

2025 AMS Annual Meeting

# **Application of National Weather Service Flood Inundation Maps: Case Study Examples from North Central Texas**

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# Flood Inundation Maps (FIMs)

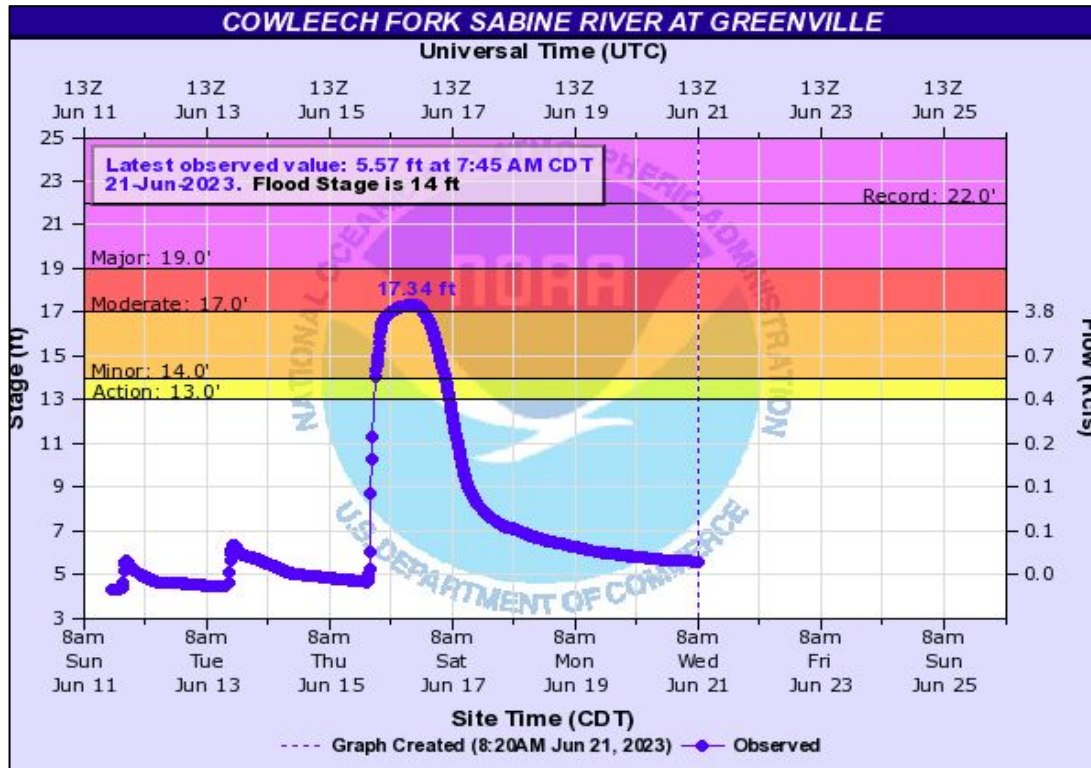
- Maps that show which areas are likely flooded along a river during a flood event
- FIM does not show flooding caused by flash floods, **only** riverine flooding!
- Types of maps:
  - Flood depth maps show where floodwaters are located AND how deep that water is expected to be
  - Flood extent maps ONLY show where floodwaters are located (not how deep it is)



# Why FIM?



Puts “water on a map” to improve risk communication



# NWS NWC FIM

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These dynamic map services are experimental and not available everywhere (yet)!



**Forecast River Forecast Center Flood Maps (RFC 5-Day Max Forecast)** - Dynamic maps downstream of ~ 3,600 RFC forecast locations. Maps derived from RFC forecast and 10-m Height Above Nearest Drainage (HAND) solution.



**Forecast National Water Model Flood Maps (NWM 5-Day Max Forecast)** - Dynamic maps along river reaches. Maps derived from NWM forecast and 10-m HAND solution.



**National Water Model Latest Analysis Flood Maps** - Dynamic maps utilizing observed rain and stream data to depict current flood extent derived from 10-m HAND solution.



The background of the entire image is a dynamic, high-speed photograph of water splashing, creating a dense field of bubbles and droplets in various shades of blue. The water appears to be moving from the top left towards the bottom right, with some larger, more complex splash structures near the top and smaller, more numerous droplets towards the bottom.

