



Drought Status Update #30

November 20, 2015

Note: This material is intended for, and contains elements of special interest to, WDFW agency staff. Non-agency readers or anyone having questions about the context, clarity, or content for items in this update should contact the author, WDFW Drought Response Lead Teresa Scott at (360) 902-2713 or teresa.scott@dfw.wa.gov

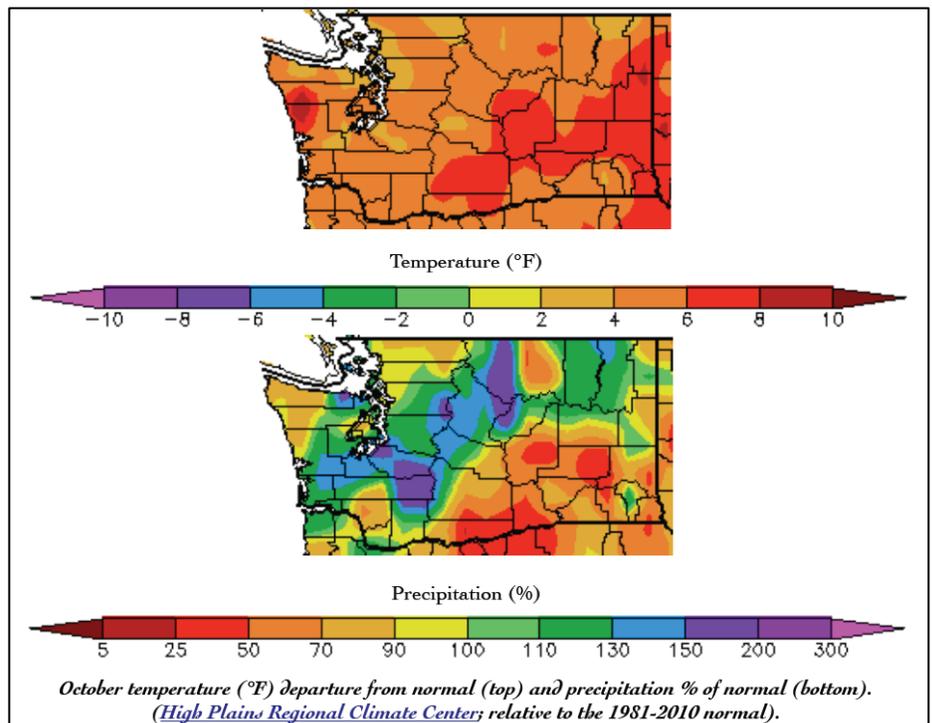
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Conditions seem to have reverted to a normal Pacific Northwest fall, with relief from the drought conditions that unfolded through last winter, spring, and summer. But are things really “back to normal?”

October Temperature and Precipitation Departure from Normal

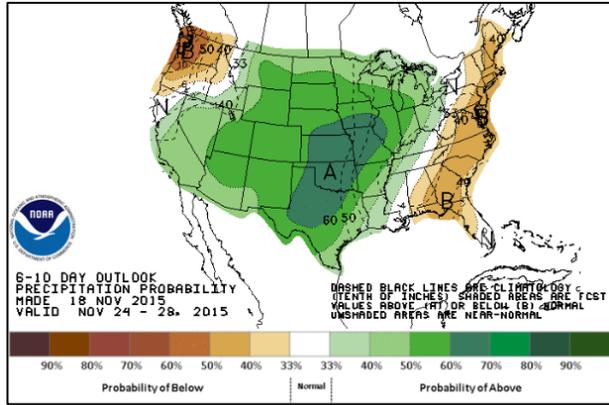
November is certainly fulfilling its reputation as our rainiest month, but **temperatures have been higher** than normal statewide. The mean temperature anomalies are quite impressive, with parts of eastern WA between 6 and 8°F warmer than normal, and the remainder of the state experiencing temperatures largely between 4 and 6°F warmer than normal. Cumulative rainfall from October 1st to-date are not quite meeting the averages in many locations. Learn more from the [monthly newsletter from the Office of the State Climatologist](#), and read on...



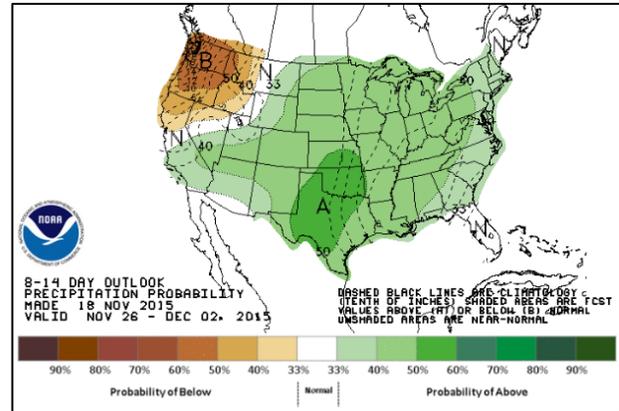
Precipitation Forecasts

The [6-to-10 day probability of precipitation](#) (below) is for **below-normal** precipitation statewide, and this carries through to the [8-to-14-day precipitation probability outlook](#).

6-10 day precipitation forecast for Nov 24-28

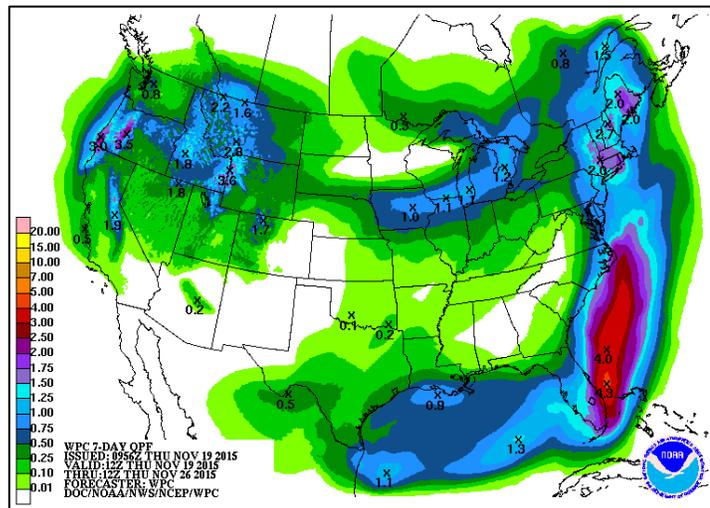


8-14 day precipitation forecast for Nov 26-Dec 2



At right is NOAA’s weather forecast for [precipitation](#) in most of Washington over the **coming week**. Climatologists are still predicting dryer-than-normal conditions into December, while meteorologists forecast up to .25 inches of rain over the next week statewide.

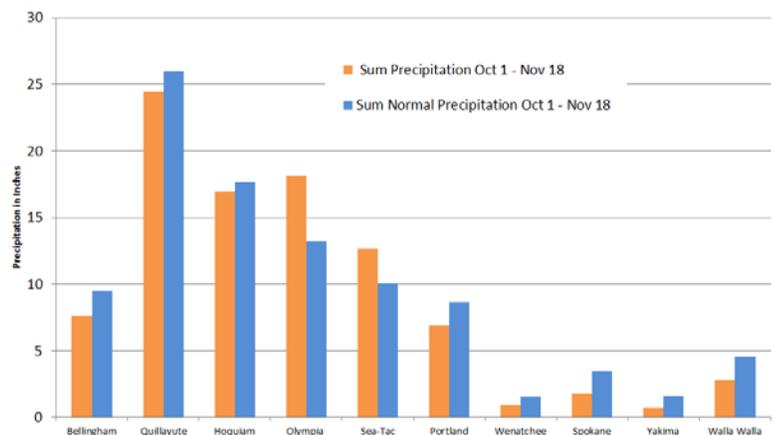
Get local weather forecasts by clicking the map at [Weather.Gov](#). Satellite images are available by scrolling down the forecast page to “Additional Resources.”



Precipitation History

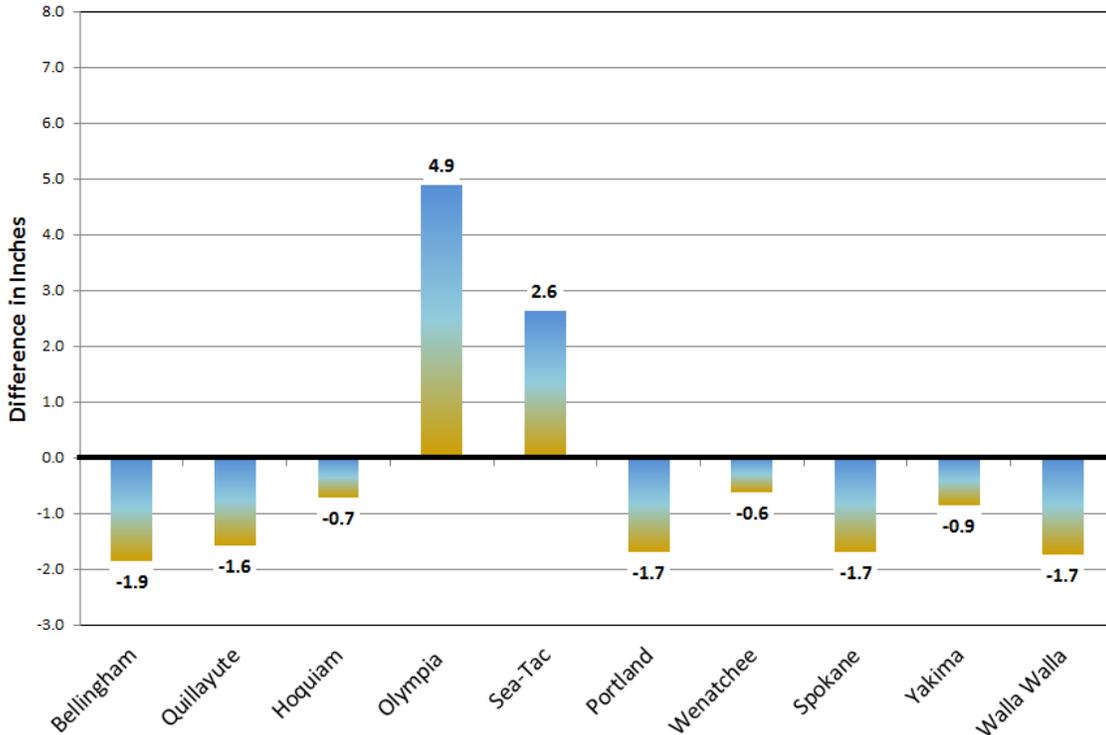
Most eastern Washington locations are not feeling the wet we’re experiencing in western Washington. Many of us from the westside can attest to beliefs (locally supported by data) that it’s been the wettest November ever. At right is a chart showing precipitation (inches) from October 1 through November 18, 2015 compared to “normal” for that date range. (NOAA NWS Nowdata)

October 1 through November 18 Precipitation Totals

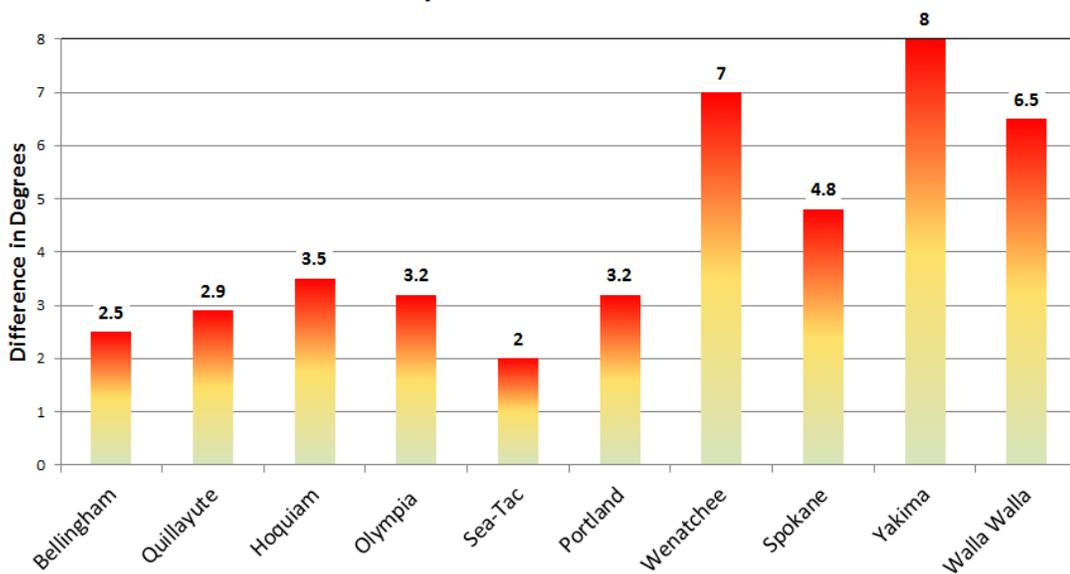


As for “the wettest ever:” The Olympia and Seattle-Tacoma areas have exceeded normal precipitation for the October 1 through November 18 period (Oct 1 starts the “water year”). Another way to look at these data is to show the difference between “normal” and actual precipitation. This comparison is presented below for our select Washington stations. Here’s

October 1 - November 18, 2015 Cumulative Precipitation Comparison to "Normal"



November 1-18, 2015 Mean Daily Temperature Comparison to "Normal"



the take-home: **Most stations are showing below-average rainfall since October 1!**

We will keep watching!

