



Indian River Lagoon Basin Management Action Plans April 2011

Allocation Calculations for Total Nitrogen and Total Phosphorus

BACKGROUND

In establishing the detailed allocations for the Indian River Lagoon (IRL) Basin Management Action Plans (BMAPs) and the reductions required by the total maximum daily loads (TMDLs) for total nitrogen (TN) and total phosphorus (TP), the Florida Department of Environmental Protection (FDEP) considered the best approach to allocate to the appropriate stakeholders in a manner that is reasonable and equitable. Section 403.067(6)(b), Florida Statutes (F.S.), includes the following guidance for allocations:

The total maximum daily loads shall include establishment of reasonable and equitable allocations of the total maximum daily load between or among point and nonpoint sources that will alone, or in conjunction with other management and restoration activities, provide for the attainment of the pollutant reductions established pursuant to paragraph (a) to achieve water quality standards for the pollutant causing impairment. The allocations may establish the maximum amount of the water pollutant that may be discharged or released into the water body or water body segment in combination with other discharges or releases. Allocations may also be made to individual basins and sources or as a whole to all basins and sources or categories of sources of inflow to the water body or water body segments. An initial allocation of allowable pollutant loads among point and nonpoint sources may be developed as part of the total maximum daily load. However, in such cases, the detailed allocation to specific point sources and specific categories of nonpoint sources shall be established in the basin management action plan pursuant to subsection (7). The initial and detailed allocations shall be designed to attain the pollutant reductions established pursuant to paragraph (a) and shall be based on consideration of the following...

This paper outlines the process that FDEP applied to calculate allocations for the BMAPs and presents the updated allocations for the Banana River Lagoon (BRL) BMAP.

OVERALL ALLOCATION APPROACH

Calculating Baseline Loads

To determine the BMAP allocations, FDEP clipped and erased from the Pollutant Loading Screening Model (PLSM) Geographic Information System (GIS) shapefile to create separate shapefiles with each entity's responsible acres by project zone. The first step will be to remove the areas associated with the land use land cover code 5400, which is used to identify the lagoon surface area, from the PSLM shapefile. Then the individual entity shapefiles were created by clipping out each entity's jurisdiction, by project zone, as follows:

- Florida Department of Transportation (FDOT) roads and right-of-ways.
- Areas with agricultural land uses.
- Municipalities, federal facilities, and water control districts, each to its own jurisdictional boundary.
- The remaining area will be assigned to the county/counties in the project zone.

Based on the clipped files, the PLSM model output used to establish the TMDL was used to determine the baseline loads (loads based on the 2000 land uses in the model) for each entity. The calculations were completed according to the procedures used by the St. Johns River Water Management District (SJRWMD) to calculate the baseline loads.

Loads Associated with the Land Use Land Cover Code 5000

The purpose of the IRL TMDLs is to reduce anthropogenic loads from the surrounding watershed in urban and agricultural areas; it is not the intent of the TMDLs to require load reductions from within surface waters. It is difficult to evaluate the contribution of internal loading in surface waters, and therefore challenging to estimate how internal loading will change with activities such as dredging.

FDEP has modified the allocation approach regarding loading from areas in the land use land cover code 5000, which will now be removed from each entity's baseline load and set aside. This land use category is surface waters and is not considered an anthropogenic land use in the TMDL process. FDEP believes that any internal loading in the surface waters will decrease with the flushing of cleaner watershed runoff once the pollutant loading from the watershed is controlled. Since the focus of these reductions is on the external, watershed loading, the loading from the 5000 land uses will be set aside and reductions from the stakeholders will not be required for these loads.

***De Minimus* Calculations**

The revised baseline loads, without loading from the 5000 land uses, was sorted for TN and TP loads, from highest to lowest, to determine whether any entity has loads low enough that reductions from these areas would have essentially no significant impact on the required reductions in the first phase of the BMAP. Those entities whose total loads in a project zone were low enough for both TN and TP are considered *de minimus*. A *de minimus* standard has already been determined for the BRL (see details in the section below). FDEP will set separate *de minimus* standards for North IRL and Central IRL based on the process outlined above.

