HYDROLOGIC REPORT
THE BIG CYPRESS BASIN

DECEMBER 2017

SUMMARY OF HYDROLOGIC CONDITIONS IN THE BIG CYPRESS BASIN

December 2017

SUMMARY

December marked the close of a very active year for the Big Cypress Basin [BCB]. Winter weather patterns held sway and dry conditions persisted throughout the month. Rainfall continued to be slight, generally associated with incoming frontal systems. Predictably, water levels in the BCB canals kept a downward trend throughout the month, although most systems continued to track the historical averages. Unsurprisingly, BCB canal outflows also diminished and had practically ceased by the beginning of January.

BCB RAINFALL

In a repeat of the previous month, rainfall across the Basin was once again below par in December. The collected average from twenty-two (22) BCB reporting stations (ref. **Figures 1, 2, Table 1**) was 1.15 inches, approximately 26% lower than the 1.54 inches typically expected. From a historical perspective, basin-wide precipitation last month was also well below the 5.8 inches received in 1997, a period of record maximum for the Basin (ref: **Figure 4a**).

December capped off a record year for rainfall received across the BCB. The final tally from local Basin gage stations topped 81.0 inches, marking 2017 as the wettest year since 1995, the previous record year which barely edged out at 81.4 inches (ref: **Figure 4b**).

Based on collected gage data, December rainfall was generally well distributed across the BCB. The dataset indicates that most stations recorded within one standard deviation of the mean, with the month's highest total measured at the County Courthouse (COLGOV R-3), which received 1.75 inches, and the lowest at Dan House (Site R-6) which received less than half that amount, 0.70 inches. These rainfall totals and their locality distribution across the BCB/ Lower West Coast are shown on **Figure 3**.

BCB CANAL SYSTEMS

Most BCB canal levels maintained a steady downward trend in December. Outfall discharge from most systems diminished considerably with only the Faka Union registering any significant outflow by the end of the month. All weirs and control structures were kept under dry season (water supply) operating criteria to prevent water loss and to optimize aquifer recharge.

- **GOLDEN GATE SYSTEM (BCB Central Collier)**

  In the Golden Gate system (ref: **Figure 5a, 5b**) the overall monthly trend was positive although canal levels were more consistently above average in the mid-upper watershed (GG4). Outfall discharge, which was at minor levels at the beginning of December, dropped throughout that period and had ceased by the start of January.

- **COCOHATCHEE SYSTEM (BCB Urban/ North Collier)**

  Water levels in the Cocohatchee system outperformed the historical average last month (ref: **Figure 6a, 6b**). Both the upper (COCO3) and lower (COCO1) watershed ended the month comfortably in upper ranges and discharge at outfall effectively ceased.

- **FAKA UNION SYSTEM (BCB East Collier and South to Port of the Islands)**

  The water levels in the Faka Union system maintained a positive track against the historical average in December (ref: **Figures 7a, 7b**). Although stages in the upper reach (FU5) showed more resilience, the lower watershed (FU1) registered steadily diminishing levels over the course of the month. Similarly, outfall discharge kept dropping during this period, with 265 cfs noted at the beginning of January.

- **HENDERSON CREEK SYSTEM (BCB Urban /South Collier)**

  In Henderson Creek (ref: **Figure 7a, 7b**) water levels in both the upper (HC2) and lower (HC1) reaches kept above the historical baseline throughout the month. The Henderson Creek system had little to no discharge during the final month of 2017.

BCB / LWC GROUNDWATER LEVELS

As per last District report (1/02/2018), the Lower West Coast [LWC] groundwater levels mostly decreased in the final weeks of December. At this time, about three-quarters of the wells in the Surficial aquifer are in the upper 76th to 90th percentile range or higher for this time of year, with the remainder at median levels. Approximately half of the Lower Tamiami aquifer well levels are also in the upper 76th to 90th percentile ranges, with the remainder at median levels. The majority of Sandstone Aquifer wells are at median levels for this time of year. Approximately two thirds of the Mid-Hawthorn aquifer monitor wells are also at median levels or higher, with the remainder in the lower 10th to 24th percentile range.

Since the last evaluation, 12/4/2017 through 1/02/2018, half of the representative monitor wells shown on **Table 2**, have seen a downward trend. The highest decrease from this sample was recorded at the **L-462** monitor well in Immokalee, which dropped by (-) 3.03 ft. The exhibit provided at the end of this report (ref: **Figure 9**) includes a reference locator map showing the status of these and some other key indicator wells in the BCB / Lower West Coast region.

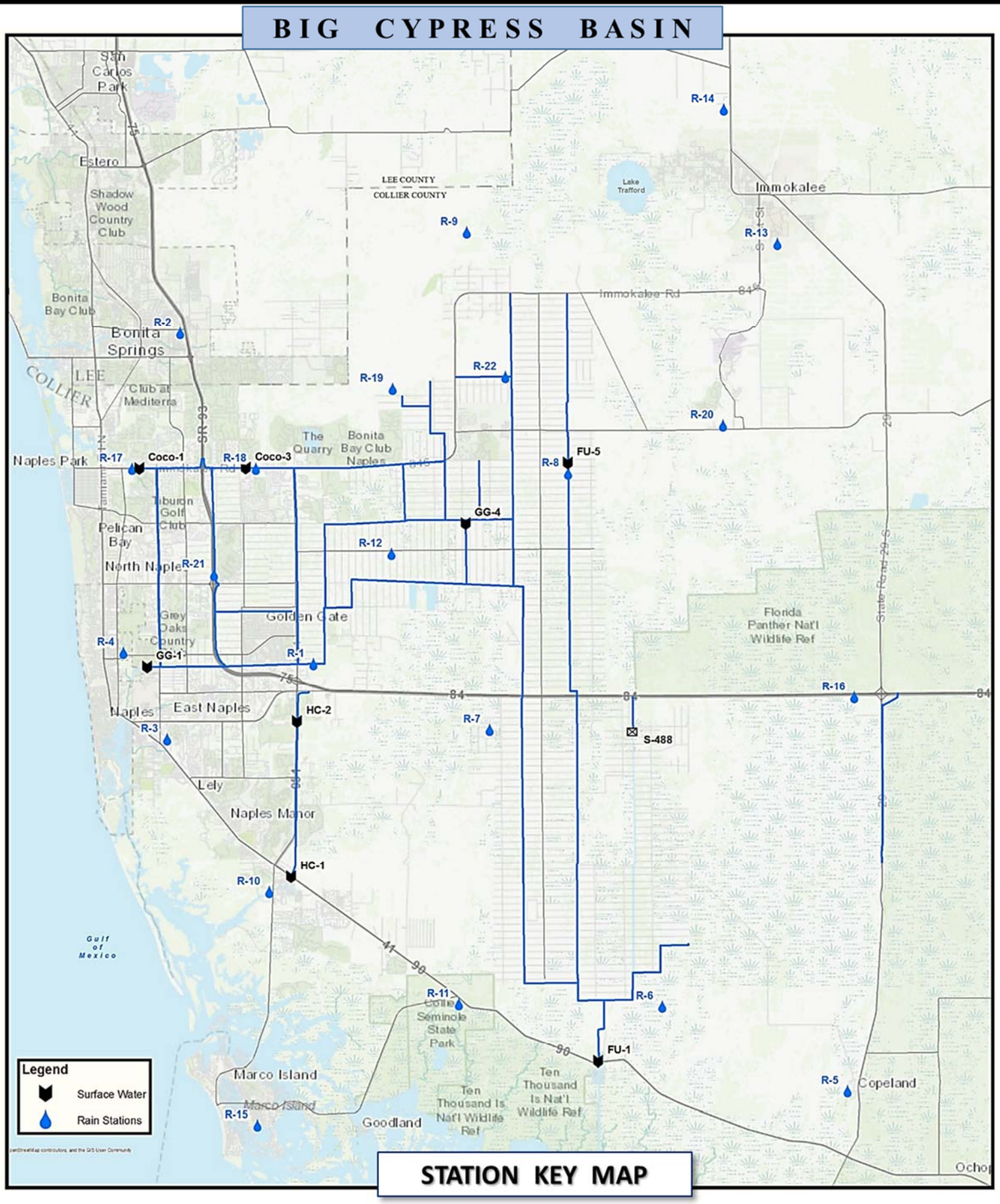
BIG CYPRESS BASIN
LEE COUNTY
COLLIER COUNTY
Estero
Bonita Springs
Naples
Naples Park
East Naples
Golden Gate
North Naples
Pelican Bay
Immokalee
Lake Trafford
Marco Island
Goodland
Copeland
Lely
Naples Manor
Gulf of Mexico
Florida Panther Nat'l Wildlife Ref
Ten Thousand Is Nat'l Wildlife Ref
Collier Seminole State Park
Immokalee Rd
R-1
R-2
R-3
R-4
R-5
R-6
R-7
R-8
R-9
R-10
R-11
R-12
R-13
R-14
R-15
R-16
R-17
R-18
R-19
R-20
R-21
R-22
Coco-1
Coco-3
GG-1
GG-4
HC-1
HC-2
FU-1
FU-5
S-488
Legend
Surface Water
Rain Stations
STATION KEY MAP

