Maximum Rainfall and Timing Product - 2024

HMT staff

Goals

HMT will:

- Select a 6 hour window where the maximum 6 hour rainfall and/or the maximum risk of flooding (i.e. areal coverage of > 1") will occur.

- Select a regional domain to capture the primary/secondary hazard area.

Forecasting:

- Extreme precip around a region. Difficulty level: Maximum.
- QPF in 6h period with risk of flooding.
- Probabilistic Thinking Games*: Confidence and probability to capture your intent.
    - Rain Max Threshold - how confident you are
    - Timing - certainty in Time
    - Contours - certainty in Location/Coverage
- Flood Key messages - be specific and informative. Not for the public.

1: Lawson,J et al , 2023: A probabilistic Wx Challenge Proposal. AMS Annual Meeting

How to draw

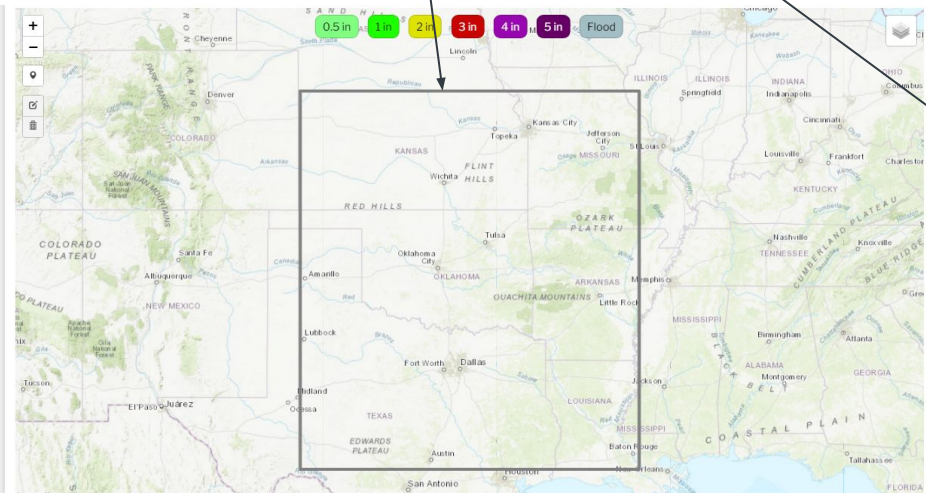1: Your URL should include href or refs as the group.

2. Choose the day 1 or 2, pick username, and enter date (YYYYMMDD)

   Username: use the same username everyday; should not include special characters. Be creative and have fun with these if you want.

3. Hit submit. Domain should appear on the map and the details will appear in the white space below submit.

General Settings

Forecast Day ? | 1 | 2 |

Username ?   MIrocks

Date ?   20240530

Load Domain

Domain for 20240530, day 1

Your Group: REFS
Start Time: 20240531 02 UTC
End Time: 20240531 08 UTC
Rain Max Prob Threshold: 5.00 inch

0.5 in   1 in   2 in   3 in   4 in   5 in   Flood

How to draw
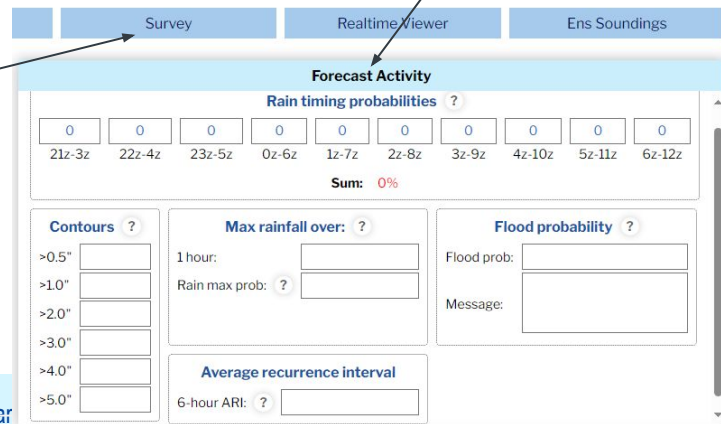
4: Draw smallest qpf first; aka start with half inch.

