NOTE: THIS SAMPLE REPORT IS MEANT TO SHOW YOU WHAT OUR REPORTS GENERALLY LOOK LIKE. EACH REPORT WILL BE CATERED SPECIFICALLY TO YOUR CASE. NAMES AND LOCATIONS HAVE BEEN CHANGED TO PRESERVE CONFIDENTIALITY.

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FORENSIC WEATHER CONSULTANTS

AMERICAN METEOROLOGICAL SOCIETY
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FORENSIC WEATHER INVESTIGATION OF THE WEATHER CONDITIONS AND RAIN ACCUMULATION ON JULY 7, 2020 AT THE INTERSECTION OF YANTIS DRIVE AND JOHNSTOWN ROAD IN NEW ALBANY, OHIO

December 23, 2020

CASE NAME:	"Mark Rathbone v. Kenneth Goodheart"
CLAIM NUMBER:	MVA98765
DATE AND TIME OF INCIDENT:	July 7, 2020 between 4:00 p.m. and 7:00 p.m. EDT
PREPARED FOR:	Mr. David Noone, Esquire
COMPANY:	The Law Firm, PLLC

This written report and all of the tables, graphs, findings, data, and opinions contained in it has been prepared for use with this specific case only. Use of any of this information for any other matter, claim or case other than what is indicated above, including for use in expert disclosures in other cases, is strictly prohibited.

ASSIGNMENT:

This case was assigned to me by The Law Firm, PLLC. I was asked to perform an in-depth weather analysis and forensic weather investigation at the intersection of Yantis Drive and Johnstown Road in New Albany, Ohio in order to determine what the weather conditions were on the day of the accident.

Forensic Weather Consultants, LLC uses various reliable sources of weather information in order to conduct a reliable weather analysis. In order to accurately determine the weather conditions that existed leading up to and including the time of the accident, a detailed search was performed to find the closest, official weather stations to the accident location. Using the computer program "Google Earth", weather station locations provided by the National Centers for Environmental Information (NCEI) and MesoWest were plotted and are indicated by a yellow pushpin. MesoWest is a cooperative project that was started at the University of Utah in 1996 with a goal of providing access to current and archived weather observations from across the United States through internet-based resources.

While not all of the weather data can be certified by the NCEI, it is mostly if not all housed and maintained on National Weather Service websites including ncei.noaa.gov and raws.wrh.noaa.gov and are the records that meteorologists rely upon during the normal course of business to conduct these investigations.

GENERAL REVIEW OF WEATHER DATA SOURCES

Many different types of weather data are gathered and analyzed as part of our investigations. While some, but not necessarily all, of these weather data sources were utilized for this case, we are providing a list of the different types of stations for informational purposes.

The Automated Surface Observing Systems (ASOS) program is a joint effort of the National Weather Service (NWS), the Federal Aviation Administration (FAA), and the Department of Defense (DOD). The ASOS systems serve as the nation's primary surface weather observing network. The ASOS systems compile various weather observations, often more than once per hour, called Local Climatological Data (**LCD**) that are reviewed, maintained, and stored by NOAA.

Through the National Weather Service (NWS) Cooperative Observer Program (**COOP**), more than 10,000 volunteers take daily weather observations at National Parks, seashores, mountaintops, and farms as well as in urban and suburban areas. COOP data usually consists of daily maximum and minimum temperatures, snowfall, and 24-hour precipitation totals ending at a specific time, such as 7:00 a.m. in many locations.

The Community Collaborative Rain, Hail and Snow Network (**CoCoRaHS**) is a network consisting of volunteer weather observers across the United States, Canada, and the Bahamas. These volunteers take daily precipitation measurements and report them to a centralized data store online, where this data is heavily utilized by the NWS, meteorologists, emergency

managers and city utilities. CoCoRaHS data is particularly useful in situations where storm systems produce sharp precipitation gradients.

The Citizen Weather Observer Program (**CWOP**) is a group of ham radio operators and other private citizens around the world that have volunteered the use of their weather data for education, research, and other uses. This program includes Internet-only connected stations, and Automatic Packet Reporting System (**APRS**) stations.

AirNow data is collected using federal reference or equivalent monitoring techniques or techniques approved by the state, local or tribal monitoring agencies. To maintain "real-time" maps, the data are displayed after the end of each hour. Although preliminary data quality assessments are performed, the data in AirNow are not fully verified and validated through the quality assurance procedures monitoring organizations used to officially submit and certify data on the EPA Air Quality System (AQS). The U.S. Environmental Protection Agency, National Oceanic and Atmospheric Administration, National Park Service, tribal, state, and local agencies developed the AirNow system to provide the public with easy access to national air quality information. State and local agencies report the air quality index (AQI) for cities across the US and parts of Canada and Mexico.

The **WeatherSTEM** network is a collection of weather stations that provide up-to-the-minute information, reporting wind speed, humidity, rainfall, ozone, heat index, cloud coverage and many other elements. It was initially created to infuse K-12 STEM curriculum with live data collected by weather instruments, cloud cameras, agricultural probes, and other sensors.

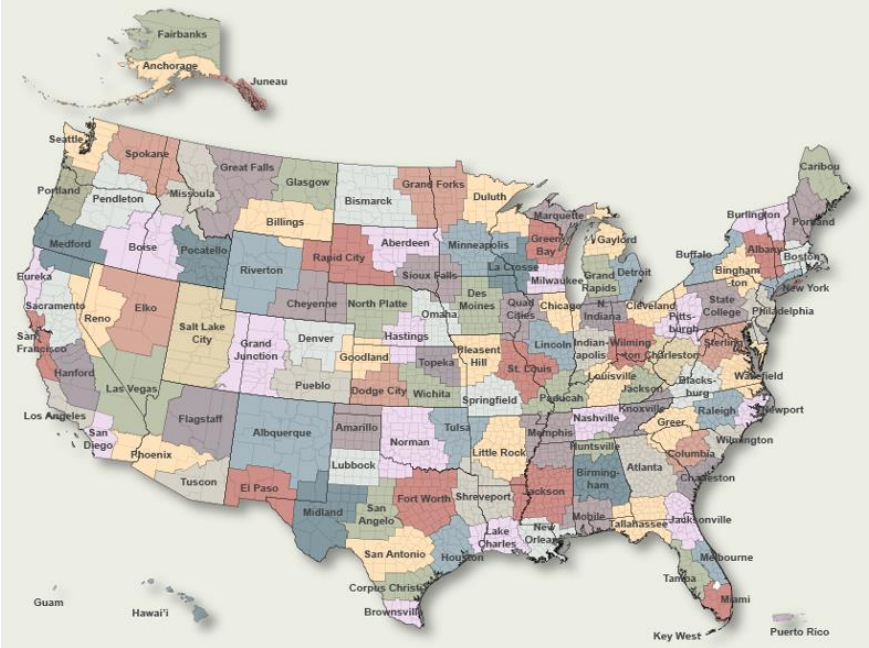
The Integrated Flood Warning and Observing Program **(IFLOWS)** began as a pilot project in seven Appalachian states (KY, NC, NY, PA, TN, VA, and WV). This is part of the Automated Flood Warning System (AFWS). The vast majority of these AFWS networks are equipped with precipitation gages, but small numbers of stream gages are also included in some systems. AFWS precipitation and stream gages directly benefit the communities in which they operate by supplying data for any municipal functions including water supply monitoring, recreation forecasts, navigation, sewer and waste treatment operations, power generation, structural design, and emergency planning. Most importantly, gages save lives and reduce property damage by providing critical, real-time information to NWS, other Federal agencies, and public officials at all levels of state and local government. In many instances AFWS provide data from locations and at times for which no other information is available, making them vital for protecting the public and the Nation’s infrastructure.

One of the most effective tools to detect precipitation is radar. Radar, which stands for RAdio Detection And Ranging, has been utilized to detect precipitation, and especially thunderstorms, since the 1940's. The radar used by the National Weather Service is called the WSR-88D, which stands for Weather Surveillance Radar - 1988 Doppler (the prototype radar was built in 1988). As its name suggests, the WSR-88D is a **Doppler radar**, meaning it can detect motions toward or away from the radar as well as the location of precipitation areas. There are approximately 155 WSR-88D Doppler radar in the nation, including the U.S. Territory of Guam and the Commonwealth of Puerto Rico, operated by the National Weather Service and the Department of Defense. Doppler radar images and several other types of weather records were used in this

