STATE OF WASHINGTON
OFFICE OF THE GOVERNOR
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April 5, 2017

The Honorable Donald J. Trump
President of the United States
The White House
1600 Pennsylvania Avenue NW
Washington, D. C. 20500

Through: Ms. Sharon Loper
Acting Regional Administrator
FEMA Region X
130 – 228th Street SW
Bothell, WA 98102

Dear Mr. President:

Under the provisions of Section 401 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. §§ 5121-5207 (Stafford Act), and implemented by 44 CFR § 206.36, I request that you declare a major disaster for the State of Washington as a result of damages incurred by a Severe Winter Storm on January 30 through February 22, 2017, which included snow, ice, rain, high winds, flooding, landslides, and mudslides. I am specifically requesting the Public Assistance Program for the following counties: Adams, Benton, Columbia, Franklin, Grant, King, Lewis, Lincoln, Pend Oreille, Skamania, Spokane, Snohomish, Wahkiakum, Walla Walla, and Whatcom Counties. I request the Hazard Mitigation Grant Program statewide.

Weather Conditions

The transition from a cold sub-freezing air mass over Washington and the Pacific Northwest at the start of February to a warmer moist air mass resulted in a continuous sequence of severe winter storm events through February 22 that included snow, rain, snowmelt, flooding, mudslides, landslides, and high winds. Cumulative impacts during this period were the result of a sequence of meteorological events. Together with antecedent conditions in place at the start of the month, a series of snow and rain storms along with freezing and melting temperatures combined to create an extended period of compounding impacts through the period.

It is not uncommon for atmospheric rivers to produce heavy amounts of precipitation with resulting flooding and landslides in Washington. Yet warmer heavy rain events in the wake of

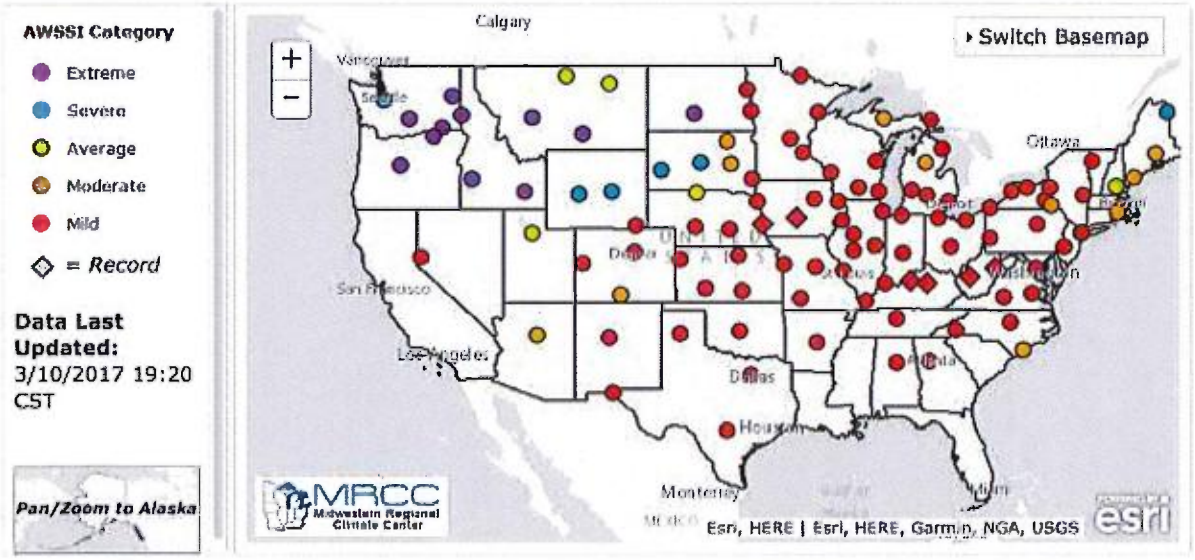
a sequence of meteorological events. Together with antecedent conditions in place at the start of the month, a series of snow and rain storms along with freezing and melting temperatures combined to create an extended period of compounding impacts through the period.