The *de minimus* entities will not receive an allocation in this iteration of the BMAP. It is important to note that the *de minimus* status is only for the first BMAP iteration and will be reviewed with each BMAP cycle. In future phases of the BMAP, TN and TP reductions may be needed from the *de minimus* entities; therefore, although they do not currently have a reduction responsibility, this does not prevent these entities from having reduction requirements in future BMAPs. Any actions taken by these entities during this first phase of the BMAP that result in TN or TP reductions should be documented by those entities for credit against any reduction requirements allocated in subsequent BMAP iterations.

Calculating the Target Loads per Acre and Allocations

The target loads per acre were determined for the nonpoint sources and will be calculated by dividing the TMDL target load by the total non-lagoon area in each project zone. The targets for the BMAPs differ from the TMDL target because the TMDL target also includes point sources. The point sources were previously assigned allocations in the TMDL and subsequently into their permits and, therefore, do not need inclusion in the BMAP targets. The TN and TP target loads for the BRL are calculated, as shown in the section below. FDEP will calculate separate TN and TP per acre target loads for each of the North IRL project zones.

The allocation for each entity will then be calculated by multiplying the entity's acres in a project zone by the BMAP per acre load target. The entity's baseline load minus their allocation will be the entity's required reductions for TN and TP by project zone. Those entities that span more than one project zone

will receive multiple allocations and reduction requirements for each project zone.

BMAP Considerations

The BMAPs will be phased over a 15-year period. The original allocation approach for the IRL BMAPs was to require each entity to achieve 33% of their required reductions in the first 5-year BMAP period. In recognition of observed improvements in seagrass growth, the allocation approach has been revised to require that 15% of the reductions be achieved in the first BMAP period. In the second phase of the BMAP, the TMDL will be updated with more current land use, seagrass depth-limit target evaluations, and water quality data. These revisions may result in a change to required reductions in future BMAP iterations. Stakeholders have also expressed concern over uncertainties they feel exist in the TMDL, such as the relationship between TN and TP reductions and the seagrass target, salinity and algae influences on the system, and basin-specific data for model calibration. This phased approach helps to ensure that FDEP does not ask the stakeholders to reduce more than is necessary by using adaptive management principles to evaluate progress towards the TMDL seagrass depth-limit targets. It must be noted that the TMDL requirements have not changed, and additional reductions may be required in subsequent iterations of the BMAP to meet the TMDL depth-limit targets.

Next Steps

The updated BRL allocations (shown below) will be discussed further at the next BRL technical meeting on June 10th. At this time, the reductions associated with completed projects submitted to FDEP will also be presented with the remaining required reductions by entity for the first iteration of the BMAP. The next steps for the BRL BMAP will also be discussed including a timeline for submitting additional projects, convening the BRL Basin Working Group for a meeting on July 8th, and preparing the monitoring plan.

Following the process outlined above, FDEP will determine allocations for the North IRL project zones, and this information will be presented at the North IRL technical meeting on June 10th. Also during this meeting, FDEP will provide a timeline for submittal of projects to determine credit towards reduction requirements.

FDEP will meet with the water control districts and the improvement district on May 13th to discuss issues specific to these stakeholders. On July 8th, a meeting with all Central IRL stakeholders will be held to answer questions related to the BMAP approach and review completed projects.

BANANA RIVER LAGOON ALLOCATIONS

Baseline Loads

The initial baseline loads for each entity were calculated using the acres in the basin and the associated loads from the PLSM. Then, the TN and TP loads from the 5000 land uses were calculated for each jurisdiction, and these loads were removed from the baseline loads. Tables 1 and 2 show the TN and TP loads, respectively, for the initial baseline loads, 5000 land use loads, and the net load for each entity. In these tables, the TN and TP baseline loads are also compared to the TMDL loads, which were taken from Table 4.9 in the TMDL document and do not include atmospheric deposition or point sources.

