Invasive Cup Corals: What is the Risk to Florida's Coral Reef Ecosystem?

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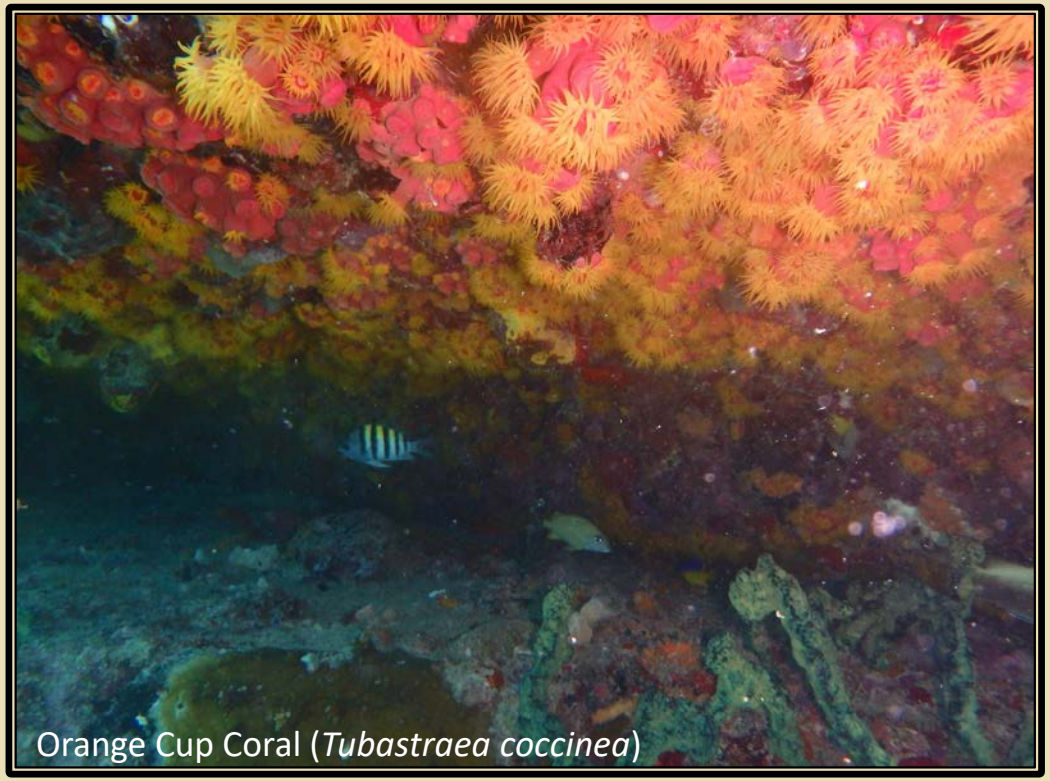
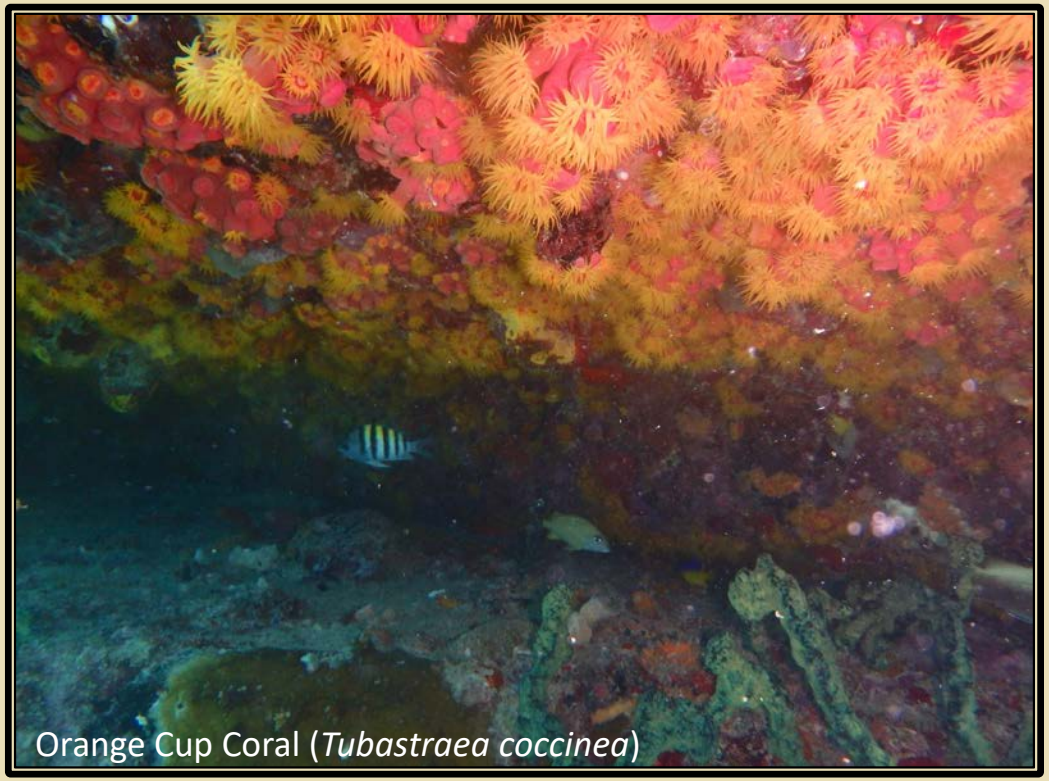
What Are Cup Corals?

- Azoothanthellate
- Primarily Inhabits Darkened Recesses in Reefs
- Highly Fecund
- Aggressive Spatial Competitors
- Resilient to Environmental Stress


Orange Cup Coral (*Tubastraea coccinea*)

What Are Cup Corals?

