

FEBRUARY final WSF sets BiOp actions as defined in table below.

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 – 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 through June Final	Manage for reservoir FRM and refill

February 3, 2015

Hungry Horse Dam

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

- Jan - Jul: 2,313 kaf (114%)
- Apr - Aug: 2,207 kaf (114%)
- May - Sep: 1,930 kaf (114%)

The minimum flows downstream of Hungry Horse are as follows:

- Columbia Falls: 3,500 cfs
- Hungry Horse: 900 cfs

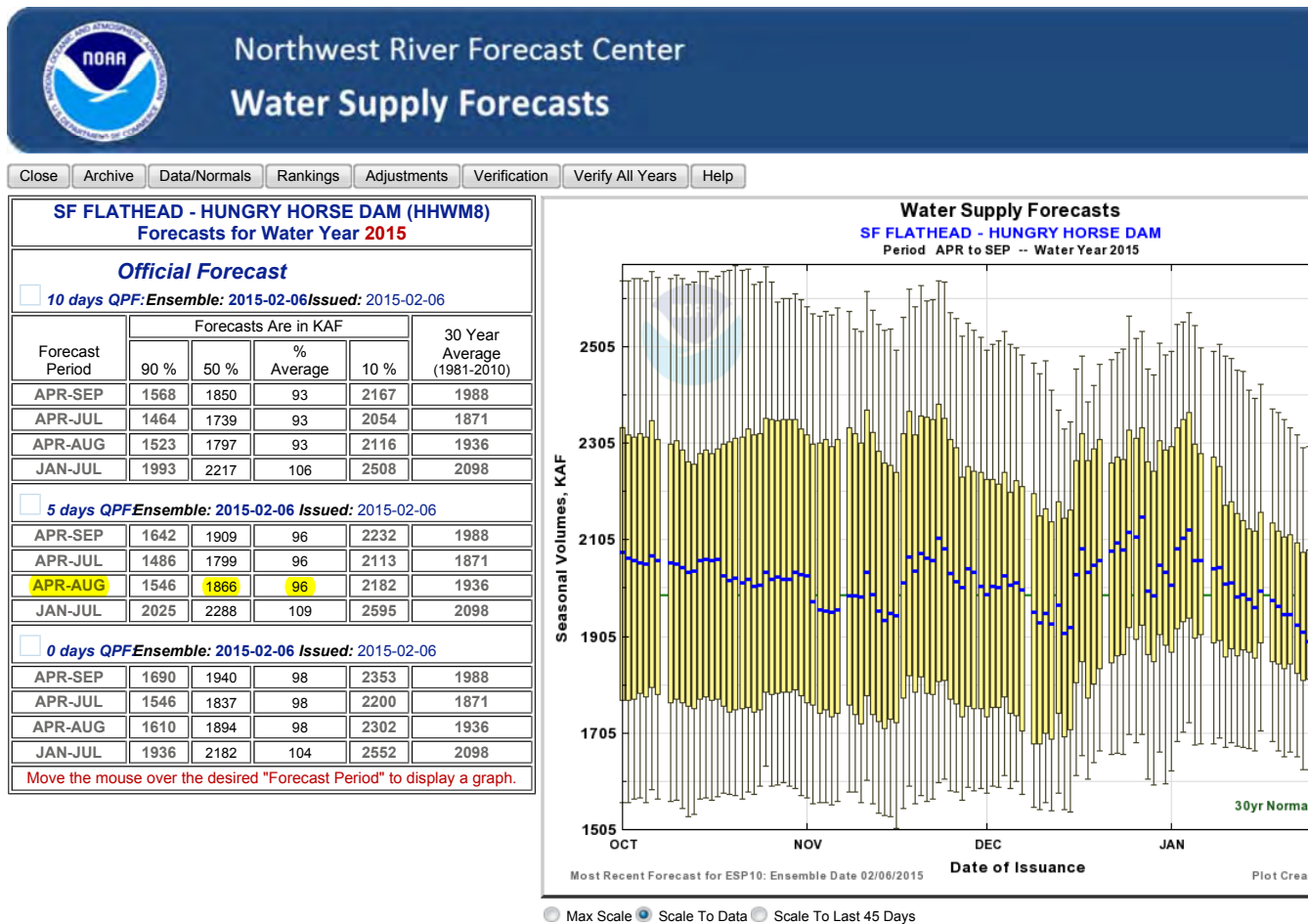
Mary Mellema

River and Reservoir Operations
U.S. Bureau of Reclamation
PN Regional Office
Boise, ID 83706

*Hungry Horse Dam official water supply forecasts computed by the Bureau of Reclamation (on previous page).