Example: click [0.5 in] to activate drawing for the 0.5" polygon. Then click on the map where you want the forecast area to start at (a crosshair shows on the map). Click to add more points, then click very first point (crosshair will become a hand prior to click) to close the polygon.

This polygon can be edited with the edit layer [✎] It can be deleted with the trash can icon. After edit/delete click save. If you changed your mind, click cancel.

5. Once you have finished drawing, answer the Forecast Activity questions that are above the drawing area and the complete your MRTP survey.

Forecast Activity Questions

- Highest 6hr ARI expected to be exceeded in years: consult ARI images on hmt_website.
- 1hr precip - max hourly accum over the 6h period in the domain.
- Flood Key message: enter key message brief, information rich on Timing, intensity, accumulation, like an MPD.
- Flood prob - how likely it is to flood, and as denoted by your flood area.
- Rain prob - how likely to exceed our chosen rain threshold, listed on the General Settings area.

Domain for 20240530, day 1

Your Group: RRFS
Start Time: 20240531 02 UTC
End Time: 20240531 08 UTC
Rain Max Prob Threshold: 5.00 inch

- Rain Timing: confidence in % that the 6hr rain max will occur for each 6h window. EX:

Rain timing probabilities ?

10	10	10	10	25	35	0	0	0	0
21z-3z	22z-4z	23z-5z	0z-6z	1z-7z	2z-8z	3z-9z	4z-10z	5z-11z	6z-12z

Sum: 100%

13: Contour confidence: estimate how confident you are for each drawing threshold. E.g. Draw a 5", but low confidence in location OR didn't draw a 5" but low confidence or zero confidence. This is for the "main" region of precipitation you are concerned about.

Survey

The survey is a way to gather feedback on what you used and in some cases why. Its located at the top of the page.

How to Submit

If you have answered all the questions these last 2 steps are the most critical.

1. Drop your points on the map A pop-up will appear and enter the 6h max rain amount for each point. Up to 5 points can be dropped but in verification we will plot only the top 3 observed maximums.
2. Click Export Features.
   a. File downloads: Success!
   b. An alert pops up. Oh No! The information on that alert will tell you what's missing. Answer the questions in Red.
      i. Try export features again.

How to Submit

Once you have successfully downloaded your forecast:

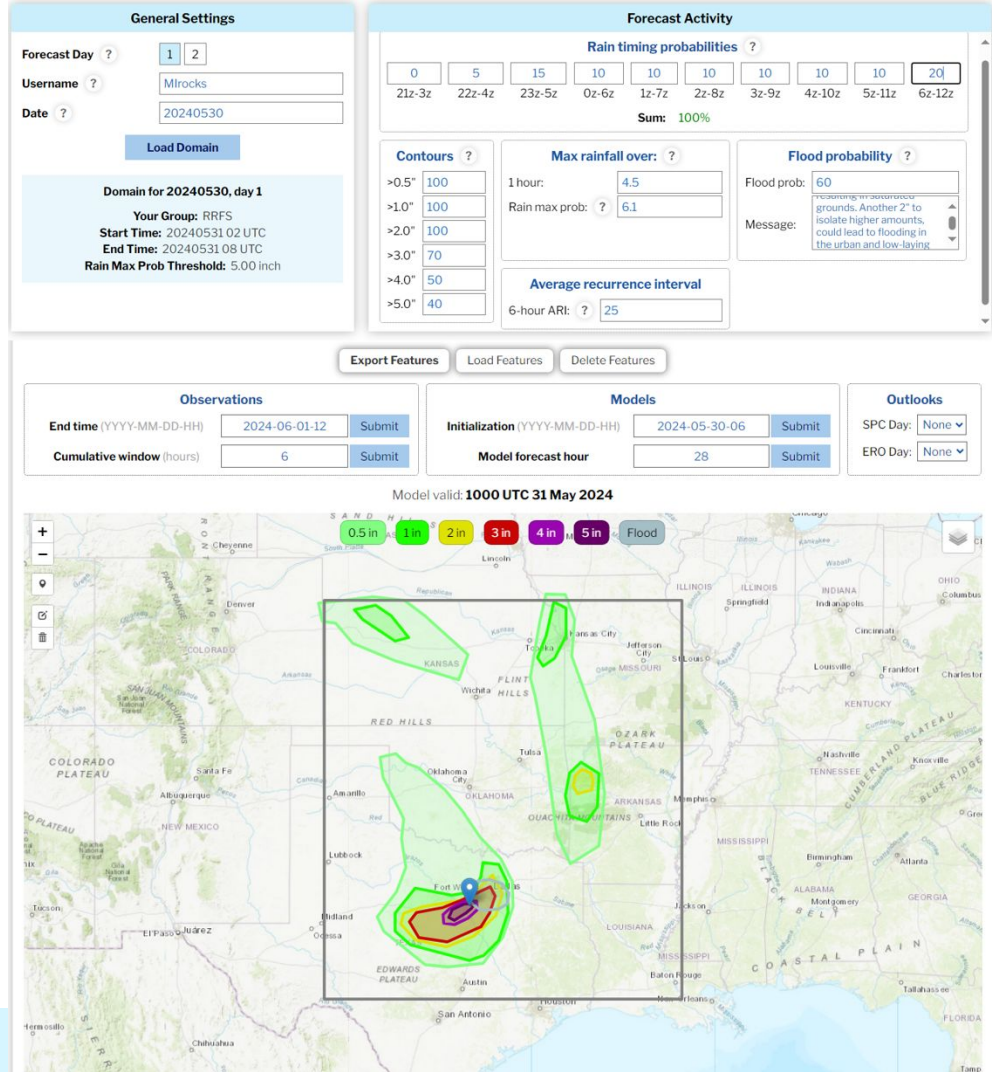3. send an email to Jimmy and Sarah with <mark>your MRTP attached.</mark>

