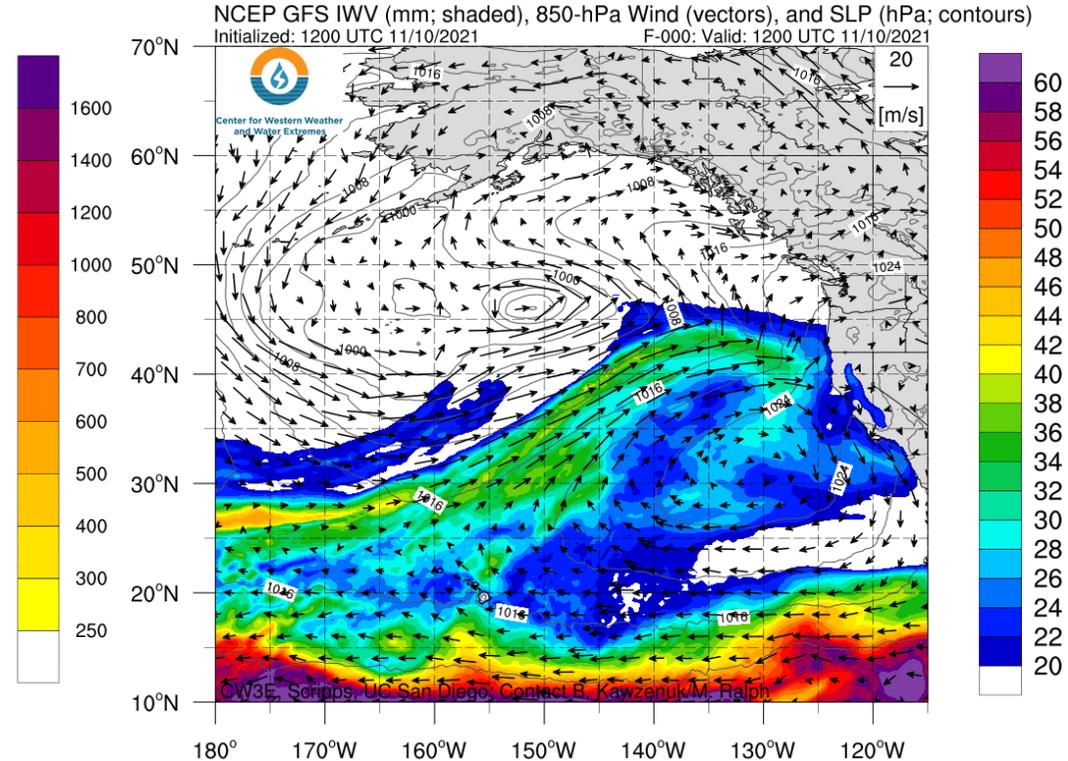
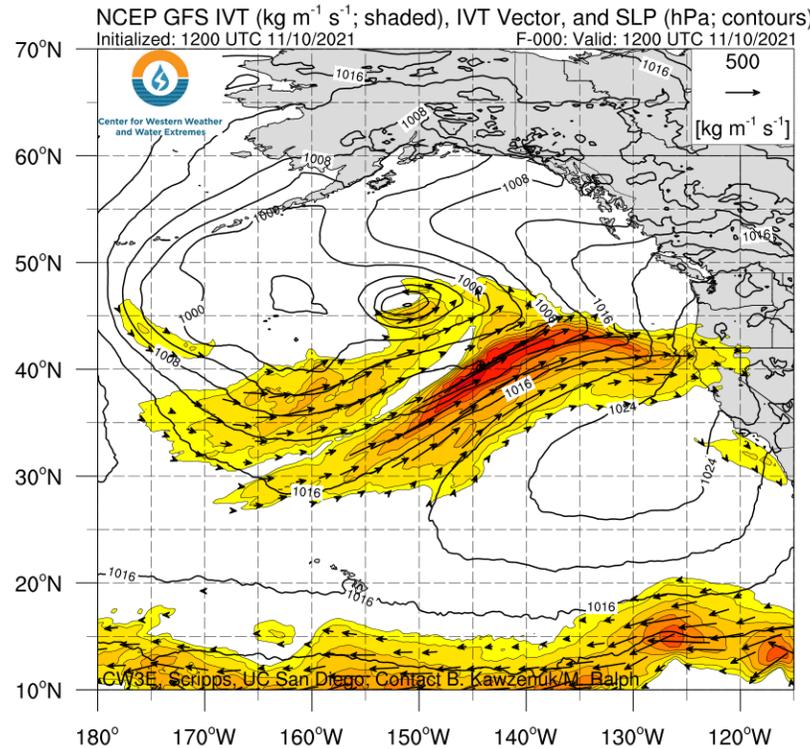


