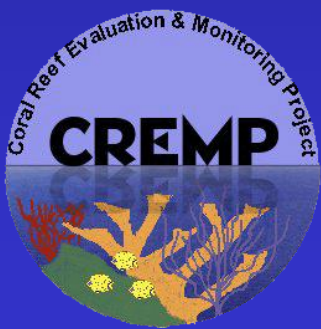


Updates on the Coral Disease Outbreak

Prepared for the US EPA Water Quality Protection Program Steering Committee Meeting

May 22nd, 2018

**Rob Ruzicka; Mike Colella; Lindsay Huebner; Ananda Ellis;
Katy Cummings; Tiffany Boisvert; Jennifer Stein; Nate Berkebile;
Stephanie Schopmeyer**

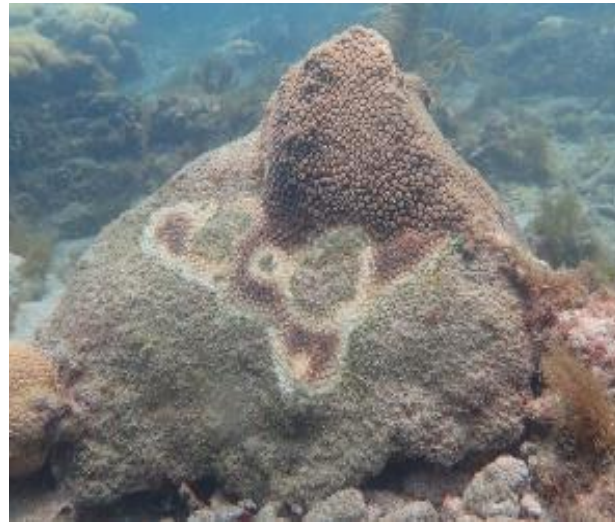


**CREMP is funded by US EPA Water Quality Protection Program
Federal Award No. X7-95447709**

First Lesions Appeared in 2014



Diploria labyrinthiformis



Montastraea cavernosa



Pseudodiploria strigosa



Dichocoenia stokesii

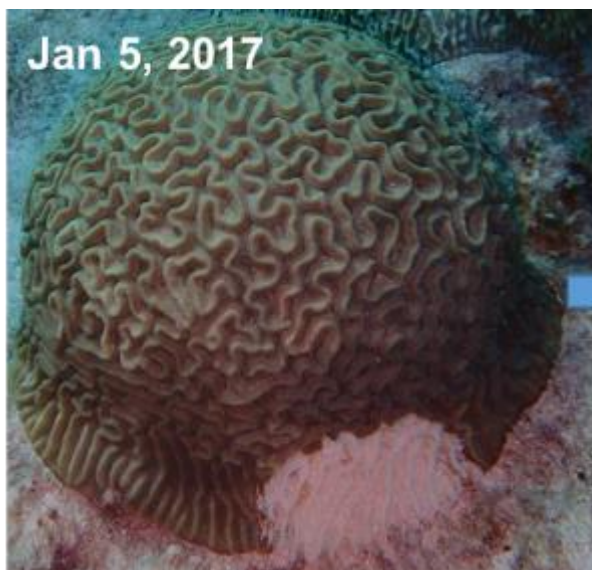
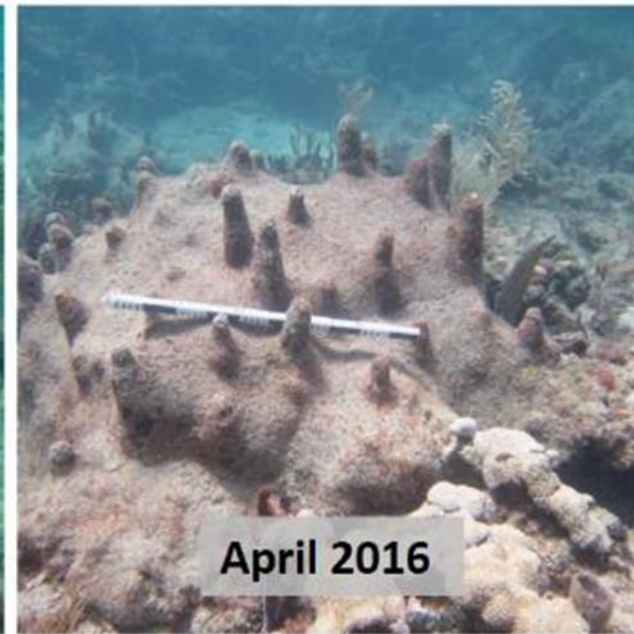
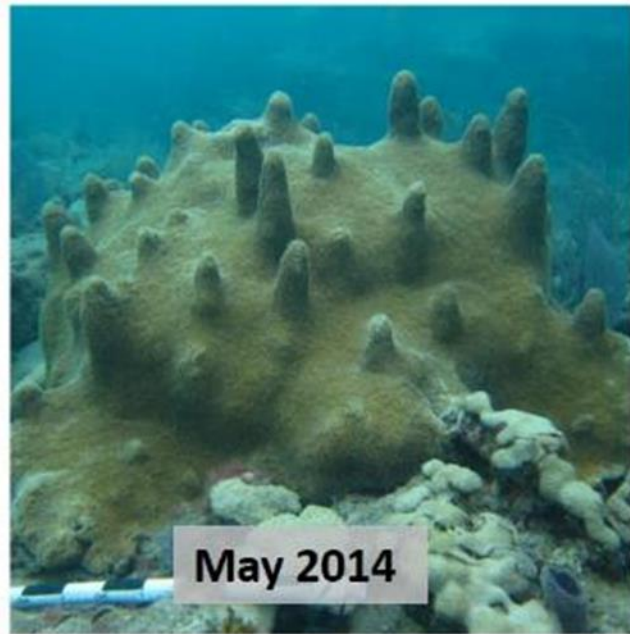


