

DECEMBER 2023

BIG CYPRESS BASIN HYDROLOGIC REPORT



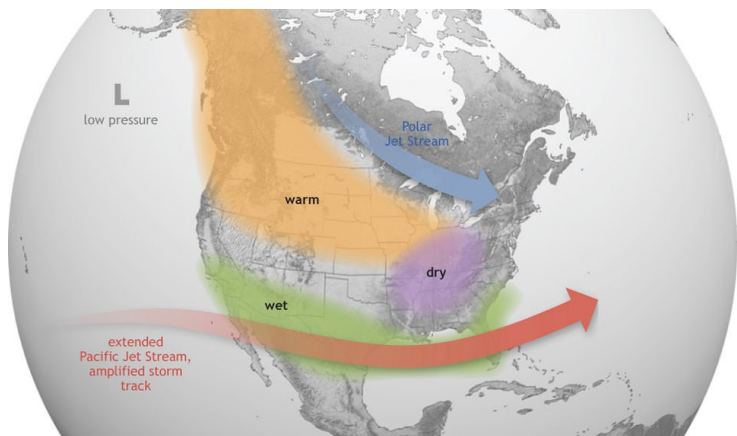
SUMMARY OF HYDROLOGIC CONDITIONS IN THE BIG CYPRESS BASIN

December 2023

SUMMARY

The first half of December continued the trend of a typical winter dry season, followed in the second half by the effects of an El Niño winter with 65% more rainfall on average than the previous December. By definition, during El Niño, trade winds weaken, causing warm water to push back east thus the Pacific jet stream moves south of its neutral position. With this shift, areas in the northern U.S. and Canada are dryer and warmer than usual. But in the U.S. Gulf Coast and Southeast, these periods are wetter than usual.

Yet, despite 43.3" of rainfall, 2023 is one of the lowest annual totals in the period of record, leaving the Basin 14 inches below the typical annual average of 57.2". December's rainfall did, however, lead to a notable increase in canal levels, now well above 90th percentile for this time of year, and are holding steady with the system operated at the top of its ranges subject to water availability.

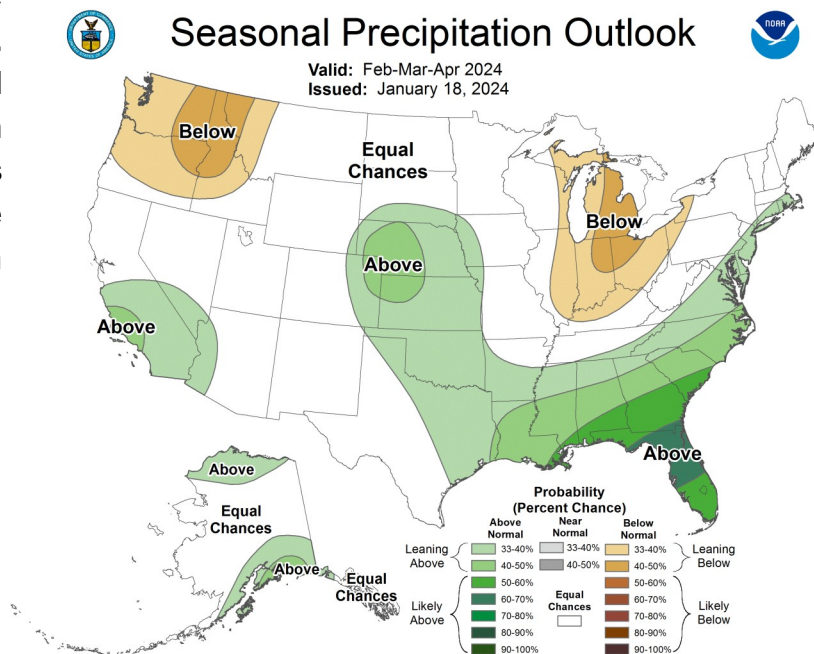


BCB RAINFALL

As measured by twenty-four (24) reporting stations (ref. **Figures 1, 2, Table 1**), the basin-wide monthly average was **2.78 inches (161% of normal)**, well above the long term monthly average **1.73 inches** typically collected.

Based on collected gauge and radar data, the rainfall distribution across the Basin was not very uniform and ranged from 2.1 inches to almost 4.3 inches. **Figure 3a** shows the average rainfall for each of the Basin's watersheds based on gauge adjusted radar. The Cochatchee basin received the highest rainfall with a **2.67 inch** areal average across the watershed and the lowest was the Faka Union basin with **1.99 inches**. The Basin's total areal weighted average rainfall was **2.29 inches**. The month's highest gauge total was collected at the IFAS rain gauge (Site R-14), which received **4.27 inches**. This month's lowest rainfall was recorded DAN HOUSE PRAIRIE (Site R-6), which received **2.07 inches**. The rainfall totals and their locality distribution across the BCB/Lower West Coast are shown on **Figure 3, 3a and 4**.

Looking at what's likely in store for the Basin, the 3-month seasonal outlook indicates an 80-90% chance of above normal precipitation and an equal chance normal temperatures (to right).



at

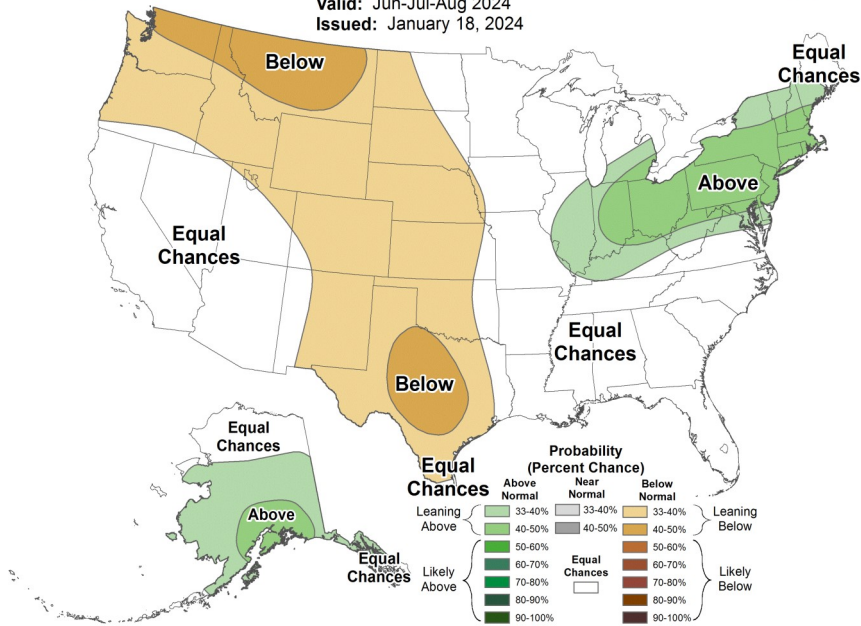
of



Seasonal Precipitation Outlook



Valid: Jun-Jul-Aug 2024
Issued: January 18, 2024



Looking even further into the future, El Nino is expected to weaken this later this spring and transition to neutral which brings equal chances of normal, below, and above rainfall (left).

BCB CANAL SYSTEMS

For the majority of December, the canals were maintained in water conservation mode to hold as much water as possible to promote groundwater recharge. There were no discharges through coastal structures until the December 16th rain event. Water levels increased throughout

most of the system as a result of much-needed rainfall. The majority of the system is currently above the 90th percentile (**Figure 4a**).

- **GOLDEN GATE SYSTEM**

Control structures in the Golden Gate Main canal system were maintained in dry season operations for the month to conserve as much water as possible to promote groundwater recharge. There were no discharges into tidal waters until the December 16th rainfall brought about 2.5 inches to this area within the Basin. The system was transitioned to flood control operations during the rainfall event and then quickly transitioned back to dry season operations. Water levels in the lower and middle reaches, coastal GG1 to GG4 part of the system, are above the 90th percentile (**Figure 5**), whereas the upper reaches, GG5 to GG7, are all above the 75th percentile.

- **COCOCHATCHEE SYSTEM**

All of the control structures in the Cocohatchee and Corkscrew canal systems were maintained in dry season operations for most of the month to conserve as much water as possible and promote groundwater recharge. However, the system was transitioned to flood control operations during the mid-December rainfall event, then transitioned back to dry-season operations. With more rainfall during the holidays and the Cocohatchee basin receiving the Basin's highest rainfall of 2.67 inches, there were minor discharges into tidal waters. Water levels in the Cocohatchee system as well as the Corkscrew system remained elevated for the month and are currently above the 90th percentile (ref **Figure 6A, 6B, & 6C**).

- **FAKA UNION SYSTEM**

The entire Faka Union system was operated in water conservation mode. December's canal levels in FU5 is above the 90th percentile, and both FU1 and FU4S are above the 75th percentile (ref **Figure 7A & 7B**).

- **HENDERSON CREEK SYSTEM**

Water control structures in the Henderson Creek system remained fully closed for December to conserve water and promote groundwater levels. There were no discharges into tidal waters for

December. Canal levels in HC1 and HC2 are above the 75th percentile and 50th percentile, respectively (ref **Figure 8A & 8B**).

