SOUTH FLORIDA WATER MANAGEMENT DISTRICT

August 2023

Big Cypress Basin Hydrologic Report

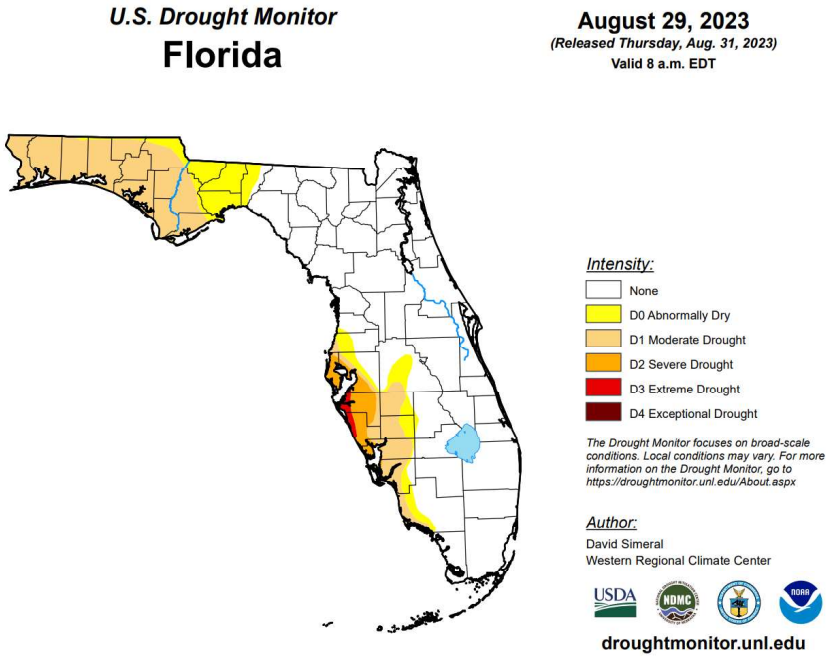
sfwmd.gov

SUMMARY OF HYDROLOGIC CONDITIONS IN THE BIG CYPRESS BASIN

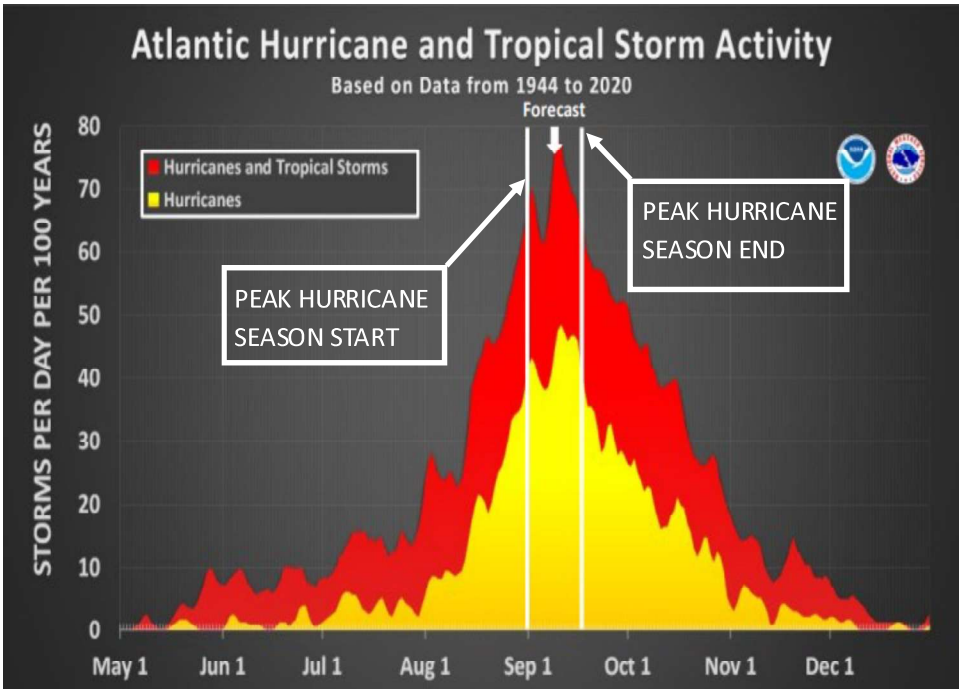
August 2023

SUMMARY

Since mid-May, westerly winds have focused most of the precipitation over the eastern half of the District creating unusually dry conditions for the Big Cypress Basin (Basin). August received 6.4 inches of rainfall, which marks it as the third lowest on record since 1990, when the Basin's period of record began. With the end of wet season approaching, the Basin is approximately at a 14.2-inch rainfall deficit based on the annual average. As of mid-September, 2023 is trending below 2007, the driest year on record for the Basin. The Basin receives almost 80% of its annual rainfall during wet season and any significant deficit could have negative impacts to canal levels heading into dry season. With a month and a half remaining of wet season, and hurricane season reaching its peak in the Atlantic (below), there's still opportunity for significant rainfall events replenishing the rainfall deficit heading into dry season.



As a result of the below-normal rainfall for August, coastal areas of the Basin have been placed in moderate drought to abnormally dry conditions, according to the U.S. Drought Monitor. Based on the most recent drought map (top right), 11% of the Basin is under moderate drought conditions and 17% are abnormally dry conditions.



On Tuesday August 29th, Hurricane Idalia passed offshore of the Basin approximately 150 miles and made landfall August 30th as a category 3 hurricane at Florida's Big Bend area. Although Idalia tracked North and did not directly hit the Basin, the area still felt the effects of storm surge and tropical storm force winds. A King tide was also in effect, which further exacerbated storm surge conditions as Hurricane Idalia passed by the Basin. During peak high tide, tailwater levels at coastal structure COCO1 measured 4.8 feet (NGVD), which is approximately 2 feet higher than normal. Coastal areas downstream of our coastal structures experienced some localized flooding in yards and roadways due to the elevated tidal conditions. Prior to Hurricane Idalia, Basin operations transitioned from water conservation operations to flood control operations. Flood control releases were made in advance of the storm and there were no

discharges from coastal structures during the minor storm surge event.

The average 3-day rainfall from Hurricane Idalia was recorded at the Basin's rain gauges, totaling 1.2 inches and did not have any significant impact on canal levels.

Based on the National Weather Service's 30-day forecast, there is an equal chance of normal precipitation. The temperature outlook for the next 30 days indicates a 40-50% likelihood of above average temperatures. The 3-month projection for the Basin predicts a 33-40% chance of above normal precipitation and a 40-50% likelihood of above-average temperatures. Long term dry season outlooks indicate above average rainfall chances for Florida from November through April 2024.

BCB RAINFALL

August rainfall was the 3rd lowest on record for the Basin. As measured by twenty-four (24) reporting stations (ref. **Figures 1, 2, Table 1**), the basin-wide monthly average was **6.4 inches (67% of normal)**, which is well below the average **9.6 inches** typically collected.

Based on collected gauge and radar data, the rainfall distribution across the Basin was not very uniform and ranged from almost 4 inches to an extreme of almost 12 inches. **Figure 3a** shows the average rainfall for each of the Basin's watersheds based on gauge adjusted radar. The Barron River basin received the highest rainfall with a **10.04 inch** areal average across the watershed and the lowest was the Gordon River Ext. basin with about **5.28 inches**. The Basin's total areal weighted average rainfall was **8.05 inches**. The month's highest gauge total was collected at Dan House Prairie (Site R-6), which received **11.63 inches.** This month's lowest rainfall was recorded at COCO#1 (Site R-17), which received **3.53 inches**. The rainfall totals and their locality distribution across the BCB/Lower West Coast are shown on **Figure 3, 3a** and **4**.

BCB CANAL SYSTEMS

All of the canals were maintained in water conservation mode for most of the month and there were no discharges through coastal structures, except for the last couple days of the month, in which the canals were transitioned to flood control mode in advance of Hurricane Idalia (**Figure 4a**).

- **GOLDEN GATE SYSTEM**
  Control structures in the Golden Gate Main canal system were kept fully closed for most of the month to conserve as much water as possible and promote groundwater recharge. However, control structures were transitioned to flood control mode at the end of the month in preparation for Hurricane Idalia. Once operational levels in the system allowed capacity for the potential tropical storm conditions, coastal structure GG1 weirs were raised to mitigate any flooding upstream caused by storm surge. Operations were quickly transitioned back to dry season operations after the storm surge and tropical force winds had passed. Water levels in the lower (coastal GG1) part of the system are above the 75th percentile. The middle reaches (GG3 to GG5) are above the 25th percentile and the upper reach (GG5 to GG7) is above the 10th percentile **(ref Figure 5A & 5B)**:

- **COCOHATCHEE SYSTEM**
  All of the control structures in the Cocohatchee and Corkscrew canal systems were maintained in dry season operations for most of the month. Hurricane Idalia passed by the Basin the last 3 days of August, and operations were briefly transitioned to flood operational mode to allow capacity in the system. Once canal levels allowed capacity for the potential tropical storm

conditions, coastal structure COCO1 gates were closed prior to the onset of Idalia to mitigate any potential flooding caused by storm surge. Once storm surge and tropical storm force winds were no longer affecting the Basin, operations were quickly transitioned back to dry season operations. There were no discharges into tidal waters for August except to draw down canal levels prior to Idalia. Water levels at COCO1 and COCO2 remain above the 50th percentile, however the rest of the Cocohatchee system is below the 25th percentile. Water levels in the Corkscrew system decreased for the month of August. CORK1 is currently above the 25th percentile while CORK2 and CORK3 are currently below the 25th percentile (ref **Figure 6A, 6B, & 6C**).

- **FAKA UNION SYSTEM**
  The entire Faka Union system was operated in water conservation mode with no water being released south through any structures except for FU5 in preparation for Hurricane Idalia. Currently, FU5's water level is above the 90th percentile, FU4S well below the 25th percentile, and FU1 is below the 25th percentile (ref **Figure 7A & 7B**).

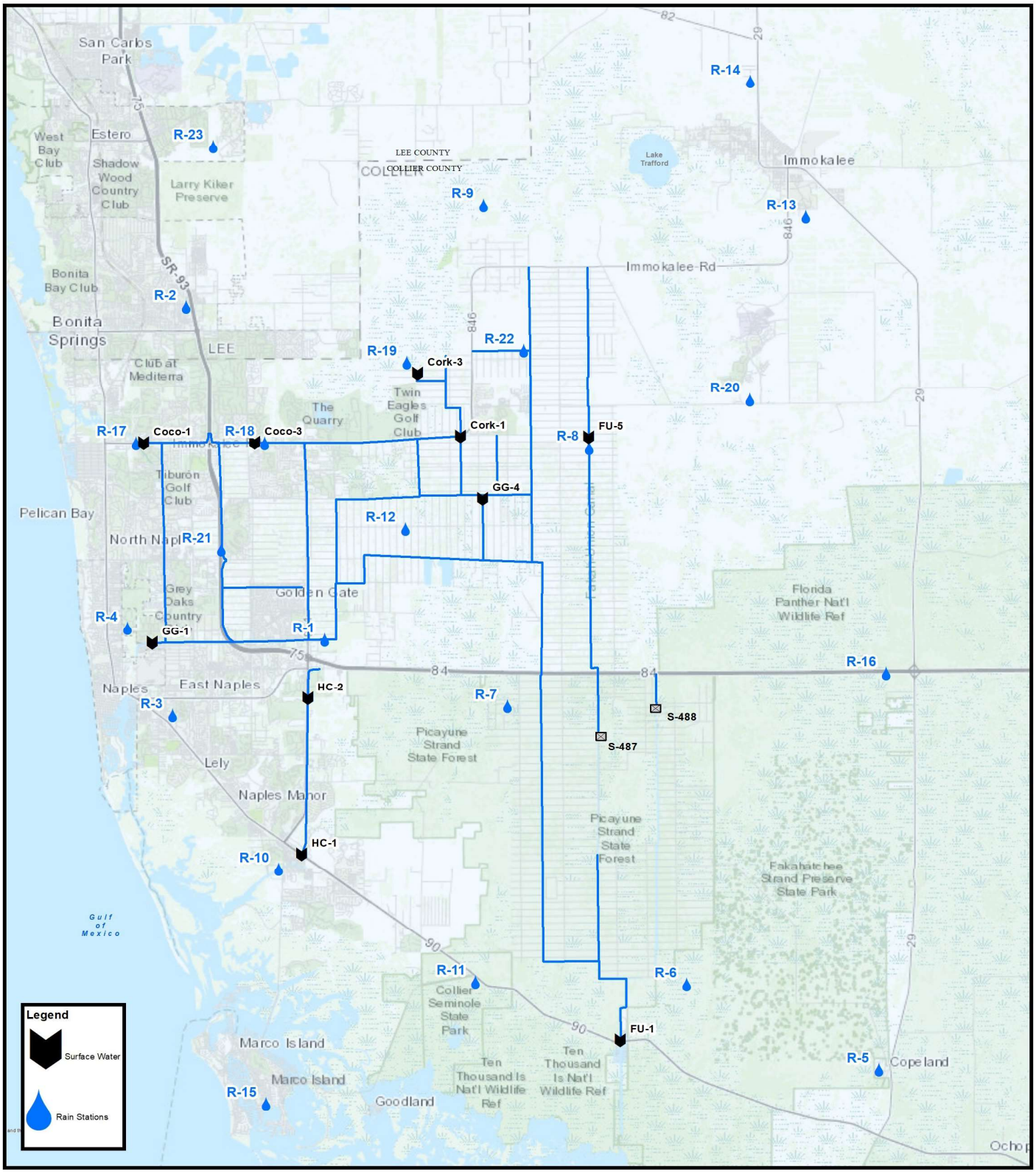
- **HENDERSON CREEK SYSTEM**
  Water control structures in the Henderson Creek system remained fully closed for August to conserve water and promote groundwater levels. There were no discharges into tidal waters for August. Canal levels experienced an increase in HC1 and HC2 through most of August, however, persistent dry conditions saw canal levels decreased going into September. Currently, HC1 and HC2 are below the 25th percentile (ref **Figure 8A & 8B**).

