Long Duration Atmospheric River Brings Heavy Rain and Snow to the Pacific Northwest

- An atmospheric river (AR) made landfall over Southern Oregon on 2 Jan 2022
- Over the next few days, the AR stalled, strengthened, and tapped into tropical moisture
- Two mesoscale frontal waves formed along the AR prolonging AR conditions over the region
- Many areas along the Oregon and Washington coast experienced AR conditions for at least 48 consecutive hours, resulting in AR 3 and AR 4 conditions (based on the Ralph et al. 2019 AR Scale)
- More than 10 inches of precipitation fell in portions northwestern Oregon, western Washington, and the Cascade Mountains
- Several river gauges were near or above flood stage; a portion of Interstate 5 was closed due to flooding along the Chehalis River in Lewis County, WA
- Multiple feet of snow fell across the Cascade Mountains where avalanches and debris forced several mountain passes to close until conditions improved

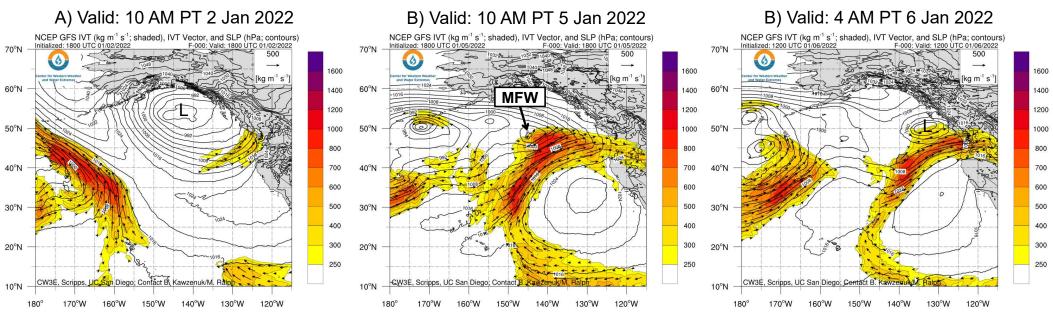


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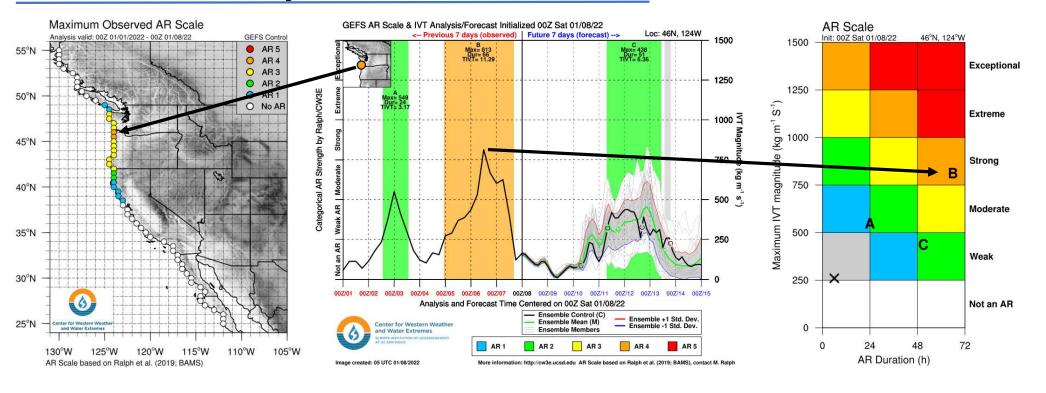


GFS IVT Analysis



- An AR associated with a weakening surface cyclone in the Gulf of Alaska moved down the coast of British Columbia and stalled over the Pacific Northwest on the morning 2 Jan (Figure A)
- The AR then began to tap into tropical moisture beginning on 4 Jan
- On the morning of 5 Jan, a mesoscale frontal wave (MFW) formed along the AR intensifying and prolonging AR conditions (Figure B)
- The AR strengthened into 6 Jan, bringing strong IVT magnitudes (>750 kg/ms) to the coast of northern Oregon (Figure C)





- The AR produced AR3 conditions for much of coastal Oregon and Washington
- A maximum IVT value of 813 kg m⁻¹ s⁻¹ and an AR duration of 66 hours, producing AR4 conditions, were observed at 46°N, 124°W (near Seaside, OR)

