Florida Department of Environmental Protection

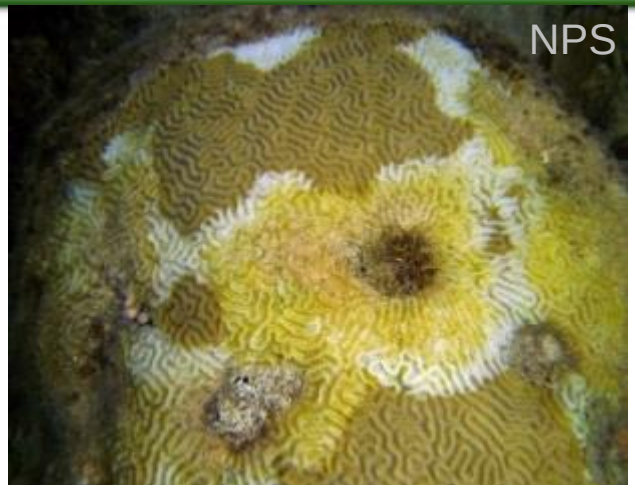
Florida Coastal Office

Florida Reef Tract Coral Disease Outbreak: Status and Response Efforts

12/12/2017

First Warning Signs in 2014

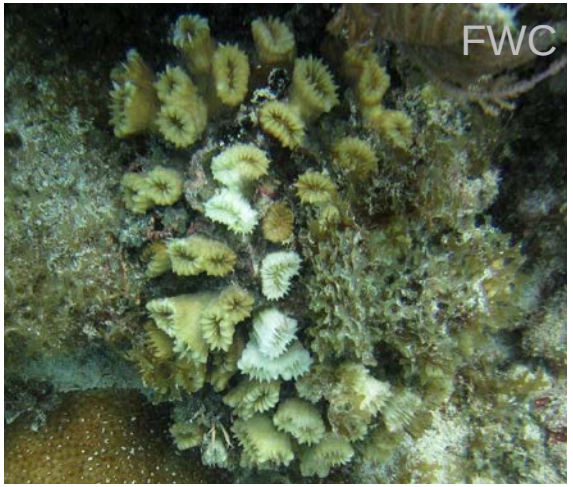
Diploria labyrinthiformis



Pseudodiploria strigosa

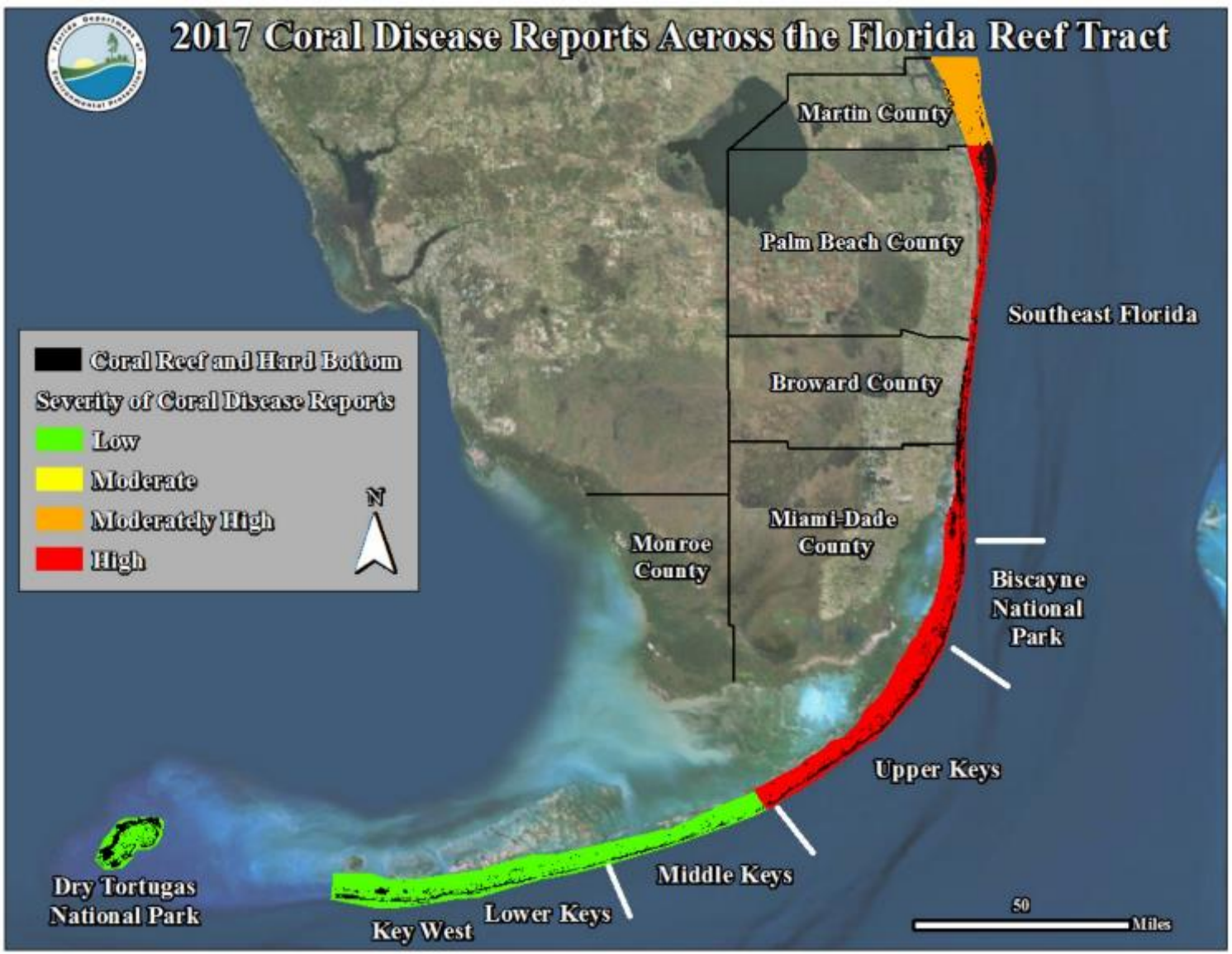
Dichocoenia stokesii

