



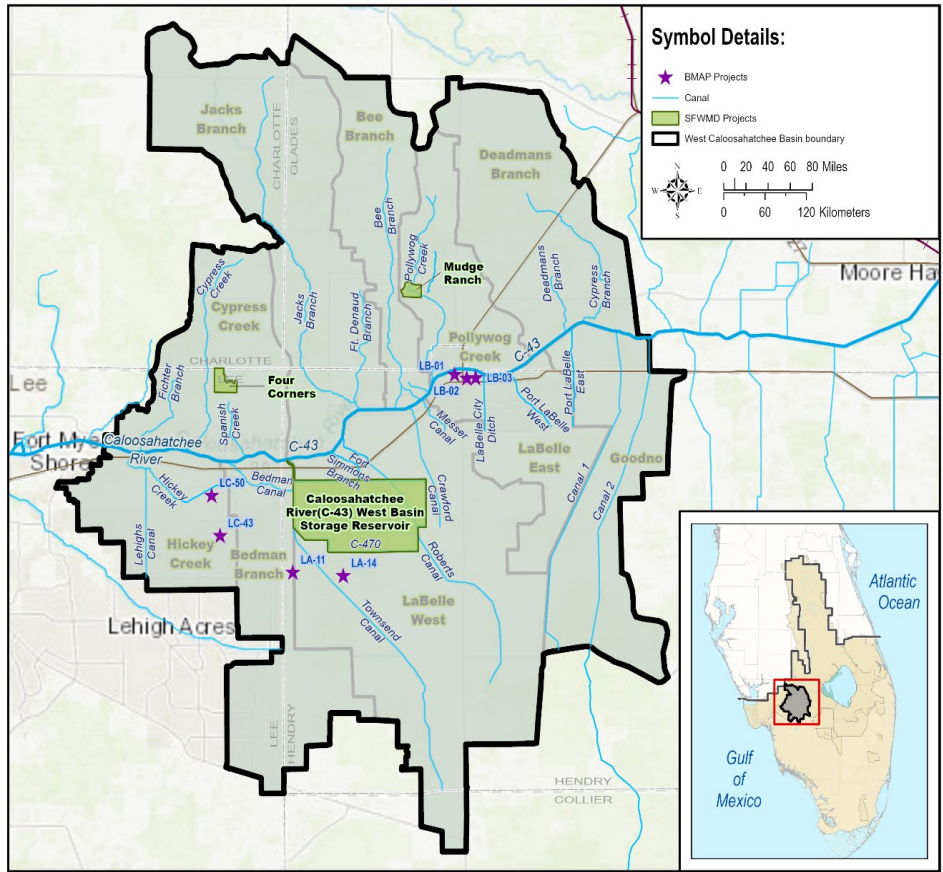
October 2024

# Caloosahatchee River Watershed West Caloosahatchee Basin Assessment

The purpose of this assessment is to pinpoint the most significant nutrient sources in the basin, determine remaining water quality improvement needs, and recommend strategic actions. Targeted reductions are needed because the Caloosahatchee River Estuary (CRE) received approximately 1,020 (t) of total nitrogen (TN) above the TMDL from the watershed during the period of WY2018-WY2022. The West Caloosahatchee Basin discharges at the S-79 structure into the CRE.

WY2018 – WY2022	
Flow	753,800 ac-ft
Projected Storage	194,000 ac-ft
Storage Planning Target	335,000 ac-ft
Remaining Storage Needed	141,000 ac-ft
Total Nitrogen (TN) Load	1,240 t
Projected TN Reductions <sup>1</sup>	84 t
TN Planning Target	611 t
Remaining TN Reductions Needed	545 t

<sup>1</sup> Estimations based on recently completed and future planned projects



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**Figure 1.** Locations of current and future projects within the West Caloosahatchee Basin.

