



**4. SNOWPACK**

The wet and snowy weather of January increased the snowpacks all across the Columbia Basin according to Dan Moore (Enc 2 and p 12 of Enc 1); the January 1 snowpack was just 76% of its normal value to 90%. The most effective snowpack increase was in the Kootenay sub-basin which went from 23% to 85% and the Canadian snowpack which increased from 7% to 94%.(Together these two sub-basins account for 41% of the normal flow at The Dalles). Other basins with large increases were the North Cascades with 107% of normal and in the Yakima Basin with 116%. Many sub-basins saw snowpack increases in excess of 25%, including the Snake Headwaters up 30 pts to 97% and the Boise/Payette up 33 pts to 88%. The Clearwater had one of the smallest increased in snowpack, up 9 pts to 80%, and currently the lowest sub-basin in the Columbia. Interestingly the Clearwater has one of the highest correlations of any sub-basin between spring runoff and the Southern Oscillation Index (SOI). Typically the February 1 snowpack is 68% of its April peak; this year its only 61%.

NRCS website contains monthly summaries of precipitation, streamflow, snow pack, and other data can be found at: [ftp://ftp.wcc.nrcs.usda.gov/data/climate/basin\\_reports/westwide.htm](ftp://ftp.wcc.nrcs.usda.gov/data/climate/basin_reports/westwide.htm)

**5. SURFACE WATER SUPPLY INDEX (SWSI)**

This year the Oregon SWSI generally increased during January due to the above normal precipitation, according to Jon Lea (Enc 3). The Idaho SWSI values indicate an increase in their water supply although the large and unchanged negative value for the Panhandle is unexplained.

**6. STREAMFLOW**

Average monthly streamflows throughout the Northwest generally increased during January, according to Ed Hubbard (Enc 4). Exceptions to this were the sites in western Montana which were below normal and decreased reflecting the below normal monthly precipitation in this area.

**7. RUNOFF VOLUME FORECASTS**

Joan Salerno reported that the forecasts increased this month, reflecting the heave precipitation and snowpack buildup. Forecasts (Enc 1) varied from highs of 105% to 110% in northeastern Washington to lows of 62% in parts of the Snake River Plain and 75% in other locations on the Snake Basin. Selected forecasts for key basins in million acre-feet, are:

	<u>January-July</u>	<u>April-July</u>	<u>April-Sept</u>
Columbia at Grand Coulee	57.7 (91%)		58.9 (91%)
Snake at Lower Granite	27.1 (91%)		19.7 (91%)
Columbia at The Dalles	95.2 (90%)		88.4 (89%)
Libby	5.71 (89%)		6.01 (89%)
Hungry Horse	1.86 (82%)		1.79 (82%)
Dworshak (NWS)	3.02 (85%)	2.30 (85%)	2.45 (85%)
Dworshak - Official (Enc 5)		1.944 (72%)	

The official Dworshak forecast procedure was developed by the NRCS and includes an El Niño effect. This has been reviewed and accepted by the Corps for official use for forecasting Dworshak runoff.

**8. RESERVOIR OPERATION**

Irrigation supply is above normal for the upcoming irrigation season according to Ted Day (Enc 6). Grand Coulee is drafting for spillway drum gate work, Hungry Horse is operating near minimum outflow to maintain fish flows on the Flathead River at Columbia Falls, and the Boise system is already below its flood control target elevation and is passing inflow.

Active content available on the end of January at 52 irrigation reservoirs (excluding Grand Coulee and Hungry

Horse) was 6,937,600 af--75% of capacity, 1,044,900 af less than last year, and 1,262,900 af more than normal, at **Franklin D Roosevelt Lake (Grand Coulee Dam)** the active contents was approximately 3,485,000 af--67% of capacity, 324,700 af more than last year, and 327,500 af less than normal, and at **Hungry Horse** the active content was 2,022,200 af--68% of capacity, 484,000 af more than last year, and 107,100 af more than normal.

Chan Modini reported on the operation of the Corps' projects (Enc 7). **Libby** drafted slowly with outflows averaging 8.4 kcfs including a 5-day period when loads were reduced to 4 kcfs for a burbot fish study. Lake Pend Oreille (**Albeni Falls**) passed inflow during January for the second year of a three year test if limits to the drafting the lake to 2055.0 ft, vice 2051.0 ft, will encourage kokanee to spawn at a higher level where there is cleaner gravel. **Dworshak** is discharging minimum outflow and the pool is slowly began to refill following the completion of the grouting work at the dam. The pool is currently 51 ft below the flood control curve. At the four **Lower Snake Projects Ice Harbor, Lower Monumental, and Little Goose** were operating at their normal operating pool levels and **Lower Granite** was operated in the top foot of its operating range due to the construction of the surface fish bypass collector.

The **Willamette basin projects** started their refill process on February 1 and are releasing minimum flow. Fill rates are low, however, due to low inflows.

Brownlee pool is at 2061 ft and drafting towards its February 28 target flood control elevation of 2034.5 ft, according to Nengjin Liu.

## **9. POWER OPERATIONS**

On January 31 the Federal System of reservoirs was at 54.6% of full storage capacity and the Coordinated System was 55.4% of full, according to Nancy Stephan. The net monthly energy delivery over the Pacific Northwest/Southwest intertie was from the north to south with a net delivery of 1,750,909 MWh. System firm loads ran near the estimate at 99.7% (after correction for temperature deviation from normal).

