

Demand, Rainfall and Temperature in the Tucson Water Service Area

Pima County Local Drought Impact
Group

7/11/2018

Measurement Issues

- Volume:
 - Annual Volume
 - Monthly
 - Daily
- Frequency:
 - Number of days of rain.
- Effective Rain:
 - 65% of the 1 day rain events are a 10th of inch or less.
 - 35% of the rain events are only a trace (1/100 of an inch)
- Distribution of Rainfall:
 - One point of measurement for a gigantic service area.
 - Observed rainfall with little change in demand/no observed rainfall significant change in demand
- When It Rains or Doesn't Rain is Important:
 - Rains when it doesn't usually rain – May.
- Falling Demand Despite Lingering Drought
 - Annual Demand Has Been Falling.
 - Exterior Demand has Been Falling the Fastest.
 - Despite drought, water usage has continued to fall – less rain thus far has not resulted in increased demand.
 - It is possible that demand would have fallen further than if there had been no drought.

- Single Family Exterior Water Use Trends:
 - Fewer and Smaller Pools: Effects falling GPCD but not aggregate demand (existing pools still evaporate at the same rate.)
 - Less real grass and more fake grass:
 - Fewer evaporative coolers:
 - All new homes now have AC and many existing homes have added AC.
 - Pricing makes exterior use very expensive: People are simply irrigating less.

Rainfall Events Are Very Skewed: Not Uncommon for a Single Storm to Exceed 15% of the Annual Rainfall.

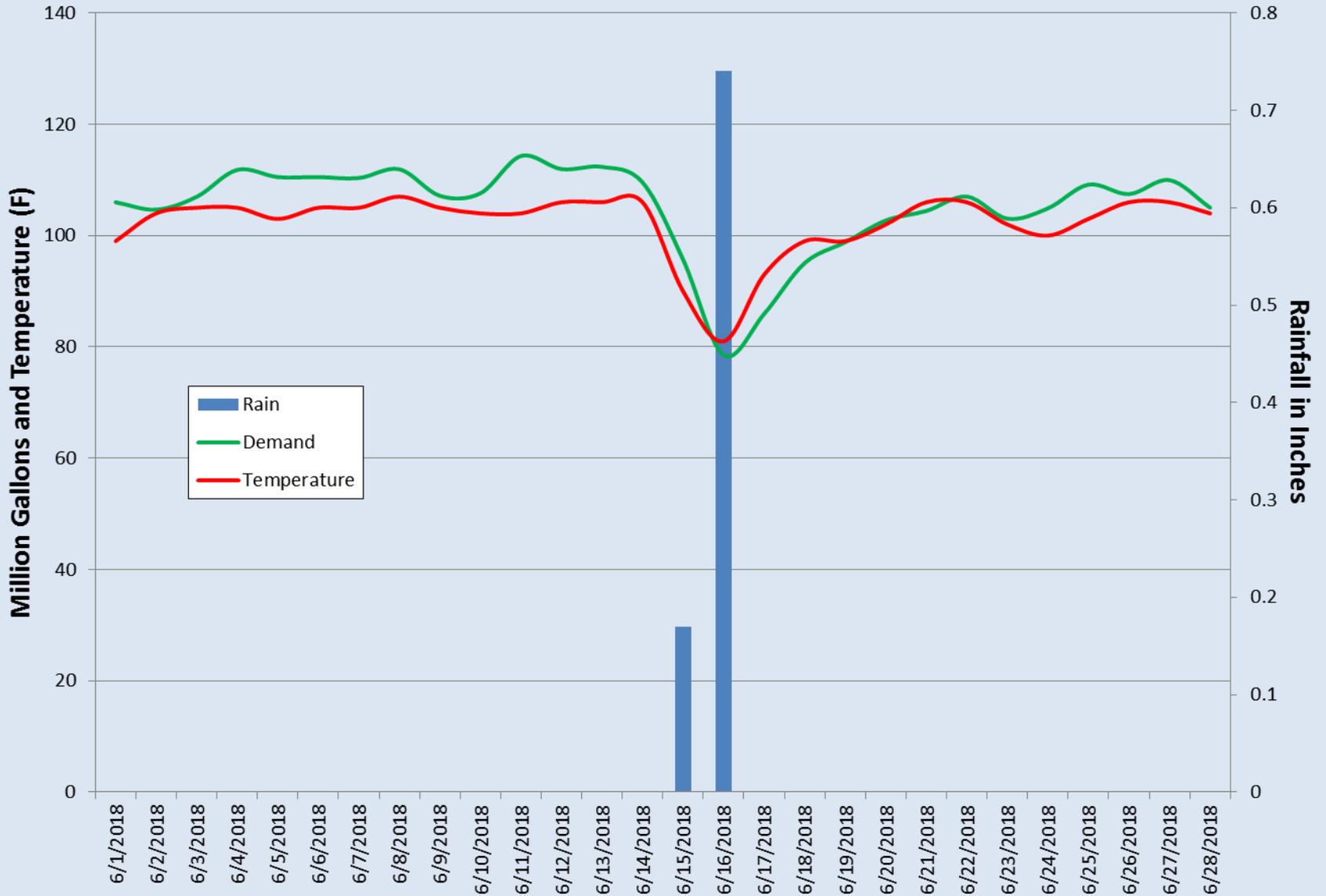
1 Day Rain Events

- 54% are less than a 10th of an inch.
- 2% Greater Than 1 Inch
- Total Rainfall Associated with Rainfall Events of Greater than 1 inch: 17%.