- Native to the tropical Indo-Pacific
- Orange Cup Coral (*Tubastraea coccinea*)
  - Introduced into the Caribbean in the 1940's
  - Now almost circumtropical
    - Gulf of Mexico
    - Caribbean Sea
    - Brazilian coast



Orange Cup Coral (*Tubastraea coccinea*)

Orange Cup Coral in the Gulf of Mexico & Florida

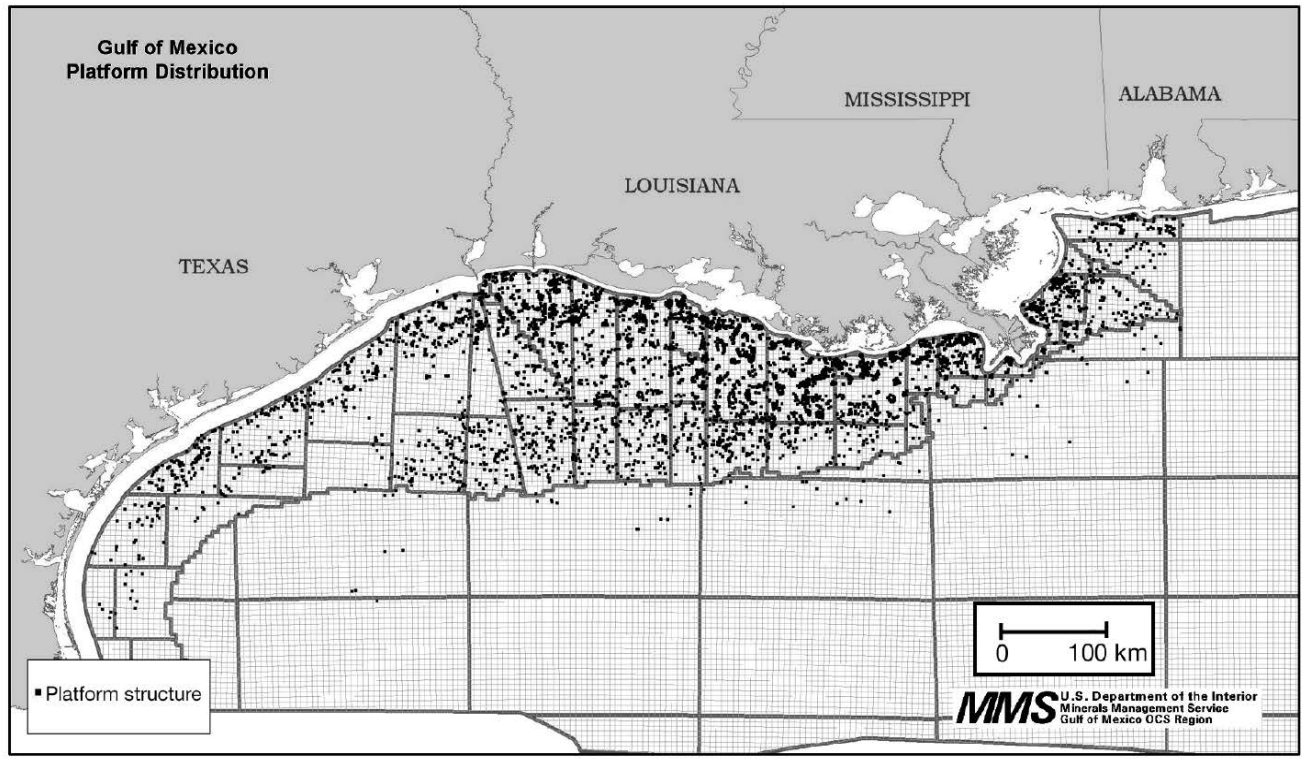
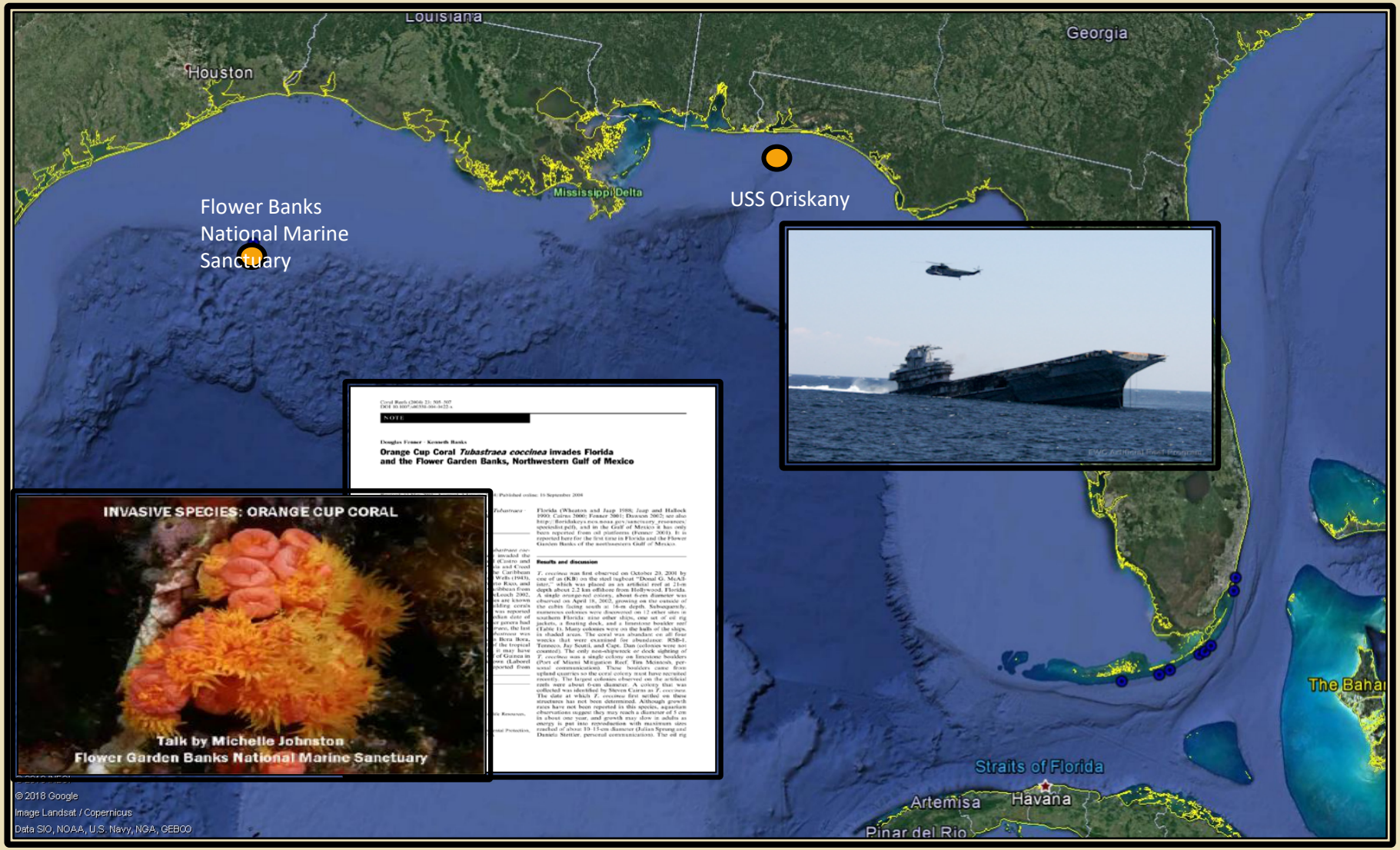


