

Washington Water Supply Outlook Report January 1, 2011



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

For more water supply and resource management information, contact:

Local Natural Resources Conservation Service Field Office

or

Scott Pattee
Water Supply Specialist
Natural Resources Conservation Service
2021 E. College Way, Suite 214
Mt. Vernon, WA 98273-2873
(360) 428-7684

or

Ron Nichols
Public Affairs Specialist
Natural Resources Conservation Service
W 316 Boone Ave., Suite 450
Spokane, WA 99201
(509) 323-2912

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.

"The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer."

Washington Water Supply Outlook

January 2011

General Outlook

The water year started off great with near to above average precipitation for both October and November. Healthy snow came early which helped most local ski areas open by or before the holidays. Activities slowed down a bit in early December when we witnessed a warming period followed by a deep freeze, neither of which provided much fresh snow. That cycle was broken in mid December allowing for new accumulation and a great end to 2010. So far 2011 has been on the dry side but long range forecasts indicate an increase in storm activity that should bring excellent snow to the mountains. Temperatures are forecasted to be below average which could result in additional low elevation snow. The next few weeks may set the stage for the rest of the season.

Snowpack

The January 1 statewide SNOTEL readings were 101% but vary greatly across the state. The Baker River snow survey data reported the lowest readings at 68% of average. Readings from the Olympic Peninsula reported the highest at 176% of average. Westside averages from SNOTEL, and January 1 snow surveys, included the North Puget Sound river basins with 82% of average, the Central Puget river basins with 83%, and the Lewis-Cowlitz basins with 119% of average. Snowpack along the east slopes of the Cascade Mountains included the Yakima area with 99% and the Wenatchee area with 92%. Snowpack in the Spokane River Basin was at 91% and the Walla Walla River Basin had 121% of average. Maximum snow cover in Washington was at Paradise SNOTEL, with water content of 29 inches. The 30-year average for Paradise on January 1 is 32.8 inches leaving the site at only 88% of average.

BASIN	PERCENT OF LAST YEAR	PERCENT OF AVERAGE
Spokane	165	91
Newman Lake	144	113
Pend Oreille	139	102
Okanogan	139	92
Methow	123	89
Conconully Lake	138	104
Wenatchee	109	82
Chelan	93	74
Upper Yakima	132	90
Lower Yakima	126	108
Ahtanum Creek	128	105
Walla Walla	135	121
Lower Snake	131	94
Cowlitz	130	108
Lewis	140	130
White	121	104
Green	117	80
Puyallup	116	105
Cedar	150	115
Snoqualmie	111	77
Skykomish	88	68
Skagit	114	87
Baker	97	68
Nooksack	98	89
Olympic Peninsula	143	176

Precipitation

During the month of December, the National Weather Service and Natural Resources Conservation Service climate stations reported near to above average precipitation totals throughout Washington river basins. The highest percent of average in the state was at Dungeness SNOTEL in the Olympic Mountains which reported 267% of average for a total of 15.5 inches. The average for Dungeness is 5.8 inches for December. The wettest spot in the state was reported at Buckinghorse SNOTEL, also within the Olympic Mountains with a December accumulation of 33.7 inches. Buckinghorse is too new to have an average however last year it only received 10.7 inches. Adequate precipitation for both October and November helped build soil moisture profiles to near holding capacity which should help increase runoff later in the year. Water-year 2010 ended with well above average precipitation statewide which also helped buffer soil moisture and reservoir levels.

RIVER BASIN	DECEMBER PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	112	109
Pend Oreille	98	107
Upper Columbia	111	109
Central Columbia	108	96
Upper Yakima	88	89
Lower Yakima	111	112
Walla Walla	111	100
Lower Snake	126	113
Lower Columbia	108	105
South Puget Sound	91	101
Central Puget Sound	96	94
North Puget Sound	112	94
Olympic Peninsula	192	139

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 455,000-acre feet, 114% of average for the Upper Reaches and 141,000-acre feet or 127% of average for Rimrock and Bumping Lakes. Storage at the Okanogan reservoirs was 123% of average for January 1. The power generation reservoirs included the following: Coeur d'Alene Lake, 134,000 acre feet, 122% of average and 56% of capacity; Chelan Lake, 323,000-acre feet, 81% of average and 48 of capacity; and the Skagit River reservoirs at 100% of average and 82% 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	56	122
Pend Oreille	56	128
Upper Columbia	85	123
Central Columbia	48	81
Upper Yakima	55	114
Lower Yakima	61	127
Lower Snake	67	94
North Puget Sound	82	100

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

Streamflow

Forecasts vary from 84% of average for the Icicle Creek near Leavenworth to 120% of average for Dungeness River. April-September forecasts for some Western Washington streams include the Cedar River near Cedar Falls, 99%; White River, 102%; and Skagit River, 96%. Some Eastern Washington streams include the Yakima River near Parker, 92%; Wenatchee River at Plain, 89%; and Spokane River near Post Falls, 99%. Volumetric forecasts are developed using current, historic and average snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS. Caution should be used when using early season forecasts for critical water resource management decisions.

Statewide December streamflows varied widely and appeared to be precipitation driven. Heavy precipitation caused localized flooding in some streams around the state. The Dungeness River had the highest reported flows with 136% of average. The Yakima at Cle Elum with 81% of average was the lowest in the state however that could be due to reservoir control. Other streamflows were the following percentage of average as reported by the River Forecast Center: the Cowlitz at Castle Rock, 107%; the Spokane at Spokane, 141%; the Columbia below Rock Island Dam, 105%; and the Cle Elum near Roslyn, 99%.

BASIN	PERCENT OF AVERAGE (50 PERCENT CHANCE OF EXCEEDENCE)
Spokane	86-99
Pend Oreille	100-103
Upper Columbia	86-93
Central Columbia	84-92
Upper Yakima	88-95
Lower Yakima	116-91
Walla Walla	104-118
Lower Snake	103-110
Lower Columbia	101-116
South Puget Sound	101-102
Central Puget Sound	95-101
North Puget Sound	96-99
Olympic Peninsula	105-120

STREAM	PERCENT OF AVERAGE DECEMBER STREAMFLOWS
Pend Oreille Below Box Canyon	116
Kettle at Laurier	100
Columbia at Birchbank	94
Spokane at Long Lake	124
Similkameen at Nighthawk	83
Okanogan at Tonasket	77
Methow at Pateros	109
Chelan at Chelan	106
Wenatchee at Pashastin	98
Yakima at Cle Elum	81
Yakima at Parker	82
Naches at Naches	87
Grande Ronde at Troy	82
Snake below Lower Granite Dam	83
SF Walla Walla near Milton Freewater	130
Columbia River at The Dalles	98
Cowlitz below Mayfield Dam	102
Skagit at Concrete	108
Dungeness near Sequim	136

