

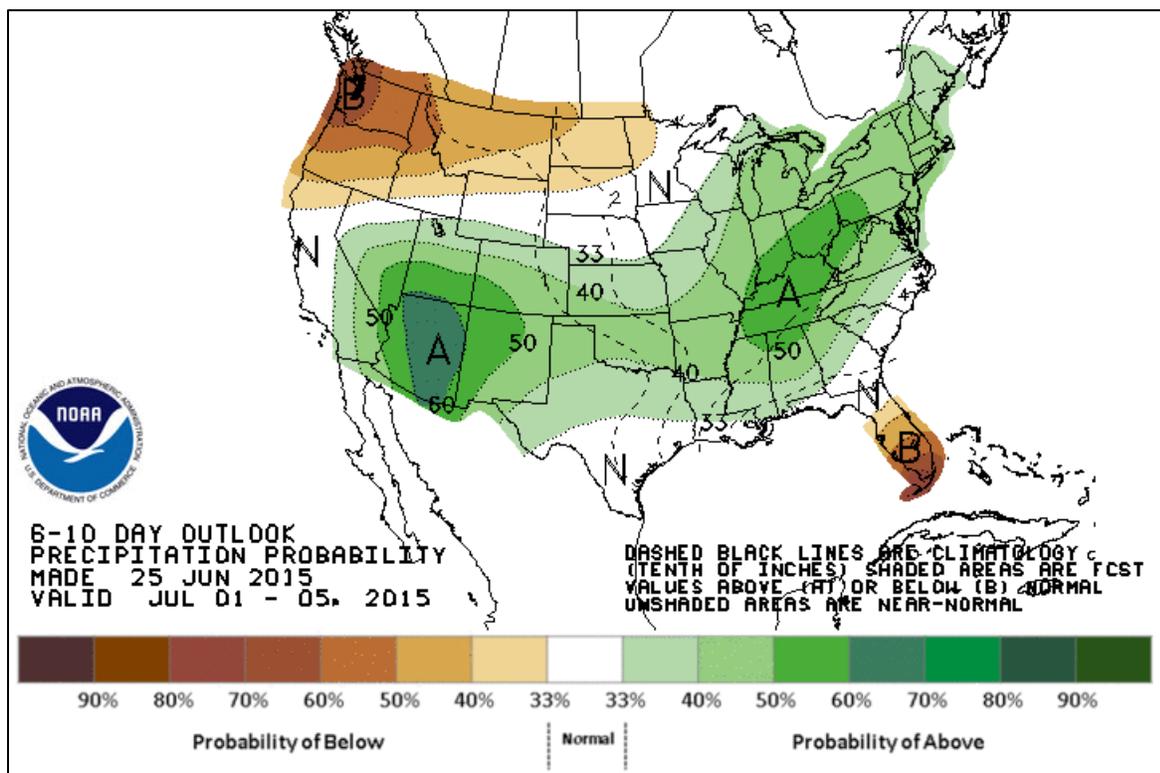


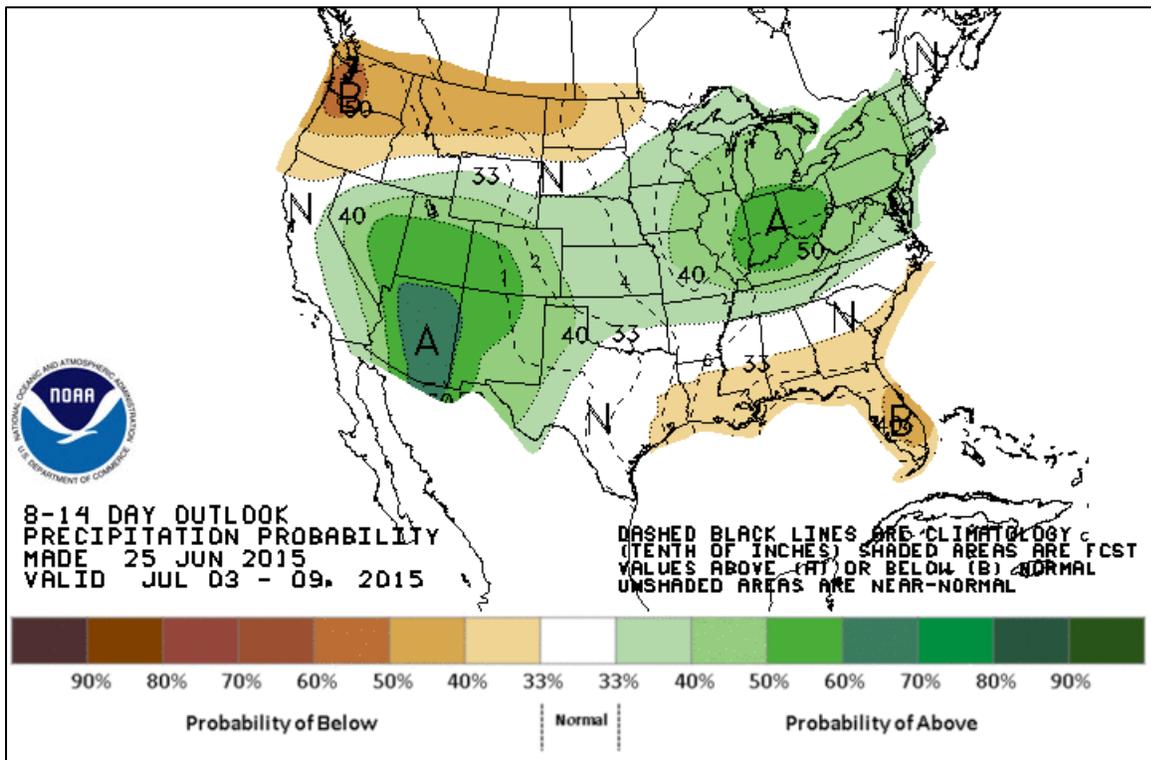
Note: This material is intended for, and contains elements of special interest to, WDFW agency staff. Non-agency readers or anyone having questions about the context, clarity, or content for items in this update should contact the author, WDFW Drought Coordinator Teresa Scott at (360) 902-2713 teresa.scott@dfw.wa.gov

Reports of stranded fish and other drought impacts on Washington streams have been increasing as the days go by. Three reports of fish stranding events were received this week, and there are likely many more that have not yet been reported. Dept. of Health has received inquiries from dozens of municipalities and small, vulnerable water systems, many in southwest Washington. Early in drought planning the assumption was that rain- and groundwater-fed basins as in Southwest Washington would not be affected by this drought. We couldn't have been more wrong! Read on for more information on WDFW drought response for the week beginning June 20.

