

The **FEBRUARY** Final WSF sets BiOp actions as defined in table below where highlighted.
Other projects provided for informational purposes only.

Forecast Point	Forecast period	Forecast	BiOp Actions to be Determined
Hungry Horse	April – August Provided by Reclamation	January, February, March Final	Sets min. flows at Hungry Horse and Columbia Falls
	May – September Provided by Reclamation	January, February, March Final	Sets VARQ FRM targets
		April Final	Sets VARQ FRM targets and VARQ refill flows
		May, June Final	Sets VARQ refill flows
The Dalles	April – September Provided by NWRFC	March Final	Sets CRWMP adjustments at Grand Coulee
	April – August Provided by NWRFC	April Final	Sets spring flow objective at McNary Dam
		May Final	Sets end of September draft limits at Hungry Horse and Libby
		July Final	Sets end of August draft limit at Grand Coulee
Lower Granite	April – July Provided by NWRFC	April Final	Sets spring flow objective at Lower Granite
		June Final	Sets summer flow objective at Lower Granite
Libby	April – August Provided by Corps Seattle District	December Final	Sets end of December variable draft target
		January, February, March Final	Sets VARQ FRM targets
		April Final	Sets VARQ FRM targets and VARQ refill flows
		May Final	Sets Libby min. sturgeon flow volume and min. bull trout flows for after sturgeon pulse through Sept. Sets VARQ FRM targets and VARQ refill flows
		June Final	VARQ refill flows
Dworshak	April – July Provided by Corps Walla Walla District	January to June Final	Manage for reservoir FRM and refill

February 4, 2016

Hungry Horse Dam – Official Water Supply Forecast

Here are the forecast volumes from the February final forecast for Hungry Horse inflow:

Feb-Jul: 1837 kaf (90%)

Jan-Jul: 1885 kaf (90%)

Apr-Aug: 1742 kaf (90%)

May-Sep: 1524 kaf (90%)

The minimum flows downstream of Hungry Horse are as follows until the March final forecast:

Columbia Falls: 3480 cfs

Hungry Horse: 860 cfs

Mary Mellema

River and Reservoir Operations

U.S. Bureau of Reclamation

PN Regional Office

Boise, ID 83706

See previous page for Official HGH WSF computed by Bureau of Reclamation.
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SF FLATHEAD - HUNGRY HORSE DAM (HHWM8) Forecasts for Water Year 2016					
Official Forecast - 10 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	1443	1702	86	2028	1988
APR-JUL	1337	1590	85	1902	1871
APR-AUG	1394	1640	85	1982	1936
JAN-SEP	1631	1897	86	2230	2215
JAN-JUL	1535	1775	85	2116	2098
OCT-SEP	1776	2041	83	2375	2447
- 5 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
APR-SEP	1461	1737	87	2126	1988
APR-JUL	1335	1625	87	2009	1871
APR-AUG	1400	1683	87	2070	1936
JAN-SEP	1666	1915	86	2369	2215
JAN-JUL	1561	1806	86	2239	2098
OCT-SEP	1811	2059	84	2514	2447
- 0 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
APR-SEP	1482	1745	88	2157	1988
APR-JUL	1331	1637	88	2039	1871
APR-AUG	1390	1702	88	2101	1936
JAN-SEP	1677	1940	88	2389	2215
JAN-JUL	1563	1808	86	2263	2098
OCT-SEP	1822	2085	85	2533	2447
Move the mouse over the desired "Forecast Period" to display a graph.					

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http://www.nwrfc.noaa.gov/chpsesp/ensemble/watersupply/HHWM8W_SQIN.ESPF10.csv

- [HHWM8W_SQIN.ESPF0.csv](#) | 2016-02-05
- [HHWM8W_SQIN.ESPF10.csv](#) | 2016-02-05
- [HHWM8W_SQIN.ESPF5.csv](#) | 2016-02-05

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The Dalles Dam FEBRUARY WSF is not used for implementation of BiOp actions.
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COLUMBIA - THE DALLES DAM (TDAO3) Forecasts for Water Year 2016					
Official Forecast - 10 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	78460	88210	95	99076	92704
APR-JUL	66637	75487	95	85437	79855
APR-AUG	73577	82748	95	93989	87532
JAN-SEP	96604	108245	95	120950	114216
JAN-JUL	84439	94890	94	108182	101368
OCT-SEP	112119	123760	95	136464	130518
- 5 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
APR-SEP	79592	88858	96	102718	92704
APR-JUL	67193	76056	95	88093	79855
APR-AUG	74529	83221	95	96625	87532
JAN-SEP	97330	108371	95	125116	114216
JAN-JUL	85035	95160	94	111618	101368
OCT-SEP	112844	123885	95	140630	130518
- 0 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
APR-SEP	80998	91119	98	102943	92704
APR-JUL	69097	77306	97	89398	79855
APR-AUG	75832	85864	98	96191	87532
JAN-SEP	99667	109852	96	126676	114216
JAN-JUL	88086	96074	95	111635	101368
OCT-SEP	115181	125366	96	142190	130518
Move the mouse over the desired "Forecast Period" to display a graph.					