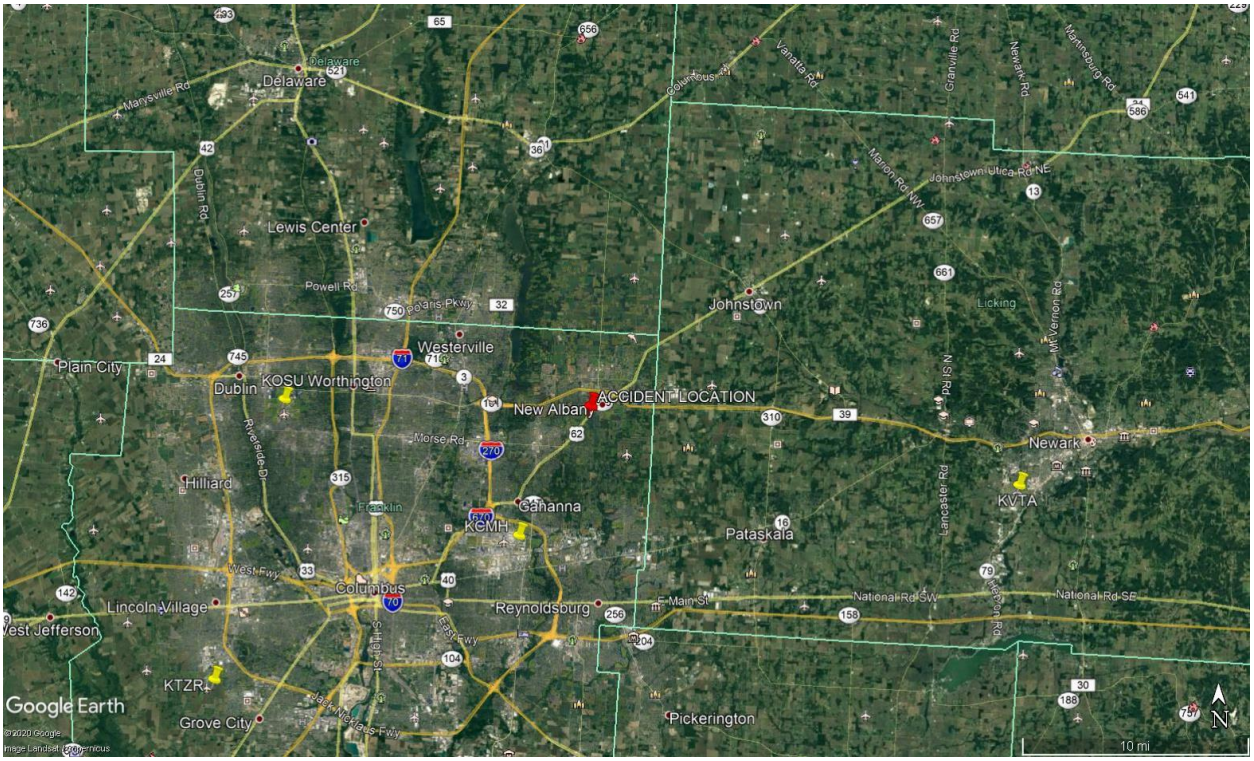
study. Doppler radar images are useful for locating precipitation. As the radar unit sends a pulse of energy into the atmosphere and if any precipitation is intercepted by the energy, part of the energy is scattered back to the radar. These return signals, called "radar echoes", are assembled to produce radar images. The location of these radar echoes helps indicate where precipitation may be falling, and the various colors on the color code key on the right side of the radar image indicates intensity. Doppler radar images are processed approximately every 1 to 5 minutes and can determine if precipitation was falling at the accident location and if so, when it started and stopped.

Storm Total Precipitation (S.T.P.) images are also received approximately every 6 minutes and give an estimate as to how much rain has accumulated with the storm. The S.T.P. images are especially useful in determining rainfall amounts where rain measurement equipment is not present. In order to generate the S.T.P Doppler Radar images, the National Oceanic and Atmospheric Administration's (NOAA's) Weather and Climate Toolkit was utilized. It is important to note that within this radar-viewing program, the locations of most airports are indicated by a green pushpin. In addition, the locations of the Automated Surface Observing Systems (ASOS)/Automated Weather Observing Systems (AWOS) are indicated by a blue pushpin. These airports and weather stations are plotted in locations corresponding to the metadata on file with the National Centers for Environmental Information.

The National Weather Service (NWS) offices around the country issue numerous weather alerts, advisories, warnings, statements, bulletins, and storm reports and these are also utilized in our investigations. A map depicting the locations of these NWS offices can be found below.

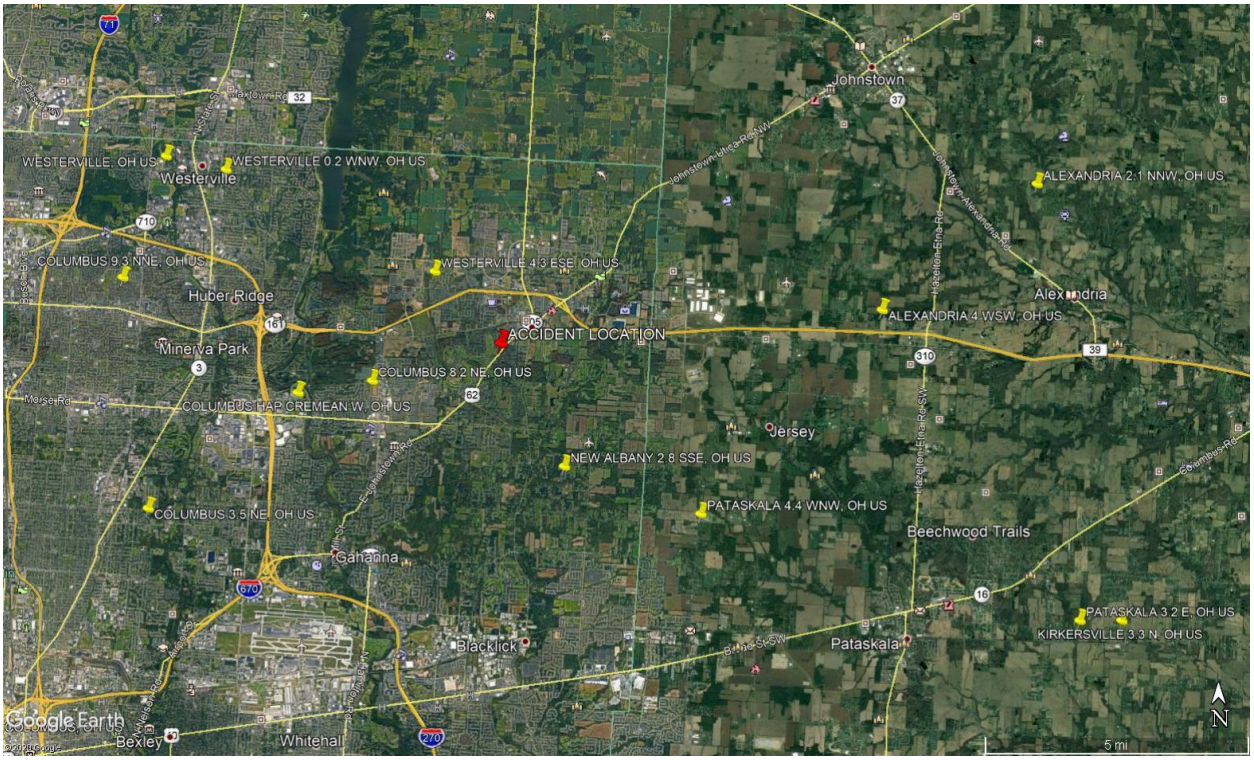


The accident location was plotted by our office and is indicated by a red pushpin. The following map will help give you an approximate location of the National Weather Service Hourly Surface Weather Observations stations and their proximity to the accident location.



The following map will help give you an approximate location of the AirNow, Citizen Weather Observer Program (CWOP), WeatherSTEM, and Integrated Flood Warning and Observing Program (IFLOWS) stations and their proximity to the accident location.

The following map will help give you an approximate location of the Cooperative Observer Program (COOP) and Community Collaborative Rain, Hail and Snow Network (CoCoRaHS) stations we used in this study and their proximity to the accident location.



<u>In order to perform my analysis of the weather conditions that existed, I obtained and reviewed official copies of the following weather records (the distance from the accident location and each weather station is also provided)</u>:

a. National Weather Service Hourly Surface Weather Observations/Local Climatological Data (LCD) from the John Glenn Columbus International Airport in Columbus, Ohio (approximately xxxx miles xxxxx of the accident location).

b. National Weather Service Hourly Surface Weather Observations/Local Climatological Data (LCD) from the Ohio State University Airport in Columbus, Ohio (approximately xxxx miles xxxx of the accident location).

c. National Weather Service Hourly Surface Weather Observations/Local Climatological Data (LCD) from the Newark-Heath Airport in Newark, Ohio (approximately xxxx miles xxxx of the accident location).

d. AirNow station reports from A4161 in New Albany, Ohio (approximately xxxx miles xxxx of the accident location).

e. WeatherSTEM station reports from 0891W – Marburn Academy in Ohio (approximately xxxx miles xxxx of the accident location).

f. Citizen Weather Observer Program (CWOP) station reports from DW1192 in New Albany, Ohio (approximately xxxx miles xxxx of the accident location).

g. Citizen Weather Observer Program (CWOP) station reports from EW1577 in New Albany, Ohio (approximately xxxx miles xxxx of the accident location).

h. Integrated Flood Warning and Observing Program (IFLOWS) station reports from BPKO1 – Blendon Woods Park in Ohio (approximately xxxx miles xxxx of the accident location).

i. Cooperative Observer Program (COOP) weather station reports from Columbus HAP Cremean WP, Ohio (approximately xxxx miles xxxx of the accident location).

j. Community Collaborative Rain, Hail, and Snow Network (CoCoRaHS) reports from Westerville 4.3 ESE, Ohio (approximately xxxx miles xxxx of the accident location).

k. Community Collaborative Rain, Hail, and Snow Network (CoCoRaHS) reports from Columbus 8.2 NE, Ohio (approximately xxxx miles xxxx of the accident location).

l. Community Collaborative Rain, Hail, and Snow Network (CoCoRaHS) reports from New Albany 2.8 SSE, Ohio (approximately xxxx miles xxxx of the accident location).

m. Community Collaborative Rain, Hail, and Snow Network (CoCoRaHS) reports from Alexandria 2.1 NNW, Ohio (approximately xxxx miles xxxx of the accident location).

n. Community Collaborative Rain, Hail, and Snow Network (CoCoRaHS) reports from Pataskala 3.2 E, Ohio (approximately xxxx miles xxxx of the accident location).

o. Community Collaborative Rain, Hail, and Snow Network (CoCoRaHS) reports from Kirkersville 3.3 N, Ohio (approximately xxxx miles xxxx of the accident location).

p. Online Community Collaborative Rain, Hail and Snow Network (CoCoRaHS) reports for Franklin County in Ohio, Delaware County in Ohio, and Licking County in Ohio.

q. Super-resolution Reflectivity Doppler Radar images from the Wilmington, Ohio radar site that were zoomed in over the accident location.

r. Storm Total Precipitation (S.T.P.) Doppler radar images from the Wilmington, Ohio radar site that were zoomed in over the accident location.

s. Gibson Ridge Analyst Edition (GRAE) data from the Wilmington, Ohio radar site.

t. Atmospheric sounding numerical data from Wilmington, Ohio on July 7, 2020.

u. Various weather bulletins, advisories and statements that were issued by the National Weather Service in Wilmington, Ohio.

v. Forensic Weather Consultants Severe Weather History Database.

w. Iowa Environmental Mesonet (IEM) Archived Warnings issued by the NWS in Wilmington, Ohio.

x. United States Surface Analysis Images from the Weather Prediction Center (WPC).