## **10. HYDROMET**

A new streamgage was installed on the Payette River at Squaw Creek (SQWI). Three more are planned for the Boise basin; details when they are installed.

## **11. OTHER**

The consensus of the Group was that the Hydrologic Data Committee (HDC) should convene to determine the technical details of improving data communication between agencies. There should also be a meeting of higher graded individuals to discuss the policies and implementation of the data communication.

The WY 97 Blue Book will be published on the Group's web page and will be readable with the free Adobe reader. The web page will be found under the Corps' web site. This page will also contain future agenda and minutes plus other information pertaining to the CRWMG.

The World Meteorological Organization (WMO) continues to use and recommend a 30-year data average according to Roger Ross. In examining the data needs of Northwest agencies the variations of long term averages were reviewed via the Desert Research Institute's web site at

<http://www.wrcc.sage.dri.edu/cgi-bin/spiMAIN.pl?3502+spi1+acc9>

Samples calculations from this site shows that there would be little change in means and averages if the normal period was changed from 1961-90 another 5 years either way. Not until the time period includes the 1930s and 1940 will there be a significant change.

**12. NEXT MEETINGS**

The next meetings are tentatively scheduled for 9:30 am, in the Customs House, Room 118, on March 12, April 14, May 12, and the travel meeting on June 11.

Roger L. Ross  
Secretary

[Point and click on blue to navigate.](#)

Enclosures

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  - b. [Feb. Final Forecast - Columbia Basin](#)
  - c. [Feb. Final Forecast - Washington State](#)
  - d. [Columbia Basin Monthly Precipitation Summary](#)
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7. [Corps Project Summary](#)

ABRIDGED

# WATER SUPPLY OUTLOOK

## COLUMBIA RIVER AND PACIFIC COAST BASINS

February 1, 1998

### COLLABORATIVE AND SUPPORTIVE AGENCIES:

Northwest River Forecast Center, NWS  
USDA/National Resource Conservation Service  
US Army Corps of Engineers, North Pacific Division  
US Bureau of Reclamation  
British Columbia Hydro and Power Authority  
Weather Services Directorate/Environment Canada  
Local water district managers and utility companies

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Enc 1

ZCZC PDXESPDR  
TTAA00 KPDR 062149

SEASONAL  
WATER SUPPLY FORECASTS  
ISSUED BY  
NATIONAL WEATHER SERVICE  
NORTHWEST RIVER FORECAST CENTER  
PORTLAND OREGON

FEB-98FINAL	1	W A T E R S U P P L Y F O R E C A S T S			
STREAM AND STATION		PERIOD	FORECAST	%	AVERAGE
COLUMBIA RIVER					
MICA RESERVOIR INFLOW, BC		FEB-SEP	12100.0	92	13170.
		APR-SEP	11700.0	92	12730.
ARROW LAKES INFLOW		FEB-SEP	25600.0	96	26800.
		APR-SEP	24400.0	96	25540.
BIRCHBANK, BC (1)		APR-SEP	41500.0	95	43800.
GRAND COULEE, WA (1)		JAN-JUL	57700.0	91	63280.
		APR-SEP	58900.0	91	64850.
ROCK ISLAND DAM BLO, WA (1)		APR-SEP	65000.0	92	70480.
THE DALLES NR, OR (1)		APR-SEP	88400.0	89	98980.
		JAN-JUL	95200.0	90	105900.
KOOTENAI RIVER					
LIBBY RES INFLOW, MT (1)		APR-SEP	6010.0	89	6772.
KOOTENAY RIVER					
KOOTENAY LAKE INFLOW, BC		APR-SEP	15100.0	91	16650.
DUNCAN RIVER					
DUNCAN RESERVOIR INFLOW, BC		FEB-SEP	2290.0	99	2319.
		APR-SEP	2210.0	99	2238.
CLARK FORK					
ST. REGIS, MT (1)		APR-SEP	3390.0	83	4095.
PEND OREILLE RIVER					
PEND OREILLE LAKE IN, ID (1)		APR-SEP	11300.0	79	14370.
S.F. FLATHEAD RIVER					
HUNGRY HORSE RES IN, MT (1)		APR-SEP	1790.0	82	2184.
FLATHEAD RIVER					
FLATHEAD LAKE INFLOW, MT (1)		APR-SEP	5650.0	82	6926.
COEUR D'ALENE RIVER					
COEUR D'ALENE LAKE IN, ID		APR-SEP	2110.0	78	2720.
SIMILKAMEEN RIVER					
NIGHTHAWK NR, WA (1)		APR-JUL	1140.0	87	1304.
OKANAGAN RIVER					
TONASKET NR, WA (1)		APR-SEP	1390.0	86	1623.
CHELAN RIVER					
LAKE CHELAN INFLOW, WA (1)		APR-SEP	1120.0	97	1160.
YAKIMA RIVER					
PARKER NR, WA		APR-SEP	1900.0	95	1994.
SKAGIT RIVER					
CONCRETE NR, WA		APR-SEP	6340.0	97	6525.
COWLITZ RIVER					
MAYFIELD RES INFLOW, WA		APR-SEP	1910.0	97	1971.
		APR-JUL	1680.0	97	1731.
CASTLE ROCK, WA		APR-SEP	2480.0	93	2668.
SNAKE RIVER					
JACKSON LAKE INFLOW, WY (1)		APR-JUL	730.0	93	781.
PALISADES RES INFLOW, ID (1)		APR-JUL	3010.0	93	3226.
HEISE NR, ID		APR-JUL	3190.0	92	3451.
WEISER, ID (1)		APR-JUL	4790.0	88	5465.
BROWNLEE RES INFLOW		APR-JUL	5080.0	88	5794.
LOWER GRANITE RES IN, WA (1)		JAN-JUL	27100.0	91	29740.
		APR-JUL	19700.0	91	21650.
TETON RIVER					
ST. ANTHONY NR, ID		APR-JUL	380.0	100	380.
HENRYS FORK					
REXBURG NR, ID		APR-JUL	1180.0	97	1219.
PORTNEUF RIVER					
TOPAZ, ID		APR-SEP	93.0	100	93.
BIG LOST RIVER					
MACKAY RESERVOIR INFLOW, ID		APR-JUL	126.0	84	150.
BIG WOOD RIVER					
HAILEY, ID (1)		APR-JUL	190.0	75	254.
MAGIC RESERVOIR INFLOW, ID		APR-JUL	184.0	62	295.
LITTLE WOOD RIVER					
CAREY NR, ID		APR-JUL	73.0	79	92.
DESCHUTES RIVER					
BENHAM FALLS, OR		APR-SEP	700.0	100	702.
OWYHEE RIVER					
OWYHEE RES INFLOW, OR		MAR-JUL	425.0	75	567.
BOISE RIVER					
BOISE NR, ID (1)		APR-JUL	1290.0	91	1421.
MALHEUR RIVER					