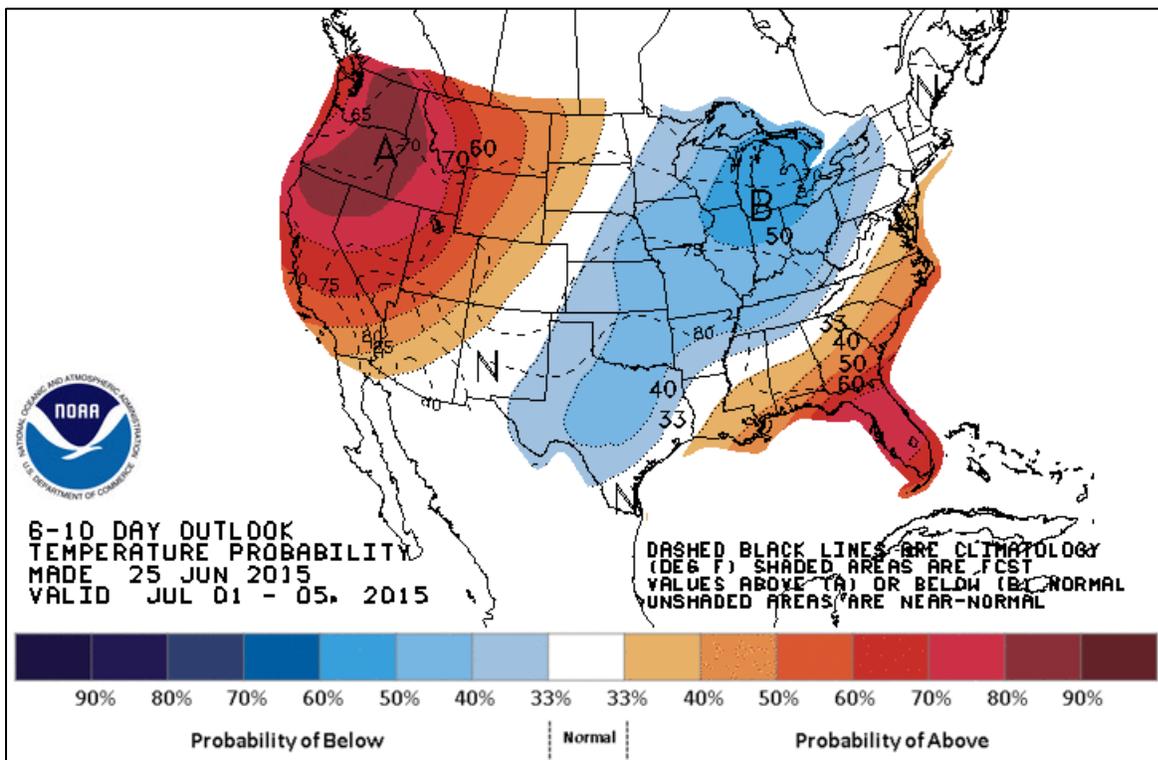
Temperature and Precipitation Forecasts

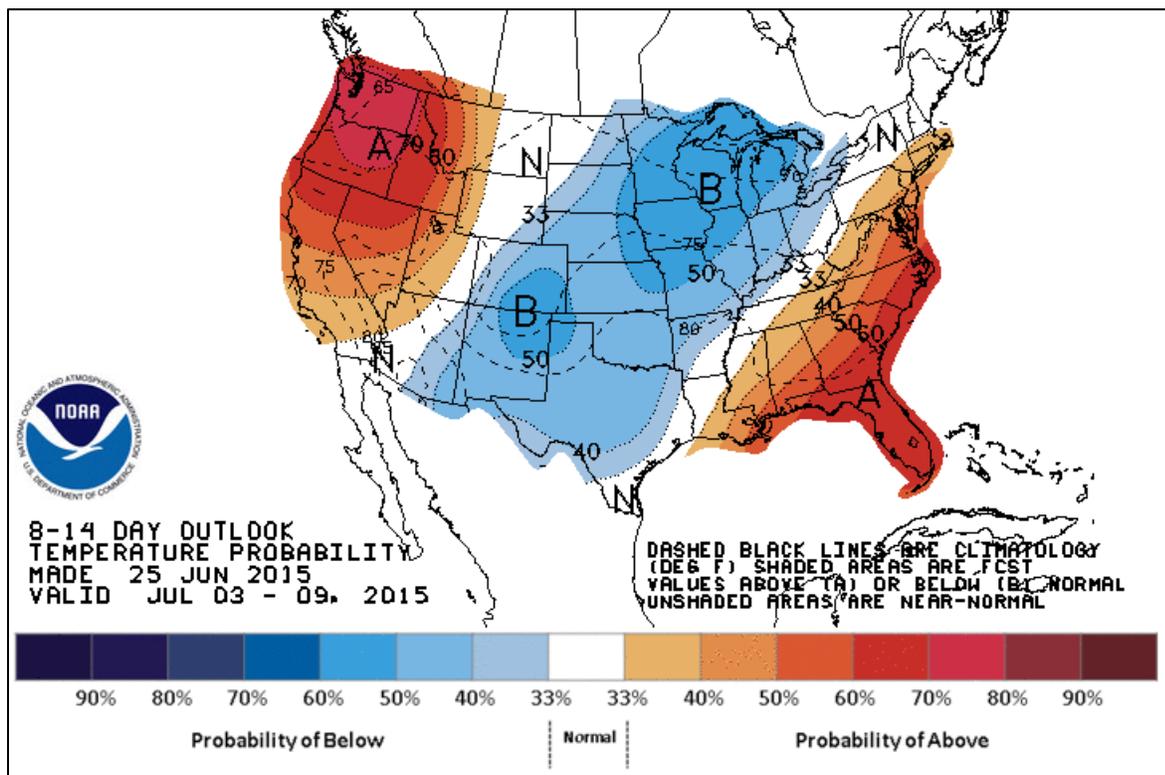
Precipitation is predicted to be below-to-far-below normal in the next 6-to-10 days and 8-to-14 days ([below](#)). If you miss the rain, Arizona might be the place to visit in the next couple of weeks.





