



Monroe County Residential Canal Demonstration Projects: Implementation

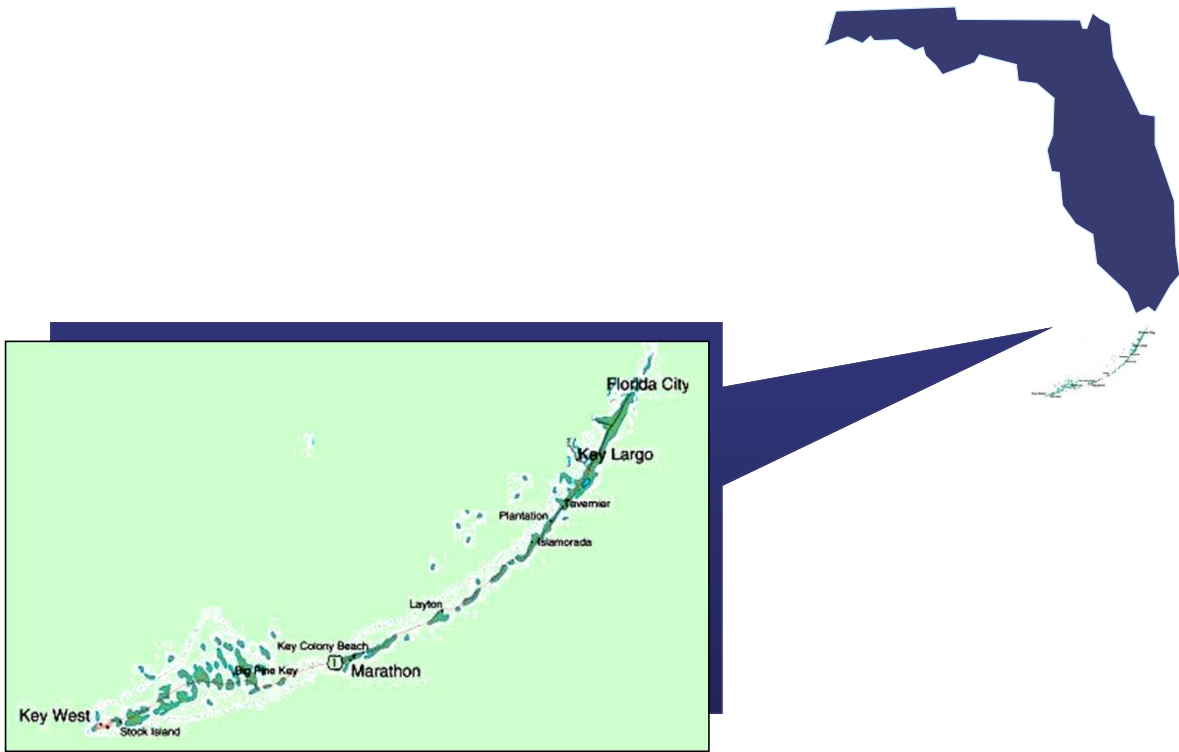
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Introduction

