



# HYDROLOGIC REPORT THE BIG CYPRESS BASIN

DECEMBER 2016

# SUMMARY OF HYDROLOGIC CONDITIONS IN THE BIG CYPRESS BASIN

December 2016

## SUMMARY

Dry conditions continued to prevail across the Big Cypress Basin [BCB] in December. In a weather pattern noted since October, the absence of meaningful frontal activity resulted in dismally low precipitation through the final month of the year. Unsurprisingly, most water levels in the BCB canals also continued to drop throughout December, with some of the systems underperforming the historic average. Consistent with this trend, the BCB and Lower West Coast groundwater monitoring wells also showed diminished levels for the month.

## RAINFALL

Low precipitation rates were noted Basin-wide, with most BCB stations receiving far less than one (1") inch of rain. The highest amount was recorded at Faka Union #5 (Site R-8), which received 1.48 inches, and the lowest at COCO1 (site R-17) which received a scant 0.18 inches. The December Basin average was hardly more encouraging, registering a mere 0.41 inches, as measured by twenty (20) reporting stations (ref. **Figure 1, 2, Table 1**). This was well below the 1.60 inches typically expected, and far less than December 1997 when the BCB received a record 5.78 inches (ref: **Figure 4**). A review of the past twelve months is somewhat more encouraging, the cumulative rainfall for 2016 now tops 60.2 inches, well in excess of the Basin-wide 54.3 inches typically received on an average year.

Extending three months into the dry season, this weather pattern has now had measurable impacts, although current conditions have yet to match previous historic periods when drought conditions prevailed. As indicated by the US Drought Monitor Index, conditions during the past month slipped into "abnormally dry" over southwest Florida (ref: **Figure 6**). Analysis of the 2000-2001 dry season (ref. **Figure 4, 5**), a period when canal water levels in Golden Gate Estates [GGE] were at historic lows, suggest that the current conditions are still arguably better. During the similar time period of late December 2000, water levels at the GG4 structure, a proxy for

central GGE conditions, registered 7.6 ft-NGVD, or about 20 inches below the 9.3 ft-NGVD recorded last month.

Although Basin-wide precipitation totals were too minimal to support a valid analysis of spatial distribution, the rainfall collected across the twenty BCB/ Lower West Coast monitoring sites has been provided on **Figure 3**.

## **STREAMFLOWS AND GROUNDWATER LEVELS**

Canal levels in all BCB watersheds maintained their downward trend in December. All weirs and control structures were kept under dry season (water supply) operating criteria to prevent water loss and to optimize aquifer recharge. With the exception of the Faka Union, no discharge was noted from system canals in December.

In the Golden Gate system (ref: **Figure 7a, 7b**) canal levels in the upper (GG4) and lower (GG1) watershed trended lower, with both sites dipping below the historic average by the end of the month. Canal levels also trended lower in the Cocohatchee system, although the lower watershed (COCO1) remained in positive range (ref: **Figure 8a, 8b**). Headwater stages in the upper watershed (COCO3) were mostly negative and underperformed the historic average.

The water levels in the upper Faka Union Canal dipped below historic baselines in December (ref: **Figures 9a, 9b**). Discharge from the system diminished considerably during this period, although it still registered 75 cfs by the beginning of January. In Henderson Creek, the Basin's smallest system, canal levels maintained a steady downward trend, finishing the month considerably below the historic average (ref. **Figures 10a, 10b**).

Groundwater levels in the Lower West Coast (LWC) monitor wells decreased in December. By the beginning of January approximately two thirds (66%) of the wells in the Surficial aquifer were in the lower 10th to 30th percentile range, with the remainder at median levels. In the Lower Tamiami aquifer, approximately half of the monitor wells recorded median levels, with the rest in the lower 10th to 30th percentile range. As noted here (**Table 2, Figure 11**), the largest decrease was at the Bonita Springs well (-0.92 ft at **L-2195**), although monitored levels at Marco Lakes also showed a significant decrease (-0.87 ft @ **C-1224**). The exhibits provided in this report include a

reference locator map showing the status of some other key indicator wells in the BCB / Lower West Coast region.

# BIG CYPRESS BASIN

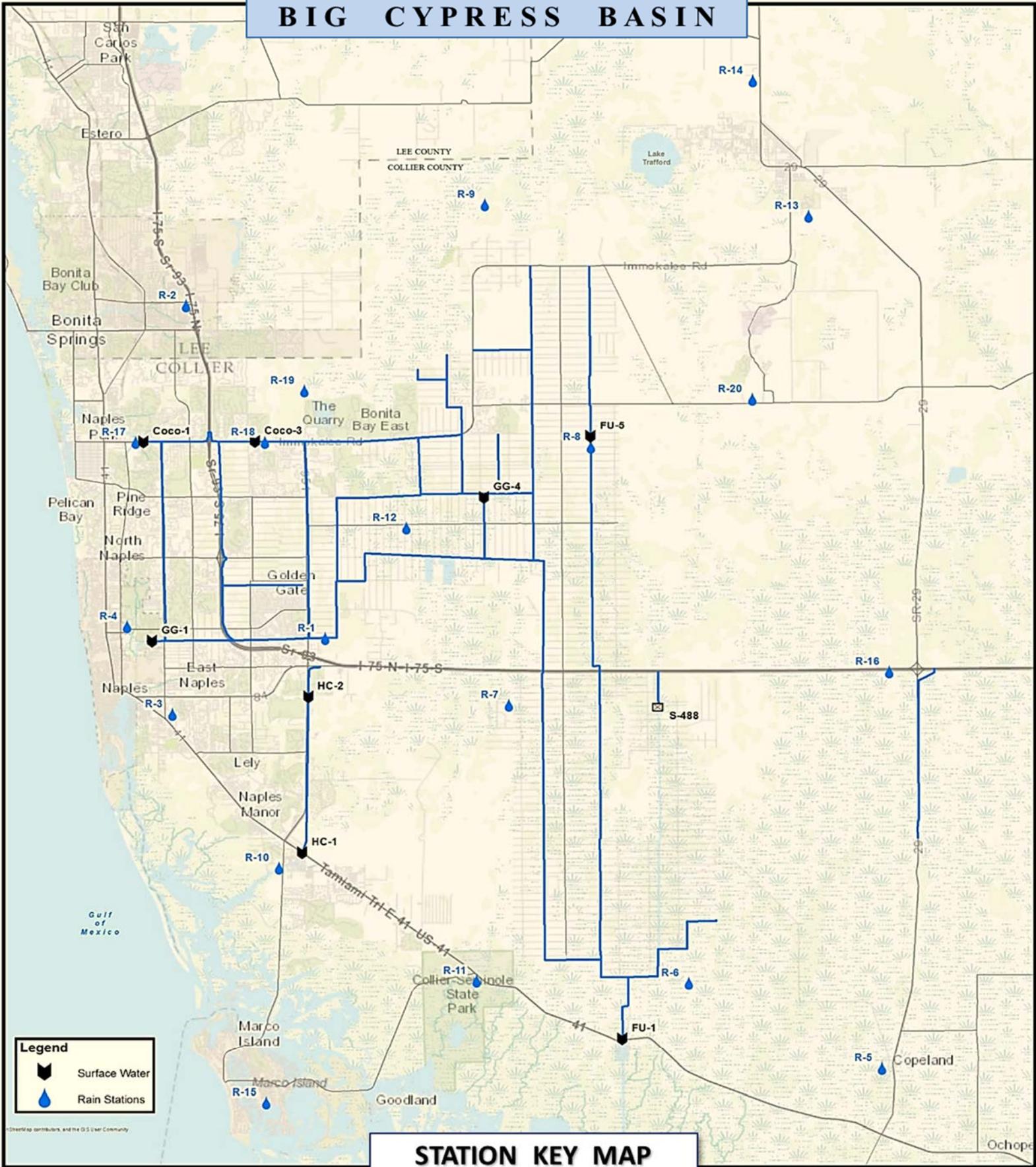


Figure 1

RAINFALL REPORT - DECEMBER 2016

DISTRICT/BASIN RAINFALL STATIONS

(ALL NUMBERS ARE IN INCHES)

