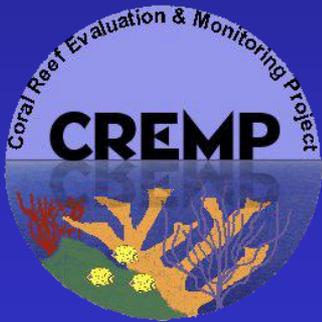


Coral Reef Evaluation and Monitoring Project US EPA Water Quality Protection Program Steering Committee Presentation March 2nd, 2016

**Rob Ruzicka, Mike Colella,
Vanessa Brinkhuis, Lindsay Huebner,
& Many Others**



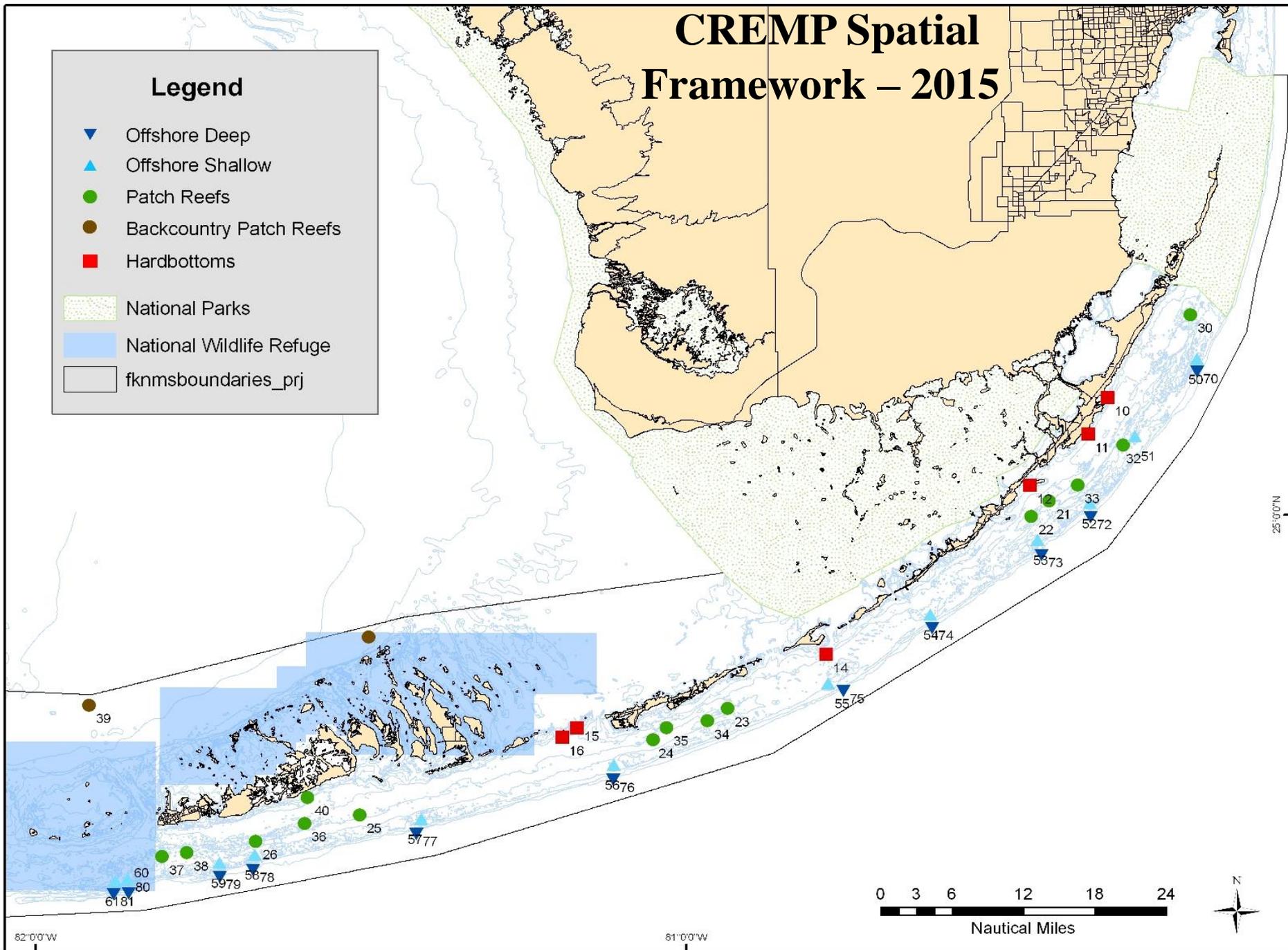
**CREMP is funded by US EPA Water Quality Protection Program
Federal Award No. X7-95447709**

**A presentation of the Florida Fish and Wildlife Conservation Commission/
Fish & Wildlife Research Institute**

CREMP Spatial Framework – 2015

Legend

- ▼ Offshore Deep
- ▲ Offshore Shallow
- Patch Reefs
- Backcountry Patch Reefs
- Hardbottoms
- ▨ National Parks
- ▨ National Wildlife Refuge
- ▭ fknmsboundaries_prj

