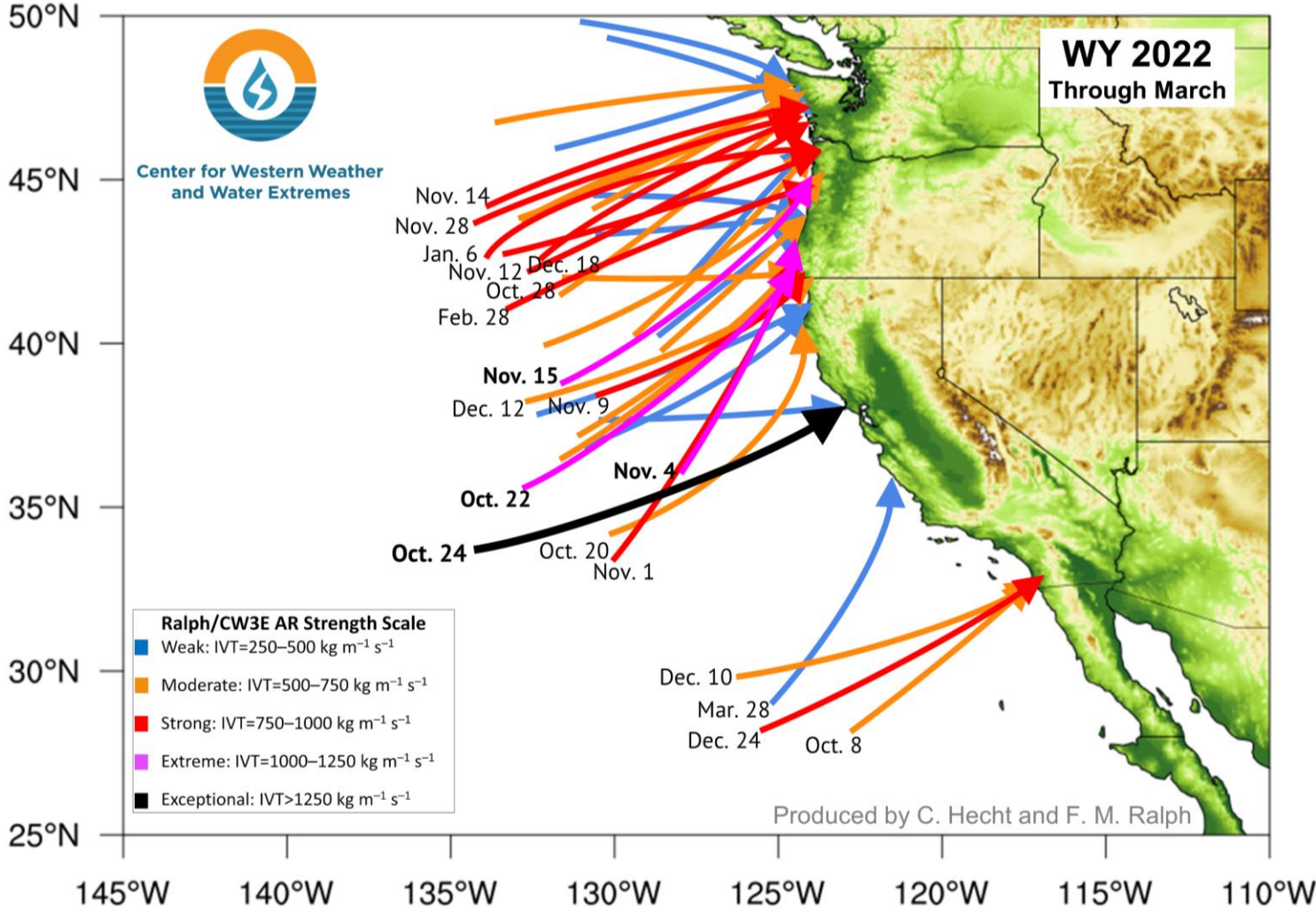


Water Year 2022 Landfalling Atmospheric Rivers through March

AR Strength	AR Count
