

RECLAMATION

Managing Water in the West

December 8, 2016

Dear Customer:

On the following pages are the Monthly Water Supply Outlook and projected reservoir and river operating plans prepared for December 2016 for the Milk River Project. If you have any questions or concerns, please contact me at 406-247-7334.

Clayton R. Jordan
Reservoir and River Operations



U. S. Department of the Interior
Bureau of Reclamation
Montana Area Office
River and Reservoir Operations

MILK RIVER PROJECT OPERATIONS
 Water Supply Forecasts and Reservoir Operations
 December 1, 2016

Current Elevation and Storage:

	Elevation (feet)	Storage (acre-feet)	Percent of Average	Percent Full
Sherburne Reservoir:	4775.57	46,349	194	70
Fresno Reservoir:	2567.51	59,708	140	65
Nelson Reservoir:	2206.03	29,257	52	37

Past Inflows: (1,000's of acre-feet):

Month	Sherburne Reservoir		Fresno Reservoir	
	Inflow	% Average	Inflow	% Average
<u>Water Year 2017</u>				
October	18.7	292	5.2	70
November	11.7	160	2.8	111
<u>Water Year 2016</u>				
October	2.8	41	2.6	34
November	7.0	95	1.8	70
December	7.5	213	1.1	75
January	2.5	88	1.2	81
February	3.0	127	10.0	213
March	5.0	126	5.5	22
April	18.8	172	31.2	104
May	26.1	85	35.8	82
June	25.9	67	17.9	34
July	13.0	67	27.1	83
August	7.0	77	27.2	90
September	7.4	133	8.4	39
April-July	83.7	84	112.1	70

December Forecasts (1,000's of acre-feet)

Lake Sherburne (December Inflow)

<u>Forecasting Agency</u>	<u>Inflow</u>	<u>Percent of Average</u>
Reclamation	3.7	102

Averages are based on past 30 years

SNOW and PRECIPITATION UPDATE Based on Mountain Data from NRCS SNOTEL Sites As of December 1, 2016

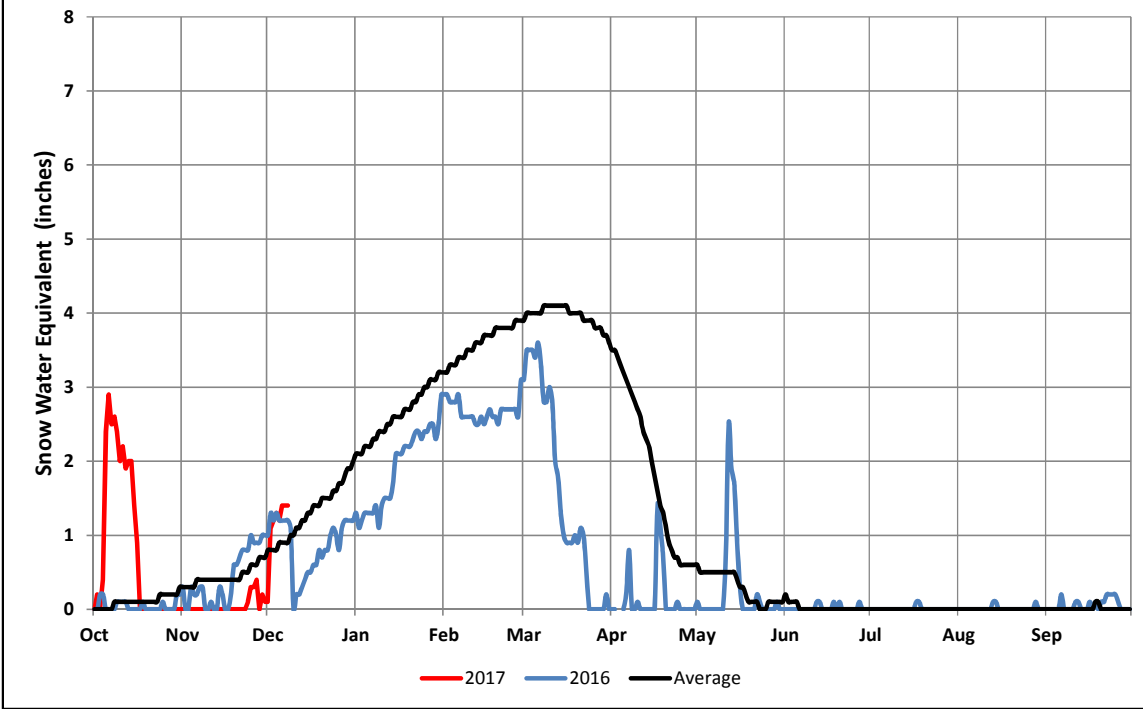
BASIN Data Site Name	Elev.	Snow Water Equivalent			Total Precipitation		
		Current	Median	% Median	Current	Median	% Median
Flattop Mtn.	6300	11.3	9.9	114	21.9	13.9	158
Many Glacier	4900	.5	2.2	23	16.3	10.9	150
Rocky Boy	4700	.3	.7	43	8.3	3.4	244
Basin Index (%)				95			165

