HYDROLOGIC REPORT
THE BIG CYPRESS BASIN

MAY 2017

SUMMARY OF HYDROLOGIC CONDITIONS IN THE BIG CYPRESS BASIN

May 2017

SUMMARY

Dry season weather conditions, having been relentless thus far in 2017, began to abate across the Big Cypress Basin [BCB] in May. Helped by some late-arriving frontal activity, the Basin saw an uptick in rainfall during the second half of the month. In fact, for the first time this year, monthly precipitation was up to par, although these totals remained low in absolute terms, and barely registered in the BCB groundwater levels and canal systems. For most of May the canal operational conditions remained unchanged, and all structures were kept under dry season criteria, with no discharge noted at outfalls.

RAINFALL

The unrelenting dry spell over the Lower West coast began to dissipate somewhat in May, which helped boost rainfall totals slightly above the Basin's historical average. However, the year-to-date deficit remains considerable, now down 3.3 inches for 2017. The month's Basin-wide rainfall average was 3.81 inches, as measured by twenty-two (22) reporting stations (ref. **Figures 1, 2, Table 1**). This tops the typical May monthly average by 5%, a positive development for the BCB. From a historic perspective, rainfall last month was also within the average, although very modest when compared to 1991 when a record 8.6 inches fell across the Basin (ref: **Figure 4**).

The spatial rainfall distribution for monitored localities across the BCB/ Lower West Coast is provided on **Figure 3**. The month's highest precipitation was recorded in Immokalee (Site R-13), which received 7.11 inches, and the lowest in north Naples at the COCO1 structure (Site R-17) which only received 1.21 inches.

We note that at the time of this writing - early June - the BCB has already been lifted out of wet season by intense rainfall events which began with calendar precision right at the beginning of June. However, during most of May dry conditions prevailed and canal levels generally reflected that reality. The analysis of previous dry periods, in this case the 2000-2001 timeframe which we

have been tracking throughout the season (ref. **Figure 5a**), indicates that canal levels in Golden Gate Estates [GGE] still fared much better this year. Recorded water levels in Central GGE (GG4 proxy) were considerably lower during that period, down to 5.4 ft-NGVD, or about one foot lower than levels recorded this year (6.4 ft-NGVD on May 31st).

STREAMFLOWS AND GROUNDWATER LEVELS

During May, surface water levels in the BCB canal systems generally trended lower, or in the best case, maintained existing low levels throughout the month. Operationally, all BCB weirs and control structures remained under dry season (water supply) criteria for most of this period, a necessary step designed to limit groundwater losses from the system watersheds.

In the Golden Gate Main (ref: **Figure 5a, 5b**) canal levels in both the upper (GG4) and lower (GG1) watershed tracked downward through May. Levels were also lower in the upper Cocohatchee Canal, although the lower watershed (COCO1) remained the lone exception, having been consistently positive throughout this season, and the only canal reach exhibiting this trend in the BCB system (ref: **Figure 6a, 6b**).

Conditions were similar for the Faka Union Canal (ref: **Figures 7a, 7b**) and Henderson Creek (ref. **Figures 8a, 8b**). Water levels kept diminishing in these systems throughout the month, although the lower reach of Henderson Creek appeared to stabilize somewhat.

As reported on 6/09/2017, the Lower West Coast [LWC] groundwater levels, increased in most of the monitor wells over the past seven days. Overall, groundwater levels remained low compared to historical averages for this time of year. Approximately two thirds of the wells in the Surficial aquifer are in the lower 10th to 24th percentile range or lower. About half of the Lower Tamiami aquifer wells are median levels, with most of the remainder in the lower 10th to 24th percentile range or lower. Most of the Sandstone aquifer monitor wells are in the lower 10th to 24th percentile range or lower. About two-thirds of the Mid-Hawthorn aquifer monitor wells are in the lower 10th to 24th percentile range or lower, with the remainder at median levels. Throughout this period, South Florida Water Management [SFWMD] staff conducted increased monitoring throughout the District associated with the Water Shortage Warning issued by the SFWMD Governing Board.

As shown here (**Table 2**, **Figure 9**), the largest net decrease in groundwater levels during that period (-0.97 ft) was recorded at the **C-462** monitor well in Immokalee, and a positive uptick (+0.52 ft) was noted at the **L-2194**, in Bonita Springs. The exhibit provided at the end of this report include a reference locator map showing the status of some other key indicator wells in the BCB / Lower West Coast region.

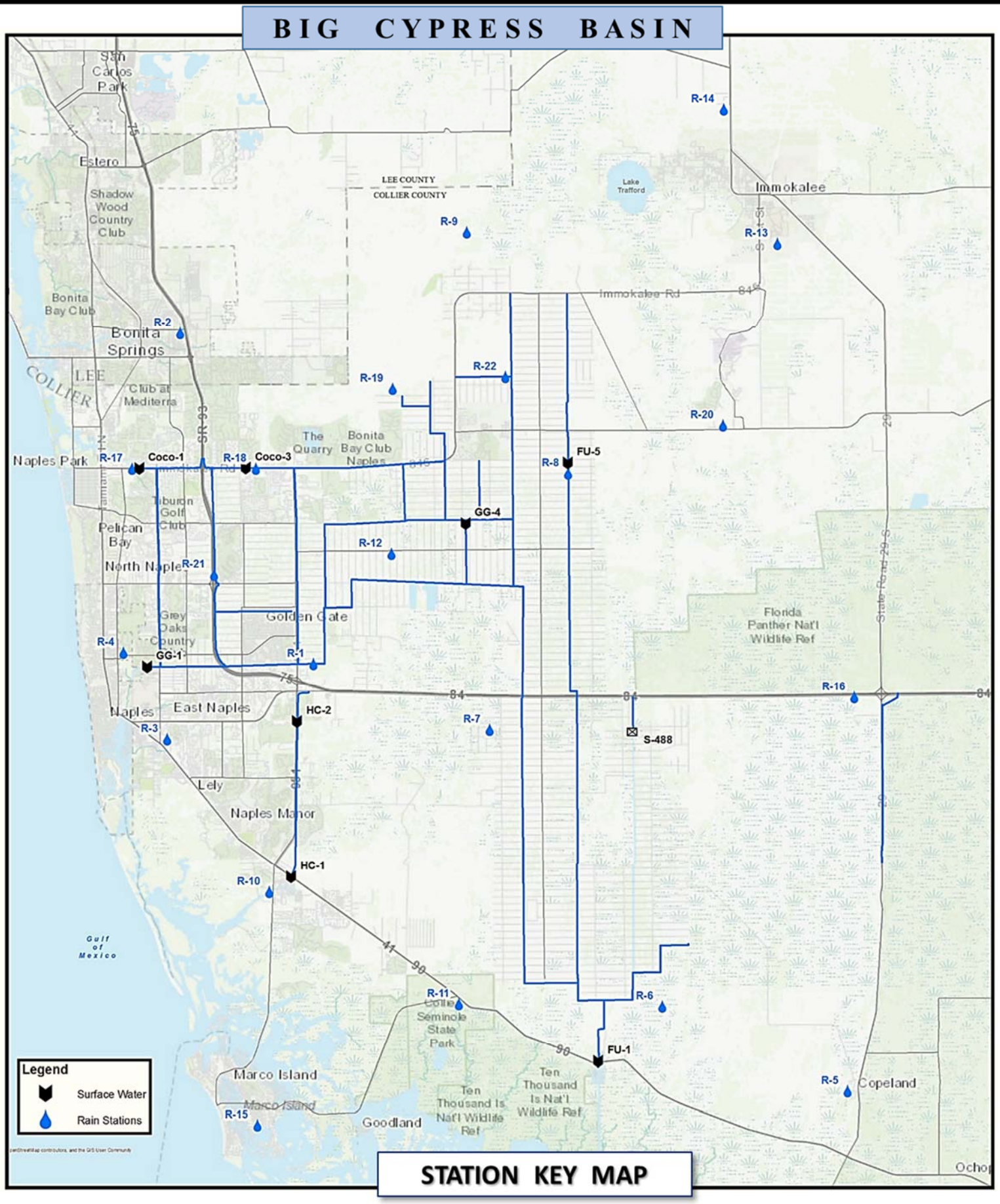

BIG CYPRESS BASIN
LEE COUNTY
COLLIER COUNTY
Lake Trafford
Immokalee
Estero
Bonita Springs
Naples Park
Naples
East Naples
North Naples
Golden Gate
Lely
Naples Manor
Marco Island
Goodland
Copeland
Gulf of Mexico
Florida Panther Nat'l Wildlife Ref
Ten Thousand Is Nat'l Wildlife Ref
Collier Seminole State 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 - MAY 2017

