



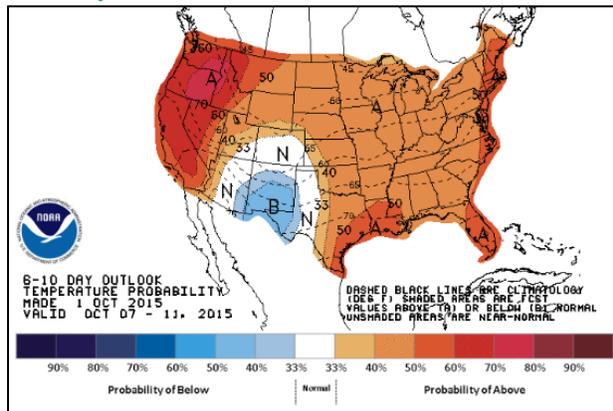
Note: This material is intended for, and contains elements of special interest to, WDFW agency staff. Non-agency readers or anyone having questions about the context, clarity, or content for items in this update should contact the author, WDFW Drought Response Lead Teresa Scott at (360) 902-2713 teresa.scott@dfw.wa.gov

In western Washington this week, the heavy nighttime dew has prevented the ground from being completely dry, but dew doesn't quite make it to streamflow. On the eastside, reports are that while nighttime lows are below freezing, it's too dry to actually create frost. Dungeness, Cowlitz, and Cascade rivers have new low-flow records for these dates in the period of record. With more fish on spawning grounds (with the pink salmon return) there is concern that superimposition of redds will reduce egg-to-fry survivals. Also, fish are returning at body sizes consistently smaller than normal for all species.

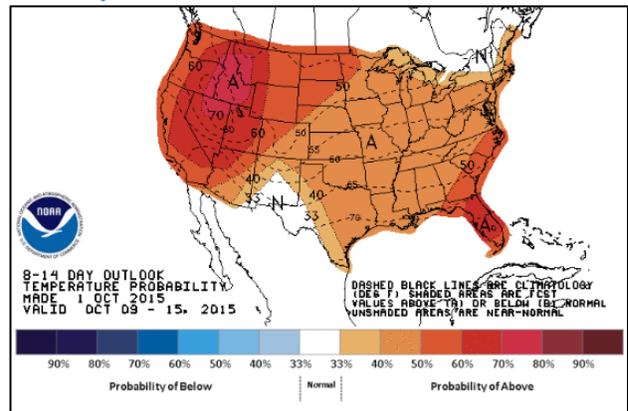
Temperature Forecasts

The [6-to-10 day temperature outlook](#) shows **HIGHER-THAN-NORMAL** temperatures throughout Washington, as does the [8-to-14 day temperature outlook](#).

6-10 day forecast on 9/24 for Oct 7-11

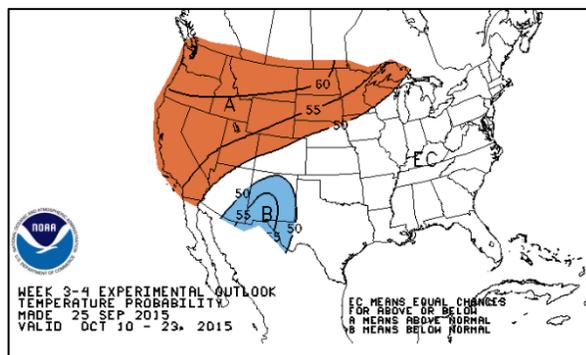


8-14 day forecast on 9/24 for Oct 9-15



NOAA has developed an experimental outlook for weeks 3 and 4, so we'll start looking at those to determine whether they help us. The legend is the same as above. This is information to keep in mind when planning your trick-or-treat costumes for later in the month.

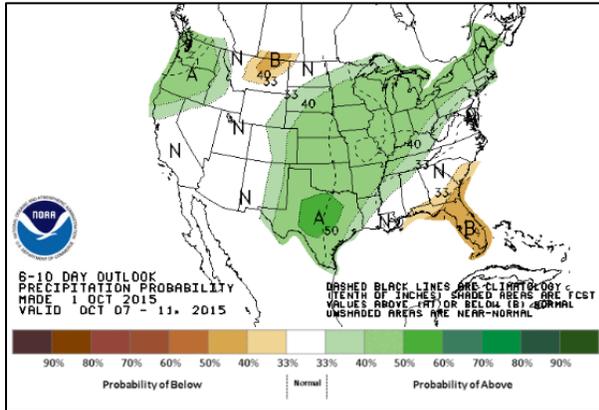
Week 3-4 Experimental Outlook for Temperature
Created on 9/25 for the period October 10-23



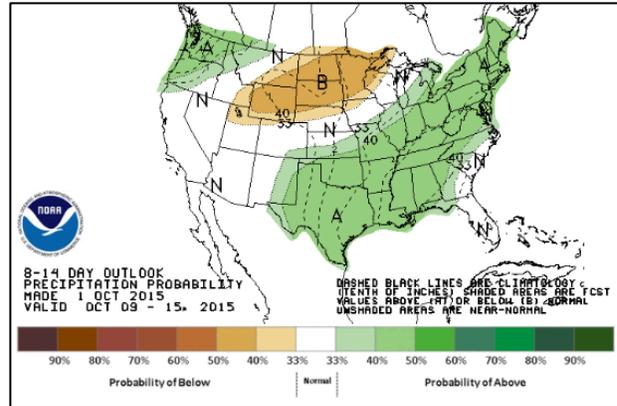
Precipitation Forecasts

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

6-10 day precipitation forecast for Oct 7-11



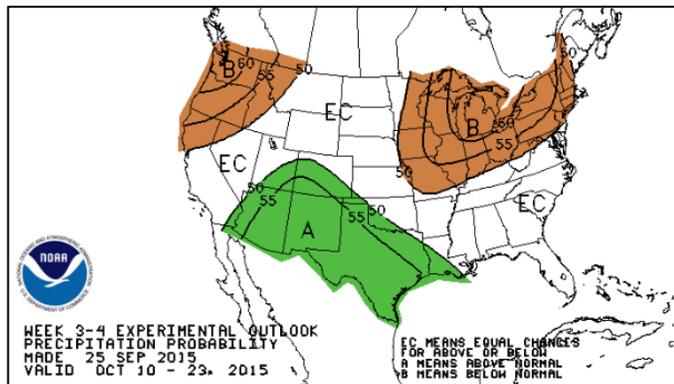
8-14 day precipitation forecast for Oct 9-15



NOAA's experimental outlook for weeks 3 and 4 precipitation is presented below. You might want to build in some sort of water repellent to that Halloween costume.

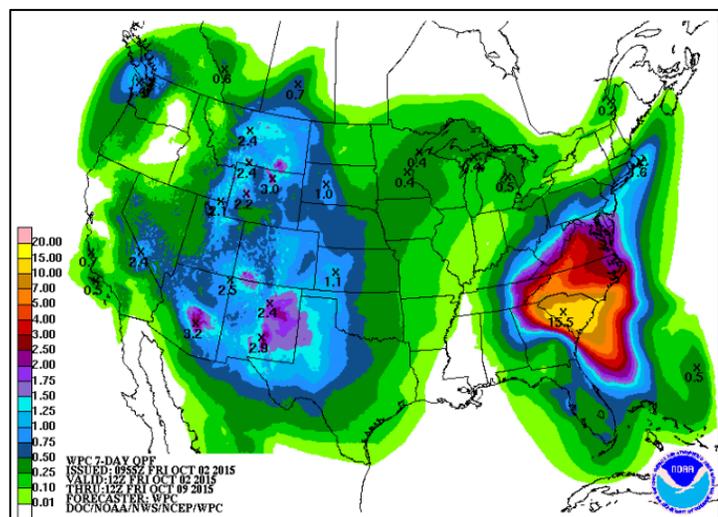
Week 3-4 Experimental Outlook for Precipitation

Created on 9/25 for the period October 10-23



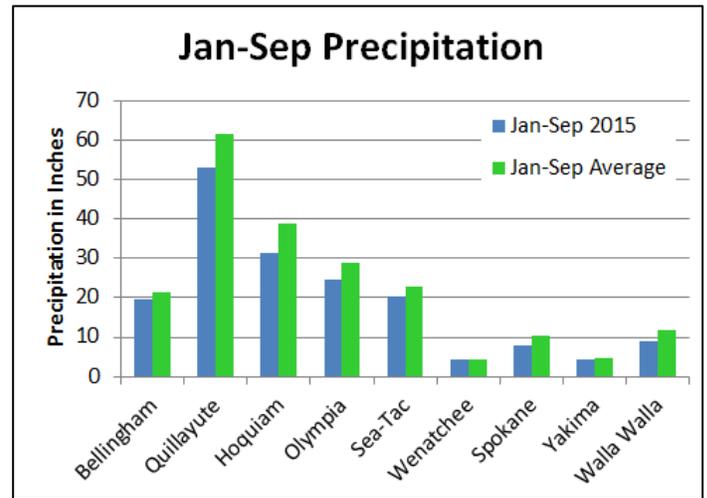
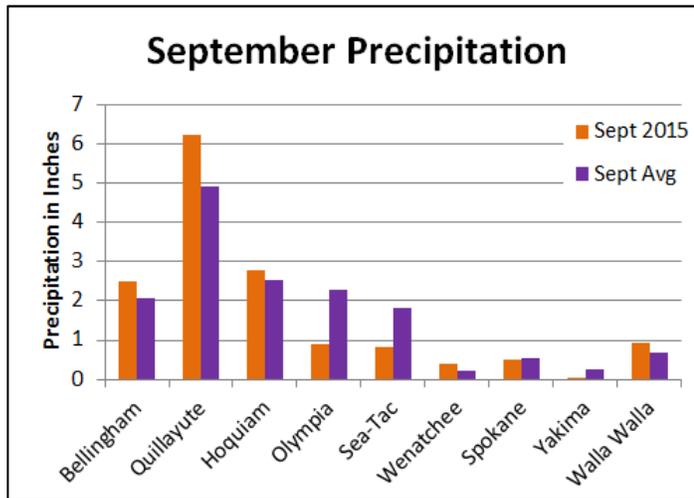
At right is NOAA's weather forecast for [precipitation](#) (right) in most of Washington over the **coming week**. Again we see low amounts (traces) predicted for Eastern Washington, and 0.25 to 1.25 inches in Western Washington.