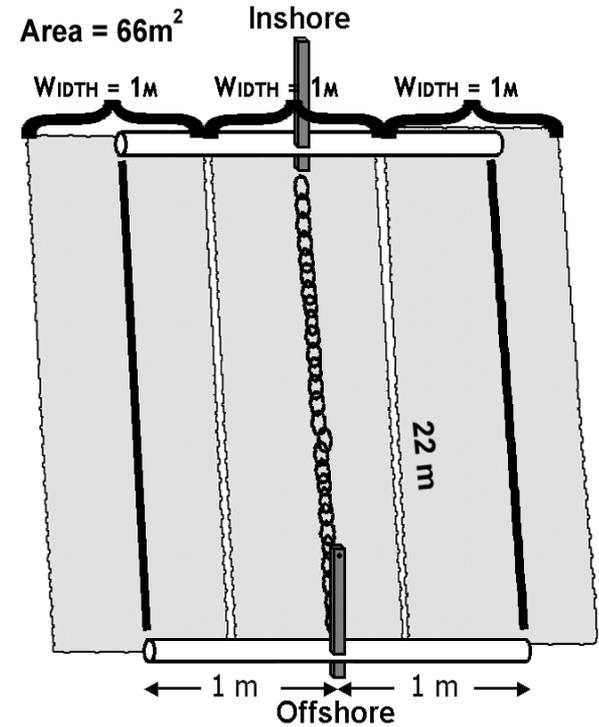
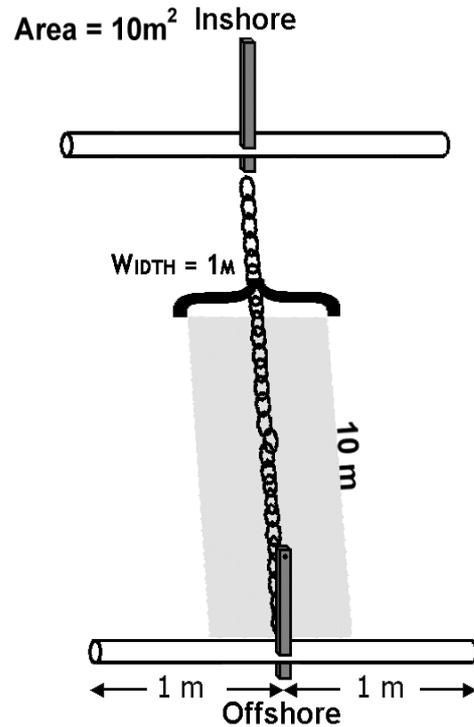
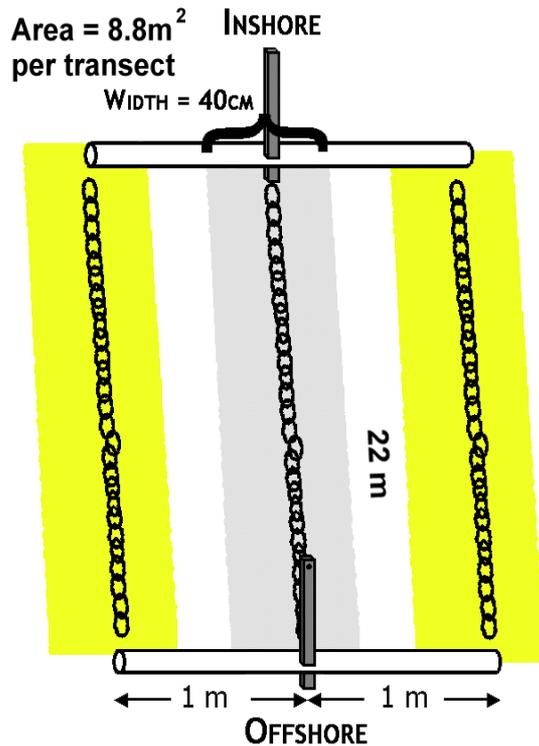


Methods - Present

Demographic Surveys

Xestospongia muta

Photo Transects



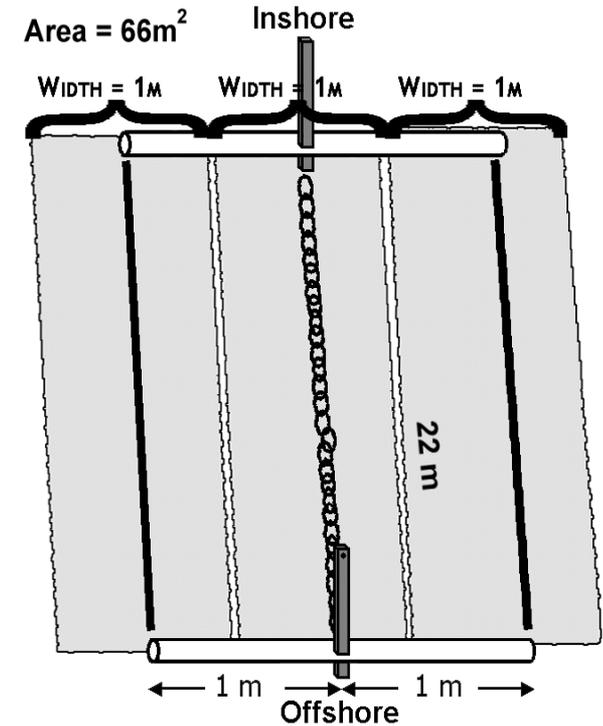
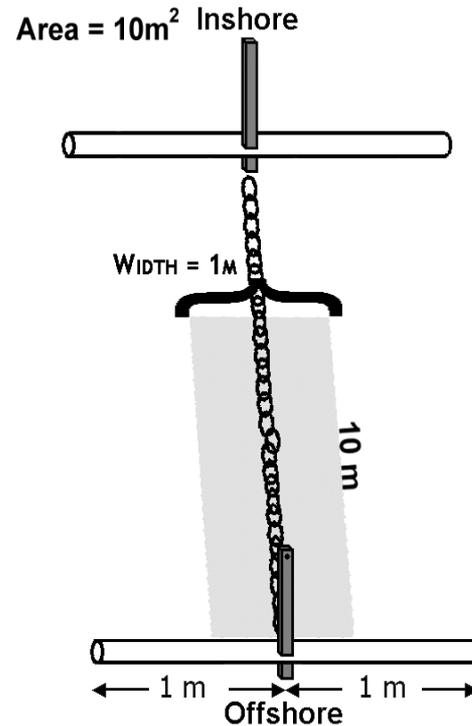
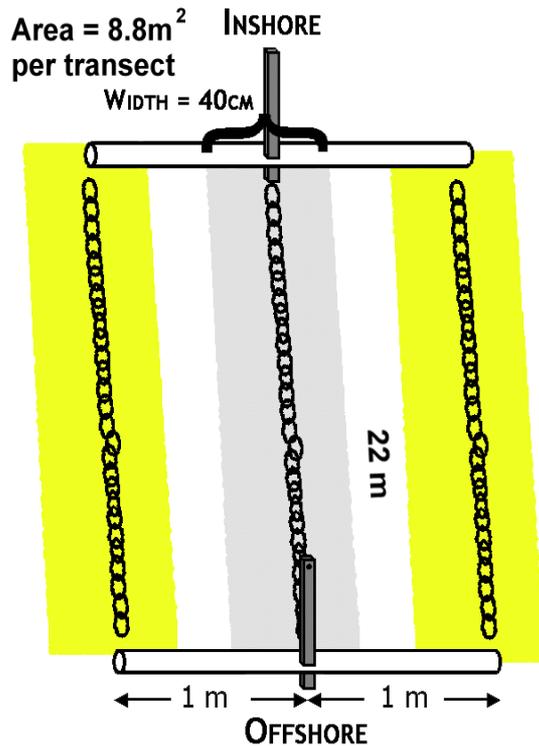
- Camera survey 300 transect – 40 sites; all stations ($n=160$ transects)
- Stony coral demographics - 40 sites; all stations ($n=160$ transects)
- Octocoral demographics – 21 sites; all stations ($n=84$ transects)
- *Xestospongia* demographics – 11 sites; 2 stations per site

