



Washington
Department of
**FISH and
WILDLIFE**

Drought Status Update #25

September 11, 2015

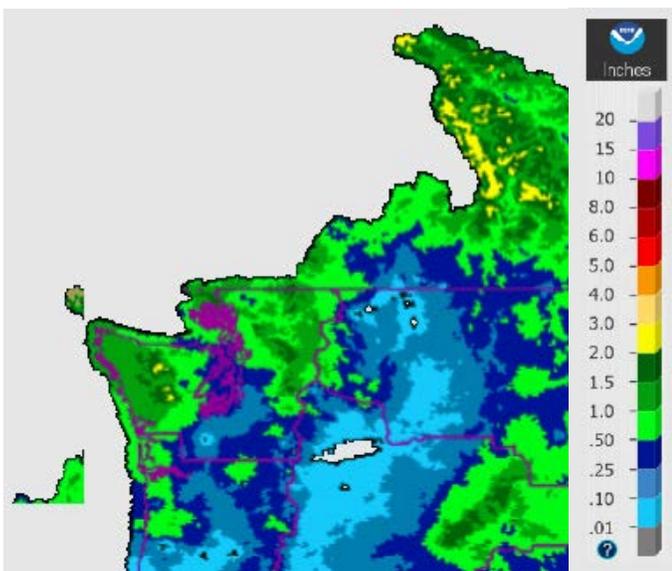
Note: This material is intended for, and contains elements of special interest to, WDFW agency staff. Non-agency readers or anyone having questions about the context, clarity, or content for items in this update should contact the author, WDFW Drought Response Lead Teresa Scott at (360) 902-2713 teresa.scott@dfw.wa.gov

The [weekly update by the Office of the State Climatologist](#) reports that the last 7 days (9/2- 9/8) were cooler than normal (by 2-10°F) for the entire state. June through August temperatures, averaged statewide, ranked as the warmest summer on record (since 1895). For precipitation, most of the state was wetter than normal over the last week, with northern Puget Sound and southeastern WA seeing between 200% and 600% of normal precipitation. There were even some light snow showers at mountain elevations above 5,500 feet!

This September 4 newspaper ad (right) from Seattle Public Utilities caught my attention this week. While forecasts call for higher-than-normal precipitation over the next 14 days, we would do well not to jump to the conclusion that we are finished with low flows (and potential associated blockages) for 2015.

Got rain?

We did pretty well for precipitation last week; the winds weren't as welcome. The [previous 7 day precipitation](#) is shown on this clipped NOAA map, below.



Office of the State Climatologist provided an analysis of Western Washington August rainfall in their September 2015 [OWSC newsletter](#). Hopefully we all realize that a couple of inches of rain don't end the drought in Washington; but it helped migrating adult salmon. Take a look at the hydrographs, below, to see what the precipitation meant for streams in Washington. Refer to the El Niño section to see why we're getting this rain when the forecasts are for drier conditions.

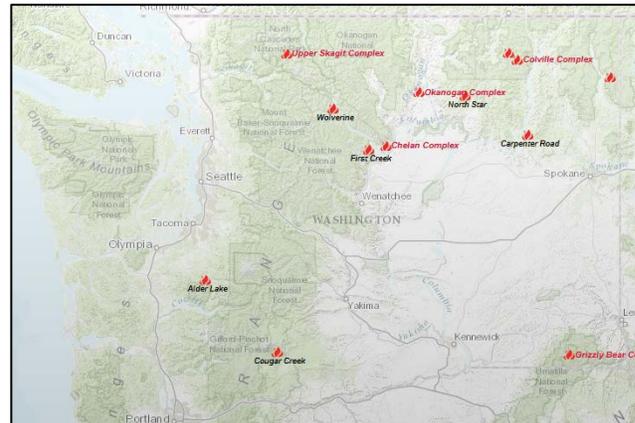
Severe Hazards

Governor Jay Inslee has a web page titled [Washington Wildfire Resources](#) with links to wildfire status updates and other resources. Social media updates are available on #waWILDFIRE. This week's map (below) from the [Northwest Interagency Coordination Center](#) shows a few more fires in Washington. [Inciweb](#) reports 28 active fires in Washington with a total of 1,058,438 acres involved as of today (9/10). There are no [NWS Severe Weather Hazards](#) predicted for the next 24 hours in Washington (other than small craft warnings off the coast from Columbia River through La Push).

NWCC incident map for today, September 10



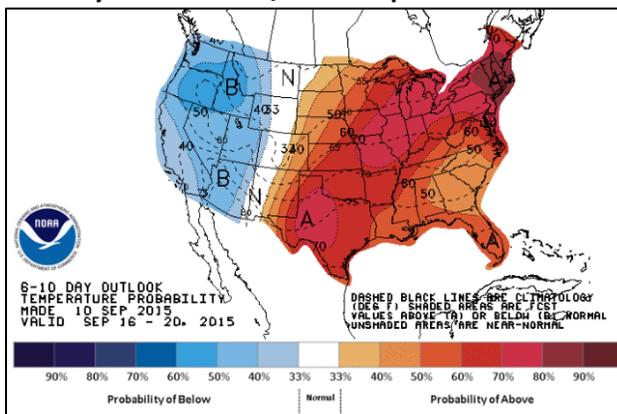
Last map provided August 21



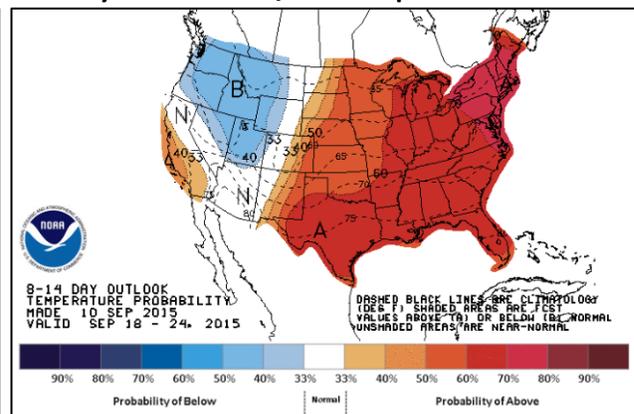
Temperature Forecasts

The [6-10 day temperature outlook](#) shows **below-normal** temperatures throughout Washington. The [8-to-14 day temperature outlook](#) looks similar to the 6-10 day forecast: More cool.

6-10 day forecast on 9/10 for Sep 16-20

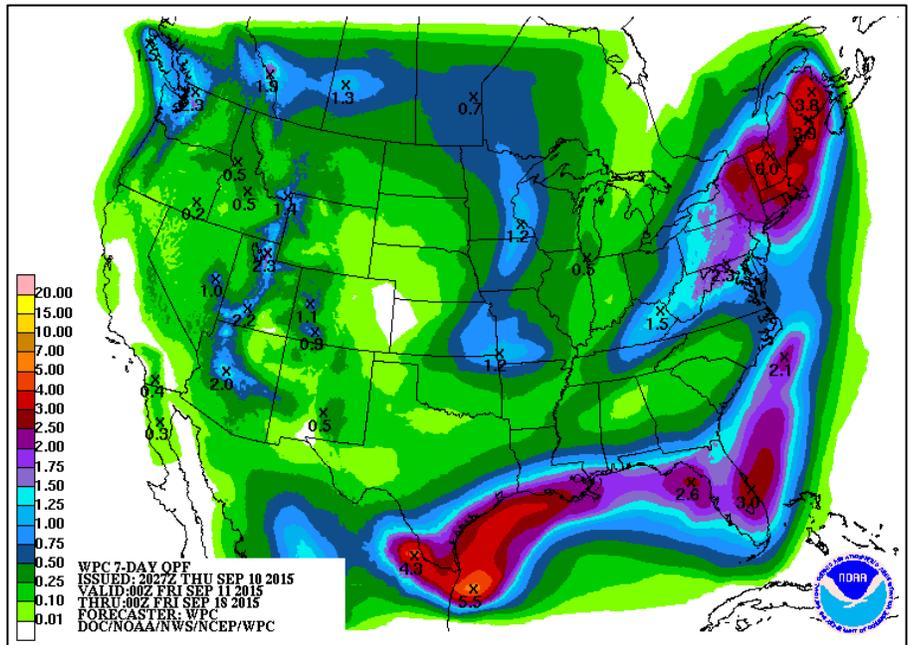


8-14 day forecast on 9/10 for Sep 18-24



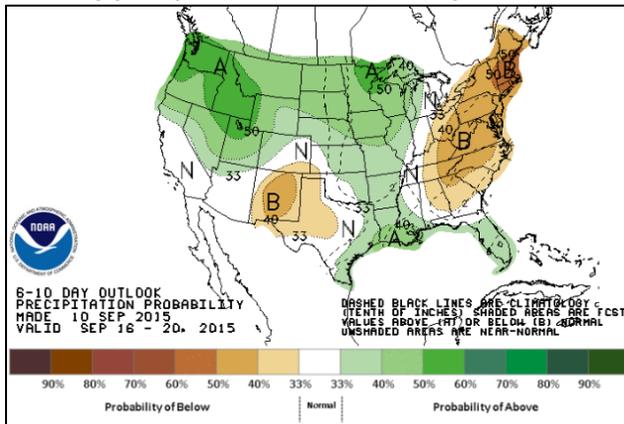
Precipitation Forecasts

Up to 1 ½ inches of [precipitation](#) is expected for Western Washington and Cascade Mountains over the next seven days (right), with small levels of precipitation expected in Eastern Washington.

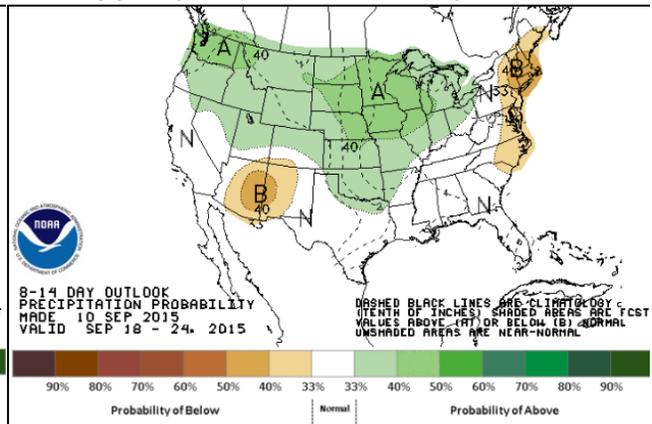


The [6-to-10 day probability of precipitation](#) is **above-normal** statewide, and this carries through to the [8-to-14-day precipitation probability outlook](#).

6-10 day precipitation forecast for Sep 16-20



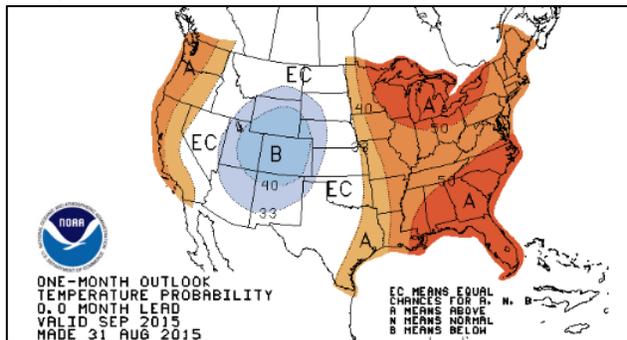
8-14 day precipitation forecast for Sep 18-24



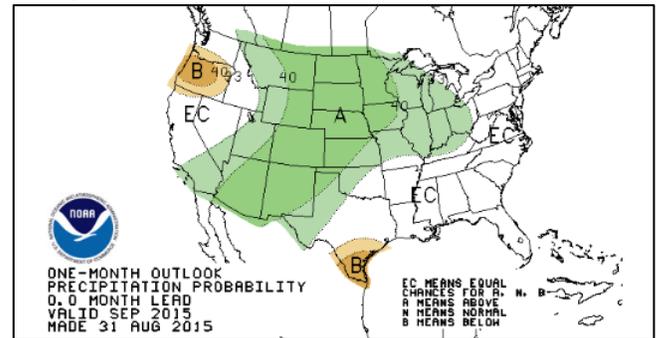
Climate Predictions

Please keep in mind the following [seasonal climate outlooks](#) for the rest of 2015 and into 2016 as we plan our fish centric activities for the rest of fall. Below are maps showing the updated September 2015 forecast. The forecast still calls for normal rain but higher than normal temperatures.