Also shown (bottom) are differences between the mean daily temperature during November and “normal” for that month.

Without exception, our select

Washington stations are all showing above-normal temperatures in November.

Other interesting precipitation factoids: Peak November one-day rainfall in the historic record for Olympia is a mere 4.33 on November 19, 1962. Possibly the statewide

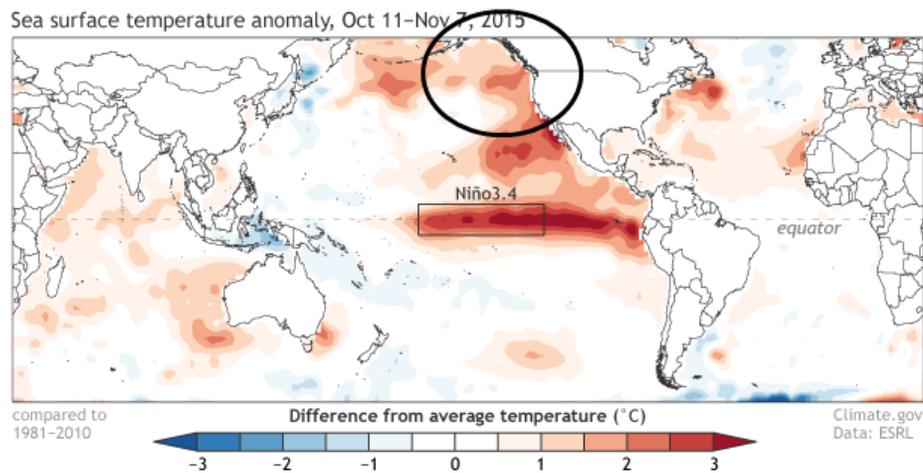
one-day rainfall record (any month) was set at Randal with 9.04 inches on November 22, 1959,

and in second place is Forks with 8.85 inches on November 3, 1955. [NOAA/NWS "Nowdata"](#) provides great resources for such research.

El Niño Update

The November 12th [El Niño/Southern Oscillation Diagnostic Discussion](#) tells us that El Niño will likely peak during the Northern Hemisphere winter 2015-16, with a transition to ENSO-neutral anticipated during the late spring or early summer 2016. According to forecasters, this event could rank among the top three strongest episodes going back to 1950 (only 1997 was greater during August-October). The next ENSO update is scheduled for December 10, 2015.

And for those of you blob watchers, the blob is alive and well (below).

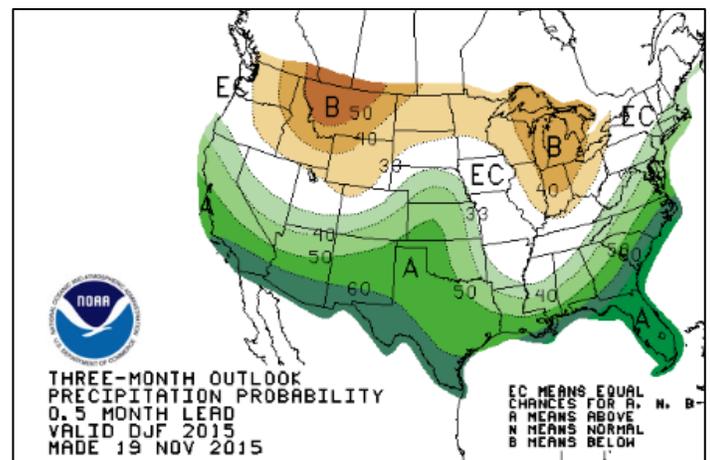
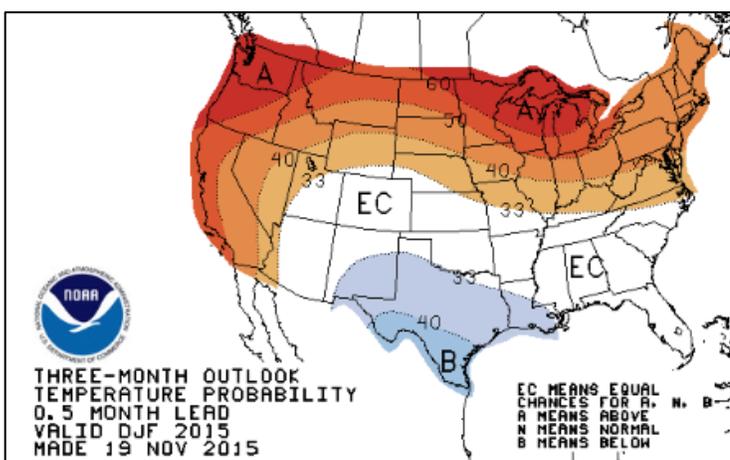


Climate Predictions

[Seasonal climate outlooks](#) generally favor above-average temperatures and below-median precipitation over the northern tier of the United States, and below-average temperatures and above-median precipitation across the southern tier of the United States.

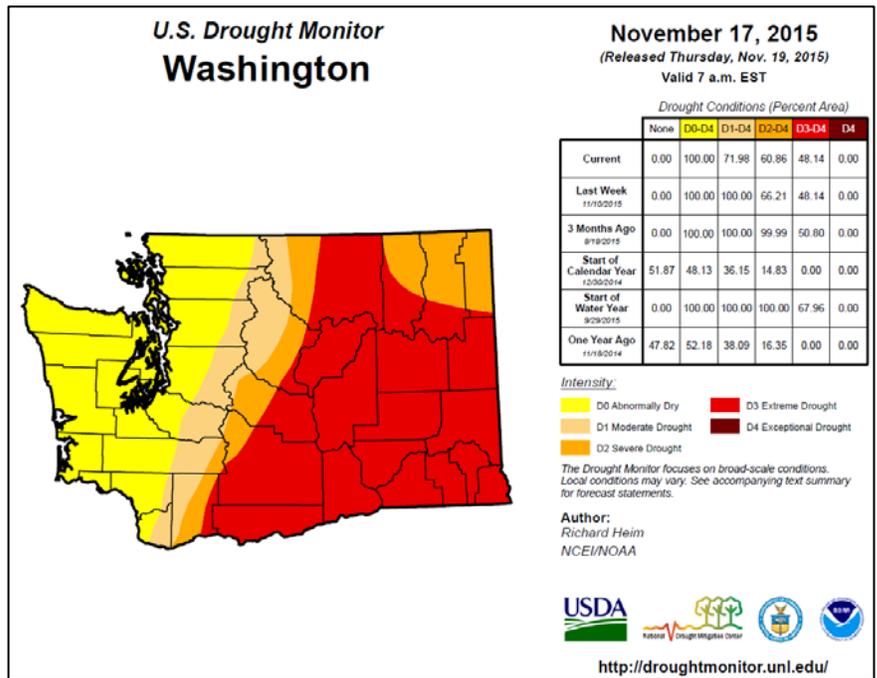
November, December, January Outlook Temperature

November, December, January Outlook Precipitation



Federal Drought Status

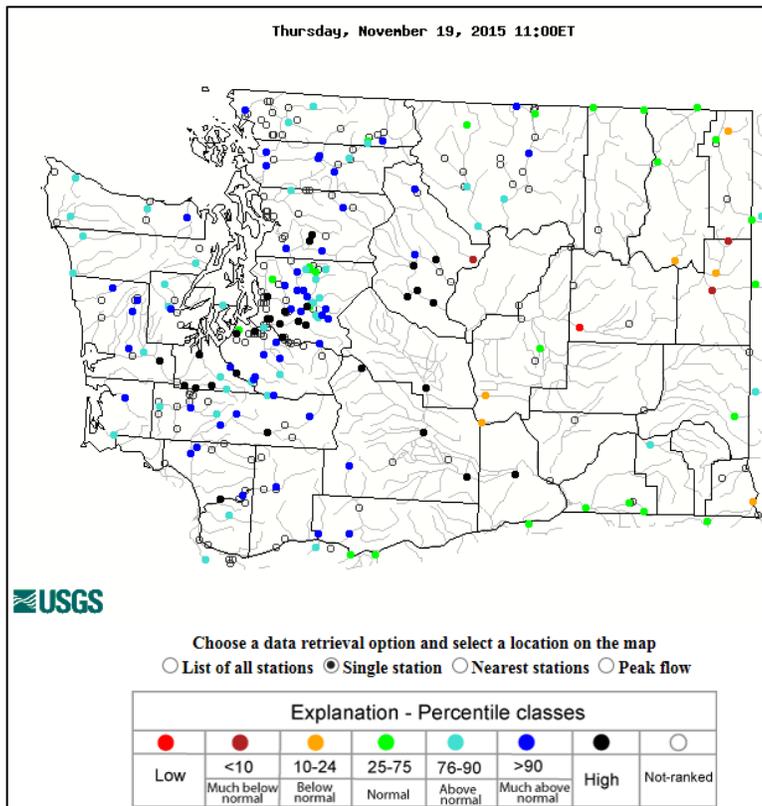
Note that the federal drought monitor hasn't called an end to drought in Washington just yet. Western Washington is holding in the "abnormally dry" category, with the Cascades and eastern Washington showing in various shades of moderate to severe drought. The [U.S. Drought Portal](http://www.drought.gov) provides the weekly drought status for the nation.



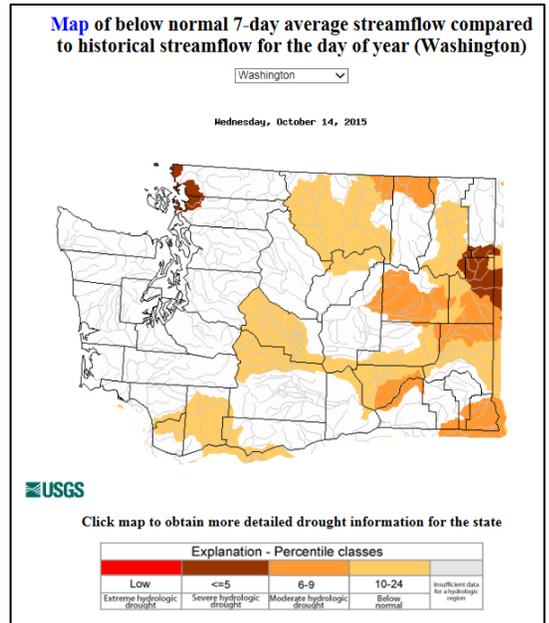
Stream Flows

The USGS [Waterwatch Streamflow Map for Washington](http://waterwatch.usgs.gov) shows today's "above average" and higher streamflows, and also reveals a few eastern Washington streams that are still flowing at below-normal levels.

This is now:
Current Streamflow Map for November 19, 2015



That was then: Below-normal 7-day average stream flow October 14, 2015



Selected Washington Streamflows Table

We are switching our emphasis to above-normal flows (from minimum stream flows), and showing maximums to give some perspective. This [Statewide Streamflows](#) table from USGS gives a quick visual reference for daily flows as a percent of normal for this date in the historic record. We selected 43 out of a total of 254 flow gauges in Washington as a subjectively representative sample of Washington conditions. Pink cells in today's flow column denote new high flow records set for this date.