Planned Projects to Reduce Nutrient Loads	2024	2028	2029	2030 and beyond
	<b>18.6 t Reduction</b> BMAP projects 4.33 t FDACS BMPs 14.3 t	<b>59.7 t Reduction</b> BMAP projects 1.74 t Four Corners 39.3 t	<b>74.9 t Reduction</b> BMAP projects 0.5 t C-43 Water Quality 14.7 t	<b>83.9 t Reduction</b> BMAP projects 6.5 t Frank Mann 2.53 t



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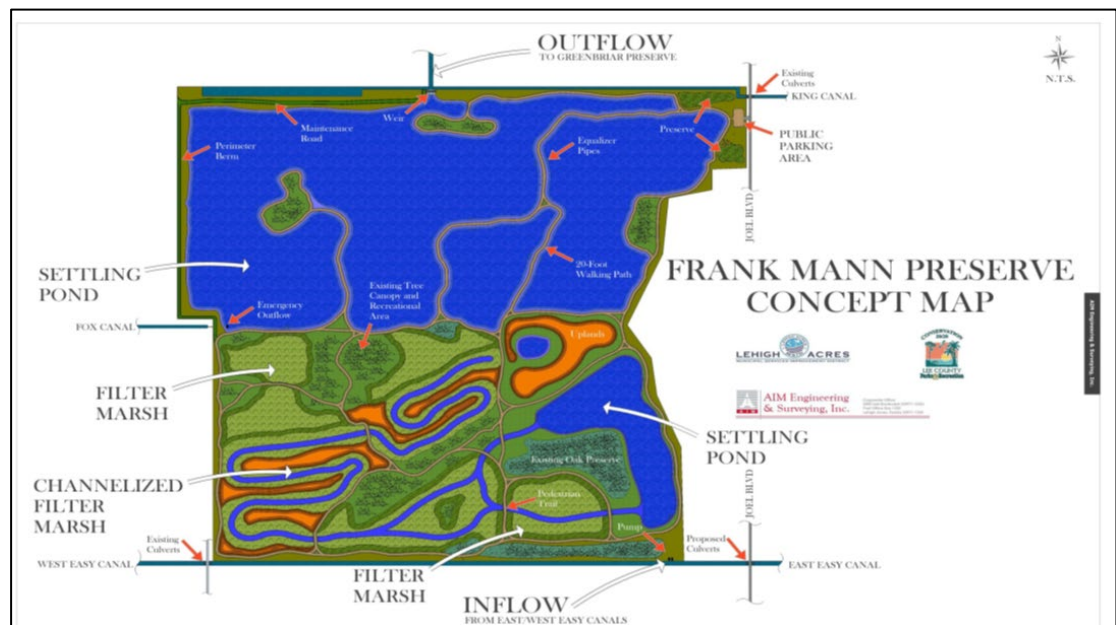
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## Opportunities

- ❖ Consider an expansion of the Mudge Ranch DWM as part of the renewal.
- ❖ Review all SFWMD lands for their suitability for storage and water quality treatment projects and consider land swaps for more optimal locations when necessary.
- ❖ Consider initiating a request for proposals for additional storage projects in the West Basin. The response must include a water availability analysis along with proposed storage and TN load reductions achieved by the project. The projects must also have the ability to return water to the C-43 when needed to maintain the health of the estuary.
- ❖ To minimize costs, any water quality treatment and large storage projects should be located at the lowest elevations, typically close to the C-43 Canal.
- ❖ Consider additional passive stormwater detention and wetland restoration projects throughout the basin to increase the storage capacity.
- ❖ Continue funding to explore alternative technologies to address dissolved organic nitrogen
- ❖ Add particulate nitrogen as a parameter to all SFWMD water quality stations to be able to directly calculate dissolved organic nitrogen.
- ❖ Consider additional tributary flow monitoring to determine from where high flows are coming to best be able to site additional storage and water quality treatment projects.

## Note

- ❖ The Frank Mann Preserve Stormwater Treatment Area which is estimated to provide 1,400 ac-ft of storage and remove 2.53 t TN and 0.71 t TP annually was fully funded since the recommendation in the detailed report.