The weather data and Climatological records used for this analysis are the official records that Meteorologists rely upon every day during the normal course of business and are either kept in our office or at the National Centers for Environmental Information. The findings in this report utilize the weather records that were available at the time of data retrieval for this case. Any additional weather records and data that become available at a later date may be incorporated into this report in the future.

It should be noted that the radar image date and time stamps that are given on the Doppler radar images are given in "GMT", which is Greenwich Mean Time. In order to convert "GMT" to Eastern Daylight Time (EDT), a subtraction of 4 hours is necessary. Additionally, the hourly surface weather observations / Local Climatological Data are given in "Local Standard Time" which requires a one-hour forward time adjustment to obtain "Eastern Daylight Time (EDT)". The only exception to this is that some of the remarks themselves are given in GMT. The findings in this report have incorporated and converted all of these times correctly.

Numerous studies and research have been conducted which led to the accepted methodologies, standards, and practices that I employed during this study. These best practices and standards are based on documented research, accepted practices and principles that experienced meteorologists utilize in these kinds of investigations. Some of the many different guidelines can be found in online National Weather Service modules located at (https://training.weather.gov/wdtd/courses/rac/severe/svr-hail/presentation_html5.html), and they are utilized by NWS offices nationwide.

As part of my analysis, the accident location was manually plotted on each Doppler radar image in order to determine the intensity and values of the different radar products. These, along with the other weather records and data were used to complete my meteorological analysis.

The methodology, practices, and principles I employed researching, analyzing, and determining the weather information contained in this report is the industry-accepted way to determine the presence of hail, hail size, wind speeds, tornadoes, and other weather conditions at a specific accident location. My findings, including extrapolation of the radar data and weather records,

are all based on sound, scientific principles, practices, and accepted methodology in the field of meteorology.

STORM TOTAL PRECIPITATION (S.T.P.) ANALYSIS:

To determine the total rain accumulation for July 7th, 2020, Storm Total Precipitation (S.T.P.) Doppler Radar images were utilized (**Figures 1-4**). S.T.P. values at the accident location, 0891W – Marburn Academy, Columbus 8.2 NE, Ohio, and the John Glenn Columbus International Airport were determined, and then compared to ground truth observations from 0891W – Marburn Academy, Columbus 8.2 NE, Ohio, and the John Glenn Columbus International Airport.

Additionally, using S.T.P. Doppler radar, the total rain that accumulated between approximately 4:00-7:00 p.m. on July 7th, 2020 was also determined (**Figures 5-7**).

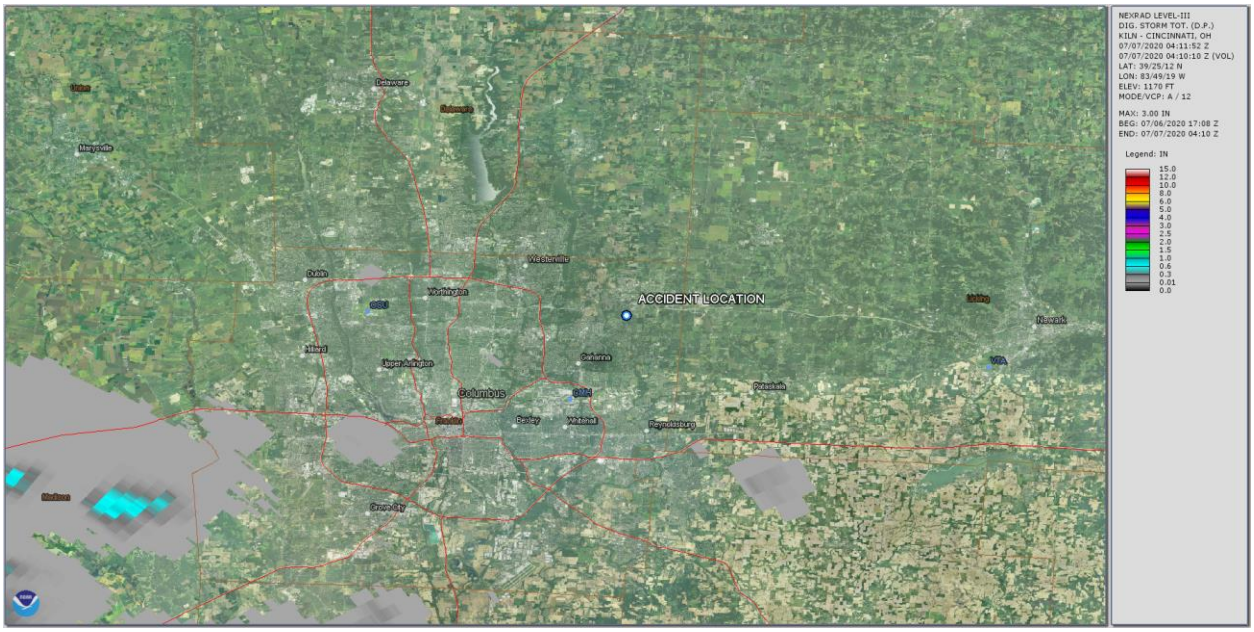


Figure 1: The Storm Total Precipitation (S.T.P) Doppler radar image above indicated that no rain accumulated at the accident location, 0891W – Marburn Academy, Columbus 8.2 NE, Ohio, or the John Glenn Columbus International Airport through approximately 12:10 a.m. EDT on July 7th, 2020.

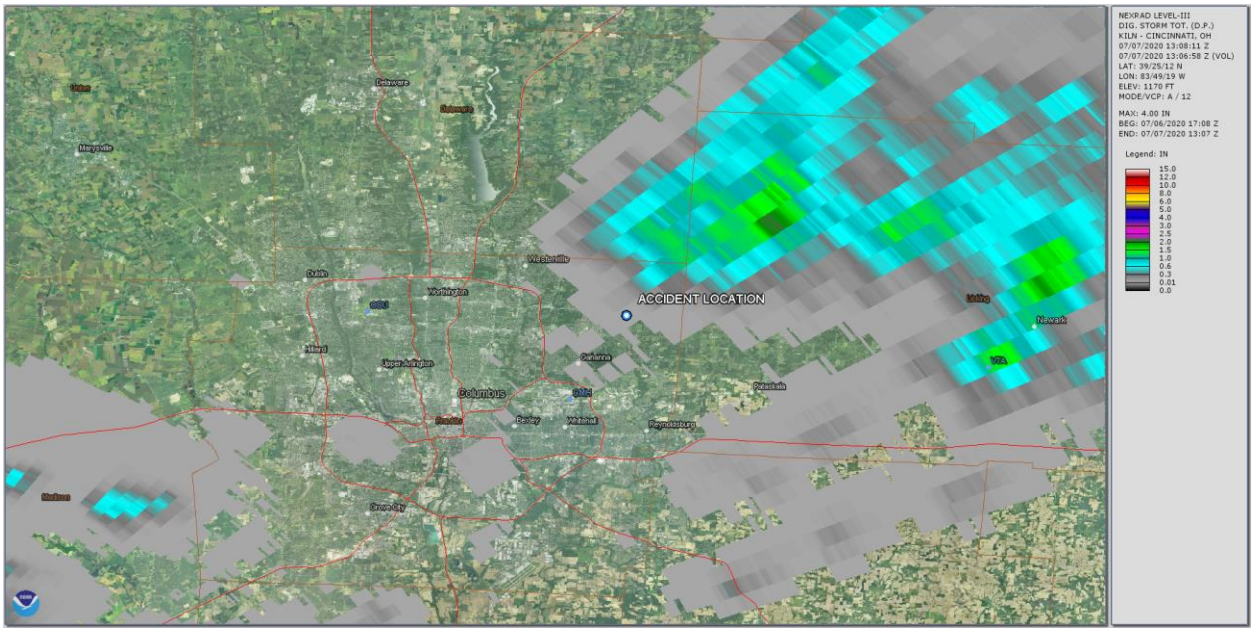


Figure 2: The Storm Total Precipitation (S.T.P) Doppler radar image above indicated that approximately 0.02" of rain accumulated at the accident location, 0.08" of rain accumulated at 0891W – Marburn Academy, 0.00" of rain accumulated at Columbus 8.2 NE, Ohio, and 0.00" of rain accumulated at the John Glenn Columbus International Airport through approximately 9:06 a.m. EDT on July 7th, 2020.