-M = Missing data

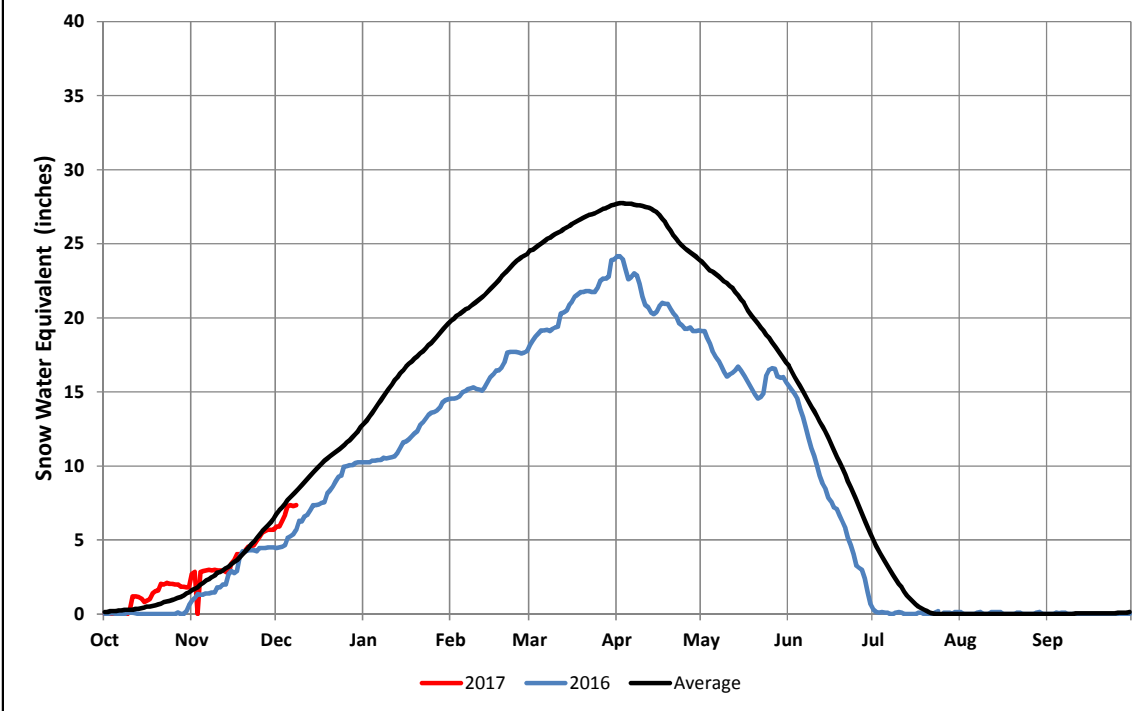
* = Data may not provide a valid measure of conditions.

Units = inches for the Current and Normal Snow Water Equivalent and
Total Precipitation values

