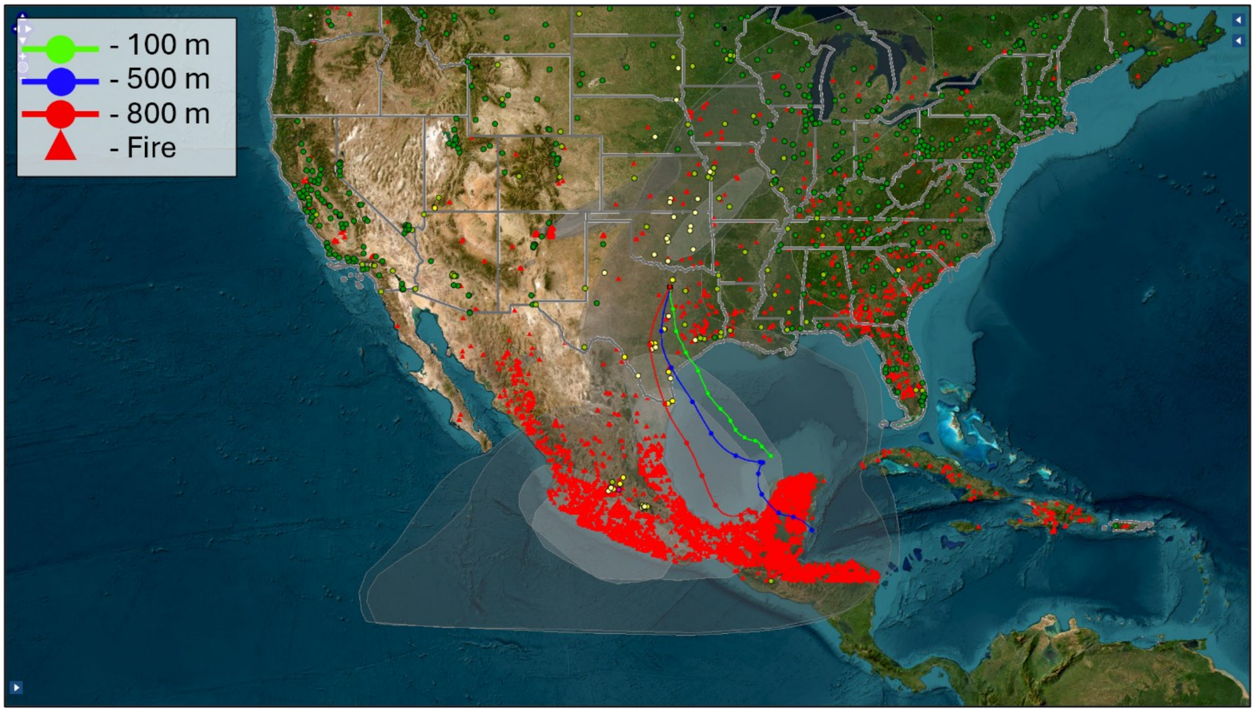

Figure 3-20: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Haws Athletic Center Monitor on May 9, 2022

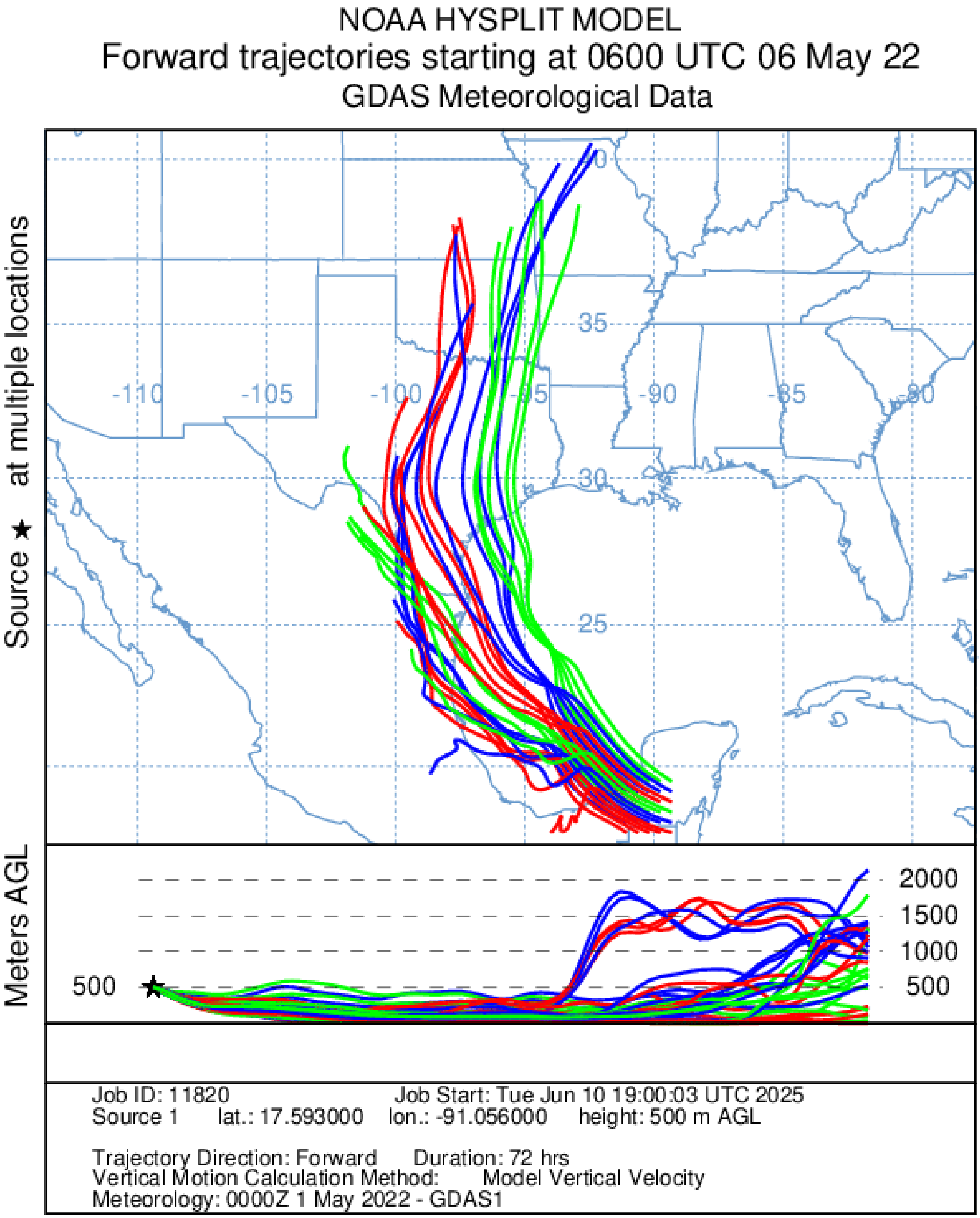

Figure 3-21: NOAA HYSPLIT 72-Hour Forward Trajectories Originating from Areas in Mexico with Fires, Starting on May 6, 2022

3.2.3 Group 3: Evidence for May 20 and May 21, 2022, Fire (Mexico/Central America) $PM_{2.5}$ Event for the Von Ormy Highway 16 Monitor, the Haws Athletic Center Monitor, and the World Trade Bridge Monitors

Event days May 20 and May 21, 2022, are classified in different tiers depending on the monitor and the date, as noted below:

- The Von Ormy Highway 16 monitor event on May 20, 2022, is classified as a Tier 2 with a 24-hour concentration of 30 $\mu g/m^3$;
- The Haws Athletic Center monitor event on May 20, 2022, is classified as a Tier 1 with a 24-hour concentration of 26.9 $\mu g/m^3$;
- The World Trade Bridge monitor event on May 20, 2022, is classified as a Tier 2 with a 24-hour concentration of 30.4 $\mu g/m^3$;
- The Von Ormy Highway 16 monitor event on May 21, 2022, is classified as a Tier 2 with a 24-hour concentration of 27.4 $\mu g/m^3$;
- The World Trade Bridge monitor event on May 21, 2022, is classified as a Tier 2 with a 24-hour concentration of 30.7 $\mu g/m^3$.

At the Von Ormy Highway 16, Haws Athletic Center, and World Trade Bridge monitors, hourly $PM_{2.5}$ graphs show evidence of changes in hourly temporal patterns of $PM_{2.5}$ due to smoke from fires in Mexico on May 20 Figure 3-22: *Hourly $PM_{2.5}$ Concentrations on May 20, 2022, Compared to Typical Concentrations at the Von Ormy Highway 16 Monitor,* Figure 3-23: *Hourly $PM_{2.5}$ Concentrations on May 20, 2022, Compared to Typical Concentrations at the Haws Athletic Center Monitor,* and Figure 3-24: *Hourly $PM_{2.5}$ Concentrations on May 20, 2022, Compared to Typical Concentrations at the World Trade Bridge Monitor*, compared to typical non-event concentrations (Tier 3 Median). Figure 3-25: *AirNow HMS Smoke Plume for May 20, 2022*, show the HMS smoke plume over impacted monitors, with the yellow dot denoting air quality in the moderate category. The HYSPLIT backward trajectory at 100 m, 500 m, and 800 m AGL passes through the area in Mexico with fires, as shown in Figure 3-26: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Von Ormy Highway 16 Monitor on May 20, 2022***,** Figure 3-27: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Haws Athletic Center Monitor on May 20, 2022***,** Figure 3-28: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the World Trade Bridge Monitor on May 20, 2022*. The HYSPLIT forward trajectories starting from areas in Mexico with fires at 72 hours before the event day arrived at Texas as shown in Figure 3-29: *NOAA HYSPLIT 72-Hour Forward Trajectories from Areas in Mexico with Fires, Starting on May 17, 2022.*

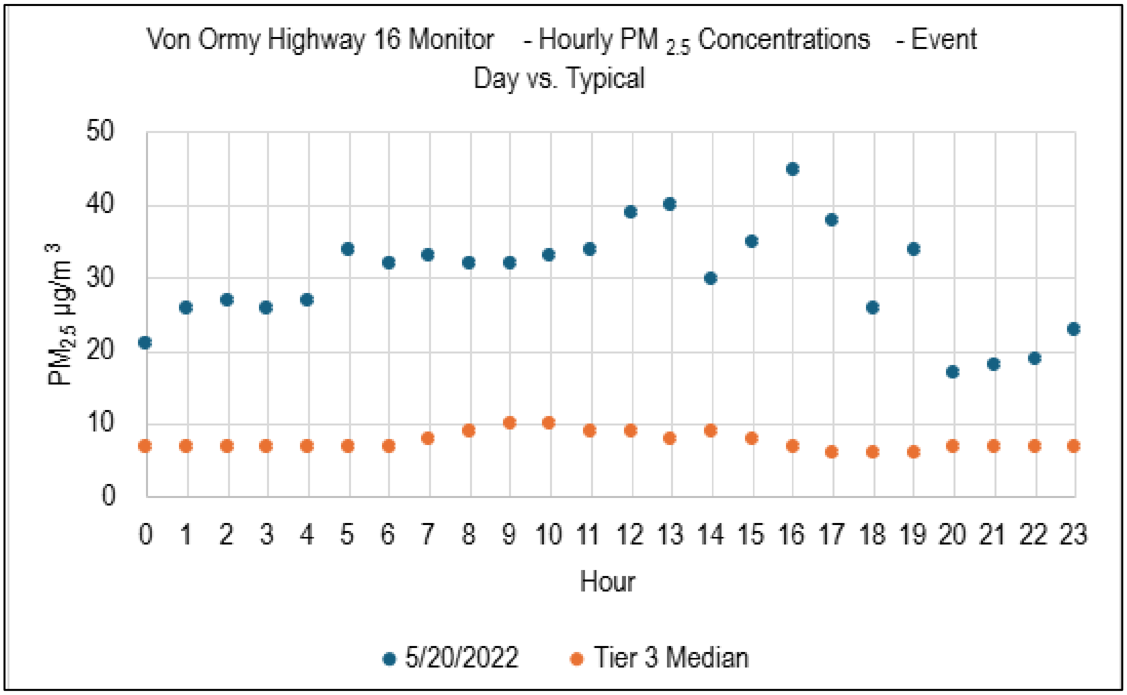

Figure 3-22: Hourly $PM_{2.5}$ Concentrations on May 20, 2022, Compared to Typical Concentrations at the Von Ormy Highway 16 Monitor

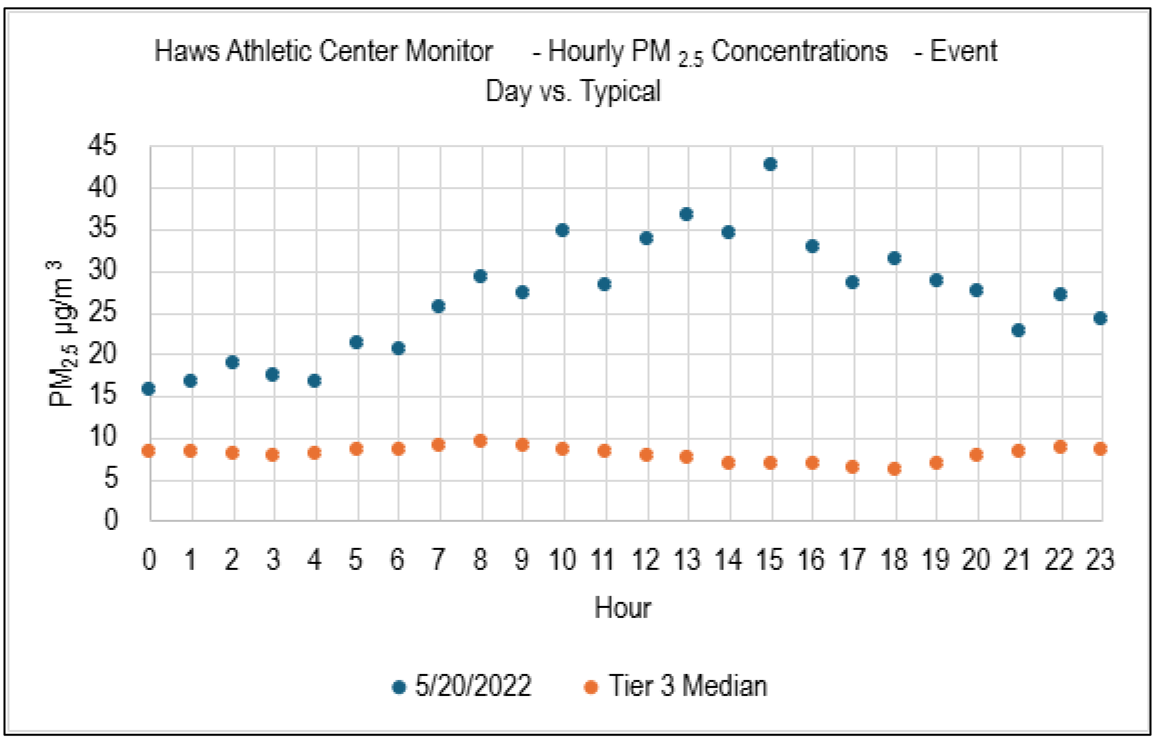

Figure 3-23: Hourly $PM_{2.5}$ Concentrations on May 20, 2022, Compared to Typical Concentrations at the Haws Athletic Center Monitor

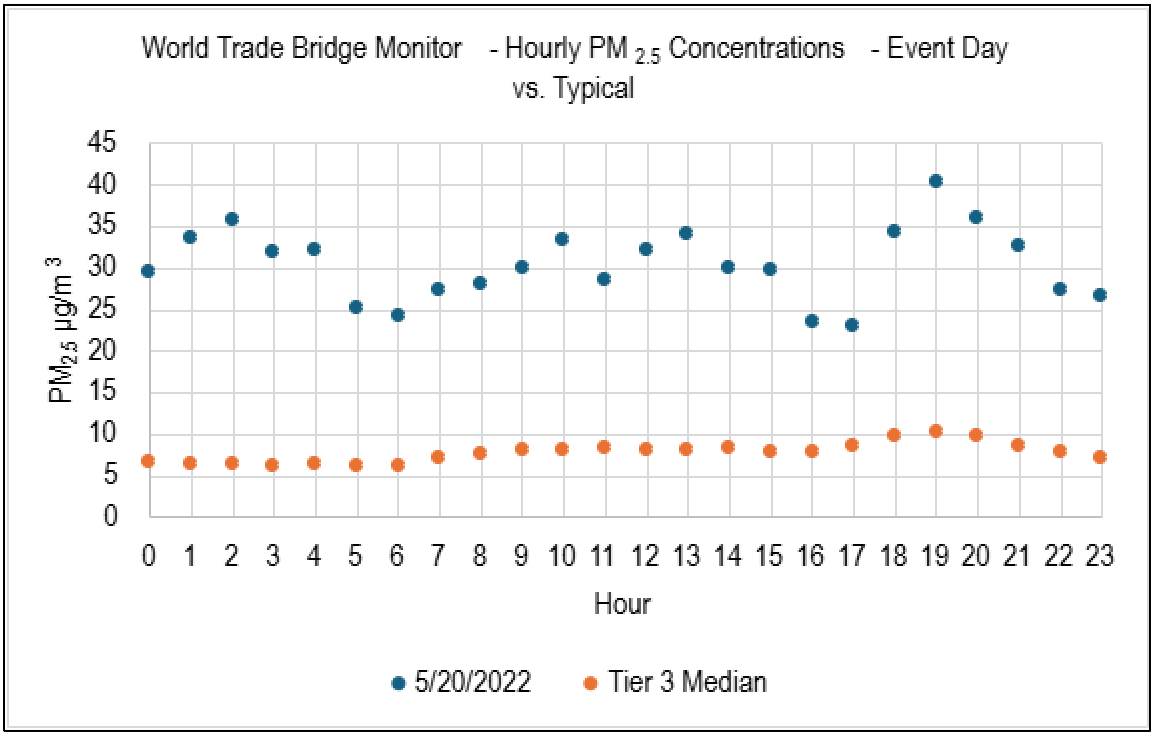

Figure 3-24: Hourly $PM_{2.5}$ Concentrations on May 20, 2022, Compared to Typical Concentrations at the World Trade Bridge Monitor

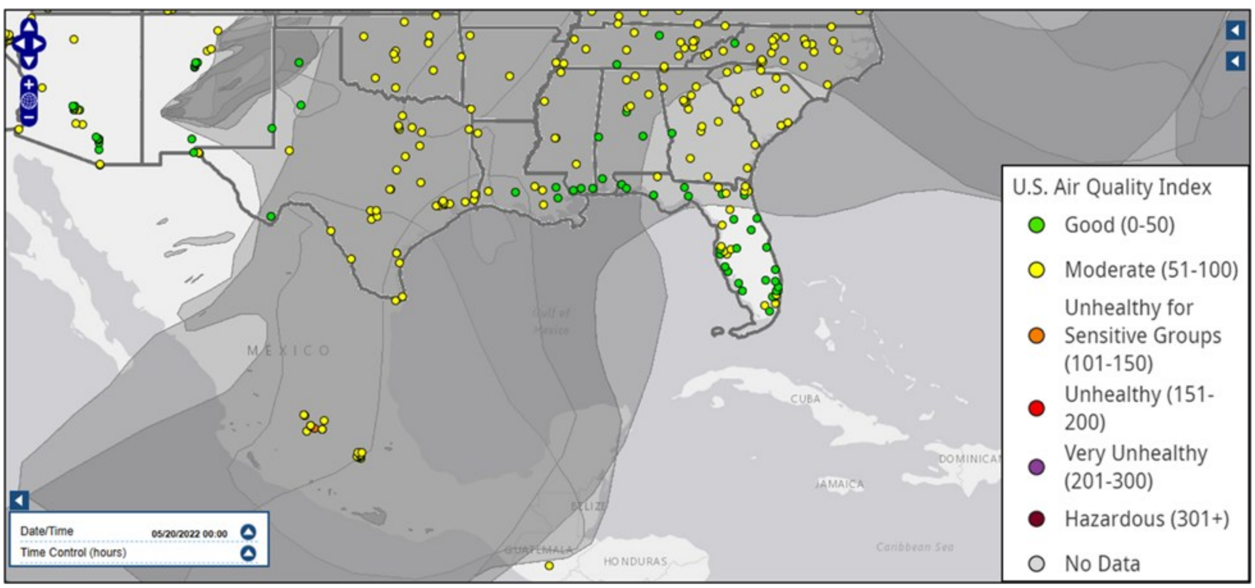

Figure 3-25: AirNow HMS Smoke Plume for May 20, 2022

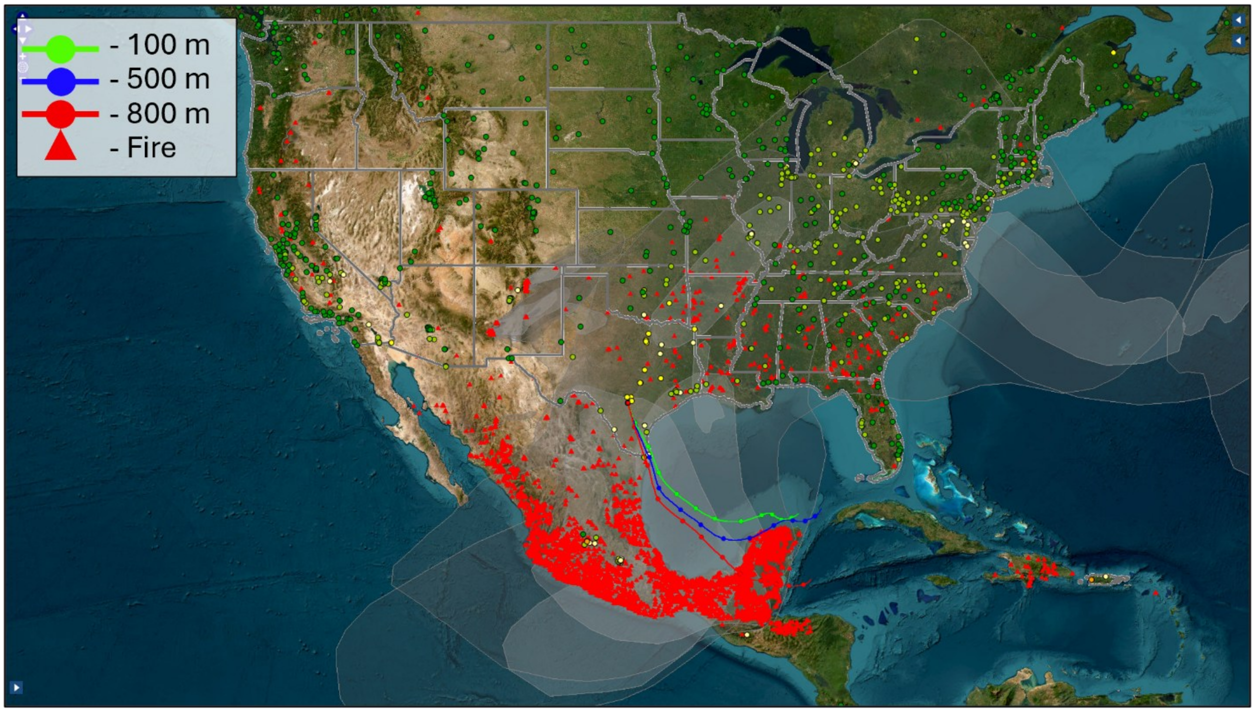

Figure 3-26: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Von Ormy Highway 16 Monitor on May 20, 2022

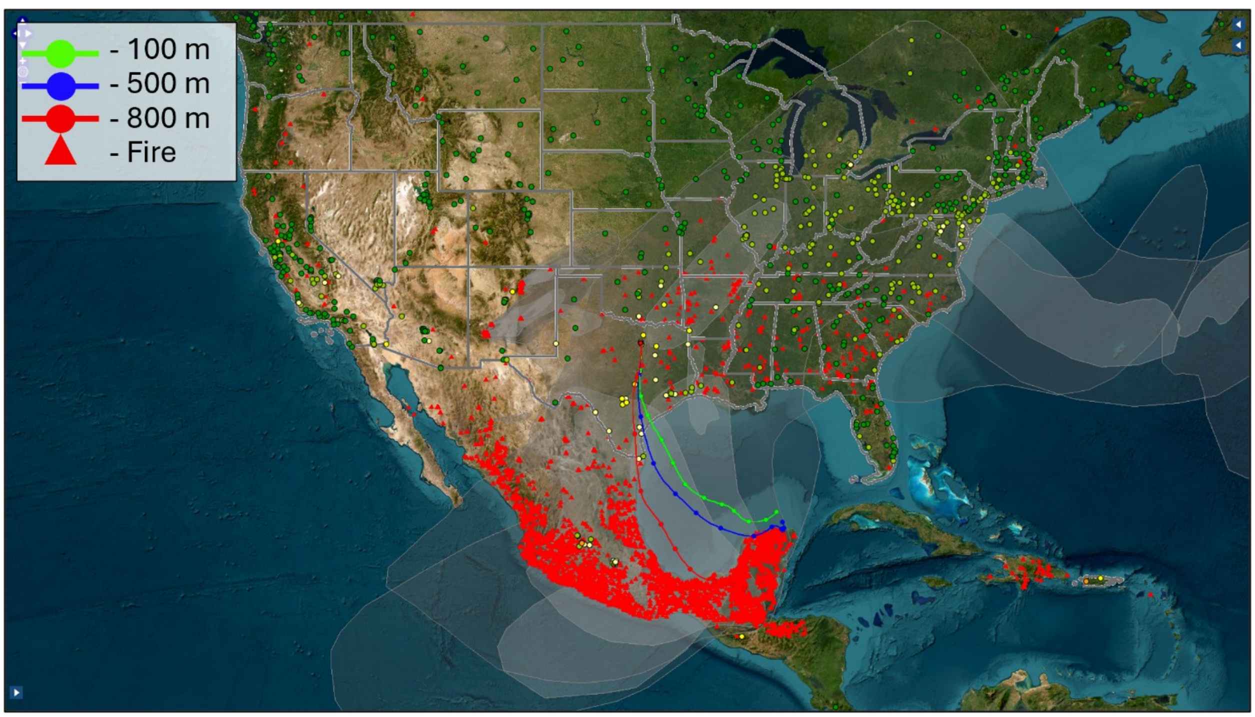

Figure 3-27: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Haws Athletic Center Monitor on May 20, 2022

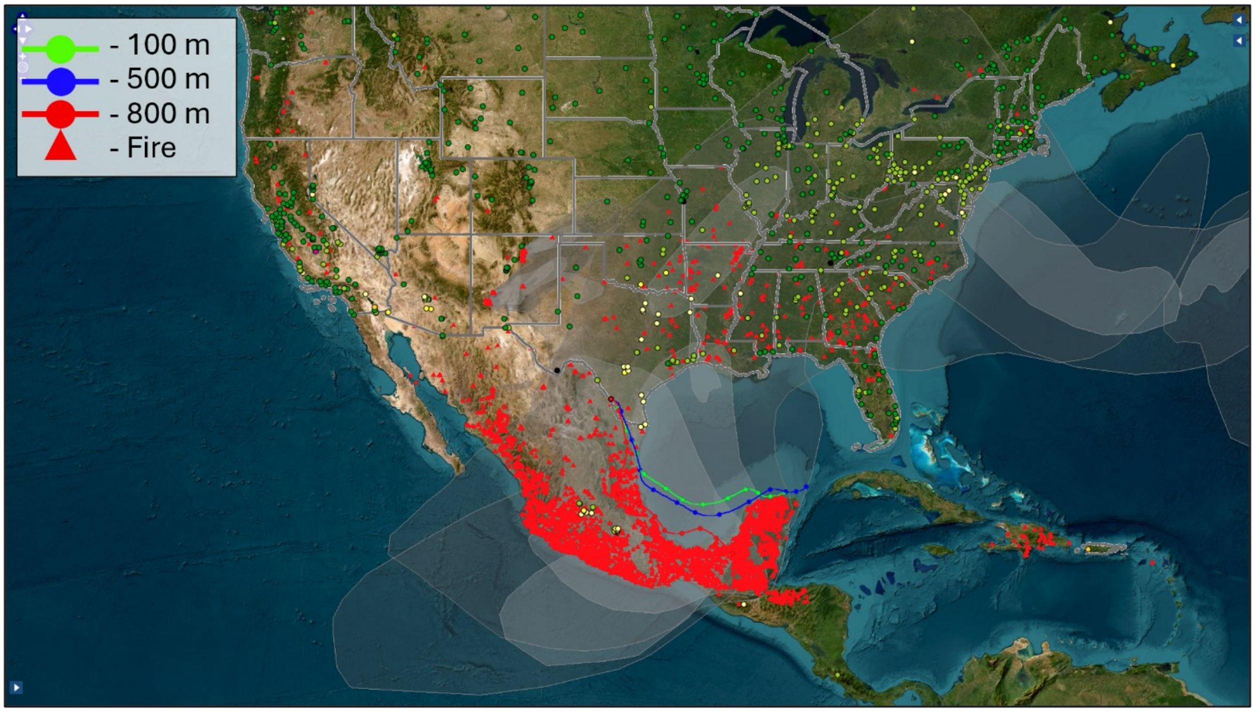

Figure 3-28: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the World Trade Bridge Monitor on May 20, 2022

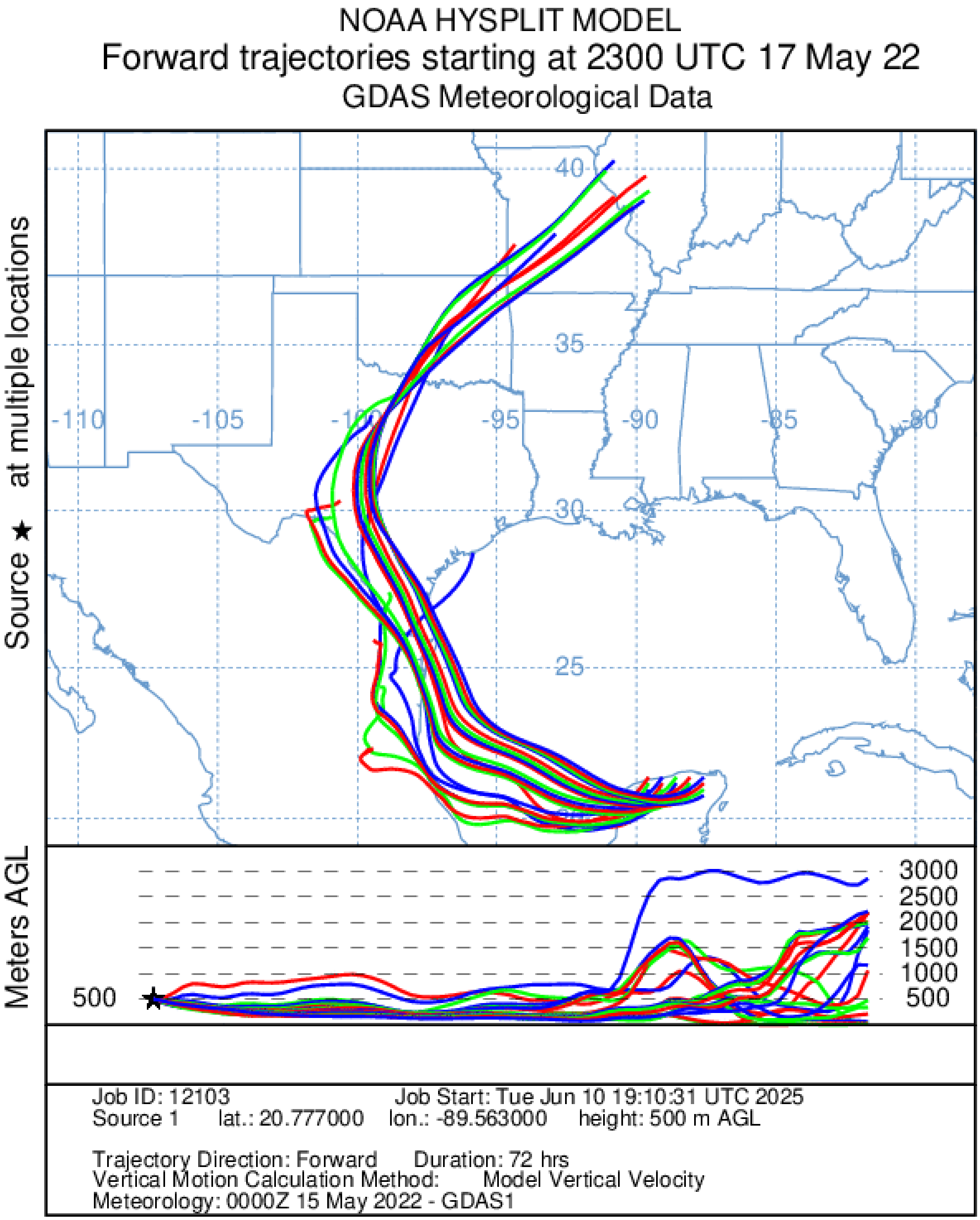

Figure 3-29: NOAA HYSPLIT 72-Hour Forward Trajectories from Areas in Mexico with Fires, Starting on May 17, 2022

At the Von Ormy Highway 16 and World Trade Bridge monitors, hourly $PM_{2.5}$ graphs show evidence of changes in hourly temporal patterns of $PM_{2.5}$ due to smoke from Fires in Mexico/Central America on May 21, 2022 (Figure 3-30: *$PM_{2.5}$ Concentrations on May 21, 2022, Compared to Typical Concentrations at the Von Ormy Highway 16 Monitor* and *Figure 3-31: Hourly $PM_{2.5}$ Concentrations on May 21, 2022, Compared to Typical Concentrations at the World*

Trade Bridge Monitor, compared to typical concentrations (Tier 3 Median). *Figure 3-32: AirNow HMS Smoke Plume for May 21, 2022*, show the HMS smoke plume over impacted monitors, with the yellow dot denoting air quality in the moderate category. The HYSPLIT backward trajectory at 100 m, 500 m, and 800 m AGL passes through the area in Mexico with fires, as shown in Figure 3-33: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Von Ormy Highway 16 Monitor on May 21, 2022*, and Figure 3-34: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the World Trade Bridge Monitor on May 21, 2022*. The HYSPLIT forward trajectories starting from areas in Mexico with fires at 72 hours before the event day arrived at Texas as shown in Figure 3-35: *NOAA HYSPLIT 72-Hour Forward Trajectories Originating from Areas in Mexico with Fires, Starting on May 19, 2022*. The evidence provided meets requirements for Tier 1 and Tier 2 demonstrations for the monitors impacted by Fire (Mexico/Central America).

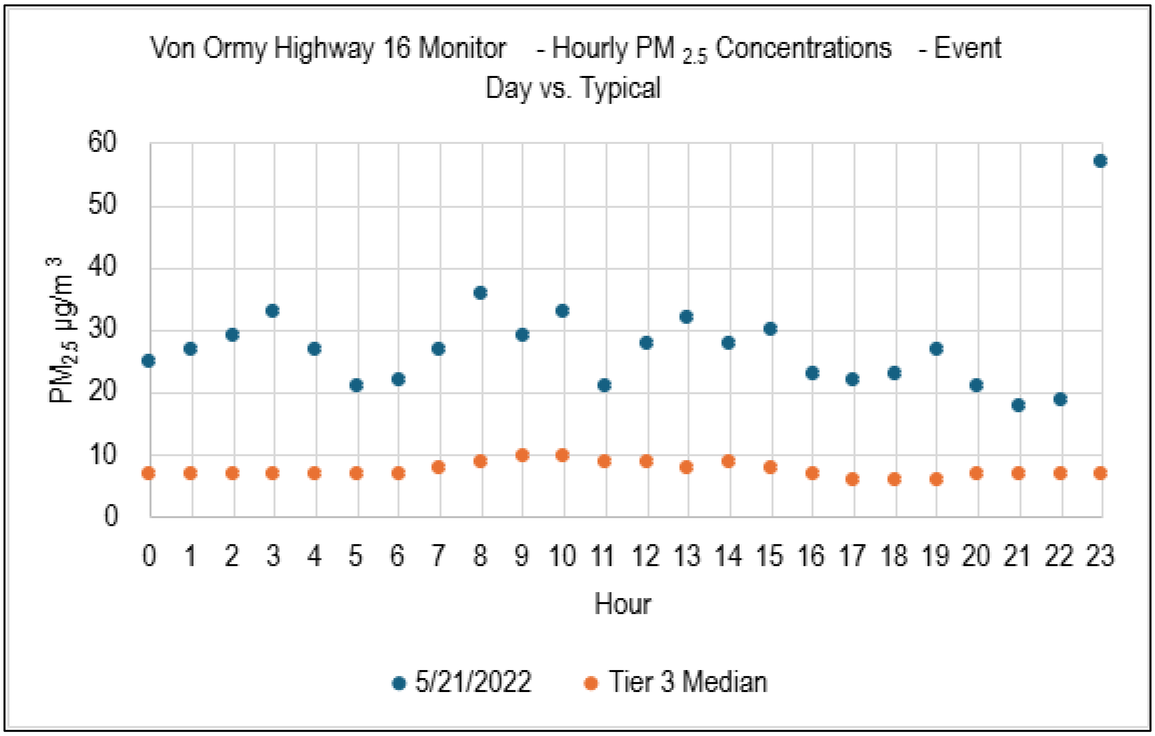

Figure 3-30: $PM_{2.5}$ Concentrations on May 21, 2022, Compared to Typical Concentrations at the Von Ormy Highway 16 Monitor

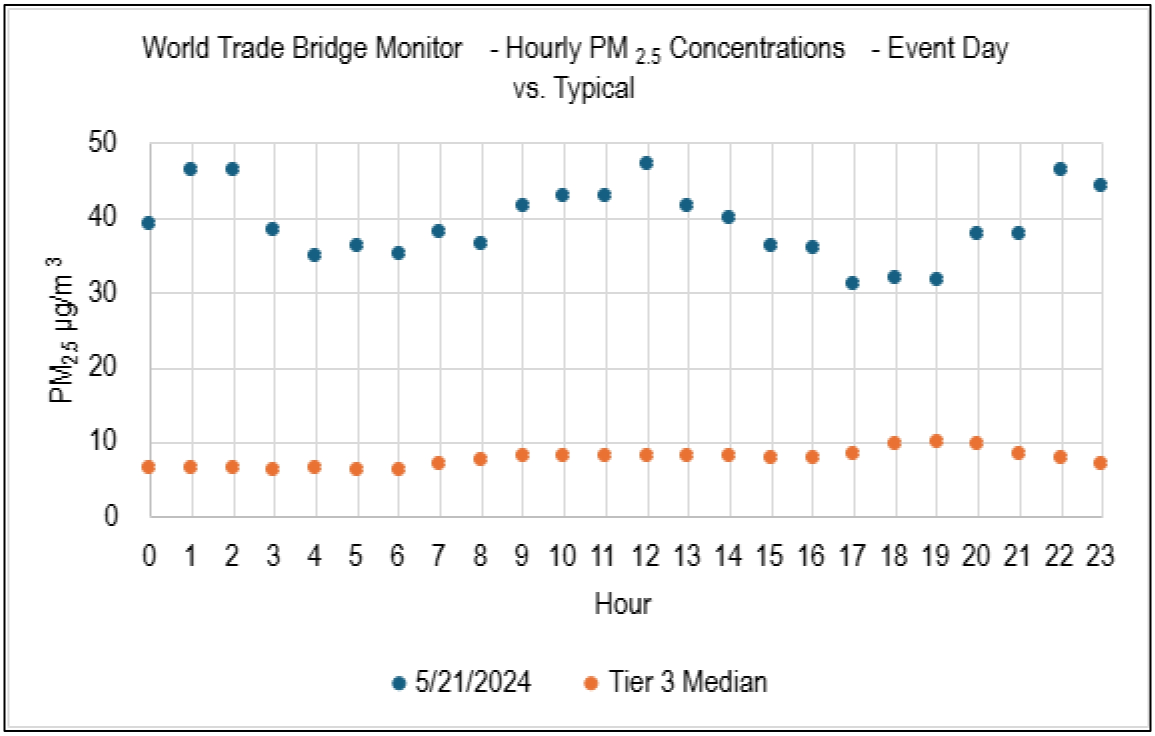

Figure 3-31: Hourly $PM_{2.5}$ Concentrations on May 21, 2022, Compared to Typical Concentrations at the World Trade Bridge Monitor

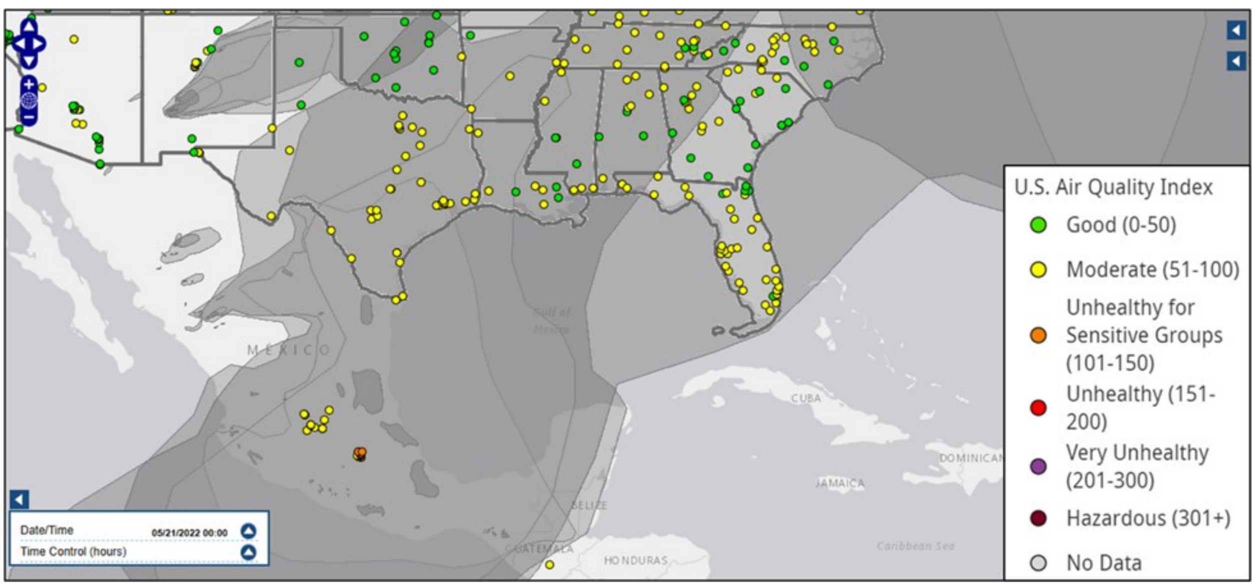

Figure 3-32: AirNow HMS Smoke Plume for May 21, 2022

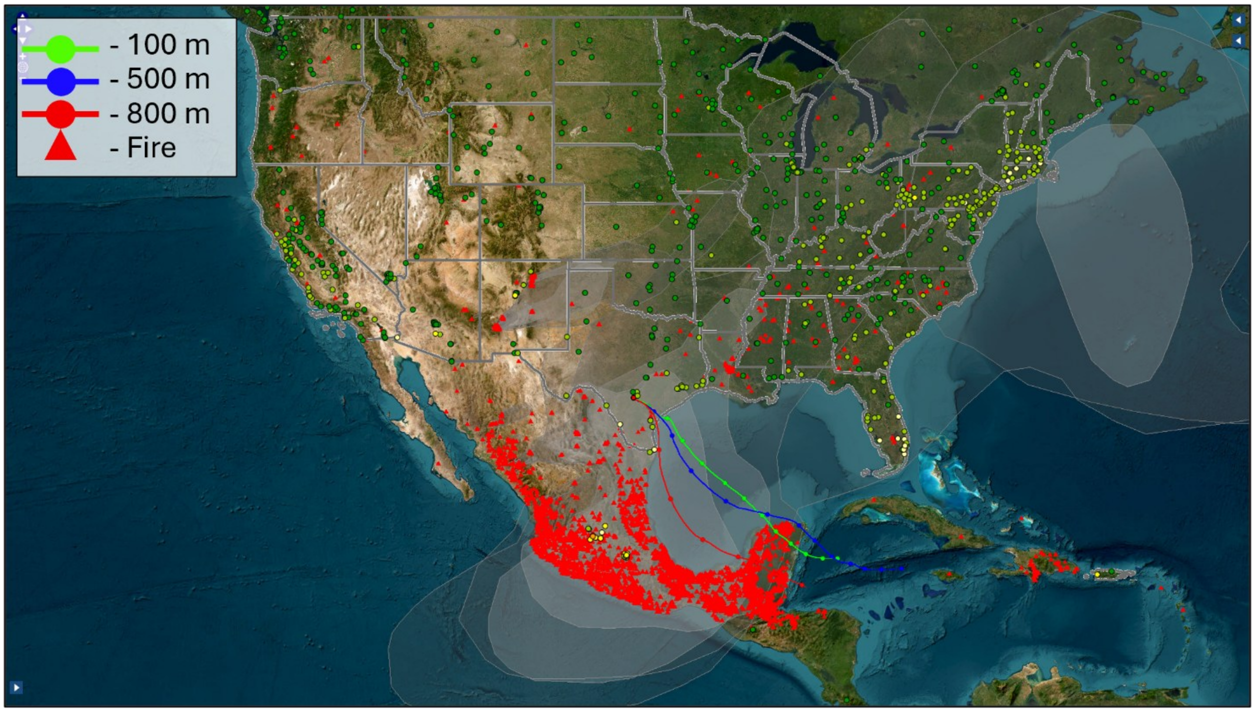

Figure 3-33: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Von Ormy Highway 16 Monitor on May 21, 2022

