

CW3E Event Summary: 2 Jan 2022 – 8 Jan 2022

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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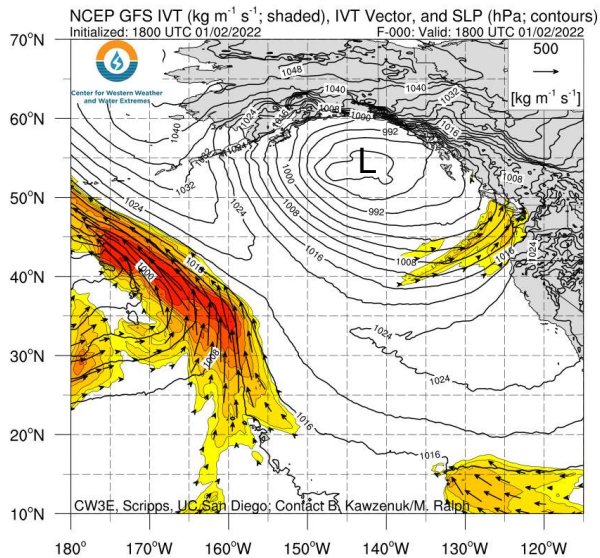
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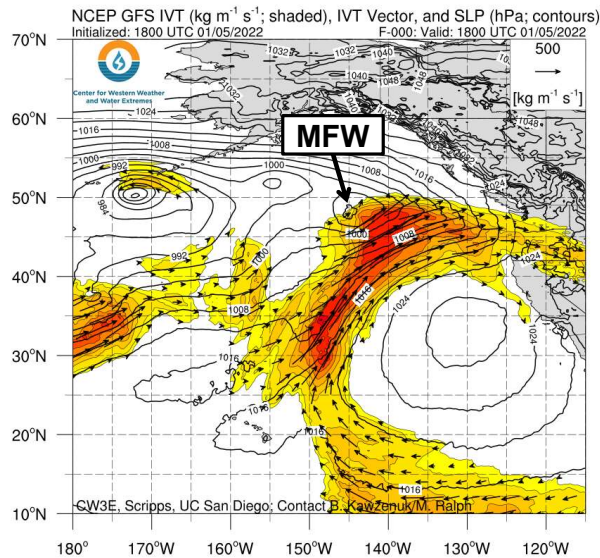
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GFS IVT Analysis