 Link to image of plot

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Forecast Ensemble

http://www.nwrfc.noaa.gov/chpsesp/ensemble/watersupply/TDAO3W_SQIN.ESPF10.csv

- TDAO3W_SQIN.ESPF0.csv | 2016-02-05
- TDAO3W_SQIN.ESPF10.csv | 2016-02-05
- TDAO3W_SQIN.ESPF5.csv | 2016-02-05

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Lower Granite Dam FEBRUARY WSF is not used for implementation of BiOp actions.
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SNAKE - LOWER GRANITE DAM (LGDW1) Forecasts for Water Year 2016					
Official Forecast - 10 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	16985	21423	96	24331	22279
APR-JUL	14802	18792	95	21554	19848
APR-AUG	15943	20195	96	23036	21091
JAN-SEP	23495	27583	92	31532	29872
JAN-JUL	21230	25074	91	28775	27440
OCT-SEP	27343	31430	91	35380	34667
- 5 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
APR-SEP	17502	21908	98	25184	22279
APR-JUL	15270	19257	97	22473	19848
APR-AUG	16430	20668	98	23849	21091
JAN-SEP	23327	28405	95	32694	29872
JAN-JUL	21134	25579	93	29856	27440
OCT-SEP	27175	32252	93	36542	34667
- 0 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
APR-SEP	17820	22287	100	25789	22279
APR-JUL	15615	19745	99	23100	19848
APR-AUG	16767	21051	100	24525	21091
JAN-SEP	23880	28218	94	32971	29872
JAN-JUL	21421	25679	94	30357	27440
OCT-SEP	27728	32066	92	36818	34667
Move the mouse over the desired "Forecast Period" to display a graph.					

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http://www.nwrfc.noaa.gov/chpsesp/ensemble/watersupply/LGDW1W_SQIN.ESPF10.csv

- LGDW1W_SQIN.ESPF0.csv | 2016-02-05
- LGDW1W_SQIN.ESPF10.csv | 2016-02-05
- LGDW1W_SQIN.ESPF5.csv | 2016-02-05

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Libby : February Runoff Forecast & Flood Risk Management Calculation

WY 2016

Runoff Forecast and Flood Risk Management

Most Probable Runoff Volume:	Apr-Aug	6318	KAF
	Apr-Jul	5735	KAF
	May-Jul	5175	KAF
29 Feb Flood Risk Management Space		2145	KAF
29 Feb Flood Risk Management Elevation		2407.0	ft

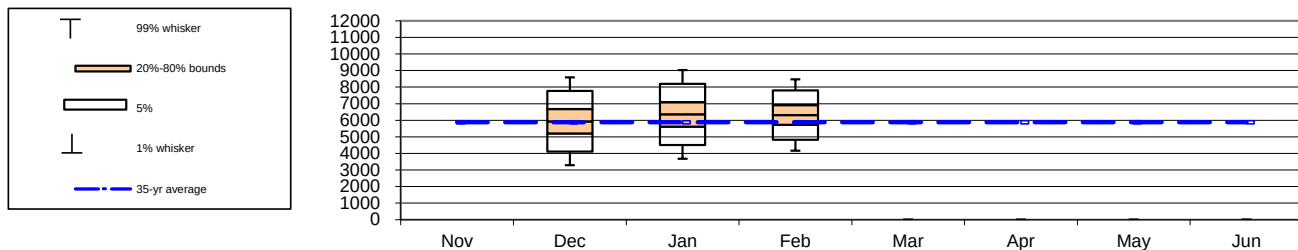
1981-2010 Average	Percent of Average	1929-2008 Average	Percent of Average
5885	107%	6282	101%
5342	107%	5720	101%
4821	107%	5199	101%

