



*Florida Department of
Environmental Protection*

Caloosahatchee Estuary BMAP Technical Meeting

December 14, 2011

South Florida Water Management District
2301 McGregor Boulevard, Ft. Myers Florida



Agenda

1. Welcome and Opening Remarks
2. Status of BMAP Management Activities
 - Conservation Lands
 - Education and Ordinances
 - BMP Projects
3. Status of BMAP Monitoring Plan
4. Status of BMAP Documentation





*Florida Department of
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Caloosahatchee Estuary BMAP

Status of BMAP

Management Activities



BMP Project List

- Each Stakeholder Provided Project List
- Based on Information Provided to Date
- Projects Considered:
 - Conservation Land Purchases (Change in Land Use to Lower Loading)
 - Education/Fertilization Restriction Ordinances
 - BMPs





Conservation Land Purchases

- From Coverage of Lands Purchased, Determined Area, Land Uses and Loading from HSPF Information (2004)
- Converted Urban and Agricultural Land Use Loading to Background Loading
- Difference in Loading = Credit





Example Conservation Calculation

Lee County Background = 4.75 lb/ac

Agricultural Background = 5.34 lb/ac

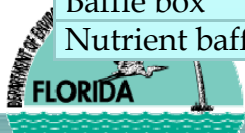
Lee County						
			Total TN			
Area	Project	Land Uses	Total Area (ac)	Loading (lb/yr)	New Load (lb/ac)	Credit (lb/yr)
	Hickory Swamp Preserve					
		A. Forest/Rural Open	0.5	2.8	2.8	0.0
		C. Agriculture/Pasture	42.7	229.5	227.9	1.6
		D. Low Density/Residential	3.0	16.1	14.3	1.9
		J. Water/Wetland	21.0	112.7	112.7	0.0
Subtotal Hickory Swamp			67.2	361.2	357.7	3.4





Removal Efficiencies for BMPs

BMPs	TP % Reduction	TN % Reduction
Off-line Retention 0.25 treatment volume	40	40
Off-line Retention 0.50 treatment volume	62	62
Off-line Retention 0.75 treatment volume	75	75
Off-line Retention 1.00 treatment volume	84	84
On-line Retention 0.25 treatment volume	30	30
On-line Retention 0.50 treatment volume	52	52
On-line Retention 0.75 treatment volume	65	65
On-line Retention 1.00 treatment volume	74	74
Grass swales with swale blocks or raised culverts	Use on-line retention BMPs above	Use on-line retention BMPs above
Grass swales without swale blocks or raised culverts	50% of value for grass swales with swale blocks or raised culverts	50% of value for grass swales with swale blocks or raised culverts
Wet detention ponds	% Removal = $44.53 + 6.146 * \ln(t_d) + 0.145 * (\ln(t_d))^2$; where t_d is the mean annual residence time	% Removal = $(43.75 * t_d) / (4.38 + t_d)$; where t_d is the mean annual residence time
BMP treatment trains using a combination of BMPs	Use BMP Treatment Train (TT) equation: BMP TT Efficiency = $Eff_1 + ((1 - Eff_1) * Eff_2)$	Use BMP Treatment Train (TT) equation: BMP TT Efficiency = $Eff_1 + ((1 - Eff_1) * Eff_2)$
Dry detention	10	10
Baffle box	2.3	0.5
Nutrient baffle box (2 nd generation)	15.5	19.05





Removal Efficiencies, continued

BMPs	TP % Reduction	TN % Reduction
Catch basins/inlet filters	Determine kg of materials removed and multiply by 300.8 mg/kg (commercial), 423.4 mg/kg (residential), or 536.97 mg/kg (highway)	Determine kg of materials removed and multiply by 467.2 mg/kg (commercial), 773.8 mg/kg (residential), or 785.4 mg/kg (highway)
Street sweeping	Determine kg of materials removed and multiply by 381.2 mg/kg (commercial), 374.9 mg/kg (residential), or 349.7 mg/kg (highway)	Determine kg of materials removed and multiply by 429.6 mg/kg (commercial), 832.4 mg/kg (residential), or 546.4 mg/kg (highway)
Alum injection	90	50
Stormwater reuse	Estimate amount water not discharged annually because used for irrigation.	Estimate amount water not discharged annually because used for irrigation.
Stormceptor	13	2
Continuous deflective separation (CDS) units	10	Not applicable
Floating islands	20	20
Public education & Ordinances	1-6, depending on extent of program	1-6, depending on extent of program
Low impact development practices	Cannot quantify	Cannot quantify