DISTRICT/BASIN RAINFALL STATIONS

(ALL NUMBERS ARE IN INCHES)

STATION INDEX NO.	STATION NAME	MAY 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	3.53		New Site	7.51	No Historical Data	
R-2	BONITA SPRINGS WATER PLANT	2.14	3.28	-1.14	5.31	12.01	-6.70
R-3	COLLIER COUNTY COURTHOUSE	3.65	3.44	0.21	8.09	11.83	-3.74
R-4	FREEDOM PARK	2.08		New Site	7.83	No Historical Data	
R-5	FAKAHATCHEE STRAND HQ	3.41	4.86	-1.45	11.35	13.36	-2.01
R-6	DAN HOUSE PRAIRIE	2.88	3.23	-0.35	8.77	10.44	-1.67
R-7	SGGE WEATHER STATION	5.60	4.11	1.49	10.23	11.75	-1.52
R-8	FAKA UNION #5	4.94		New Site	10.03	No Historical Data	
R-9	CORKSCREW SWAMP NORTH END	5.76	2.77	2.99	12.42	10.37	2.05
R-10	ROOKERY BAY HQ	3.30	2.73	0.57	7.59	11.02	-3.43
R-11	COLLIER SEMINOLE STATE PARK	2.81	3.32	-0.51	8.20	11.70	-3.50
R-12	G.G. FIRE STATION	3.28	3.94	-0.66	8.85	12.84	-3.99
R-13	IMMOKALEE LANDFILL	7.11	4.23	2.88	13.14	13.55	-0.41
R-14	IFAS	4.68	3.99	0.69	10.49	13.29	-2.80
R-15	MARCO R.O. PLANT	3.43	3.08	0.35	8.75	12.28	-3.53
R-16	FAKAHATCHEE STRAND NORTH END	5.00	5.11	-0.11	11.93	15.39	-3.46
R-17	COCO#1	1.21	2.62	-1.41	5.06	10.64	-5.58
R-18	COCO#3	1.75	2.92	-1.17	6.76	10.86	-4.10
R-19	BIRD ROOKERY	3.70		New Site	7.45	No Historical Data	
R-20	AVE MARIA	6.18	4.27	1.91	11.10	13.72	-2.62
R-21	I75W2	2.74		New Site	7.39	No Historical Data	
R-22	GG#7	4.74		New Site	8.33	No Historical Data	
	AVERAGES	3.81	3.62	0.20	8.94	12.19	-3.26