Table 1. Baseline TN Loads for Each Entity in BRL

Entity	Area (acres)	TN Baseline (lbs/yr)	TN 5000 Land Use Load (lbs/yr)	TN Net Load (lbs/yr)	TN Net Load (lbs/acre/yr)
Agriculture	231	1,361	-	1,361	5.89
Brevard County	10,365	74,447	6,097	68,350	6.59
Cape Canaveral	857	8,976	1	8,975	10.47
Cape Canaveral Air Force Station (AFS)	13,801	53,029	85	52,944	3.84
Cocoa Beach	1,842	18,616	97	18,519	10.05
FDOT 5	559	5,477	20	5,457	9.76
Indian Harbour Beach	1,244	11,800	225	11,575	9.31
Kennedy Space Center	18,545	70,837	727	70,110	3.78
Melbourne	4	30	-	30	7.98
Patrick Air Force Base (AFB)	1,835	24,897	334	24,563	13.38
Port Canaveral	333	1,430	158	1,272	3.82
Satellite Beach	1,737	17,572	327	17,245	9.93
U.S. Army Corps of Engineers (USACE)	30	165	-	165	5.49
Total	51,383	288,637	8,071	280,566	5.46
TMDL Baseline (2000) Loads	-	289,117	-	-	-
% Difference	-	0.0%	-	-	-

Table 2. Baseline TP Loads for Each Entity in BRL

Entity	Area (acres)	TP Baseline (lbs/yr)	TP 5000 Land Use Load (lbs/yr)	TP Net Load (lbs/yr)	TP Net Load (lbs/acre/yr)
Agriculture	231	340.0	-	340.0	1.472
Brevard County	10,365	14,776.8	574.0	14,202.8	1.370
Cape Canaveral	857	2,031.4	0.2	2,031.2	2.369
Cape Canaveral AFS	13,801	11,089.9	16.5	11,073.4	0.802
Cocoa Beach	1,842	3,845.7	22.2	3,823.5	2.075
FDOT 5	559	1,707.7	3.3	1,704.4	3.050
Indian Harbour Beach	1,244	2,143.3	22.1	2,121.2	1.706
Kennedy Space Center	18,545	8,969.2	104.1	8,865.1	0.478
Melbourne	4	5.5	-	5.5	1.463
Patrick AFB	1,835	6,508.6	41.4	6,467.2	3.524
Port Canaveral	333	209.1	13.3	195.8	0.588
Satellite Beach	1,737	3,342.6	29.1	3,313.5	1.908
USACE	30	33.5	-	33.5	1.115
Total	51,383	55,003.3	826.2	54,177.1	1.054
TMDL Baseline (2000) Loads	-	54,981.0	-	-	-
% Difference	-	0.0%	-	-	-

***De Minimus* Loads**

The data from Tables 1 and 2 were then sorted for TN and TP loads, from highest to lowest, to determine whether any entity had loads low enough that reductions from these areas would have essentially no significant impact on the required reductions in the first phase of the BMAP. Tables 3 and 4 present the sorted data and the shaded cells signify the *de minimus* load contributions.

Table 3. Entity Baseline TN Loads Sorted from Highest to Lowest

Entity	TN Net Load (lbs/yr)	% of Total Net Load	Cumulative Net Load (lbs/yr)	Cumulative % of Total Net Load
Kennedy Space Center	70,110	25.0%	70,110	25.0%
Brevard County	68,350	24.4%	138,460	49.4%
Cape Canaveral AFS	52,944	18.9%	191,404	68.2%
Patrick AFB	24,563	8.8%	215,967	77.0%
Cocoa Beach	18,519	6.6%	234,486	83.6%
Satellite Beach	17,245	6.1%	251,731	89.7%
Indian Harbour Beach	11,575	4.1%	263,306	93.8%
Cape Canaveral	8,975	3.2%	272,281	97.0%
FDOT 5	5,457	1.9%	277,738	99.0%
Agriculture	1,361	0.5%	279,099	99.5%
Port Canaveral	1,272	0.5%	280,371	99.9%
USACE	165	0.1%	280,536	100.0%
Melbourne	30	0.0%	280,566	100.0%