SELECTED WASHINGTON STREAMFLOWS ON NOVEMBER 19, 2015	TODAY'S MEAN FLOW (CFS)	PERCENT OF AVERAGE FOR THIS DATE IN THE RECORD	MEAN FLOW (CFS)	MAX FLOW (CFS)	YR OF MAX FLOW
Mf Nooksack River Near Deming, Wa	1,280	195%	656	2,340	1998
Nooksack River At Ferndale, Wa	13,500	369%	3,660	13,500	1976
Skagit River Near Concrete, Wa	36,800	277%	13,300	43,200	1998
Sauk River At Darrington, Wa	4,690	219%	2,140	7,680	2013
Cascade River At Marblemount, Wa	2,750	225%	1,220	3,320	2013
Nf Stillaguamish River Near Arlington, Wa	5,230	243%	2,150	16,300	1998
Snoqualmie River Near Carnation, Wa	13,800	413%	3,340	15,000	1976
Skykomish River Near Gold Bar, Wa	15,800	425%	3,720	29,100	1998
Issaquah Creek Near Mouth Near Issaquah, Wa	349	379%	92	1,020	1976
Cedar River Below Diversion Near Landsburg, Wa	3,070	727%	422	706	2015
Cedar River At Renton, Wa	3,930	824%	477	1,580	1976
Big Soos Creek Above Hatchery Near Auburn, Wa	479	798%	60	249	1976
Green River Near Auburn, Wa	7,800	831%	939	4,550	1976
South Prairie Creek At South Prairie, Wa	870	448%	194	1,500	1998
Puyallup River At Puyallup, Wa	12,200	510%	2,390	9,720	1956
Nisqually River At Mckenna, Wa	3,390	326%	1,040	5,340	1956
Deschutes River Near Rainier, Wa	918	592%	155	1,810	1998
Nf Skokomish R Bl Staircase Rpds Nr Hoodspport, Wa	1,530	267%	574	3,820	1998
Dungeness River Near Sequim, Wa	1,120	439%	255	1,710	1998
Hoko River Near Sekiu, Wa	1,110	196%	567	3,630	2000
Calawah River Near Forks, Wa	2,870	199%	1,440	8,350	1998
Hoh River At Us Highway 101 Near Forks, Wa	7,100	234%	3,030	15,600	1998
Satsop River Near Satsop, Wa	7,030	364%	1,930	19,400	1976
Chehalis River Near Grand Mound, Wa	28,300	1715%	1,650	10,800	1956
Naselle River Near Naselle, Wa	1,950	406%	480	4,120	1976
Cowlitz River Below Mayfield Dam, Wa	14,800	312%	4,740	24,400	1956
Cowlitz River At Packwood, Wa	3,340	274%	1,220	11,200	1998
Lewis River At Ariel, Wa	23,900	583%	4,100	16,500	1934
White Salmon River Near Underwood, Wa	1,390	210%	662	2,200	1998
Klickitat River Above West Fork Nr Glenwood, Wa	563	373%	151	725	1998

Walla Walla River Near Touchet, Wa	233	197%	118	1,100	2013
Tucannon River Near Starbuck, Wa	123	134%	92	180	2013
Grande Ronde River At Troy, Or	1,020	107%	952	2,610	2013
Yakima River At Kiona, Wa	12,500	479%	2,610	5,530	1950
American River Near Nile, Wa	708	745%	95	610	1998
Wenatchee River At Plain, Wa	9,750	871%	1,120	4,790	1934
Methow River Near Pateros, Wa	809	161%	501	1,700	1960
Okanogan River At Malott, Wa	2,060	160%	1,290	2,600	2004
Okanogan River At Oroville, Wa	405	83%	489	1,200	1949
Spokane River At Spokane, Wa	2,540	102%	2,480	7,850	1934
Colville River At Kettle Falls, Wa	159	120%	133	286	1928
Pend Oreille River Below Box Canyon Nr Lone, Wa	19,300	84%	23,000	37,800	1960

Drought Impacts to Fish and Wildlife

Hatchery Returns To-Date - Total Adult Salmon Returned to WDFW Facilities by Species and Run Type

Hatchery Returns through 10/19/2015 - Total does not include jacks. Numbers are preliminary estimates only.

FACILITY	CHINOOK			CHUM	COHO	PINK	SOCKEYE	STEELHEAD		
	FALL	SPRING	SUMMER					SUMMER	WINTER	WINTER-LATE
Kendall Cr Hatchery		2919		150	20	144	4		446	
Whatcom Cr Hatchery	21			9830	15	90				
Glenwood Springs	858									
Samish Hatchery	6114				518					
Baker Lk Hatchery					173		6301			
Marblemount Hatchery		1735	91		1255	51				
Whitehorse Pond			7		22	2	4	79	172	
Reiter Ponds								712		
Sunset Falls Fcf			498	1	6507	17293	8	734		
Tokul Cr Hatchery	78									
Wallace R Hatchery			3020		2421	1600		808		
Cedar River Hatchery	38						3240			
Issaquah Hatchery	3373				1578		2			
Soos Creek Hatchery	7909			28	3376	33		74		
Voights Cr Hatchery	2892				6217	705				
Tumwater Falls Hatch	3747									
Garrison Hatchery	49				11					
Minter Cr Hatchery	2777	187		12332	2484	193				
George Adams Hatchry	6033			6524	2720		2			
Mckernan Hatchery				40327						
Hoodsport Hatchery	2157			19924	61	5948				
Dungeness Hatchery		47			300					
Hurd Cr Hatchery		191								
Morse Creek Hatchery	44				4	28		2		
Elwha Hatchery	1556			122	6		4			

Bogachiel Hatchery								611		
Solduc Hatchery			517		5998			9		
Humptulips Hatchery	1376				784			176		
Lk Aberdeen Hatchery	336			160	222	1		682		
Mayr Brothers Rearin	56			138	620					
Bingham Cr Hatchery	158			1398	3135					
Satsop Springs Ponds	269			1192	2195					
Skookumchuck Hatchry					640					
Wynoochee Dam Trap	29				384			119		
Forks Creek Hatchery	14171			1851	2881			4	2	
Naselle Hatchery	5709			495	7082			21		
Nemah Hatchery	2386			364	6			1		
Cowlitz Salmon Hatch	7951	17600		2	6087	7	13	8424		
Cowlitz Trout Hatch								893		
Kalama Falls Hatchry	4248	2674			1999			5723	6	11
North Toutle Hatchry	2296				1364			109		
Fallert Cr Hatchery	75	1			610			44		
Lewis River Hatchery	580	218			9613		1	116		
Merwin Dam Fcf	765	690			1382		30	4286	1	
Merwin Hatchery								339		
Modrow Trap	28757				1940			1688		
Speelyai Hatchery		863			3623					
Skamania Hatchery								1883		
Washougal Hatchery	4963				450			171		
Washougal River Fish Weir	16551				31			453		
Lyons Ferry Hatchery	2118	362								
Tucannon Hatchery		622								
Priest Rapids Hatchery	60732						2	12		
Ringold Springs Hatchery	14492				16			419		
Chiwawa Hatchery		450						2		
Chelan Hatchery										
Methow Hatchery		3353								
Omak Hatchery										
Eastbank Hatchery		303	1144				1485	162		
Wells Hatchery		0	1952					441		
Spokane Hatchery										

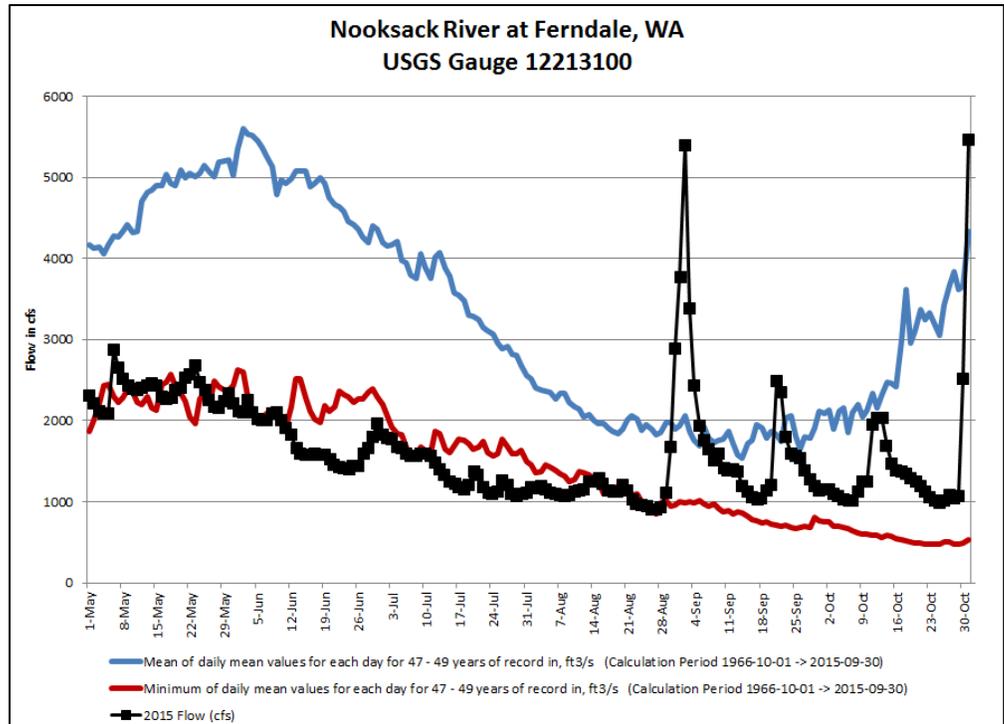
Hydrographs and local reports

Hydrographs are provided through October 31, 2015. The purpose for these charts has been to track minimum daily flows during the drought period. This depiction is inadequate to represent the magnitude of mayhem wrought near some Washington streams since November 1. Charts in the following section closes the loop on minimum daily flow monitoring for this drought season. Additional information for post-October flows is provided where available.

Nooksack

Prior to the end of October, the Nooksack, like many Washington streams, returned to below-normal (near minimum) flows between bouts of precipitation.

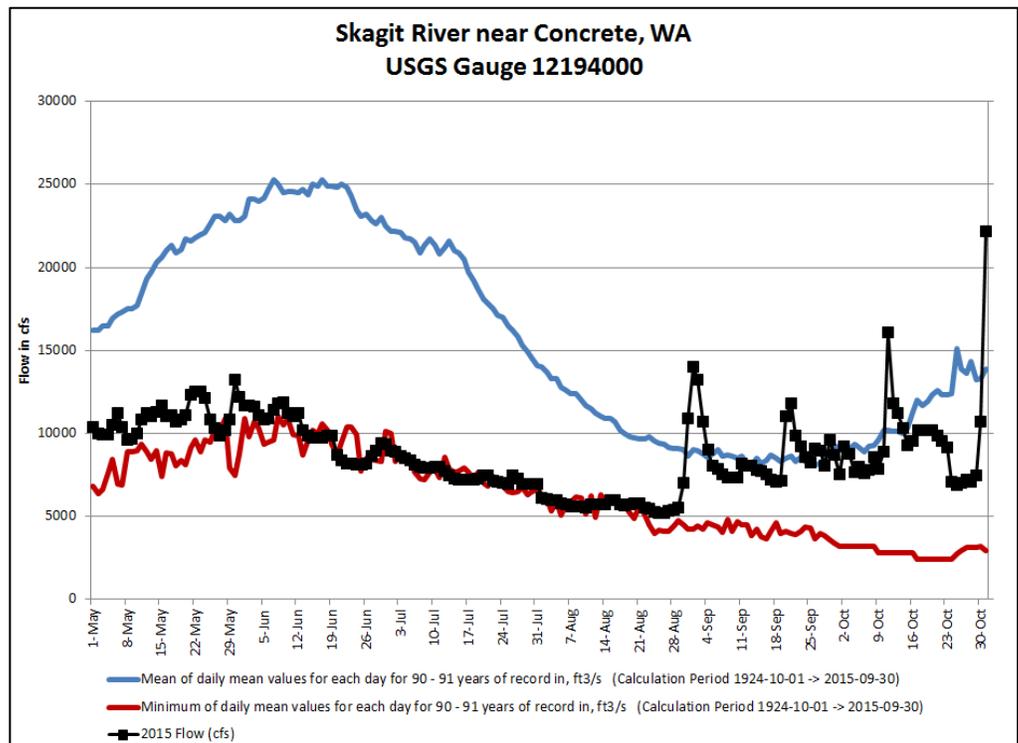
Daily maximum flow at this site has reached from 3,000 cfs to 27,000 cfs between November 1 and 19.



Skagit

Minimum flow on November 1 was 33,900 cfs, with a maximum that day of 58,600.

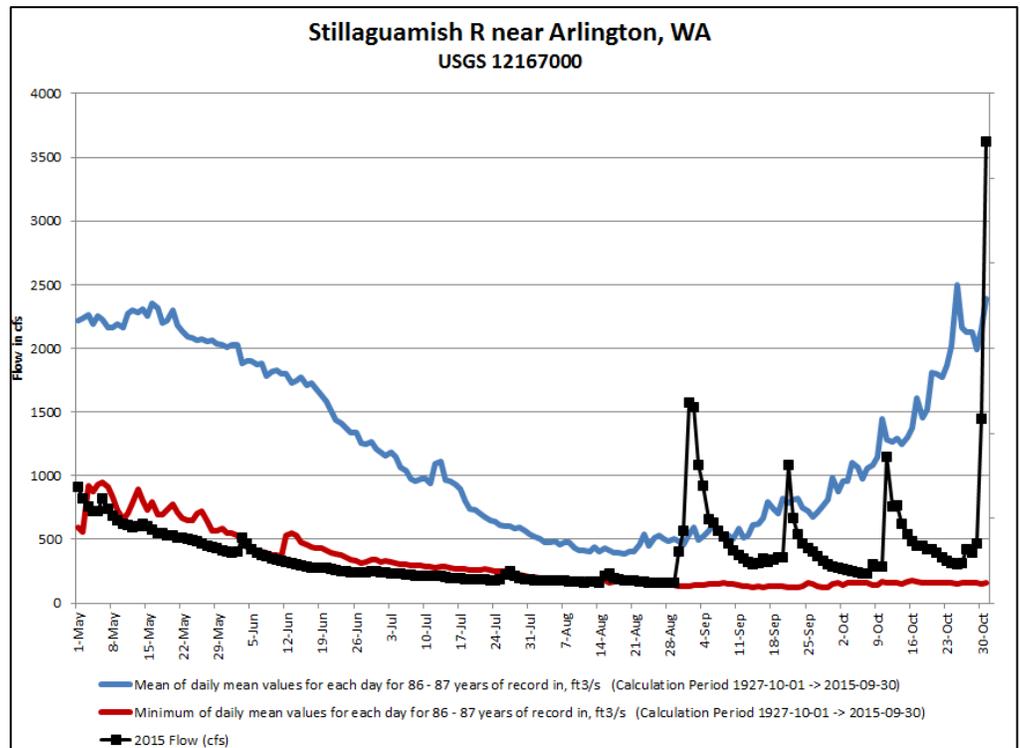
Maximums have ranged between 16,700 and 95,800 cfs between November 1 and 19.



