

St. John

SITE SUMMARIES

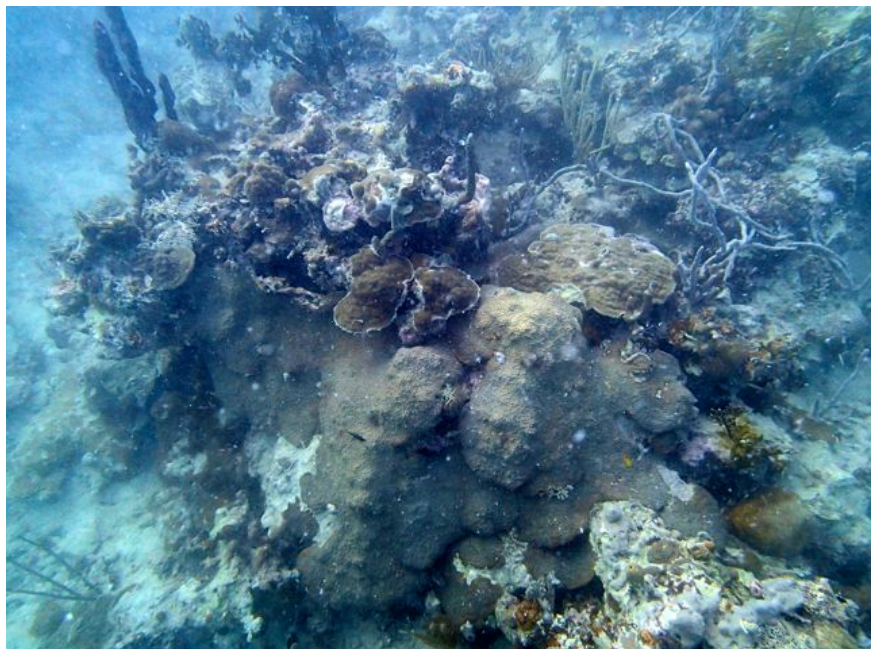
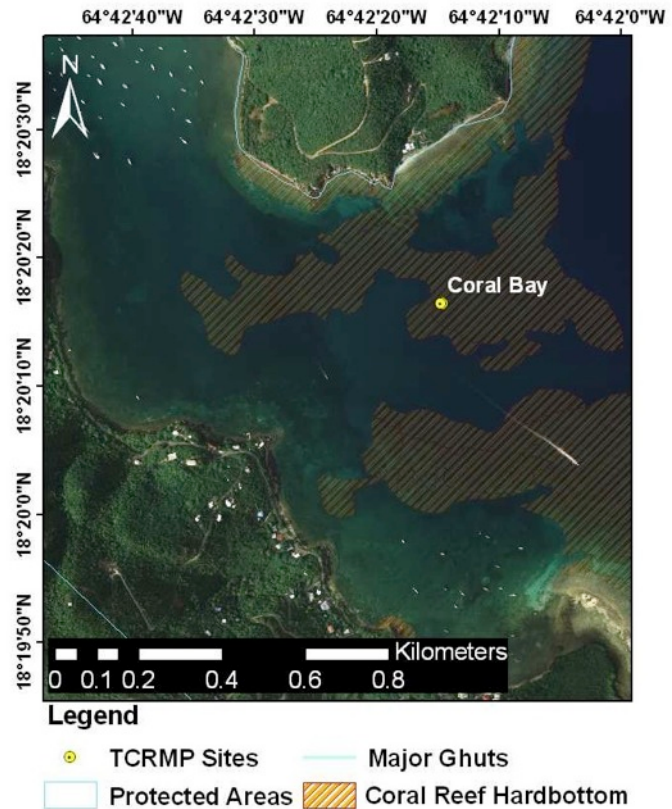
CORAL BAY

Description. The Coral Bay site is atop a patch reef complex at the southeast mouth of Coral Harbor. The reef is a low carbonate build up with high coral diversity. Coral Bay appears to be a true reef with a well-developed carbonate framework over bedrock. Coral Bay monitoring was initiated in 2011.

Outstanding Feature. Coral Bay supports a high diversity of coral and an apparent high rate of coral recruitment.

Threats. Coral Bay is subject to land-based sources of pollution, primarily as sediment influx from the large and steep Coral Bay watershed. Recent restoration activities in the watershed are expected to decrease the sediment influx. Coral Bay may also be threatened by maritime activities within Coral Harbor. Proximity to land makes this site in territorial waters potentially vulnerable to fishing.

Figure 99. Coral Bay.
(top) Location. (right) A representative photo of the reef.



