Subject: Confirmation of 110(a)(2)((D) 2015 Ozone NAAQS Requirements in the Current Alabama SIP

110(a)(2)(D) Requirements – Alabama

Section 110(a) element	Summary of element	How Addressed in Submittal
§110(a)(2)(D)(i)(I)	*contain adequate provisions—* *(i) prohibiting, consistent with the provisions of this title, any source or other type of emissions activity within the state from emitting any air pollutant in amounts which will--* *(I) contribute significantly to nonattainment in, or interfere with maintenance by, any other state with respect to any such national primary or secondary ambient air quality standard.*	In regards to Prong 1, there are no nonattainment areas in the State of Alabama. Seven counties around the Atlanta area were designated nonattainment. Georgia is the only state bordering Alabama that has counties designated as nonattainment. EPA's air quality modeling data for ozone for the year 2023 which uses the 2016v2 platform, demonstrates that Alabama does not contribute above 1ppb to any nonattainment or maintenance areas outside of the State. ADEM is able to regulate sources contributing to ozone through ADEM Admin. Code rs. 335-3-6, "Control of Organic Emissions, 335-3-8, "Control of Nitrogen Oxide Emissions", 335-3-14-.01, "General Provisions", 335-3-14-.02, "Permit Procedure", 335-3-14-.03, "Standards for Granting Permits", 335-3-14-.04, "Prevention of Significant Deterioration in Permitting" and 335-3-14-.05, "Air Permits Authorizing Construction in or Near Nonattainment Areas". The State of Alabama has also implemented several major federal programs, which have led to ozone precursor emissions reductions. These programs include: EPA's Tier 1 and 2 mobile source rules, EPA's nonroad Diesel Rule, EPA's 2007 Heavy-duty Highway Rule, New Source Performance Standards, National Emission Standards for Hazardous Air Pollutants and the Cross State Air Pollution Rule (CSAPR). While the Cross State Air Pollution Rule does not specifically address the 2015 ozone standard, the rule provides residual benefits in the form of NOx emissions reductions, which is an ozone precursor. Alabama's CSAPR rules were approved on August 31, 2016 (81 FR 59869), and October 6, 2017 (82 FR 46674). Due to the implementation of the programs above, ozone precursor emissions in the State have recently declined, and will continue to decline in future years. Based on EPA's air quality modeling of the 2016v2 emissions, Alabama does not contribute above 1ppb of the NAAQS at any monitors that are projected to be in nonattainment. After reviewing EPA's 2023 modeling data, the Department agrees with these findings and believes that it can be concluded that Alabama is meeting its Section 110(a)(2)(D)(i) Prong 1 obligations for the 2015 ozone NAAQS (See Appendix A). Based on the information provided above, Alabama does not significantly contribute to nonattainment of the 2015 ozone standard in another state. Regarding Prong 2, there are no maintenance areas in the State of Alabama. The State of Alabama has also implemented several major federal programs, which have led to ozone precursor emissions reductions. These programs include: EPA's Tier 1 and 2 mobile source rules, EPA's nonroad Diesel Rule, EPA's 2007 Heavy-duty Highway Rule, New Source Performance Standards, National Emission Standards for Hazardous Air Pollutants and the Cross State Air Pollution Rule (CSAPR).

Section 110(a) element	Summary of element	How Addressed in Submittal
		While the Cross State Air Pollution Rule does not specifically address the 2015 ozone standard, the rule provides residual benefits in the form of NOx emissions reductions, which is an ozone precursor. Alabama's CSAPR rules were approved August 31, 2016 (81 FR 59869), and October 6, 2017 (82 FR 46674). Due to the implementation of the programs above, ozone precursor emissions in the State have recently declined, and will continue to decline in future years. Based on EPA's air quality modeling of the 2016v2 emissions, Alabama does not contribute above 1ppb of the NAAQS at any monitors that are projected to be maintenance receptors. After reviewing EPA's 2023 modeling data, the Department agrees with these findings and believes that it can be concluded that Alabama is meeting its Section 110(a)(2)(D)(i) Prong 2 obligations for the 2015 ozone NAAQS (See Appendix A). In regards to prong 2, based on the information provided above, Alabama does not interfere with maintenance of the 2015 ozone standard in another state. ADEM's Rules and Regulations may be accessed at: www.adem.state.al.us

Appendix A

Alabama's Weight of Evidence (WOE) Analysis for the 2015 8-hr Ozone NAAQS Interstate Transport Modeling Results

Weight of Evidence (WOE) Analysis

A weight of evidence approach relies on assessing all available information and weighing data by considering the relevance and quality of the information through both qualitative and quantitative analyses. For this analysis, the January 2022 2016v2 modeling platform results for the 2023 future year 2015 8-hr Ozone NAAQS are being evaluated. These projections identify 1 predicted nonattainment monitor, and 1 predicted maintenance monitor, in Harris County and Denton County, Texas, respectively. The table below provides the projected 2023 concentrations, as well as Alabama's projected impacts on those concentraitons.

2016v2 Modeling Results for the 2015 8-hr Ozone NAAQS

Monitor Site	Average Concentration (ppb)	Maximum Concentration (ppb)	Alabama Contribution (ppb)	Projected Monitor Status
Denton Co, TX	70.4	72.2	0.71	Maintenance
Harris Co, TX	71.0	72.0	0.88	Non-Attainment

For this ISIP, the following points are provided as part of the WOE analysis:

Meteorological Influence:

During the most recent 3 year period, 2018-2020, very few back trajectories (72 hours back in time) indicated concentrations above the 8-hr Ozone NAAQS, at the above monitors, where the air originated or passed though Alabama. In Harris County, during 2018-2020, only 4 days out of 31 exceedance days showed air that moved over Alabama, and in Denton County, during the same period, only 3 days out of 26 exceedance days showed air that moved over Alabama. Of those days, weather patterns do not indicate that upper level transport of emissions from Alabama would have contributed to concentrations at those monitors. It is important to note in Attachment A to this analysis that, on those days where Alabama could have contributed to the Denton and Harris monitors, the air quality the previous days fell into the good or moderate AQI categories. In looking at the back trajectories, it is much more reasonable to conclude that the monitor exceedances on those days are locally driven. It is also important to note that while the Denton and Harris monitors' design values have remained relatively static, design values across Alabama continue to decline. Please see Attachment A for the full meteorological analysis.

Alabama Emission Sources:

As stated in the TSD associated with the January 2022 modeling platform, the impacts at downwind monitors were based on statewide emissions, not point source only. Given that the highest NO_x emissions in Alabama come from the mobile sector, not the point source sector, it is expected that ozone would be created and remain locally. Further, statewide NO_x emissions from point sources continue to decline, as shown by the precipitous drop in tonnage in our

major source emissions inventory. Mobile source emissions will continue to decrease nationwide due to turnover in the gasoline and diesel fleets and due to the rise in use of electric vehicles.

Alabama 2017 NEI NOx Emissions- Tons per Year (TPY)

Sector	Statewide TPY	Signal
Point (EGU + NonEGU)	79,678	Point source NOx emissions continue to decline
Mobile (Onroad + Nonroad)	111,185	Mobile source NOx emissions continue to increase

The TSD states that the threshold alone does not determine whether a state significantly contributes to a nonattainment or maintenance monitor from a downwind state. After identifying potential state-wide significant contributors, the third step is to identify which sources contribute to downwind nonattainment/maintenance. Since the biggest sources of NOx in Alabama are from mobile sources, controls on those sources should be evaluated first. For the remaining sources, the two areas of the state with the largest emissions sources are located in the Birmingham (Jefferson and Shelby County) and Mobile (Mobile and Baldwin County) areas. When evaluating sources in these areas, EGUs are still among the biggest emitters of NOx. However, NOx emissions from EGUs have dropped significantly, on the order of 80%. The overwhelming majority of these EGUs are already fully controlled for NOx.

Model Performance:

The models themselves cannot adequately reproduce such small concentrations. The 0.71 ppb threshold clearly falls within the noise of the model. For example, in the TSD titled *"Air Quality Modeling for the 2016v2 Emissions Platform Technical Support Document: Appendix A*" model performance is discussed. For both the Southeast (AL) and the South (TX) regions there is bias and error in the model ranging from +/-2.9 to 6.1 ppb in the southeast and +/-7.8 to 9.1 ppb in the south. This bias/error is considered acceptable when evaluating how well the model replicates monitor concentrations. Given the magnitude of the acceptable bias/error, it seems illogical that such a small threshold could adequately represent, with true accuracy, impacts from states hundreds of miles away.

Significance Threshold:

The most recent guidance documents discussing significance thresholds, issued in March and August of 2018, discuss significance thresholds, with the former allowing flexibility in

determining significance, and the latter finding a significance level of 1 ppb as a sufficient threshold. Based on these documents, the significance threshold can be set at 1 ppb.

There is also precedent for setting significance thresholds for ozone in the PSD program, which set the level at 1 ppb. Since the purpose of the PSD program is to show compliance with the NAAQS, this level should be consistent for determining future year significance against the same NAAQS.

Additionally, it can be argued that there should be a difference in significance for predicted nonattainment monitors versus maintenance monitors. In an EPA memo dated October 2018, titled *"Consideration for Identifying Maintenance Receptors for Use in Clean Air Act Section 110(a)(2)(D)(i)(I) Interstate Transport State Implementation Plan Submissions for the 2015 Ozone National Ambient Air Quality Standards"*, alternate methods were discussed for evaluating maintenance receptors. Specifically, the memo states that one of the flexibilities allows EPA to consider that emissions in an area are expected to continue to decline in the upwind and downwind states out to the attainment date of the receptor. Given the maintenance receptor identified in the latest round of modeling (January 2022) projects an average concentration of 70.4 ppb and a maximum concentration of 72.2 ppb in 2023, coupled with continuing reductions in Alabama point source NOx emissions, the only emissions that Alabama can reasonably control, it serves that this is a justifiable argument for excluding Alabama as a significant contributor.

Conclusion:

Based on an assessment of all available information, and weighing the data by considering the relevance and quality of the information through both qualitative and quantitative analyses, ADEM asserts that emissions from Alabama do not significantly contribute to downwind nonattainment or maintenance receptors for the 2015 8-hr Ozone NAAQS.

Attachment A

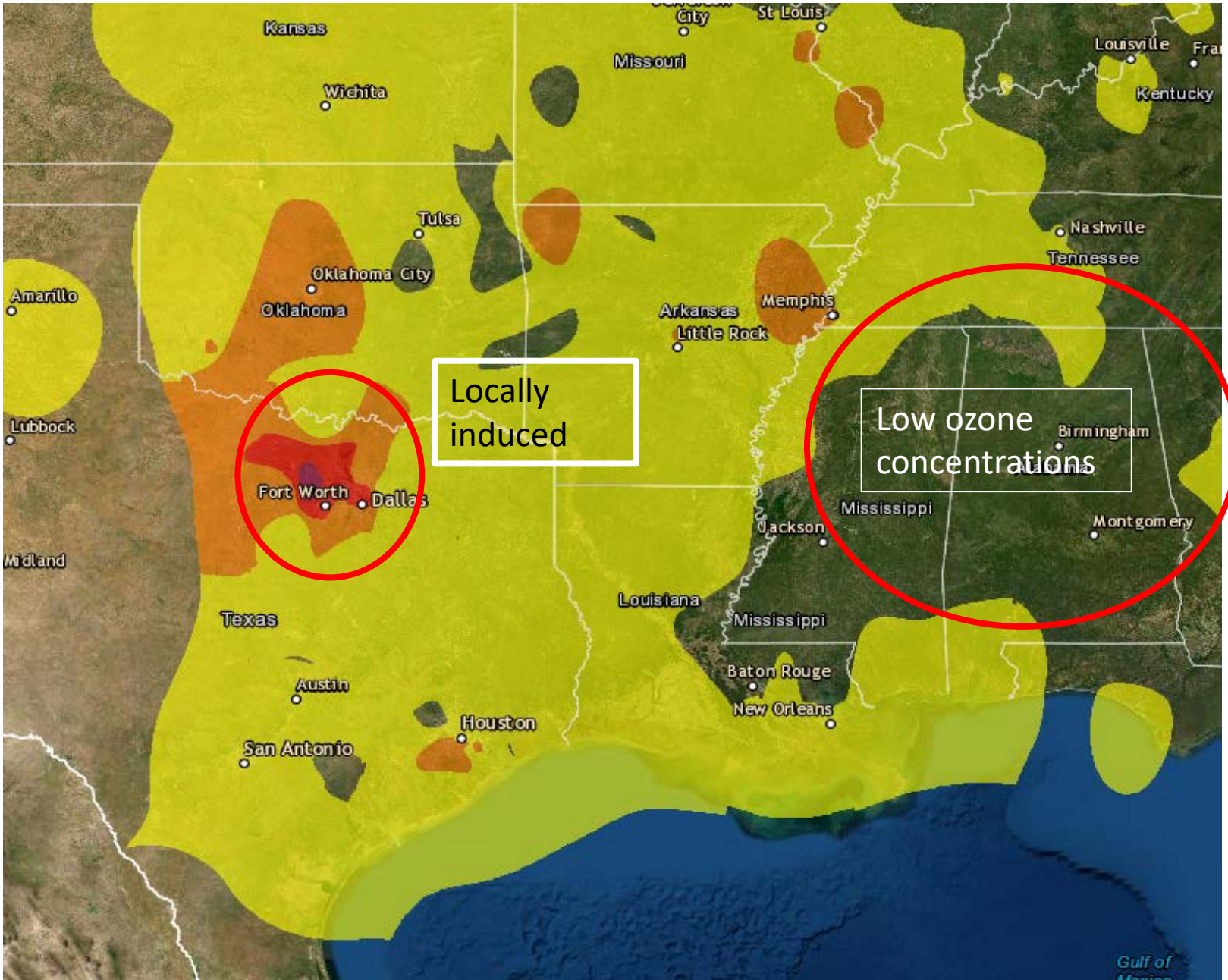
Meteorological Analysis

Denton and Harris Counties, TX

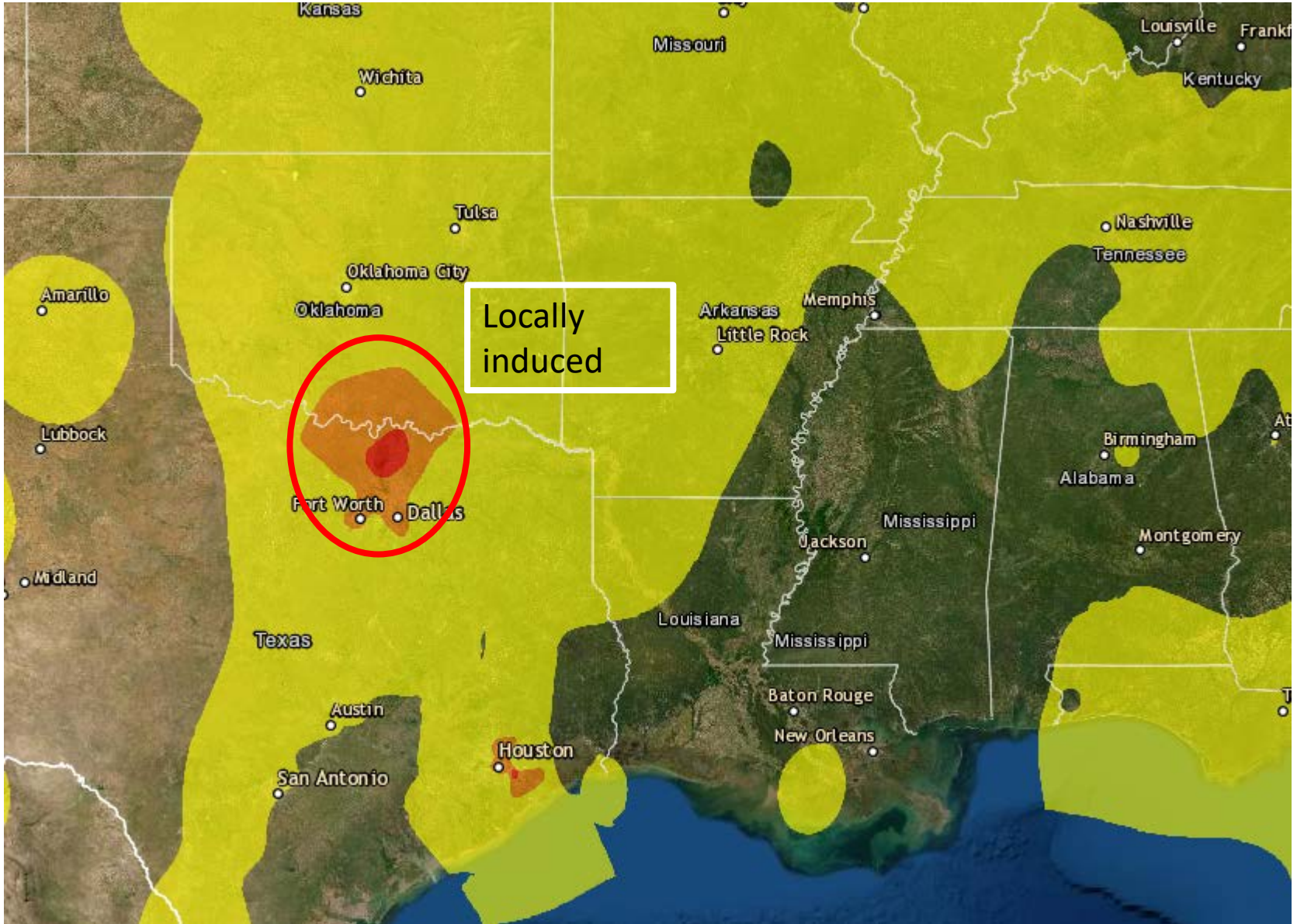
Alabama Department of Environmental Management