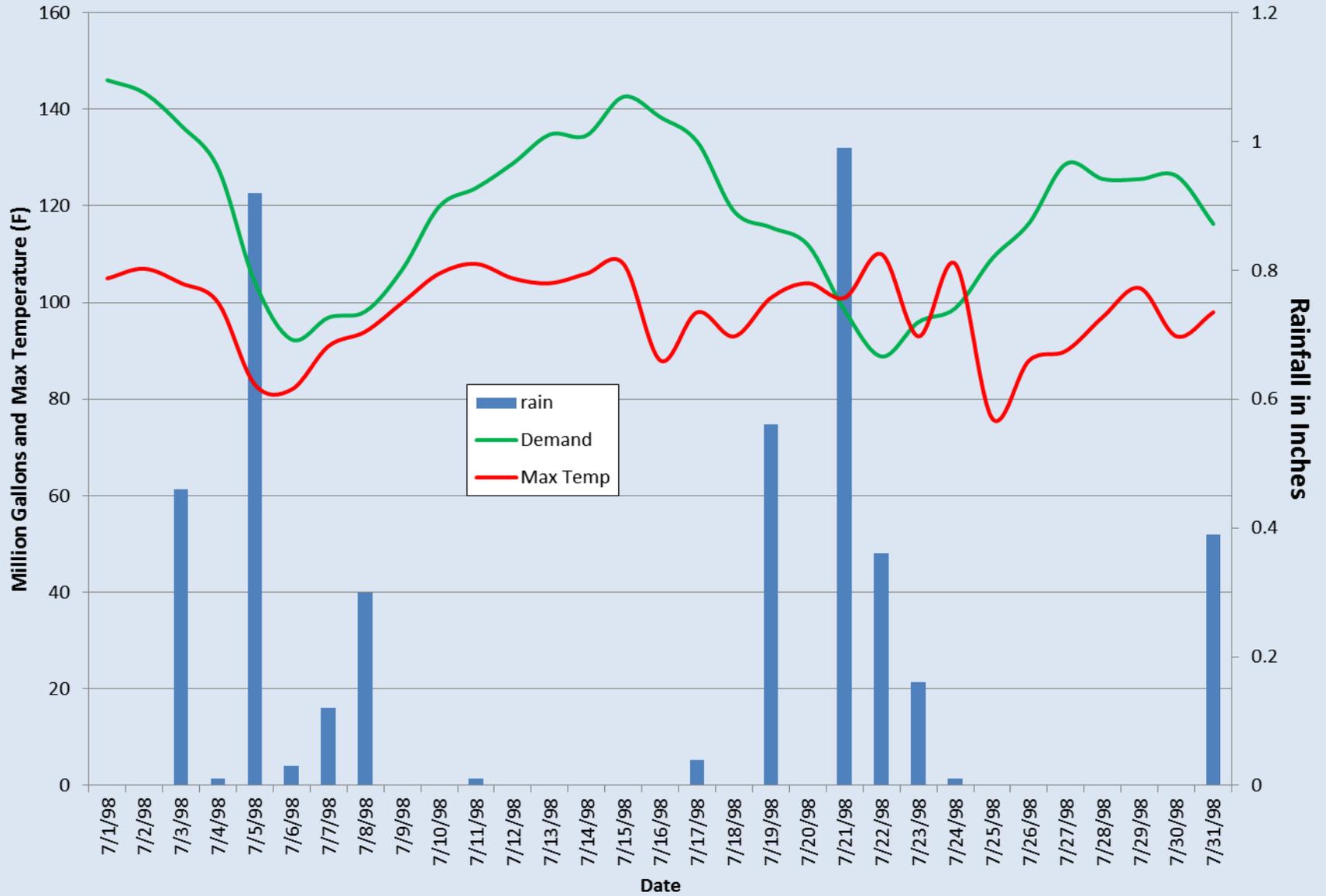
3 Day Rain Events

- 43% are less than a 10th of an inch.
- 6% are more than 1 Inch
- Total Rainfall Associated Rainfall Events of Greater than 1 inch: 27%.

