



2024 Biological Data Summary Report

Suwannee River Water Management District

Summary

In 2024, the Suwannee River Water Management District (District) contracted with WSP USA Environment and Infrastructure, Inc. (WSP), to perform biological monitoring under Task Work Assignments 19/20-041.24 and 23/24-149.01. WSP conducted aquatic macroinvertebrate monitoring following Stream Condition Index (SCI) methodology at 8 river and spring run stations in 2024. Also in 2024, WSP conducted periphyton monitoring at 6 river stations. The 2024 biological monitoring station locations are illustrated in Figure 1 below. To obtain data referenced in this report, please contact the Office of Water Resources at 386-362-1001.

Cover photo courtesy of Brandi Sistrunk.

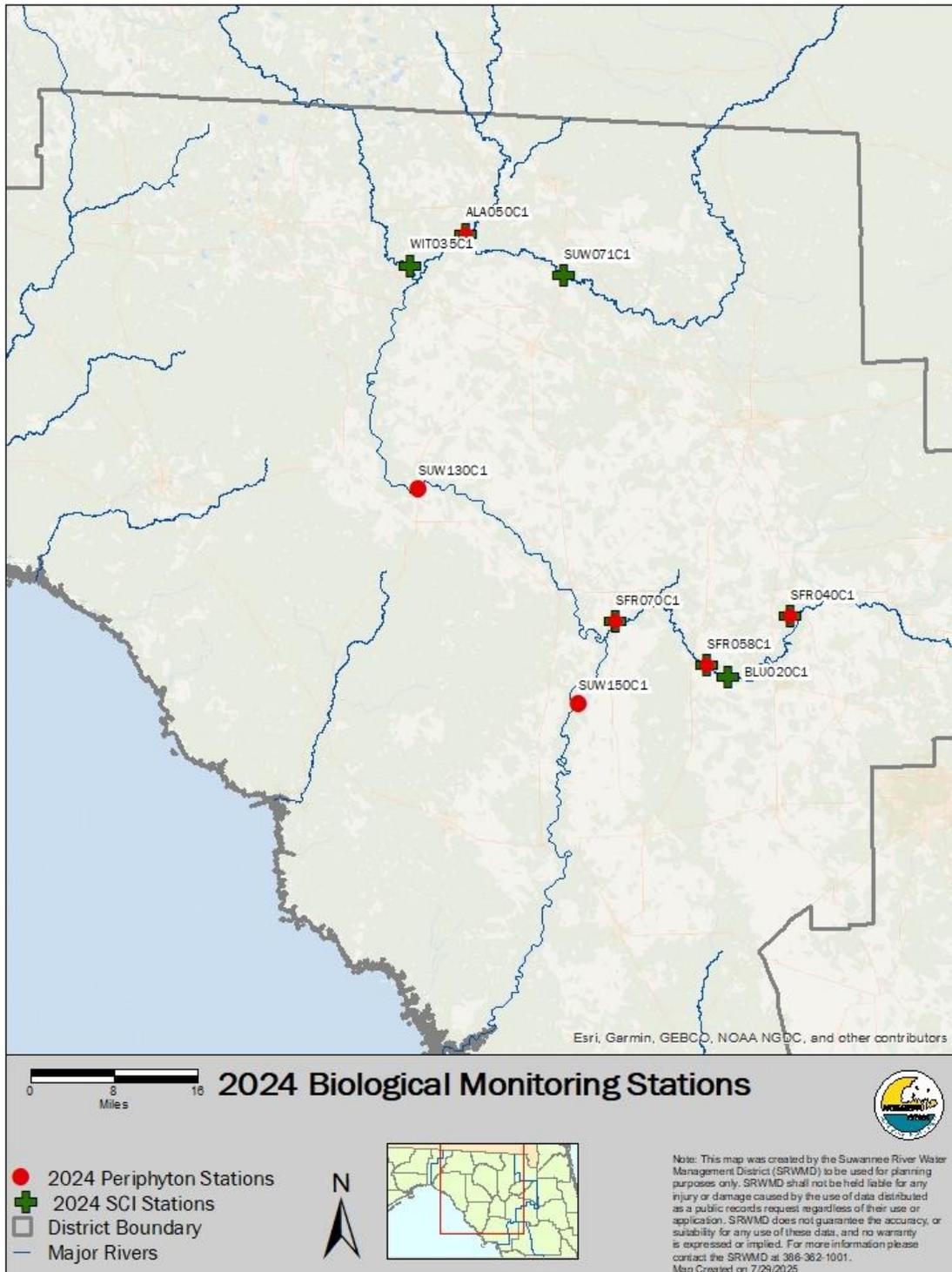


Figure 1: 2024 Biological Monitoring Stations

2024 Stream Condition Index (SCI) Monitoring

In January through November 2024, WSP conducted quarterly SCI sampling at *Santa Fe River at O'Leno State Park* (SFR040C10), *Santa Fe River near Fort White* (SFR058C1), *Alapaha River at CR 751 Nobles Ferry Road* (ALA060C1), and *Santa Fe River at US 129 near Hildreth* (SFR070C1). New SCI sites, added in the fall of 2024, include the *Withlacoochee River near Lee* (WIT035C1), *Ichetucknee River at HWY 27 near Hildreth* (ICH009C1), *Suwannee River at Suwannee Springs* (SUW071C1), and *Gilchrist Blue Spring Run* (BLU020C1).

The District has conducted macroinvertebrate sampling dating back to 1990 at *Santa Fe River at O'Leno State Park*, *Alapaha River At CR 751 Nobles Ferry Road*, and *Santa Fe River at US 129 near Hildreth* using non-SCI methods such as qualitative dip net sampling, Hester-Dendy, and petite Ponar dredge; *Santa Fe River at O'Leno State Park* and *Santa Fe River near Fort White* have been sampled using SCI methods since 2017. November 2023 was the first time the District conducted SCI sampling at *Alapaha River at CR 751 Nobles Ferry Road* and *Santa Fe River at US 129 Near Hildreth*, and November 2024 was the first time the District conducted SCI sampling at *Withlacoochee River near Lee*, *Ichetucknee River at HWY 27 near Hildreth*, *Suwannee River at Suwannee Springs*, and *Gilchrist Blue Spring Run*.

SCI methods generally follow FDEP SOP SCI 1000 Stream Condition Index Methods 10012024. Sampling consists of 20 dipnet sweeps of the most productive habitats found in a 100-meter stretch of a river or stream. Organisms collected in the 20 sweeps are preserved and brought back to the laboratory for processing and identification. Data generated on the taxonomy and abundance of these organisms are used to calculate ten biological metrics, each of which has been shown to respond predictably to human disturbance. The points from each of these 10 biological metrics are then summed to determine an overall score of biological health. Two replicates are collected for each site, and the final SCI score for a site is based on the average score of the two replicates. Scores of 64 - 100 are considered exceptional, scores from 40 - 63 are considered healthy, and scores of 0 - 39 are considered impaired. For each SCI, a Habitat Assessment (HA), habitat sketch, and physical/chemical characterization are performed to collect physical data components for the site, determine the types and quantity of substrates present, and measure stream attributes known to have potential effects on the stream biota. Eight habitat parameters are given a score and assigned a rating corresponding to one of four categories: optimal = 120 - 160 points; suboptimal = 80 - 119 points; marginal = 40 - 79 points; and poor = 11 - 39 points (FDEP 2024a). The 10 biological metrics used in the SCI scoring and 8 habitat parameters used in HA scoring are indicated below in Table 1.

SCI Biological Metrics	HA Parameters
Total number of taxa	Substrate Diversity
Number of long-lived taxa (those that require more than one year to complete their life cycle)	Substrate Availability
Number of Ephemeroptera (mayfly) taxa	Water Velocity
Number of Trichoptera (caddisfly) taxa	Habitat Smothering
Number of sensitive taxa	Artificial Channelization
Number of clinger taxa	Bank Stability
Percent dominant taxon	Riparian Buffer Zone Width
Percent Tanytarsini	Riparian Zone Vegetation Quality
Percent very tolerant taxa	
Percent filterer individuals	

Table 1: SCI and HA Scoring Metrics

Scores from the 10 SCI events in 2024 are summarized in Table 2. All SCI ratings are exceptional or healthy. All HA ratings are optimal except for suboptimal habitat assessments at *Alapaha River at CR 751 Nobles Ferry Road* at each assessment event. This site scored lowest in substrate availability and habitat smothering. A suboptimal HA score combined with Healthy to Exceptional SCI score suggests that while the site’s physical habitat may be degraded, the biological community is relatively healthy; this may be due to factors such as stable food webs, low levels of pollution, and stable dissolved oxygen. To view the water quality data for this site please visit the District’s water quality portal ([Interactive Map of SRWMD Water Quality Station Locations](#)).

SCI scores with Dissolved Oxygen (DO) grab sample results and SCI with river discharge (cubic feet per second) for *Santa Fe River at O’Leno State Park* and *Santa Fe River near Fort White* are illustrated in Figures 2 - 5. The other sites were not plotted due to the short period of record.

In total 1,560 individual specimens were observed in 2024, and the number of specimens identified in each major group for each site is provided in Table 3. Flies were the most abundant group observed at all sites. The taxa composition for each sampling site and event is provided in Figures 6 – 9. Percent (%) EPT refers to the percentage of species within the pollution-sensitive orders of Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies).