8/31 climate forecast for September 2015 Temperature



8/31 climate forecast for September 2015 Precipitation



Refer back to update #24 for the most recent forecasts for October-December 2015, and January-June 2016. The general outlook is warmer and drier than normal, turning to normal precipitation in late spring 2016. Obviously a lot can happen between now and then, read on.

El Niño Update

The following [El Niño/Southern Oscillation](#) diagnostic discussion was issued September 10. All models surveyed predict El Niño to continue in the northern hemisphere into spring 2016, with a peak in late fall/early winter (3-month sea surface temperature values of +1.5°C or greater). Overall, there is an approximately 95% chance that El Niño will continue through Northern Hemisphere winter 2015-16, gradually weakening through spring 2016. Click [CPC/IRI consensus forecast](#) and see table below for the chance of El Niño for each 3-month period. To crack the code, associate the first row's seasonal grouping on the table below as "August-September-October," followed by "September-October-November," and so forth. The next El Niño/Southern Oscillation update will be issued October 8, 2015.

CPC/IRI Early-Month Consensus ENSO Forecast Probabilities

Season	El Niño Probability
ASO 2015	100%
SON 2015	99%
OND 2015	99%
NDJ 2015	98%
DJF 2015	97%

JFM 2016	94%
FMA 2016	87%
MAM 2016	75%
AMJ 2016	55%

The NOAA Climate Prediction Center (CPC) and the International Research Institute for Climate and Society at Columbia University (IRI) partner to develop ENSO forecasts. IRI sponsors a website with coherent [El Niño Southern Oscillation \(ENSO\) resources](#) and discussions, and is worth a look if you're interested to dig into this topic further.

One outcome related to El Niño conditions is an increase in hurricane-like conditions in the tropical and eastern-north Pacific. NOAA's May 27, [2015 Eastern Pacific Hurricane Season Outlook](#) indicates a 70% chance of an above-normal season. The [main climate factor expected to enhance the 2015 eastern Pacific hurricane season is El Niño](#), which is now present and is predicted to last throughout the hurricane season. As noted above, many [models predict this El Niño to strengthen further](#) as the season progresses. El Niño decreases the vertical wind shear over the eastern tropical Pacific, which favors more and stronger tropical storms and hurricanes. El Niño is already affecting the wind and rainfall patterns across the equatorial and subtropical Pacific Ocean. For the 2015 hurricane season, NOAA predicts 15-22 named storms, 7-12 hurricanes, 5-8 major hurricanes, and an Accumulated Cyclone Energy (ACE) index range from 110%-190% of the median (anything over 115% is "above-normal"). Check it out at the NOAA CPC [East Pacific Hurricane Monitoring](#) web site. It's Columbus Day 1962 all over again, and earlier than ever!

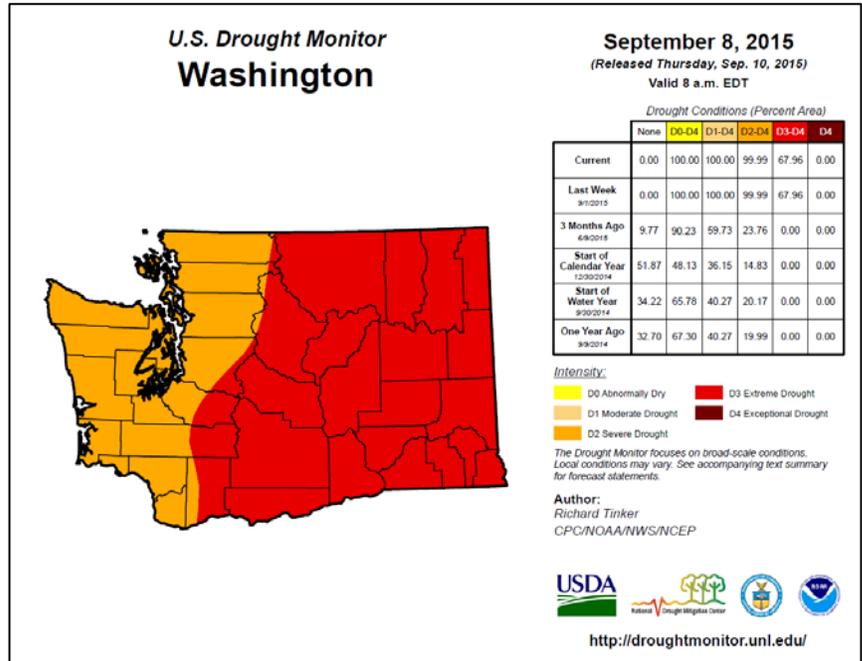
Read Cliff Mass' Weather Blog for Monday August 31 for more on the [Strongest Summer Storm in Northwest History.](#), and Cliff's thoughts on [whether the remnants of Hurricane Ignacio will reach the Northwest](#). Also, don't miss [Godzilla El Niño Versus The BLOB: Who Will Win?](#) It's a cliff-hanger (pun intended).

Federal Drought Status

The [U.S. Drought Portal](#) provides the weekly drought status for the nation. Find out more about U.S. Department of Agriculture disaster status and relief programs at the [USDA Disaster Assistance](#) web page. The total area of Washington in Extreme Drought Category D-3 is down to 67.96% this week (right) from 84.64% the week of August 25.

Many farmers suffering crop losses in the statewide drought are now eligible for low interest emergency loans from the U.S. Department of Agriculture.

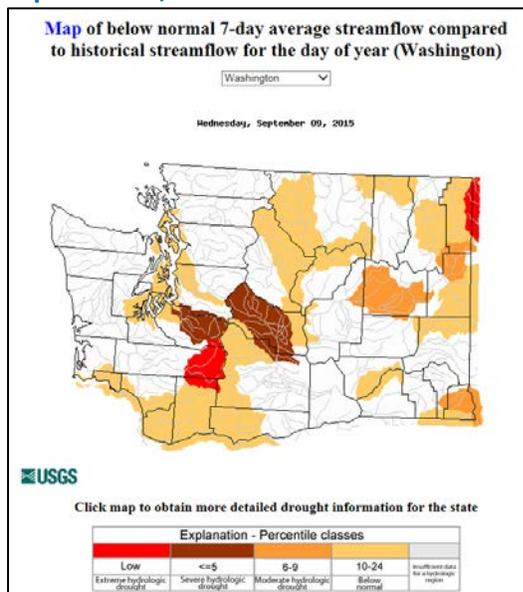
[2015 United States Department of Agriculture Drought Disaster Updates](#). [Small Business Administration](#) offers low interest drought disaster loans in all Washington counties to small businesses, small agricultural cooperatives, small aquaculture businesses, and non-profit organizations of all sizes.



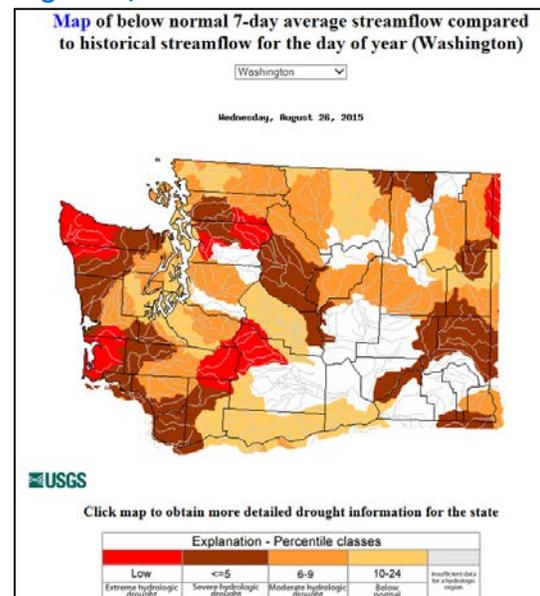
Stream Flows

Just a glance at the USGS figure showing [stream gauges with below normal streamflow](#) for 7 days or more (below, left) provides a good overview of Washington conditions this week, and demonstrates improvement when contrasted with the figure downloaded on August 26.

Below-normal 7-day average stream flow September 9, 2015



Below-normal 7-day average stream flow August 26, 2015



Selected Washington Streamflows Table

The table 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. The first column shows the gauge location, the second column shows today's stream flow readings, the third column shows today's flows as a percentage of average flows for this date throughout the period of record, column four shows the (previous) minimum flow for this date, and the fifth column shows in what year that minimum occurred. **Only one** of our select set of 43 locations set record lows on September 10, 2015. Flows are moving to values within the range of historic observations in many Washington streams. Colors in the table emphasize flows less than 75% of average (orange-yellow) and less than 50% (red) for this day in the record. [Statewide streamflows](#) are available from USGS.

Selected Washington Streamflows For 43 Out Of 254 Gauges In Washington	Today's Flow (cfs)	Percent of average for this date in the record	MinFlow (cfs)	Min Yr
Mf Nooksack River Near Deming, Wa	174	63%	67	1965
Nooksack River At Ferndale, Wa	1,570	89%	912	2007
Skagit River Near Concrete, Wa	7,830	91%	4,060	1962
Sauk River At Darrington, Wa	579	85%	332	1928
Cascade River At Marblemount, Wa	372	68%	358	2007
Nf Stillaguamish River Near Arlington, Wa	454	85%	150	1938
Snoqualmie River Near Carnation, Wa	912	83%	420	1940
Skykomish River Near Gold Bar, Wa	753	68%	368	2007
Issaquah Creek Near Mouth Near Issaquah, Wa	26	81%	15	2003
Cedar River Below Diversion Near Landsburg, Wa	82	58%	88	1995
Cedar River At Renton, Wa	129	65%	43	1958
Big Soos Creek Above Hatchery Near Auburn, Wa	43	130%	21	1995
Green River Near Auburn, Wa	312	92%	175	1969
South Prairie Creek At South Prairie, Wa	34	60%	24	1965
Puyallup River At Puyallup, Wa	1,120	65%	992	1997
Nisqually River At Mckenna, Wa	535	104%	32	1962
Deschutes River Near Rainier, Wa	25	66%	19	2006
Nf Skokomish R Bl Staircase Rpds Nr Hoodspport, Wa	64	44%	31	1930
Dungeness River Near Sequim, Wa	110	60%	82	1928
Hoko River Near Sekiu, Wa	50	128%	13	2014
Calawah River Near Forks, Wa	128	56%	47	2014
Hoh River At Us Highway 101 Near Forks, Wa	1,050	95%	522	2014
Satsop River Near Satsop, Wa	444	128%	197	1944
Chehalis River Near Grand Mound, Wa	219	76%	96	1967
Naselle River Near Naselle, Wa	37	60%	21	1949
Cowlitz River Below Mayfield Dam, Wa	3,520	136%	1,130	1940
Cowlitz River At Packwood, Wa	262	46%	254	1997
Lewis River At Ariel, Wa	857	48%	524	1945

White Salmon River Near Underwood, Wa	482	77%	381	1994
Klickitat River Above West Fork Near Glenwood, Wa	78	76%	57	2001
Walla Walla River Near Touchet, Wa	32	94%	3	1973
Tucannon River Near Starbuck, Wa	67	102%	30	1931
Grande Ronde River At Troy, Or	545	75%	391	2001
American River Near Nile, Wa	39	66%	30	1944
Crab Creek At Irby, Wa	1	10%	0	1992
Wenatchee River At Plain, Wa	366	55%	250	2005
Methow River Near Pateros, Wa	260	59%	219	2005
Okanogan River At Malott, Wa	633	53%	329	1988
Okanogan River At Oroville, Wa	250	43%	87	1944
Spokane River At Spokane, Wa	725	44%	544	2007
Colville River At Kettle Falls, Wa	57	63%	18	1930
Pend Oreille River Below Box Canyon Near lone, Wa	5,780	44%	4,280	1961

Real-Time Water Temperature from USGS and Ecology

USGS doesn't collect Real Time water temperature at every stream flow gauge in Washington, but the sixty-five gauges that do include water temperature provide extremely helpful information to stream watchers and fish managers. Follow this link to see the [Real Time Temperature Stations map](#) for Washington. Below is a table showing September 10 [water temperature at all Washington gauges](#) having that attribute, in degrees C. Colors emphasize lethal (red, above 20 degrees C), dangerous (yellow, above 18 degrees), and acceptable (green) temperatures for salmon. Only three of 65 temperature gauges in Washington are registering at or higher than the lethal threshold for salmon, which is good news for Washington fish. There were 23 stations at or above lethal levels two weeks ago. Note that this sample of gauges is heavily weighted by stations at Columbia-Snake hydropower facilities, so statistics like *percent-of-Washington-gauges* would not be representative of overall status in Washington.