Snowpack below Fresno Reservoir



Snowpack above Sherburne Reservoir



MILK RIVER BASIN MONTHLY OPERATIONS

Based on December 2016 Most Probable Inflow Forecast

Sherburne Reservoir		Initial Cont				Maximum Cont				Minimum Cont				Total
		2016	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	
		Elev 4775.54 ft				Elev 4788.03 ft				Elev 4731.73 ft				
Sherburne Inflow	kaf	3.7	2.9	2.8	3.2	9.5	32.9	39.3	17.5	8.6	7.2	6.8	5.3	139.7
Sherburne Rels	kaf	0.0	0.0	0.0	9.2	17.9	18.4	28.9	17.5	35.3	36.3	8.9	0.0	172.4
Sherburne Rels	cfs	0	0	0	150	301	299	486	285	574	610	145	0	
Net Content Change	kaf	3.7	2.9	2.8	-6.0	-8.4	14.5	10.4	0.0	-26.7	-29.1	-2.1	5.3	-32.7
End-Month Content	kaf	50.0	52.9	55.7	49.7	41.3	55.8	66.2	66.2	39.5	10.4	8.3	13.6	
End-Month Elevation	ft	4778.03	4779.92	4781.70	4777.83	4771.96	4781.76	4788.03	4788.03	4770.60	4742.49	4739.74	4746.36	
St. Mary River		Initial Cont				Maximum Cont				Minimum Cont				Total
2016	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov		
		Elev 2567.48 ft				Elev 2575.00 ft				Elev 2531.90 ft				
St Mary Runoff	kaf	6.5	7.2	6.1	8.7	24.5	95.5	135.0	80.6	32.3	19.0	18.7	12.9	447.0
Nat Flow @ Boundary	kaf	10.2	10.1	8.9	11.9	34.0	128.4	174.3	98.1	40.9	26.2	25.5	18.2	586.7
St Mary canal rels	cfs	0	0	0	99	200	550	550	600	600	600	200	0	
St Mary canal rels	kaf	0.0	0.0	0.0	6.1	11.9	33.8	32.7	36.9	36.9	35.7	12.3	0.0	206.3
Fresno Reservoir		Initial Cont				Maximum Cont				Minimum Cont				Total
2016	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov		
		Elev 2567.48 ft				Elev 2575.00 ft				Elev 2531.90 ft				
Milk River runoff	kaf	2.2	1.9	4.9	19.6	22.6	23.8	19.4	6.8	3.5	7.7	6.3	3.4	122.1
From St Mary Canal	kaf	0.0	0.0	0.0	5.5	10.7	30.4	29.4	33.2	33.2	32.1	11.1	0.0	185.6
Fresno inflow	kaf	2.2	1.9	4.9	25.1	33.3	54.2	48.8	40.0	36.7	39.8	17.4	3.4	307.7
Fresno Release	kaf	2.8	2.8	2.5	2.8	24.5	54.2	48.8	69.1	70.9	24.7	10.0	2.7	315.8
Fresno Release	cfs	46	46	45	46	412	881	820	1124	1153	415	163	45	
Net Content Change	kaf	-0.6	-0.9	2.4	22.3	8.8	0.0	0.0	-29.1	-34.2	15.1	7.4	0.7	-8.1
End-Month Content	kaf	59.1	58.2	60.6	82.9	91.7	91.7	91.7	62.6	28.4	43.5	50.9	51.6	
End-Month Elev	ft	2567.31	2567.07	2567.72	2573.21	2575.00	2575.00	2575.00	2568.31	2555.25	2562.18	2564.88	2565.10	
Project Allotment	f/ac	0.00	0.00	0.00	0.00	0.00	0.25	0.50	0.70	0.70	0.15	0.00	0.00	2.30
Project Delivery	kaf	0.0	0.0	0.0	0.0	0.0	23.2	46.3	64.9	64.9	13.9	0.0	0.0	213.2
FBIIP Demand	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.0	3.0	0.0	0.0	7.0
Fresno-Dodson Gain	kaf	0.0	0.0	0.0	17.4	18.2	12.6	16.4	6.8	2.0	2.2	0.0	0.0	75.6
Bowdoin Demand	kaf	0.0	0.0	0.0	0.0	2.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	3.5
Transfer to Nelson	kaf	0.0	0.0	0.0	10.0	20.0	20.0	10.0	10.0	5.0	10.0	10.0	0.0	95.0
Nelson Reservoir		Initial Cont				Maximum Cont				Minimum Cont				Total
2016	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov		
		Elev 2206.05 ft				Elev 2221.61 ft				Elev 2199.91 ft				
Deliv to Nelson	kaf	0.0	0.0	0.0	9.0	18.0	18.0	9.0	9.0	4.5	9.0	9.0	0.0	85.5
Net Content Change	kaf	-0.9	-0.9	-0.8	8.1	17.1	12.2	-1.4	-11.6	-16.1	3.9	8.1	-0.9	16.8
End-Month Content	kaf	28.4	27.5	26.7	34.8	51.9	64.1	62.7	51.1	35.0	38.9	47.0	46.1	
End-Month Elev	ft	2205.62	2205.18	2204.78	2208.53	2214.60	2217.95	2217.58	2214.37	2208.61	2210.23	2213.11	2212.83	
Total Release	kaf	0.0	0.0	0.0	0.0	0.0	4.6	9.2	19.4	19.4	4.2	0.0	0.0	56.8
Malta Delivery	kaf	0.0	0.0	0.0	0.0	0.0	4.6	9.2	12.9	12.9	2.8	0.0	0.0	42.4
Glasgow Delivery	kaf	0.0	0.0	0.0	0.0	0.0	2.3	4.7	6.5	6.5	1.4	0.0	0.0	21.4

