

**DATE:** December 3, 2019  
**TO:** Matt Jordan, General Manager  
**FROM:** Kenneth R. Herd, Chief Science and Technical Officer *KRH*  
**SUBJECT:** Hydrologic Conditions Update – *Status Report*

**SUMMARY**

The following report summarizes water production and hydrologic conditions in the three-county Tampa Bay area (Tri-county area) during October 2019, November 2019 and the past 12-Month period (December 1, 2018 through November 30, 2019).

**RECOMMENDATION**

Receive Status Report.

**COST/FUNDING SOURCE**

None.

**DISCUSSION**

**I. Rainfall**

Tampa Bay Water monitors daily rainfall at numerous sites on and near our water supply facilities. The data discussed in this report are collected at seven of Tampa Bay Water's regional wellfields and at the Tampa Bypass Canal. These data are compared to historical rainfall data to help assess the current hydrologic conditions near our wellfields and surface water sources. These data assessments help guide the Agency's supply management decisions and enhance our ability to coordinate and communicate with our member governments and regulators. The rainfall data are summarized below and presented geographically in Figures 1 through 3.

- Tri-county rainfall during **October 2019** ranged from 4.3 to 11.0 inches and **averaged 4.8 inches above** the historical average for the month, based on wellfield sites.
- Tri-county rainfall during **November 2019** ranged from 0.6 to 2.6 inches and **averaged 0.6 inch below** the historical average for the month, based on wellfield sites.

Tri-county rainfall based on wellfield sites during the 12-month period ending November 30, 2019 ranged from 52.5 to 79.2 inches depending on location and **averaged 12.4 inches above** the historical

*mf*

12-month average. The rainfall data is accurate for the specific sites shown; however, there is much variability in annual rainfall over the Tri-county area. Average rainfall is reported as a general trend and does not indicate hydrologic conditions in any specific region or surface water basin.

## **II. Water Resource Production**

Water production data from Tampa Bay Water's permitted resources for October 2019 and November 2019 are summarized below and provided in additional detail in Table 1 and Figures 4 and 5. Agenda Item D.5 included in this Board Agenda Packet contains further information regarding water supply conditions.

- The Consolidated Permit (11 wellfields) 12-month running average production for the period ending November 30, 2019 was 82.12 million gallons per day (mgd) compared to the 90 mgd permit limit.
- The South-Central Hillsborough Regional Wellfield 12-month running average production for the period ending November 30, 2019 was 22.82 mgd compared to the 24.1 mgd permit limit.
- The average Tampa Bay Water source water distribution for the past 12 calendar months was:
  - Groundwater – 110.7 mgd (63.0% of total);
  - Surface Water – 58.3 mgd (33.2% of total); and
  - Seawater Desalination – 6.6 mgd (3.8% of total).

## **III. Environmental Conditions**

Tampa Bay Water closely monitors the environmental conditions around Agency wellfields and these data are used to guide production and wellfield management decisions. Figure 6 depicts the locations of selected Upper Floridan Aquifer monitor sites and lake or wetland sites. A summary of observed conditions in and around the 11 Consolidated Permit Wellfields is provided in Figures 7 through 16. These figures show pumping and rainfall at wellfields for the past 22 years as well as water-level data from the Upper Floridan Aquifer and a lake or wetland located on or near that wellfield. A reference line on the lake and wetland hydrographs shows the lake minimum level or the normal pool elevation in the wetland. The normal pool elevation of a wetland is the water-surface elevation that is normally reached at the end of the rainy season during an average rainfall year. This is typically the highest water level reached in a wetland during an average rainfall year; water levels are expected to fluctuate below this elevation during the year.

Water levels in lakes and wetlands respond more directly to changes in rainfall than does the Floridan Aquifer. Many lakes and wetlands recovered to normal or above-normal levels during 2012 due to high rainfall totals during the summer months. Water levels in these lakes and wetlands have generally fluctuated within their normal water level ranges since 2012 with notably higher water levels during summer 2015 and lower water levels during the winter and spring of 2016/2017. With the above-normal rainfall in the summer months of 2017, surface water levels returned to high or very high conditions. Even with substantially reduced groundwater production, because of the strong relation to rainfall conditions, water levels in some lakes and wetlands on and near wellfields will exhibit normal water level fluctuations *only* as rainfall occurs in normal or above-normal amounts. With a sustained

reduction in groundwater pumping and normal rainfall, water levels in area lakes and wetlands should more closely approximate normal water-level fluctuations.

General water-level changes are summarized as follows:

- Groundwater levels generally **decreased about 2.0 feet** during October 2019.
- Groundwater levels generally **decreased about 0.1 foot** during November 2019.
- Groundwater levels in November 2019 were generally **0.5 foot lower** than in November 2018.
- Average water levels in the 10 indicator lakes and wetlands located on and near Consolidated Permit Wellfields **decreased 7.3 inches** during October 2019 and **decreased 0.4 inch** during November 2019 (based on data collected throughout the month, not necessarily end-of-month).
- Average water levels in the 10 indicator lakes and wetlands in November 2019 were about **2.9 inches higher** than water levels in November 2018.

### III. Enhanced Surface Water System

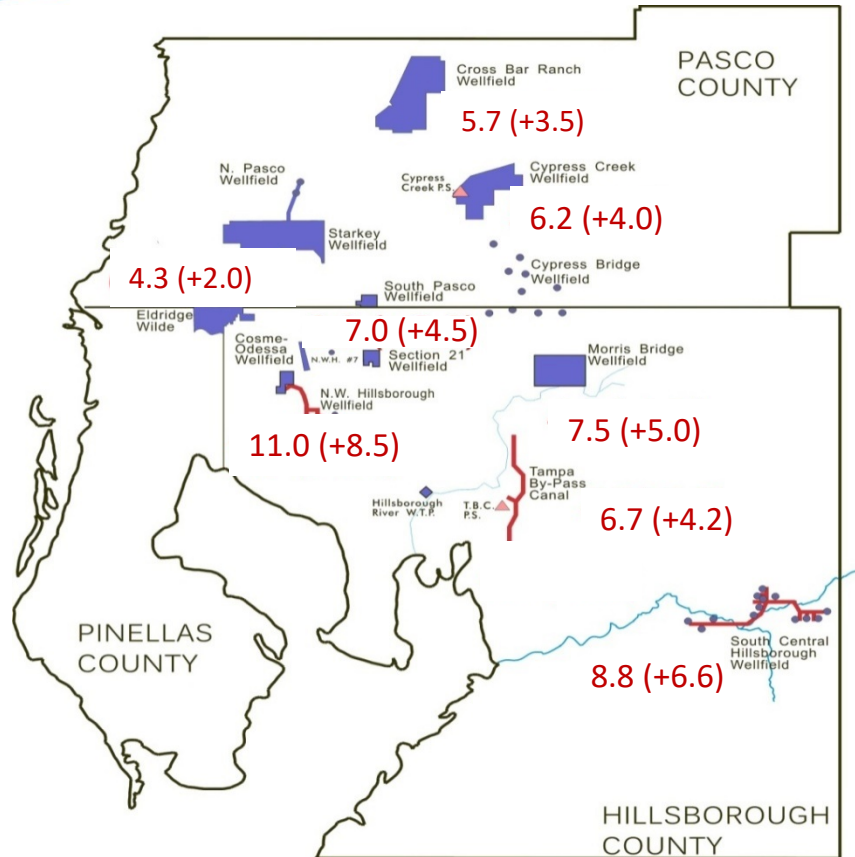
Tampa Bay Water's Enhanced Surface Water System is comprised of surface water withdrawals from the Alafia River, Hillsborough River and Tampa Bypass Canal, and the C.W. Bill Young Regional Reservoir. Current hydrologic conditions in the Hillsborough and Alafia Rivers are summarized below.

Figures 17 and 18 illustrate surface water conditions in the two river sources.

- Flow in the Alafia River at Bell Shoals was 18% **above** normal in October 2019 and 17% **above** normal in November 2019.
- Flow in the Hillsborough River was 27% **above** normal in October 2019 and 87% **above** normal in November 2019.
- Information regarding withdrawals from the Tampa Bypass Canal and Alafia River is included in Agenda Item D.5 in this Board Agenda Packet.