CW3E Atmospheric River Outlook

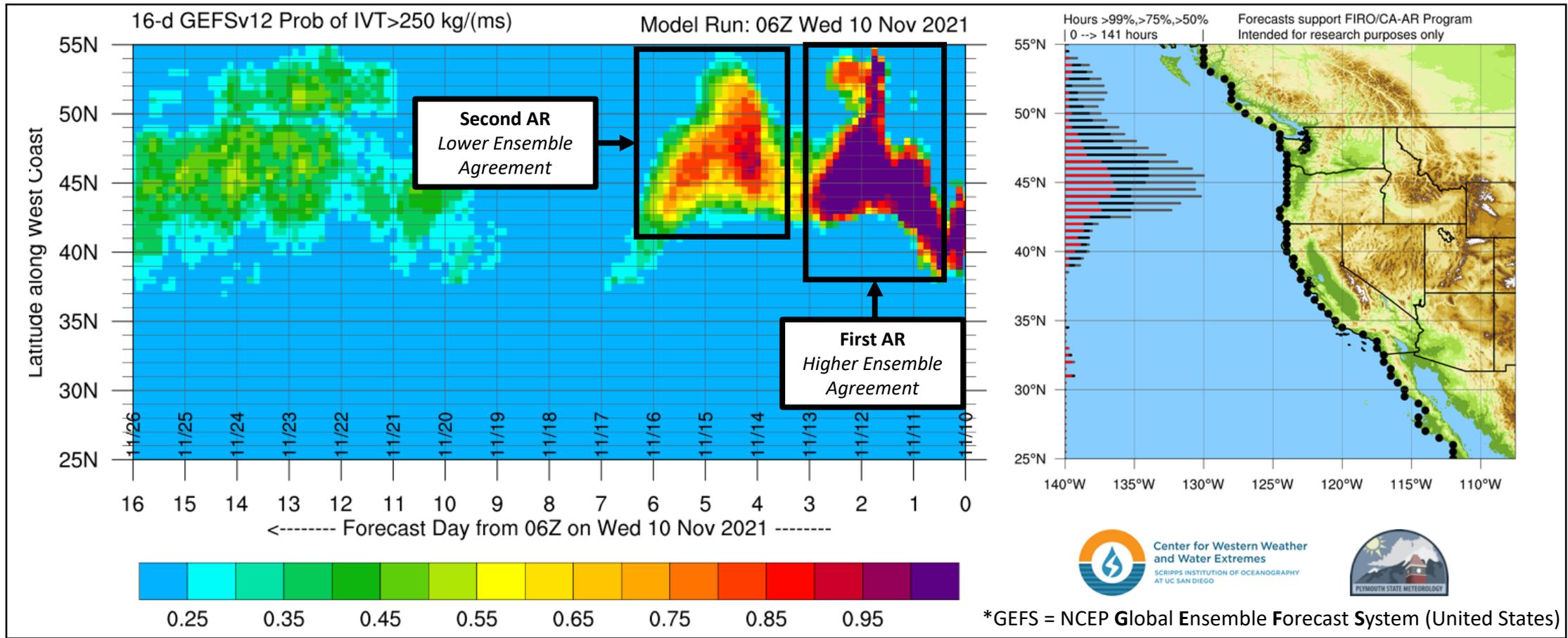
Multiple atmospheric rivers are forecast to bring moderate to strong AR conditions to the Pacific Northwest

- The first AR is forecast to make landfall over coastal Washington tomorrow, bringing AR 4 conditions to much of the Coast
- Current precipitation forecasts indicate that this first AR could bring more than 5 inches of precipitation to the Cascade, Olympic, and Coastal Mountains in Oregon and Washington
- A second AR is forecast to make landfall over the Olympic Peninsula during the weekend
- There is currently large model uncertainty pertaining to the timing, maximum intensity, and overall duration of the second AR, though several GEFS ensemble members are predicting AR 4 conditions for South-Coastal Washington
- In total, the Coastal, Olympic, and Cascade Mts. could receive >7 inches of precipitation during the next 7-days