CORAL BAY

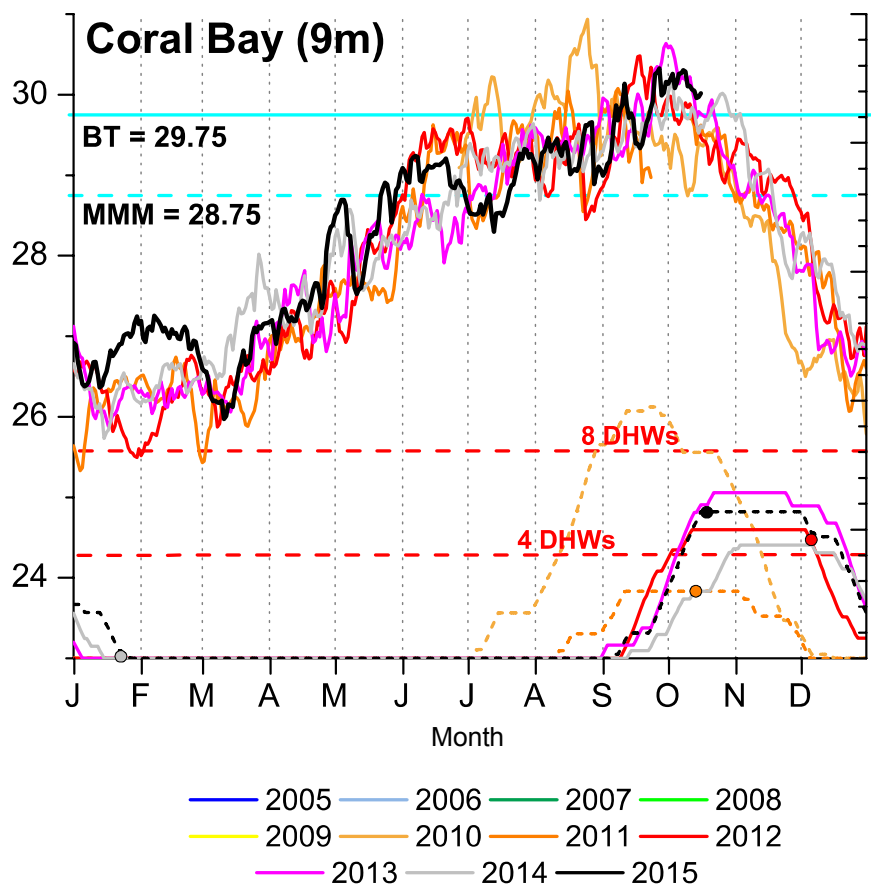


Figure 100. Coral Bay benthic temperature (9 m depth)

Physical Characteristics.

Current. Currents have not been measured by the TCRMP, however, Dr. Sarah Gray (University of San Diego) has measured 2-D near bottom measurements for some years between 2009-2011. Oscillatory currents are expected to be light and only weak unidirectional currents have been experienced.

Temperature. Coral Bay may have restricted water circulation and had very high temperatures during the 2010 bleaching event.

Other. This site and the wider Coral Bay area have been under investigation for land-based sources of pollution impacts since 2009. Projects have been involved terrestrial sediment measurement/modeling, marine sediment flux, coral demographic plots, and biological monitoring. The area has also been involved in water quality monitoring (Smith et al. 2013a).

SITE SUMMARIES

Benthic Community. Coral Bay has a very diverse coral community, with no clear dominance of cover. In contrast to most sites, the mustard hill coral *Porites astreoides* has the greatest cover among coral species. Sponges and gorgonians are also very common at this site. Epilithic algae and a high abundance of crustose coralline algae dominate the algal community, with very low abundance of macroalgae. This is surprising at this turbid reef site that likely receives high inputs of particulate and dissolved nutrient sources, and indicates that grazing is quite high. There is not a high abundance of herbivorous fish and only the occasional occurrence of *Diadema antillarum*. However, there is a great abundance of the rock boring urchin *Echinometra* spp. that appears to be the dominant grazer. This genus is not monitored in TCRMP protocols, but perhaps should be included in future years.

Coral Health. It is not known how corals were affected by bleaching in 2005. There was a low prevalence of low extent bleaching in 2011. Diseases were not recorded in 2011. Old partial mortality prevalence was low in 2011, but this may partly be explained by the high abundance of small coral colonies that are less prone old partial mortality. Recent mortality had low prevalence in 2011.

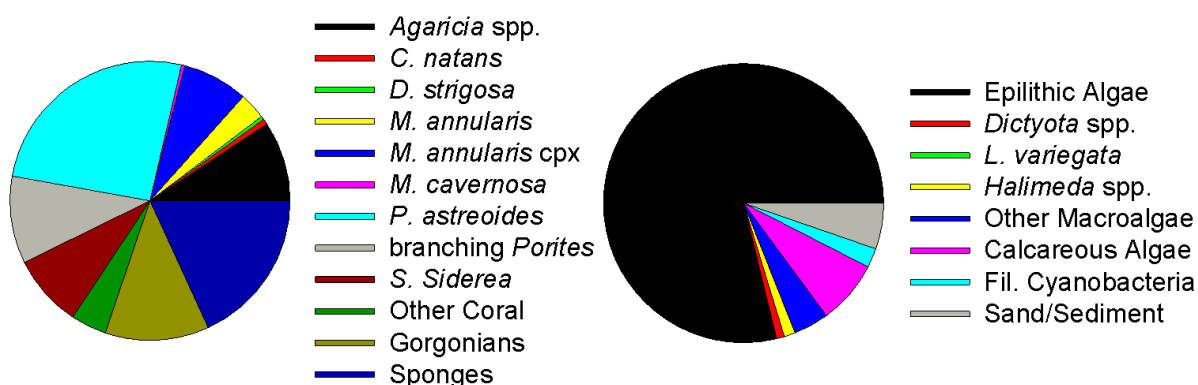


Figure 101. Coral Bay (left) Relative composition of the sessile epibenthic animal community. (right) Relative composition of the algal community and unconsolidated sediment.