Table 4. Entity Baseline TP Loads Sorted from Highest to Lowest

Entity	TP Net Load (lbs/yr)	% of Total Net Load	Cumulative Net Load (lbs/yr)	Cumulative % of Total Net Load
Brevard County	14,202.8	26.2%	14,202.8	26.2%
Cape Canaveral AFS	11,073.4	20.4%	25,276.2	46.7%
Kennedy Space Center	8,865.1	16.4%	34,141.3	63.0%
Patrick AFB	6,467.2	11.9%	40,608.5	75.0%
Cocoa Beach	3,823.5	7.1%	44,432.0	82.0%
Satellite Beach	3,313.5	6.1%	47,745.5	88.1%
Indian Harbour Beach	2,121.2	3.9%	49,866.7	92.0%
Cape Canaveral	2,031.2	3.7%	51,897.9	95.8%
FDOT 5	1,704.4	3.1%	53,602.3	98.9%
Agriculture	340.0	0.6%	53,942.3	99.6%
Port Canaveral	195.8	0.4%	54,138.1	99.9%
USACE	33.5	0.1%	54,171.6	100.0%
Melbourne	5.5	0.0%	54,177.1	100.0%

Four entities each contributed less than 1% of the total load: agriculture, Port Canaveral, USACE, and the City of Melbourne. These entities are thus considered to be *de minimus*. Combined they contribute approximately 1% of the total load and therefore will not be assigned an allocation for either TN or TP for the first phase of the BMAP. This *de minimus* designation does preclude these entities from implementing reductions in the near term future.

Calculating the Target Loads per Acre

The target loads per acre were calculated by dividing the TMDL target load by the total non-lagoon area in the BRL system, as shown in Table 5. The TMDL target loads were summed from Table 6.3a in the TMDL document for waterbody identification numbers (WBIDs) 3044A, 3057A and 3057B, and 3057C, and do not include atmospheric deposition or point sources.

Table 5. Calculated Target Loads per Acre for TN and TP

Category	TN	TP
Non-lagoon acres (from Table 1)	51,383	51,383
TMDL Target Load (lbs)	104,642	17,697
Target Load (lbs/acre)	2.04	0.344

The target nonpoint source loads are thus 2.04 lbs/acre and 0.344 lbs/acre for TN and TP, respectively. This target differs from the TMDL target of 2.18 lbs/acre for TN and 0.374 lbs/acre for TP because the TMDL includes the contributions from point sources.

Required Reductions

A preliminary calculation of the required load reductions for each entity, based on the targets in Table 5, is included in Tables 6 and 7. The resulting load is higher than the target load in these tables because the *de minimus* entities are not required to reduce loads in the first iteration of the BMAP.

Table 6. Preliminary TN Load Allocations by Entity

Entity	Area (acres)	TN Target (lbs/acre/yr)	TN Target (lbs/yr)	TN Net Load (lbs/yr)	Required Reduction (lbs/yr)	Required Reduction (%)	Resulting Load (lbs/yr)
Brevard County	10,365	2.04	21,107	68,350	47,243	69.1%	21,107
Cape Canaveral	857	2.04	1,746	8,975	7,229	80.5%	1,746
Cape Canaveral AFS	13,801	2.04	28,106	52,944	24,838	46.9%	28,106
Cocoa Beach	1,842	2.04	3,752	18,519	14,767	79.7%	3,752
FDOT 5	559	2.04	1,138	5,457	4,319	79.1%	1,138
Indian Harbour Beach	1,244	2.04	2,533	11,575	9,042	78.1%	2,533
Kennedy Space Center	18,545	2.04	37,767	70,110	32,343	46.1%	37,767
Patrick AFB	1,835	2.04	3,738	24,563	20,825	84.8%	3,738
Satellite Beach	1,737	2.04	3,537	17,245	13,708	79.5%	3,537
<i>de minimus</i>	598	-	-	2,828	0	0.0%	2,828
Total	51,383	-	103,425	280,566	174,313	62.1%	106,253