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

BASIN SUMMARY OF
SNOW COURSE DATA

JANUARY 2011

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00	SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
ALPINE MEADOWS SNTL	3500	1/01/11	42	13.9	15.9	20.1	MONASHEE PASS CAN.	4500	12/31/10	19	4.3	--	6.6
ASHLEY DIVIDE	4820	1/02/11	29	5.2	.8	3.4	MORSE LAKE SNOTEL	5410	1/01/11	91	25.9	23.7	23.4
BADGER PASS SNOTEL	6900	1/01/11	46	12.3	15.8	15.2	MOSES MTN SNOTEL	5010	1/01/11	25	6.3	4.1	7.1
BARKER LAKES SNOTEL	8250	1/01/11	31	6.3	9.5	6.7	MOSQUITO RDG SNOTEL	5200	1/01/11	---	15.6	11.1	15.5
BARNES CREEK CAN.	5320	12/31/10	28	6.7	9.3	10.9	MOULTON RESERVOIR	6850	1/05/11	22	4.4	2.0	3.5
BASIN CREEK SNOTEL	7180	1/01/11	20	3.9	3.6	3.7	MOUNT BLUM AM	5800	12/30/10	60	18.0	21.0	28.1
BEAVER CREEK TRAIL	2200	12/28/10	39	11.0	--	--	MOUNT CRAG SNOTEL	3960	1/01/11	78	21.1	13.5	11.6
BEAVER PASS	3680	12/30/10	50	16.5	--	--	MT. KOBAN CAN.	5500	12/31/10	22	4.9	--	5.4
BEAVER PASS SNOTEL	3630	1/01/11	64	18.4	14.9	18.8	MOWICH SNOTEL	3160	1/01/11	4	.4	.8	.4
BLACK PINE SNOTEL	7100	1/01/11	26	5.6	3.4	5.2	MOUNT GARDNER SNOTEL	2920	1/01/11	34	9.7	4.1	7.4
BLEWETT PASS#2SNOTEL	4240	1/01/11	29	8.1	5.5	8.2	N.F. ELK CR SNOTEL	6250	1/01/11	27	6.3	3.2	5.1
BROWN TOP AM	6000	12/28/10	92	24.5	--	--	NEVADA RIDGE SNOTEL	7020	1/01/11	36	7.6	5.9	6.8
BUCKINGHORSE SNOTEL	4870	1/01/11	109	36.8	31.6	--	NEW HOZOMEEN LAKE	2800	12/28/10	16	4.2	--	--
BUMPING LAKE (NEW)	3400	1/04/11	37	10.0	6.0	7.2	NEZ PERCE CMP SNOTEL	5650	1/01/11	28	6.0	4.0	6.1
BUMPING RIDGE SNOTEL	4610	1/01/11	51	13.2	11.3	12.1	NOISY BASIN SNOTEL	6040	1/01/11	88	28.1	17.0	19.8
BUNCHGRASS MDWSNOTEL	5000	1/01/11	44	10.3	11.9	12.6	OLALLIE MDWS SNOTEL	4030	1/01/11	56	19.4	19.3	22.2
BURNT MOUNTAIN PIL	4170	1/01/11	25	6.4	4.2	5.7	OPHIR PARK	7150	1/01/11	33	7.6	6.0	6.6
CALAMITY SNOTEL	2500	1/01/11	11	3.4	1.3	--	PARADISE SNOTEL	5130	1/01/11	90	29.0	28.8	32.8
CAYUSE PASS SNOTEL	5240	1/01/11	94	28.5	21.4	--	PARK CK RIDGE SNOTEL	4600	1/01/11	62	16.7	19.6	22.5
CHESSMAN RESERVOIR	6200	1/04/11	---	1.5E	1.5	1.5	PEPPER CREEK SNOTEL	2140	1/01/11	17	5.1	2.5	--
COMBINATION SNOTEL	5600	1/01/11	14	2.5	1.7	2.2	PETERSON MDW SNOTEL	7200	1/01/11	23	4.2	4.2	4.4
COPPER BOTTOM SNOTEL	5200	1/01/11	30	5.6	3.2	5.3	PIGTAIL PEAK SNOTEL	5800	1/01/11	78	22.9	19.3	23.1
CORRAL PASS SNOTEL	5800	1/01/11	55	14.8	12.1	15.8	PIKE CREEK SNOTEL	5930	1/01/11	33	8.7	7.1	12.0
COUGAR MTN. SNOTEL	3200	1/01/11	28	7.8	2.9	8.5	PIPESTONE PASS	7200	12/28/10	13	2.1	1.5	2.2
COYTE HILL	4200	12/30/10	24	4.6	2.1	4.3	POPE RIDGE SNOTEL	3590	1/01/11	36	7.5	6.7	9.8
DALY CREEK SNOTEL	5780	1/01/11	24	5.1	3.6	4.9	POTATO HILL SNOTEL	4510	1/01/11	60	15.7	12.2	12.4
DEVILS PARK	5900	12/30/10	62	19.9	--	--	QUARTZ PEAK SNOTEL	4700	1/01/11	46	11.5	8.0	10.2
DISCOVERY BASIN	7050	12/30/10	24	4.7	2.2	4.2	RAGGED MOUNTAIN	4200	1/01/11	49	10.6	6.4	9.9
DIX HILL	6400	1/01/11	26	6.1	2.9	4.5	RAGGED MTN SNOTEL	4210	1/01/11	49	11.7	5.7	--
DOCK BUTTE AM	3800	12/30/10	70	22.4	18.8	28.5	RAINY PASS SNOTEL	4890	1/01/11	51	14.3	14.8	19.9
DOMMERIE FLATS	2200	1/04/11	21	6.2	1.0	3.9	RAINY PASS	4780	12/27/10	53	12.7	--	--
DUNGENESS SNOTEL	4010	1/01/11	34	9.3	4.1	3.5	REX RIVER SNOTEL	3810	1/01/11	41	13.2	8.7	13.0
EASY PASS AM	5200	12/30/10	72	21.6	19.2	31.9	ROCKER PEAK SNOTEL	8000	1/01/11	30	6.9	6.1	6.4
ELBOW LAKE SNOTEL	3200	1/01/11	45	14.7	14.7	15.4	ROCKY CREEK AM	2100	12/30/10	24	8.2	15.6	12.9
EMERY CREEK SNOTEL	4350	1/01/11	30	7.7	6.1	7.0	SF THUNDER CK AM	2200	12/30/10	0	.0	2.4	5.0
FARRON CAN.	4000	12/31/10	28	5.6	--	6.1	SADDLE MTN SNOTEL	7900	1/01/11	52	12.7	7.0	11.7
FISH CREEK	8000	1/05/11	23	5.1	4.8	4.4	SALMON MDWS SNOTEL	4460	1/01/11	24	5.5	4.0	5.3
FISH LAKE	3370	1/04/11	42	12.6	10.4	14.5	SASSE RIDGE SNOTEL	4340	1/01/11	44	12.0	9.4	14.7
FISH LAKE SNOTEL	3430	1/01/11	40	10.9	10.4	15.0	SAVAGE PASS SNOTEL	6170	1/01/11	51	11.8	7.4	11.7
FLATTOP MTN SNOTEL	6300	1/01/11	68	19.0	21.0	21.4	SAWMILL RIDGE SNOTEL	4640	1/01/11	59	17.4	20.2	--
FOURTH OF JULY SUM	3200	12/28/10	18	3.9	--	3.7	SCHREIBERS MDW AM	3400	12/30/10	68	21.8	19.2	23.2
FREEZEOUT CK. TRAIL	3500	12/29/10	22	6.6	--	--	SENTINEL BT SNOTEL	4680	1/01/11	26	4.9	4.2	4.0
FROHNER MDWS SNOTEL	6480	1/01/11	22	3.9	3.0	3.4	SHEEP CANYON SNOTEL	3990	1/01/11	71	24.0	12.5	15.4
GRAVE CRK SNOTEL	4300	1/01/11	25	7.2	6.7	7.7	SHERWIN SNOTEL	3200	1/01/11	---	5.2	2.6	5.1
GRAYSTOKE LAKE CAN.	5500	12/30/10	19	5.5	--	--	SKALKAHO SNOTEL	7260	1/01/11	41	9.9	6.0	10.3
GREEN LAKE SNOTEL	5920	1/01/11	43	10.6	9.2	10.7	SKOOKUM CREEK SNOTEL	3310	1/01/11	25	7.9	4.4	10.8
GROUSE CAMP SNOTEL	5390	1/01/11	38	9.1	6.9	9.6	SOURDOUGH GUL SNOTEL	4000	1/01/11	6	1.3	.6	--
HAND CREEK SNOTEL	5030	1/01/11	31	6.4	4.0	5.9	SPENCER MDW SNOTEL	3400	1/01/11	51	16.9	13.5	12.5
HARTS PASS SNOTEL	6490	1/01/11	60	22.0	15.1	21.7	SPIRIT LAKE SNOTEL	3520	1/01/11	15	3.5	1.9	3.6
HARTS PASS	6500	12/27/10	72	20.8	--	--	SPOTTED BEAR MTN.	7000	1/03/11	29	6.8	4.9	6.9
HELL ROARING DIVIDE	5770	12/28/10	47	13.9	11.2	13.4	SPRUCE SPGS SNOTEL	5700	1/01/11	28	5.1	5.7	7.4
HIGH RIDGE SNOTEL	4920	1/01/11	65	16.8	10.3	10.4	STAHL PEAK SNOTEL	6030	1/01/11	64	19.8	15.6	17.1
HOLBROOK	4530	1/01/11	21	3.0	1.4	4.2	STAMPEDE PASS SNOTEL	3850	1/01/11	49	14.4	10.7	19.4
HOODOO BASIN SNOTEL	6050	1/01/11	74	17.5	10.8	19.3	STEVENS PASS SNOTEL	3950	1/01/11	50	12.9	14.7	19.1
HUCKLEBERRY SNOTEL	2250	1/01/11	6	1.2	1.2	1.0	STORM LAKE	7780	12/30/10	28	5.0	4.4	5.5
HUMBOLDT GLCH SNOTEL	4250	1/01/11	---	5.5	3.7	6.0	SUMMERLAND RES CAN.	4200	12/29/10	19	4.2	3.2	4.5
INDIAN ROCK SNOTEL	5360	1/01/11	65	21.8	15.4	--	SUNSET SNOTEL	5540	1/01/11	---	8.9	5.1	13.6
ISINTOK LAKE CAN.	5100	12/29/10	13	2.4	2.3	3.4	SURPRISE LKS SNOTEL	4290	1/01/11	81	24.6	16.9	20.3
JASPER PASS AM	5400	12/30/10	65	19.5	16.8	40.9	SWAMP CREEK SNOTEL	3930	1/01/11	27	6.6	7.0	9.6
JUNE LAKE SNOTEL	3440	1/01/11	75	23.5	15.3	17.1	SWIFT CREEK SNOTEL	4440	1/01/11	99	32.4	29.6	24.0
KELLOGG PEAK	5560	12/28/10	43	15.7	7.8	11.7	TEN MILE LOWER	6600	1/04/11	---	3.1E	3.2	3.0
KLESILKWA CAN.	3450	12/30/10	17	4.4	3.3	4.6	TEN MILE MIDDLE	6800	1/04/11	---	4.7E	4.9	4.6
KRAFT CREEK SNOTEL	4750	1/01/11	33	7.1	4.4	6.9	THUNDER BASIN SNOTEL	4320	1/01/11	44	12.7	13.7	15.7
LOLO PASS SNOTEL	5240	1/01/11	54	11.6	8.1	13.0	TINKHAM CREEK SNOTEL	2990	1/01/11	47	13.2	10.2	12.3
LONE PINE SNOTEL	3930	1/01/11	72	22.7	17.8	16.2	TOUCHET SNOTEL	5530	1/01/11	60	13.5	12.1	14.7
LOOKOUT SNOTEL	5140	1/01/11	55	13.6	8.0	13.7	TRINKUS LAKE	6100	1/01/11	---	19.2E	16.0	19.4
LOST HORSE SNOTEL	5120	1/01/11	35	9.3	6.3	8.3	TROUGH #2 SNOTEL	5480	1/01/11	25	6.6	4.9	5.3
LOST LAKE SNOTEL	6110	1/01/11	80	20.4	14.0	27.1	TRUMAN CREEK	4060	1/02/11	22	4.1	.5	2.0
LUBRECHT FOREST NO 3	5450	12/30/10	21	3.8	1.0	2.7	TUNNEL AVENUE	2450	1/05/11	35	11.3	5.4	8.3
LUBRECHT FOREST NO 4	4650	12/30/10	15	2.7	.8	1.4	TV MOUNTAIN	6800	1/03/11	48	11.9	4.7	7.7
LUBRECHT SNOTEL	4680	1/01/11	18	3.5	1.9	2.6	TWELVEMILE SNOTEL	5600	1/01/11	30	6.1	4.7	7.5
LYMAN LAKE SNOTEL	5980	1/01/11	81	22.6	23.3	29.7	TWIN LAKES SNOTEL	6400	1/01/11	58	15.0	10.0	17.5
LYNN LAKE SNOTEL	3900	1/01/11	29	7.7	4.8	--	TWIN SPIRIT DIVIDE	3480	1/01/11	25	3.6	1.8	6.6
MARIAS PASS	5250	12/31/10	34	7.7	4.3	7.3	UPPER HOLLAND LAKE	6200	1/03/11	54	15.1	8.0	15.2
MARTEN LAKE AM	3600	12/30/10	80	25.6	30.4	32.4	UPPER WHEELER SNOTEL	4330	1/01/11	27	6.0	4.1	5.9
MARTEN RIDGE SNOTEL	3520	1/01/11	64	22.8	26.4	--	WARM SPRINGS SNOTEL	7800	1/01/11	40	9.7	8.6	9.4
MEADOWS CABIN	1900	12/30/10	5	1.2	--	--	WATSON LAKES AM	4500	12/30/10	65	19.5	14.4	25.1
MEADOWS PASS SNOTEL	3230	1/01/11	43	12.7	9.6	9.6	WATERHOLE SNOTEL	5010	1/01/11	61	20.8	18.3	14.0
M F NOOKSACK SNOTEL	4970	1/01/11	56	20.7	20.7	26.1	WELLS CREEK SNOTEL	4030	1/01/11	46	14.0	15.1	14.2
MICA CREEK SNOTEL	4510	1/01/11	41	8.7	7.3	11.7	WHITE PASS ES SNOTEL	4440	1/01/11	44	11.2	7.9	10.7



Natural Resources Conservation Service

Washington State
Snow, Water and Climate Services

Program Contacts

Roylene Rides At The Door
State Conservationist
Spokane State Office
W. 316 Boone Ave., Suite 450
Spokane, WA 99201-2348
phone: 509-323-2961
fax: 509-323-2979
roylene.rides-at-the-door@wa.usda.gov

Jon Lea
DCO Supervisor
Oregon Data Collection Office
101 SW Main St, Suite 1300
Portland, OR 97204
Phone: 503-414-3267
Fax: 503-414-3277
jon.lea@or.usda.gov

Scott Pattee
Water Supply Specialist
Washington Snow Survey Office
2021 E. College Way, Suite 214
Mount Vernon, WA 98273-2873
phone: 360-428-7684
fax: 360-424-6172
scott.pattee@wa.usda.gov

Rashawn Tama
Forecast Hydrologist
National Water and Climate Center
101 SW Main St., Suite 1600
Portland, OR 97204-3224
phone: 503-414-3010
fax: 503-414-3101
rashawn.tama@por.usda.gov