Meandrina Meandrites

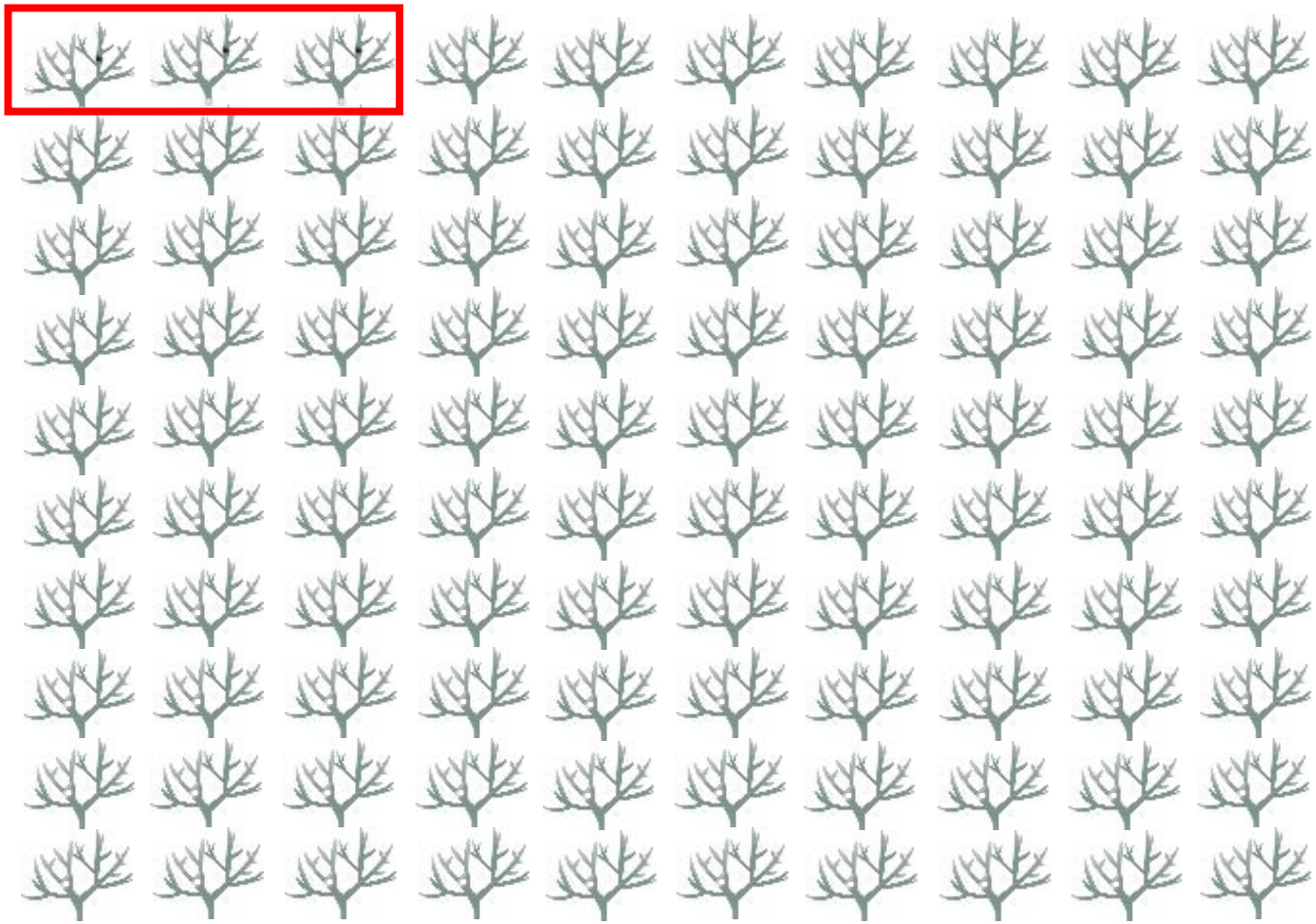


Eusmilia fastigiata

Disease Progression



Background Coral Disease



Endemic Disease Prevalence:

2-3%

Current Disease Outbreak

At some sites

>25%

of the entire coral population is affected

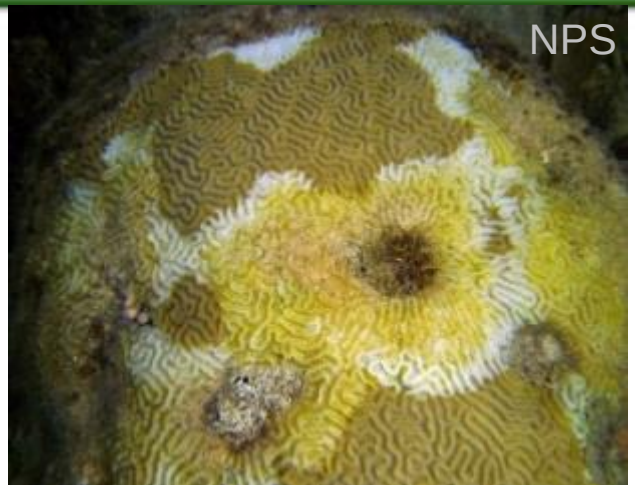
Current Disease Outbreak

Species Specific Disease Prevalence:

66-100%

Disease Prevalence

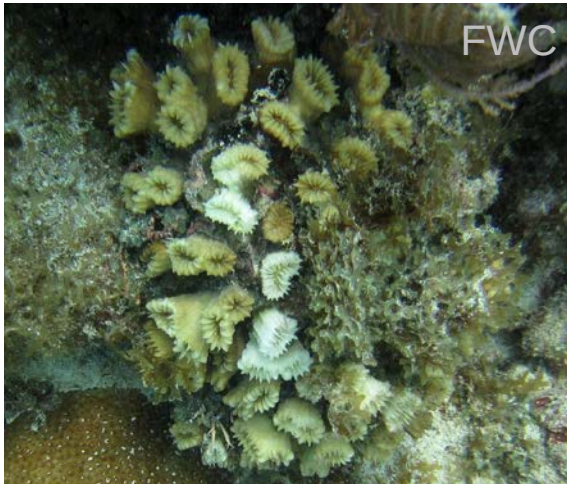
Hens & Chickens: 28%



Hens & Chickens: 66%

Hens & Chickens: 33%

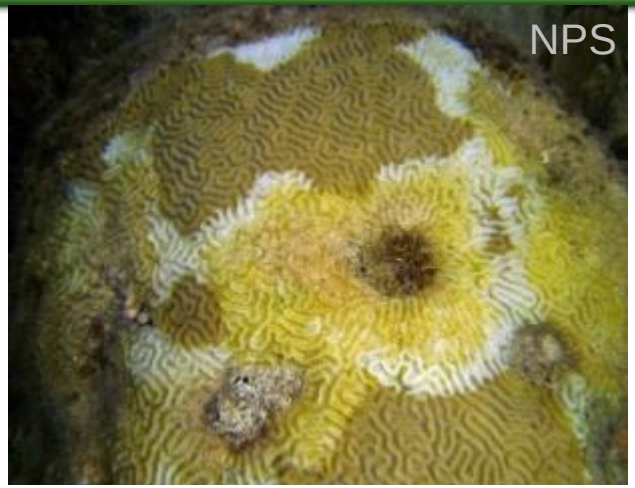
Hens & Chickens: 100%



Hens & Chickens: N/A

Whole Colony Mortality Rates

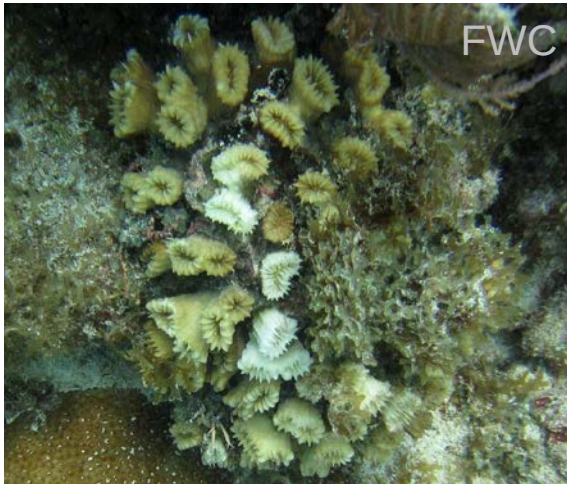
Grecian Rocks: 66%



Grecian Rocks: 100%

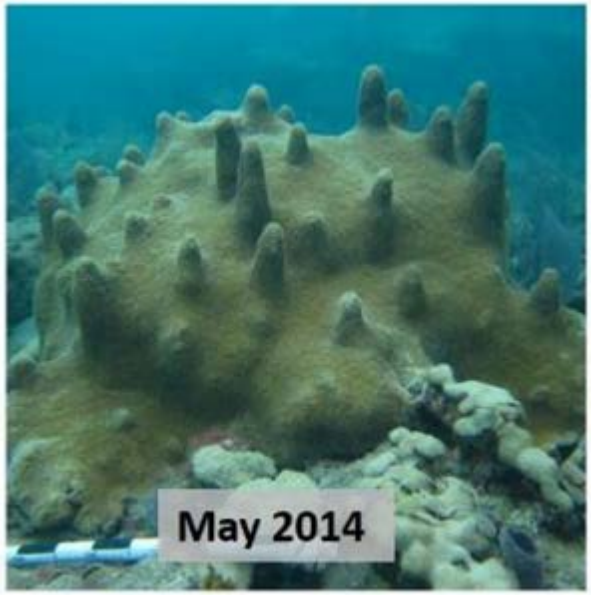
Grecian Rocks: 92%

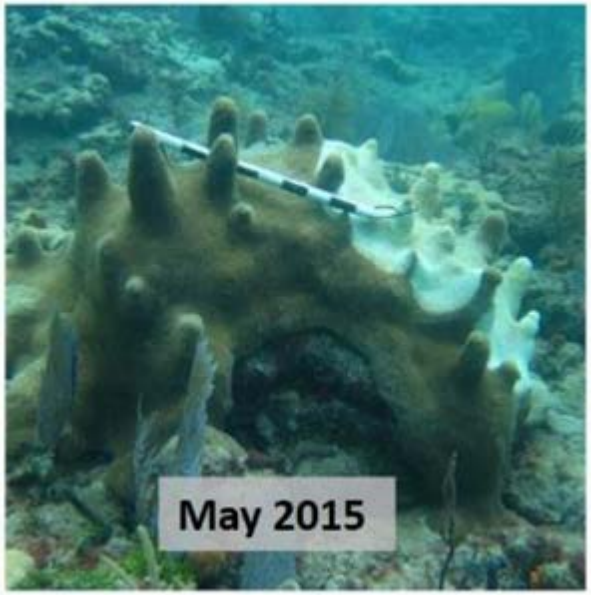
Grecian Rocks: 100%

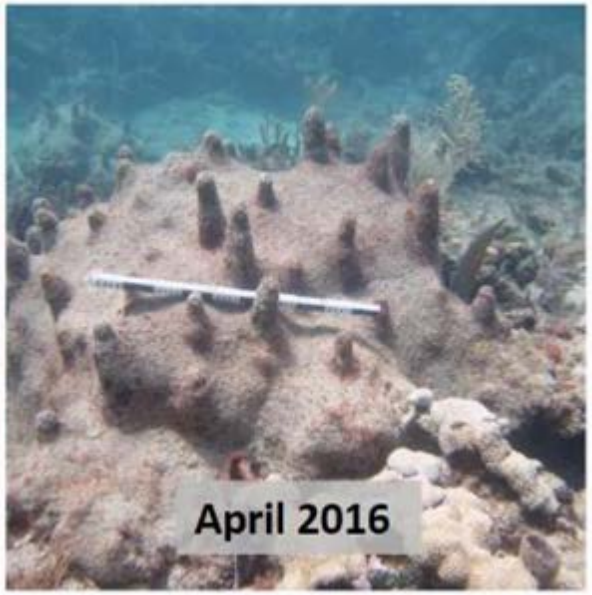


Grecian Rocks: 66%

Rapid Disease Progression



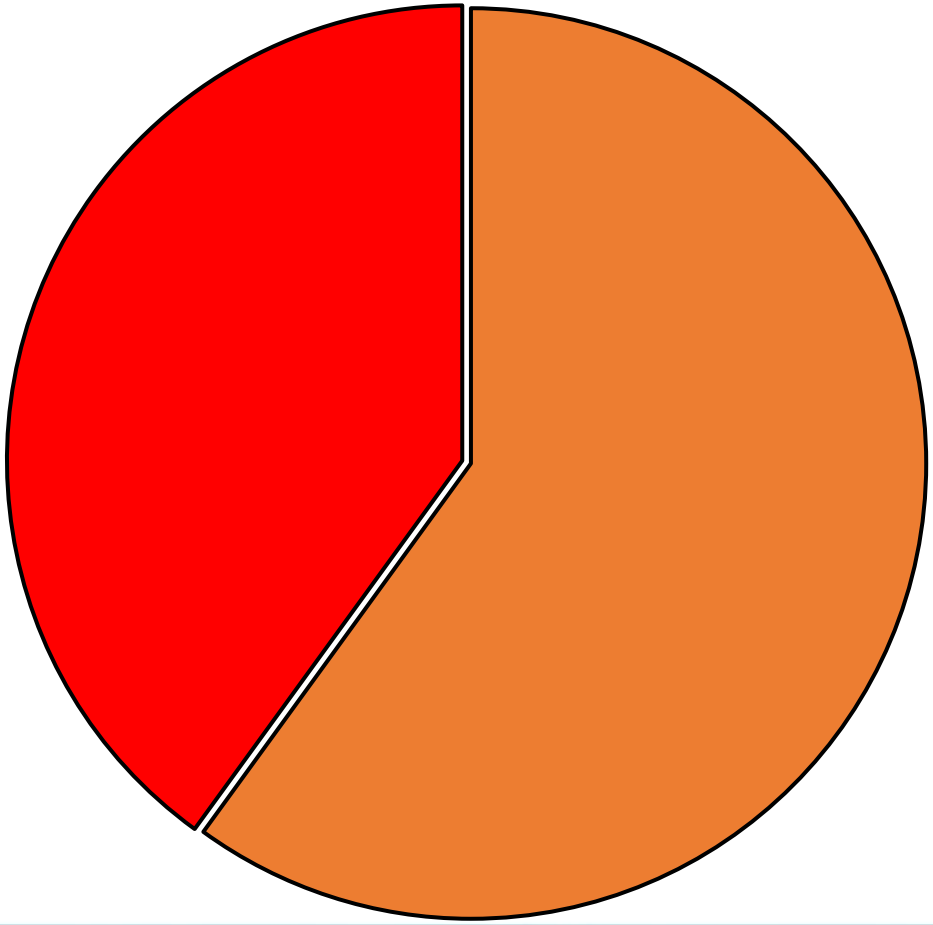




Coral Susceptibility to Outbreak

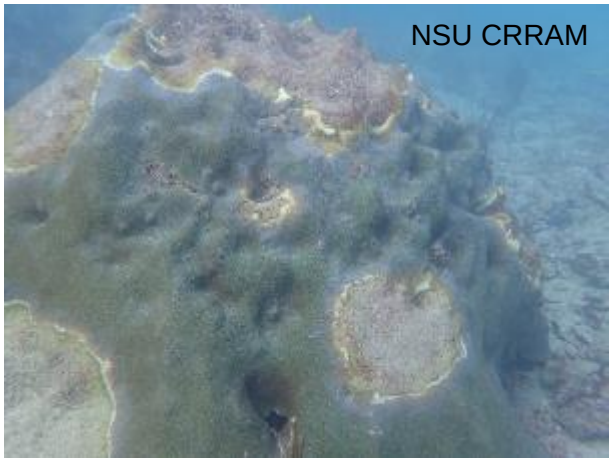
Nearly 50% of the species along the Florida Reef Tract have been affected during this outbreak

Species confirmed with tissue lesions



Unaffected species to date

Impact to Primary Reef Builders



Orbicella faveolata

Orbicella annularis

Colpophyllia natans

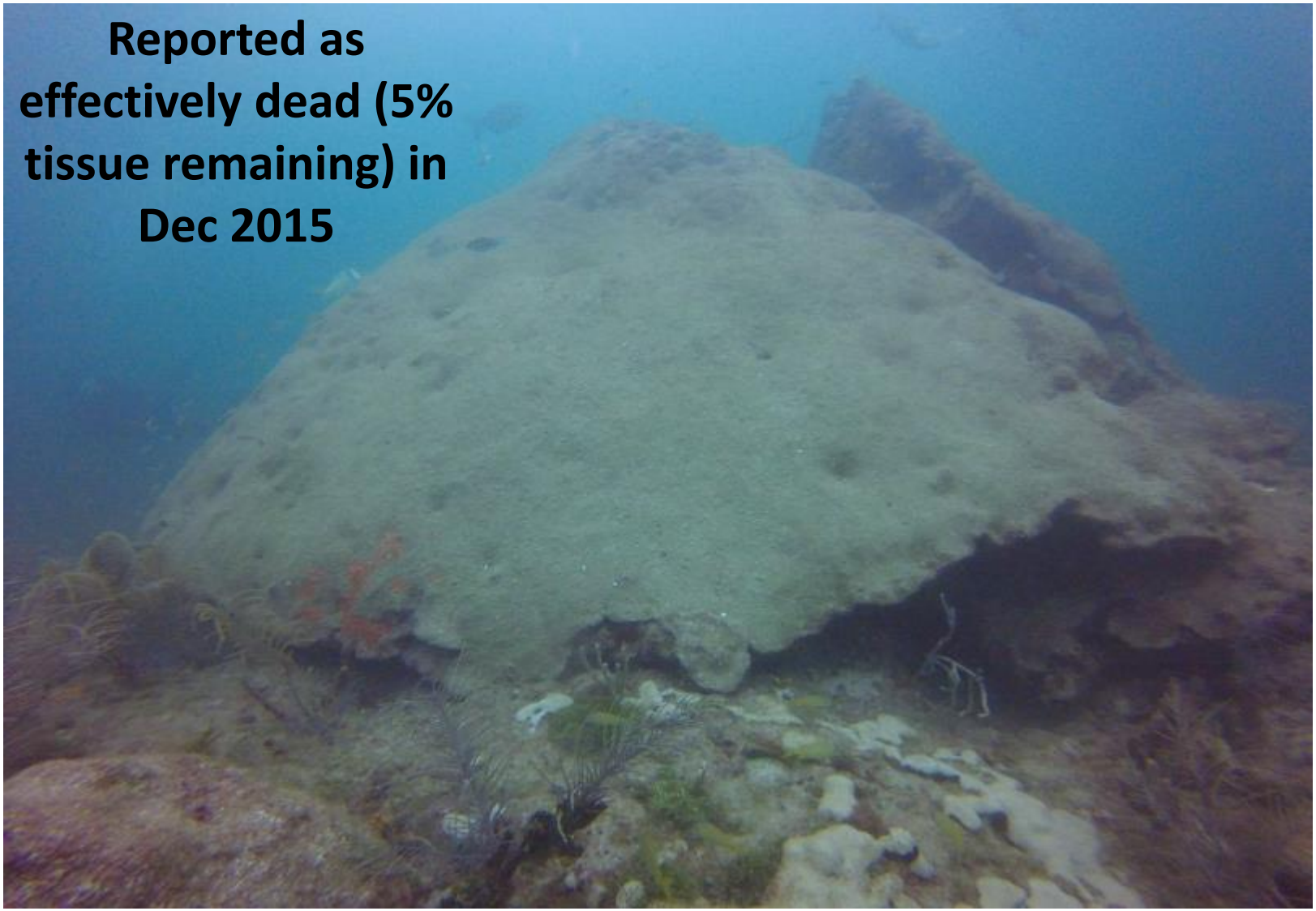
Montastraea cavernosa

Siderastrea siderea

Oldest Living Corals

330+ years old

Oldest living corals



Economic and Ecological Significance

New time or place

Greater frequency

Species of concern

Unidentified lesions

UNPRECEDENTED EVENT

1. **Tenure of the disease outbreak.** After 3 years, it is still active in on some species in SEFL. Actively starting on many reefs in the FL Keys with most vulnerable species
2. **The # of coral species affected.** This outbreak has impacted nearly half the species in FL. Documented on all the primary/massive reef builders along the FL reef tract
3. **Spatial scale.** It has now encompassed half of the Florida Reef Tract
4. **The incredibly high frequency of whole colony mortality.** If a colony becomes infected it will likely suffer 100% mortality
5. **Reduction in coral population structure.** The loss of massive, framework building species will disproportionally contribute to a loss of coral cover.
6. **The ramifications for FL:** FL depends on healthy reef ecosystems for economic vitality, loss of ecosystem services could be catastrophic. Recovery will require hundreds of years!