Weak	11
Moderate	15
Strong	10
Extreme	3
Exceptional	1

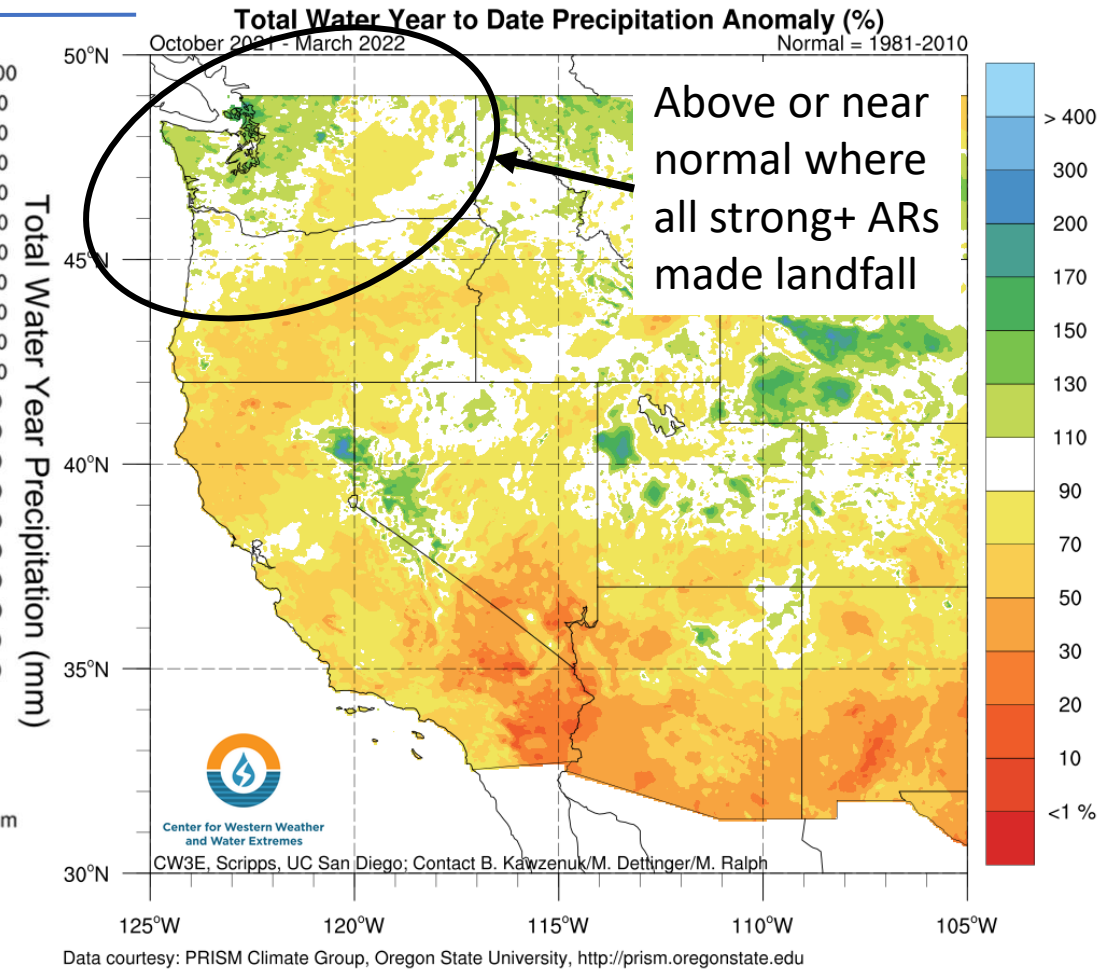
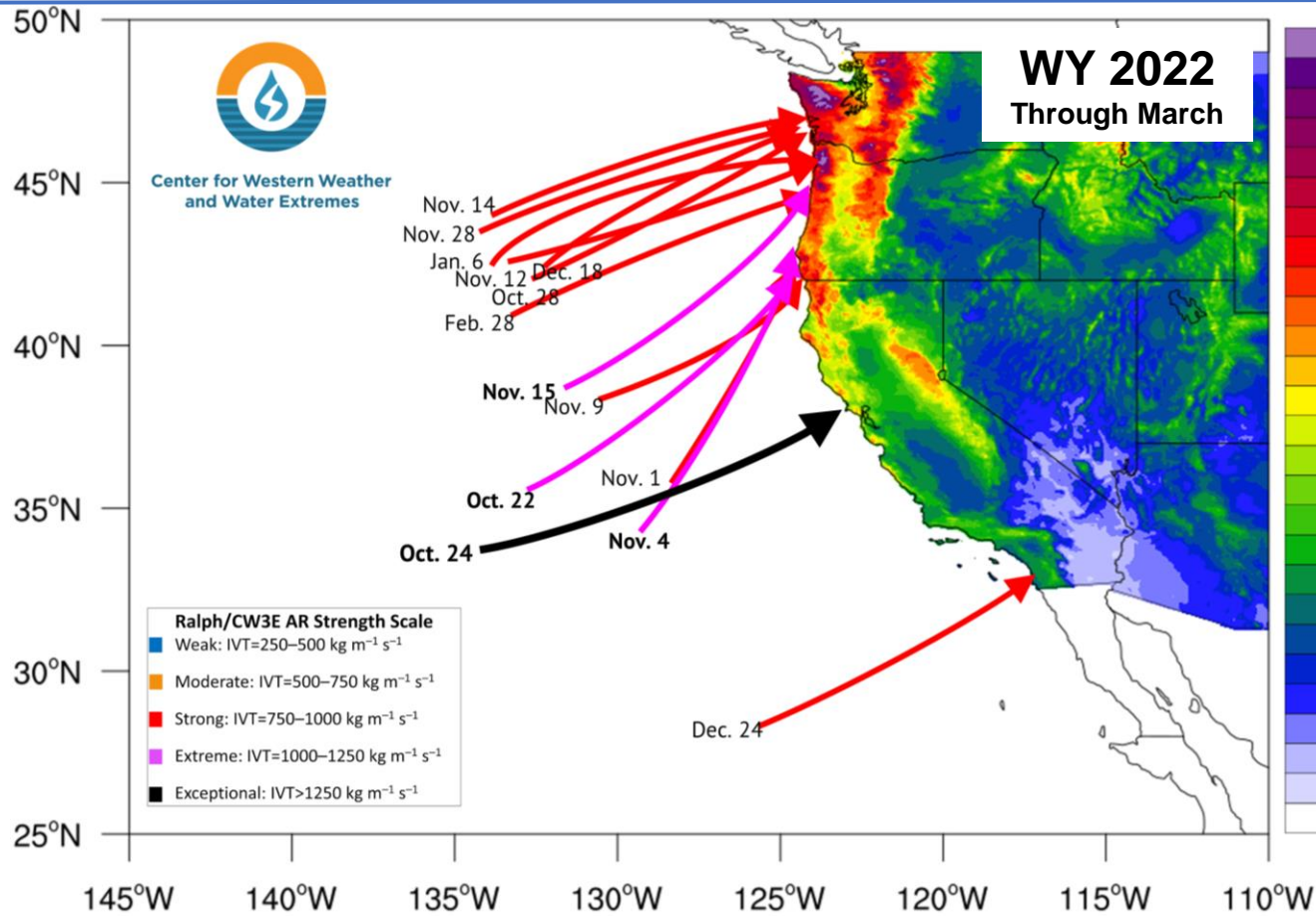
Regions Impacted by Each AR	
State/Region	AR Conditions
Washington	36
Oregon	36
Northern CA	26
Central CA	15
Southern CA	11