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>

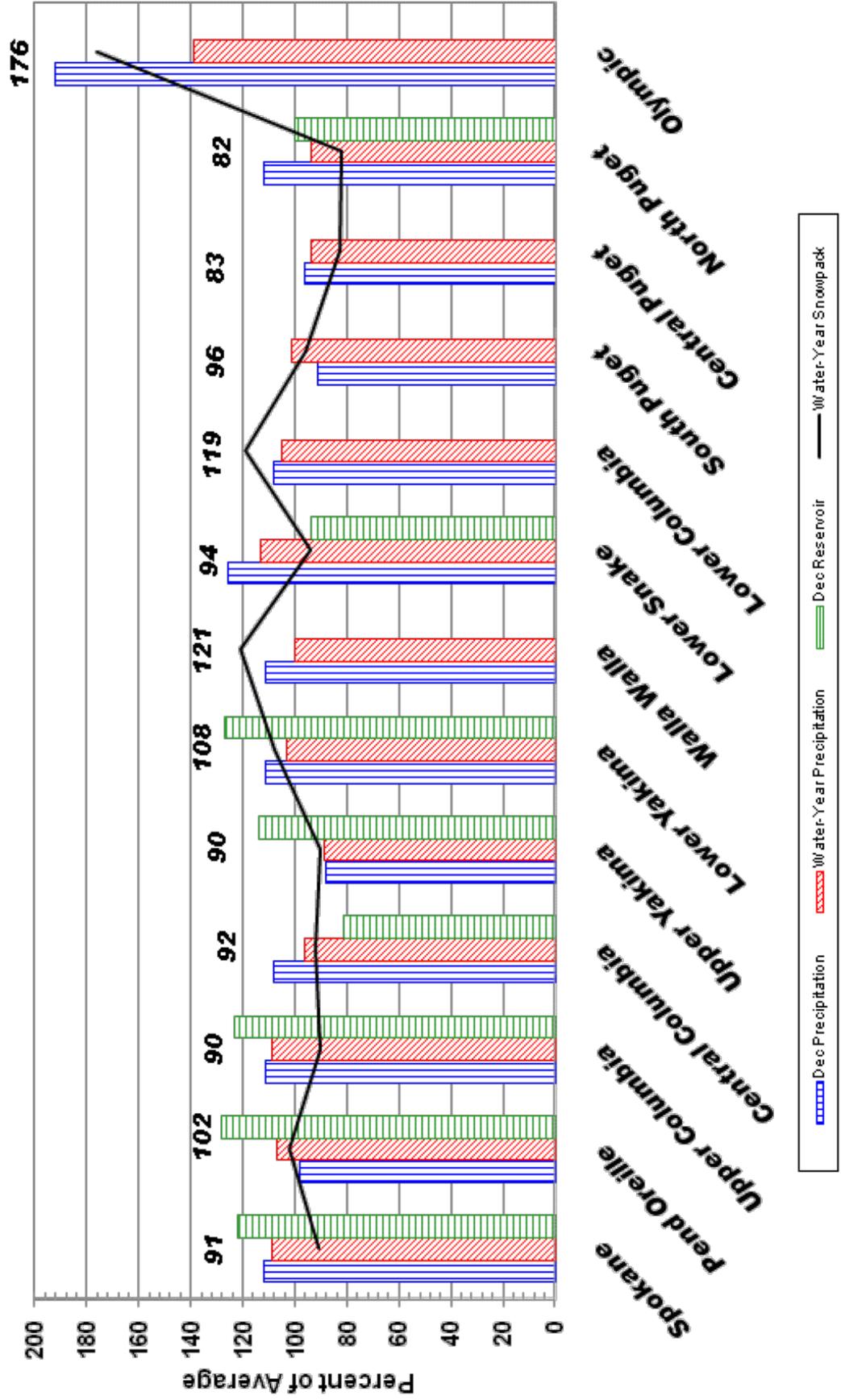
USDA-NRCS Agency Homepages

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

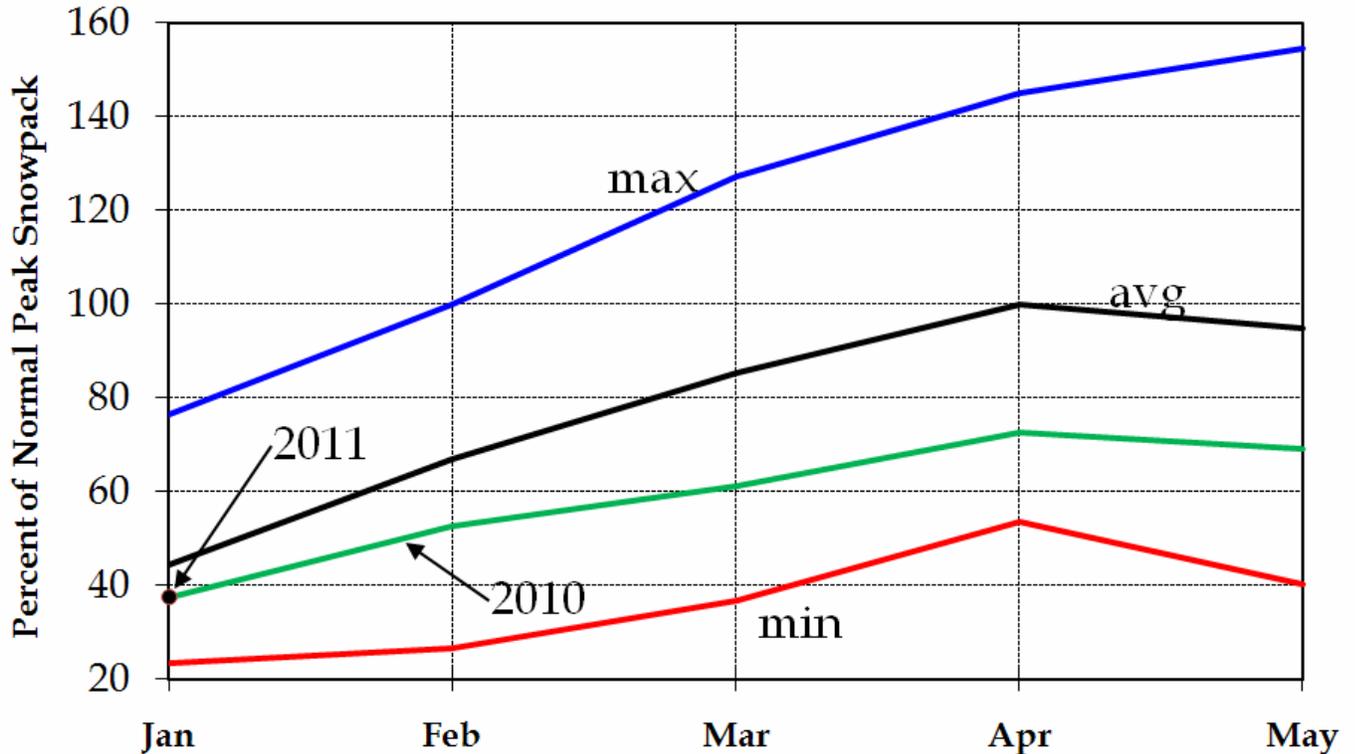
NRCS National:
<http://www.nrcs.usda.gov>

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

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



Columbia above The Dalles



January 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 88 percent of average, compared to 85 percent of average last year. It's early in the season, but the snowpack in Canada has a lot of catching up to do. Fortunately, the low Canadian snowpack is offset by above average snowpacks in the Snake, Boise, Salmon, and Pend Oreille basins; and all of Oregon. Heavy, early season snowfall was recorded over western Montana, the Idaho panhandle, and everywhere south of the Oregon/Washington border, extended eastward.

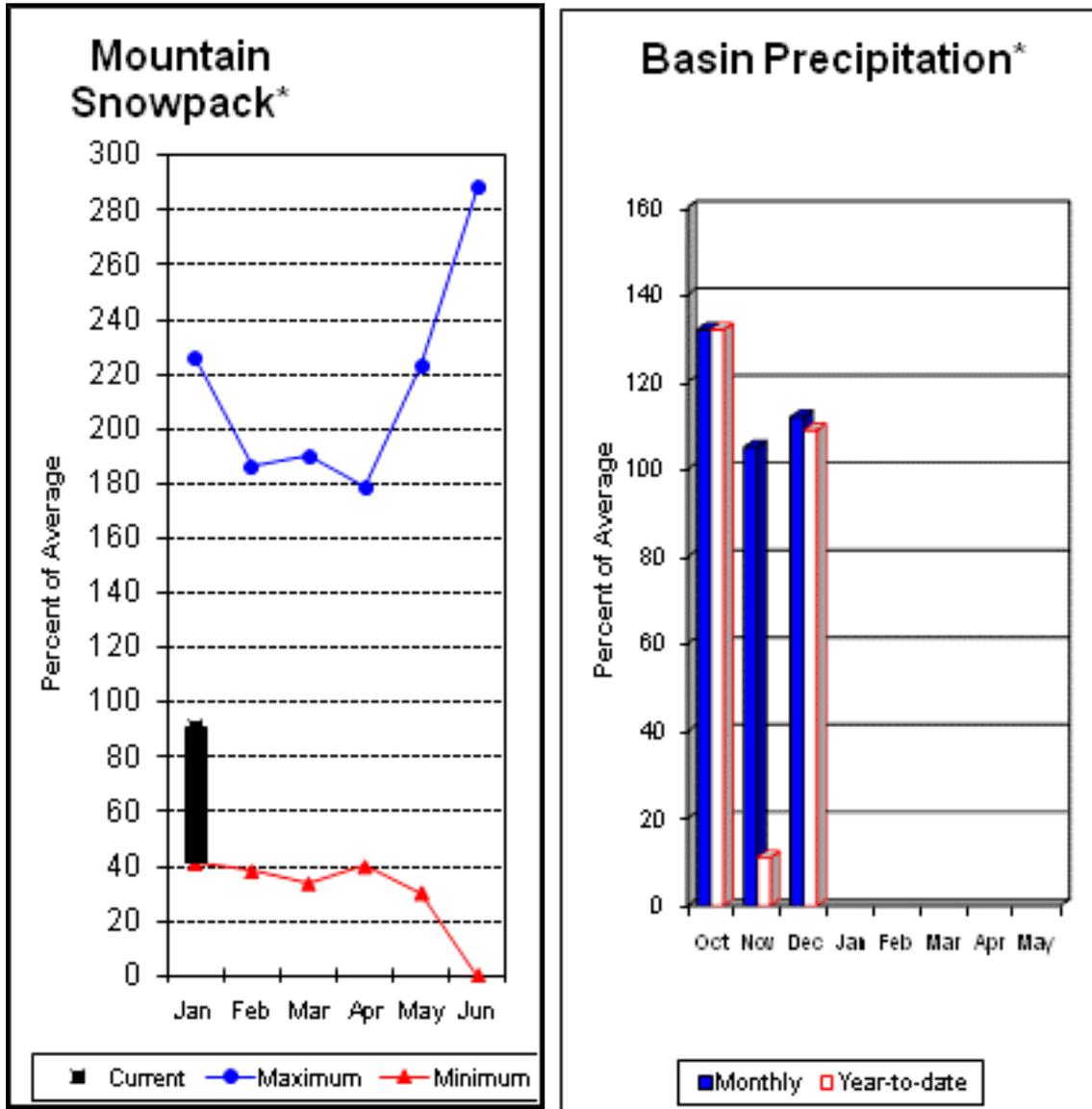
The best Columbia Basin snowpack is the John Day at 136%, followed closely by the Snake headwaters at 130%. Other above average snowpacks include the Deschutes at 127%, the Boise at 125%, and eastern Oregon at 121%. The worst snowpack by far is the upper Canadian snowpack at just 62%, followed by the Kettle at 73%, the Kootenay at 81%, the North Cascades at 82%, and the Spokane at 87%. The Pend Oreille, Yakima, Salmon, and Clearwater snowpacks are all near average.

The overall snowpack above The Dalles is at 39 percent of the average peak accumulation. This compares to 38 percent last year.

The snowpack in the Columbia Basin above Castlegar is at 70 percent of average. This compares to 102 percent last year. For the basin above Grand Coulee, the snowpack is at 79 percent of average, compared to 93 percent last year. The Snake River snowpack above Ice Harbor is at 110 percent of average, compared to 65 percent last year.

The next 10 days promises to be wet in the Columbia Basin. It is anticipated that we will see improvement in the Spokane and Canadian snowpacks.

Spokane River Basin



*Based on selected stations

The January 1 forecasts for summer runoff within the Spokane River Basin are 99% of average near Post Falls and 98% at Long Lake. The Chamokane River near Long Lake forecasted to have 86% of average flows for the May-August period. The forecast is based on a basin snowpack that is 91% of average and precipitation that is 109% of average for the water year. Precipitation for December was above normal at 112% of average. Streamflow on the Spokane River at Long Lake was 124% of average for December. January 1 storage in Coeur d'Alene Lake was 134,000 acre feet, 122% of average and 56% of capacity. Snowpack at Quartz Peak SNOTEL site was 113% of average with 11.5 inches of water content. Average temperatures in the Spokane basin were near normal for December and for the water year.

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

Spokane River Basin

Streamflow Forecasts - January 1, 2011

Forecast Point	Forecast Period	Future Conditions				30-Yr Avg. (1000AF)	
		<<==== Drier =====>>		==== Wetter =====>>			
		90% (1000AF)	70% (1000AF)	Chance Of Exceeding * 50% (1000AF) (% AVG.)	30% (1000AF)	10% (1000AF)	
Spokane R nr Post Falls (2)	APR-JUL	1610	2140	2510 98	2880	3410	2550
	APR-SEP	1690	2240	2610 99	2980	3530	2650
Spokane R at Long Lake (2)	APR-JUL	1770	2380	2790 98	3200	3810	2850
	APR-SEP	1940	2570	3000 98	3430	4060	3070
Chamokane Ck nr Long Lake	MAY-AUG	5.4	7.4	8.8 86	10.2	12.2	10.2

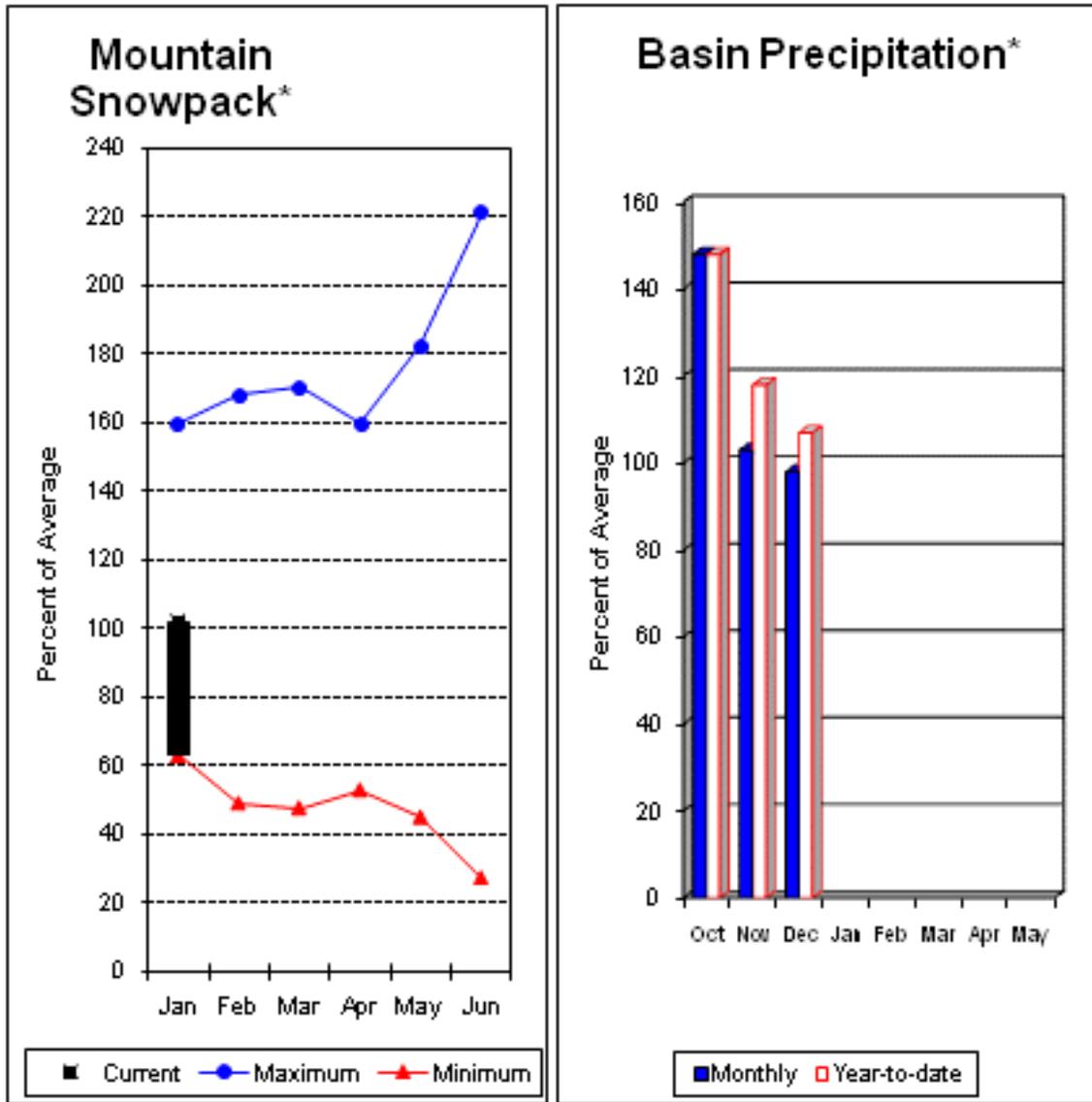
SPOKANE RIVER BASIN Reservoir Storage (1000 AF) - End of December					SPOKANE RIVER BASIN Watershed Snowpack Analysis - January 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
COEUR D'ALENE	238.5	134.2	41.3	110.1	SPOKANE RIVER	12	165	91
					NEWMAN LAKE	1	144	113

* 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 April – September average forecast for the Priest River near the town of Priest River is 100% and the Pen Orielle below Box Canyon is 103%. December streamflow was 195% of average on the Pend Oreille River and 94% on the Columbia Birchbank. January 1 snow cover was 102% of average in the Pend Oreille Basin River Basin. Bunchgrass Meadows SNOTEL site had 10.3 inches of snow water on the snow pillow. Normally Bunchgrass would have 12.6 inches on January 1. Precipitation during December was 98% of average, bringing the year-to-date precipitation to 107% of average. Reservoir storage in the basin, including Lake Pend Oreille and Priest Lake was 128% of normal. Average temperatures were slightly above normal for December and for the water year.

