NRCS
Natural
Resources
Conservation
Service

United States Department of Agriculture

Washington
Water Supply Outlook Report
May 1, 2011

Water Supply Outlook Reports
and
Federal - State – Private Cooperative Snow Surveys

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How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. These forecasts are coordinated between hydrologists in the Natural Resources Conservation Service and the National Weather Service. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

Washington
Water Supply Outlook

May 2011

General Outlook

Just like the Energizer Bunny; this winter just keeps going and going and going. With temperatures running way below normal last month the snowpack is just now reaching peak density and beginning to show signs of melt. It is important to realize that the increased percent of averages over last month are as much related to the lack of normal melt rates then to the actual increase in snow water content. However above normal precipitation in most all mountain locations did indeed help build additional snowpack. Swamp Creek, Potato Hill and Waterhole SNOTEL sites, all located in completely different regions of the state, had one thing in common in that they all surpassed the previous record maximum May 1st snow water content set in 2008. Short term forecasts are for continued colder than normal temperatures but there are mixed opinions for below, above or normal precipitation. Long term projections call for gradual warming and drying to near normal conditions for the summer.

Snowpack

The May 1 statewide SNOTEL readings were 156% of average, up 41% from last month. The Chelan River snow survey data reported the lowest readings at 113% of average Colockum Creek near Wenatchee reported the highest at 323% of average. Westside averages from SNOTEL, and May 1 snow surveys, included the North Puget Sound river basins with 136% of average, the Central Puget river basins with 177%, and the Lewis-Cowlitz basins with 170% of average. Snowpack along the east slopes of the Cascade Mountains included the Yakima area with 120% and the Wenatchee area with 191%. Snowpack in the Spokane River Basin was at 167% and the Walla Walla River Basin had 153% of average. Maximum confirmed snow cover in Washington was at Paradise SNOTEL, with water content of 95.8 inches. The 30-year average for Paradise on May 1 is 74.8 inches.

BASIN	PERCENT OF LAST YEAR	PERCENT OF AVERAGE
Spokane	324	167
Newman Lake	583	230
Pend Oreille	236	162
Okanogan	199	140
Methow	160	124
Conconully Lake	369	246
Wenatchee	165	124
Chelan	147	113
Upper Yakima	169	119
Lower Yakima	134	122
Ahtanum Creek	134	133
Walla Walla	241	153
Lower Snake	226	155
Cowlitz	160	151
Lewis	174	189
White	132	118
Green	185	119
Puyallup	135	139
Cedar	338	257
Snoqualmie	186	136
Skykomish	179	132
Skagit	171	133
Baker	n/a	N/A
Nooksack	163	140
Olympic Peninsula	148	177

Precipitation

During the month of April, the National Weather Service and Natural Resources Conservation Service climate stations reported much above average precipitation in all river basins in the state, bringing all basins to well above normal for the water-year. The lowest percent of average in the state was at Winthrop in north central Washington which reported 55% of average for a total of 0.42 inches. The average for Winthrop is 0.77 inches for April. Paradise SNOTEL was the wettest spot in the state last month with 23.4 inches or 245% of average. Valley versus mountain precipitation varied greatly throughout Central WA with examples of Yakima Airport at only 60% and Morse Lake SNOTEL at 284%, both within the Lower Yakima River Basin.

RIVER BASIN	APRIL PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	244	135
Pend Oreille	246	127
Upper Columbia	179	125
Central Columbia	144	117
Upper Yakima	162	115
Lower Yakima	186	116
Walla Walla	160	118
Lower Snake	160	122
Lower Columbia	179	117
South Puget Sound	198	119
Central Puget Sound	184	122
North Puget Sound	156	118
Olympic Peninsula	118	13

Reservoir

Seasonal reservoir levels in Washington can vary greatly due to specific watershed management practices required in preparation for irrigation season, fisheries management, power generation, municipal demands and flood control. Reservoir storage in the Yakima Basin was 725,000-acre feet, 117% of average for the Upper Reaches and 182,000-acre feet or 108% of average for Rimrock and Bumping Lakes. Storage at the Okanogan reservoirs was 104% of average for May 1. The power generation reservoirs included the following: Coeur d'Alene Lake, 202,000-acre feet, 81% of average and 85% of capacity; Chelan Lake, 134,000-acre feet, 51% of average and 20% of capacity; and the Skagit River reservoirs at 81% of average and 43% of capacity. Recent climate impacts and management procedures may affect these numbers on a daily or weekly basis.

BASIN	PERCENT OF CAPACITY	CURRENT STORAGE AS PERCENT OF AVERAGE
Spokane	85	81
Pend Oreille	44	76
Upper Columbia	84	104
Central Columbia	20	51
Upper Yakima	87	117
Lower Yakima	79	108
Lower Snake	43	59
North Puget Sound	43	81

For more information contact your local Natural Resources Conservation Service office.

Streamflow

Forecasts vary from 106% of average for the S.F. Walla Walla near Milton-Freewater to 170% of average for the Cedar River at Cedar Falls. May-September forecasts for some Western Washington streams include the Cedar River near Cedar Falls, 146%; White River, 119%; and Skagit River, 114%. Some Eastern Washington streams include the Yakima River near Parker, 115%: Wenatchee River at Plain, 120%; and Spokane River near Post Falls, 164%. Volumetric forecasts are developed using current, historic and average snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS.

Statewide April streamflows varied by region but were surprisingly low in some locations considering the amount of precipitation that we had. The Walla Walla River had the highest reported natural flows with 220% of average. The Similkameen at Nighthawk with 41% of average was the lowest in the state. Other streamflows were the following percentage of average as reported by the River Forecast Center: the Cowlitz at Castle Rock, 152%; the Spokane at Spokane, 128%; the Columbia below Rock Island Dam, 81%; and the Cle Elum near Roslyn, 80%. Some operations were obviously voiding storage to make room for the impending snowmelt which is running surprisingly late this season.

BASIN	PERCENT OF AVERAGE (50 PERCENT CHANCE OF EXCEEDENCE)
Spokane	146-164
Pend Oreille	133-150
Upper Columbia	127-172
Central Columbia	112-120
Upper Yakima	113-131
Lower Yakima	115-137
Walla Walla	106-114
Lower Snake	121-144
Lower Columbia	118-137
South Puget Sound	106-119
Central Puget Sound	129-170
North Puget Sound	108-121
Olympic Peninsula	140-141

STREAM	PERCENT OF AVERAGE APRIL STREAMFLOWS
Pend Oreille Below Box Canyon	96
Kettle at Laurier	43
Columbia at Birchbank	62
Spokane at Long Lake	129
Similkameen at Nighthawk	41
Okanogan at Tonasket	52
Methow at Pateros	79
Chelan at Chelan	76
Wenatchee at Pashastin	85
Yakima at Cle Elum	74
Yakima at Parker	117
Naches at Naches	121
Grande Ronde at Troy	148
Snake below Lower Granite Dam	129
SF Walla Walla near Milton Freewater	220
Columbia River at The Dalles	109
Cowlitz below Mayfield Dam	151
Skagit at Concrete	75
Dungeness near Sequim	97

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Soil Moisture

Current soil moisture data is available from a limited number of SNOTEL sites scattered throughout each basin. As the effort continues to install additional sensors and more years of data are acquired this information will become invaluable to the streamflow forecasting community. Heavy fall precipitation has allowed for above the curve soil moisture carryover through the winter. This will be of great benefit to water supplies come runoff season since the melting snow won't have to first fill a depleted soil moisture profile.

BASIN	ESTIMATED PERCENT SATURATION
Spokane	64
Pend Oreille	71
Upper Columbia	54
Central Columbia	67
Upper Yakima	62
Lower Yakima	71
Walla Walla	74
Lower Snake	74
Lower Columbia	70
South Puget Sound	67
Central Puget Sound	N/A
North Puget Sound	89
Olympic Peninsula	48