It is not uncommon for atmospheric rivers to produce heavy amounts of precipitation with resulting flooding and landslides in Washington. Yet warmer heavy rain events in the wake of an outbreak of cold sub-freezing temperatures with snow and ice on the ground are rather rare. This 2017 event was comparable to similar disaster events in late 1996-early 1997 and in the winter of 1985 that also had compounding impacts over several weeks.

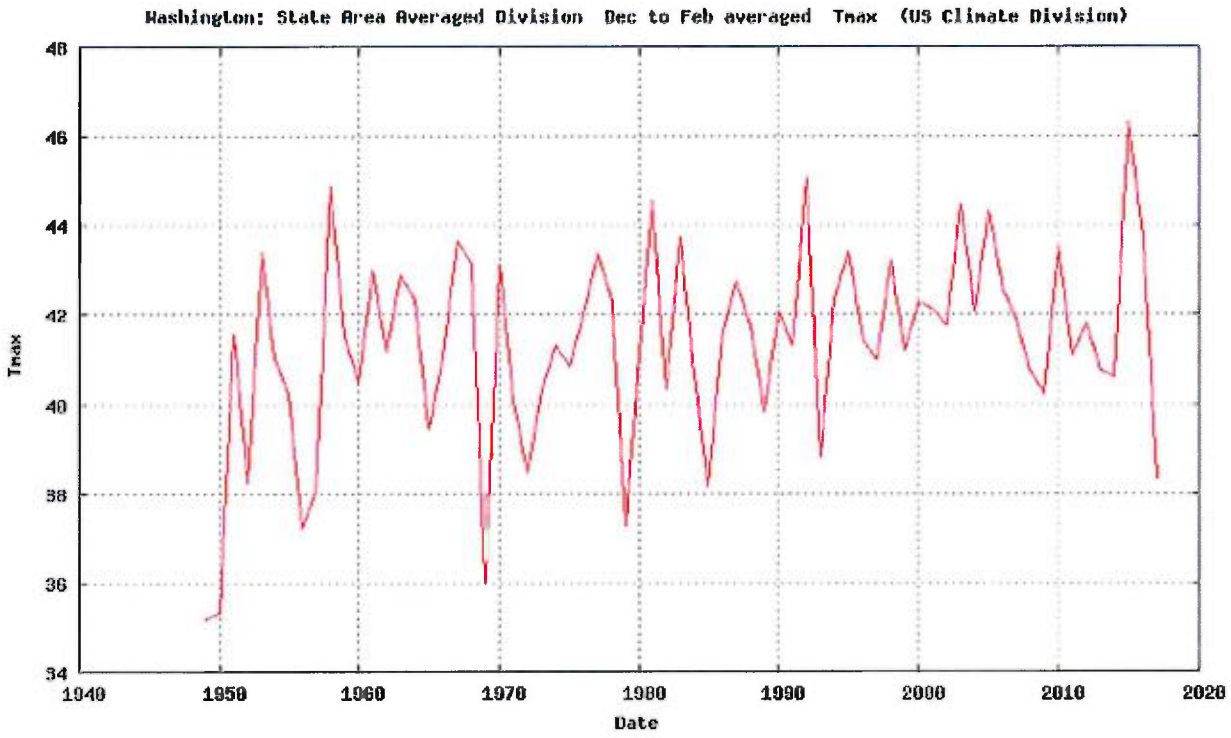
An atmospheric river of moisture colliding with the transitioning air mass resulted in a continuous stream of gale warnings, winter storm warnings, ice storm warnings, high wind warnings, flood warnings, and areal flood warnings throughout all regions of the state during the January 30 to February 22 event period.

This was not the usual winter. In fact, this winter was described as "the coldest winter in a generation for the Pacific Northwest". The National Weather Service (NWS) Accumulated Winter Season Severity Index (AWSSI) placed the Seattle Area (Western Washington) as "severe winter conditions and Eastern Washington/Eastern Oregon/Idaho as extreme winter". Extreme is the highest rating as the index considers such parameters as cold and snow and how conditions have deviated from normal.