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COLUMBIA - THE DALLES DAM (TDAO3) Forecasts for Water Year 2015

Official Forecast

☐ 10 days QPF: Ensemble: 2015-02-06 Issued: 2015-02-06

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	77118	87231	94	95790	92704
APR-JUL	64793	72815	91	82234	79855
APR-AUG	71825	81867	94	90263	87532
JAN-JUL	90898	100945	100	112720	101368

☐ 5 days QPF Ensemble: 2015-02-06 Issued: 2015-02-06

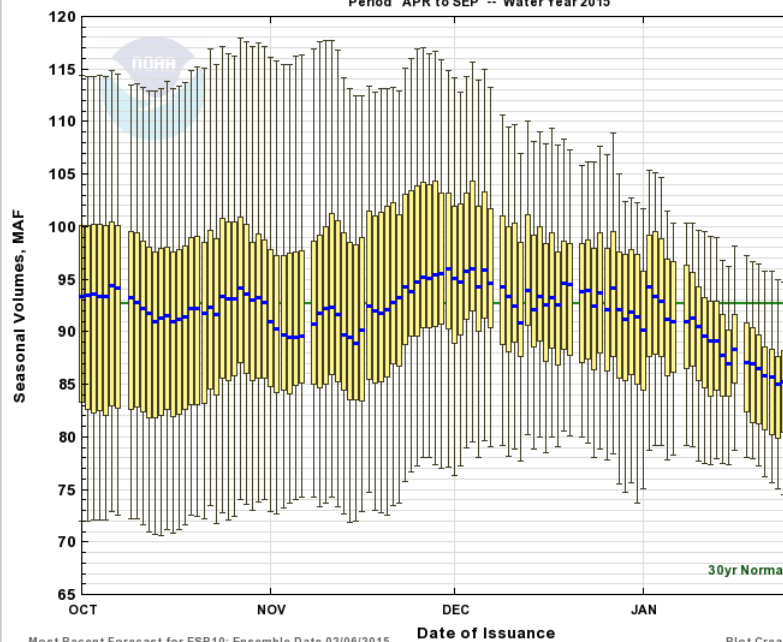
APR-SEP	79662	88204	95	98909	92704
APR-JUL	67269	75649	95	86459	79855
APR-AUG	74271	83108	95	93698	87532
JAN-JUL	93380	103786	102	117413	101368

☐ 0 days QPF Ensemble: 2015-02-06 Issued: 2015-02-06

APR-SEP	78076	88238	95	97240	92704
APR-JUL	66280	74805	94	85075	79855
APR-AUG	73459	82695	94	92131	87532
JAN-JUL	88664	97972	97	111461	101368

Move the mouse over the desired "Forecast Period" to display a graph.

Water Supply Forecasts COLUMBIA - THE DALLES DAM Period APR to SEP -- Water Year 2015



☐ Max Scale ☒ Scale To Data ☐ Scale To Last 45 Days

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SNAKE - LOWER GRANITE DAM (LGDW1) Forecasts for Water Year 2015

Official Forecast

☐ 10 days QPF: Ensemble: 2015-02-06 Issued: 2015-02-06

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	16535	20826	93	23782	22279
APR-JUL	14414	18348	92	21291	19848
APR-AUG	15498	19616	93	22562	21091
JAN-JUL	23847	27571	100	31325	27440

☐ 5 days QPF Ensemble: 2015-02-06 Issued: 2015-02-06

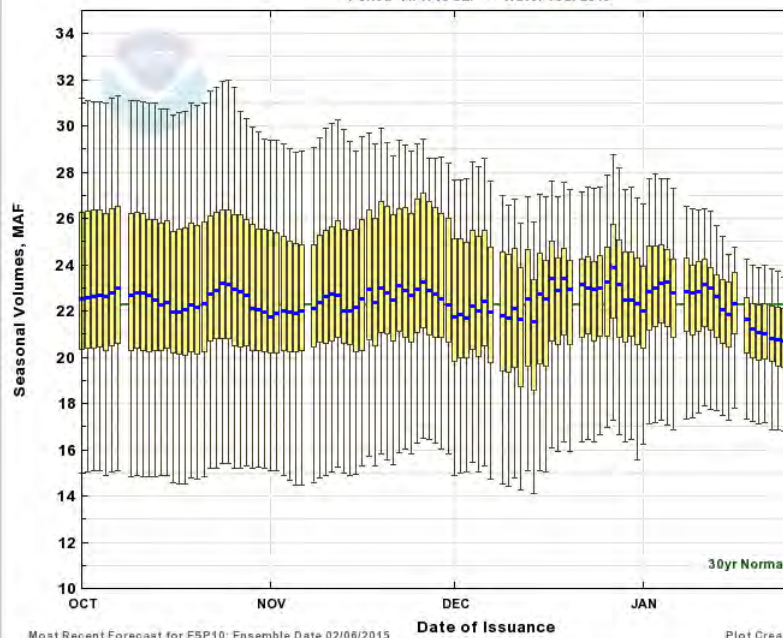
APR-SEP	17651	21923	98	24783	22279
APR-JUL	15465	19396	98	22050	19848
APR-AUG	16580	20719	98	23487	21091
JAN-JUL	24516	28729	105	33502	27440

☐ 0 days QPF Ensemble: 2015-02-06 Issued: 2015-02-06

APR-SEP	17466	21455	96	24145	22279
APR-JUL	15139	19021	96	21661	19848
APR-AUG	16396	20270	96	22925	21091
JAN-JUL	22349	26180	95	30637	27440

Move the mouse over the desired "Forecast Period" to display a graph.