BMP Percent Reductions

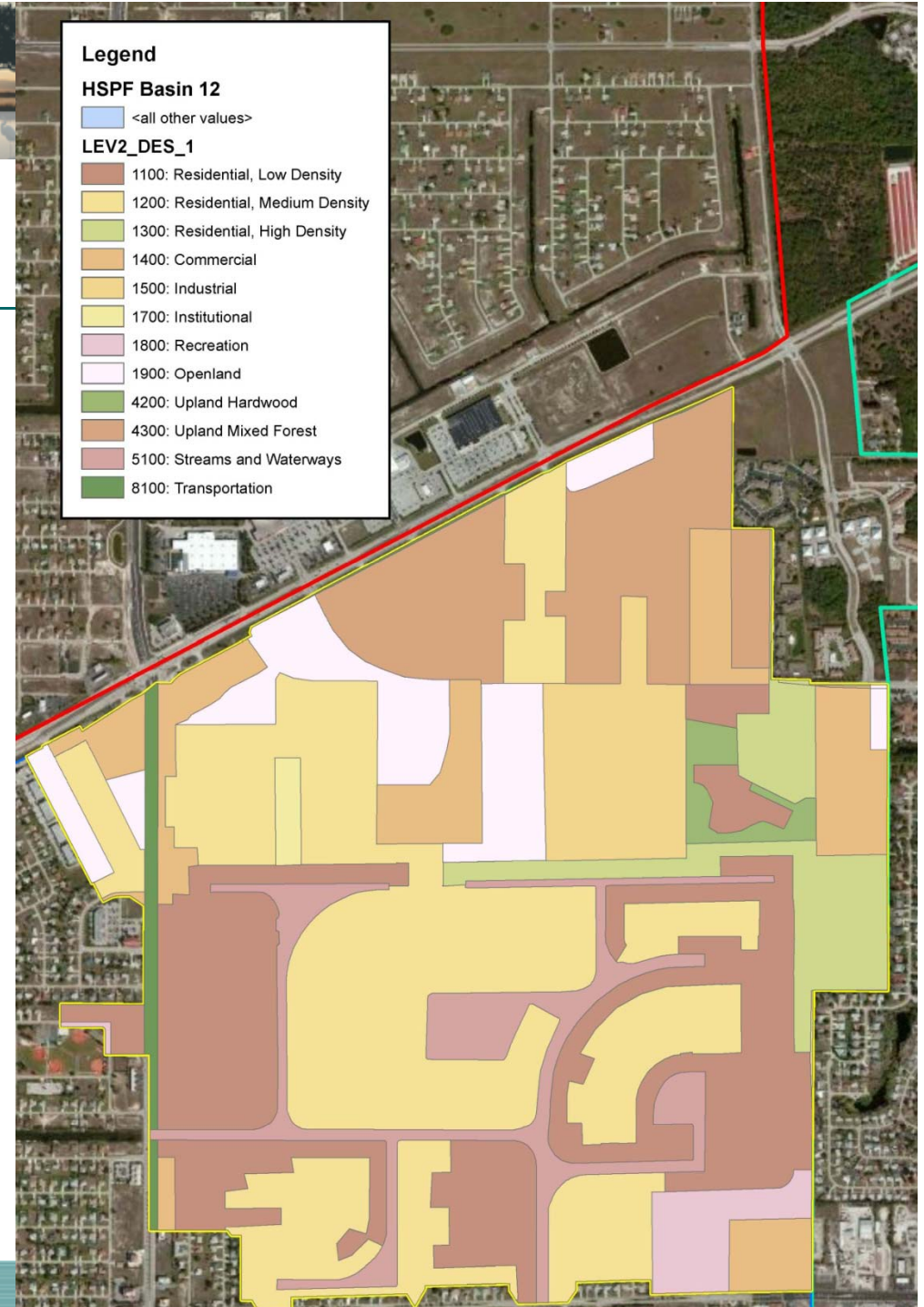
- If Stakeholder Documented Percent Reduction of BMP, This Was Used.
- If Stakeholder Did Not Document Percent Reduction, or Reduction Presented Not Justified, Table Used.





