

Tidal Creek Condition Index

A Watershed Management Tool

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Index Development

- ◆ Tidal Creek Background
- ◆ Preliminary Index Work
- ◆ Current Index Work
- ◆ Anticipated Outcome
- ◆ Future Work – What's Next?

Background

- ◆ What are tidal creeks?
 - Coastal rivers, streams, and creeks draining watersheds that are influenced by daily tide cycles
- ◆ Why are they important?
 - Unique ecosystems
 - Link uplands and estuaries
 - Deliver freshwater and nutrients to marshes and estuaries
 - Transport and deposit sediment
 - Provide food and shelter for many aquatic organisms
 - Deliver non-point source stormwater pollution

Background Cont'd

- ◆ What is a Tidal Creek Condition Index?
 - A method or technique using various biological indicators to assess the ecological health of the tidal creek ecosystem
- ◆ Why is an Index a valuable tool?
 - Compare multiple systems and develop a report card of watershed condition
 - Document temporal health of a system
 - Used as a baseline to compare with future trends as watersheds are altered by development or restoration
 - Used to develop strategies to meet TMDLs
 - Used to develop Basin Management Action Plans
 - Track success of Watershed Management Plans

“Tidal creeks are sentinels that provide early warning of the degree to which land development affects coastal environmental quality”.

-Holland, Sanger, et. al.,2005



What is the Question?

- ◆ Can a Tidal Creek Condition Index be developed for Sarasota County?
 - Indices have been developed for freshwater systems – SCI – DEP
 - Indices have been developed for marine and estuarine systems
 - Unsuccessful attempts have been made to develop a tidal creek index

Sarasota County Tidal Creeks

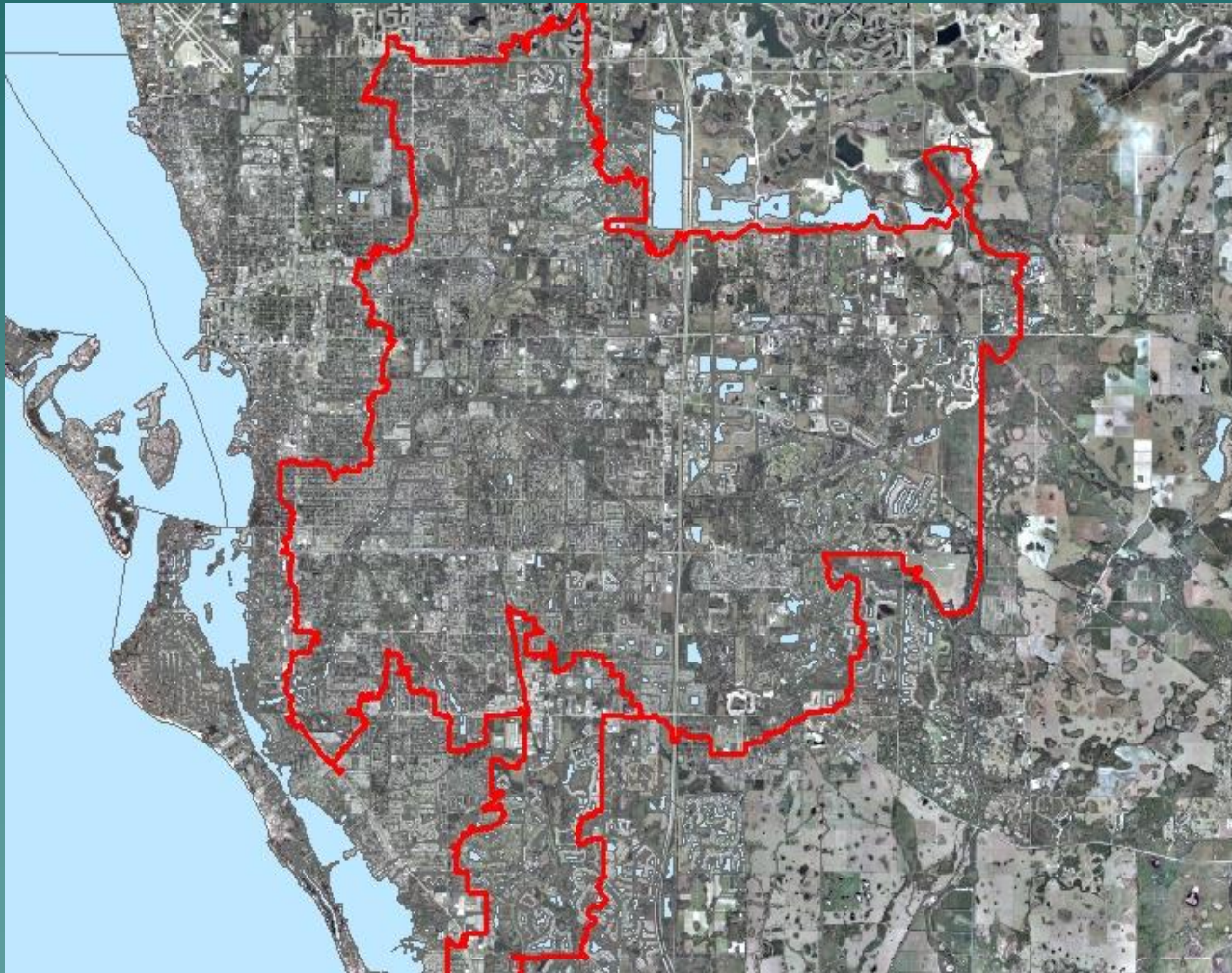
- ◆ Whitaker Bayou
- ◆ Hudson Bayou
- ◆ Phillippi Creek
- ◆ Matheny Creek
- ◆ Clower Creek
- ◆ Catfish Creek
- ◆ North Creek
- ◆ South Creek
- ◆ Shakett Creek
- ◆ Curry Creek
- ◆ Hatchett Creek
- ◆ Alligator Creek
- ◆ Woodmere Creek
- ◆ Forked Creek
- ◆ Gottfried Creek
- ◆ Ainger Creek