MILK RIVER BASIN MONTHLY OPERATIONS

Based on December 2016 Minimum Probable Inflow Forecast

Sherburne Reservoir		Initial Cont				Maximum Cont				Minimum Cont				Total
		2016	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	
		Elev 4775.54 ft				Elev 4788.03 ft				Elev 4731.73 ft				
Sherburne Inflow	kaf	2.7	2.2	1.4	2.9	8.5	25.1	27.2	14.4	6.4	3.9	4.5	3.9	103.1
Sherburne Rels	kaf	0.0	0.0	0.0	4.3	39.0	22.5	15.5	33.3	19.4	3.9	0.0	0.0	137.9
Sherburne Rels	cfs	0	0	0	70	655	366	260	542	316	66	0	0	
Net Content Change	kaf	2.7	2.2	1.4	-1.4	-30.5	2.6	11.7	-18.9	-13.0	0.0	4.5	3.9	-34.8
End-Month Content	kaf	49.0	51.2	52.6	51.2	20.7	23.3	35.0	16.1	3.1	3.1	7.6	11.5	
End-Month Elevation	ft	4777.37	4778.82	4779.73	4778.82	4754.01	4756.56	4766.97	4749.18	4731.73	4731.73	4738.78	4743.86	
St. Mary River		Initial Cont				Maximum Cont				Minimum Cont				Total
2016	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov		
		Elev 4775.54 ft				Elev 4788.03 ft				Elev 4731.73 ft				
St Mary Runoff	kaf	5.4	4.0	4.6	4.1	7.4	68.2	81.5	42.1	21.7	14.5	8.4	4.8	266.7
Nat Flow @ Boundary	kaf	8.1	6.2	6.0	7.0	15.9	93.3	108.7	56.5	28.1	18.4	12.9	8.7	369.8
St Mary canal rels	cfs	0	0	0	99	600	550	550	600	325	101	0	0	
St Mary canal rels	kaf	0.0	0.0	0.0	6.1	35.7	33.8	32.7	36.9	20.0	6.0	0.0	0.0	171.2
Fresno Reservoir		Initial Cont				Maximum Cont				Minimum Cont				Total
2016	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov		
		Elev 2567.48 ft				Elev 2575.00 ft				Elev 2531.90 ft				
Milk River runoff	kaf	0.2	0.3	0.7	2.5	3.2	2.2	2.8	0.8	0.8	1.9	1.0	0.5	16.9
From St Mary Canal	kaf	0.0	0.0	0.0	5.5	32.1	30.4	29.4	33.2	18.0	5.4	0.0	0.0	154.0
Fresno inflow	kaf	0.2	0.3	0.7	8.0	35.3	32.6	32.2	34.0	18.8	7.3	1.0	0.5	170.9
Fresno Release	kaf	2.8	2.8	2.5	2.8	12.9	38.4	46.3	60.6	20.9	7.2	2.8	2.7	202.7
Fresno Release	cfs	46	46	45	46	217	625	778	986	340	121	46	45	
Net Content Change	kaf	-2.6	-2.5	-1.8	5.2	22.4	-5.8	-14.1	-26.6	-2.1	0.1	-1.8	-2.2	-31.8
End-Month Content	kaf	57.1	54.6	52.8	58.0	80.4	74.6	60.5	33.9	31.8	31.9	30.1	27.9	
End-Month Elev	ft	2566.76	2566.03	2565.48	2567.01	2572.67	2571.40	2567.69	2557.98	2556.97	2557.02	2556.12	2554.98	
Project Allotment	f/ac	0.00	0.00	0.00	0.00	0.00	0.25	0.50	0.60	0.15	0.00	0.00	0.00	1.50
Project Delivery	kaf	0.0	0.0	0.0	0.0	0.0	23.2	46.3	55.6	13.9	0.0	0.0	0.0	139.0
FBIIP Demand	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.0	3.0	0.0	0.0	7.0
Fresno-Dodson Gain	kaf	0.0	0.0	0.0	8.7	9.1	6.3	8.2	1.0	1.0	0.8	0.0	0.0	35.1
Bowdoin Demand	kaf	0.0	0.0	0.0	0.0	2.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	3.5
Transfer to Nelson	kaf	0.0	0.0	0.0	10.0	20.0	20.0	5.0	5.0	5.0	5.0	0.0	0.0	70.0
Nelson Reservoir		Initial Cont				Maximum Cont				Minimum Cont				Total
2016	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov		
		Elev 2206.05 ft				Elev 2221.61 ft				Elev 2199.91 ft				
Deliv to Nelson	kaf	0.0	0.0	0.0	9.0	18.0	18.0	4.5	4.5	4.5	4.5	0.0	0.0	63.0
Net Content Change	kaf	-0.9	-0.9	-0.8	8.1	17.1	9.9	-7.4	-13.3	-0.9	3.6	-0.9	-0.9	12.7
End-Month Content	kaf	28.4	27.5	26.7	34.8	51.9	61.8	54.4	41.1	40.2	43.8	42.9	42.0	
End-Month Elev	ft	2205.62	2205.18	2204.78	2208.53	2214.60	2217.35	2215.32	2211.09	2210.74	2212.06	2211.75	2211.43	
Total Release	kaf	0.0	0.0	0.0	0.0	0.0	6.9	10.7	16.6	4.2	0.0	0.0	0.0	38.4
Malta Delivery	kaf	0.0	0.0	0.0	0.0	0.0	4.6	9.2	11.0	2.8	0.0	0.0	0.0	27.6
Glasgow Delivery	kaf	0.0	0.0	0.0	0.0	0.0	2.3	4.7	5.6	1.4	0.0	0.0	0.0	14.0