Table 1

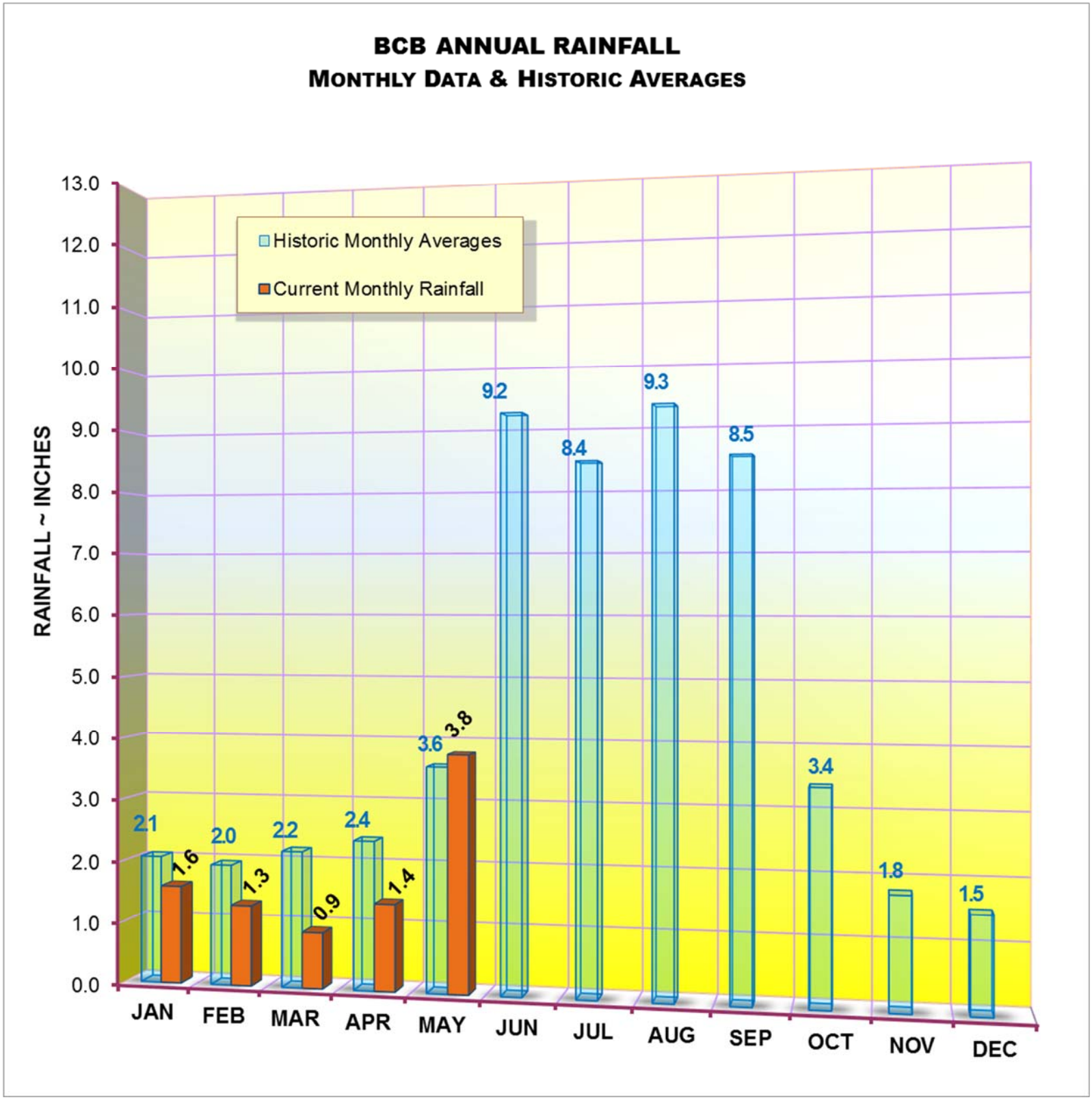


Figure 2

BCB MONTHLY RAINFALL - THROUGH MAY 2017

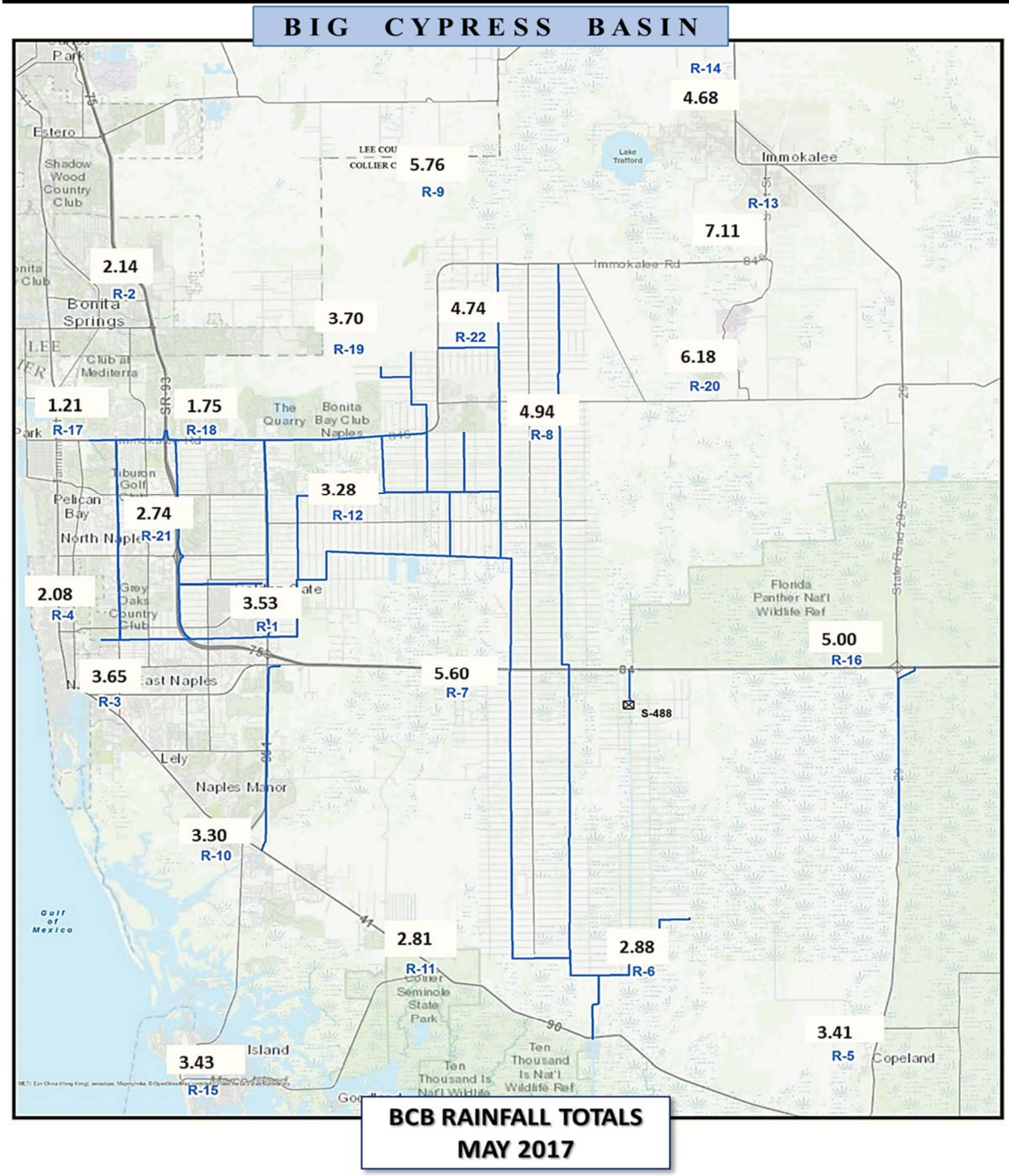

BIG CYPRESS BASIN
R-14
4.68
Immokalee
Lake Trafford
LEE COU
COLLIER C
5.76
R-9
R-13
7.11
Immokalee Rd
2.14
R-2
Bonita Springs
3.70
R-19
4.74
R-22
6.18
R-20
Club at Mediterra
1.21
R-17
1.75
R-18
The Quarry
Bonita Bay Club Naples
4.94
R-8
3.28
R-12
Pelican Bay
2.74
R-21
North Naple
2.08
R-4
Grey Oaks Country Club
3.53
R-1
Florida Panther Nat'l Wildlife Ref
5.00
R-16
3.65
R-3
5.60
R-7
S-488
Lely
Naples Manor
3.30
R-10
Gulf of Mexico
2.81
R-11
2.88
R-6
Collier Seminole State Park
3.41
R-5
Copeland
3.43
R-15
Ten Thousand Is Nat'l Wildlife Ref
BCB RAINFALL TOTALS
MAY 2017