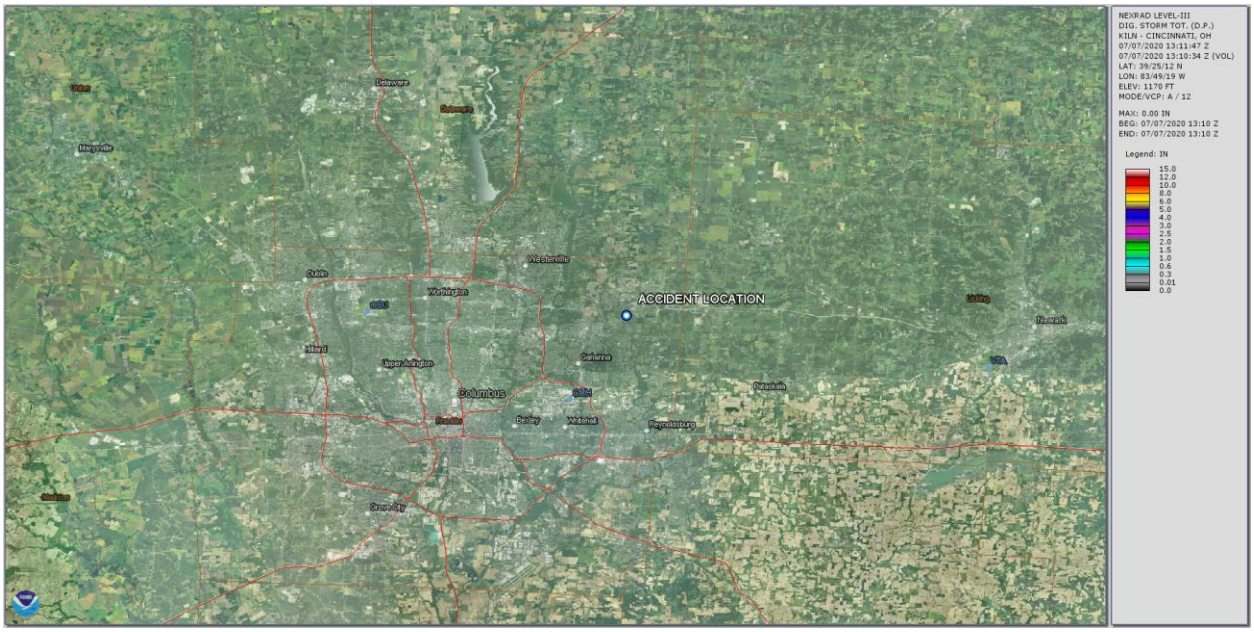


Figure 3: The Storm Total Precipitation (S.T.P) Doppler radar image above indicated that a reset occurred at approximately 9:10 a.m. EDT on July 7th, 2020.

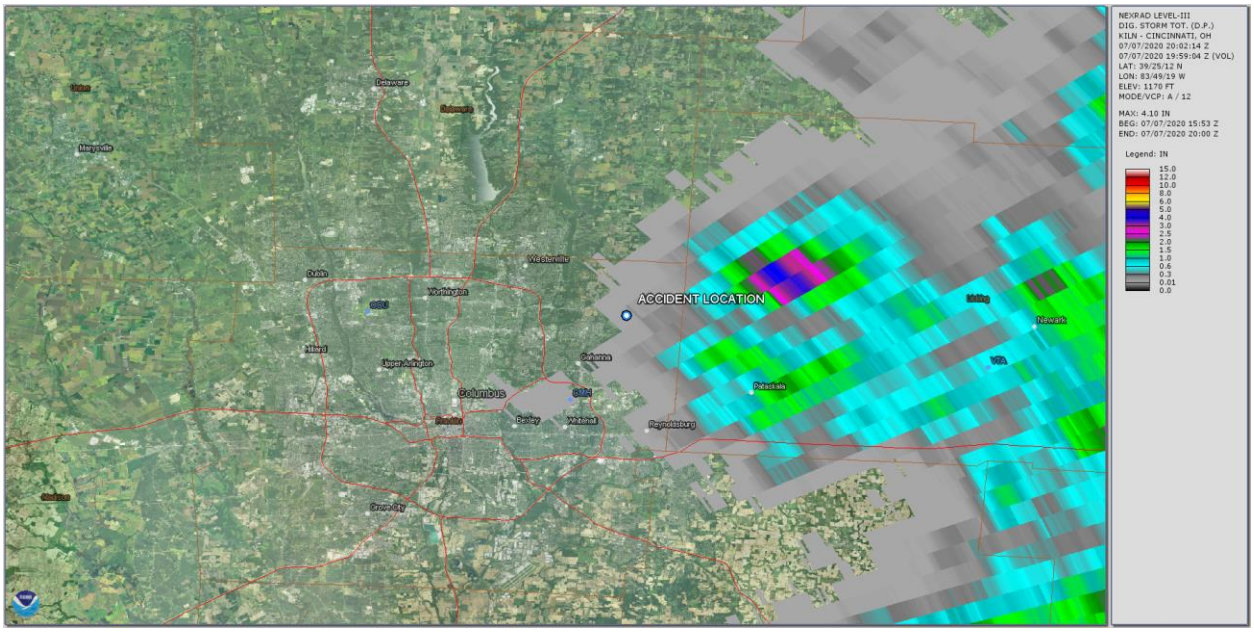


Figure 4: The Storm Total Precipitation (S.T.P) Doppler radar image above indicated that approximately 0.78" of rain accumulated at the accident location, 0.86" of rain accumulated at 0891W – Marburn Academy, 0.92" of rain accumulated at Columbus 8.2 NE, Ohio, and 0.98" of rain accumulated at the John Glenn Columbus International Airport through approximately 11:59 p.m. EDT on July 7th, 2020.

According to the S.T.P. Doppler radar image at approximately 12:10 a.m. EDT on July 7th, 2020, there was no rain accumulation at the accident location. Additionally, there was also no rain accumulation at 0891W – Marburn Academy, Columbus 8.2 NE, Ohio, or the John Glenn Columbus International Airport.

As we progressed forward through the available S.T.P. Doppler radar images, we noted that these images reset at approximately 9:10 a.m. EDT on July 7th, 2020. The S.T.P. Doppler radar image that was processed at approximately 9:06 a.m. EDT on July 7th, 2020 and immediately before this reset indicated that approximately 0.02" of rain accumulated at the accident location, 0.08" of rain accumulated at 0891W – Marburn Academy, 0.00" of rain accumulated at Columbus 8.2 NE, Ohio and 0.00" of rain accumulated at the John Glenn Columbus International Airport.

As we progressed forward through the S.T.P. Doppler radar images, at approximately 11:59 p.m. on July 7th, 2020, the S.T.P. Doppler radar image indicated that approximately 0.78" of rain accumulated at the accident location, 0.86" of rain accumulated at 0891W – Marburn Academy, 0.92" of rain accumulated at Columbus 8.2 NE, Ohio and 0.98" of rain accumulated at the John Glenn Columbus International Airport.

By adding the S.T.P. Doppler radar indicated rain accumulations from between approximately 12:10 a.m. and 9:06 a.m. on July 7th, 2020 to the rain accumulations from between approximately 9:10 a.m. and 11:59 p.m. on July 7th, 2020, the total S.T.P. Doppler radar indicated rain accumulation on July 7th, 2020 was approximately 0.80" at the accident location, 0.94" at 0891W – Marburn Academy, 0.92" at Columbus 8.2 NE, Ohio and 0.98" at the John

Glenn Columbus International Airport.

The actual observed rain accumulations for the day on July 7th, 2020 were 0.91" at 0891W – Marburn Academy, 1.16" at Columbus 8.2 NE, Ohio and 1.34" at the John Glenn Columbus International Airport. Thus, S.T.P. Doppler radar images were overestimating the rain accumulation by approximately 0.03" at 0891W – Marburn Academy, underestimating the rain accumulation by approximately 0.24" at Columbus 8.2 NE, Ohio, and underestimating the rain accumulation by approximately 0.36" at the John Glenn Columbus International Airport. By averaging these underestimations/overestimations, we determined that the S.T.P. Doppler radar images were underestimating the rain accumulation by approximately 0.19" at the accident location.

The average underestimation of 0.19" was then added to the S.T.P. Doppler radar indicated rain accumulation of 0.80" at the accident location, and **we determined that approximately 0.99" of rain accumulation occurred at the accident location on July 7th, 2020.**

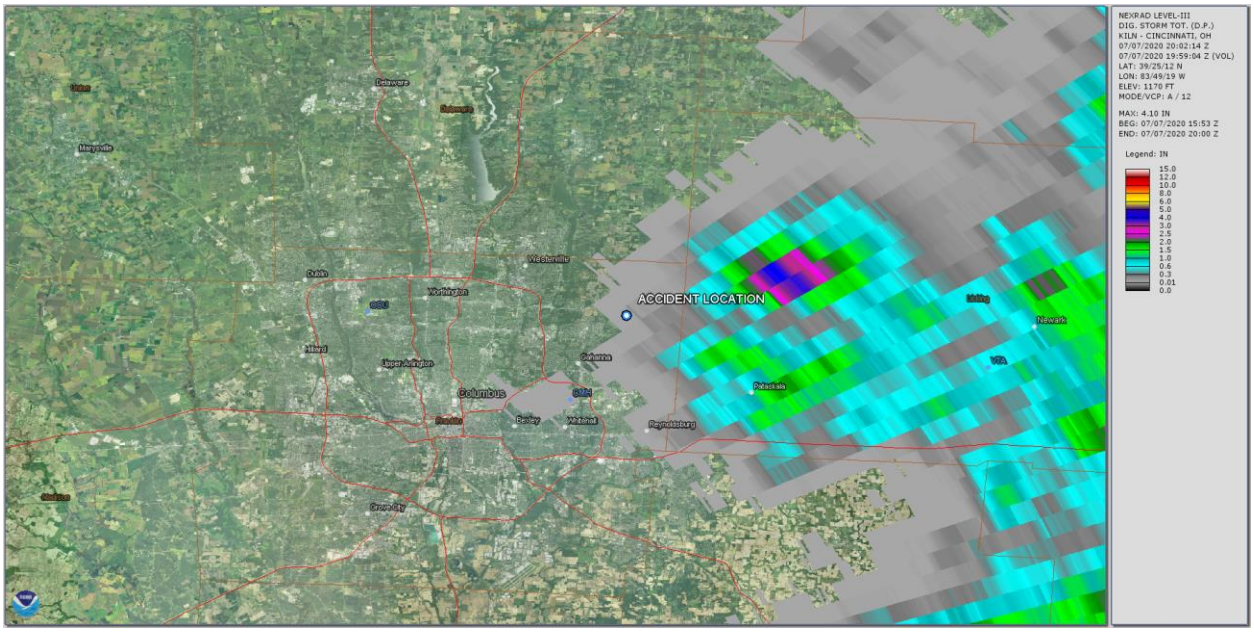


Figure 5: The Storm Total Precipitation (S.T.P) Doppler radar image above indicated that approximately 0.14" of rain accumulated at the accident location through approximately 3:59 p.m. EDT on July 7th, 2020.

