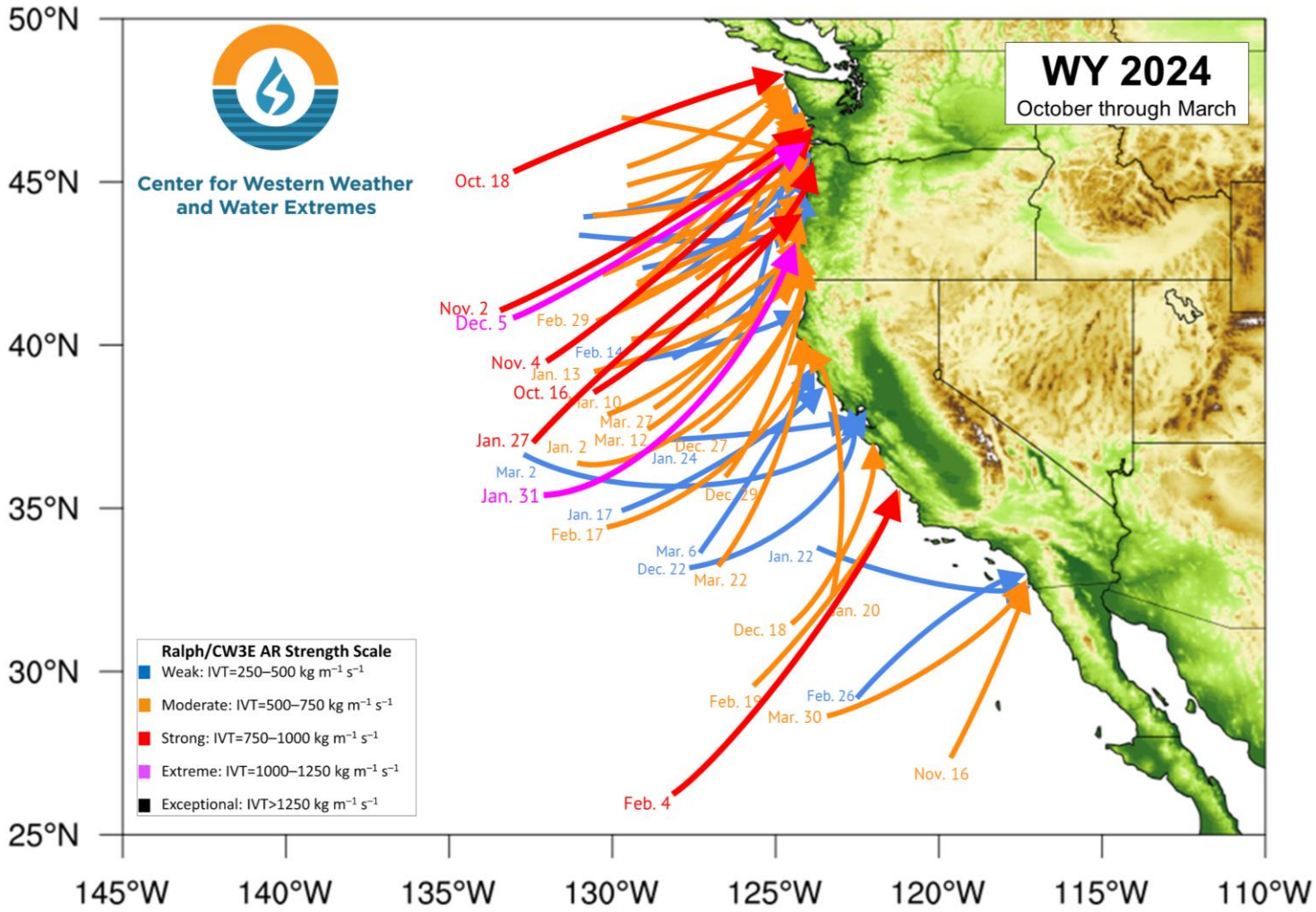
The Landfalling Atmospheric Rivers of Water Year (WY) 2024