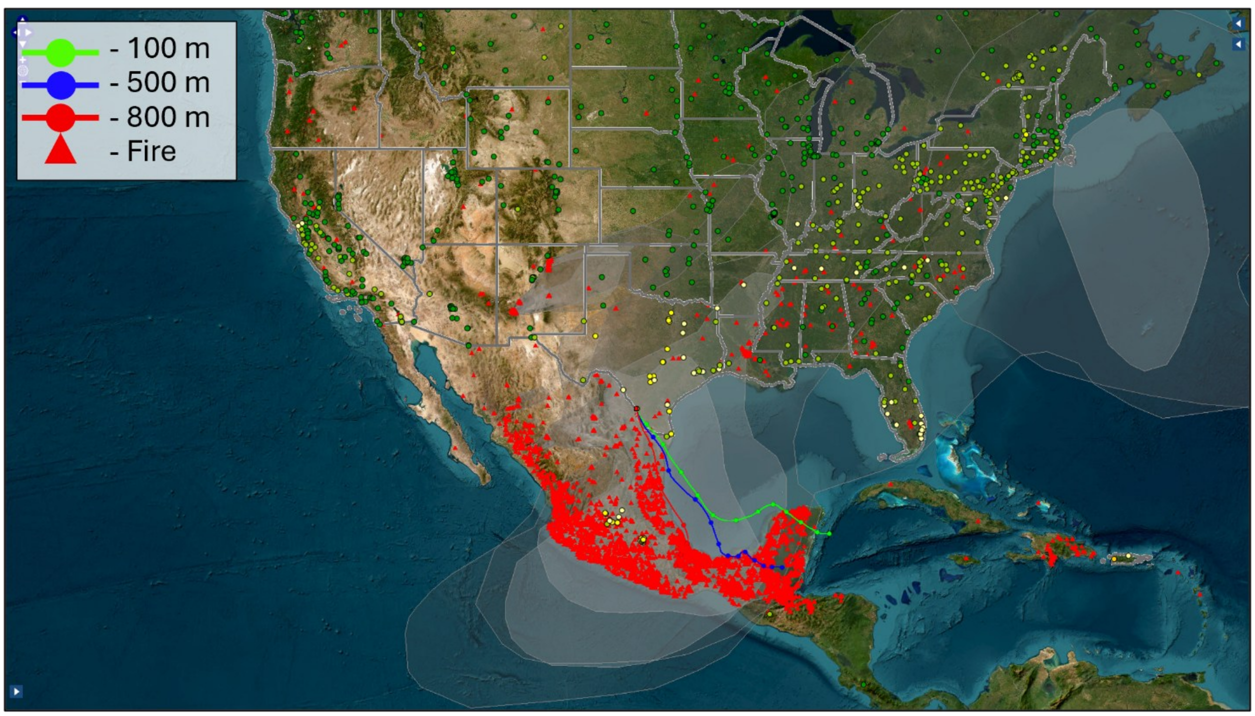

Figure 3-34: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the World Trade Bridge Monitor on May 21, 2022

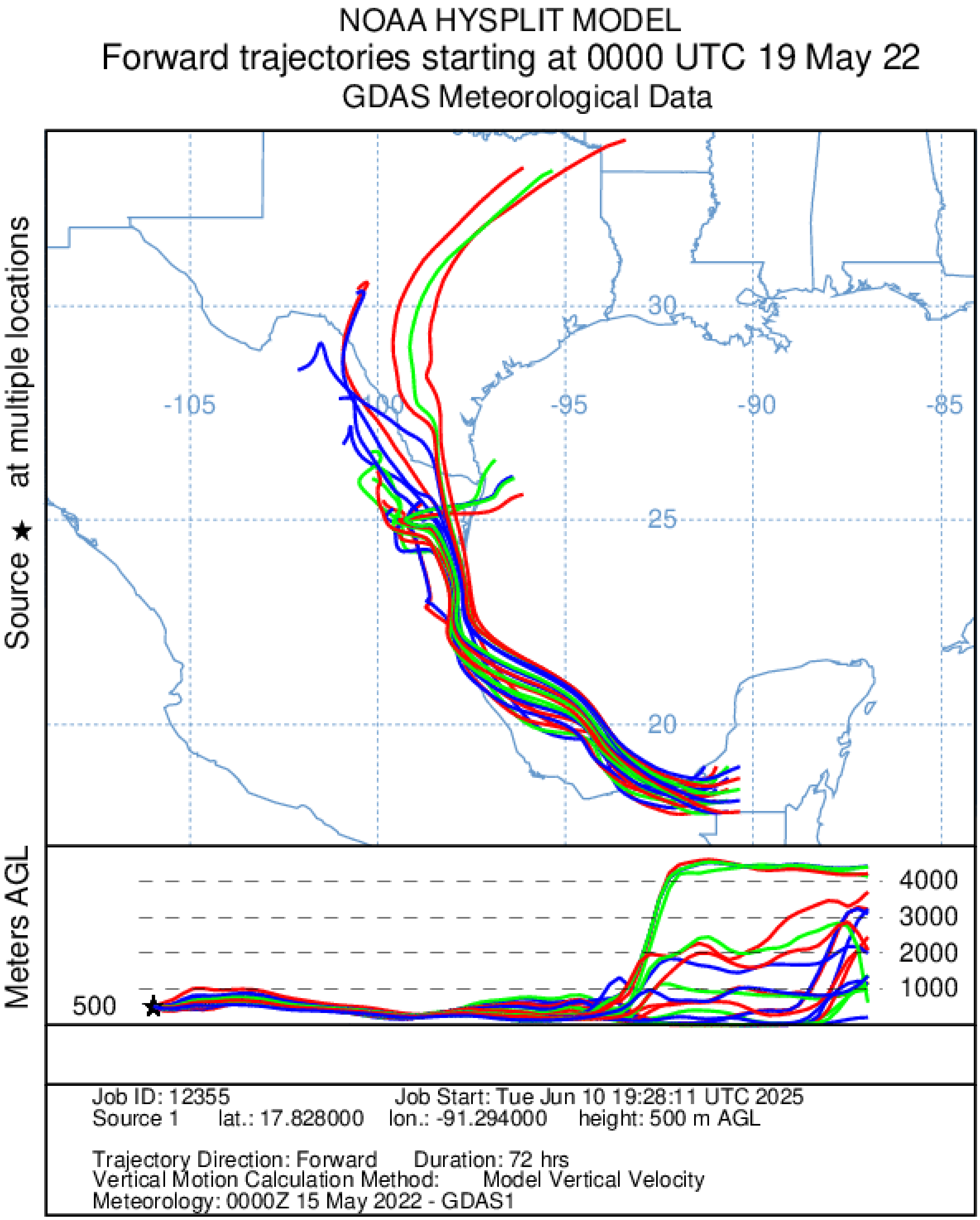

Figure 3-35: NOAA HYSPLIT 72-Hour Forward Trajectories Originating from Areas in Mexico with Fires, Starting on May 19, 2022

3.2.4 Group 4: Evidence for June 12 through June 17, 2022, African Dust $PM_{2.5}$ Event for the Edinburg East Freddy Gonzalez Drive Monitor, the Von Ormy Highway 16 Monitor, the Haws Athletic Center Monitor, the World Trade Bridge Monitor, and the Dona Park Monitors

All five monitoring sites were impacted by Saharan dust during the regional episode of June 12 through June 17, 2022. The event days are classified in different tiers depending on the monitor and the date, as noted below:

- The Edinburg East Freddy Gonzalez Drive monitor event on June 12, 2022, is classified as a Tier 1 day with a 24-hour concentration of 40.6 $\mu g/m^3$;
- The Dona Park monitor event on June 12, 2022, is classified as a Tier 1 day with a 24-hour concentration of 34.9 $\mu g/m^3$;
- The Edinburg East Freddy Gonzalez Drive monitor event on June 13, 2022, is classified as a Tier 2 day with a 24-hour concentration of 26.2 $\mu g/m^3$;
- The Von Ormy Highway 16 monitor event on June 13, 2022, is classified as a Tier 1 day with a 24-hour concentration of 36.5 $\mu g/m^3$;
- The Haws Athletic Center monitor event on June 13, 2022, is classified as a Tier 1 day with a 24-hour concentration of 33.4 $\mu g/m^3$;
- The World Trade Bridge monitor event on June 13, 2022, is classified as a Tier 2 day with a 24-hour concentration of 28.8 $\mu g/m^3$;
- The Von Ormy Highway 16 monitor event on June 14, 2022, is classified as a Tier 2 day with a 24-hour concentration of 31.6 $\mu g/m^3$;
- The Haws Athletic Center monitor event on June 14, 2022, is classified as a Tier 1 day with a 24-hour concentration of 34.2 $\mu g/m^3$;
- The Edinburg East Freddy Gonzalez Drive monitor event on June 15, 2022, is classified as a Tier 1 day with a 24-hour concentration of 30.9 $\mu g/m^3$;
- The Edinburg East Freddy Gonzalez Drive monitor event on June 16, 2022, is classified as a Tier 1 day with a 24-hour concentration of 40.5 $\mu g/m^3$;
- The Dona Park monitor event on June 16, 2022, is classified as a Tier 1 day with a 24-hour concentration of 36.0 $\mu g/m^3$;
- The Von Ormy Highway 16 monitor event on June 16, 2022, is classified as a Tier 1 day with a 24-hour concentration of 41.3 $\mu g/m^3$;
- The Haws Athletic Center monitor event on June 16, 2022, is classified as a Tier 1 day with a 24-hour concentration of 36.2 $\mu g/m^3$;
- The World Trade Bridge monitor event on June 16, 2022, is classified as a Tier 1 day with a 24-hour concentration of 40.6 $\mu g/m^3$;
- The Edinburg East Freddy Gonzalez Drive monitor event on June 17, 2022, is classified as a Tier 2 day with a 24-hour concentration of 23.6 $\mu g/m^3$;
- The Haws Athletic Center monitor event on June 17, 2022, is classified as a Tier 1 day with a 24-hour concentration of 33.6 $\mu g/m^3$.

Local media also reported high concentrations of Saharan dust in Texas, as shown in Figure C-1 through C-5 of Appendix C. The evidence provided meets requirements for Tier 1 and Tier 2 demonstrations for the days impacted by Saharan dust event.

At the Edinburg East Freddy Gonzalez Drive and the Dona Park monitors, hourly $PM_{2.5}$ graphs show evidence of changes in hourly temporal patterns of $PM_{2.5}$ due to impact of Saharan dust on June 12, 2022 (Figure 3-36: *Hourly $PM_{2.5}$ Concentrations on June 12, 2022, Compared to Typical Concentrations at the Edinburg East Freddy Gonzalez Drive Monitor and* Figure 3-37: *Hourly $PM_{2.5}$ Concentrations on June 12, 2022, Compared to Typical Concentrations at the Dona Park Monitor*) compared to typical non-event concentrations (Tier 3 Median). Figure 3-38: *AirNow Tech Aerosol Optical Depth (AOD) Map, with MODIS Terra and Aqua Satellite Layers on June 12, 2022*, show a MODIS Aqua and Terra AOD image corroborating the high concentration of dust seen over the Gulf of America and the impacted Edinburg East Freddy Gonzalez Drive and Dona

Park monitoring sites, with the yellow dot denoting air quality in the moderate category. The HYSPLIT backward trajectory originating from the impacted monitoring sites (Figure 3-39: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Edinburg East Freddy Gonzalez Drive Monitor on June 12, 2022,* and Figure 3-40: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Dona Park Monitor on June 12, 2022*) at 100 m, 500 m, and 800 m AGL passes over the Gulf of America containing aerosols of oncoming Saharan dust. HYSPLIT Forward trajectories starting from Western Africa arrive at Texas, as shown in Figure 3-41: *NOAA HYSPLIT 14-Day Forward Trajectories Originating from Western Africa, Starting on May 30,* **2022.**

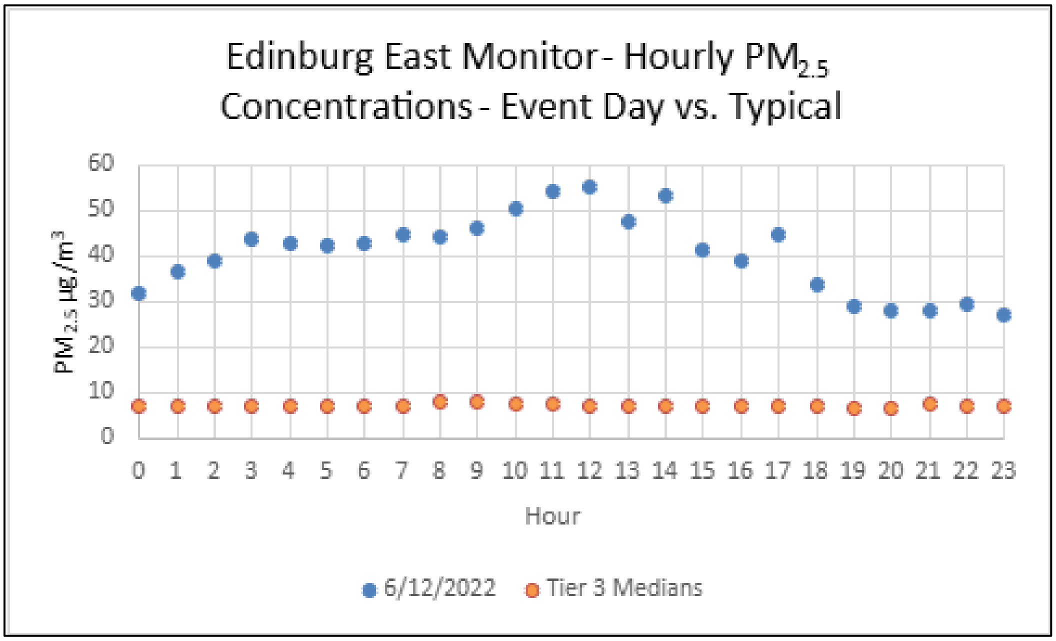

Figure 3-36: Hourly $PM_{2.5}$ Concentrations on June 12, 2022, Compared to Typical Concentrations at the Edinburg East Freddy Gonzalez Drive Monitor

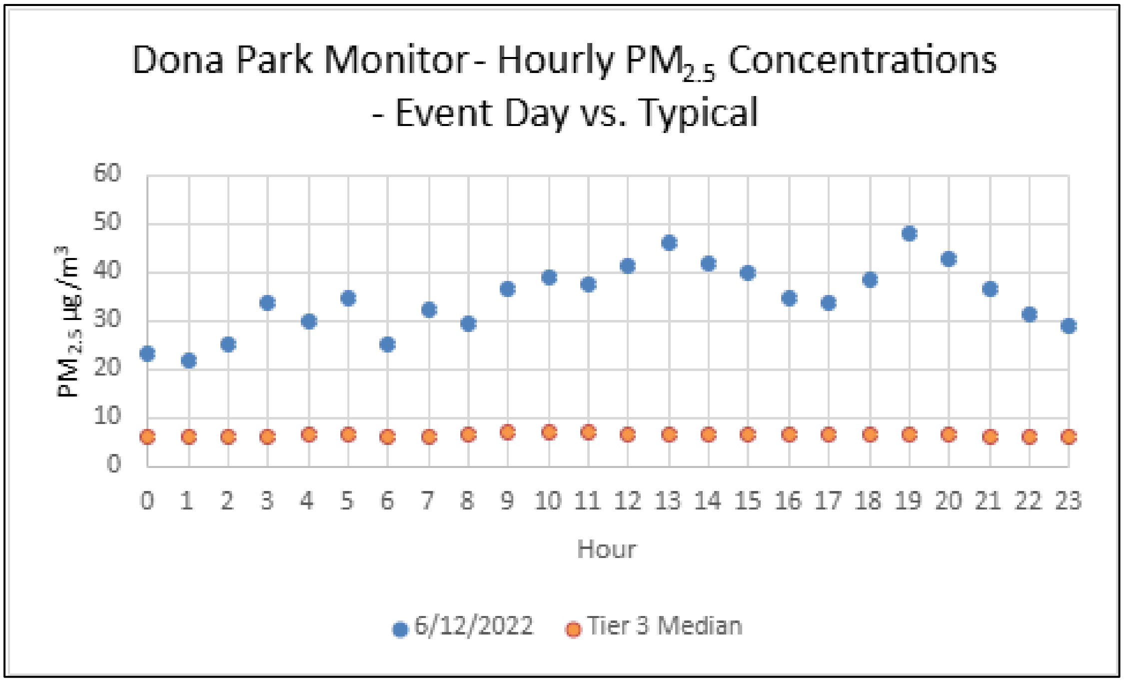

Figure 3-37: Hourly $PM_{2.5}$ Concentrations on June 12, 2022, Compared to Typical Concentrations at the Dona Park Monitor

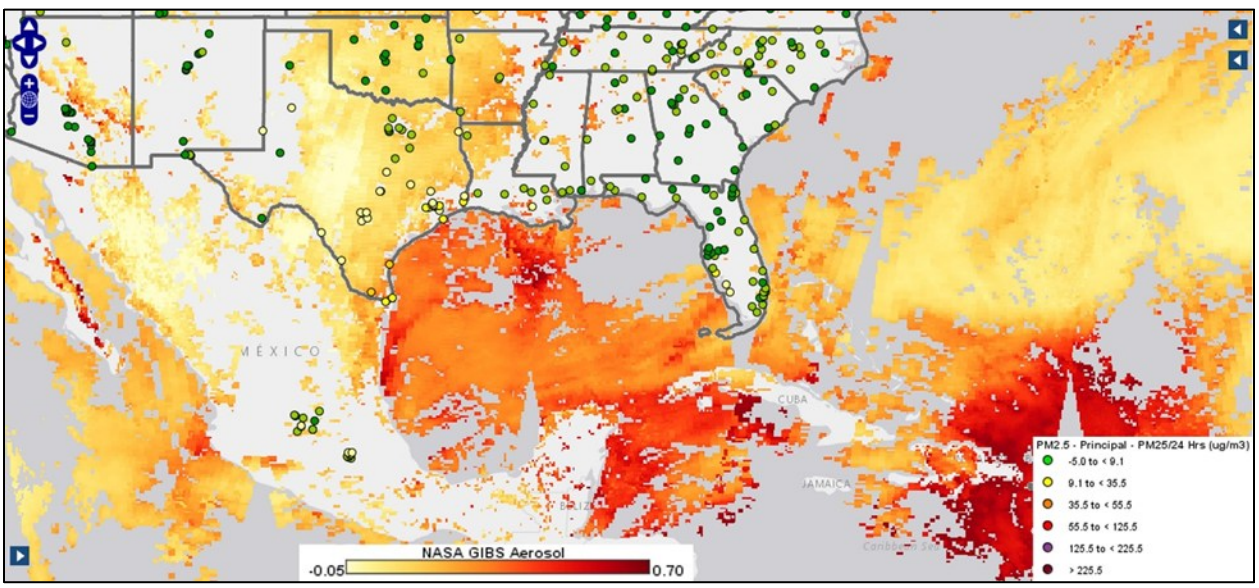

Figure 3-38: AirNow Tech Aerosol Optical Depth (AOD) Map, with MODIS Terra and Aqua Satellite Layers on June 12, 2022

Figure 3-39: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Edinburg East Freddy Gonzalez Drive Monitor on June 12, 2022

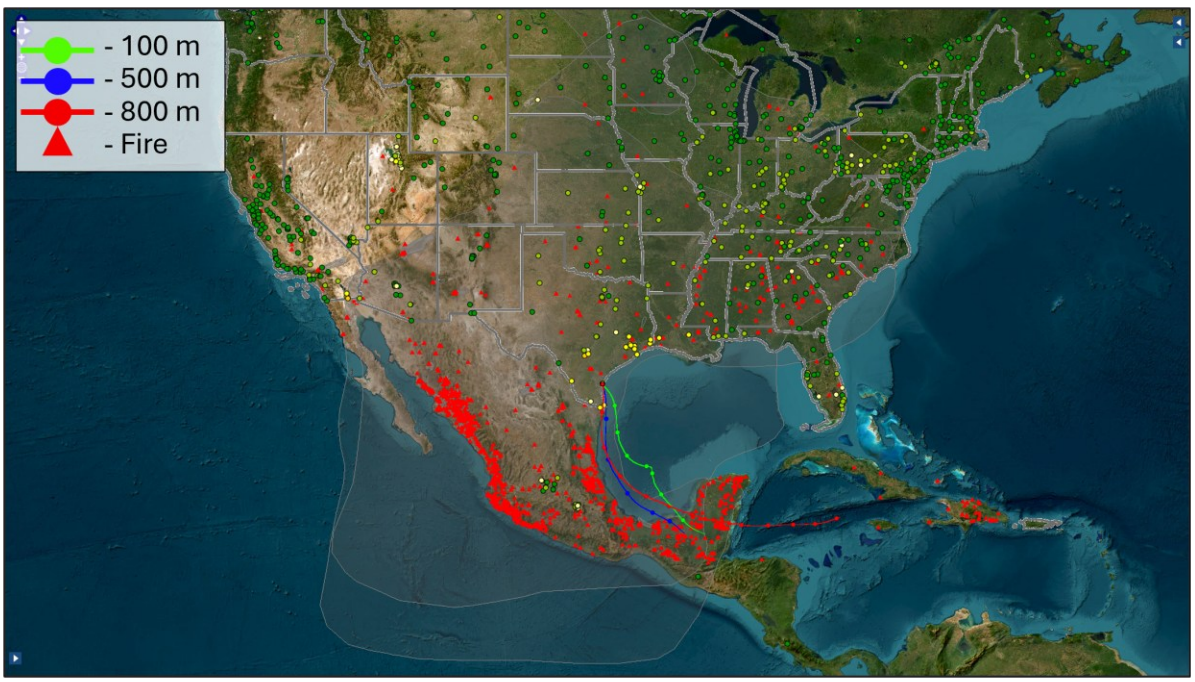

Figure 3-40: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Dona Park Monitor on June 12, 2022

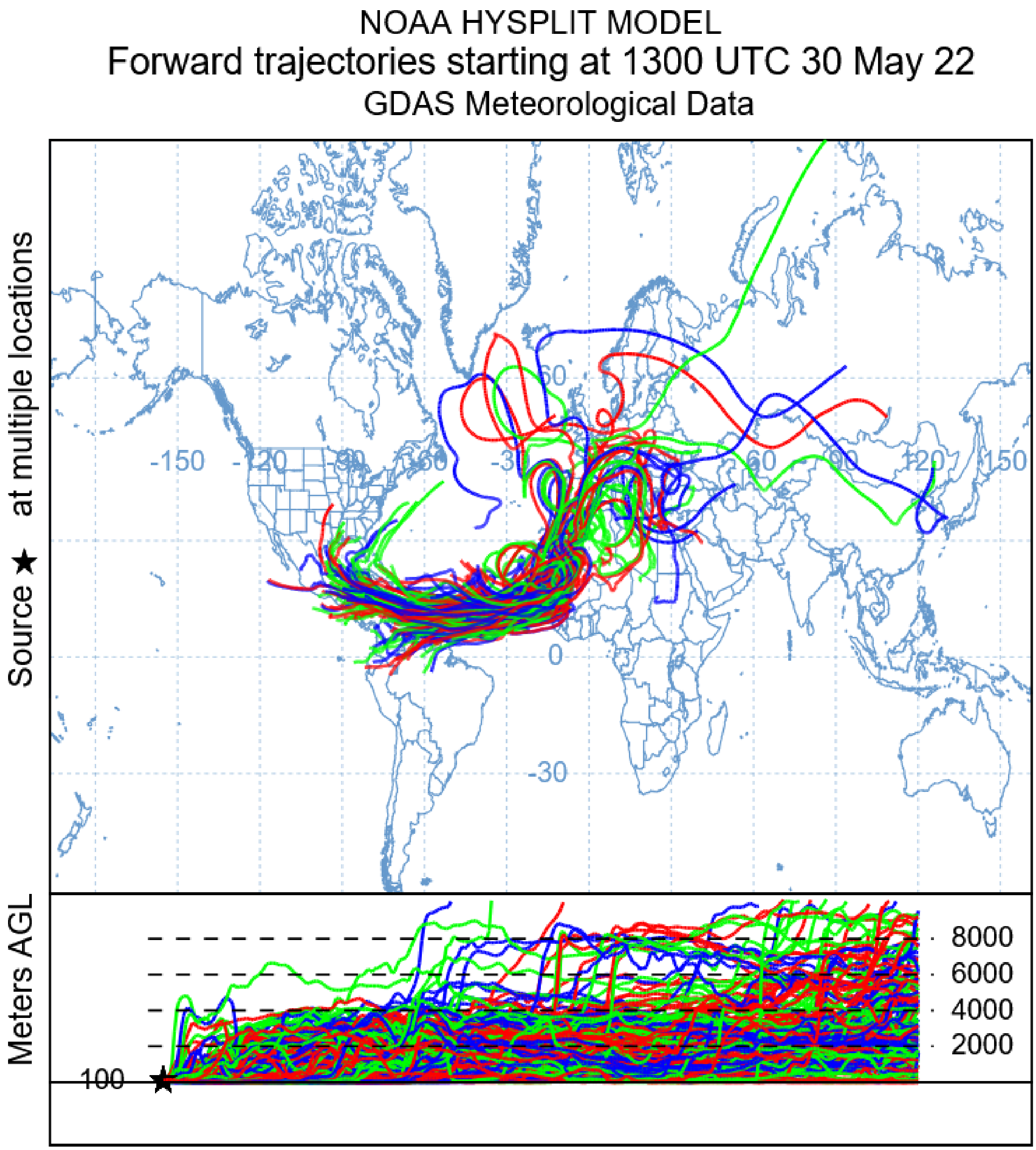

Figure 3-41: NOAA HYSPLIT 14-Day Forward Trajectories Originating from Western Africa, Starting on May 30, 2022

At the Edinburg East Freddy Gonzalez Drive, the Von Ormy Highway 16, the Haws Athletic Center, and the World Trade Bridge monitors, hourly $PM_{2.5}$ graphs show evidence of changes in hourly temporal patterns of $PM_{2.5}$ due to the impact of Saharan dust on June 13 (Figure 3-42: *Hourly $PM_{2.5}$ Concentrations on June 13, 2022, Compared to Typical Concentrations at the Edinburg East Freddy Gonzalez Drive Monitor*, Figure 3-43: *Hourly $PM_{2.5}$ Concentrations on June 13, 2022, Compared to Typical Concentrations at the Von Ormy Highway 16 Monitor*, Figure 3-44: *Hourly $PM_{2.5}$ Concentrations on June 13, 2022, Compared to Typical Concentrations at the Haws Athletic Center Monitor*, and Figure 3-45: *Hourly $PM_{2.5}$ Concentrations on June 13, 2022,* *Compared to Typical Concentrations at the World Trade Bridge Monitor*) compared to typical non-event concentrations (Tier 3 Median). Figure 3-46: *AirNow Tech Aerosol Optical Depth (AOD) Map, with MODIS Terra and Aqua Satellite Layers on June 13, 2022*, shows a MODIS Aqua and Terra AOD image corroborating the high concentration of dust seen over the Gulf and the four impacted monitoring sites, with the yellow dot denoting air quality in the moderate category. The HYSPLIT backward trajectory originating from the impacted monitoring sites (Figure 3-47: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Von Ormy Highway 16 Monitor on June 13, 2022*, Figure 3-48: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Edinburg East Freddy Gonzalez Drive Monitor on June 13, 2022*, Figure 3-49: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Haws Athletic Center Monitor on June 13, 2022* and Figure 3-50: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the World Trade Bridge Monitor on June 13, 2022*) at 100 m, 500 m, and 800 m AGL passes over the Gulf of America containing aerosols of incoming Saharan dust. HYSPLIT forward trajectories starting from Western Africa arrive in Texas, as shown in Figure 3-51: *NOAA HYSPLIT 14-Day Forward Trajectories Originating from Western Africa, Starting on May 29,* **2022**.

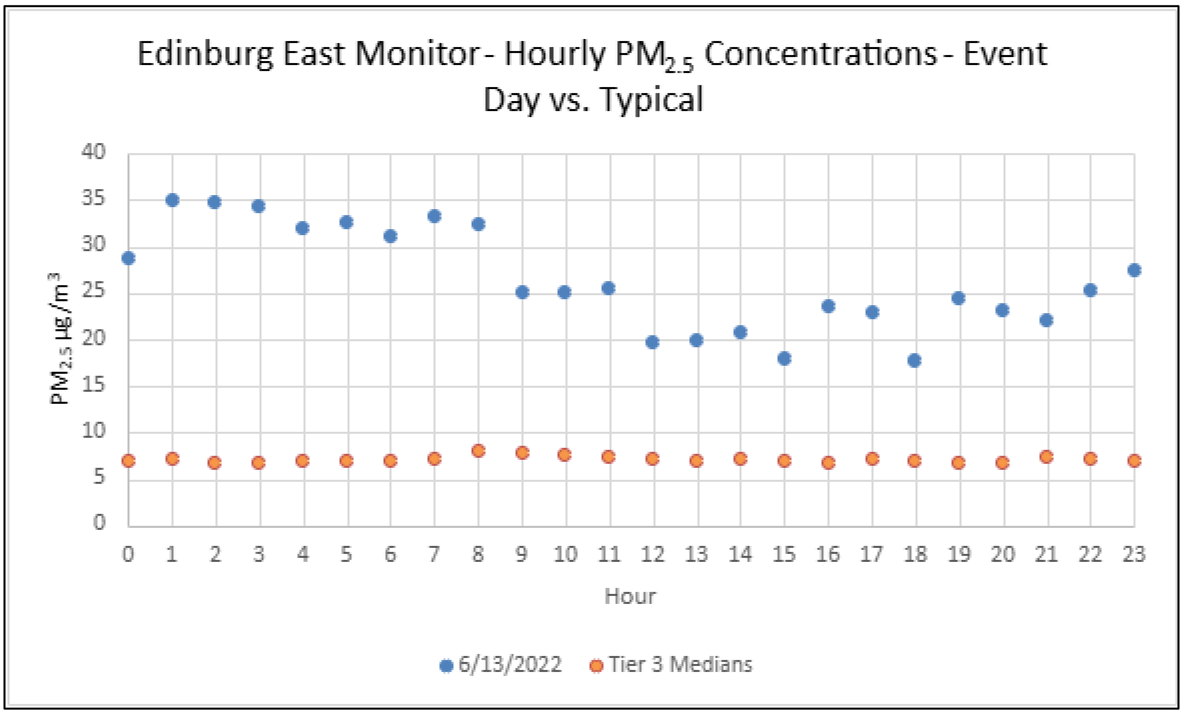

Figure 3-42: Hourly $PM_{2.5}$ Concentrations on June 13, 2022, Compared to Typical Concentrations at the Edinburg East Freddy Gonzalez Drive Monitor

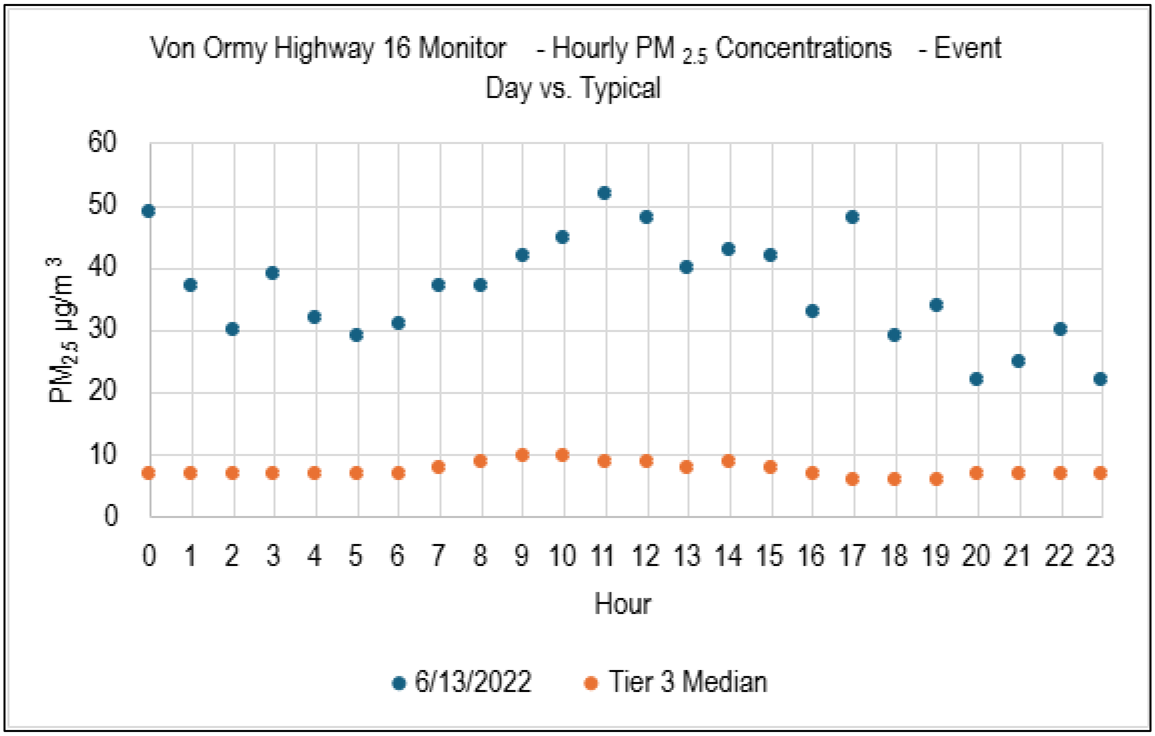

Figure 3-43: Hourly $PM_{2.5}$ Concentrations on June 13, 2022, Compared to Typical Concentrations at the Von Ormy Highway 16 Monitor

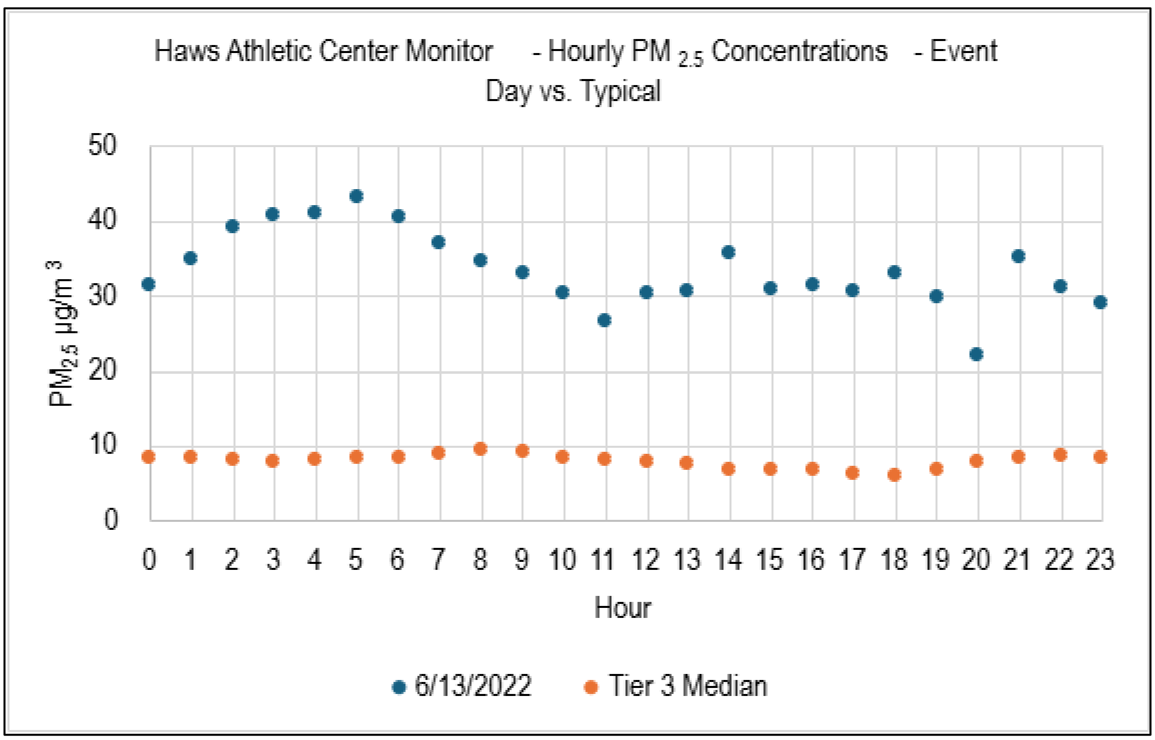

Figure 3-44: Hourly $PM_{2.5}$ Concentrations on June 13, 2022, Compared to Typical Concentrations at the Haws Athletic Center Monitor

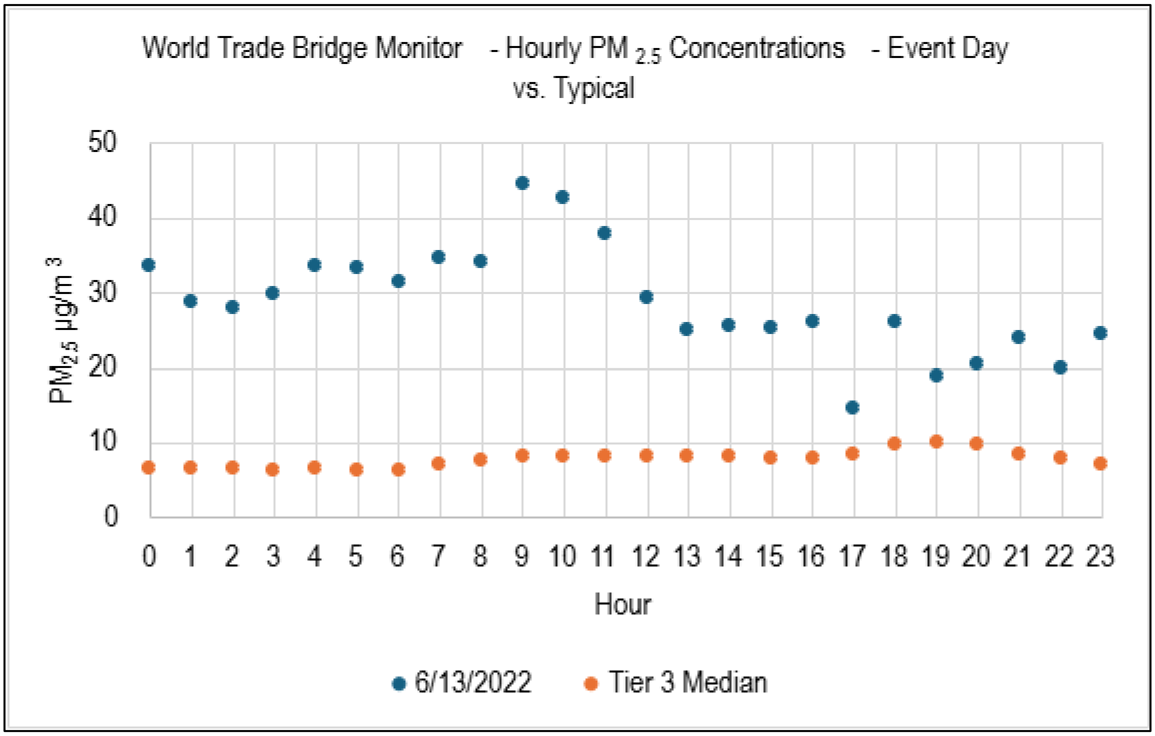

Figure 3-45: Hourly $PM_{2.5}$ Concentrations on June 13, 2022, Compared to Typical Concentrations at the World Trade Bridge Monitor

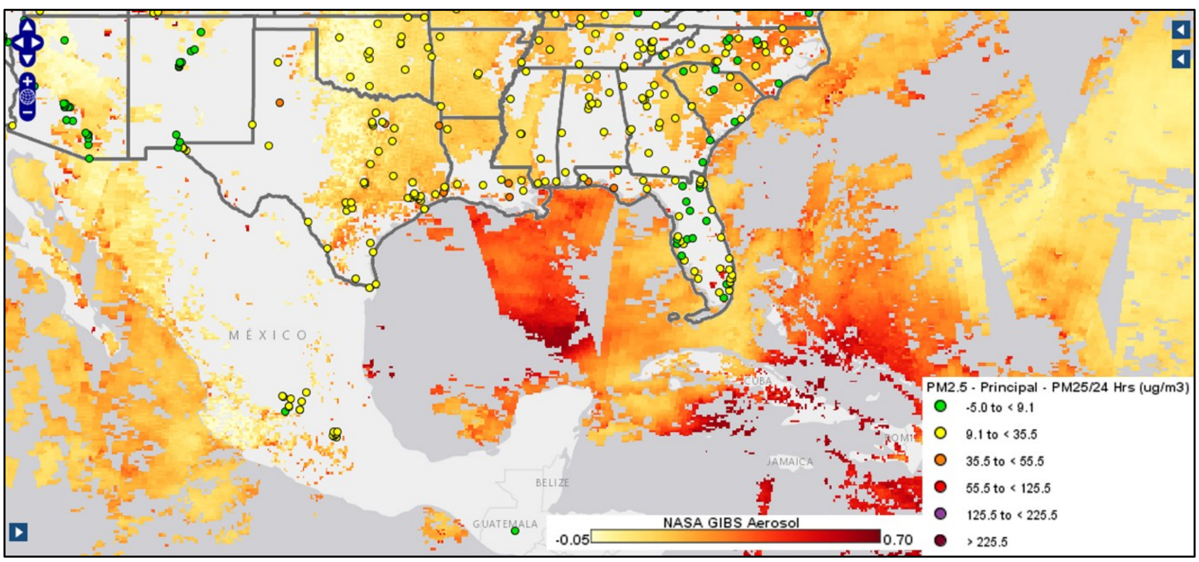

Figure 3-46: AirNow Tech Aerosol Optical Depth (AOD) Map, with MODIS Terra and Aqua Satellite Layers on June 13, 2022

