



*Florida Department of  
Environmental Protection*

# *Banana River Lagoon Basin Management Action Plan*

June 7, 2012



# *Overview of the BMAP*

***DRAFT***

## **BASIN MANAGEMENT ACTION PLAN**

for the Implementation of Total Maximum Daily Loads for Nutrients  
Adopted by the Florida Department of Environmental Protection

*in the*

## **Indian River Lagoon Basin Banana River Lagoon**

*developed by the*

***Banana River Lagoon Technical Stakeholders***

*in cooperation with the*

***Florida Department of Environmental Protection***

*Division of Environmental Assessment and Restoration*

*Bureau of Watershed Restoration*

*Tallahassee, Florida 32399*

**May 2012**





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# *Chapter 1: Context, Purpose, and Scope of the Plan*





## *Stakeholder Involvement*

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- Technical meetings began in June 2009.
  - The purpose of these meetings was to organize and review the technical information that is the basis of the BMAP, gather information to aid in the development of the BMAP, and identify management actions that improved water quality.
- Policy briefings began in February 2012.
  - The purpose of the briefings was to obtain feedback on the BMAP process from the policy makers from each responsible BMAP entity.





## *Plan Purpose and Scope*

- The purpose of the Banana River Lagoon (BRL) BMAP is to implement the total nitrogen (TN) and total phosphorus (TP) TMDLs to achieve the seagrass median depth limit targets.
- Focuses on the BRL subbasin and two project zones:
  - BRL A – the area north of and including the State Road 528 Causeway; and
  - BRL B – the area south of State Road 528 Causeway.
- Note: new maps are being prepared to show the waterbody identification (WBID) numbers and the entities in each project zone.





## *BMAP Approach*

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- The TMDL reductions will be achieved over a 15-year period.
- The first iteration of the BMAP will cover a 5-year period.
  - Approximately end-2012 through end-2017.
- Each entity in the BRL B project zone is required to achieve 15% of their TN and TP reductions in this first iteration.
  - The remainder of any necessary reductions to achieve the seagrass targets will be achieved by the end of the 15-year timeline.





## *TMDLs Addressed in the BMAP*

- The TMDLs for the IRL Basin were adopted in March 2009.
- The TMDLs identify TN and TP reductions estimated to allow seagrass re-growth at in deeper water habitat.

| WBID        | Parameter | TMDL (lbs/yr) | WLA <sub>ww</sub> (lbs/yr) | WLA <sub>sw</sub> | LA (lbs/yr) |
|-------------|-----------|---------------|----------------------------|-------------------|-------------|
| 3057C       | TN        | 116,314       | 1,214                      | 67%               | 115,100     |
| 3057C       | TP        | 7,825         | 302                        | 72%               | 7,523       |
| 3057A+3057B | TN        | 144,780       | 6,173                      | 59%               | 138,607     |
| 3057A+3057B | TP        | 12,181        | 1221                       | 64%               | 10,960      |
| 3044A       | TN        | 30,661        | N/A                        | 66%               | 30,661      |
| 3044A       | TP        | 3,247         | N/A                        | 70%               | 3,247       |



## *Assumptions for the First BMAP Iteration*

- The TMDL requires TN and TP reductions from the watershed to improve water quality to allow seagrass to grow at greater depths. Therefore, reducing nutrient loading to the BRL is the most important factor to improving seagrass depth limits.
- Some of the BMPs that are listed in the project tables that reduce TN and TP will also result in total suspended solids (TSS) reductions. TSS is another factor that limits light penetration in the lagoon; therefore, reductions in TSS, in conjunction with reductions in nutrients, should allow seagrass to grow at deeper depths.





## *Assumptions, continued*

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- The lock at Port Canaveral does not have a significant impact on water quality or seagrass distribution in the BRL subbasin.
- The allocations do not include load reductions from atmospheric deposition because it is considered a background, uncontrollable source.
- Certain non-structural BMPs were assigned provisional credit for load reductions in this iteration of the BMAP while additional research is conducted to quantify the effectiveness. These reduction estimates may change, as additional research results are available.





## *Considerations for Future Iterations*

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- Land uses –The loading estimates for this iteration of the TMDL and BMAP were based on 2000 land use data. Future iterations may consider more recent land use information and whether allocations should be adjusted accordingly.
- Soil types – The Natural Resources Conservation Service released a new soil coverage for Florida in February 2010. **During the next iteration of the BMAP, FDEP will review the updated soil coverage and make adjustments to the Pollutant Load Screening Model (PLSM), as needed.**





## *Considerations, continued*

- Basin boundaries – Additional data about the topography of the BRL subbasin have been collected. During the next iteration of the BMAP, FDEP will review the available data and make any additional adjustments to the drainage basin, as needed.
- County roads – Stakeholders expressed concern during the BMAP process that county roads were included as part of the loading to each municipality. If the county road coverages are available for the next BMAP iteration, FDEP will use this information to refine the allocations.





