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2018 - Salinas Valley Hydrologic Subareas, 4th Quarter Water Conditions

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Report on Salinas Valley water conditions for the fourth quarter of Water Year 2017-2018.

CHANGES TO PRESENTATION OF GROUNDWATER LEVEL TRENDS:

Beginning with the first quarter Water Year 2017-2018 (WY18) report, we introduced changes to the presentation of groundwater level data. The aim of these changes is to enhance understanding of the nature of Salinas Valley groundwater level data and its relationship to basin health and management, to better communicate this information to stakeholders, and to more efficiently maintain the Agency's groundwater level monitoring network.

The changes are graphically incorporated into attachments E through J. As in past Quarterly Reports, attachments E through J summarize water level trends for the current and previous water years (WY18 and WY17, respectively). However, instead of "depth to water," water levels are now presented as "water surface elevation," relative to mean sea level. Unlike depth to water, water surface elevation is independent of well elevation, making replacement of study wells a less costly and more objective process. Water surface elevation also ties Salinas Valley groundwater level data directly to a universally recognized datum, facilitating comparative analysis and scientific collaboration.

A second change is the replacement of the "normal" conditions water level trend curve, as represented by a single selected water year (WY85), with the more objective "long-term average" water level curve, a data set based on averaged monthly water levels for the most recent 30-years for each subarea. In this way, each month's data will now be compared to an objective measure of central tendency based on data that encompass a more representative range of climatic and operational conditions in the Salinas Valley.

Finally, for comparison to water levels in dry conditions, WY15 replaces WY91. With this change, current groundwater level data will now be compared to data from a recent extended drought within a time of contemporary operational constraints. Using WY15 also minimizes uncertainty associated with the gradual loss and replacement of study wells since WY91.

SUMMARY/DISCUSSION:

This report covers the fourth quarter of Water Year 2017-2018 (WY18), July through September 2018. It provides a brief overview of water conditions in the Salinas Valley (Attachment A) with discussion of precipitation, reservoir storage, and groundwater level trends. Data for each of these components are included as graphs and tables in Attachments B through J.

Precipitation – Preliminary National Weather Service rainfall data indicates that the fourth quarter of WY18 brought no rainfall to Salinas and King City. Totals for normal rainfall for the fourth quarter are 0.20 at the Salinas Airport, and 0.17 inches in King City.

Attachment B contains graphs for both stations showing monthly and cumulative precipitation data for the current and a "normal" water year, based on long-term monthly precipitation averages. Attachment B also includes tables showing values for precipitation totals as well as percent of "normal" precipitation.

Reservoirs - The following table compares fourth quarter storage at Nacimiento and San Antonio reservoirs for the past two years. Storage in Nacimiento Reservoir is 130,275 acre-feet lower than in September 2017, and storage in San Antonio Reservoir is 69,038 acre-feet lower.

Reservoir	September 30, 2018 (WY18) Storage in acre-feet	September 30, 2017 (WY17) Storage in acre-feet	Difference in acre-feet
Nacimiento	50,763	181,038	-130,275
San Antonio	42,312	111,350	-69,038

Graphs showing daily reservoir storage for the last five water years along with 30-year average daily storage for comparison are included as Attachments C and D.

Groundwater Levels – More than 90 wells are measured monthly throughout the Salinas Valley to monitor seasonal groundwater level fluctuations. Data from approximately 50 of these wells are used in the preparation of this report. The measurements are categorized by hydrologic subarea, averaged, and graphed to compare current water levels (WY18) with selected past conditions. Graphs for individual subareas, showing the current year’s water level conditions, last year’s conditions (WY17) and dry conditions (WY15) are found in Attachments E through I. For comparison to long term conditions, a curve showing monthly water levels averaged over the most recent 30 years (WY1987-WY2017) is included on each graph. Attachment J is a summary of water level changes for all subareas.

By the end of the fourth quarter of WY18, groundwater levels began recovering in all subareas except the Upper Valley. Over the last month of the quarter, average groundwater levels rose by four feet in the Pressure 180-Foot Aquifer, by three feet in the Pressure 400-Foot Aquifer, by seven feet in the East Side Subarea, by one foot in the Forebay Subarea, while decreasing by less than one foot in the Upper Valley Subarea.

Compared to September 2017, average groundwater levels in September 2018 increased by less than one foot in the Pressure 180-Foot Aquifer, by one foot in the East Side Subarea, by two feet in the Forebay Subarea, and by one foot Upper Valley Subarea. Groundwater levels decreased by less than one foot in the Pressure 400-Foot Aquifer.

When compared to 30 year average groundwater conditions, September 2018 water levels were four feet higher in the Pressure 400-Foot Aquifer, less than one foot lower in the Pressure 180-Foot Aquifer and Forebay Subarea, six feet lower in the East Side Subarea, one foot lower in the Upper Valley Subarea.

Average groundwater levels at end of the fourth quarter of WY18 were higher in all subareas than in WY15 (dry conditions).