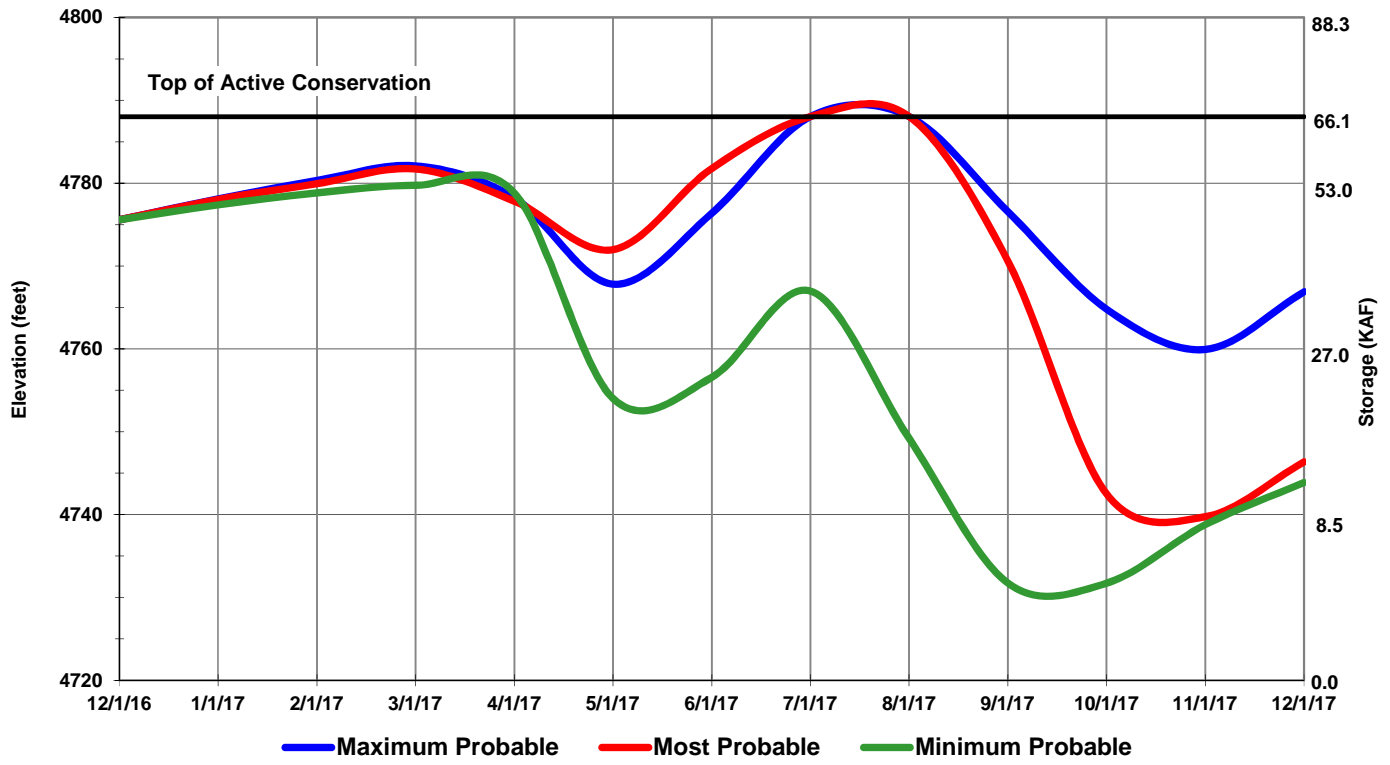
MILK RIVER BASIN MONTHLY OPERATIONS

Based on December 2016 Maximum Probable Inflow Forecast

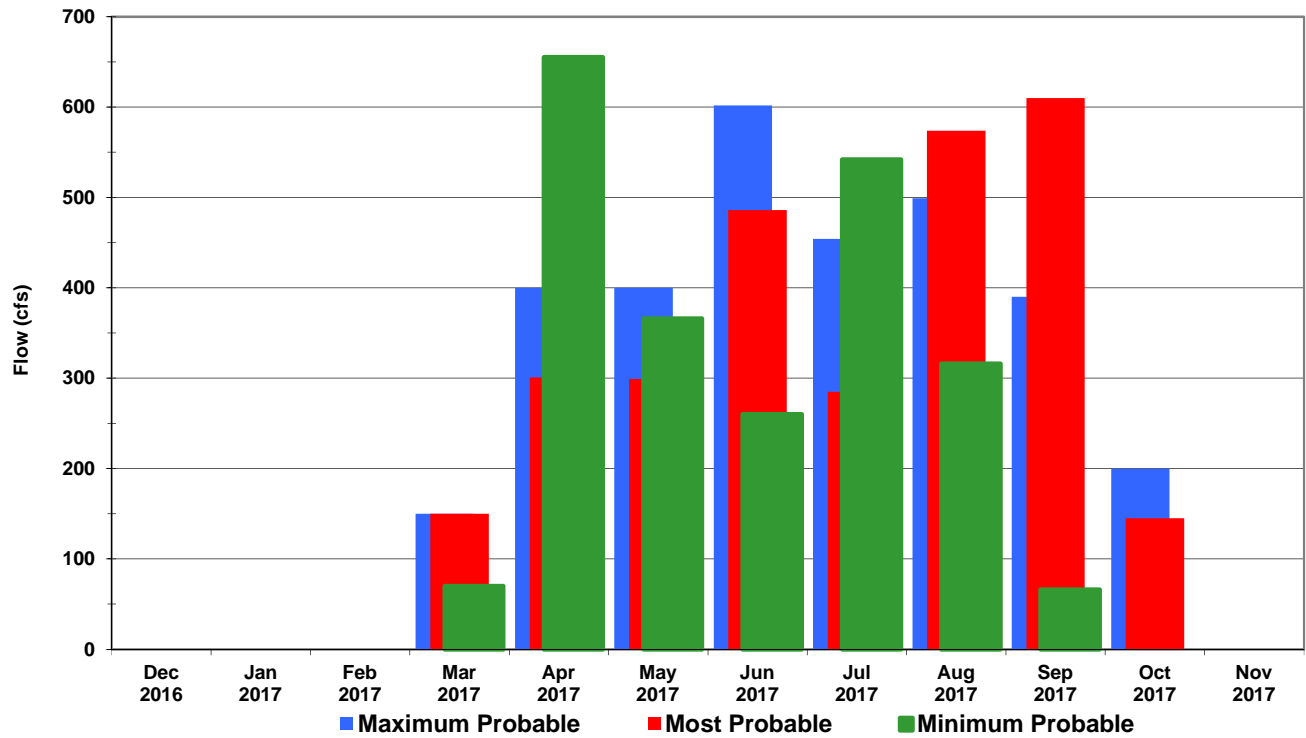
Sherburne Reservoir		Initial Cont					Maximum Cont					Minimum Cont				
		Elev 4775.54 ft					Elev 4788.03 ft					Elev 4731.73 ft				
	2016	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Total		
Sherburne Inflow	kaf	3.8	3.4	2.8	3.2	9.5	36.1	54.5	27.9	12.3	7.8	6.8	8.0	176.1		
Sherburne Rels	kaf	0.0	0.0	0.0	9.2	23.8	24.6	35.8	27.9	30.7	23.2	12.3	0.0	187.5		
Sherburne Rels	cfs	0	0	0	150	400	400	602	454	499	390	200	0			
Net Content Change	kaf	3.8	3.4	2.8	-6.0	-14.3	11.5	18.7	0.0	-18.4	-15.4	-5.5	8.0	-11.4		
End-Month Content	kaf	50.1	53.5	56.3	50.3	36.0	47.5	66.2	66.2	47.8	32.4	26.9	34.9			
End-Month Elevation	ft	4778.10	4780.31	4782.08	4778.23	4767.80	4776.36	4788.03	4788.03	4776.56	4764.79	4759.93	4766.89			
St. Mary River		Initial Cont					Maximum Cont					Minimum Cont				
		Elev 4775.54 ft					Elev 4788.03 ft					Elev 4731.73 ft				
	2016	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Total		
St Mary Runoff	kaf	21.2	15.8	14.4	21.7	46.1	147.5	215.6	130.5	51.7	39.3	45.9	34.6	784.3		
Nat Flow @ Boundary	kaf	25.0	19.2	17.2	24.9	55.6	183.6	270.1	158.4	64.0	47.1	52.7	42.6	960.4		
St Mary canal rels	cfs	0	0	0	0	0	99	600	600	600	600	0	0			
St Mary canal rels	kaf	0.0	0.0	0.0	0.0	0.0	6.1	35.7	36.9	36.9	35.7	0.0	0.0	151.3		
Fresno Reservoir		Initial Cont					Maximum Cont					Minimum Cont				
		Elev 2567.48 ft					Elev 2575.00 ft					Elev 2531.90 ft				
	2016	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Total		
Milk River runoff	kaf	3.4	1.9	4.9	41.3	41.1	40.7	16.1	18.2	7.7	11.2	10.3	4.4	201.2		
From St Mary Canal	kaf	0.0	0.0	0.0	0.0	0.0	5.5	32.1	33.2	33.2	32.1	0.0	0.0	136.1		