B A S I N S U M M A R Y O F
S N O W C O U R S E D A T A

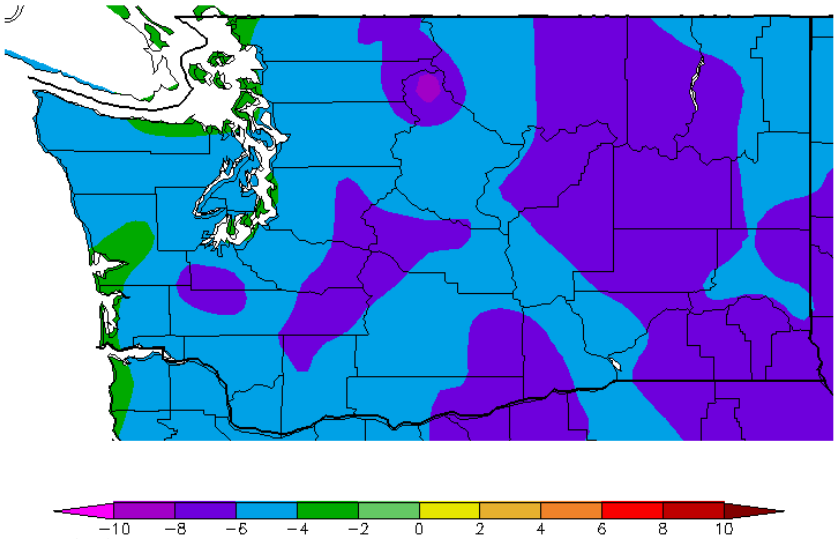
MAY 2011

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
ALPINE MEADOWS SNTL	3500	5/01/11	139	66.0	35.1	45.8
AMBROSE	6480	4/29/11	56	18.4	7.0	11.1
ASHLEY DIVIDE	4820	4/29/11	20	7.6	.0	1.1
BADGER PASS SNOTEL	6900	5/01/11	129	52.5	26.9	36.2
BAREE CREEK	5500	4/28/11	140	57.4	27.4	40.3
BAREE MIDWAY	4600	4/28/11	111	40.9	18.1	27.4
BAREE TRAIL	3800	4/28/11	30	10.8	.0	1.3
BARKER LAKES SNOTEL	8250	5/01/11	71	21.1	17.3	16.2
BARNES CREEK CAN.	5320	5/01/11	70	26.0	11.1	19.7
BASIN CREEK SNOTEL	7180	5/01/11	44	12.3	7.0	10.0
BEAVER CREEK TRAIL	2200	4/30/11	34	14.4	.0	4.4
BEAVER PASS	3680	5/01/11	100	44.0	23.2	27.2
BEAVER PASS SNOTEL	3630	5/01/11	116	54.6	33.6	35.5
BIG WHITE MTN CAN.	5510	4/30/11	75	25.4	15.4	19.4
BLACK MOUNTAIN	7750	4/27/11	68	22.3	11.5	16.9
BLACK PINE SNOTEL	7100	5/01/11	52	18.0	6.1	11.0
BLACKWALL PILL CAN.	6370	5/01/11	98	41.0	28.1	34.9
BLEWETT PASS#2SNOTEL	4240	5/01/11	17	8.4	.0	5.0
BLUE LAKE	5900	5/02/11	85	32.6	15.5	22.4
BROOKMERE CAN.	3000	4/30/11	25	8.6	.9	4.0
BROWN TOP AM	6000	5/01/11	168	72.2	56.0	62.1
BRUSH CREEK TIMBER	5000	4/27/11	45	18.6	.0	3.6
BUCKINGHORSE SNOTEL	4870	5/01/11	257	95.0	72.1	--
BULL MOUNTAIN	6600	4/25/11	27	9.1	.0	2.6
BUMPING RIDGE SNOTEL	4610	5/01/11	95	36.4	24.7	27.5
BUNCHGRASS MDWSNOTEL	5000	5/01/11	97	36.6	23.2	28.6
BURNT MOUNTAIN PIL	4170	5/01/11	74	27.1	7.4	5.6
CALAMITY SNOTEL	2500	5/01/11	7	4.0	.0	--
CARMI CAN.	4100	4/30/11	18	5.7	--	1.1
CAYUSE PASS SNOTEL	5240	5/01/11	211	85.1	53.4	--
CHESSMAN RESERVOIR	6200	4/28/11	21	7.6	.0	1.7
CHICKEN CREEK	4060	4/26/11	56	20.9	4.7	5.4
COMBINATION SNOTEL	5600	5/01/11	14	4.5	.0	1.2
COPPER BOTTOM SNOTEL	5200	5/01/11	12	4.8	.0	4.5
COPPER MOUNTAIN	7700	4/26/11	52	15.5	6.7	10.0
CORRAL PASS SNOTEL	5800	5/01/11	123	44.3	30.8	35.3
COTTONWOOD CREEK	6400	4/27/11	33	9.8	4.0	7.3
COUGAR MTN. SNOTEL	3200	5/01/11	62	24.4	1.0	11.0
COX VALLEY	4500	5/01/11	142	40.0	37.8	37.1
COYOTE HILL	4200	4/29/11	22	8.2	.3	2.6
DALY CREEK SNOTEL	5780	5/01/11	36	12.7	2.3	5.3
DEER PARK	5200	4/27/11	77	30.9	18.6	15.2
DEVILS PARK	5900	4/29/11	135	54.3	35.5	44.7
DISCOVERY BASIN	7050	4/26/11	52	16.6	7.2	9.4
DIX HILL	6400	5/01/11	38	14.3	.0	3.8
DOMMERIE FLATS	2200	4/28/11	0	.0	.0	--
DUNGENESS SNOTEL	4010	5/01/11	49	22.7	2.9	.9
EAST FORK R.S.	5400	4/28/11	2	.3	.0	.7
EMERY CREEK SNOTEL	4350	5/01/11	58	22.2	2.3	7.4
ESPERON CK. UP CAN.	5050	4/29/11	50	16.4	10.6	15.4
FARRON CAN.	4000	4/27/11	41	15.7	4.1	8.1
FATTY CREEK	5500	5/02/11	113	43.4	25.2	23.4
FISH CREEK	8000	4/29/11	53	15.2	8.7	11.5
FISH LAKE	3370	5/02/11	62	30.1	15.8	23.1
FISH LAKE SNOTEL	3430	5/01/11	69	31.3	17.0	28.8
FLATTOP MTN SNOTEL	6300	5/01/11	169	64.7	39.8	46.7
FLEECER RIDGE	7500	4/25/11	41	13.6	1.1	8.7
FOURTH OF JULY SUM	3200	4/29/11	7	1.8	.0	.3
FREEZEOUT CK. TRAIL	3500	5/01/11	34	12.3	.0	6.4
FROHNER MDWS SNOTEL	6480	5/01/11	37	11.3	4.3	6.5
GRAVE CRK SNOTEL	4300	5/01/11	63	25.2	5.5	7.0
GREEN LAKE SNOTEL	5920	5/01/11	84	29.6	23.7	24.6
GRIFFIN CR DIVIDE	5150	4/27/11	39	14.1	.0	4.9
GROUSE CAMP SNOTEL	5390	5/01/11	56	21.3	13.1	11.1
GUNSIGHT LAKE	6300	5/02/11	141	57.6	25.4	--
HAND CREEK SNOTEL	5030	5/01/11	42	16.4	4.1	6.8
HARTS PASS SNOTEL	6490	5/01/11	132	66.1	35.8	47.7
HARTS PASS	6500	4/29/11	140	58.0	43.6	44.4
HELL ROARING DIVIDE	5770	4/29/11	122	48.3	21.5	29.0
HERRIG JUNCTION	4850	4/26/11	90	35.8	18.8	22.9
HIGH RIDGE SNOTEL	4920	5/01/11	74	29.6	9.3	15.9
HOLBROOK	4530	5/02/11	12	3.0	.0	1.2
HOODOO BASIN SNOTEL	6050	5/01/11	157	59.2	26.7	45.7
HUCKLEBERRY SNOTEL	2250	5/01/11	0	.0	.0	.0
HUMBOLDT GLCH SNOTEL	4250	5/01/11	---	17.7	1.7	5.5
HURRICANE	4500	4/25/11	74	30.9	14.5	17.9
INDIAN ROCK SNOTEL	5360	5/01/11	95	45.2	27.7	--
INTERGAARD	6450	4/24/11	32	7.4	1.9	6.1
ISINTOK LAKE CAN.	5100	4/28/11	33	8.1	1.3	5.4
JUNE LAKE SNOTEL	3440	5/01/11	144	70.3	32.5	29.6
KRAFT CREEK SNOTEL	4750	5/01/11	39	14.8	.6	5.2
LOGAN CREEK	4300	4/27/11	32	10.4	.0	1.7
LOLO PASS SNOTEL	5240	5/01/11	90	37.4	10.8	24.5
LONE PINE SNOTEL	3930	5/01/11	144	65.3	39.0	34.2
LOOKOUT SNOTEL	5140	5/01/11	112	41.6	12.4	27.2
LOST HORSE SNOTEL	5120	5/01/11	41	17.3	11.4	10.7
LOST LAKE SNOTEL	6110	5/01/11	201	75.8	32.9	59.7
LOWER SANDS CREEK #2	3120	5/02/11	66	26.9	.0	15.8
LUBRECHT FOREST NO 3	5450	4/28/11	15	3.8	.0	1.7
LUBRECHT FOREST NO 4	4650	4/28/11	0	.0	.0	.1
LUBRECHT FOREST NO 6	4040	4/28/11	0	.0	.0	.0
LUBRECHT HYDROPLOT	4200	4/28/11	0	.0	--	.1
LUBRECHT SNOTEL	4680	5/01/11	0	.0	.0	.5
LYMAN LAKE SNOTEL	5980	5/01/11	182	74.9	55.3	67.2
LYNN LAKE SNOTEL	3900	5/01/11	91	34.6	11.4	--
MARIAS PASS	5250	4/30/11	72	26.9	4.0	12.5
MARTEN RIDGE SNOTEL	3520	5/01/11	168	85.8	47.5	--
MEADOWS CABIN	1900	5/02/11	0	.0	.0	1.1
MEADOWS PASS SNOTEL	3230	5/01/11	77	35.2	9.1	10.8
M F NOOKSACK SNOTEL	4970	5/01/11	193	83.2	53.9	69.9
MICA CREEK SNOTEL	4510	5/01/11	85	27.3	8.6	15.3
MINERAL CREEK	4000	4/27/11	41	17.8	.0	9.6
MISSION CREEK CAN.	5840	5/01/11	77	25.9	17.3	21.3
MONASHEE PASS CAN.	4500	5/01/11	48	17.0	5.9	11.4
MORSE LAKE SNOTEL	5410	5/01/11	164	65.0	63.0	57.0
MOSES MTN SNOTEL	5010	5/01/11	49	20.5	11.4	10.9
MOSQUITO RDG SNOTEL	5200	5/01/11	---	55.9	25.0	32.2
MOULTON RESERVOIR	6850	4/29/11	31	8.0	.0	3.5
MOUNT CRAG SNOTEL	3960	5/01/11	139	48.7	36.8	27.8
MT. KOBAU CAN.	5500	4/30/11	53	17.2	13.3	12.8
MOWICH SNOTEL	3160	5/01/11	0	.0	.0	.0
MOUNT GARDNER SNOTEL	2920	5/01/11	51	20.0	.0	4.8
N.F. ELK CR SNOTEL	6250	5/01/11	53	18.6	5.2	8.0
NEVADA RIDGE SNOTEL	7020	5/01/11	69	25.0	8.8	14.4
NEW HOZOMEEN LAKE	2800	4/29/11	0	.0	.0	3.9
NEZ PERCE CMP SNOTEL	5650	5/01/11	46	16.8	5.5	10.8
NEZ PERCE PASS	6570	4/29/11	61	23.4	7.8	14.2
NOISY BASIN SNOTEL	6040	5/01/11	192	76.6	38.8	43.8
NORTH FORK JOCKO	6330	5/01/11	---	63.2E	38.1	41.2
OLALLIE MDWS SNOTEL	4030	5/01/11	139	65.1	51.2	55.1
OPHIR PARK	7150	5/01/11	67	21.9	8.2	16.0
OYAMA LAKE CAN.	4100	4/28/11	25	6.9	.3	2.6
PARADISE SNOTEL	5130	5/01/11	205	95.8	64.4	74.8
PARK CK RIDGE SNOTEL	4600	5/01/11	105	52.3	34.8	39.8
PEPPER CREEK SNOTEL	2140	5/01/11	8	4.2	.0	--
PETERSON MDW SNOTEL	7200	5/01/11	58	15.3	10.4	11.0
PIGTAIL PEAK SNOTEL	5800	5/01/11	173	64.9	51.3	56.5
PIKE CREEK SNOTEL	5930	5/01/11	72	27.7	5.0	25.9
PIPESTONE PASS	7200	4/26/11	32	9.2	1.8	4.8
POPE RIDGE SNOTEL	3590	5/01/11	38	14.5	8.8	7.0
POSTILL LAKE CAN.	4200	4/29/11	32	8.9	1.7	5.3
POTATO HILL SNOTEL	4510	5/01/11	113	44.9	28.1	18.9
QUARTZ PEAK SNOTEL	4700	5/01/11	95	34.2	8.5	14.9
RAGGED MTN SNOTEL	4210	5/01/11	74	31.9	5.1	--
RAGGED RIDGE	3330	4/29/11	7	2.1	.0	--
RAINY PASS SNOTEL	4890	5/01/11	102	48.7	27.4	43.2
RAINY PASS	4780	4/30/11	102	38.3	28.5	39.3
REX RIVER SNOTEL	3810	5/01/11	101	50.5	20.0	19.0
ROCKER PEAK SNOTEL	8000	5/01/11	80	23.0	13.6	16.6
ROUND TOP MTN	4020	5/02/11	48	17.6	1.0	--
SADDLE MTN SNOTEL	7900	5/01/11	94	35.5	13.7	26.5
SALMON MDWS SNOTEL	4460	5/01/11	26	9.6	2.6	3.9
SASSE RIDGE SNOTEL	4340	5/01/11	90	35.9	26.0	32.3
SATUS PASS	4030	5/02/11	19	8.2	--	--
SAVAGE PASS SNOTEL	6170	5/01/11	93	37.2	14.3	25.2
SAWMILL RIDGE SNOTEL	4640	5/01/11	109	56.1	40.8	--
SENTINEL BT SNOTEL	4680	5/01/11	44	14.7	5.4	3.5
SHEEP CANYON SNOTEL	3990	5/01/11	146	64.8	31.7	32.0
SHERWIN SNOTEL	3200	5/01/11	---	4.9	.0	3.3
SILVER STAR MTN CAN.	5600	5/01/11	93	38.1	25.9	30.1
SKALKAHO SNOTEL	7260	5/01/11	87	32.6	12.3	25.4
SKITWISH RIDGE	5110	5/02/11	133	56.4	21.3	25.8
SKOOKUM CREEK SNOTEL	3310	5/01/11	88	44.3	6.0	14.6
SLIDE ROCK MOUNTAIN	7100	4/24/11	65	20.6	8.8	15.7
SOURDOUGH GUL SNOTEL	4000	5/01/11	0	.0	.0	--
SPENCER MDW SNOTEL	3400	5/01/11	89	44.3	23.3	21.8
SPIRIT LAKE SNOTEL	3520	5/01/11	22	14.7	.0	.6
SPOTTED BEAR MTN.	7000	5/02/11	54	22.1	3.6	7.6
SPRUCE SPGS SNOTEL	5700	5/01/11	51	19.7	.8	--
STAHL PEAK SNOTEL	6030	5/01/11	161	59.3	34.0	37.1
STAMPEDE PASS SNOTEL	3850	5/01/11	98	39.7	23.3	42.7
STEMPLE PASS	6600	5/01/11	---	14.5E	5.6	9.3
STEVENS PASS SNOTEL	3950	5/01/11	113	40.8	24.4	35.2
STORM LAKE	7780	4/26/11	63	20.4	12.3	14.3
STRYKER BASIN	6180	4/26/11	131	47.7	25.1	32.6
SUMMERLAND RES CAN.	4200	4/29/11	28	8.5	.0	5.1
SUNSET SNOTEL	5540	5/01/11	---	38.7	12.7	28.7
SURPRISE LKS SNOTEL	4290	5/01/11	158	70.2	44.6	41.8
SWAMP CREEK SNOTEL	3930	5/01/11	53	24.6	.0	4.6
SWIFT CREEK SNOTEL	4440	5/01/11	210	100.4	78.7	59.7

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
TEN MILE LOWER	6600	4/28/11	34	10.9	1.2	4.5
TEN MILE MIDDLE	6800	4/28/11	48	14.1	7.5	11.2
THUNDER BASIN SNOTEL	4320	5/01/11	76	35.2	23.3	27.4
THUNDER BASIN	4200	5/02/11	67	24.9	12.7	21.2
THOMPSON CREEK	2500	4/28/11	4	1.5	.0	--
TINKHAM CREEK SNOTEL	2990	5/01/11	82	34.4	12.3	20.0
TOUCHET SNOTEL	5530	5/01/11	81	34.9	17.5	26.2
TRINKUS LAKE	6100	5/02/11	146	58.6	45.9	40.8
TROUGH #2 SNOTEL	5480	5/01/11	33	13.9	9.1	4.3
TROUT CREEK CAN.	5650	4/29/11	35	10.6	3.0	3.7
TRUMAN CREEK	4060	4/29/11	6	1.8	.0	.1
TUNNEL AVENUE	2450	4/29/11	42	19.2	2.0	12.0
TV MOUNTAIN	6800	5/02/11	76	29.5	12.8	17.1

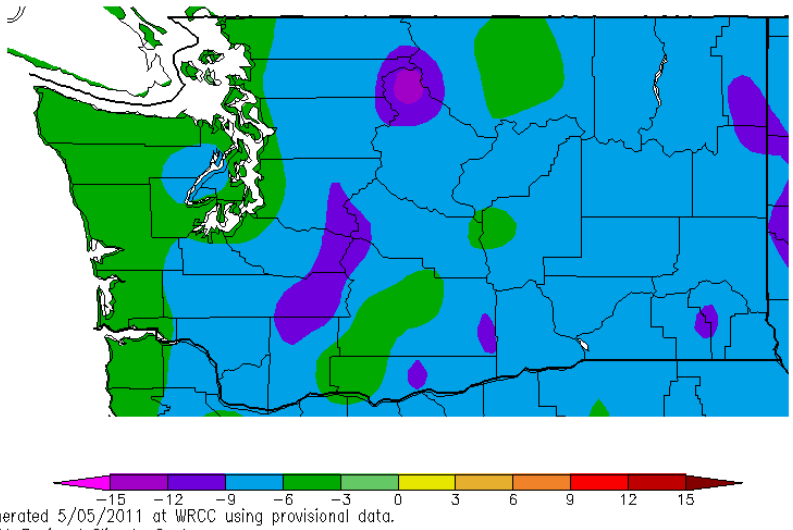
SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
TWELVEMILE SNOTEL	5600	5/01/11	51	18.6	.9	8.8
TWIN CREEKS	3580	5/02/11	21	9.1	.7	1.7
TWIN LAKES SNOTEL	6400	5/01/11	127	52.6	22.8	38.5
UPPER HOLLAND LAKE	6200	5/02/11	126	53.3	25.2	33.5
UPPER WHEELER SNOTEL	4330	5/01/11	29	12.0	6.6	6.3
WARM SPRINGS SNOTEL	7800	5/01/11	107	33.3	21.6	23.7
WATERHOLE SNOTEL	5010	5/01/11	143	65.9	50.6	36.4
WEASEL DIVIDE	5450	5/01/11	---	49.0E	23.2	32.7
WELLS CREEK SNOTEL	4030	5/01/11	119	52.1	29.3	26.9
WHITE PASS ES SNOTEL	4440	5/01/11	78	23.4	17.0	21.4
WHITE ROCKS MTN CAN.	7200	4/29/11	61	23.2	17.6	21.0

Ave. Temperature dep from Ave (deg F)
4/5/2011 – 5/4/2011



Generated 5/05/2011 at WRCC using provisional data.
NOAA Regional Climate Centers

Av. Max. Temperature dep from Ave (deg F)
4/5/2011 – 5/4/2011



Generated 5/05/2011 at WRCC using provisional data.
NOAA Regional Climate Centers

