

# Establishing a Long-term Monitoring Plan for Hallandale Beach, Florida Nearshore Coral Reef Habitats.

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## Introduction

- The city of Hallandale passed the “Our Local Coral Reef Protection Ordinance” in order to fund the protection and restoration of their coral reef (*Hallandale Beach, 2019*).
- A baseline of Hallandale’s reef will be made to be comparable with future monitoring data, as well as determine the effectiveness of the management plans in place.
- AGRRA (Atlantic Gulf Rapid Reef Assessment) protocols will be applied to create a basic level survey easily adaptable by citizen scientists.
- SCUBA is recommended for effective data collection and a minimum of 6 divers is needed.
- This proposal will briefly explain the important indicators each SCUBA diver will be required to record for each survey type.

## Fish



- Coral habitats provide shelter for reef fish but these fish species have positive impacts in return for the structure of the reef (*AGRRA, 2020*).
- Reef fish have different eating habits that promote positive structure changes such as, keeping turf algae in check clearing room for recruitment of polyps (*AGRRA, 2020*).
- Divers will observe and record fish:
  - Diversity (Angelfish, grunts, surgeonfish, parrotfish, etc.)
  - Abundance and size – this can be an indicator of successful reproduction or overfishing.
  - Key species – herbivorous fish such as the parrotfish.

## Lionfish (*Pterois spp.*)

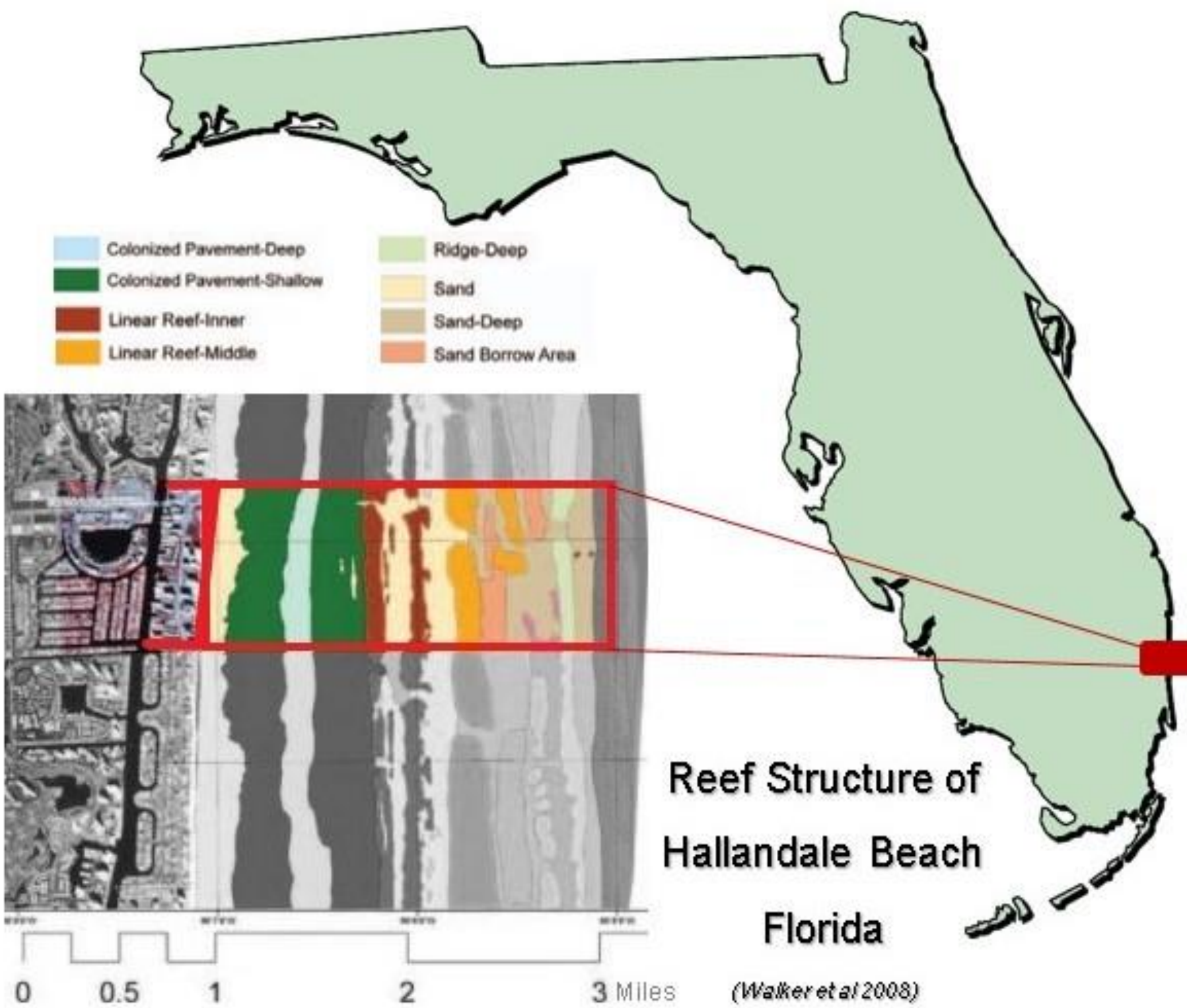
- Each surveyor must be on the look out for the increasingly abundant and invasive Lionfish.