CORAL BAY

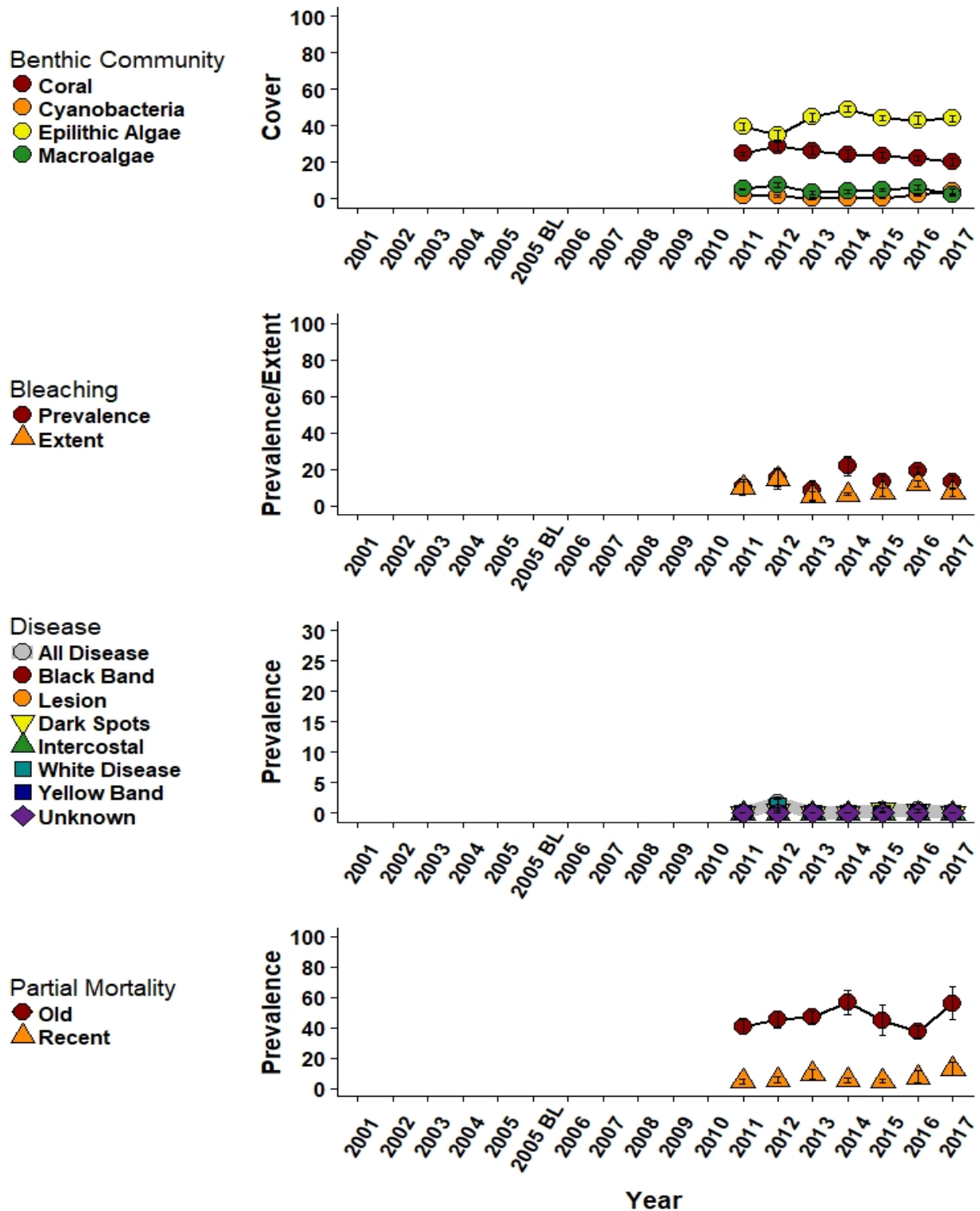


Figure 102. Coral Bay benthic cover and coral health through time (mean $\pm$ SE).

SITE SUMMARIES

Fish Community. The Coral Bay site is low in fish diversity, biomass and abundance.

Although epilithic algae are prolific, large grazers are nearly absent. Three spot damselfish dominate the group in both abundance and biomass. Planktivores in the high turbidity habitat are limited to a few juvenile yellowtail snapper and pomacentrids. Although benthic invertivores were more prolific and diverse, only a few individuals comprise each species group. Likewise piscivores had a very low biomass and have been limited to a few individuals during monitoring surveys, most notably the schoolmaster snapper.

