

CW3E Precipitation Outlook: 12 September 2024

Remnants of Tropical System Forecast to Bring Precipitation to Interior Western US

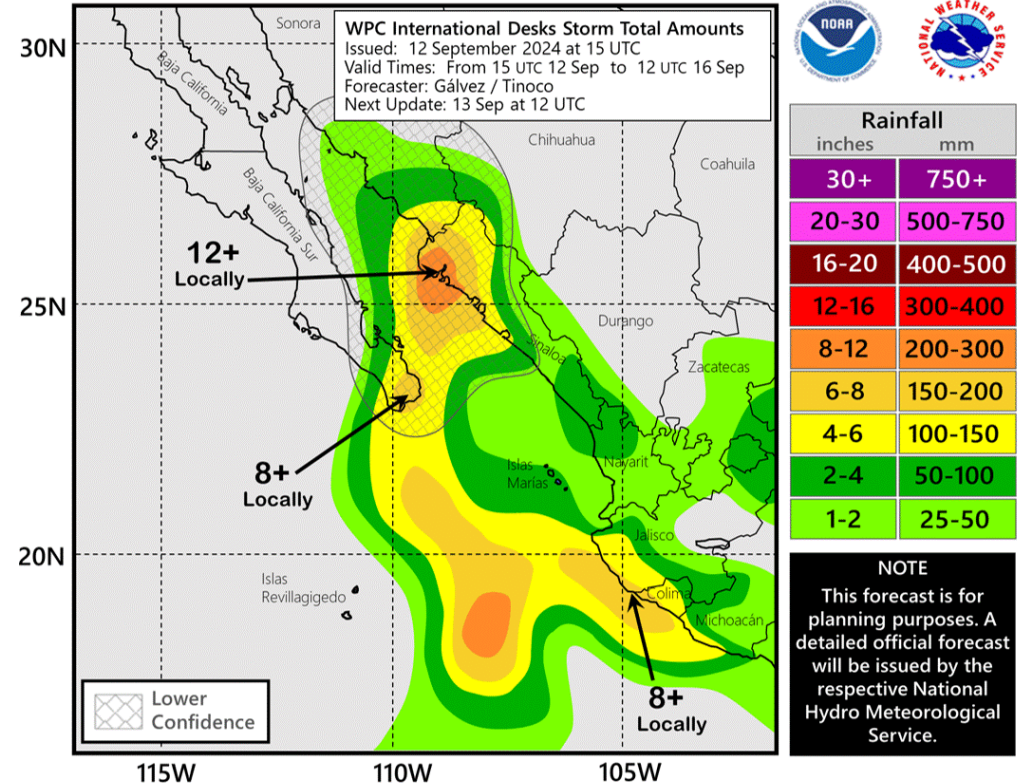
- A tropical depression (TD 9E) currently located south of the Baja Peninsula is forecast to strengthen into a tropical storm and track northward through the Gulf of California during the next several days.
- Tropical moisture associated with the tropical cyclone (TC) is forecast to expand northward into the interior southwestern US this weekend, setting the stage for showers and thunderstorms that could produce flash flooding.
- Meanwhile, a deepening mid-level trough near the US West Coast is forecast to move eastward and bring widespread light-to-moderate precipitation to the Great Basin and Northern Rockies.
- As this trough moves onshore, it will interact with the remnant TC moisture, leading to a broad region of enhanced moisture transport over the Colorado River Basin.
- The Global Ensemble Forecast System (GEFS) is showing a high likelihood (> 85% probability) of atmospheric river (AR) conditions ($IVT \geq 250 \text{ kg m}^{-1} \text{ s}^{-1}$) in southern AZ on 15–16 Sep.
- The NWS Weather Prediction Center (WPC) is forecasting 0.5–1.5 inches of precipitation in portions of central and southeastern AZ, southwestern CO, northern NV, and northern UT during the next 5 days.
- The NWS WPC has issued a **marginal risk** of rainfall exceeding flash flood guidance in central and southeastern AZ Saturday into Sunday morning, expanding to much of AZ and western NM Sunday into Monday morning, expanding further northward into southwestern CO Monday into Tuesday morning.