Did someone say lionfish derby?

Lionfish derbies are popular community building events in the Florida Keys and can be here too in Southeast Florida.

## Study Area



- The length of Hallandale Beach is approximately 0.80mi in length (4200ft).
- From the coastline, the linear reef inner begins about 0.80 mi (4200ft) out and the liner reef middle ends at about 1.75mi (9240ft) out. There is no linear outer reef (*Walker et al., 2008*).
- *Acropora cervicornis* (Staghorn coral), is said to be found ½ mile offshore.

## Coral



- Coral monitoring is important because corals are the primary builders of the reef habitat (*AGRRA, 2020*).
- Effects of natural disasters and global climate change can be determined by monitoring changes in the structure of the coral reef (*AGRRA, 2020*; *Feingold et al., 2003*).
- Divers will observe and record presence of coral:
  - Species and their abundance.
  - Growth – new polyps or accumulation of skeletal mass.
  - Size – can identify approximate age.
  - Mortality and condition (disease, bleaching).
  - Predation and competition.

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## Benefits to Hallandale Beach

- Long-term monitoring of Hallandale beach’s nearshore coral reef will allow for comparison and effective monitoring of the complexity and resilience of Hallandale’s coral reef.
- Baselines are important historical data that enables the city to identify changes in the reefs structure and responses to climate change to make proactive decisions (*Walker et al., 2008*; *AGRRA, 2020*).
- Coral Reefs provide protection against storm surges that without, coastal erosion would increase and leave the city without an offshore defense against high energy wave action (*AGRRA, 2020*).
- Complex coral reef systems bring higher biodiversity and will raise the economic value of the reef to tourism (*Feingold et al., 2013*).
- Community building and outreach opportunities through citizen science and volunteering.

## Benthos



- Benthos refers to all the organisms and vegetation that inhabit the seafloor.
- Coral Reefs benefit from benthic monitoring by recording presence of coral polyp recruitment, invertebrates, promotors and/or detractors (*AGRRA, 2020*).
- Promotors such as reef building corals, crustose coralline algae and minimal turf algae encourage a healthy reef habitat (*AGRRA, 2020*).
- Detractors such as seaweeds, overgrown turf algae and cyanobacteria are competitive and have negative impacts on coral recruitment (*AGGRA, 2020*).
- Queen conch (*Lobatus gigas*), long-spined black urchin (*Diadema antillarum*), and the spiny lobster (*Panulirus argus*) are key invertebrates to be monitored.

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