Water Supply Forecasts SNAKE - LOWER GRANITE DAM Period APR to SEP -- Water Year 2015



☐ Max Scale
 ☒ Scale To Data
 ☐ Scale To Last 45 Days

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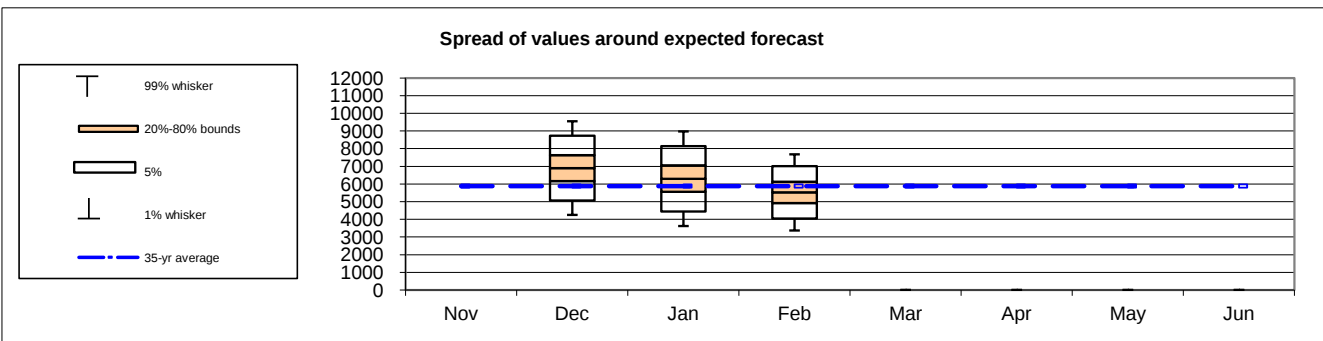
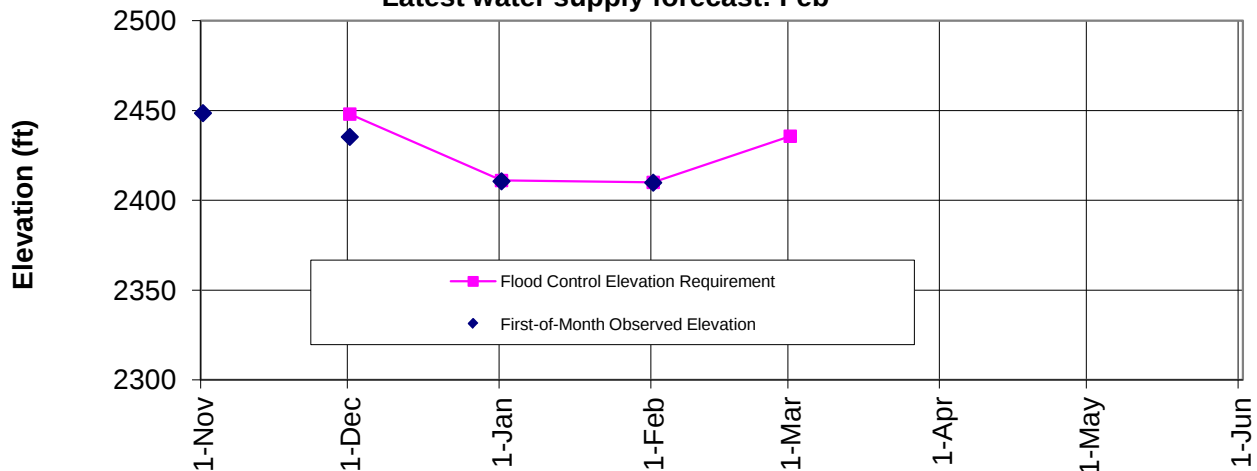
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Libby : February Runoff Forecast & Flood Control Calculation**WY 2015**

Runoff Forecast and Flood Control			
Most Probable Runoff Volume:			
	Apr-Aug	5523	KAF
	Apr-Jul	5014	KAF
	May-Jul	4524	KAF
28 Feb Flood Control Space			
		1032	KAF
28 Feb Flood Control Elevation			
		2435.7	ft

1981-2010 Average	Percent of Average	1929-2008 Average	Percent of Average
5885	94%	6282	88%
5342	94%	5720	88%
4821	94%	5199	88%

Seasonal Flood Control VARQ Flood Control Implemented								
Forecast Date >>	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Apr-Aug Runoff Forecast		6899	6297	5523				
First-of-Month Elev	2448.5	2435.3	2410.6	2409.8				
Date >>	30-Nov	31-Dec	31-Jan	28-Feb	15-Mar	31-Mar	15-Apr	30-Apr
Flood Control Space	500	2000	2037	1032				
Flood Control Elevation	2448.0	2411.0	2410.0	2435.7				

**Libby Flood Control Elevations - 2015****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, 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.