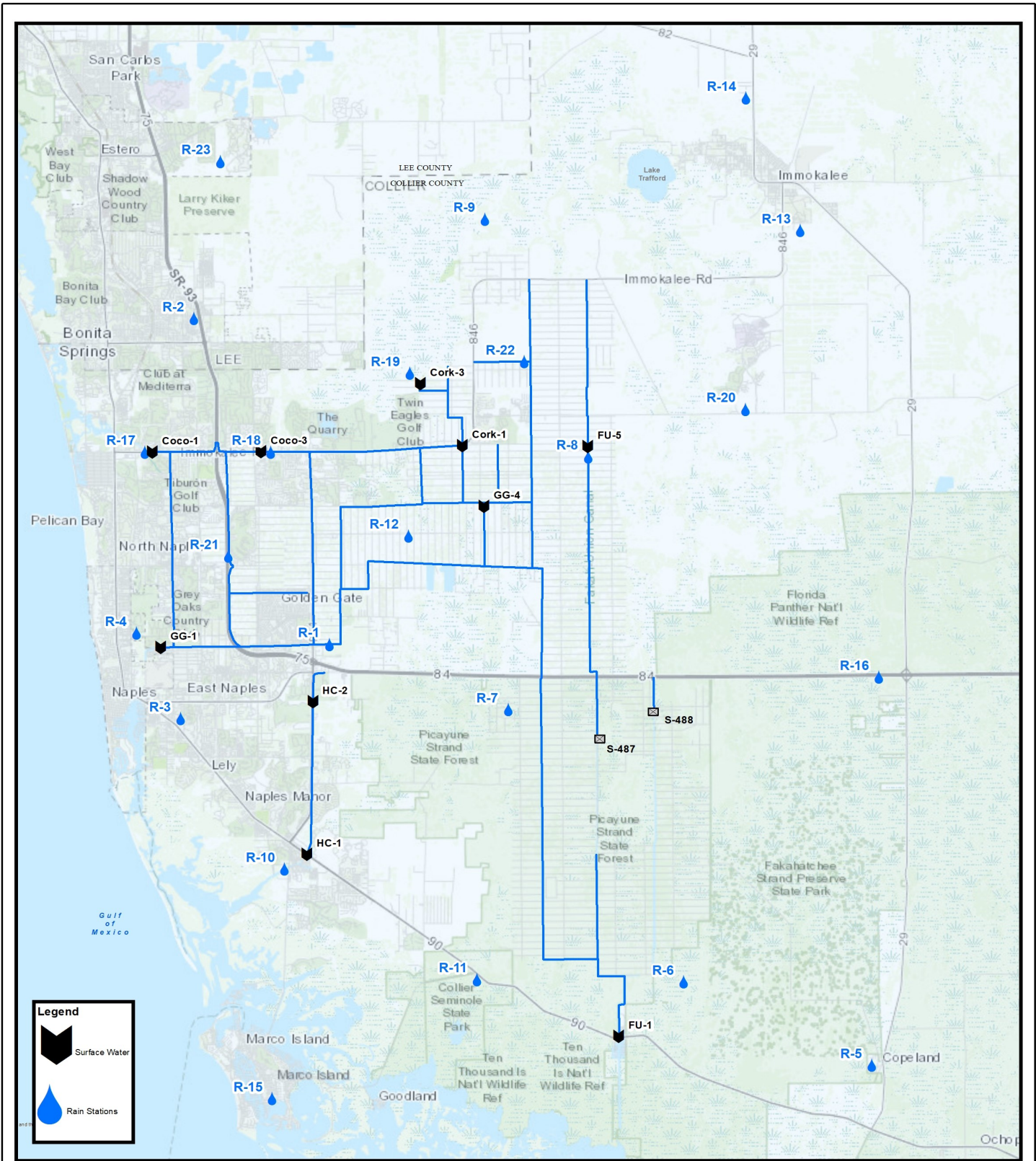
- **CORKSCREW SWAMP**

Figure 10 shows the historical trends for Corkscrew Swamp, Bird Rookery, and the Cork 3 structure and the 2023 corresponding water levels; instead of trending downward as more typical during dry season, these held in December due to the higher-than-normal rainfall. Corkscrew Swamp and Cork 3 are currently above the 90th percentile, with Bird Rookery rising above the 90th percentile by month's end. Lake Trafford water levels remained elevated throughout the month and is currently well above the 75th percentile heading into the new year (**Figure 11**).

Figure 12 and Figure 13 show the locations for Southern Corkscrew (SOCREW) sites 1 through 6, all of which are surface or groundwater monitoring wells, as well as the historical trends for SOCREW1 and SOCREW2. These both saw an increase in groundwater levels, both above the 90th percentile, as compared to last month due to the El Niño rains mid to late December. While SOCREW sites 3, 4, 5 and 6 only have a period of record for approximately 1.5 years, all stations rose in November and December and are closer to typical levels seen during the wet season.

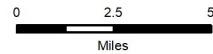
BIG CYPRESS BASIN & LOWER WEST COAST GROUNDWATER LEVELS

While current reporting (01/01/2024) for the Lower West Coast [LWC] groundwater levels are mixed, overall there was an average increase of 0.67, a nominal decrease of 0.02 feet from November. All sites are above the 50th percentile with the exception of C-462 (Immokalee, Lower Tamiami) and C-1224 (Marco lakes, Lower Tamiami) which are above the 90th percentile and C-948R which is below the historic minimum. L-738 (Bonita Springs, Lower Tamiami) recorded the largest increase of 2.21 feet, and C-948R (Golden Gate, Mid Hawthorn) recorded the largest decrease of 1.31 feet (ref. **Table 2, Figure 9**).



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

FIGURE 1

Hydrologic Station Map

Collier County, Florida



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

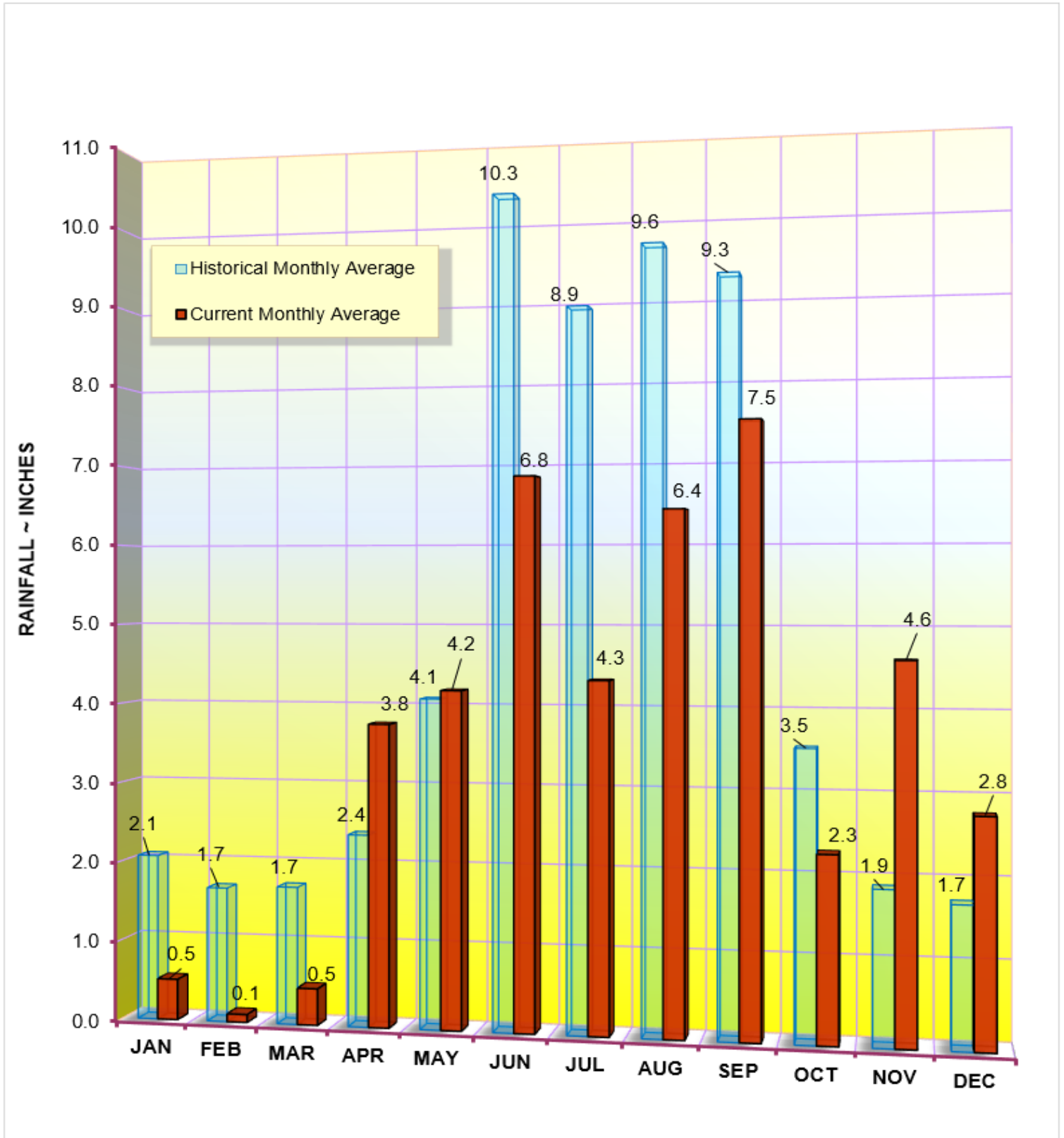
STATION INDEX NO.	STATION NAME	DECEMBER 2023	LONG TERM MONTHLY AVERAGE	MONTHLY DIFFERENCE	CALENDAR YEAR 2023 CUMULATIVE TOTAL	AVERAGE CALENDAR YEAR TO DATE	YEAR TO DATE DIFFERENCE
R-1	GG#3	2.44	1.99	0.45	47.08	66.29	-19.21
R-2	BONITA SPRINGS WATER PLANT	2.98	1.46	1.52	43.87	52.22	-8.35
R-3	COLLIER COUNTY COURTHOUSE	3.78	1.69	2.09	40.77	53.66	-12.89
R-4	FREEDOM PARK	3.09	1.95	1.15	33.41	59.70	-26.29
R-5	FAKAHATCHEE STRAND HQ	2.12	1.56	0.56	41.14	59.64	-18.50
R-6	DAN HOUSE PRAIRIE	2.07	1.48	0.59	46.79	53.02	-6.23
R-7	SGGE WEATHER STATION	3.44	1.49	1.95	52.80	61.70	-8.90
R-8	FAKA UNION #5	2.81	1.86	0.95	47.73	63.99	-16.26
R-9	CORKSCREW SWAMP NORTH END	2.86	1.59	1.27	48.47	51.79	-3.32
R-10	ROOKERY BAY HQ	3.01	1.73	1.28	35.48	56.37	-20.89
R-11	COLLIER SEMINOLE STATE PARK	2.62	1.72	0.90	43.14	57.53	-14.39
R-12	G.G. FIRE STATION	2.75	1.67	1.08	44.65	59.31	-14.66
R-13	IMMOKALEE LANDFILL	2.20	1.51	0.69	40.97	52.94	-11.97
R-14	IFAS	4.27	1.55	2.72	54.43	50.51	3.92
R-15	MARCO R.O. PLANT	3.36	1.67	1.69	35.24	53.56	-18.32
R-16	FAKAHATCHEE STRAND NORTH END	2.74	1.96	0.78	55.87	60.57	-4.70
R-17	COCO#1	2.70	1.69	1.01	34.32	49.83	-15.51
R-18	COCO#3	2.24	1.79	0.45	40.10	56.79	-16.69
R-19	BIRD ROOKERY	2.70	2.18	0.52	47.73	64.00	-16.27
R-20	AVE MARIA	2.08	1.58	0.50	37.49	54.24	-16.75
R-21	I75W2	2.65	2.43	0.23	40.74	62.85	-22.11
R-22	GG#7	2.33	1.95	0.38	43.18	60.17	-16.99
R-23	FPWX	2.48	1.34	1.14	40.82	54.75	-13.93
R-24	DSOTO10	2.93	New Site	New Site	New Site	No Historical Data	

AVERAGES	2.78	1.73	1.05	43.31	57.19	-13.88
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FIGURE 2

BCB GAUGE RAINFALL MONTHLY AVERAGES THROUGH DECEMBER 2023

BCB 2023 Rainfall - 43.3"
BCB Average Rainfall - 57.2"
Deficit 13.9" - 75% of Average



