

JUNE 2024

BIG CYPRESS BASIN HYDROLOGIC REPORT



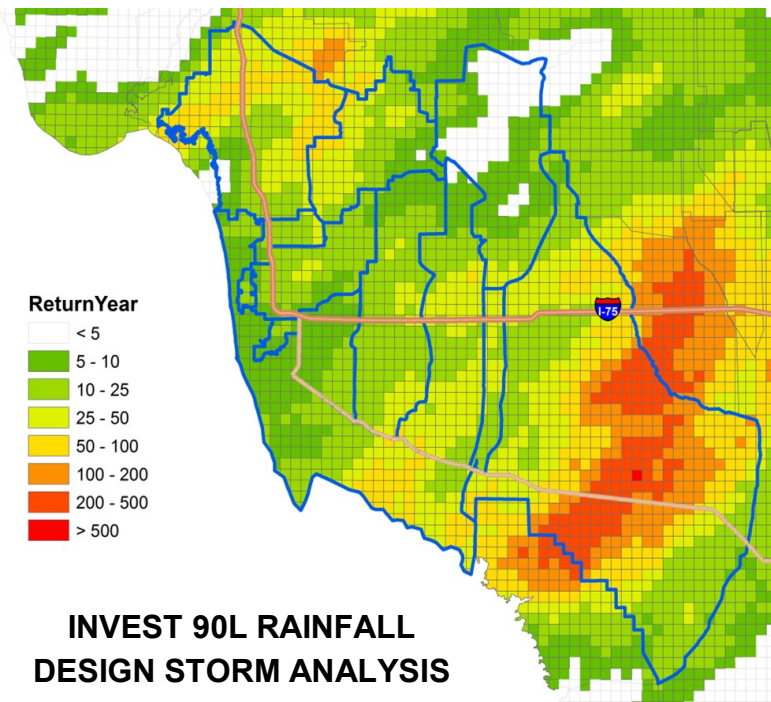
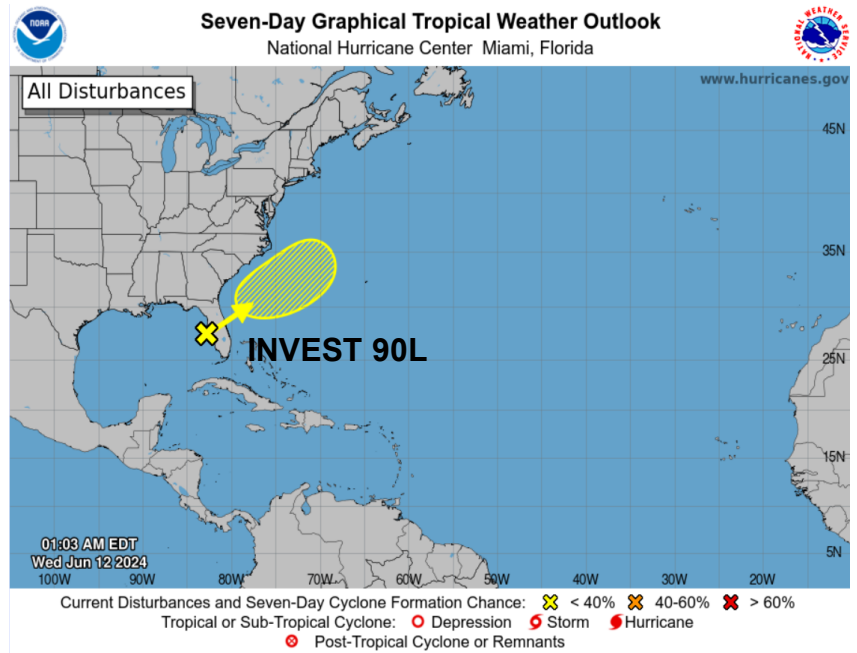
SUMMARY OF HYDROLOGIC CONDITIONS IN THE BIG CYPRESS BASIN

June 2024

SUMMARY

June was one of the warmest and wettest months on record for the Big Cypress Basin (BCB). The first week of June started with below-average rainfall and abnormally dry conditions, as reported by the U.S. Drought Monitor. However, the second week of June experienced record-breaking rainfall due to a surge of tropical moisture, which was named Invest 90L (90L) by the National Hurricane Center (see below).

90L, was an elongated area of low pressure that made its way through the state with the effects of the system lasting from June 10th to June 14th in the BCB. The storm system brought with it 11.2-inches of rainfall in 3-days (based on rain gauge data). The average rainfall for the entire month of June is 10.5-inches and the BCB received more than the monthly total within 3-days. According to the District daily rainfall records for the Southwest Coast (Lee County and Collier County), the 90L event, which experienced heavy rainfall over a 3-day period, ranked 3rd, 4th and 5th out of the top 10 wettest days in June. However, looking at the top 10 wettest 3-days on record for all months for the Southwest Coast, this event is ranked as the wettest on record.

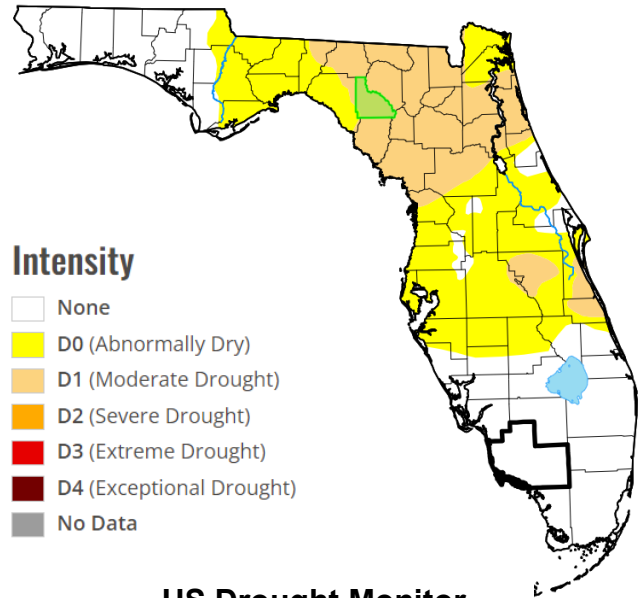


The District also evaluated the average design storm for this event. A design storm is the statistical likelihood of a rainfall event occurring in a given year. These storms, or precipitation frequencies, are site-specific and based on historical precipitation observations, serving as standards for designing infrastructure and assessing flood hazards. It was determined that 90L exceeded a 25-year, 3-day storm based on BCB rain gauges. The highest concentration of rainfall was recorded at the Fakahatchee Strand rain gauge, indicating a 73-year, 3-day storm. The lowest return interval was at the Rookery Bay rain gauge, which experienced approximately a 10-year, 3-day storm. The maximum rainfall amounts based on radar accumulated totals were also evaluated for the design storm and ranged from a

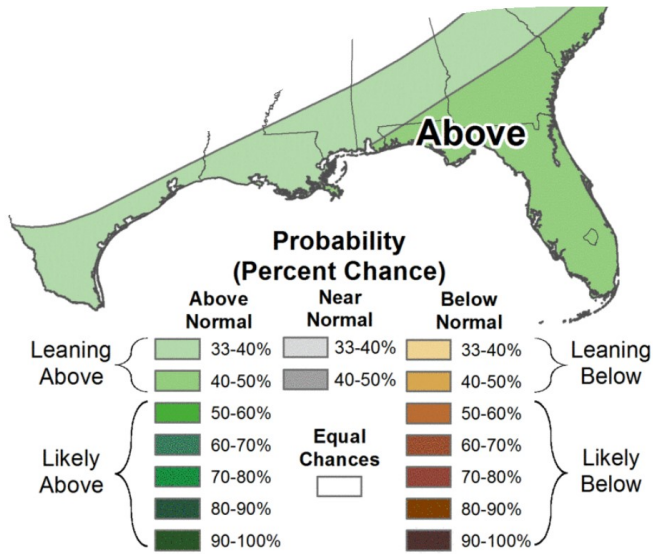
10-year, 3-day storm (>9.26-inches) in the East Naples basin to a 500-year, 3-day storm (>21.4-inches) in the East Collier basin (see left). Additional rainfall analyses are included in Appendix A.

Forecasts for 90L were sent out well in advance for water control operations to quickly transition the

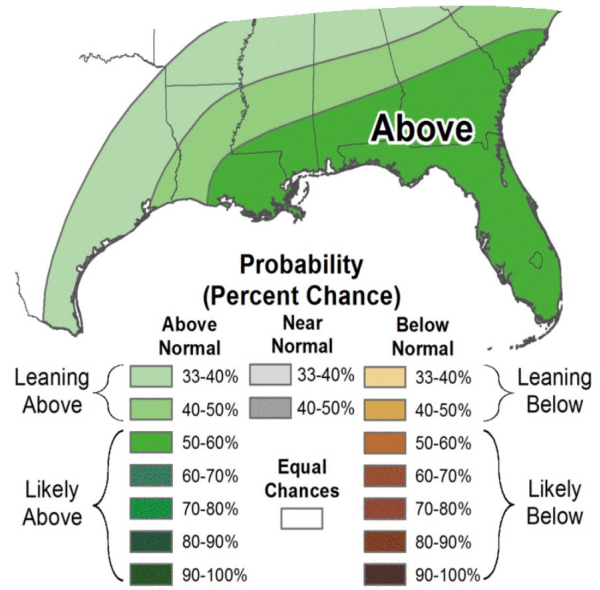
system from water conservation operations (dry-season) to full flood control operations. A pre-storm drawdown was initiated starting on June 9th ahead of the extreme rainfall forecast. The abnormally dry conditions that persisted through April and May allowed the BCB system to accommodate additional storage brought on by the extreme rainfall event. Alternatively, if groundwater conditions had been fully -saturated as is typical during wet season, a large majority of rainfall would have contributed directly to run-off and potentially leading to flooding in vulnerable areas. However, since the storm was the first of the season, groundwater conditions were either near historic minimums or around the 25th percentile (not fully-saturated). This helped the system perform effectively, with no over-topping of banks, flooding or water elevations exceeding operational levels with the exception of GG2 which crested above operational levels by 6-inches briefly.



US Drought Monitor



July 2024



July– Sep 2024

By the end of the month, June received a total of 17.3-inches of rainfall (171% of normal), which is the 3rd highest rainfall amount for the period of record at the BCB since 1990, surpassing the monthly average of 10.1-inches and the drought status changed to none (no drought) according to the U.S. Drought Monitor (see top right).

Based on the National Weather Service's 30-day forecast, there is a 40-50% chance of above normal precipitation through August (see above left). The temperature outlook for the next 30 days indicates a 60-70% likelihood of above-average temperatures. Additionally, the 3-month projection for the Basin predicts a 50-60% of above-normal precipitation (see above right) and 60-70% above normal temperature.

BCB RAINFALL

As measured by twenty-four (24) reporting stations (ref. **Figures 1, 2, Table 1**), the basin-wide monthly average was **17.3 inches (171% of normal)**, which is above the 10.1 inch average typically collected.

Based on collected gauge data, the rainfall distribution across the Basin varied from 13.41 inches to 21.91 inches. The month's highest gauge totals were collected at G.G. Fire Station (Site R-12) which received **21.91 inches**. This month's lowest rainfall was recorded at Ave Maria (Site R-20), which received **13.41 inches**. **Figure 3a** shows the average rainfall for each of the Basin's watersheds based on gauge adjusted radar. The East Naples basin received the highest rainfall with a **17.71 inch** areal average across the watershed and the lowest was the Okaloacoochee basin with about **13.40 inches**. The Basin's total areal weighted average rainfall was **15.73 inches**. 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 during the beginning of the month due to dry conditions, however on June 9th, water operations were quickly transitioned into flood control operations and a pre-storm drawdown in which all structures were opened in preparation for 90L. As the month ended, all of the BCB canals were above the 25th percentile with the exception of some reaches in the Golden Gate Main canal system that were above the 10th percentile due to flood control operations (**Figure 4a**).

- **GOLDEN GATE SYSTEM**

Control structures in the Golden Gate Main canal system were briefly operated in water conservation mode for the first week of June due to the drier than normal conditions. However, in anticipation of the extreme rainfall event, 90L, the entire Golden Gate system was quickly moved into flood control operations to allow for additional capacity in the system. Prior to 90L, there were no discharges through coastal structure GG1, and the average discharges for June typically total 17,000 acre-feet. During and after 90L, discharges for the month totaled 44,400 acre-feet, which is more than 2.5 times the average monthly volume discharged. Currently canal water levels for the Golden Gate system are all above the 10th percentile (ref **Figure 5A & 5B**).

- **COCOATCHEE SYSTEM**

The entire Cocohatchee system was operated in water conservation mode at the beginning of June but quickly transitioned to flood control operations in response to 90L. Like other coastal structures, discharges were negligible prior to 90L. Similarly to other coastal structures, discharges were negligible leading up to 90L. The monthly total discharge through COCO1 was 7,200 acre-feet, which is significantly higher than the June average of 1,700 acre-feet. Levels in the Cocohatchee system are all above the 25th percentile for the end of June (ref **Figure 6A, 6B, 6C, & 6D**).

- **FAKA UNION SYSTEM**

The entire Faka Union system was operated in water conservation mode the first week of June and in preparation for 90L the system was quickly moved into flood control operations. Post 90L, the system was still maintained in flood control operations and water levels are currently above the 25th percentile (ref **Figure 7A & 7B**).