CW3E Precipitation Outlook: 12 September 2024

NHC Guidance: Tropical Depression 9E



Tropical Depression Nine-E Total Forecast Rainfall

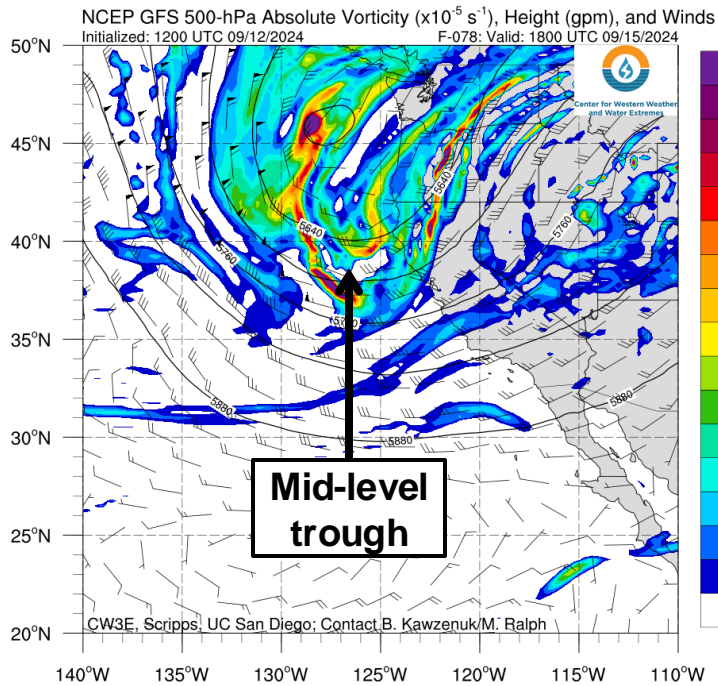


- As of 10 AM PT today, Tropical Depression 9E was located about 275 miles SSE of Cabo San Lucas, Mexico.
- This system is forecast to strengthen into a tropical storm later today and gradually move northward into the Gulf of California over the next several days.
- Very heavy rainfall is forecast over the southern tip of Baja California Sur, as well as northwestern Sinaloa, where more than 12 inches of total rainfall is possible in some locations through Monday morning.

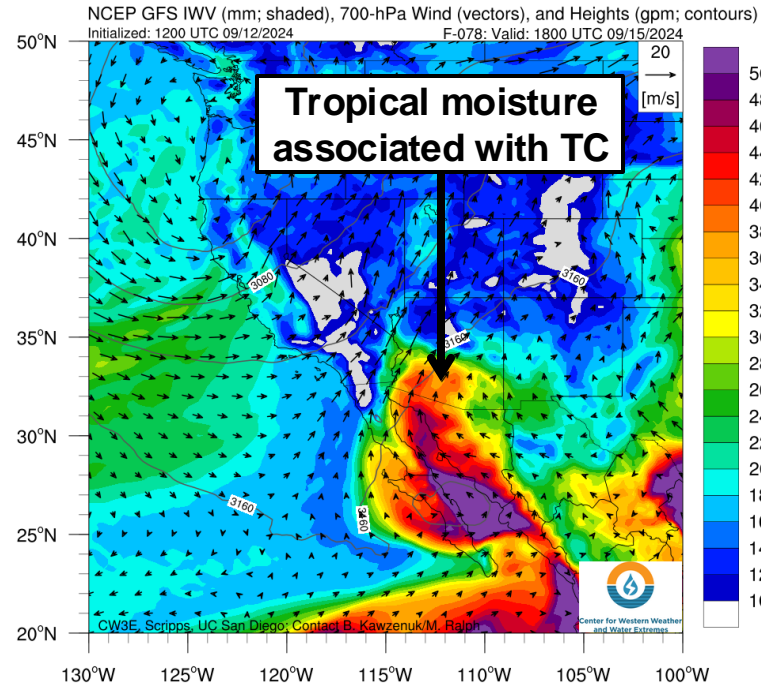
CW3E Precipitation Outlook: 12 September 2024

