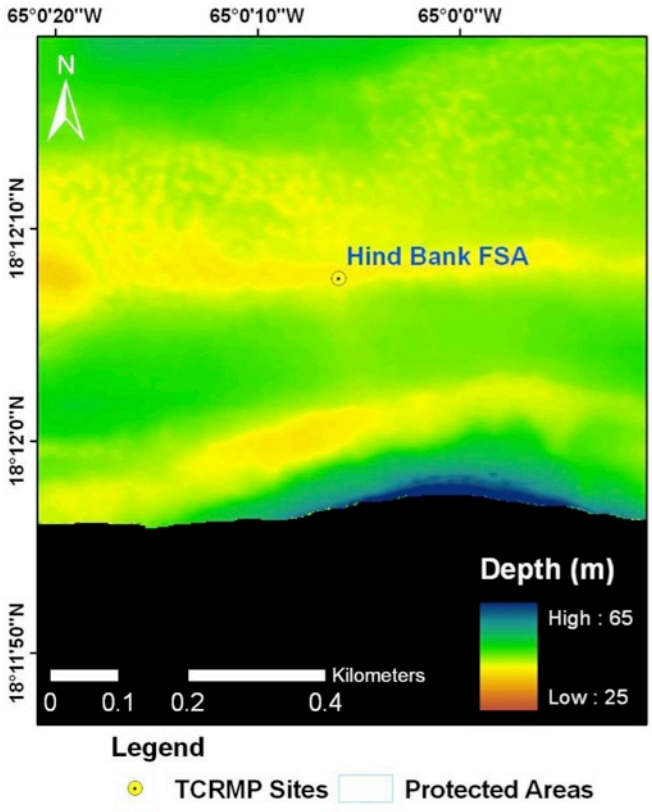
HIND BANK

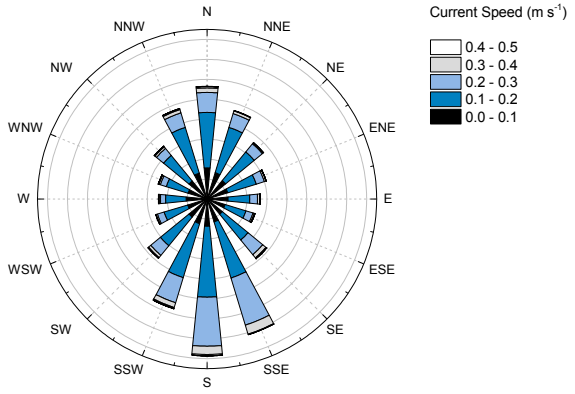
Description. The Hind Bank is a mesophotic tertiary bank in depths of 38 – 42 m. The reef is part of a patchy complex of star coral (*Orbicella* spp.) dominated reefs that stretch across the eastern Red Hind Marine Conservation District. The Hind Bank has been monitored since 2003, with permanent benthic transects installed in 2007.

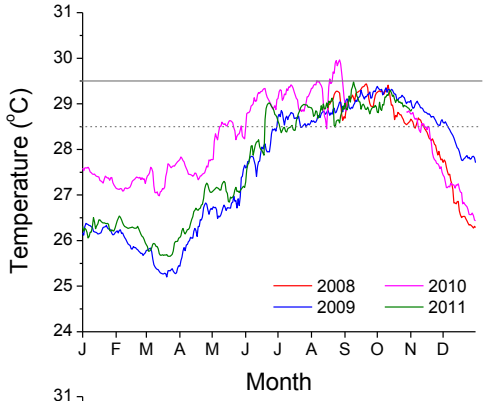


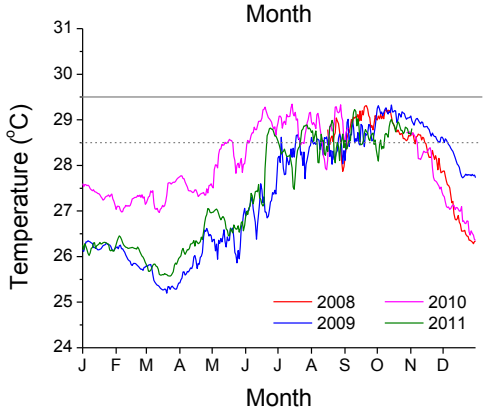
Outstanding Feature. The Hind Bank is within a no-take marine reserve and fish populations are recovering and robust. The Hind Bank monitoring site hosts a multispecies spawning aggregation, including a recovering mating population of the commercially important red hind grouper (*Epinephelus guttatus*).

Threats. The Hind Bank and surrounding dense reefs are somewhat buffered from high thermal stress, but they are susceptible to chronic coral white diseases. Periodic disease outbreaks follow high thermal stress. The Indo-Pacific lionfish (*Pterois volitans*) has formed dense populations within the study area and may be affecting native fish populations.

Figure 139. Hind Bank (top) Location. (right) A representative photo of the reef.







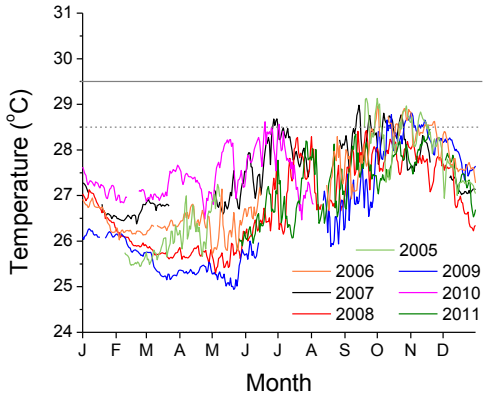


Figure 140. Hind Bank benthic current speed (40m depth). Benthic temperature record at 20, 30, and 40 m depth.

Physical Characteristics.

Current. Hind Bank has moderately strong unidirectional near-benthic currents that are dominated by a north to south components. Currents can be moderate to strong (>20cm s^{-1}). Current speeds are based on near-continuous ADCP deployments from February 2005 to May 2012, with measurements at 30 or 60 min. intervals. Oscillatory currents are not known from the Hind Bank.

Temperature. Benthic temperatures at the Hind Bank were augmented with a subsurface buoyed thermistor string carrying thermistors at 20 and 30 m depth. Benthic temperatures show strong inter-annual variability, but were much cooler than temperatures in the mixed layer at 20 m depth. This was particularly evident in 2010; when temperatures were warmest at 20 m in late August during coral bleaching, temperatures were unseasonably cool on the bottom. The 30 m thermistor was intermediate, with warming to near the bleaching threshold in 2010, but not surpassing the threshold like the 20 m depth. One caveat for the accuracy of the 20 and 30 m thermistors is that they can change depth to some degree by bowing of the buoy line by currents.

Benthic Community. The Hind Bank site is dominated by boulder star corals (*Orbicella* spp.), but also has a high abundance of lettuce corals (*Agaricia* spp.). The Hind Bank site lost 21.8% of its coral cover in the 2005 bleaching event, but had regained 71.4% of this cover by 2011. The algal community is co-dominated by epilithic algae and the macroalga *Lobophora variegata*. There is also high representation of crustose coralline algae and other unidentified macroalgal species.

Coral Health. Bleaching during the 2005 event was nearly indistinguishable from background levels of bleaching in both prevalence and extent. The prevalence of bleaching was actually higher during the 2010 coral bleaching event. In later years the high prevalence of moderate prevalence, low colony extent bleaching was often associated with granular bleaching. This bleaching pattern shows pigmented spots surrounded by bleached tissue. Coral diseases are common at the Hind Bank and may be increasing. White disease was the dominant disease, and 2011 showed a peak of disease signs. In 2009 there was a high prevalence of intercostal mortality syndrome, which is only known from mesophotic coral reefs (Smith et al. 2010b). Old partial mortality increased after the 2005 bleaching event and the high prevalence was not reduced until 2011. Recent partial mortality prevalence is often high and reflects the impacts of disease and predation.

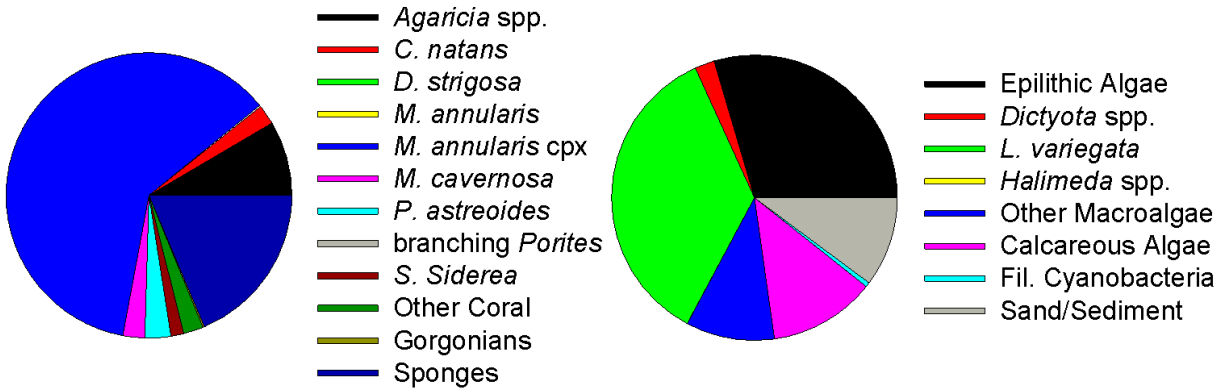


Figure 141. Hind Bank. (left) Relative composition of the sessile epibenthic animal community. (right) Relative composition of the algal community and unconsolidated sediment.

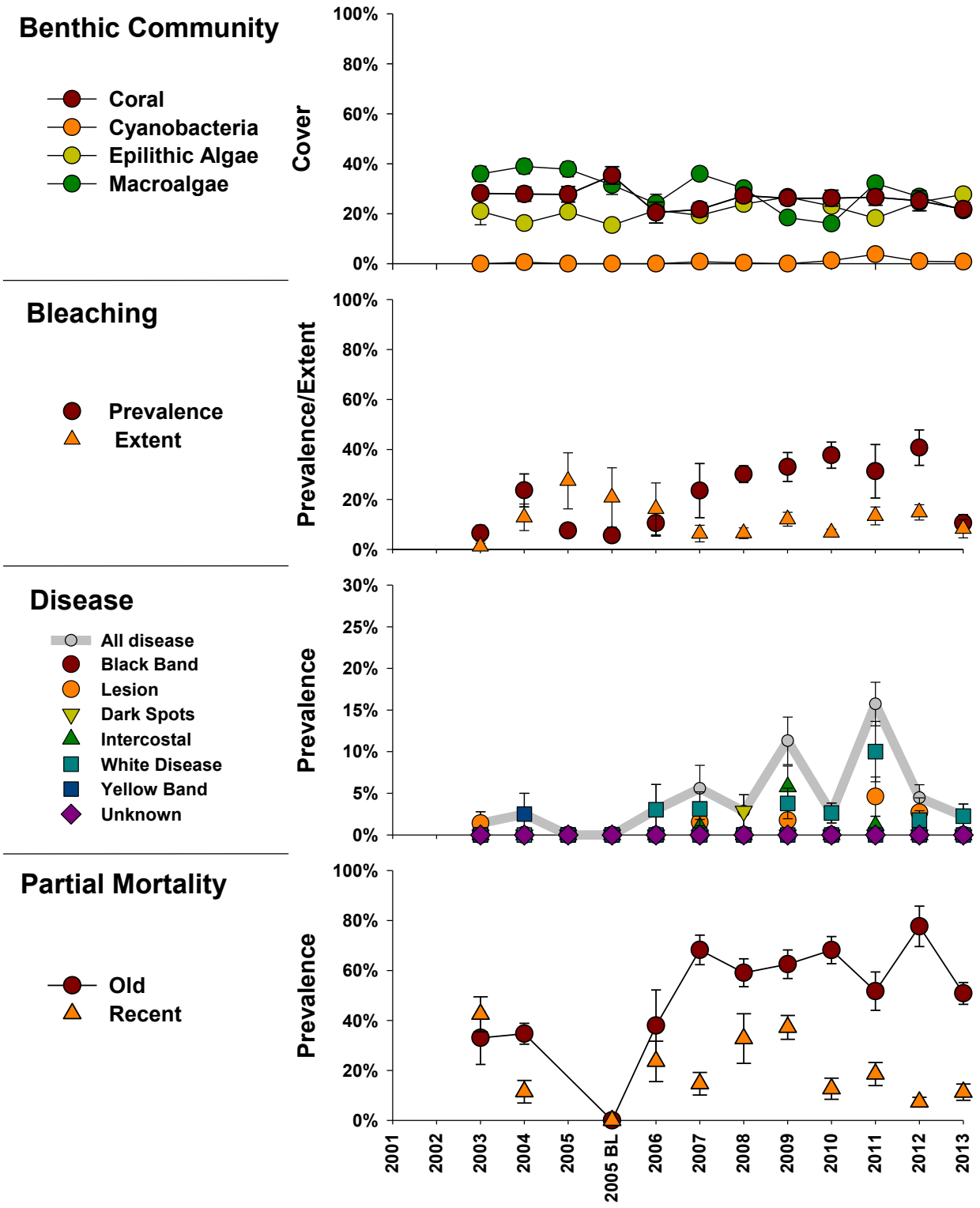


Figure 142. Hind Bank benthic cover and coral health through time (mean ±SE).

Fish Community. The Hind Bank is characterized by a high number of piscivorous fish. The site is within the Marine Conservation District (MCD) and is protected year round from all fishing, except surface trolling. It is the spawning site for several species including red hind, mutton snapper, tiger grouper and schoolmaster snapper. Surveys often coincide with the occurrence of schoolmaster snapper. This drives up the relative piscivore biomass; however, there are also commonly members of the pelagic jack family (Carangidae) and large barracuda observed. Invertivores are dominated by goatfish as the likely result of the proximity of sand areas around reefs. Creole wrasse are not nearly as dominant as on other mesophotic sites. Herbivores are less common than on nearshore sites and are dominated by adult or semi-adult princess parrotfish. Juvenile parrotfish and surgeonfish are uncommon, as on all mesophotic sites. Yellowhead wrasse are fairly common on the Hind Bank, however bluehead wrasse are not.