Figure 3

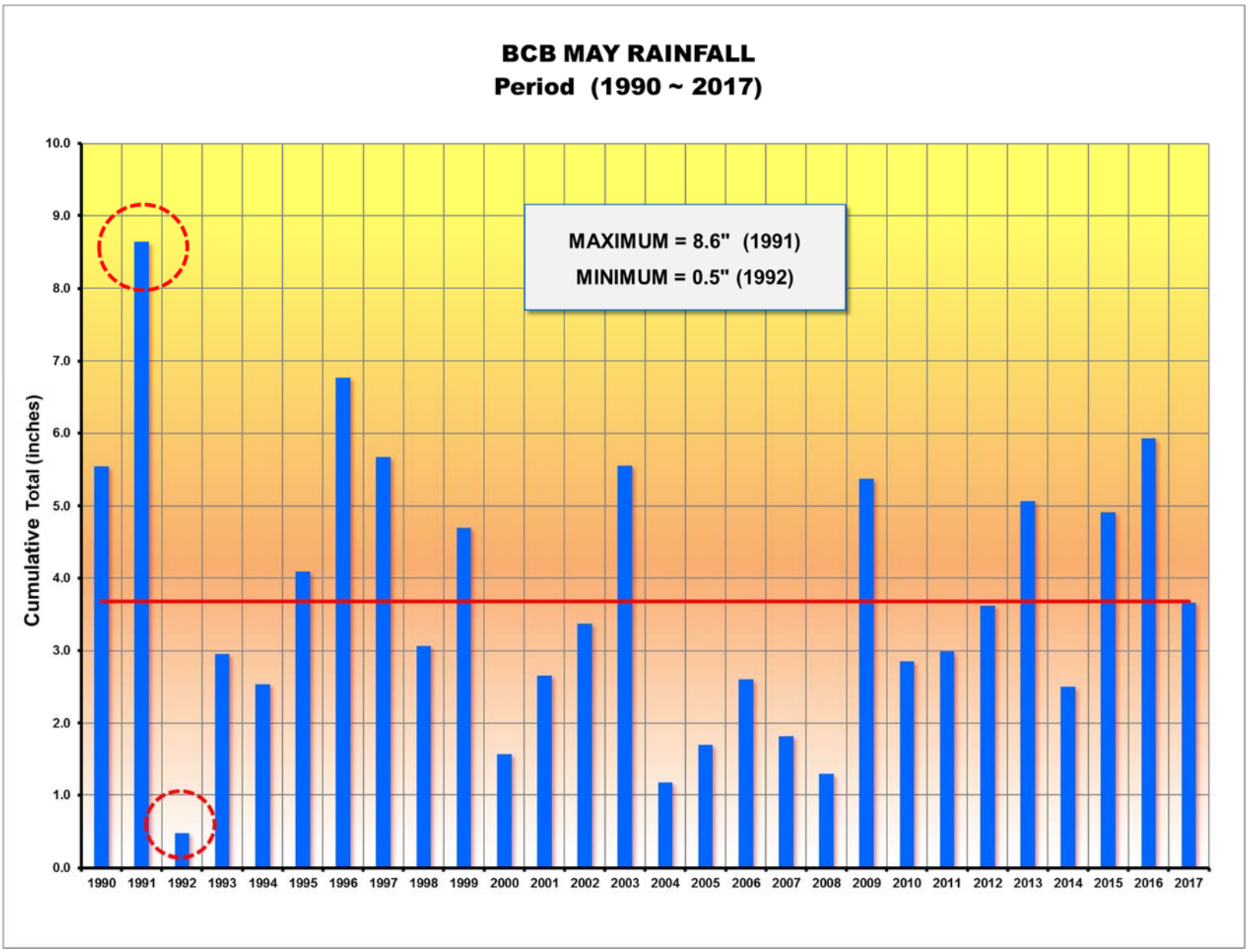


Figure 4

BCB PERIOD OF RECORD - THROUGH 2017

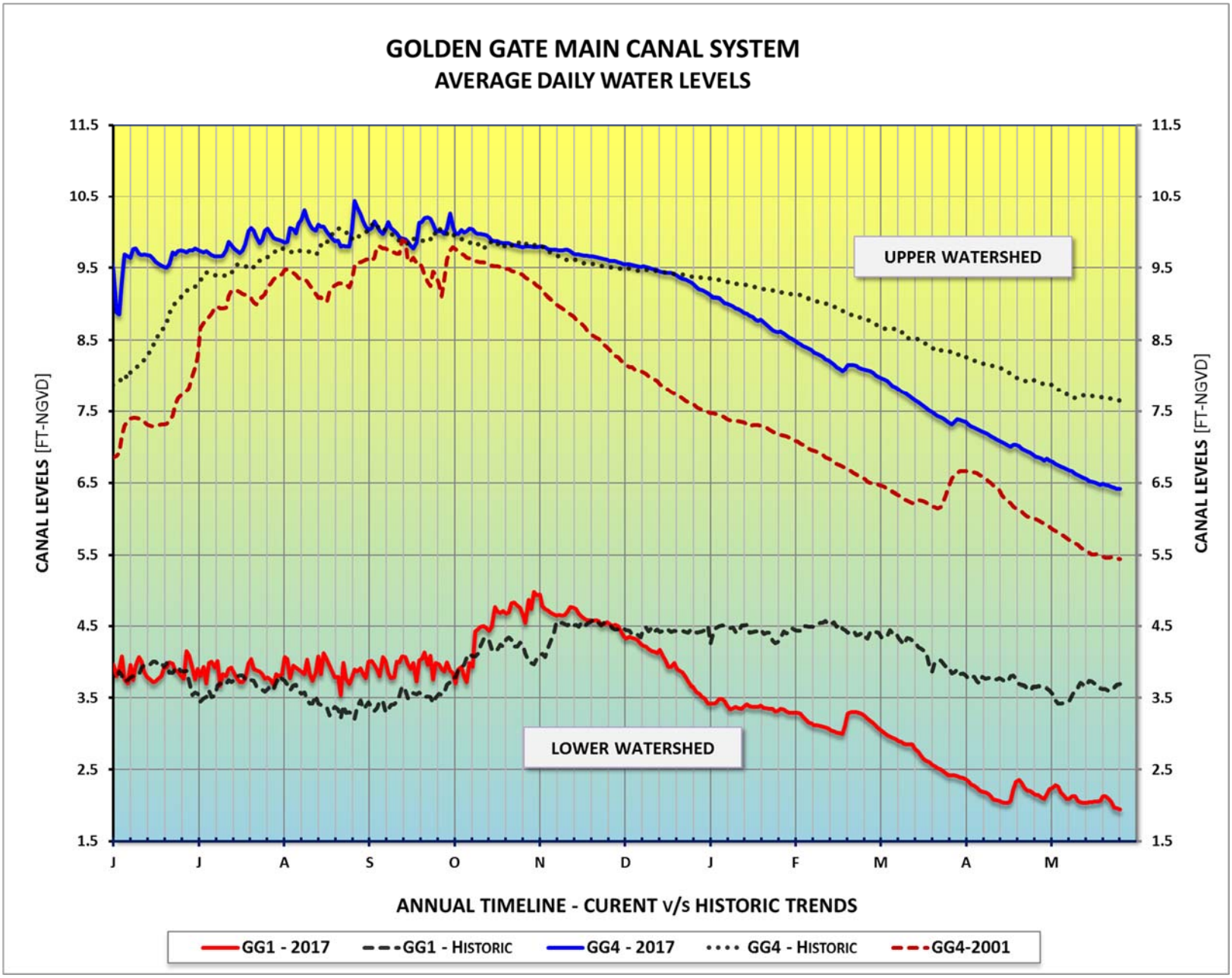
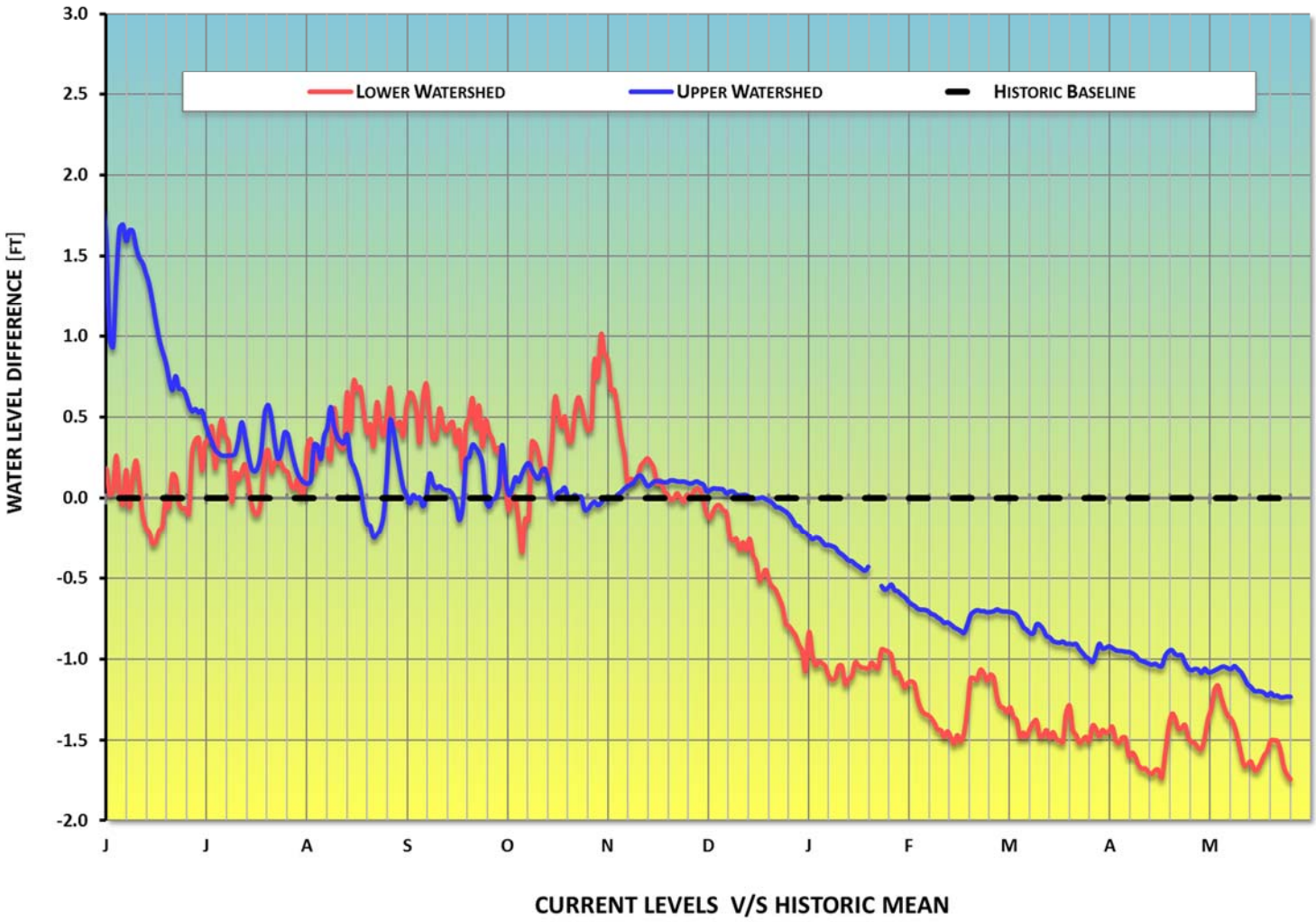