GFS Model Forecasts: Valid 11 AM PT 15 Sep

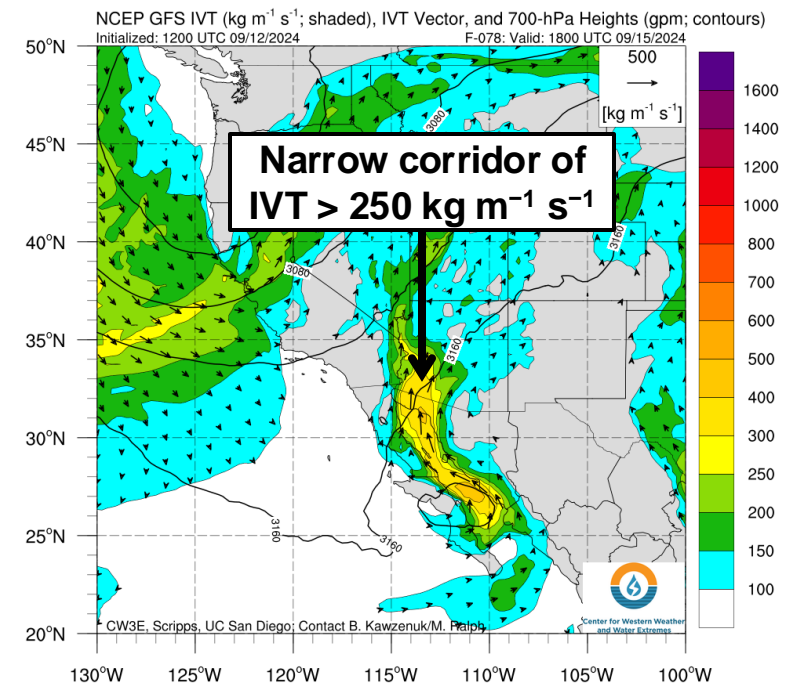
A) 500-hPa Geopotential Height



B) IWV



C) IVT

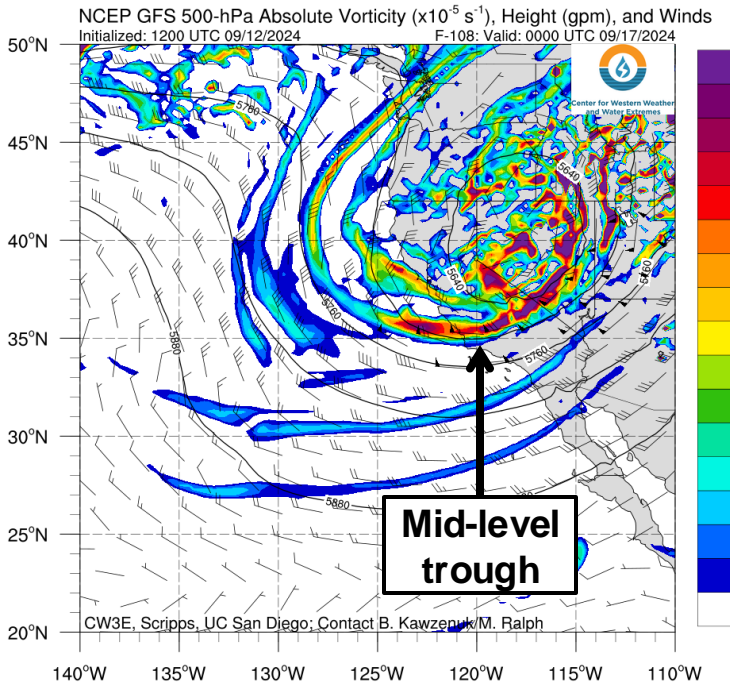


- As the tropical cyclone (TC) moves through the Gulf of California, tropical moisture is forecast to expand northward into southern AZ, with IWV values potentially reaching 40 mm by midday Sun 15 Sep (Figure B).
- Very moist air combined with weak southerly mid-level winds will support the development of a narrow corridor of enhanced moisture transport north of the TC (Figure C).
- Meanwhile, a deepening mid-level trough is forecast to approach the US West Coast and eventually move onshore early next week (Figure A).

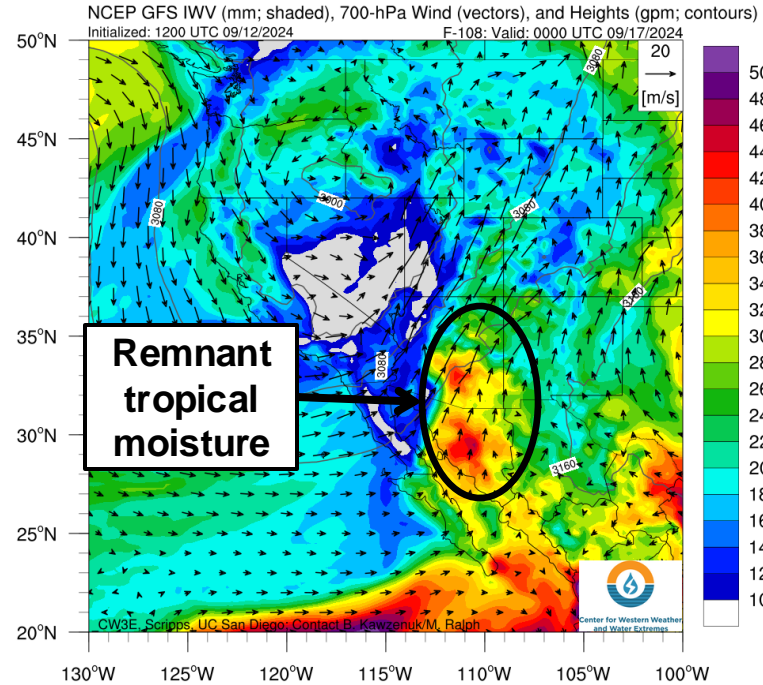
CW3E Precipitation Outlook: 12 September 2024