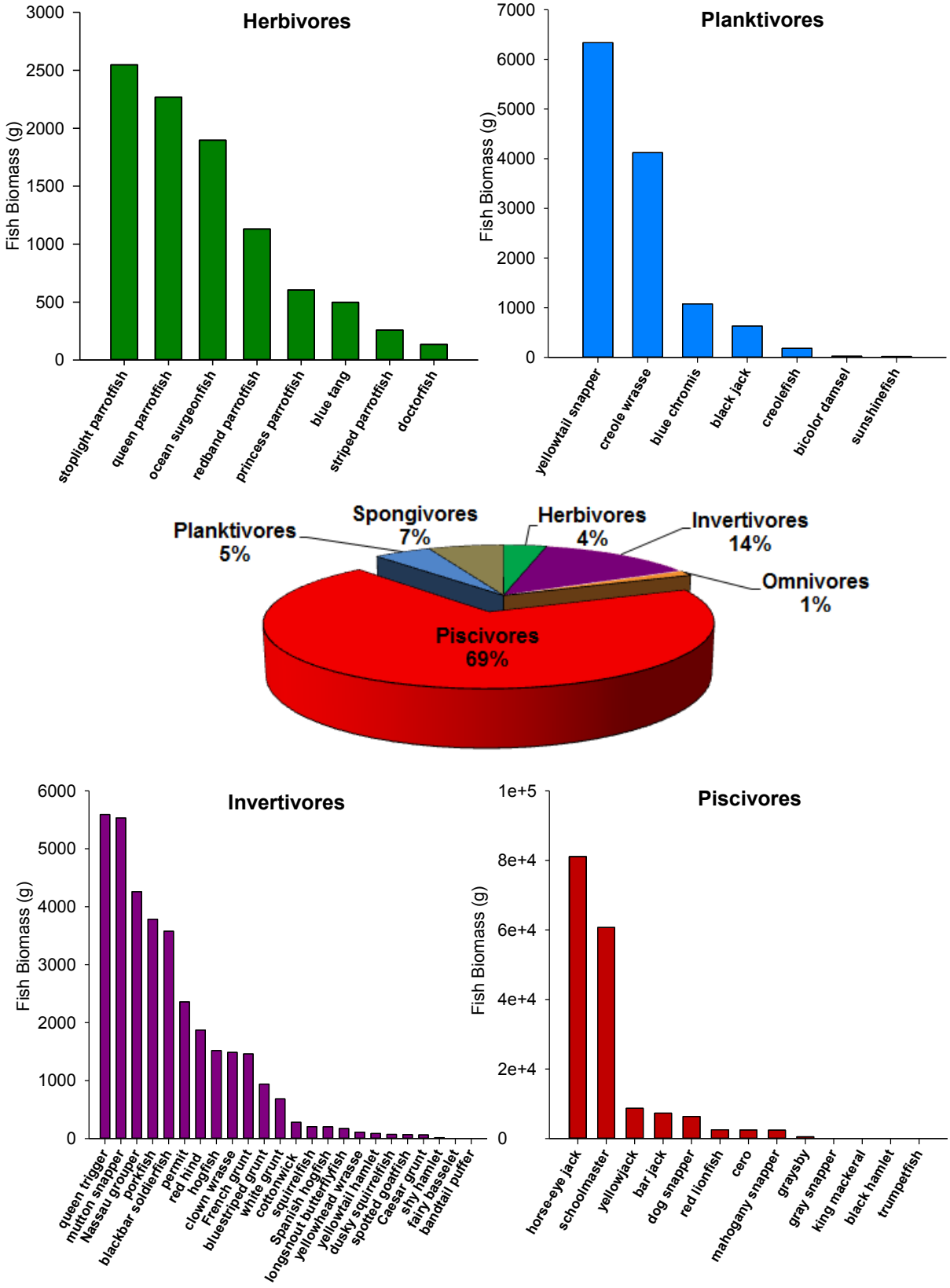
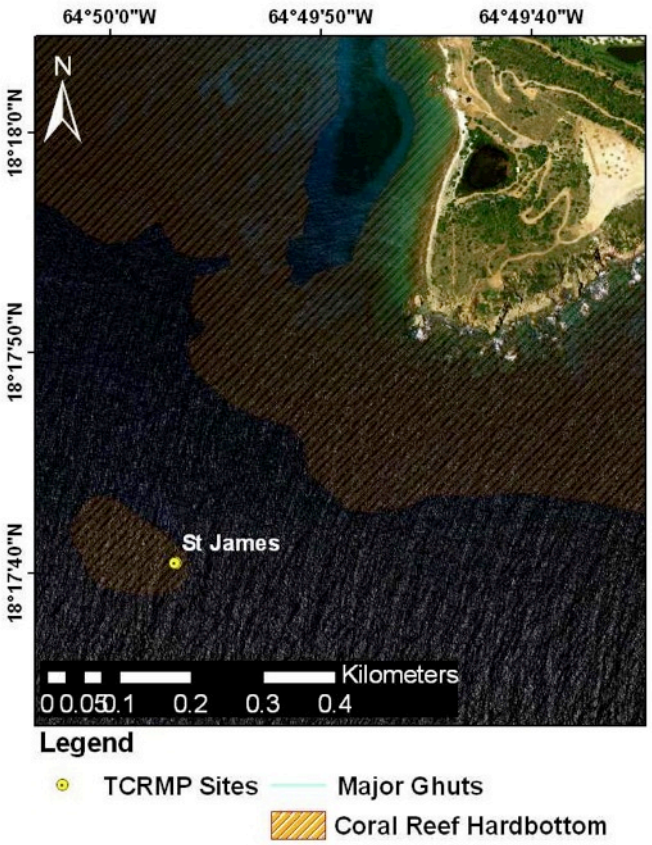


Figure 143. The Hind Bank East fish community by absolute and relative biomass.

LITTLE SAINT JAMES

Description. The Little St. James site is a midshelf hardbottom reef in depths of 16-22 m. The reef is a patch reef surrounded by sand/rhodolith plain. Little St. James has been monitored since 2005, with permanent benthic transects installed in 2007.

Outstanding Feature. The Little St. James site is just outside the St. Thomas East End Reserve and supports occasional high densities of snappers, grunts, and queen trigger.



Threats. Commercial fisherman target the Little St. James site and active and derelict fish traps are in high abundance. The site is down-current of development on Little St. James Island and is potentially threatened by land-based source of pollution.

Figure 144. Little St. James. (top) Location. (right) A representative photo of the reef.

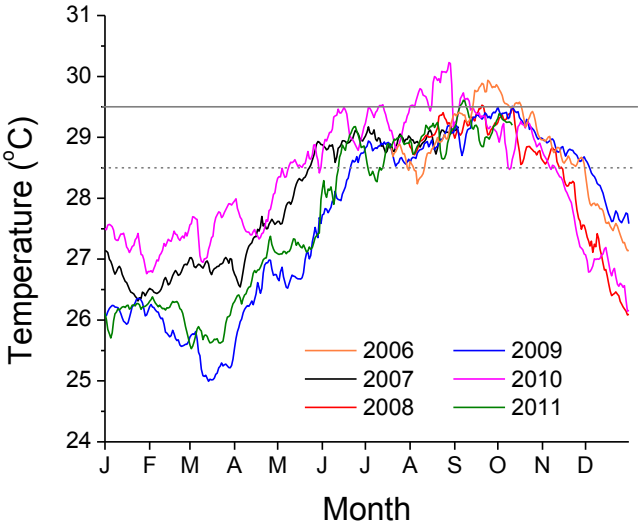


Figure 145. Little St. James benthic temperature record (19m depth).

Physical Characteristics.

Current. Currents have not been directly measured at St. James. Unidirectional benthic currents have only been weak during monitoring. Strong wave-driven oscillatory currents may take place, as evidenced by the high proportion of gorgonians and *Sargassum* spp. at the site.

Temperature. Benthic temperatures at St. James can be high during warm years, such as 2010.

Benthic Community. The sparse coral community of the Little St. James site is diverse. There is a high proportion of rare species, such as *Eusmilia fastigiatum*, *Madracis* spp., and *Mycetophyllia* spp.. The site lost 16.5% of coral cover in the 2005 bleaching event but had apparently regained 376.2% of this loss by 2011. This large increase above bleaching losses may be explained by the fact that transects were not made permanent until 2007 and were then sited in areas with the densest coral. The sessile epibenthic community overall is largely composed of sponges and gorgonians. The algal community is dominated by the macroalgae *Dictyota* spp. and the *Sargassum* spp.. *Lobophora variegata* and epilithic algae are also in high proportional abundance.

Coral Health. The coral community at Little St. James was highly affected by the 2005 coral bleaching event, with all corals assessed completely bleached. Half the corals were affected by low extent bleaching in 2010. Low-level bleaching is a common feature of the site. Diseases are less common, with the exception of a white disease outbreak that preceded the coral bleaching event in June 2005. Dark spots disease can also be common. Old partial mortality increased rapidly after the 2005 bleaching event. Recent partial mortality is not very prominent.

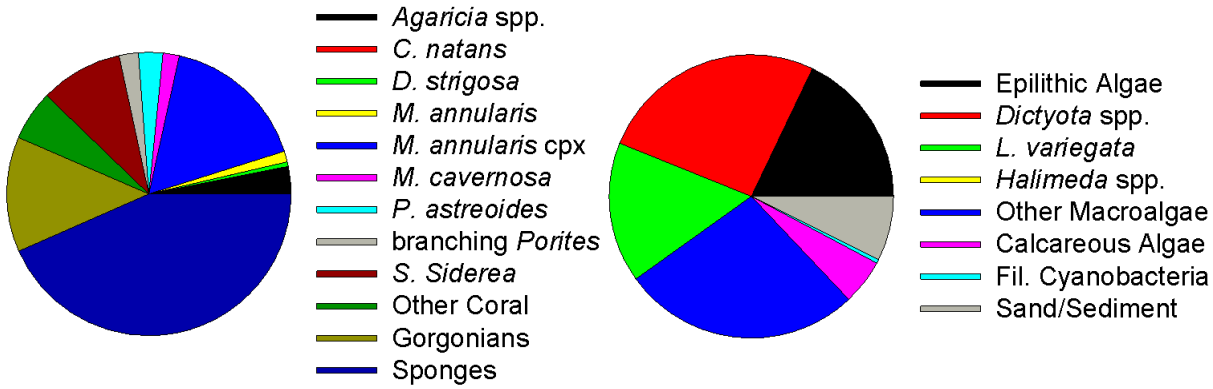


Figure 146. Little St. James. (left) Relative composition of the sessile epibenthic animal community. (right) Relative composition of the algal community and unconsolidated sediment.

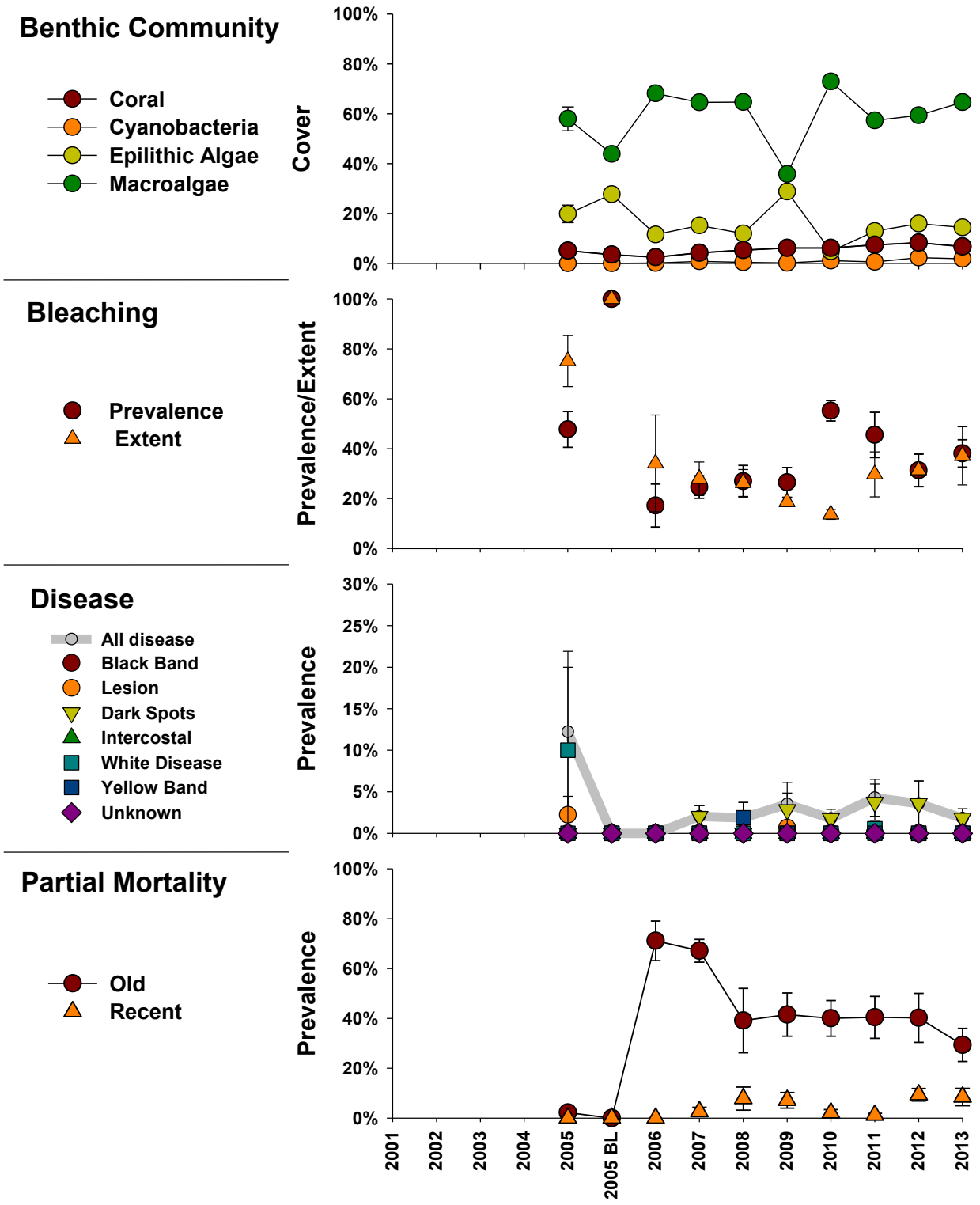
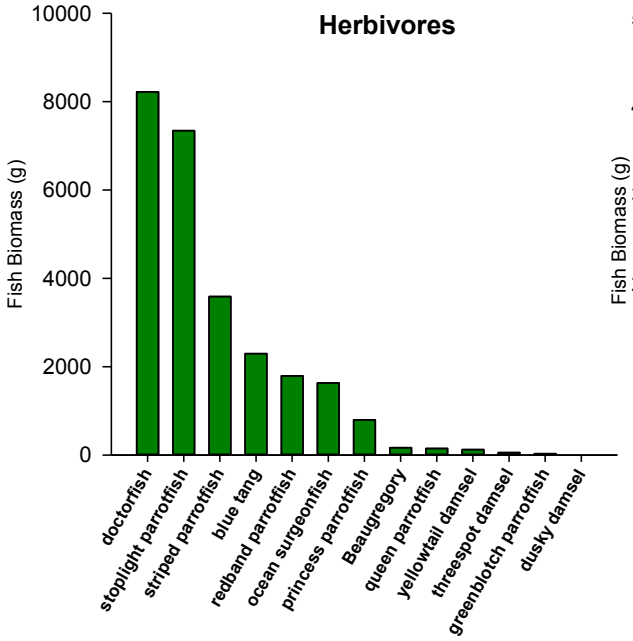
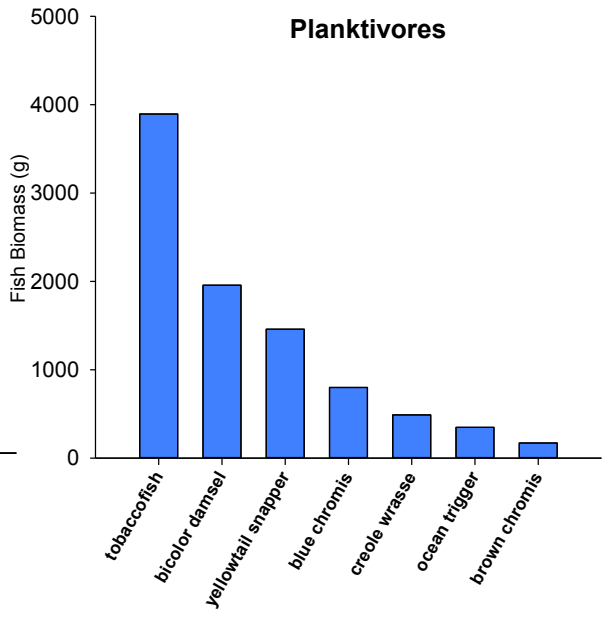
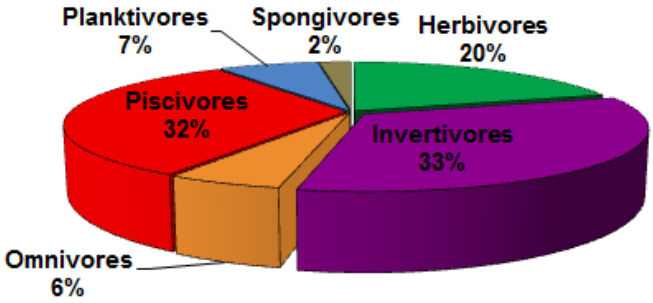


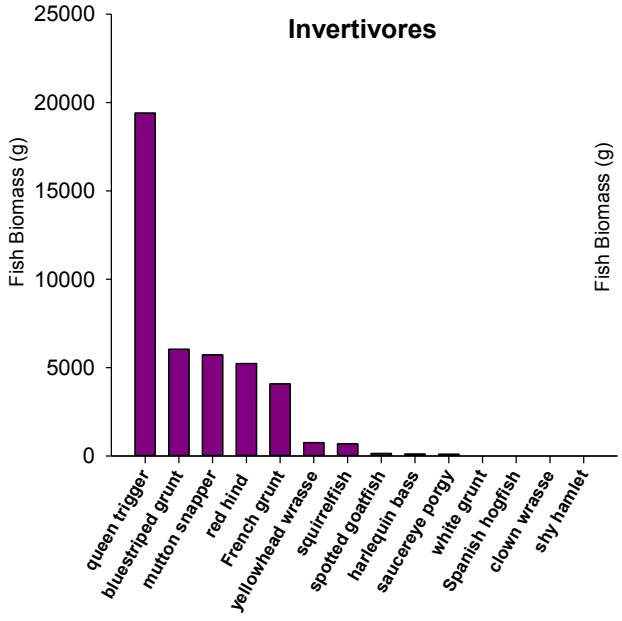
Figure 147. Little St. James benthic cover and coral health through time (mean ±SE).

