Staghorn Coral Restoration Project

Meaghan Johnson
Marine Program Coordinator
TNC Florida Keys Office

"National Partnership between the NOAA Community-based Restoration Program and The Nature Conservancy"

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Objectives

- Pilot project to determine how different genotypes of staghorn coral behave (survival, growth) within different FRRP reef zones.

- Create localized thickets of genetically diverse staghorn coral within the Upper Keys

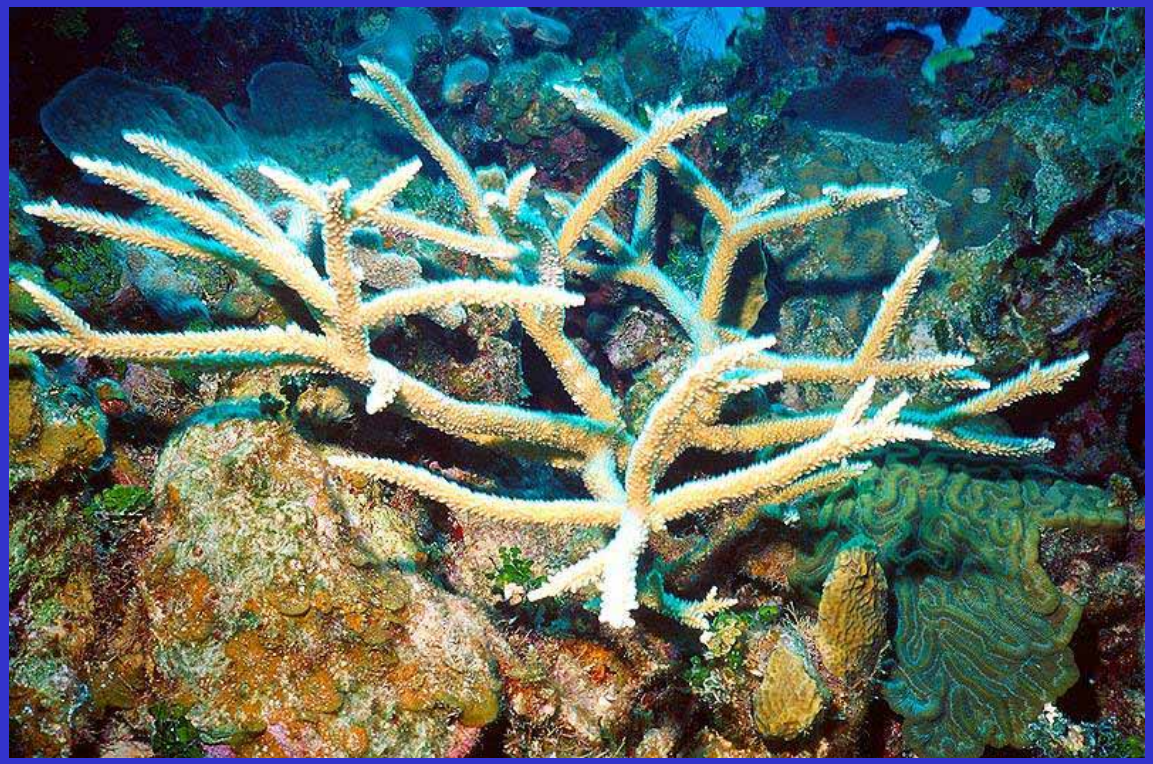
- Enhance community awareness and involvement

Overview

- Restoration Project (2 phases)
  1) Nursery
     -Methods
     -Results
  2) Outplanting sites
     -Methods
     -Results

- Lessons Learned
  -Application to the expansion sites and future projects

Staghorn Characteristics



- Major reef building coral in the Florida Keys and the Caribbean
- One of the fastest growing corals species
- Provide fisheries habitat and biodiversity
- Reproduces sexually and asexually (fragmentation)
- Endangered species list (threatened)

Live Rock Farm (Coral Nursery)

- Approximately 25 colonies of staghorn coral naturally settled onto a privately owned live rock farm in Tavernier, FL
- Continued to propagate them to produce more colonies

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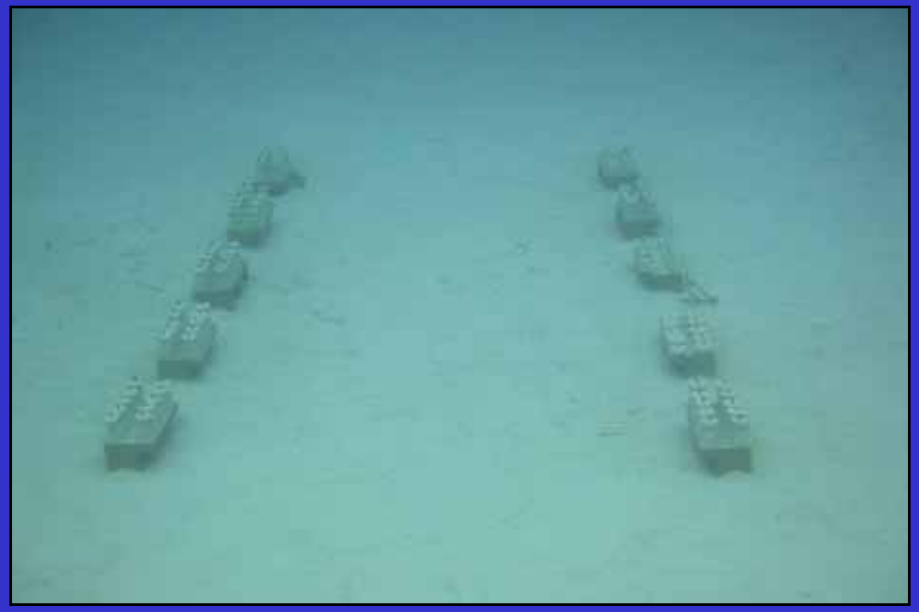
Coral Nursery