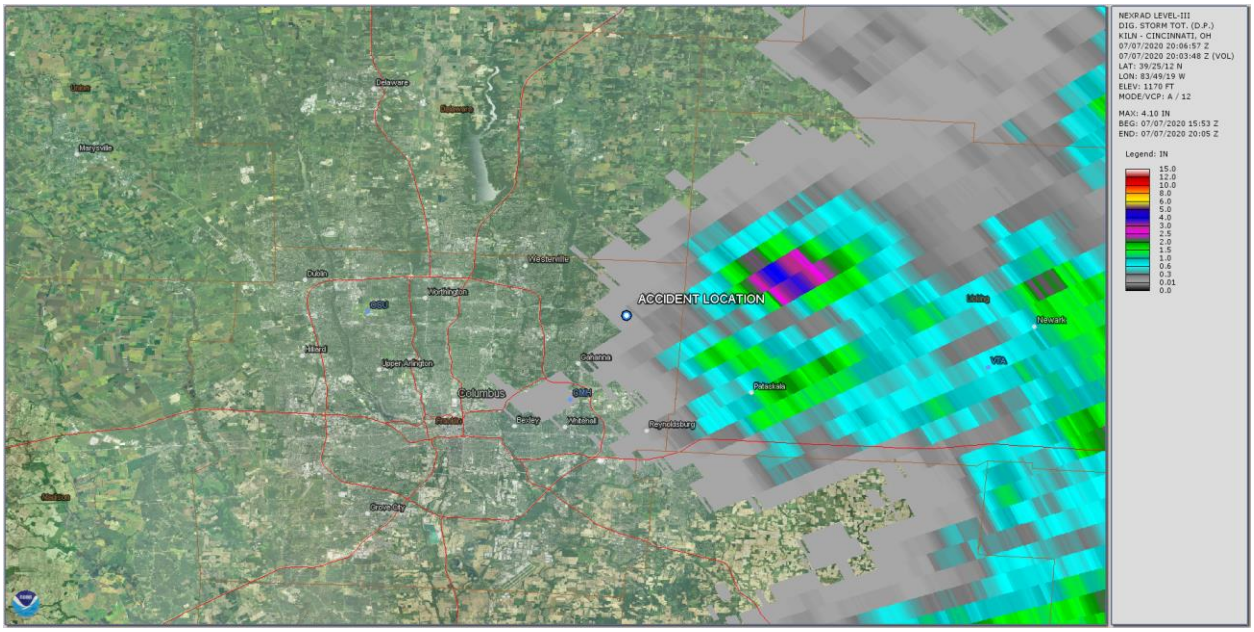


Figure 6: The Storm Total Precipitation (S.T.P) Doppler radar image above indicated that approximately 0.14" of rain accumulated at the accident location through approximately 4:03 p.m. EDT on July 7th, 2020.

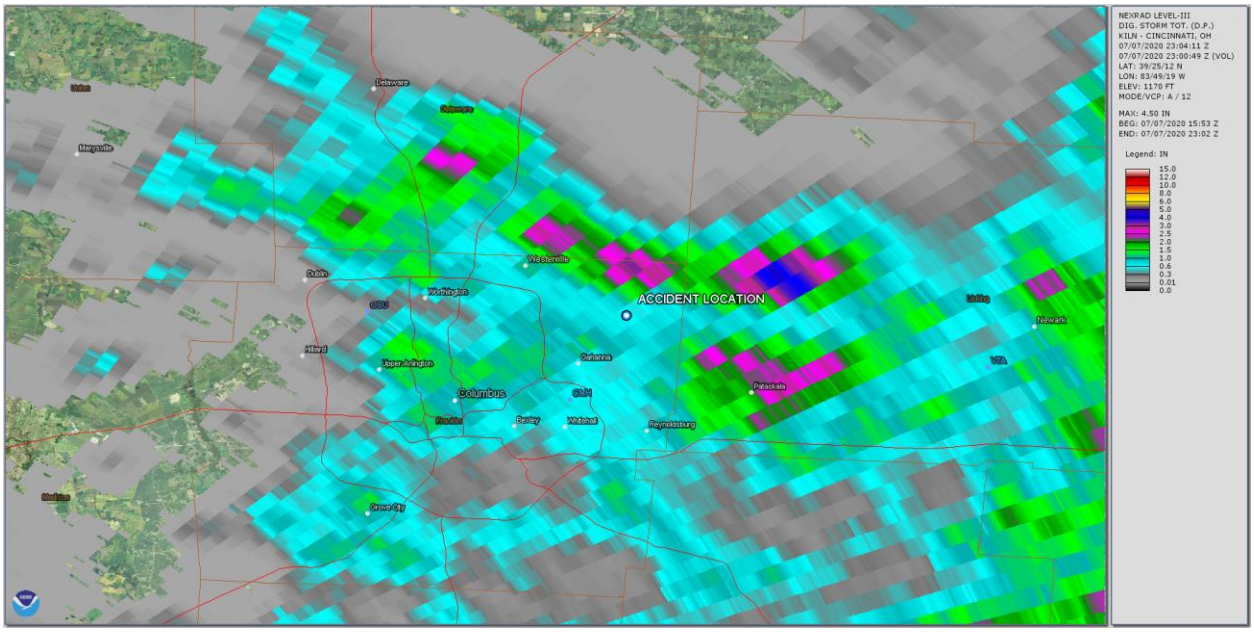


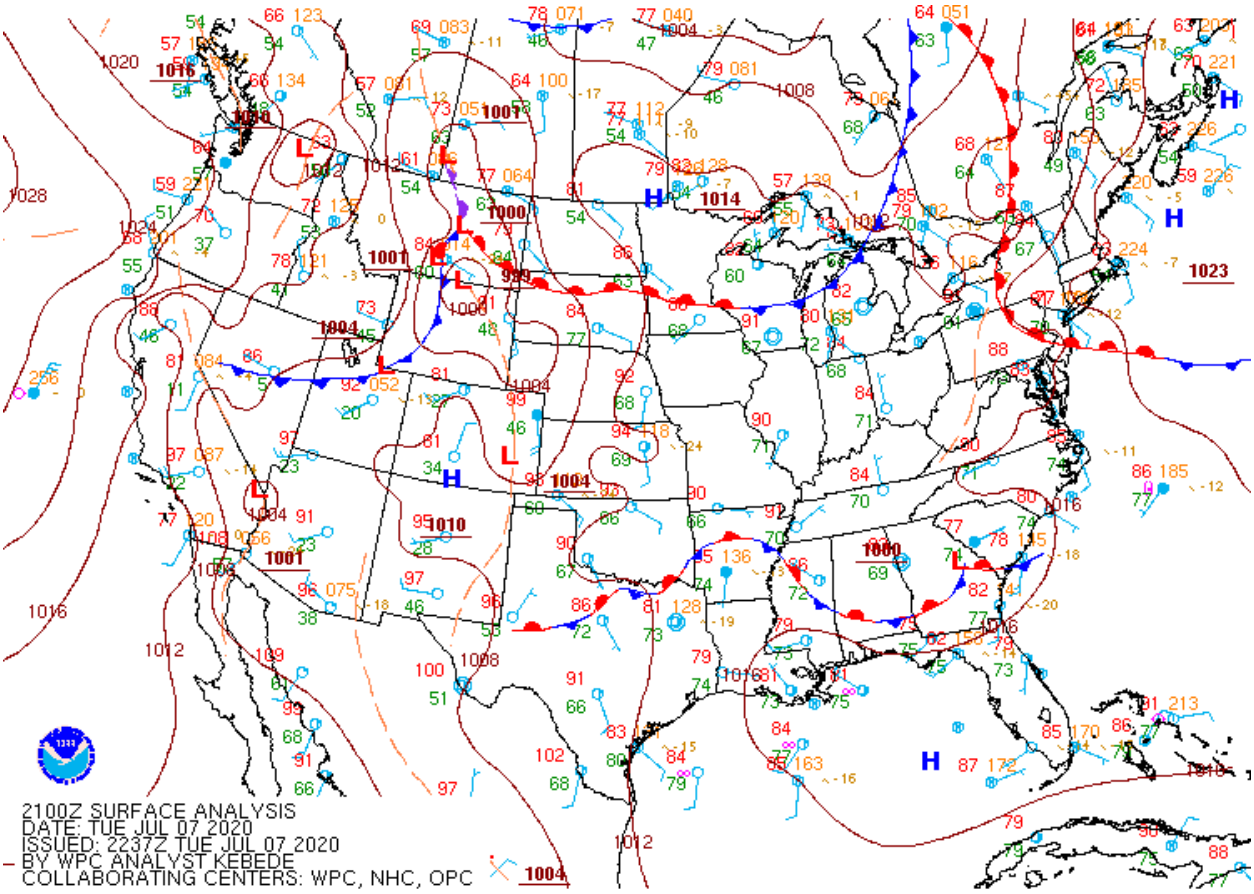
Figure 7: The Storm Total Precipitation (S.T.P) Doppler radar image above indicated that approximately 0.66" of rain accumulated at the accident location through approximately 7:00 p.m. EDT on July 7th, 2020.

By subtracting out the 0.14" of rain that accumulated through the 3:59 p.m. EDT and 4:03 p.m. EDT S.T.P. Doppler radar images from the 0.66" of rain that accumulated through 7:00 p.m. EDT on July 7th, 2020, we determined that S.T.P. Doppler radar indicated that approximately 0.52" of rain accumulated at the accident location between approximately 4:00 p.m. and 7:00 p.m. EDT on July 7th, 2020.

By adding the 0.19" S.T.P. underestimation to the total rain accumulation that occurred between approximately 4:00 p.m. and 7:00 p.m. EDT on July 7th, 2020, we determined that approximately 0.71" of rain accumulated at the accident location during this time.