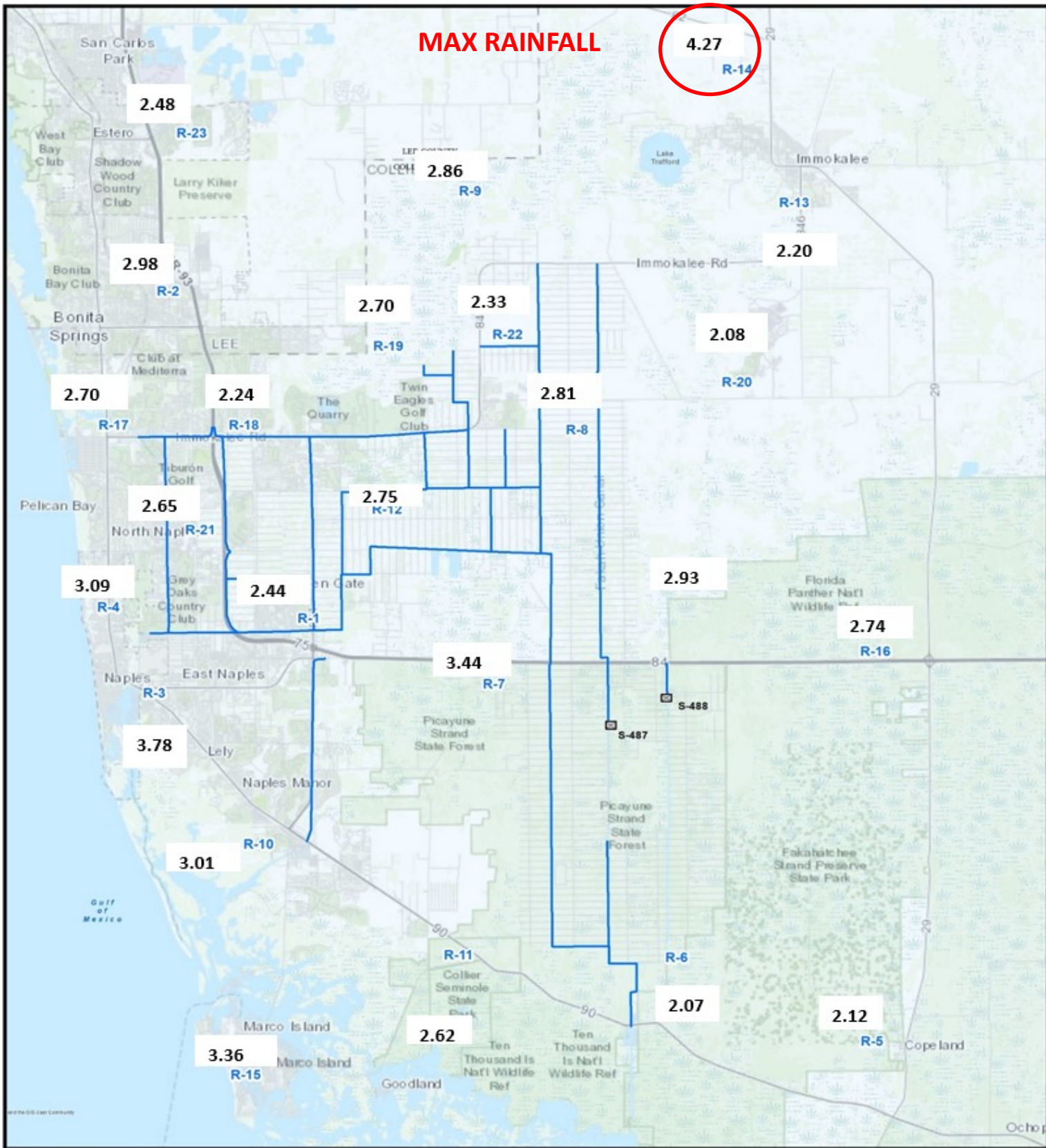
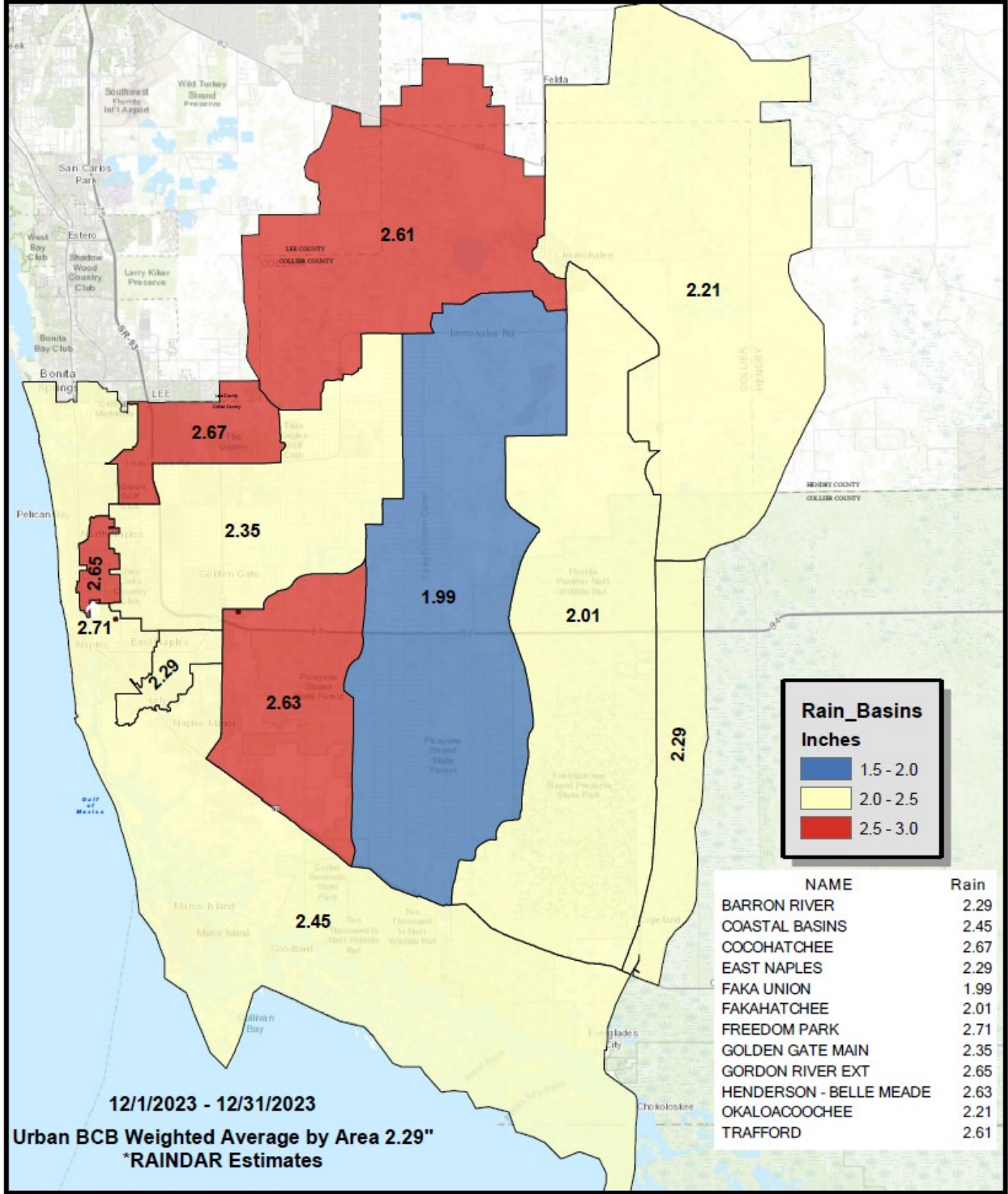


FIGURE 3
BCB RAINFALL DISTRIBUTION
DECEMBER 2023

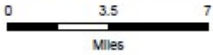


Rain_Basins
Inches

- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0

NAME	Rain
BARRON RIVER	2.29
COASTAL BASINS	2.45
COCOHATCHEE	2.67
EAST NAPLES	2.29
FAKA UNION	1.99
FAKAHATCHEE	2.01
FREEDOM PARK	2.71
GOLDEN GATE MAIN	2.35
GORDON RIVER EXT	2.65
HENDERSON - BELLE MEADE	2.63
OKALOACOOCHEE	2.21
TRAFFORD	2.61

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*Rainfall estimates based on gauge adjusted radar



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BCB RAINFALL
SPATIAL DISTRIBUTION

Urban Collier County, Florida



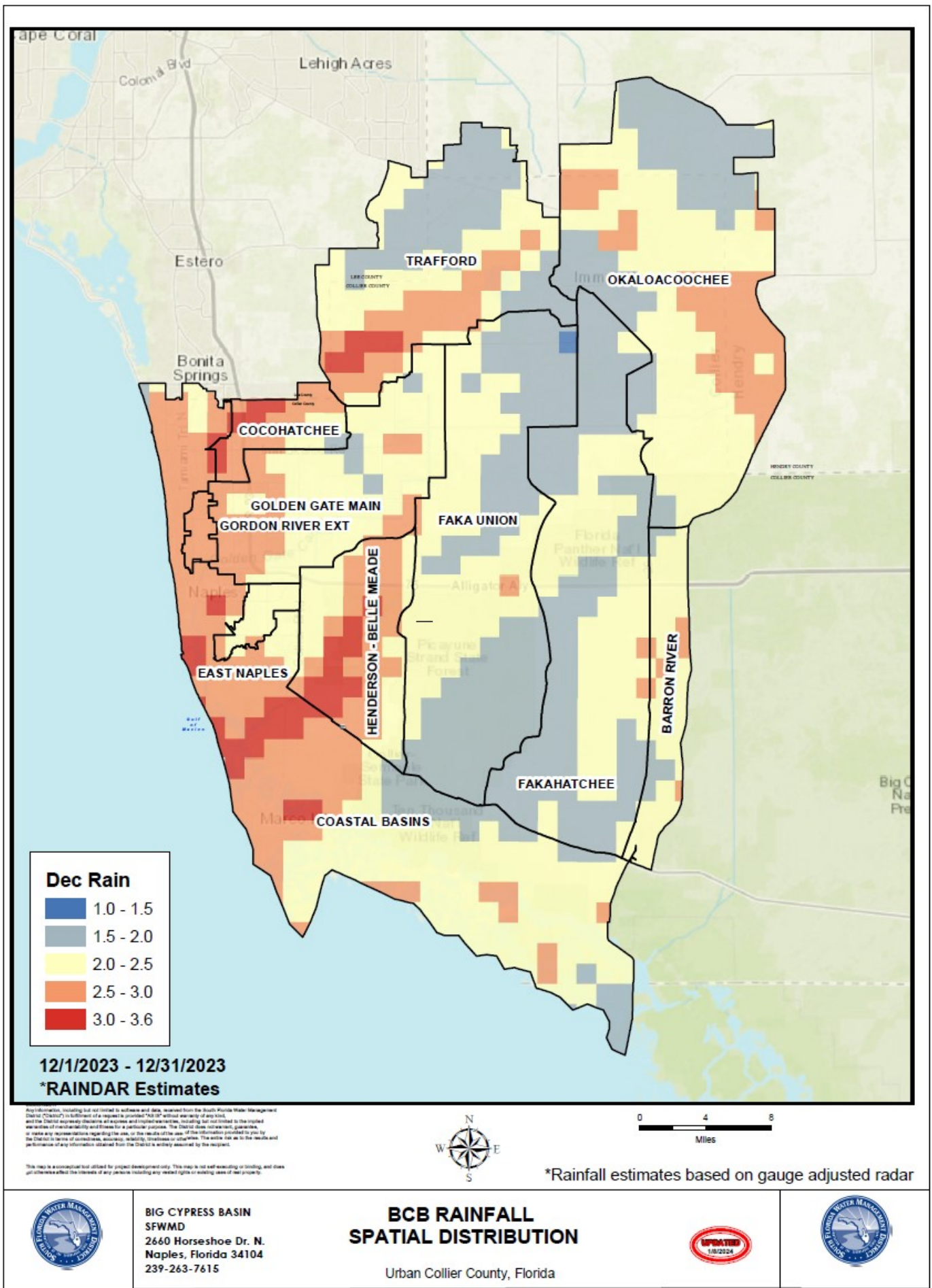
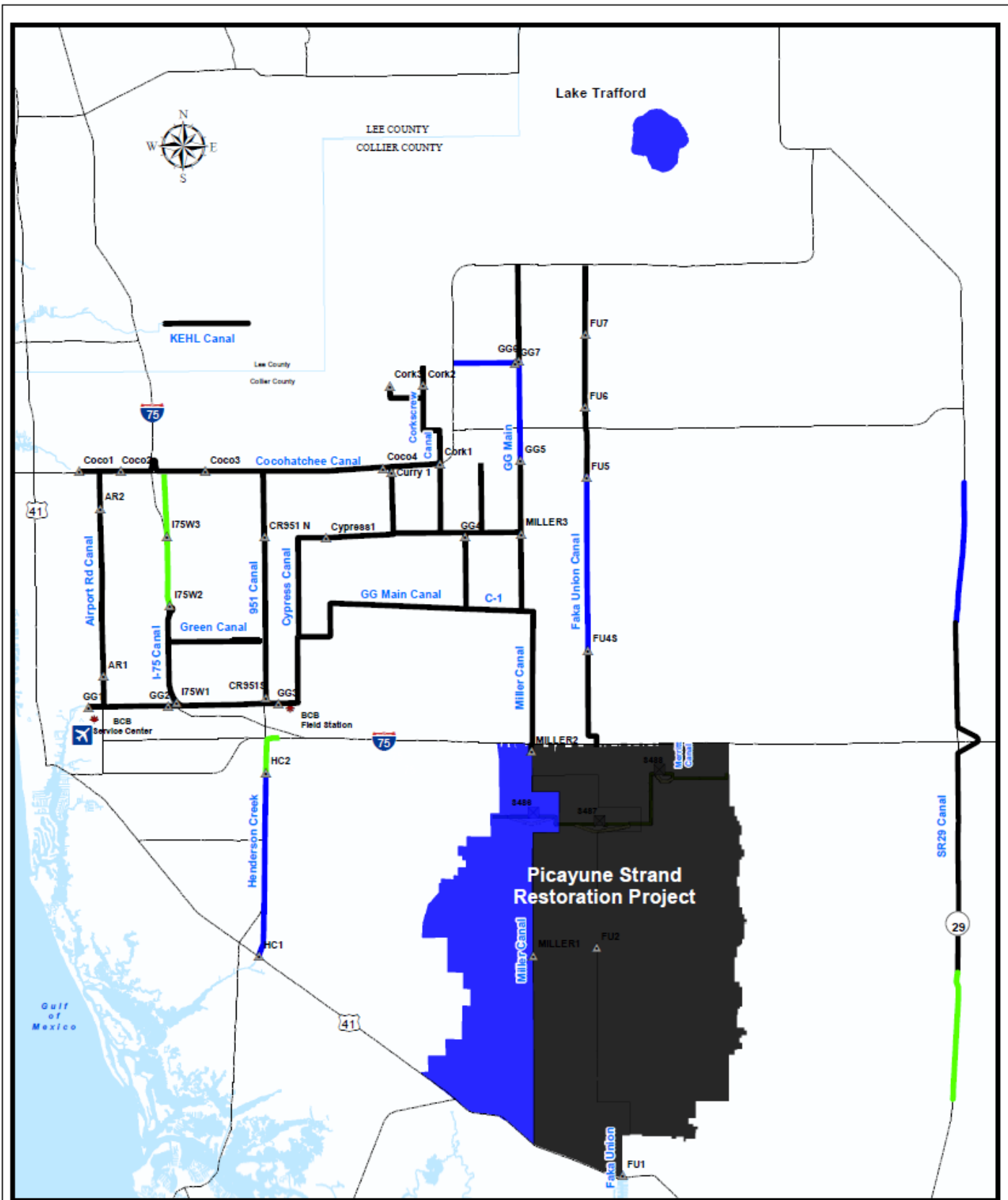


