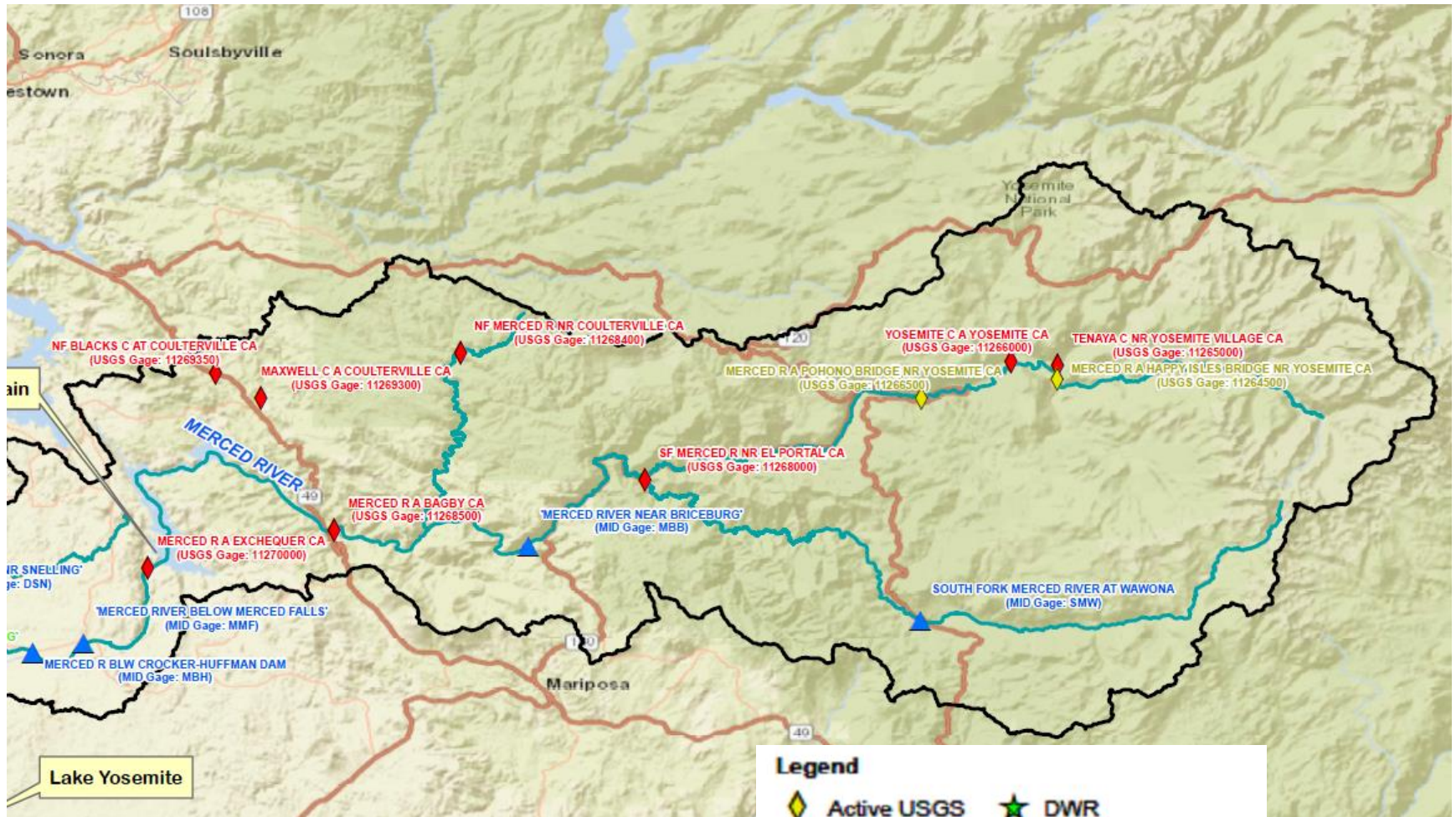




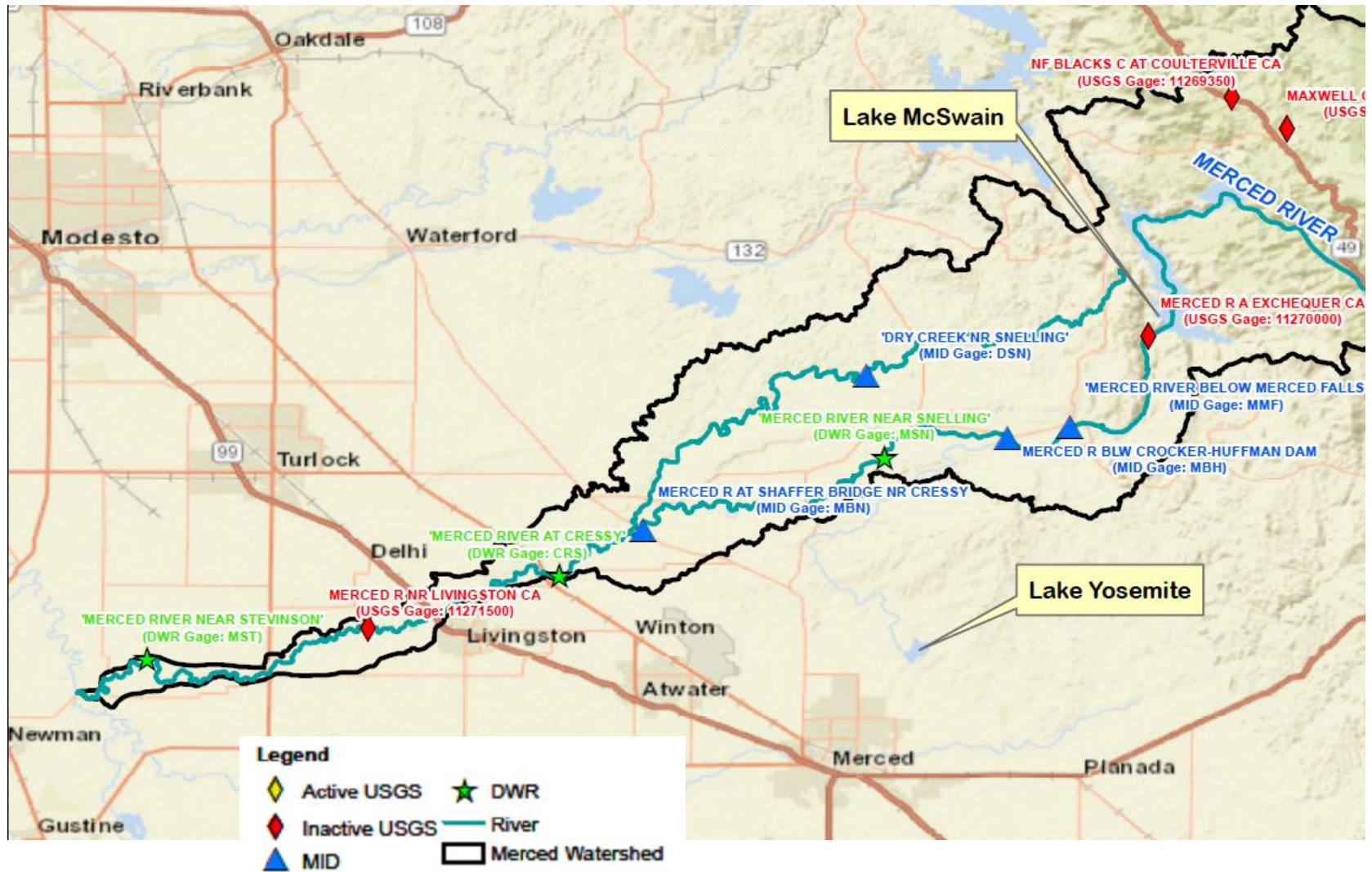
# Data Sources & Challenges, Dewberry

# Stream