

# RECLAMATION

*Managing Water in the West*

## **Reclamation Workshop to Review Current Operations Practices, Communicating Risk and Uncertainty**

**June 16, 2009**



U.S. Department of the Interior  
Bureau of Reclamation

# Great Plains Region-- Current Operations Practices

- R. Scott Guenther, Hydraulic Engineer
- Water Resources Operations & Water Rights



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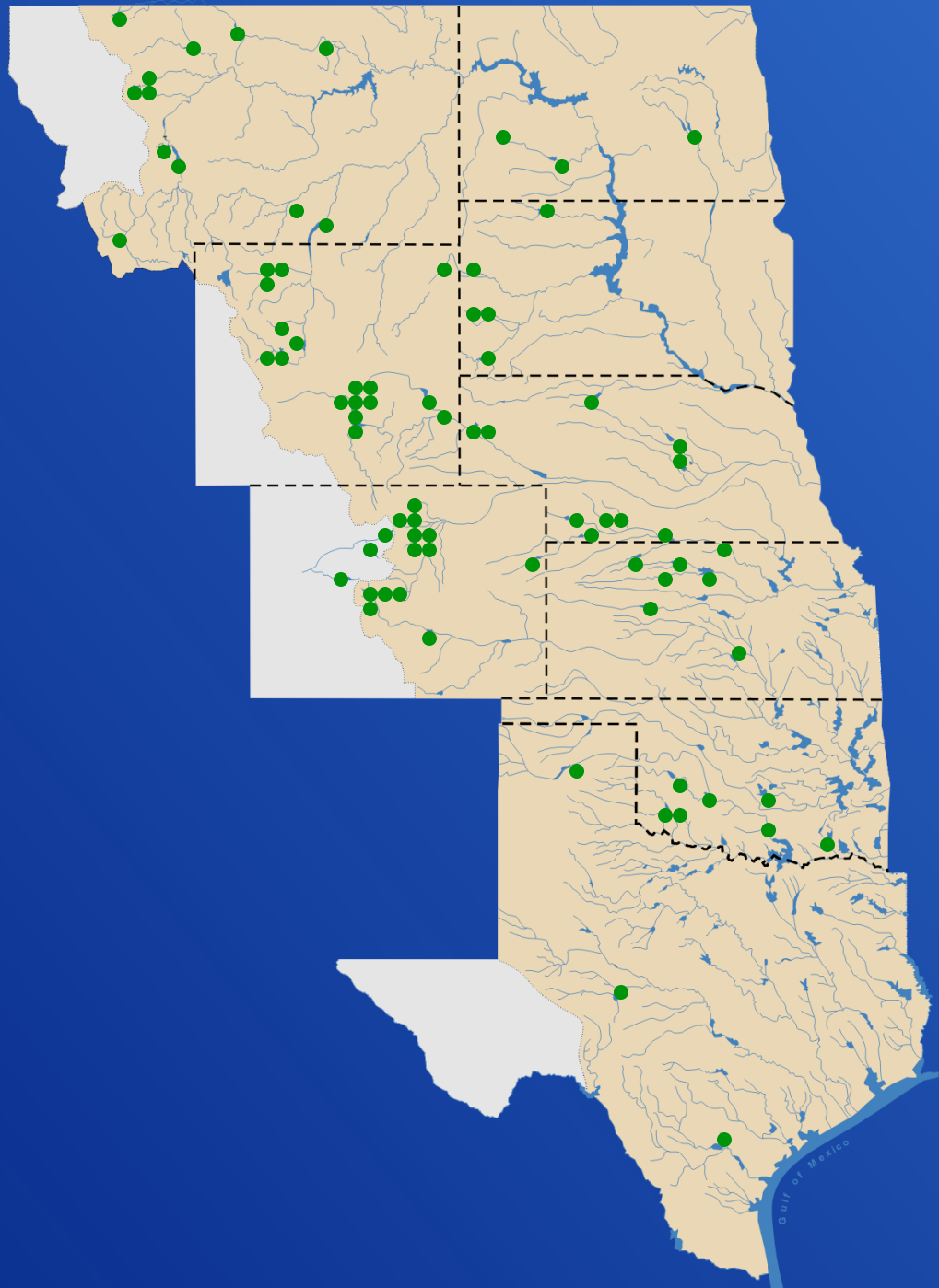


