Mississippi Department of Environmental Quality

MS AERMOD Ready Met Files

Support Documentation

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Supporting Documentation:

The Mississippi Department of Environmental Quality (MDEQ) has posted preprocessed meteorological files for use with the US EPA regulatory model AERMOD on the MDEQ website. The posting of these files in no way dictates their use nor supplants the use of professional judgment in determining whether the files are appropriate for any particular application. This report documents the development of the preprocessed files.

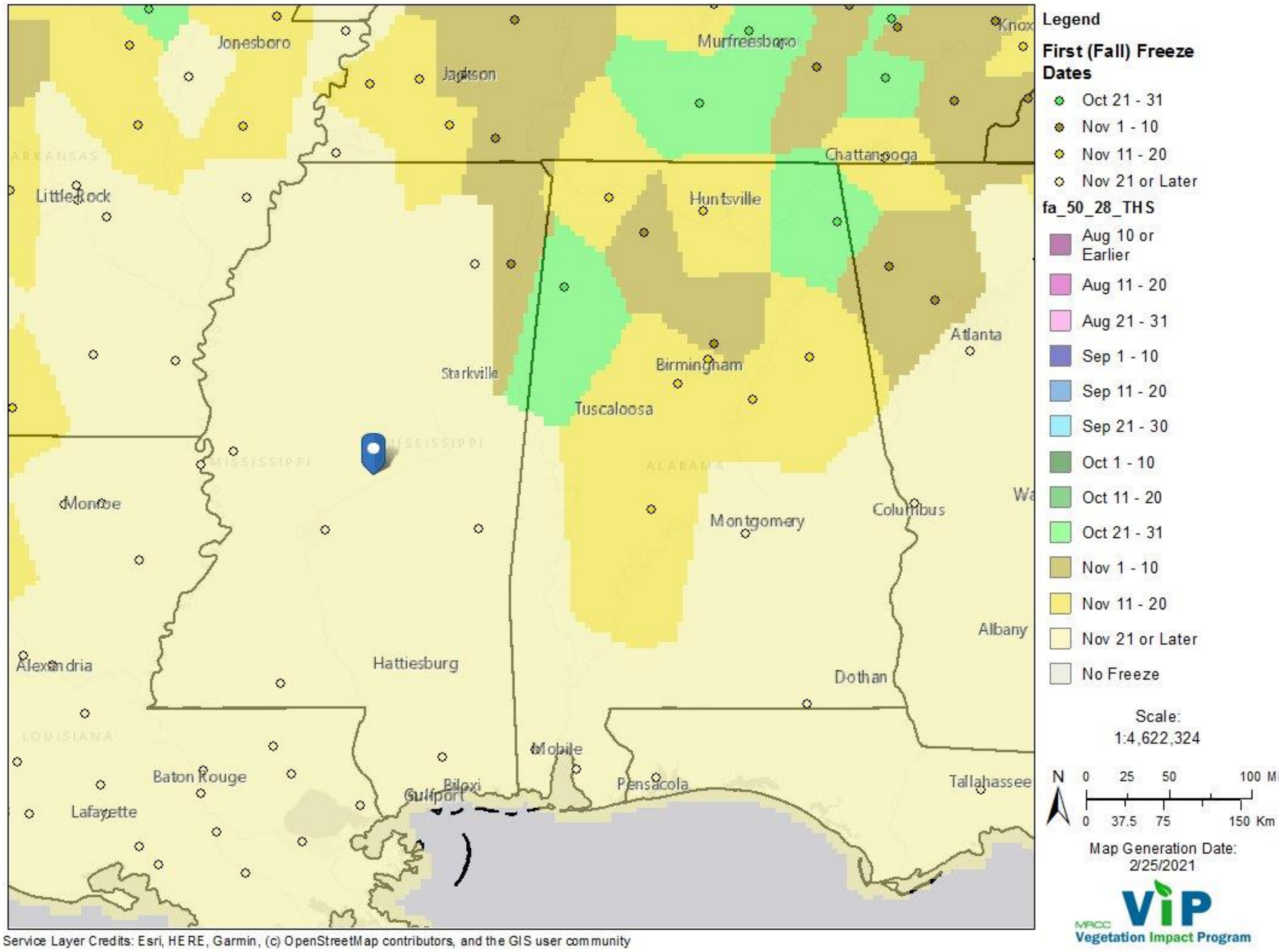
Integrated surface data were obtained from NCDC in DS3505 format (ftp://ftp.ncdc.noaa.gov/pub/data/noaa/). Radiosonde observations were obtained from the NOAA/ESRL Radiosonde Database (https://ruc.noaa.gov/raobs/). When available, one and five minute ASOS wind data were included in the processing of the met data through the use of AERMINUTE – Version 15272. One and five-minute data was obtained through the National Climatic Data Center (NCDC) (ftp://ftp.ncdc.noaa.gov/pub/data/asos-onemin/ & ftp://ftp.ncdc.noaa.gov/pub/data/asos-fivemin/).

When applying the AERMET meteorological processor to prepare the meteorological data for the AERMOD model, the user must determine appropriate values for three surface characteristics: surface roughness length {zo}, albedo {r}, and Bowen ratio {Bo}. AERSURFACE (v20060), a tool that processes land cover data to determine these surface characteristics for use in AERMET, was used in the processing of the posted met files.

Aersurface Monthly Seasonal Designations

Winter with continuous snow on the ground does not occur in Mississippi; therefore, this seasonal designation was not used in the AERSURFACE input files. The AERMET user's guide defines spring as the 1-2 months after the last killing frost. Freeze/Frost occurrence data was used to determine the beginning of spring, using the 50 percent probability date for 28^{o} F. Likewise, the fall 50 percent probability date for 28^{o} F was used to determine the late autumn after frost and harvest seasonal designation. These dates are were determined from Frost/Freeze Data 1981-2010 (CLIM20-01: Freeze/Frost Occurrence Data), NCDC and indicate the date on which there is a 50% probability that a freeze date may be later in the spring or earlier in the fall. Dates for the stations within a climate division were averaged.

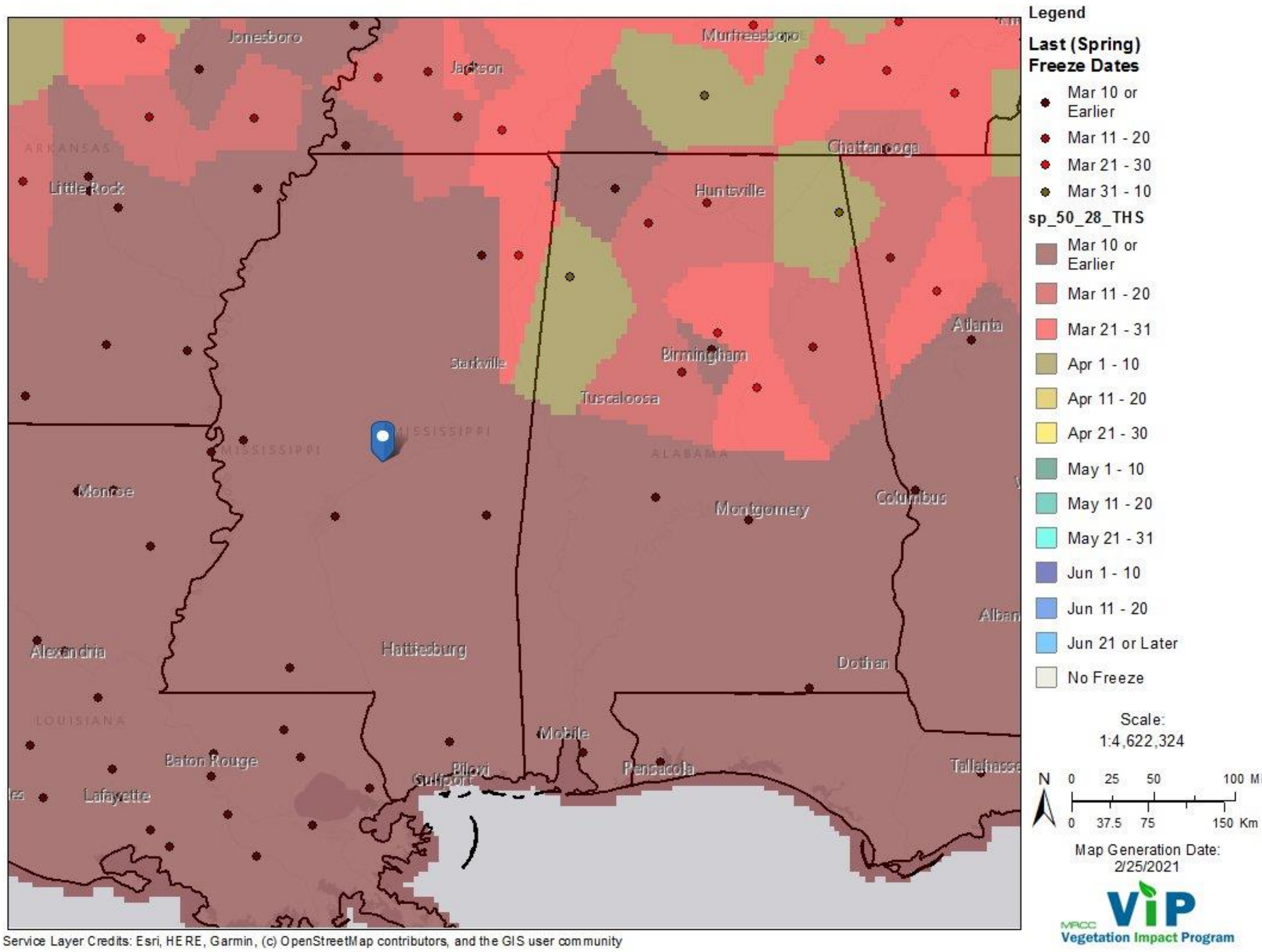
Climatology: Median (50th percentile) First (Fall) 28°F Freeze, based on 1981-2010 data



Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

[Frost/Freeze Guidance]

Climatology: Median (50th percentile) Last (Spring) 28°F Freeze, based on 1981-2010 data



Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

[Frost/Freeze Guidance]

Months that fall between the fall and spring dates (rounded to beginning or end of month, whichever was closer) were considered to be, “Winter with no snow/WINTERNS.”

