



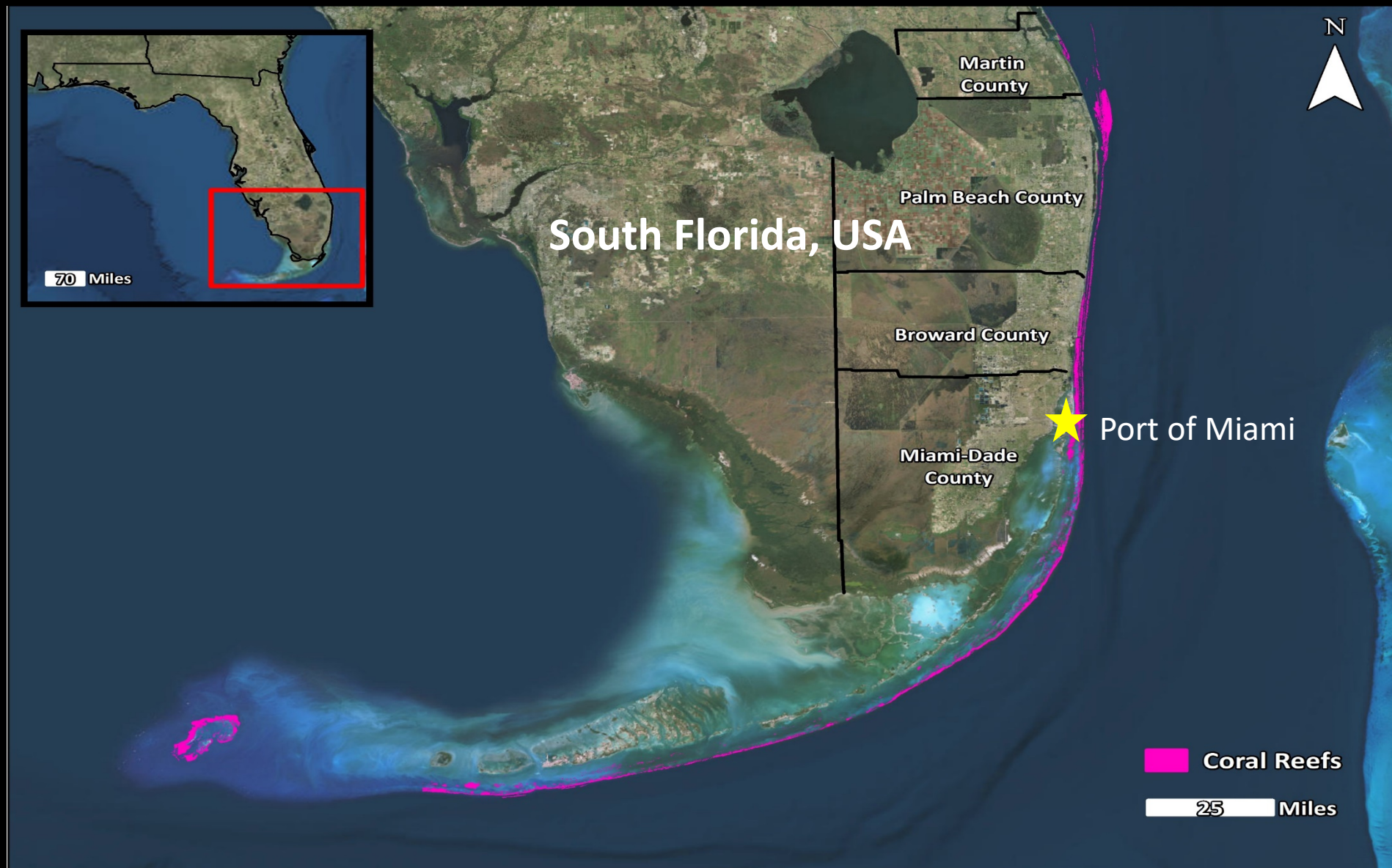
V. Brandtneris

# Stony Coral Tissue Loss Disease Spreads to the Wider Caribbean... and beyond?

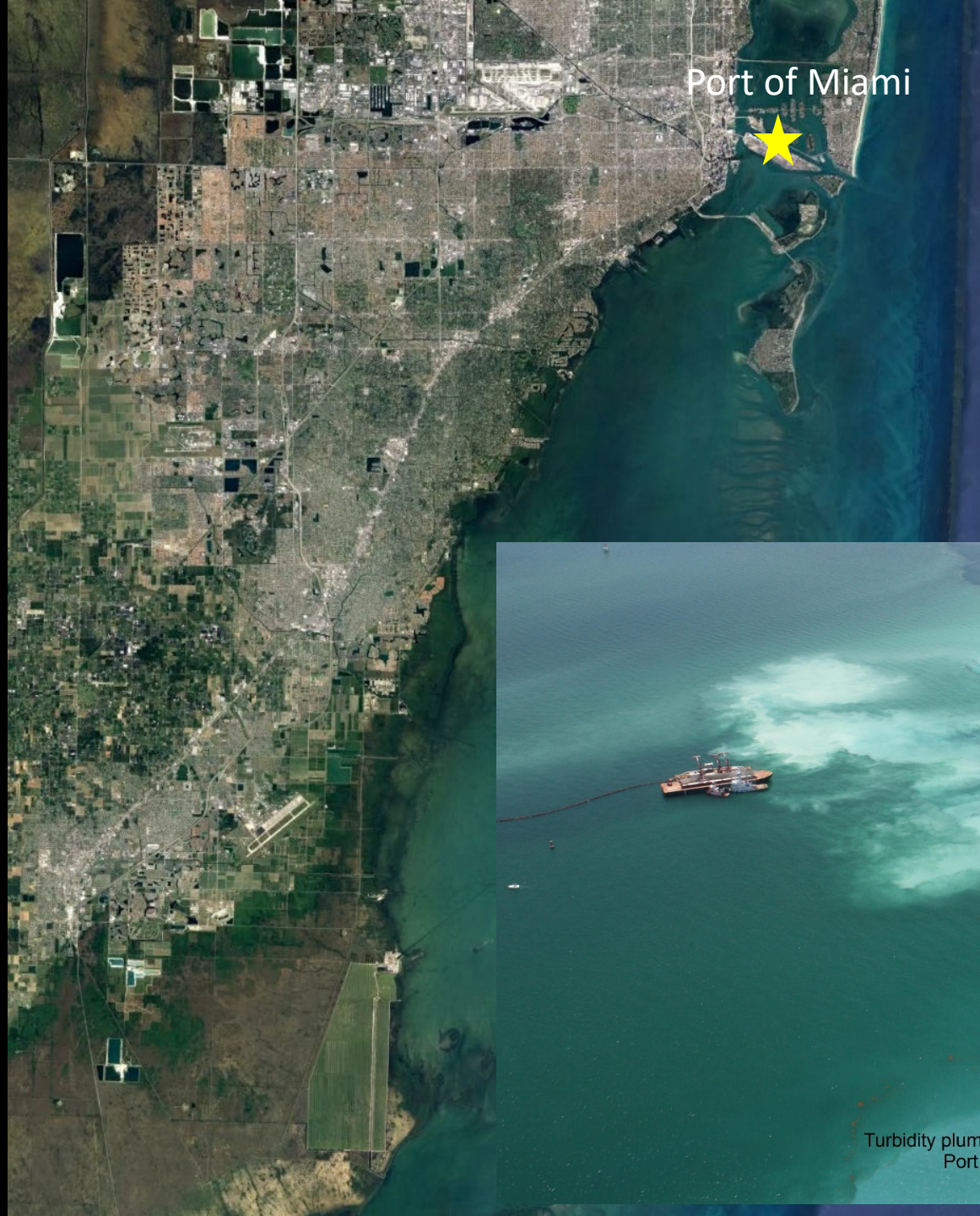
**Leslie Henderson<sup>1</sup>, Sean Griffin<sup>2</sup> and  
Michael Nemeth<sup>2</sup>**

