

Does One Acre Foot equal 324,900 gallons or 325,900 gallons?
 Does One Cubic Foot Per Second equal 646,320 or 646,272 gallons per day?

SHR-717
 (poster format)

CONVERSION CHART COMPARISON: CALSIM, DWR, USGS		Which conversion formula is correct?		Did DWR finally correct the formulas for conversion of acre-feet to gallons?
AGENCY CHART				
DWR-USBR CalSim 3.0 Dec 2017	1 acre foot = 43,560 cubic feet = 324,900 gallons	1 cfs = 1.983 acre-feet per 24 hours = 0.646 mdd	http://baydeltaoffice.water.ca.gov/modeling/hydrology/CalSim3/documentation/ReleaseReady112917/MainReport.pdf page 32 of 625	
DWR 2001 (CalSim)	1 acre-foot = 325,900 gallons	1 cfs=1.98 acre-feet a day = 646,320 gallons day	http://www.water.ca.gov/swp/operationscontrol/docs/annual/annual01.pdf	
USGS	na	1 cfs = 646,272 gallons per day	http://md.water.usgs.gov/cfsalc/ last viewed 2014	
MT online conversion table	1 acre-foot = 325,851 gallons or 43,560 cubic feet	1 cfs = 1.98 acfe-feet per day	http://dnrc.mt.gov/iwrd/water_rts/wr_general_info/wrforms/615.pdf	

In 2009, 2011, 2014 NSS asked various DWR-Resources representatives what is the correct formula for converting cfs flow into gallons and acre-feet. This question was asked because it was noticed that the formulas used by DWR were different than what USGS and other government agencies use. DWR documents from 2000 to 2010 published conversion charts, and one from 2001 related to model results, such as CalSim 1 (at that time) provide conversion charts. Using an incorrect formula can result in an assumption of too much flow or too little flow, depending on which conversion table was used. Considering how much each acre-foot makes for water contractors, use of correct formulas would be important, one would think. As an example, if DWR and SWC were underreporting diversions because of use of an incorrect conversion formula when converting cfs to gallons to acre feet, the result would be additional acre feet available for sale. Based on the chart to the right, each additional acre foot available for sale would generate approximate \$600 more income.

It is noted that for CalSim 3 DWR has recently updated the conversion formulas, which may explain the differences shown in the flow chart comparisons for that report. Perhaps California Waterboard should itself publish its own water-related conversion chart and direct that all computer modeling and reports submitted to Waterboard be certified by the report author and computer modeler(s) that the conversion formulas used match exactly the conversion formula published by Waterboard.

Q: Does 1 cubic foot/second equal 646,320 OR 646,272 gallons a day?

Why does DWR use different conversion numbers from USGS? Compare converting CFS to gallons per day

<http://md.water.usgs.gov/cfsalc/>

USGS CFS Conversion Calculator

Convert to: gallons per day

CFS Value (FPA) 1

Result: 646272

Conversion factors for cfs calculations: 1 cfs =

7.48	gallons per second
448.8	gallons per minute
26,928	gallons per hour
646,272	gallons per day
28.32	liters per second
1,699.2	liters per minute
101,952	liters per hour
2,446,648	liters per day
2,446,648	million liters of water per day
0.646272	million gallons per day
62.5	pounds of water per second
3,750	pounds of water per minute
228,000	pounds of water per hour
5,400,000	pounds of water per day

WATER CONVERSION TABLE

GPM = Gallons per minute CFS = Cubic feet per second AF = Acre-feet

1 Cubic foot of water equals	7.48	Gallons
1 AF of water equals	325,851	Gallons
	43,560	Cubic feet
	448.8	GPM
1 CFS equals	1.98	AF per day
	40	Mime's inches
1 GPM equals	1,440	Gallons per 24 hour day
	1.61	AF per year
1 Surface Acre equals	Size of area in square feet = 43,560	

