

Marco Island Waterways Quality Improvement Issues, Studies and Policy Changes

Top six issues (not in order of priority)

1. Swales, Streets and Water Retention

a. Issues

- i. MI has a system of swales, inlets and outfalls which convey stormwater from the streets to the waterways. This design of this system focused on reducing street flooding. How can this system be improved to positively affect water quality?

b. Studies

- i. First-flush study to determine magnitude of swale conveyance issue
- ii. Street vacuuming study to determine impact of vacuuming on street runoff
- iii. Long term effectiveness of pervious pavers

c. Policy Changes

- i. Reshape swales to increase stormwater percolation times
- ii. Raise stormwater inlets to increase stormwater percolation times
- iii. Create program of regular street vacuuming
- iv. Allow additional credits for pervious pavers

2. Fertilizers and Groundskeeping

a. Issues

- i. The use of fertilizers may increase the nutrient load in the waterways if the chemicals, particularly nitrogen and phosphorus, are conveyed to the canals

b. Studies

- i. Review the literature and conduct local studies to determine BP

c. Policy Changes

- i. Ban the application of fertilizers under certain conditions and during certain times of the year
- ii. Prohibit actions which could introduce grass clippings and other organic matter into the waterways such as operating lawnmowers without grass catchers, mowing within a specified distance of a seawall, blowing grass clippings into storm water inlets, etc.
- iii. Improve enforcement of regulations

3. Water Testing

a. Issues

- i. The current program of water testing includes twelve inland sites and is performed quarterly. Would more and different data be of value.

b. Studies

- i. Review the data from the existing program and recommended BP

c. Policy Changes

- i. Expand the water testing program to include monthly testing, additional inland sites and offshore sites
- 4. Reuse Water
 - a. Issues
 - i. Reuse Water contains nitrogen and phosphorus. It may have an impact on the waterways if the irrigation water is conveyed to the canals.
 - b. Studies
 - i. Study the potential impact of reuse water on the nutrient loading in the canals, especially the impact on nitrogen and phosphorus levels.
 - ii. Quantify the amount for reuse water and its spatial distribution and model how much of it ends up in the canals.
 - iii. Utilization of sampling wells to determine groundwater nutrient flow to canals
 - iv. Track the amount of reuse water distributed by the water system over time and compare that against nitrogen and phosphorus levels recorded in the canals.
 - c. Policy Changes
 - i. Modify the amount of reuse water allowed.
 - ii. Enforce conditions under which reuse water may be applied.
- 5. Nutrient loading from sources away from Marco Island
 - a. Issues
 - i. The impact on MI waterways from distant sources is not currently well known or understood
 - b. Studies
 - i. Review data from distant sites for potential impacts on MI
 - ii. Test current flows to determine probability of impacts from distant sites
 - iii. Long distance offshore testing in the Gulf of Mexico
 - iv. Testing in the Marco River
 - v. Testing for impacts from the Goodland septic system
 - vi. Testing for impacts from the Isle of Capri septic system
 - c. Policy Changes
 - i. Factor the distant source loading into all locally generated data
- 6. Subsurface Sampling and analysis
 - a. Issues
 - i. The MI canal system has a significant quantity of biological and other waste material over the sand at the bottom of most canals. This material may have an impact on water quality
 - b. Studies
 - i. Evaluate of the quantity and composition of the accumulated material on canal bottoms
 - ii. Determine the impacts of this material on the canal water chemical composition, oxygen availability, turbidity, plant life and fish life survivability
 - c. Policy Changes

- i. Review options for remediation of the accumulated material

Additional Issues (yet to be prioritized)

7. Site Development

- a. Requirement that certain residential property permit applications include a site plan demonstrating that the Pervious/Impervious Ratio meets the specified standard.
- b. Requirement that certain commercial property permit applications include a site plan demonstrating that the Pervious/Impervious Ratio meets the specified standard.
- c. Requirement that certain residential property permit applications include a site plan demonstrating that the stormwater retention capability meets the specified standard.

8. Weather Events

- a. A retrospective study to determine what correlation, if any, exists between reordered rainfall amounts and recorded water quality measurements.
- b. First Flush Study - Study the chemical composition of stormwater as it is recovered from specified surfaces such as roofs, driveways, swales, etc., immediately after the beginning of a rain event and in closely spaced time intervals thereafter until the samples approach equilibrium
- c. Review of the changes to water sampling data in relation to hurricane and tropical storm events

9. Gulf Loop Current

- a. Study the effects of the Gulf of Mexico Loop Current in both the macro and micro currents operating in the waterways.
- b. Study the flushing effect of currents within of tidal currents in the canal system

10. Seawalls, Inlets and Outfalls

- a. Study the impact of aging and deteriorating seawalls on nutrient transfer into the canals.
- b. Study the impact of extending the canal seawalls into a lot to create the well for a nautical garage.
- c. Review the results of the MS-4 outfall study
- d. Review the results of the Inlet location study

11. Sources from boat uses and anchorages

- a. Boat bottom cleaning at residential docks
- b. Boat bottom cleaning at commercial docks and marinas
- c. Holding tank discharges

12. Water treatment plant discharges

13. Sources from golf courses

14. Stormwater
 - a. Stormwater from residential properties
 - b. Stormwater from commercial properties
 - c. Outfall filter effectiveness
15. Animal, bird and bat feces
16. Industrial discharges
17. Parking lot discharges
18. Study the impact of artificial reefs
19. Tidal cycle and volume modeling
20. Seagrass study-does the seagrass die because of water chemistry imbalance or turbidity?

Additional Issues that may be added to the list

21. _____

a. Issues

b. Studies

c. Policy Changes

22. _____

a. Issues

b. Studies

c. Policy Changes

23. _____

a. Issues

b. Studies

c. Policy Changes

24. _____

a. Issues

b. Studies

c. Policy Changes

25. _____
a. Issues

b. Studies

c. Policy Changes

26. _____
a. Issues

b. Studies

c. Policy Changes

27. _____
a. Issues

b. Studies

c. Policy Changes

28. _____
a. Issues

b. Studies

c. Policy Changes