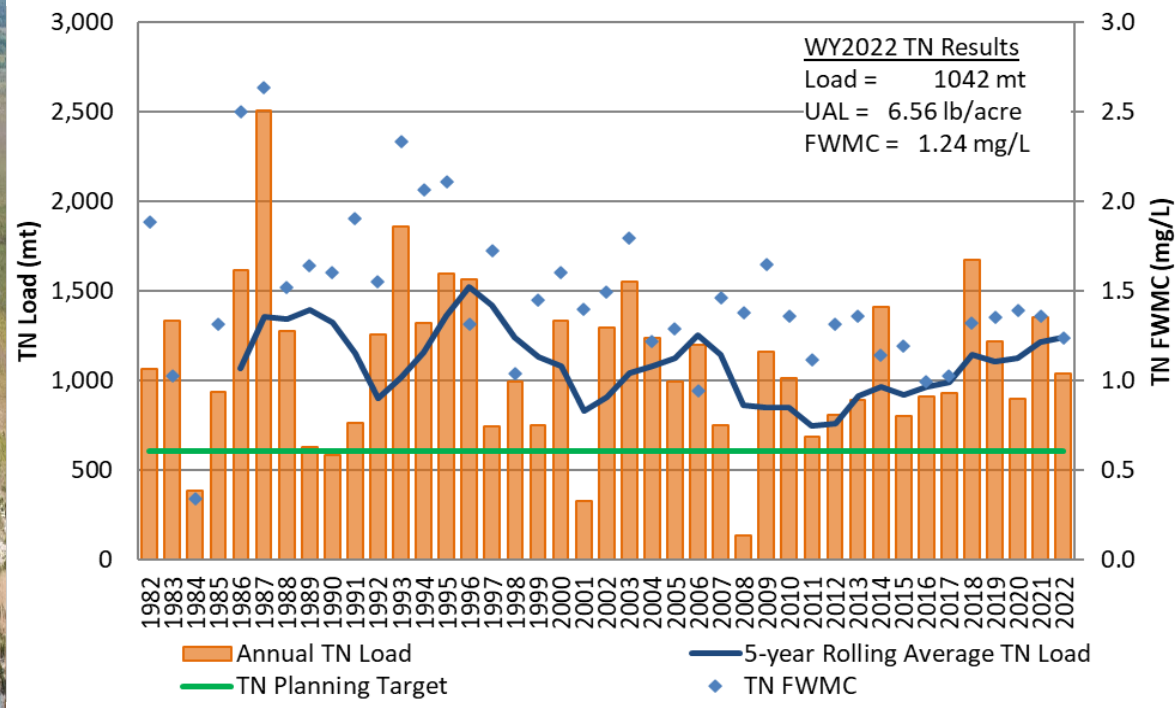






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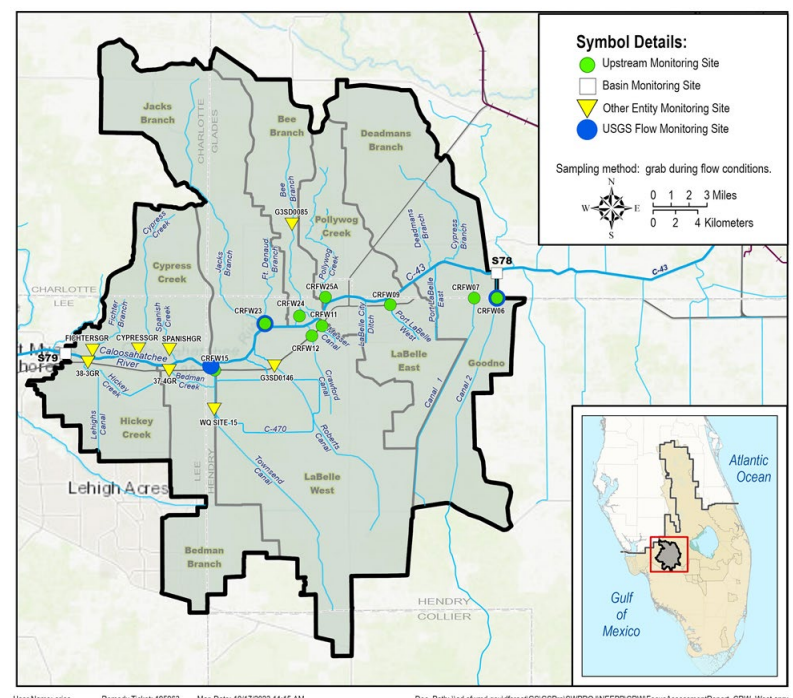
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**Figure 2.** TN load and FWMC data for WY1982-WY2022 with the 5-year rolling average for the West Caloosahatchee Basin.