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

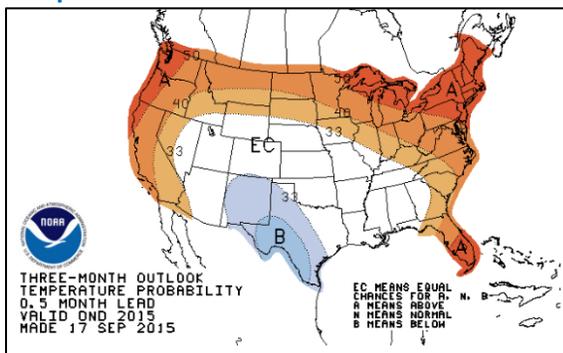
Below is a chart showing the recent history of precipitation at nine Washington weather stations for September and January-through-September. Each is compared to 2000-2014 averages for those periods. Bellingham, Hoquiam, Quillayute, and Walla Walla (go figure) stand out as having higher-than-normal September precipitation, but cumulative annual amounts are less-than-normal statewide, and, really, not by much. Here's an interesting discussion about "water year" (October-September) in a recent [KOMU News Weather Blog](#).



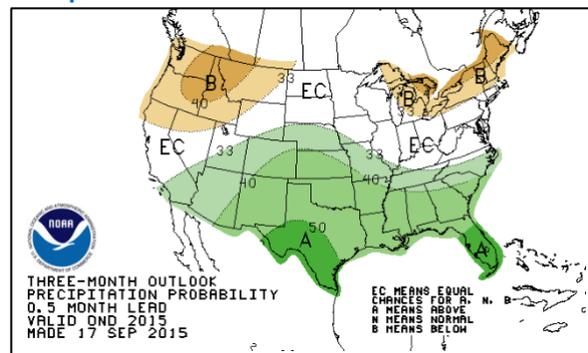
Climate Predictions

Nothing has changed with the [seasonal climate outlooks](#) for October, November, and December. Enough said.

October, November, December Outlook Temperature



October, November, December Outlook Precipitation

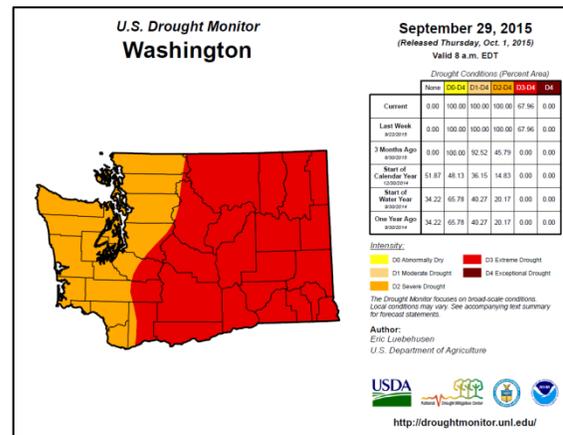


El Niño Update

Our next edition will include the October 8th El Niño/Southern Oscillation update.

Federal Drought Status

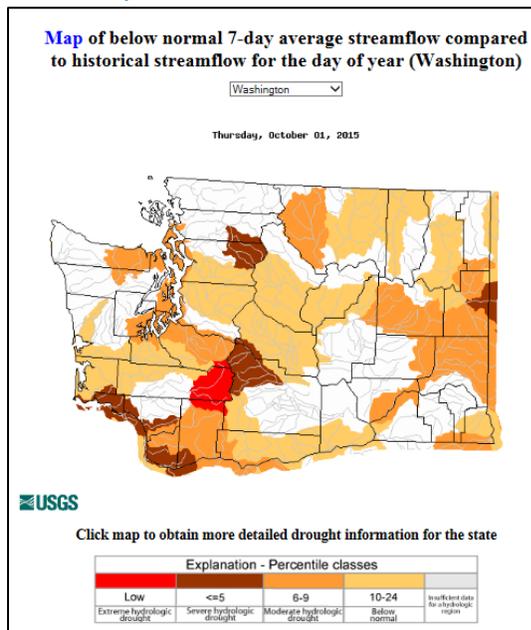
There were no changes in Washington's drought status this week. The [U.S. Drought Portal](#) provides the weekly drought status for the nation.



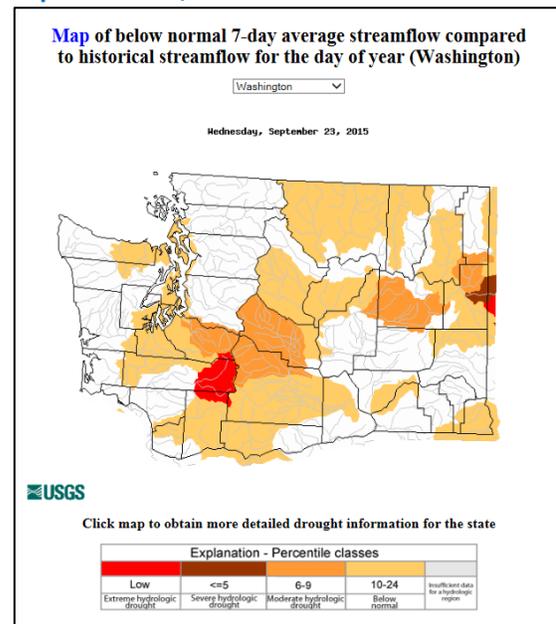
Stream Flows

The USGS figure showing [stream gauges with below normal streamflow](#) for 7 days or more shows streamflows degrading somewhat this week.

Below-normal 7-day average stream flow October 1, 2015



Below-normal 7-day average stream flow September 23, 2015



Selected Washington Streamflows Table

Three locations show record low flows for this date in the record for October 1. Today, Dungeness River flows plunged below the 82 cfs mark, setting a new record for today.

This [Statewide Streamflows](#) tables 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. 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, the fifth column shows in what year that minimum occurred, and the average is provided in the 6th column. Colors in the table emphasize flows less than 100% of average (orange-yellow) and less than 50% (red) for this day in the record. Flows at 100% or more of average are green.

SELECTED WASHINGTON STREAMFLOWS FOR 43 OUT OF 254 GAUGES IN WASHINGTON	TODAY'S FLOW (CFS)	PERCENT OF AVERAGE FOR THIS DATE IN THE RECORD	MIN FLOW (CFS)	YR OF MIN FLOW	MEAN FLOW (CFS)
Mf Nooksack River Near Deming, Wa	193	39%	32	1965	492
Nooksack River At Ferndale, Wa	1,170	55%	770	1985	2,110
Skagit River Near Concrete, Wa	9,610	104%	3,400	1925	9,250
Sauk River At Darrington, Wa	445	38%	300	1929	1,180
Cascade River At Marblemount, Wa	255	34%	294	2006	759
Nf Stillaguamish River Near Arlington, Wa	301	31%	154	1938	983
Snoqualmie River Near Carnation, Wa	607	33%	435	1938	1,850
Skykomish River Near Gold Bar, Wa	489	24%	430	1987	2,010
Issaquah Creek Near Mouth Near Issaquah, Wa	24	52%	13	2003	46
Cedar River Below Diversion Near Landsburg, Wa	225	81%	145	1995	278
Cedar River At Renton, Wa	254	92%	50	1958	276
Big Soos Creek Above Hatchery Near Auburn, Wa	31	76%	21	1999	41
Green River Near Auburn, Wa	449	89%	202	1989	507
South Prairie Creek At South Prairie, Wa	28	24%	23	2003	118
Puyallup River At Puyallup, Wa	935	52%	700	1934	1,800
Nisqually River At Mckenna, Wa	576	90%	136	1963	637
Deschutes River Near Rainier, Wa	22	27%	20	2002	81
Nf Skokomish R Bl Staircase Rpd Nr Hoodspport, Wa	67	31%	40	1939	215
Dungeness River Near Sequim, Wa	85	50%	82	1928	169
Hoko River Near Sekiu, Wa	75	43%	12	1998	174
Calawah River Near Forks, Wa	148	36%	42	2003	414
Hoh River At Us Highway 101 Near Forks, Wa	759	51%	433	1965	1,500
Satsop River Near Satsop, Wa	363	56%	192	1998	645
Chehalis River Near Grand Mound, Wa	188	33%	108	1967	563
Naselle River Near Naselle, Wa	26	18%	22	2006	146
Cowlitz River Below Mayfield Dam, Wa	3,540	128%	960	1934	2,770
Cowlitz River At Packwood, Wa	182	26%	275	1930	694
Lewis River At Ariel, Wa	867	40%	534	1945	2,180
White Salmon River Near Underwood, Wa	472	76%	403	1994	625
Klickitat River Above West Fork Near Glenwood, Wa	78	72%	55	1993	108
Walla Walla River Near Touchet, Wa	5	8%	2	1994	64
Tucannon River Near Starbuck, Wa	69	91%	51	1915	76
Grande Ronde River At Troy, Or	504	66%	443	2001	769
Yakima River At Kiona, Wa	537	28%	497	1979	1,950
American River Near Nile, Wa	31	53%	28	1942	58
Crab Creek At Irby, Wa	1	12%	0	1992	7
Wenatchee River At Plain, Wa	272	41%	270	1942	656
Methow River Near Pateros, Wa	248	58%	236	1994	431