# The Great Plains Region and Reclamation offices

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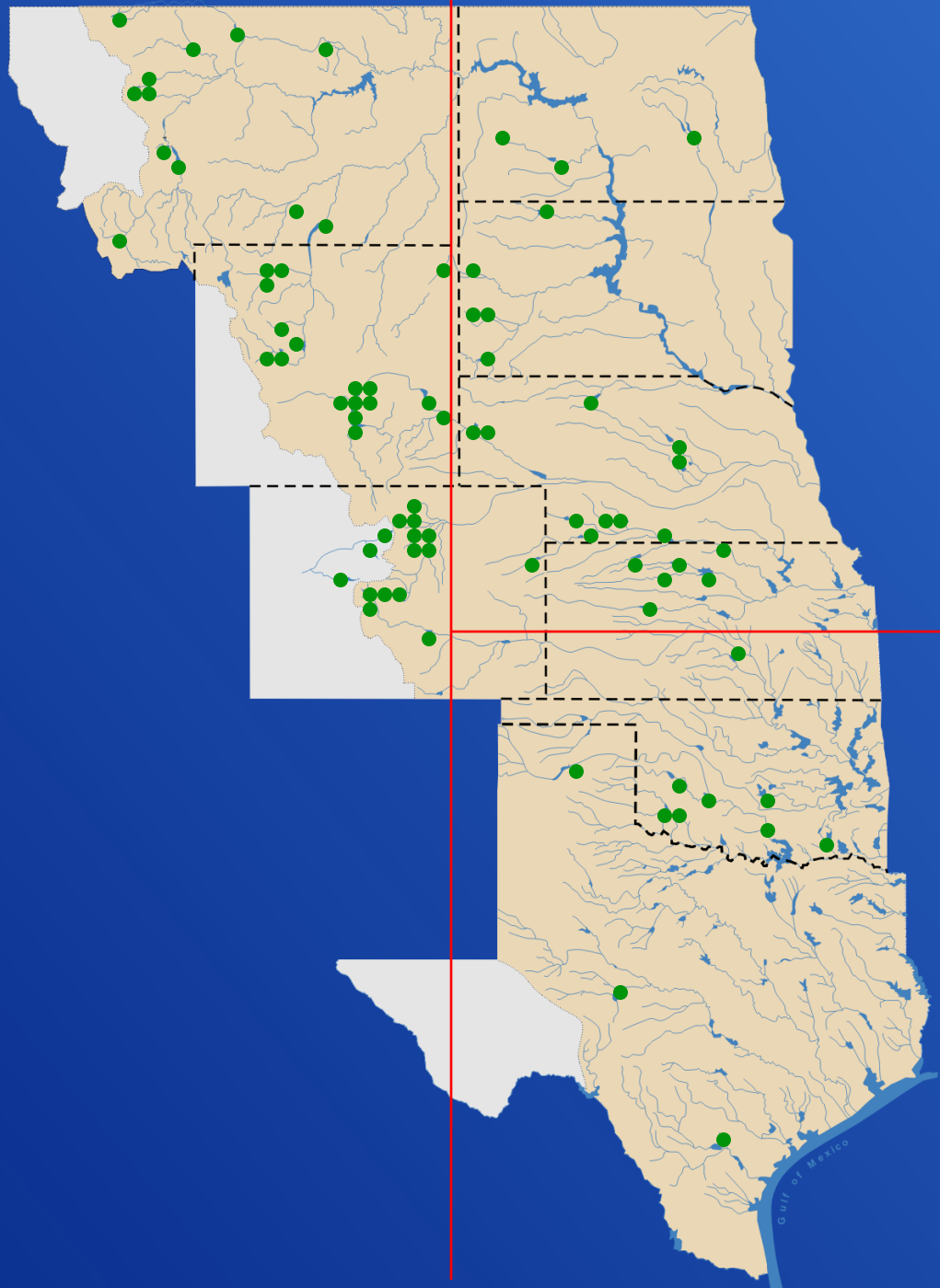
# Great Plains Region

80 reservoirs ●



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80 reservoirs ●



# Operations Plans-Current Practices

- Utilize Operations Models
- 12-month look ahead period
- Many plans updated every month
- Generally, produce three Plans
  - Most Probable inflow
  - Minimum Probable Inflow
  - Maximum Probable Inflow