OTHER AGENCY INVOLVEMENT:

None

FINANCING:

Funds 111 and 116

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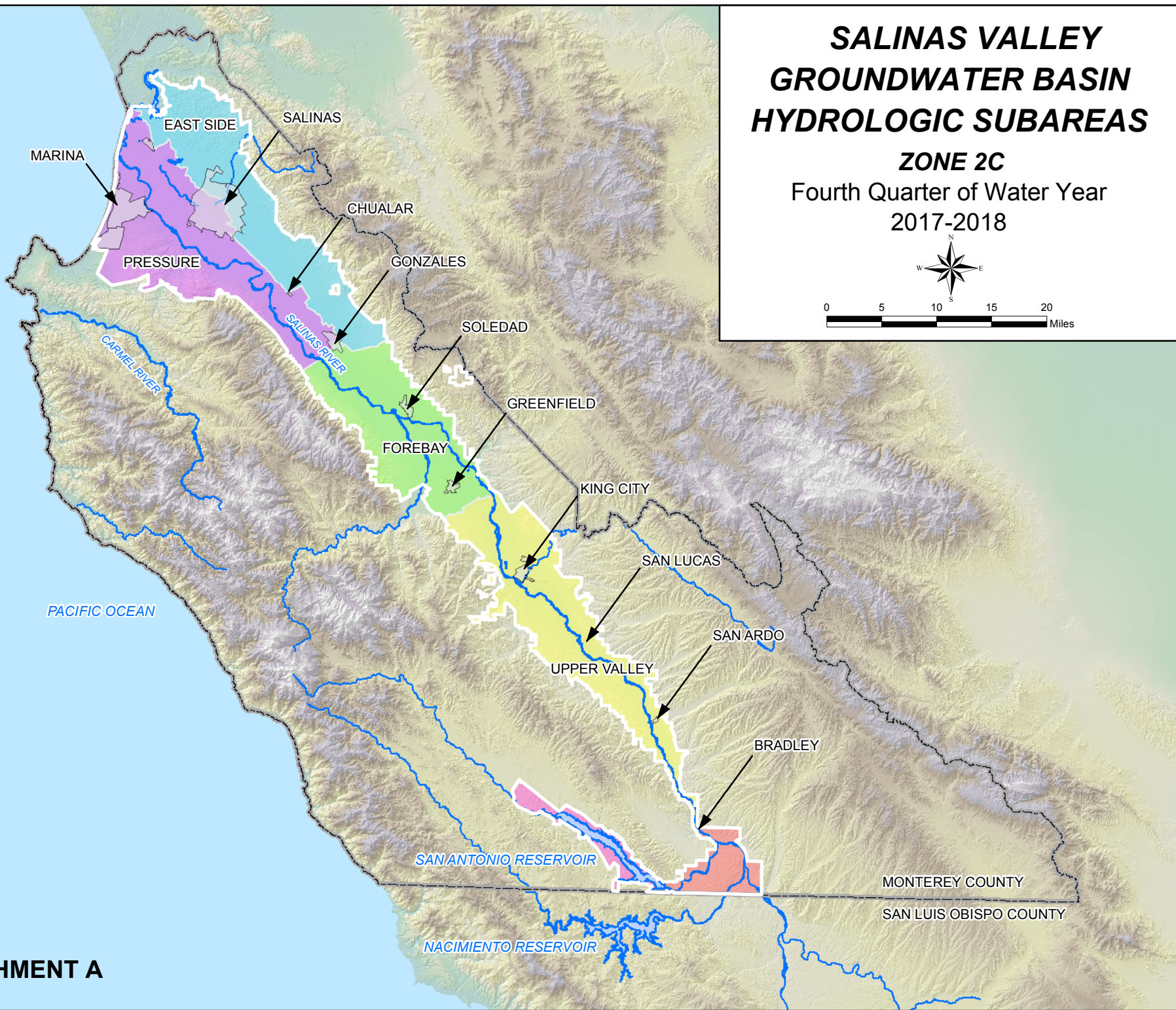
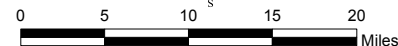
Attachments:

1. Attachment A, Salinas Valley Hydrologic Subareas Map
2. Attachment B, Salinas and King City Precipitation Graphs
3. Attachment C, Nacimiento Reservoir Graph
4. Attachment D, San Antonio Reservoir Graph
5. Attachment E, Groundwater Trends Pressure 180-Foot Aquifer
6. Attachment F, Groundwater Trends Pressure 400-Foot Aquifer
7. Attachment G, Groundwater Trends East Side Subarea
8. Attachment H, Groundwater Trends Forebay Subarea
9. Attachment I, Groundwater Trends Upper Valley Subarea
10. Attachment J, Groundwater Trends Summary