Okanogan River At Malott, Wa	593	56%	450	1967	1,050
Okanogan River At Oroville, Wa	242	49%	120	1944	495
Spokane River At Spokane, Wa	810	44%	1,000	1954	1,860
Colville River At Kettle Falls, Wa	53	51%	23	1931	104
Pend Oreille River Below Box Canyon Near Lone, Wa	18,400	108%	6,020	1963	17,100

Real-Time Water Temperature

Water temperatures are still relatively high in the Columbia and Snake mainstems, and Lake Osoyoos (Canadian Okanogan). There are no stations reporting temperatures above 20 degrees C!!!

Follow this link to see the USGS [Real Time Temperature Stations map](#) for Washington. Below is a table showing September 23 [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. 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 GAUGES IN WASHINGTON	WATER TEMP. DEGREES C
Nf Skokomish R Bl Staircase Rpds Nr Hoodspport, Wa	13.7
White River At Headworks Ab Flume Nr Buckley, Wa	11.4
White River At R Street Near Auburn, Wa	13
Lake Tapps Diversion At Dieringer, Wa	12.5
Ysi 6920v2-2 At Wsu 2 At Puyallup, Wa	10.6
Clarks Creek At Tacoma Road Near Puyallup, Wa	11
Duwamish River At Golf Course At Tukwila, Wa	13.7
Cedar River Near Cedar Falls, Wa	11.1
Cedar River At Cedar Falls, Wa	14.6
Cedar River Below Diversion Near Landsburg, Wa	12
Cedar River At Renton, Wa	13
South Fork Sultan River Near Sultan, Wa	8.9
Sultan River Below Diversion Dam Near Sultan, Wa	13.1
North Fork Tolt River Near Carnation, Wa	9.4
South Fork Tolt River Near Index, Wa	9.2
South Fork Tolt River Near Carnation, Wa	12.3
Sf Tolt River Bl Regulating Basin Nr Carnation, Wa	11.8
Nf Stillaguamish East Pooled Slide Area Nr Oso, Wa	6.4
Skagit River At Newhalem, Wa	10.2
Skagit River At Marblemount, Wa	10.9
Nf Nooksack River Bl Cascade Creek Nr Glacier, Wa	8.6
Sf Nooksack River At Saxon Bridge, Wa	11.5
Nooksack River At North Cedarville, Wa	11.1
Boundary Reservoir At Forebay Nr Metaline Falls	15.4
Pend Oreille River At International Boundary	15.6

Columbia River At Bridgeport, Wa	17.1
Ninemile Creek Near Oroville, Wa	
Osoyoos Lake Near Oroville, Wa	18.6
Okanogan River At Oroville, Wa	17.7
Similkameen River Near Nighthawk, Wa	13.4
Okanogan River Near Tonasket, Wa	15.7
Okanogan River At Malott, Wa	15.9
Okanogan River Nr Wakefield Br South Of Malott, Wa	15.3
Andrews Creek Near Mazama, Wa	10
Methow River Near Mouth Near Pateros, Wa	13.8
Wells Powerplant Headwater Near Pateros, Wa	17.2
Wells Powerplant Headwater Near Pateros, Wa	16.9
Wells Powerplant Headwater Near Pateros, Wa	16.8
Columbia River Below Hwy 395 Bridge At Pasco, Wa	
Snake River Bl Mcduff Rapids At China Gardens, Id	19.2
Snake River Near Anatone, Wa	18.8
North Fork Clearwater River At Ahsahka, Id	9.5
Clearwater River Nr Peck Id	12.5
Clearwater River Nr Peck Id	12.2
Clearwater River Near Lewiston, Id	15.2
Lower Granite Lk Forebay At Lower Granite Dam, Wa	
Snake River (Right Bank) Bl Lower Granite Dam, Wa	18.1
Lake Bryan Forebay At Little Goose Dam, Wa	
Snake River Below Little Goose Dam, Wa	17.8
Lake H G West Forebay At Lower Monumental Dam, Wa	
Snake River Below Lower Monumental Dam, Wa	17.7
Lake Sacajawea Forebay At Ice Harbor Dam, Wa	
Snake River Bl Goose Island Bl Ice Harbor Dam, Wa	18.2
Columbia River At McNary Dam Lock Nr Umatilla, Or	
Columbia River Below McNary Dam Near Umatilla, Or	18.4
Columbia River At The Dalles, Or	18.8
Columbia River, Right Bank, Near Cliffs, Wa	19

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

Hatchery Returns To-Date

Total Adult Salmon Returned to WDFW Facilities by Species and Run Type

Hatchery Returns through 9/30/2015 - Total does not include jacks. Numbers are preliminary estimates only.

FACILITY	SPECIES RUN	CHINOOK							STEELHEAD	
		FALL	SPRING	SUMMER	CHUM	COHO	PINK	SOCKEYE	SUMMER	WINTER
Kendall Cr Hatchery			2,916				144	4		446
Whatcom Cr Hatchery		18				4	88			
Glenwood Springs		855								
Samish Hatchery		3,387				61				
Baker Lk Hatchery						5		6,301		
Marblemount Hatchery			1,723	64		172	51			
Whitehorse Pond				4					11	172
Reiter Ponds									626	
Sunset Falls Fcf				436		1,542	17,252	6	694	
Tokul Cr Hatchery		72								
Wallace R Hatchery				3,220		50	1,645		798	
Cedar River Hatchery		24						1,266		
Issaquah Hatchery		2,125				75		1		
Soos Creek Hatchery		4,228					31		63	
Voights Cr Hatchery		2,493				1,000	705			
Tumwater Falls Hatch		2,900								
Garrison Hatchery		40				10				
Minter Cr Hatchery		2,765	187			1,183	163			
George Adams Hatchery		5,707				140				
Hoodspout Hatchery		2,054			3	16	6,435			
Dungeness Hatchery			6							
Hurd Cr Hatchery			191							
Morse Creek Hatchery		27				1	23		2	
Bogachiel Hatchery									369	
Solduc Hatchery				509		4,208			9	
Humtulpis Hatchery		30							30	
Lk Aberdeen Hatchery		22				34			339	
Forks Creek Hatchery		5,090				95				
Naselle Hatchery		4,763				239				18
Cowlitz Salmon Hatch		2,903	17,601		1	349	4	6	7,538	
Cowlitz Trout Hatch									893	
Kalama Falls Hatchery		3,707	2,674			6			5,050	
North Toutle Hatchery		761				91			51	
Fallert Cr Hatchery		4	1			5			6	
Lewis River Hatchery		93	218			828		1	92	
Merwin Dam Collection		213	690			142		30	3,895	

FACILITY	SPECIES RUN	CHINOOK			CHUM	COHO	PINK	SOCKEYE	STEELHEAD	
		FALL	SPRING	SUMMER					SUMMER	WINTER
Merwin Hatchery									321	
Modrow Trap		24,675				797			1,416	
Speelyai Hatchery			863			529				
Skamania Hatchery									1,685	
Washougal Hatchery		2,235							168	
Washougal River Weir		8,109				1			314	
Lyons Ferry Hatchery		1,439	478							
Tucannon Hatchery			622							
Priest Rapids Hatchery		7,964						1	10	
Ringold Springs Hatchery		3,973				1			105	
Chiwawa Hatchery			450						2	
Methow Hatchery			3,388							
Eastbank Hatchery			291	768				950	64	
Wells Hatchery				1,939					300	

Snake & Columbia Rivers

Grand Coulee Reservoir is at 1,282.0 feet (9-27-15) and has held steady over the last week.

Outflows at Grand Coulee have ranged between 62.4 and 88.5 Kcfs over the last week.