AR Strength	AR Count
Weak	15
Moderate	28
Strong	6
Extreme	2
Exceptional	0

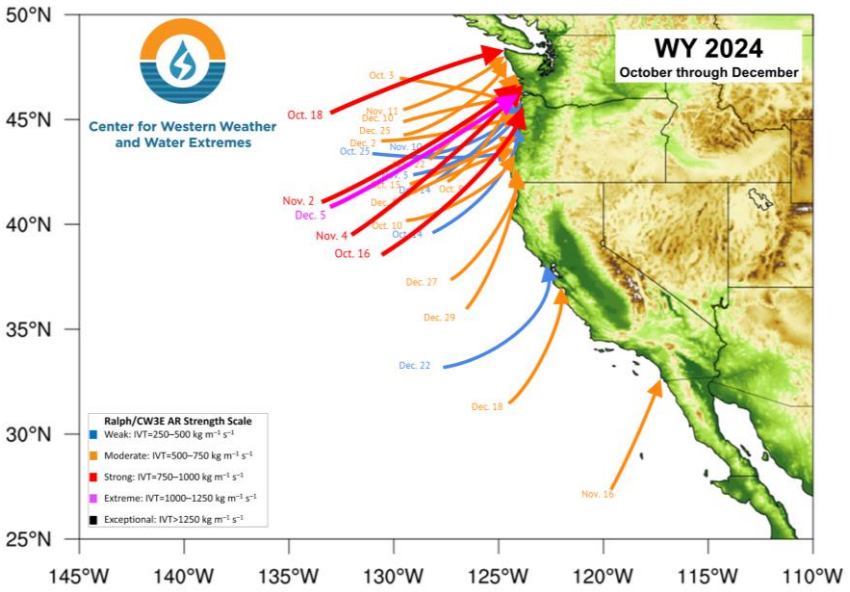
Regions Impacted by Each AR	
State/Region	ARs
Washington	41
Oregon	46
Northern CA	43
Central CA	25
Southern CA	16

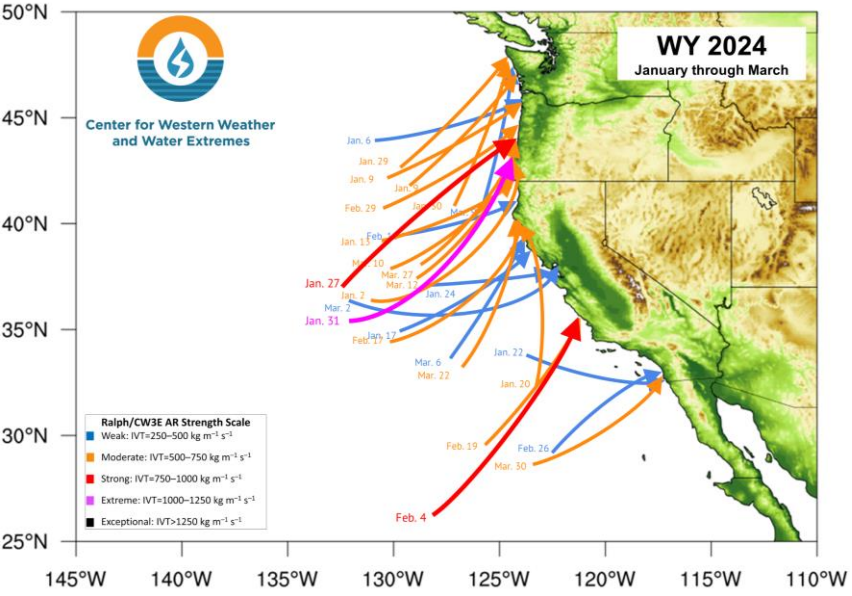
51 atmospheric rivers made landfall
over the U.S. West Coast during Water Year 2024