Figure 3-47: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Von Ormy Highway 16 Monitor on June 13, 2022

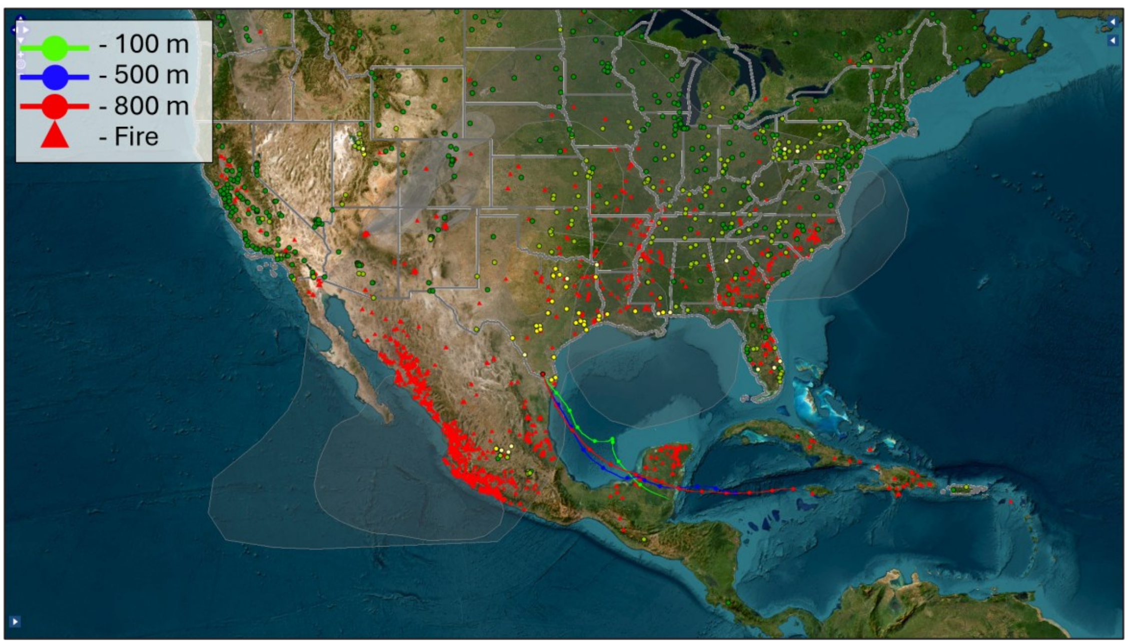

Figure 3-48: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Edinburg East Freddy Gonzalez Drive Monitor on June 13, 2022

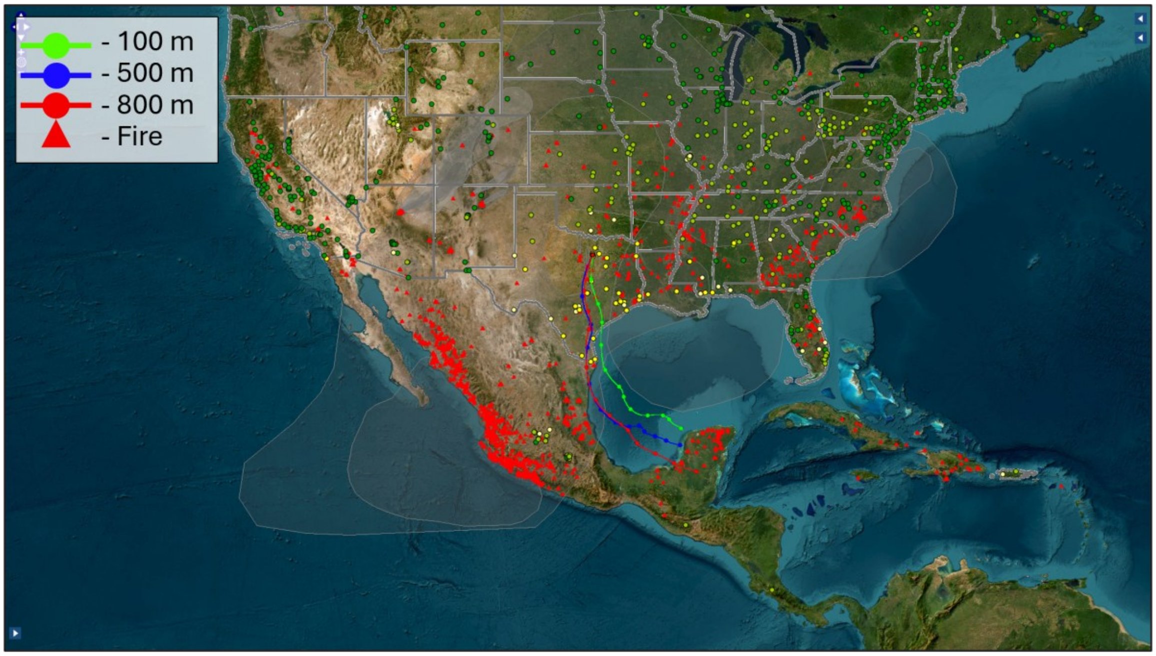

Figure 3-49: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Haws Athletic Center Monitor on June 13, 2022

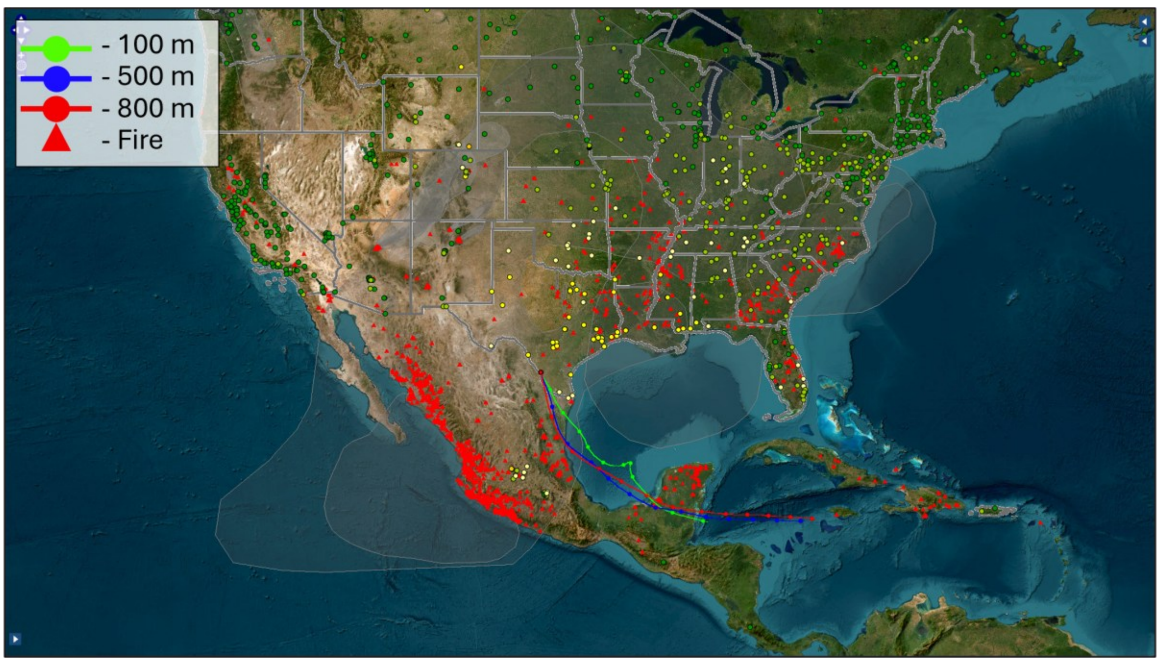

Figure 3-50: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the World Trade Bridge Monitor on June 13, 2022

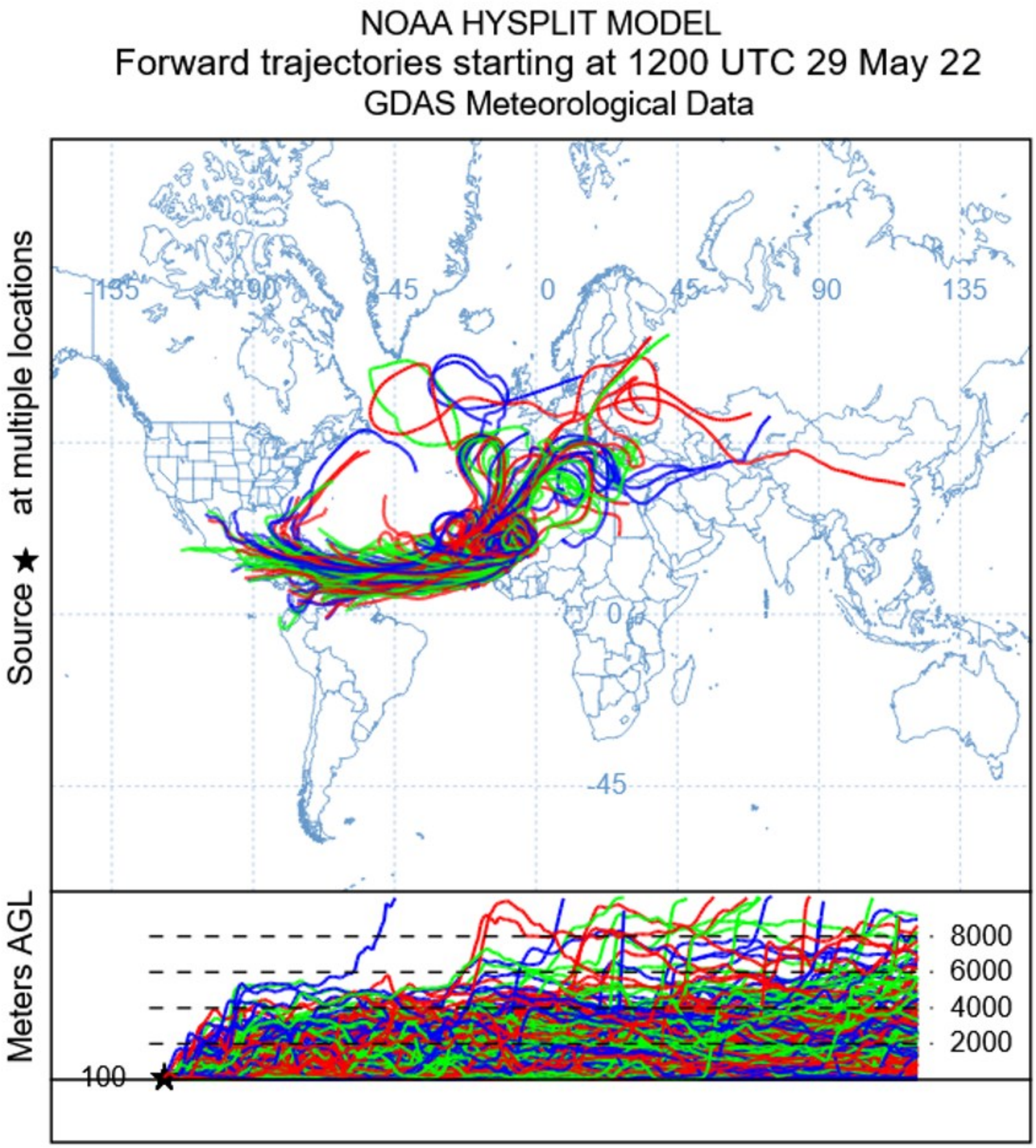

Figure 3-51: NOAA HYSPLIT 14-Day Forward Trajectories Originating from Western Africa, Starting on May 29, 2022

At the Von Ormy Highway 16, and the Haws Athletic Center monitors, hourly $PM_{2.5}$ graphs show evidence of changes in hourly temporal patterns of $PM_{2.5}$ due to impact of Saharan dust on June 14, 2022 (Figure 3-52: *Hourly $PM_{2.5}$ Concentrations on June 14, 2022, Compared to Typical Concentrations at the Von Ormy Highway 16 Monitor*, and *Figure 3-53: Hourly $PM_{2.5}$ Concentrations on June 14, 2022, Compared to Typical Concentrations at the Haws Athletic Center Monitor*) compared to typical non-event concentrations (Tier 3 Median). Figure 3-54: *AirNow Tech Aerosol Optical Depth (AOD) Map, with MODIS Terra and Aqua Satellite Layers on June 14, 2022*, shows a MODIS Aqua and Terra AOD image corroborating the high concentration of dust seen over the Gulf of America and impacted Von Ormy Highway 16 and Haws Athletic Center monitoring sites, with the yellow dot denoting air quality in the moderate category. The HYSPLIT backward trajectory originating from the impacted monitoring sites (*Figure 3-55:*

AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Von Ormy Highway 16 Monitor on June 14, 2022 and Figure 3-56: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Haws Athletic Center Monitor on June 14, 2022*) at 100 m, 500 m, and 800 m AGL passes over the Gulf of America containing aerosols of incoming Saharan dust. HYSPLIT forward trajectories starting from Western Africa arrive in Texas, as shown in Figure 3-57: *NOAA HYSPLIT 14-Day Forward Trajectories Originating from Western Africa, Starting on May 31,* **2022.**

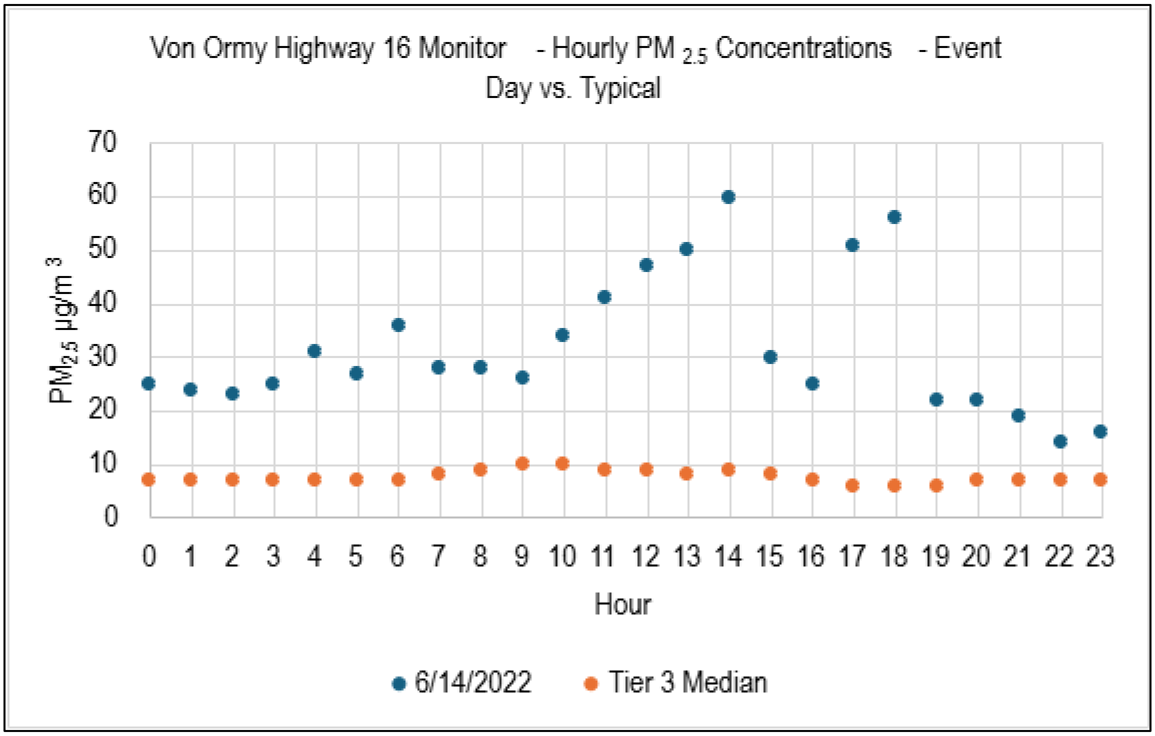

Figure 3-52: Hourly $PM_{2.5}$ Concentrations on June 14, 2022, Compared to Typical Concentrations at the Von Ormy Highway 16 Monitor

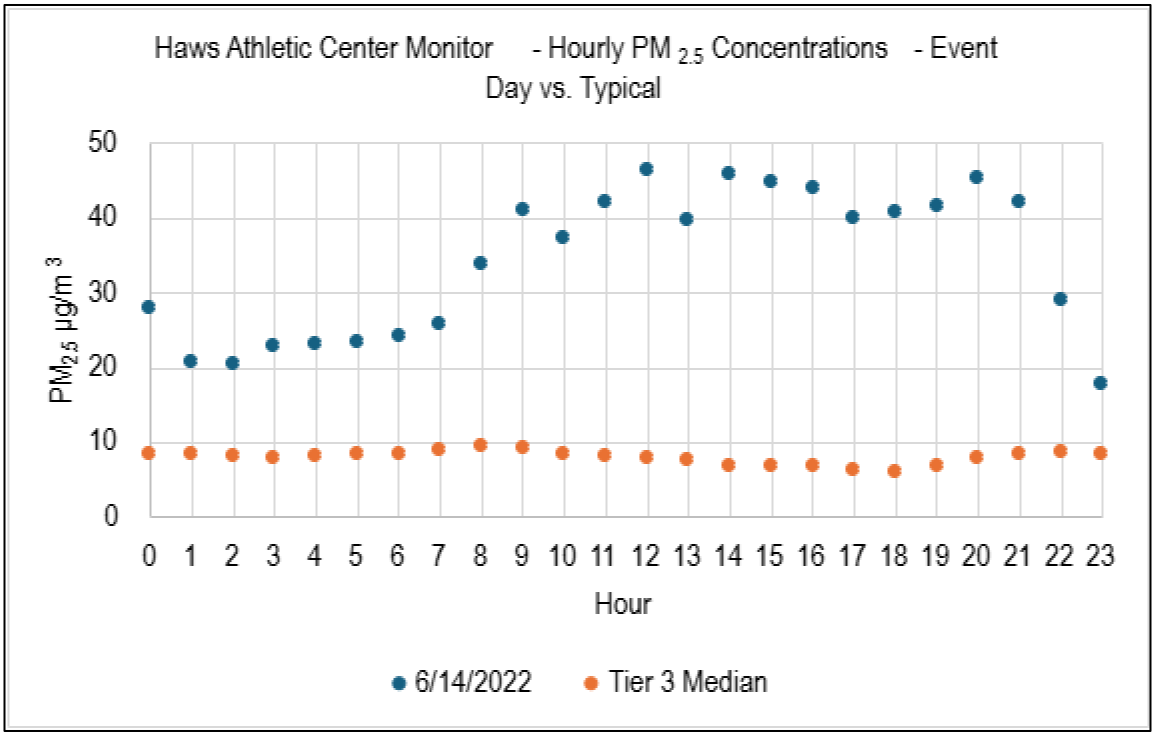

Figure 3-53: Hourly $PM_{2.5}$ Concentrations on June 14, 2022, Compared to Typical Concentrations at the Haws Athletic Center Monitor

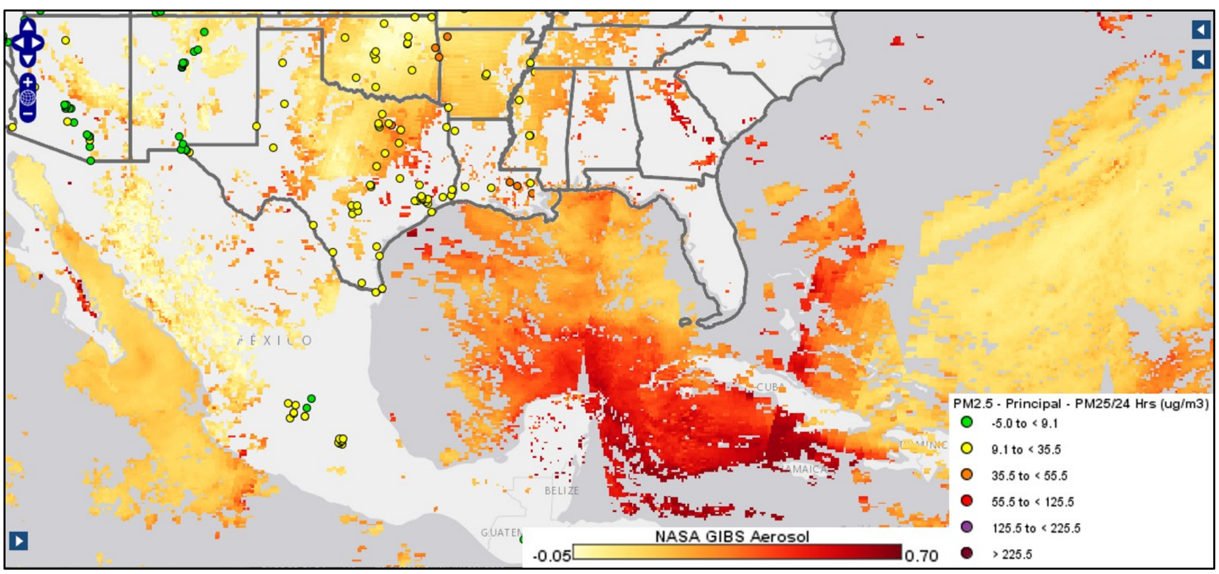

Figure 3-54: AirNow Tech Aerosol Optical Depth (AOD) Map, with MODIS Terra and Aqua Satellite Layers on June 14, 2022

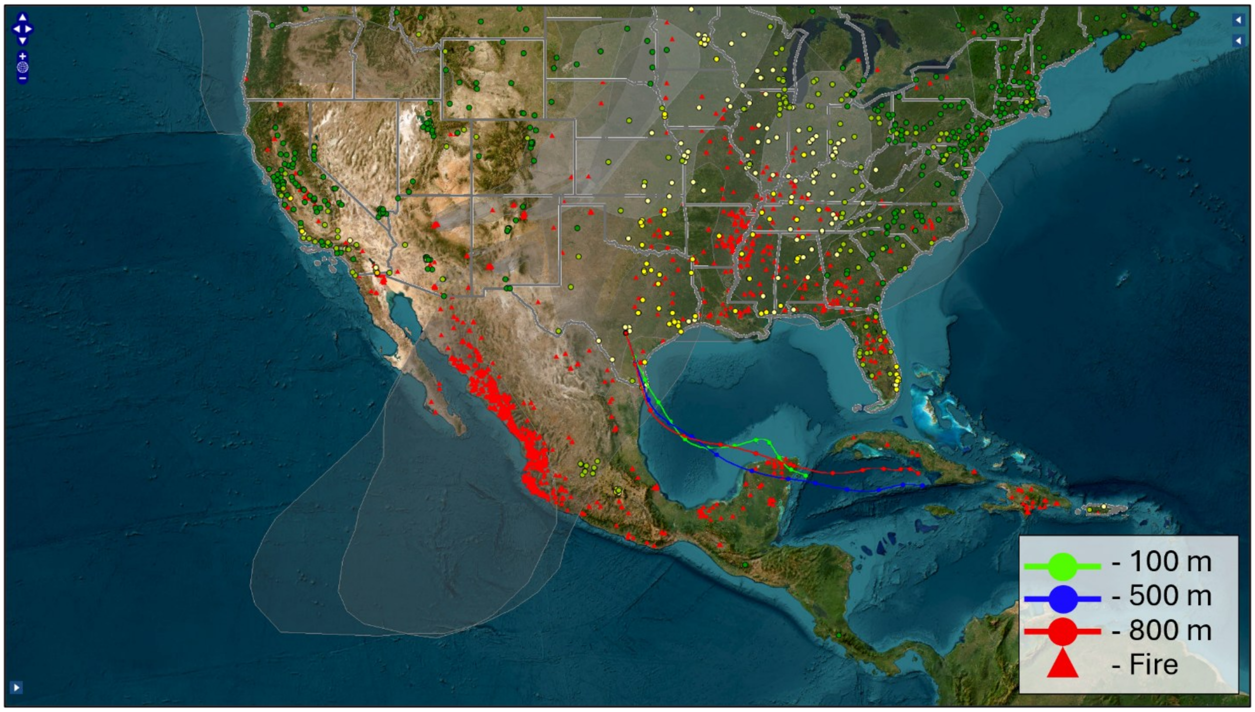

Figure 3-55: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Von Ormy Highway 16 Monitor on June 14, 2022

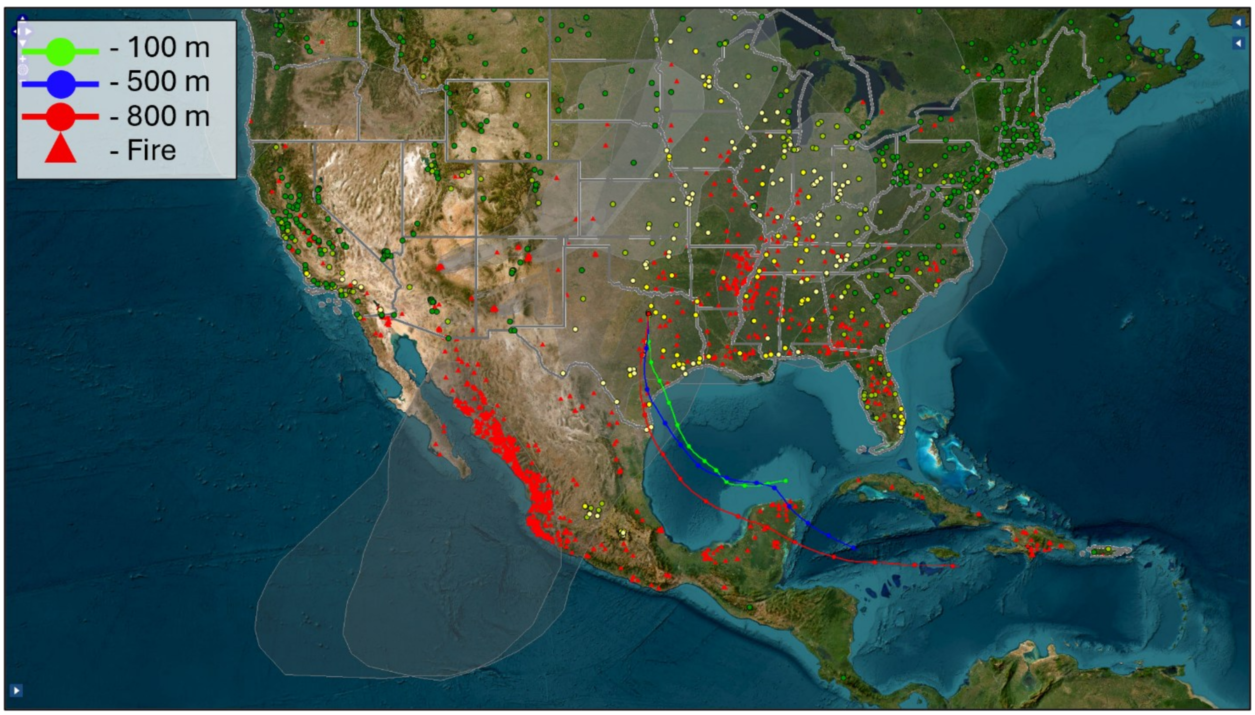

Figure 3-56: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Haws Athletic Center Monitor on June 14, 2022

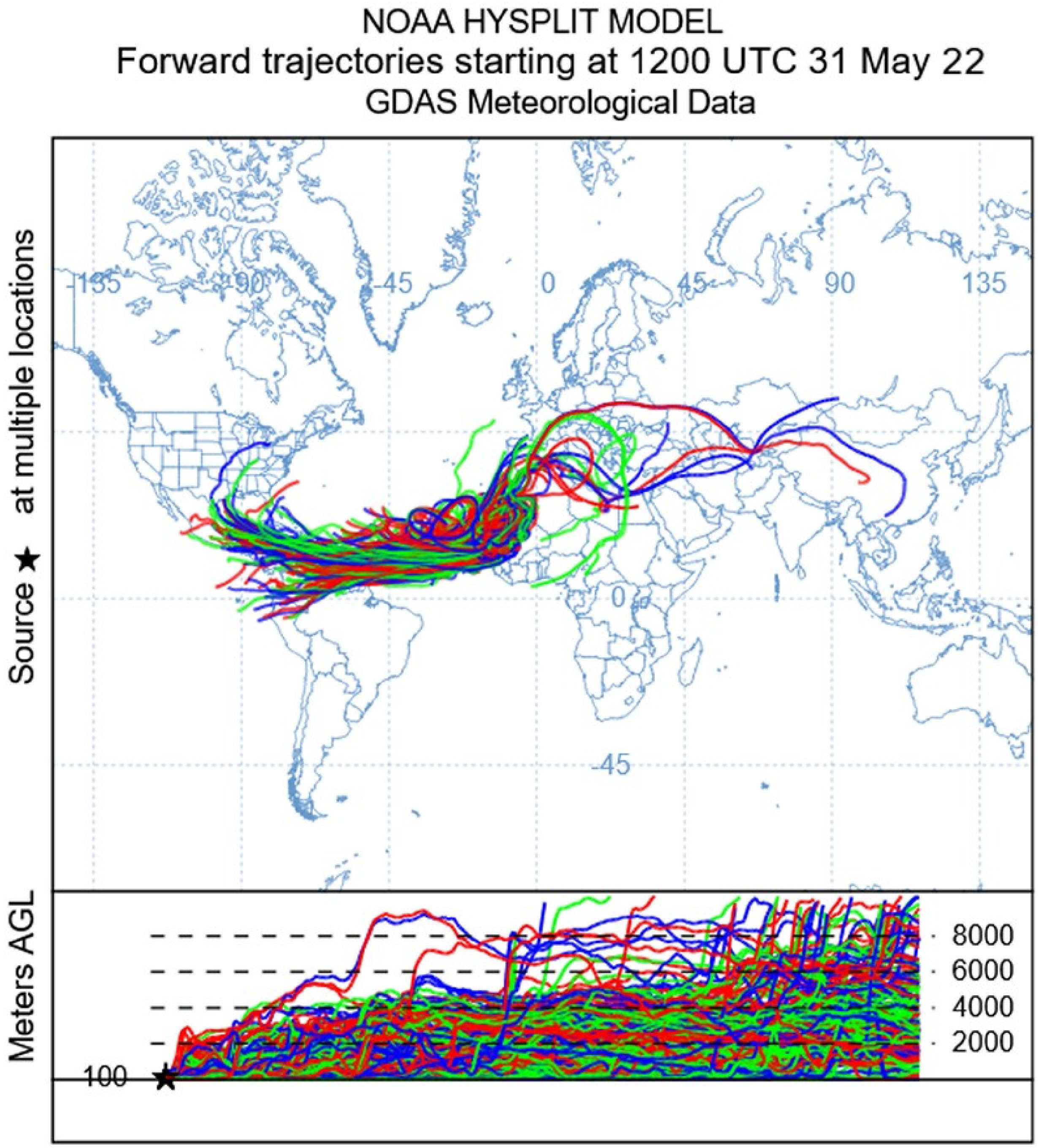

Figure 3-57: NOAA HYSPLIT 14-Day Forward Trajectories Originating from Western Africa, Starting on May 31, 2022

At the Edinburg East Freddy Gonzalez Drive monitor, hourly $PM_{2.5}$ graphs show evidence of changes in hourly temporal patterns of $PM_{2.5}$ due to the impact of Saharan dust on June 15, 2022 (Figure 3-58: *Hourly $PM_{2.5}$ Concentrations on June 15, 2022, Compared to Typical Concentrations at the Edinburg East Freddy Gonzalez Drive Monitor*) compared to typical non-event concentrations (Tier 3 Median). Figure 3-59: *AirNow Tech Aerosol Optical Depth (AOD) Map, with MODIS Terra and Aqua Satellite Layers on June 15, 2022*, shows a MODIS Aqua and Terra AOD image corroborating the high concentration of dust seen over the Gulf of America and the impacted Edinburg East Freddy Gonzalez Drive site, with the yellow dots denoting air quality in the moderate category. The HYSPLIT backward trajectory originating from the impacted Edinburg East Freddy Gonzalez Drive monitoring site (Figure 3-60: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Edinburg East Freddy Gonzalez Drive Monitor on June 15, 2022*) at 100 m, 500 m, and 800 m AGL passes over the Gulf of America containing aerosols of incoming Saharan dust. HYSPLIT forward trajectories starting from western Africa arrive at Texas, as shown in Figure 3-61: *NOAA HYSPLIT 14-Day Forward Trajectories Originating from Western Africa, Starting on June 1,* 2022.

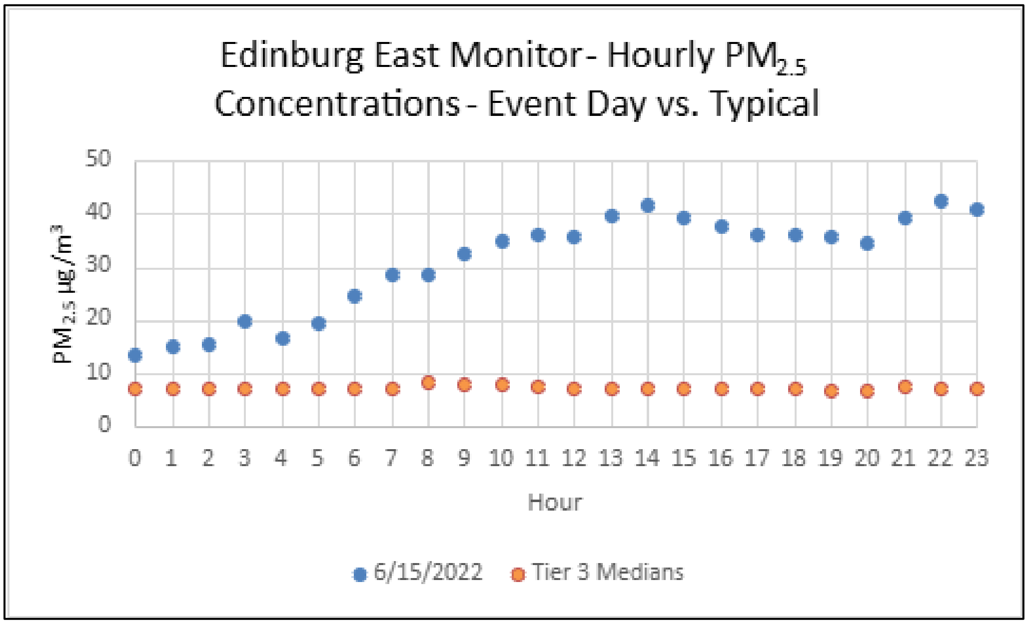

Figure 3-58: Hourly $PM_{2.5}$ Concentrations on June 15, 2022, Compared to Typical Concentrations at the Edinburg East Freddy Gonzalez Drive Monitor

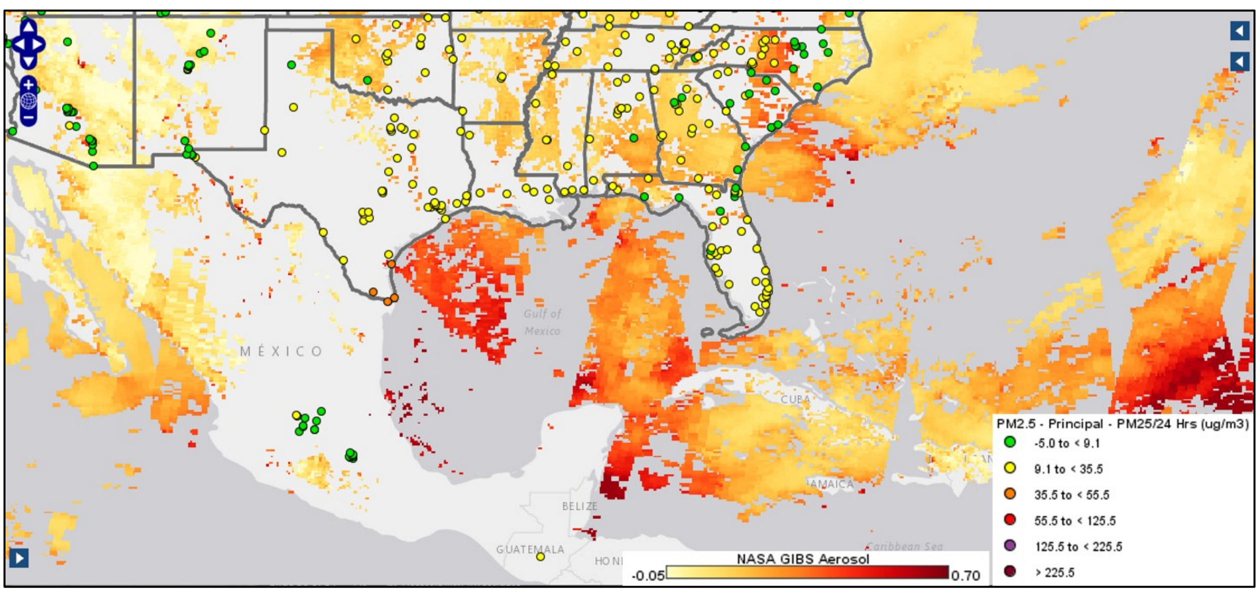

Figure 3-59: AirNow Tech Aerosol Optical Depth (AOD) Map, with MODIS Terra and Aqua Satellite Layers on June 15, 2022

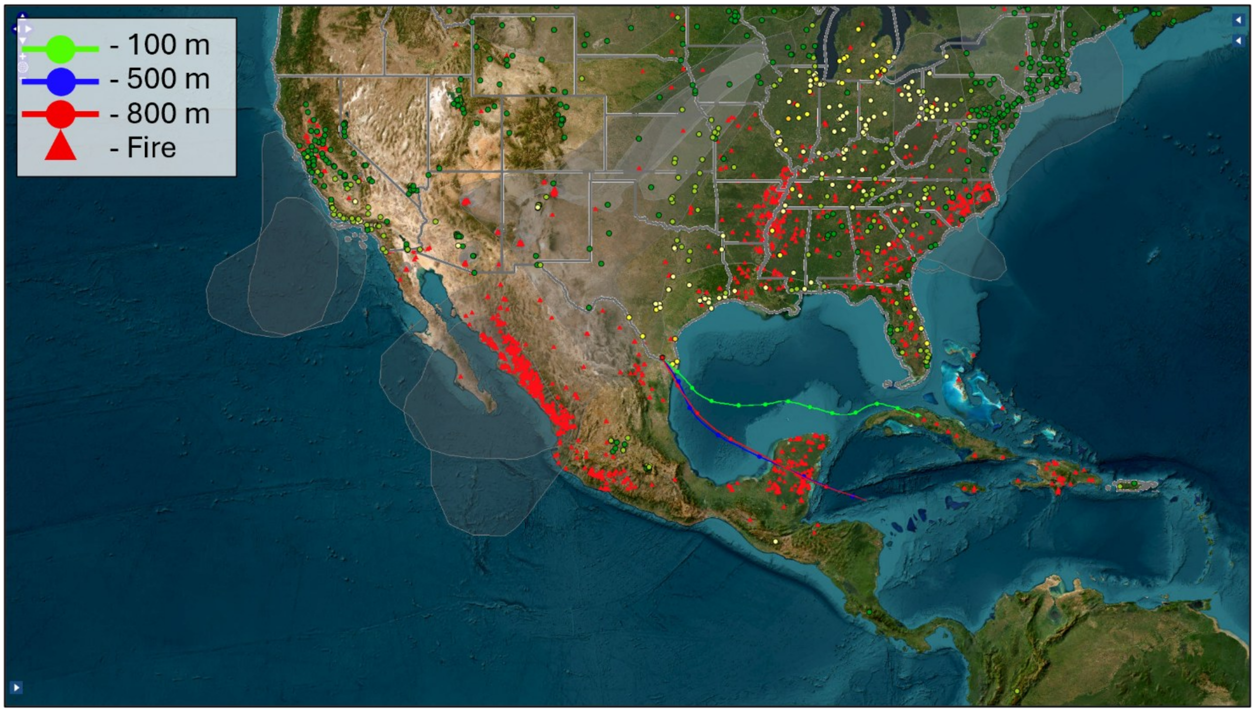

Figure 3-60: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Edinburg East Freddy Gonzalez Drive Monitor on June 15, 2022

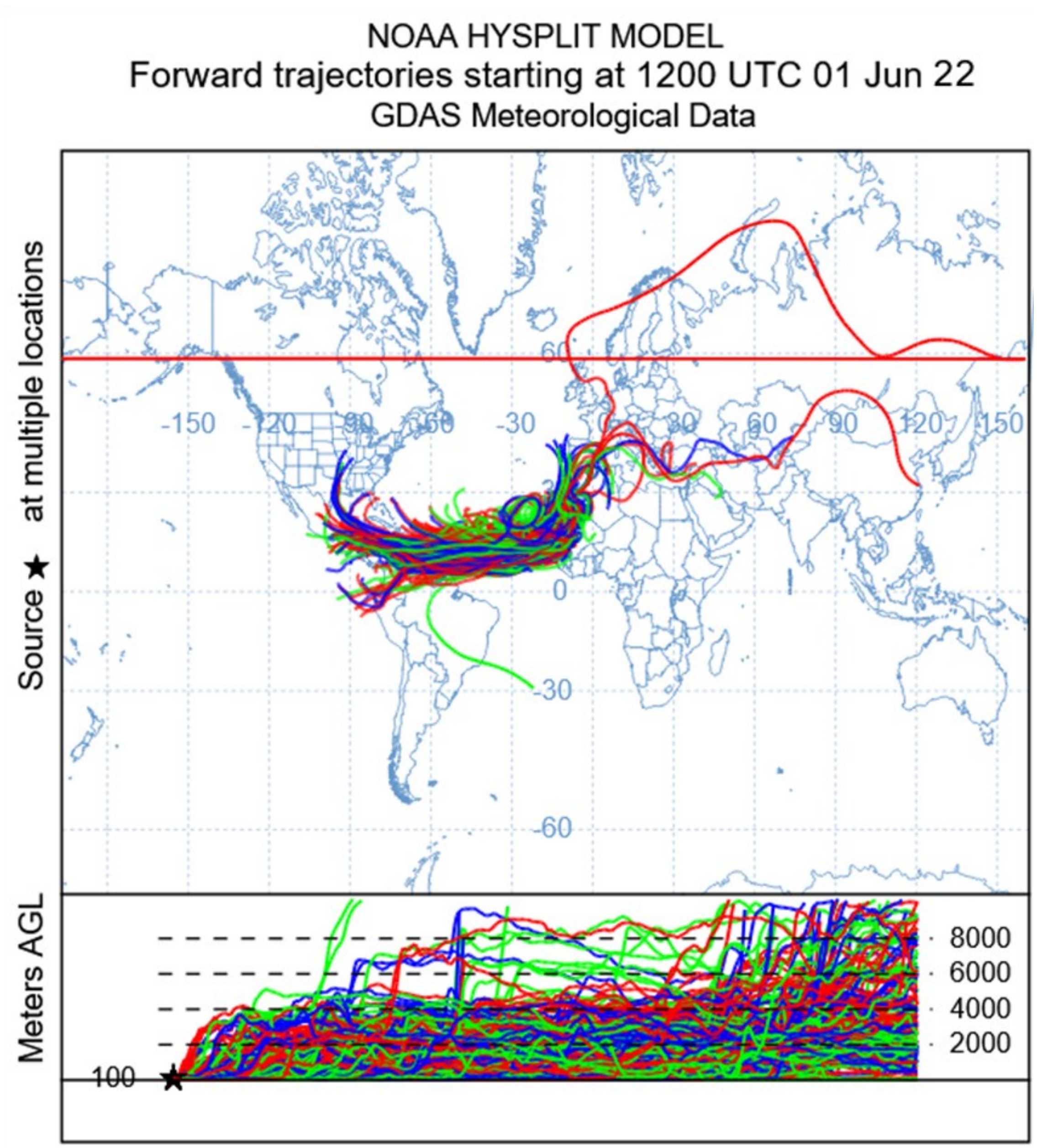

Figure 3-61: NOAA HYSPLIT 14-Day Forward Trajectories Originating from Western Africa, Starting on June 1, 2022

At the Edinburg East Freddy Gonzalez Drive, the Dona Park, the Von Ormy Highway 16, the Haws Athletic Center, and the World Trade Bridge monitors, hourly $PM_{2.5}$ graphs show evidence of changes in hourly temporal patterns of $PM_{2.5}$ due to the impact of Saharan dust on June 16, 2022 (Figure 3-62: *Hourly $PM_{2.5}$ Concentrations on June 16, 2022, Compared to Typical Concentrations at the Edinburg East Freddy Gonzalez Drive Monitor*, Figure 3-63: *Hourly $PM_{2.5}$ Concentrations on June 16, 2022, Compared to Typical Concentrations at the Dona Park Monitor*, Figure 3-64: *Hourly $PM_{2.5}$ Concentrations on June 16, 2022, Compared to Typical Concentrations at the Von Ormy Highway 16 Monitor*, Figure 3-65: *Hourly $PM_{2.5}$ Concentrations on June 16, 2022, Compared to Typical Concentrations at the Haws Athletic Center Monitor*, and Figure 3-66: *Hourly $PM_{2.5}$ Concentrations on June 16, 2022, Compared to Typical Concentrations at the World Trade Bridge Monitor*) compared to typical non-event concentrations (Tier 3 Median). Figure

3-67: *AirNow Tech Aerosol Optical Depth (AOD) Map, with MODIS Terra and Aqua Satellite Layers on June 16, 2022* shows a MODIS Aqua and Terra AOD image corroborating the high concentration of dust seen over the Gulf of America and five impacted monitoring sites, with the yellow dots and orange dots denoting air quality in the moderate to unhealthy for sensitive groups category. The HYSPLIT backward trajectories (Figure 3-68: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Edinburg East Freddy Gonzalez Drive Monitor on June 16, 2022*, Figure 3-69: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Dona Park Monitor on June 16, 2022*, Figure 3-70: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Von Ormy Highway 16 Monitor on June 16, 2022*, Figure 3-71: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Haws Athletic Center Monitor on June 16, 2022*, Figure 3-72: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the World Trade Bridge Monitor on June 16, 2022*) at 100 m, 500 m, and 800 m AGL pass over the Gulf of America containing aerosols incoming from the Saharan dust. HYSPLIT forward trajectories from the Saharan Desert, Figure 3-73: *NOAA HYSPLIT 14-Day Forward Trajectories Originating from Western Africa, Starting on June 3, 2022*, shows the trajectories reaching the monitoring locations.