Denton County, TX (Dallas) Air Quality Study on 3 Days when Alabama could have Contributed to an Ozone Exceedance

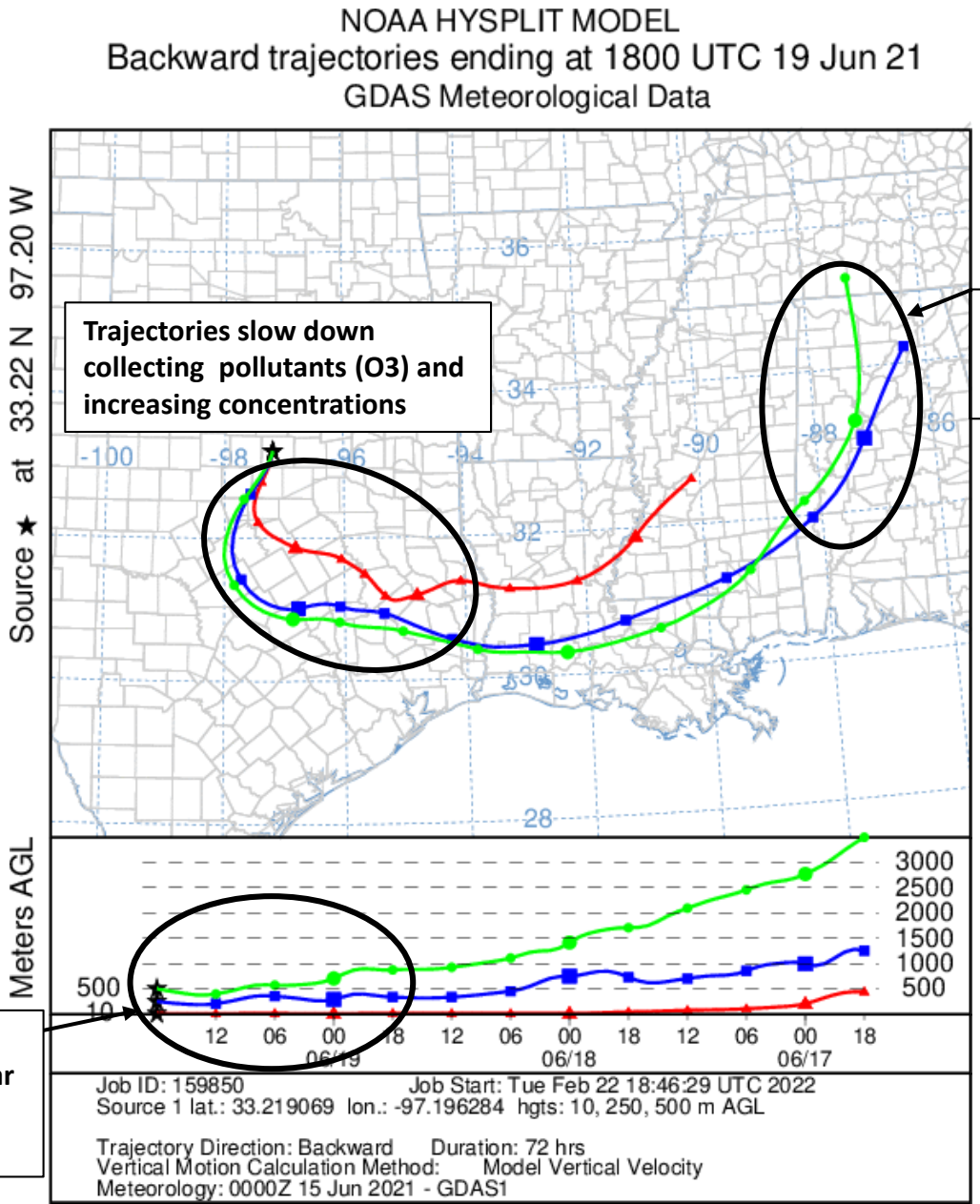
3 Days before AL could have Contributed to Denton (Dallas) 85 ppb on June 19, 2021



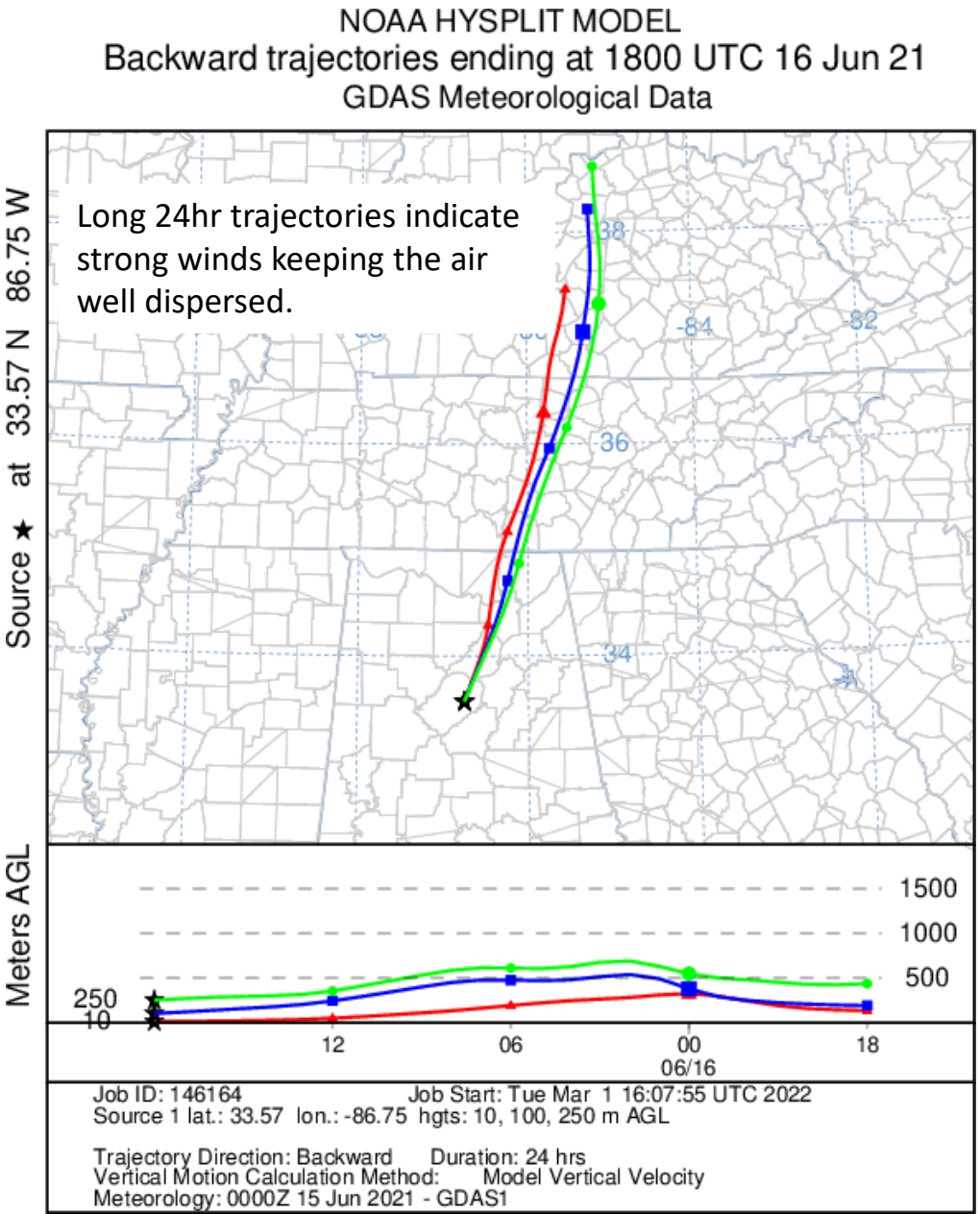
The Day AL could have Contributed to Denton (Dallas) 85 ppb
On June 19, 2021



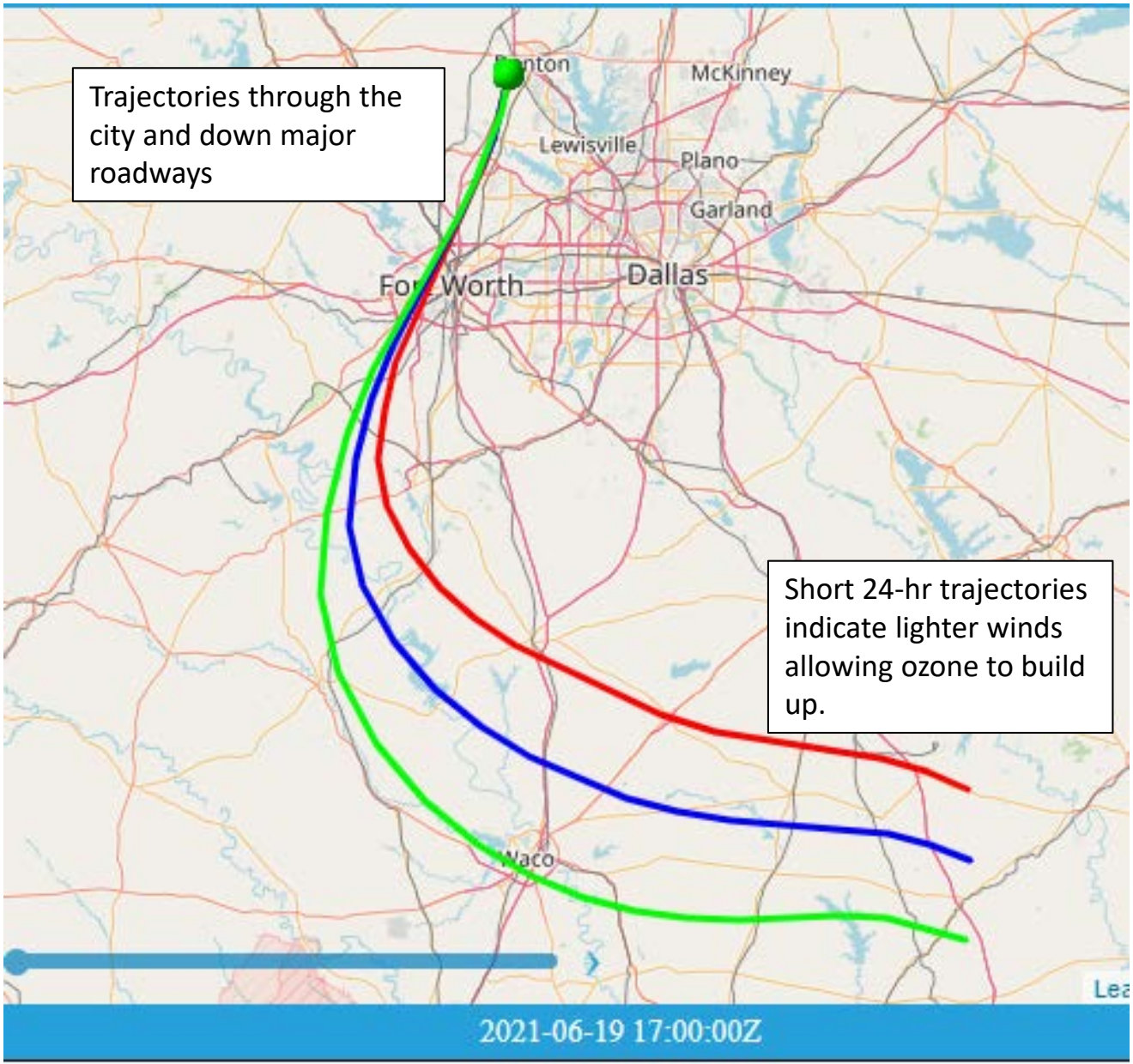
Back Trajectories the Day AL could have Contributed to Denton (Dallas)
June 19, 2021 Ozone = 85 ppb



24-hr Low Level Back Trajectories from Birmingham 3 Days before AL could have Contributed to Denton (Dallas)

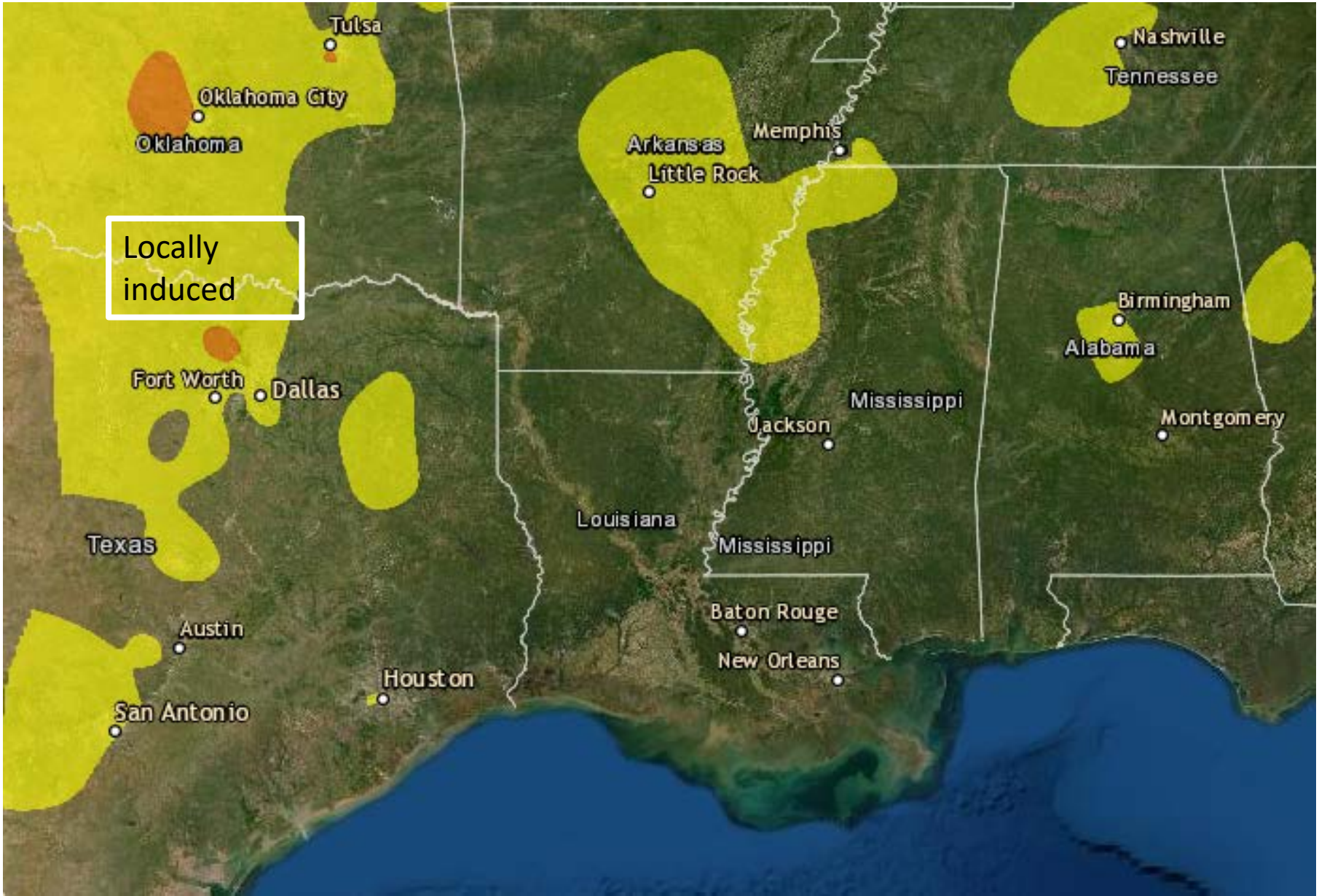


Low Level 24-hr Back Trajectories the Day AL could have Contributed to Denton (Dallas) 6-19-21 85 ppb