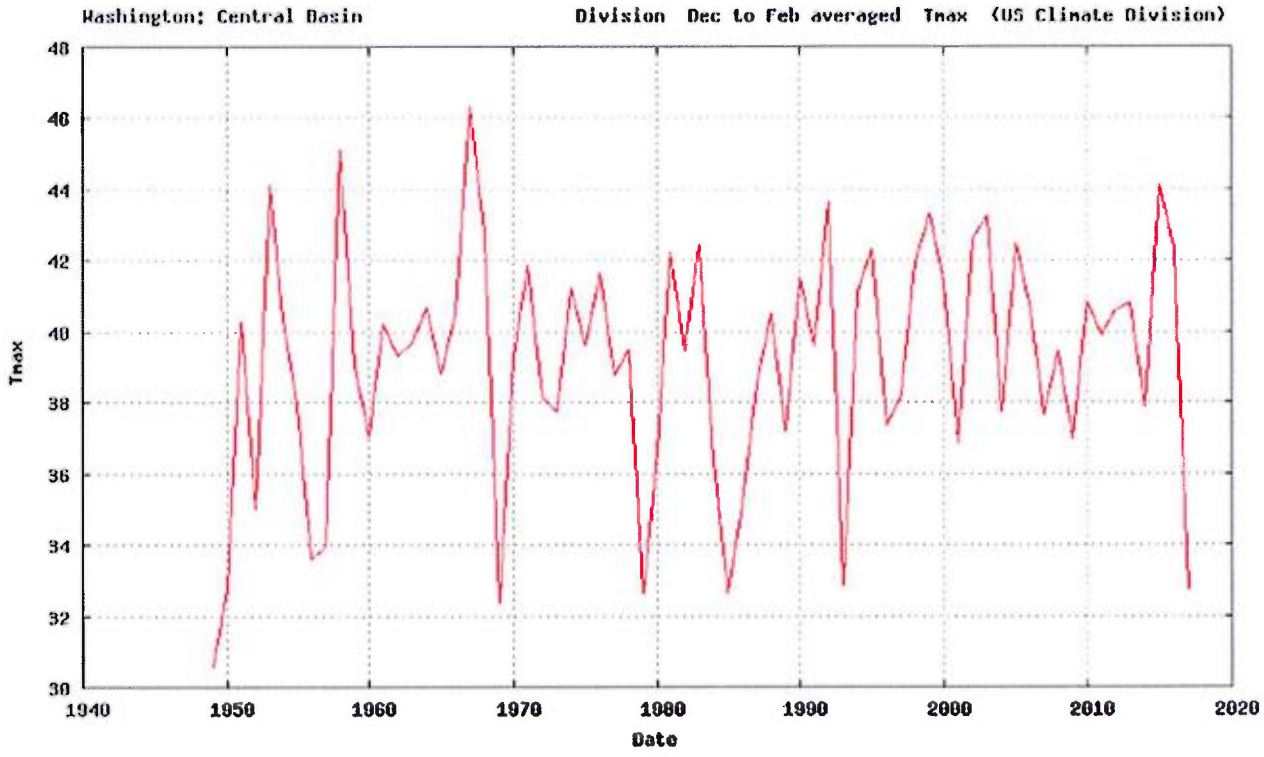
Current Season



Confirming the NWS AWSSI deviation from the norm findings as well as the winter being described as coldest winter in a generation, the following graphs outline the average maximum temperatures (for Dec-Feb) for the past 70 years. The first graph is Washington State Averaged and the second graph is the Columbia Basin. The high temperatures in Washington State this winter were the coldest since 1985.



The high temperatures in the Columbia Basin around Richland this winter were the coldest since 1985 (although 1993 came close).



At the beginning of February, Eastern Washington had between one and two feet of snow on the ground with temperatures in the single digits. More snow fell in Eastern Washington on February 5-6 with areas in Western Washington getting from a few inches to as much as two feet in the same short period.