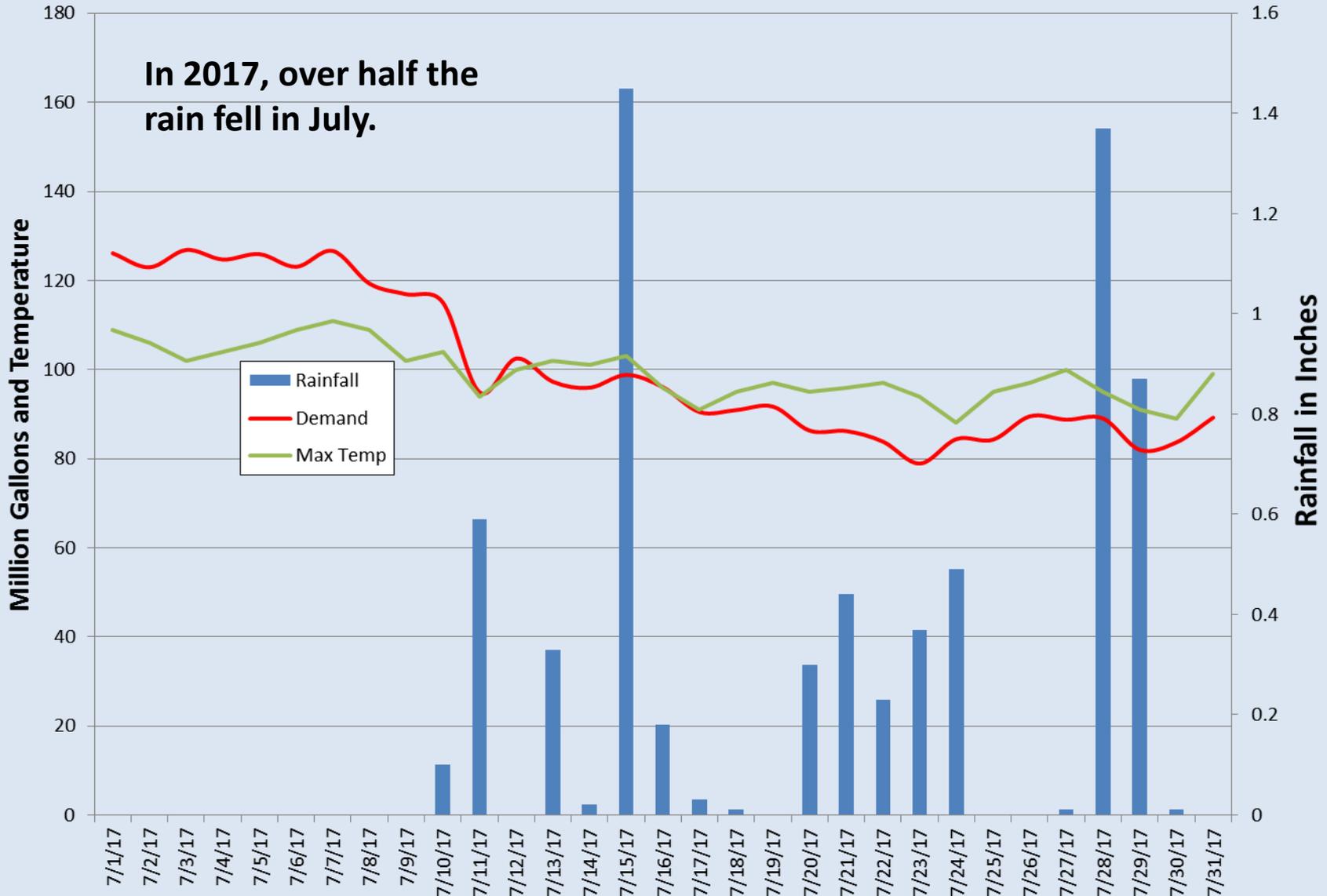
Demand, Temperature and Rainfall: June 2018



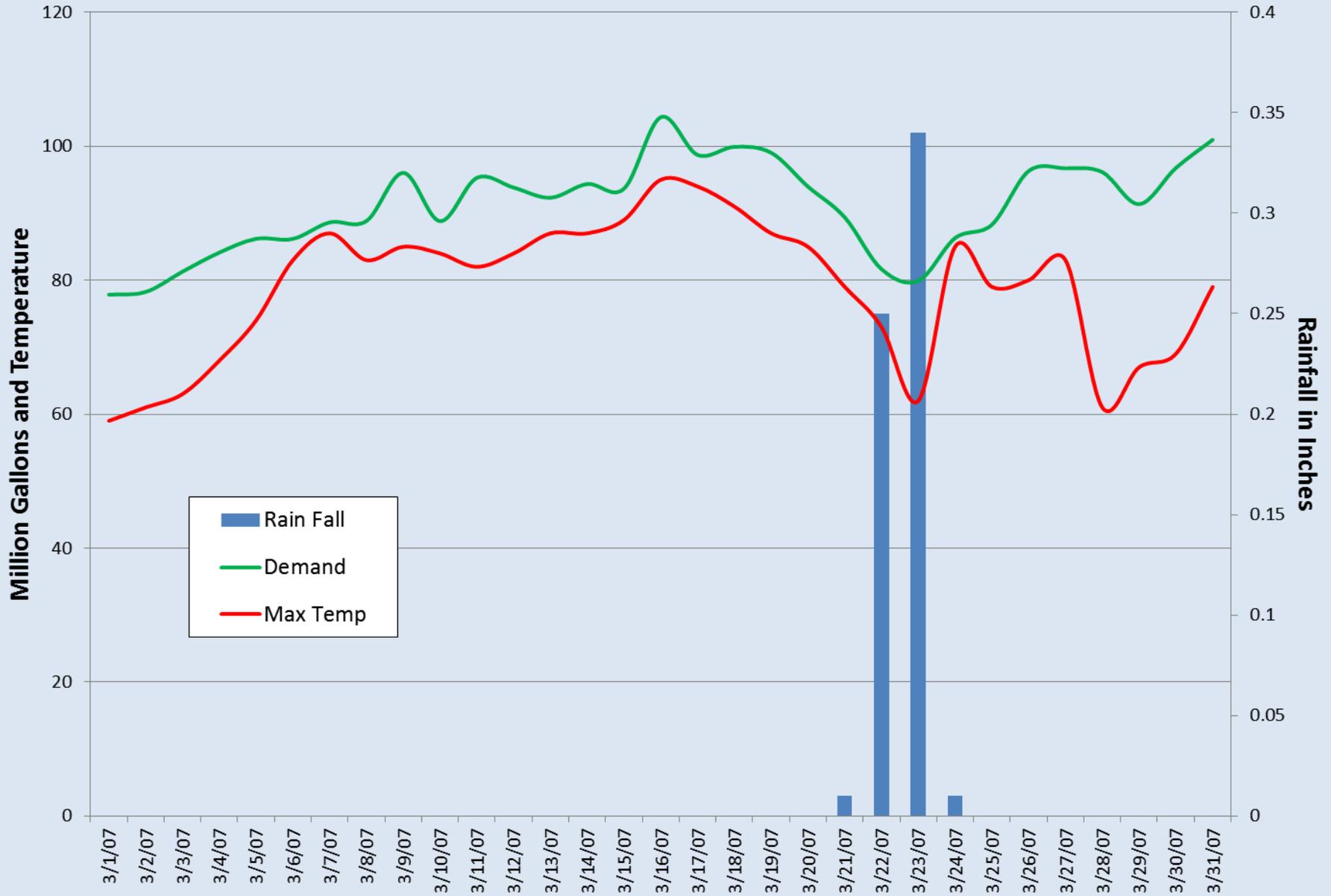
Daily Demand, Max Temperature and Rainfall: July 1998