Table 7. Preliminary TP Load Allocations by Entity

Entity	Area (acres)	TP Target (lbs/acre/yr)	TP Target (lbs/yr)	TP Net Load (lbs/yr)	Required Reduction (lbs/yr)	Required Reduction (%)	Resulting Load (lbs/yr)
Brevard County	10,365	0.344	3,570	14,203	10,633	74.9%	3,570
Cape Canaveral	857	0.344	295	2,031	1,736	85.5%	295
Cape Canaveral AFS	13,801	0.344	4,753	11,073	6,320	57.1%	4,753
Cocoa Beach	1,842	0.344	635	3,824	3,189	83.4%	635
FDOT 5	559	0.344	192	1,704	1,512	88.7%	192
Indian Harbour Beach	1,244	0.344	428	2,121	1,693	79.8%	428
Kennedy Space Center	18,545	0.344	6,387	8,865	2,478	28.0%	6,387
Patrick AFB	1,835	0.344	632	6,467	5,835	90.2%	632
Satellite Beach	1,737	0.344	598	3,314	2,715	81.9%	598
<i>de minimus</i>	598	-	-	575	-	0.0%	575
Total	51,383	-	17,491	54,177	36,111	66.7%	18,066

In examining these tables, the required TN reduction for Kennedy Space Center appeared large given the

high proportion of undeveloped lands within this facility. To determine why this might be occurring, FDEP calculated the required reductions for TN per built-up acre for each entity. As highlighted in Table 8, the required reduction for TN per built-up acre is significantly higher for Kennedy Space Center than the other entities.

Table 8. TN Required Reduction per Built Up Acre by Entity

Entity	TN Required Reduction (lbs)	Undeveloped Acres	Built-Up Acres	TN Required Reduction per Built-Up Acre	% Undeveloped
Brevard County	47,243	4,787	5,578	8.5	46.2%
Cape Canaveral	7,229	247	610	11.9	28.8%
Cape Canaveral AFS	24,838	11,109	2,691	9.2	80.5%
Cocoa Beach	14,767	134	1,709	8.6	7.3%
FDOT 5	4,319	54	505	8.6	9.6%
Indian Harbour Beach	9,042	142	1,101	8.2	11.4%
Kennedy Space Center	32,343	16,792	1,753	18.5	90.5%
Patrick AFB	20,825	106	1,729	12.0	5.8%
Satellite Beach	13,708	212	1,525	9.0	12.2%
<i>de minimus</i>	0	-	-	-	-

As a comparison, FDEP also calculated the average TN loads for the undeveloped areas for the overall BRL basin, as well as for Kennedy Space Center (Tables 9 and 10). These loads do not include loading associated with the 5000 land uses. It's also important to note that in the BRL basin, approximately 66% of the acres are undeveloped areas, and the majority of these areas (82%) occur on Kennedy Space Center and Cape Canaveral AFS. As shown in these tables, the average loading from the undeveloped land for Kennedy Space Center is higher than the basin average.

Table 9. TN and TP Loads for Undeveloped Acres in Banana River Lagoon

Entity	Natural Area (acres)	% of Total Area	TN (lbs/yr)	TP (lbs/yr)	TN (lbs/acre/yr)	TP (lbs/acre/yr)
Brevard County	4,787	46.2%	8,897	800.4	1.86	0.167
Cape Canaveral	247	28.8%	583	44.0	2.36	0.178
Cape Canaveral AFS	11,109	80.5%	17,783	1,896.1	1.60	0.171
Cocoa Beach	134	7.3%	316	34.2	2.36	0.256
FDOT 5	54	9.6%	117	8.8	2.18	0.164
Indian Harbour Beach	142	11.4%	534	42.1	3.75	0.296
Kennedy Space Center	16,792	90.5%	48,303	3,284.3	2.88	0.196
Melbourne	0	0.8%	-	-	-	-
Patrick AFB	106	5.8%	429	49.5	4.03	0.465
Port Canaveral	266	79.8%	704	53.5	2.65	0.201
Satellite Beach	212	12.2%	880	58.7	4.15	0.277
USACE	19	62.4%	-	-	-	-
Total	33,869	-	78,546	6,272	2.32	0.185