Seasonal Flood Risk Management

VARQ Flood Risk Management Implemented

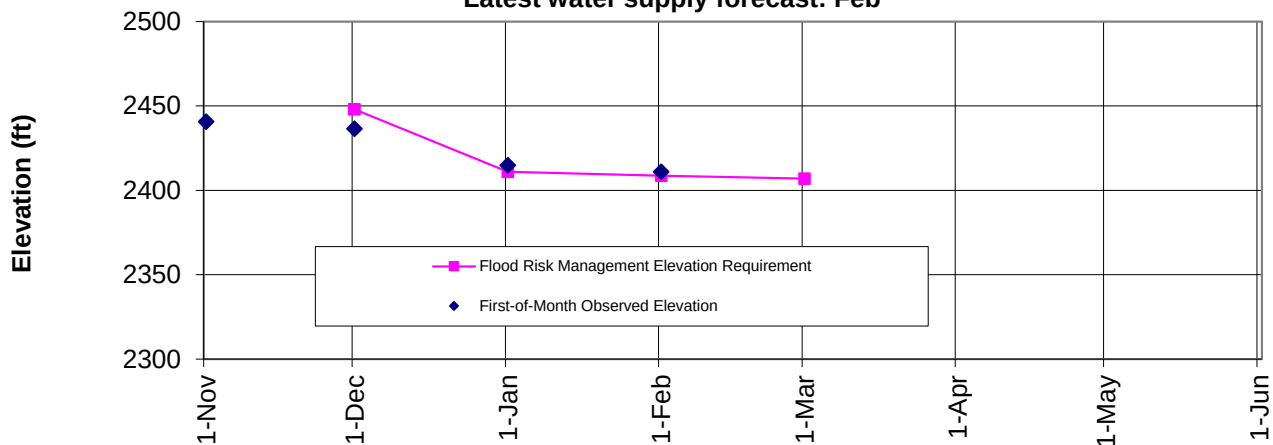
Forecast Date >>	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Apr-Aug Runoff Forecast		5940	6354	6318				
First-of-Month Elev	2440.7	2436.5	2415.0	2411.0				
Date >>	30-Nov	31-Dec	31-Jan	29-Feb	15-Mar	31-Mar	15-Apr	30-Apr
Flood Risk Management Space	500	2000	2083	2145				
Flood Risk Management Elevation	2448.0	2411.0	2408.7	2407.0				

Spread of values around expected forecast



Libby Flood Risk Management Elevations - 2016

Latest water supply forecast: Feb



Notes:

1. The given forecast is the official Corps of Engineers forecast for Libby. If you have any questions please contact Joel Fenolio (206) 764-6683, Kristy Riley (206) 316-3947, Kevin Shaffer (206) 764-3660, Adam Price (206) 764-3604, or Kristian Mickelson (206) 764-6927.
2. If a prior month's forecast as published in this document is different than what was originally published in the issue month, then the earlier forecast has been adjusted to reflect updated values for precipitation or streamflow.

See previous page for Official Libby WSF computed by Corps Seattle District.
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Close	Data/Normals	Rankings	ENSO / Runoff	Adjustments	Verification	Verify All Years	Archive	Monthly Water Supply Forecasts
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KOOTENAI - LIBBY DAM (LYDM8) Forecasts for Water Year 2016					
Official Forecast - 10 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	4489	5603	90	6652	6254
APR-JUL	3833	4751	89	5682	5342
APR-AUG	4217	5294	90	6281	5885
JAN-SEP	5068	6188	90	7271	6914
JAN-JUL	4390	5375	90	6370	6002
OCT-SEP	5886	7006	90	8089	7806
- 5 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
APR-SEP	4692	5652	90	6805	6254
APR-JUL	3916	4898	92	5857	5342
APR-AUG	4321	5380	91	6381	5885
JAN-SEP	5237	6270	91	7460	6914
JAN-JUL	4450	5460	91	6519	6002
OCT-SEP	6055	7088	91	8278	7806
- 0 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
APR-SEP	4880	5728	92	6872	6254
APR-JUL	4082	4945	93	5869	5342
APR-AUG	4488	5457	93	6462	5885
JAN-SEP	5404	6374	92	7540	6914
JAN-JUL	4617	5499	92	6527	6002
OCT-SEP	6222	7192	92	8358	7806
Move the mouse over the desired "Forecast Period" to display a graph.					