Midsummer with lush vegetation was assumed to be months with a monthly normal temperature above 70^{o} F. Monthly normal temperatures were taken from “Climatography of the US No. 85, Divisional Normals and Standard Deviations of Temperature, Precipitation, and Heating and Cooling Degree Days 1981-2010”.

Spring months were considered those between the determined Late Autumn months and the midsummer months. Autumn months were considered those between the determined midsummer months and the late autumn months. Seasonal designations used are listed in Table 2.

Surface Moisture

Surface Moisture was determined using divisional precipitation ranks on the NOAA website at (Divisional Precipitation Ranks). In order to place each month and season into historical context, NCEI assigns ranks for each geographic area (division, state, region, etc.) based on how the temperature or precipitation value compares with other values throughout the entire record when sorted from lowest to highest value. The "Below Normal", "Near Normal", and "Above Normal" shadings on the color maps represent the bottom, middle, and upper tercile (or three equal portions) of the distribution, respectively. The lowest and uppermost decile (or 10%) of the distribution are marked as "Much Below Normal" and "Much Above Normal", respectively. Surface moisture was determined to be dry for ranks of “Below Normal”, average for ranks of “Near Normal” and wet for ranks “Above Normal.” Table 2 and Table 3 summarize the surface moisture designations for the years 2015 through 2020.

The Memphis, Mobile and Tallulah/Vicksburg stations are not located within Mississippi. The surface moisture for these stations was taken as that in the adjacent climate division in Mississippi.

AERSURFACE 20060 Inputs

Locations of the monitoring stations included in the Aersurface files were checked by reviewing aerial photography in Google Earth and Bing Bird’s Eye View. No attempts were made to correct Aersurface runs for changes in land use after the 2016 determination.

In determining the correct runway headings, aeronautical information was used.

Runway 14/32		
Dimensions:	9002 x 150 feet / 2744 x 46 meters	
Surface:	Asphalt-Concrete / Grooved in Good Condition	
Weight Limits:	194/F/A/W/T, S-81, D-300, ST-555, DT-870 2S-175.	
Edge Lighting:	High Intensity	
	Runway 14	Runway 32
Coordinates:	N30°24.90' / W89°4.94'	N30°23.85' / W89°3.73'
Elevation:	18.9	22.0
Traffic Pattern:	Left	Left
Runway Heading:	135° True	315° True
Markings:	Precision Instrument in good condition.	Precision Instrument in good condition.
Glide Slope Indicator	P4R (3.00° Glide Path Angle)	P4L (3.00° Glide Path Angle)
RVR Equipment	Touchdown	Touchdown
Approach Lights:	MALSR 1,400 Foot Medium-intensity Approach Lighting System with runway alighment indicator lights.	MALSR 1,400 Foot Medium-intensity Approach Lighting System with runway alighment indicator lights.
Obstacles:	50 ft Trees 1900 ft from runway, 300 ft right of center	70 ft Tower 2100 ft from runway

Gulfport-Biloxi International Airport Aeronautial Information

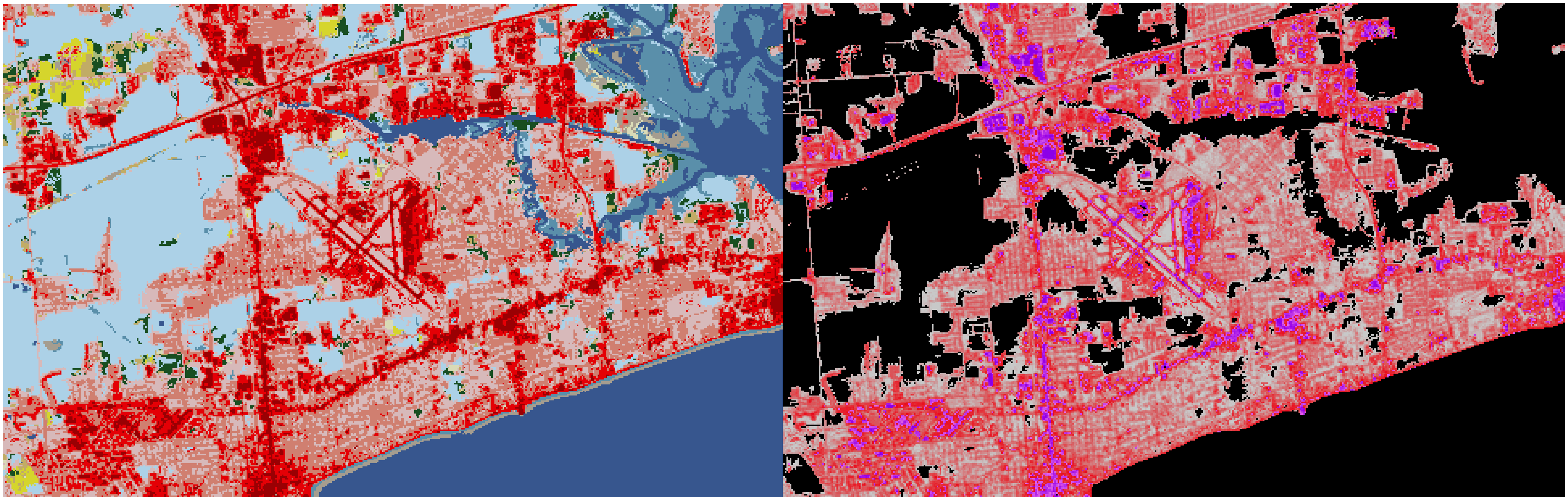
The AERSURFACE inputs were selected to be consistent with the "Users Guide for AERSURACE Tool" (EPA-454/B-20-008 February 2020). Various sectors Airport (AP) vs Nonairport (NONAP) were used for the determination of land cover/surface roughness and the surface parameters were selected as described above. The following is an example use case at the Gulfport airport. The standard AERSURFACE input file used also is defined below:

1KM radius.

Airport sector 315 degrees to 135 degrees.

Non-Airport sector 180 degrees to 315 degrees.

Airport sector 135 degrees to 180 degrees. Total airport sector 315-180 degrees.



KGPT 2016 land cover, impervious, and tree canopy data.

Each airport location included 2016 land cover, impervious, and tree canopy data obtained from the Multi-Resolution Land Characteristics Consortium (MRLC).

```
**Control File

CO STARTING
   TITLEONE  AERSURFACE Control File
   TITLETWO  GPT- Met Tower, 2016 NLCD

** Using default options for OPTIONS keyword and parameters
   OPTIONS   PRIMARY  ZORAD

   DEBUGOPT  GRID  TIFF

   CENTERLL  30.412000   -89.081000   NAD83

   DATAFILE  NLCD2016  "KGPT2016LC.tiff"
   DATAFILE  CNPY2016  "KGPT2016TC.tiff"
   DATAFILE  MPRV2016  "KGPT2016IMP.tiff"

** Use default 1 km radius
   ZORADIUS  1.0

   CLIMATE   AVERAGE  NOSNOW   NONARID

** Get monthly values for two sectors
** Vary AP/Non-AP sectors
   FREQ_SECT   MONTHLY    2  VARYAP

**        index  start    end
   SECTOR   1   315.00   180.00  AP
   SECTOR   2   180.00   315.00  NONAP

** Winter with no snow
   SEASON   WINTERNS    1
   SEASON   SPRING        2 3 4
   SEASON   SUMMER      5 6 7 8 9
   SEASON   AUTUMN      10 11 12

   RUNORNOT  RUN
CO FINISHED

OU STARTING
   SFCCHAR    "gpt_2016_lc_can_imp_zorad_sfc.txt"
   NLCDGRID   "gpt_2016_lc_can_imp_zorad_lc_grid.txt"
   CNPYGRID   "gpt_2016_lc_can_imp_zorad_can_grid.txt"
   MPRVGRID   "gpt_2016_lc_can_imp_zorad_imp_grid.txt"
OU FINISHED
```

Aersurface ran with each of the surface moisture condition, Wet, Dry and Avg. The Aersurface output file for each year was merged from the three runs based on the surface moisture conditions listed in Table 3. The merged files were used in Stage 3 of AERMET.

Beginning with the draft version 19039_DRFT and carried forward in version 20060, individual sectors can now be identified as either airport or non-airport sectors to more accurately represent the makeup of those sectors (e.g., a "Developed" category that is predominately made up of airport runways or paved lots vs buildings or structures). A sector can be identified as airport or non-airport independently of whether the meteorological tower is physically located at an airport and should be judged by the predominant land use within a kilometer radius of the meteorological tower, giving more weight to land use nearest the tower. Source: 2.3.2 Airports vs Non-Airport Locations - "Users Guide for AERSURACE Tool" (EPA-454/B-20-008 February 2020

AERMET 19191 Inputs

Integrated surface data in DS3505 format was obtained from NCDC for each station. Upper air data was downloaded in FSL format from the NOAA/ESRL Radiosonde Database. Observations obtained from Slidell, LA were used for the Mobile station and stations located in the Coastal Division. Observations obtained from Jackson, MS were used for all other divisions with the exception of Memphis where Little Rock, Arkansas (LZK) was used. Running individual surface files as downloaded from NCDC results in missing data for the last 6 hours of each year. To avoid this missing data in each year, the surface files were merged to include all of the years being evaluated. The upper air data was downloaded as one file encompassing the entire study period. Individual years were run from Jan 1st to Jan 1st; therefore, each output file contains one year plus the first day of the next year. These extra days can be removed from the files prior to running AERMOD or AERMOD can be set up to only read dates from the desired year.

