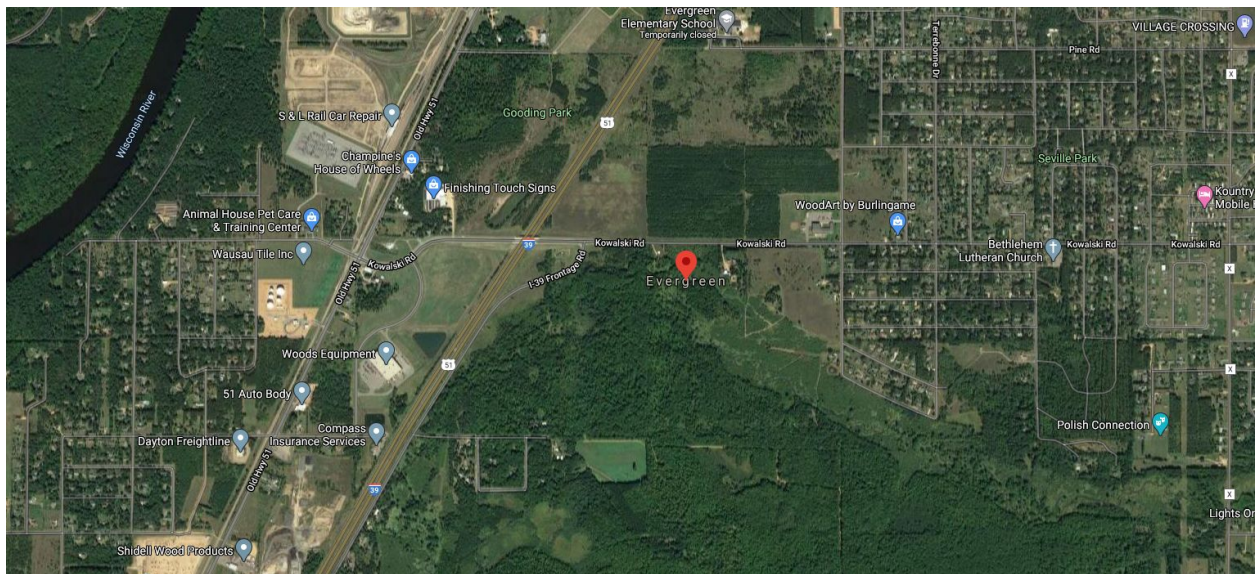


Rainfall Report

1 July 2020

OVERVIEW

This investigation was assigned to Weather.Lawyer by a municipality in Wisconsin. On 20 June 2020, the town's wastewater system was inundated by rainfall. The municipality requested a rainfall report to determine the amount of rain that fell on that date.



The following data collection, analysis, and conclusions are in regards to this specific investigation only. Data consists of National Weather Service (NWS) precipitation measurements and NWS NEXRAD images. Special algorithms were applied to estimate atmospheric conditions for the given address at the geographical point of 44.8435932,-89.6432423.

Weather Synopsis

Radar shows widespread light to moderate rain across the area surrounding the municipality (Image A). Heavy rain also existed very close to the municipality. Mesonet data showed over 4 inches of rain fell within the county (Image B). The surface analysis indicates (Image C) a low pressure system over Iowa, with a stationary front over Wisconsin. Since stationary fronts move

very slowing, heavy rainfall is prone to fall under these conditions. These background images were used for this weather synopsis and as guidance for the remainder of the investigation.

DATA COLLECTION

The following data artifacts were collected to perform the Meteorological Analysis. The collected data are official government records known to exist that the time of analysis. Any additional weather information that becomes available may be included into this report at a later time. Data was collected from the National Center for Environmental Information (NCEI). NCEI is responsible for hosting and providing access to world weather archives, with comprehensive oceanic, atmospheric, and geophysical data. NCEI is the leading government authority for environmental information.