Figure 1

RAINFALL REPORT - DECEMBER 2017							
DISTRICT/BASIN RAINFALL STATIONS							
(ALL NUMBERS ARE IN INCHES)							
STATION INDEX NO.	STATION NAME	DECEMBER 2017	LONG TERM AVERAGE FOR THIS MONTH	MONTHLY DIFFERENCE	CALENDAR YEAR 2017 CUMULATIVE TOTAL	AVERAGE CALENDAR YEAR TO DATE	YEAR TO DATE DIFFERENCE
R-1	GOLDEN GATE #3	1.34		New Site	85.70	No Historical Data	
R-2	BONITA SPRINGS WATER PLANT	0.97	1.37	-0.40	70.22	51.67	18.55
R-3	COLLIER COUNTY COURTHOUSE	1.75	1.53	0.22	88.45	51.73	36.72
R-4	FREEDOM PARK	1.41		New Site	82.41	No Historical Data	
R-5	FAKAHATCHEE STRAND HQ	0.85	1.52	-0.67	84.84	60.24	24.60
R-6	DAN HOUSE PRAIRIE	0.70	1.36	-0.66	86.44	50.28	36.16
R-7	SGGE WEATHER STATION	0.87	1.27	-0.40	88.42	59.52	28.90
R-8	FAKA UNION #5	0.87		New Site	89.46	No Historical Data	
R-9	CORKSCREW SWAMP NORTH END	1.44	1.48	-0.04	76.34	49.47	26.87
R-10	ROOKERY BAY HQ	0.90	1.59	-0.69	75.44	54.26	21.18
R-11	COLLIER SEMINOLE STATE PARK	1.26	1.61	-0.35	85.61	56.42	29.19
R-12	G.G. FIRE STATION	1.08	1.59	-0.51	77.07	59.18	17.89
R-13	IMMOKALEE LANDFILL	1.45	1.48	-0.03	87.46	51.86	35.60
R-14	IFAS	1.18	1.54	-0.36	72.12	49.96	22.16
R-15	MARCO R.O. PLANT	1.05	1.58	-0.53	68.48	53.53	14.95
R-16	FAKAHATCHEE STRAND NORTH END	0.92	1.98	-1.06	86.95	60.80	26.15
R-17	COCO#1	1.14	1.53	-0.39	75.99	48.88	27.11
R-18	COCO#3	0.94	1.65	-0.71	75.87	56.20	19.67
R-19	BIRD ROOKERY	1.43		New Site	82.50	No Historical Data	
R-20	AVE MARIA	1.28	1.58	-0.30	77.27	54.34	22.93
R-21	I75W2	1.23		New Site	89.08	No Historical Data	
R-22	GG#7	1.13		New Site	76.83	No Historical Data	
	AVERAGES	1.15	1.54	-0.40	81.04	54.27	26.77

