



— BUREAU OF —
RECLAMATION

River Operations and TWSA Meeting

Yakima Basin, Washington

April 6, 2020, WY 2020



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Reclamation announces Yakima basin water supply – April forecast

YAKIMA, Wash. – The Bureau of Reclamation's April 2020 Total Water Supply Available (TWSA) forecast for the Yakima basin indicates the water supply will fully satisfy senior water rights while the junior water rights will be limited to an estimated 96% of their full entitlements this irrigation season.

"March precipitation, at 42% of normal, fell far short of expectations. Snowpack, as percent of average, has declined about 5% since March 1. The five reservoirs are just over 62% full and filled about as expected in March", Yakima Project River Operations supervisor. "The Yakima Basin reservoir storage is currently 102% of average and the snowpack is 95% of average."

Reclamation manages the water in the five Yakima Project storage reservoirs, along with the basin's unregulated inflows to fulfill water rights, water contracts and instream flow obligations. Water shortages in the basin are shared equally by the junior water rights, which represent over half of the water rights in the basin.

Specific water-delivery levels, such as water rights allocations and stream flow targets, will be set, normally in June, when the Yakima system requires reservoir storage releases to meet irrigation diversions and river flows. Reclamation will provide an updated water supply forecast and water allocation each month—at least through July—using the latest data to reflect changing conditions as they develop.

The April forecast is based on flows, precipitation, snowpack, and reservoir storage as of April 1, along with estimates of future precipitation and river flows. Other future weather conditions that determine the timing of the runoff and the demand for water also are critical in determining streamflows, prorrations and the extent to which the reservoirs fill.

"We still have several key months ahead of us that can have a big influence on the ultimate water supply this summer," says Garner.