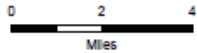
FIGURE 4



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Percentile Classes				
● < 10	● 10 - 24	● 25 - 75	● 76 - 90	● > 90



* Based on period of record for each canal reach



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BCB Conditions Index
 12/31/23
 Urban Collier County, Florida



FIGURE 4A

Figure 5 Golden Gate Canal Historic Average Daily Headwater Percentiles

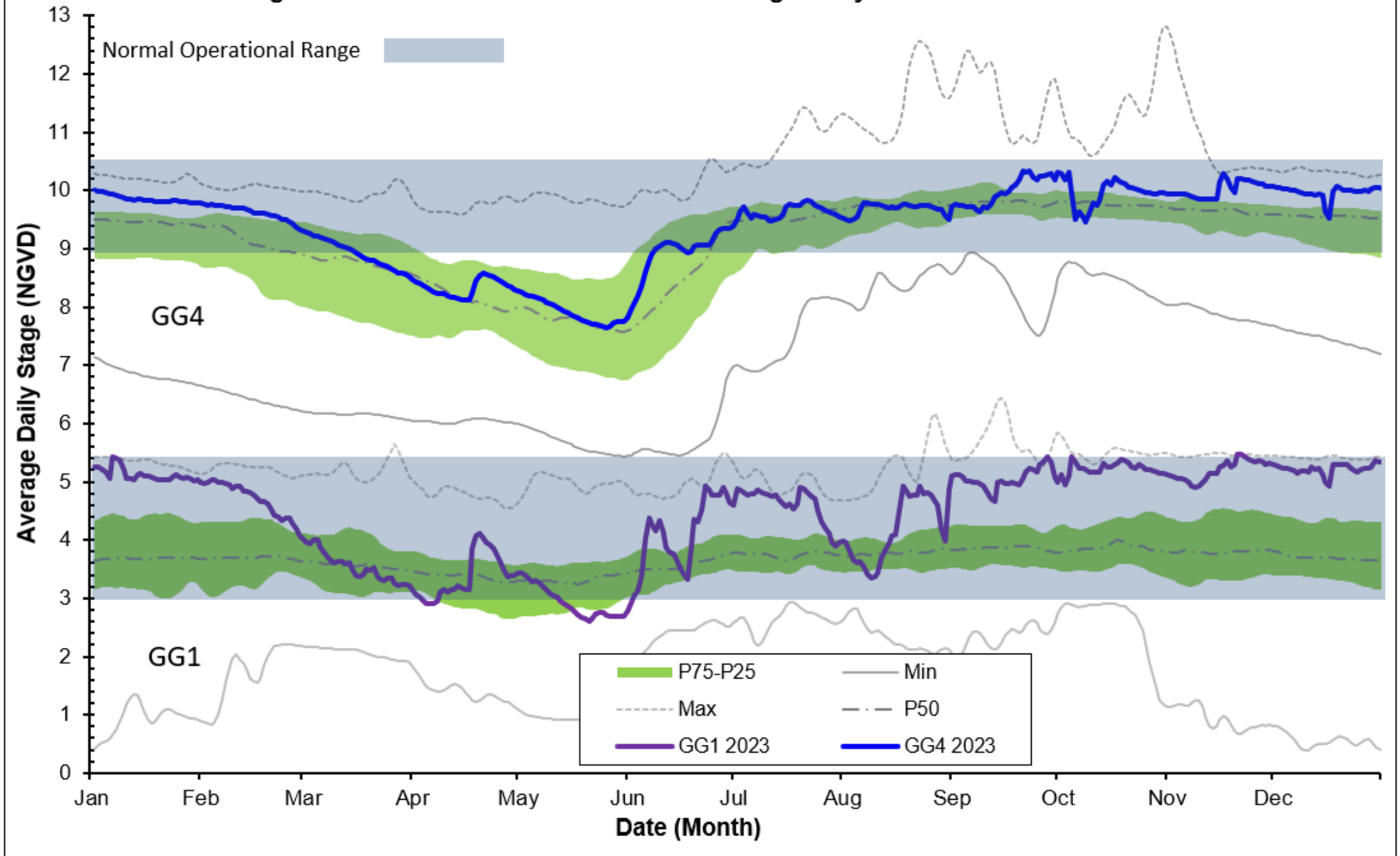


Figure 6A Cocohatchee Canal Historic Average Daily Headwater Percentiles

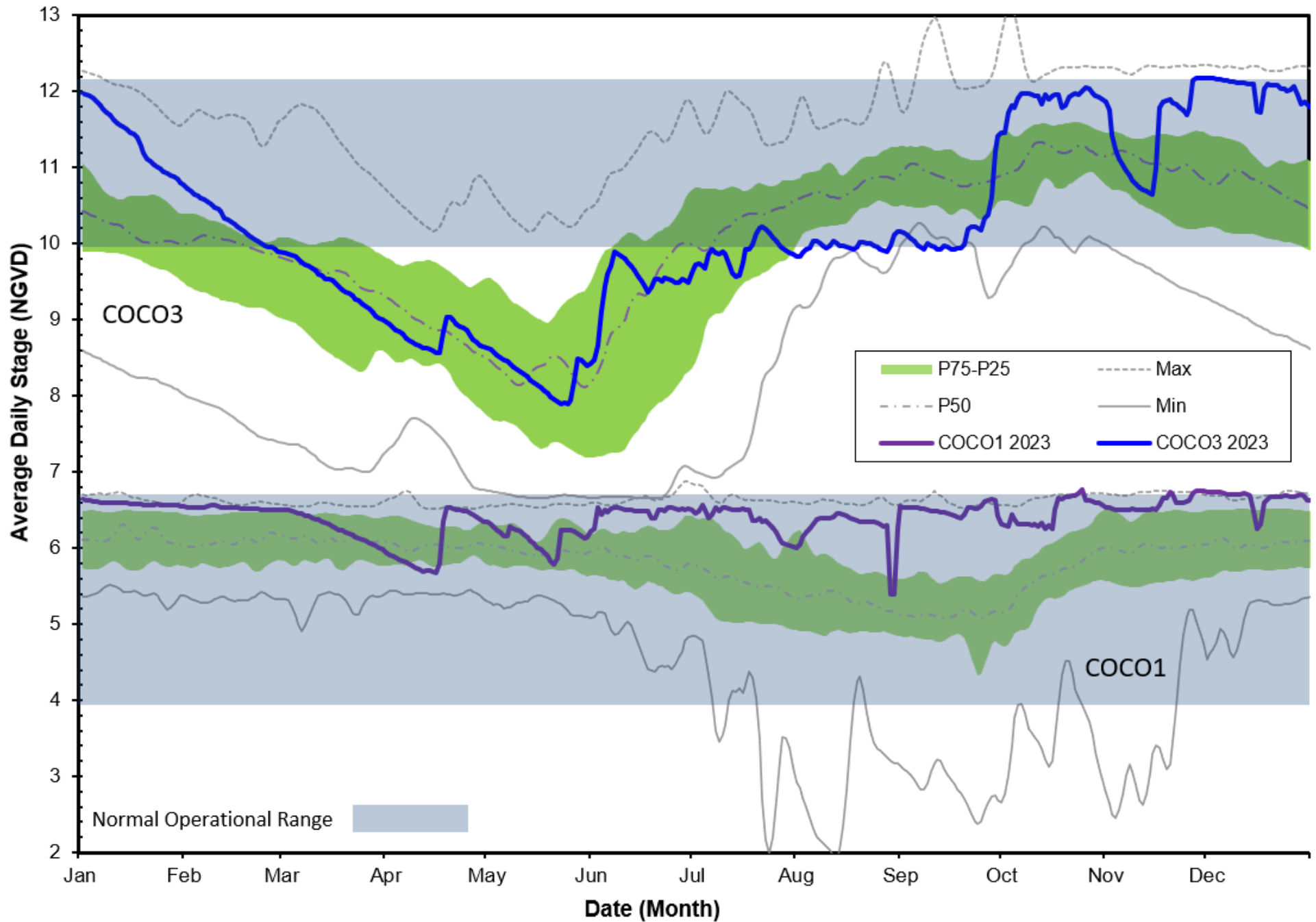


Figure 6B - CORK1 Historic Daily Headwater Percentiles (1989 - 2022)