Gages U/S of Lake McClure

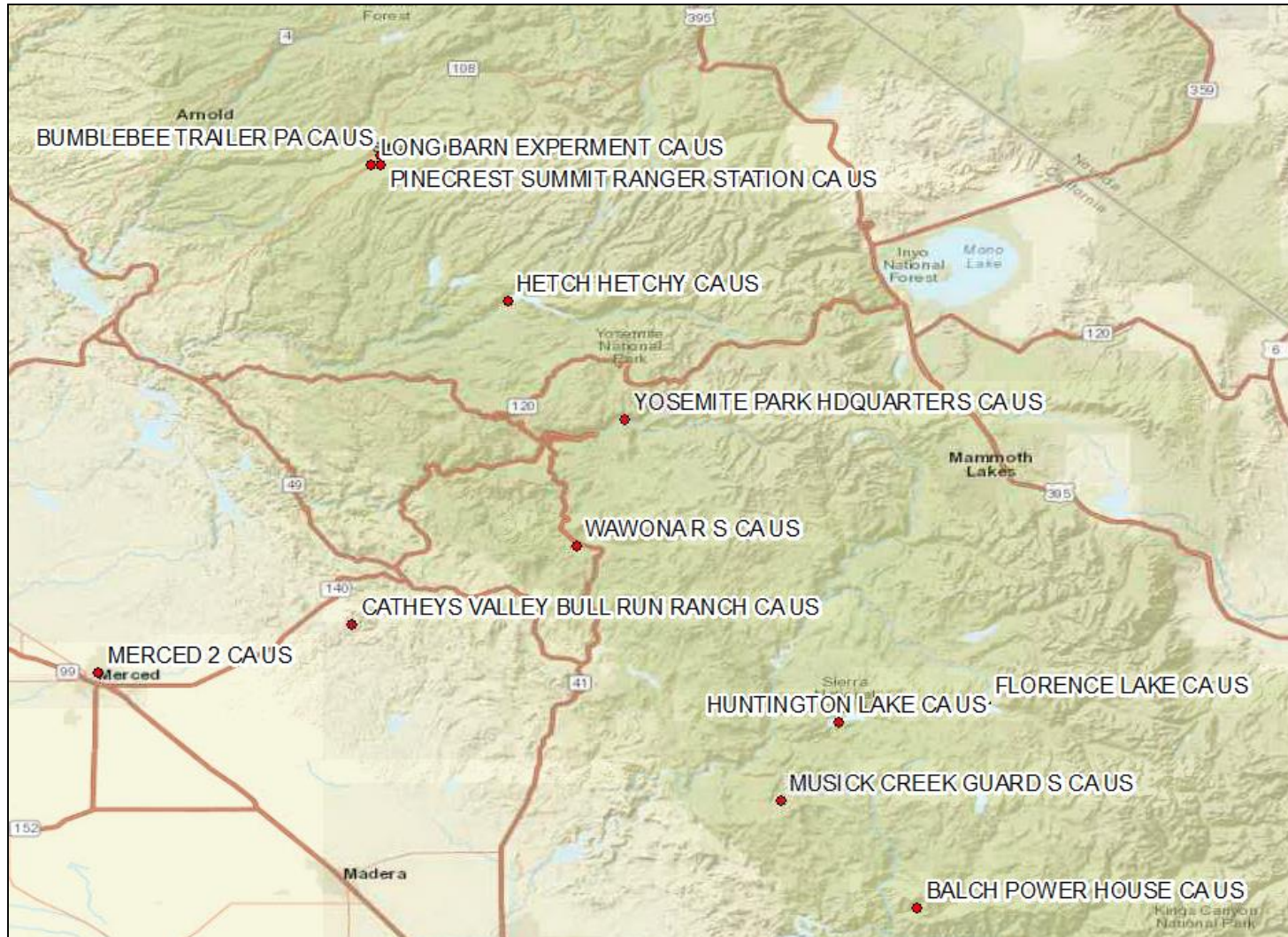


Many gages have been abandoned

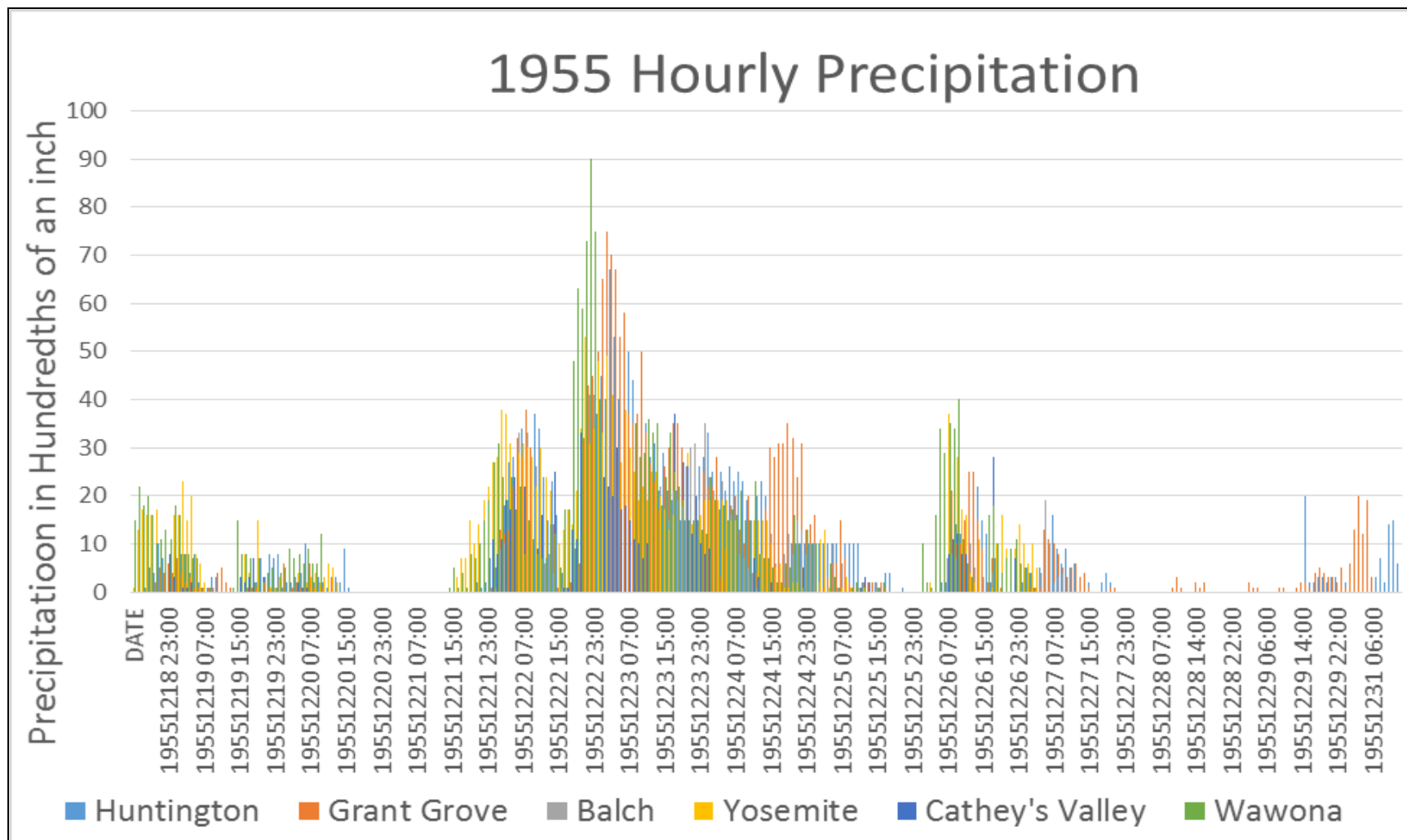
# Streamgages D/S of Lake McClure



# NOAA Precipitation Data



# NOAA Historic Precipitation Data



Demands spreadsheet replaces default demands for two days and estimates demands for the next 5 days. These values are sent to WISKI then RTS.