Response Efforts

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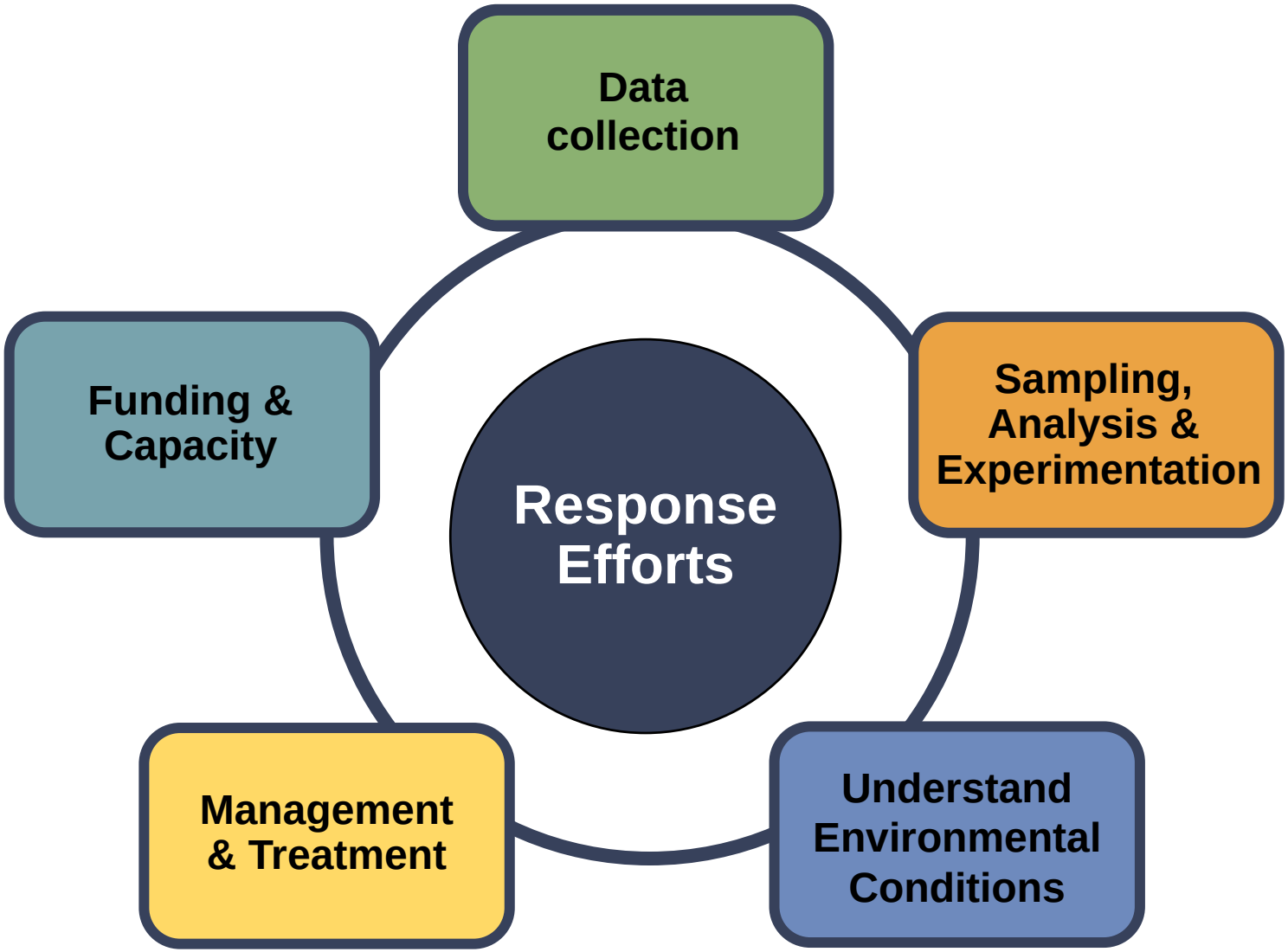


Response Efforts

Data Collection

Document the distribution, prevalence, severity and impacts associated with the disease outbreak.