40 atmospheric rivers have made landfall over the U.S. West Coast during Water Year 2021



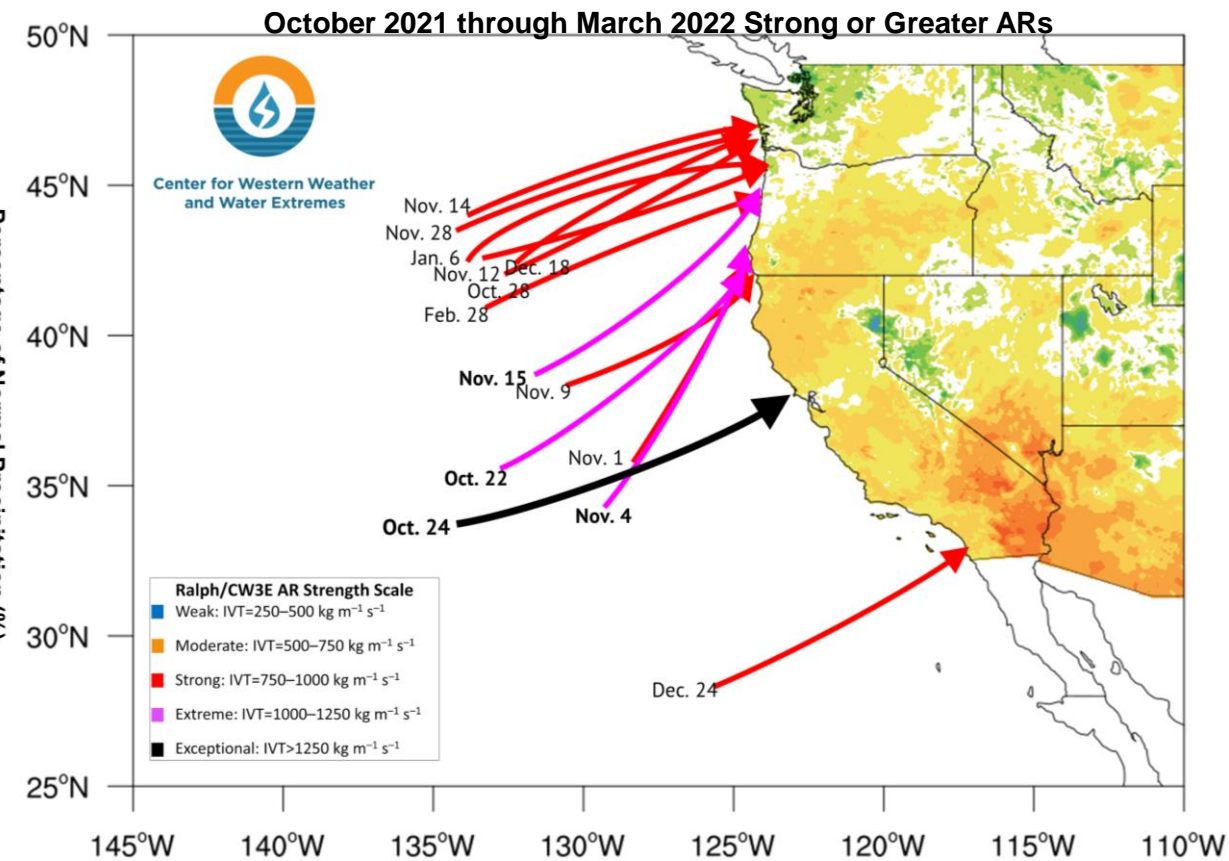
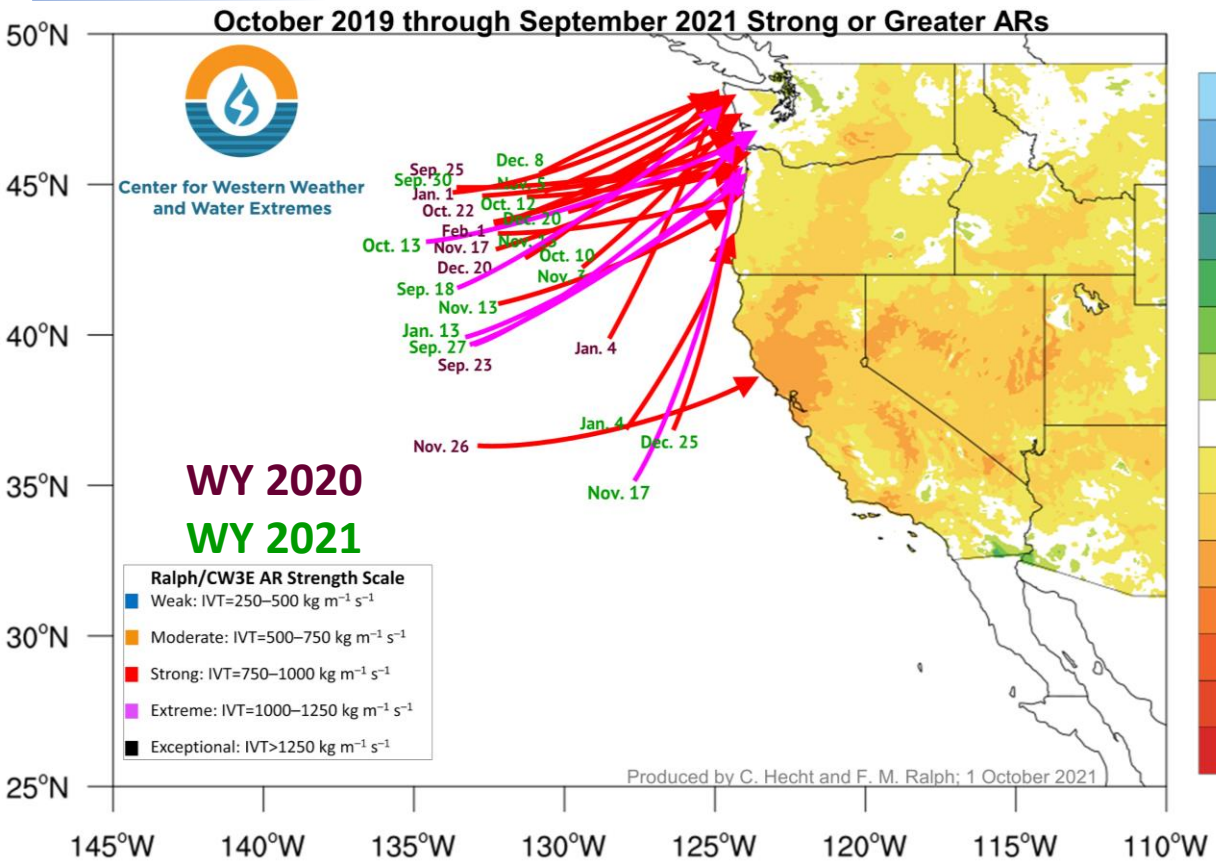
*Arrows are placed on the map where each AR was strongest over the coast