Meandrina Meandrites

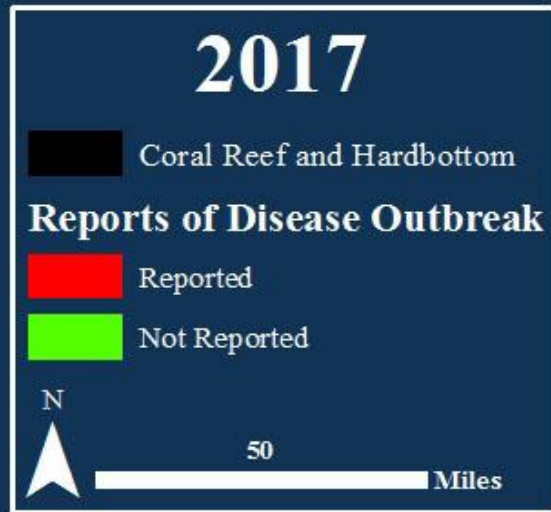


Siderastrea siderea

Rate of Tissue Loss



Coral Disease Outbreak Extent Across the Florida Reef Tract



Dry Tortugas
National Park

Key West

Lower Keys

Middle Keys

Upper Keys

Biscayne
National
Park

Monroe
County

Miami-Dade
County

Broward County

Palm Beach County

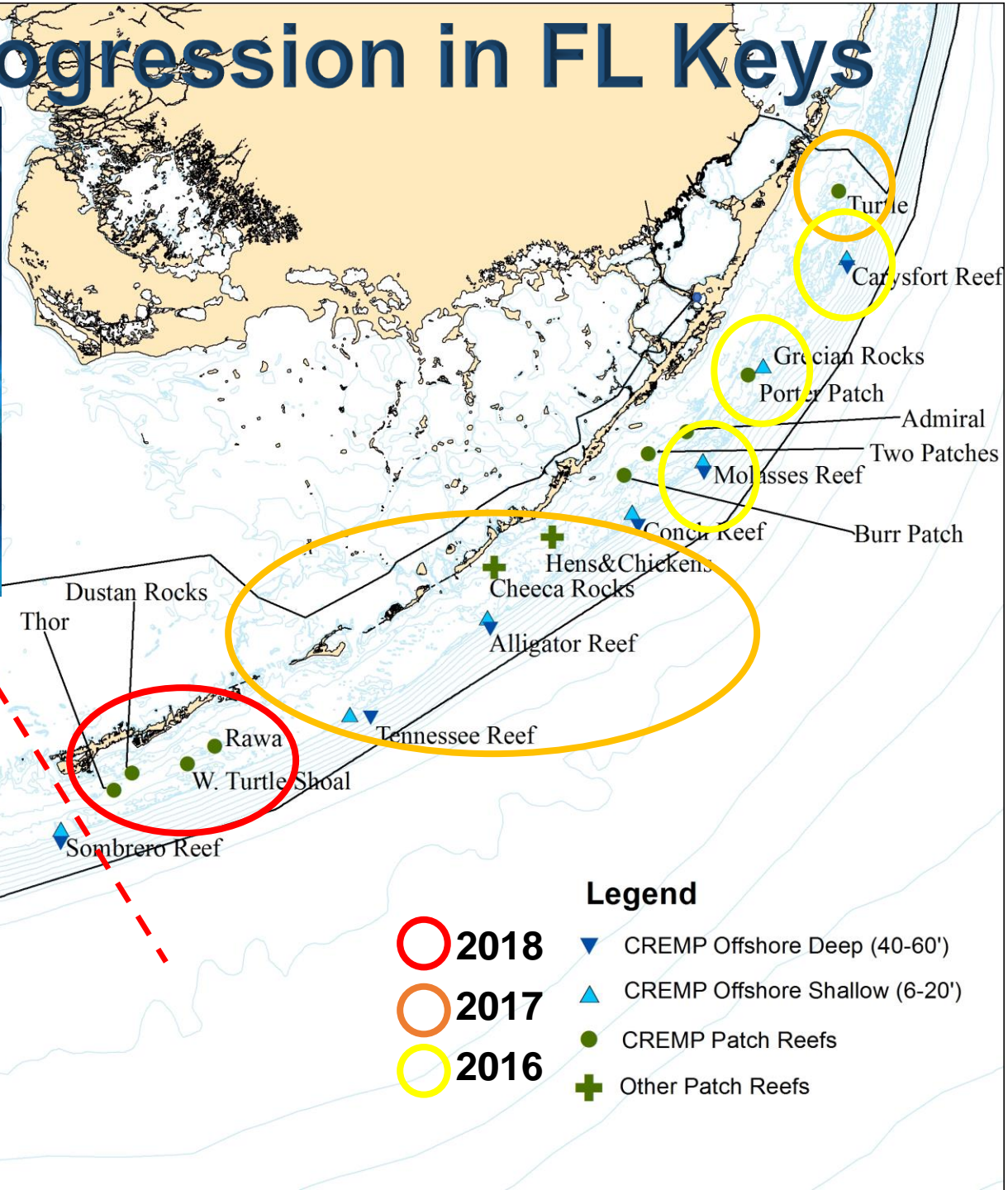
Martin County

Southeast Florida



Current Progression in FL Keys

Coral Disease Outbreak Extent Across the Florida Reef Tract



Legend

- 2018** (Red circle)
- 2017** (Orange circle)
- 2016** (Yellow circle)
- ▼ CREMP Offshore Deep (40-60')
- ▲ CREMP Offshore Shallow (6-20')
- CREMP Patch Reefs
- ✚ Other Patch Reefs









**Hens and Chickens
Sanctuary Preservation Area
Florida Keys National Marine Sanctuary**



MyFWC.com



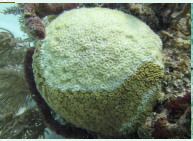





Florida Fish and Wildlife
Conservation Commission

CREMP Coral Disease Prevalence 2011–2017 Upper FL Keys

Year	CNAT	DLAB	DSTO	MCAV	MMEA	PSTR	SSID	ORBI	Total
									
2011	0.0	11.1	7.4	0.0	0.0	9.1	6.2	1.2	3.4
2012	0.0	0.0	3.0	1.2	0.0	0.0	6.5	2.5	2.9
2013	0.0	0.0	0.0	3.7	0.0	0.0	3.4	1.4	1.4
2014	0.0	0.0	2.9	3.1	0.0	16.7	13.5	3.2	5.7
2015	0.0	0.0	2.9	1.4	0.0	0.0	14.2	4.1	6.1
2016	0.0	0.0	0.0	6.6	0.0	7.1	4.9	9.7	3.8
2017	50.0	7.1	20.0	10.5	0.0	50.0	22.3	19.7	10.7