STATION INDEX NO.	STATION NAME	DECEMBER 2016	LONG TERM AVERAGE FOR THIS MONTH	MONTHLY DIFFERENCE	CALENDAR YEAR 2016 CUMULATIVE TOTAL	AVERAGE CALENDAR YEAR TO DATE	YEAR TO DATE DIFFERENCE
R-1	GOLDEN GATE #3	0.42		New Site	60.25	No Historical Data	
R-2	BONITA SPRINGS WATER PLANT	0.20	1.40	-1.20	42.20	51.92	-9.72
R-3	COLLIER COUNTY COURTHOUSE	0.19	1.57	-1.38	39.23	52.09	-12.86
R-4	FREEDOM PARK	0.41		New Site	60.07	No Historical Data	
R-5	FAKAHATCHEE STRAND HQ	1.13	1.53	-0.40	60.42	60.23	0.19
R-6	DAN HOUSE PRAIRIE	0.25	1.42	-1.17	57.30	49.91	7.39
R-7	SGGE WEATHER STATION	0.20	1.35	-1.15	73.86	58.42	15.44
R-8	FAKA UNION #5	1.48		New Site	73.15	No Historical Data	
R-9	CORKSCREW SWAMP NORTH END	0.49	1.54	-1.05	72.94	48.05	24.89
R-10	ROOKERY BAY HQ	0.92	1.65	-0.73	65.22	53.35	11.87
R-11	COLLIER SEMINOLE STATE PARK	0.24	1.65	-1.41	71.55	55.93	15.62
R-12	G.G. FIRE STATION	0.30	1.63	-1.33	65.84	58.98	6.86
R-13	IMMOKALEE LANDFILL	0.25	1.52	-1.27	60.25	51.60	8.65
R-14	IFAS	0.27	1.56	-1.29	59.36	49.79	9.57
R-15	MARCO R.O. PLANT	0.20	1.62	-1.42	57.65	53.41	4.24
R-16	FAKAHATCHEE STRAND NORTH END	0.19	2.02	-1.83	69.01	60.62	8.39
R-17	COCO#1	0.18	1.57	-1.39	52.46	48.77	3.69
R-18	COCO#3	0.20	1.77	-1.57	50.38	56.69	-6.31
R-19	CR951 EXT	0.31	1.79	-1.48	54.14	59.60	-5.46
R-20	AVE MARIA	0.39	1.63	-1.24	58.29	54.21	4.08
	AVERAGES	0.41	1.60	-1.19	60.18	54.33	5.85

Table 1

**BCB ANNUAL RAINFALL  
MONTHLY DATA & HISTORIC AVERAGES**

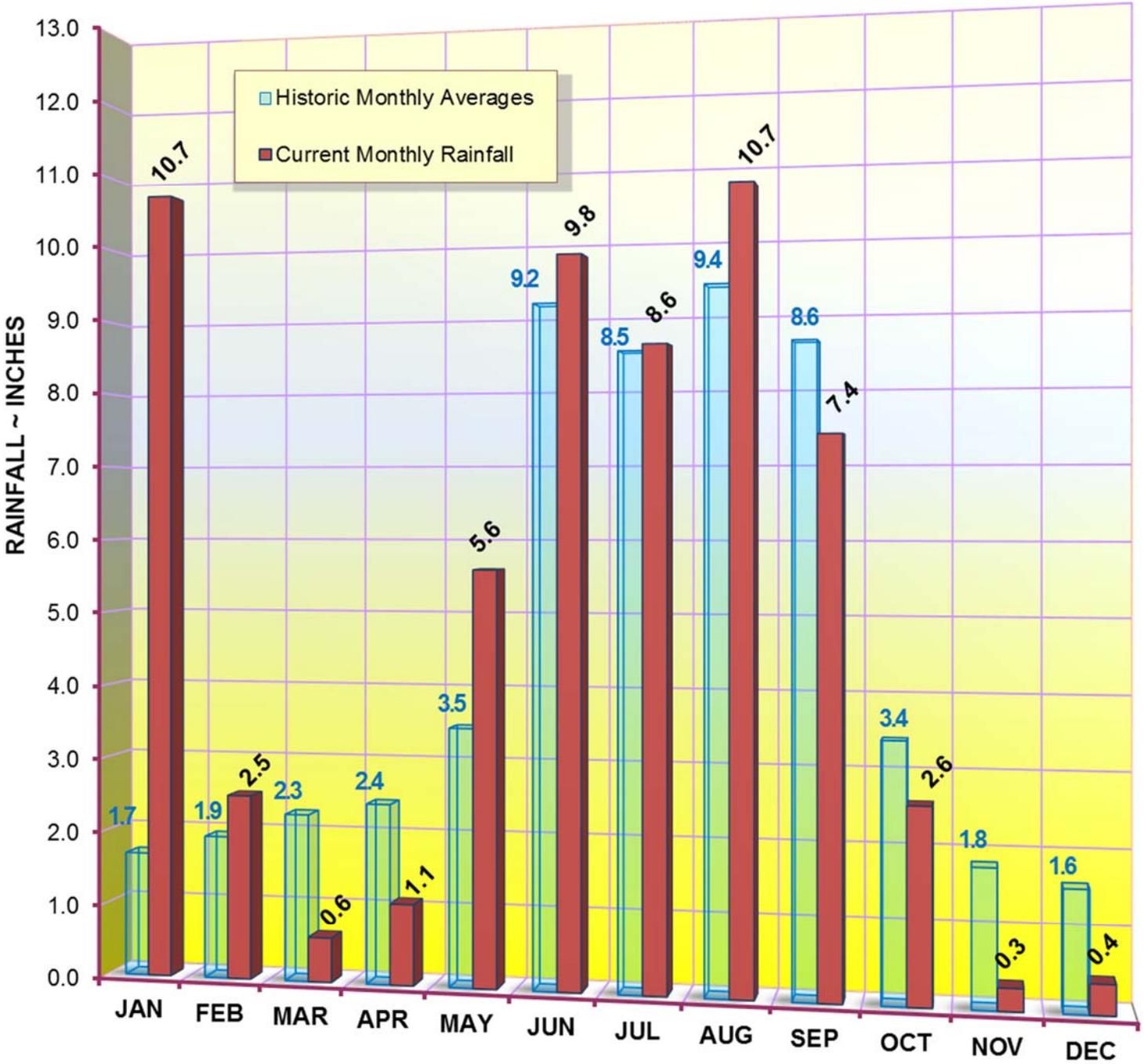
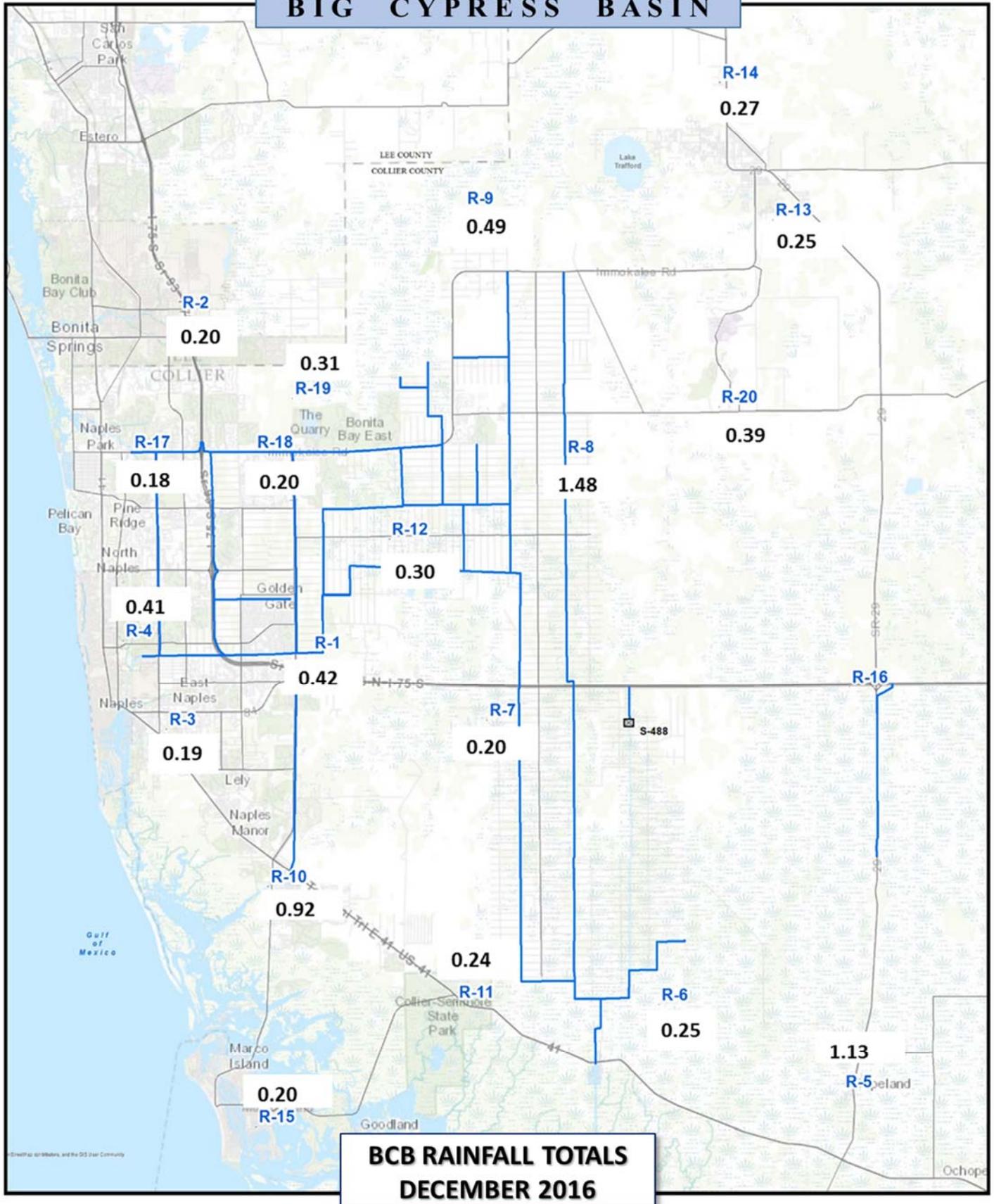