GFS Model Forecasts: Valid 5 PM PT 16 Sep

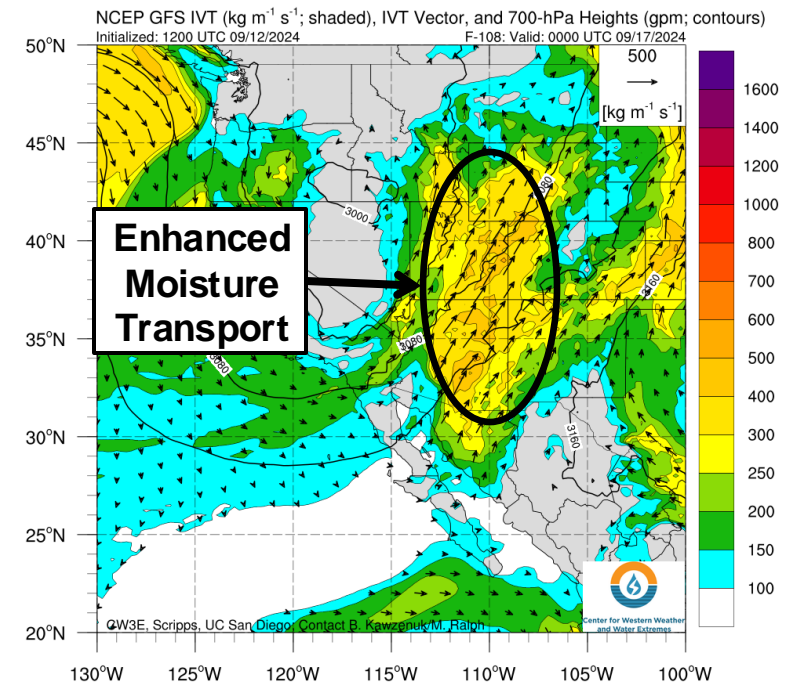
A) 500-hPa Geopotential Height



B) IWV



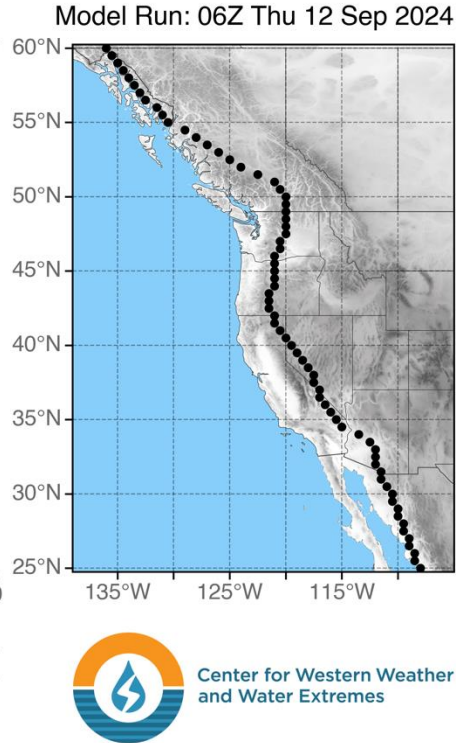
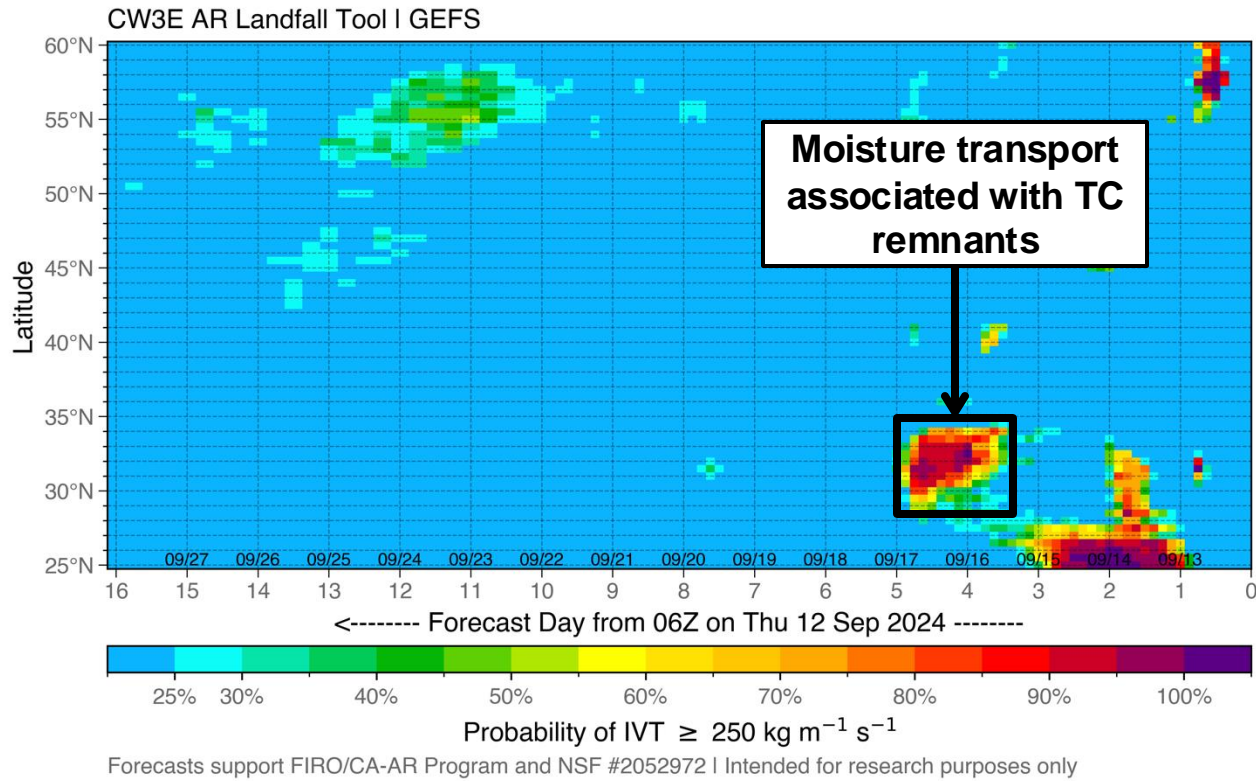
C) IVT



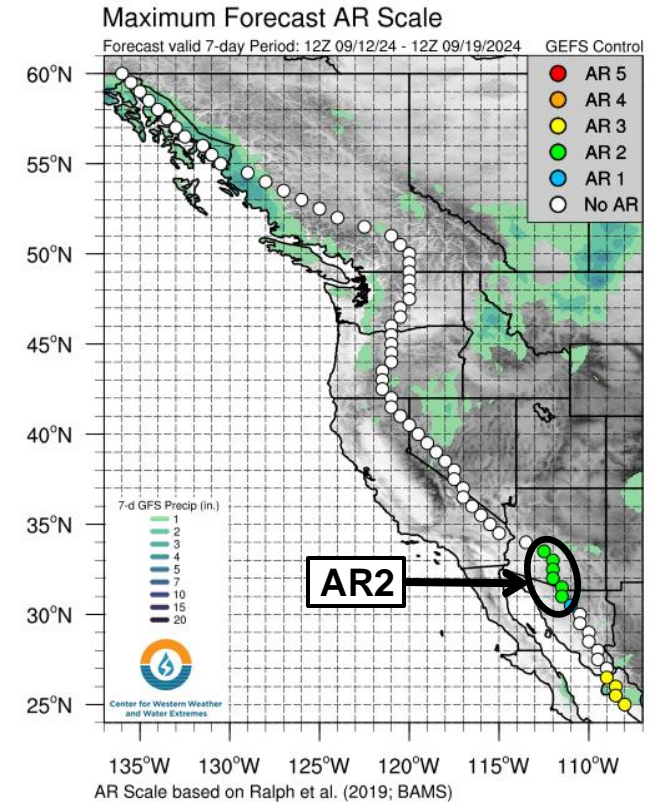
- As the mid-level trough moves onshore, southerly flow is forecast to strengthen downstream of the trough (Figure A).
- The interaction between the strengthening southerly mid-level winds and remnant tropical moisture will lead to a broad region of enhanced moisture transport over the Colorado River Basin (Figures B and C).
- Strong southerly moisture transport downstream of the trough could lead to orographic enhancement of precipitation in areas of higher terrain.