January 2006

June 2006

Collection of Wild Colonies

- Collection of wild colonies in December 2005
- Collected fragments from 22 different wild colonies in the Upper Keys (300+ fragments)
- Brought back to live rock farm to be cemented on platforms

Nursery Work

- Fragments mounted on numbered disks
- Ten disks per block, all of the same genotype

Nursery Work

- Measure the corals immediately after mounting
- Follow up with bi-monthly measurements and monitoring

Maintenance

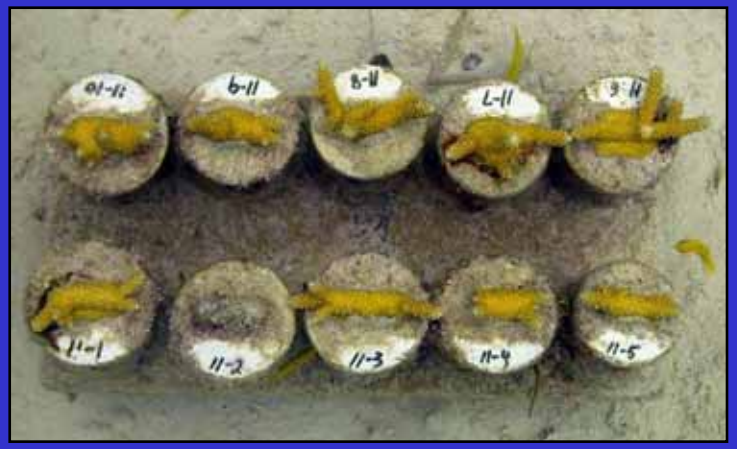
- Coral platforms will need to be cleaned monthly
- Photos indicate algae growth after two months

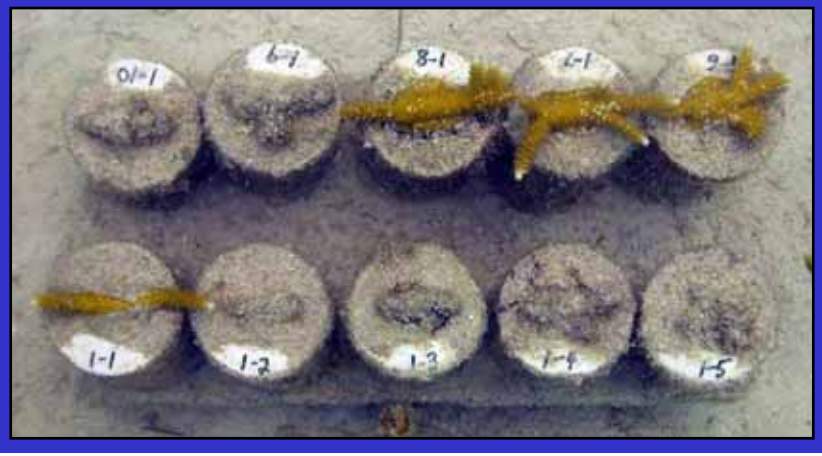
Day 1

Day 60

Nursery Results

- Survivorship differences between colonies
- Overall survivorship from December 2005-November 2006 was 72.3%





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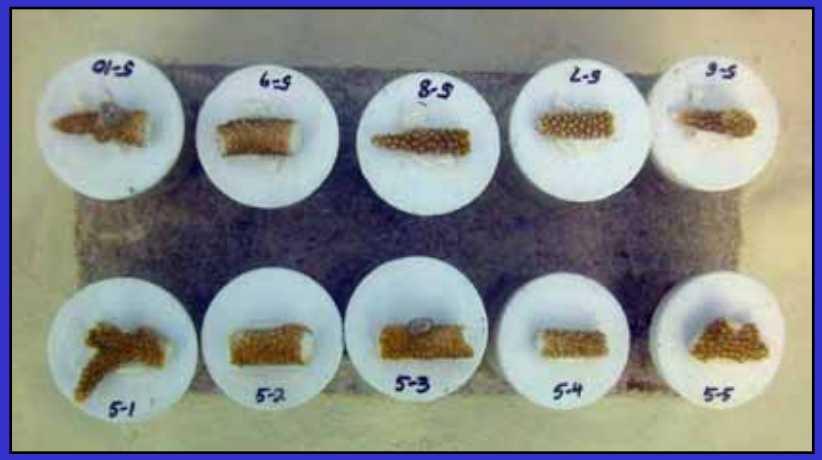
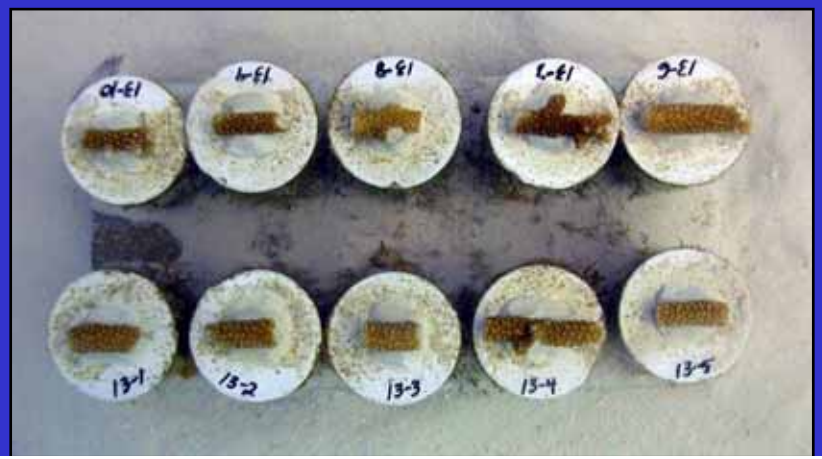
Nursery Results