- **CORKSCREW SWAMP**
  Figure 10 shows the historical trends for Corkscrew, Bird Rookery, and the Cork 3 structure and the 2023 corresponding levels. The month of August saw a mixture of water level activity for Corkscrew, Bird Rookery and Cork 3. Corkscrew, Bird Rookery and Cork3 saw water levels increase at the beginning of August, but with the absence of meaningful rainfall, water levels regressed heading into September. Corkscrew is currently above the 25th percentile, Bird Rookery is currently **3.4 feet below** the historic minimum and Cork 3 is near the 10th percentile. Lake Trafford water levels increased slightly throughout the month and are above the 10th percentile heading into September (**Figure 11**).

  Figure 12 and Figure 13 shows the locations for Southern Corkscrew (SOCREW) sites 1 through 6 and the historical trends for SOCREW1 and SOCREW2. SOCREW sites 3, 4, 5 and 6 only have a period of record for a little over a year. All SOCREW sites are surface and shallow groundwater wells and their corresponding locations are depicted on **Figures 12 and 13.** SOCREW1 and SOCREW 2 both saw an increase in groundwater levels the beginning of August but with an absence of meaningful rainfall started to regress heading into September. Both monitoring wells are below historic minimums at the beginning of September. In comparison to this time last year water levels for SOCREW3 are down 1.5 feet, SOCREW 4 is down 0.9 feet, and SOCREW5 and SOCREW6 are both down 3 feet.

BIG CYPRESS BASIN & LOWER WEST COAST GROUNDWATER LEVELS

The current reporting (09/05/2023) for the Lower West Coast [LWC] indicate an increase in groundwater wells from the previous reporting in July. Most of the groundwater levels increased throughout August with the exception of C-462 and C-1004R which showed a decrease in water levels. With the persistence of dry conditions the majority of groundwater levels are below or near their respective historic minimums, with the exception of C-462 which is above the 25th percentile. All reported wells in **Table 2** show an average increase of 0.79 feet. L-738 recorded the largest increase of 2.68 feet, and C-951R the smallest increase of 0.52 feet (ref. **Table 2, Figure 9**).



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This map is a conceptual tool utilized for project development only. This map is not self-executing or binding, and does not otherwise affect the interests of any persons including any vested rights or existing uses of real property.

BIG CYPRESS BASIN
SFWMD
2660 Horseshoe Dr. N.
Naples, Florida 34104
239-263-7615

FIGURE 1
Hydrologic Station Map

Collier County, Florida

UPDATED July 2021

Hydrologic_map_Jan_2016.mxd

TABLE 1
RAINFALL REPORT - AUGUST 2023
DISTRICT/BASIN RAINFALL STATIONS
(ALL NUMBERS ARE IN INCHES)

STATION INDEX NO.	STATION NAME	AUGUST 2023	LONG TERM MONTHLY AVERAGE	MONTHLY DIFFERENCE	CALENDAR YEAR 2023 CUMULATIVE TOTAL	AVERAGE CALENDAR YEAR TO DATE	YEAR TO DATE DIFFERENCE
R-1	GG#3	7.76	12.18	-4.42	29.05	47.49	-18.44
R-2	BONITA SPRINGS WATER PLANT	6.17	8.99	-2.82	25.91	37.35	-11.44
R-3	COLLIER COUNTY COURTHOUSE	4.89	8.98	-4.09	26.57	37.66	-11.09
R-4	FREEDOM PARK	6.08	9.95	-3.87	19.43	41.72	-22.29
R-5	FAKAHATCHEE STRAND HQ	6.01	10.63	-4.62	25.40	43.70	-18.30
R-6	DAN HOUSE PRAIRIE	11.63	8.98	2.65	31.98	37.17	-5.19
R-7	SGGE WEATHER STATION	6.43	10.89	-4.46	30.36	44.22	-13.86
R-8	FAKA UNION #5	6.41	10.44	-4.03	31.74	47.08	-15.34
R-9	CORKSCREW SWAMP NORTH END	8.58	7.53	1.05	33.01	37.81	-4.80
R-10	ROOKERY BAY HQ	8.33	9.84	-1.51	19.64	39.27	-19.63
R-11	COLLIER SEMINOLE STATE PARK	8.73	9.94	-1.21	25.43	40.40	-14.97
R-12	G.G. FIRE STATION	4.40	10.27	-5.87	21.99	43.10	-21.11
R-13	IMMOKALEE LANDFILL	4.04	7.61	-3.57	25.23	37.69	-12.46
R-14	IFAS	5.18	7.80	-2.62	32.24	37.00	-4.76
R-15	MARCO R.O. PLANT	8.19	8.80	-0.61	22.65	37.46	-14.81
R-16	FAKAHATCHEE STRAND NORTH END	9.56	9.53	0.03	34.21	44.35	-10.14
R-17	COCO#1	3.53	8.06	-4.53	21.06	34.68	-13.62
R-18	COCO#3	5.24	11.09	-5.85	25.83	40.80	-14.97
R-19	BIRD ROOKERY	7.55	10.40	-2.85	28.85	45.41	-16.56
R-20	AVE MARIA	3.74	8.85	-5.11	21.32	38.98	-17.66
R-21	I75W2	5.70	12.23	-6.53	22.16	43.72	-21.56
R-22	GG#7	6.43	8.88	-2.45	24.55	41.66	-17.11
R-23	FPWX	4.17	9.83	-5.66	26.97	39.06	-12.09
R-24	DSOTO10	5.29	New Site	New Site	New Site	No Historical Data	
	AVERAGES	6.42	9.64	-3.22	26.33	40.77	-14.44

