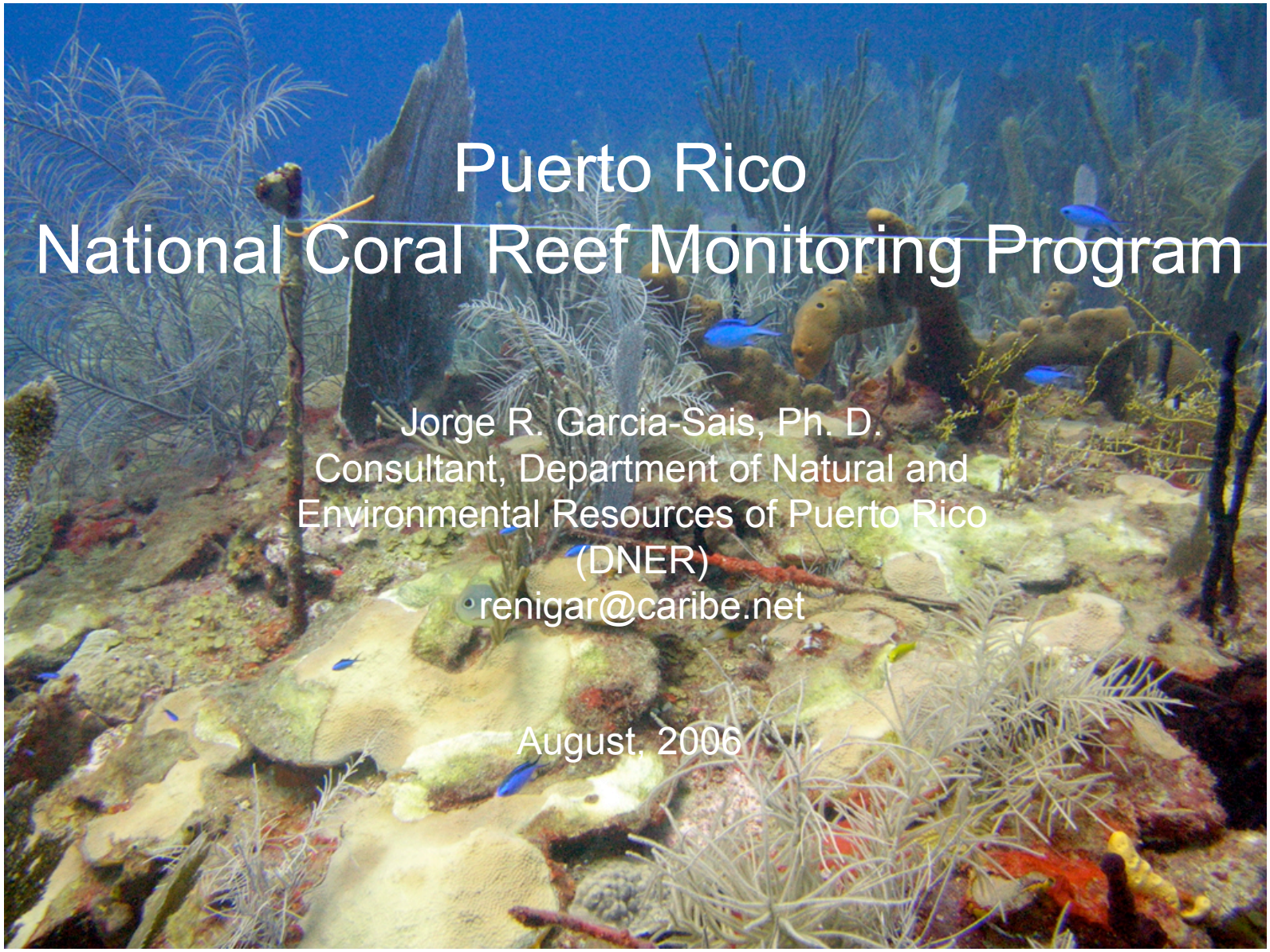

Puerto Rico
National Coral Reef Monitoring Program

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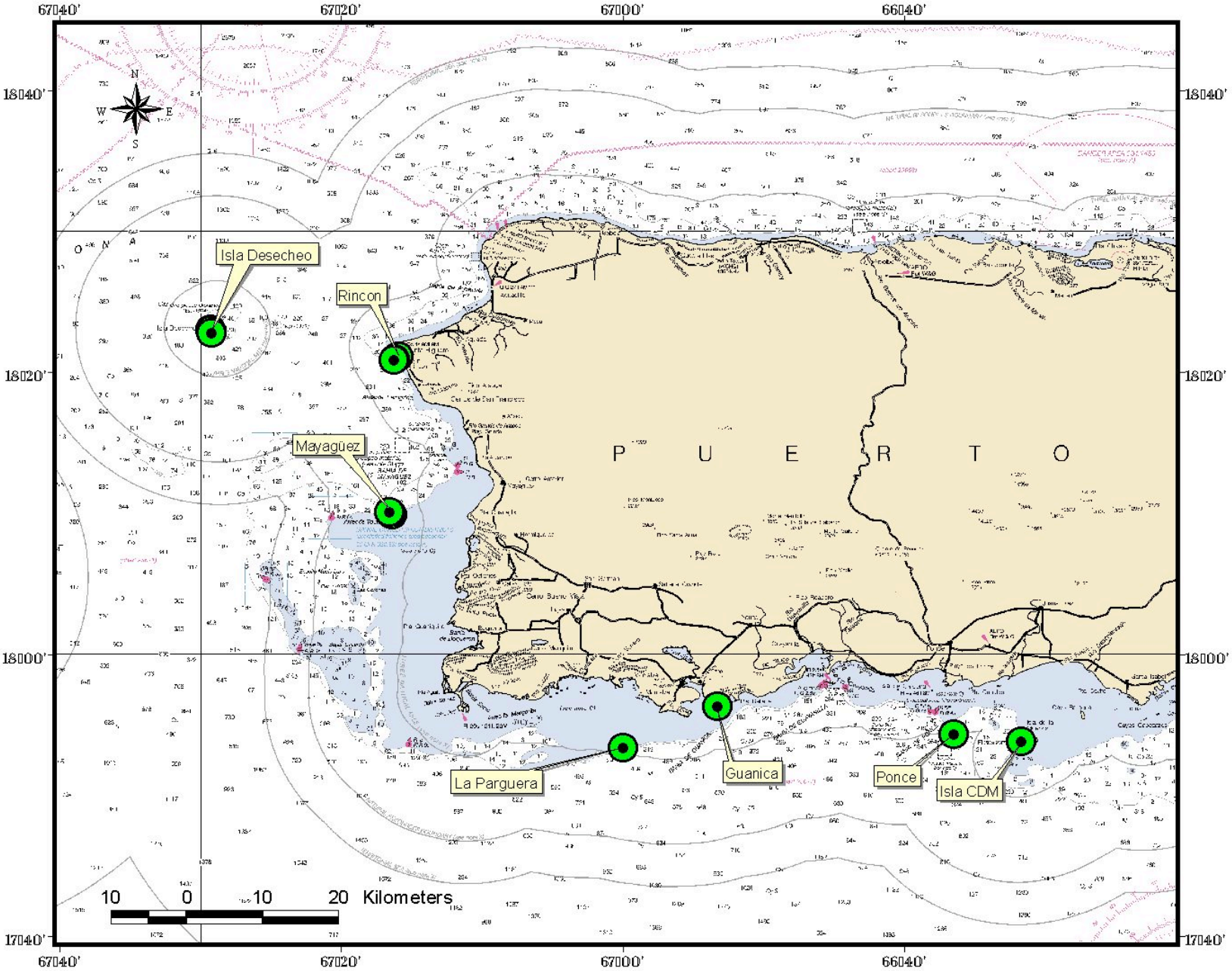
P. R. Monitoring Program Background

- Baseline characterization (1999 – 2001), comprised a total of 65 reefs within DNER desig. Natural Reserves

- Methods:
  - sets of 5 perm transects/reef
  - % reef substrate cover determined by continuous chain link intercept technique (CARICOMP)
  - 5-3x10m belt-transects/reef for quantification of fish and motile megabenthic invert
  - 1- ASEC per reef
  - video-transects for archival reference
  - Time series analyses of variations in % reef substrate cover using Repeated measurements ANOVA

- Depth stratified approach included (2004) as part of the monitoring program at three reefs of the west coast (Isla Desecheo, Mayaguez and Rincon

- Presently monitoring a total of 12 reef stations/yr
  e.g. (Isla Desecheo 30,20,15m; Mayaguez 30,20,10m; Rincon 20,10,5m; Derrumbadero 20m; Guanica 10m; CDM 15m


67040'
67020'
67000'
66040'
18040'
18020'
18000'
17040'
N
S
E
W
Isla Desecheo
Rincon
Mayagüez
P U E R T O
La Parguera
Guanica
Ponce
Isla CDM
10 0 10 20 Kilometers

P. R. Monitoring Program Highlights (1999 – 2005)

- Live coral cover remained stable at reefs monitored in the west coast (Isla Desecheo, Mayaguez, Rincon)
  and Isla Vieques from 1999-2005.

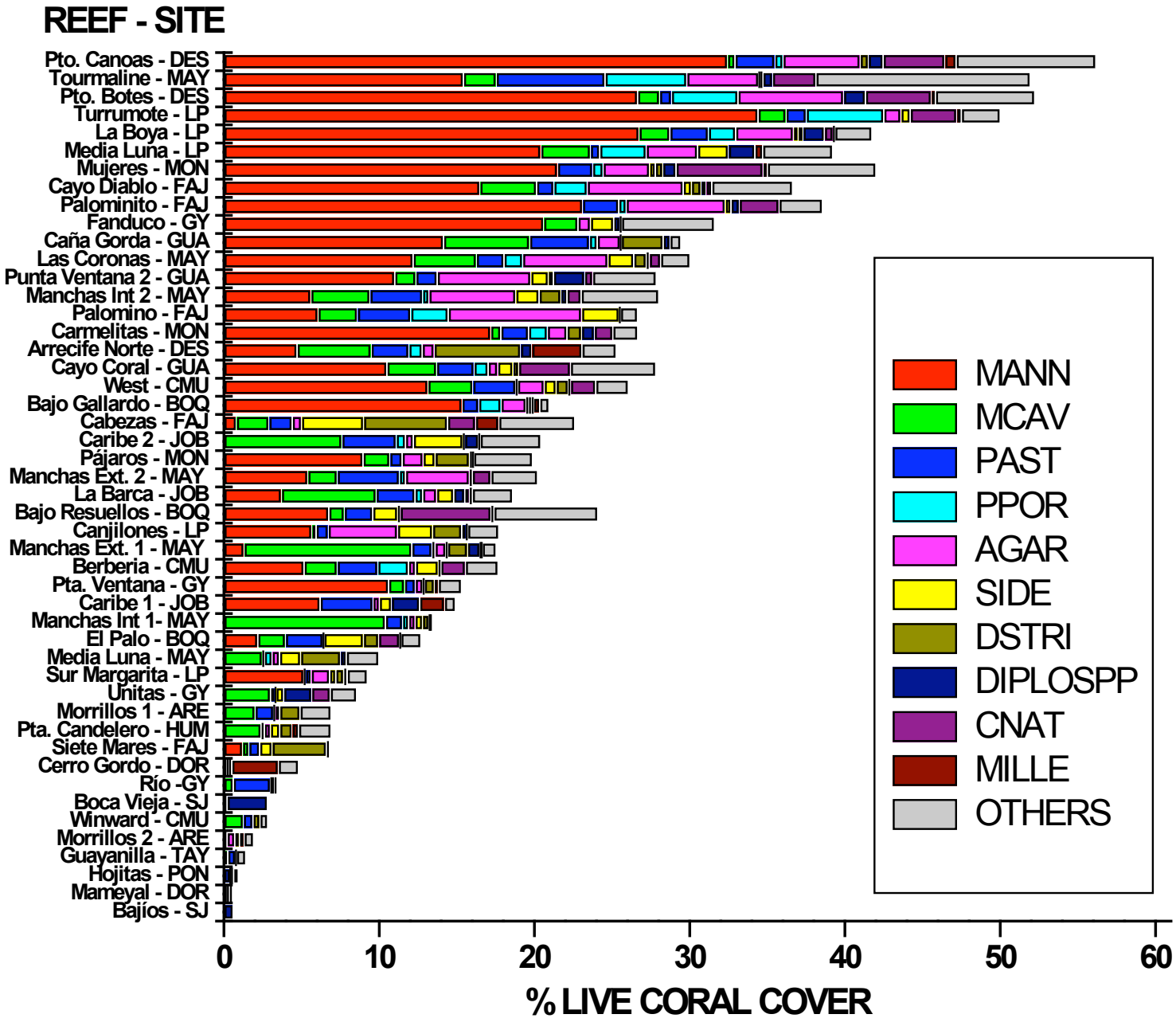
- Stat. sig. declines of live coral cover detected for south coast reef sites (Ponce, CDM, Guanica) between baseline and 2005

- Declines of live coral cover largely associated with the dominant reef building species (*Montastrea annularis*), but included other spp.