The temperature outlook ([below](#)) is for above-normal temperatures throughout Washington for the next 6-to-10 and 8-to-14 days. A bit of an understatement!





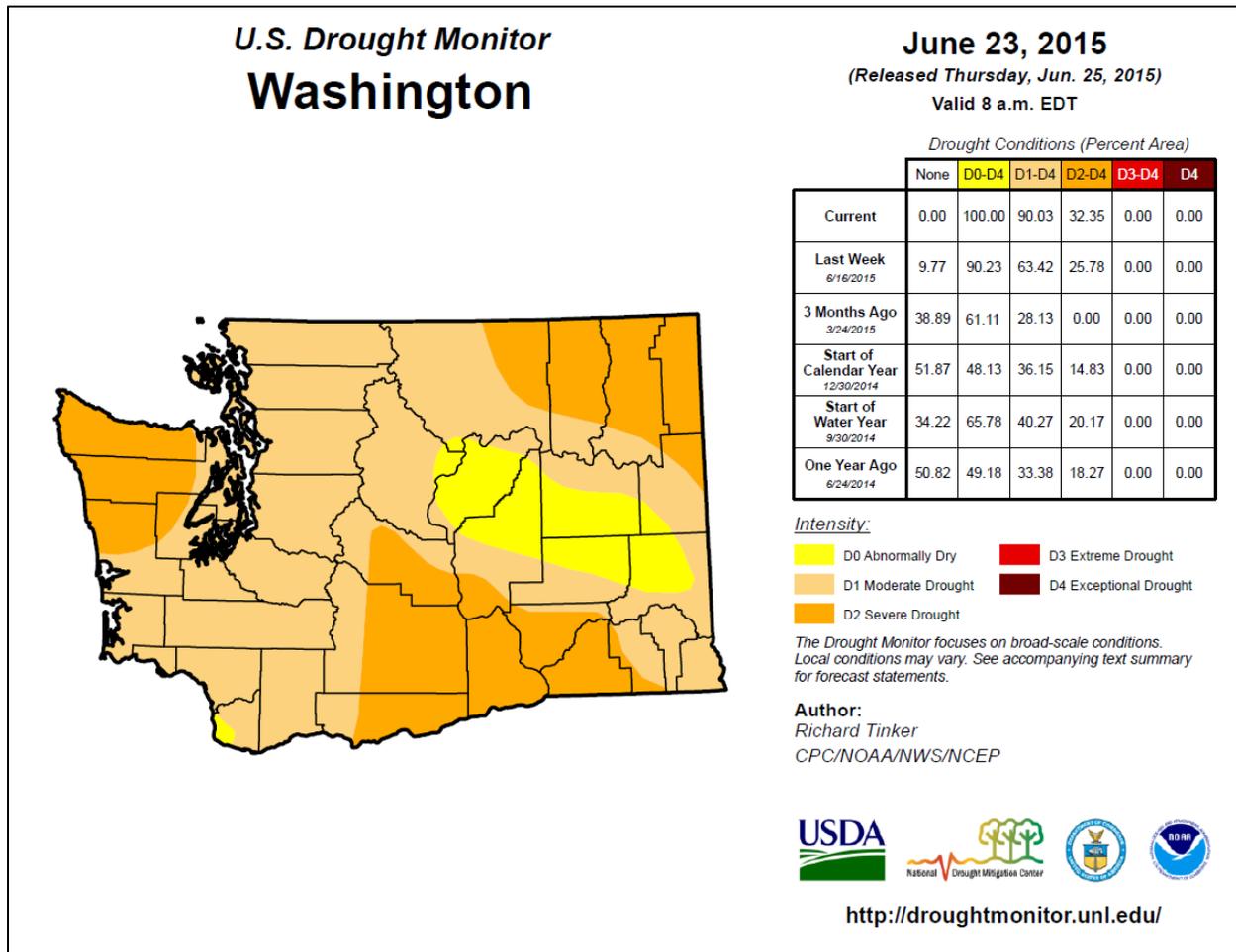
Record high temperatures this weekend are forecasted to include thunderstorms, with lightning expected in the Olympic mountains and likely elsewhere. Keep hydrated this weekend, and let me know the damages as you assess them early next week.