When available, ASOS 1-minute and 5-minute data was incorporated using AERMINUTE version 15272. The threshold wind speed was set at 0.5 m/s in Stage 3 when ASOS 1- minute data was used. The SUBNWS parameter was also used with ASOS 1-minute data to replace wind data from the standard NWS format. The SUB_CC and SUB_TT parameters were indicated in the stage 3 input files. The AERMET user's guide indicates that these are default parameters unless the application involves both NWS and ONSITE surface data. The data was processed with and without the ADJ_U* option in Stage 3.

Example input files for the Jackson, MS station are presented below:

Stage 1

```
JOB
  REPORT      KJAN.RP1
  MESSAGES    KJAN.MG1

UPPERAIR

  DATA        "C:\Users\rcuevas\Documents\Modeling\MetData\AERMINUTE\KJAN\KJAN16-20UA.TXT" FSL
  EXTRACT     KJAN.UAX
  AUDIT       UAPR  UAHT  UATT  UATD  UAWD  UAWS
  QAOUT       KJAN.UQA

  XDATES      2016/01/01 TO 2020/01/01

** Station: JACKSON, MS
  LOCATION    3940 32.320N    90.070W 6

SURFACE

** Location of the Surface Data File
** C:\Users\rcuevas\Documents\Modeling\MetData\AERMINUTE\KJAN\KJAN20.ish

  DATA        KJAN20.ish ISHD ASOS
  EXTRACT     KJAN.SAX
  AUDIT       SLVP PRES CLHT TSKC PWTH ASKY HZVS RHUM
  QAOUT       KJAN.SQA

  XDATES      2016/01/01 TO 2020/01/01

** Station:   Jackson-Medgar Wiley Evers International Airport
  LOCATION    3940 32.317N    90.083W 6 91.00
```

Stage 2

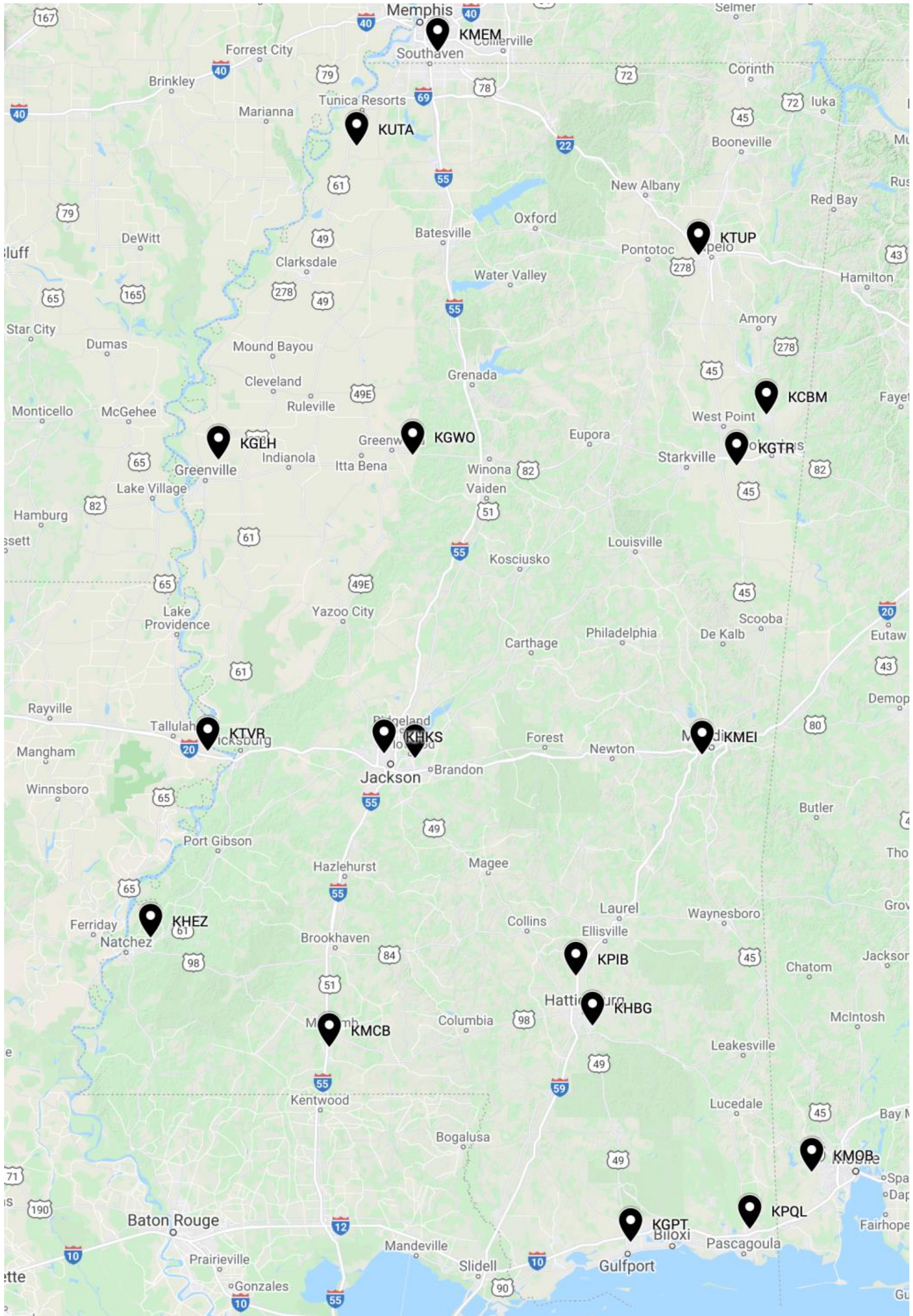
```
JOB
  REPORT     KJAN.RP2
  MESSAGES   KJAN.MG2

UPPERAIR

  QAOUT      KJAN.UQA

SURFACE

  QAOUT      KJAN.SQA

** Location of the Hourly Wind Data File
** C:\Users\rcuevas\Documents\Modeling\MetData\AERMINUTE\KJAN\AERMINUTE_hour.dat
  ASOS1MIN   C:\Users\rcuevas\Documents\Modeling\MetData\AERMINUTE\KJAN\AERMINUTE_hour.dat

MERGE

  OUTPUT     KJAN.MRG

  XDATES     2016/01/01 TO 2021/01/01
```

Stage 3

```
JOB
  REPORT     KJAN.RP3
  MESSAGES   KJAN.MG3

METPREP

  DATA       KJAN.MRG
  MODEL      AERMOD

  OUTPUT     KJAN2020.sfc
  PROFILE    KJAN2020.pfl

  XDATES     2020/01/01 TO 2021/01/01

  METHOD     REFLEVEL  SUBNWS
  METHOD     WIND_DIR  RANDOM
  METHOD     CCVR SUB_CC
  METHOD     TEMP SUB_TT
  THRESH_1MIN 0.50
  NWS_HGT    WIND 10.00


** Primary Surface Characteristics
  AERSURF   KJAN_2017.AS.txt
```

Table 1 – Station List

City	Station Name	WBAN	INT CALL	Latitude	Longitude	Arerminute Available	Anemometer Height (m)
GREENVILLE	MID DELTA REGIONAL AIRPORT	13939	KGLH	33.477228	-90.984658	Yes	10
GREENWOOD	GREENWOOD-LEFLORE AIRPORT	13978	KGWO	33.496194	-90.089419	Yes	10
GULFPORT	GULFPORT-BILOXI INTERNATIONAL AIRPORT	93874	KGPT	30.412000	-89.081000	Yes	10
HATTIESBURG	BOBBY L CHAIN MUNICIPAL AIRPORT	13833	KHBG	31.269483	-89.256108	Yes	10
JACKSON	HAWKINS FIELD AIRPORT	13927	KHKS	32.337572	-90.221397	Yes	10
JACKSON	JACKSON INTERNATIONAL AIRPORT	3940	KJAN	32.319836	-90.077756	Yes	10
McCOMB	McCOMB/PIKE COUNTY/JOHN E LEWIS FIELD AIRPORT	93919	KMCB	31.182278	-90.472025	Yes	10
MERIDIAN	KEY FIELD AIRPORT	13865	KMEI	32.334861	-88.750728	Yes	10
PASCAGOULA	TRENT LOTT INTERNATIONAL AIRPORT	53858	KPQL	30.463058	-88.531556	Yes	7.92
TALLULAH/VICKSBURG	VICKSBURG/TALLULAH REGIONAL AIRPORT	3996	KTVR	32.348000	-91.030000	Yes	10
TUPELO	TUPELO REGIONAL AIRPORT	93862	KTUP	34.262131	-88.771161	Yes	10
COLUMBUS	GOLDEN TRIANGLE RGNL	53893	KGTR	33.456278	-88.592656	No	10
COLUMBUS	COLUMBUS AFB	13825	KCBM	33.652258	-88.457136	No	10
NATCHEZ	NATCHEZ/HARDY(AWOS)	3961	KHEZ	31.615919	-91.297267	No	10
HATTIESBURG	HATTIESBURG LAUREL	53808	KPIB	31.465756	-89.333464	No	10
METCALFE	TUNICA MUNI	23903	KUTA	34.676575	-90.343956	No	10
MEMPHIS	MEMPHIS INTL ARPT	13893	KMEM	35.036472	-89.971861	Yes	10
MOBILE	MOBILE/BATES FIELD	13894	KMOB	30.688222	-88.245969	Yes	10