Figure 5a
(Includes 2000-2001 DRY SEASON)


GOLDEN GATE MAIN CANAL SYSTEM
DIFFERENCE IN CANAL LEVELS
CURRENT COMPARED to HISTORIC TRENDS
LOWER WATERSHED
UPPER WATERSHED
HISTORIC BASELINE
WATER LEVEL DIFFERENCE [FT]
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
J
J
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M
CURRENT LEVELS V/S HISTORIC MEAN

Figure 5b

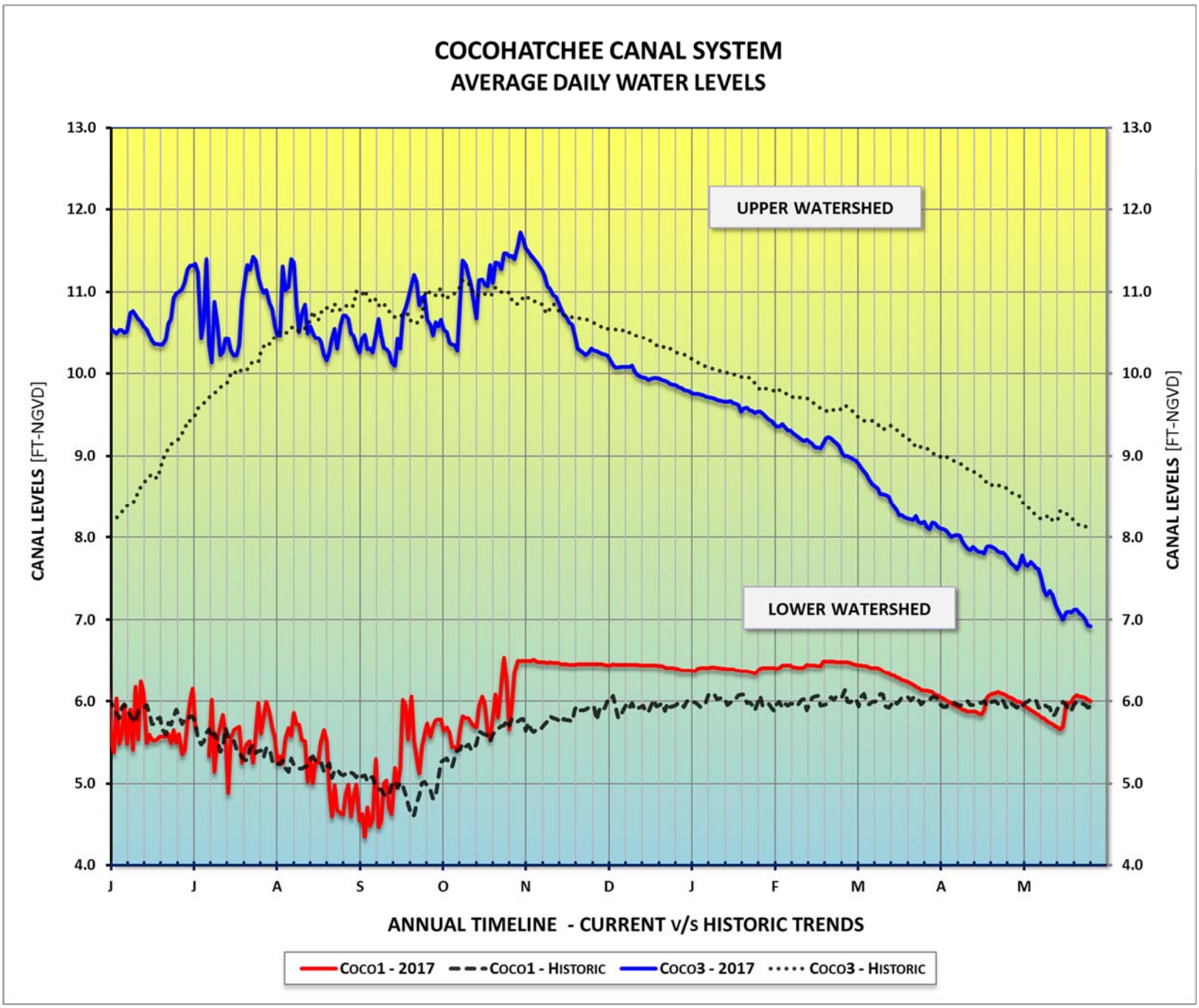

COCOHATCHEE CANAL SYSTEM
AVERAGE DAILY WATER LEVELS
UPPER WATERSHED
LOWER WATERSHED
CANAL LEVELS [FT-NGVD]
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
J
J
A
S
O
N
D
J
F
M
A
M
ANNUAL TIMELINE - CURRENT v/s HISTORIC TRENDS
COCO1 - 2017
COCO1 - HISTORIC
COCO3 - 2017
COCO3 - HISTORIC