Attachments

# October 2019 Rainfall

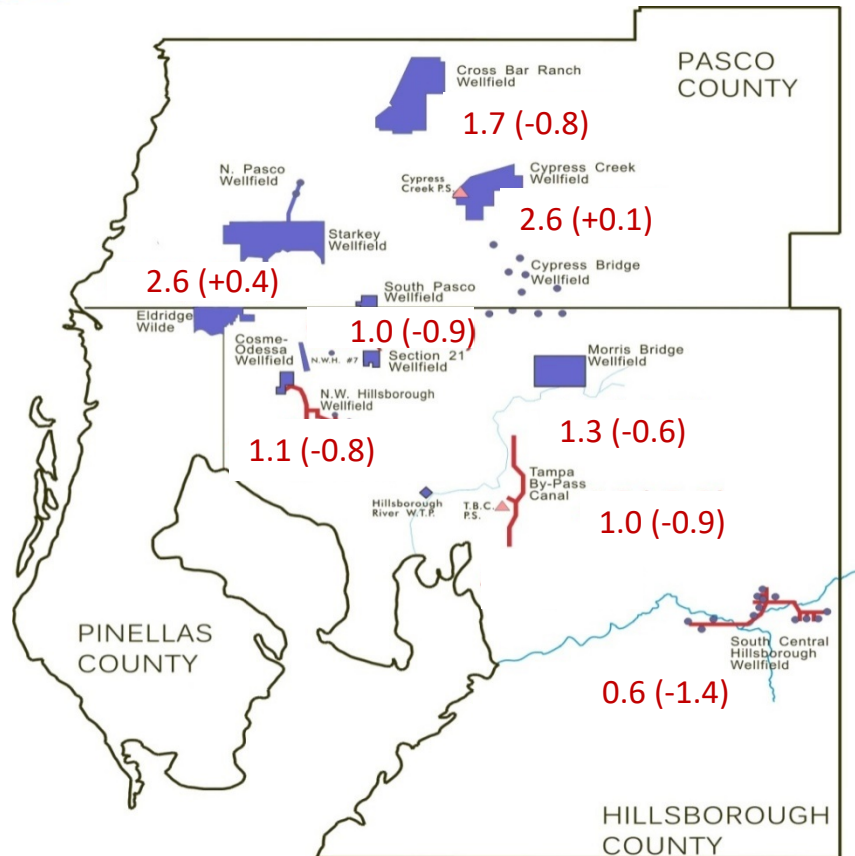


**Figure 1**

**8.8 Example of Actual  
Monthly Rainfall**

**(+6.6) - Variance From  
Normal (NOAA)**

# November 2019 Rainfall

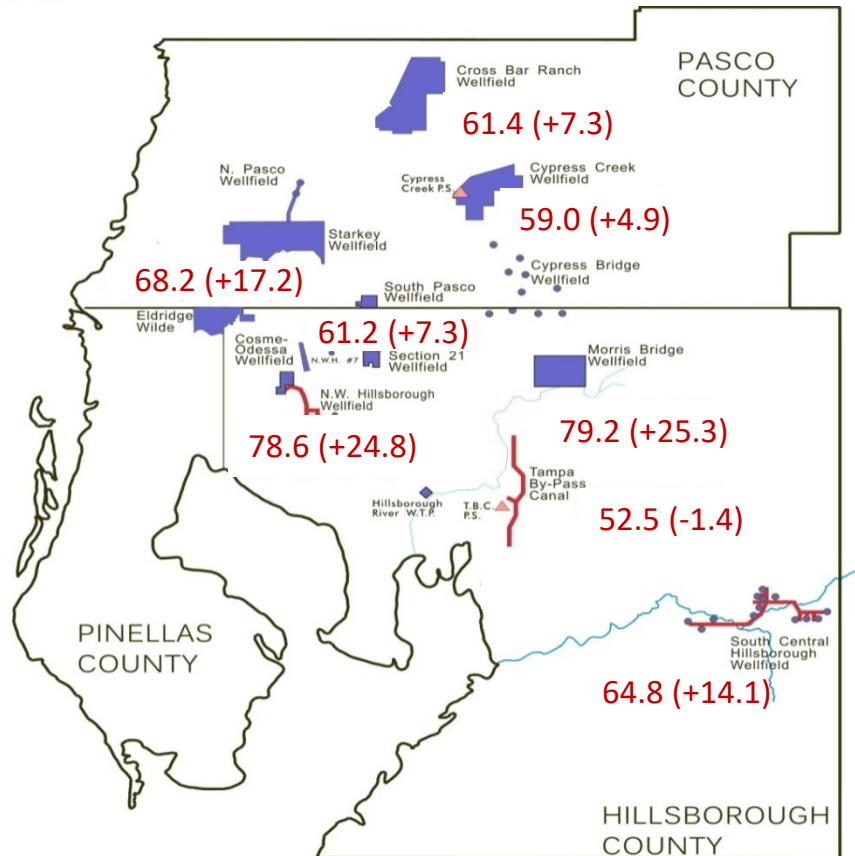


**Figure 2**

**0.6 Example of Actual  
Monthly Rainfall**

**(-1.4) - Variance From  
Normal (NOAA)**

# Cumulative Rainfall For The Past 12 Months (December 1, 2018 Through November 30, 2019)



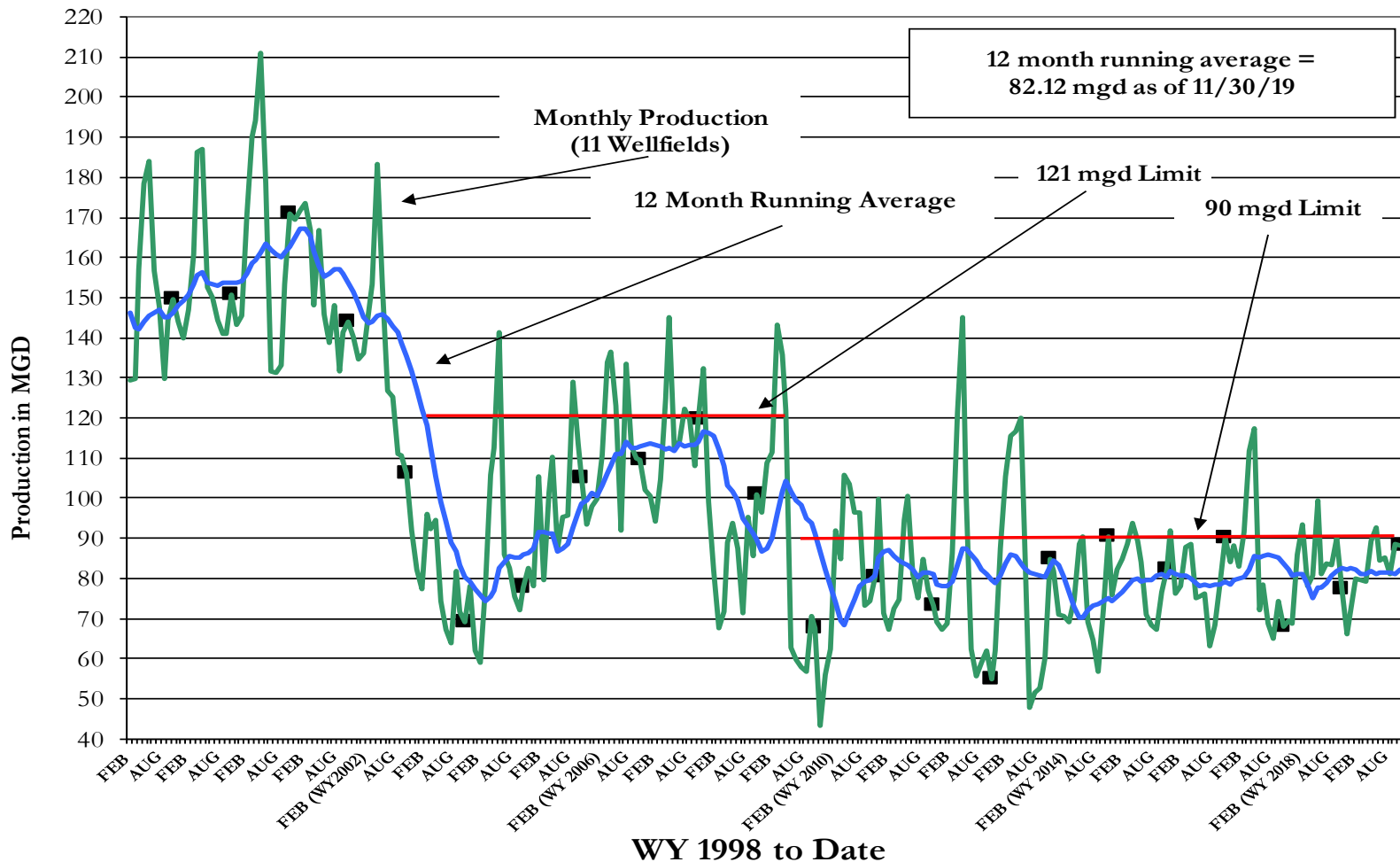
**Figure 3**

**64.8 Example of Actual  
Monthly Rainfall**

**(+14.1) - Variance From  
Normal (NOAA)**

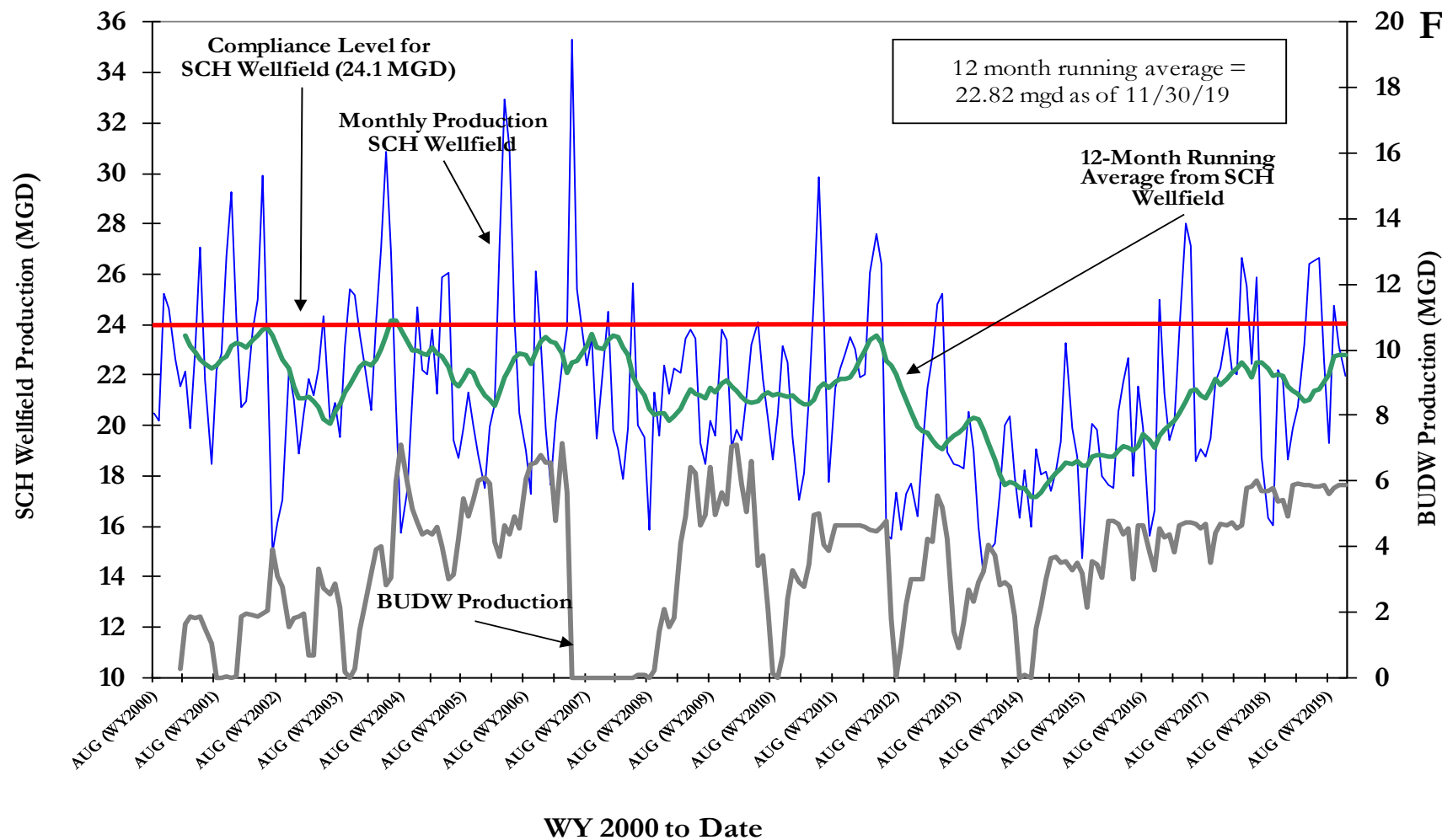


# 12 Month Running Average and Monthly Production - Consolidated WUP Wellfields



**Figure 4**

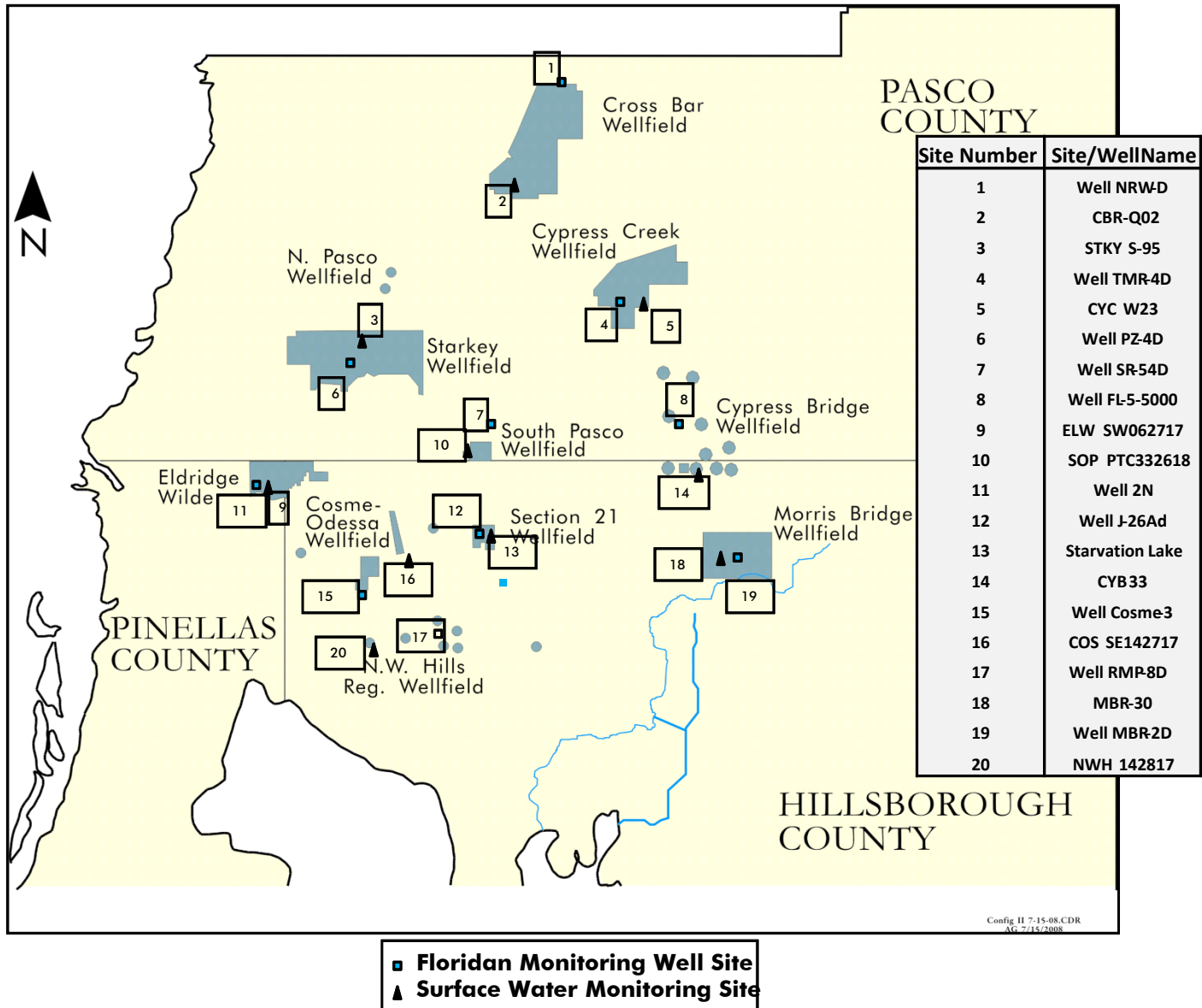
# South Central Hillsborough Service Area Demand and Supply