DREWSEY NR, OR	MAR-JUL	87.0	84	103.
N.F. MALHEUR RIVER				
BEULAH RES INFLOW, OR (1)	MAR-JUL	67.0	88	76.
PAYETTE RIVER				
HORSESHOE BEND NR, ID (1)	APR-JUL	1640.0	101	1618.
WEISER RIVER				
WEISER NR, ID (1)	APR-JUL	380.0	98	386.
POWDER RIVER				
SUMPTER NR, OR	MAR-JUL	52.0	78	67.
SALMON RIVER				
WHITEBIRD, ID (1)	APR-JUL	5740.0	96	5956.
GRANDE RONDE RIVER				
LA GRANDE, OR	MAR-JUL	184.0	84	218.
TROY, OR (1)	MAR-JUL	1420.0	97	1471.
CLEARWATER RIVER				
OROFINO, ID (1)	APR-JUL	4230.0	90	4718.
N.F. CLEARWATER RIVER				
DWORSHAK RES INFLOW, ID (1)	APR-JUL	2300.0	85	2700.
	APR-SEP	2450.0	85	2874.
CLEARWATER RIVER				
SPALDING, ID (1)	APR-JUL	6780.0	89	7618.
	APR-SEP	7160.0	89	8052.
UMATILLA RIVER				
GIBBON NR, OR	APR-JUL	65.0	93	70.
PENDLETON, OR	APR-JUL	131.0	93	141.
S.F. WALLA WALLA RIVER				
MILTON NR, OR	APR-JUL	51.0	96	53.
M.F. JOHN DAY RIVER				
RITTER, OR (1)	APR-JUL	101.0	87	116.
N.F. JOHN DAY RIVER				
MONUMENT NR, OR	APR-JUL	500.0	88	567.
JOHN DAY RIVER				
SERVICE CREEK, OR (1)	APR-SEP	755.0	92	821.
CROOKED RIVER				
PRINEVILLE RES INFLOW, OR	MAR-JUL	142.0	83	171.
OCHOCO CREEK				
OCHOCO RES INFLOW, OR	MAR-JUL	29.0	88	33.
S. SANTIAM RIVER				
WATERLOO, OR	APR-SEP	525.0	91	576.
N. SANTIAM RIVER				
MEHAMA, OR	APR-SEP	780.0	94	832.
WILLAMETTE RIVER				
SALEM, OR	APR-SEP	4200.0	90	4670.
CLACKAMAS RIVER				
ESTACADA, OR	APR-SEP	700.0	94	742.
MCKENZIE RIVER				
VIDA NR, OR	APR-SEP	1050.0	89	1184.
ROGUE RIVER				
RAYGOLD, OR	APR-SEP	770.0	89	868.
SILVIES RIVER				
BURNS NR, OR	APR-SEP	92.0	102	90.

THESE FORECASTS ARE SELECTED FROM THOSE PREPARED BY: NATIONAL WEATHER SERVICE, NATURAL RESOURCE CONSERVATION SERVICE, AND B.C. HYDRO AND POWER AUTHORITY. FOR VARIOUS PROJECT INFLOWS, THE FORECASTS HAVE BEEN COORDINATED WITH THE COLUMBIA RIVER FORECAST SERVICE AND THE U.S. BUREAU OF RECLAMATION.

ALL FORECASTS ARE IN THOUSANDS OF ACRE-FEET  
 ALL AVERAGES ARE FOR THE PERIOD 1961 THROUGH 1990  
 END.....NOAA/NWS/NORTHWEST RFC.....

