2012 Hydrograph Development

Status

March 8, 2011

2011 Process

- Developed flexible constraints under MLFF
- Tested under 3 hydrologic scenarios
- Presented to Western
- Presented to AMWG
- AMWG recommended to Secretary
- Adopted by Secretary
- Agreed to more inclusive process in 2012

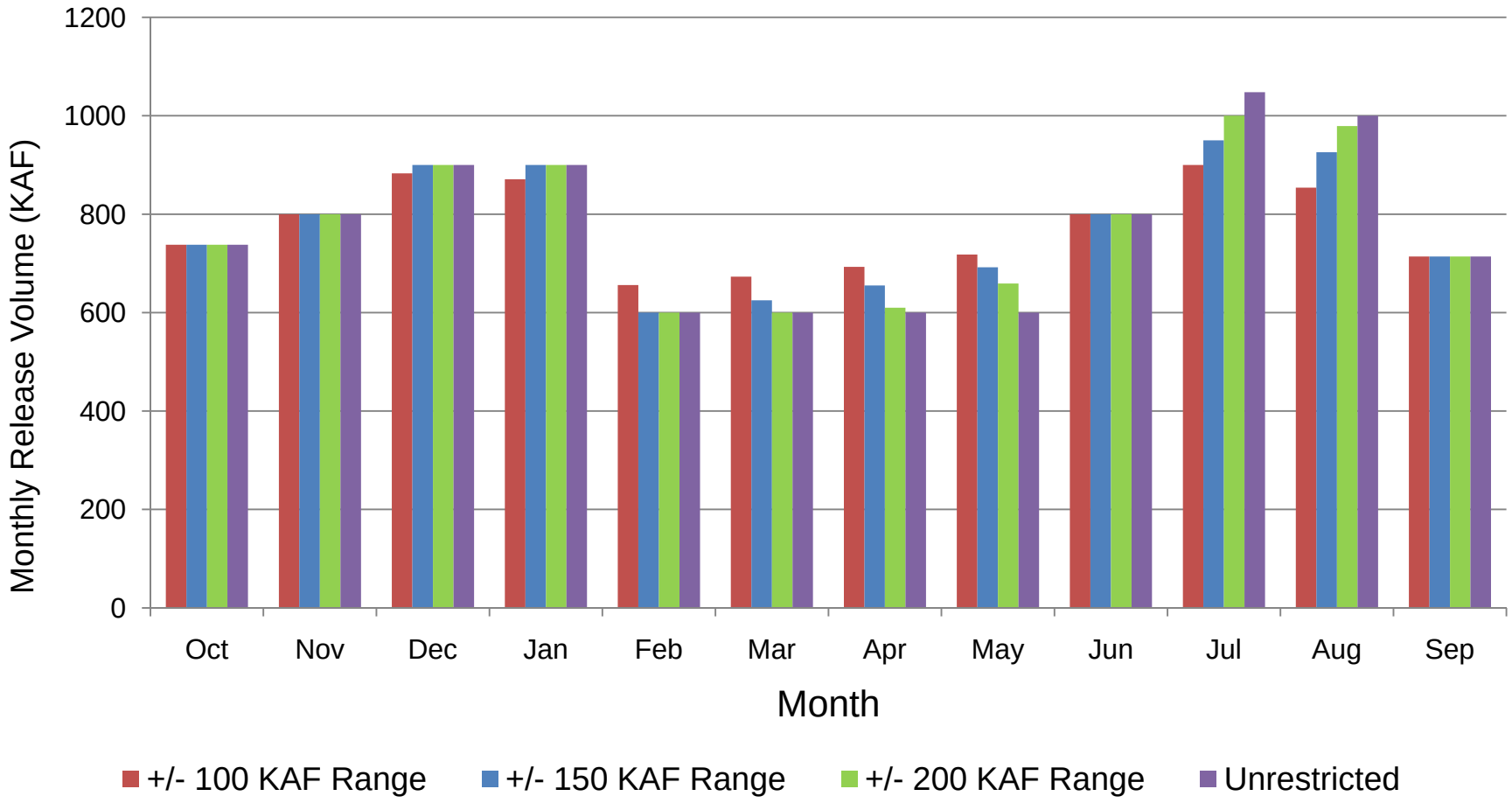