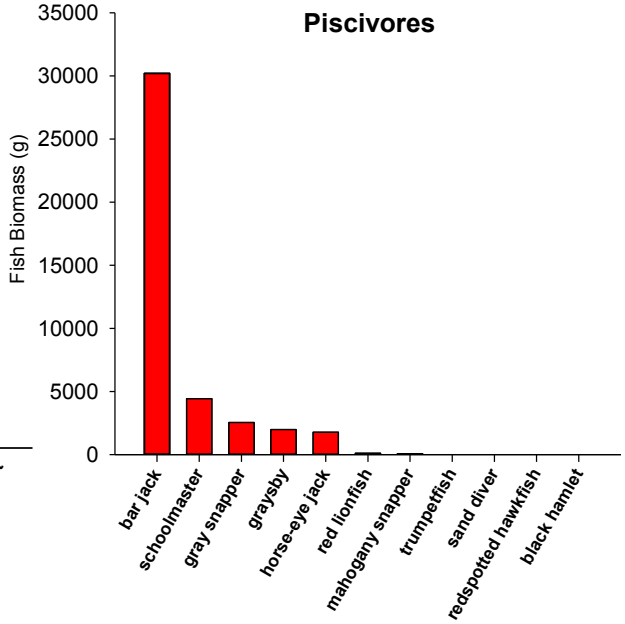
Fish Community. The fish community of Little St. James differs slightly from those of the more developed reef habitats, perhaps representing a hard bottom fish community. Queen triggerfish and mutton snapper are far more common on Little St. James than on other TCRMP sites. Red hind are also very common, especially for a nearshore site. The reef is outside of the boundaries of the St. Thomas East End Reserves, and fish traps are observed regularly on the site. During parts of the year, grunts (French, and white) have been observed in huge numbers, and may use the site for spawning. Bar and yellow jacks are very common swimming in the water column above the Little St. James site, and the schoolmaster, gray, and mahogany snapper are the major benthic piscivores. All three of these species are considered ciguatoxic in this area and so are not targeted by hook and line or spear fishermen.


Herbivores
Fish Biomass (g)
10000
8000
6000
4000
2000
0
doctorfish
stoplight parrotfish
striped parrotfish
blue tang
redband parrotfish
ocean surgeonfish
princess parrotfish
Beaugregory
queen parrotfish
yellowtail damsel
threespot damsel
greenblotch parrotfish
dusky damsel


Planktivores
Fish Biomass (g)
5000
4000
3000
2000
1000
0
tobaccofish
bicolor damsel
yellowtail snapper
blue chromis
creole wrasse
ocean trigger
brown chromis

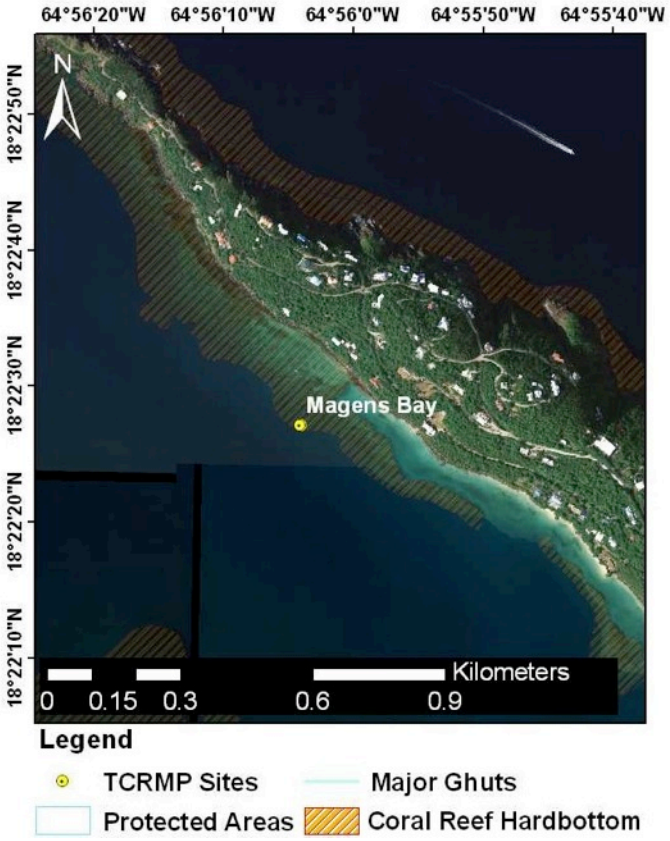

Planktivores
7%
Spongivores
2%
Herbivores
20%
Piscivores
32%
Invertivores
33%
Omnivores
6%


Invertivores
Fish Biomass (g)
25000
20000
15000
10000
5000
0
queen trigger
bluestriped grunt
mutton snapper
red hind
French grunt
yellowhead wrasse
squirrelfish
spotted goatfish
harlequin bass
saucereye porgy
white grunt
Spanish hogfish
clown wrasse
shy hamlet


Piscivores
Fish Biomass (g)
35000
30000
25000
20000
15000
10000
5000
0
bar jack
schoolmaster
gray snapper
graysby
horse-eye jack
red lionfish
mahogany snapper
trumpetfish
sand diver
redspotted hawkfish
black hamlet

MAGENS BAY

Description. The Magens Bay site is a nearshore fringing reef located along Peterborg Point in depths of 4 – 14 m. The reef has a sharp break in slope leading to a steep escarpment that terminates in a sand/sediment plain at the reef base. Magens Bay has been monitored since 2001.



Outstanding Feature. The Magens Bay site is well protected northside reef near one of the most popular tourist beaches in the Caribbean.

Threats. Magens Bay is in a highly enclosed embayment receiving a very large and developed watershed. Sediment run-off is high and deposition on reefs is favored by slow current speeds. In addition, leaky septic systems may impair bay waters. Recreational/artisanal fishers frequently fish this site with hand line and spear.

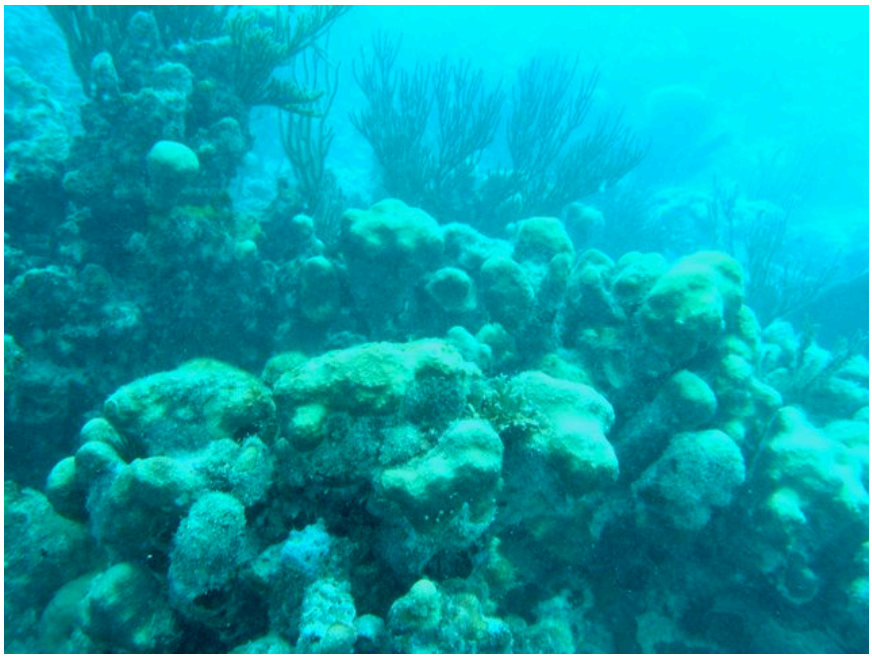


Figure 148. Magens Bay. (top) Location. (right) A representative photo of the reef.

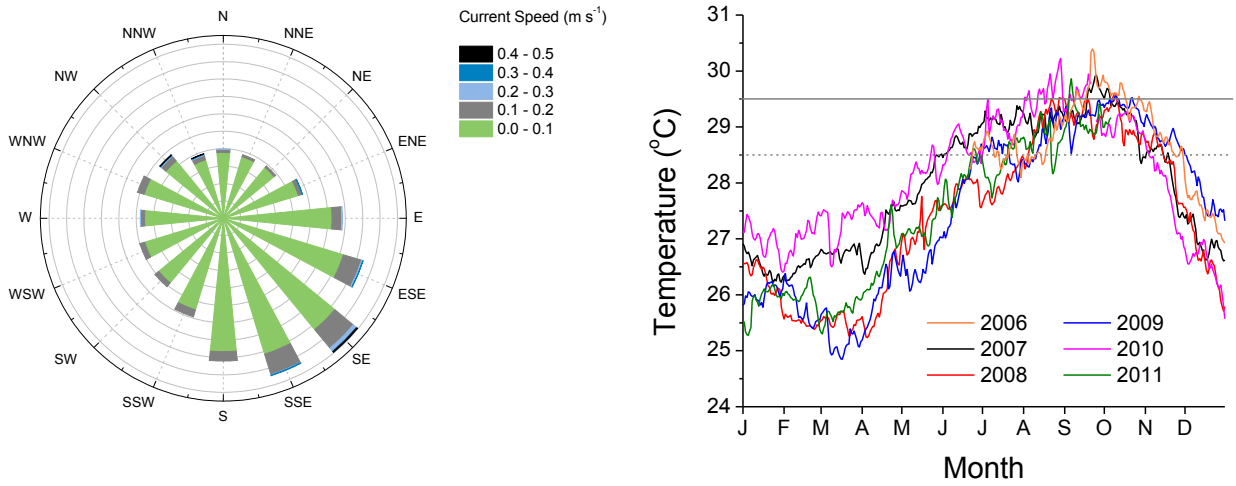


Figure 149. Magens Bay current speed and benthic temperature record (9 m depth).

Physical Characteristics. **Current**. Magens Bay has restricted water flow dominated by weak currents running counter or orthogonally to the left of the dominant wind direction. This may indicate that there is a counter flowing eddy. Current data are based on average data from Dec. 2006-Oct. 2007 7.5 m above the sensor head. **Temperature**. Magens Bay has low circulation, but temperatures are kept cooler by exposure to the Atlantic. **Chlorophyll & Turbidity**. Magens Bay is susceptible to very high chlorophyll and turbidity values indicating very high productivity that is likely fueled by terrestrial run-off. By blocking light this shallows the depth limits for coral growth and water column productivity favors heterotrophic organisms, such as sponges and gorgonians.

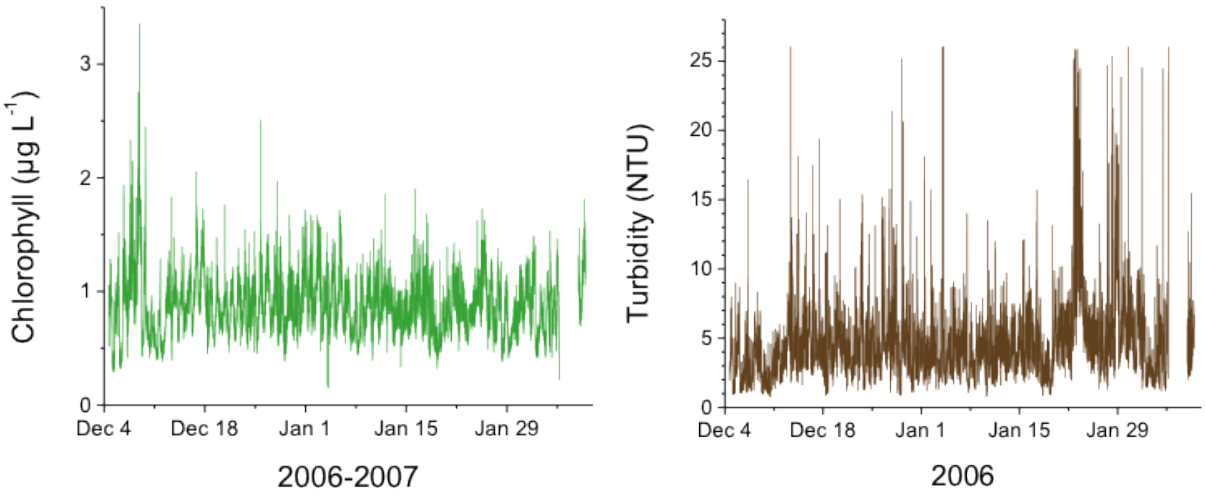


Figure 150. Magens Bay chlorophyll (left) and turbidity (right) record (16 m depth).

Benthic Community. The sparse coral community at Magens Bay is very diverse, with no real dominance by any one species. The site lost 12.4% of its coral cover in the 2005 bleaching and has continued to lose coral, with a cover loss of 33.1% from 2005 pre-bleaching to 2011. Gorgonians and then sponges dominate the sessile epibenthic community. Epilithic algae and the macroalga *Dictyota* spp. dominate the algal community. Filamentous cyanobacteria are also common. There is a high proportion of sand/sediment around corals at the Magens Bay site.

Coral Health. Corals were highly affected by the 2005 bleaching event, with about 80% of corals 80% affected across the colony surface. This site also showed a strong response to the 2010 bleaching event with about 60% of corals bleached at a low extent. Diseases can be high and are dominated by dark spots disease. Old partial mortality increased after the 2005 bleaching event and then declined, with a slight increase from 2009 to 2011. Recent partial mortality is common at the Magens Bay site, largely as the result of biting by territorial damselfish (*Stegastes* spp.; data not shown).

