



Solving the Spruce Creek Problem

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The Situation

Spruce Creek is a local river south of Daytona Beach with direct access to the ocean, making it popular for boaters. However, when the Florida East Coast Railway was built, one section was artificially shrunk by building peninsulas to make it easier to build a bridge across. While this saved the railroad money, the modifications caused the river's current to become dangerously strong, making it difficult (and dangerous) for ocean-going boats to pass through. Efforts by the community to widen the river to make it safer have been complicated by economic and environmental concerns.



Figure 1:
Spruce
Creek
bridge

Problem Statement

The Spruce Creek watershed, which terminates in the Atlantic Ocean, has been diminished in both aquacultural and physical health due to the implementation of a railroad bridge. Of great importance is the sustainability of the oyster population in this area, which provides filtration and shoreline stabilization necessary for the success of the watershed. It is our goal as well as the goal of the Spruce Creek Rising organization to improve the health of the creek in the most safe and beneficial mannerism with a focus on oyster population stabilization as well as the socio-political communal issues surrounding the creek.

Analysis of Previous Situations: The Chesapeake Bay

The issues at Spruce Creek are a microcosm of the issues that, over the past two decades, have plagued the Chesapeake Bay area. The decline of the Chesapeake Bay oyster population and the diminishing of natural substrates grossly affected the filtration, wildlife prevalence, and shoreline stabilization of the Bay area in a statistically similar fashion as Spruce Creek. The cause of the sedimentary change in both watersheds were man-induced; structures such as lighthouses and railroad bridges as well as the implementation of unsafe fishing practices and a boom in tourism directly declined the quantity of oysters per square foot as well as the quality of their natural living environment. The oyster population in both watersheds was, at some point, at 50% less than what it was approximately half a century earlier. In the bay area, habitat replacement strategies have increased the oyster population to the highest it has been since 1985. It is our understanding that implementing the habitat replacement strategy used in the bay area to Spruce Creek (man-made/fishery management, repletion, habitat replacement, and brood-stock sanctuary) would increase the oyster population per square foot in the creek, thus improving the general water health and stabilizing the shoreline. With these community-oriented processes, Spruce Creek can once again be maneuverable and healthy for the access of both humans and indigenous wildlife alike.

Results and Conclusions

In order to ensure the health of the river, the plan should include three parts:

- 1) Build oyster beds/artificial oyster reefs above and below the bridge
 - 1) Oysters: keystone species, filters for pollutants
 - 2) Will help river adjust to changes
- 2) Institute a system to care for the oysters within the community
 - 1) Individuals or groups of individuals
 - 2) Help get community involved in the project
- 3) Use community support to offset economic concerns
 - 1) Will make the solution more economically viable to legislators
 - 2) Is more "expensive" in people's time

The research done into how to keep Spruce Creek healthy is only as useful to the community as they want it to be. None of this can be done without an effort convince the county to go through with changing the width of the river and spend the money to build the oyster reefs and any other protections for the river. We plan to hand off this information to the organization Spruce Creek Rising, so that they can use it as a base to give to the local government and the community. We also hope that it can be used to better educate the general public on maintaining a healthy river. The information is here for the taking – now it is up to the residents of Spruce Creek to take this and make their home a safer and more environmentally-conscious place.