- **HENDERSON CREEK SYSTEM**

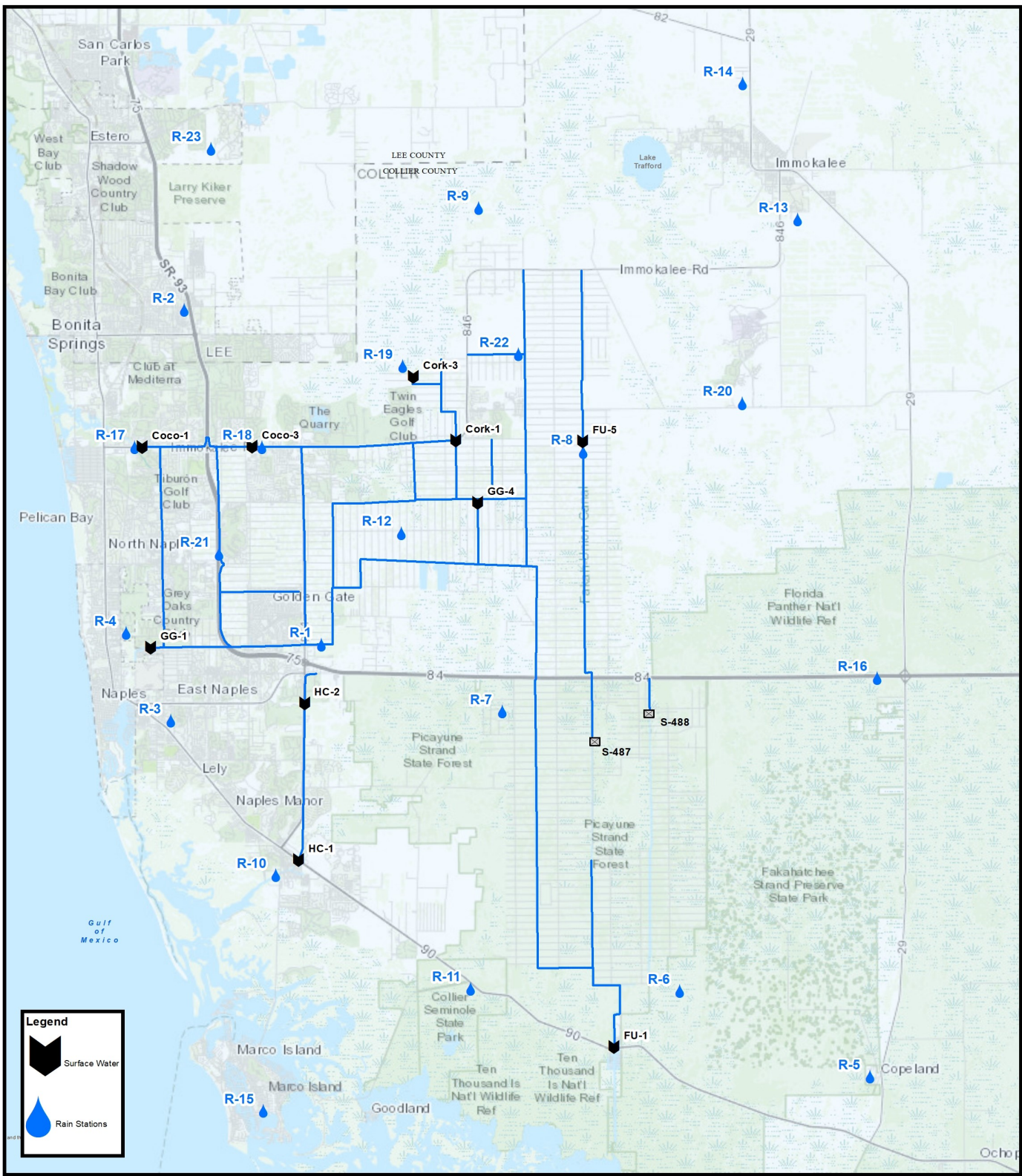
Water control structures in the Henderson Creek system were transitioned to flood control operations in preparation for 90L. Canal levels are all above the 75th percentile for the end of June (ref **Figure 8A & 8B**).

- **CORKSCREW SWAMP**

Figure 10 shows the historical trends for Corkscrew, Bird Rookery, and the CORK 3 structure and the 2024 corresponding levels. Water levels at all three sites continued to decrease the beginning of June, however with Invest 90L water levels increased dramatically with the record rainfall amounts. All three sites are above the 75th percentile for the beginning of July. **Figure 11** displays the water levels at Lake Trafford, indicating that the lake's water levels have increased and are above the 75th percentile. **Figures 12 and Figure 13** show the locations for Southern Corkscrew (SOCREW) sites 1 through 6 as well as the historical trends for SOCREW1 and SOCREW2, all of which are a combination of surface and groundwater monitoring wells. SOCREW1 and SOCREW2 both ended the month above the 50th percentile.

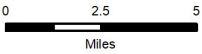
BIG CYPRESS BASIN & LOWER WEST COAST GROUNDWATER LEVELS

The Lower West Coast [LWC] groundwater levels all increased for the month of June, ranging from 2.23 ft at C-948R (Golden Gate, Mid Hawthorn) to 9.52 ft (L-738 (Bonita Springs, Lower Tamiami). C-462 (Immokalee, Lower Tamiami), C-951R (Golden Gate, Lower Tamiami) and C-1224 (Marco Lakes, Lower Tamiami) ended the month above the 75th percentile while C-1004R (Naples, Lower Tamiami), L-738 (Bonita Springs, Lower Tamiami), L-2194 (Bonita Springs, Sandstone) and L-2195 (Bonita Springs, Surficial) ended the month above the 50th percentile. C-948R (Golden Gate, Mid Hawthorn) despite the extreme rainfall is at the 25th percentile, however it is up from near the historic minimum from last month (ref **Table 2 and Figure 9**).



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FIGURE 1
Hydrologic Station Map

Collier County, Florida

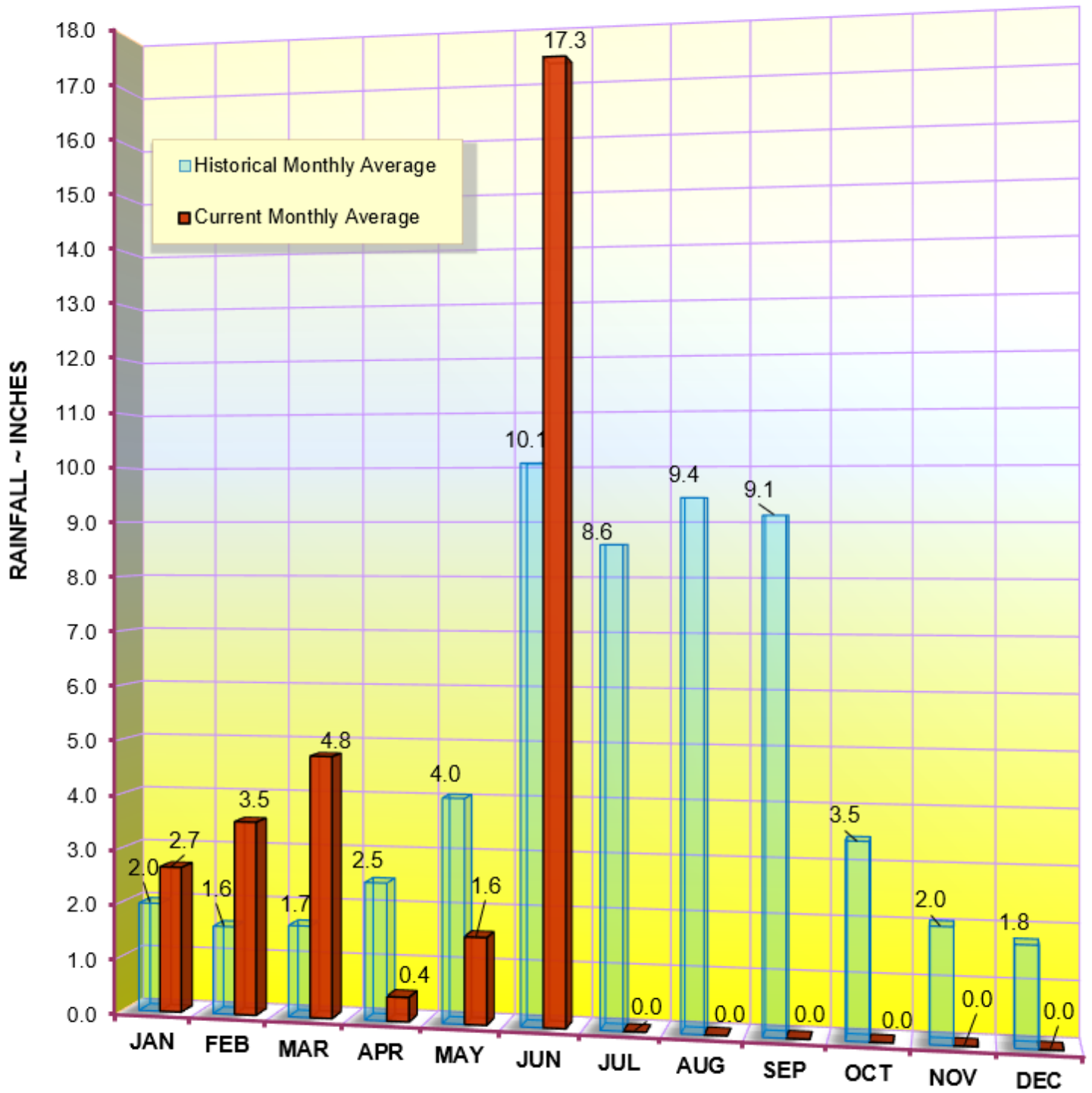


TABLE 1
RAINFALL REPORT - JUNE 2024
DISTRICT/BASIN RAINFALL STATIONS
 (ALL NUMBERS ARE IN INCHES)

STATION INDEX NO.	STATION NAME	JUNE 2024	LONG TERM MONTHLY AVERAGE	MONTHLY DIFFERENCE	CALENDAR YEAR 2024 CUMULATIVE TOTAL	AVERAGE CALENDAR YEAR TO DATE	YEAR TO DATE DIFFERENCE
R-1	GG#3	19.83	11.92	7.91	31.65	24.96	6.69
R-2	BONITA SPRINGS WATER PLANT	14.34	8.59	5.75	26.67	20.11	6.56
R-3	COLLIER COUNTY COURTHOUSE	20.59	8.34	12.25	33.78	20.14	13.64
R-4	FREEDOM PARK	17.75	9.58	8.17	29.25	20.92	8.33
R-5	FAKAHATCHEE STRAND HQ	15.74	11.00	4.74	25.29	23.84	1.45
R-6	DAN HOUSE PRAIRIE	17.21	9.28	7.93	28.80	19.73	9.07
R-7	SGGE WEATHER STATION	21.12	11.46	9.66	33.96	23.85	10.11
R-8	FAKA UNION #5	17.36	12.32	5.04	31.82	25.73	6.09
R-9	CORKSCREW SWAMP NORTH END	17.72	11.56	6.16	29.71	22.29	7.42
R-10	ROOKERY BAY HQ	16.11	9.67	6.44	30.06	20.53	9.53
R-11	COLLIER SEMINOLE STATE PARK	19.87	9.98	9.89	34.09	21.36	12.73
R-12	G.G. FIRE STATION	21.91	9.93	11.98	36.94	22.42	14.52
R-13	IMMOKALEE LANDFILL	15.70	8.91	6.79	25.11	22.03	3.08
R-14	IFAS	14.88	8.93	5.95	27.88	21.94	5.94
R-15	MARCO R.O. PLANT	16.63	9.14	7.49	31.92	20.80	11.12
R-16	FAKAHATCHEE STRAND NORTH END	17.92	10.42	7.50	30.98	25.36	5.62
R-17	COCO#1	14.42	8.22	6.20	24.58	18.72	5.86
R-18	COCO#3	15.39	8.83	6.56	30.46	19.39	11.07
R-19	BIRD ROOKERY	17.53	13.00	4.53	32.84	23.26	9.58
R-20	AVE MARIA	13.41	8.72	4.69	25.62	21.84	3.78
R-21	I75W2	20.53	11.02	9.51	32.43	21.28	11.15
R-22	GG#7	14.62	10.50	4.12	28.75	20.99	7.76
R-23	FPWX	15.97	9.91	6.06	27.80	20.59	7.21
R-24	DSOTO10	18.13	New Site	New Site	New Site	No Historical Data	

AVERAGES	17.28	10.05	7.23	30.02	21.83	8.19
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**BCB ANNUAL RAINFALL
MONTHLY AVERAGE & HISTORICAL AVERAGE TRENDS
(FROM BCB RAINFALL GAUGE DATA)**



