

Mote Tropical Research Laboratory

David E. Vaughan, PhD.

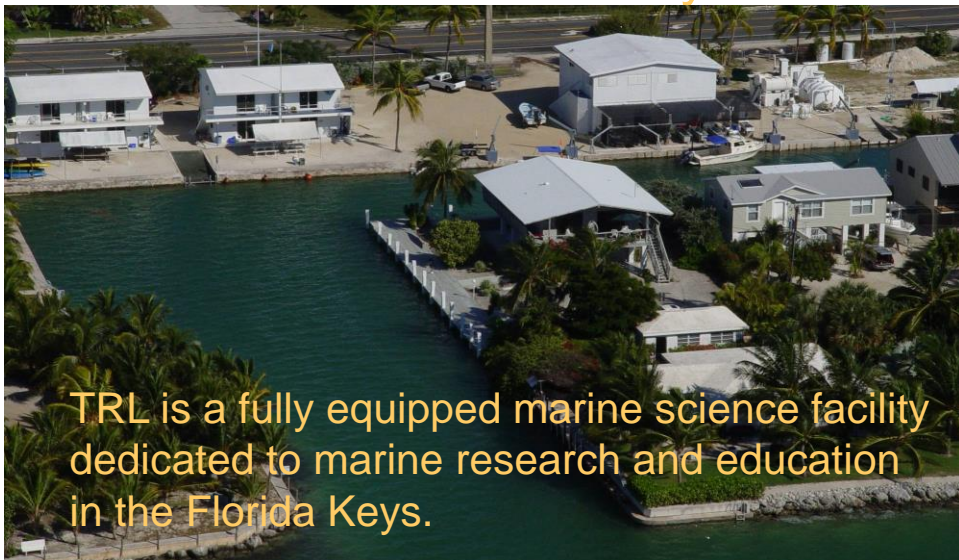
Executive Director

Florida Keys



Summerland Key and Key West

Tropical Research Lab (TRL) Summerland Key



TRL is a fully equipped marine science facility dedicated to marine research and education in the Florida Keys.

Tropical Research Lab

Coral Reef Monitoring and Assessment Program - Erich Bartels, Cory Walter

Coral Reef Science and Visiting Researchers Support
Staghorn nursery project

Red Tide/HAB Monitoring in the Keys

- Marine Ecosystem Event Response and Assessment (MEERA)
- Coral Bleaching Early Warning Network (BleachWatch)



Reef Restoration Program – *David Vaughan, Ph.D., Director, C. Page staff Scientist* Developing the science and technologies for restoring reef ecosystems, including hard corals, soft corals, seagrass meadows, macroalgae, invertebrates, vertebrates and factors involved in the reef community.



Other Coral Reef Programs –



Education

Mote Marine Laboratory began to offer marine education programs in 1994. Today, Mote's Education Department continues to offer marine science field programs at TRL for a variety of ages and backgrounds.

Education Programs and Summer-camp Programs

Support of visiting student groups and educational programs

Advanced Courses in Marine Sciences: Coral Diseases, Sponges, etc.



Why Do we work here?
The Florida Keys National Marine Sanctuary
Home To The 3rd Largest Living Coral Reef
System On The Planet



The Environment and
The Economy are
Directly Linked in the Florida Keys



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Slide Thanks to Billy Causey



Why are our Coral Reefs so important ?

Coral Reefs support as much as 40% of all the marine life on the planet and it is estimated that as much as 50% of the marine life in the Florida Keys depend on Coral Reefs at some point in their life cycle or benefit from coral reef habitat.

Condition of our Coral Reefs:

Since the 1970's, it is estimated that we've lost as much as 80-90% of our indigenous coral coverage in the Florida Keys, including some species such as staghorn and Elkhorn have experienced a decline of more than 97%.