NNNN

ZCZC PDXESGPDR  
 TTAA00 KPDR 092055  
 PEAK FLOW/STAGE FORECAST  
 NATIONAL WEATHER SERVICE  
 NW RIVER FORECAST CENTER  
 2/9/98

STATION	FEBRUARY		FINAL FORECAST			
	**** PROBABLE		RANGE		****	
	FLOOD STAGE (FEET)	LOW STAGE (FEET)	HIGH STAGE (FEET)	LOW FLOW (KCFS)	HIGH FLOW (KCFS)	
COLUMBIA BASIN						
COLUMBIA RIVER						
PRIEST RAPIDS - WASH	32.0	18.4	24.6	153.0	253.0	
THE DALLES				249.8	329.8	
VANCOUVER	16.0	#N/A	13.2			
WILLAMETTE RIVER						
PORTLAND - OREG.	18.0	#N/A	12.7			
CLARK FORK						
MISSOULA (ABV) - MT.	11.0	6.8	10.4	9.1	18.9	
ST. REGIS - MT.	19.0	12.6	15.0	23.5	36.1	
FLATHEAD RIVER						
COLUMBIA FALLS - MT.	14.0	10.0	13.2	27.7	47.6	
PEND OREILLE RIVER						
NEWPORT - WASH.	100KCFS			41.1	61.1	
SPOKANE RIVER						
SPOKANE - WA.	27.0	23.8	25.4	17.1	23.9	
OKANOGAN RIVER						
TONASKET - WA.	15.0	12.0	14.4	11.9	18.3	
WENATCHEE RIVER						
PESHASTIN - WA.	13.0	9.6	11.6	13.8	19.8	
YAKIMA RIVER						
PARKER (NR) - WA.	10.0	6.0	8.2	7.0	13.6	
SNAKE RIVER						
LOWER GRANITE - WA.				131.0	215.1	
HENRYS FORK						
REXBURG - ID.	9.5	8.8	9.8	6.4	8.9	
PAYETTE RIVER						
EMMETT - ID.	16KCFS	7.6	10.8	9.2	16.9	
SALMON RIVER						
WHITEBIRD - ID.	32.0	25.8	28.8	54.6	75.3	
CLEARWATER RIVER						
SPALDING - ID.	18.0	10.6	14.4	39.4	73.2	

PEAK FORECASTS PREDICT THE RANGE OF THE 67% CHANCE (1-SIGMA ABOUT THE MEDIAN) OF OCCURRENCE. ABNORMAL WEATHER DURING THE CRITICAL MELT PERIOD MAY CAUSE THE PEAK TO BE OUTSIDE THE INDICATED RANGE.

:end/nwrfc/ms

NNNN

ZCZC PDXESGWA  
 TTAA00 KPDR 092058  
 PEAK FLOW & CREST STAGE FORECAST  
 NOAA - NATIONAL WEATHER SERVICE  
 NORTHWEST RIVER FORECAST CENTER  
 2/9/98  
 WASHINGTON

STATION	FLOOD STAGE (FEET)	FEBRUARY FINAL FORECAST			
		***** LOW STAGE (FEET)	PROBABLE HIGH STAGE (FEET)	RANGE LOW FLOW (KCF'S)	***** HIGH FLOW (KCF'S)
SNAKE AT LOWER GRANITE				131.0	215.1
PALOUSE HOOPER		10.8	13.6	5.5	11.5
SNAKE ANATONE	21.0	12.0	17.2	73.9	123.4
PEND OREILLE AT NEWPORT	106KCF'S			41.1	61.1
KETTLE R. LAURIER		12.6	14.4	20.0	26.0
COLVILLE R. KETTLE FALLS				1.3	1.9
SPOKANE R. SPOKANE	27.0	23.8	25.4	17.1	23.9
PRIEST R. AT PRIEST RIVER		5.4	6.2	5.0	6.3
PEND OREILLE R. - HOPE	63.5	54.8	57.2		
COEUR D'ALENE AT ENAVILLE	72.0	65.0	67.2	7.5	12.5
ST JOE- CALDER	13.0	10.4	12.4	9.3	16.1
ST JOE- ST. MARIES	32.5	31.1	32.9		
COEUR D'ALENE CATALDO	43.0	40.0	43.8	11.3	24.5
COEUR D'ALENE INFLOW				24.2	34.2
COEUR D'ALENE ELEVATION	2135.0	2129.4	2131.1		
SIMILKAMEEN AT HEDLEY	13.0 A	10.0	13.0	8.8	15.8
SIMILKAMEEN NR NIGHTHAWK	11.0 A	8.8	12.4	9.3	19.3
OKANOGAN TONASKET	15.0	12.0	14.4	11.9	18.3
METHOW- PATEROS	10.0	7.2	9.2	9.0	15.6
CHELAN LAKE INFLOW				10.0	14.6
WENATCHEE R. PESHASTIN	13.0	9.6	11.6	13.8	19.8
PRIEST RAPIDS NATURAL		27.6	32.2	310.9	410.9
PRIEST RAPIDS OBSERVED	32.0	18.4	24.6	153.0	253.0
YAKIMA R. AT CLE ELUM	10KCF'S	4.8	5.8	3.8	7.8
YAKIMA R. AT PARKER	10.0	6.0	8.2	7.0	13.6
NACHES R. AT NACHES	17.0	15.6	17.0	4.3	7.7
YAKIMA R. AT KIONA	13.0	7.2	10.8	7.0	13.6
WALLA WALLA R. TOUCHET	10.0	7.2	9.8	1.8	3.8
COWLITZ AT CASTLEROCK	23.0	10.6	12.6	10.4	15.4
SKAGIT R. AT CONCRETE	28.0	23.8	27.4	39.3	59.3
SKAGIT AT MT. VERNON	28.0	21.6	26.2	39.3	59.3