CORAL BAY

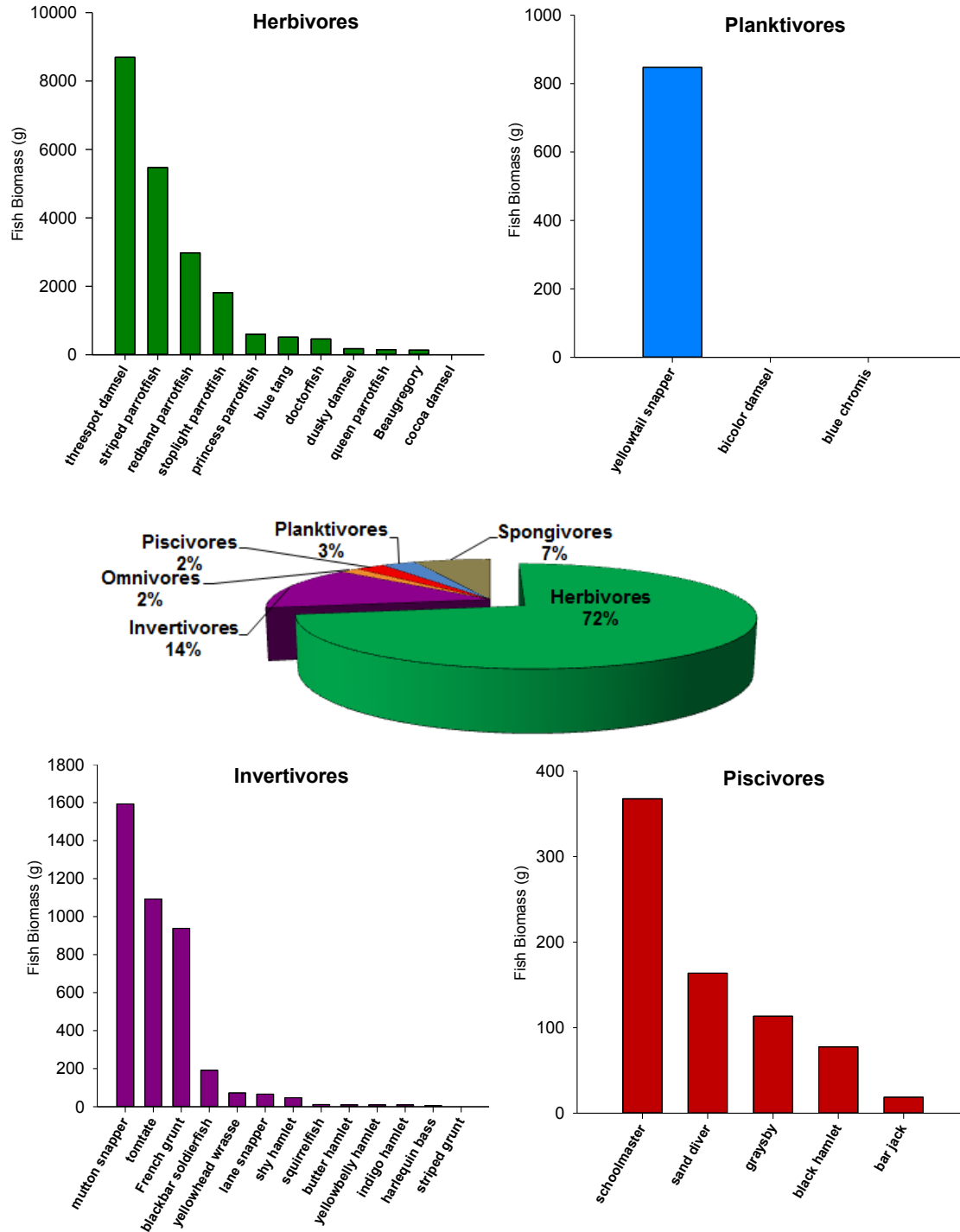


Figure 103. The Coral Bay fish community by absolute and relative biomass.

SITE SUMMARIES

FISH BAY

Description. Fish Bay is a nearshore Fringing Reef in territorial waters. The monitoring site is a sharp edge of a shallow water coral community dropping to sand at 7 m depth. The site has been monitored since 2001.

Outstanding Feature. Fish Bay inner transects (1 – 3) are heavily sediment impacted, while outer transects (4-6) support large boulder star corals (*Orbicella faveolata*).

Threats. Fish Bay is subjected to land-based sources of pollution. Inner bay transects tend to have turbid water and overgrowth by macroalgae. This site may also be vulnerable to fishing impacts.

Figure 104. Fish Bay. (top) Location. (right) A representative photo of the reef.



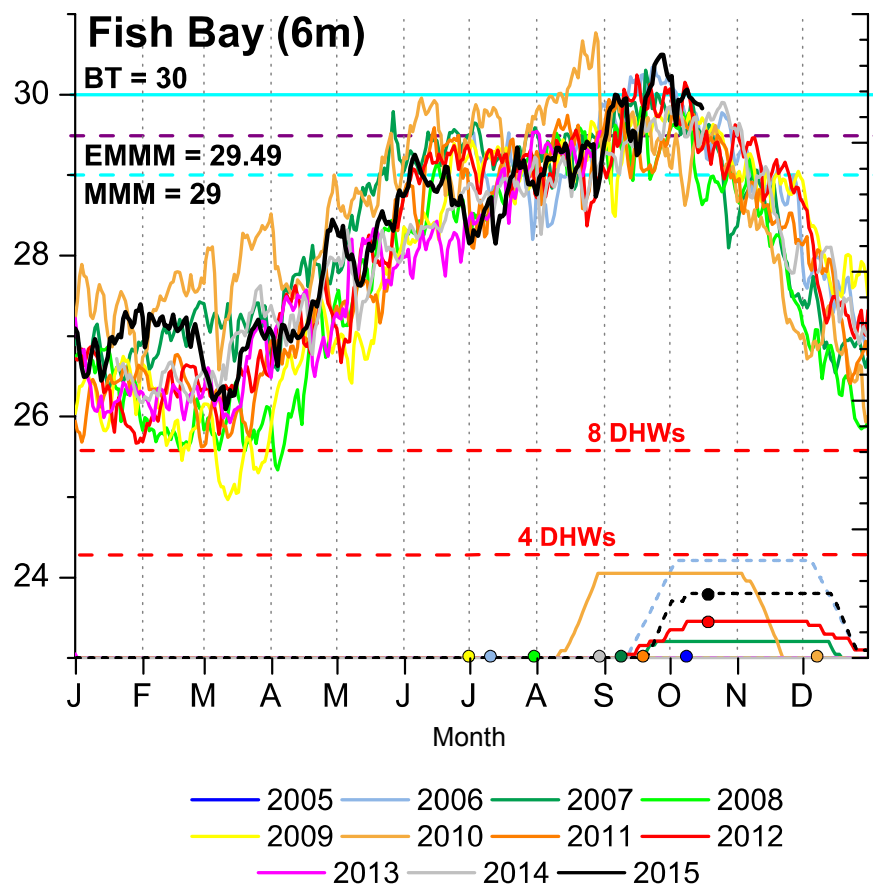


Figure 105. Fish Bay benthic temperature record (6 m depth).

Physical Characteristics.

Current. Fish Bay currents have not been measured directly by the TCRMP. Unidirectional currents are mild to slack. Because of the southeast exposure, wave driven oscillatory currents can be quite intense, particularly on the outer transects.

Temperature. Fish Bay has relatively high mean temperatures and was very far over the regional bleaching threshold in 2010.

SITE SUMMARIES

Benthic Community. The coral community of Fish Bay is dominated by the boulder star coral *Orbicella* spp.. In particular, large (>2m wide) colonies of *O. faveolata* are common on the seaward transects (4-6). The inner transects (1-3) are mostly depauperate of coral (< 4% cover as of 2011). The site lost 37.1% of its cover due to the 2005 coral bleaching event, but had regained 136.1% of cover by 2011. Gorgonians are also very common on the wave-washed outer transects. Equal parts epilithic algae and the macroalgae *Dictyota* spp. dominate the algal community. The site also has a high abundance of *Halimeda opuntia*, which can smother coral on inner bay transects closest to land-based sources of pollution.

Coral Health. Fish Bay corals were very severely affected in the 2005 with 100% of corals showing almost 100% bleaching. Bleaching is also normally high at this site even in years without thermal stress, a likely consequence of sediment and macroalgal interactions. Diseases, particularly dark spots disease and white disease, can have very high prevalence at Fish Bay. Old partial mortality did increase after the 2005 coral bleaching event, with a decline in 2010 and resurgence in 2011. Recent partial mortality can also be relatively high compared with other sites, largely as the results of bites from site-attached damselfish (*Stegastes* spp.).