Table 2: 2024 SCI and HA Results

Site ID	Site Name	Sampling Date	SCI Avg. Score	SCI Rating	HA Score	HA Rating
SFR040C1	Santa Fe River at O'Leno State Park	2/8/2024	67	Exceptional	139	Optimal
SFR040C1	Santa Fe River at O'Leno State Park	5/9/2024	66	Exceptional	132	Optimal
SFR040C1	Santa Fe River at O'Leno State Park	8/28/2024	83	Exceptional	122	Optimal
SFR040C1	Santa Fe River at O'Leno State Park	10/23/2024	88	Exceptional	138	Optimal
SFR058C1	Santa Fe River near Fort White	2/8/2024	72	Exceptional	143	Optimal
SFR058C1	Santa Fe River near Fort White	5/9/2024	55	Healthy	142	Optimal
SFR058C1	Santa Fe River near Fort White	8/28/2024	52	Healthy	135	Optimal
SFR058C1	Santa Fe River near Fort White	10/23/2024	69	Exceptional	150	Optimal
ALA060C1	Alapaha River at CR 751 Nobles Ferry Road	2/7/2024	48	Healthy	115	Suboptimal
ALA060C1	Alapaha River at CR 751 Nobles Ferry Road	5/8/2024	68	Exceptional	117	Suboptimal
ALA060C1	Alapaha River at CR 751 Nobles Ferry Road	9/4/2024	64	Exceptional	117	Suboptimal
ALA060C1	Alapaha River at CR 751 Nobles Ferry Road	11/20/2024	77	Exceptional	114	Suboptimal
SFR070C1	Santa Fe River at US 129 near Hildreth	2/7/2024	53	Healthy	127	Optimal
SFR070C1	Santa Fe River at US 129 near Hildreth	5/8/2024	53	Healthy	134	Optimal
SFR070C1	Santa Fe River at US 129 near Hildreth	9/4/2024	51	Healthy	138	Optimal
SFR070C1	Santa Fe River at US 129 near Hildreth	11/20/2024	59	Healthy	142	Optimal
WIT035C1	Withlacoochee River near Lee	11/4/2024	84	Exceptional	128	Optimal
SUW071C1	Suwannee River at Suwannee Springs	11/4/2024	67	Exceptional	131	Optimal
BLU020C1	Gilchrist Blue Spring Run	11/11/2024	53	Healthy	154	Optimal
ICH009C1	Ichetucknee River at HWY 27 near Hildreth	11/11/2024	68	Exceptional	151	Optimal

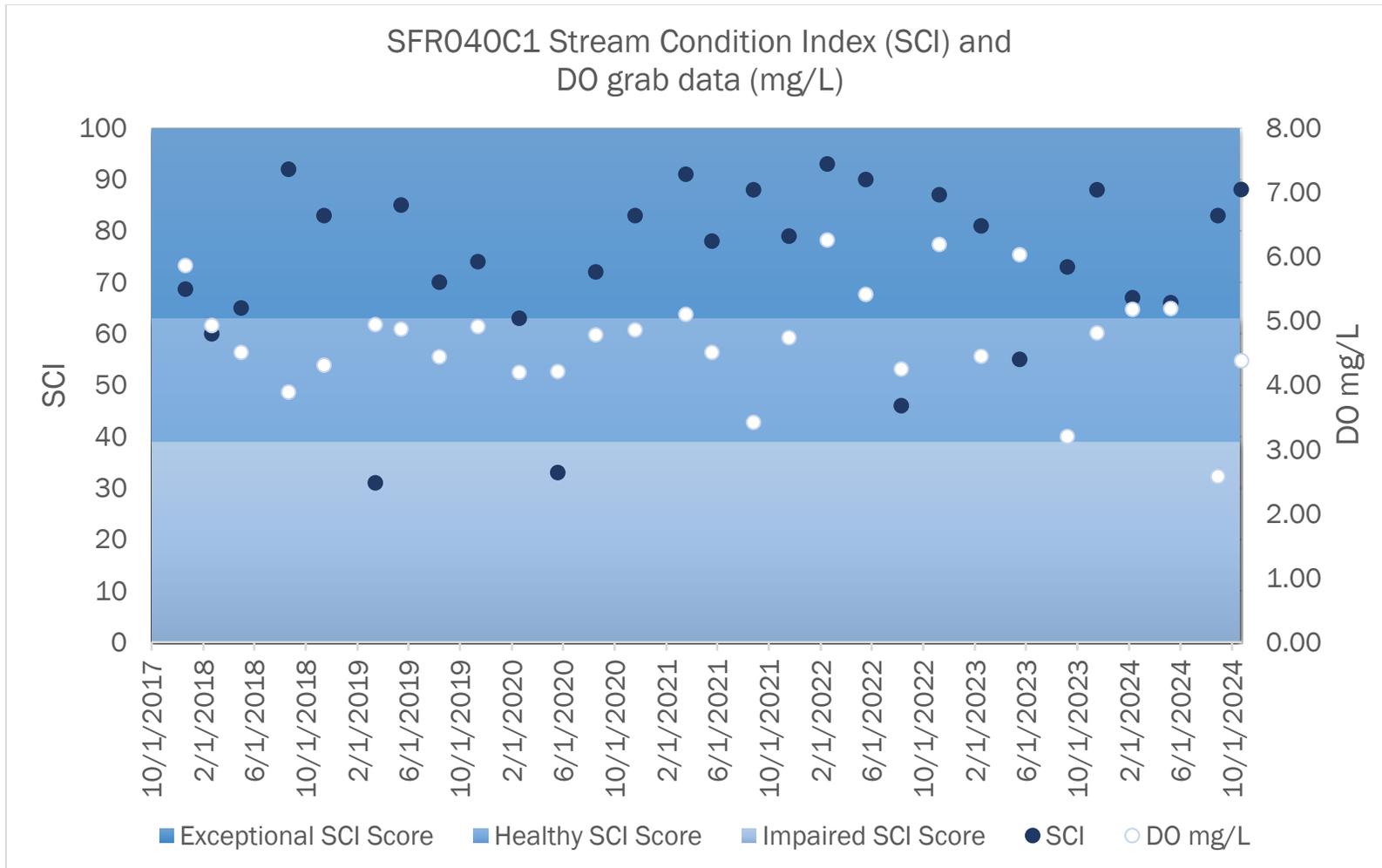


Figure 2: Historic SCI Scores and DO grab sample results at Santa Fe River at O'Leno State Park

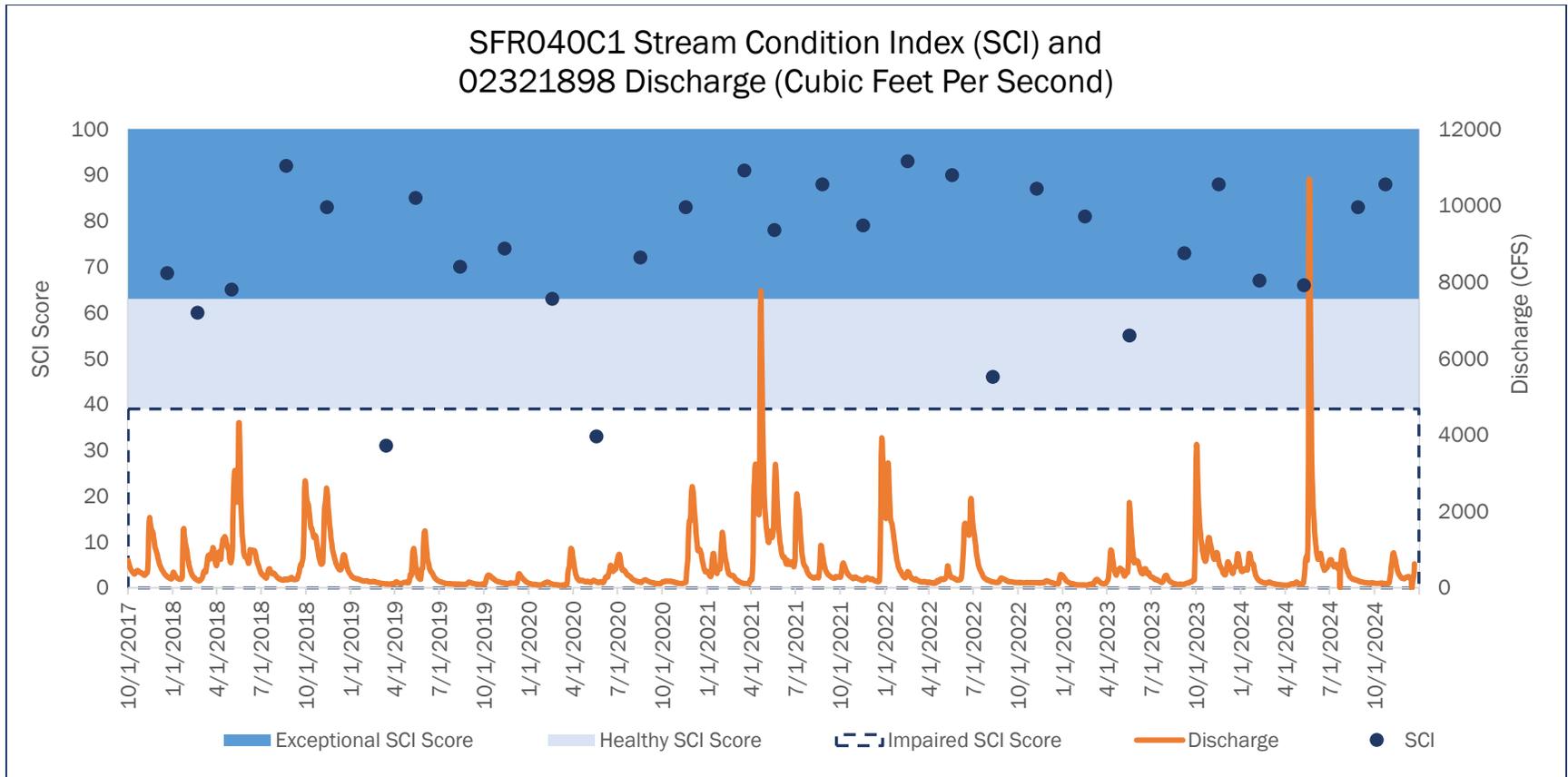


Figure 3: Historic SCI Scores and River Discharge at Santa Fe River at O’Leno State Park