Table 1

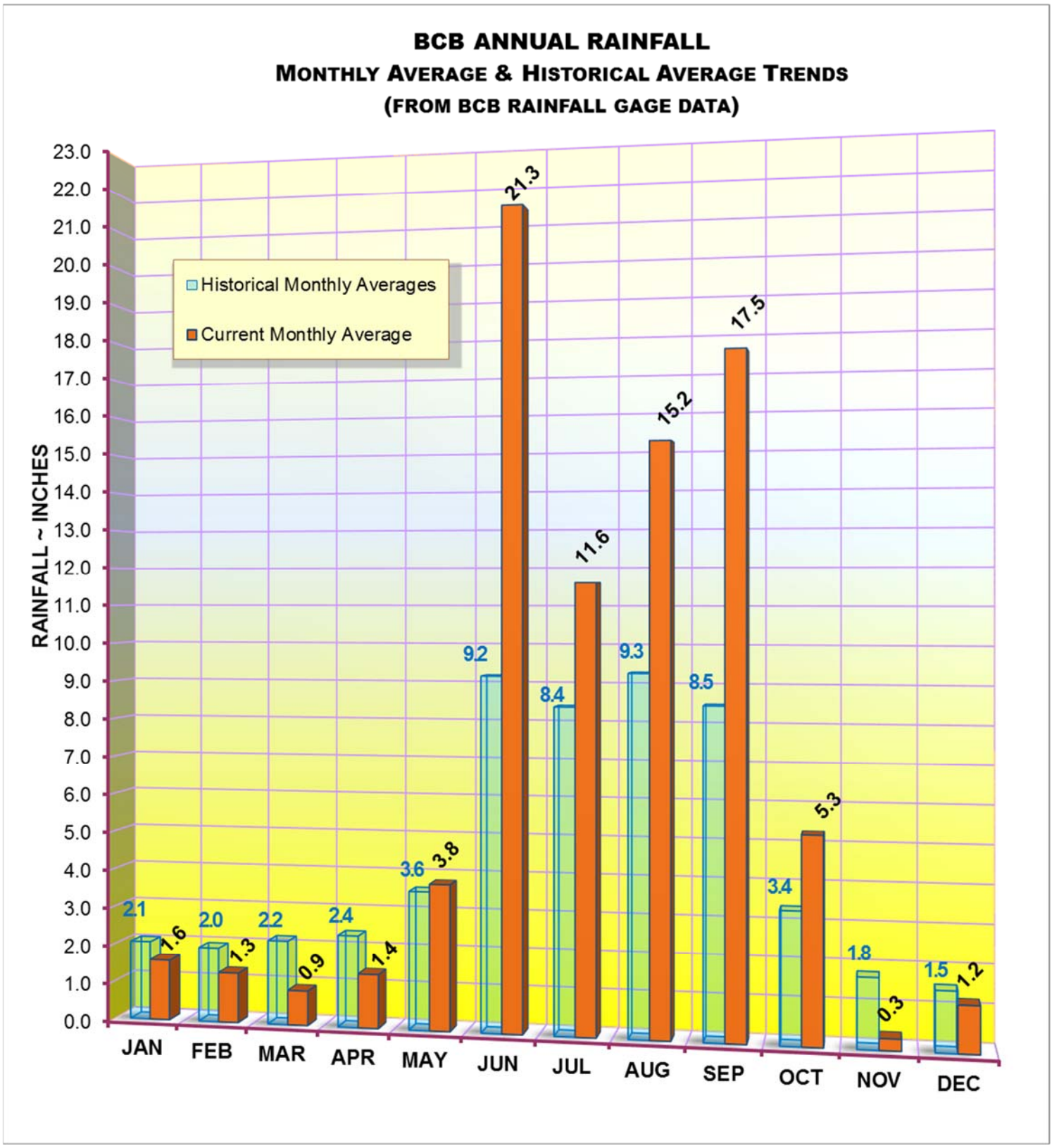

Figure 2
BCB GAGE RAINFALL – MONTHLY AVERAGES THROUGH DECEMBER 2017

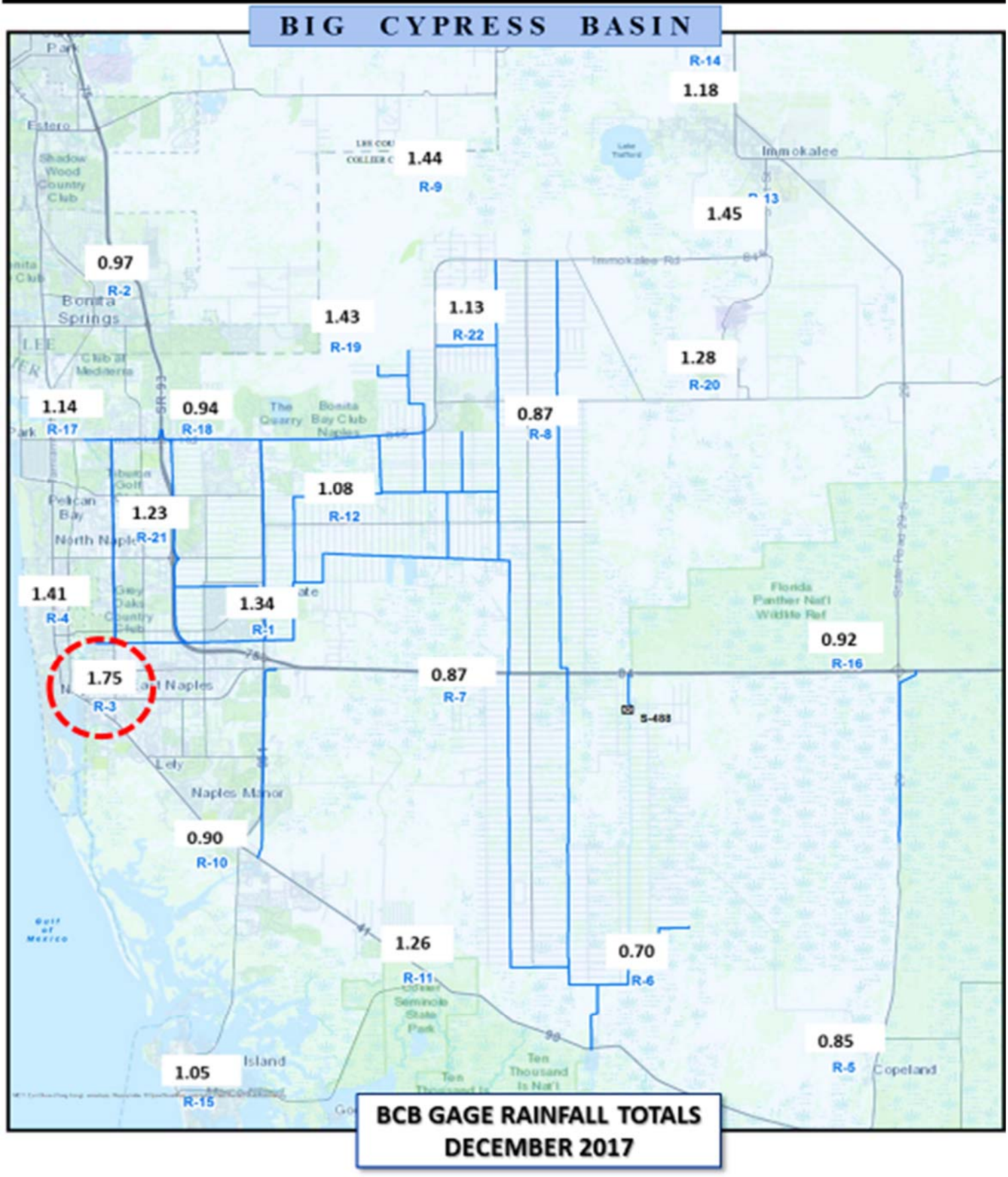

Figure 3
BCB GAGE RAINFALL – LOCALITY DISTRIBUTION DECEMBER 2017

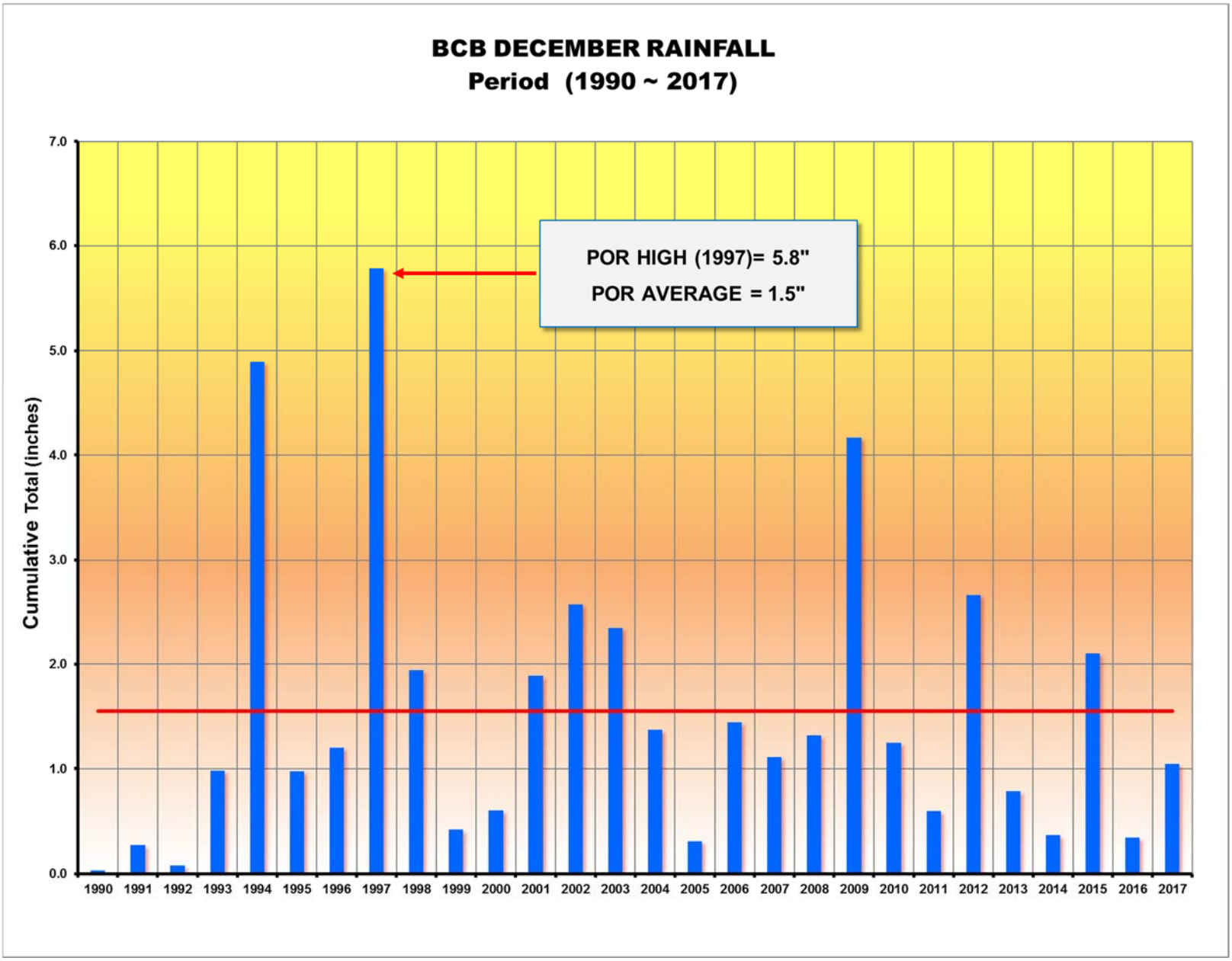

Figure 4a

BCB MONTHLY AVERAGE RAINFALL – HISTORICAL TRENDS

(Period of Record: 1990 ~ 2017)