Sarasota County Tidal Creeks

Figure 1. Maps of Sarasota County Coastal Creeks



Phillippi Creek Watershed



Preliminary Work – Phase I

- ◆ County staff developed existing data on 16 tidal creeks to characterize them and their subbasins
- ◆ Parameters were based on % and acreages
- ◆ Agriculture; Total Impervious; Undeveloped; Total Wetlands; Total Uplands; Total Population; Population Density/Acre and Septic Density/Acre.
- ◆ Developed a rough grading in order of best condition to worst condition
- ◆ Conclusion: There were enough creeks with significantly different major basin features to move forward with the next phase.

Preliminary Work – Phase II

- ◆ Data and grading of creeks from Phase I used to identify 2 creeks with opposing conditions
- ◆ Gottfried Creek chosen as “best” (least impacted)
- ◆ Whitaker Bayou chosen as “worst” (most impacted)
- ◆ Creeks surveyed

Phase II – Cont'd

◆ Results

- Ecological differences supported the best and worst
 - Sufficient number of creeks to develop a biologically- based tidal creek condition index
 - Watersheds differed widely
 - Extremely different basins had greatly different tidal creeks
- ### ◆ Results supported the decision to move forward with the next phase of the project

Preliminary Work – Phase III

- ◆ Prototype index developed
- ◆ Further refined metrics and field sheets
- ◆ Tested prototype on tidal creeks
- ◆ Conclusions:
 - A representative site could be identified in most
 - creeks
 - A scoring methodology was developed from data analysis
 - Ranked in order of best to worst

Three Groups of Creeks

- Tidal creeks could be divided into 3 groups:
 - Upper (Highest Scores)
 - Middle (Middle Scores)
 - Lower (Lowest Scores)

Phase III – Cont'd

- Index results interpreted as a test of its metrics
- Prototype should be tested against independent standards
- Further refinement and testing can lead to a workable tidal creek condition index
- The index should be further refined and field tested in dry season 2007 – Phase IV

Current Work – Phase IV

2007 Dry Season Assessment

- ◆ Sample metrics refined
- ◆ SOP document developed
- ◆ Final field sheets created
- ◆ Reference site in all 16 tidal creeks assessed and sampled – completed 6/07
- ◆ Benthic infaunal and sediment samples currently being analyzed
- ◆ Final report expected late 2007 or early 2008

Anticipated Outcome

- ◆ Workable Tidal Creek Condition Index
- ◆ Final ranking of county tidal creeks
- ◆ Baseline to compare with future trends
- ◆ Develop proactive strategies for watershed protection, management, and maintenance

Future Work

- ◆ Workshop to present Index and solicit peer review
- ◆ Index results compared with independent standards: LDI, WQ data, Oyster monitoring data, etc.
- ◆ Develop comprehensive tidal creek monitoring plan
- ◆ Train county staff to conduct field work
- ◆ Apply Tidal Creek Condition Index to county creeks annually

Questions?

Thank You!