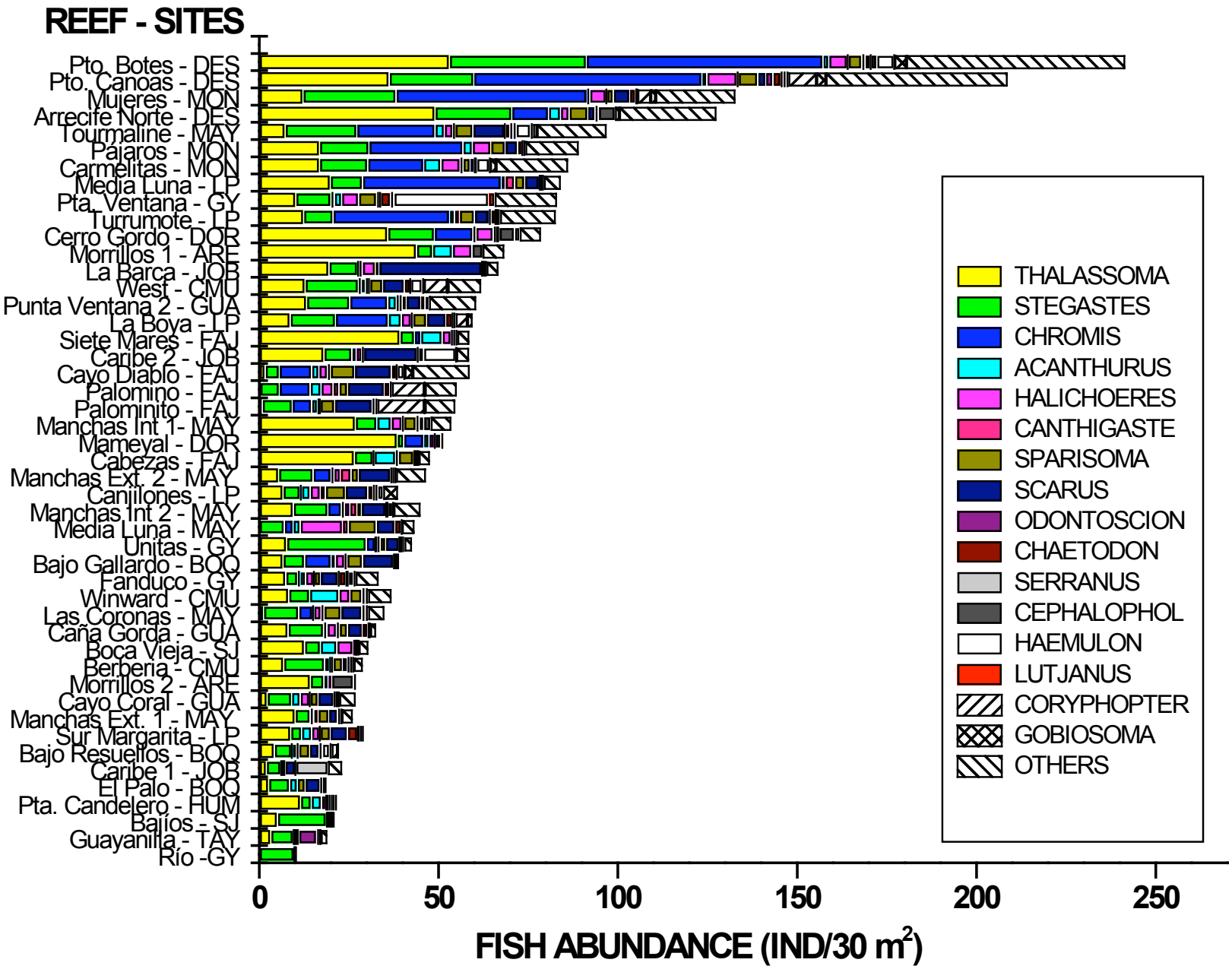
- Reef fish species richness and abundance positively correlated with live coral cover and rugosity

- High temporal variability of fish abundance associated with large fluctuations by schooling, aggregated spp., (such as masked gobies, chromis spp., wrasses, others)

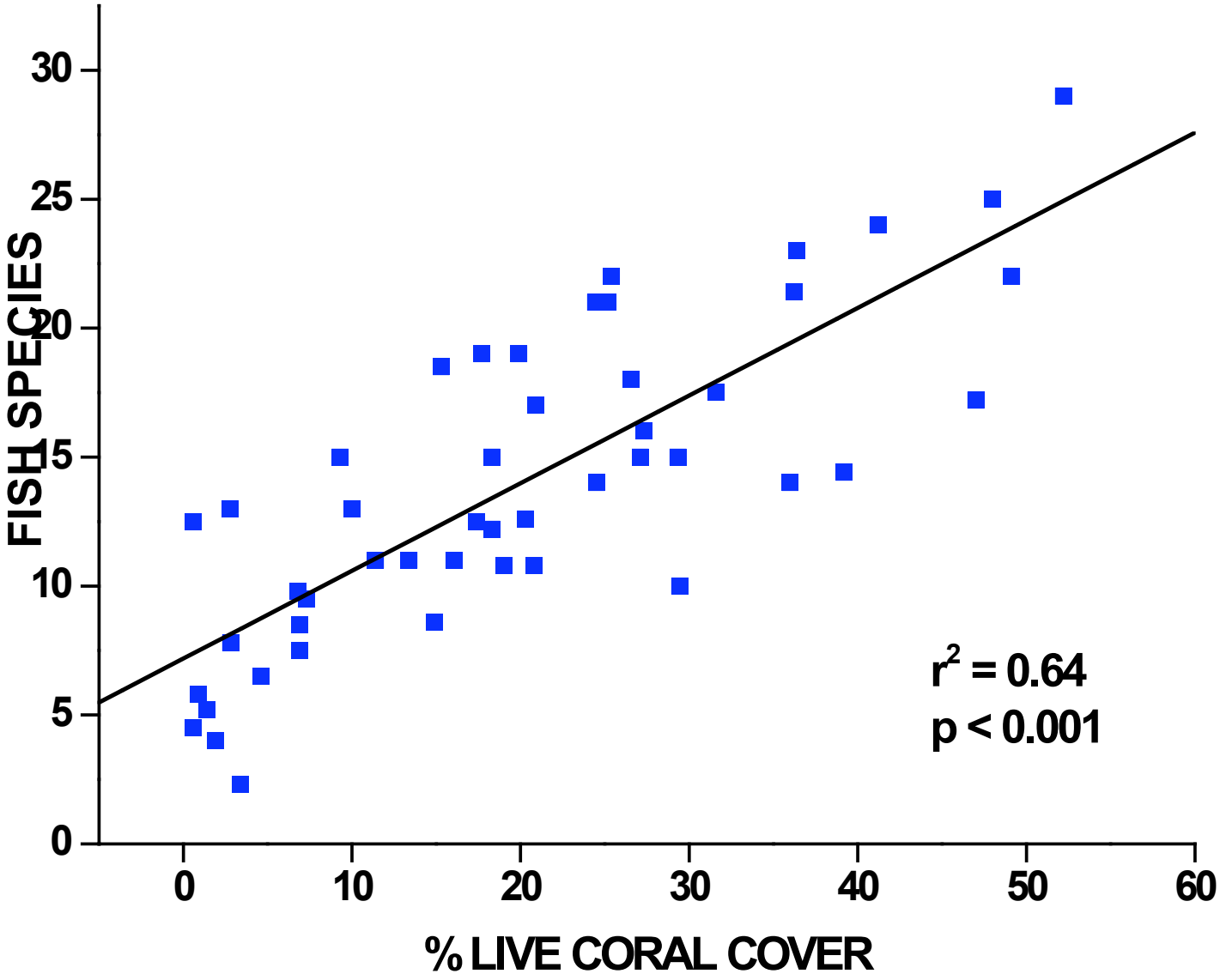
Percent live coral cover at reef sites – baseline data set



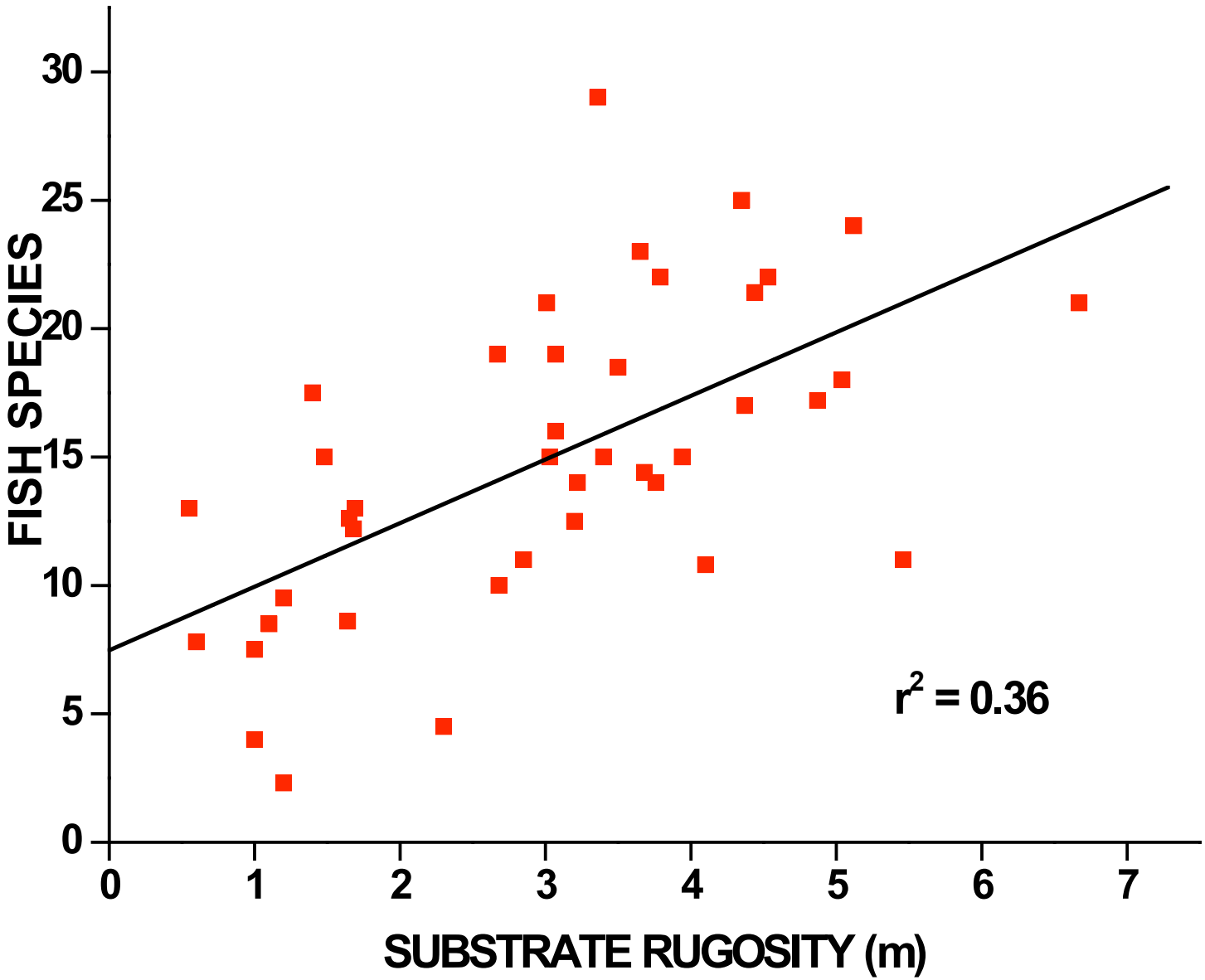
Abundance and taxonomic composition of dominant fish assemblages at reef sites studied