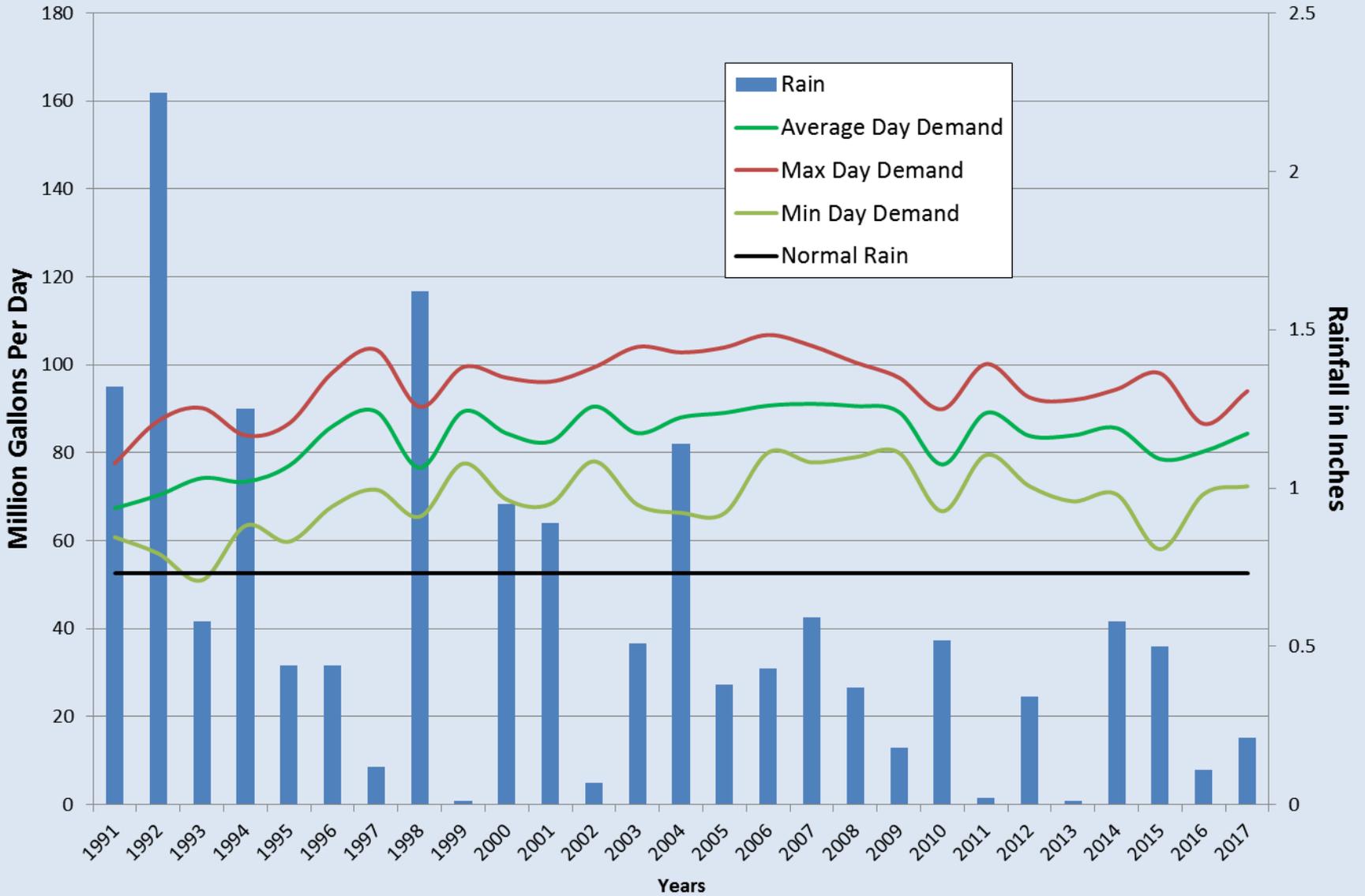
Demand, Max Temp and Rainfall: July 2017