SALINAS VALLEY GROUNDWATER BASIN HYDROLOGIC SUBAREAS

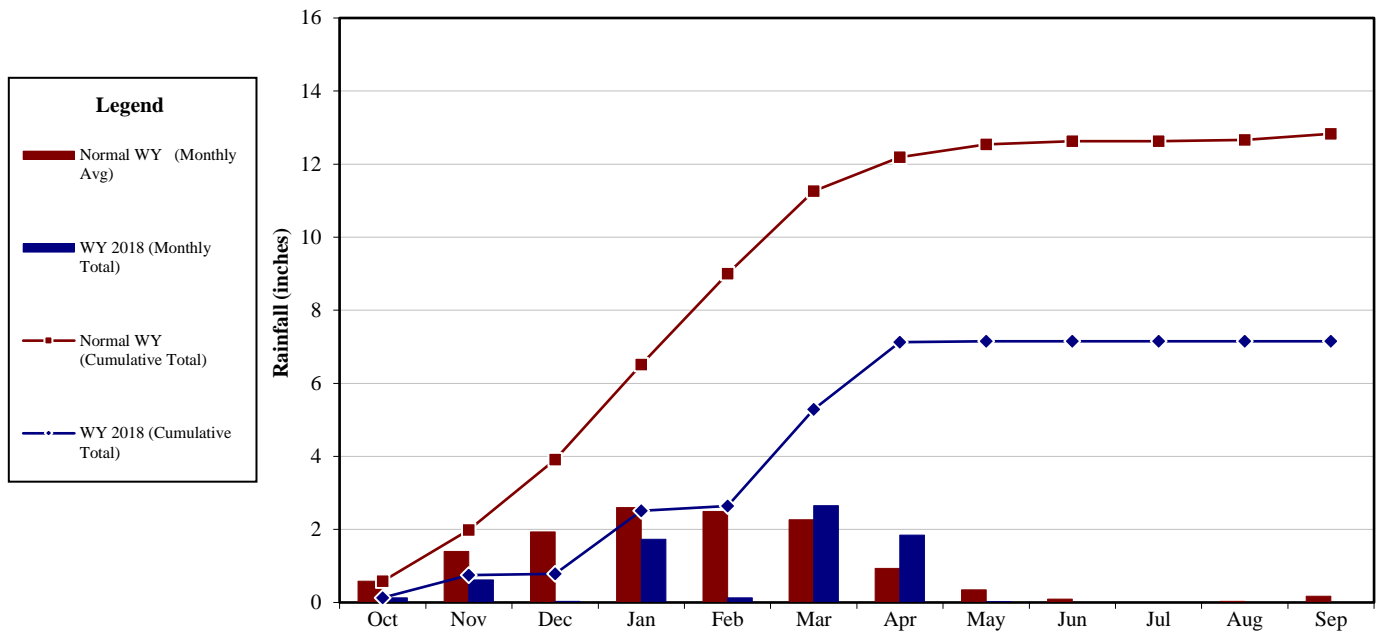
ZONE 2C

Fourth Quarter of Water Year
2017-2018



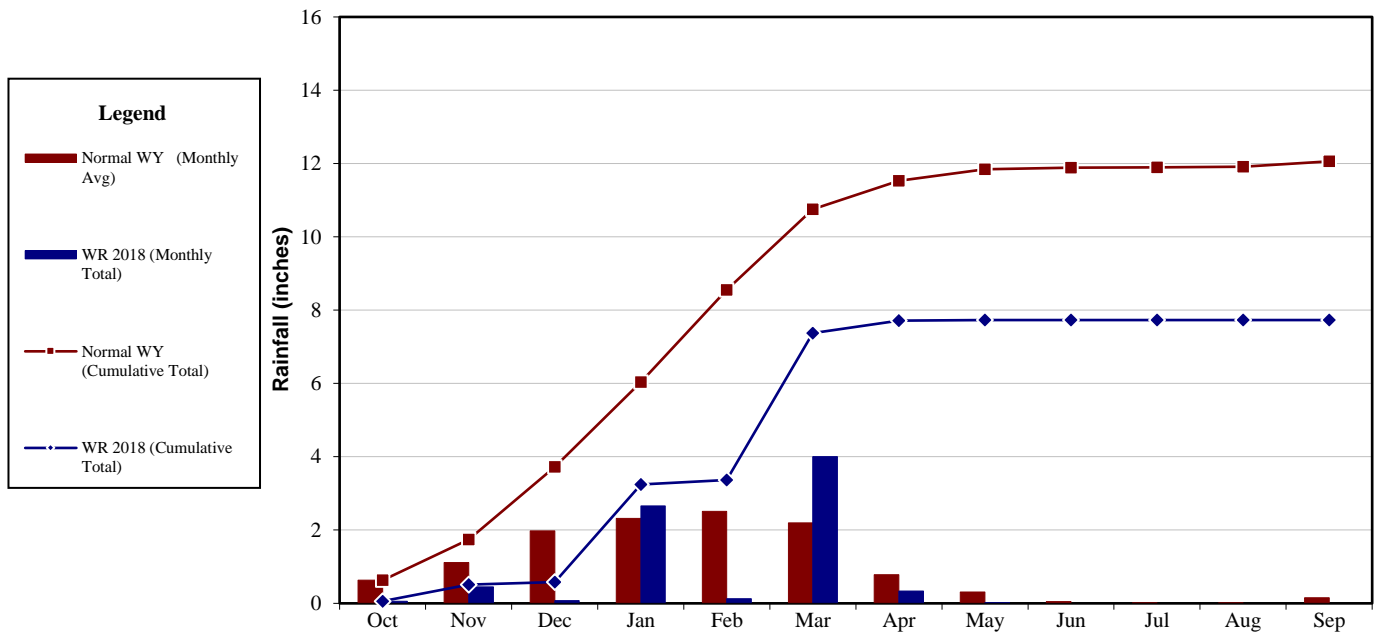
ATTACHMENT A

SALINAS AIRPORT RAINFALL WATER YEAR 2018



Monthly Rainfall (WY 2018)	0.13	0.62	0.03	1.73	0.13	2.65	1.84	0.02	0.00	0.00	0.00	0.00
Monthly Rainfall (Normal WY*)	0.58	1.40	1.93	2.60	2.49	2.26	0.93	0.35	0.09	0.00	0.03	0.17
Percent of Normal for Month	22%	44%	2%	67%	5%	117%	198%	6%	0%	0%	0%	0%
Cumulative Rainfall (WY 2018)	0.13	0.75	0.78	2.51	2.64	5.29	7.13	7.15	7.15	7.15	7.15	7.15
Cumulative Rainfall (Normal WY*)	0.58	1.98	3.91	6.51	9.00	11.26	12.19	12.54	12.63	12.63	12.66	12.83
Percent of Cumulative Normal	22%	38%	20%	39%	29%	47%	58%	57%	57%	57%	56%	56%