WATER TEMPERATURE FOR 65 GAUGES IN WASHINGTON ON SEPTEMBER 10, 2015	DEGREES C
Nf Skokomish R Bl Staircase Rpds Nr Hoodsport, Wa	10.6
White River At Headworks Ab Flume Nr Buckley, Wa	12.9
White River At R Street Near Auburn, Wa	13.9
Lake Tapps Diversion At Dieringer, Wa	13.2
Puyallup River At Puyallup, Wa	10.6
Duwamish River At Golf Course At Tukwila, Wa	17.0
Cedar River Near Cedar Falls, Wa	10.2
Cedar River At Cedar Falls, Wa	15.4
Cedar River Below Diversion Near Landsburg, Wa	11.0
Cedar River At Renton, Wa	14.0
South Fork Sultan River Near Sultan, Wa	9.7
Sultan River Below Diversion Dam Near Sultan, Wa	11.3
North Fork Tolt River Near Carnation, Wa	10.6
South Fork Tolt River Near Index, Wa	9.7
South Fork Tolt River Near Carnation, Wa	12.5
Sf Tolt River Bl Regulating Basin Nr Carnation, Wa	11.9

Nf Stillaguamish East Pooled Slide Area Nr Oso, Wa	6.4
Skagit River At Newhalem, Wa	10.8
Skagit River At Marblemount, Wa	10.7
Nf Nooksack River Bl Cascade Creek Nr Glacier, Wa	9.0
Sf Nooksack River At Saxon Bridge, Wa	12.9
Nooksack River At North Cedarville, Wa	11.9
Boundary Reservoir At Forebay Nr Metaline Falls	18.3
Pend Oreille River At International Boundary	18.0
Columbia River At Bridgeport, Wa	18.6
Osoyoos Lake Near Oroville, Wa	19.7
Okanogan River At Oroville, Wa	19.0
Similkameen River Near Nighthawk, Wa	15.8
Okanogan River Near Tonasket, Wa	17.4
Okanogan River At Malott, Wa	17.8
Okanogan River Nr Wakefield Br South Of Malott, Wa	16.6
Andrews Creek Near Mazama, Wa	7.1
Methow River Near Mouth Near Pateros, Wa	14.9
Wells Powerplant Headwater Near Pateros, Wa	18.3
Wells Powerplant Headwater Near Pateros, Wa	18.1
Wells Powerplant Headwater Near Pateros, Wa	18.1
Columbia River Below Hwy 395 Bridge At Pasco, Wa	19.4
Snake River Bl Mcduff Rapids At China Gardens, Id	20.5
Snake River Near Anatone, Wa	19.9
North Fork Clearwater River At Ahsahka, Id	8.3
Clearwater River Nr Peck Id	9.9
Clearwater River Nr Peck Id	9.8
Clearwater River Near Lewiston, Id	11.0
Lower Granite Lk Forebay At Lower Granite Dam, Wa	17.9
Snake River (Right Bank) Bl Lower Granite Dam, Wa	17.3
Lake Bryan Forebay At Little Goose Dam, Wa	18.6
Snake River Below Little Goose Dam, Wa	18.3
Lake H G West Forebay At Lower Monumental Dam, Wa	19.3
Snake River Below Lower Monumental Dam, Wa	19.1
Lake Sacajawea Forebay At Ice Harbor Dam, Wa	19.7
Snake River Bl Goose Island Bl Ice Harbor Dam, Wa	19.6
Columbia River At McNary Dam Lock Nr Umatilla, Or	19.0
Columbia River Below McNary Dam Near Umatilla, Or	19.0
Columbia River At The Dalles, Or	20.1
Columbia River, Right Bank, At Washougal, Wa	19.9
Columbia River At The Dalles Dam Forebay, Wa	20.1
Columbia River At Bonneville Dam Forebay, Wa	19.9
Columbia River At Cascade Island, Wa	19.8
Columbia River, Right Bank, Near Cliffs, Wa	19.7
Columbia River At John Day Dam Navigation Lock, Wa	19.8

Most Puget Sound streams are cool and cooler, with only the Duwamish at the golf course showing temperatures in the upper teens. Temperatures above 20 degrees C are still occurring along the mainstem Columbia at The Dalles and at one Snake River station. Okanogan and Pend Oreille temperatures are below 20 degrees for the first time in weeks.

Ecology's [Flow Monitoring Network](#) provides water temperature monitoring at several Ecology and co-op stations. Definitely check out whether there is an Ecology gauge in your area and spend a little time looking at the information. Data for the Lake Washington Ship Canal can be found [here](#).

Drought Impacts to Fish and Wildlife

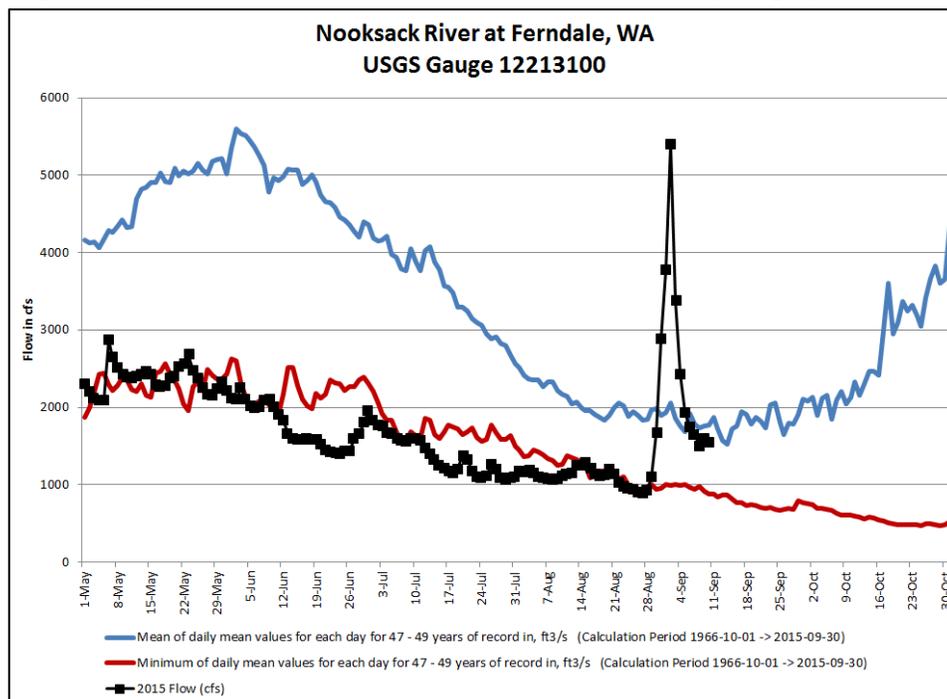
Some emergency fishing closures have been rescinded now that temperatures are cooling in Washington streams. WDFW's latest drought news regarding fishing and hydraulic projects closures and restrictions can be found at <http://wdfw.wa.gov/conservation/drought/>.

Nooksack River

On the Nooksack, Ecology has actively curtailed 9 water rights as of August 28th.

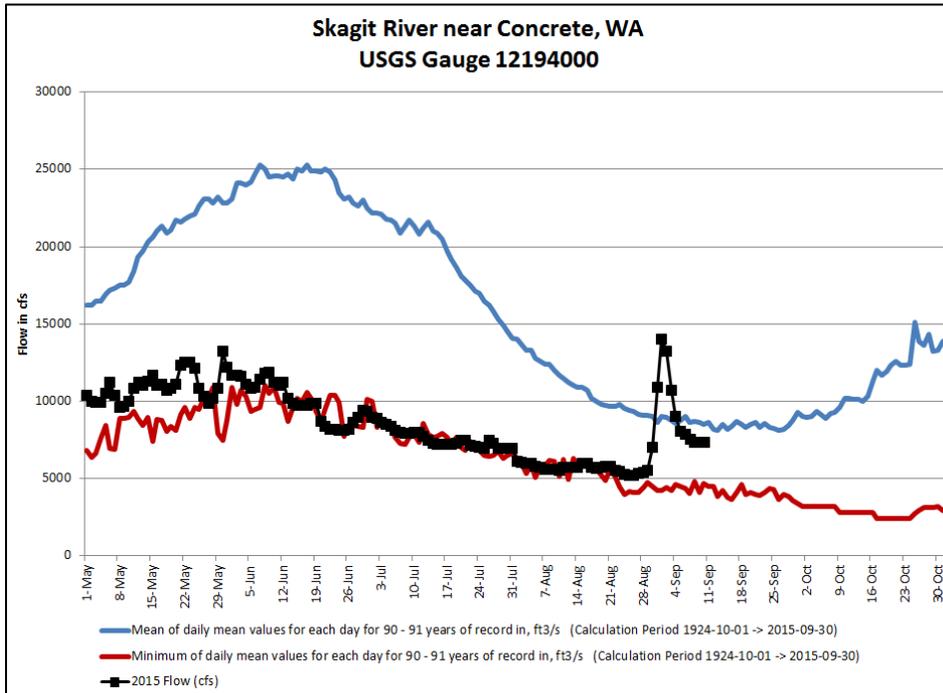
It would be an understatement to say that Nooksack flows at Ferndale perked up as a result of the rains beginning on August 28. USGS re-calibrated the Nooksack gauge that week (a frequent occurrence for gauges on dynamic Pacific Northwest streams), so the hydrograph is adjusted. Whip out Update # 24 and compare the pre-8/28 flows to the revised values shown on this table. The upshot is that we were in a lot worse shape in July than we thought on the Nooksack, making the recent rain response all the more dramatic and welcomed.

The question is “what will flows do in the coming weeks?” Will flows return to below-historic levels, or stay near the historic average?



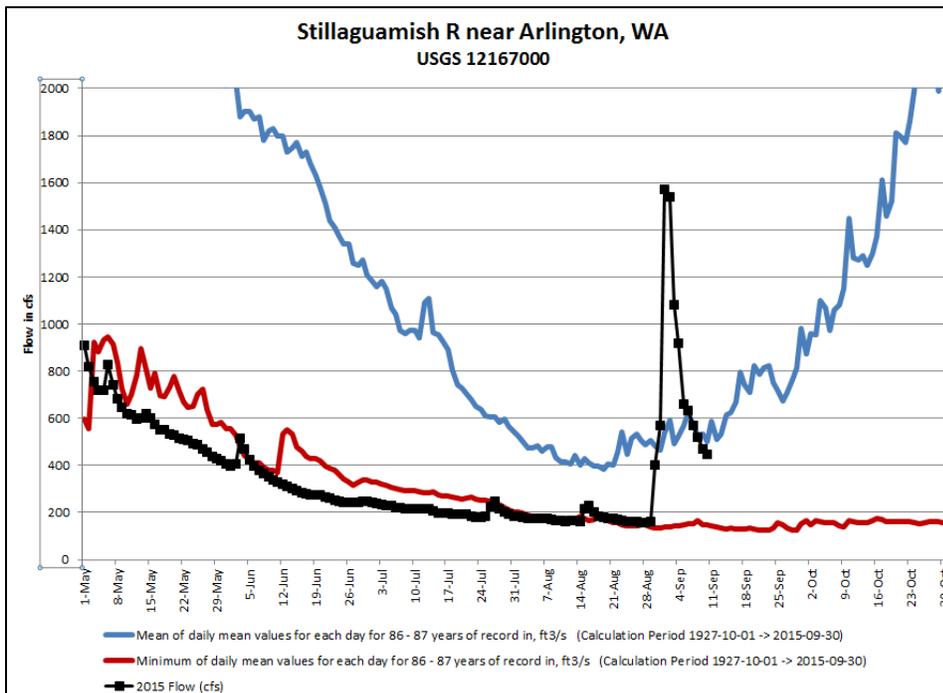
Skagit River

Skagit flows show a rain response similar to the Nooksack. Ecology has sent 3 letters warning water users of potential for curtailment.