Growth Rate Differences

January 2006

June 2006





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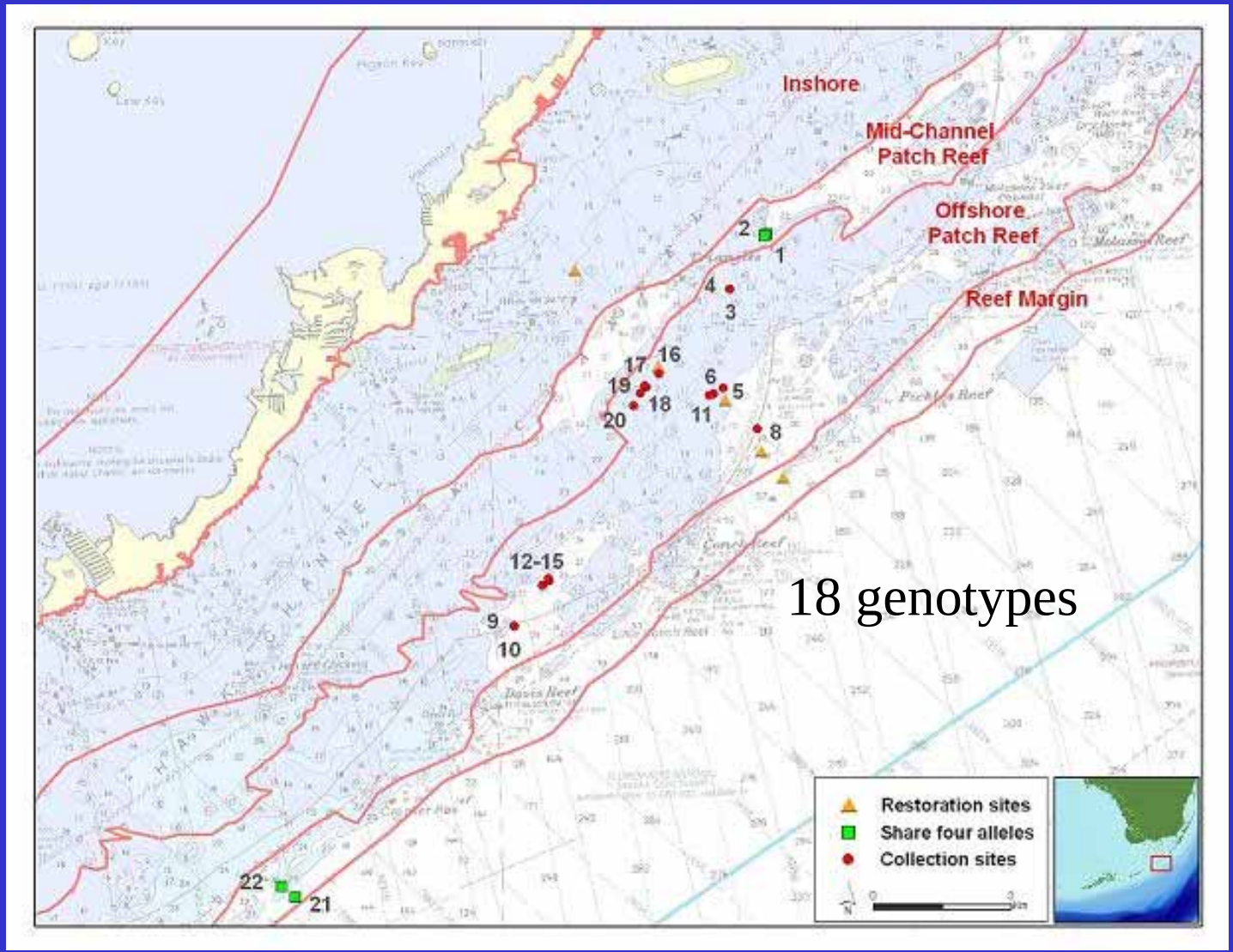
Genetic Analysis



Outplanting

•In November, the fragments were ready once again for fragmenting (clipping) and were then outplanted