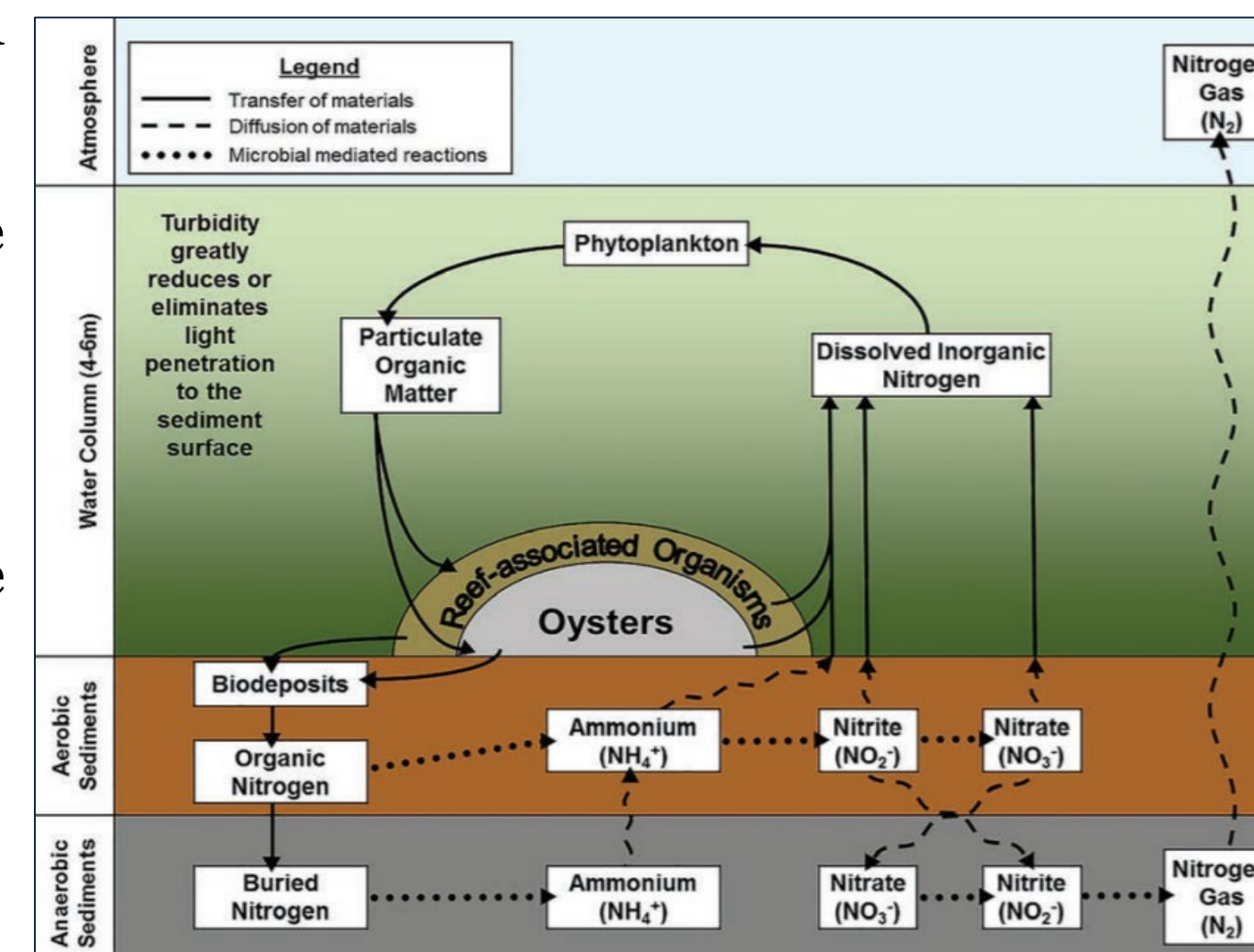


Figure 2: Nitrogen cycle with oysters



Figure 3: Cement castles being used as a base for an oyster reef

Stakeholders

The stakeholders can be divided into the following major categories:

- Community stakeholders
 - Residents that live along Spruce Creek and the area around it
 - Spruce Creek Rising activist group
- Economic and government stakeholders
 - Florida East Coast Railway
 - Local and state government
 - Tourism industries along Spruce Creek

Methodology

The team used interviews with locals for information on the Creek itself. For example, a Spruce Creek Rising representative was contacted for specifics about the creek itself and the area surrounding it, and county legislators were contacted for logistics regarding the railroad and general economic feasibility. Other sources concerning similar problems in other river systems were used to compare the situation that Spruce Creek is in. These sources include extensive scholarly research and information on Florida's marine life and aquaculture as well as the parallel application of Chesapeake Bay's oysters, which was included from the University of Maryland.

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