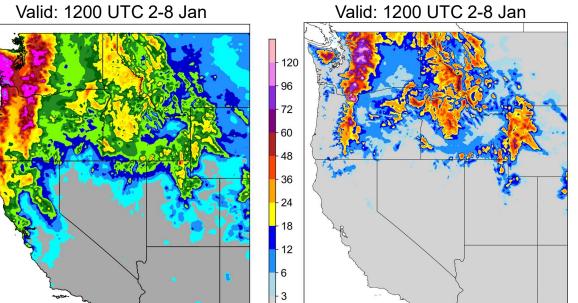


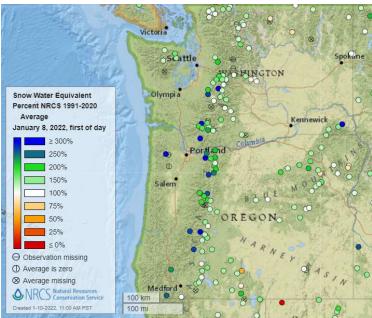
NCEP Stage IV QPE

NOHRSC Interpolated Snowfall

SWE Percent of Average

Valid: 8 Jan





- More than 10 inches of precipitation fell in portions northwestern Oregon, western Washington, and the Cascade Mountains with many 24-hour precipitation records broken
- Several feet of snow fell across the Cascade Mountains with some areas receiving more than 6 feet.
- Hoquiam, WA airport set a daily precipitation record for 6 Jan with 5.78" of rain
- Astoria, OR set a daily precipitation record for 6 Jan with 5.07" of rain
- The Wenatchee Experiment Station set an all time 24-hour snowfall record between 5-6 Jan with 23" of snow



20.0 15.0 10.0

8.0

6.0

5.0

4.0

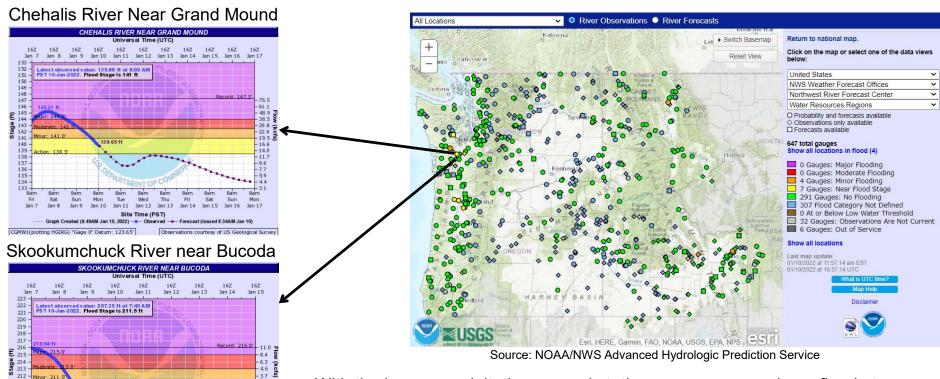
3.0

1.5 1.0

0.50

0.10

0.01



- With the heavy precipitation several stations were near or above flood stage
- The Chehalis River Near Grand Mound reached major flood stage at 145.2 ft on 8 Jan and is still above action level
- The Skookumchuck River near Bucoda reached record levels of major flood stage at 215.9 ft on 7 Jan

Source: NOAA/NWS Advanced Hydrologic Prediction Service

Site Time (PST)



Flooding around the Chehalis Airport, Lewis County



Source: Washington State Patrol

Flooding of State Highway 6 near Adna, Lewis County



Source: Washington State Patrol

A 20-mile stretch of Interstate 5 in Lewis County, WA between Grand Mound and Highway 12, just south of Chehalis, was shut
due to the Chehalis River flooding



Landslide covering the Columbia River Highway 30



Source: Multnomah Co. Sheriff's Office Twitter Feed

Landslide covering the Columbia River Highway 30



Source: Multnomah Co. Sheriff's Office Twitter Feed

• A landslide that covered the Historic Columbia River Highway 30 caused it to closed from Larch Mountain Road in Corbett to the intersection of I-84 at Ainsworth State Park.



US 101 flooding at Seaside, OR

Updated: Jan 06 2022 9:29 AM Elevation 20 TripCheck.com Milepost 23.17

Source: NWS Portland Twitter Feed

Snow removal on White Pass after an avalanche



Source: Snoqualmie Pass Twitter Feed

- US Highway 101 at Seaside, OR saw flooding on 06 Jan due to heavy precipitation
- Snoqualmie Pass, Stevens Pass, White Pass, and Blewett pass were closed due to avalanches and debris covering roadways