Water Acquisition Decision Model Assumptions, Reports, & Navigation

Assumptions

Current Fiscal Year: 2014

Base/Current Data: 6.272

Conversion: cfs to TAF: 1.983117

Revised: 1.983117

Expected Water Year

Anticipated River Drainage: below normal

Sacramento River Drainage: below normal

San Joaquin River Drainage: below normal

Cost Comparisons (Approximate) 2017 Dollars

	Stage 1 Base Case (4% Interest)	Full Project Base Case (4% Interest)
Marginal Cost		
• South Delta Pumps	\$588 /AF	\$613 /AF
• Delivered/Treated	\$815 /AF	\$840 /AF
Household Cost¹	\$1.90 - \$2.40 / month	\$1.90 / month

¹ Household impact based on 6.2 million occupied residential households in MWD Service area, 70% residential / 30% industrial split. Stage 1 assumes that up to 1,000 cfs of capacity is available for CVP use. The cost range shown is from 0 to 1,000 cfs of CVP use.

Water Planning and Stewardship Committee Item 6a Slide 11 February 12, 2018

Conversion Factors

1 million gallons per day (mgd) = 1.547 cubic feet per second (cfs) = 3.068 acre-feet per day

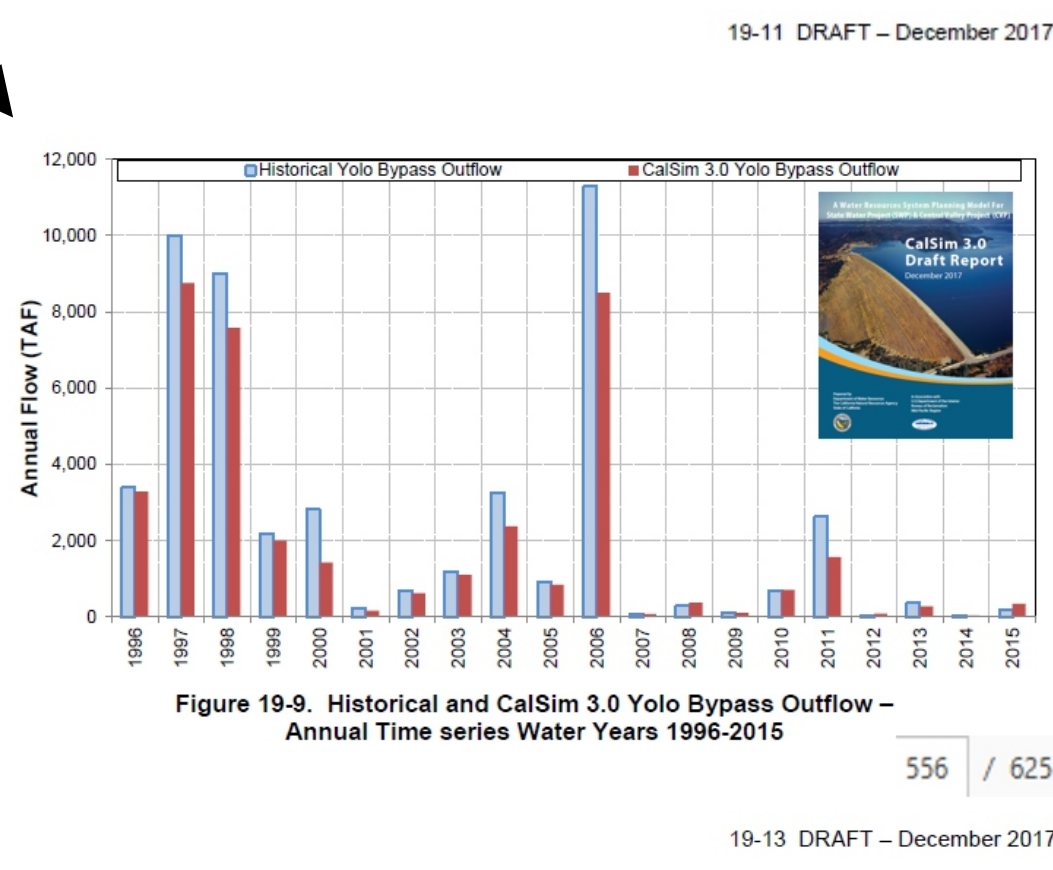
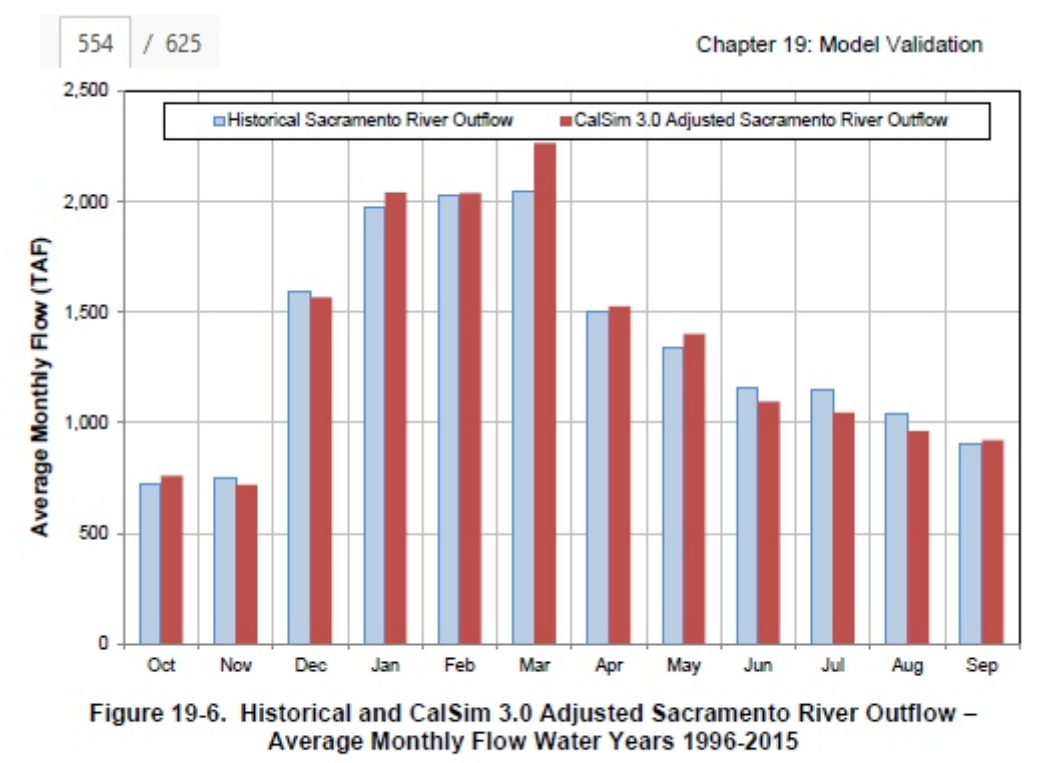
1 mgd = 1.120 acre-feet per year

1 acre-foot = 43,560 cubic feet = 324,900 gallons

1 cfs = 1.983 acre-feet per 24 hours = 0.646 mdd

CalSim 3.0 Draft Report December 2017

xiv DRAFT - December 2017



http://www.deltarevision.com/it_depends_on_who_is_counting.html

DWR CORRECTS WATER BALANCE TABLE... MAYBE

Location of flow study based on the first chart posted by DWR: http://www.sngaharbor.net/images-2014/bcp/flows/unaccounted_diversions.pdf

SCREEN PRINT OF DWR CHART ONLINE BEFORE DWR UPDATE

SCREEN PRINT OF DWR CHART CORRECTED BY DWR AND POSTED 3/19/2014

Corrected chart posted online 3/19/14 with no reference to the fact it is a correction of the previous posting by DWR