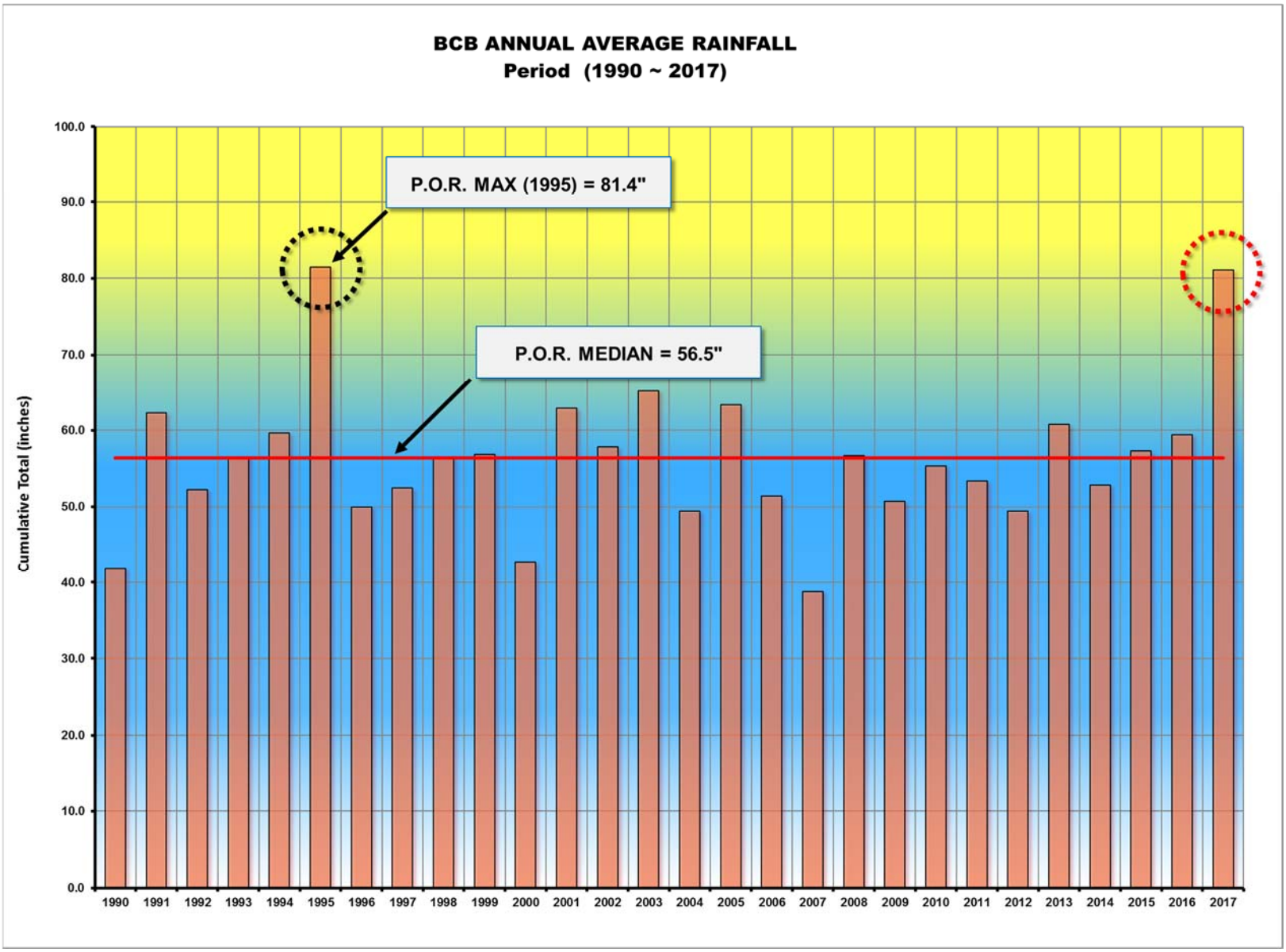

Figure 4b

BCB ANNUAL AVERAGE RAINFALL – HISTORICAL TRENDS

(Period of Record: 1990 ~ 2017)

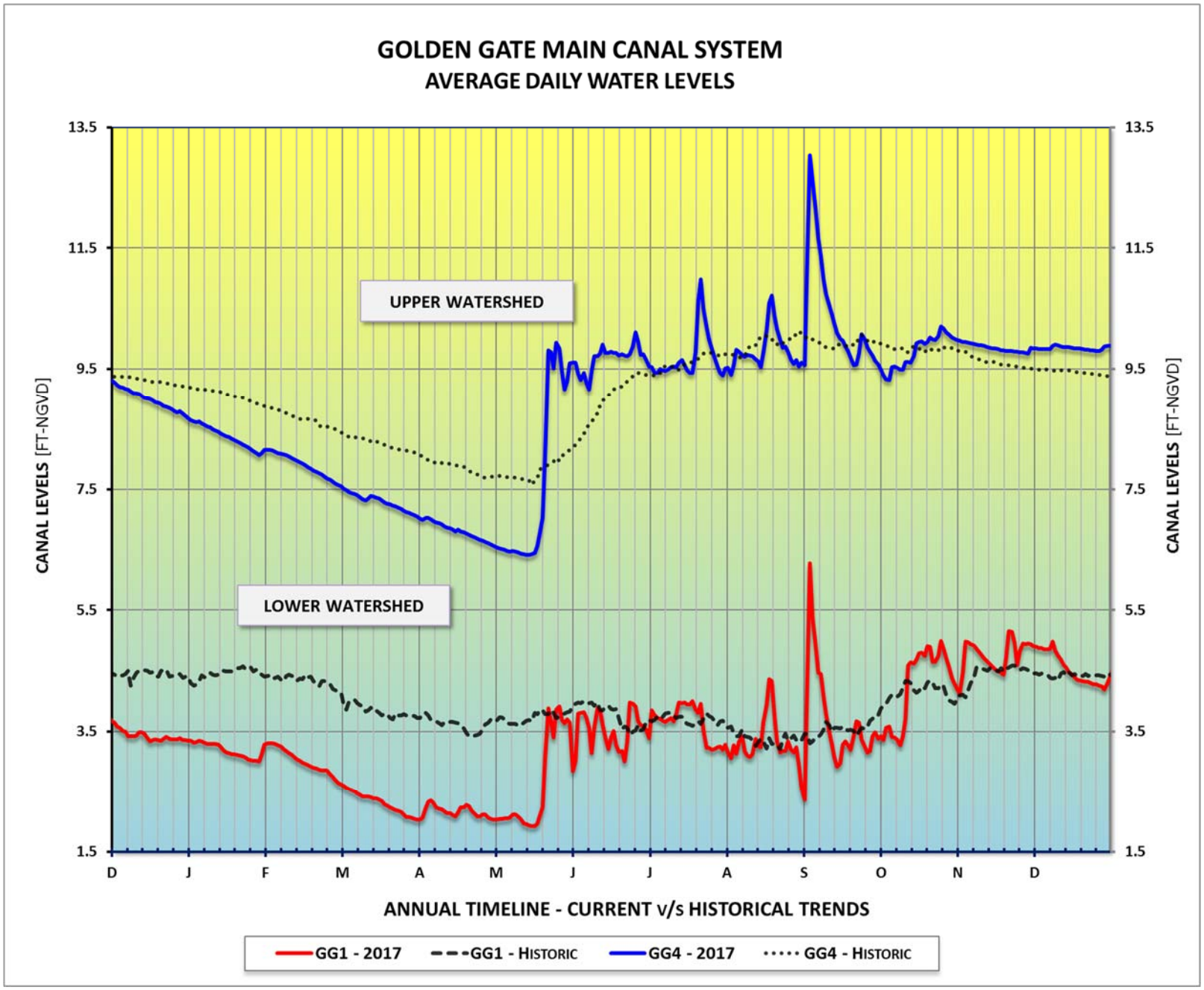
GOLDEN GATE MAIN CANAL SYSTEM
AVERAGE DAILY WATER LEVELS
UPPER WATERSHED
LOWER WATERSHED
CANAL LEVELS [FT-NGVD]
13.5
11.5
9.5
7.5
5.5
3.5
1.5
D
J
F
M
A
M
J
J
A
S
O
N
D
ANNUAL TIMELINE - CURRENT v/s HISTORICAL TRENDS
GG1 - 2017
GG1 - HISTORIC
GG4 - 2017
GG4 - HISTORIC