**FIGURE 2
BCB GAUGE RAINFALL
MONTHLY AVERAGES THROUGH JUNE 2024**

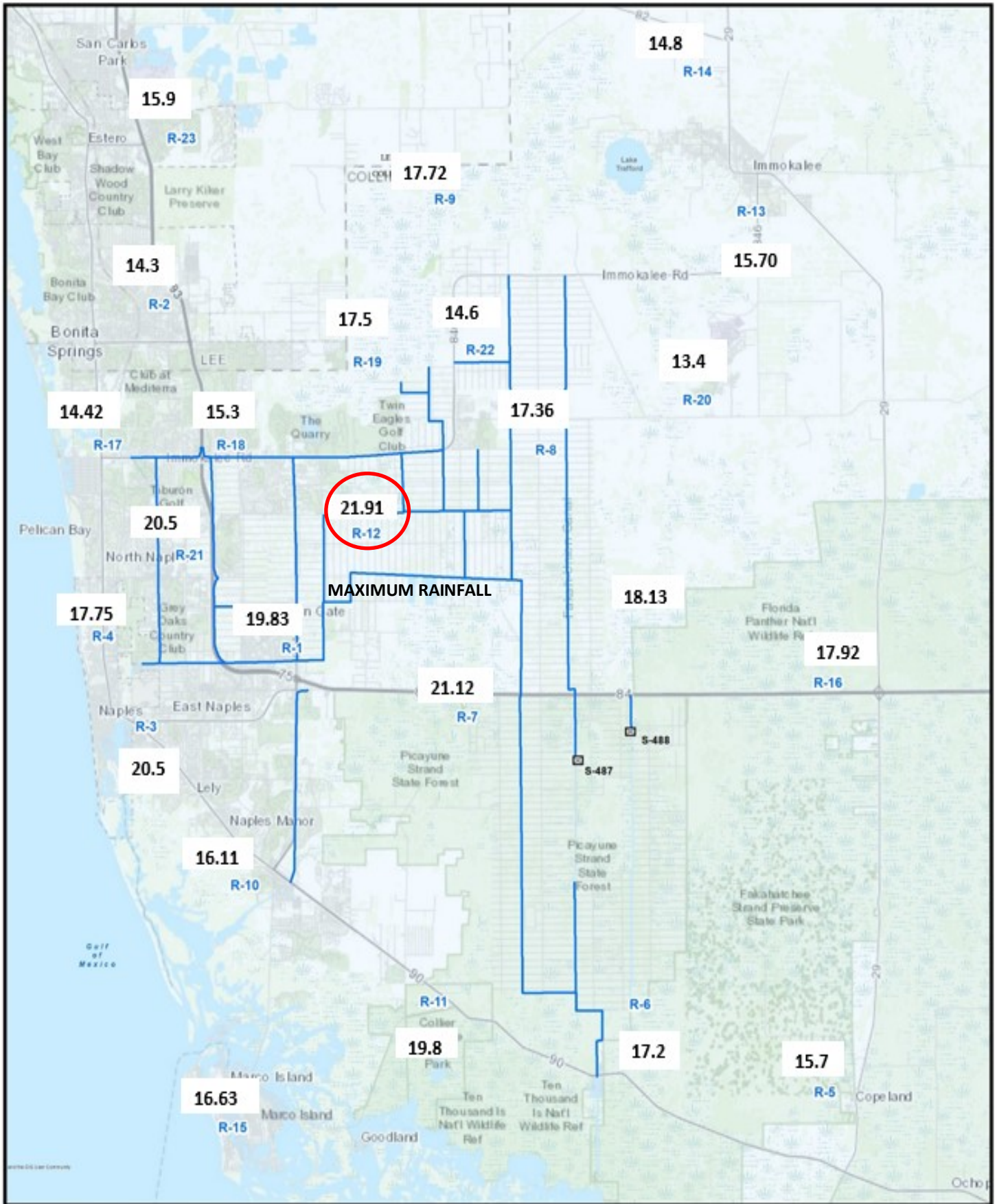
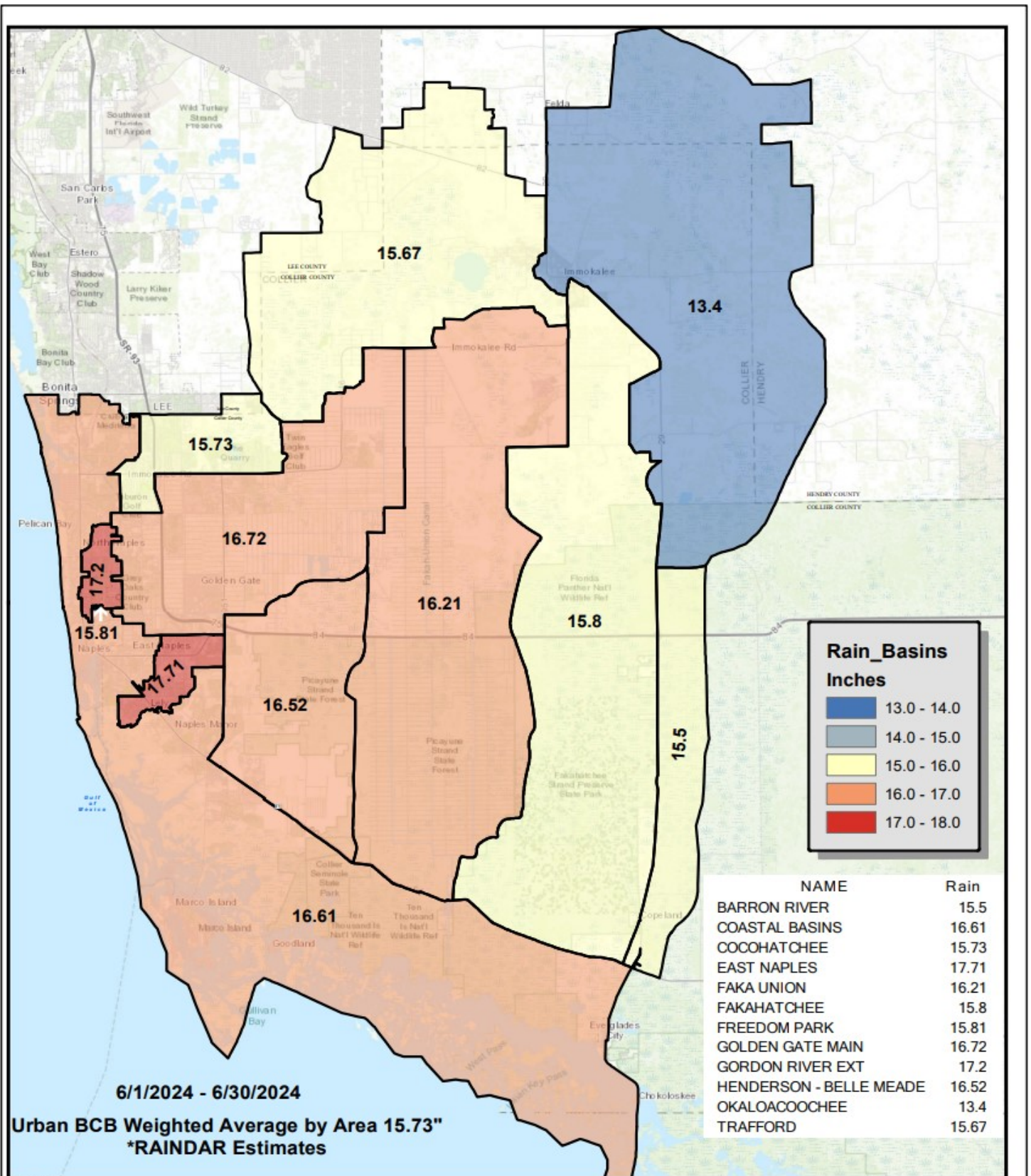
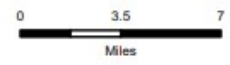


FIGURE 3
BCB RAINFALL DISTRIBUTION
JUNE 2024



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*Rainfall estimates based on gauge adjusted radar



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BCB RAINFALL
SPATIAL DISTRIBUTION

Urban Collier County, Florida



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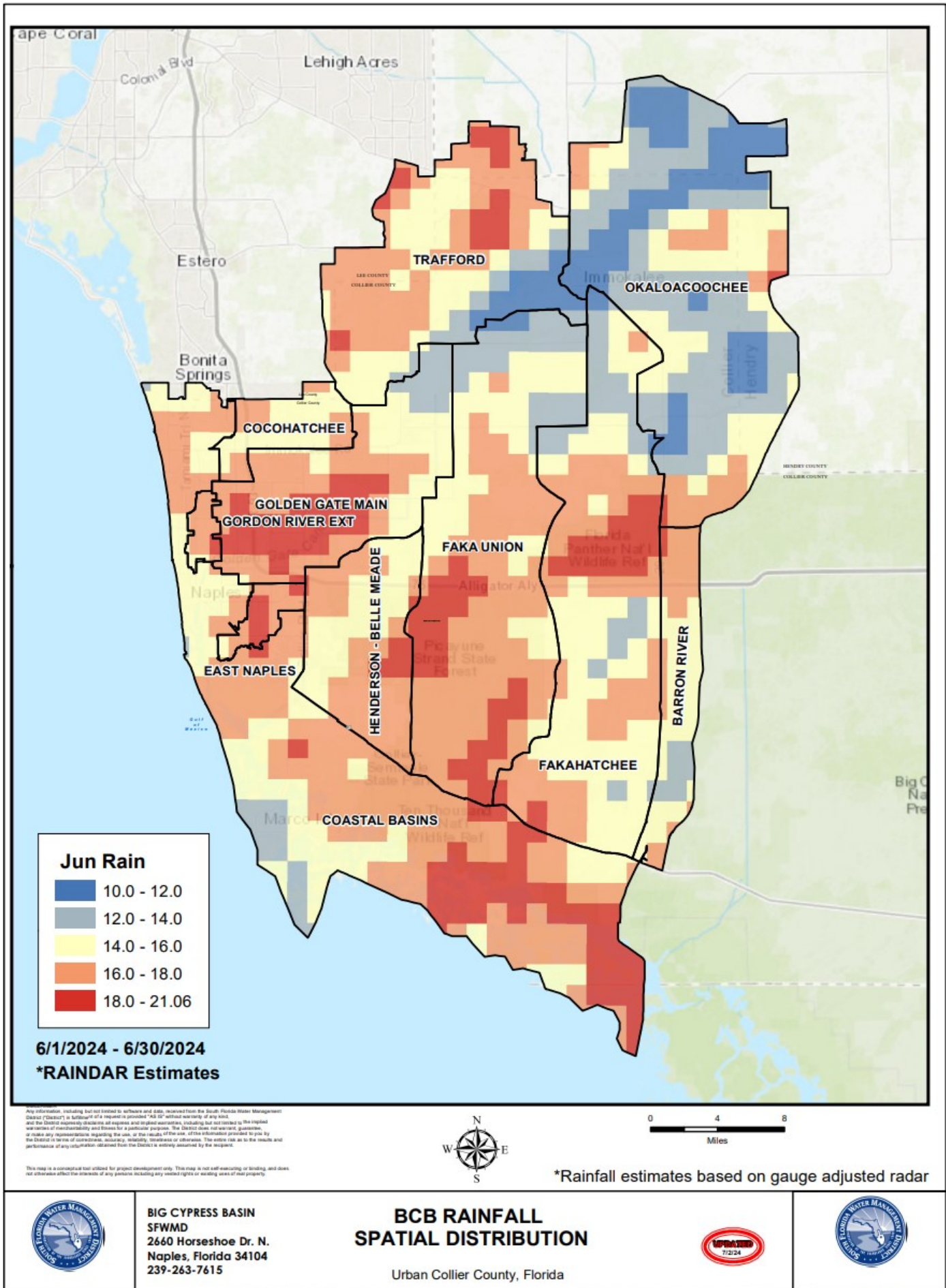
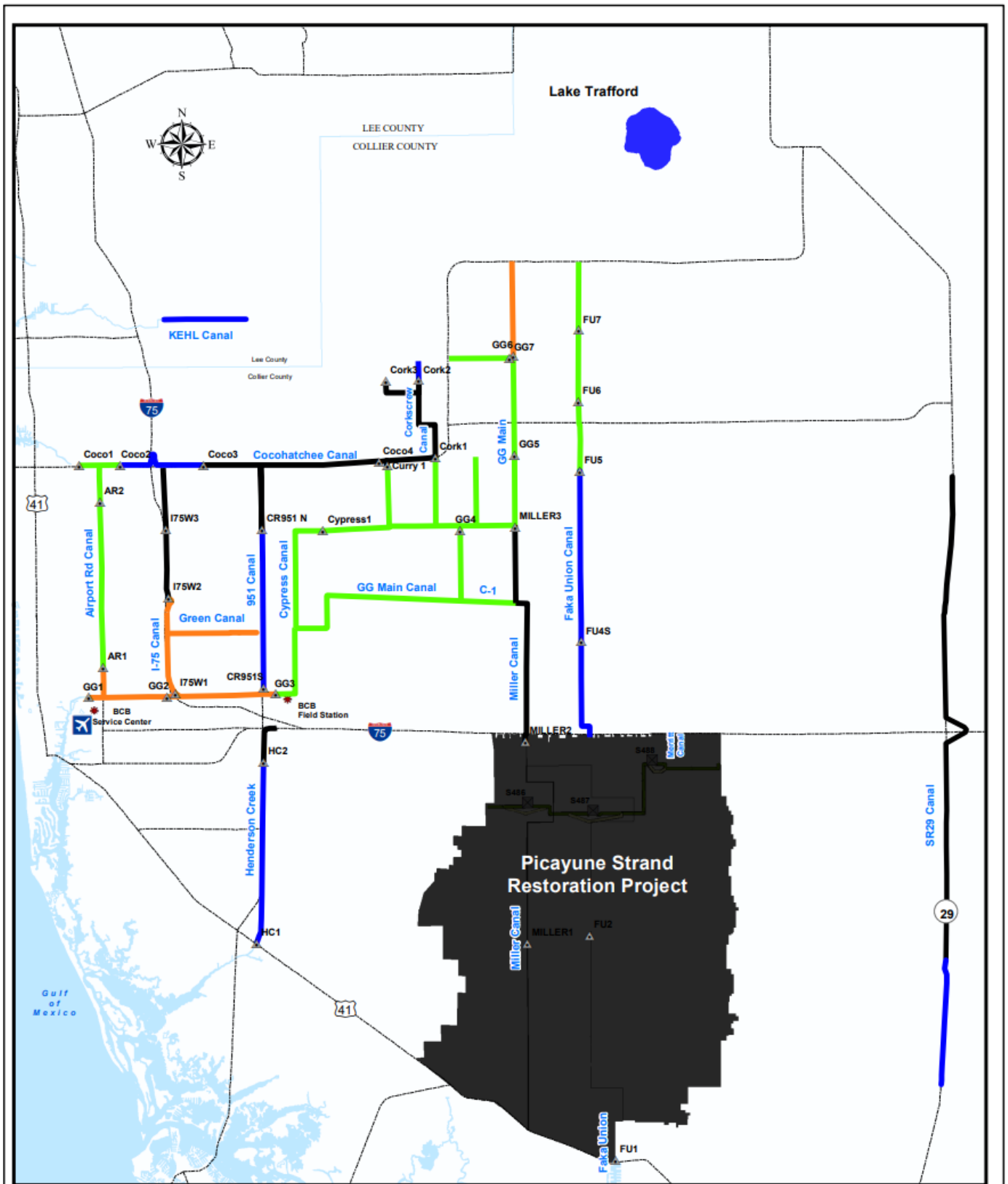