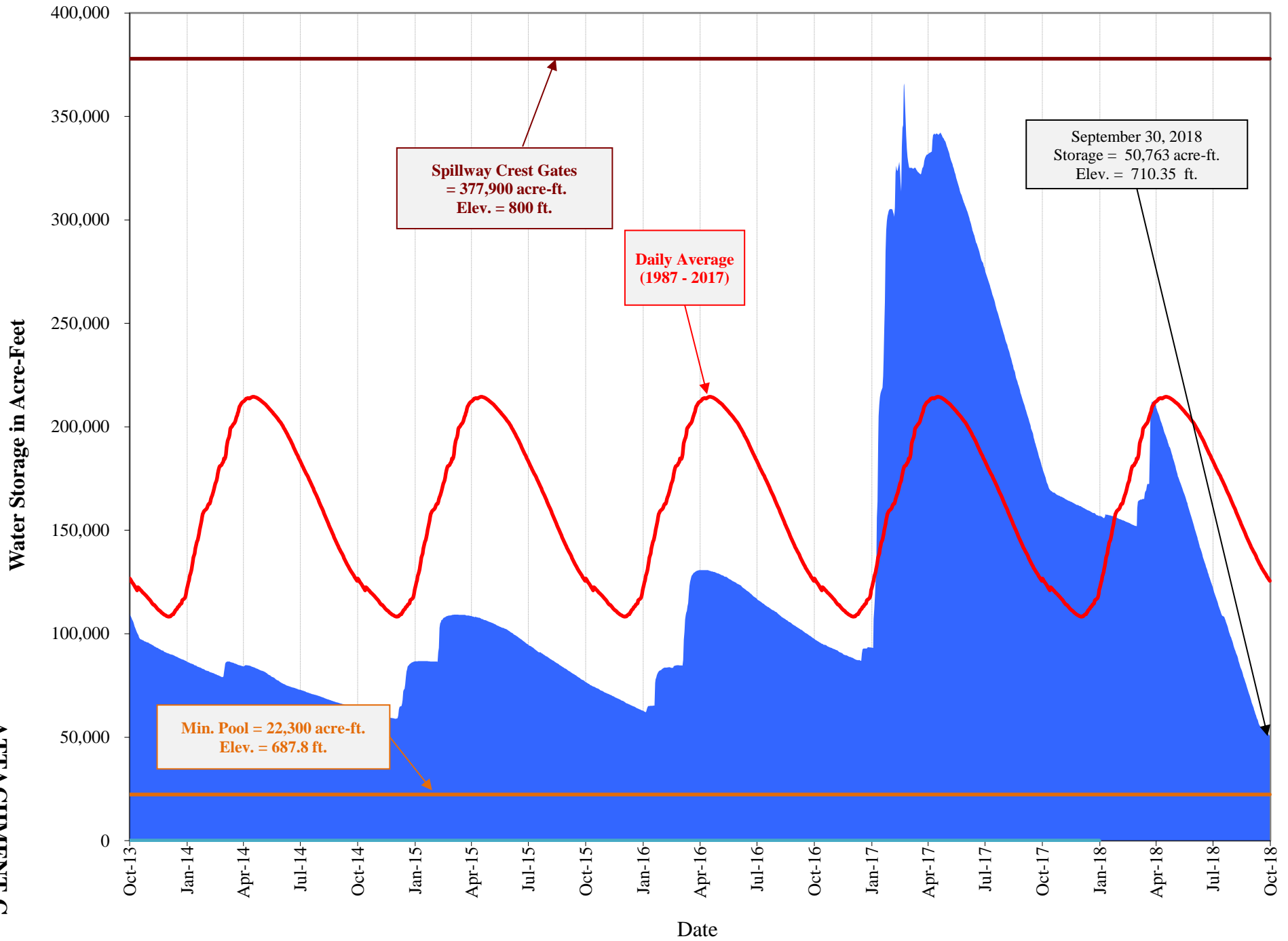
KING CITY RAINFALL WATER YEAR 2018



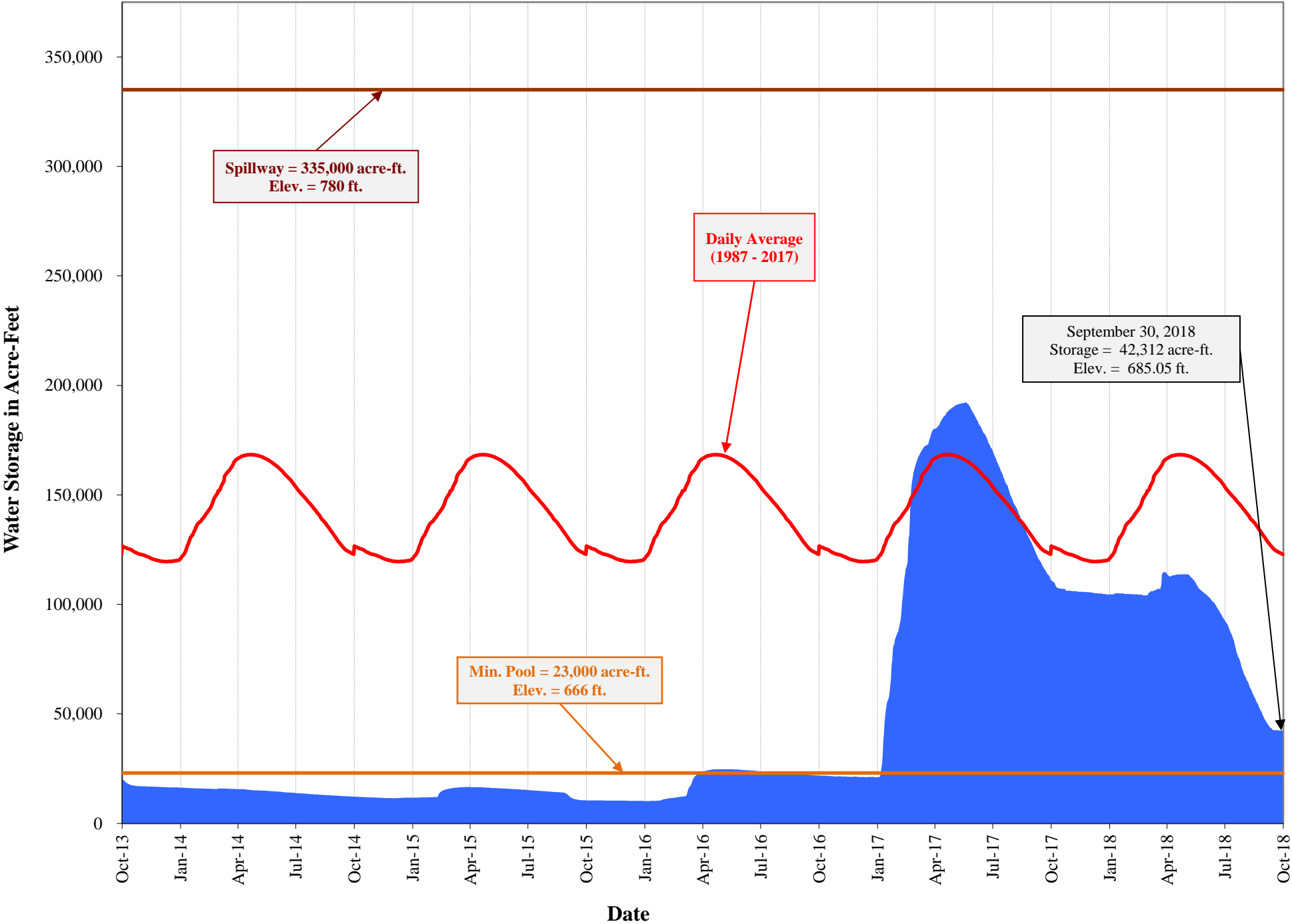
Monthly Rainfall (WR 2018)	0.06	0.45	0.07	2.66	0.13	4.00	0.34	0.02	0.00	0.00	0.00	0.00
Monthly Rainfall (Normal WY*)	0.63	1.11	1.98	2.32	2.51	2.20	0.78	0.31	0.05	0.01	0.01	0.15
Percent of Normal for Month	10%	41%	4%	115%	5%	182%	44%	6%	0%	0%	0%	0%
Cumulative Rainfall (WR 2018)	0.06	0.51	0.58	3.24	3.37	7.37	7.71	7.73	7.73	7.73	7.73	7.73
Cumulative Rainfall (Normal WY*)	0.63	1.74	3.72	6.04	8.55	10.75	11.53	11.84	11.89	11.90	11.91	12.06
Percent of Cumulative Normal	10%	29%	16%	54%	39%	69%	67%	65%	65%	65%	65%	64%