PEAK FORECASTS PREDICT THE RANGE OF THE 67% CHANCE (1-SIGMA ABOUT THE MEDIAN) OF OCCURRENCE. ABNORMAL WEATHER DURING THE CRITICAL MELT PERIOD MAY CAUSE THE PEAK TO BE OUTSIDE THE INDICATED RANGE.

end/nwrfc/ms

NNNN

ZCZC PDXRRMPD2 WES  
TTAA00 KPDR DDHMM

NORTHWEST RIVER FORECAST CENTER - PORTLAND, OREGON

COLUMBIA BASIN PRECIPITATION (MONTHLY SUMMARY)

NWS PORTLAND RIVER FORECAST CENTER  
COLUMBIA BASIN DIVISION AVERAGES OF SEASONAL PRECIPITATION

DIVISION	..JAN TO DAY 31..			....OCT - JAN....		
	OBSD	DEP	PCT AV	OBSD	DEP	PCT AV
COLUMBIA ABOVE COULEE	3.18	.16	105.	9.10	-1.54	86.
SNAKE RV AB ICE HARBOR	2.82	.73	135.	6.63	-.62	91.
COLUMBIA AB THE DALLES	3.64	.68	123.	9.47	-.87	92.
COLUMBIA AB CASTLEGAR	4.76	.55	113.	14.66	-.25	98.
KOOTENAI	3.40	.35	111.	8.58	-2.34	79.
CLARK FORK	1.81	-.23	88.	5.43	-1.16	82.
FLATHEAD	2.09	-.42	83.	6.37	-2.56	71.
PEND OREILLE--SPOKANE	4.27	.25	106.	12.89	-1.15	92.
NORTHEAST WASHINGTON	3.02	1.15	162.	7.48	-.29	96.
OKANOGAN	2.75	.99	156.	6.62	.31	105.
EAST SLOPES WASH CASC.	8.75	1.71	124.	24.09	1.34	106.
CENTRAL WASHINGTON	1.58	.56	155.	4.15	-.04	99.
UPPER SNAKE	3.50	1.20	152.	7.65	-.24	97.
SNAKE RIVER PLAIN	1.78	.70	165.	3.55	-.61	85.
OWYHEE--MALHEUR	2.07	.85	170.	3.87	-.81	83.
SALMON/ BOISE/ PAYETTE	3.76	1.04	138.	8.37	-.85	91.
BURNT/ GRANDE RONDE	2.62	.67	135.	6.48	-.51	93.
CLEARWATER	3.61	-.31	92.	11.75	-1.23	91.
SOUTHEAST WASHINGTON	2.46	.15	106.	8.03	-.33	96.
UPPER JOHN DAY	3.09	1.42	185.	5.64	-.86	87.
UMATILLA LWR JOHN DAY	3.54	1.58	181.	8.18	.83	111.
UPR DESCHUTES CROOKED	3.74	1.64	178.	6.88	-.68	91.
HOOD/ LOWER DESCHUTES	5.96	1.36	130.	14.62	-1.16	93.
NW SLOPE WASH CASCADES	15.02	1.63	112.	48.63	2.48	105.
SW WA CASCADES/COWLITZ	12.40	1.33	112.	39.31	1.55	104.
WILLAMETTE VALLEY	12.36	3.42	138.	30.33	-1.66	95.
ROGUE--UMPQUA	9.02	3.68	169.	20.26	.03	100.
KLAMATH BASIN	5.41	2.81	208.	10.66	.89	109.
LAKE COUNTY GOOSE LAKE	2.32	.87	160.	4.91	-.72	87.
HARNEY--MALHEUR BASIN	2.26	1.00	179.	5.48	.26	105.

DIVISION VALUES ARE COMPUTED BY UTILIZING UN-WEIGHTED PRECIPITATION AMOUNTS FROM KEY STATIONS IN EACH AREA. NORMALS BASED ON 1961-1990. FOR FURTHER INFORMATION CONTACT: NWRFC (503) 326-7291.

A WARM AND VERY WET JANUARY BROKE THE "EL NINO" TREND IN THE PACIFIC NORTHWEST. SOME SITES ON THE SOUTH OREGON COAST AND SOUTHWEST WASHINGTON HAD 20 - 25 INCHES OF PRECIP!! SNOW-PACKS DOUBLED BY THE 3rd WEEK, THEN MELTED SLIGHTLY BY THE 31ST. POCATELLO REPORTED THE 4th WARMEST JANUARY ON RECORD.