1. VI Department of Planning and Natural Resources
2. NOAA's Restoration Center









Port of Miami

## Port of Miami Dredging Project 2014-2015

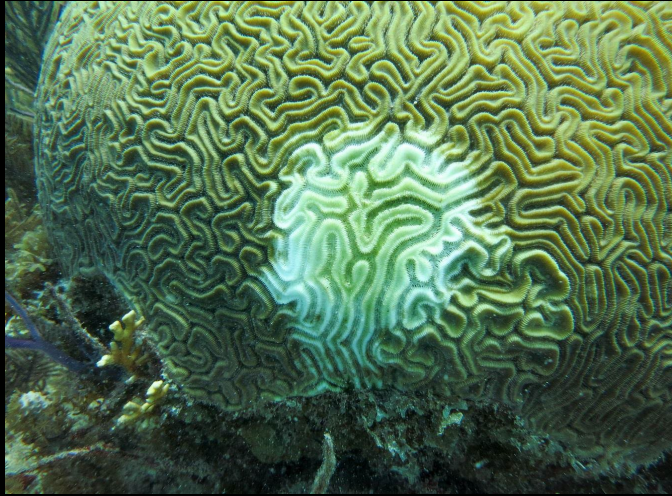


Turbidity plume from Great Lakes Dredge Texas,  
Port Miami - June 25, 2014

D. Kipnis



# First signs of trouble



**Grooved Brain Coral**  
(*Diploria labyrinthiformis*)



**Symmetrical Brain Coral**  
(*Pseudodiploria strigosa*)



**Elliptical Star Coral**  
(*Dichocoenia stokesii*)



**Maze Coral**  
(*Meandrina meandrites*)



**Smooth Flower Coral**  
(*Eusmilia fastigiata*)

Photos: Rob Ruzicka, FWC



# Key Research Findings of Stony Coral Tissue Loss Disease (SCTLD) from Florida Studies:

## Susceptibility among coral species differs

Maze coral



Highly susceptible

Grooved brain coral