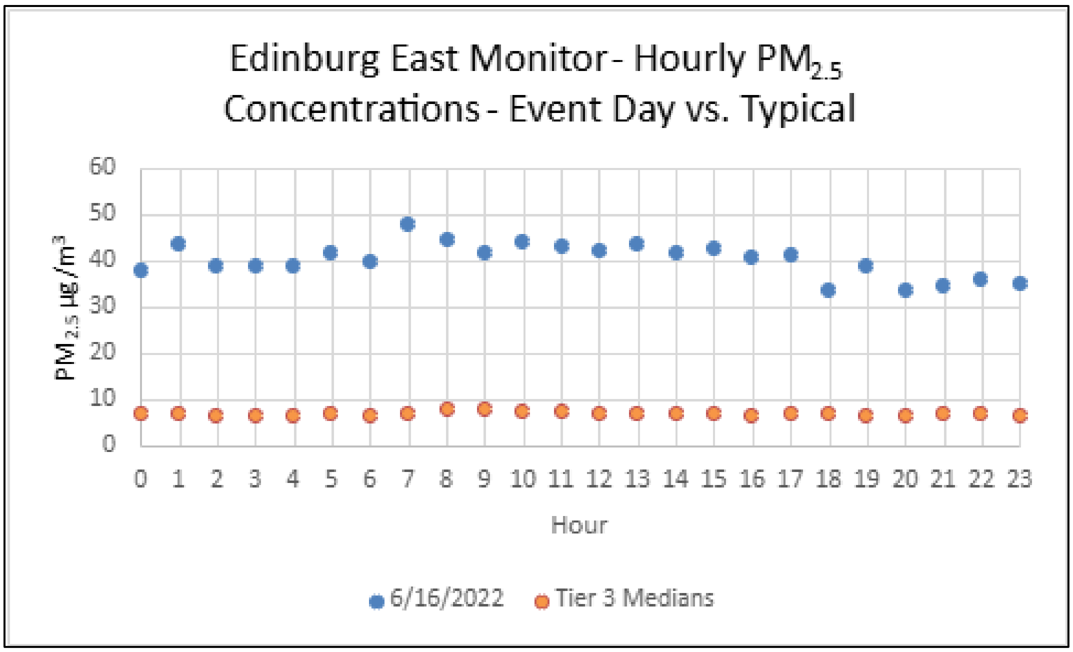

Figure 3-62: Hourly $PM_{2.5}$ Concentrations on June 16, 2022, Compared to Typical Concentrations at the Edinburg East Freddy Gonzalez Drive Monitor

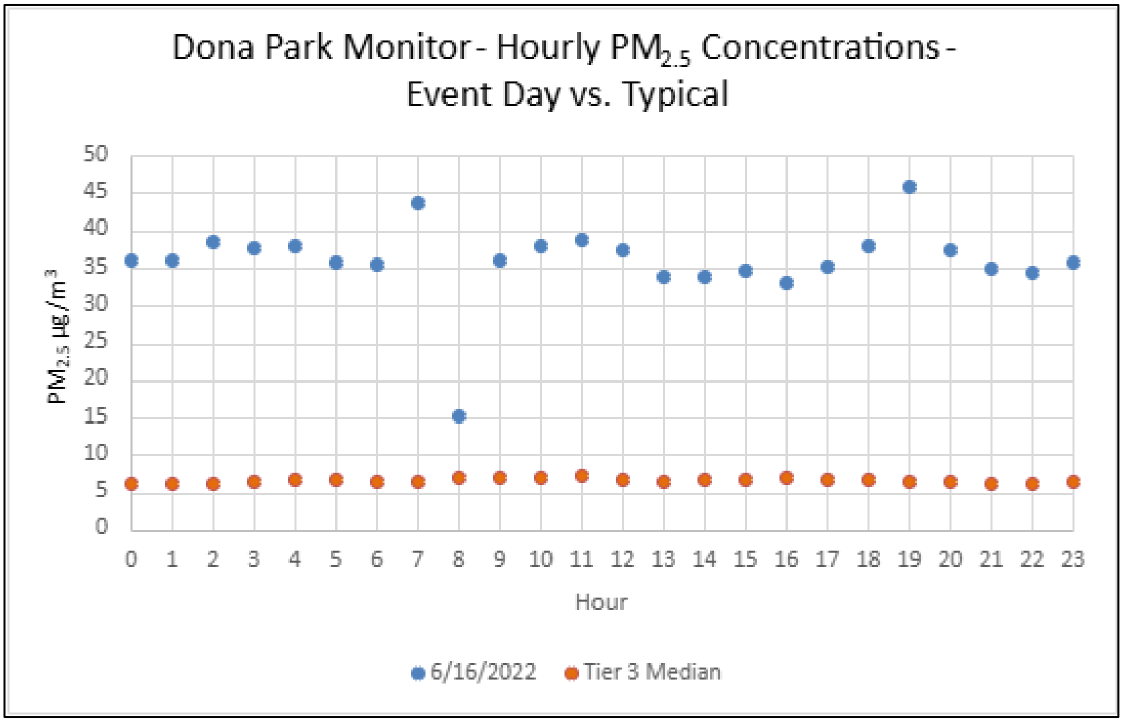

Figure 3-63: Hourly $PM_{2.5}$ Concentrations on June 16, 2022, Compared to Typical Concentrations at the Dona Park Monitor

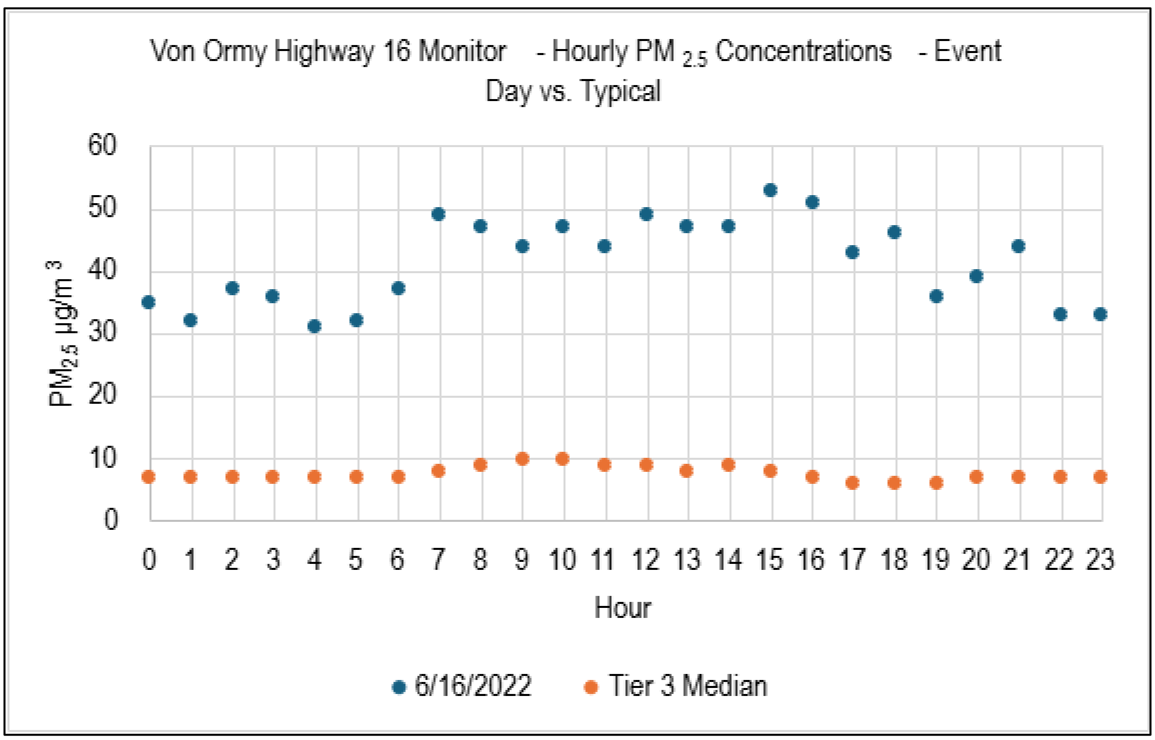

Figure 3-64: Hourly $PM_{2.5}$ Concentrations on June 16, 2022, Compared to Typical Concentrations at the Von Ormy Highway 16 Monitor

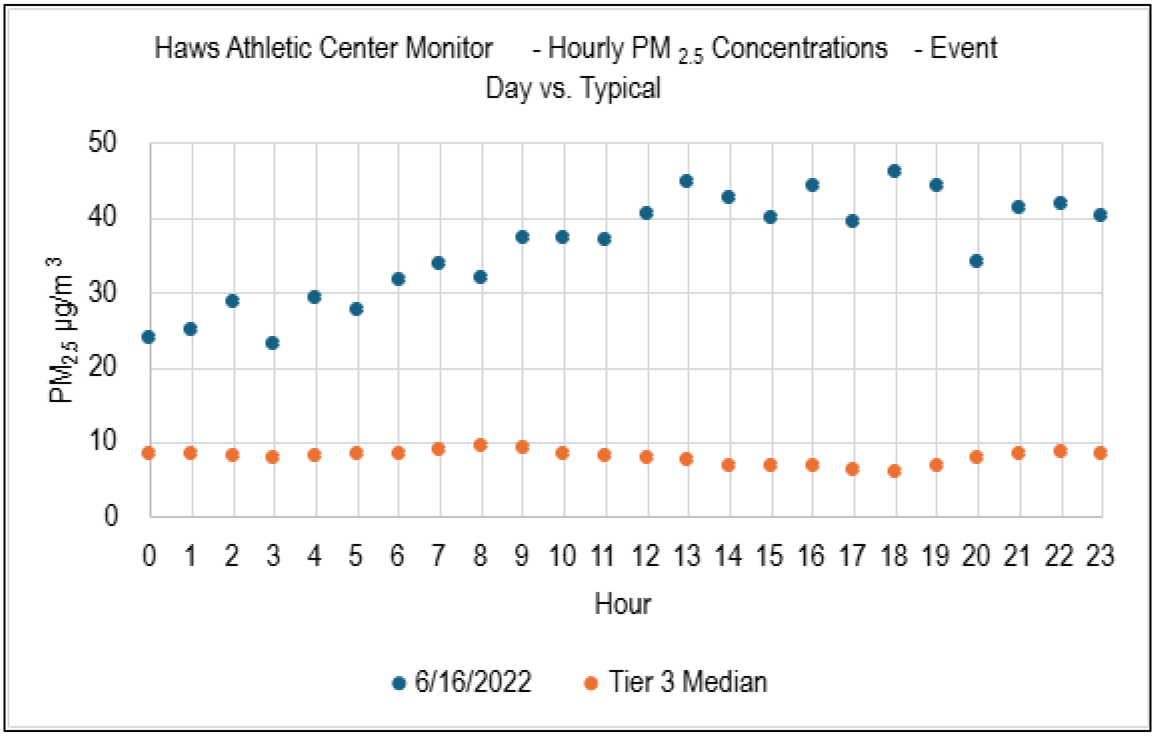

Figure 3-65: Hourly $PM_{2.5}$ Concentrations on June 16, 2022, Compared to Typical Concentrations at the Haws Athletic Center Monitor

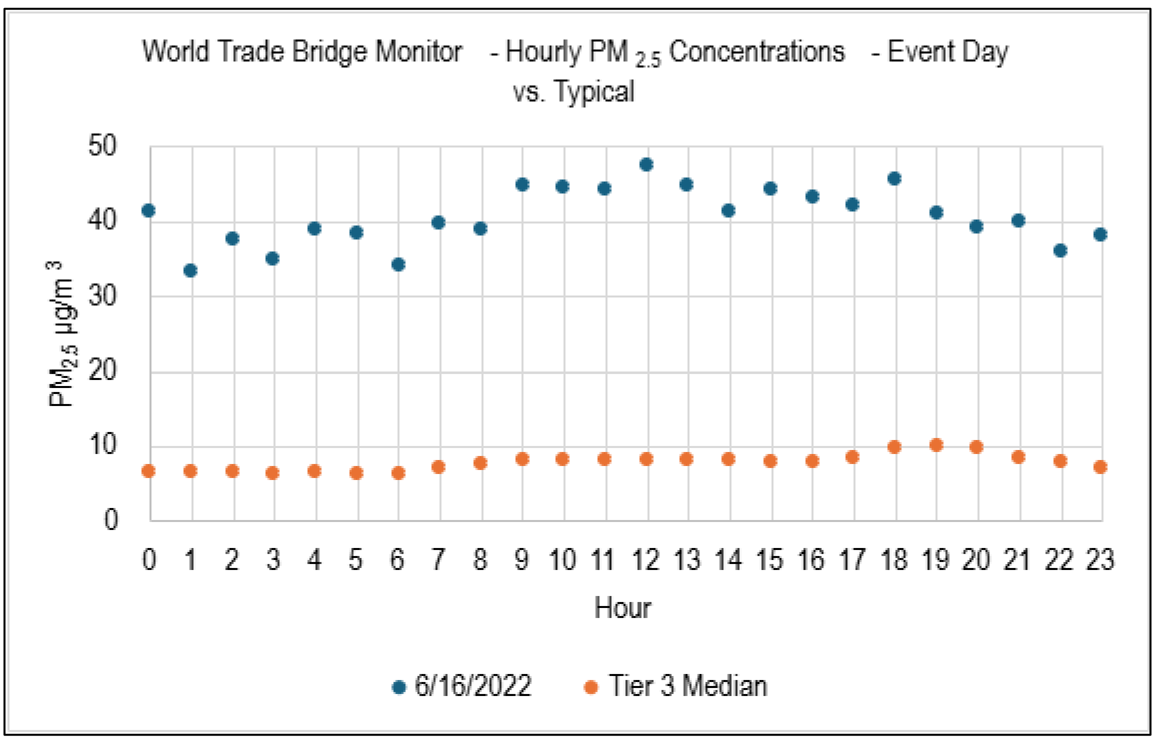

Figure 3-66: Hourly $PM_{2.5}$ Concentrations on June 16, 2022, Compared to Typical Concentrations at the World Trade Bridge Monitor

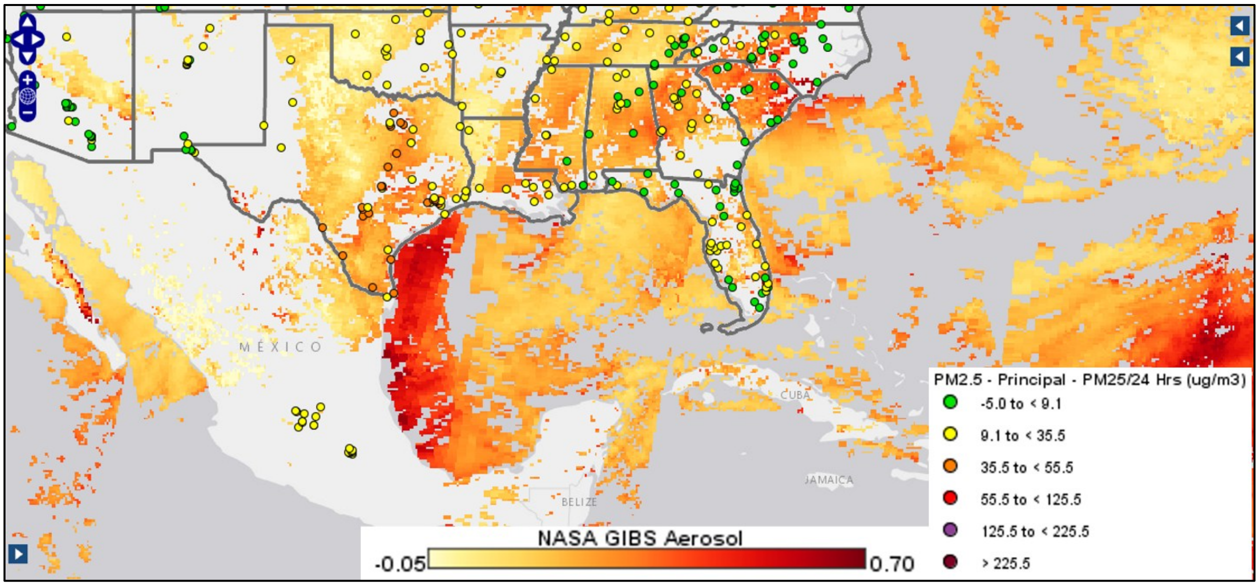

Figure 3-67: AirNow Tech Aerosol Optical Depth (AOD) Map, with MODIS Terra and Aqua Satellite Layers on June 16, 2022

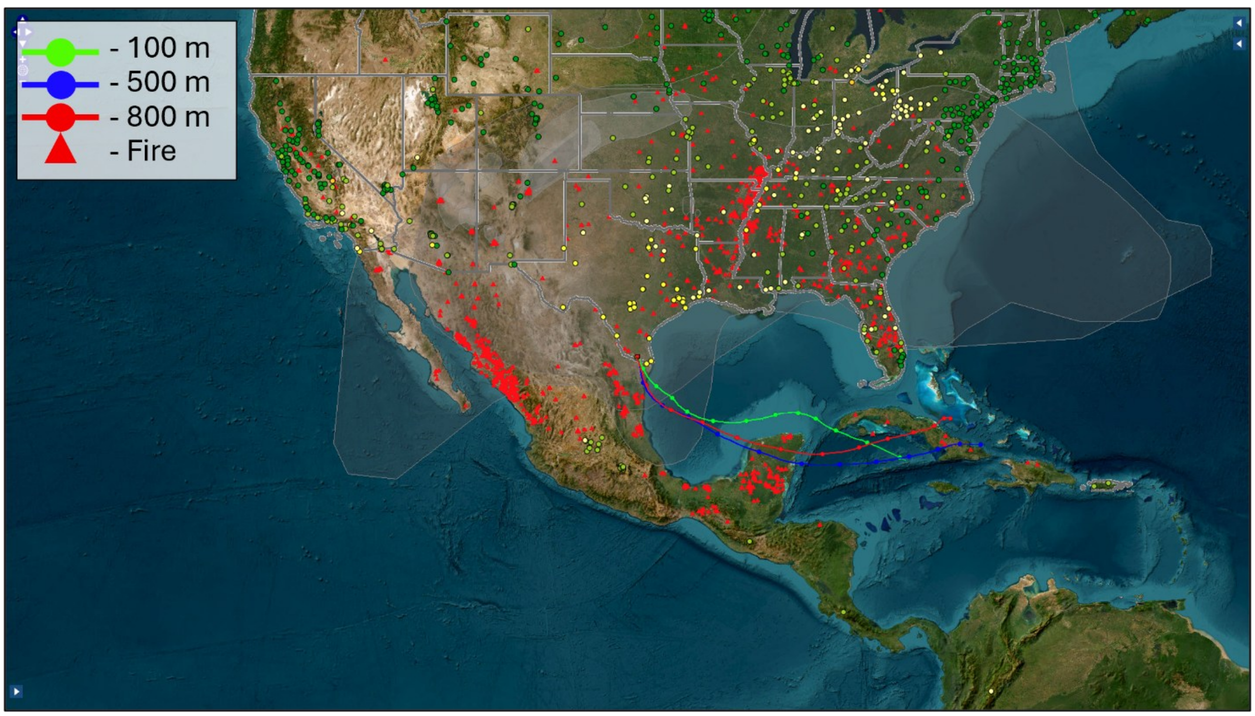

Figure 3-68: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Edinburg East Freddy Gonzalez Drive Monitor on June 16, 2022

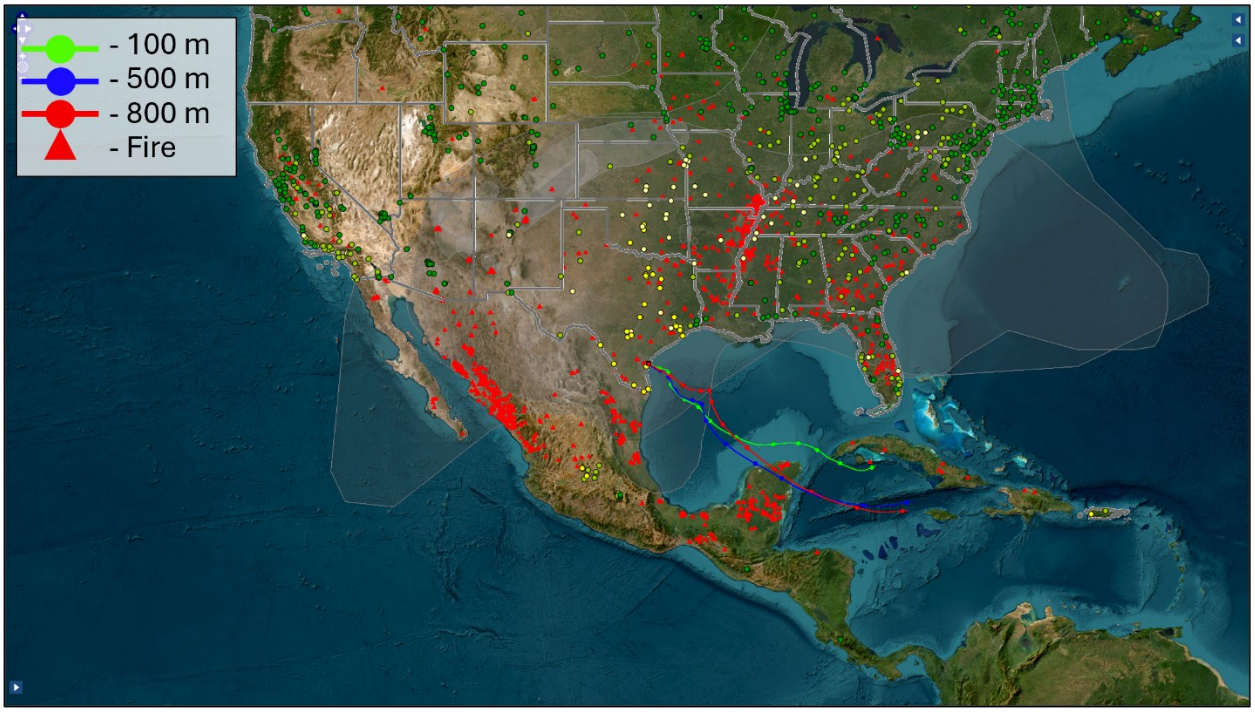

Figure 3-69: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Dona Park Monitor on June 16, 2022

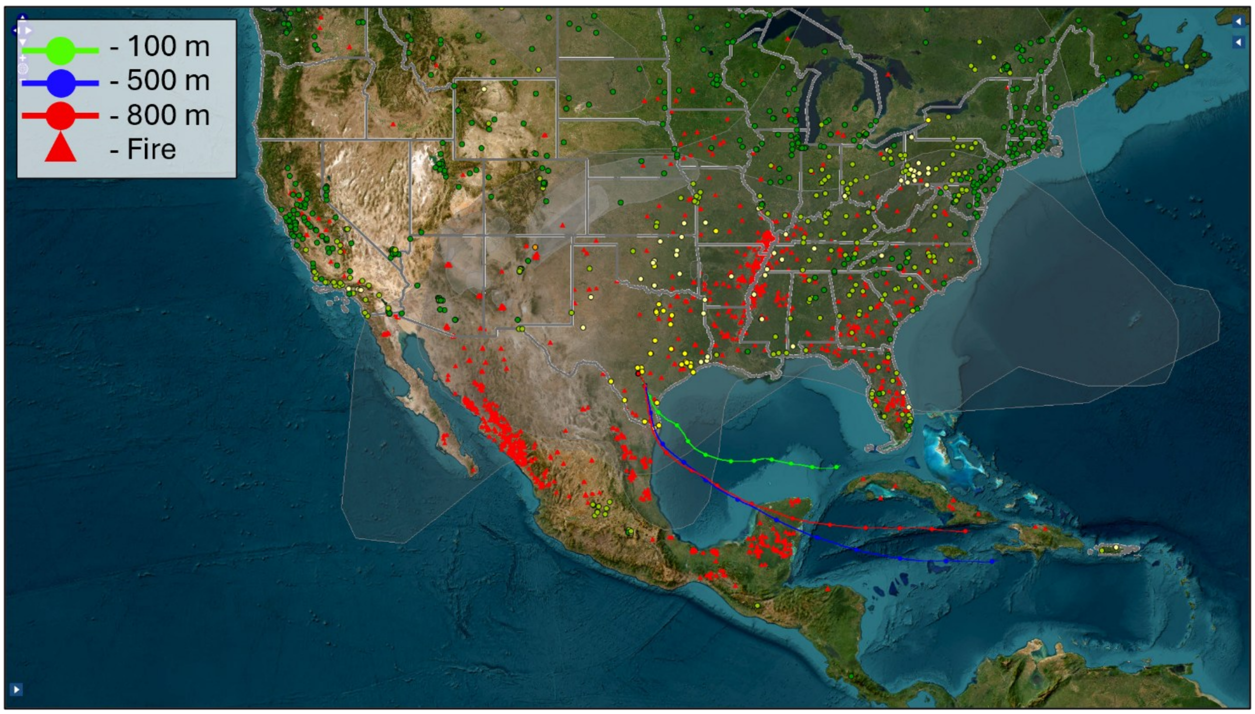

Figure 3-70: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Von Ormy Highway 16 Monitor on June 16, 2022

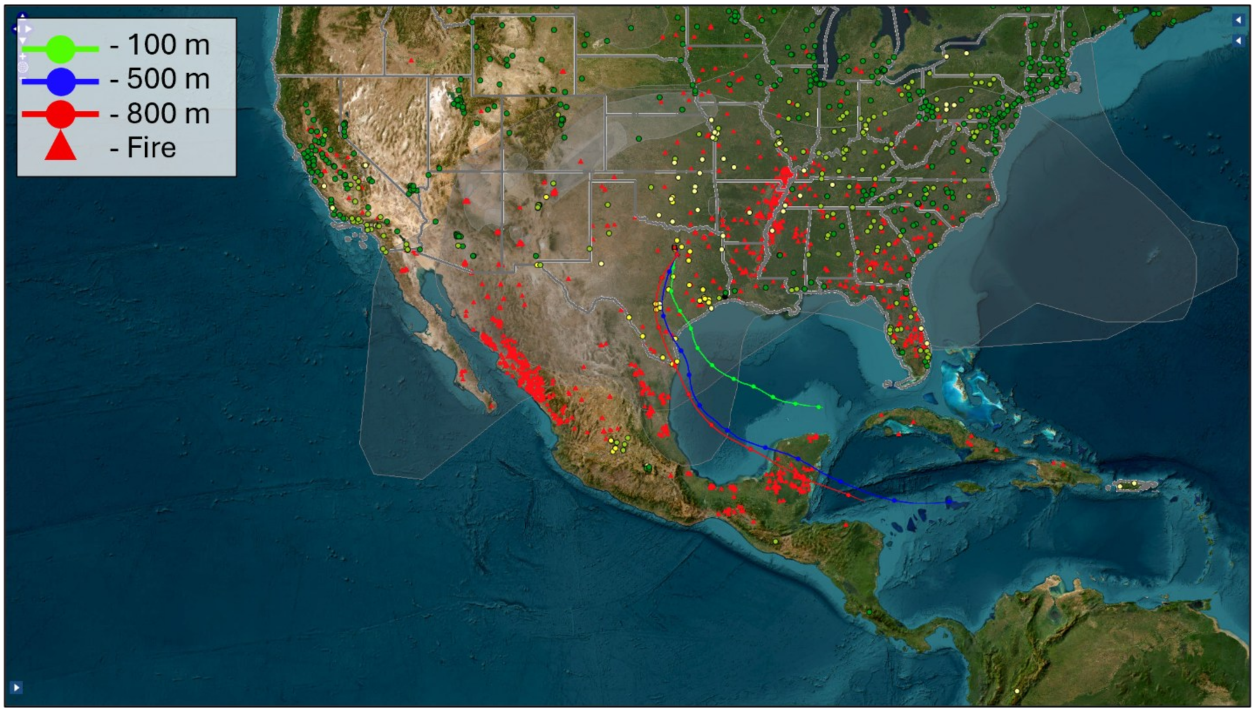

Figure 3-71: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Haws Athletic Center Monitor on June 16, 2022

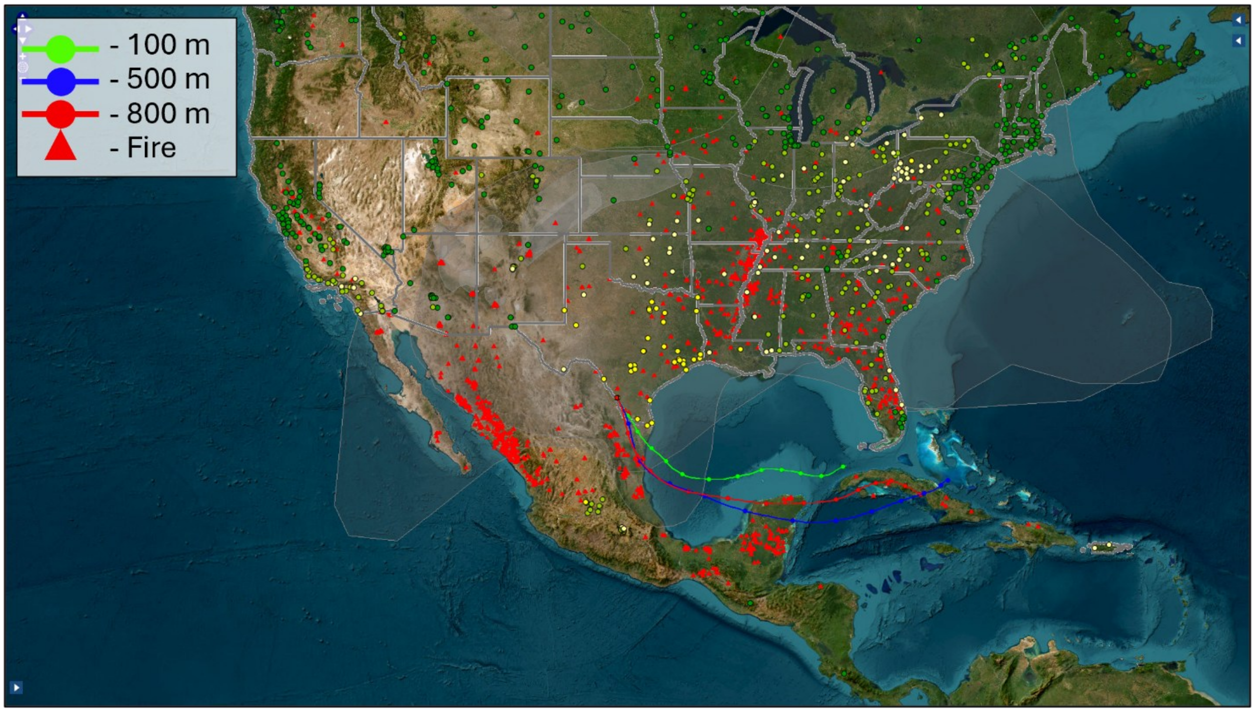

Figure 3-72: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the World Trade Bridge Monitor on June 16, 2022

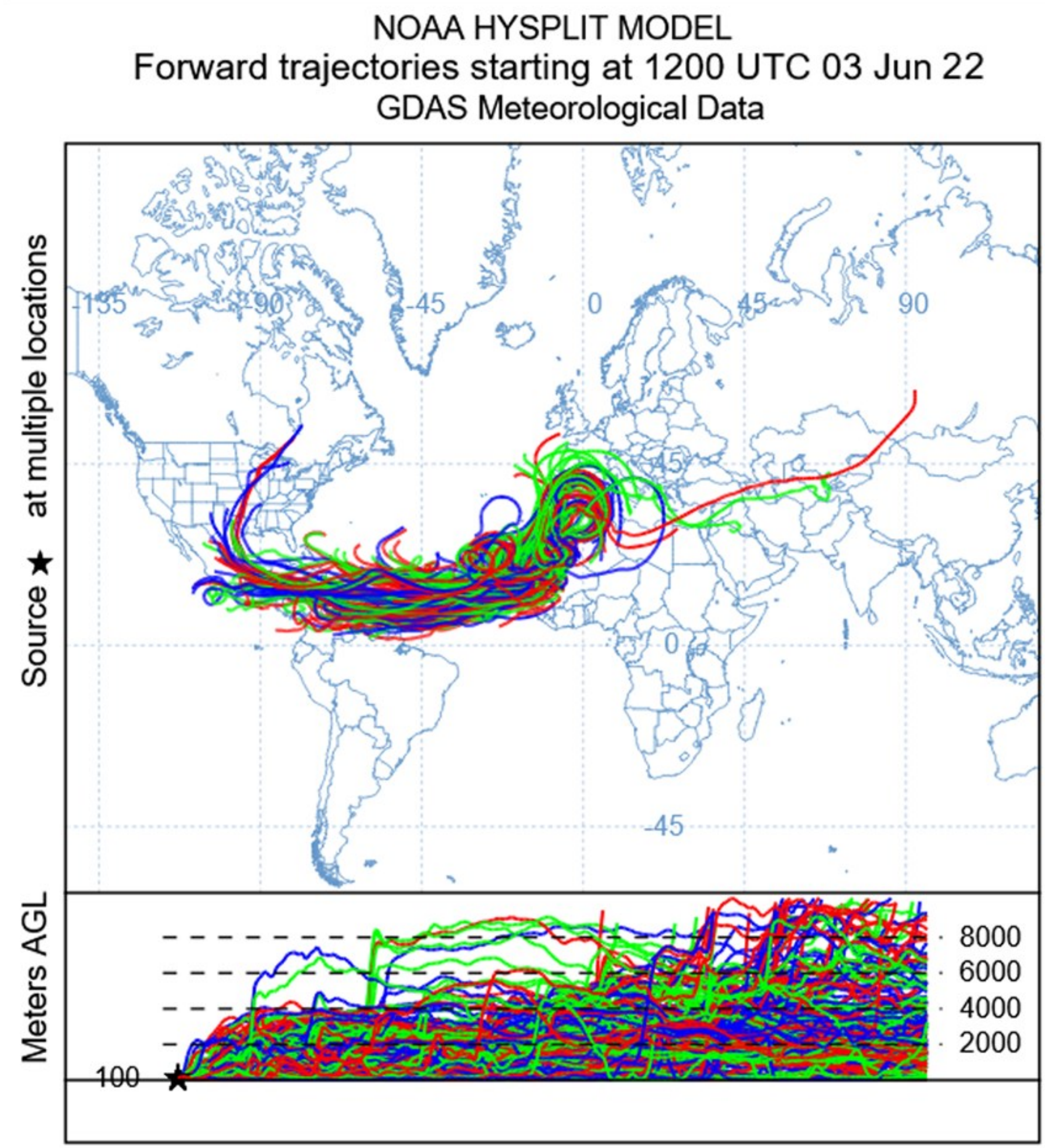

Figure 3-73: NOAA HYSPLIT 14-Day Forward Trajectories Originating from Western Africa, Starting on June 3, 2022

At the Edinburg East Freddy Gonzalez Drive and the Haws Athletic Center monitors, hourly $PM_{2.5}$ graphs show evidence of changes in hourly temporal patterns of $PM_{2.5}$ due to impact of Saharan dust on June 17, 2022 (Figure 3-74: *Hourly $PM_{2.5}$ Concentrations on June 17, 2022, Compared to Typical Concentrations at the Edinburg East Freddy Gonzalez Drive Monitor*, and Figure 3-75: *Hourly $PM_{2.5}$ Concentrations on June 17, 2022, Compared to Typical Concentrations at the Haws Athletic Center Monitor*) compared to typical non-event concentrations (Tier 3 Median). Figure 3-76: *AirNow Tech Aerosol Optical Depth (AOD) Map, with MODIS Terra and Aqua Satellite Layers on June 17, 2022*, shows a MODIS Aqua and Terra AOD image corroborating the high concentration of dust seen over the Gulf of America and the impacted

Edinburg East Freddy Gonzalez Drive and Haws Athletic Center monitoring sites, with the yellow dots denoting air quality in the moderate category. The HYSPLIT backward trajectory originating from the impacted monitoring sites (Figure 3-77: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Haws Athletic Center Monitor on June 17, 2022*, and Figure 3-78: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Edinburg East Freddy Gonzalez Drive Monitor on June 17, 2022*) at 100 m, 500 m, and 800 m AGL passes over the Gulf of America containing aerosols of incoming Saharan dust. HYSPLIT forward trajectories starting from Western Africa arrive at Texas, as shown in Figure 3-79: *NOAA HYSPLIT 14-Day Forward Trajectories Originating from Western Africa, Starting on June 4,* 2022.