Figure 2

BCB MONTHLY RAINFALL - THROUGH DECEMBER 2016

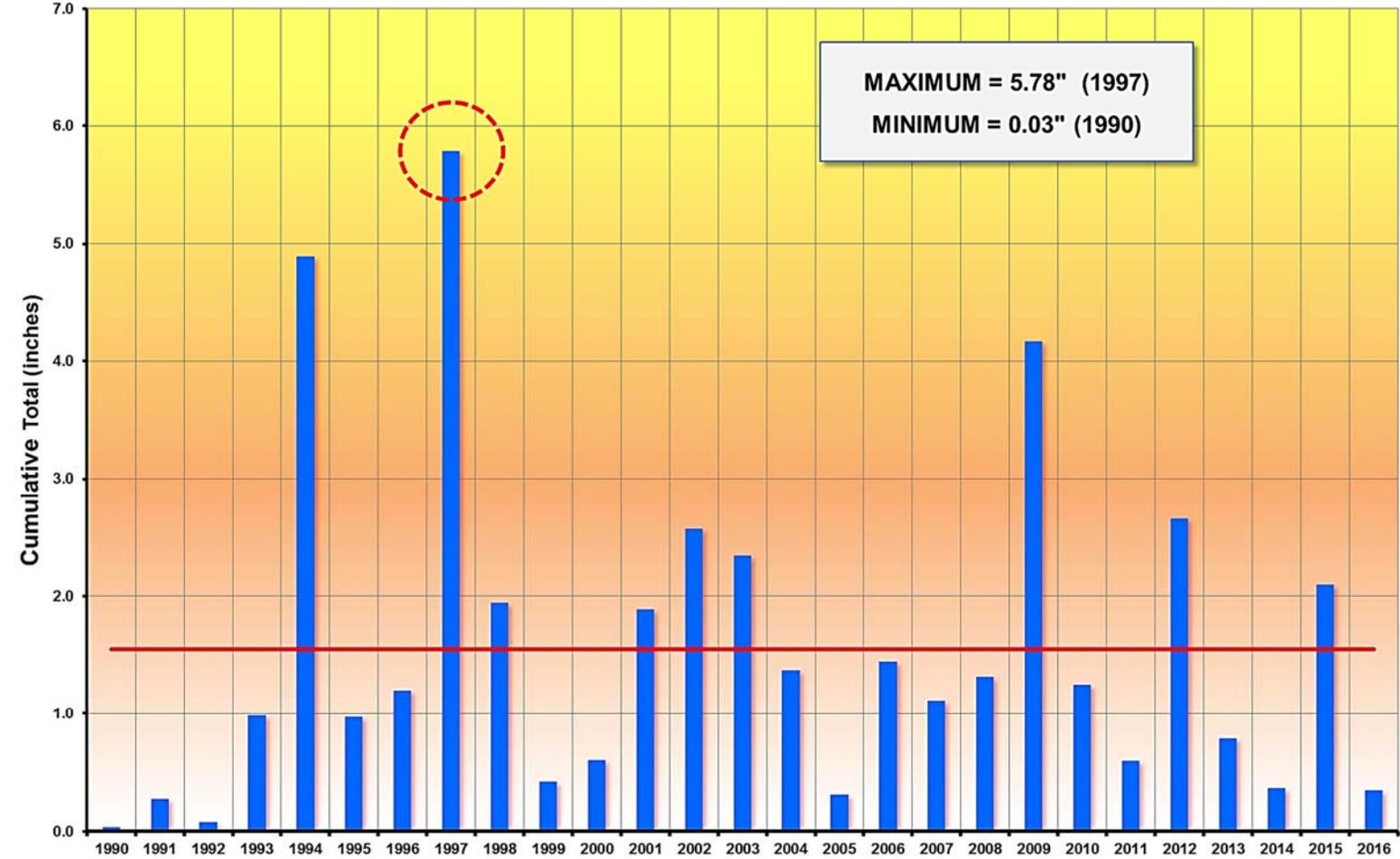
**BIG CYPRESS BASIN**



**BCB RAINFALL TOTALS  
DECEMBER 2016**

Figure 3

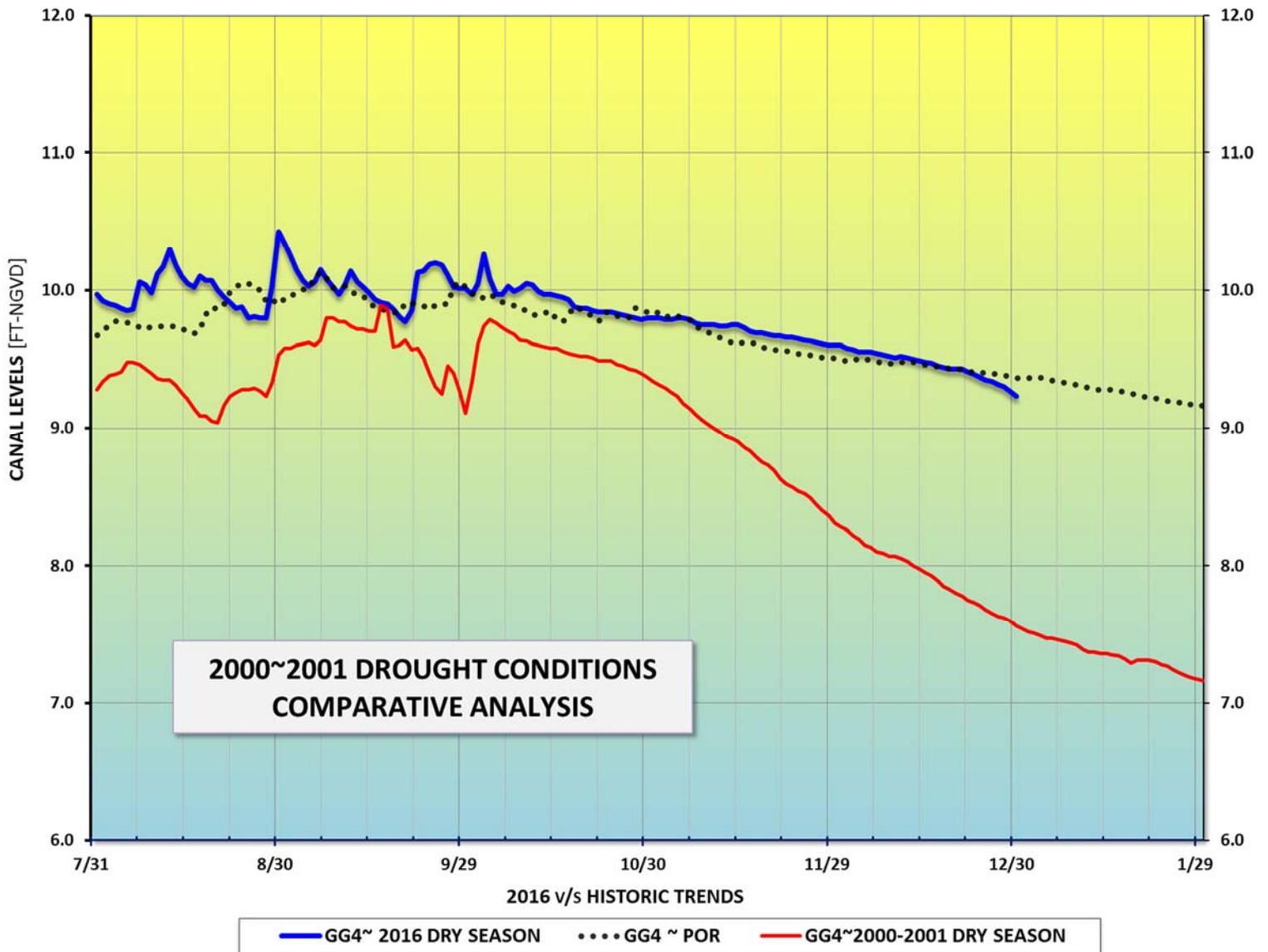
**BCB DECEMBER RAINFALL**  
**Period (1990 ~ 2016)**