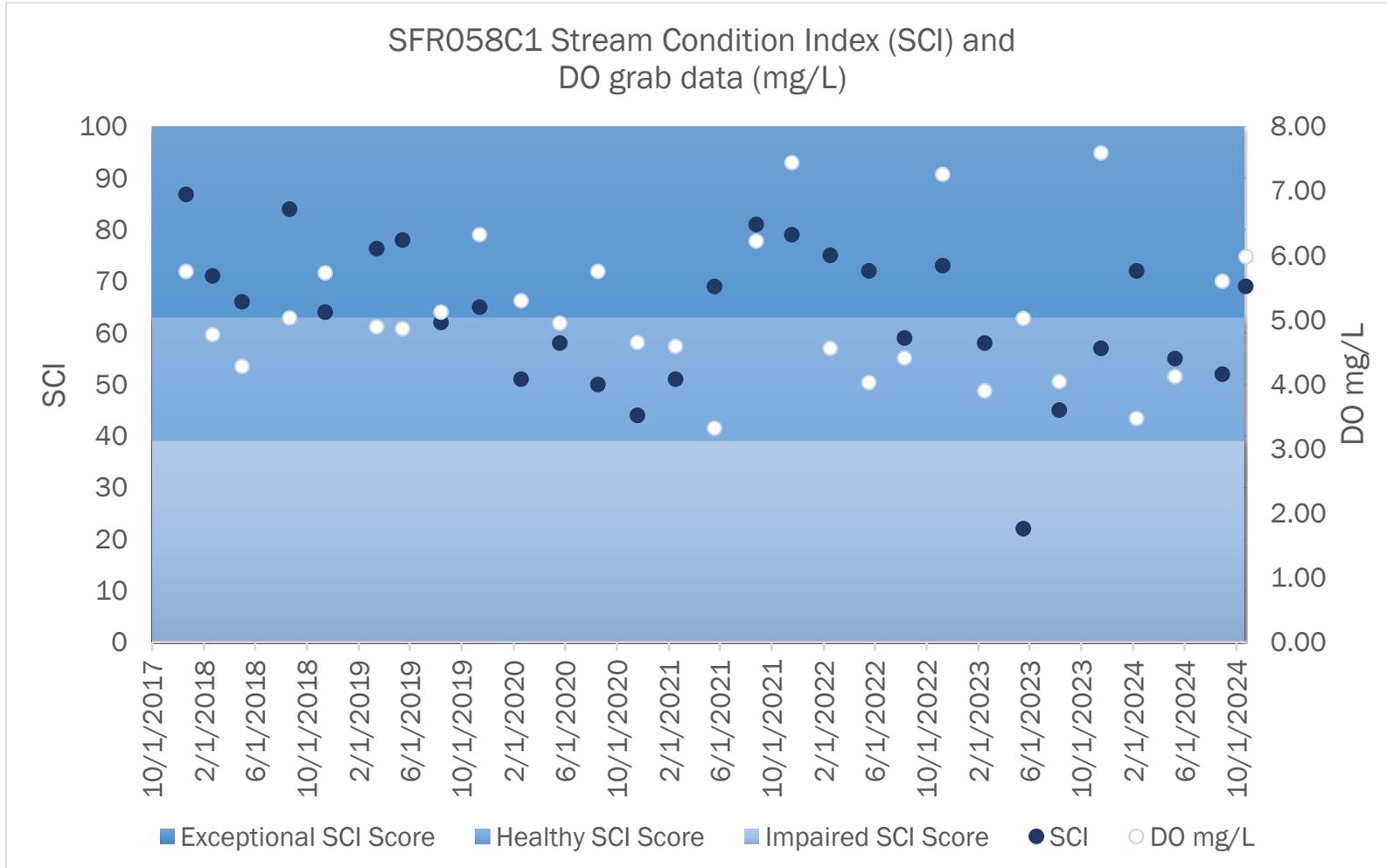


Figure 4: Historic SCI Scores and DO grab sample results at Santa Fe River near Fort White

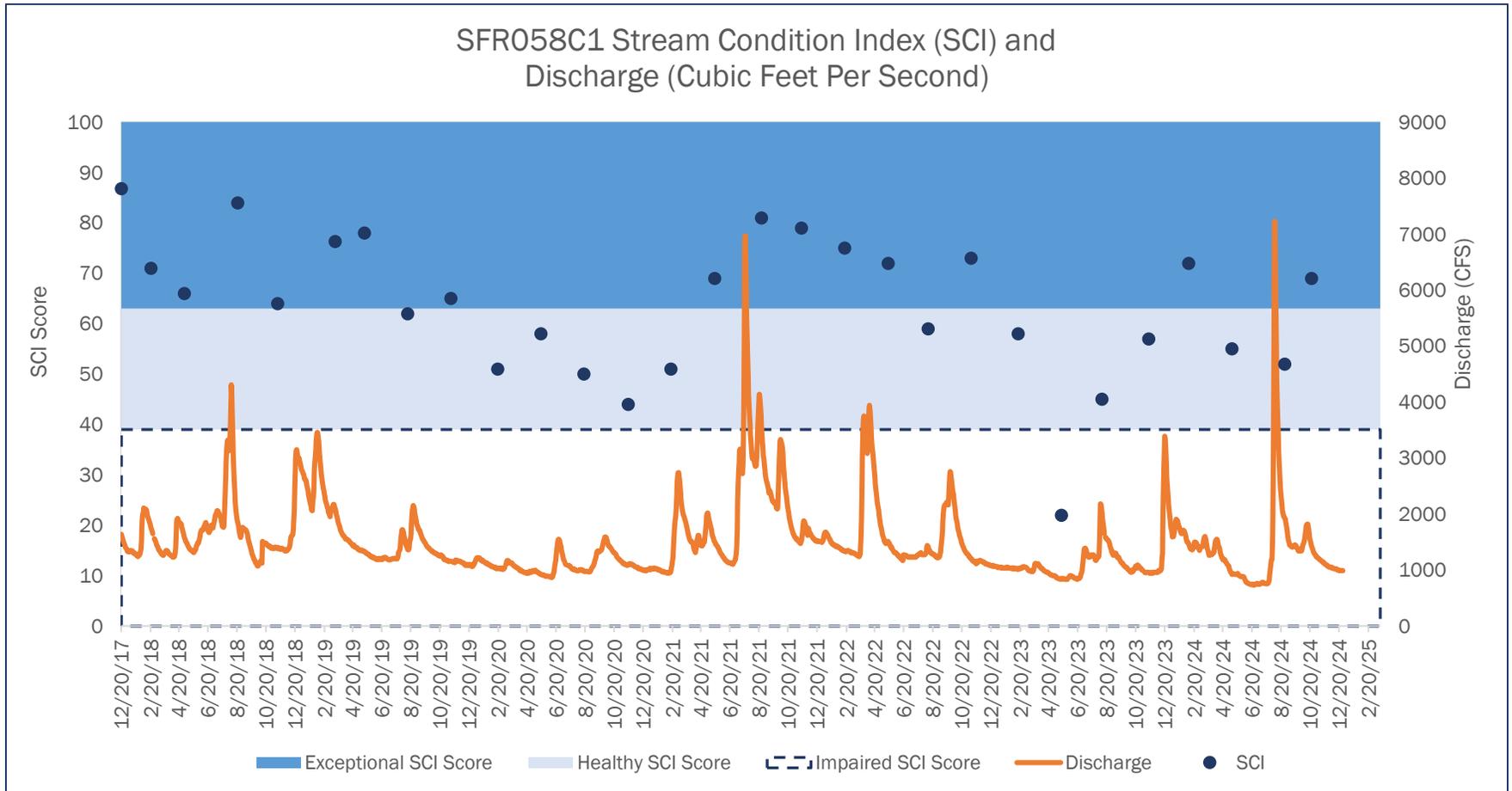


Figure 5: Historic SCI Scores and River Discharge at/near Santa Fe River near Fort White

Table 3: 2024 Group Specimens Identified

Group	Number of Specimens at Alapaha River at CR 751 Nobles Ferry Road 4 sampling events	Number of Specimens at Gilchrist Blue Spring Run 1 sampling event	Number of Specimens at Ichetucknee River at HWY 27 Near Hildreth 1 sampling event	Number of Specimens at Santa Fe River At O'Leno State Park 4 sampling events	Number of Specimens at Santa Fe River near Fort White 4 sampling events	Number of Specimens at Santa Fe River at US 129 Near Hildreth 4 sampling events	Number of Specimens at Suwannee River at Suwannee Springs 1 sampling event	Number of Specimens at Withlacoochee River near Lee 1 sampling event
Amphipods (Crustacea)	5	2	5	9	29	26	5	1
Beetles (Coleoptera)	17	2	4	27	22	15	7	7
Bivalves (Mollusca)	12	0	0	7	1	3	0	5
Caddisflies (Trichoptera)	19	4	7	44	42	24	14	13
Damselflies (Odonata)	1	5	3	2	5	13	1	3
Decapods (Crustacea)	3	3	4	6	6	5	1	3
Dragonflies (Odonata)	1	0	1	3	0	6	0	0
Flatworms (Platyhelminthes)	0	1	1	1	1	0	0	1
Flies (Chironomidae & Diptera)	184	24	21	142	62	91	20	37
Hemipterans (Hemiptera)	5	0	0	0	1	3	2	0
Isopods (Crustacea)	5	0	2	4	6	7	2	2
Leeches (Oligochaeta)	3	0	0	3	1	1	1	0
Mayflies (Ephemeroptera)	39	6	8	41	32	51	14	8
Megalopterans (Megaloptera)	0	0	0	1	0	1	0	0
Midges (Diptera & Nematocera)	2	3	2	2	2	2	3	4
Mites (Acari)	2	2	10	7	16	18	1	5
Moths (Lepidoptera)	0	0	0	0	1	4	1	0
Proboscis Worms (Hoploneurata & Monostilifera)	1	0	0	0	0	2	0	1
Snails (Mollusca)	9	7	6	18	27	26	1	3
Springtails (Symphypleona)	0	0	0	0	0	2	0	0
Stoneflies (Plecoptera)	1	0	0	0	0	0	0	1
Worms (Oligochaeta)	19	6	3	22	5	9	6	10
Total	328	65	77	339	259	309	79	104