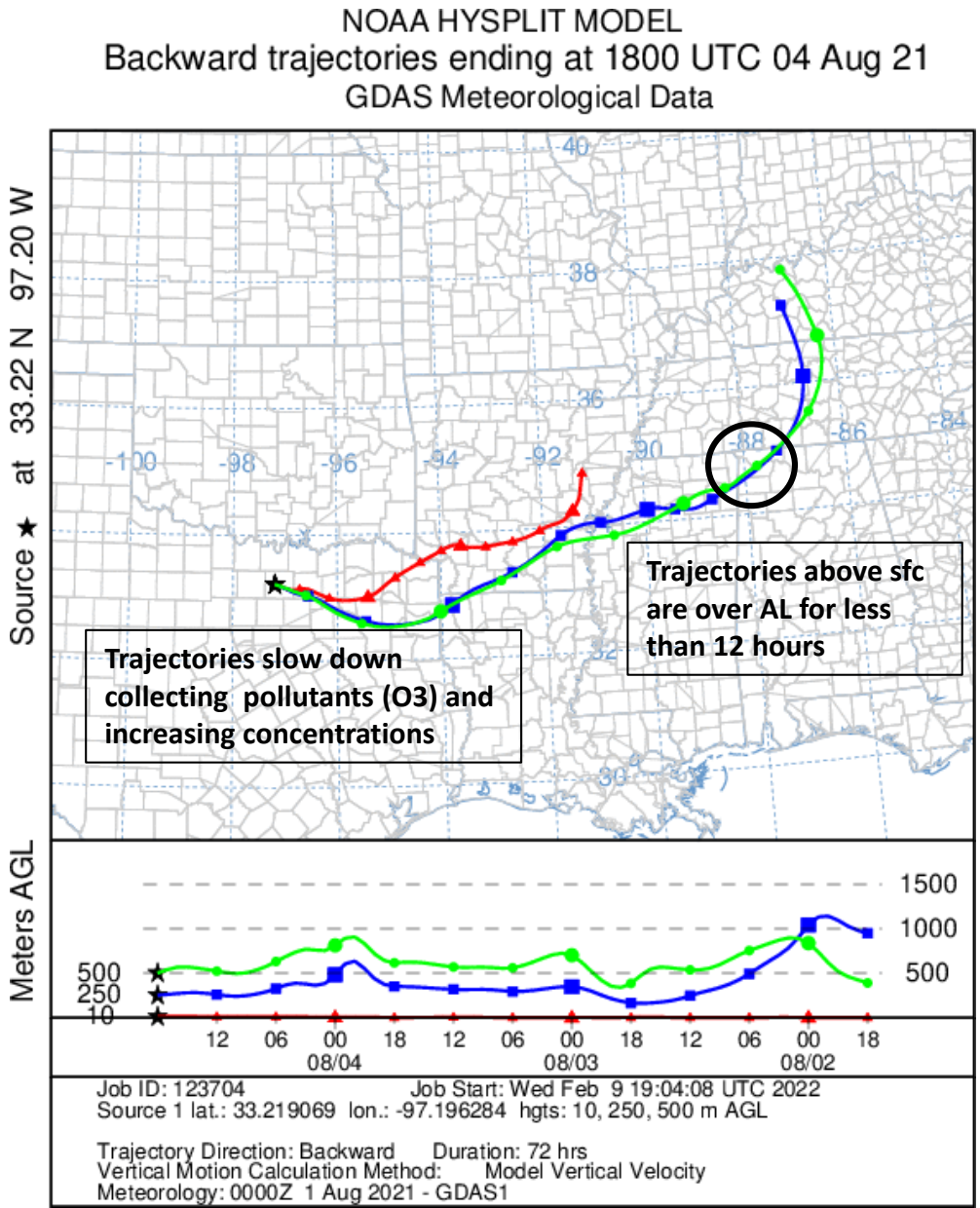


3 Days before AL could have Contributed to Denton (Dallas) 74 ppb on August 4, 2021

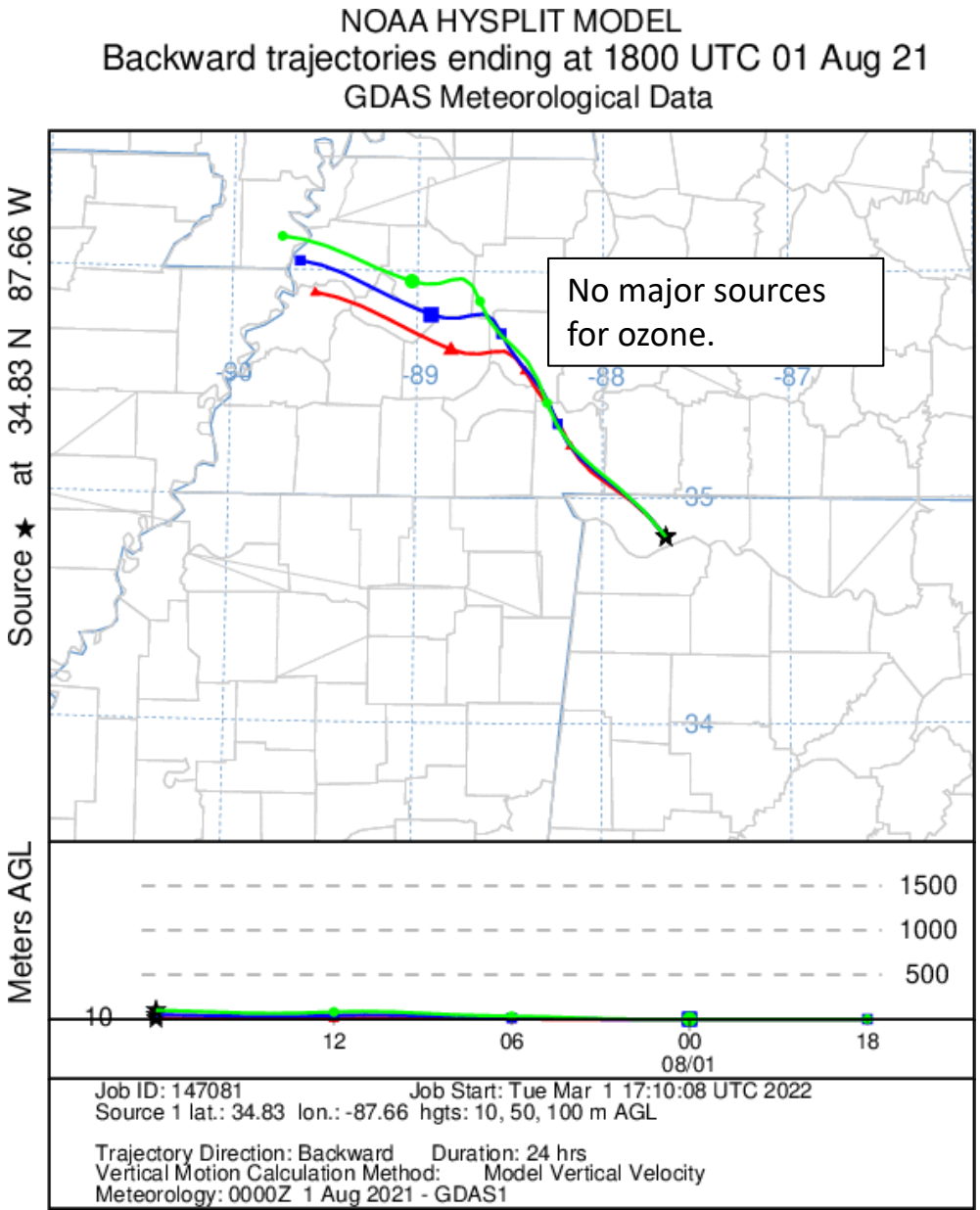
The Day AL could have Contributed to Denton (Dallas) 74 ppb on August 4, 2021



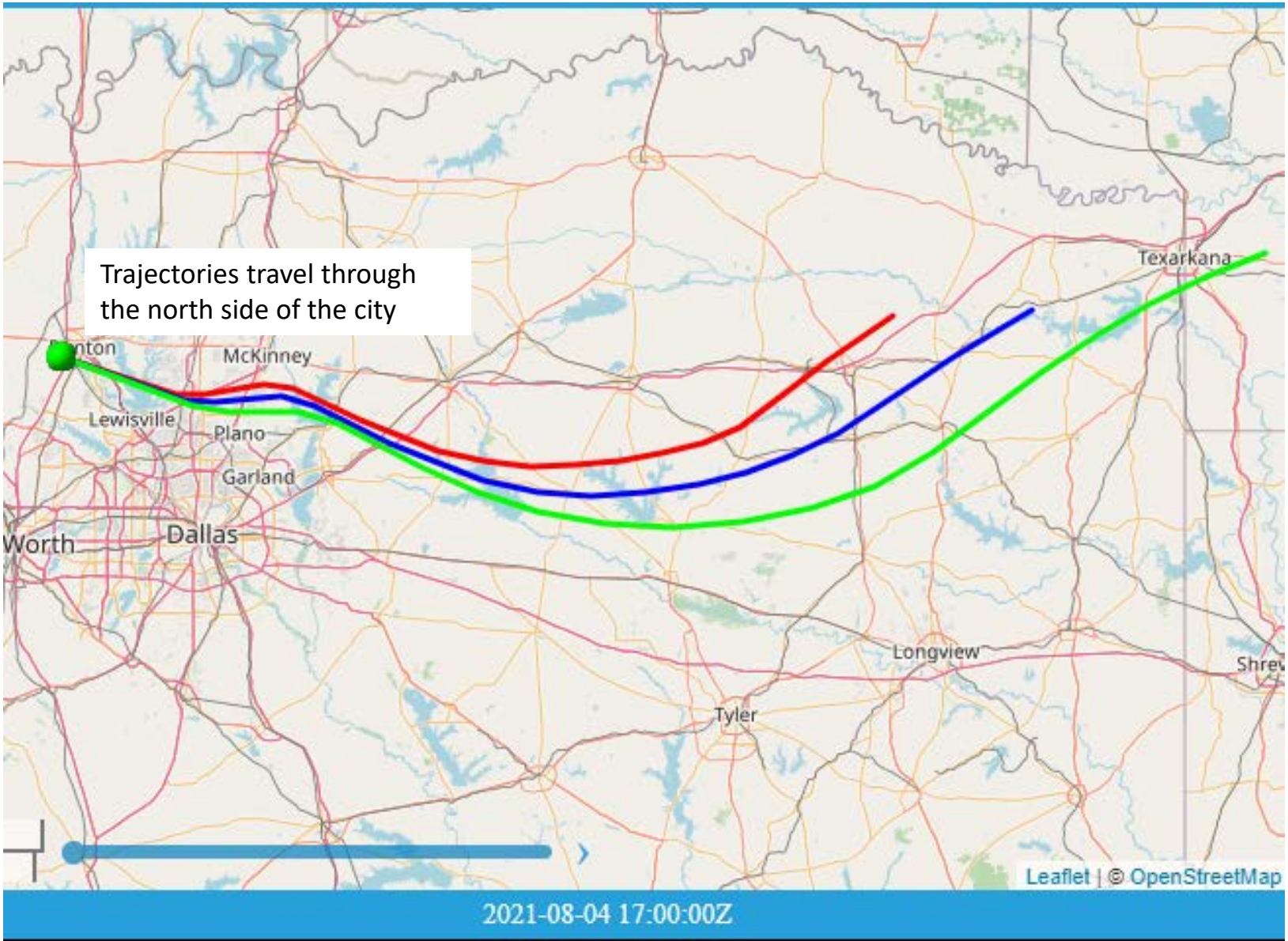
Back Trajectories the Day AL could have Contributed to Denton (Dallas)
August 4, 2021 Ozone = 74 ppb



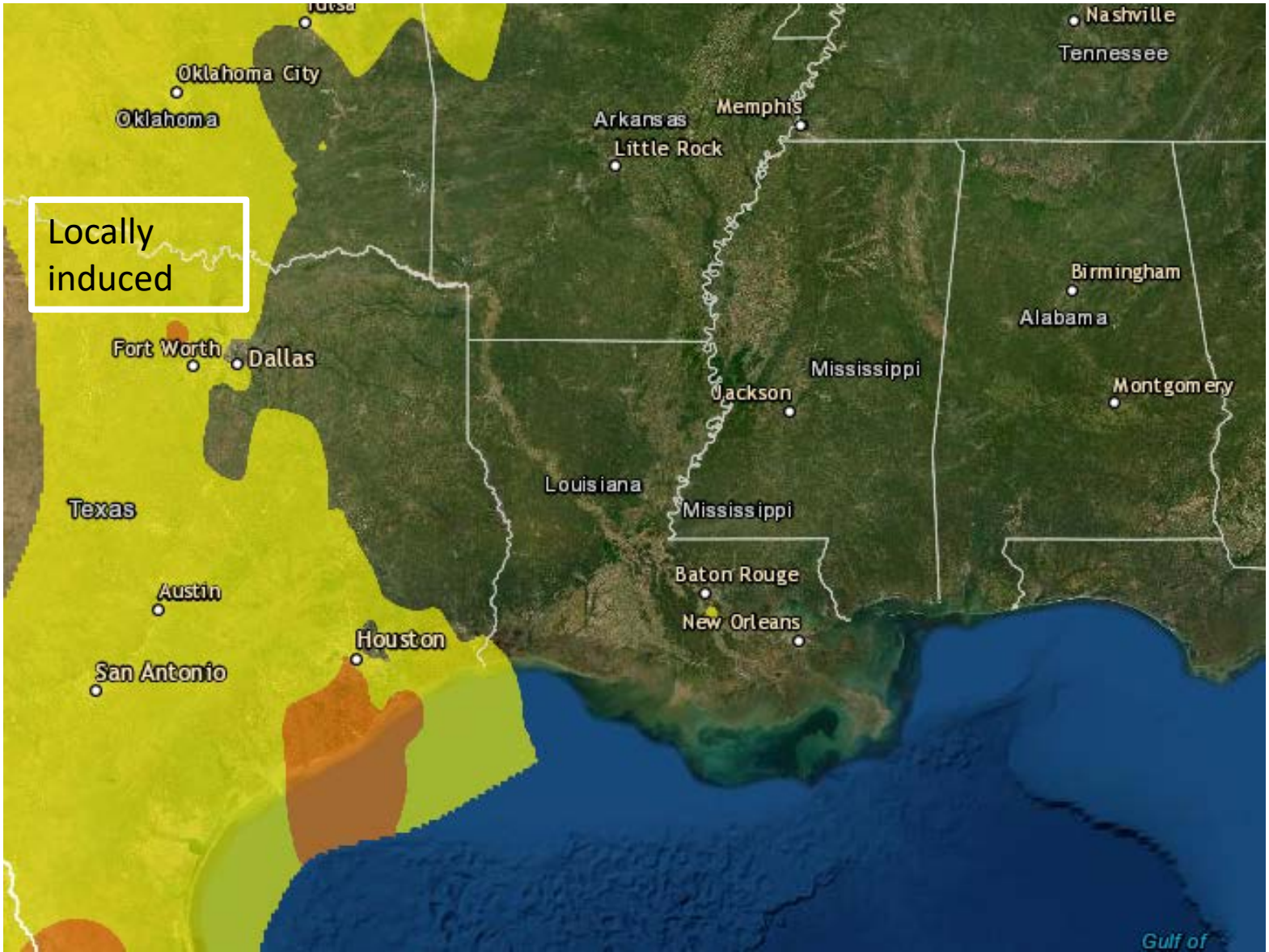
24-hr Low Level Back Trajectories from Birmingham 3 Days before AL could have Contributed to Denton (Dallas)



Low Level 24-hr Back Trajectories the Day AL could have Contributed to Denton (Dallas) 8-4-21 74 ppb