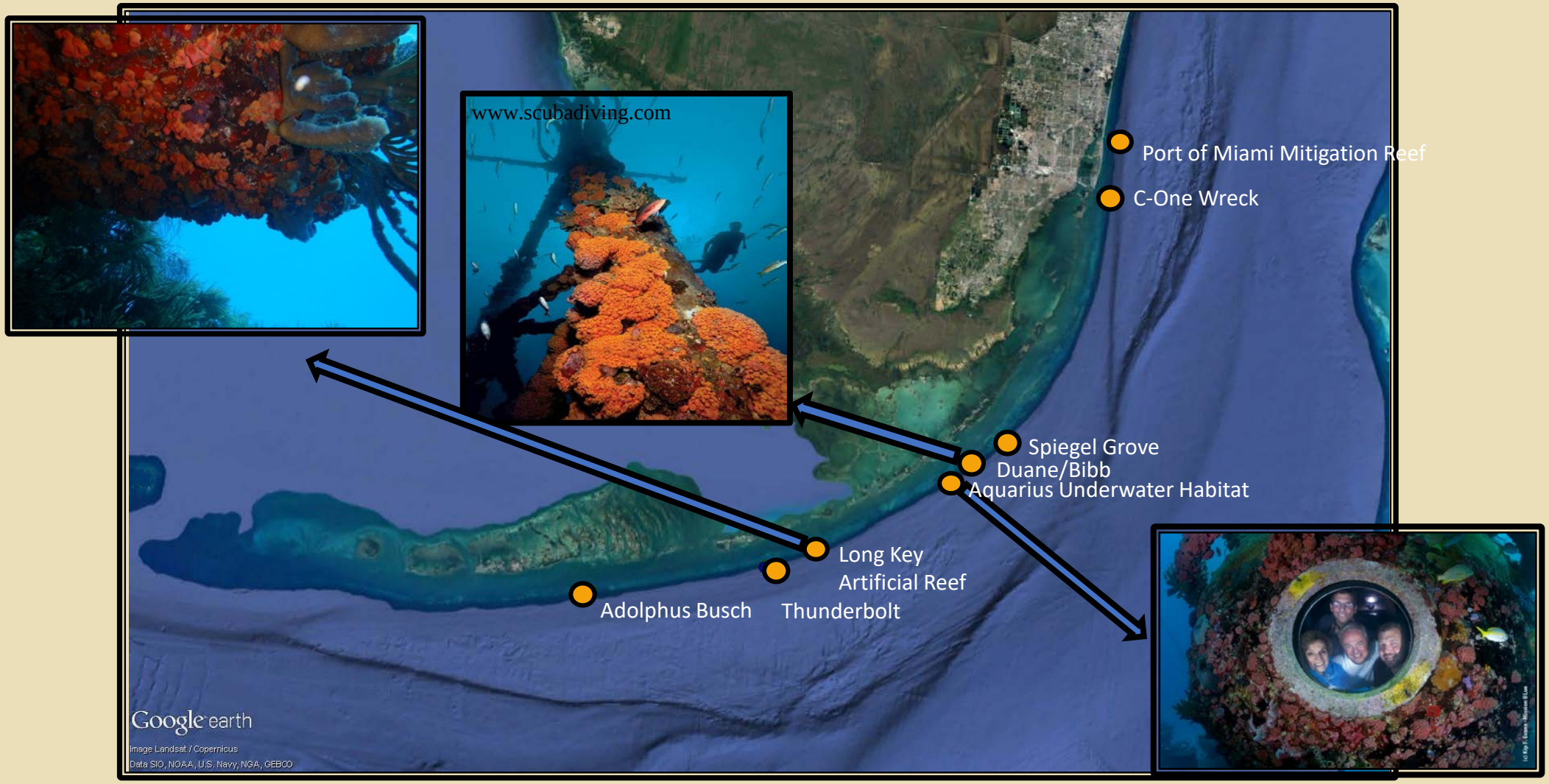
Fig. 1. Northern Gulf of Mexico, showing location of oil and gas platforms present in 2003. Total number of platforms: ~4000, total number of wells drilled since the 1940s: ~40 000