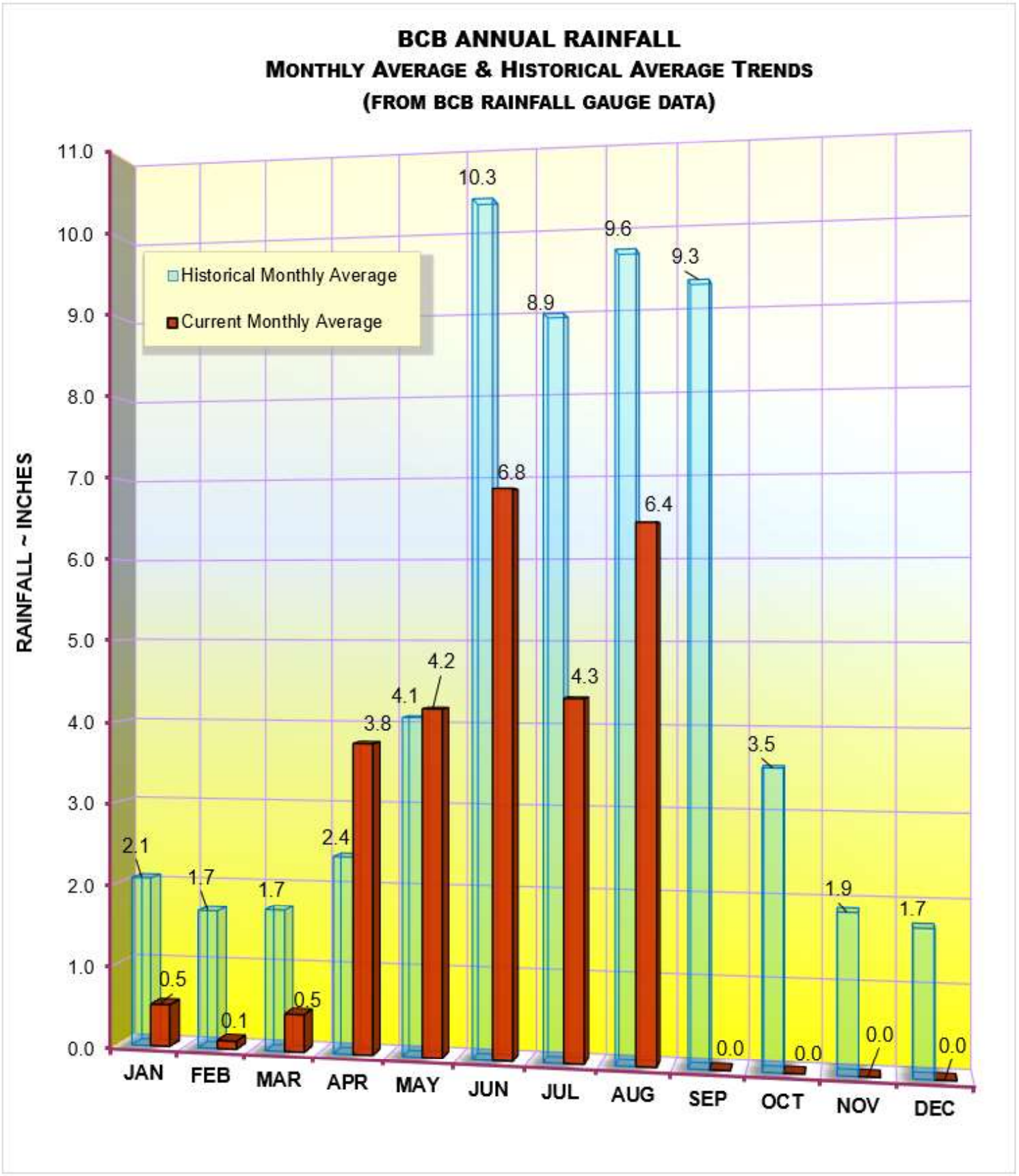


FIGURE 2
BCB GAUGE RAINFALL
MONTHLY AVERAGES THROUGH AUGUST 2023

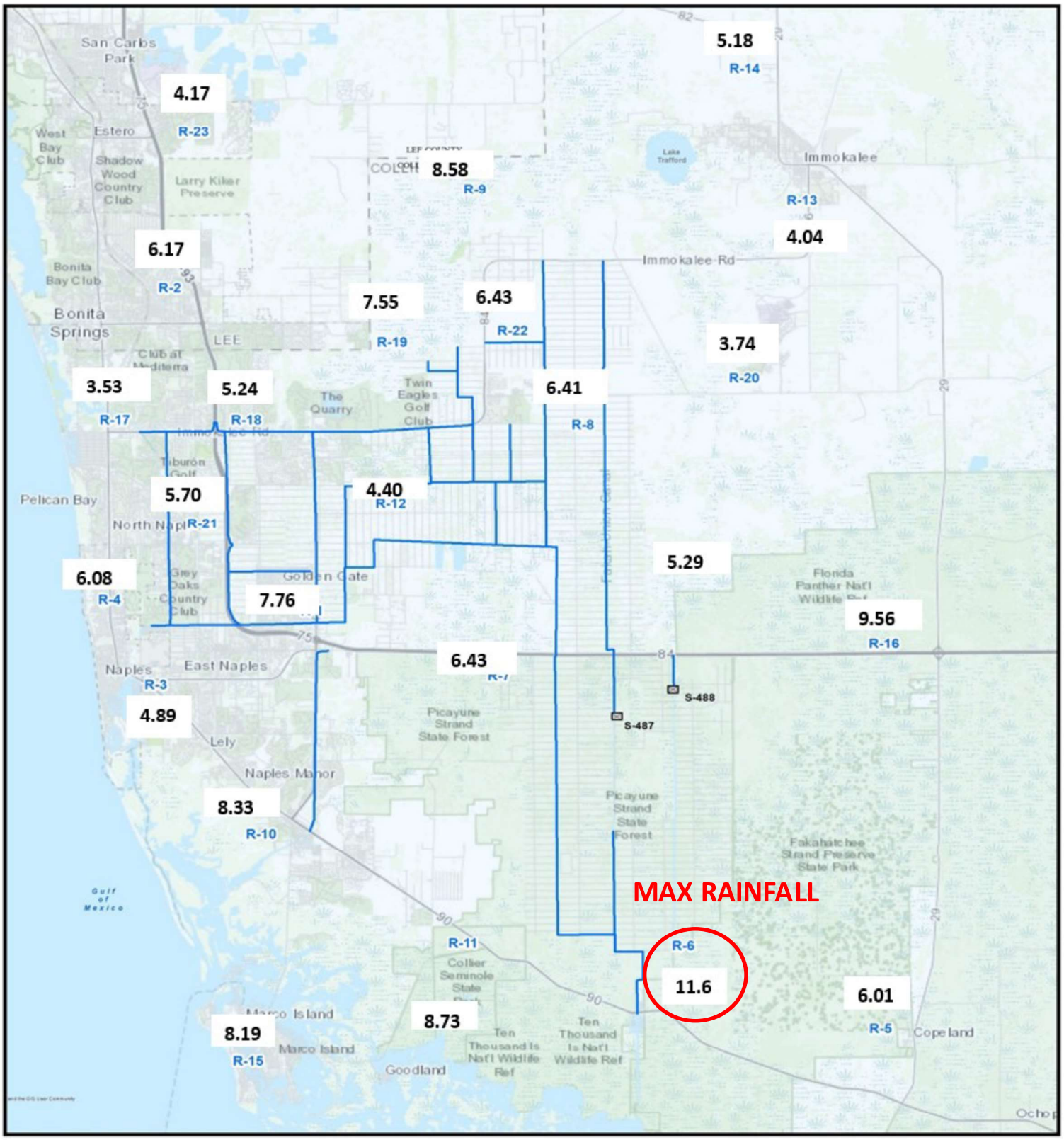
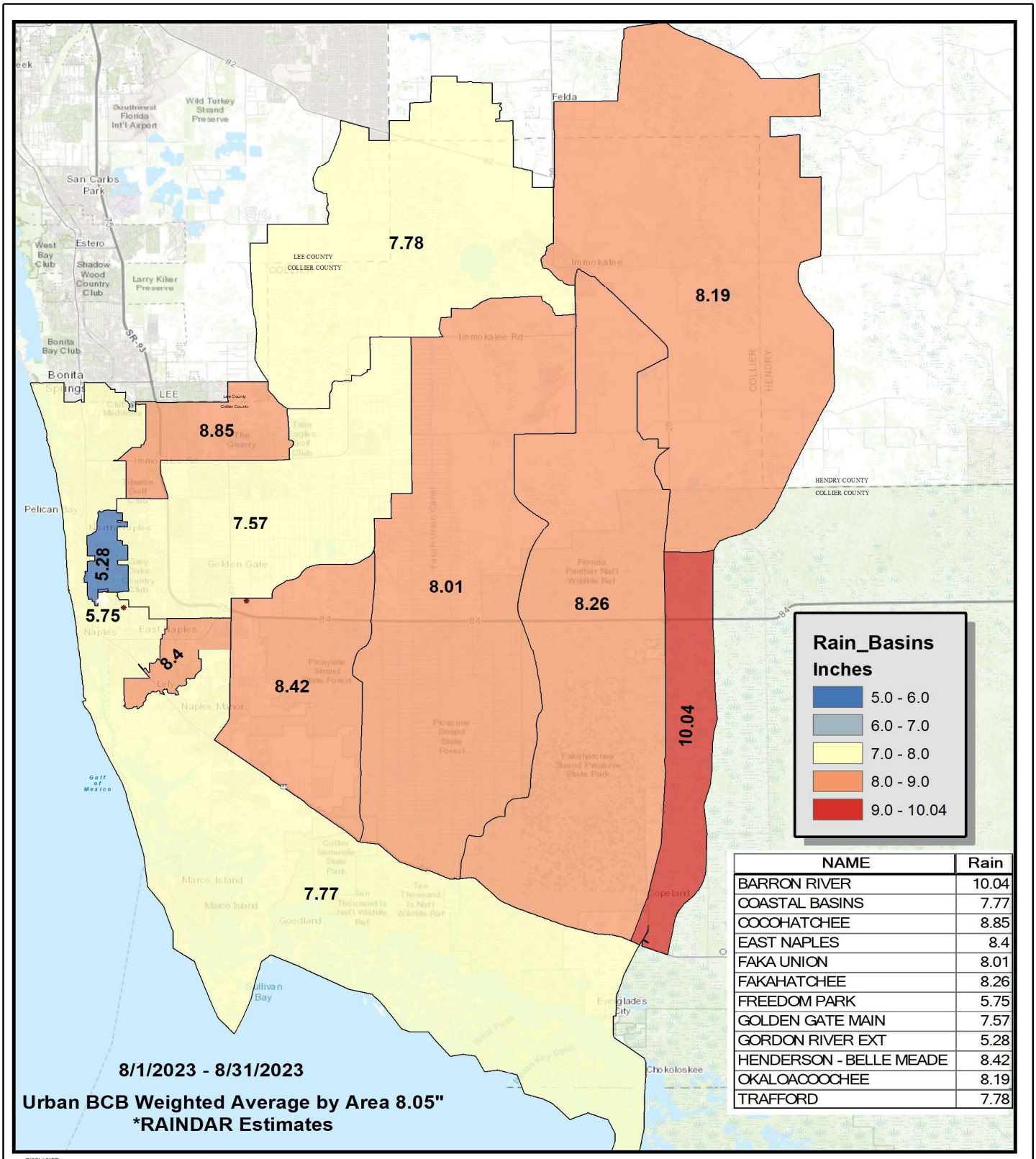


FIGURE 3
BCB RAINFALL DISTRIBUTION
AUGUST 2023



NAME	Rain
BARRON RIVER	10.04
COASTAL BASINS	7.77
COCOHATCHEE	8.85
EAST NAPLES	8.4
FAKA UNION	8.01
FAKAHATCHEE	8.26
FREEDOM PARK	5.75
GOLDEN GATE MAIN	7.57
GORDON RIVER EXT	5.28
HENDERSON - BELLE MEADE	8.42
OKALOACOOCHEE	8.19
TRAFFORD	7.78

N W E S

0 3.5 7
Miles

*Rainfall estimates based on gauge adjusted radar

BIG CYPRESS BASIN
SFWMD
2660 Horseshoe Dr. N.
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BCB RAINFALL SPATIAL DISTRIBUTION

Urban Collier County, Florida

UPDATED Sept 6 2023

SFWMD_FI_Map_Mar_2019

FIGURE 3a

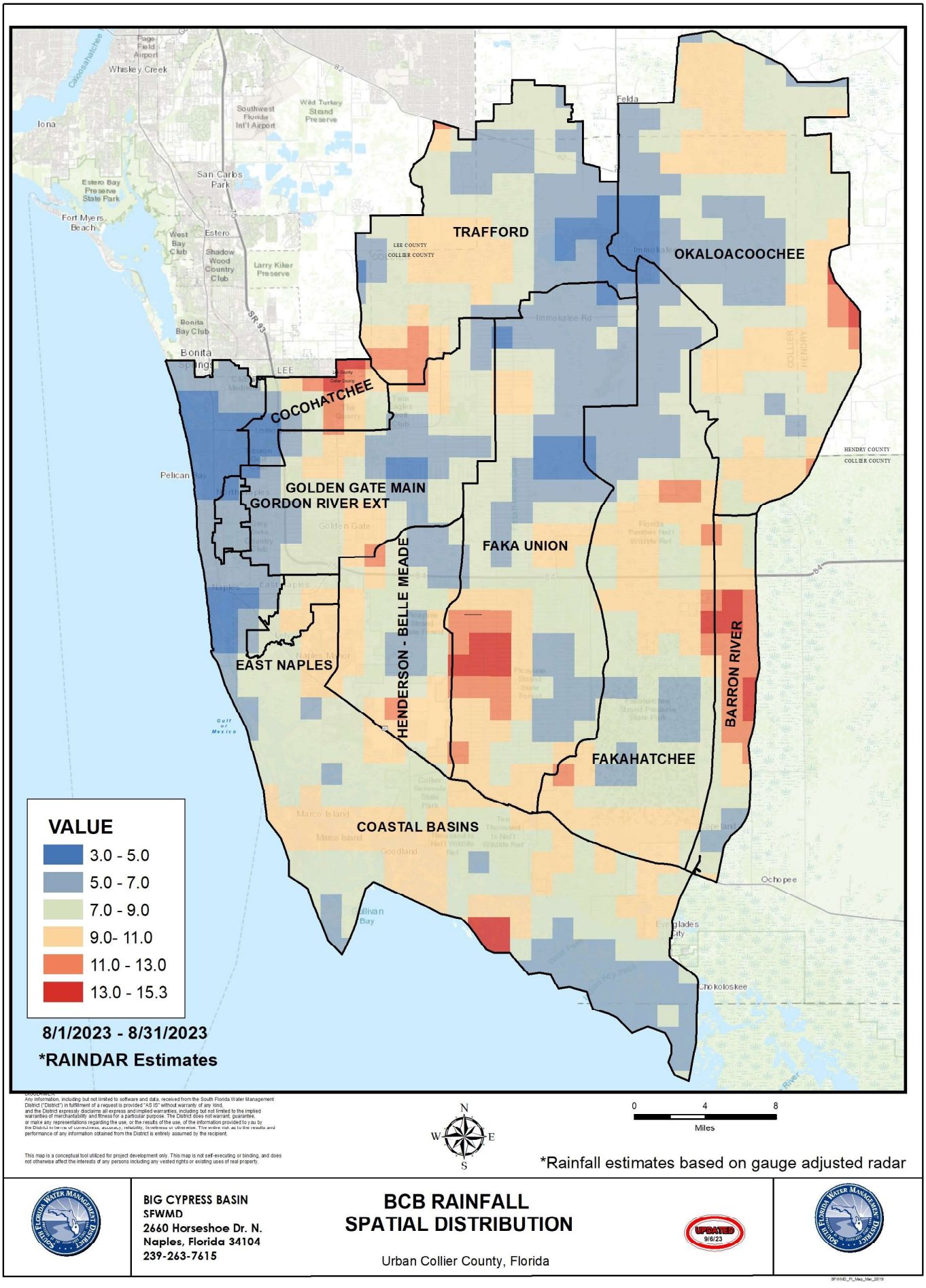

TRAFFORD
OKALOACOOCHEE
COCOHATCHEE
GOLDEN GATE MAIN
GORDON RIVER EXT
FAKA UNION
HENDERSON - BELLE MEADE
BARRON RIVER
EAST NAPLES
FAKAHATCHEE
COASTAL BASINS
LEE COUNTY
COLLIER COUNTY
HENDRY COUNTY
COLLIER COUNTY
VALUE
3.0 - 5.0
5.0 - 7.0
7.0 - 9.0
9.0- 11.0
11.0 - 13.0
13.0 - 15.3
8/1/2023 - 8/31/2023
*RAINDAR Estimates
N
W
E
S
0
4
8
Miles
*Rainfall estimates based on gauge adjusted radar
BIG CYPRESS BASIN
SFWMD
2660 Horseshoe Dr. N.
Naples, Florida 34104
239-263-7615
BCB RAINFALL
SPATIAL DISTRIBUTION
Urban Collier County, Florida
UPDATED
9/6/23

FIGURE 4

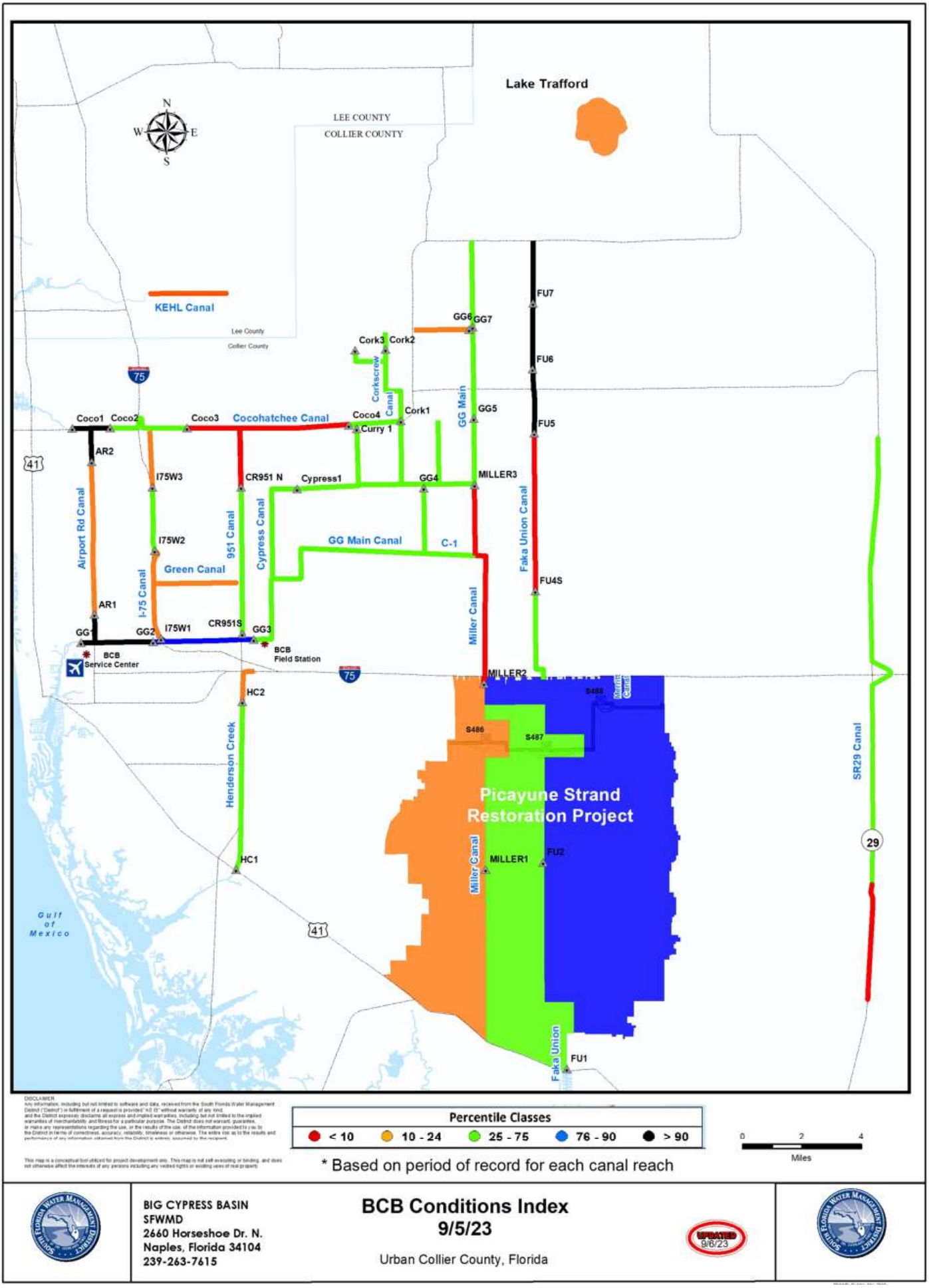

Lake Trafford
LEE COUNTY
COLLIER COUNTY
KEHL Canal
Lee County
Collier County
Corkscrew Canal
Cocohatchee Canal
GG Main
Airport Rd Canal
951 Canal
Cypress Canal
GG Main Canal
C-1
Faka Union Canal
Green Canal
I-75 Canal
Miller Canal
Henderson Creek
SR29 Canal
Gulf of Mexico
BCB Service Center
BCB Field Station
Picayune Strand Restoration Project
Coco1
Coco2
Coco3
Coco4
Cork1
Cork2
Cork3
Curry 1
AR1
AR2
I75W1
I75W2
I75W3
CR951S
CR951 N
Cypress1
GG1
GG2
GG3
GG4
GG5
GG6
GG7
HC1
HC2
MILLER1
MILLER2
MILLER3
FU1
FU2
FU4S
FU5
FU6
FU7
S486
S487
S488
Percentile Classes
< 10
10 - 24
25 - 75
76 - 90
> 90
* Based on period of record for each canal reach
Miles
BIG CYPRESS BASIN
SFWMD
2660 Horseshoe Dr. N.
Naples, Florida 34104
239-263-7615
BCB Conditions Index
9/5/23
Urban Collier County, Florida
UPDATED 9/6/23