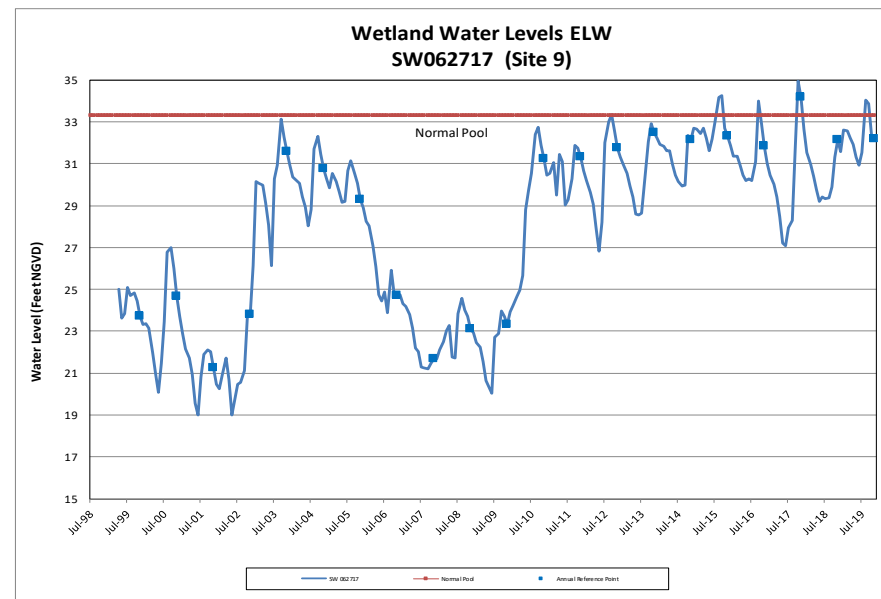
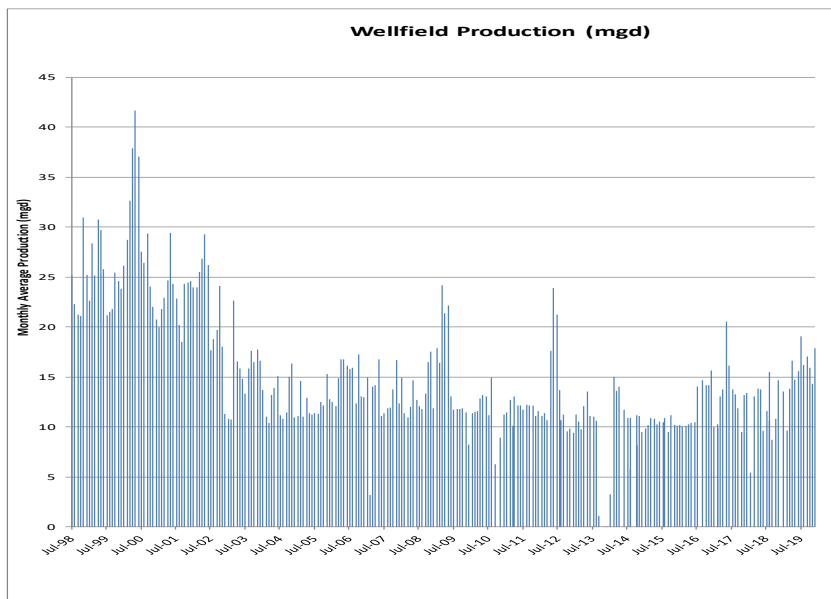
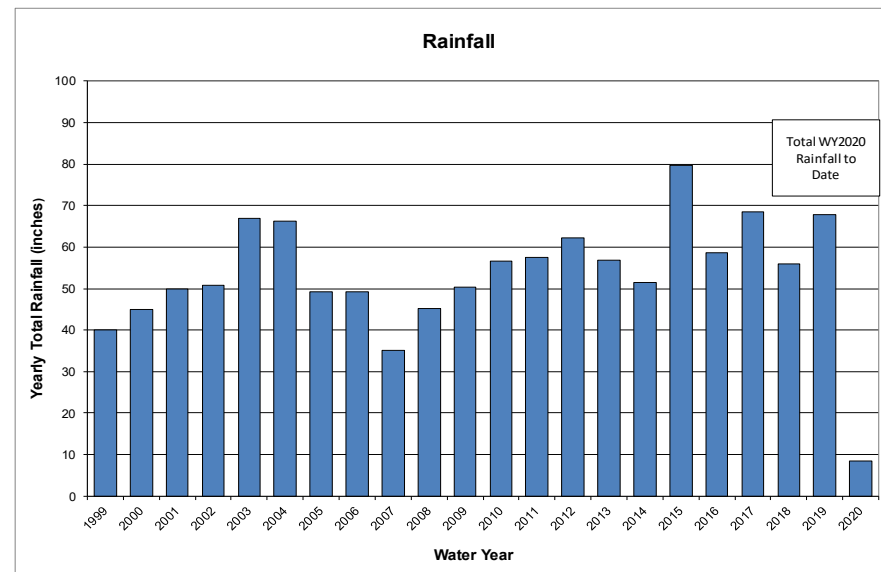
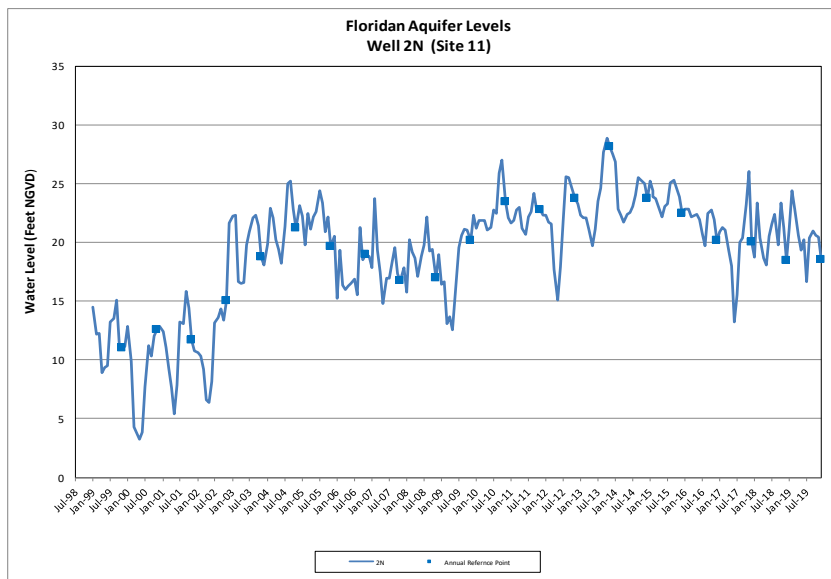
# Monitoring Site Location Map

# Figure 6



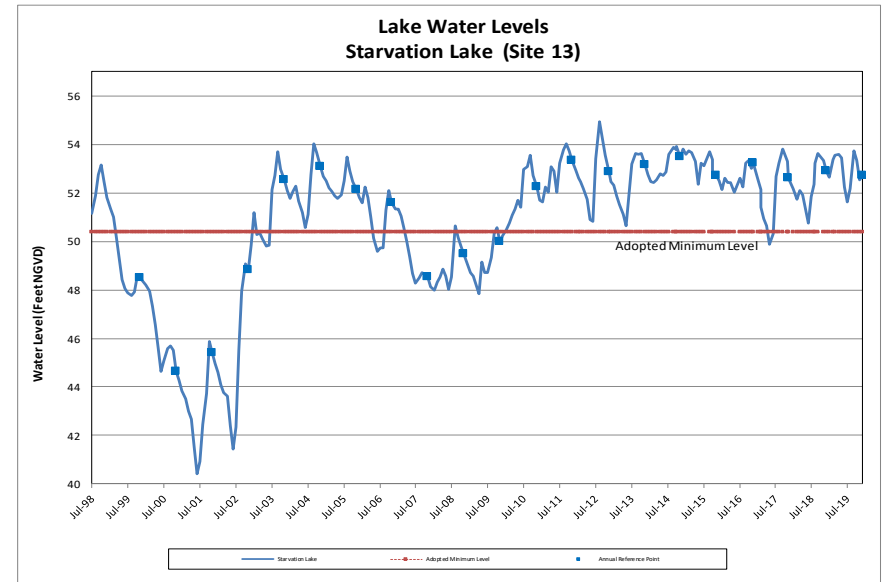
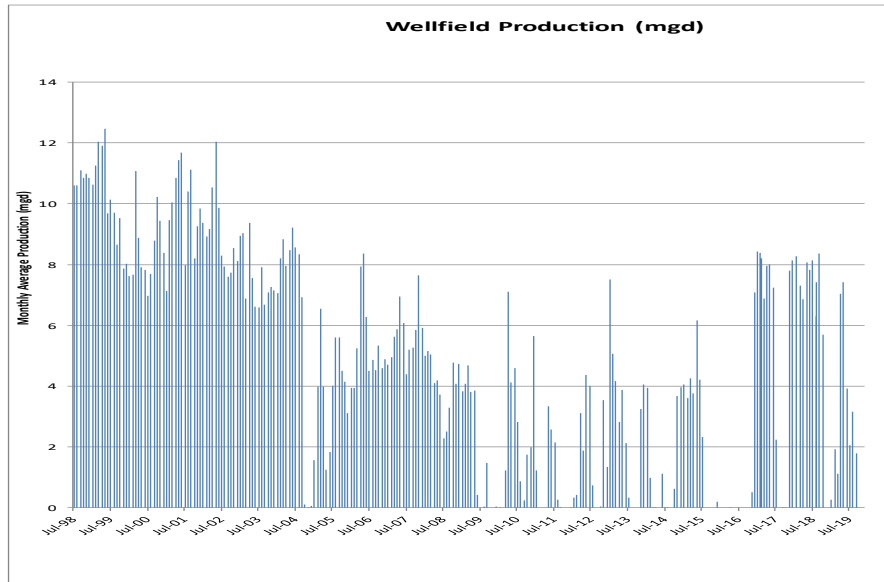
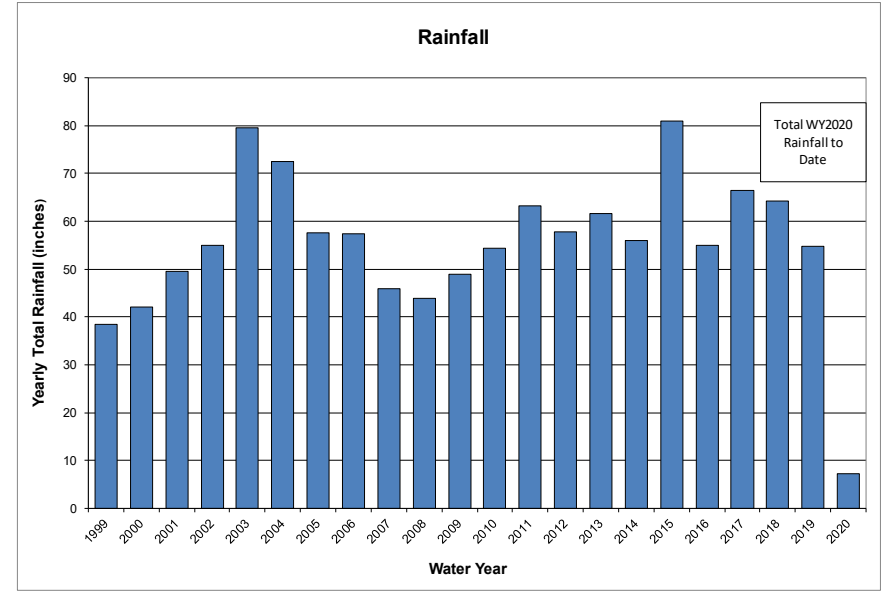
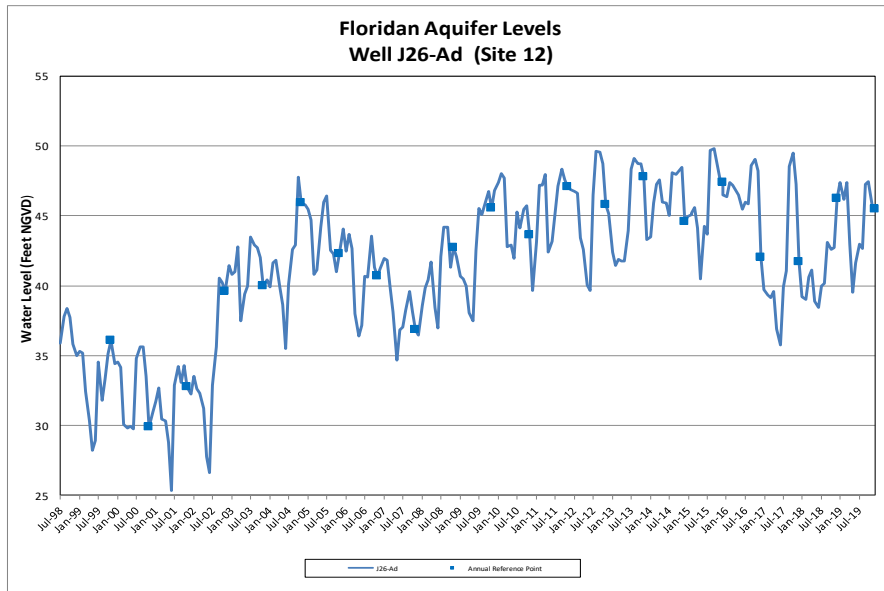
# Eldridge Wilde Wellfield

