Fish and Wildlife Program Mainstem Amendments

October 15, 2002

Spokane, Washington

Northwest Power Planning Council

Caveats

- Best attempt made to capture the "intent" of each scenario
- This is a DRAFT analysis and may require fine tuning
- Electricity prices used reflect more "normal" conditions with an annual average of about $28/MW-hour
- These analyses reflect regional impacts

Mainstem Scenarios

- Montana
  - With 110%, 115% and 120% gas limits
  - With a September 20’ draft limit
  - Without an April fill requirement
- Idaho
- Washington
  - With a 1288’ or 1283’ elevation limit
- Oregon
  - With 1,427 or 427 kaf of upper Snake Water
- Combination of MT, ID and WA

Major Issues

- Amount of bypass spill
- Amount and timing of flow augmentation volumes
- Method for release of flow augmentation volume
  - Lower river flow objectives, or
  - At-site control of release
- Requirement to fill by April 10th

Oregon Scenario

- September-April
  - Increase flows for Chum
  - Fill to flood control elevations by April 10
- April-June
  - Keep biop flow objectives (85 to 100 kcfs)
  - Provide bypass spill 24 hours/day
  - Fill reservoirs by end of June
  - Increase max flow at Dworshak to 22 kcfs

Oregon Scenario (cont'd)

- July-August
  - Acquire 1.427 maf of upper Snake water
  - Provide bypass spill 24 hours/day
  - Acquire 1 maf of non-Treaty water
  - Increase max flow at Dworshak to 22 kcfs

Oregon Scenario (cont'd)

- End of August
  - Max draft at Libby is 2429' (30' from full)
  - Max draft at Horse is 3530' (30' from full)
  - Max draft at Coulee is 1270' (20' from full)
  - Max draft at Dworshak is 1500' (100' down)

Summary of Impacts

- River Flows & Augmentation Volumes
- Bypass Spill
- Reservoir Elevations
- Retention Time at Grand Coulee
- Hydroelectric Generation
- Cost

Oregon Summary
(Probability of Meeting Biop Flow Objectives)

	LWG	427 kaf	Biop	MCN	427 kaf	Biop
April	85	52	54	220	66	50
May	85	72	72	220	90	80
June	85	68	68	220	72	74
July	50	72	68	200	72	56
Aug1-15	50	18	0	200	62	40
Aug 16-31	50	8	0	200	40	12

Oregon Summary
(relative to the 2000 biological opinion)

	427 kaf	1427 kaf	Comments
Apr-Jun Flow Volume (kaf)	399	733	+2.6 kcfs / +4.8 kcfs
Jul-Aug Flow Volume (kaf)	2932	3132	+23.7 kcfs / +25.3 kcfs
Sept Flow Volume (kaf)	-221	-160	Decrease flows slightly
Bypass Spill Volume (maf)	25	25	Increase spill from 84 maf
April 15th Fed Content (kaf)	-130	-116	Lower than biop
June 30th Fed Content (kaf)	-35	-40	About the same as biop
Aug 31st Fed Content (kaf)	-1093	-881	1600 / 1250 MW-mo less Could affect reliability
Coulee Jul-Aug Ret (days)	-6.2	-5.8	About 33 days, min is 40
Annual Hydro Gen (aMW)	-261	-234	Or about 3,000 MW-months
Dec-Mar Gen (MW-mo)	-2579	-2554	Could affect reliability
Regional Cost (millions)	$ 47.1	$ 42.2	

Montana Scenario

- October-April
  - Continue to provide flows for Chum
  - Continue to fill to flood control elevations by April 10
- April-June
  - Remove flow objectives
  - Limit bypass spill to 115% gas level
  - Fill reservoirs by end of June
  - Revised flows for sturgeon in May and June

Montana Scenario (cont'd)

- July-September
  - Remove flow objectives
  - Limit bypass spill to 115% gas level
  - Release flow augmentation water at Libby and Horse to level outflows
  - Release flow augmentation water at Coulee and Dworshak evenly over this period

Montana Scenario (cont'd)

- End of September
  - Max draft at Libby is 2449' (10' from full)
  - Libby can draft to 2439' in 20% driest years
  - Max draft at Horse is 3550' (10' from full)
  - Horse can draft to 3540' in 20% driest years
  - Max draft at Coulee is 1280' (10' from full)
  - Max draft at Dworshak is 1520' (80' down)

Montana Summary
(relative to the 2000 biological opinion)

	115%	110%	120%	No April	20' Draft
Apr-Jun Flow Volume (kaf)	264	264	264	-376	217
Jul-Aug Flow Volume (kaf)	-1095	-1095	-1095	-1109	-837
Sept Flow Volume (kaf)	847	847	847	847	986
Bypass Spill Volume (maf)	-36.1	-56.7	-2	-36	-36
April 15th Fed Content (kaf)	-54	-54	-54	-705	-95
June 30th Fed Content (kaf)	-60	-60	-60	-70	-60
Aug 31st Fed Content (kaf)	978	978	978	978	709
Coulee Jul-Aug Ret (days)	2.9	2.9	2.9	2.9	2.1
Annual Hydro Gen (aMW)	345	532	70	343	346
Dec-Mar Gen (MW-mo)	218	218	114	1279	234
Regional Cost (millions)	-$ 60.6	-$ 102.3	-$ 8.7	-$ 67.8	-$ 65.2

Idaho Scenario

- October-April
  - Continue to provide flows for Chum
  - Continue to fill to flood control elevations by April 10
- April-June
  - Limit Lower Granite flow objective to 85 Kcfs
  - Fill reservoirs by end of June

Idaho Scenario (cont'd)

- July-September
  - Keep biological opinion flow objectives
  - Libby and Horse on IRC operation
  - Coulee on retention time operation
  - Dworshak elevation targets
    - » **1584' by July 31st**
    - » **1562.5' by August 15th**
    - » **1538' by August 31st**
    - » **1520' by September 30th**

Idaho/Combo Summary
(relative to the 2000 biological opinion)

	Idaho				ID+MT+WA
Apr-Jun Flow Volume (kaf)	104				-267
Jul-Aug Flow Volume (kaf)	-18				-886
Sept Flow Volume (kaf)	220				416
Bypass Spill Volume (maf)	0				-36
April 15th Fed Content (kaf)	-88				-585
June 30th Fed Content (kaf)	-10				-60
Aug 31st Fed Content (kaf)	24				774
Coulee Jul-Aug Ret (days)	0				2.7
Annual Hydro Gen (aMW)	41				340
Dec-Mar Gen (MW-mo)	-158				824
Regional Cost (millions)	-$ 9.6				-$ 55