FIGURE 4



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BCB Conditions Index 7/2/24

Urban Collier County, Florida



FIGURE 4A

Figure 5 Golden Gate Canal Historic Average Daily Headwater Percentiles

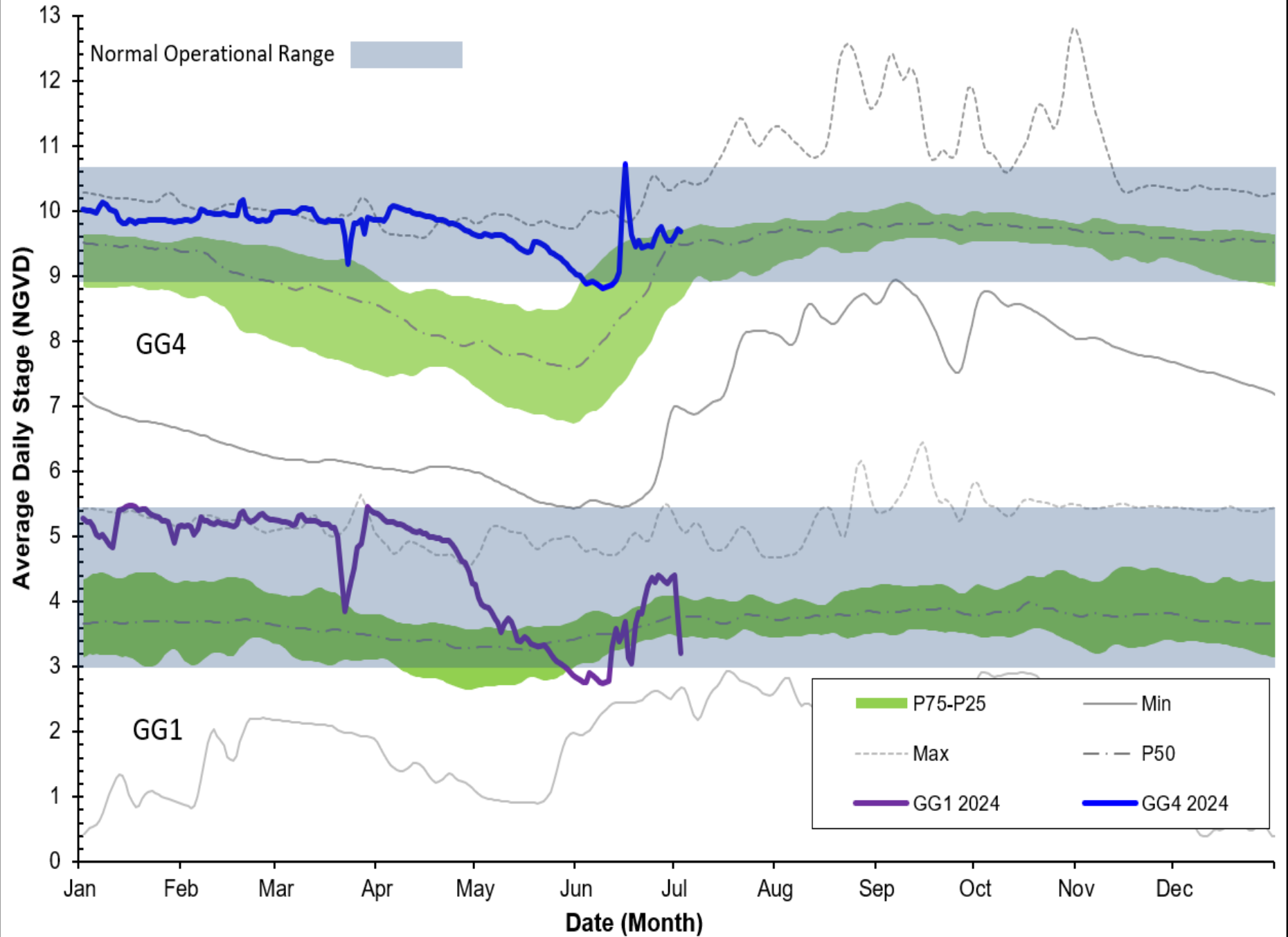


Figure 6A Cocohatchee Canal Historic Average Daily Headwater Percentiles

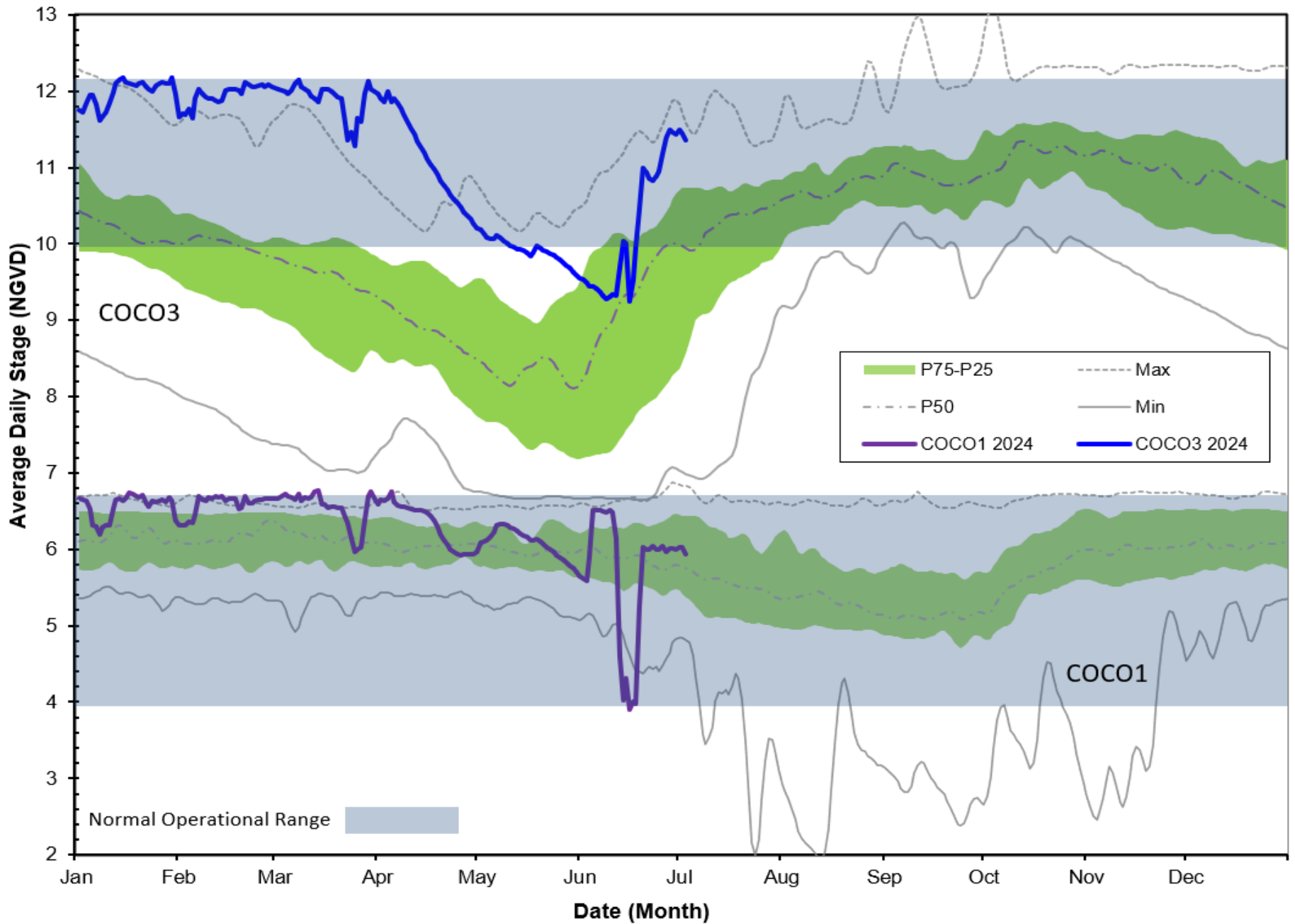


Figure 6 - B CORK1 Historic Average Daily Headwater Percentiles (1989-2022)

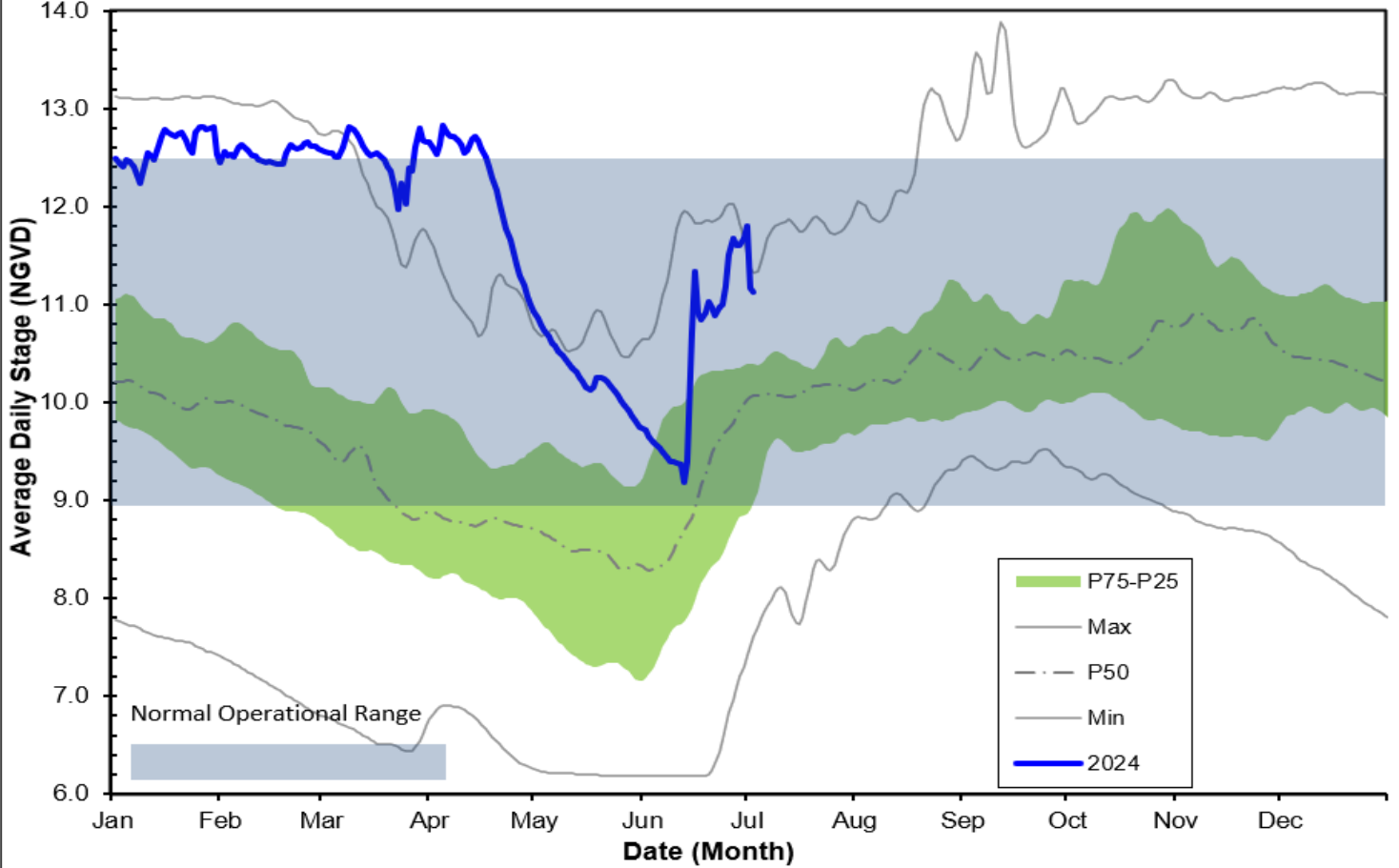


Figure 6C - CORK3 Historic Daily Headwater Percentiles (2004 - 2022)

