Geospatial Analysis of 14 Years of Artificial Reef Monitoring in Martin County

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Overview

- Timeline Martin County Artificial Reef Program
- Biological Monitoring Program
- Preliminary Data Analysis
- Findings
- What is next
Preliminary Data Analysis

- Difference between reefs materials
- Location of the Reef
  - Near exiting natural reef ridges vs. between natural reefs ridges
  - Reef Density and unit distribution
  - Depth and relief
- Species of interest in the Artificial Reefs
  - Managed
  - Protected
- Spawning Habitat
- Size (Juvenile vs adult populations)
- Abundance
- Species Richness
Reefs are monitored annually after deployment for two years then enter into a rotating schedule.

- Species Inventories
- Benthic and fish census
  - Diving
  - REEF’s Rover Diving Technique
Managed Species

Several managed species of fish, crustaceans, and coral occur in the artificial reefs nearshore and offshore.
Managed Fish Species

Within 2 years
Goliath grouper

Legend:
- Goliath grouper (Epinephelus itajara)
- Artificial Reef Types
  - Concrete and Steel Scrap
  - Concrete Reef Modules
  - Limestone Rock
  - Steel Tower
- Steel Vessels
- St Lucie Hump Marine Protected Area
- Permitted Reef Sites
- Colonized Hardbottom and Coral Reef

Sources: Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors.
Gag Grouper

LEGEND
- Gag Grouper (Mycteroperca microlepis)
- Artificial Reef Types
  - Concrete and Steel Scrap
  - Concrete Reef Modules
  - Limestone Rock
  - Steel Tower
- Steel Vessels
- St Lucie Hump Marine Protected Area
- Permitted Reef Sites
- Colonized Hardbottom and Coral Reef

Within 2, 5 and 10 years

Spiny Lobster
Several managed species of fish, crustaceans, and coral occur in the artificial reefs nearshore and offshore.
Coral Reefs

Within 2, 5 and 10 years
Preliminary Data Analysis

- Difference between reefs materials
- Location of the Reef
  - Near exiting natural reef ridges vs. between natural reefs ridges
  - Reef Density and unit distribution
  - Depth and relief
- Species of interest in the Artificial Reefs
  - Managed
  - Protected
- Spawning Habitat
- Size (Juvenile vs adult populations)
- Abundance
- Species Richness
Spawning and Nursery Areas
Spawning and Nursery Areas
Spawning and Nursery Areas

Legend:
- Hard bottom
- Artificial Reef Types:
  - Concrete and Steel Scrap
  - Concrete Reef Modules
  - Limestone Rock
  - Steel Tower
  - Steel Vessels
- St. Lucie Hump Marine Protected Area
- Permitted Reef Sites
- Colonized Hardbottom and Coral Reef

Esi DeLorme, GEBCO, NOAA NGDC, and other contributors
Species Abundance
Species Richness

2004 to 2005

LEGEND
Fish Census: Species Richness
- Less than 5
- 6 - 10
- 11 - 25
- 26 - 50
- More than 50

Artificial Reef Types
- Concrete and Steel Scrap
- Concrete Reef Modules
- Limestone Rock
- Steel Tower
- Steel Vessels

- St. Lucie Inlet
- Port Salerno
- Hobe Sound
- South County

Nearshore A
Nearshore B
Nearshore C

Donaldson Reef
Sirokin Reef
Emst Reef
Permitted Reef Sites
Colonized Hardbottom and Coral Reef

Eri, DeLorme, GEBCO, NOAA NGDC, and other contributors
Species Richness
Species Richness
What is next…

• Tune-up current biological monitoring program

• Detail into and look at
  – Location
  – Reef material
  – Individual species and assemblies

• Changes over Time
  – Abundance
  – Species Richness

• Compare with data from natural reefs
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