Sammarco *et al*. 2004

Orange Cup Coral in the Gulf of Mexico & Florida



Orange Cup Coral in SE Florida



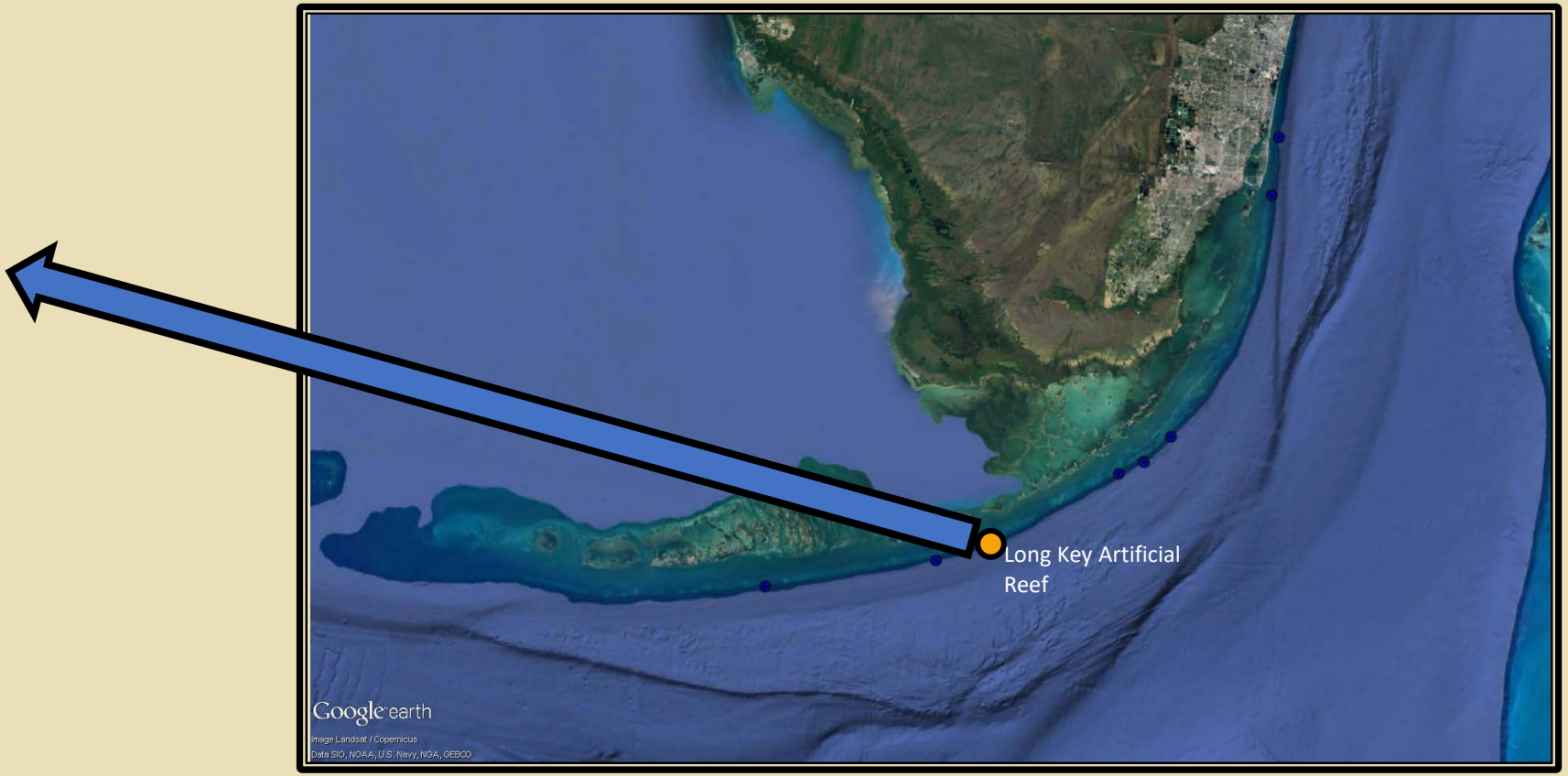
Orange Cup Coral –The Issue

- Prized by Marine Aquarists
- Marine Life Collectors have asked FWC's fisheries managers to consider allowing collection

So…What Is The Risk of Collecting?

- Our managers asked if collecting would cause the spread of orange cup coral at existing locations and to new locations?