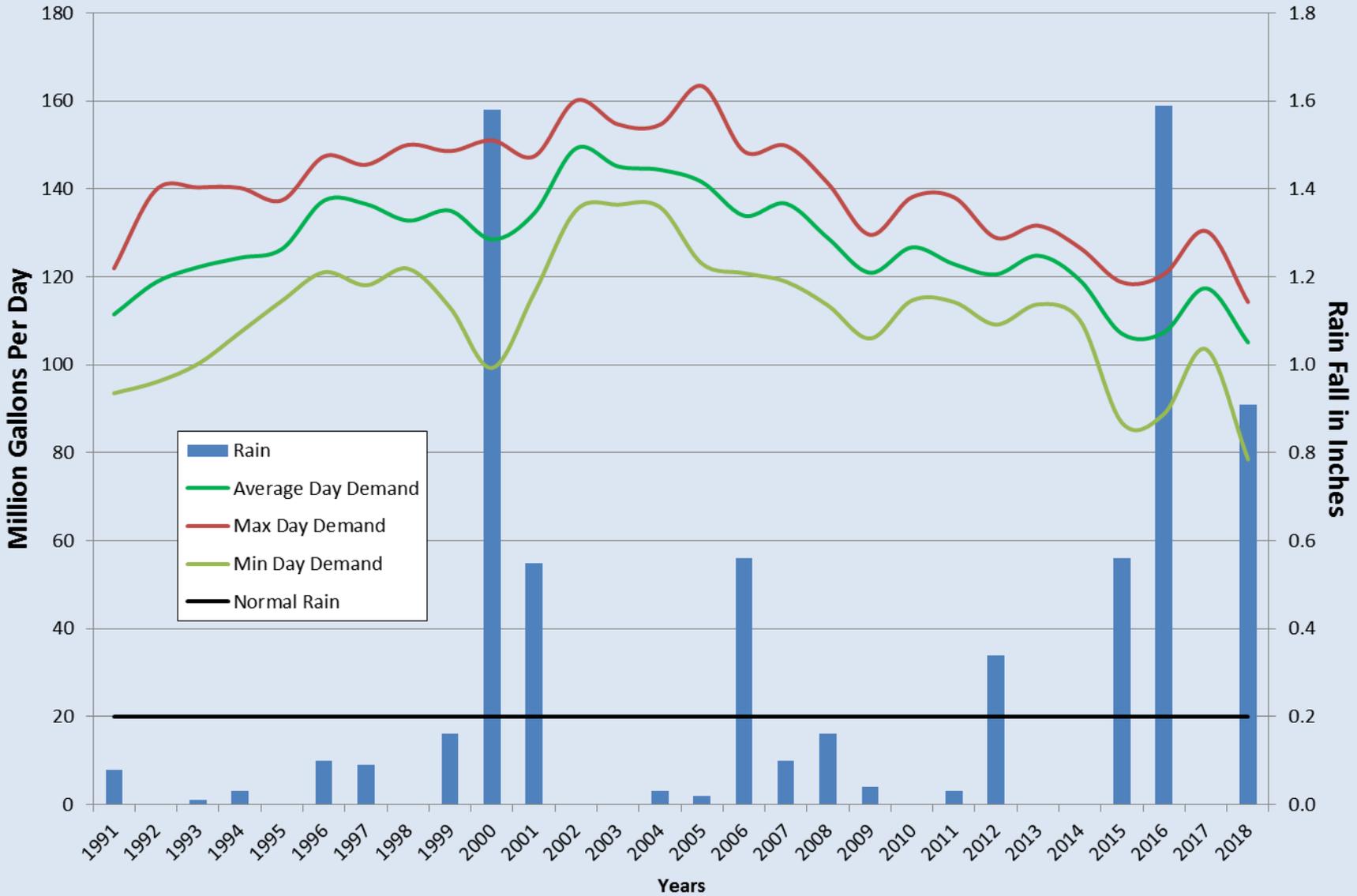
Daily Demand, Temperature and Rainfall March 2007



