

**COLUMBIA RIVER WATER MANAGEMENT GROUP
MEETING NO. 499**

1. ATTENDANCE

The following met at 9:30 a.m. on Tuesday, April 13, 1999, in the Custom House, Portland, OR

Members or Alternates Present

Peter Brooks, Corps of Eng-NWD-NP , Chair
Nancy Stephan, Bonneville Power Admin
Ted Day, US Bureau of Reclamation David
Westnedge, National Weather Svc-RFC
Ed Hubbard, US Geological Survey - Portland
Dan Moore, Nat'l Resources Conservation Svc
Walter Boyle, Federal Energy Regulatory Comm
Doug McChesney, WA Dept Ecology
Roger Ross, Corps of Engineers - NWD

Others Present

Eric Weiss, BC Hydro
Jim Gaspard, BC Hydro
Nengjin Liu, Idaho Power
Raquel Mills, Idaho Power
Glenn Traeger, Avista Energy
Kevin Krcil, Avista Energy
Dušica Jevremović, Fish Passage Center

Others Present - Continued

Doug Bornemeier, PacifiCorp
Elaine Prause, PacifiCorp
Tim Heizenrader, ECT (Enron)
Jeff Richter, ECT (Enron)
Stan Fox, Nat'l Resources Conservation Svc
Phil Pasteris, Nat'l Resources Conservation Svc
Sharon Demeaux, Corps of Engineers - NWD-NP
Julie Ammann, Corps of Engineers - NWD-NP

Members Not Present or Represented

, Nat'l Marine Fisheries Svc
Jack Gakstatter, US Environ'l Protection Agy
Bruce McCammon, US Forest Service
Marvin Yoshinaka, US Fish and Wildlife Svc
Bill Brooks, Bureau of Land Management
Barry Norris, Oregon Dept of Water Res
Mike Turnipseed, Nevada State Engineer
Gordon Fassett, Wyoming State Engineer
Jack Stults, Montana Dept of Nat'l Res/Cons

2. WEATHER SUMMARY

British Columbia weather in the Columbia basin was very warm and wet following a warm but dry October according to Eric Weiss. In fact for the last 19 months average monthly temperatures have been above normal. Some of the coastal basins in BC (not part of the Columbia drainage) set new monthly precipitation records.

Mid to late March warming and snowmelt focused along the middle Snake but was countered by a dominant winter-like storm pattern elsewhere as stated by Dave Westnedge. This pattern was interrupted only a few times by transient widespread fair weather episodes across the region. Mean temperatures were 0.5°F above normal with mean temperatures at individual stations varying from -3.2°F to +4.5°F from normal. More data can be found on http://www.nwrfc.noaa.gov/web_res/ppm.afs and http://www.nwrfc.noaa.gov/water_supply/1999/April/toc.shtml .

March precipitation was 80% of normal for the Columbia River above Grand Coulee; 61% of normal for the Snake Basin above Ice Harbor; and 76% for the basin above The Dalles. The Willamette Valley averaged 99% while the Rogue averaged 90%. **Seasonal** precipitation (Oct-Mar) was 113% of normal for the Columbia River above Grand Coulee; 110% of normal for the Snake Basin above Ice Harbor; and 115% for the basin above The Dalles. The Willamette Valley averaged 132% while the Rogue averaged 127%.

3. SNOWPACK

In the Columbia Basin in BC samples of snowpacks are 168% of normal above Mica Dam and 145% above Castlegar. Eric Weiss reported that record snowpacks are occurring at higher elevations basins that are in the southern portion of BC. The BC Ministry of Environment Lands & parks has snowpack information at http://www.elp.gov.bc.ca/wat/snow_bulletin/archive/1999/199904/columbia.html .

The US snowpacks at 133% of normal this year, according to Dan Moore, are similar to 1997 which has 138%. All subbasins have above normal snowpacks with 176% in the Yakima, 160% in the North Washington Cascades, tapering to the lowest of 115% in the upper Snake Basin. Stan Fox added that some snow sites continue to accumulate snow at this time and that there have been 22 sites with record snowpacks. More information on snow can be found at (these URLs may not link properly so you may have to type them in): http://www.wcc.nrcs.usda.gov/water/w_data.html and select “Snowpack Maps” and “Columbia River Snowpack Summary”.