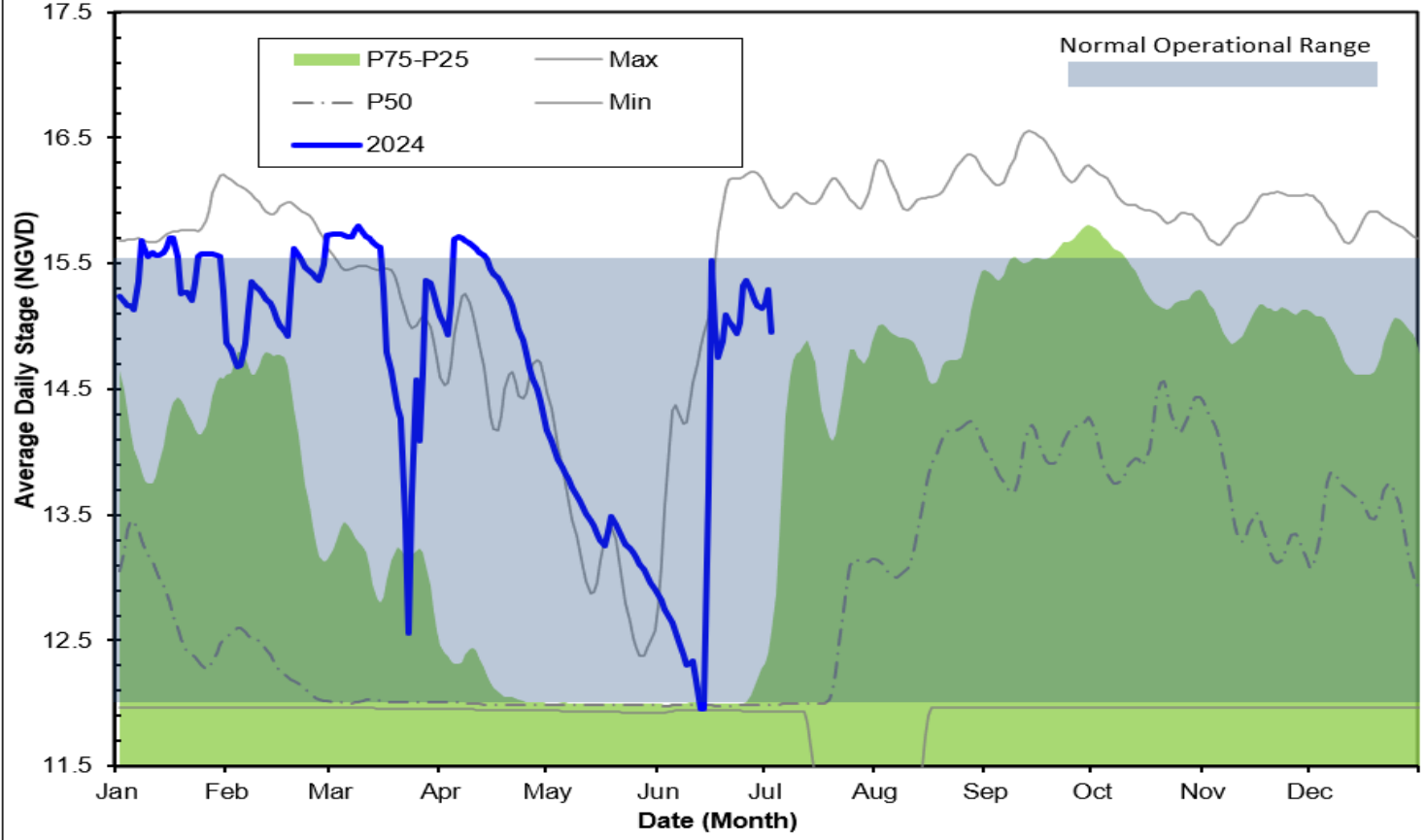


Figure 7A Faka Union Canal Historic Average Daily Headwater Percentiles

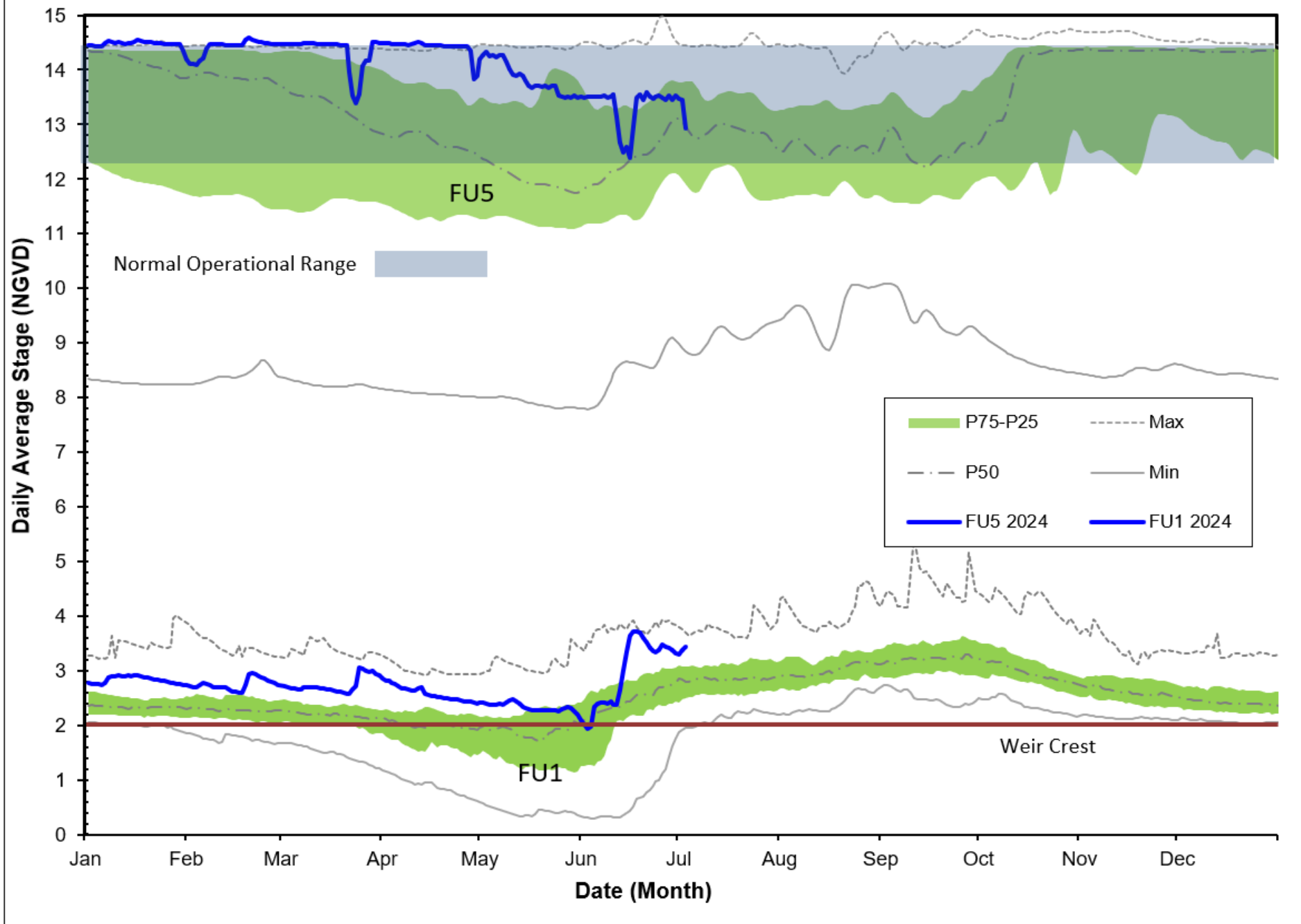


Figure 7B FU4S Historic Average Daily Water Percentiles

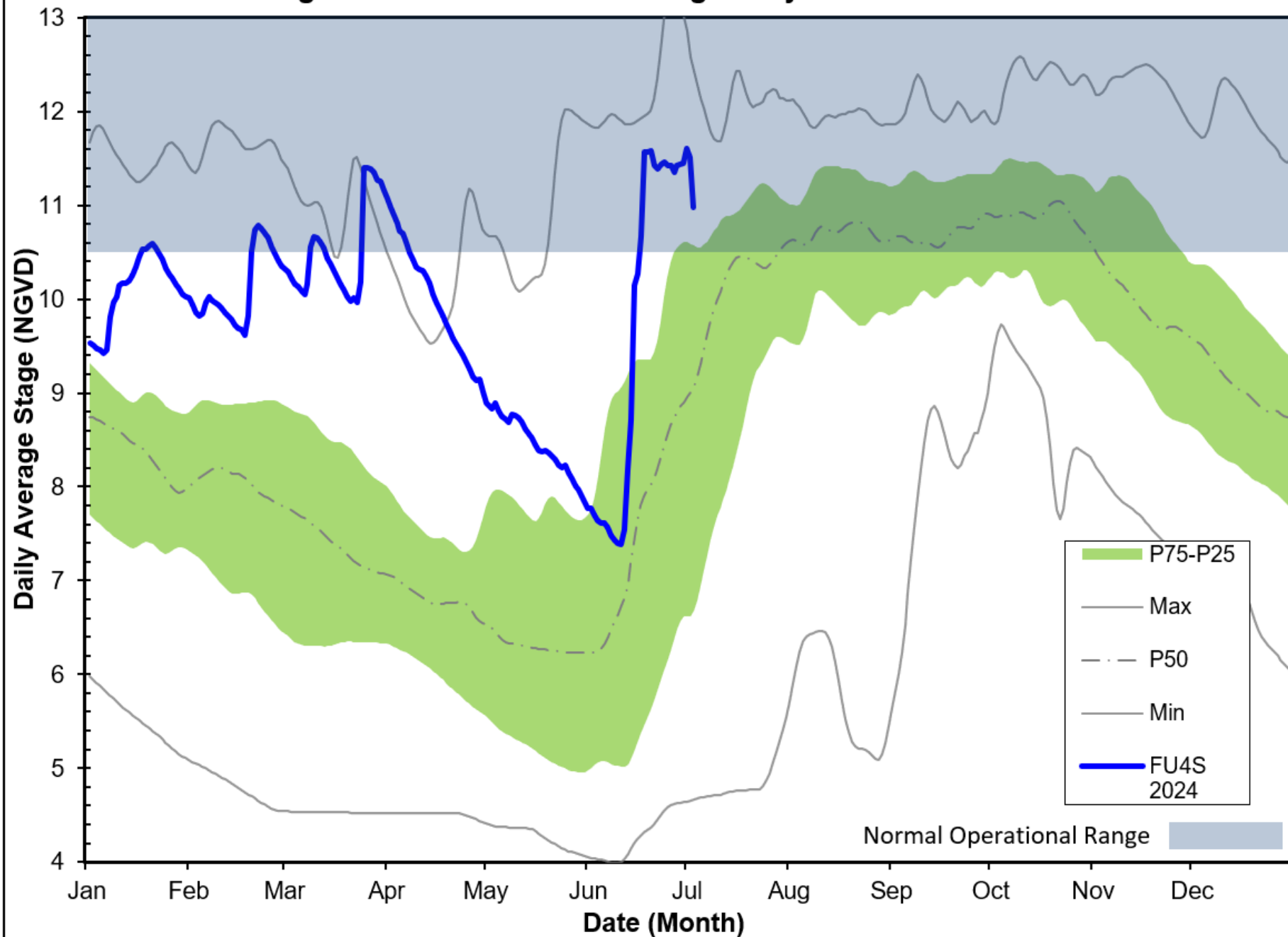


Figure 8A HC1 Historic Average Daily Headwater Percentiles

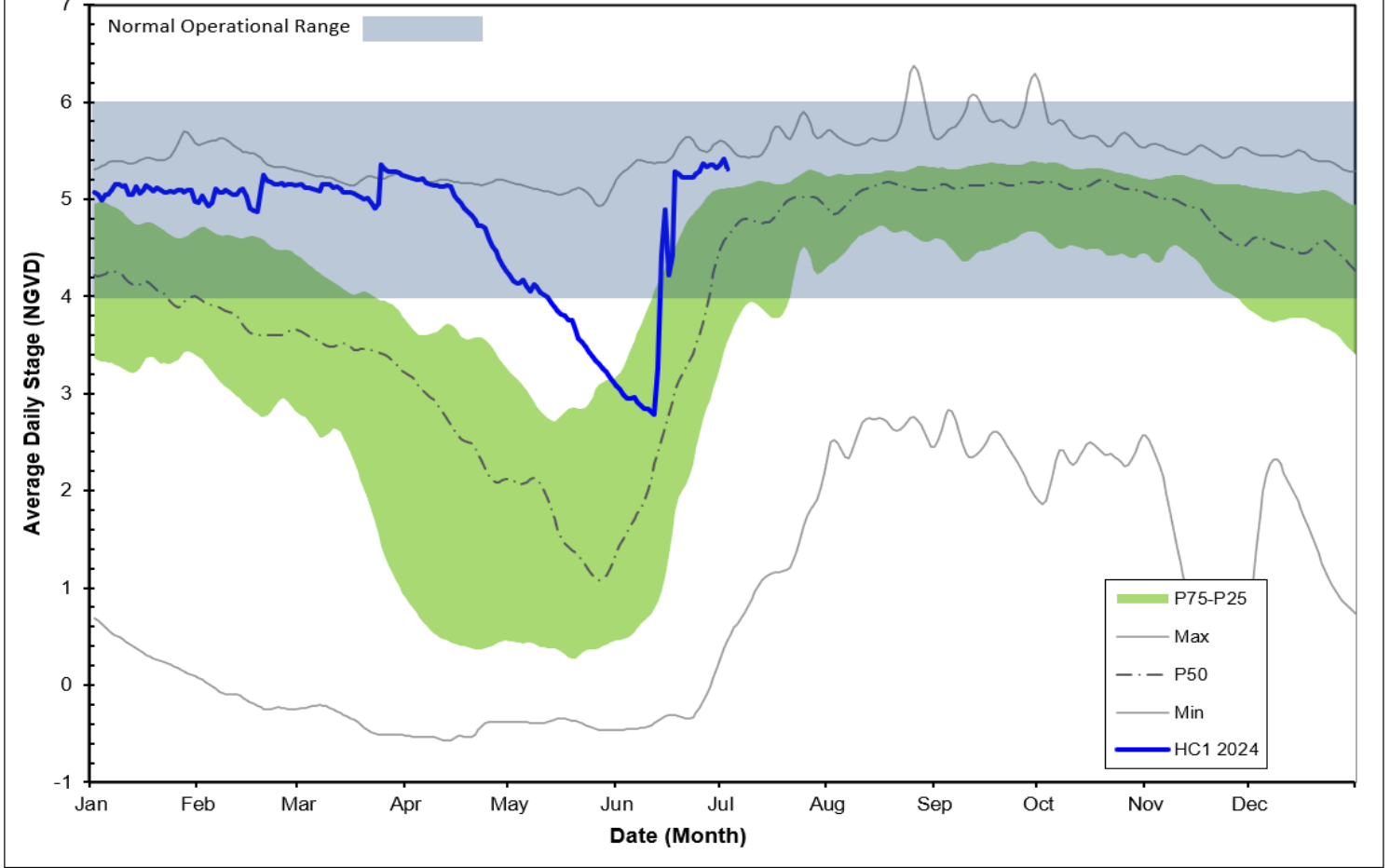
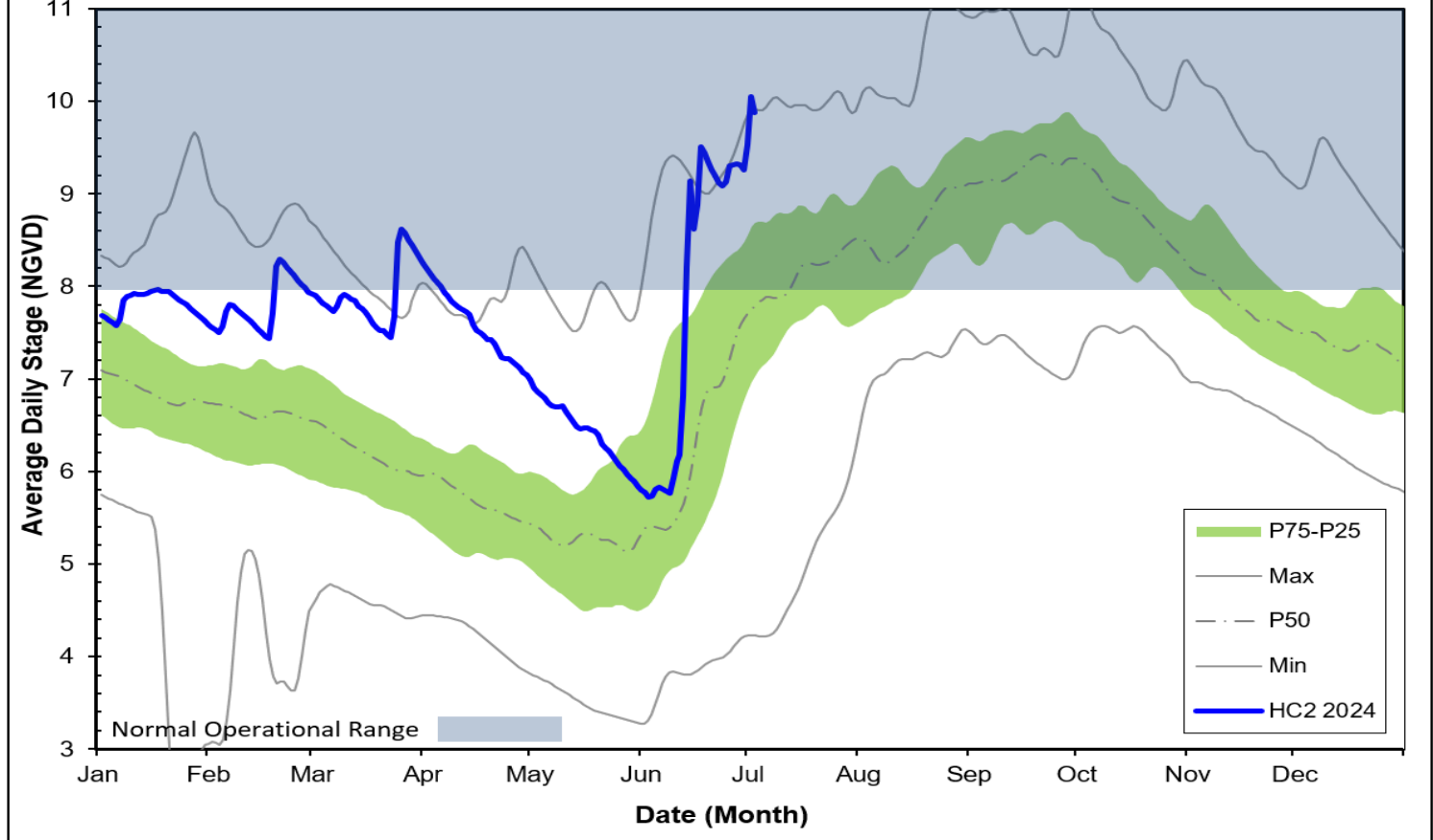


Figure 8B HC2 Historic Average Daily Headwater Percentiles



WATER CONDITIONS SUMMARY - June 2024
SELECTED STATIONS for BCB AREA / SW FLORIDA

Last Reading Date :		July 1, 2024					
Previous Period Reading Date:		June 1, 2024					
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	4.75	29.83	34.58	↑	GREEN