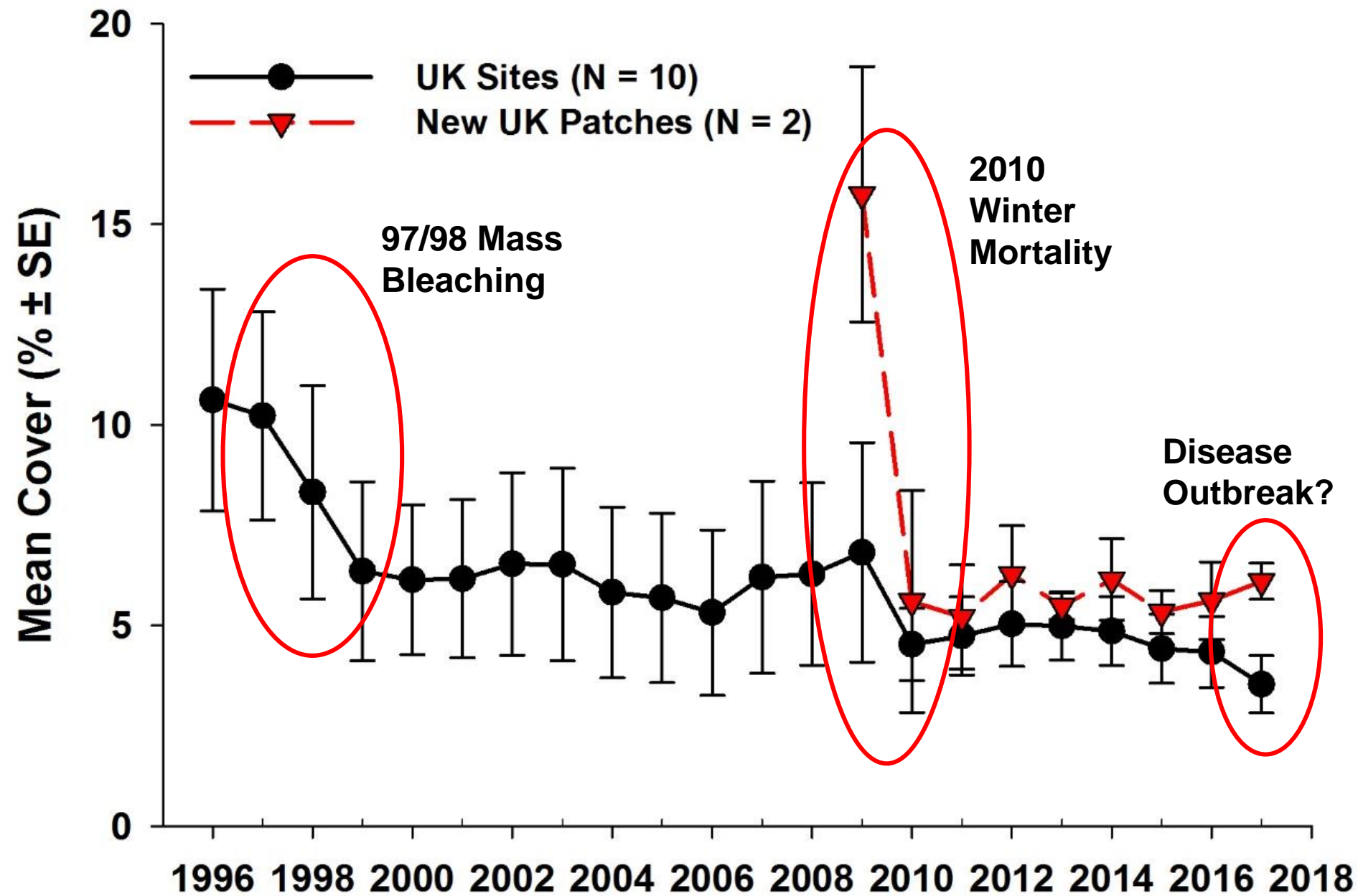
- $N = 14$ sites in the Upper Keys; data pooled for all sites,
- Prevalence = Percentage of all colonies
- Lesion causing agents include: White Plague, Dark Spots, Black Band