NEXRAD

NEXRAD is a network of 159 high-resolution S-band Doppler weather radars operated by the NWS. NEXRAD detects precipitation and atmospheric movement. Electro-magnetic beams return data which when processed can be displayed in a mosaic map, and show patterns of precipitation and its corresponding movement. The radar system operates in two basic modes, selectable by the operator: a slow-scanning *clear-air mode* for analyzing air movements when there is little or no activity in the area, and a *precipitation mode*, with a faster scan for tracking active weather. NEXRAD has an increased emphasis on automation, including the use of algorithms and automated volume scans. For this analysis the Green Bay, WI (GRB) radar was used. GRB was in clear-air mode at the time of the incident. Radar indicated that there was a maximum of 5.7 inches of rain associated with this storm.

METEOROLOGICAL ANALYSIS

Overview

Daily summaries show heavy rainfall over a 24 hour period on June 20. Light rainfall was recorded the prior day (June 19). Our algorithms were applied to determine the estimated conditions for Evergreen, WI using data from the surrounding area. The distance to Evergreen and elevation differences are taken into consideration by the algorithms.

Table 1 - Site Comparisons

Site	Distance to location	Elevation	Elevation Difference
KAUW	11.5 miles	1207	-155
KRHI	66.3 miles	1549	+187

KGRB	96.6 miles	581	-781
WI-MT-2	5.6 miles	1293	-69

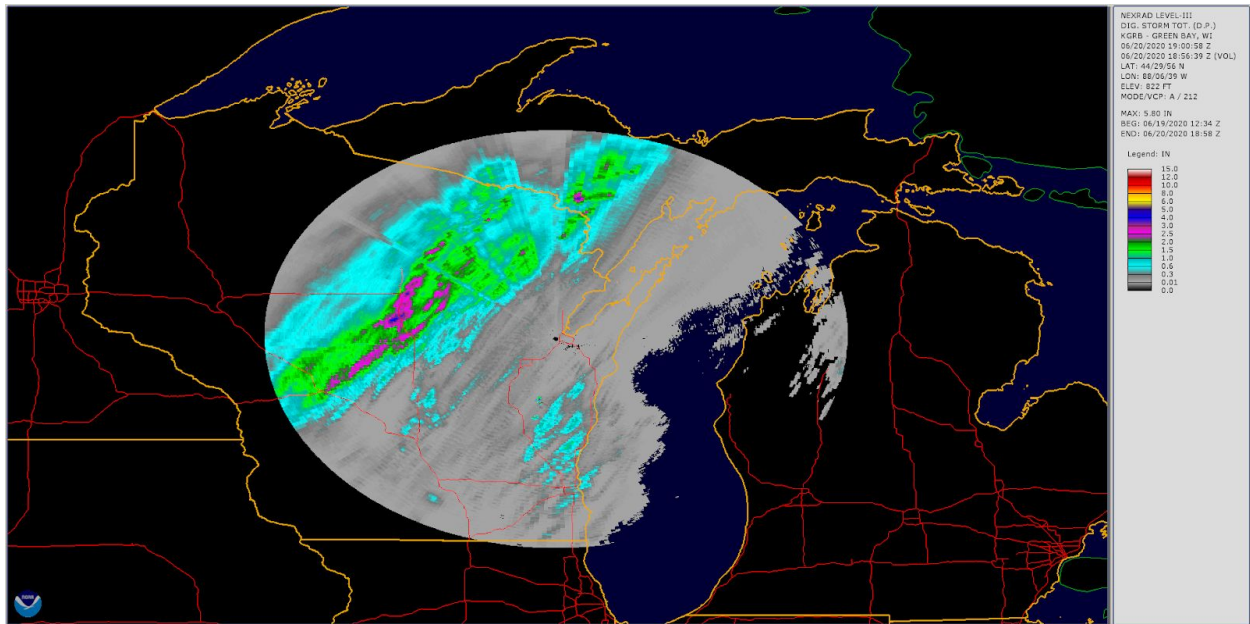
Table 2 - Rainfall Measurements

Site	Significant Wx	Precipitation
KAUW	Heavy Rain	3.04
KRHI	Rain	0.38
KGRB	Rain	0.84
WI-MT-2	Heavy Rain	3.20
Radar Estimate	Heavy Rain	2.70
Evergreen	Heavy Rain	3.04

Precipitation

The radar covering Evergreen, WI shows moderate to heavy rainfall over the area. This rainfall was moving along a stationary front, and continued for over 8 hours. The radar indicates that 2.7 inches of rainfall occurred over Evergreen. However, a nearby mesonet station recorded 3.20 inches. Using our algorithms, it was determined that Evergreen received 3.04 inches of rain on 20 June 2020.