•Placed in four different reef zones according to the Florida Reef Resilience Program

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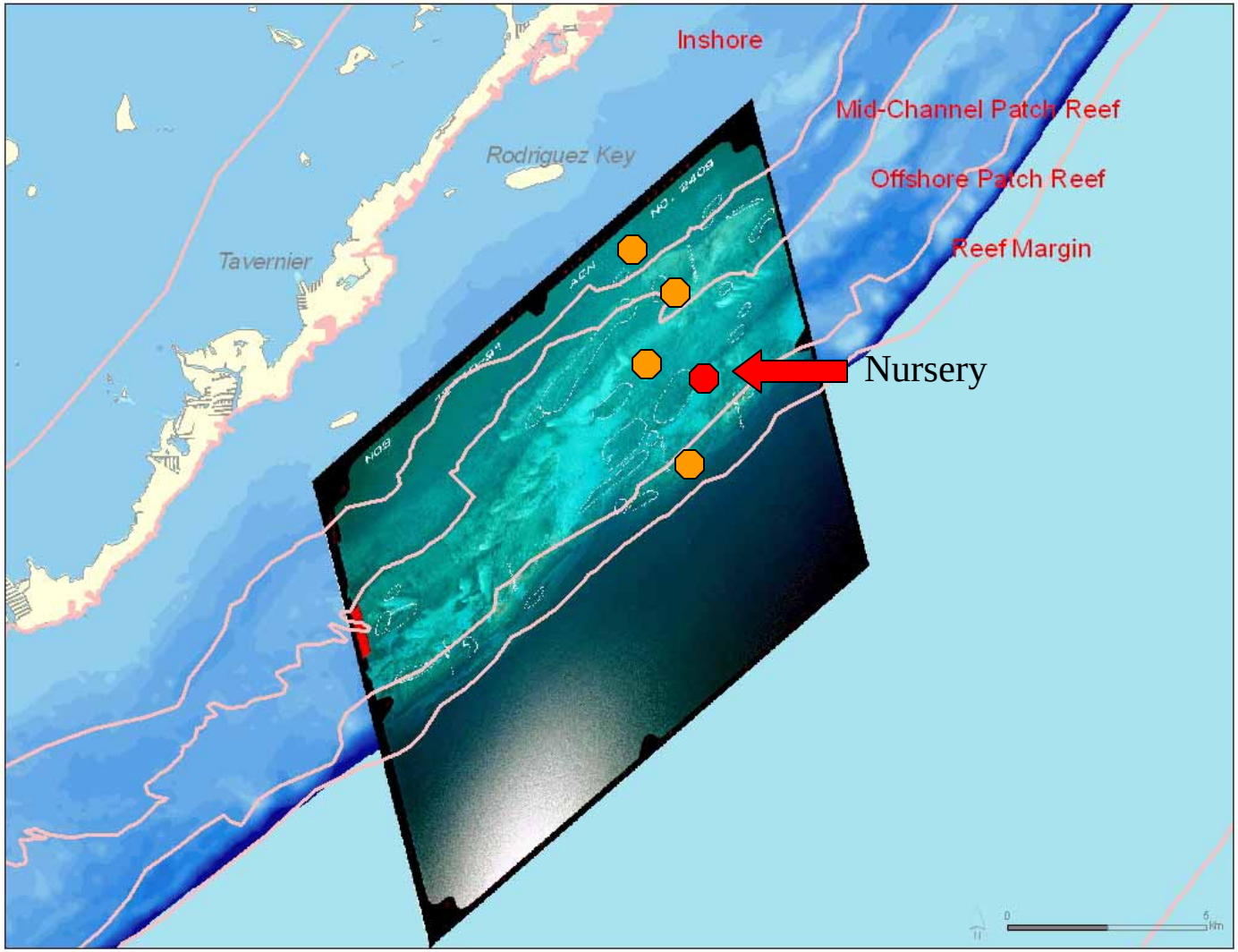
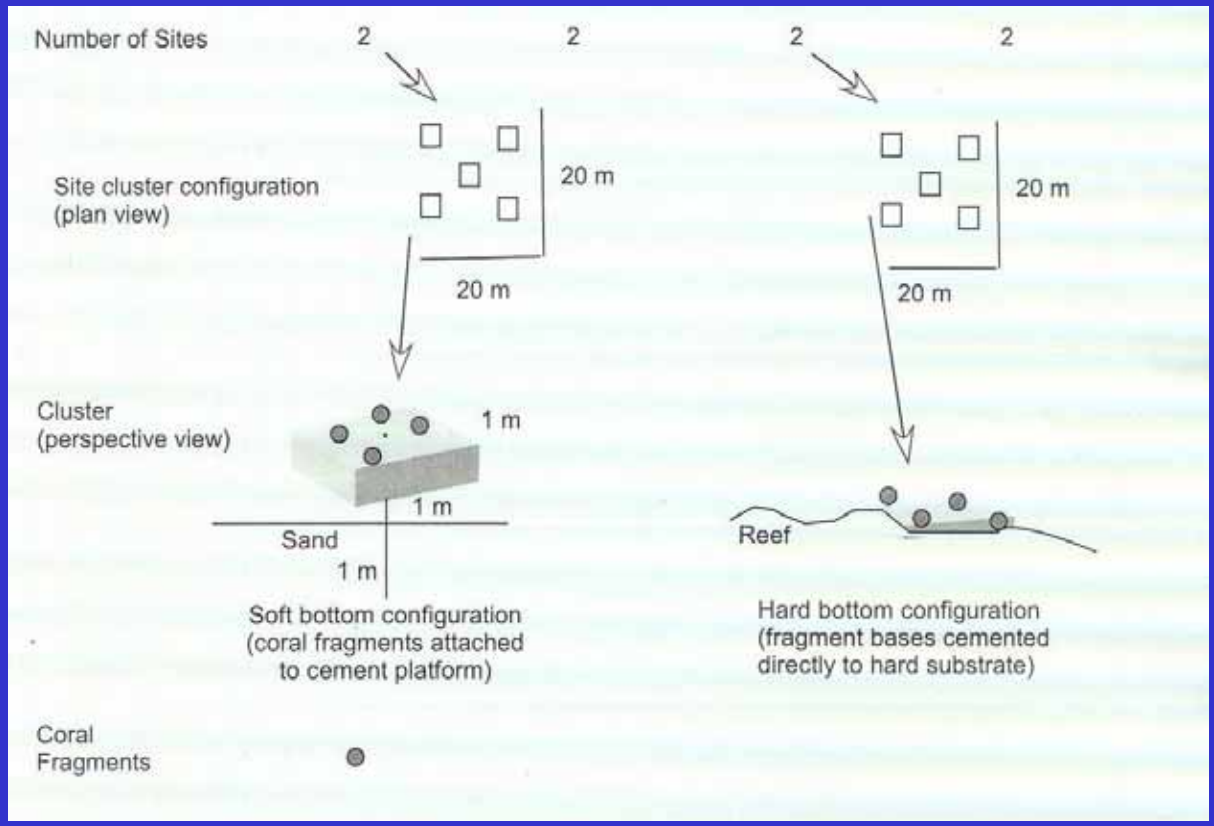
Outplanting Sites