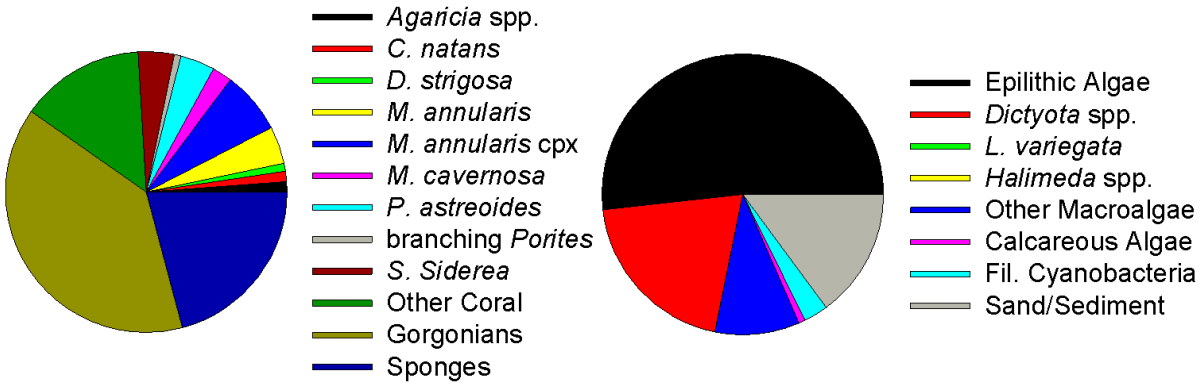


Figure 151. Magens Bay. (left) Relative composition of the sessile epibenthic animal community. (right) Relative composition of the algal community and unconsolidated sediment.

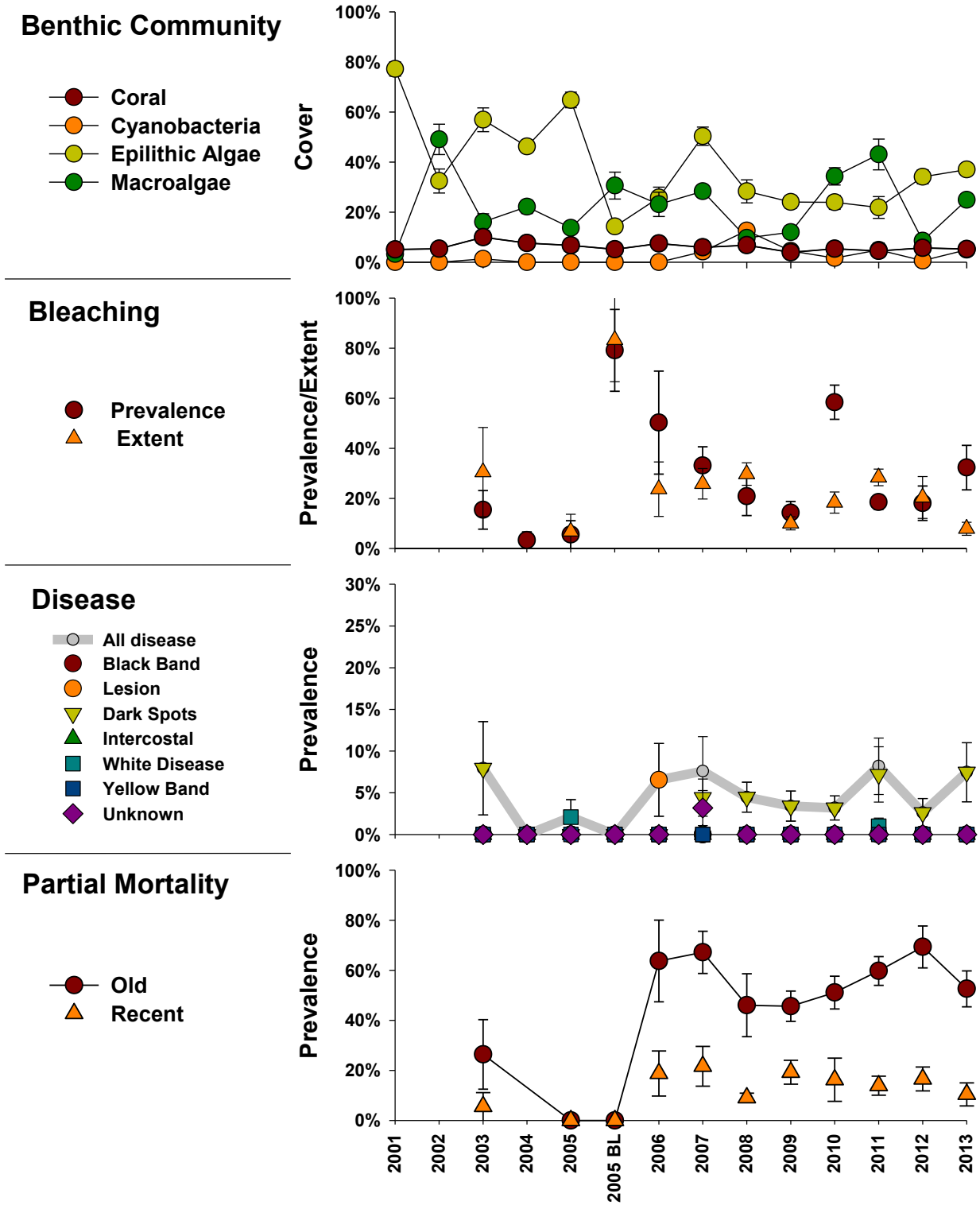
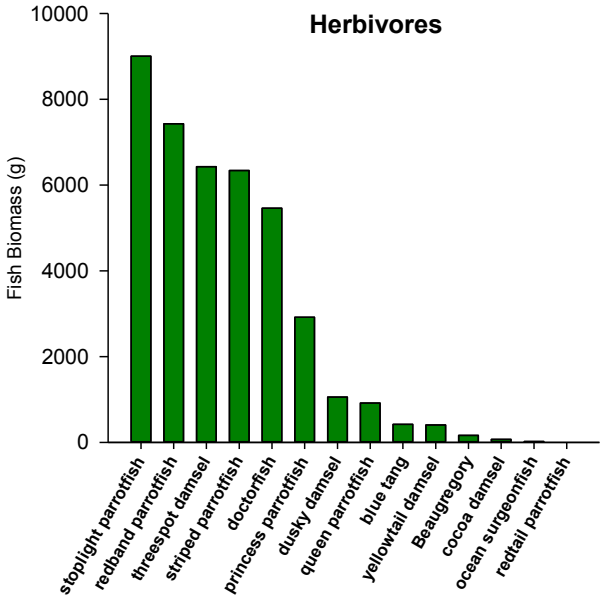
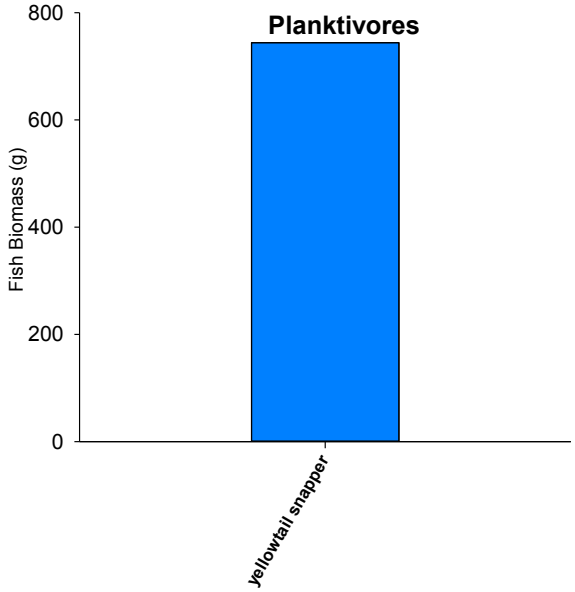
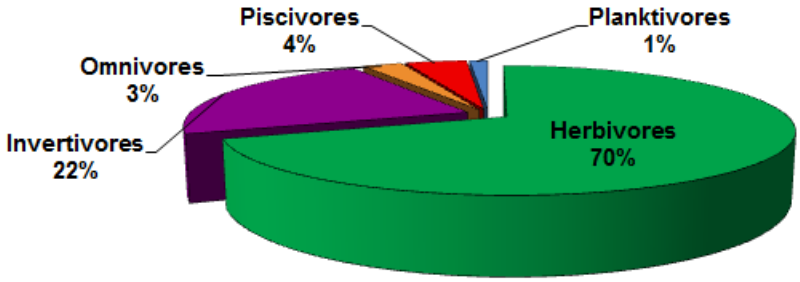


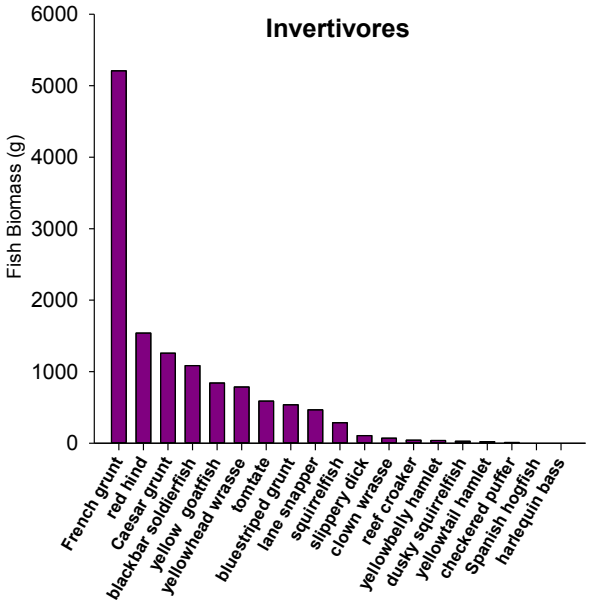
Figure 152. Magens Bay benthic cover and coral health through time (mean ±SE).

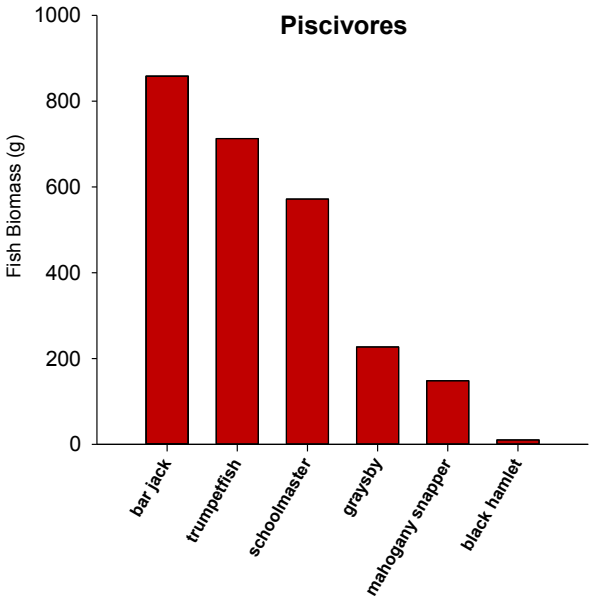
Fish Community. Magens Bay once supported its own rich fishery and was the notorious site of the only fatality by shark attack recorded in St. Thomas. The days of large, commercially important fish in Magens Bay have been gone since the 1970's; however, the bay is connected to the deeper Puerto Rican shelf to the north and large sharks are known to frequent the bay. Tiger sharks are still caught commonly off either point defining the bay to the east or west. Anecdotally, hammerheads mate in the middle of Magens Bay during one moon phase of the year, and along the mile long sandy beach it is not uncommon to see young of the year sharks swimming in the clear water, suggesting that the deep protected bay is the pupping ground for at least one species of shark. Along the reef that is the TCRMP monitoring site, large fish are rare, and herbivores make up the bulk of the fish biomass. The largest fish swim along the reef edge, where occasional mahogany and lane snapper reside, along with grunts, goatfish and larger parrotfishes. Schools of wrasse, mixed with juvenile parrotfish, and damselfishes, occupy the top of the reef. The threespot damselfish is extremely prolific. No large groupers or snappers were observed in Magens Bay in 2012, the first year of fish monitoring.


Herbivores
Fish Biomass (g)
10000
8000
6000
4000
2000
0
stoplight parrotfish
redband parrotfish
threespot damsel
striped parrotfish
doctorfish
princess parrotfish
dusky damsel
queen parrotfish
blue tang
yellowtail damsel
Beaugregory
cocoa damsel
ocean surgeonfish
redtail parrotfish


Planktivores
Fish Biomass (g)
800
600
400
200
0
yellowtail snapper

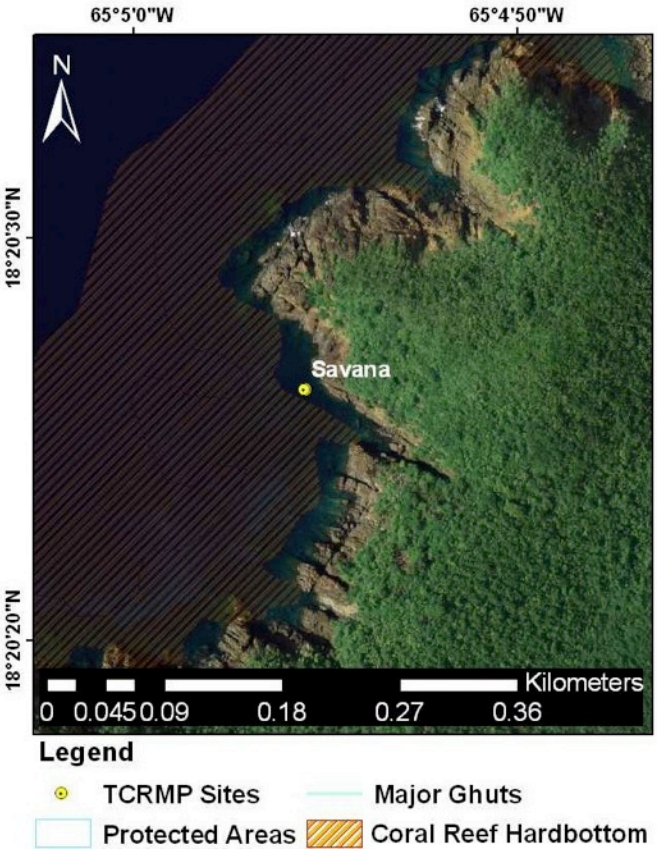

Piscivores
4%
Planktivores
1%
Omnivores
3%
Invertivores
22%
Herbivores
70%


Invertivores
Fish Biomass (g)
6000
5000
4000
3000
2000
1000
0
French grunt
red hind
Caesar grunt
blackbar soldierfish
yellow goatfish
yellowhead wrasse
tomtate
bluestriped grunt
lane snapper
squirrelfish
slippery dick
clown wrasse
reef croaker
yellowbelly hamlet
dusky squirrelfish
yellowtail hamlet
checkered puffer
Spanish hogfish
harlequin bass


Piscivores
Fish Biomass (g)
1000
800
600
400
200
0
bar jack
trumpetfish
schoolmaster
graysby
mahogany snapper
black hamlet

SAVANA ISLAND

Description. The Savana Island site is a midshelf fringing reef facing the Atlantic Ocean to the northwest in depths of 5 – 17 m. The reef is a well-developed coral community atop bedrock, with some insipient carbonate accumulation. Savana has been monitored since 2003, with permanent benthic transects installed in 2007.



Outstanding Feature. Savana harbors behemoth colonies of boulder star coral (*Orbicella faveolata*) and a diverse and abundant fish community.

Threats. Savana is threatened by warming ocean temperatures, as *O. faveolata* can be susceptible to bleaching, disease, and partial mortality. The area is also open to fishing and the occasional accumulation of debris can be seen.