FlowDemandTable\_Final.xlsx - Excel

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW DEVELOPER

AA2 :

	A	B	C	X	Y	Z	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1	Date			Main Canal				Northside Canal (cfs)			Fish pulse (cfs)	Other Water Transfer (cfs)	Return Flow (cfs)	Total Demand - Dry (cfs)	Total Demand - Normal (cfs)	Total Demand - Wet (cfs)	From Table 2 This Yr is:	WET							
2	MONTH	DAY		Cowell-Normal	Cowell-Dry	Cowell-Wet	Total-Normal	Total-Dry	Total-Wet	Not to Exceed (cfs)	Merced Wildlife Refuge (cfs)	Dry	Normal	Wet	Dry	Normal	Wet								
519			May 31, 2017	10.4	8.6	30.7	109.2	89.4	230.2	225.0		1602	1811.0	1961.0	78.0	85.0	79.0		0	0	1829.4	2080.2	2345.2	May 31, 2017	2345.2
520			June 1, 2017	11.3	11.8	51.7	117.9	123.4	251.2	250.0		1653	1807.0	1966.0	77.0	85.0	79.0		0	0	1868.4	2034.9	2321.2	June 1, 2017	2321.2
521			June 2, 2017	11.1	12.6	36.3	116.3	132.1	235.8	250.0		1653	1807.0	1961.0	77.0	85.0	79.0		0	0	1877.1	2033.3	2300.8	June 2, 2017	2300.8
522			June 3, 2017	10.3	16.0	33.5	107.6	167.7	233.0	250.0		1649	1811.0	1961.0	77.0	75.0	80.0		0	0	1908.7	2018.6	2299.0	June 3, 2017	2299.0
523			June 4, 2017	11.2	13.9	35.7	117.1	144.8	235.2	250.0		1653	1760.0	1961.0	77.0	75.0	80.0		0	0	1889.8	1977.1	2301.2	June 4, 2017	2301.2
524			June 5, 2017	10.4	13.2	20.9	108.4	138.4	218.3	250.0		1653	1753.0	1966.0	77.0	76.0	79.0		0	0	1883.4	1962.4	2288.3	June 5, 2017	2288.3
525			June 6, 2017	11.1	13.2	37.6	115.5	137.7	237.1	250.0		1656	1711.0	1961.0	77.0	85.0	79.0		0	0	1885.7	1936.5	2302.1	June 6, 2017	2302.1
526			June 7, 2017	10.6	12.8	25.8	110.8	133.7	225.3	250.0		1656	1745.0	1961.0	76.0	90.0	79.0		0	0	1880.7	1970.8	2290.3	June 7, 2017	2290.3
527			June 8, 2017	10.4	13.2	64.1	108.4	138.4	263.6	250.0		1705	1825.0	1966.0	77.0	86.0	80.0		0	0	1935.4	2044.4	2334.6	June 8, 2017	2334.6
528			June 9, 2017	10.4	14.5	42.9	108.4	151.1	242.4	250.0		1712	1825.0	1966.0	75.0	88.0	78.0		0	0	1953.1	2046.4	2311.4	June 9, 2017	2311.4
529			June 10, 2017	0.1	13.6	41.3	0.0	130.6	240.0	360.0		1712	1825.0	1966.0	75.0	91.0	79.0		0	0	1922.6	2035.0	2310.0	June 10, 2017	2310.0

1 spreadsheet – 8 Tabs – 148 columns

Addresses FERC requirements, Fish Pulse, Irrigation Demands, Water Transfers, Power, Conditional Storage, Supplemental Release, Bulletin 120 projections, etc.

Operations provides estimate of diversions for today and tomorrow.