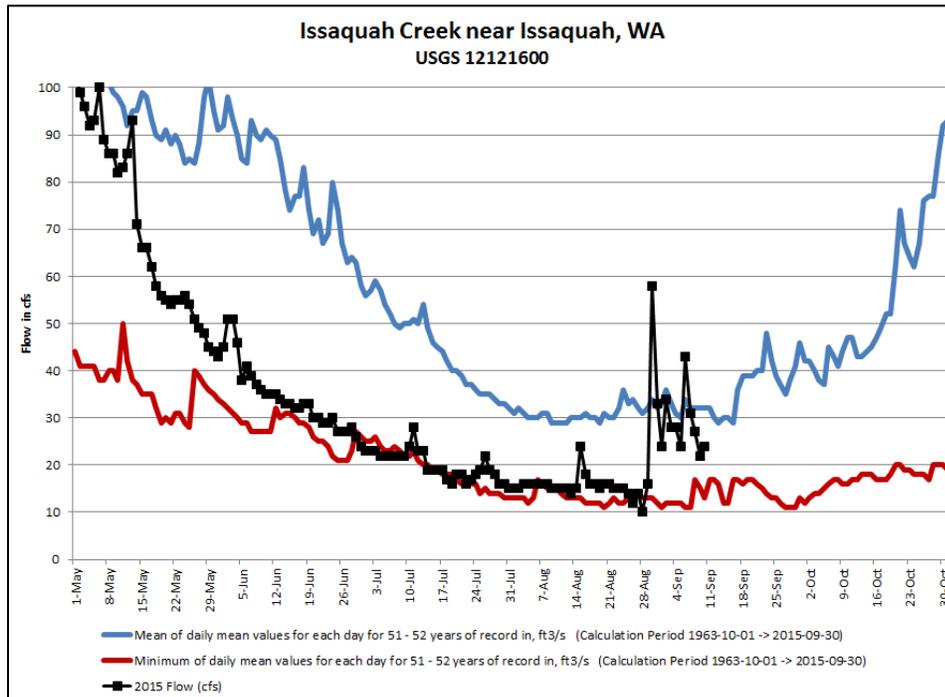
Stillaguamish

Again, recent rains provided a spike in flow.



Lake Washington/Cedar

Interesting rain response in Issaquah Creek!



King County Flow and Temperature Conditions August 31 through September 9

Following are excerpts from correspondent Curtis DeGasperi from King County Department of Natural Resources and Parks. King County presents weekly summaries on King County river and creek flows and temperatures. Request data and/or get on the distribution list for this information from Jim.Simmonds@kingcounty.gov

Headlines from the week

Although Western Washington has received above normal precipitation over the past several days and the wet weather has resulted in cooler air and stream temperatures; Seattle, Everett, Tacoma and Cascade Water Alliance ask customers to continue to reduce their water use as the welcome precipitation has resulted in only a modest increase in the amount of water stored in our water supply reservoirs. More information about reservoir status is available here: <http://www.seattle.gov/util/MyServices/Water/AbouttheWaterSystem/WaterSupply/index.htm>.

A recent opinion piece in the Seattle Times highlighted the importance of continuing conservation measures to protect local water supplies and fish populations and provided some suggestions for building resiliency as this year's flow and temperature conditions become the new normal: <http://www.seattletimes.com/opinion/our-salmon-are-in-hot-water/>.

A recent article in the Oregonian described how the drought has affected Northwest fish hatcheries and what few options they have to adapt to less and warmer water. Story here: http://www.oregonlive.com/environment/index.ssf/2015/09/few_options_to_keep_northwest.html.

An article from the Seattle Times describes the loss of glacier ice across the North Cascades since 1983 and implications for the future. Story here: <http://www.seattletimes.com/seattle-news/science/disastrous-low-snow-heat-eat-away-at-northwest-glaciers/>. And see Cliff Mass' blog post for a deconstruction of the article and a longer look at glacier loss globally and locally: <http://cliffmass.blogspot.com/2015/09/seattle-times-glacier-disaster.html> .

WATER SUPPLY STATUS

- The second stage water shortage response plan (voluntary reduction) initiated on August 11 by Seattle, Everett, Tacoma, and the Cascade Water Alliance remains in effect. Customers have been asked to continue to help by voluntarily reducing water use by 10 percent. More information available here: <http://www.seattle.gov/util/MyServices/Water/AbouttheWaterSystem/WaterSupply/index.htm> and here <http://www.savingwater.org/>.
- As of August 31, Seattle Public Utilities (SPU) reports that the combined reservoir storage of Chester Morse Lake, Masonry Pool, Lake Youngs and South Fork Tolt Reservoir remains below the long term average for this time of the year. See summary graphs from SPU below.
- Cascade Water Alliance has been maintaining the agreed-upon recreational level for Lake Tapps (<http://cascadewater.org/news/lake-tapps-news/> for more information). The lake is now within the agreed-upon recreation level. However, minimum instream flows in the White River below the diversion to Lake Tapps are not currently being met (see White River flow graph below).

FLOW AND TEMPERATURE STATUS

- Of 16 rivers and 24 creeks with over 15 years of flow data and real-time data delivery, only four creeks had the lowest flows ever recorded for the week. The effects of the recent rains was apparent as several rivers and creeks had higher than typical flows for this time of year, including record high weekly average flows on Issaquah (near Hobart) and Big Soos creeks.
- None of the 15 rivers/streams with over 15 years of temperature data and real-time data delivery had the highest temperatures ever recorded for the week though 1 of the 15 was still higher than typical for the week (SF Tolt below the reservoir). Only one temperature exceeded 20 °C (Sammamish River at Marymoor), an improvement over previous weeks.
- Water levels in Lakes Washington and Union did not decrease substantially over the past week, remaining above 20 ft. For the week of August 31 to September 6, the 2015 levels are the 6th lowest on record (1940-2015). Maximum daily water temperatures at the fish ladder at the Ballard Locks have dropped below 20°C, reaching the average temperatures for the week of August 31 to September 6 (2004-2015). See figures below.
- The level of Lake Sammamish increased by one inch over the past week. The lake elevation is the third lowest since the weir modification in 1998 and is 1.3 inches below the median lake elevation (1998-present) for the week of August 31 to September 6. See figure below.

ECOLOGICAL IMPACTS

- Data collected by the Muckleshoot Tribe show that 5,093 adult Chinook salmon and almost 34,000 sockeye salmon had migrated past the Ballard Locks into the Lake Washington watershed as of September 6. This is about 49% of the 10-year average Chinook return and about 27% of the 10-year average sockeye return by September 6. Over the past 10 years, an average of about 90% of the Chinook run and almost 100% of the sockeye run had passed the Ballard Locks by September 6.
- Low flows and high temperatures may hinder adult salmon from reaching upstream spawning grounds. Temperatures above 20 to 21 degrees C are generally considered to be a migratory barrier to migration. Pink salmon in Alaska have shown increased mortality above 17 degrees C combined with lower than typical dissolved oxygen. Temperatures between 20 degrees C and 23 degrees C can cause thermal stress to many salmonids and increase disease outbreaks and infection, while temperatures above 23 degrees C can cause substantial health impacts or mortality to many salmonids. Low flows also decrease available wetted habitat for spawning and rearing, limit food availability, and increase predation.
- Starting in mid-August, over 600,000 pink salmon are projected to return to the Green/Duwamish and over 1.6 million pink salmon are projected to return to the Snohomish River. Recreational salmon fishing has opened on the Snoqualmie and Green-Duwamish rivers, including fishing for pink salmon. 2015 pink run size will be estimated based on spawning ground surveys conducted in mid-September. We have no qualitative information on the current run, but returning pink salmon have been observed in both rivers.

REGULATORY AND LEGAL CONSIDERATIONS

- The recent rains have raised the flow of the Snoqualmie River above the minimum instream flow level. See figure below.
- Recent rains have also allowed for increased flows in the Green River at Auburn. Flows remain higher than instream flows required during drought years for Tacoma Public Utilities to withdraw water from the Green River using its primary water right claim under agreements with the Muckleshoot Tribe, but are still below the minimum instream flow for Tacoma Public Utilities to withdraw water from the Green River with its second diversion water right claim. See figure below.
- Flows in the Cedar River remain higher than the normal minimum flow required by the Habitat Conservation Plan to be maintained by Seattle Public Utilities during normal years. See figure below.
- Flows in the White River fell below the minimum flow required by the White River Management Agreement between the Puyallup Tribe of Indians, the Muckleshoot Indian Tribe and the Cascade Water Alliance. See figure below.

River Flow Summary

Status	Regulated Rivers*	Unregulated Rivers
Lower flow for the week than during 90% of other years	Cedar below reservoir	White River above Mud Mountain
Below typical flow for week	Cedar at Renton	Cedar above reservoir, Sammamish
Typical flow for week	Green (at Auburn), SF Tolt (below reservoir)	Raging, SF Snoqualmie, MF Snoqualmie
Above typical flow for week		Skykomish, Snoqualmie (mainstem at Carnation), NF Snoqualmie, Tolt (mainstem near Carnation), NF Tolt
Higher flow for week than during 90% of other years		SF Tolt above reservoir

Creek Flow Summary*

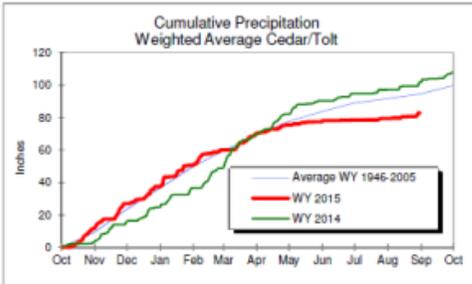
Status	WRIA 8	WRIA 9	WRIA 10
Lowest flow ever for week	Rock (near Ravensdale)	Covington, Little Soos	Boise
Below typical flow for week	Taylor (Selleck), Rock (Maple Valley)		
Typical flow for week	Bear, Issaquah (at mouth), Thornton, Juanita	Crisp, Soosette, Mill (Kent)	
Above typical for week	McAleer, Laughing Jacobs, Mercer, Lyon	Des Moines trib (at Tye Weir), Springbrook	
Higher flow for week than during 90% of other years	Juanita	Judd, Des Moines	
Highest flow ever for week	Issaquah near Hobart	Big Soos	

*No creeks in WRIA 7 have 15 years of flow data and real-time data delivery

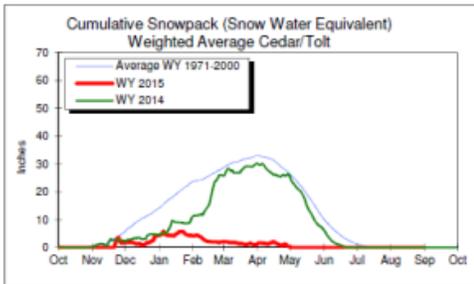
River and Creek Temperature Summary

Status	River/Creek
Higher than typical temperatures for week	SF Tolt (below reservoir)
Typical temperatures for week	Cedar (above and below reservoir), Cedar at Renton, Jenkins, Covington, Judd, NF Tolt, Bear, Laughing Jacobs, Soosette
Below typical for week	Cedar (below diversion), SF Tolt (above reservoir), Little Soos
Lower for week than 90% of other years	
Lowest ever for week	Crisp

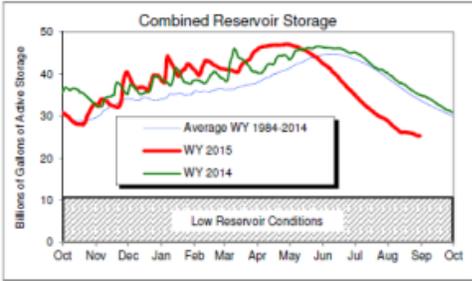
Seattle Public Utilities Water System Synopsis as of August 31, 2015



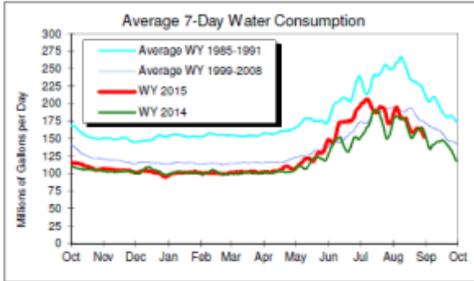
Precipitation was recorded in the Cedar River and South Fork Tolt River Watersheds over the past week.



The average snow accumulation across the sites that we monitor is estimated to be about 0.0 inches snow water equivalent which is at the long term average for this time of the year.