*Average precipitation over the most recent 30-year period ending in a decade (1981-2010)

NACIMIENTO RESERVOIR DAILY STORAGE

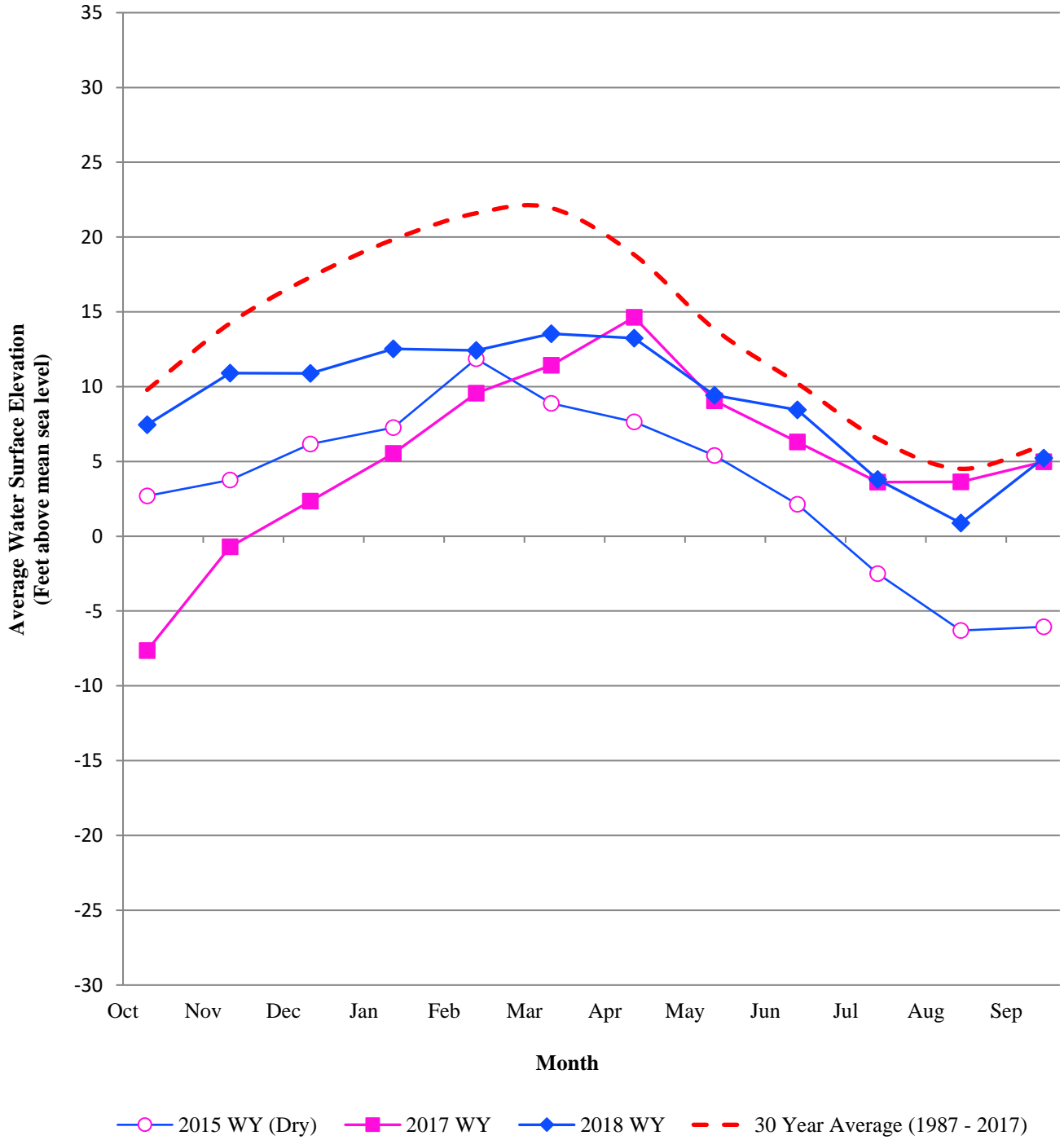