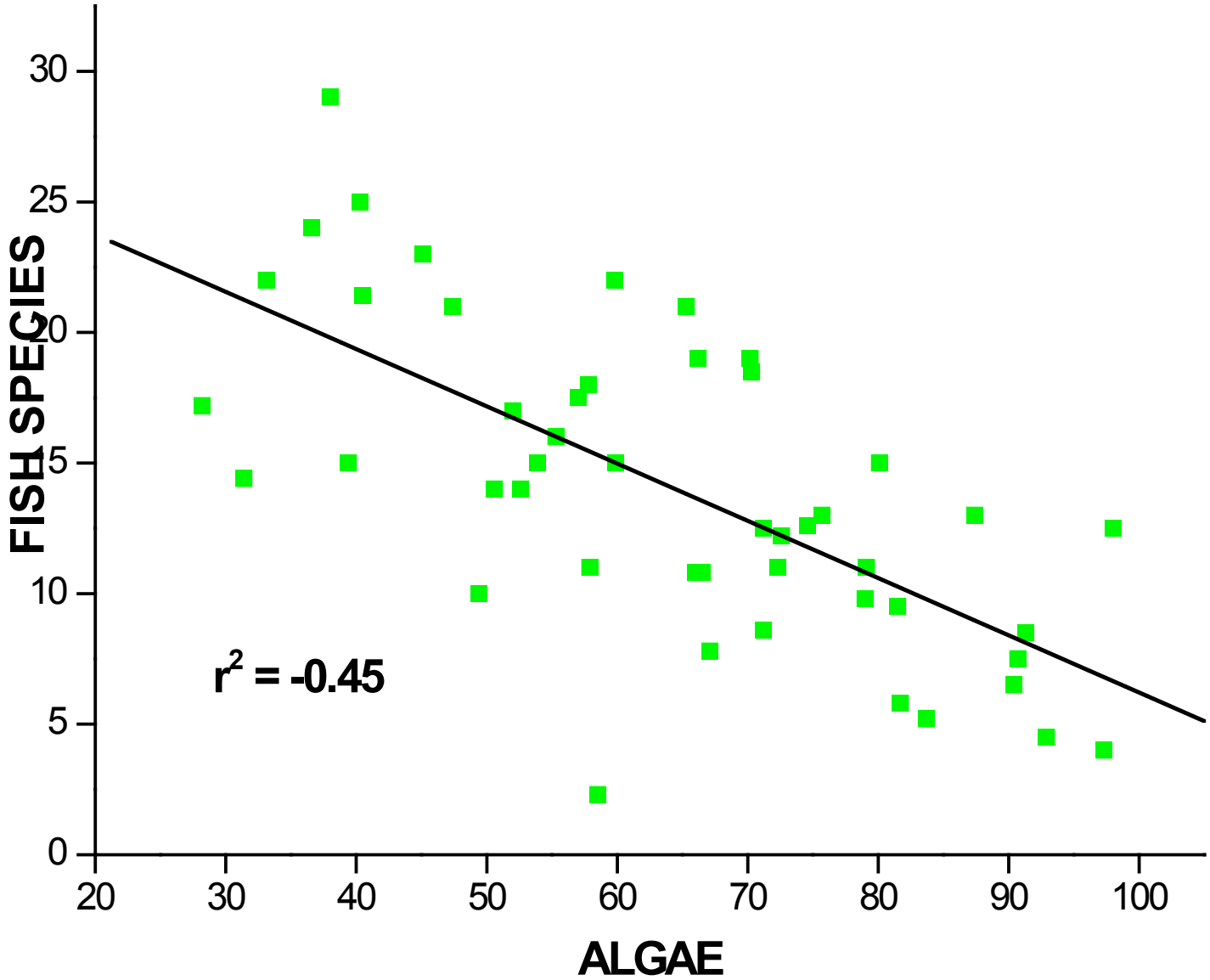
Positive correlation between live coral cover and richness of fish species



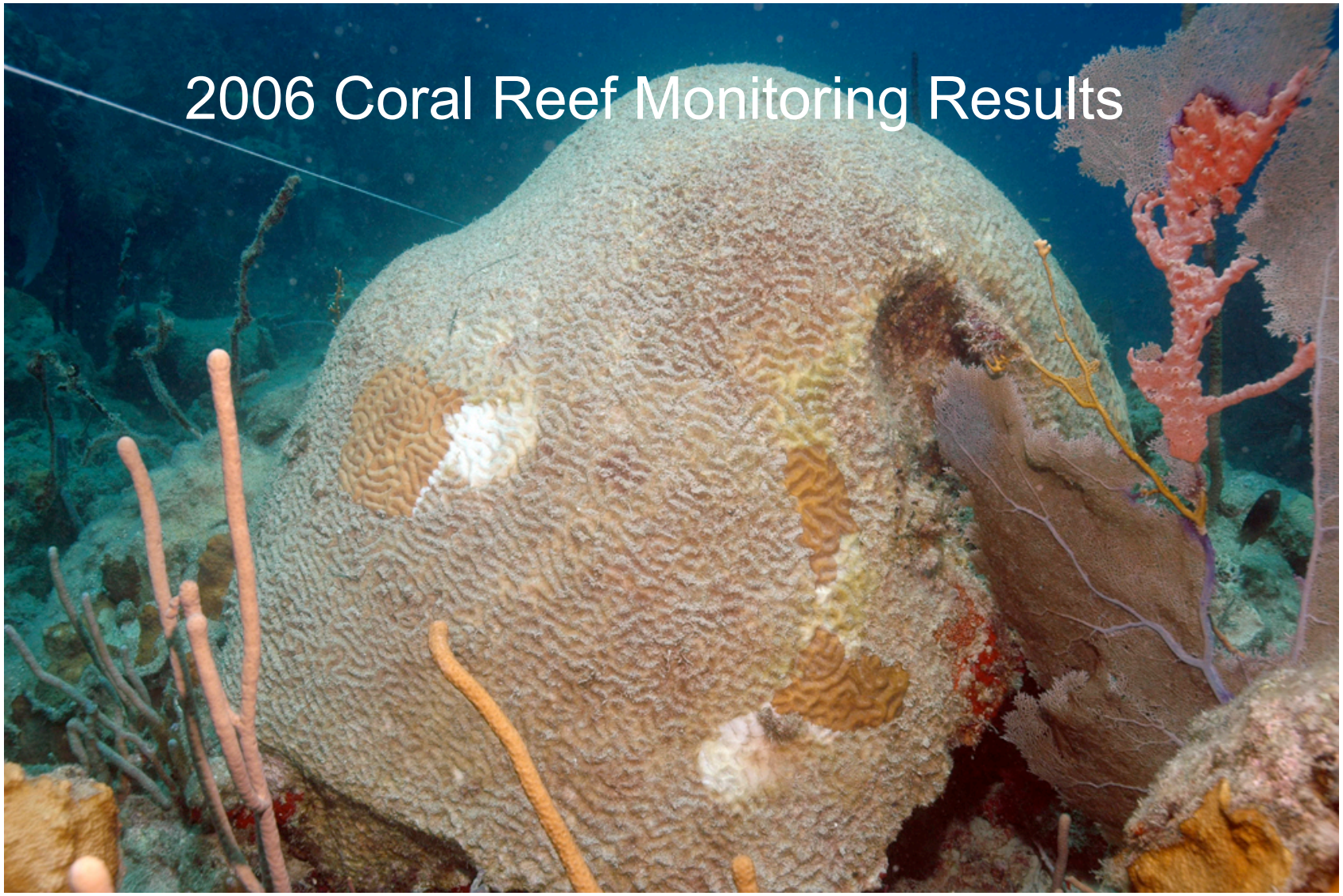
Positive correlation between reef substrate rugosity and richness of reef fish species



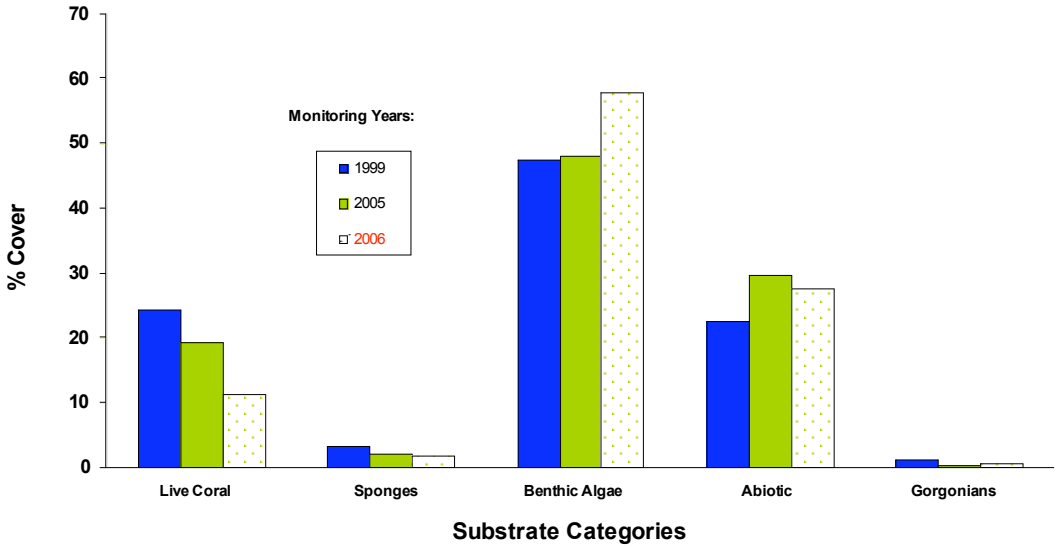
Negative correlation between reef substrate cover by benthic algae and richness of fish species