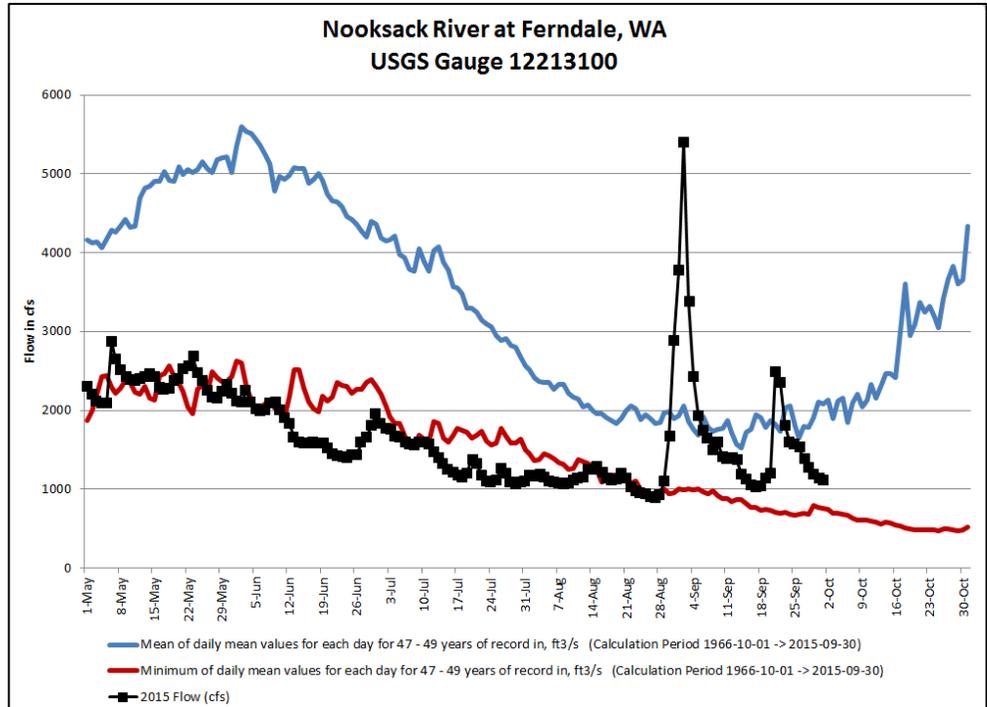
Dworshak is currently at an elevation of 1,518.7 feet (9-27-15) and drafted 1.0 feet over the last week. Outflows have been 1.6 to 2.7 Kcfs over the last week.

Fisheries Changes

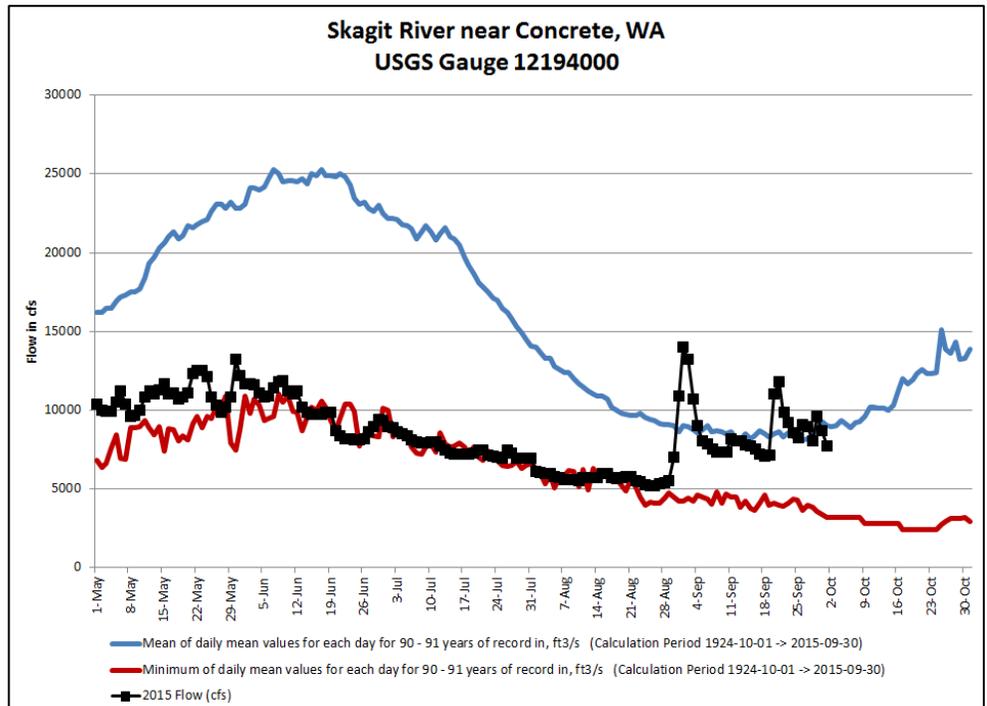
Fishing restrictions were lifted on Black River, Raging, and Wallace Rivers this week. Information about status of drought-related fisheries changes can be found at

<http://wdfw.wa.gov/conservation/drought/> .