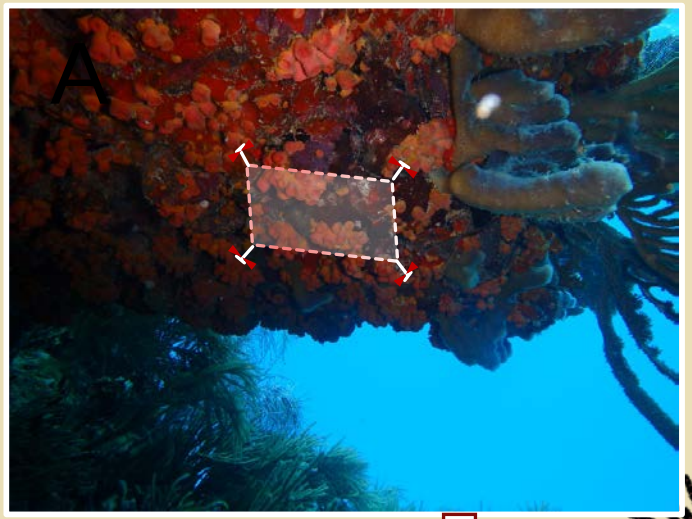
Studies At The Long Key Artificial Reef

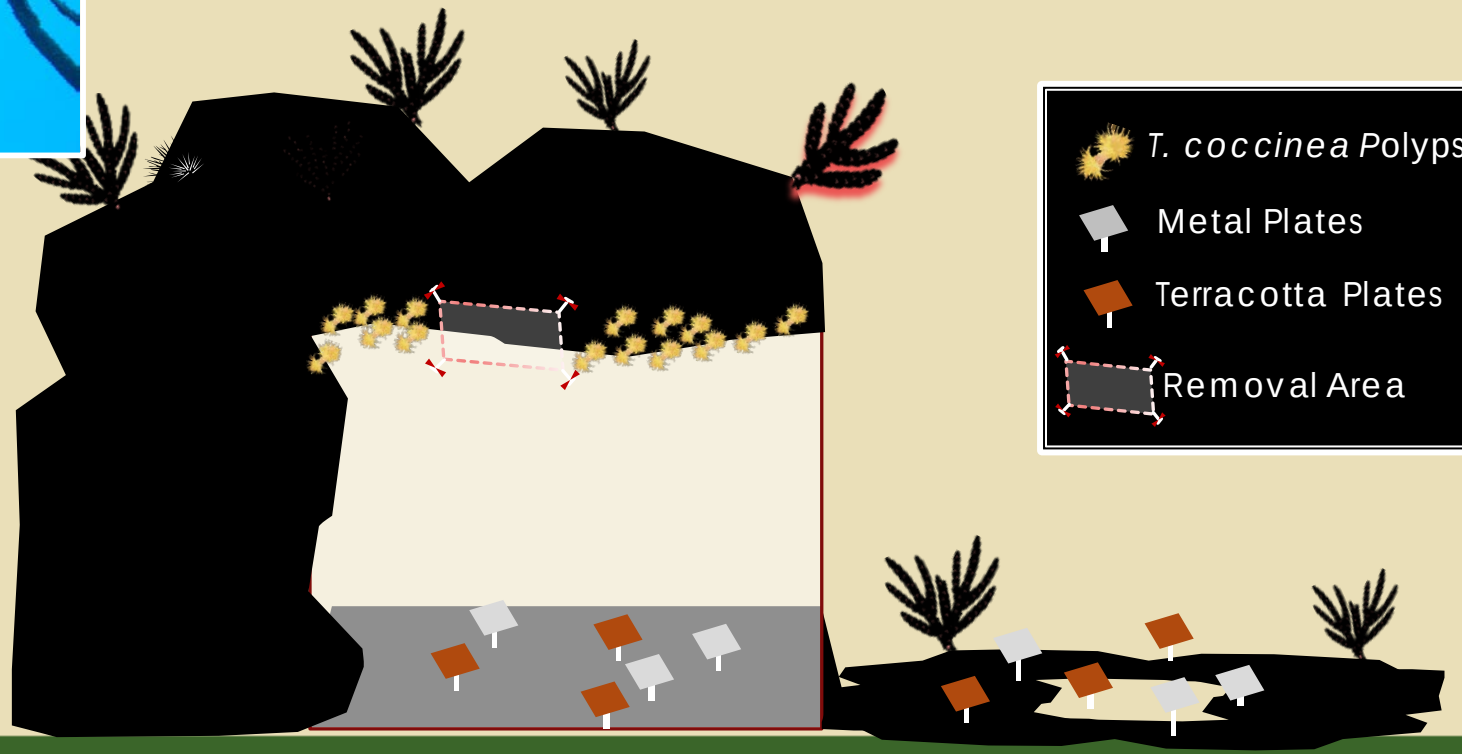


Studies At The Long Key Artificial Reef

- Assess the effects of the removal of orange cup coral (*Tubastrea coccinea)* from the artificial reefs within the FKNMS – Can we detect enhanced recruitment?
- Direct manipulations to assess competition between OCC and native benthic organisms, esp. corals