Figure 153. Savana. (top) Location. (right) A representative photo of the reef during the 2005 coral bleaching event. The dog snapper *Lutjanus jocu*) is approximately 50cm in length.

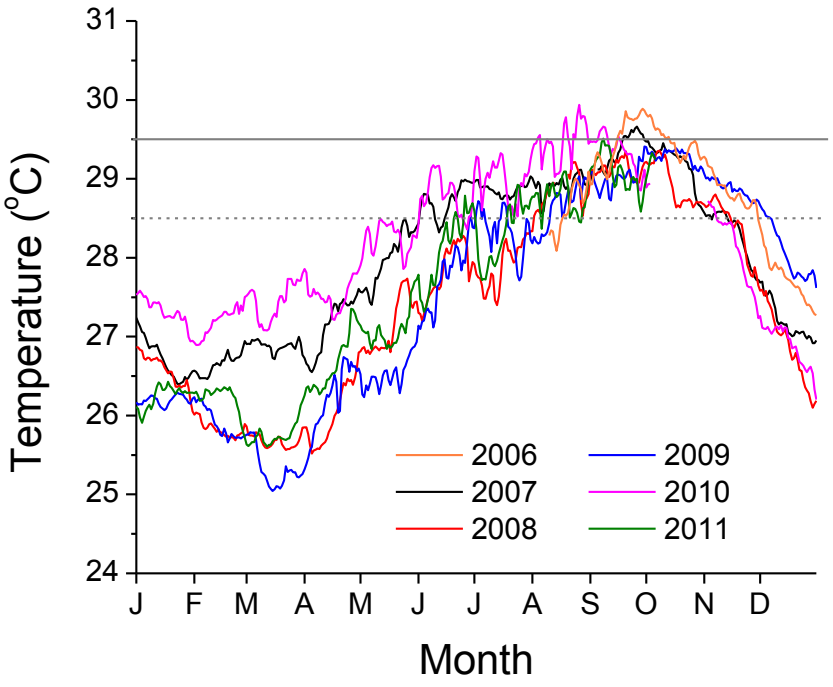


Figure 154. Savana benthic temperature record (10m depth).

Physical Characteristics.

Current. Currents have not been measured directly at Savana. Strong unidirectional currents can influence the surface near the site. Wave-driven oscillatory currents are common and occasionally strong.

Temperature. Savana has temperatures cooler than other shallow sites, likely due to the proximity of the open Atlantic Ocean.

Benthic Community. Boulder star corals, predominately large (>2m wide) colonies of *Orbicella faveolata*, dominate the coral community at the Savana monitoring site. The site lost 45.2% of its coral cover in the 2005 bleaching event. Some of the largest losses occurred between 2010 and 2011, but there was no indication of the cause, since the site bleached moderately and no disease outbreaks were noted. Gorgonians and sponges are also prominent components of the sessile epibenthic animal community.

Coral Health. The coral community at Savana was highly affected in the 2005 bleaching event, with 80% of corals affected on almost 90% of the colony surface. Bleaching was also very prominent in 2006, but at a lower extent. Bleaching was moderate during the 2010 bleaching event, with over 50% of colonies bleached at a low extent. Coral diseases can reach high prevalence and are diversely represented. Particularly noticeable is the dramatic outbreak of white disease in 2006. Dark spots disease has also affected a high proportion of corals from 2008 onwards. Old partial mortality increased markedly after the 2005 coral bleaching event and has declined only slightly. Recent partial mortality after the 2005 coral bleaching event was unprecedented for any site. Recent mortality has also been common after 2007 and is largely caused by bites from territorial damselfish (*Stegastes* spp.).

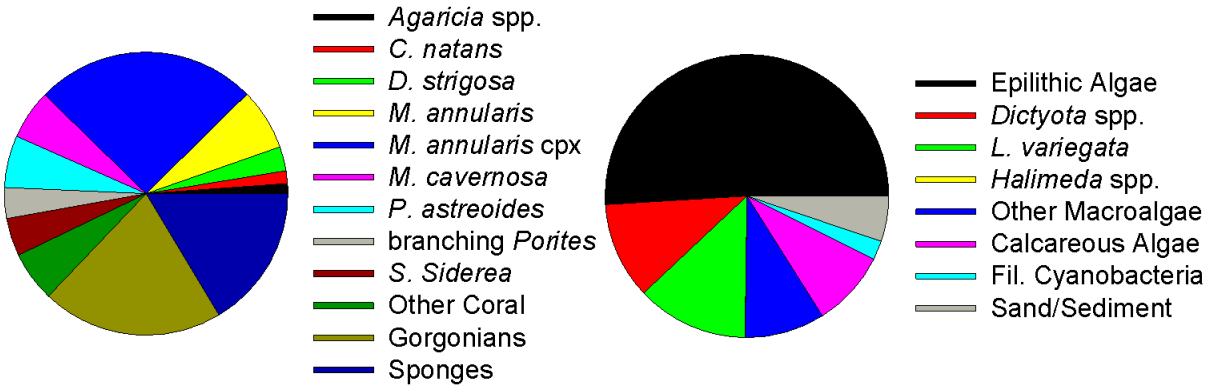


Figure 155. Savana Island. (left) Relative composition of the sessile epibenthic animal community. (right) Relative composition of the algal community and unconsolidated sediment.

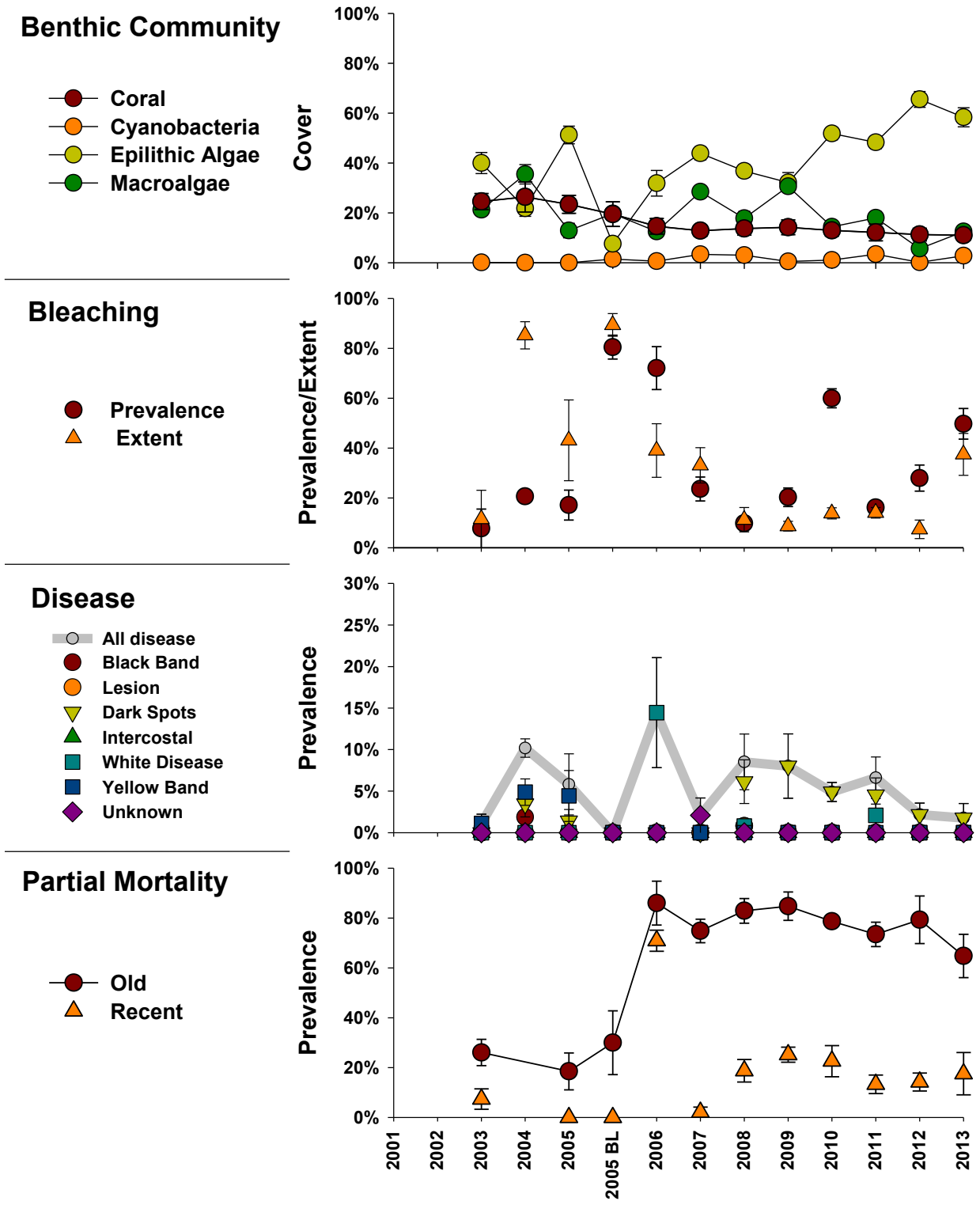
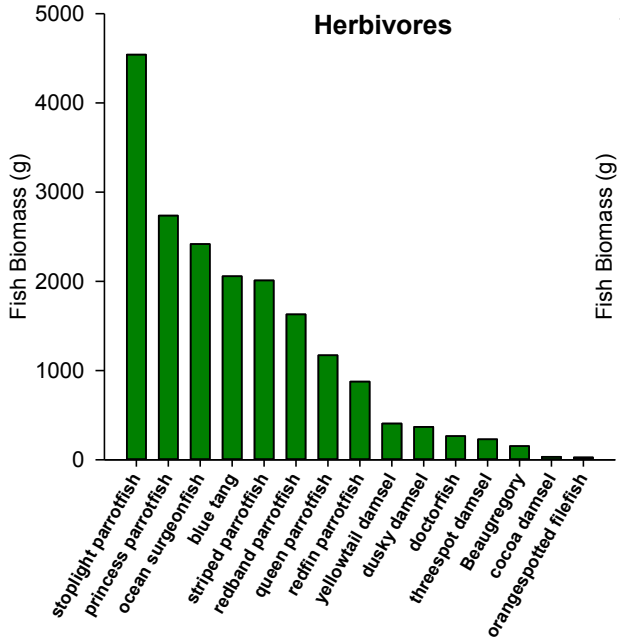
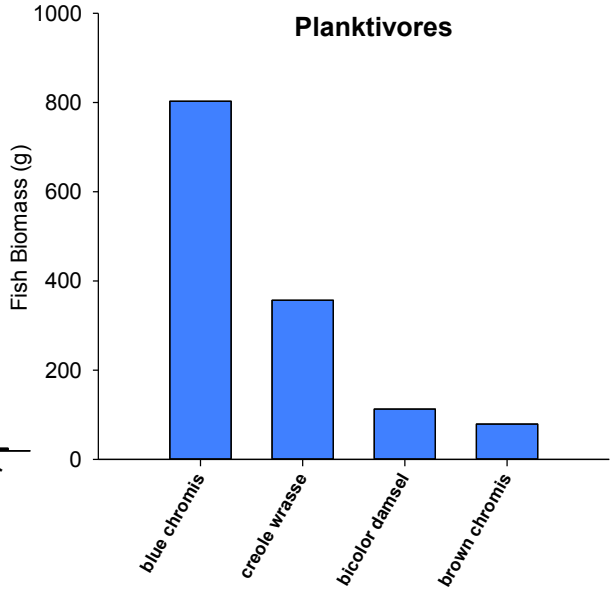
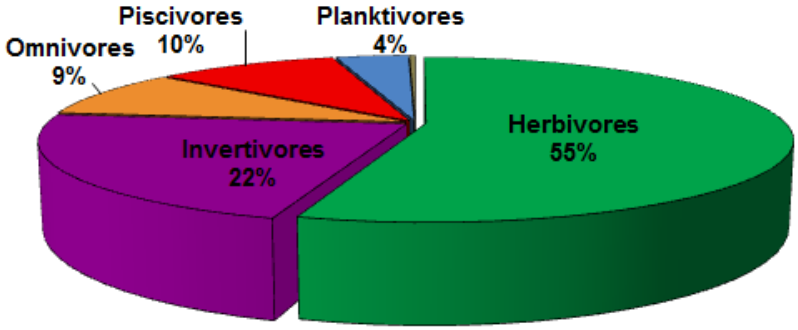


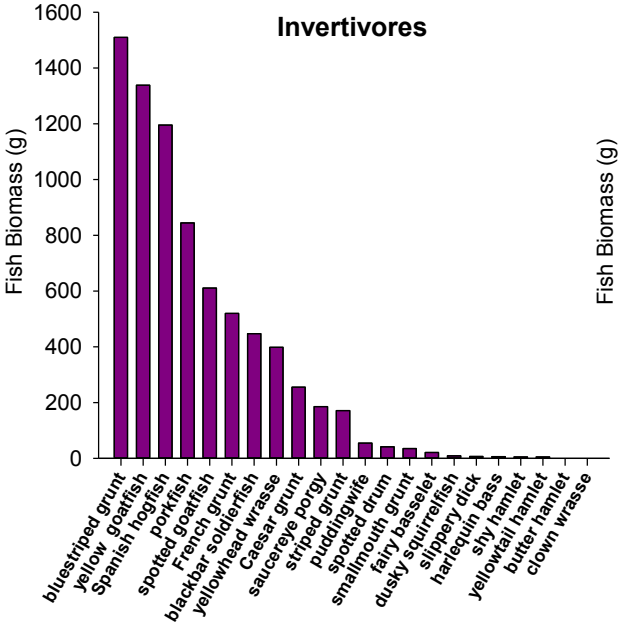
Figure 156. Savana Island benthic cover and coral health through time (mean ±SE).

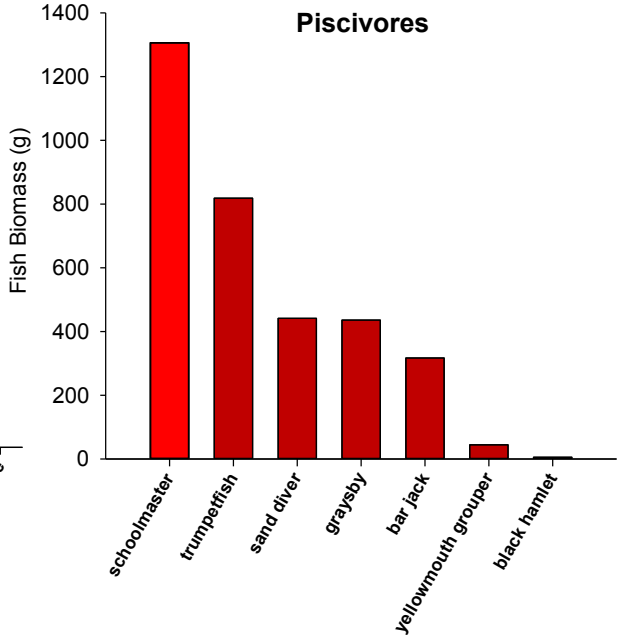
Fish Community. The Savana Island fish community is fairly small in biomass, but is quite diverse, and highlights the variety of benthic resources available to fishes in the area. The site is dominated by herbivores, but it also supports a diverse invertivore community. Planktivores in the quiet protected bay are limited to the smaller pomocentrids and wrasses. However, these fish groups are all quite prolific. The most numerous piscivore observed in the first year of fish monitoring was the schoolmaster snapper. One small yellowmouth grouper (11-20 cm) was observed on a belt transect, the first seen on a site in shallow water located near land. The area around Savana is highly fished with fish traps, and no large commercially important fish were seen in the bay.