- Superimpose Boundary of BMP
- Identify Land Uses

Example –
Cape Coral
Basin 12





Example Credit

- Information:
 - 932 acres for Drainage Area to BMP
 - Type - Retention ($\Rightarrow$ 74% Reduction Allowed)
 - Total Load w/o BMP = 11,155 lb/yr TN (Based on Land Uses in Drainage Area)
- Calculation of Credit
 - $11,155 \text{ lb/yr} \times 74\% = 8,255 \text{ lb/yr Credit}$





Summary Results

Summary by Jurisdiction	1st 5-Yr Preliminary Target	Credit
Lee County	46,951	31,609
Cape Coral	34,471	45,621
Ft. Myers	13,641	12,965
Charlotte Co	314	52
ECWCD	12,579	23,169
Lucaya	44	0
FDOT	3,040	11,384
Total	111,040	124,800





Agricultural BMP Enrollment

- In a BMAP, agricultural operations are required to either enroll in applicable FDACS BMP program(s) or conduct water quality monitoring at their own expense
- 39,347 acres of agriculture, according to 2004 Land Use/Land Cover data
 - 29,890 acres are pasture (76%)





Agricultural BMP Enrollment

- 404 acres enrolled, representing 24 operations
 - Enrollment focus in area has been container nurseries; almost 100% of container nurseries enrolled
- Currently working with Babcock Ranch Preserve to enroll ranching and farming operations
 - Represents about 37% of total agricultural land use identified in basin



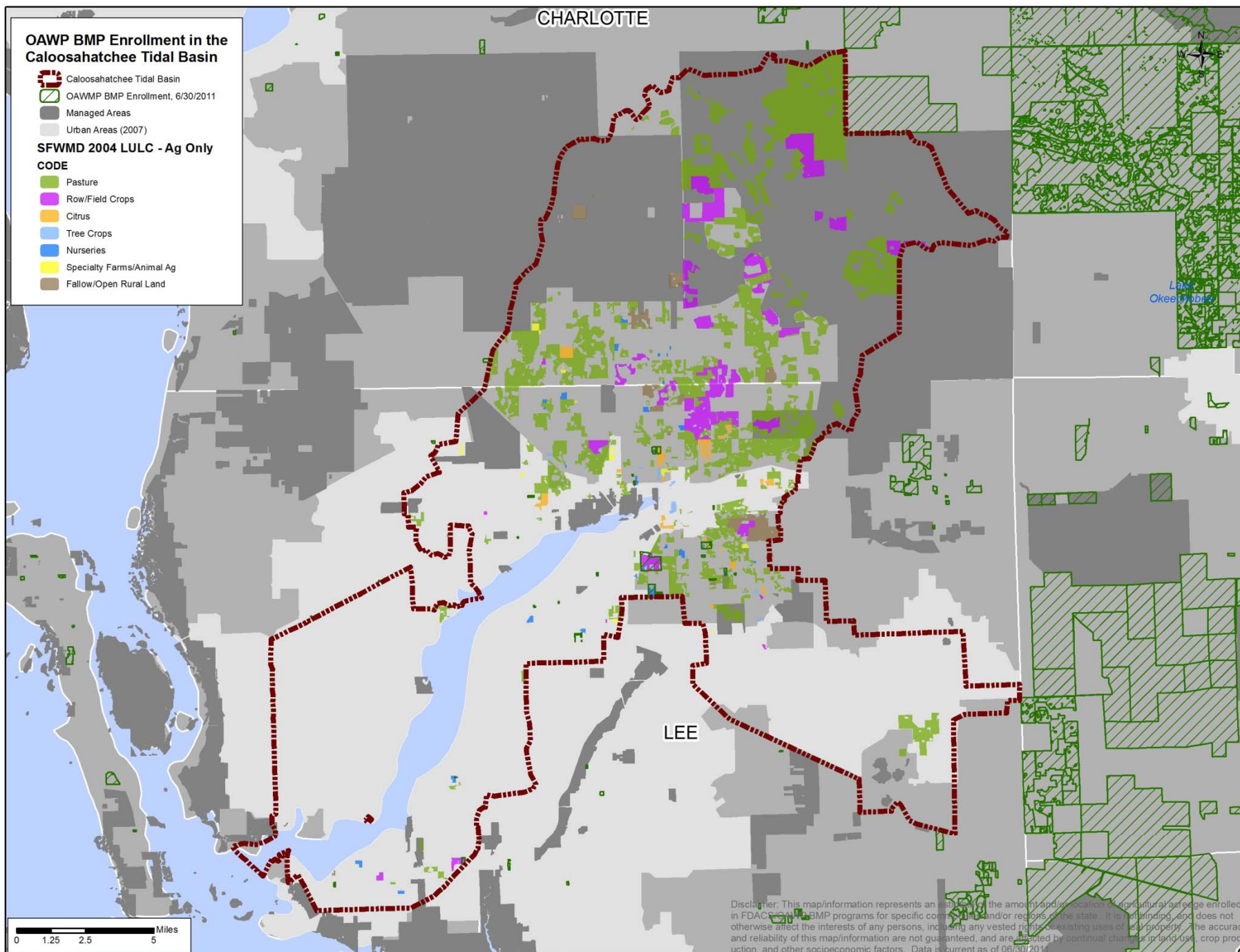
OAWP BMP Enrollment in the Caloosahatchee Tidal Basin