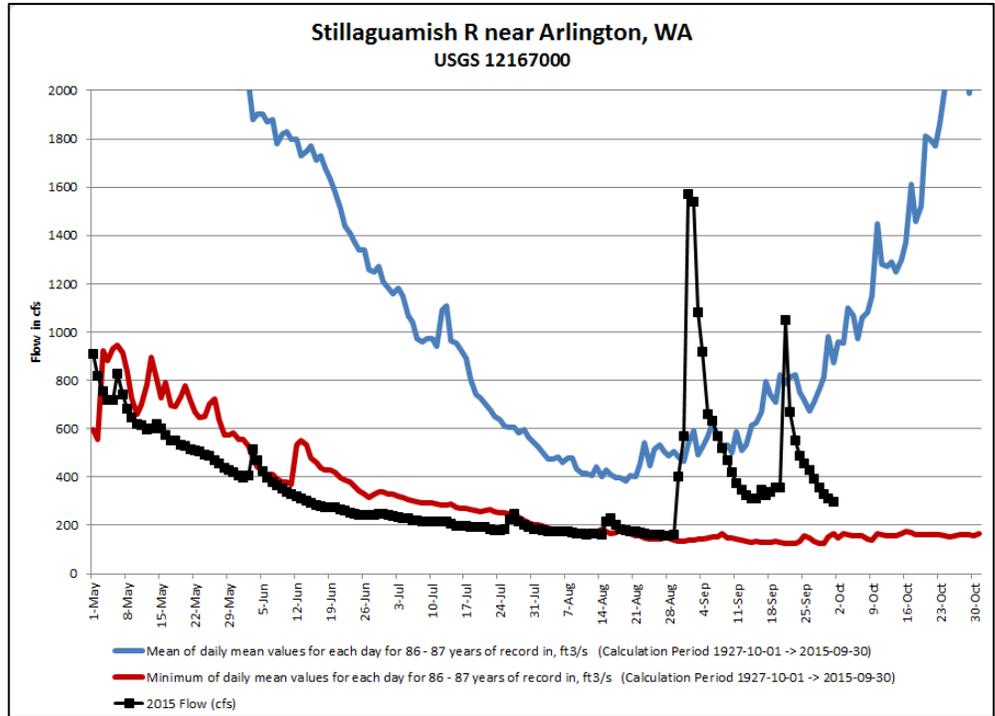
Nooksack



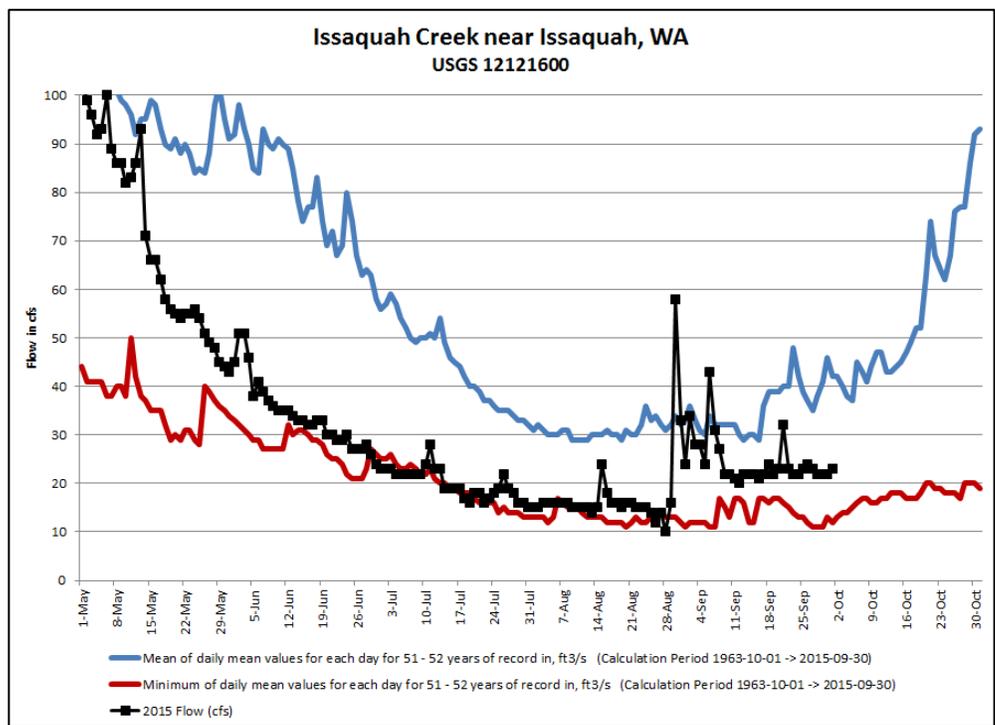
Skagit



Stillaguamish

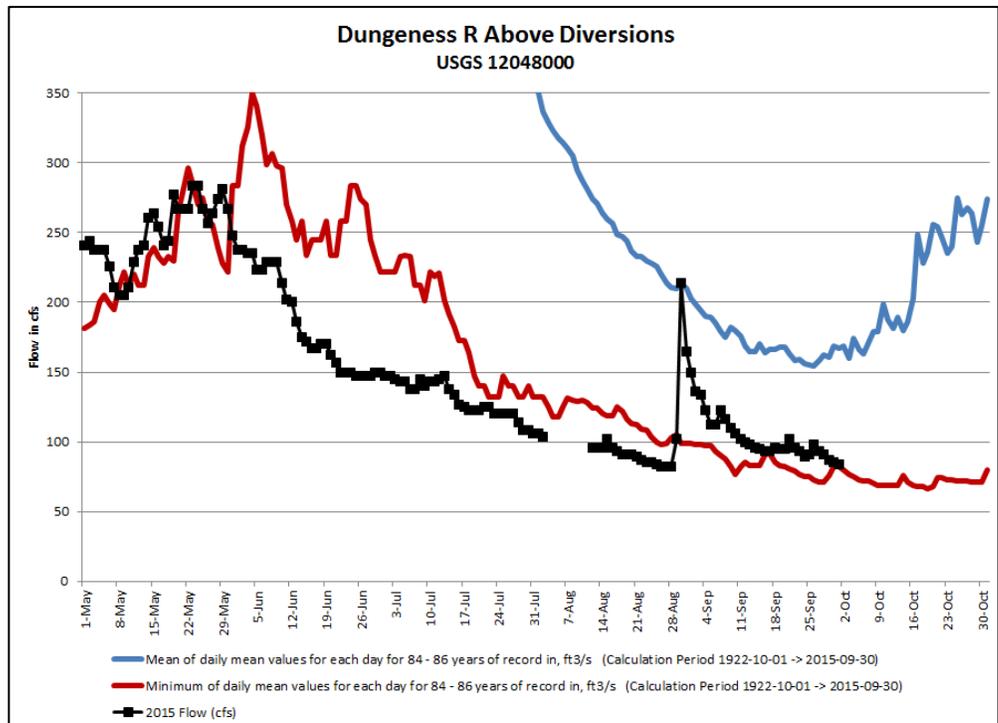


Lake Washington

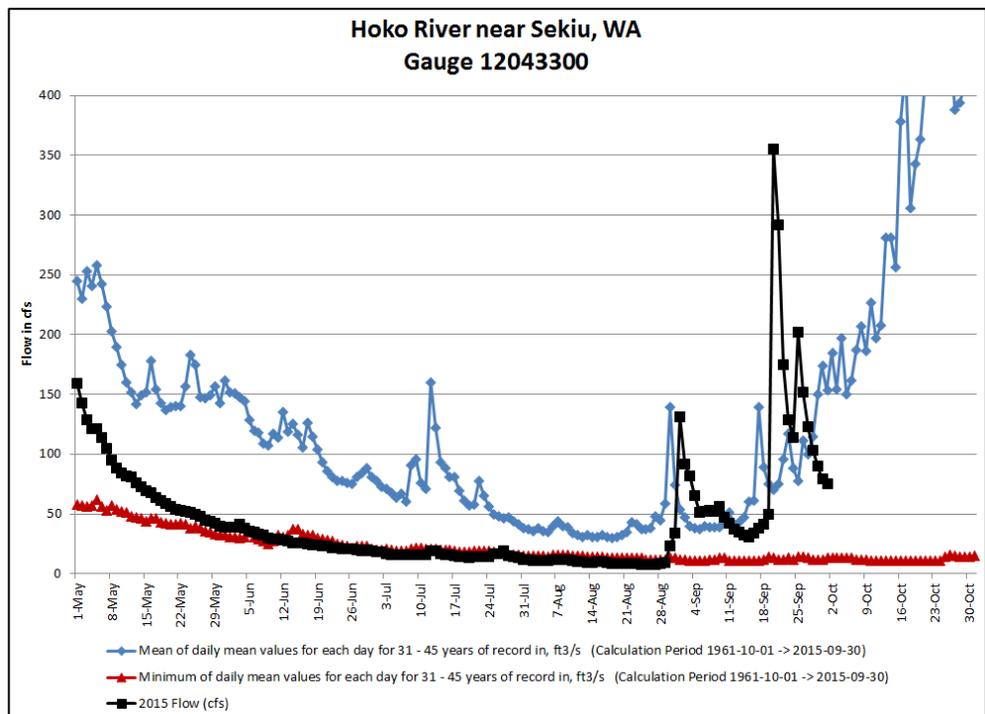


Dungeness

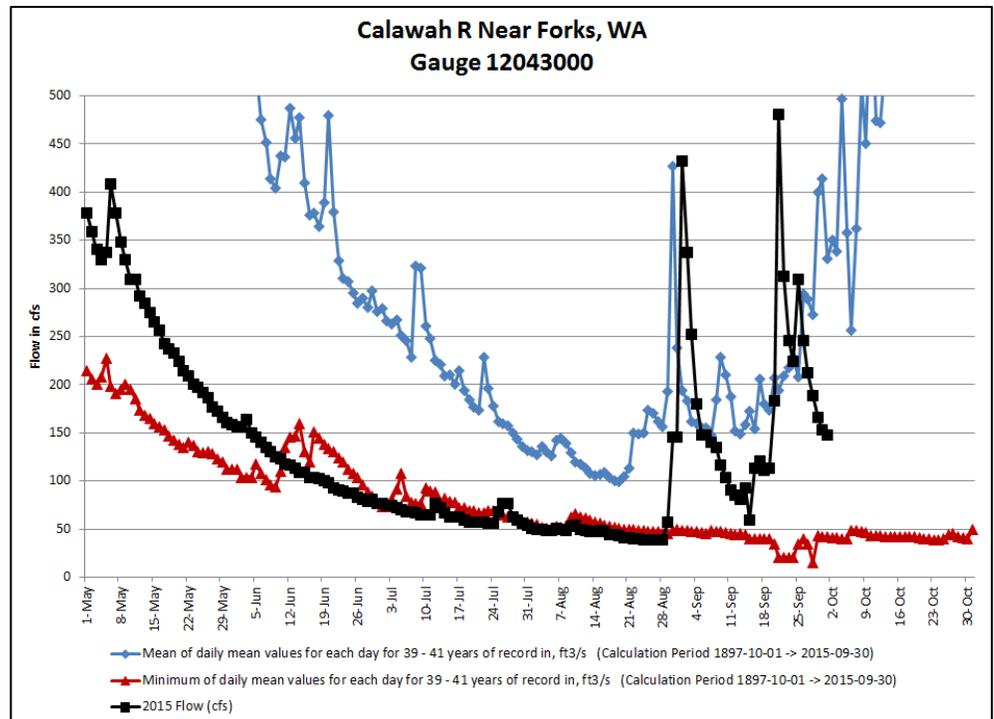
Flow on 10/2 was 82 cfs, which is a new low for 2015. Pink and chinook are spawning now; coho to come.