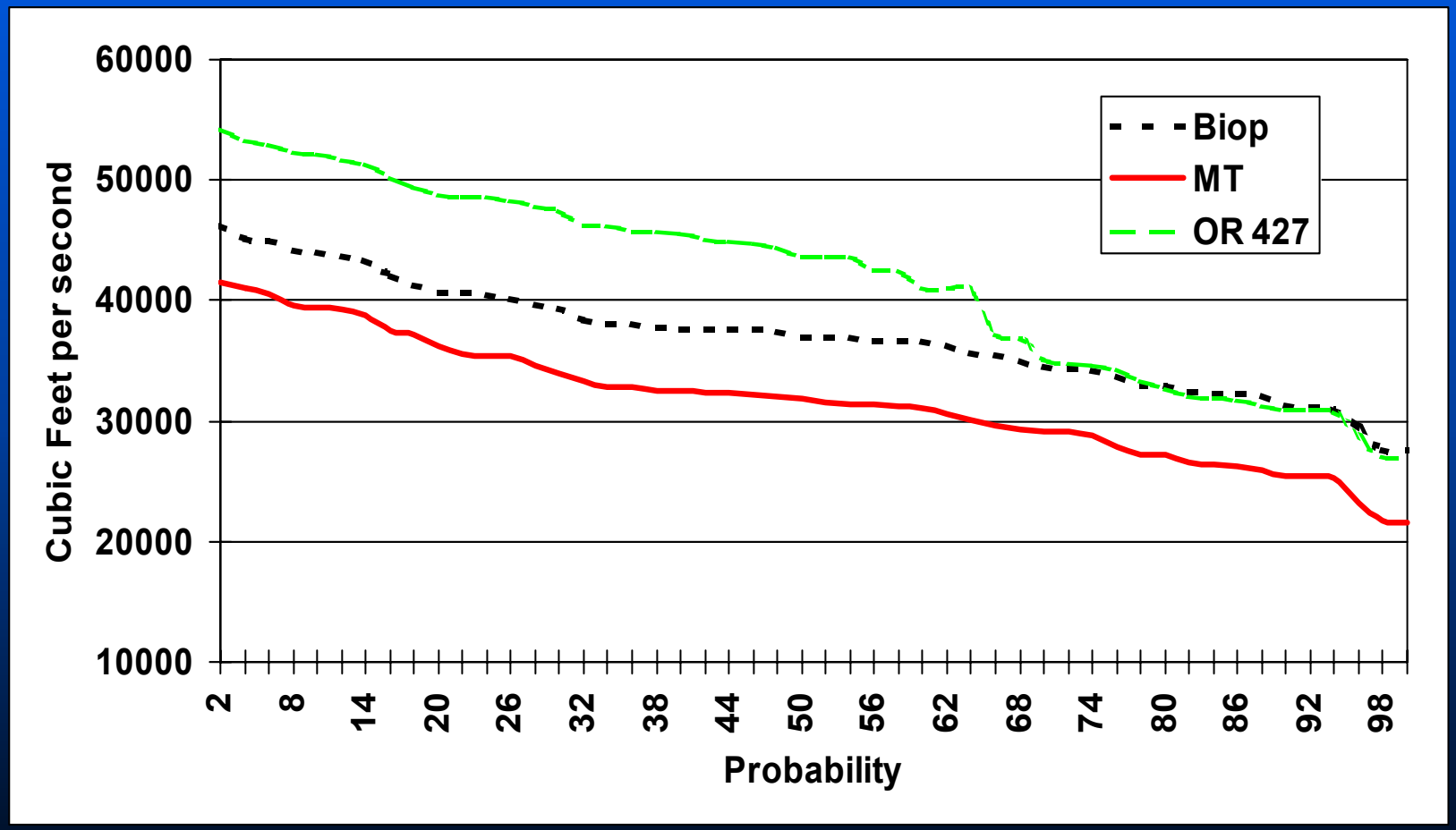
Washington Scenario

- High priority to target elevations at Coulee
  - January 1270 feet
  - February 1260 feet
  - March-April 15 1250 feet
  - April 16-30 1255 feet
  - May 1265 feet
  - June-December 1288 feet

Washington Summary
(relative to the 2000 biological opinion)

	1283'	1288'			
Apr-Jun Flow Volume (kaf)	-453	-335			
Jul-Aug Flow Volume (kaf)	-250	-785			
Sept Flow Volume (kaf)	305	292			
Bypass Spill Volume (maf)	0	0			
April 15th Fed Content (kaf)	-635	-600			
June 30th Fed Content (kaf)	0	-80			
Aug 31st Fed Content (kaf)	254	704			
Coulee Jul-Aug Ret (days)	1.1	3.5			
Annual Hydro Gen (aMW)	42	57			
Dec-Mar Gen (MW-mo)	1184	1183			
Regional Cost (millions)	-$ 6.3	-$ 4.1			

Flow Profiles – Lower Granite August 1-15



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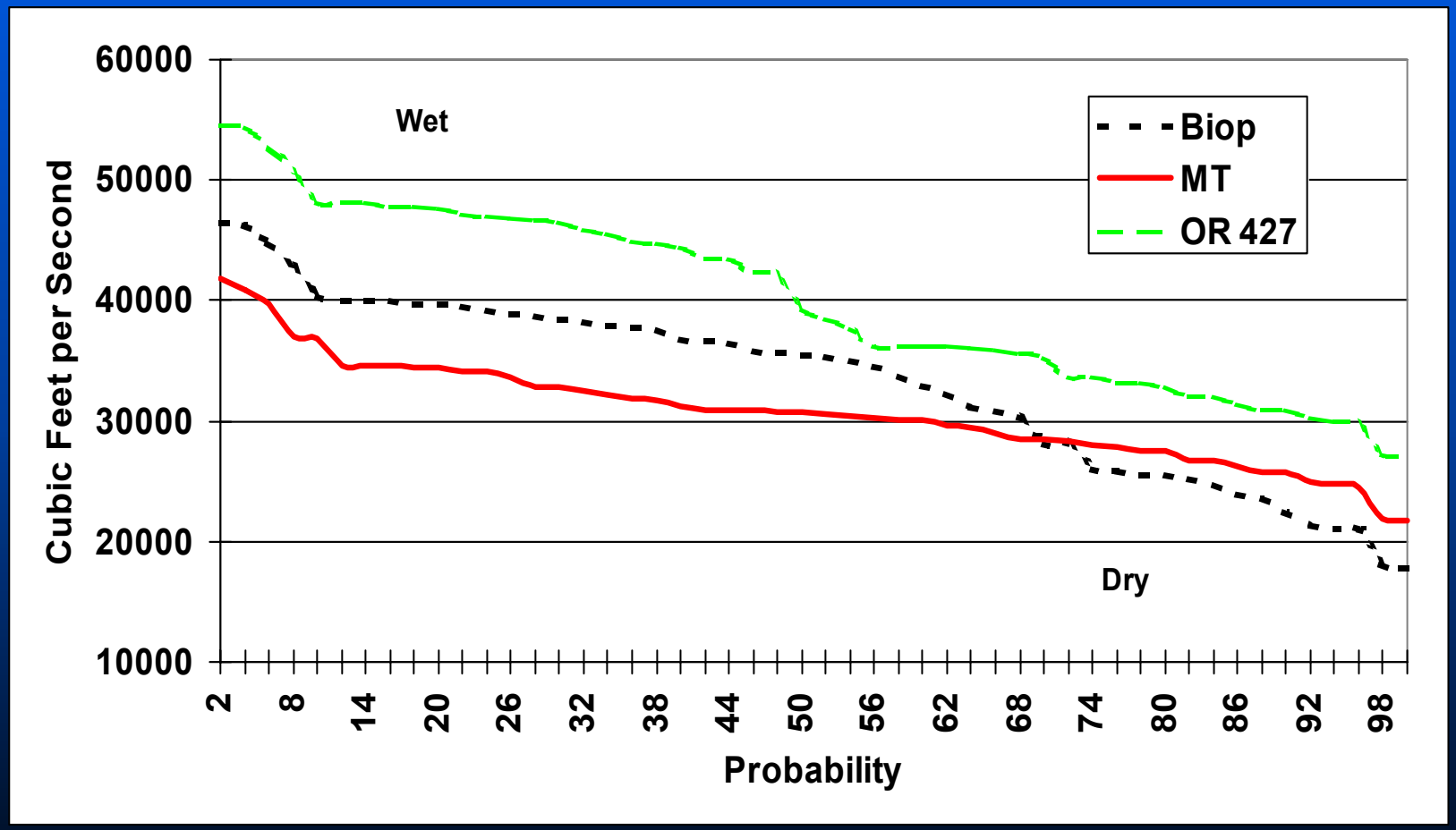
Flow Profiles – Lower Granite August 16-31



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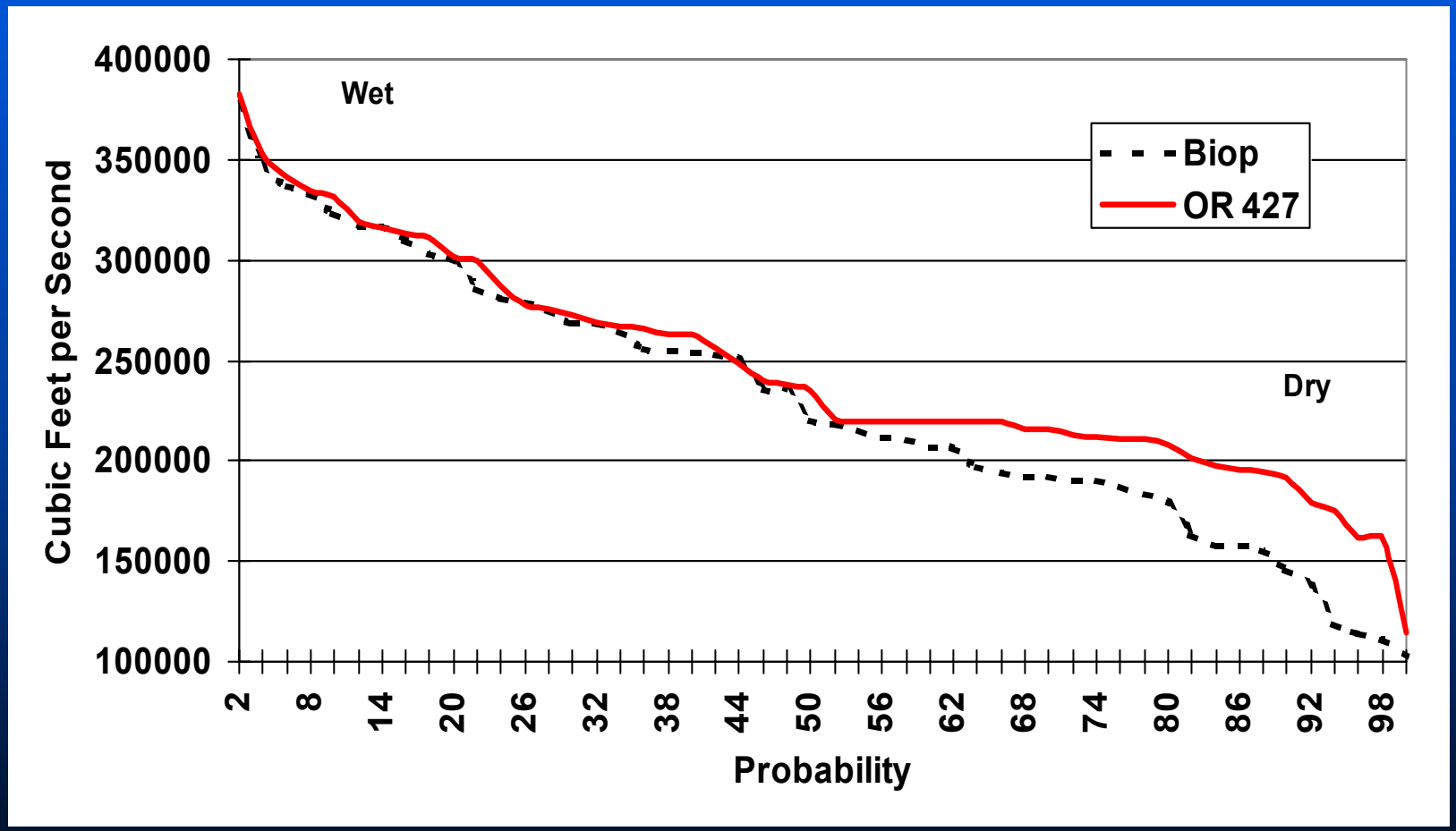
Flow Profiles – McNary April 16-30