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

Pend Oreille River Basins

Streamflow Forecasts - January 1, 2011

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		Drier		Wetter		Chance Of Exceeding *		
		90% (1000AF)	70% (1000AF)	50% (1000AF)	30% (1000AF)	10% (1000AF)	(% AVG.)	
Pend Oreille Lake Inflow (2)	APR-JUL	10200	11900	13000	102	14100	15800	12700
	APR-SEP	11200	13000	14200	102	15400	17200	13900
Priest R nr Priest River (1,2)	APR-JUL	510	720	815	100	910	1120	815
	APR-SEP	545	770	870	100	970	1190	870
Pend Oreille R bl Box Canyon (2)	APR-JUL	10400	12100	13300	103	14500	16200	12900
	APR-SEP	11500	13300	14500	103	15700	17500	14100

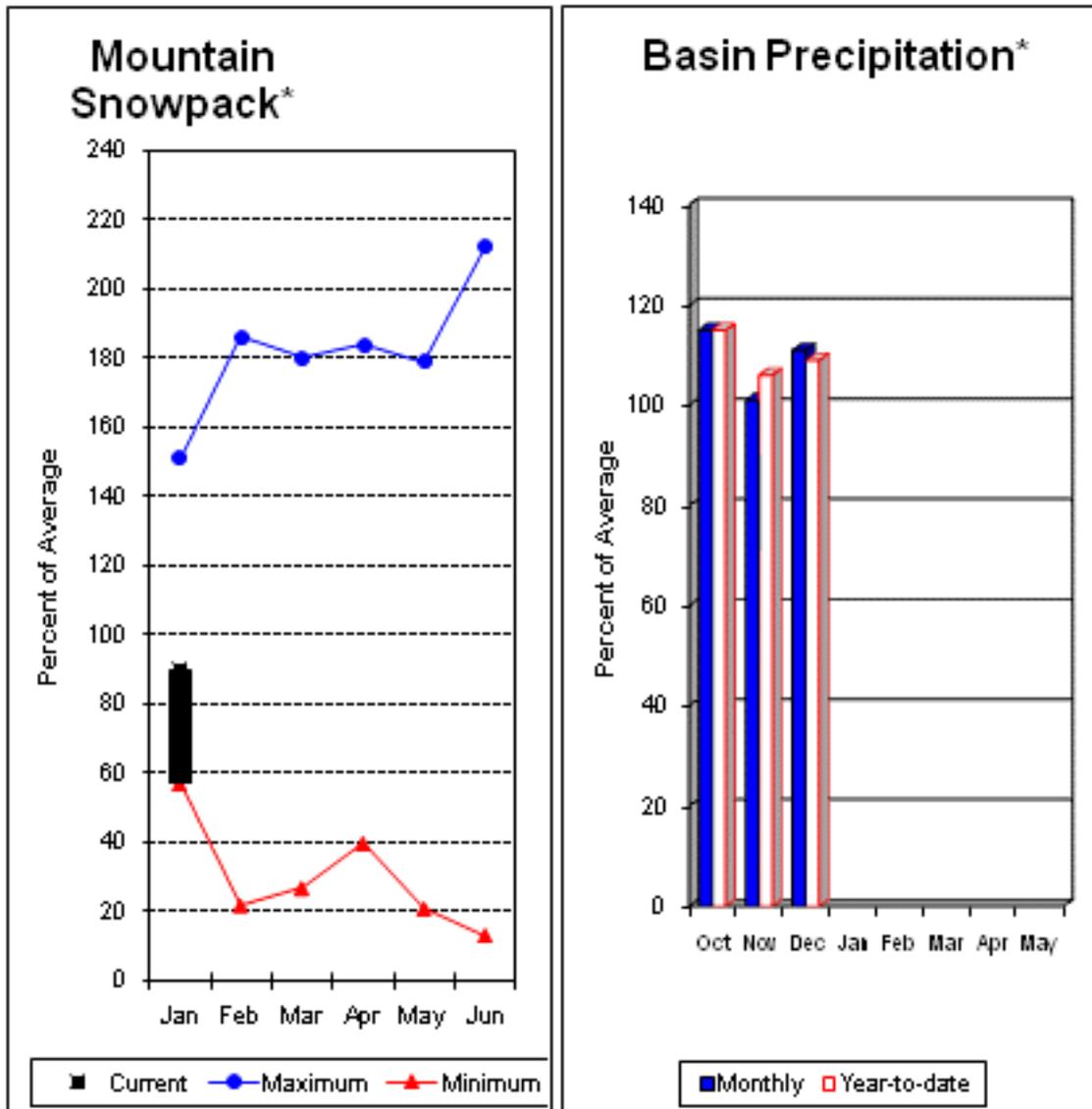
PEND OREILLE RIVER BASINS Reservoir Storage (1000 AF) - End of December					PEND OREILLE RIVER BASINS Watershed Snowpack Analysis - January 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
PEND OREILLE	1561.3	880.5	545.6	673.4	COLVILLE RIVER	0	0	0
PRIEST LAKE	119.3	53.6	55.5	55.7	PEND OREILLE RIVER	8	143	91
					KETTLE RIVER	1	117	123

* 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 86%, Similkameen River is 90%, Kettle River 92% and Methow River is 93%. January 1 snow cover on the Okanogan was 92% of average, Omak Creek was 89% and the Methow was 89%. December precipitation in the Upper Columbia was 111% of average, with precipitation for the water year at 109% of average. December streamflow for the Methow River was 109% of average, 77% for the Okanogan River and 83% for the Similkameen. Snow-water content at Salmon Meadows SNOTEL was 5.5 inches. Average for this site is 5.3 inches on January 1. Combined storage in the Conconully Reservoirs was 20,000-acre feet, which is 85% of capacity and 123% of the January 1 average. Temperatures were 2-3 degrees normal for December and for the water year.

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

Upper Columbia River Basins

Streamflow Forecasts - January 1, 2011

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)
		Chance Of Exceeding *						
		90% (1000AF)	70% (1000AF)	50% (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
Colville R at Kettle Falls	APR-JUL	41	85	115	90	145	189	128
	APR-SEP	46	94	127	90	160	210	141
Kettle R nr Laurier	APR-JUL	1190	1510	1720	92	1930	2250	1870
	APR-SEP	1250	1580	1810	92	2040	2370	1970
Columbia R at Grand Coulee (2)	APR-JUL	35300	45700	50500	94	55300	65700	53800
	APR-SEP	41800	54300	60000	94	65700	78200	64000
Similkameen R nr Nighthawk (1)	APR-JUL	780	1090	1230	91	1370	1680	1350
	APR-SEP	835	1170	1320	91	1470	1800	1450
Okanogan R nr Tonasket (1)	APR-JUL	615	1130	1360	86	1590	2110	1580
	APR-SEP	670	1250	1520	86	1790	2370	1770
Okanogan R at Malott (1)	APR-JUL	620	1160	1400	86	1640	2180	1630
	APR-SEP	685	1290	1570	86	1850	2460	1830
Methow R nr Pateros	APR-SEP	620	795	915	93	1030	1210	985
	APR-JUL	565	730	845	93	960	1130	910

UPPER COLUMBIA RIVER BASINS Reservoir Storage (1000 AF) - End of December					UPPER COLUMBIA RIVER BASINS Watershed Snowpack Analysis - January 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
SALMON LAKE	10.5	8.6	5.6	8.5	OKANOGAN RIVER	2	144	102
CONCONULLY RESERVOIR	13.0	11.3	4.1	7.7	OMAK CREEK	1	154	89
					SANPOIL RIVER	0	0	0
					SIMILKAMEEN RIVER	0	0	0
					TOATS COULEE CREEK	0	0	0
					CONCONULLY LAKE	1	138	104
					METHOW RIVER	3	123	89

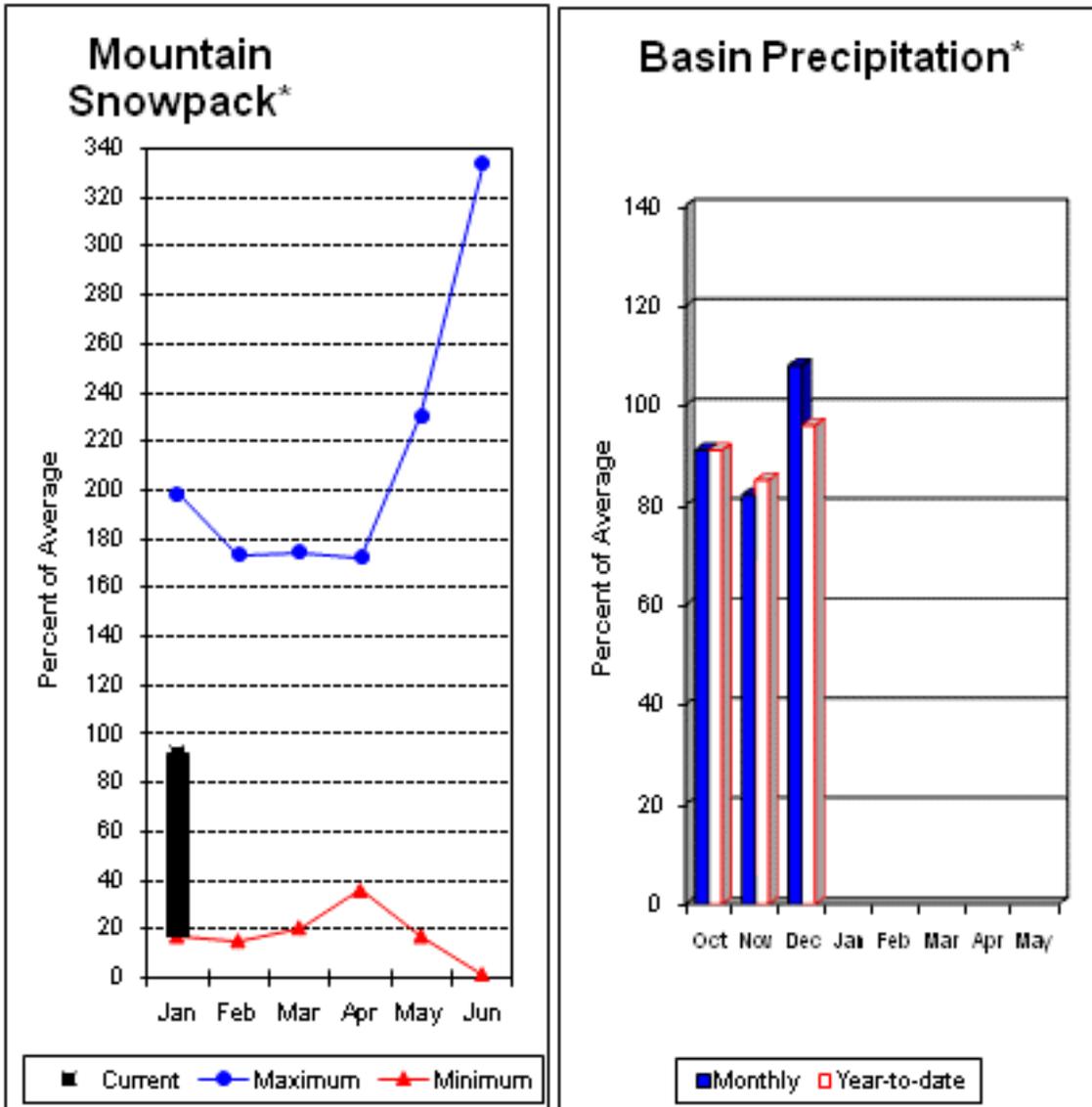
* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

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 December was 108% of average in the basin and 96% for the year-to-date. Runoff for Entiat River is forecast to be 85% of average for the summer. The January-September average forecast for Chelan River is 89%, Wenatchee River at Plain is 89%, Stehekin River is 92% and Icicle Creek is 84%. December average streamflows on the Chelan River were 106% and on the Wenatchee River 98%. January 1 snowpack in the Wenatchee River Basin was 82% of average; the Chelan, 74%; the Entiat, 77%; Stemilt Creek, 102% and Colockum Creek, 125%. Reservoir storage in Lake Chelan was 323,000-acre feet, 81% of January 1 average and 48% of capacity. Lyman Lake SNOTEL had the most snow water with 22.6 inches of water. This site would normally have 29.7 inches on January 1. Temperatures were near normal for December and for the water year.