- Reef tract-wide monitoring programs

Coral Reef Evaluation and Monitoring Projects

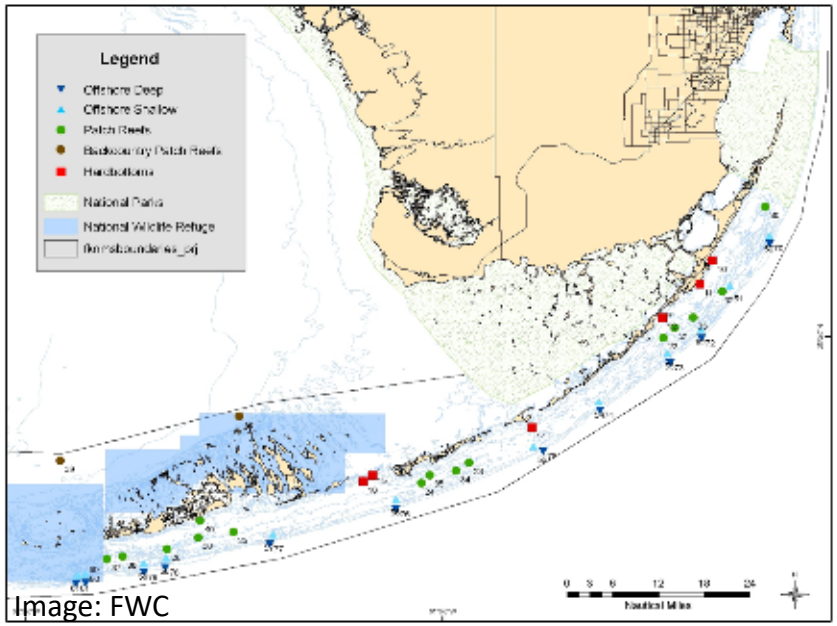


Image: FWC

Florida Reef Resilience Program

Photo: NSU

Response Efforts

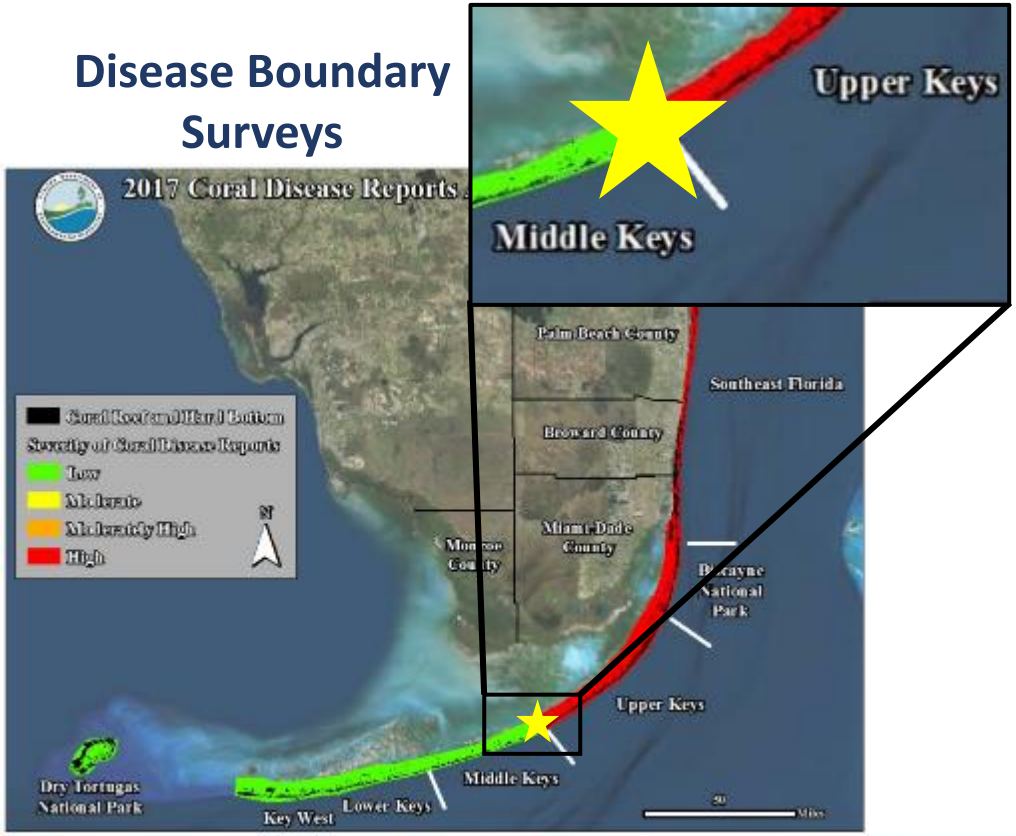
Data Collection

Document the distribution, prevalence, severity and impacts associated with the disease outbreak.

- Targeted coral disease surveys

Large Coral Assessment

Disease Boundary Surveys



Response Efforts

Data Collection

Document the distribution, prevalence, severity and impacts associated with the disease outbreak.

- Citizen science

SEAFAN
Southeast Florida Action Network
We're All Connected ~ Keep It Protected

COCEAN
COMMUNITY-BASED OBSERVATIONS OF COASTAL ECOSYSTEMS AND ASSESSMENT NETWORK

Response Efforts

Sampling, Analysis & Experimentation

Identify potential pathogens and characterize the disease(s).

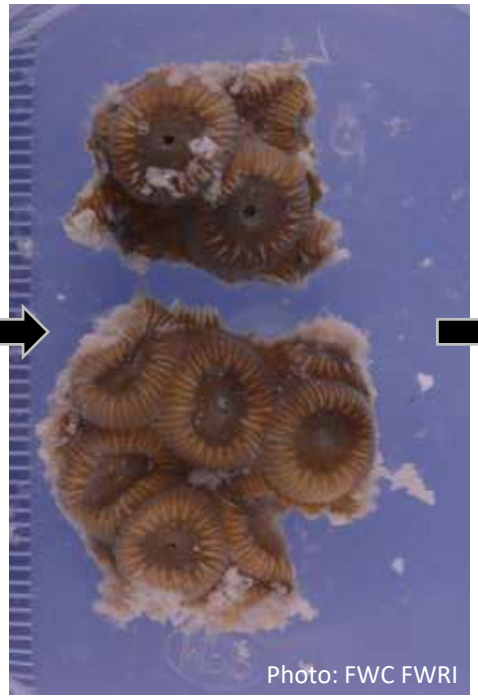
- Coral tissue sample collection

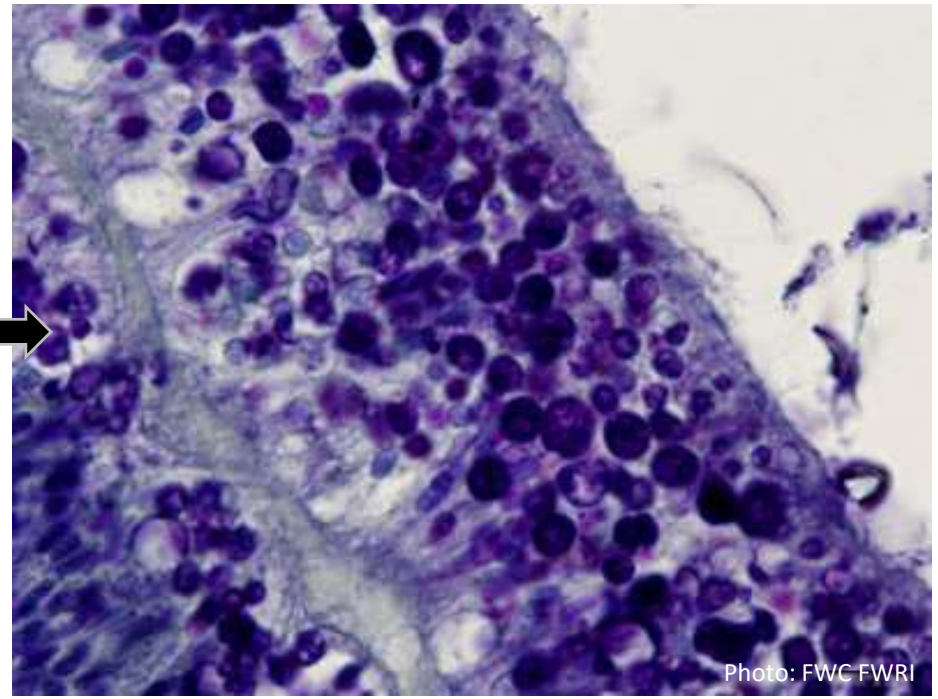
Response Efforts

Sampling, Analysis & Experimentation

Identify potential pathogens and characterize the disease(s).