Carysfort Reef Florida Keys 1980



Carysfort Reef Florida Keys 2011



Causation

What is causing coral populations and coverage to decline at such an alarming rate?- Human caused

➤ **Climate Change/Global Warming**

➤ **Ocean Acidification**

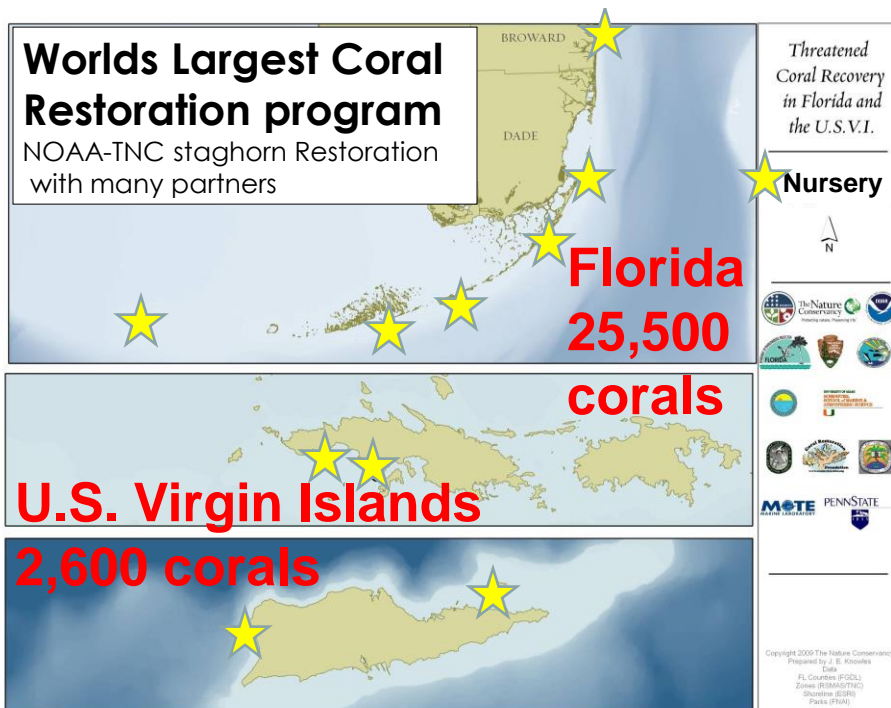
Water Quality/Pollution/Disease Resulting from the Above Stressors

➤ **Loss of Keystone Reef Species : Diadema... AKA Long Spined Sea Urchins**



What can be done to slow the decline of coral coverage and reef systems in the Florida Keys ?

- Reef Restoration Programs
- Marine Protection Areas Updated
- Water Quality Improvement Initiatives and Protections



Was Staghorn coral cultured rapidly and planted successfully YES!



Coral Reef Nurseries





11 Months - April 2014

>95% survival after 1 year

OLD CORALS – NEW TRICKS

- AGE 4-6,000 years
- Sexual Rep: success every 50-100 years
- GROWTH 2.6 mm year (1-2m/6,000yr)
- SURVIVAL recent loss 25% / 30 years
- FORCAST another 25% next 25 years

ALTERNATIVE RESTORATION



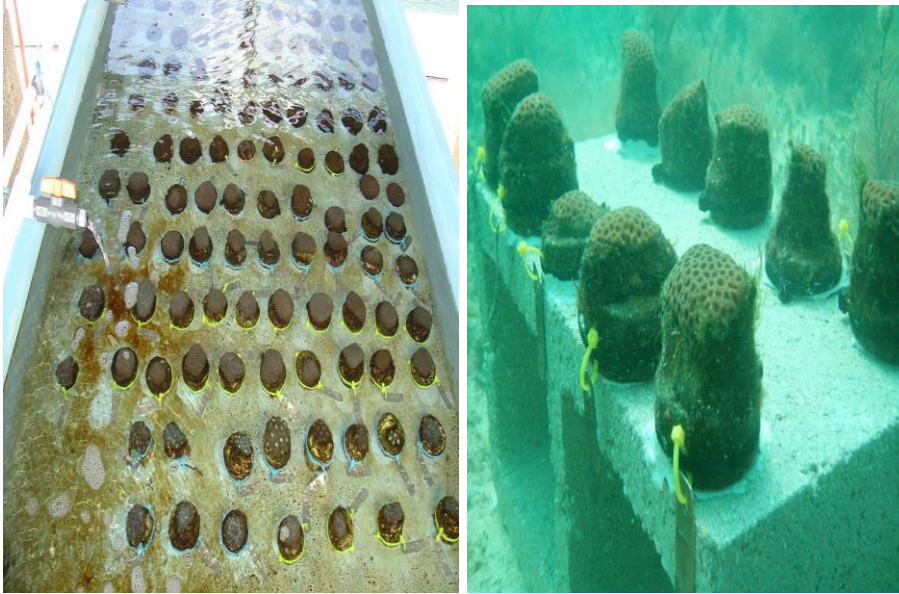
Objective: Maintain & Monitor Survival of Corals in Coral Gene Bank