**Figure 4**

**DECEMBER BCB RAINFALL**  
**PERIOD OF RECORD - THROUGH 2016**

**GOLDEN GATE ESTATES - DRY SEASON WATER LEVELS  
GG4 HW STAGE - DRY SEASON 2016 v/s 2000**



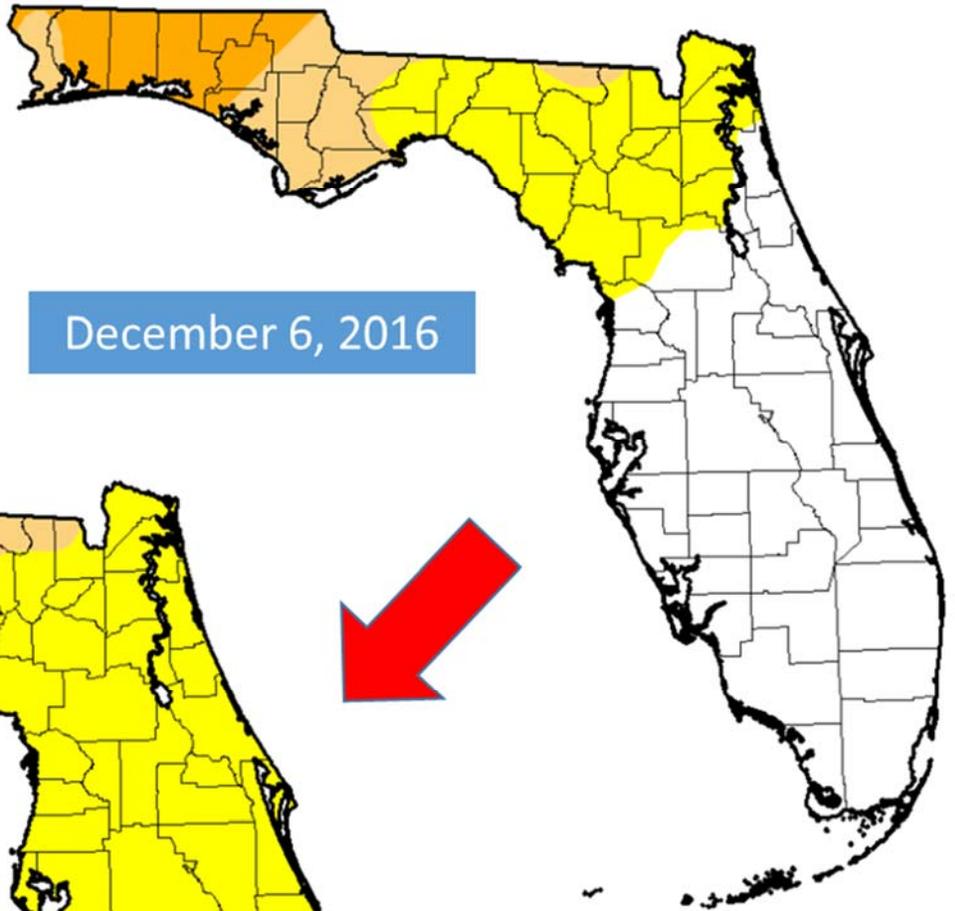
**Figure 5**

**DRY SEASON 2016 COMPARED TO DROUGHT CONDITIONS  
PERIOD OF RECORD - THROUGH 2016**

U.S. Drought Monitor Legend

Drought Severity

- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)