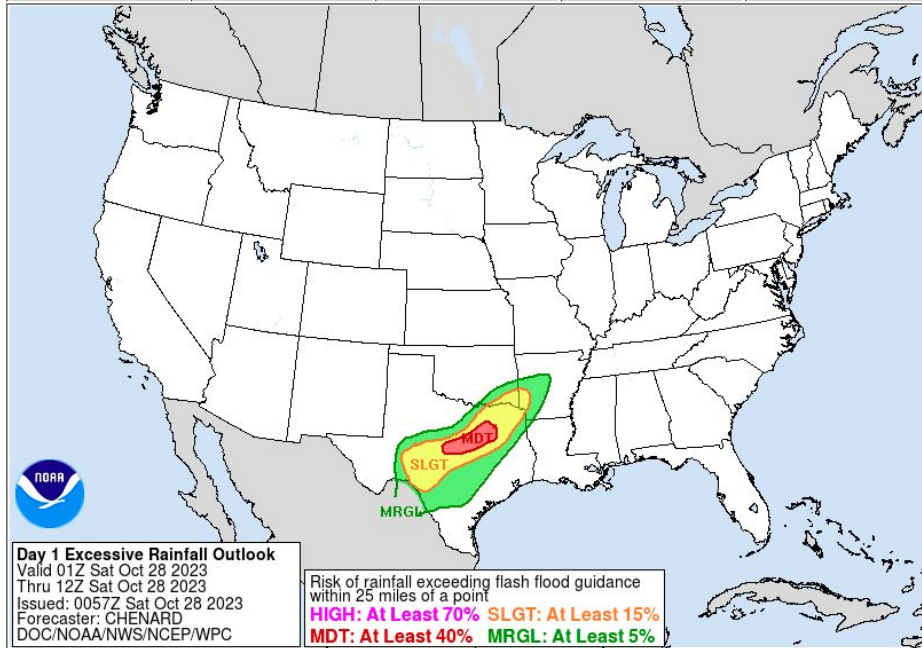
# **Bosque County, Texas Flood Event**

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October 2023

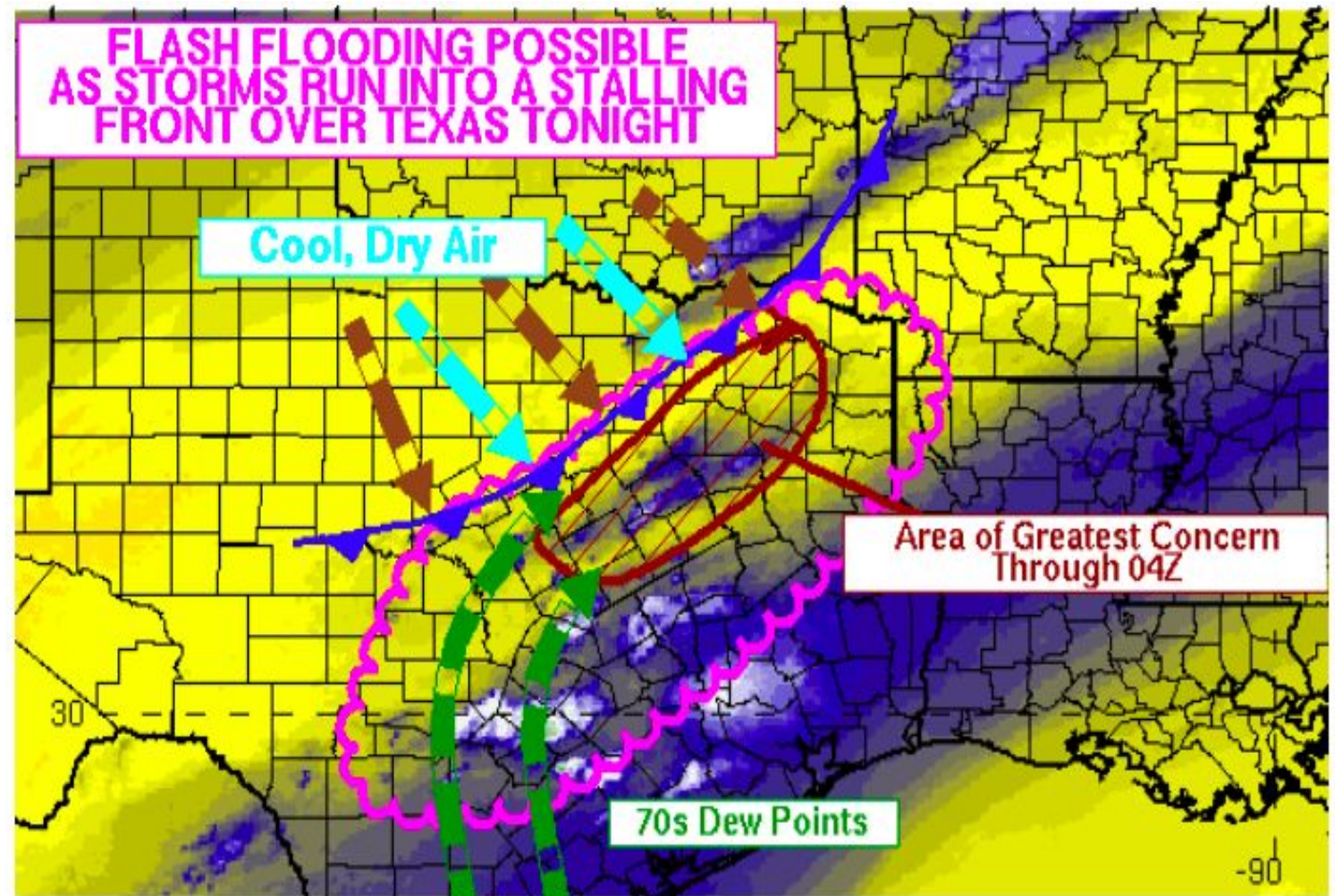


# Bosque County October 2023 Event Setup



WPC Day 1 ERO issued 18z 27 Oct 2023