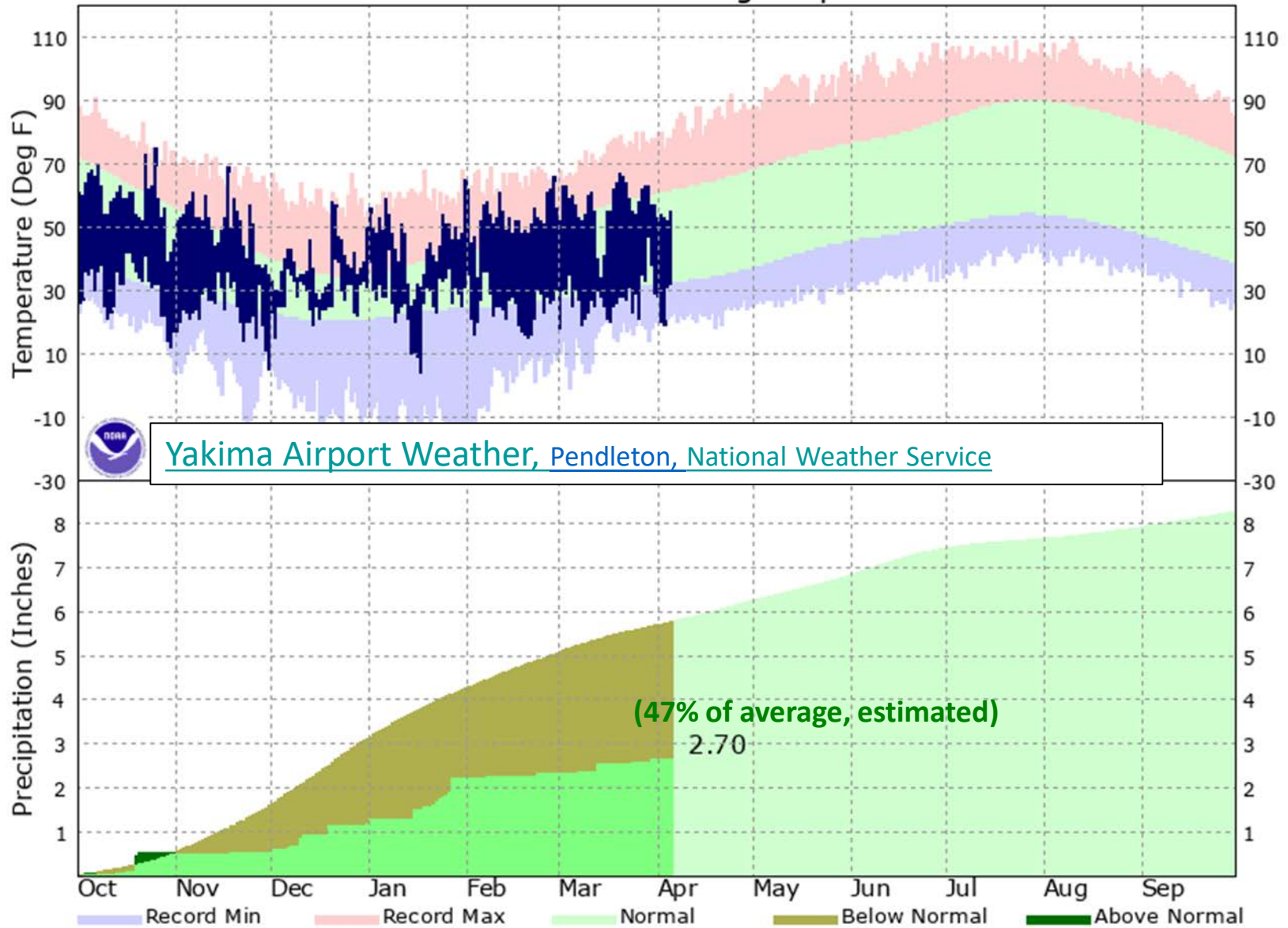
For more information, visit

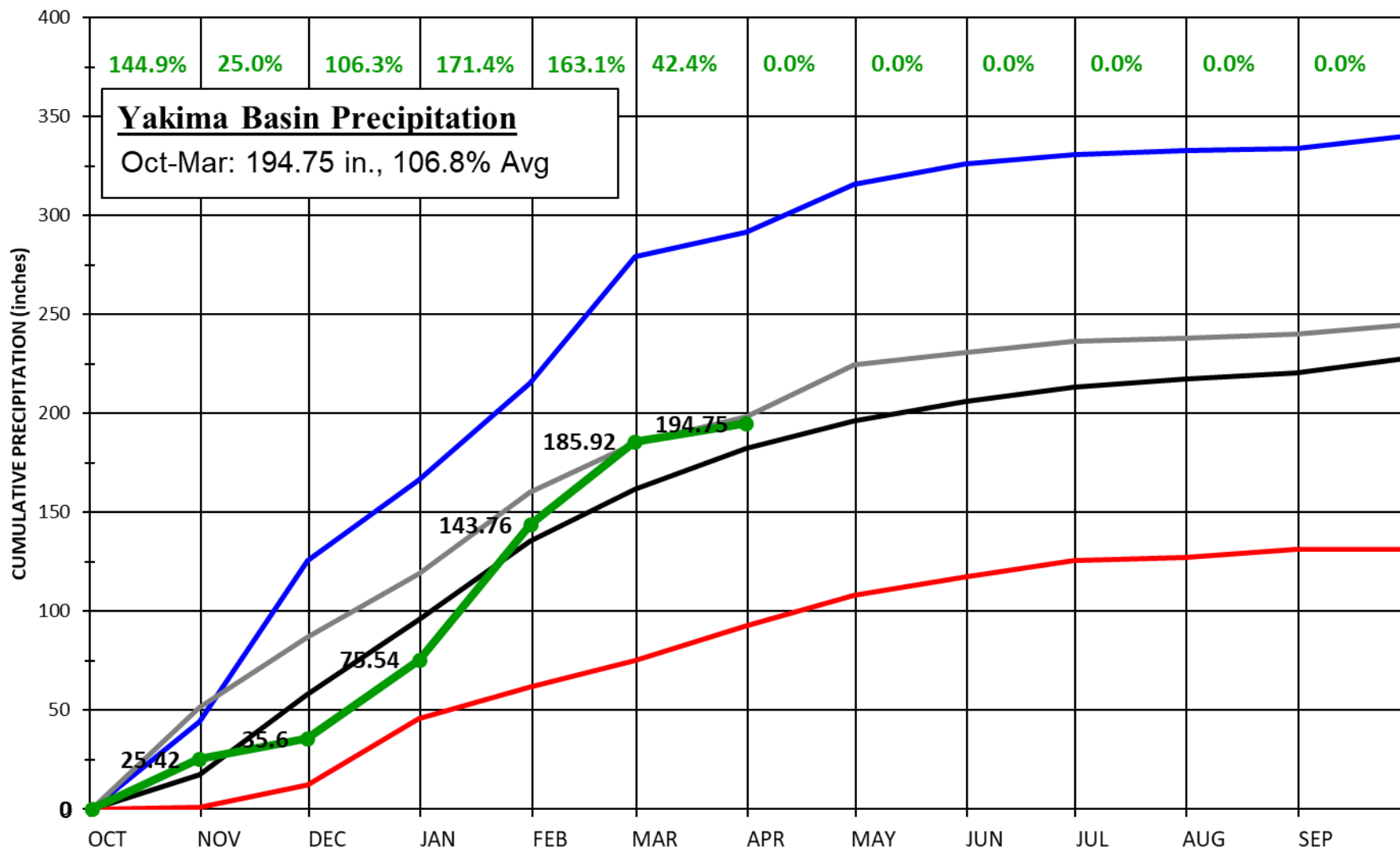


[/hydromet/yakima.](https://hydromet.yakima.usbr.gov/)



KYKM - Oct 2019 Through Sep 2020





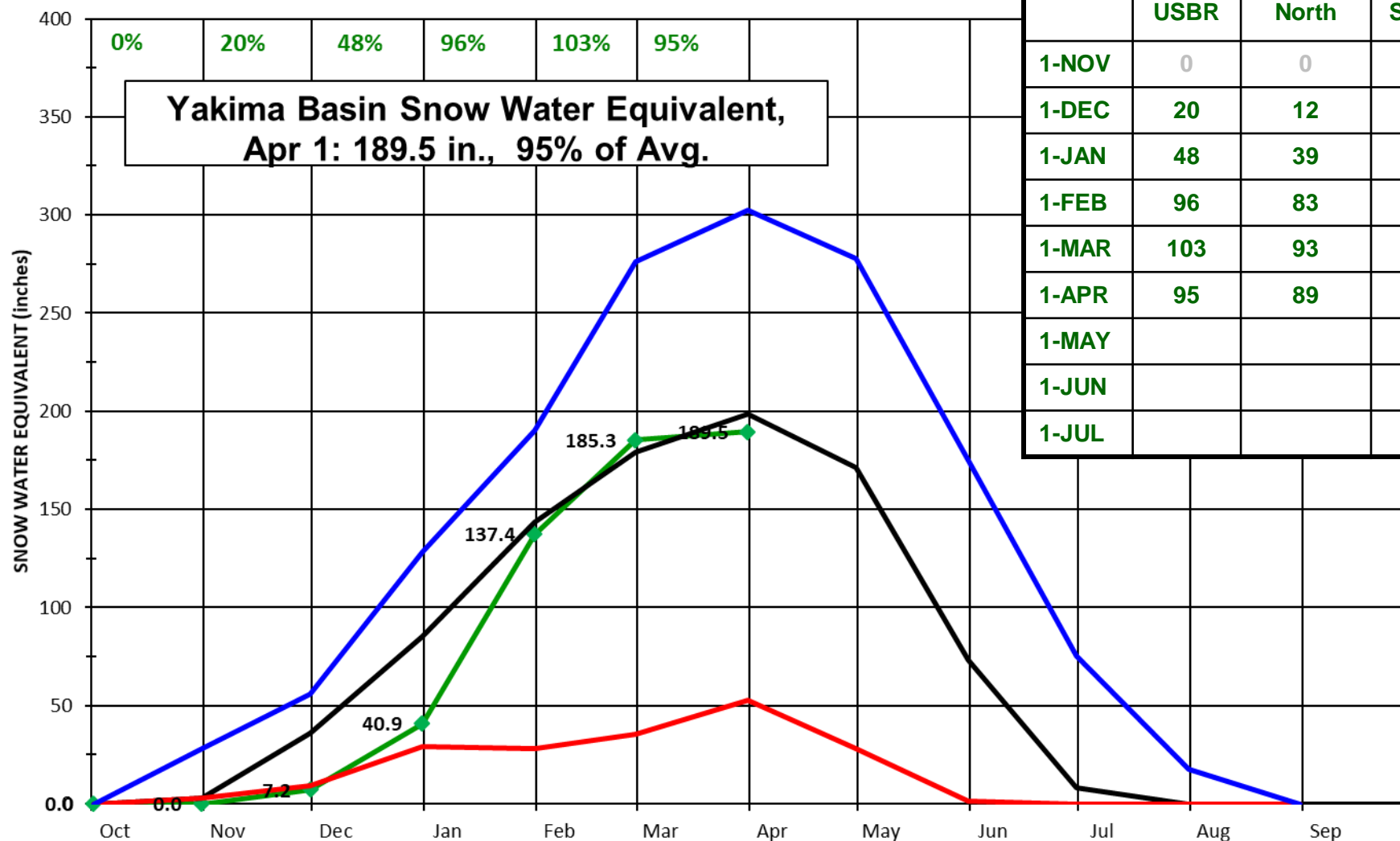
YAKIMA BASIN
Combined Cumulative Precipitation
5 Reservoir Sites
WATER YEARS 1981-2010

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YAKIMA FIELD OFFICE
1917 MARSH ROAD
YAKIMA, WA 98901

- Maximum
- Average
- Minimum
- WY2018
- WY 2020

NRCS SWE % AVG

	USBR	North	South
1-NOV	0	0	0
1-DEC	20	12	39
1-JAN	48	39	60
1-FEB	96	83	102
1-MAR	103	93	114
1-APR	95	89	112
1-MAY			
1-JUN			
1-JUL			