Federal Drought Status

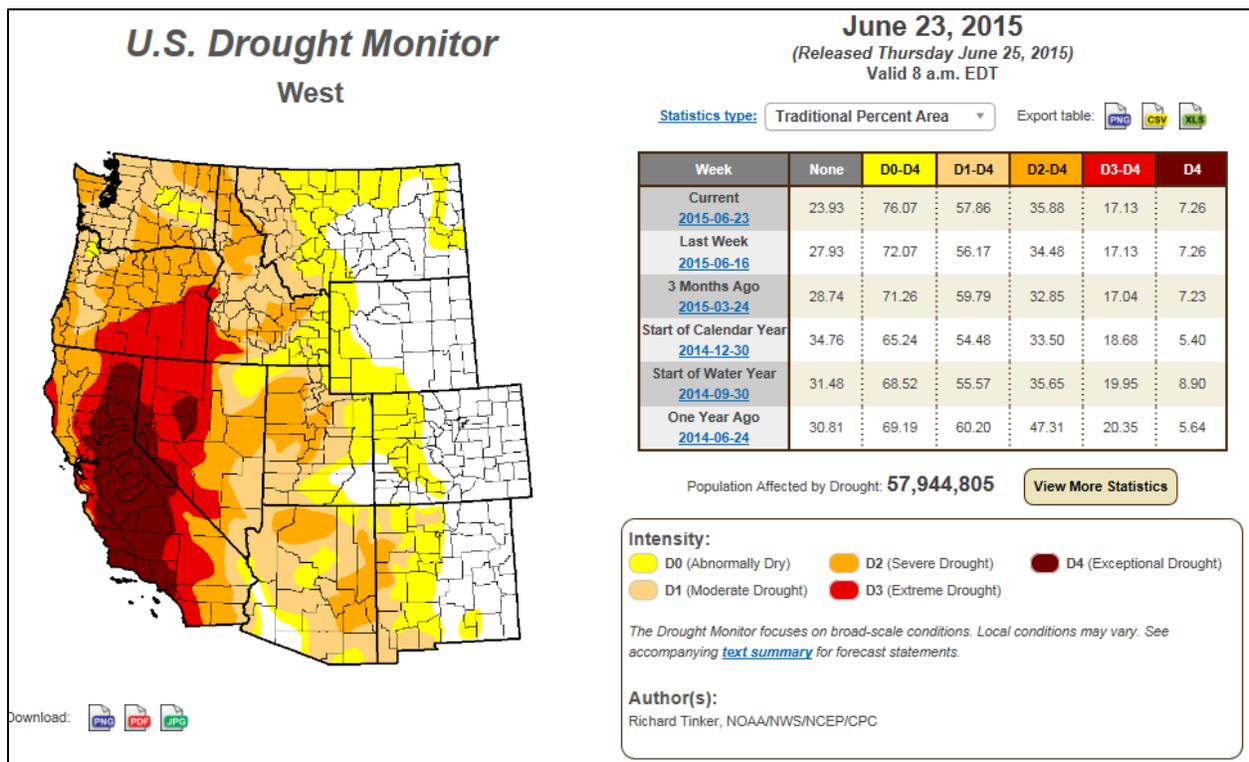
Area	Status	Federal designation
Northwest Olympic Coast	Week 1 at "Severe Drought"	In 7 weeks
South Central	Week 9 at "Severe Drought"	Asotin, Benton, Columbia, Garfield, Klickitat, Walla Walla Counties declared (June 24)
Northeast	Week 6 at "Severe Drought"	In 2 weeks
Columbia Basin	Week 1 at "Moderate Drought"	
Everything else	"Moderate Drought"	

It's official. The remaining non-drought areas from last week achieved "Moderate Drought" status this week. Recall that a federal drought designation is automatic for any county when D2 (severe drought) conditions exist for eight weeks in a row. A Secretarial disaster designation makes farm operators in designated counties eligible to be considered for certain assistance from the Farm Service Agency. Federal designation and all the associated activities are coordinated through Washington Department of Agriculture; information distinguishing state-

declared and federal drought designations, and the effect of federal designations, are available on the Ag web site.



Let's pause to look at drought status throughout the west: However poor conditions are in Washington, our challenges don't yet match those of our southern neighbors (below).



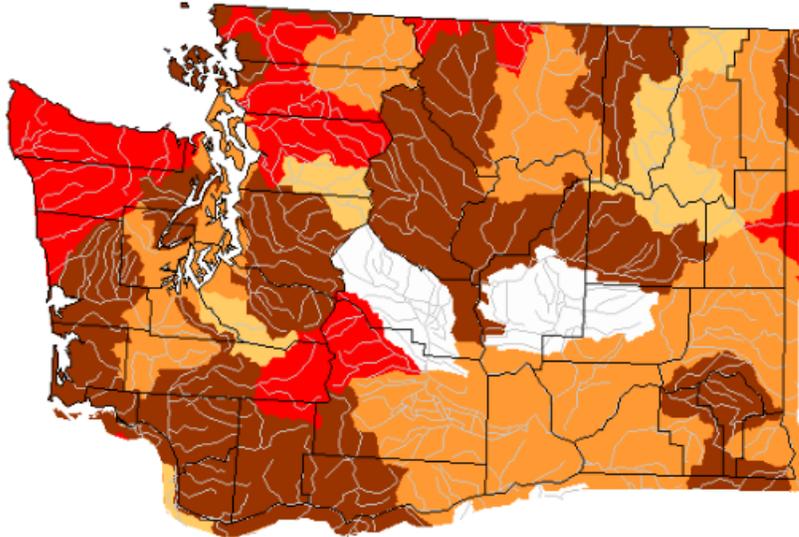
Stream Flows

For the state as a whole, the figure showing [stream gauges with below normal streamflow](#) for 7 days or more is still dramatic, with most of the state running stream flows that are some level below normal (“average”). New this week is indication that flows are below normal even in upper Columbia/Lake Roosevelt areas that are controlled by flows coming out of Canada. Note that watersheds with “normal” stream flows are watersheds in highly-regulated systems: Upper Yakima receives Reclamation project flows from upper reservoirs, and the mid-Columbia Basin area is influenced by Columbia Basin Reclamation Project flows.

Map of below normal 7-day average streamflow compared to historical streamflow for the day of year (Washington)

Washington

Hednesday, June 24, 2015



Click map to obtain more detailed drought information for the state

Explanation - Percentile classes				
Low	≤5	6-9	10-24	Insufficient data for a hydrologic region
Extreme hydrologic drought	Severe hydrologic drought	Moderate hydrologic drought	Below normal	

Hydrograph Sampler

I was not able to get to the Hydrograph Sampler Charts this week. If I get time, I will add those charts to a version of this report residing on the WDFW “S” drive. These charts will (hopefully) be back in next week’s update.