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

Central Columbia River Basins

Streamflow Forecasts - January 1, 2011

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		<<===== Drier =====>>		=====		>>===== Wetter =====>>		
		90% (1000AF)	70% (1000AF)	Chance Of Exceeding * 50% (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	
Stehekin R at Stehekin	APR-JUL	490	580	645	92	710	800	700
	APR-SEP	595	695	765	92	835	935	830
Chelan R at Chelan (2)	APR-JUL	735	855	935	89	1020	1140	1050
	APR-SEP	820	965	1060	89	1160	1300	1190
Entiat R nr Ardenvoir	APR-JUL	128	162	185	86	210	240	215
	APR-SEP	144	180	205	85	230	265	240
Wenatchee R at Plain	APR-JUL	700	850	950	89	1050	1200	1070
	APR-SEP	775	940	1050	89	1160	1320	1180
Icicle Ck nr Leavenworth	APR-JUL	193	235	260	84	285	325	310
	APR-SEP	215	255	285	84	315	355	340
Wenatchee R at Peshastin	APR-JUL	995	1190	1330	90	1470	1670	1480
	APR-SEP	1100	1320	1470	90	1620	1840	1630
Columbia R bl Rock Island Dam (2)	APR-JUL	42600	50500	55900	95	61300	69200	59000
	APR-SEP	50100	59400	65800	95	72200	81500	69500

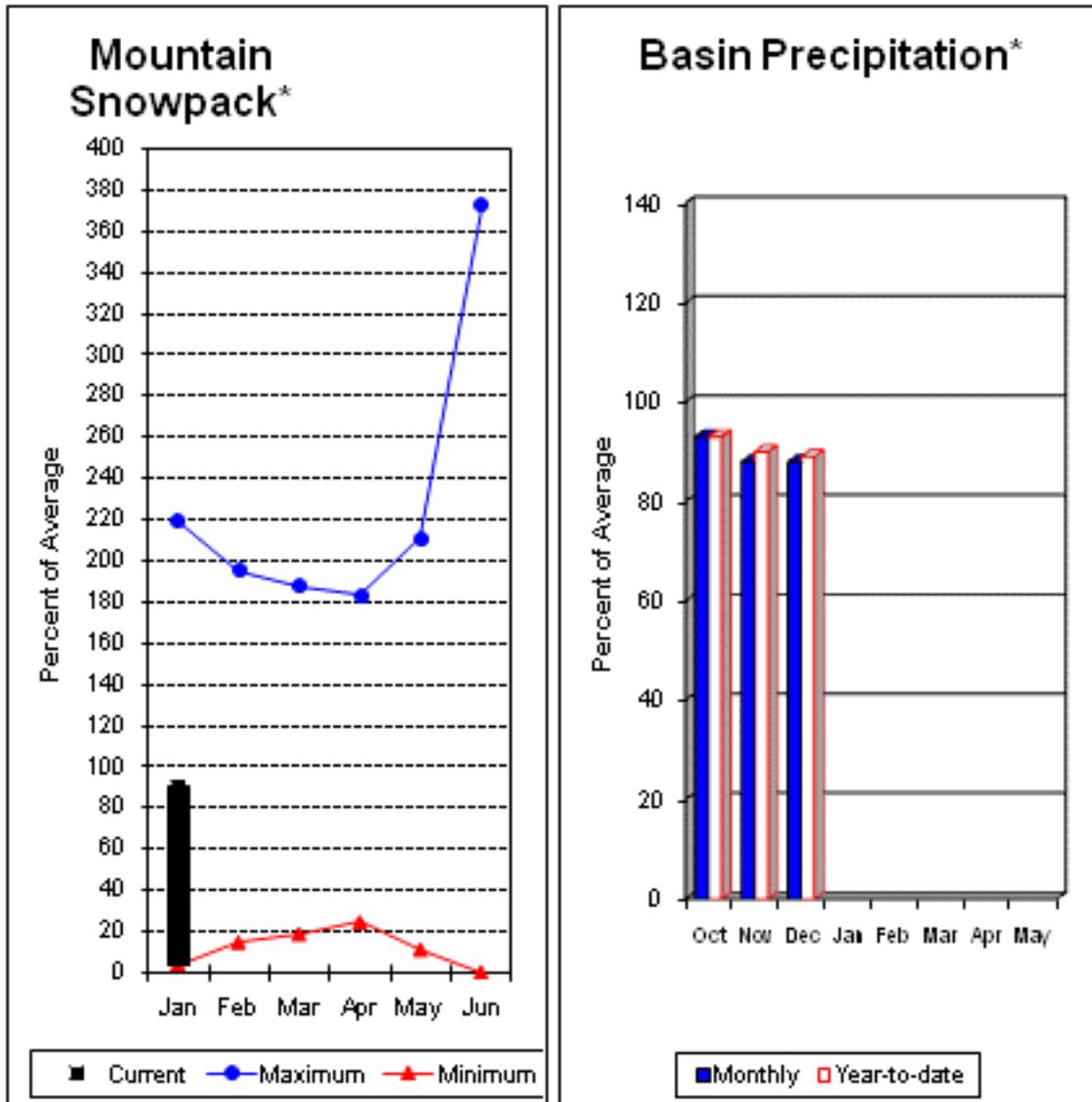
CENTRAL COLUMBIA RIVER BASINS Reservoir Storage (1000 AF) - End of December					CENTRAL COLUMBIA RIVER BASINS Watershed Snowpack Analysis - January 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
CHELAN LAKE	676.1	322.8	449.6	396.9	CHELAN LAKE BASIN	3	93	74
					ENTIAT RIVER	1	112	77
					WENATCHEE RIVER	7	109	82
					STEMILT CREEK	1	146	102
					COLOCKUM CREEK	1	135	125

* 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

January 1 reservoir storage for the Upper Yakima reservoirs was 455,000-acre feet, 114% of average. Forecasts for the Yakima River at Cle Elum are 92% of average and the Teanaway River near Cle Elum is at 88%. Lake inflows are all forecasted to be slightly below this summer. December streamflows within the basin were Yakima at Cle Elum at 81% and Cle Elum River near Roslyn at 99%. January 1 snowpack was 90% based upon 9 snow course and SNOTEL readings within the Upper Yakima Basin. Precipitation was 88% of average for December and 89% 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.

Upper Yakima River Basin

Streamflow Forecasts - January 1, 2011

Forecast Point	Forecast Period	Future Conditions <<==== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)		
		90% (1000AF)		70% (1000AF)		Chance Of Exceeding * 50% (1000AF) (% AVG.)			30% (1000AF) 10% (1000AF)	
Keechelus Reservoir Inflow (2)	APR-JUL	77	100	115	95	130	153	121		
	APR-SEP	87	110	126	95	142	165	133		
Kachess Reservoir Inflow (2)	APR-JUL	66	87	102	92	117	138	111		
	APR-SEP	75	96	110	92	124	145	120		
Cle Elum Lake Inflow (2)	APR-JUL	265	330	375	92	420	485	410		
	APR-SEP	300	370	415	92	460	530	450		
Yakima R at Cle Elum (2)	APR-JUL	520	660	755	92	850	990	820		
	APR-SEP	580	730	830	92	930	1080	900		
Teanaway R bl Forks nr Cle Elum	APR-JUL	69	103	126	88	149	183	143		
	APR-SEP	71	105	128	88	151	185	146		

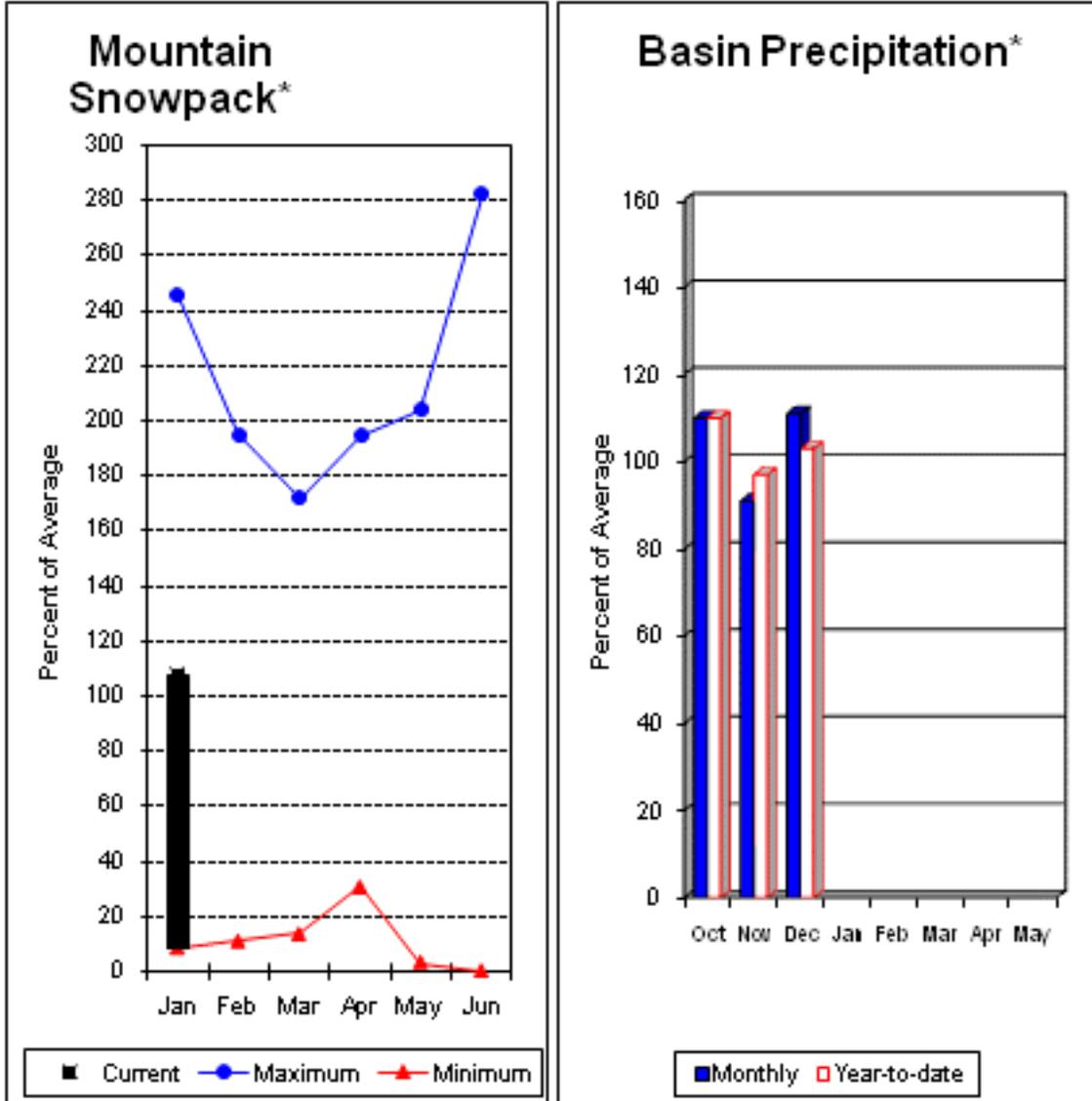
UPPER YAKIMA RIVER BASIN Reservoir Storage (1000 AF) - End of December					UPPER YAKIMA RIVER BASIN Watershed Snowpack Analysis - January 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
KEECHELUS	157.8	83.3	69.7	78.0	UPPER YAKIMA RIVER	9	132	90
KACHESS	239.0	150.9	129.8	125.5				
CLE ELUM	436.9	220.3	145.0	194.7				

* 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

December average streamflows within the basin were: Yakima River near Parker, 82%; Naches River near Naches, 87%; and Yakima River at Kiona, 71%. January 1 reservoir storage for Bumping and Rimrock reservoirs was 141,000-acre feet, 127% of average. Forecast averages for Yakima River near Parker are 92%; American River near Nile, 100%; Ahtanum Creek, 91%; and Klickitat River near Glenwood, 110%. January 1 snowpack was 108% based upon 7 snow course and SNOTEL readings within the Lower Yakima Basin and Ahtanum Creek reported in at 105% of average. Precipitation was 111% of average for December and 103% year-to-date for water. Temperatures were near normal for December and for the water year. Volume forecasts for Yakima Basin are for natural flow. As such, they January 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.

