Acropora cervicornis restoration: Coral Restoration Foundation's 7 year summary for the Upper Keys

Davis Reef Restoration

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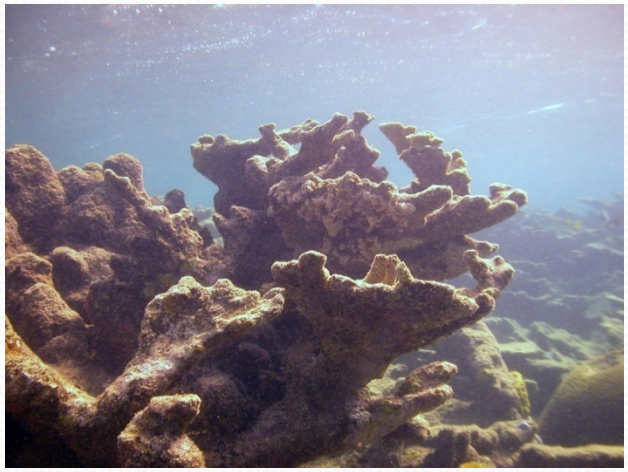
Why Restore Coral Reefs?

- Provide protection and life support for countless species, including humans[2]

- Coral Reefs are valued at $375 billion a year[1]

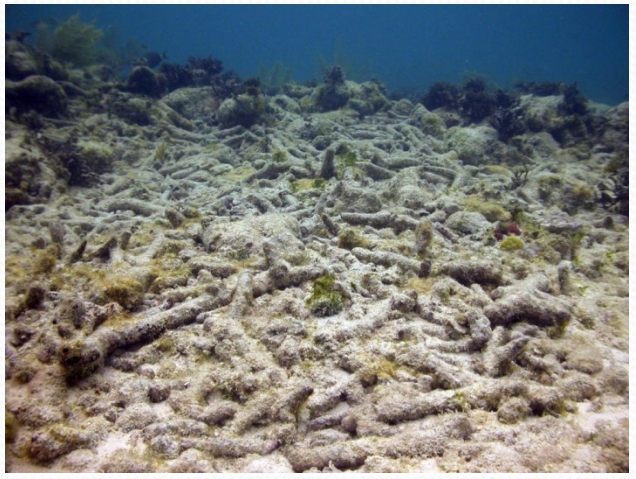
1 billion people in 100 countries are estimated to be dependant on food and/or income from coral reefs[2]

([1]Costanza et al. 1997, [2]Mastny 2001)



1970's

Today



Coral Restoration Foundation

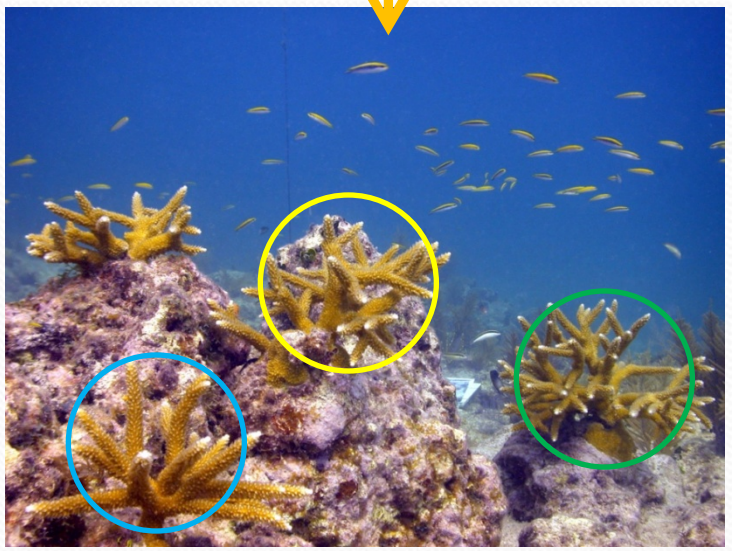
- Non-profit, 501 C (3) based in Tavernier, FL
- Develops practical solutions for restoring coral reef
- Uses volunteers to help maintain & transplant corals from off-shore nurseries to reefs
- Specializing in restoring threatened staghorn (*Acropora cerviconis*) & elkhorn corals (*Acropora palmata*)