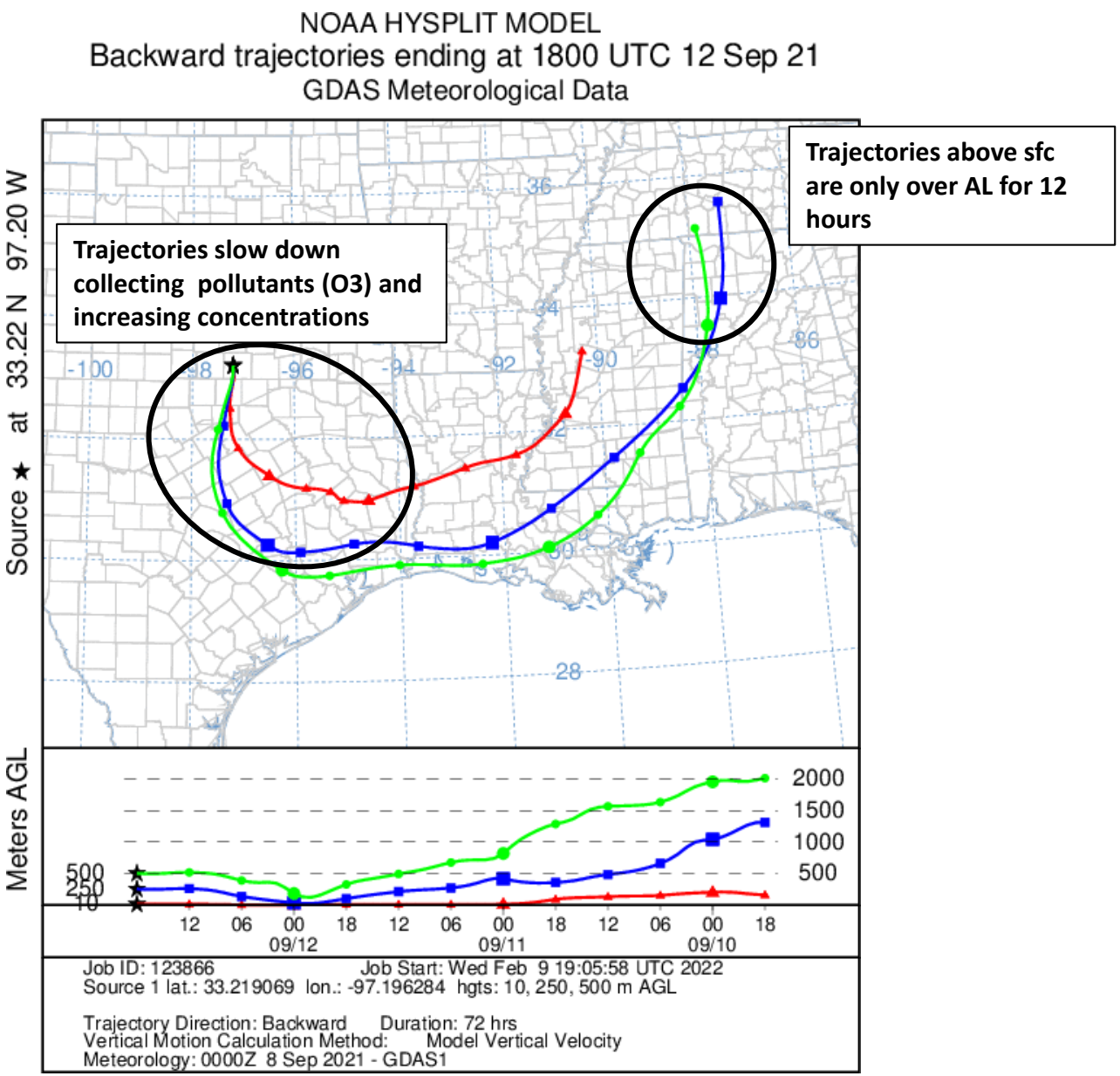


3 Days before AL could have Contributed to Denton (Dallas) 73 ppb on September 12, 2021

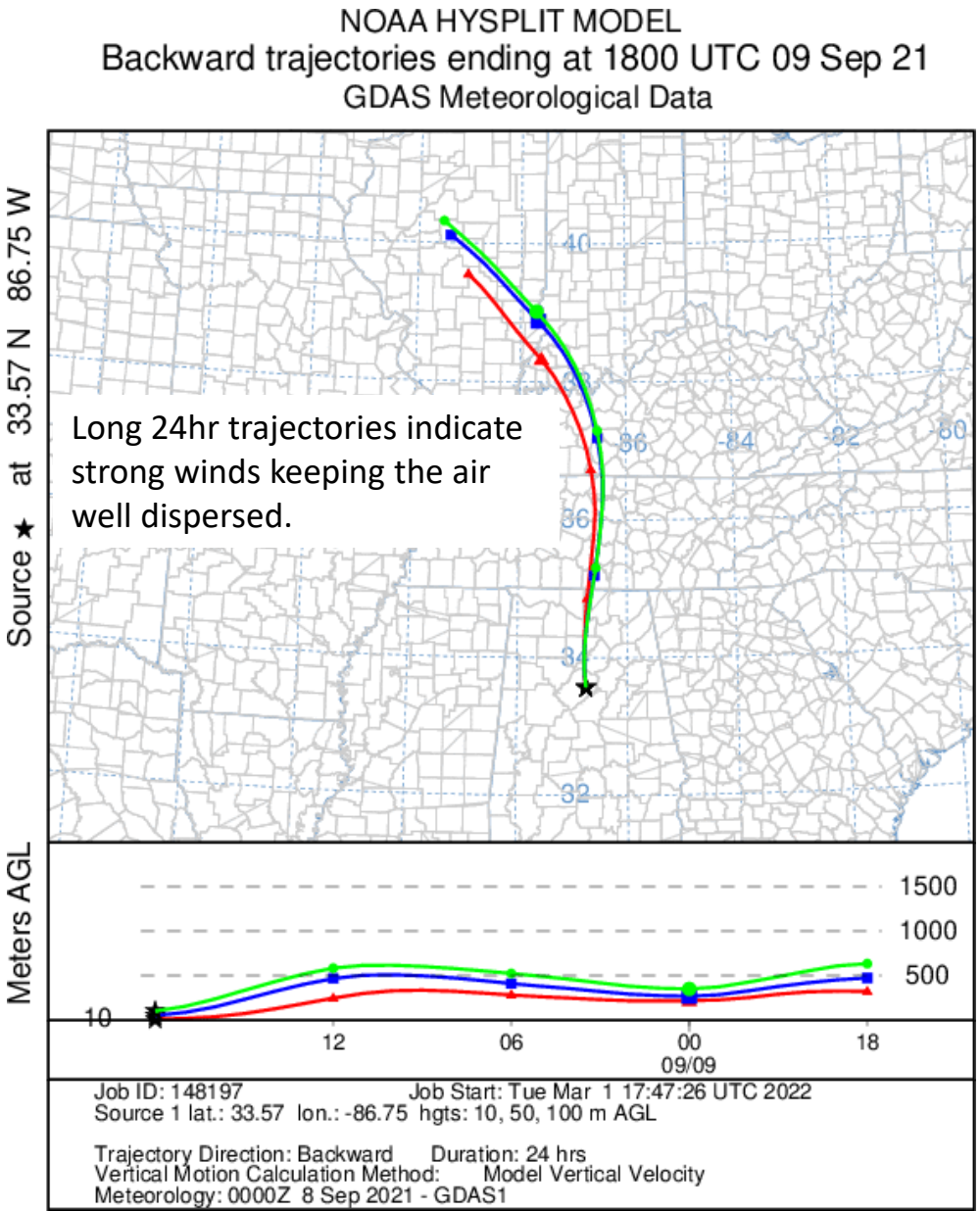


The Day AL could have Contributed to Denton (Dallas) 73 ppb on September 12, 2021

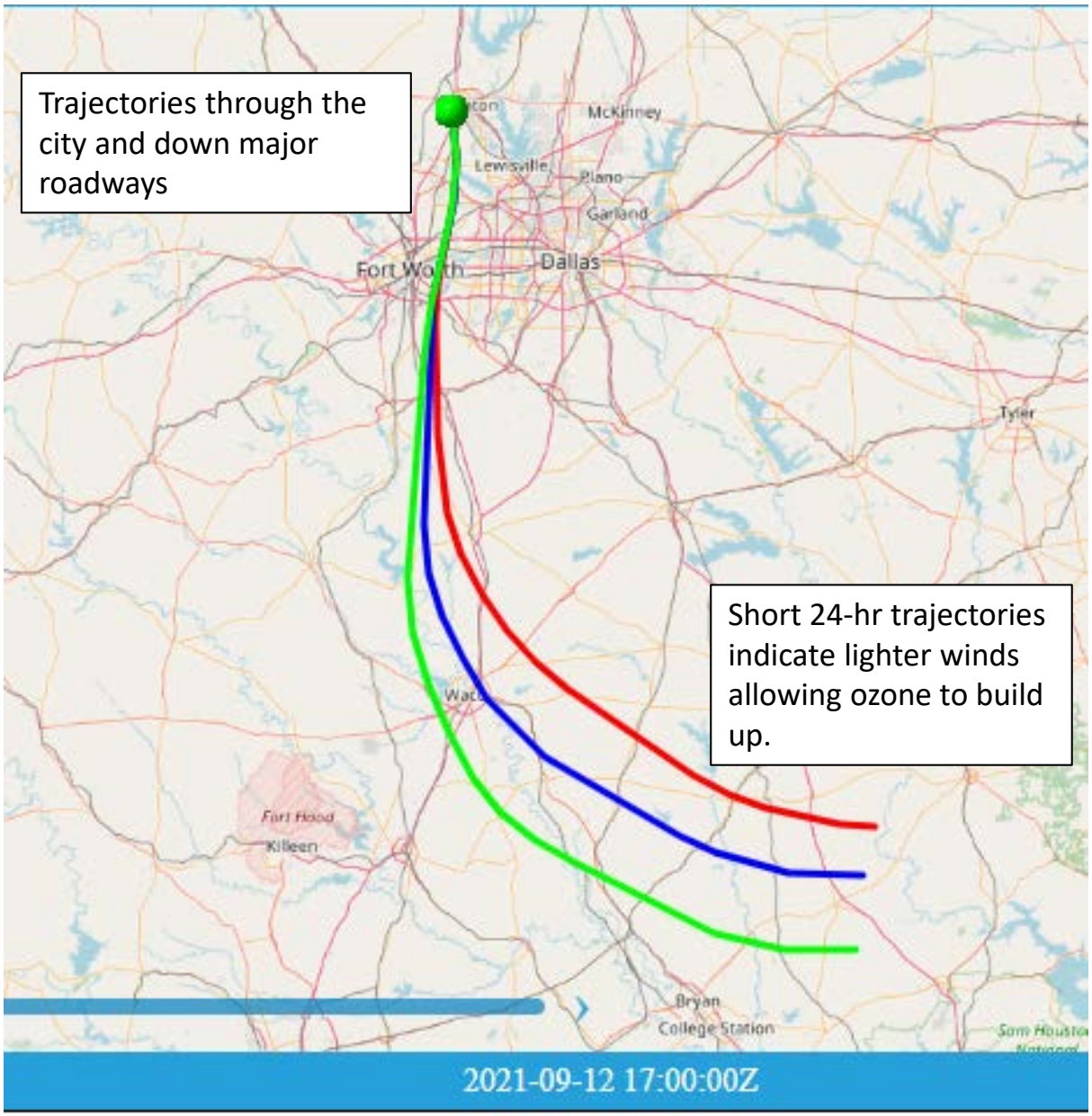
Denton, TX
September 12, 2021 Ozone = 73 ppb



24-hr Low Level Back Trajectories from Birmingham 3 Days before AL could have Contributed to Denton (Dallas)

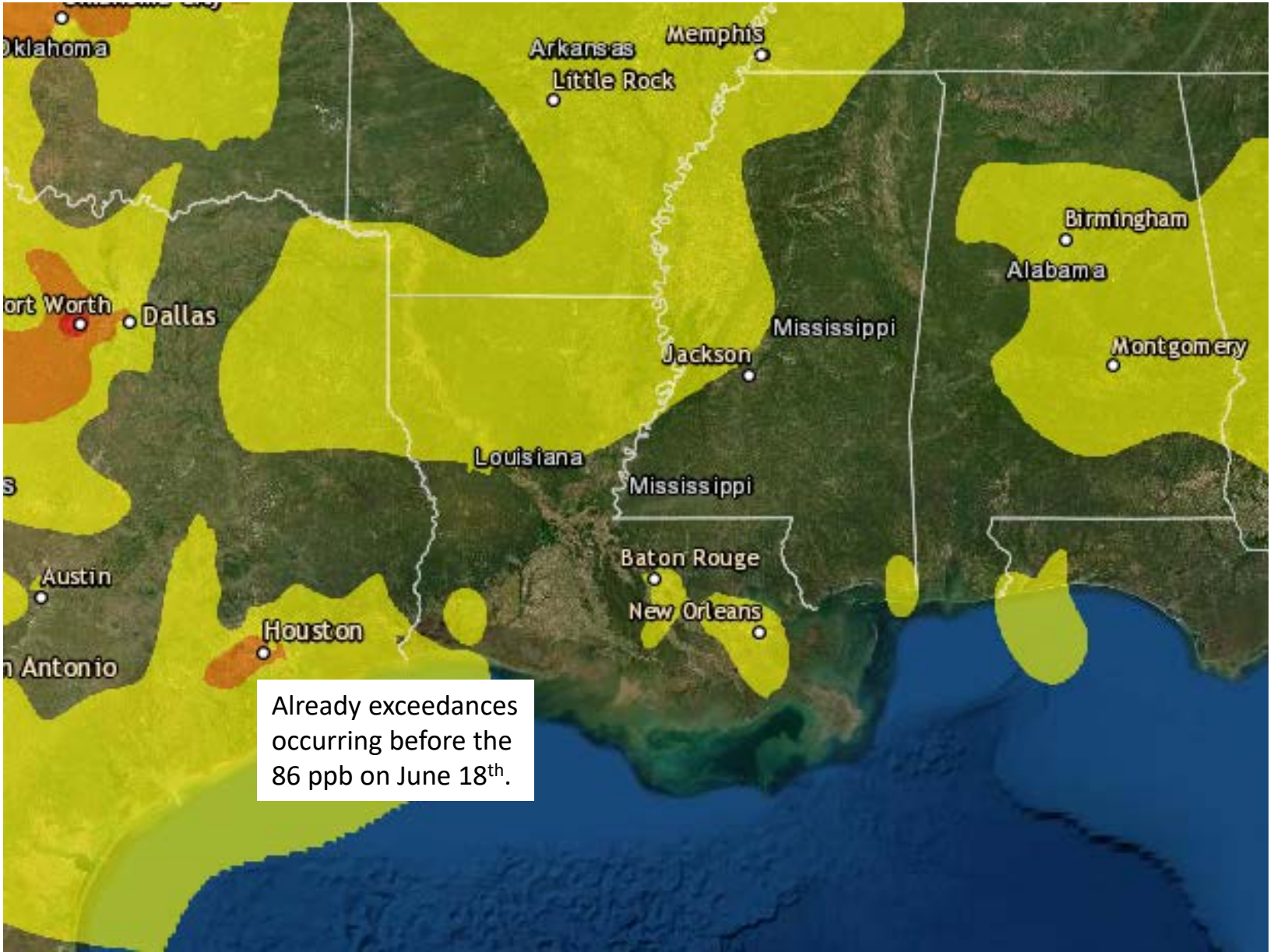


Low Level 24-hr Back Trajectories the Day AL could have Contributed to Denton (Dallas) 9-12-21 73 ppb

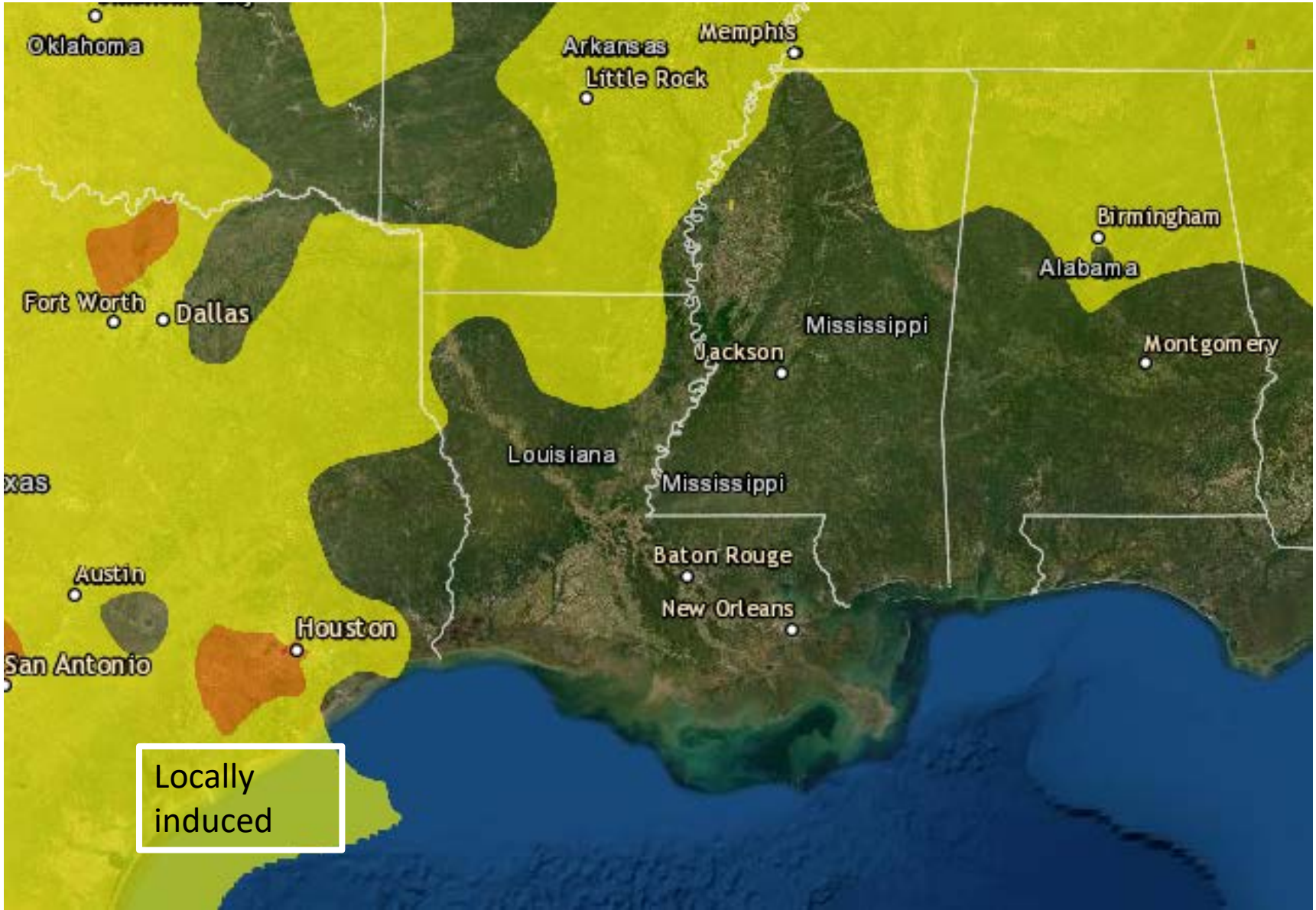


Harris County, TX (Houston) Air Quality Study on 3 Days when Alabama could have Contributed to an Ozone Exceedance