The snowfall was documented in the National Climatic Data Center (NCDC) snow records database with 61 Cooperative Observer Network (COOP) weather stations registering record snow. These weather stations 'record snow' recordings exceeded established COOP station records which previously stood between 37 to 124 years. This is not to say that the snowfall broke the NCDC 1-day, 2-day, or 3-day historical records for counties, but does indicate significant snowfall from January 31 to February 9.

Warmer rain followed with cumulative impacts in Western Washington initially including freezing rain in Whatcom County and the Columbia River Gorge, resulting in downed trees and power outages. In the Cascade Mountains, heavy wet snow fell and later was accompanied by freezing rain resulting in avalanches and downed trees that closed all three Cascade mountain pass highways from February 4-10. This is a significant amount of snow closures as the last time all three Cascade mountain passes were closed at the same time was in 2008 and before that 1996. Rain amounts during this period were exceptional with many areas receiving near record February monthly amounts on both sides of the Cascades. Eastern Washington precipitation amounts ranged from 100 to 200 percent above normal monthly averages. Despite warmer conditions developing during the month, temperatures during this period remained about 2-4 degrees below seasonal averages statewide.

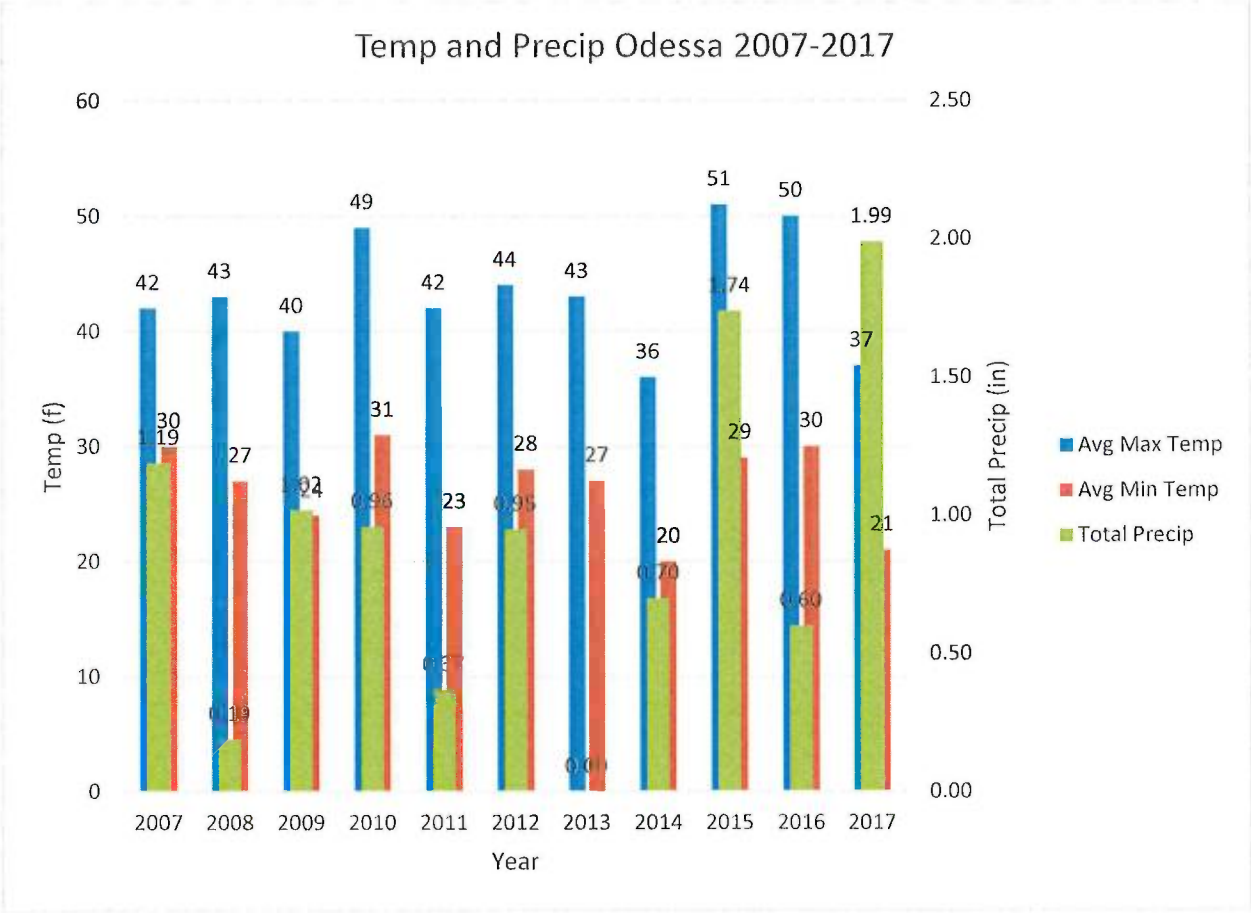
Rain amounts during this period were exceptional with many areas receiving near record February monthly amounts. As an example, SeaTac Airport had 8.32 inches through the 21st making it the fourth wettest February on record with a week remaining in the month.