Nursery Methods

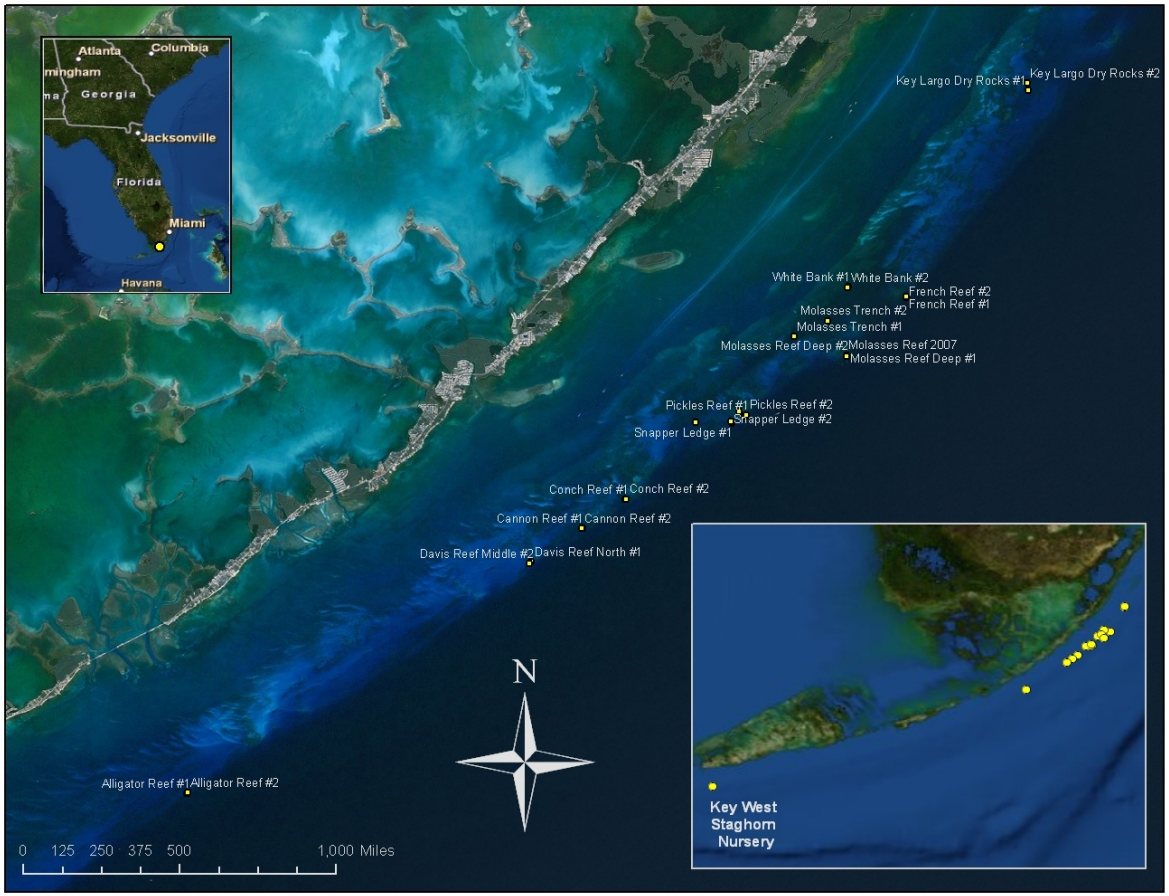
- Organized by genotype = row
- Platforms anchored by rebar rod
- Corals pruned once/year
- Trimmed fragments 2-3 cm
- Attached in epoxy to coral mount
- Maintained (algae removal) until needed to transplant
- Current size: 6000+ colonies representing 65 genotypes

Restoration Methods

- Transplant 1 year old corals
- Arranged in groups with 3 different genotypes (triad)
- Reef surface scraped to white limestone in attachment area
- Concrete base attached and covered with epoxy to reef
- Periodic maintenance
- Annual measurements