Natural Resources Conservation Service

Washington State
Snow, Water and Climate Services

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Helpful Internet Addresses

NRCS Snow Survey and Climate Services Homepages

Washington:
http://www.wa.nrcs.usda.gov/snow

Oregon:
http://www.or.nrcs.usda.gov/snow

Idaho:
http://www.id.nrcs.usda.gov/snow

National Water and Climate Center (NWCC):
http://www.wcc.nrcs.usda.gov

USDA-NRCS Agency Homepages

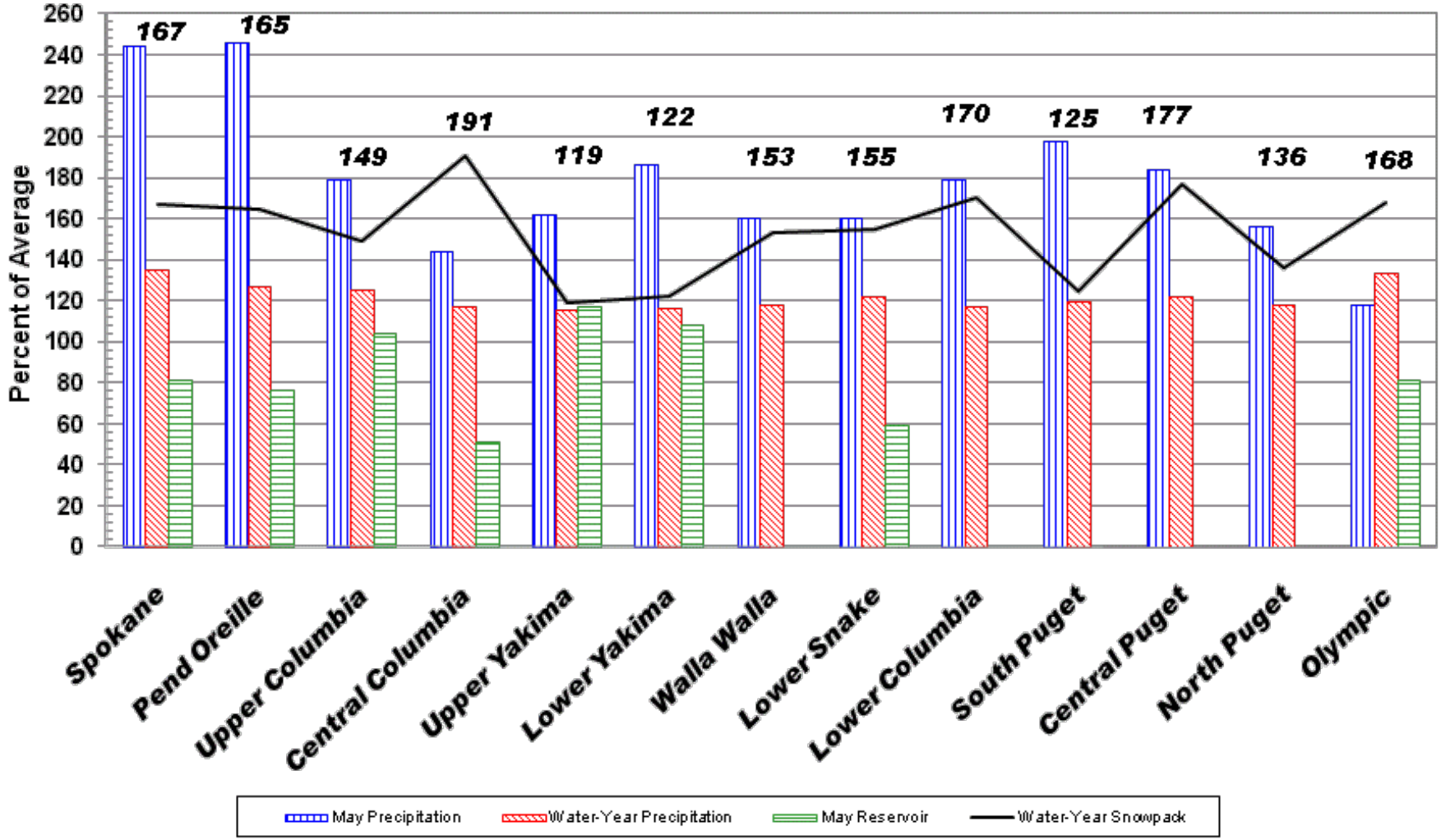
Washington:
http://www.wa.nrcs.usda.gov

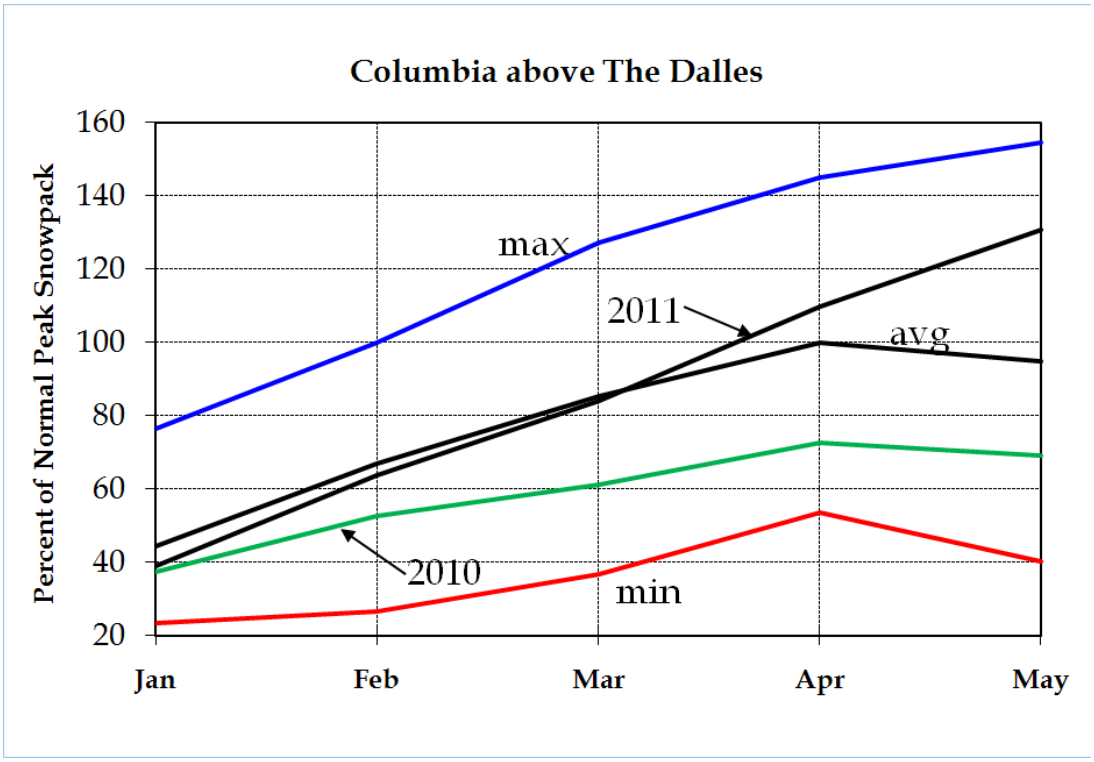
NRCS National:
http://www.nrcs.usda.gov

NRCS Natural Resources Conservation Service

May 1, 2011 - Snowpack, Precipitation and Reservoir Conditions at a Glance

(Water Year = October 1, 2010 - Current Date)





May 1, 2011

The Columbia Basin snowpack charts are produced, using only automated data. These data are telemetered via remote collection sites in Canada and the United States. The data are provisional, until they are officially released by the responsible data collection agency.

The combined Columbia Basin snowpack above The Dalles is currently at 138 percent of average, compared to 110 percent of average last month and 73 percent last year. This increase in the snowpack percent of average was due to generally above normal precipitation over the basin, combined with temperatures that were 6 to 8 degrees below normal. The cool weather over the entire basin prevented or slowed down the normal April snowmelt significantly, allowing the snowpack to remain the same in areas where precipitation was at or below normal and increase significantly in those areas that experienced above normal precipitation. All areas of the basin were affected.

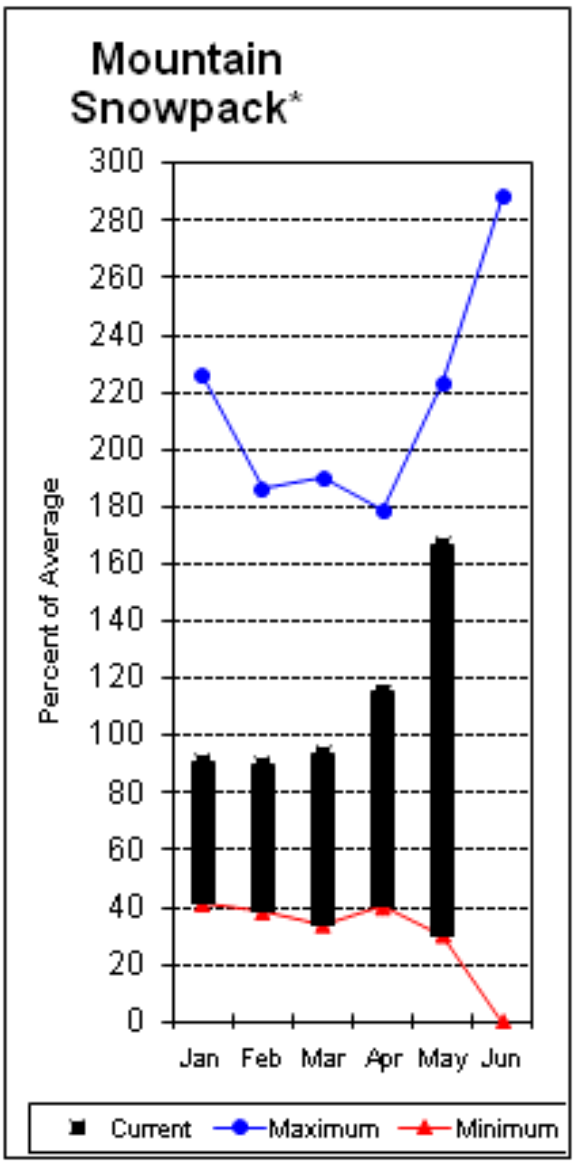
The snowpack increases as a percent of average were quite impressive. The increases ranged from 12% along the Columbia River mainstem in Canada to 71% in eastern Oregon. The Kootenay Basin snowpack percent of average increased 25% from April 1, Pend Oreille 40%, Kettle 15%, Spokane 44%, North Cascades 24%, Yakima 19%, Snake headwaters 47%, southern Idaho 38%, Salmon 28%, Clearwater 34%, John Day 70% and Deschutes 31%.

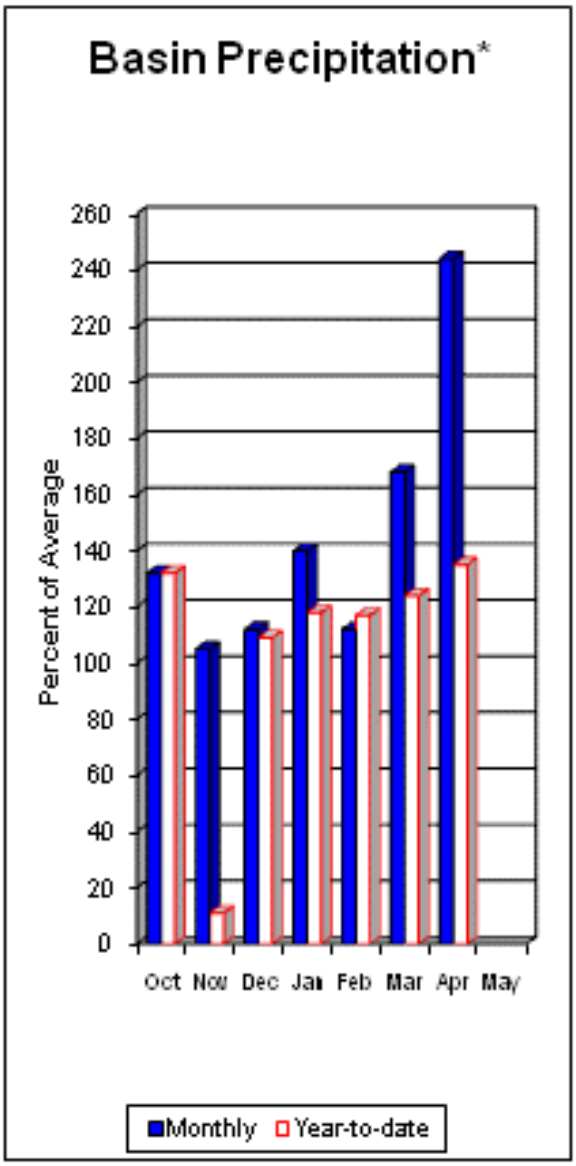
The overall snowpack above The Dalles is at 131 percent of the average peak accumulation. This compares to 69 percent last year. The snowpack continues to build. Normally, the snowpack reaches its peak near April 1 and declines afterward. This delay in the onset of significant melt has the potential to intensify the amount of runoff when temperatures finally warm up. The delay and subsequent warming could start melting at all elevations at once, instead of an orderly meltout.

The snowpack in the Columbia Basin above Castlegar is at 124 percent of average. This compares to 106 percent last month and 80 percent last year. For the basin above Grand Coulee, the snowpack is at 134 percent of average, compared to 109 percent last month and 76 percent last year. The Snake River snowpack above Ice Harbor is at 151 percent of average, compared to 112 percent last month and 62 percent last year.

An early forecast at The Dalles by the National Weather Service projects the 2011 April-September runoff at 120 million acre-feet (MAF), or 122% of the 1971-2000 average. Years with similar snowpack are 1971, 1975, 1982, and 1999. The runoff for those years was 127 MAF, 109 MAF, 123 MAF, and 118 MAF respectively. One of the highest snowpack years, 1997, was only slightly higher than this year and the seasonal runoff was 141 MAF.