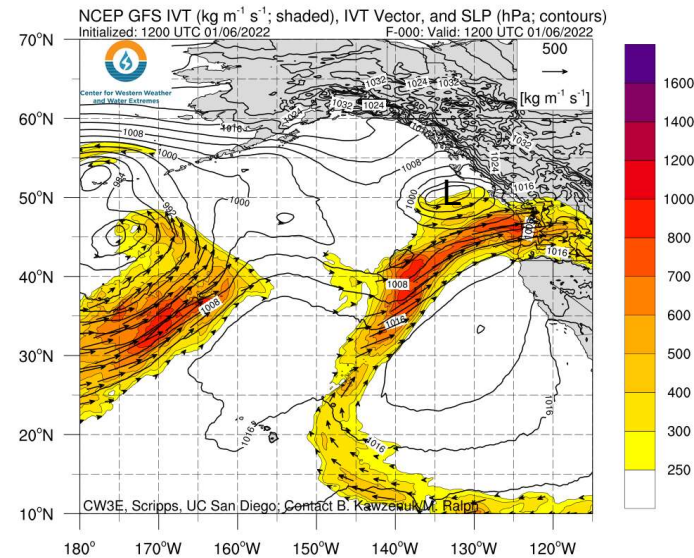
A) Valid: 10 AM PT 2 Jan 2022



B) Valid: 10 AM PT 5 Jan 2022

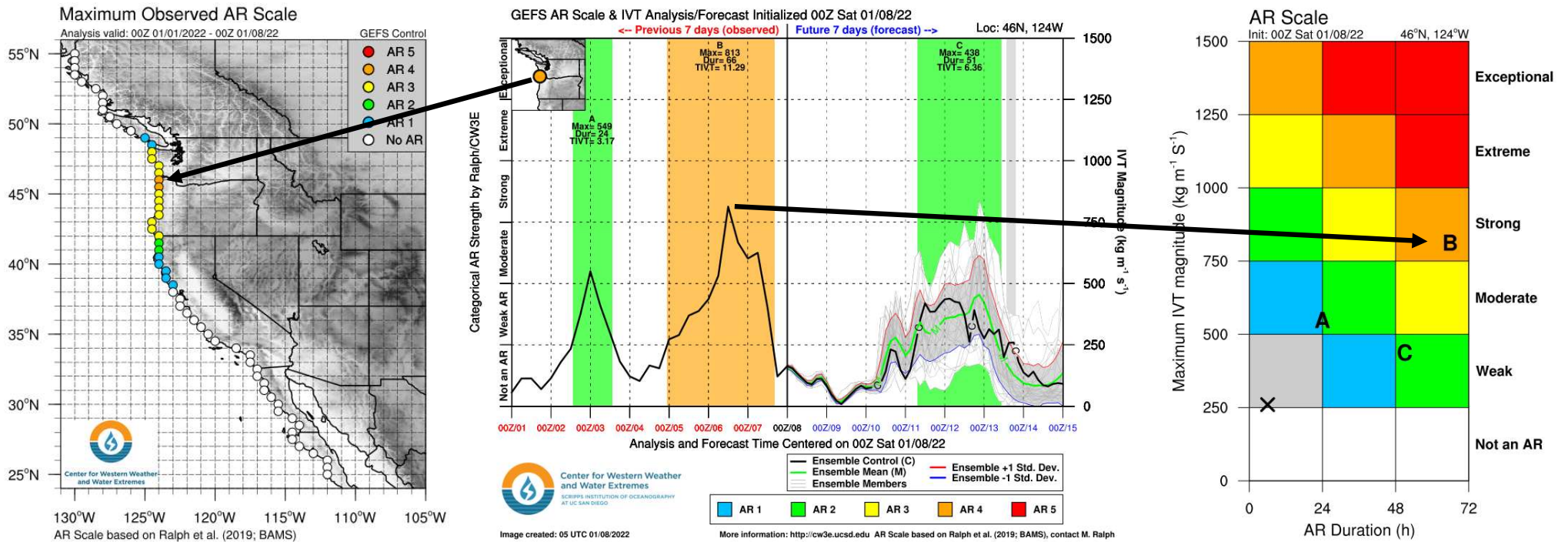


B) Valid: 4 AM PT 6 Jan 2022



- 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)

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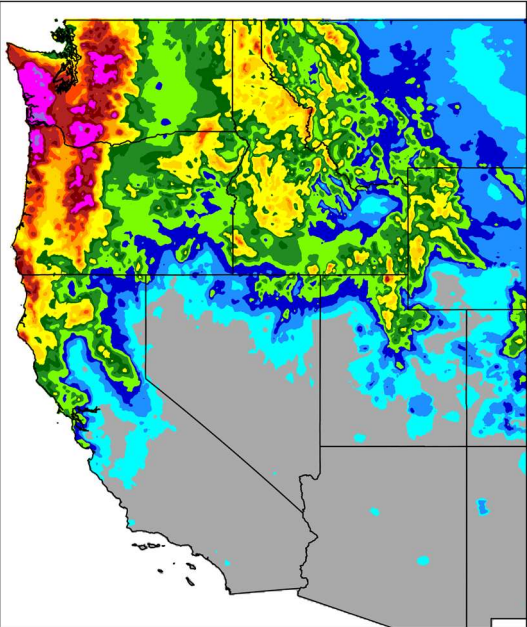