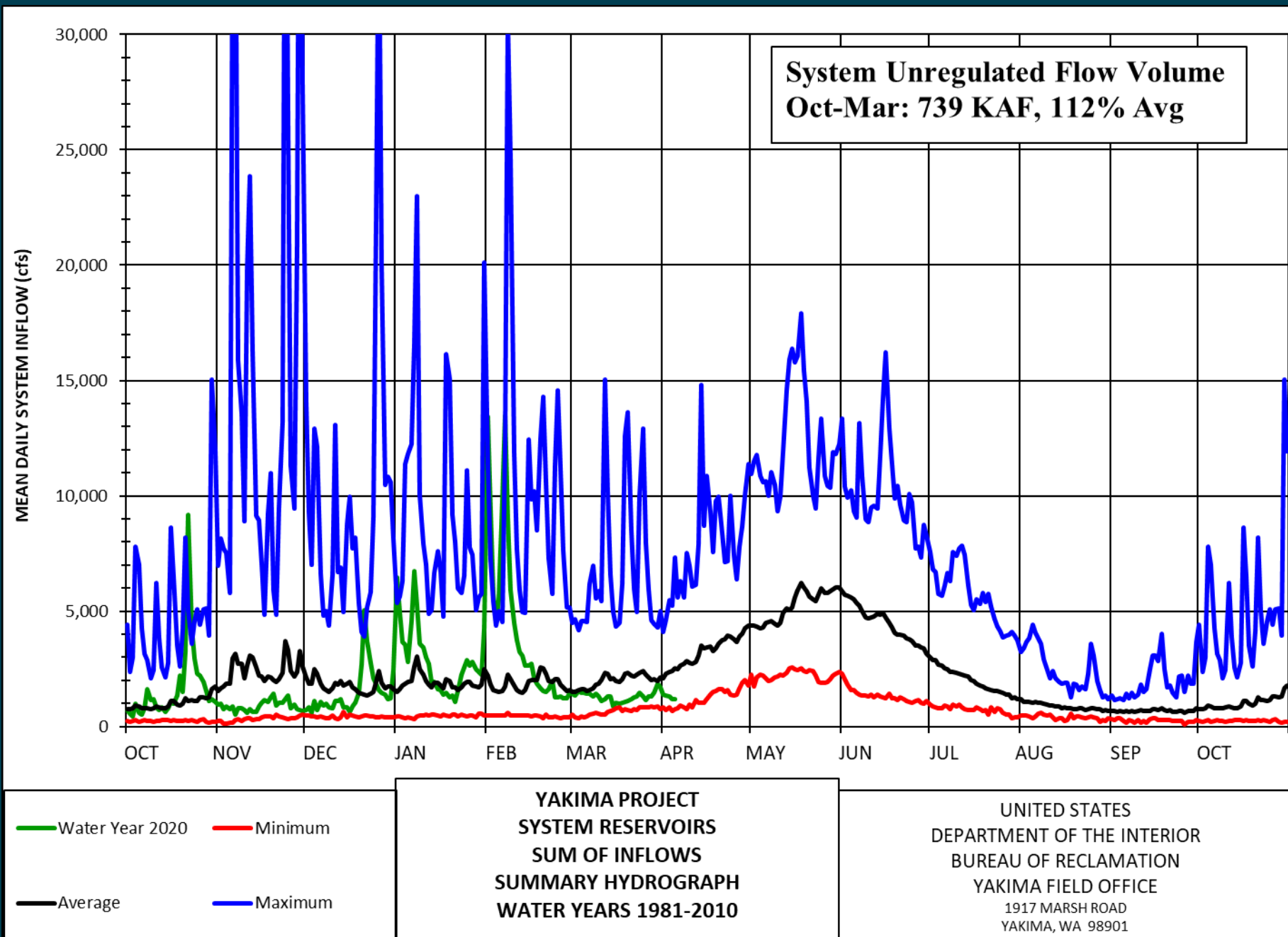


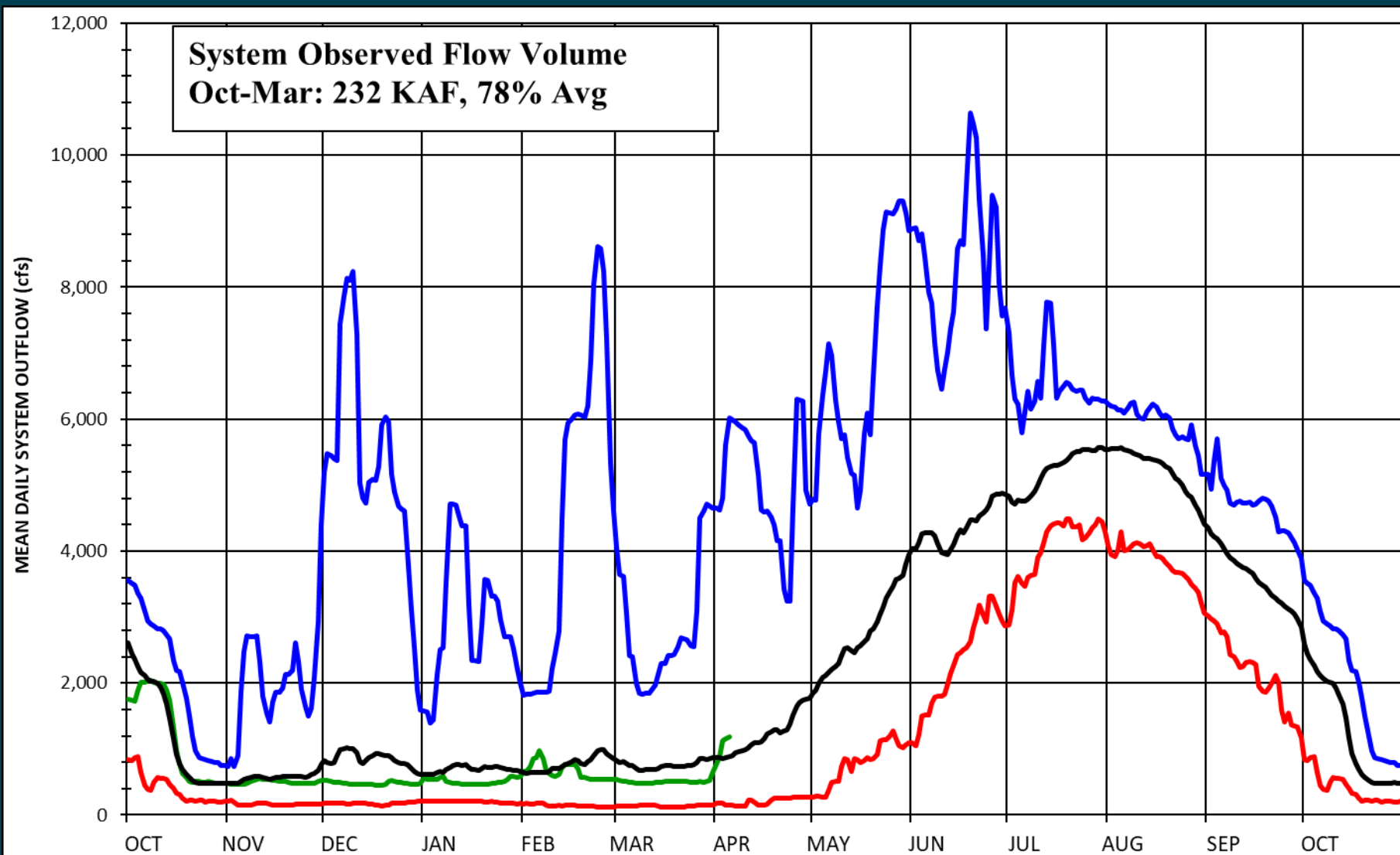
- ◆ Water Year 2020
- Average
- Low Year (2005)
- High Year (1999)

YAKIMA BASIN WATER YEAR SNOW WATER EQUIVALENT

Average based on greater of 1971-2000 or POR-1995
Totals derived from 7 Yakima forecast sites
Corral, Stampede, Olallie, Fish, Bumping, Domerie, & Tunnel Avenue

