Current Strategies

Reasonable Assurance Plan

Canal Restoration Projects

Water Quality Improvement
Canal Restoration

• 2011 – Numerous canals determined to not meet dissolved oxygen water quality standard

• 2012 – Water Quality Protection Plan Canal Restoration Sub-committee initiated Phase 1 of the Canal Management Master Plan for Monroe County

• 2017 – DEP to assess the waters in the Florida Keys
Waterbody Identification Number - WBID

Assessment Unit (waterbody)

Unnamed Tributary

WBID Boundary Line
### DRAFT Dissolved Oxygen (DO) Assessment

Using the DEP Impaired Waters Rule assessment methodology

<table>
<thead>
<tr>
<th>WBID</th>
<th>Waterbody Name</th>
<th>Exceedances/Samples</th>
<th>DO Saturation (DOSAT) Assessment</th>
<th>DOSAT Stations Located Near (or within) Amec-designated Poor Water Quality Canals</th>
</tr>
</thead>
<tbody>
<tr>
<td>6006A</td>
<td>South Key Largo</td>
<td>1/19</td>
<td>Not Impaired</td>
<td>Yes</td>
</tr>
<tr>
<td>6006B</td>
<td>Middle Key Largo</td>
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<td>Insufficient Data</td>
<td>No</td>
</tr>
<tr>
<td>6009</td>
<td>Plantation Keys</td>
<td>2/19</td>
<td>Not Impaired</td>
<td>Yes</td>
</tr>
<tr>
<td>6011A</td>
<td>Vaca Key</td>
<td>0/19</td>
<td>Not Impaired</td>
<td>No</td>
</tr>
<tr>
<td>6011C</td>
<td>Grassy Key</td>
<td>1/22</td>
<td>Not Impaired</td>
<td>Yes</td>
</tr>
<tr>
<td>6012A</td>
<td>Big Pine Key</td>
<td>0/19</td>
<td>Not Impaired</td>
<td>Yes</td>
</tr>
<tr>
<td>6012C</td>
<td>No Name Key</td>
<td>0/5</td>
<td>Insufficient Data</td>
<td>No</td>
</tr>
<tr>
<td>6013A</td>
<td>Saddlebunch Keys</td>
<td>0/11</td>
<td>Not Impaired</td>
<td>Yes</td>
</tr>
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<td>6013C</td>
<td>Cudjoe Key</td>
<td>0/16</td>
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<td>Yes</td>
</tr>
<tr>
<td>6014C</td>
<td>US Naval Air Station Key West</td>
<td>3/43</td>
<td>Not Impaired</td>
<td>Yes</td>
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<tr>
<td>6017</td>
<td>Upper Matecumbe Key</td>
<td>0/22</td>
<td>Not Impaired</td>
<td>No</td>
</tr>
<tr>
<td>6019</td>
<td>Lower Matecumbe Key</td>
<td>0/5</td>
<td>Insufficient Data</td>
<td>Yes</td>
</tr>
</tbody>
</table>
DEP Monitoring Strategy

• Perform statewide preliminary assessment

• Does the waterbody meet water quality standards?
  • No – low priority for monitoring until restoration goals and plan are complete
  • Yes – low priority, because water quality status is known
  • Maybe – Prioritize for sampling until sufficient data are collected

• What basin is the waterbody in?
  • What year will this basin be assessed?

• Is someone other than DEP monitoring the waterbody?
  • Coordinate with them to collect appropriate data
Monitoring Requirements/Considerations

- **Select representative sampling locations**
  - Don’t necessarily focus all monitoring on problem areas (dead-end of canal)

- **Collect samples within different “seasons” or under different conditions during different times of the year**

- **Minimum of 20 samples for DO**
  - Sampling within 7.5 years for DEP assessment
  - Could be done for 4 months after implementation of restorative technology
    - (5 days of continuous monitoring x 4 months = 20 daily average samples)

- **# of locations varies with size of the canal**
Recommendations

• Review the available data in conjunction with the Amec evaluation
  • Done for previous data collected, but would like to include new information

• Implement monitoring based on considerations discussed

• Prioritize canal restoration
  • Amec – canal master plan
  • DEP – water quality status
  • Results of demonstration projects
Prioritizing Canal Restoration

- **Ecological Considerations**
  - Severity of the water quality problem
  - Proximity to coral reefs or species of concern