WPC MPD issued 0z 28 Oct 2023

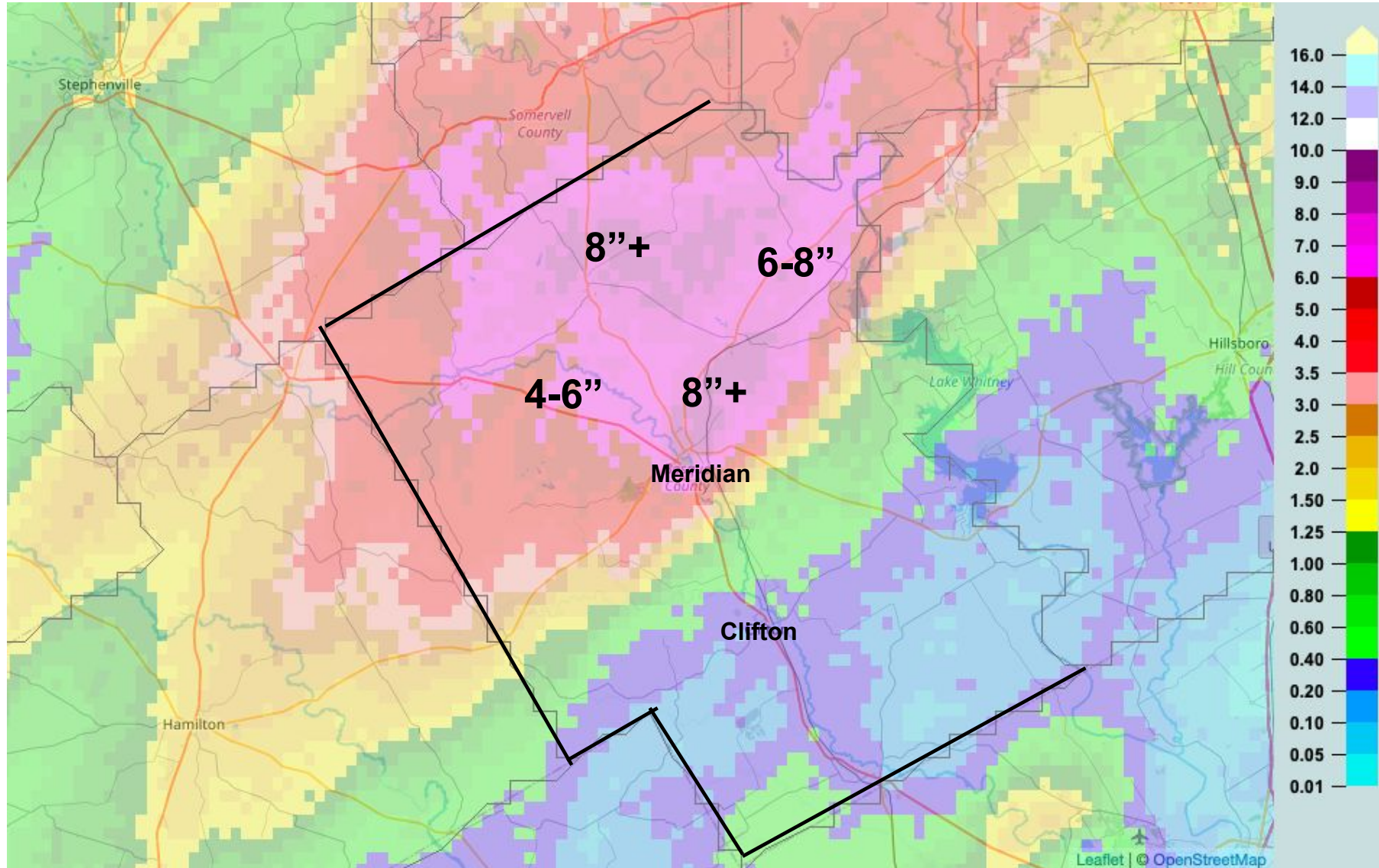


231027/2150 GOES16 CH09 WV\_6.9  
WPC MPD #1164





# 12 hr. Rainfall Totals (ending 12z 28 Oct 2023)



# River Response

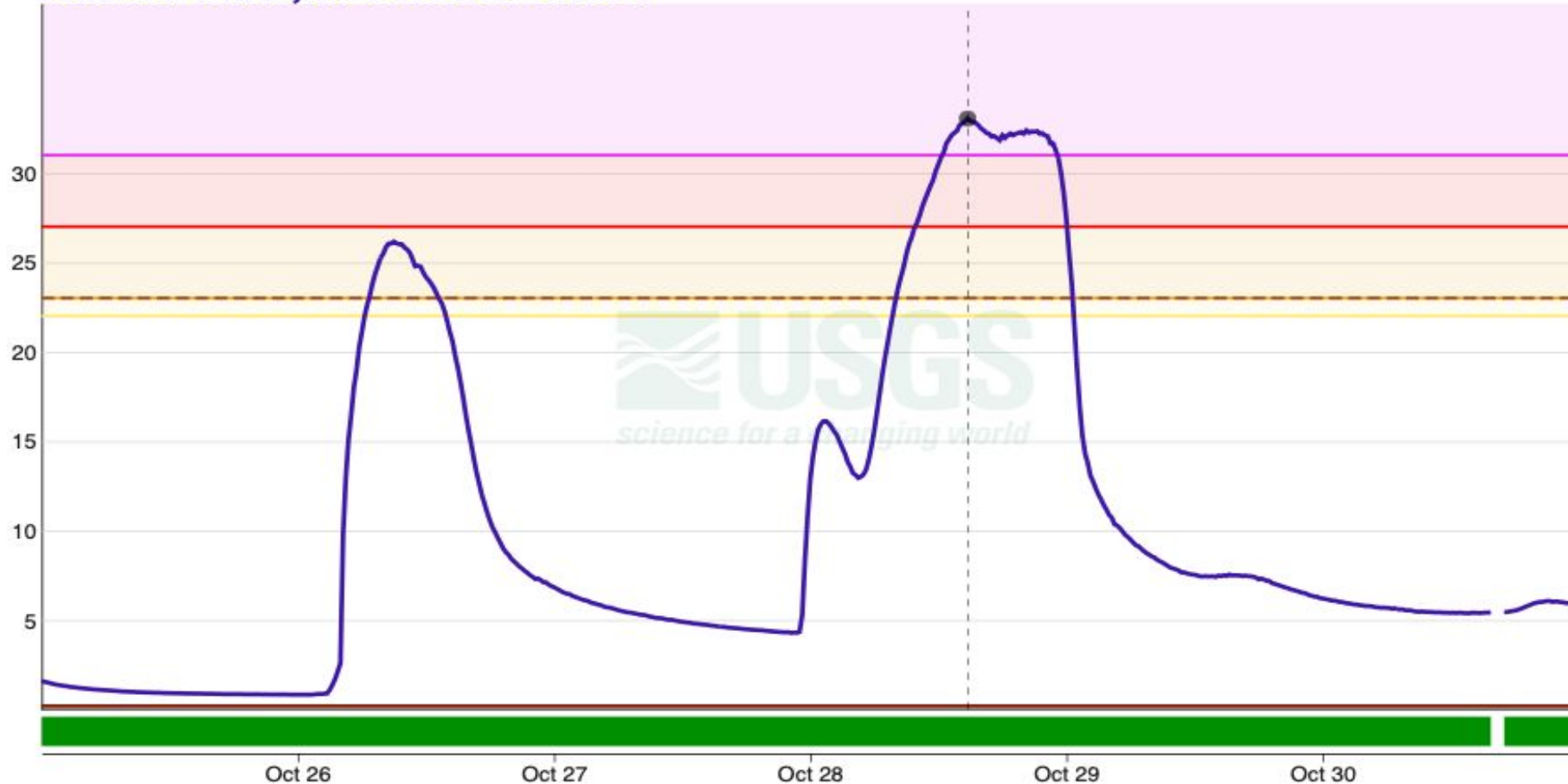