Water Year 2022 Precipitation Summary



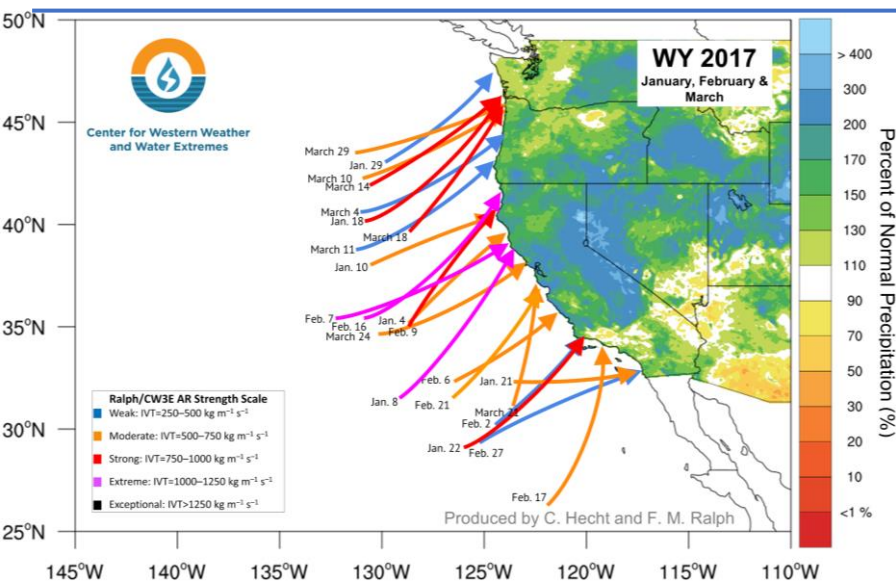
- The western half of Washington, received above or near normal precipitation where a majority of the strong or greater magnitude ARs made landfall
- The only location in California to receive above normal precipitation is the lee of the Northern Sierra, where the late October and exceptionally strong AR brought record breaking precipitation to the region