Figure 5a

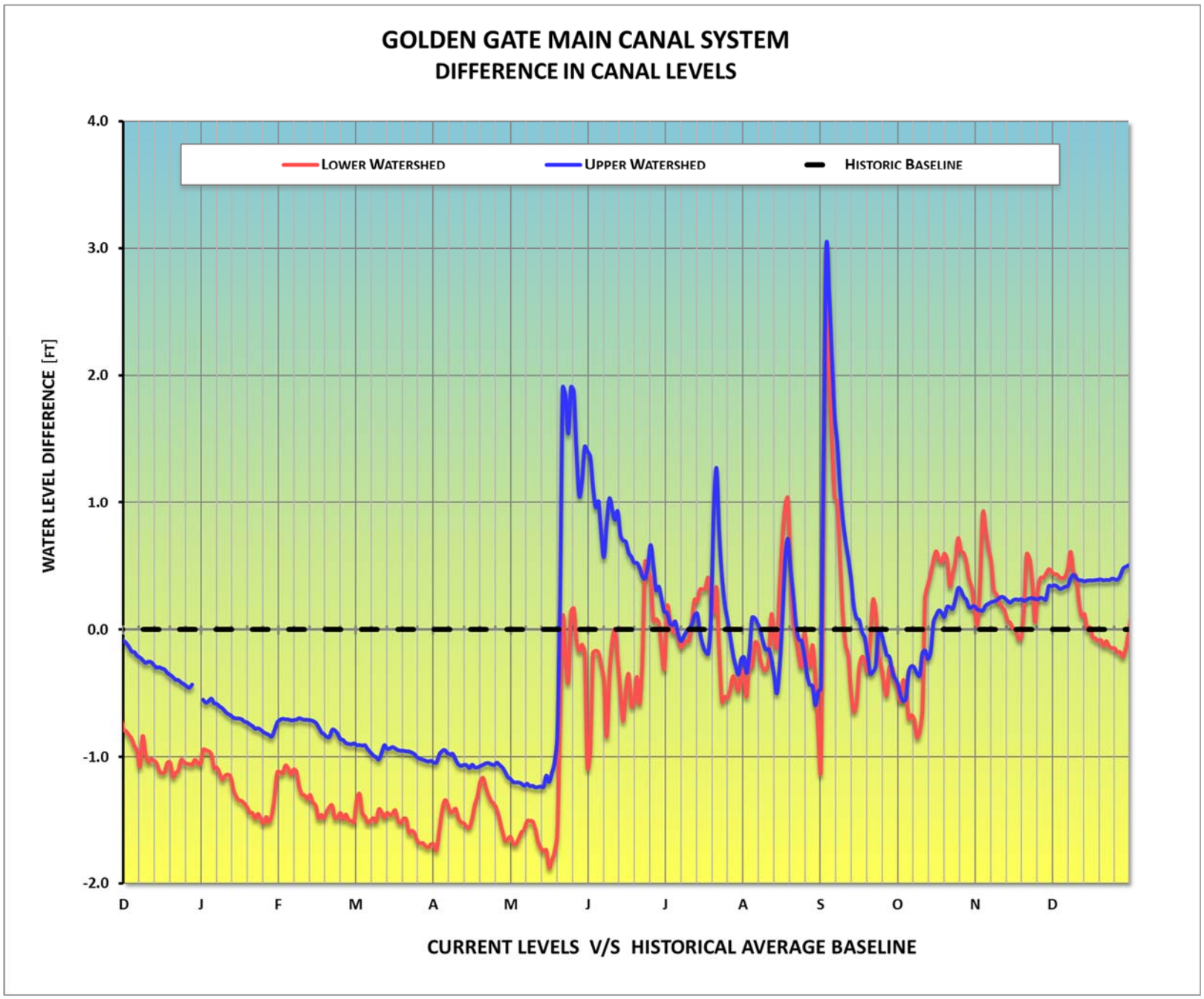
GOLDEN GATE MAIN CANAL SYSTEM
DIFFERENCE IN CANAL LEVELS
LOWER WATERSHED
UPPER WATERSHED
HISTORIC BASELINE
WATER LEVEL DIFFERENCE [FT]
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
D
J
F
M
A
M
J
J
A
S
O
N
D
CURRENT LEVELS V/S HISTORICAL AVERAGE BASELINE

Figure 5b

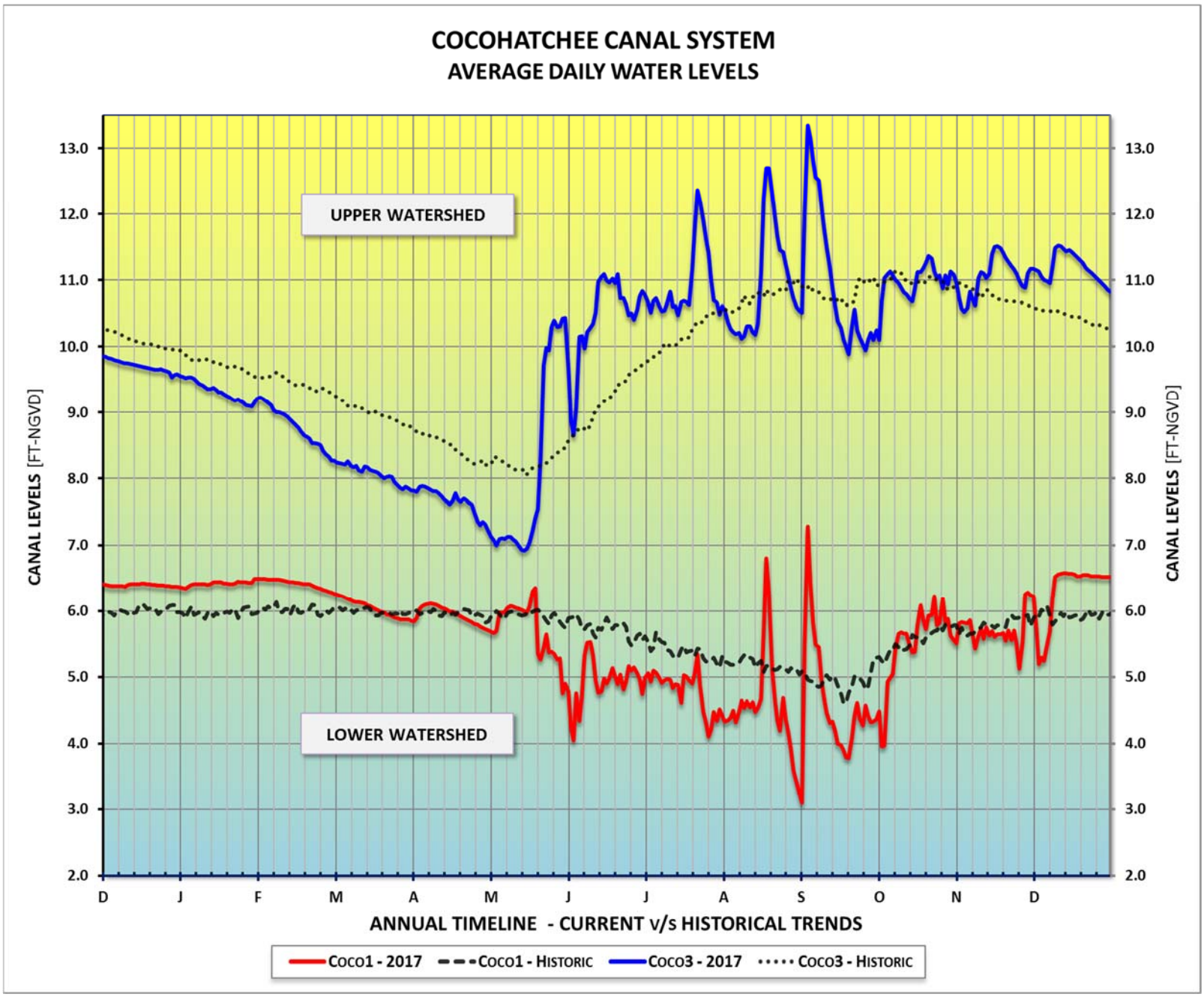
COCOHATCHEE CANAL SYSTEM
AVERAGE DAILY WATER LEVELS
UPPER WATERSHED
LOWER WATERSHED
CANAL LEVELS [FT-NGVD]
CANAL LEVELS [FT-NGVD]
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
D
J
F
M
A
M
J
J
A
S
O
N
D
ANNUAL TIMELINE - CURRENT v/s HISTORICAL TRENDS
COCO1 - 2017
COCO1 - HISTORIC
COCO3 - 2017
COCO3 - HISTORIC