Libby : February Runoff Forecast & Flood Control Calculation**Apr-Aug Runoff Forecast Calculation:**

Variable	Month(s)	Units	Observed Value	Percent of Average	Regression Coefficient	Marginal Runoff (KAF)
			A		B	=A*B
SOI	Σ Jun:Jul					
Eureka RS, MT	Σ Oct:Jan Prcp	inches	5.40	125%	78.5	423.7
West Glacier, MT	Σ Oct:Jan Prcp	inches	15.56	127%	31.0	481.6
Cranbrook A, BC	Σ Oct:Jan Prcp	inches	131.40	113%	2.8	373.2
Fernie, BC	Σ Oct:Jan Prcp	inches	587.90	119%	0.7	423.3
Hawkins Lake, MT	1-Feb SWE	inches	11.80	72%	30.6	361.1
Stahl Peak, MT	1-Feb SWE	inches	19.10	81%	23.0	439.1
East Creek, BC	1-Feb SWE	inches	537.00	88%	0.8	402.8
Moyie Mountain, BC	1-Feb SWE	inches	193.00	67%	1.5	285.6
Sunshine Village, AB	1-Feb SWE	inches	266.00	69%	1.5	391.0
Akamina Pass, AB	1-Feb SWE	inches	230.00	72%	1.3	292.1
South Racehorse Creek, AB	1-Feb SWE	inches	234.00	83%	1.5	358.0
Intercept			1		1291.5	1291.5
1-Feb Forecast (KAF)					Σ	5523.0

Data used in Libby Water Supply Forecast**WY 2015**

Climate Data	Jan-14	Feb-14	Mar-14	Jun-14	Jul-14	Oct-14	Nov-14	Dec-14	Jan-15
SOI				0.20	-0.20				
Precipitation Data	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Units
Eureka RS, MT	0.55	2.42	1.22	1.21					inch
West Glacier, MT	2.64	5.77	4.07	3.08					inch
Cranbrook A, BC	29.40	53.60	25.50	22.90					mm
Fernie, BC	126.90	273.00	95.00	93.00					mm
Snow Water Equiv	1-Jan			1-Feb	1-Mar	1-Apr	1-May	1-Jun	Units
Hawkins Lake, MT				12					inch
Stahl Peak, MT			15	19					inch
East Creek, BC				537					mm
Moyie Mountain, BC			131	193					mm
Sunshine Village, AB			200	266					mm
Akamina Pass, AB				230					mm
South Racehorse Creek, AB				234					mm
Streamflow	Jan			Feb	Mar	Apr	May	Jun	Units
Libby Inflow Volume			218.8						KAF
Reservoir Elevation	1-Nov	1-Dec	1-Jan	1-Feb	1-Mar	1-Apr	1-May	1-Jun	Units
Libby FOM Elev	2448.5	2435.3	2410.6	2409.8					feet

for:

Peter F. Brooks, P.E., D. WRE
 Approving Official
 Ch., Hydrologic Engineering and Power Branch
 Northwestern Division

Joel Fenolio, P.E.
 Upper Columbia Senior Water Manager
 Seattle District

*Libby Dam official water supply forecasts computed by the Corps Seattle District (on previous pages).