The following presents Daily Precipitation (inches) for selected sites from February 3-21, 2017.

February	3	4	5	6	7	8	9	10	11	12
Quileute	1.34	0.77	0.19	0.23	0	1.34	1.45	0.30	0.05	0
Astoria, OR	0.51	1.07	1.42	0.37	0.04	2.09	1.28	0.16	0.02	0
Bellingham	0.32	0.46	0.22	0.50	0.10	0.35	0.74	0.04	0	0
SeaTac Airport	0.70	0.94	0.82	0.65	0.01	0.70	1.63	0.02	0	0
Olympia	0.46	1.04	1.02	0.22	0	1.09	1.51	0.33	0.01	0
Spokane	0.73	0.14	0.38	0.05	0	0.39	0.28	0	0	0
Pullman	0.04	0.17	0.09	T	T	0.23	0.21	T	0	0
Walla Walla	0.11	0.05	T	0.01	0.10	0.27	0.23	0.01	0	0
Yakima	0.22	T	0.28	0.05	T	0.40	0.18	0	0	0

February	13	14	15	16	17	18	19	20	21	Total
Quileute	0	0.65	2.61	0.24	0.08	0.12	0.54	T	0.07	9.92
Astoria, OR	0	0.17	1.47	0.14	T	0.17	1.35	0.55	0.01	10.82
Bellingham	0	0.19	0.30	0.19	0.08	0.13	0.04	0.03	0.01	3.70
SeaTac Airport	0	0.23	1.63	0.50	0.01	0.15	0.06	0.20	0.07	8.32
Olympia	0	0.40	1.16	0.15	0.02	0.28	0.23	0.31	0.13	8.36
Spokane	0	0	0.74	0.44	0.02	0.17	0.17	0.30	0.25	4.06
Pullman	0	0	0.33	0.58	0.08	0.21	0.11	0.21	0.63	2.89
Walla Walla	0	0	0.20	0.53	0.01	0.14	0.09	0.09	0.57	2.41
Yakima	0	0	0.45	0.07	0	0.15	T	0.30	0.15	2.25

The following bar graphs highlight the February temperature/precipitation for the past 10 years (2007-2017) showing this winter's high level of precipitation and the colder maximum and minimum temperatures in Central-Eastern Washington.



This cumulative and compounding combination of significantly colder temperatures and precipitation proved to be especially damaging. Temperatures at night dropped below freezing while daytime highs east of the Cascades rose into the 30s and 40s. This daily freeze-thaw

sequence combined with snowmelt runoff including ponding water and erosion, resulted in considerable road damage east of the Cascades to the Idaho border. Over 750 roadways suffered freeze-thaw damage such as road failure depressions, boils, heaves and settlements. Damages to this extent were last previously experienced in mid 1990s and before that in mid 1980s.