Lower Yakima River Basin

Streamflow Forecasts - January 1, 2011

Forecast Point	Forecast Period	Future Conditions					30-Yr Avg. (1000AF)	
		Drier		Wetter		Chance Of Exceeding * 50% (1000AF) (% AVG.)		
		90% (1000AF)	70% (1000AF)	30% (1000AF)	10% (1000AF)			
Bumping Lake Inflow (2)	APR-JUL APR-SEP	89 97	108 117	120 130	98 99	132 143	151 163	122 132
American R nr Nile	APR-JUL APR-SEP	81 88	97 106	108 118	100 100	119 130	135 148	108 118
Rimrock Lake Inflow (2)	APR-JUL APR-SEP	156 185	182 215	200 235	98 98	220 255	245 285	205 240
Naches R nr Naches (2)	APR-JUL APR-SEP	535 575	650 705	730 790	101 101	810 875	925 1000	720 780
Ahtanum Ck at Union Gap	APR-JUL APR-SEP	11.8 13.4	21 23	27 29	90 91	33 35	42 45	30 32
Yakima R nr Parker (2)	APR-JUL APR-SEP	1150 1270	1450 1600	1660 1820	92 92	1870 2040	2170 2370	1800 1980
Klickitat R nr Glenwood	APR-JUL APR-SEP	103 140	124 163	139 179	110 110	154 195	175 220	126 163
Klickitat R nr Pitt	APR-JUL APR-SEP	420 505	485 585	530 635	115 116	575 685	640 765	460 550

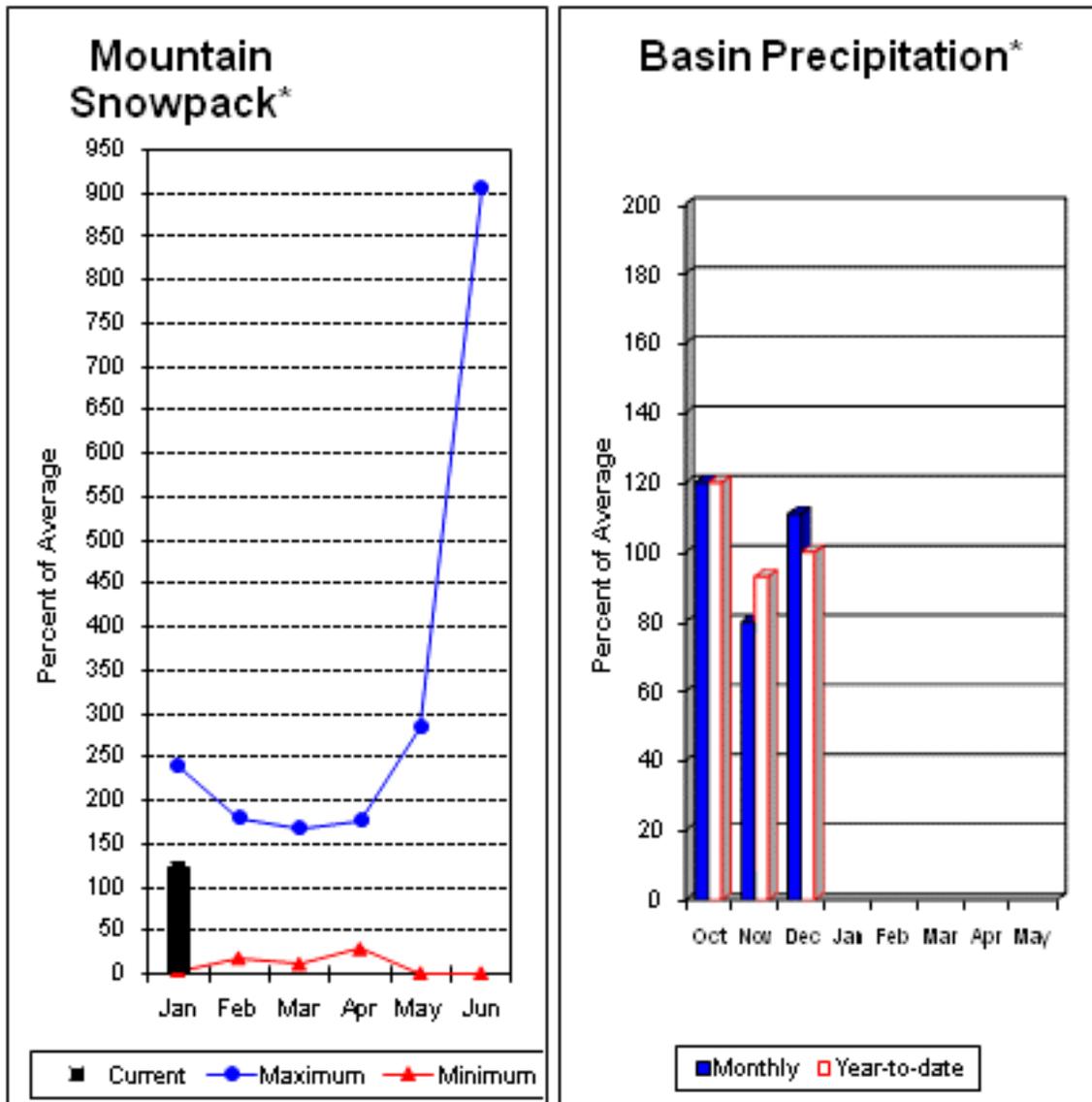
LOWER YAKIMA RIVER BASIN Reservoir Storage (1000 AF) - End of December					LOWER YAKIMA RIVER BASIN Watershed Snowpack Analysis - January 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
BUMPING LAKE	33.7	19.2	12.8	10.3	LOWER YAKIMA RIVER	7	126	108
RIMROCK	198.0	121.8	75.5	101.1	AHTANUM CREEK	2	128	105

* 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.

Walla Walla River Basin



*Based on selected stations

December precipitation was 111% of average, maintaining the year-to-date precipitation at 100% of average. Snowpack in the basin was 121% of average. Streamflow forecasts are 104% of average for Mill Creek and 118% for the SF Walla Walla near Milton-Freewater. December streamflow was 130% of average for the SF Walla Walla River. Average temperatures were slightly below normal for December and for the water year.

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

Walla Walla River Basin

Streamflow Forecasts - January 1, 2011

Forecast Point	Forecast Period	<<==== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)				
		90% (1000AF)		70% (1000AF)		Chance Of Exceeding * 50% (1000AF) (% AVG.)			30% (1000AF)		10% (1000AF)	
SF Walla Walla R nr Milton-Freewater	MAR-SEP	83	91	96	119	101	109	81				
	APR-JUL	54	60	64	119	68	74	54				
	APR-SEP	68	74	79	118	84	90	67				
Mill Ck nr Walla Walla	APR-JUL	18.2	22	25	104	28	32	24				
	APR-SEP	22	26	29	104	32	36	28				

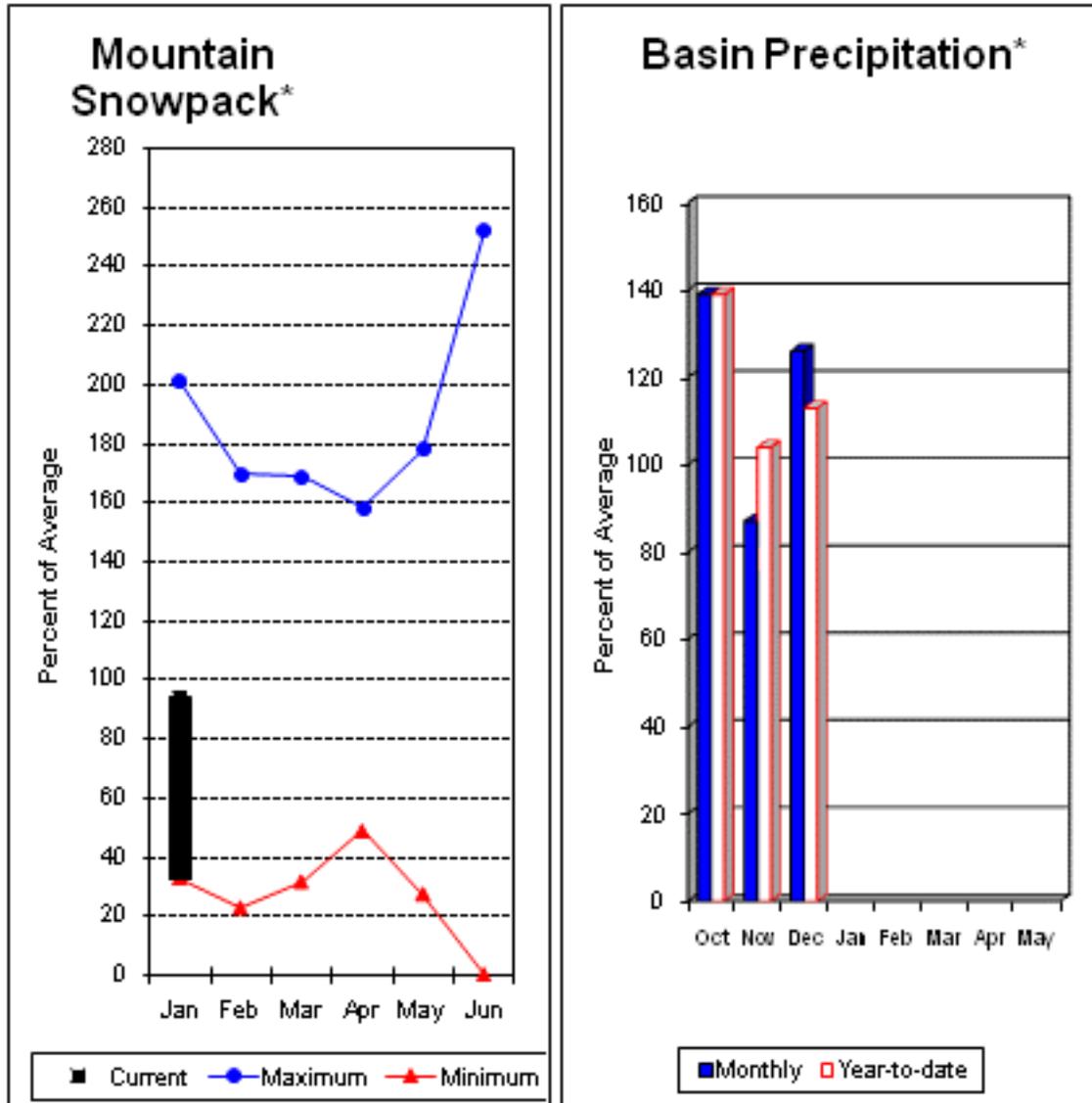
WALLA WALLA RIVER BASIN					WALLA WALLA RIVER BASIN			
Reservoir Storage (1000 AF) - End of December					Watershed Snowpack Analysis - January 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					WALLA WALLA RIVER	2	135	121

* 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 Snake River Basin



*Based on selected stations

The April - September forecast is for 103% for Clearwater River at Spalding. The Snake and Grande Ronde rivers can expect summer flows to be about 110% and 105% of normal respectively. A newly developed forecast point for Asotin Creek at Asotin predicts 103% of average flows for the April – July runoff period. December precipitation was 126% of average, bringing the year-to-date precipitation to 113% of average. January 1 snowpack readings averaged 94% of average. December streamflow was 83% of average for Snake River below Lower Granite Dam and 82% for Grande Ronde River near Troy. Dworshak Reservoir on the Clearwater River is at 94% of average. Average temperatures were near normal for December and for the water year.

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

Lower Snake River Basin

Streamflow Forecasts - January 1, 2011

Forecast Point	Forecast Period	<<----- Drier ----- Future Conditions ----- Wetter ----->>						30-Yr Avg. (1000AF)		
		90% (1000AF)		70% (1000AF)		Chance Of Exceeding * 50% (1000AF) (% AVG.)			30% (1000AF)	10% (1000AF)
Grande Ronde R at Troy (1)	MAR-JUL	1120	1490	1660	105	1830	2200	1580		
	APR-SEP	925	1280	1440	105	1600	1950	1370		
Asotin Ck at Asotin	APR-JUL	17.7	29	36	103	43	54	35		
Clearwater R at Spalding (1,2)	APR-JUL	5210	6900	7660	103	8420	10100	7430		
	APR-SEP	5500	7270	8080	103	8890	10700	7850		
Snake R bl Lower Granite Dam (1,2)	APR-JUL	12800	20300	23700	110	27100	34600	21600		
	APR-SEP	14300	22700	26500	110	30300	38700	24100		

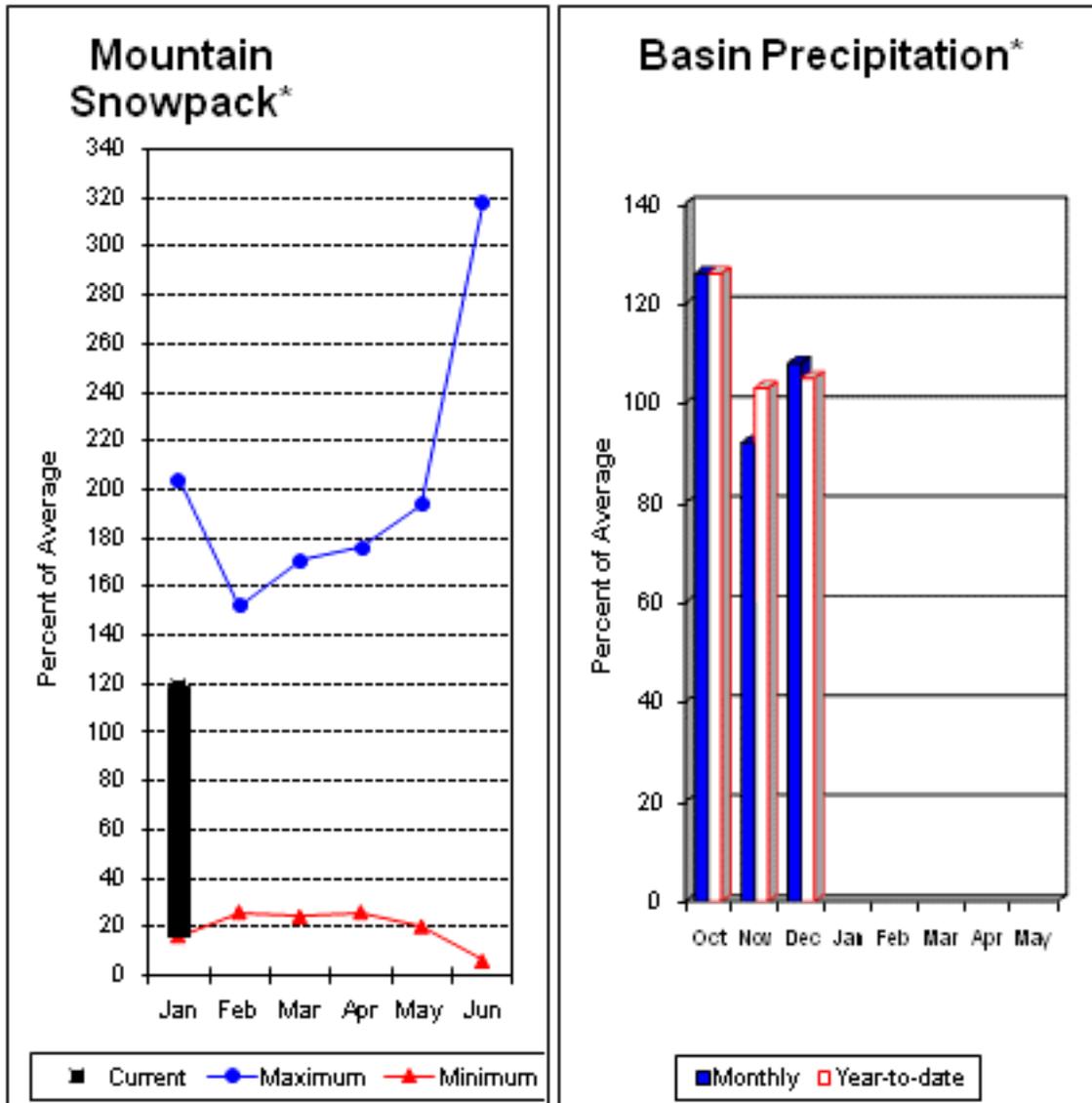
LOWER SNAKE RIVER BASIN Reservoir Storage (1000 AF) - End of December					LOWER SNAKE RIVER BASIN Watershed Snowpack Analysis - January 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
DWORSHAK	3468.0	2333.8	2149.0	2481.4	LOWER SNAKE, GRANDE RONDE	11	131	94