2011 Experiences

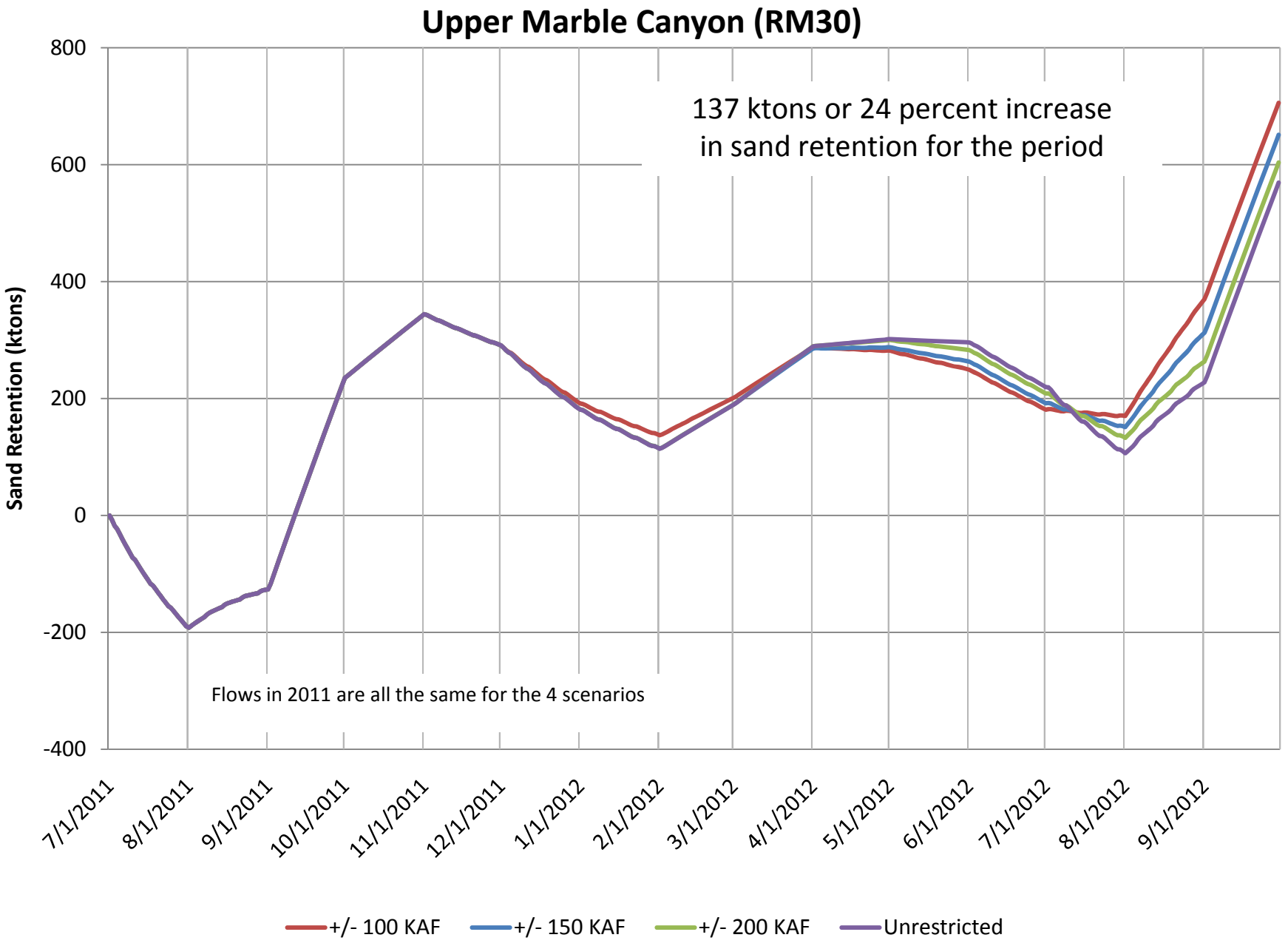
- 2011 method has been successfully applied
- Effects will be determined at year end
- Some complications with maintenance and unit outages
- Lower releases (than permitted) in the winter may be desirable to retain sediment in anticipation of a spring HFE