## N Bosque Rv nr Clifton, TX - 08095000

October 25, 2023 - October 30, 2023

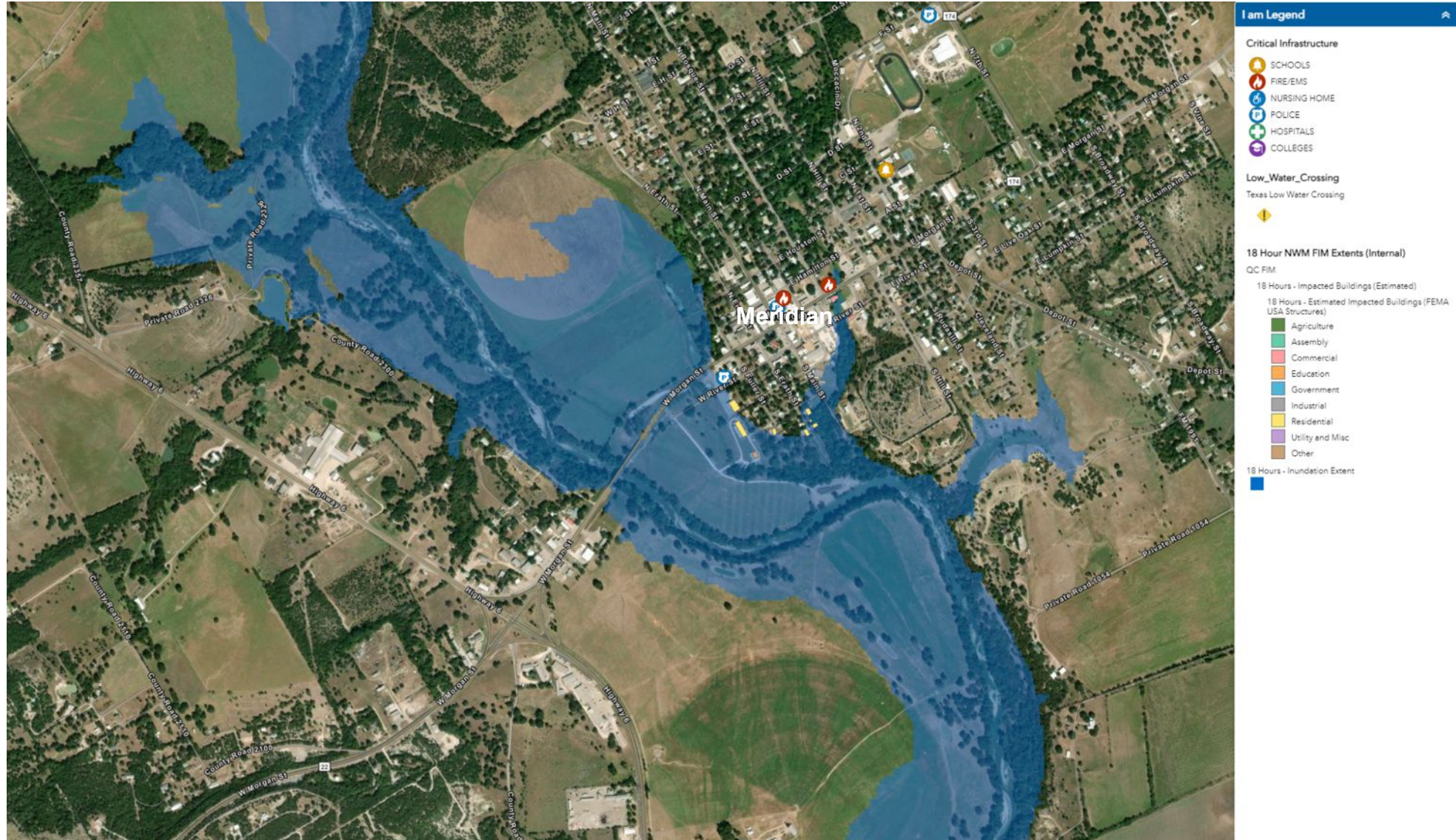
Gage height, feet

33.05 ft - Oct 28, 2023 02:45:00 PM CDT





# Latest Analysis NWM FIM (28 Oct 2023)





A dynamic