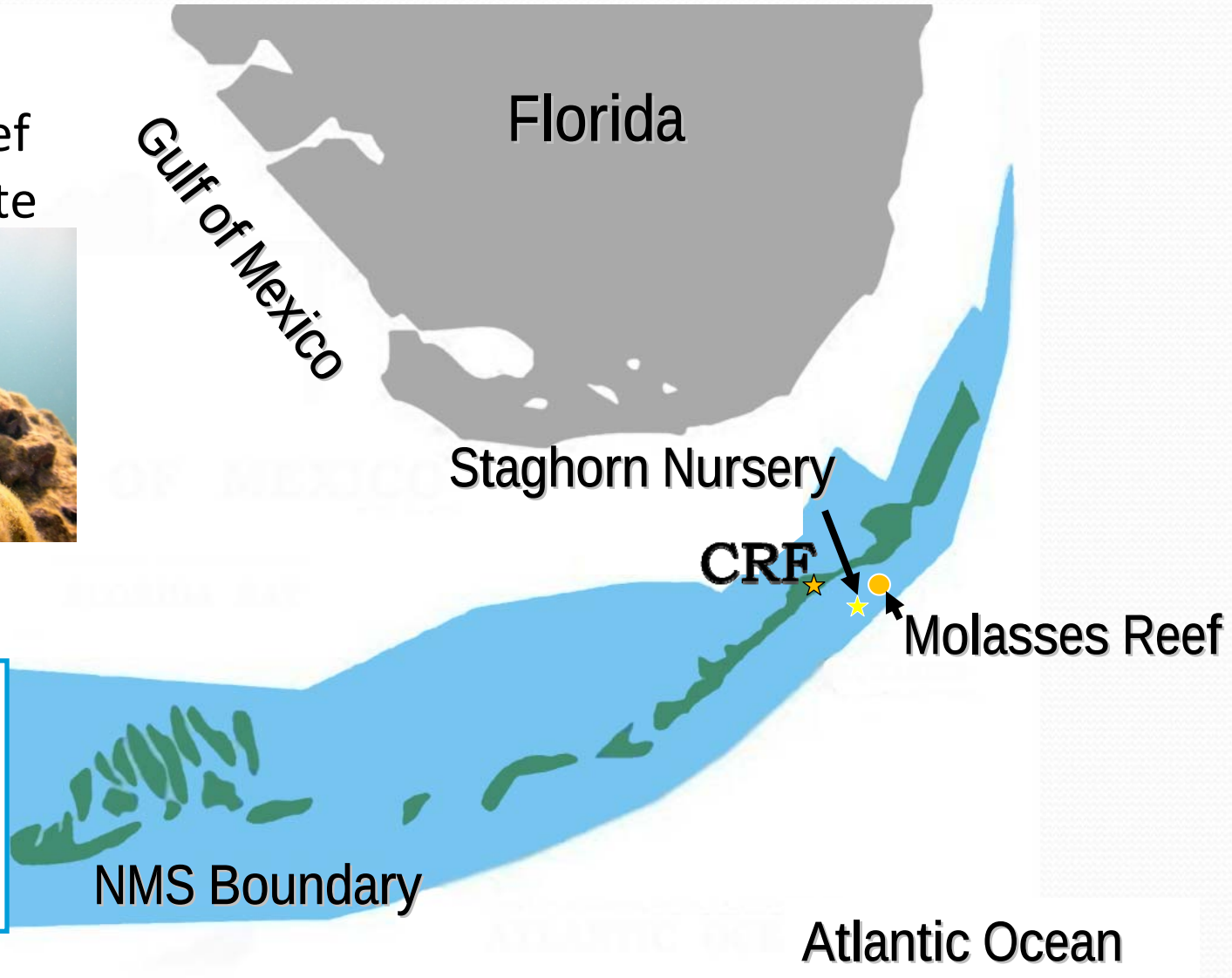


Restoration Site Locations



2003 Restoration Sites

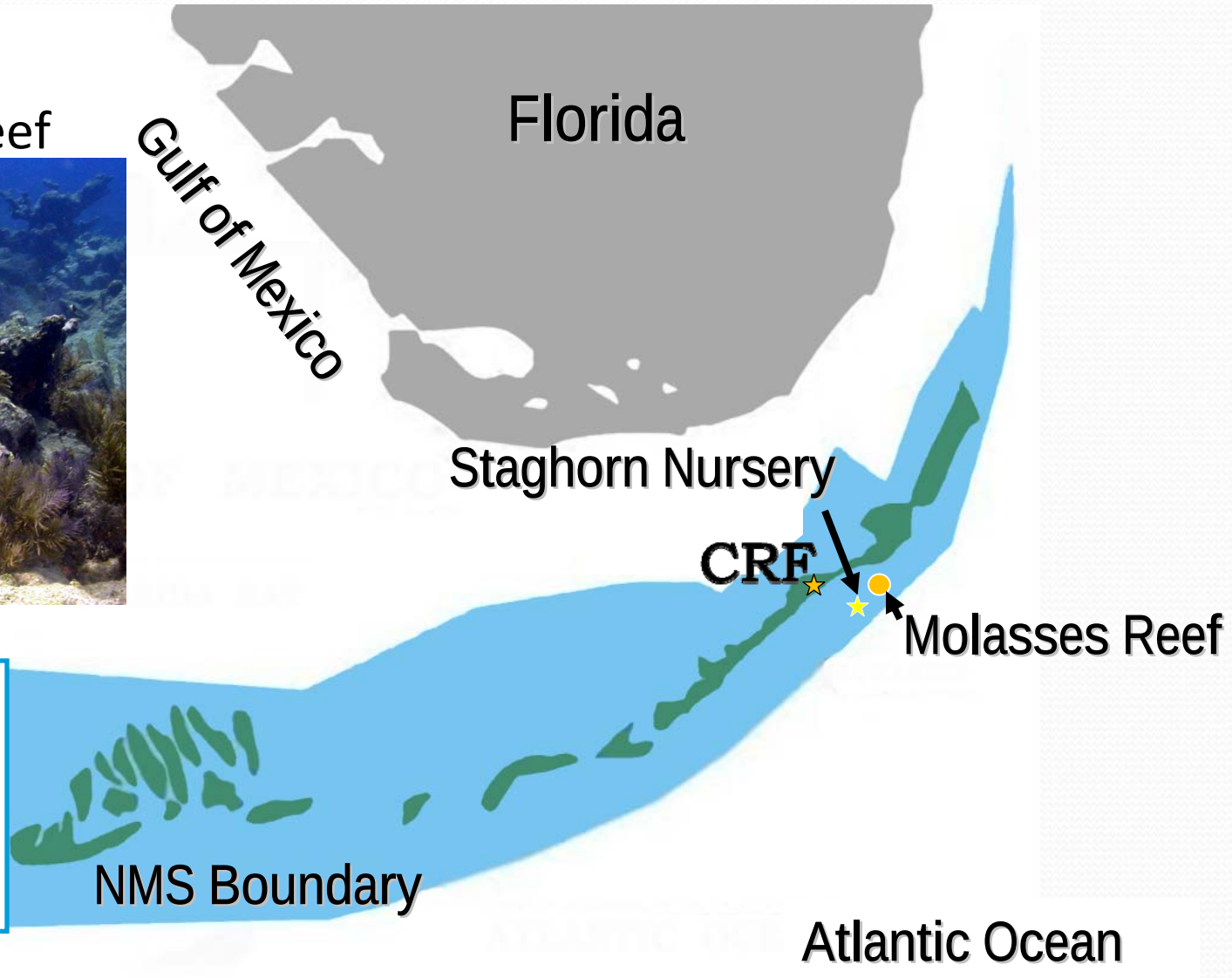
Molasses Reef
Wellwood Site



Total corals planted:
6

2007 Restoration Sites

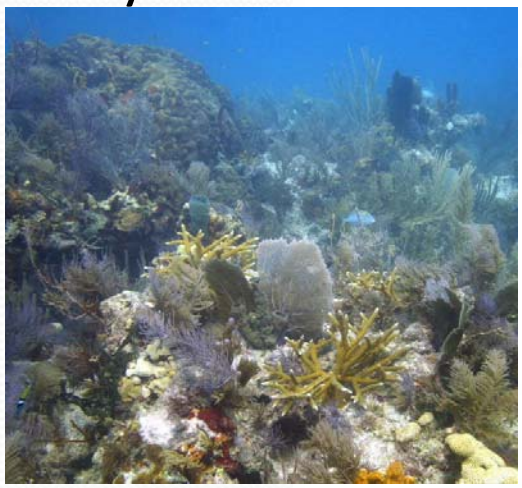
Molasses Reef

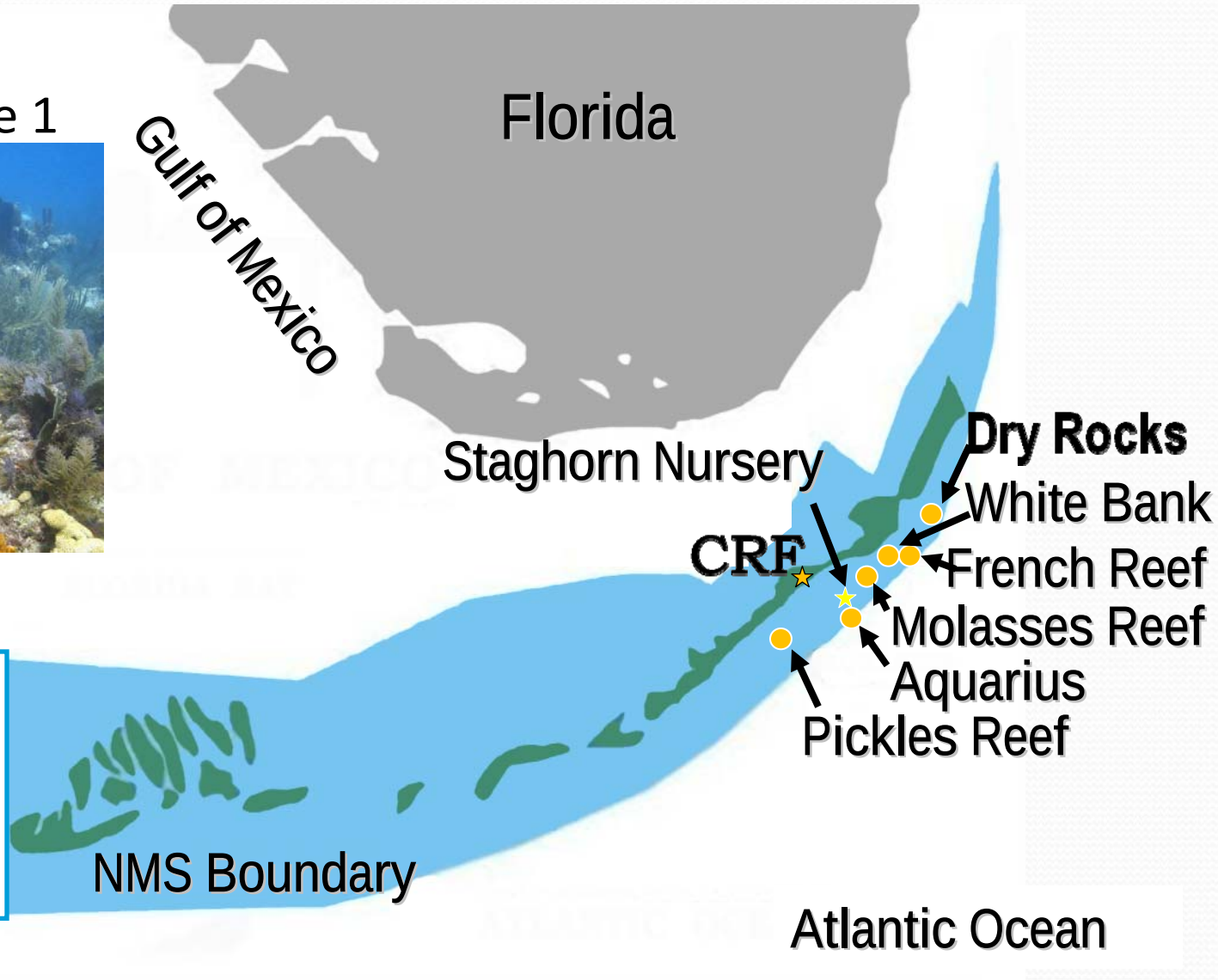


Total corals planted: 24

2008 Restoration Sites

Dry Rocks site 1

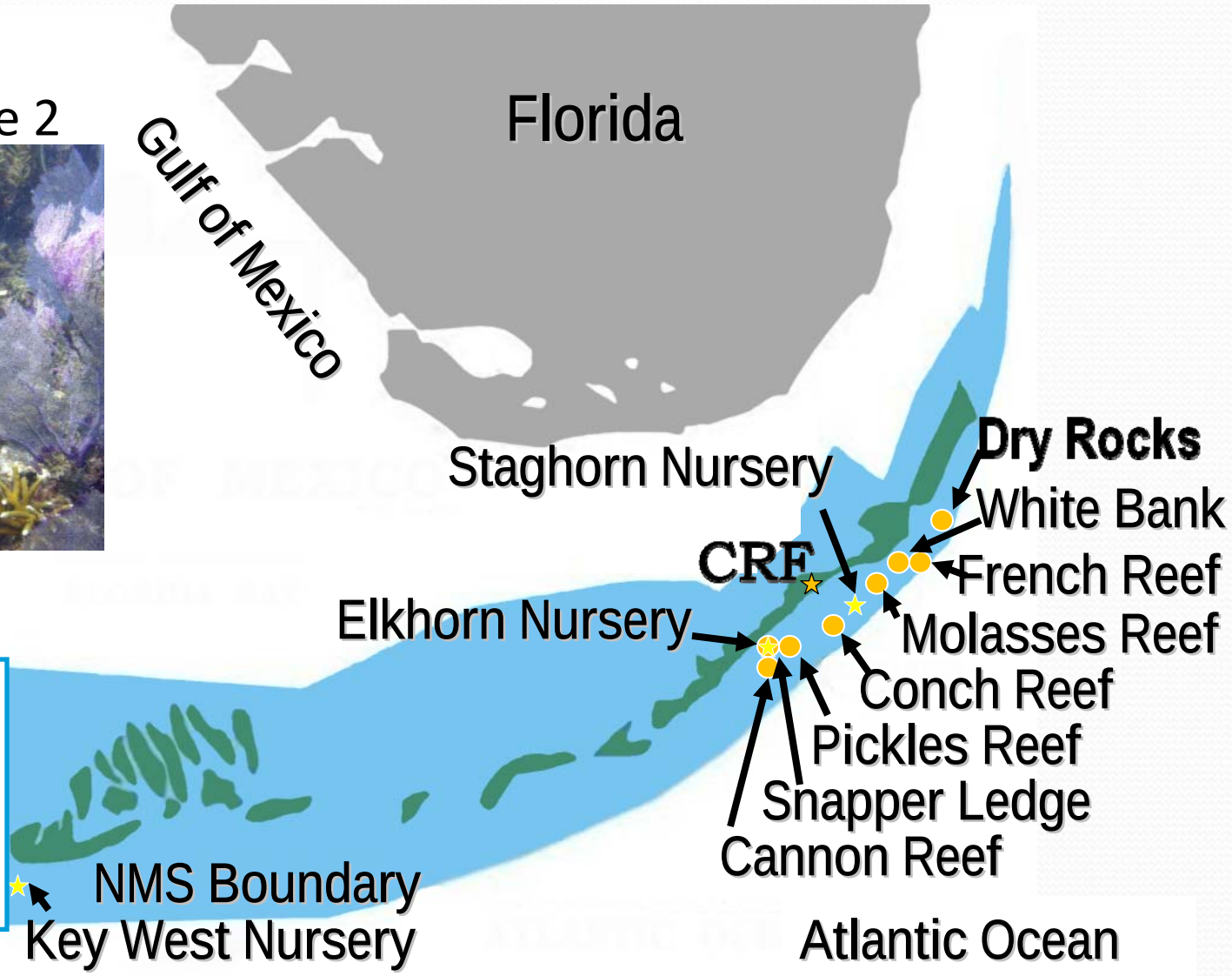