# Montana 2008 Water Supply Forecasts

RESERVOIR	JAN 1 <sup>1/</sup>		FEB 1 <sup>1/</sup>		MAR 1 <sup>1/</sup>		APR 1 <sup>2/</sup>		MAY 1 <sup>3/</sup>		JUN 1 <sup>4/</sup>		ACTUAL APRIL-JULY <sup>5/</sup>		% OF APRIL FORE- CAST REC'D
	1,000 AC- FT	% OF AVG	1,000 AC-FT	% OF AVG	1,000 AC-FT	% OF AVG	1,000 AC-FT	% OF AVG	1,000 AC-FT	% OF AVG	1,000 AC-FT	% OF AVG	1,000 AC-FT	% OF AVG	
Clark Canyon	44.6	40	85.0	75	92.0	82	90.0	80	72.0	79	47.0	74	52.9	47	59
Canyon Ferry	1,762.0	87	1,910.0	94	1,950.0	96	1,880.0	93	1,685.0	100	1,355.0	122	2,199.2	108	117
Gibson	366.0	77	418.0	88	463.0	97	441.5	92	414.5	95	318.3	119	530.7	111	120
Tiber	313.0	64	421.0	87	460.0	95	456.0	94	431.0	102	257.0	101	488.6	101	107
Sherburne	85.0	82	101.0	97	107.0	103	106.0	102	101.0	106	67.0	107	115.8	111	109
Fresno	48.0	58	70.0	84	75.0	90	51.0	84	30.0	72	29.0	149	66.8	67	131
Yellowtail	743.9	67	807.0	72	794.0	71	820.0	74	786.6	83	990.9	141	1,298.3	117	158

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# Canyon Ferry Lake Operations Plan

Based on October 1 2008 Probable Inflow Estimates  
 2009 Most Probable Plan

Canyon Ferry Reservoir		Initial Cont Elev 1756.4 kaf 3792.88 ft				Maximum Cont Elev 1993.0 kaf 3800.00 ft				Minimum Cont Elev 445.5 kaf 3732.31 ft			
	2008	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Reservoir Inflow	kaf	181.6	201.2	174.2	168.1	175.0	225.5	321.6	514.0	618.9	258.4	118.0	155.7
Evaporation Loss	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HV Canal Diversions	kaf	0.0	0.0	0.0	0.0	0.0	4.0	11.0	22.0	17.0	21.0	21.0	12.0
HV Pump Turbines	kaf	0.0	0.0	0.0	0.0	0.0	5.3	14.6	27.0	18.2	21.0	22.2	13.7
Turbine Release	kaf	240.9	234.2	252.3	252.3	227.9	247.1	266.4	286.6	317.8	241.5	245.6	222.6
Turbine Release	cfs	3918	3936	4103	4103	4104	4019	4477	4661	5341	3928	3994	3741
Spill/Waste	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
River Release	kaf	240.9	234.2	252.3	252.3	227.9	252.4	281.0	313.6	336.0	262.5	267.8	236.3
River Release	cfs	3918	3936	4103	4103	4104	4105	4722	5100	5647	4269	4355	3971
Min Release	cfs	3918	3936	3939	3928	3893	3880	3911	3959	3707	3981	3975	3944
Total Dam Release	kaf	240.9	234.2	252.3	252.3	227.9	256.4	292.0	335.6	353.0	283.5	288.8	248.3
Total Dam Release	cfs	3918	3936	4103	4103	4104	4170	4907	5458	5932	4611	4697	4173
End-Month Content	kaf	1697.1	1664.1	1586.0	1501.8	1448.9	1418.0	1447.6	1626.0	1891.9	1866.8	1696.0	1603.4
End-Month Elevation	ft	3791.0	3790.0	3787.6	3784.8	3783.1	3782.0	3783.0	3788.8	3797.0	3796.3	3791.0	3788.1
Net Change	kaf	-59.3	-33.0	-78.1	-84.2	-52.9	-30.9	29.6	178.4	265.9	-25.1	-170.8	-92.6
Canyon Ferry Power	2008	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Turbine Release	cfs	3918	3936	4103	4103	4104	4019	4477	4661	5341	3928	3994	3741
Tailwater Elev	ft	3650.8	3650.8	3650.9	3650.9	3650.9	3650.9	3650.9	3651.0	3651.0	3650.9	3650.9	3650.8
Average Head	ft	141.2	139.7	137.9	135.3	133.1	131.7	131.6	135.0	142.0	145.7	142.8	138.8
Average Power	mw	43.0	42.9	44.4	43.7	43.1	41.7	46.8	50.0	59.6	44.2	44.4	40.2
Average Kwh/Af		133	132	131	129	127	126	127	130	135	136	134	130
Generation	gwh	31.992	30.859	33.063	32.520	28.956	31.025	33.725	37.170	42.898	32.907	33.004	28.922
End-Month Power Cap	mw	60	60	60	60	60	60	60	60	60	60	60	60