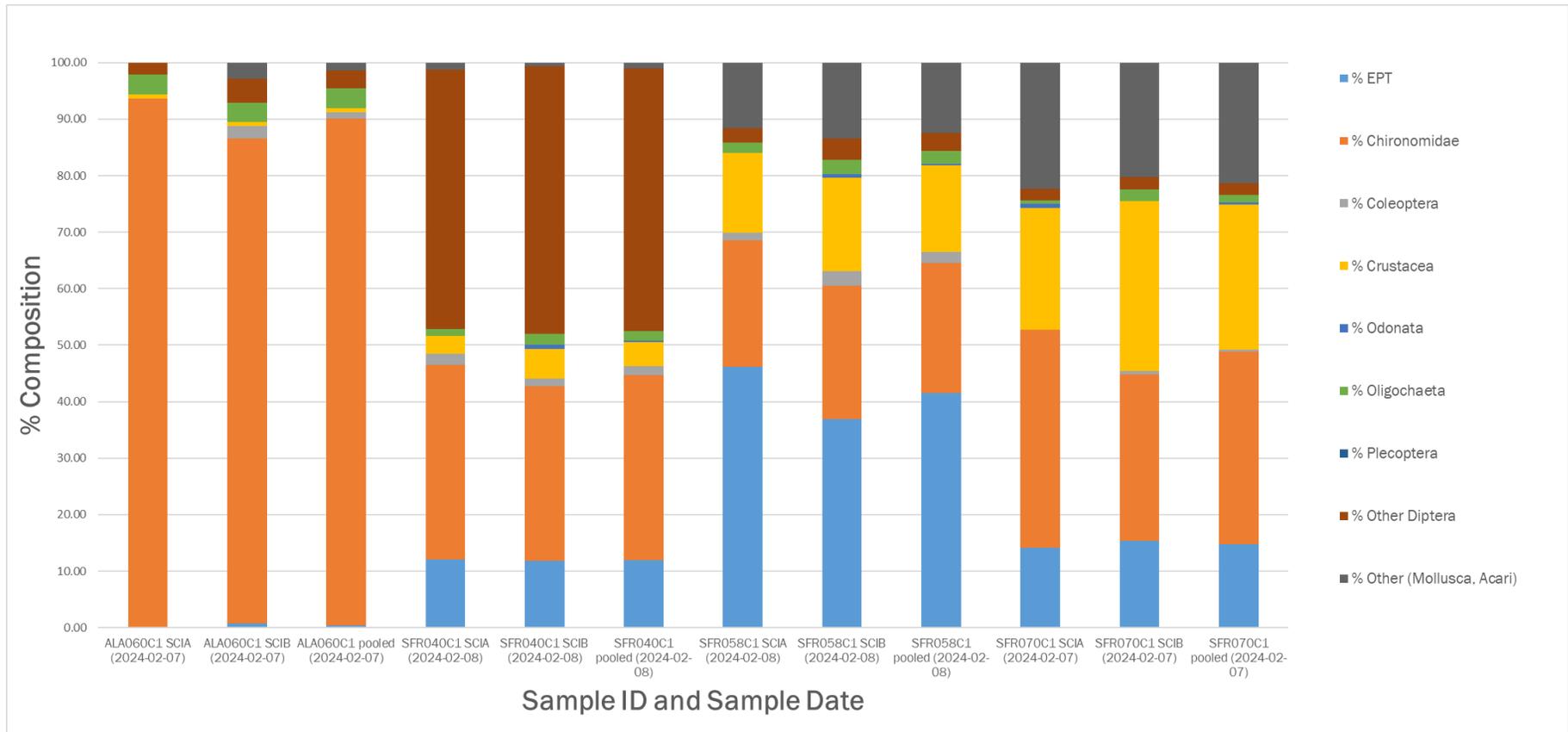


Figure 6: February 2024 SCI Taxa Composition, SCIA and SCIB designate the first and second SCIs calculated on each visit, while pooled designates the combined SCI datasets from A and B into one large dataset for analysis

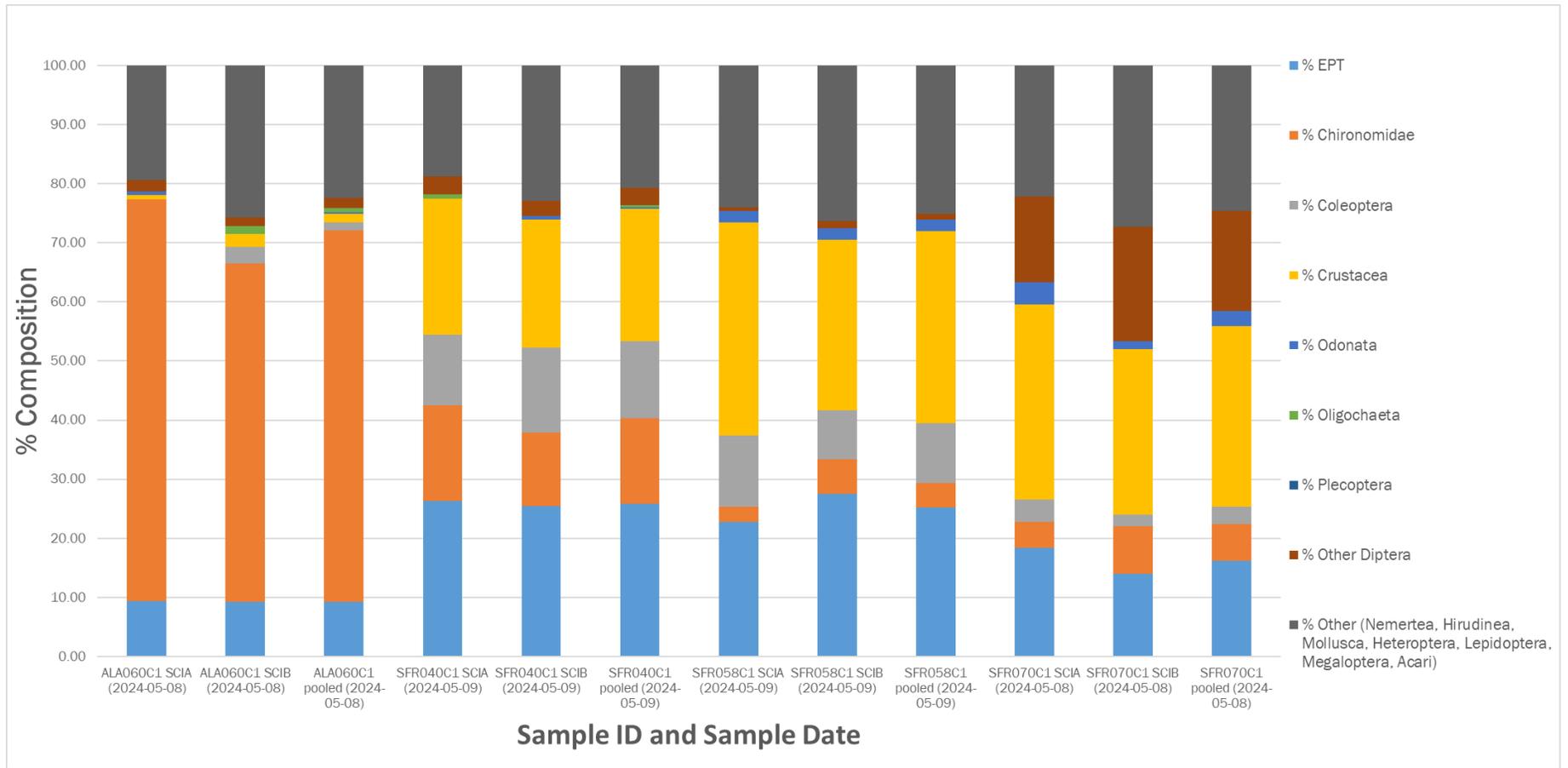


Figure 7: May 2024 SCI Taxa Composition, SCIA and SCIB designate the first and second SCIs calculated on each visit, while pooled designates the combined SCI datasets from A and B into one large dataset for analysis

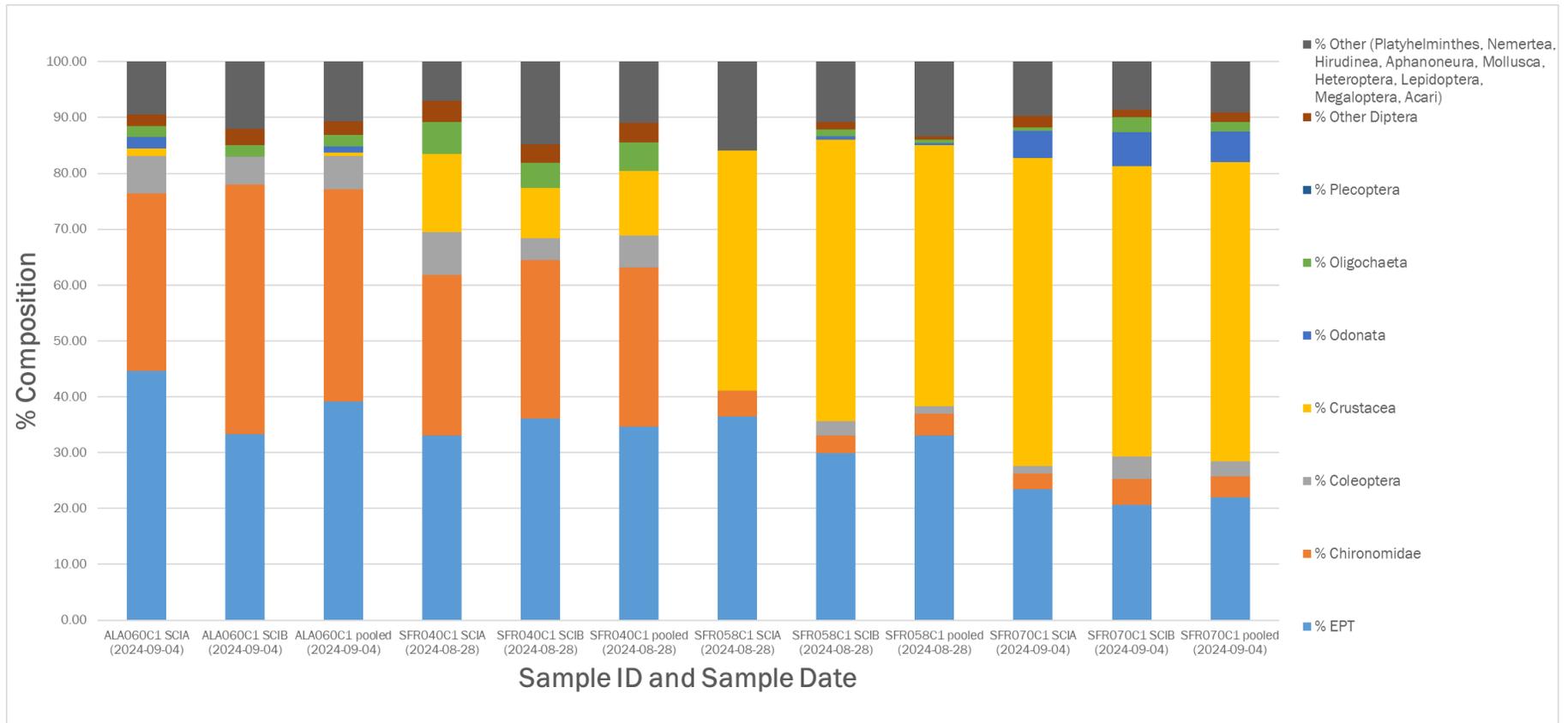


Figure 8: August & September 2024 SCI Taxa Composition, SCIA and SCIB designate the first and second SCIs calculated on each visit, while pooled designates the combined SCI datasets from A and B into one large dataset for analysis