MEAN TEMPERATURES DEPARTED +4.3 DEGREES (31 STATIONS) FROM NORMAL FOR THE PACIFIC NORTHWEST RELATIVE TO 1961-1990 NORMALS. MEAN TEMPERATURE DEPARTURES RANGED BETWEEN 11.3 AND -0.2 DEGREES. ONE RECORD LOW WAS TIED IN KALISPELL ON THE 12TH (-21 DEGREES). BY THE 31ST, REGIONAL SNOW DEPTHS (IN INCHES) WERE AS FOLLOWS: TETE JAUNE, B.C., 79; BLUE RIVER, B.C., 28; DIXIE, ID, 45; ELK CITY, ID, 18, POWELL, ID, 26; MISSOULA, MT, 2; BUTTE, MT, 2; MIDDLE FORK RANCH, ID, 9, YELLOWPINE BAR, ID, 11, SALMON, ID, 9; WEST YELLOWSTONE, MT, 29; WILD HORSE RESERVOIR, NV, 5; CRATER LAKE NP, OR, 90; MT. HOOD-TIMBERLINE LODGE, OR, 109; MT. RAINIER-PARADISE RS, WA, 144; STAMPEDE PASS, WA, 83; SNOQUALMIE PASS, WA, 80; STEVENS PASS, WA, 87; AND MT. BAKER LODGE, WA, 132.

SEVERAL FRONTS AND EXTENDED DEEP ALEUTIAN TROUGHS MOVED ACROSS THE BASIN WITH SOUTHWESTERLY FLOW THROUGH THE 9TH. A STATIONARY ARCTIC FRONT CENTERED ALONG THE COLUMBIA GORGE HELPED PRODUCE A SNOW STORM IN PORTLAND (7 INCHES) ON THE 10TH - 12TH... WITH MUCH FREEZING RAIN. THE SNOW EXTENDED UP PAST OLYMPIA (9 INCHES) AND AS FAR SOUTH AS SALEM. WARM WESTERLY FLOW WITH SEVERAL FRONTS HELPED MELT THE SNOW-ICE GRIP ON THE WEST SIDE BY THE 15TH. FROM THE 11TH TO THE 19TH, THESE HIGHLY PRECIPITABLE VIGOROUS FRONTS, ASSISTED BY DEEP EXTENDING ALEUTIAN TROUGHS, DUMPED THE HEAVIEST PRECIP OF THE MONTH. WESTERLY FLOW RETURNED BRIEFLY ON THE 20TH - 23RD. MORE EXTENDED ALEUTIAN TROUGHS AND VIGOROUS FRONTS GUIDED BY SOUTHWESTERLY FLOW ROARED OVER THE NORTHWEST BY THE 31ST. SOME STREAMS IN THE WILLAMETTE VALLEY AND PUGET SOUND BRIEFLY FLOODED.

FOR JANUARY...PRECIPITATION WAS 105 PERCENT OF NORMAL (1961-1990) AT  
COLUMBIA ABOVE COULEE; 135 PERCENT OF NORMAL AT THE SNAKE RIVER  
ABOVE ICE HARBOR; AND 123 PERCENT AT COLUMBIA ABOVE THE DALLES.

\*\*\* Includes late precip reports \*\*\*

end/nwrfc/kmartin  
NNNN

**US GEOLOGICAL SURVEY, WATER RESOURCES DIVISION**  
**Oregon District**  
**COMPARATIVE FLOW TABLE FOR JANUARY, 1998**

<u>Station</u>	<u>Monthly mean discharge</u>		<u>Change in discharge from previous month (percent)</u>	<u>Discharge near end of month</u>		<u>Accumulated Runoff</u>
	<u>Cubic feet per second</u>	<u>Percent of average</u>		<u>Cubic feet per second</u>	<u>Date</u>	
John Day River at Service Creek, OR	1,316	68	+175	2,190	31	63
Wilson River nr Tillamook, OR	3,568	139	+103	1,390	31	132
Umpqua River nr Elkton, OR	19,966	124	+218	14,040	31	80
Columbia River at The Dalles, OR	101,353(a)	105	15	181,000	31	123
Willamette River at Salem, OR	58,304(a)	120	+158	46,880	31	90
Chehalis River nr Grand Mound, WA	9,800	145	+86	5,020	31	133
Skykomish River nr Gold Bar, WA	4,205	96	+17	3,870	31	119
Spokane River at Spokane, WA	4,814(a)	87	+32	5,980	31	107
Snake River at Heise, ID	4,074(a)	133	+8	3,870	31	121
Snake River at Weiser, ID	19,253	103	+2	19,400	31	111
Salmon River at White Bird, ID	4,681	101	+3	4,690	31	106
Clearwater River at Spalding, ID	7,101	85	+29	11,400	30	103
Clark Fork at St. Regis, MT	2,290	69	+29	3,020	31	91
MF Flathead River nr West Glacier, MT	578	78	-3	510	31	94

Percent of Average computed using 30-year base period, Water Years 1961-90.  
(a) adjusted for upstream storage 02/10/98

**CORPS OF ENGINEERS, NORTH PACIFIC DIVISION**  
**REPORT FOR FEBRUARY 1998 CRWMG MEETING**

**Libby.**

The reservoir began January at elevation 2411.7 feet. The flood control objective based on the January final volume forecast was 2402.7 feet for the end of January. The actual elevation was 2403.0 feet. Average outflows for the month of January were 8.4 kcfs, which included a 5 day period when releases were reduced to 4 kcfs to facilitate an Idaho Fish and Game burbot monitoring study. A similar low flow operation started 7 February and was completed 10 February. Outflows from 11 – 20 February are expected to be about 15 kcfs during weekdays and 5 kcfs on the weekends. The last week in February outflows are expected to be about 10 kcfs. Inflows in the month of January averaged 3.4 kcfs, 104 percent of normal. The February final volume forecast for April – August is 5.6 MAF, which is 88% of normal. The end of February and end of March target flood control elevations, based on this volume forecast are 2392.3 feet and 2389.5 feet, respectively.