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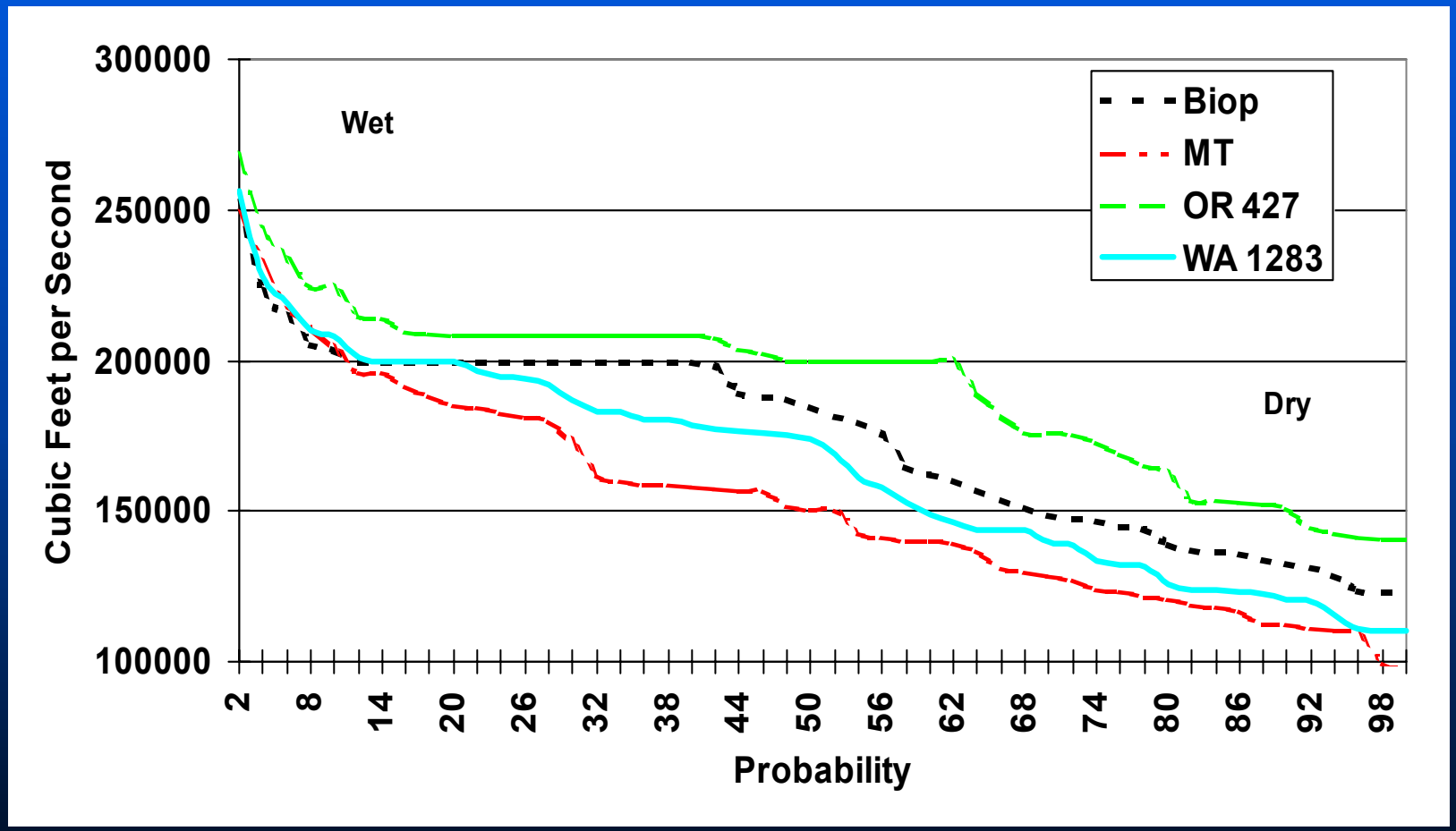
Flow Profiles – McNary August 1-15



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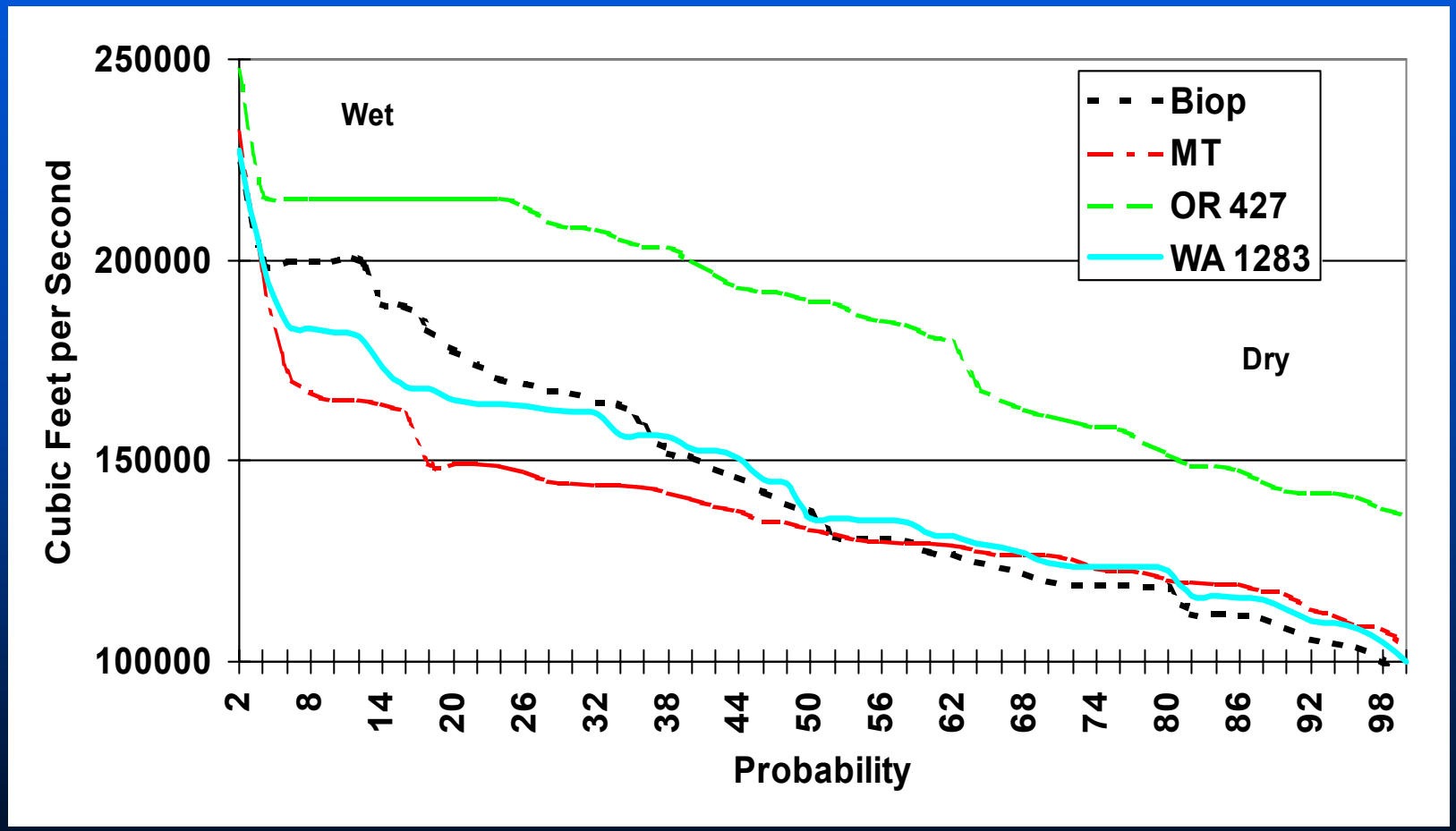