## *Considerations, continued*

- Atmospheric Deposition – The TMDL assumed that no reduction in atmospheric deposition would occur. However, there are two power plants in the North IRL subbasin and these contributions could be reduced in the future. For future BMAP iterations, **FDEP will evaluate any changes in atmospheric deposition** and adjust the estimated loading to the lagoon, as appropriate.
- Progress towards seagrass depth limit targets – FDEP will continue to assess progress towards the seagrass depth limit targets for the BRL subbasin. Adjustments will be made to the required TN and TP reductions in future BMAP iterations, as needed, based on seagrass response.





## *Future Growth in the Basin*

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- Section 403.067(7)(a)(2), Florida Statutes, requires: BMAPs to:  
*“...identify the mechanisms by which potential future increases in pollutant loading will be addressed.”*
- The BMAP will not include an allocation for new development.
- New discharges cannot increase existing load and must meet “net environmental improvement” for the Environmental Resource Permit (ERP) program requirements.





## *Reducing Loads from Future Growth*

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- Local governments are encouraged to pursue measures to control loads from future growth such as:
  - Low impact development (LID) standards and Incentives;
  - Florida friendly landscaping; and
  - Modifications to local development regulations.





# *Comments and Questions on Chapter 1*

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## *Chapter 2: Banana River Lagoon Basin Setting*





## *Basin Hydrology*

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- Circulation in the BRL is influenced by winds and tidal exchange via a direct connection to the IRL.
- BRL is shallow, with an average depth of 2 meters, and poorly flushed, with estimated 2 years for a complete turnover of water.
- The high evaporation rate and limited freshwater inputs contribute to a higher salinity level in the BRL than in the southern portions of the IRL.
- Construction of the causeways has narrowed portions of the lagoon, making it more susceptible to watershed pollutants.





## *Land Uses in the Basin*

- The BRL watershed covers about 51,423 acres (not including the lagoon itself).
- Based on 2000 land uses:
  - 34.6% of the area is urban;
  - 21.3% of the area is wetlands;
  - 19.9% of the area is upland forest;
  - 20.1% of the area is rangeland; and
  - 4.1% of the area is water, barren land, and agriculture.
- Note: A new map is being prepared to show the land uses in the BRL.





## *Seagrass Evaluation*

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- The BRL A project zone is compliant with the seagrass depth limit target:
  - For the period of 2003-2007 and the period of 2005-2009.
- The BRL B project zone is not meeting the seagrass depth limit target:
  - For the period of 2003-2007 and the period of 2005-2009.
- Therefore, reductions are required in this iteration of the BMAP for only the stakeholders in the BRL B project zone.





## *Comments and Questions on Chapter 2*

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## *Chapter 3: Pollutant Sources and Anticipated Outcomes*





## *Sources in the TMDL*

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- Point source facilities;
- Municipal separate storm sewer systems (MS4s);
- Nonpoint stormwater sources;
- Agriculture; and
- Atmospheric deposition directly on the lagoon.
  - Considered a background, uncontrollable source in the TMDL; therefore, reductions were not required of these sources.





## *Point Source Facilities*

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- The point source facilities were assigned specific allocations in the adopted TMDLs.
- Reductions addressed through permits.
- The BRL facilities are:
  - Cape Canaveral Wastewater Treatment Facility (WWTF); and
  - Cocoa Beach WWTF.





## *MS4s*

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- The MS4s are all Phase II:
  - Brevard County;
  - City of Cape Canaveral;
  - City of Cocoa Beach;
  - City of Indian Harbour Beach;
  - City of Satellite Beach;
  - Florida Department of Transportation (FDOT) District 5; and
  - Patrick Air Force Base (PAFB).





## *Non-MS4s*

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- The Non-MS4s are :
  - Cape Canaveral Air Force Station; and
  - Kennedy Space Center.
- Both of the non-MS4s are located in the BRL A project zone and were not assigned allocations.





## *Agriculture*

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- The primary agricultural land use in the BRL subbasin was citrus.
- Since the 2000 land uses, there have been significant changes in agriculture due to urban encroachment, citrus health issues and the economic downturn.
- There do not appear to be any active commercial agricultural operations in the BRL subbasin.