Figure 6a

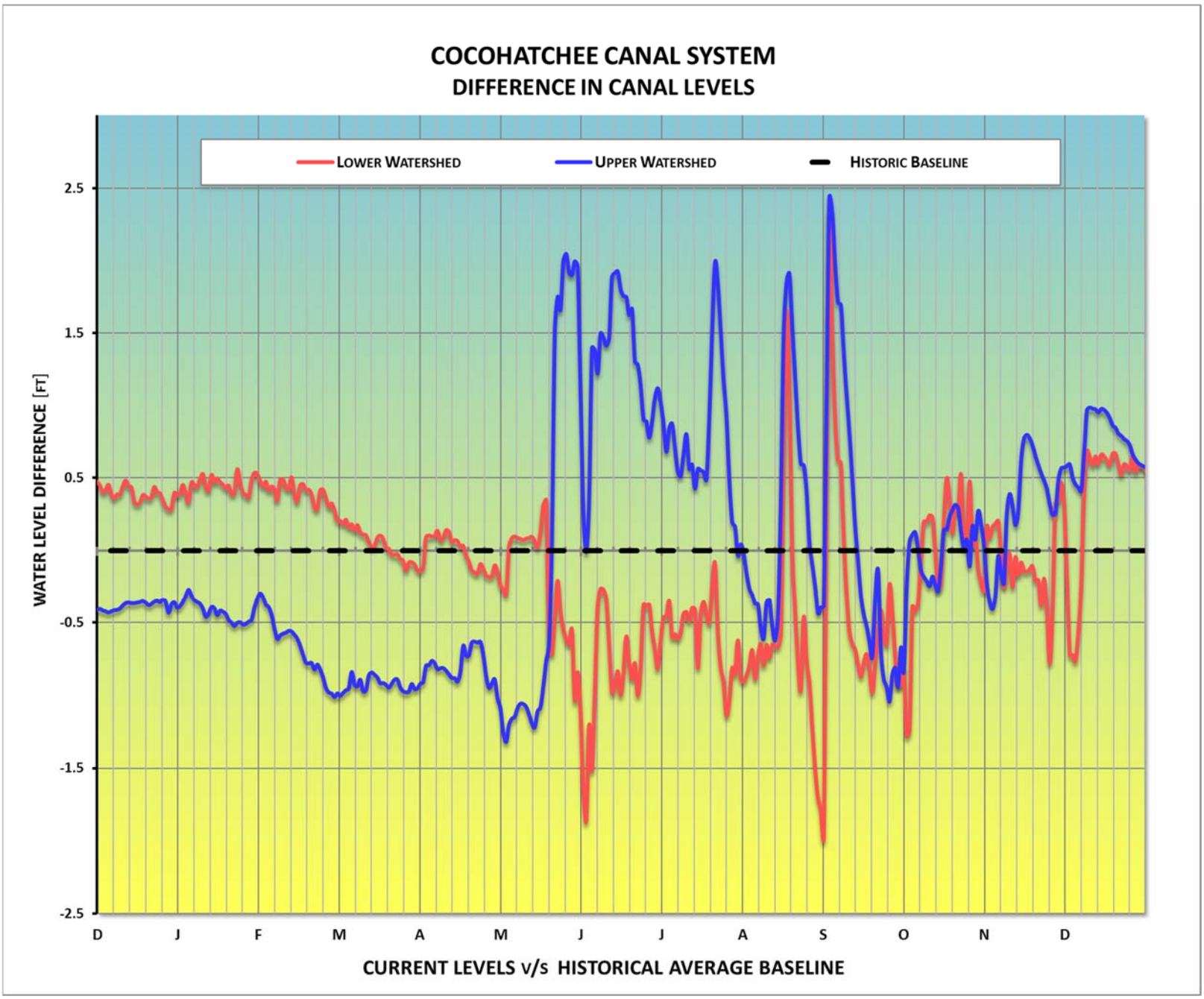
COCOHATCHEE CANAL SYSTEM
DIFFERENCE IN CANAL LEVELS
LOWER WATERSHED
UPPER WATERSHED
HISTORIC BASELINE
WATER LEVEL DIFFERENCE [FT]
2.5
1.5
0.5
-0.5
-1.5
-2.5
D
J
F
M
A
M
J
J
A
S
O
N
D
CURRENT LEVELS v/s HISTORICAL AVERAGE BASELINE

Figure 6b

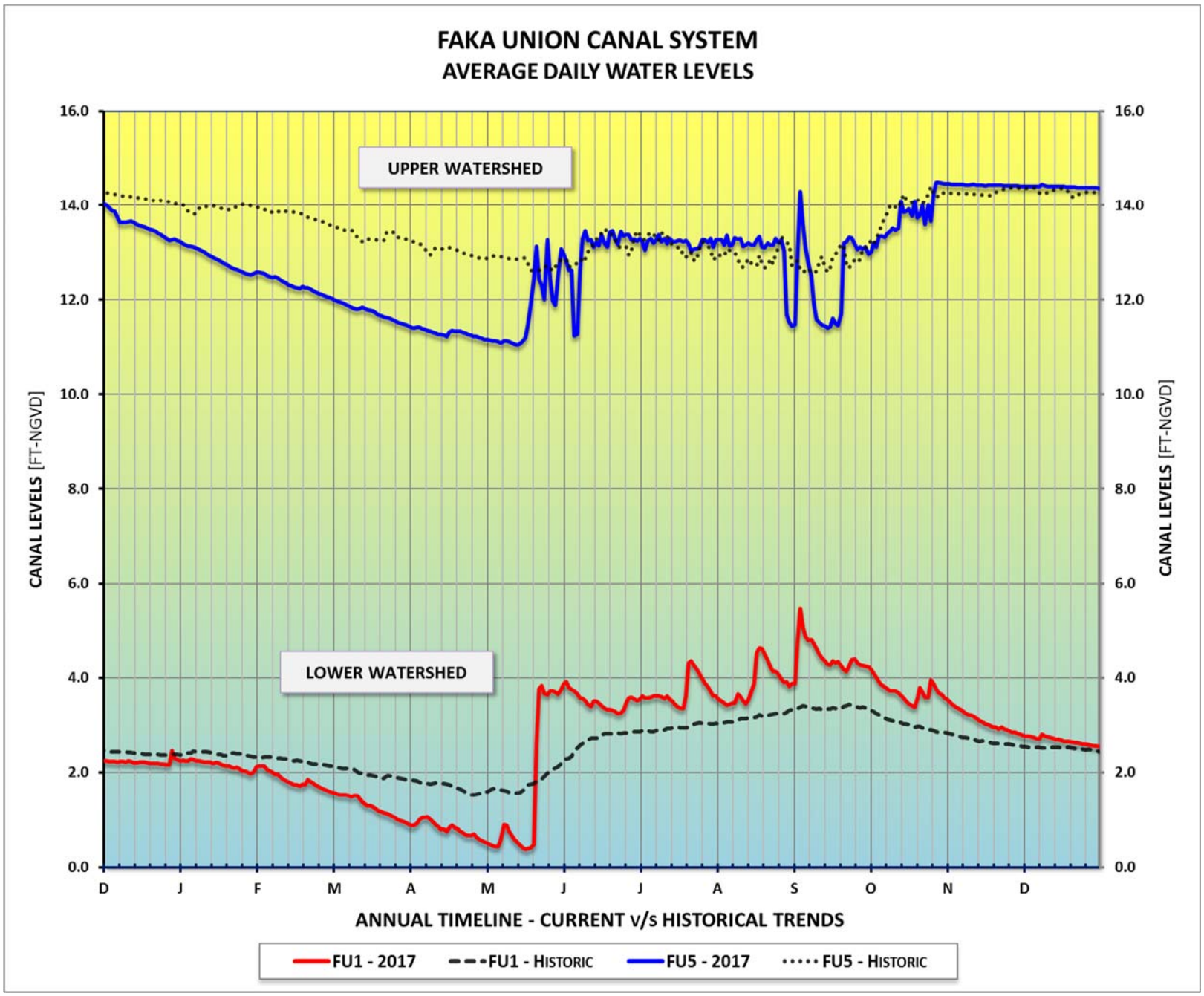
FAKA UNION CANAL SYSTEM
AVERAGE DAILY WATER LEVELS
UPPER WATERSHED
LOWER WATERSHED
CANAL LEVELS [FT-NGVD]
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
D
J
F
M
A
M
J
J
A
S
O
N
D
ANNUAL TIMELINE - CURRENT v/s HISTORICAL TRENDS
FU1 - 2017
FU1 - HISTORIC
FU5 - 2017
FU5 - HISTORIC