Herbivores
Fish Biomass (g)
5000
4000
3000
2000
1000
0
stoplight parrotfish
princess parrotfish
ocean surgeonfish
blue tang
striped parrotfish
redband parrotfish
queen parrotfish
redfin parrotfish
yellowtail damsel
dusky damsel
doctorfish
threespot damsel
Beaugregory
cocoa damsel
orangespotted filefish


Planktivores
Fish Biomass (g)
1000
800
600
400
200
0
blue chromis
creole wrasse
bicolor damsel
brown chromis


Piscivores
10%
Planktivores
4%
Omnivores
9%
Herbivores
55%
Invertivores
22%

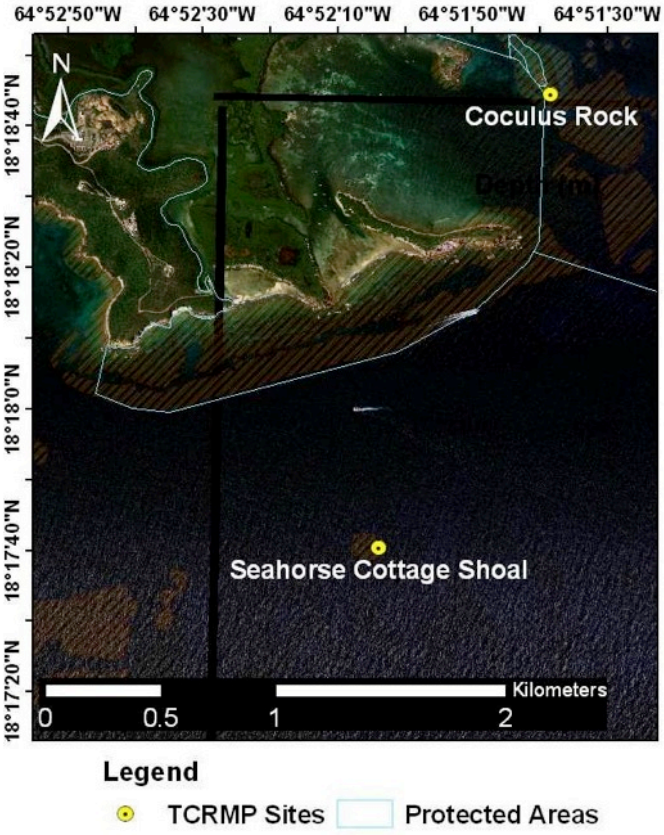

Invertivores
Fish Biomass (g)
1600
1400
1200
1000
800
600
400
200
0
bluestriped grunt
yellow goatfish
Spanish hogfish
porkfish
spotted goatfish
French grunt
blackbar soldierfish
yellowhead wrasse
Caesar grunt
saucereye porgy
striped grunt
puddingwife
spotted drum
smallmouth grunt
fairy basselet
dusky squirrelfish
slippery dick
harlequin bass
shy hamlet
yellowtail hamlet
butter hamlet
clown wrasse


Piscivores
Fish Biomass (g)
1400
1200
1000
800
600
400
200
0
schoolmaster
trumpetfish
sand diver
graysby
bar jack
yellowmouth grouper
black hamlet

SEAHORSE COTTAGE SHOAL

Description. The Seahorse Cottage Shoal site is a large patch reef surrounded by sand and rhodolith in depths of 17 – 23m. The isolated reef is flat topped and dominated by *Orbicella* spp.. Seahorse has been monitored since 2003, with permanent benthic transects installed in 2007. A ciguatera study with monthly sampling has been ongoing since 2009.

Outstanding Feature. Seahorse supports a diverse and abundant coral and fish community adjacent to the St. Thomas East End Reserves.



Threats. Seahorse is buffered from land-based sources of pollution. The site is a targeted site in the St. Thomas trap fishery and trap strings have been observed over and adjacent to the site.

Figure 157. Seahorse Cottage Shoal. (top) Location. (right) A representative photo of the reef.

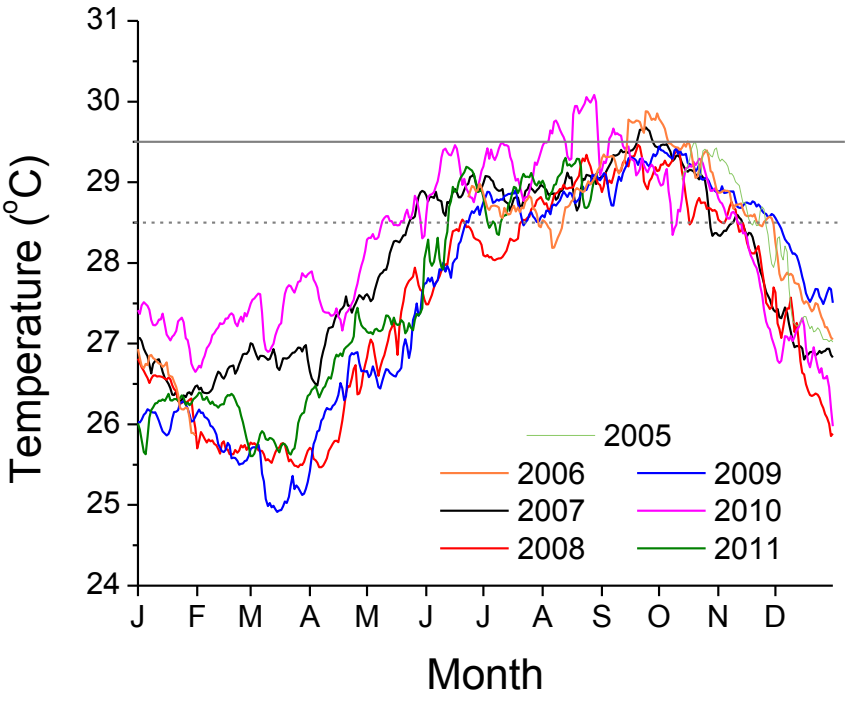


Figure 158. Seahorse benthic temperature record (21m depth).

Physical Characteristics.

Current. Currents have not been directly measured at Seahorse Cottage Shoal. Unidirectional benthic currents tend to be slow and wave-driven oscillatory currents only occur during heavy storm activity.

Temperature. Benthic temperatures are moderate to high during warming events.

Benthic Community. The coral community of the Seahorse site is dominated by the boulder star coral (*Orbicella* spp.), but hosts a high diversity of other coral species. The site lost 46.6% of its cover in the 2005 bleaching event and had only regained 4.7% of this loss by 2011. Gorgonians and sponges are also common components of the sessile epibenthic animal community. The algal community is co-dominated by epilithic algae and the macroalgae *Lobophora variegata* and *Dictyota* spp..

Coral Health. The coral community bleached severely in the 2005 bleaching event with nearly 100% of corals bleaching over about 100% of their surface. Bleaching prevalence after 2005 was slow to decline due to delayed recovery in large *Orbicella* spp. colonies. The site also had a high prevalence of bleaching in the 2010 event, but at a low extent on colonies. Bleaching was also moderately prevalent in 2011. Coral diseases are common and diverse at Seahorse. White disease was also prevalent in 2004, which is rare for a site at this depth. Dark spots disease is also ubiquitous. Old partial mortality increased to a very high prevalence after the 2005 bleaching event, but had declined by 2011.

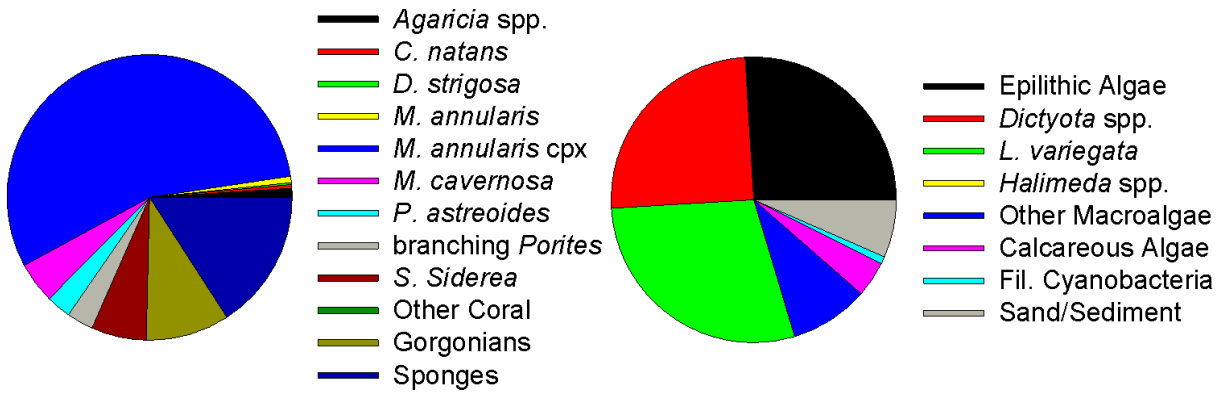


Figure 159. Seahorse Cottage Shoal. (left) Relative composition of the sessile epibenthic animal community. (right) Relative composition of the algal community and unconsolidated sediment.

SEAHORSE COTTAGE SHOAL

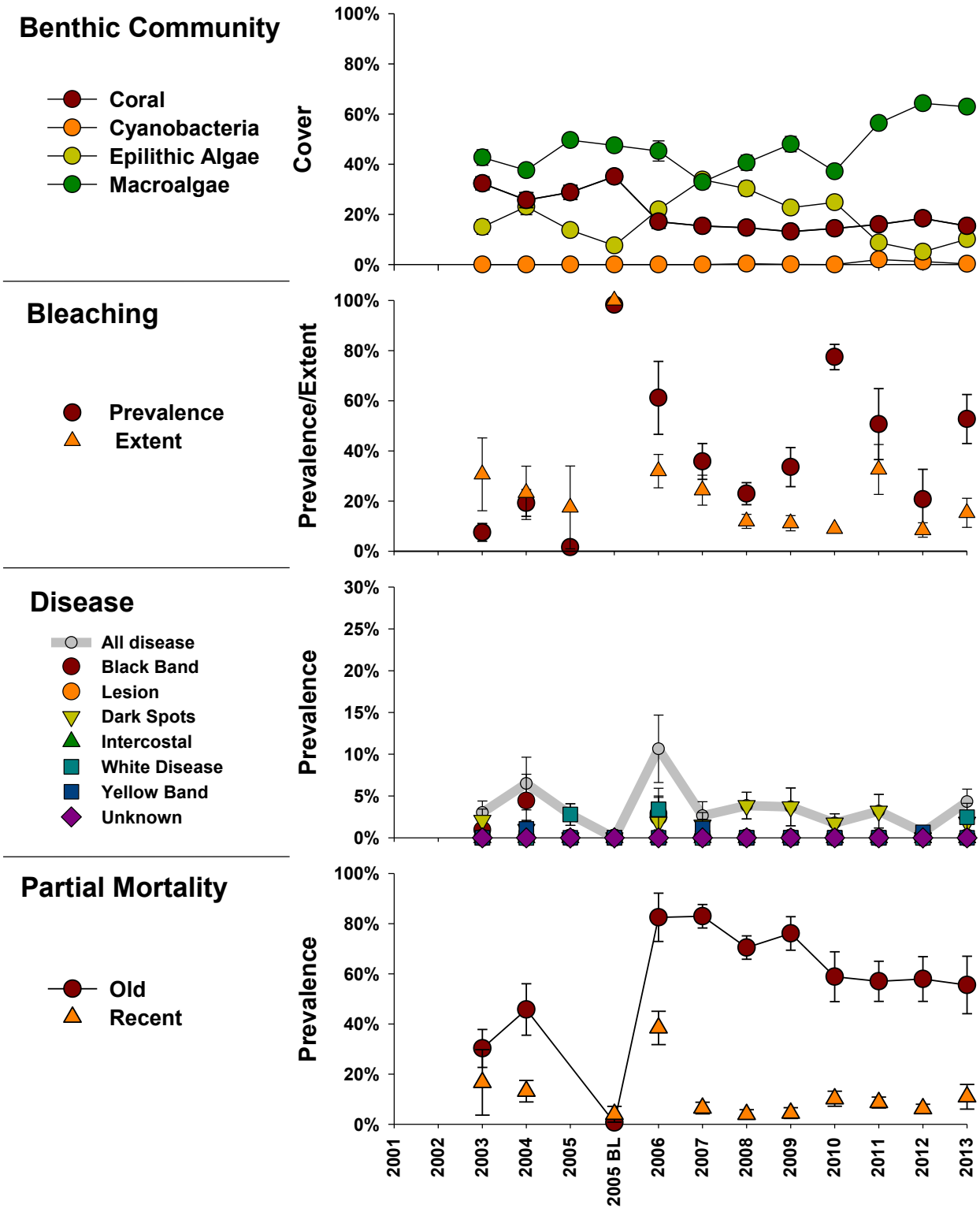


Figure 160. Seahorse Cottage Shoal benthic cover and coral health through time (mean ±SE).

Fish Community. Seahorse Cottage Shoal supports a large variety of reef fish and hosts spawning aggregations of gray snapper and lane snapper during the summer months. The trophic guilds on the offshore reef are split relatively evenly between herbivores, invertivores, and piscivores. This reflects the heterogeneity of reef substrates and the availability of unconsolidated sand and rhodolith habitat surrounding the reef. Mutton snapper and queen triggerfish are relatively common. Adult stoplight and redband parrotfish dominate herbivores, although most of the larger parrotfish species do occur, including the juvenile phase. Glasseye snapper and graysby dominate piscivores. Large groupers have never been seen on the reef. Seahorse Cottage Shoal is well known to fishermen and fairly heavily fished. Traps on the reef are common during surveys. However, schoolmaster, lane, gray and mahogany snapper are all common. This may reflect the proximity to nursery habitats in the St. Thomas East End Reserves and the mangrove habitats therein. Planktivores are limited nearly entirely to yellowtail snapper.