Weather Impact Timeline

A cold arctic-like air mass invaded the Pacific Northwest including all of Washington State in January. Low temperatures in Western Washington were frequently in the teens and twenties; this was 10 to 20 degrees below average. East of the Cascades, high temperatures were often only in the teens and twenties, while low temperatures were frequently in the single digits, at times dropping to as low as 10 degrees below zero. Snowfall was above normal with Spokane receiving 13 inches of snow, Yakima 18 inches, and Pasco 15 inches.

On January 30-31, the initial winter storm warnings were issued for the south-central Washington counties along the Columbia and Snake Rivers. As the month of February began, the transition to a warmer air mass slowly unfolded over the next three weeks with a series of adverse weather impacts across all areas of the state.

In Western Washington, gale and high wind warnings were issued on February 1-2, strong east winds of 40 mph with gusts to 60 mph blew through the east Puget Sound lowlands blowing down trees and knocking out power to over 100,000 customers. In addition, in Central and Eastern Washington, winter storm warnings were issued for heavy snow and ice accumulation expected for the east Cascades, Columbia River Gorge, and the northeast Washington counties.

On February 3-4, winter storm warnings were expanded to Eastern Washington Spokane region, the east slopes of the central and southern Washington Cascades, and the western Columbia River Gorge areas. In addition to the gale and high wind warnings in Western Washington, winter storm warnings were issued with significant snow expected throughout the mountains, Cascade passes, and higher lowlands.

On February 5-6, much of Western Washington received anywhere from a few inches of snow to as much as two feet in parts of Whatcom County. The snow load on trees helped bring down trees and adjacent power lines. Also, winter storm warnings were expanded to include north central Washington, southwest Washington, and northwest Washington for excessive snow accumulation. Late on February 6, a flood warning was issued this time for southeast Washington.

On February 6-10, warmer temperatures and rain followed. However, during the transition the snow changed to freezing rain on February 8 resulting in downed trees and widespread power outages finally turning to rain on February 9. This transition produced local flooding and ponding of water on roadways due to the ice and snow clogged storm drains and drainages. Winter storm warnings were issued February 7-9 for south central Washington along the south

Washington Cascades as well as along the Columbia and Snake Rivers. Ice storm warnings were issued for the east slope of the Cascades in Central Washington.

From February 4-10, the Cascade Mountains had two to four feet of heavy wet snowfall, and later it was accompanied by freezing rain resulting in avalanches and downed trees which eventually closed all three of the Cascade mountain passes connecting Western and Eastern Washington. Road crews struggled to remove snow, ice, trees, and debris so the closed passes could be reopened.