Table 10. TN and TP Loads for Undeveloped Acres on Kennedy Space Center

LCCODE	FLUCCS	Area (acres)	TN (lbs/yr)	TP (lbs/yr)	TN (lbs/acre/yr)	TP (lbs/acre/yr)
3100	Herbaceous (Dry Prairie)	2,935	17,226	918	5.87	0.31
3200	Shrub and Brushland	3,837	20,859	1,109	5.44	0.29
3300	Mixed Rangeland	155	892	47	5.76	0.30
4100	Upland Coniferous Forests	52	187	24	3.57	0.46
4110	Pine Flatwoods	1,908	6,703	862	3.51	0.45
4200	Upland Hardwood Forests	280	732	95	2.61	0.34
4210	Xeric Oak	31	92	12	2.95	0.39
4340	Hardwood - Coniferous Mixed	379	802	103	2.12	0.27
4370	Australian Pines	7	9	1	1.24	0.17
4430	Forest Regeneration Areas	24	74	10	3.12	0.40
5100	Streams and Waterways	59	-	-	-	-
5200	Lakes	2	-	-	-	-
5300	Reservoirs	87	-	-	-	-
5340	Reservoirs less than 10 acres (4 hectares) which are dominant features	48	-	-	-	-
5430	Embayments not opening directly into the Atlantic Ocean	483	-	-	-	-
6120	Mangrove Swamps	623	-	-	-	-
6150	Streams and Lake Swamps (Bottomland)	0	-	-	-	-
6170	Mixed Wetland Hardwoods	1,145	-	-	-	-
6181	Willow and Elderberry	39	-	-	-	-
6182	Willow and Elderberry	286	-	-	-	-
6210	Cypress	16	-	-	-	-
6300	Wetland Forested Mixed	297	-	-	-	-
6410	Freshwater Marshes	1,948	-	-	-	-
6420	Saltwater Marshes	410	-	-	-	-
6430	Wet Prairies	197	-	-	-	-
6440	Emergent Aquatic Vegetation	2	-	-	-	-
6460	Treeless Hydric Savanna	1,534	-	-	-	-
6500	Non-Vegetated	8	-	-	-	-
Total	Undeveloped	16,792	47,576	3,180	2.83	0.19

From Table 9, the average loading (2.32 lbs/acre) from the undeveloped acres in the BRL basin is greater than the nonpoint source TMDL target load (2.04 lbs/acre). Due to the large percentage of undeveloped area in this basin, FDEP decided to use the average loading from the undeveloped acres as the interim target for TN in the first phase of the BMAP. Therefore, a target load of 2.32 lbs/acre of TN will be used in this BMAP. However, the average loading from undeveloped acres on Kennedy Space Center is greater than the basin-wide average. Since Kennedy Space Center has such a large portion of their area (approximately 91%) as undeveloped land, FDEP determined that the average undeveloped area load per acre of 2.88 will be used as the target for Kennedy Space Center. Using this target puts the required reductions for TN per built-up acre on Kennedy Space Center in line with the other entities (see Table 11). The TMDL nonpoint target for TP of 0.344 lbs/acre will be applied for all stakeholders. It is important to note that the TMDL requirements have not changed; however, FDEP is using an interim

target for the purposes of allocating reduction requirements in this first phase of the BMAP. Additional reductions may be required in later iterations of the BMAP to meet the TMDL targets.

Table 11. TN Required Reduction per Built Up Acre by Entity Using the Interim Target

Entity	TN Required Reduction (lbs/yr)	Undeveloped Acres	Built-Up (acres)	TN Required Reduction per Built-Up Acre	% Undeveloped
Brevard County	44,314	4,787	5,578	7.9	46.2%
Cape Canaveral	6,987	247	610	11.4	28.8%
Cape Canaveral AFS	20,938	11,109	2,691	7.8	80.5%
Cocoa Beach	14,246	134	1,709	8.3	7.3%
FDOT 5	4,161	54	505	8.2	9.6%
Indian Harbour Beach	8,691	142	1,101	7.9	11.4%
Kennedy Space Center	16,700	16,792	1,753	9.5	90.5%
Patrick AFB	20,306	106	1,729	11.7	5.8%
Satellite Beach	13,217	212	1,525	8.7	12.2%
<i>de minimus</i>	0	-	-	-	-
Total	149,560	33,584	17,201	8.69	66.1%

BMAP Phase 1 Allocations

Using the target loads discussed above, the final allocations for Phase 1 of the BRL BMAP are shown in Tables 12 and 13.