Figure 7a

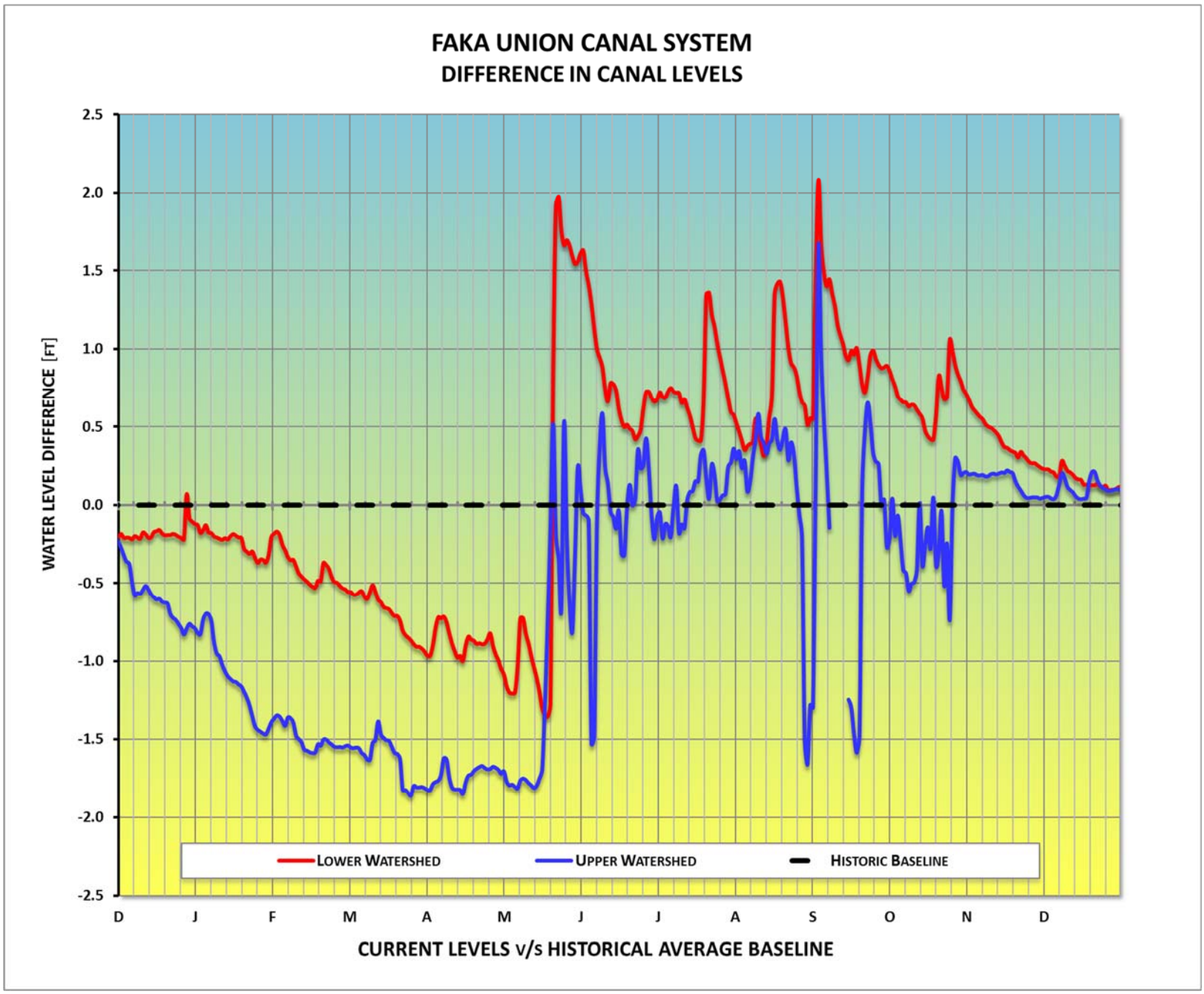
FAKA UNION CANAL SYSTEM
DIFFERENCE IN CANAL LEVELS
WATER LEVEL DIFFERENCE [FT]
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
LOWER WATERSHED
UPPER WATERSHED
HISTORIC BASELINE
D
J
F
M
A
M
J
J
A
S
O
N
D
CURRENT LEVELS v/s HISTORICAL AVERAGE BASELINE

Figure 7b

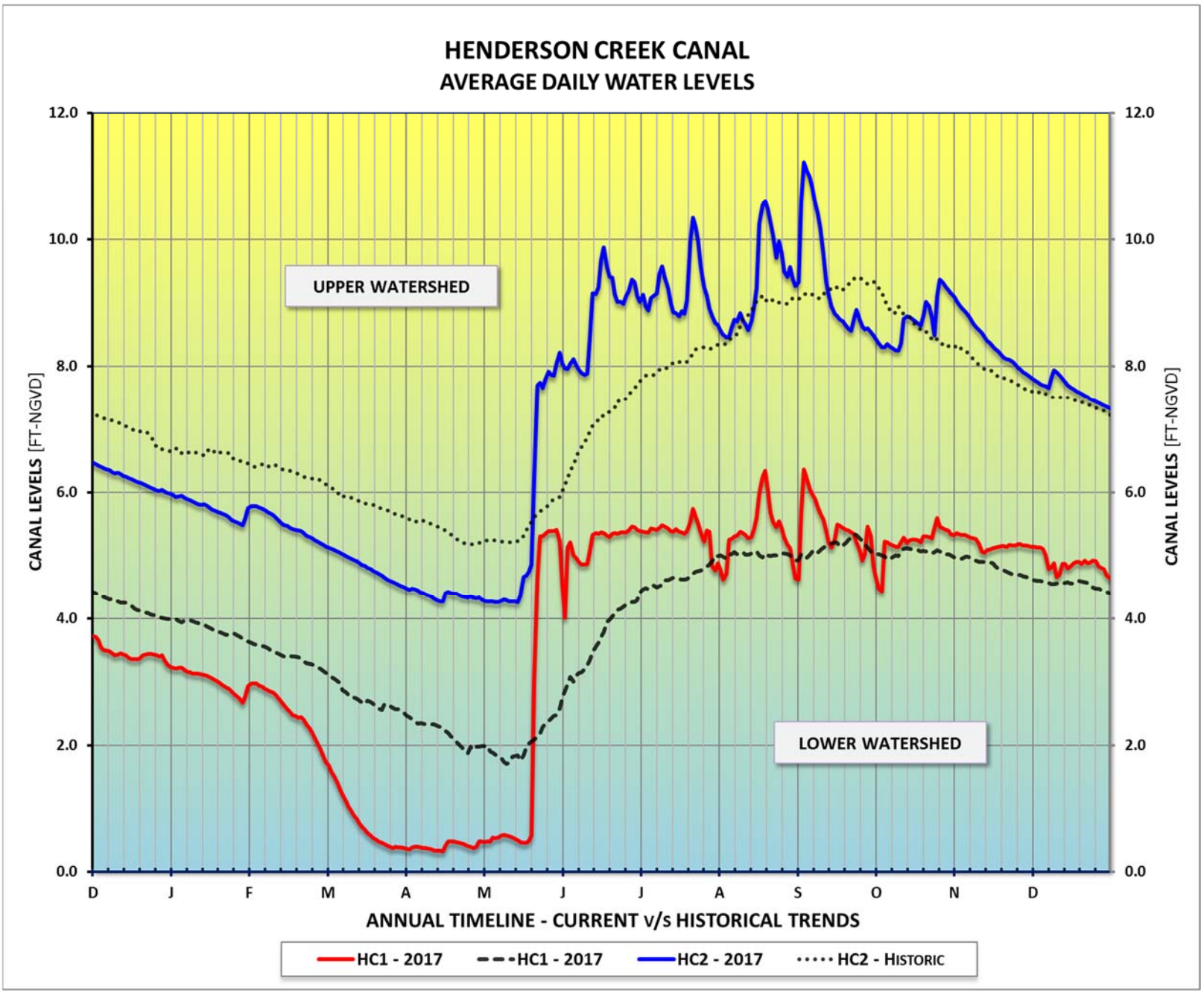
HENDERSON CREEK CANAL
AVERAGE DAILY WATER LEVELS
UPPER WATERSHED
LOWER WATERSHED
CANAL LEVELS [FT-NGVD]
CANAL LEVELS [FT-NGVD]
12.0
10.0
8.0
6.0
4.0
2.0
0.0
D
J
F
M
A
M
J
J
A
S
O
N
D
ANNUAL TIMELINE - CURRENT v/s HISTORICAL TRENDS
HC1 - 2017
HC1 - 2017
HC2 - 2017
HC2 - HISTORIC