Atmospheric River Outlook: 10 November 2021

Probability of AR Conditions Along Coast



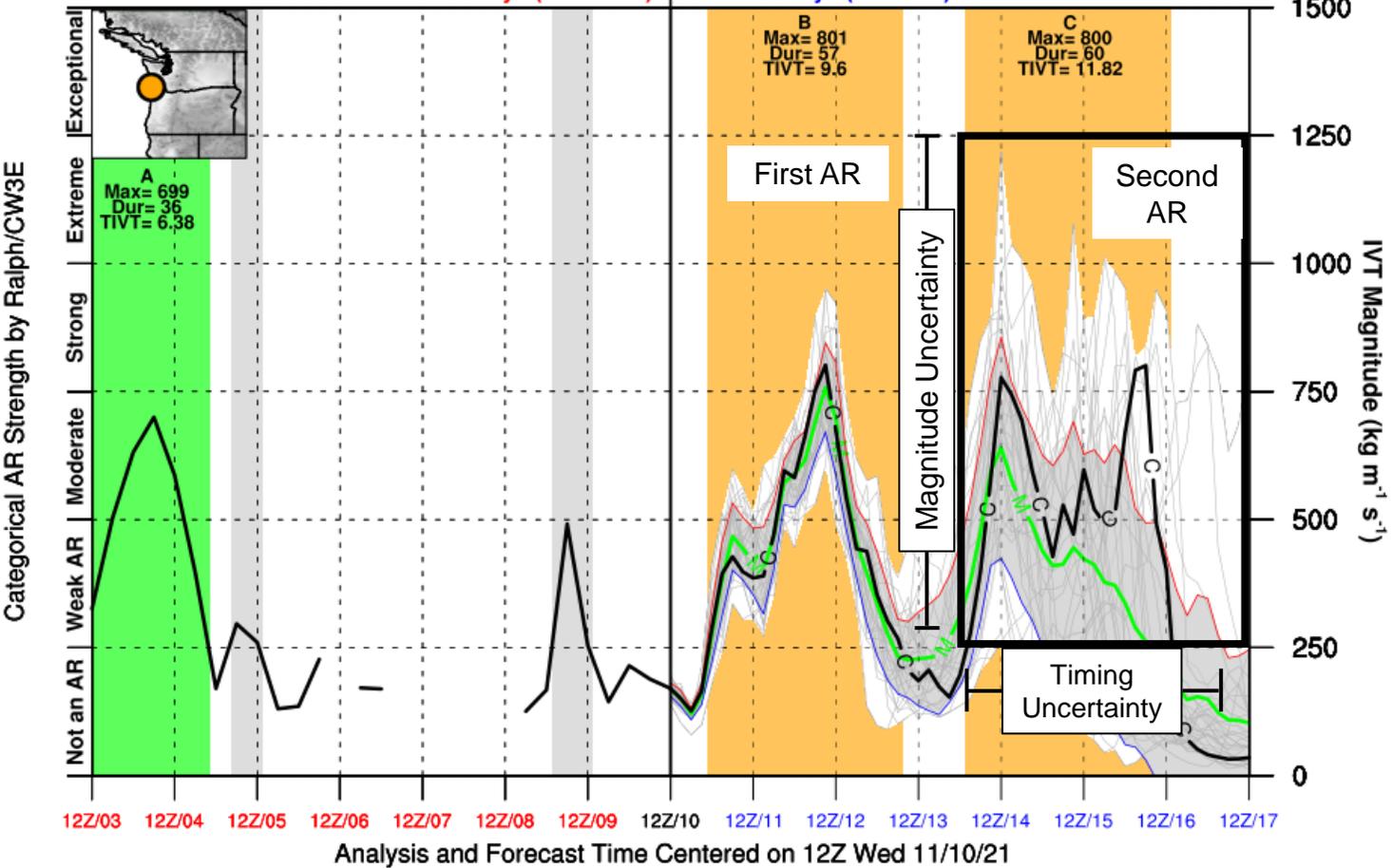
- The GEFS landfall tool is highlighting higher ensemble agreement of AR conditions (IVT > 250 kg/ms) during the first AR over Coastal WA and OR during the next couple of days (~100% of ensembles agree there will be AR conditions for at least 12 hours for much of the region)
- ~75–95% of ensembles are indicating AR conditions will impact the PNW during a period from 14 to 16 Nov. within the second AR

Atmospheric River Outlook: 10 November 2021

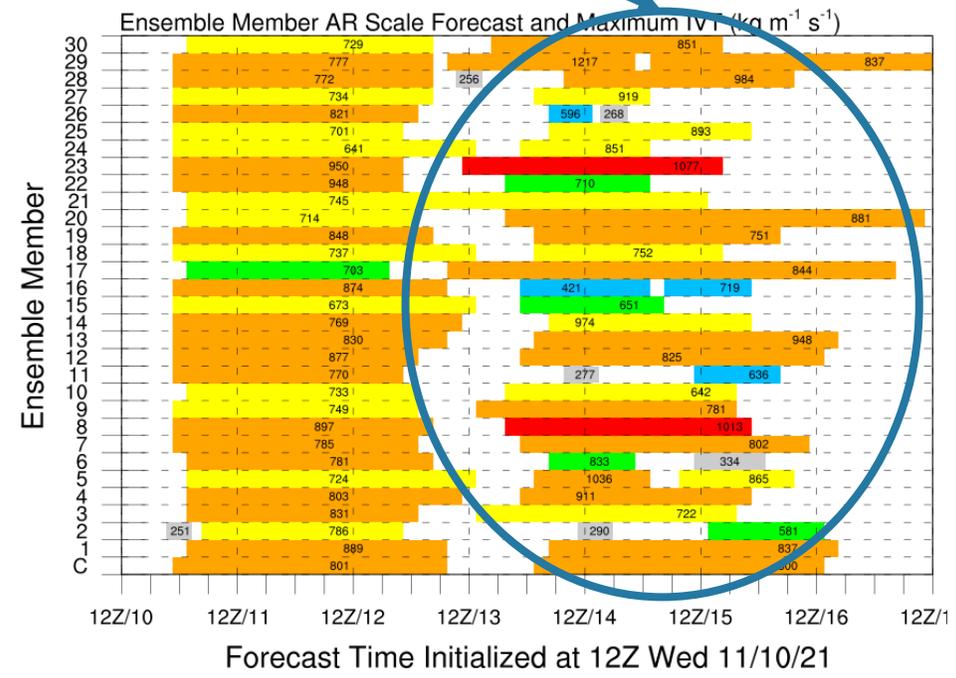
GEFS AR Scale & IVT Analysis/Forecast Initialized 12Z Wed 11/10/21

← Previous 7 days (observed) | Future 7 days (forecast) →

Loc: 46N, 124W



- The GEFS control is forecasting the first AR to bring a max IVT magnitude of 801 kg/ms and a total duration of 47 hrs to Clatsop County, OR resulting in AR 4 conditions on the AR scale
- There is significant ensemble spread in the overall timing, magnitude, and duration of the second AR, where 3 ensemble members are predicting AR 1 conditions, 3 AR 2, 8 AR 3, 14 AR 4, and 2 AR 5



— Ensemble Control (C) — Ensemble +1 Std. Dev.
— Ensemble Mean (M) — Ensemble -1 Std. Dev.
 Ensemble Members