METEOROLOGICAL ANALYSIS FOR JULY 7, 2020

The following is a surface analysis map of the contiguous United States at 5:00 p.m. EDT on July 7th, 2020 that was prepared by the Weather Prediction Center (WPC), a division of the National Weather Service. This surface map indicated that a surface trough was located over western Pennsylvania and through West Virginia. A cold front extended from east of the Hudson Bay in Canada through central Wisconsin. A warm front extended from east of the Hudson Bay in Canada through southern New Jersey and into the Atlantic Ocean.



At the surface, air temperatures were in the mid 90's during the early afternoon and dew points were in the upper 60's. The combination of instability, a lifting mechanism and other favorable atmospheric conditions led to the formation of weak training thunderstorms.

Doppler radar images that were zoomed in over the accident location and other information indicated that a weak thunderstorm formed over the accident location during the early morning hours and caused light to occasionally moderate rain to affect the accident location from approximately 3:23 a.m. through 3:45 a.m. During the afternoon, weak thunderstorms initiated

near the accident location. Periods of light rain affected the accident location from approximately 2:31 p.m. through 3:32 p.m. Additional training weak thunderstorms with light to occasionally moderate and heavy rain affected the accident location from approximately 4:29 p.m. through 8:23 p.m. According to the National Weather Service, *"Training thunderstorms produce tremendous rainfall over relatively small areas leading to flash flooding."*[1] Periods of light rain then affected the accident location through approximately 9:18 p.m.

Approximately 0.99" of rain accumulated on July 7th, 2020 (day of the accident).

At 5:42 p.m. on July 7th, 2020, the National Weather Service in Wilmington, Ohio issued a "Special Weather Statement," which stated, ***"A strong thunderstorm will affect North Central Franklin, Southwestern Delaware and Eastern Union counties in Central Ohio until 615 pm EDT."*** This "Special Weather Statement" also stated that very heavy rain was expected.

At 6:07 p.m. on July 7th, 2020, the National Weather Service in Wilmington, Ohio issued a "Flood Advisory" that was in effect through 9:00 p.m. EDT on July 7th, 2020. This advisory stated that, ***"At 607 PM EDT, radar indicated thunderstorms with heavy rain nearly stationary over the advised area."*** This advisory also stated that New Albany, Ohio would be impacted by these thunderstorms and heavy rainfall.

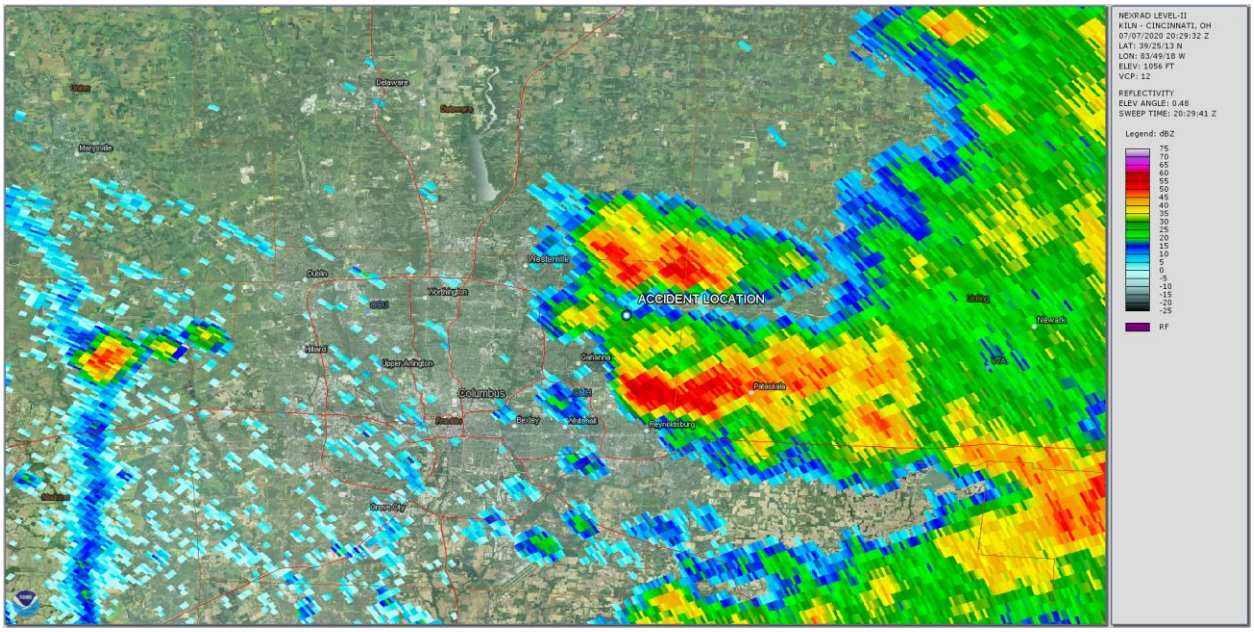
Between 4:00 p.m. and 7:00 p.m. on July 7th, 2020 (approximate time and date of the accident), periods of training thunderstorms with light to occasionally moderate and heavy rain affected the accident location at times. Approximately 0.71" of rain accumulated at the accident location during this time. A "Flood Advisory" was issued at 6:07 p.m. on July 7th, 2020 as a result of this precipitation, and this advisory remained in effect through 9:00 p.m. on July 7th, 2020. In addition, horizontal surface visibilities were as low as 1 Statute Mile between 4:00 p.m. to 7:00 p.m. on July 7th, 2020.

BASE REFLECTIVITY DOPPLER RADAR ANALYSIS

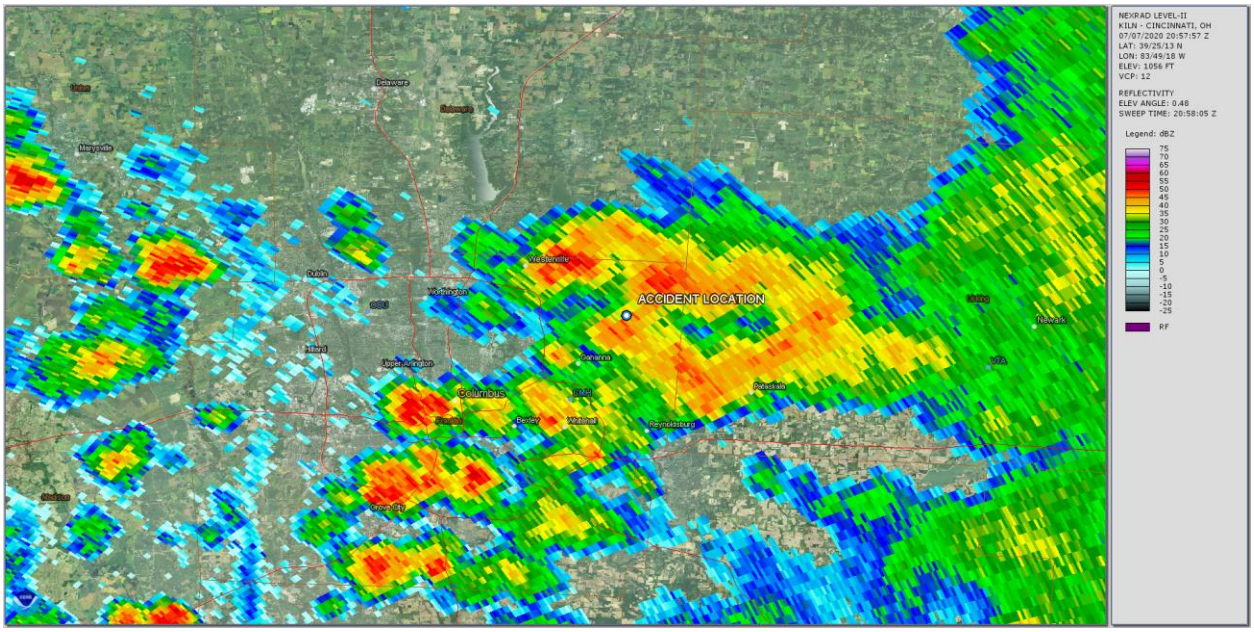
The following images are Base Reflectivity Doppler radar images that were processed at 20:29:32 GMT, 20:57:57 GMT, 21:31:05 GMT, 21:59:28 GMT, 22:27:54 GMT and 23:00:49 GMT (4:29 p.m. EDT, 4:57 p.m. EDT, 5:31 p.m. EDT, 5:59 p.m. EDT, 6:27 p.m. EDT and 7:00 p.m. EDT) on July 7th, 2020. The accident location is indicated by a white pushpin on the base map. The color code on the right side indicates the intensity of the precipitation.