Outplanting Design



- Each site will consist of 5 Ecoreef modules
- Each module (5 per site) will consist of a few fragments from each genotype
- Place in 4 different reef zones based on FRRP design

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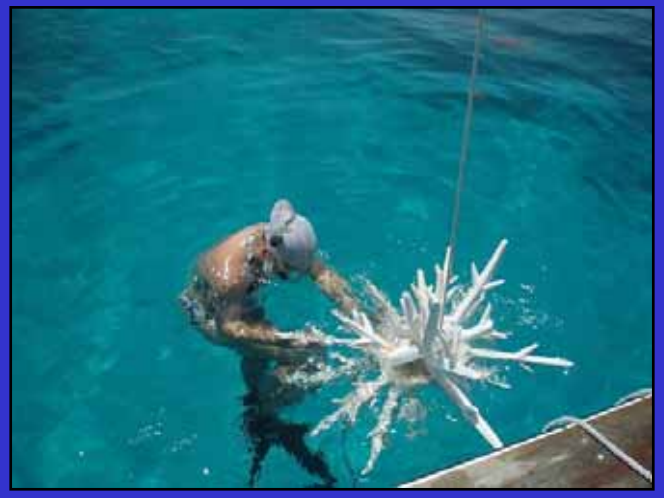
EcoReef Modules



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Outplanting

- Six coral disks per EcoReef module
- 120 total fragments outplanted
- 2 replicate fragments of seven genotypes within each zone

