Monroe County Residential Canal Demonstration Projects: Implementation

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Introduction

The Past & Future of Canal Water Quality in the Florida Keys
History of the Florida Keys

- Developed after WW II as a relaxed winter haven for fishing
- 1940’s - 1970’s land development and the demand for waterfront property initiated canal construction
- Close location to Miami increased development

Development of the Florida Keys

- 1.9 million visitors in 1990
- Tourist Development Council formed
- 37,000 acres of dredged and filled land
- Electricity brought to most of the Keys
- Water Pipeline built
Impact of Rapid Growth

Canal Construction in the Florida Keys

- Canal development initiated before ecologists and resource managers were aware of the implications
- Dredge and fill activities created 111 miles of canals, with 312 miles of waterfront property
- Many canals dug 15 - 30 feet to maximize fill material
- Most canals are long dead-end networks with little or no tidal flushing
**Dredge and Fill Operations**

![Image of Sugarloaf Shores](developing-sugarloaf-shores.jpg)

**Damage Caused by Canal Development**

- Increased population growth into a sensitive area without storm water and waste water treatment infrastructure in place
- Destroyed shoreline habitat especially mangroves
- Added turbidity and sediment to the nearshore waters
- Produced long-term water quality degradation in the canals
- Water quality that does not meet State of Florida standards
Common Problems and Nuisances Associated with Residential Canals

Within the Canal
- Reduced tidal flushing or mixing
- Accumulation and decomposition of seaweed in canals
- Buildup of trash
- Fish kills within the canals
- The constant smell of rotten eggs

Outside the Canal
- Weather induced discharges that have resulted in the following:
  - Acute damage to coral reefs
  - Diminished oxygen content in coastal waters
  - Increased levels of hydrogen sulfide in nearshore waters

What Does This Mean for Florida’s Aquatic Resources

- Permanent damage to nearshore coral reefs and seagrass beds from contaminated discharges
- Decrease in overall fish populations including commercial species (i.e. snapper, grouper, etc.)
- Health concerns for swimmers, snorkelers, and divers
City of Key West: 1950’s Goliath Grouper Spear Fishing Tournament

Long Key Fish Camp (1916)

Inshore fly fishing for amberjack and barracuda
My Last Keys Fishing Trip (2014)

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Marathon, Florida Keys in Early 1900

The village of Marathon in 1911
Marathon 1957

Marathon looking south at Seven Mile Bridge, c. 1957

Plantation Key 1953

Plantation Yacht Harbor MM 87 - 1953
Not All Canals Were Made Equally: Sugarloaf Key

- Short straight shallow canals
- Rapid flushing to a high energy outfall
- No commercial usage
- Continued presence of Goliath Grouper as of 2013
Scientific and Regulatory Response to Water Quality Impairment

- Numerous scientific studies completed between 1990 and 2003 that identified residential canals as a major culprit in the degradation of nearshore water quality.

- 2008 Florida Keys Reasonable Assurance Document (FKRAD)
  - Submittal focused on a list of proposed actions required to reduce nutrient loading into nearshore waters (i.e. sewers, stormwater improvements, etc.).

- 2011 FKRAD Update focused on additional actions required to address substandard dissolved oxygen levels in residential canals (i.e. best management practices and canal restoration).

Monroe County’s Integrated, Multi-Disciplinary Response to FKRAD

- Science — Identifying problems through ecological observations and water quality monitoring
- Engineering — Evaluation of physical characteristics, water quality impairment, and restoration technology design
- Government — Guidance, funding, regulatory action, and permitting
- Public — Local support for the demonstration projects and willingness to fund the long term O&M
Mitigation Efforts Initiated

- Implementations of Growth Restrictions
- Storm water infrastructure improvements
- Sanitary Sewers (Completion 2015)
- Best Management Practices (ongoing)
- Development of Canal Management Master Plan
- Canal Restoration Demonstration Projects