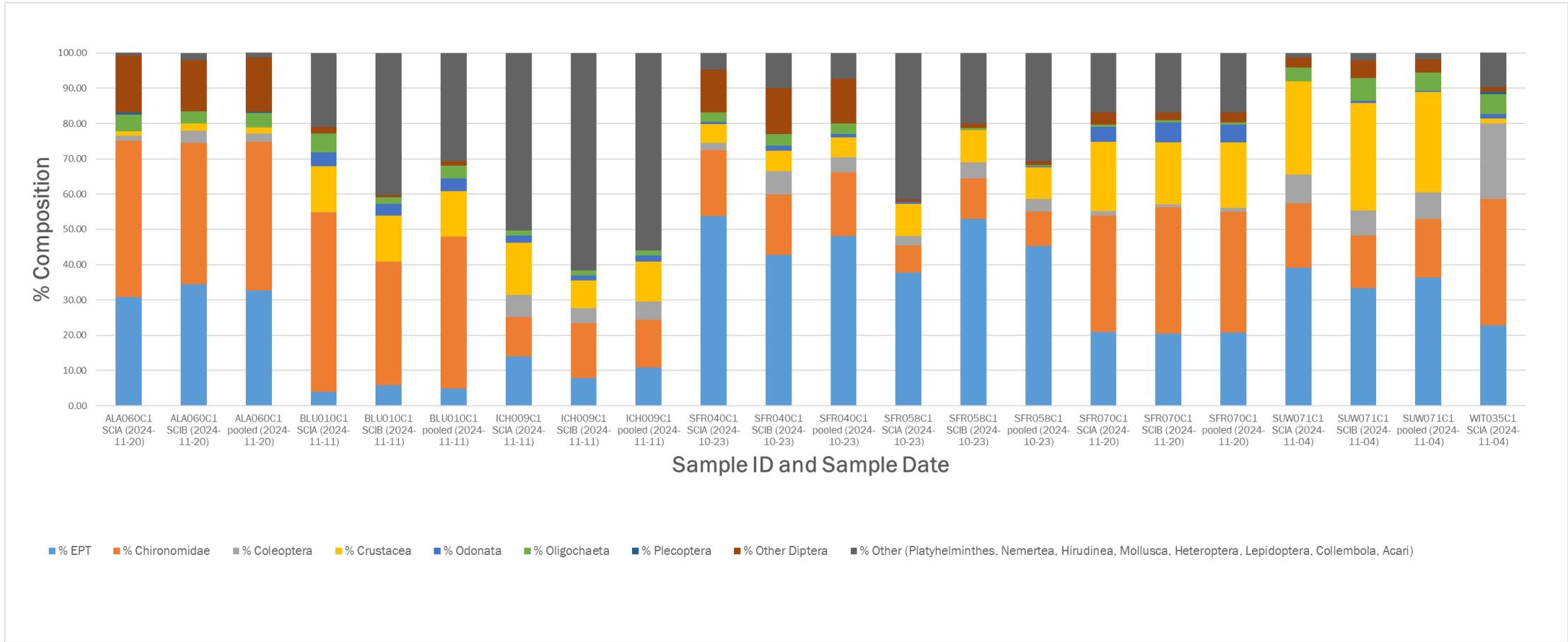


Figure 9: November 2024 SCI Taxa Composition (Gilchrist Blue Spring Run, Ichetucknee River at HWY 27 Near Hildreth, Suwannee River at Suwannee Springs, and Withlacoochee River near Lee added in this sampling quarter). SCIA and SCIB designate the first and second SCIs calculated on each visit, while pooled designates the combined SCI datasets from A and B into one large dataset for analysis



Figure 10: SCI Transect at Santa Fe River near Fort White, Santa Fe River near Fort White



Figure 11: *Didymops transversa*, seen at Santa Fe River at O'Leno State Park



Figure 12: District staff demonstrating sorting a SCI dipnet sweep, with the field sheet



Figure 13: Macroinvertebrate collected in dipnet sweep

2024 Periphyton Monitoring

WSP conducted quarterly periphyton monitoring at 6 stations on the Santa Fe, Suwannee, and Alapaha rivers in 2024 for a total of 24 periphyton sampling events. *Santa Fe River at O'Leno State Park* (SFR040C1), *Santa Fe River near Fort White* (SFR058C1), *Santa Fe River near Hildreth at US 129* (SFR070C1), *Suwannee River near Rock Bluff* (SUW150C1), and *Suwannee River at Luraville* (SUW130C1) were monitored for periphyton quarterly throughout the year, while *Alapaha River at CR 751 Nobles Ferry Road* (ALA060C1) began quarterly periphyton monitoring in December of 2024. Quantitative sampling methods for periphyton generally follow FDEP SOP FS 7210. Two samplers containing glass settling racks are deployed in the river for 28 days in the most unshaded location possible. Slides are then retrieved and sent to the laboratory for processing, where at least 300 cells are enumerated for each sample by counting organisms under magnification along at least one central transect. All algal forms are enumerated using natural counting units, which are defined as one unit for each colony, filament, diatom cell, or unicell. Algal taxa are identified to the lowest practical taxonomic level. The number of algal cells comprising each multicellular counting unit are also counted, and abundance is calculated in both natural units/cm² and cells/cm². Three of the slides from the periphyton samplers are also used for determination of dry weight and ash-free dry weight biomass. For each station and sampling event in 2024, Table 4 summarizes the total number of taxa identified, the average ash-free dry weight (g/m²), Margalef's Richness Index, the dominant taxon/species as identified by total cell count (as opposed to natural units), the major division of the dominant taxon, and the chlorophyll *a* concentration for the associated water quality sample. Margalef's index is a species richness index which compensates for the effects of sample size through dividing the number of species in a sample by the natural log of the number of organisms collected.

In 2024, 628 total algal taxa were counted between all 6 periphyton monitoring sites. The highest species richness occurred at *Alapaha River at CR 751 Nobles Ferry Road* in September and *Santa Fe River near Fort White* in August. The dominant taxon by total cells was Heterokontophyta for 14 of 24 of the sampling events, with 2 instances of Chlorophyta dominance and 8 instances of cyanobacteria dominance. Some of the species of cyanobacteria identified in the samples can produce toxins, although no toxin analysis was performed. In 2024 there were no algae blooms reported to FDEP within any of the waterbodies monitored by the District for periphyton (FDEP 2024b). Cyanobacteria blooms can pose health risks to people recreating in the water (FDEP 2012). The World Health Organization (WHO) has advised that in systems where cyanobacteria are the dominant species with chlorophyll *a* levels greater than 50 µg/L, cyanobacteria can present a moderate risk of adverse health effects (Chorus & Welker 2021). Chlorophyll *a* concentrations at these river stations are indicated in Table 4 in µg/L and have been well below the level identified to pose moderate risk of adverse health effects. Figures 16 - 20 illustrate periphyton ash-free dry weight measurements over time, plotted with discharge for each station, except for *Alapaha River at CR 751 Nobles Ferry Road*, as there is no discharge recorded. Figures 21 - 24 illustrate the distribution by natural units within each

division for each sample. This differs from the dominant taxon by total cell count metric because it groups multicellular colonies, filaments, etc., into natural units.



Figure 14: Retrieval of a periphyton sampler at Santa Fe River at O'Leno State Park



Figure 15: Close-up of a periphyton sampler

Table 4: 2024 Periphyton Monitoring Events

Station ID	Station	Sample Collection Date	Total # of Taxa	Margalef's Richness Index	Average AFDW (g/m ²)	Dominant Taxon (Cells)	Dominant Taxon Division (Cells)	Chlorophyll a Concentration (µg/L)	Chlorophyll a Date
SUW130C1	Suwannee River at Luraville	2/6/2024	9	1.4	7.96	<i>Gomphonema parvulum</i>	Heterokontophyta	0.189	2/6/2024
ALA060C1	Alapaha River at CR 751 Nobles Ferry Road	2/7/2024	14	2.28	1.84	<i>Gomphonema parvulum</i>	Heterokontophyta	1.174	2/7/2024
SFR070C1	Santa Fe River near Hildreth at US 129	2/7/2024	25	4.21	3.76	<i>Protoderma</i> sp.	Chlorophyta	0.361	2/7/2024
SFR040C1	Santa Fe River at O'Leno State Park	2/8/2025	14	2.28	2.11	<i>Gomphonema parvulum</i>	Heterokontophyta	0.150	2/8/2024
SFR058C1	Santa Fe River near Fort White	2/8/2025	23	3.86	1.98	<i>Gomphonema parvulum</i>	Heterokontophyta	0.073	2/8/2024
SUW150C1	Suwannee River near Rock Bluff	3/5/2024	22	3.68	13.55	<i>Gomphonema parvulum</i>	Heterokontophyta	0.258	2/6/2024
SUW130C1	Suwannee River at Luraville	5/7/2024	28	4.73	2.78	<i>Aphanocapsa</i> sp.	Cyanobacteria	0.149	5/7/2024

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SUW150C1	Suwannee River near Rock Bluff	5/7/2024	24	4.03	.11	<i>Aphanocapsa</i> sp.	Cyanobacteria	0.149	5/7/2024
ALA060C1	Alapaha River at CR 751 Nobles Ferry Road	5/8/2024	18	2.98	.13	<i>Aphanocapsa</i> sp.	Cyanobacteria	0.499	5/8/2024
SFR070C1	Santa Fe River near Hildreth at US 129	5/8/2024	14	2.28	9.95	Unknown Cyanophyte (coccoid) sp.	Cyanobacteria	0.010	5/8/2024
SFR040C1	Santa Fe River at O'Leno State Park	5/9/2024	29	4.91	3.22	Unknown Cyanophyte (coccoid) sp.	Cyanobacteria	0.995	5/9/2024
SFR058C1	Santa Fe River near Fort White	5/9/2024	28	4.73	3.72	<i>Sellaphora</i> sp.	Heterokontophyta	0.474	5/9/2024
SUW130C1	Suwannee River at Luraville	8/6/2024	26	4.38	15.27	<i>Cocconeis placentula</i>	Heterokontophyta	0.980	8/6/2024
SUW150C1	Suwannee River near Rock Bluff	8/6/2024	25	4.21	1.27	<i>Cocconeis placentula</i>	Heterokontophyta	1.284	8/6/2024
SFR070C1	Santa Fe River near Hildreth at US 129	8/7/2024	20	3.32	6.04	<i>Gogorevia exilis</i>	Heterokontophyta	0.193	9/4/2024
SFR058C1	Santa Fe River near Fort White	8/8/2024	53	9.10	1.52	<i>Phormidium</i> sp.	Cyanobacteria	0.569	8/28/2024
ALA060C1	Alapaha River at CR 751 Nobles Ferry Road	9/4/2024	66	10.79	0.44	Unknown Cyanophyte (filament) sp.	Cyanobacteria	0.268	9/4/2024
SFR040C1	Santa Fe River at O'Leno State Park	9/25/2024	38	6.48	0.32	<i>Planktolyngbya</i> sp.	Cyanobacteria	0.236	8/28/2024