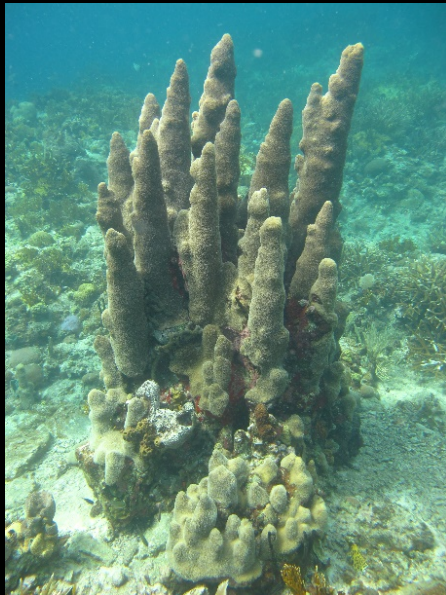
Boulder brain coral



Elliptical star coral



Pillar coral



Symmetrical brain coral



Smooth Flower Coral





February 1, 2019



February 12, 2019



February 21, 2019

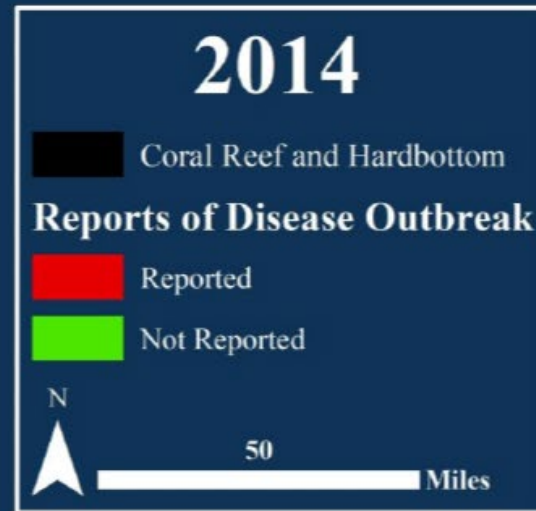


March 3, 2019





# Coral Disease Outbreak Extent Across the Florida Reef Tract



Dry Tortugas  
National Park



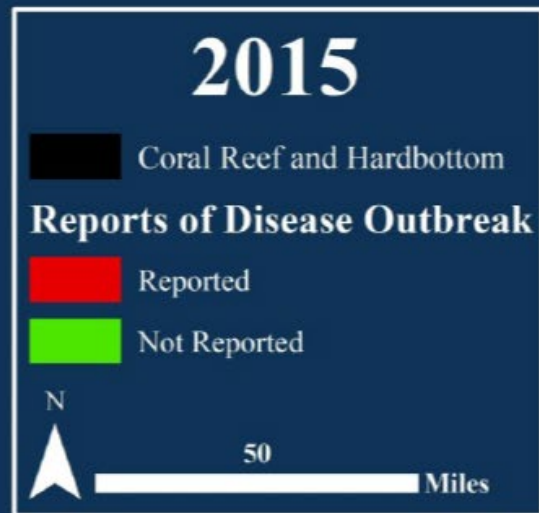
Southeast Florida

Biscayne  
National  
Park





# Coral Disease Outbreak Extent Across the Florida Reef Tract



Dry Tortugas  
National Park

Lower Keys

Middle Keys

Upper Keys



Martin County

Palm Beach County

Southeast Florida

Broward County

Monroe  
County

Miami-Dade  
County

Biscayne  
National  
Park

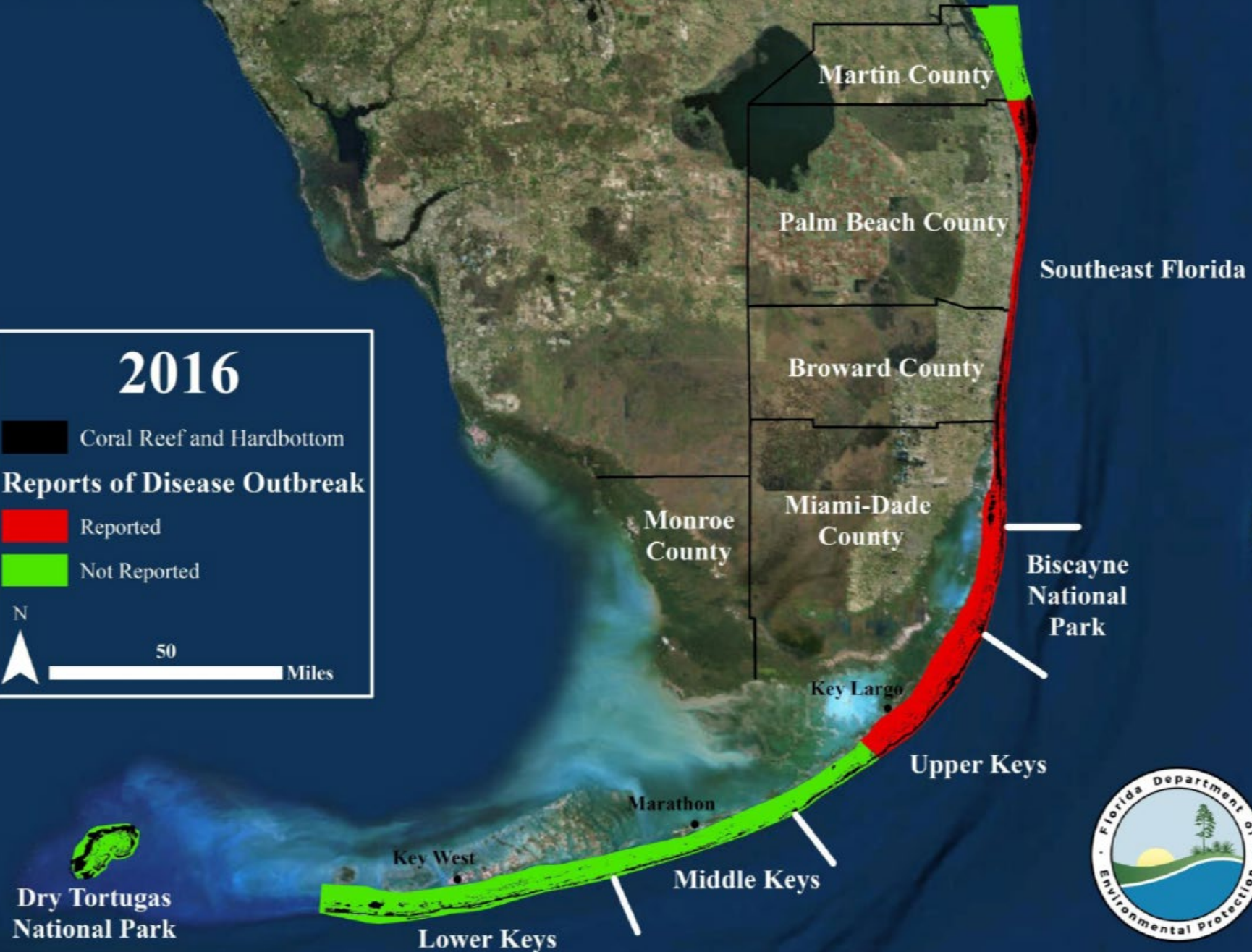
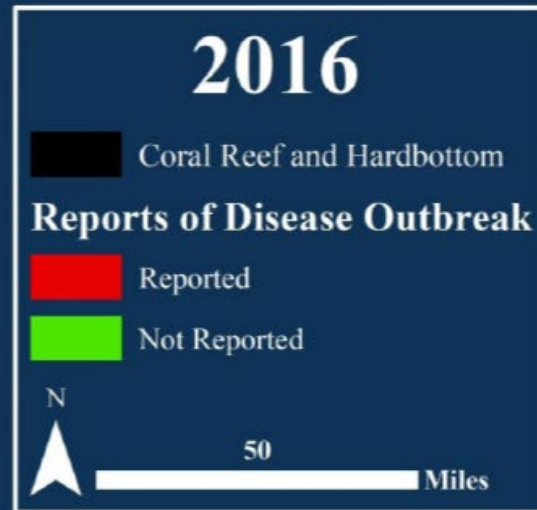
Key Largo