C-1004R	Naples	Lower Tamiami Aquifer	8.58	-3.07	5.51	↑	GREEN
C-1224	Marco Lakes	Lower Tamiami Aquifer	2.76	2.59	5.35	↑	GREEN
C-948R	Golden Gate	Mid Hawthorn Aquifer	2.23	28.35	30.58	↑	
C-951R	Golden Gate	Lower Tamiami Aquifer	5.18	1.96	7.14	↑	
L-2194	Bonita Springs	Sandstone Aquifer	7.66	0.20	7.86	↑	GREEN
L-2195	Bonita Springs	Surficial Aquifer System	4.22	8.58	12.80	↑	GREEN
L-738	Bonita Springs	Lower Tamiami Aquifer	9.52	-5.36	4.16	↑	GREEN

TABLE 2
BCB WATER CONDITIONS SUMMARY
JUNE 2024

BIG CYPRESS BASIN

JUNE 2024

GROUNDWATER LEVEL DAILY TRENDS COMPARED TO HISTORICAL AVERAGE

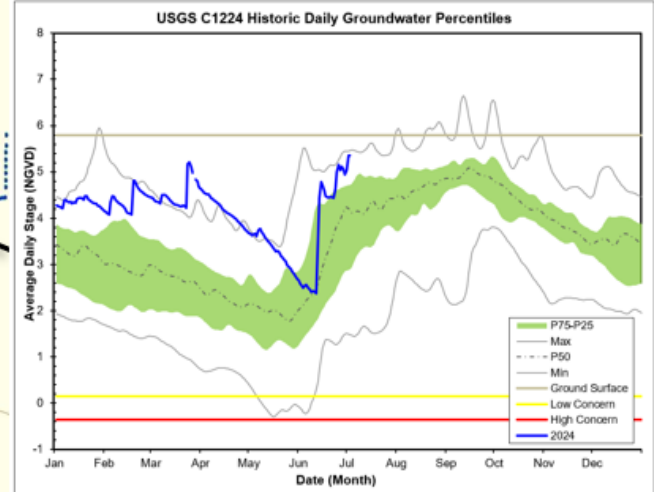
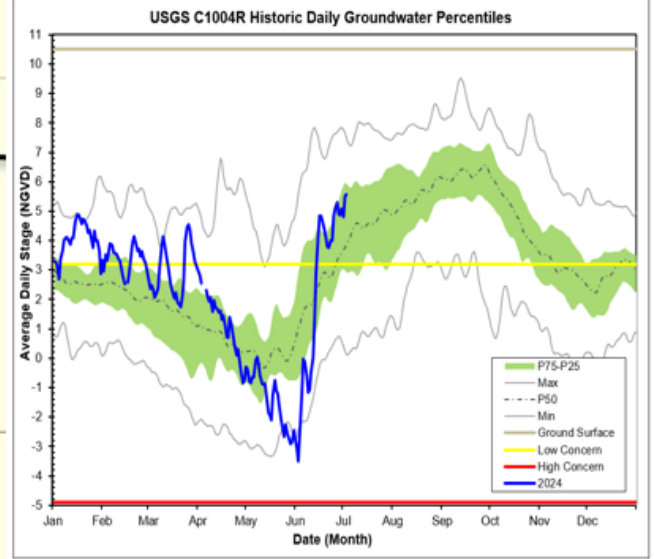
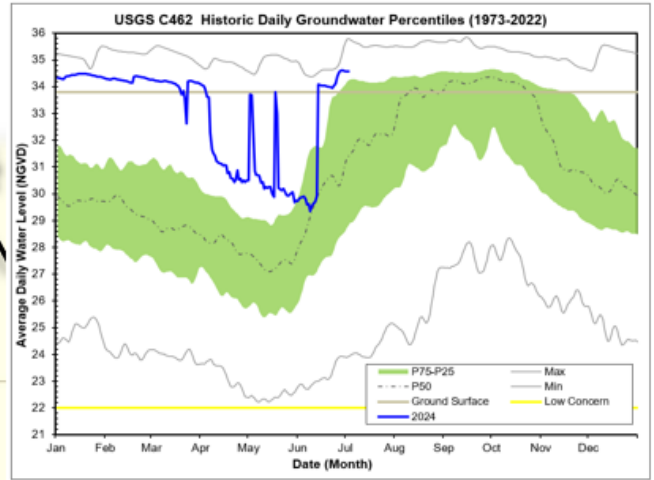
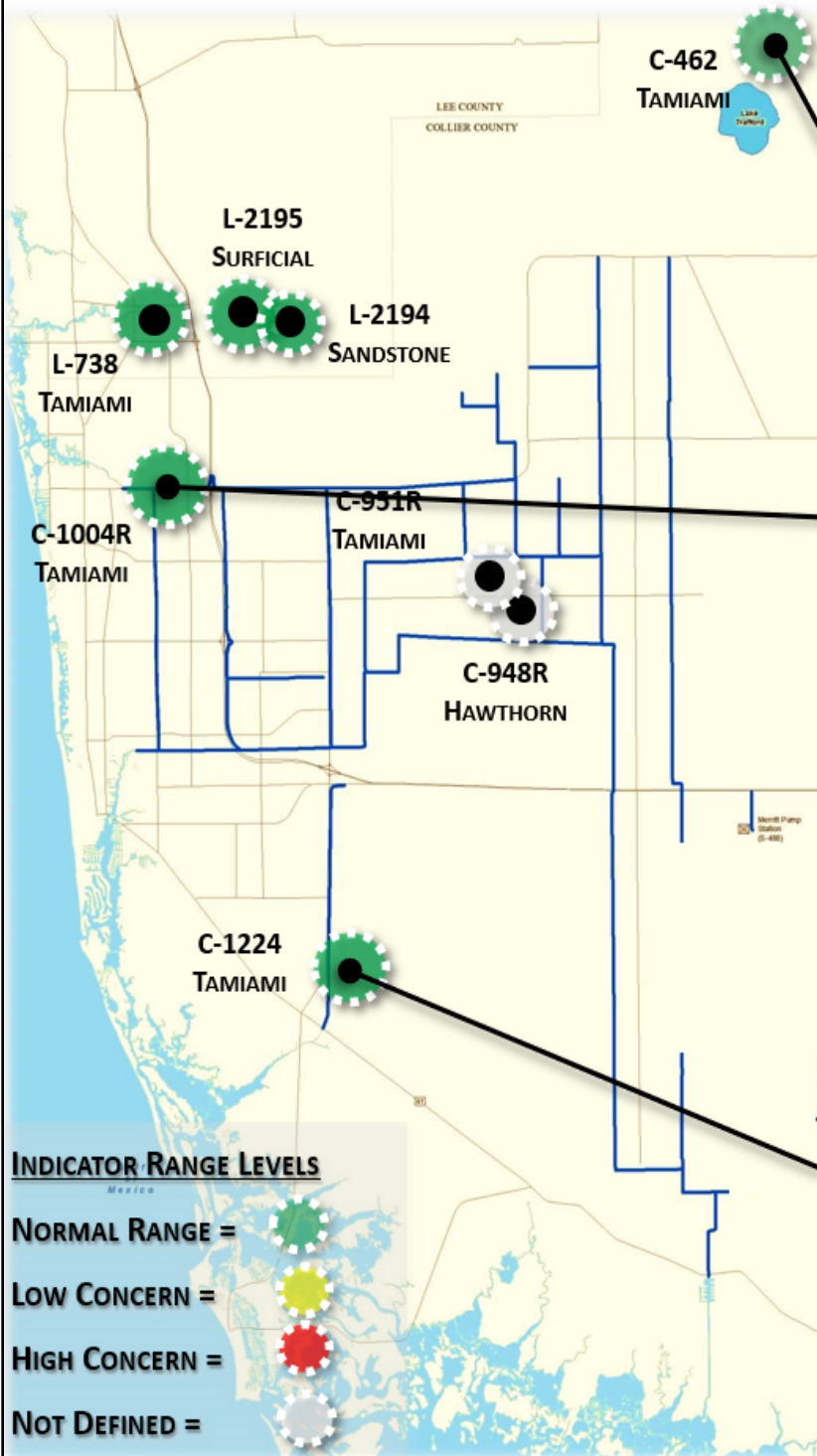