- Laboratory analysis





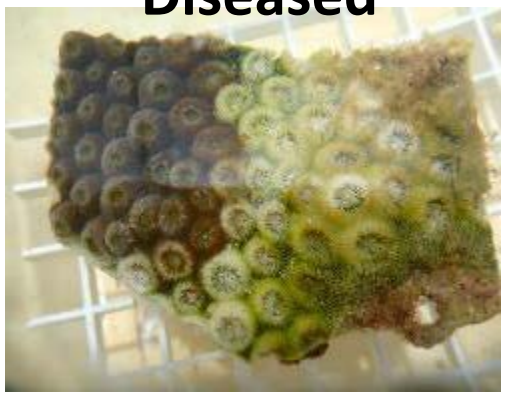
Response Efforts

Sampling, Analysis & Experimentation

Identify potential pathogens and characterize the disease(s).

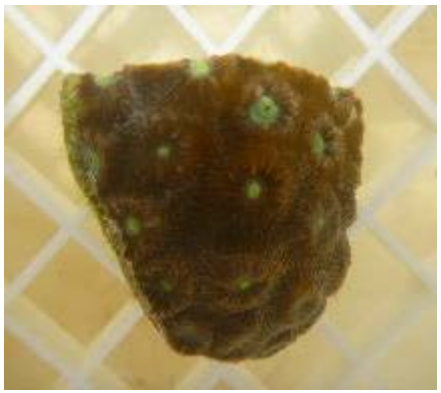
- Laboratory transmission experiments

Diseased



Touching

Non-touching



Response Efforts

Understand Environmental Conditions

Understand if changes in environmental conditions may have caused or contributed to the outbreak.

Why did this coral disease outbreak happen when it did?

Coral Data

Photo: DEP

Water Temperature

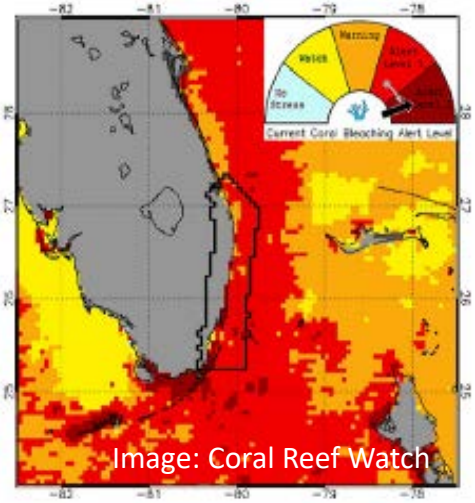


Image: Coral Reef Watch

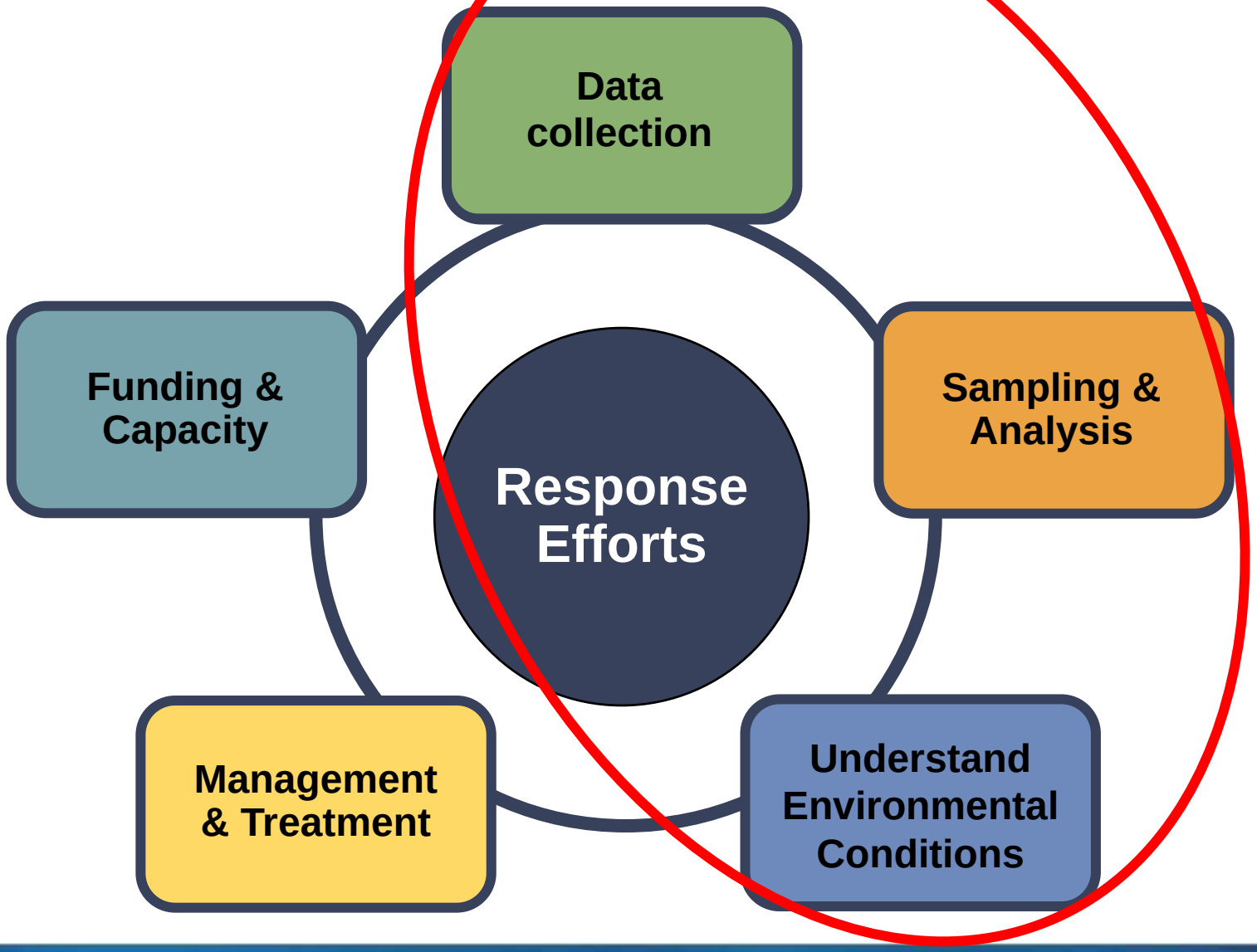
Water Quality

Photo: NSUOC

Sedimentation

Photo: DEP

Response Efforts



Response Efforts

Management & Treatment

Implement management interventions and experiment with treatments.