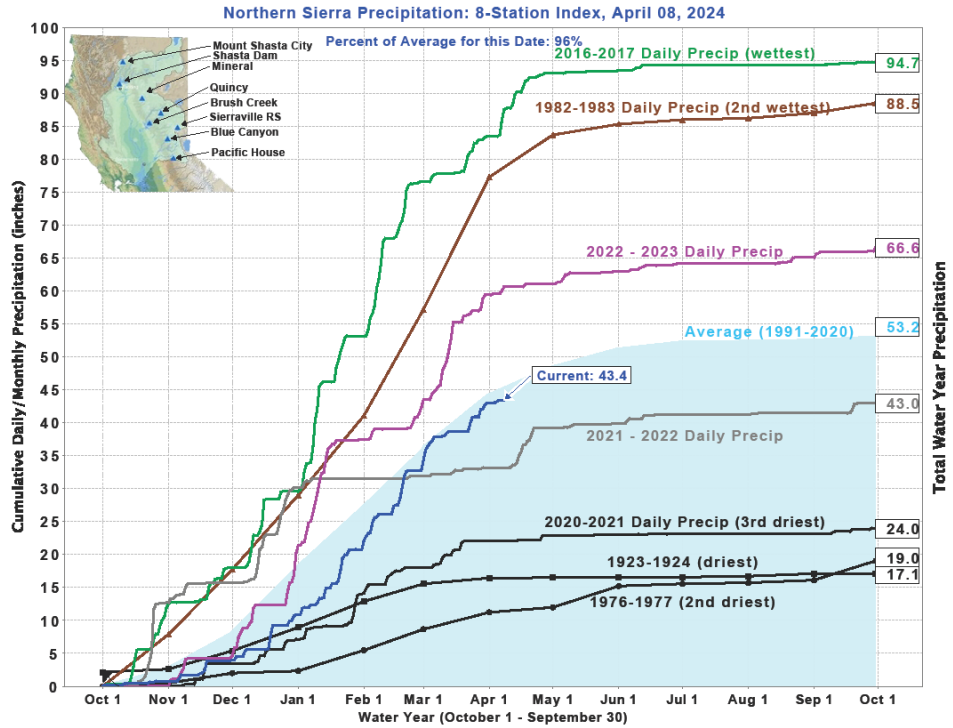
*Arrows are placed on the map where each AR was strongest over the coast

A Slow Start for California





- In the first three months of the water year (October through December), Northern California experienced 18 atmospheric rivers (12 weak and 6 moderate)
- During the second three months of the water year (January through March), Northern California experienced 25 atmospheric rivers (14 weak, 9 moderate, and 2 strong)
- At the end of December, the Northern Sierra 8-Station index was ~6 inches below normal for the date, but the switch to more atmospheric river activity in the second half of the winter resulted in the index rising to near normal