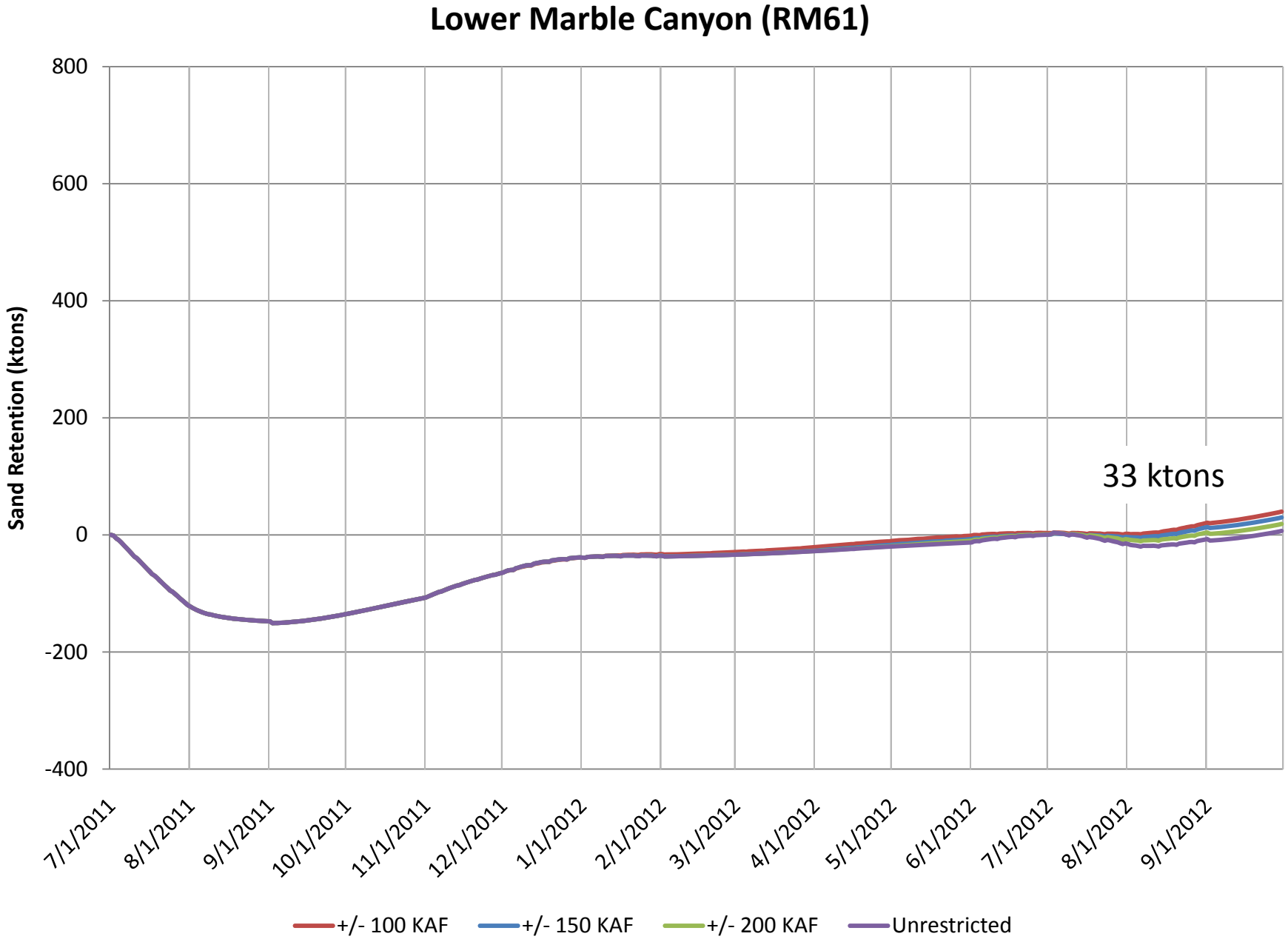
2012 Hydrograph Development

- Start with 2011 Hydrograph
- Consider operating experiences from 2011
- Look to improve the combination of cost and benefit
- 2012 Hydrograph recommendation will need to be within existing environmental compliance
- Non-MLFF ideas referred to LTEMP

Round 1
2012 Hydrograph Parameter Analysis
Monthly Volumes Distributions for 9.3 maf Release




Upper Marble Canyon (RM30)
Sand Retention (ktons)
800
600
400
200
0
-200
-400
137 ktons or 24 percent increase in sand retention for the period
Flows in 2011 are all the same for the 4 scenarios
7/1/2011
8/1/2011
9/1/2011
10/1/2011
11/1/2011
12/1/2011
1/1/2012
2/1/2012
3/1/2012
4/1/2012
5/1/2012
6/1/2012
7/1/2012
8/1/2012
9/1/2012
+/- 100 KAF
+/- 150 KAF
+/- 200 KAF
Unrestricted


Lower Marble Canyon (RM61)
Sand Retention (ktons)
800
600
400
200
0
-200
-400
33 ktons
7/1/2011
8/1/2011
9/1/2011
10/1/2011
11/1/2011
12/1/2011
1/1/2012
2/1/2012
3/1/2012
4/1/2012
5/1/2012
6/1/2012
7/1/2012
8/1/2012
9/1/2012
+/- 100 KAF
+/- 150 KAF
+/- 200 KAF
Unrestricted