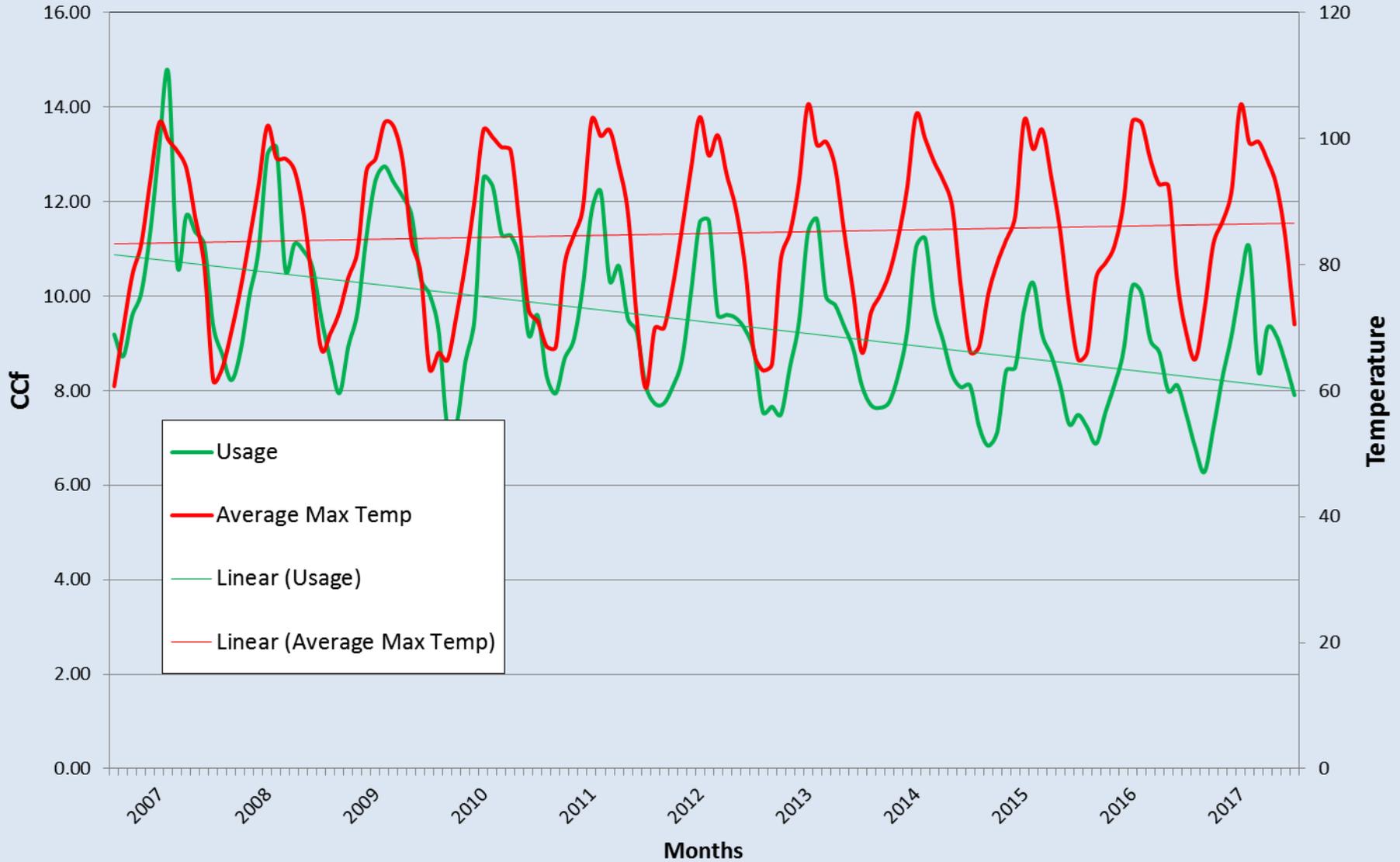
March Potable System Daily Demands and Rainfall: 1991 to 2017