[1] https://www.weather.gov/jetstream/tstrmtypes

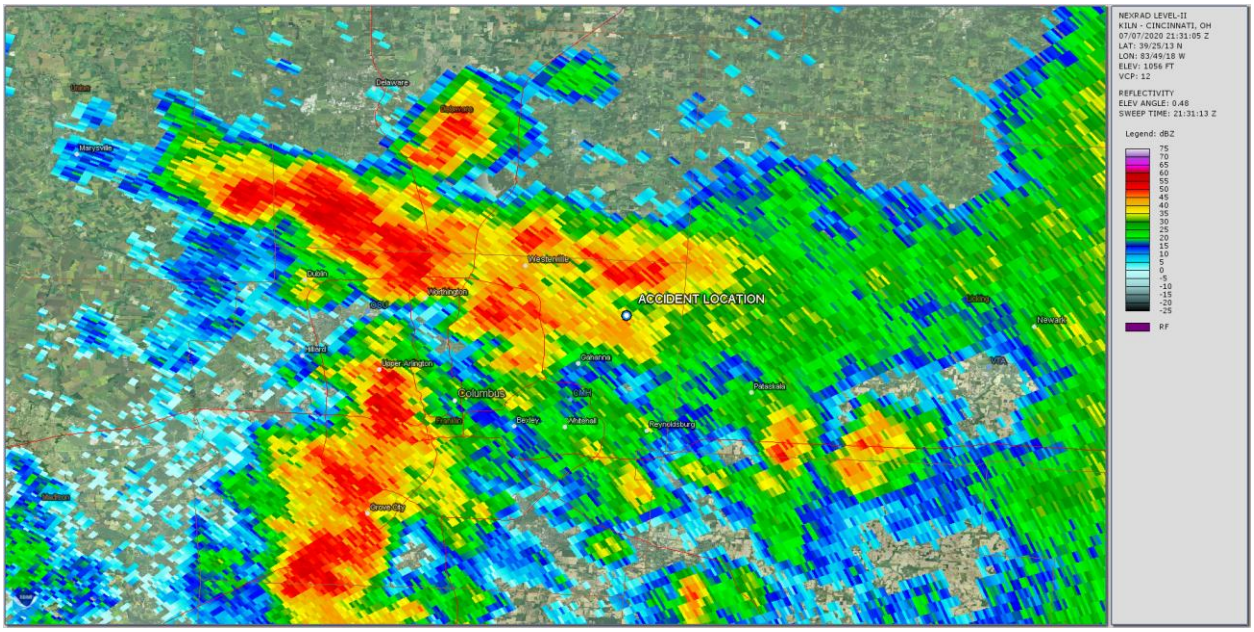
Doppler Radar Image from 4:29 p.m. EDT on July 7th, 2020



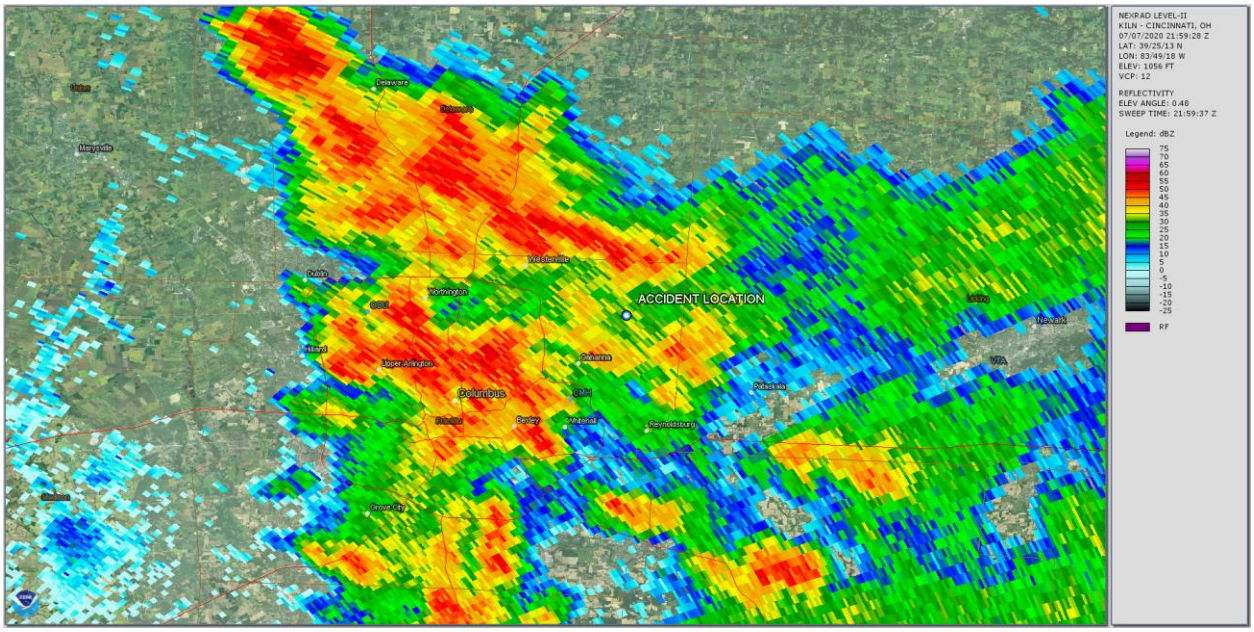
Doppler Radar Image from 4:57 p.m. EDT on July 7th, 2020



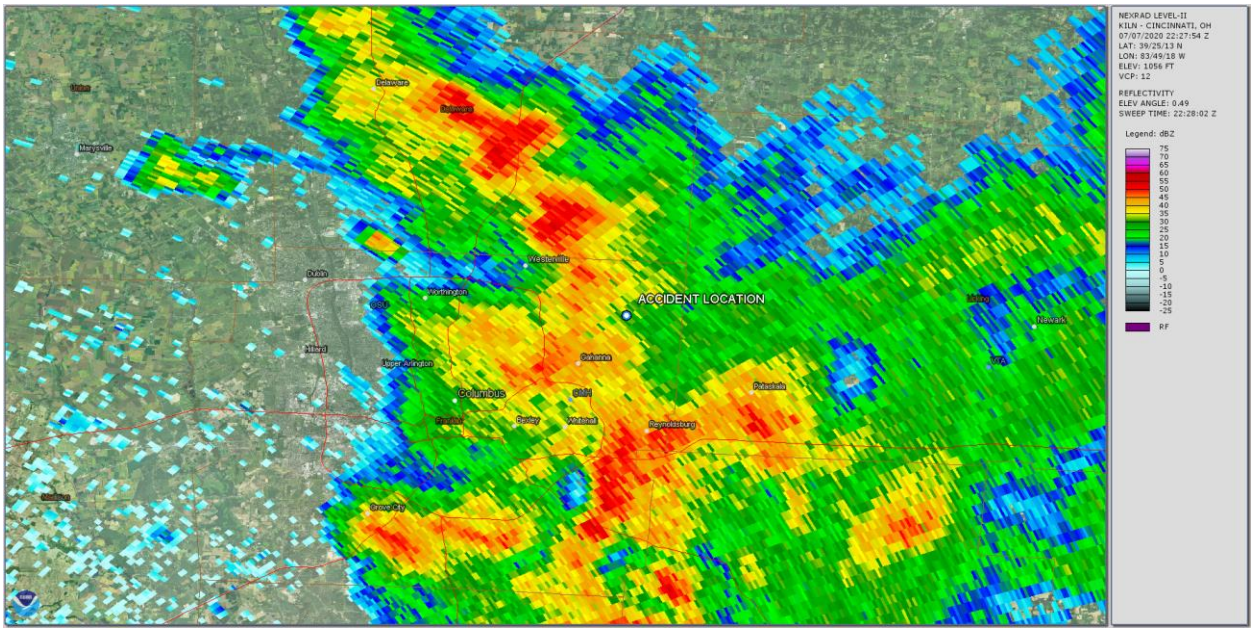
Doppler Radar Image from 5:31 p.m. EDT on July 7th, 2020



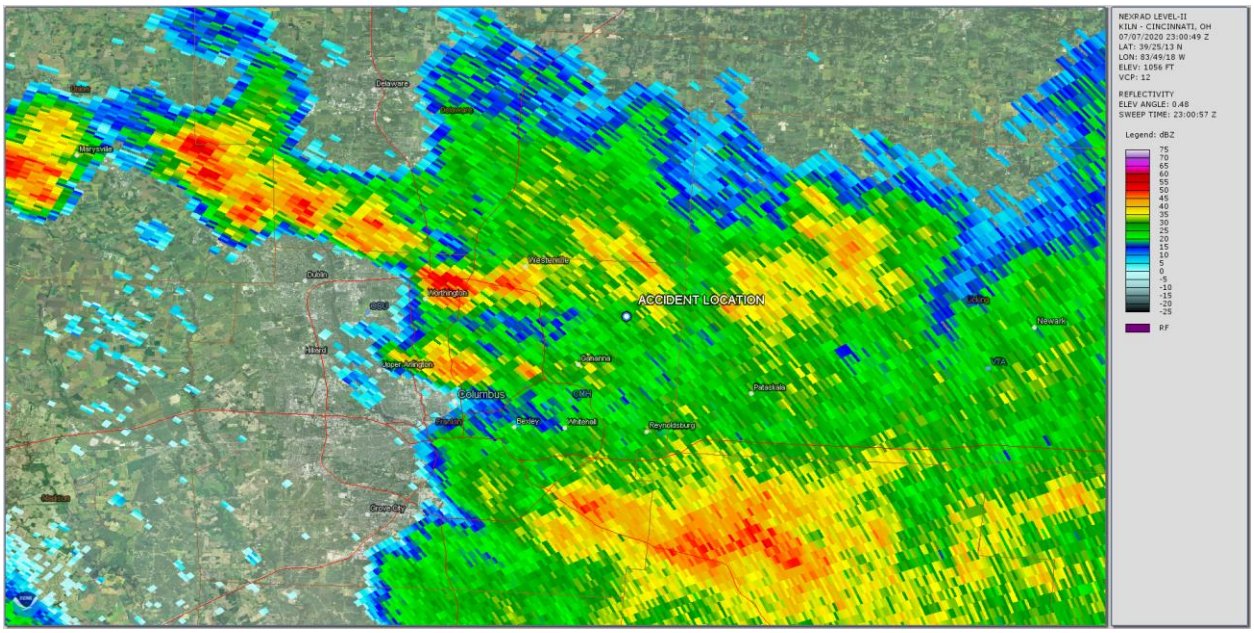
Doppler Radar Image from 5:59 p.m. EDT on July 7th, 2020