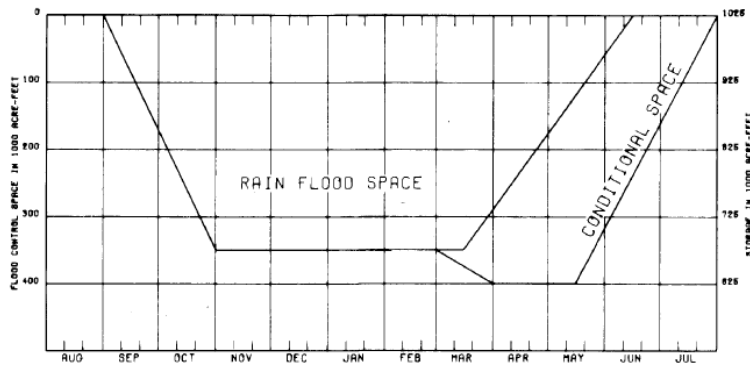
FlowDemandTable\_Final.xlsx - Excel

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW DEVELOPER

C10

	A	B	C
1	<b>AUGUST 28, 2017</b>		
2	<b>LOCATIONS</b>	<b>TODAY</b>	<b>TOMORROW</b>
3		<b>FLOW (CFS)</b>	<b>FLOW (CFS)</b>
4	<b>TOTAL CAD DIVERSION</b>		
5	<b>MAIN CANAL</b>	<i>1700.0</i>	<i>1700.0</i>
9	<b>NORTHSIDE CANAL</b>	<i>25.0</i>	<i>50.0</i>
10	<b>OTHER WATER TRANSFERS</b>		
11	<b>Color Codes:</b>		
12	<b>ENTER VALUES</b>		
13	<b>DO NOT CHANGE</b>		
14			
15			
16			
17			
18			

# New Exchequer Dam Water Control Diagram



**USE OF DIAGRAM**

1. Water stored in Rain Flood Space will be released as rapidly as possible without causing flows in Merced River at Stevenson to exceed 6000 c.f.s. unless greater releases are required by the emergency spillway release diagram.
2. Water stored in Conditional Space that is required for flood control must be released as a supplemental release in addition to releases for power and other uses. The Conditional Space required for flood control is equal to the space required to store estimated runoff in excess of demand for power and other uses. This can be determined from the nomograph below using the forecasted runoff from a given date to 31 July and the forecasted demand for power and other uses from the given date to 15 June (after 25 May, use the forecasted demand for power and other uses for the next 20 days or through 31 July whichever is less). The supplemental release is also determined from the nomograph below.
3. When the forecasted runoff is large the nomograph below may indicate that a supplemental release is necessary even though the Conditional Space is empty. Although such releases do not fall under Corps of Engineers authority to regulate flood control space, it is advisable that in such cases supplemental releases be made to preclude larger releases or spills later.
4. The Corps of Engineers may direct that flood releases be increased or decreased from those required by this diagram based on conditions prevailing at the time.

**SAMPLE COMPUTATION**

**GIVEN DATA:**

Date.....1 May  
 Forecasted runoff from 1 May to 31 July.....650,000 ac.-ft.  
 Forecasted demand for power and other uses from 1 May to 15 June.....160,000 ac.-ft.  
 Required release to meet demand for power and other uses on 1 May.....1,500 c.f.s.  
 Space available in Lake McClure on 1 May.....250,000 ac.-ft.

**COMPUTATION OF SPACE REQUIRED TO STORE ESTIMATED RUNOFF IN EXCESS OF DEMAND FOR POWER AND OTHER USES:**

1. Enter nomograph at "A" with current date 1 May and draw a line from "A" through the forecasted runoff from the current date through 31 July (650,000 ac.-ft.) at "B" and read the estimated runoff prior to maximum pool 550,000 ac.-ft. at "C".
2. From "D", using the same value obtained at "C", draw a line through the demand for power and other uses from the current date to 15 June (160,000 ac.-ft.) at "E" after 25 May, use the forecasted demand for power and other uses for the next 20 days or until 31 July whichever is less and obtain the space required to store the estimated runoff in excess of demand for power and other uses (390,000 ac.-ft.) at "F".