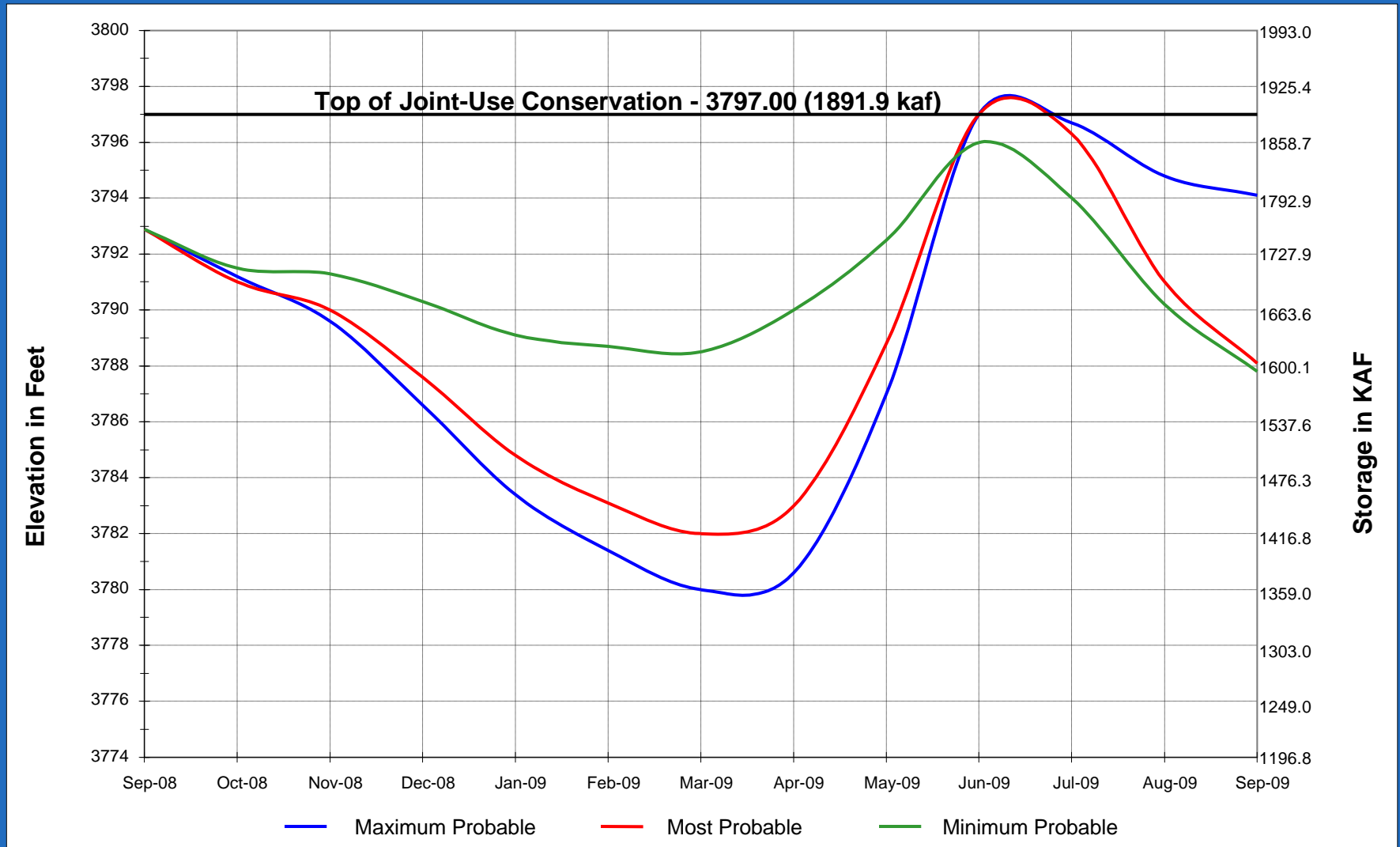
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## January Runoff Forecast for Canyon Ferry April-July Inflow; 1,000 Acre-Feet