- The AR produced AR3 conditions for much of coastal Oregon and Washington
- A maximum IVT value of $813 \text{ kg m}^{-1} \text{ s}^{-1}$ and an AR duration of 66 hours, producing AR4 conditions, were observed at 46°N , 124°W (near Seaside, OR)

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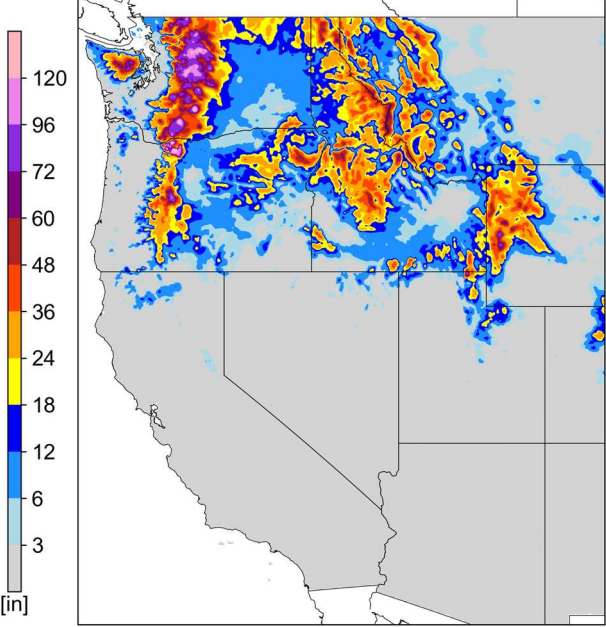
NCEP Stage IV QPE