background image featuring a blue-tinted water splash. The water is captured in mid-air, creating a sense of movement and energy. The splash originates from the top left and spreads across the frame, with numerous droplets and bubbles visible. The overall color palette is various shades of blue, from deep navy to light sky blue.

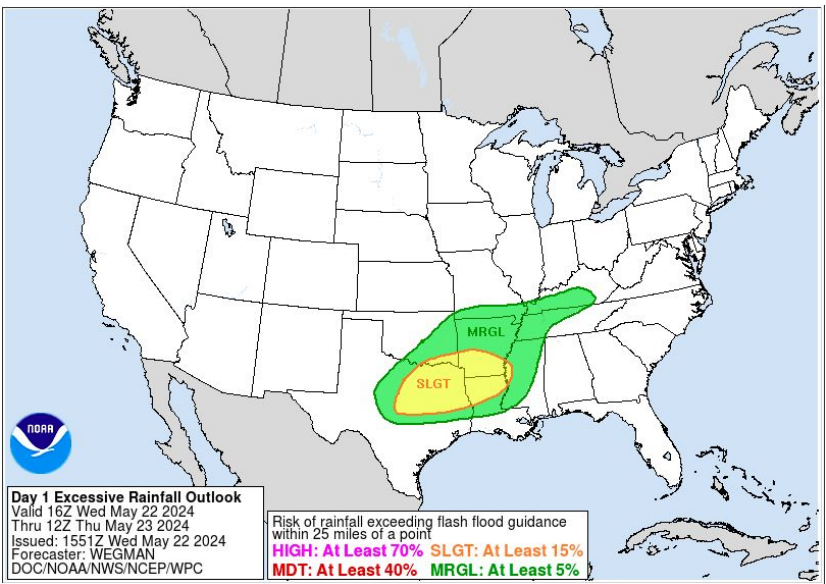
# Waco, Texas Flood Event

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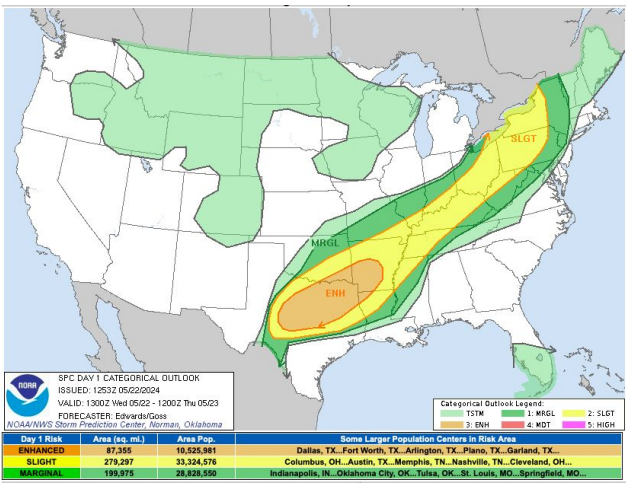
May 2024