Spokane River Basin





*Based on selected stations

The May 1 forecasts for summer runoff within the Spokane River Basin are 164% of average near Post Falls and 160% at Long Lake. The Chamokane River near Long Lake forecasted to have 146% of average flows for the May-August period. The forecast is based on a basin snowpack that is 167% of average and precipitation that is 135% of average for the water year. Precipitation for April was above normal at 244% of average. Streamflow on the Spokane River at Long Lake was 129% of average for April. May 1 storage in Coeur d'Alene Lake was 202,000acre feet, 81% of average and 85% of capacity. Snowpack at Quartz Peak SNOTEL site was 230% of average with 34.2 inches of water content. Average temperatures in the Spokane basin were 4-6 degrees below normal for April and near normal for the water year.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - May 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Spokane R nr Post Falls (2)	MAY-JUL	2290	2570	2750	165	2930	3210	1670
	MAY-SEP	2400	2700	2900	164	3100	3400	1770
Spokane R at Long Lake (2)	MAY-JUL	2520	2850	3070	161	3290	3620	1910
	MAY-SEP	2820	3160	3400	160	3640	3980	2130
Chamokane Ck nr Long Lake	MAY-AUG	10.3	13.0	14.9	146	16.8	19.5	10.2

SPOKANE RIVER BASIN
Reservoir Storage (1000 AF) - End of April

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
COEUR D'ALENE	238.5	201.8	182.3	249.7

SPOKANE RIVER BASIN
Watershed Snowpack Analysis - May 1, 2011

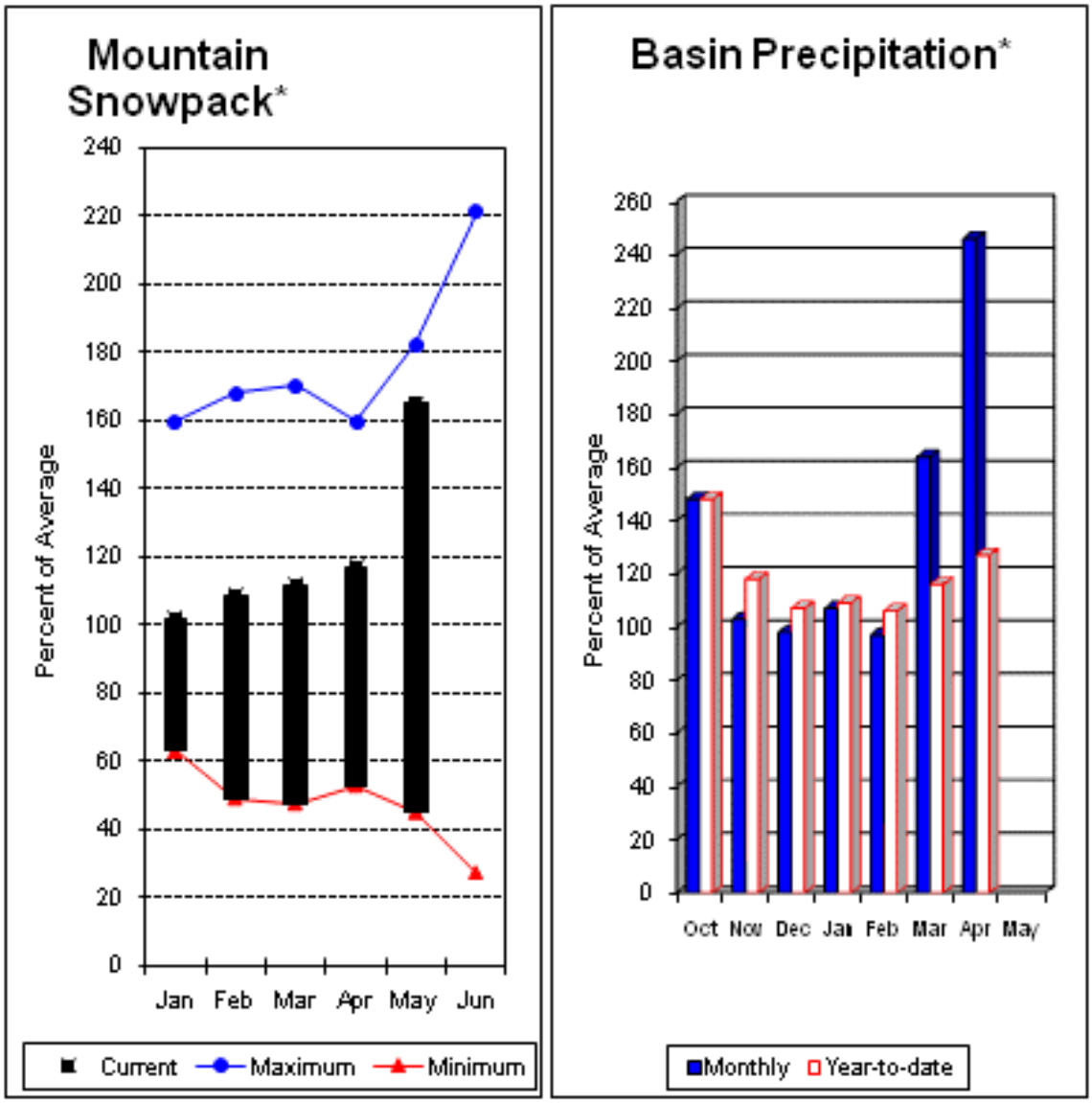
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
SPOKANE RIVER	11	324	167
NEWMAN LAKE	1	583	230

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

Pend Oreille River Basins



*Based on selected stations

The May – September average forecast for the Priest River near the town of Priest River is 133% and the Pen Orielle below Box Canyon is 150%. April streamflow was 114% of average on the Pend Oreille River and 62% on the Columbia at Birchbank. May 1 snow cover was 162% of average in the Pend Oreille Basin River Basin. Bunchgrass Meadows SNOTEL site had 36.6 inches of snow water on the snow pillow. Normally Bunchgrass would have 28.6 inches on May 1. Precipitation during April was 246% of average, bringing the year-to-date precipitation to 127% of average. Reservoir storage in the basin, including Lake Pend Oreille and Priest Lake was 76% of normal. Average temperatures were 4-6 degrees below normal for April and near normal for the water year.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - May 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Pend Oreille Lake Inflow (2)	MAY-JUL	14400	15400	16000	151	16600	17600	10600
	MAY-SEP	15800	16900	17600	149	18300	19400	11800
Priest R nr Priest River (1,2)	MAY-JUL	680	780	825	134	870	970	615
	MAY-SEP	725	840	890	133	940	1050	670
Pend Oreille R bl Box Canyon (2)	MAY-JUL	14500	15500	16100	151	16700	17700	10700
	MAY-SEP	16000	17100	17800	150	18500	19600	11900

PEND OREILLE RIVER BASINS Reservoir Storage (1000 AF) - End of April

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
PEND OREILLE	1561.3	693.8	844.8	916.7
PRIEST LAKE	119.3	71.5	94.9	102.5

PEND OREILLE RIVER BASINS Watershed Snowpack Analysis - May 1, 2011

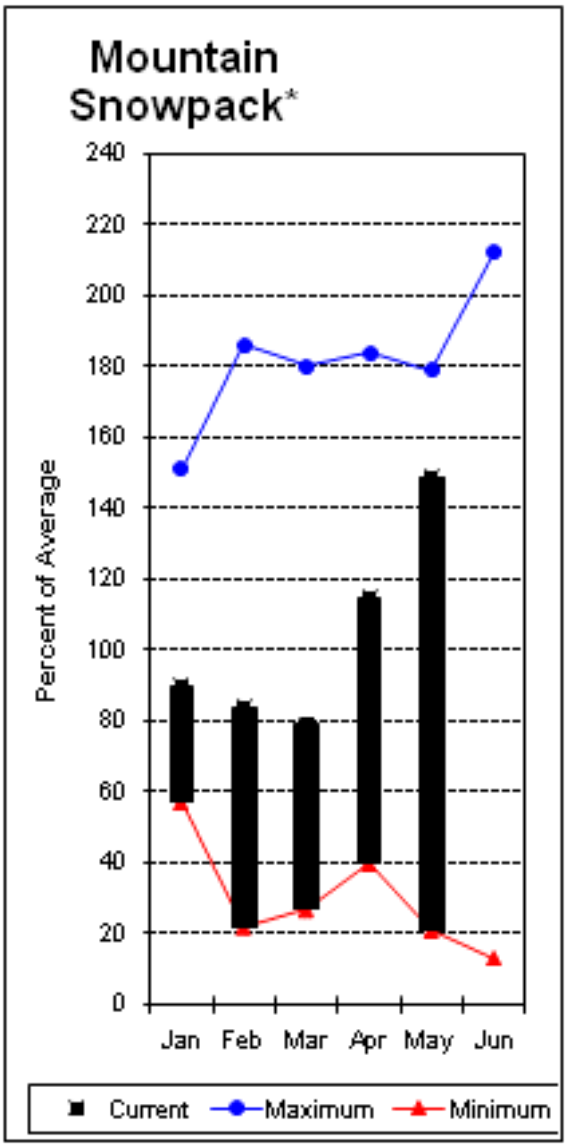
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
COLVILLE RIVER	0	0	0
PEND OREILLE RIVER	8	275	154
KETTLE RIVER	1	272	420

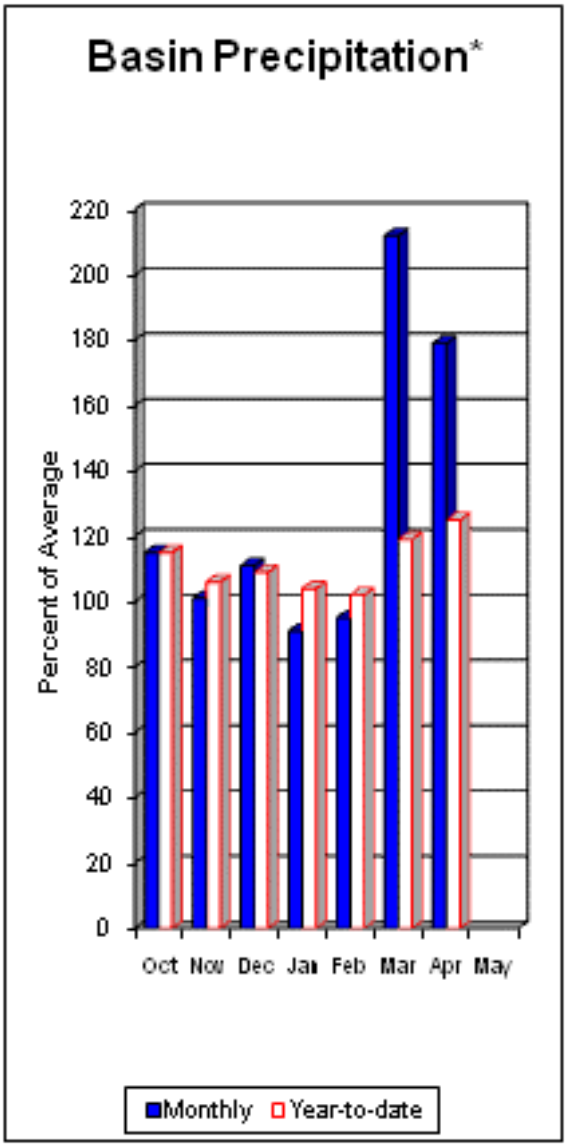
* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

Upper Columbia River Basins





*Based on selected stations

Summer runoff average forecast for the Okanogan River is 132%, Similkameen River is 127%, Kettle River 127% and Methow River is 130%. May 1 snow cover on the Okanogan was 140% of average, Omak Creek was 188% and the Methow was 124%. April precipitation in the Upper Columbia was 179% of average, with precipitation for the water year at 125% of average. April streamflow for the Methow River was 79% of average, 52% for the Okanogan River and 41% for the Similkameen. Snow-water content at Salmon Meadows SNOTEL was 9.6 inches. Average for this site is 3.9 inches on May 1. Combined storage in the Conconully Reservoirs was 20,000-acre feet, which is 84% of capacity and 104% of the May 1 average. Temperatures were 4-8 degrees below normal for April and near normal for the water year.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - May 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Colville R at Kettle Falls	MAY-JUL	97	120	136	172	152	175	79
	MAY-SEP	113	140	158	172	176	205	92
Kettle R nr Laurier	MAY-JUL	1710	1860	1970	128	2080	2230	1540
	MAY-SEP	1780	1960	2080	127	2200	2380	1640
Columbia R at Birchbank (1,2)	MAY-JUL	31300	34500	36000	114	37500	40700	31600
	MAY-SEP	40100	44000	45800	114	47600	51500	40200
Columbia R at Grand Coulee (2)	MAY-JUL	53400	56100	57300	123	58500	61200	46600
	MAY-SEP	65400	68400	69700	123	71000	74000	56700
Similkameen R nr Nighthawk (1)	MAY-JUL	1310	1480	1560	128	1640	1810	1220
	MAY-SEP	1430	1610	1700	129	1790	1970	1320
Okanogan R nr Tonasket (1)	MAY-JUL	1400	1710	1850	132	1990	2300	1400
	MAY-SEP	1590	1940	2100	132	2260	2610	1590
Okanogan R at Malott (1)	MAY-JUL	1440	1760	1910	132	2060	2380	1450
	MAY-SEP	1630	1990	2160	132	2330	2690	1640
Methow R nr Pateros	MAY-SEP	1010	1090	1140	130	1190	1270	880
	MAY-JUL	915	990	1040	128	1090	1160	810

UPPER COLUMBIA RIVER BASINS
Reservoir Storage (1000 AF) - End of April

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
SALMON LAKE	10.5	9.0	7.4	8.9
CONCONULLY RESERVOIR	13.0	10.8	7.8	10.1

UPPER COLUMBIA RIVER BASINS
Watershed Snowpack Analysis - May 1, 2011

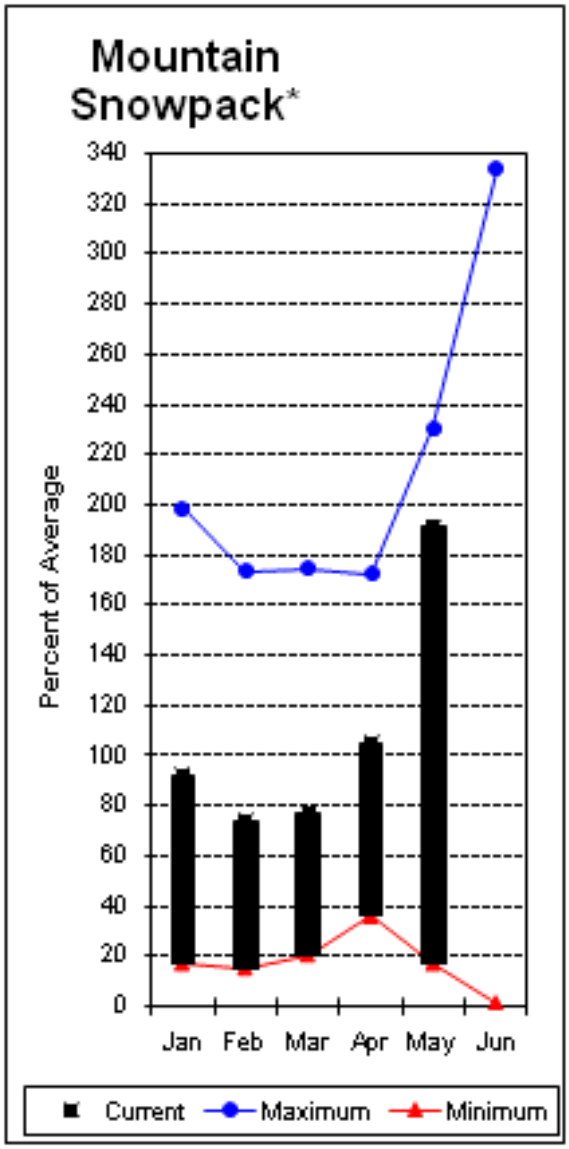
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
OKANOGAN RIVER	3	229	152
OMAK CREEK	1	180	188
SANPOIL RIVER	0	0	0
SIMILKAMEEN RIVER	0	0	0
TOATS COULEE CREEK	0	0	0
CONCONULLY LAKE	1	369	246
METHOW RIVER	5	160	124