* 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 Columbia River Basins



*Based on selected stations

Forecasts for April – September streamflows within the basin are Lewis River at Ariel, 104% and Cowlitz River at Castle Rock, 101% of average. The Columbia at The Dalles is forecasted to have 97% of average flows this summer. December average streamflow for Cowlitz River was 102%. The Columbia River at The Dalles was 98% of average. December precipitation was 108% of average and the water-year average was 105%. January 1 snow cover for Cowlitz River was 108%, and Lewis River was 130% of average. Average temperatures were 1-3 degrees above normal during December and for the water year.

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

Lower Columbia River Basins

Streamflow Forecasts - January 1, 2011

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)				
		90% (1000AF)		70% (1000AF)		Chance Of Exceeding * 50% (1000AF) (% AVG.)			30% (1000AF)		10% (1000AF)	
Columbia R at The Dalles (2)	APR-JUL	62400	74100	82000	97	89900	102000	84600				
	APR-SEP	73100	86700	96000	97	105000	119000	98600				
Klickitat R nr Glenwood	APR-JUL	103	124	139	110	154	175	126				
	APR-SEP	140	163	179	110	195	220	163				
Klickitat R nr Pitt	APR-JUL	420	485	530	115	575	640	460				
	APR-SEP	505	585	635	116	685	765	550				
Lewis R at Ariel (2)	APR-JUL	775	950	1070	104	1190	1360	1031				
	APR-SEP	910	1100	1220	104	1340	1530	1176				
Cowlitz R bl Mayfield Dam (2)	APR-JUL	1220	1520	1730	102	1940	2240	1689				
	APR-SEP	1320	1700	1960	102	2220	2600	1922				
Cowlitz R at Castle Rock (2)	APR-JUL	1810	2110	2320	101	2530	2830	2295				
	APR-SEP	2090	2440	2670	101	2900	3250	2639				

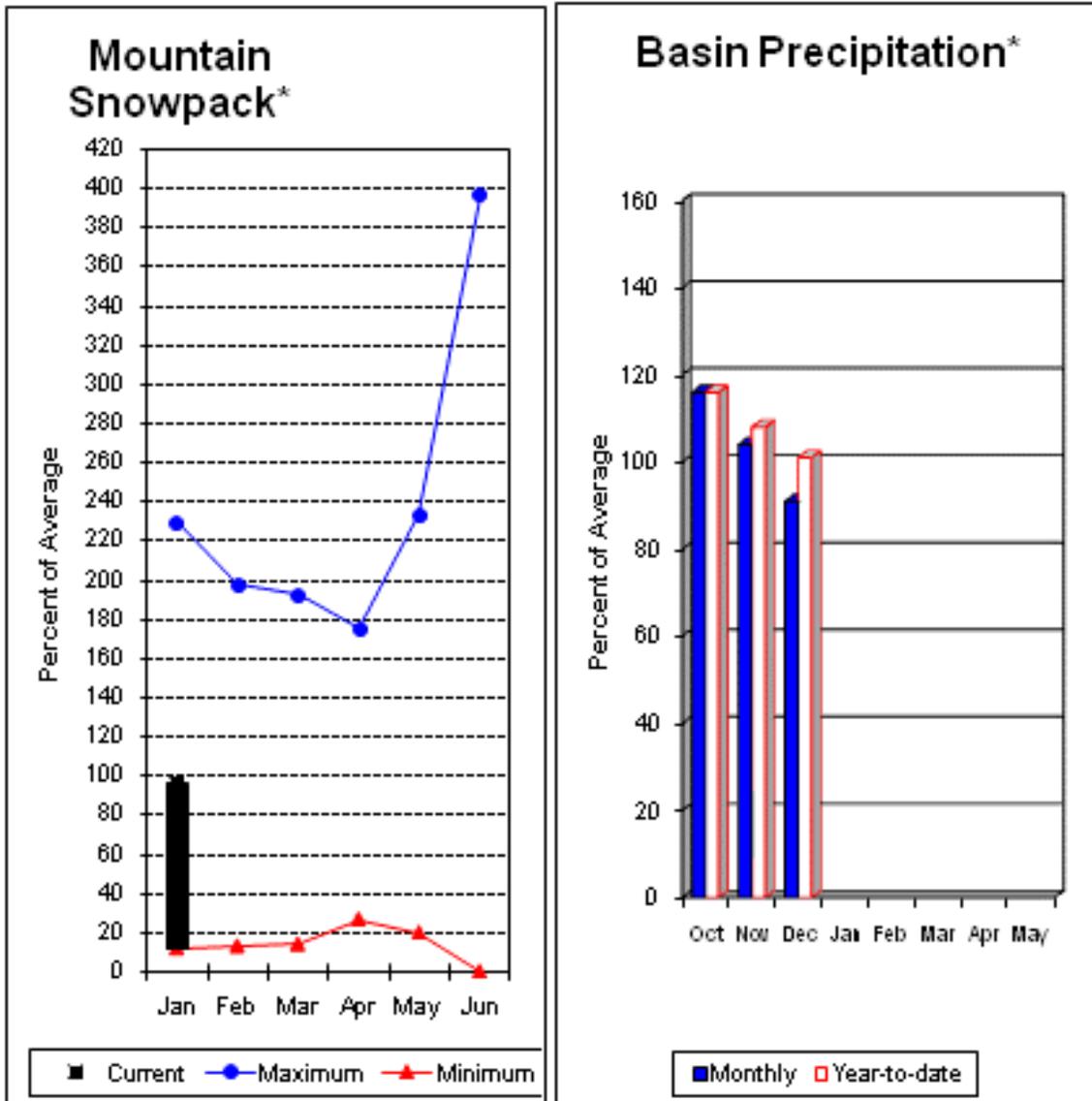
LOWER COLUMBIA RIVER BASINS Reservoir Storage (1000 AF) - End of December					LOWER COLUMBIA RIVER BASINS Watershed Snowpack Analysis - January 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
MOSSYROCK	0.0	1263.9	1192.3	---	LEWIS RIVER	5	140	130
SWIFT	0.0	702.4	718.1	---	COWLITZ RIVER	6	130	108
YALE	0.0	360.8	365.7	---				
MERWIN	0.0	414.5	402.3	---				

* 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.

South Puget Sound River Basins



*Based on selected stations

Summer runoff is forecast to be 101% of normal for the Green River below Howard Hanson Dam and 102% for the White River near Buckley. January 1 snowpack was 104% of average for the White River, 105 % for Puyallup River and 80% in the Green River Basin. Water content on January 1 at Corral Pass SNOTEL, at an elevation of 6,000 feet, was 14.8 inches. This site has a January 1 average of 15.8 inches. December precipitation was 91% of average, bringing the water year-to-date to 101% of average for the basins. Average temperatures in the area were 1-3 degrees above normal for December and for the water-year.

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

South Puget Sound River Basins

Streamflow Forecasts - January 1, 2011

Forecast Point	Forecast Period	Future Conditions				30-Yr Avg. (1000AF)
		Drier		Wetter		
		Chance Of Exceeding *				
		90%	70%	50%	30%	10%
		(1000AF)	(1000AF)	(1000AF)	(1000AF)	(1000AF)
		(% AVG.)				
White R nr Buckley (1)	APR-JUL	340	420	455	103	440
	APR-SEP	415	505	545	102	534
Green R bl Howard Hanson Dam (1,2)	APR-JUL	158	220	245	100	245
	APR-SEP	183	245	270	101	268

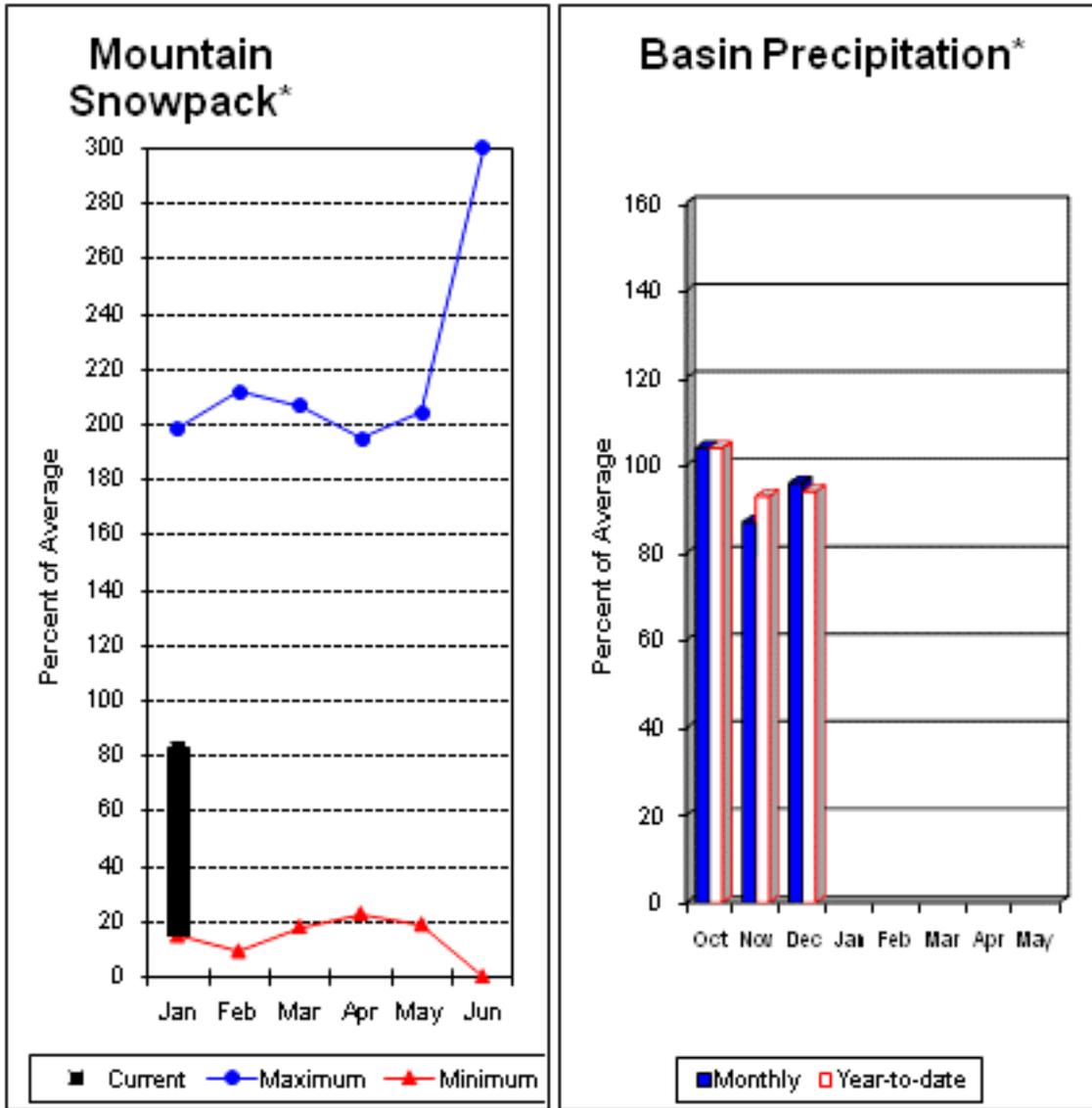
SOUTH PUGET SOUND RIVER BASINS Reservoir Storage (1000 AF) - End of December				SOUTH PUGET SOUND RIVER BASINS Watershed Snowpack Analysis - January 1, 2011				
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					WHITE RIVER	3	121	104
					GREEN RIVER	2	117	80
					PUYALLUP RIVER	5	116	105

* 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 Puget Sound River Basins



*Based on selected stations

Forecast for spring and summer flows are: 101% for Cedar River near Cedar Falls; 100% for Rex River; 95% for South Fork of the Tolt River; 96% for Taylor Creek near Selleck, and 99% for Cedar River at Cedar Falls. Basin-wide precipitation for December was 96% of average, bringing water-year-to-date to 94% of average. January 1 average snow cover in Cedar River Basin was 115%, Tolt River Basin was 71%, Snoqualmie River Basin was 77%, and Skykomish River Basin was 68%. Olallie Meadows SNOTEL site, at 3960 feet, had 19.4 inches of water content. Average January 1 water content is 22.2 inches at Olallie Meadows. Temperatures were 1-3 degrees above normal for December and 1 degree above for the water-year.