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. 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.

A lighter red/orange, yellow, or green color in the third column represents values that are a higher percentage of historic average, with none topping 75% of average; anything that’s a bright red is less than 50% of average. The dark red cells in the second column indicate that today’s flows are record low for this date.

Twenty-six of our select set of 43 locations set record lows on June 25, 2015. Northwestern Olympic Peninsula and north Puget Sound streams are almost all setting records low flows daily as we move into summer. Streams “in the yellow and green zone” are regulated, with outflows exceeding averages that include flows occurring before current outflow provisions were set. [Statewide streamflows](#) are available from USGS.

Selected Washington Streamflows	Today's Flow (cfs)	Percent of average for this date in the record	Min Flow (cfs)	Year of min flow
MF NOOKSACK RIVER NEAR DEMING, WA	257	41%	281	1934
NOOKSACK RIVER AT FERNDALE, WA	1,480	33%	2,300	2003
SKAGIT RIVER NEAR CONCRETE, WA	8,480	36%	9,930	2003
SAUK RIVER AT DARRINGTON, WA	735	21%	930	1926
CASCADE RIVER AT MARBLEMOUNT, WA	718	31%	1,450	2009
NF STILLAGUAMISH RIVER NEAR ARLINGTON, WA	248	18%	363	1992
SNOQUALMIE RIVER NEAR CARNATION, WA	683	17%	1,080	1992
SKYKOMISH RIVER NEAR GOLD BAR, WA	540	9%	1,510	1992
ISSAQUAH CREEK NEAR MOUTH NEAR ISSAQUAH, WA	28	35%	22	1992
CEDAR RIVER BELOW DIVERSION NEAR LANDSBURG, WA	250	58%	145	1992
CEDAR RIVER AT RENTON, WA	271	47%	98	1962
BIG SOOS CREEK ABOVE HATCHERY NEAR AUBURN, WA	23	34%	29	1992
GREEN RIVER NEAR AUBURN, WA	254	30%	280	1979
SOUTH PRAIRIE CREEK AT SOUTH PRAIRIE, WA	44	24%	39	1992
PUYALLUP RIVER AT PUYALLUP, WA	1,250	30%	1,600	1934
NISQUALLY RIVER AT MCKENNA, WA	549	66%	165	1962
DESCHUTES RIVER NEAR RAINIER, WA	39	48%	35	1992
NF SKOKOMISH R BL STAIRCASE RPDS NR HOODSPORT, WA	65	13%	136	1934
DUNGENESS RIVER NEAR SEQUIM, WA	155	23%	284	1926
HOKO RIVER NEAR SEKIU, WA	19	24%	24	1992
CALAWAH RIVER NEAR FORKS, WA	85	28%	112	1995
HOH RIVER AT US HIGHWAY 101 NEAR FORKS, WA	625	32%	1,010	2003
SATSOP RIVER NEAR SATSOP, WA	280	46%	344	1992
CHEHALIS RIVER NEAR GRAND MOUND, WA	238	32%	254	1992
NASELLE RIVER NEAR NASELLE, WA	38	33%	40	1982
COWLITZ RIVER BELOW MAYFIELD DAM, WA	3,710	56%	1,480	1968

COWLITZ RIVER AT PACKWOOD, WA	572	21%	796	2005
LEWIS RIVER AT ARIEL, WA	2,360	74%	155	1931
WHITE SALMON RIVER NEAR UNDERWOOD, WA	590	51%	523	1977
KLICKITAT RIVER NEAR GLENWOOD, WA	116	22%	133	1992
WALLA WALLA RIVER NEAR TOUCHET, WA	16	11%	12	1992
TUCANNON RIVER NEAR STARBUCK, WA	56	37%	45	2005
GRANDE RONDE RIVER AT TROY, OR	980	21%	997	1977
YAKIMA RIVER AT KIONA, WA	858	21%	588	1977
AMERICAN RIVER NEAR NILE, WA	57	11%	122	1992
CRAB CREEK AT IRBY, WA	6	20%	2	1992
WENATCHEE RIVER AT PLAIN, WA	1,160	20%	1,340	2005
METHOW RIVER NEAR PATEROS, WA	1,220	25%	1,290	2001
OKANOGAN RIVER AT MALOTT, WA	2,090	25%	1,890	1992
OKANOGAN RIVER AT OROVILLE, WA	384	36%	85	1987
SPOKANE RIVER AT SPOKANE, WA	1,030	13%	1,480	1992
COLVILLE RIVER AT KETTLE FALLS, WA	76	26%	47	1977
PEND OREILLE RIVER NEAR IONE, WA	19,800	35%	9,690	1977

Real-Time Water Temperature from USGS and Ecology

Water temperatures are already reaching lethal levels in some areas. [USGS temperature stations in Washington](#) provides water temperature for stations having that feature (below). Temperatures above 20 degrees C are occurring in the South Fork Nooksack River at Saxon Bridge (20.8), Cedar River at Renton (20.3), Duwamish R near the Tukwila golf course (20.9), numerous locations on the Columbia River through the gorge, Snake River, Methow near Pateros (20.2), Okanogan River (23 to 24 degrees), and at Boundary Dam on the Pend Oreille (21).

June 25, 2015 21:31ET



Explanation							
<1	1-4.9	5-9.9	10-19.9	20-29.9	30-35	>35	No Data

Ecology's [Flow Monitoring Network](#) provides air and water temperature monitoring at several Ecology and Co-op stations. There are a number of stations of interest, so follow the link and check it out.

Data for the Lake Washington Ship Canal can be found [here](#).