Table 12. BRL BMAP Phase 1 Required TN Reductions for the BRL BMAP

Entity	Area (acres)	TN Target (lbs/acre/yr)	TN Target (lbs/yr)	5000 Land Use Loads Set Aside (lbs/yr)	Net Load (lbs/yr)	Required Reduction (lbs/yr)	15% BMAP 1 Required Reduction (lbs/yr)
Brevard County	10,365	2.32	24,036	6,097	68,350	44,314	6,647.1
Cape Canaveral	857	2.32	1,988	1	8,975	6,987	1,048.1
Cape Canaveral AFS	13,801	2.32	32,006	85	52,944	20,938	3,140.7
Cocoa Beach	1,842	2.32	4,273	97	18,519	14,246	2,136.9
FDOT 5	559	2.32	1,296	20	5,457	4,161	624.2
Indian Harbour Beach	1,244	2.32	2,884	225	11,575	8,691	1,303.7
Kennedy Space Center	18,545	2.88	53,410	727	70,110	16,700	2,505.0
Patrick AFB	1,835	2.32	4,257	334	24,563	20,306	3,045.9
Satellite Beach	1,737	2.32	4,028	158	17,245	13,217	1,982.6
<i>de minimus</i>	598	-	2,828	327	2,828	0	0.0
Total	51,383	-	128,178	8,071	280,566	149,560	22,434.0

Table 13. BRL BMAP Phase 1 Required TP Reductions for the BRL BMAP

Entity	Area (acres)	TP Target (lbs/acre/yr)	TP Target (lbs/yr)	5000 Land Use Loads Set Aside (lbs/yr)	Net Load (lbs/yr)	Required Reduction (lbs/yr)	15% BMAP 1 Required Reduction (lbs/yr)
Brevard County	10,365	0.344	3,570	574.0	14,203	10,633	1,595.0
Cape Canaveral	857	0.344	295	0.2	2,031	1,736	260.4
Cape Canaveral AFS	13,801	0.344	4,753	16.5	11,073	6,320	948.0
Cocoa Beach	1,842	0.344	635	22.2	3,824	3,189	478.4
FDOT 5	559	0.344	192	3.3	1,704	1,512	226.8
Indian Harbour Beach	1,244	0.344	428	22.1	2,121	1,693	254.0
Kennedy Space Center	18,545	0.344	6,387	104.1	8,865	2,478	371.7
Patrick AFB	1,835	0.344	632	41.4	6,467	5,835	875.3
Satellite Beach	1,737	0.344	598	13.3	3,314	2,715	407.3
<i>de minimus</i>	598	-	575	29.1	575	0	0.0
Total	51,383	-	18,066	826.2	54,177	36,111	5,416.7

Comparison to the TMDL

Tables 14 and 15 provide a summary of the total BMAP loading in the basin, using the target loads for nonpoint sources described above, compared to the TN and TP loading required by the TMDL.

Table 14. Comparison of TN Loading in the BMAP Allocations to the TMDL

Source	BMAP TN Loading (lbs/yr)	TMDL TN Loading (lbs/yr)	Difference in Loading (lbs/yr)	% Difference in Loading
Nonpoint sources	128,178	104,642	23,536	22.5%
Wastewater treatment facilities	7,387	7,387	0	0.0%
Atmospheric deposition	179,727	179,727	0	0.0%
Total	315,292	291,755	23,536	8.1%

Table 15. Comparison of TP Loading in the BMAP Allocations to the TMDL

Source	BMAP TP Loading (lbs/yr)	TMDL TP Loading (lbs/yr)	Difference in Loading (lbs/yr)	% Difference in Loading
Nonpoint sources	18,066	17,697	369	2.1%
Wastewater treatment facilities	1,523	1,523	0	0.0%
Atmospheric deposition	4,033	4,033	0	0.0%
Total	23,622	23,253	369	1.6%