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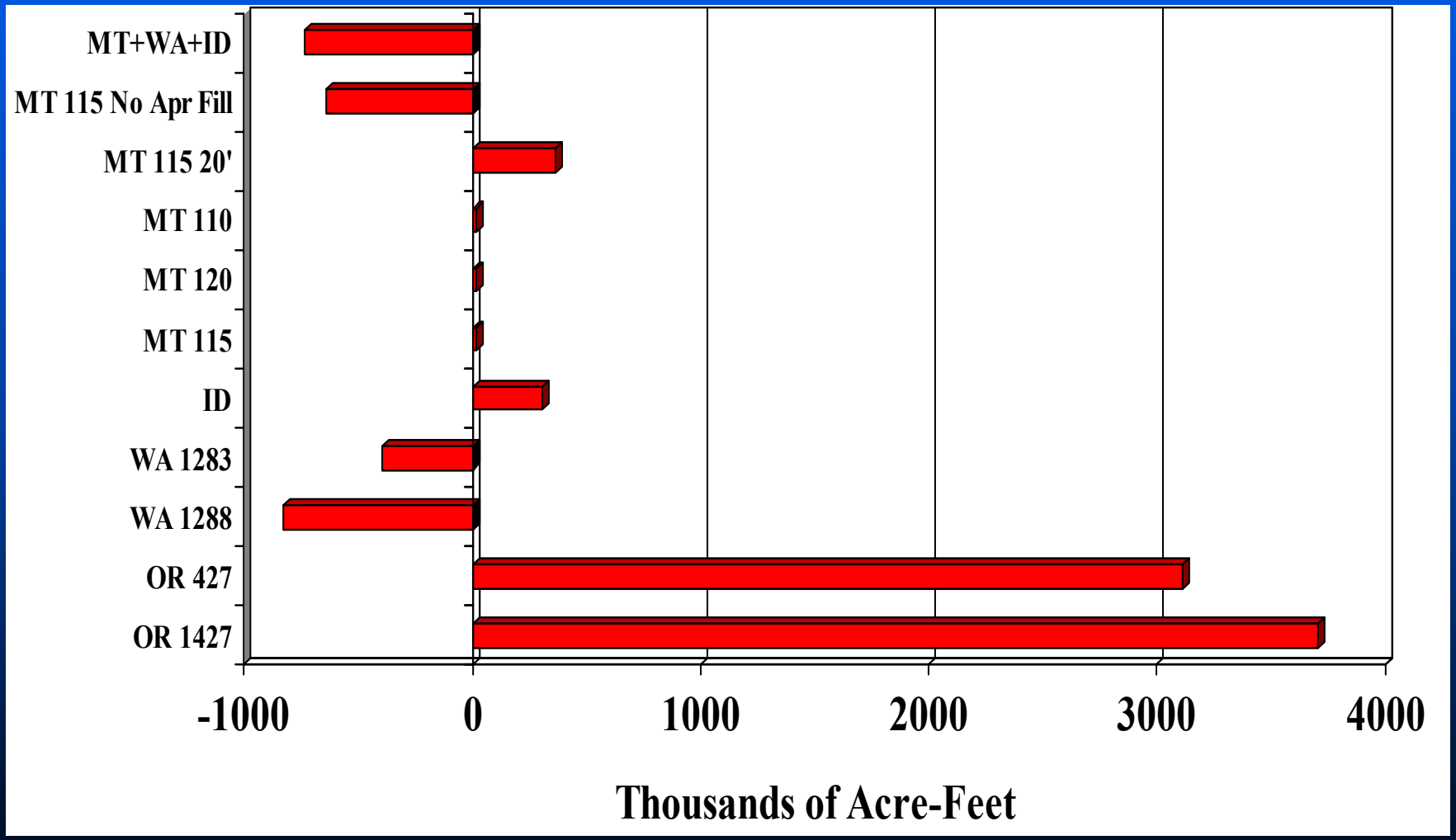
Change in Flow Volume – Apr16-Sep
(50-Year Average at McNary vs. Biop)



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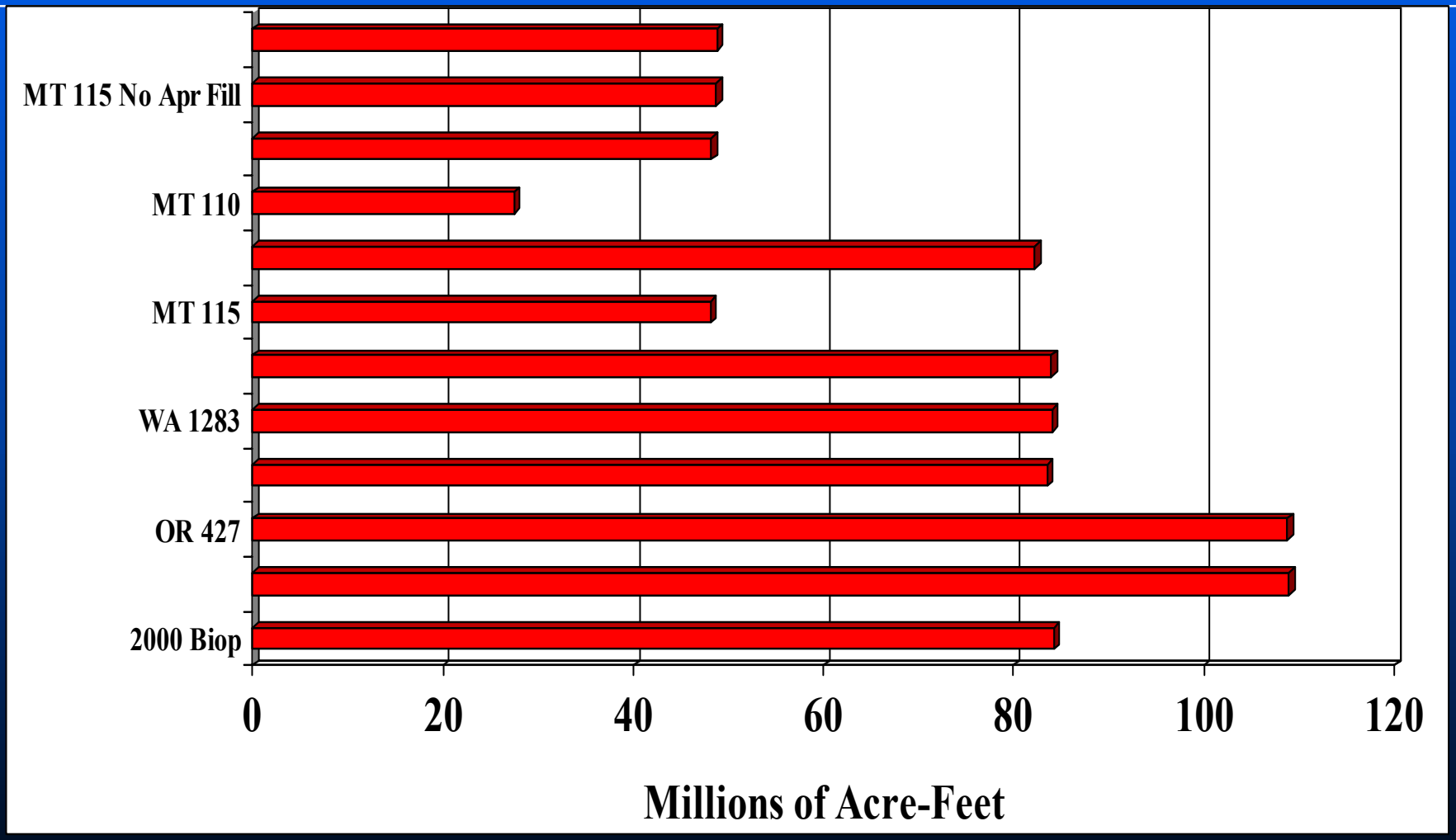
Bypass Spill Volumes – Apr16-Aug
(50-Year Average)