Source: *https://cdec.water.ca.gov/cgi-progs/products/PLOT_ESI.pdf*

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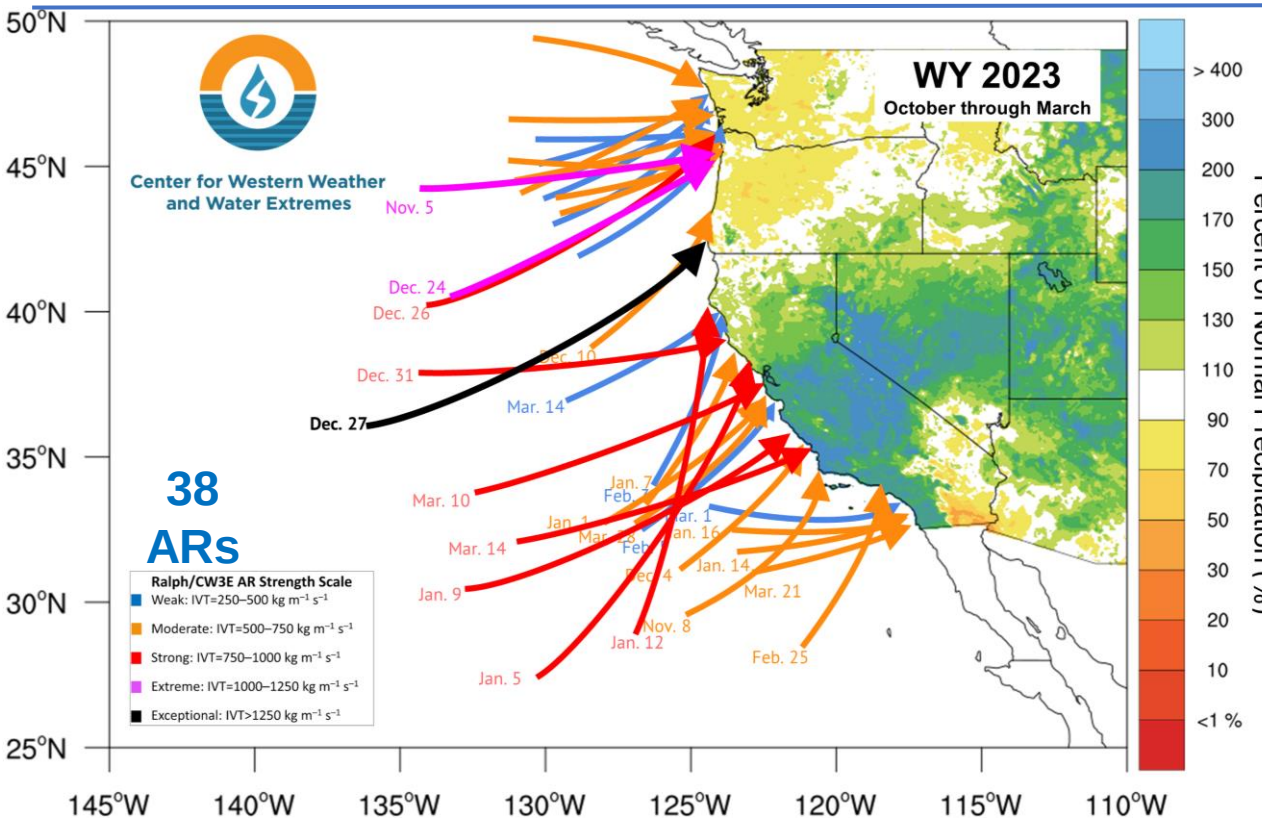
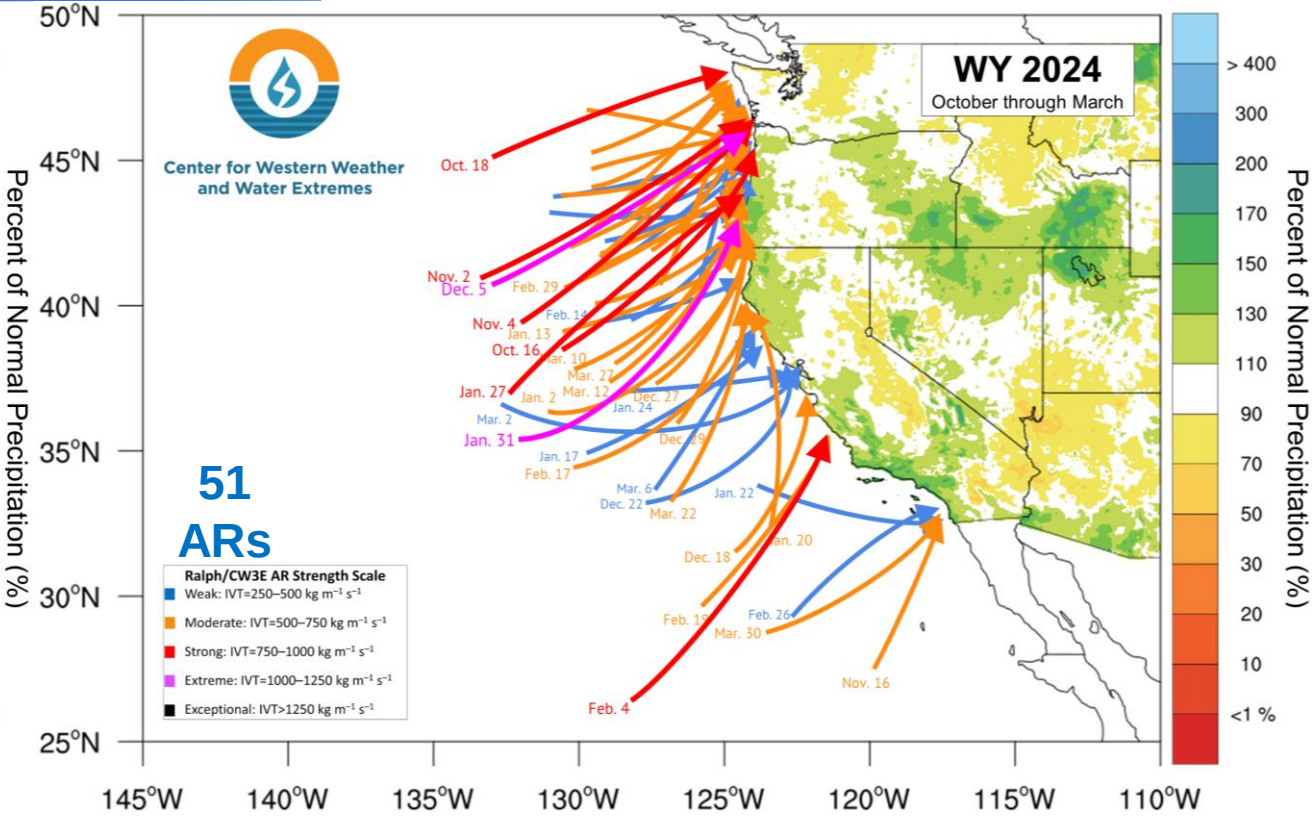
Water Year 2024 Compared to Water Year 2023