4. STREAMFLOW

Streamflows in BC were typified by Mica inflows which were 78% to 88% of normal during October through December and then rapidly increased to 125% during March, according to Eric Weiss.

Monthly streamflow conditions throughout the US Pacific Northwest are indexed at 14 long term stations. During the January through March period they were generally above normal in all basins except eastern basins during February, according to Ed Hubbard (Enc 1). The lowest was the MF Flathead R near West Glacier which had only 71% of normal during February but picked up to 116% during March. Total seasonal runoff (Oct-Mar) was also above normal for the index stations except for the West Glacier gage which rose from 60% in January to 71% in March. A composite chart of average monthly discharge at these stations shows that after an initial period of high runoff in October the subsequent five months have had near normal discharge.

Charts were presented of accumulated monthly runoff for five selected station for 1999, 1998, and normal. They show the Umpqua and Skykomish rivers with above normal runoff and the Clark Fork, the Snake River at Weiser, and Columbia River at The Dalles were near normal.

5. SWSI

Stan Fox reported that the Surface Water Supply Index for Oregon was above normal due to the heavy snowpacks as shown at <http://crystal.or.nrcs.usda.gov/snowsveys/swsi0499.gif> .

6. RUNOFF VOLUME FORECASTS

Flood forecasts in British Columbia are near normal; Mica 107% and Arrow 125%, according to Jim Gaspard. The BC Ministry ELP forecasts can be found at

http://www.elp.gov.bc.ca/wat/snow_bulletin/archive/1999/199904/columfcap.html .

Dave Westnedge reported that the forecasts were lower (by up to 9% in the Snake Basin) this month due to lower precipitation but still varied from highs of 121% of normal in central Oregon to lows of 64% in portions of Idaho and western Montana. NWS-RFC forecasts will be found on the web at:

http://www.nwrfc.noaa.gov/cgi-bin/r_fcst .

NWRFC forecasts in maf for key basin are:

	<u>Jan-Jul</u>	<u>Apr-Jul</u>	<u>Apr-Sep</u>
Columbia at Grand Coulee	73.8 (117%)		73.4 (113%)
Snake at Lower Granite		26.2 (121%)	
Columbia at The Dalles	128.0 (121%)		119.0 (120%)
Libby	7.02 (110%)		7.39 (109%)
Hungry Horse	2.44 (108%)		2.38 (109%)
Dworshak	4.45 (125%)	3.40 (126%)	3.62 (126%)

The Corps’ official Dworshak inflow forecast method for Apr-Jul, accepted by the Corps, computed a forecast of 3.8 maf or 141% of normal and the official Libby forecast is for April-August inflow of 6956 kaf, 109% of normal. See <http://www.nwd-wc.usace.army.mil/cafe/forecast/dwrf.txt> and

<http://www.nwd-wc.usace.army.mil/cafe/forecast/lib99apr.pdf> .

Spring peak flows are forecast to be high on the northeastern Washington Cascades and in parts of the Snake Basin and western Montana. See http://www.nwrfc.noaa.gov/web_res/PDXESGPDR .

Labh Sachdev submitted a report stating that the Skagit snow survey suggests that the forecast runoff with

normal precipitation for April through July is 1175 ksf and April through August is 1280 ksf.

7. RESERVOIR OPERATION

Treaty storage is empty at the Canadian projects, according to Eric Weiss. BCH plans to fill Mica to within the top 5 ft by mid-August or the end of September, Arrow should be filled within the top 4 ft by the end of July, Duncan is passing inflow and is empty awaiting the freshet, and Kootenay Lake, whose levels are driven the IJC rulings, should peak this year between 1749 ft and 1753 ft.