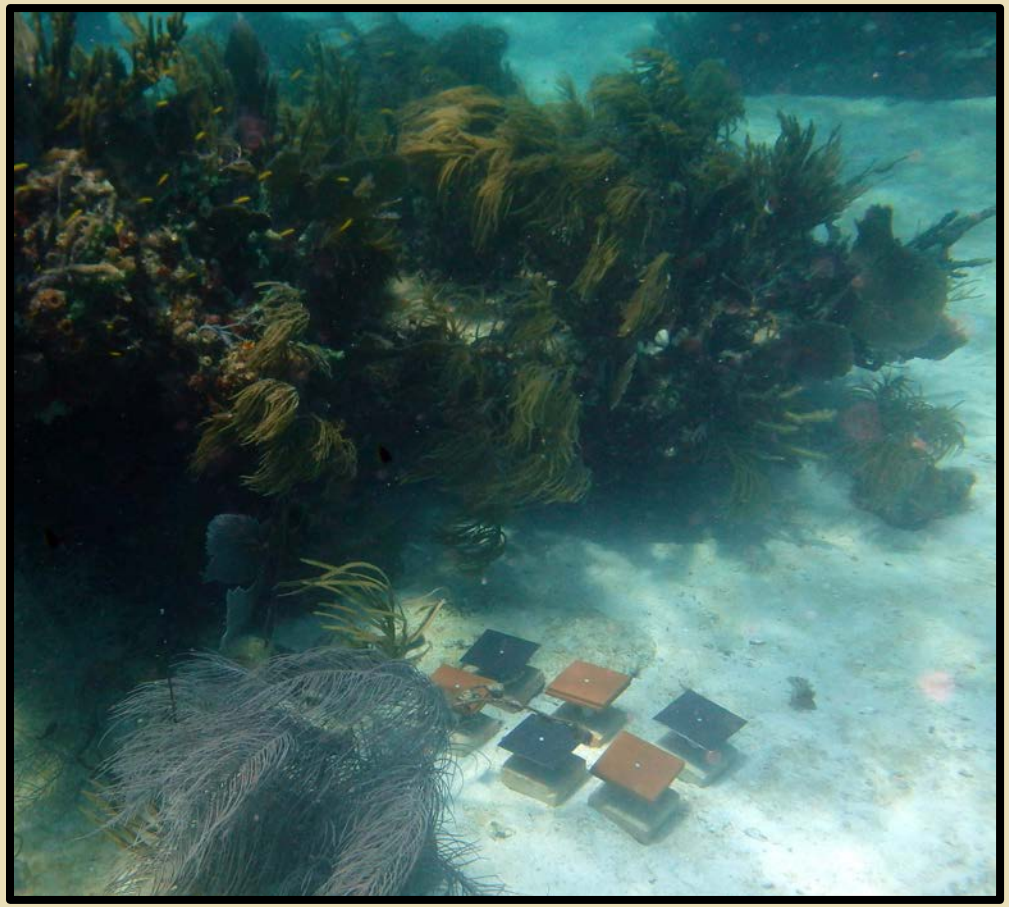
Manipulative Experiments

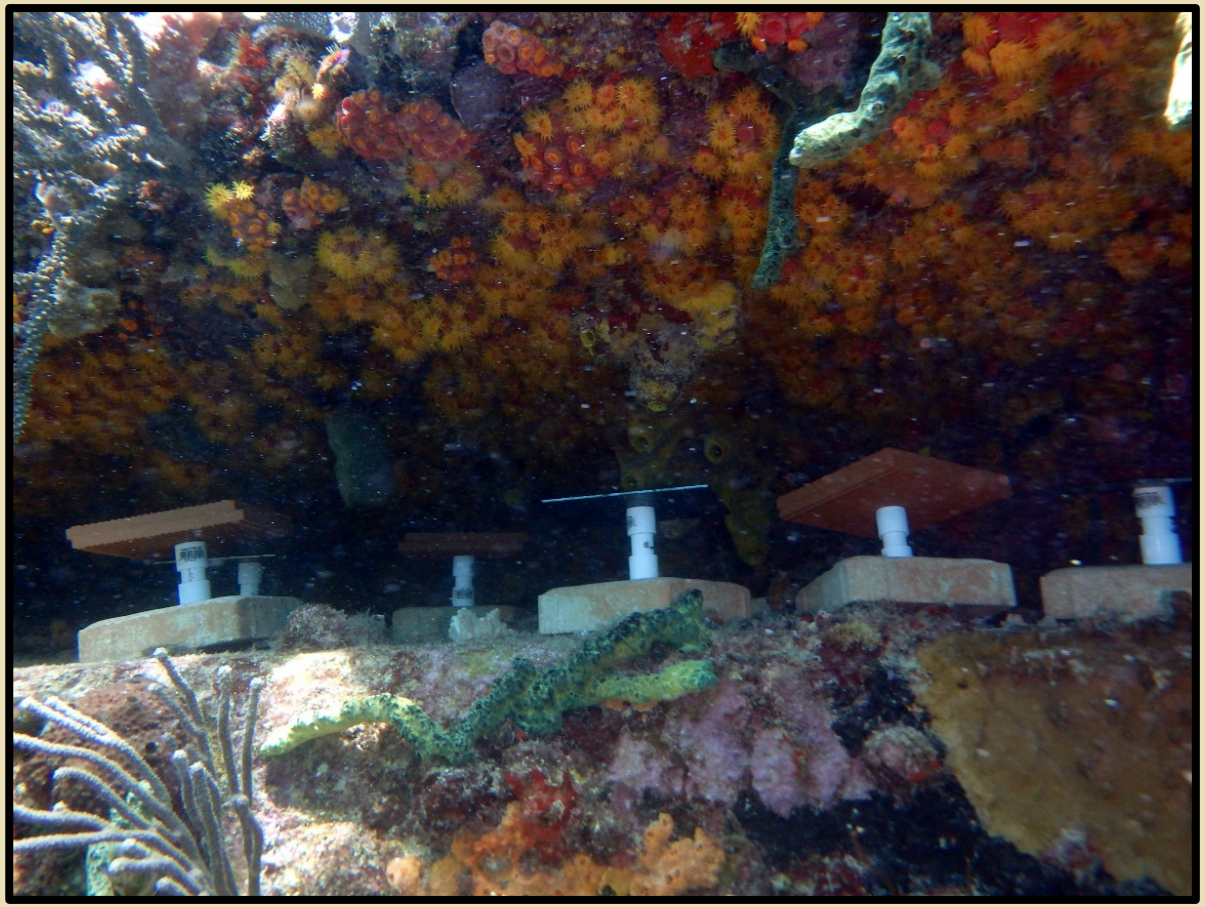




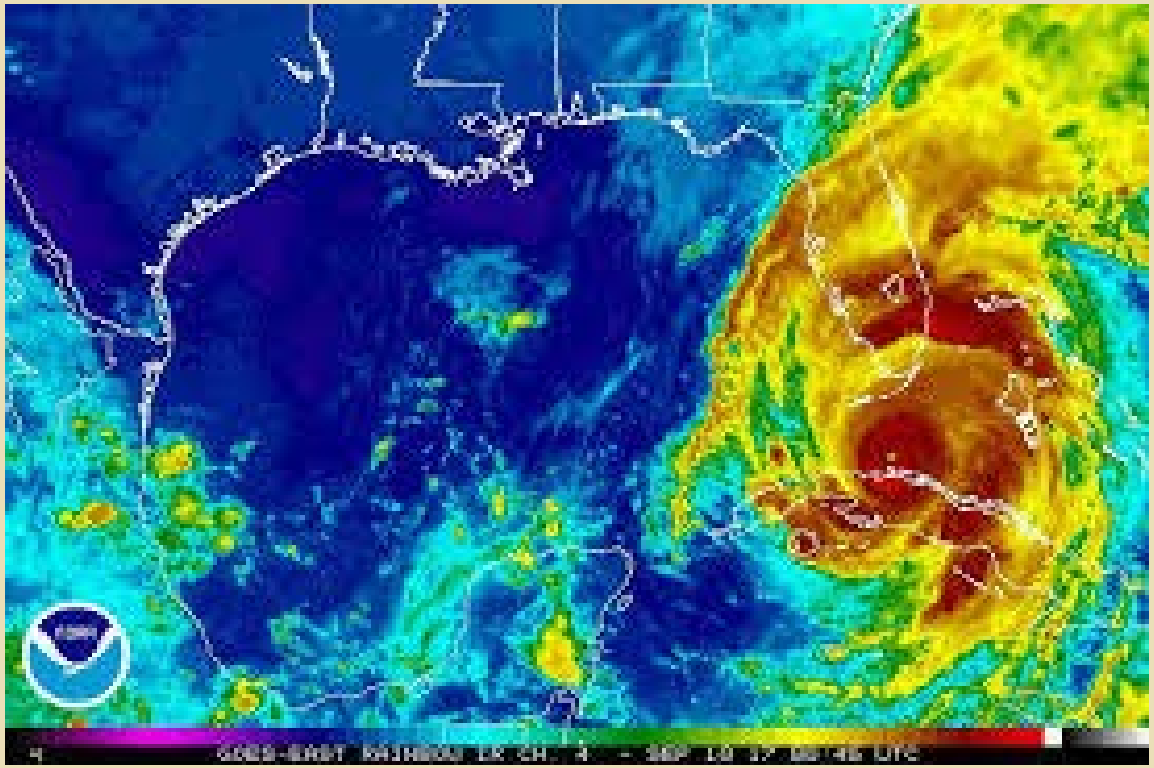
Manipulative Experiments

Manipulative Experiments





Setbacks



So…What Is The Ecological Risk?

- What is the potential for *Tubastraea* to outcompete native species in the shallow water natural coral reef environment

So What Have We Found?...

- Morphologically distinct polyps at the Long Key Artificial Reef

Other Cup Coral Species in the Atlantic

Aquatic Invasions (2011) Volume 6, Supplement 1: S105–S110
doi: 10.3391/ai.2011.6.S1.024
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Aquatic Invasions Records

Expansion of the invasive corals *Tubastraea coccinea* and *Tubastraea tagusensis* into the Tamoios Ecological Station Marine Protected Area, Brazil