Figure 6a

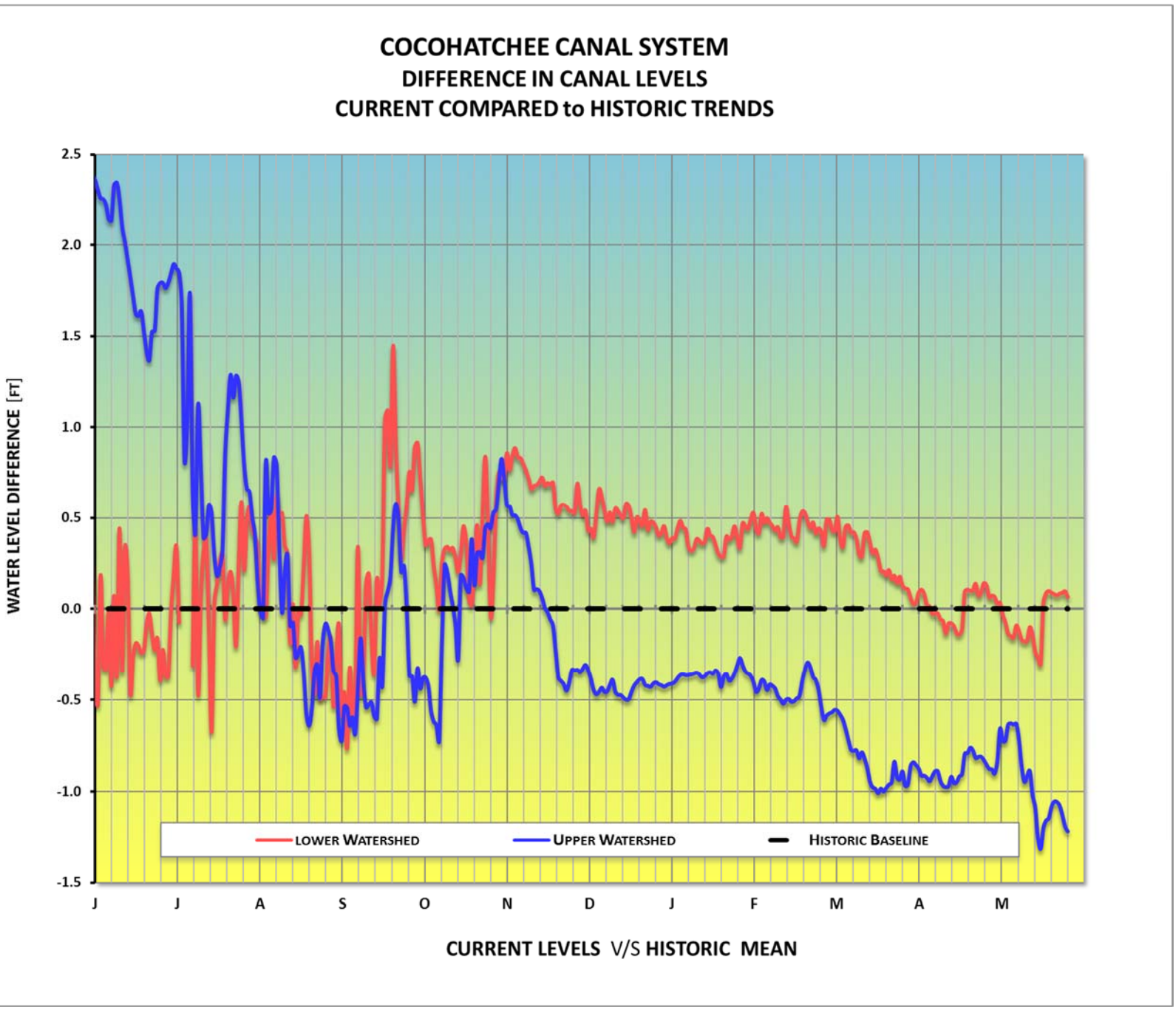

COCOHATCHEE CANAL SYSTEM
DIFFERENCE IN CANAL LEVELS
CURRENT COMPARED to HISTORIC TRENDS
WATER LEVEL DIFFERENCE [FT]
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
LOWER WATERSHED
UPPER WATERSHED
HISTORIC BASELINE
J
J
A
S
O
N
D
J
F
M
A
M
CURRENT LEVELS V/S HISTORIC MEAN

Figure 6b

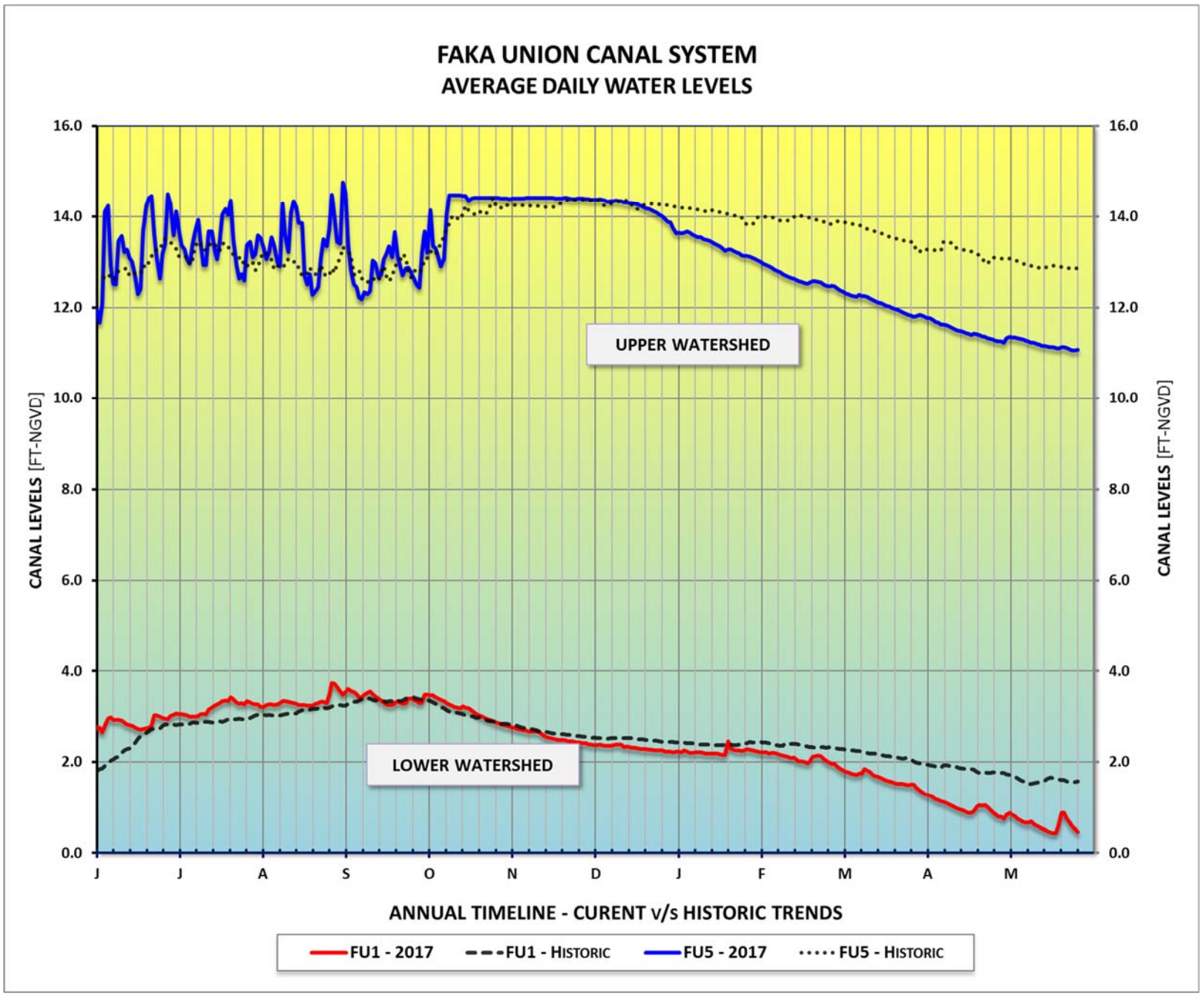
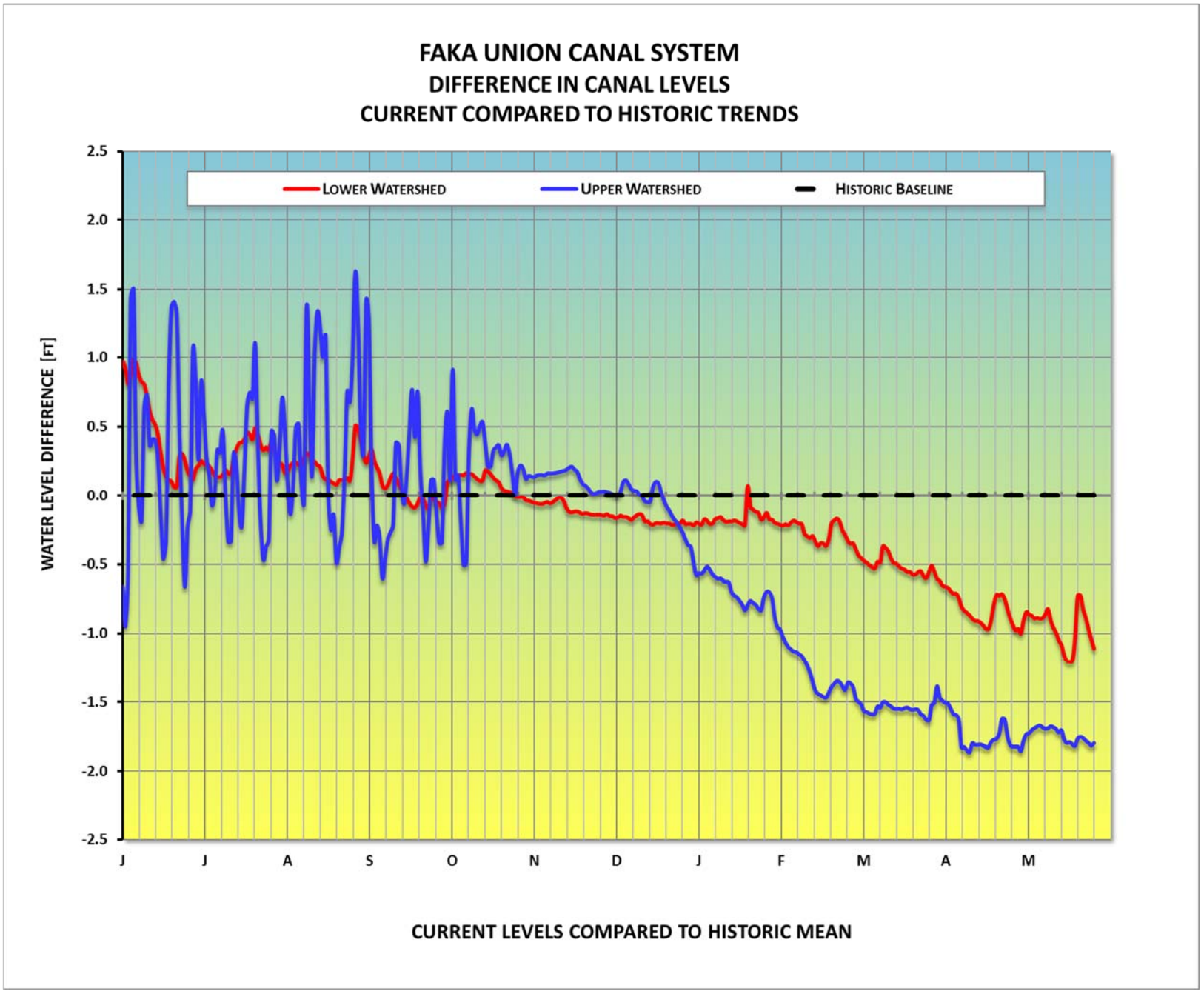