Summaries of the operation of Corps projects for January, February and March are presented by Cathy Hlebechuk (Enc 2). As of the end of March **Libby** was 13 ft above its March 31 target flood control elevation due in part to the sturgeon refill curve. **Albeni Falls** will continue to operate between 2055 ft and 2056 ft through April 30. **Dworshak** reached minimum pool on April 9. The **lower Snake projects** began operating at their Minimum Operating Pools (MOP) according to the 1998 BiOp and have started night time voluntary spill for fish at the request of the Salmon Managers through the Technical Management Team (TMT) process. All projects **Willamette projects** continue to refill. Although the power projects (Hills Creek, Lookout Point, Cougar, Green Peter, and Detroit) remain 3-7 days behind their refill schedules to provide additional flood control storage for this years high snowpack (121% on April 1).

Active content available on March 31 at 52 irrigation reservoirs (excluding Grand Coulee and Hungry Horse Dam) was 6,976,000 af–68% of capacity, 1,499,400 af less than last year, and 472,200 af less than normal. Active content available at **Franklin D. Roosevelt Lake** (behind **Grand Coulee Dam**) was 2,126,900 af–41% of capacity, 667,500 af less than last year, and 599,000 af more than normal. Active content of **Hungry Horse** was 1,500,000 af–50% of capacity, 377,900 af less than last year, and 117,700 af less than normal. Reclamation’s graphic display of project operation (teacup plots) are on the internet: <http://www.pn.usbr.gov/hydromet/> .

Brownlee in on target for meeting the required mid April and April 30 flood control levels, according to Nengjin Liu. Refill is to begin on May 1.

Ross is below last year’s elevation at this time to make room for an anticipated early runoff. With normal weather the pool should refill quite easily, according to Labh Sachdev’s report.

8. POWER OPERATIONS

No power reports were submitted.

9. FISHERIES

As reported by Dušica Jevremović fish-related activities are beginning for the year will be found in <http://www.fpc.org> . The adult runs are just beginning, and may be slowed by the cool weather.

10. OTHER

The Blue Book (the annual water management report) is complete and should be on the website by month’s end at <http://www.nwd-wc.usace.army.mil> and look for “reports” under option 5 “Columbia River Water Management Group”.

The Corps of Engineers Northwestern Division North Pacific Office has a new web page site for project data and CRWGMG agenda, minutes, and reports like the Blue Book: <http://www.nwd-wc.usace.army.mil/> .

The web site with hourly data from Reclamation projects will be found on <http://www.pn.usbr.gov/hydromet/> .

11. NEXT MEETINGS

The site and date of the next meeting will be decided in an E-mail poll of members.

Roger L. Ross
Secretary

Enclosures

1. Streamflow Summary
2. COE Project Summary

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US GEOLOGICAL SURVEY, WATER RESOURCES DIVISION
Oregon District

COMPARATIVE FLOW TABLE FOR JANUARY 1999

Station	Cubic feet per second	Percent of average (percent)	Change in dis- charge from previous month (percent)	Discharge near end of month Cubic feet per second	Accumulated Runoff Oct-Jan Percent of Date	Average
John Day River at Service Creek, OR	2,640	137	+152	1,800	31	130
Wilson River nr Tillamook, OR	3,510	137	-27	4,000	31	157
Umpqua River nr Elkton, OR	21,270	132	-6	9,430	31	145
Columbia River at The Dalles, OR	127,800(a)	132	+20	216,000	31	106
Willamette River at Salem, OR	66,660(a)	137	-10	51,300	31	141
Chehalis River nr Grand Mound,	9,860	146	-8	20,600	31	155
Skykomish River nr Gold Bar, WA	6,747	154	-5	4,530	31	136
Spokane River at Spokane, WA	8,191(a)	147	+47	7,740	31	122
Snake River at Heise, ID	3,566(a)	117	+6	2,930	31	109
Snake River at Weiser, ID	21,273	113	+12	18,070	31	105
Salmon River at White Bird, ID	4,920	106	-3	4,340	31	103
Clearwater River at Spalding, ID	12,669	152	+42	7,420	31	122
Clark Fork at St. Regis, MT	3,660	110	+15	3,200	31	95
MF Flathead River nr West Glacier, MT	695	94	+13	617	31	60

Percent of Average computed using 30-year base period, Wtr Yrs 1961-90
(a) adjusted for upstream storage