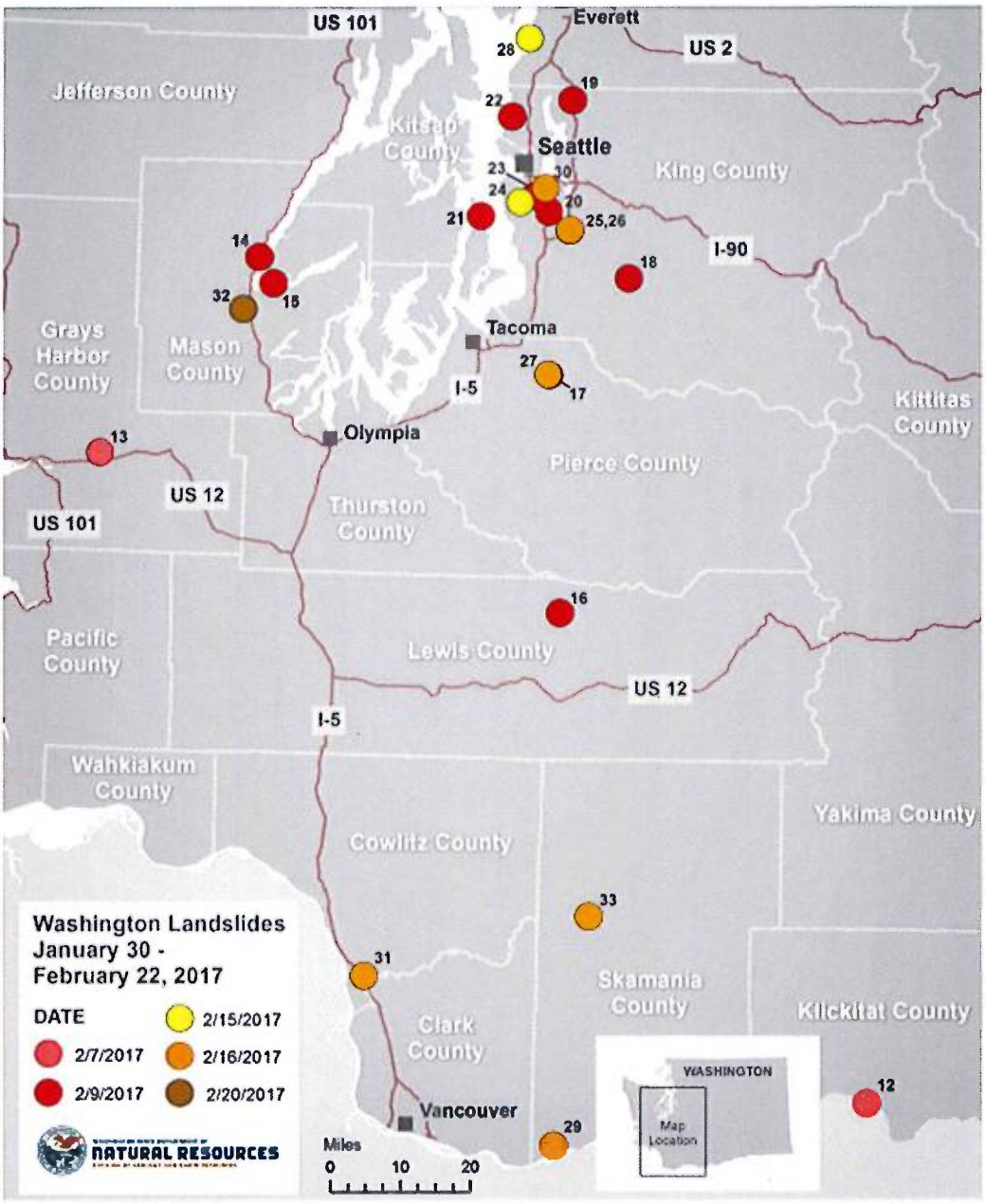
East of the Cascades, from February 3-8, another four inches to a foot and a half of new snow fell on the existing snow on the ground. On February 9-10, temperatures warmed into the 40s resulting in the snow on the ground starting to melt and the creation of ice jams in some streams. One example was on the North Fork of Ahtanum Creek in Yakima County where ice moved downstream damaging five homes with water and structural damage. Flood warnings were issued for urban and small streams in the central Yakima area.

During February 10-14, Eastern Washington temperatures had daytime highs rise into the 30s and 40s and nighttime readings drop below freezing which began to produce the greatest cumulative impacts. The warmer daytime temperatures helped melt more of the snow and ice on the ground, freezing again at night, maintaining frozen ground and leaving nowhere for water to run off. Due to this cycle, the combination of snow and ice clogged drainage ditches, frozen and saturated ground, and soaked roadway sub-bases produced considerable ponding of water and water over roadways. This compounding freeze/thaw sequence and limited runoff drainage set the perfect conditions for over 750 roadways to suffer severe damage ranging from road failure depressions, boils, heaves, settlements and erosion.

It was an exceptionally wet period in Western Washington from February 7-10. Saturated soils combined with the heavy rain amounts and melting lowland snow resulted in nearly two dozen shallow landslides and mudslides, producing significant impacts. A shallow landslide blocked SR-14 near Rowena on February 7. On February 9, shallow landslides closed multiple roads: US-101 near Hoodsport, SR-106 near Shelton, SR-7 north of Morton, and SR-162 near Puyallup. In addition, heavy storm water runoff on February 9, from over 1.5 inches of rain falling in the Seattle area, resulted in the King County West Point Wastewater Facility being overwhelmed and flooding the interior of the facility, destroying all of the treatment equipment and electronics and resulting in millions of gallons of untreated and/or limited treated wastewater flowing into Puget Sound. Also, from February 9-13, flood warnings were issued for southwest Washington, central and south Puget Sound regions, and gale warnings were issued for north Puget Sound regions and Hood Canal area.