<u>Agency</u>	<u>Inflow</u>	<u>% Normal</u>
Reclamation	1,783	88
NRCS	1,838	91
<u>CORPS</u>	<u>1,960</u>	<u>97</u>
<b>Average</b>	<b>1,860</b>	<b>92</b>

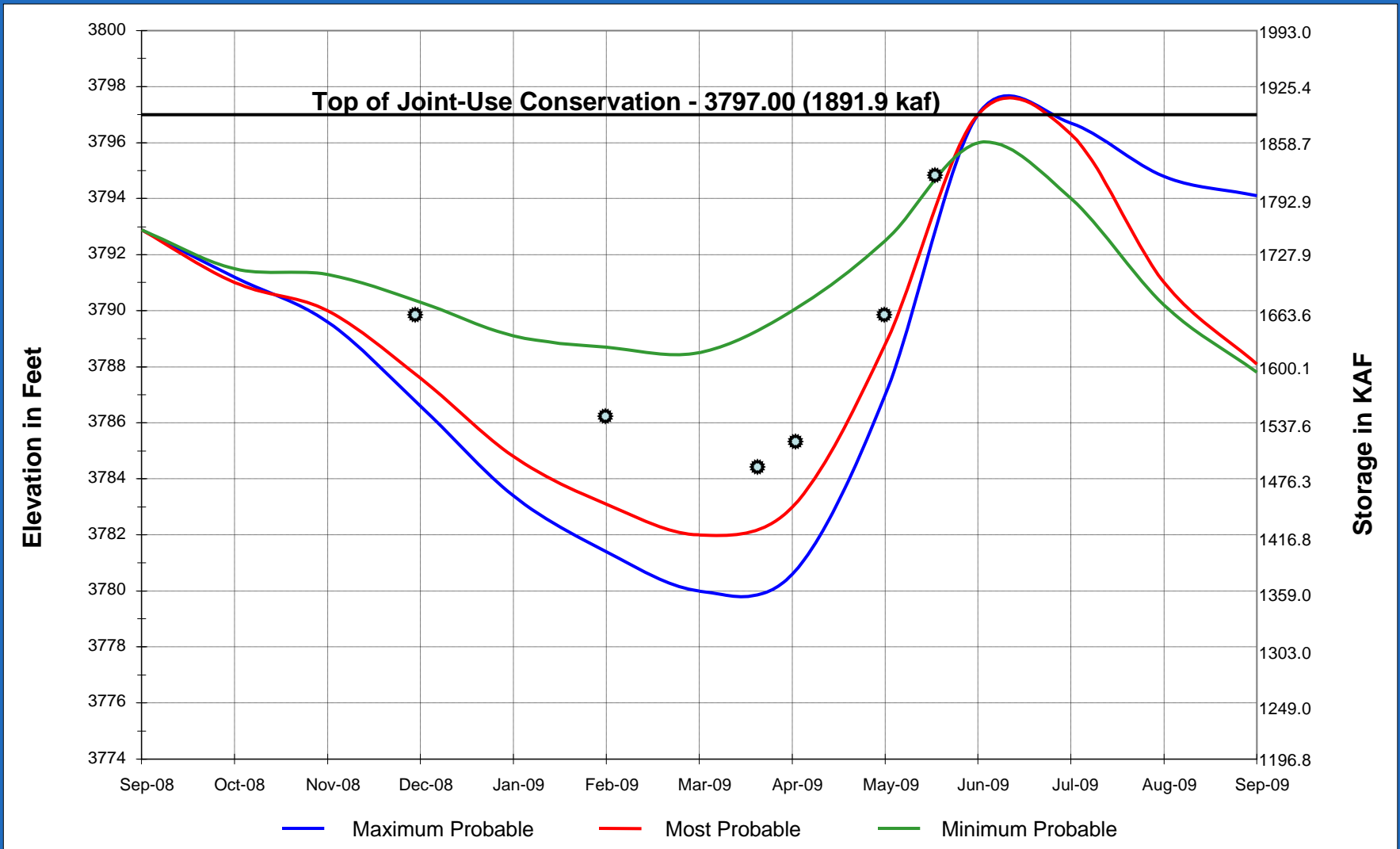
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# CANYON FERRY RESERVOIR