NEXRAD Rainfall Estimate - Green Bay, WI (GRB)



CONCLUSION

A slow moving stationary front brought heavy rain to the Evergreen, WI area on 20 June 2020. Based on data from nearby stations and NEXRAD, our algorithms determined that 3.04 inches of rain fell on Evergreen over a 24-hour period.

CERTIFICATION

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

BACKGROUND MAPS

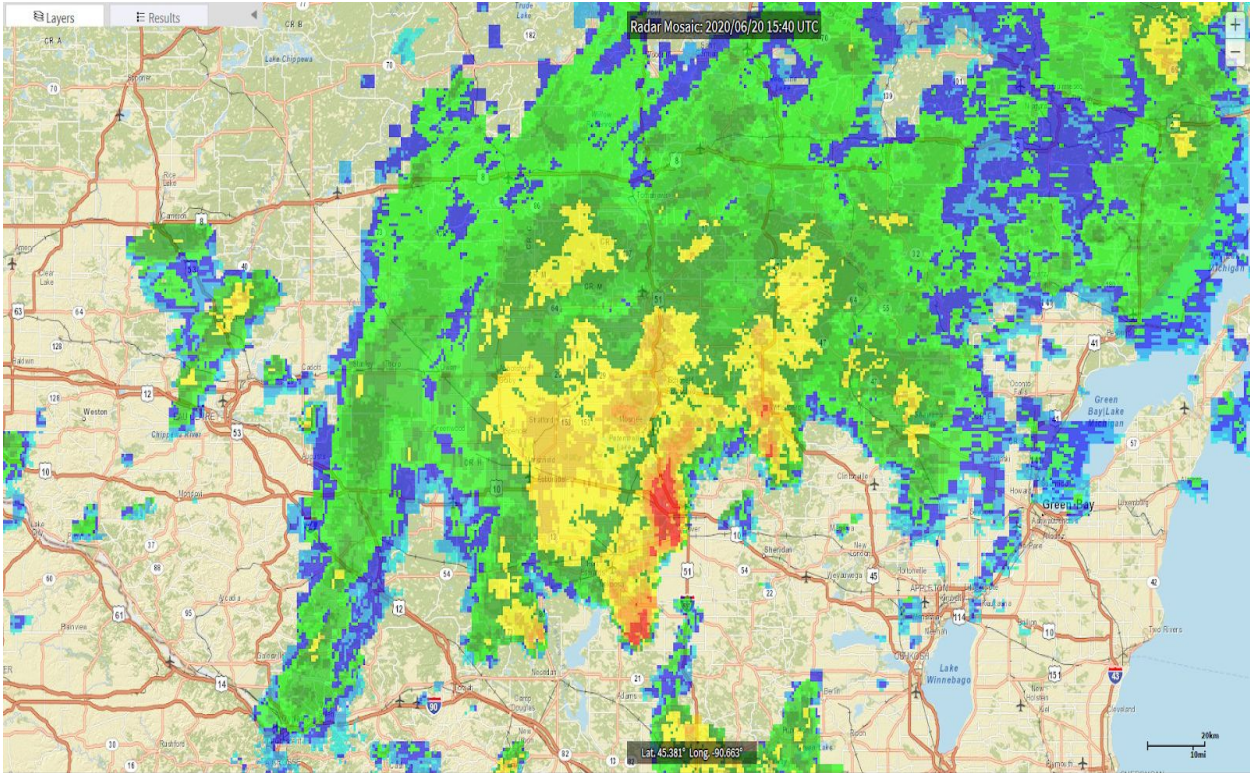


Image A - Radar Summary

Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am
Marathon County, Wisconsin 6/20/2020