Total corals planted: 250

2009 Restoration Sites

Dry Rocks Site 2

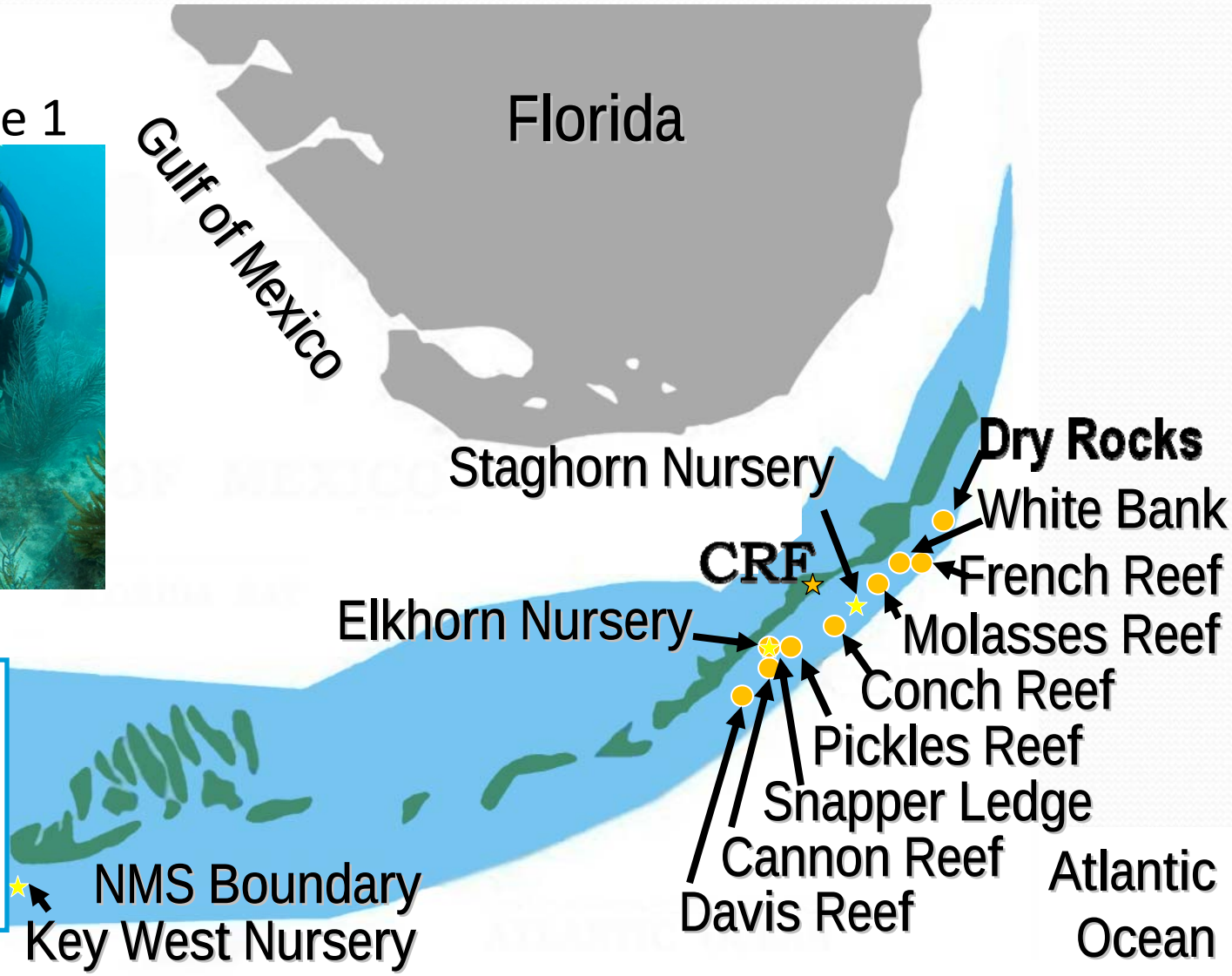


Total corals planted: 508

2010 Restoration Sites

Davis Reef Site 1

Total corals planted: 628

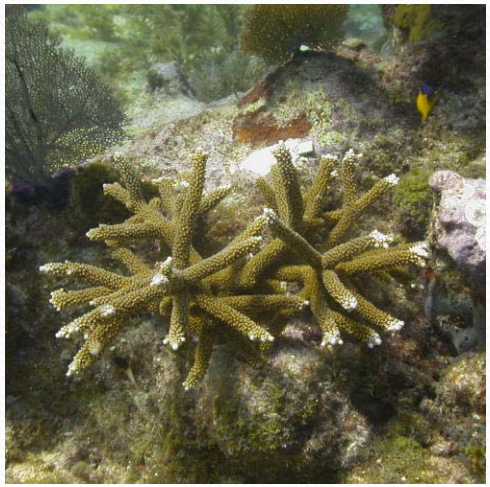


Restoration Success

July 2007

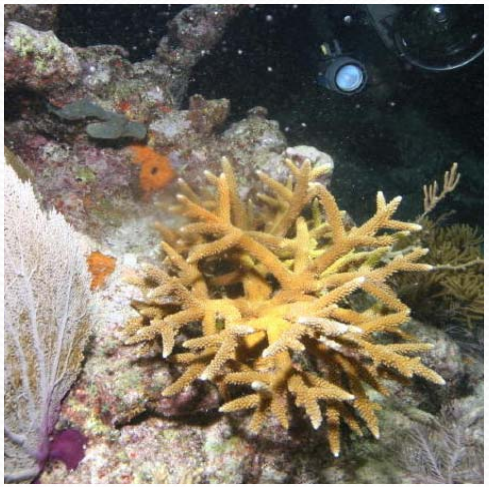
December 2007

July 2008



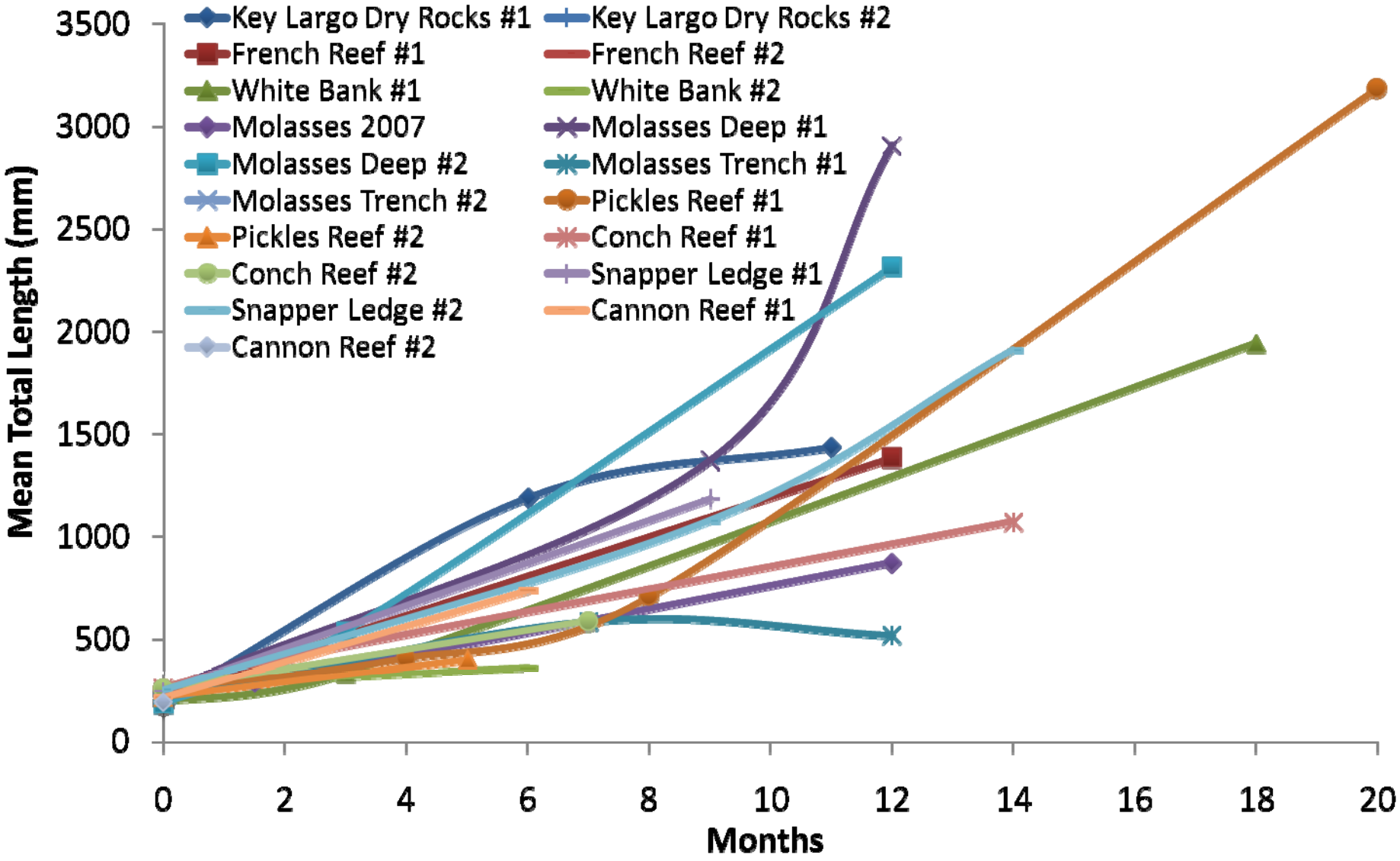
January 2009

August 2009



Spawning 2009