**Albeni Falls.**

In September, Lake Pend Oreille started drafting from full (2062.5') to 2055' by mid-November. This is the second year of a three year study during which Lake Pend Oreille will only be drafted to 2055' rather than 2051' to see if kokanee will spawn at higher elevations in cleaner gravels. The current operating range as of 1 January is 2055' - 2056'. This is the expected range of operation through March. The average outflows in January were 12.1 kcfs. The unregulated inflow to Lake Pend Oreille in December was 9.4 kcfs, 81% of normal.

**Dworshak.**

Dworshak elevation reached 1500' at the end of August and remained at this elevation through 1 December to facilitate grouting work to slow down seepage through the dam. Outflows have been at minimum flow (1.3 kcfs) since 1 December and are expected to remain at this level at least through March as the project is currently far below the rule curve.. The flood control objective based on the January final volume forecast was 1564.3 feet for the end of January. Actual elevation was 1512.7 feet. Inflow in January was 2.8 kcfs, 83% of normal. The February final volume forecast for April – July was 1.95 MAF, 72% of normal. The end of February and end of March target flood control elevations are 1560 feet and 1571.2 feet, respectively.

**Lower Snake Projects.**

Lower Granite December inflows were 33.4 kcfs, 92% of normal. Little Goose, Lower Monumental and Ice Harbor are operating in their normal operating ranges (633' – 638', 537' – 540', and 437' – 440'). Lower Granite returned to its normal operating range of 734' – 738' on 15 November (normally 733' is minimum pool but because of navigation problems at Lewiston, pool is being held higher). Because of construction work on the Lower Granite Behavioral Guidance System which will facilitate juvenile fish to swim towards the surface bypass collector, only two units have been available since 26 Jan. The remaining 4 units expect to be put back in service around 26 February, if all scheduled deliveries and installation occurs as planned. The February final volume forecast for Lower Granite was 91% of normal.

**Willamette Basin Projects.**

All Willamette projects started filling on 1 February, per flood control rule curves. Snowcap is only about 70% of normal. There is some concern about refilling projects in time for summer recreation. All projects are releasing minimum outflows, but are unable to fill at the normal filtrate due to low inflows. Fern Ridge is the only exception and the project is able to follow the rule curve with outflows above minimum.



WATER CONDITIONS REPORT - PN REGION

RESERVOIR STORAGE - January, 1998

End of Month Reservoir Contents (1000 AF):

STATION - CODE	ACTIVE CAPACITY	JAN			
		1998	% OF CAPACITY	AVG	% OF AVG
HGH-AF-HUNGRY HORSE DAM & R	2981.20	2022.19H	68	1915.06	106
CMO-AF-COMO DAM AND LAKE ON	35.10	16.23I	46	11.22	145
Yakima River Basin					
CLE-AF-CLE ELUM LAKE, WA	436.90	325.56O	75	259.40R	126
KAC-AF-KACHESS LAKE, WA	239.00	166.09O	69	173.20	96
KEE-AF-KEECHELUS LAKE, WA	157.80	129.44O	82	97.60	133
RIM-AF-TIETON DAM & RIMROCK	198.00	133.85O	68	117.90	114
BUM-AF-BUMPING LAKE, WA	33.70	8.65O	26	7.80R	111
Columbia Basin					
GCL-AF-GRAND COULEE DAM & F	5185.45	3485.00H	67	3812.50	91
BNK-AF-BANKS LAKE NR GRAND	715.00	****	***	593.68	***
POT-AF-O'SULLIVAN DAM & POT	332.20	****	***	242.35	***
Okanogan River Basin					
CCR-AF-CONCONULLY DAM & RES	13.00	10.85I	83	6.74	161
CCL-AF-SALMON LK DAM & CONC	10.50	8.70I	83	8.13	107
Snake River Basin					
JCK-AF-JACKSON LAKE NEAR MO	847.00	656.39V	77	479.62	137
PAL-AF-PALISADES RESERVOIR	1200.00	1085.43V	90	843.43	129
ISL-AF-ISLAND PARK RESERVOI	135.20	112.73V	83	100.30	112
GRS-AF-GRASSY LAKE NR MORAN	15.20	8.14V	54	10.76	76
RIR-AF-RIRIE RESERVOIR NEAR	80.50	41.62V	52	34.16E	122
AMF-AF-AMERICAN FALLS RES A	1672.60	1294.75V	77	1122.57	115
MIN-AF-MINIDOKA DAM & LAKE	95.20	37.26V	39	46.91	79
WOD-AF-LITTLE WOOD RESERVOI	30.00	24.35V	81	15.44	158
Boise River Basin					
AND-AF-ANDERSON RANCH RES A	423.20	390.75V	92	249.13	157
ARK-AF-ARROWROCK RESERVOIR	286.60	227.76V	79	216.04	105
LUC-AF-LUCKY PEAK LAKE NEAR	264.40	95.76V	36	76.87	125
LOW-AF-LAKE LOWELL, ID	169.10	115.37V	68	114.14	101
Payette River Basin					
CSC-AF-CASCADE RESERVOIR AT	653.00	513.75V	79	363.33	141
DED-AF-DEADWOOD RESERVOIR N	161.90	129.80V	80	79.09	164
Weiser River Basin					
MAN-AF-MANN CR DAM & RES ON	11.10	2.64O	24	4.56E	58
Clearwater River Basin					
RES-AF-LEWISTON ORCHARDS RE	3.00	0.88V	29	1.37E	64
SOL-AF-SOLDIERS MEADOW DAM,	2.37	****	***	0.56E	***
Owyhee River Basin					
OWY-AF-LAKE OWYHEE NEAR NYS	715.00	467.63V	65	442.12	106
WLD-AF-WILDHORSE RESERVOIR	71.50	54.31V	76	31.50	172
Malheur River Basin					
BEU-AF-AGENCY VALLEY DAM &	59.90	39.27V	66	26.57	148
BUL-AF-BULLY CREEK RESERVOI	30.00	16.45V	55	13.90E	118
WAR-AF-WARM SPRINGS RESERVO	191.00	109.59V	57	86.34	127
Powder River Basin					
PHL-AF-MASON DAM & PHILLIPS	73.50	49.95V	68	38.87E	129
THF-AF-THIEF VALLEY RESERVO	17.40	13.66V	78	16.46E	83
Burnt River Basin					
UNY-AF-UNITY RESERVOIR NEAR	25.20	9.80V	39	12.64	78
Umatilla River Basin					
MCK-AF-MCKAY RESERVOIR NR P	66.26	30.26V	46	32.11	94
CLS-AF-COLD SPRINGS DAM & R	38.33	9.41V	25	25.49	37
Deschutes River Basin					
CRA-AF-CRANE PRAIRIE DAM &	55.30	48.11I	87	40.46	119
CRE-AF-CRESCENT LK DAM & LK	86.90	80.12V	92	50.81	158