AR 1 AR 2 AR 3 AR 4 AR 5

More information: <http://cw3e.ucsd.edu> AR Scale based on Ralph et al. (2019; BAMS), contact M. Ralph

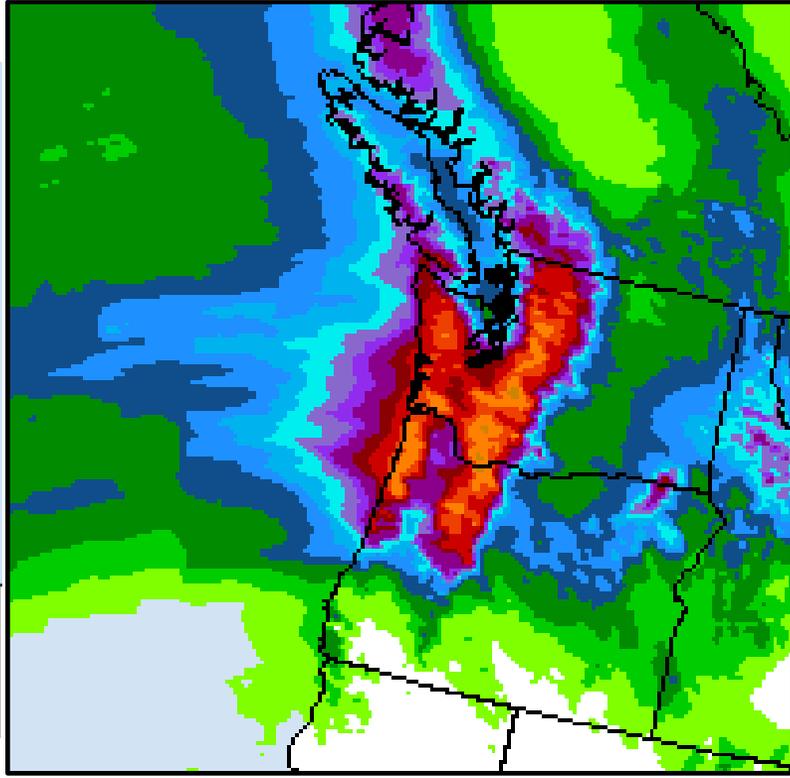
Image created: 17 UTC 11/10/2021