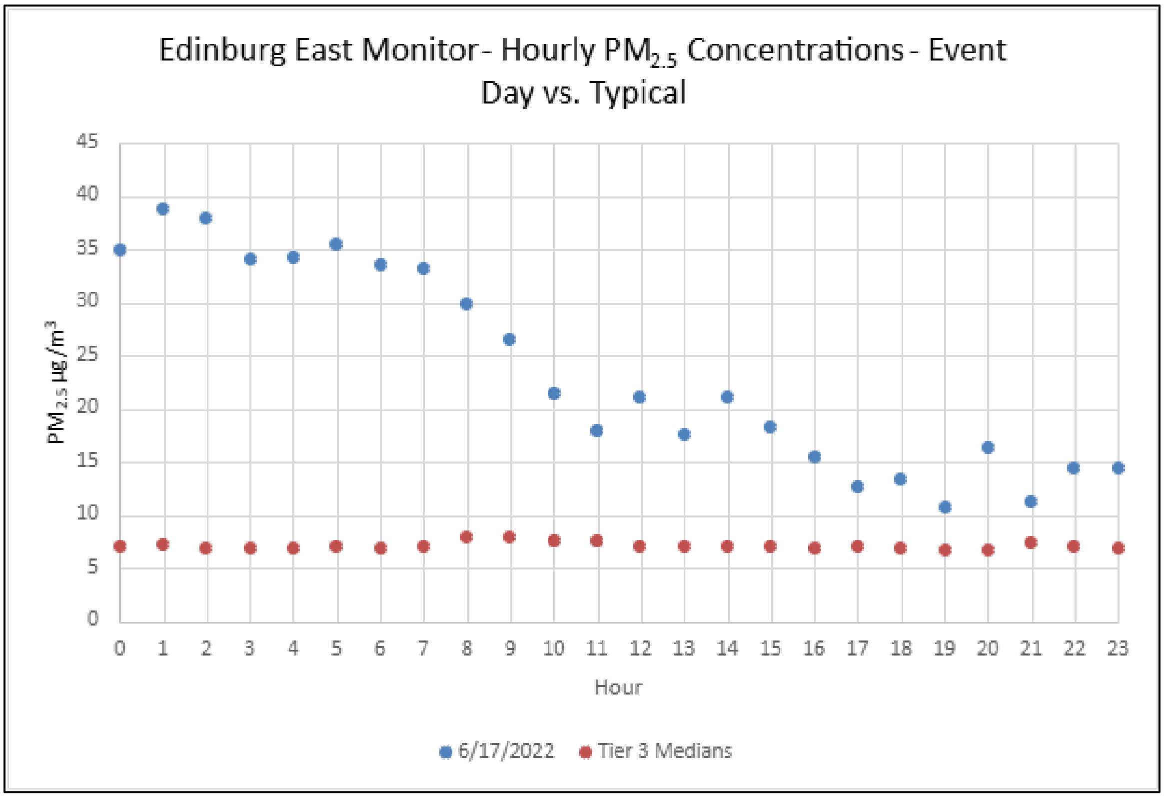

Figure 3-74: Hourly $PM_{2.5}$ Concentrations on June 17, 2022, Compared to Typical Concentrations at the Edinburg East Freddy Gonzalez Drive Monitor

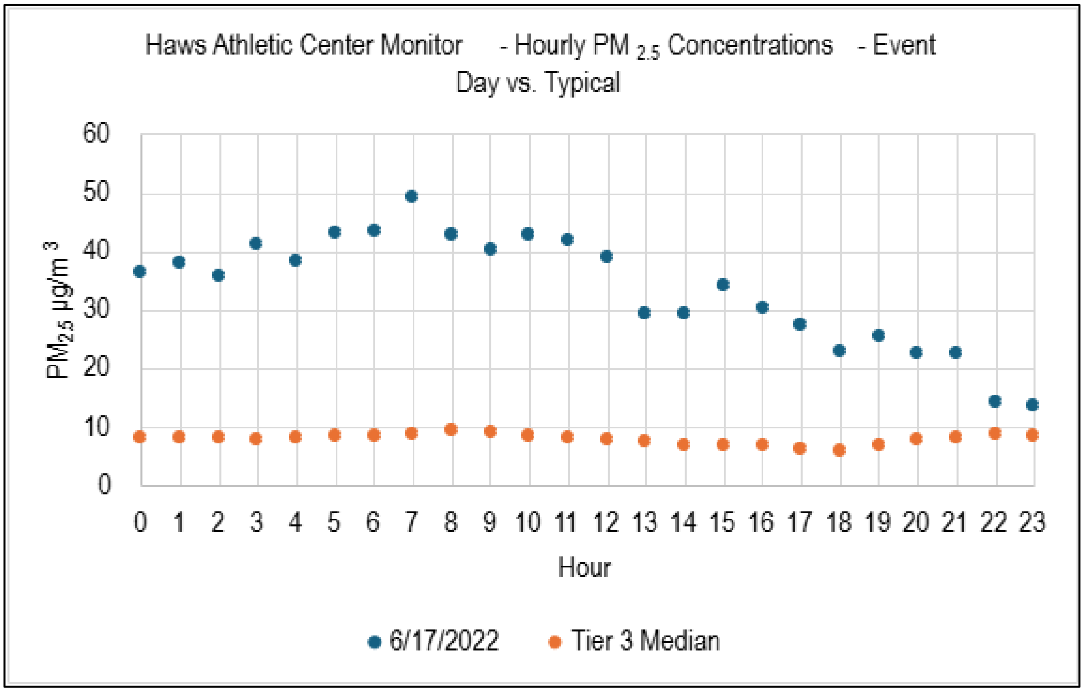

Figure 3-75: Hourly $PM_{2.5}$ Concentrations on June 17, 2022, Compared to Typical Concentrations at the Haws Athletic Center Monitor

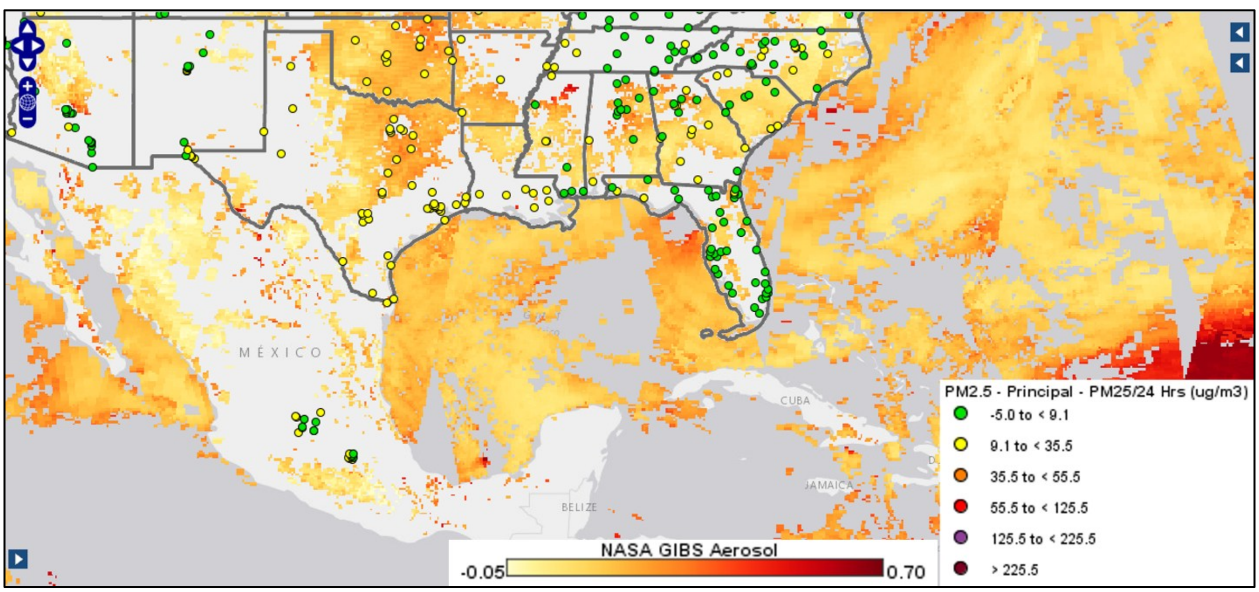

Figure 3-76: AirNow Tech Aerosol Optical Depth (AOD) Map, with MODIS Terra and Aqua Satellite Layers on June 17, 2022

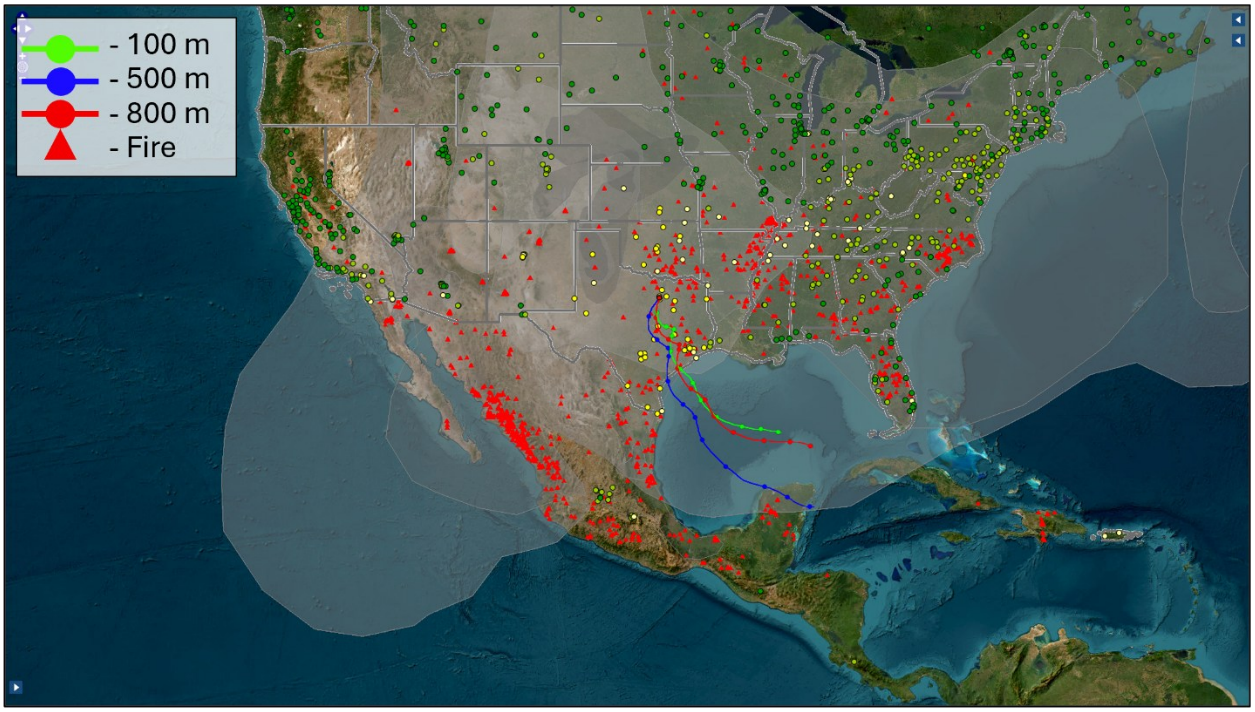

Figure 3-77: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Haws Athletic Center Monitor on June 17, 2022

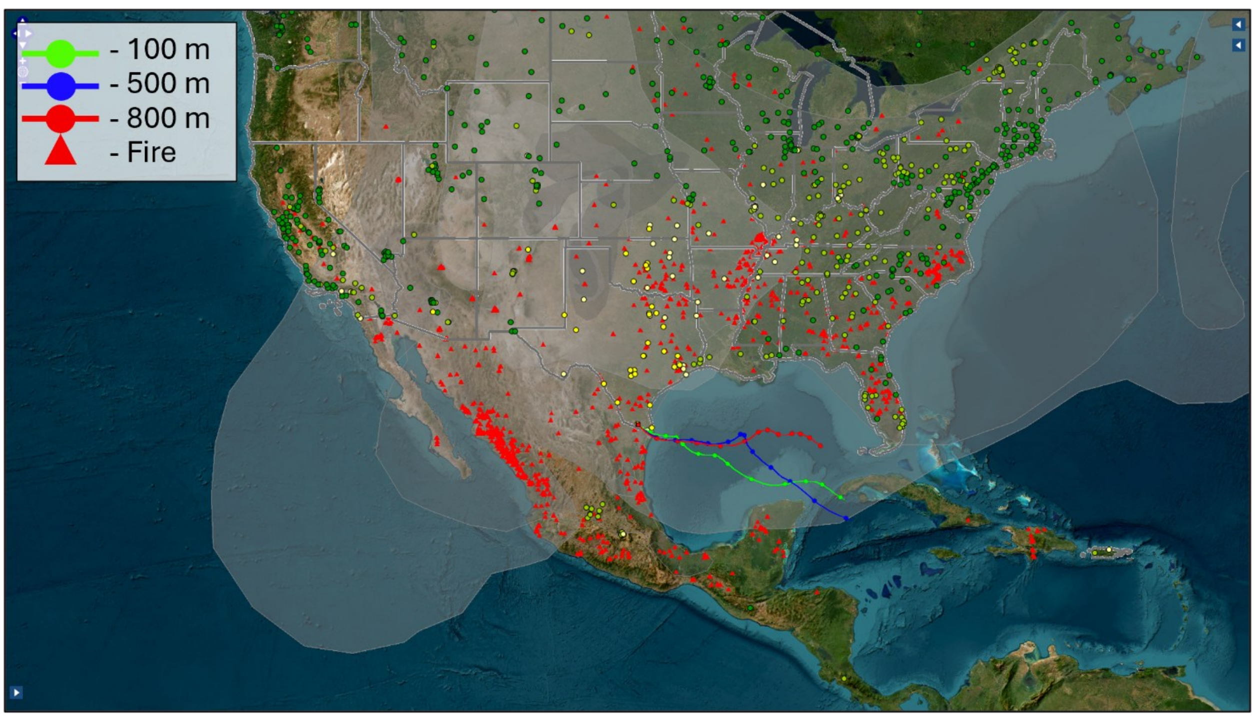

Figure 3-78: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Edinburg East Freddy Gonzalez Drive Monitor on June 17, 2022

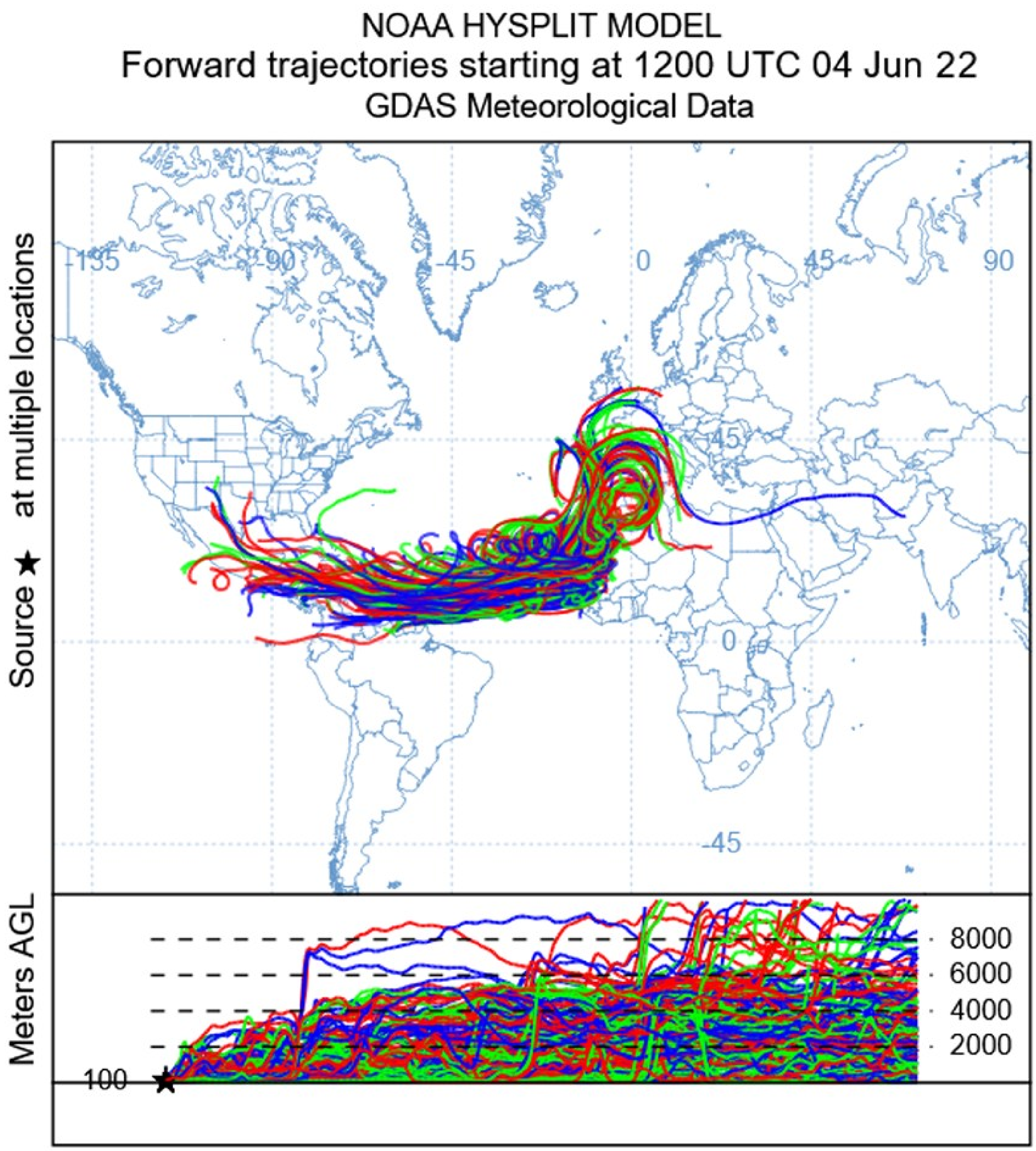

Figure 3-79: NOAA HYSPLIT 14-Day Forward Trajectories Originating from Western Africa, Starting on June 4, 2022

3.2.5 Group 5: Evidence for July 16 through July 18, 2022, African Dust $PM_{2.5}$ Event for the Edinburg East Freddy Gonzalez Drive Monitor, the Von Ormy Highway 16 Monitor, the Haws Athletic Center Monitor, and the World Trade Bridge Monitor

Four monitoring sites were impacted by Saharan dust during this episode of July 16 through July 18, 2022. Event days are classified in different tiers depending on the monitor and the date, as noted below:

- The Edinburg East Freddy Gonzalez Drive monitor event on July 16, 2022, is classified as a Tier 2 day with a 24-hour concentration of 26.5 $\mu g/m^3$;
- The World Trade Bridge monitor event on July 16, 2022, is classified as a Tier 2 day with a 24-hour concentration of 30 $\mu g/m^3$;
- The Edinburg East Freddy Gonzalez Drive monitor event on July 17, 2022, is classified as a Tier 2 day with a 24-hour concentration of 28.7 $\mu g/m^3$;
- The Von Ormy Highway 16 monitor event on July 17, 2022, is classified as a Tier 2 day with a 24-hour concentration of 29.6 $\mu g/m^3$;
- The Haws Athletic Center monitor event on July 17, 2022, is classified as a Tier 1 day with a 24-hour concentration of 27.9 $\mu g/m^3$;
- The World Trade Bridge monitor event on July 17, 2022, is classified as a Tier 1 day with a 24-hour concentration of 31.2 $\mu g/m^3$;
- The Haws Athletic Center monitor event on July 18, 2022, is classified as a Tier 1 day with a 24-hour concentration of 29.2 $\mu g/m^3$.

The local media also reported about Saharan dust in Texas as shown in Figure C-6 and Figure C-7 of Appendix C. The evidence provided meets requirements for Tier 1 and Tier 2 demonstrations for the Saharan dust impact.

At the Edinburg East Freddy Gonzalez Drive and the World Trade Bridge monitors, hourly $PM_{2.5}$ graphs show evidence of changes in hourly temporal patterns of $PM_{2.5}$ due to impact of Saharan dust on July 16th (Figure 3-80: *Hourly $PM_{2.5}$ Concentrations on July 16, 2022, Compared to Typical Concentrations at the Edinburg East Freddy Gonzalez Drive Monitor*, and Figure 3-81: *Hourly $PM_{2.5}$ Concentrations on July 16, 2022, Compared to Typical Concentrations at the World Trade Bridge Monitor*), compared to typical non-event concentrations (Tier 3 Median). Figure 3-82: *AirNow Tech Aerosol Optical Depth (AOD) Map, with MODIS Terra and Aqua Satellite Layers on July 16, 2022*, shows a MODIS Aqua and Terra AOD image corroborating the high concentration of dust seen over the Gulf of America and the impacted Edinburg East Freddy Gonzalez Drive and World Trade Bridge monitoring sites, with the yellow dot denoting air quality in the moderate category. The HYSPLIT backward trajectories originating from the Edinburg East Freddy Gonzalez Drive (Figure 3-83: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Edinburg East Freddy Gonzalez Drive Monitor on July 16, 2022*), and the World Trade Bridge (Figure 3-84: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the World Trade Bridge Monitor on July 16, 2022*) sites at 100 m, 500 m, and 800 m AGL pass over the Gulf of America containing aerosols and go beyond Mexico/Central America towards the path of incoming Saharan dust. HYSPLIT forward trajectories starting from Western Africa arrive at Texas, as shown in Figure 3-85: *NOAA HYSPLIT 14-Day Forward Trajectories Originating from Western Africa, Starting on July 2,* 2022.

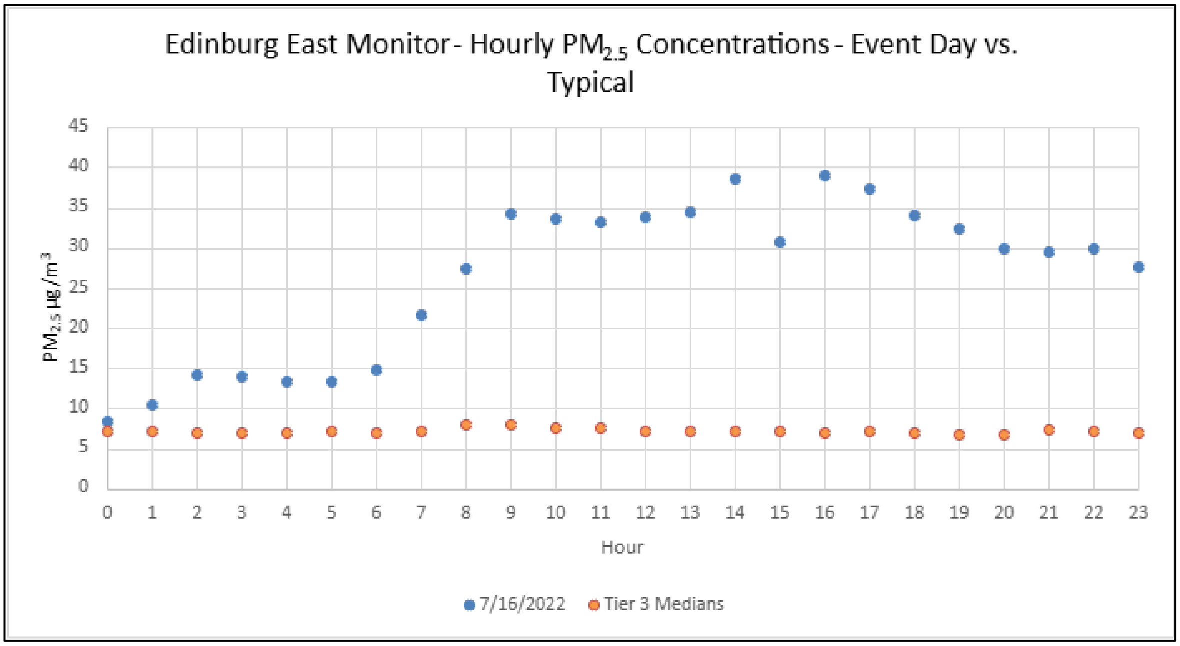

Figure 3-80: Hourly $PM_{2.5}$ Concentrations on July 16, 2022, Compared to Typical Concentrations at the Edinburg East Freddy Gonzalez Drive Monitor

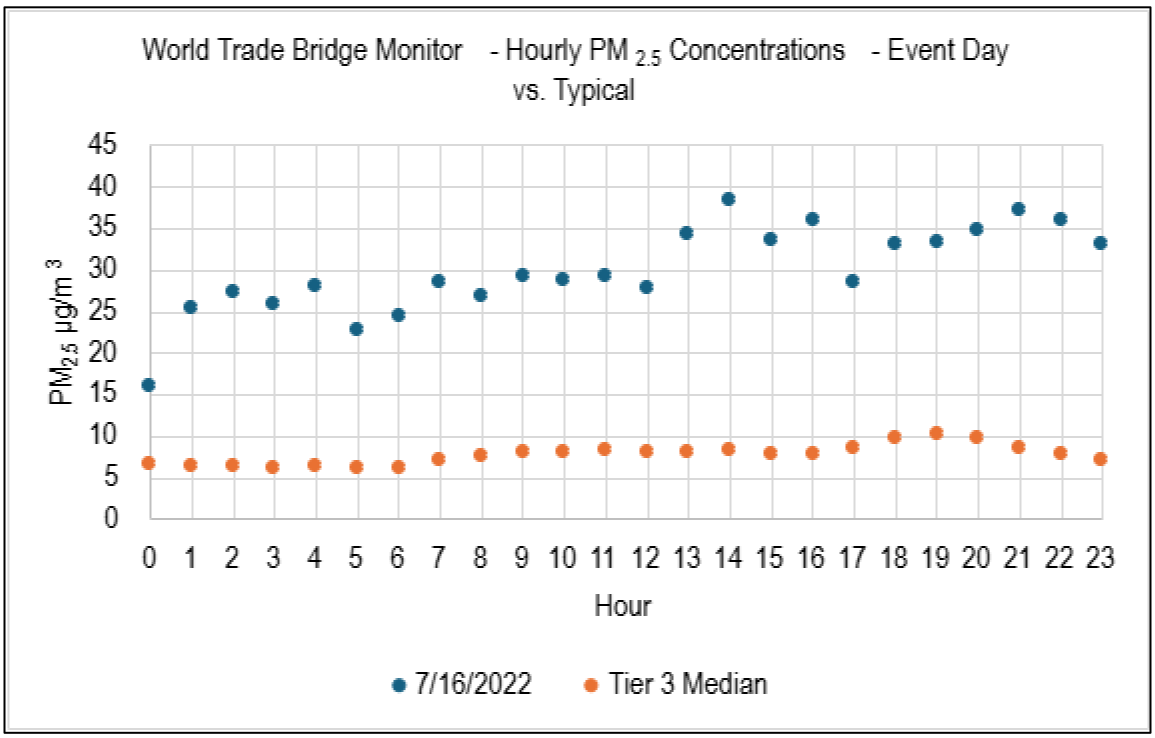

Figure 3-81: Hourly $PM_{2.5}$ Concentrations on July 16, 2022, Compared to Typical Concentrations at the World Trade Bridge Monitor

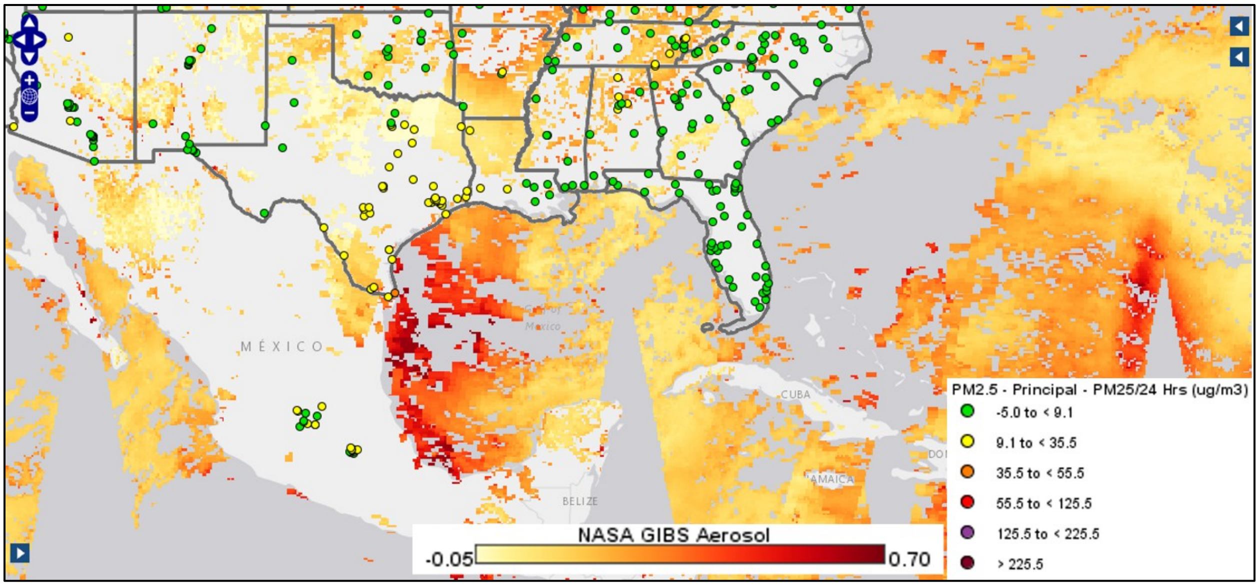

Figure 3-82: AirNow Tech Aerosol Optical Depth (AOD) Map, with MODIS Terra and Aqua Satellite Layers on July 16, 2022

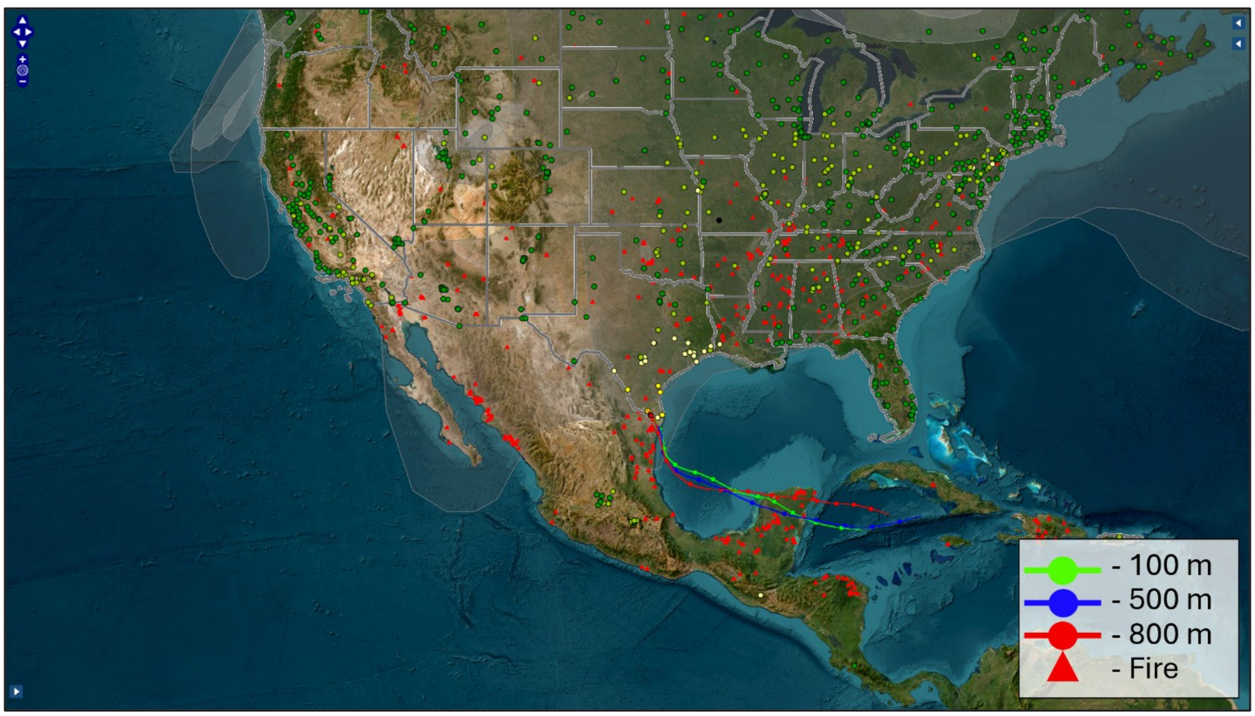

Figure 3-83: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Edinburg East Freddy Gonzalez Drive Monitor on July 16, 2022

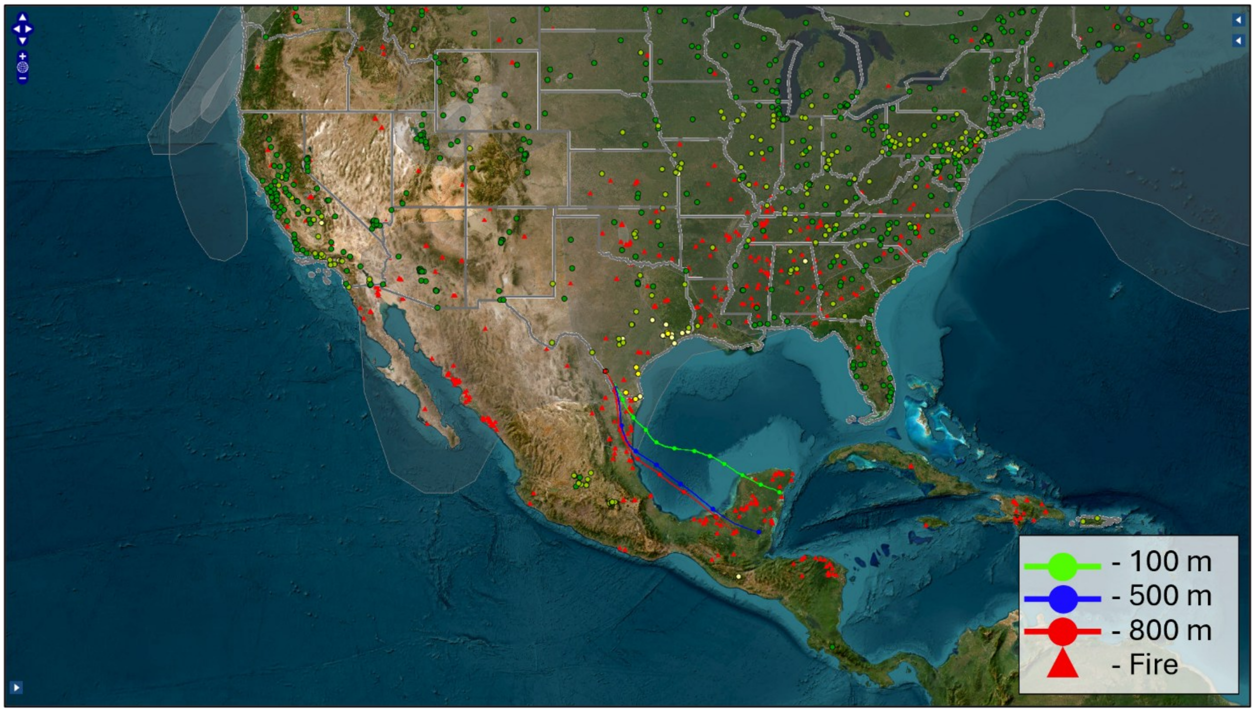

Figure 3-84: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the World Trade Bridge Monitor on July 16, 2022

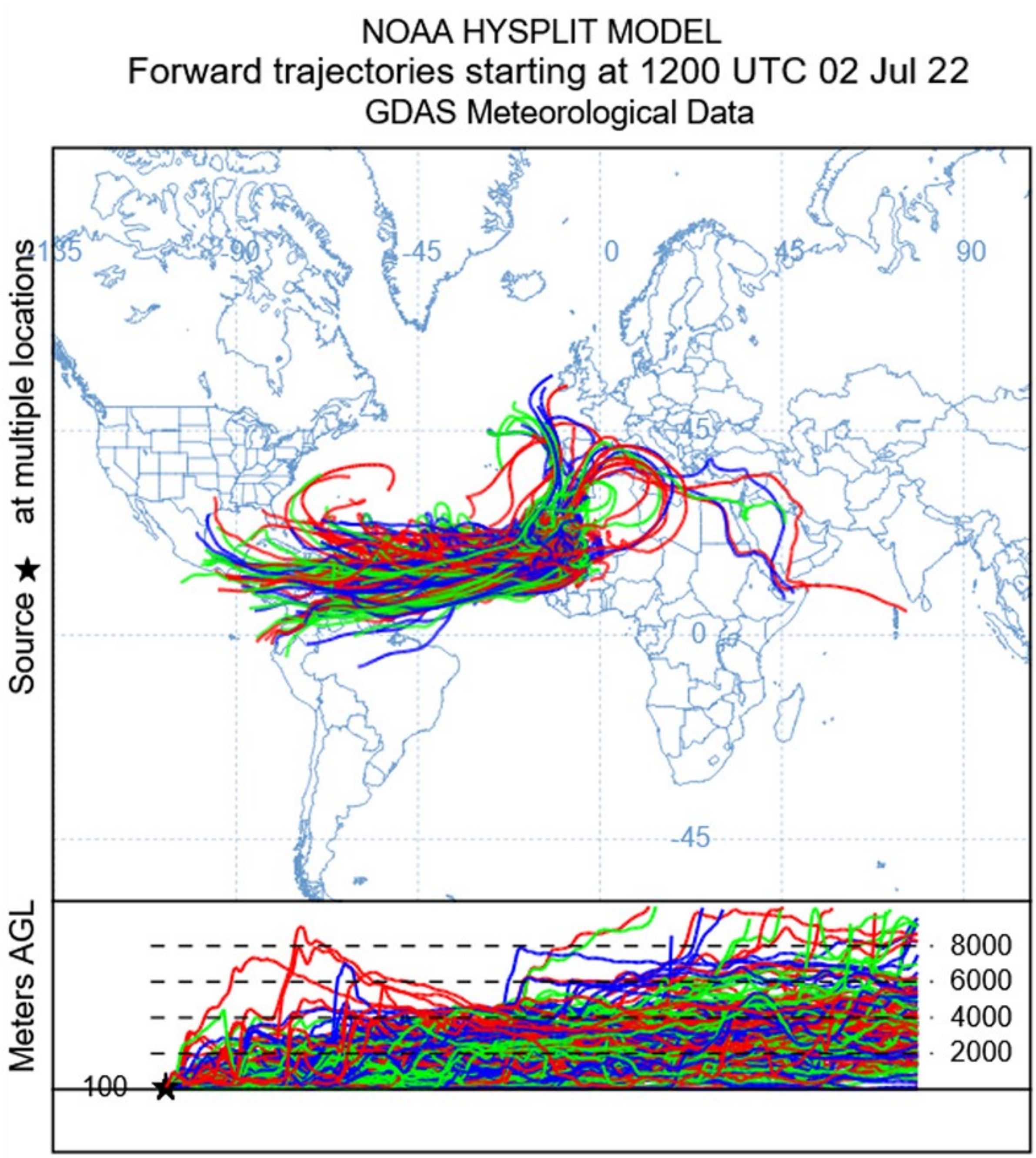

Figure 3-85: NOAA HYSPLIT 14-Day Forward Trajectories Originating from Western Africa, Starting on July 2, 2022

At the Edinburg East Freddy Gonzalez Drive, the World Trade Bridge, the Von Ormy Highway 16, and the Haws Athletic Center monitors, hourly $PM_{2.5}$ graphs show evidence of changes in hourly temporal patterns of $PM_{2.5}$ due to the impact of Saharan dust on July 17, 2022. Figure 3-86: *Hourly $PM_{2.5}$ Concentrations on July 17, 2022, Compared to Typical Concentrations at the Edinburg East Freddy Gonzalez Drive Monitor*, Figure 3-87: *Hourly $PM_{2.5}$ Concentrations on July 17, 2022, Compared to Typical Concentrations at the World Trade Monitor*, Figure 3-88: *Hourly $PM_{2.5}$ Concentrations on July 17, 2022, Compared to Typical Concentrations at the Von Ormy Highway 16 Monitor*, and Figure 3-89: *Hourly $PM_{2.5}$ Concentrations on July 17, 2022, Compared to Typical Concentrations at the Haws Athletic Center Monitor*), compared to typical non-event concentrations (Tier 3 Median). Figure 3-90: *AirNow Tech Aerosol Optical Depth (AOD) Map, with MODIS Terra and Aqua Satellite Layers on July 17, 2022*, shows a MODIS Aqua and Terra AOD image corroborating the high concentration of dust seen over the Gulf of America and all four impacted monitoring sites, with the yellow dot denoting air quality in the moderate category. The HYSPLIT backward trajectories originating from these four monitors (Figure 3-91: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Edinburg East Freddy Gonzalez Drive Monitor on July 17, 2022*, Figure 3-92: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the World Trade Bridge Monitor on July 17, 2022*, Figure 3-93: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Von Ormy Highway 16 Monitor on July 17, 2022*, and Figure 3-94: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Haws Athletic Center Monitor on July 17, 2022*) at 100 m, 500 m, and 800 m AGL pass over the Gulf of America containing aerosols of incoming Saharan dust. HYSPLIT forward trajectories starting from Western Africa arrive at Texas, as shown in Figure 3-95: *NOAA HYSPLIT 14-Day Forward Trajectories Originating from Western Africa, Starting on July 3,* 2022.