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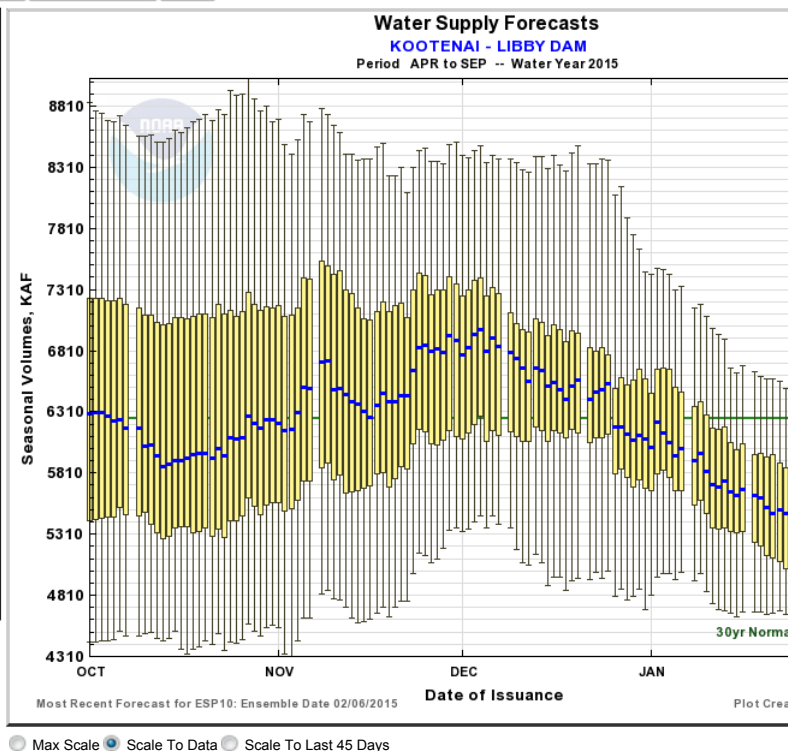
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KOOTENAI - LIBBY DAM (LYDM8) Forecasts for Water Year 2015					
Official Forecast					
☐ 10 days QPF: Ensemble: 2015-02-06 Issued: 2015-02-06					
Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	4744	5820	93	6724	6254
APR-JUL	4044	4926	92	5775	5342
APR-AUG	4458	5472	93	6301	5885
JAN-JUL	4915	5840	97	6716	6002
☐ 5 days QPF: Ensemble: 2015-02-06 Issued: 2015-02-06					
APR-SEP	4955	5952	95	6954	6254
APR-JUL	4182	5162	97	6047	5342
APR-AUG	4597	5641	96	6583	5885
JAN-JUL	4994	6018	100	7018	6002
☐ 0 days QPF: Ensemble: 2015-02-06 Issued: 2015-02-06					
APR-SEP	4939	5825	93	6922	6254
APR-JUL	4143	4976	93	5870	5342
APR-AUG	4580	5454	93	6394	5885
JAN-JUL	4850	5683	95	6697	6002
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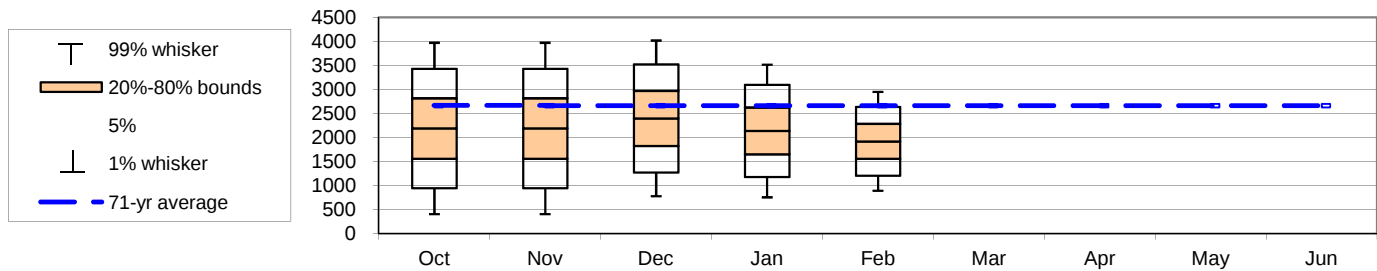
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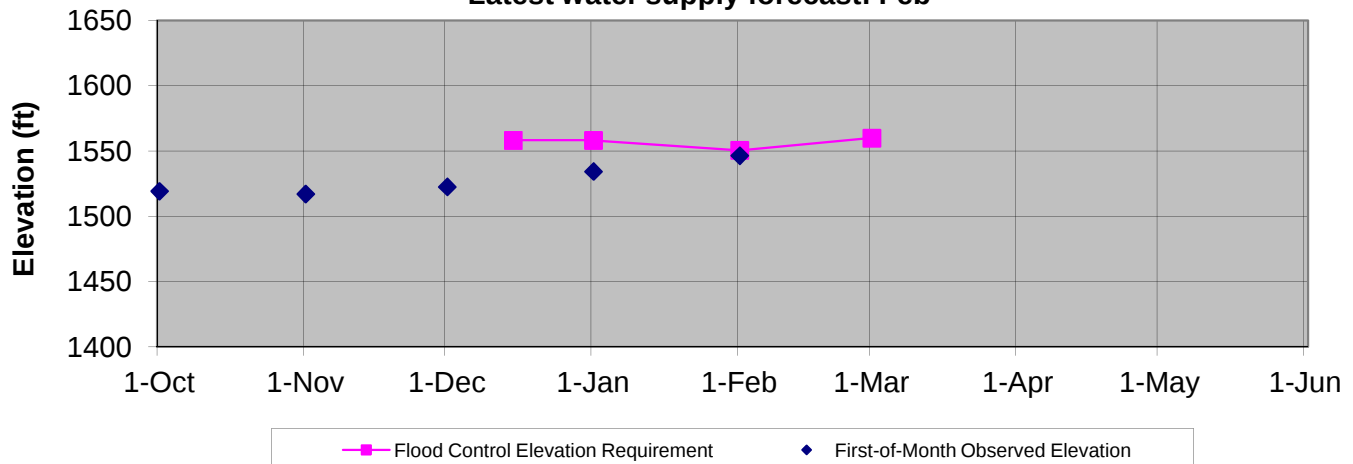
Dworshak : February Runoff Forecast & Flood Control Calculation**WY 2015**