Species Specific & Total Coral Abundance 2011–2017 Upper FL Keys

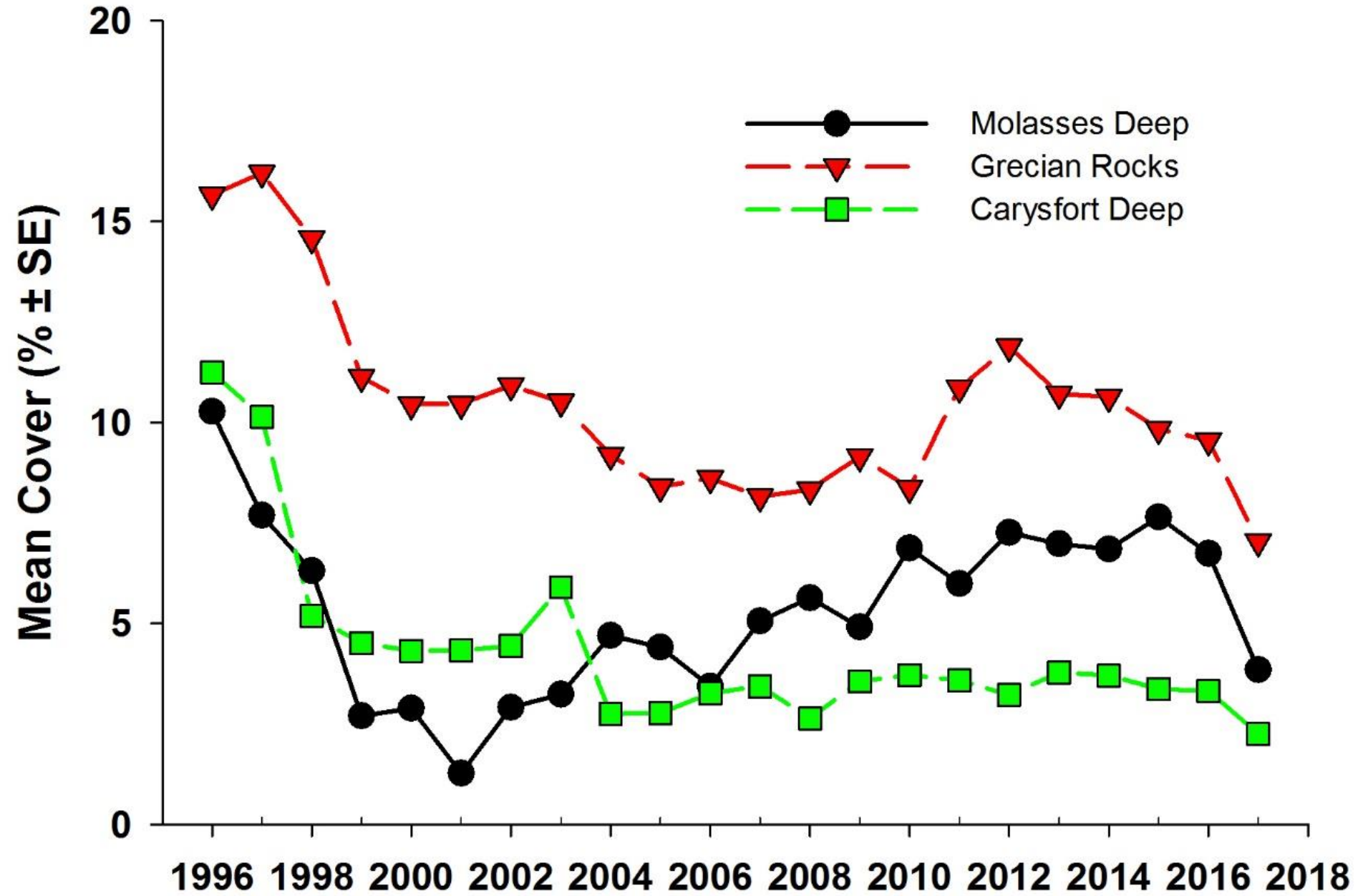
Year	CNAT	DLAB	DSTO	MCAV	MMEA	PSTR	SSID	ORBI	Total
									
2011	13	9	27	77	7	11	505	82	2078
2012	6	8	33	81	9	15	583	79	2395
2013	10	11	32	81	9	13	601	72	2282
2014	8	11	34	64	10	12	543	62	2132
2015	8	11	35	70	11	15	579	73	2097
2016	3	13	33	76	10	14	650	62	2132
2017	2	14	10	38	0	6	560	66	1834