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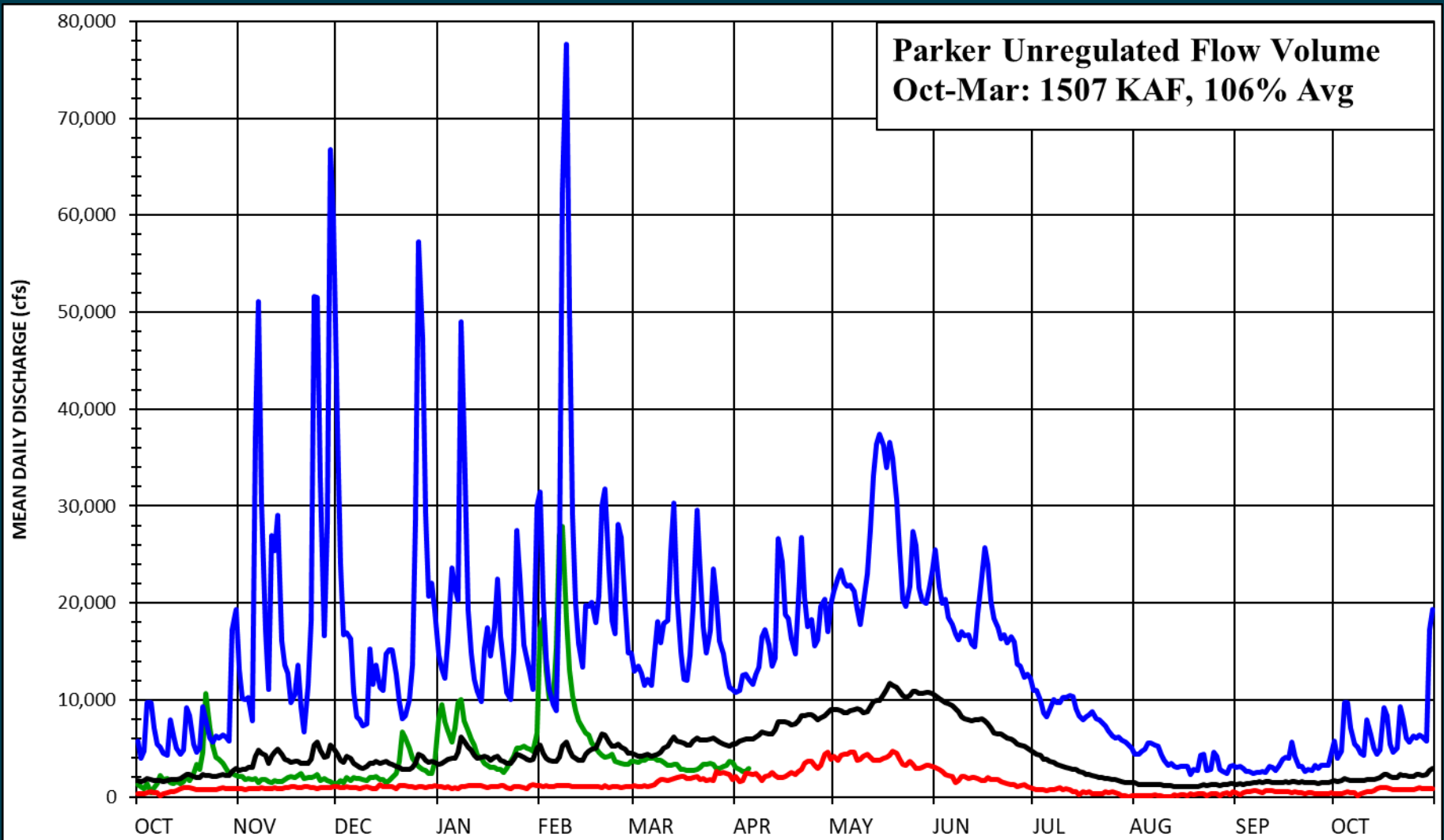




— Water Year 2020
— Minimum
— Average
— Maximum

**SYSTEM RESERVOIRS
SUM OF OUTFLOWS
SUMMARY HYDROGRAPH
WATER YEARS 1981-2010**

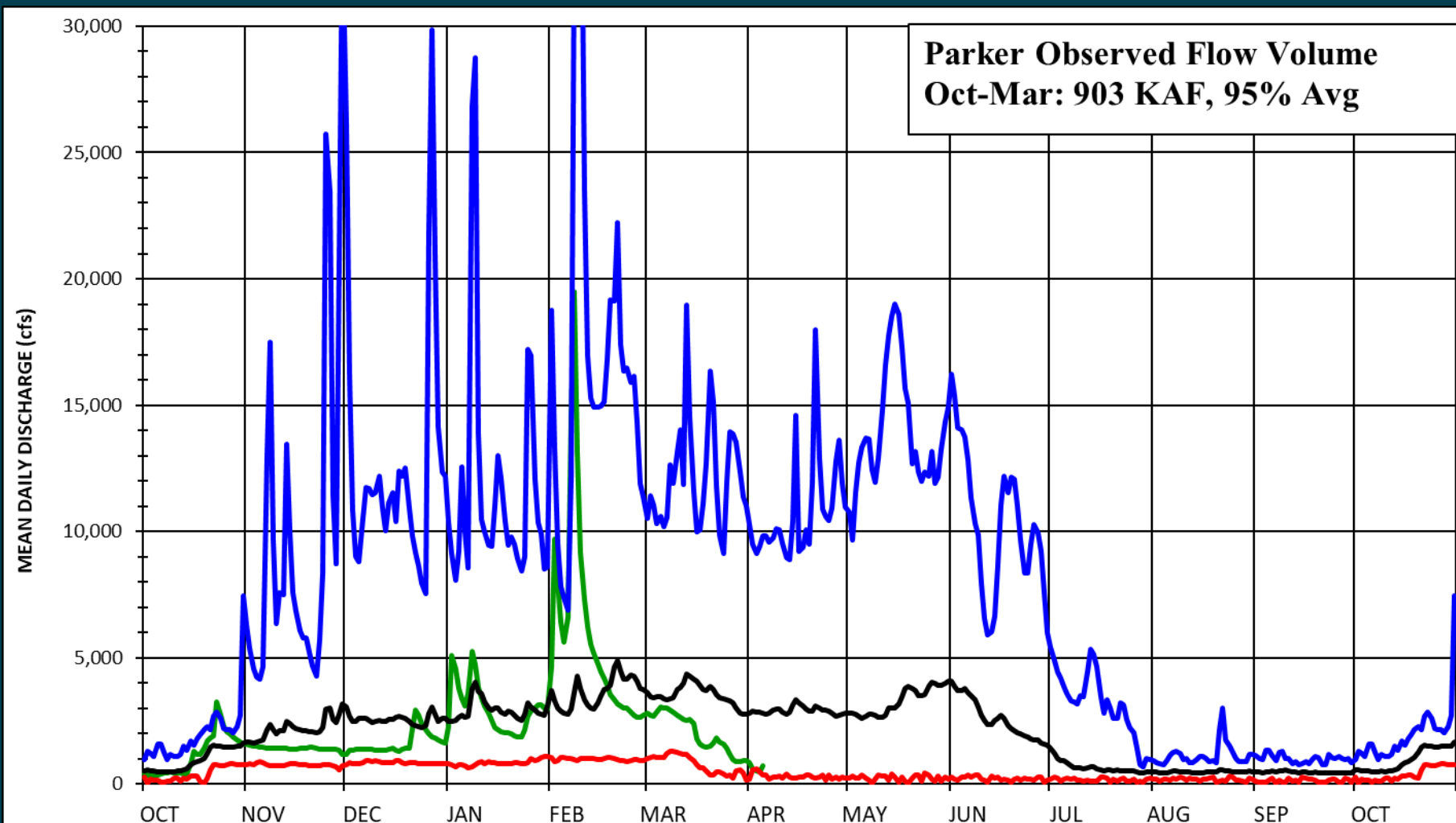
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- Water Year 2020
- Minimum
- Average
- Maximum