Atmospheric River Outlook: 10 November 2021

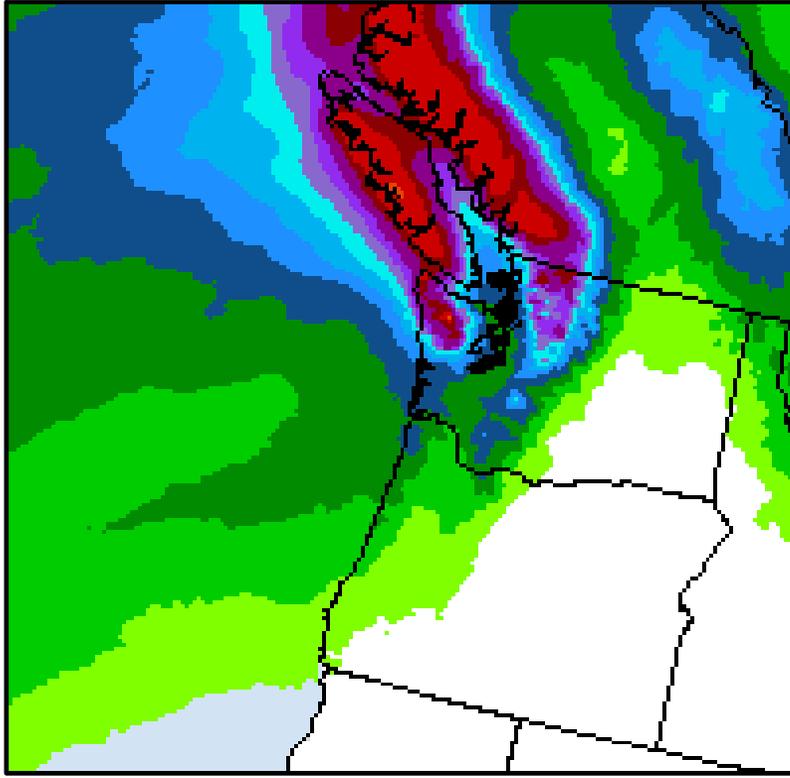


NOAA Weather Prediction Center Precipitation Forecasts

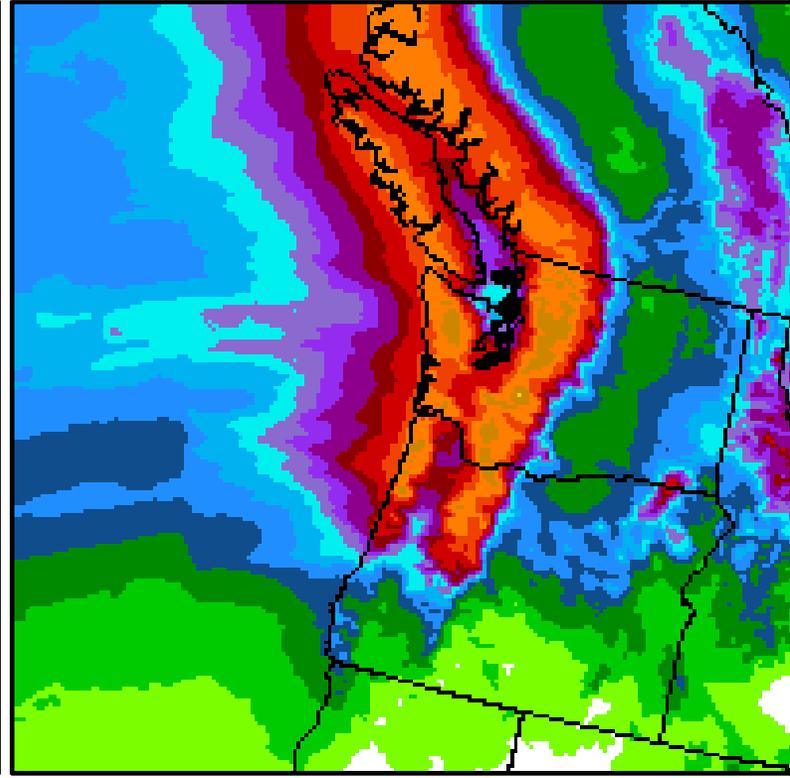
Days 1–3 QPF
Valid: 00Z 11-14 November