Marathon

Key West

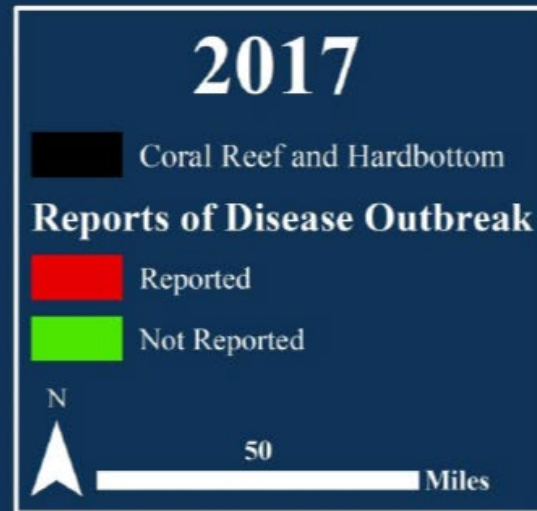


# Coral Disease Outbreak Extent Across the Florida Reef Tract





# Coral Disease Outbreak Extent Across the Florida Reef Tract



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Monroe  
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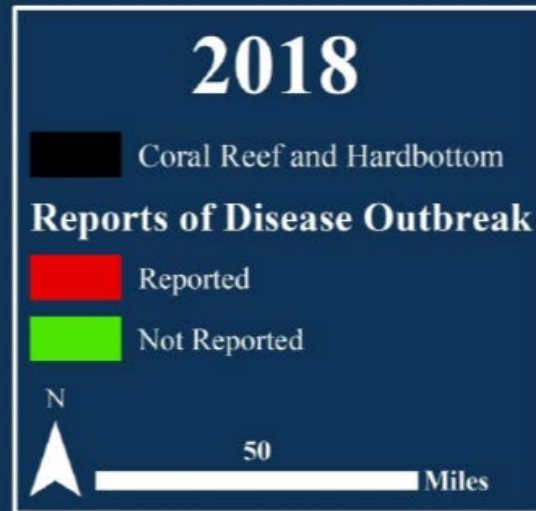
Palm Beach County

Martin County

Southeast Florida



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Lower Keys

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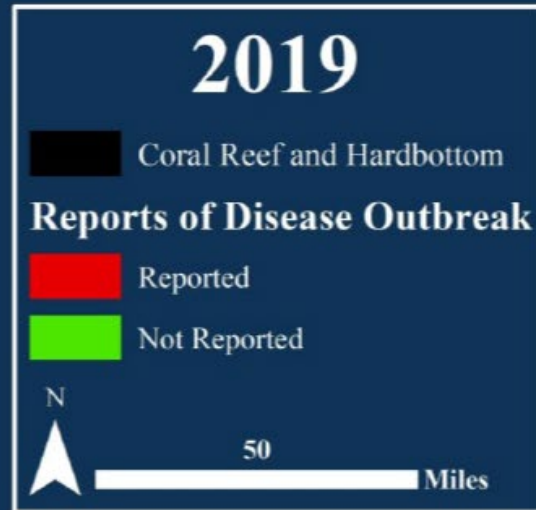
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Dry Tortugas  
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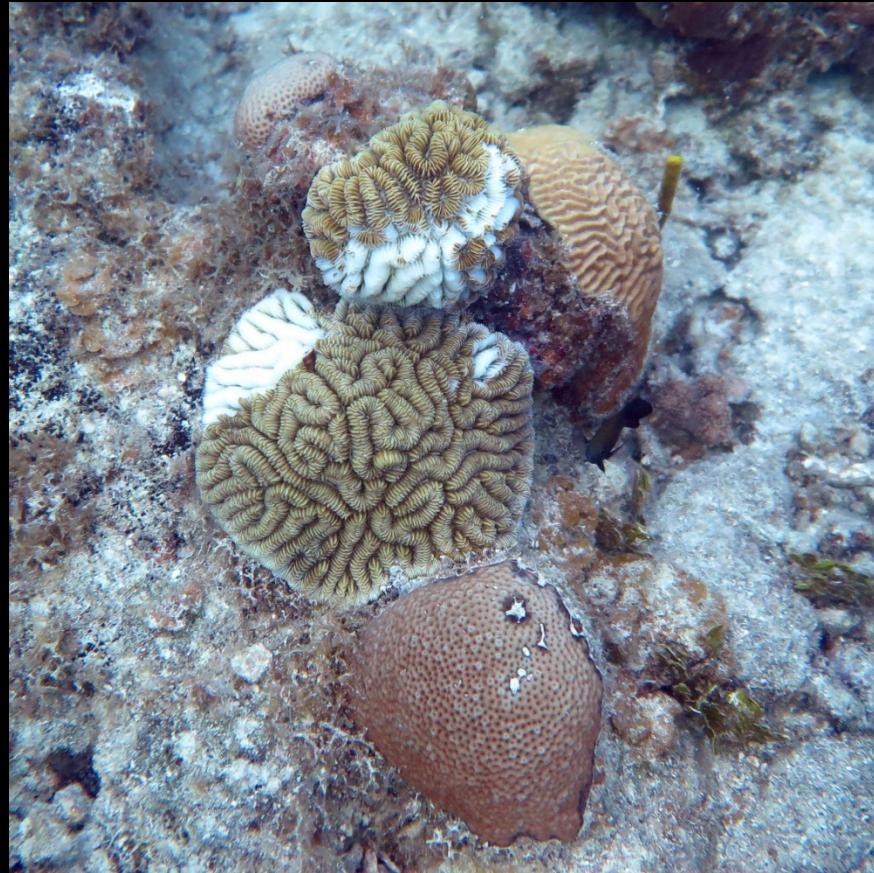
Martin County