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SUW150C1	Suwannee River near Rock Bluff	11/19/2024	28	4.73	10.98	<i>Gomphonema parvulum</i>	Heterokontophyta	0.264	10/22/2024
SUW130C1	Suwannee River at Luraville	11/19/2024	30	5.08	6.23	<i>Gomphonema parvulum</i>	Heterokontophyta	0.033	10/22/2024
ALA060C1	Alapaha River at CR 751 Nobles Ferry Road	11/20/2024	26	4.38	0.61*	<i>Aphanothece</i> sp.	Heterokontophyta	0.560	11/20/2024
SFR070C1	Santa Fe River near Hildreth at US 129	11/20/2024	24	4.03	5.66	<i>Chaetophora</i> sp.	Heterokontophyta	4.489	11/20/2024
SFR058C1	Santa Fe River near Fort White	11/20/2024	16	2.63	0.74	Unknown Chlorophyte sp.	Chlorophyta	0.525	10/23/2024
SFR040C1	Santa Fe River at O'Leno State Park	11/20/2024	28	6.49	3.54	<i>Cocconeis fluviatilis</i>	Heterokontophyta	0.140	10/23/2024

*One sampler was dry, and the other had one slide missing (only 2 slides for AFDW)

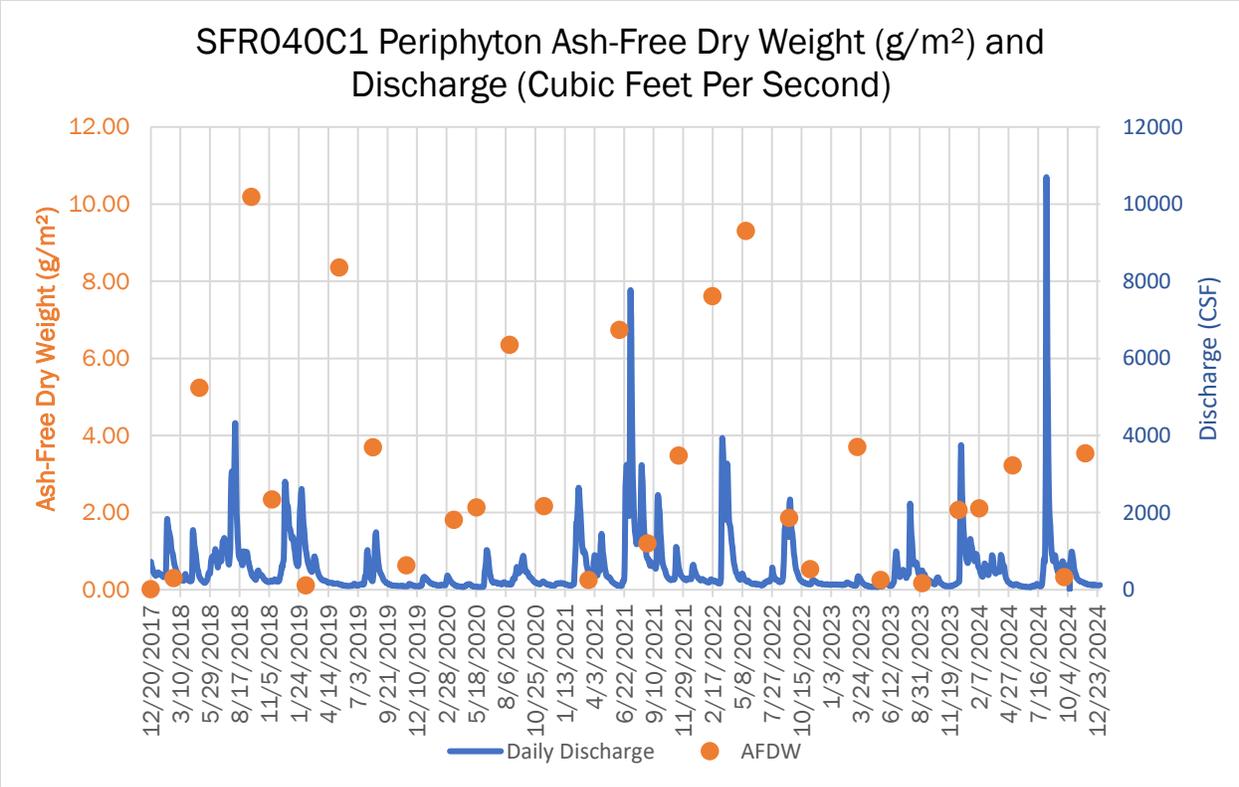


Figure 16: Santa Fe River at O'Leno State Park Historic Periphyton Ash-Free Dry Weight (g/m²) and Discharge Cubic Feet per Second (CFS)

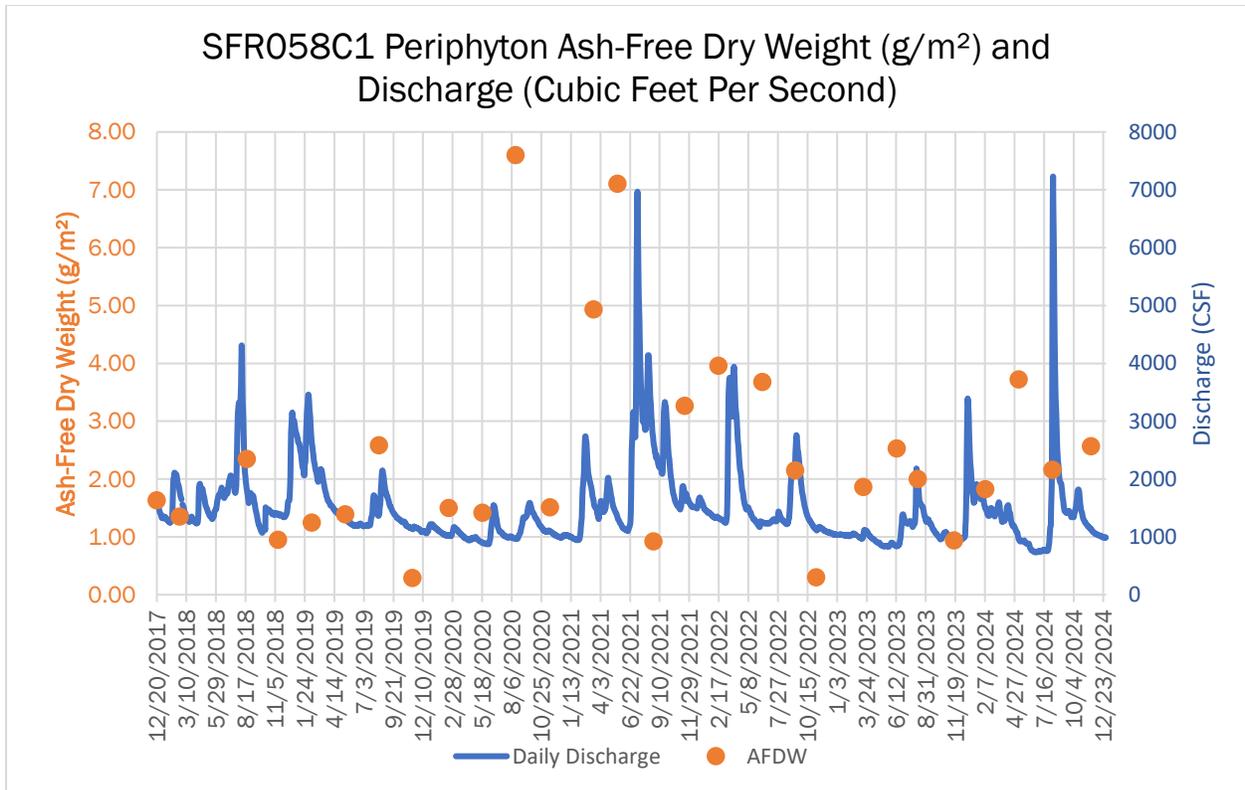


Figure 17: Santa Fe River near Fort White Historic Periphyton Ash-Free Dry Weight (g/m²) and Discharge (CFS)