Stillaguamish

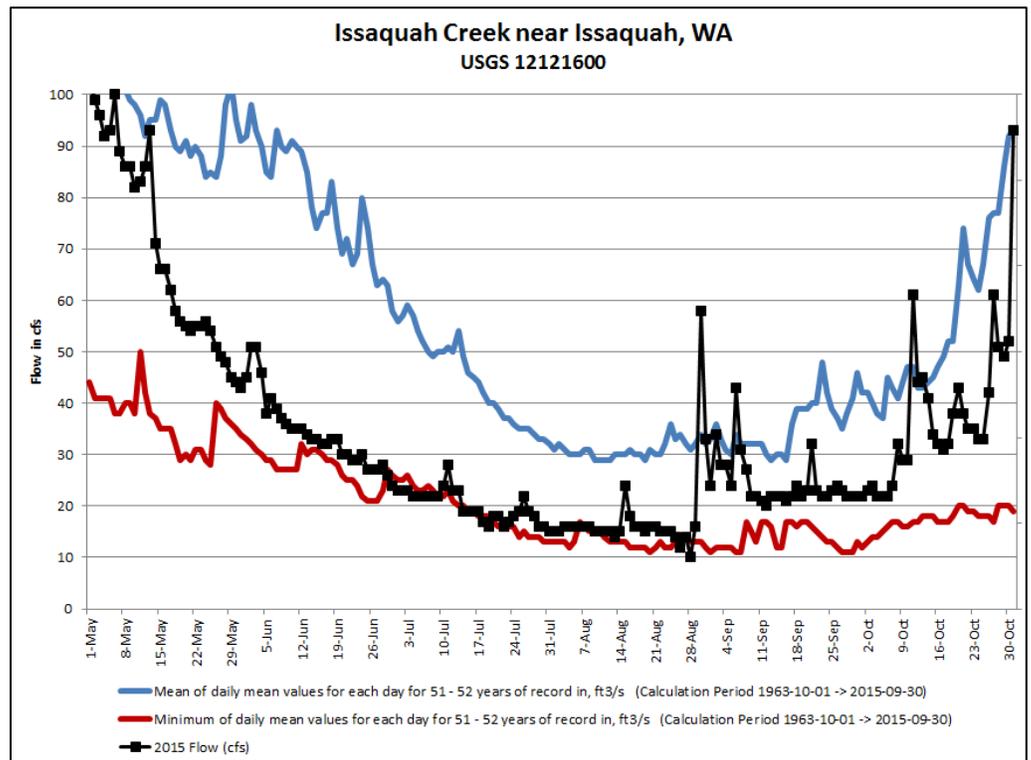
Stillaguamish was also floundering in the low-flow range between October rainstorms.

Minimum flow on November 1 was 7,610 cfs, and the maximum was 14,600. Since November 1, maximum daily flow has ranged from 1,640 to 48,800 cfs.



Lake Washington

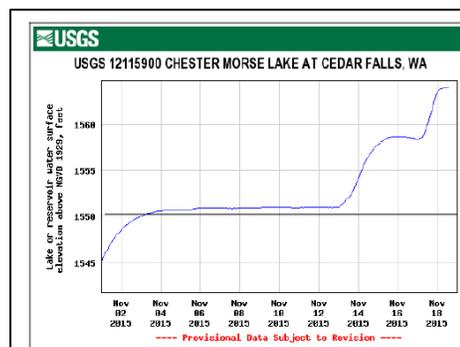
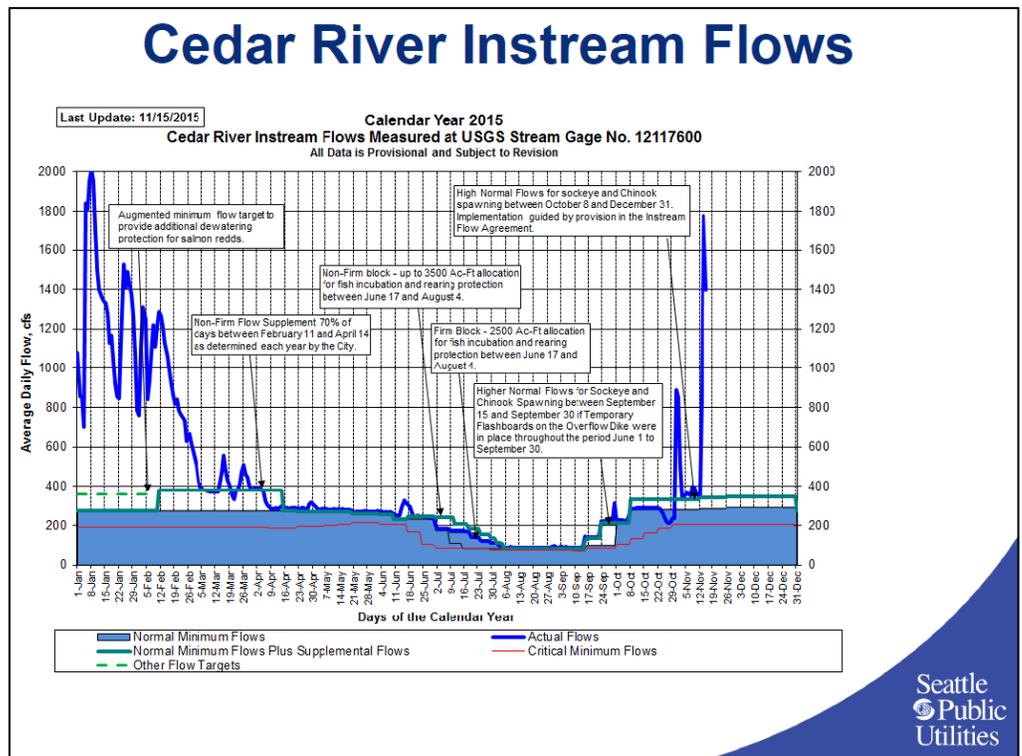
Issaquah Creek minimum flow on November 1 was 345 cfs, and the maximum that day was 435 cfs. Maximum daily flows have ranged from 107 to 1,460 cfs since Nov. 1.



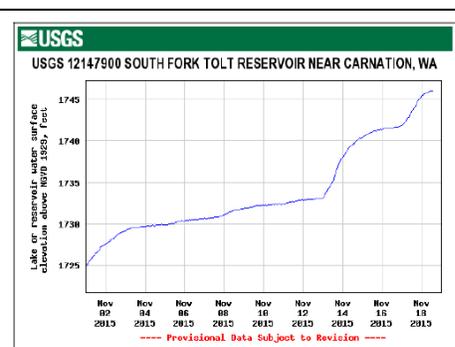
Seattle Public Utilities (SPU), along with Everett and Tacoma, announced on November 10 the lifting of the voluntary water conservation measures and returning to the Advisory Stage of the Water Shortage Contingency Plan.

SPU shared their reservoir and Cedar River flow status today. Operations on the Cedar River were reduced to Critical Minimum flows during the week of October 22 - 29, and then Halloween rains brought flows above the minimum fish flow range.

Tolt and Cedar reservoirs are nearly full and are being managed for flood control (with a conservative eye toward El Niño and snowpack) throughout the winter



Chester Morse Lake is spilling and will be lowered to normal fall levels.
 Normal Flood Season: 1550'
 Spillway Crest: 1557'
 Normal Full, Sustained: 1563'
 Current: 1564'
 Maximum, Short-Term: 1570'



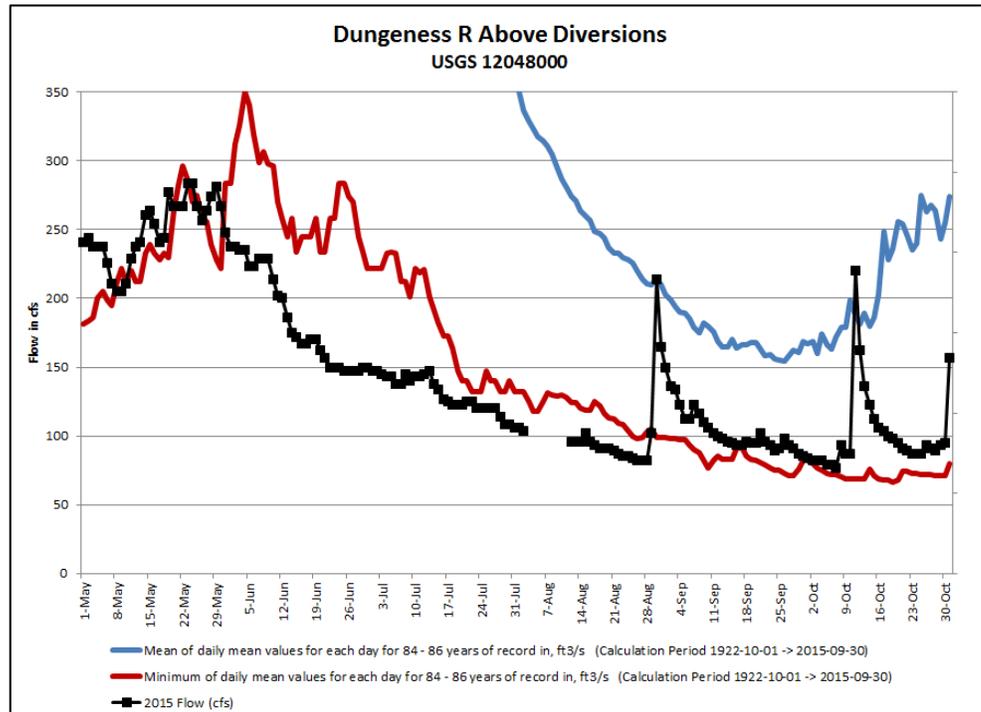
SF Tolt is refilling; capturing all inflows.
 Normal Flood Season: 1754'
 Spillway Crest: 1762'
 Normal Full/Max: 1765'+
 Current: 1746'

Seattle Public Utilities

Dungeness

Dungeness has remained in low-flow range, even as precipitation increases. We have already observed that Dungeness responds quickly and strongly to precipitation, and indeed has left its banks in recent days.

Minimum flow on November 1 was 471 cfs, with a maximum of 750 that day. Since Nov. 1, maximum daily flows have ranged from 197 cfs (shockingly low!) to 5,160 cfs.

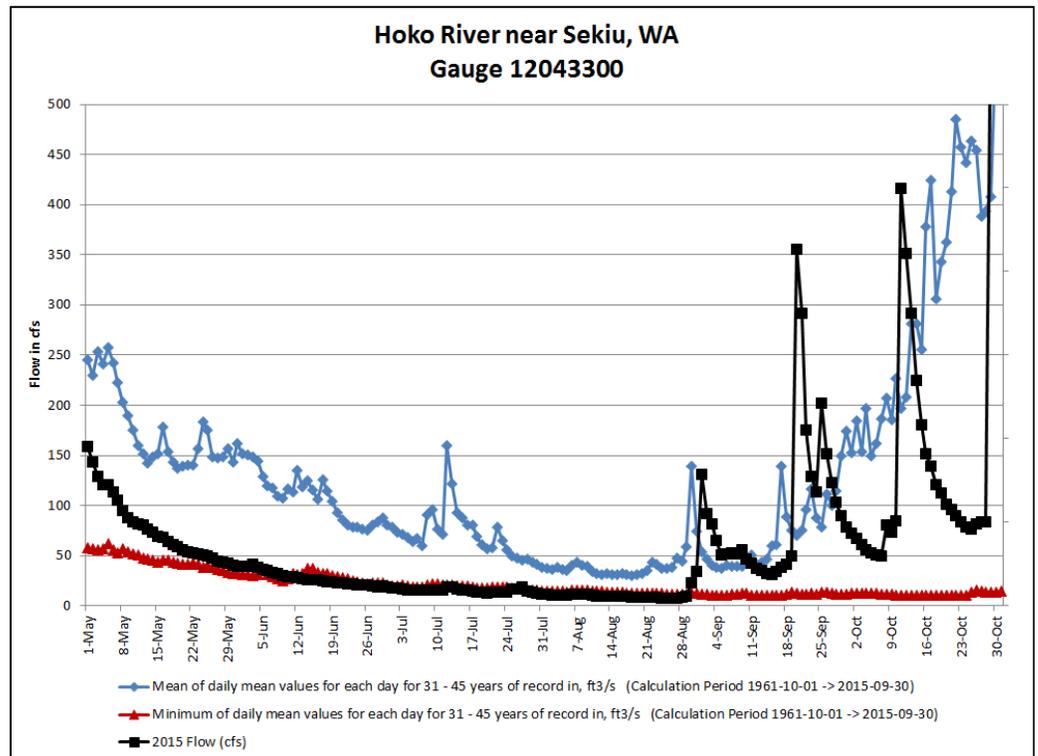


Here are photos of the Dungeness at the Old Olympic Highway Bridge showing the progression from spring to summer to fall, culminating in the flood flows seen below the Woodcock Road bridge yesterday.