## *Enforcement of BMAPs*

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- A BMAP is developed collaboratively with stakeholders to meet provisions in Section 403.067(7), Florida Statutes ( F.S.).
- For point sources, BMAPs are enforceable through WWTF and MS4 National Pollutant Discharge Elimination System (NPDES) permits.
- For nonpoint sources, BMAP projects are enforceable through the BMAP itself.
- For agriculture, best management practices (BMPs) or monitoring is required.
- BMAPs are adopted by FDEP Secretarial Order.





# *Anticipated Outcomes of BMAP Implementation*

- Improved water quality trends in the BRL, which will help improve seagrass coverage;
- Decreased loading of TN and TP;
- Decreased loading in TSS from some of the projects implemented to reduce TN and TP loads;
- Increased coordination among state and local governments and within divisions of local governments in problem solving for surface water quality restoration;
- Securing additional state and local funding for water quality restoration;
- Determination of effective projects through the stakeholder decision-making and priority-setting processes;
- Enhanced public awareness of pollutant sources, pollutant impacts on water quality, and corresponding corrective actions; and

Enhanced understanding of basin hydrology, water quality, and pollutant sources.





## *Comments and Questions on Chapter 3*

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## *Chapter 4: Detailed Allocations*





# *Allocations*

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- The details of the allocation approach for BRL B are included in the BMAP.
- This information was reviewed earlier in the meeting.



# *Comments and Questions on Chapter 4*

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## *Chapter 5: Management Actions*





## *Project Collection*

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- Stormwater management focused.
- Stakeholders submitted projects that were completed or planned to achieve TN and TP reductions.
- Projects completed since January 1, 2000 and later were eligible for credit.
- All projects must be located in the appropriate BRL project zone and address nutrients.
- Credit only counted for treatment above and beyond any permitted requirements.





## *Types of Projects Eligible for Credit*

- Retention BMPs (such as basins and exfiltration trenches);
- Wet detention ponds;
- Treatment trains;
- Dry detention;
- Baffle box (1<sup>st</sup> generation);
- Nutrient baffle box (2<sup>nd</sup> generation);
- Catch basin inserts/inlet filters;
- Grass;
- Alum injection;
- Stormceptor;
- Continuous deflective separation (CDS) unit (TP only);
- Street sweeping; and
- Public education and outreach efforts.





# ***BRL B Reductions***

| Type         | Entity                          | TN Reduction<br>(lbs/yr) | TP Reduction<br>(lbs/yr) |
|--------------|---------------------------------|--------------------------|--------------------------|
| MS4          | Brevard County                  | 5,893                    | 1,515.7                  |
| MS4          | City of Cape Canaveral          | 1,821                    | 613.3                    |
| MS4          | City of Cocoa Beach             | 2,769                    | 782.0                    |
| MS4          | City of Indian Harbour<br>Beach | 970.5                    | 277.9                    |
| MS4          | City of Satellite Beach         | 2,521                    | 576.6                    |
| MS4          | FDOT District 5                 | 2,246                    | 495.5                    |
| MS4          | PAFB                            | 4,012                    | 1,059.2                  |
| <b>Total</b> | <b>Total</b>                    | <b>20,232.5</b>          | <b>5,497.2</b>           |





# ***BRL A Reductions***

| Type         | Entity                           | TN Reduction<br>(lbs/yr) | TP Reduction<br>(lbs/yr) |
|--------------|----------------------------------|--------------------------|--------------------------|
| MS4          | Brevard County                   | 142                      | 48.0                     |
| MS4          | FDOT District 5                  | 152                      | 31.7                     |
| Non-MS4      | Cape Canaveral Air Force Station | 3,436                    | 1,813.1                  |
| Non-MS4      | Kennedy Space Center             | 18,301                   | 2,787.4                  |
| <b>Total</b> | <b>Total</b>                     | <b>22,031</b>            | <b>4,680.2</b>           |





## *Comments and Questions on Chapter 5*

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## *Chapter 6: Assessing Progress and Making Changes*





## *Seagrass Evaluation*

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- In year four of the BMAP, FDEP will use the 2007, 2009, 2011, and 2013 seagrass mapping data to reassess seagrass depth limit compliance.
- If the project zones meet the TMDL depth limit targets, a second BMAP would not be needed.
- If during this assessment any of the project zones are not compliant, FDEP would ask for stakeholders in that project zone(s) to make reductions in the second BMAP.





## *Tracking Implementation*

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- FDEP will work with the stakeholders to organize the monitoring data and track project implementation.
- This information will be organized into annual progress reports.
- The stakeholders will meet at least annually to review progress and modify project lists and the monitoring plan, as needed.