-  Caloosahatchee Tidal Basin
-  OAWP BMP Enrollment, 6/30/2011
-  Managed Areas
-  Urban Areas (2007)

SFWMD 2004 LULC - Ag Only

CODE

-  Pasture
-  Row/Field Crops
-  Citrus
-  Tree Crops
-  Nurseries
-  Specialty Farms/Animal Ag
-  Fallow/Open Rural Land





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Caloosahatchee Estuary BMAP

Monitoring Program

	Basin	Agency	Label	Lat	Long
1	Caloosahatchee	City of Cape Coral	242	26.643928	-81.874258
2	Caloosahatchee	City of Cape Coral	300	26.636611	-81.930506
3	Caloosahatchee	City of Cape Coral	400	26.600036	-81.941153
4	Caloosahatchee	City of Cape Coral	445	26.599600	-82.029917
5	Caloosahatchee	City of Cape Coral	450	26.583544	-82.035844
6	Caloosahatchee	City of Cape Coral	455	26.576278	-82.024108
7	Caloosahatchee	City of Cape Coral	470	26.577628	-81.943761
8	Caloosahatchee	City of Cape Coral	540	26.552647	-81.973419
9	Caloosahatchee	City of Cape Coral	550	26.549261	-82.034086
10	Caloosahatchee	City of Cape Coral	570	26.547361	-82.024378
11	Caloosahatchee	City of Cape Coral	580	26.543108	-82.018925
12	Caloosahatchee	City of Cape Coral	590	26.543933	-82.010739
13	Caloosahatchee	City of Cape Coral	600	26.542819	-82.003256
14	Caloosahatchee	FDEP	28020109	26.691810	-81.759610
15	Caloosahatchee	Lee County	16-3GR	26.659968	-81.897703
16	Caloosahatchee	Lee County	20-9GR	26.704126	-81.844718
17	Caloosahatchee	Lee County	23-5GR	26.715748	-81.808624
18	Caloosahatchee	Lee County	24-7GR	26.715065	-81.799786
19	Caloosahatchee	Lee County	27-6GR	26.740151	-81.736947
20	Caloosahatchee	Lee County	270-GR20	26.740289	-81.755697





	Basin	Agency	Label	Lat	Long
21	Caloosahatchee	Lee County	28-5GR	26.727144	-81.718961
22	Caloosahatchee	Lee County	29-8GR	26.730683	-81.701632
23	Caloosahatchee	USGS	Billy's Creek	26.651670	-81.854720
24	Caloosahatchee	FDEP	CALUSA0024FTM	26.730040	-81.701740
25	Caloosahatchee	FDEP	CALUSA0025FTM	26.667100	-81.896450
26	Caloosahatchee	City of Ft. Myers	CFMBILLY1	26.650717	-81.852887
27	Caloosahatchee	Lee County	CFMBILLY1	26.650717	-81.852887
28	Caloosahatchee	City of Ft. Myers	CFMBROADWAY	26.645803	-81.871771
29	Caloosahatchee	Lee County	CFMBROADWAY	26.645803	-81.871771
30	Caloosahatchee	City of Ft. Myers	CFMMANUEL	26.627138	-81.880023
31	Caloosahatchee	Lee County	CFMMANUEL	26.627138	-81.880023
32	Caloosahatchee	Lee County	DEEPGR10	26.539163	-81.918465
33	Caloosahatchee	USGS	Hancock Creek	26.667220	-81.896390
34	Caloosahatchee	USGS	Orange River	26.691920	-81.759440
35	Caloosahatchee	USGS	Popash Creek	26.715780	-81.808670
36	Caloosahatchee	Lee County	POWLGR20	26.683132	-81.877392
37	Caloosahatchee	SFWMD	S79	26.722929	-81.693201
38	Caloosahatchee	USGS	Telegraph Creek	26.729940	-81.701860