CW3E Precipitation Outlook: 12 September 2024

GEFS Probability of AR Conditions Inland



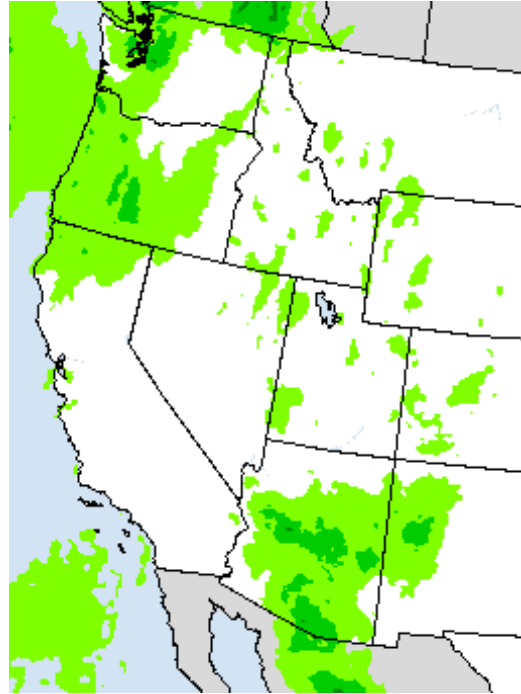
GEFS Control AR Scale



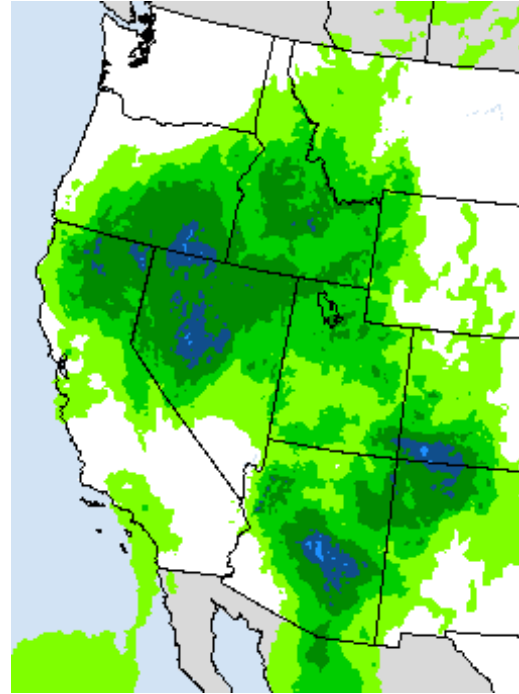
- CW3E's AR landfall tool is showing a strong signal of enhanced moisture transport ahead of the TC as it moves northward and begins to weaken.
- The 06Z GEFS is indicating high confidence ($> 85\%$ probability) in a period of AR conditions ($IVT \geq 250 \text{ kg m}^{-1} \text{ s}^{-1}$) over southern AZ on 15–16 Sep.
- The 12Z GEFS control run is forecasting AR2 conditions over south-central AZ.

WPC Precipitation Forecasts

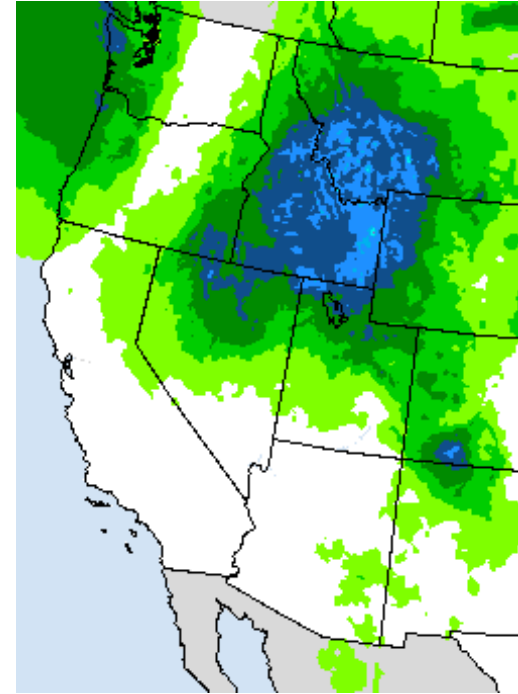
A) WPC Day 3 QPF: Valid Ending 5 PM PT 15 Sep