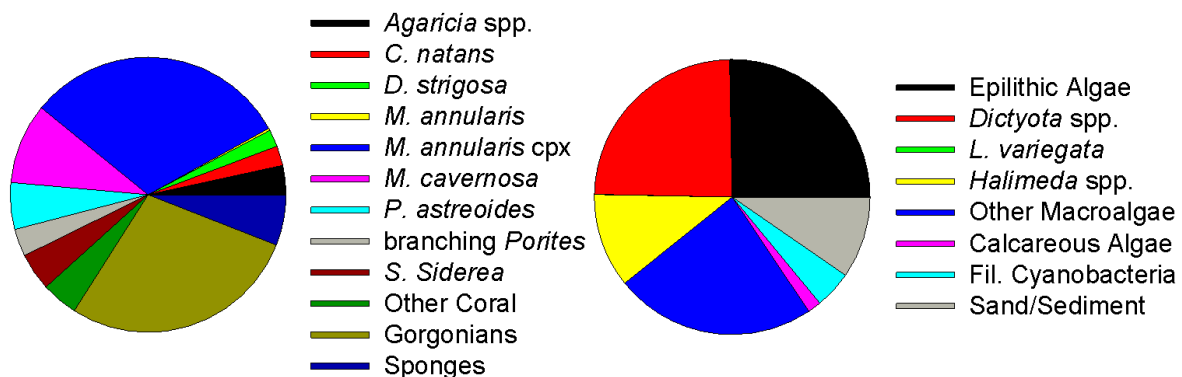


Figure 106. Fish Bay (left) Relative composition of the sessile epibenthic animal community. (right) Relative composition of the algal community and unconsolidated sediment.

FISH BAY

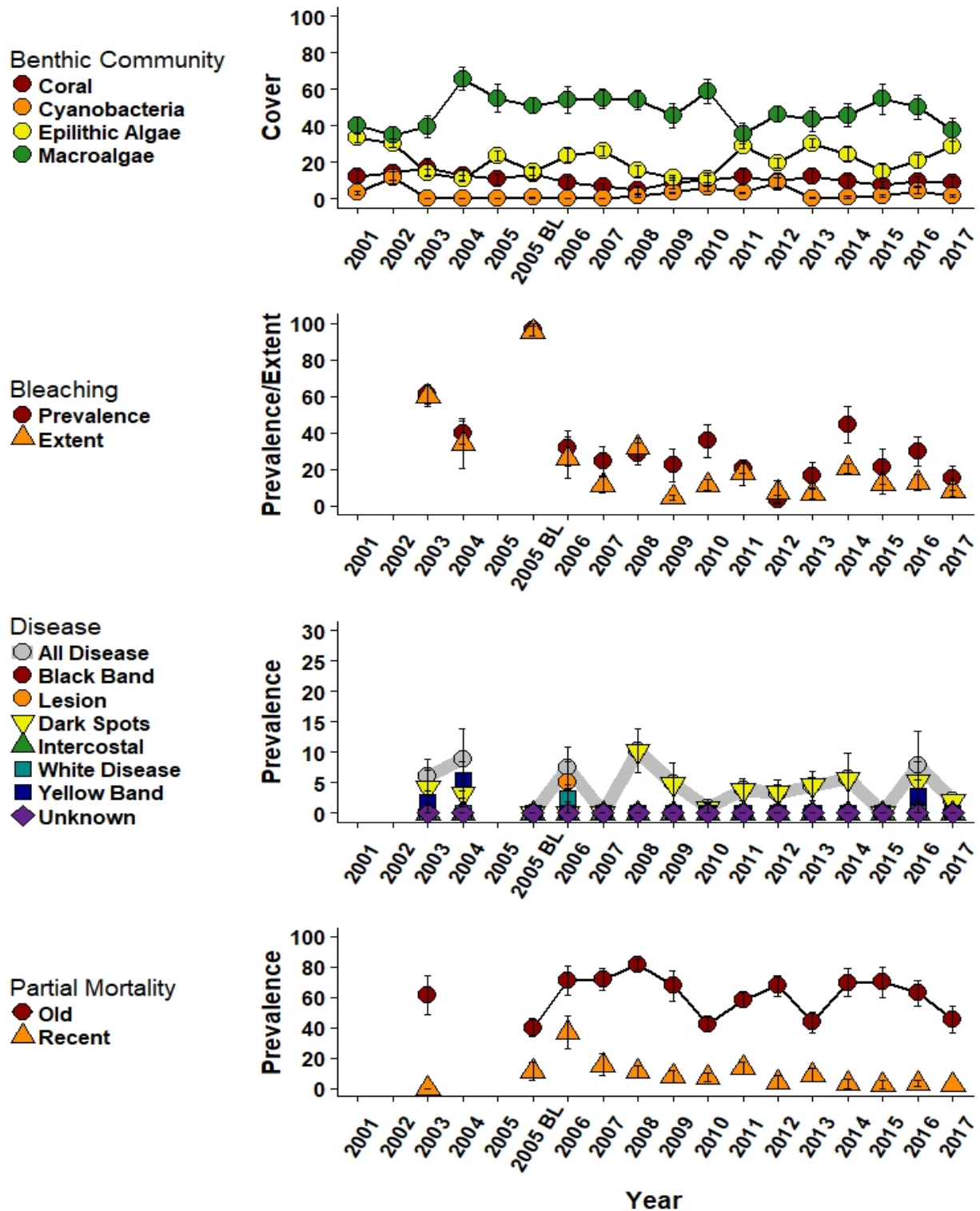


Figure 107. Fish Bay benthic cover and coral health through time (mean $\pm$ SE).