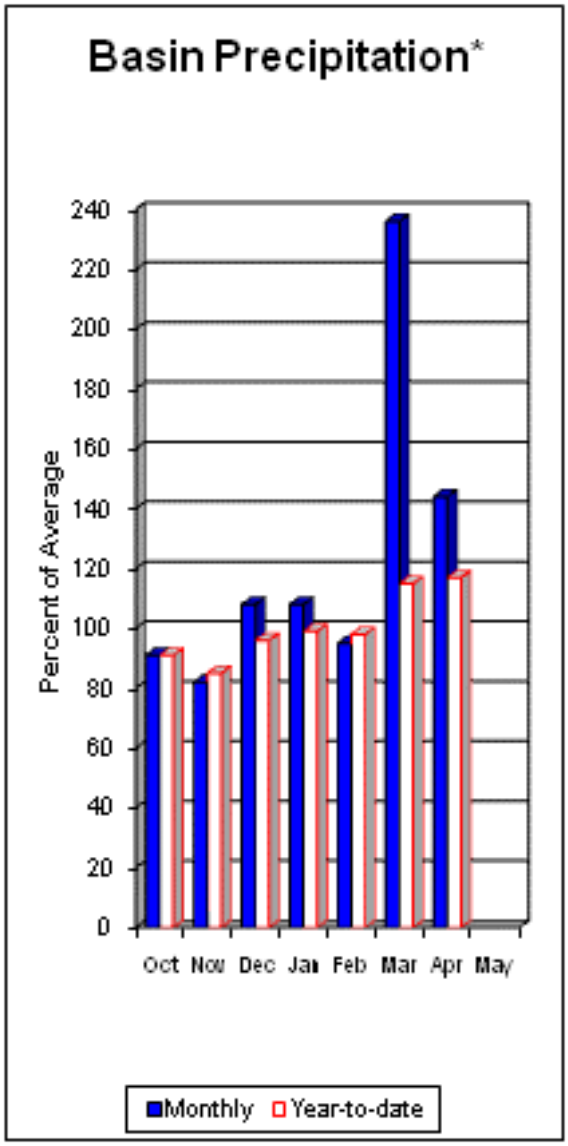
* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

Central Columbia River Basins





*Based on selected stations

Precipitation during April was 144% of average in the basin and 117% for the year-to-date. Runoff for Entiat River is forecast to be 121% of average for the summer. The May-September average forecast for Chelan River is 112%, Wenatchee River at Plain is 120%, Stehekin River is 111605% and Icicle Creek is 112%. April average streamflows on the Chelan River were 76% and on the Wenatchee River 85%. May 1 snowpack in the Wenatchee River Basin was 124% of average; the Chelan, 113%; the Entiat, 207%; Stemilt Creek, 190% and Colockum Creek, 323%. Reservoir storage in Lake Chelan was 134,000-acre feet, 7519% of May 1 average and 20% of capacity. Lyman Lake SNOTEL had the most snow water with 74.9 inches of water. This site would normally have 67.2 inches on May 1. Temperatures were 4-6 degrees below normal for April and near normal for the water year.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - May 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Stehekin R at Stehekin	MAY-JUL	610	675	720	116	765	830	620
	MAY-SEP	760	825	865	116	905	970	745
Chelan R at Chelan (2)	MAY-JUL	930	985	1020	112	1060	1110	910
	MAY-SEP	1090	1140	1180	112	1220	1270	1050
Entiat R nr Ardenvoir	MAY-JUL	210	225	235	121	245	260	195
	MAY-SEP	235	250	260	121	270	285	215
Wenatchee R at Plain	MAY-JUL	985	1050	1090	120	1130	1200	905
	MAY-SEP	1110	1170	1220	120	1270	1330	1020
Icicle Ck nr Leavenworth	MAY-JUL	260	285	300	111	315	340	270
	MAY-SEP	290	320	335	112	350	380	300
Wenatchee R at Peshastin	MAY-JUL	1320	1400	1460	117	1520	1600	1250
	MAY-SEP	1500	1590	1650	117	1710	1800	1410
Columbia R bl Rock Island Dam (2)	MAY-JUL	59100	62100	64100	125	66100	69100	51100
	MAY-SEP	70600	74200	76600	124	79000	82600	61600

CENTRAL COLUMBIA RIVER BASINS
Reservoir Storage (1000 AF) - End of April

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
CHELAN LAKE	676.1	134.4	391.3	265.6

CENTRAL COLUMBIA RIVER BASINS
Watershed Snowpack Analysis - May 1, 2011

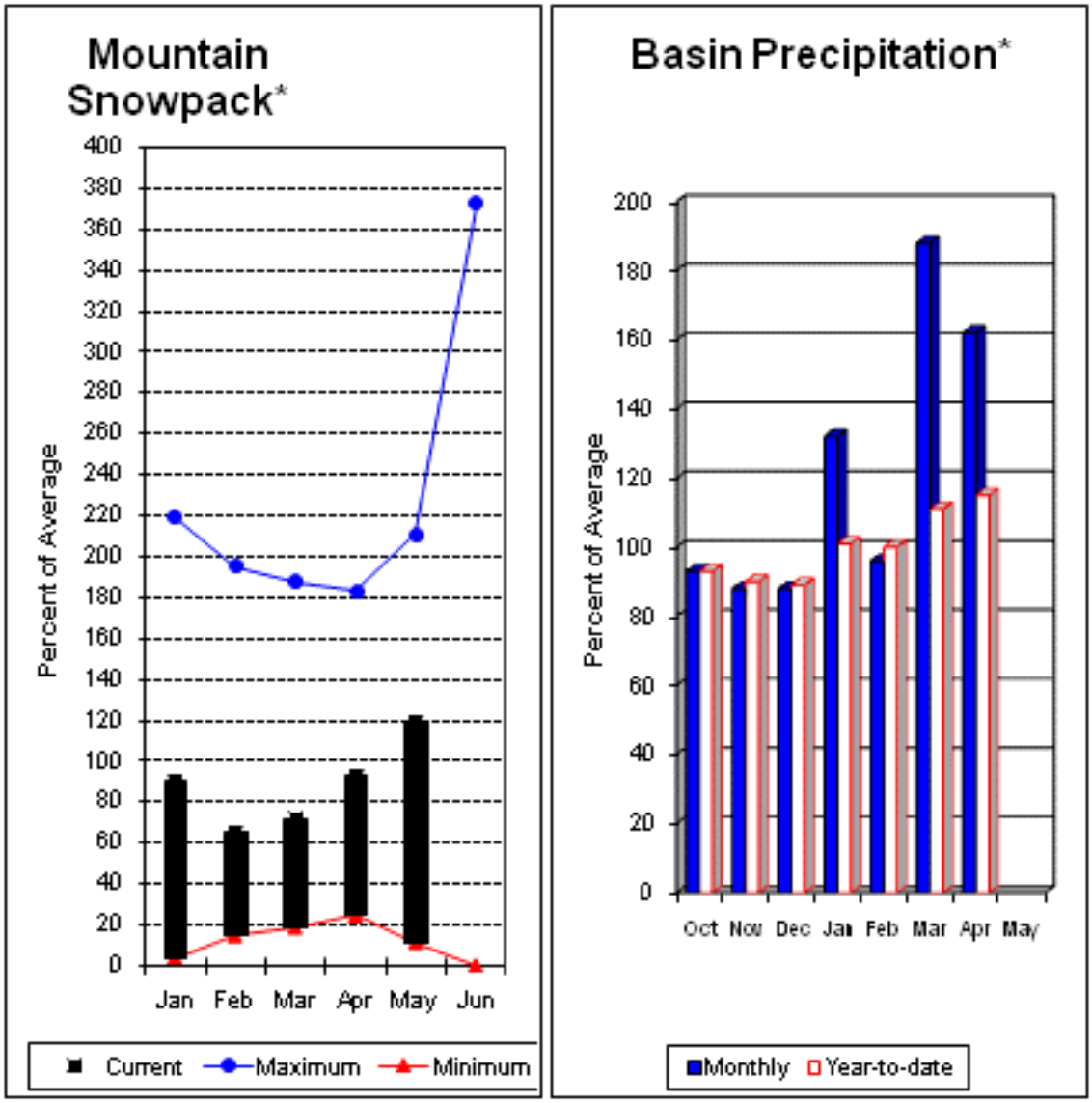
Watershed	Number of Data Sites	This Year as % of Last Yr	This Year as % of Average
CHELAN LAKE BASIN	4	147	113
ENTIAT RIVER	1	165	207
WENATCHEE RIVER	7	165	124
STEMILT CREEK	1	182	190
COLOCKUM CREEK	1	153	323

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

Upper Yakima River Basin



*Based on selected stations

May 1 reservoir storage for the Upper Yakima reservoirs was 725,000-acre feet, 117% of average. Forecasts for the Yakima River at Cle Elum are 116% of average and the Teanaway River near Cle Elum is at 131%. Lake inflows are all forecasted to be above average this summer as well. April streamflows within the basin were Yakima at Cle Elum at 74% and Cle Elum River near Roslyn at 80%. May 1 snowpack was 119% based upon 8 snow course and SNOTEL readings within the Upper Yakima Basin. Precipitation was 162% of average for April and 115% year-to-date for water. Volume forecasts for the Yakima Basin are for natural flow. As such, they may differ from the U.S. Bureau of Reclamation's forecast for the total water supply available, which includes irrigation return flow.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - May 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Keechelus Reservoir Inflow (2)	MAY-JUL	95	103	108	117	113	121	92
	MAY-SEP	105	114	121	118	128	137	103
Kachess Reservoir Inflow (2)	MAY-JUL	89	94	98	117	102	107	84
	MAY-SEP	97	103	108	117	113	119	92
Cle Elum Lake Inflow (2)	MAY-JUL	345	365	375	114	385	405	330
	MAY-SEP	390	410	425	113	440	460	375
Yakima R at Cle Elum (2)	MAY-JUL	665	705	735	116	765	805	635
	MAY-SEP	730	790	830	116	870	930	715
Teanaway R bl Forks nr Cle Elum	MAY-JUL	94	109	119	131	129	144	91
	MAY-SEP	99	114	124	131	134	149	95

UPPER YAKIMA RIVER BASIN
Reservoir Storage (1000 AF) - End of April

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
KEECHELUS	157.8	132.4	112.1	125.6
KACHESS	239.0	216.0	180.9	188.3
CLE ELUM	436.9	376.2	244.6	307.0

UPPER YAKIMA RIVER BASIN
Watershed Snowpack Analysis - May 1, 2011

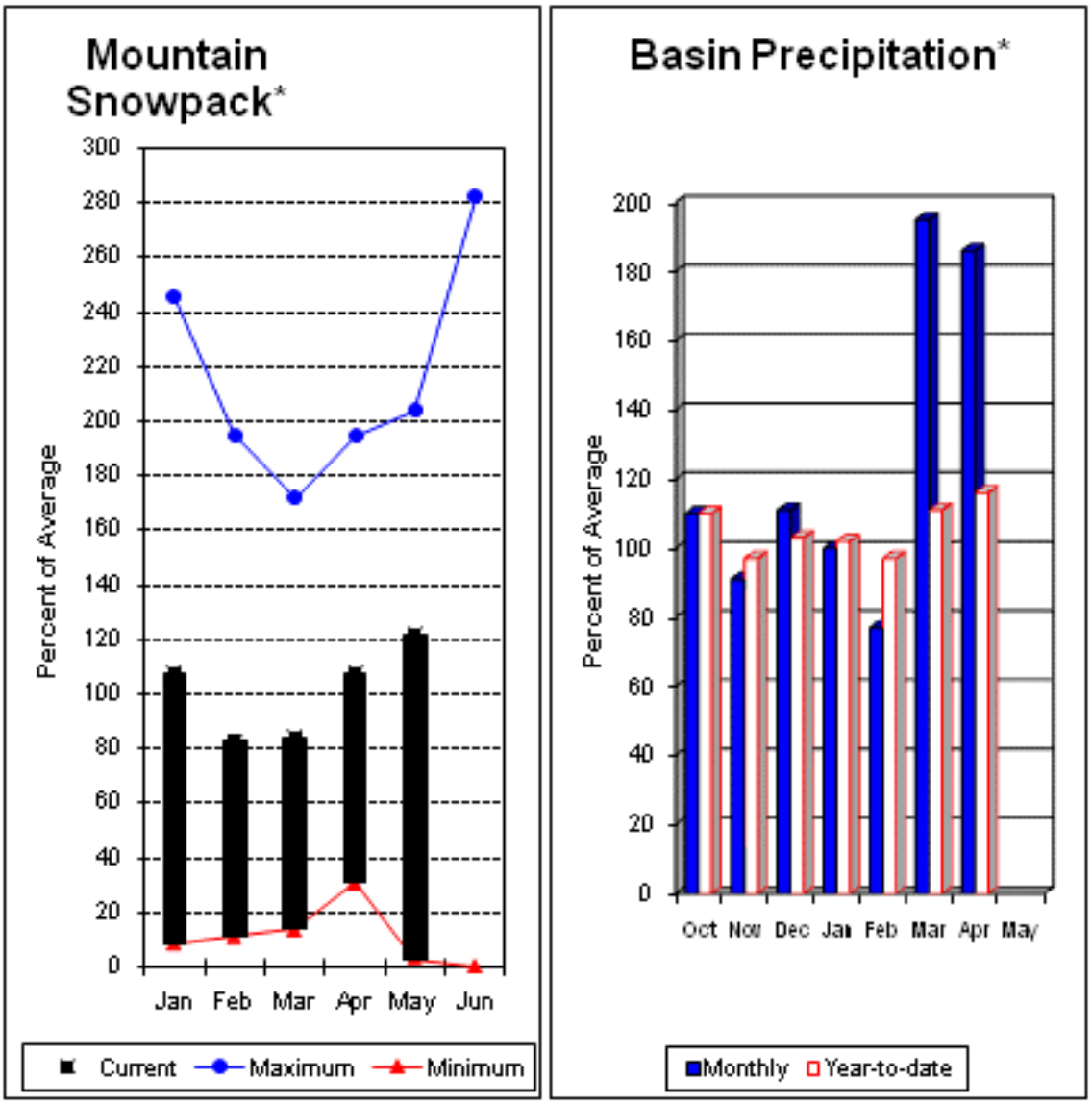
Watershed	Number of Data Sites	This Year as % of Last Yr	This Year as % of Average
UPPER YAKIMA RIVER	8	169	119