Figure 8a

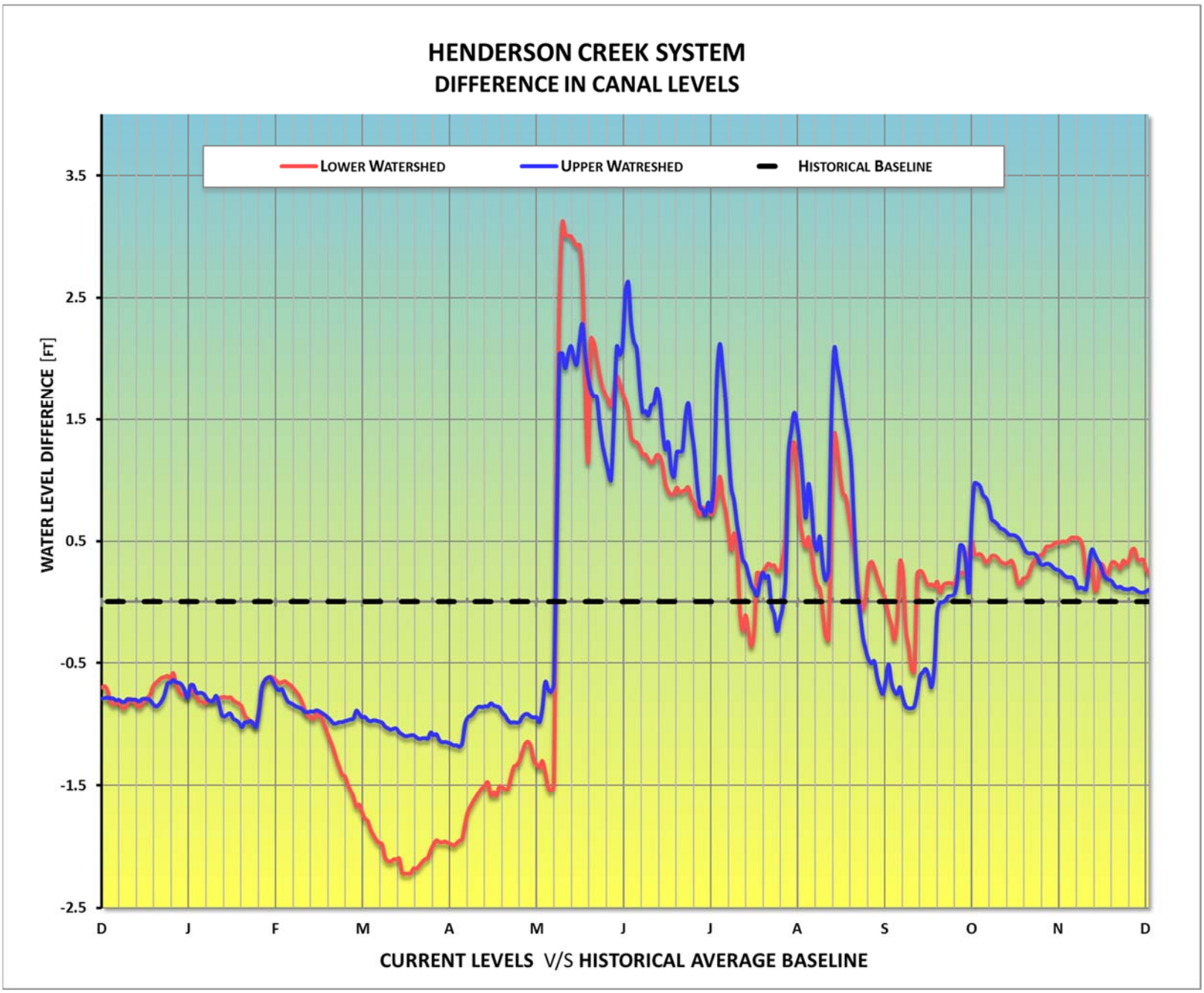
HENDERSON CREEK SYSTEM
DIFFERENCE IN CANAL LEVELS
LOWER WATERSHED
UPPER WATRESHED
HISTORICAL BASELINE
WATER LEVEL DIFFERENCE [FT]
3.5
2.5
1.5
0.5
-0.5
-1.5
-2.5
D
J
F
M
A
M
J
J
A
S
O
N
D
CURRENT LEVELS V/S HISTORICAL AVERAGE BASELINE

Figure 8b

WATER CONDITIONS SUMMARY - December 2017

SELECTED STATIONS for BCB AREA / SW FLORIDA

Last Reading Date :	**January 2, 2018**
Previous Period Reading Date:	**December 4, 2017**

STATION INDEX NO.	WELL LOCATION	WELL / AQUIFER - TYPE	CHANGE (from previous date)	PREVIOUS LEVEL (12/4/2017)	CURRENT LEVEL (ft)	DIRECTION OF CHANGE	CONCERN INDICATOR
ALL INDICATOR LEVELS SHOWN IN FT-NGVD							
C-462	**Immokalee**	**Lower Tamiami Aquifer**	**-3.03**	**34.19**	**31.16**	↓	**GREEN**
C-1004R	**Naples**	**Lower Tamiami Aquifer**	**0.61**	**2.01**	**2.62**	↑	**YELLOW**
C-1224	**Marco Lakes**	**Lower Tamiami Aquifer**	**0.29**	**3.61**	**3.90**	↑	**GREEN**
L-2194	**Bonita Springs**	**Sandstone Aquifer**	**-0.72**	**5.14**	**4.42**	↓	**GREEN**
L-2195	**Bonita Springs**	**Surficial Aquifer System**	**-0.9**	**11.45**	**10.55**	↓	**GREEN**
L-738	**Bonita Springs**	**Lower Tamiami Aquifer**	**0.12**	**1.54**	**1.66**	↑	**GREEN**

Table 2

BIG CYPRESS BASIN

DECEMBER 2017

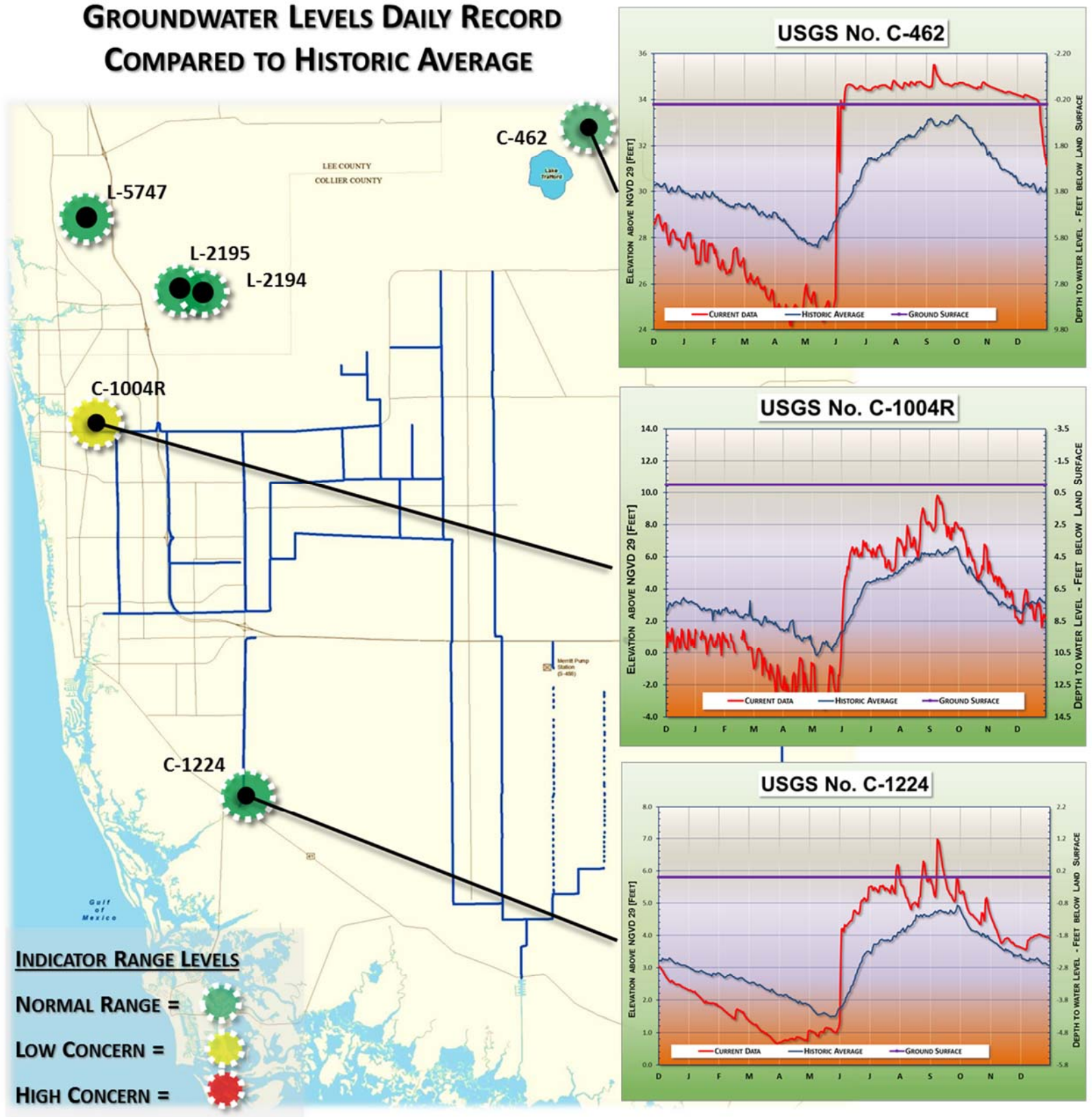

Figure 9