Methods - Present

Demographic Surveys

Xestospongia muta

Photo Transects



Percent Cover:

1. Corals
2. Octocorals
3. Sponges
4. Zoanthids
5. Macroalgae
6. Cyanobacteria
7. Other benthic critters

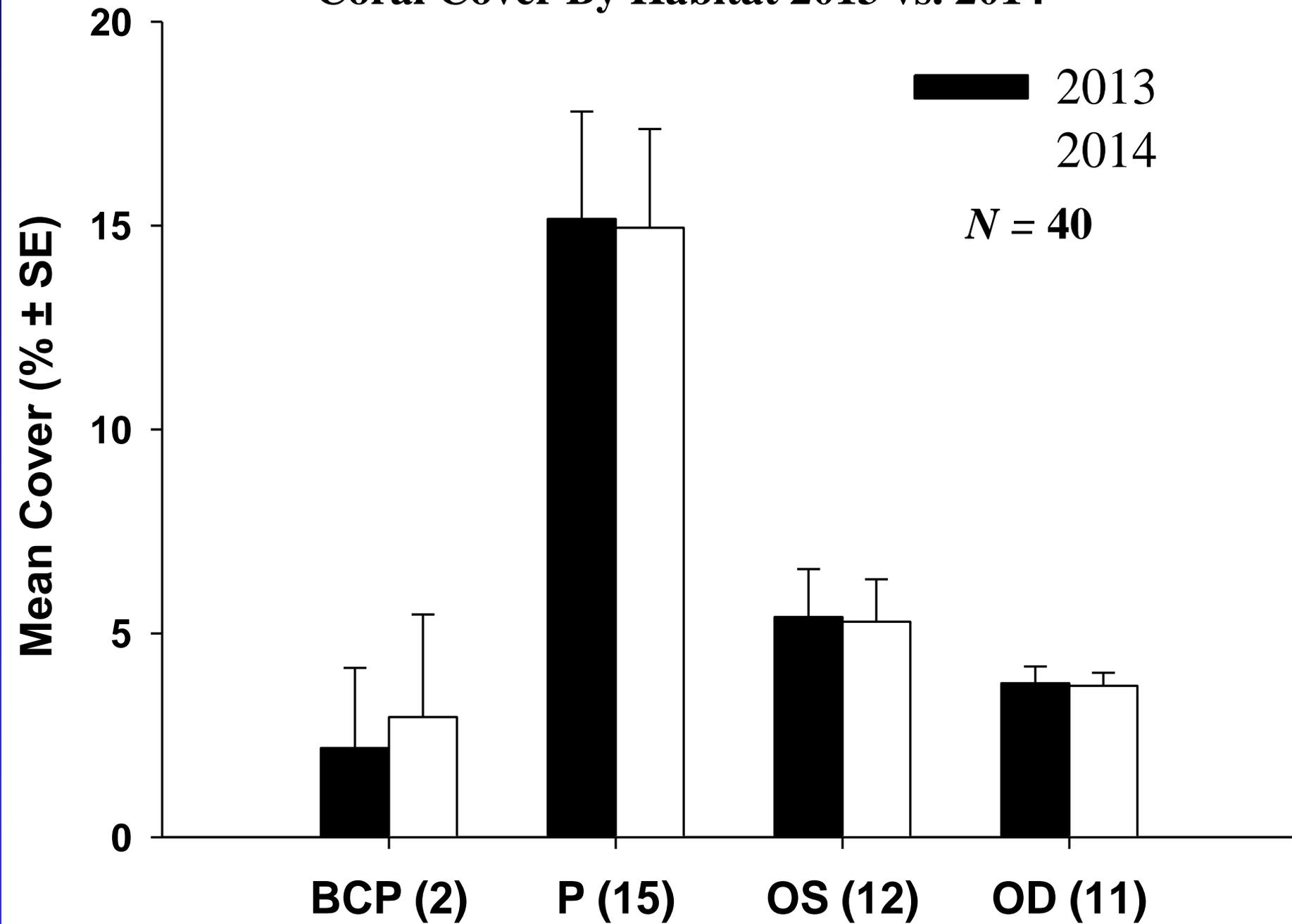
Coral & Octocoral:

1. Abundance (density)
2. Size Class Information
3. Living Tissue Estimates
4. Disease Prevalence
5. Bleaching Prevalence
6. Incidence of Recent Mortality