Example of Power Cost Detail

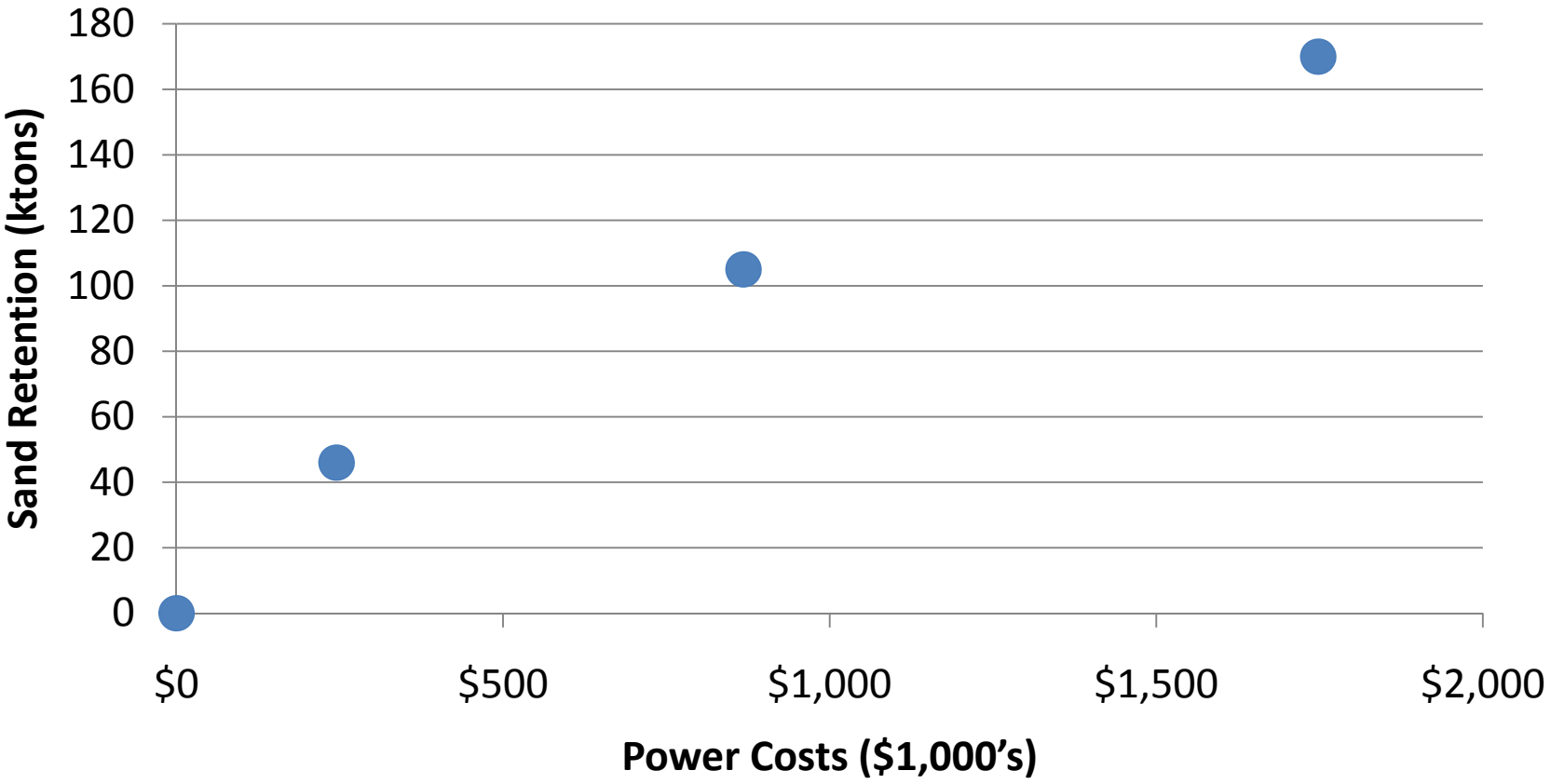
Scenario: +/-100k acre feet/month

	Monthly SLCA/IP Net Purchases (MWh)			Ave Price ($/MWh)		Monthly Net Revenue ($1,000)		
	On-Peak	Off-Peak	Total	On-Peak	Off-Peak	On-Peak	Off-Peak	Total
Oct	12,824	1,365	14,189	40.75	31.75	523	43	**566**
Nov	17,599	4,444	22,043	40.75	31.75	717	141	**858**
Dec	13,717	2,234	15,951	40.75	31.75	559	71	**630**
Jan	4,661	1,002	5,664	42.00	33.75	196	34	**230**
Feb	-53,725	-6,970	-60,695	38.50	29.50	-2,068	-206	**-2,274**
Mar	-49,712	-17,488	-67,200	38.60	28.50	-1,919	-498	**-2,417**
Apr	2,188	0	2,188	38.75	23.75	85	0	**85**
May	45,885	7	45,892	38.50	23.50	1,767	0	**1,767**
Jun	42,906	14	42,920	39.00	24.00	1,673	0	**1,674**
Jul	75,939	2,789	78,728	47.00	30.50	3,569	85	**3,654**
Aug	54,060	646	54,706	47.00	30.50	2,541	20	**2,561**
Sep	37,316	35	37,350	47.00	30.50	1,754	1	**1,755**
Tot	**203,658**	**-11,922**	191,736	**41.55**	**29.15**	**9,396**	**-308**	**9,087**

Summary of Round 1

Restriction Level	Additional Power Costs	Tons in Marble Canyon	Additional Tons Retained in Marble Canyon
100	$1,748,000	746,000	170,000
150	$868,000	681,000	105,000
200	$245,000	622,000	46,000
None	$0	576,000	0