SITE SUMMARIES

Fish Community. The Fish Bay fish community is typical of a nearshore reef habitat that receives moderate to heavy sedimentation. The site is dominated by herbivores that include all of the common Caribbean parrotfishes, large schools of mixed acanthurids, and herbivorous pomacentrids. Planktivores in the turbid water are limited to juvenile yellowtail snapper and a few small pomacentrids. Benthic invertivores and piscivores are more diverse and abundant but are dominated by wrasses and jacks, respectively. Large serranids and lutjanids are absent from Fish Bay although occasional juvenile lemon sharks are seen in the murky water, where adult females are known to pup.

FISH BAY

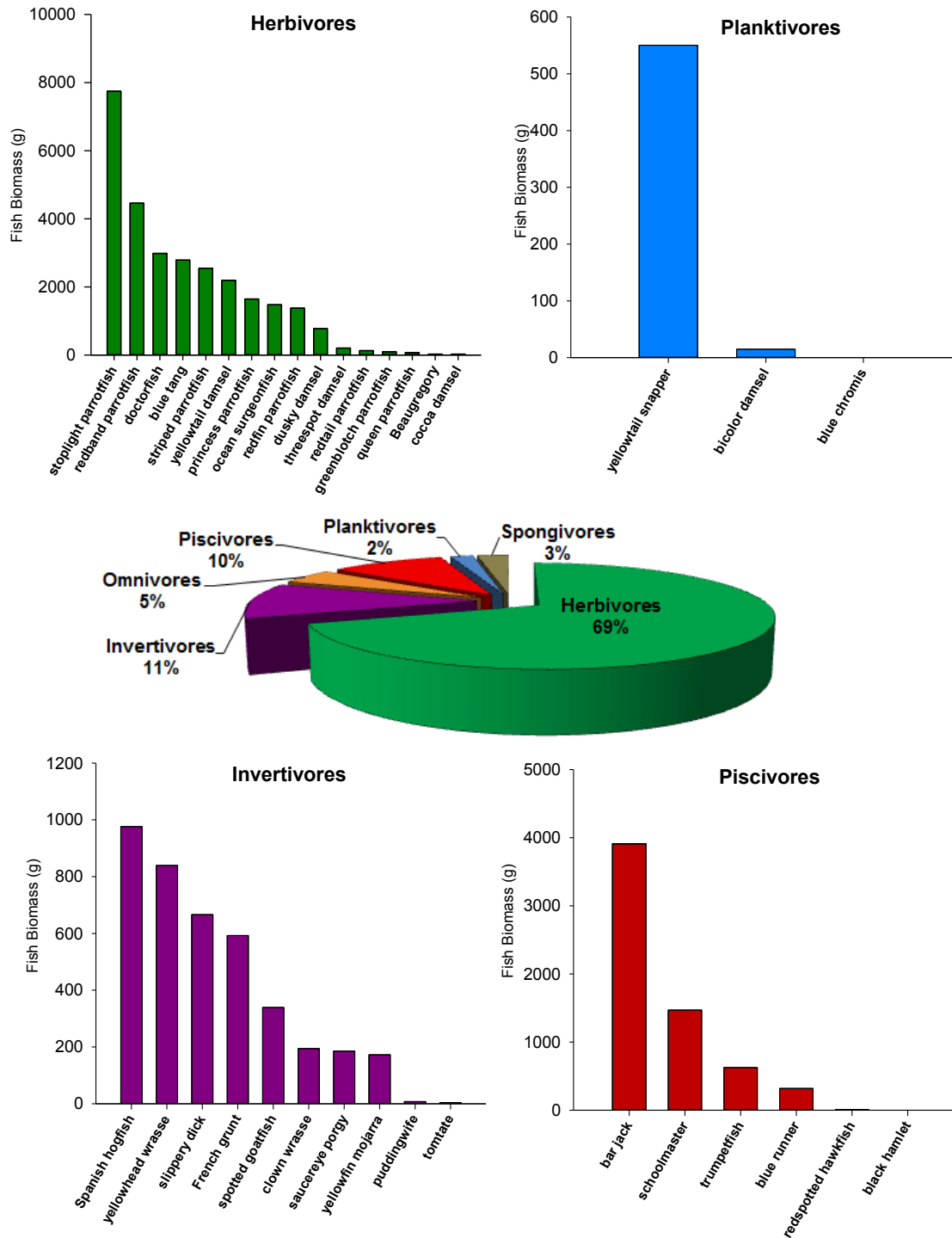
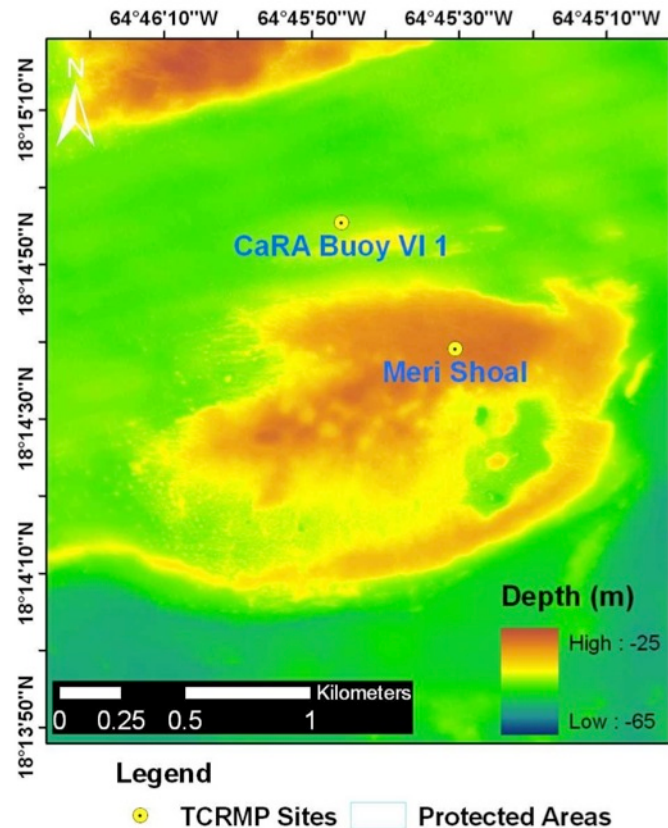


Figure 108. The Fish Bay fish community by absolute and relative biomass.