KMEM
KUTA
KTUP
KCBM
KGTR
KGLH
KGWO
KTVR
KHKS
KMEI
KHEZ
KPIB
KHBG
KMCB
KMOB
KPQL
KGPT

Divisional Sections for Mississippi

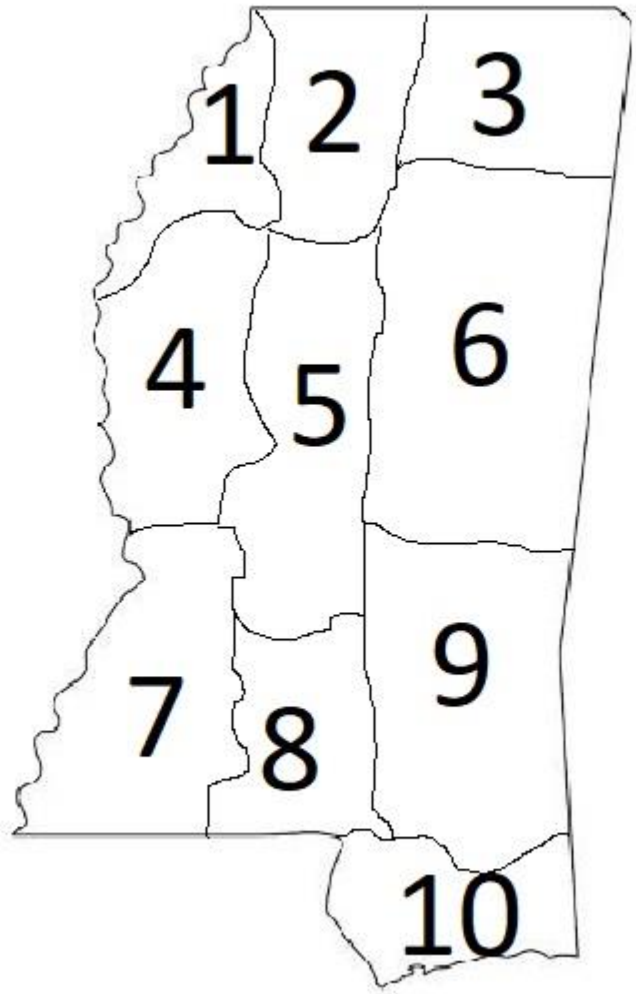


Table 2 - AERSURFACE Monthly Designations

Station	Months Normal above 70°F	Spring 50% Probability @ 28° F.	Fall 50% Probability @ 28° F	Late Autumn Months	Transitional Spring Months	Midsummer Months	Autumn Months
MS-01 Upper Delta	May-Sep	3-Mar	21-Nov	12, 1, 2	3,4	5,6,7,8,9	10,11
MS-02 North Central	June-Sep	20-Mar	9-Nov	11,12, 1, 2,3	4,5	6,7,8,9	10
MS-03 Northeast	June-Sep	19-Mar	12-Nov	11,12, 1, 2,3	4,5	6,7,8,9	10
MS-04 Lower Delta	May-Sep	23-Feb	26-Nov	12, 1, 2	3,4	5,6,7,8,9	10,11
MS-05 Central	May-Sep	11-Mar	15-Nov	12, 1,2	3,4	5,6,7,8,9	10,11
MS-06 East Central	May-Sep	10-Mar	15-Nov	12, 1,2	3,4	5,6,7,8,9	10,11
MS-07 Southwest	May-Sep	25-Feb	26-Nov	12, 1, 2	3,4	5,6,7,8,9	10,11
MS-08 South Central	May-Sep	27-Feb	25-Nov	12, 1, 2	3,4	5,6,7,8,9	10, 11
MS-09 Southeast	May-Sep	2-Mar	24-Nov	12, 1, 2,	3,4	5,6,7,8,9	10,11
MS-10 Coastal	May-Sep	12-Feb	16-Dec	1	2,3,4	5,6,7,8,9	10,11,12

Table 3 – Surface Moisture Based on NCEI Divisional Precipitation Ranks 2015-2020

Division	MS 01	MS 02	MS 03	MS 04	MS 05	MS 06	MS 07	MS 08	MS 09	MS 10	MS 01	MS 02	MS 03	MS 04	MS 05	MS 06	MS 07	MS 08	MS 09	MS 10
	2015										**2016**									
Jan	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Avg	Avg	Dry	Dry	Dry	Dry	Avg
Feb	Avg	Avg	Avg	Avg	Avg	Avg	Dry	Dry	Dry	Dry	Wet	Wet	Avg	Avg	Wet	Wet	Avg	Avg	Avg	Avg
Mar	Wet	Avg	Avg	Avg	Avg	Avg	Wet	Avg	Avg	Avg	Wet	Wet	Avg	Wet	Wet	Wet	Wet	Wet	Wet	Wet
Apr	Wet	Wet	Wet	Avg	Avg	Wet	Avg	Avg	Avg	Wet	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Wet	Wet
May	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Avg	Avg	Avg	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Avg
Jun	Dry	Wet	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Dry	Dry	Avg	Wet	Avg	Avg	Avg	Avg	Wet	Wet
Jul	Wet	Avg	Wet	Dry	Dry	Avg	Dry	Avg	Avg	Avg	Wet	Wet	Avg	Wet	Wet	Avg	Wet	Wet	Dry	Dry
Aug	Avg	Wet	Wet	Dry	Dry	Avg	Dry	Dry	Dry	Dry	Wet	Avg	Wet	Wet	Wet	Avg	Wet	Wet	Wet	Wet
Sep	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Avg	Avg	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Avg	Dry	Dry
Oct	Wet	Avg	Avg	Wet	Wet	Avg	Wet	Wet	Wet	Wet	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Nov	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Dry	Dry	Dry
Dec	Wet	Wet	Wet	Avg	Avg	Wet	Avg	Wet	Wet	Wet	Avg	Avg	Avg	Avg	Avg	Dry	Avg	Avg	Avg	Wet
	2017										**2018**									
Jan	Avg	Avg	Avg	Wet	Avg	Avg	Wet	Wet	Wet	Wet	Avg	Avg	Dry	Dry	Dry	Dry	Avg	Avg	Dry	Avg
Feb	Dry	Dry	Dry	Avg	Avg	Dry	Dry	Dry	Dry	Dry	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet
Mar	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Wet	Avg	Avg	Wet	Wet	Dry	Avg	Avg	Dry	Dry
Apr	Avg	Avg	Avg	Wet	Wet	Avg	Wet	Avg	Wet	Avg	Wet	Wet	Wet	Avg	Wet	Wet	Wet	Avg	Wet	Wet
May	Wet	Wet	Avg	Avg	Wet	Avg	Wet	Wet	Wet	Wet	Avg	Avg	Wet	Dry	Avg	Dry	Dry	Avg	Avg	Avg
Jun	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Avg	Avg	Wet	Avg	Dry	Ave	Dry	Avg	Avg	Avg
Jul	Dry	Avg	Dry	Dry	Avg	Dry	Wet	Wet	Avg	Avg	Dry	Avg	Dry	Avg	Avg	Avg	Avg	Avg	Avg	Wet
Aug	Wet	Wet	Avg	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Avg	Avg	Wet	Avg	Avg	Avg	Wet	Wet	Avg
Sep	Wet	Wet	Wet	Avg	Avg	Avg	Dry	Dry	Dry	Dry	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet
Oct	Dry	Dry	Avg	Dry	Dry	Avg	Wet	Avg	Wet	Wet	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Avg
Nov	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet
Dec	Wet	Wet	Wet	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet

Division	MS 01	MS 02	MS 03	MS 04	MS 05	MS 06	MS 07	MS 08	MS 09	MS 10	MS 01	MS 02	MS 03	MS 04	MS 05	MS 06	MS 07	MS 08	MS 09	MS 10
	2019										2020									
Jan	Wet	Wet	Wet	Wet	Wet	Wet	Avg	Avg	Avg	Avg	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet
Feb	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Avg	Avg	Avg	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Ave
Mar	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Wet	Wet	Wet	Wet	Wet	Wet	Ave	Dry	Dry	Dry
Apr	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Ave	Ave
May	Wet	Avg	Avg	Wet	Wet	Wet	Wet	Wet	Wet	Avg	Dry	Dry	Ave	Dry	Dry	Dry	Ave	Ave	Ave	Ave
Jun	Wet	Wet	Wet	Wet	Avg	Wet	Wet	Avg	Avg	Avg	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet
Jul	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Avg	Avg	Avg	Avg	Avg	Avg	Wet	Avg	Wet	Wet	Wet	Wet
Aug	Avg	Wet	Wet	Avg	Wet	Wet	Wet	Wet	Wet	Wet	Avg	Wet	Wet	Avg	Avg	Avg	Wet	Wet	Avg	Avg
Sep	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Wet	Avg	Wet	Wet	Wet	Avg	Wet	Avg	Dry	Dry
Oct	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet
Nov	Avg	Avg	Avg	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Wet	Ave	Ave	Ave
Dec	Avg	Avg	Wet	Avg	Avg	Wet	Avg	Avg	Avg	Dry	Ave	Ave	Ave	Ave	Ave	Ave	Ave	Dry	Dry	Dry