- **Social Considerations**
  - Recreational use
  - Public input

- **Economic considerations**
  - Types of successful restoration technologies
  - Cost of restoration activity – get the biggest bang for the buck!
Florida Keys Reasonable Assurance Documentation (RAD) Update & Monitoring
Identified as impaired for nutrients

1998

Began development of RA plan

2006

RA Plan approved

2008

Status of RA Plan reported

2011

Next assessment & RA plan update

2017

RA Plan projects completed

2020
• **Last update performed in 2011**
  - 68 projects were completed
  - 58 projects were not yet complete

• **For the 2017 update**
  - DEP will be requesting updates on the incomplete projects
  - Need to evaluate water quality monitoring
    - Gives indication whether or not the completion of projects and implementation of activities are sufficient to meet the water quality targets
There are 46 total WBIDs (not including beach WBIDs) in the Florida Keys. The FKRAD includes 23 WBIDs (representing the island waterbodies). 7 out of the 23 FKRAD WBIDs have sufficient total nitrogen and total phosphorus data.
Schedule for Updating the RAD

- **April** - Hold a stakeholder meeting to discuss the update
- **May** - Follow up with project workbook via e-mail to gather info
- **July/August** - Draft RA update report and deliver to stakeholders for review
- **September** - Revise update, hold another meeting, if needed
- **October/November** - Finalize report, update assessments
- **December** - Adopt assessments by end of 2017
DEP ROCs Florida Keys 2016 and 2017 sampling:
- 2016 - 14 WBIDs and 102 samples
- 2017 – 11 WBIDs and 100 samples

Florida Keys RAP compliance sampling:
- 23 WBIDs (Estuaries)
- Estimate of 252 samples needed to fully assess the 23 FKRAD WBIDs for nutrients (63 estimated number of stations with 4 samples collected in a calendar year).
- Each sampling would require at least 2 staff for sample collection.
<table>
<thead>
<tr>
<th>WBID</th>
<th>Waterbody Name</th>
<th>Number of Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>6006A</td>
<td>South Key Largo</td>
<td>6</td>
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<tr>
<td>6006B</td>
<td>Middle Key Largo</td>
<td>4</td>
</tr>
<tr>
<td>6006C</td>
<td>Upper Key Largo</td>
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<tr>
<td>6009</td>
<td>Plantation Keys</td>
<td>4</td>
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<tr>
<td>6010</td>
<td>Long Key</td>
<td>2</td>
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<tr>
<td>6011A</td>
<td>Vaca Key</td>
<td>4</td>
</tr>
<tr>
<td>6011B</td>
<td>Key Colony</td>
<td>4</td>
</tr>
<tr>
<td>6011C</td>
<td>Grassy Key</td>
<td>2</td>
</tr>
<tr>
<td>6012A</td>
<td>Big Pine Key</td>
<td>2</td>
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<tr>
<td>6012C</td>
<td>No Name Key</td>
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<tr>
<td>6012D</td>
<td>Long Beach</td>
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<tr>
<td>6012E</td>
<td>Big Torch Key</td>
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<tr>
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<td>Saddlebunch Keys</td>
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<tr>
<td>6013B</td>
<td>Sugarloaf</td>
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<tr>
<td>6013C</td>
<td>Cudjoe Key</td>
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<td>6014B</td>
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<td>6014C</td>
<td>US Naval Air Station Key West</td>
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<tr>
<td>6016</td>
<td>Duck Key</td>
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<td>6017</td>
<td>Upper Matecumbe Key</td>
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<td>6018</td>
<td>Bahia Honda State Park</td>
<td>2</td>
</tr>
<tr>
<td>6019</td>
<td>Lower Matecumbe Key</td>
<td>4</td>
</tr>
</tbody>
</table>
Monitoring Requirements/Considerations

- Select representative sampling locations
- Collect samples within different “seasons”
- Minimum of 4 samples, prefer from each location
  - Total nitrogen (TN) and Total phosphorus (TP)
  - DEP approved methods
- # of locations varies with size of the WBID and land activities

Do you see the overlap with the Canals Monitoring Needs?
Combined Monitoring Strategy

• Select representative sampling locations
  • Canal location + 2-3 locations within RAD boundary

• Collect samples under different conditions based on restoration activities

• Minimum # of samples
  • 4 for TN and TP = 4 sampling events
  • 4 months = 4 sampling events OR
  • 4 stations x 4 events = 16 “grab” DO measurements

• Rotate through areas to achieve each goal
Questions?
Example of WBID with many more monitoring locations
Example of a monitoring location within “poor” canal