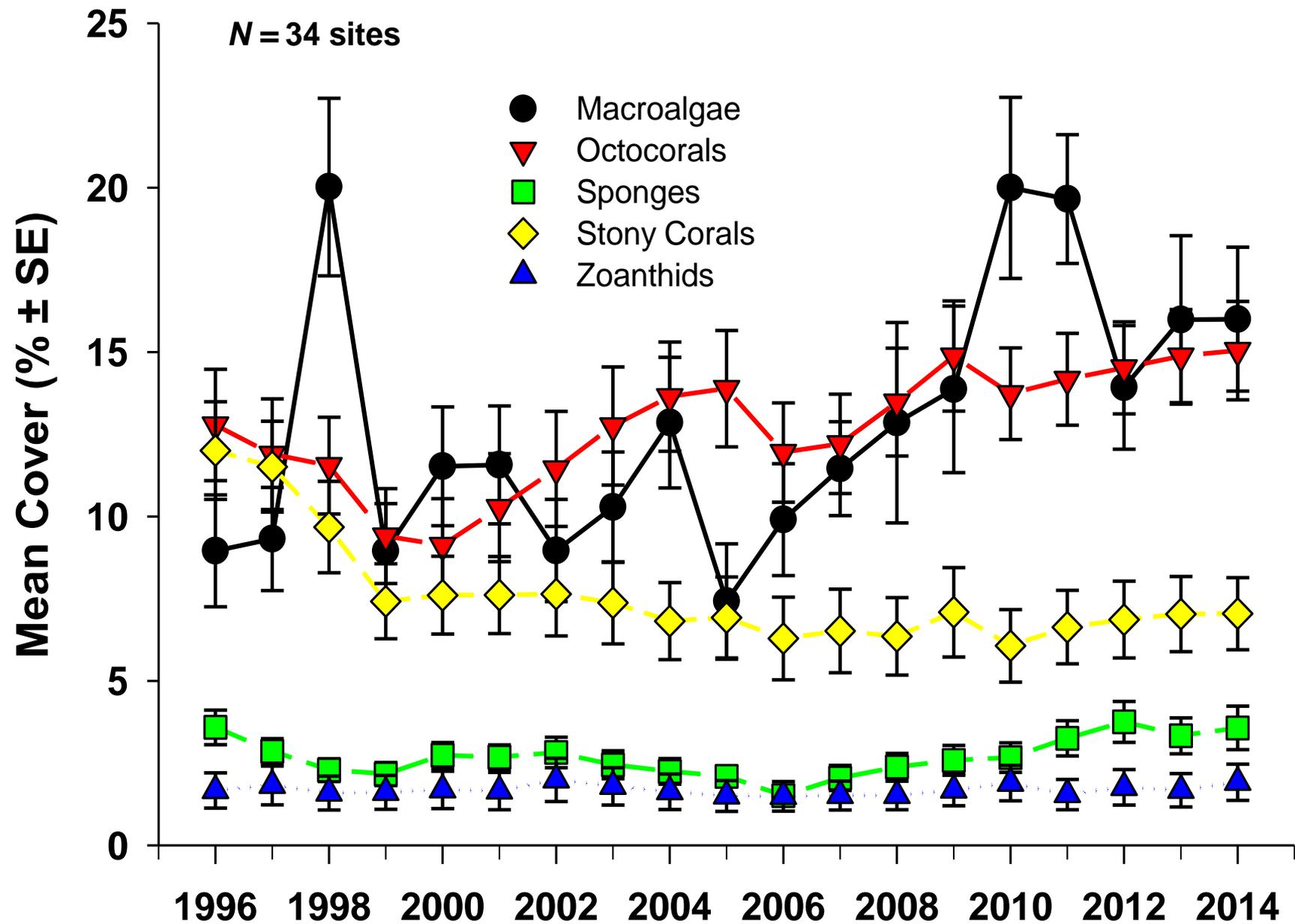
Sponge:

1. Abundance (density)
2. Size Class Information
3. Recruitment Rates
4. Mortality Rates
5. Disease Prevalence

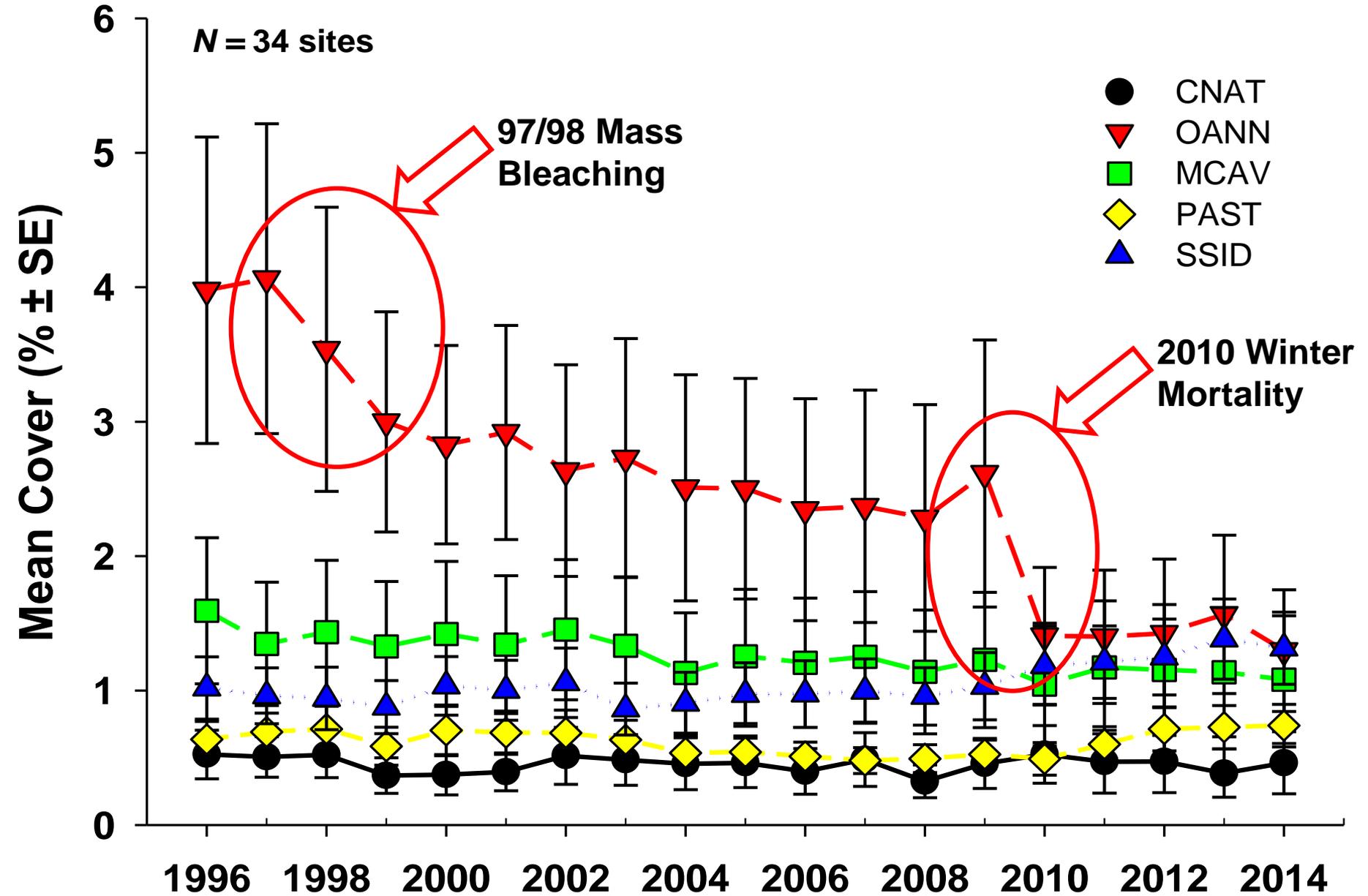
Coral Cover By Habitat 2013 vs. 2014



Long Term Trends in Benthic Cover – Florida Keys

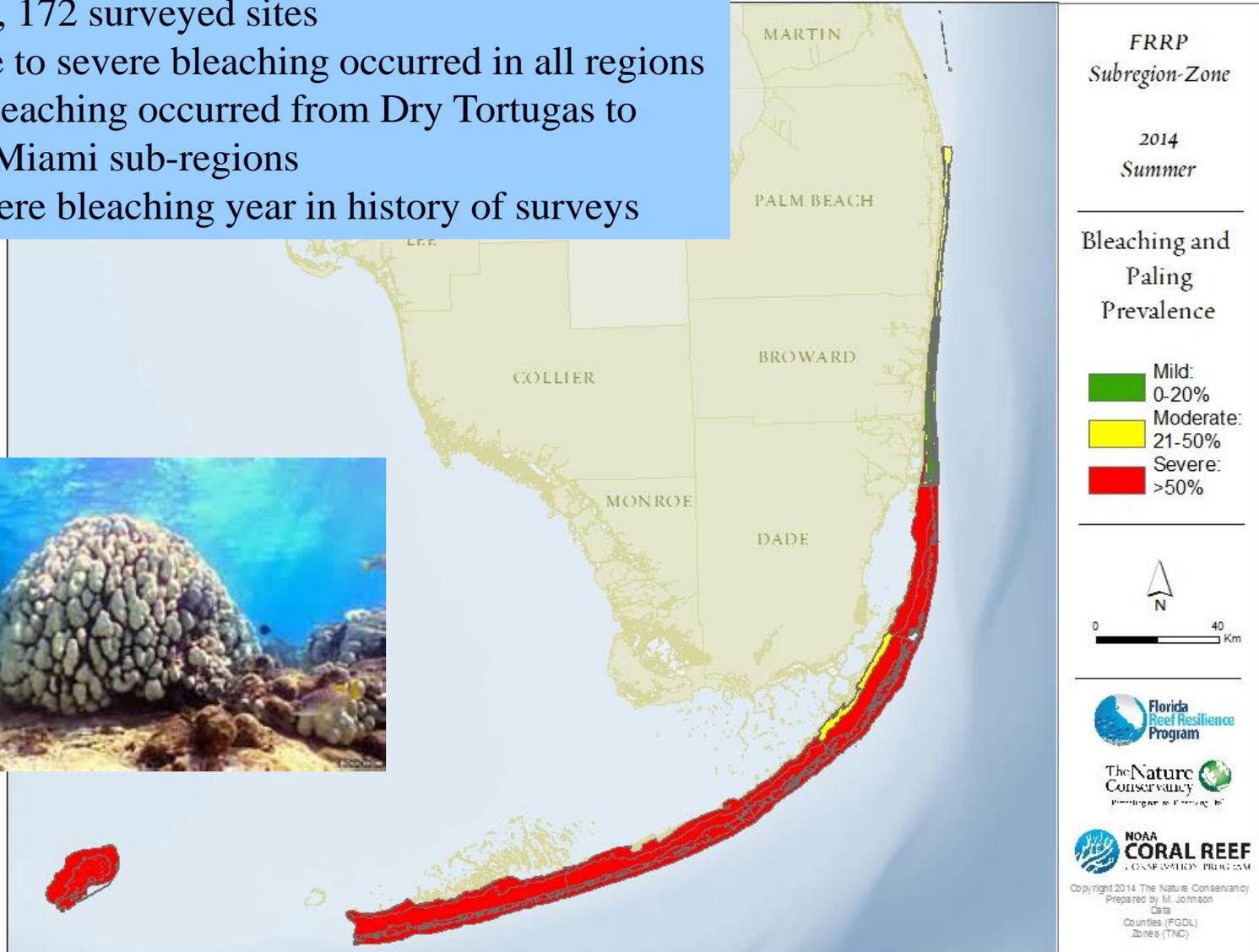


Long Term Trends in Benthic Cover – Coral Species



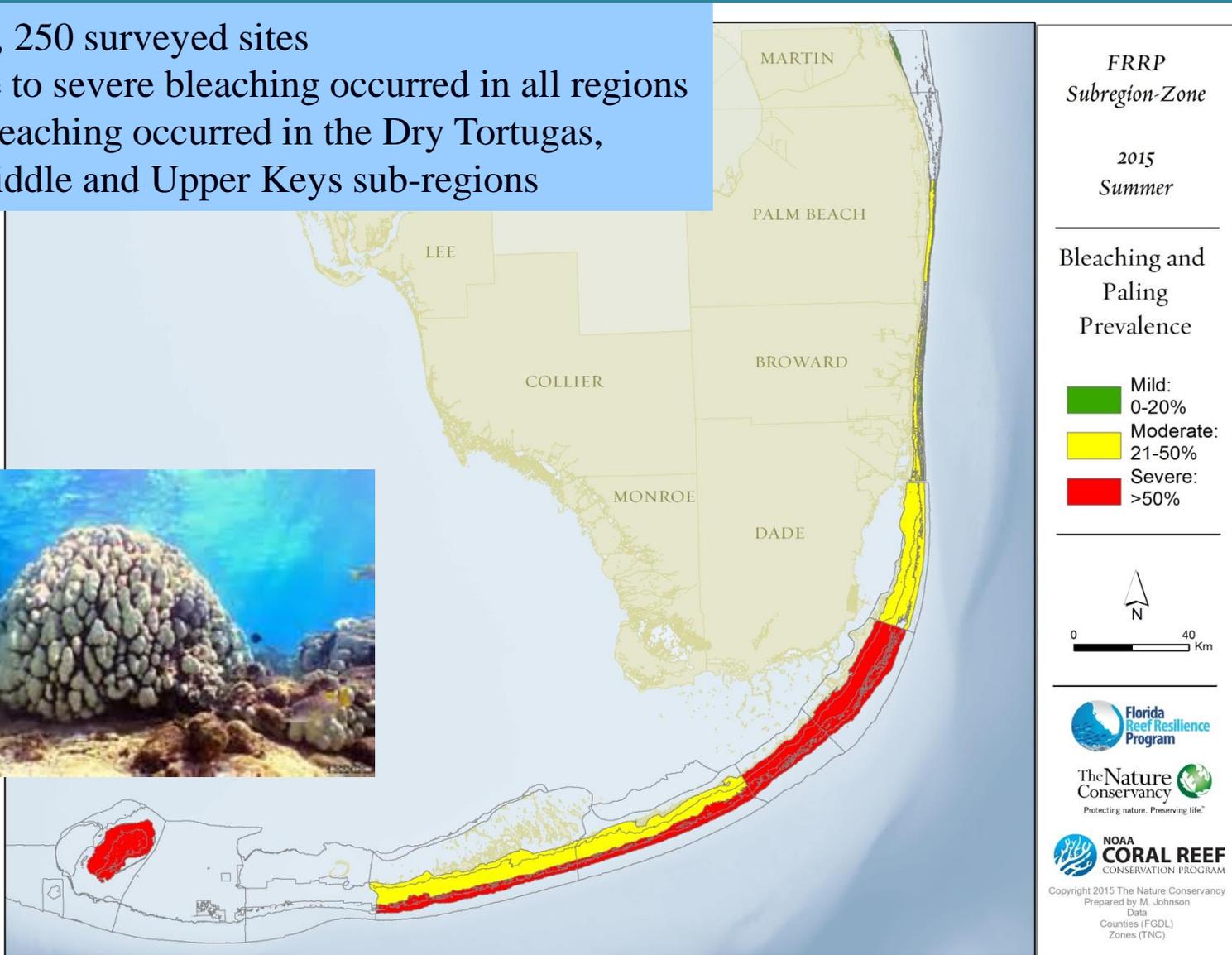
2014 Bleaching Extent By Zone

- For 2014, 172 surveyed sites
- Moderate to severe bleaching occurred in all regions
- Severe bleaching occurred from Dry Tortugas to Broward-Miami sub-regions
- Most severe bleaching year in history of surveys



2015 Bleaching Extent By Zone

- For 2015, 250 surveyed sites
- Moderate to severe bleaching occurred in all regions