# Waco, TX May 2024 Event Setup

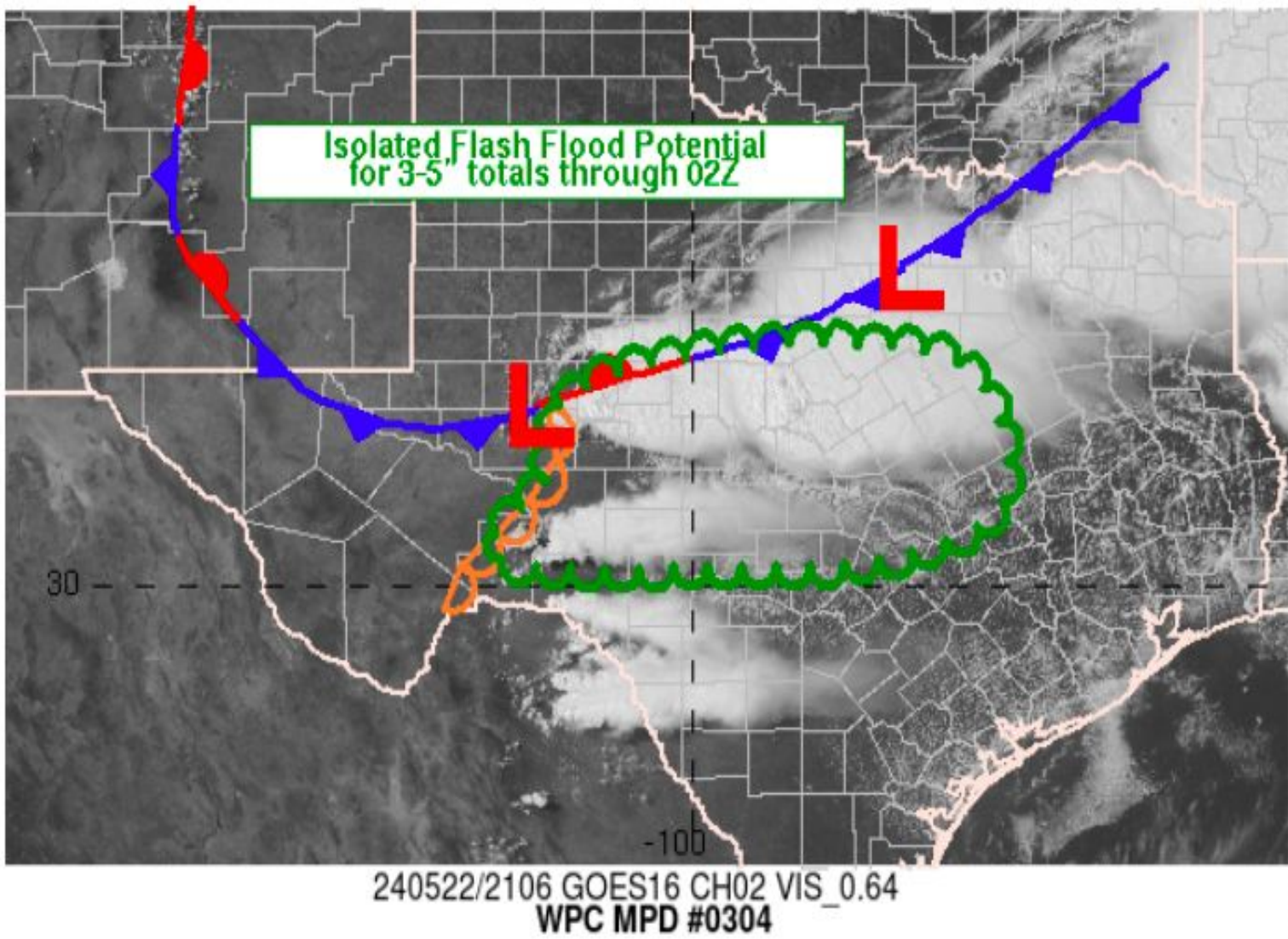


WPC Day 1 ERO issued 18z 22 May 2024



SPC Day 1 Outlook issued 13z 22 May 2024

WPC MPD issued 22z 22 May 2024

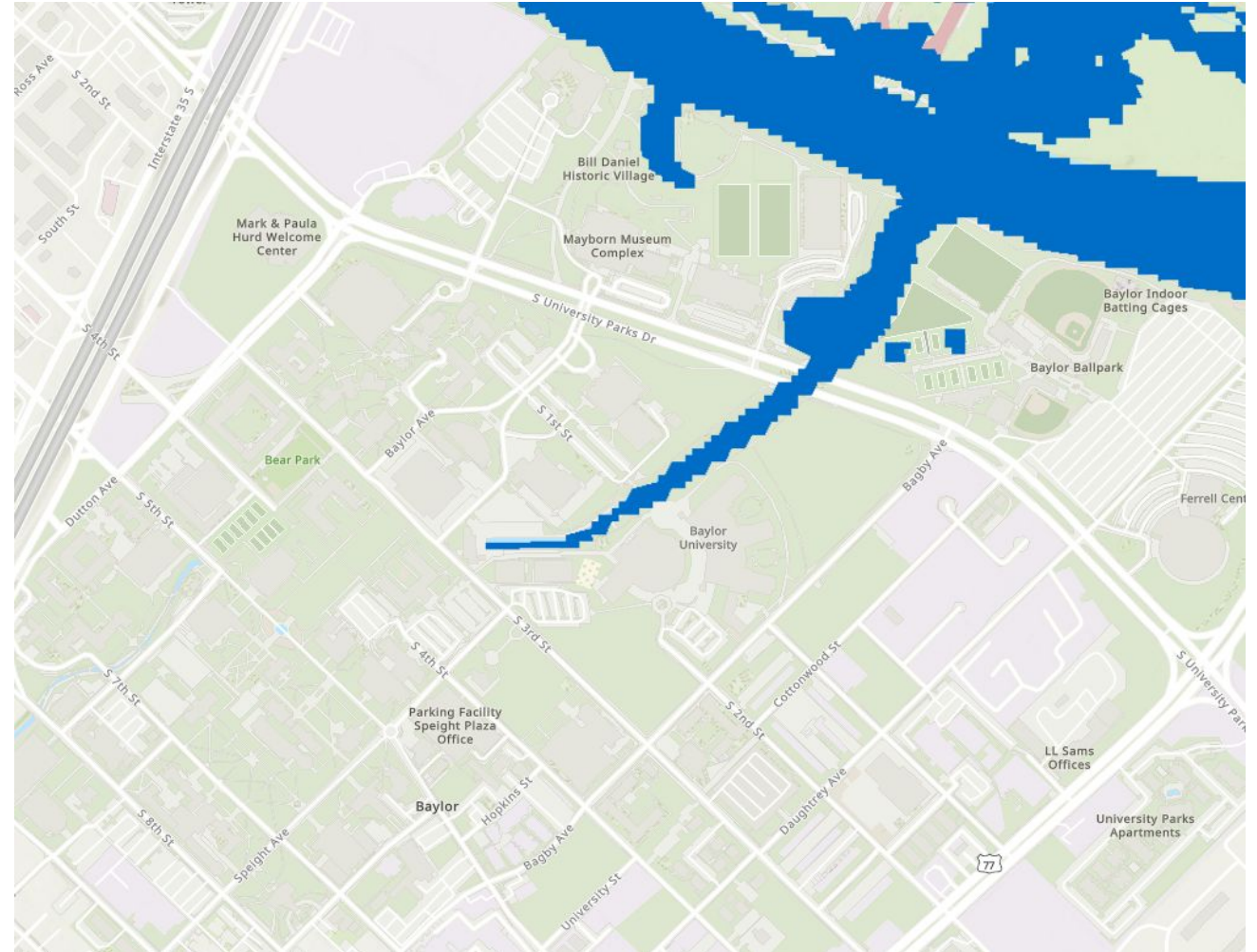




# NWM Latest Analysis FIM (22 May 2024)



- EM request (via NWSChat 2.0) guidance for Waco Creek (Baylor University)
  - Creek overflowing/road flooding/stranded motorists
- No river observations available
- Local/RFC modeling unavailable
- **NWS NWM and Latest Analysis FIM used to estimate timing of peak**





# Key Takeaways



- **Flood Inundation Maps (FIM) put "water on a map";** they illustrate where flooding may occur in an area to improve risk communication
- **FIM only applicable for river flooding, NOT flash flooding!**
- **Several types of FIM exist and all have various strengths and shortcomings**
- **Latest Analysis FIM, a dynamic flood extent map product from the NWS, provided useful guidance to local EMs during high-impact flood events in North Central Texas**



A dynamic blue-toned image of water splashing, with numerous bubbles and droplets visible against a lighter blue background.

# Questions??

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