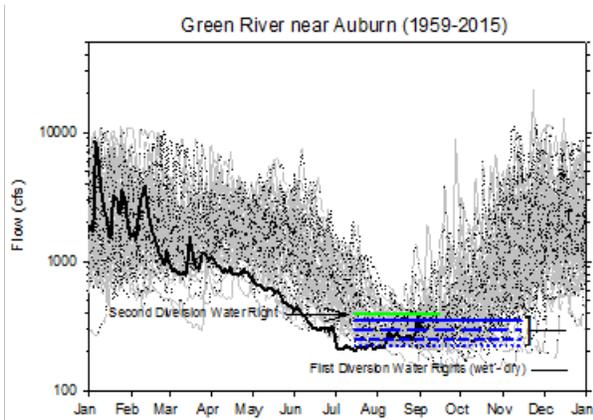
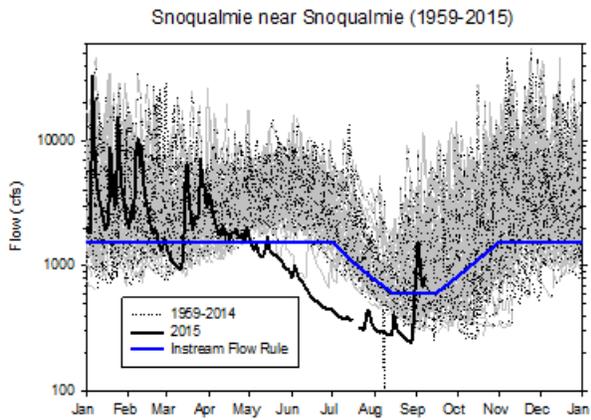


The combined reservoir storage of Chester Morse Lake, Masonry Pool, Lake Youngs and South Fork Tolt Reservoir is below the long term average for this time of the year.



Water use over the past week averaged about 152 million gallons per day (mgd), which is less than the 174 mgd used during the same period over the years 1999-2008.

All data is provisional and subject to revision.



Many thanks to Curtis for sharing this information with us!

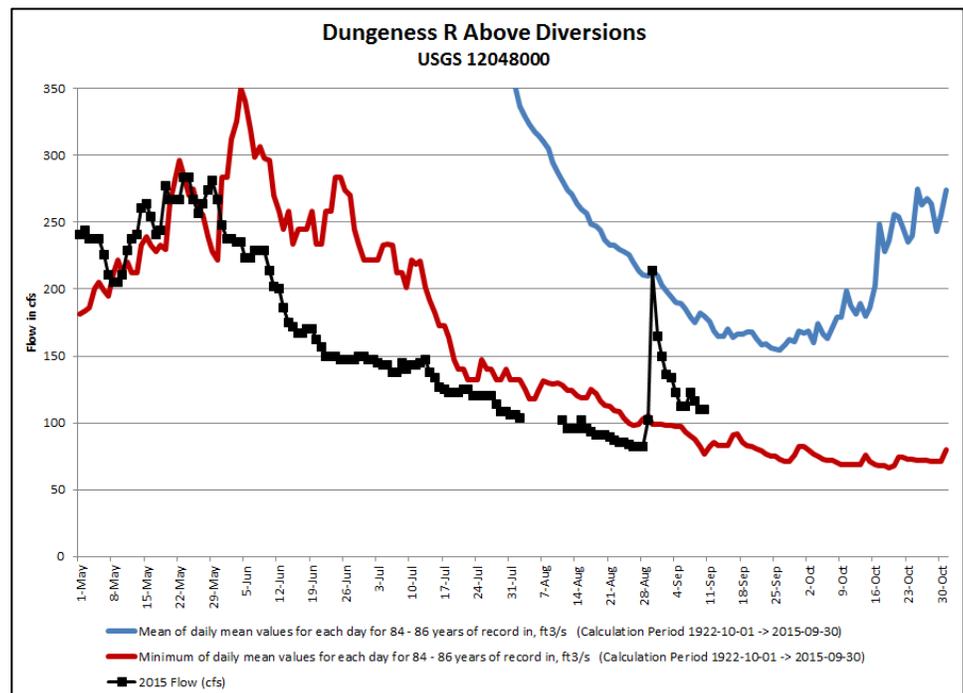
WDFW correspondent Aaron Bosworth reports that though it's very early in the spawning season, normal numbers of Chinook and pink salmon have moved up and into all Lake Washington and Green river systems and started spawning. In the Green River there are Chinook and pink are spread throughout the system, and both species are also showing up at the Soos Creek Hatchery in good numbers. In Lake Washington-Cedar River there are currently several hundred sockeye and a small number of Chinook spread throughout the river. Lower water temperatures have made a big difference in these systems. Although it's early, a good number of Chinook have been able to move up through the Sammamish River, and more than

100 have entered the Issaquah Hatchery, with an additional 100-200 holding and spawning in Issaquah Creek below the hatchery.

Dungeness

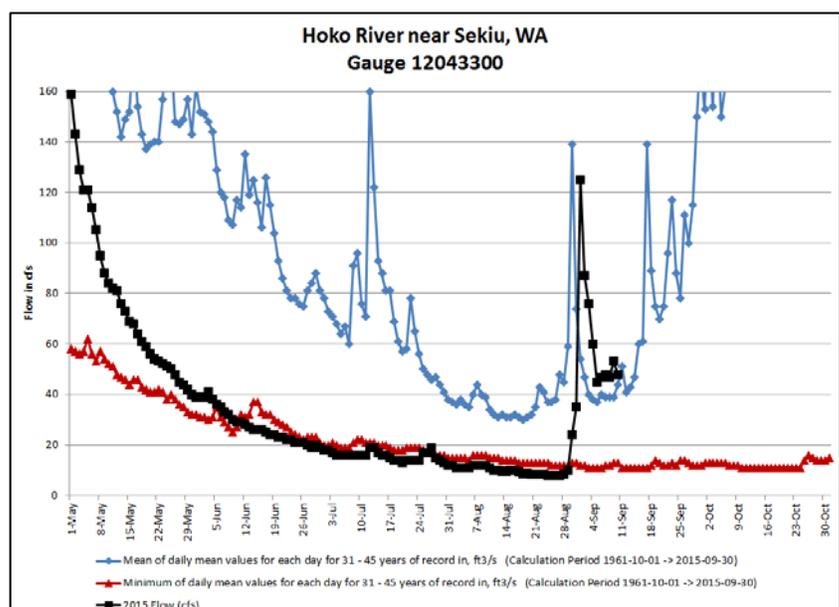
The August 29th storm shows an instant response in the Dungeness, but the flows thereafter have returned to relatively lower levels than streams in Puget Sound. Irrigators traditionally cease diversions for the season on September 15.

WDFW correspondent Randy Cooper reports that pink salmon returns are well below the forecast, but it's still a very good return for the basin. The distribution of pink salmon in the Graywolf and Upper Dungeness looks very good. Even the upper Graywolf from RM 2.5-5.1 shows pink activity, and the numbers in the Graywolf index section from RM 0.0-1.0 and RM 1.0-2.5 look good, too. Pinks also made it to the upper reaches of the Dungeness below the falls. This week survey crews are starting to see more live Chinook and spawning activity than in previous weeks.



Recall that passage conditions on the Dungeness were enhanced using temporary channel constrictions in several places along the river. I'm not sure we will get a quantitative analysis of how many more fish made it to upper stream reaches because of this work. It's reasonable, however, to associate successful upper watershed passage and spawning with the blockage remediation work conducted in the lower and middle mainstem. Well done, Dungeness Team!!

Hoko flows responded similarly to the Dungeness, and that response brings Hoko out of record-low territory.



North Coast

Calawah River values give us an indication of conditions in the Bogachiel, Dickey, Sol Duc, and Quillayute Rivers. Again, rain response is similar to Dungeness and Hoko.

WDFW correspondent David Low reports that initial fall salmon surveys on north coast streams last week showed not as many fish as had been hoped. This week, survey crews are starting to see a few redds and a few more fish. For example, two of the South Fork Hoh index sections have 1 new redd and 5 new redds,

respectively. This is relatively low for the start of the survey season but those fish haven't had much time or inclination to move and work the gravel.

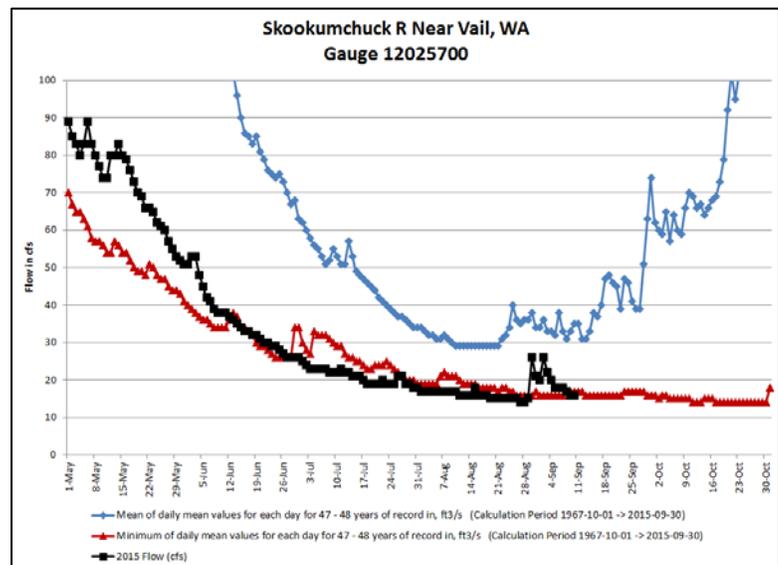
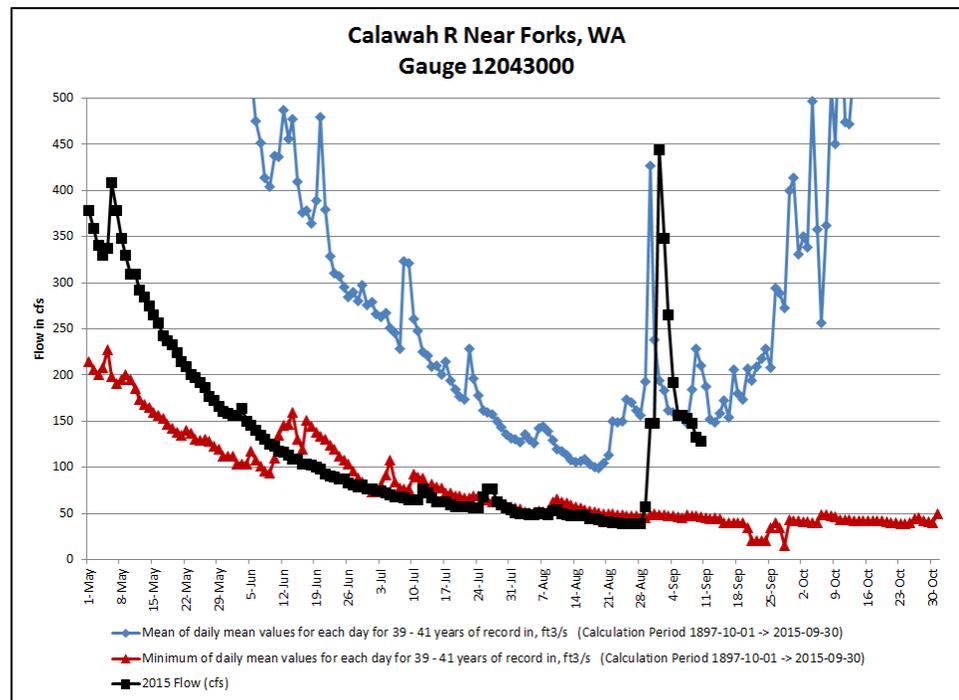
David reports that the most astounding habitat changes occurred in June during steelhead surveys. By the end of those June surveys crews were witnessing tributaries that were already in late summer/early fall flow conditions with long dry reaches. In the canyon areas the flows were so low in mid-June that redds were left high and dry and raccoons had excavated all the eggs/sac fry. David guesses that in some areas as much as a third of steelhead redds were lost to predation or de-watering.

Chehalis Basin

Ecology has actively curtailed 93 water users and issued one compliance order as of August 28th.