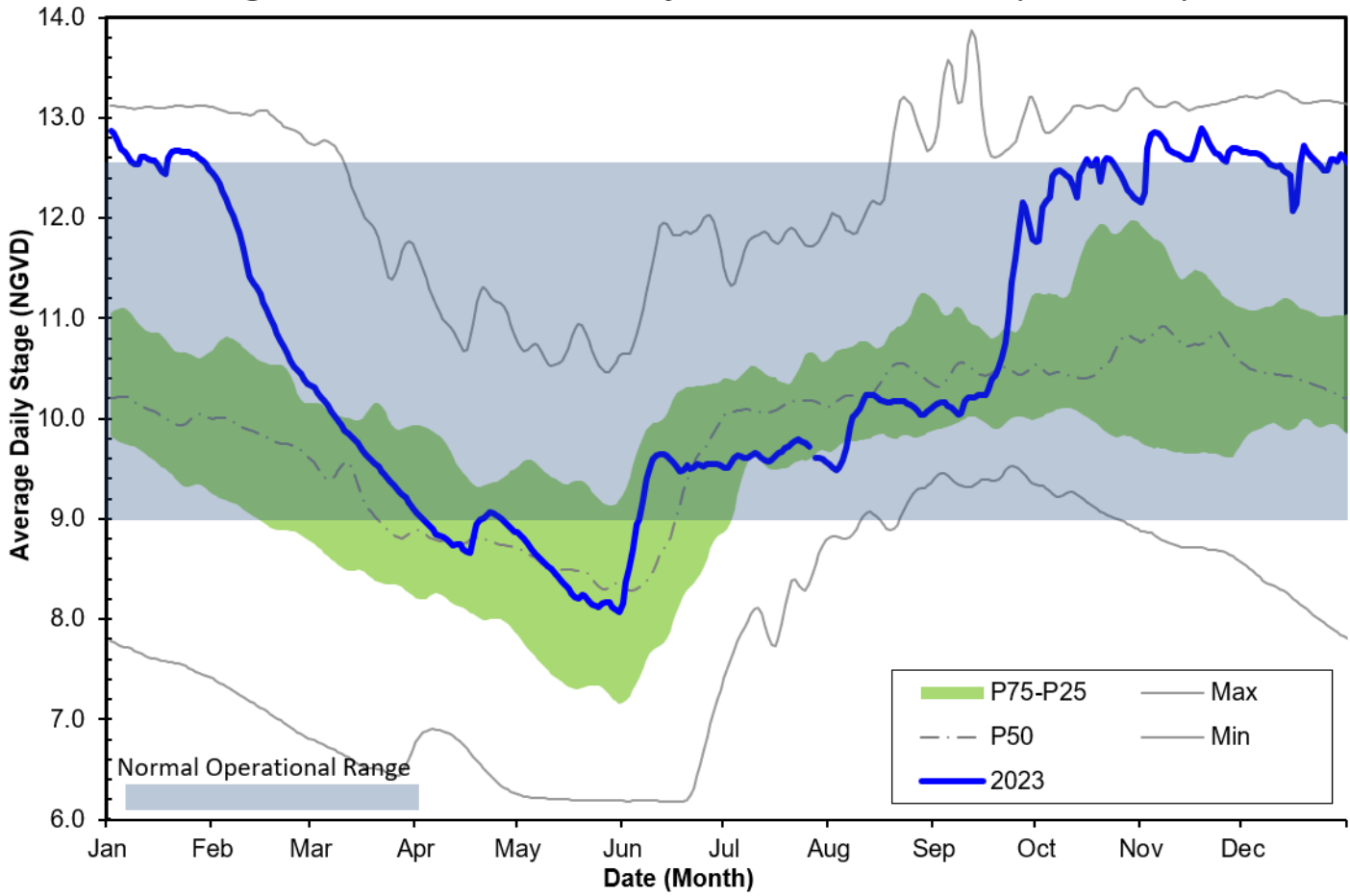


Figure 6C - CORK3 Historic Daily Headwater Percentiles (2004 - 2022)