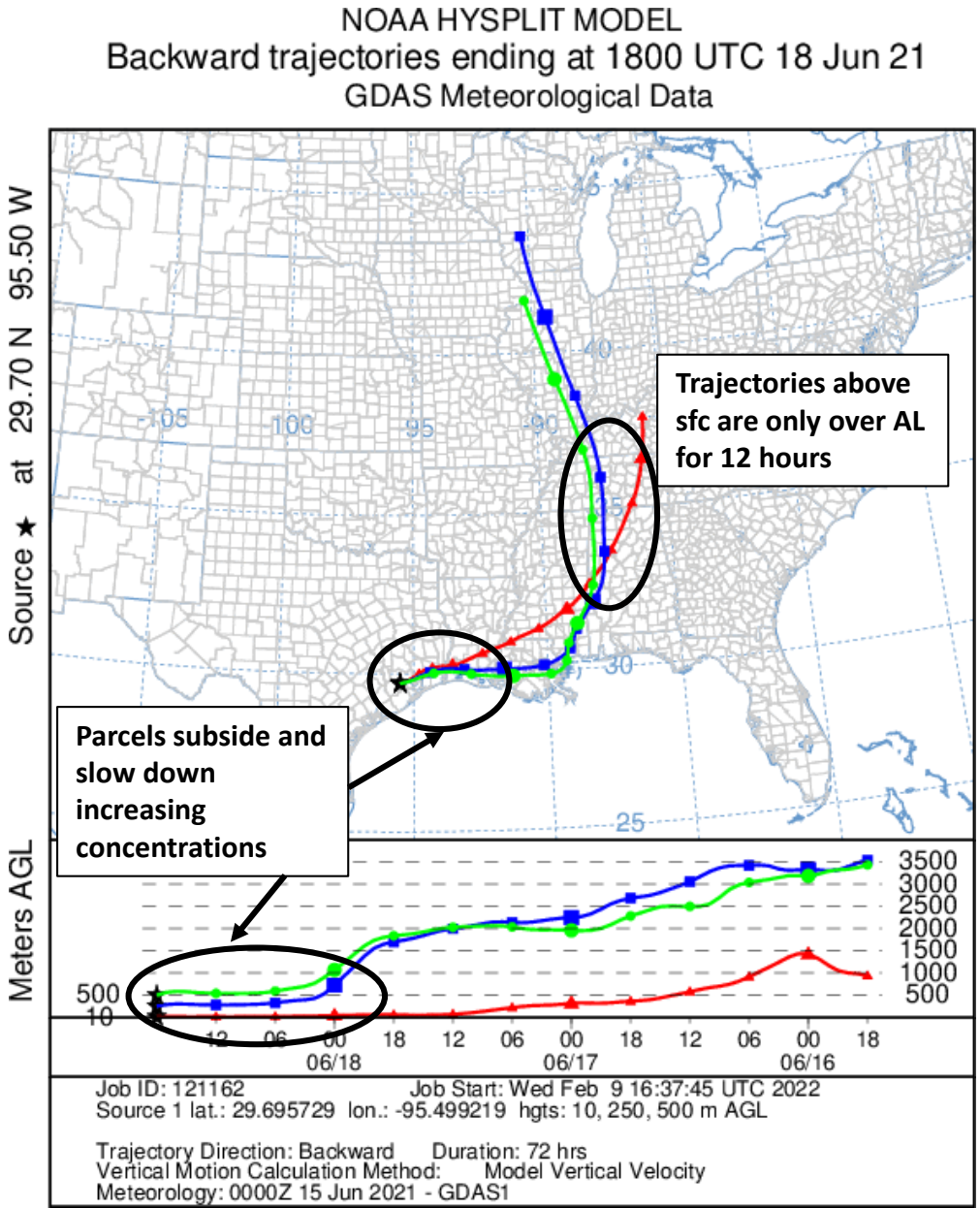
3 Days before AL could have Contributed to Harris (Houston) 86 ppb on June 18, 2021



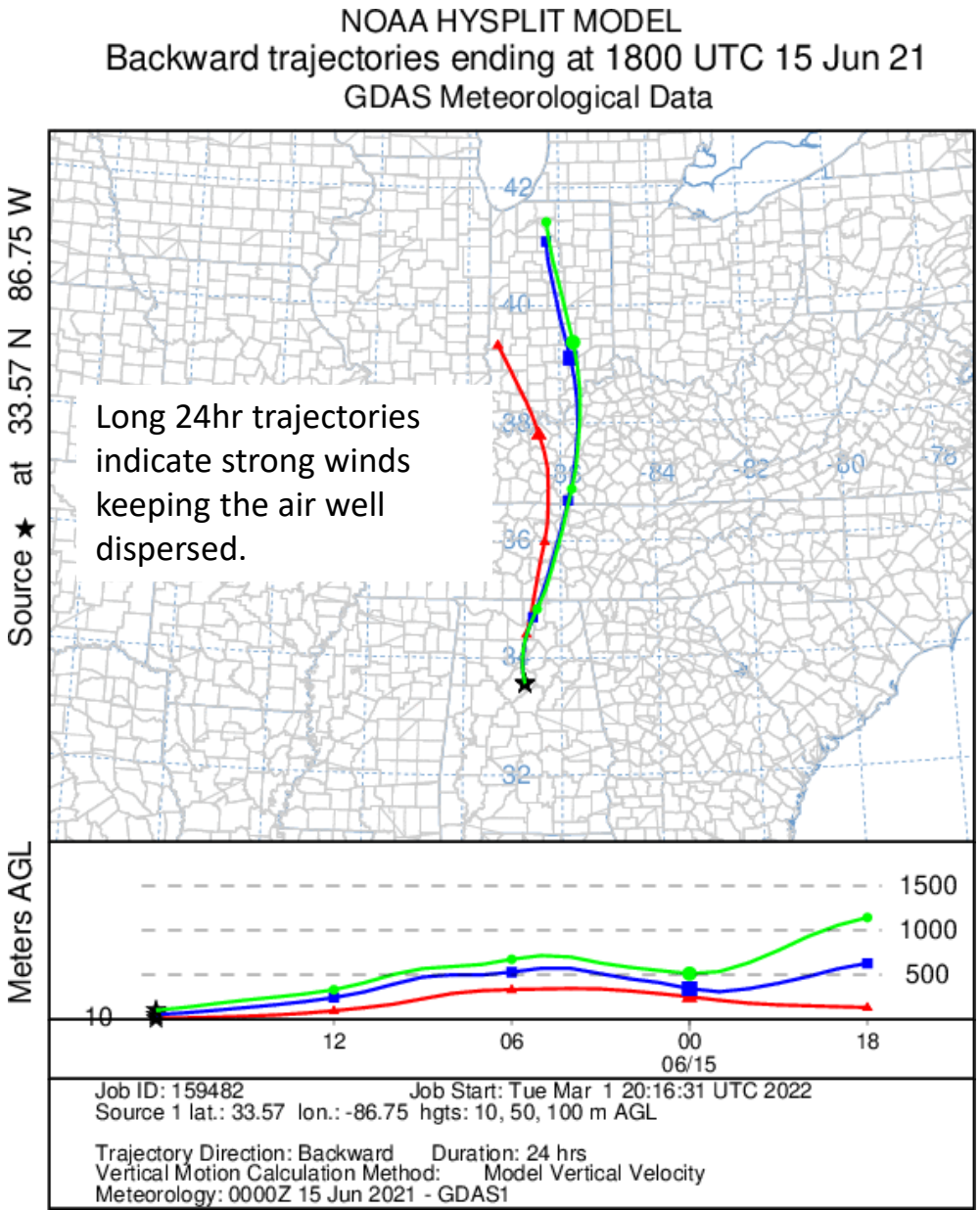
The Day AL could have Contributed to Harris (Houston) 86 ppb
On June 18, 2021



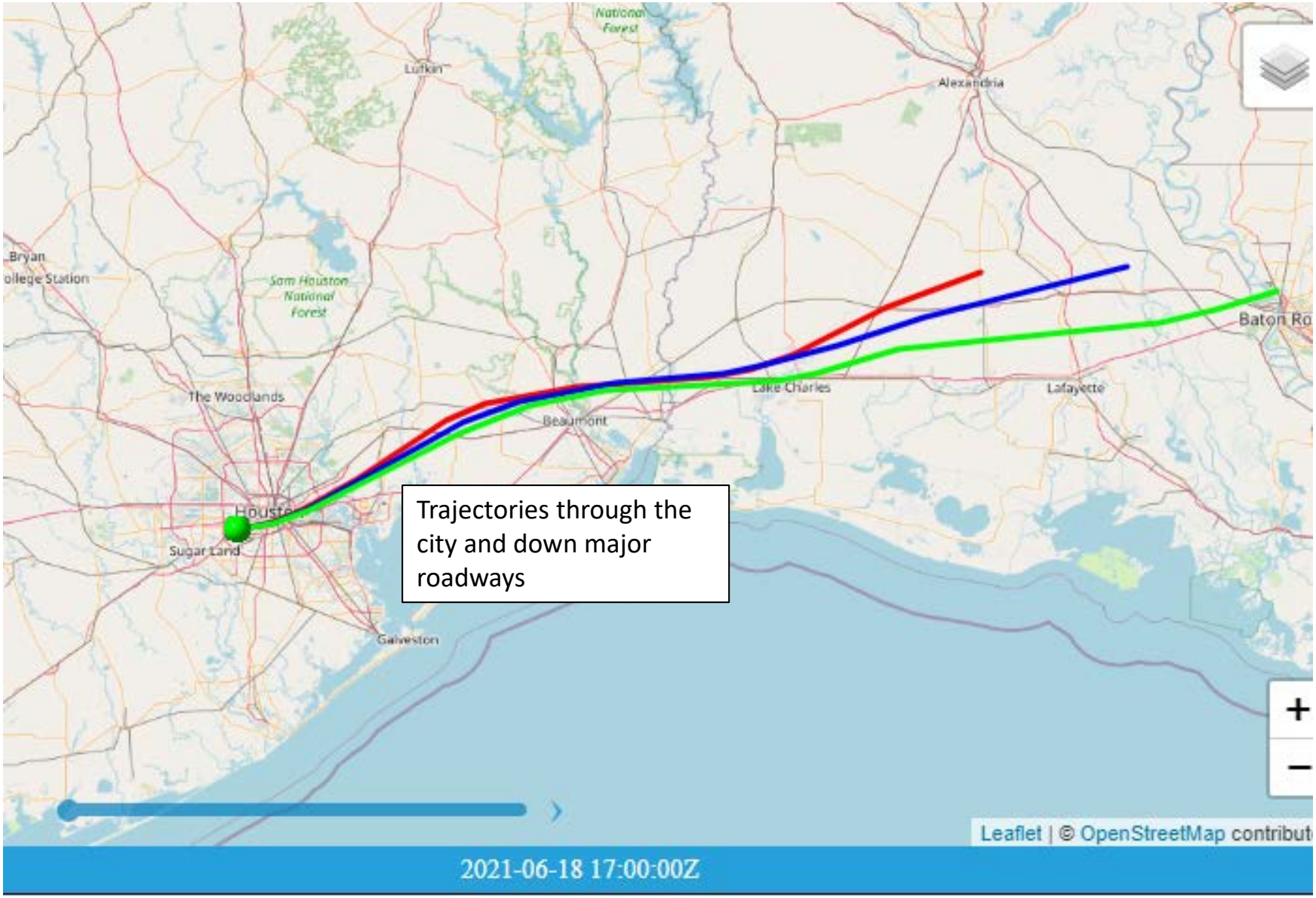
Back Trajectories the Day AL could have Contributed to Harris (Houston)
June 18, 2021 Ozone = 86 ppb



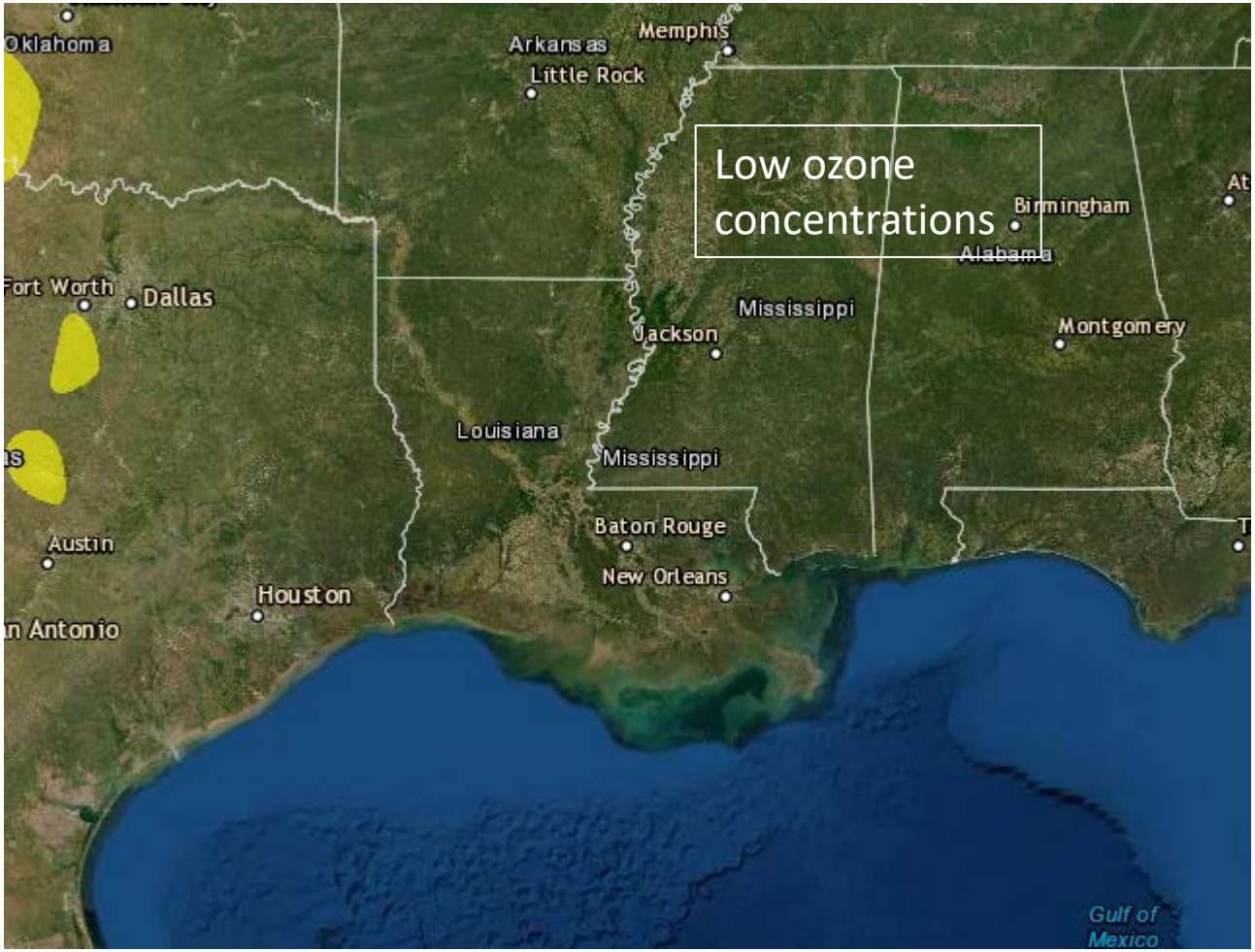
24-hr Low Level Back Trajectories from Birmingham 3 Days before AL could have Contributed to Harris(Houston)



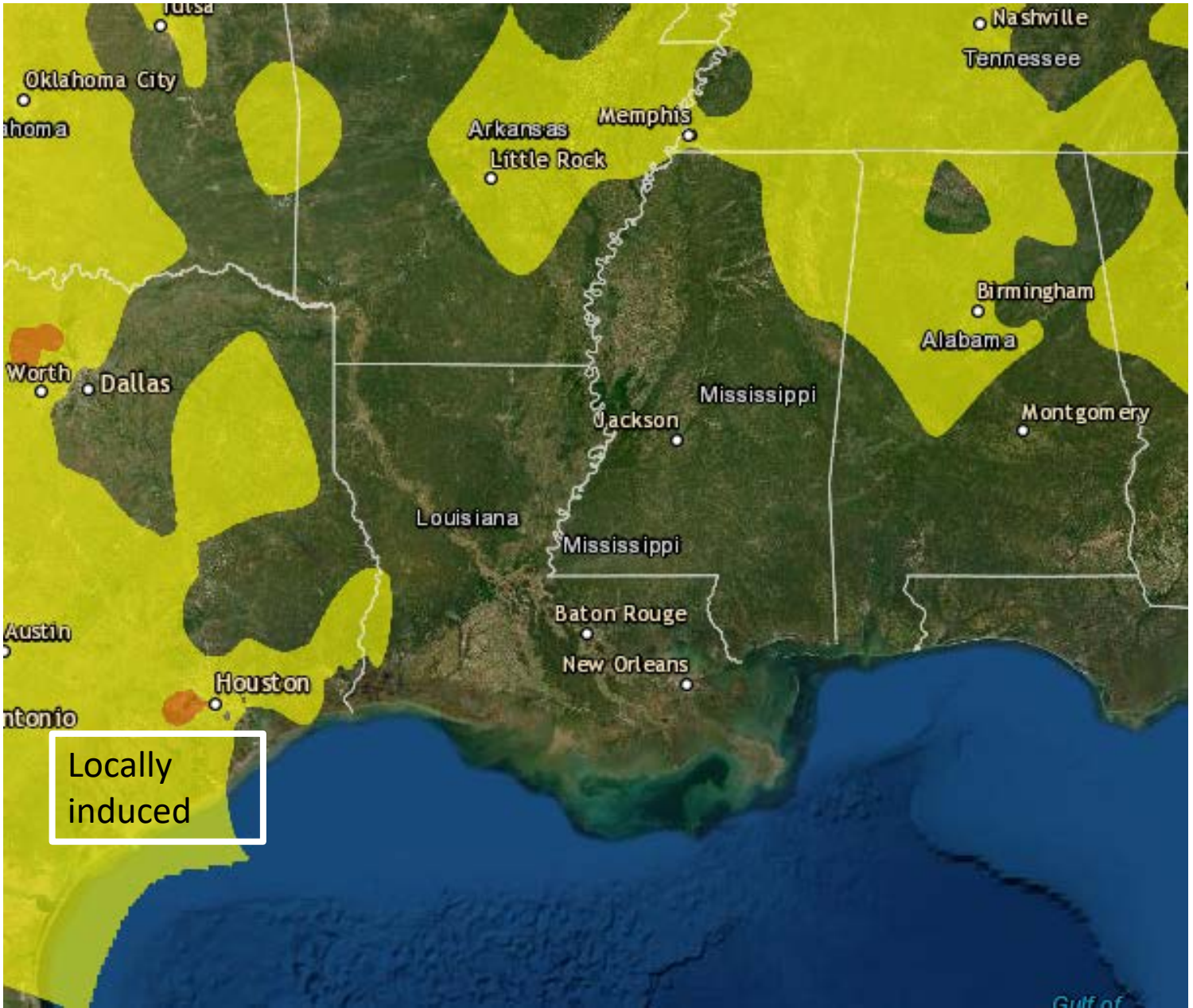
Low Level 24-hr Back Trajectories the Day AL could have Contributed to Harris (Houston) 6-18-21 86 ppb