- Severe bleaching occurred in the Dry Tortugas, Lower, Middle and Upper Keys sub-regions



CREMP Coral Bleaching Prevalence 2011 - 2015

YEAR	CNAT	DSTO	MMEA	MCAV	PAST	SSID	SMIC	UAGA	OANN	All Corals
										
2011	1.46	1.64	0.00	1.84	1.18	2.78	2.69	1.16	2.05	2.31
2012	10.80	1.67	2.94	1.51	3.22	6.41	1.51	2.49	8.95	4.41
2013	0.55	1.63	0.00	2.19	0.75	3.23	0.23	0.72	4.15	1.66
2014	28.57	10.66	10.81	23.20	11.38	22.56	11.22	20.02	15.99	17.72
2015	18.38	10.77	12.20	10.97	8.54	17.39	12.38	17.03	16.67	14.07

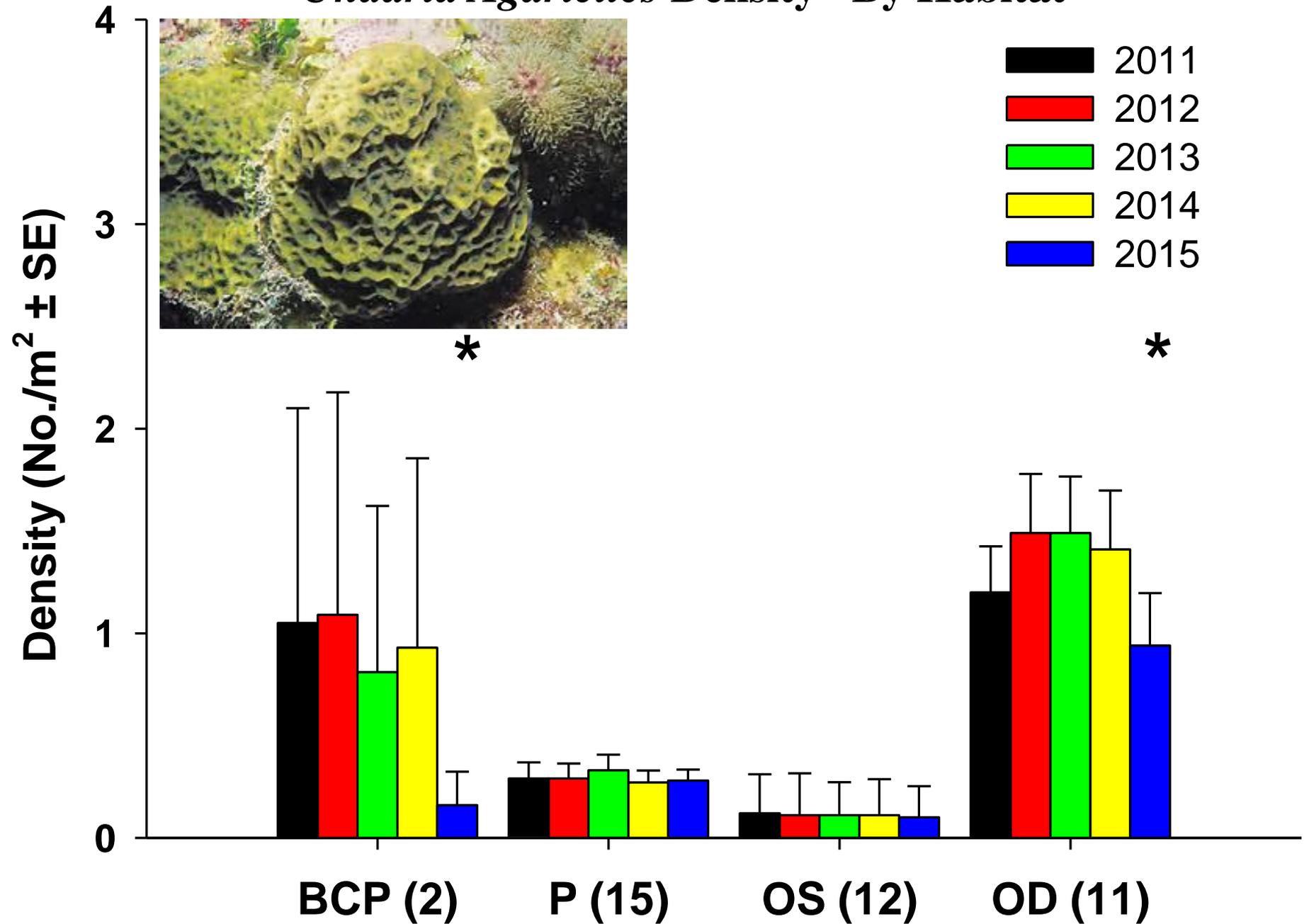
- $N = 40$ sites; data pooled for all sites, % of all colonies
- Prevalence includes three classifications: Paling, Partially Bleached, Bleached
- CREMP survey timeline: Middle Keys – May; Upper Keys – July; Lower Keys – August