WIC-AF-WICKIUP DAM & RES ON	200.00	185.18I	93	156.79	118
OCH-AF-OCHOCO DAM & RES ON	45.24	27.08V	60	23.57	115
PRV-AF-ARTHUR R BOWMAN DAM	152.80	94.62V	62	94.66	100
HAY-AF-HAYSTACK DAM & RES O	5.64	4.47I	79	4.72E	95
WAS-AF-WASCO DAM & CLEAR LA	11.90	5.02V	42	5.40	93
Rogue River Basin					
AGA-AF-AGATE DAM AND RES ON	4.70	4.29V	91	3.33E	129
EMI-AF-EMIGRANT DAM & LK ON	39.00	25.58V	66	23.27	110
FIS-AF-FISH LK NR LAKE CR,	7.90	6.50V	82	5.37E	121
FOR-AF-FOURMILE LAKE, OR	15.60	14.19V	91	8.35E	170
HPD-AF-HOWARD PRAIRIE DAM &	60.60	46.75V	77	41.90E	112
HYA-AF-HYATT DAM & RES NR A	16.00	11.10V	69	10.90E	102
Tualatin River Basin					
SCO-AF-SCOGGINS DAM AND HEN	53.60	47.53I	89	34.39E	138
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TOTAL OF 50 RESERVOIRS	17381.91	12444.84	72	11397.19	109

AF is acre-feet.

AVG is published 30-year average, 1961-1990.

Please note that all data are PROVISIONAL and subject to revision.

This report is updated monthly, after the 15th of each month.

23-FEB-98 08:35:21 U.S.BUREAU OF RECLAMATION  
 YAKIMA PROJECT  
 SYSTEM STATUS AT 08:00

RESERVOIR	CONTENT	TOTAL CAPACITY	PERCENT CAPACITY	RESERVOIR INFLOW	RESERVOIR RELEASES
	AF	AF	%	CFS	CFS
Keechelus	130842.	157800.	83.	159.	159.
Kachess	174056.	239000.	73.	175.	8.
Cle Elum	331973.	436900.	76.	424.	272.
Bumping	8106.	33700.	24.	119.	123.
Rimrock	136000.	198000.	69.	327.	256.
TOTALS	780977.	1065400.	73.	1203.	818.

IRRIGATION DIVERSIONS	CFS	RIVER FLOWS	CFS
Kittitas	0.	Yakima River near Easton	424.
Roza	0.	Yakima River at Cle Elum	1010.
Yakima-Tieton	0.	Teanaway River bl. Forks	303.
Wapato	0.	Yakima River at E'Burg	1942.
Sunnyside	0.	Yakima River at Umtanum	2172.
MAJOR USERS TOTAL	0.	Naches River nr. Clf'Del	549.
		Tieton R. bl. Can. Hdwks	328.
Westside	0.	Naches River nr. Naches	663.
Naches-Selah	0.	Yakima River at Parker	4401.
OTHERS ABOVE PARKER	80.	Yakima River at Prosser	4203.
TOTAL ABOVE PARKER	80.		
Kennewick	0.		

OTHER CANAL DIVERSIONS	CFS
Wapatox	437.
Roza	1022.
Chandler	1325.

UNREGULATED TRIBUTARY & RETURN FLOW ABOVE PARKER - - 3663. CFS

OPERATIONAL COMMENTS:

FEBRUARY'S PRECIP. TO-DATE IS 46% OF MONTH'S AVERAGE.  
 TO-DAY'S SWC IS 112% OF AVERAGE BASED ON SNOTEL DATA.