Sand Retention



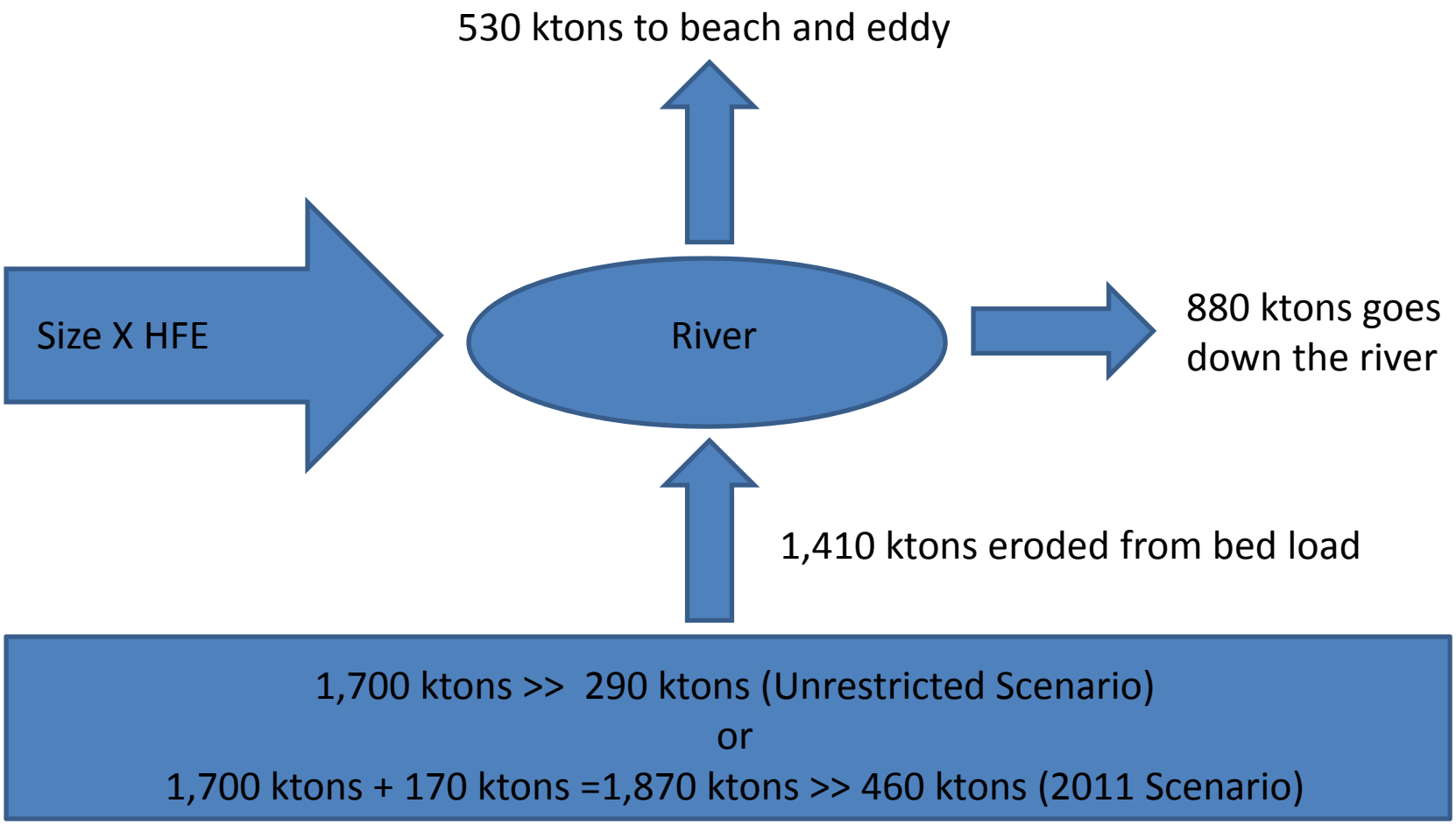
Comparison of Unrestricted vs. +/- 100 kaf

- The +/-100 kaf scenario retained 170 ktons in Marble Canyon
- Historically HFE's have deposited about 600 ktons above 8000 cfs level (somewhat independent of sediment input)
- Starting with a higher bed load could be expected to help reduce the net loss of sediment from the system by an HFE.
- Additional Cost = $1.75m

Sand Budget Illustration 1

(Fixed HFE but with Higher Retention)