SAN ANTONIO RESERVOIR DAILY STORAGE

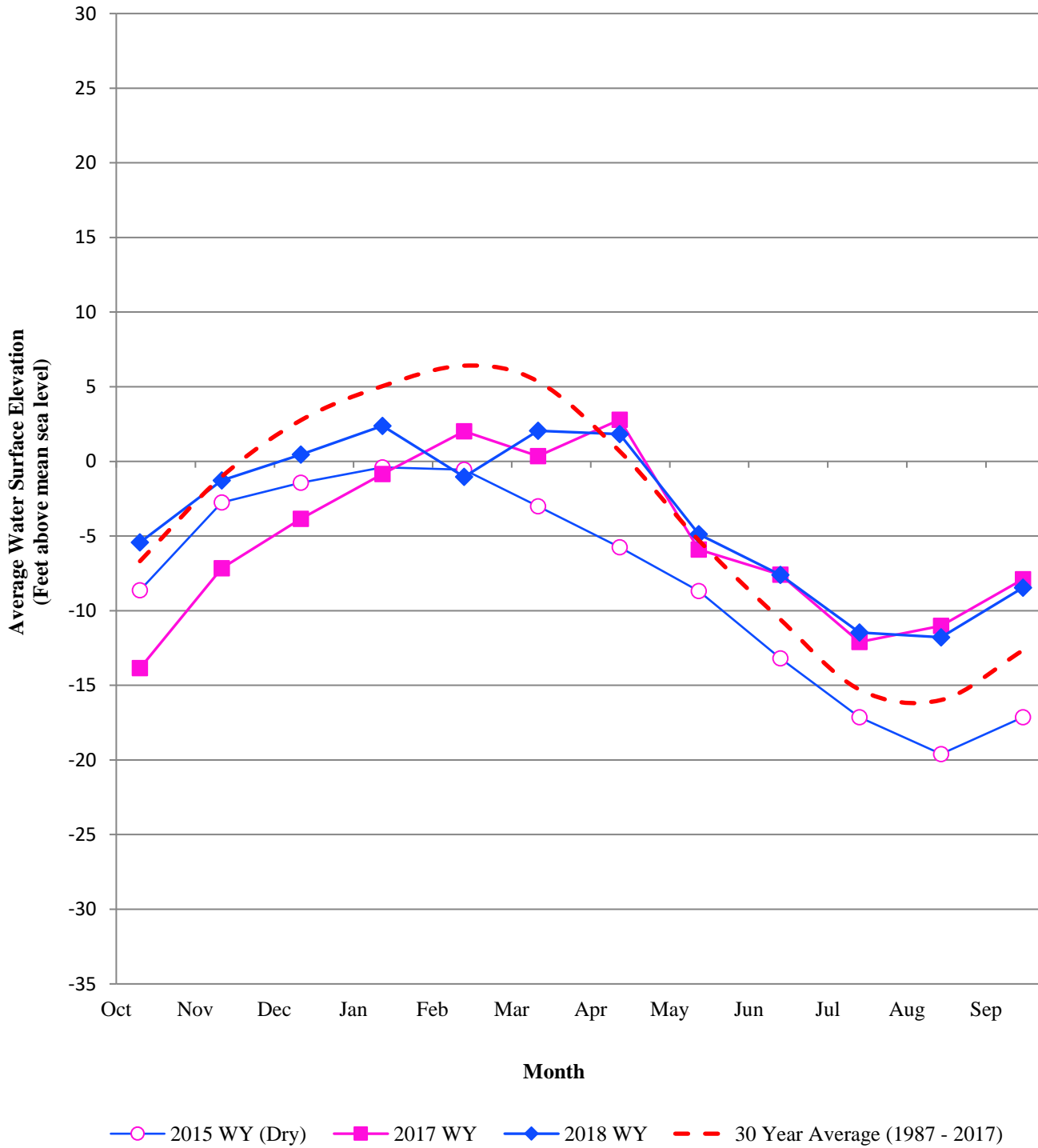


ATTACHMENT D

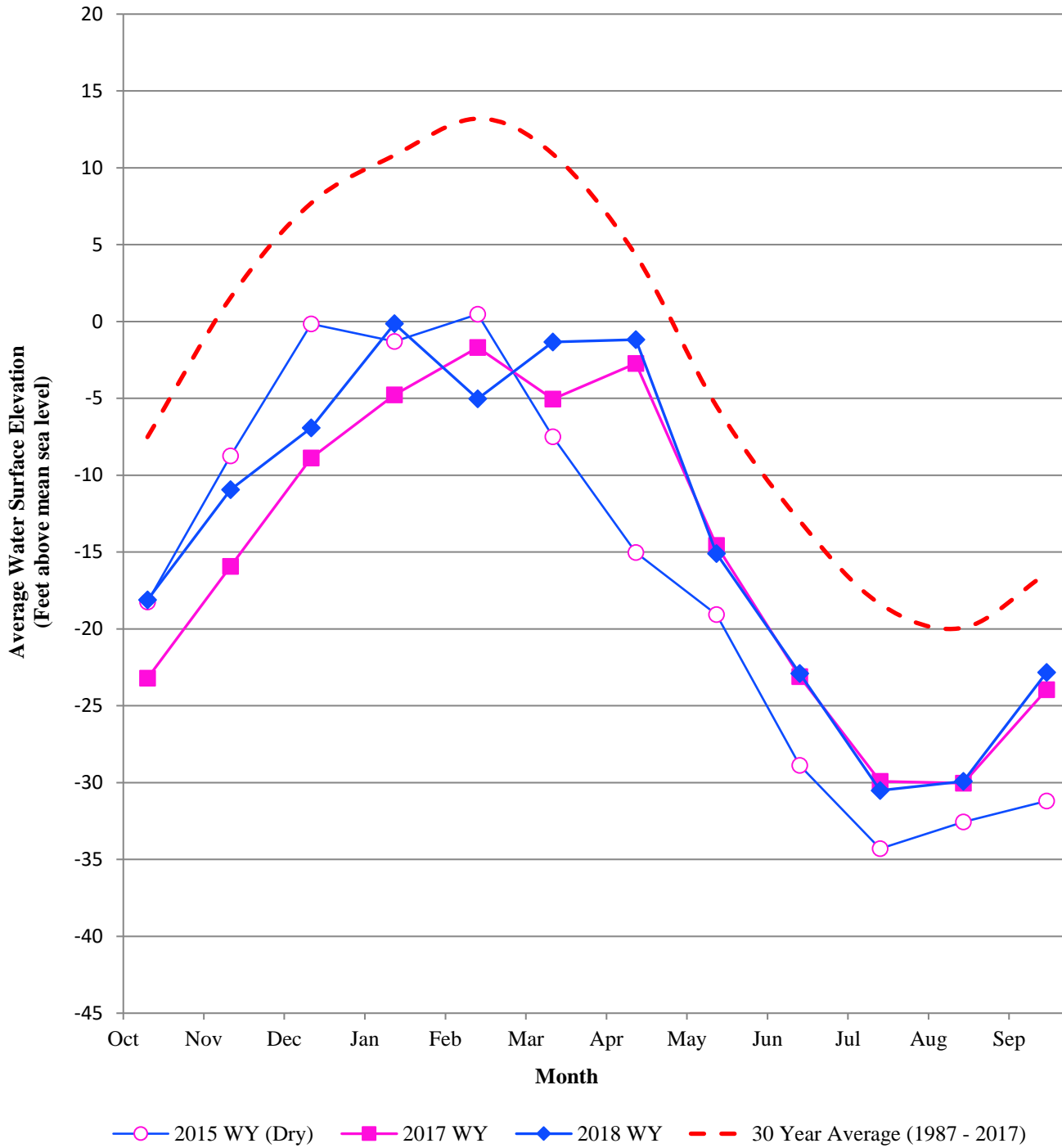