FIGURE 4A

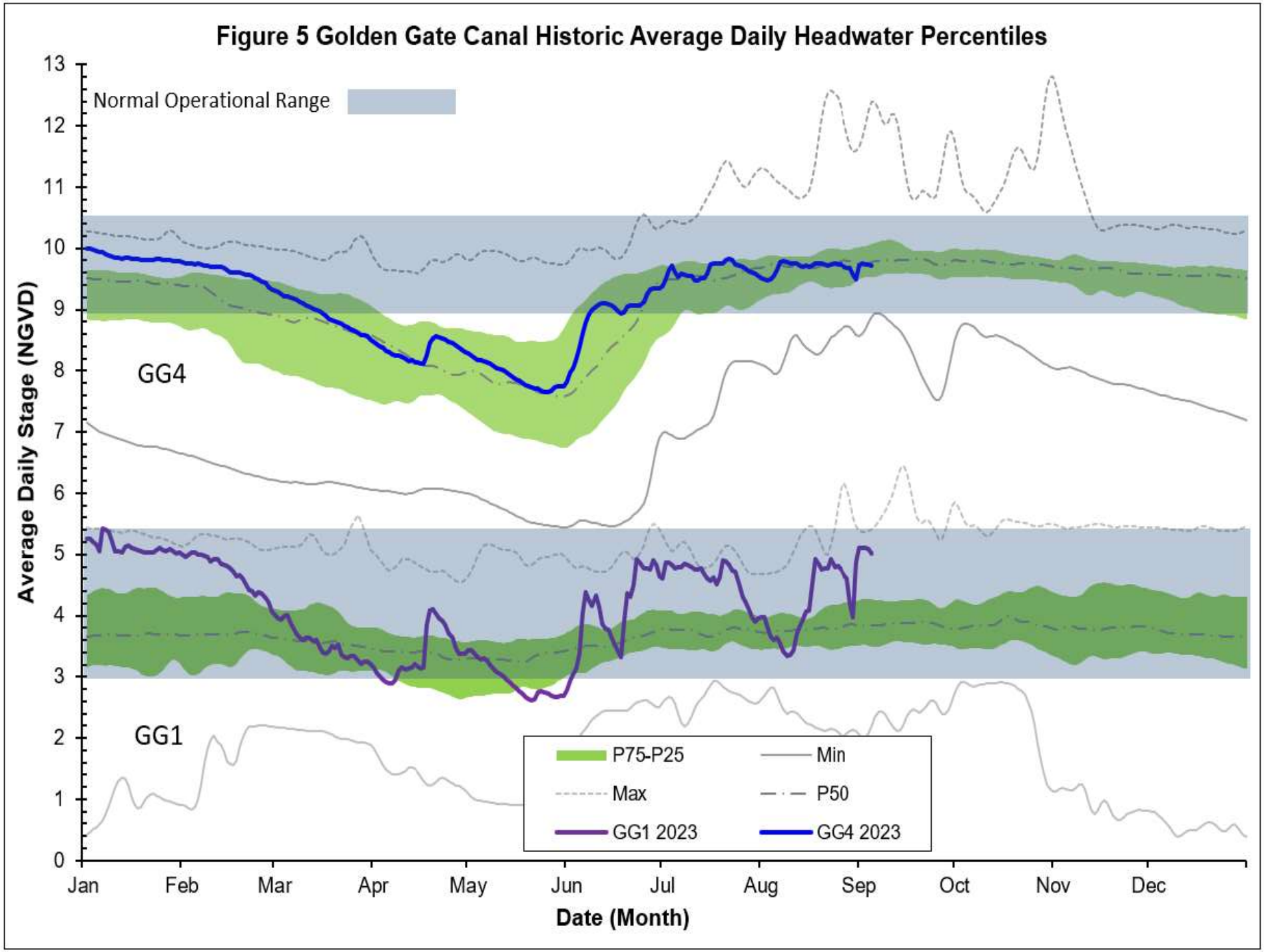
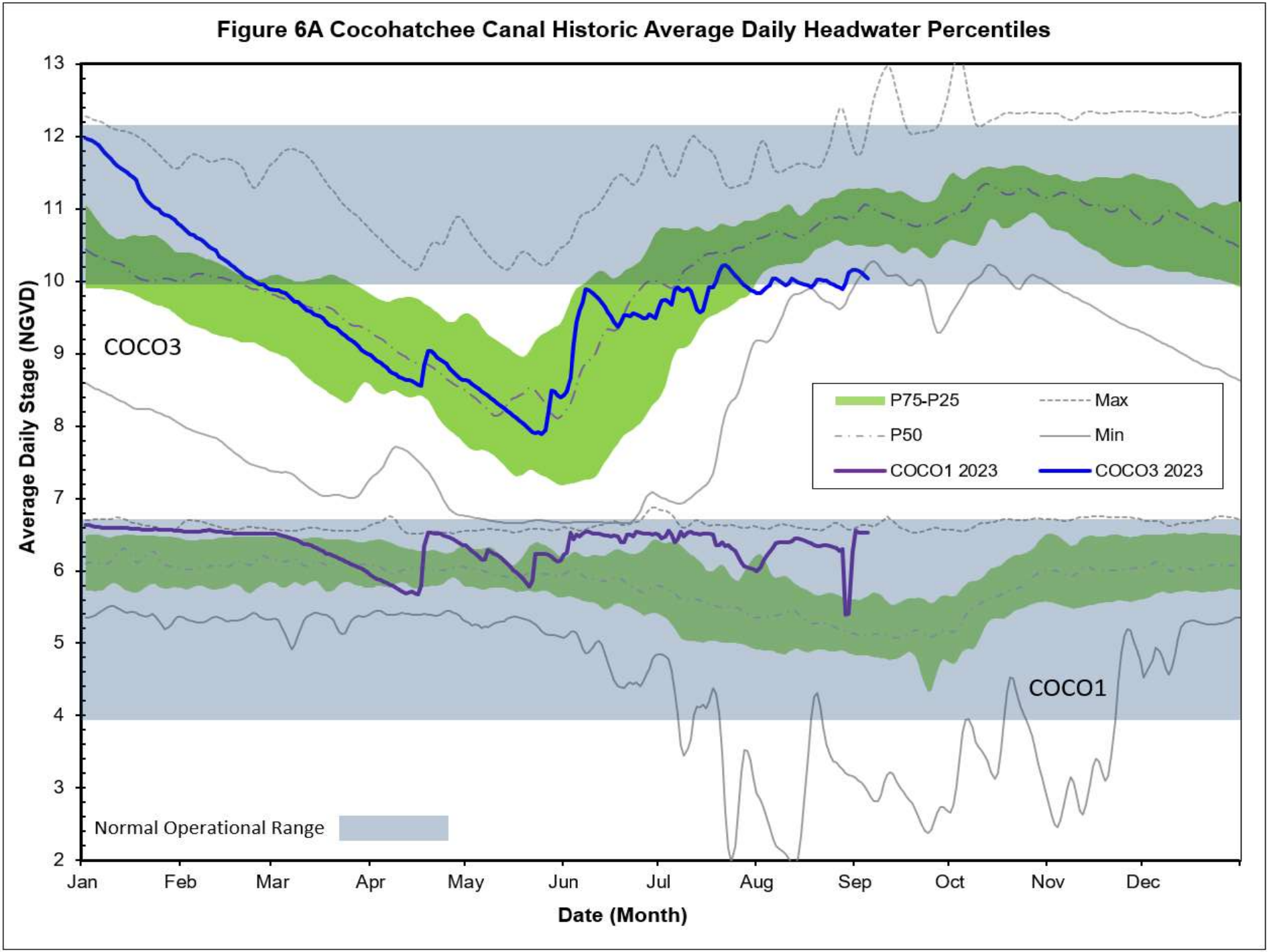


Figure 5 Golden Gate Canal Historic Average Daily Headwater Percentiles
Normal Operational Range
GG4
GG1
Average Daily Stage (NGVD)
Date (Month)
P75-P25
Min
Max
P50
GG1 2023
GG4 2023
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
0
1
2
3
4
5
6
7
8
9
10
11
12
13

Figure 6A Cocohatchee Canal Historic Average Daily Headwater Percentiles



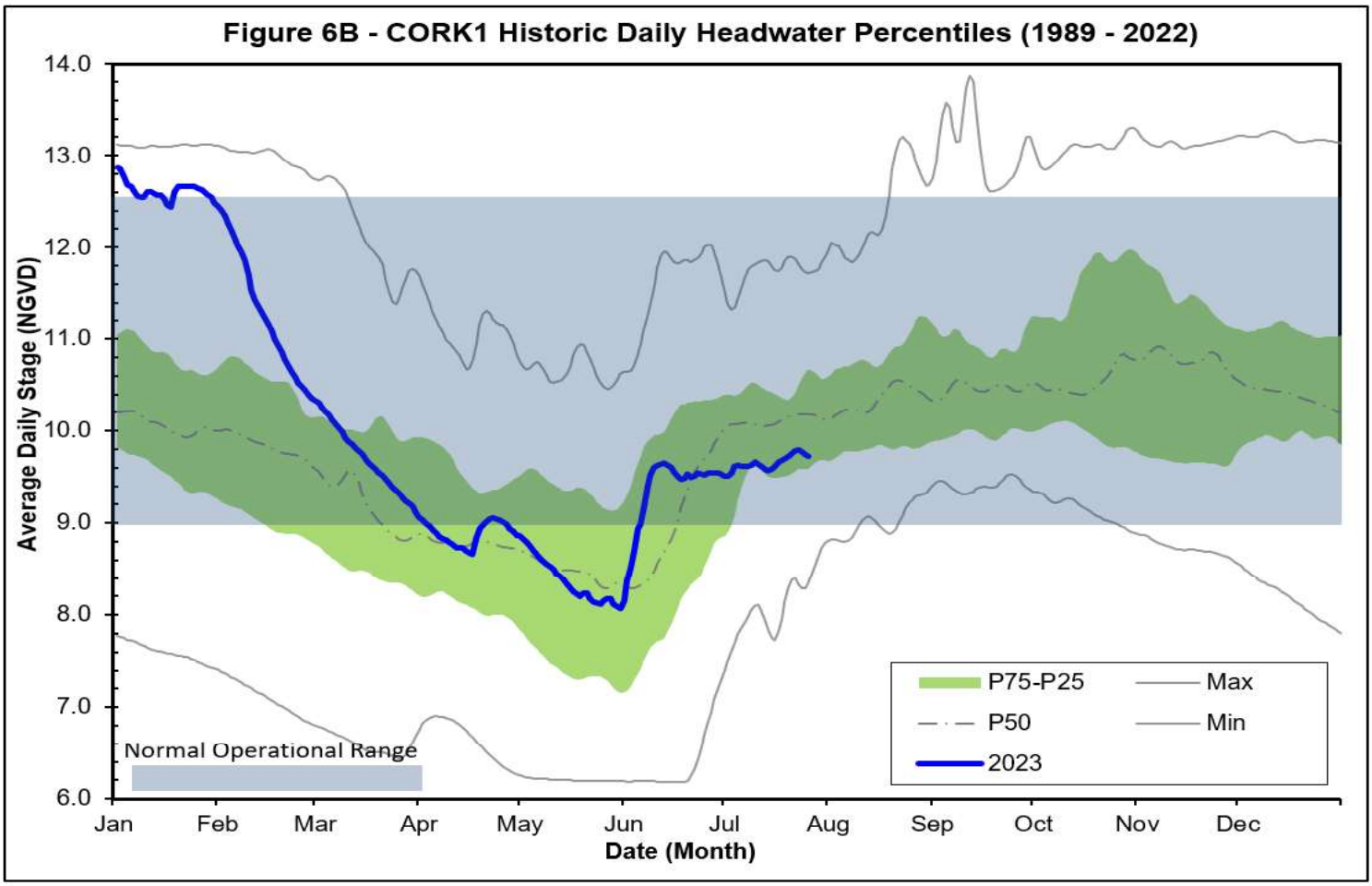


Figure 6B - CORK1 Historic Daily Headwater Percentiles (1989 - 2022)
Average Daily Stage (NGVD)
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Date (Month)
Normal Operational Range
P75-P25
Max
P50
Min
2023