Lack of Impactful Events over Consecutive Years

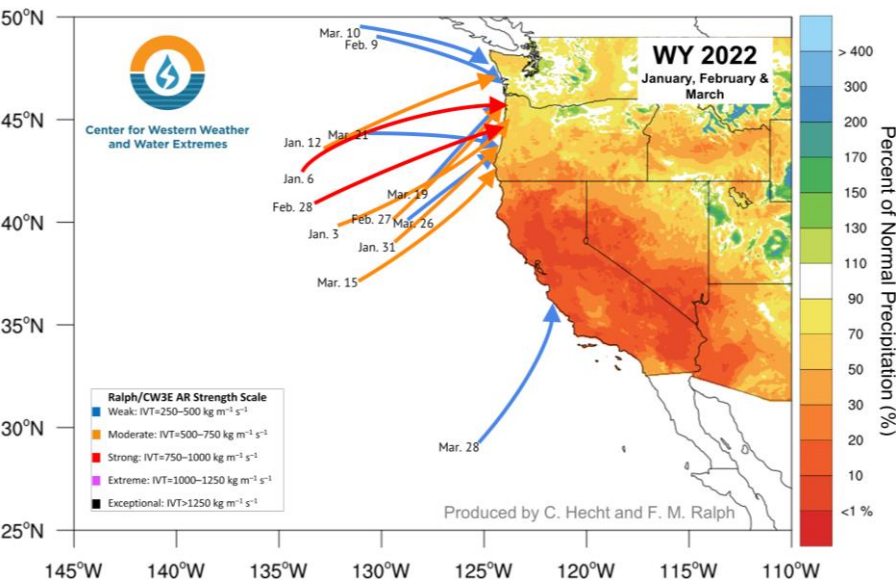
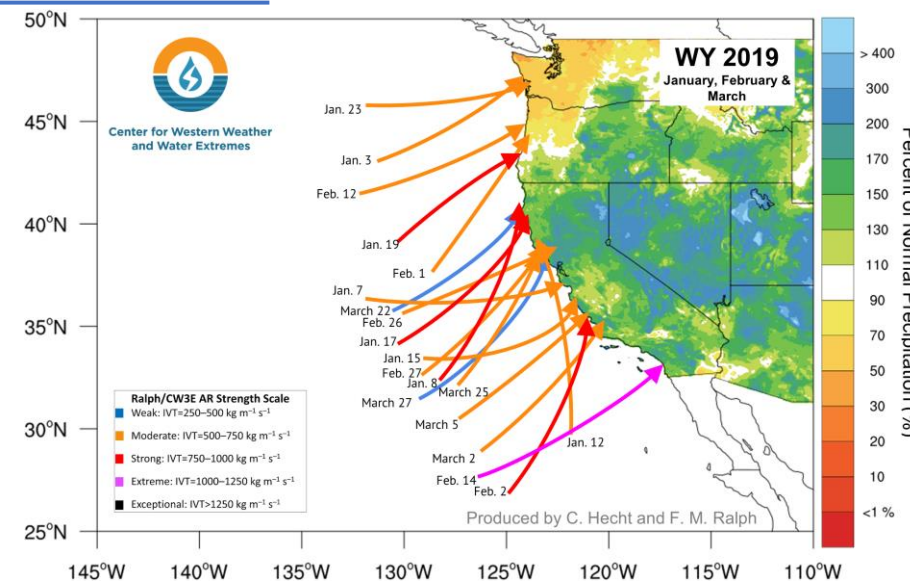


- The lack of strong or greater magnitude ARs over California over multiple water years has resulted in extremely dry conditions.
- On average, California **experiences SEVEN** strong or greater magnitude ARs in a Water Year
- California only experienced strong or greater magnitude AR conditions **THREE** times during Water Years 2020 & 2021 combined
- While Water Year 2022 began with an exceptional AR over California in October, the state only experienced strong or greater magnitude **AR conditions FIVE times**, resulting in three straight water years of below normal activity.

January, February, March 2022 compared to WY 2017 & 2019



- California only experienced 8 (0 strong or greater magnitude) atmospheric rivers during the most active stretch of the wet season, January through March
- For comparison, California experienced 21 (7 strong+) and 17 (4 strong+) between January and March during the abnormally wet water years of 2017 and 2019
- The lack of atmospheric rivers during this stretch of the winter resulted in a large stretch of the state receiving <20% of the normal precipitation, setting the stage for a third consecutive dry water year