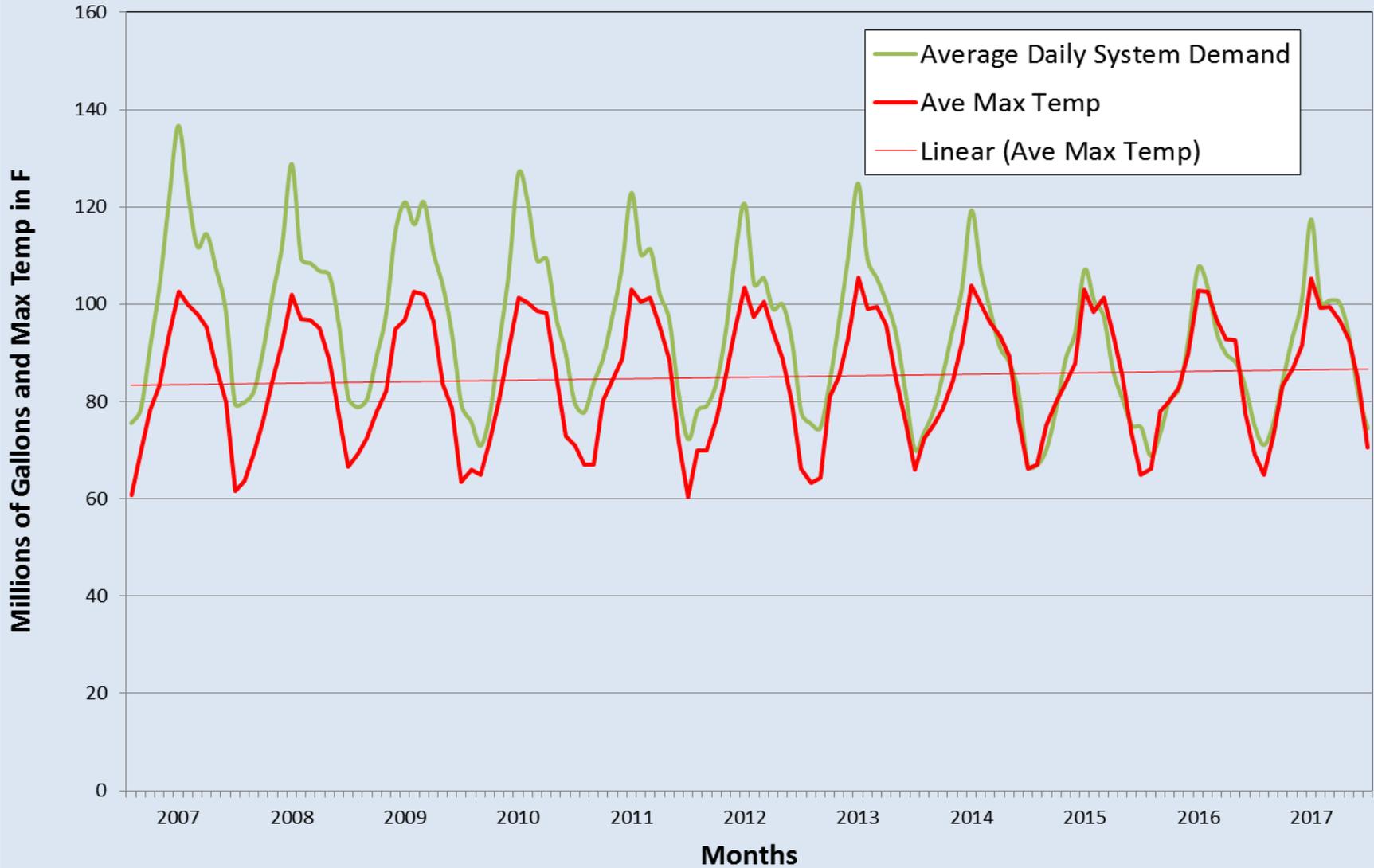
June Potable System Daily Demands and Rainfall: 1991 to 2018



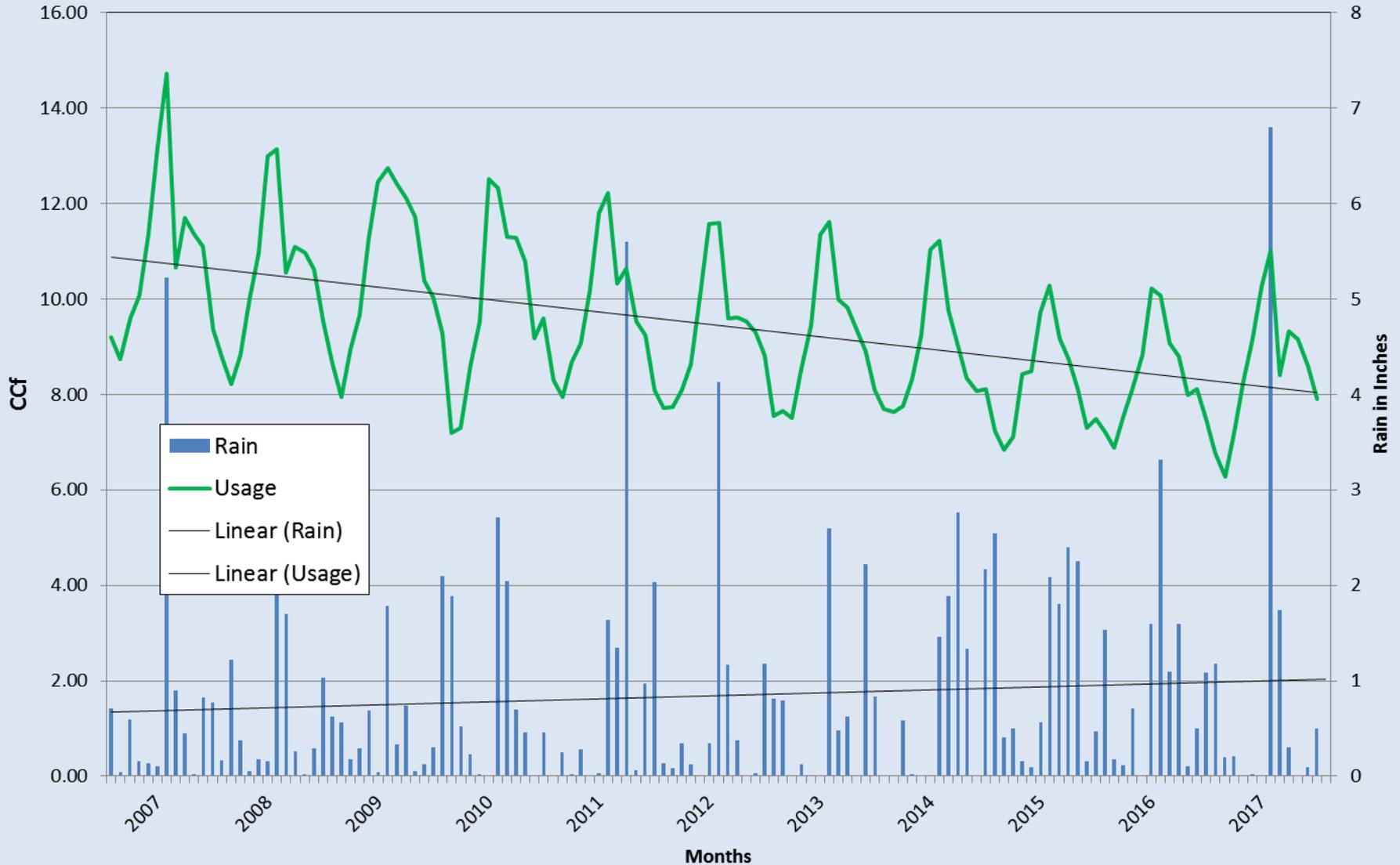
Single Family Monthly Water Use Per Service and Average Max Temperature: 2007 to 2017