02/08/99

Enc 1

US GEOLOGICAL SURVEY, WATER RESOURCES DIVISION
Oregon District

COMPARATIVE FLOW TABLE FOR FEBRUARY 1999

Station	----- Monthly mean discharge -----		Change in dis- charge from	----- Discharge near end of month -----		----- Accumulated Runoff -----	
	Cubic feet per second	Percent of average	previous month (percent)	Cubic feet per second	Date	Oct-Feb Percent of Average	
John Day River at Service Creek, OR	2,284	86	-13	6,210	28	114	
Wilson nr Tillamook, OR	5,143	243	+47	11,400	28	175	
Umpqua River nr Elkton, OR	25,300	182	+19	54,340	28	154	
Columbia River at The Dalles, OR	126,600(a)	112	-1	227,000	28	108	
Willamette River at Salem, OR	63,090(a)	146	-5	86,600	28	142	
Chehalis River nr Grand Mound,	13,660	243	+39	19,100	28	175	
Skykomish River nr Gold Bar, WA	3,869	100	-43	5,680	28	129	
Spokane River at Spokane, WA	7,082(a)	93	-14	9,770	28	113	
Snake River at Heise, ID	3,801(a)	120	+7	3,390	28	111	
Snake River at Weiser, ID	24,489	116	+15	36,400	28	108	
Salmon River at White Bird, ID	4,603	93	-6	5,390	28	101	
Clearwater River at Spalding, ID	11,015	97	-13	28,200	28	115	
Clark Fork at St. Regis, MT	3,120	83	-15	3,550	28	93	
MF Flathead River nr West Glacier, MT	530	71	-24	564	28	62	

Percent of Average computed using 30-year base period, Water Years 1961-90
(a) adjusted for upstream storage 03/03/99

US GEOLOGICAL SURVEY, WATER RESOURCES DIVISION

Oregon District

COMPARATIVE FLOW TABLE FOR March, 1998

Station	Monthly mean discharge		Change in discharge from	Discharge near end of month	Date	Accumulated Runoff
	Cubic feet per second	Percent of average	previous month (percent)	Cubic feet per second		Oct-May Percent of Average
John Day River 6,074. at Service Creek, OR	154	+166	5,690	31		129
Wilson River nr Tillamook, OR	1,997.	112	-61	1,740		31 165
Umpqua River 15,370. nr Elkton, OR	123	-39	12,080	31		148
Columbia River 197,800.(a) at The Dalles, OR	143	+56	302,000	31		116
Willamette River at Salem, OR	43,110.(a)	118	-32	34,500		31 138
Chehalis River 7,122. nr Grand Mound,	154	-48	8,500	31		171
Skykomish River nr Gold Bar, WA	3,315.	101	-14	3,400		31 125
Spokane River 12,695.(a) at Spokane, WA	134	+79	16,450	31		119
Snake River at Heise, ID	3,560.(a)	112	-6	4,330		31 111
Snake River at Weiser, ID	39,171.	160	+60	40,800		31 119
Salmon River at White Bird, ID	8,191.	137	+78	10,600		31 108
Clearwater River at Spalding, ID	21,736.	139	+97	20,500		31 122
Clark Fork at St. Regis, MT	5,180.	113	+66	7,540		31 97
MF Flathead River nr West Glacier, MT	1,050.	116	+98	1,870		31 71

Percent of Average computed using 30-year base period, Water Years 1961-90

(a) adjusted for upstream storage

04/05/99

CORPS OF ENGINEERS, NORTH PACIFIC DIVISION
REPORT FOR FEBRUARY 1999 CRWGM MEETING

Libby.

The reservoir began January near elevation 2405.6 feet . Outflows ranged between 21.5 and 26 kcfs between January 1 and 17. Starting on January 18, flows were reduced gradually to 6 kcfs to provide Idaho Dept of Fish and Game a chance to monitor burbot movement. Flows were increased again on January 25. The end of January elevation was 2373.9 feet, 1.8 feet below the end of January target flood control elevation based on the January final volume forecast. The January inflow was 4.15 kcfs, 124 % of average. The February final volume forecast for April – August was 6.9 MAF, 108% of normal. The target flood control elevations for February 28 and March 15 are 2333.8' and 2320.1'.