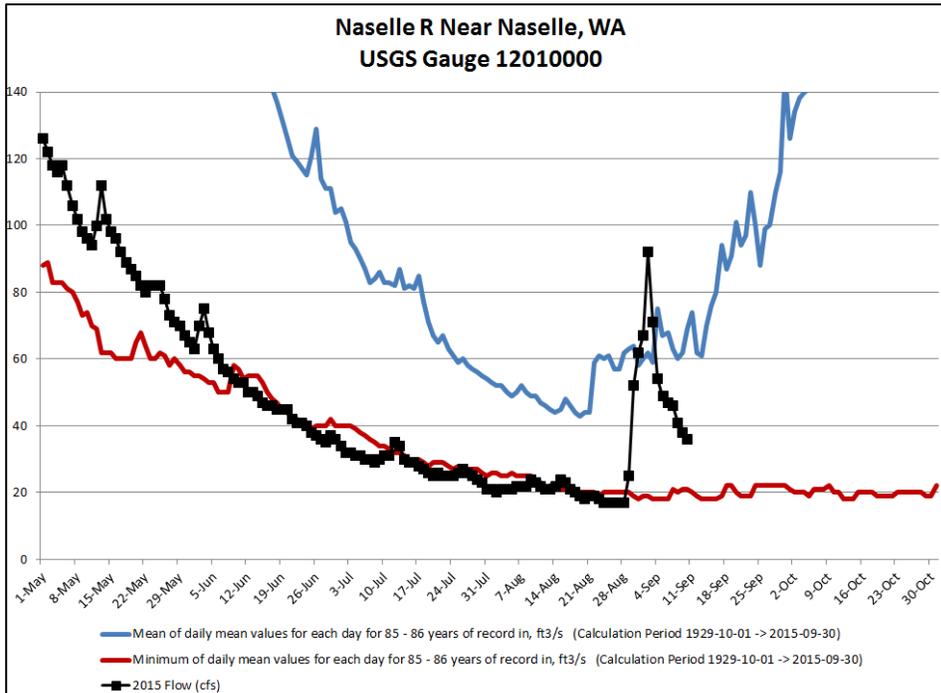
Skookumchuck:

Flows in the figure below represent inflow to the Skookumchuck Reservoir. After a bump from the rains, flows have returned to near-minimum historic levels.

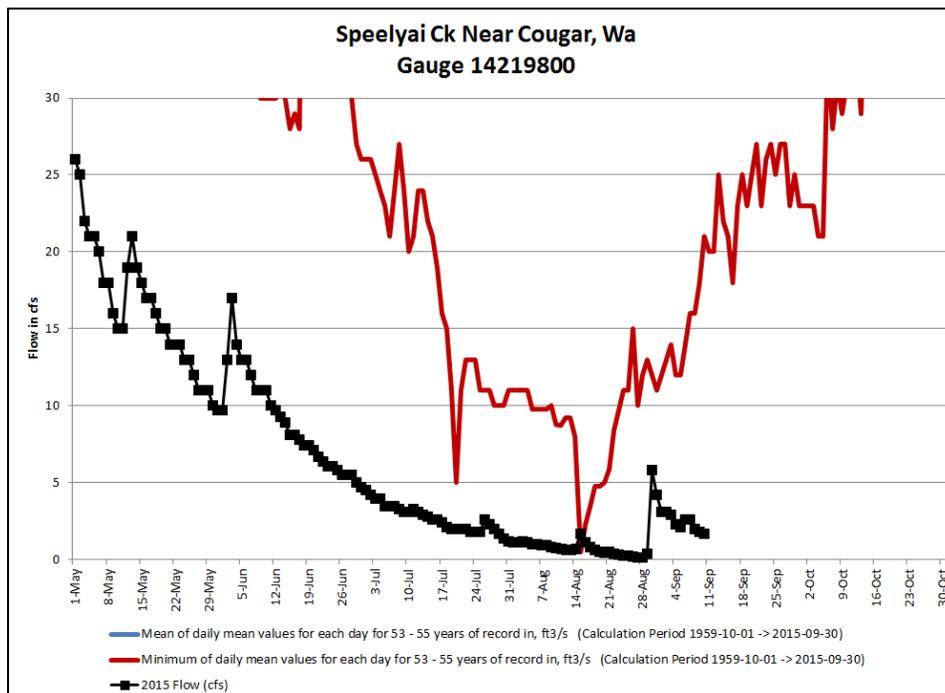


Southwest Region

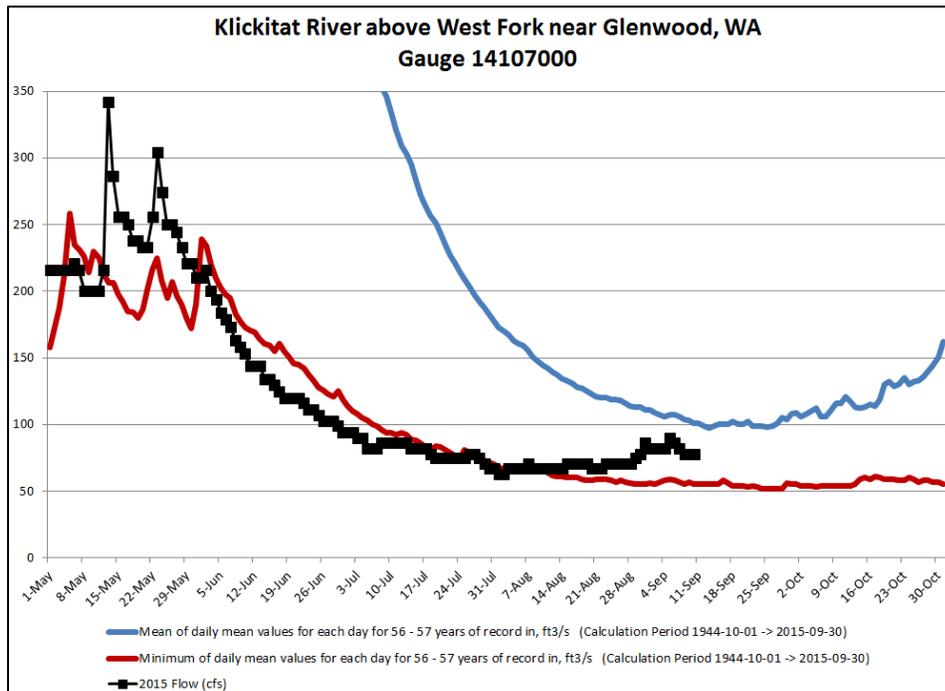
Naselle River shows a good response to recent rains.



Speelyai Creek bumped above 5 cfs, and might yet be above 1 cfs.



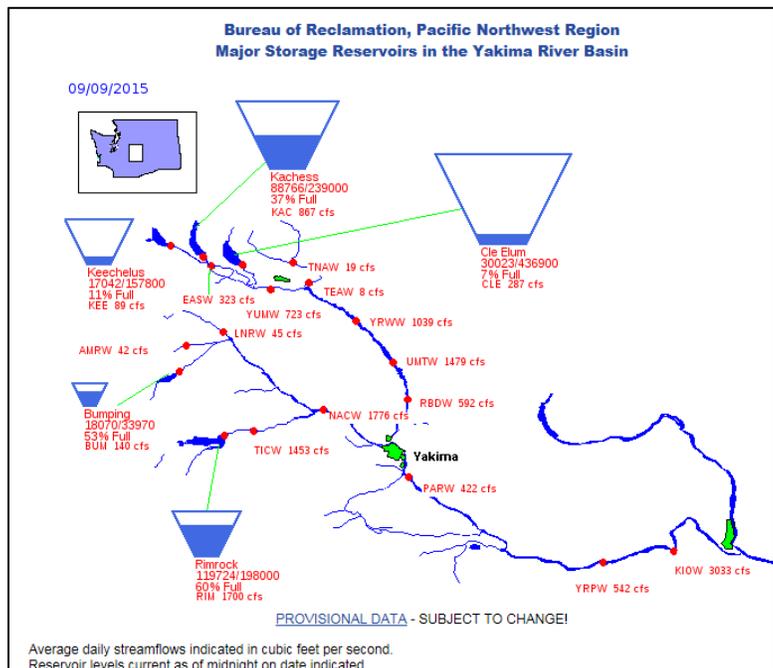
Looks like Upper Klickitat has indeed “bottomed out,” with a small boost from precipitation last week.



Yakima

The Reclamation Teacup Diagram for Yakima Basin shows Lake Keechelus volume down to 11%, Kachess down to 37%, and Cle Elum down to 7%. Bumping is at 53% of full, and Rimrock is 60% full. Storage is 65.7% of average (1981-2010).

Yakima River flow in the Easton reach and the Cle Elum River will be reduced to about 200 cfs today to get close to final spawning flows; flow at Easton were 258 cfs the morning of 9/10. Flow in the Tieton River will increase by 100 to 150cfs today; flows the morning of 9/10 were 1,555 cfs at the Tieton gauge near the canal headworks.



Inflow to the five reservoirs is 92%, releases from the five are 82% and major canal diversions are 79% of average for September 10th.

Yakima water right curtailments by Ecology total 18 post-1805 rights, 55 Teanaway users, 32 Teanaway second-notice users, and 74 users on the Cowiche as of August 28th.

Yakima Adult Fish Migration Status

(Provisional data from Reclamation Yakima Field Office 9/3)

2015 spring Chinook run: Through September 1; 8,884 fish have passed Prosser Dam

2015 spring Chinook run: Through August 23; 5,970 fish have passed Roza

2015 summer Chinook run: Through September 1; 820 fish have passed Prosser Dam

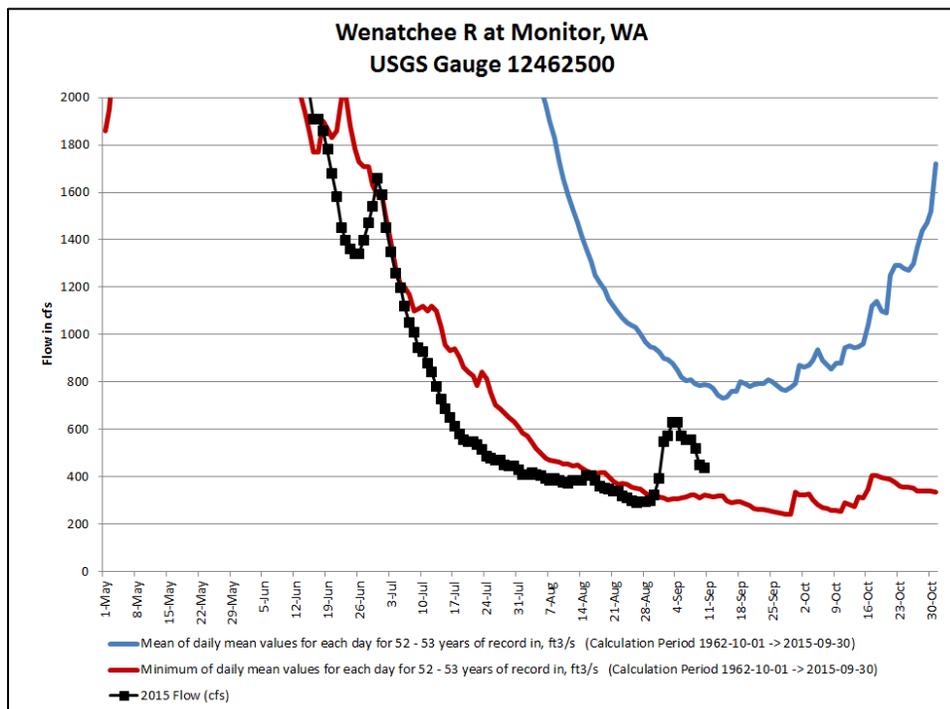
2015 sockeye run: Through September 1; 40 fish have passed Prosser Dam.

A pulse flow of an additional 1000 cfs at Parker was requested by the System Operations Advisory Committee (SOAC) on August 27 to aid upstream migration of adult salmon (focal species was sockeye) to coincide with the forecasted cooler weather projected on/after August 29. Results of the pulse suggest that a decrease in water temperature in the lower river was the key environmental driver that resulted in a surge of spring and summer Chinook past Prosser Dam between August 24 and September 1. The pulse peak at Prosser Dam and Kiona-Benton occurred September 1 at both locations and the peak fish counts at Prosser occurred on August 25 and 26. However the daily minimum water temperatures were below the 69.8° F threshold for adult sockeye migration as early as August 23, which coincided with initial upstream migration of spring and summer Chinook.