Figure 7



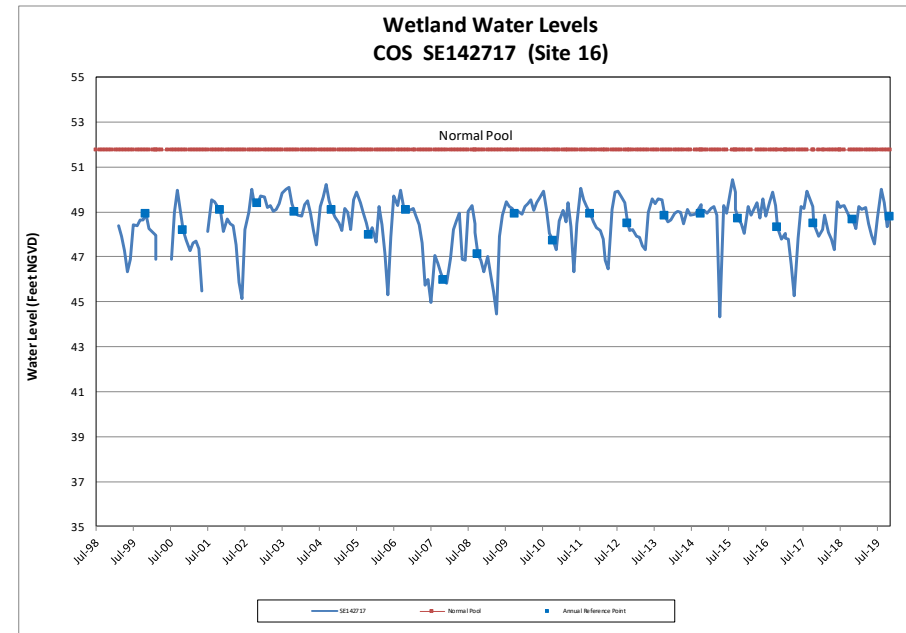
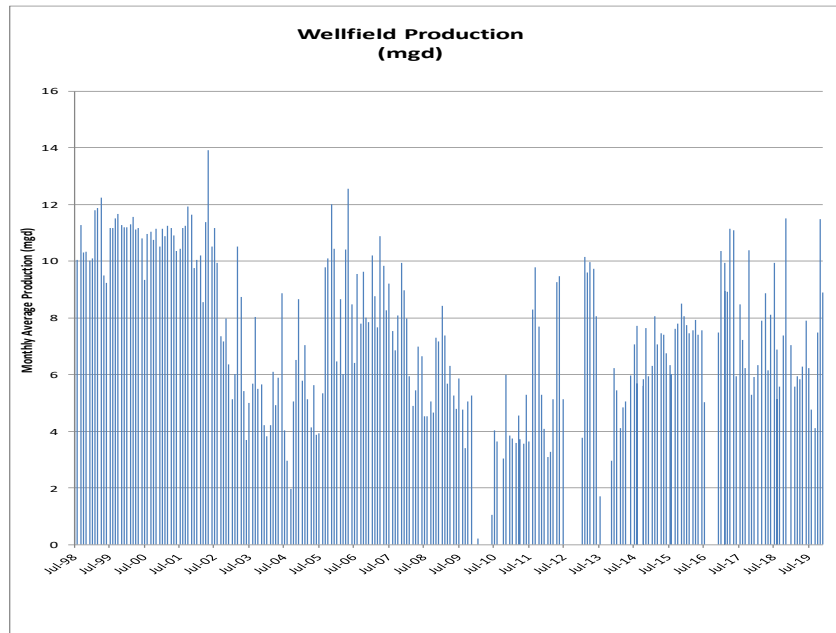
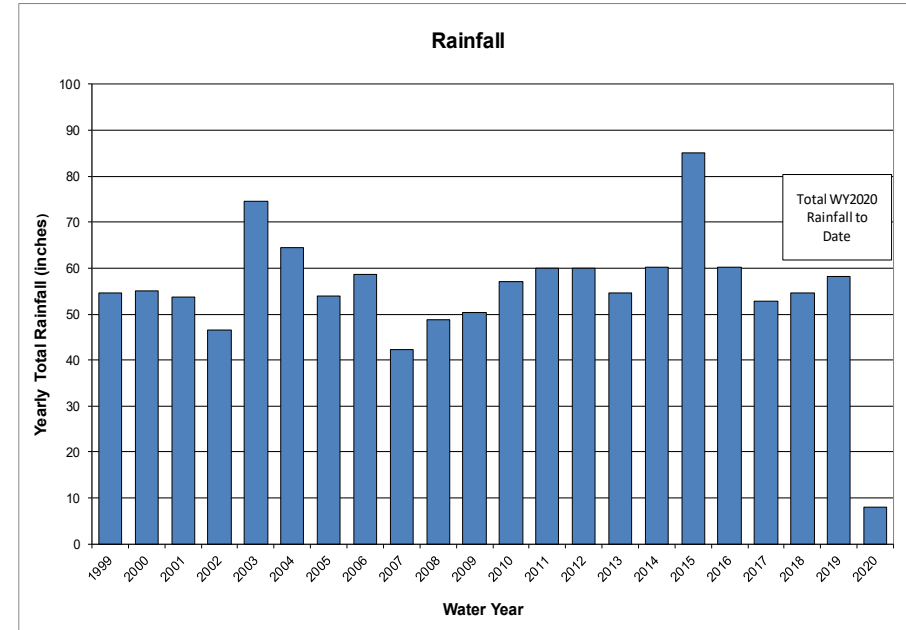
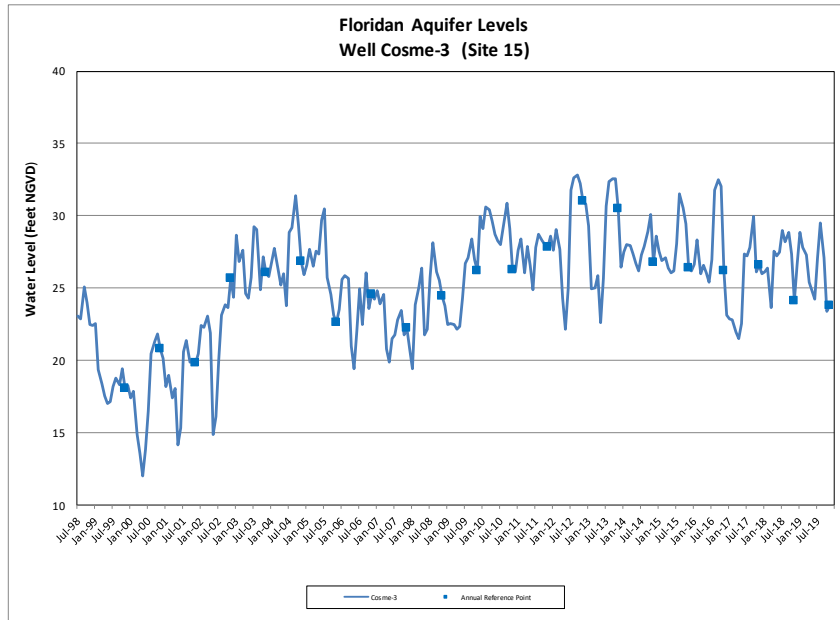
# Section 21 Wellfield

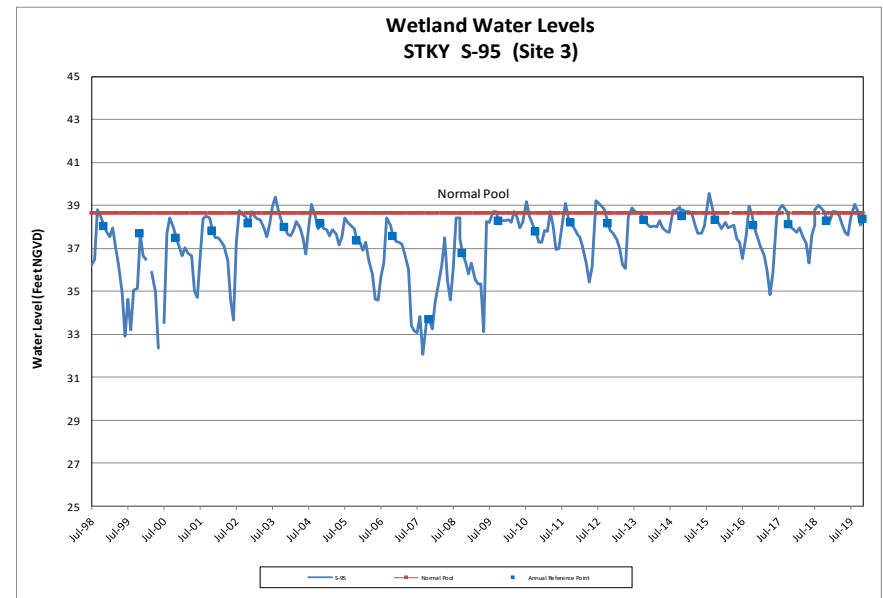
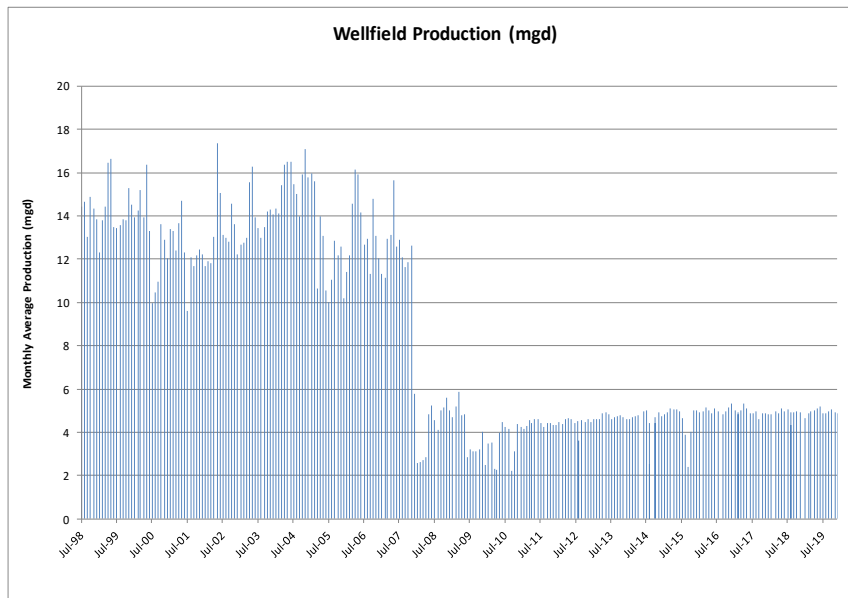
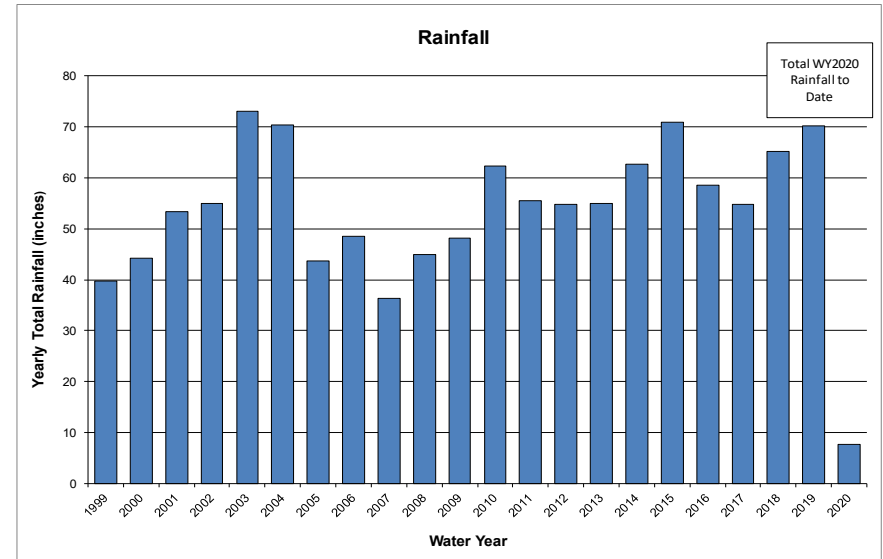
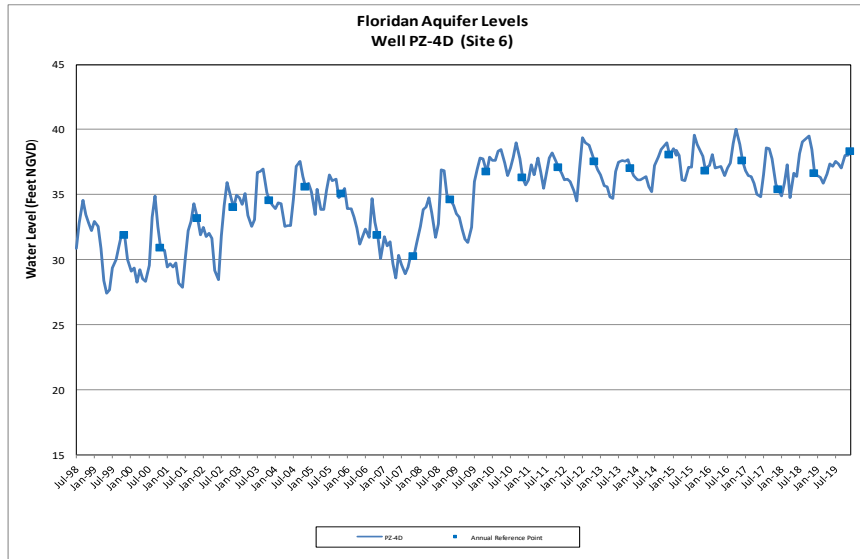
Figure 8