December 6, 2016

January 3, 2017

Figure 6

US DROUGHT MONITOR INDEX  
CHANGE THROUGH DECEMBER 2016

## GOLDEN GATE MAIN CANAL SYSTEM AVERAGE DAILY WATER LEVELS

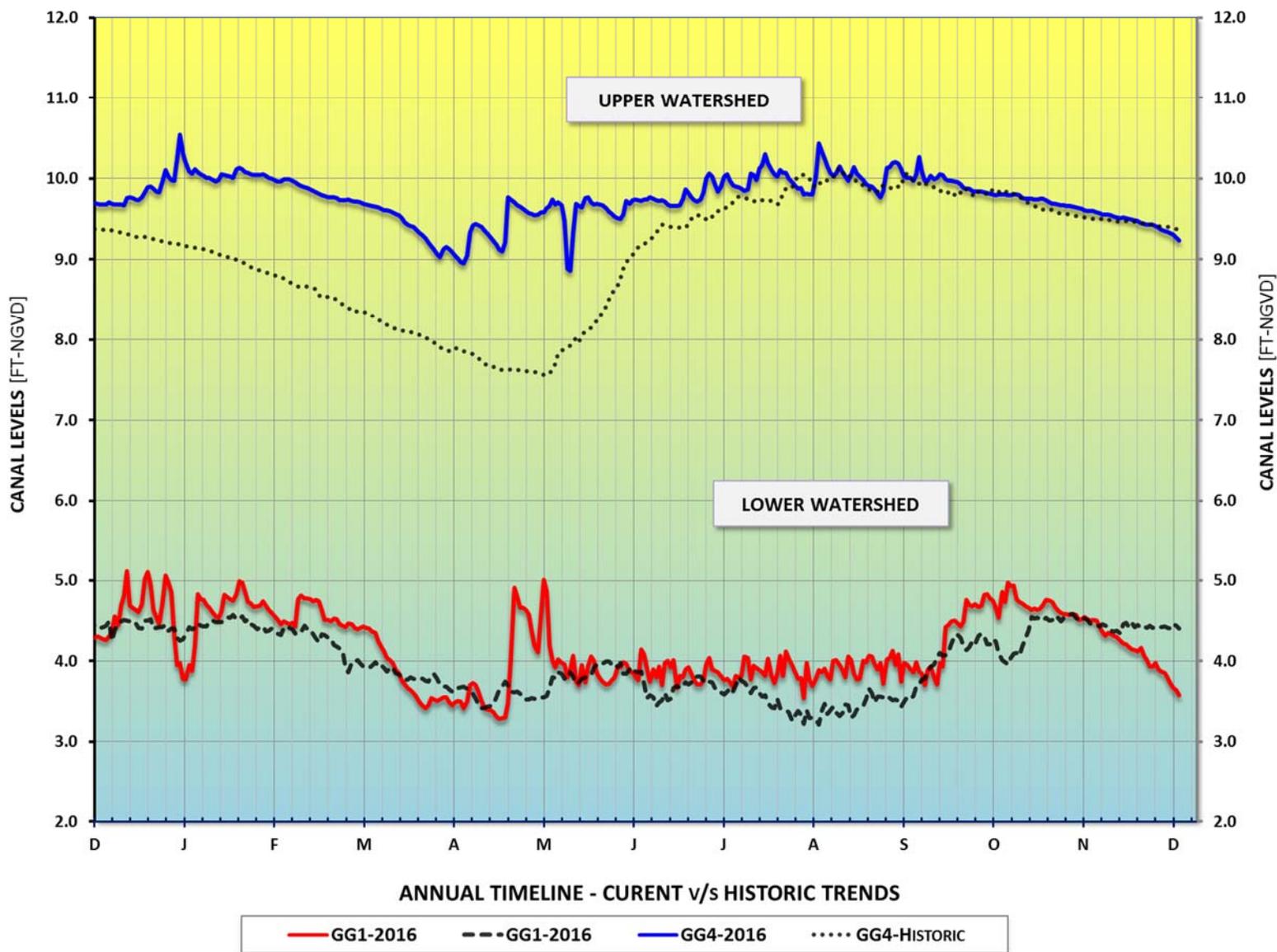
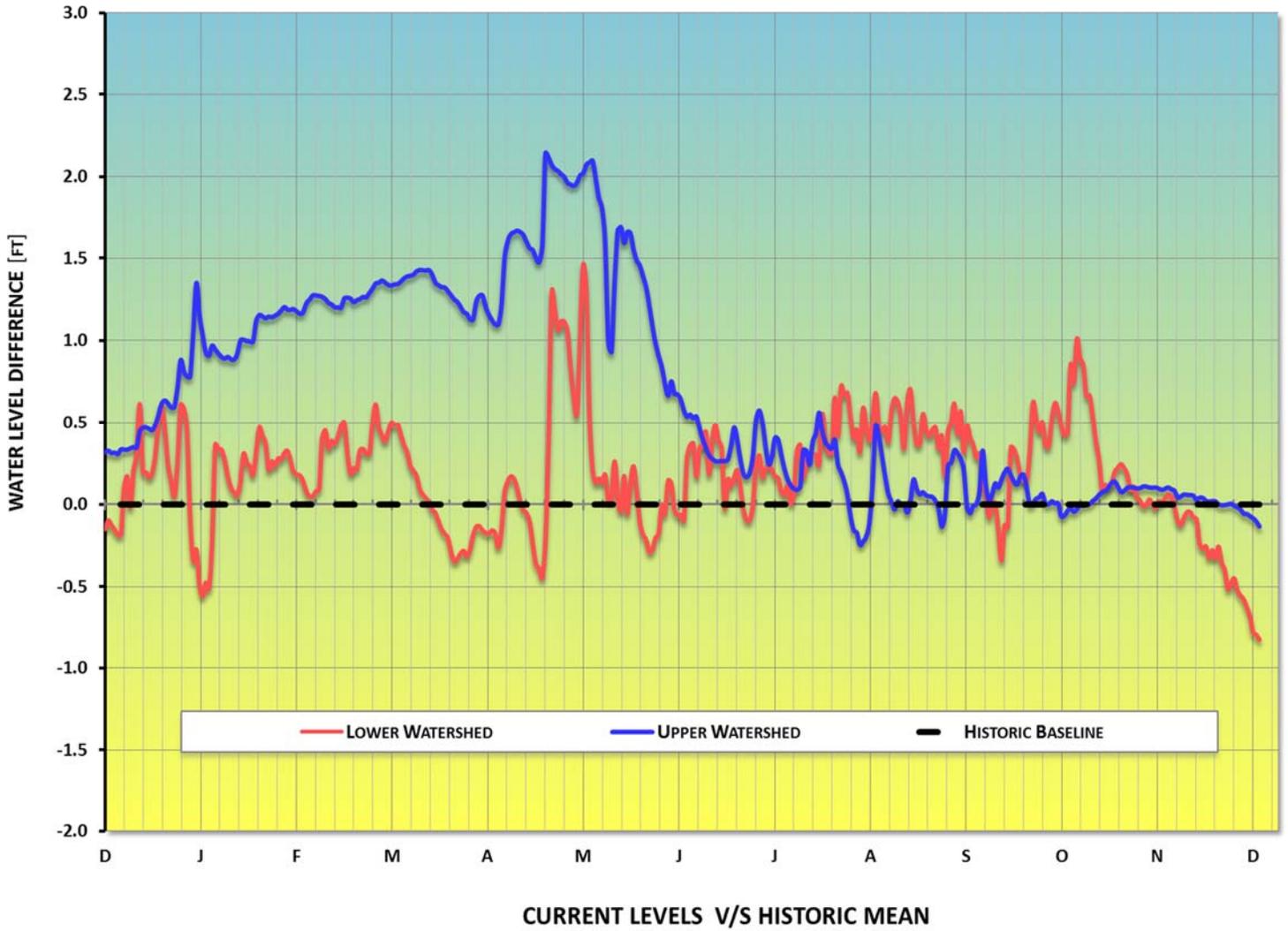