FIGURE 9

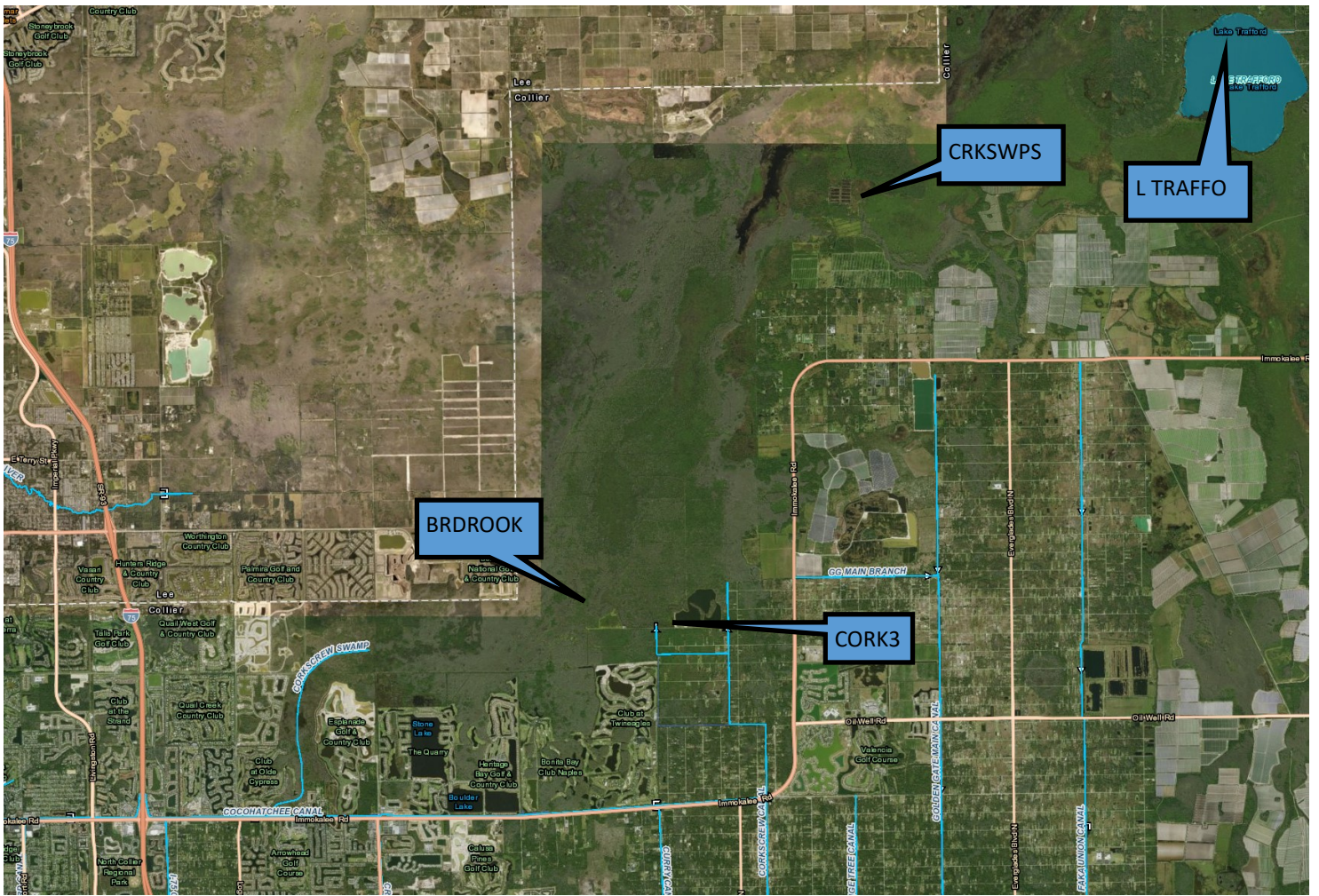


Figure 10-Corkscrew Historic Average Daily Headwater Percentiles (1984-2022)

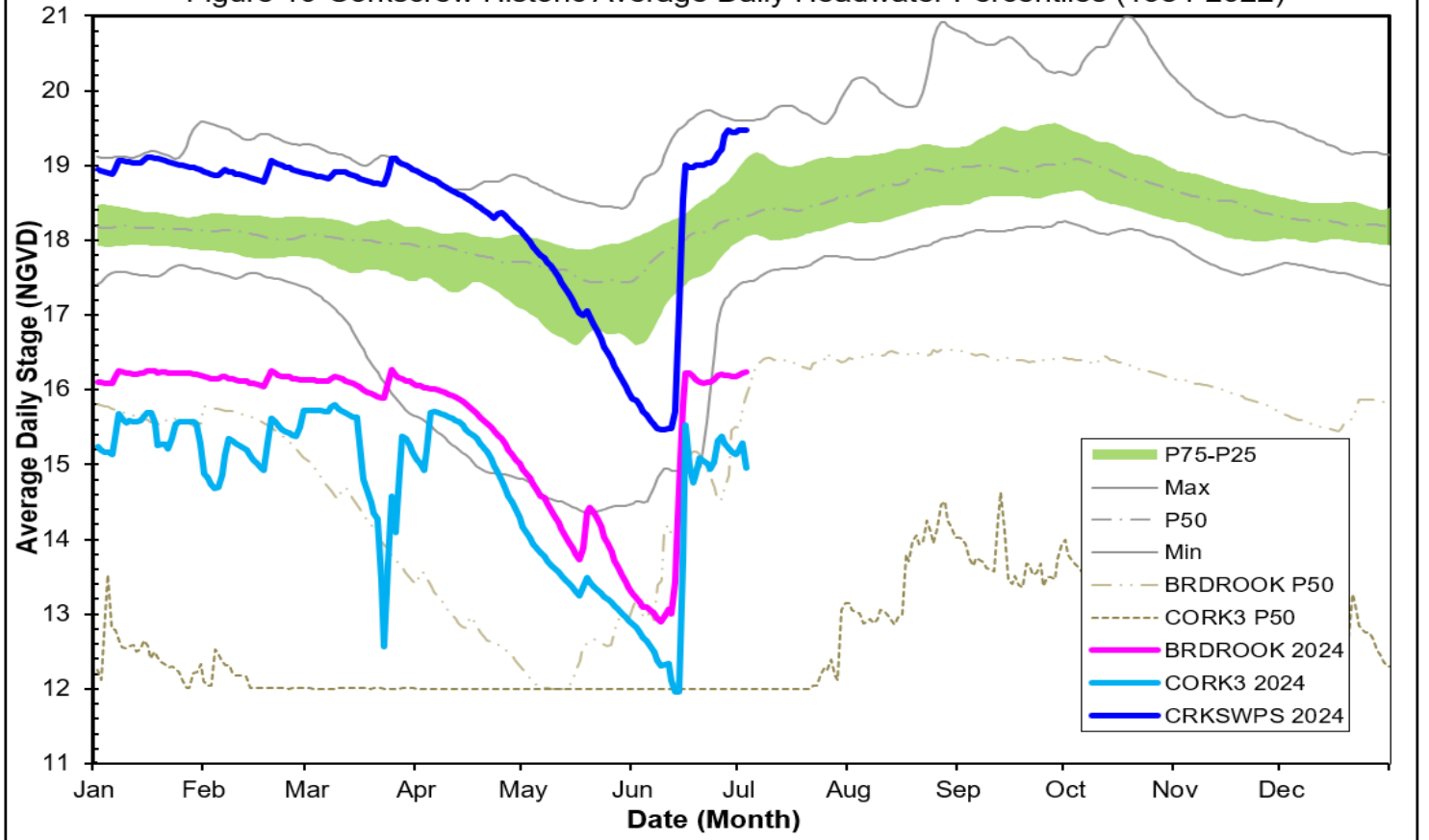
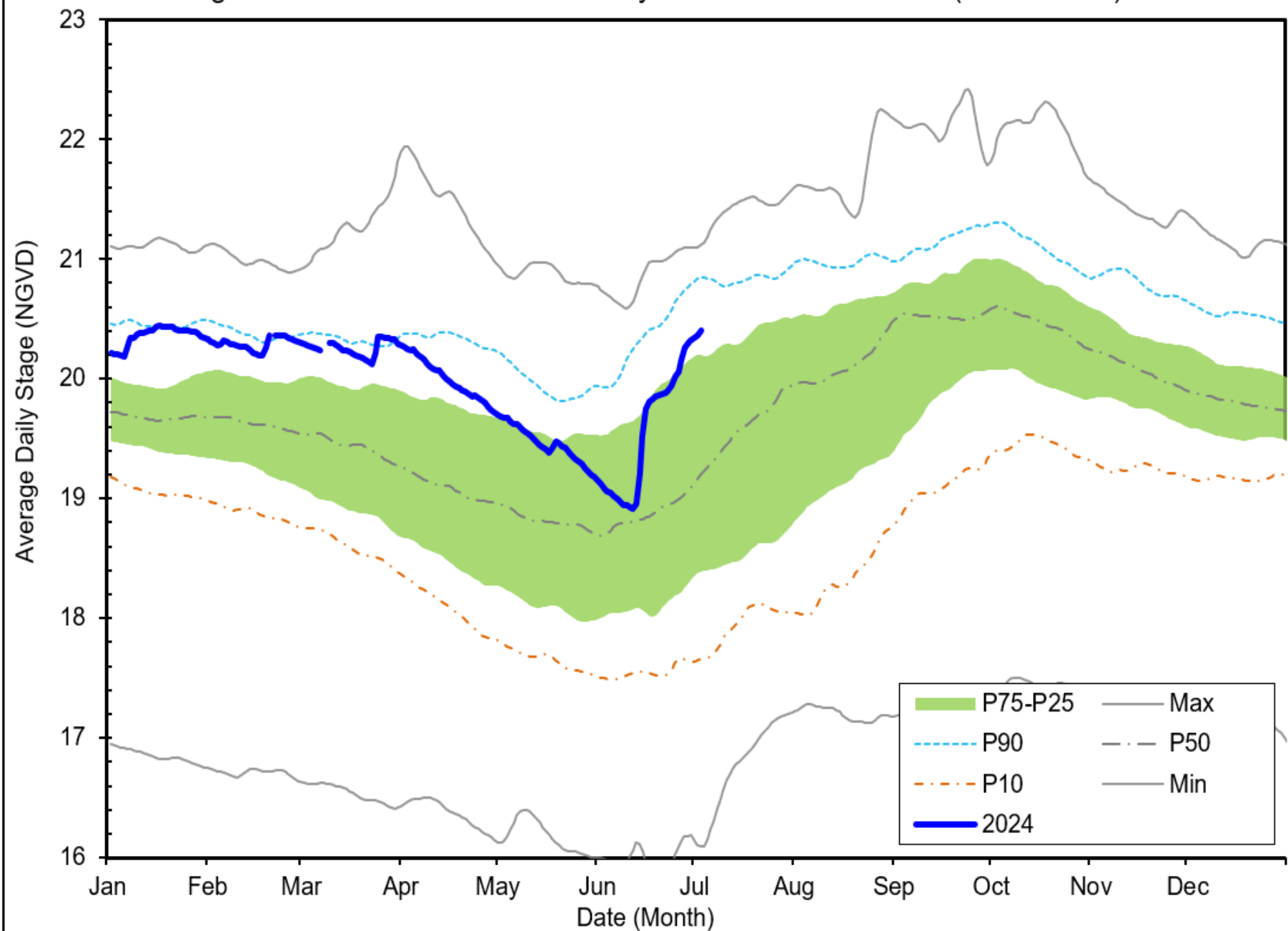


Figure 11 Lake Trafford Historic Daily Headwater Percentiles (1941 - 2022)