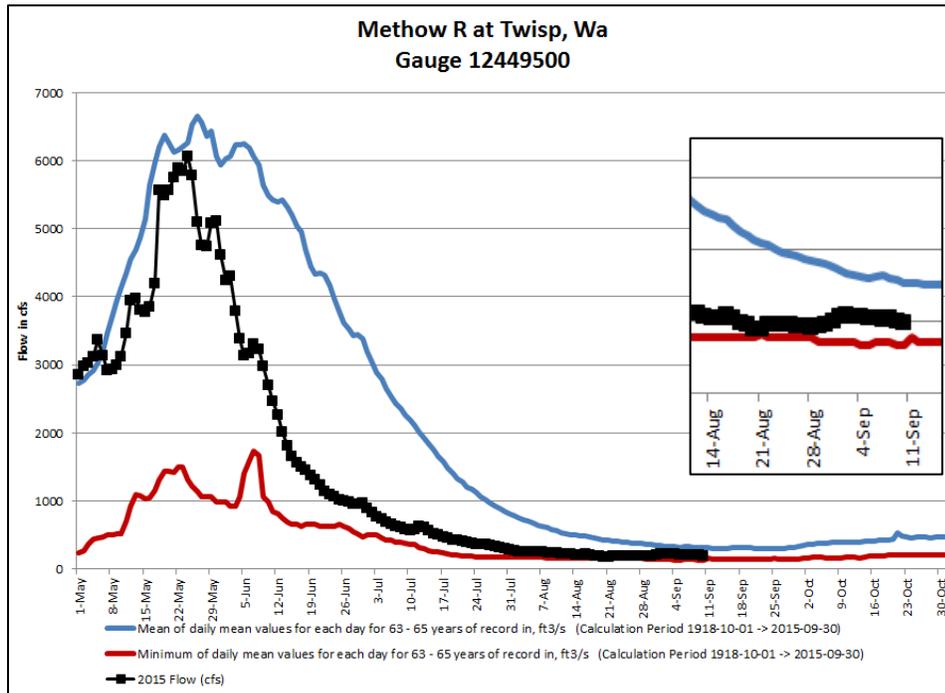
Reclamation notes that only 11 adult sockeye migrated upstream during this period, which is a strong indicator that the vast majority of expected returning 2015 sockeye succumbed in the Columbia River due to excessive water temperatures and disease.

North Central Washington

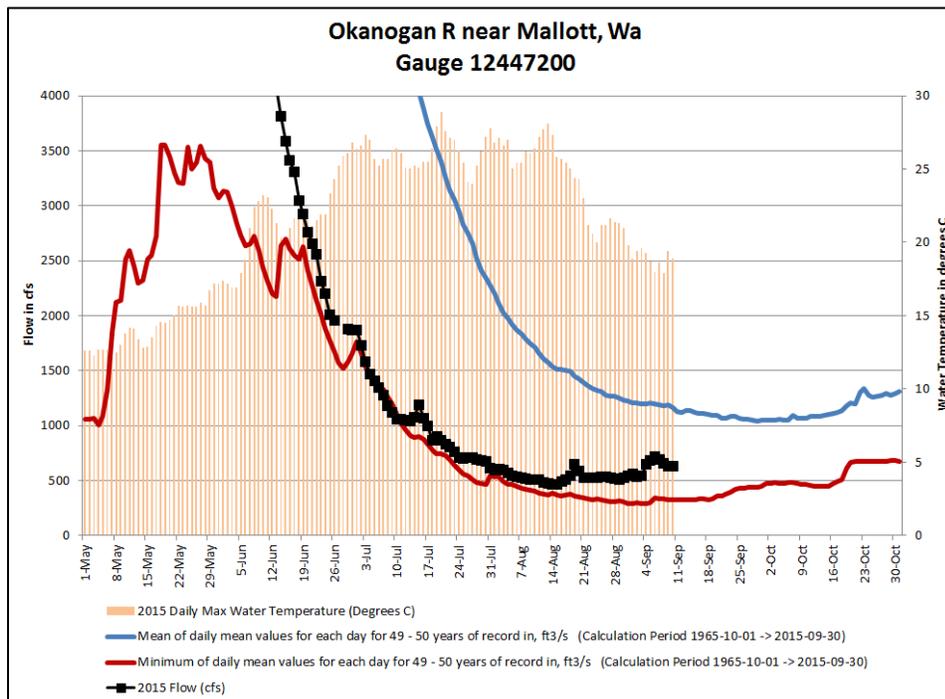
Eastside rain response isn't as dramatic as on the west side; this is probably because there wasn't as much rain. Ecology has curtailed 91 Wenatchee basin water users.



Methow River at Twisp flow is tracking with its historic hydrograph and low base flows. The inset shows the negligible precipitation response at this gauge. Ecology has curtailed 70 water users in the Methow.

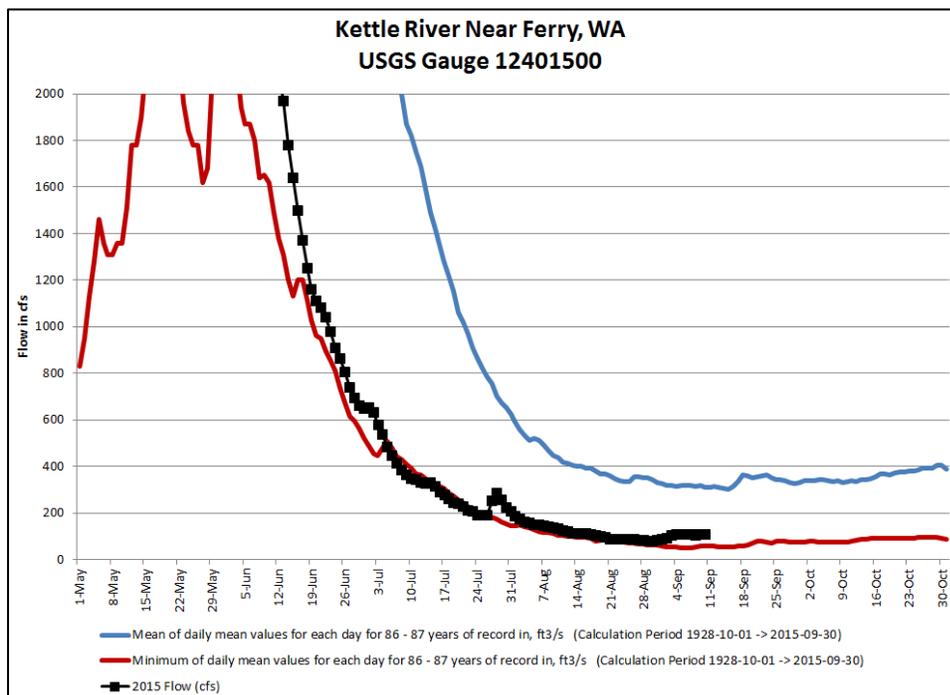
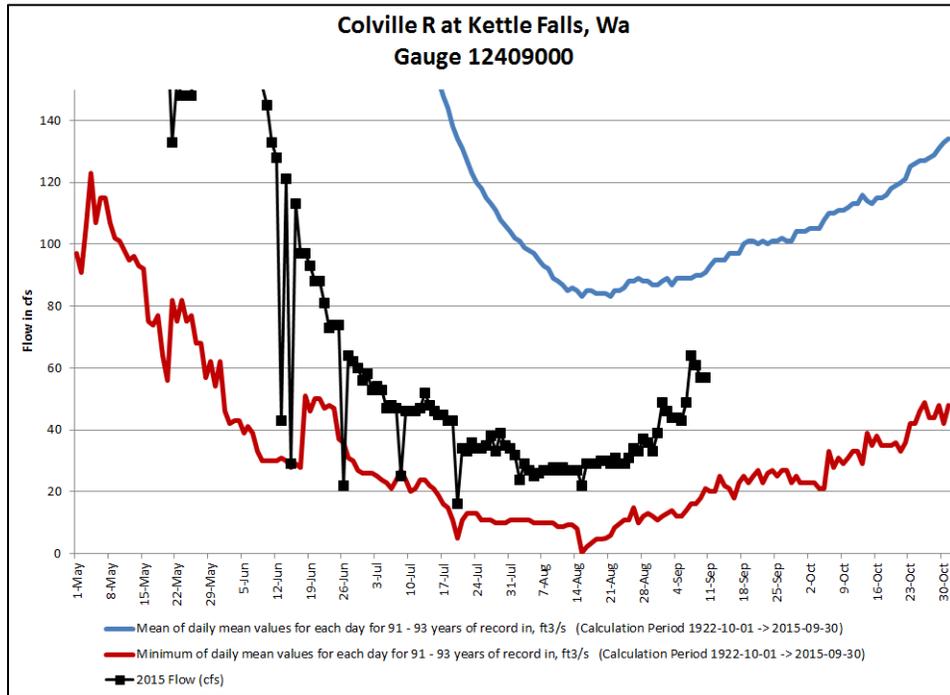


Okanogan River flows continue to rise in discharge and reduce in temperature. Temperatures in the Okanogan at Mallott are just breaking below the 20 degree mark. Ecology has curtailed 101 water users in the Okanogan/Similkameen basins, with one compliance order active.



Spokane, Northeast, and Southeast Washington

Colville River (below) flows are increasing in accordance with the customary hydrograph. Kettle River flows (also below) are low and appear to be leveling off or slightly increasing. Your author doesn't know these systems well enough to determine whether the slight bumps for both streams resulted from rain. Ecology has curtailed 55 water users in the Colville Basin, 140 in the Little Spokane Basin, 84 in the Walla Walla/Touchet basins, 15 in Tucannon/Asotin basins, and 41 elsewhere in the eastern region. There are also 34 compliance orders active in this region.



Snake & Columbia Rivers

Grand Coulee Reservoir is at 1,280.5 feet (9-7-15) elevation and has refilled 2.8 feet over the last week. Outflows at Grand Coulee have ranged between 51.1 and 76.8 Kcfs over the last week. Dworshak is currently at an elevation of 1,528.0 feet (9-7-15) and drafted 4.6 feet over the last week; Dworshak Outflows have been 5.8 Kcfs over the last week.

The Summer Biological Opinion flow period began on June 21st and ended on August 31st with a flow objective of 50 Kcfs. Over the Summer Flow Period, flows at Lower Granite Dam averaged 25.9 Kcfs. The Summer Biological Opinion Flow Objective at McNary Dam (which began July 1st and ended August 31st) was 200 Kcfs. Over the Summer Flow Period, flows at McNary averaged 142.6 Kcfs.

Many thanks to Dave Benner and Paul LeBaron at Fish Passage Center for sharing this report on reservoir operations and river flows each week.

WDFW Headquarters Drought Response Activity

Staff drought resources are available on the WDFW shared drive at <S:\All Agency\Shared Projects\DROUGHT 2015>.

Drought-related Hatchery Actions for the week of September 1-7

REGION	FACILITY (SPECIES)	MORTALITY (% PRODUCTION)	COMMENTS
3	Naches Hatchery	0 this week 0 cum. (0% cum.)	Naches is moving forward with the two wells and it appears we should have those done by the end of the month.
4	Bellingham (Rainbow Trout)	0 this week 5,760 cum. (80% cum.)	
4	Issaquah (Coho)	0 this week 6,728 cum. (1% cum.)	
4	Soos Creek (Summer Steelhead)	0 this week 41,308 cum. (60% cum.)	
4	Soos Creek (Coho)	0 this week 172,963 cum. (21% cum.)	
5	Grays River (Steelhead)	0 this week 150,300 cum. (93% cum.)	
5	North Toutle (Coho)	0 this week 101,746 (76% cum.)	
5	Washougal (Coho)	0 this week 37,000 cum. (2% cum.)	

6	Elwha	0 this week 0 cum. (0% cum.)	We plan to move forward on drilling a well for additional water supply at Elwha. We anticipate the work beginning in late October or early November. We are currently awaiting a decision on our Declaration of Emergency submitted to Ecology for approval.
6	Forks Creek (Steelhead)	0 this week 14,489 cum. (24% cum.)	
6	Lake Aberdeen (Steelhead)	0 this week 64,903 cum. (22% cum.)	
6	Naselle (Steelhead)	0 new 64,989 cum. (22% cum.)	
6	Naselle (Coho)	0 new 639,646 cum. (44% cum.)	
6	Voights Creek (Coho)	0 new 347,000 cum. (44% cum.)	