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

Lower Yakima River Basin



*Based on selected stations

April average streamflows within the basin were: Yakima River near Parker, 117%; Naches River near Naches, 121%; and Yakima River at Kiona, 165%. May 1 reservoir storage for Bumping and Rimrock reservoirs was 182,000-acre feet, 108% of average. Forecast averages for Yakima River near Parker are 115%; American River near Nile, 117%; Ahtanum Creek, 117%; and Klickitat River near Glenwood, 137%. May 1 snowpack was 122% based upon 6 snow course and SNOTEL readings within the Lower Yakima Basin and Ahtanum Creek reported in at 133%of average. Precipitation was 186% of average for April and 116% year-to-date for water. Temperatures were 4-8degrees below normal for April and slightly below for the water year. Volume forecasts for Yakima Basin are for natural flow. As such, they May differ from the U.S. Bureau of Reclamation's forecast for the total water supply available, which includes irrigation return flow.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - May 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Bumping Lake Inflow (2)	MAY-JUL	101	114	123	119	132	145	103
	MAY-SEP	111	125	134	119	143	157	113
American R nr Nile	MAY-JUL	89	98	105	117	112	121	90
	MAY-SEP	99	110	117	117	124	135	100
Rimrock Lake Inflow (2)	MAY-JUL	170	184	193	115	200	215	168
	MAY-SEP	210	225	235	115	245	260	205
Naches R nr Naches (2)	MAY-JUL	595	660	705	124	750	815	570
	MAY-SEP	655	730	780	124	830	905	630
Ahtanum Ck at Union Gap	MAY-JUL	18.0	22	25	119	28	32	21
	MAY-SEP	19.9	24	27	117	30	34	23
Yakima R nr Parker (2)	MAY-JUL	1390	1490	1560	115	1630	1730	1360
	MAY-SEP	1580	1690	1770	115	1850	1960	1540
Klickitat R nr Glenwood	MAY-JUL	135	145	151	137	157	167	110
	MAY-SEP	167	178	185	137	192	205	135
Klickitat R nr Pitt	MAY-JUL	405	435	455	138	475	505	330
	MAY-SEP	515	550	575	137	600	635	420

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

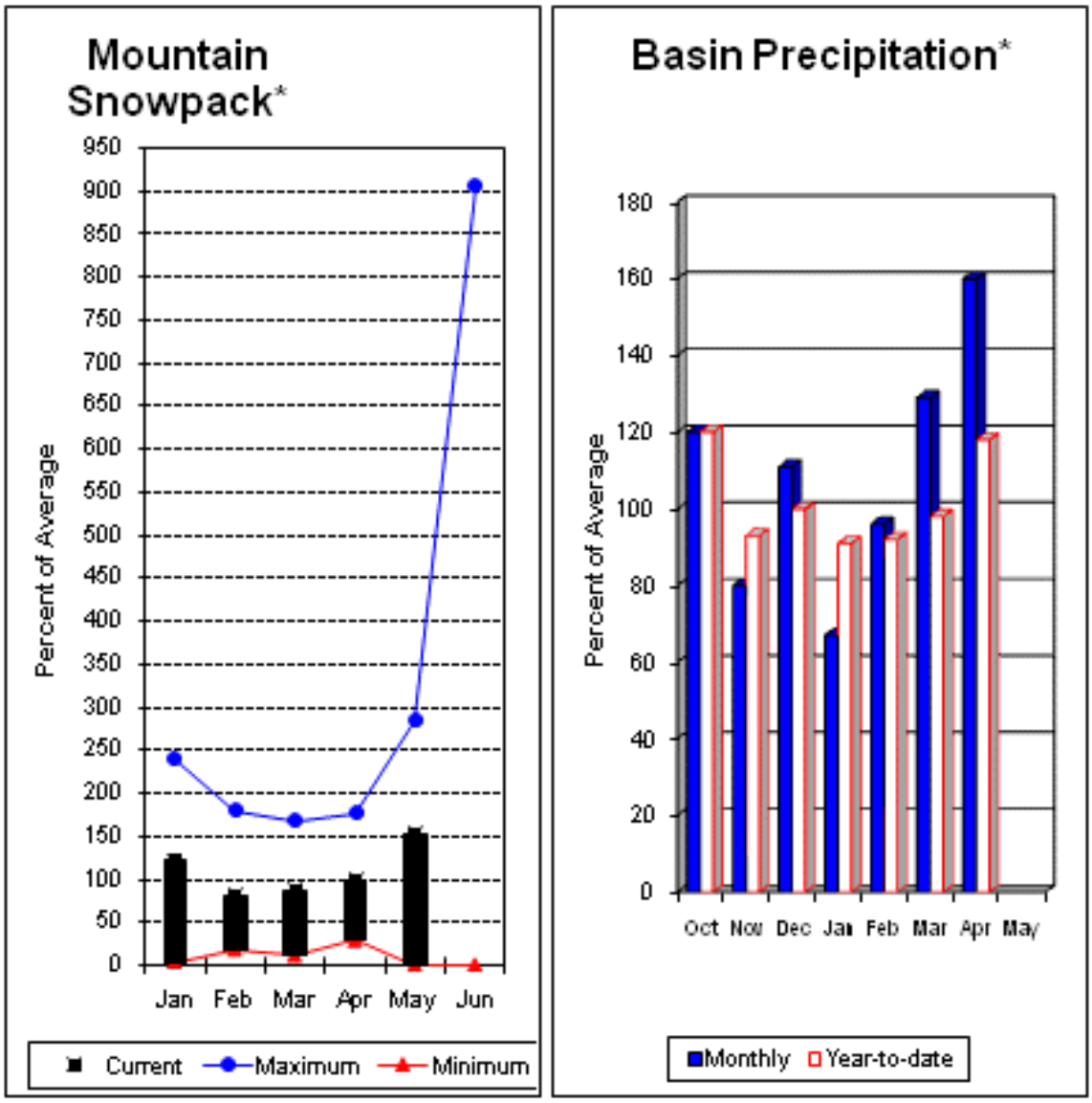
LOWER YAKIMA RIVER BASIN
Reservoir Storage (1000 AF) - End of April

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
BUMPING LAKE	33.7	15.3	14.0	19.6
RIMROCK	198.0	167.0	132.7	149.4

LOWER YAKIMA RIVER BASIN
Watershed Snowpack Analysis - May 1, 2011

Watershed	Number of Data Sites	This Year as % of: Last Yr	Average
LOWER YAKIMA RIVER	6	134	122
AHTANUM CREEK	2	134	133

Walla Walla River Basin



*Based on selected stations

April precipitation was 160% of average, maintaining the year-to-date precipitation at 118% of average. Snowpack in the basin was 153% of average. Streamflow forecasts are 114% of average for Mill Creek and 106% for the SF Walla Walla near Milton-Freewater. April streamflow was 220% of average for the SF Walla Walla River. Average temperatures were 4-6 degrees below normal for April and near normal for the water year.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - May 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== 90% (1000AF)	70% (1000AF)	Future Conditions ======= Chance Of Exceeding * ======= 50% (1000AF)	50% (% AVG.)	Wetter =====>> 30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
SF Walla Walla R nr Milton-Freewater	MAY-JUL	31	37	40	105	43	49	38
	MAY-SEP	44	50	54	106	58	64	51
Mill Ck nr Walla Walla	MAY-JUL	13.0	15.2	16.8	114	18.4	21	14.7
	MAY-SEP	16.9	19.3	21	114	23	25	18.4

WALLA WALLA RIVER BASIN
Reservoir Storage (1000 AF) - End of April

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg

WALLA WALLA RIVER BASIN
Watershed Snowpack Analysis - May 1, 2011

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
WALLA WALLA RIVER	2	241	153

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

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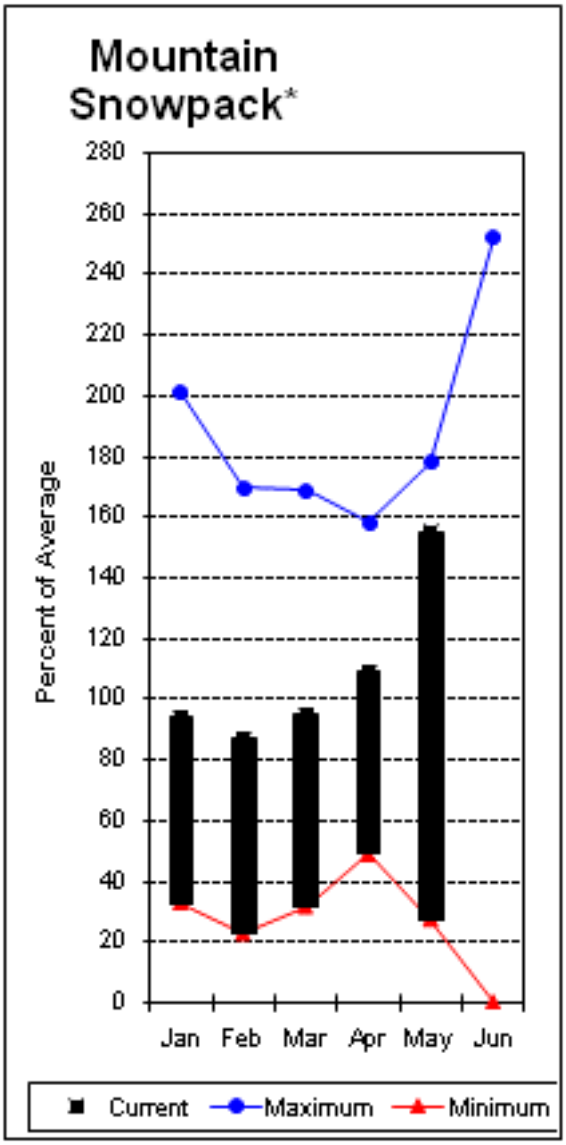
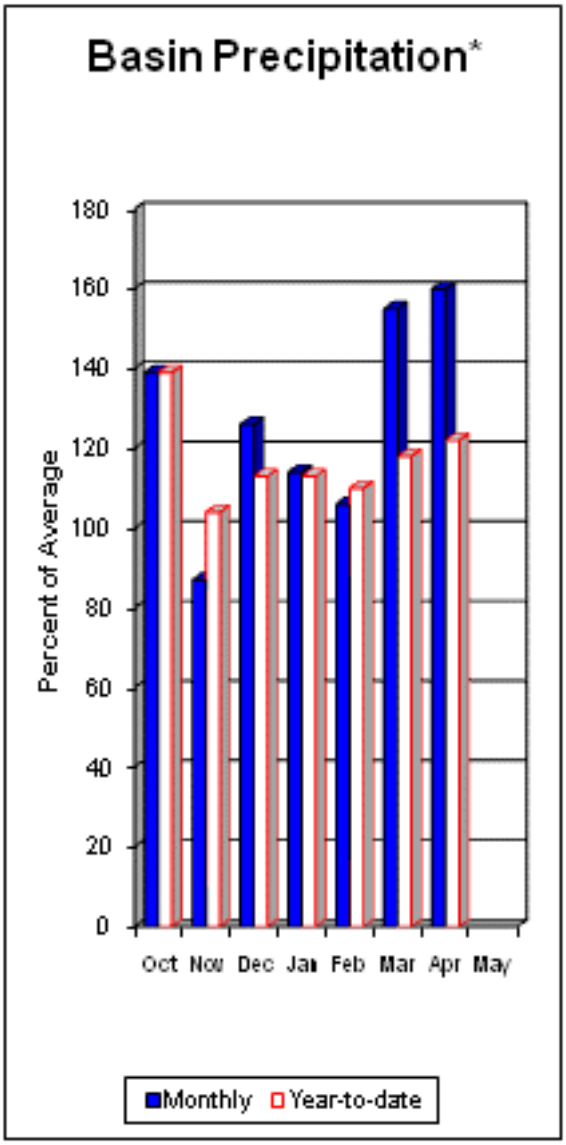
Lower Snake River Basin





*Based on selected stations

The May - September forecast is for 116% for Clearwater River at Spalding. The Snake and Grande Ronde rivers can expect summer flows to be about 116% and 144% of normal respectively. A newly developed forecast point for Asotin Creek at Asotin predicts 121% of average flows for the May – July runoff period. April precipitation was 160% of average, bringing the year-to-date precipitation to 122% of average. May 1 snowpack readings averaged 155% of average. April streamflow was 129% of average for Snake River below Lower Granite Dam and 148% for Grande Ronde River near Troy. Dworshak Reservoir on the Clearwater River is at 59% of average. Average temperatures were 408 degrees below normal for April and near normal for the water year.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - May 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Grande Ronde R at Troy (1)	MAY-JUL	830	1040	1140	125	1240	1450	910
	MAY-SEP	945	1160	1260	125	1360	1570	1010
Asotin Ck at Asotin	MAY-JUL	20	26	29	121	32	38	24
Clearwater R at Spalding (1,2)	MAY-JUL	6640	7440	7800	135	8160	8960	5770
	MAY-SEP	7180	8040	8430	136	8820	9680	6190
Snake R bl Lower Granite Dam (1,2)	MAY-JUL	18800	21100	22100	132	23100	25400	16700
	MAY-SEP	21500	24100	25300	131	26500	29100	19300

LOWER SNAKE RIVER BASIN
Reservoir Storage (1000 AF) - End of April

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
DWORSHAK	3468.0	1502.8	2621.0	2560.7

LOWER SNAKE RIVER BASIN
Watershed Snowpack Analysis - May 1, 2011

Watershed	Number of Data Sites	This Year as % of Last Yr	This Year as % of Average
LOWER SNAKE, GRANDE RONDE	10	226	155