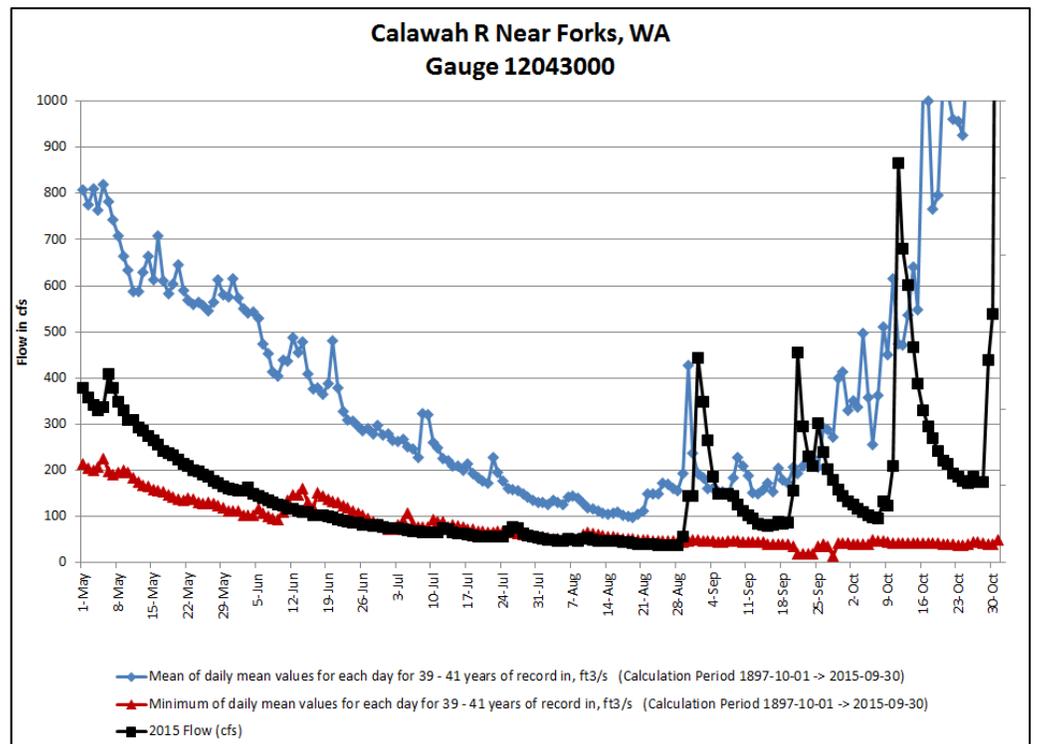
Hoko

Minimum daily flow on November 1 was 1,240 cfs, and maximum was 1,930. Maximum daily flows have ranged from 377 cfs to 9,730 cfs since November 1.



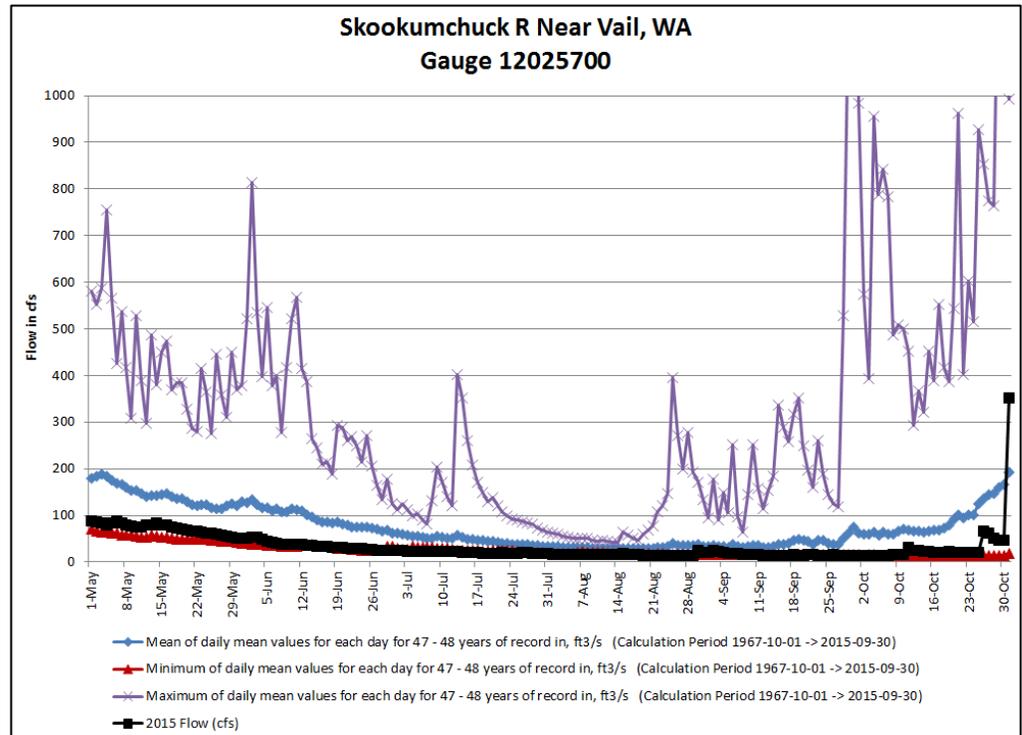
Calawah

Calawah minimum flows on November 1 were 3,690 cfs, and the maximum that day was 5,120 cfs. Maximum daily flows have ranged from 796 to 24,900 cfs since November 1.



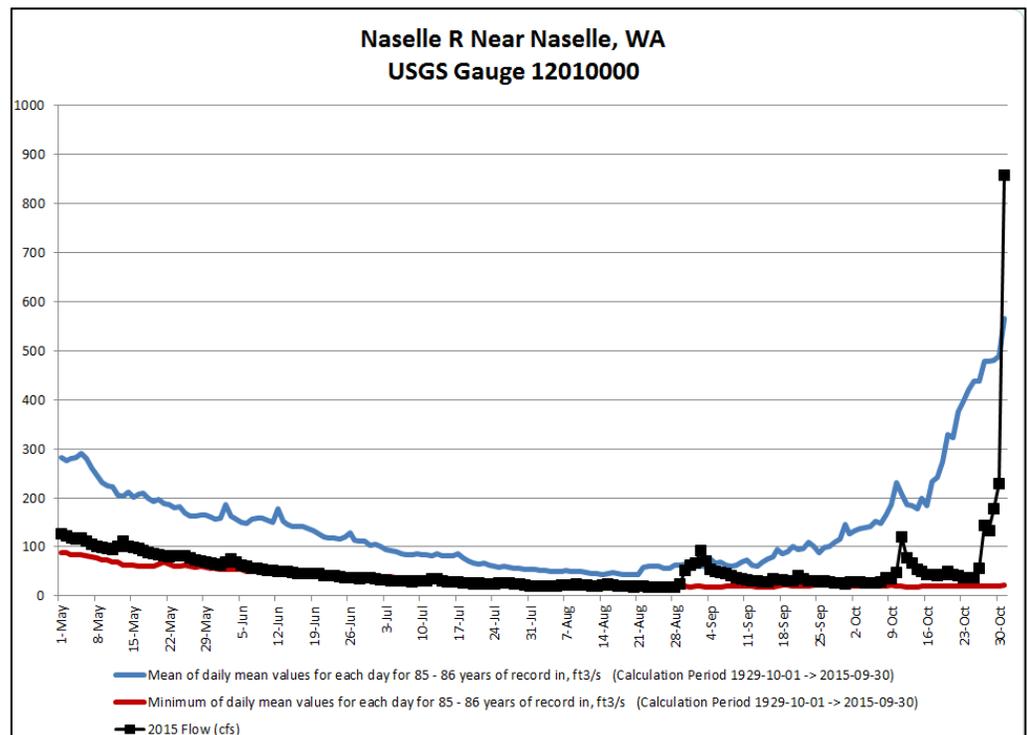
Skookumchuck

Conditions near the Skookumchuck remained dry through the end of October. Minimum flow on November 1 was 771 cfs and the maximum was 1,050 cfs. Since November 1st, maximum daily flows have ranged from 145 to 5,050 at this location.



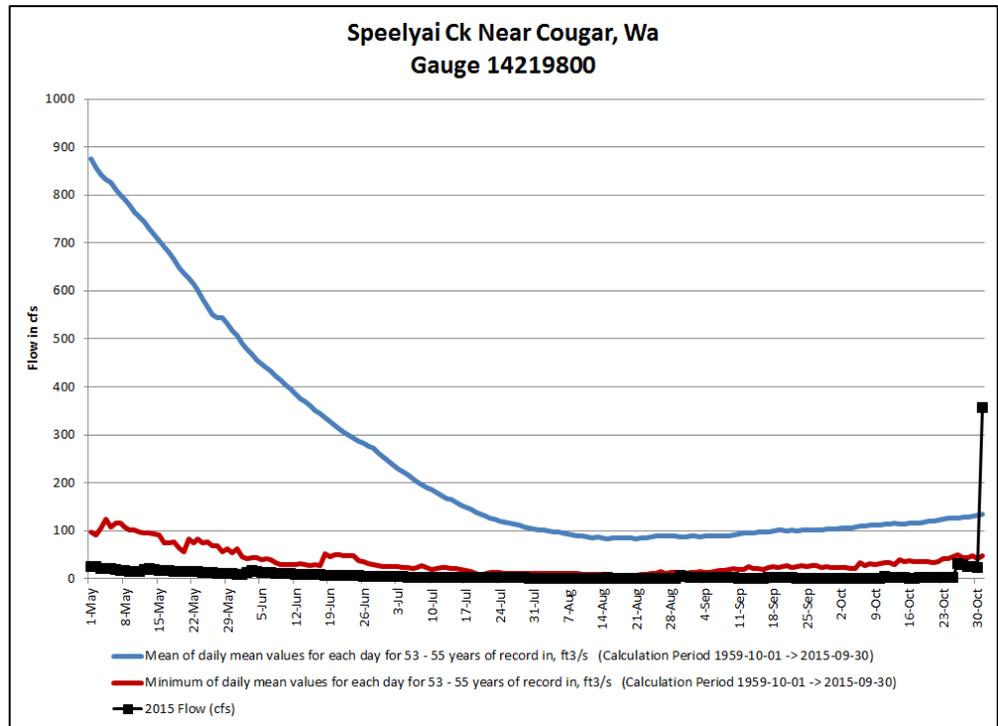
Naselle

The scale has been modified since our October update in order to depict the October 31 rainfall in the context with average streamflows. Naselle is another stream remaining dryer than normal through the end of October. Minimum flows on November 1 were 1,510 cfs, and maximum was 3,220 cfs. Maximum daily flows have ranged from 582 to 7,480 cfs since November 1.



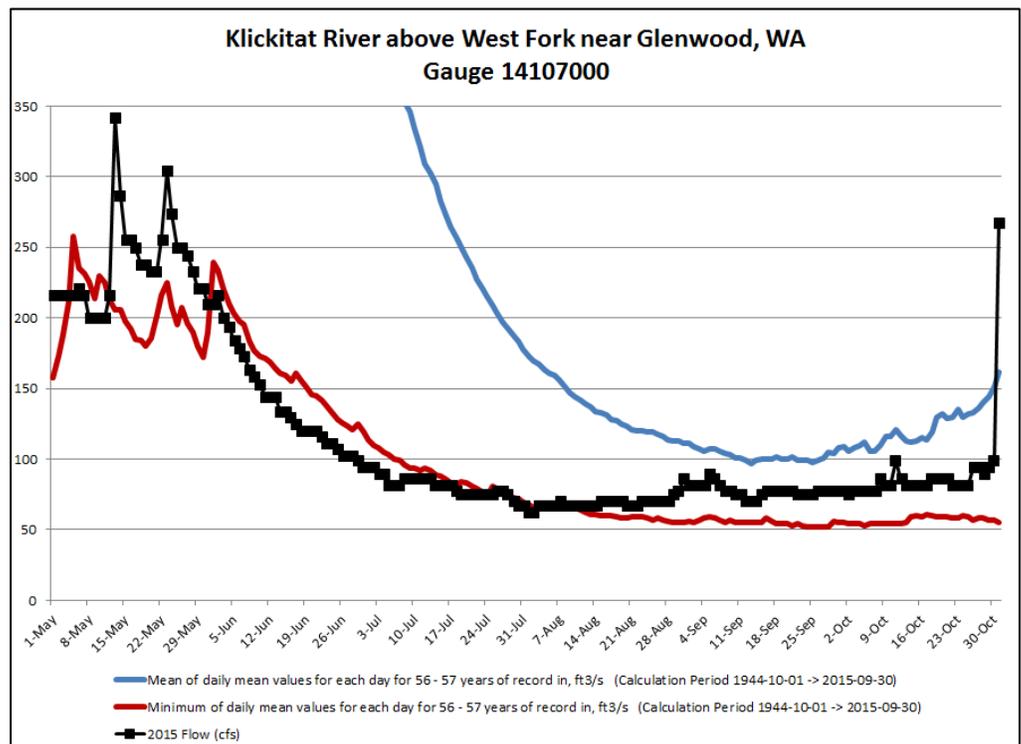
Speelyai

Our charts have not shown historic mean flows all summer so we could follow the detail of 2015 flows. With the scale changed and the mean flow line restored, the Speelyai story is difficult to see, except that the October 31 rains restored Speelyai flow to some semblance of normalcy. Since November 1, maximum daily flows have ranged from 85 cfs to 2,140 cfs.