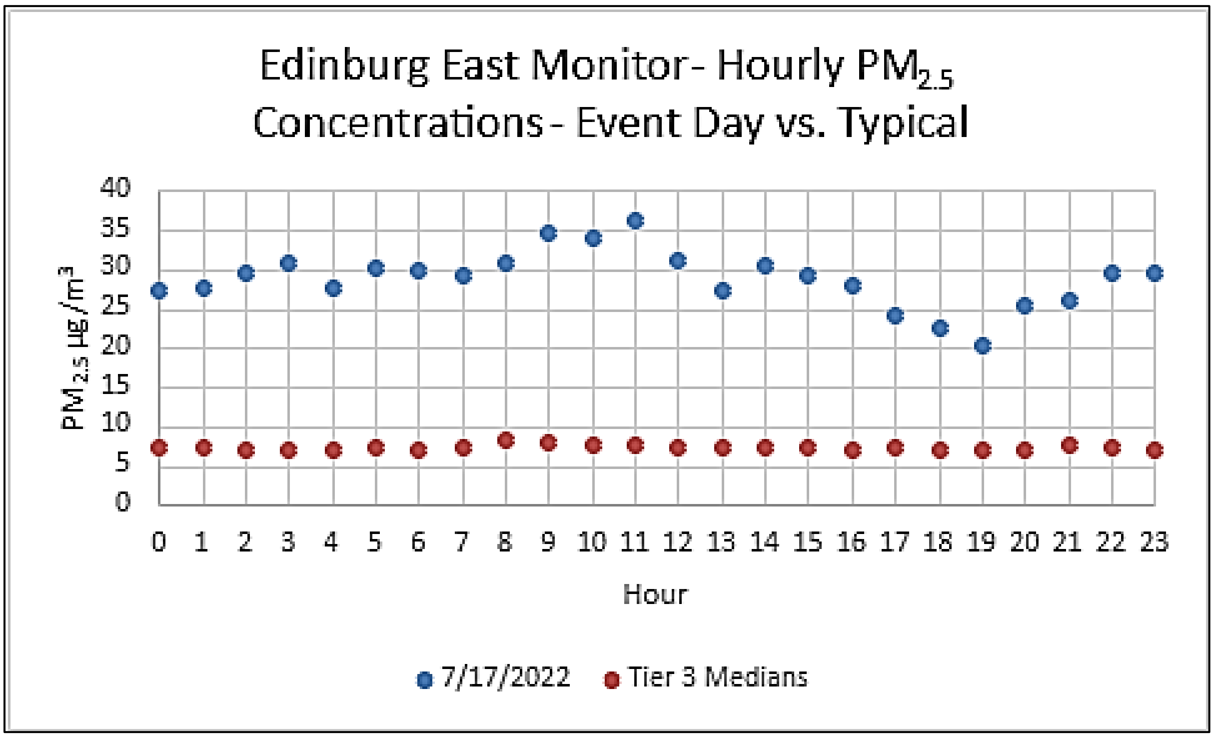

Figure 3-86: Hourly $PM_{2.5}$ Concentrations on July 17, 2022, Compared to Typical Concentrations at the Edinburg East Freddy Gonzalez Drive Monitor

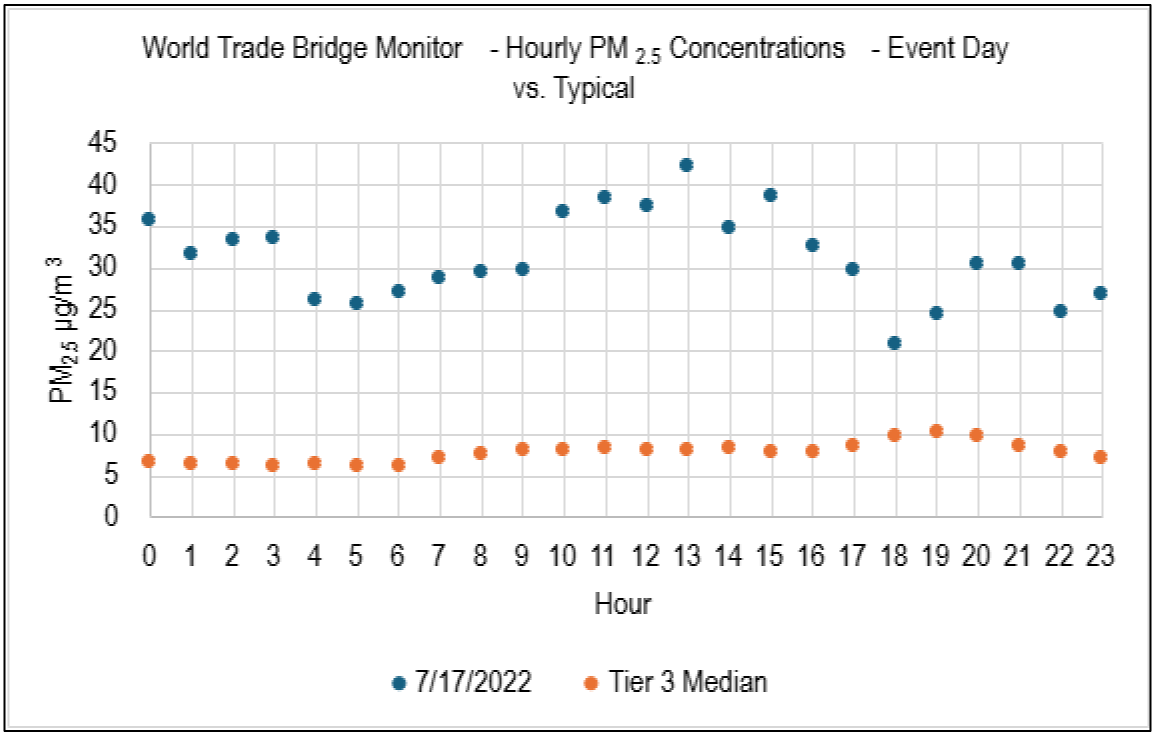

Figure 3-87: Hourly $PM_{2.5}$ Concentrations on July 17, 2022, Compared to Typical Concentrations at the World Trade Monitor

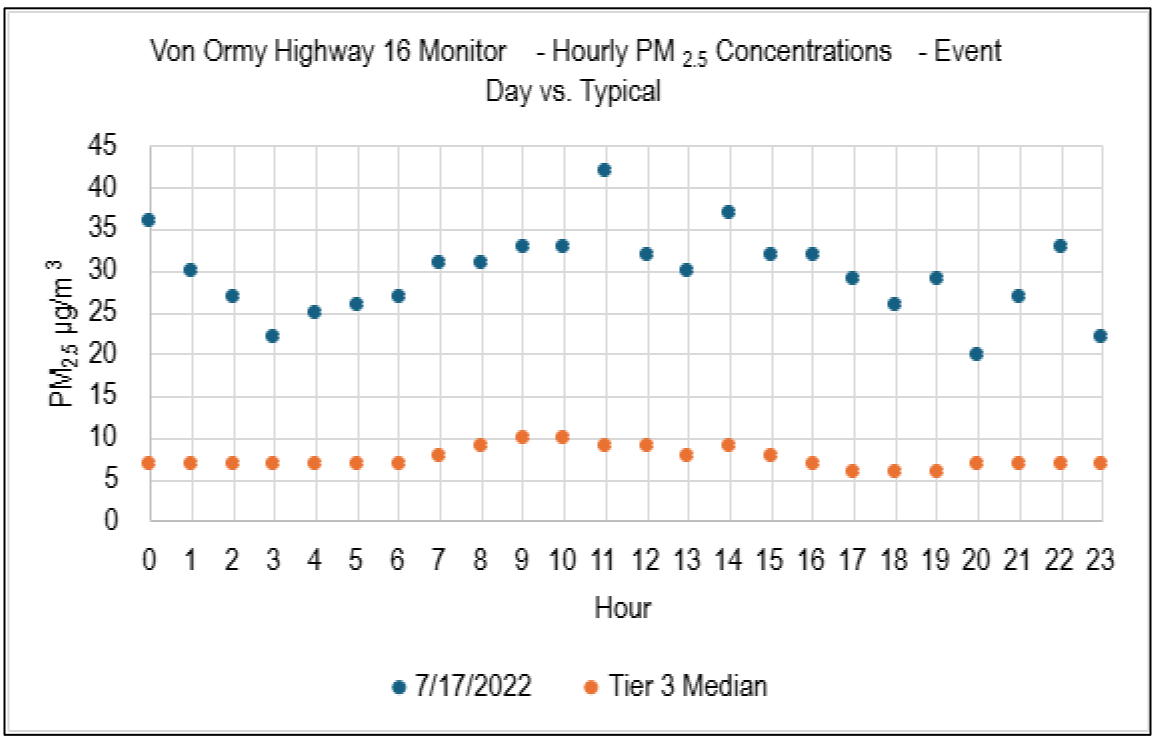

Figure 3-88: Hourly $PM_{2.5}$ Concentrations on July 17, 2022, Compared to Typical Concentrations at the Von Ormy Highway 16 Monitor

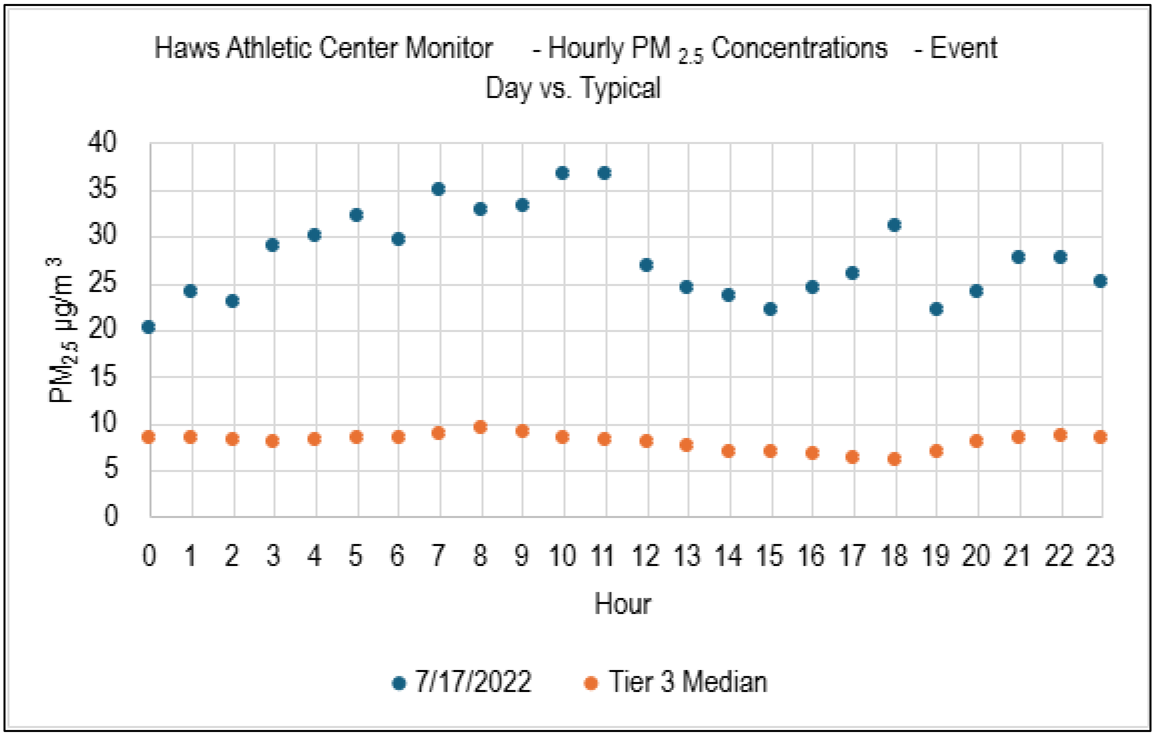

Figure 3-89: Hourly $PM_{2.5}$ Concentrations on July 17, 2022, Compared to Typical Concentrations at the Haws Athletic Center Monitor

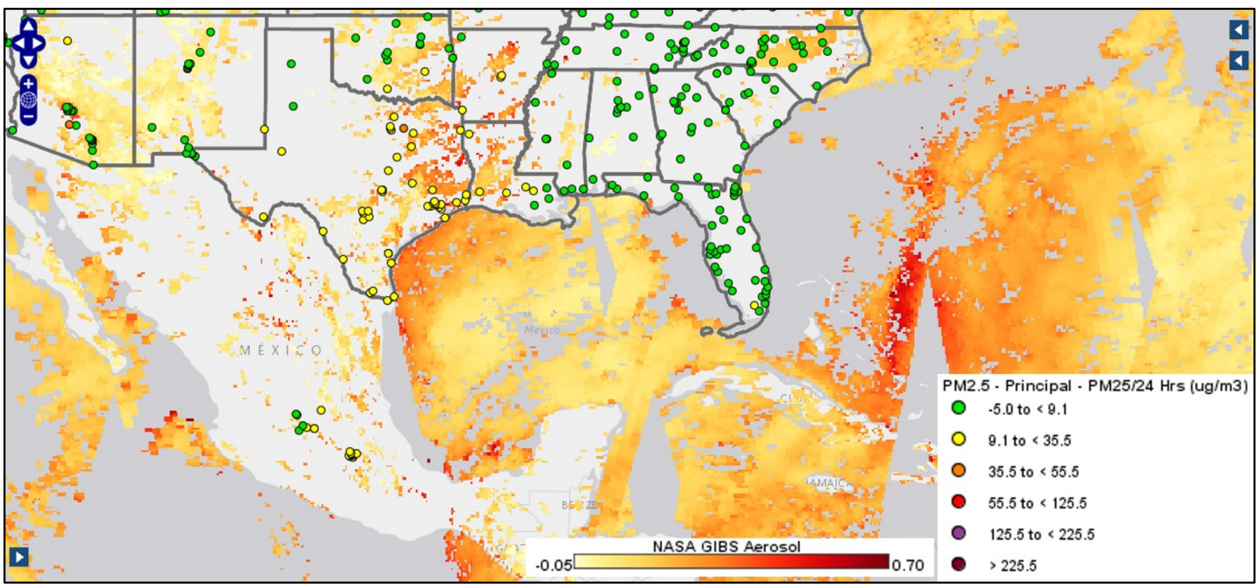

Figure 3-90: AirNow Tech Aerosol Optical Depth (AOD) Map, with MODIS Terra and Aqua Satellite Layers on July 17, 2022

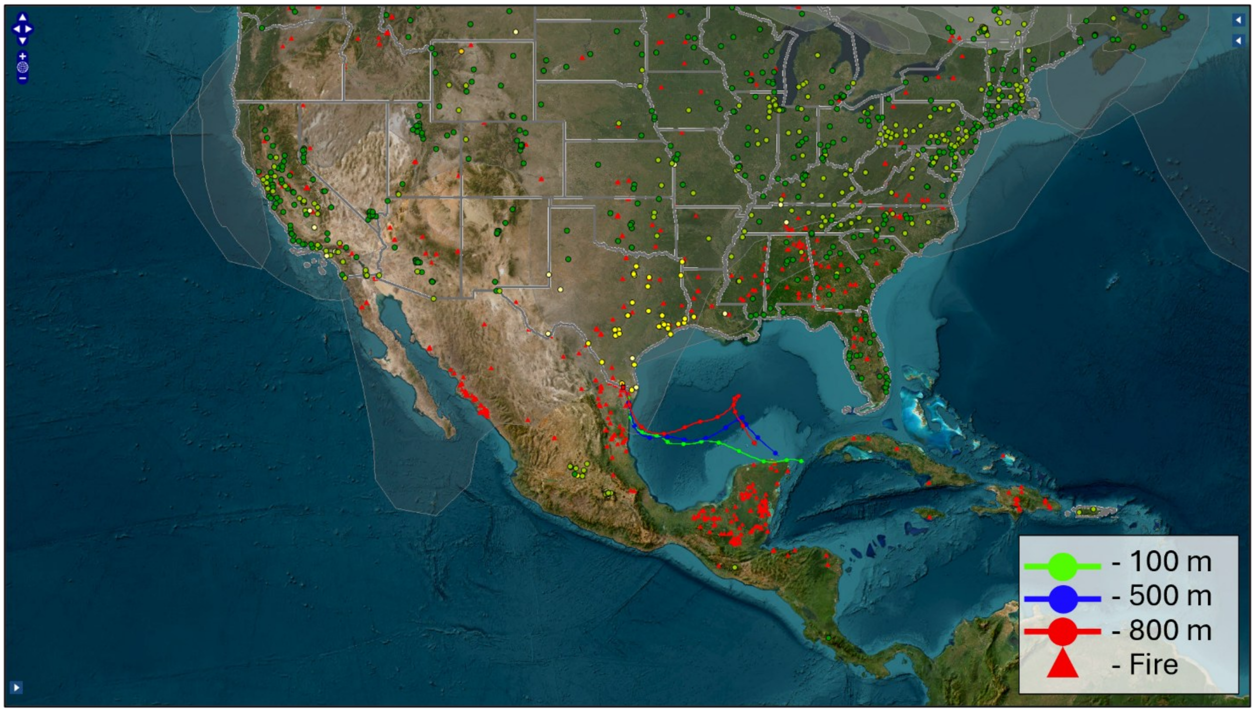

Figure 3-91: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Edinburg East Freddy Gonzalez Drive Monitor on July 17, 2022

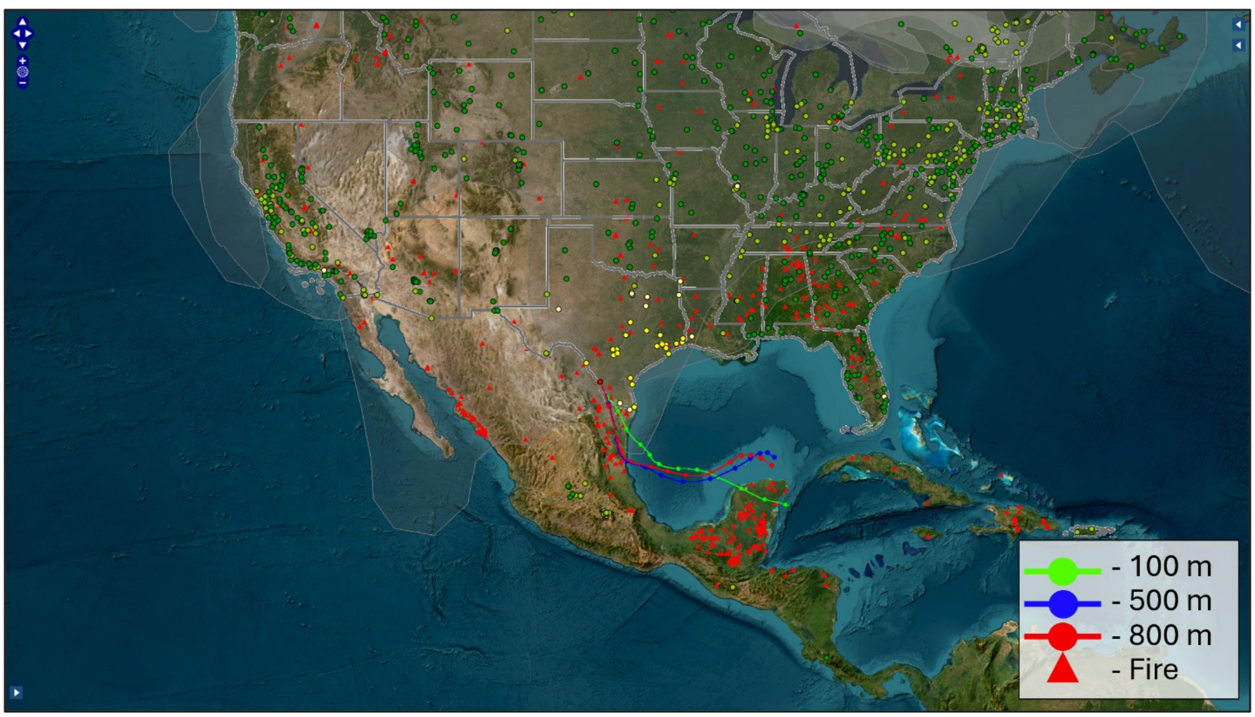

Figure 3-92: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the World Trade Bridge Monitor on July 17, 2022

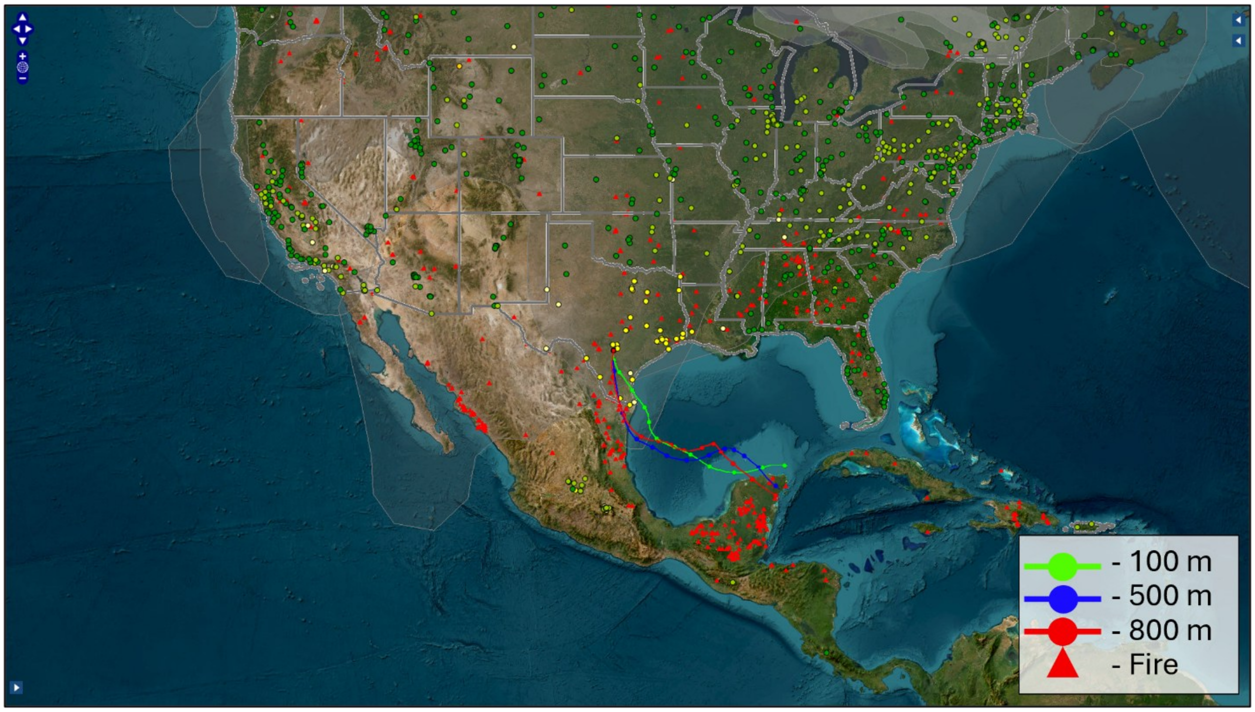

Figure 3-93: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Von Ormy Highway 16 Monitor on July 17, 2022

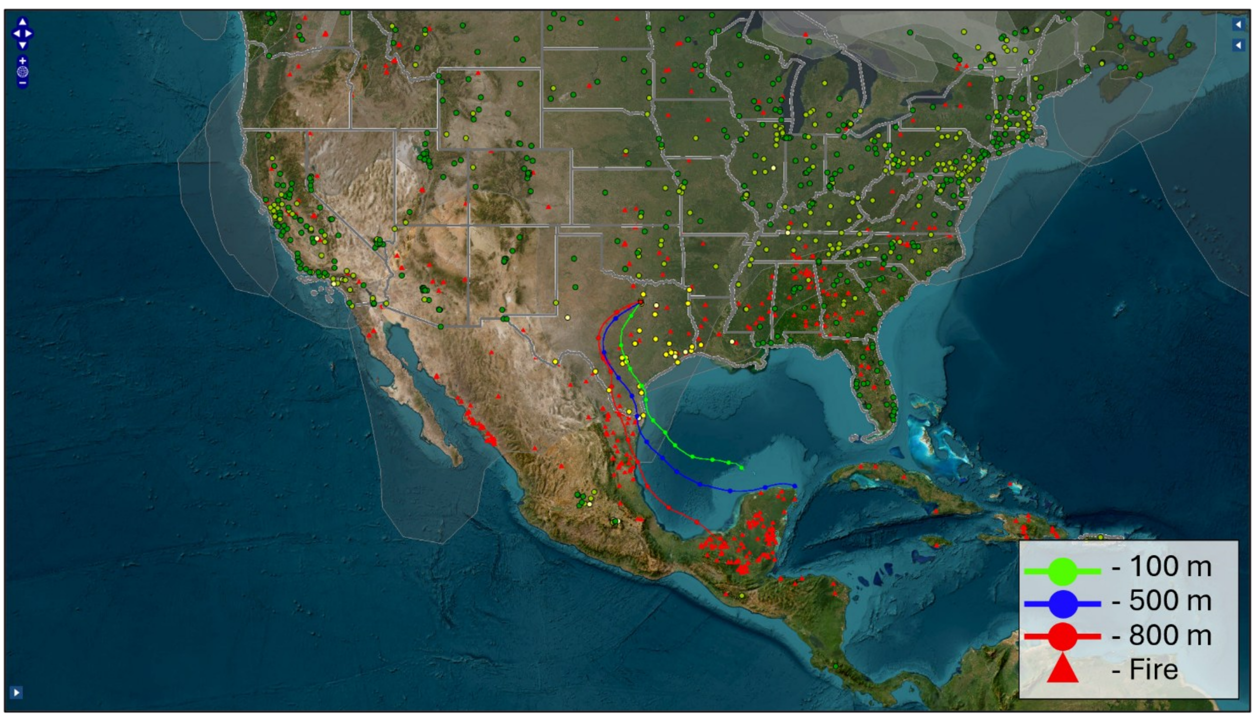

Figure 3-94: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Haws Athletic Center Monitor on July 17, 2022

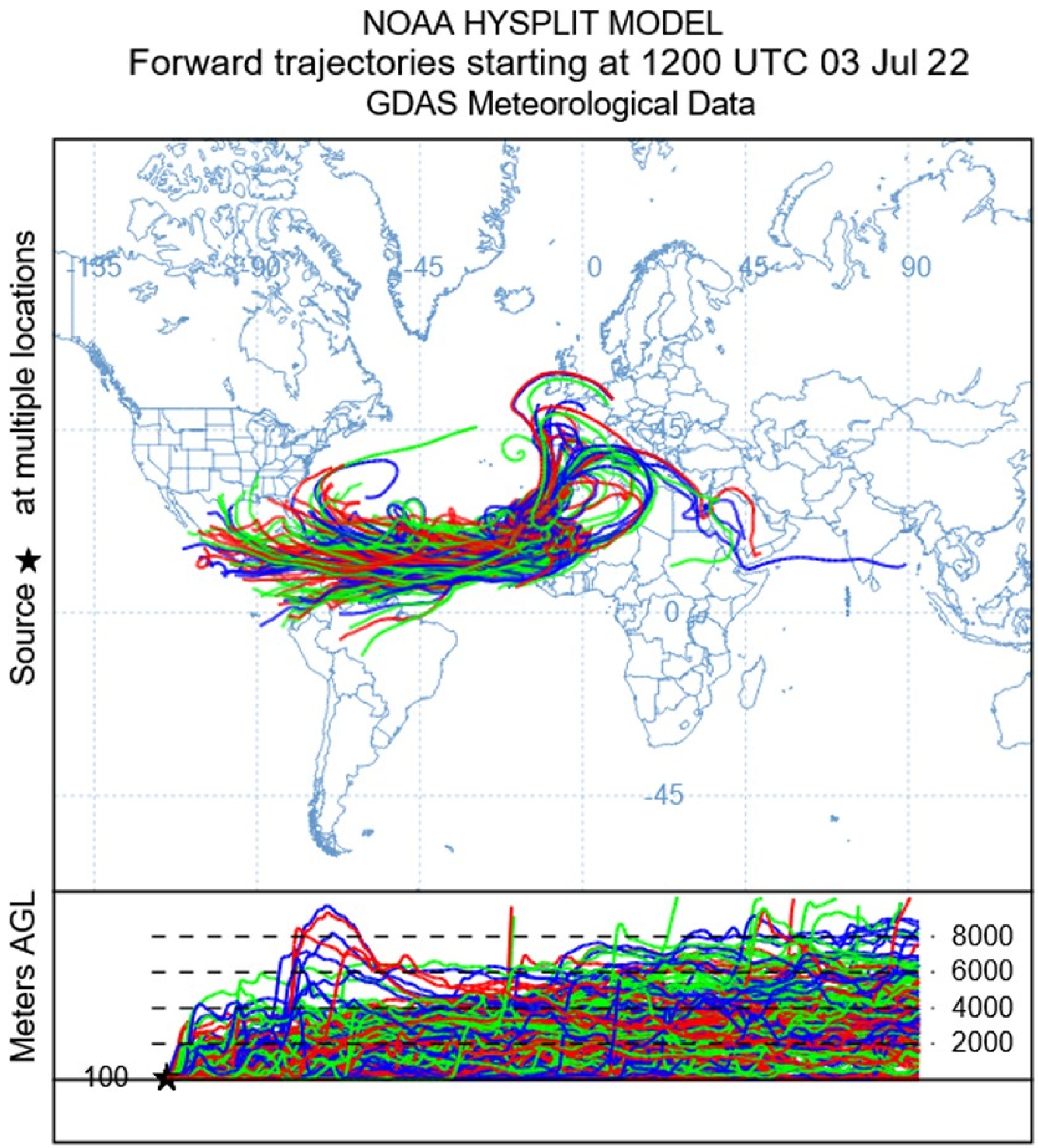

Figure 3-95: NOAA HYSPLIT 14-Day Forward Trajectories Originating from Western Africa, Starting on July 3, 2022

At the Haws Athletic Center monitor, hourly $PM_{2.5}$ graphs show evidence of changes in hourly temporal patterns of $PM_{2.5}$ due to the impact of Saharan dust on July 18, 2022 (Figure 3-96: *Hourly $PM_{2.5}$ Concentrations on July 18, 2022, Compared to Typical Concentrations at the Haws Athletic Center Monitor*), compared to typical non-event concentrations (Tier 3 Median). Figure 3-97: *AirNow Tech Aerosol Optical Depth (AOD) Map, with MODIS Terra and Aqua Satellite Layers on July 18, 2022,* shows a MODIS Aqua and Terra AOD image corroborating the high concentration of dust seen over the Gulf of America and impacted Haws Athletic Center monitoring site, with the yellow dots denoting air quality in the moderate category. The HYSPLIT backward trajectories originating from the monitor (Figure 3-98: *AirNow Tech HYSPLIT*

72-Hour Backward Trajectories Originating from the Haws Athletic Center Monitor on July 18, 2022) at 100 m, 500 m, and 800 m AGL pass over the Gulf of America containing aerosols of incoming Saharan dust. HYSPLIT forward trajectories starting from western Africa arrive at Texas, as shown in Figure 3-99: *AirNow Tech HYSPLIT 14-Day Forward Trajectories Originating from Western Africa, Starting on July 4, 2022*.

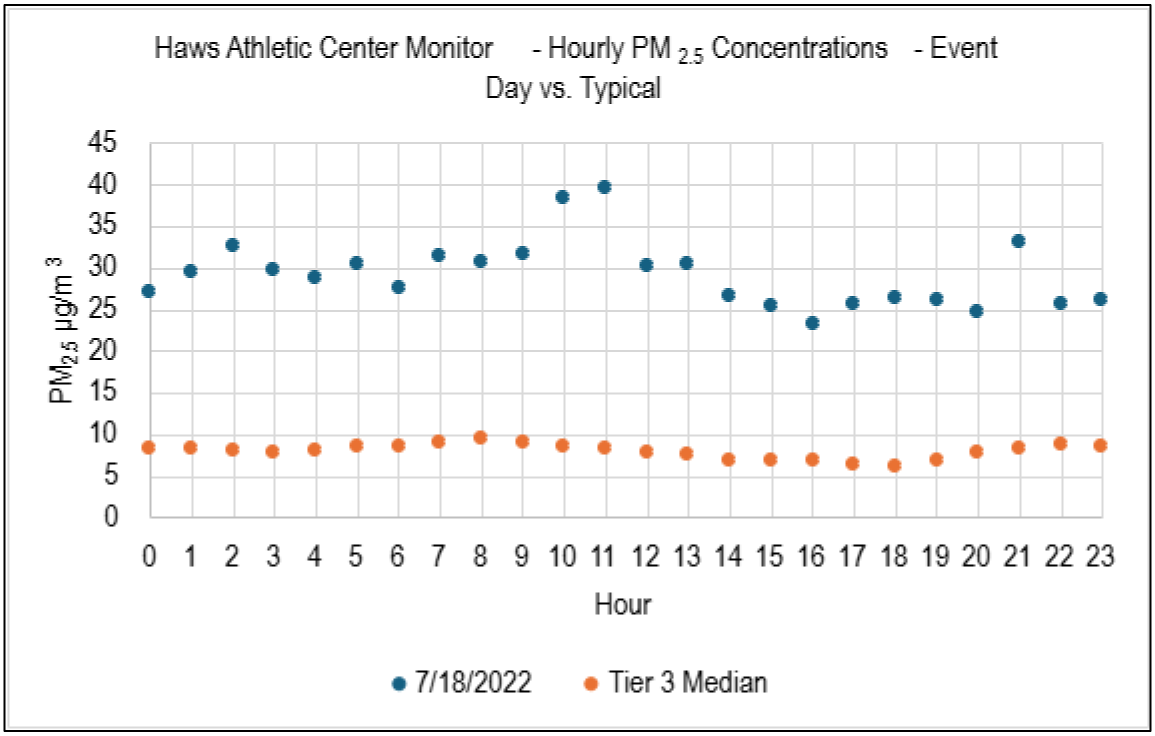

Figure 3-96: Hourly $PM_{2.5}$ Concentrations on July 18, 2022, Compared to Typical Concentrations at the Haws Athletic Center Monitor

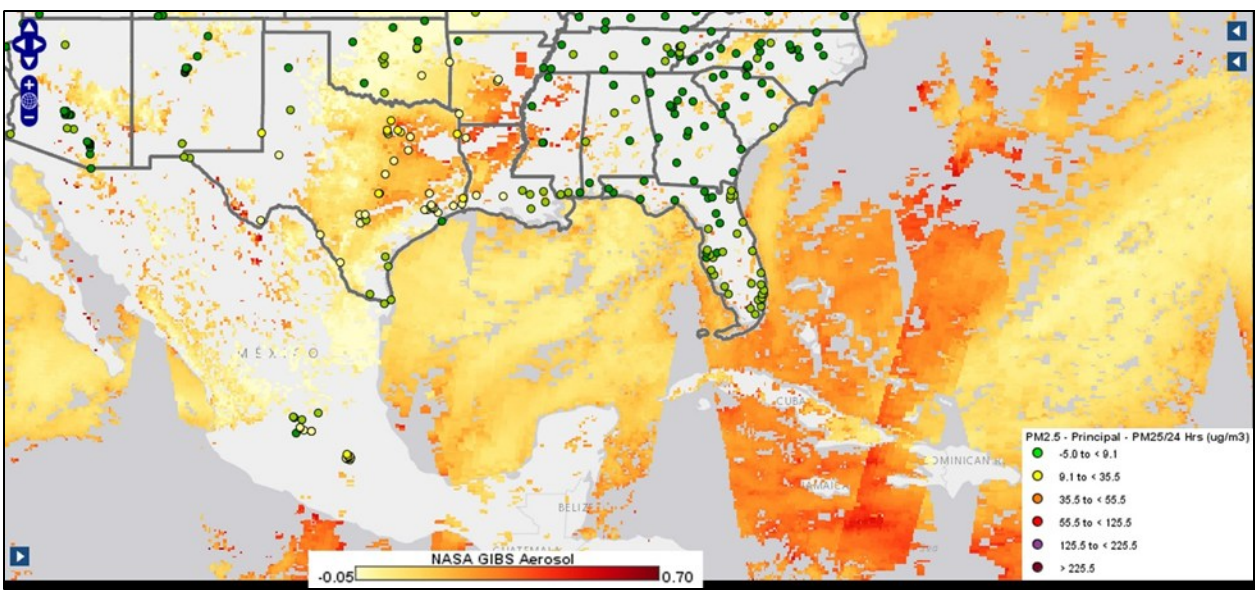

Figure 3-97: AirNow Tech Aerosol Optical Depth (AOD) Map, with MODIS Terra and Aqua Satellite Layers on July 18, 2022

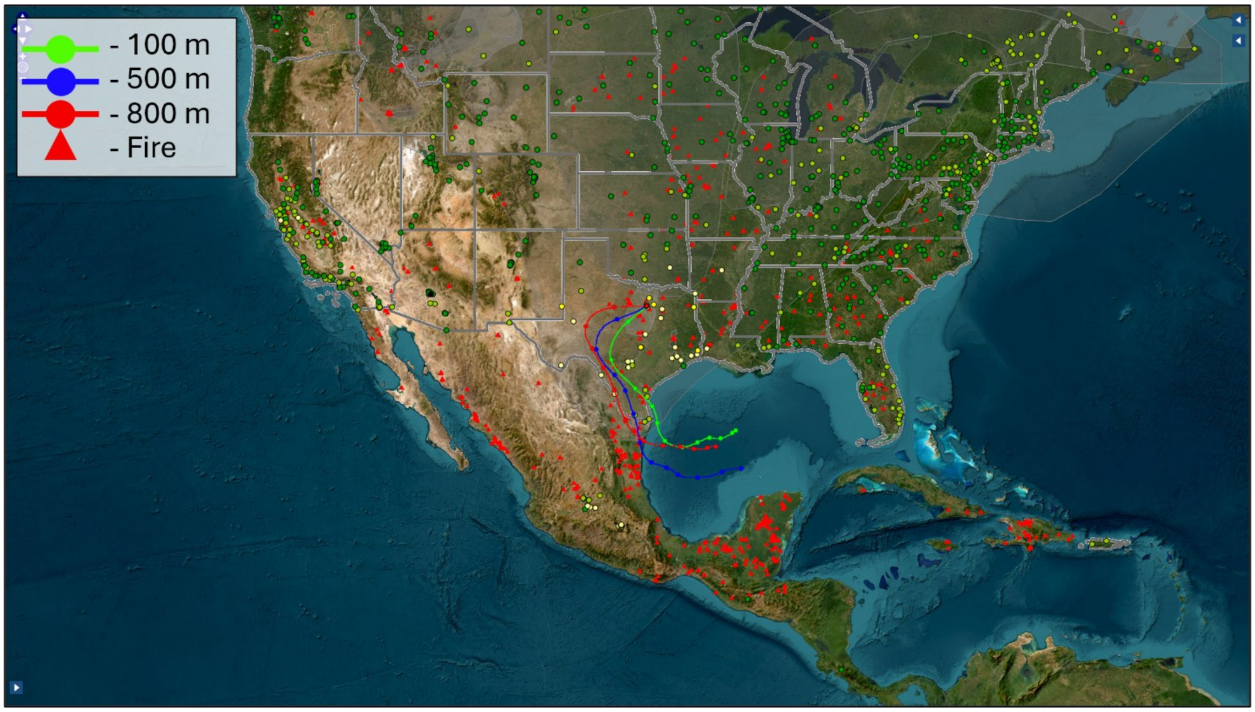

Figure 3-98: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Haws Athletic Center Monitor on July 18, 2022

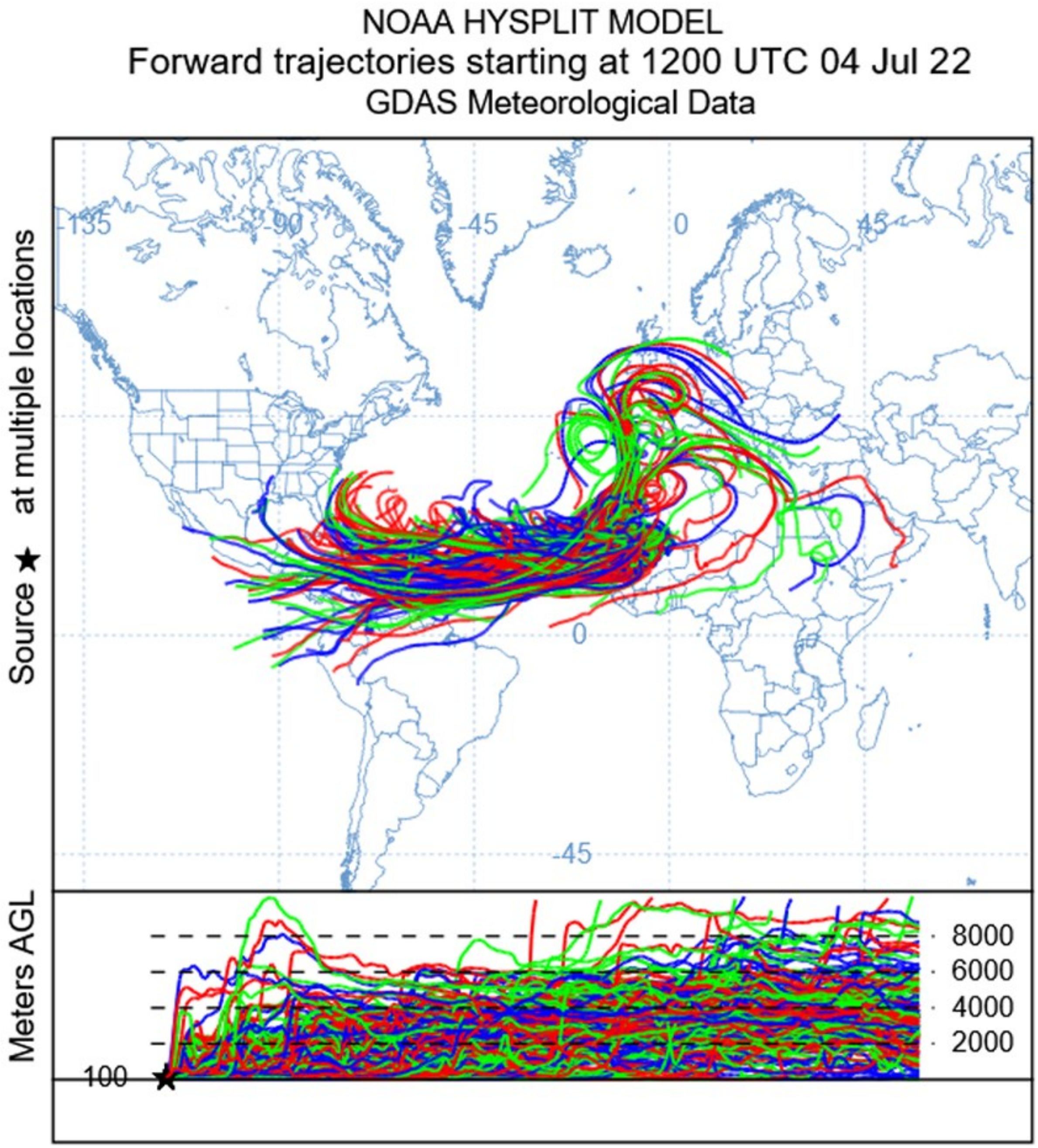

Figure 3-99: AirNow Tech HYSPLIT 14-Day Forward Trajectories Originating from Western Africa, Starting on July 4, 2022

3.2.6 Group 6: Evidence for October 3, 2022, Prescribed Fire $PM_{2.5}$ Event for the Haws Athletic Center Monitor

October 3, 2022, was identified as a Tier 1 day at the Haws Athletic Center Monitor with a 24-hour concentration of 30 µg/m^3 impacted by seasonal prescribed burning in the Southeast U.S. where residual smoke traveled into Texas. Changes in hourly temporal patterns with elevated concentrations of $PM_{2.5}$ in the early morning hours is seen in Figure 3-100: *Hourly $PM_{2.5}$ Concentrations on October 3, 2022, Compared to Typical Concentrations at the Haws Athletic Center Monitor*, compared to typical non-event data (Tier 3 Median). Figure 3-101: *AirNow HMS Smoke Plume for October 3, 2022*, shows an HMS smoke plume over the impacted Haws Athletic

Center monitor, with the yellow dots denoting air quality in the moderate category. The HYSPLIT backward trajectories at 100 m, 500 m and 800 m AGL pass through the heavy amount of smoke and cluster of fires near the Mississippi River, as shown in Figure 3-102: *AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Haws Athletic Center Monitor on October 3, 2022*. Together this evidence meets the requirements for Tier 1 demonstrations for the Haws Athletic Center monitor being impacted by Prescribed fire on the event day.

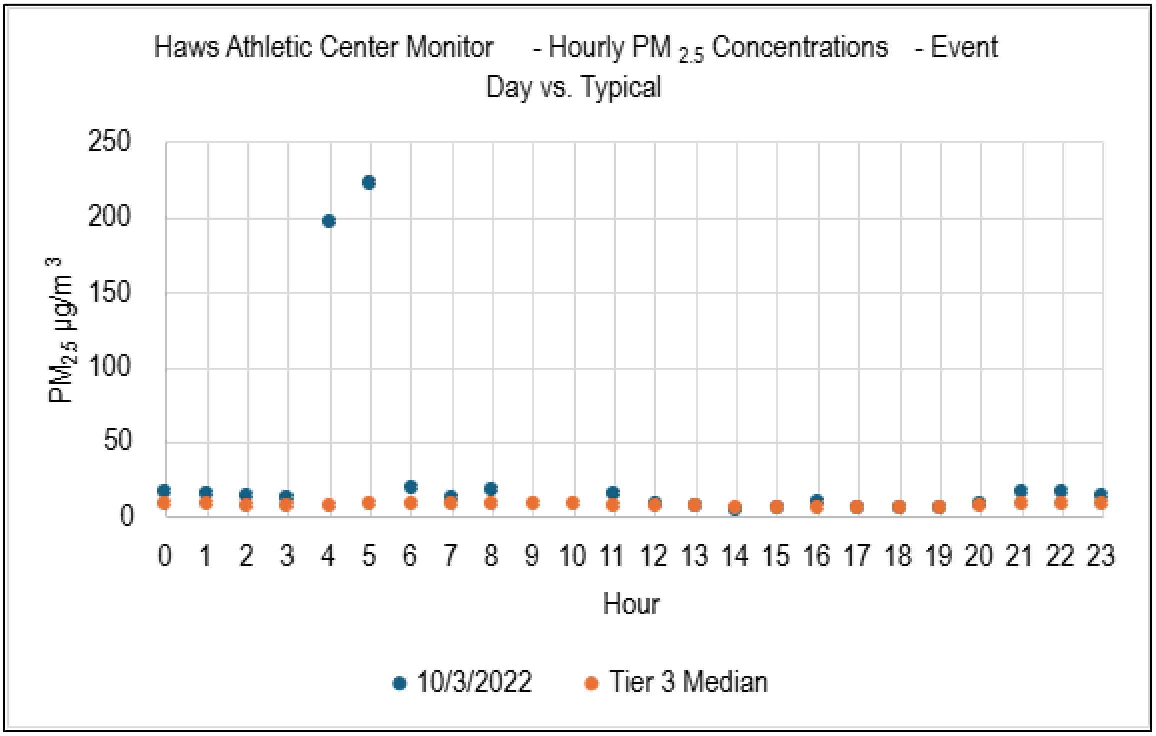

Figure 3-100: Hourly $PM_{2.5}$ Concentrations on October 3, 2022, Compared to Typical Concentrations at the Haws Athletic Center Monitor

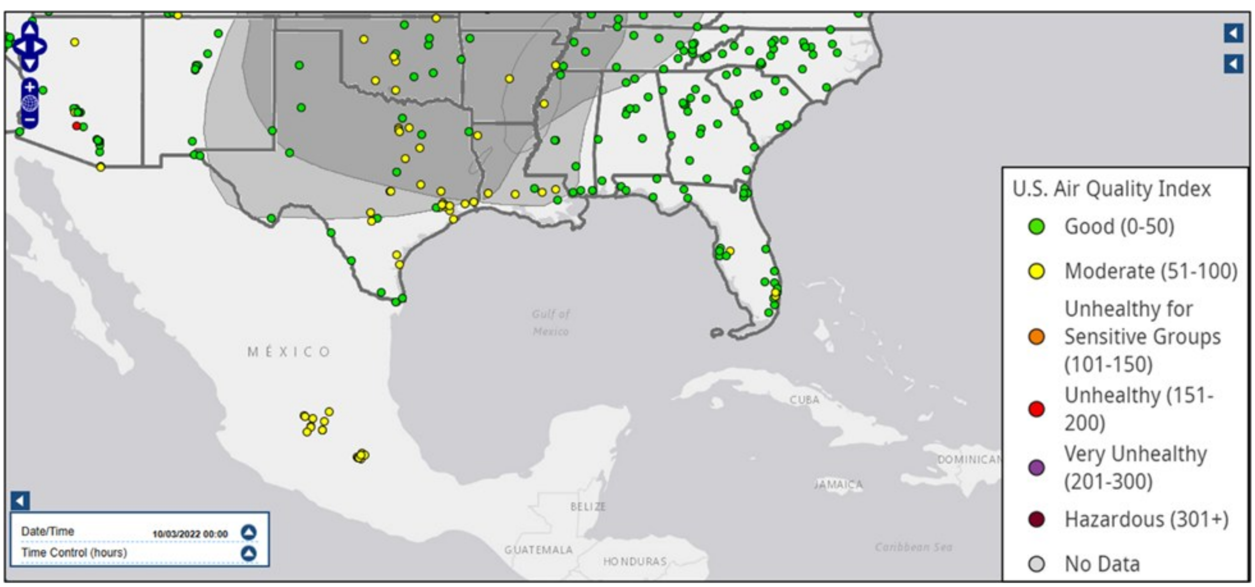

Figure 3-101: AirNow HMS Smoke Plume for October 3, 2022

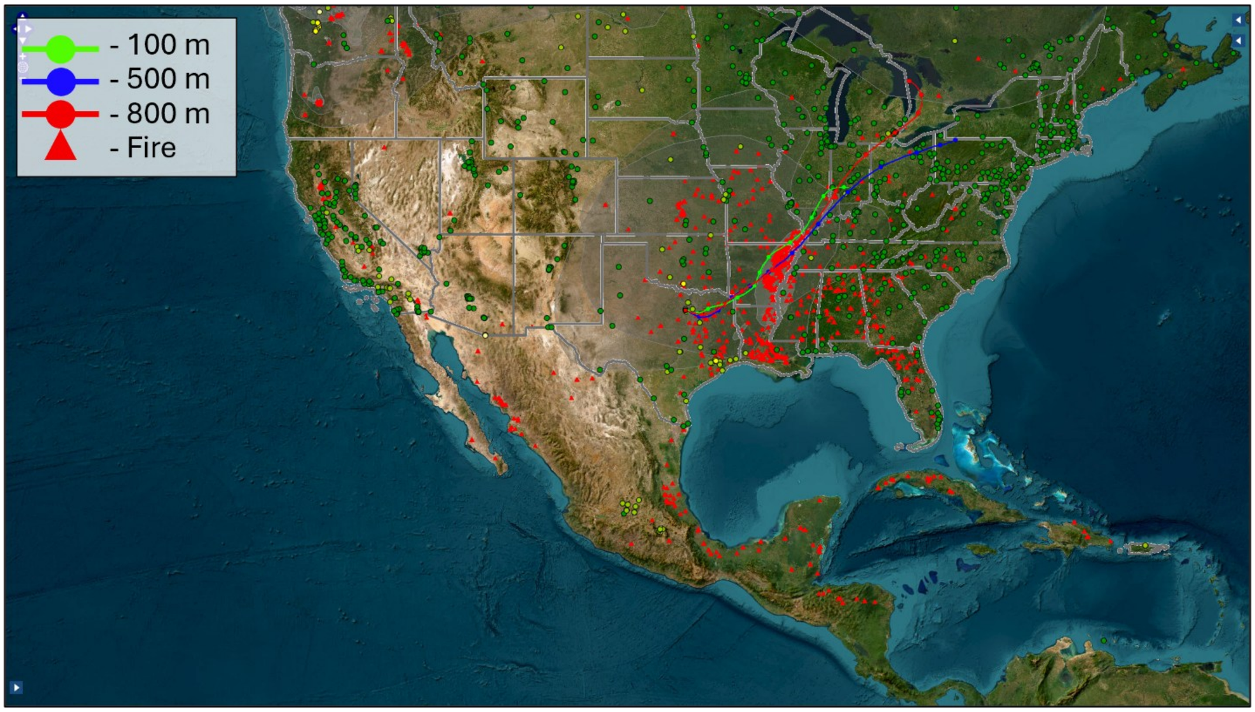

Figure 3-102: AirNow Tech HYSPLIT 72-Hour Backward Trajectories Originating from the Haws Athletic Center Monitor on October 3, 2022

SECTION 4: NOT REASONABLY CONTROLLABLE AND NOT REASONABLY PREVENTABLE

4.1 OVERVIEW

This section satisfies the Exceptional Events Rule Requirements at 40 CFR §50.14(c)(3)(iv)(A), CFR §50.1(j), 40 CFR §50.14(c)(3)(iv)(D), and 40 CFR §50.14(b)(4): The event was caused by a natural event; an exceptional event is one that is not reasonably controllable or preventable.