FAKA UNION CANAL SYSTEM
AVERAGE DAILY WATER LEVELS
CANAL LEVELS [FT-NGVD]
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
UPPER WATERSHED
LOWER WATERSHED
J
J
A
S
O
N
D
J
F
M
A
M
ANNUAL TIMELINE - CURENT v/s HISTORIC TRENDS
FU1 - 2017
FU1 - HISTORIC
FU5 - 2017
FU5 - HISTORIC

Figure 7a


FAKA UNION CANAL SYSTEM
DIFFERENCE IN CANAL LEVELS
CURRENT COMPARED TO HISTORIC TRENDS
LOWER WATERSHED
UPPER WATERSHED
HISTORIC BASELINE
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
J
J
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M
CURRENT LEVELS COMPARED TO HISTORIC MEAN

Figure 7b

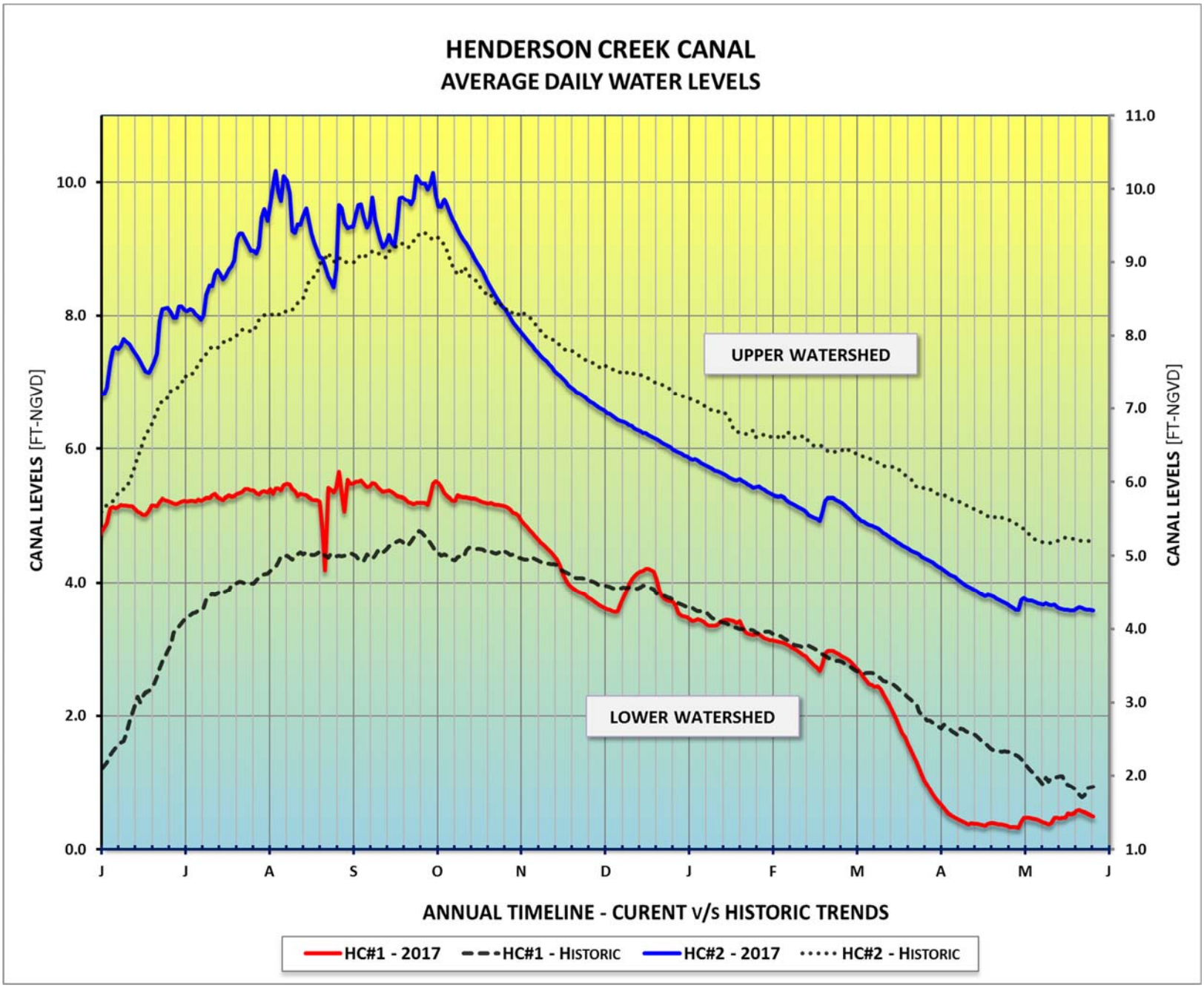
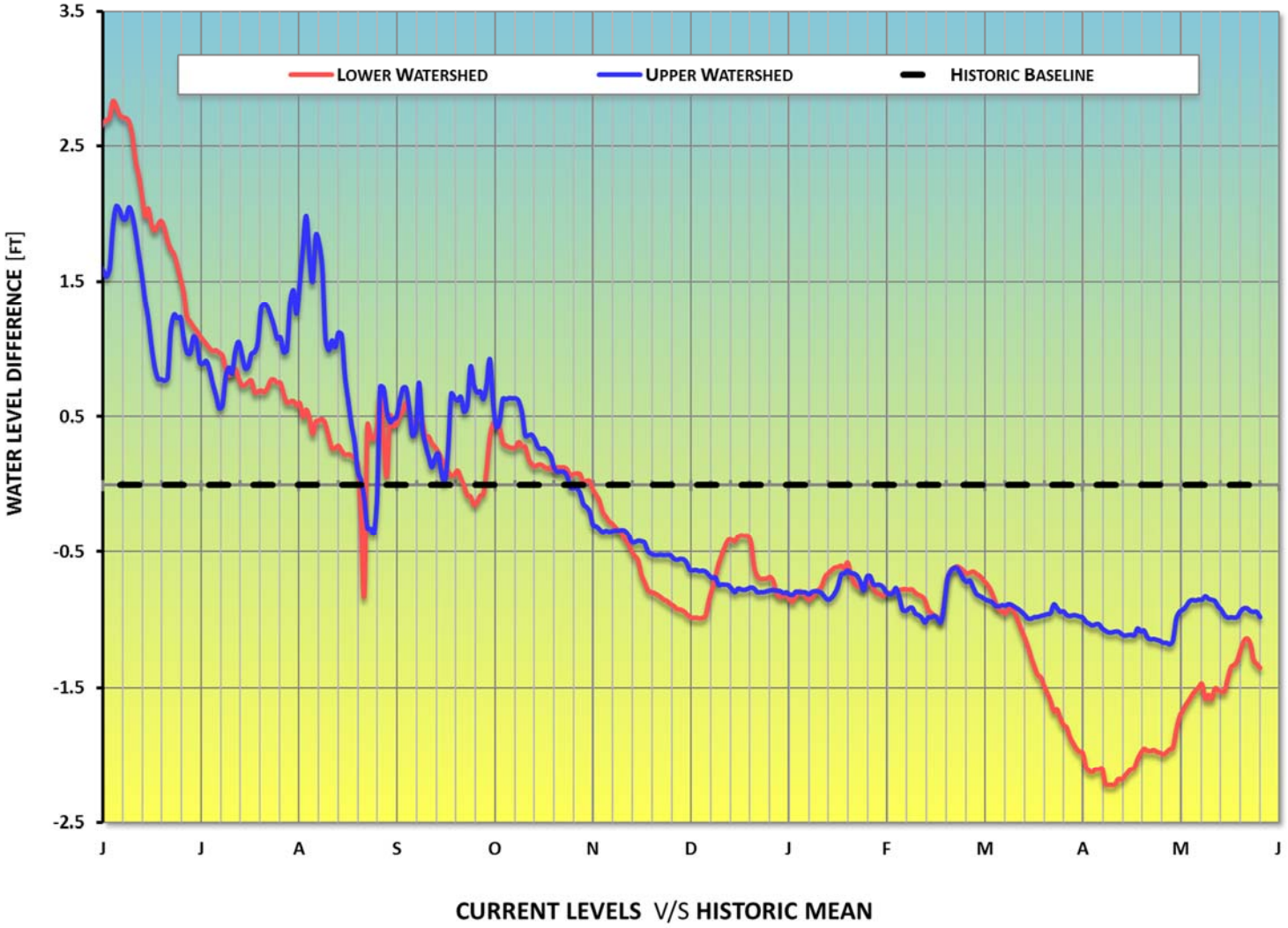