Runoff Forecast and Flood Control						1981-2010 Average	Percent of Average	1929-2010 Average	Percent of Average
Most Probable Runoff Volume		Apr-Jul	1922	KAF		2438	79%	2663	72%
		May-Jul	1409	KAF		1784	79%	1953	72%
28/29 Feb Flood Control Space			674	KAF					
28/29 Feb Flood Control Elevation			1560.0	ft					
Seasonal Flood Control (assumes no shift of flood control space to Grand Coulee)									
Forecast Date>>	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Apr-Jul Runoff Forecast	2189	2189	2398	2136	1922				
First-of-Month Elev	1519.4	1517.2	1522.7	1534.4	1546.5				
Date >>		15-Dec	31-Dec	31-Jan	28-Feb	31-Mar	15-Apr	30-Apr	
Flood Control Space	--	700	700	811	674				
Flood Control Elevation	--	1558.2	1558.2	1550.6	1560.0				

Spread of values around expected forecast

**Dworshak Flood Control Elevations - 2015**

Latest water supply forecast: Feb

**Notes:**

1. The given forecast is the official Corps of Engineers forecast for Dworshak. If you have any questions please contact Jeremy Giovando (509 527 7053), or Steve Hall (509 527 7550).
2. Due to updated values for precipitation, snow or streamflow, subsequent forecasts may be different from the forecast published herein.
3. 15-Dec and 31-Dec flood control space is fixed at 700 KAF.

Dworshak : February Runoff Forecast & Flood Control Calculation**Apr-Jul Runoff Forecast Calculation:**

Variable	Month	Observed Value	% of Average	Regression Coefficient	Marginal Runoff (KAF)
		A		B	=A*B
SOI	Sep	-0.70		264.27	-185.0
HQSI Cumulative Precip	Oct-Date	20.50	115%	27.04	554.3
Elk Butte SWE	1-Jan	17.3	65%	12.06	208.6
Cool Creek SWE	1-Jan	23.5	70%	11.35	266.7
Hoodoo Basin SWE	1-Jan	20.2	67%	10.97	221.6
Sherwin SWE	1-Jan	3.4	40%	29.17	99.2
Lost Lake SWE	1-Jan	24.1	59%	7.60	183.2
Intercept		1		572.93	572.9

1-Feb Forecast (KAF)

Σ 1921.6

Data Station	Sept	Nov	Dec	1-Jan	1-Feb	1-Mar	1-Apr	1-May	1-Jun
Climate (Stdzd SOI)									
September SOI	-0.70								
Precipitation (in)									
Oct									
Headquarters, ID	2.60	7.10	5.50	5.30	--	--	--		
Cumulative HQSI Data	2.60	9.70	15.20	20.50	--	--	--		
Snow Water Equiv (First of Month values) (in)									
Elk Butte, ID				10.5	17.3	--	--		
Cool Creek, ID				16.7	23.5				
Hoodoo Basin, MT				14.0	20.2	--	--	--	--
Sherwin, ID				1.4	3.4	--	--		
Shanghi Summit, ID								--	--
Lost Lake, ID				16.1	24.1	--	--	--	--
Hemlock, ID								--	--
Crater Meadows Mar						--	--		
Streamflow (End of Month) (kaf)				Jan	Feb	Mar	Apr	May	Jun
Dworshak Inflow				260	--	--	--	--	--

Approval:

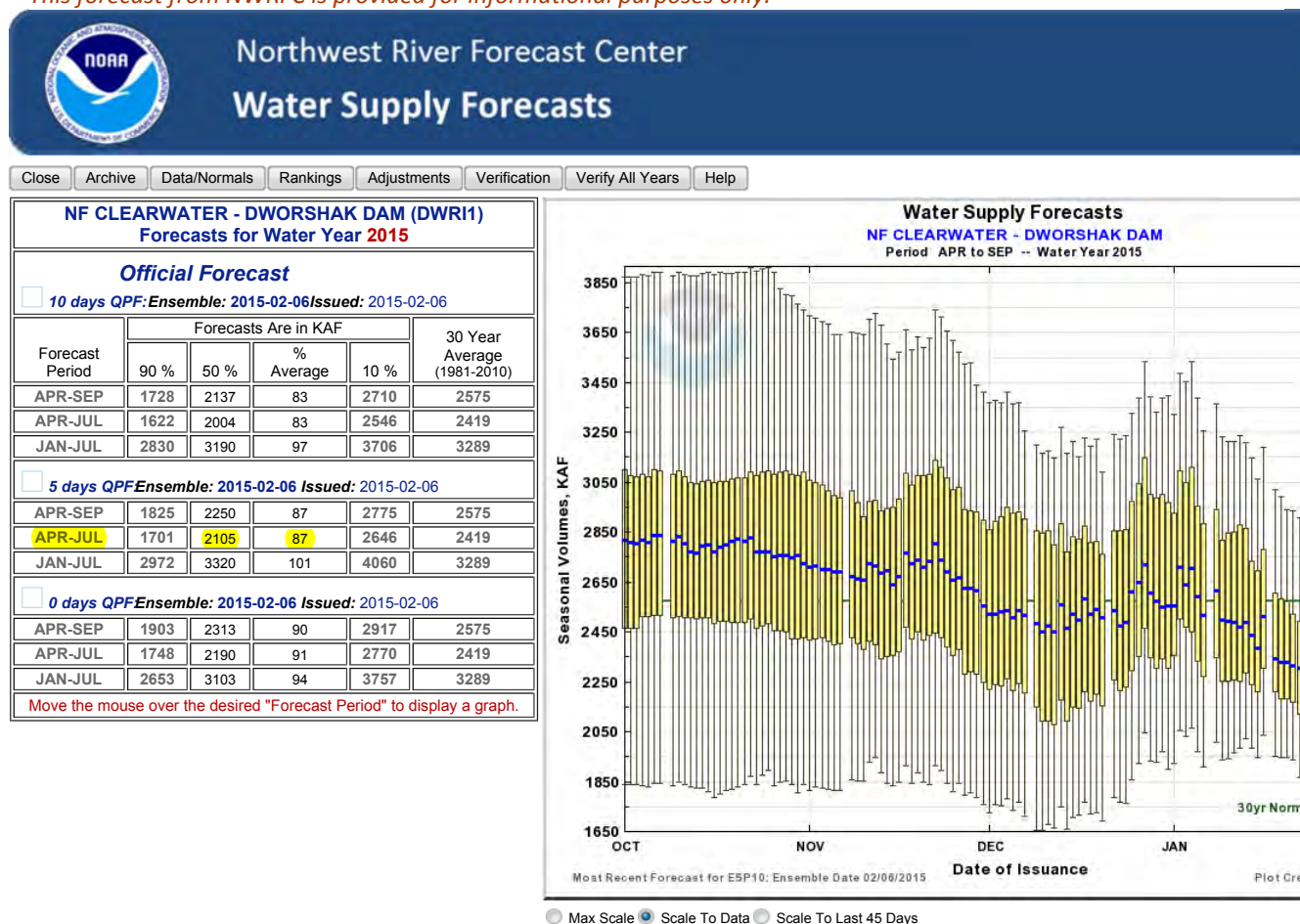
John J. Heitstuman P.E.
Chief Hydrology Section
Walla Walla District USACE