Figure 7a

**GOLDEN GATE MAIN CANAL SYSTEM  
DIFFERENCE IN CANAL LEVELS  
CURRENT COMPARED to HISTORIC TRENDS**



**Figure 7b**

# COCOHATCHEE CANAL SYSTEM AVERAGE DAILY WATER LEVELS

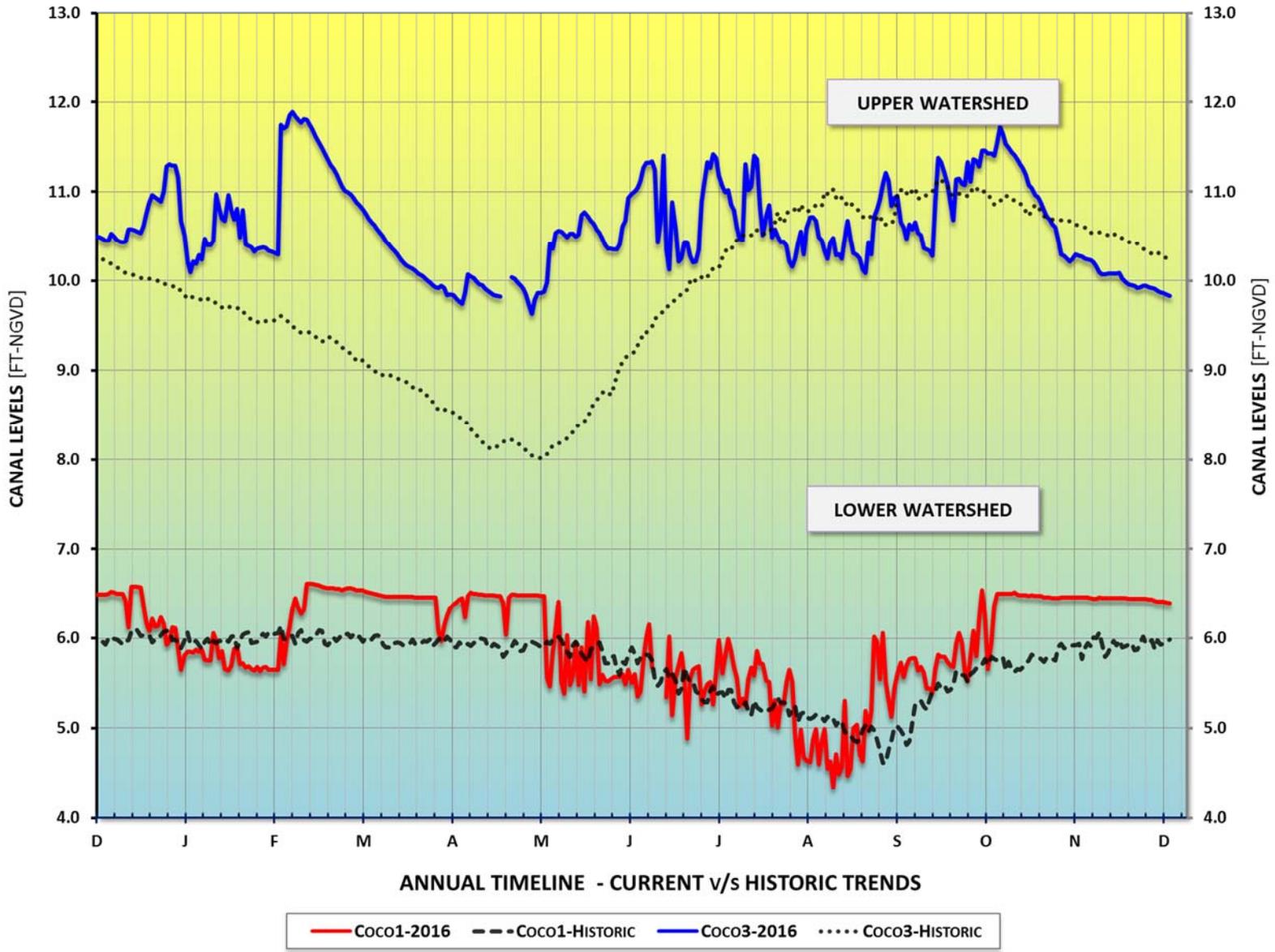


Figure 8a

**COCOHATCHEE CANAL SYSTEM  
DIFFERENCE IN CANAL LEVELS  
CURRENT COMPARED to HISTORIC TRENDS**

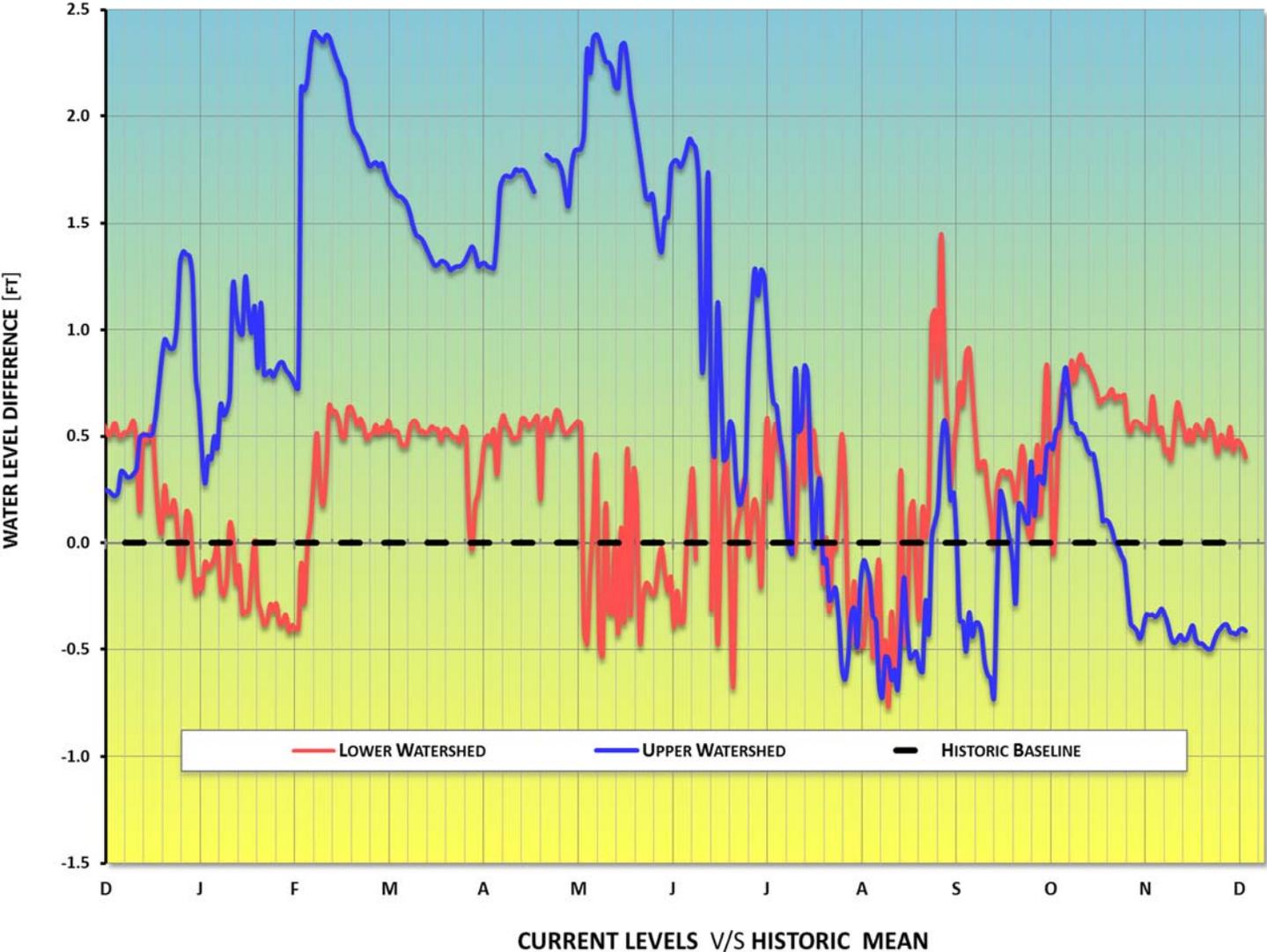


Figure 8b

### FAKA UNION CANAL SYSTEM AVERAGE DAILY WATER LEVELS

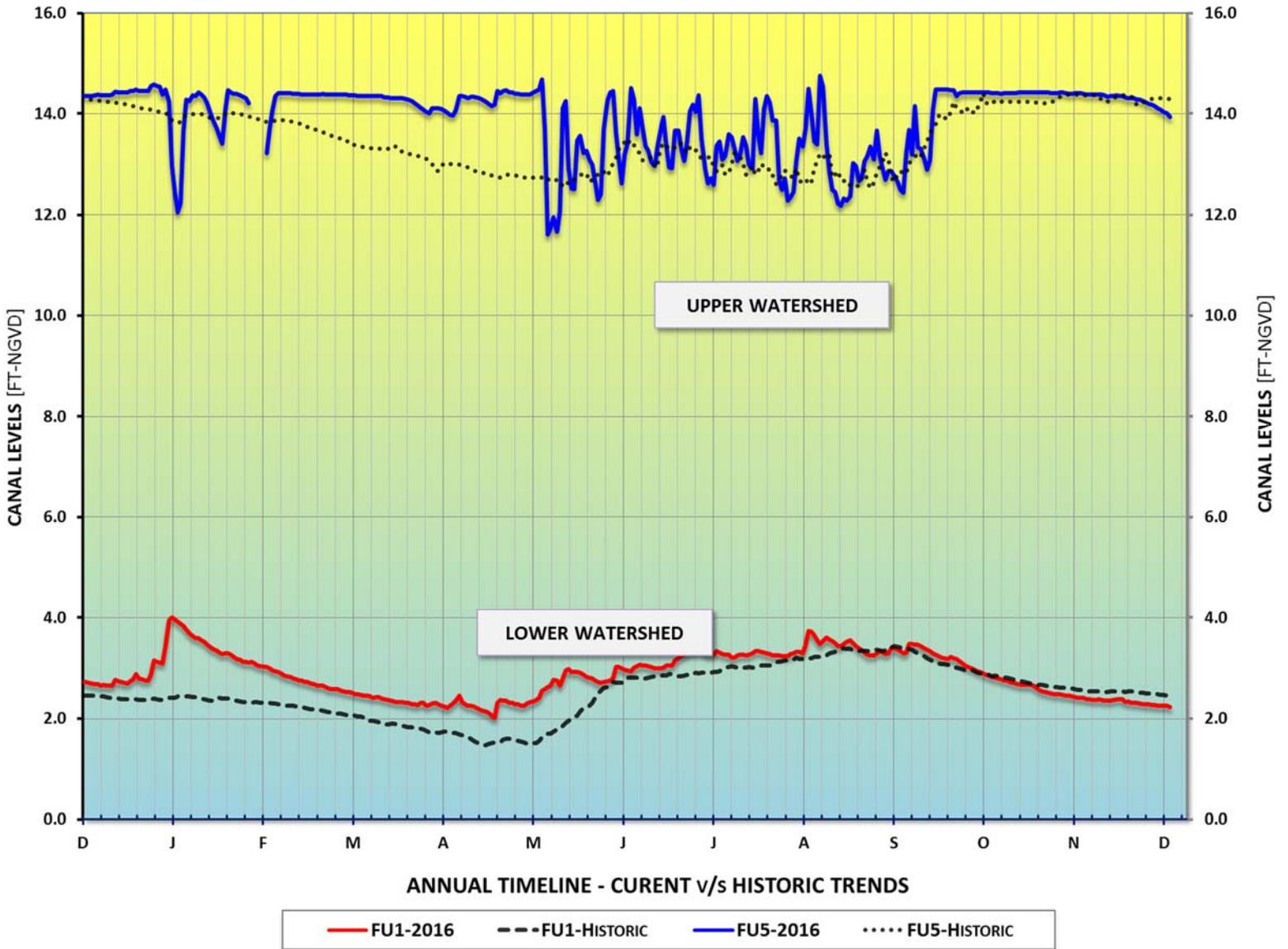
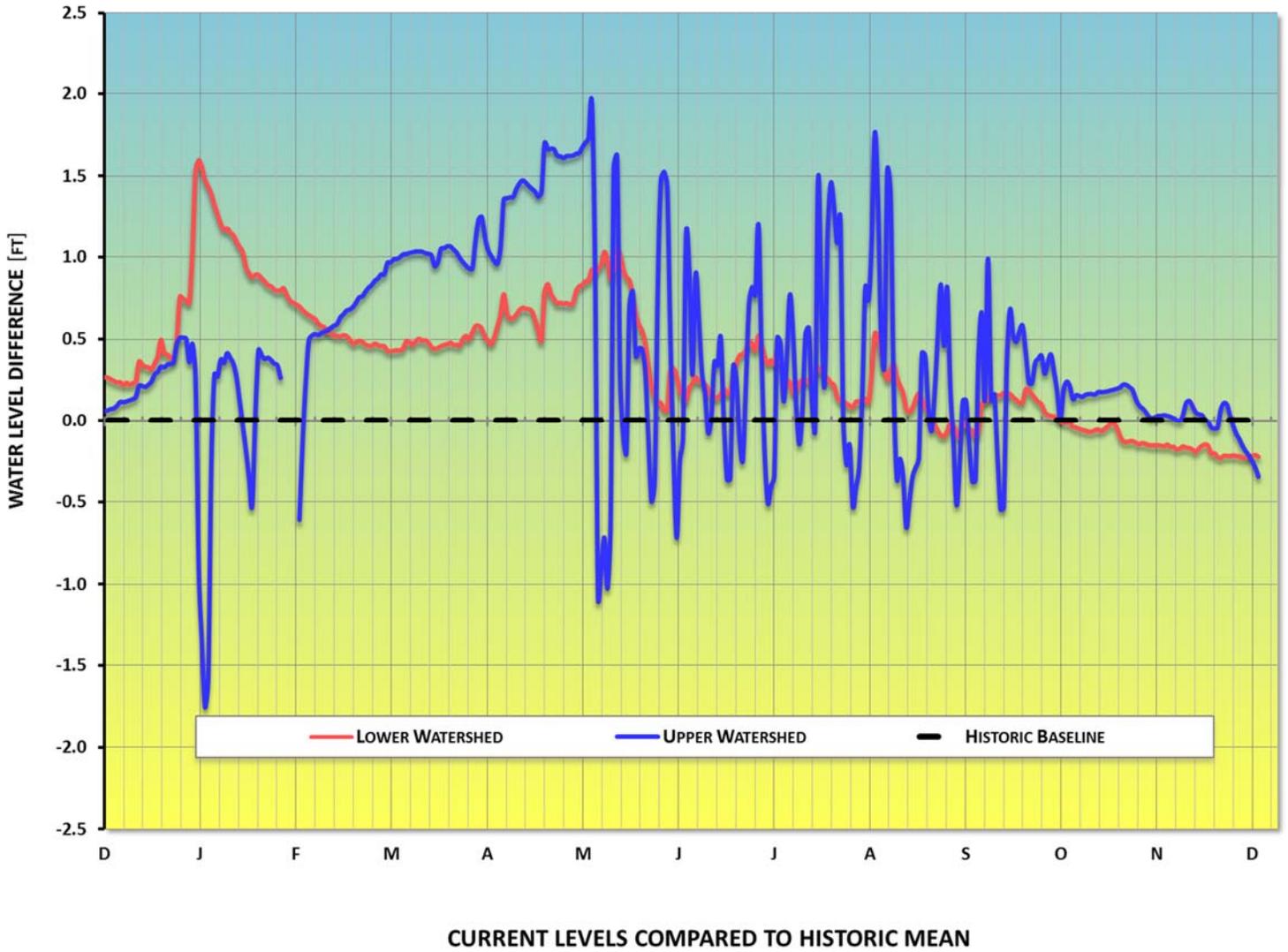