SITE SUMMARIES

MERI SHOAL

Description. Meri Shoal is an offshore mesophotic coral bank 30 m depth. The reef is located four miles south of St. John and is on the southernmost of two impressive midshelf coral banks. The reef is dominated by interlocking colonies of boulder star corals (*Orbicella* spp.). The reef top is very flat coral plain. The site is named for Dr. Meri Whitaker, former director of the VI EPSCoR Program who passed away in 2009. Meri Shoal has been monitored since 2005.



Outstanding Feature. Meri Shoal has the highest star coral abundance of any site in the TCRMP and is bathed in clear, clean water.

Threats. Meri Shoal is vulnerable to fishing impacts, as it is outside any marine protected area. The high density of corals may also make this site vulnerable to disease impacts.

Figure 109. Meri Shoal. (top) Location. (right) A representative photo of the reef during the 2005 coral bleaching event (Oct. 6, 2005). The brain coral in the foreground is 1.8 m wide.



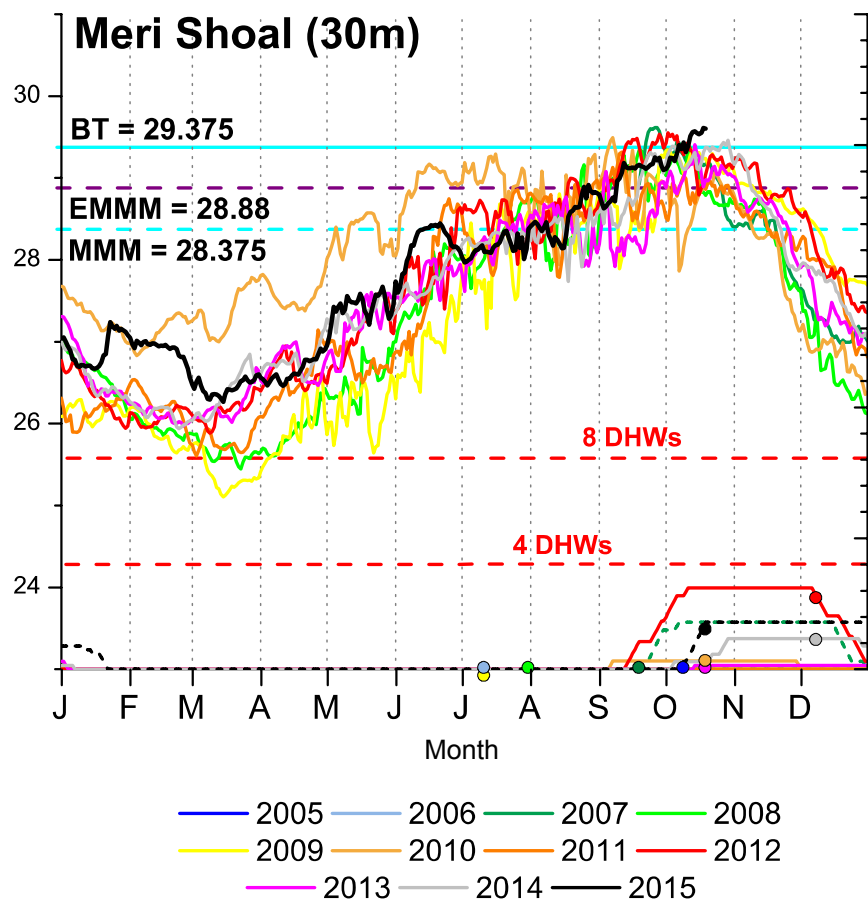


Figure 110. Meri Shoal benthic temperature record (30 m depth).

Physical Characteristics.

Current. Currents have not been measured directly at the Meri Shoal site, although the Caribbean Regional Association buoy VI 1 is located within 700 m and its downward focused ADCP has been recording data since April 2011.

Temperature. Meri Shoal has relatively low temperatures that are more similar to other mesophotic sites.

SITE SUMMARIES

Benthic Community. The Meri Shoal site is exceptional for its dominance by boulder star corals (*Orbicella* spp.). Cover of this and other coral species was exceptionally high when the site was first monitored during the 2005 coral bleaching event, but declined by 36.0% after bleaching and had not recovered any cover as of 2011 (-9.6%). Surprisingly, given the high coral cover, *Lobophora variegata*, and not epilithic algae, dominate the algal community and there has been a trend of increasing macroalgal cover since 2008.

Coral Health. Coral bleaching was relatively high for a mesophotic site during the coral bleaching event in 2005. Bleaching was again at high prevalence, but low extent in the thermal stress of 2010. However, low-extent bleaching at moderate prevalence is a persistent feature of Meri Shoal. Disease, particularly white disease and lesions that are likely the remnants of white disease, are highly prevalent, particularly in years following high thermal anomalies, such as 2006 and 2011. Old partial mortality climbed steeply from the 2005 coral bleaching event onwards and reached very high levels by 2006. Recent partial mortality has also been consistently high as the result of white disease and disease lesions.