**YAKIMA RIVER NEAR PARKER
MEAN DAILY UNREGULATED DISCHARGE
SUMMARY HYDROGRAPH
WATER YEARS 1981-2010**

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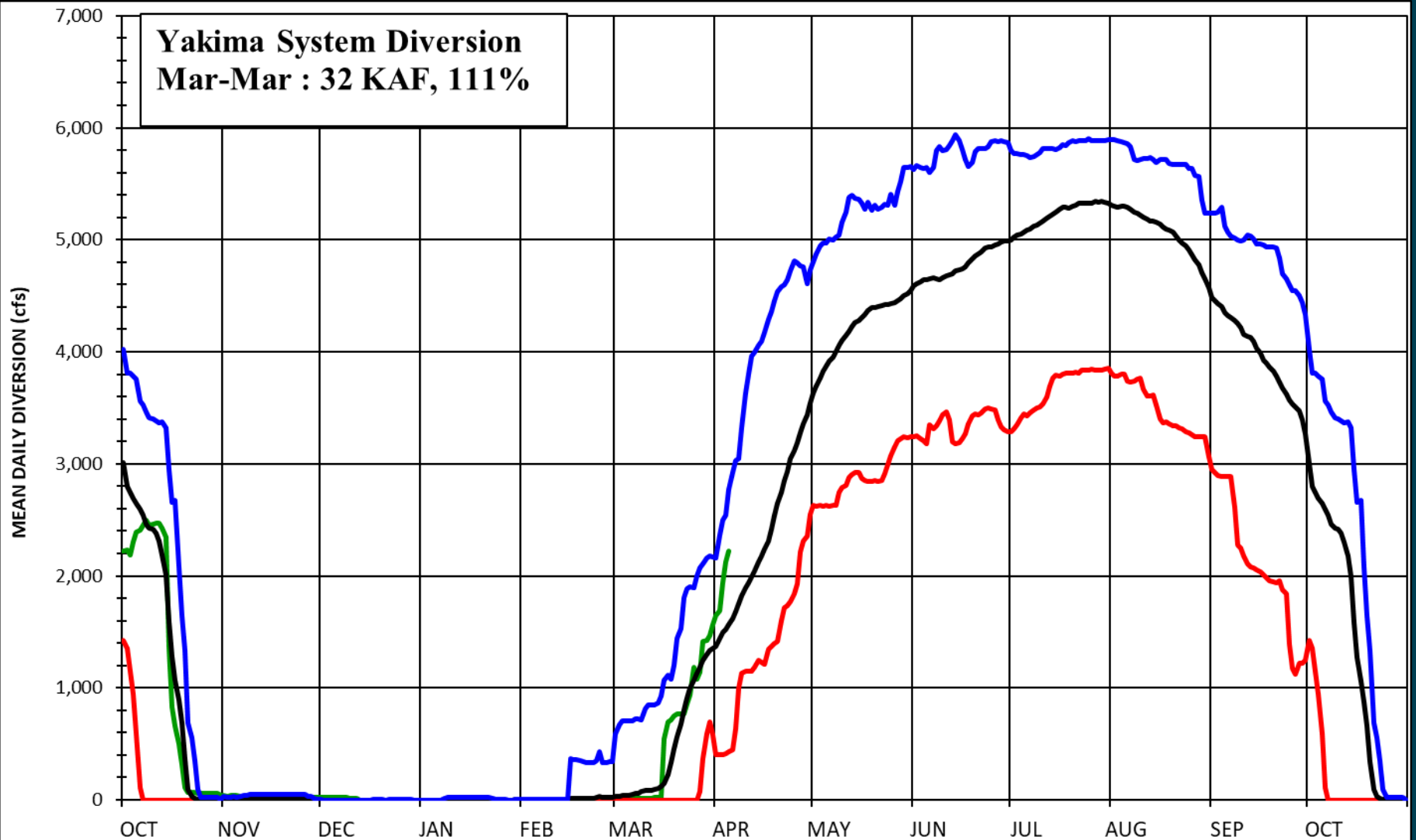


— Water Year 2020
— Minimum
— Average
— Maximum

**YAKIMA RIVER NEAR PARKER
MEAN DAILY REGULATED DISCHARGE
SUMMARY HYDROGRAPH
WATER YEARS 1981-2010**

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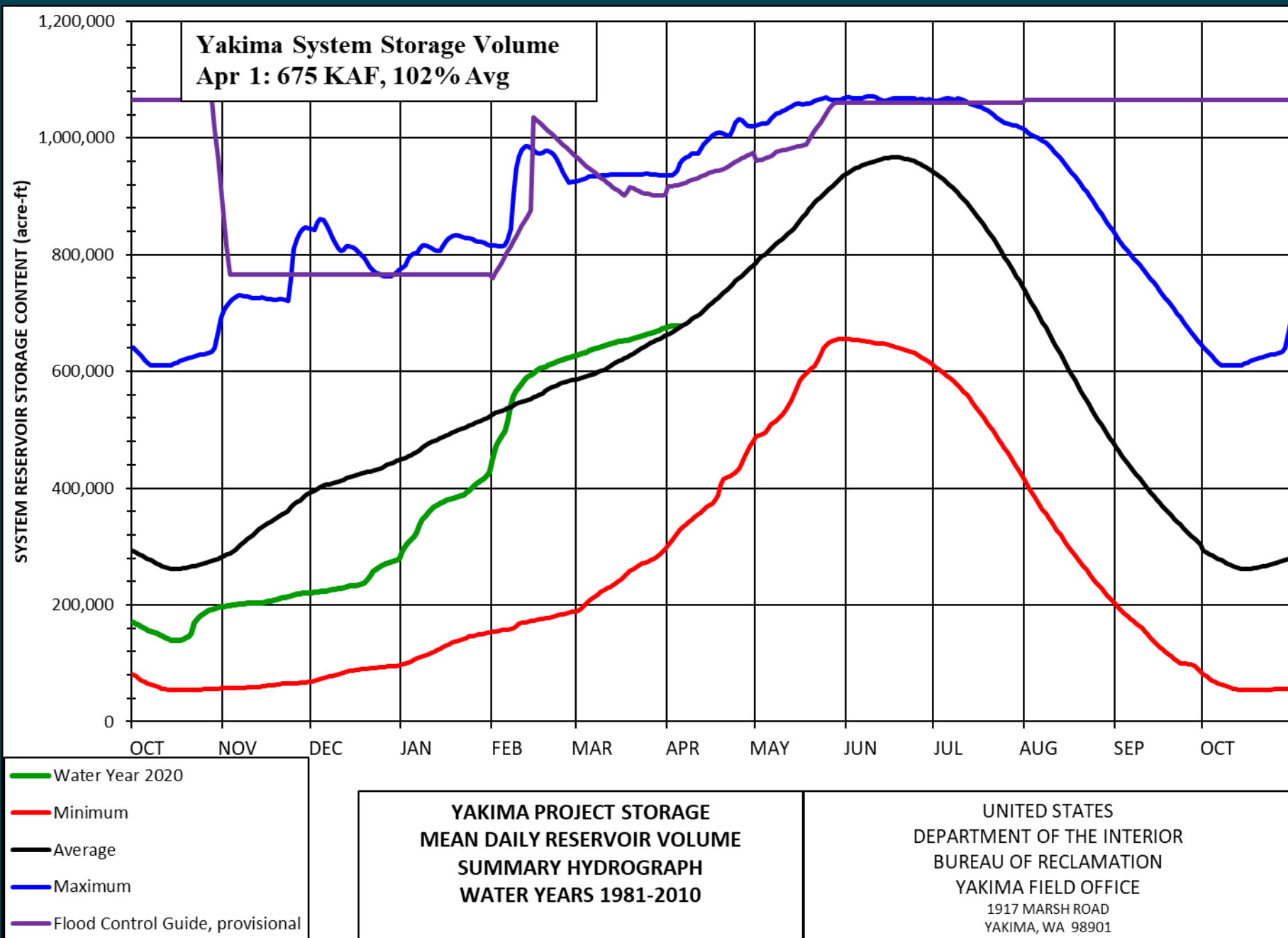
Yakima System Diversion
Mar-Mar : 32 KAF, 111%