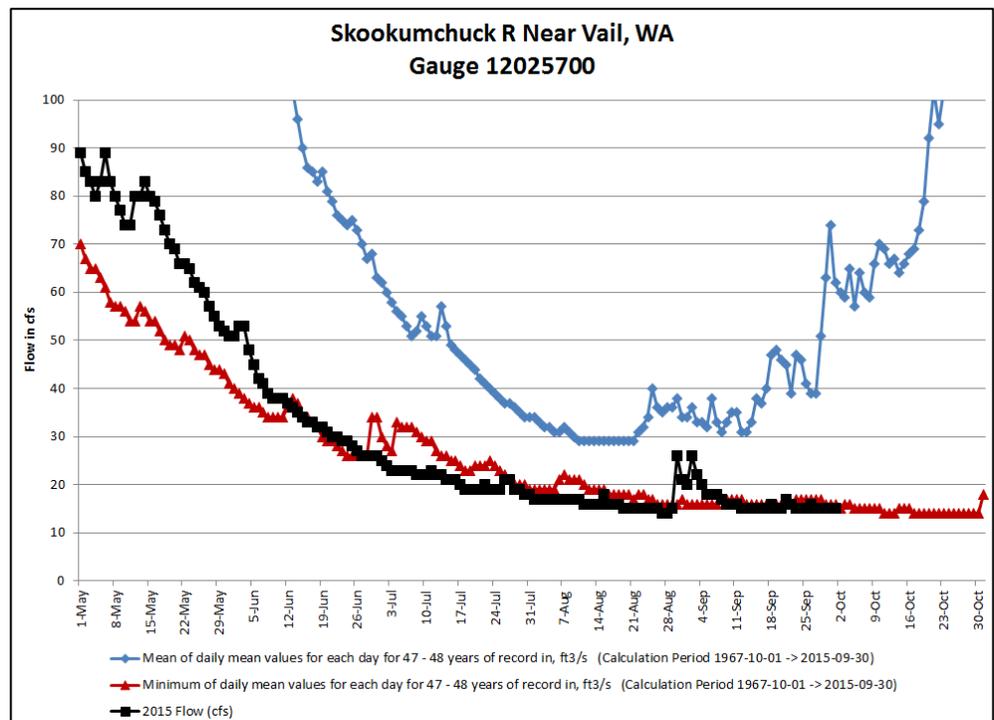
Hoko



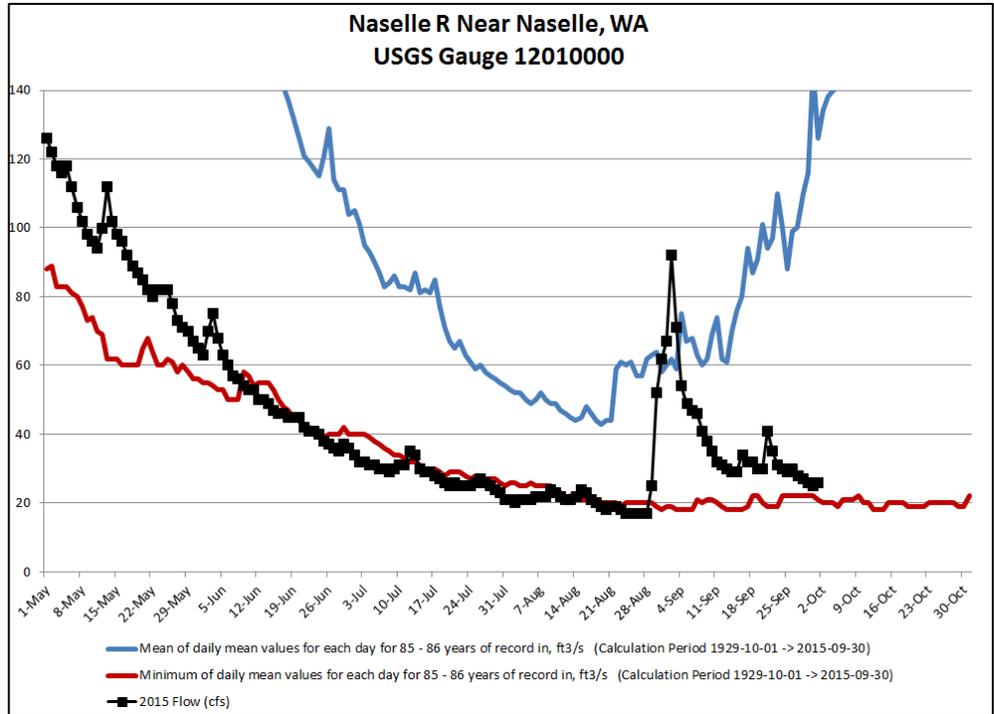
Calawah



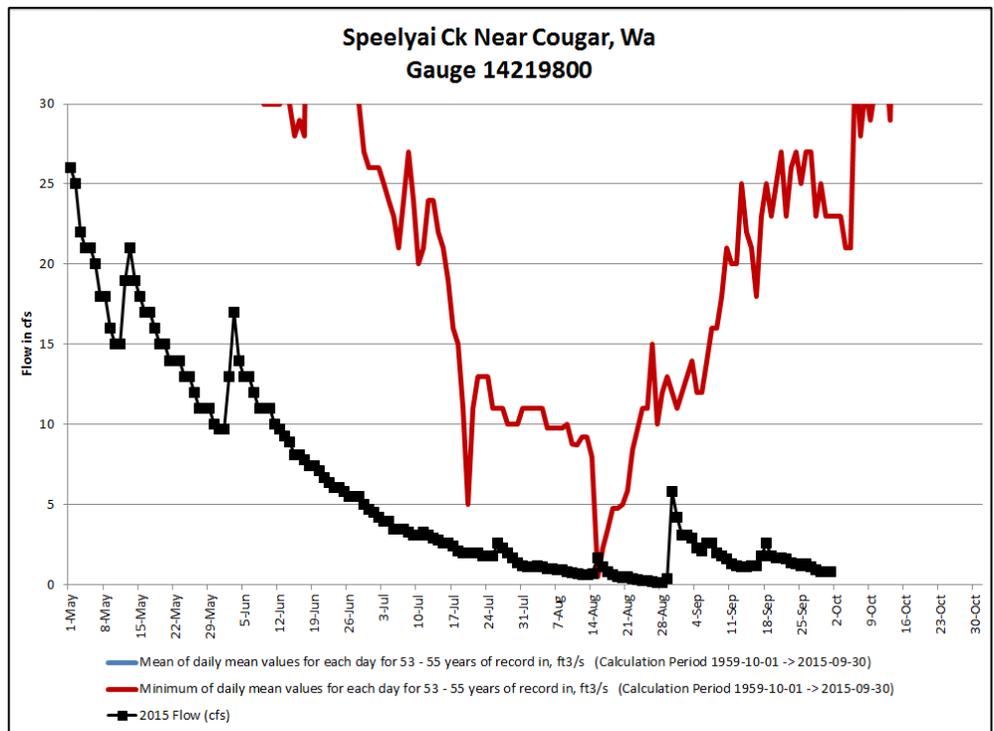
Skookumchuck



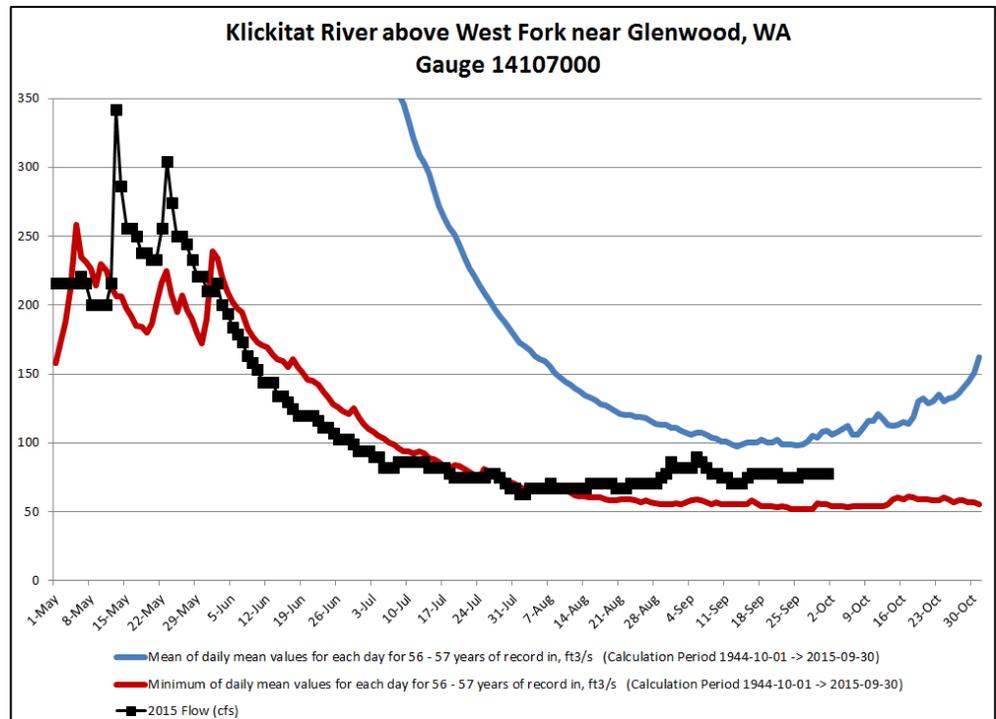
Naselle



Speelyai



Klickitat



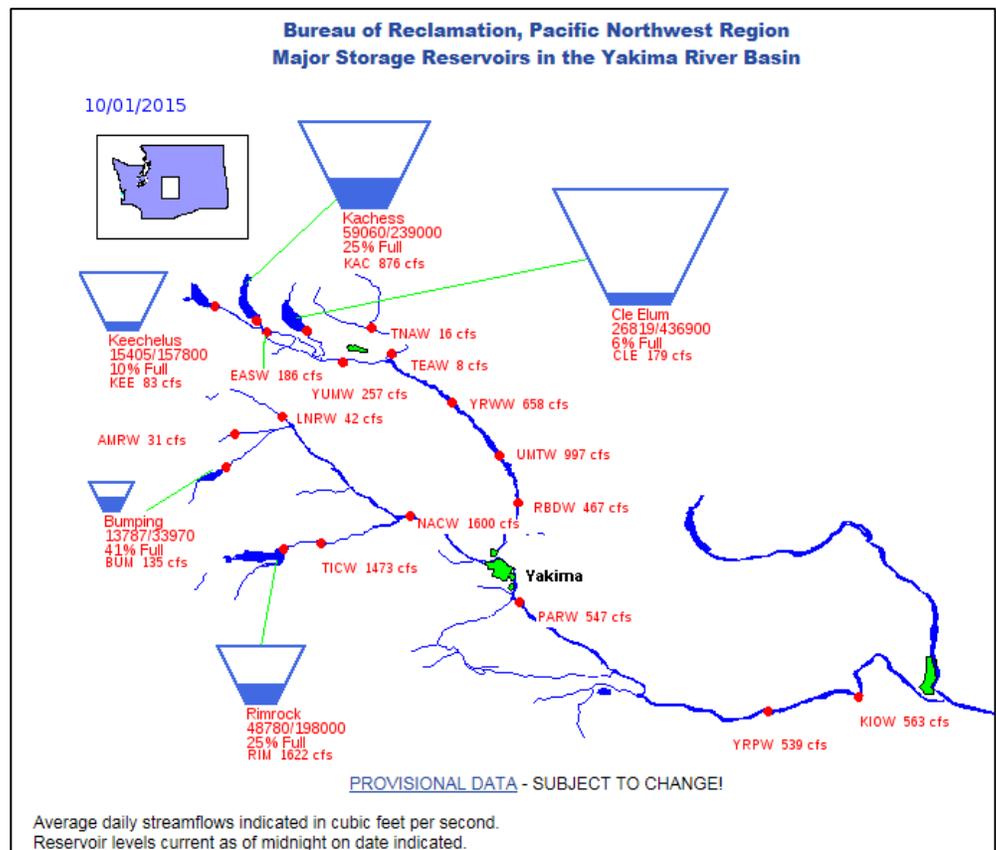
Yakima

Keechelus is 10% full;
 Kachess 25%;
 Cle Elum 6%;
 Bumping 41%;
 Rimrock 25%.