Fresno inflow	kaf	3.4	1.9	4.9	41.3	41.1	46.2	48.2	51.4	40.9	43.3	10.3	4.4	337.3		
Fresno Release	kaf	2.8	2.8	2.5	11.4	41.1	46.2	64.9	69.1	52.3	21.5	15.0	2.7	332.3		
Fresno Release	cfs	46	46	45	185	691	751	1091	1124	851	361	244	45			
Net Content Change	kaf	0.6	-0.9	2.4	29.9	0.0	0.0	-16.7	-17.7	-11.4	21.8	-4.7	1.7	5.0		
End-Month Content	kaf	60.3	59.4	61.8	91.7	91.7	91.7	75.0	57.3	45.9	67.7	63.0	64.7			
End-Month Elev	ft	2567.64	2567.40	2568.09	2575.00	2575.00	2575.00	2571.50	2566.82	2563.14	2569.66	2568.41	2568.87			
Project Allotment	f/ac	0.00	0.00	0.00	0.00	0.00	0.25	0.70	0.70	0.50	0.15	0.00	0.00	2.30		
Project Delivery	kaf	0.0	0.0	0.0	0.0	0.0	23.2	64.9	64.9	46.3	13.9	0.0	0.0	213.2		
FBIIP Demand	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.0	3.0	0.0	0.0	7.0		
Fresno-Dodson Gain	kaf	0.0	0.0	0.0	26.1	27.3	18.9	24.6	6.8	2.0	5.4	0.0	0.0	111.1		
Bowdoin Demand	kaf	0.0	0.0	0.0	0.0	2.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	3.5		
Transfer to Nelson	kaf	0.0	0.0	0.0	10.0	20.0	20.0	10.0	10.0	5.0	10.0	15.0	0.0	100.0		
Nelson Reservoir		Initial Cont					Maximum Cont					Minimum Cont				
		Elev 2206.05 ft					Elev 2221.61 ft					Elev 2199.91 ft				
	2016	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Total		
Deliv to Nelson	kaf	0.0	0.0	0.0	9.0	18.0	18.0	9.0	9.0	4.5	9.0	13.5	0.0	90.0		
Net Content Change	kaf	-0.9	-0.9	-0.8	8.1	17.1	12.2	-5.1	-11.6	-10.6	3.9	12.6	-0.9	23.1		
End-Month Content	kaf	28.4	27.5	26.7	34.8	51.9	64.1	59.0	47.4	36.8	40.7	53.3	52.4			
End-Month Elev	ft	2205.62	2205.18	2204.78	2208.53	2214.60	2217.95	2216.60	2213.24	2209.37	2210.94	2215.01	2214.75			
Total Release	kaf	0.0	0.0	0.0	0.0	0.0	4.6	12.9	19.4	13.9	4.2	0.0	0.0	55.0		
Malta Delivery	kaf	0.0	0.0	0.0	0.0	0.0	4.6	12.9	12.9	9.2	2.8	0.0	0.0	42.4		
Glasgow Delivery	kaf	0.0	0.0	0.0	0.0	0.0	2.3	6.5	6.5	4.7	1.4	0.0	0.0	21.4		