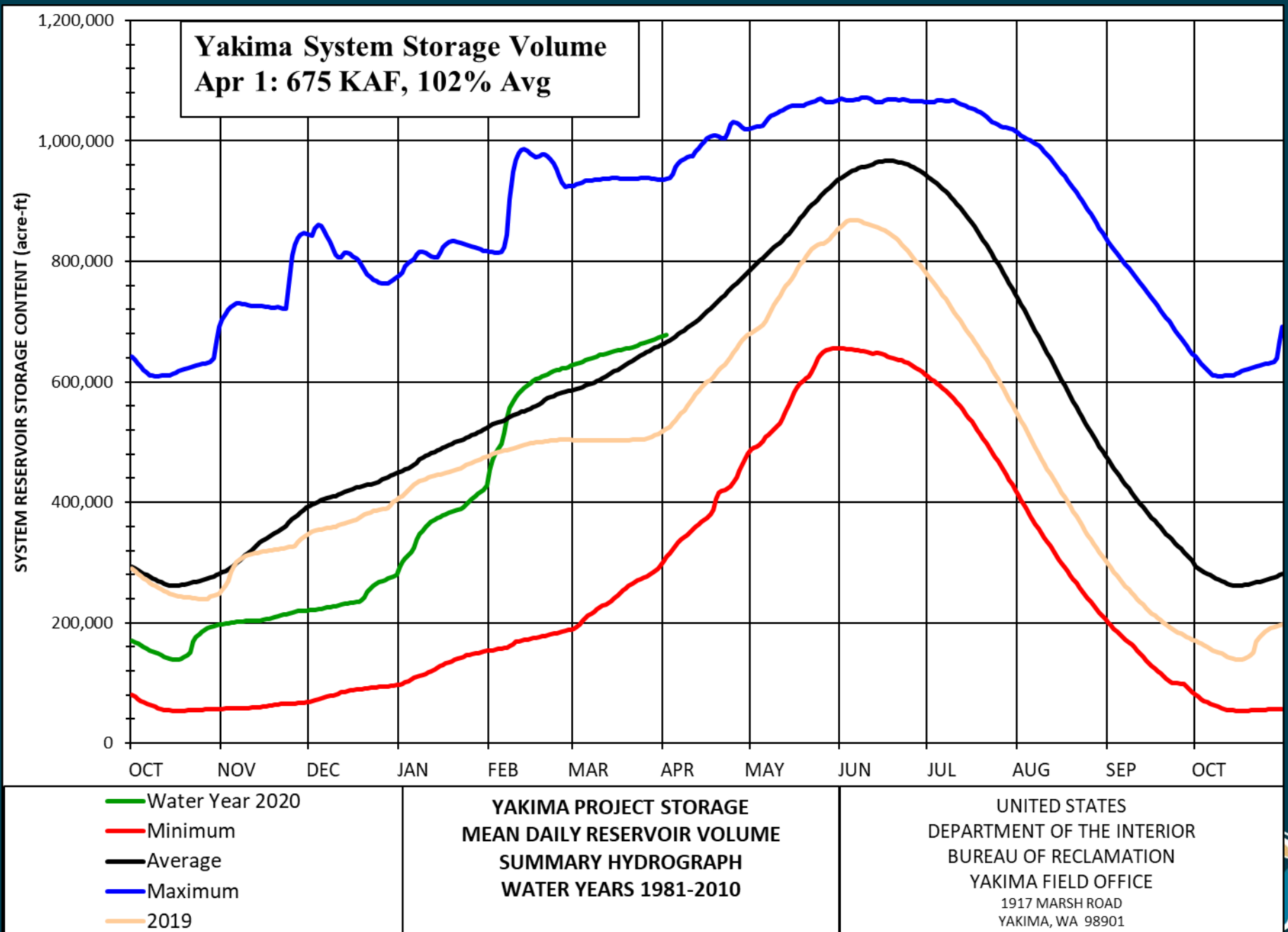


— Water Year 2020 — Minimum
 — Average — Maximum

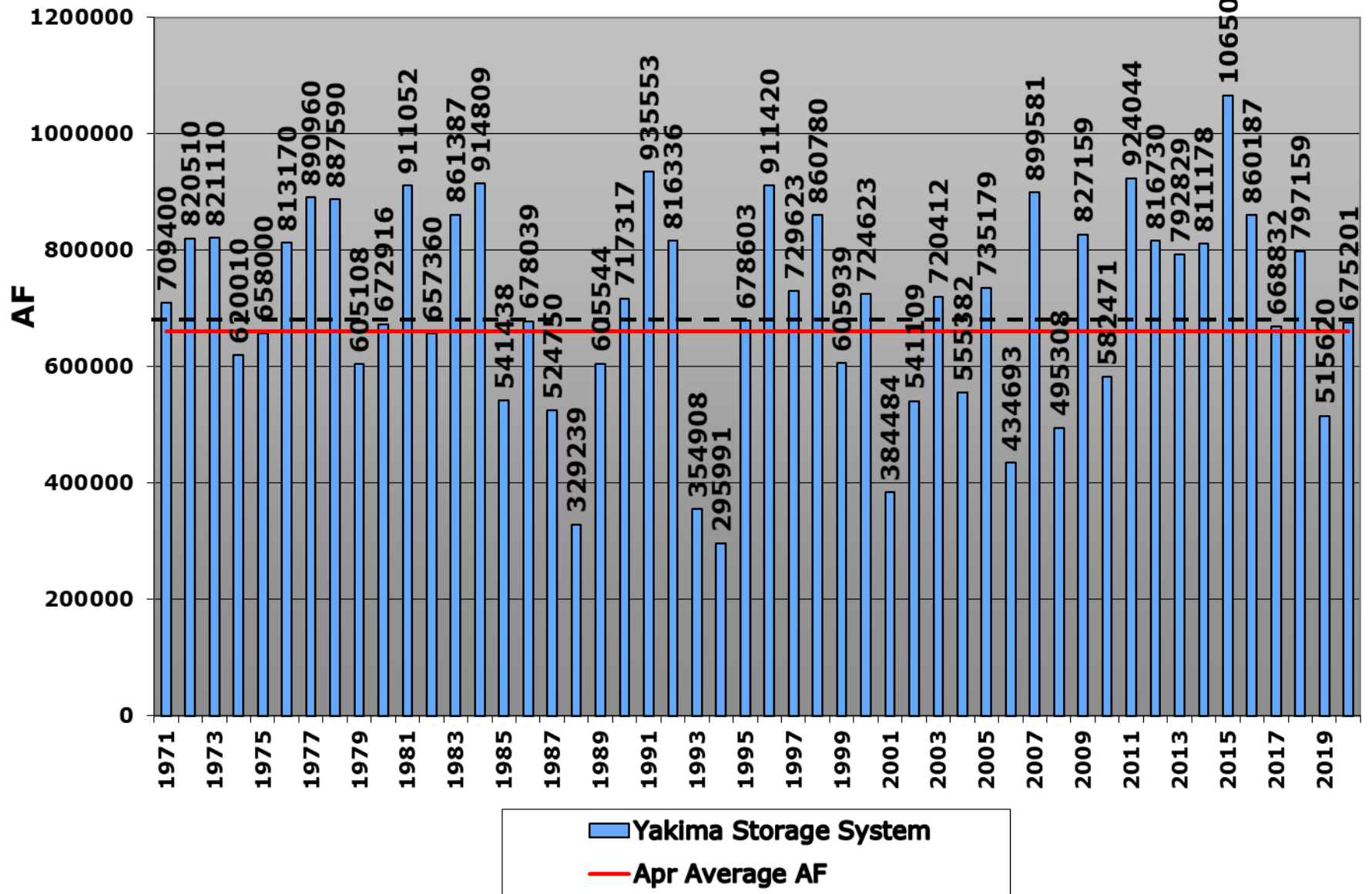
**5 MAJOR IRRIGATION DIVERSIONS
 YAKIMA R. ABOVE PARKER
 SUMMARY HYDROGRAPH
 WATER YEARS 1981-2010**