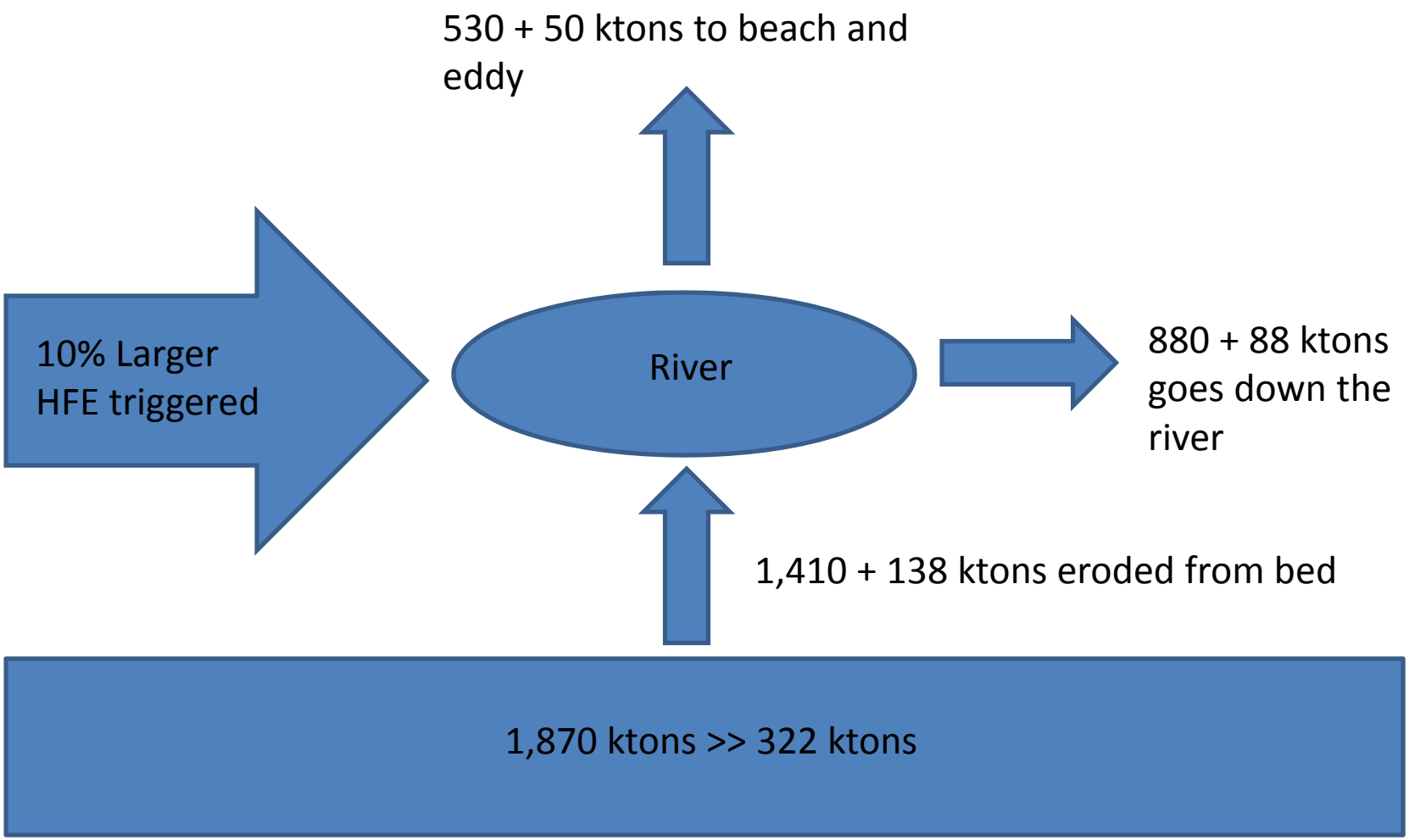
Assumes: No change in HFE, Historic budget



Sand Budget Illustration 2

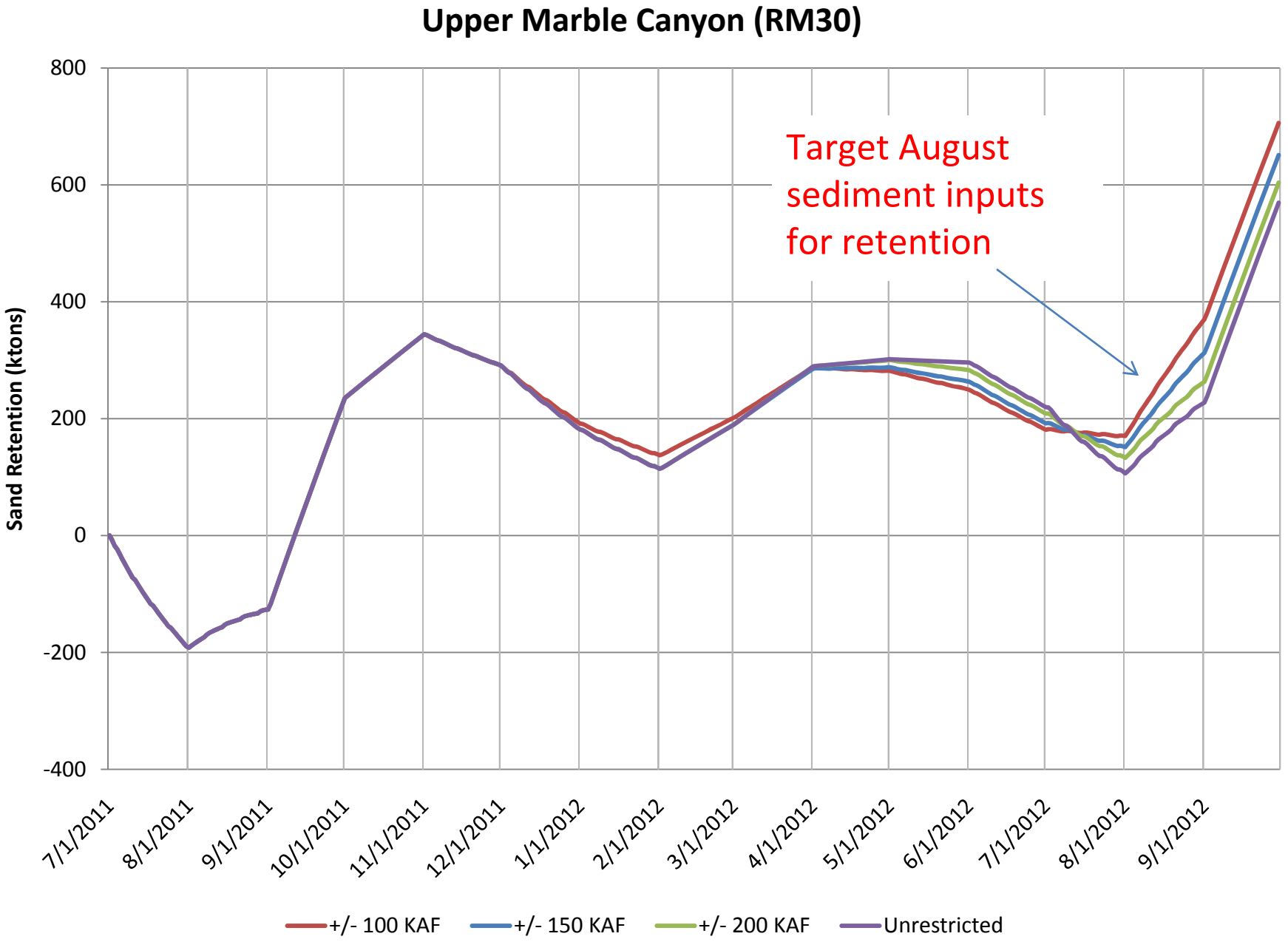
(Larger HFE Triggered by Retention)