Drought Impacts to Fish and Wildlife

North Puget Sound

Stillaguamish Tribal staff have developed a plan to rescue/salvage chinook in the Stillaguamish in coordination with Region 4 staff. No other reports have come in from Region 4, probably because they are too busy doing it to send an email about it.

Skagit River Hydro- As of now, we are expecting 5% exceedance from the tributaries coming into the project, which is being described as worse-case scenario. Although Seattle City Light can protect all steelhead redds with enough incubation flow, the Flow Coordination Committee (FCC) is considering sacrificing one redd to save water for August and September. The FCC will wait to see what flows look like in the tributaries and make the decision.

Baker River Hydro- Fortunately, Puget Sound Energy will not be generating power due to maintenance and replacement of a turbine. As of now, they have enough water in the reservoirs to deliver the mandatory instream flows.

Jackson Hydro- Snohomish PUD is operating the Powerhouse in State 4 (Zone of Water Conservation) to satisfy the requirements of their obligations to the City of Everett (drinking

water) and the instream flow requirements of the Sultan River, but they cannot meet the reservoir target elevations described in the license. (Brock Applegate)

Central & South Puget Sound

Cedar/Tolt/Green

Water temperatures on the Cedar at Renton are alarmingly high.

Lake Washington Ship Canal

The Corps has implemented lockage limitations to reduce saltwater intrusion into the ship canal and Lakes Union/Washington.

White River/Lake Tapps

Lake Tapps opened for non-motorized recreation on June 20. The Cascade Water Alliance warns users that not all areas of the lake are safe yet for access, and motorized access remains prohibited. Current lake elevation is almost 537 feet.

Puyallup River

Biologist Larry Phillips was contacted by KING-5 news after they received a report of juvenile fish stranded from the mainstem Puyallup River. When Larry arrived on the scene, he determined that the fish were stickleback and shared insights about low flows and drought with KING-5 news. <http://www.king5.com/story/news/local/2015/06/25/puyallup-river-water-level-fish-stranded/29302759/> In the photo (below) Larry is shown netting fish to determine their species. Larry has a real future as spokesperson for our fish and our agency; thanks, Larry!!



WDFW is encouraging citizens to contact the agency with reports of stranded fish.

Olympic Peninsula and Coastal Washington

Dungeness

Dungeness flows on June 25 have dipped to 155 cfs. Curtailment of irrigation begins at 120 cfs pursuant to an operating agreement of the Sequim-Dungeness Water Users Association.

Washington Northwest Coast

A wildfire in the upper Queets River area (within Olympic National Park) was detected on June 17. As of June 24, 954 acres were involved and a total of 102 people are assigned to the incident. Growth of the fire is expected to continue, and conditions are ripe for additional fires in the Olympics due to high temperatures and anticipated lightning strikes. ONP has implemented a ban on all open fires in the park's wilderness backcountry. Follow the Paradise Fire situation at <http://inciweb.nwccg.gov/incident/4305/>.

The second fish salvage project brought to this writer's attention occurred on Elk Creek and was conducted by staff from Quileute Nation. As shown in the photo (below left), Elk Creek isn't large to start with; staff found fish stranded in the isolated pool in the far right of the photo. Jacob Turner and his crew rescued 153 steelhead fry, 1 skulpin, and 2 crawdads (below right).



A community forum sponsored by Ecology at the request of local citizens is being held the evening of June 30 in Amanda Park, Washington.

Southwest Washington

Water supply shortages for municipalities, small domestic water systems, and hatcheries dominate the news in southwest.

Lewis River basin - PacifiCorps announced that the boat ramp at Cougar Camp on Yale Reservoir and the ramp at Swift Forest Camp (North Fork Lewis River) are both unusable due to dropping water levels. The utility held water in Swift, the largest and uppermost of the three reservoirs, during late spring and early summer. In order to keep the most ramps open for the largest number of boaters, PacifiCorp is releasing water to Yale and Merwin reservoirs. PacifiCorp's federal license also has minimum-flow requirements at Merwin Dam in order to protect fish in the lower North Fork of the Lewis River. Biologist John Weinheimer tells us that without boat access, fishing effort and success are likely to be minimal in Swift in spite of generous trout plants this spring.

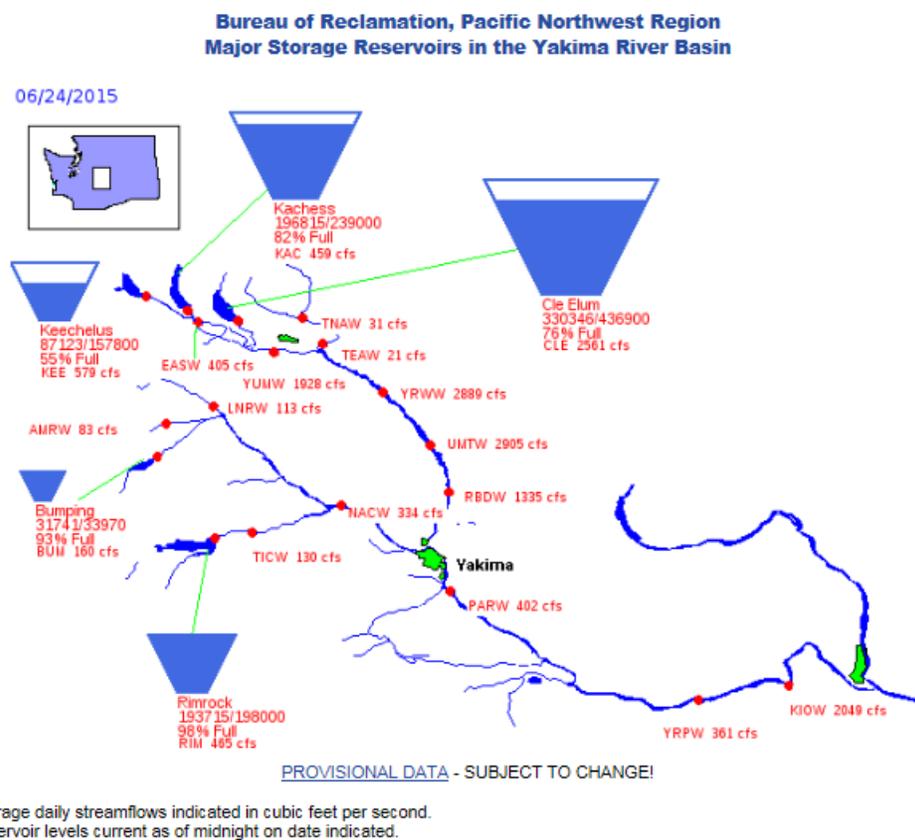
Chehalis - A presentation on drought response occurred at the June 26 Chehalis Partnership meeting. Residents are justifiably concerned about the possibility of water right curtailment to protect instream flows; Ecology is notifying junior water right holders (post 1988) of the