**COMPUTATION OF SUPPLEMENTAL RELEASE:**

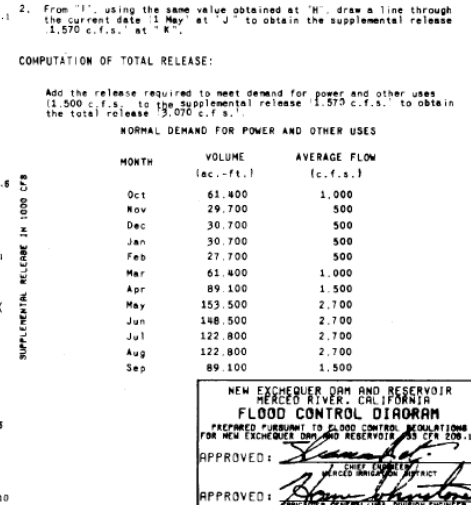
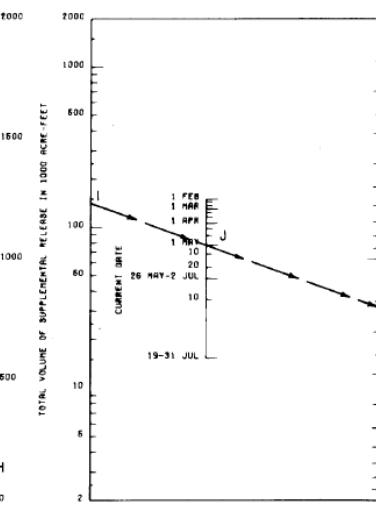
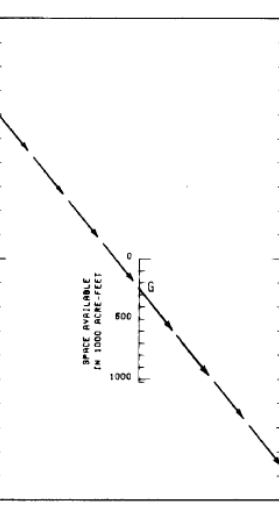
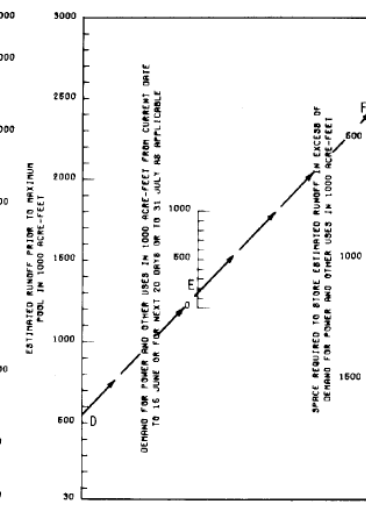
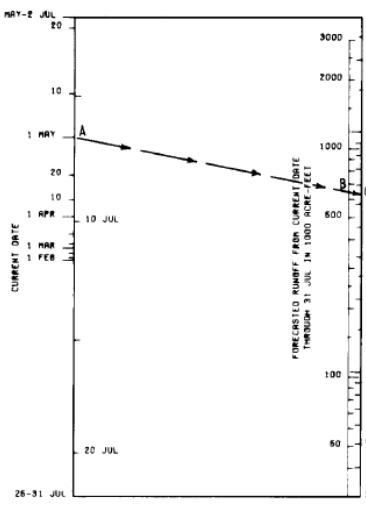
1. Draw a line from "F" through the space available in Lake McClure (250,000 ac.-ft.) at "G" to obtain the volume of the supplemental release (140,000 ac.-ft.) at "H".
2. From "I", using the same value obtained at "H", draw a line through the current date 1 May at "J" to obtain the supplemental release (1,570 c.f.s.) at "K".

**COMPUTATION OF TOTAL RELEASE:**

Add the release required to meet demand for power and other uses (1,500 c.f.s.) to the supplemental release (1,570 c.f.s.) to obtain the total release (3,070 c.f.s.).