The wet weather was not done yet creating more compounding impacts. Another surge of heavy precipitation hit both sides of the Cascades. From February 14-22, two to four inches of rain fell in Western Washington pushing over a half dozen rivers to rise above flood stage, and creating more landslides. A shallow landslide in the Maple Valley area on February 15 destroyed a home. On February 16, westbound lanes of I-90 were blocked by a shallow landslide in Issaquah; another shallow landslide near Edmonds closed the BNSF rail line

between Seattle and Everett; and a shallow landslide also closed the northbound lanes of I-5 north of Woodland. (Ref: Washington State DNR Landslide Map)



On February 14, a high wind warning was issued for the south Washington coast, and an ice storm warning was issued for the western and central Columbia River Gorge with ice accumulations. The high wind warning was further expanded to the Olympic Peninsula on February 15. On February 16, flood warnings were issued in southwest Washington and central Puget Sound.

From February 15-21, the wet and warmer weather extended east of the Cascades extending the cumulative impacts there. The wet conditions with high temperatures climbing into the 40s combined with snow and ice clogged drainage systems, resulting in more flooding conditions including areas of significant ponding and standing water. Again, saturated road sub-base and roadway surfaces in Eastern Washington suffered major damage from repeated freeze-thaw cycles that produced frost heaves, as well as altered drainage and water runoff including washouts, shallow landslides and closures. For example, Lind, Washington, had an inch of rain on February 15-16, and coupled with saturated soils from melting snow on the ground created numerous area road washouts, undermining, erosion, and slides. Many Eastern Washington smaller streams such as the Palouse River and Hangman Creek also suffered ice jam flooding.

East of the Cascades, a winter storm warning was issued for the east slopes of the Northern Cascades on February 15 and flood warnings were issued on February 16 for Spokane and Ferry counties. Also on February 16, areal flood warnings were issued throughout Central and Eastern Washington due to heavy rain and snow melt. On February 17, because of heavy snow melt run-off, the City of Connell levee breached flooding the entire downtown area.

On February 21, in south central Washington, along the Columbia and Snake Rivers, a flood warning for rain and snow melt was issued with the expectation of significant residual snowmelt causing flooding.

State and Local Impacts and Response

The Washington State Emergency Operations Center Alert and Warning Center conducted real-time monitoring and information dissemination of all weather, flood levels, mountain pass closures, road disruptions, and coordinated essential support to emergency activities throughout the incident period. I signed Governor's Proclamation 17-3 on March 14, 2017, proclaiming a state of emergency existed in Adams, Asotin, Benton, Chelan, Clallam, Clark, Columbia, Cowlitz, Franklin, Garfield, Grant, Jefferson, King, Kitsap, Klickitat, Lewis, Lincoln, Mason, Pend Oreille, Pierce, Skamania, Snohomish, Spokane, Stevens, Wahkiakum, Walla Walla, Whatcom, and Whitman counties during the period of January 30 through February 22, 2017, due to a series of severe winter storms that struck Washington State producing high winds, heavy snowfall, ice accumulation, and extreme rainfall that saturated soils and caused major flooding, shallow landslides, streambank and slope erosion, fallen tree limbs, and uprooted trees. The effects of this storm severely disrupted vehicle traffic across Stevens Pass, Snoqualmie Pass and White Pass closing all three passes at the same time for the first time since 2008 and before that 1996. These simultaneous pass closures significantly impacted commercial trucking to and from Eastern and Western Washington, and in particular, to and from the ports of Seattle and Tacoma and the Kent Valley warehouses.

This severe winter storm caused multiple injuries to people, power outages in excess of 100,000 customers, temporary residential evacuations, extensive road damage, road closures and detours, rail line closures, ferry system and airline cancellations, as well as extensive damage to homes, businesses, public utilities, electrical power systems, infrastructure and property.