possibilities and procedures in letters to be delivered within the next two weeks. Neither drought response planners nor weather/climate/flow forecasters could have foreseen the early and intense flow and water supply issues we are already experiencing in the Chehalis – indeed forecasters predicted that the Chehalis would probably survive the drought unscathed. Speaking for myself and other agency drought coordinators, we had no clue that drought would unfold so dramatically.

South Central Washington

Yakima

The [Reclamation Teacup Diagram](#) (below) for Yakima Basin shows Lake Keechelus volume down to 55%, and Kachess and Cle Elum are starting to draw significantly (82% and 76% full, respectively). Overall storage is 87% of average. Inflow to the five reservoirs is 20% of average, releases are 91% of average, and major canal diversions are 74% of average for June 25.



Another fish salvage/rescue project occurred on June 24 on Jack Creek, a tributary to the North Fork Teanaway River in the Teanaway Community Forest. Staff from WDFW, the Bull Trout Task Force, and Yakama Nation moved 44 rainbow trout/steelhead juveniles (40-100 mm in size), 4 Eastern brook trout (between 6 and 12 inches in length) and 5 sculpins from isolated pools into Jack Creek downstream from those pools, where surface flow made passage into the Teanaway was still possible. WDFW biologist Brent Renfrow recommends frequent monitoring of Jack Creek and nearby creeks because flows are going subsurface.



North Central Washington

CORRECTION from last week: Your author misquoted correspondent Tom Kahler regarding water temperatures in the mainstem Columbia upstream of Wells Dam. What Tom actually reported is that temperatures at Wells just hit 15 degrees C (week beginning 6/15), which is probably slightly warmer than immediately upstream of the Okanogan. Apologies for the misinformation!!!

Temperatures in the Okanogan downstream from Malott are in excess of 24 degrees C as of June 25.

Mid-Columbia PUD Hydro- In general the warmer temperatures in the Columbia River are resulting in earlier spawn timing of white sturgeon, making it extremely difficult for larval white sturgeon collection activities in Lake Roosevelt and Lake Wallula. Due to the lack of white sturgeon larvae, mid-Columbia River PUDs will be relying upon adult derived broodstock heavily for the 2016 supplementation releases stipulated in FERC license conditions. Although these fish will have a high level of genetic diversity, larval collections offer the highest level of genetic diversity. It is hypothesized that the warmer temperatures have not only caused the spawn event to occur earlier than usual, but also may have confused spawn timing. (Patrick Verhey)

Northeast and Southeast Washington

Spokane River – Following is a report that demonstrates the deliberation that occurs when utilities request deviations from prescribed outflows (“fish flows”). The Avista FERC license agreement for the Spokane River and the 2014 Spawning and Fry Emergence Protection Plan

requires that discharge be maintained through the fry emergence period of April 16 to June 7 each year.

The Protection Plan agreement states that: “if the target Post Falls HED discharge for effective incubation flow that preserves 50 percent of the combined index spawning sites wetted through June 7 is not achieved during any two consecutive years then the following year will be prioritized and preserve 70 percent or greater of the combined index spawning site wetted through June 7 of that year. “

On June 5, Avista contacted Idaho Fish and Game and WDFW with a request for a reduction of the target flow of 3, 538 cfs from the Post Falls HED to begin immediately , two days prior to June 7, and to decrease the discharge to approximately 1,400 cfs by Saturday evening. The reason for this request is based on the following information:

This year is an unusually dry year, with inflows into Coeur d’Alene Lake reduced due to lack of snowpack and precipitation.

With declining inflows to Lake Coeur d’Alene, Avista does not predict being able to achieve the summer lake elevation of 2, 128 feet and to maintain the target discharge through June 7, as described in the Plan.

Monitoring of the rainbow trout spawning areas in the Spokane River confirmed that fry emergence occurred as early as May 15, 2015 with increased fry emergence observed by May 28, 2015. This early emergence makes sense because of the warmer water temperatures measured at 21 degrees C measured on May 28.

Avista is making this request to reduce the target discharge from Post Falls HED, as described in the Plan, to balance Coeur d’Alene Lake’s elevation and the downstream discharge.

WDFW Regional Director Pozzanghera, District Fish Biologist Osborne, and Karin Divens met to discuss. (Regional Habitat Program Manager Wachtel and Regional Fish Program Manager Whalen were contacted via phone for their thoughts on the matter as they were unable to attend the meeting.) Below is a summary of our discussion as written up by Regional Director Pozzanghera:

Here is the formal request from Avista – I had good conversations with Karin and Randy and we had the opportunity to get Tim Vore on the phone. I had brief conversations with Mark and John and was also informed by Tim Vore that they had been able to reach Chip Corsi with IDFG and Chip was going to concur with Avista’s request. I also called Chip and left him a message that I was just wanting to close the loop with him.

I am going to concur with the Avista request.