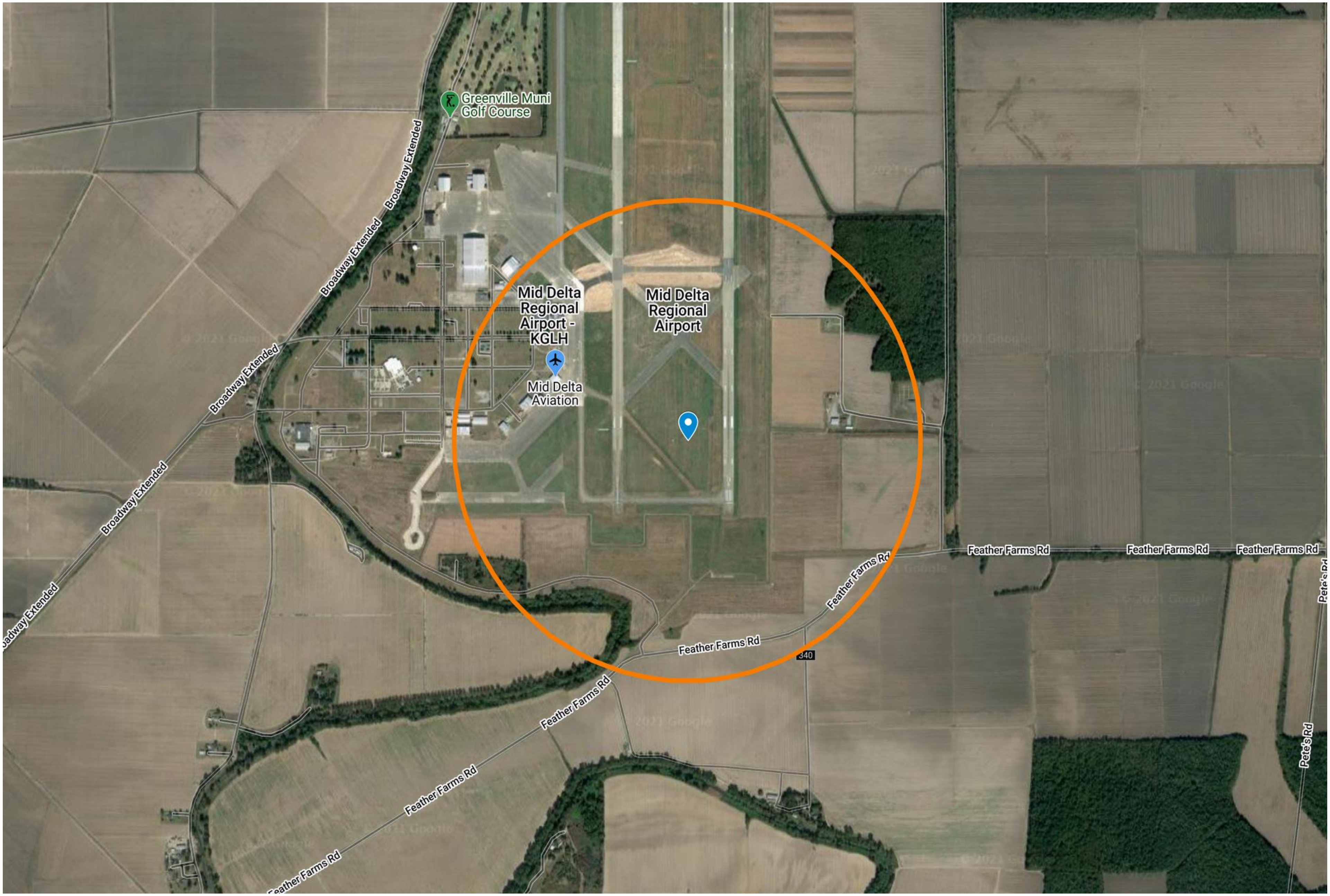
Data Completeness

The processed met files were used in test runs with AERMOD version 19191. The files were run by quarter and the percentage of missing hours noted from the AERMOD output file. Table 5 summarizes the results of the completeness check. Additional years of met data were processed for each site until five years of complete data, by year, were obtained. Completeness must satisfy 90 percent per quarter. Any quarter with completeness less than 90 percent is highlighted in yellow.

	2016				2017				2018				2019				2020			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
KCBM	6.6	10.1	10.5	3.7	20.1	2.4	5.3	2.8	3.1	1.5	4.8	5.4	3.2	9.3	4.1	3.5	1.5	8.8	2.7	0.9
KGLH	0.1	4.1	5.3	2.7	1.3	3.3	0.5	1.0	0.0	0.8	3.6	0.5	7.2	7.8	0.1	0.6	3.4	1.8	1.5	1.0
KGPT	1.8	1.4	1.4	0.1	0.5	3.3	0.0	2.4	0.4	0.2	0.7	1.7	0.5	0.0	0.2	1.1	0.2	0.7	0.0	1.5
KGTR	5.5	4.2	4.5	6.0	7.1	7.0	10.1	9.3	7.0	7.3	6.2	6.0	5.9	8.2	7.0	4.7	4.0	6.5	6.1	5.5
KGWO	2.5	2.0	1.9	0.5	1.4	1.2	0.5	1.6	0.1	0.0	2.0	3.6	0.9	1.1	0.5	0.8	0.3	4.9	0.6	1.1
KHBG	2.8	4.5	6.1	4.5	1.3	0.1	0.5	0.8	1.0	0.5	1.0	2.0	5.7	2.8	7.4	1.4	3.8	0.5	1.0	1.4
KHEZ	1.5	14.4	20.4	0.7	6.5	9.8	30.5	7.4	3.9	6.9	6.4	4.3	3.0	5.5	5.8	3.4	2.9	7.6	9.5	6.6
KHKS	0.2	1.3	1.2	2.0	1.2	0.1	0.5	1.9	0.1	0.1	1.6	1.0	6.7	6.1	6.9	6.7	0.1	0.7	0.7	1.4
KJAN	0.3	0.4	1.1	0.5	1.3	0.0	0.6	0.9	0.2	0.1	0.5	0.9	0.4	1.3	0.1	1.0	0.0	0.2	0.5	1.1
KMCB	0.2	0.6	1.5	0.4	1.3	0.0	0.6	1.3	1.1	0.2	1.1	1.1	0.8	1.1	0.9	0.1	0.1	0.1	0.5	1.4
KMEI	0.2	0.6	1.5	0.5	1.3	0.0	0.5	0.8	0.1	0.1	0.9	1.5	1.2	2.9	0.3	1.0	0.1	0.6	0.5	2.4
KMEM	0.3	0.1	1.4	0.4	1.4	0.1	0.5	0.8	0.1	0.2	1.0	0.5	0.5	1.2	0.4	0.7	0.1	0.6	0.0	1.0
KMOB	1.7	0.7	1.1	0.1	0.6	3.5	0.0	1.2	0.4	0.4	0.2	0.9	2.7	3.6	6.1	4.2	0.1	0.7	0.8	0.9
KPIB	0.1	1.2	1.6	0.5	2.9	5.9	10.6	7.5	6.3	15.4	11.2	7.7	6.5	12.1	14.0	9.8	8.3	12.2	12.8	11.6
KPQL	2.0	0.9	1.5	0.2	0.5	3.3	0.1	1.3	0.4	10.4	0.6	1.5	0.4	0.1	0.3	1.0	0.1	0.9	0.8	2.0
KTUP	0.6	0.9	2.5	1.9	1.2	1.7	0.5	0.8	0.1	5.7	1.2	1.0	1.2	4.0	1.3	0.4	0.1	0.0	1.9	0.8
KTVR	3.3	2.8	3.0	0.5	2.1	0.1	0.5	1.5	0.0	0.0	1.1	0.9	0.4	2.8	0.6	0.5	2.6	1.5	0.6	2.3
KUTA	11.2	0.1	2.4	0.7	1.2	13.4	66.2	79.1	90.6	82.0	68.4	78.9	86.5	84.3	63.9	75.1	58.4	2.1	5.5	3.2