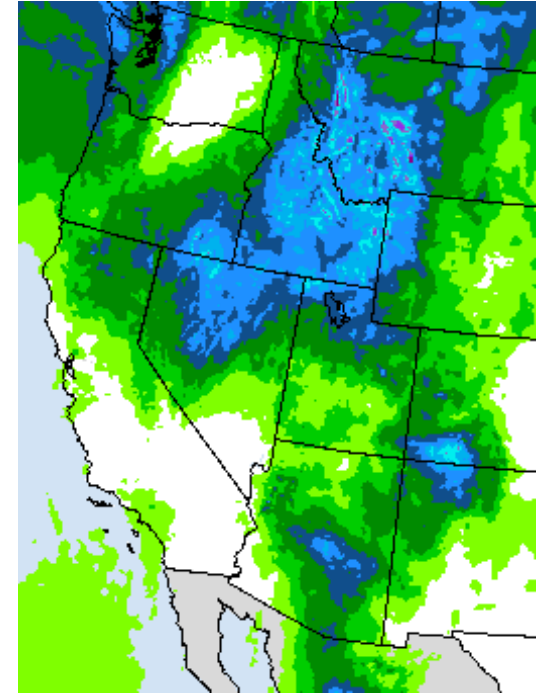
B) WPC Day 4 QPF: Valid Ending 5 PM PT 16 Sep