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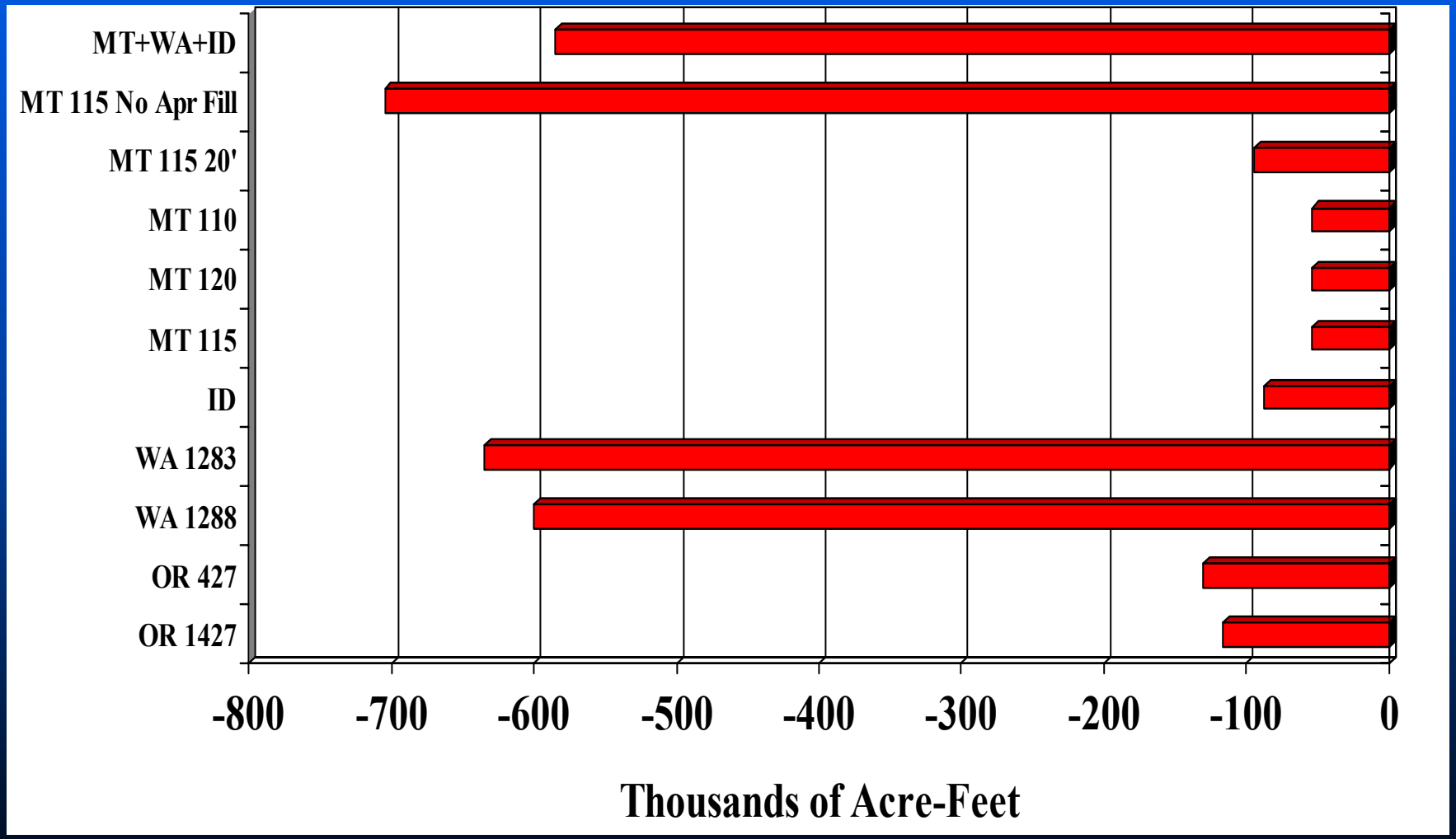
Difference in Apr15 Fed Content
(50-Year Average relative to the biop)



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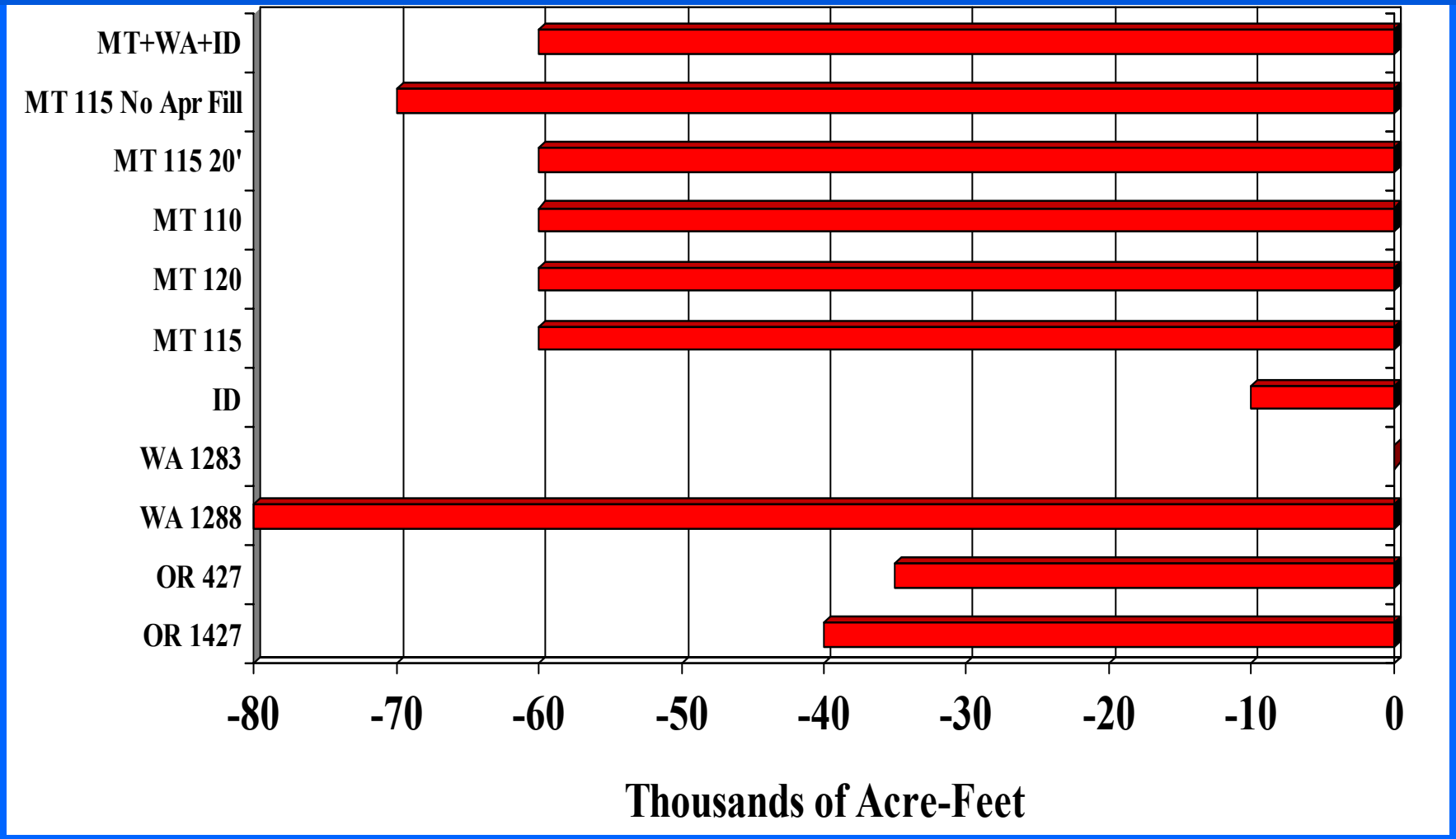
Difference in June30 Fed Content
(50-Year Average relative to the biop)