4.2 NATURAL AND ANTHROPOGENIC SOURCE CONTRIBUTIONS

Stationary point source emissions data are collected annually from sites that meet the reporting requirements of 30 Texas Administrative Code (TAC) §101.10, and the emissions data are compiled in TCEQ's State of Texas Environmental Electronic Reporting System (STARS). STARS fine particulate matter ($PM_{2.5}$) emissions data are presented for each county. Emissions for other sectors from the 2020 National Emissions Inventory (NEI) are presented for each county.[10]

The wind rose at each monitor is from the EPA *$PM_{2.5}$ Designations Mapping Tool*.[11] The wind rose shows the general wind direction and speed for each monitor during the period from 2021 to 2023. The circular format of the wind rose shows the direction the winds blew from and the length of each "spoke" around the circle shows how often the wind blew from that direction.[12]

4.2.1 Atascosa County

The Von Ormy Highway 16 monitor is located in Atascosa County, in the city of Von Ormy, Texas. The major point sources of $PM_{2.5}$ (as defined in 40 CFR §§51.165 and 51.166) are located in southern Atascosa County, while other major point sources can be seen north of Atascosa County, in southern Bexar County (Figure 4-1: *Point Sources in and around Atascosa County, from 2022*); however, a majority of the $PM_{2.5}$ emissions within Atascosa County are non-point, as shown in Table 4-1: *Emissions Inventory in Atascosa County, from 2020*.

[10] https://www.epa.gov/air-emissions-inventories/2020-national-emissions-inventory-nei-data
[11] https://experience.arcgis.com/experience/a2ca272ce9fc4019a88ce35b863e2cab
[12] https://www.epa.gov/sites/default/files/2019-01/documents/how_to_read_a_wind_rose.pdf

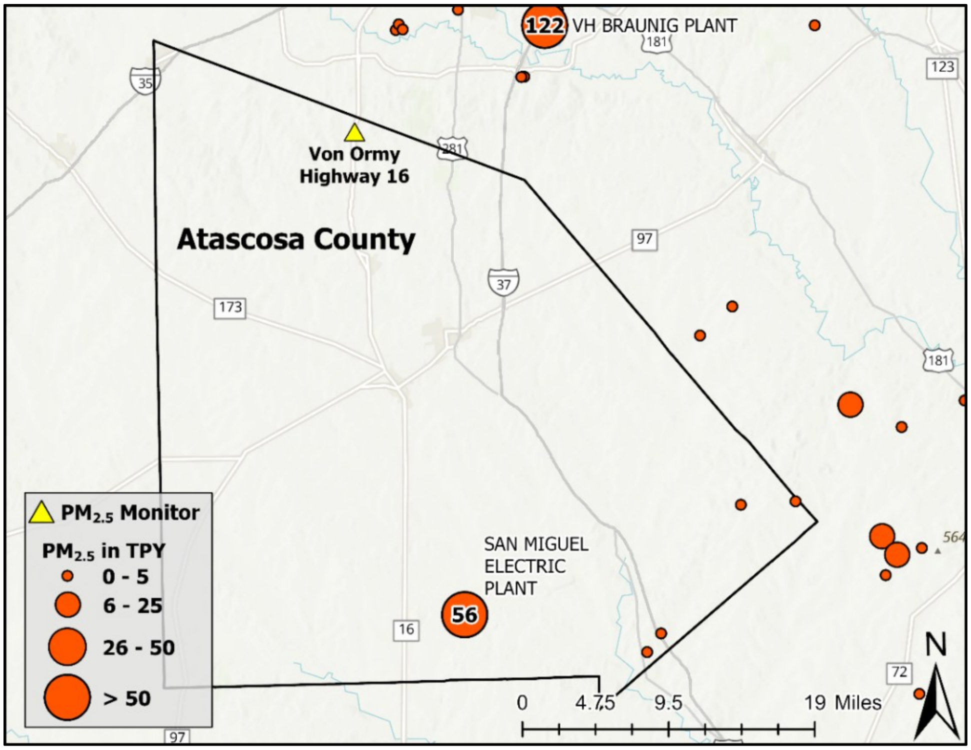

Figure 4-1: Point Sources in and around Atascosa County, from 2022

Table 4-1: Emissions Inventory in Atascosa County, from 2020

Emissions Categories	Emissions (tons per year)
On-road	23.10
Nonroad	8.22
Nonpoint	1,212.63
Point	88.05
Total	1,332.10

Figure 4-2: *Wind Roses in Atascosa County, from 2021-2023* shows that in monitors located in Atascosa County, a higher percentage of winds is coming from the south/southeast direction. Figure 4-3: *Hourly Average Continuous $PM_{2.5}$ Concentrations at the Von Ormy Highway 16 Monitor by Peak Area Hourly Wind Speed in Atascosa County* for 2022, 2023, and 2024 displays hourly wind speeds at the Von Ormy Highway 16 monitor plotted against $PM_{2.5}$ concentrations at the same monitor. The pattern in Figure 4-3 shows that the highest $PM_{2.5}$ concentrations were recorded when hourly wind speeds were relatively low. This pattern is believed to be due to the fact that $PM_{2.5}$ can be transported great distances where local wind conditions are less of a factor than wind conditions at the point from which the $PM_{2.5}$ was initially entrained in the air.

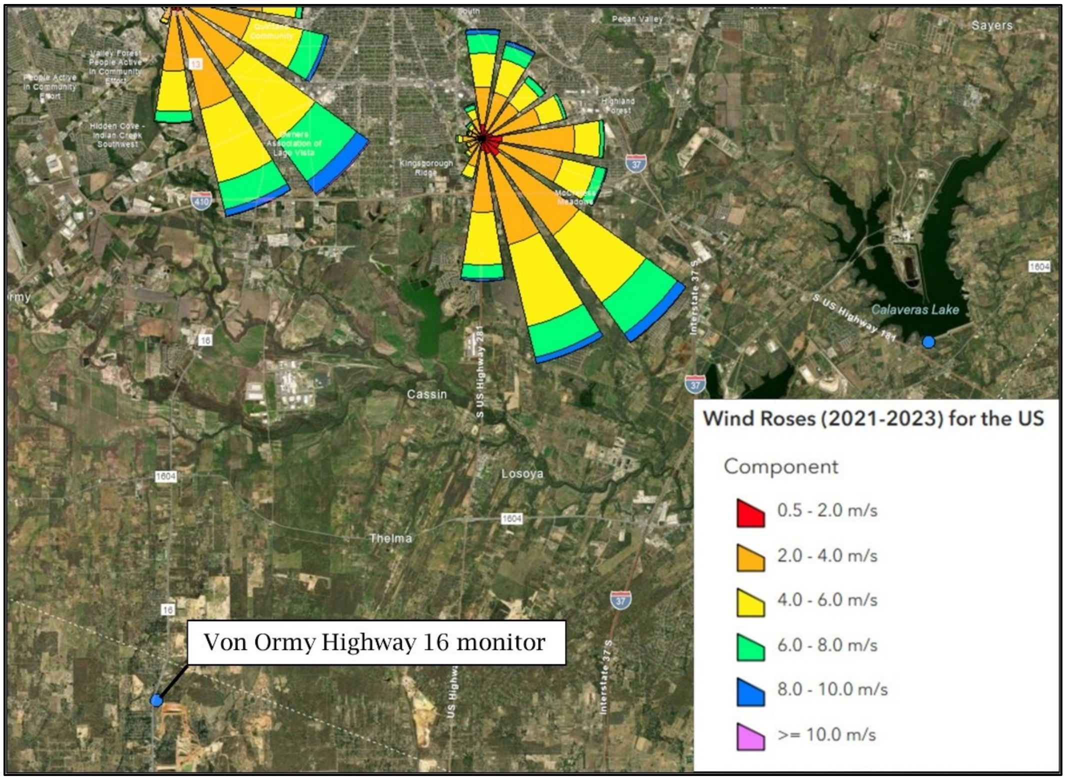

Figure 4-2: Wind Roses in Atascosa County, from 2021-2023

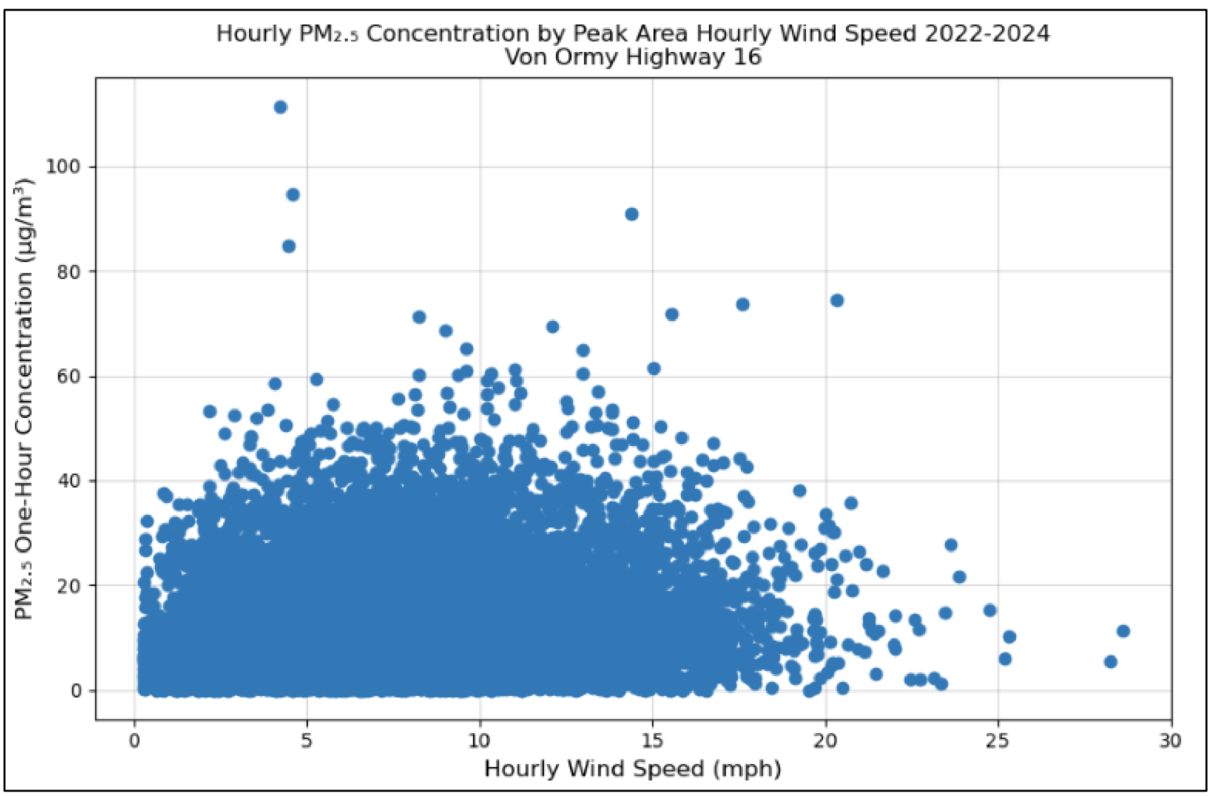

Figure 4-3: Hourly Average Continuous $PM_{2.5}$ Concentrations at the Von Ormy Highway 16 Monitor by Peak Area Hourly Wind Speed in Atascosa County for 2022, 2023, and 2024

4.2.2 Hidalgo County

The Edinburg East Freddy Gonzalez Drive monitor is located in Edinburg, Texas within Hidalgo County. The highest sources of $PM_{2.5}$ emissions within Hidalgo County (less than 50 tons per year) are approximately in the south-central and southern portions of Hidalgo County (Figure 4-4: *Point Sources in and around Hidalgo County, from 2022*); however, a majority of the $PM_{2.5}$ emissions are non-point, as shown in Table 4-2: *Emissions Inventory in Hidalgo County, from 2020*.

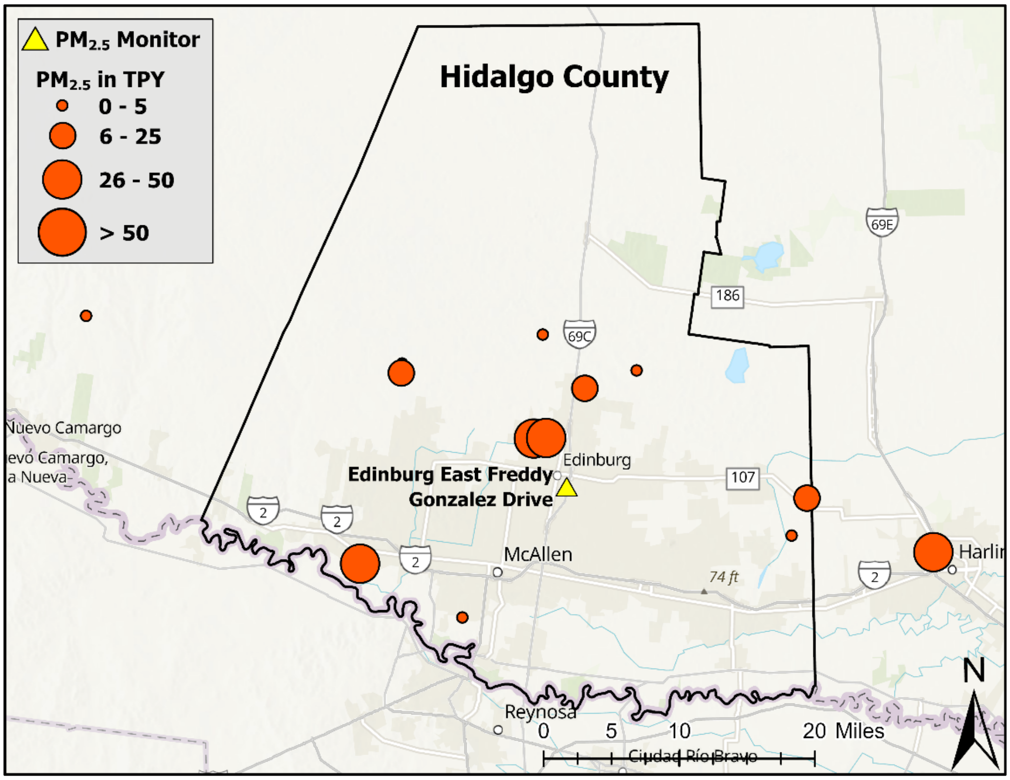

Figure 4-4: Point Sources in and around Hidalgo County, from 2022

Table 4-2: Emissions Inventory in Hidalgo County, from 2020

Emissions Categories	Emissions (tons per year)
On-road	125.52
Nonroad	84.51
Nonpoint	5,019.03
Point	235.45
Total	5,464.51

Figure 4-5: *Wind Roses in Hidalgo County, from 2021-2023* shows that at Edinburg East Freddy Gonzalez Drive and other Hidalgo County monitors, a higher percentage of winds is coming from the south and east directions. Figure 4-6: *Hourly Average Continuous $PM_{2.5}$ Concentrations at the Edinburg East Freddy Gonzalez Drive Monitor by Peak Area Hourly Wind Speed in Hidalgo County* for 2022, 2023, and 2024 displays peak area hourly wind speeds at Hidalgo County monitors plotted against $PM_{2.5}$ concentrations at the Edinburg East Freddy Gonzalez Drive

monitor. The pattern in Figure 4-6 shows that the highest $PM_{2.5}$ concentrations were recorded when hourly wind speeds were relatively low, or between five and 15 miles per hour.

Figure 4-5: Wind Roses in Hidalgo County, from 2021-2023

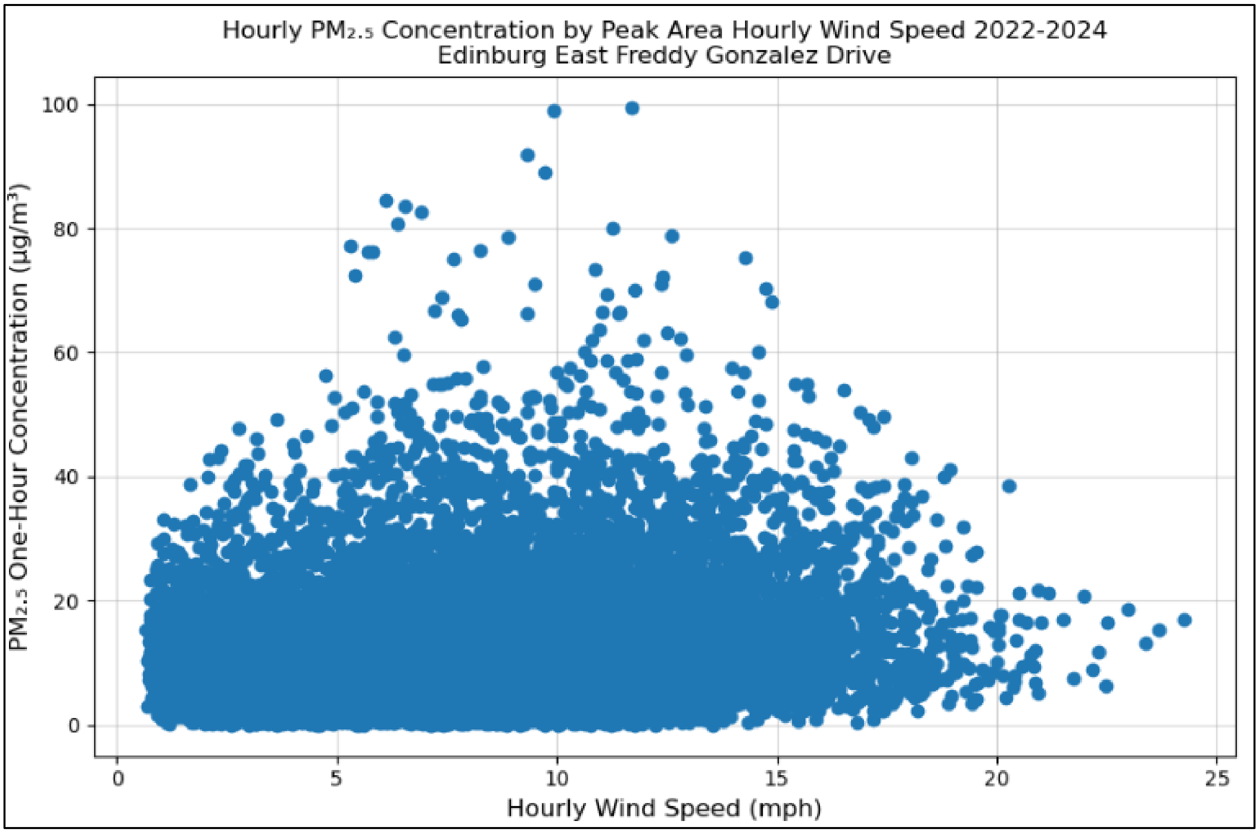

Figure 4-6: Hourly Average Continuous $PM_{2.5}$ Concentrations at the Edinburg East Freddy Gonzalez Drive Monitor by Peak Area Hourly Wind Speed in Hidalgo County for 2022, 2023, and 2024

4.2.3 Nueces County

The Corpus Christi Huisache and Dona Park monitors are located in Corpus Christi, Texas within Nueces County. The major sources of $PM_{2.5}$ emissions are located in the southeast and north portions of Nueces County, while other major point sources can be seen north of Nueces County, in San Patricio County (Figure 4-7: *Point Sources in and around Nueces County, from 2022*); however, a significant portion of the $PM_{2.5}$ emissions is non-point, as shown in Table 4-3: *Emissions Inventory in Nueces County, from 2020*.

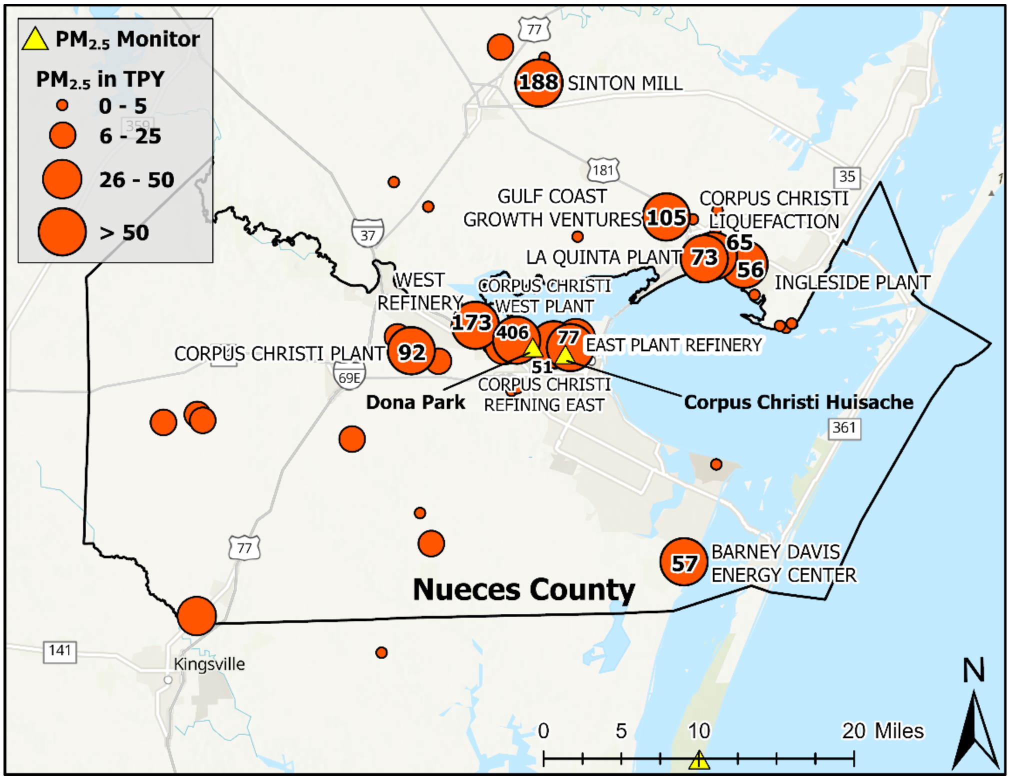

Figure 4-7: Point Sources in and around Nueces County, from 2022

Table 4-3: Emissions Inventory in Nueces County, from 2020

Emissions Categories	Emissions (tons per year)
On-road	64.59
Nonroad	76.64
Nonpoint	2,016.46
Point	1,362.19
Total	3,519.88

Figure 4-8: *Wind Rose in Nueces County,* from 2021-2023 shows that at Nueces County monitors, a higher percentage of winds is coming from the south/southeast direction. Figure 4-9: *Hourly Average Continuous $PM_{2.5}$ Concentrations at the Corpus Christi Huisache Monitor by Peak Area Hourly Wind Speed in Nueces County* for 2022, 2023, and 2024 and Figure 4-10: *Hourly Average Continuous $PM_{2.5}$ Concentrations at the Dona Park Monitor by Peak Area Hourly Wind Speed in Nueces County* for 2022, 2023, and 2024 display peak area hourly wind speeds at Nueces County monitors plotted against $PM_{2.5}$ concentrations at the Corpus Christi Huisache and Dona Park monitors, respectively. While there are a few high $PM_{2.5}$ concentrations at relatively low wind speeds, there is no other definitive pattern in Figure 4-9 and Figure 4-10, and this is due to the fact that the characteristically small particles of $PM_{2.5}$ can be transported

great distances where local wind conditions are less of a factor than wind conditions at the point from which the $PM_{2.5}$ was initially entrained in the air.

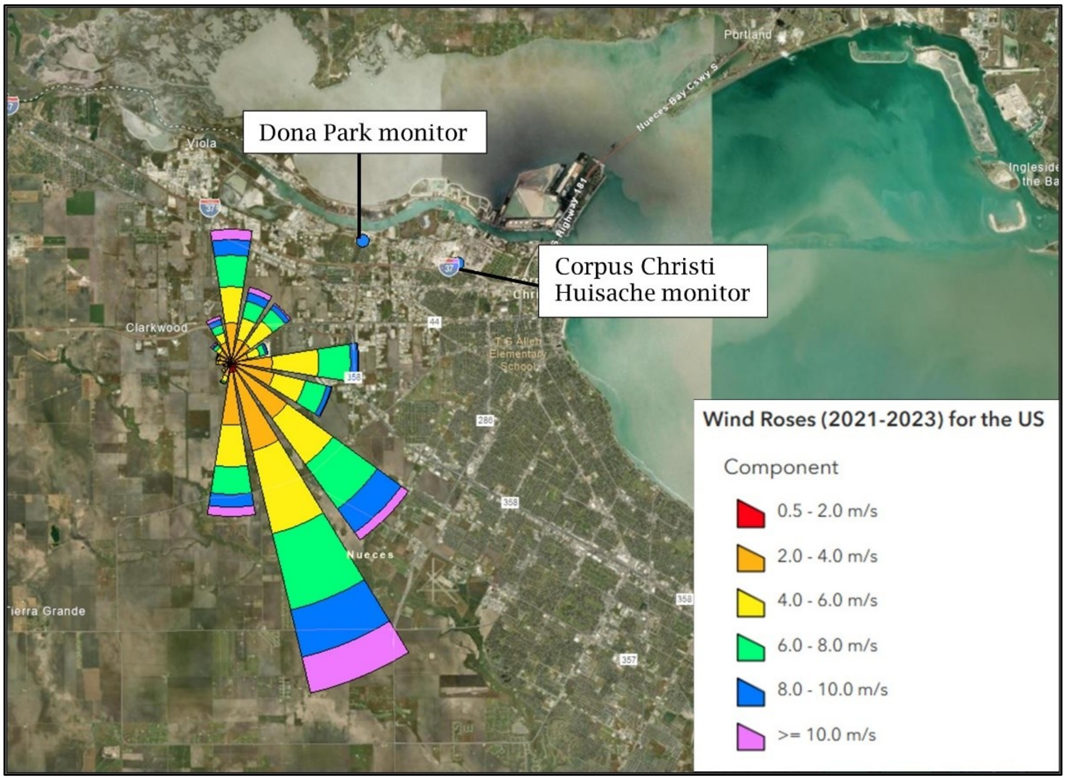

Figure 4-8: Wind Rose in Nueces County, from 2021-2023

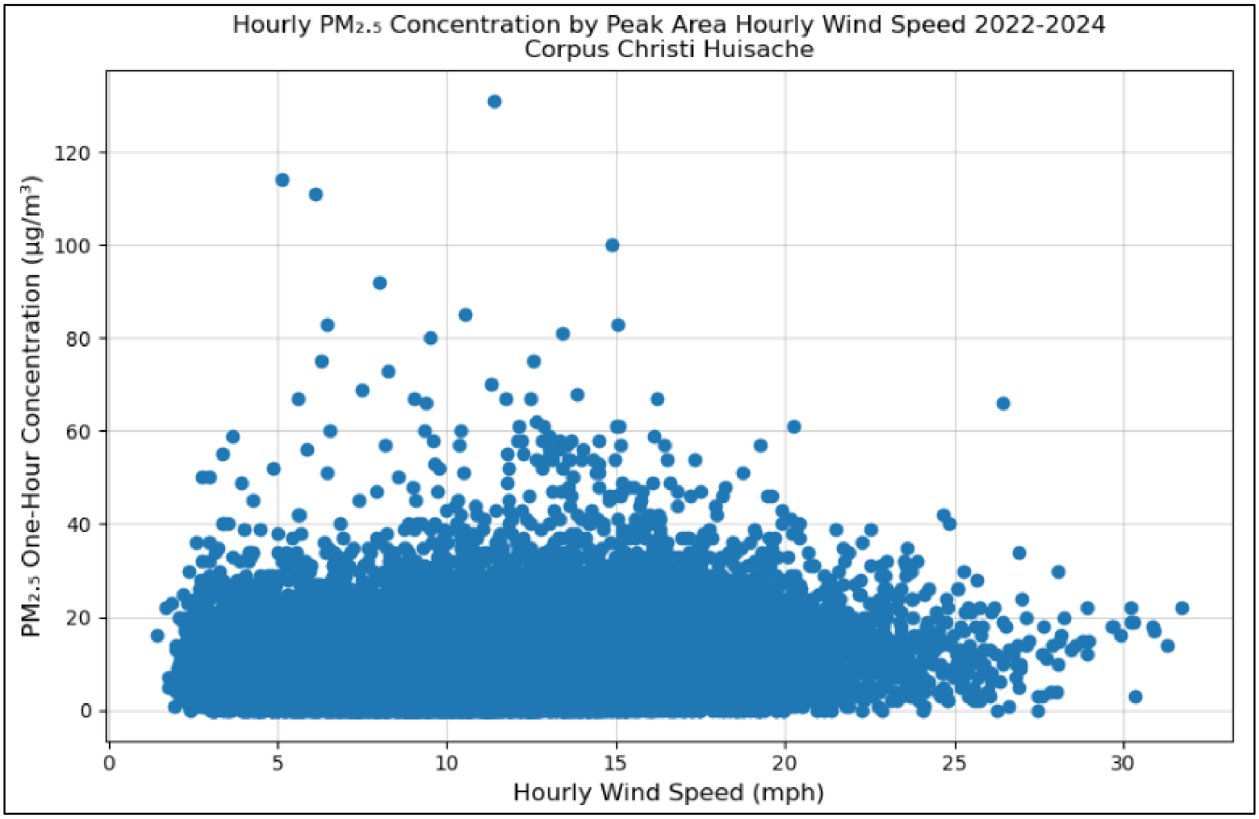

Figure 4-9: Hourly Average Continuous $PM_{2.5}$ Concentrations at the Corpus Christi Huisache Monitor by Peak Area Hourly Wind Speed in Nueces County for 2022, 2023, and 2024

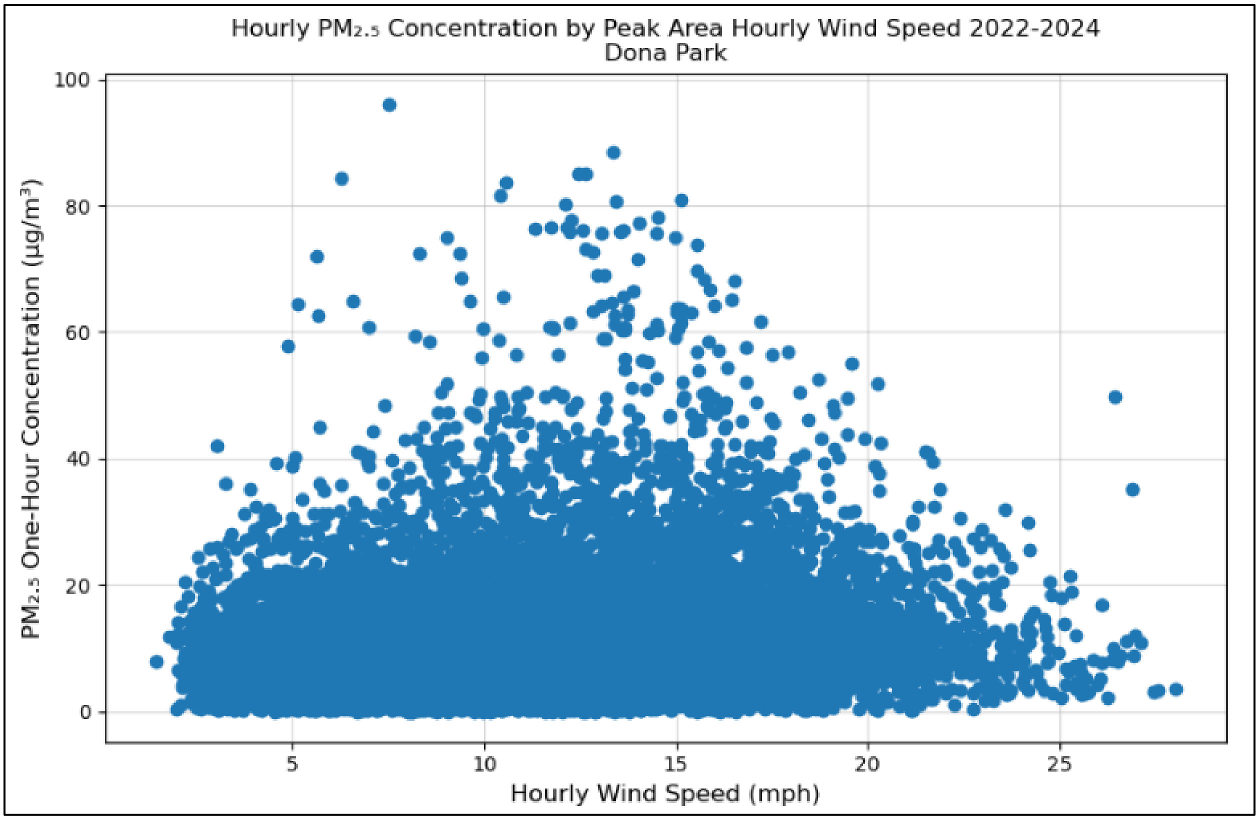

Figure 4-10: Hourly Average Continuous $PM_{2.5}$ Concentrations at the Dona Park Monitor by Peak Area Hourly Wind Speed in Nueces County for 2022, 2023, and 2024

4.2.4 Tarrant County

The Fort Worth Northwest and Haws Athletic Center monitors are located in Fort Worth, Texas within Tarrant County. The major sources of $PM_{2.5}$ emissions are located approximately in the central portion of the county, while other major point sources can be seen southeast adjacent, in Ellis County (Figure 4-11: *Point Sources in and around Tarrant County, from 2022*); however, a significant portion of the $PM_{2.5}$ emissions are non-point, as shown in Table 4-4: *Emissions Inventory in Tarrant County, from 2020.*

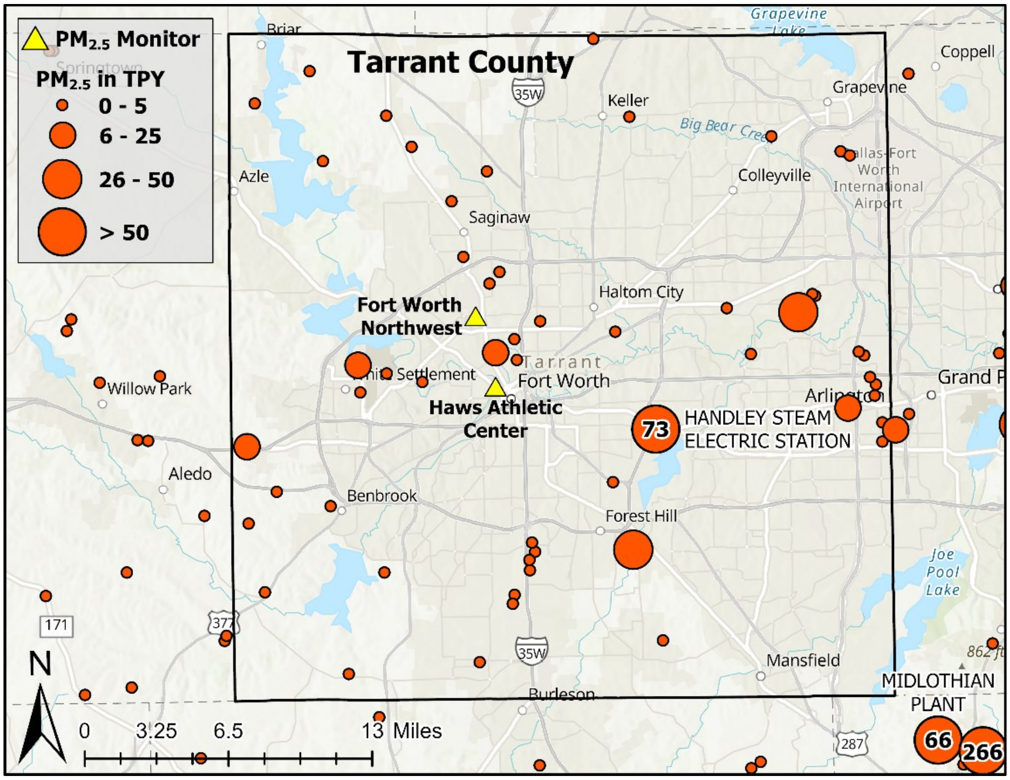

Figure 4-11: Point Sources in and around Tarrant County, from 2022

Table 4-4: Emissions Inventory in Tarrant County, from 2020

Emissions Categories	Emissions (tons per year)
On-road	319.06
Nonroad	301.17
Nonpoint	2,875.00
Point	243.57
Total	3,738.80

Figure 4-12: *Wind Roses in Tarrant County, from 2021-2023* shows that at Fort Worth Northwest and other Tarrant County monitors, a higher percentage of winds is coming from the south/southeast direction. Figure 4-13: *Hourly Average Continuous $PM_{2.5}$ Concentrations at the Fort Worth Northwest Monitor by Peak Area Hourly Wind Speed in Tarrant County* for 2022, 2023, and 2024 and Figure 4-14: *Hourly Average Continuous $PM_{2.5}$ Concentration at the Haws Athletic Center Monitor by Peak Area Hourly Wind Speed in Tarrant* County for 2022, 2023, and 2024 displays peak area hourly wind speeds at Tarrant County monitors plotted against $PM_{2.5}$ concentrations at the Fort Worth Northwest and Haws Athletic Center monitors, respectively. There is no definitive pattern in Figure 4-13, while Figure 4-14 displays higher $PM_{2.5}$ concentrations when wind speeds were lower.