Days 4 & 5 QPF
Valid: 00Z 14-16 November



Days 1–7 QPF
Valid: 00Z 11-18 November

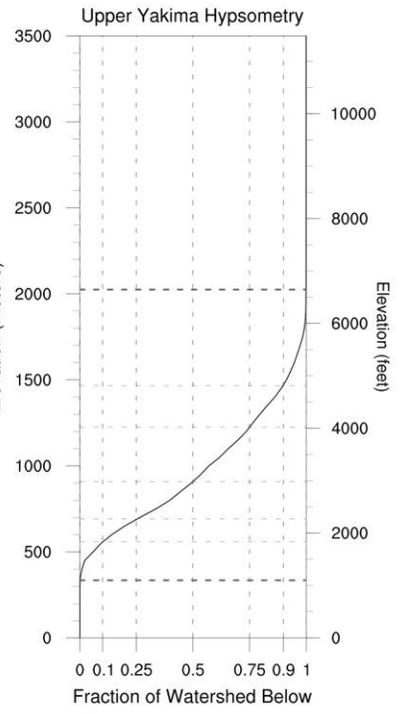
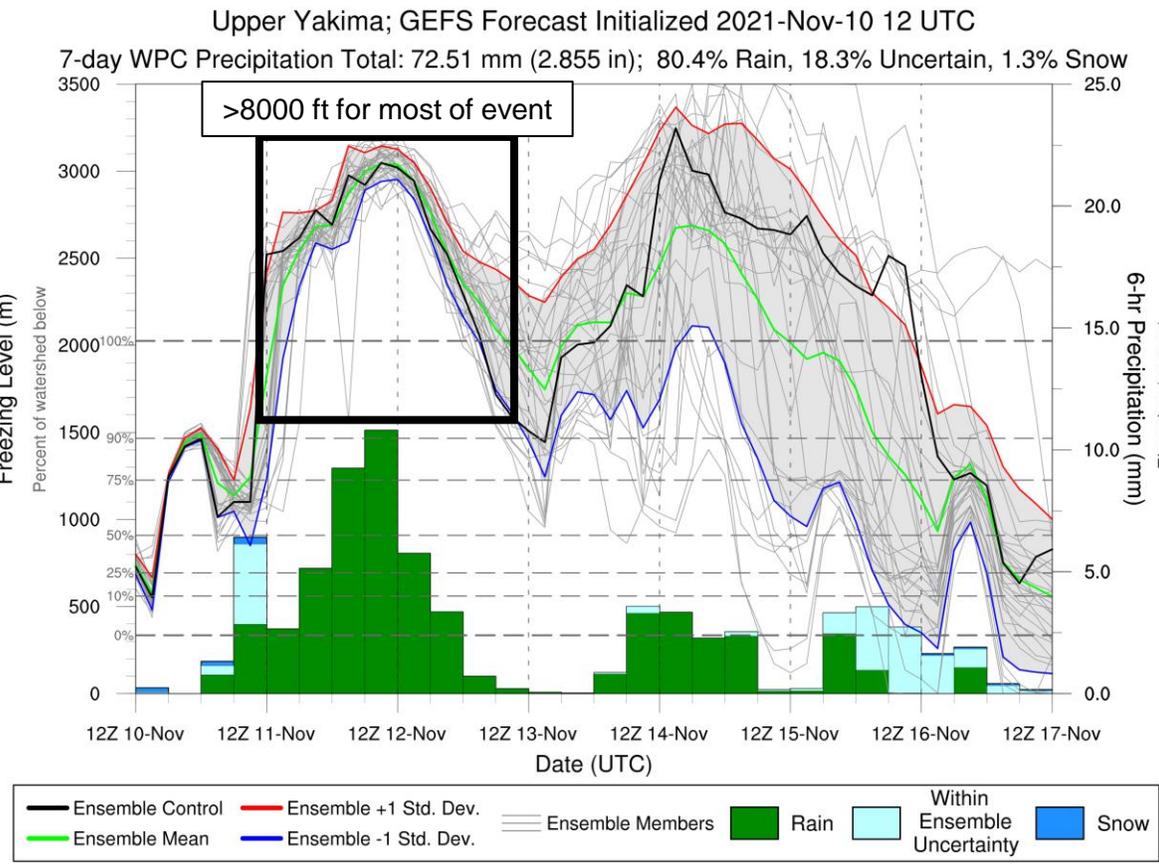
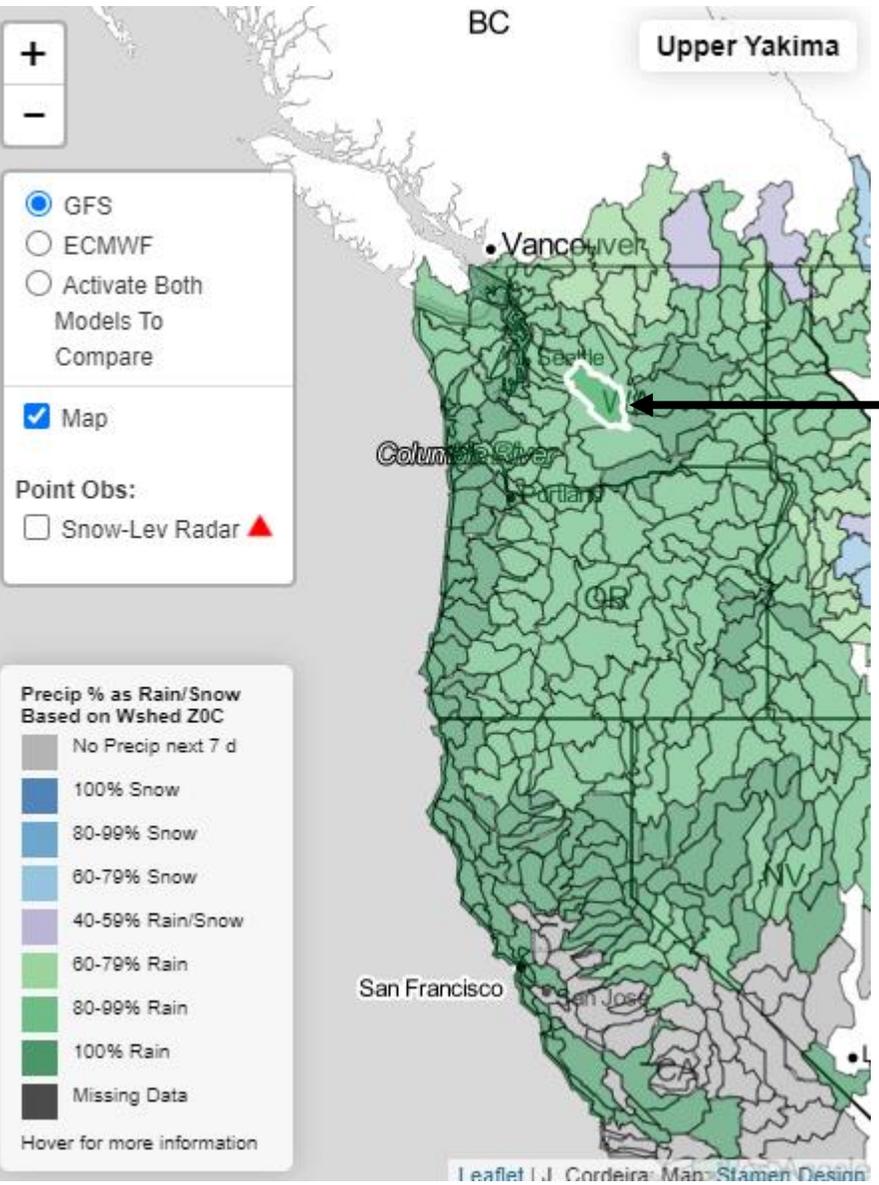