# Cosme-Odessa Wellfield

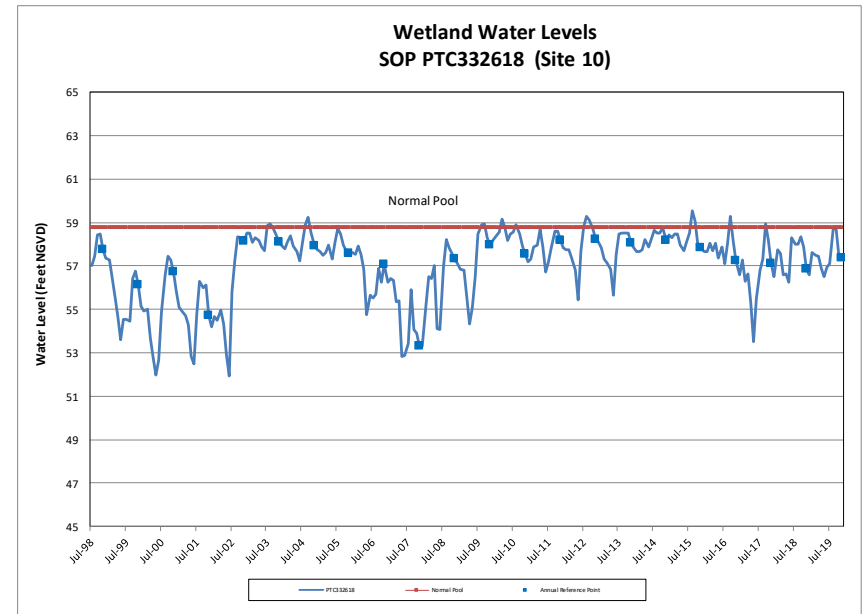
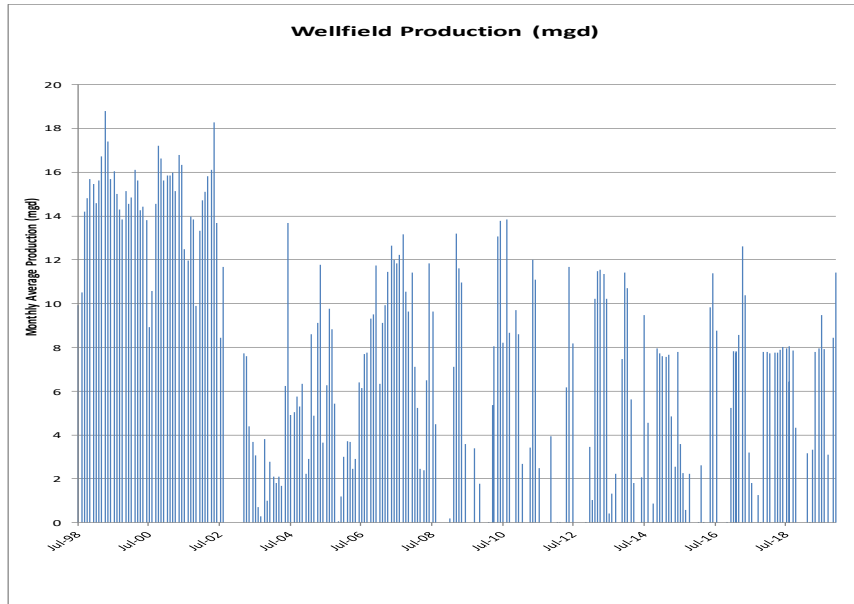
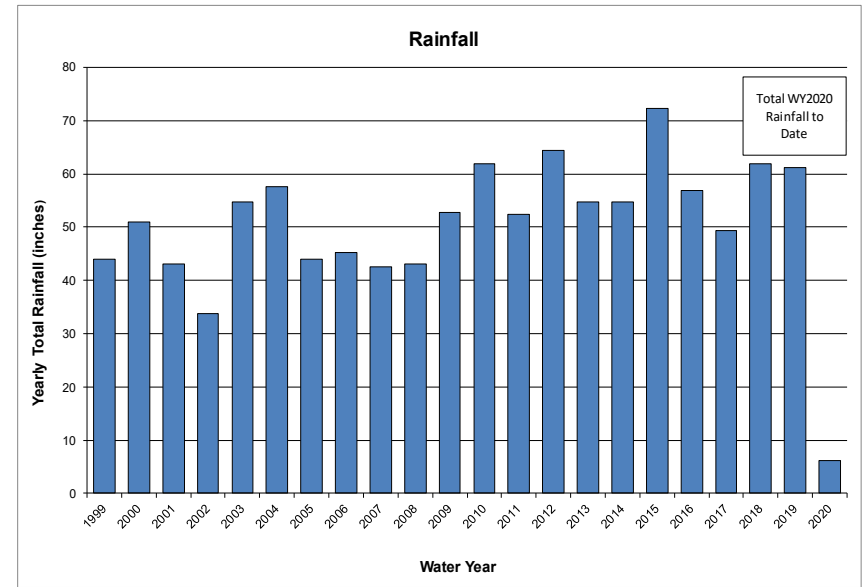
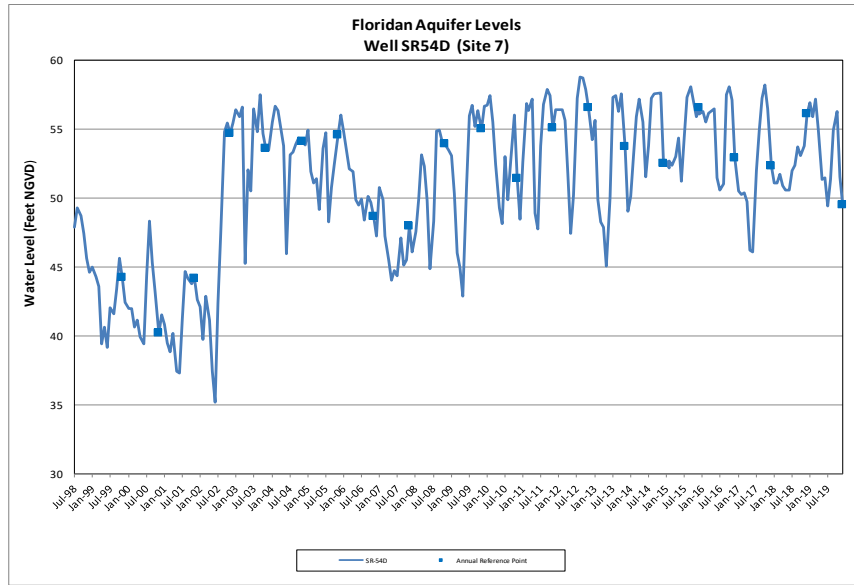
Figure 9





# South Pasco Wellfield

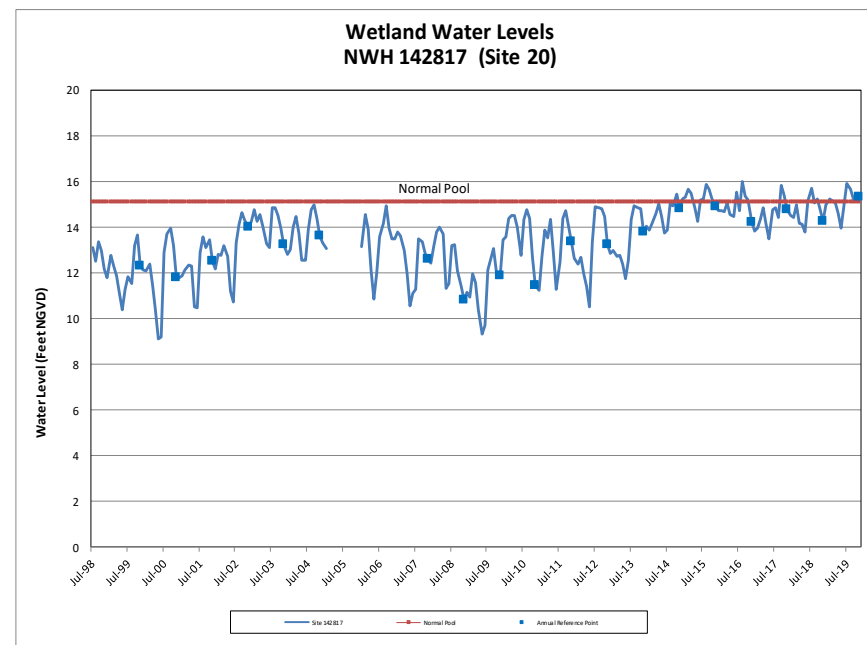
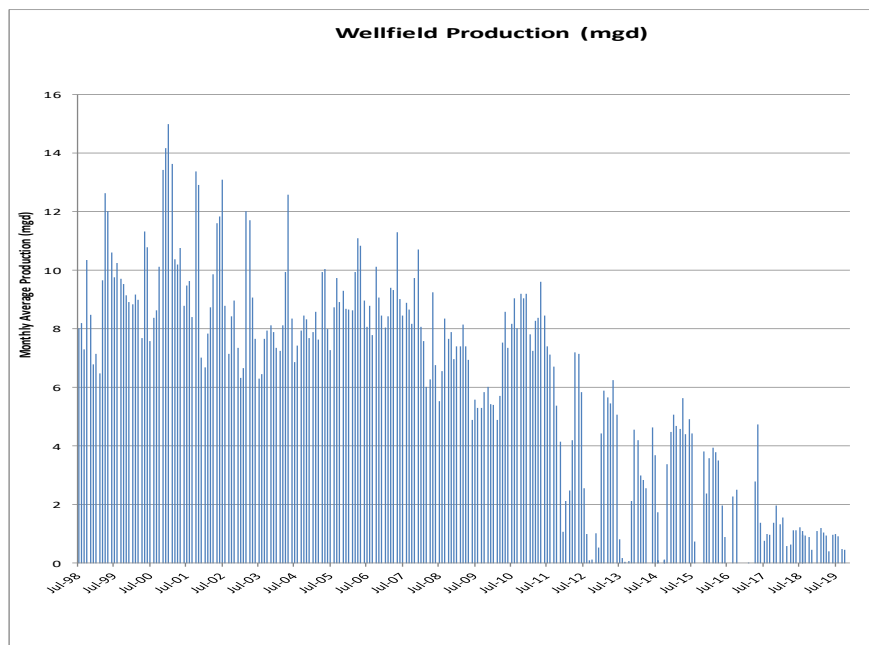
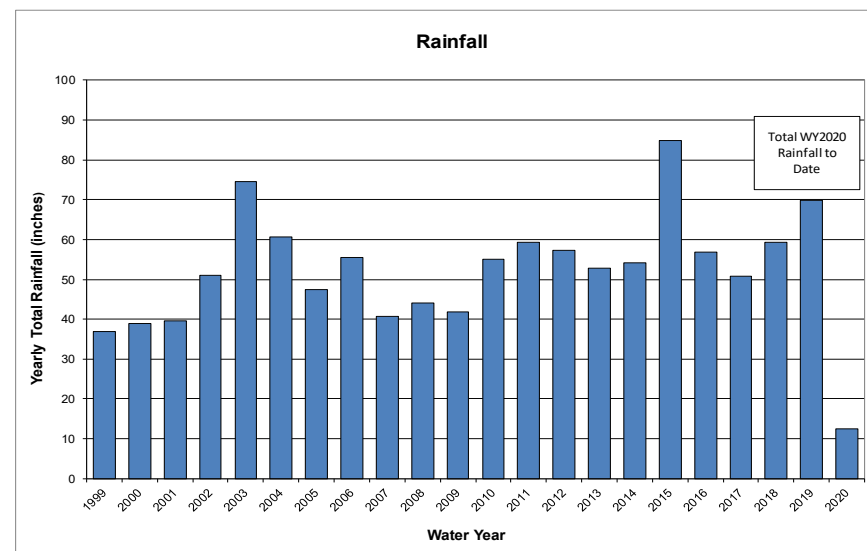
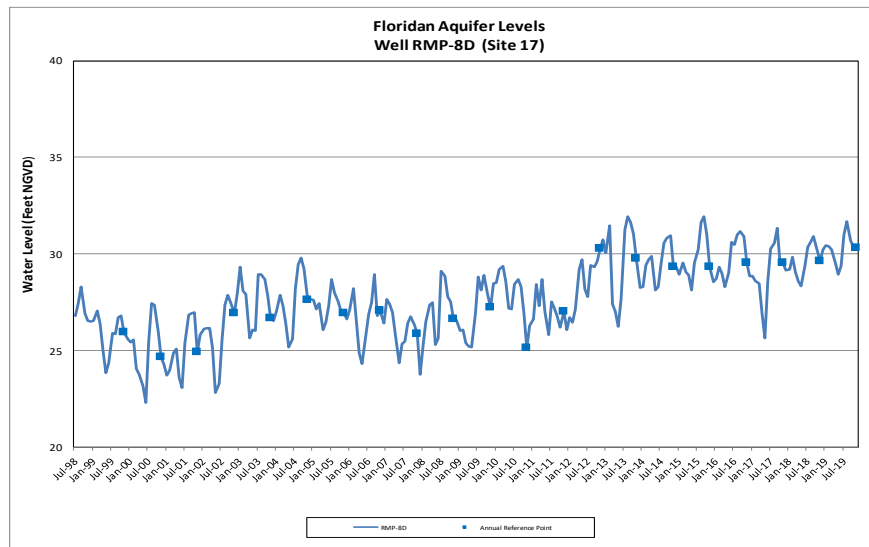
Figure 11