**NORMAL DEMAND FOR POWER AND OTHER USES**

MONTH	VOLUME (ac.-ft.)	AVERAGE FLOW (c.f.s.)
Oct	61,400	1,000
Nov	29,700	500
Dec	30,700	500
Jan	30,700	500
Feb	27,700	500
Mar	61,400	1,000
Apr	89,100	1,500
May	153,500	2,700
Jun	148,500	2,700
Jul	122,800	2,700
Aug	122,800	2,700
Sep	89,100	1,500



NEW EXCHEQUER DAM AND RESERVOIR  
 MERCED RIVER, CALIFORNIA  
**FLOOD CONTROL DIAGRAM**  
 PREPARED PURSUANT TO FLOOD CONTROL REGULATIONS  
 FOR NEW EXCHEQUER DAM AND RESERVOIR, AS PER 200-111  
 APPROVED: *[Signature]* CHIEF ENGINEER  
 MERCED BARRAGE DISTRICT  
 APPROVED: *[Signature]* DISTRICT ENGINEER  
 SANJOAQUIN COUNTY, CALIFORNIA  
 EFFECTIVE DATE: 19 APR 1951 FILE NO.



# Demands spreadsheet calculates Conditional Storage and Supplemental Release form ACOE nomograph.

FlowDemandTable\_Final.xlsx - Excel

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW DEVELOPER

A32 :

	A	B	C	J	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AB	AD	AF	AG	AH	AI	AJ	AK	
10			This is Constant October 1 of this Water year!	Power and Irr Demand	Sum to June 15th	Sum for next 20 days	Sum until July 31	Min of Sum of Demands	"Conditional Storage Space" Minus Irr and Power	Storage, ac-ft	Corps Website Storage	Space Available, ac-ft	Conditional Storage - Lower Limit	Storage Rain Limit	Calculated Conditional Storage	Corps Conditional Storage	Storage Above Rain Limit	Must Release for Snowmelt	# of days for Supplemental Release	Supplemental release, cfs	Projected Total Release cfs	Projected Total Release from McClure, cfs	Actual Total Release, ac- ft	Release, ac- ft/day	Release, ac- ft	inflow, cfs	inflow, ac- ft	Sum of Inflow since first of each month, ac- ft
11	Date			cfs	ac-ft	ac-ft	ac-ft	ac-ft	ac-ft																			
12																												
13	2017	May 1, 2017	October 1, 2016	1316	167,106			167,106	681,862	663,478	663,478	360522	624,600	857,208	624,600	628,631	0	321,340	44	3,682	4,997	6,868	13,623	13,623	7,253	14,386	14,386	
14		May 2, 2017	October 1, 2016	1318	164,498			164,498	670,329	664,242	664,242	359759	624,600	861,010	624,600	634,411	0	310,571	43	3,641	4,959	6,877	13,641	13,641	8,187	16,239	30,625	
15		May 3, 2017	October 1, 2016	1409	161,884			161,884	657,292	666,840	666,840	357160	624,600	864,817	624,600	642,512	0	300,132	42	3,603	5,012	6,874	13,635	13,635	9,584	19,010	49,635	
16		May 4, 2017	October 1, 2016	1409	149,090			149,090	642,905	672,216	672,216	357160	624,600	868,622	624,600	652,399	0	291,120	41	3,580	4,989	6,872	13,631	13,631	10,669	21,162	70,797	
17		May 5, 2017	October 1, 2016	1468	146,295			146,295	625,999	679,747	679,745	344253	624,600	872,428	624,600	662,325	0	281,745	40	3,551	5,009	6,508	12,909	12,909	10,710	21,243	92,040	
18		May 6, 2017	October 1, 2016	1467	143,403			143,403	609,179	688,081	688,077	335919	624,600	876,231	624,600	669,632	0	273,261	39	3,532	4,989	6,500	12,893	12,893	9,147	18,143	110,183	
19		May 7, 2017	October 1, 2016	1537	140,515			140,515	595,014	693,332	693,325	330668	624,600	880,035	624,600	673,377	0	264,345	38	3,507	5,044	6,497	12,887	12,887	7,003	13,890	124,074	
20		May 8, 2017	October 1, 2016	1542	137,467			137,467	584,575	694,335	694,327	329665	624,600	883,839	624,600	676,690	0	254,910	37	3,473	5,015	6,497	12,887	12,887	6,744	13,377	137,451	
21		May 9, 2017	October 1, 2016	1536	134,408			134,408	574,614	694,825	694,801	329175	624,600	887,644	624,600	681,106	0	245,439	36	3,437	4,973	5,658	11,223	11,223	7,410	14,712	152,162	