LAKE SHERBURNE

LAKE SHERBURNE ELEVATION

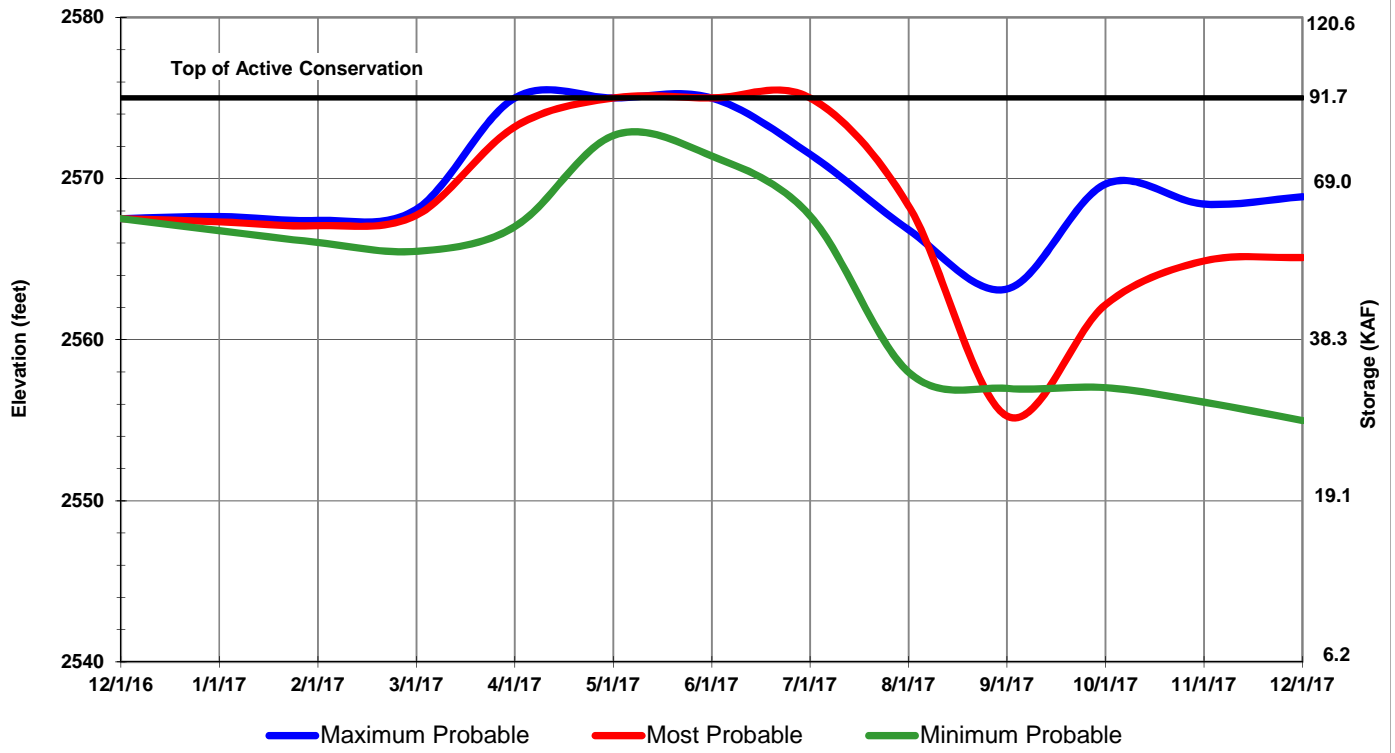


TOTAL DISCHARGE FROM LAKE SHERBURNE

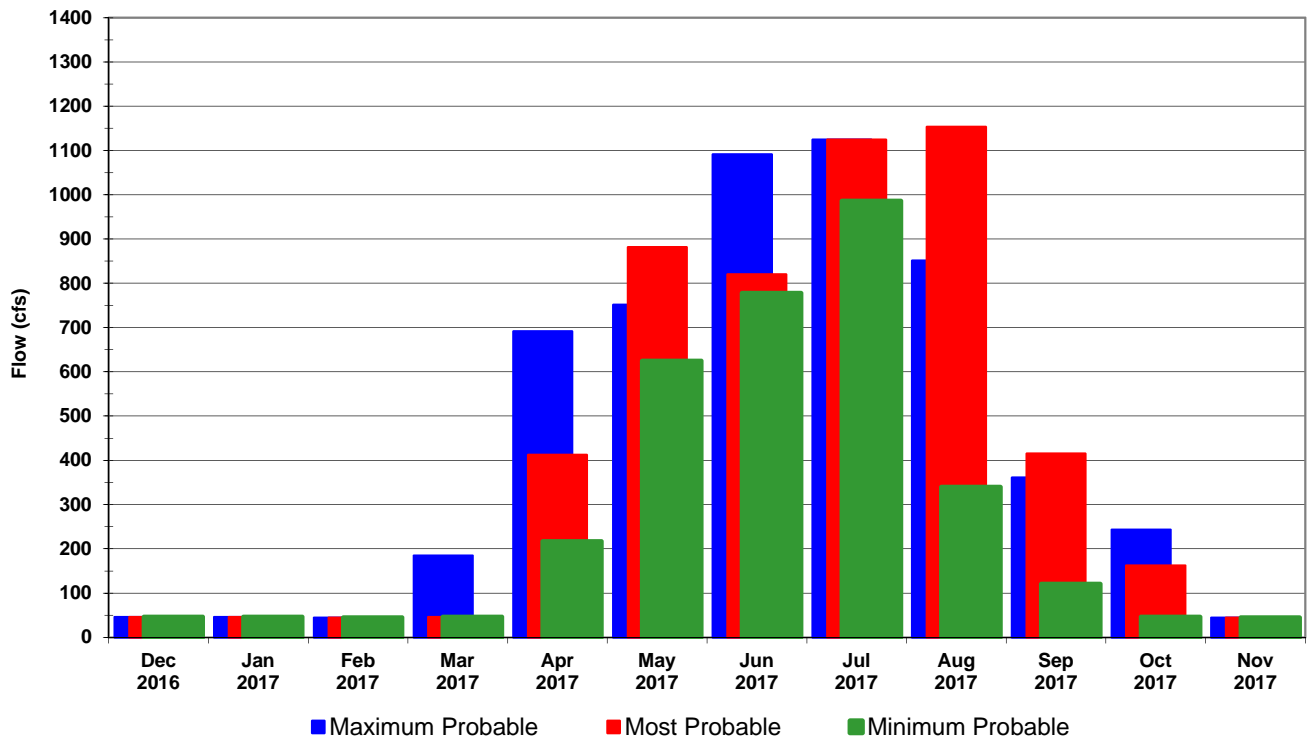


FRESNO RESERVOIR