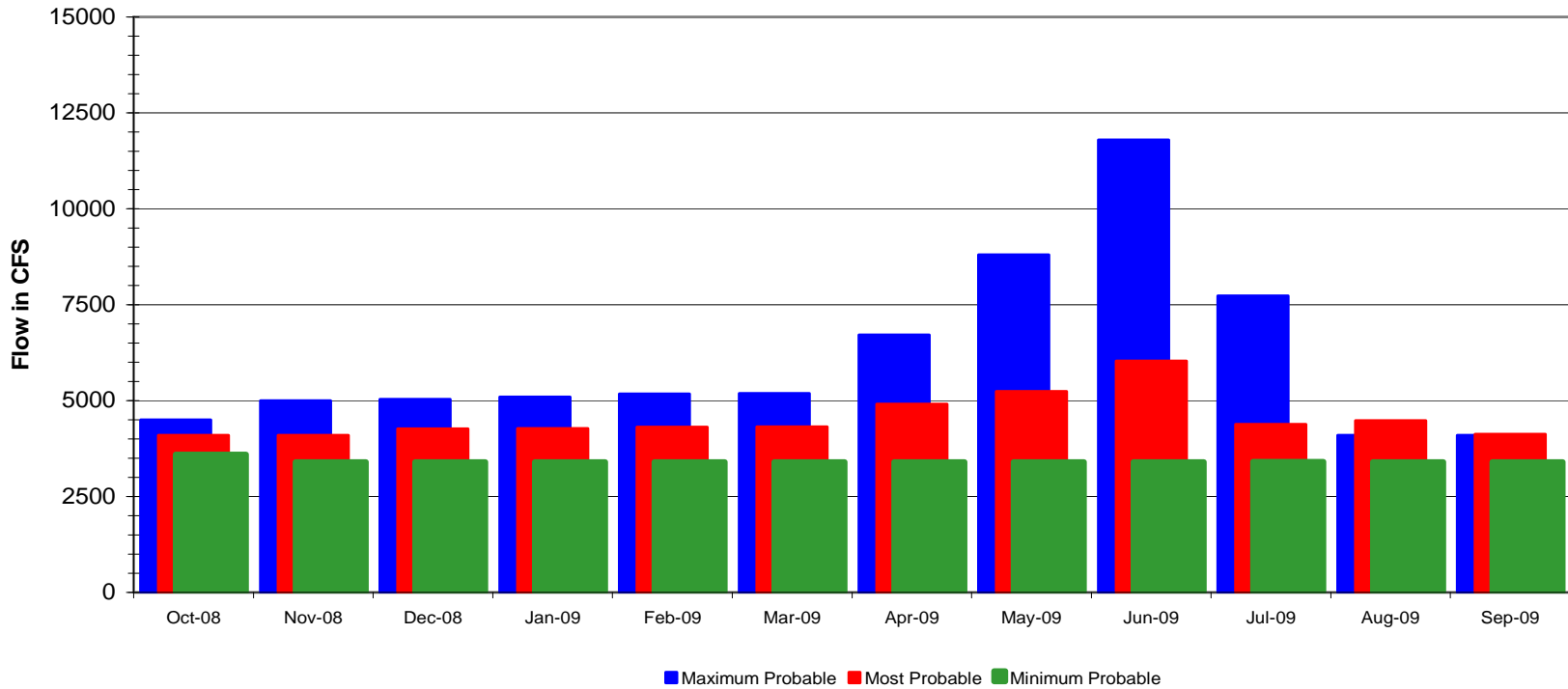
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# CANYON FERRY RESERVOIR



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## MISSOURI RIVER FLOW BELOW HOLTER



WATER YEAR 2009

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# Communication of the Operation Plan

- Information Provided to Stakeholders
  - Current Storage and Elevation
  - Recent Inflow, up to previous 12 months
  - Runoff forecast, where available
  - Snowpack Information
  - Operating Plans
    - Tabular and graphic form