GROUNDWATER TRENDS PRESSURE 180-FOOT AQUIFER 5 Wells



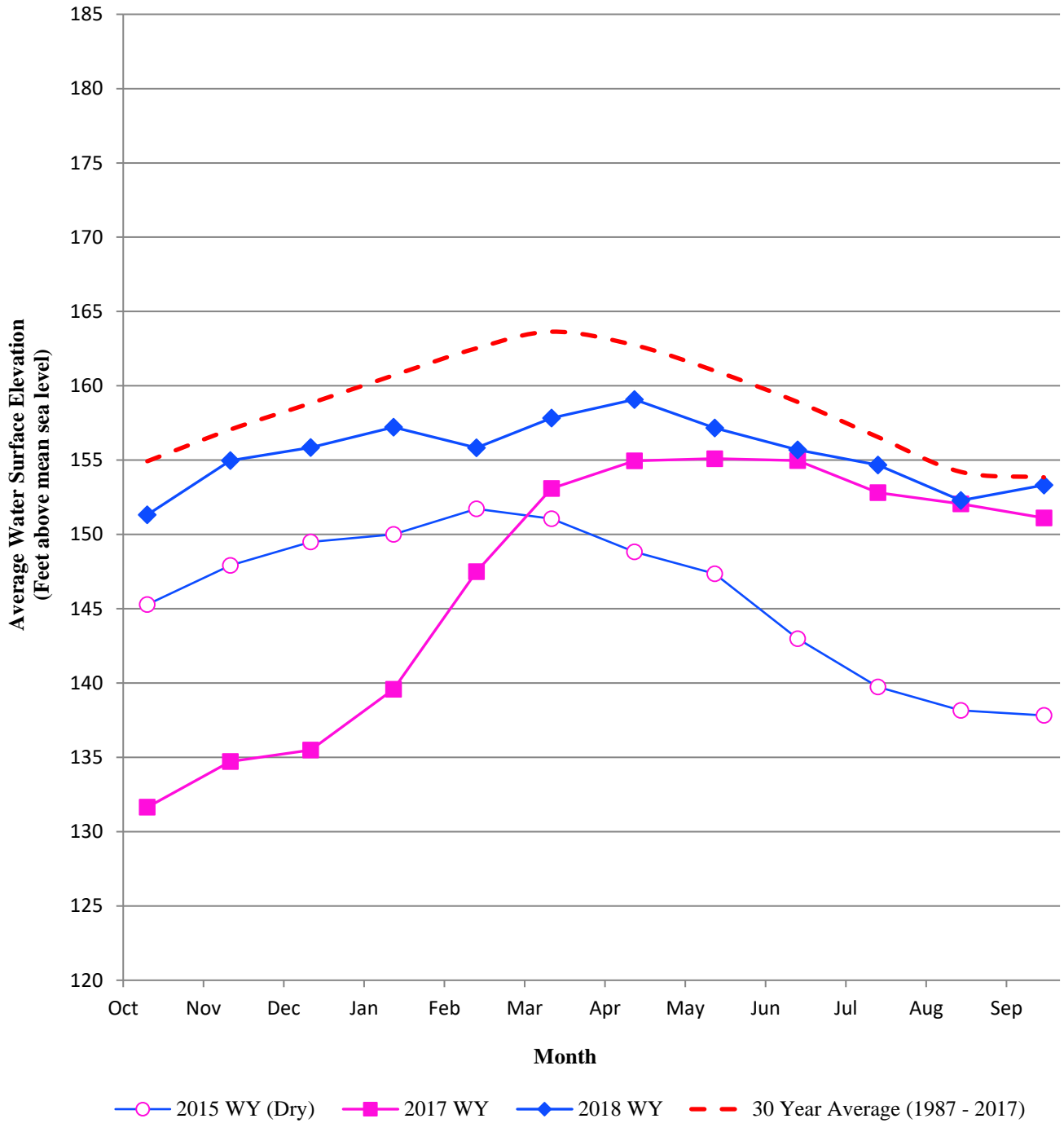
GROUNDWATER TRENDS PRESSURE 400-FOOT AQUIFER 11 Wells