C) WPC Day 5 QPF: Valid Ending 5 PM PT 17 Sep



D) WPC Days 1–5 QPF: Valid Ending 5 PM PT 17 Sep

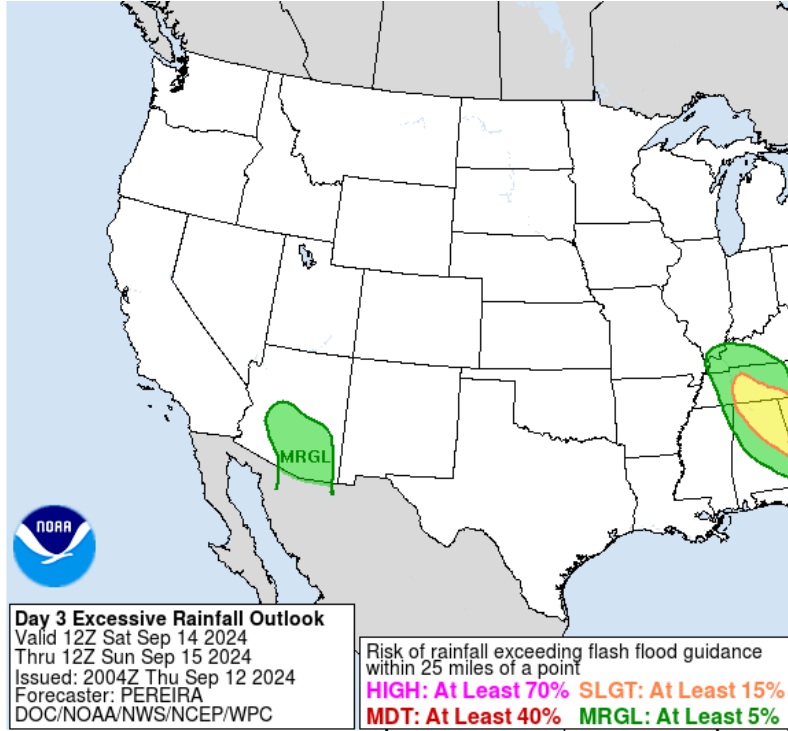


Source: NOAA/NWS Weather Prediction Center

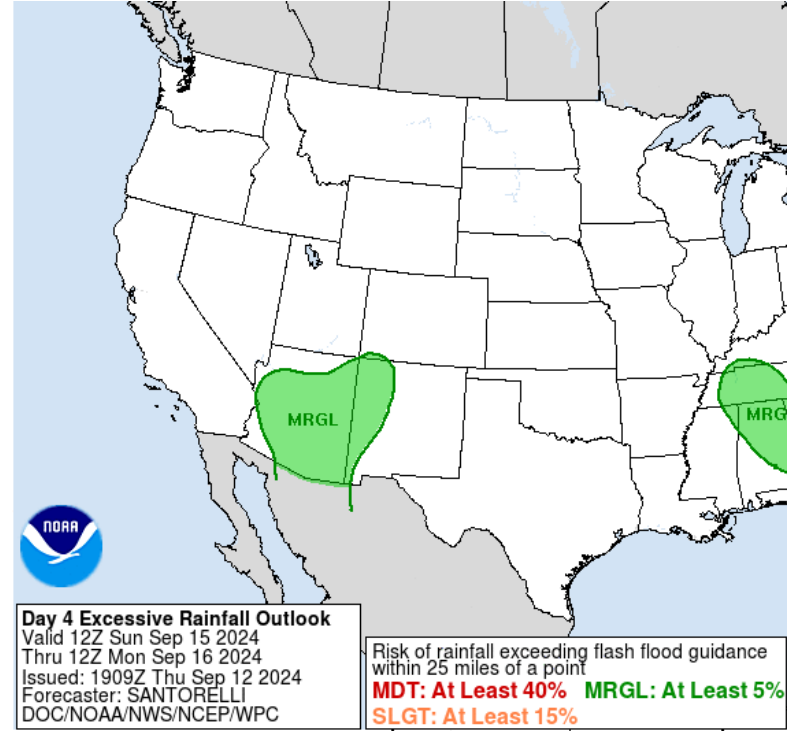
- The heaviest precipitation in AZ is forecast to occur during the 24-h period ending 5 AM PT Mon 16 Sep in association with the remnants of the TC (Figure B).
- Further north, light-to-moderate precipitation is forecast over portions of interior Northern CA, the Great Basin, and the Northern Rockies between Sun 15 Sep and Tue 17 Sep as the mid-level trough moves onshore (Figures B and C).
- The NWS Weather Prediction Center (WPC) is forecasting 0.5–1.5 inches of total precipitation in portions of central and southeastern AZ, southwestern CO, northern NV, and northern UT during the next 5 days (Figure D).

WPC Excessive Rainfall Outlook

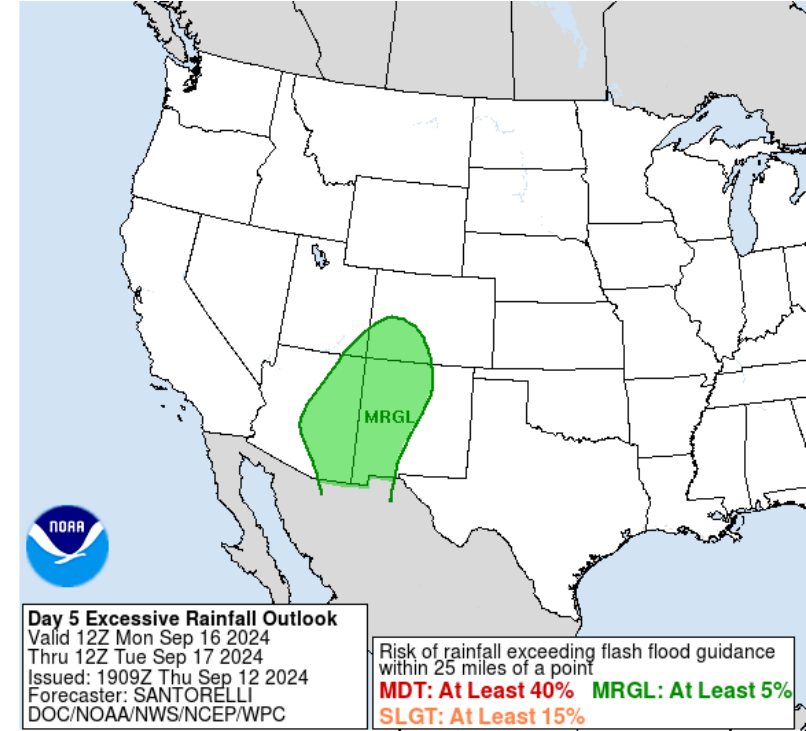
Day 3: Valid 5 AM PT 14–15 Sep



Day 4: Valid 5 AM PT 15–16 Sep



Day 5: Valid 5 AM PT 16–17 Sep



- Heavy showers and thunderstorms could produce flash flooding over portions of the interior southwestern US.
- The NWS WPC has issued a **marginal risk** of rainfall exceeding flash flood guidance over central and southeastern AZ on Day 3 (Saturday into Sunday morning), expanding to much of AZ and western NM on Day 4 (Sunday into Monday morning), and expanding further northward into southwestern CO on Day 5 (Monday into Tuesday morning).