Peter Brooks, P.E., D. WRE
Ch., Hydrologic Engineering and Power Branch
Columbia Basin Water Management Division

* Dworshak Dam official water supply forecasts computed by the Corps Walla Walla District (on previous pages).

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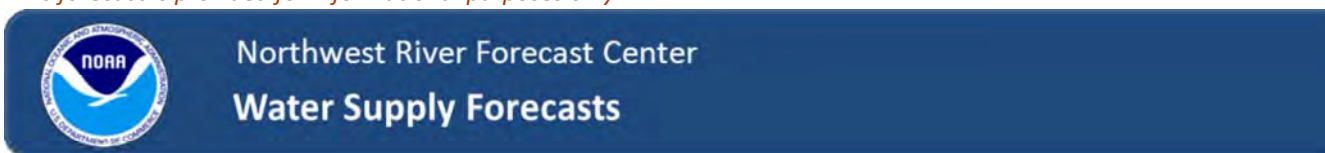
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* Grand Coulee Dam water supply forecasts are not used for implementation of BiOp actions.

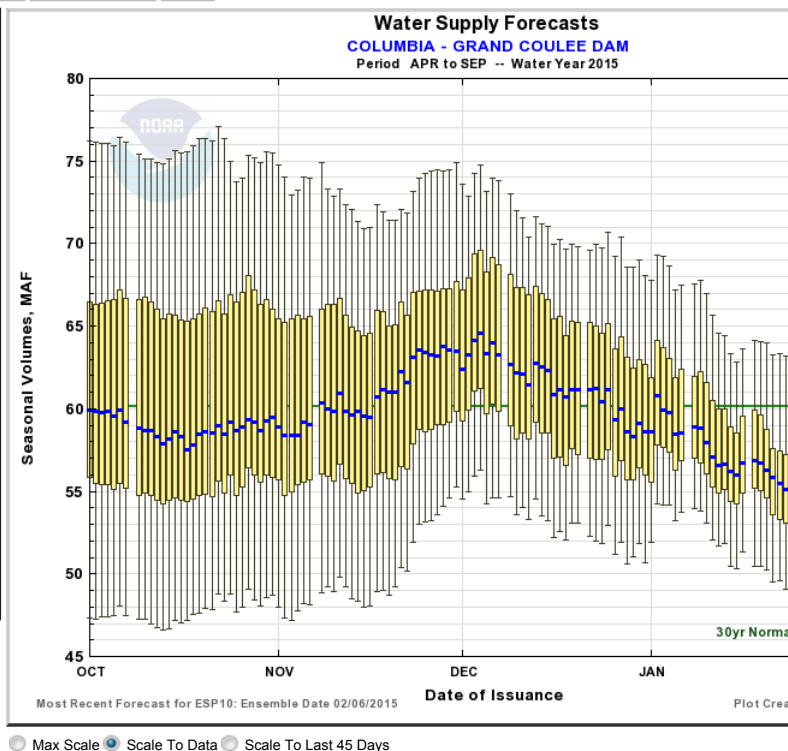
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COLUMBIA - GRAND COULEE DAM (GCDW1) Forecasts for Water Year 2015					
Official Forecast					
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Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	51612	57408	96	63290	60110
APR-JUL	42507	48227	95	53878	51015
APR-AUG	48421	54076	95	59484	56763
JAN-JUL	54390	60021	101	67438	59599
☐ 5 days QPF: Ensemble: 2015-02-06 Issued: 2015-02-06					
APR-SEP	53919	59047	98	66965	60110
APR-JUL	44938	50346	99	56258	51015
APR-AUG	50612	55845	98	63375	56763
JAN-JUL	56789	61455	103	71383	59599
☐ 0 days QPF: Ensemble: 2015-02-06 Issued: 2015-02-06					
APR-SEP	52404	58608	98	66850	60110
APR-JUL	43768	48735	96	55110	51015
APR-AUG	48826	55077	97	62458	56763
JAN-JUL	53835	59042	99	66921	59599
Move the mouse over the desired "Forecast Period" to display a graph.					