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Forecast Ensemble

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- LYDM8W_SQIN.ESPF0.csv | 2016-02-05
- LYDM8W_SQIN.ESPF10.csv | 2016-02-05
- LYDM8W_SQIN.ESPF5.csv | 2016-02-05

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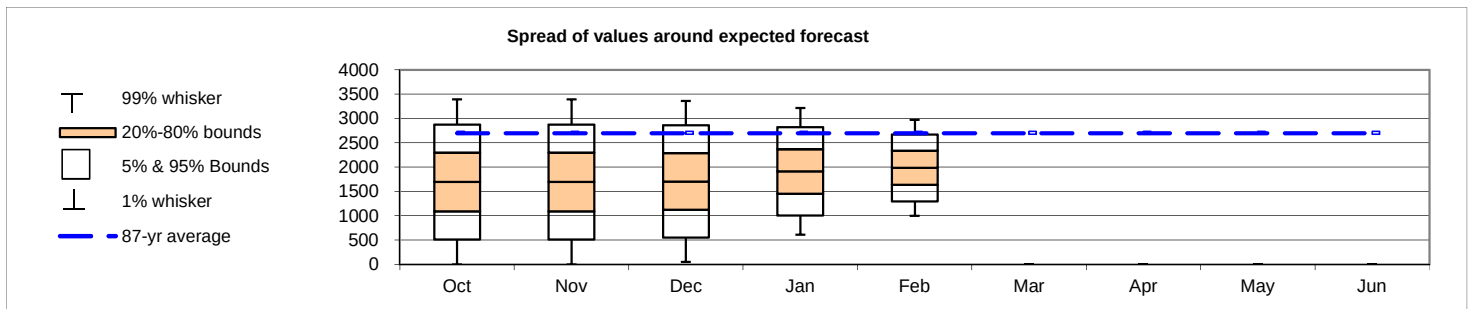
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Dworshak : February Runoff Forecast & Flood Risk Management Calculation

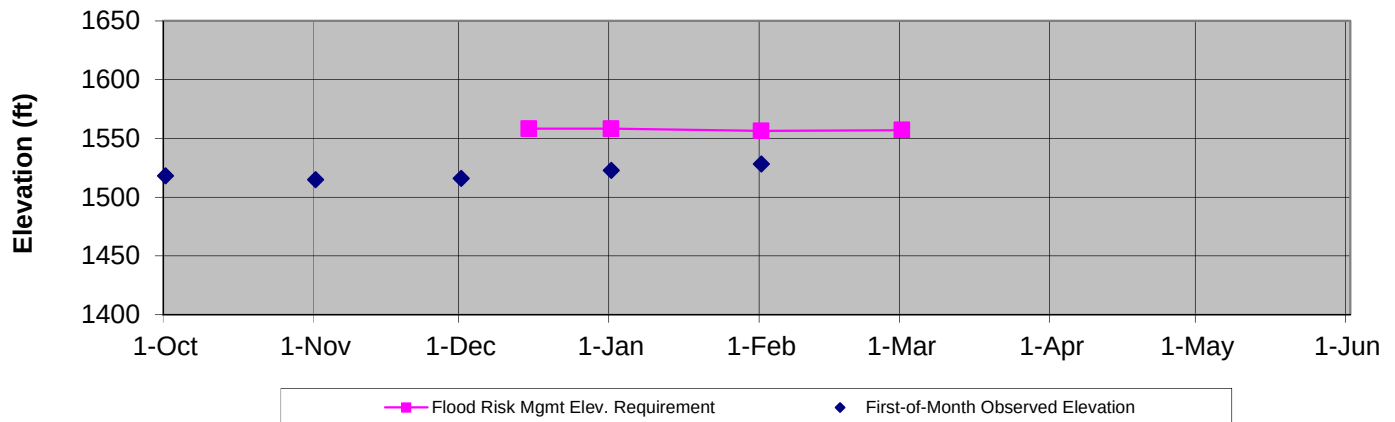
WY 2016

Runoff Forecast and Flood Risk Management (FRM)				1981-2010 Average	Percent of 30yr Average	1929-2008 Average	Percent of Average		
Most Probable Runoff Volume	Apr-Jul	1986	KAF	2418	82%	2696	74%		
	May-Jul	1452	KAF	1771	82%	1972	74%		
28/29-Feb Flood Risk Management Space		718	KAF						
28/29-Feb Flood Risk Management Elevation		1557.0	ft						
Seasonal Flood Risk Management (assumes no shift of flood risk management space to Grand Coulee)									
Forecast Date>>	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Apr-Jul Runoff Forecast	1676	1676	1708	1913	1986				
First-of-Month Elev	1518.2	1515.0	1516.1	1522.7	1528.2				
Date >>	15-Dec		31-Dec	31-Jan	28-Feb	31-Mar	15-Apr	30-Apr	
FRM Space	--	700	700	727	718				
FRM Elevation	--	1558.2	1558.2	1556.4	1557.0				