Average Daily Potable System Demand by Month and Ave Max Temperature for Month: 2007 to 2017

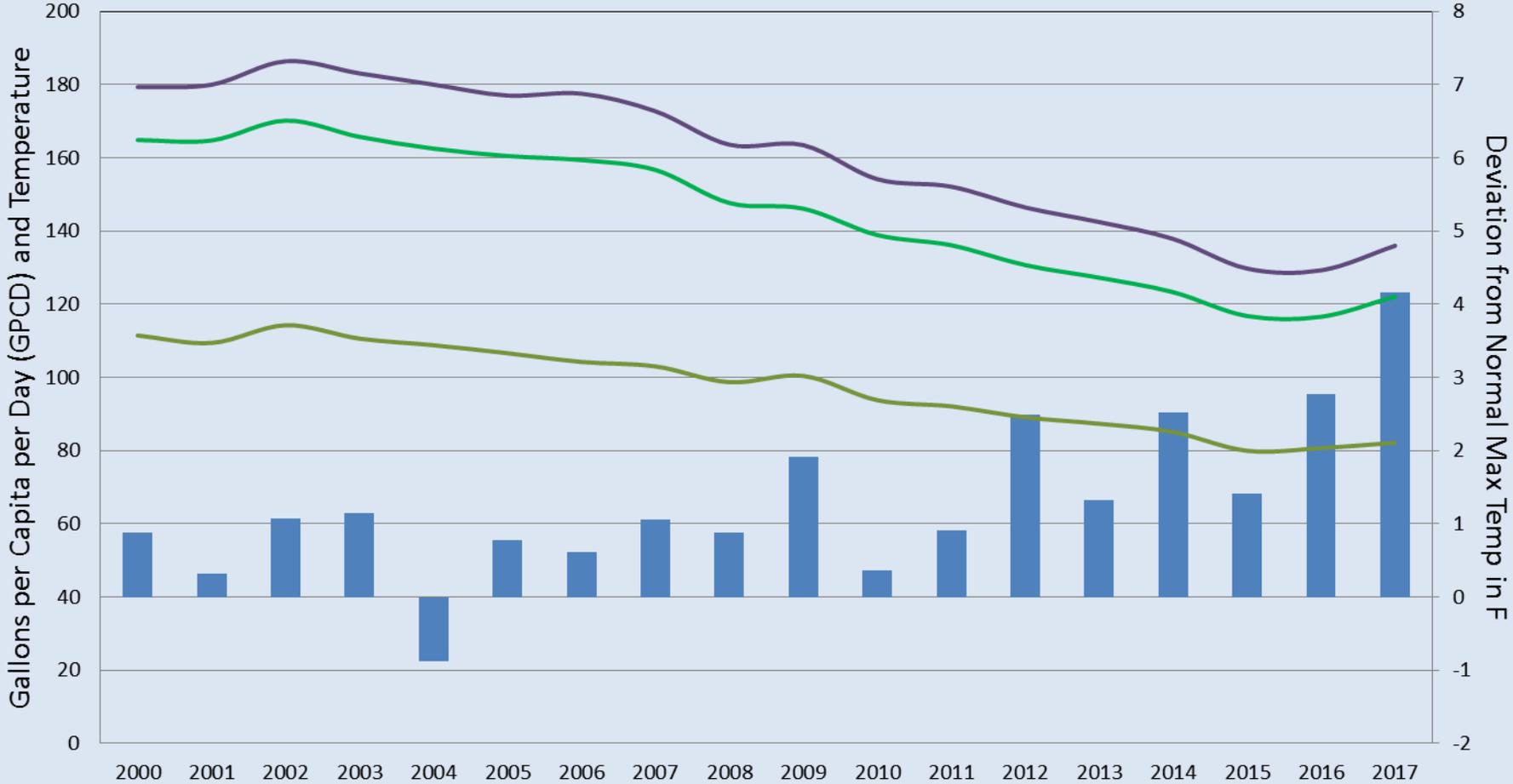


Single Family Monthly Water Use Per Service and Rainfall: 2007 to 2017



Tucson Water GPCD and Deviation from Normal Max Temperature 2000 - 2017

- Deviation from Normal Max Temp
- Potable and Reclaimed GPCD
- Potable GPCD
- Residential GPCD



Tucson Water GPCD and Deviation from Normal Rainfall 2000 - 2017

- Deviation from Normal Rain
- Potable and Reclaimed GPCD
- Potable GPCD
- Residential GPCD