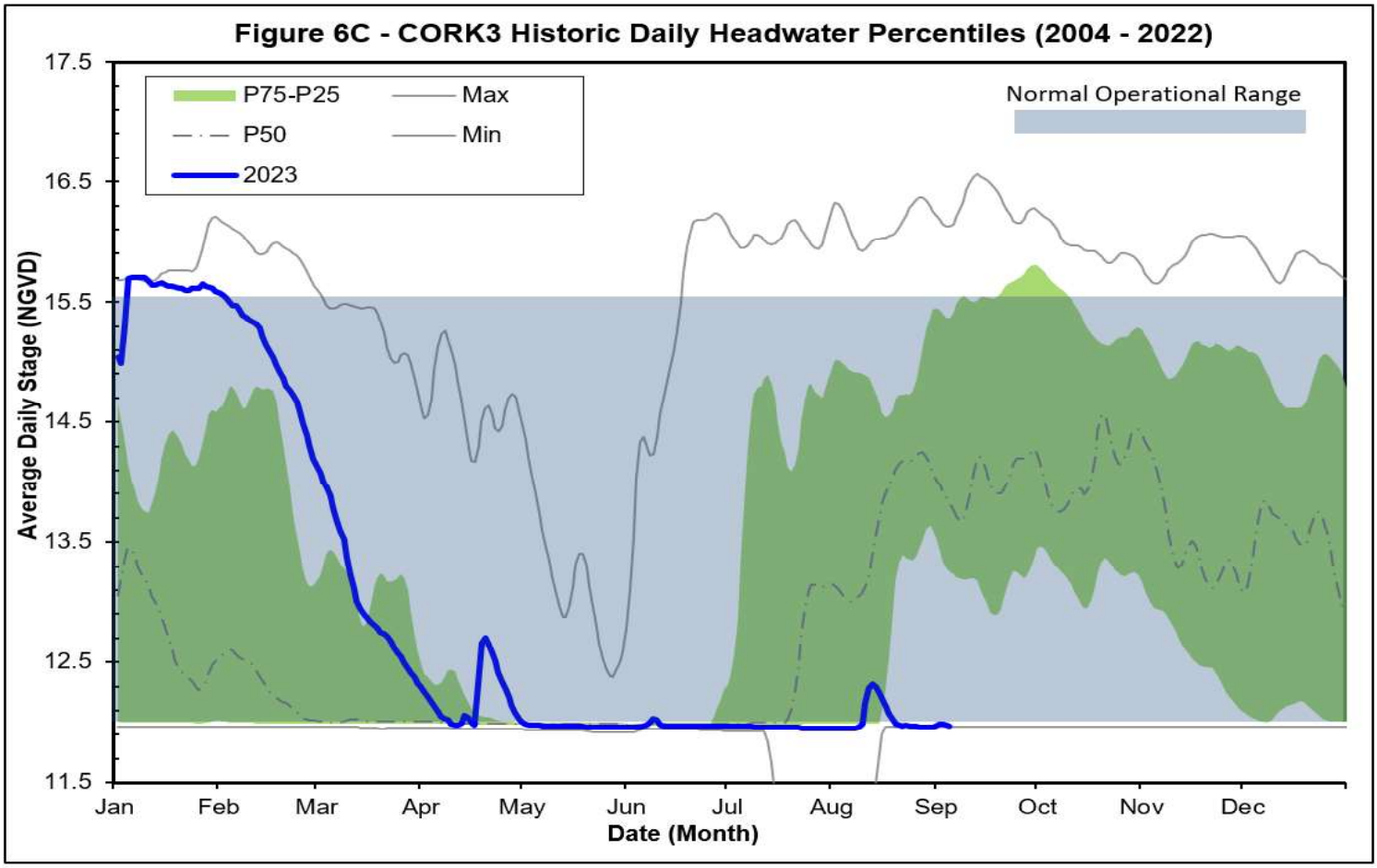


Figure 6C - CORK3 Historic Daily Headwater Percentiles (2004 - 2022)
Average Daily Stage (NGVD)
17.5
16.5
15.5
14.5
13.5
12.5
11.5
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Date (Month)
P75-P25
Max
P50
Min
2023
Normal Operational Range

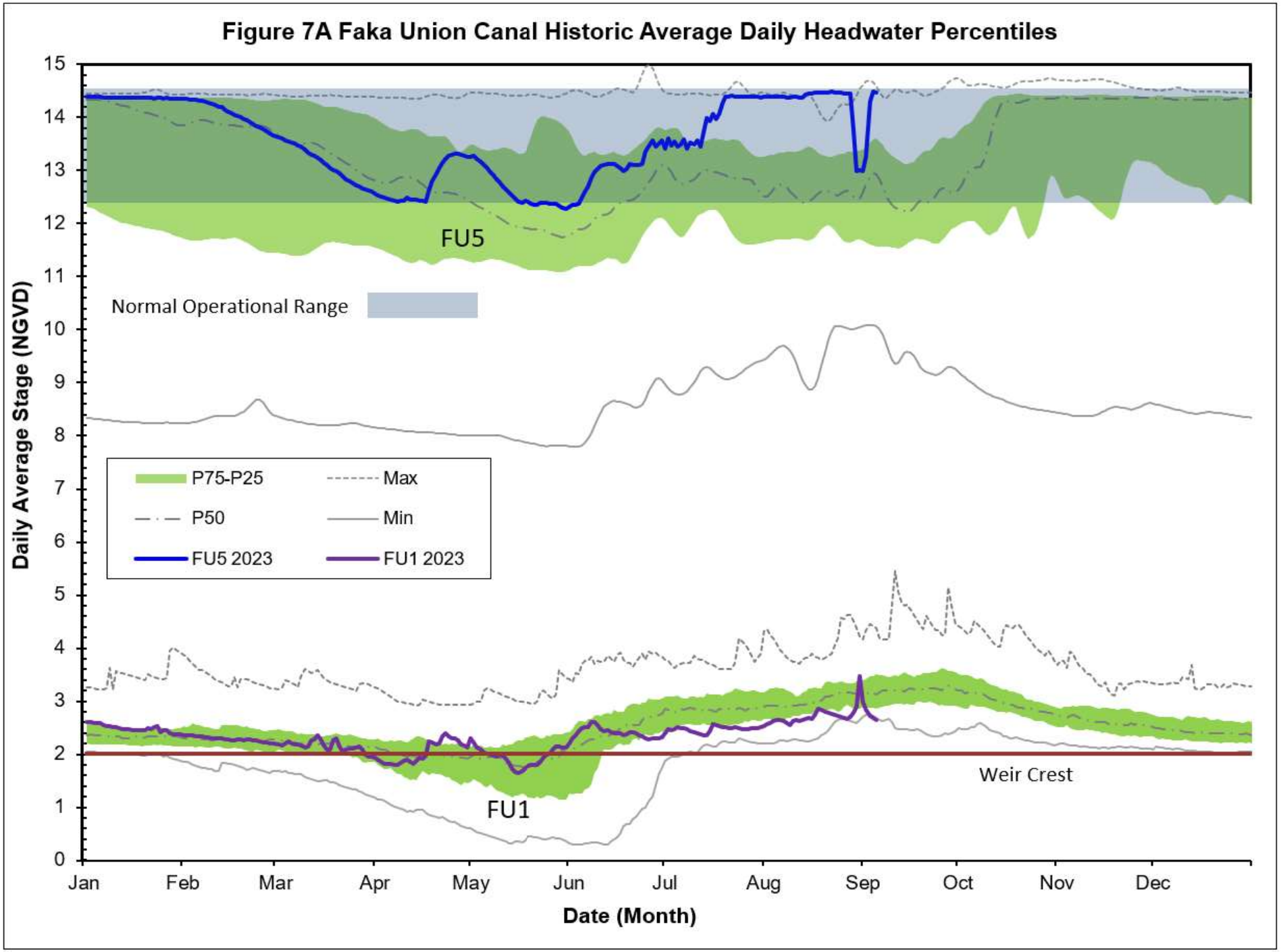


Figure 7A Faka Union Canal Historic Average Daily Headwater Percentiles
Daily Average Stage (NGVD)
Date (Month)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
FU5
Normal Operational Range
P75-P25
Max
P50
Min
FU5 2023
FU1 2023
FU1
Weir Crest

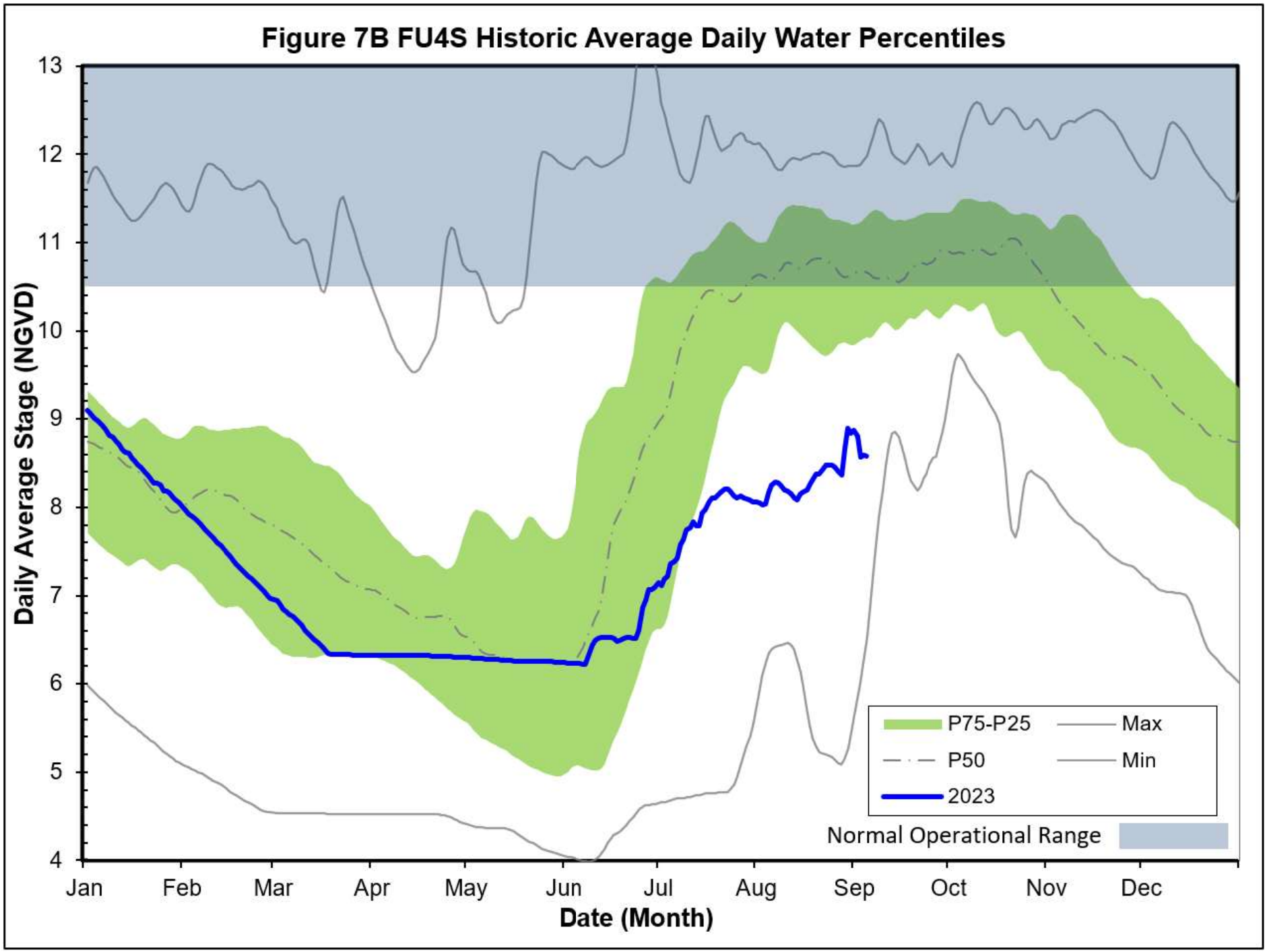


Figure 7B FU4S Historic Average Daily Water Percentiles
Daily Average Stage (NGVD)
13
12
11
10
9
8
7
6
5
4
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Date (Month)
P75-P25
Max
P50
Min
2023
Normal Operational Range