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



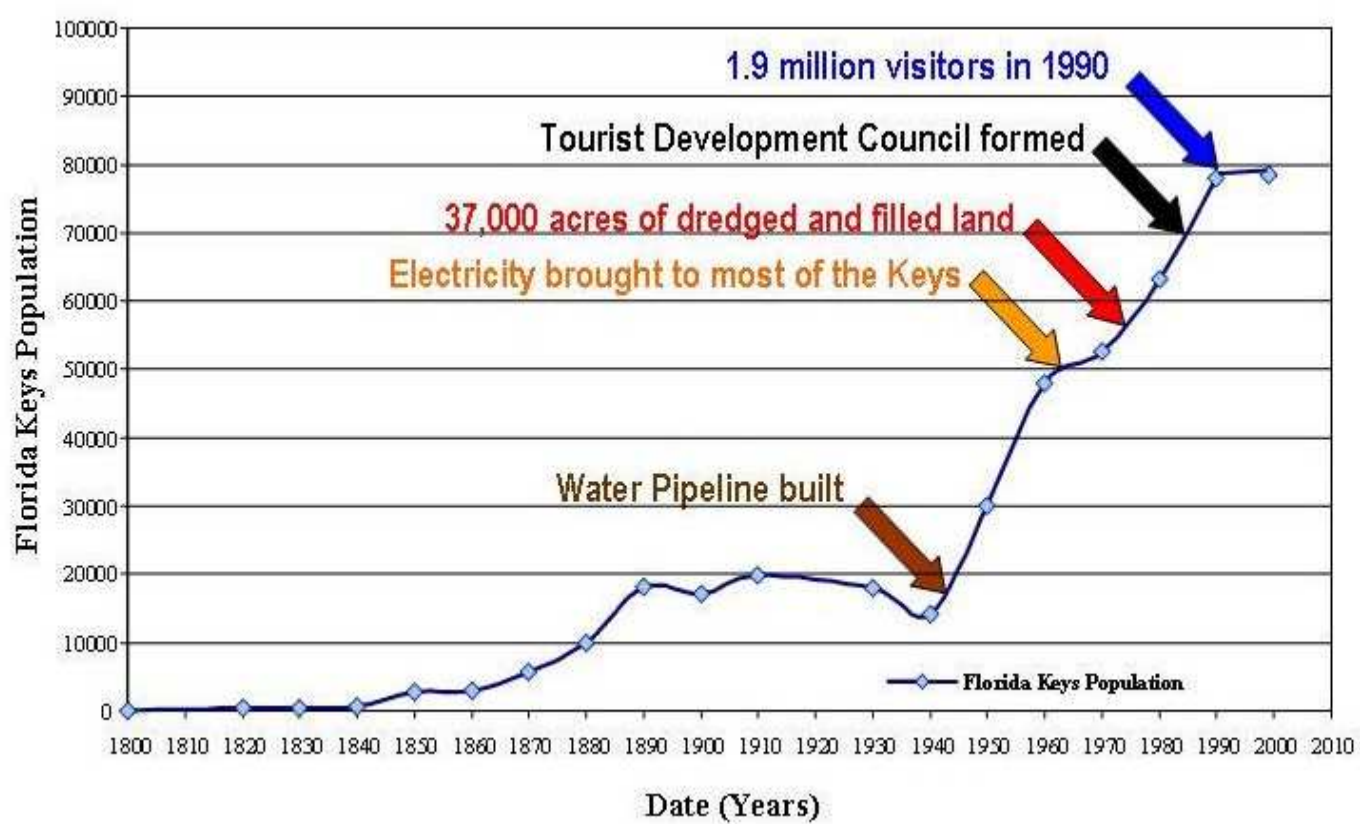
History of the Florida Keys



- 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



Impact of Rapid Growth



5

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



6

Dredge and Fill Operations



Developing of Sugarloaf Shores

7

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



8

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



9

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, ect.)
- Health concerns for swimmers, snorkelers, and divers



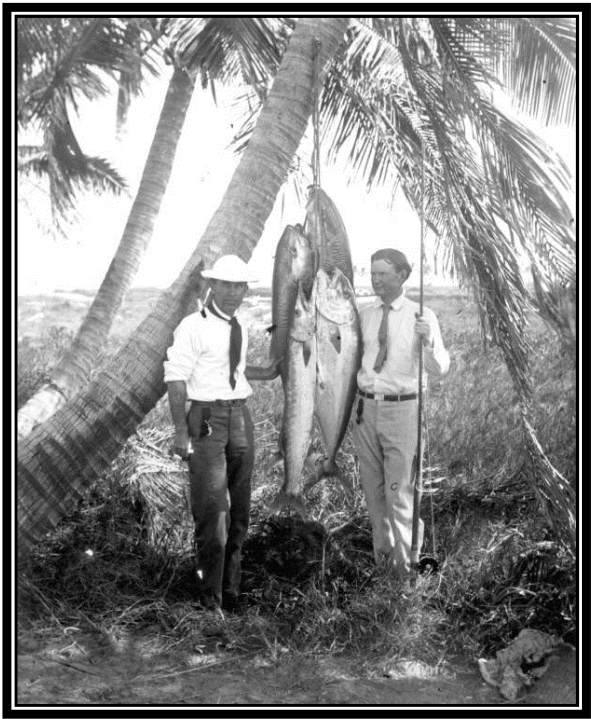
Bleached Corals

10

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

Plantation Key Today



17

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



18

Scientific and Regulatory Response to Water Quality Impairment



- Numerous scientific studies completed between 1990 and 2003 that indentified 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, ect.).
 - 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



21

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)

22

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, ect.)
- Accessibility (i.e. staging areas, vacant lots, ect.)
- *Homeowner Approval*



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

23

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

24

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



“Responses for just one canal”

➤ Negative Reactions

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

Who Wouldn't Want Cleaner Water?



Express Mail
2-13-14

amec

March 1, 2014

[Redacted]

Subject: DETERMINING HOMEOWNER INTEREST IN PARTICIPATING IN
CANAL RESTORATION DEMONSTRATION PROJECT
PARCEL ID 266650, located at 29007 Palmetto Dr, Big Pine Key
AMEC PROJECT NUMBER 6783-13-2561

Dear Mr. [Redacted]

Monroe County is considering the potential implementation of various water quality improvement technologies within residential canals throughout the Keys. The Board of County Commissioners has approved a few demonstration projects and has secured funding for the installation of the projects. The installation should improve the water in your canal and there will be no charge for the equipment or installation. On some canals property owners may be asked to pay for the maintenance of the equipment installed in the canal.

Your canal has been identified as a potential candidate for implementation of a restoration technology and we are soliciting information from you to assist in the final selection process.

Your participation in the selection process is vital and necessary to determine whether your canal will be selected. Please take a few moments to answer the following questions related to your canal:

1. Your canal has been identified as being a suitable candidate for installation of a pumping system to enhance flushing. Please refer to the attached preliminary design information for an overview of the technology. Are you interested in Monroe County implementing this water quality improvement in your canal and being a part of the demonstration project?

Yes: ☐
No: ☒ **HELL NO!**

Comments:
I RECEIVED THIS LETTER ON MARCH 11, 6 DAYS AFTER A MEETING TOOK PLACE DISCUSSING WHAT MIGHT HAPPEN TO MY PROPERTY. THIS IN MY OPINION IS JUST A BACK DOOR APPROACH TO GOING AROUND THE LAND OWNER AND IF YOU TRY TO PLACE ANY DEVICE ON MY PROPERTY, YOU WILL BE TRESPASSING AND I WILL

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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)



27

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



28