Results: Growth comparison among sites planted from 2007-2010



Restoration Challenges

Cold Stress

Stunted Growth

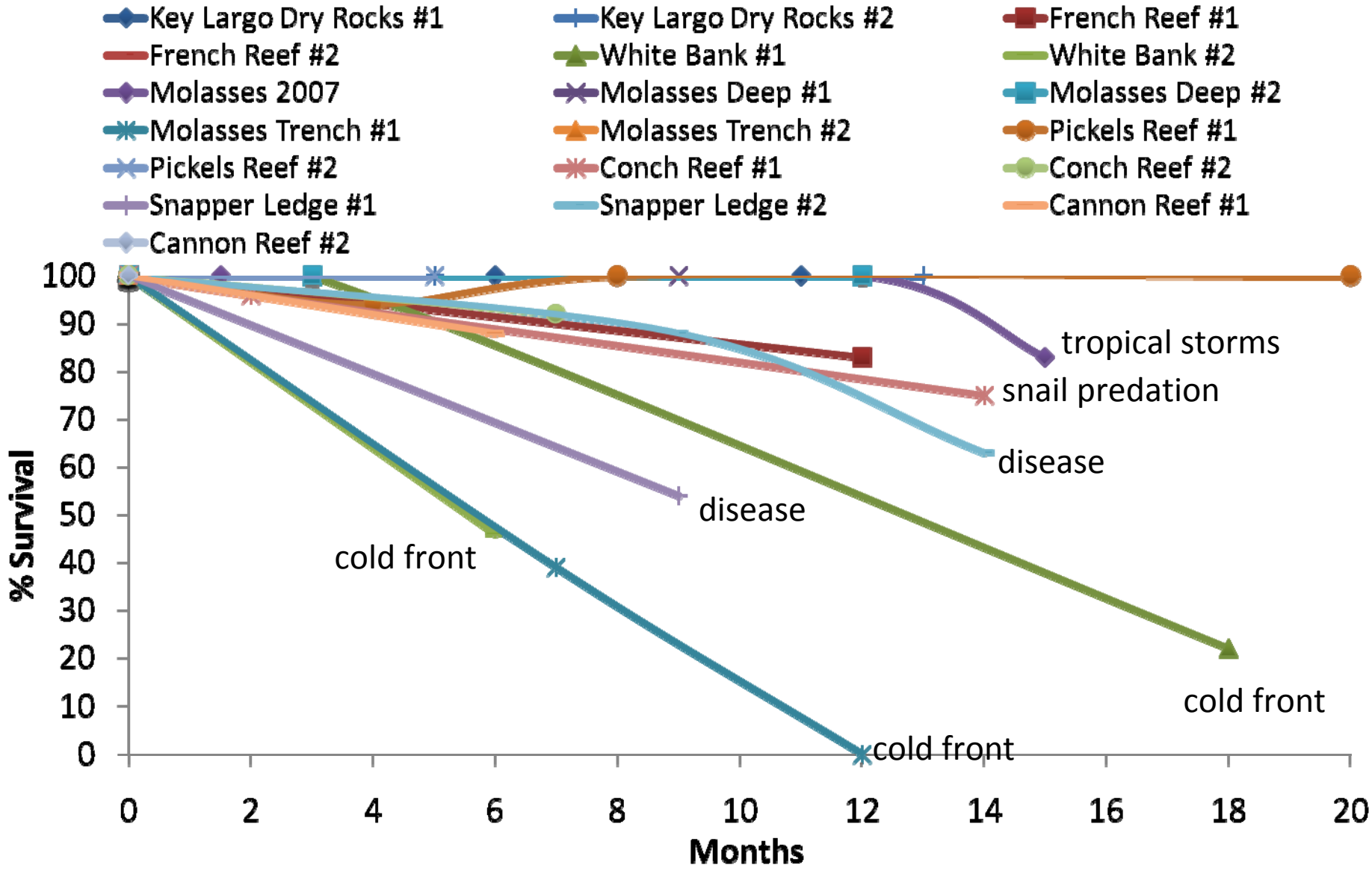
Snail Damage

Damselfish Damage

Disease

Worm Damage

Results: Survival comparison among sites planted from 2007-2010



Summary

- Acropora is an excellent model species for coral restoration
- Fast growth rates allow coral to reach transplant size in 1 year