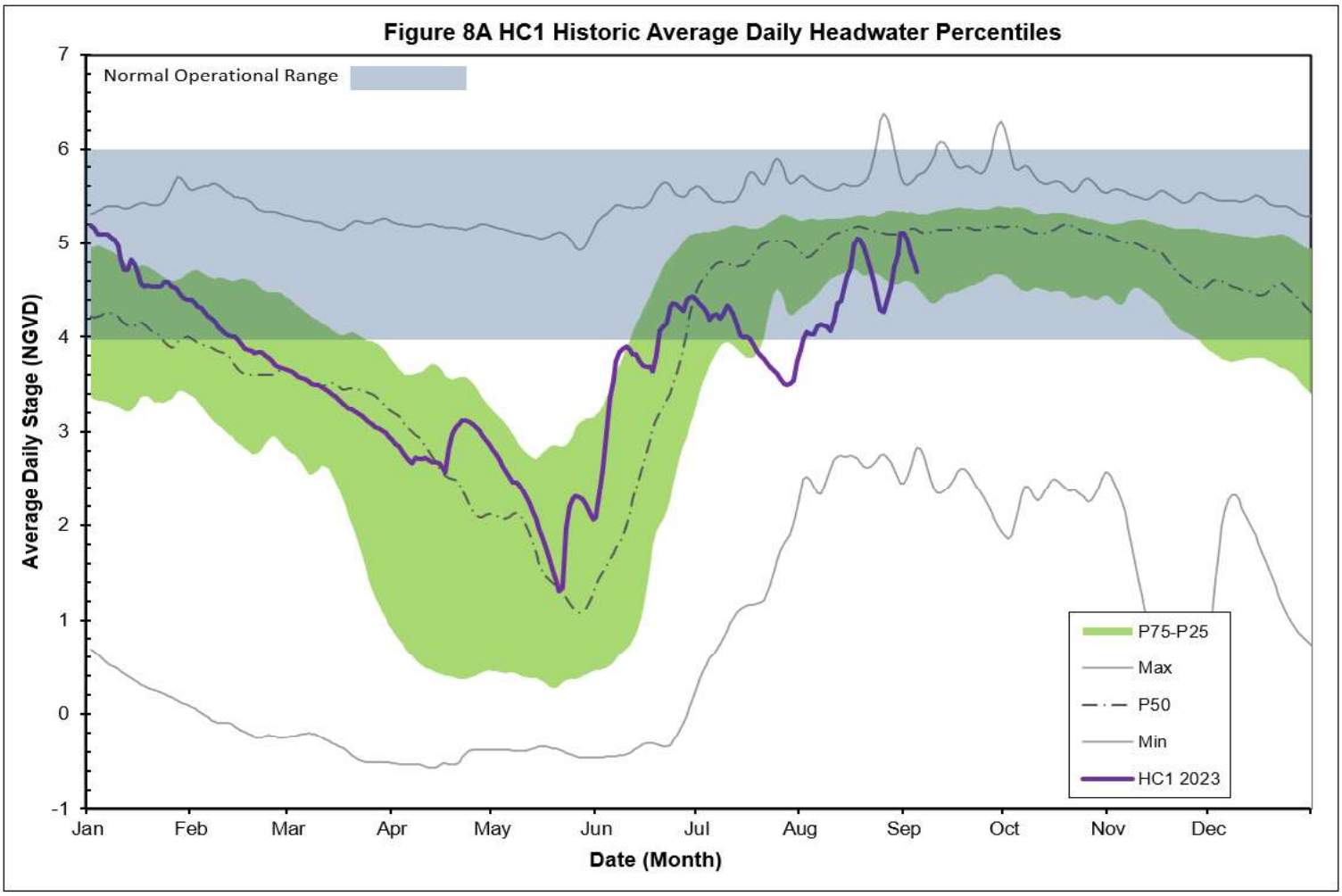


Figure 8A HC1 Historic Average Daily Headwater Percentiles
Normal Operational Range
Average Daily Stage (NGVD)
7
6
5
4
3
2
1
0
-1
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Date (Month)
P75-P25
Max
P50
Min
HC1 2023

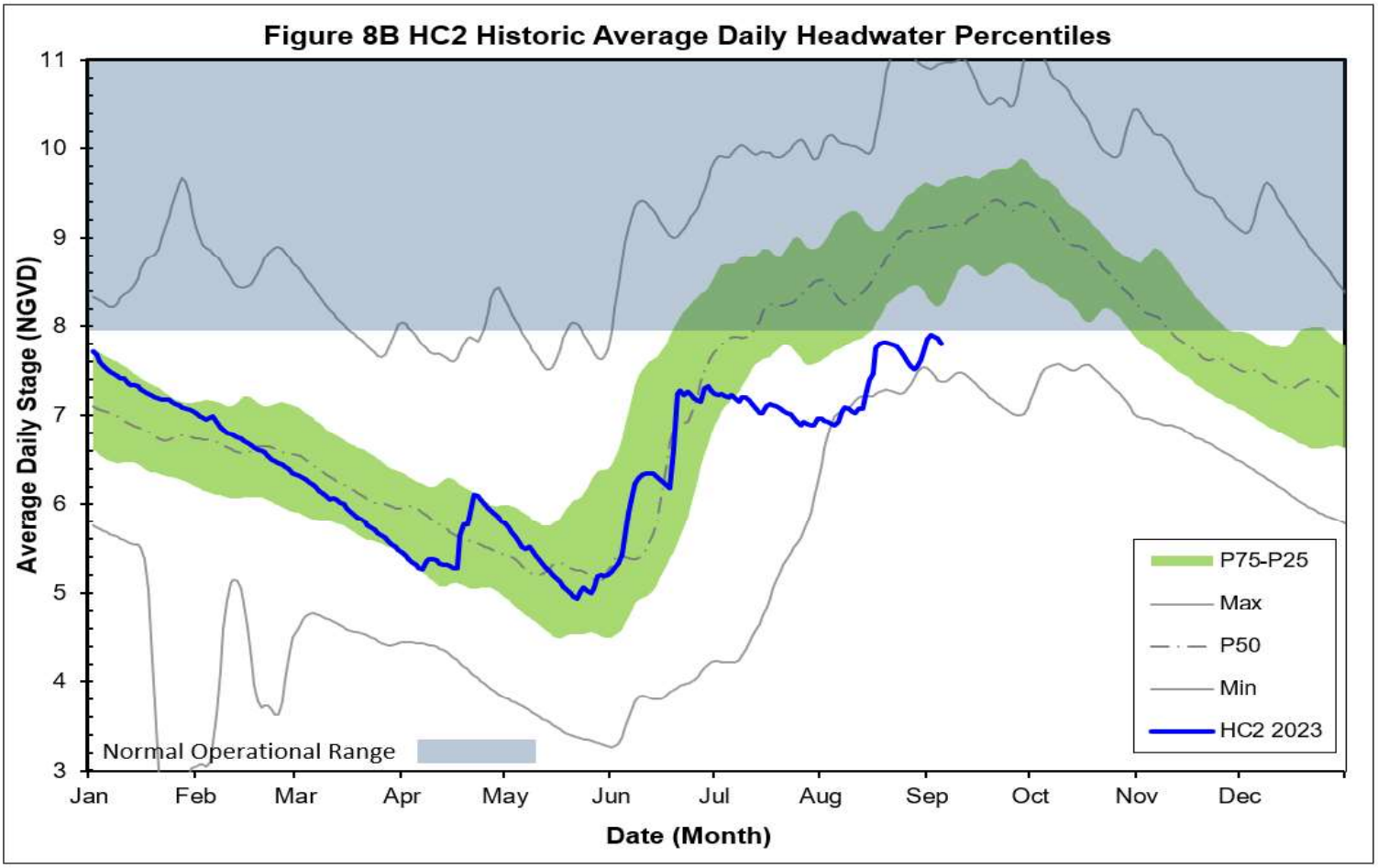


Figure 8B HC2 Historic Average Daily Headwater Percentiles
Average Daily Stage (NGVD)
11
10
9
8
7
6
5
4
3
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Date (Month)
Normal Operational Range
P75-P25
Max
P50
Min
HC2 2023

WATER CONDITIONS SUMMARY - August 2023

SELECTED STATIONS for BCB AREA / SW FLORIDA

Last Reading Date :		September 5, 2023					
Previous Period Reading Date:		July 31, 2023					
STATION INDEX NO.	WELL LOCATION	WELL / AQUIFER - TYPE	CHANGE (from previous date)	PREVIOUS LEVEL	CURRENT LEVEL (ft)	DIRECTION OF CHANGE	CONCERN INDICATOR
ALL INDICATOR LEVELS SHOWN IN FT-NGVD							
C-462	Immokalee	Lower Tamiami Aquifer	-1.44	33.77	32.33	↓	GREEN
C-1004R	Naples	Lower Tamiami Aquifer	-0.39	0.05	-0.34	↓	YELLOW
C-1224	Marco Lakes	Lower Tamiami Aquifer	1.33	2.07	3.40	↑	GREEN
C-948R	Golden Gate	Mid Hawthorn Aquifer	1.34	31.37	32.71	↑	
C-951R	Golden Gate	Lower Tamiami Aquifer	0.52	2.50	3.02	↑	
L-2194	Bonita Springs	Sandstone Aquifer	1.83	1.38	3.21	↑	GREEN
L-2195	Bonita Springs	Surficial Aquifer System	0.97	8.88	9.85	↑	GREEN
L-738	Bonita Springs	Lower Tamiami Aquifer	2.68	-3.75	-1.07	↑	GREEN

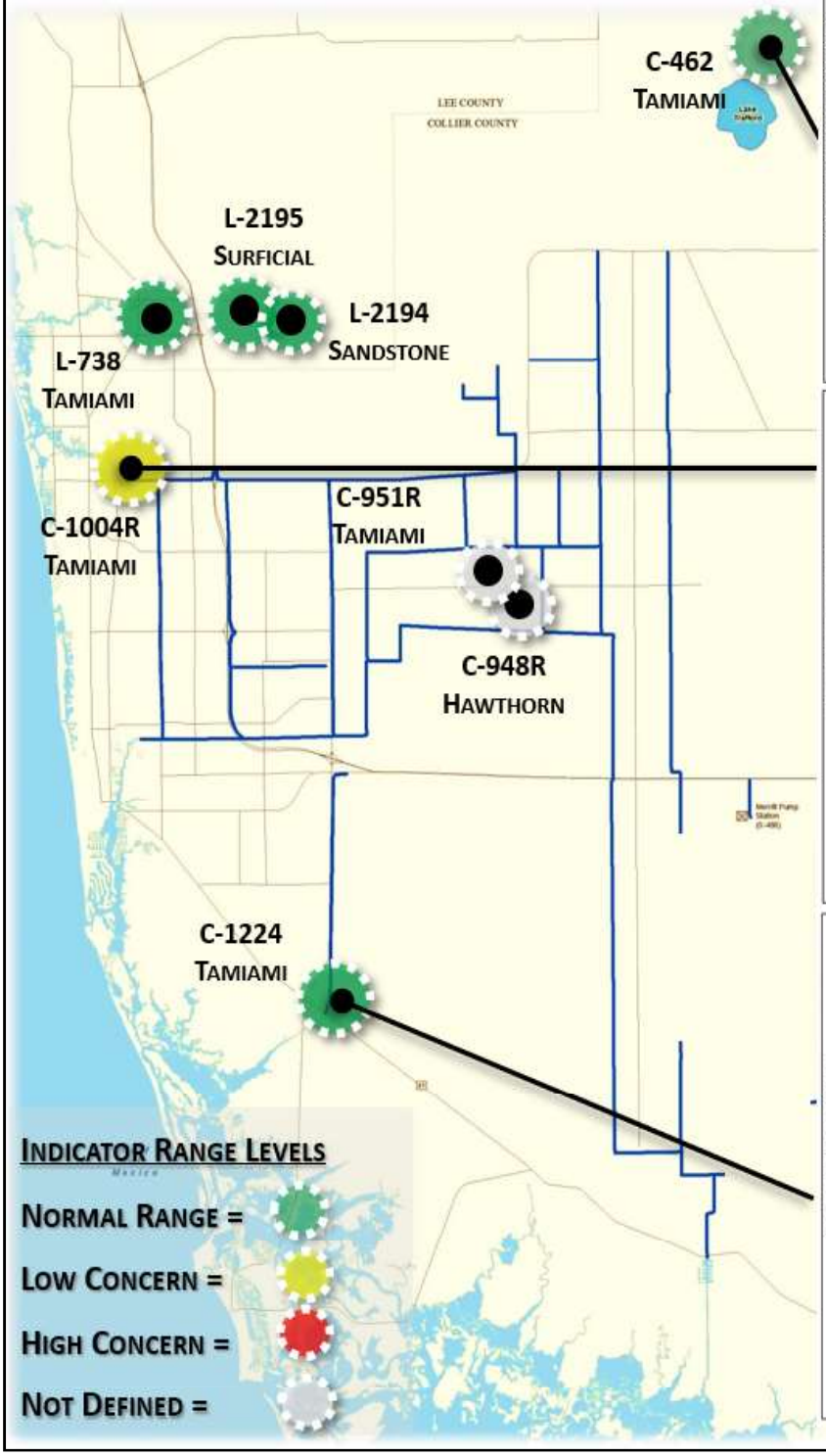
TABLE 2
BCB WATER CONDITIONS SUMMARY
AUGUST 2023

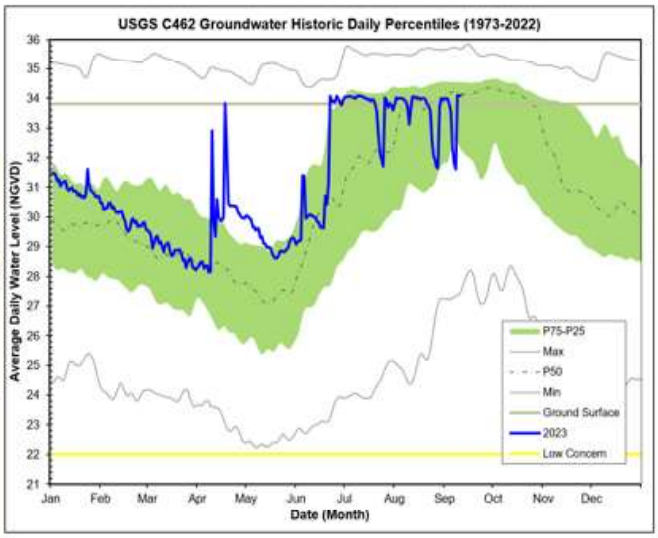
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