Species Specific and Total Coral Abundance 2011 - 2015

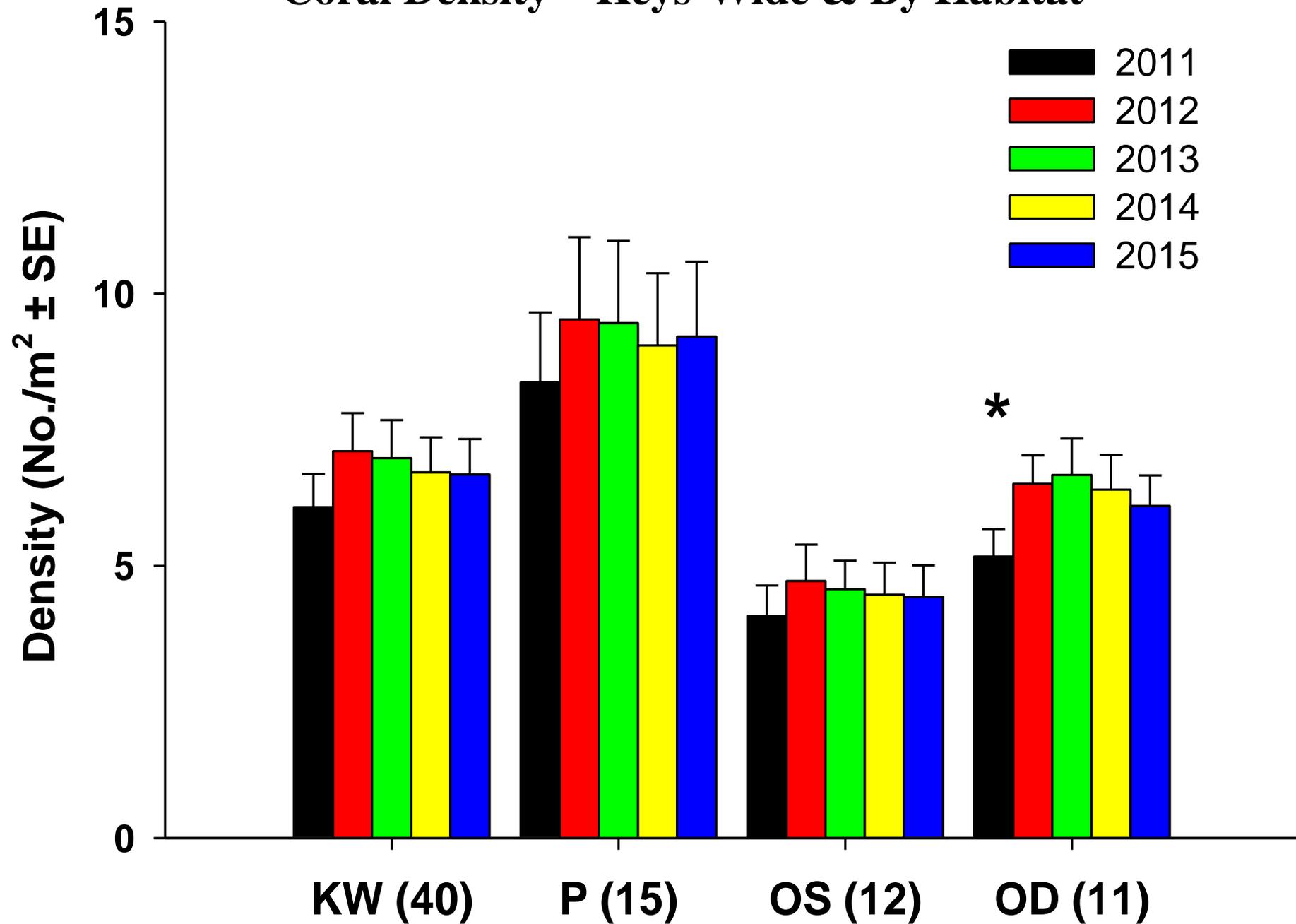
YEAR	CNAT	DSTO	MMEA	MCAV	PAST	SSID	SMIC	UAGA	OANN	All Corals
										