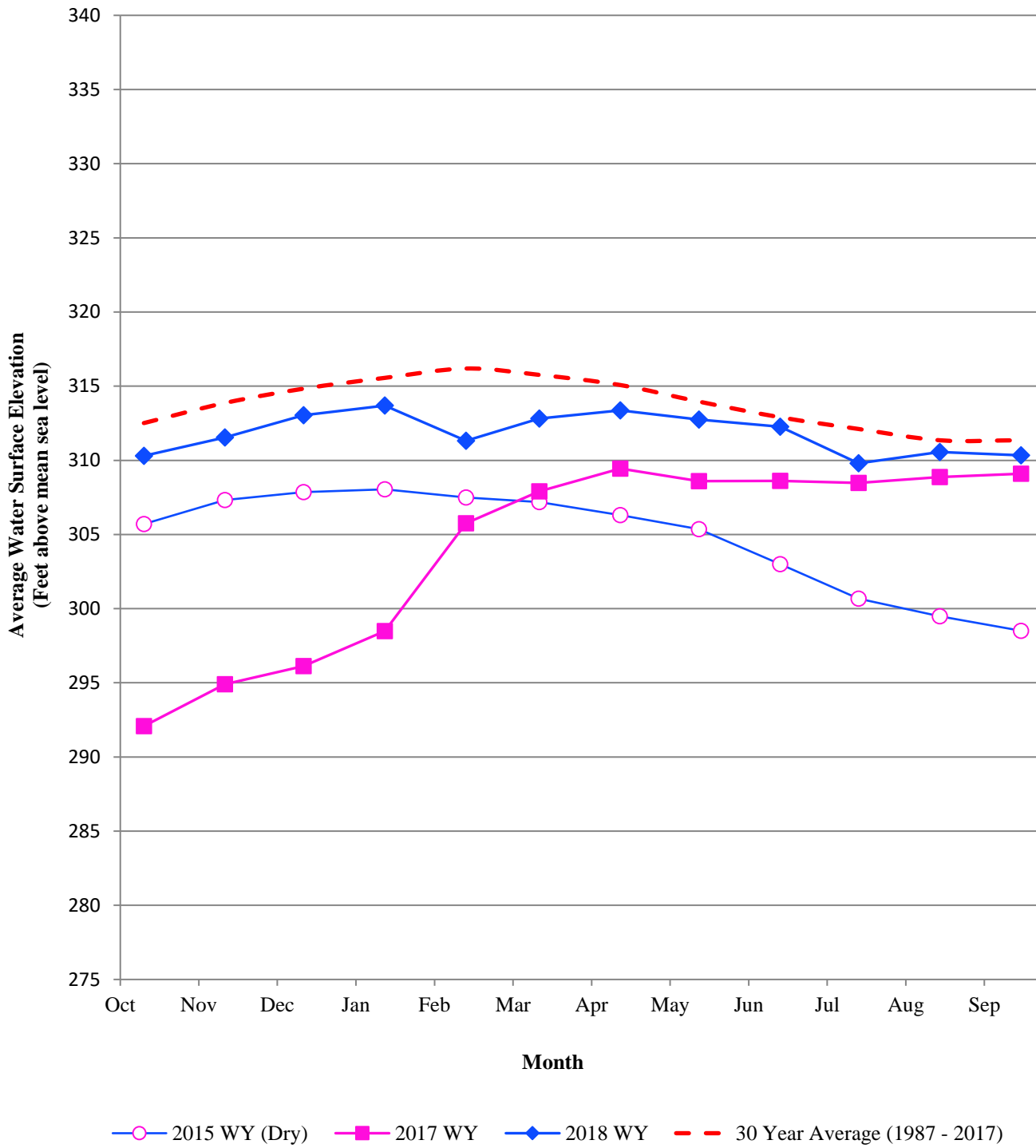
GROUNDWATER TRENDS EAST SIDE SUBAREA 11 Wells



GROUNDWATER TRENDS FOREBAY SUBAREA 10 Wells



GROUNDWATER TRENDS UPPER VALLEY SUBAREA 9 Wells



Groundwater Trends Summary September 2018

Area	September 2018 Groundwater Elevation (ft msl)	1 Year Change	Difference from 30 year Average Elevation	1 Month Change
Pressure 180-Foot Aquifer	5 '	Up < 1 '	Down < 1 '	Up 4 '
Pressure 400-Foot Aquifer	-9 '	Down < 1 '	Up 4 '	Up 3 '
East Side Subarea	-23 '	Up 1 '	Down 6 '	Up 7 '
Forebay Subarea	153 '	Up 2 '	Down < 1 '	Up 1 '
Upper Valley Subarea	310 '	Up 1 '	Down 1 '	Down < 1 '