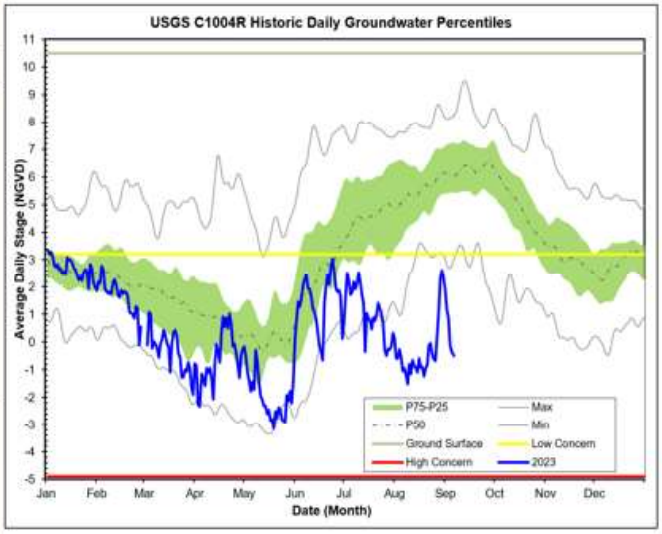
BIG CYPRESS BASIN

AUGUST 2023

GROUNDWATER LEVEL DAILY TRENDS COMPARED TO HISTORICAL AVERAGE







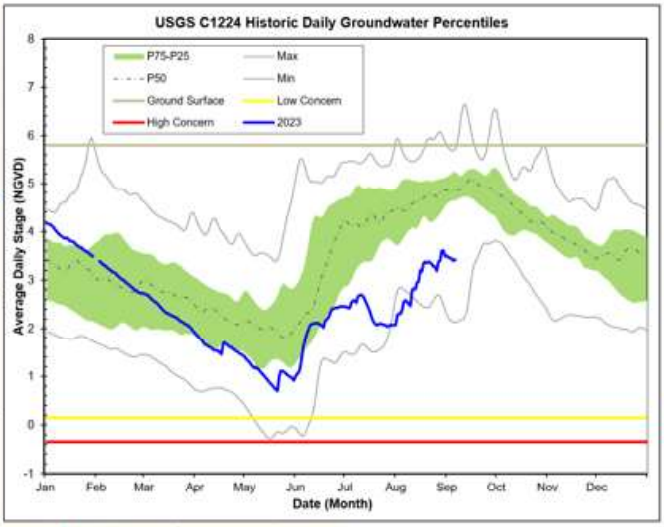


FIGURE 9

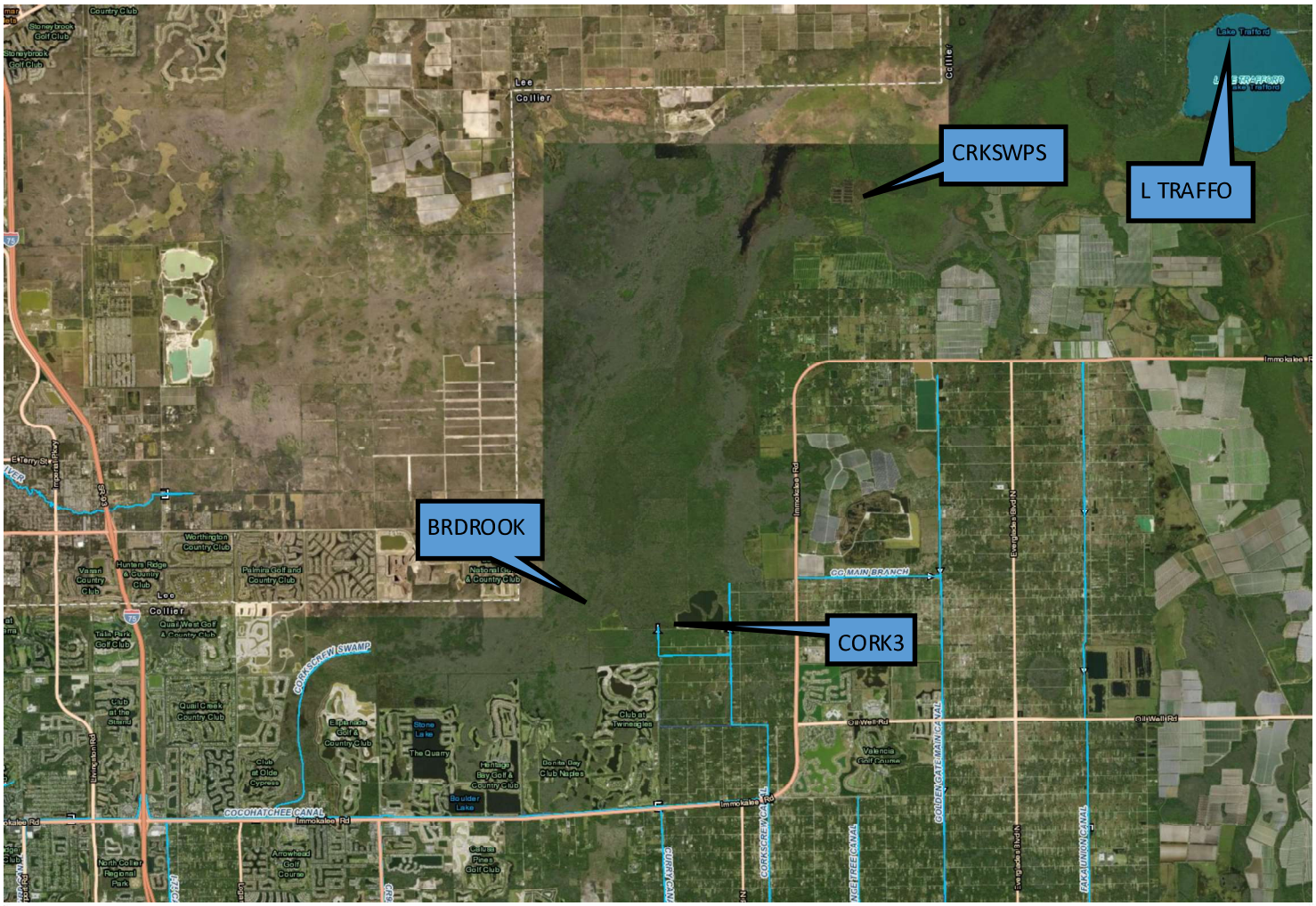
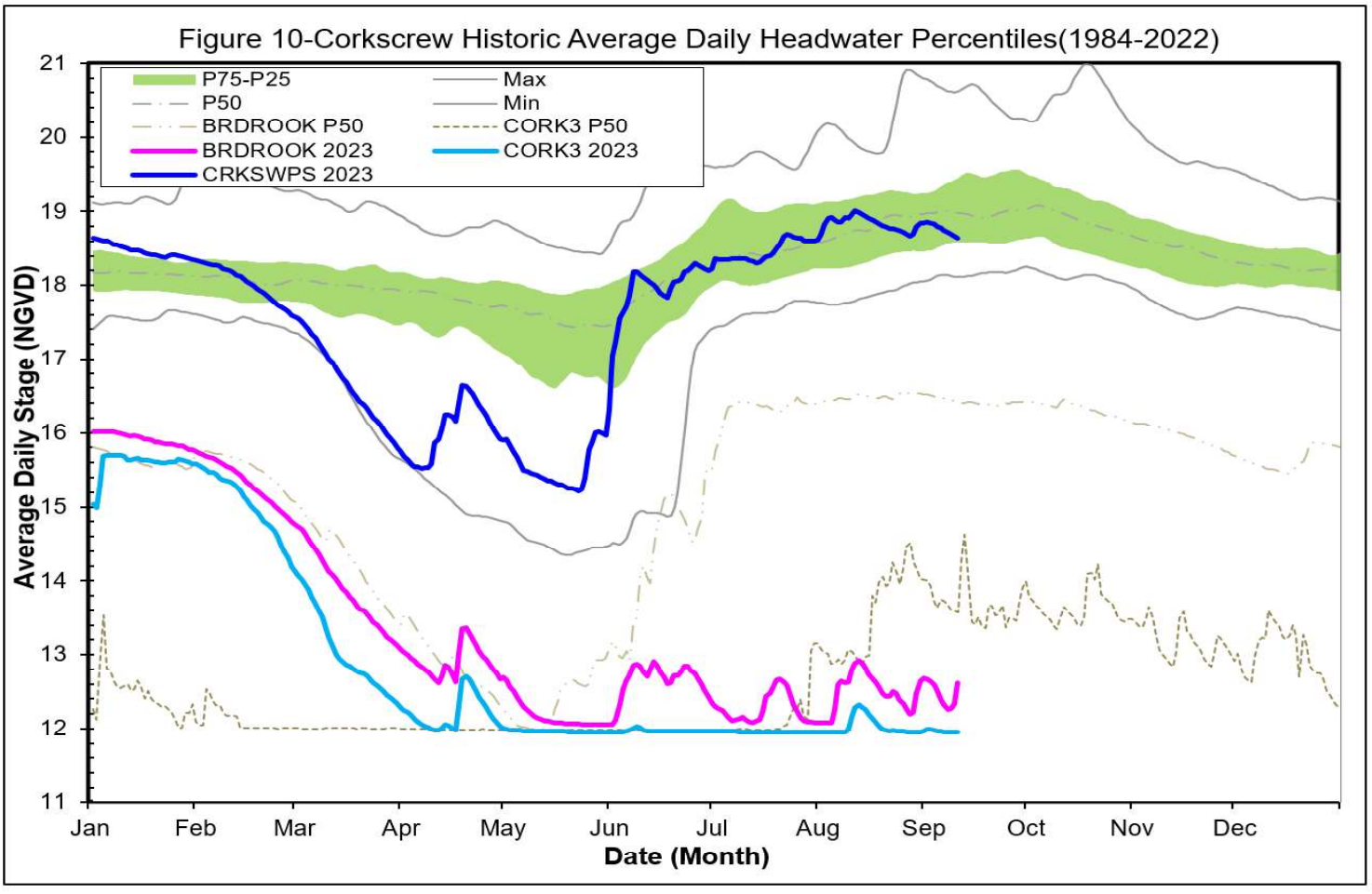


Figure 10-Corkscrew Historic Average Daily Headwater Percentiles(1984-2022)