2011	206	122	33	597	1698	2412	1041	1206	292	8786
2012	176	120	34	664	2019	3040	1258	1368	313	10372
2013	183	123	36	639	2010	3065	1282	1247	289	10106
2014	196	122	37	612	1916	2961	1221	1214	269	9632
2015	185	130	41	629	1991	3191	1292	822	264	9528
<i>P</i>	NS	NS	NS	NS	NS	NS	NS	*	NS	NS

• $N = 40$ sites; transect data pooled for all sites

Undaria Agaricites Density –By Habitat

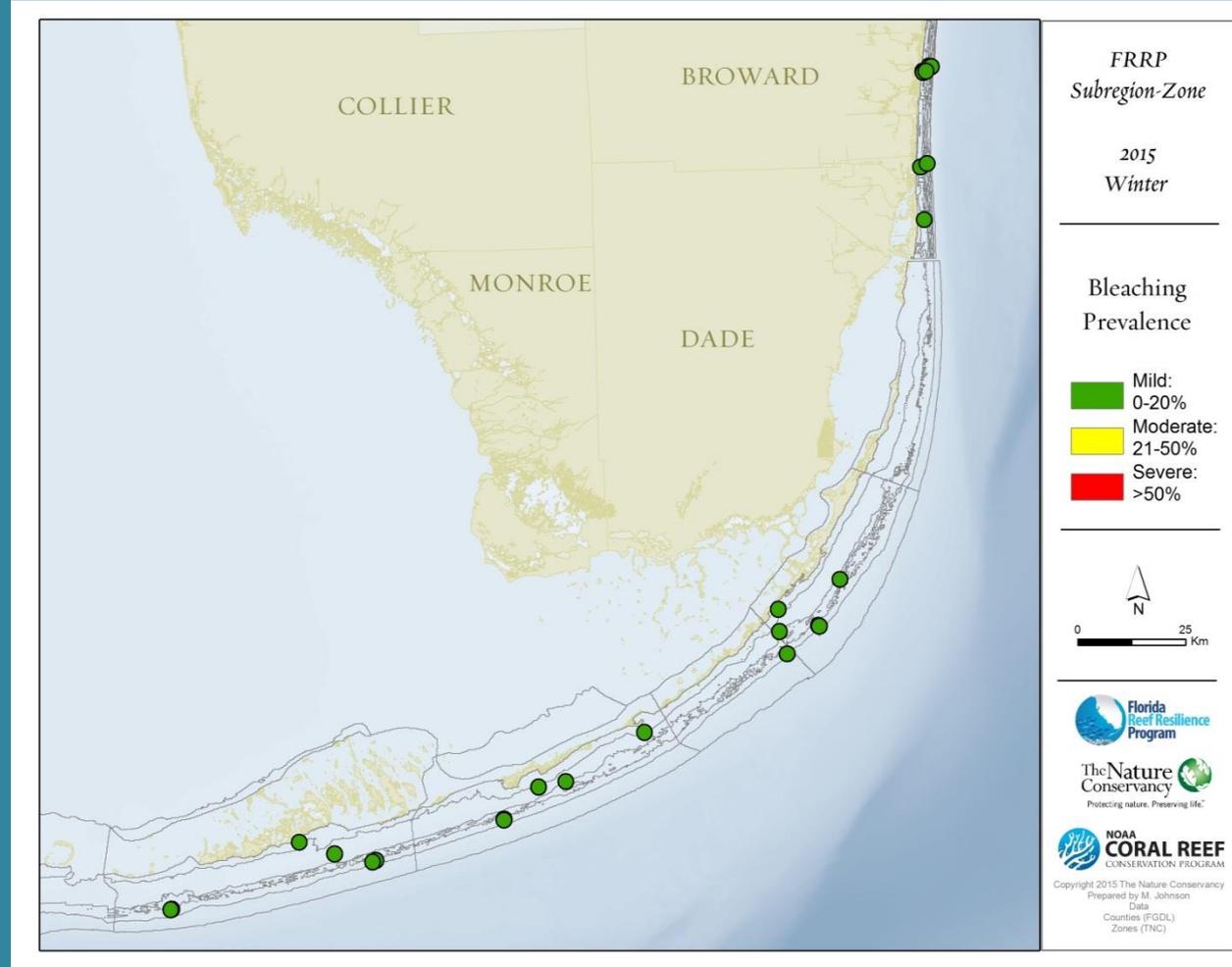


Coral Density – Keys-Wide & By Habitat



2015 Post-Bleaching Surveys

- Surveys completed at 25 CREMP and SECREMP sites
- Surveys took place from January-February 2015
- Mild bleaching occurred at all sites.
- This data shows bleaching only, NO paling



Disease Prevalence 2011 - 2015

YEAR	CNAT	DSTO	MMEA	MCAV	PAST	SSID	SMIC	UAGA	OANN	All Corals
										
2011	0.97	2.46	0.00	1.17	0.06	3.36	2.79	1.24	3.42	2.01
2012	0.00	1.67	0.00	1.05	0.15	3.91	2.07	3.07	1.28	2.05
2013	0.55	0.00	0.00	0.94	0.05	3.20	2.96	0.64	1.04	1.61
2014	1.02	3.28	0.00	1.47	0.16	5.71	5.16	1.07	2.97	3.01
2015	0.54	1.54	0.00	0.48	0.20	6.42	5.73	0.73	3.03	3.26

- $N = 40$ sites; data pooled for all sites, % of all colonies
- Diseases included: White Plague, Dark Spots, Black Band
- CREMP survey timeline: Middle Keys – May; Upper Keys – July; Lower Keys – August

Summary

1. Little change in cover between 2013 & 2014 for all taxa groups
2. Although prevalence of bleaching was “severe” in 2014, the density of large framework building corals has remained similar the last five years; still evaluating changes in size class distribution
3. At present, only significant change in abundance is for *Undaria/Agaricia agaricites*
4. Preliminary indications of resilience but need 2016 data to evaluate effects 2015 bleaching
 - Collaborating with TNC DRM to assess direct effects of bleaching at a subset of CREMP and SECREMP sites

CREMP Publications and Reports available at
<http://research.myfwc.com/>