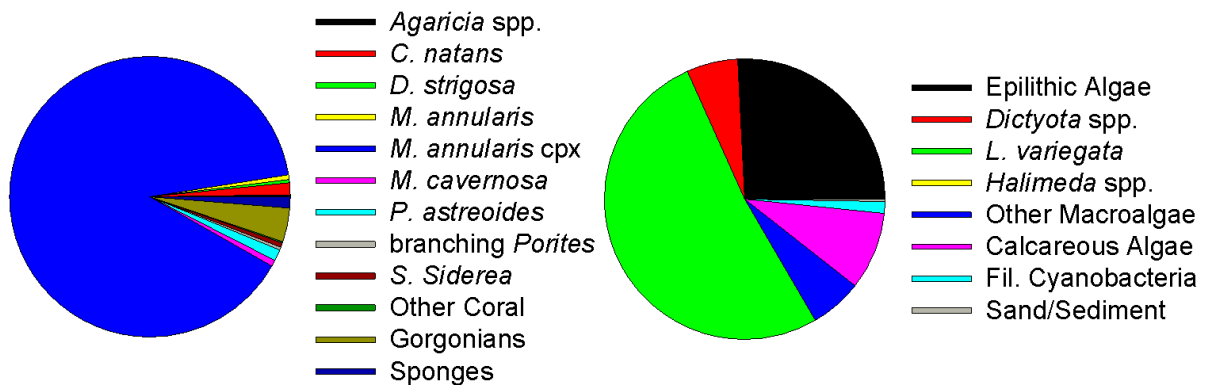


Figure 111. Meri Shoal (left) Relative composition of the sessile epibenthic animal community. (right) Relative composition of the algal community and unconsolidated sediment.

MERI SHOAL

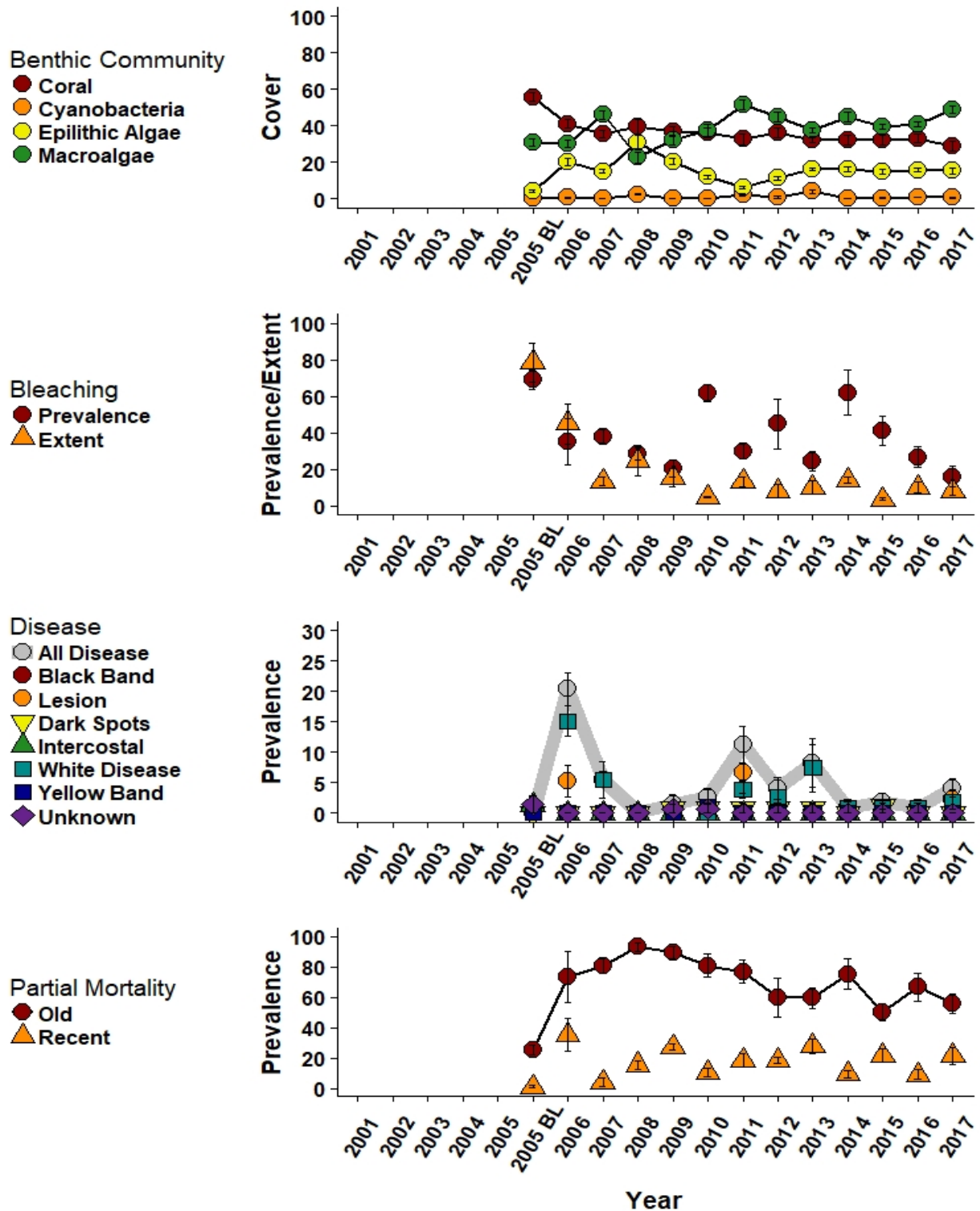


Figure 112. Meri Shoal benthic cover and coral health through time (mean $\pm$ SE).

SITE SUMMARIES

Fish Community. Meri Shoal is a beautiful site in relatively deep water and holds a dynamic fish community of high biomass. Important planktivores include the very prolific creole wrasse, feeding on tiny jellyfish, invertivore larvae and phytoplankton, and the black surgeon, primarily a zooplankton feeder. Herbivores observed on the site include large stoplight parrotfish, all of the common smaller parrotfish, and all three acanthurids in fairly large numbers. Queen triggerfish and red hind are both common. In 2012 a tiger grouper was observed on a belt transect and another on a roving dive. A Nassau grouper was also observed on a roving dive in 2013. These are exciting encounters as the site is not near a spawning aggregation area and is not protected from traps or any type of fishing. Jacks, mackerels, and barracuda are also regularly observed in the water column at Meri Shoal.