# *Monitoring Plan Objectives*

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- Primary objective: Track seagrass depth limit responses to BMAP implementation.
  - Compliance determined through the seagrass flyover mapping and aerial photography interpretation.
  - FDEP and the St. Johns River Water Management District (SJRWMD) will fund this.
- Secondary objective: Track trends in ambient water quality in the Banana River Lagoon.
  - Evaluated through data collected in the ambient monitoring network.





## *Monitoring Network*

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- SJRWMD will continue their existing monthly water quality sampling in the BRL subbasin.
- The monitoring network includes:
  - BRL A – 1 existing monthly water quality station.
  - BRL B – 5 existing monthly water quality stations.





## *Data Management*

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- All ambient water quality data included in the BMAP monitoring must be collected following FDEP's standard operating procedures and should be uploaded to Florida STORET or its replacement.
- Any biological or storm event data collected will be maintained by the entity collecting the data.
- Seagrass data will be evaluated approximately every 2 years.
- Water quality data will be evaluated in year four of the BMAP.





## *Research Priorities*

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- Research priorities identified include:
  - Updated bathymetry coverage;
  - Seagrass transects monitoring;
  - Phytoplankton, drift algae, and microalgae monitoring;
  - Storm event monitoring at major outfalls;
  - Tracking watershed loads; and
  - Verifying BMP effectiveness, as needed.
- During the first BMAP iteration, stakeholders will work with the IRL Estuary Program, SJRWMD and FDEP to prioritize research efforts and develop scopes of work to guide future efforts, as funding becomes available.





## *Comments and Questions on Chapter 6*

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## *Chapter 7: Commitment to Plan Implementation*





## *Commitment to the BMAP*

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- The stakeholders have worked collaboratively to develop the BMAP.
- The stakeholders have committed to the activities included in the BMAP.
- This chapter will include letters of commitment or resolutions of support for the BMAP provided by the stakeholders.





## *Letters of Commitment*

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- Providing a letter of commitment or resolution of support for the BMAP is not required.
- However, stakeholders in other basins have stated that having this letter provides a way to show support for the BMAP as staff and board/commission members change over time.
- An example letter will be provided. The wording and format can be modified to meet each stakeholder's needs.





## *Comments and Questions on Chapter 7*

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# *Appendices*





## *BMAP Appendices*

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- Appendix A: TMDL Basin Rotation Schedule
  - Explains the FDEP watershed assessment cycle.
- Appendix B: Summary of Statutory Provisions Guiding BMAP Development and Implementation
  - Includes excerpts from Sections 403.067(6) and (7) in Florida Statutes
- Appendix C: Summary of EPA-Recommended Elements of a Comprehensive Watershed Plan
  - Outlines key elements in a watershed plan; necessary to obtain certain types of funding.





## *BMAP Appendices, continued*

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- Appendix D: Projects to Achieve the TMDL
  - Important appendix – project tables for each stakeholder.
  - *Please review the information in your project tables carefully for accuracy and completeness.*
  - *Projects listed in BMAP are what will be adopted and are what you will be held responsible for completing.*
- Appendix E: Glossary of Terms
- Appendix F: Bibliography of Key References and Websites





# *Comments and Questions on Appendices*

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# *Steps to BMAP Adoption*





## *Stakeholder and FDEP Staff Actions*

| Action                                                                                        | Responsible Party                               |
|-----------------------------------------------------------------------------------------------|-------------------------------------------------|
| Comments on first Draft BMAP due <i>June 22nd</i>                                             | Stakeholders                                    |
| Technical meeting to review updated Draft BMAP                                                | FDEP and Technical Stakeholders                 |
| Comments on second Draft BMAP due                                                             | Stakeholders                                    |
| Policy briefing on final Draft BMAP                                                           | FDEP, Policy Makers, and Technical Stakeholders |
| Public meeting on BMAP                                                                        | Public/FDEP                                     |
| Public comment period closes (30 days after meeting)                                          | FDEP                                            |
| Review of public comments by staff complete (about 1 week after end of public comment period) | FDEP                                            |
| Letters of commitment due for inclusion in BMAP package to FDEP Secretary                     | Policy Makers and Technical Stakeholders        |





## *FDEP Secretarial Adoption Process*

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- Brief FDEP DEAR management on BMAP.
- Brief FDEP Deputy Secretary on BMAP.
- Brief FDEP Secretary on BMAP and obtain Secretarial approval.
- Notify interested parties and place Florida Administrative Weekly (FAW) notice.
- End of challenge period (21-days after notice).
- BMAP adopted and enforceable (if there are no challenges).





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# *Questions?*