Assumes: 10% Larger HFE Triggered due to Higher Retention
10% more to beach, eddy, and export

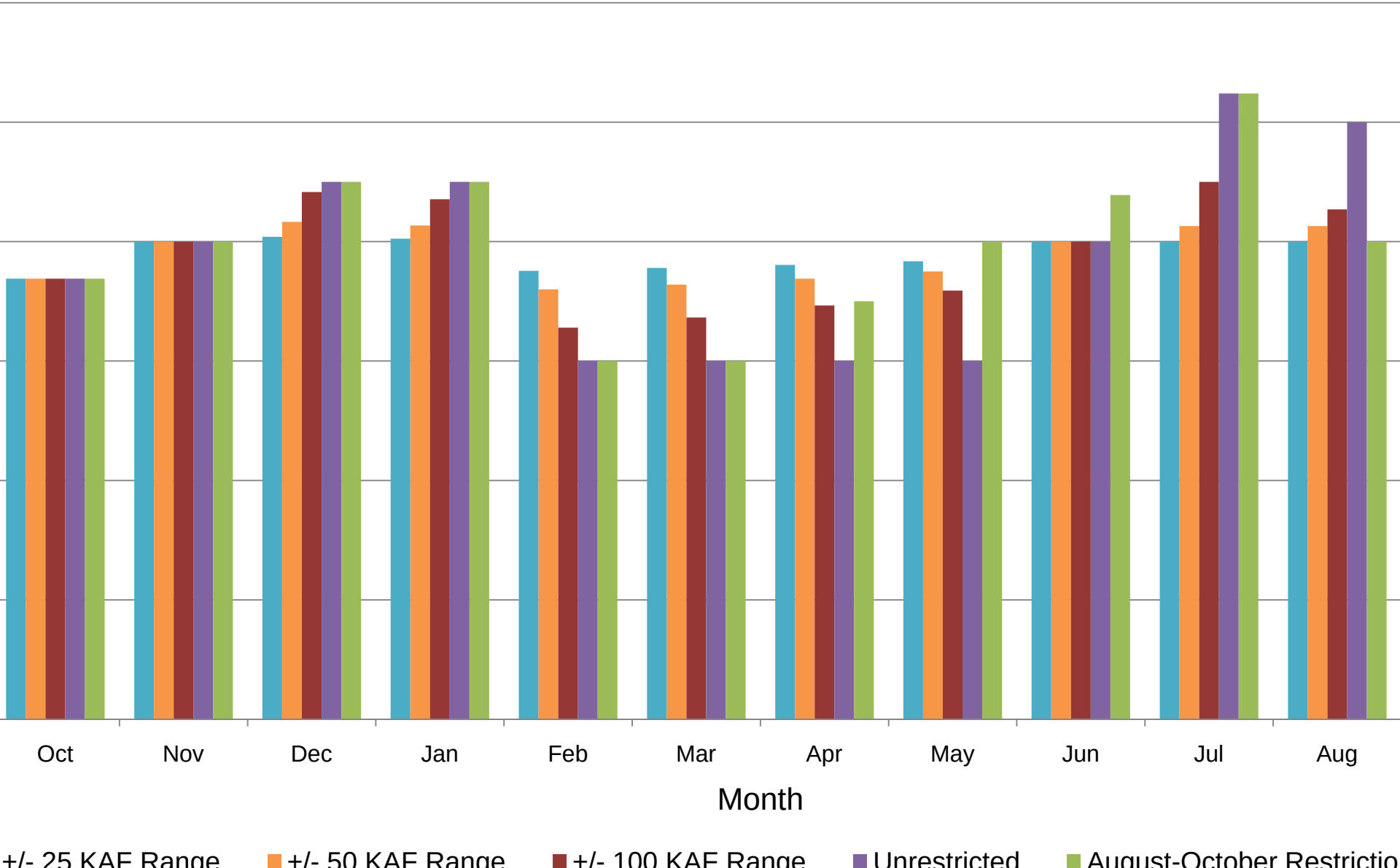


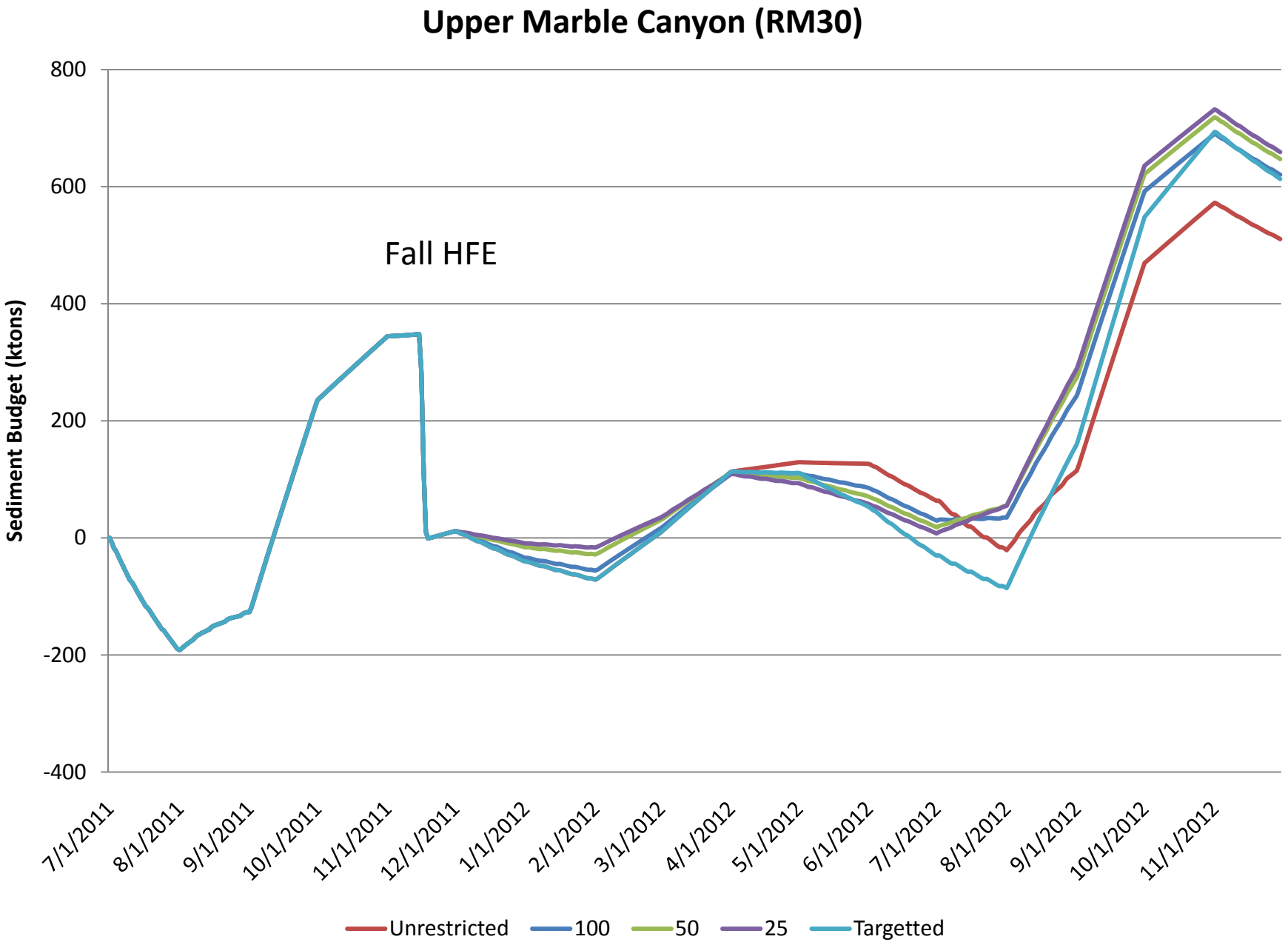
Next Steps – Round 2

- Add possible November 2011 HFE to all runs to better simulate starting conditions for 2012
- Scenario 5 – run +/- 25 kaf restriction
- Scenario 6 – run +/- 50 kaf restriction
- Scenario 7 – run +/- 100 kaf restriction
- Scenario 8 – run +/- unrestricted
- Scenario 9 - run targeted August-Oct restriction
  - (August 800 kaf)
  - (Sept/Oct at 5yr Steady Flow Test levels)


Upper Marble Canyon (RM30)
Sand Retention (ktons)
800
600
400
200
0
-200
-400
7/1/2011
8/1/2011
9/1/2011
10/1/2011
11/1/2011
12/1/2011
1/1/2012
2/1/2012
3/1/2012
4/1/2012
5/1/2012
6/1/2012
7/1/2012
8/1/2012
9/1/2012
Target August sediment inputs for retention
+/- 100 KAF
+/- 150 KAF
+/- 200 KAF
Unrestricted

Round 2
2012 Hydrograph Parameter Analysis
Monthly Volumes Distributions for 9.3 maf Release




Upper Marble Canyon (RM30)
Fall HFE
Sediment Budget (ktons)
800
600
400
200
0
-200
-400
7/1/2011
8/1/2011
9/1/2011
10/1/2011
11/1/2011
12/1/2011
1/1/2012
2/1/2012
3/1/2012
4/1/2012
5/1/2012
6/1/2012
7/1/2012
8/1/2012
9/1/2012
10/1/2012
11/1/2012
Unrestricted
100
50
25
Targetted

Add
Round 2
Power Costs