Albeni Falls.

Albeni Falls started drafting for winter flood control September 8 and reached minimum pool 2055' on November 22. This is the third year of a 3 year winter test to keep Albeni Falls elevation higher than normal (2051' is normal) in the hopes this will encourage kokanee to spawn in cleaner gravels. The project operated 2055' – 2055.5' through December 31 and started operating 2055' – 2056 in January. Outflows averaged 16kcfs and kcfs in January. The unregulated inflow to Lake Pend Oreille was 13.0 kcfs, 102% of average in January.

Dworshak.

Outflows were 1.3 kcfs (minimum flow) between September 1 and January 6. Outflows were increased on January 7 in response to the volume forecast. The project has been at full load (about 10 kcfs) since January 19 and is expected to continue at or above this outflow through March. The elevations at the beginning and end of January were 1533' and 1519.9'. Inflow in January was 5.2 kcfs, 139% of average. The February final volume forecast for April – July was 3.2 MAF, 119% of normal. The target end of month flood control elevations for February and March are 1491.5' and 1445', respectively.

Lower Snake Projects.

Lower Granite January inflow was 44.8 kcfs, 124% of average. Lower Granite was returned to normal operating range November 14 as juvenile fish numbers had dropped off. The project is currently operating for flood control at Lewiston. Lower Monumental and Little Goose and Ice Harbor are operating in their normal pool levels. Ice Harbor flip lip construction work was completed on February 5, thereby cancelling the no spill and constrained operating range. Dredging below Lower Monumental Dam will be done this winter to take care of the navigation hazard. This will allow Ice Harbor to operate at MOP next spring. The February final volume forecast for April – July at Lower Granite was 23.6 Maf, 109% above normal.

Willamette Basin Projects.

The Willamette projects began January by drafting water stored during the 28 December rain event. By 13 January, all projects had evacuated the water stored, bringing the overall system storage down from 33% to 1% full. Additional storm systems that arrived during the second and third week of January stored more water in the reservoirs and pushed many streamflows back to bankful. Fern Ridge remained above its rule curve through the end of the month, while all other projects were back at their rule curves by the end of January. Overall, the Willamette received precipitation that was 120% of average. This kept streamflows high and reservoir pools above the rule curve for the majority of the month.

CORPS OF ENGINEERS, NORTH PACIFIC DIVISION
REPORT FOR MARCH 1999 CRWMG MEETING

Libby.

The reservoir began February at elevation 2373.9 feet . Outflows ranged between 19 and 23 kcfs for the entire month. Between 1 and 9 February, there were 4 units available and these units were run at full load. Between 10 and 28 February, 5 units were available and these units were run at full load. The end of February elevation was 2345.25 feet, about 11 feet above the end of February target flood control elevation based on the February final volume forecast. The February inflow was 3.75 kcfs, 109 % of average. The March final volume forecast for April – August was 7.09 MAF, 111% of normal. The target flood control elevations for March 15 and March 31 are both 2310.9’.

Albeni Falls.

The project has been operating 2055’ – 2056’ since January 1 and will continue to do so through April 30. This is the third year of a 3 year winter test to keep Albeni Falls elevation higher than normal (2051’ is normal) in the hopes this will encourage kokanee to spawn in cleaner gravels. The Northwest Power Planning Council, Corps, Indian Tribes, are currently trying to determine if 2055’ should be the minimum elevation in all future years. Outflows averaged 15.2 kcfs in February.. The unregulated inflow to Lake Pend Oreille was 15.2 kcfs, 85% of average in February.

Dworshak.

The project was at full load (about 10 kcfs) between January 19 and March 3. Since March 4, outflows were increased to about 14 kcfs (including about 4 kcfs spill) to target the end of February flood control elevation. This is flow expected to continue through the end of March. The elevation at the beginning of February was 1519.9’. The end of February elevation was 1489.21’, about 2 feet below the end of February target flood control elevation based on the February final volume forecast. Inflow in February was 4.1 kcfs, 89 % of average. The March final volume forecast for April – July was 3.6 MAF, 135% of normal. The target end of month flood control elevation for March is 1445’.