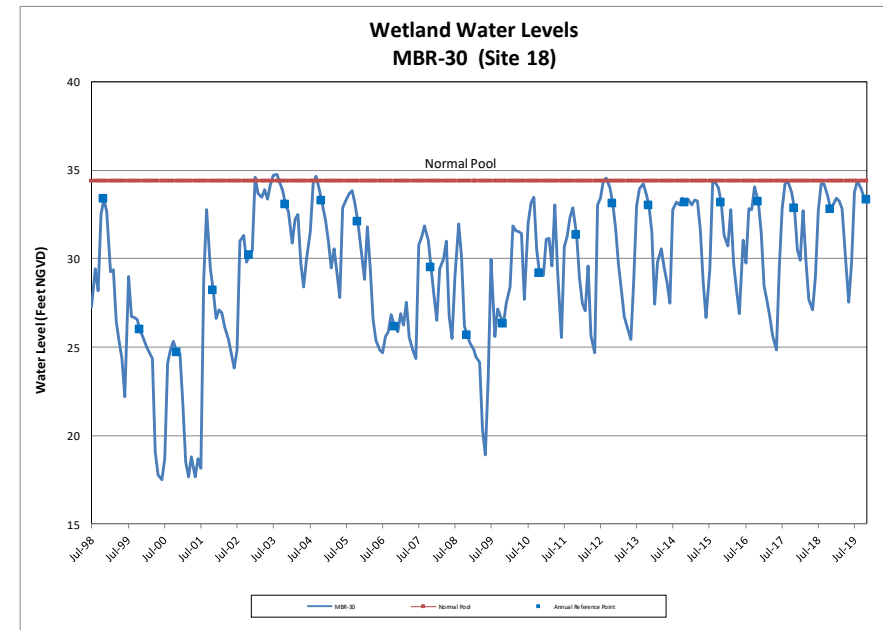
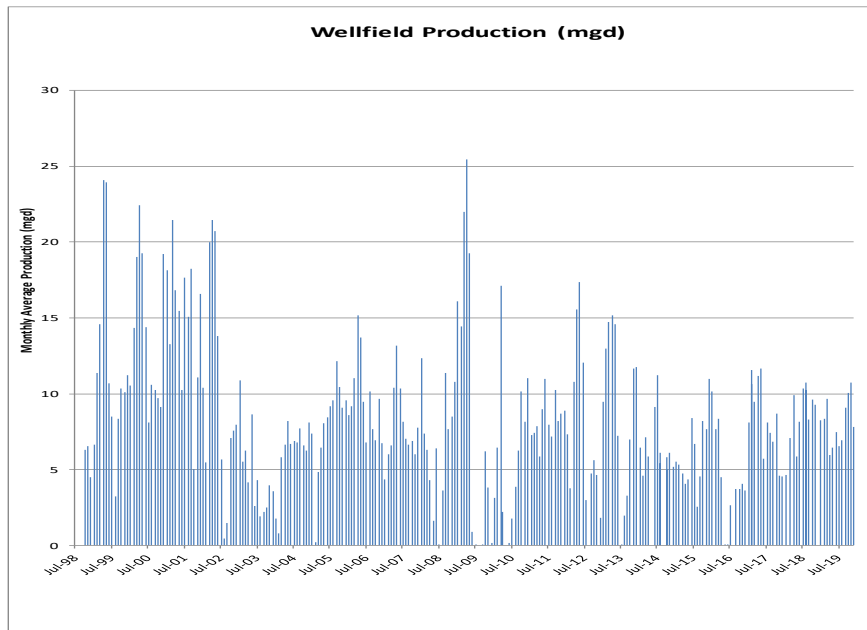
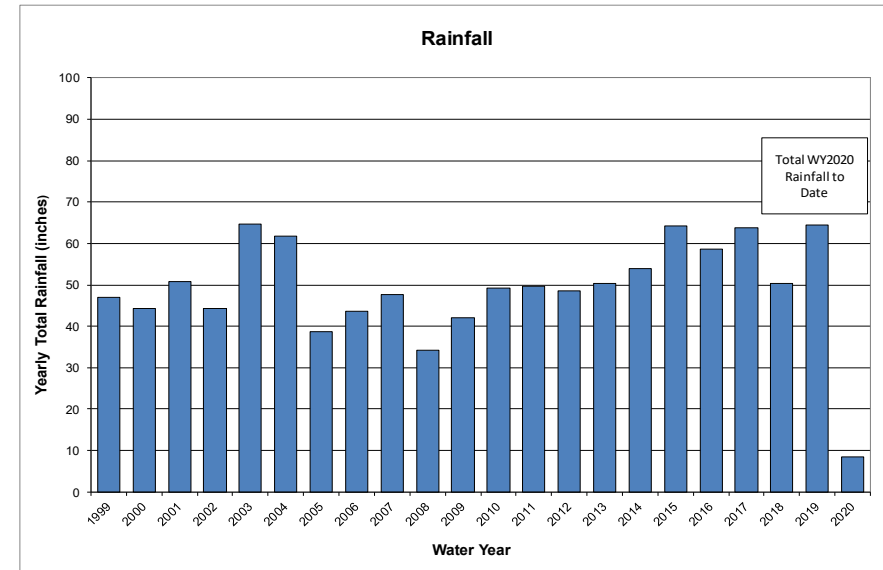
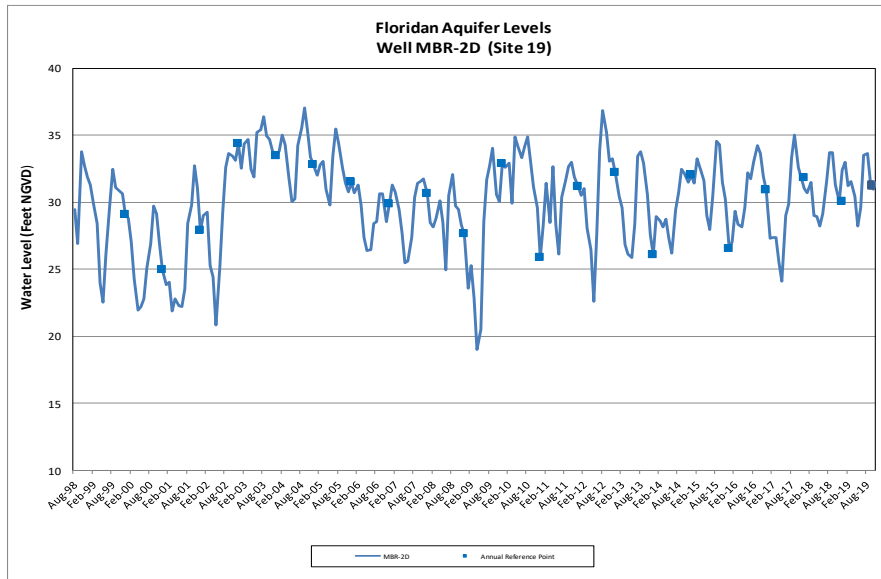
# Northwest Hillsborough Regional Wellfield

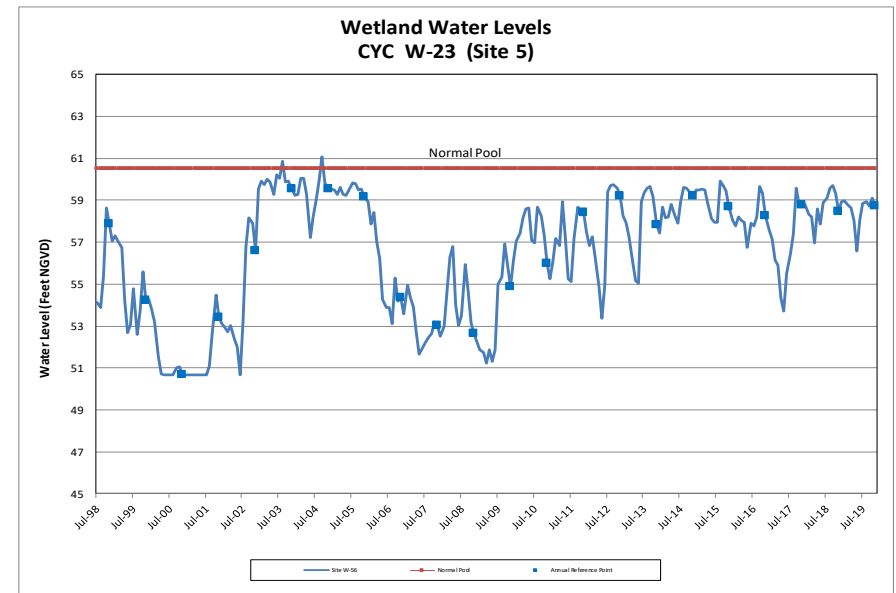
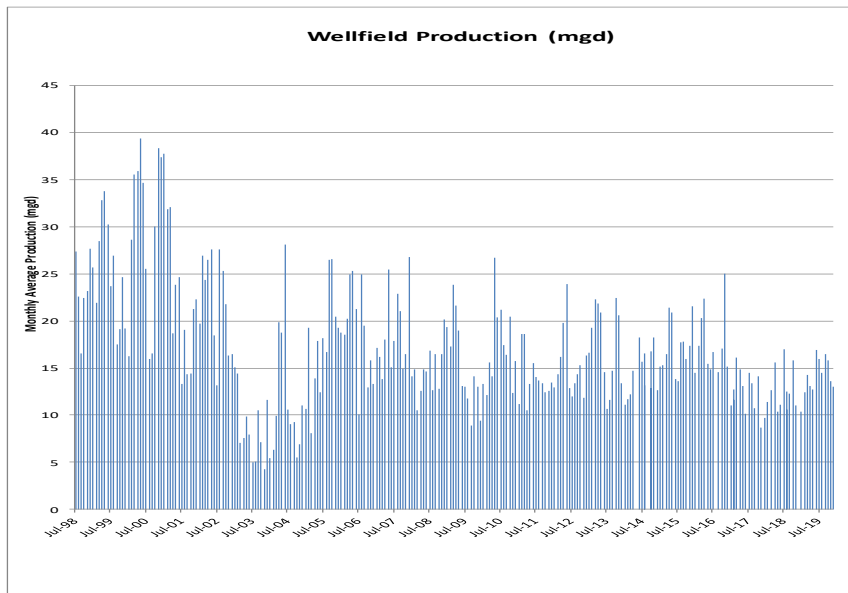
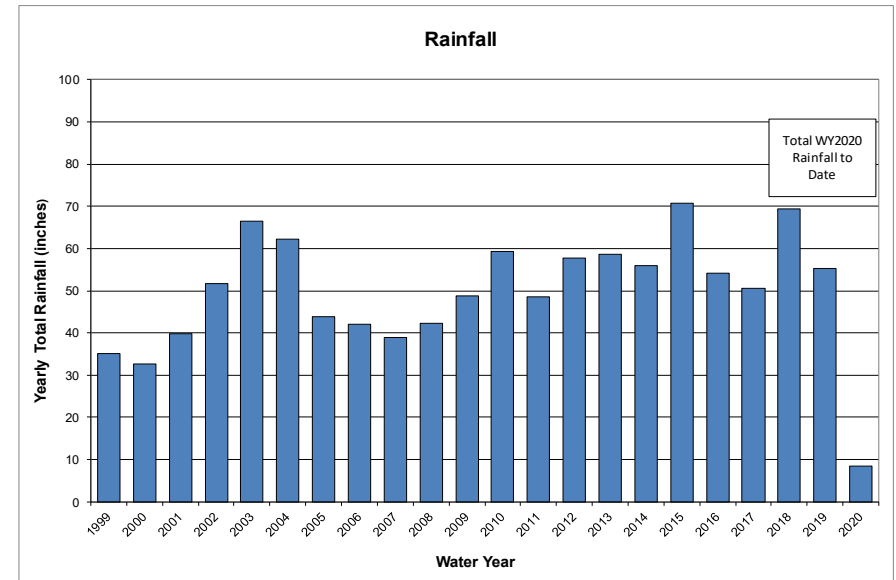
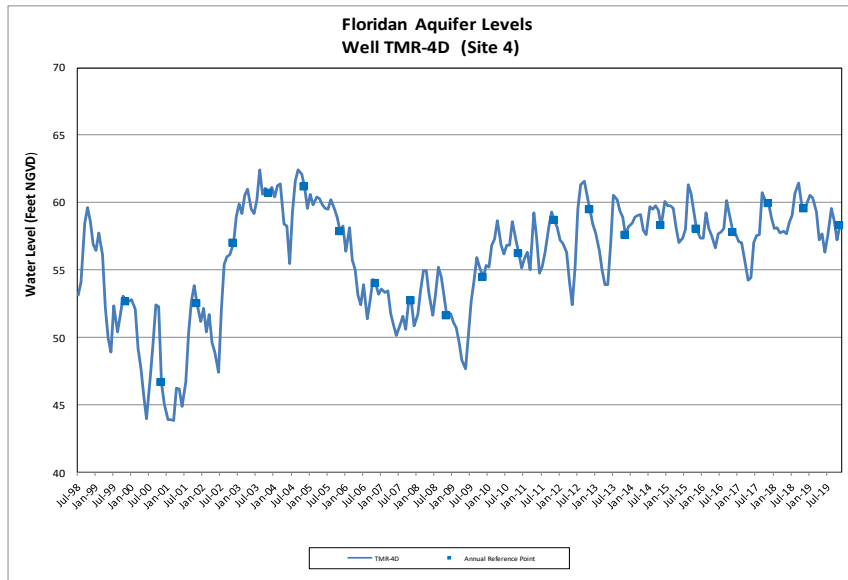
Figure 12