HENDERSON CREEK CANAL
AVERAGE DAILY WATER LEVELS
CANAL LEVELS [FT-NGVD]
CANAL LEVELS [FT-NGVD]
UPPER WATERSHED
LOWER WATERSHED
ANNUAL TIMELINE - CURENT v/s HISTORIC TRENDS
HC#1 - 2017
HC#1 - HISTORIC
HC#2 - 2017
HC#2 - HISTORIC

Figure 8a


HENDERSON CREEK SYSTEM
DIFFERENCE IN CANAL LEVELS
CURRENT COMPARED to HISTORIC TRENDS
LOWER WATERSHED
UPPER WATERSHED
HISTORIC BASELINE
WATER LEVEL DIFFERENCE [FT]
3.5
2.5
1.5
0.5
-0.5
-1.5
-2.5
J
J
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J
CURRENT LEVELS V/S HISTORIC MEAN

Figure 8b

WATER CONDITIONS SUMMARY - May 2017

SELECTED STATIONS for BCB AREA / SW FLORIDA

Last Reading Date :		June 5, 2017					
Previous Period Reading Date:		May 8, 2017					
STATION INDEX NO.	WELL LOCATION	WELL / AQUIFER - TYPE	CHANGE (from previous date)	PREVIOUS LEVEL (5/8/2017)	CURRENT LEVEL (ft)	DIRECTION OF CHANGE	CONCERN INDICATOR
ALL INDICATOR LEVELS SHOWN IN FT-NGVD							
C-462	Immokalee	Lower Tamiami Aquifer	-0.97	26.01	25.04	↓	GREEN
C-1004R	Naples	Lower Tamiami Aquifer	0.28	-0.69	-0.41	↑	YELLOW
C-1224	Marco Lakes	Lower Tamiami Aquifer	0.03	1.06	1.09	↑	GREEN
L-2194	Bonita Springs	Sandstone Aquifer	0.52	-2.38	-1.86	↑	RED
L-2195	Bonita Springs	Surficial Aquifer System	0.3	6.85	7.15	↑	YELLOW
L-738	Bonita Springs	Lower Tamiami Aquifer	0.24	-4.04	-3.80	↑	YELLOW

Table 2

BIG CYPRESS BASIN

MAY 2017

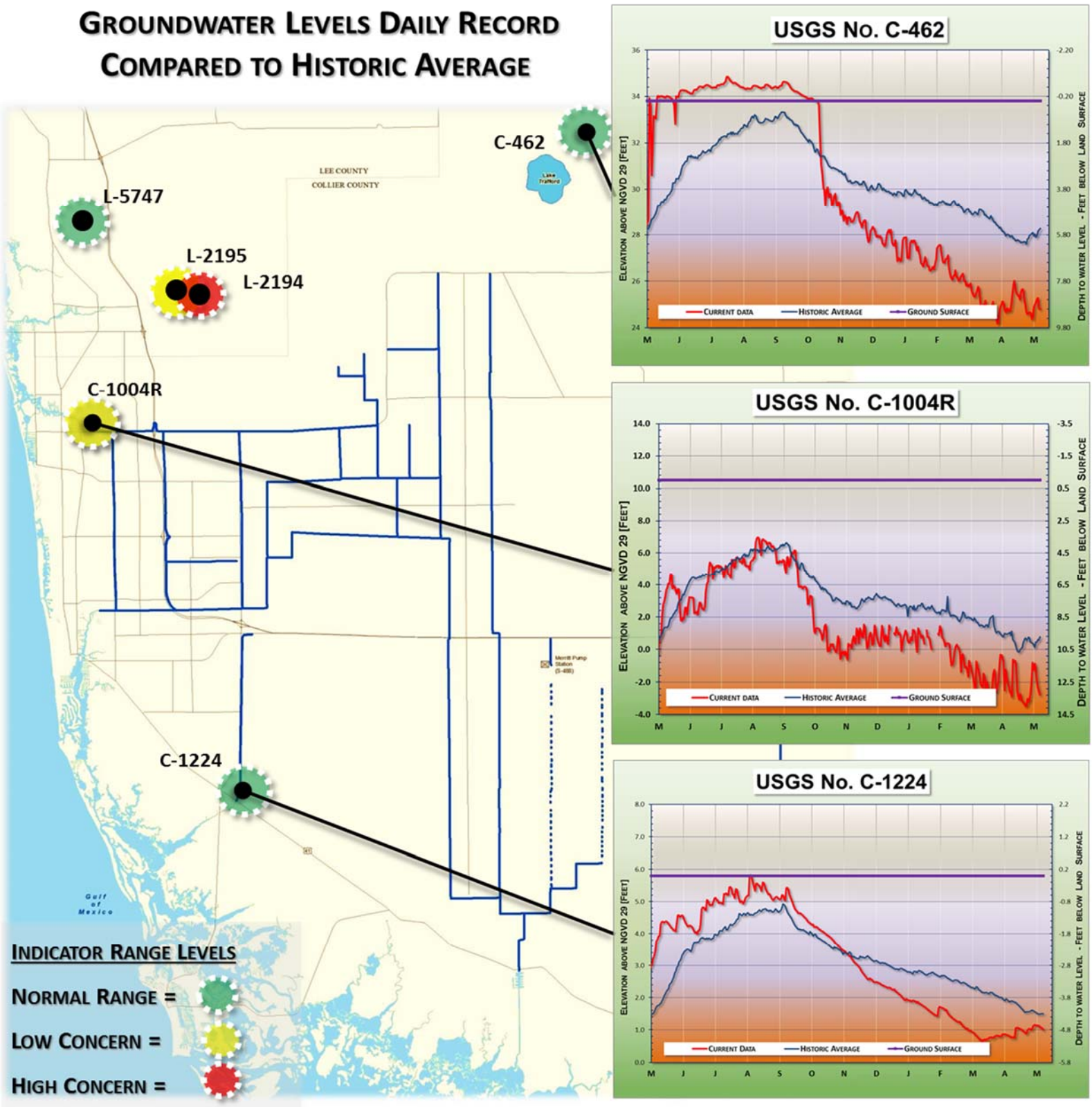

Figure 9