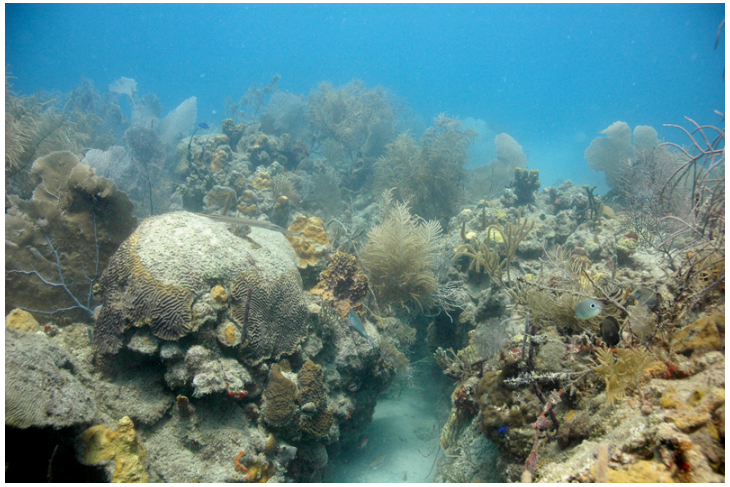


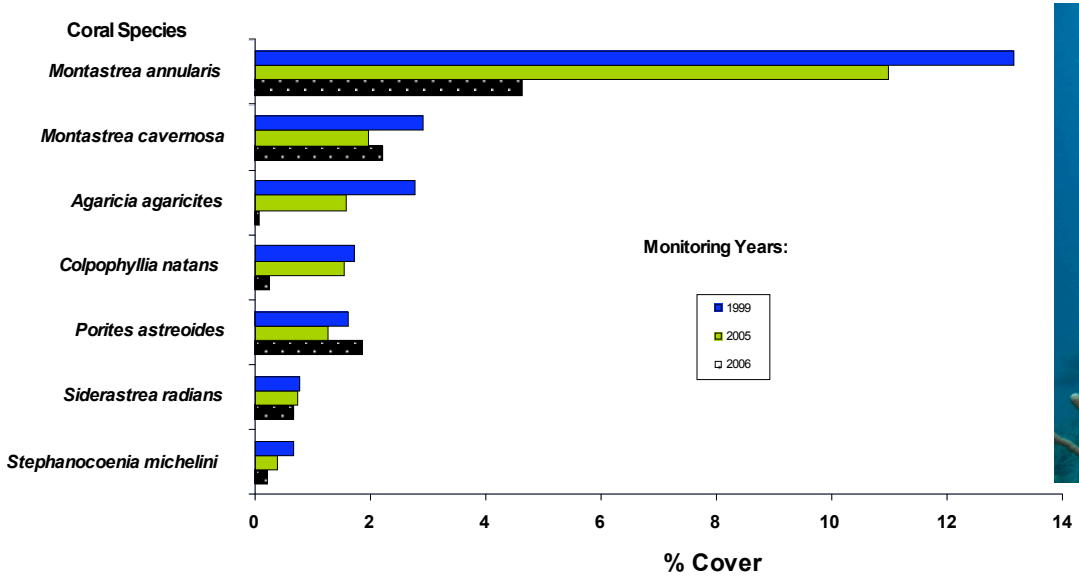
2006 Coral Reef Monitoring Results



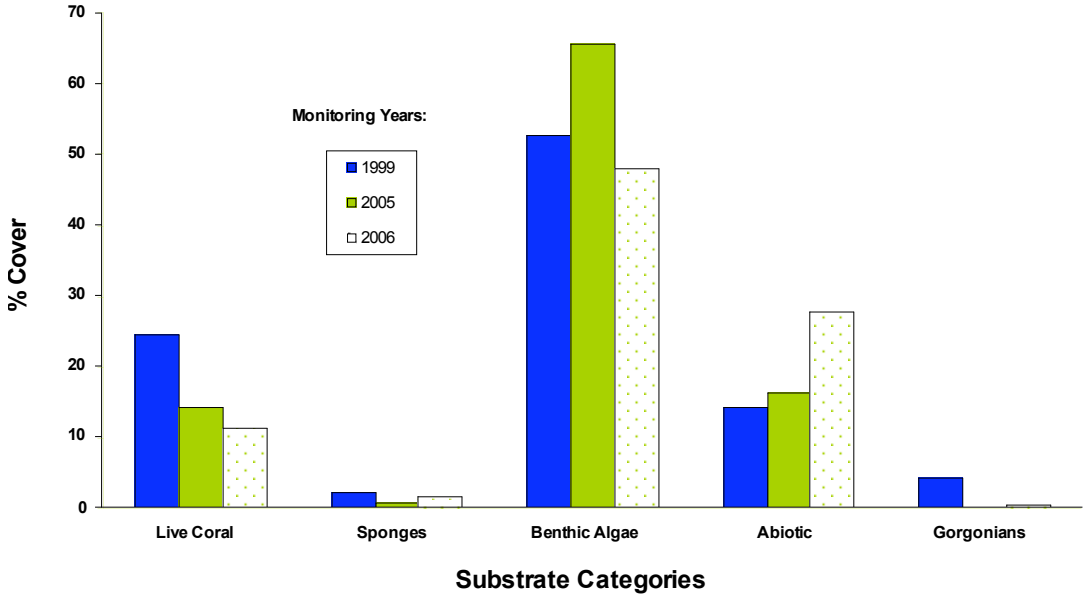
Caja de Muerto Reef - Ponce

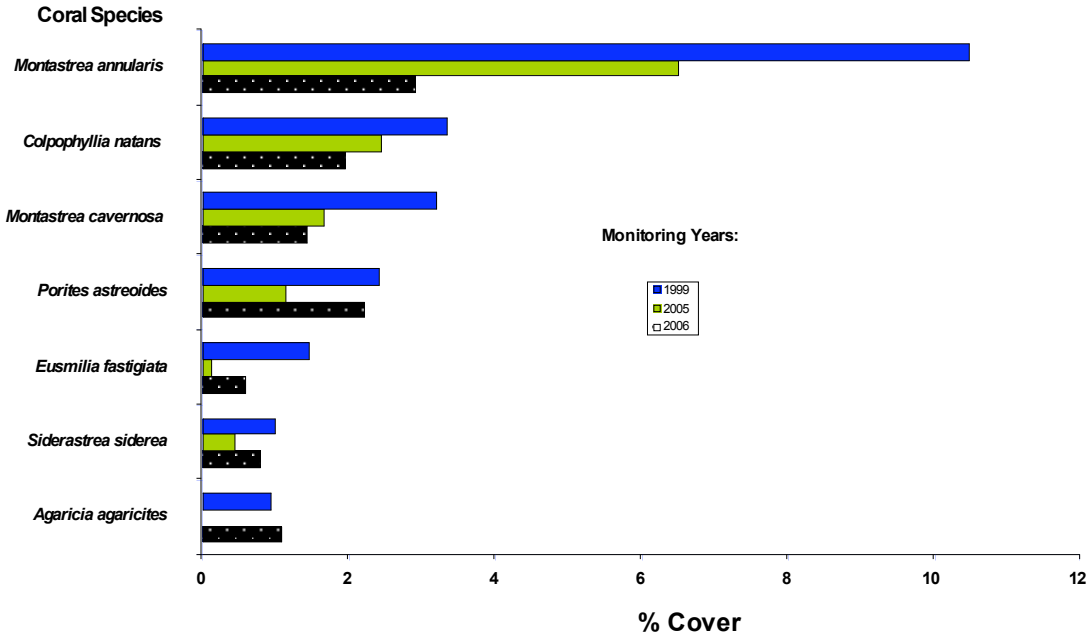


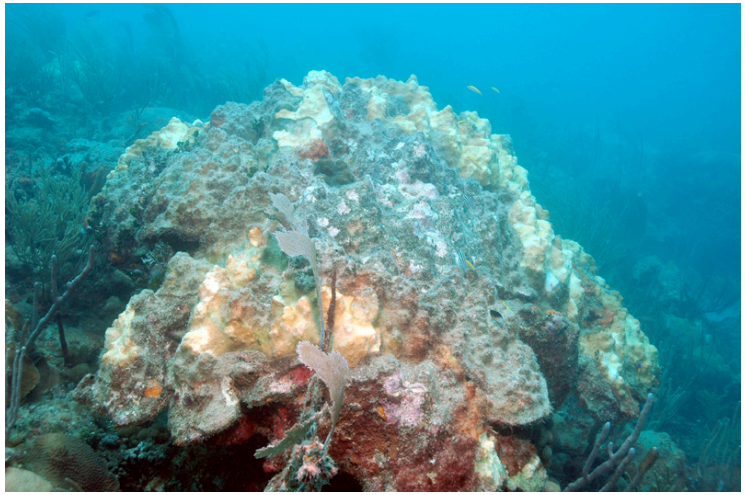




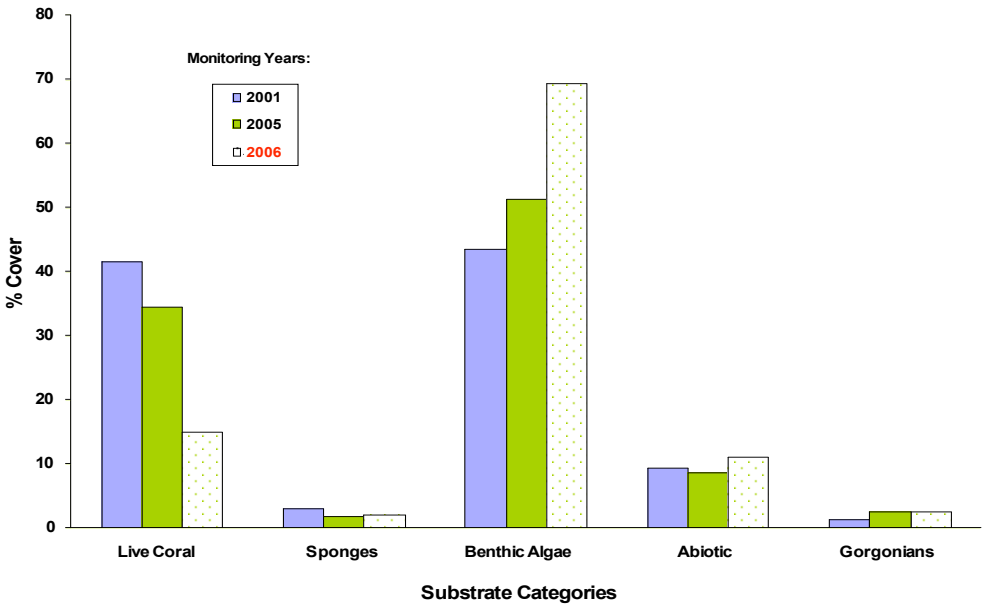
Cayo Coral - Guanica

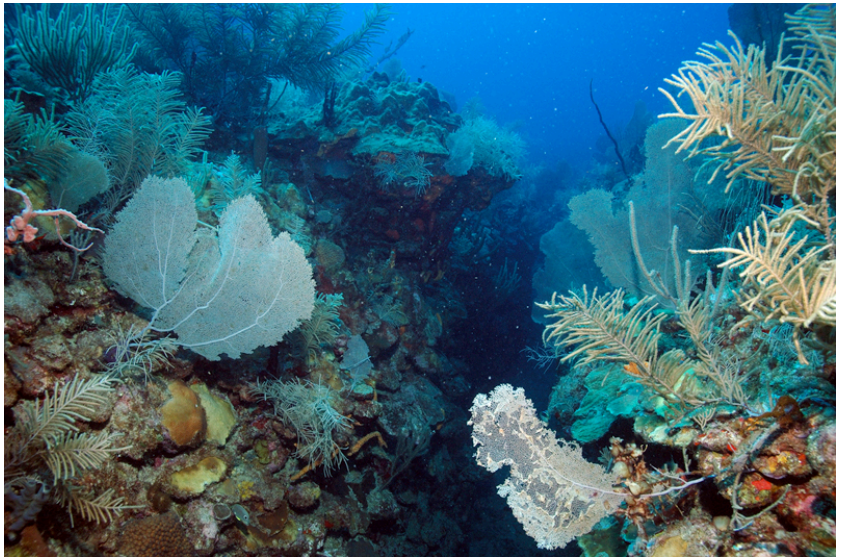


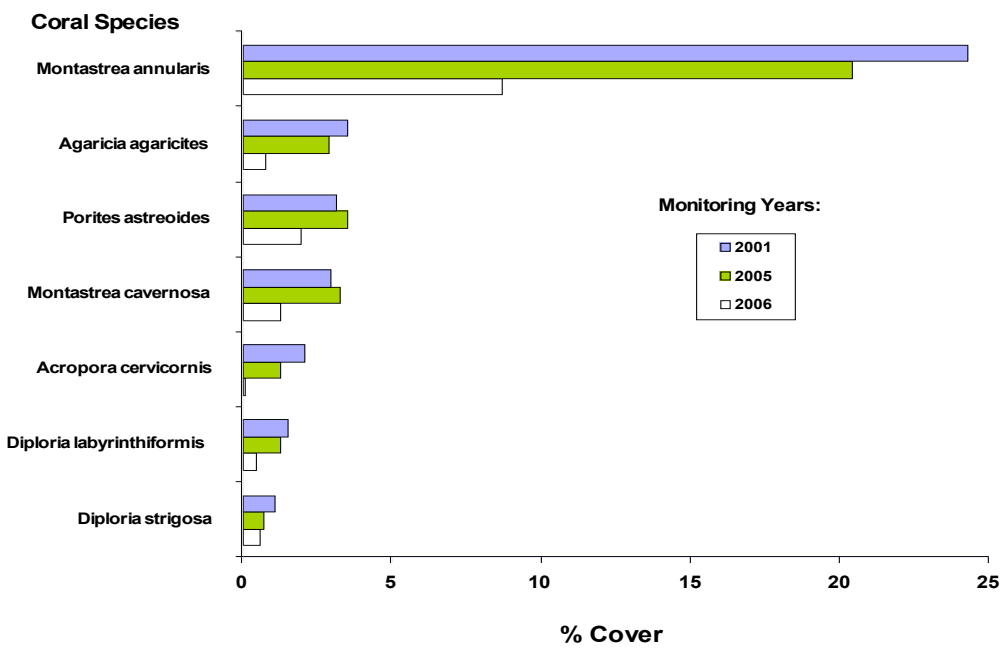


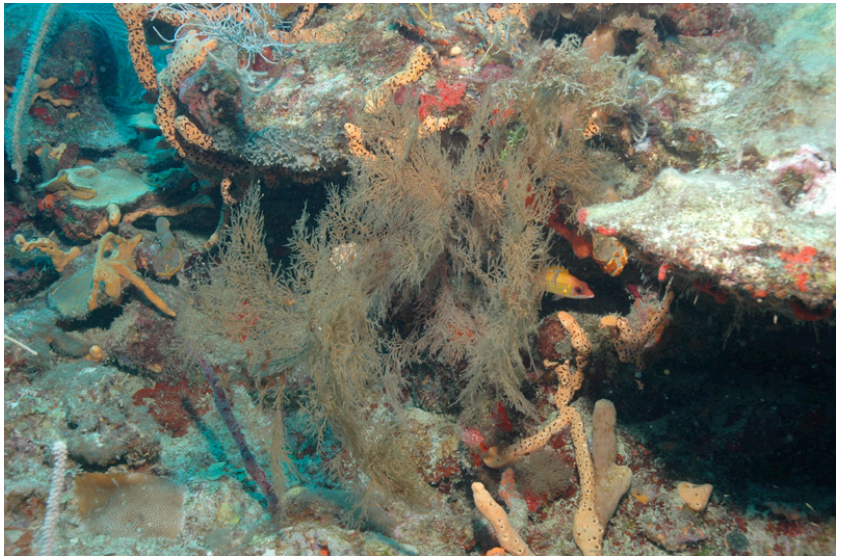


Derrumbadero Reef - Ponce