Southeast Florida



## Key Research Findings of Stony Coral Tissue Loss Disease (SCTLD) from Florida Studies:

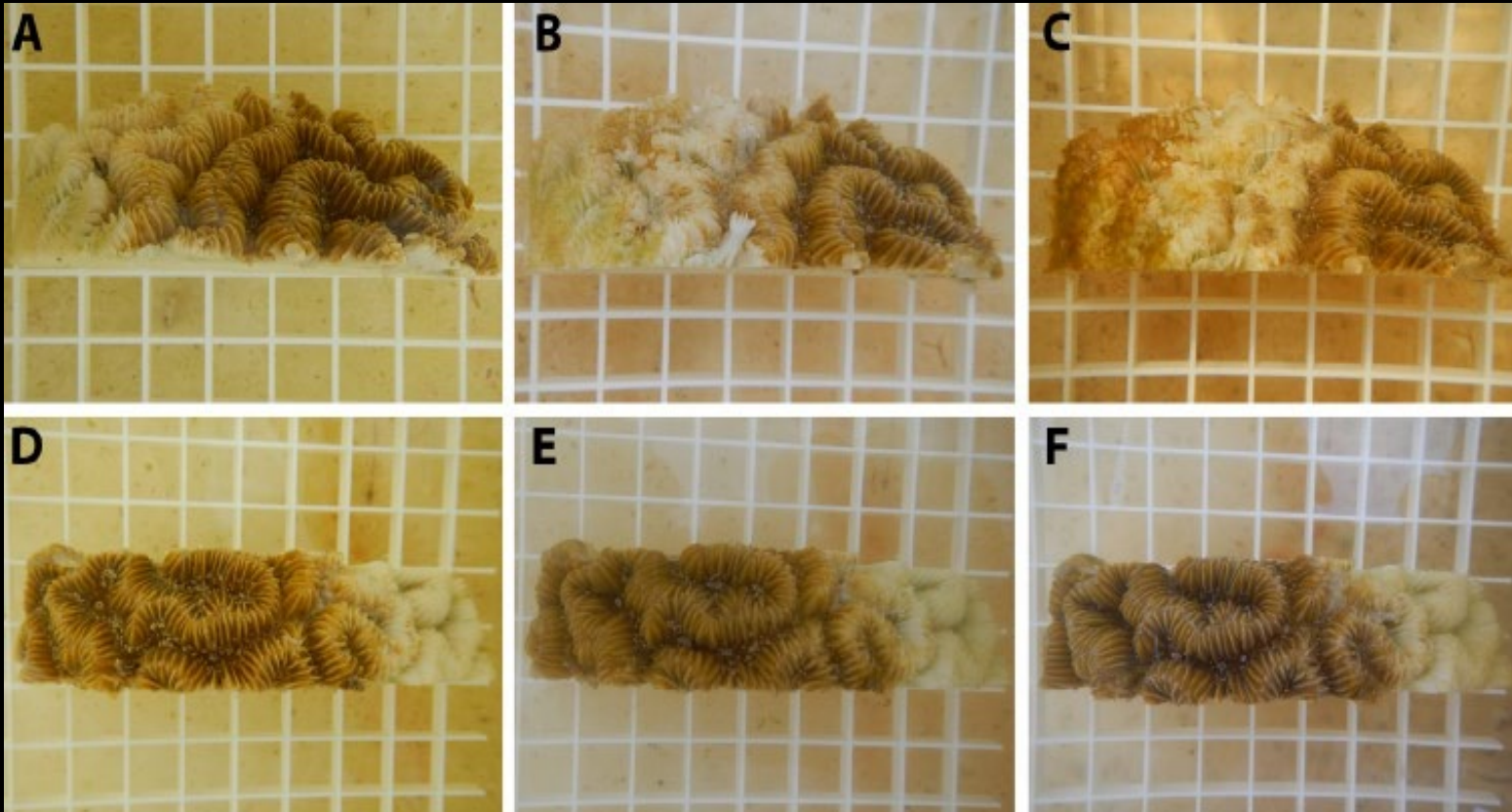
Transmission experiments demonstrate that SCTLD is infectious (transmissible) and can transmit **through water transport**





## Key Research Findings of Stony Coral Tissue Loss Disease (SCTLD) from Florida Studies:

Studies have suggested that a bacterial pathogen(s) are involved but no specific pathogen has been identified



No treatment

Treated w/ amoxicillin &  
kanamycin



A satellite map of the Caribbean Sea and surrounding landmasses, including Central America, the northern coast of South America, and the Caribbean islands. Red pins are placed on the map to indicate locations of SCTLD reports. There is a cluster of about 10 pins along the northern coast of Central America (Belize and Guatemala), a single pin on the northern coast of South America (Venezuela), a cluster of about 5 pins in the central Caribbean (Cuba and Haiti area), and a few more pins on the eastern Caribbean islands (Jamaica and Barbados area).