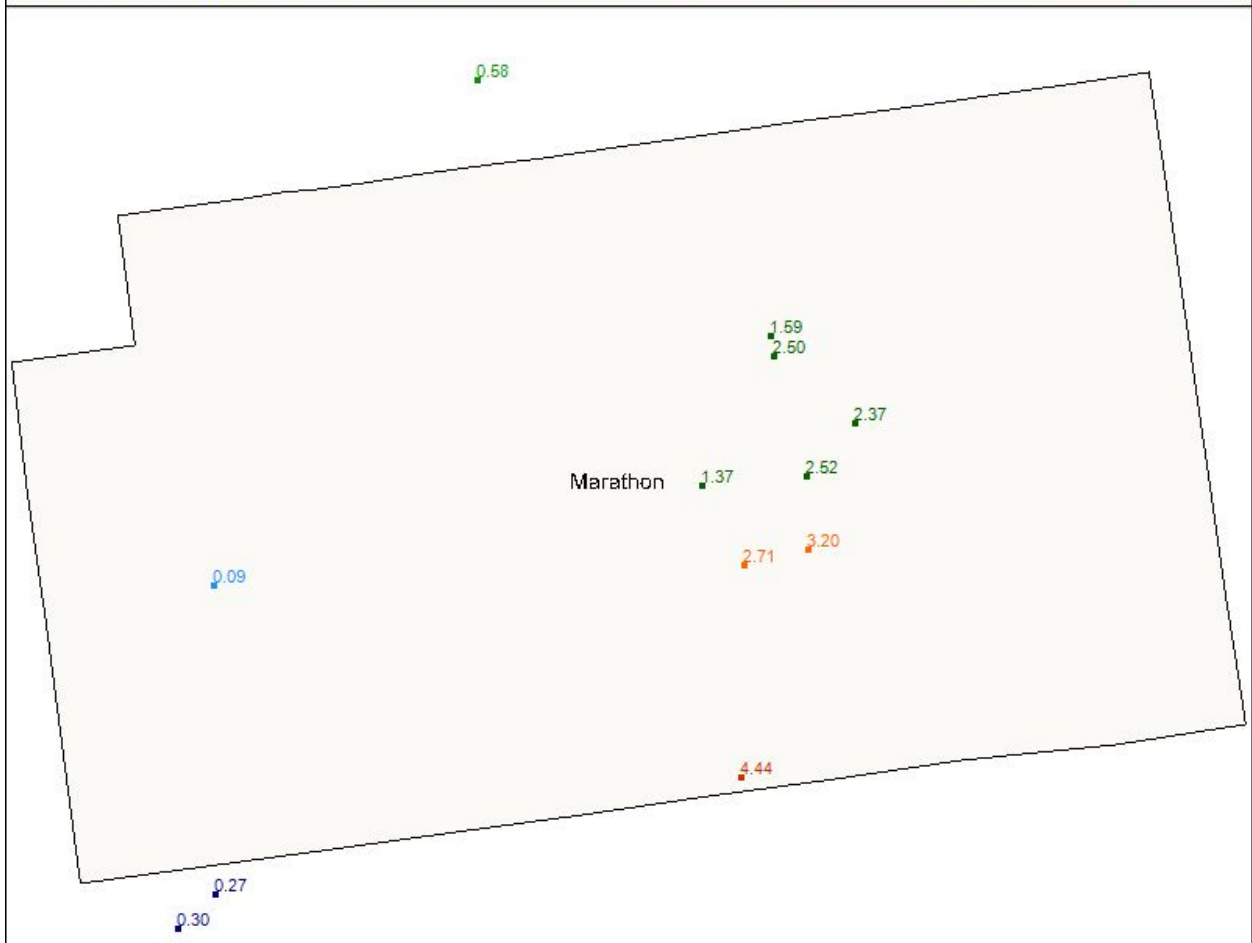
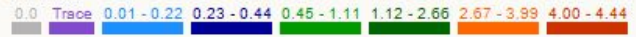