- $N = 12$ sites; data pooled for all sites
- Total No. of Colonies

CREMP Coral Cover in the Upper Keys



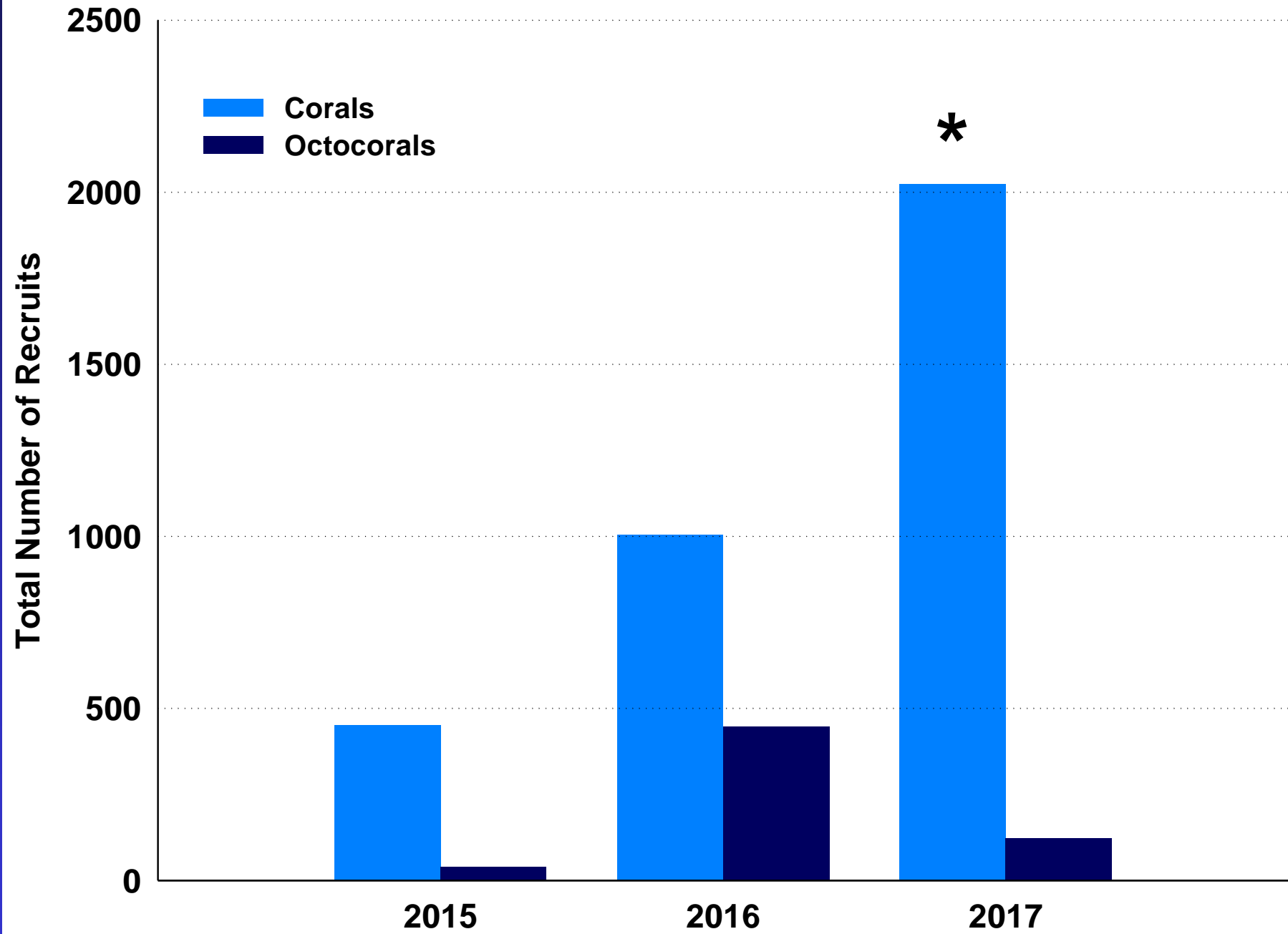
CREMP Coral Cover At Three Reefs in the Upper Keys



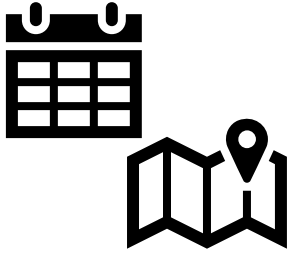
Coral Recruitment Project and Settlement



Coral Recruitment in the Florida Keys



Economic & Ecological Significance



New time or place



Greater frequency



Species of concern



Unidentified lesions

UNPRECEDENTED EVENT

- 1. Tenure of the disease outbreak.** Currently entering its 4th year and is still active in SE FL on coral species like MCAV. Actively starting on many reefs in the Middle FL Keys
- 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 two-thirds 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 disproportionately 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!



Disease Response Partners

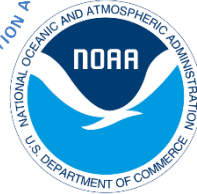


Smithsonian

SOLUTIONS TODAY FOR REEFS TOMORROW.

NATIONAL MARINE SANCTUARIES

FLORIDA KEYS



NOAA CORAL REEF CONSERVATION PROGRAM



CRY OF THE WATER

UNIVERSITY OF MIAMI ROSENSTIEL SCHOOL OF MARINE & ATMOSPHERIC SCIENCE



Protecting nature. Preserving life.™



UNIVERSITY OF SOUTH FLORIDA



NOVA SOUTHEASTERN UNIVERSITY