<http://www.agrra.org/coral-disease-outbreak/>

## SCTLD reports in the Wider Caribbean Region





Quintana Roo, Mexico

Dominican Republic

Jamaica

St. Thomas

St. Maarten

Map Credit: Kramer, P. and Roth, L. 2019. AGRRA SCTLD database







Known spatial  
distribution as of  
9 May 2019

- In water surveys
- ★ 1<sup>st</sup> Observation, severe
  - Present, severe
  - Present, moderate
  - Checked, not observed
  - Area of interest

St. Thomas

Flat Cay

Sail Rock





# What we know: It's fast... and getting faster

- Most large brain corals dead within 2-3 weeks
- Much faster mortality rates than observed in beginning of Florida outbreak

1 month time series →





# What we know: It's bad... worse than bleaching



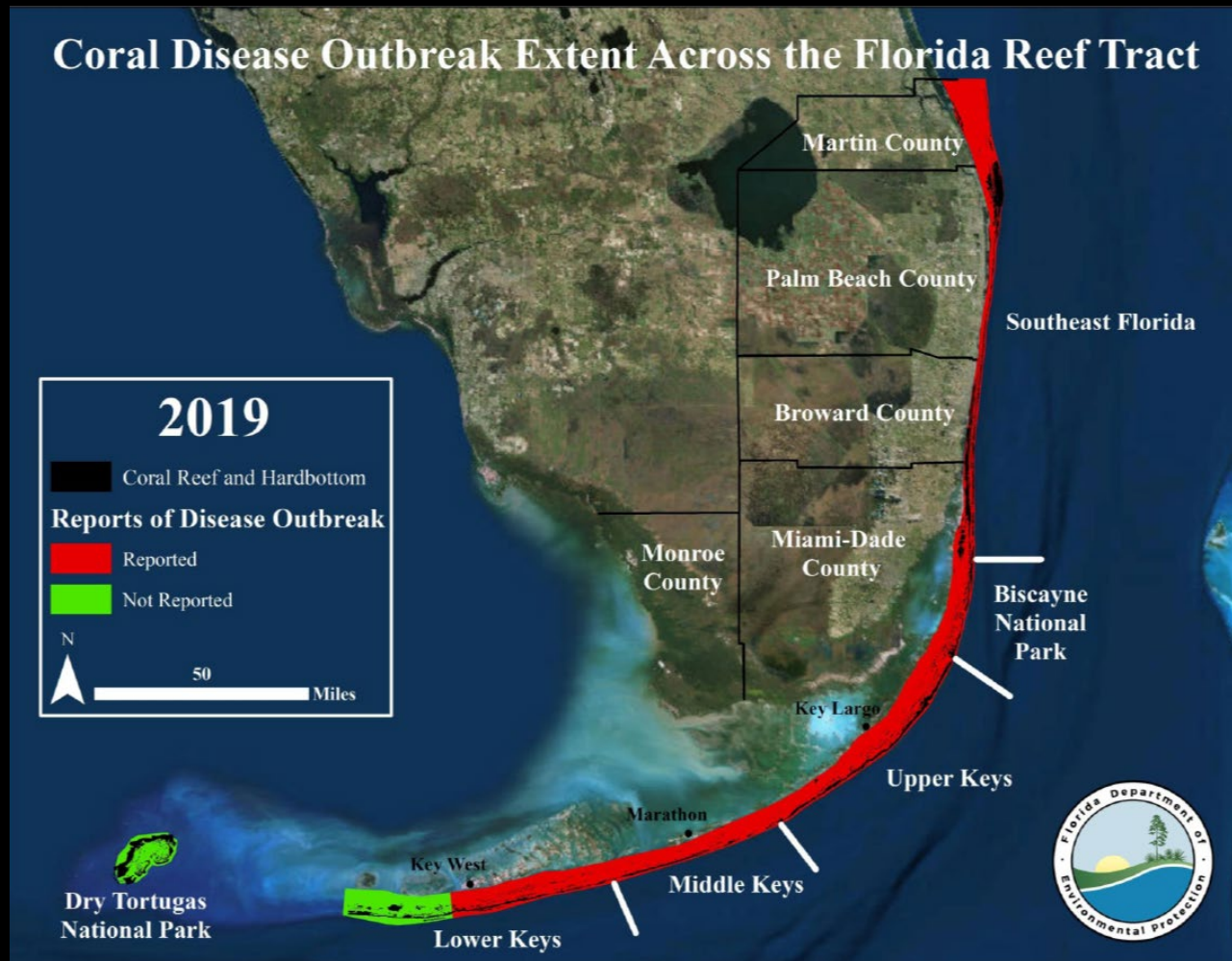
Drop in Coral Cover at Flat Cay from SCTLD =  
In 3 months = **35% change**  
Florida Keys have lost 40% coral; some  
species almost completely wiped out



Drop in Coral Cover at Flat Cay from bleaching  
In 1 year = **22% change**



# What we know: It lingers









Sites where SCTLD outbreak was detected in 2014 still have active lesions





# Weekly Coordination Calls

- Tracking/reports
  - UVI and partner disease surveys
  - Bleachwatch for public reports



Virgin Islands Coral Reef Advisory Group  
Disease Advisory Committee



SITE NAME:		SURVEY AREA: ~10m radius	
LATITUDE:		DISEASE VISIBLY PRESENT: ( Y / N / UK )	
LONGITUDE:		If N: Disease passed through / Disease not yet impacted	
Endemic (long-term)   (2) Epidemic (hotspot)   (3) Invasion (leading edge)   (4) Vulnerable (ahead of outbreak)			
Colonies WITH disease	Colonies WITHOUT disease	SPECIES NAME	
N S F M A	N S F M A	Colphophyllia natans	
N S F M A	N S F M A	Dendogyra cylindrus	
N S F M A	N S F M A	Diploria labyrinthiformis	
N S F M A	N S F M A	Dichocoenia stokesi	
MCAV	N S F M A	N S F M A	Montastraea cavernosa
MMEA*	N S F M A	N S F M A	Meandrina meandrites
Orbicella spp.	N S F M A	N S F M A	Orbicella annularis Orbicella faveolata Orbicella franksi
Pseudodiploria spp.	N S F M A	N S F M A	Pseudodiploria clivosa Pseudodiploria strigosa
SSID	N S F M A	N S F M A	Siderastrea siderea
Other	N S F M A	N S F M A	
Tally corals >10 cm (*except DCYL, DSTO, and MMEA)      None(0), Single (1), Few (2-10), Many (11-30), Abundant (30+)			

NOTES



# Weekly Coordination Calls

- Tracking/reports
  - UVI and partner disease surveys
  - Bleachwatch for public reports
- Messaging
  - Website [dpnr.vi.gov/czm/sctld](http://dpnr.vi.gov/czm/sctld)
  - Public meetings
  - Citizen science trainings



Photo courtesy of Joe Townsend

## PARTICIPATE IN A 2-TANK CITIZEN SCIENCE DIVE

### TO HELP SURVEY REEFS FOR DISEASED CORAL

The information gathered will help coral scientists plan how to manage the **Stony Coral Tissue Loss Disease (SCTLD)** that is devastating USVI corals. Divers will survey two reefs for SCTLD to record the numbers of diseased versus healthy corals.