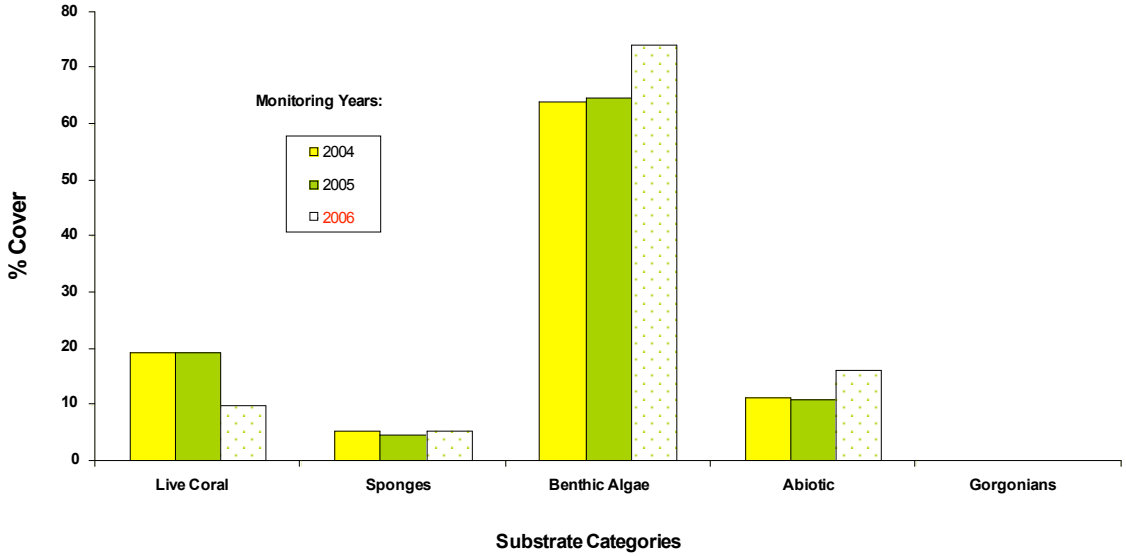


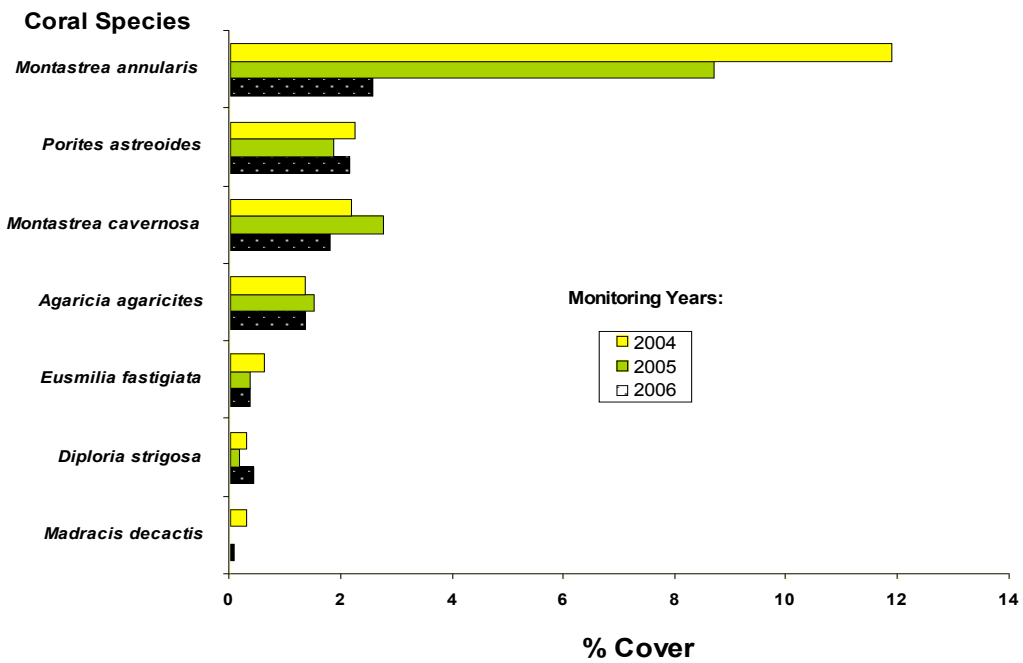


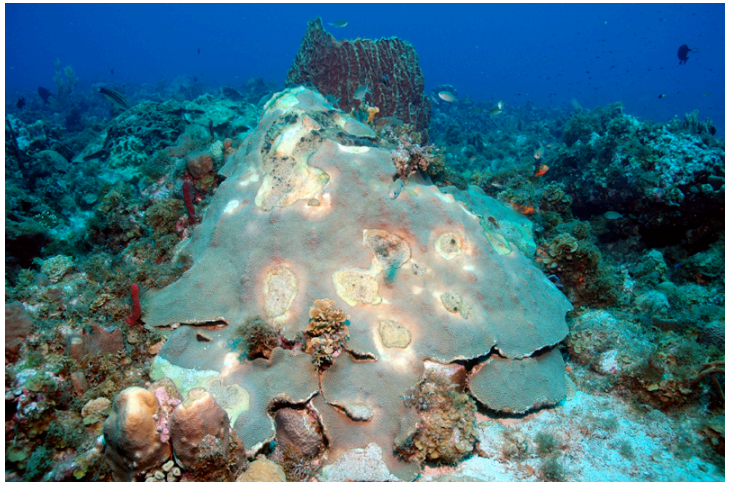




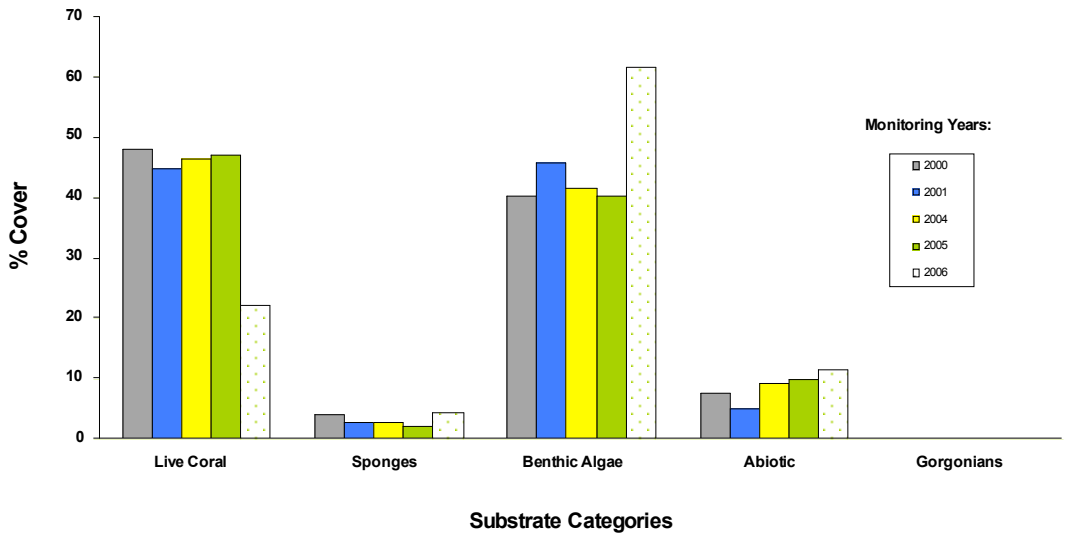
Puerto Botes Reef 15 m - Desecheo

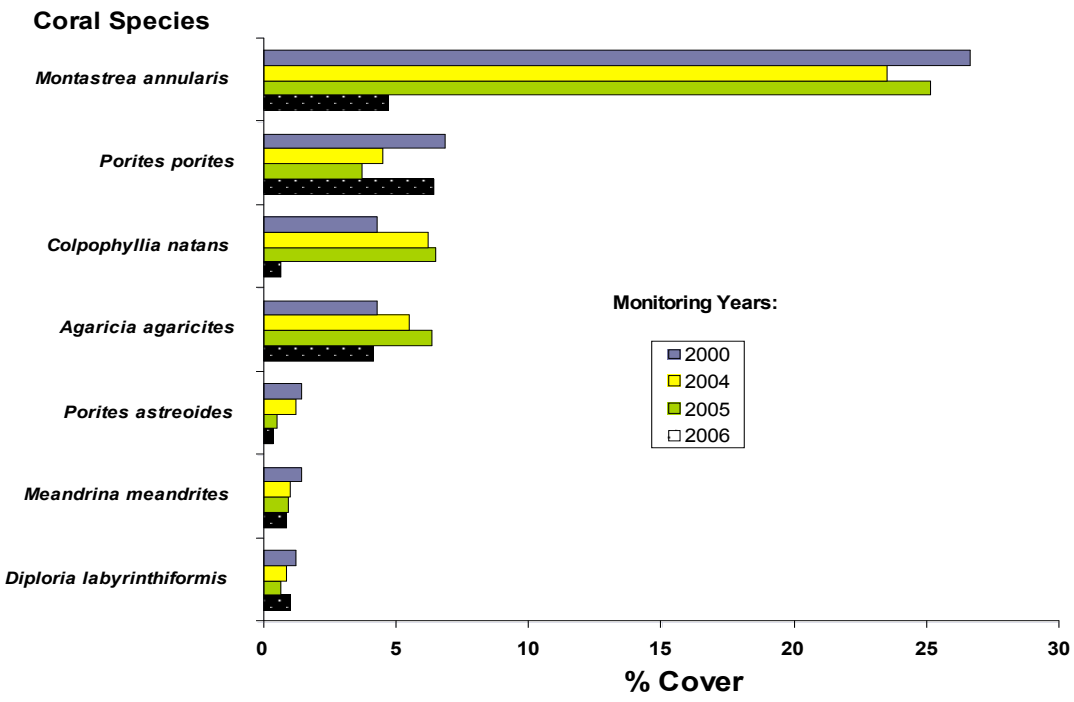




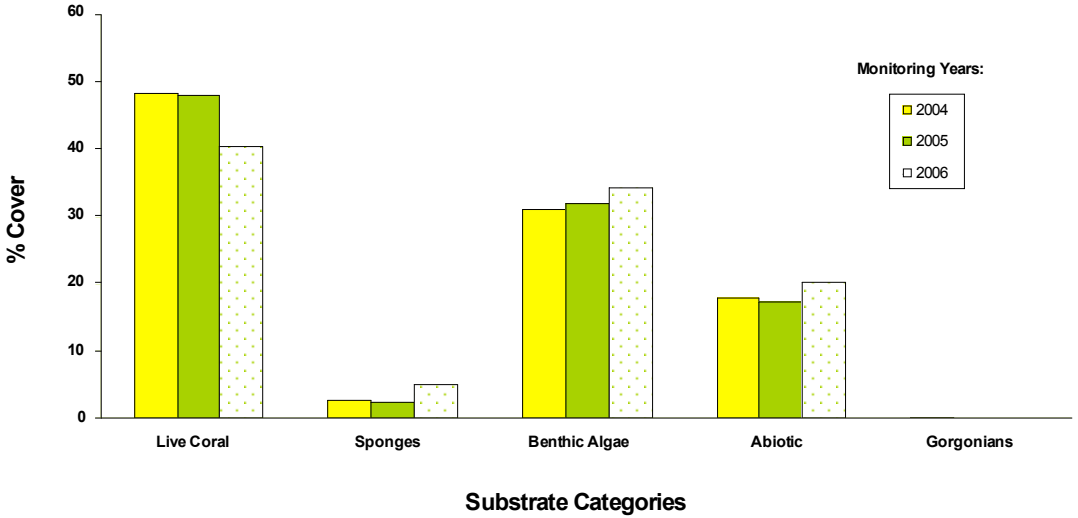


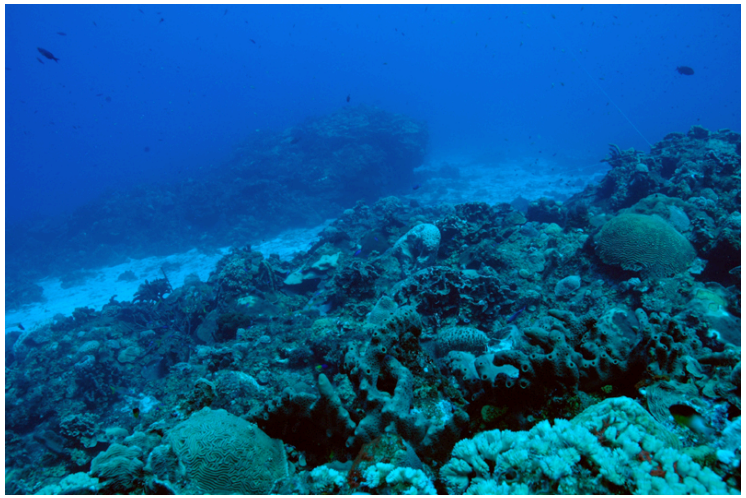
Puerto Canoas Reef 20 m - Desecheo

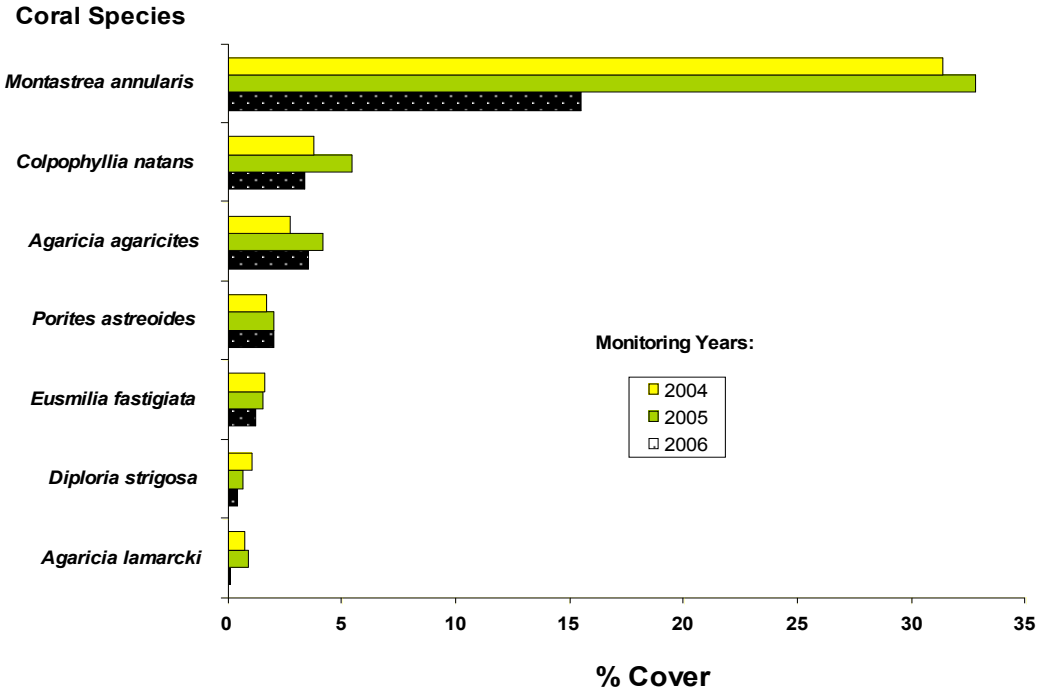




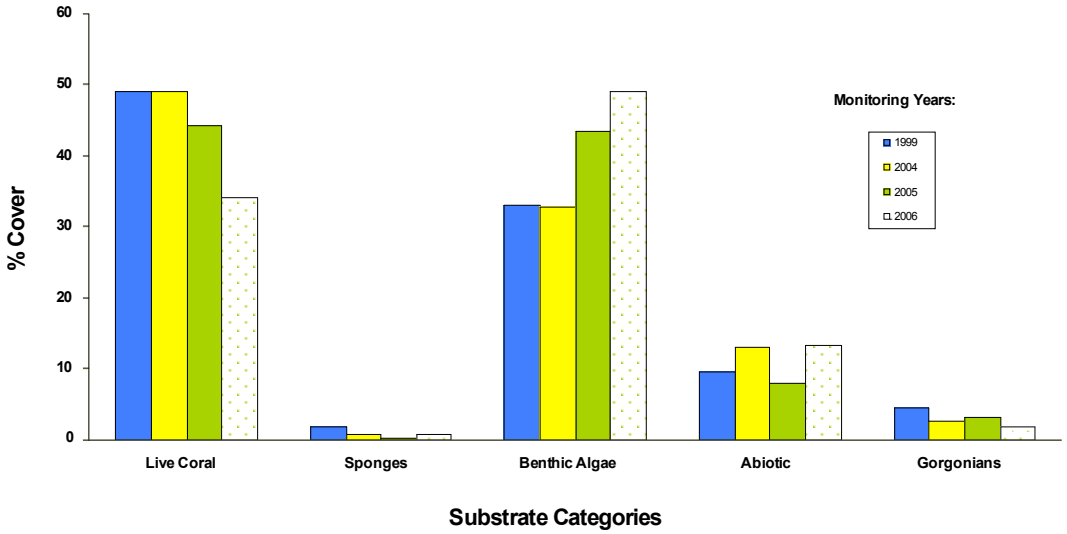
Puerto Canoas Reef 30 m - Desecheo