Doppler Radar Image from 6:27 p.m. EDT on July 7th, 2020



Doppler Radar Image from 7:00 p.m. EDT on July 7th, 2020



Radiosonde (Balloon Launch) Observations

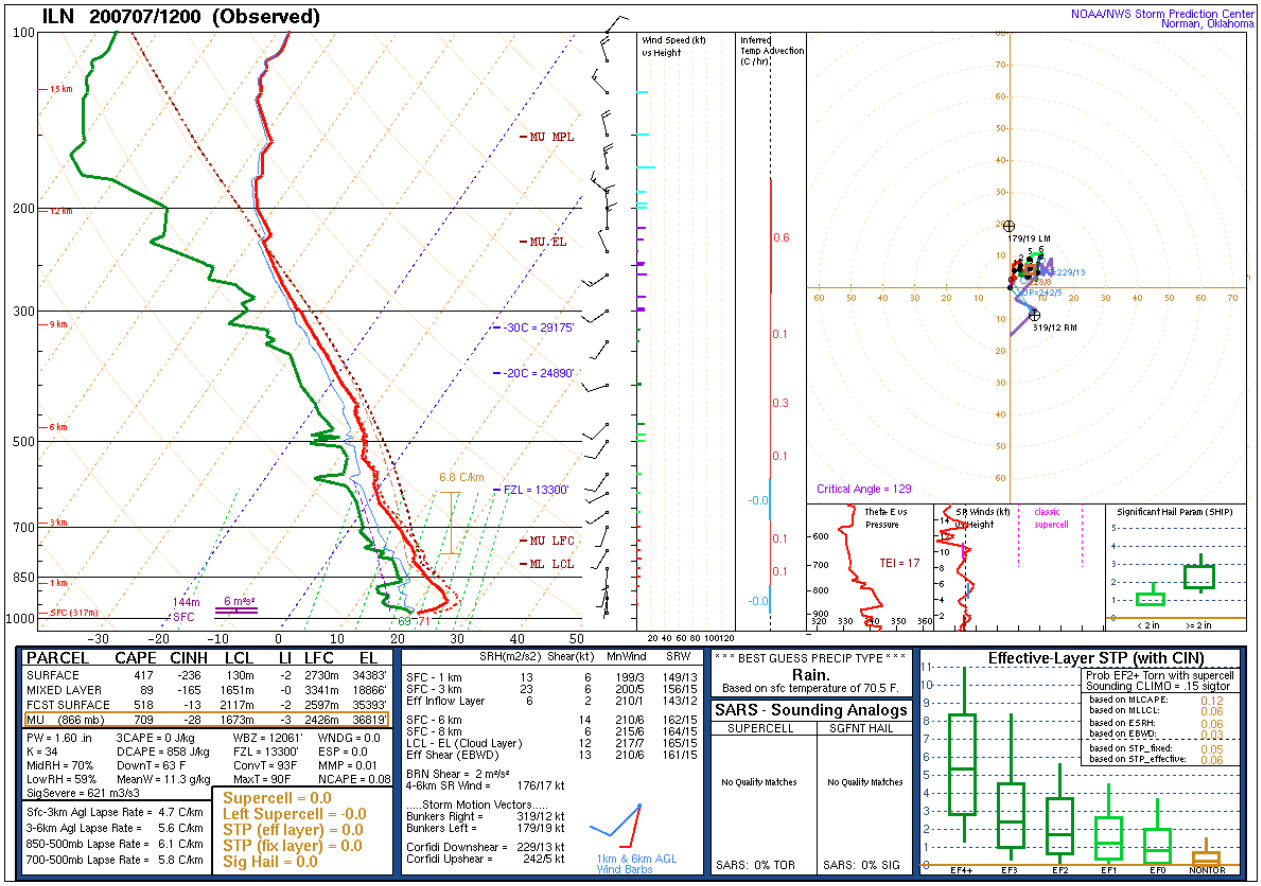


Figure 8: According to this radiosonde image (balloon launch) from Wilmington, Ohio that was prepared at 8:00 a.m. EDT on July 7th, 2020, the precipitable water was 1.60". This indicates that there was a lot of available moisture in the atmosphere.

NATIONAL WEATHER SERVICE BULLETINS, WARNINGS AND ADVISORIES

The following are publicly issued advisories and special weather statement from the National Weather Service in Wilmington, Ohio, which included the accident location and surrounding areas.

At 5:42 p.m. on July 7th, 2020, the National Weather Service in Wilmington, Ohio issued a "Special Weather Statement," which included North Central Franklin County in Ohio through 6:15 p.m. on July 7th, 2020:

Special Weather Statement
National Weather Service Wilmington OH
542 PM EDT Tue Jul 7 2020
OHZ045-046-055-072215-
Delaware OH-**Franklin OH**-Union OH-
542 PM EDT Tue Jul 7 2020
...A STRONG THUNDERSTORM WILL AFFECT NORTH CENTRAL FRANKLIN...
SOUTHWESTERN DELAWARE AND EASTERN UNION COUNTIES IN CENTRAL OHIO
UNTIL 615 PM EDT...

At 542 PM EDT, radar indicated a strong thunderstorm over Powell, moving northeast at 5 mph.
STORM HAZARDS INCLUDE...
Winds to 40 mph...
Pea size hail...
Frequent cloud-to-ground lightning...
Very heavy rain...
Locations impacted include...
Columbus, Dublin, Westerville, Delaware, Worthington, Powell, Polaris, Shawnee Hills, Galena, Interstate 71 at US Route 36/State Route 37, Alum Creek State Park, Stratford, Bellepoint, Columbus Zoo and Lewis Center.
This includes I-71 in Ohio between mile markers 120 and 133.
Do not stay in the open or seek shelter under trees when lightning threatens. Move indoors when a thunderstorm approaches.
Water will pond on roads and may quickly fill roadside ditches and small streams.
To report hazardous weather conditions, go to our website at weather.gov/iln and submit your report via social media, when you can do so safely.

At 6:07 p.m. on July 7th, 2020, the National Weather Service in Wilmington, Ohio issued a "Flood Advisory" that was in effect for Northeastern Franklin County through 9:00 p.m. on July 7th, 2020:

Flood Advisory
National Weather Service Wilmington OH
607 PM EDT Tue Jul 7 2020
OHC041-049-089-080100-
/O.NEW.KILN.FA.Y.0090.200707T2207Z-200708T0100Z/
/00000.N.ER.000000T0000Z.000000T0000Z.000000T0000Z.OO/
Franklin OH-Delaware OH-Licking OH-
607 PM EDT Tue Jul 7 2020
The National Weather Service in Wilmington has issued a
*** Flood Advisory for...**
Northeastern Franklin County in central Ohio...
Southern Delaware County in central Ohio...
West central Licking County in central Ohio...
*** Until 900 PM EDT.**
*** At 607 PM EDT, radar indicated thunderstorms with heavy rain nearly stationary over the advised area.**
*** Minor flooding of low-lying and poorly drained streets, highways and underpasses will occur. In addition, farmland near creeks, streams and drainage ditches will experience minor flooding.**
Some locations that will experience minor flooding include...
Columbus, Dublin, Westerville, Reynoldsburg, Delaware, Upper Arlington, Gahanna, Hilliard, Worthington, Bexley, Pataskala, Powell, Sunbury, Minerva Park, Ohio State University, Polaris, Easton, Whitehall, **New Albany** and Grandview Heights.
PRECAUTIONARY/PREPAREDNESS ACTIONS...
Turn around, don't drown when encountering flooded roads. Most flood deaths occur in vehicles.
Keep children away from storm drains, culverts, creeks and streams. Water levels can rise rapidly and sweep children away.
To report flooding, go to our website at weather.gov/iln and submit your report via social media, when you can do so safely.

At 8:51 p.m. on July 7th, 2020, the National Weather Service in Wilmington, Ohio issued an official update for the expiration of the "Flood Advisory" that was in effect for Northeastern Franklin County through 9:00 p.m. on July 7th, 2020:

Flood Advisory
National Weather Service Wilmington OH
851 PM EDT Tue Jul 7 2020
OHC041-049-089-080100-
/O.EXP.KILN.FA.Y.0090.000000T0000Z-200708T0100Z/

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/00000.N.ER.000000T0000Z.000000T0000Z.000000T0000Z.OO/
Franklin OH-Delaware OH-Licking OH-
851 PM EDT Tue Jul 7 2020
...THE FLOOD ADVISORY FOR NORTHEASTERN FRANKLIN...SOUTHERN DELAWARE
AND WEST CENTRAL LICKING COUNTIES WILL EXPIRE AT 900 PM EDT...
The heavy rain has ended and flooding is no longer expected to pose a
threat.
Please report previous flooding to the National Weather Service by
going to our website at weather.gov/iln and submitting your report
via social media.
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CONCLUSIONS

In conclusion, it is my opinion that:

- Training weak thunderstorms with light to occasionally moderate and heavy rain affected the accident location from approximately 4:29 p.m. through 8:23 p.m. on July 7th, 2020.
- At 5:42 p.m. on July 7th, 2020, the National Weather Service in Wilmington, Ohio issued a "Special Weather Statement," which stated, ***"A strong thunderstorm will affect North Central Franklin, Southwestern Delaware and Eastern Union counties in Central Ohio until 615 pm EDT."*** This "Special Weather Statement" also stated that very heavy rain was expected.
- Between 4:00 p.m. and 7:00 p.m. on July 7th, 2020 (approximate time and date of the accident), periods of training thunderstorms with light to occasionally moderate and heavy rain affected the accident location at times and horizontal visibilities were as low as 1 statute mile at times.
- Approximately 0.71" of rain accumulated at the accident location between 4:00-7:00 p.m. on July 7th, 2020.
- A "Flood Advisory" was issued at 6:07 p.m. on July 7th, 2020 as a result of this precipitation, and this advisory remained in effect through 9:00 p.m. on July 7th, 2020.
- The total rain accumulation that occurred at the accident location was approximately 0.99" on July 7th, 2020 (day of the accident).

CERTIFICATION

I certify that the above information contained in this report is true and accurate to the best of my ability and that all of my opinions, findings, estimations, and interpolations expressed in this report were made with accuracy as a professional meteorologist within a reasonable degree of meteorological certainty.

By: _____

Certified Consulting Meteorologist

Certified Consulting Meteorologist
Awarded by the American Meteorological Society.