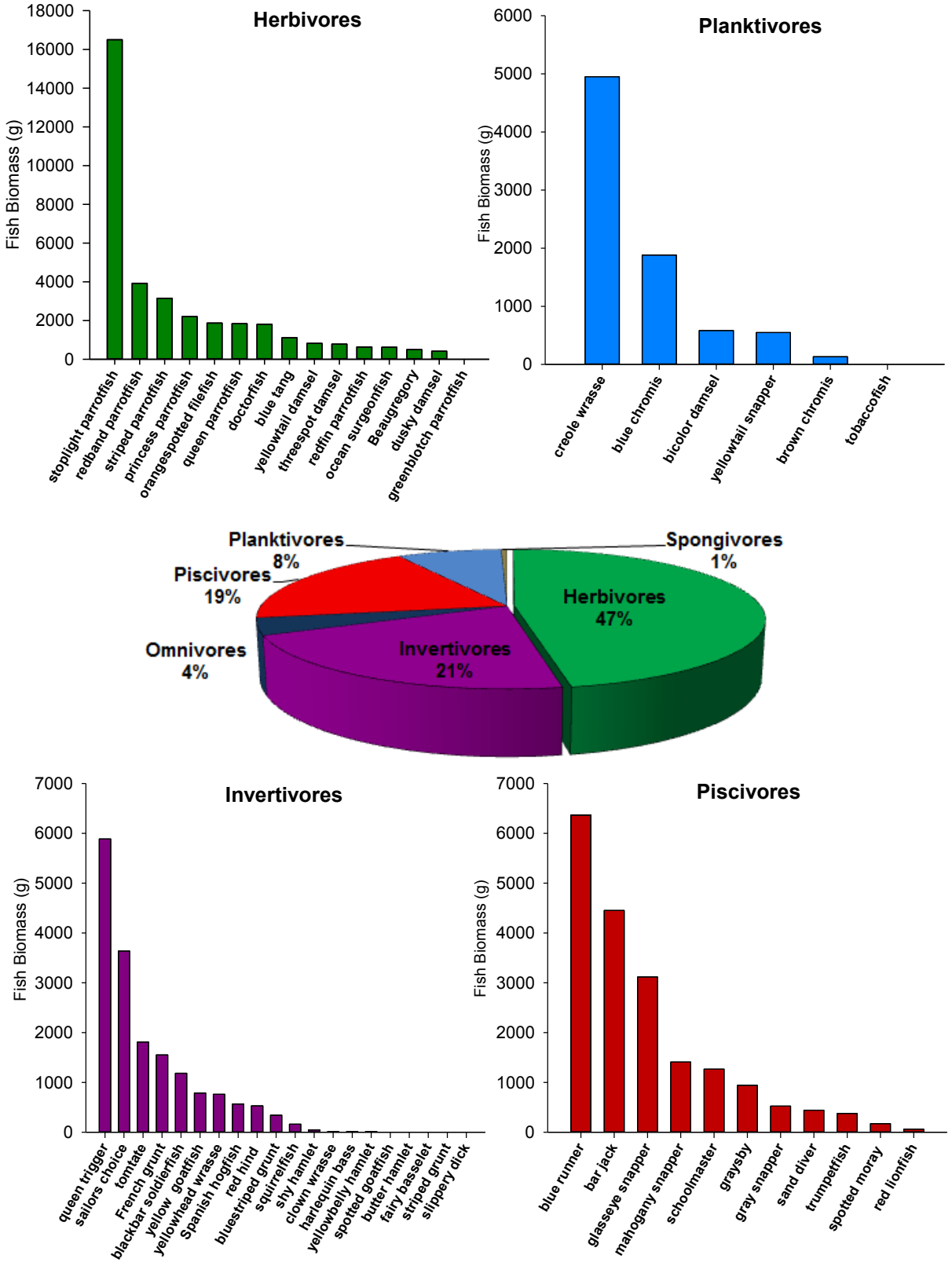
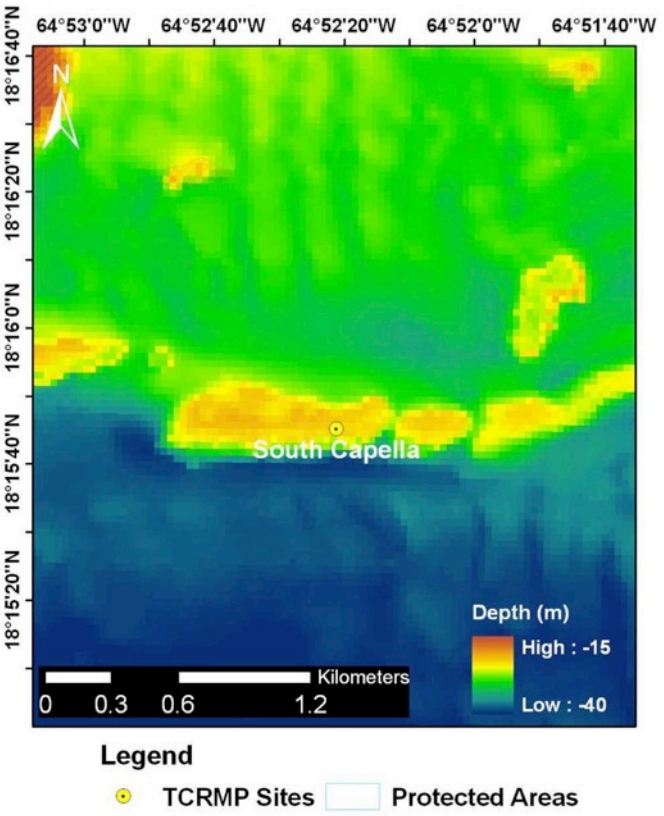


Figure 161. The Seahorse Cottage Shoal fish community by absolute and relative biomass.

SOUTH CAPELLA

Description. The South Capella site is located on a rise of the St. Thomas-St. John midshelf reef complex in depths of 16 - 25 m. The reef is made of rolling ridges of coral and pavement interspersed with sand grooves. South Capella has been monitored since 2003, with permanent benthic transects installed in 2007.

Outstanding Feature. The South Capella site is part of an outstanding shallow water midshelf reef system that is essential fish habitat.



Threats. The St. Thomas trap fishery heavily targets South Capella. Active and derelict trap strings crisscross the site and a derelict trap appeared in permanent transect 1 in 2008 and has been degrading there since. The trap was still fully intact as of 2012 but open to fish passage. The reef was also highly affected by the 2005 coral bleaching event, suggesting a susceptibility to rising sea surface temperatures.

Figure 162. South Capella. (top) Location. (right) A representative photo of the reef.

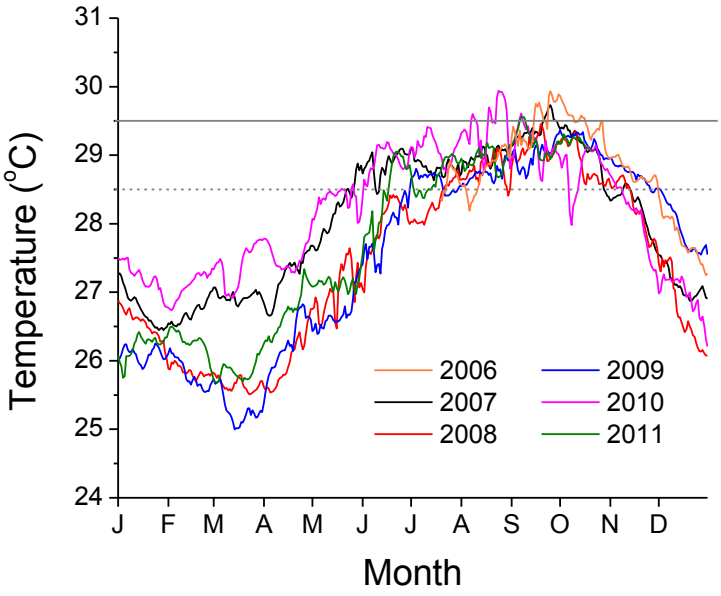


Figure 163. South Capella benthic temperature record (24m depth).

Physical Characteristics.

Current. Currents have not yet been directly measured at South Capella. Wave-driven oscillatory currents have not been experienced but are likely during swells and storms. Unidirectional benthic currents are usually weak, but strong currents can develop from the surface to midwater.

Temperature. South Capella has relatively cool benthic temperatures for a shallow site during warm years, which may be a reflection of its moderately deep depth and proximity to deep water to the south.

Benthic Community. Boulder star corals (*Orbicella* spp.) dominate the coral community at South Capella. These corals were very heavily affected by mortality due to the 2005 coral bleaching event. The site lost 56.4% of its cover and had not regained any cover by 2011 (-3.7% recovery). Gorgonians and sponges are also common components of the sessile epibenthic animal community. The macroalga *Lobophora variegata* dominates the algal community, with epilithic algae and *Dictyota* spp. comprising the second largest shares. There was also a high abundance of crustose coralline algae and filamentous cyanobacteria.

Coral Health. Corals were moderately-heavily affected by the 2005 bleaching event, with a prevalence of 80%, but an extent on colonies of only about 50%. Bleaching prevalence also increased during the 2010 bleaching event, but at a low extent. Bleaching is moderately prevalent at this site even in years without notable thermal stress. Coral diseases are common and diverse at South Capella. White disease was prevalent after the 2005 bleaching event in 2006, and then again in 2009 and 2011. Black band disease was found in 2002, which is unusual for a site at these depths. Dark spots disease was also typically present in most years. Old partial mortality increased after the 2005 bleaching event and has declined to 2011. Recent partial mortality was prevalent in most years of monitoring, particularly in 2006. In years not following thermal stress the highest identifiable source of recent partial mortality was biting from territorial damselfish (*Stegastes* spp.).

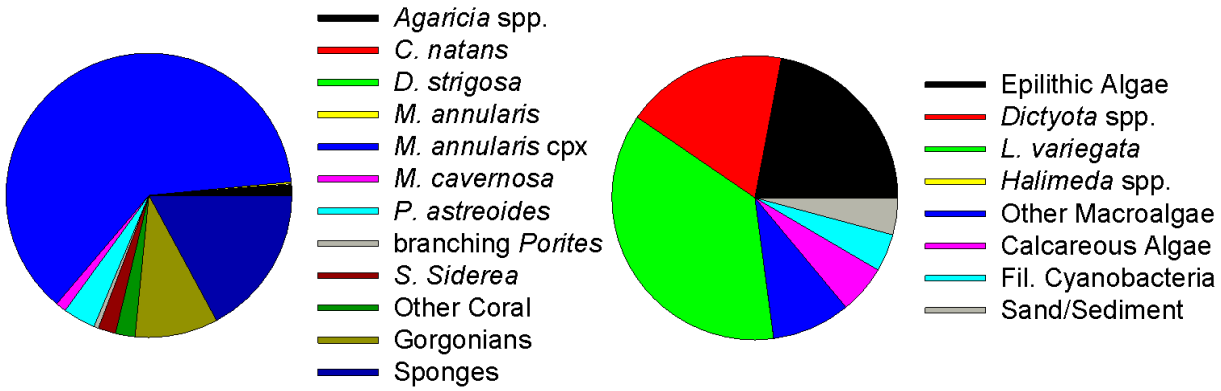


Figure 164. South Capella. (left) Relative composition of the sessile epibenthic animal community. (right) Relative composition of the algal community and unconsolidated sediment.

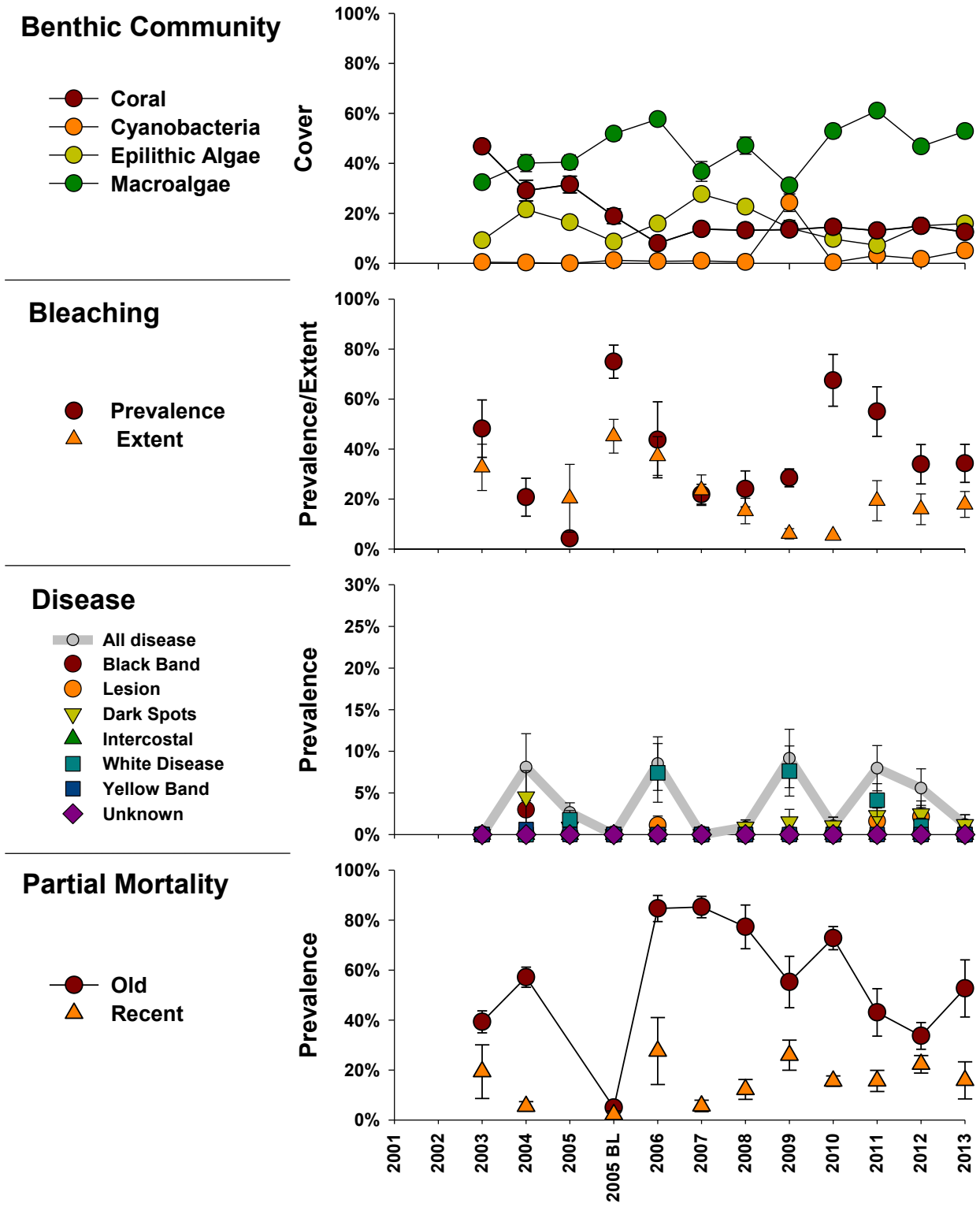


Figure 165. South Capella benthic cover and coral health through time (mean ±SE).

Fish Community. South Capella is characterized by a fairly diverse fish community that is fairly well split between trophic levels. In 2011 a large school of schoolmaster snapper skewed this balance toward piscivores; however, this was probably a spawning event, and not typical of the daily fish community. The reef is spur and groove with complex reef edges and sand channels that support a large number of invertivores and variety of omnivores. Planktivores are limited nearly entirely to yellowtail snapper. Herbivores are dominated in biomass by stoplight parrotfish and black durgeon. The South Capella reef is highly fished and traps are commonly seen during our survey events. The complex reef is noticeably bare of large snappers and groupers. Lionfish are more common than on other sites.