Dworshak Flood Risk Management Elevations - 2016

Latest water supply forecast: Feb



See previous page for Official DWR WSF computed by Corps Walla Walla.
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NF CLEARWATER - DWORSHAK DAM (DWRI1) Forecasts for Water Year 2016					
Official Forecast - 10 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	2069	2441	95	3108	2575
APR-JUL	1945	2318	96	2949	2419
JAN-SEP	2957	3383	98	4033	3445
JAN-JUL	2841	3247	99	3881	3289
OCT-SEP	3312	3738	96	4388	3891
- 5 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
APR-SEP	2126	2524	98	3184	2575
APR-JUL	1987	2386	99	3019	2419
JAN-SEP	2994	3372	98	4139	3445
JAN-JUL	2880	3229	98	3981	3289
OCT-SEP	3349	3727	96	4495	3891
- 0 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
APR-SEP	2157	2592	101	3318	2575
APR-JUL	2004	2441	101	3149	2419
JAN-SEP	2989	3469	101	4149	3445
JAN-JUL	2870	3321	101	4002	3289
OCT-SEP	3344	3824	98	4504	3891
Move the mouse over the desired "Forecast Period" to display a graph.					

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Overlay

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http://www.nwrfc.noaa.gov/chpsesp/ensemble/watersupply/DWRI1W_SQIN.ESPF10.csv

- DWRI1W_SQIN.ESPF0.csv|2016-02-05
- DWRI1W_SQIN.ESPF10.csv|2016-02-05
- DWRI1W_SQIN.ESPF5.csv|2016-02-05

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Grand Coulee Dam forecasts are not used for implementation of BiOp actions.
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COLUMBIA - GRAND COULEE DAM (GCDW1)					
Forecasts for Water Year 2016					
Official Forecast					
- 10 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	50925	57038	95	64458	60110
APR-JUL	42071	48271	95	54329	51015
APR-AUG	47684	53204	94	60695	56763
JAN-SEP	59244	65845	96	74552	68694
JAN-JUL	50503	56286	94	64143	59599
OCT-SEP	67539	74140	97	82847	76824
- 5 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
APR-SEP	52004	57588	96	66998	60110
APR-JUL	43156	48833	96	56229	51015
APR-AUG	48715	54491	96	62950	56763
JAN-SEP	59775	65826	96	77050	68694
JAN-JUL	51077	56772	95	65884	59599
OCT-SEP	68070	74121	96	85345	76824
- 0 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
APR-SEP	51944	58232	97	67157	60110
APR-JUL	43603	48814	96	56335	51015
APR-AUG	48565	54832	97	62695	56763
JAN-SEP	59671	66683	97	77143	68694
JAN-JUL	51907	57161	96	65607	59599
OCT-SEP	67966	74978	98	85438	76824
Move the mouse over the desired "Forecast Period" to display a graph.					

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Forecast Ensemble

http://www.nwrfc.noaa.gov/chpsesp/ensemble/watersupply/GCDW1W_SQIN.ESPF10.csv

- GCDW1W_SQIN.ESPF0.csv | 2016-02-05
- GCDW1W_SQIN.ESPF10.csv | 2016-02-05
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PEND OREILLE - ALBENI FALLS DAM (ALFW1) Forecasts for Water Year 2016					
Official Forecast - 10 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	9132	11098	87	13127	12815
APR-JUL	8294	9907	84	11895	11777
APR-AUG	8752	10526	85	12576	12354
JAN-SEP	11313	13254	87	15429	15226
JAN-JUL	10487	12167	86	14265	14189
OCT-SEP	13005	14946	87	17121	17218
- 5 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
APR-SEP	9289	11519	90	13700	12815
APR-JUL	8240	10381	88	12429	11777
APR-AUG	8780	11038	89	13144	12354
JAN-SEP	11477	13570	89	16866	15226
JAN-JUL	10568	12504	88	15599	14189
OCT-SEP	13170	15263	89	18559	17218
- 0 days QPF: Ensemble: 2016-02-05 Issued: 2016-02-05 Hide Forecast					
APR-SEP	9419	11596	90	13855	12815
APR-JUL	8445	10492	89	12777	11777
APR-AUG	8941	11083	90	13361	12354
JAN-SEP	11759	13879	91	16780	15226
JAN-JUL	10954	12732	90	15511	14189
OCT-SEP	13452	15572	90	18473	17218
Move the mouse over the desired "Forecast Period" to display a graph.					

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Forecast Ensemble

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- ALFW1IW_SQIN.ESPF0.csv|2016-02-05
- ALFW1IW_SQIN.ESPF10.csv|2016-02-05
- ALFW1IW_SQIN.ESPF5.csv|2016-02-05

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