**SUNDAY, APRIL 14**

Contact Admiralty Dive Center at (340) 777-9802  
to reserve your spot, space is limited.

### SCTLD IS

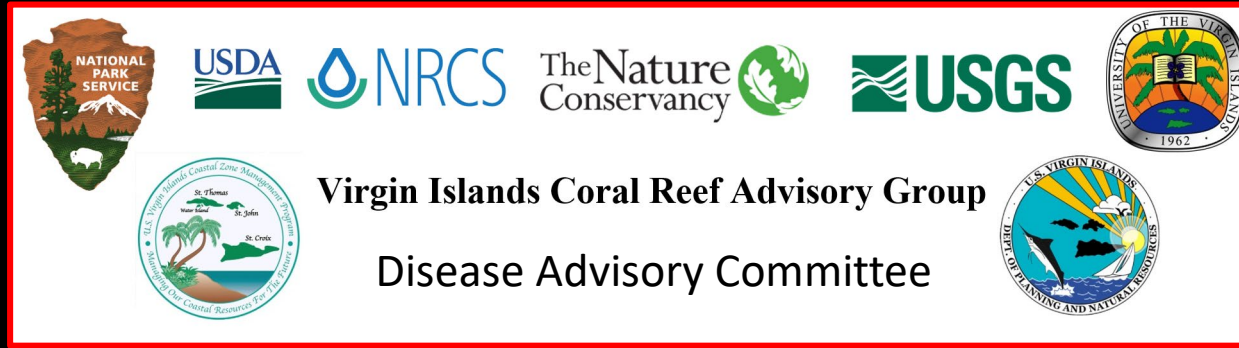
- A lethal coral disease
- Not a threat to human health
- Cause unknown
- Spreads and kills stony corals quickly





# Weekly Coordination Calls

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- Training/Response
  - Learning Exchange April 29<sup>th</sup>
  - Response Kits
  - 15 boat days



Funded thanks to:





# Weekly Coordination Calls

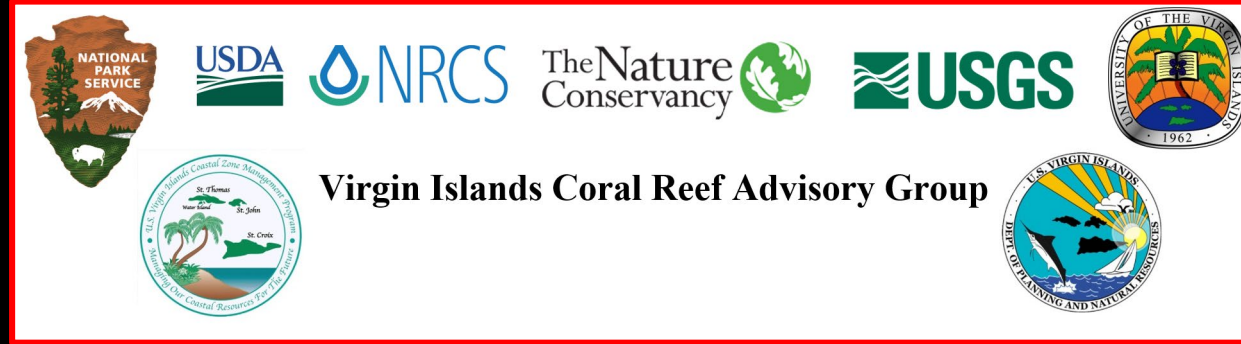
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- Permitting
  - Local permitting team on board
  - Working with NPS for federal waters