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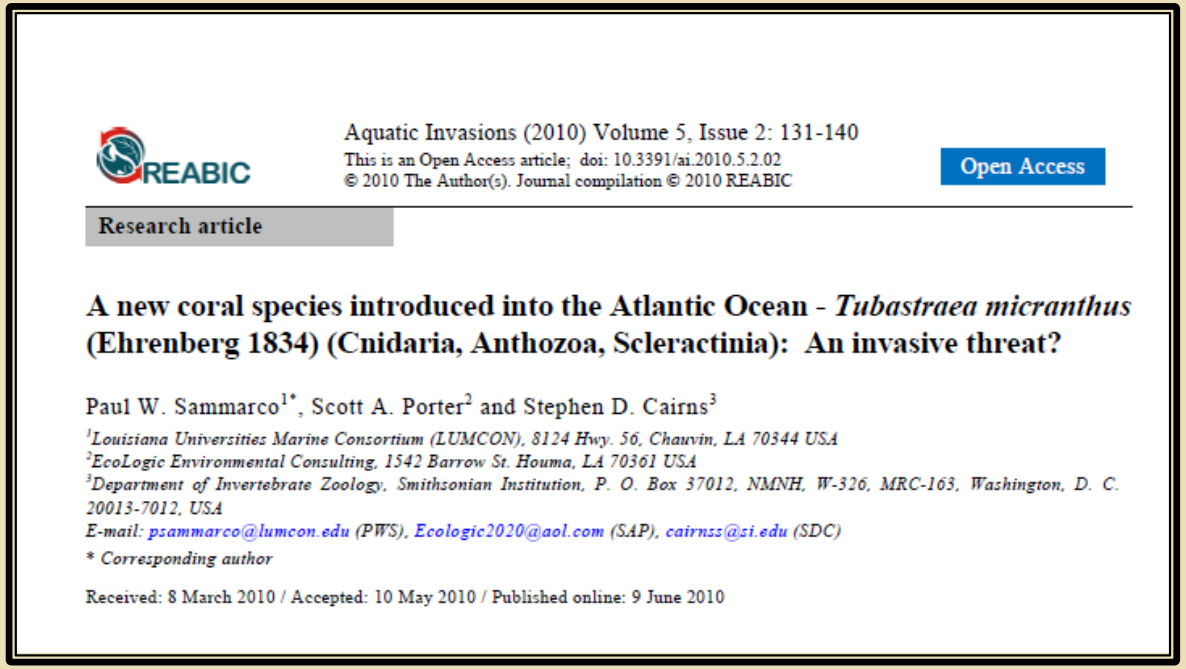
Received: 3 March 2011 / Accepted: 26 August 2011 / Published online: 19 September 2011

- Brazil – *Tubastraea taguensis*



Aquatic Invasions (2010) Volume 5, Issue 2: 131-140
This is an Open Access article; doi: 10.3391/ai.2010.5.2.02
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Research article

A new coral species introduced into the Atlantic Ocean - *Tubastraea micranthus* (Ehrenberg 1834) (Cnidaria, Anthozoa, Scleractinia): An invasive threat?

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Received: 8 March 2010 / Accepted: 10 May 2010 / Published online: 9 June 2010