    a.   Email title - MRTP Day #

    b.   Emails - james.correia@noaa.gov and sarah.trojniak@noaa.gov

Example of completed MRTP (minus survey)

Time controls

When the page loads - it loads the current time. To activate archive data for verification, aka to look at observations, enter date-hour and how far back in time you want to look. Click Submit.

Observations

End time (YYYY-MM-DD-HH)	2024-06-03-12	Submit
Cumulative window (hours)	6	Submit

Pull obs valid from 06-12UTC 03 June 2024

The model date-cycle is controlled similar but also requires forecast hour. Click Submit.

Models

Initialization (YYYY-MM-DD-HH)	2024-06-03-00	Submit
Model forecast hour	36	Submit

Pulls 00z cycle guidance that is valid ending 12UCT 04 June 2024 (aka fhr36)

Visualization Elements

Model/Ens. 6 hour QPF/PMM contours and object Maxima (hourly)

Ensemble 6 hour probs for 1", 2", 3", and 5" (3 hourly)

MRMS 6 hour precip contours and Object Maxima (hourly)

Mesoscale Precip Discussions (current time or obs time sync)

Situational Awareness:

- Prob severe (latest updates every 15 minutes),
- Warnings (user selected),
- LSRs (user selected),
- ASOS prates last 6hrs (user selected),
- Social Vulnerability Index (SVI; static),
- Burn scars/Urban Areas,
- FLASHiness - USGS gauge sites with flashiness for 1hr, 25yr ARI
- (Saharia et al 2017: Mapping Flash Flood Severity in the United States. JHM;
- Saharia et al 2021: On the Impact of Rainfall Spatial Variability, Geomorphology, and Climatology on Flash Floods)

Drawing Elements

- QPF areas (0.5",1,2,3,4,5")
    - You do not have to draw for every threshold but you must draw for every threshold lower than the maximum threshold you draw for.
    - Can have multiple regions.
- Flooding area (flooding may occur in a variety of ways).
- Your Point Maximum location corresponds to the maximum 6hr rainfall you input in your forecast.
    - Can have multiple of these (up to 5) depending on event or confidence.

Verification Elements

- We will verify as a group for the time confidence
- Objective scores provided for each QPF threshold
- Each model/ens will be verified for each threshold
- LSRs will be used to assess flash flooding areas

Each participant can load their own MRTP forecast back into the browser for assessment as well as the HMT imagery

Other

- To find the valid date/time for the MRTP click on the grey border that outlines the MRTP domain