FRESNO RESERVOIR ELEVATION

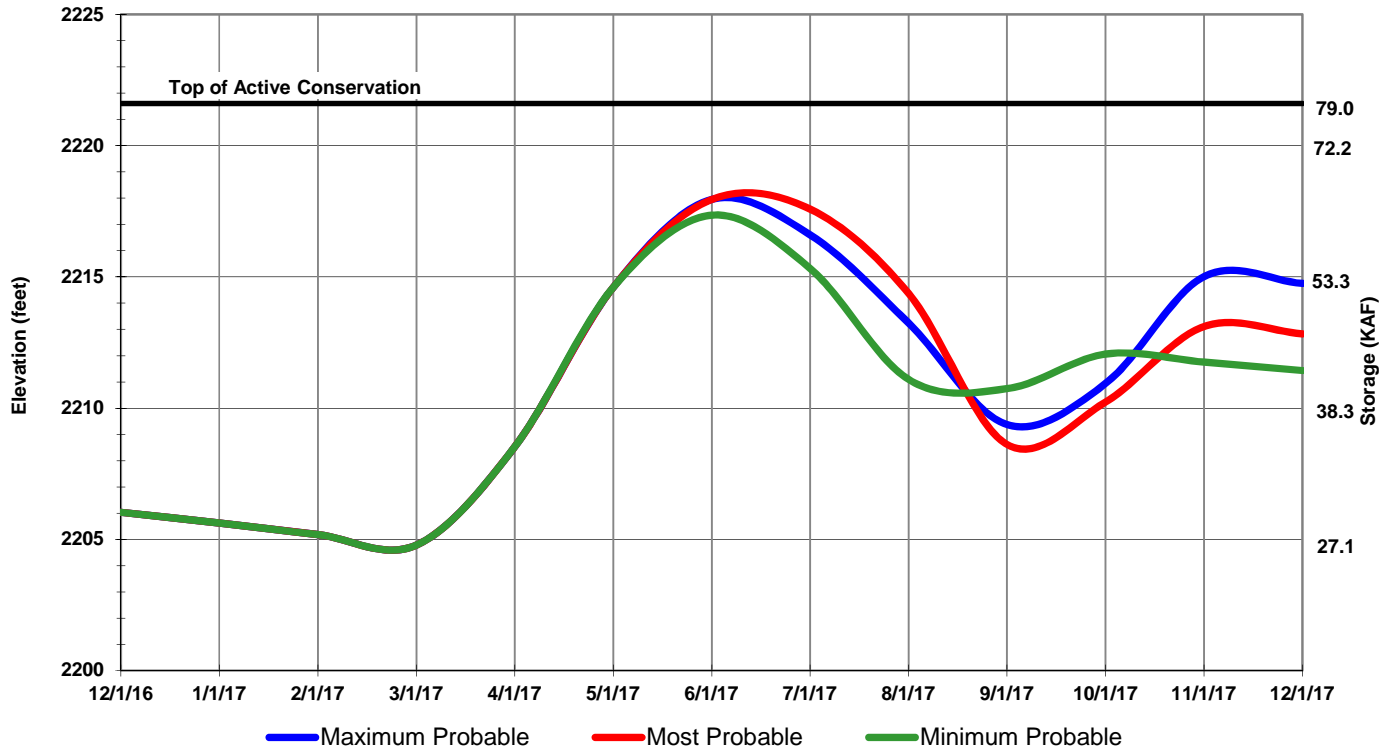


TOTAL DISCHARGE FROM FRESNO RESERVOIR



NELSON RESERVOIR

NELSON RESERVOIR ELEVATION



TOTAL DISCHARGE FROM NELSON RESERVOIR