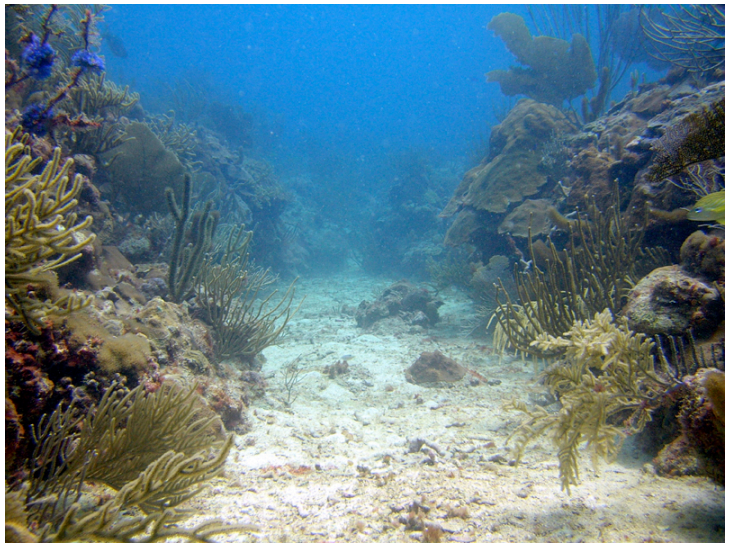


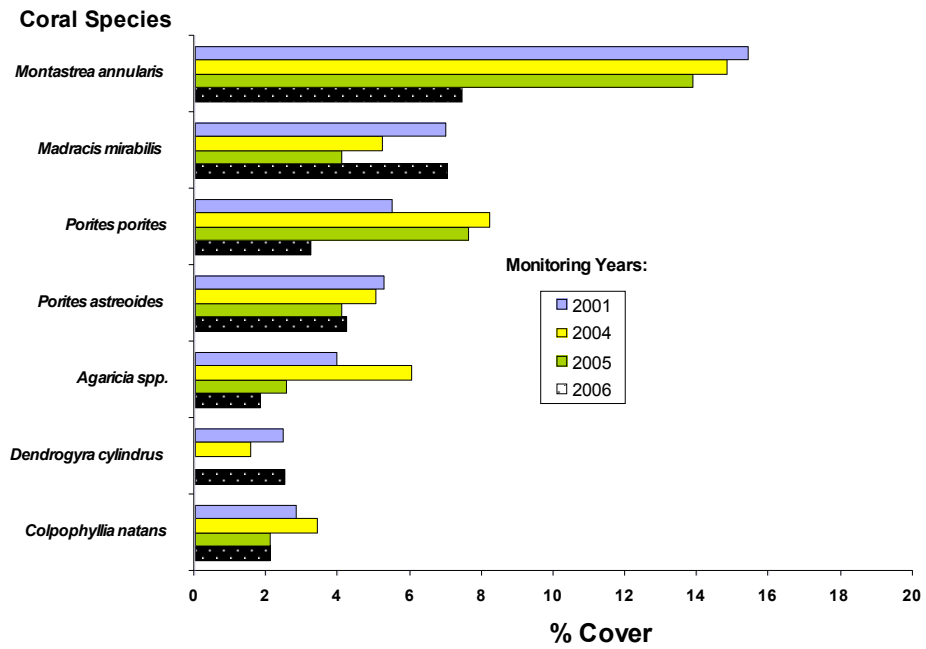


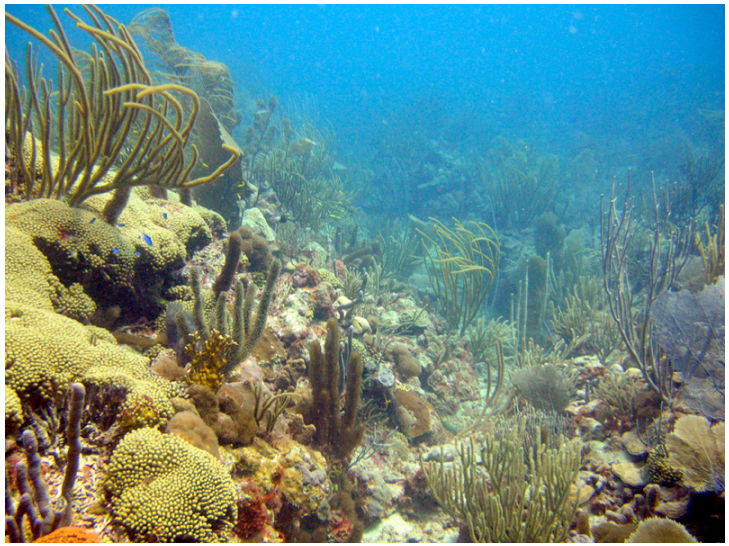


Tourmarine 10 m - Mayaguez

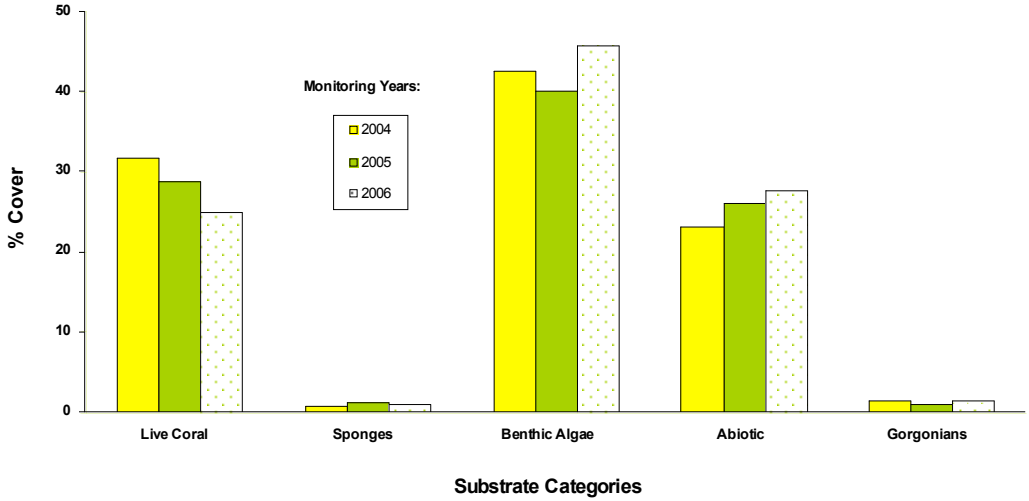


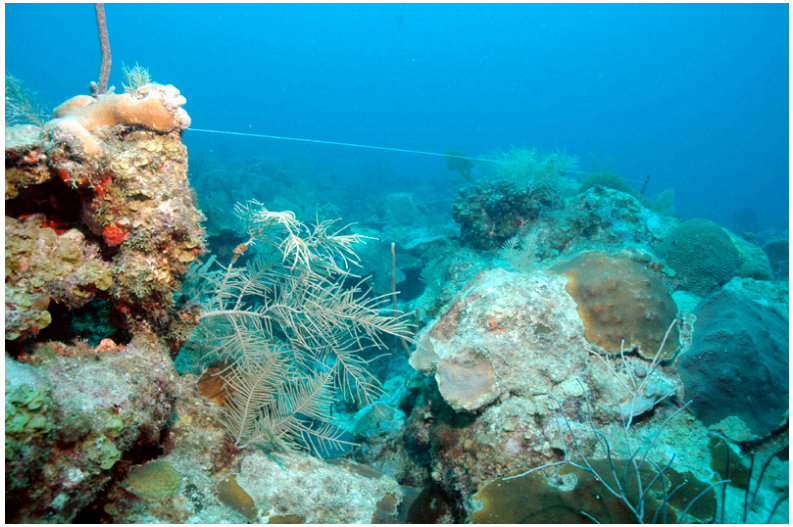


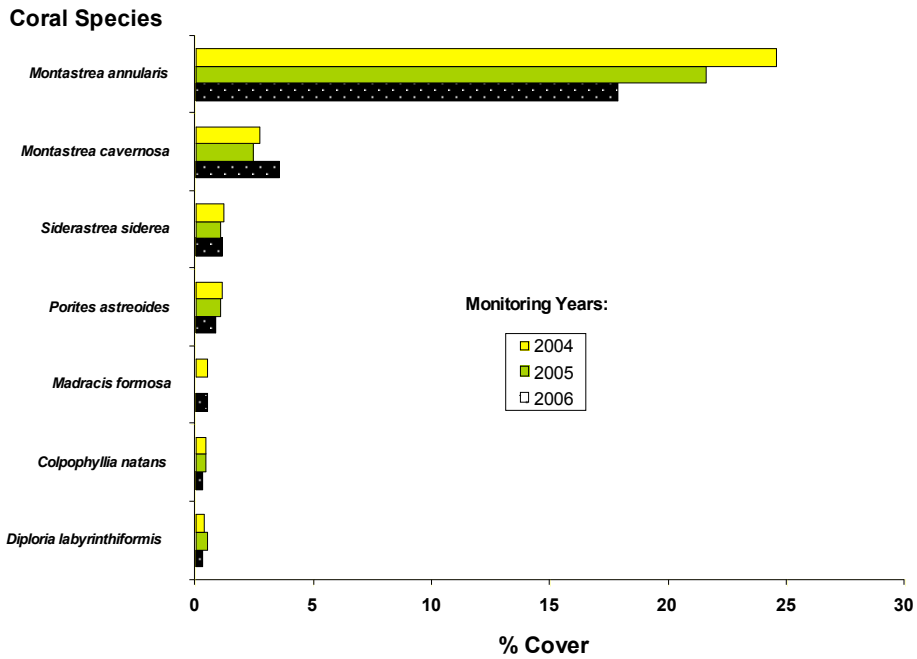


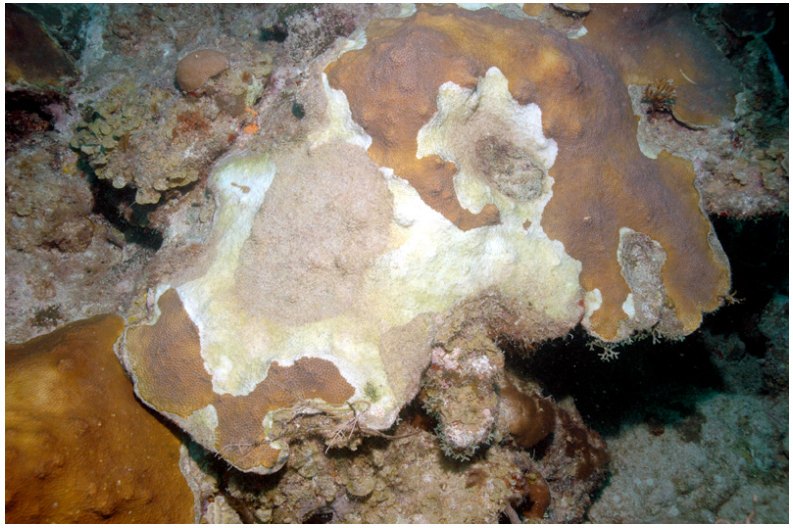


Tourmarine 20 m - Mayaguez

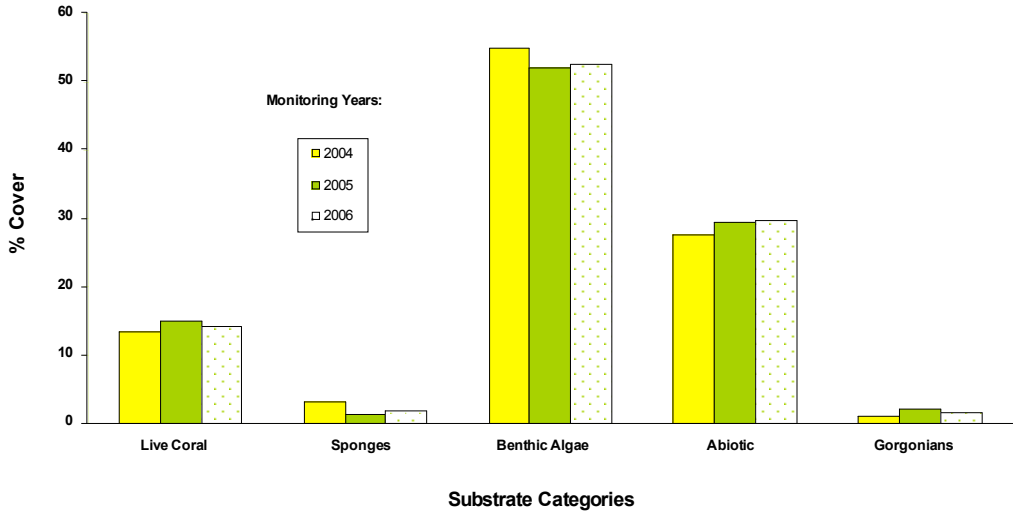


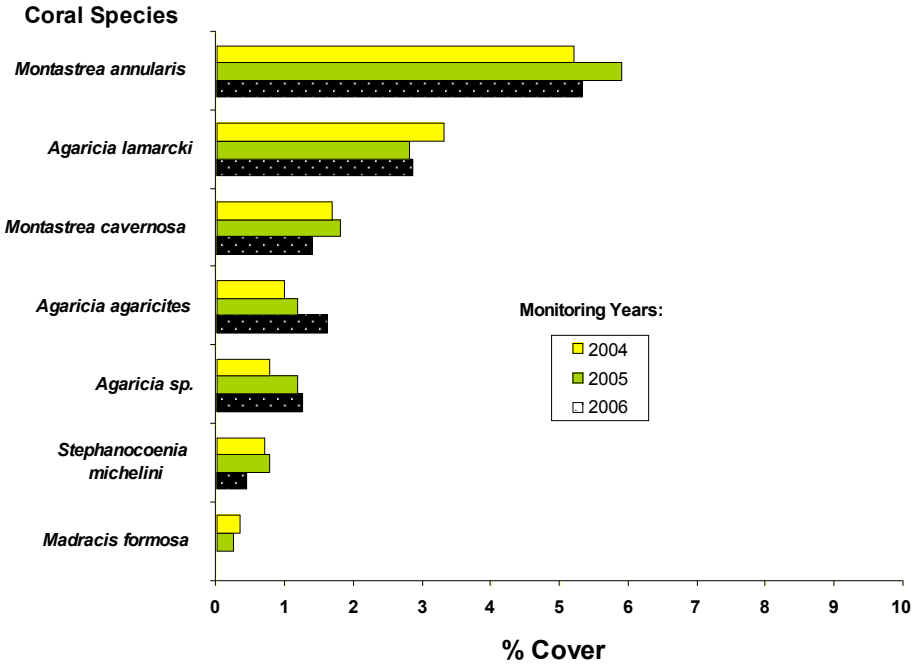


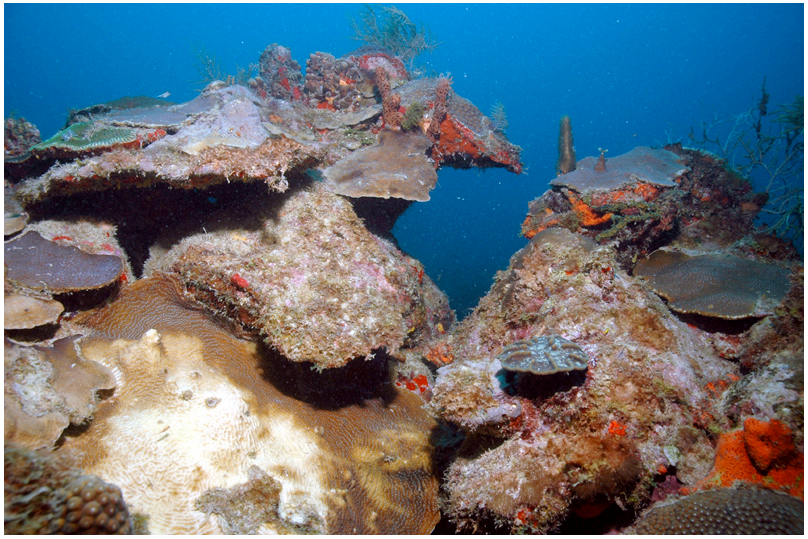