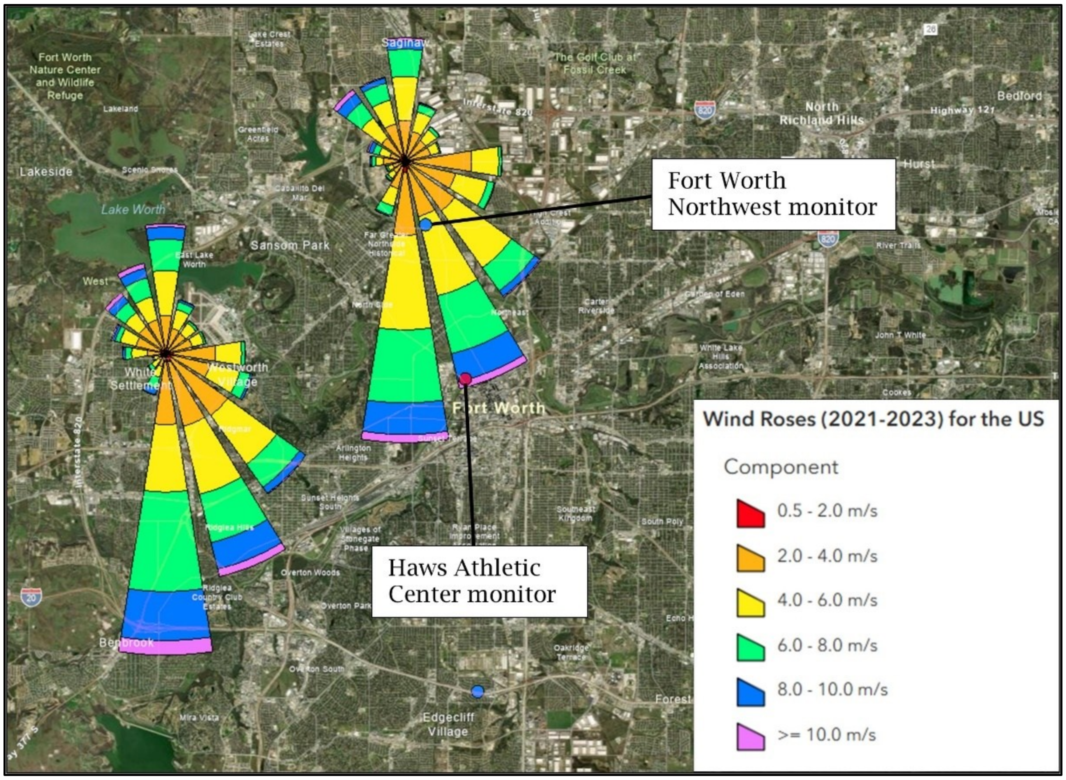

Figure 4-12: Wind Roses in Tarrant County, from 2021-2023

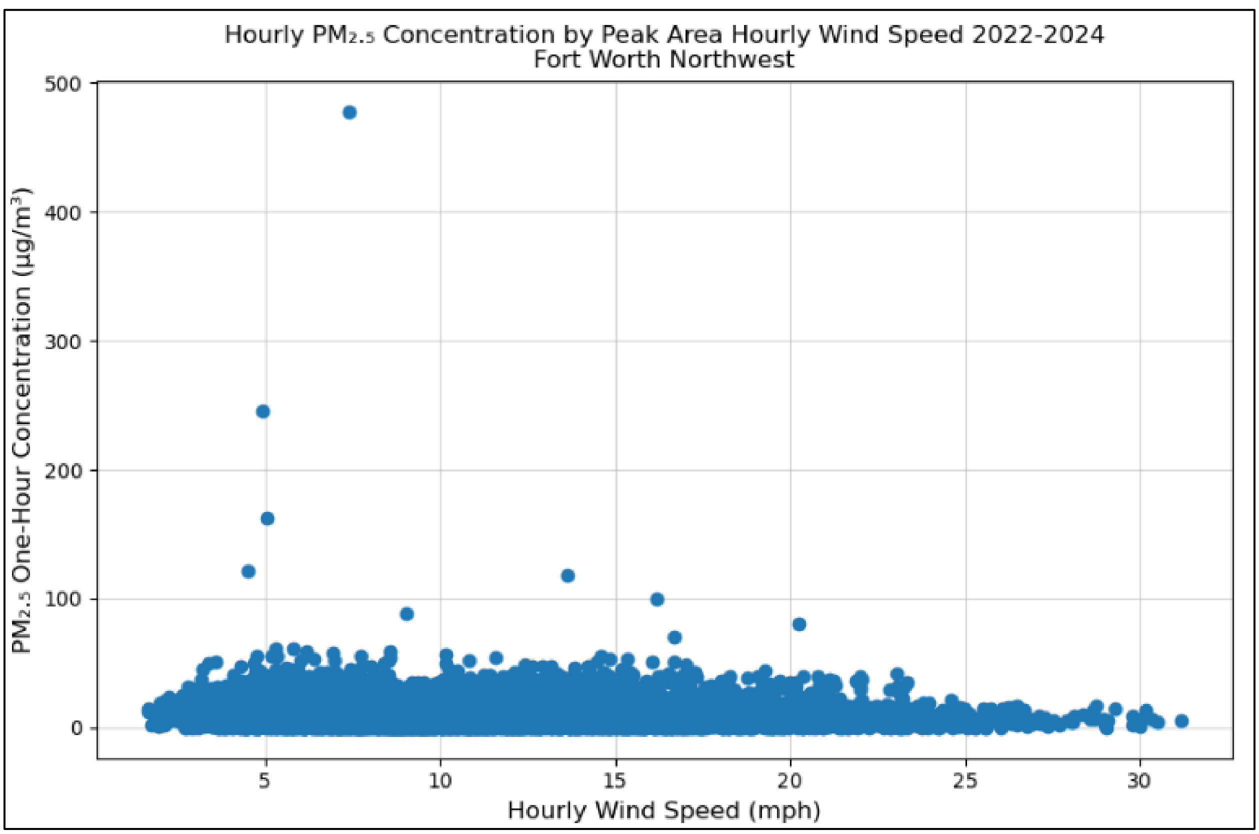

Figure 4-13: Hourly Average Continuous $PM_{2.5}$ Concentrations at the Fort Worth Northwest Monitor by Peak Area Hourly Wind Speed in Tarrant County for 2022, 2023, and 2024

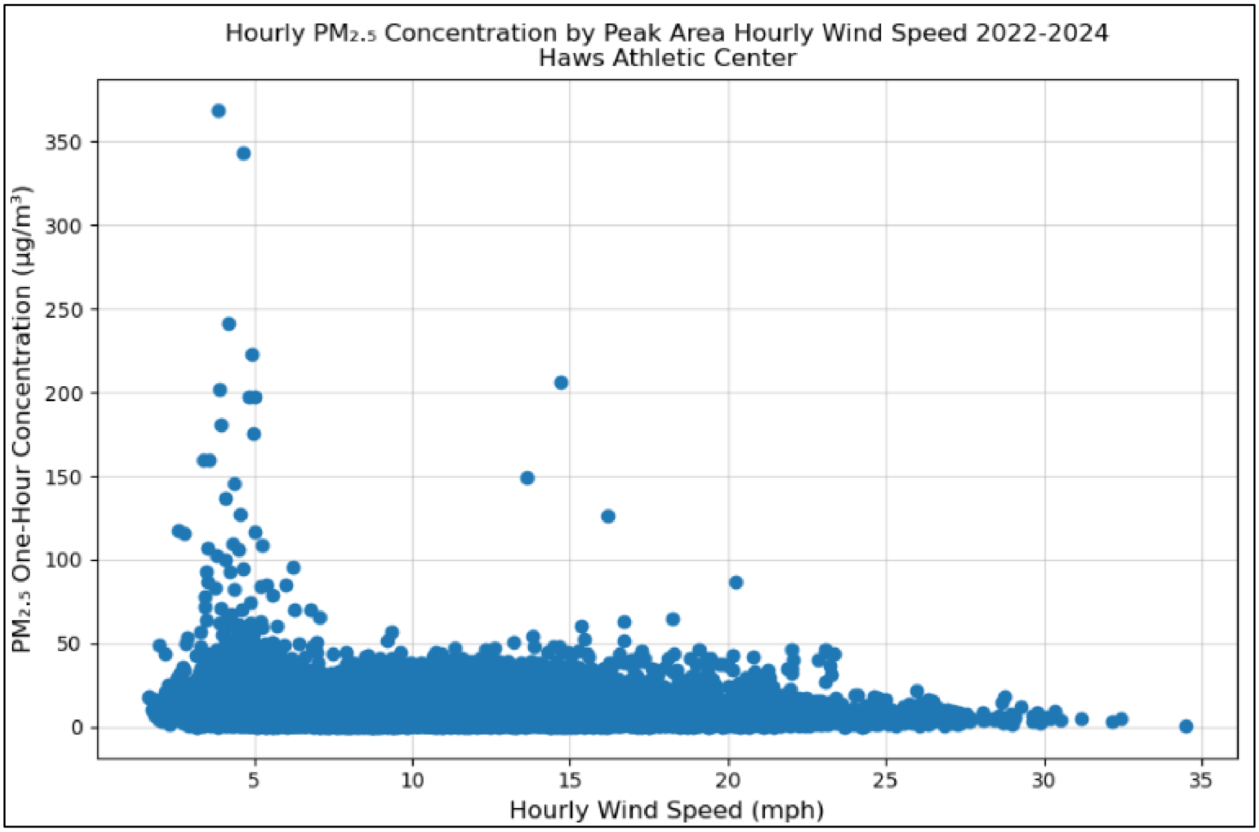

Figure 4-14: Hourly Average Continuous $PM_{2.5}$ Concentration at the Haws Athletic Center Monitor by Peak Area Hourly Wind Speed in Tarrant County for 2022, 2023, and 2024

4.2.5 Webb County

The World Trade Bridge monitor is located in Laredo, Texas within Webb County. There are no major sources of $PM_{2.5}$ emissions in Webb County, as seen in Figure 4-15: *Point Sources in and around Webb County, from 2022*, and a significant portion of $PM_{2.5}$ emissions is non-point, as shown in Table 4-5: *Emissions Inventory in Webb County, from 2020*.

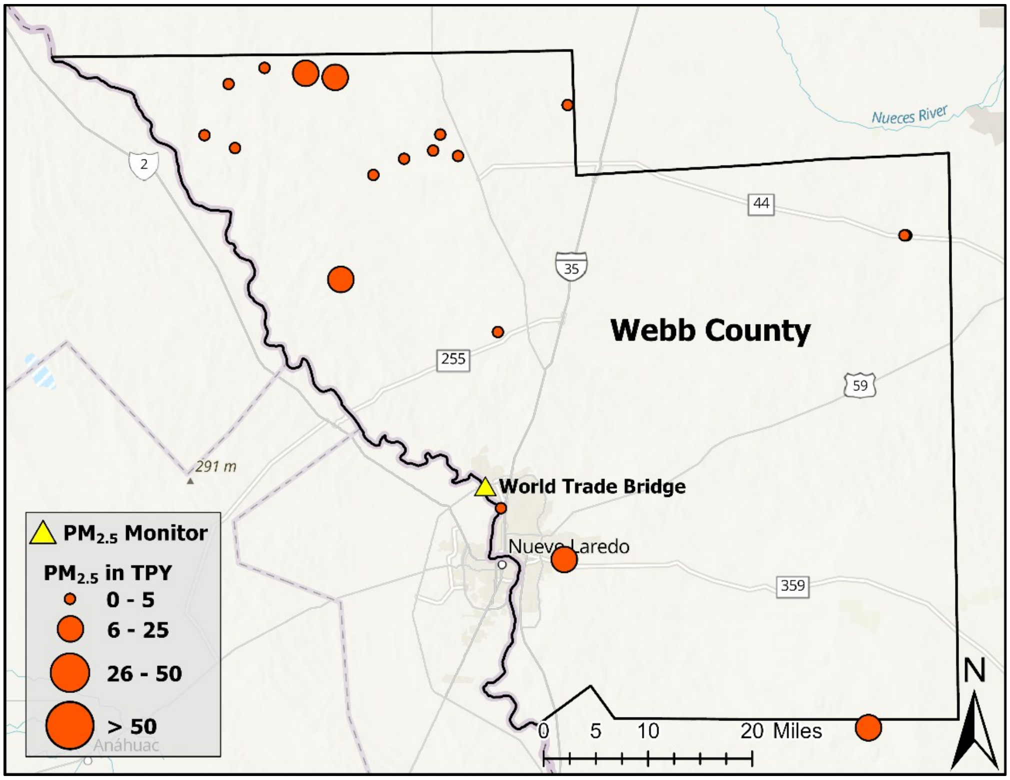

Figure 4-15: Point Sources in and around Webb County, from 2022

Table 4-5: Emissions Inventory in Webb County, from 2020

Emissions Categories	Emissions (tons per year)
On-road	70.92
Nonroad	60.04
Nonpoint	1,425.34
Point	59.34
Total	1,615.65

Figure 4-16: *Wind Roses in Webb County, from 2021-2023* shows that at Webb County monitors, a higher percentage of winds are coming from the south/southeast direction. Figure 4-17: *Hourly Average Continuous $PM_{2.5}$ Concentration at the World Trade Bridge Monitor by Peak Area Hourly Wind Speed in Webb County* for 2022, 2023, and 2024 displays peak area hourly wind speeds at Webb County monitors plotted against $PM_{2.5}$ concentrations at the World Trade Bridge monitor. There is no definitive pattern in Figure 4-17, though there are a few higher concentrations of $PM_{2.5}$ associated with slower wind speeds (less than 15 miles per hour).

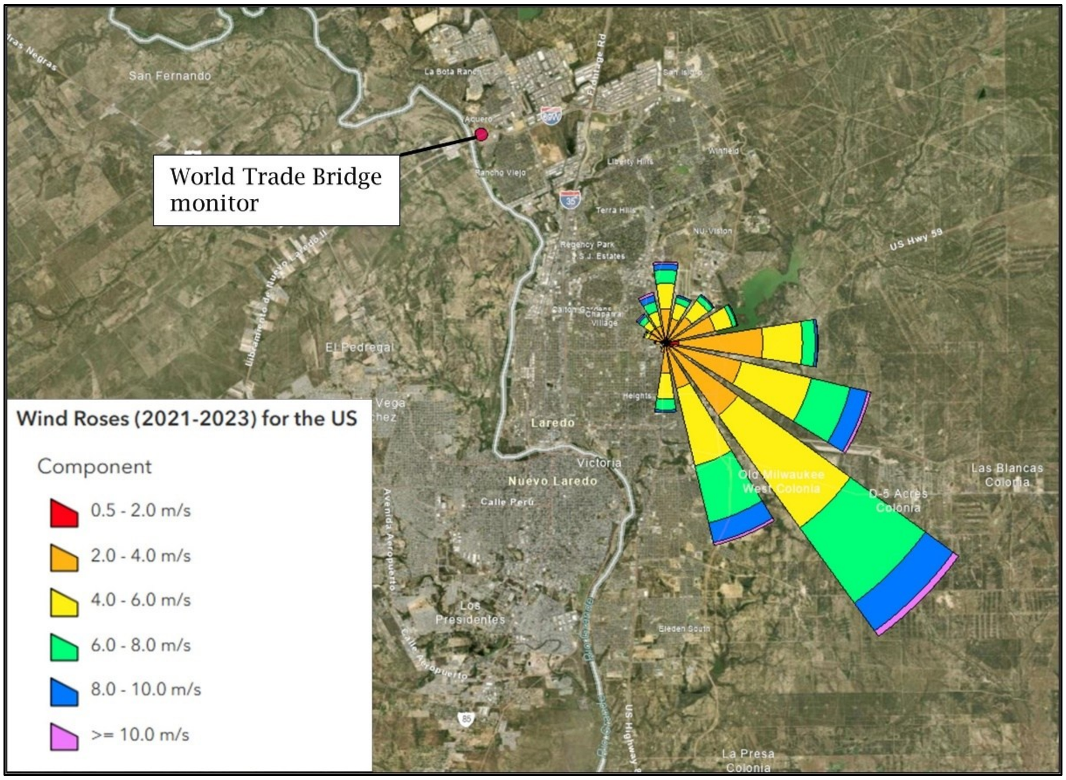

Figure 4-16: Wind Roses in Webb County, from 2021-2023

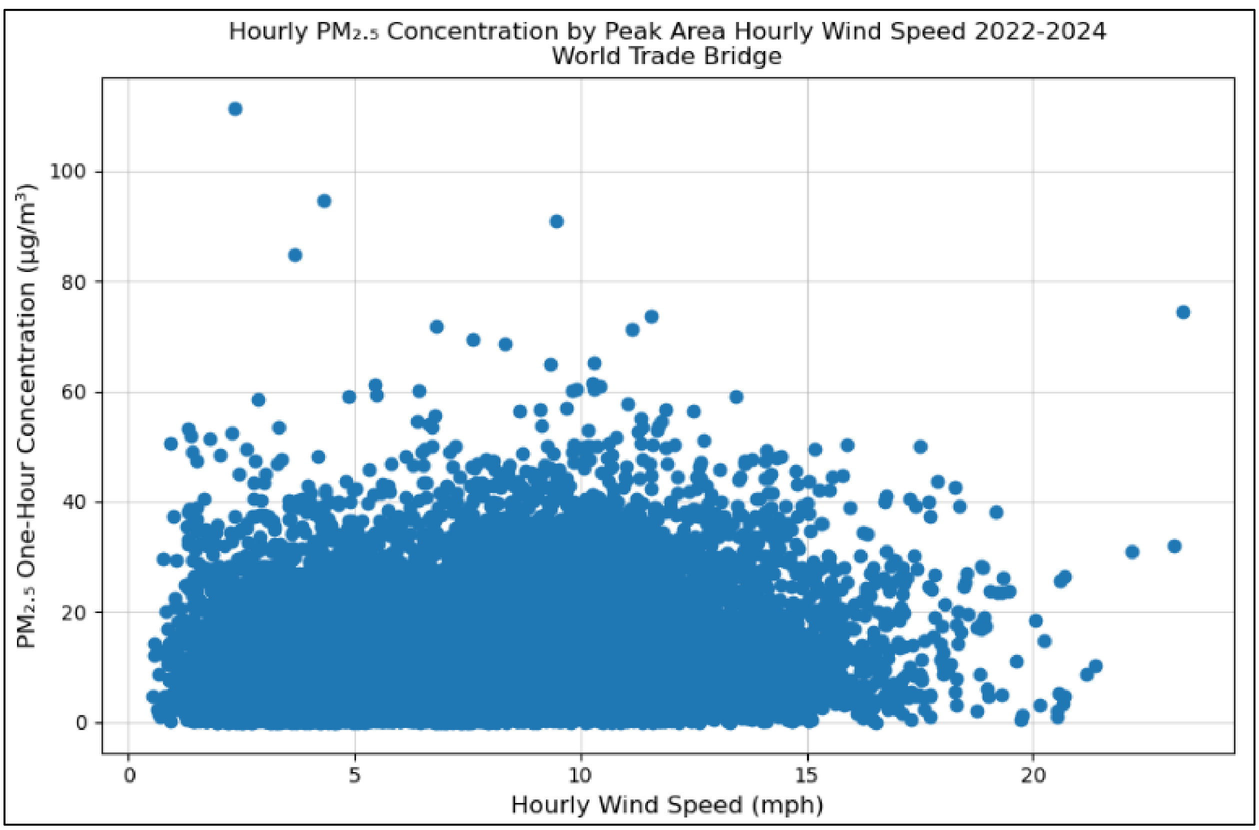

Figure 4-17: Hourly Average Continuous $PM_{2.5}$ Concentration at the World Trade Bridge Monitor by Peak Area Hourly Wind Speed in Webb County for 2022, 2023, and 2024

4.3 ATTAINMENT STATUS AND CONTROL MEASURES

Atascosa, Hidalgo, Nueces, Tarrant, and Webb Counties are currently designated as attainment for the 2012 primary annual $PM_{2.5}$ standard of 12.0 µg/m^3. In February 2024, EPA lowered the primary annual standard to 9.0 µg/m^3, and 2024 design values show that $PM_{2.5}$ concentrations in the aforementioned counties are above the revised standard. In this document, TCEQ demonstrates that the $PM_{2.5}$ concentrations at monitors on the dates listed in Table 1-1 were caused by exceptional events and requests that these dates be excluded from regulatory decisions for the 2024 annual $PM_{2.5}$ NAAQS.

As a part of the state implementation plan (SIP) strategy, Texas has established statewide rules to attain or maintain the National Ambient Air Quality Standards for particulate matter (PM). Title 30 TAC §111, Subchapter A includes statewide regulations for visible emissions and PM.[13] These regulations contain control requirements that apply to various sources of PM emissions and monitoring, testing, and recordkeeping requirements for affected sources. Title 30 TAC §111, Subchapter B is a statewide regulation that addresses outdoor burning and is applicable to particulate matter control.[14]

4.4 PRESCRIBED FIRES AND SMOKE MANAGEMENT PLANS

The Texas A&M Forest Service (TFS, formally called Texas Forest Service) coordinates fire and smoke management issues in Texas to address basic smoke management practices for prescribed fire used for agricultural and wildland vegetation management purposes and smoke management programs pursuant to the requirements under the Regional Haze Rule 40 CFR §51.308(f)(2)(iv)(D).[15] The 34th Texas Legislature created the TFS in 1915. The legal mandate of the TFS includes the responsibility to "assume direction of all forest interests and all matters pertaining to forestry within the jurisdiction of the state." The TFS has developed a voluntary approach called the Texas Forest Service Smoke Management System, under which all land managers in Texas, including the National Park Service, inform the TFS before performing prescribed burns.

The Regional Haze Rule allows for states to have smoke management programs that are comparable to smoke management plans (SMP) without being certified as SMPs. The following list is documentation that Texas has a structure in place, with rules, communication systems, and data collection to help reduce PM, which reduces visibility. The following are documents, rules, memorandums of understanding, etc., that help establish that Texas has a working smoke management program to help reduce smoke and fires throughout the state. This list is not exhaustive and is only a sample. The documents are updated periodically.

- Texas Forest Service (TFS), 2023. Texas Wildfire Protection Plan.[16]
- TFS, 2018. Texas A&M Forest Service Smoke Management Plan.[17]
- TCEQ, 2015. Outdoor Burning in Texas, publication number: RG-049.[18]

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[13] https://texreg.sos.state.tx.us/public/readtac$ext.ViewTAC?tac_view=5&ti=30&pt=1&ch=111&sch=A
[14] https://texreg.sos.state.tx.us/public/readtac$ext.ViewTAC?tac_view=5&ti=30&pt=1&ch=111&sch=B&rl=Y
[15] https://tfsweb.tamu.edu/
[16] https://tfsweb.tamu.edu/uploadedFiles/TFSMain/Wildfires_and_Disasters/Contact_Us(3)/Texas%20Wildfire%20Protection%20Plan_May%202023%20Revision.pdf
[17] https://tfsweb.tamu.edu/uploadedFiles/TFS_Main/Manage_Forests_and_Land/Prescribed_Fires/TFS%20SMP.pdf
[18] https://www.tceq.texas.gov/downloads/publications/rg/outdoor-burning-in-texas-rg-49.pdf

- Texas Administrative Code (TAC), Title 30, Environmental Quality, Part 1, Texas Commission on Environmental Quality, Chapter 111, Control of Air Pollution from Visible Emissions and Particulate Matter, Subchapter B, Outdoor Burning.[19]
- Texas Parks and Wildlife Department, 2015. General Plan for Prescribed Burning on Texas Parks and Wildlife Department Lands.[20]
- Master Cooperative Wildland Fire Management and Stafford Act Response Agreement with U.S. Forest Service, National Park Service, U.S. Fish & Wildlife Service, Bureau of Indian Affairs, Texas Forest Service, and Texas Parks and Wildlife Department, 2015.[21]

4.5 FIRES FROM MEXICO/CENTRAL AMERICA AND AFRICAN DUST

Section 40 CFR §50.14 (a)(8)(vii) provides that a state would not be required to provide case-specific justification to support the not reasonably controllable or preventable portion of the rule when the emissions-generating event was outside the state. Specifically, Section 40 CFR § 50.14 (a)(8)(vii) states:

> *The Administrator shall not require a State to provide case-specific justification to support the not reasonably controllable or preventable criterion for emissions-generating activity that occurs outside of the State's jurisdictional boundaries within which the concentration at issue was monitored.*

[19] https://texreg.sos.state.tx.us/public/readtac$ext.ViewTAC?tac_view=5&ti=30&pt=1&ch=111&sch=B&rl=Y
[20] https://tpwd.texas.gov/publications/pwdpubs/media/pwd_lf_w7000_1818_general_plan_for_burning_on_tpwd_lands.pdf
[21] https://gacc.nifc.gov/swcc/management_admin/incident_business/docs/25.Texas%20Master%20Agreement.pdf

SECTION 5: HUMAN ACTIVITY UNLIKELY TO RECUR AT A PARTICULAR LOCATION OR NATURAL EVENT

5.1 OVERVIEW

This section satisfies the Exceptional Events Rule Requirement at 40 CFR §50.14(c)(3)(iv)(E): A demonstration that the event was a human activity that is unlikely to recur at a particular location or was a natural event.

Smoke that is attributable to human causes that occur outside of Texas, due to agricultural or industrial burning, are not controllable or preventable by the State of Texas.

5.2 AFRICAN DUST – NATURAL EVENT

Based on the documentation provided in Section 3 of this demonstration, the event qualifies as a natural event due to dust originating from the Sahara Desert, which is relatively undisturbed by human activity, and has commonly occurring dust storms.

EPA generally considers the emissions of $PM_{2.5}$ from dust events to meet the regulatory definition of a natural event under 40 CFR 50.1(k), defined as one 'in which human activity plays little or no direct causal role.'

Saharan dust impacts monitors in Texas every year, mainly in the summer. The three to six episodes per year are typically intense and characterized by high incoming background levels that last one to three days or more. Satellite imagery provides good visual evidence of African dust moving across the Atlantic Ocean, through the Caribbean, and into the Gulf of America. NASA Worldview satellite imagery of dust surface mass concentration layers created from time-averaged 2-dimensional mean data collections from 2022 and 2023, show dust being transported from west Africa through the Caribbean and into Texas (Figure 5-1: *July 2022 Monthly Average Dust Surface Mass Concentration (MERRA-2)*).[22]

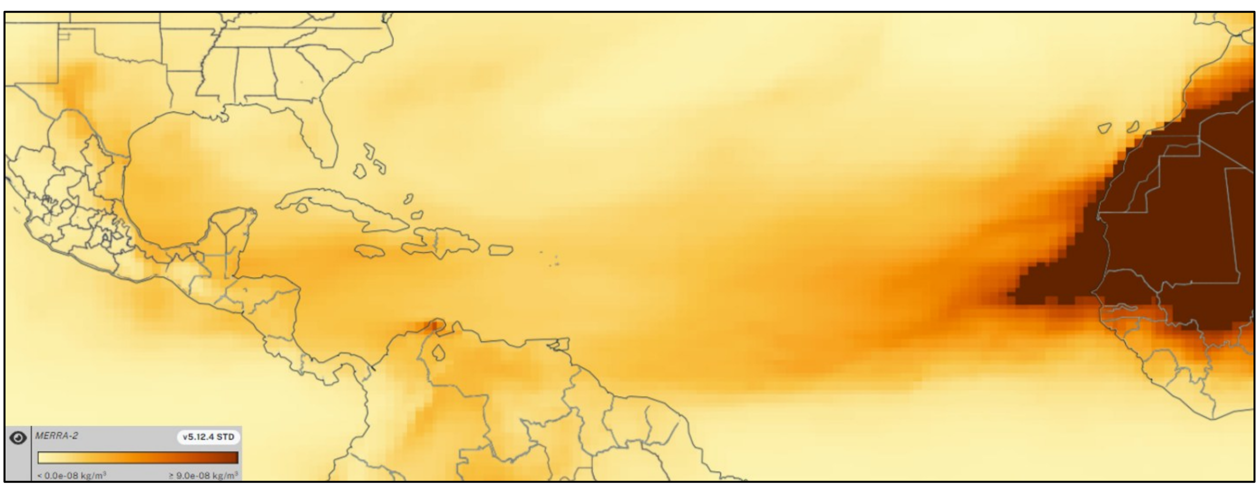

Figure 5-1: July 2022 Monthly Average Dust Surface Mass Concentration (MERRA-2)

[22] https://worldview.earthdata.nasa.gov/, accessed July 8, 2025

5.3 PRESCRIBED FIRES – HUMAN ACTIVITY UNLIKELY TO RECUR AT A PARTICULAR LOCATION

Prescribed fires are recognized as being caused by human activity and therefore must satisfy the 'human activity unlikely to recur at a particular location' portion of the rule. Recurrence for prescribed fires is defined by either "the natural fire return interval or the prescribed fire frequency needed to establish, restore and/or maintain a sustainable and resilient wildland ecosystem contained in a multi-year land or resource management plan with a stated objective to establish, restore and/or maintain a sustainable and resilient wildland ecosystem and/or to preserve endangered or threatened species through a program of prescribed fire." Thus, the recurrence frequency for prescribed fire is specific to the ecosystem and resource needs of the affected area.

The Texas A&M Forest Service coordinates prescribed fires and establishes smoke management plans for the state, as described in Section 4.4. Smoke from prescribed fires in other states may impact Texas monitors as well. The prescribed fires impacting monitors in Texas occurred in the Mississippi. Any prescribed fires occurring outside the State of Texas were not reasonably controllable or preventable by the State of Texas and are essentially treated as wildfires in this demonstration. The State of Mississippi maintains robust programs aimed at responding to wildfires and preventing future ones. The Mississippi Forestry Commission maintains information for prescribed burning on its Prescribed Burning webpage.[23]

Based on the documentation provided in Section 3 of this submittal, the prescribed fire events satisfied the 'human activity unlikely to recur at a particular location' criterion by describing the transitory nature of the fire smoke and the high $PM_{2.5}$ concentration on event days.

5.4 FIRES IN MEXICO/CENTRAL AMERICA - HUMAN ACTIVITY UNLIKELY TO RECUR AT A PARTICULAR LOCATION

A recent report titled "*Fires in Mexico as Exceptional Events: Documentation and Implications*" provided evidence that the vast majority of the fires in Mexico are not caused by agricultural burning, and that they do not reoccur at the same location.[24] The evidence includes statistics on the source of fires from the Mexican government and other sources.

A majority of the observed fires are forest fires or burns performed to clear land for development, and these are also not expected to recur at a particular location. Once the forest is burned at a specific location, the biomass is consumed, and the land is not prime for additional fires in the following years. The Global Forest Watch website shows that areas with highest rates of tree loss due to forest fires occur along the east coast of Mexico. Mexican fires show seasonality that follows known climatology with a dry season, typically in the period of January to May, that affects Mexico and Central America. This dry season favors conditions for starting of wildfires.

TCEQ independently verified the data in the report and agrees that most of the fires and smoke from fire in Mexico during the dry season should be considered non-recuring and thus should be considered exceptional events as it satisfies that is an event caused by human activity that is unlikely to recur at a particular location or a natural event.

TCEQ downloaded data on the number of reported fires in 2022 and possible causes of these fires from the Gobierno de Mexico's "*Concentrado Nacional de Incendios Forestales*"

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[23] https://www.mfc.ms.gov/burning-info/prescribed-burning/prescribed-fire-process/
[24] https://www.tceq.texas.gov/downloads/air-quality/sip/pm/ramboll_mexicanfires.pdf

(Government of Mexico's National Concentration of Forest Fires) webpage.[25] In 2022, a total of 6,719 instances of fires were reported with 15 unique possible causes: Camp Fires, Unknown, Intentional, Smokers, Transportation, Agricultural activities, Celebrations and Rituals, Hunters, Cattle Activities, Burning Trash, Natural, Other productive activities, Forest Waste, Road Clearing, and Illegal Activities. Of the 6,719 fires, 2,198 (33%) fires occurred in protected natural areas and are unlikely to recur. Figure 5-2: *Map of Forest Fires in Mexico in 2022* is a map of all the instances of forest fires reported in 2022. Figure 5-3: *Fires in Mexico in 2022 classified as unlikely or likely to recur based on possible causes* shows that 45% of fires that occurred in 2022 are unlikely to recur based on the possible causes provided and covered a surface area of 286,854.66 hectares where fires are unlikely to recur.[26] It should be noted that the data available on the website is only for forest fires and is therefore only a subset of fires that happened in 2022.

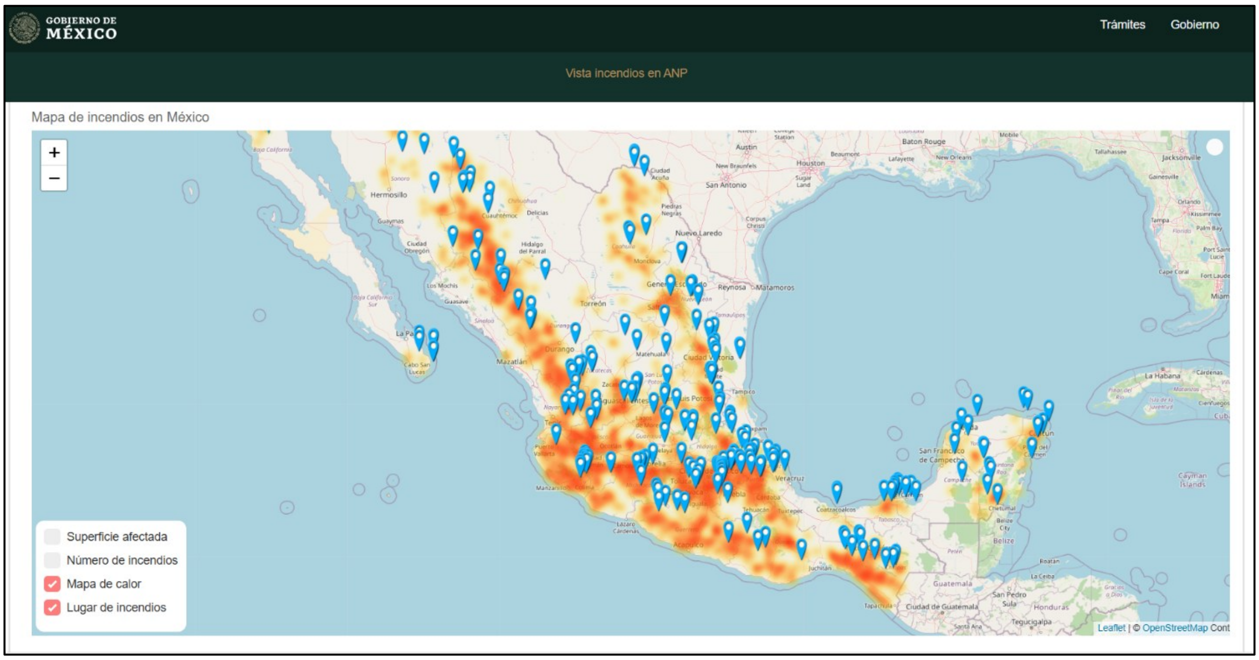

Figure 5-2: Map of Forest Fires in Mexico in 2022

[25] https://monitor_incendios.cnf.gob.mx/incendios_tarjeta_semanal, accessed on January 27, 2025.
[26] TCEQ classified forest fires that had possible causes of Camp Fires, Intentional, Smokers, Hunters, Natural, Forest Waste, and Illegal Activities as unlikely to recur.

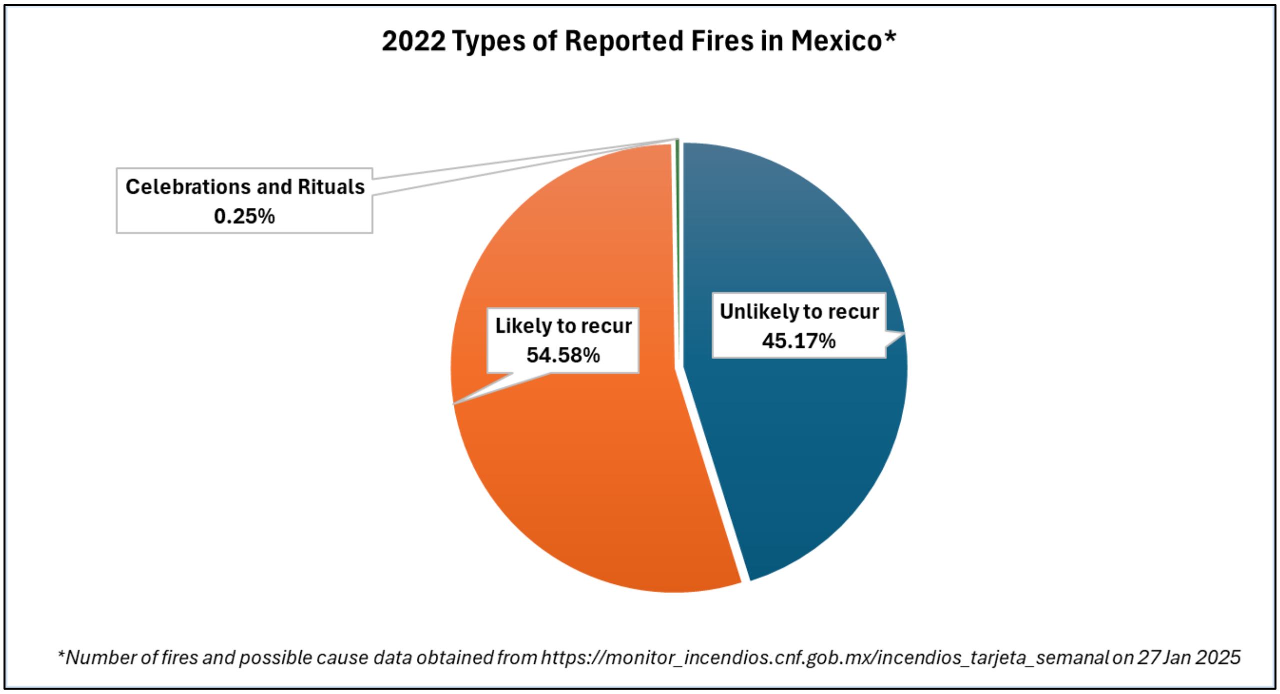

Figure 5-3: Fires in Mexico in 2022 Classified as Unlikely or Likely to Recur Based on Possible Causes

SECTION 6: PUBLIC NOTIFICATION AND MITIGATION ACTIONS

6.1 OVERVIEW

This section satisfies the requirements in 40 CFR §51.930(a): "A state requesting to exclude air quality data due to exceptional events must take appropriate and reasonable actions to protect public health from exceedances or violations of the NAAQS. These are commonly referred to as mitigation actions."

Each of the specific requirements are addressed individually below.

6.2 PROMPT PUBLIC NOTIFICATION

The first mitigation requirement is to "provide for prompt public notification whenever air quality concentrations exceed or are expected to exceed an applicable ambient air quality standard." TCEQ provided (and continues to provide) ozone, $PM_{2.5}$, and particulate matter less than or equal to 10 microns in diameter (PM_{10}) AQI forecasts for the current day and the next three days for 14 areas in Texas. These forecasts are available to the public on the Today's Texas Air Quality Forecast webpage of the TCEQ website and on EPA's AirNow website.[27,28]

TCEQ provides near real-time hourly $PM_{2.5}$ measurements from monitors across the state which the public may access on the Latest Hourly $PM_{2.5}$ Levels webpage of the TCEQ website.[29] TCEQ also publishes an AQI Report for many Texas metropolitan areas on the AQI and Data Reports webpage of the TCEQ website, which displays current and historical daily AQI measurements.[30]

Finally, TCEQ publishes daily updates to its air quality forecast to interested parties through e-mail and social media platforms. Any person wishing to receive these updates may register on the Air Quality Forecast and Ozone Action Day Alerts webpage on the TCEQ website.[31] These measures provide daily and near real-time notification to the public, including the media, of current, expected, and changing air quality conditions.

6.3 PUBLIC EDUCATION

The second mitigation requirement is to "provide for public education concerning actions that individuals may take to reduce exposures to unhealthy levels of air quality during and following an exceptional event." Through its website, TCEQ provides the public with technical, health, personal activity, planning, and legal information and resources concerning particulate matter (PM) pollution. Besides its website, TCEQ publishes daily updates to its air quality forecast to interested parties through e-mail and social media platforms to provide daily and near real-time notification to the public of current, expected, and changing air quality conditions.

TCEQ maintains a particulate matter webpage, which provides important information regarding the health effects of particulate matter, steps that individuals can take to limit particulate matter emissions, and actions they may wish to take to reduce their exposure to higher levels of particulate matter.[32] The webpage also addresses the latest air quality planning for the particulate matter NAAQS.

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[27] http://www.tceq.texas.gov/airquality/monops/forecast_today.html
[28] http://airnow.gov
[29] https://www.tceq.texas.gov/cgi-bin/compliance/monops/select_curlev.pl?user_param=88101
[30] https://www.tceq.texas.gov/airquality/monops/data-reports
[31] http://www.tceq.texas.gov/airquality/monops/ozone_email.html
[32] https://www.tceq.texas.gov/airquality/sip/criteria-pollutants/sip-pm

TCEQ's main Air webpage provides air quality information on topics such as advisory groups, emissions inventories, air quality modeling and data analysis, scientific field studies, state implementation plan (SIP) revisions, air permits, rules, air monitoring data, and how to file complaints.[33]

TCEQ's website provides a hyperlink to the Texas AirNow website operated by EPA. This website links the public to additional information regarding health effects of PM, strategies for reducing one's exposure to PM, and actions that individuals can take to reduce pollution levels.[34]

The Texas Department of Transportation (TxDOT) sponsors the public education and awareness through the Drive Clean Across Texas campaign.[35] The campaign raises awareness about the impact of vehicle emissions on air quality and motivates drivers to take steps to reduce air pollution.

TCEQ sponsors the Take Care of Texas program, which addresses air quality and provides the public with proactive steps to reduce air pollution particularly on days when air quality forecasts are issued predicting greater potential for high PM concentrations.[36]

6.4 IMPLEMENTATION OF MEASURES TO PROTECT PUBLIC HEALTH

The third requirement is to "provide for the implementation of appropriate measures to protect public health from exceedances or violations of ambient air quality standards caused by exceptional events."

Particulate matter regulations are in place in Title 30 Texas Administrative Code Chapter 111 that are applicable to particulate matter control statewide. These regulations are previously described in Section 4: *Not Reasonably Controllable or Preventable*.

6.5 MITIGATION PLAN REQUIREMENTS

Section 319(b) of the federal Clean Air Act (FCAA) governs the identification of air quality monitoring data as exceptional events and how that data may be excluded from consideration for air quality regulatory purposes. EPA has adopted rules in 40 Code of Federal Regulation (CFR) §§50.14 and 51.930 to implement FCAA, §319, requiring states to adopt and implement mitigation plans in areas with historically documented or known seasonal events.

For $PM_{2.5}$, TCEQ has developed mitigation plans for exceptional events in Harris County and El Paso County that can be found on the TCEQ website.[37]

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[33] http://www.tceq.texas.gov/agency/air_main.html
[34] https://www.airnow.gov
[35] http://www.drivecleanacrosstexas.org
[36] http://takecareoftexas.org/air-quality
[37] https://www.tceq.texas.gov/downloads/air-quality/modeling/exceptional/texas-ee-mitigation-plan-final.pdf

SECTION 7: PUBLIC COMMENT PERIOD

7.1 OVERVIEW

This section satisfies the Exceptional Events Rule Requirement at 40 CFR §50.14(c)(3)(iv)(A), (B), (C): "document that the air agency followed the public comment process and that the comment period was open for a minimum of 30 days, which could be concurrent with the beginning of EPA's initial review period of the associated demonstration provided the air agency can meet all requirements in this paragraph; submit the public comments received along with its demonstration to the Administrator; and address in the submission to the Administrator those comments disputing or contradicting factual evidence provided in the demonstration."

7.2 PUBLIC COMMENT PROCESS

The public comment period for this demonstration is from August 5, 2025, through September 5, 2025. During this comment period, the demonstration is available on TCEQ's website at https://www.tceq.texas.gov/airquality/monops/pm_flags.html. Written comments will be accepted via mail or e-mail. TCEQ will include all comments received or postmarked by 5:00 p.m. CDT on September 5, 2025, with the final demonstration submitted to EPA. TCEQ will also address those comments disputing or contradicting factual evidence provided in the final demonstration.

SECTION 8: CONCLUSION

This exceptional events demonstration shows that the Von Ormy Highway 16, Dona Park, Edinburg East Freddy Gonzalez Drive, Haws Athletic Center, and World Trade Bridge monitors were impacted by smoke and dust from a prescribed fire, fires in Mexico, and African dust. These exceptional events caused the elevated $PM_{2.5}$ concentrations on the dates listed in Table 1-1, as explained in Section 3: *Clear Causal Relationship*.

This demonstration shows that the exceptional events that influenced $PM_{2.5}$ concentrations are consistent with EPA's definition of an exceptional event under the 2016 Exceptional Events Rule. TCEQ requests that EPA concur with the exclusion from regulatory decisions the $PM_{2.5}$ concentration(s) in Table 1-1. The days and sites for which TCEQ is requesting concurrence were impacted by events consistent with EPA's definition of "unusual or naturally occurring events" that can affect air quality but are not reasonably controllable using techniques that tribal, state, or local air agencies may implement in order to attain and maintain the 2024 primary annual $PM_{2.5}$ NAAQS.