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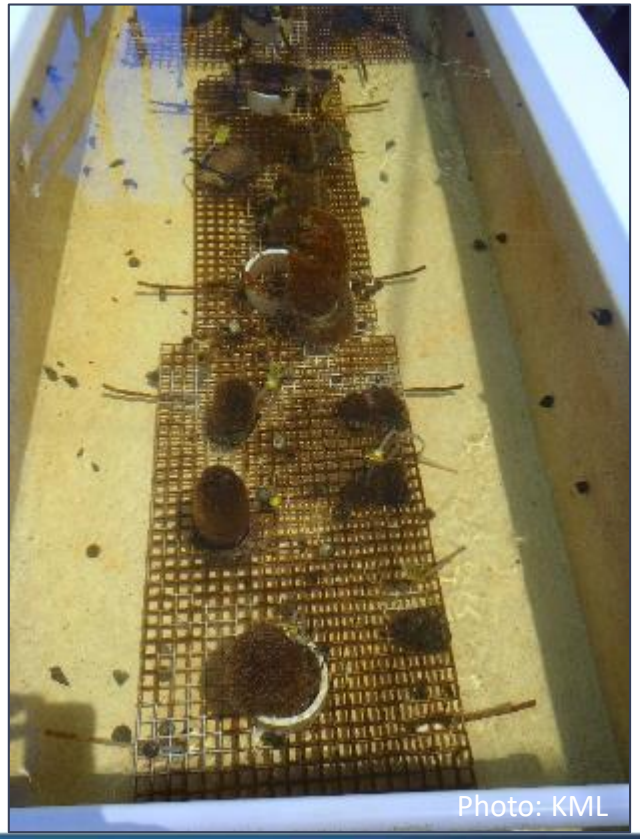
Management & Treatment

Implement management interventions and experiment with treatments.

- Pillar coral rescue effort



Response Efforts

Management & Treatment

Implement management interventions and experiment with treatments.

- Laboratory-based treatment experiments

Photos: NOAA

Response Efforts

Funding & Capacity

Seek additional funding and capacity to support more comprehensive response efforts.

Thanks to the Florida Legislature and Governor Scott, FCO Southeast Region received $1 Million in FY17 to support Florida's coral reefs:

Priority Coral Disease Response

- **Coral Disease Investigation Training**
- **Strategic Sampling & Laboratory Analysis**
- **Coral Disease Surveys & Fixed Site Monitoring**
- **Data Management and Epidemiological Analysis**
- **Sampling Plan and Disease Intervention Workshops**

Photo: T. Grollimund

What's Next?

Continue coral disease investigation.

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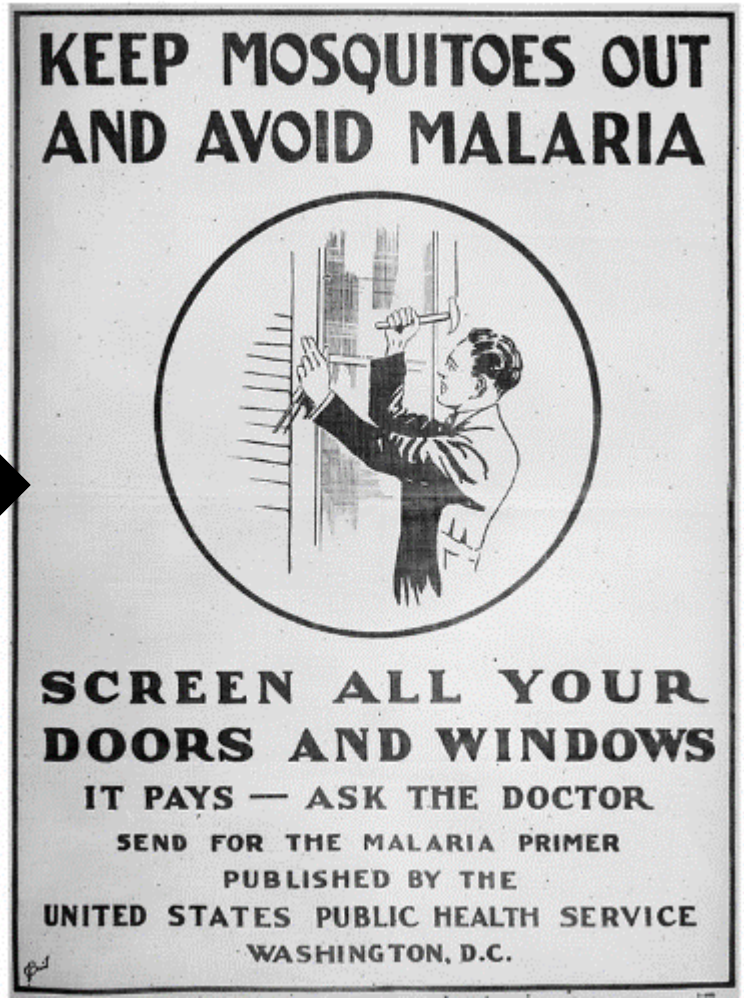


What's Next?

Implement management interventions.

Laboratory studies

Small-scale field trials

Larger-scale field application

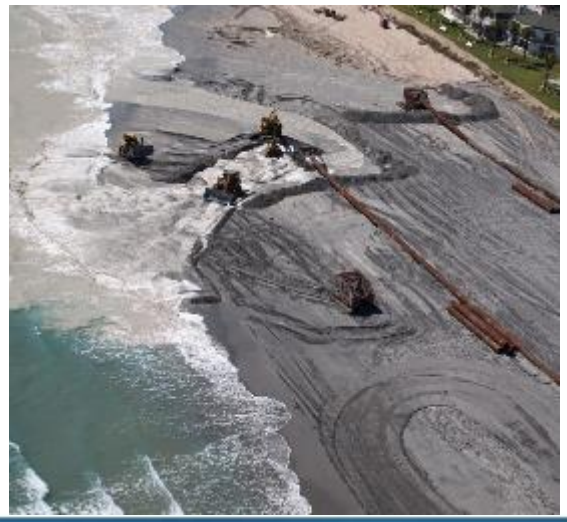
Photos: NSU CRRAM

What's Next?

Continue coordinating with partners.

What's Next?

Control what we can: Address underlying environmental conditions.



Thank You!

Karen Bohnsack

FKNMS Liaison

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