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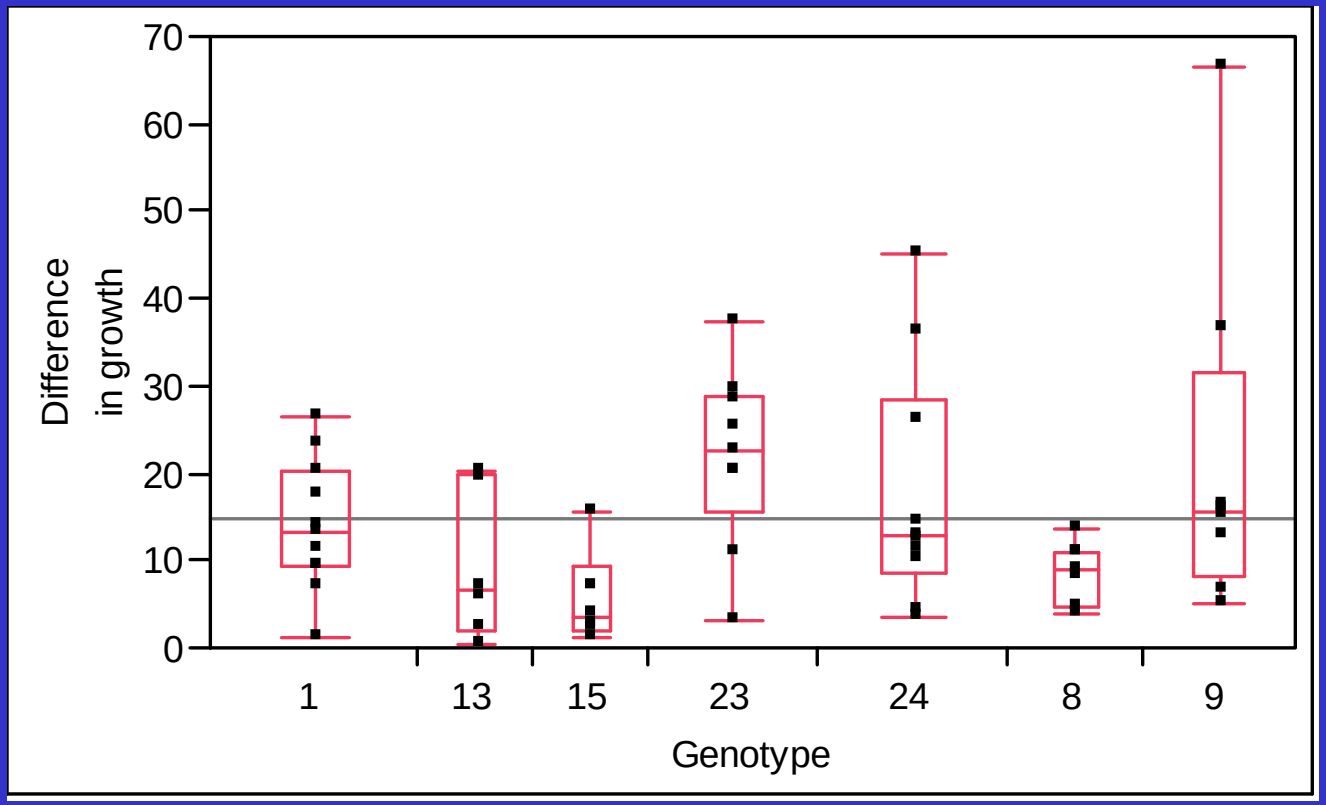
Outplanting Results