Recently Completed Actions by Monroe County

- Monroe County Canal GIS Geodatabase Update (2012)
- Phase I Monroe County Canal Management Master Plan (CMMP) (2012)
- Phase II CMMP (2013)
- Bathymetric Survey of Residential Canals (2013)
- Sediment Characterization Study (2013)
- Monroe County Selection of Canals for Water Quality Improvements (2013)
- Geiger Key Canals 470 and 472 Restorations, Permitting and Design (2014)
Ongoing Actions: Monroe County Canal Demonstration Projects

- Monroe County is evaluating the effectiveness of the following technologies:
  - Bubble curtains
  - Seaweed removal
  - Backfilling
  - Aeration
  - Pumping
  - Culverts

- Canal Selection Process
  - Evaluation of observed impacts
  - Permittability (i.e., location, ownership, and resources, etc.)
  - Accessibility (i.e., staging areas, vacant lots, etc.)
  - Homeowner Approval

- 7 canals out of 502 were selected for restoration through the demo process

Homeowner Approval Process

- **Initial letters of interest** were sent to all property owners on the demonstration canals which included:
  - Information on the proposed restoration
  - Yes or No answer for participating in the program
  - Yes or No answer for contributing to pay operation and maintenance (O&M) costs

- Monroe County’s initial goal was to obtain 100% approvals

- Extensive follow up was undertaken to obtain approvals
  - Answering abundant phone calls
  - Site visits and meetings with homeowners
  - Using local contacts in each community to assist with obtaining approvals and providing phone numbers/email addresses of non-respondents
  - Certified letters
Homeowner Reactions

Positive Reactions
- Residents baked team members Chocolate Chip Cookies in an act of appreciation
- Some residents continue to plead for their canal’s inclusion in the demonstration project
- Willingness to help convince fellow residents
- Recommendations for improving restorations

Negative Reactions
- Enthusiastic response letters
- Friendly reminders of their constitutional rights
- Threats of lawsuits

Who Wouldn’t Want Cleaner Water?

March 1, 2014

Subject: Encouraging Homeowner Involvement in Participating in
Cleaner Water Quality Improvement Program - Postcard Questionnaire

Dear [Name],

Macon County is considering the potential implementation of various water quality improvement technologies within the canal system throughout the Town. The Board of County Commissioners has approved a new demonstration project, and we have launched a postcard survey questionnaire to determine the interest of the residents and property owners in participating and making a commitment to this new project.

The postcard questionnaire is intended to solicit participation from every canal and relevant property owner. Information collected through this survey will be used in making a final decision on the potential implementation of a new water pollution control system. The survey is voluntary, and participation is not mandatory.

Survey Questions:
1. Your canal has been identified as having a suitable candidate for installation of a cleansing system in advance planning. Please review the attached preliminary design information for an overview of the technology. Are you interested in having a cleansing system installed in your canal and being part of an ongoing effort to improve the quality of water in your canal and vicinity?

Yes: HELL NO!

Comments:
I RECEIVED THIS LETTER ON MARCH 6, 8 DAYS AFTER A MEETING THEY PLACE DISCUSSIONING WHAT MY HANDS TO MY PROPERTY. THIS APPROACH OF GOING AROUND THE IS JUST A BACK DOOR APPROACH TO GETTING ME TO COMPLY AND IF YOU TRY TO \[INCOMPLETE TEXT]

Your postcard response needs to be received by March 20, 2014.

Thank you for your attention to this matter.

Sincerely,

[Signature]
[Name]
[Title]
[Company]
Lessons Learned from the Homeowner Approval Process

- Planning for opposition in advance
- Canal specific scoping meetings
- Treating their concerns seriously
  - Even if not properly conveyed, the concerns may be legitimate.
  - The most thorough assessment can miss the most obvious of issues
- Willingness to modify project design if necessary
- Organize the supportive residents
- 100% approval is unrealistic (75% acceptable)

NEXT STEPS IN THE PROCESS FOR MONROE COUNTY

- Permitting and final design of demonstration projects
- FIU’s evaluation of residential canal restorations
- Cost/benefit analysis
- Public Outreach
- Identifying additional funding sources