Difference in Aug31 Fed Content
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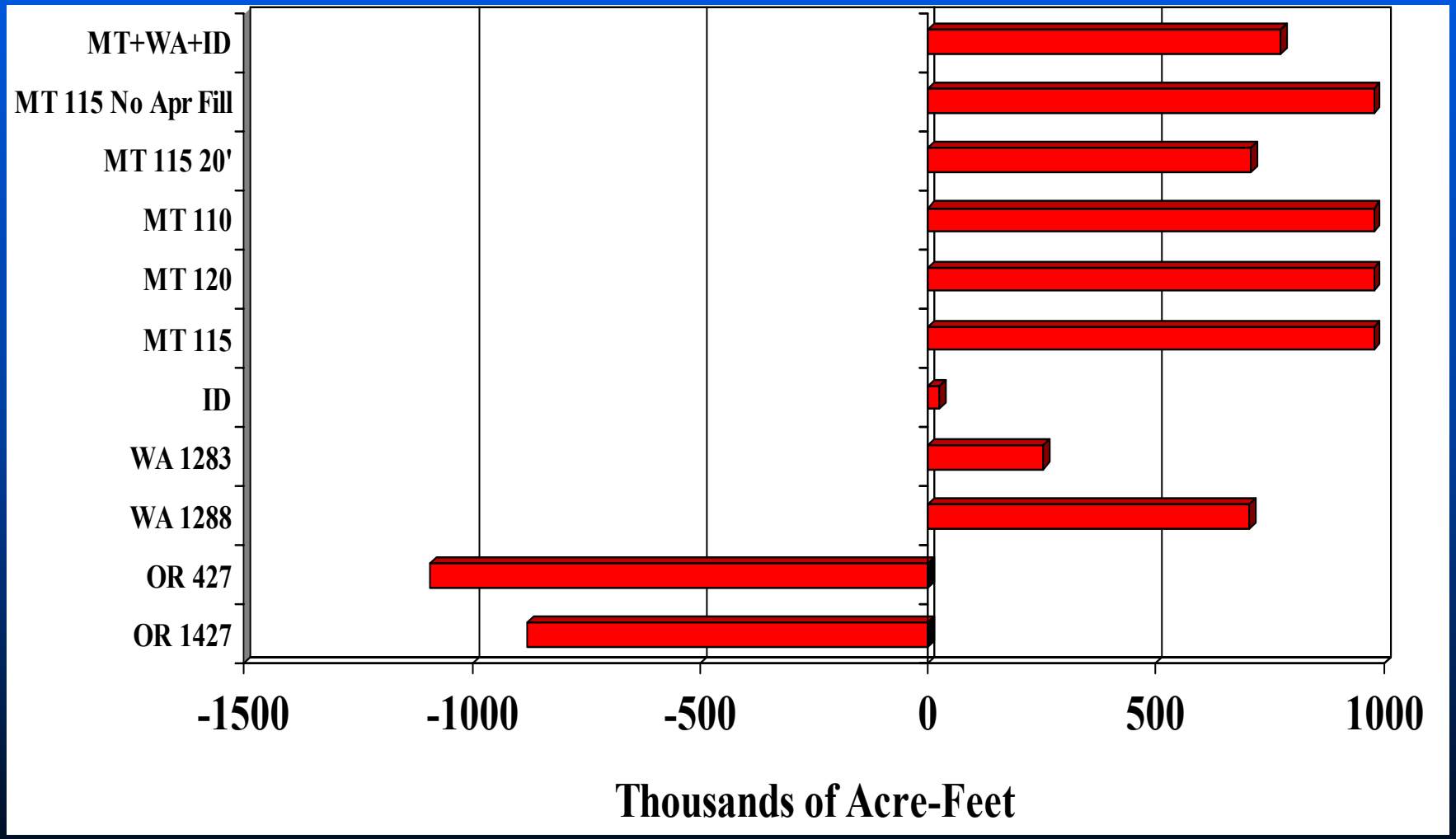

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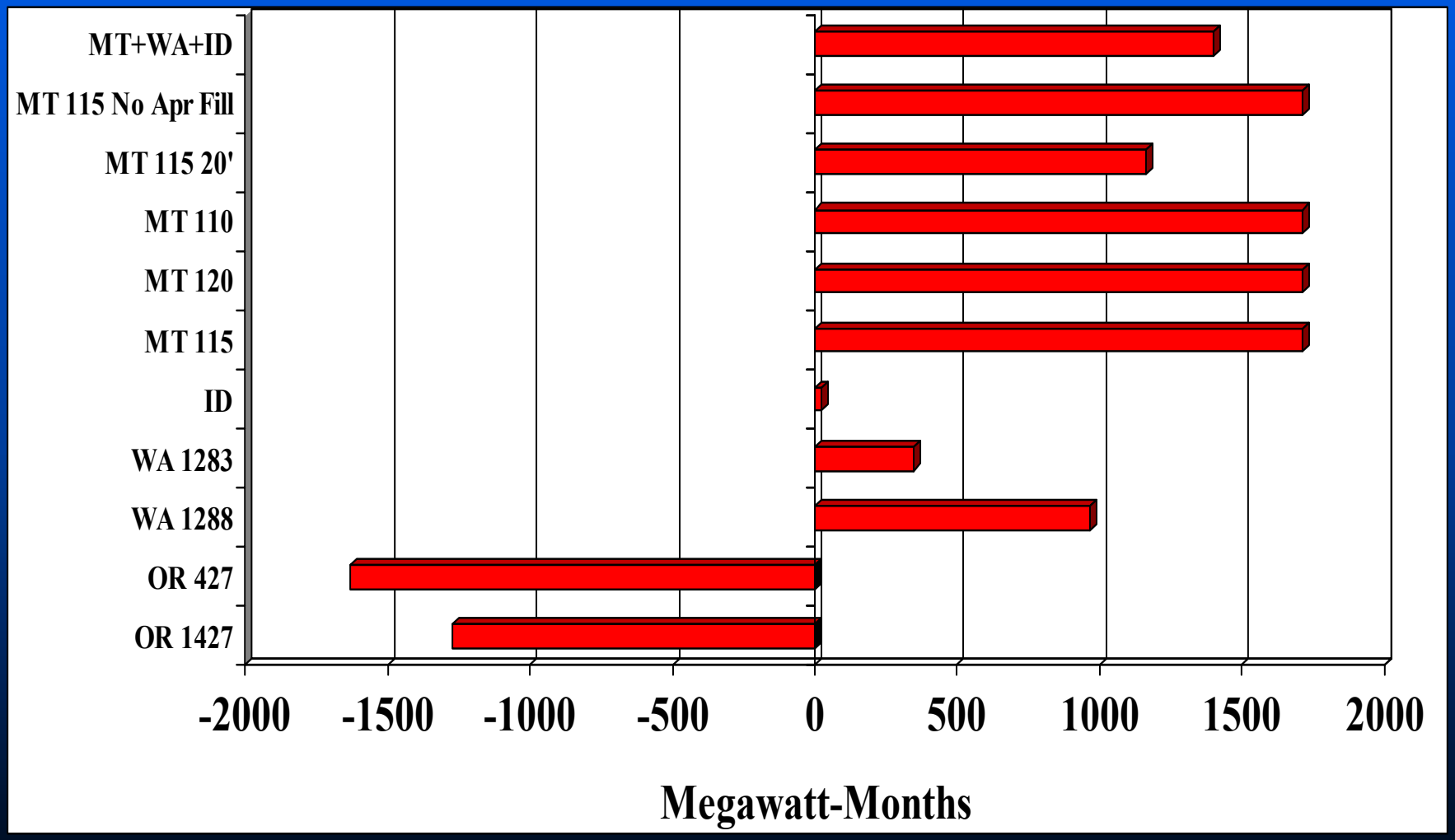
Difference in Sep Starting Content
(50-Year Average relative to the biop)



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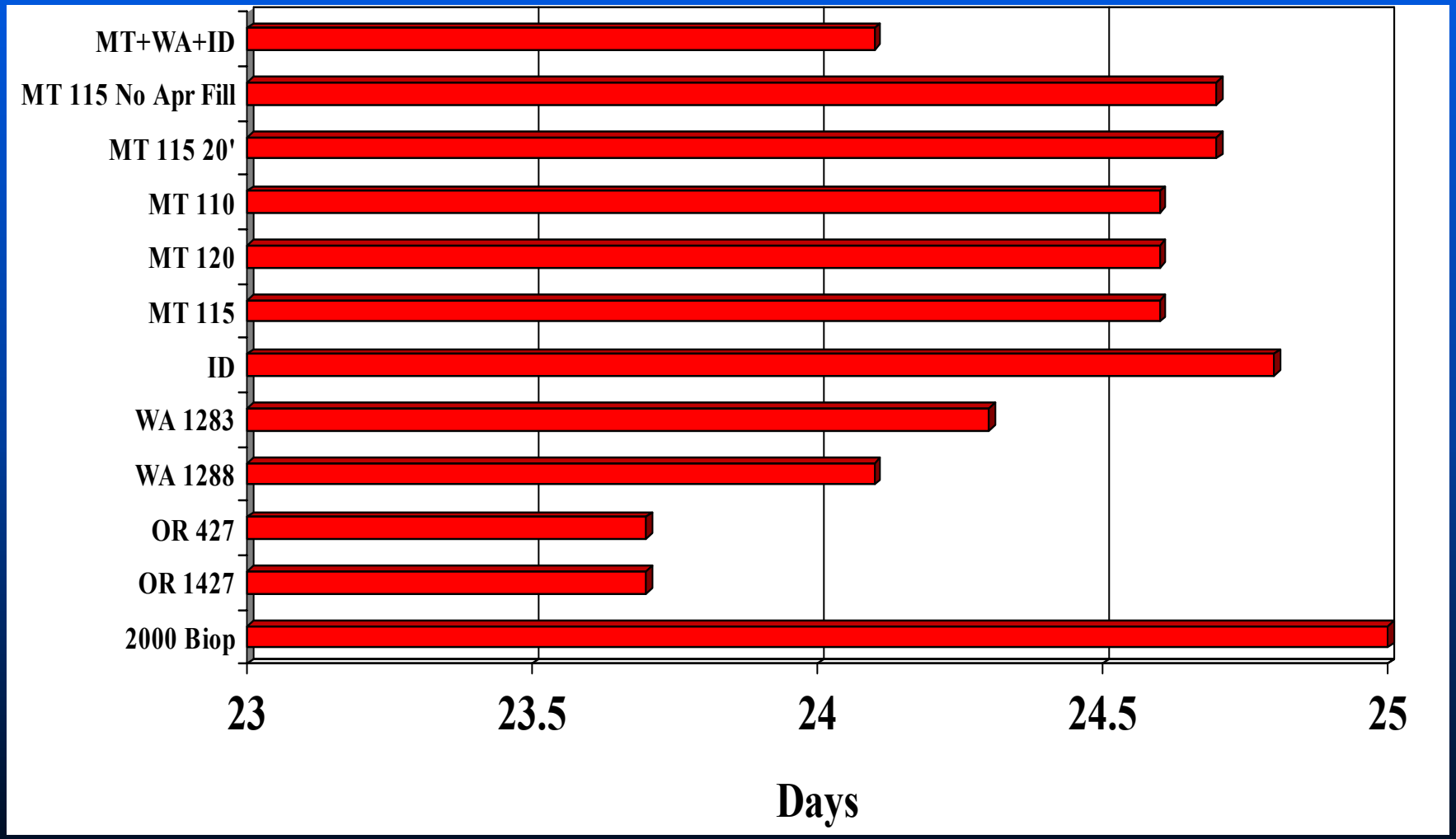
Coulee Retention Time – Apr16-June (50-Year Average)