Difference in Growth by Genotype



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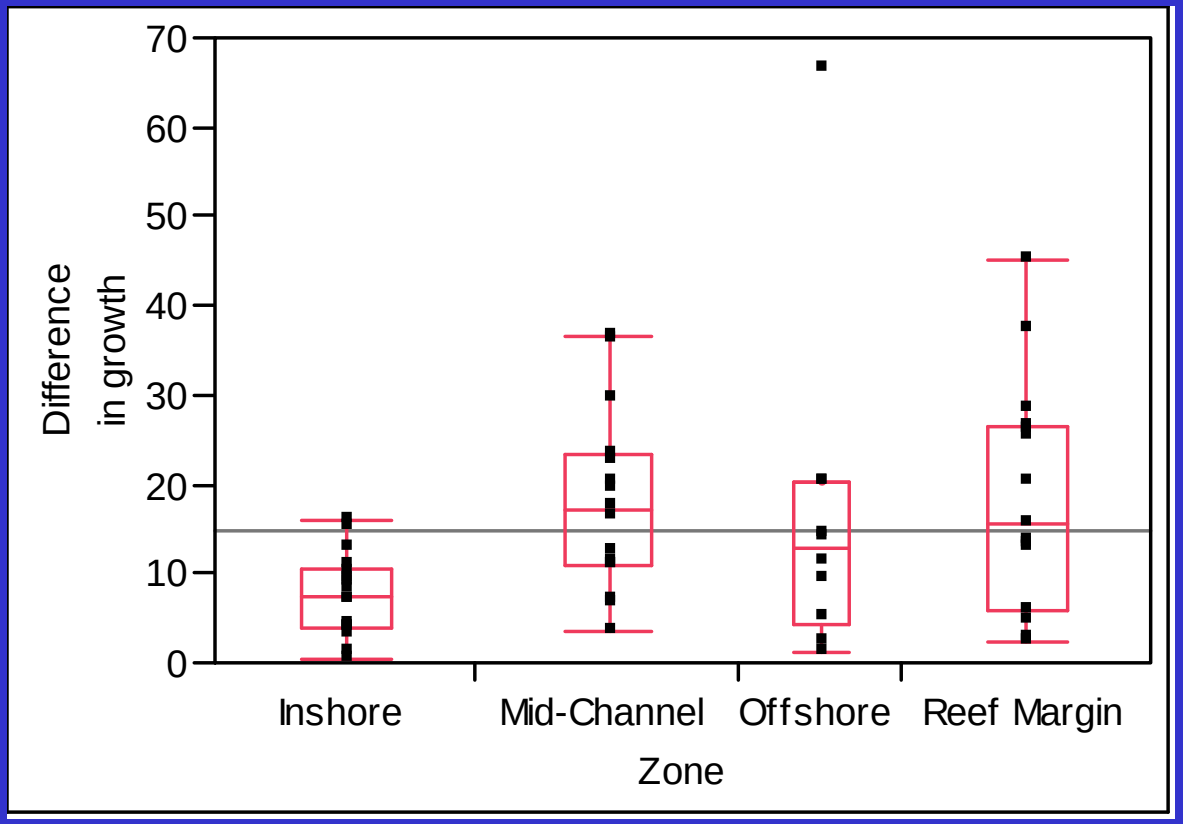
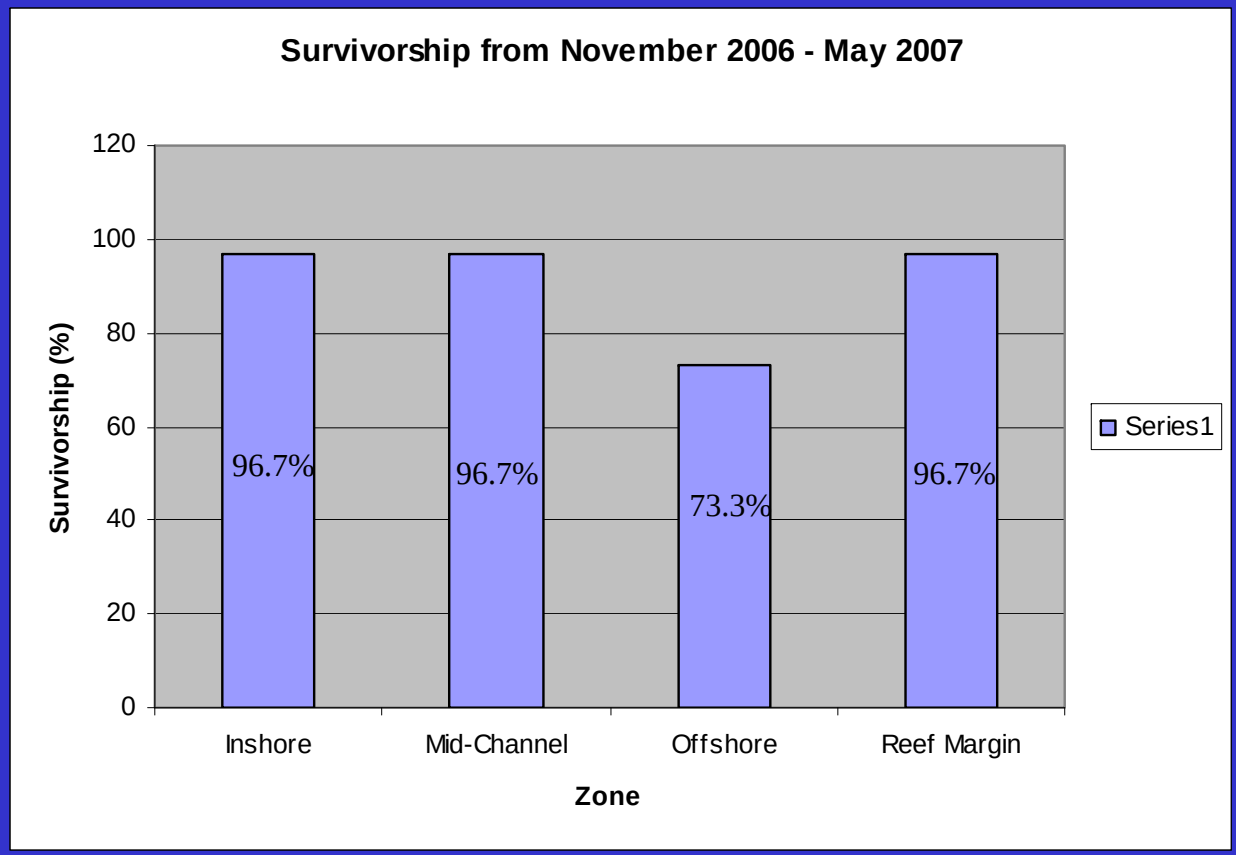
Outplanting Results

Difference in Growth by Zone



Survivorship

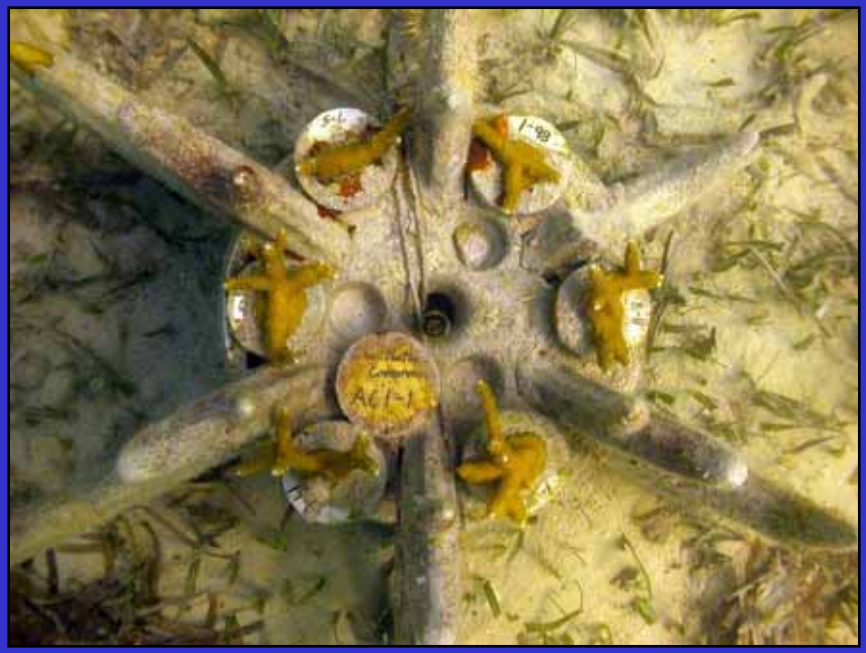
- Lowest in the offshore zone
- Overall 90.8%