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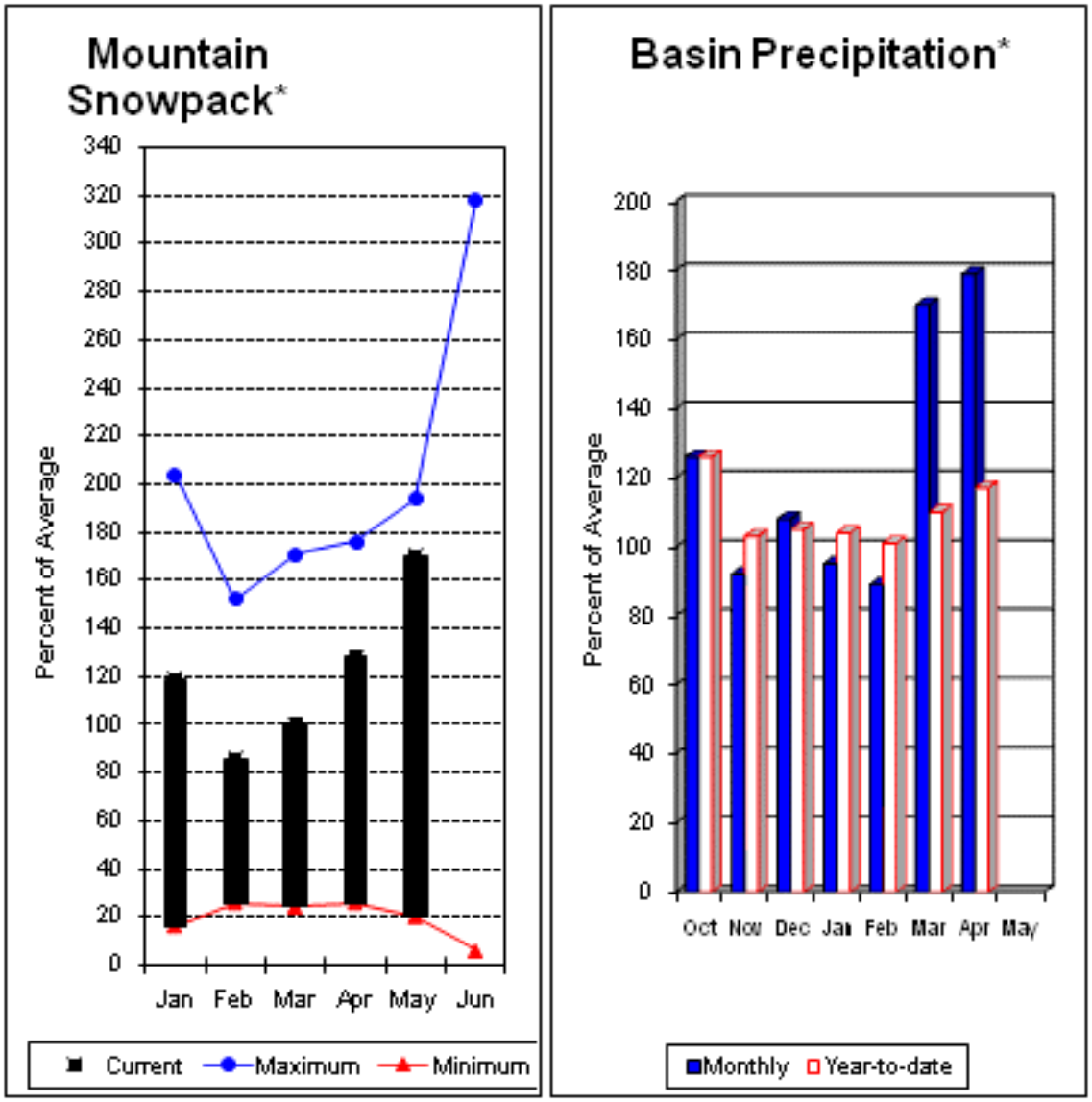
Lower Columbia River Basins



*Based on selected stations

Forecasts for May – September streamflows within the basin are Lewis River at Ariel, 120% and Cowlitz River at Castle Rock, 119% of average. The Columbia at The Dalles is forecasted to have 123% of average flows this summer. April average streamflow for Cowlitz River below Mayfield Dam was 151%. The Columbia River at The Dalles was 109% of average. April precipitation was 179% of average and the water-year average was 117%. May 1 snow cover for Cowlitz River was 151%, and Lewis River was 189% of average. Average temperatures were 2-6 degrees below normal during April and 1-4 degrees below for the water year.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - May 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Columbia R at The Dalles (2)	MAY-JUL	80400	84600	87400	124	90200	94400	70500
	MAY-SEP	95600	101000	104000	123	107000	112000	84500
Klickitat R nr Glenwood	MAY-JUL	135	145	151	137	157	167	110
	MAY-SEP	167	178	185	137	192	205	135
Klickitat R nr Pitt	MAY-JUL	405	435	455	138	475	505	330
	MAY-SEP	515	550	575	137	600	635	420
Lewis R at Ariel (2)	MAY-JUL	655	740	800	120	860	945	667
	MAY-SEP	815	910	975	120	1040	1130	812
Cowlitz R bl Mayfield Dam (2)	MAY-JUL	1180	1350	1470	118	1590	1760	1247
	MAY-SEP	1360	1590	1750	118	1910	2140	1478
Cowlitz R at Castle Rock (2)	MAY-JUL	1610	1810	1940	119	2070	2270	1629
	MAY-SEP	1990	2200	2350	119	2500	2710	1972

LOWER COLUMBIA RIVER BASINS
Reservoir Storage (1000 AF) - End of April

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
MOSSYROCK	0.0	1310.0	1260.4	---
SWIFT	0.0	723.4	727.9	---
YALE	0.0	371.7	394.8	---
MERWIN	0.0	395.3	417.6	---

LOWER COLUMBIA RIVER BASINS
Watershed Snowpack Analysis - May 1, 2011

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
LEWIS RIVER	5	174	189
COWLITZ RIVER	6	160	151

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

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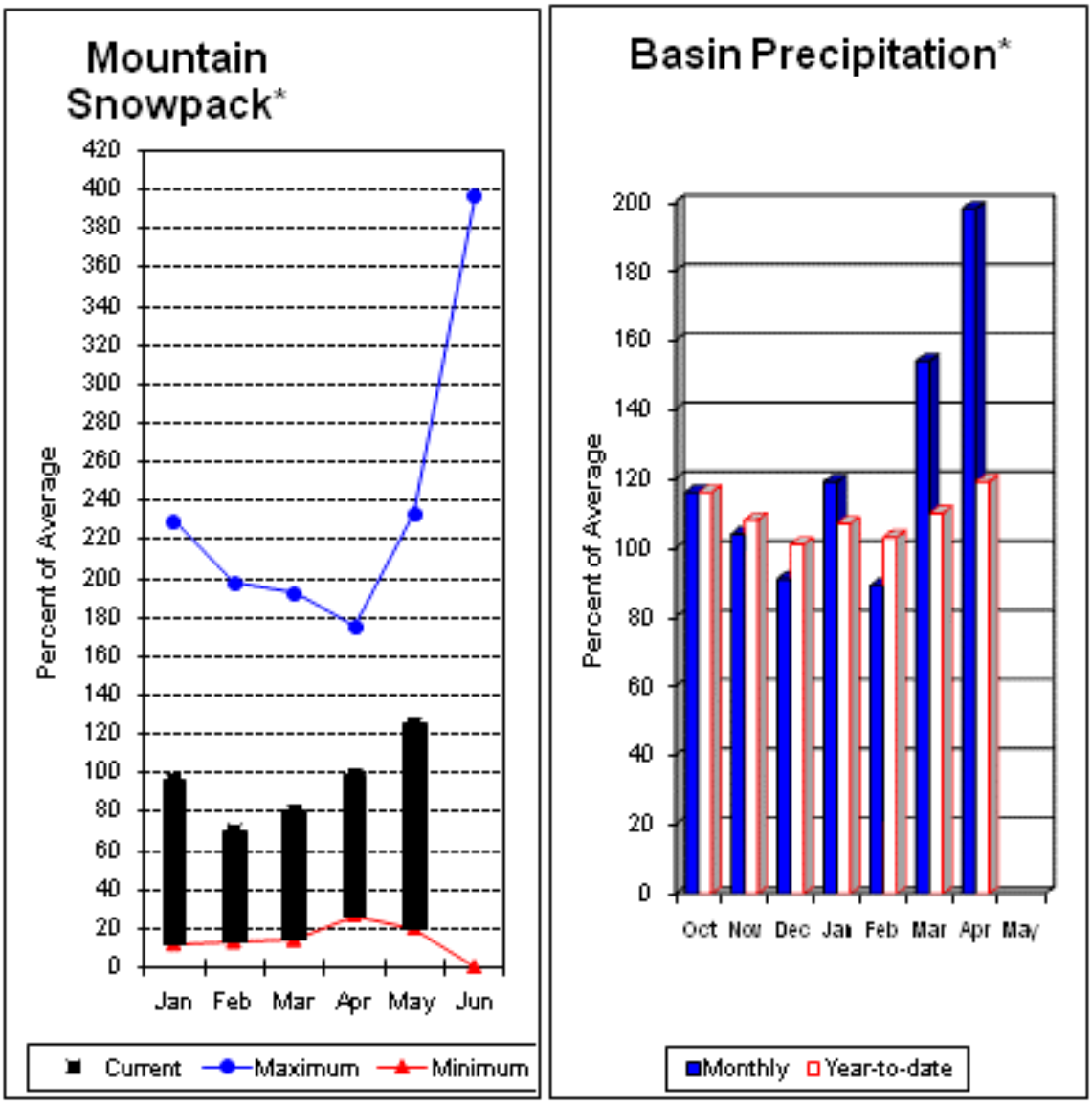
South Puget Sound River Basins



*Based on selected stations

Summer runoff is forecast to be 106% of normal for the Green River below Howard Hanson Dam and 119% for the White River near Buckley. May 1 snowpack was 118% of average for the White River, 139% for Puyallup River and 119% in the Green River Basin. Water content on May 1 at Corral Pass SNOTEL, at an elevation of 6,000 feet, was 44.3 inches. This site has a May 1 average of 35.3 inches. April precipitation was 198% of average, bringing the water year-to-date to 119% of average for the basins. Average temperatures in the area were 4-8 degrees below normal for April and slightly below for the water-year.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - May 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
White R nr Buckley (1)	MAY-JUL	320	385	415	119	445	510	348
	MAY-SEP	410	490	525	119	560	640	442
Green R bl Howard Hanson Dam (1,2)	MAY-JUL	138	172	188	107	205	240	176
	MAY-SEP	157	197	215	106	235	275	202

SOUTH PUGET SOUND RIVER BASINS
Reservoir Storage (1000 AF) - End of April

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg

SOUTH PUGET SOUND RIVER BASINS
Watershed Snowpack Analysis - May 1, 2011

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
WHITE RIVER	3	132	118
GREEN RIVER	2	185	119
PUYALLUP RIVER	5	135	139

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

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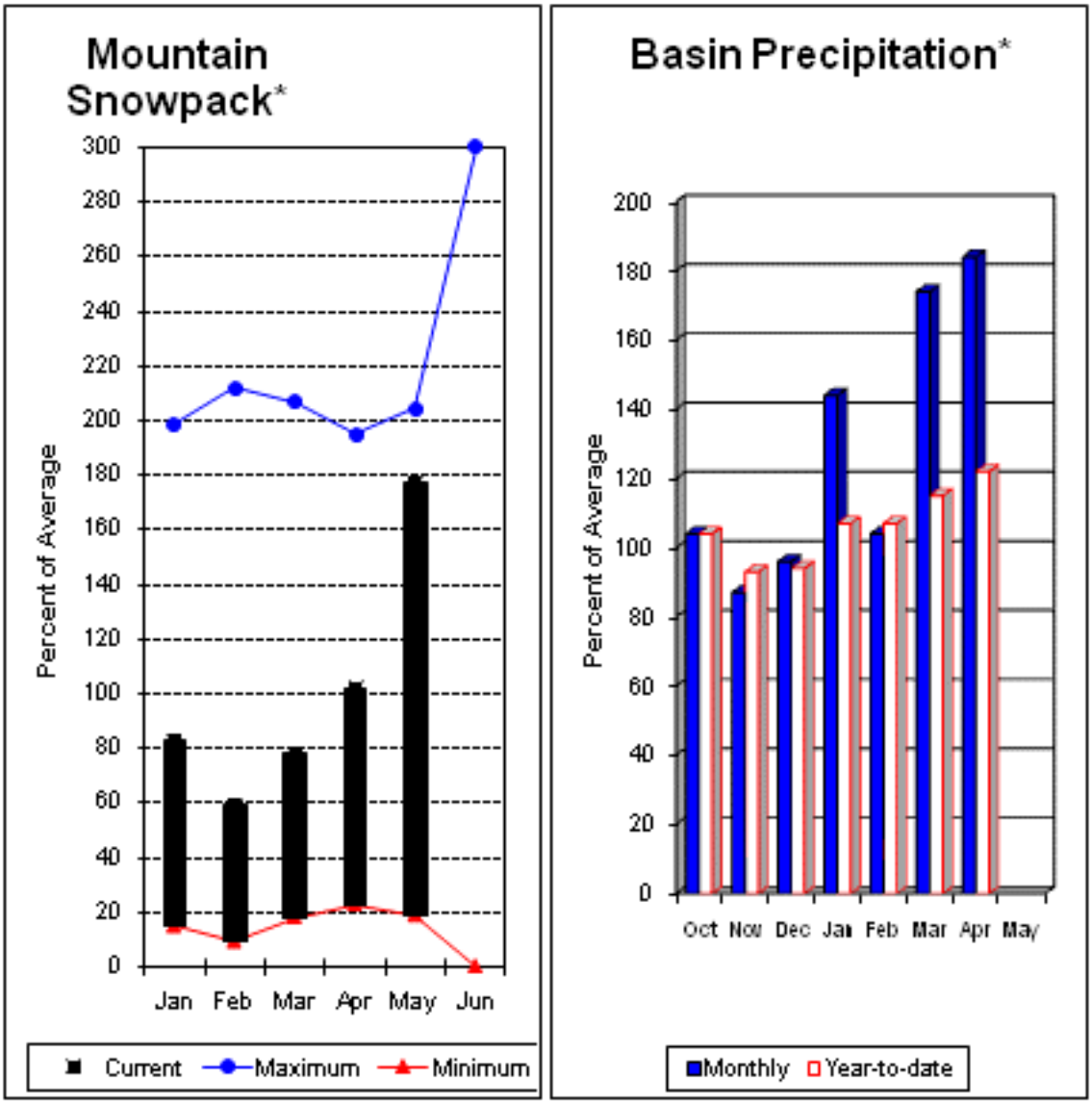
Central Puget Sound River Basins