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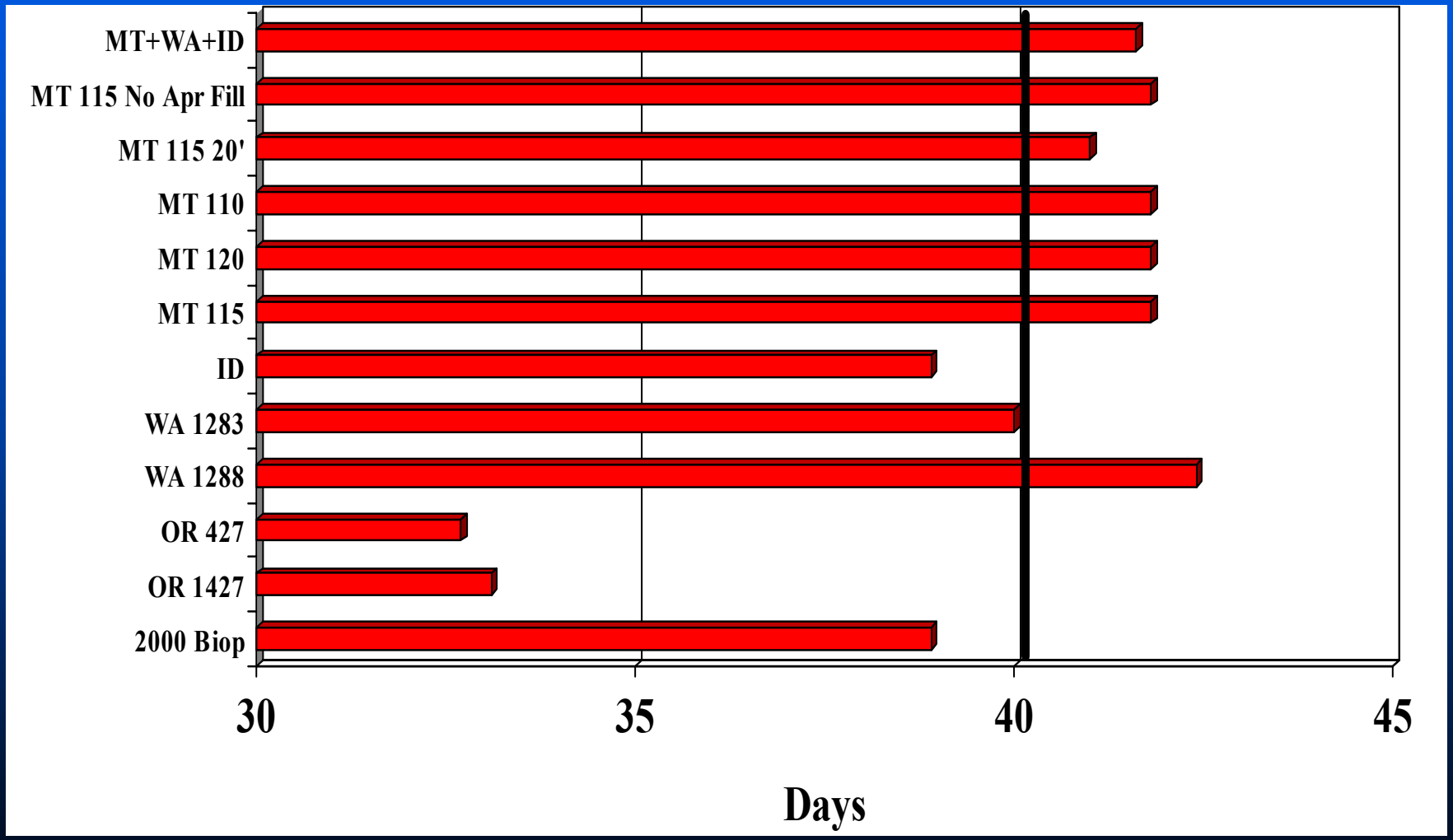
Coulee Retention Time – July-August
(50-Year Average)



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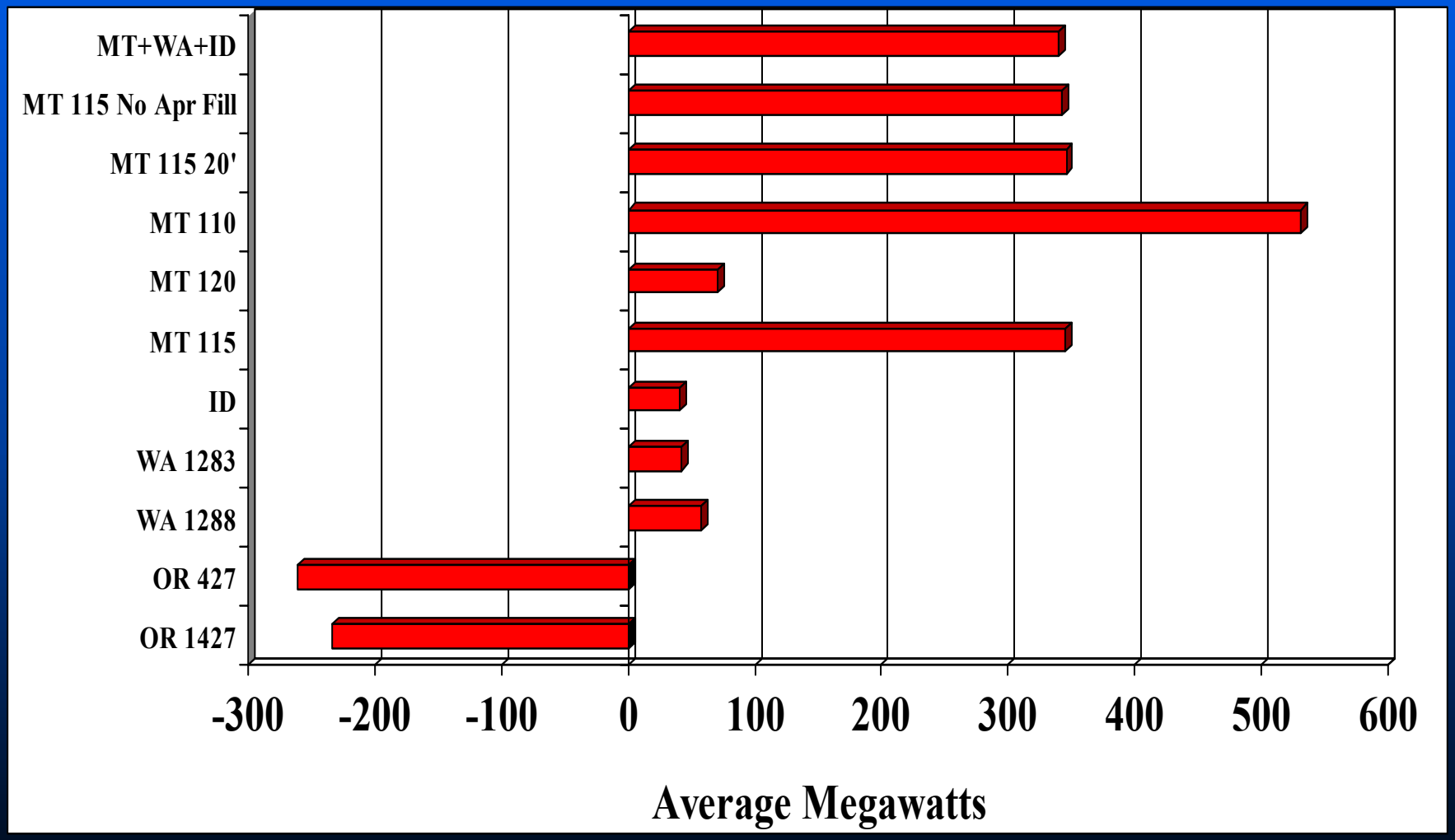
Change in Annual Hydro Generation
(Regional 50-Year Average)