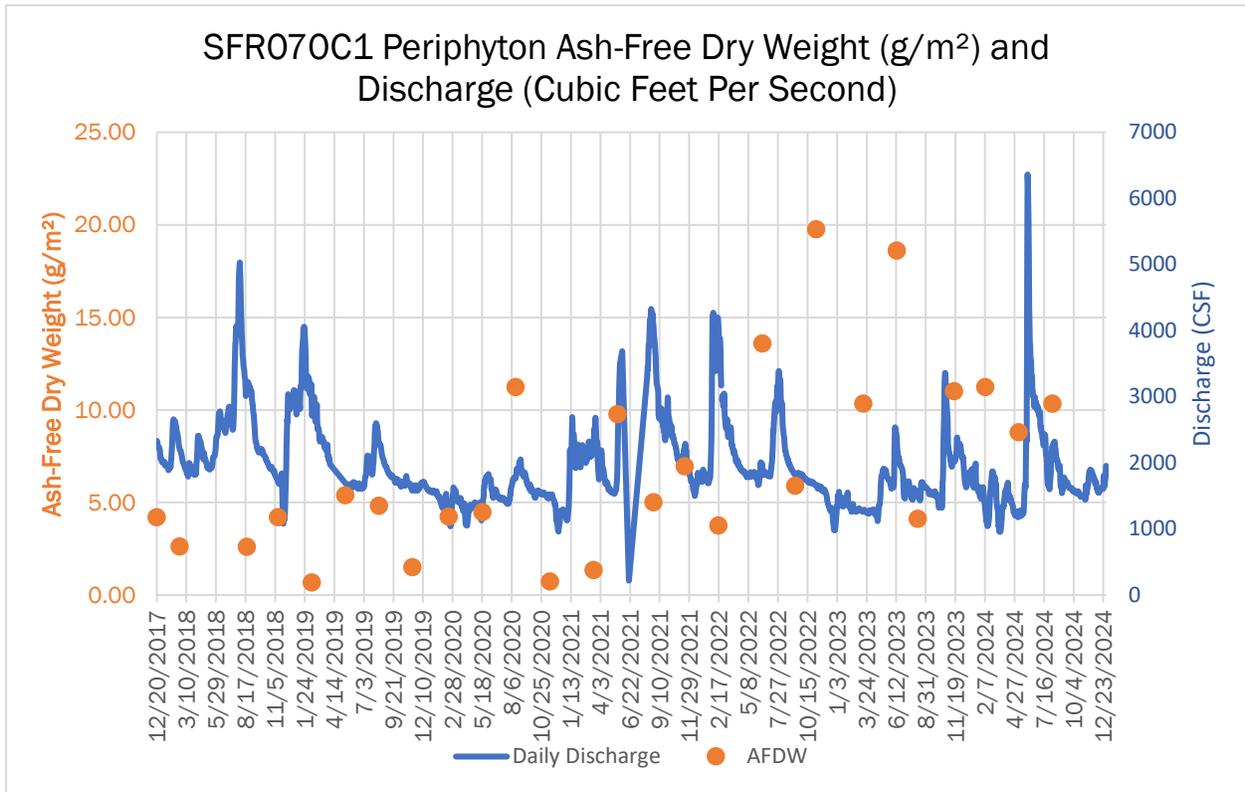


Figure 18: Santa Fe River at US 129 near Hildreth Historic Periphyton Ash-Free Dry Weight (g/m²) and Discharge (CFS)

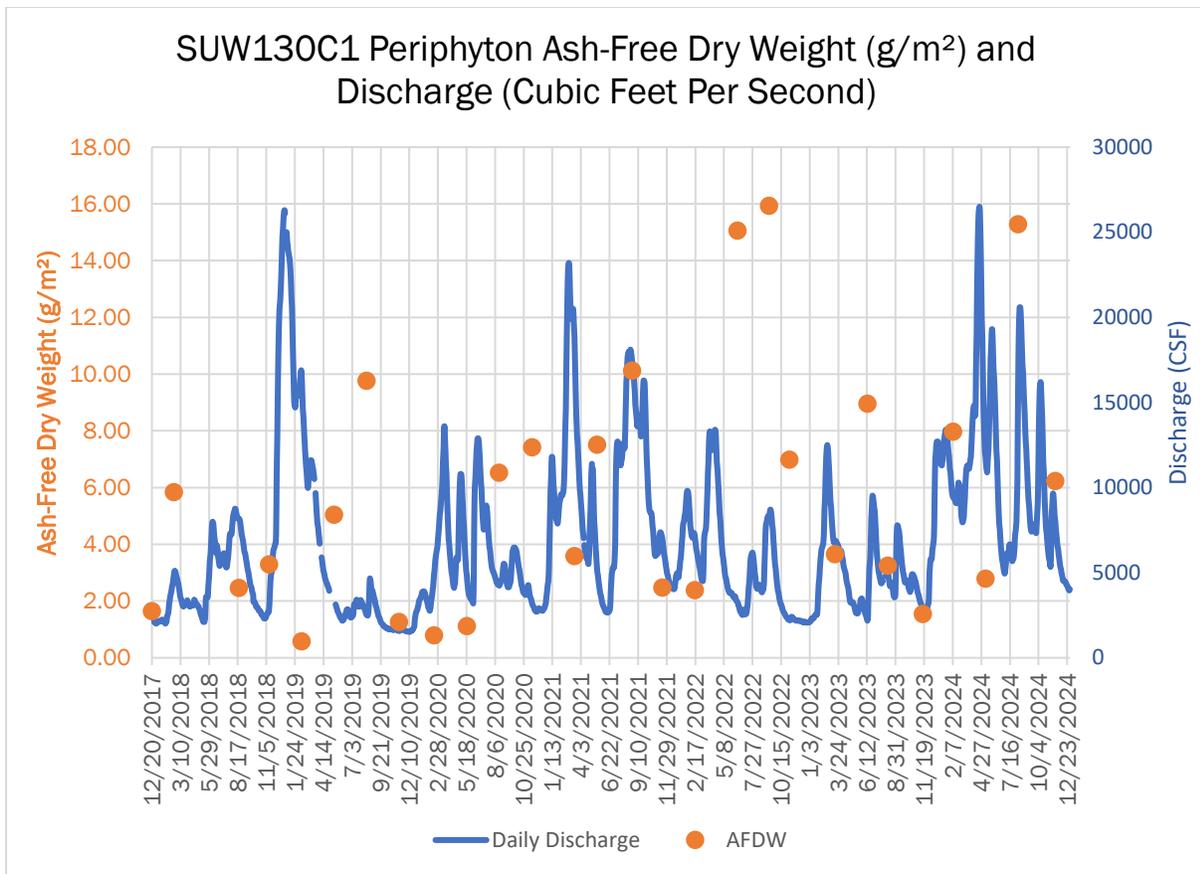


Figure 19: Suwannee River at Luraville Historic Periphyton Ash-Free Dry Weight (g/m²) and Discharge (CFS)

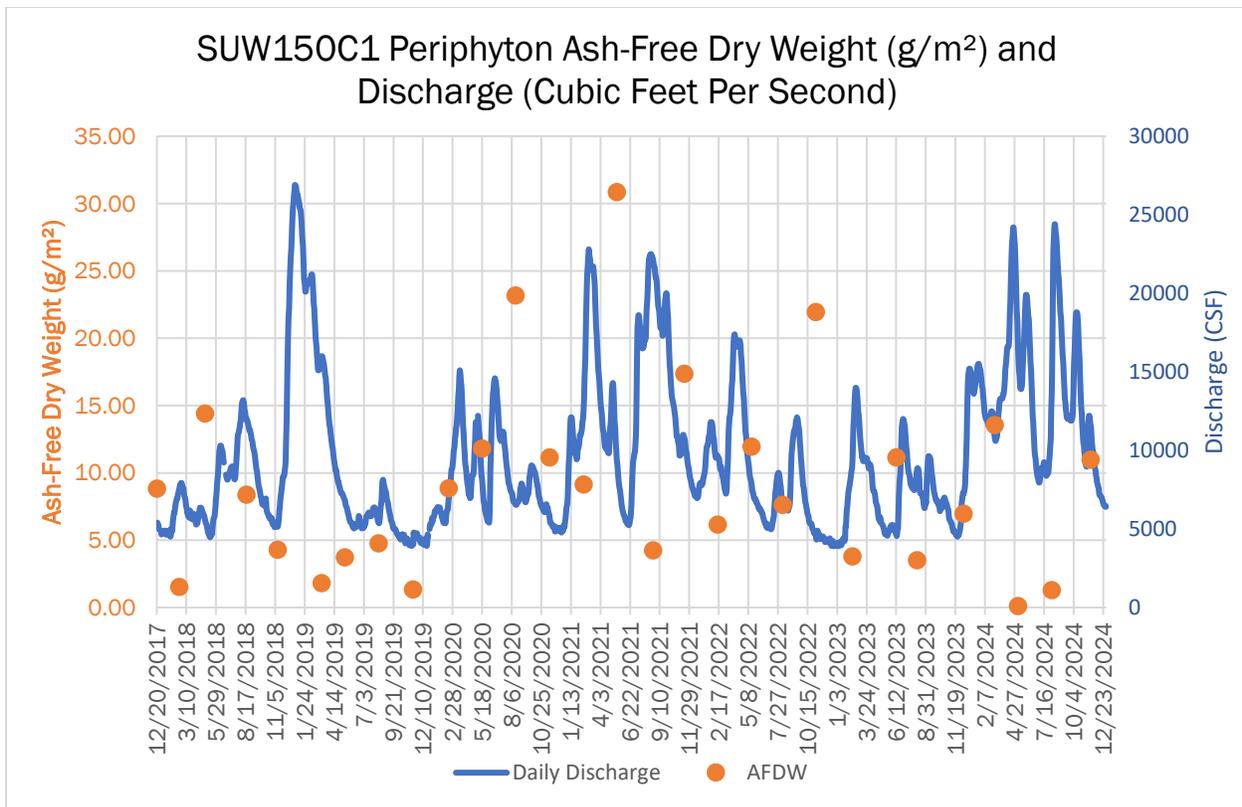


Figure 20: Suwannee River near Rock Bluff Historic Periphyton Ash-Free Dry Weight (g/m²) and Discharge (CFS)

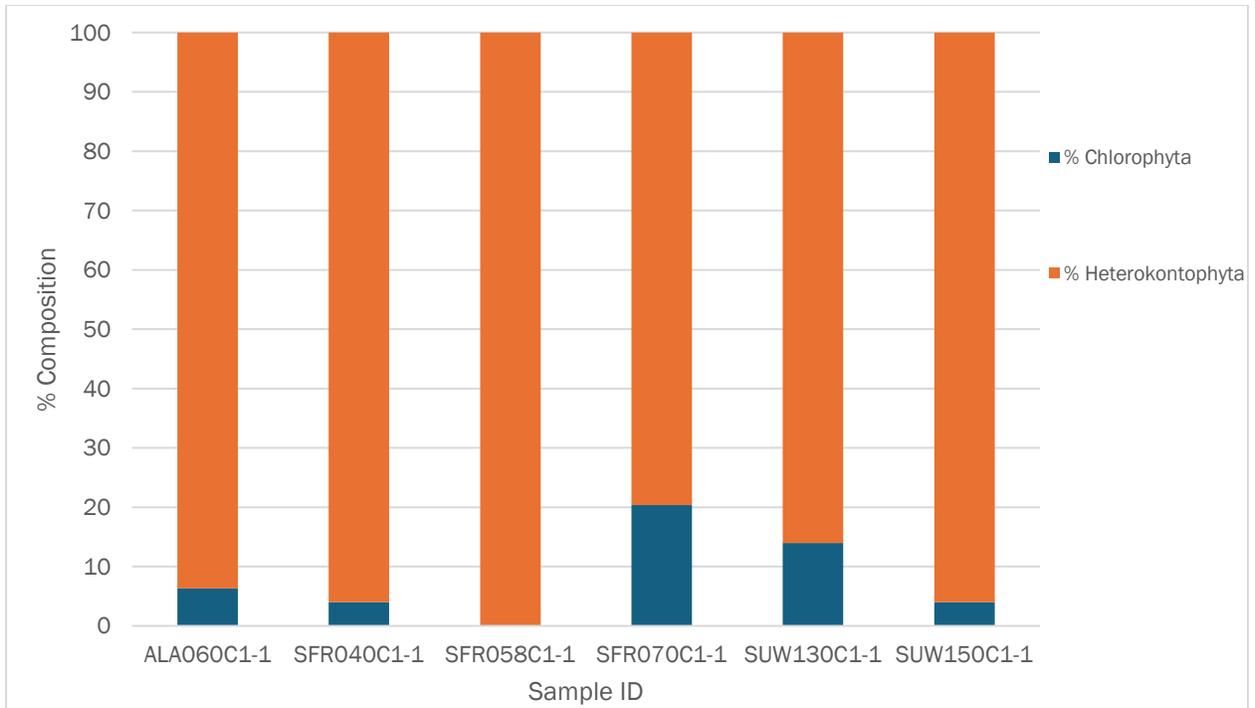


Figure 21: February/March 2024 Periphyton Composition (Natural Units)