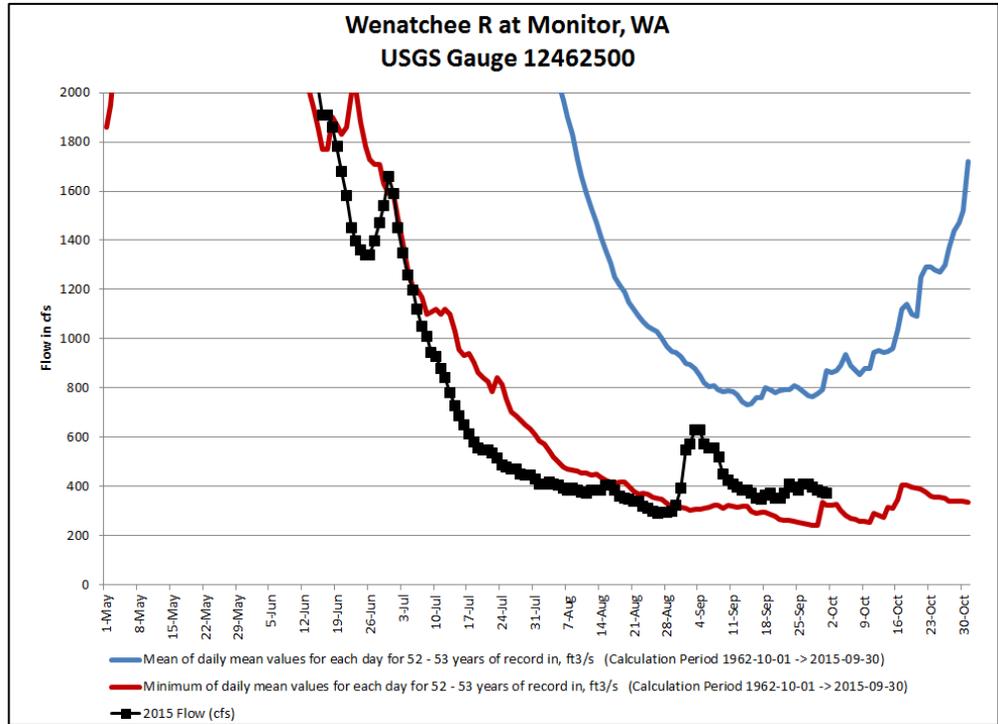
Compared to
 “average”:

Storage is 55.9%
 Inflows 51%
 Releases 111%
 Major Diversions 99%

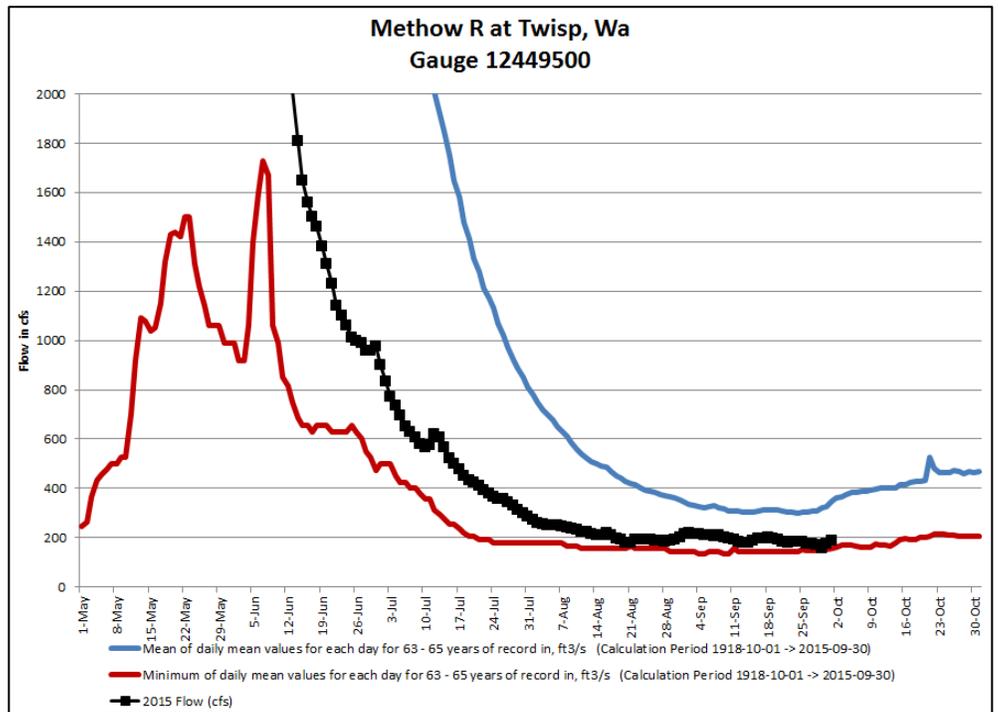
For Box Canyon Creek
 bull trout aficionados:
 The Bureau reports
 that Kachess will draft
 to about elevation
 2208 ft., which is 8
 feet lower than the
 elevation on
 Wednesday 9/30.