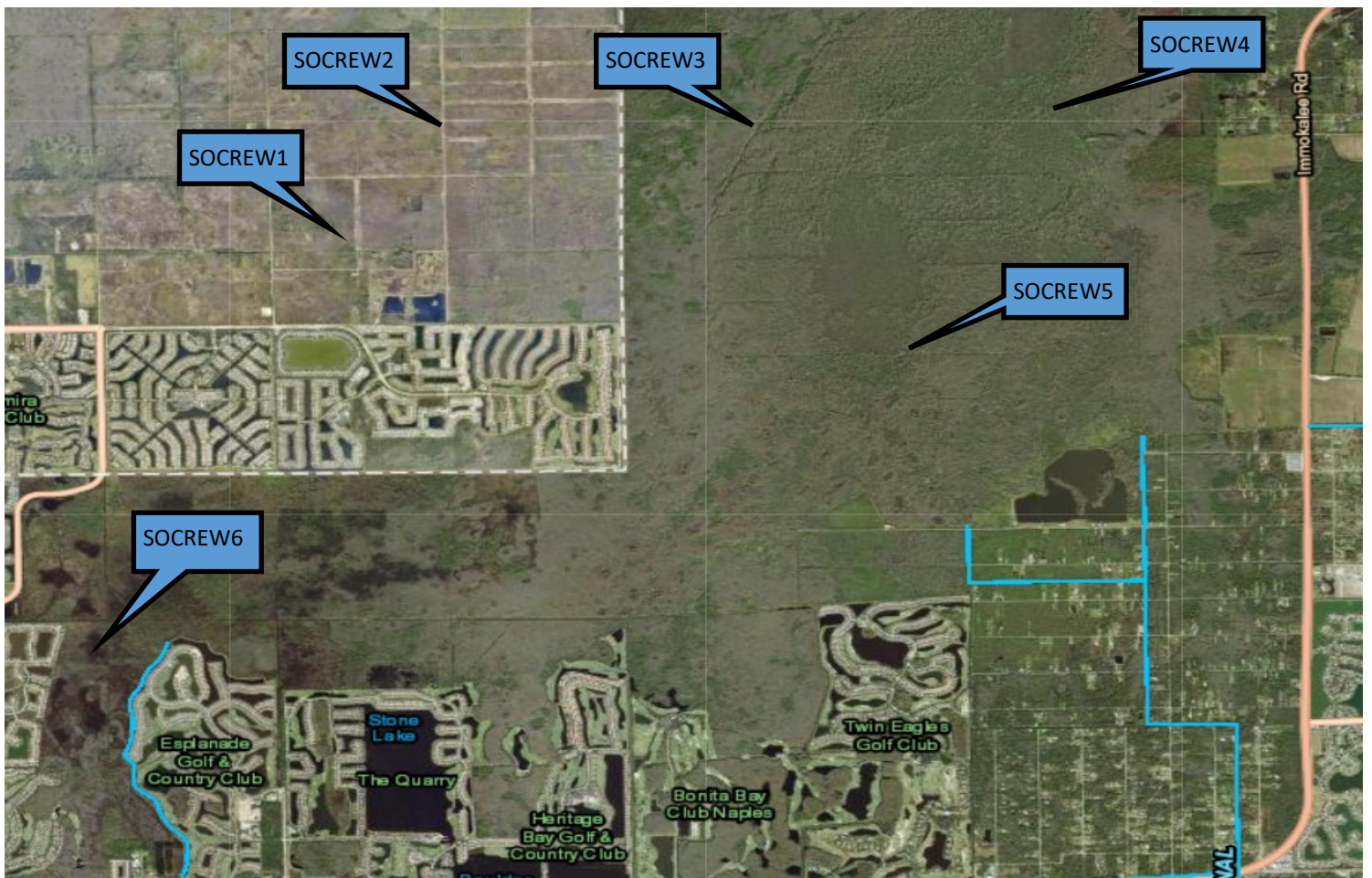
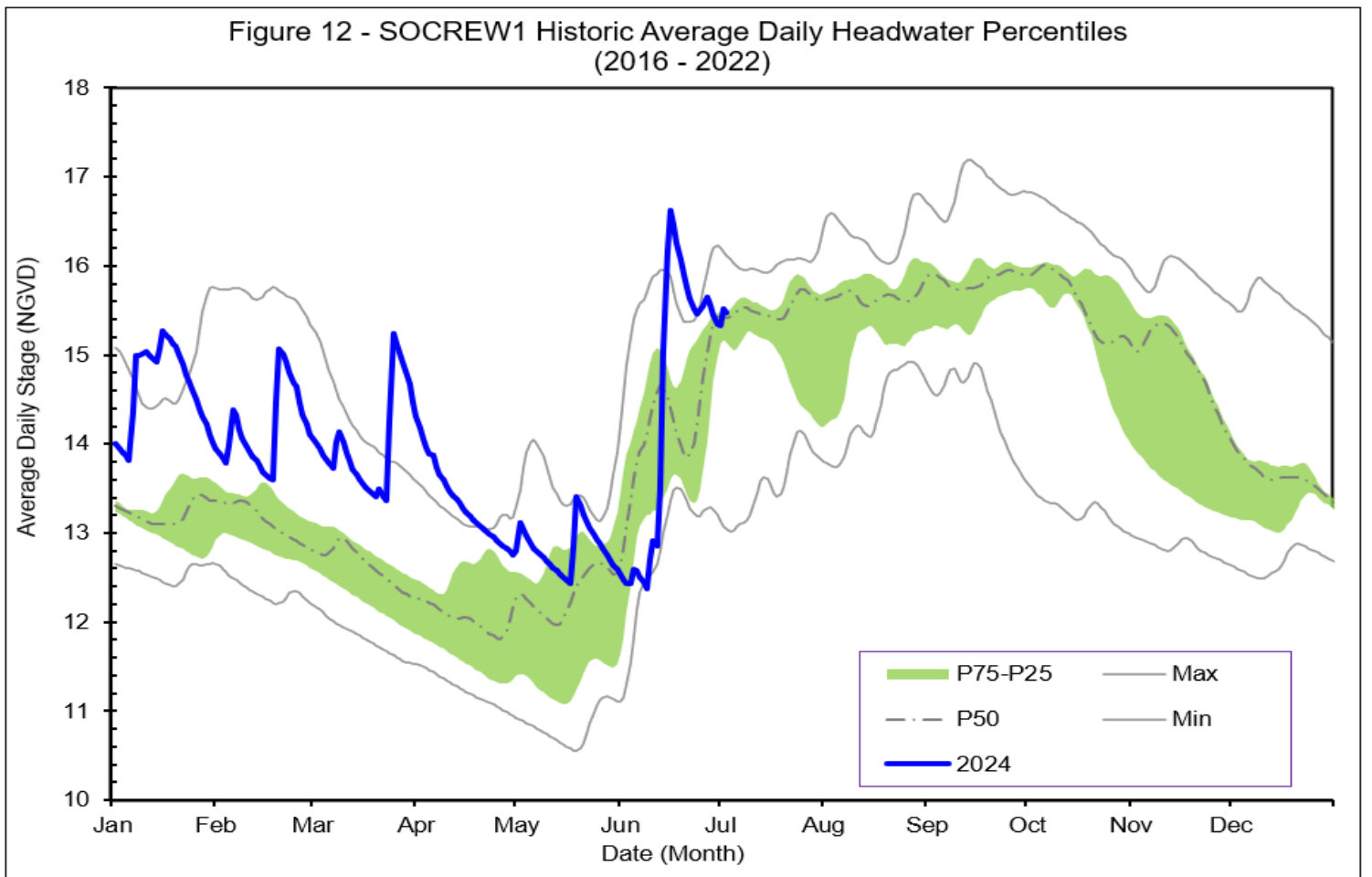


Figure 12 - SOCREW1 Historic Average Daily Headwater Percentiles (2016 - 2022)



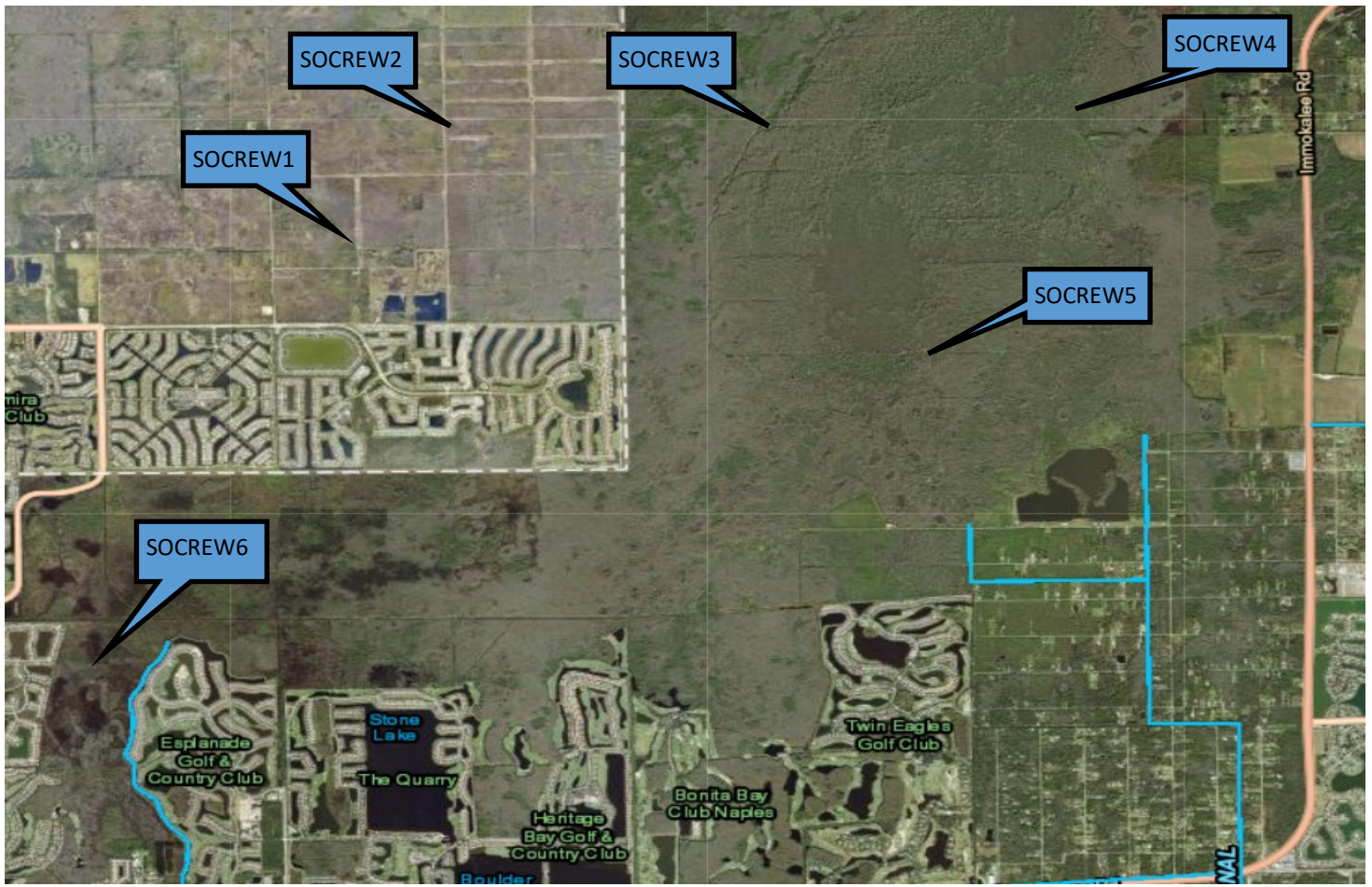
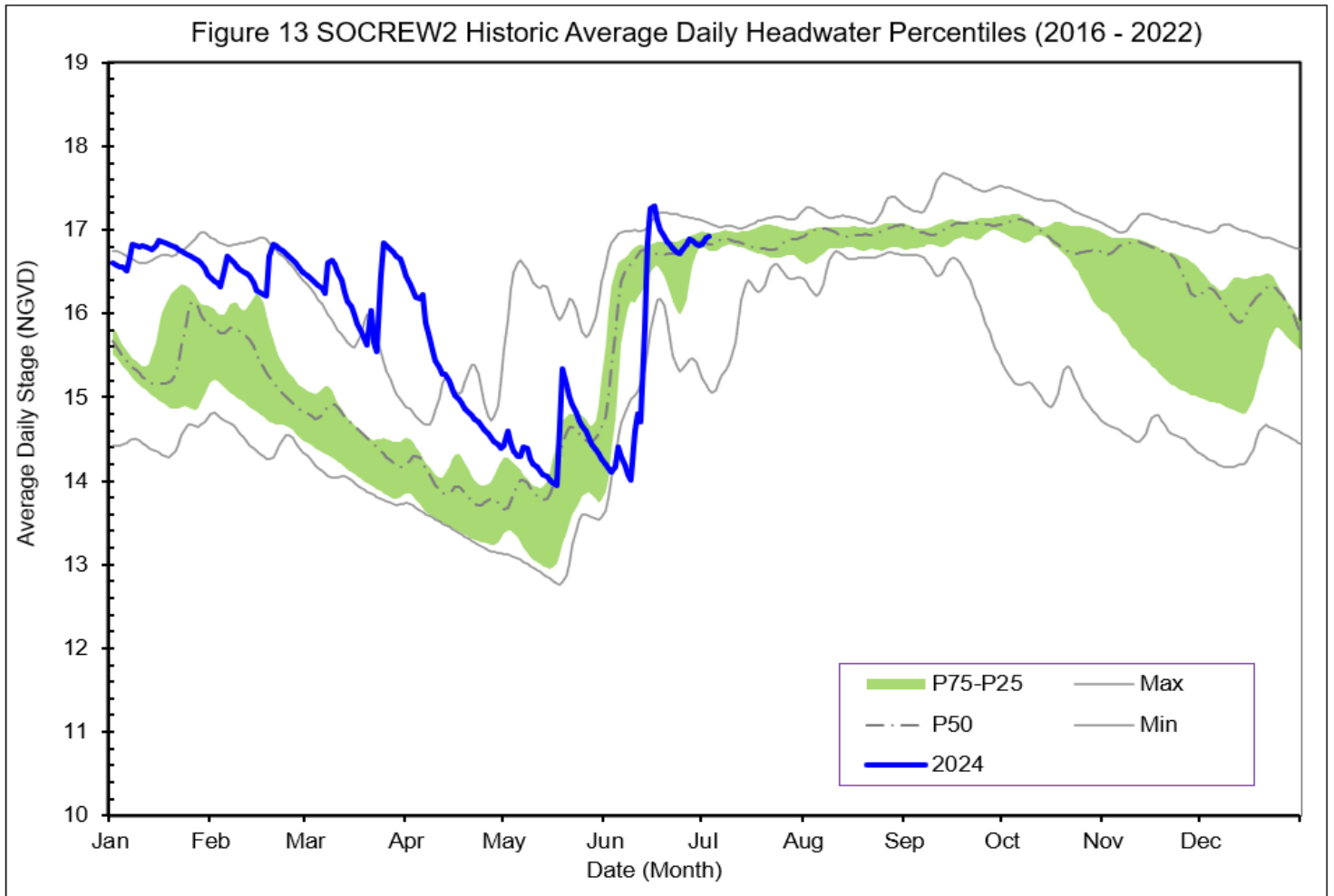


Figure 13 SOCREW2 Historic Average Daily Headwater Percentiles (2016 - 2022)



APPENDIX A

INVEST 90L RAINFALL ANALYSIS

BCB RAINFALL FREQUENCY - AL-90 2024			
DISTRICT/BASIN RAINFALL STATIONS			
(ALL NUMBERS ARE IN INCHES)			
STATION INDEX NO.	STATION NAME	3-Day Peak	Frequency (Yr)
R-1	GG#3	11.01	22
R-2	BONITA SPRINGS WATER PLANT	N/A	N/A
R-3	COLLIER COUNTY COURTHOUSE	12.31	33
R-4	FREEDOM PARK	9.62	12
R-5	FAKAHATCHEE STRAND HQ	11.64	28
R-6	DAN HOUSE PRAIRIE	14.11	71
R-7	SGGE WEATHER STATION	10.72	21
R-8	FAKA UNION #5	12.51	53
R-9	CORKSCREW SWAMP NORTH END	11.18	31
R-10	ROOKERY BAY HQ	8.89	9
R-11	COLLIER SEMINOLE STATE PARK	12.76	40
R-12	G.G. FIRE STATION	11.42	29
R-13	IMMOKALEE LANDFILL	5.93	3
R-14	IFAS	N/A	N/A
R-15	MARCO R.O. PLANT	11.23	22
R-16	FAKAHATCHEE STRAND NORTH END	13.41	73
R-17	COCO#1	9.17	11
R-18	COCO#3	10.95	22
R-19	BIRD ROOKERY	12.84	55
R-20	AVE MARIA	10.25	23
R-21	I75W2	12.13	34
R-22	GG#7	11.21	31
R-23	FPWX	10.71	22
R-24	DSOTO10	11.71	36
	AVERAGES	11.17	31