The WPC is currently forecasting >5 in. of precipitation to fall over the higher elevations of the Cascade and Coastal Mountains in the PNW during 11, 12, & 13 Nov. from the first AR

An additional 3–5 inches of precipitation could fall over the North Cascades and Olympic peninsula on 14 and 15 Nov. due to the second AR, but there is currently large uncertainty

In total, the Coastal, Olympic, and Cascade Mts. could receive >7 inches of precipitation during the next 7-days, where lower elevations, like Seattle are forecast to receive 2–4 inches

Atmospheric River Outlook: 10 November 2021

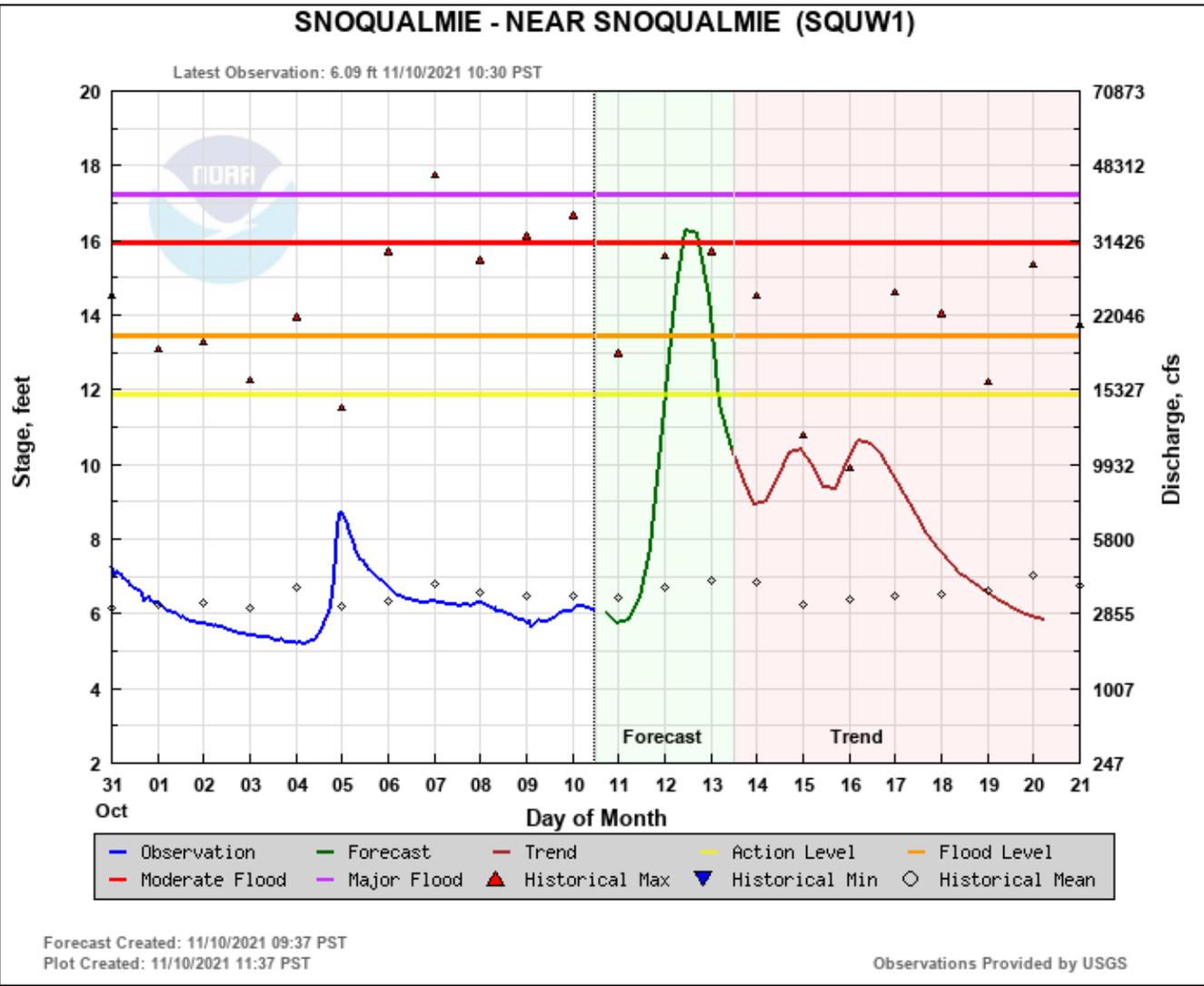
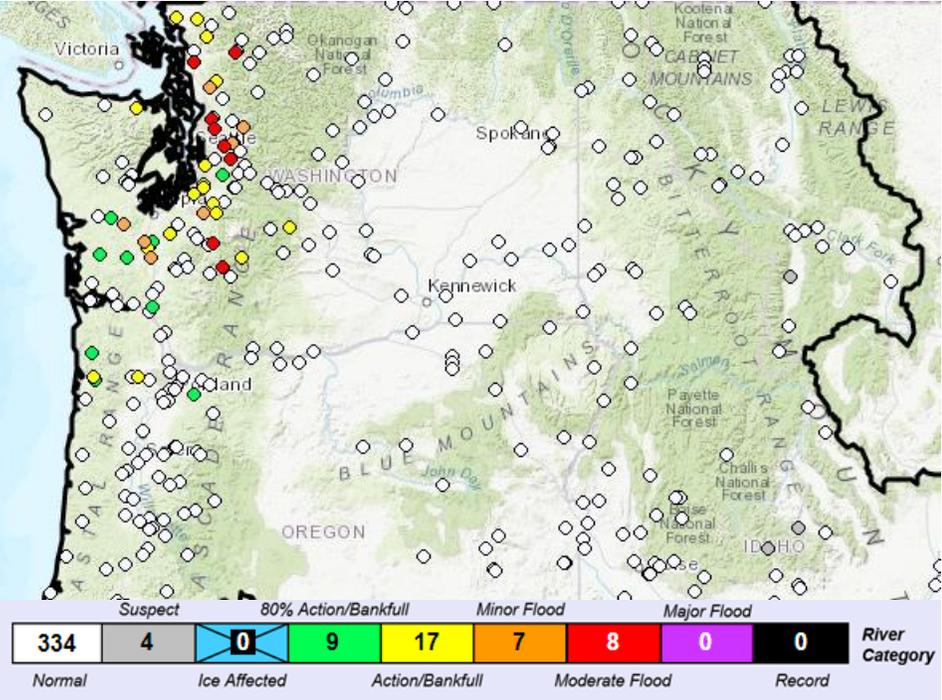


- Ensemble forecasts of freezing level indicate that freezing levels will be above 8,000 feet for a majority of both ARs which would result in a majority of the precipitation falling as rain through the Pacific Northwest
- Similar to the ensemble forecast of AR conditions, there is large uncertainty associated with the height of the freezing level during the second AR, though the ensemble mean height is well above the height of the entire watershed for a majority of the event