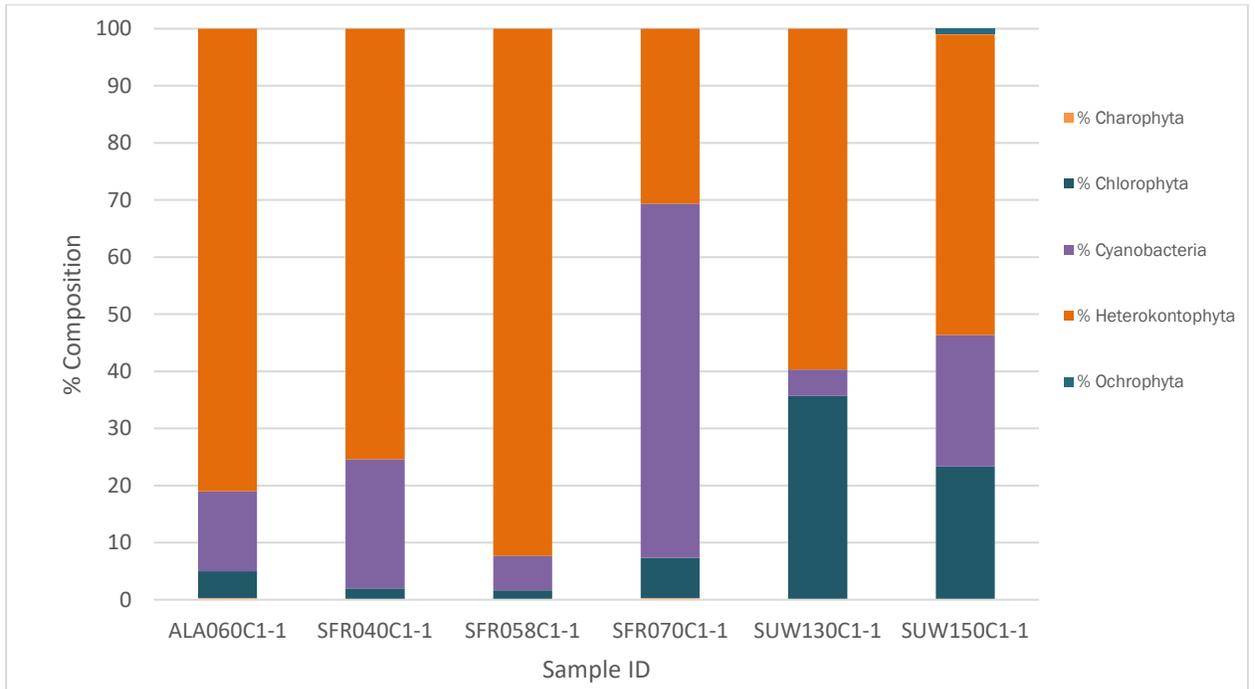


Figure 22: May 2024 Periphyton Composition (Natural Units)

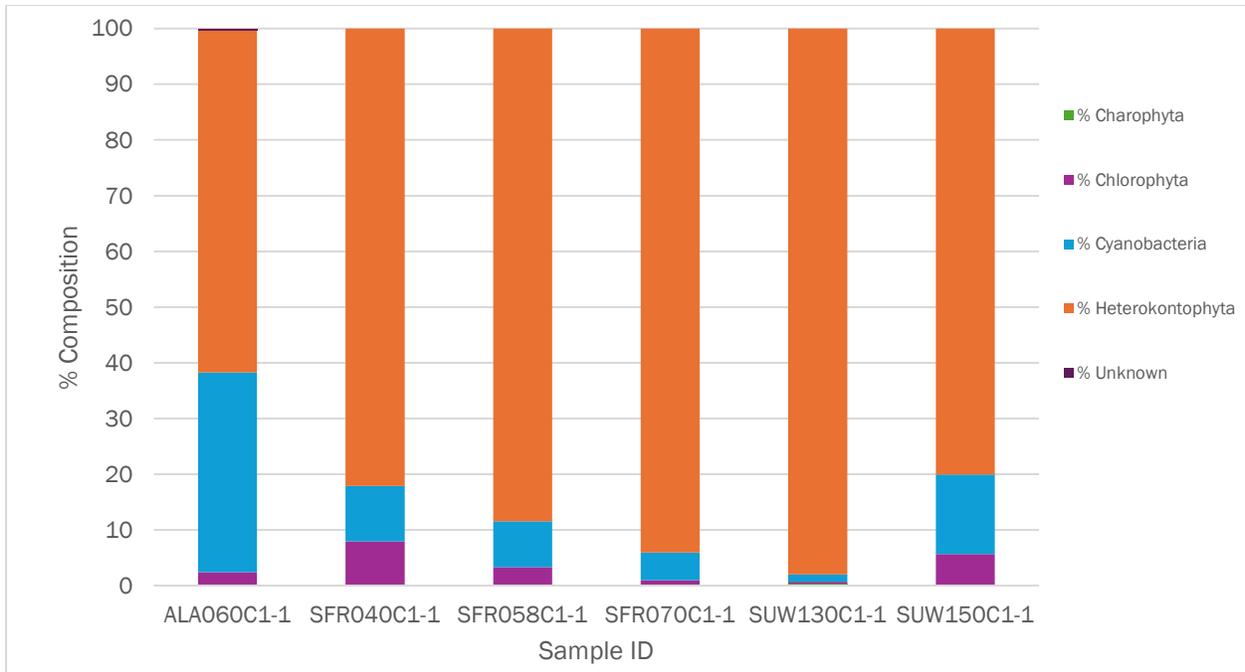


Figure 23: August/September 2024 Periphyton Composition (Natural Units)

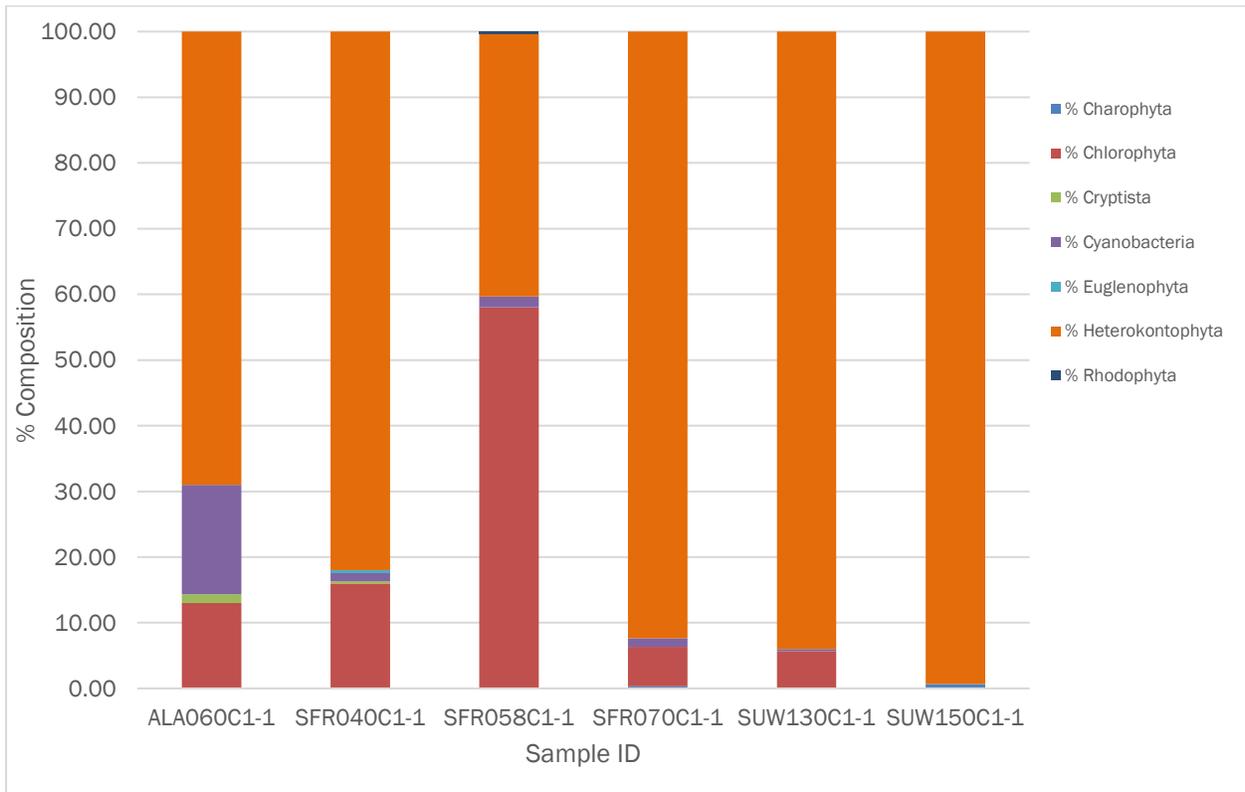


Figure 24: November 2024 Periphyton Composition (Natural Units)

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