*Based on selected stations

Forecast for spring and summer flows are: 146% for Cedar River near Cedar Falls; 145% for Rex River; 145% for South Fork of the Tolt River; 113% for Taylor Creek near Selleck, and 170% for Cedar River at Cedar Falls. Basin-wide precipitation for April was 184% of average, bringing water-year-to-date to 122% of average. May 1 average snow cover in Cedar River Basin was 257%, Tolt River Basin was 183%, Snoqualmie River Basin was 136%, and Skykomish River Basin was 132%. Stevens Pass SNOTEL site, at 3950 feet, had 40.8 inches of water content. Average May 1 water content is 35.2 inches at Stevens Pass. Temperatures were 4-8 degrees below normal for April and slightly below for the water-year.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - May 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Cedar R nr Cedar Falls	MAY-JUL	66	72	76	146	80	86	52
	MAY-SEP	74	81	86	146	91	98	59
Rex R nr Cedar Falls	MAY-JUL	21	23	25	144	27	29	17.4
	MAY-SEP	24	27	29	145	31	34	20
Cedar R at Cedar Falls (2)	MAY-JUL	63	73	80	170	87	97	47
	MAY-SEP	59	70	78	170	86	97	46
Taylor Ck nr Selleck	MAY-JUL	13.1	15.3	16.8	129	18.3	20	13.0
	MAY-SEP	17.5	20	22	129	24	27	17.0
SF Tolt R nr Index	MAY-JUL	12.6	14.6	16.0	146	17.4	19.4	11.0
	MAY-SEP	14.6	17.3	19.1	145	21	24	13.2

CENTRAL PUGET SOUND RIVER BASINS
Reservoir Storage (1000 AF) - End of April

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg

CENTRAL PUGET SOUND RIVER BASINS
Watershed Snowpack Analysis - May 1, 2011

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
CEDAR RIVER	4	338	257
TOLT RIVER	2	268	183
SNOQUALMIE RIVER	4	186	136
SKYKOMISH RIVER	2	179	132

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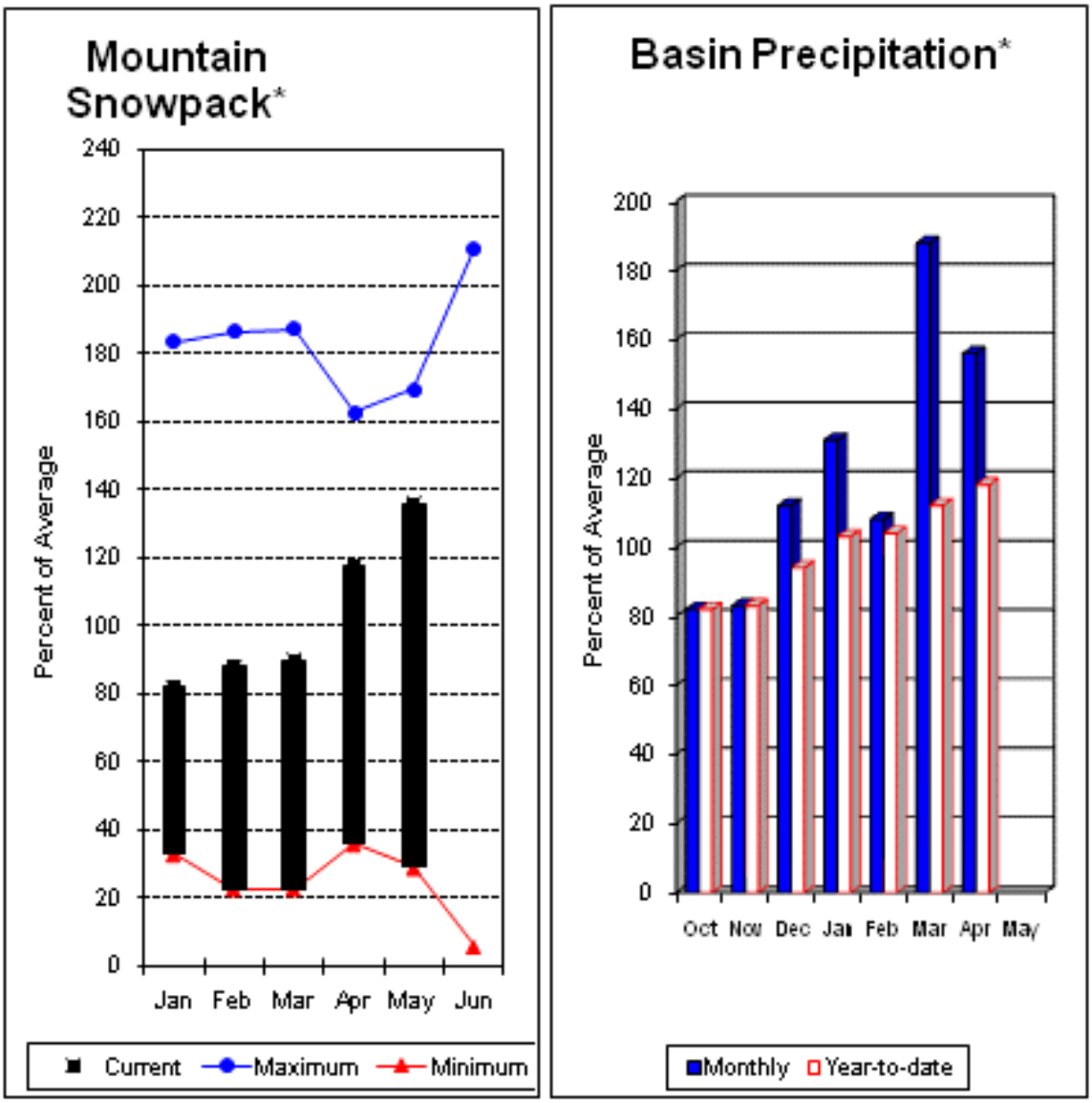
North Puget Sound River Basins



*Based on selected stations

Forecast for Skagit River streamflow at Newhalem is 114% of average for the spring and summer period. April streamflow in Skagit River was 75% of average. Other forecast points included Baker River at 121% and Thunder Creek at 108% of average. Basin-wide precipitation for April was 156% of average, bringing water-year-to-date to 118% of average. May 1 average snow cover in Skagit River Basin was 133% and Nooksack River Basin was 140%. Brown Top snow course, at 6,000 feet, had 72.2 inches of water content. Average May 1 water content is 62.1 inches at Brown Top. May 1 Skagit River reservoir storage was 81% of average and 43% of capacity. Average temperatures for April were 4-8 degrees below normal for the basin and 1-2 degrees below average for the water year.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - May 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>>					30-Yr Avg. (1000AF)
		Chance Of Exceeding *					
		90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	
Thunder Ck nr Newhalem	MAY-JUL	197	215	230	109	245	265	212
	MAY-SEP	300	320	335	108	350	370	310
Skagit R at Newhalem (2)	MAY-JUL	1690	1780	1840	114	1900	1990	1611
	MAY-SEP	2060	2170	2240	114	2310	2420	1964
Baker R nr Concrete (2)	MAY-JUL	705	775	825	121	875	945	684
	MAY-SEP	905	1020	1100	121	1180	1300	906

NORTH PUGET SOUND RIVER BASINS
Reservoir Storage (1000 AF) - End of April

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
ROSS	1404.1	561.4	860.2	708.8
DIABLO RESERVOIR	90.6	85.5	86.0	85.9

NORTH PUGET SOUND RIVER BASINS
Watershed Snowpack Analysis - May 1, 2011

Watershed	Number of Data Sites	This Year as % of: Last Yr	Average
SKAGIT RIVER	15	171	133
BAKER RIVER	0	181	0
NOOKSACK RIVER	2	163	140

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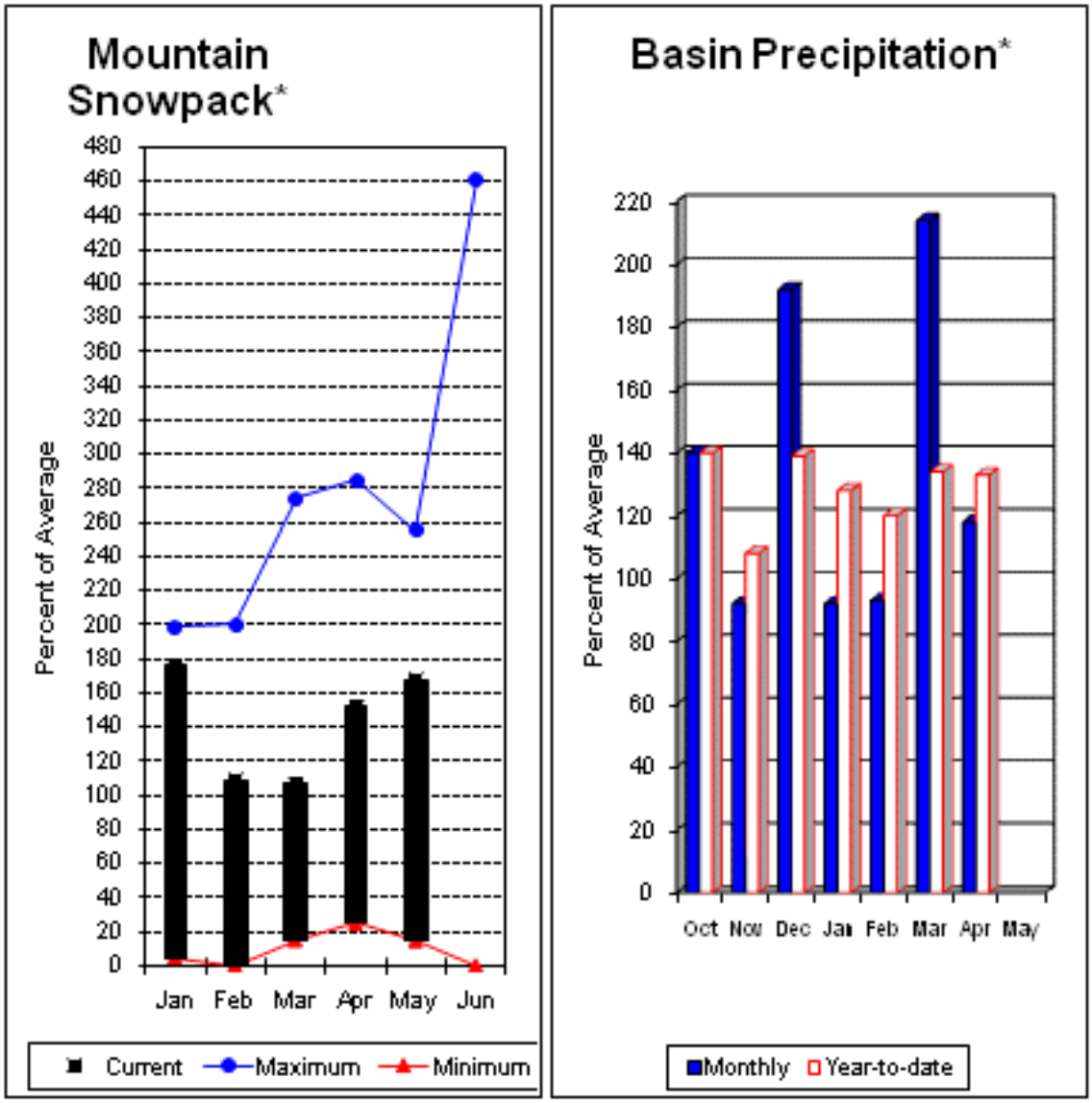
Olympic Peninsula River Basins



*Based on selected stations

Forecasted average runoff for streamflow for the Dungeness River is 140% and Elwha River is 141%. April runoff in the Dungeness River was 97% of normal. Big Quilcene and Wynoochee rivers should expect near to above average runoff this summer also. April precipitation was 118% of average. Precipitation has accumulated at 133% of average for the water year. April precipitation at Quillayute was 7.84 inches. The thirty-year average for April is 7.44 inches. Olympic Peninsula snowpack averaged 168% of normal on May 1. Temperatures were 4-6 below average for April and near normal for the water year.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - May 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Dungeness R nr Sequim	MAY-JUL	128	139	147	140	155	166	105
	MAY-SEP	159	175	185	140	195	210	132
Elwha R at Mcdonald Bridge	MAY-JUL	430	455	475	141	495	520	338
	MAY-SEP	535	570	595	141	620	655	423

OLYMPIC PENINSULA RIVER BASINS
Reservoir Storage (1000 AF) - End of April

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg

OLYMPIC PENINSULA RIVER BASINS
Watershed Snowpack Analysis - May 1, 2011

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
OLYMPIC PENINSULA	6	148	177

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Issued by

Dave White
Chief
Natural Resources Conservation Service
U.S. Department of Agriculture

Released by

Roylene Rides At The Door
State Conservationist
Natural Resources Conservation Service
Spokane, Washington

The Following Organizations Cooperate with the Natural Resources Conservation Service in Snow Survey Work*:

Canada	Ministry of Sustainable Resources
	Snow Survey, River Forecast Centre, Victoria, British Columbia
State	Washington State Department of Ecology
	Washington State Department of Natural Resources
Federal	Department of the Army
	Corps of Engineers
	U.S. Department of Agriculture
	Forest Service
	U.S. Department of Commerce
	NOAA, National Weather Service
	U.S. Department of Interior
	Bonneville Power Administration
	Bureau of Reclamation
	Geological Survey
	National Park Service
	Bureau of Indian Affairs
	Recourse Conservation & Development Councils
Local	City of Tacoma
	City of Seattle
	Chelan County P.U.D.
	Pacific Power and Light Company
	Puget Sound Power and Light Company
	Washington Water Power Company
	Snohomish County P.U.D.
	Colville Confederated Tribes
	Spokane County
	Yakama Indian Nation
	Whatcom County
	Pierce County
	Kalispel Tribe of Indians
	Spokane Indian Tribe
	Jamestown S'klallum Tribe
Private	Okanogan Irrigation District
	Wenatchee Heights Irrigation District
	Newman Lake Homeowners Association
	Whitestone Reclamation District

***Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.**

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Mount Vernon, WA 98273-2873

Washington Water Supply Outlook Report

Natural Resources Conservation Service
Spokane, WA