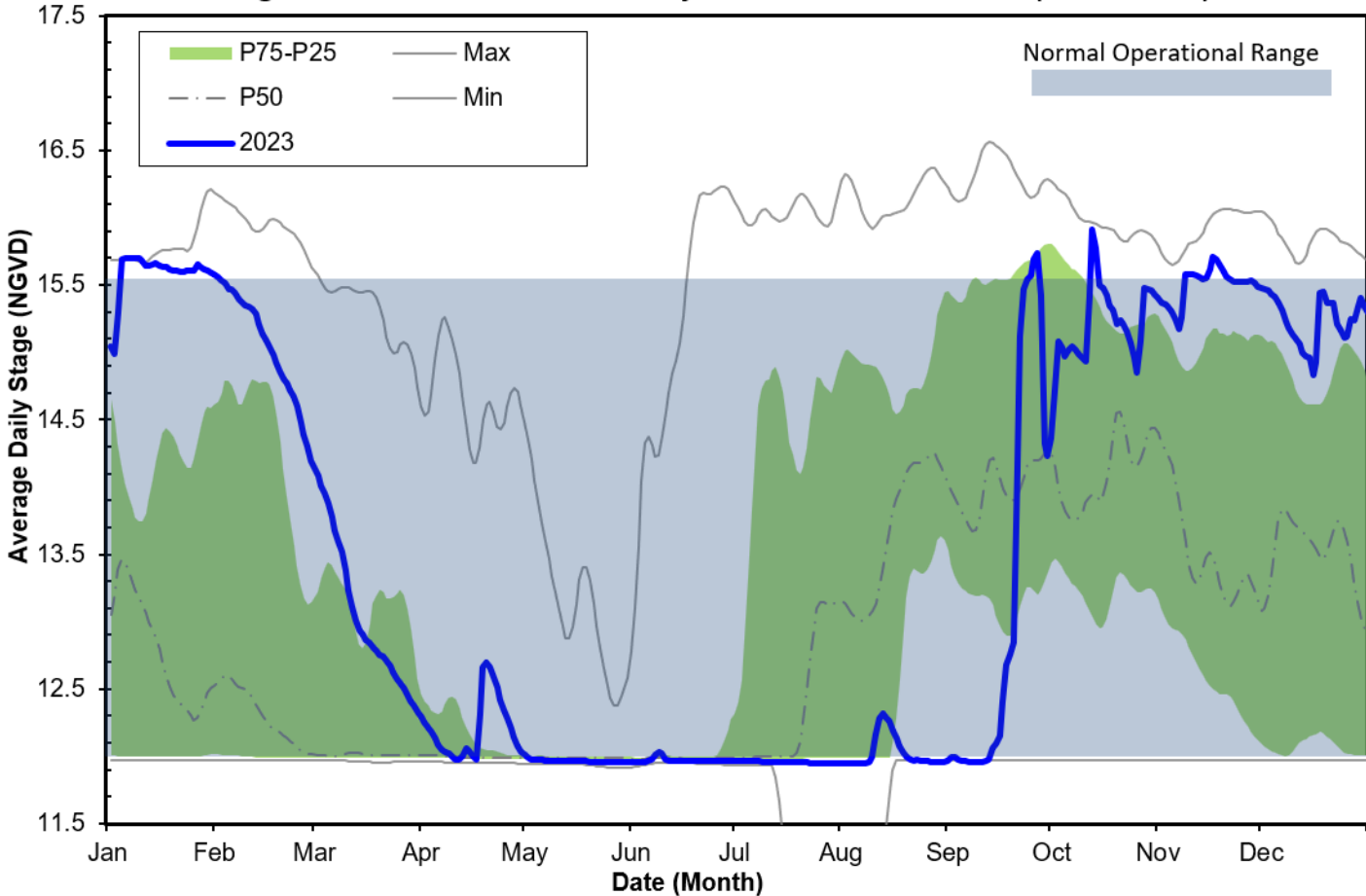


Figure 7A Faka Union Canal Historic Average Daily Headwater Percentiles

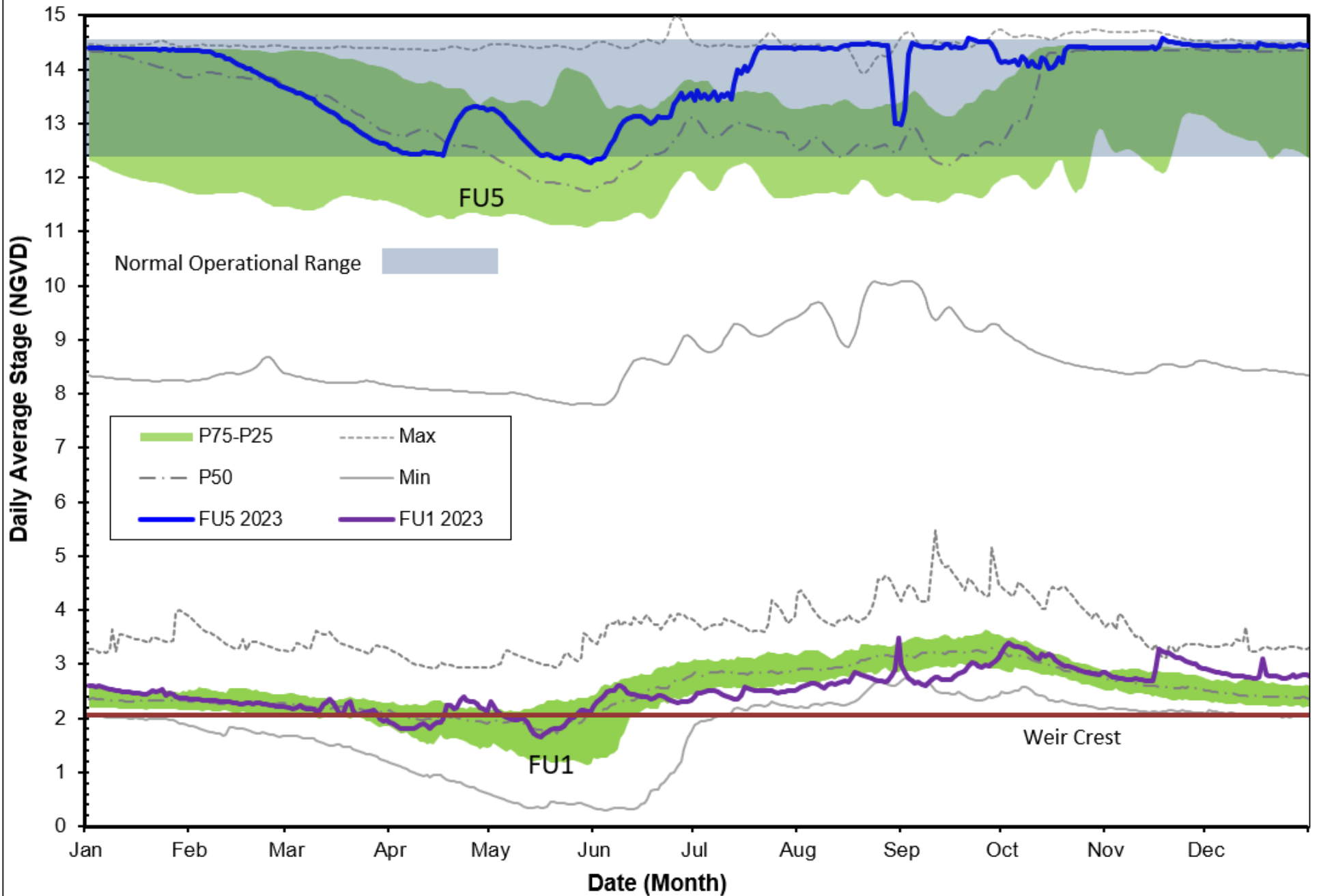


Figure 7B FU4S Historic Average Daily Water Percentiles

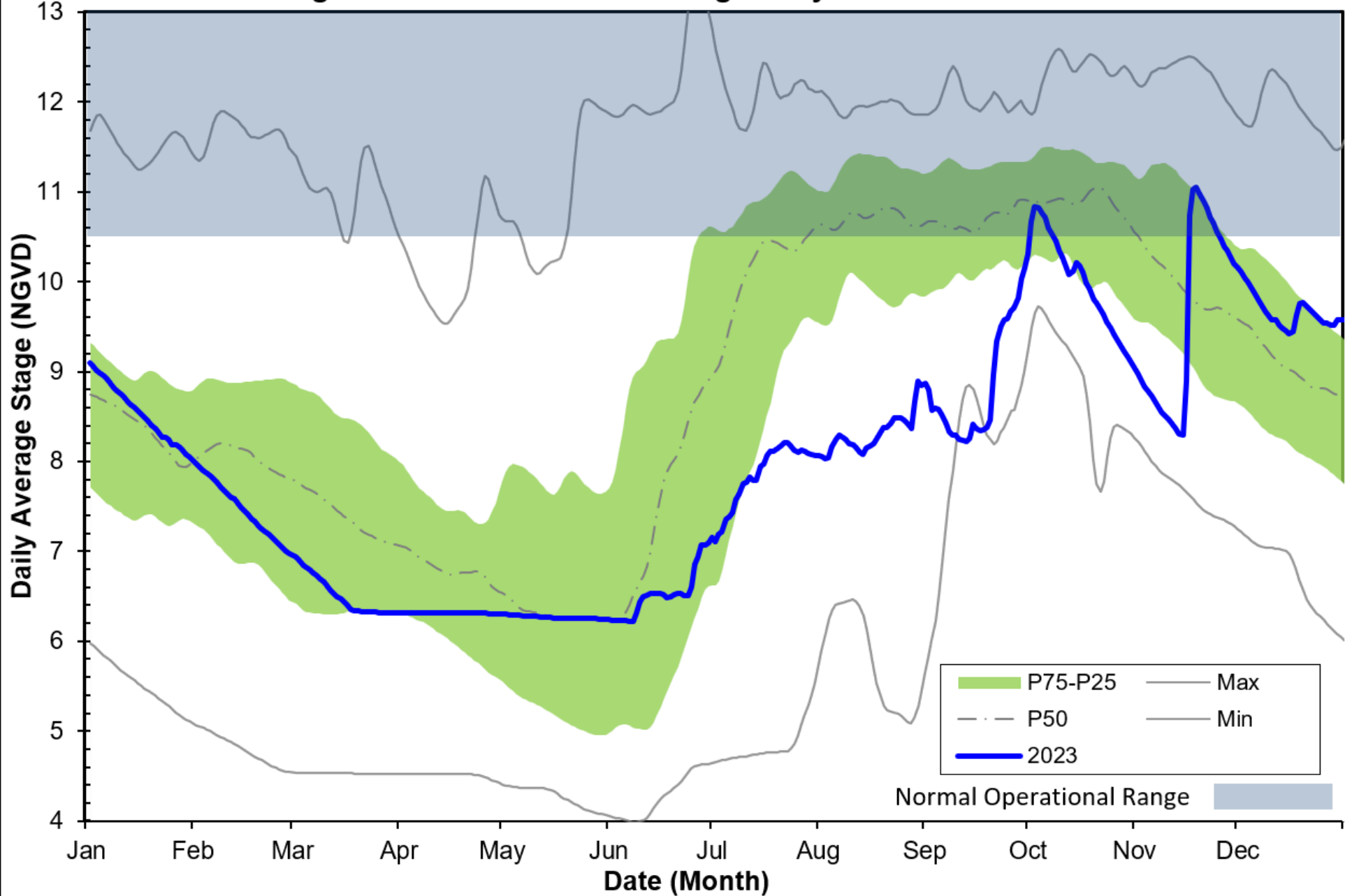


Figure 8A HC1 Historic Average Daily Headwater Percentiles

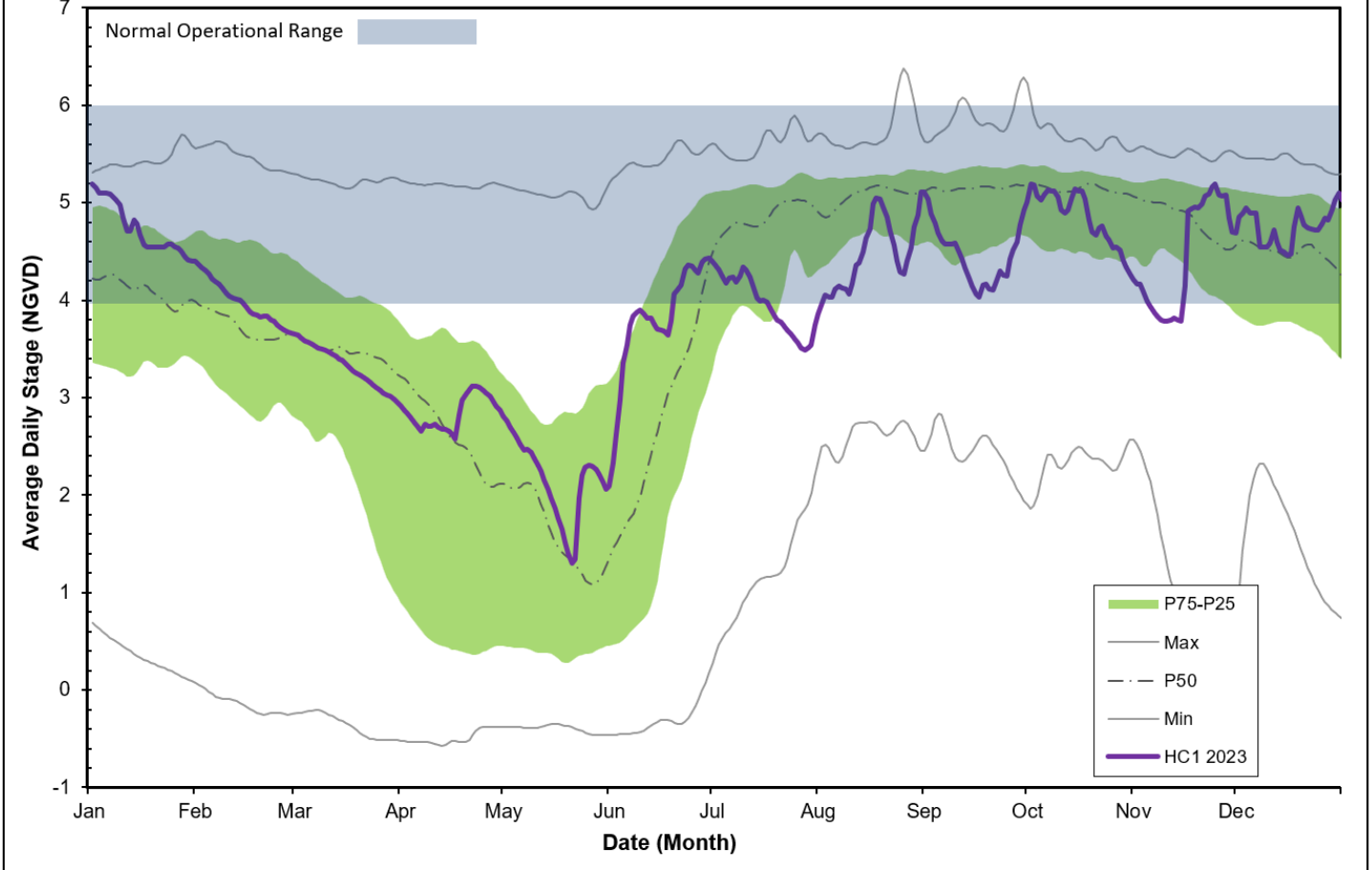
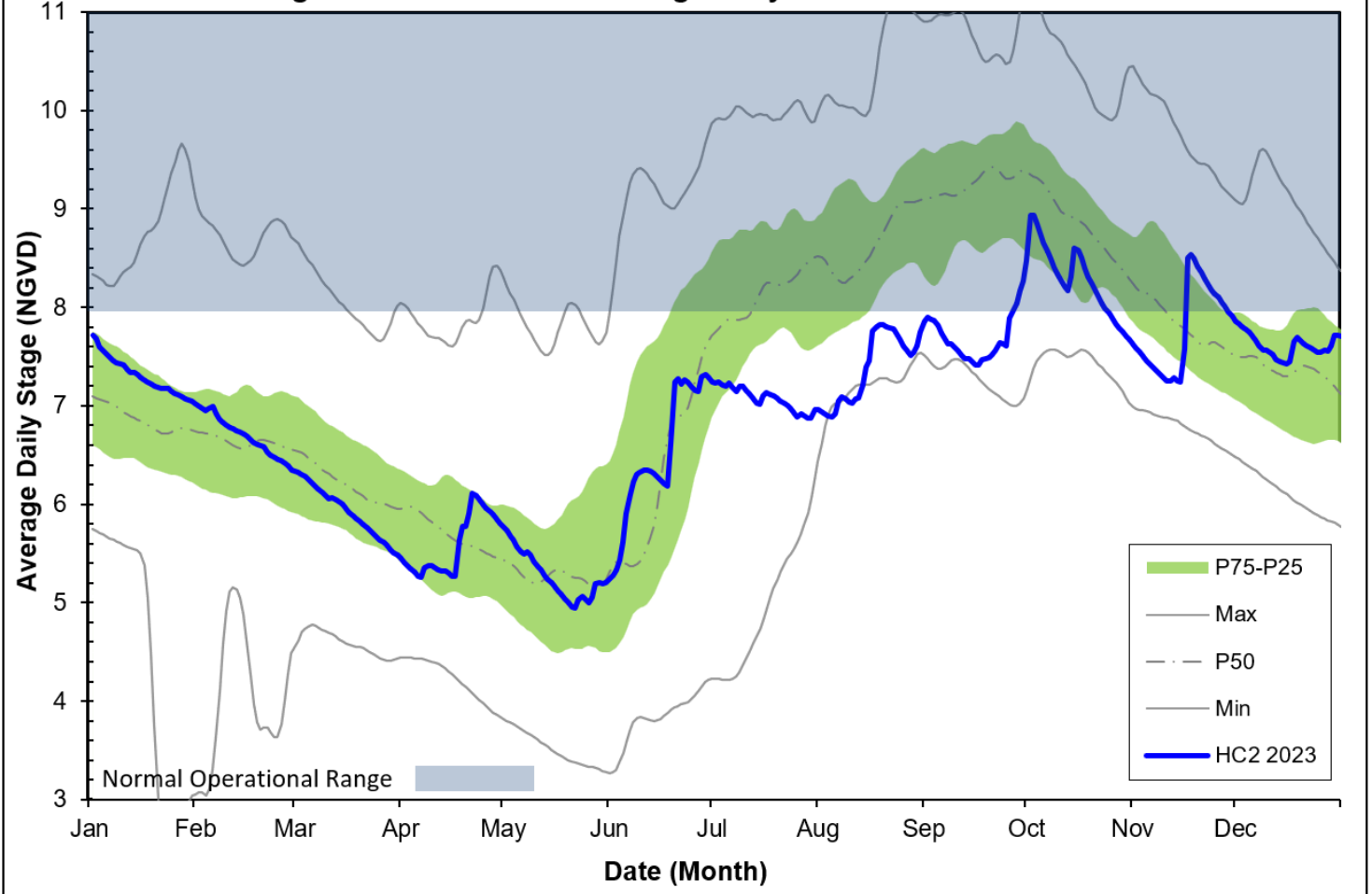