Overlay ESP10 ESP5 ESP0	Data Files CSV (ESP10 / APR-SEP)
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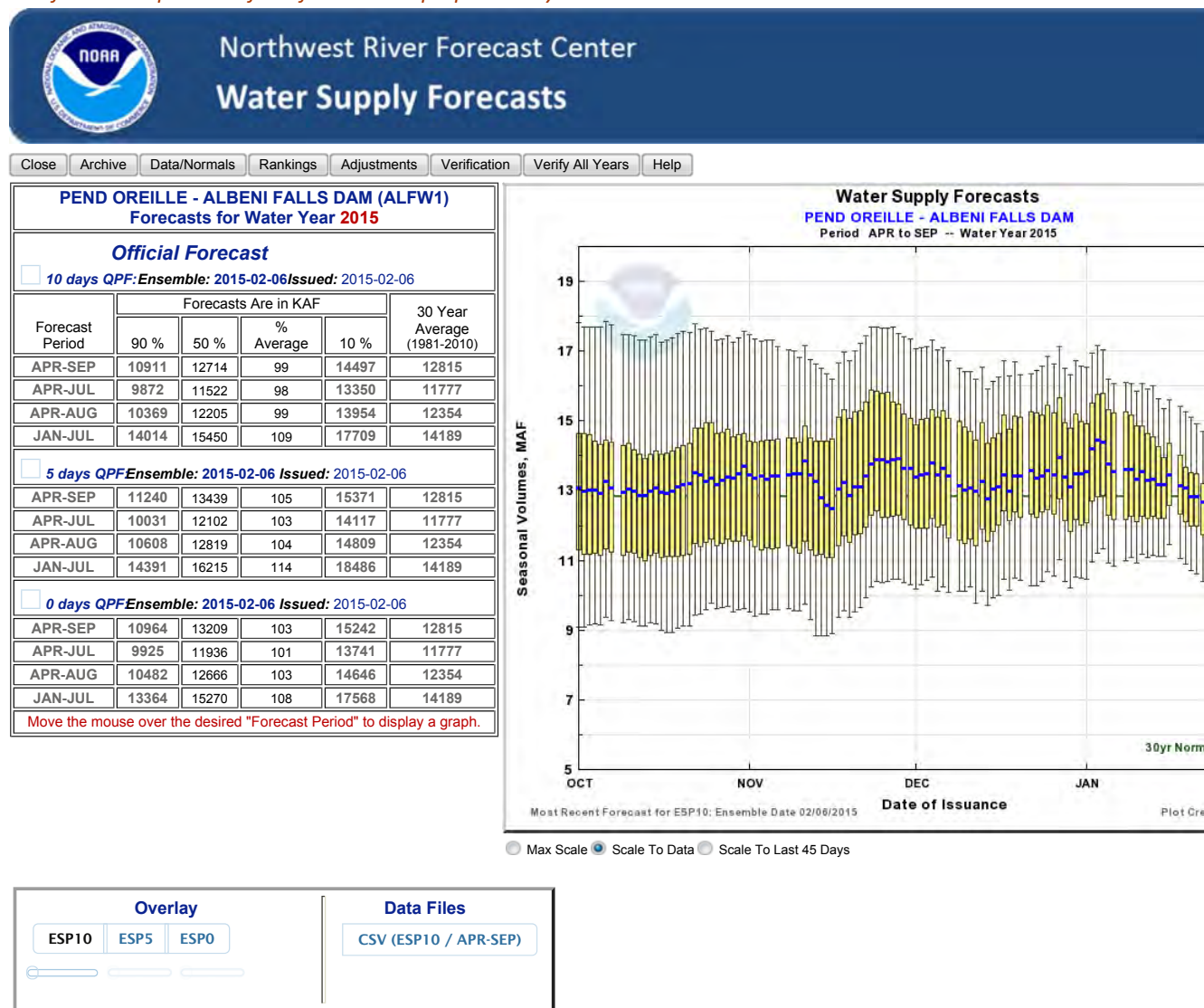
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* Albeni Falls Dam water supply forecasts are not used for implementation of BiOp actions.

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