- Water Year 2023 experienced a total of **38 landfalling ARs** over the U.S. West Coast, 13 fewer than Water Year 2024.
- While WY 2024 experienced more ARs, a much larger majority, especially the stronger storms, only impacted the Pac. Northwest
- Water Year 2023 was dominated by a more southerly storm track, bringing stronger and more frequent ARs to California compared to the WY 2024
- This variation in storm track and storm strength during WY 2024 resulted in more widespread normal to near normal conditions across the West instead of the dipole and near record breaking precipitation in California in WY 2023.

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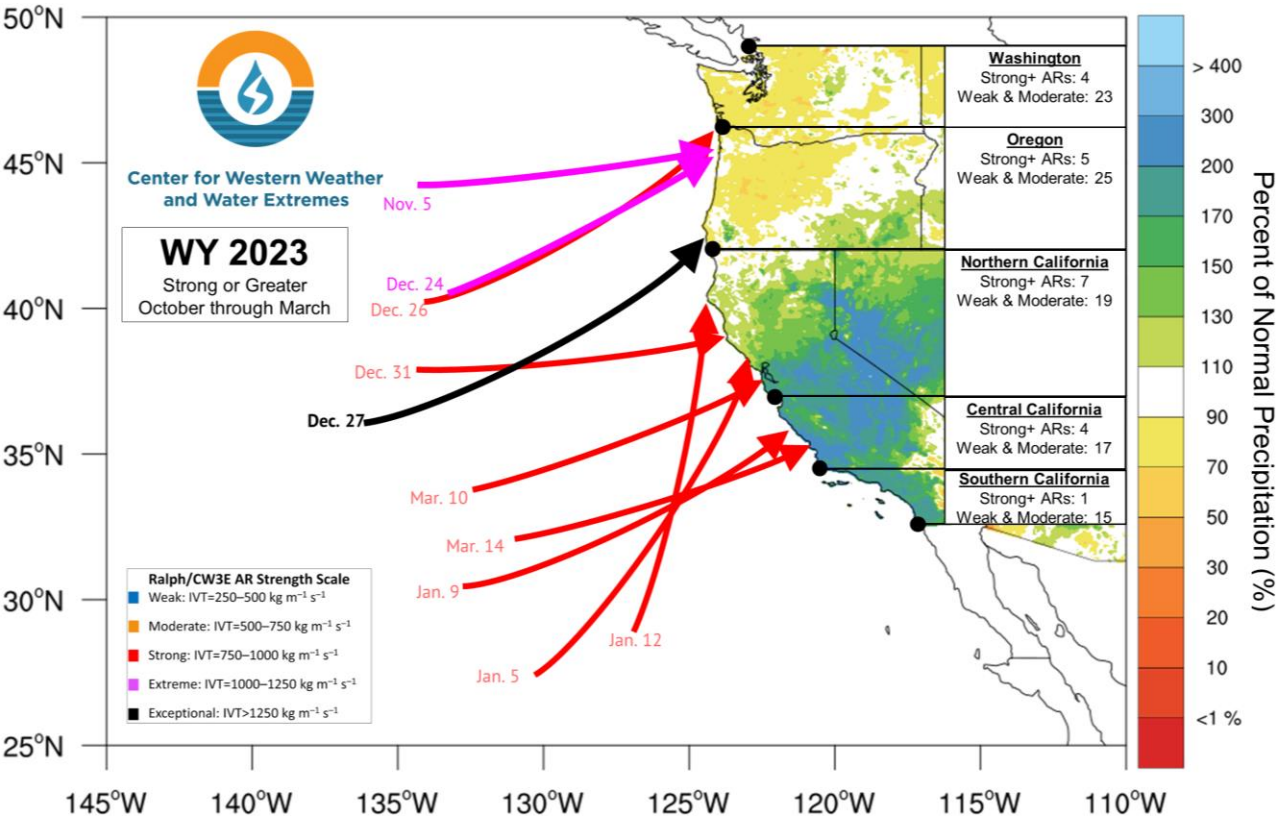
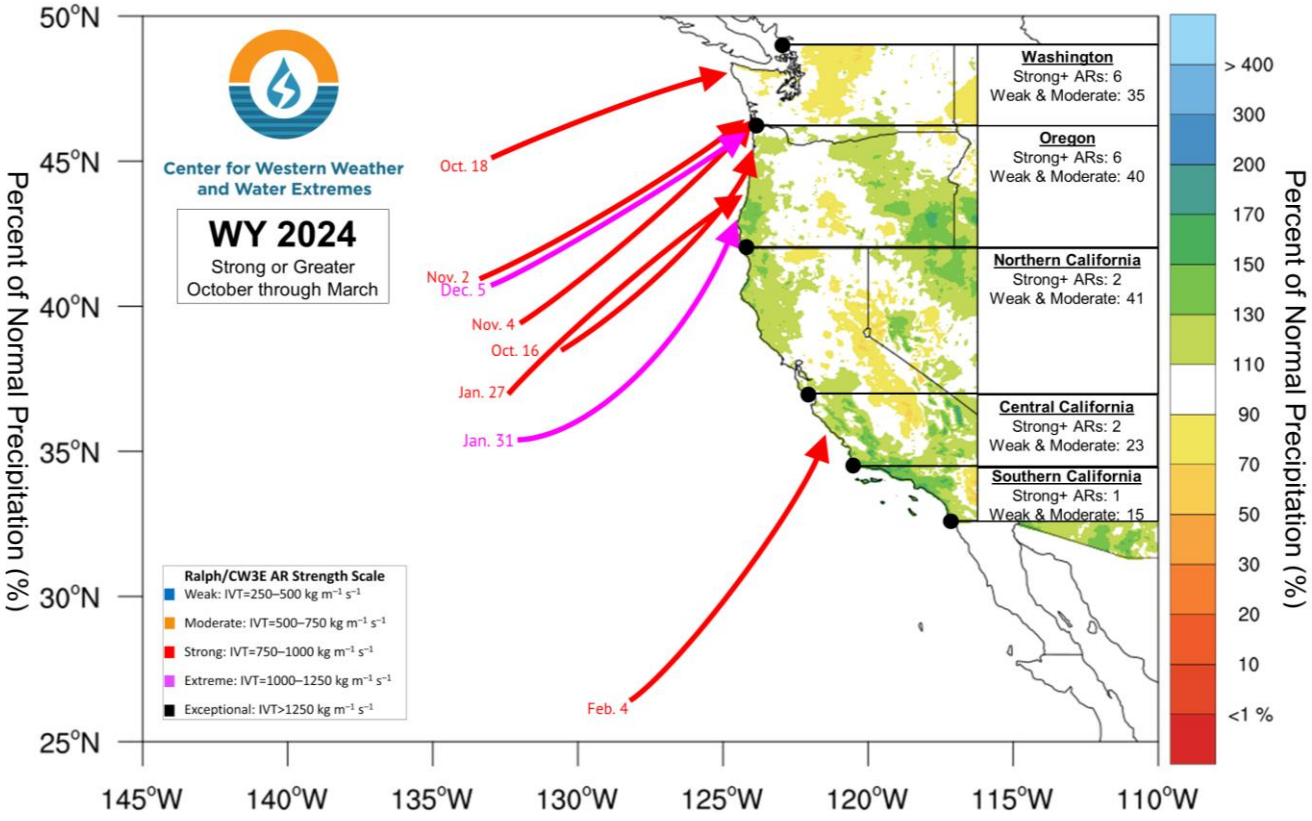
The Composition of a Water Year