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

Central Puget Sound River Basins

Streamflow Forecasts - January 1, 2011

Forecast Point	Forecast Period	Future Conditions <<==== Drier ===== Wetter =====>>						30-Yr Avg. (1000AF)
		90% (1000AF)		70% (1000AF)		Chance Of Exceeding * 50% (1000AF) (% AVG.)		
		30% (1000AF)		10% (1000AF)				
Cedar R nr Cedar Falls	APR-JUL	52	65	74	101	83	96	73
	APR-SEP	59	72	81	101	90	103	80
Rex R nr Cedar Falls	APR-JUL	13.4	20	25	100	30	37	25
	APR-SEP	16.1	23	28	100	33	40	28
Cedar R at Cedar Falls (2)	APR-JUL	44	61	73	99	85	102	74
	APR-SEP	39	59	72	99	85	105	73
Taylor Ck nr Selleck	APR-JUL	13.7	16.8	19.0	95	21	24	20
	APR-SEP	17.4	21	23	96	25	29	24
SF Tolt R nr Index	APR-JUL	9.4	12.1	14.0	95	15.9	18.6	14.7
	APR-SEP	11.2	14.1	16.0	95	17.9	21	16.9

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

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

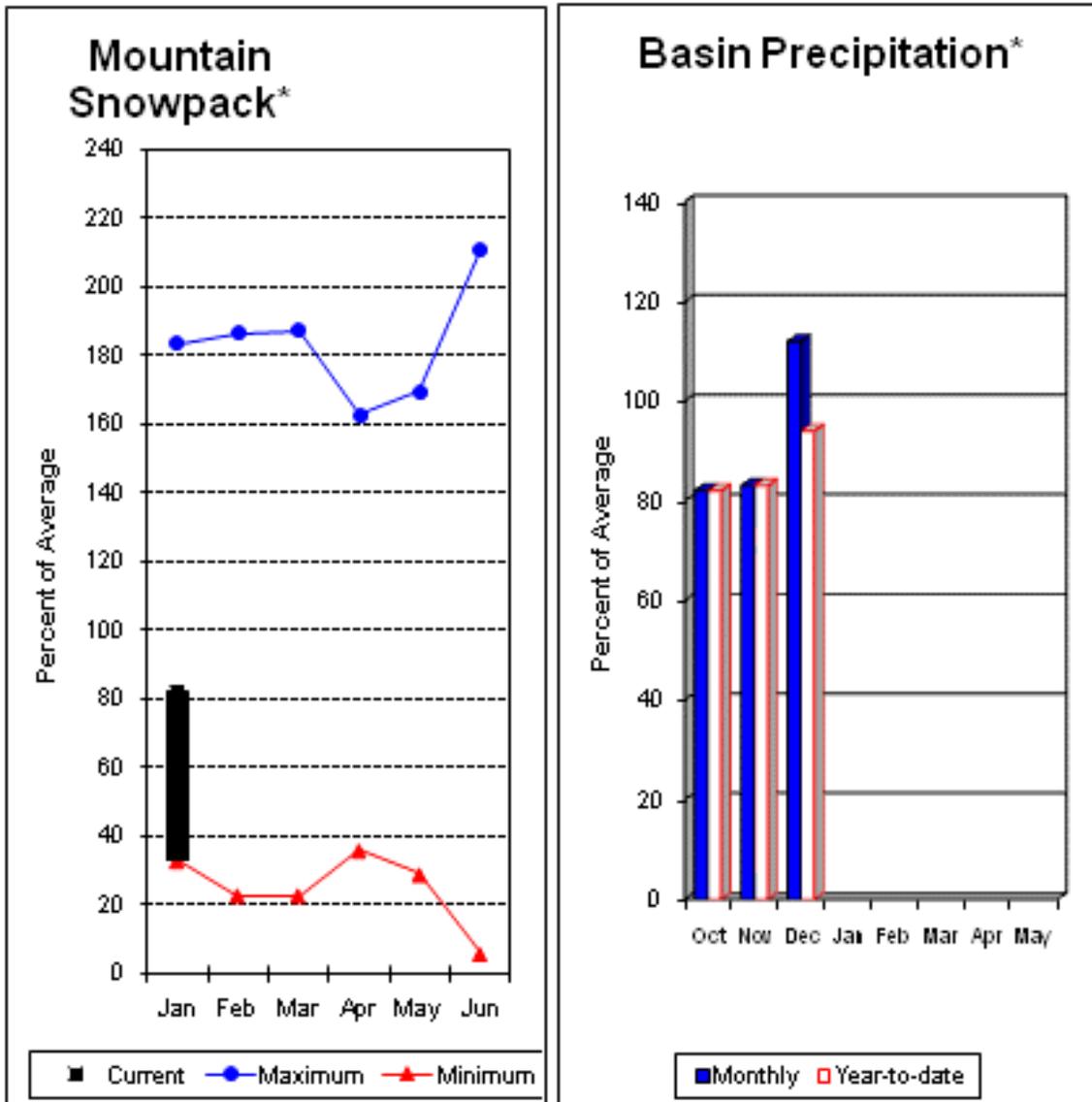
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					CEDAR RIVER	4	150	115
					TOLT RIVER	2	107	71
					SNOQUALMIE RIVER	4	111	77
					SKYKOMISH RIVER	2	88	68

* 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.

North Puget Sound River Basins



*Based on selected stations

Forecast for Skagit River streamflow at Newhalem is 96% of average for the spring and summer period. December streamflow in Skagit River was 108% of average. Other forecast points included Baker River at 96% and Thunder Creek at 99% of average. Basin-wide precipitation for December was 112% of average, bringing water-year-to-date to 94% of average. January 1 average snow cover in Skagit River Basin was 87%, Nooksack River Basin was 89% and Baker River Basin was 69% of average. Rainy Pass SNOTEL, at 4,780 feet, had 14.3 inches of water content. Average January 1 water content is 19.9 inches at Rainy Pass. January 1 Skagit River reservoir storage was 100% of average and 82% of capacity. Average temperatures for December were 1-2 degrees above normal for the basin and near average for the water year.

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

North Puget Sound River Basins

Streamflow Forecasts - January 1, 2011

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>				30-Yr Avg. (1000AF)		
		Chance Of Exceeding *						
		90% (1000AF)	70% (1000AF)	50% (1000AF) (% AVG.)	30% (1000AF)	10% (1000AF)		
Thunder Ck nr Newhalem	APR-JUL	200	220	235	100	250	270	234
	APR-SEP	290	315	330	99	345	370	333
Skagit R at Newhalem (2)	APR-JUL	1430	1640	1790	96	1940	2150	1864
	APR-SEP	1740	1970	2130	96	2290	2520	2217
Baker R nr Concrete (2)	APR-JUL	620	725	795	96	865	970	828
	APR-SEP	775	915	1010	96	1100	1240	1050

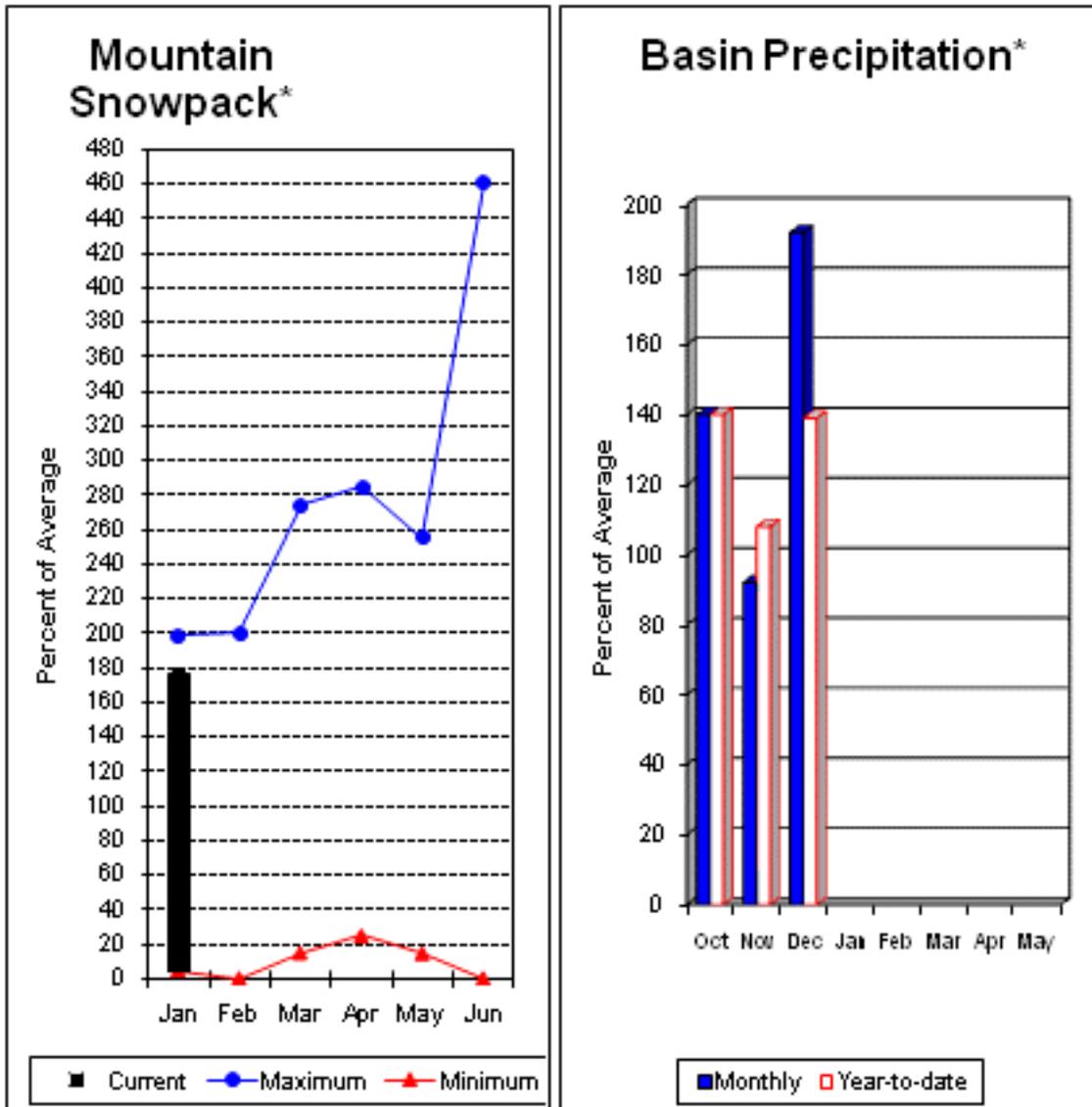
NORTH PUGET SOUND RIVER BASINS Reservoir Storage (1000 AF) - End of December					NORTH PUGET SOUND RIVER BASINS Watershed Snowpack Analysis - January 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
ROSS	1404.1	1138.8	1155.2	1142.1	SKAGIT RIVER	5	113	86
DIABLO RESERVOIR	90.6	85.7	85.3	85.3	BAKER RIVER	9	97	69
					NOOKSACK RIVER	3	98	89

* 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.

Olympic Peninsula River Basins



*Based on selected stations

Forecasted average runoff for streamflow for the Dungeness River is 93% and Elwha River is 90%. December runoff in the Dungeness River was 87% of normal. Big Quilcene and Wynoochee rivers should expect near average runoff this summer also. December precipitation was 56% of average. Precipitation has accumulated at 143% of average for the water year. December precipitation at Quillayute was 6.91 inches. The thirty-year average for December is 14.5 inches. Olympic Peninsula snowpack averaged 123% of normal on January 1. Temperatures were near average for December and for the water year.

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

Olympic Peninsula River Basins

Streamflow Forecasts - January 1, 2011

Forecast Point	Forecast Period	Future Conditions					30-Yr Avg. (1000AF)	
		Drier		Wetter		Chance Of Exceeding *		
		90% (1000AF)	70% (1000AF)	50% (1000AF)	10% (1000AF)	10% (1000AF)		
Dungeness R nr Sequim	APR-JUL	88	124	149	120	174	210	124
	APR-SEP	95	147	182	120	215	270	152
Elwha R at McDonald Bridge	APR-JUL	330	395	440	105	485	550	419
	APR-SEP	410	480	530	105	580	650	503

OLYMPIC PENINSULA RIVER BASINS Reservoir Storage (1000 AF) - End of December					OLYMPIC PENINSULA RIVER BASINS Watershed Snowpack Analysis - January 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					OLYMPIC PENINSULA	3	143	176

* 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.

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.



Washington Snow Survey Office
2021 E. College Way, Suite 214
Mount Vernon, WA 98273-2873



Washington Water Supply Outlook Report

Natural Resources Conservation Service
Spokane, WA