Outdoor Tanks and Raceways

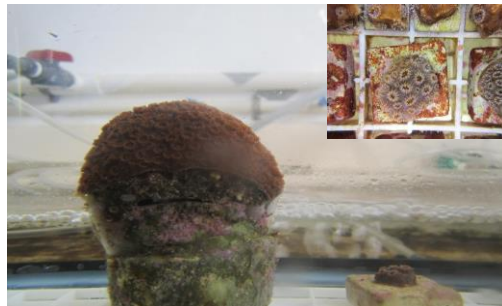


Tagged and transplanted to field



Expanded Production

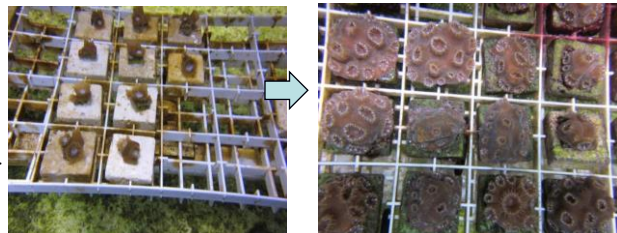
- Major paradigm shift occurring at Mote-TRL
- Shift from large fragments to microfragments



- Significance of changes
- Optimize growth and increase the rate of production
- Allows coral to integrate with dead reef structure much faster upon outplant

“Reskinning” bare reef structure

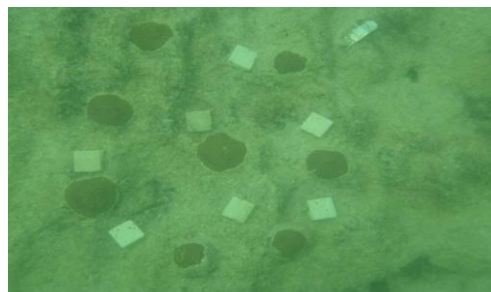
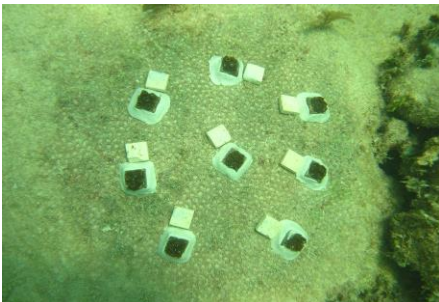
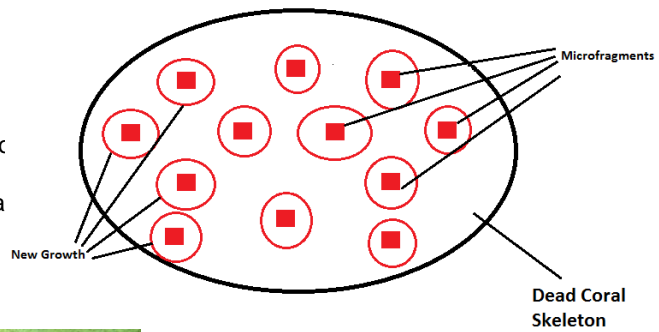
- Designed to carry out restoration of stony corals at a much larger scale





New Phase + Future Work

The **“reskinning”** of reef building coral skeletal
A novel Approach in
Response to Mass Morta
and Increasingly Acidic
Conditions



Small Fragments Fuse back together to form new coral head



We can now restore breeding size colonies to degraded reefs and corals of many species and types in our generation



With your Help