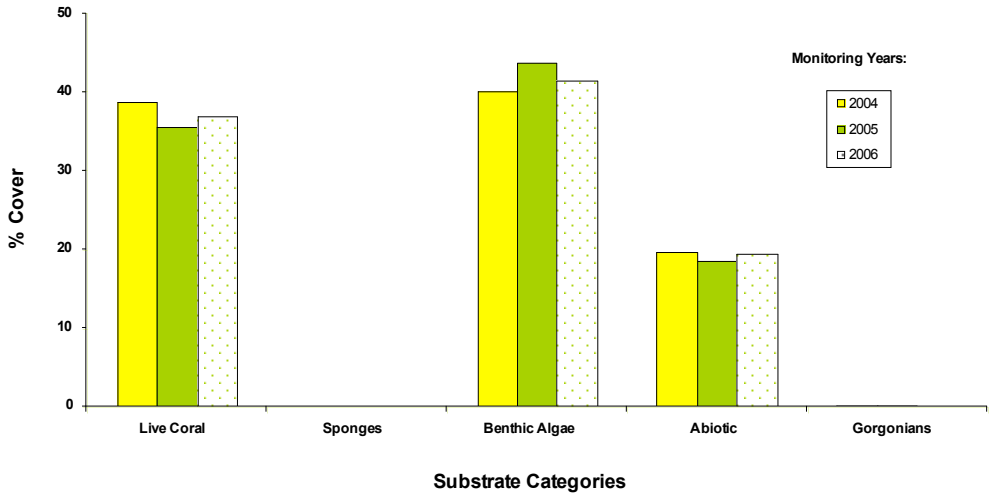
Tourmarine 30 m - Mayaguez

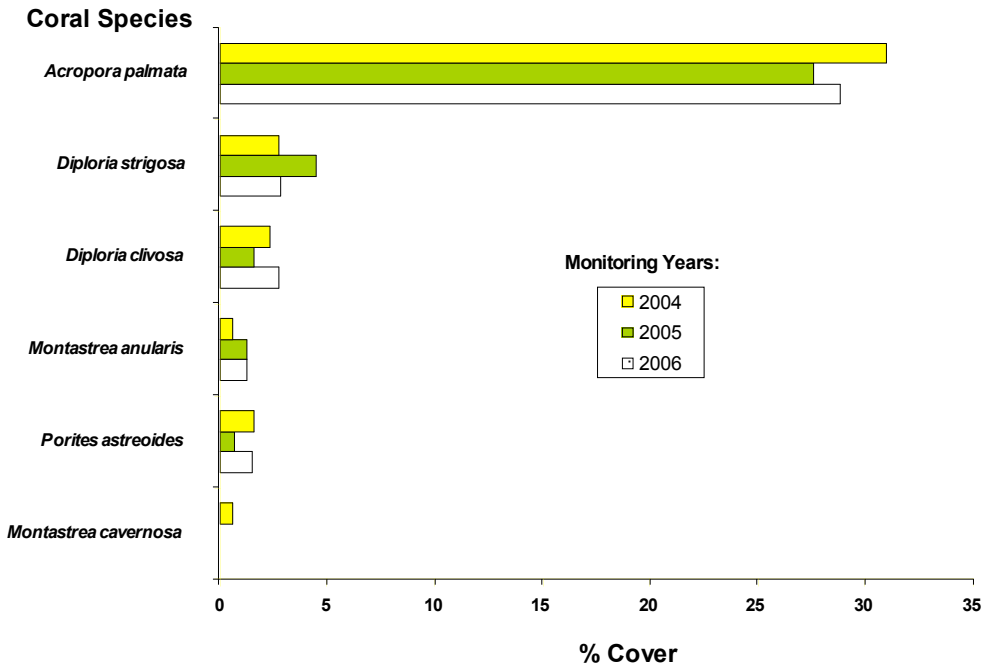




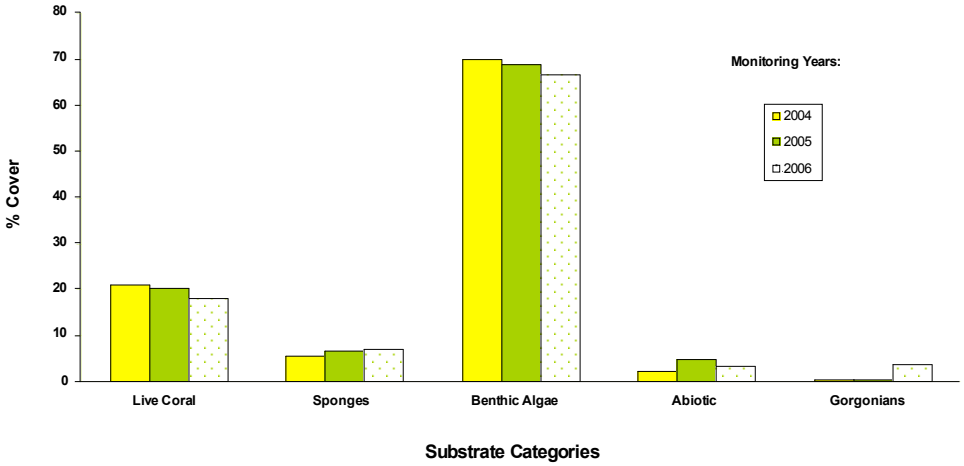


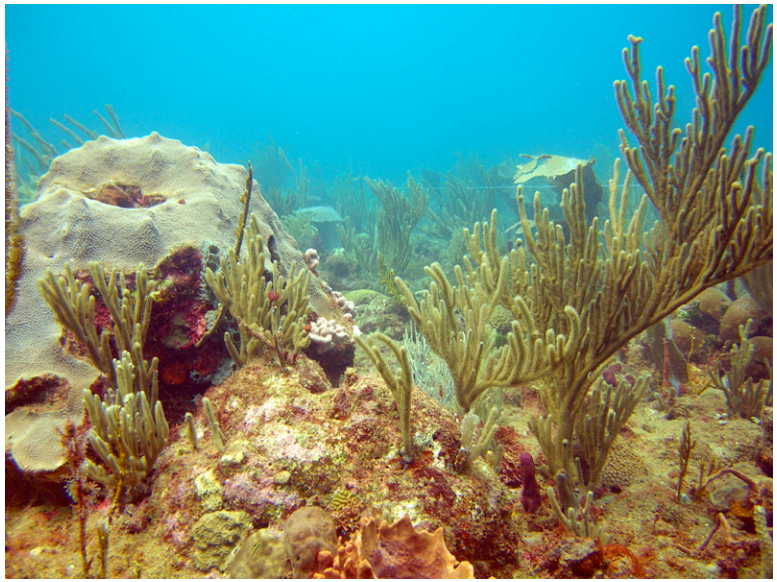
Tres Palmas Reef 5 m - Rincon

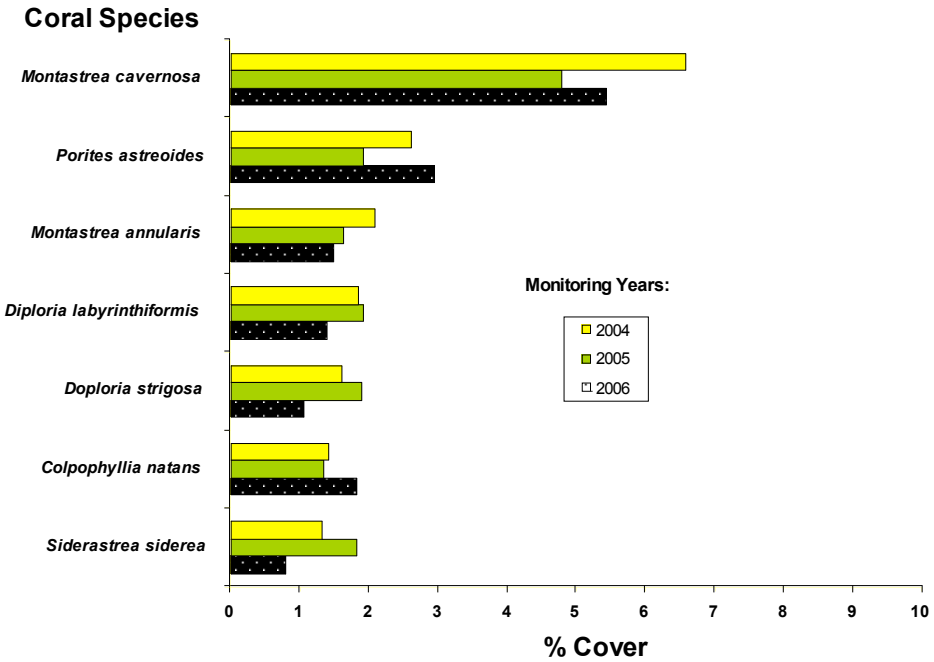




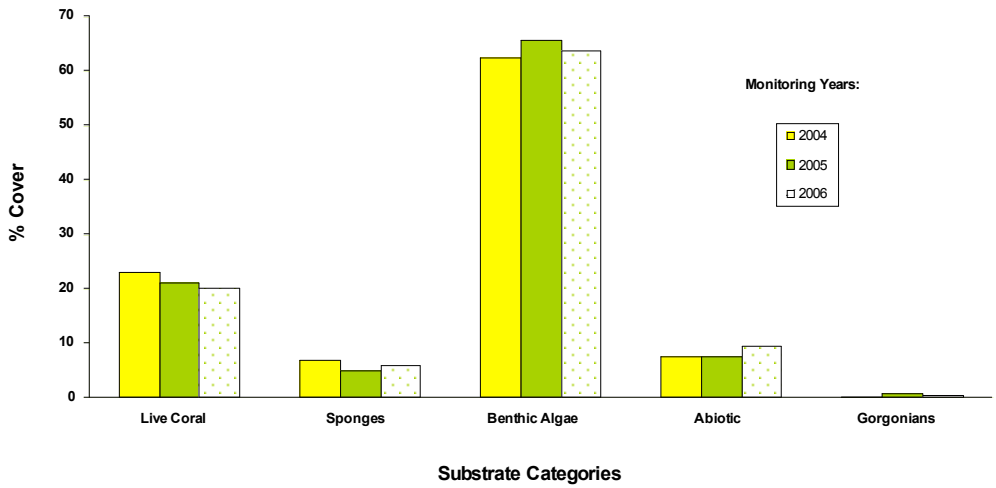
Tres Palmas Reef 10 m - Rincon

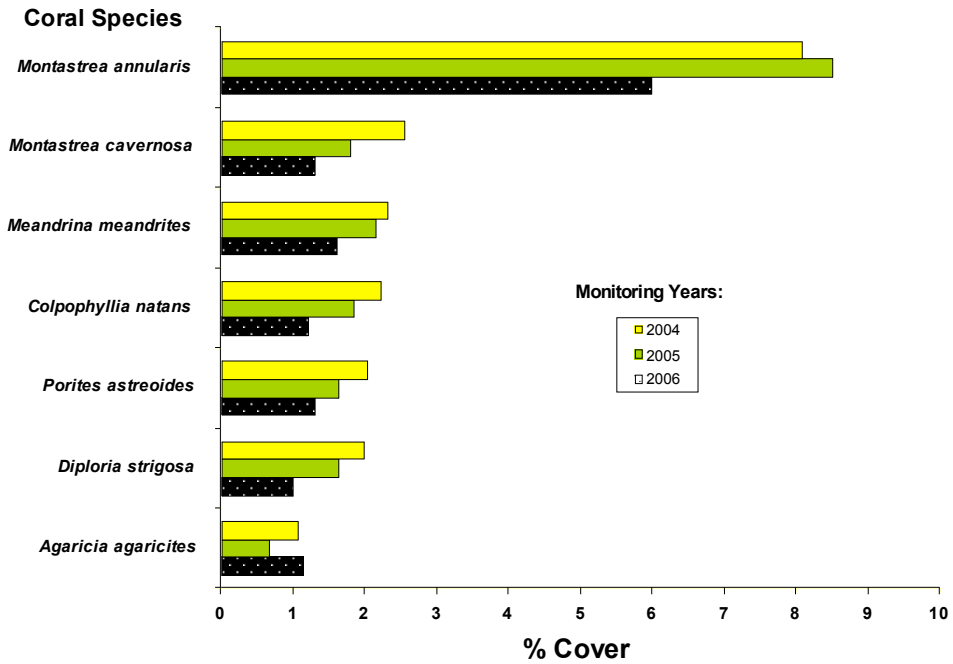






Tres Palmas Reef 20 m - Rincon





Conclusions

- Coral reef systems at the west and south coast of Puerto Rico experienced major reductions of live coral cover never before measured/reported
- Most of the remaining live coral is still partially bleached after the October 2005 bleaching event
- The dominant reef building coral, *Montastrea annularis* was the most severely impacted coral species
- Tres Palmas (Rincon) coral reefs and deep (>20 m) zones of the Tourmaline Reef (Mayaguez) not significantly impacted
- Coral bleaching action plan in effect
- Hobo temps installed at all reef sites