- Transplanted corals have high survival rates long term
- Effectiveness of planting genetically diverse groups was observed within 2 years = spawning
- Methods are simple, cost effective, and easy to replicate, however site selection and management are key
- Success of these restorations has lead to seascape scale restoration opportunities

Coastal Restoration *at work*

Threatened Coral Recovery and Restoration

Florida and the U.S. Virgin Islands

The American Recovery and Reinvestment Act of 2009

Coastal Restoration at Work ❖ *Creating Jobs for America* ❖ *Restoring Habitat for Fish and Wildlife*

Acknowledgements

Supporters

- NOAA Habitat Restoration Center
- NOAA Fisheries
- National Undersea Research Center
- Florida Wildlife Legacy Fund
- Disney Wildlife Conservation Fund
- The Nature Conservancy
- Islamorada Charter Boat Association
- Sanctuary Friends Foundation
- Ocean Reef Conservation Association
- Islamorada Fishing Club (IFACT)
- Sealife Inc.

Partners

- Florida Keys National Marine Sanctuary
- Florida's Fish and Wildlife Commission
- Keys Marine Lab
- Coral Shores High School
- Island Christian School
- Florida Keys Dive Center
- Amoray Dive Resort
- Ocean Quest Dive Center
- REEF
- Rainbow Reef Dive Center
- Atlantis Dive Center
- Sundowners
- Keys Diver
- Quiescence
- Forrest Tek Lumber
- Holiday Inn