Table 5 - Data Completeness by Quarter

GREENVILLE	MID DELTA REGIONAL AIRPORT	13939	KGLH	33.477228	-90.984658

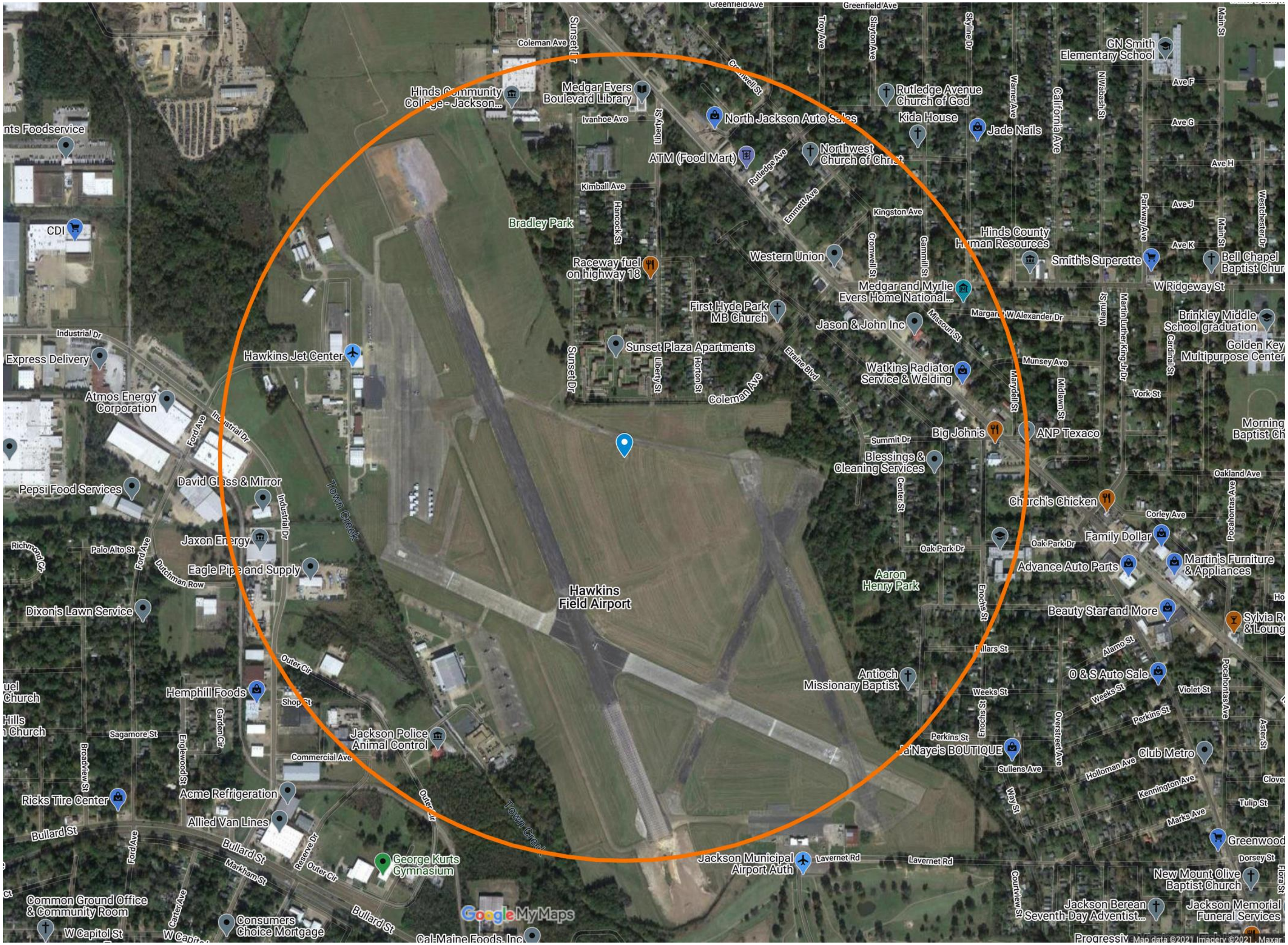


GREENWOOD	GREENWOOD-LEFLORE AIRPORT	13978	KGWO	33.496194	-90.089419

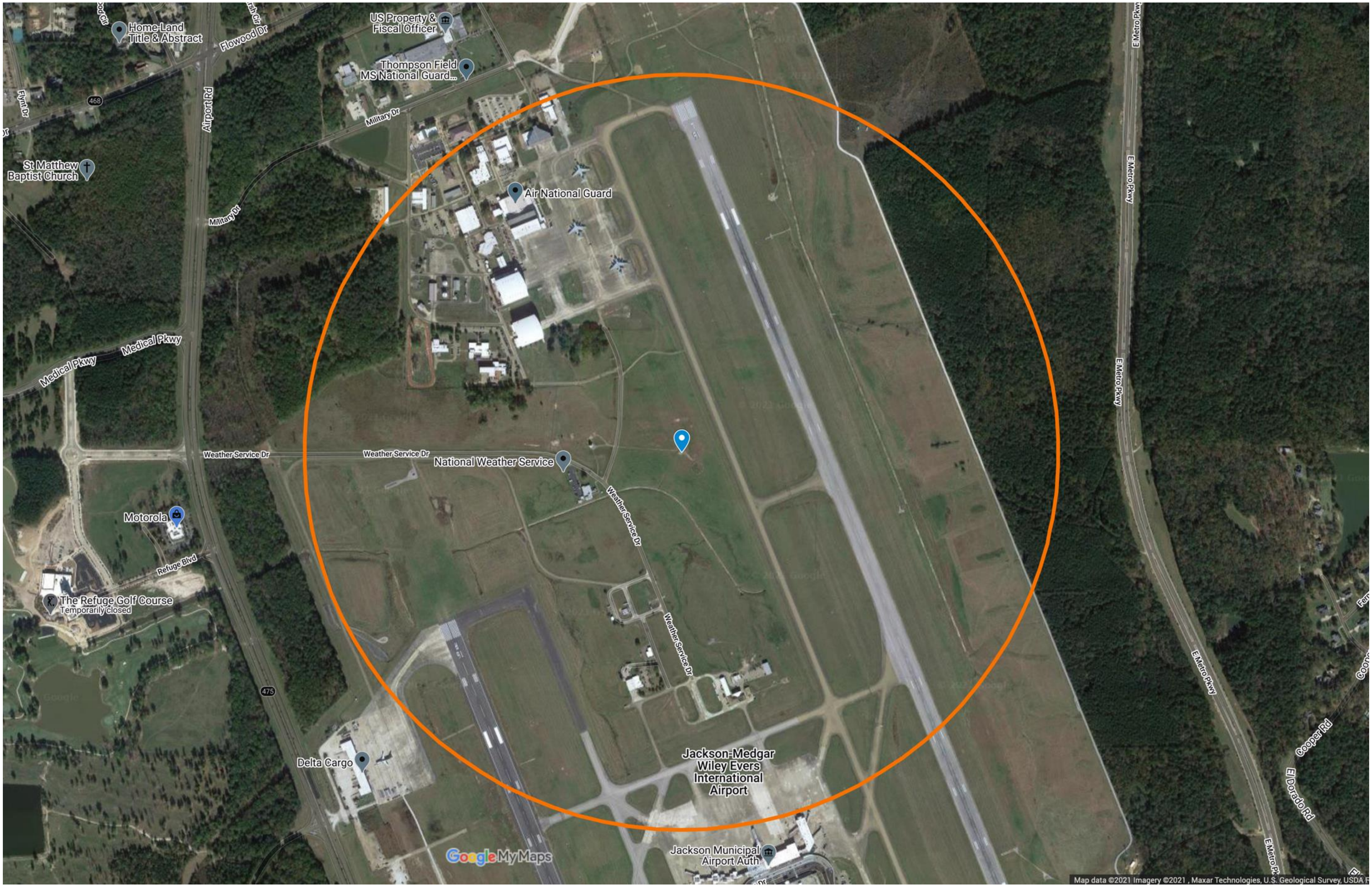
GULFPORT	GULFPORT-BILOXI INTERNATIONAL AIRPORT	93874	KGPT	30.412000	-89.081000

HATTIESBURG	BOBBY L CHAIN MUNICIPAL AIRPORT	13833	KHBG	31.269483	-89.256108

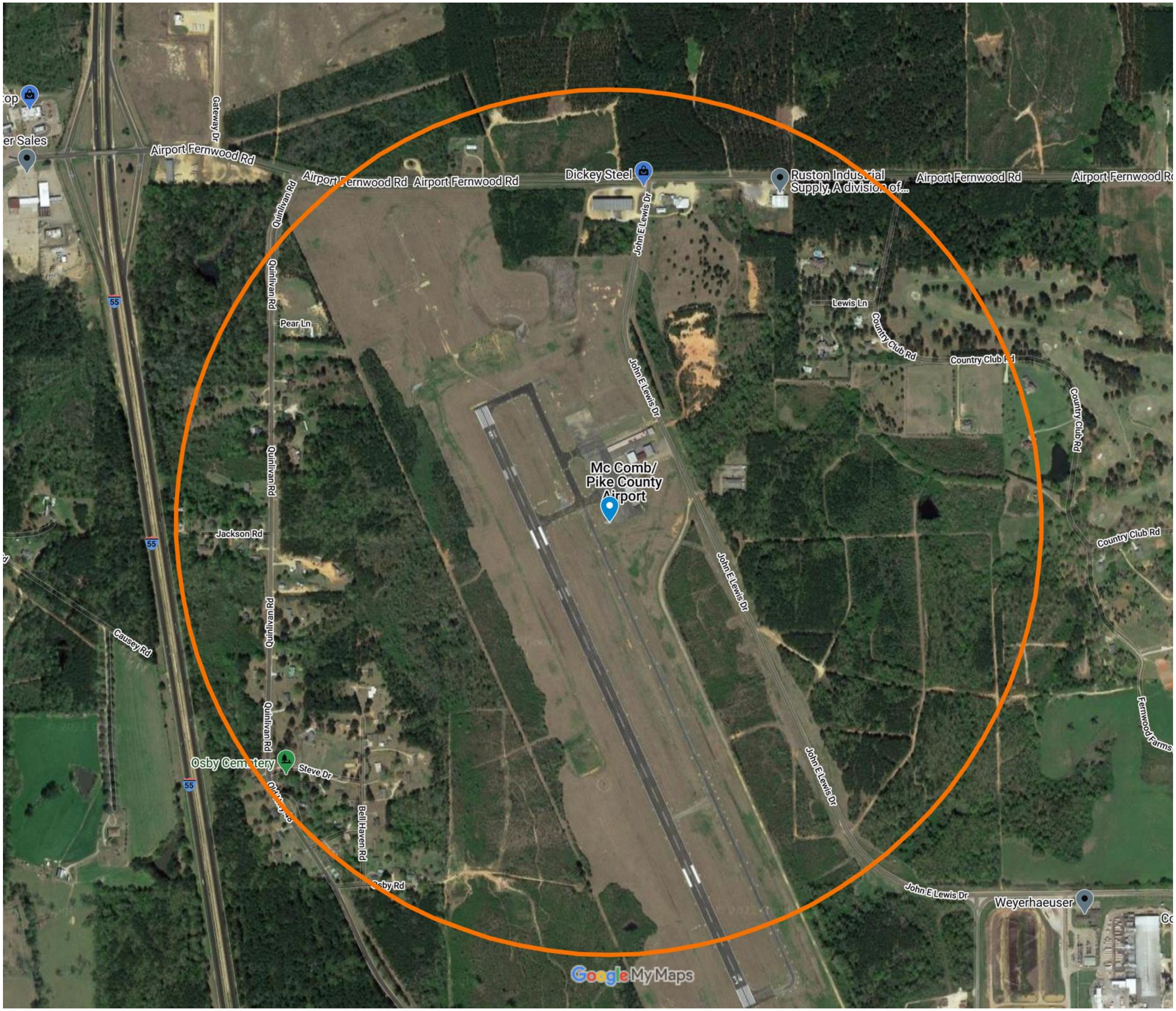
JACKSON	HAWKINS FIELD AIRPORT	13927	KHKS	32.337572	-90.221397