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 1917 MARSH ROAD
 YAKIMA, WA 98901





Yakima Basin Storage, Historical Comparison



Yakima Sub-basin forecasts

April-July runoff volumes, AF

April, 2020	low	Adopted	high	low	Adopted	high
Parw	1387456	1697031	1917056	0.84	1.02	1.16
kee	91818	114829	132265	0.79	0.99	1.14
kac	79284	100726	114566	0.76	0.96	1.10
cle	301110	384093	425372	0.78	1.00	1.11
bum	96406	120130	133883	0.84	1.05	1.17
rim	154888	191051	216253	0.83	1.02	1.16
Yumw	595983	739000	820164	0.79	0.97	1.08
Nacw	524707	723446	849925	0.75	1.03	1.21



April

Runoff Forecast to Reservoir Space Available

Refill Ratios

Kee

3.25

Kac

1.07

Cle

1.86

Bum

13.13

Rim

2.97

500.00

400.00

300.00

200.00

100.00

0.00

1000 Acre-ft

Keechelus

Kachess

Cle Elum

Bumping

Rimrock

Capacity

Content

Low

Mid

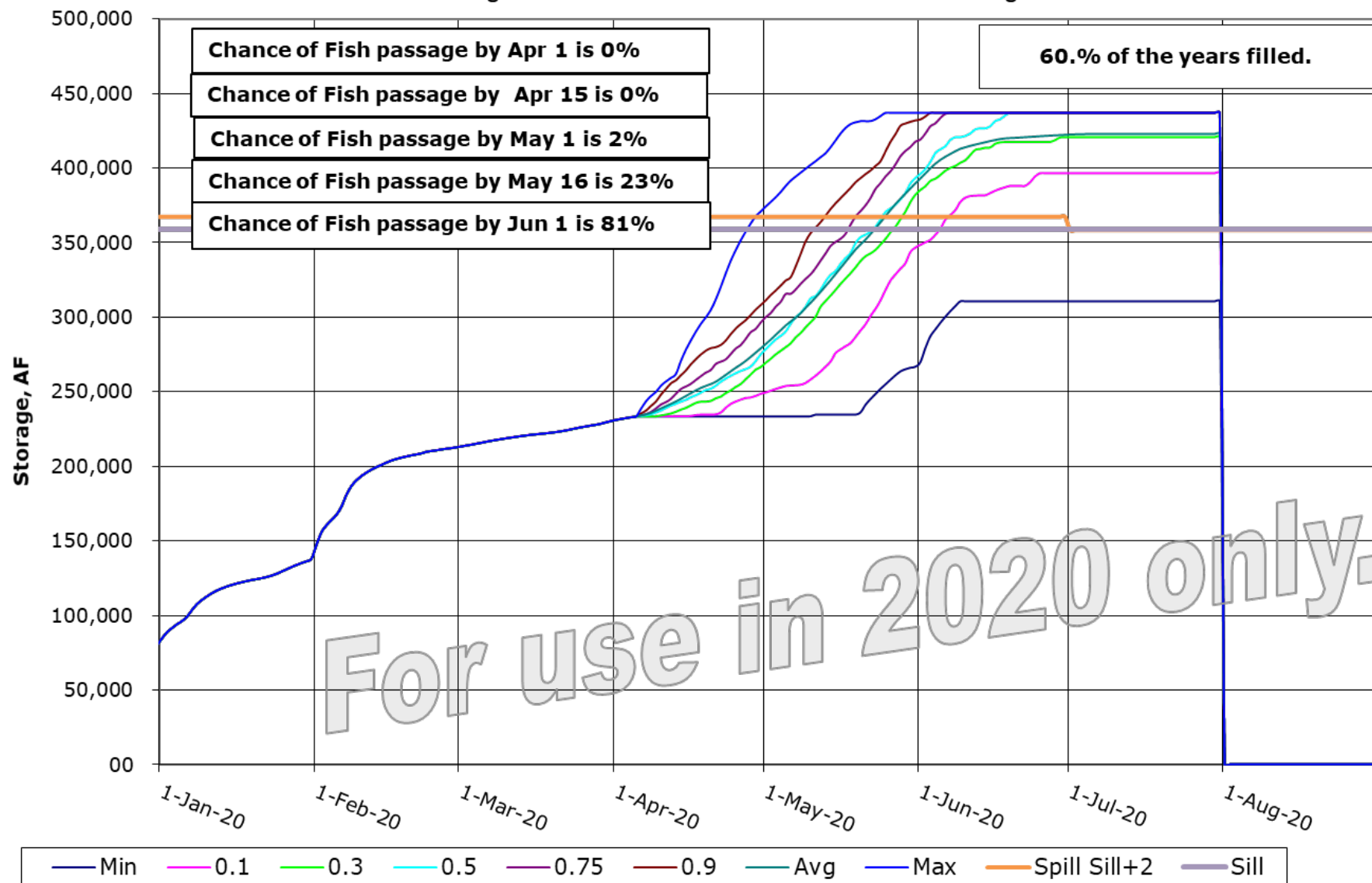
High



Cle Elum Reservoir, Fill Analysis

ENSO = 2

Forecast Range is 0.80 to 1.14 with a median 1.00 and an average 0.97



4/5/2020



Reservoir Refill, run April 6, 2020

Project: % yrs fill, likely date, (date Range)

- **Cle fish flume (SW+2) 100%, likely May 23. (Apr 29-Jun 6)**
- **Cle: 60% fill, median of June 19 (May 25-Jun 28)**
- **Kee: 67% fill, median of May 25 (May 4-Jun 8)**
- **Kac: 12% fill, median of June 16 (Jun 8-Jun 30)**
- **Bum: 98% fill, depends on operations**
- **Rim: 100% fill, median of May 25 (April 27-Jun 6)**



April 1, 2020 TWSA ESTIMATE

April 1 - September 30

Parameter*	+/-/=	Low	Adopted	High
Apr 1-Sep 30 Natural Flow at Parker est.	+	1523	1858	2089
Return Flow Estimate, est	+	335	340	350
April 1, Reservoir Content, est	+	675	675	675
TWSA	=	2533	2874	3115
SEP 30 EST RESERVOIR CONTENT	-	76	76	132
FLOW OVER SUNNYSIDE DAM	-	375	536	674
TWSA FOR IRRIGATION	=	2082	2261	2309
NONPRORATABLE ENTITLEMENT	-	1070	1070	1070
REMAINING TWSA	=	1012	1191	1239
PRORATABLE ENTITLEMENT		1239	1239	1239
% RATIO= REMAINING TWSA/PRORATABLE ENTITLEMENT		82%	96%	100%
TITLE XII FLOW TARGET, cfs	April	300	400	500
Added flow available, cfs **		120	125	126
Non-storeable Portion of added flow, cfs		14	14	14
Storable portion of added flow, cfs		106	110	112

*Values are in 1,000 ac-ft unless otherwise specified.