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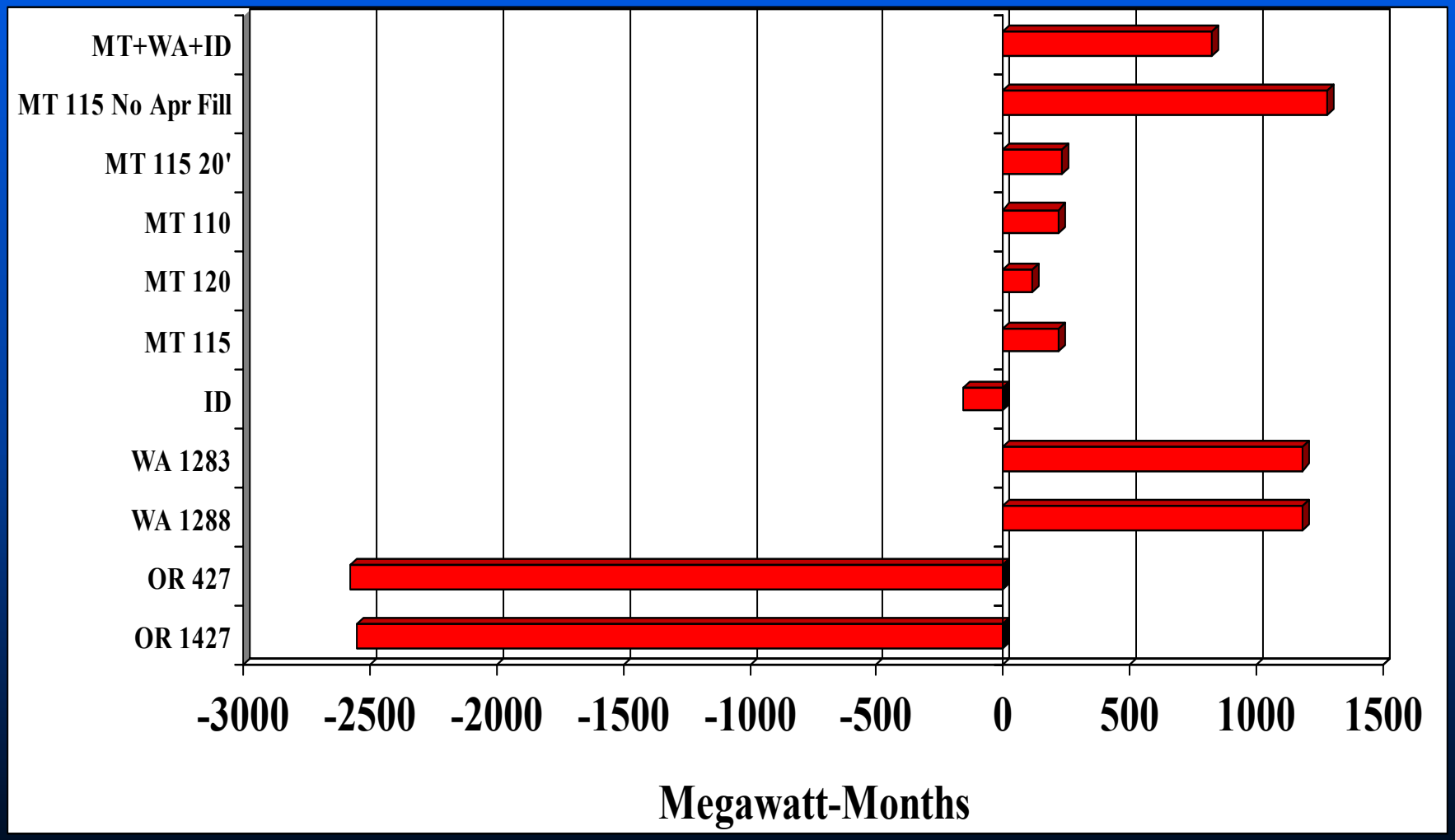
Change in Dec-Mar Hydro Generation
(Regional 50-Year Average)



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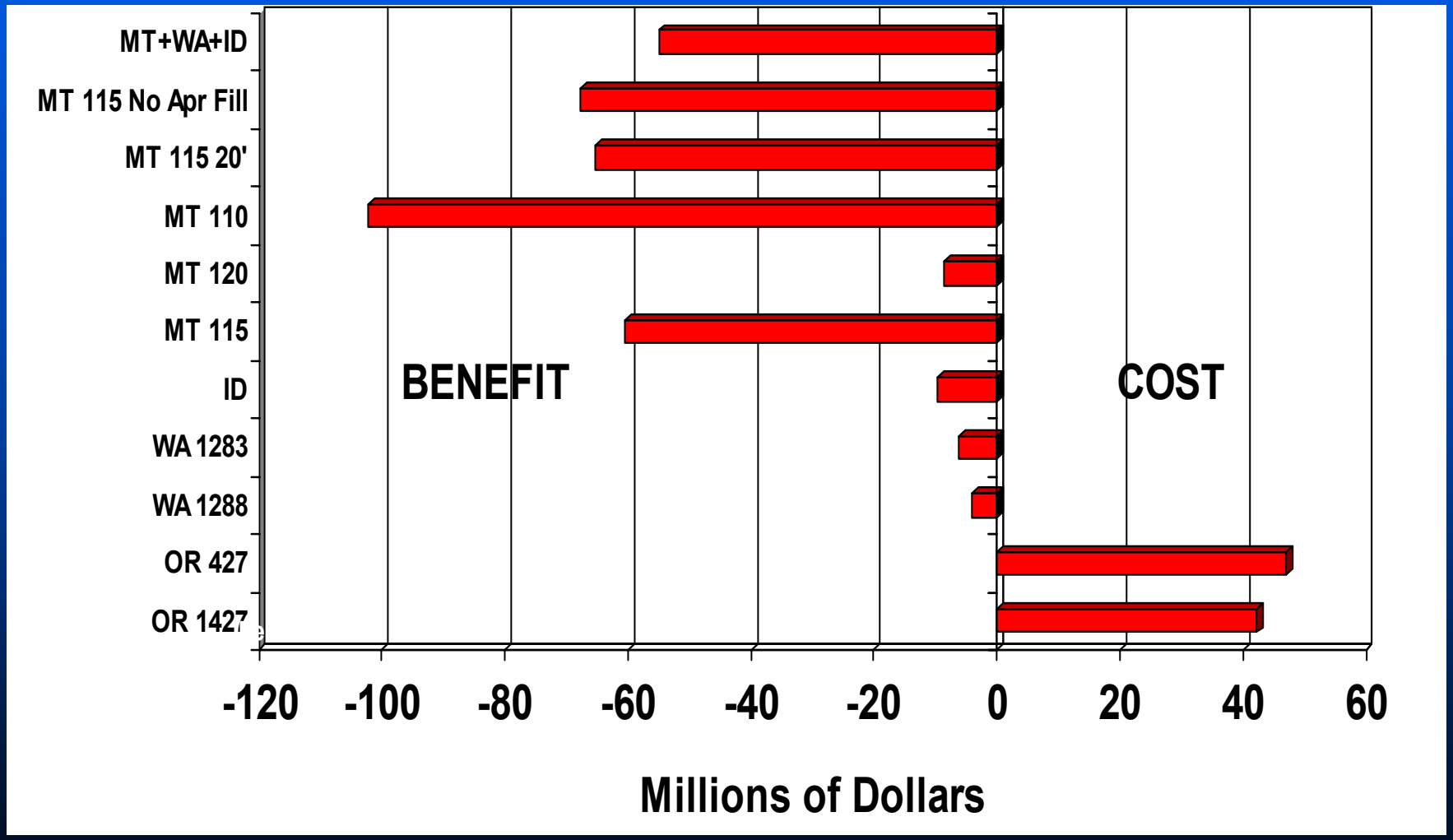
Annual Cost/Benefit
(Regional 50-Year Average)



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Approximate Reservoir Volumes (Kaf)

From Full	Coulee	Libby	Horse	Dworshak
2’	165			
10’	750	460	240	
20’	1,500	900	470	
80’				1,200