Figure 9a

**FAKA UNION CANAL SYSTEM  
DIFFERENCE IN CANAL LEVELS  
CURRENT COMPARED TO HISTORIC TRENDS**



**Figure 9b**

### HENDERSON CREEK CANAL AVERAGE DAILY WATER LEVELS

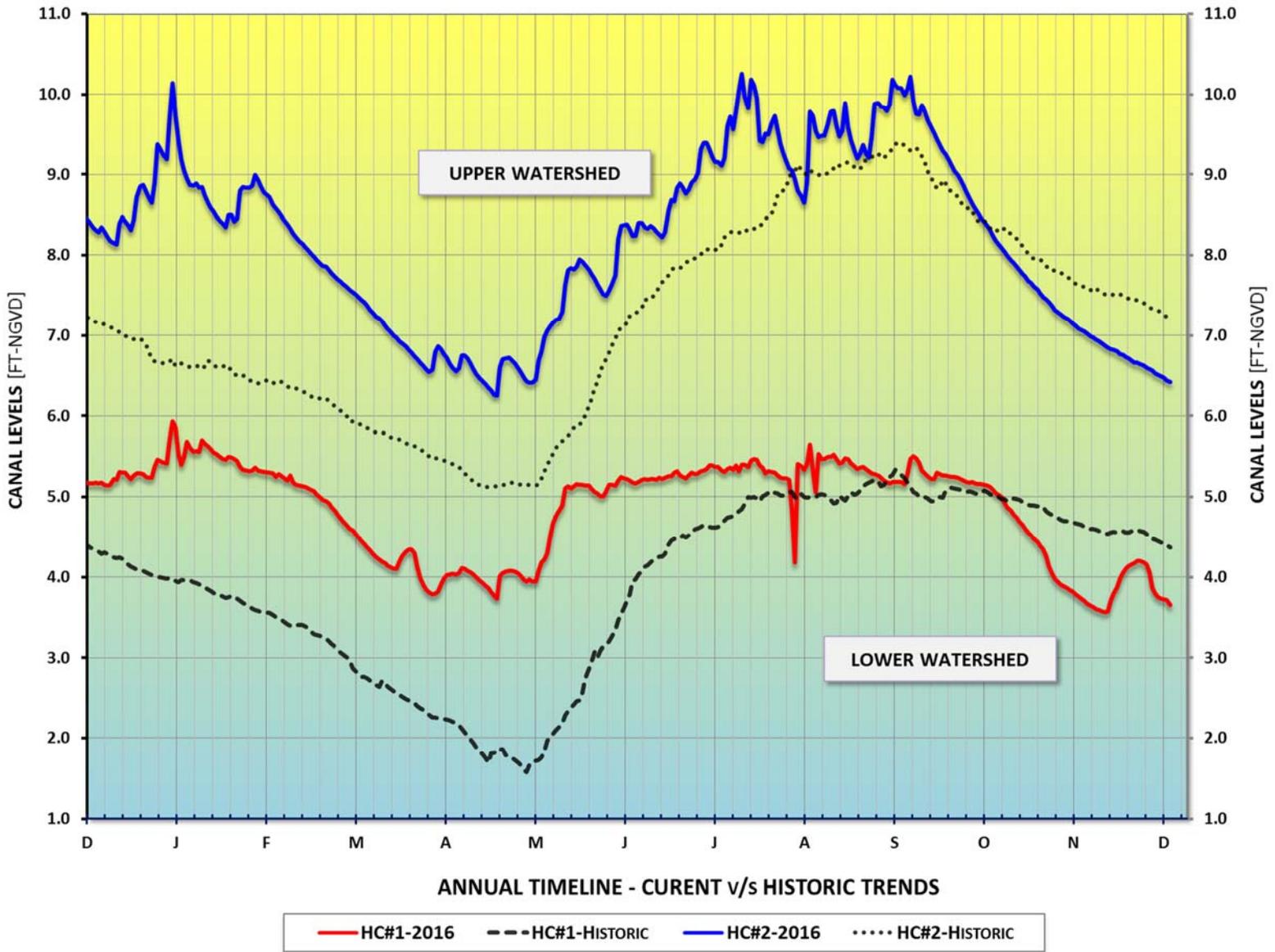
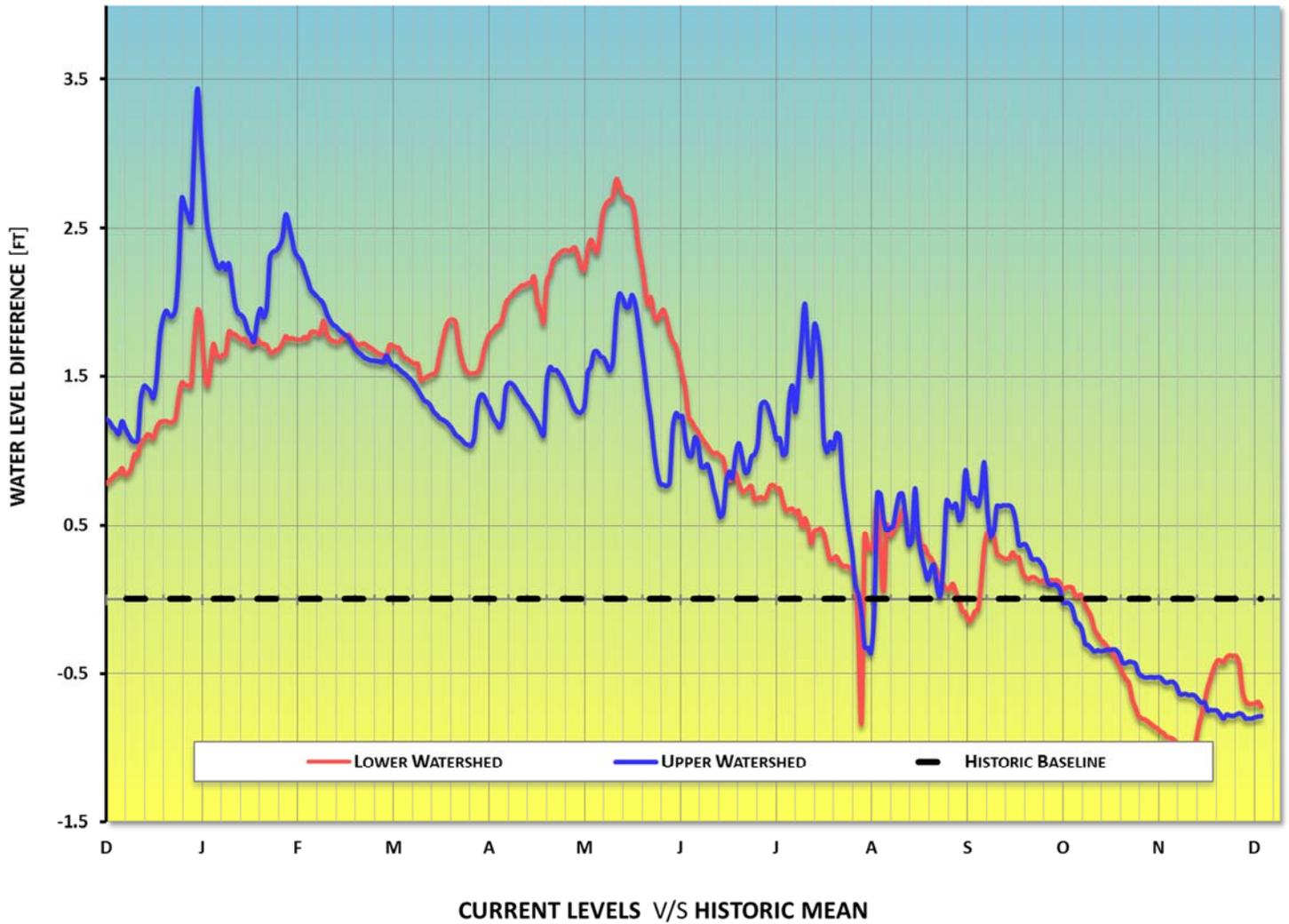