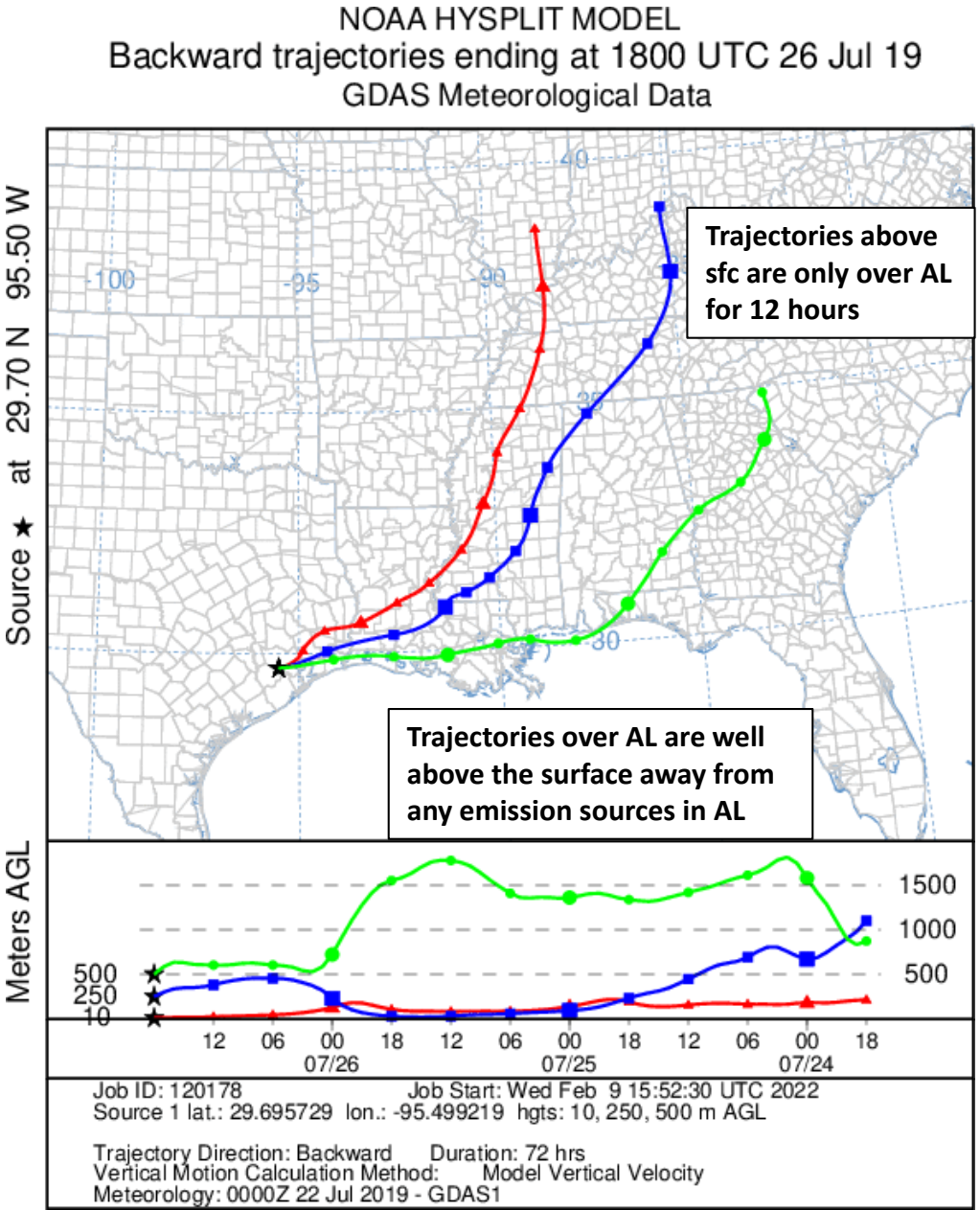
3 Days before AL could have Contributed to Harris (Houston) 73 ppb on July 26, 2019



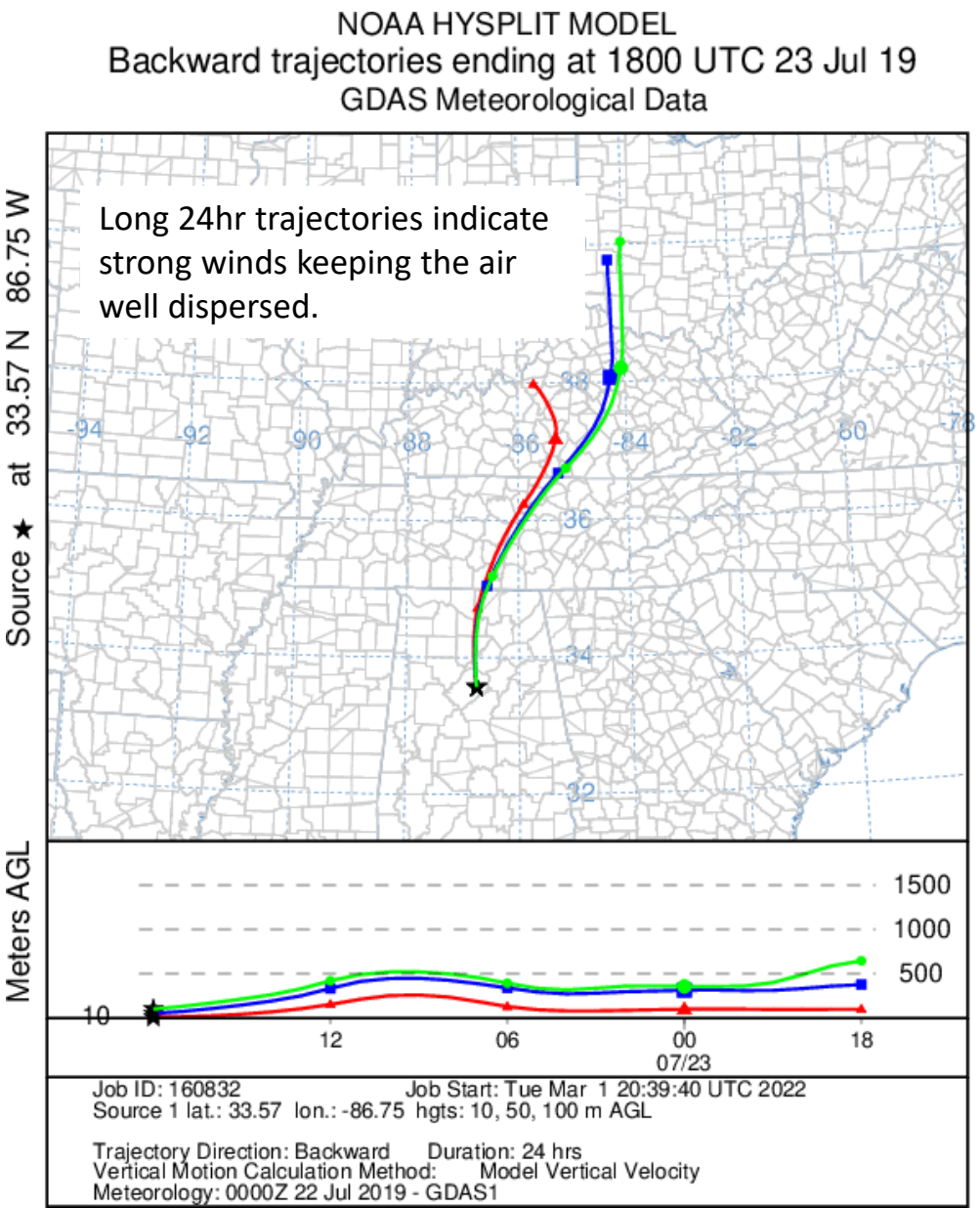
The Day AL could have Contributed to Harris (Houston) 73 ppb
On July 26, 2019



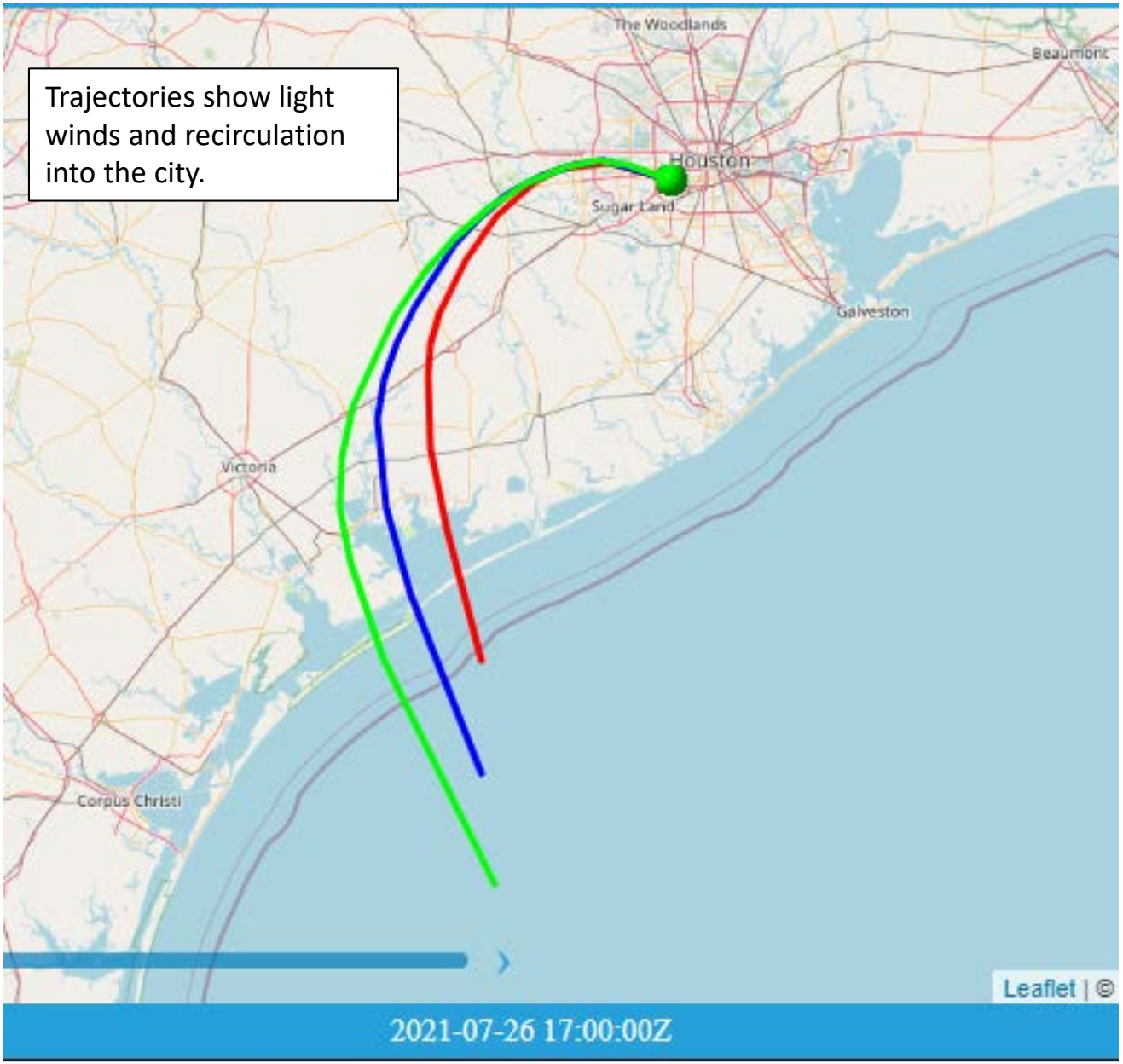
Back Trajectories the Day AL could have Contributed to Harris (Houston)
July 26, 2019 Ozone = 73 ppb



24-hr Low Level Back Trajectories from Birmingham 3 Days before AL could have Contributed to Harris(Houston)

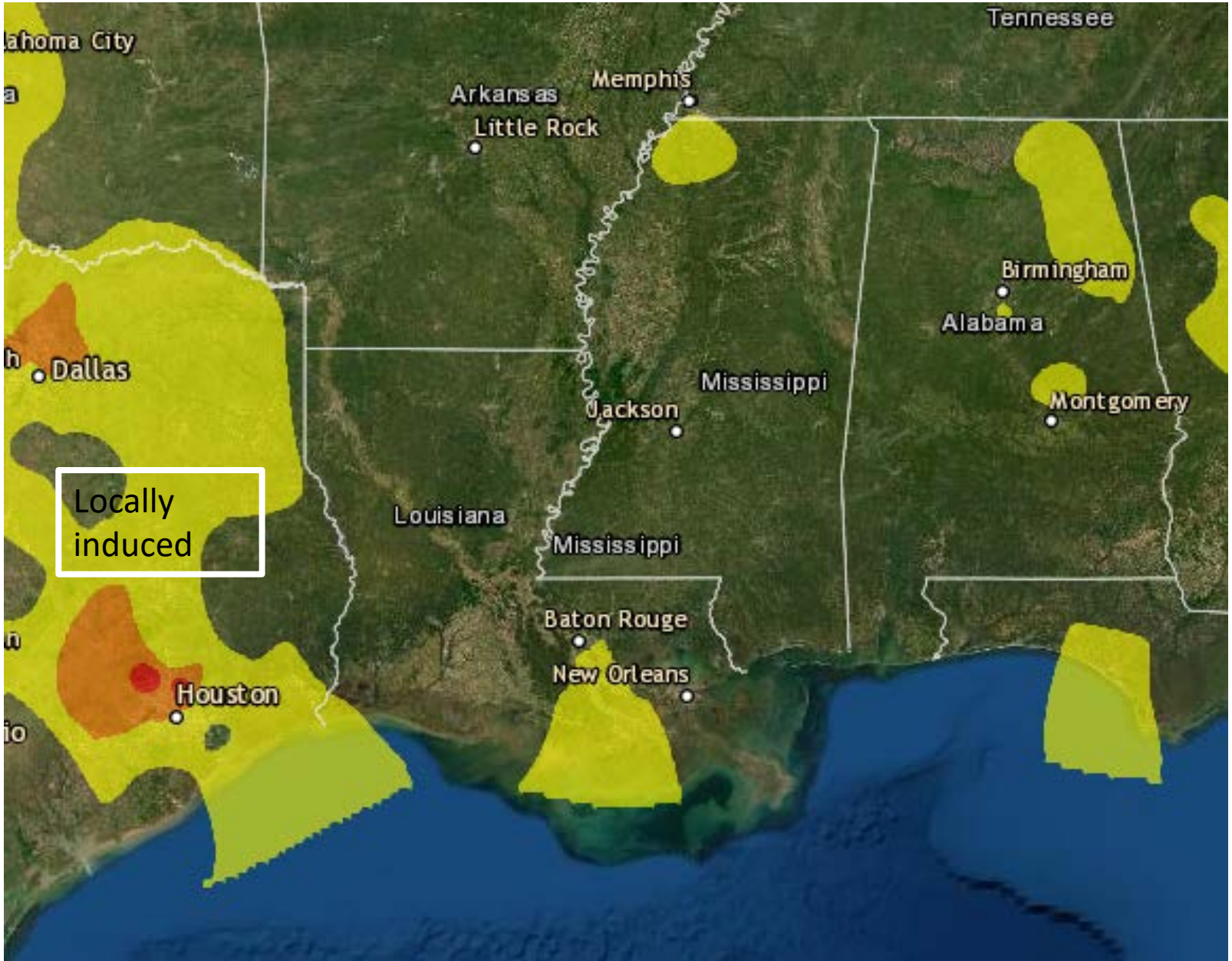


Low Level 24-hr Back Trajectories the Day AL could have Contributed to Harris (Houston) 7-26-19 73 ppb