Bleaching and Disease

- Disease occurred in May only within the offshore nursery and outplanting site
- Bleaching occurred in early August
- Full recovery by all corals

August 2007- Inshore bleached



November 2007- Inshore full recovery

Lessons Learned

Nursery

- Installation of rebar after Hurricane Wilma
- Consistency in measurements
- Measure corals before and after fragmentation
- Establish consistent labeling system

After Hurricane Wilma

Outplanting

- Measure corals immediately after outplanting
- Collect enough coral tissue to allow for replication of all colonies

Pounding in rebar to anchor blocks

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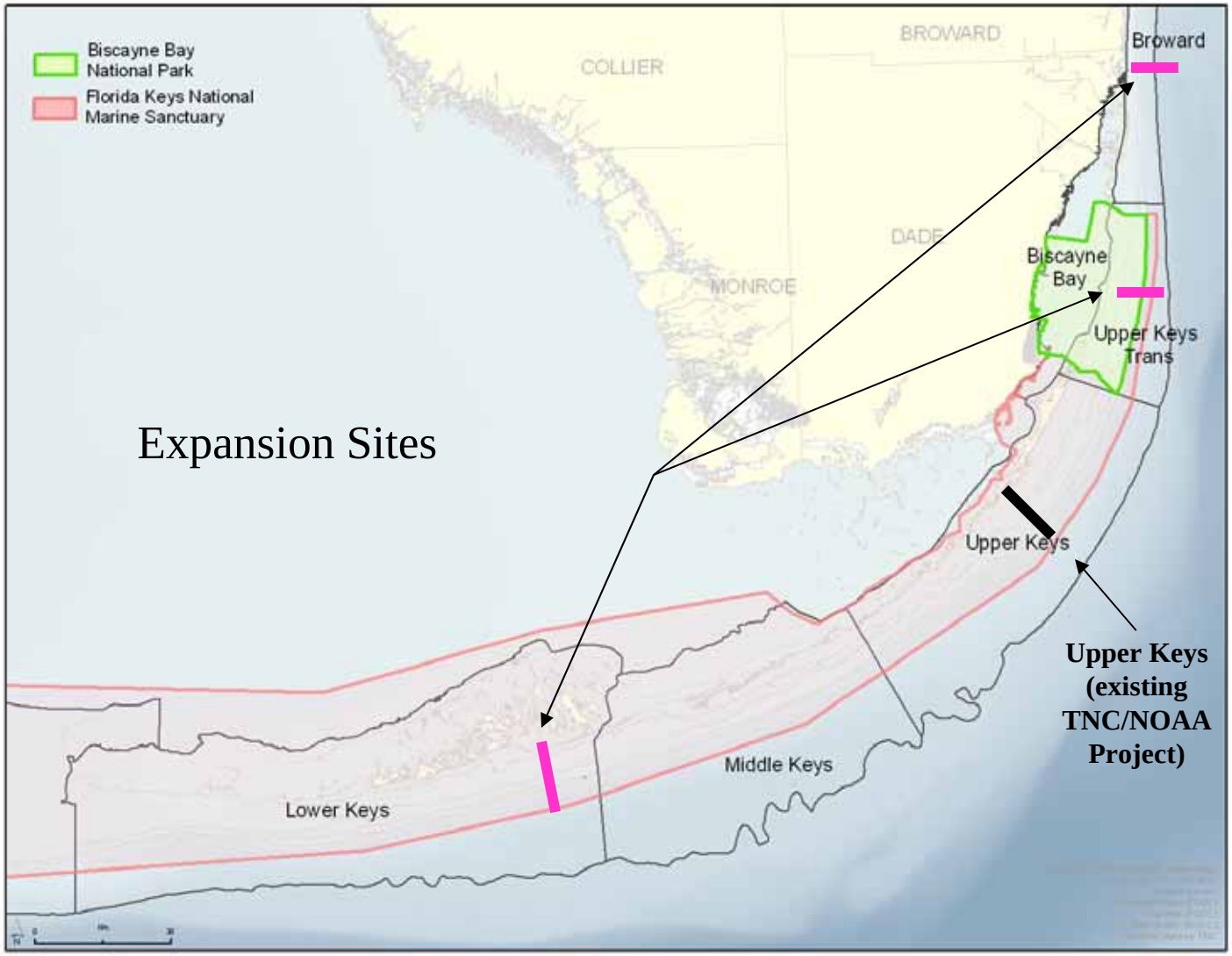
Expansion Sites



Expansion Project Goals

- To compare genotypic fitness in staghorn coral across four sub-regions of the south Florida reef tract
- To evaluate sub-regional and sub-zonal variation in growth and survival
- Determine reef areas where large-scale restoration efforts will provide the greatest returns.
- To establish a restoration network between universities, management agencies, and NGO's for sharing and working together.

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Community Involvement

Future Projects

- Staghorn learning network
- Combine knowledge of other existing projects, and expansion to other areas (eg. Jamaica, Puerto Rico,Virgin Islands)

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Thank You!