Karin, Mark and Randy were in agreement with the following thinking; we do believe that there is minimal biological risk to fry/fish based on two fronts: early fry emergence due to warmer than normal water temps and a proposed slow ramp down on discharge that will allow fish to move out of/escape low water conditions. The request only shortens the proposed discharge by two days, and during a period when full is not attainable even without this early shut off. The concern that a two day reduction in flow will exacerbating drought conditions such that some type of monitoring is needed does not seem realistic.

The Spokane River is now at about 1000 cfs. Normal for this date is around 11,000 cfs. (Karin Divens)

WDFW Headquarters Drought Response Activity

Fish in Nature:

Low-flow migration blockage intervention: Planning for response in the Dungeness is proceeding in spite of a lack of funds. Activities include landowner contacts and soliciting volunteer help.

WDFW ESA Coverage: WDFW has ESA coverage for unintended fish handling as a result of our drought response actions (NOAA 4(d) limit 3; USFWS Section 6 agreement). All ESA fish handled during the course of our work must be reported to Val Tribble in Fish Program following the existing protocol. Instream work conducted to remediate low flow fish migration blockages is covered under a joint NOAA and USFWS programmatic opinion regarding work done instream to restore or protect salmon/steelhead/ bull trout habitats (2008 Habitat Restoration programmatic consultation). We are awaiting a return call from the Army Corps of Engineers to round out pre-authorizations for in-stream work. Contact Teresa for info about SMA and other permits.

Let 'em Pass Signs: Let 'em Pass signs will be shipped to regional offices and selected other locations as soon as they are received.

Constant Vigilance - Please remain vigilant, and report looming, suspected, or real-time blockages or stranded fish to your regional program manager AND to Drought Coordinator Teresa Scott at teresa.scott@dfw.wa.gov . Stay tuned for a centralized reporting mechanism.

Drought-related fishery closures

On June 17, Sol Duc River near the Sol Duc Hatchery became our first low-flow-related closure of the season.

Fish in hatcheries:

Hatchery Division is embarking on the unenviable task of determining which fish to save if adequate water supplies can't be maintained at all facilities during the drought. Conditions at many (even most) hatcheries are much worse than any of us anticipated when planning and budget development began.

Columnaris has become a problem at Priest Rapids hatchery.

Water access:

Implementation of ramp extension projects awaits funding from the legislature.

News Clips

[Crews tackle spot fires southeast of Twisp](#)

Methow Valley News - June 22, 2015

[Bulk of Oregon under drought declarations](#)

Bend Bulletin – 22 June 2015

[Washington on brink of federal drought declaration](#)

Capital Press - June 23, 2015

[Skagit seed crop threatened by drought](#)

King 5 – June 22 2015

[Drought In Wash. Could Bring More Sting To A Government Shutdown](#)

Northwest Public Radio Earthfix – 23 June 2015

[Snowpack? What snowpack? State measurements show zero](#)

Seattle Times - June 23, 2015

[Water management affects every living thing](#)

Spokesman Review - June 23, 2015

[DNR burn ban expanded to include Western Washington](#)

The Olympian - June 23, 2015

[Snowpack in Washington state is gone, and it's showing](#)

Tri-City Herald - June 23, 2015

[Region's rivers hit record low flows](#)

Spokesman Review - June 24, 2015

[Drought In Wash. Could Bring More Sting To A Government Shutdown](#)

KUOW - June 24, 2015

[It's not just a snowpack drought any more](#)

Olympic National Park via Twitter 24 June 2015

[A year without snow](#)

Pacific Standard - 24 June 2015

[Paradise Fire Incident Information](#)

National Park Service information from InciWeb – as of 25 June 2015 4pm

[Swift Reservoir boat ramp to be unusable soon](#)

Columbian – 25 June 2015

[Fish stranded in Puyallup River due to low water levels](#)

King5.com - June 25, 2015

[How A Historical Blunder Helped Create The Water Crisis In The West](#)

OPB - June 26, 2015

Links

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

Office of the State Climatologist now offers a [weekly drought update for Washington State](#).

State departments of [Health](#) and [Agriculture](#) have posted drought web pages.

[Pacific Northwest Drought Portal](#)

NOAA [El Nino Portal](#)

Monthly and Seasonal climate outlooks are continuously updated and available at [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](#)

For Further Information:

Drought talking points and other staff resources, including the Drought 2015 archive, are available on the “S” drive.

Contact WDFW Drought Coordinator Teresa Scott at teresa.scott@dfw.wa.gov or (360) 902-2713 with questions and suggestions.

Hydrograph Sampler Charts - Streamwatch (Real Time Flows USGS)

Apologies for the lack of hydrographs this week. We can all imagine this week’s data based on the trends shown in previous weeks.

In place of the charts, here are the links for each of the usually-reported gauges:

Stilly	http://waterdata.usgs.gov/wa/nwis/uv?site_no=12167000
Issaquah	http://waterdata.usgs.gov/wa/nwis/uv?site_no=12121600
Dungeness	http://waterdata.usgs.gov/wa/nwis/uv?site_no=12048000
Hoko	http://waterdata.usgs.gov/wa/nwis/uv?site_no=12043300
Calawah	http://waterdata.usgs.gov/wa/nwis/uv?site_no=12043000
Skookumchuck	http://waterdata.usgs.gov/wa/nwis/uv?site_no=12025700
Naselle	http://waterdata.usgs.gov/wa/nwis/uv?site_no=12010000
Speelyai	http://waterdata.usgs.gov/wa/nwis/uv?site_no=14219800
Klickitat	http://waterdata.usgs.gov/wa/nwis/uv?site_no=14107000
Walla Walla	http://waterdata.usgs.gov/wa/nwis/uv?site_no=14018500
Methow	http://waterdata.usgs.gov/wa/nwis/uv?site_no=12447383
Okanogan	http://waterdata.usgs.gov/wa/nwis/uv?site_no=12447200
Colville	http://waterdata.usgs.gov/wa/nwis/uv?site_no=12409000
Kettle	http://waterdata.usgs.gov/wa/nwis/uv?site_no=12401500