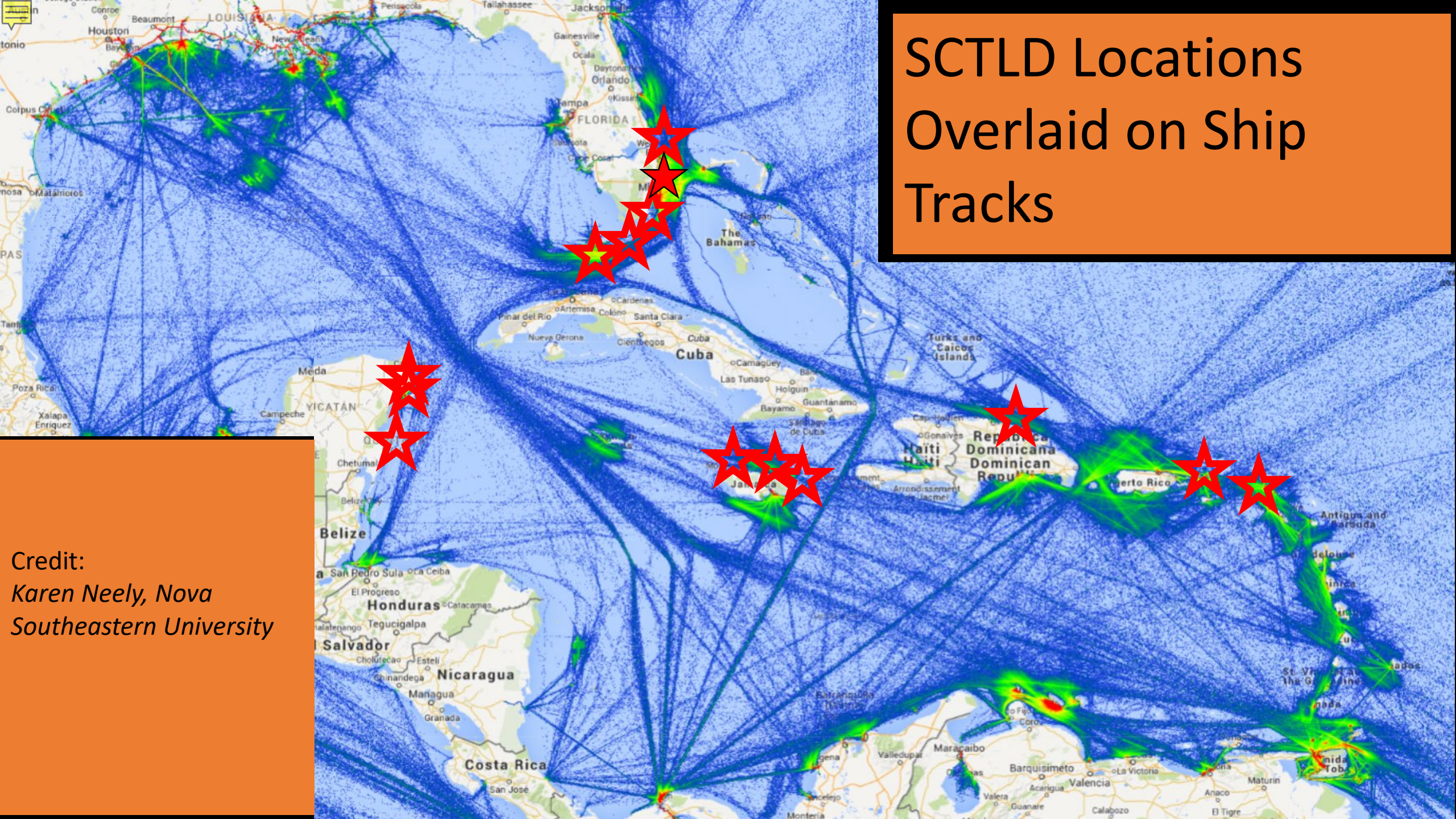
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- **Ballast Water**
  - Communication with VI Port Authority, EPA, USCG, CRRT?





# SCTLD Locations Overlaid on Ship Tracks



Credit:  
*Karen Neely, Nova  
Southeastern University*



# If Ballast Water is a vector, what can be done?

- Per comms with UNEP CEP :
- The Netherlands' Shipping Inspectorate is issuing a warning to ships coming from areas where STCLD has been reported that they are not allowed to discharge any ballast water in any harbor of the islands of the Caribbean Netherlands that have not yet been affected (i.e. Bonaire, and St. Eustatius [both with large oil transshipment facilities] and Saba).
- Ships will have to exchange their ballast water at least 50 miles offshore in water depths of >200 m before coming into the harbor.
- This is being done just in case ballast water is a vector for SCTLD and is allowed under the Ballast Water Management Convention (BWMC) under the IMO.
- The Netherlands Shipping Inspectorate has also reached out to the Caribbean MoU on Port State Control (CMOU-PSC) for support of other member states to make this a regional policy.







# NEEDS

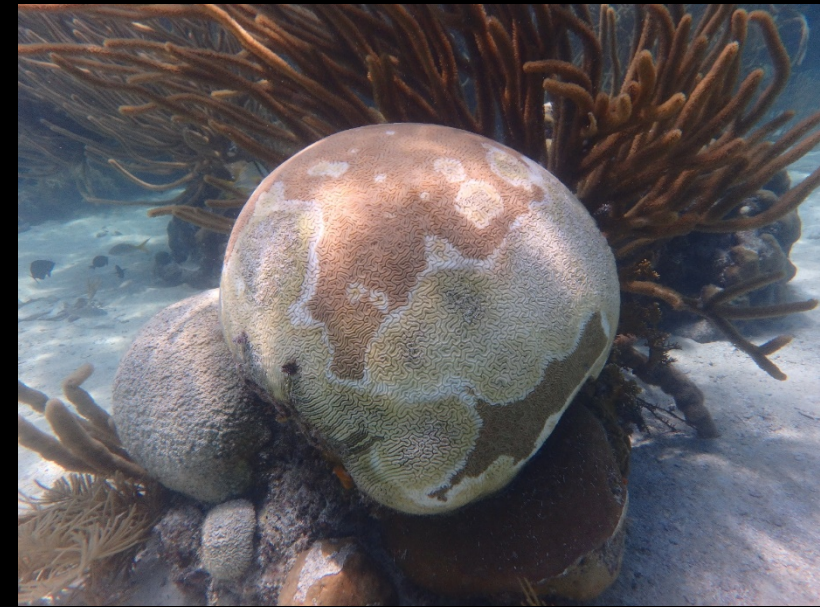
- Request/Require SCTLD survey in projects
  - Report positive and negative results
- Connect and inform your contacts in wider Caribbean





# NEEDS

- Request/Require SCTLD survey in projects
  - Report positive and negative results
- Connect and inform your contacts in wider Caribbean
- Dedicated leadership in scoping and addressing ballast water as potential disease vector
  - Identification of BMPs that can be applied NOW
  - Enforcement of existing regulations
  - Collaboration with shipping/ cruise/ boating industries
  - Recognition that this is **URGENT!**





# More RESOURCES

For SCTLD in Florida:

- <https://floridakeys.noaa.gov/coral-disease/>
  - <https://floridadep.gov/fco/coral/content/florida-reef-tract-coral-disease-outbreak>
- 

For USVI SCTLD

- <https://dpnr.vi.gov/czm/sctld/>
  - <https://viepscor.org/sctld-outbreak>
- 

For Caribbean wide

- <http://www.agrra.org/coral-disease-outbreak/>

Thank You!!