Image B - Recorded Rainfall

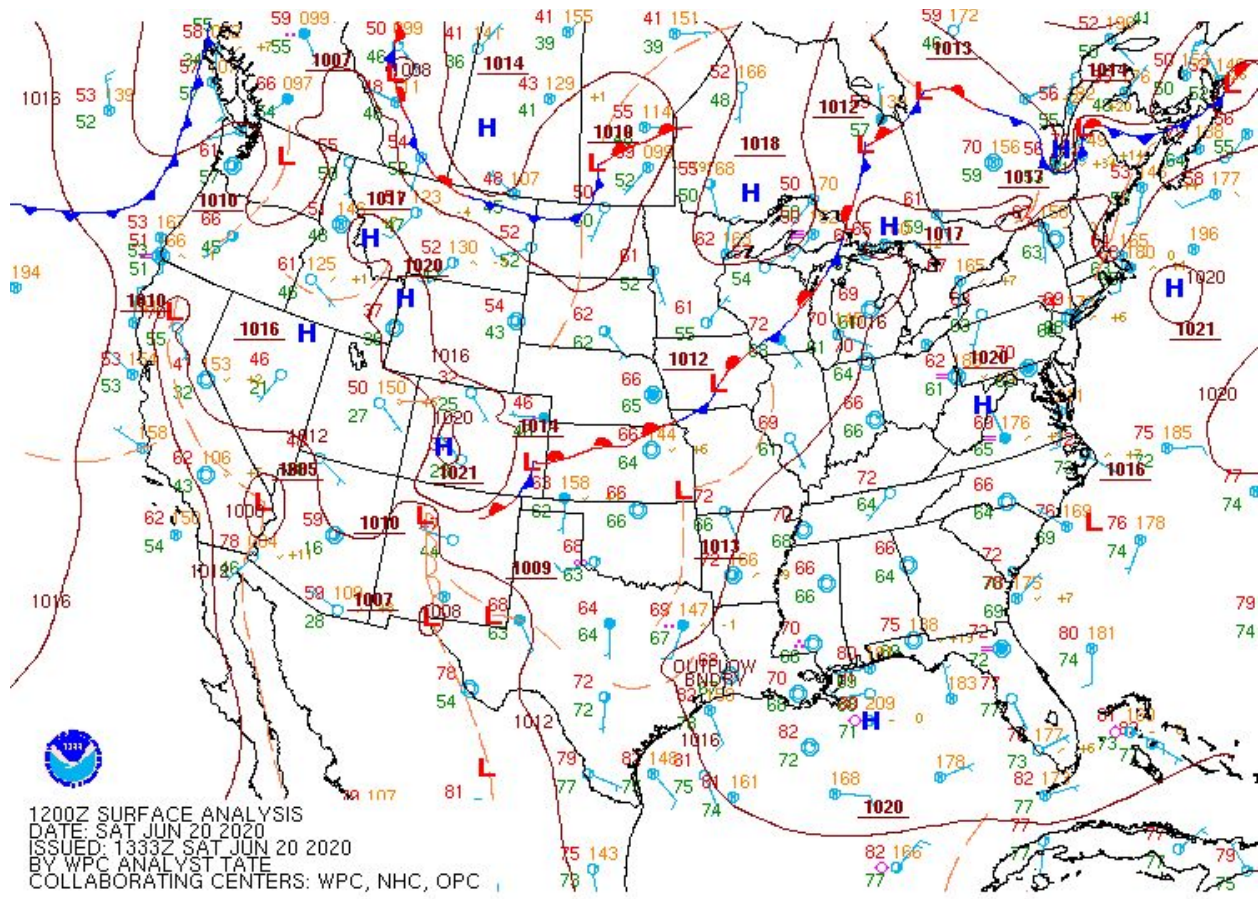


Image C - US Surface Analysis