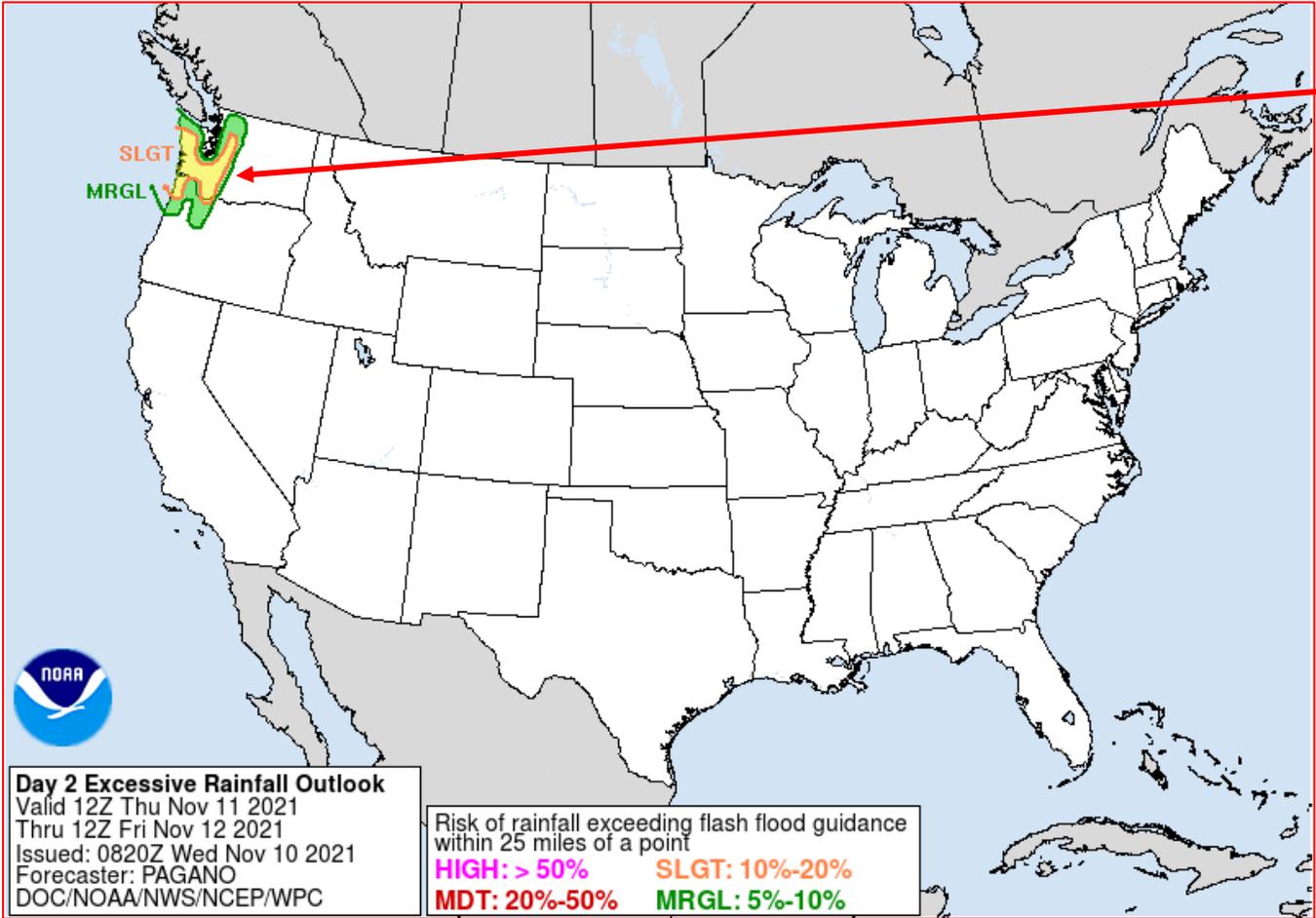
Atmospheric River Outlook: 10 November 2021



- Due to the potential for heavy precipitation combined with high freezing levels (rain on snow), this AR could result in higher runoff that may lead to flooding
- The Pacific Northwest River Forecast Center is currently forecasting 17 rivers to rise to action/bankfull stage and 8 rivers to experience moderate flooding, primarily in western Washington
- The Snoqualmie River is currently forecast to rise to 16.24 feet, .3 feet above moderate flood stage



Atmospheric River Outlook: 10 November 2021



- The NOAA Weather Prediction Center has issued a slight risk of rainfall exceeding flash flood guidance for far northwestern Oregon and western Washington
- The National Weather Service forecast offices in Portland and Seattle have issued hydrologic outlooks for possible impacts associated with tomorrow's AR, including river flooding, debris flows near recent burn areas, and landslides near steep terrain

↓
Hydrologic Outlook

Hydrologic Outlook
ORZ001>008-010>016-WAZ019>022-039-040-045-046-110000-

Hydrologic Outlook
National Weather Service Portland OR
203 AM PST Wed Nov 10 2021

...POTENTIAL FOR RIVER FLOODING THURSDAY THROUGH SATURDAY ALONG CREEKS AND RIVERS IN SOUTHWEST WASHINGTON AND NORTHWEST OREGON...

...POTENTIAL FOR DEBRIS FLOWS OVER AND NEAR THE LIONSHEAD, BEACHIE CREEK, AND RIVERSIDE BURN AREAS...

...LANDSLIDES POSSIBLE NEAR STEEP TERRAIN...

Visit [weather.gov](https://www.weather.gov) for location specific forecasts, watches, and warnings