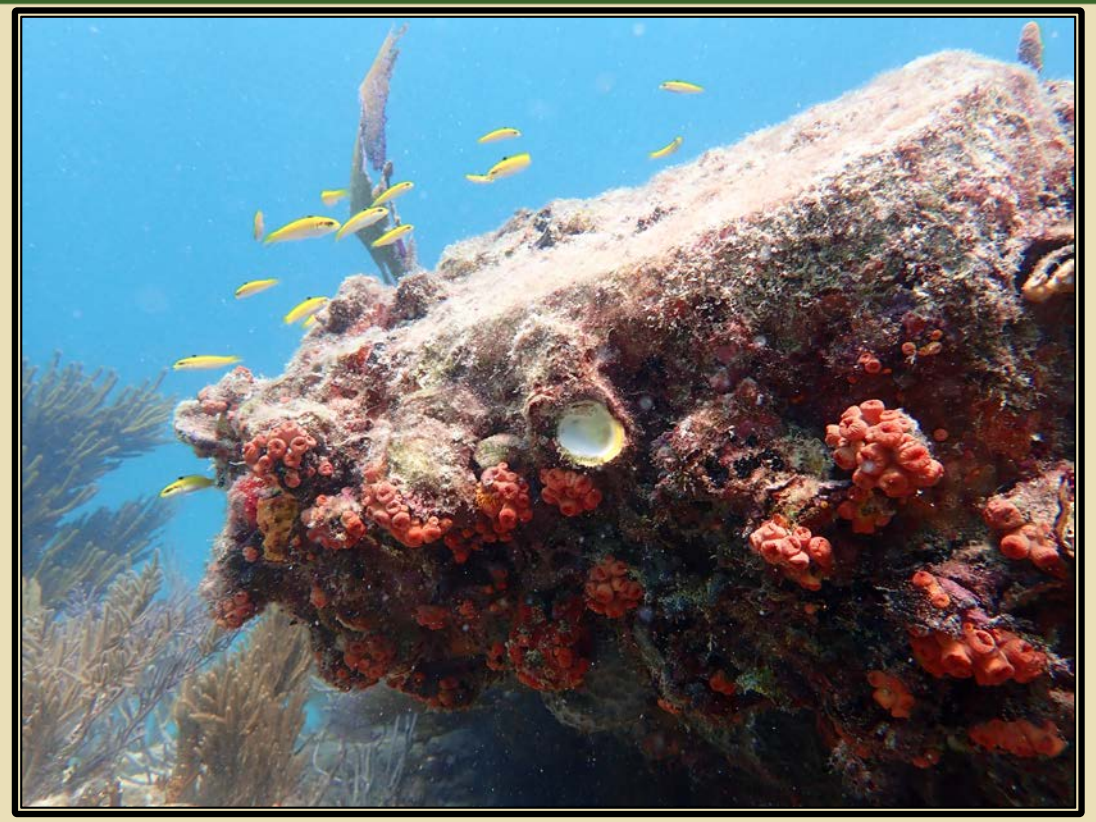
- GOM – *Tubastraea micranthus*

So What Have We Found…

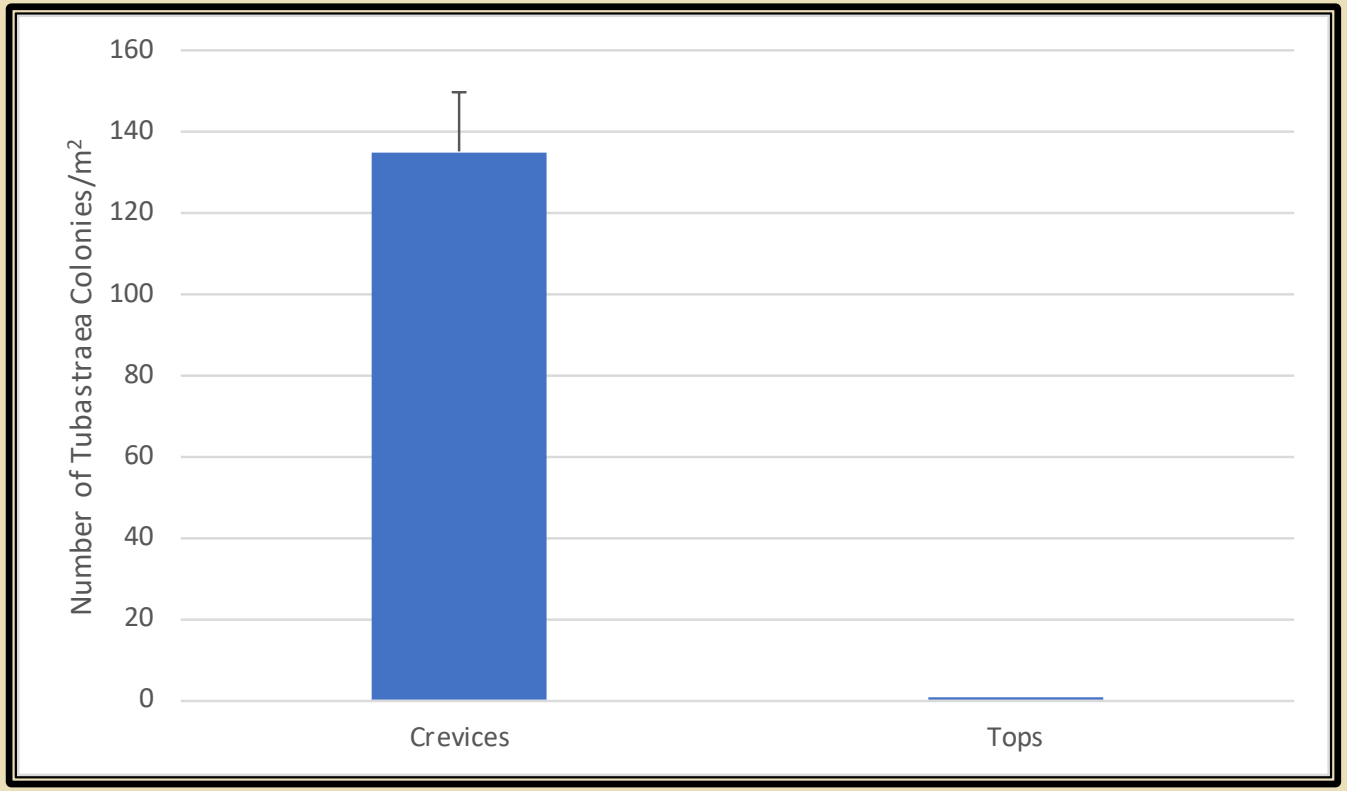
- Genetic evidence suggest that there multiple species invading Florida wat

- Two of the species invading Florida wa also invading Brazilian waters
  - Genetically they are either the same or very similar

So What Have We Found…



- *Tubastraea* confined to darkened crevices?

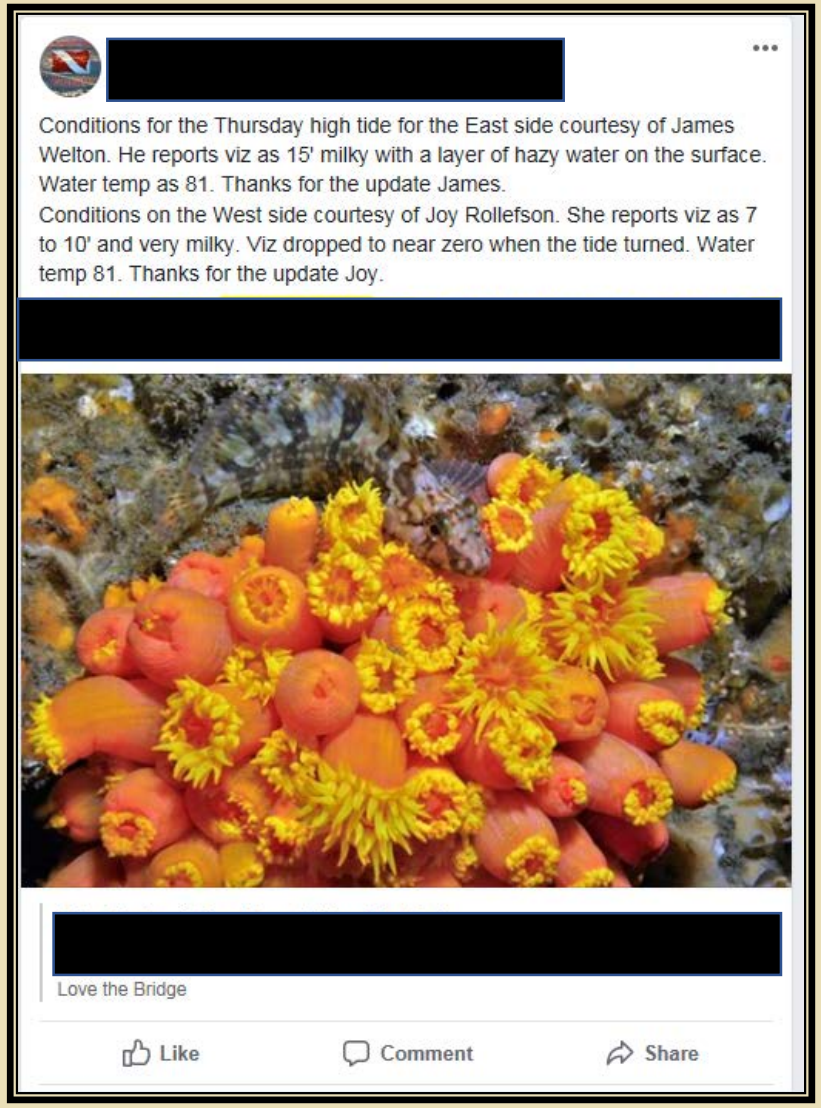


Risk to The Coral Reef Ecosystem

- Largely confined artificial structures; darkened crevices in shallow water
- Has it successfully colonized the darkened recesses of natural reefs?
  - Much of the hard surface area of reefs lies within crevices, caves, and other cavities

Parting Comment

- Be on the lookout for cup corals…we welcome reports!!



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Think locally, Act neighborly
invasive species know no boundaries!