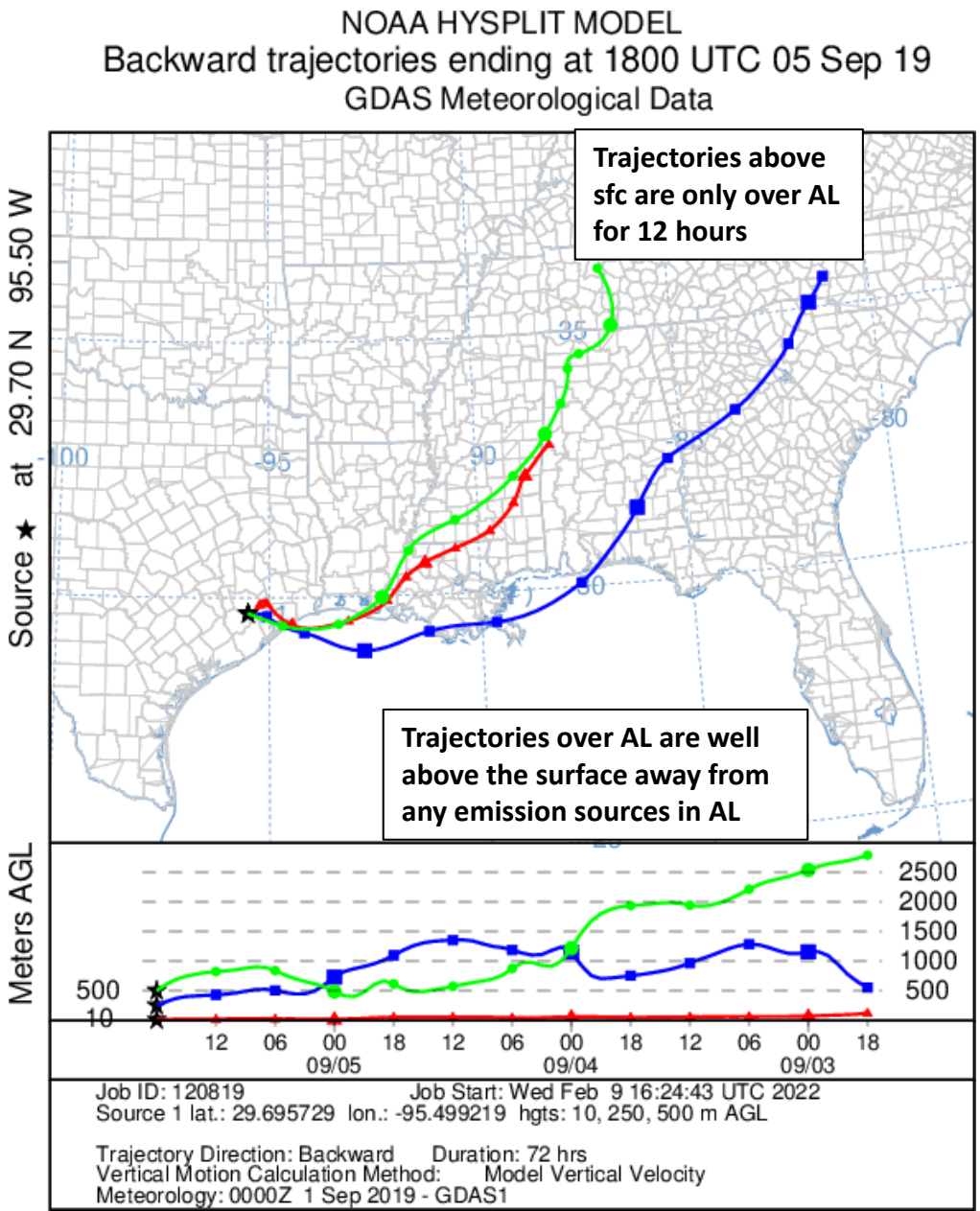


3 Days before AL could have Contributed to Harris (Houston) 73 ppb on September 5, 2019

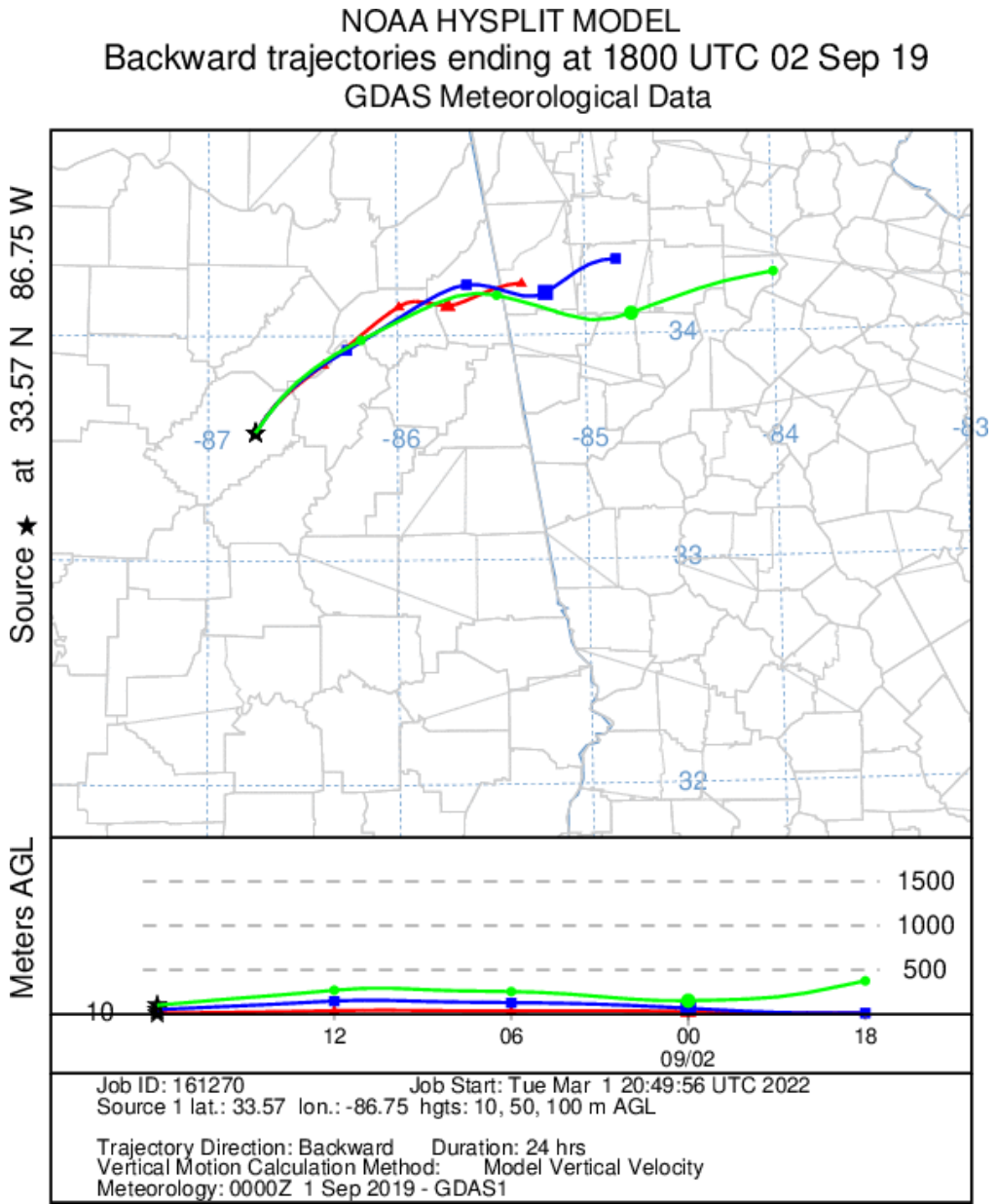
The Day AL could have Contributed to Harris (Houston) 73 ppb
On September 5, 2019



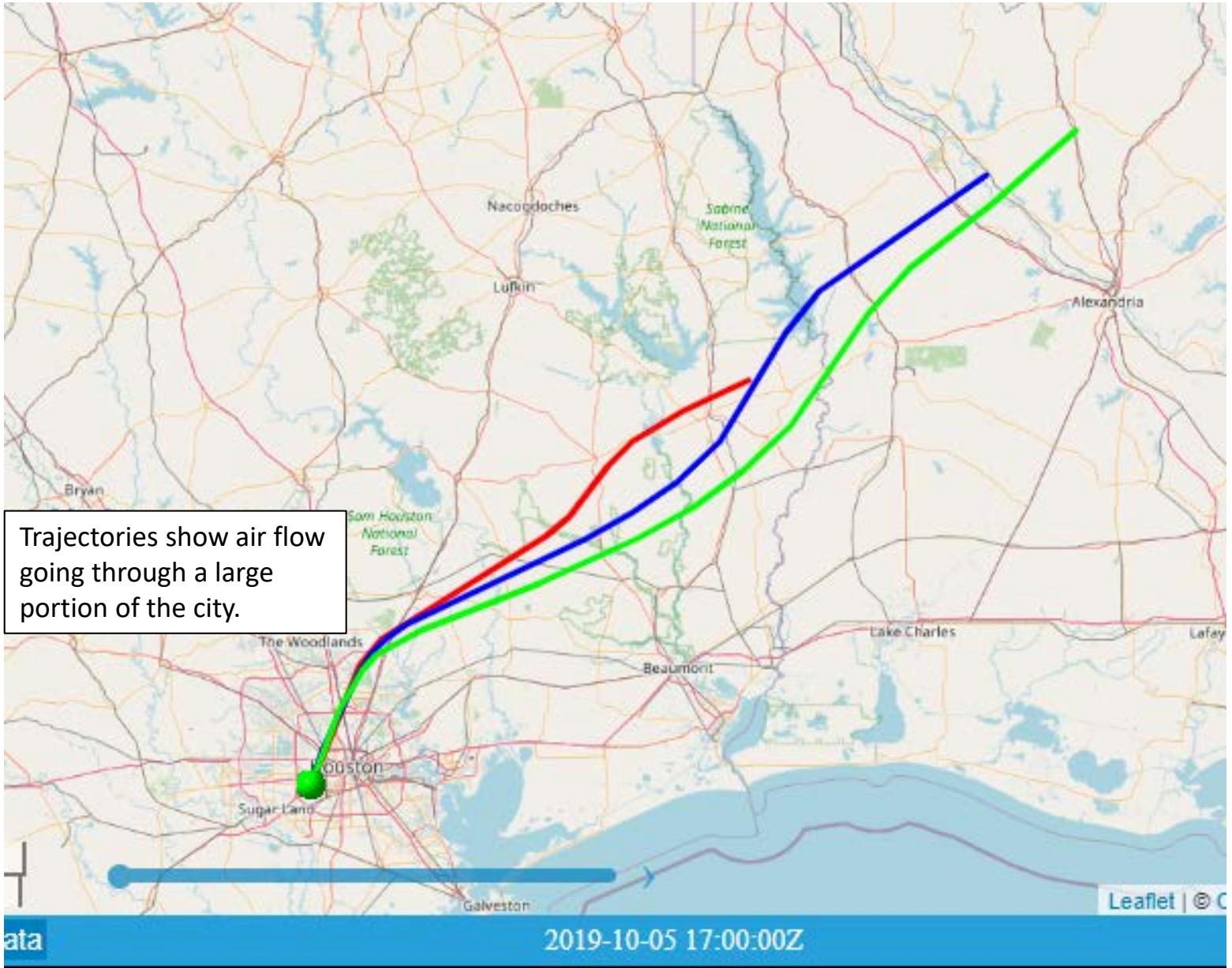
Back Trajectories the Day AL could have Contributed to Harris (Houston)
September 5, 2019 Ozone = 73 ppb



24-hr Low Level Back Trajectories from Birmingham 3 Days before AL could have Contributed to Harris(Houston)

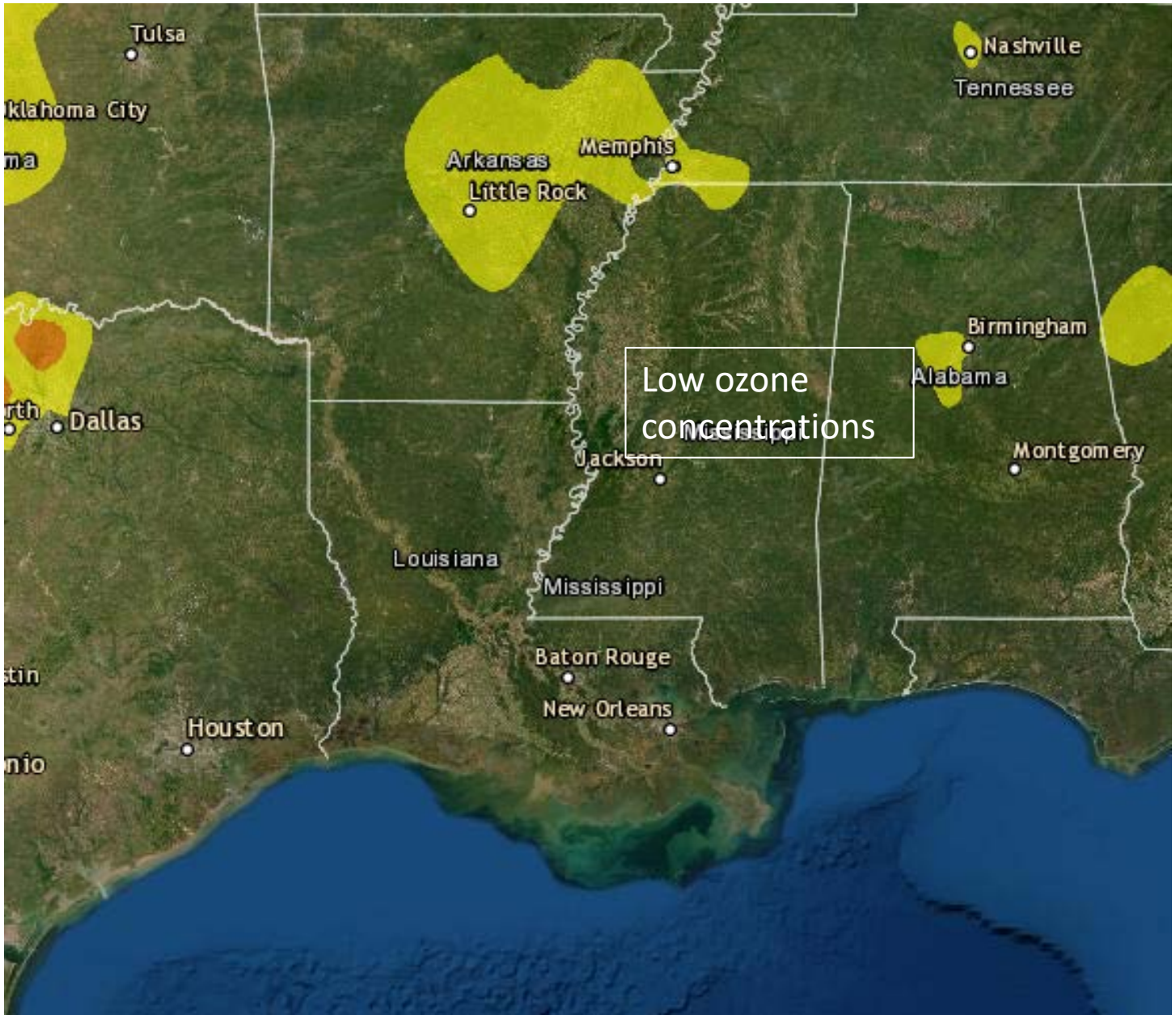


Low Level 24-hr Back Trajectories the Day AL could have Contributed to Harris (Houston) 9-5-19 73 ppb

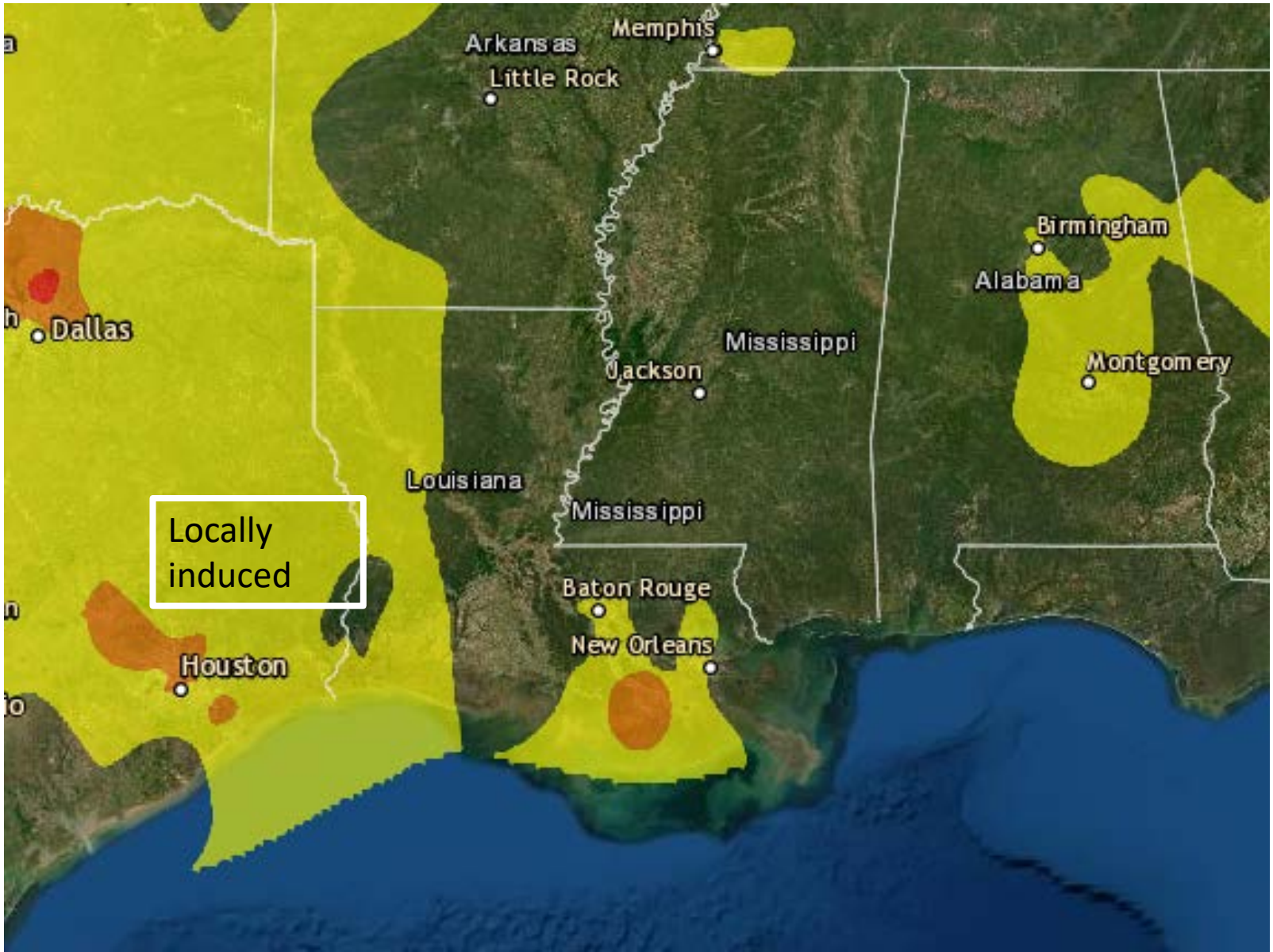


Trajectories show air flow going through a large portion of the city.