	Basin	Agency	Label	Lat	Long
1	Caloosahatchee	City of Cape Coral	350	26.623058	-81.909744
2	Caloosahatchee	FDEP	28020111	26.695278	-81.815556
3	Caloosahatchee	FDEP	CALUSA0005FTM	26.723361	-81.720972
4	Caloosahatchee	FDEP	CALUSA0006FTM	26.719333	-81.738556
5	Caloosahatchee	FDEP	CALUSA0007FTM	26.696833	-81.796500
6	Caloosahatchee	FDEP	CALUSA0008FTM	26.691278	-81.822278
7	Caloosahatchee	FDEP	CALUSA0009FTM	26.681917	-81.834306
8	Caloosahatchee	FDEP	CALUSA0010FTM	26.662000	-81.859417
9	Caloosahatchee	FDEP	CALUSA0011FTM	26.641528	-81.882944
10	Caloosahatchee	FDEP	CALUSA0011FTM	26.641528	-81.882944
11	Caloosahatchee	FDEP	CALUSA0012FTM	26.538306	-81.945194
12	Caloosahatchee	FDEP	CALUSA0013FTM	26.523889	-82.004444
13	Caloosahatchee	FDEP	CALUSA0014FTM	26.529000	-82.017722
14	Caloosahatchee	FDEP	DEP Site 4	26.529920	-82.026570
15	Caloosahatchee	FDEP	MP05	26.514940	-82.055110
16	Caloosahatchee	FDEP	SC 03	26.477520	-82.025330
17	Caloosahatchee	FDEP	Site 2	26.672660	-81.865530
18	Caloosahatchee	FDEP	Site 5	26.525990	-81.956080





	Basin	Agency	Label	Lat	Long
19	Caloosahatchee	Lee County	CES01	26.721332	-81.693234
20	Caloosahatchee	Lee County	CES04	26.681650	-81.833660
21	Caloosahatchee	Lee County	CES06	26.578560	-81.912420
22	Caloosahatchee	Lee County	CES03	26.716640	-81.760870
23	Caloosahatchee	Lee County	PI-01	26.507070	-82.018390
24	Caloosahatchee	Lee County	PI-02	26.522700	-82.040350
25	Caloosahatchee	Lee County	PI-14	26.492660	-82.048300
26	Caloosahatchee	SCCF	CALUSA0008FTM	26.691130	-81.822140
27	Caloosahatchee	SCCF	MARKER 94	26.525480	-82.003150
28	Caloosahatchee	SFWMD	CES02	26.726500	-81.707900
29	Caloosahatchee	SFWMD	CES03	26.716694	-81.760600
30	Caloosahatchee	SFWMD	CES04	26.681700	-81.833800
31	Caloosahatchee	SFWMD	CES05	26.636600	-81.888700
32	Caloosahatchee	SFWMD	CES06	26.582300	-81.910200
33	Caloosahatchee	SFWMD	CES07	26.530222	-81.965600
34	Caloosahatchee	SFWMD	CES08	26.523300	-81.992006
35	Caloosahatchee	SFWMD	CES09	26.501167	-82.014333
36	Caloosahatchee	SFWMD	CES11	26.480556	-82.060278
37	Caloosahatchee	USGS	Caloosahatchee River at Marker #52	26.641530	-81.882920
38	Caloosahatchee	USGS	Caloosahatchee River at Punta Blanca	26.529000	-82.017780
39	Caloosahatchee	USGS	Caloosahatchee River at Shell Point	26.523940	-82.004440





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Caloosahatchee Estuary BMAP

BMAP

Documentation



BMAP Write Up on Load Allocations

Paragraph 403.067(7)(a)1., F.S., authorizes the Department to adopt BMAPs that provide for phased implementation of the strategies necessary to ultimately achieve the associated TMDL. Phased BMAPs are re-evaluated every five years as part of the Department's rotating basin approach. This BMAP provides for such phased implementation.

In the five-year, first phase of this BMAP, the required activities are not expected to achieve the TMDL. Rather, this BMAP only calls for projects and other activities necessary to achieve reductions of _____ TN by the end of the first phase. During this time, the Department anticipates amending the Tidal Caloosahatchee TN TMDL to reflect updated modeling. Future revisions to this BMAP may require implementation of additional management strategies to achieve the TMDL, as amended.





BMAP Report

- Preliminary Template Developed
- TMDL Information Inserted (October)
- Outline Handout
- Next Steps:
 - Add Allocations and Monitoring
 - Add Projects and Load Reductions





Questions & Comments?

At the
End of
the
Rainbow