# Morris Bridge Wellfield

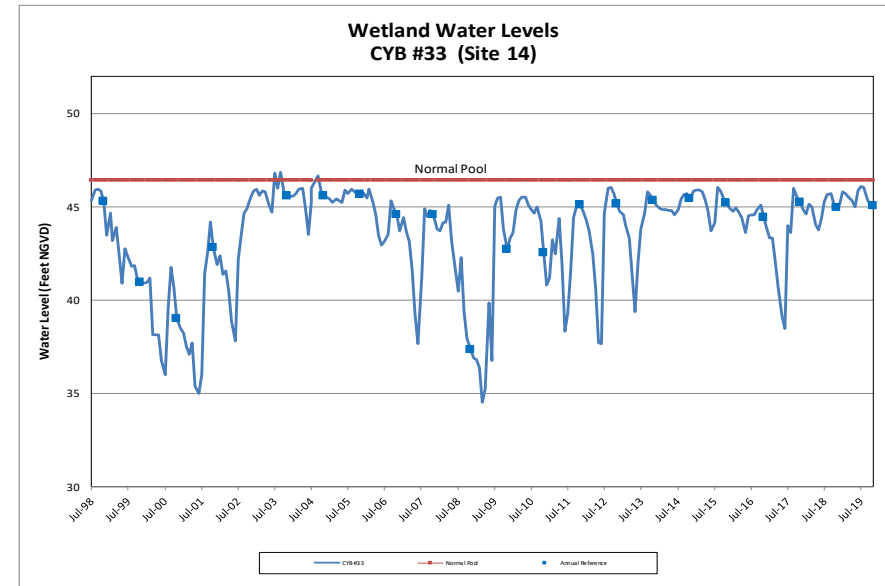
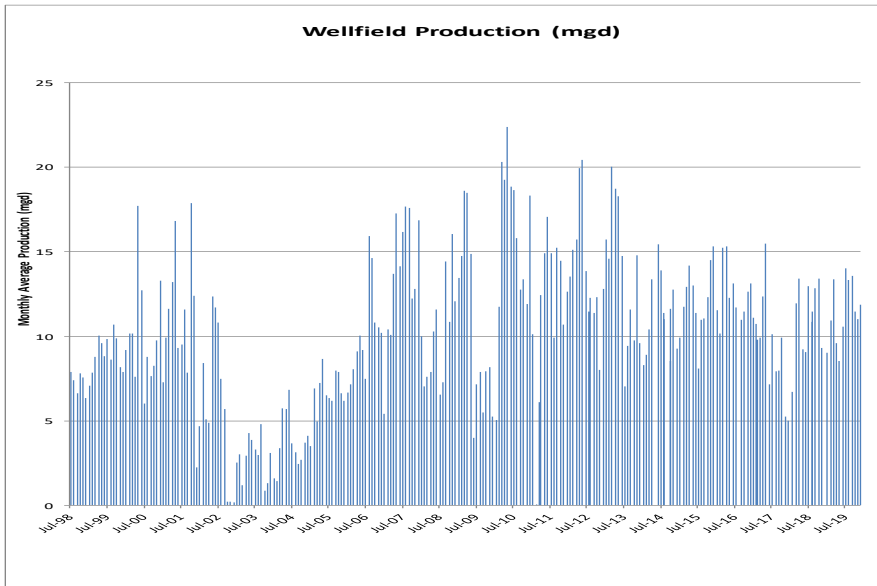
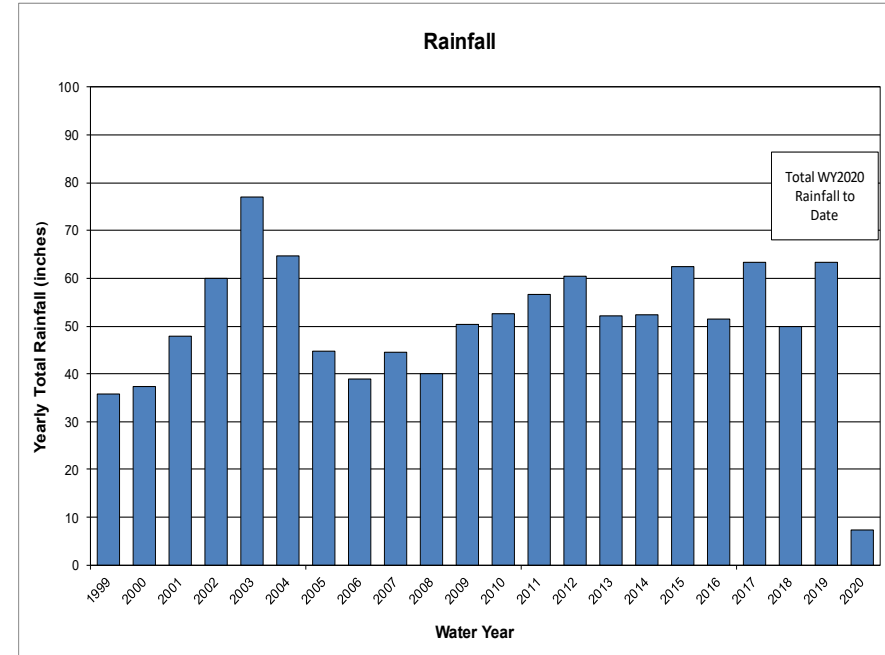
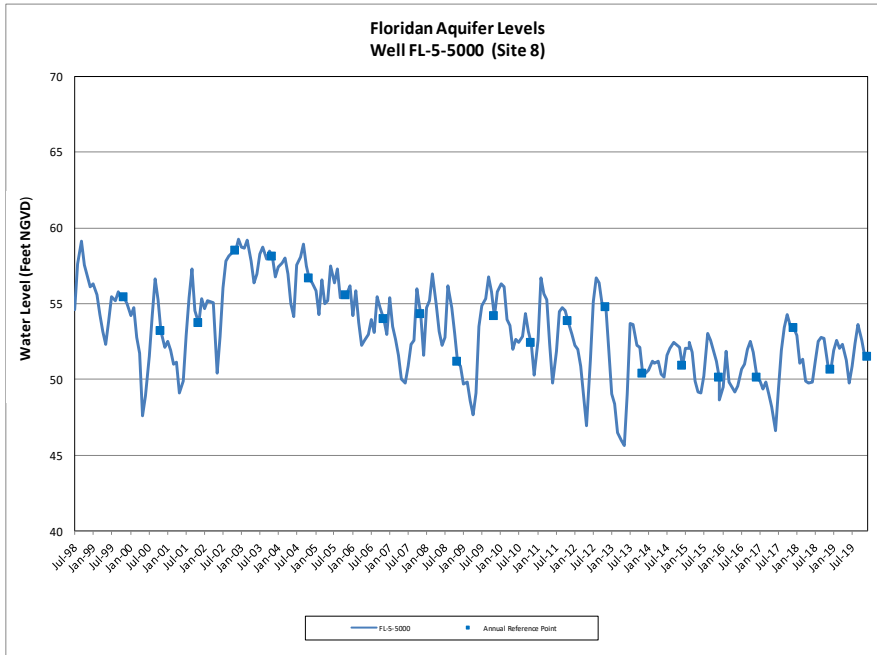
Figure 13





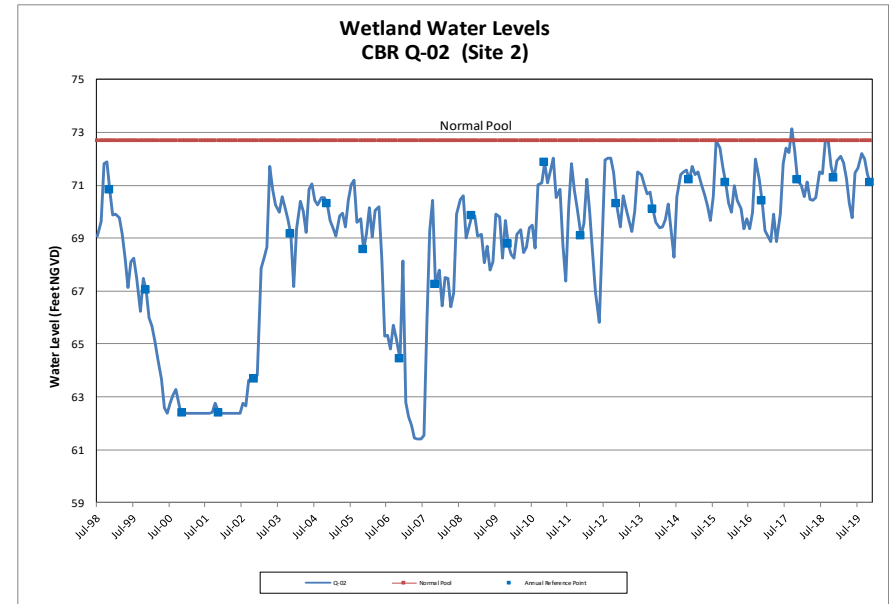
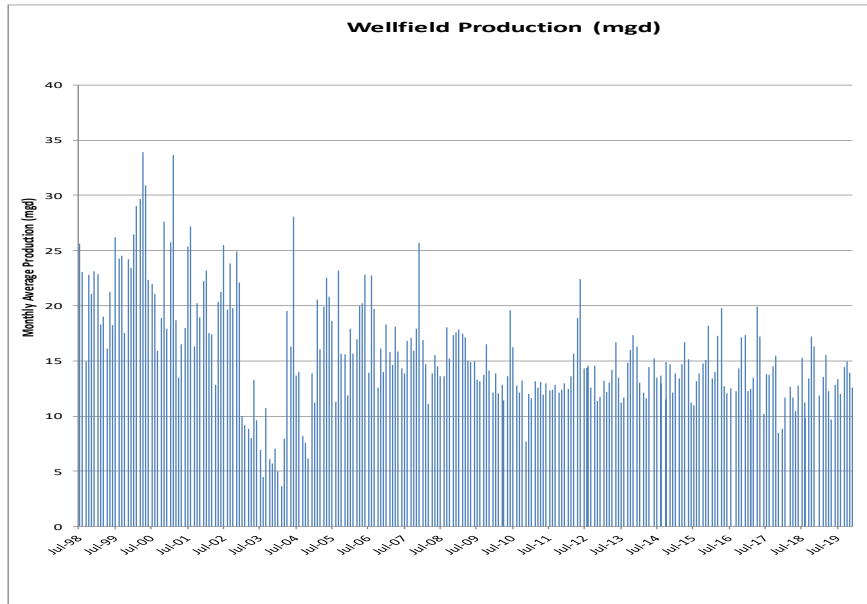
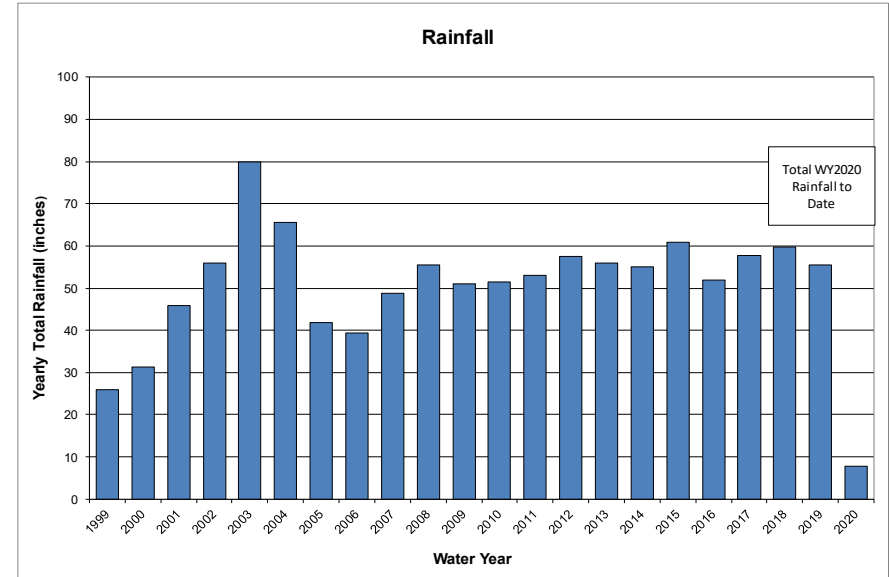
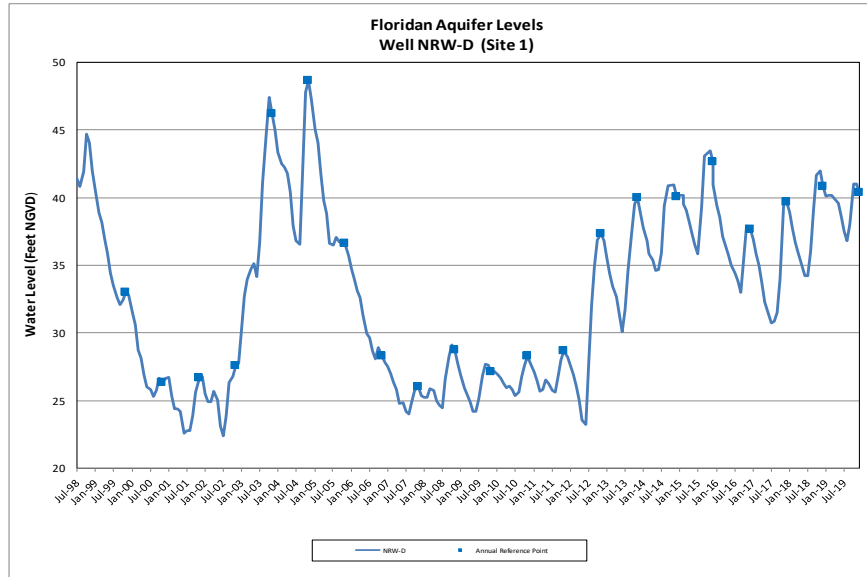
# Cypress Bridge Wellfield