Valid: 1200 UTC 2-8 Jan



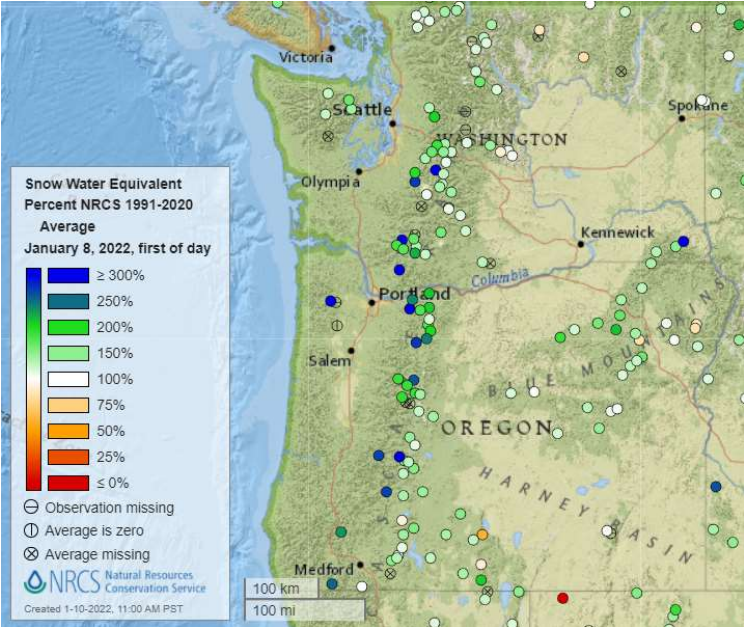
NOHRSC Interpolated Snowfall

Valid: 1200 UTC 2-8 Jan



SWE Percent of Average

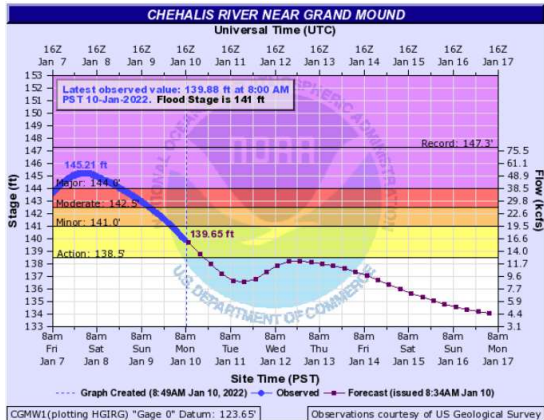
Valid: 8 Jan



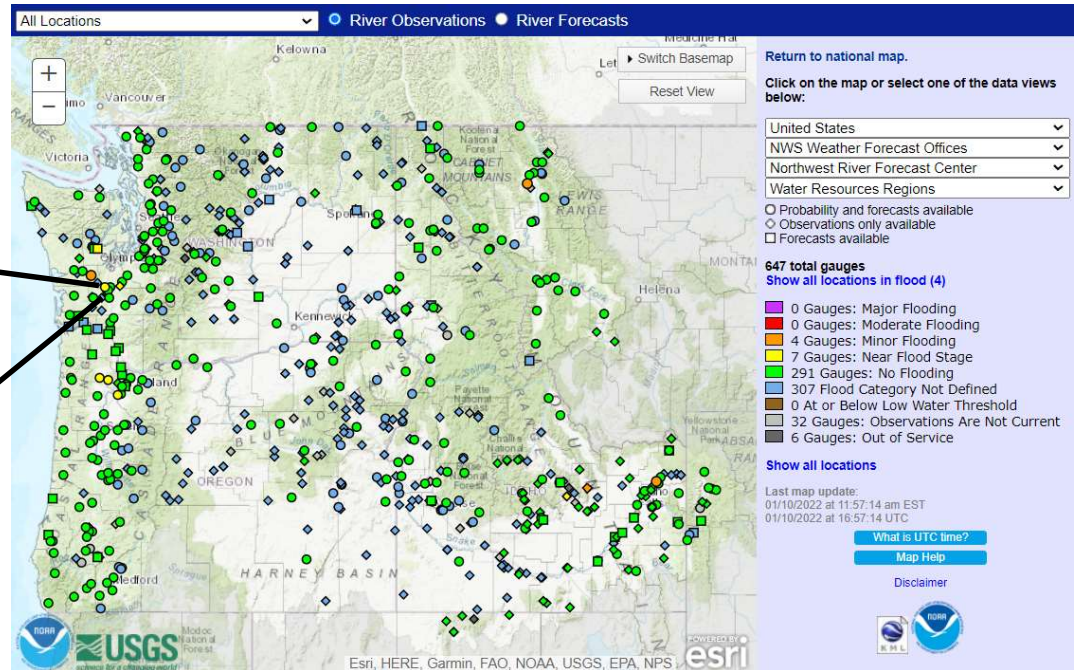
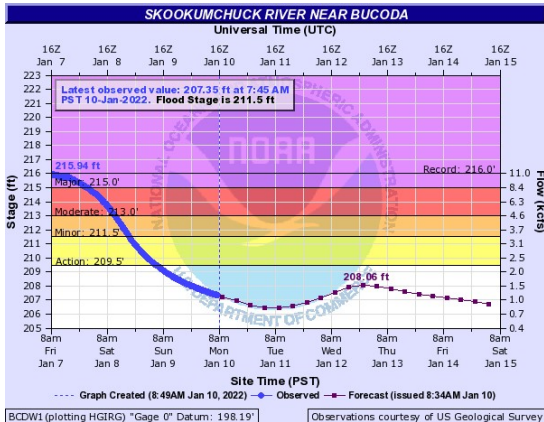
- More than 10 inches of precipitation fell in portions northwestern Oregon, western Washington, and the Cascade Mountains with many 24-hour precipitation records broken
- Several feet of snow fell across the Cascade Mountains with some areas receiving more than 6 feet.
- Hoquiam, WA airport set a daily 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

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Chehalis River Near Grand Mound



Skookumchuck River near Bucoda



Source: NOAA/NWS Advanced Hydrologic Prediction Service

- 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

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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

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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 be closed from Larch Mountain Road in Corbett to the intersection of I-84 at Ainsworth State Park.

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US 101 flooding at Seaside, OR



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