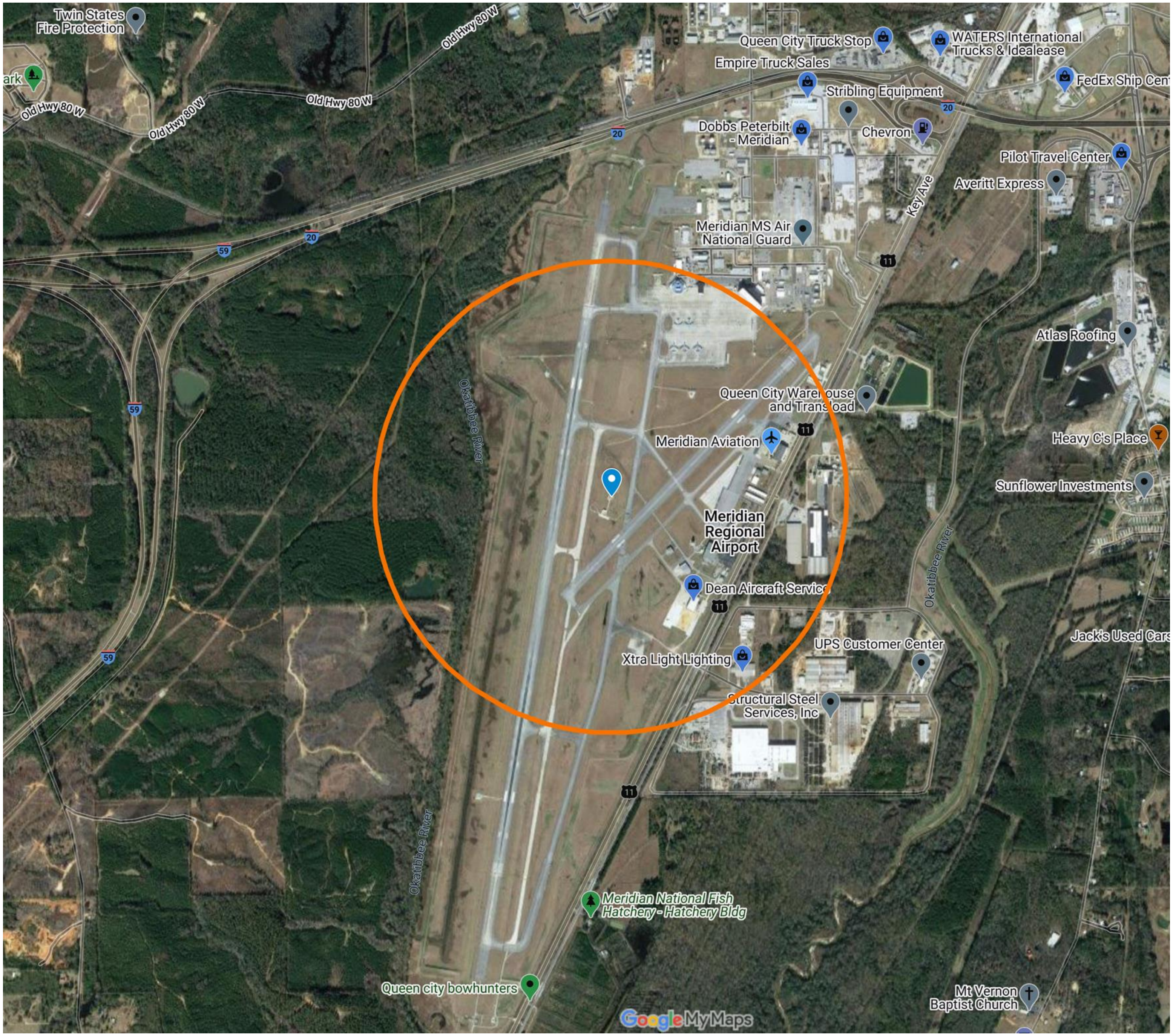
JACKSON	JACKSON INTERNATIONAL AIRPORT	3940	KJAN	32.319836	-90.077756



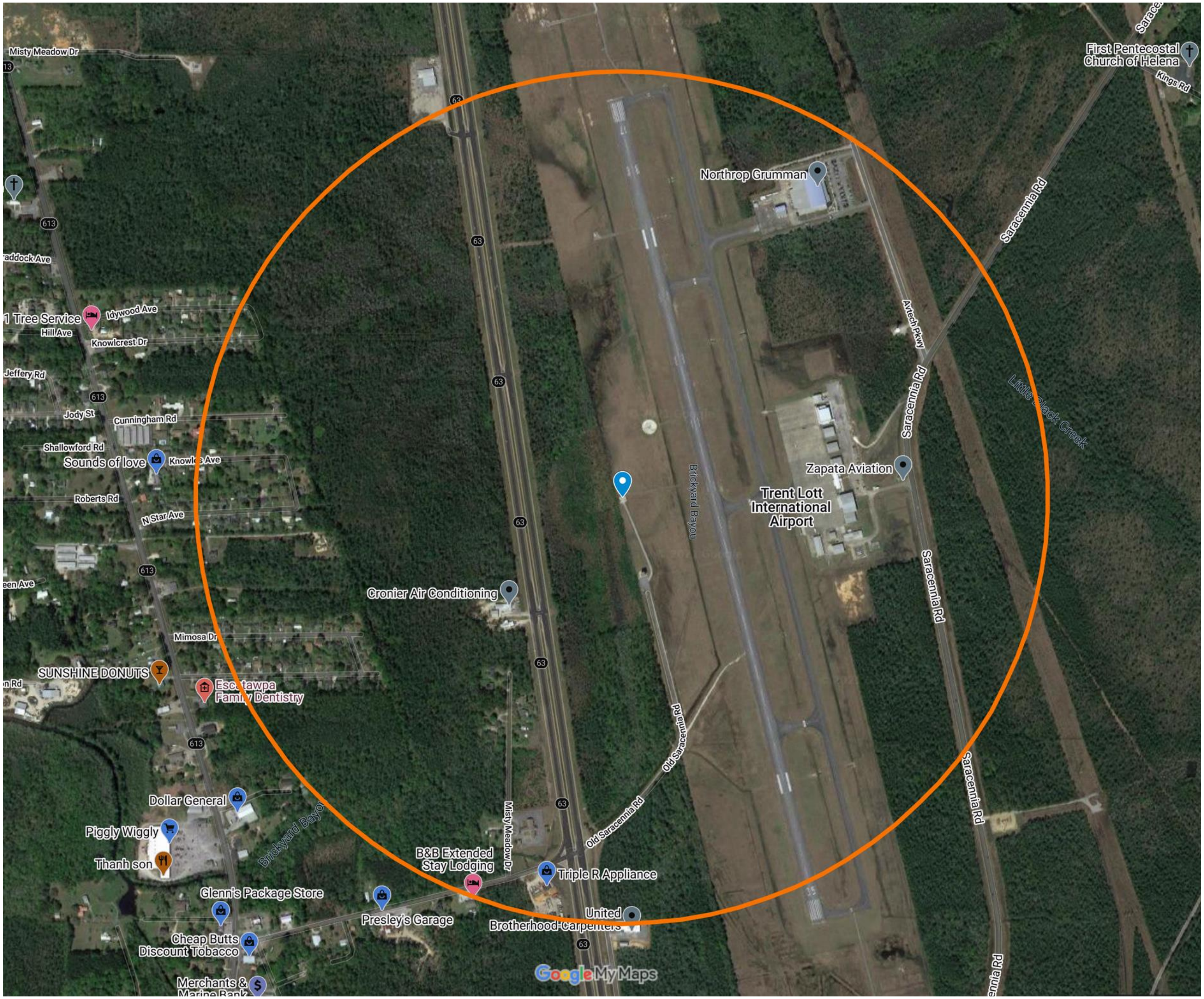
McCOMB	MC COMB/PIKE COUNTY/JOHN E LEWIS FIELD AIRPORT	93919	KMCB	31.182278	-90.472025



MERIDIAN	KEY FIELD AIRPORT	13865	KMEI	32.334861	-88.750728



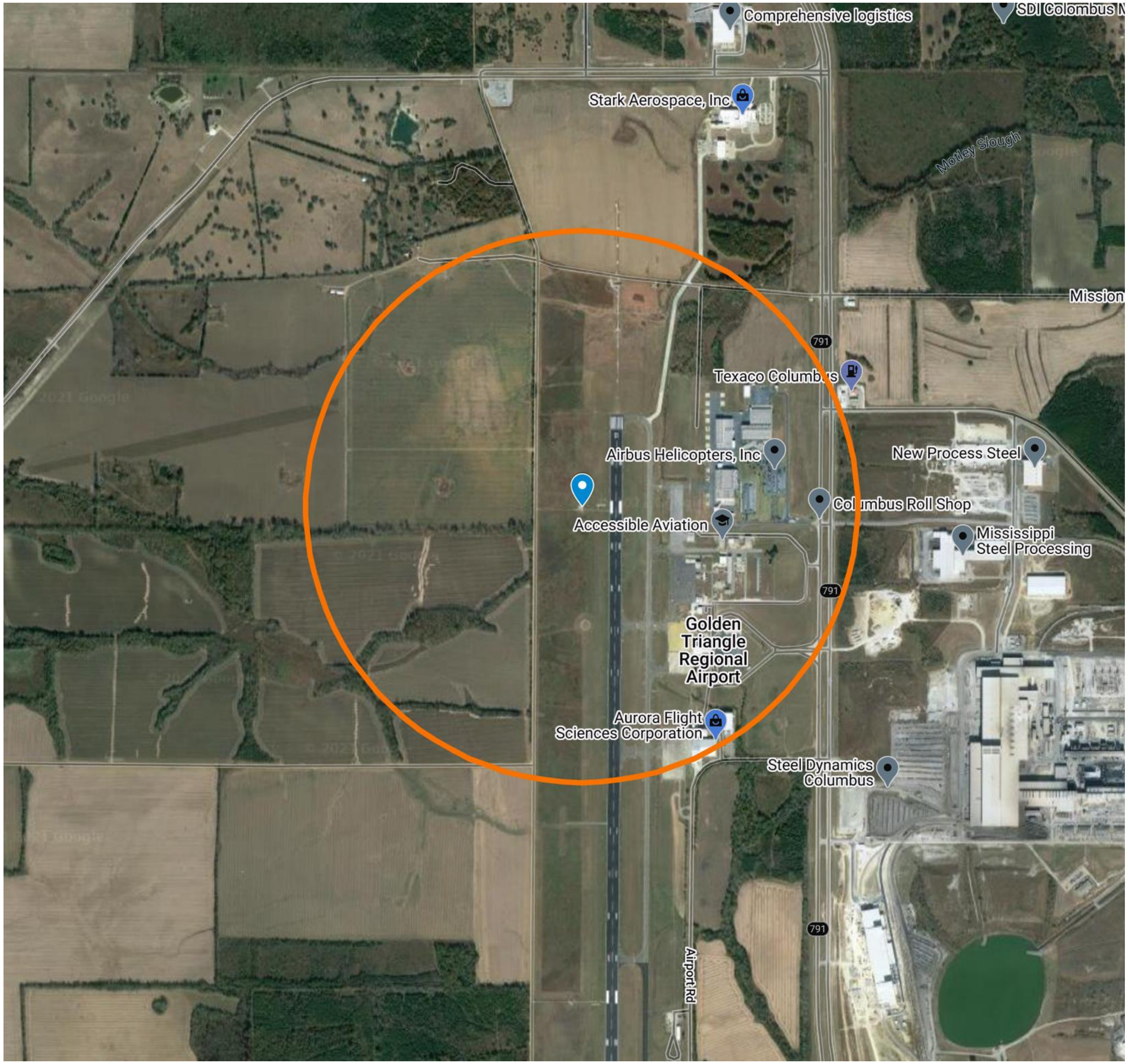
PASCAGOULA	TRENT LOTT INTERNATIONAL AIRPORT	53858	KPQL	30.463058	-88.531556