Klickitat

Minimum flow on November 1 was 416 cfs, and the maximum was 716. Maximum daily flows have ranged between 163 cfs and 1,290 since November 1st.

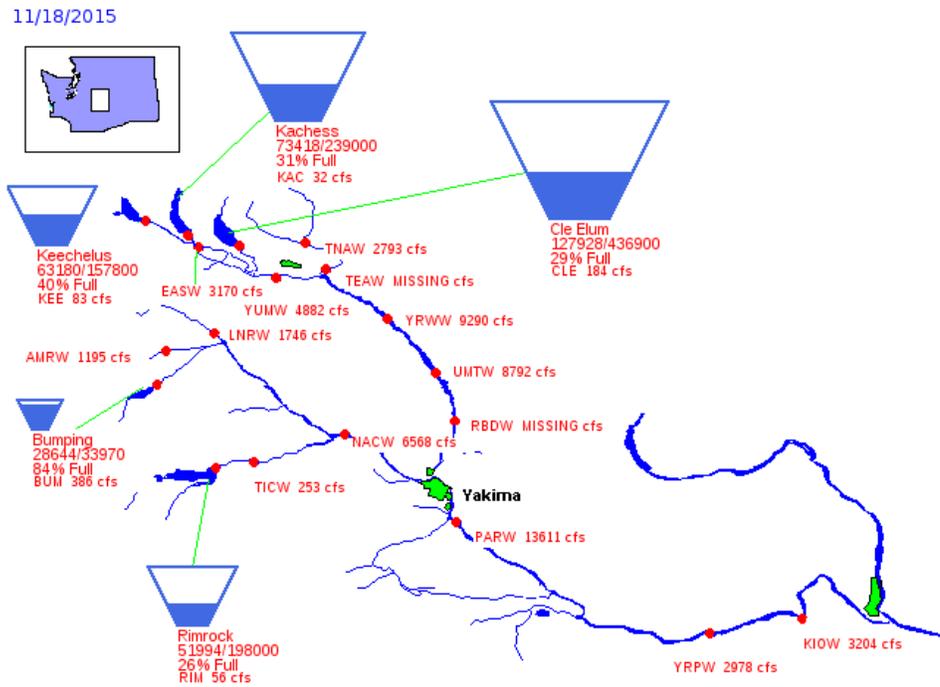


Yakima

Keechelus is 40% full;
 Kachess 31%;
 Cle Elum 29%;
 Bumping 84%;
 Rimrock 26%.

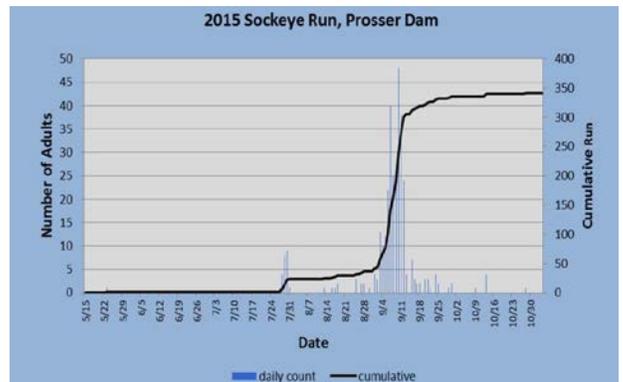
Inflow to the five reservoirs is 780%, and releases from the five are 128% of average.

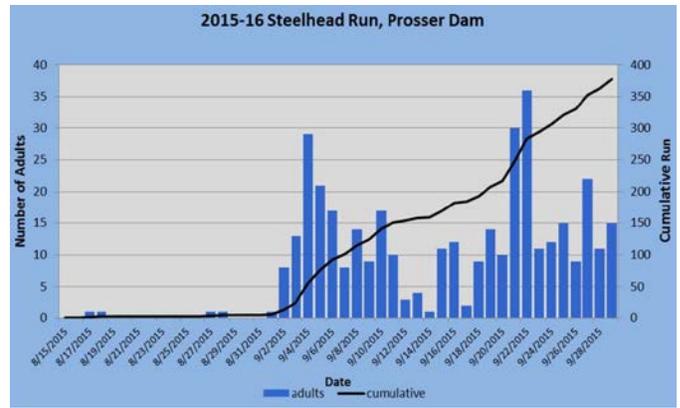
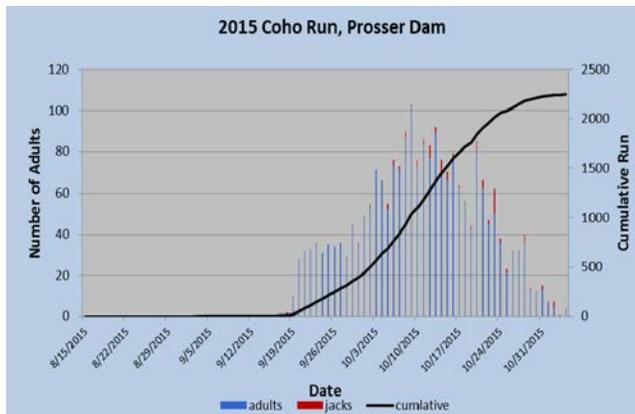
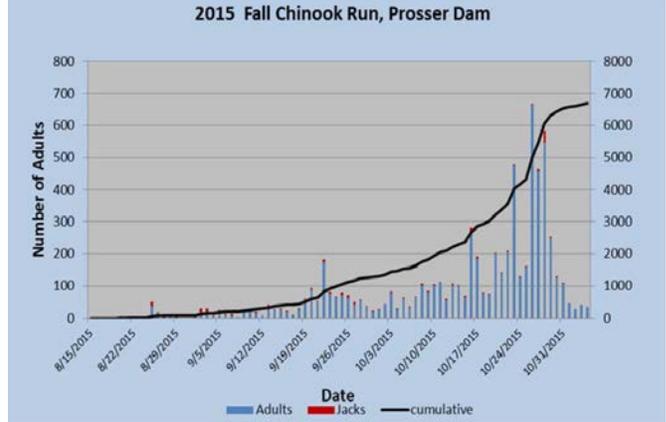
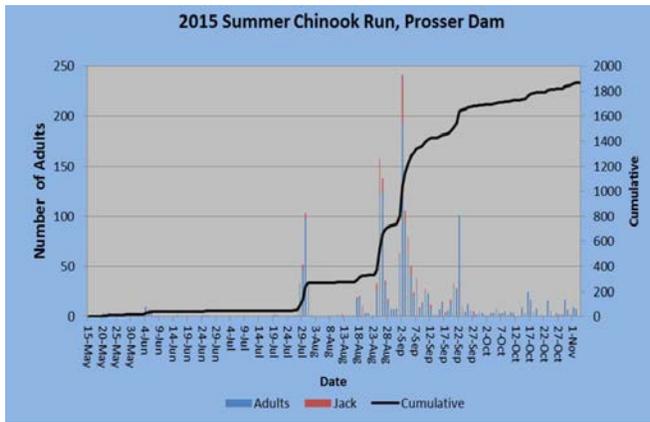
Inflow to the five reservoirs for the Water Year to date (Oct. 1 to Nov. 18) is 286 thousand acre-feet (KAF), or 196% of average and releases from the five total 109 KAF, or 113% of average. (Bureau of Reclamation)



PROVISIONAL DATA - SUBJECT TO CHANGE!

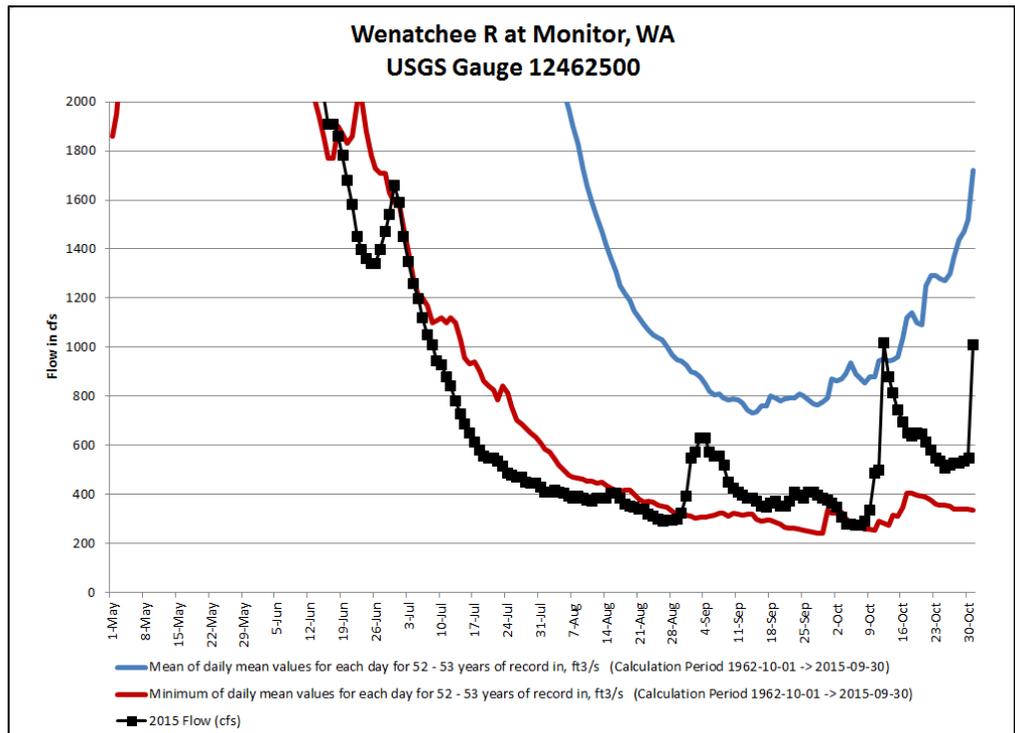
The following figures are provided by the Yakima-Klickitat Fisheries Project. Note the sudden push of sockeye and summer chinook starting about September 1. Water temperatures in the lower Yakima had been above salmon-tolerant levels prior to about the end of August.





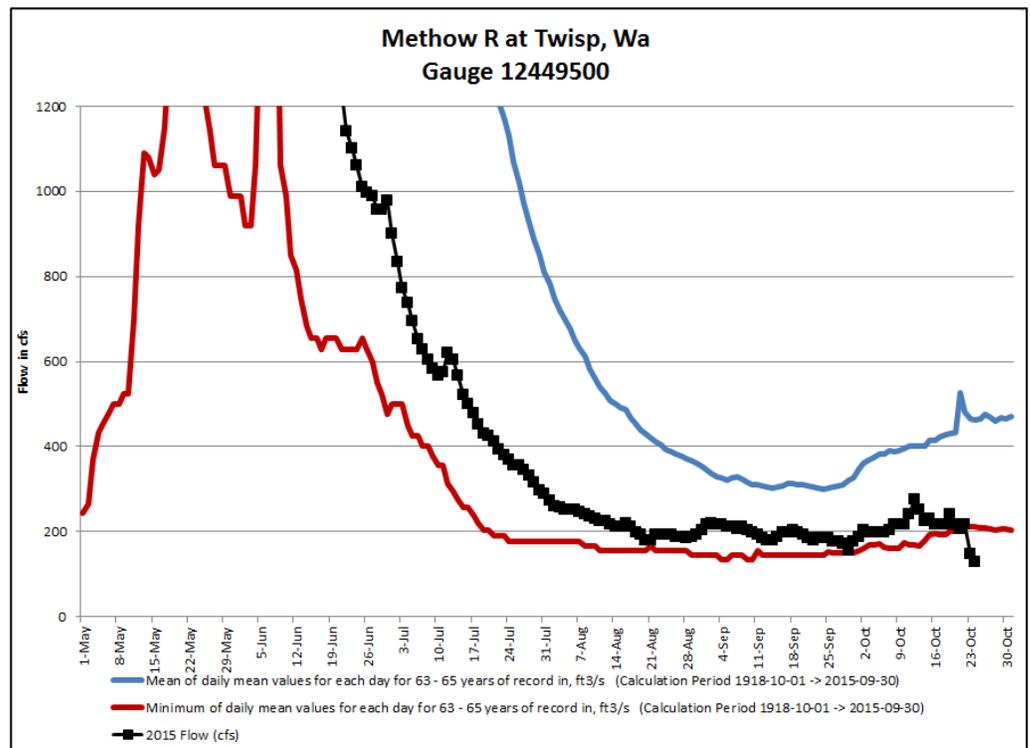
Wenatchee

As of the end of October, flows in the Wenatchee remained in the “below-normal” range. November 1 minimum flow was 8,210 cfs and the maximum was 10,200 cfs. Maximum flows have ranged between 2,330 and 20,000 cfs since November 1st.