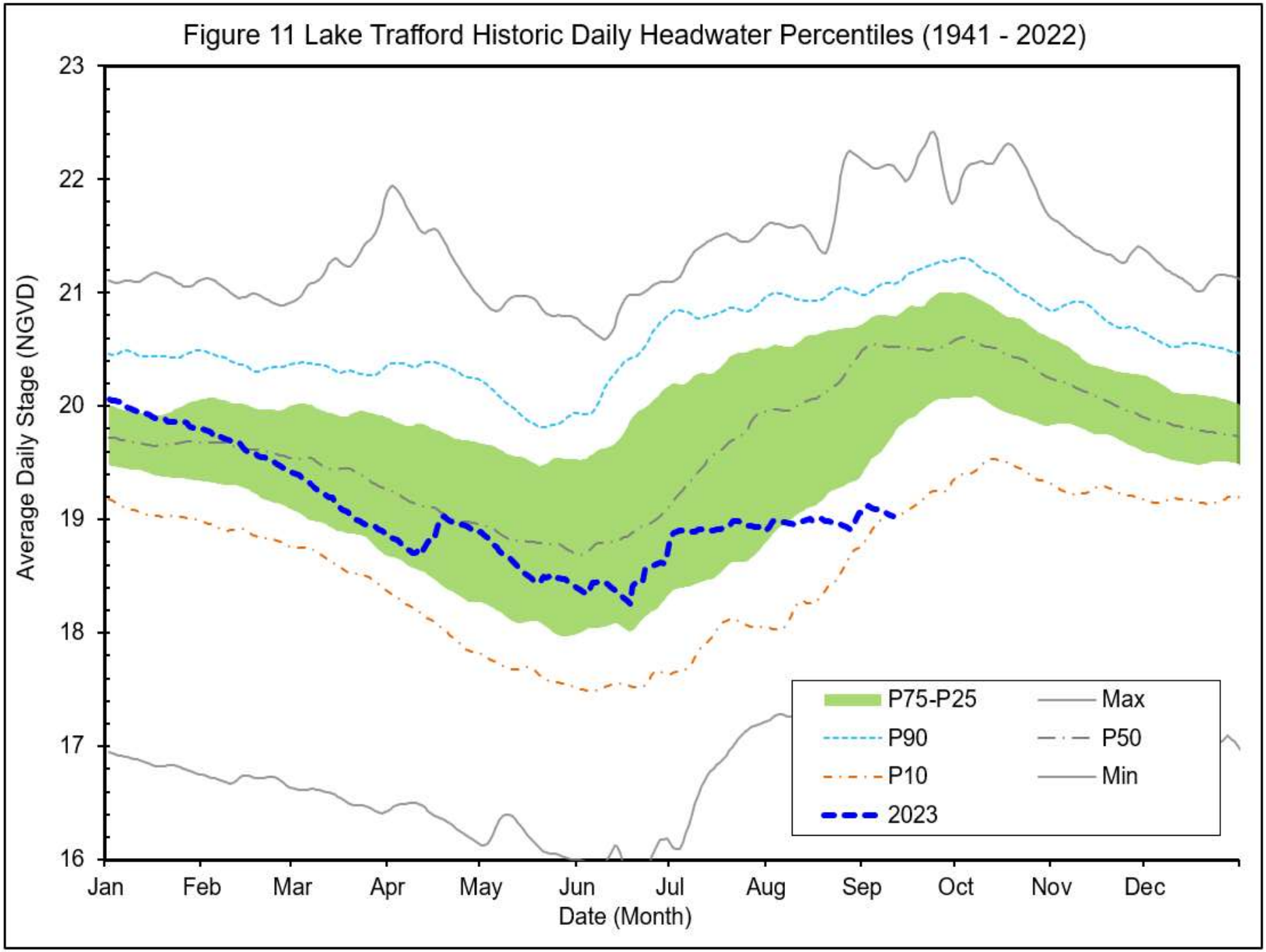
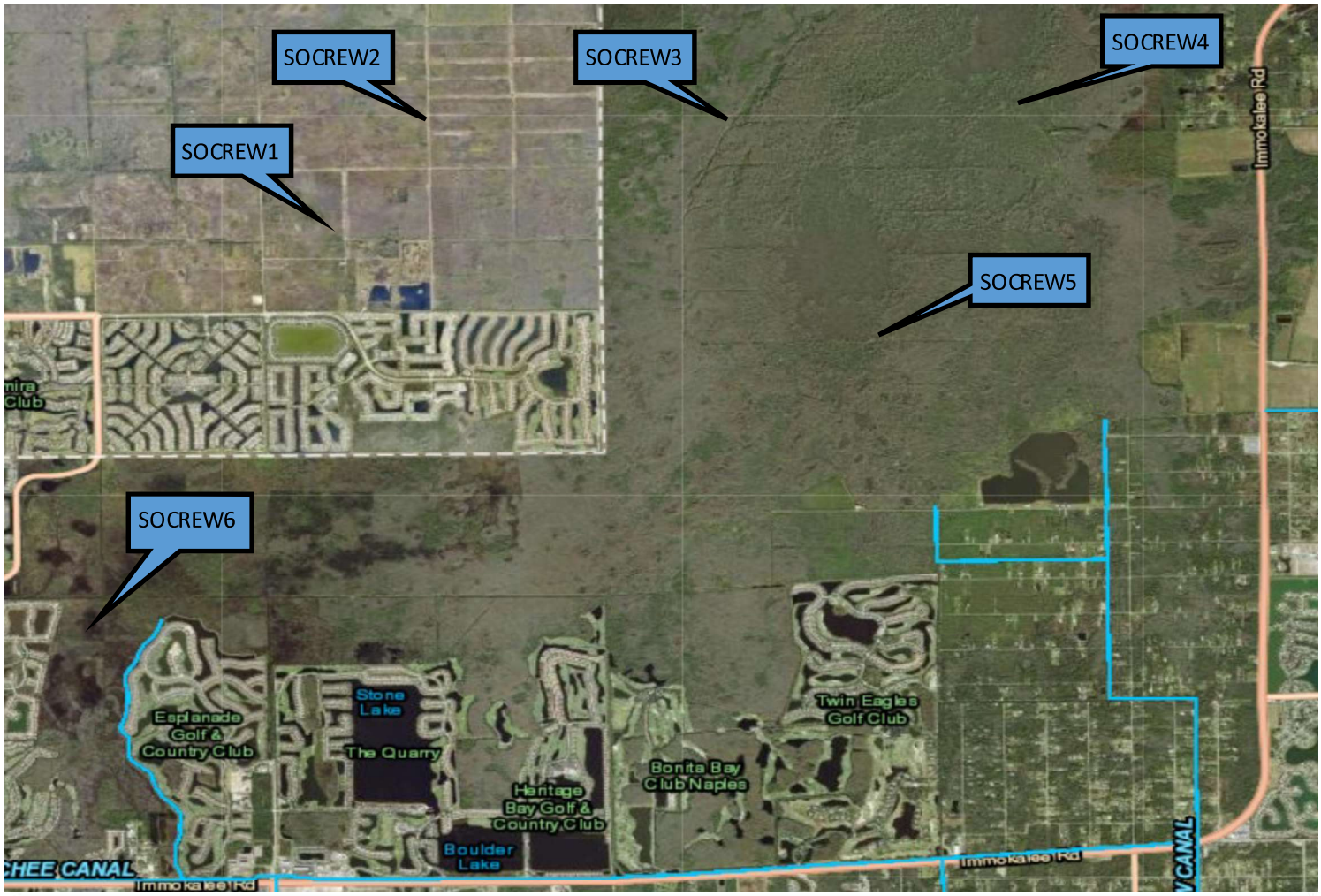


Figure 11 Lake Trafford Historic Daily Headwater Percentiles (1941 - 2022)
Average Daily Stage (NGVD)
23
22
21
20
19
18
17
16
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Date (Month)
P75-P25
Max
P90
P50
P10
Min
2023


SOCREW1
SOCREW2
SOCREW3
SOCREW4
SOCREW5
SOCREW6
Immokalee Rd
Esplanade Golf & Country Club
Stone Lake
The Quarry
Heritage Bay Golf & Country Club
Boulder Lake
Bonita Bay Club Naples
Twin Eagles Golf Club
Immokalee Rd
Immokalee Rd

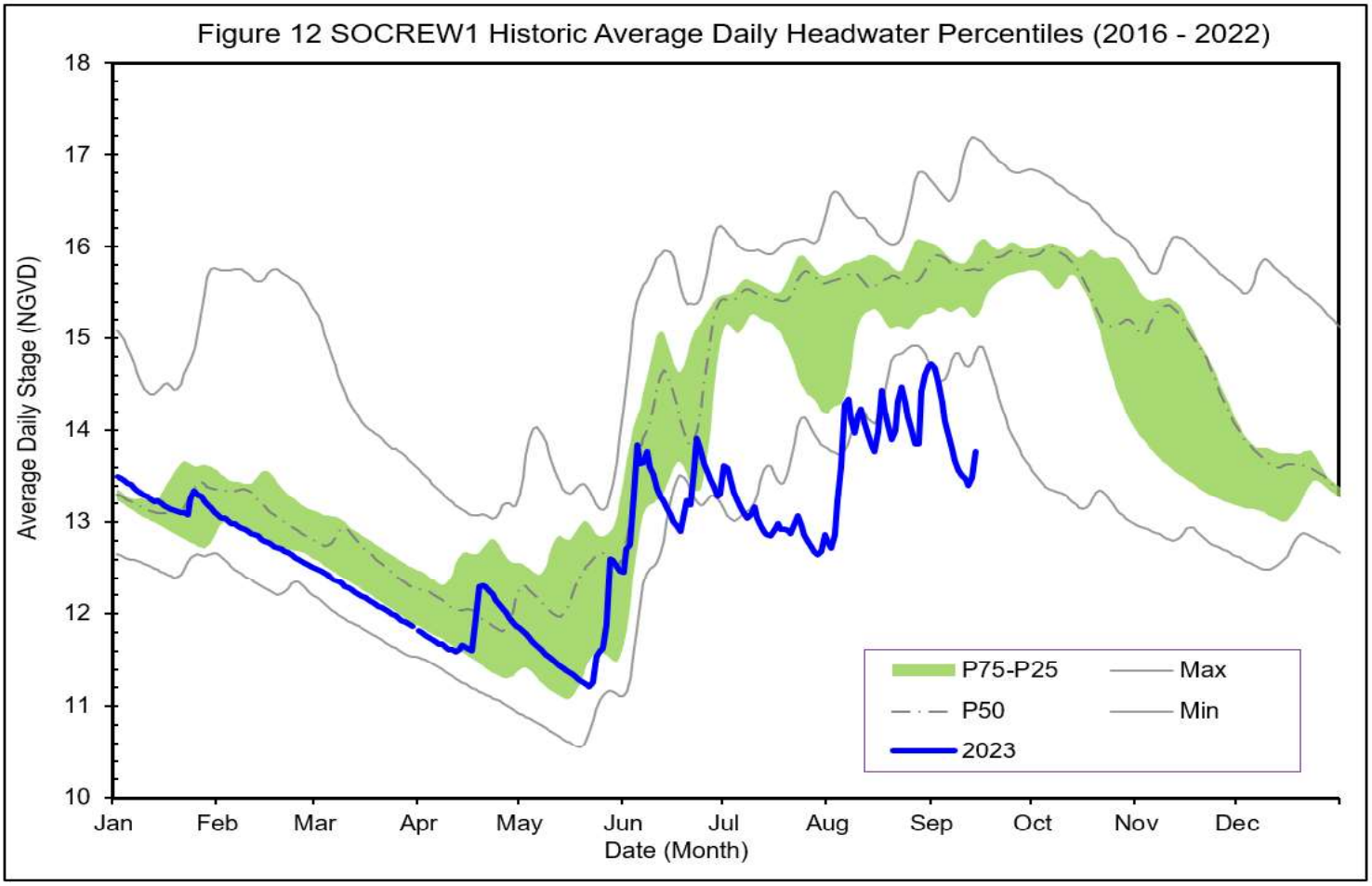


Figure 12 SOCREW1 Historic Average Daily Headwater Percentiles (2016 - 2022)
Average Daily Stage (NGVD)
18
17
16
15
14
13
12
11
10
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Date (Month)
P75-P25
Max
P50
Min
2023

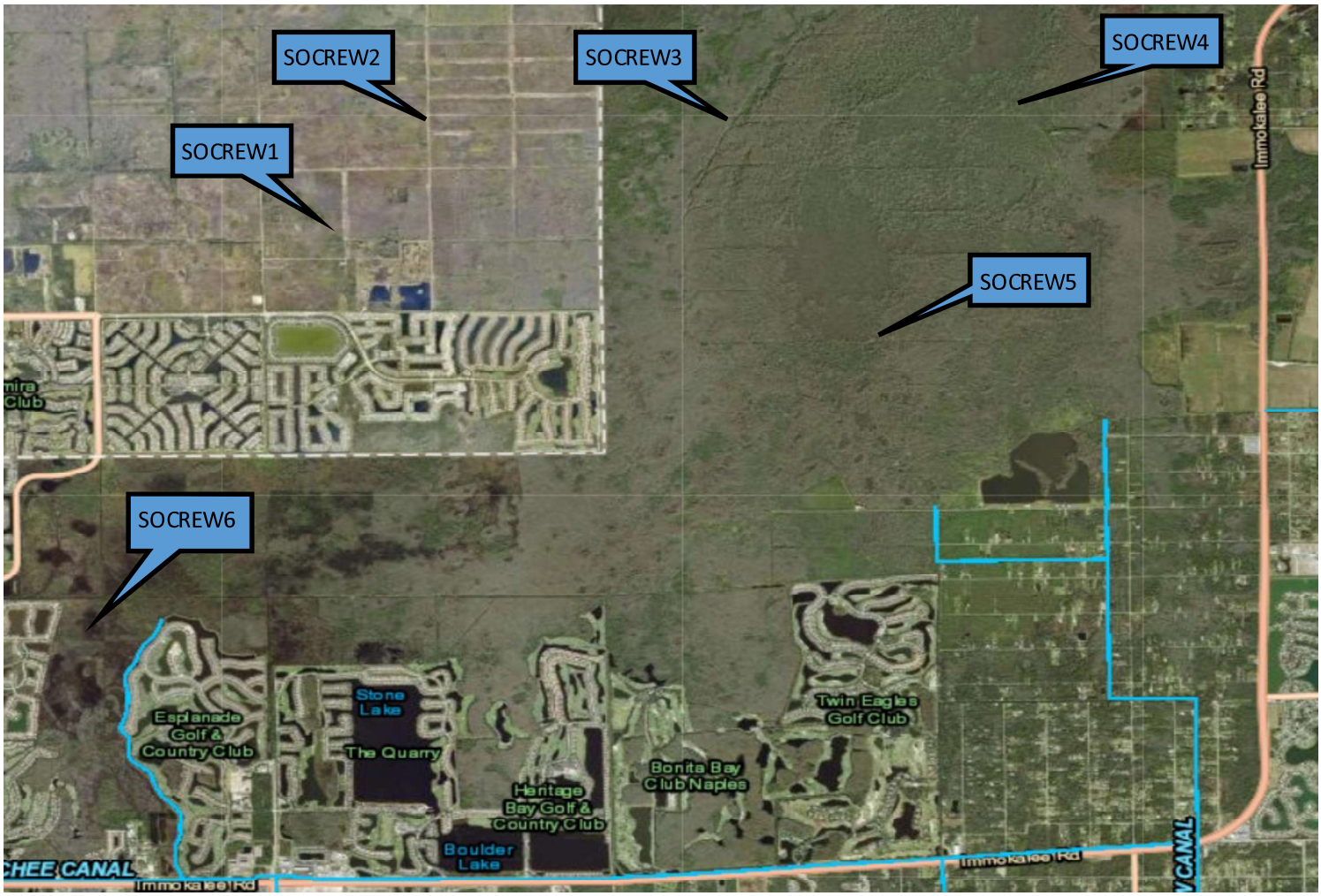


Figure 13 SOCREW2 Historic Average Daily Headwater Percentiles (2016 - 2022)