Water Year 2023



Water Year 2024



- In water year 2023, California experienced **seven** instances of strong or greater magnitude AR conditions, nearly equaling the total from the previous three water years and resulting in >200% of normal water year precipitation across central California from the Coast to the Sierra and the Intermountain West
- In Water Year 2024, California only experienced two instances of strong or greater AR conditions but an abundance of weak and moderate ARs were able to make up for the lack of strong ARs to bring a large portion of the state to near or above normal precipitation

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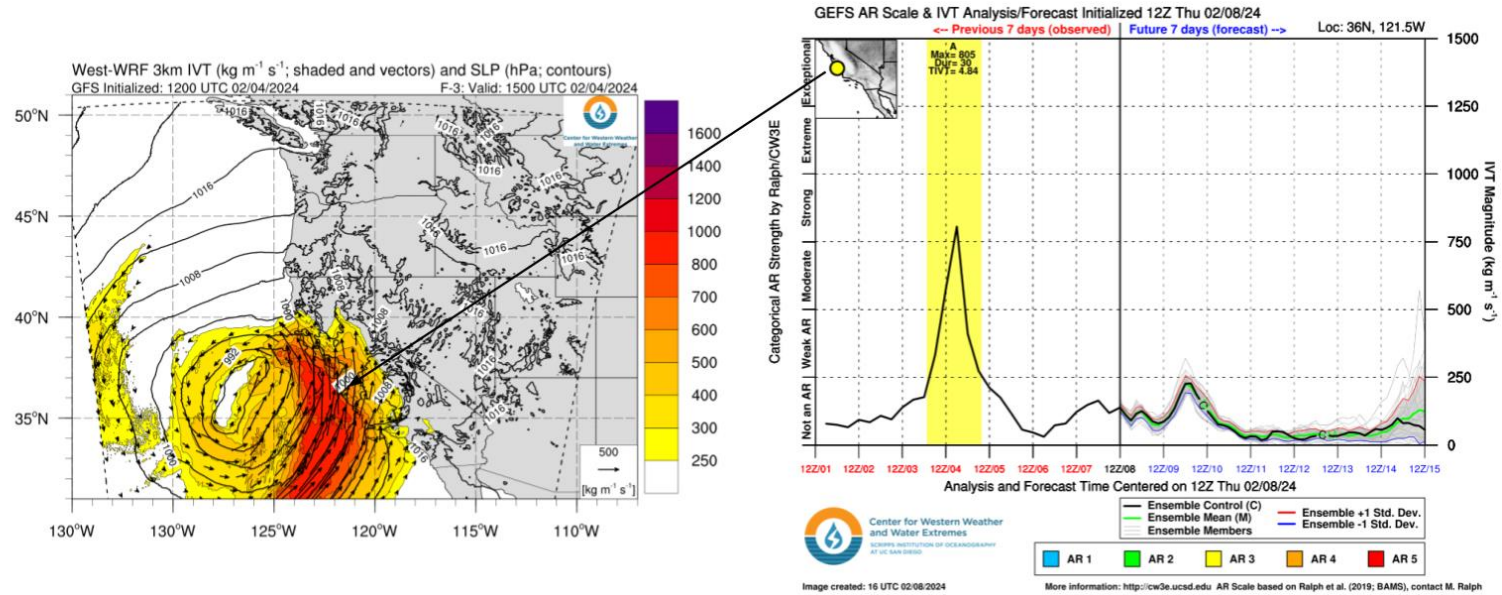
Water Year 2024 Highlights



- The strongest atmospheric river to impact Central and Southern California occurred on 4–6 February and brought efficient southerly IVT, heavy precipitation, and strong winds to much of the Southern California Bight from Santa Barbara to the Los Angeles Basin.
- Downtown Los Angeles received 8.51 inches of rain from 4 to 6 February, which was the second wettest 3-day stretch on record.
- Additionally, snowfall in the Sierra Nevada increased the year-to-date snowpack by 10 to 20%.
- This event was a great example how only a few strong storms over Southern California can make or break a water year.

Street Flooding in Santa Barbara

Source: Ethan Swope, AP Photos: https://weather.com/photos/news/2024-02-04-california-flood-images-slideshow

High Flow through the Los Angeles River

Source: The Guardian
https://www.theguardian.com/us-news/2024/feb/06/los-angeles-river-pictures-rain-storms-flooding