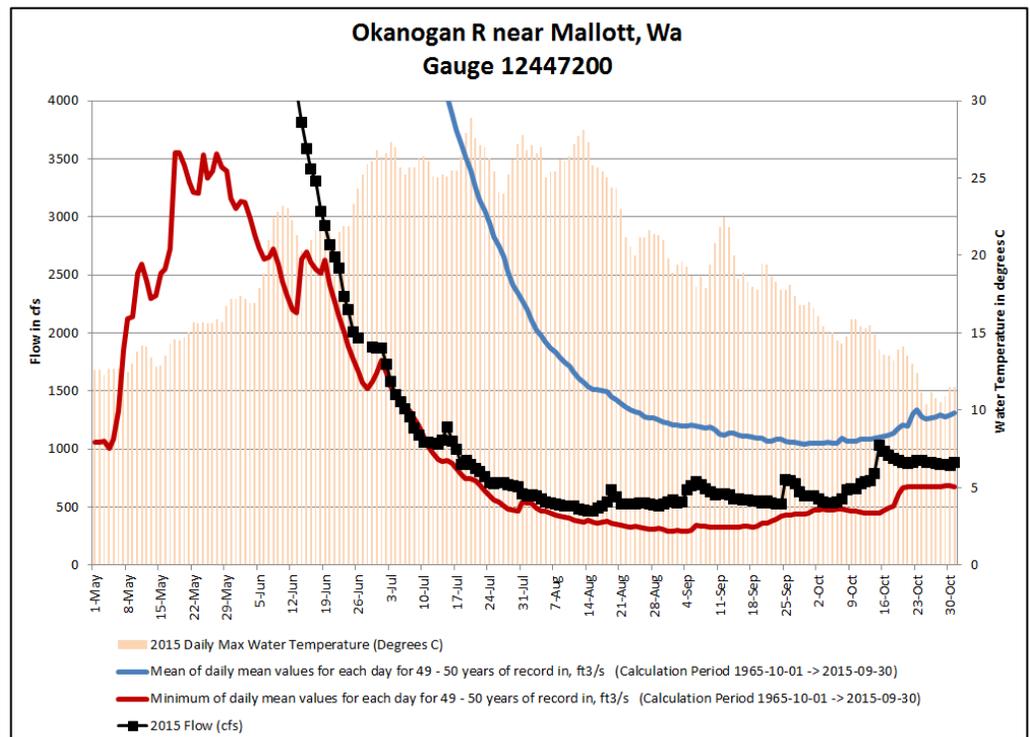
Methow

The gauge on the Methow at Twisp has been out since the 24th of October, with service restored November 17th.



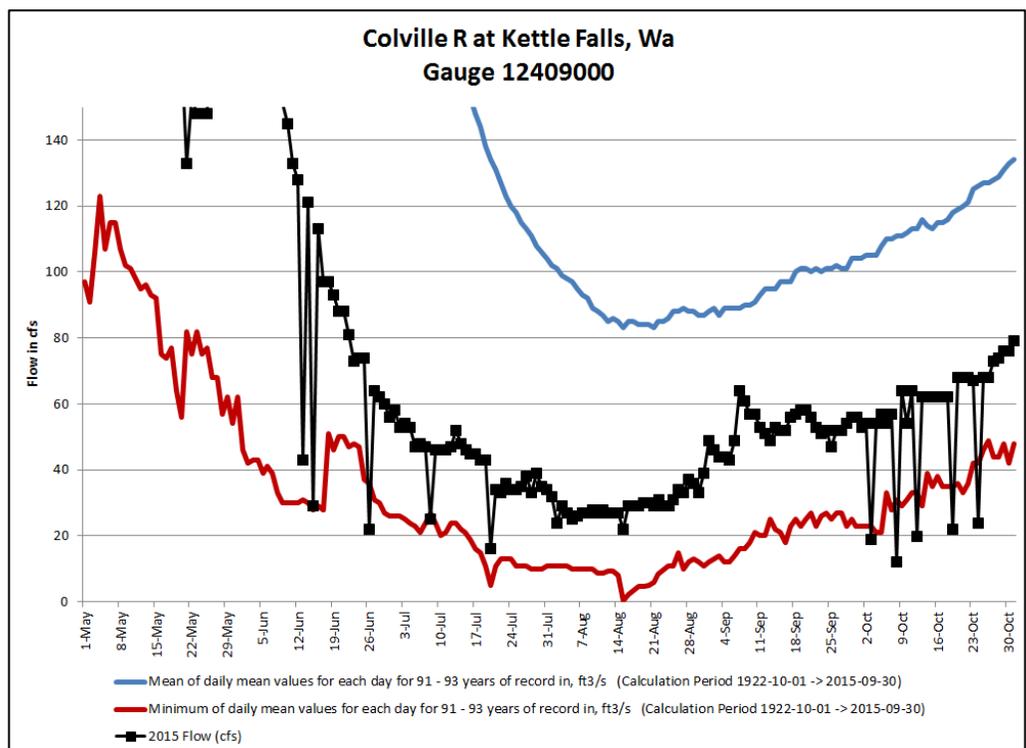
Okanogan

Flow remained in the low range until November 3, at which point flows began to increase past the 2,000 cfs mark. Maximum daily flows have ranged between 1,430 cfs and 3,780 cfs since November 1st.



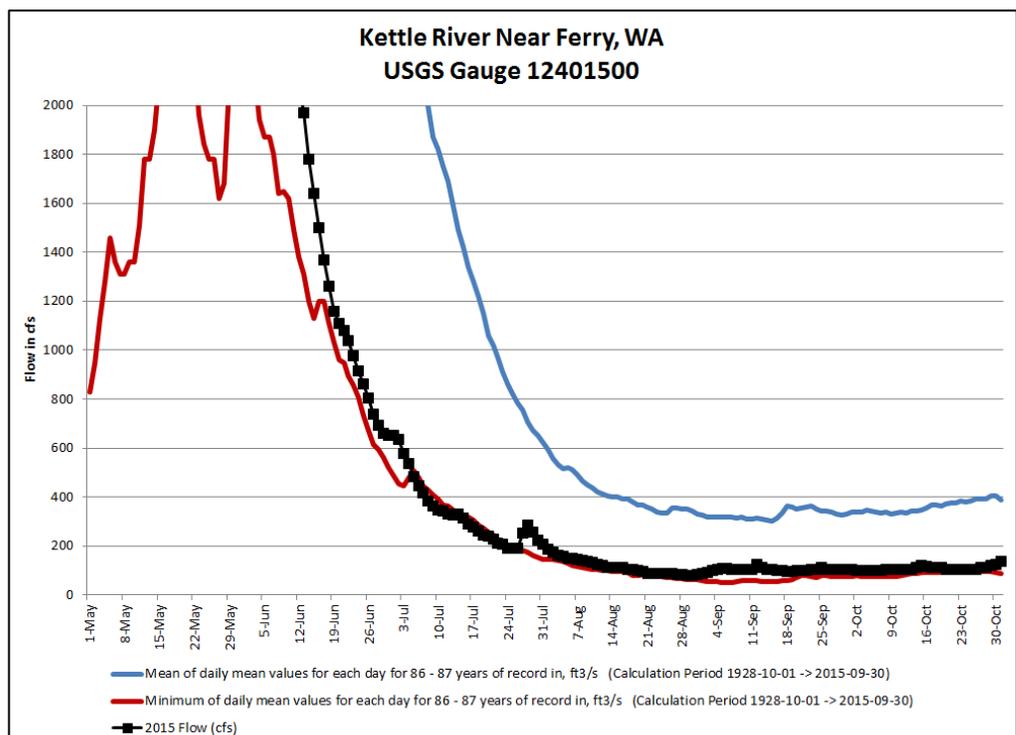
Colville

Flows on November 1st ranged between 84 and 108 cfs. Since then, maximum daily flows have been between 83 and 1,130 cfs (November 11th), hovering mostly in the 200 cfs range.



Kettle

Kettle River flow ranged from 159 to 213 cfs on November 1st, and has reached as high as 310 cfs in recent days.



Columbia & Snake Rivers

Under the long term Non-Treaty Storage Agreement the U.S. has firm release rights for up to 500 thousand acre feet (KAF) of water during the spring of the driest 20th percentile of years, if not exercised in the previous year. BPA exercised the right to release 500 KAF of water under the Dry Water Provisions of the NTSA during the 2015 Operating Year. If 2016 is also a dry year, BPA may request the release of additional water; however the release is at the discretion of BC Hydro. More information about Federal Columbia River Power System operations for 2016 is available in the annual [Water Management Plan](#) available on the [Corps of Engineers Technical Management Team](#) web site. The November 20 forecast from the Northwest River Forecast Center for April through September 2016 flows in the [Columbia River at The Dalles Dam](#) is 87.7 million acre feet (MAF), which is below the 30-year average of 92.7 MAF. Washington state [regulatory "drought" trigger](#) for the Columbia River at The Dalles is 60 MAF.

Hatchery Drought Planning and Response for 2015

WDFW drought coordinators worked with hatchery managers across the state in February to begin identifying anticipated needs for drought emergency purchases and strategies. Hatchery managers then developed a statewide Drought Response Plan. Without truly understanding what to expect from the drought, hatchery staff were proactive in making adjustments to their drought plans as conditions changed.

- ❖ Naches and Elwha hatcheries were identified as having a critical lack of available water. Drought funds were used to drill two wells at Naches and one at Elwha to help get them a sufficient amount of water to continue rearing fish during drought conditions.
- ❖ Many facilities planned and implemented early release strategies. These early releases required careful consideration and a large amount of collaboration in obtaining approvals through our co-managers.
- ❖ A few facilities transferred all or remaining fish populations to another facility with cooler water temperatures to ensure the survival of their program.
- ❖ Many of our facilities had fish health issues and kept a ready supply of formalin, medicated feed, and salt on-hand at their facilities.
- ❖ Due to low flows, many facilities needed sediment removal from their intake channels. CAMP and Fish Program coordinated to implement scheduled maintenance and add maintenance projects for at-risk facilities.
- ❖ Shade cloth was experimentally deployed to five hatcheries over the summer with a high success level in providing shade and protecting fish from high temperatures.
- ❖ Statewide weekly conference calls were held to report any issues and work through possible solutions.

Juvenile Fish Loss Associated with Drought at WDFW Hatcheries

- ❖ Soos Creek Hatchery - Summer Steelhead lost 41,308 (60% of program)
- ❖ Soos Creek Hatchery - Coho lost 172,963 (21% of program)
- ❖ Issaquah Hatchery - Coho lost 6,728 (1% of program)
- ❖ Grays River Hatchery - Steelhead lost 150,300 (93% of program)
- ❖ North Toutle Hatchery - Coho lost 101,746 (76% of program)
- ❖ Washougal Hatchery - Coho lost 37,000 (2% of program)
- ❖ Forks Creek Hatchery - Steelhead lost 14,489 (24% of program)
- ❖ Lake Aberdeen Hatchery - Steelhead lost 64,903 (22% of program)
- ❖ Naselle Hatchery - Steelhead lost 64,989 (22% of program)

- ❖ Naselle Hatchery – Coho lost 639,646 (44% of program)
- ❖ Voights Creek – Coho lost 347,000 (44% of program)

WDFW Facilities most impacted by drought

- ❖ Grays River Hatchery lost 93% of their Steelhead program due to disease caused by high temperatures. By acting quickly, staff was able to move the remaining survivors to Cowlitz Salmon hatchery with tremendous success.
- ❖ Soos Creek Hatchery lost ~60% of its summer steelhead program and 21% of its coho program due to disease caused by high temperatures.
- ❖ Both Naselle Hatchery and Voights Creek Hatchery lost ~40% of their coho programs due to disease caused by high temperatures.
- ❖ A number of Westside hatcheries either experienced elevated mortalities or had fish health and disease issues to combat during the hot dry months. Thankfully the eastside of the state did not seem to have experienced the level of drought impacts that we saw on the Westside.