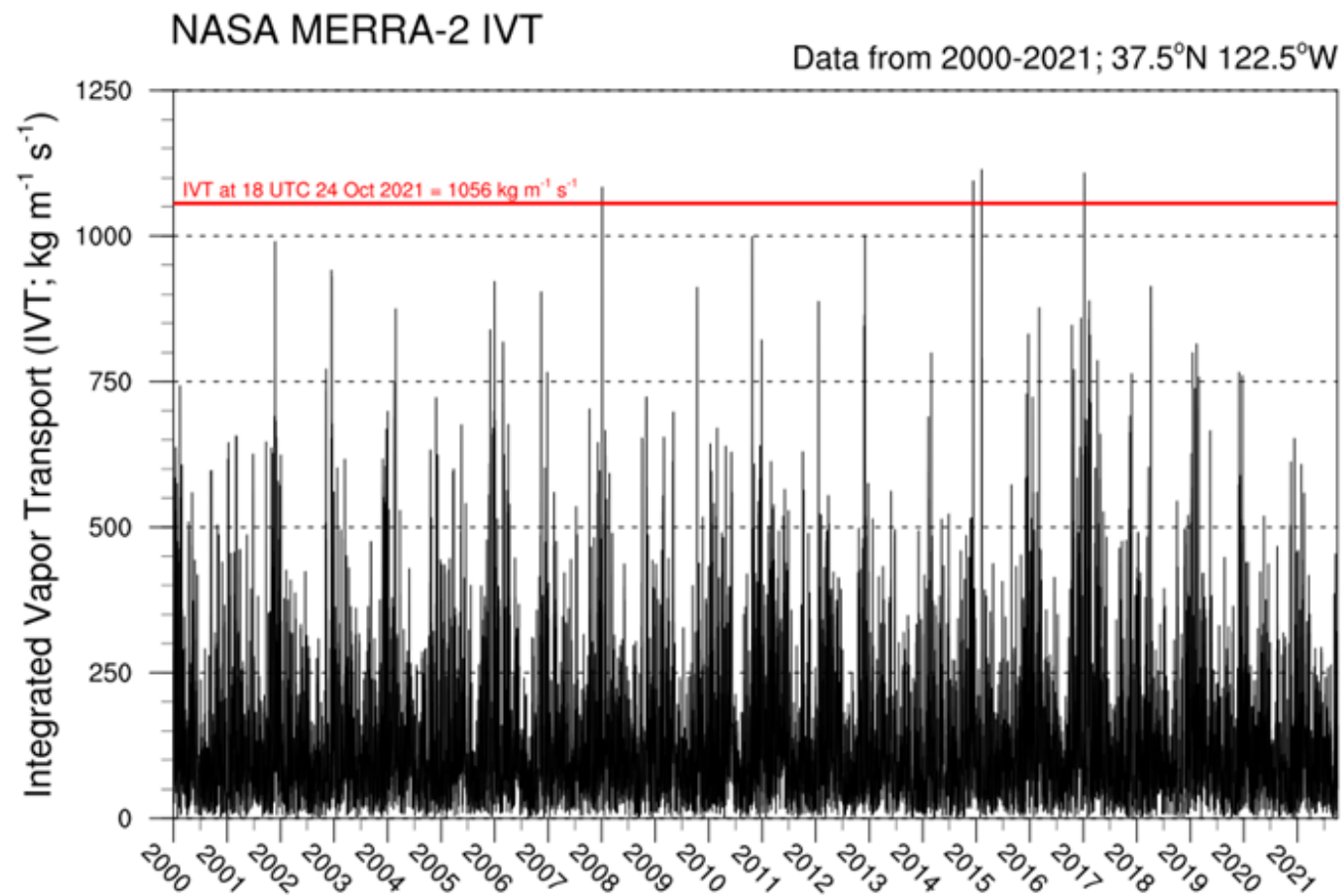


Atmospheric Rivers over California January through March

Strength	WY 2017	WY 2019	WY 2022
Weak	5	5	6
Moderate	9	8	2
Strong	4	3	0
Extreme	3	1	0
Total	21	17	8

Highlights of October 24th AR over CA

- Based on GFS analysis the maximum IVT observed over San Francisco was $1056 \text{ kg m}^{-1} \text{ s}^{-1}$
- A maximum IVT of $1056 \text{ kg m}^{-1} \text{ s}^{-1}$ makes this the strongest AR to make landfall over San Francisco since Jan 2017, and the 5th strongest since 2000 based on NASA MERRA-2 reanalysis
- This is the strongest AR to make landfall over San Francisco during the month of October during the MERRA-2 period of record (1980-2020)



NASA MERRA-2 reanalysis IVT at 37.5°N 122.5°W from Jan 2000 – September 2021. Red horizontal line represents the observed IVT from GFS analysis at 18 UTC 24 Oct 2021 at 37.5°N 122.5°W