Figure 15



# Cross Bar Ranch Wellfield

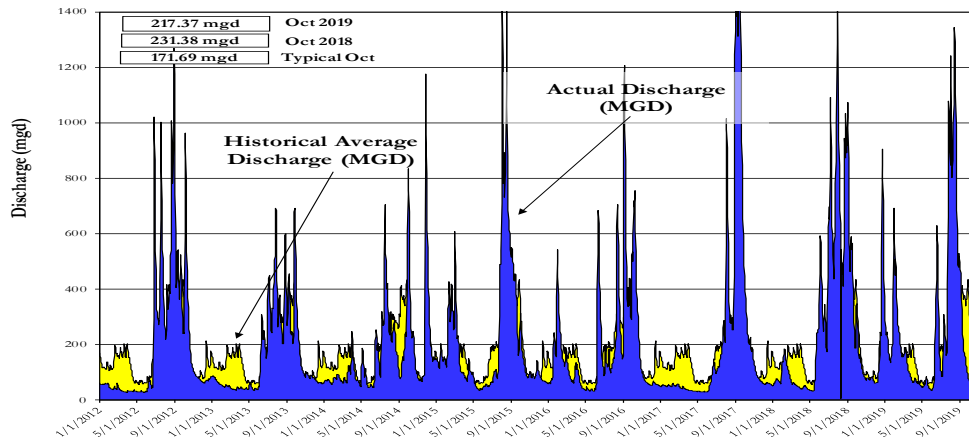
Figure 16



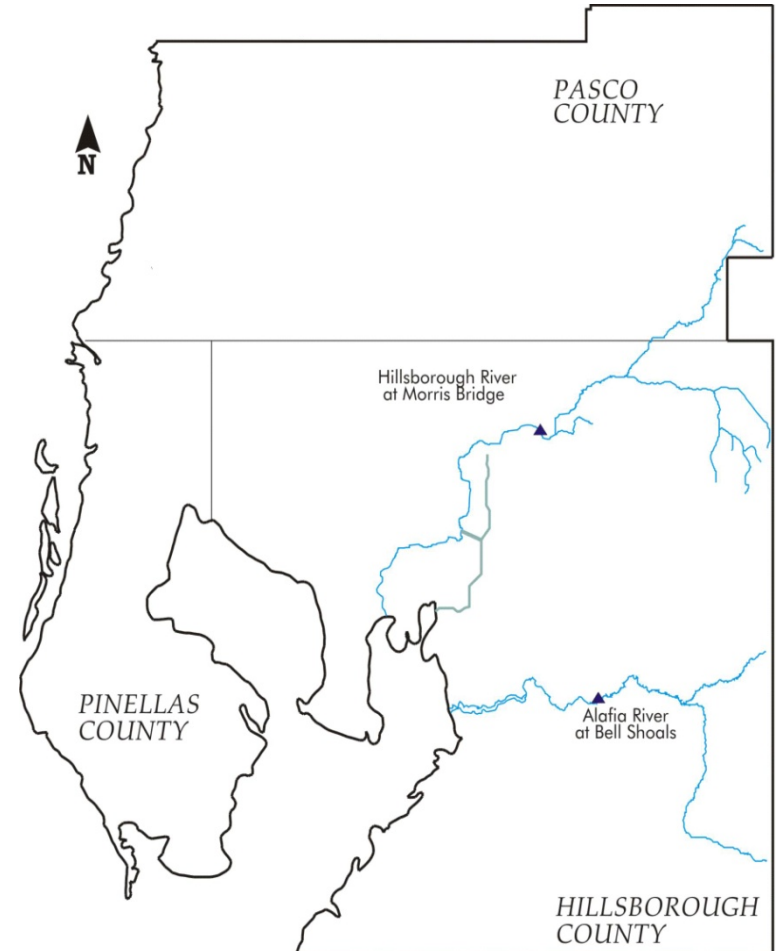
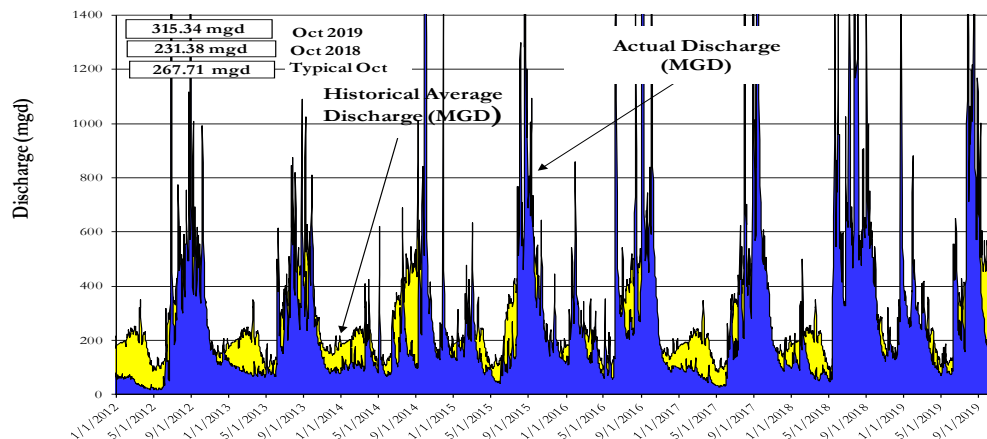
# Regional Surface Water Discharge October 2019

Figure 17

## Hillsborough at Morris Bridge (1)



## Estimated Flow, Alafia at Bell Shoals (2)

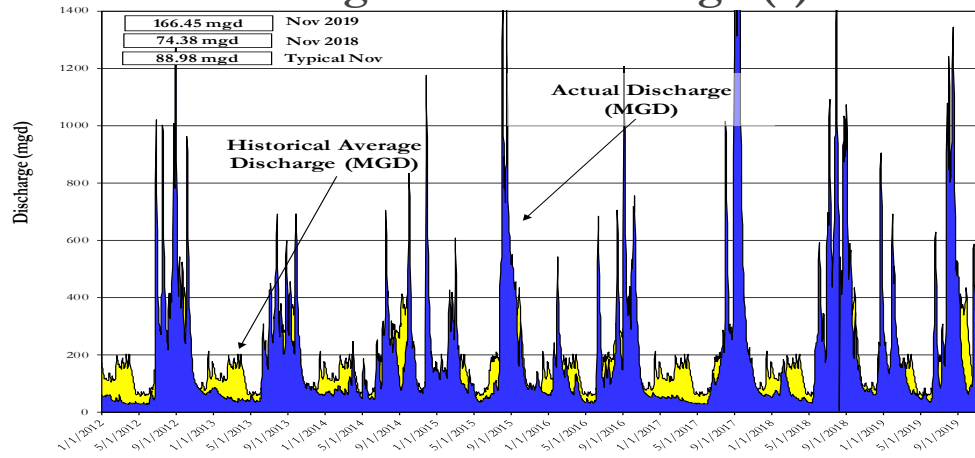




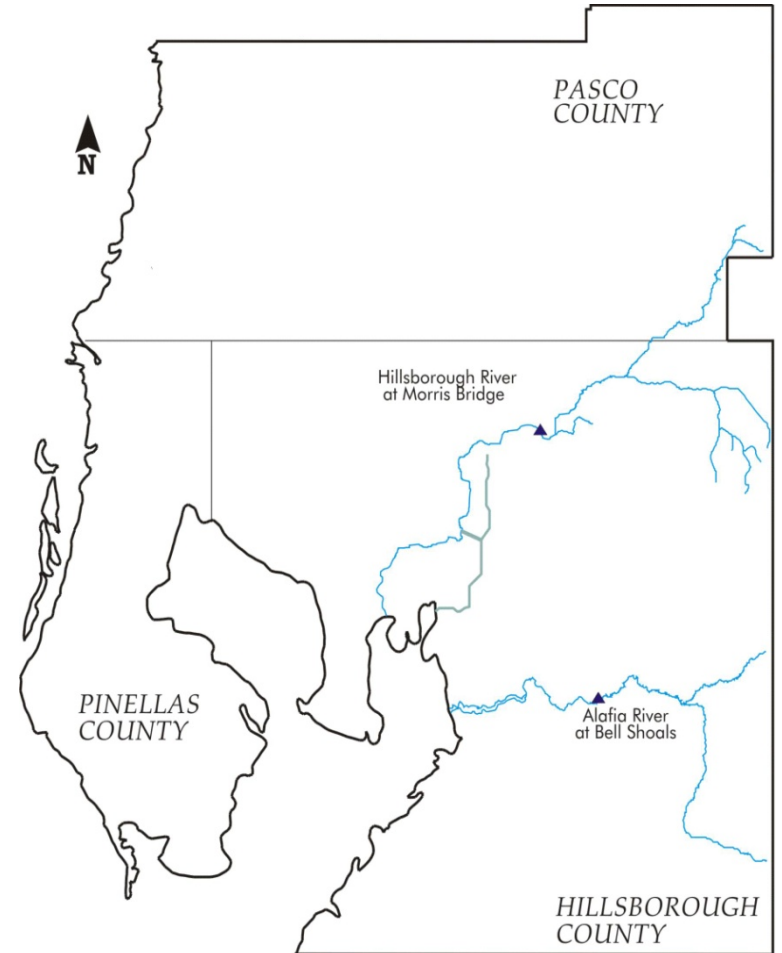
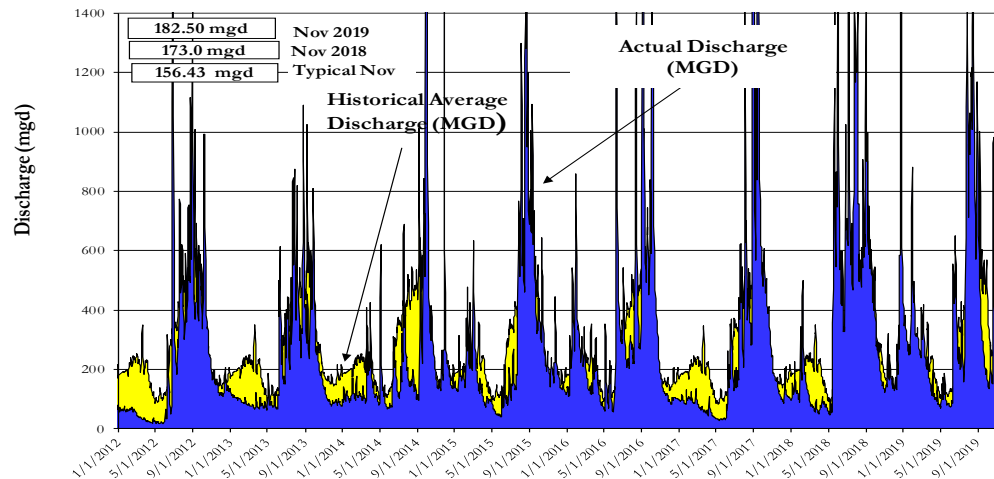
# Regional Surface Water Discharge November 2019

**Figure 18**

## Hillsborough at Morris Bridge (1)



## Estimated Flow, Alafia at Bell Shoals (2)



**TABLE 1****Regional Production Table**

<b>Month</b>	<b>Consolidated Permit Wellfields Monthly Production (mgd)</b>	<b>*Surface Water Monthly Production (mgd)</b>	<b>Seawater Desalination Plant Monthly Production (mgd)</b>	<b>**Other Groundwater Facility Monthly Production (mgd)</b>
October (WY19)	90.1	60.2	0.0	27.6
November	77.4	69.7	0.0	27.2
December	66.1	60.8	10.4	23.6
January	71.6	55.0	12.7	25.8
February	79.8	51.3	13.2	26.7
March	79.5	54.9	13.1	29.1
April	79.1	54.0	15.0	32.3
May	89.3	53.4	14.6	32.3
June	92.6	59.8	0.0	32.5
July	84.7	59.4	0.0	28.4
August	85.0	54.1	0.0	24.9
September	81.0	72.7	0.0	30.6
October (WY20)	88.4	63.6	0.0	29.0
November	88.3	60.1	0.0	27.8
<b>12-Month Average</b>	<b>82.1</b>	<b>58.3</b>	<b>6.6</b>	<b>28.6</b>
<b>Difference Between November 2018 and November 2019</b>	<b>10.9</b>	<b>-9.6</b>	<b>0.0</b>	<b>0.6</b>

\* Tampa Bay Water Surface Water Treatment Plant and the Tampa-Hillsborough Interconnect (THIC)

\*\*South Central Hillsborough Regional Wellfield, Brandon Wells, and the Carrollwood Wells.