Figure 8B HC2 Historic Average Daily Headwater Percentiles



WATER CONDITIONS SUMMARY - December 2023

SELECTED STATIONS for BCB AREA / SW FLORIDA

Last Reading Date :		January 1, 2024					
Previous Period Reading Date:		November 30, 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	-0.07	34.39	34.32	↓	GREEN
C-1004R	Naples	Lower Tamiami Aquifer	1.42	1.88	3.30	↑	GREEN
C-1224	Marco Lakes	Lower Tamiami Aquifer	0.55	3.73	4.28	↑	GREEN
C-948R	Golden Gate	Mid Hawthorn Aquifer	-1.31	29.85	28.54	↓	
C-951R	Golden Gate	Lower Tamiami Aquifer	-0.45	4.73	4.28	↓	
L-2194	Bonita Springs	Sandstone Aquifer	1.18	4.31	5.49	↑	GREEN
L-2195	Bonita Springs	Surficial Aquifer System	-0.15	10.62	10.47	↓	GREEN
L-738	Bonita Springs	Lower Tamiami Aquifer	2.21	-0.63	1.58	↑	GREEN

**TABLE 2
BCB WATER CONDITIONS SUMMARY
DECEMBER 2023**

BIG CYPRESS BASIN

DECEMBER 2023

GROUNDWATER LEVEL DAILY TRENDS COMPARED TO HISTORICAL AVERAGE

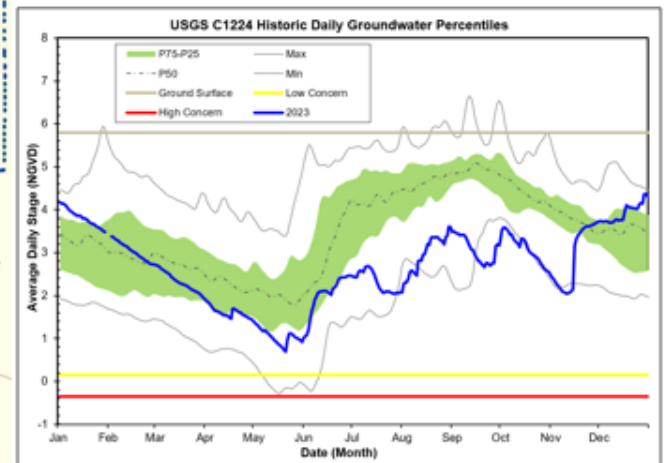
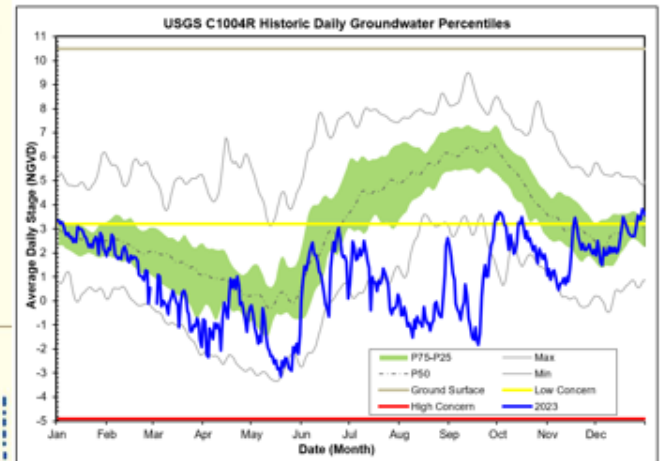
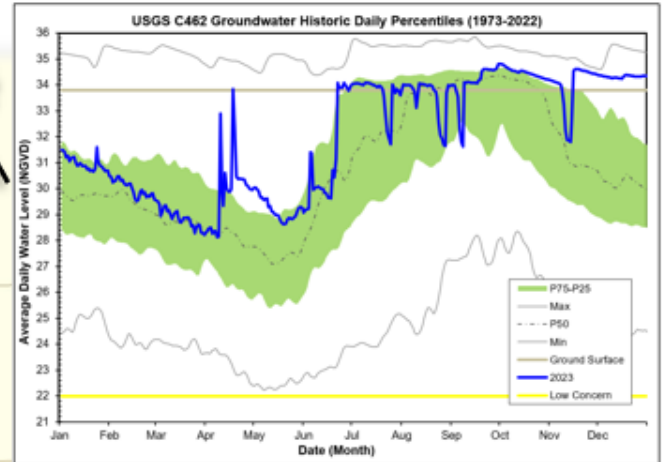
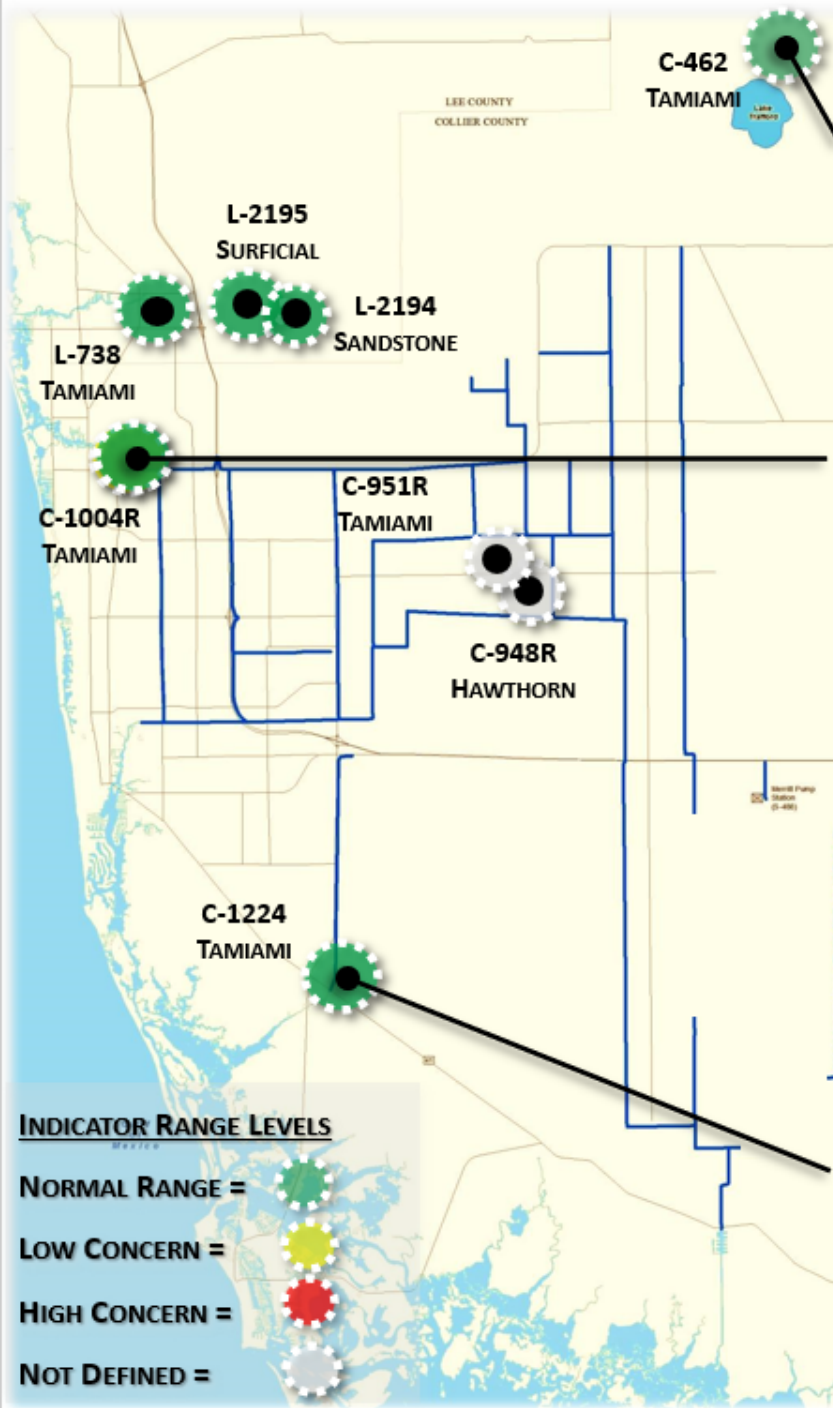
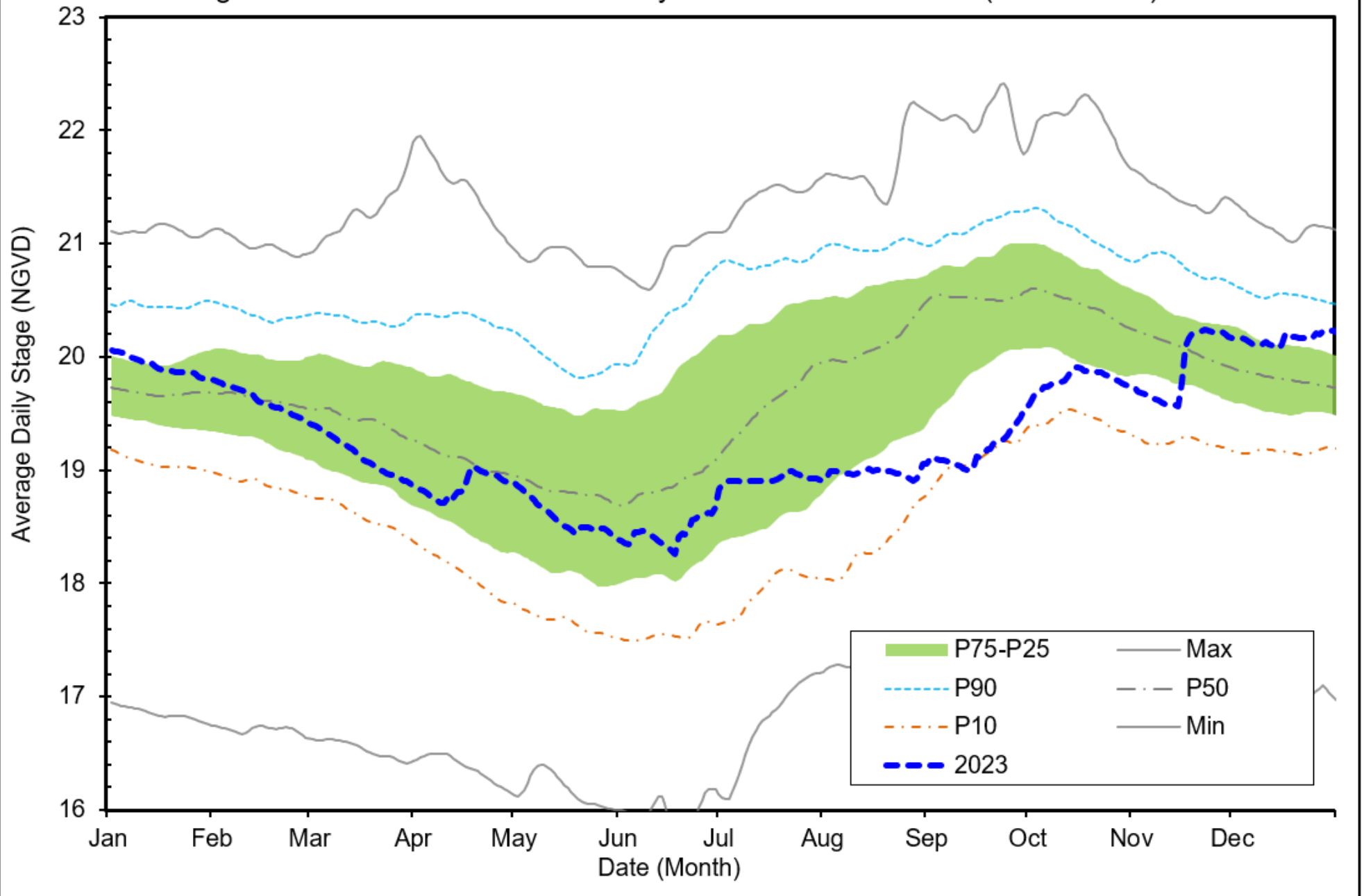


FIGURE 9

Figure 11 Lake Trafford Historic Daily Headwater Percentiles (1941 - 2022)