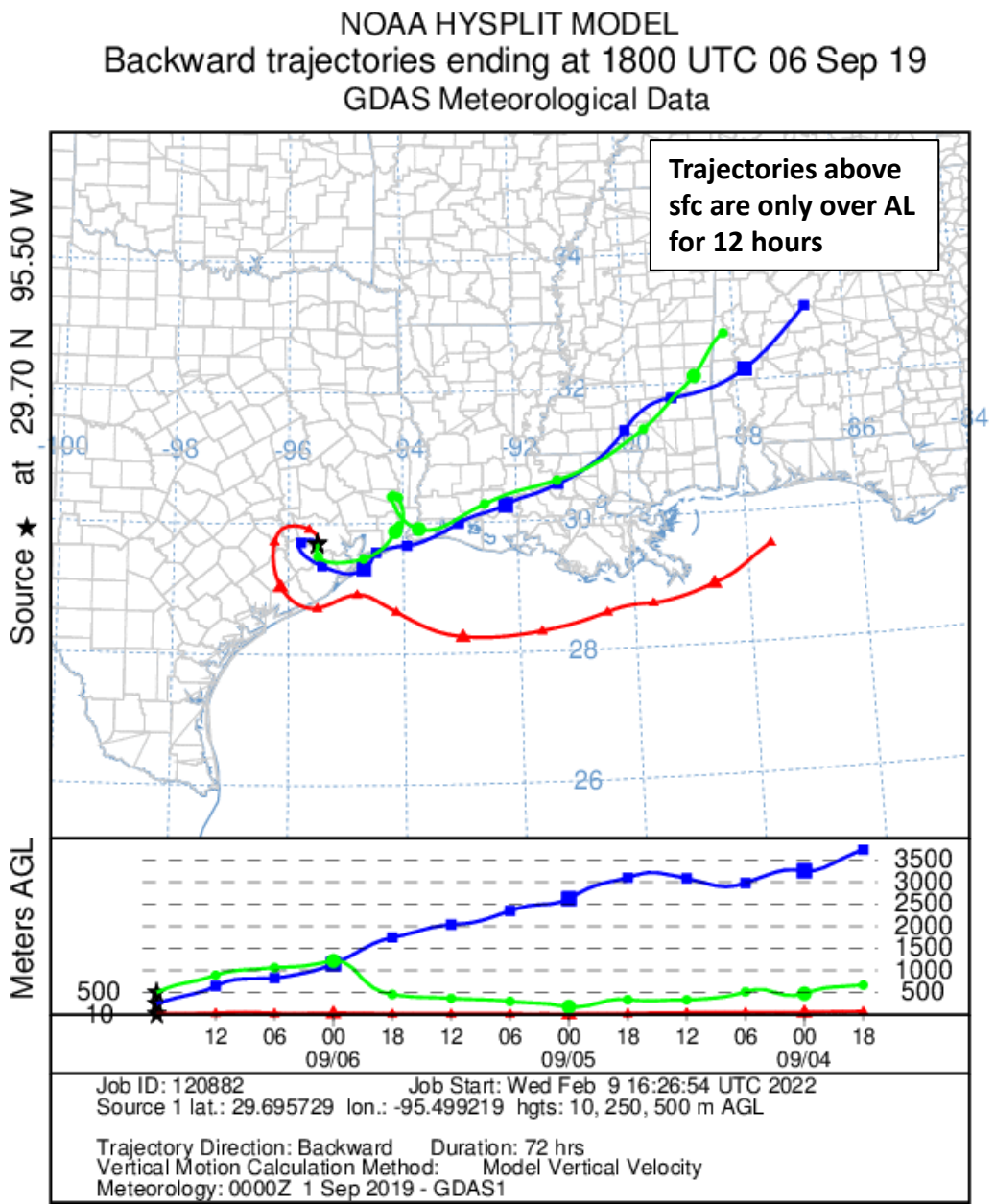
3 Days before AL could have Contributed to Harris (Houston) 72 ppb on September 6, 2019



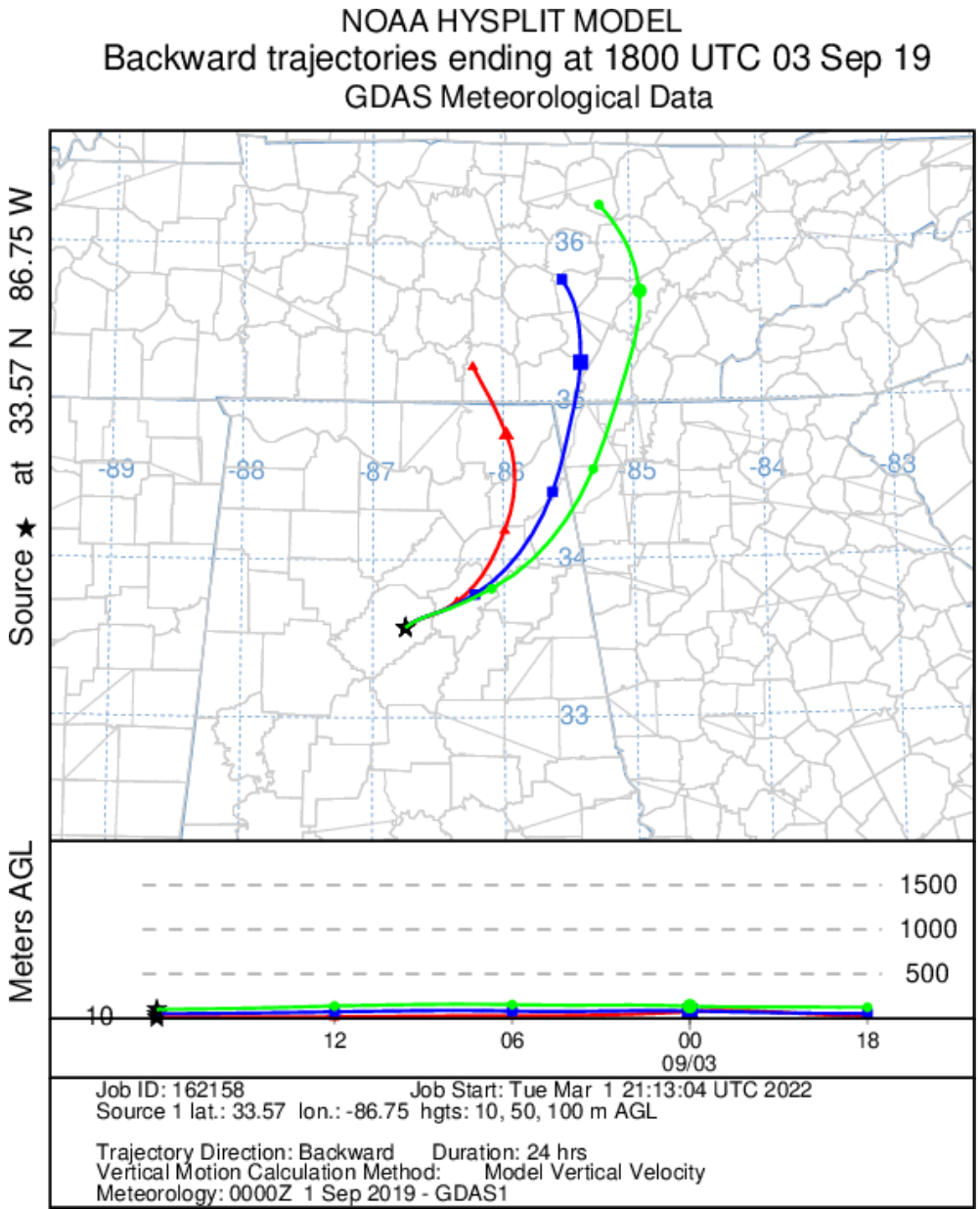
The Day AL could have Contributed to Harris (Houston) 72 ppb
On September 6, 2019



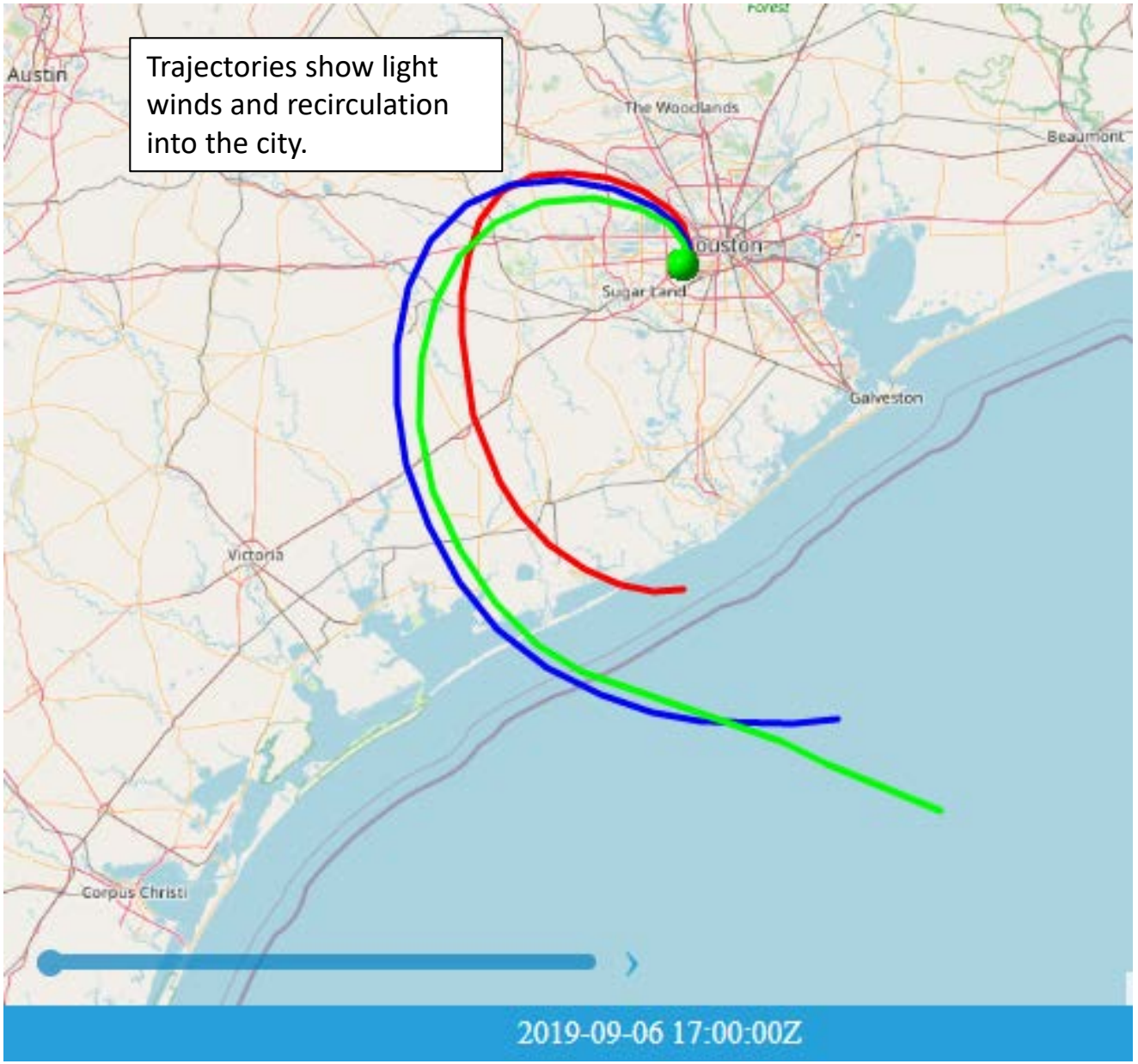
Back Trajectories the Day AL could have Contributed to Harris (Houston)
September 6, 2019 Ozone = 72 ppb

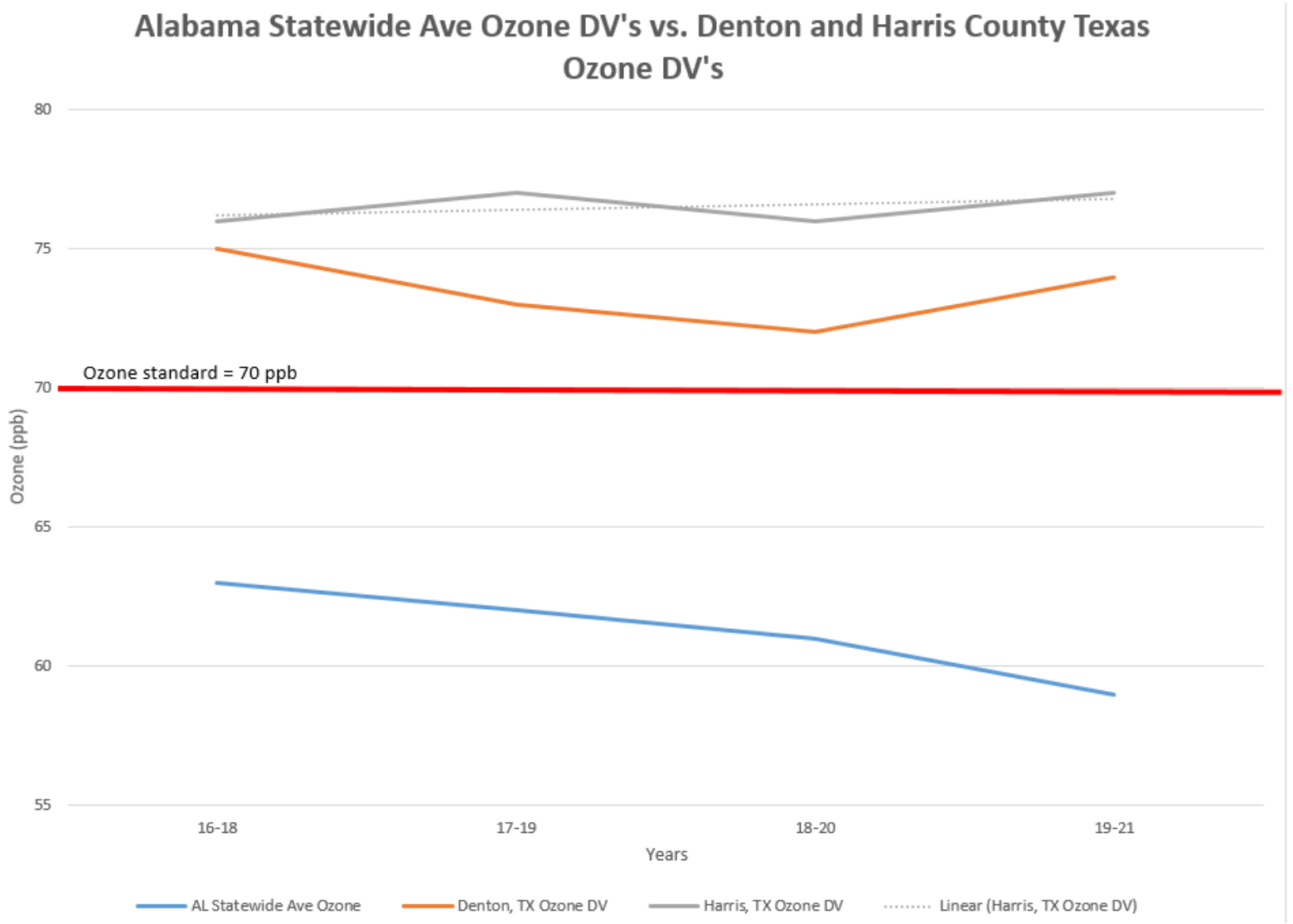


24-hr Low Level Back Trajectories from Birmingham 3 Days before AL could have Contributed to Harris(Houston)



Low Level 24-hr Back Trajectories the Day AL could have Contributed to Harris (Houston) 9-6-19 72 ppb





- Note that the Texas DVs for both Denton and Harris are steady or even increasing over the period.
- As for Alabama, the statewide DV average continues to decrease with a 4 ppb drop through the period.
- This likely contributes to less contributions to downwind sites like Texas.