Lower Snake Projects.

Lower Granite February inflow was 44.8 kcfs, 101% of average. Lower Granite was returned to normal operating range November 14 as juvenile fish numbers had dropped off. The project is currently operating for flood control at Lewiston. Lower Monumental and Little Goose and Ice Harbor are operating in their normal pool levels. Dredging below Lower Monumental Dam will be done this winter to take care of the navigation hazard. This will allow Ice Harbor to operate at MOP next spring. The March final volume forecast for April – July at Lower Granite was 28.3 Maf, 131% above normal.

Willamette Basin Projects.

February marked the beginning of the spring refill in the Willamette. All projects except Fern Ridge began storing water according to the refill schedule. Fern Ridge continued to evacuate water throughout the month. Storm systems arrived throughout the month, resulting in a February precipitation total that was 186% of average. High project inflows throughout the month helped the projects stay at or near the rule curve during February, which is the steepest part of the refill schedule. Streamflows remained within their banks during the month.

CORPS OF ENGINEERS, NORTH PACIFIC DIVISION
REPORT FOR APRIL 1999 CRWVG MEETING

Libby.

The reservoir began March at elevation 2345.25 feet . Between 1 and 8 March, there were 4 units available and these units were run at full load. Between 9 and 11 March, the outflow was reduced to 4 kcfs to target the 95 % confidence sturgeon refill curve. The end of March elevation was 2323.46 feet, about 13 feet (240 KAF) above the end of March target flood control elevation based on the March final volume forecast. The March inflow was 4.24 kcfs, 116 % of average. The April final volume forecast for April – August was 6.96 MAF, 109% of normal

Albeni Falls.

The project has been operating 2055' – 2056' since January 1 and will continue to do so through April 30. This is the third year of a 3 year winter test to keep Albeni Falls elevation higher than normal (2051' is normal) in the hopes this will encourage kokanee to spawn in cleaner gravels. The Northwest Power Planning Council, Corps, Indian Tribes, are currently trying to determine if 2055' should be the minimum elevation in all future years. Outflows averaged 20.2 kcfs in March. The unregulated inflow to Lake Pend Oreille was 17.7 kcfs, 104% of average in March.

Dworshak.

The project was at full load (about 10 kcfs) between January 19 and March 3. Between March 4 and April 2, outflows were increased to about 14 kcfs (including about 4 kcfs spill) to target the end of March flood control elevation. On April 3, outflows were reduced to full load (about 10 kcfs) to transition the project forebay to it's March 31 target elevation. The project is expected to reach minimum pool about April 9 and will start passing inflow at this point. The elevation at the beginning of March was 1489.2'. The end of March elevation was 1456.2'. Inflow in March was 8.7 kcfs, 139 % of average. The April final volume forecast for April – July was 3.8 MAF, 140.7% of normal. The target flood control elevations for April 15 and 30 are 1445'.

Lower Snake Projects.

Lower Granite March inflow was 82 kcfs, 148% of average. Warm temperatures in March created a lot of snow melt and runoff. The Lower Snake projects starting night time voluntary spill for fish for fish passage at the request of the Salmon Managers through the Technical Management Team Process. Spill at Lower Granite, Little Goose and Lower Monumental started on April 2. Spill at Ice Harbor started on April 3. The Lower Snake projects starting operating at Minimum Operating Pool (MOP) on April 3 in accordance with the 1998 Supplemental Biological Opinion. The April final volume forecast for April – July at Lower Granite was 26.2 Maf, 121% above normal.

Willamette Basin Projects.

March began with high streamflows in the Willamette, caused by a storm in the final days of February. Many streams approached bankfull conditions but none reached or exceeded bankfull. All projects except Fern Ridge continued to refill in March. Fern Ridge spent the first part of March evacuating water, finally reaching its rule curve on 11 March. Starting in mid-March, the power projects (Hills Creek, Lookout Point, Cougar, Green Peter, Detroit) remained 3-7 days behind their respective refill schedules. This is to provide additional flood control room given this years high snowpack (174% as of 1 March). Projects with little or no snow contribution will remain at their rule curves.