An atmospheric river (AR) and low-pressure system will bring widespread precipitation to the US West Coast over the next several days, including very heavy snowfall in the Sierra Nevada.

The AR has made landfall over the PNW and is forecast to move down the USWC through Fri 1 Mar.

Behind this AR, the associated low pressure system and a mid-level trough will help continue this precipitation event over CA through Sun 3 Mar.

There is potential for a pulse of IVT from the central Pacific to reach the USWC and extend AR conditions and precipitation duration over northern and central CA.

The NWS Weather Prediction Center (WPC) is forecasting significant precipitation over the next 5 days along the WA through N. CA coasts and over the Cascades and Sierra Nevada.

The National Blend of Models (NBM) is showing very high probabilities (>90%) of snowfall exceeding 48 inches for portions of the Sierra Nevada, with accumulations forecast to potentially exceed 80 inches.

West-WRF Ensemble meteograms are also showing very high probabilities of significant snowfall (totals > 48 inches) in the Sierra Nevada.

The WPC Excessive Rainfall Outlooks include a Marginal Risk (level 1 of 4, or at least 5% chance) for flooding for the WA/OR/N. CA/S. CA coasts and the Sierra Nevada foothills with the the AR as it moves down the coast.

Stay alert to official NWS forecasts, watches, and warnings at weather.gov and follow guidance from local emergency management officials.
The AR has made landfall over the PNW and will progress down the US west coast through Thu 29 Feb, fueling a major precipitation event for the western US.

A pulse of IVT from the central Pacific extends toward the USWC Thu 29 Feb before reaching the USWC Fri 1 Mar. This pulse shortly follows the initial AR and has the potential to continue AR conditions over central CA.
A mid-level trough that developed over the Aleutian Islands is forecast to continue to deepen in the Gulf of Alaska and move over the USWC by Fri 1 Mar.

This trough alongside the low pressure system are likely to help extend the precipitation event over CA due to favorable forcing for ascent associated with the feature.
• CW3E’s ensemble AR Landfall tool illustrates the timing and location of the IVT associated this AR and following IVT pulse as they move onshore and shift to the south along the West Coast into California.

• All 31 GEFS members show IVT > 250 kg m\(^{-1}\) s\(^{-1}\) making landfall from the PNW to C. CA with the AR for 28 Feb through 1 Mar.
• The heaviest precipitation is expected in the Olympic Mountains, OR Coast Ranges, Northern CA Coast Ranges, and Sierra Nevada.
• The WPC is forecasting more than 5 inches of total precipitation in these areas during the next 5 days, with more than 10 inches possible in the southern OR Coast Ranges.
• A Marginal Risk (level 1 of 4, or at least 5% chance) for flash flooding is forecast by WPC along the coastal mountains of Washington, Oregon, and Northern and Southern California as well as around the Sierra Nevada at times from 4 AM PT Wed 28 Feb through 4 AM PT Sun 3 Mar.
The 00Z GFS is forecasting higher precipitation totals in the Southern Sierra Nevada and coastal WA/OR watersheds during the next 10 days, whereas the 00Z ECMWF is forecasting higher precipitation totals in the OR Cascades and Northern CA. Both models are forecasting more than 8 inches of mean areal precipitation in the Upper Yuba River watershed over the next 10 days. The GFS forecast is higher for the incoming AR, whereas the ECMWF is forecasting more precipitation later in the period. The GEFS ensemble members are also showing higher forecast spread compared to the EPS.
The GEFS is forecasting freezing levels to steadily drop from ~8000 to ~1000 feet above mean sea level in the Upper Yuba watershed during the next several days, creating favorable conditions for significant snow accumulations in the Sierra foothills.

There is some uncertainty in freezing level during this event, with ensemble spread exceeding 2000 feet.

Nearly 50% of total precipitation in the Upper Yuba during the next 7 days is forecast to fall as snow.
The AR and following trough are forecast to bring heavy snowfall to the Cascades and Sierra Nevada.

Currently, the NBM is forecasting very high probabilities (>90%) of 72 hour snowfall accumulations exceeding 24 inches across much of the Sierra Nevada and OR Cascades for 72 hour period ending 4 PM PT Mon 4 Mar.

The NBM also has very high probabilities of snowfall exceeding 48 inches in the Sierra Nevada.
The heaviest snowfall during this event is expected over the Sierra Nevada, where the NBM is forecasting large regions of snowfall totals greater than 80 inches, with possibility to exceed 100 inches in the highest peaks.

The OR Cascades are forecast to receive another 20-30+ inches and the WA Cascades receive 18-24 inches at the highest elevations during this period.

With this period, there is also again large regions of low-level snowfall, with regions of 1-6 inches throughout WA, OR and CA.
For this location at Truckee-Tahoe in the Northern Sierra Nevada, the West-WRF ensemble is showing >95% likelihood of total snowfall exceeding 36 inches by 4 AM PT Sun 3 Mar.

A majority of ensemble members (~70%) are forecasting >48 inches of total snow during this period, with ~10% forecasting >72 inches.
The WPC’s Winter Storm Severity Index (WSSI) is indicating major-to-extreme winter storm impacts across the Olympic Mountains, Cascades, Klamath Mountains, and Sierra Nevada during the next 3 days.

The worst impacts are expected in the Sierra Nevada beginning Friday, continuing into Saturday.

The probabilistic WSSI tool is showing a high likelihood (>70%) of extreme impacts in the Sierra Nevada during the 24-hour period ending 4 AM PT Sat 2 Mar.
Blizzard Warnings for Sierra Nevada

- The National Weather Service has issued a Blizzard Warning over much of the Sierra Nevada due to a combination of heavy snow and high winds.
- NWS Sacramento is forecasting 5-10 feet of snow above 5,000 feet and 1-4 feet of snow between 3,000 and 5,000 feet in the Northern and Central Sierra Nevada.
- NWS Hanford is forecasting 5-8 feet of snow above 6,000 feet in the Southern Sierra Nevada.
Although river levels are forecast to rise in Northern CA, major flooding is not anticipated given the moderate rainfall intensities and a substantial portion of the precipitation expected to fall as snow.

CNRFC is currently forecasting 9 stream gages to exceed monitor stage in the next 5 days.

The Sacramento River at Tehama Bridge (top left) and Cosumnes River at Michigan Bar are both forecast to reach monitor stage on Sat 2 Mar.
Current AR Recon Planned Flight Sequence

- CW3E’s Atmospheric River Reconnaissance (AR Recon) field campaign continues in WY2024, with the ongoing sequence of flights focusing on the current AR.
- Today’s scheduled flight (IOP40) will sample the AR and essential atmospheric features within the upstream mid-level trough.
- These sampling missions provide data in near real-time to the global forecast models to improve weather forecasts. Data from these missions are archived for future AR research.

The AR Recon team has planned the first flight of this sequence sampling the incoming event. The team has planned one additional flight sampling this system.

IOP39 - 28 Feb
IOP40 - 29 Feb