Fisheries Changes Relating to Drought

REGION	RIVER	CURRENT FISHERY	RATIONALE
1	North Fork Touchet above Spangler Creek (9/11)	Trout	River flows and cooler temperature
1	South Fork Touchet (9/11)	Trout	
1	Wolf Fork (Touchet) (9/11)	Trout	
1	Asotin Creek and tributaries (9/11)	Trout	
1	Kettle River (9/11)	Redband Trout	River flows and cooler temperature
1	Mill Creek (Walla Walla Co.) from Bennington Dam to State Line midnight (9/11)	All species	River flows and cooler temperature
2	Wenatchee River from mouth to Icicle River Road Bridge (7/18)	Spring Chinook	Low flow and high temperature; protect ESA-listed steelhead and Chinook; allow passage of sockeye to Lake Wenatchee for escapement.
2	Icicle River from mouth to 500' downstream of Leavenworth Hatchery (7/18)	Spring Chinook	Protect ESA-listed steelhead and Chinook.
2	Lake Wenatchee (7/18) Open to sockeye (7/30) Lake Wenatchee closed to sockeye (8/12)	Sockeye	Protect ESA-listed Chinook.
2	Columbia River from Rocky Reach Dam upstream to Chief Joseph Dam (7/27)	Summer Chinook, Sockeye, Gamefish	Ensure adequate sockeye spawners.
2	Okanogan River from the Hwy 97 bridge upstream to Zosel Dam (7/18)	Summer Chinook, Sockeye, Gamefish	High temperature. Protect ESA- listed steelhead and wild summer Chinook
2	Similkameen River mouth upstream to Enloe Dam (7/18)	Summer Chinook, Sockeye	
3	Ahtanum Creek (7/18)	Trout	Extreme low flow and high temperature. Protect ESA-listed juvenile steelhead and ESA-listed bull trout.
3	Little Naches River (7/18)	Trout	Extreme low flow and high temperature. Protect isolated adult spring Chinook and ESA-listed juvenile steelhead.

REGION	RIVER	CURRENT FISHERY	RATIONALE
3	Teanaway River (7/18)	Trout	Extreme low flow and high temperature. Protect isolated adult spring Chinook, ESA-listed bull trout, and ESA-listed juvenile steelhead.
3	Yakima River from I-82 Bridge at Union Gap to the South Cle Elum Bridge (9/2)	All game fish	Cooler weather
3	Swauk Creek and all tributaries downstream of Williams Creek (8/14)	All game fish	Low water flows and higher than normal water temperatures
3	Swauk Creek and all tributaries upstream of Williams Creek (8/14)	All game fish	Low water flows and higher than normal water temperatures
3	Williams Creek and all tributaries (8/14)	All game fish	Low water flows and higher than normal water temperatures
3	American River from mouth to Hwy. 410 Bridge downstream of the USFS Hell's Crossing Campground & upstream of the Mesatchee Creek Trail crossing at river mile 15.8 (8/14)	All game fish	Low water flows and higher than normal water temperatures
4	Raging River (7/18)	Trout	Extreme low flow and high temperature. Protect ESA-listed juvenile steelhead.
4	Skykomish River from the mouth upstream to the mouth of the Sultan River (9/2)	All species	Flows have increased and temperatures decreased
4	The Skykomish River from mouth of the Sultan River upstream to the Highway 2 Bridge in Goldbar (Big Eddy Access). (9/11)	Summer Steelhead, Trout	Flows have increased and temperatures decreased
4	Wallace River (7/18)	Trout	Extreme low flow and high temperature. Meet adult Chinook broodstock needs at hatchery.
4	Stillaguamish River upstream of Marine Drive (9/2)	All species	Flows have increased
4	Nooksack River from the Lummi Indian Reservation boundary to the yellow marker at the FFA high school barn in Deming. (9/2) Upstream from Deming in the mainstem Nooksack, forks and tributaries remain closed.	All species	flows and river temperatures have improved
4	Snoqualmie River: From the mouth to Snoqualmie Falls – Closed to fishing daily from (9/11)	All species	Flows have increased and temperatures decreased
4	North Fork Nooksack from the mouth to Nooksack Falls. All tributaries draining into the North Fork Nooksack from the mouth to Nooksack Falls. The Middle Fork Nooksack from mouth to the City of Bellingham Diversion Dam. All tributaries draining into the Middle Fork Nooksack from the mouth to the Diversion Dam. The mainstem Nooksack from Slater Road to the forks.	All species	Flows have increased and temperatures decreased

REGION	RIVER	CURRENT FISHERY	RATIONALE
4	South Fork Nooksack (Whatcom Co.) From the mouth to Skookum Creek, and from Wanlick Creek to headwaters including Wanlick and all tributaries. (10/1)	All Species	
4	Sauk River (Skagit/Snohomish Co.) From the mouth of the Suiattle River to the Forks, closed to fishing. The North Fork Sauk from mouth to the North Fork Fall, closed to fishing. The South Fork Sauk from the mouth to Elliot Creek, closed to fishing. (9/11)	All species	Flows have increased and temperatures decreased
4	Buck, Downey, and Sulphur creeks (tributaries to Suiattle River) (7/21)	Trout	Extreme low flow. Protect isolated and concentrated ESA-listed adult Chinook
5	East Fork Lewis River from Lewisville Park downstream (9/2)	All species	River flows and cooler temperature
5	Washougal River from Mt. Norway Bridge downstream (9/2)	All species	River flows and cooler temperature
6	Bogachiel River downstream of Highway 101(9/2)	All species	River flows and cooler temperature
6	Calawah River downstream of Highway 101 bridge (9/2)	All species	
6	Dickey River (Clallam Co.) from the confluence of the East and West forks (9/2)	All species	
6	Sol Duc River downstream of the concrete pump station at the Sol Duc Hatchery (9/2)	All species	
6	Quillayute River (Clallam Co.) outside Olympic National Park	All species	
6	The upper portions of the Dickey, Bogachiel, Calawah, Sol Duc and Clearwater rivers. (9/17)	All species	
6	Big Quilcene effective Aug. 16 From the mouth to Highway 101 (9/2)	Salmon	
6	Newaukum and all tributaries (8/11)	All species	Low water flows and higher than normal water temperatures
6	Clearwater River from the Snahapish River downstream to the mouth. (9/2)	All species	Cooler temperatures
6	Tributaries of the Queets River (Matheny Creek) (9/17)	All species	River flows and cooler temperature
6	Salmon River outside the Quinault Indian Reservation and Olympic National Park	All species	Cooler temperatures
6	Black River – All species From the mouth upstream to Black Lake (8/12)	All species	Low water flows and higher than normal water temperatures
6	Nisqually River from the mouth to Military Tank Crossing Bridge. (9/2)	All species	Cooler water temperature

Media Clips

[Climate Change, \[human\] Migration, and the Puget Sound Region](#)
 Saperstein/ UW Evans School of Public Policy - June 1, 2015
[Mapping fish die-offs in warming waters](#)

High Country News September 4, 2015
[New Wildfire Recovery Website](#)

September 8. WSU -September 8, 2015
[Floodwatch Preparation](#)

Central Washington Fire Recovery - September 14, 2015
[How Treaty Tribes Are Responding to the Drought](#)

Northwest Treaty Tribes - September 15, 2015
[Did the Pacific Blob starve salmon?](#)

Northwest Treaty Tribes - September 15, 2015
[Washington's historic drought not over yet; Drought predicted to extend into second year](#)

Department of Ecology - September 26, 2015
[Drought has bears looking for food before winter, wandering into suburban & urban areas](#)

KHQ Right Now - October 16, 2015
[Feds eye refuges for cold-water species in Western states](#)

The Spokesman-Review - October 18, 2015
[What's Up With Puget Sound Coho This Year?](#)

Northwest Sportsman - October 21, 2015
[Port Angeles ends water restrictions; Forks last community in state to limit resource](#)

Peninsula Daily News (AP) - October 21, 2015
[To save Washington's Yakima Basin fish, just add water](#)

High Country News - October 22, 2015
[KRD using first-of-its-kind effort to lessen drought effects](#)

Daily Record News - October 22, 2015
[Faculty Friday - Cliff Mass](#)

The Whole U - University of Washington October 22, 2015
[2015 Likely to Be Hottest Year Ever Recorded](#)

NY Times - October 22, 2015
[Columbia River Basin Agencies Release Draft 2016 Water Management Plan](#)

Columbia Basin Fish and Wildlife Bulletin - October 23, 2015
[Will the Snowpack Be Back?](#)

Seattle Weekly - October 23, 2015
[FEMA to help some wildfire-ravaged counties in Washington](#)

Capital Press - October 23, 2015
[Federal Fish Managers Brace For Another Warm Year In The Northwest](#)

Kuow - October 28, 2015
[Relief from Clallam's dry spell](#)

Sequim Gazette - October 28, 2015
[Climate Change, Wildfire Seen Transforming Northwest Forests](#)

OPB - October 30, 2015
[Juvenile Spring Outmigration On Columbia, Snake Unusually Low In 2015](#)
[Idaho Wild Steelhead Constrain But Don't Stop Fisheries](#)
[\[Hanford\] Fall Chinook Run Very Close To 2013 Record](#)

Northwest Fishletter November 2, 2015
[Washington Tribe Confronts Climate Change, Sea Level Rise](#)

Kuow - November 09, 2015
[Washington Weekly Crop Progress and Condition Report](#)

USDA NASS NW Region November 9, 2015
[Central Washington Holds Summit To Take Stock Of Worst Fire Season In History](#)

NW Public Radio - November 12, 2015
[Chinook salmon return to Hanford Reach in record numbers](#)

Yakima Herald Republic - November 11, 2015
[Columbia River Inter-Tribal Fish Commission reports new record for adult fall chinook returns](#)

The Seattle Times - November 10, 2015

[Welcome rain improves outlook for Puget Sound water supply](#)
Goskagit.com - November 10, 2015

[Group suggests climate changes preparations for North Olympic Peninsula after study](#)
Peninsula Daily News (AP) - November 12, 2015

[El Nino affecting Washington's seafood](#)
Northwest Cable News - November 13, 2015

[Erosion, flooding likelihood dramatically increased after fires](#)
Methow Valley News - November 13, 2015

[Conference: Higher Temps For PNW New Normal No Matter What Happens With Greenhouse Gases](#)
Columbia Basin Fish and Wildlife Bulletin - November 13, 2015

[Report: Fish also fought warm water at dams along Columbia this summer](#)
Yakima Herald Republic - November 14, 2015

[Growers may see a repeat of 2015 drought](#)
Sunnyside Daily Sun News - November 16, 2015

[Toxic algae creating deep trouble on West Coast](#)
Seattle Times - November 16, 2015

[Lingering drought seen in region's low lakes, waterways](#)
The Spokesman-Review - November 16, 2015

[Chum in Hood Canal and Puget Sound near peak despite rainy weather](#)
The Seattle Times - November 18, 2015

[OUTDOORS: Rivers still have too much water](#)
Peninsula Daily News (AP) - November 19, 2015

Links

[WDFW's drought web page](#) is no longer being maintained

[WDFW's 2015 Drought Status Updates](#) web page

[Ecology's "Washington Drought 2015"](#)

Washington State Climatologist [weekly drought update for Washington State](#).

Drought web pages for State departments of [Health](#) and [Agriculture](#)

National Integrated Drought Information System [Pacific Northwest Drought Portal](#)

NOAA Climate.gov [ENSO Blog](#)

NOAA [El Nino Portal](#)

[NOAA's Climate Prediction Center](#) and [North American Multi-Model Ensemble](#)

[Northwest River Forecast Center Water Supply](#)

USGS [Real time stream data for Washington](#)

WRCC [Washington Climate Anomaly Maps and Tables](#)

Fire incidents maps from [Northwest Interagency Coordination Center](#)

NWS [Severe Weather Hazards](#) predictions

[Inciweb](#) reports active wildfires in the U.S.

U.S. Army Corps of Engineers [Seattle District Reservoir Control Center](#)

[Rich Landers Outdoors Blog](#) Spokesman Review – ongoing

[Concerns mount as drought deepens](#) Columbian Special Project July 11, 2015

[Washington Wildfire Resources](#)

Ecology Dam Safety web page [Wildfire Impacts on Dams](#)

Social media fire updates are available on #waWILDFIRE

[Get Everett water supply information.](#)

[Get Seattle water supply information.](#)

[Get Tacoma water supply information.](#)

[Saving Water Partnership](#)

For Further Information:

Contact WDFW Drought Coordinator Teresa Scott at teresa.scott@dfw.wa.gov or (360) 902-2713 with questions, suggestions, and reports or observations. WDFW is working closely with Ecology and other agencies to monitor conditions through the winter and consider the potential for drought conditions to re-emerge.

The current drought declaration expires on December 31, 2015. The Water Supply Availability Committee will meet in early December to review available climate, El Niño, and weather information and potentially make recommendations about winter-spring conditions. The Executive Water Emergency Committee will meet in Mid-December to hear those recommendations and consider drought action.

A short update will be provided after the December deliberations and, if drought conditions persist, the next regularly-scheduled WDFW status update will be released in February 2016.

Your author would like to express special thanks to Jill Cady, Katrina Simmons, Donna Bighouse, Danny Garrett, Jonathan Kohr, Robert Granger, Joshua Rogala, Danny Didricksen, the Lacey and Yakima construction shops, and all WDFW staff and correspondents for your outstanding work helping fish and wildlife (and WDFW) survive drought in 2015!