TALLULAH/VICKSBURG	VICKSBURG/TALLULAH REGIONAL AIRPORT	3996	KTVR	32.348000	-91.030000

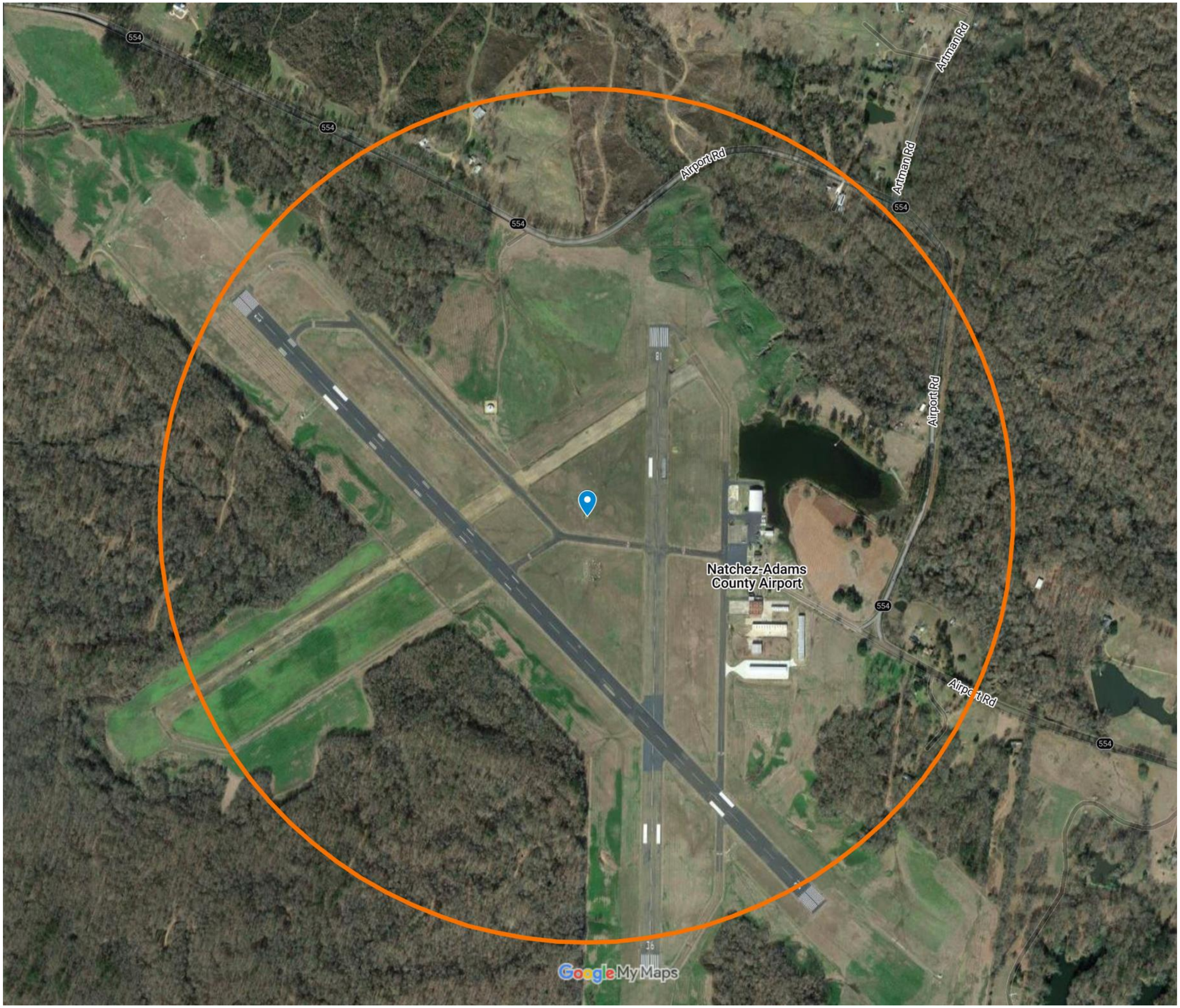
TUPELO	TUPELO REGIONAL AIRPORT	93862	KTUP	34.262131	-88.771161	Yes

COLUMBUS	GOLDEN TRIANGLE RGNL	53893	KGTR	33.456278	-88.592656



COLUMBUS	COLUMBUS AFB	13825	KCBM	33.652258	-88.457136

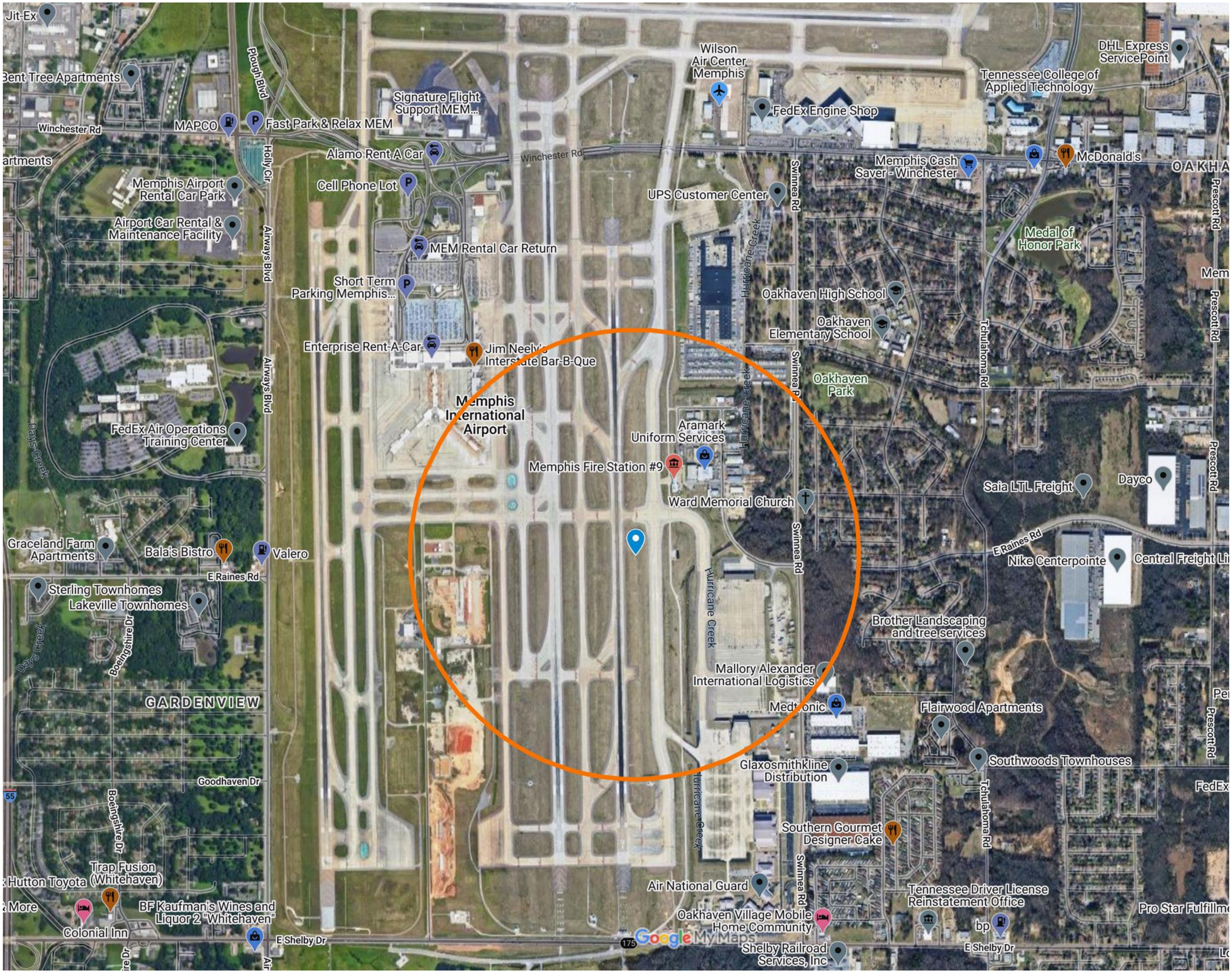
NATCHEZ	NATCHEZ/HARDY(AWOS)	3961	KHEZ	31.615919	-91.297267



HATTIESBURG	HATTIESBURG LAUREL	53808	KPIB	31.465756	-89.333464

METCALFE	TUNICA MUNI	23903	KUTA	34.676575	-90.343956

MEMPHIS	MEMPHIS INTL ARPT	13893	KMEM	35.036472	-89.971861



MOBILE	MOBILE/BATES FIELD	13894	KMOB	30.688222	-88.245969