Drought-related fishery actions for the week of 8/28- 9/7

- Effective July 18: Sturgeon fisheries, including catch-and-release, closed Bonneville Dam upstream in the Columbia River, the lower Snake River, and adjacent tributaries.
Restriction lifted on September 9.
- Effective July 18: “Hoot-Owl” restrictions put in place in 8 rivers in Region 1, 2 rivers in Region 3, 4 rivers in Region 4, and 2 rivers in Region 5. **Restrictions are lifted per the table below.**
- **New closures or re-openings since August 28 are shown in bold red**

Region	River	Current Fishery	Rule	Rationale
1	North Fork Touchet above Spangler Creek (7/18)	Trout	Closed	Extreme low flows. Protect adult spring Chinook and juvenile steelhead
1	South Fork Touchet (7/18)	Trout	Closed	
1	Wolf Fork (Touchet) (7/18)	Trout	Closed	
1	Asotin Creek and tributaries (7/18)	Trout	Closed	
1	Kettle River (7/18)	Redband Trout	Closed	Extreme low flows and high temperatures; reports of fish mortality. Protect redband trout.
1	Mill Creek (Walla Walla Co.) from Bennington Dam to State Line midnight (8/14)	All species	closed 2:00 p.m. to midnight	Low water flows and higher than normal water temperatures
2	Wenatchee River from mouth to Icicle River Road Bridge (7/18)	Spring Chinook	Closed	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	Closed	Protect ESA-listed steelhead and Chinook.
2	Lake Wenatchee (7/18) Open to sockeye (7/30) Lake Wenatchee closed to sockeye (8/12)	Sockeye	Closed to Chinook, steelhead, bull trout.	Protect ESA-listed Chinook.
2	Columbia River from Rocky Reach Dam upstream to Chief Joseph Dam (7/27)	Summer Chinook, Sockeye, Gamefish	No Sockeye Retention	Ensure adequate sockeye spawners.
2	Okanogan River from the Hwy 97 bridge upstream to Zosel Dam (7/18)	Summer Chinook, Sockeye, Gamefish	Salmon Closed Gamefish Open	High temperature. Protect ESA- listed steelhead and wild summer Chinook
2	Similkameen River mouth upstream to Enloe Dam (7/18)	Summer Chinook, Sockeye	Closed	
3	Ahtanum Creek (7/18)	Trout	Closed	Extreme low flow and high temperature. Protect ESA-listed juvenile steelhead and ESA-listed bull trout.
3	Little Naches River (7/18)	Trout	Closed	Extreme low flow and high temperature. Protect isolated adult spring Chinook and ESA-listed juvenile steelhead.
3	Teanaway River (7/18)	Trout	Closed	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	Hoot-owl restrictions lifted	Cooler weather
3	Swauk Creek and all tributaries downstream of Williams Creek (8/14)	All game fish	Closed 2:00 p.m. until midnight	Low water flows and higher than normal water temperatures
3	Swauk Creek and all tributaries upstream of Williams Creek (8/14)	All game fish	Closed	Low water flows and higher than normal water temperatures
3	Williams Creek and all tributaries (8/14)	All game fish	Closed	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	Closed	Low water flows and higher than normal water temperatures
4	Raging River (7/18)	Trout	Closed	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	Open	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). (7/18)	Summer Steelhead, Trout	Closed, except Near Reiter Ponds Hatchery	Extreme low flow and high temperature. Protect isolated and concentrated ESA-listed adult Chinook, juvenile and adult steelhead.
4	Wallace River (7/18)	Trout	Closed	Extreme low flow and high temperature. Meet adult Chinook broodstock needs at hatchery.
4	Stillaguamish River upstream of Marine Drive (9/2)	All species	Open	Flows have increased
4	The mainstem Nooksack from the Lummi Indian Reservation boundary to the yellow marker at the FFA high school barn in Deming. (9/2)	All species	Open	flows and river temperatures have improved
4	Snoqualmie River: From the mouth to Snoqualmie Falls closed to fishing daily from (9/1)	All species	Closed 2:00 p.m. until one hour before official sunrise.	Low water flows and higher than normal water temperatures
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. South Fork Nooksack (Whatcom Co.) From the mouth to Skookum Creek, and from Wanlick Creek to headwaters including Wanlick and all tributaries.	All species	Closed	Low water flows and higher than normal water temperatures
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.	All species	Closed	Low water flows and higher than normal water temperatures
4	Buck, Downey, and Sulpher creeks (tributaries to Suiattle River) (7/18)	Trout	Closed	Extreme low flow. Protect isolated and concentrated ESA-listed adult Chinook,

5	East Fork Lewis River from Lewisville Park downstream (9/2)	All species	Open	River flows and cooler temperatures
5	Washougal River from Mt. Norway Bridge downstream (9/2)	All species	Open	
6	Bogachiel River downstream of Highway 101(9/2)	All species	Open	
6	Calawah River downstream of Highway 101 bridge (9/2)	All species	Open	
6	Dickey River (Clallam Co.) from the confluence of the East and West forks (9/2)	All species	Open	
6	Sol Duc River downstream of the concrete pump station at the Sol Duc Hatchery (9/2)	All species	Open	
6	Quillayute River (Clallam Co.) outside Olympic National Park	All species	Open	
	All tributaries remain closed. The upper portions of the Dickey, Bogachiel, Calawah, Sol Duc and Clearwater rivers also remain closed.	All species	Closed	Low water flows and higher than normal water temperatures
6	Big Quilcene effective Aug. 16 From the mouth to Highway 101 (9/2)	Salmon	Open	Cooler temperature
6	Newaukum and all tributaries (8/11)	All species	Closed	Low water flows and higher than normal water temperatures
6	Clearwater River from the Snahapish River downstream to the mouth. (9/2)	All species	Open	Cooler temperatures
6	Tributaries of the Queets River (Matheny Creek) (8/10)	All species	Closed	Low water flows and higher than normal water temperatures
	Salmon River outside the Quinault Indian Reservation and Olympic National Park	All species	Open	Cooler temperatures
6	Black River – All species From the mouth upstream to Black Lake (8/12)	All species	Closed	Low water flows and higher than normal water temperatures
6	Nisqually River from the mouth to Military Tank Crossing Bridge. (9/2)	All species	Open	Cooler water temperature

News Clips

[Wildlife officials surveying impact of Okanogan wildfires](#)

Spokesman Review - September 10, 2015

[Promising forecast for fall chinook run on Columbia River](#)

Yakima Herald Republic - September 10, 2015

[Low pink salmon return prompts Upper Skagit Indian Tribe to close its fishery](#)

Skagit Valley Herald - September 10, 2015

[After A Bad Fire Season, Northwest Tribes Question Federal Firefighting Priorities](#)

NW Public Radio - September 10, 2015

[Fire Season Challenges Western States](#)

OPB - September 10, 2015

[Paying for wildfire fight needs new tack, Washington congressman says](#)

Spokesman Review - September 10, 2015

[Rain, snow dampen N. Washington fires](#)

Capital Press - September 09, 2015

[Yakima farmers say water flow or lack of it added to crop woes](#)

Seattle Times - September 09, 2015

[Salmon 'nightmare' ahead?](#)

Chinook Observer - September 08, 2015

[Rain washes away 'extreme' drought in W. Washington](#)

Capital Press - September 08, 2015

['Disastrous': Low snow, heat eat away at Northwest glaciers](#)

The Seattle Times - September 08, 2015

[Initial Impacts Of Fires On WDFW Lands, Rare Grouse Habitat Detailed](#)

NW Sportsman - September 08, 2015

[Monday wildfire update: Okanogan complex 70 percent contained](#)

The Seattle Times - September 07, 2015

[Lake Washington's low sockeye run worries fishery managers](#)

The Seattle Times - September 05, 2015

[The escalating human and financial cost of wildfires](#)

The Seattle Times - September 05, 2015

[Few options to keep Northwest hatchery salmon alive during drought](#)

The Oregonian - OregonLive.com - September 05, 2015

[Our salmon are in hot water](#)

The Seattle Times - September 04, 2015

[This season's Columbia River chinook return knocking on all-time record set in 2001](#)

The Seattle Times - September 04, 2015

[Climate Change Could Leave Pacific Northwest Amphibians High And Dry](#)

ScienceNewsline - September 04, 2015

[Mapping fish die-offs in warming waters](#)

High Country News - September 04, 2015

[Forest Service spends a record \\$243M in a week on wildfires](#)

Capital Press - September 04, 2015

[NW wildfires slide to second in national priority behind Rockies](#)

Seattle Times - September 04, 2015

[OUTDOORS: Wild coho retention allowed on ocean; West End rivers reopened to fishing](#)

Peninsula Daily News (AP) - September 03, 2015

[WDFW compiles information on upcoming hunting seasons](#)

The Daily News - September 03, 2015

[Massive wildfires in U.S. Northwest destroyed habitats, threaten wildlife](#)

Reuters US News - September 03, 2015

[Washington Fishery Managers Lift Some Drought Restrictions](#)

NW Sportsman - September 03, 2015

[Watch Western Wildfires Burn After Years of Drought](#)

National Geographic - September 03, 2015

[OUTDOORS: Rainfall raises, reopens some Peninsula rivers to recreational fishing](#)

Peninsula Daily News (AP) - September 02, 2015

[Weekend storm hampers pink salmon fishing](#)

HeraldNet.com - September 02, 2015

[Many rivers reopen for fishing after summer drought condition restrictions lifted](#)

The Seattle Times - September 02, 2015

[Rain brings temporary relief to Skagit Valley](#)

Skagit Valley Herald - September 02, 2015

[Firefighters Use Mild Conditions To Go On the Offense In Washington State](#)

NW Public Radio - September 02, 2015

[Some Puget Sound region rivers to see drought fishing restrictions lifted very soon](#)

The Seattle Times - September 01, 2015

[Taking Water From A Cascades Lake to Irrigate Orchards](#)

OPB - September 01, 2015

[Drought threatens westside water rights, Washington ecology warns](#)

Capital Press - September 01, 2015

[Rain and cool temps calm fires](#)

Wenatchee World - September 01, 2015

[Sturgeon angling moratorium ends](#)

The Columbian - September 01, 2015

[Taneum Creek canyon crucial for fish, wildlife](#)

Daily Record News - September 01, 2015

[10 Tips For Hunters Navigating Wildfire Dangers](#)

Northwest Sportsman - August 31, 2015

[Drought, Water Quality on Many Minds](#)

Whatcom Watch Online - September 01, 2015

[Fish And Crabs Struggle For Oxygen In Hood Canal's Depleted Waters](#)

Kuow - August 31, 2015

[2 p.m. fishing curfew is lifted on most Oregon waters](#)

Statesman Journal - September 01, 2015

[Cooler, wet weather gives crews helping hand in wildfire battle](#)

Seattle Times - August 31, 2015

[Lack of oxygen killing marine life in Hood Canal waters](#)

The Seattle Times - August 28, 2015

[Razor-clam digs might happen in the fall as toxin levels declining](#)

The Seattle Times - August 30, 2015

[Drought persists, Nooksack personal use fishing suspended](#)

The Bellingham Herald - August 29, 2015

[NOAA Fisheries embraces — not ignores — climate research](#)

The Seattle Times - August 29, 2015

[Anglers flouting rules on Puyallup River](#)

The Olympian - August 28, 2015

[Rain Showers Aid Modest Progress On Wildfires](#)

NW Public Radio - August 31, 2015

[If Seattle loses salmon, we also could lose city's soul](#)

The Seattle Times - August 28, 2015

[Lake Washington is at its lowest in nearly three decades](#)

Kirkland Reporter - August 28, 2015

[The Fishing Corner: River closures has dominated fishing news this summer](#)

The Daily World - August 29, 2015

[Parched Olympic Peninsula Community Eyes New Reservoir](#)

Kuow - August 28, 2015

Links

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

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

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 [El Nino Portal](#)

[NOAA's Climate Prediction Center](#)

[Northwest River Forecast Center Water Supply](#)

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

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

For Further Information:

Drought-related staff resources are available on the "S" drive at [S:\All Agency\Shared Projects\DROUGHT 2015](#). Contact WDFW Drought Coordinator Teresa Scott at teresa.scott@dfw.wa.gov or (360) 902-2713 with questions and suggestions.