Figure 10a

**HENDERSON CREEK SYSTEM  
DIFFERENCE IN CANAL LEVELS  
CURRENT COMPARED to HISTORIC TRENDS**



**Figure 10b**

WATER CONDITIONS SUMMARY - December 2016

SELECTED STATIONS for BCB AREA / SW FLORIDA

Last Reading Date :		January 9, 2017					
Previous Period Reading Date:		December 5, 2016					
STATION INDEX NO.	WELL LOCATION	WELL / AQUIFER - TYPE	CHANGE (from previous date)	PREVIOUS LEVEL (12/5/2016)	CURRENT LEVEL (ft)	DIRECTION OF CHANGE	CONCERN INDICATOR
ALL INDICATOR LEVELS SHOWN IN FT-NGVD							
C-462	Immokalee	Lower Tamiami Aquifer	-0.08	28.19	28.11	↓	GREEN
C-1004R	Naples	Lower Tamiami Aquifer	1.43	-0.48	0.95	↑	YELLOW
C-1224	Marco Lakes	Lower Tamiami Aquifer	-0.87	3.10	2.23	↓	GREEN
L-2194	Bonita Springs	Lower Tamiami Aquifer	-0.41	2.38	1.97	↓	GREEN
L-2195	Bonita Springs	Surficial Aquifer System	-0.92	9.94	9.02	↓	GREEN
L-738	Bonita Springs	Lower Tamiami Aquifer	0.6	-1.66	-1.06	↑	GREEN

Table 2

# BIG CYPRESS BASIN

DECEMBER 2016

## GROUNDWATER LEVELS DAILY RECORD COMPARED TO HISTORIC AVERAGE

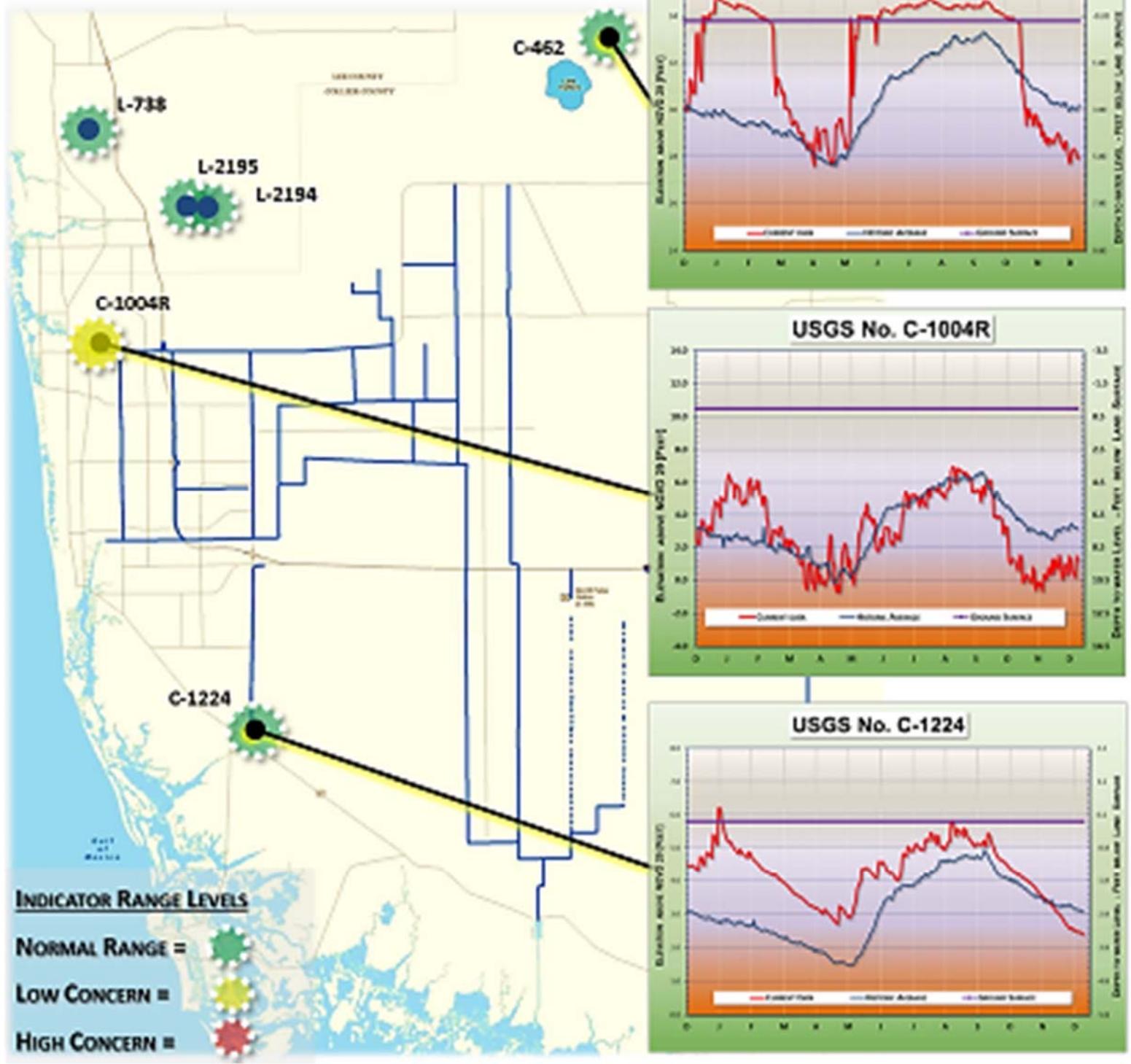


Figure 11