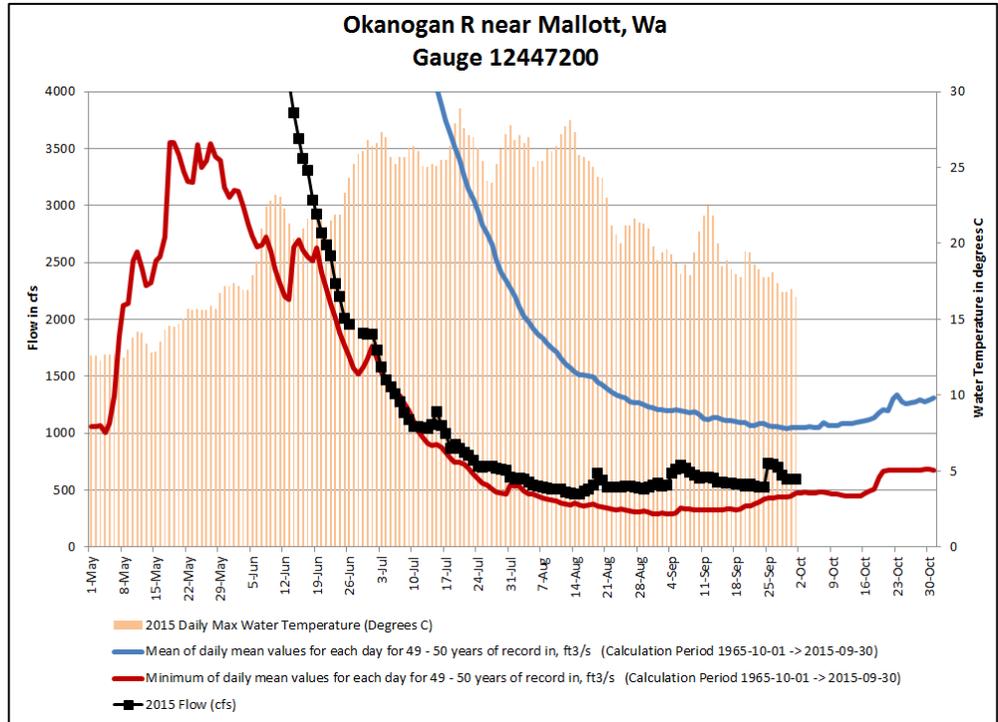
Wenatchee



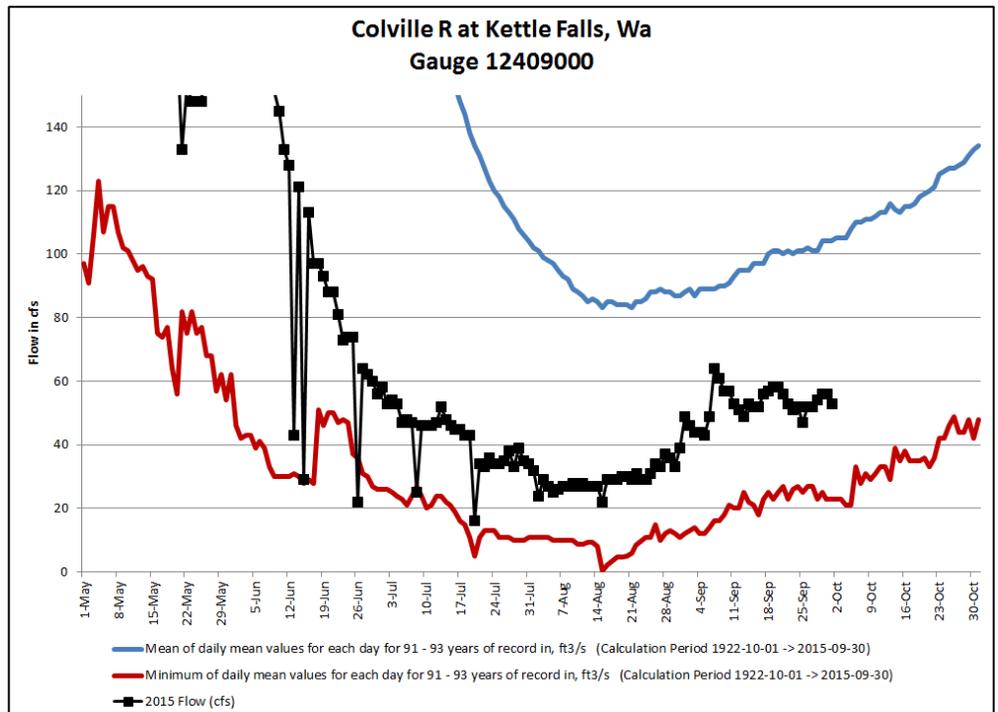
Methow



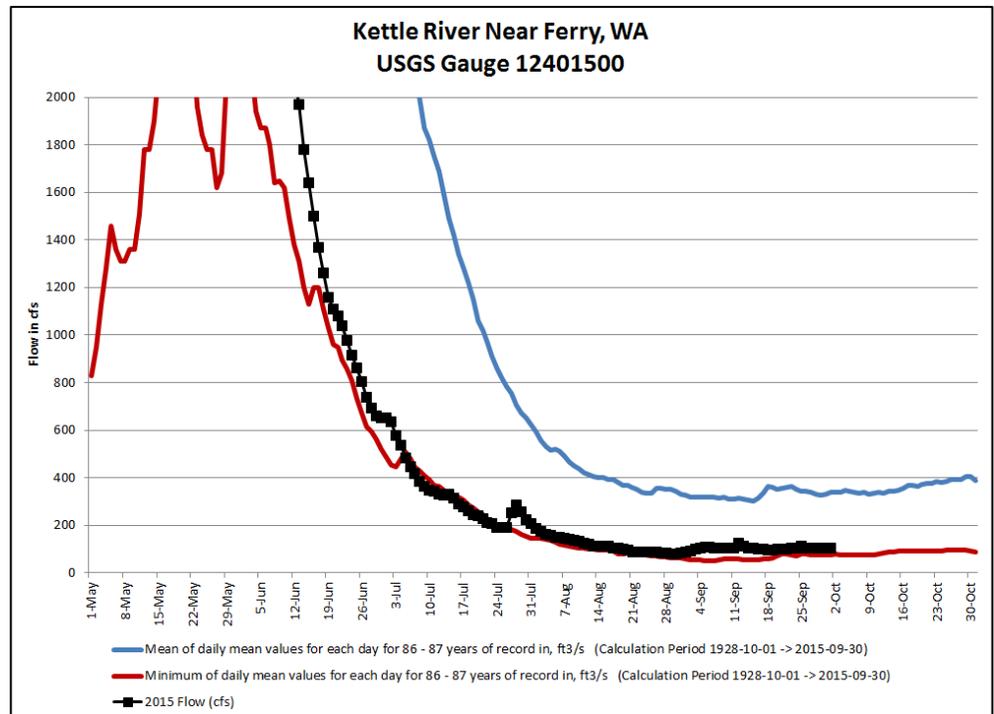
Okanogan



Colville



Kettle



Low Flow Remediation

Region 3: Box Canyon Creek, Kachess Reservoir

Habitat Water Science Team members, Habitat Fish Passage staff, Yakima Screen Shop staff, local Habitat biologists, and staff from Kittitas Conservation Trust and Mid-Columbia Fisheries Enhancement Group met Monday Sept. 28 to construct a passage flume at Box Canyon Creek to facilitate volitional bull trout migrations from the lake upstream to upper spawning reaches. The flume is slightly less than four hundred feet long, and used 4 roles of plastic sheeting, 168 weed-free straw bales, and lots of fence posts. Low creek flows and little precipitation continue to impede passage, and the reservoir levels are lower than normal and dropping. Spawning ground surveys being conducted today will tell us how many bull trout have used the flume for migration so far.

First section looking upstream from mouth



Watering up section 1



Laying plastic sheeting for second section



Drought-related impacts to fish at hatcheries

Mortalities are shown for drought-caused losses only. “% Production” represents the % lost of the total production of the identified species at that facility.

REGION	FACILITY (SPECIES)	MORTALITY (% PRODUCTION)	TRANSFERS & RELEASES
3	Naches Hatchery	-0-	Two new wells have been drilled at this facility to replace the previous unreliable water supply.
4	Bellingham (Rainbow Trout)	5,760 (80%)	
4	Issaquah (Coho)	6,728 (1%)	
4	Soos Creek (Summer Steelhead)	41,308 (60%)	
4	Soos Creek (Coho)	172,963 (21%)	Transferred 480,000 coho to Keta Creek Complex (Muckleshoot). This is a normal activity that was executed early this year.
4	Icy Creek (chinook)	-0-	107,000, or 33%, of the population was released early into the Green River on 7/29.
5	Grays River (Steelhead)	150,300 (93%)	450k type S coho were transferred to Cowlitz Trout Hatchery on July 28th and 29 th due to low water supply at Grays.
5	North Toutle (Coho)	101,746 (76%)	On July 14, the remaining 33,600 Type S Toutle Stock Coho were transferred to Cowlitz Trout Hatchery. The move was prompted by the losses due to columnaris (left).
5	Lewis (chinook)	-0-	On Mon. Aug. 3rd 500k Spring were released (~38% of the Lewis Spring program); standard release in Oct.
5	Speelyai (kokanee)	-0-	Fall Kokanee program released early due to construction of new intake at facility.
5	Vancouver	-0-	Well level is dropping so plans are underway to plant 15K brown trout early .
5	Washougal (Coho)	37,000 (2%)	
6	Elwha	0 (0%)	Staff is working to develop a replacement well at this facility
6	Forks Creek (Steelhead)	14,489 (24%)	
6	Lake Aberdeen (Steelhead)	64,903 (22%)	
	Naselle (Chinook)	2,700 new	Stream survey staff walked the 4,000-foot section below the hatchery weir and the powerlines on the Naselle River again and counted an additional 1,400 fall Chinook mortalities in that section. Staff will work the fish to check for tags and take heads of tagged fish. The loss is due to Ich which is elevated due to low flow conditions, loss was expect but not at this level.
6	Naselle (Steelhead)	64,989 (22%)	
6	Naselle (Coho)	639,646 (44%)	
6	Voights Creek (Coho)	347,000 (44%)	

News Clips

[09/27/2015: "Late-Season Crab Fishing Opens Oct. 1"](#)

Island Guardian - September 28, 2015

[Vancouver Lake restoration efforts aim to improve water flow](#)

The Columbian - September 28, 2015

[South coast of Washington reopens to crab fishing](#)

The Daily World - September 26, 2015

[Rare and strange fish "opah" landed off Westport could be a new state record](#)

The Seattle Times - September 28, 2015

[What we should expect for the coming winter](#)

King 5 - September 30, 2015

[Sport crabbing reopens as ocean toxin clears](#)

Chinook Observer - September 29, 2015

[Olympic National Park blasting boulders out of Elwha River to ease way for fish passage](#)

Peninsula Daily News (AP) - September 29, 2015

[City seeks volunteers to work on boat ramp](#)

North County Outlook - September 29, 2015

[New Plan For Recovering Bull Trout Takes Effect](#)

Kuow - October 01, 2015

[Columbia coho run may prove disappointing](#)

The Columbian - September 30, 2015

[Plenty of crab remaining as late season opens](#)

HeraldNet.com - October 01, 2015

[OUTDOORS: Crabbing reopens on North Olympic Peninsula; changes to salmon regulations](#)

Peninsula Daily News (AP) - September 30, 2015

[Ocean salmon season ends on a high note, and tuna action remains fairly good](#)

The Seattle Times - September 30, 2015

[Forest thinning promoted as effective way to reduce fire risks](#)

Methow Valley News - October 02, 2015

[The Lowdown On The Lake Wenatchee Sockeye Slowdown](#)

Northwest Sportsman - October 02, 2015

['Water year' rainfall nearly normal, so how are we in a drought?](#)

Weather Blogs - KOMO News - October 02, 2015

[Drought was rough on sockeye, and future could be an upstream battle](#)

Yakima Herald Republic - October 01, 2015

[Coho run looking weak so far](#)

The Daily News - October 01, 2015

Links

[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:

Drought-related staff resources are available on WDFW shared 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, suggestions, and reports or observations.

The next WDFW status update will be distributed October 16. Between mid-November, and February 2016, drought news will be distributed as needed; it's currently anticipated that regular drought status updates will resume in February 2016.