## Upstream Analysis

- ❖ The TN concentrations at the upstream monitoring sites are increasing in the Cypress Creek and Bedman Branch subbasins according to FDEP.
- ❖ Only one site had TN concentrations above the numeric nutrient criteria based on a 2-year average (3.30 mg/L).



**Figure 3.** West Caloosahatchee subbasins, SFWMD expanded upstream level monitoring sites and other entity upstream level monitoring sites.



# West Caloosahatchee Basin Assessment

## Long-term Basin Characteristics & Analysis

- ❖ The issue for this basin is primarily flow as it discharges a large volume of water relative to its size (Table 1) perhaps due to an 80 feet drop in elevation.
- ❖ However, to maintain the health of the CRE, a minimum optimum flow of 542,972 ac-ft is needed so additional nutrient reductions are also needed.
- ❖ Approximately 190,000 to 335,000 ac-ft of storage is needed to reduce the TN loads by approximately 300 to 500 t annually and assist with achieving the 611 t TN planning target. Of that storage goal, 194,000 ac-ft has been planned and will aid in maintain healthy CRE flows, however, an additional 141,000 ac-ft of storage would be needed to provide an additional 200 t TN reduction.
- ❖ To achieve the 611 t planning TN target with the minimum optimum flow 542,972 ac-ft for a healthy estuary at S-79, the average TN concentrations need to be reduced to 0.913 mg/L (below the TN numeric nutrient criteria of 1.54 mg/L). The TN flow weighted mean concentrations (FWMC) at the basin outlet have been below the numeric nutrient criteria for the past five water years (Table 2) but above the planning target concentrations of 0.913 mg/L. This concentration may be difficult to achieve without alternative technologies currently being tested. In the interim projects should be focused on additional storage.
- ❖ One study reviewed found that only 32% of the primary component of the TN in the Caloosahatchee River is biologically available. Another study suggested that biological availability be considered during TMDL development. Based on those studies and the TN numeric criteria being met at the basin outlet, it is recommended that SFWMD prioritize flow attenuation regional projects in this basin .

**Table 1.** 5-year average flows and runoff in inches for WY2018-WY2022

Subwatershed or Basin	Acreage	WY2018-WY2022	
		Flow ac-ft/yr	Runoff Inches/yr
West Caloosahatchee	350,116	753,800	25.84
East Caloosahatchee	204,095	243,800	14.33
Lake Istokpoga	394,203	326,000	9.92
Lower Kissimmee	429,188	337,000	9.42
Upper Kissimmee	1,028,421	826,000	9.64

**Table 2.** Basin monitoring data summarized with the 5-year average (WY2018–WY2022) within the West Caloosahatchee Basin

Water Year	TP			TN			Flow (ac-ft x 10 <sup>3</sup> )
	Load (t)	UAL (lbs/ac)	FWMC (µg/L)	Load (t)	UAL (lbs/ac)	FWMC (mg/L)	
WY2018	218.4	1.38	173	1673.4	10.54	1.32	1024.8
WY2019	148.0	0.93	164	1222.3	7.7	1.36	730.0
WY2020	107.7	0.68	166	901.7	5.68	1.39	524.8
WY2021	129.3	0.81	130	1357.6	8.55	1.36	808.5
WY2022	118.8	0.75	141	1042.5	6.56	1.24	681.2
<b>5-Year Avg.</b>	<b>144.4</b>	<b>0.91</b>	<b>155</b>	<b>1239.5</b>	<b>7.80</b>	<b>1.33</b>	<b>753.8</b>



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