** State & YRBWEP Trust, Acquisition, & Conservation additions to Title XII flow range from 120 to 126 cfs.



April 1, 2020 TWSA Comparison

April 1 - September 30

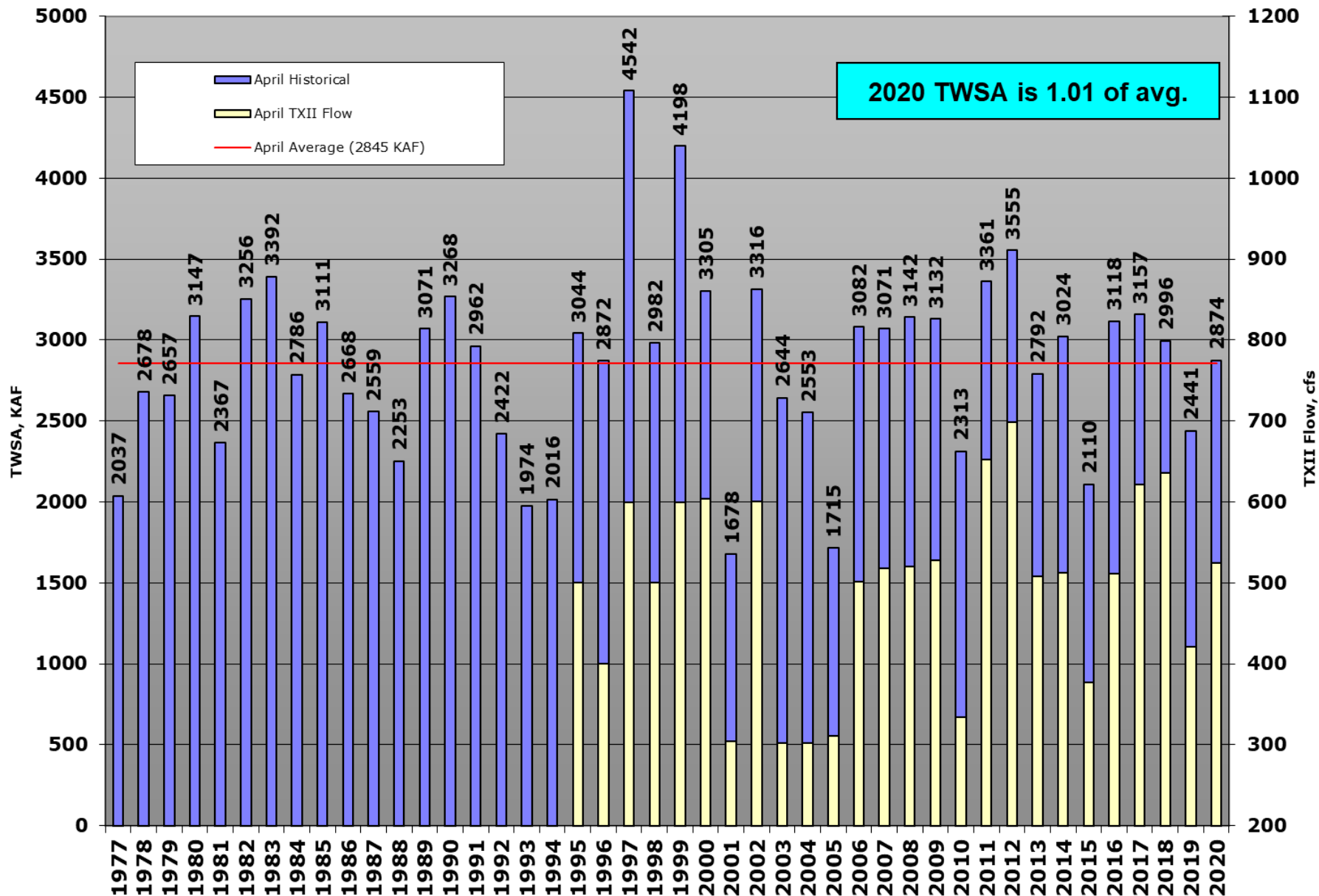
Parameter	" +/- = "	Mar's 2020	Apr 2020	Apr 2019
Apr 1-Sep 30 Natural Flow at Parker est.	+	1845	1858	1590
Return Flow Estimate	+	350	340	335
April 1, Reservoir Content	+	660	675	516
TWSA	=	2855	2874	2441
SEP 30 EST RESERVOIR CONTENT*	-	76	76	76
FLOW OVER SUNNYSIDE DAM	-	532	536	337
TWSA FOR IRRIGATION	=	2246	2261	2027
NONPRORATABLE ENTITLEMENT	-	1070	1070	1070
REMAINING TWSA	=	1176	1191	957
PRORATABLE ENTITLEMENT		1239	1239	1239
% RATIO= REMAINING TWSA/PRORATABLE ENTITLEMENT		95%	96%	77%
TITLE XII FLOW REQUIREMENTS, cfs	April	400	400	300
TOTAL FLOW AVAILABLE AT PARKER, cfs ***		525	525	421

*Values are in 1,000 ac-ft unless otherwise specified.

*** State & YRBWEP Trust, Acquisition, & Conservation additions to Title XII flow.



Yakima Basin Historical TWSA's



Yakima Basin Outmigration Flows

Table 2-14. Minimum volume of water (acre-feet) that will be available in April and May during years when water prorationing levels are equal to or greater than 70% to provide outmigration flows. Outmigration flows are measured at Tieton Dam (RIM), Cle Elum Dam (CLE), and Yakima River at Easton gage (EASW).

	Monthly Min. acre-feet for Outmigration Flows		
April TWSA (MAF)	< 2.36	2.36 - 3.13	> 3.13
May TWSA (MAF)	< 2.20	2.20 – 2.61	> 2.61
RIM	4,500	8,400	14,800
CLE	4,200	9,900	18,800
EASW	3,700	4,800	9,900

Easton (EASW) can be met from unregulated local inflow below Kee and Kac.

Hydrologic Summary

- Neutral El Nino continues in WY2020.
- System Storage is nearly average.
- Most of the snow is at higher elevations, relatively.
- WY precip and snow are near normal.
- Reservoir refill outlook is poorer than last month.
- Prorationing is 96%.
- Parker TXII target is at 400 cfs (with added Parw is 525 waters, YRPW target is 560 cfs.)
- BA Pulse flow guidelines are at the mid-range.