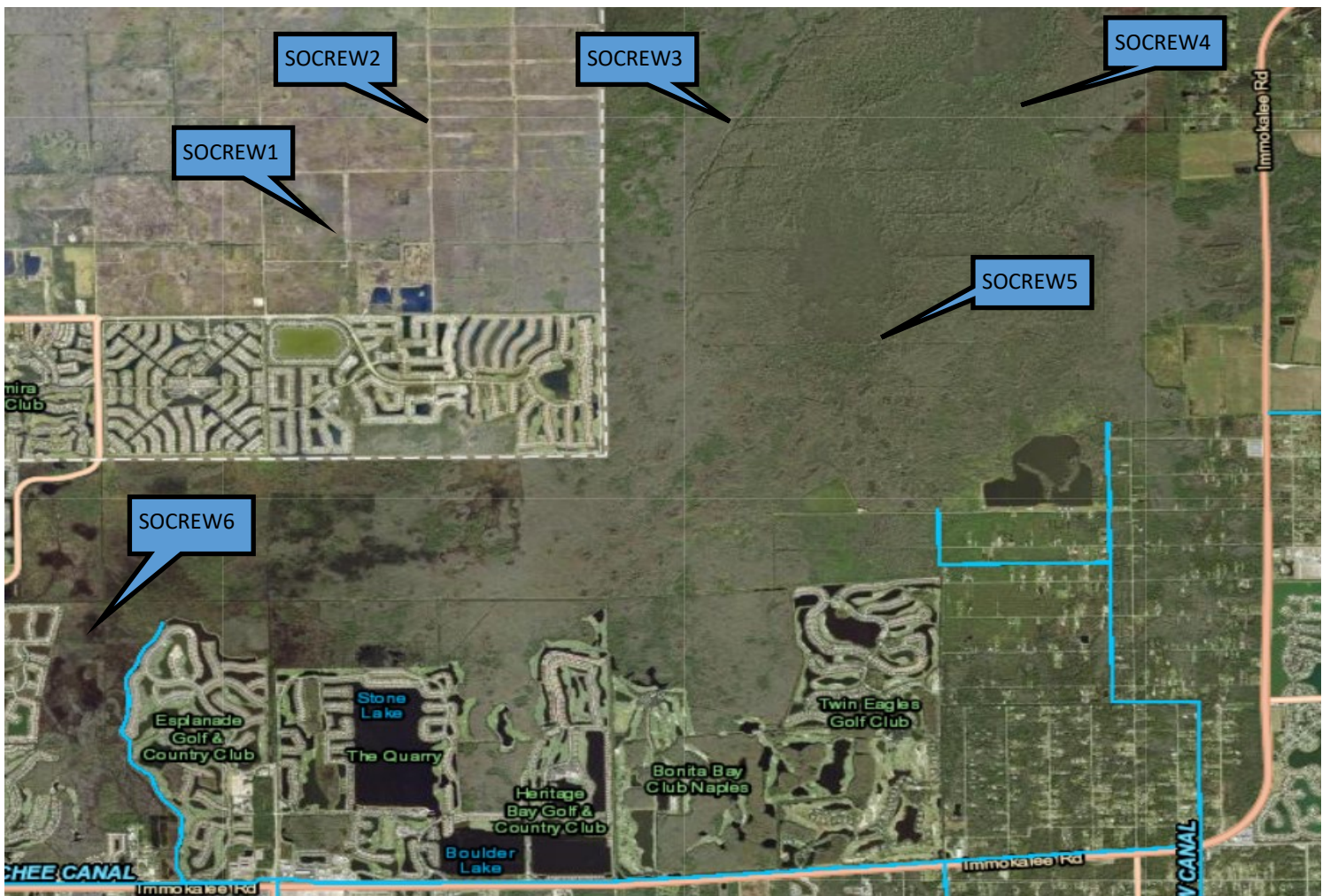
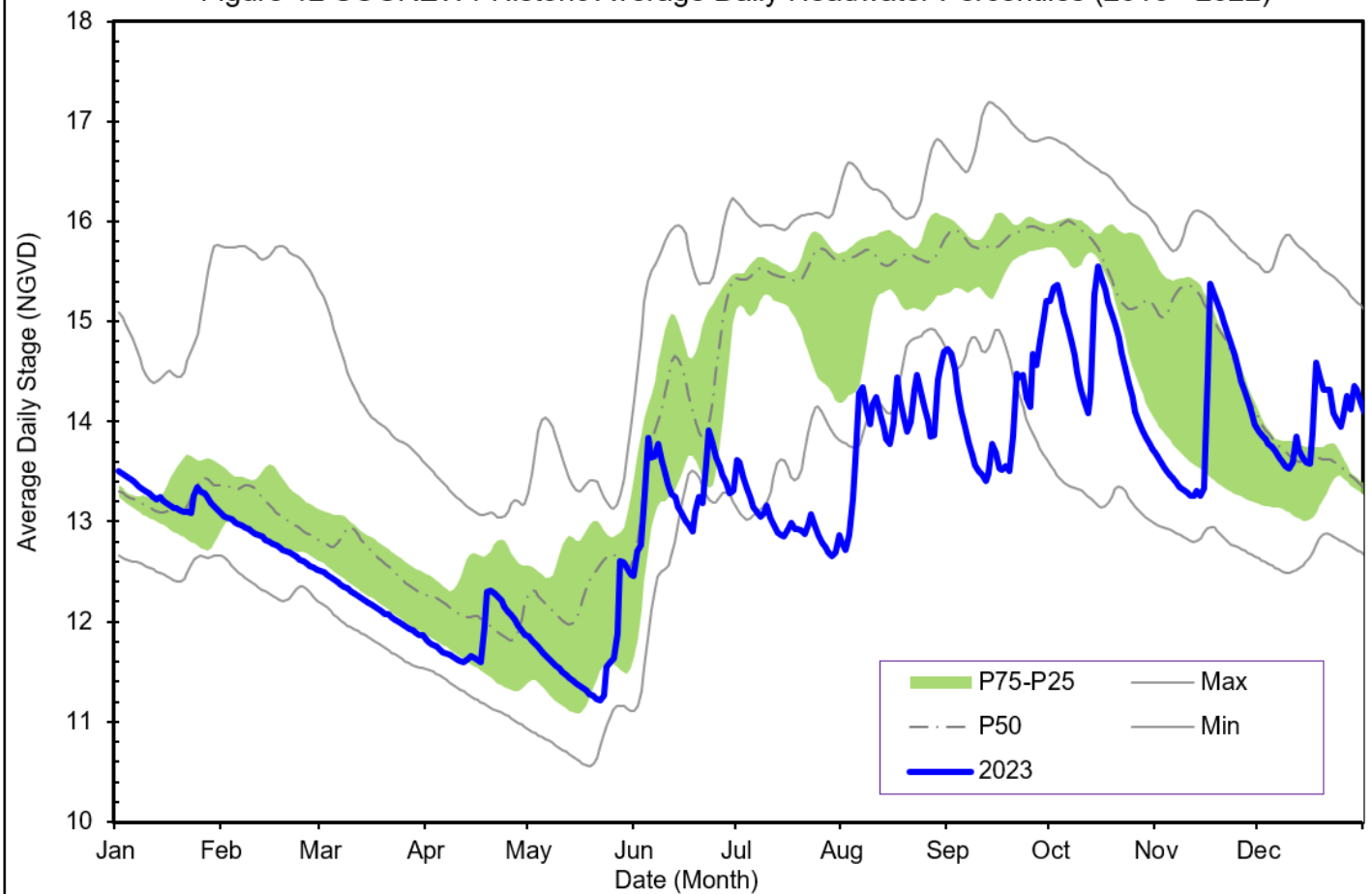


Figure 12 SOCREW1 Historic Average Daily Headwater Percentiles (2016 - 2022)



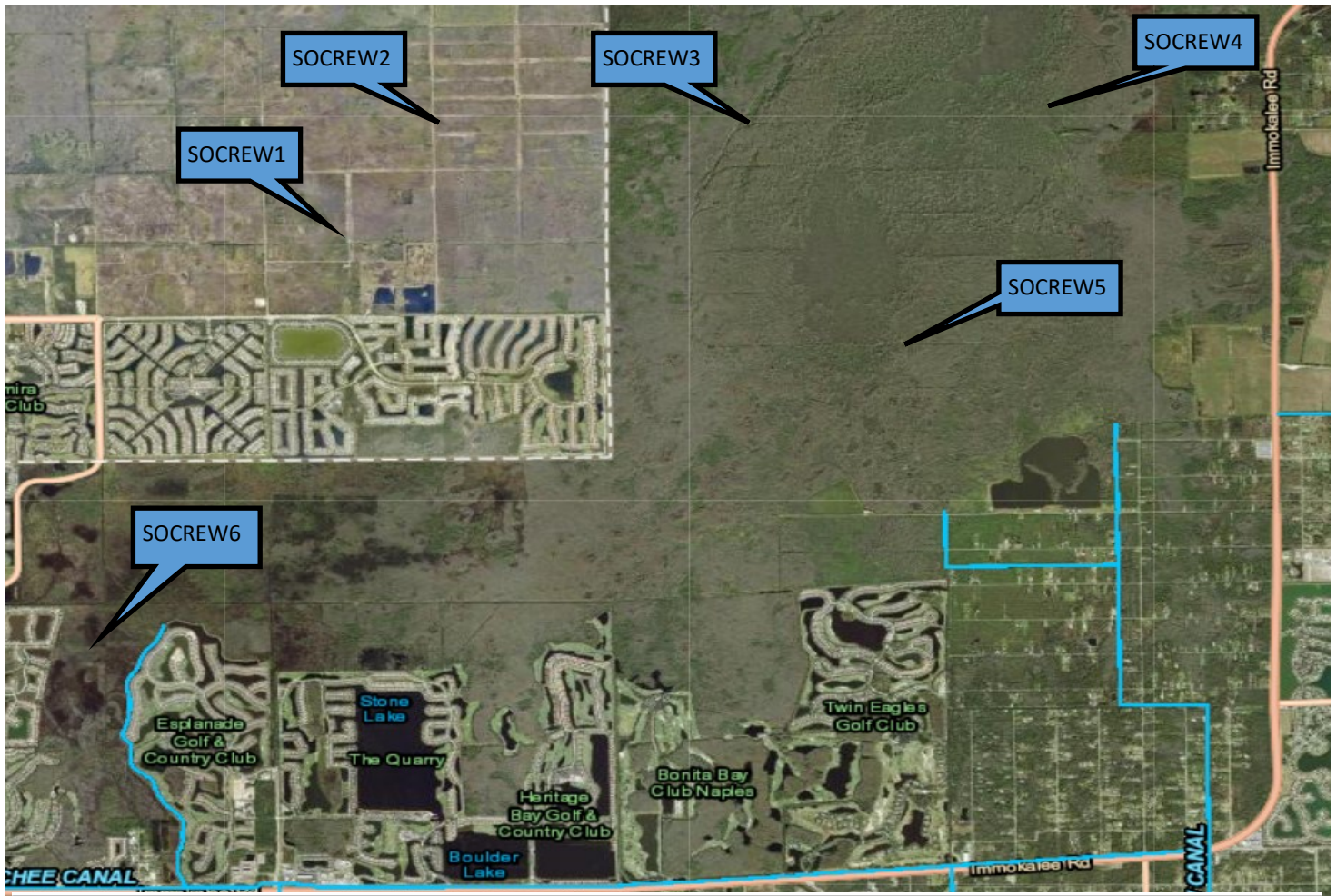


Figure 13 SOCREW2 Historic Average Daily Headwater Percentiles (2016 - 2022)