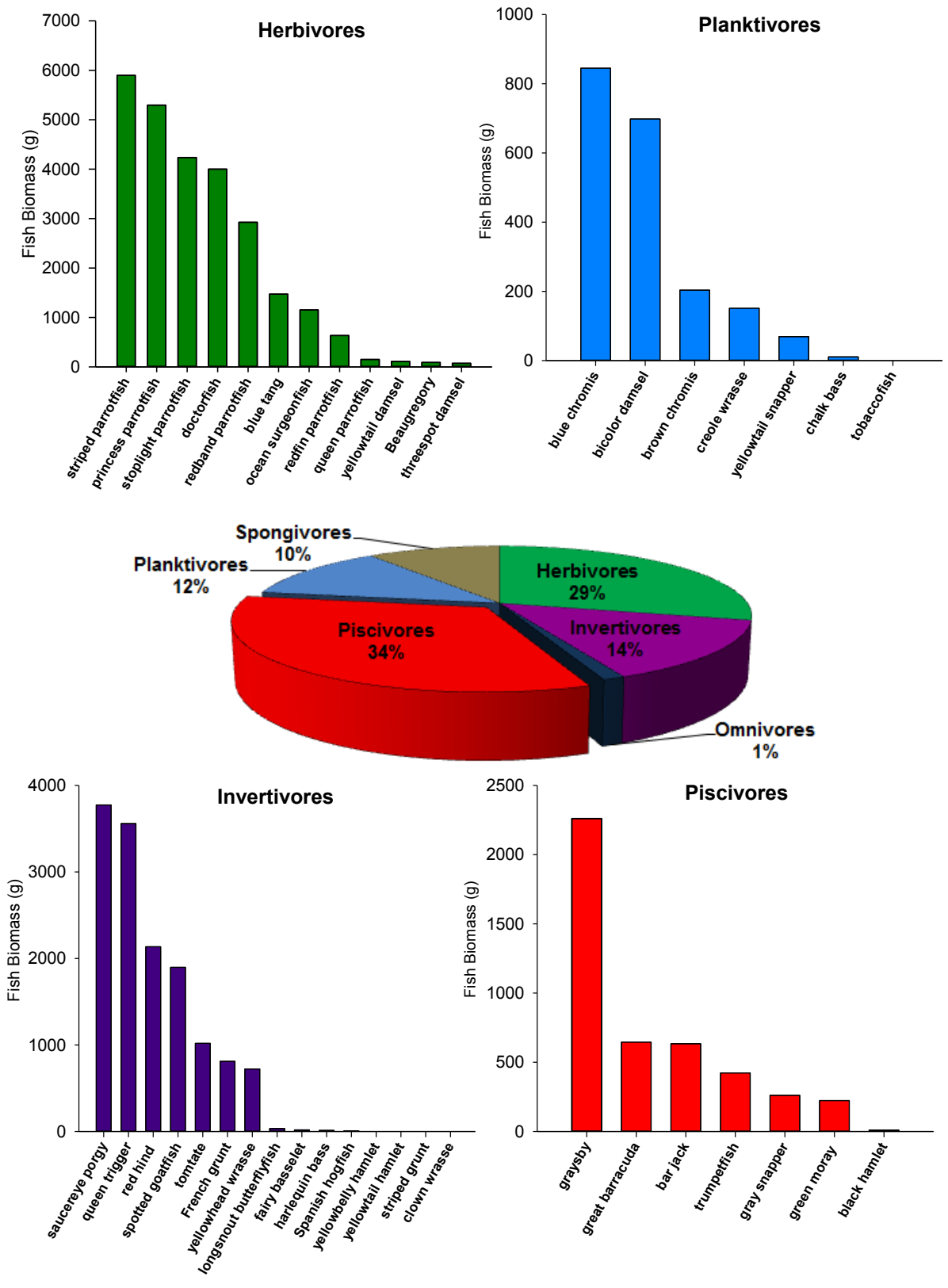
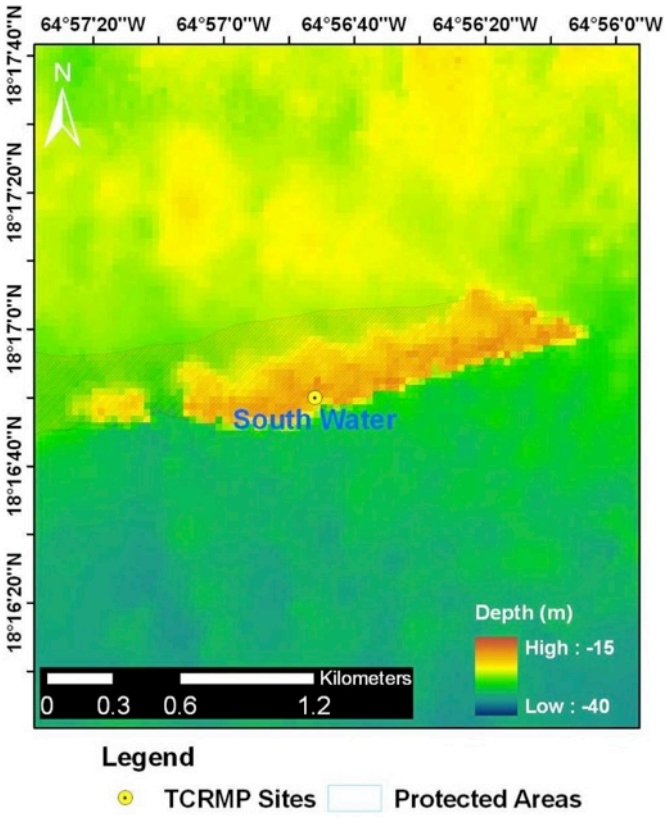


Figure 166. The South Capella fish community by absolute and relative biomass.

SOUTH WATER

Description. South Water is a hardbottom coral community along the sharp break of a midshelf reef complex in depths of 17 – 28 m. The reef has a sharp break in slope leading to a steep escarpment that terminates in a sand/sediment plain at the reef base. South Water has been monitored since 2005, with permanent benthic transects installed in 2007.



Outstanding Feature. South Water is a commercially important fishing ground for reef fishes and spiny lobster.

Threats. South Water is primarily threatened by fishing and strings of fish and lobster traps are common over the site.

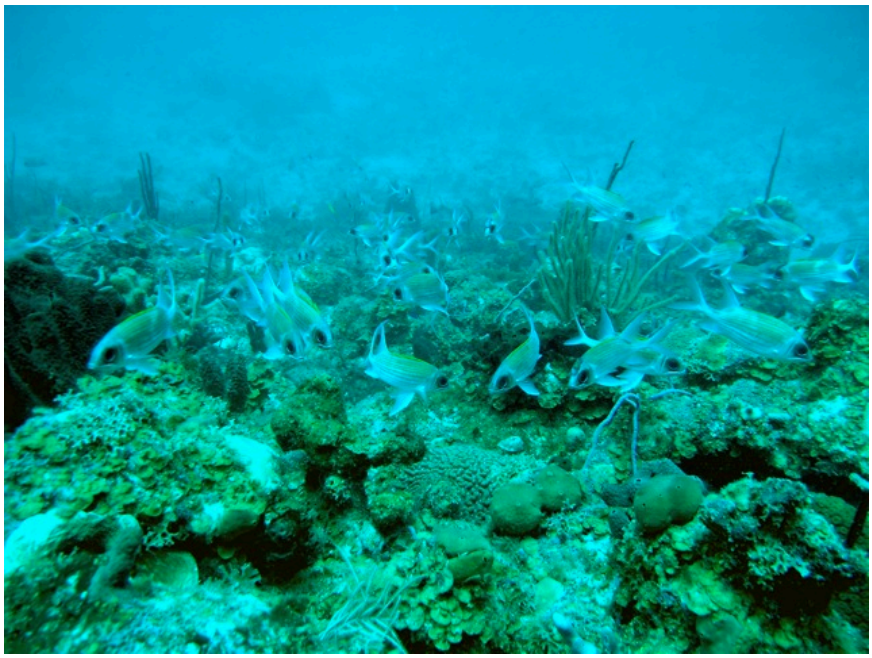


Figure 167.South Water. (top) Location. (right) A representative photo of the reef.

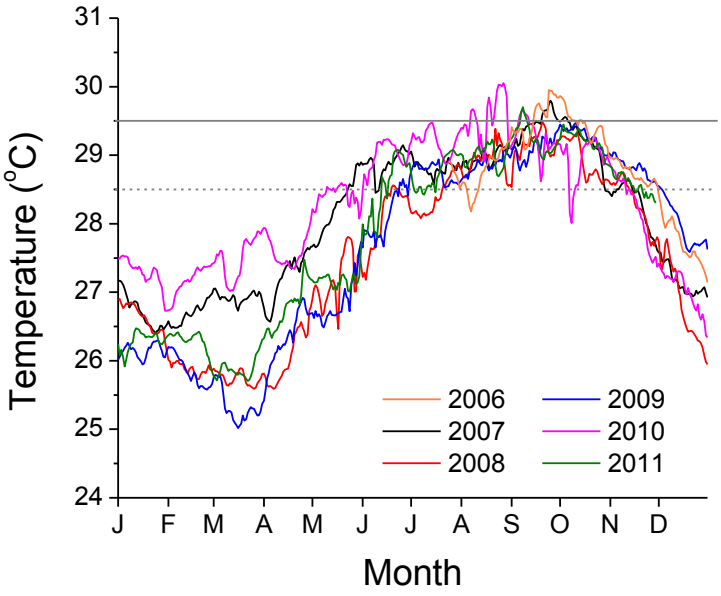


Figure 168. South Water benthic temperature record (24m depth)

Physical Characteristics.

Current. Current measurements have not been taken at the South Water site. Unidirectional benthic currents can be moderate on the hardbottom reef top and strong from the surface to midwater. Wave-driven oscillatory currents are likely to be felt on the reef top during swells and storms.

Temperature. South Water has relatively moderate temperatures compared with other shallow water sites during warm years. This may be due to the deeper depths of the site and the proximity of deep water.

Benthic Community. The sparse coral community at South Water is very diverse. Coral cover increased by 21.3% over the 2005 bleaching event and had increased by 42.6% between 2005 and 2011. However, permanent transects were not installed until 2007 and the low coral cover means that small variations in detection of corals can lead to large apparent year-to-year differences in cover. Sponges and gorgonians dominate the sessile epibenthic animal community. The algal community is nearly equally divided between *Lobophora variegata*, *Dictyota* spp., and epilithic algae. Crustose coralline algae and filamentous cyanobacteria are also very common.

Coral Health. Corals were severely affected by the 2005 coral bleaching event, with over 80% of corals bleaching over nearly the entire coral surface. Corals were moderately affected in the 2010 bleaching event, with just less than 50% of corals bleaching at a low extent. Bleaching tends to be moderately prevalent even in non-thermal stress years. Coral diseases are not common, although there is a trend of increasing dark spots disease. Old partial mortality increased in prevalence after the 2005 bleaching event, but at a lower prevalence than most other sites. Recent partial mortality is rare.

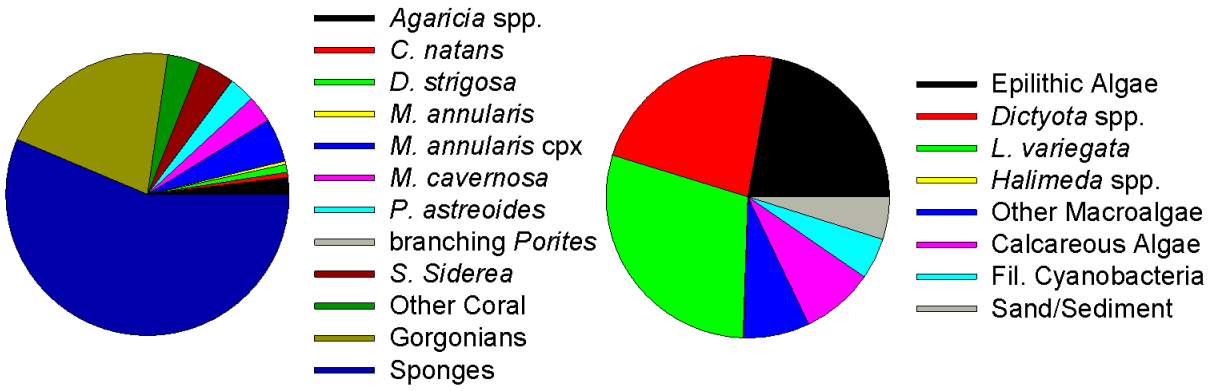


Figure 169. South Water. (left) Relative composition of the sessile epibenthic animal community. (right) Relative composition of the algal community and unconsolidated sediment.

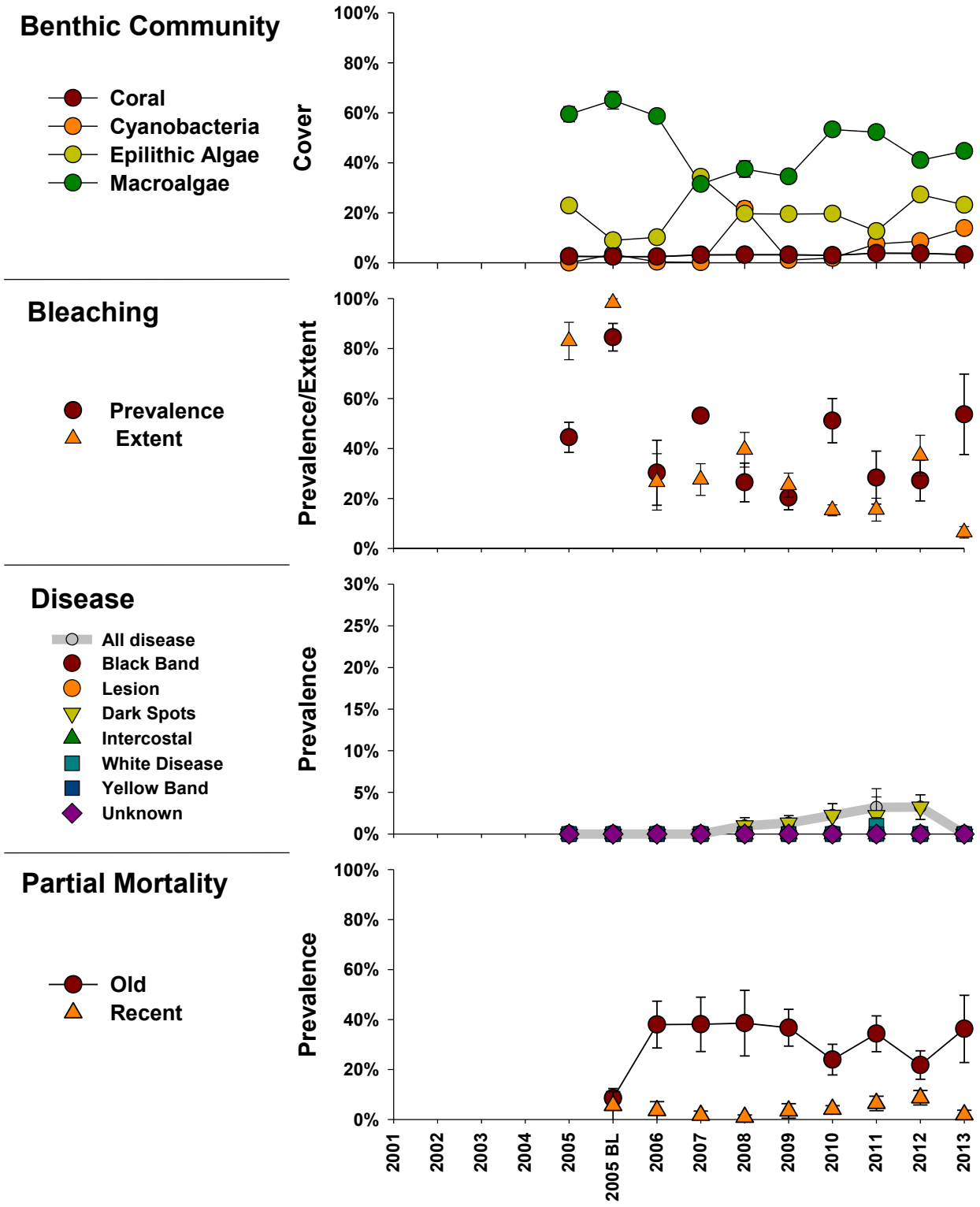


Figure 170. South Water benthic cover and coral health through time (mean ±SE).

Fish Community. South Water Island is a low lying reef with hard bottom that supports primarily invertivores. Fish biomass is lower on this site than other offshore St. Thomas sites. Invertivore biomass is dominated by queen trigger and red hind. Mutton snapper are occasional. Stoplight and princess parrotfish dominate herbivores, and many juvenile and sub-adults of these species occur on the site. Piscivores make up only 5% of the biomass on the South Water Island site, and is primarily composed of the graysby. South Water Island is highly fished and traps are commonly seen during our survey events. Except for mutton snapper, the reef is bare of large snappers and groupers. Lionfish (*Pterois* volitans) are more common on this site.

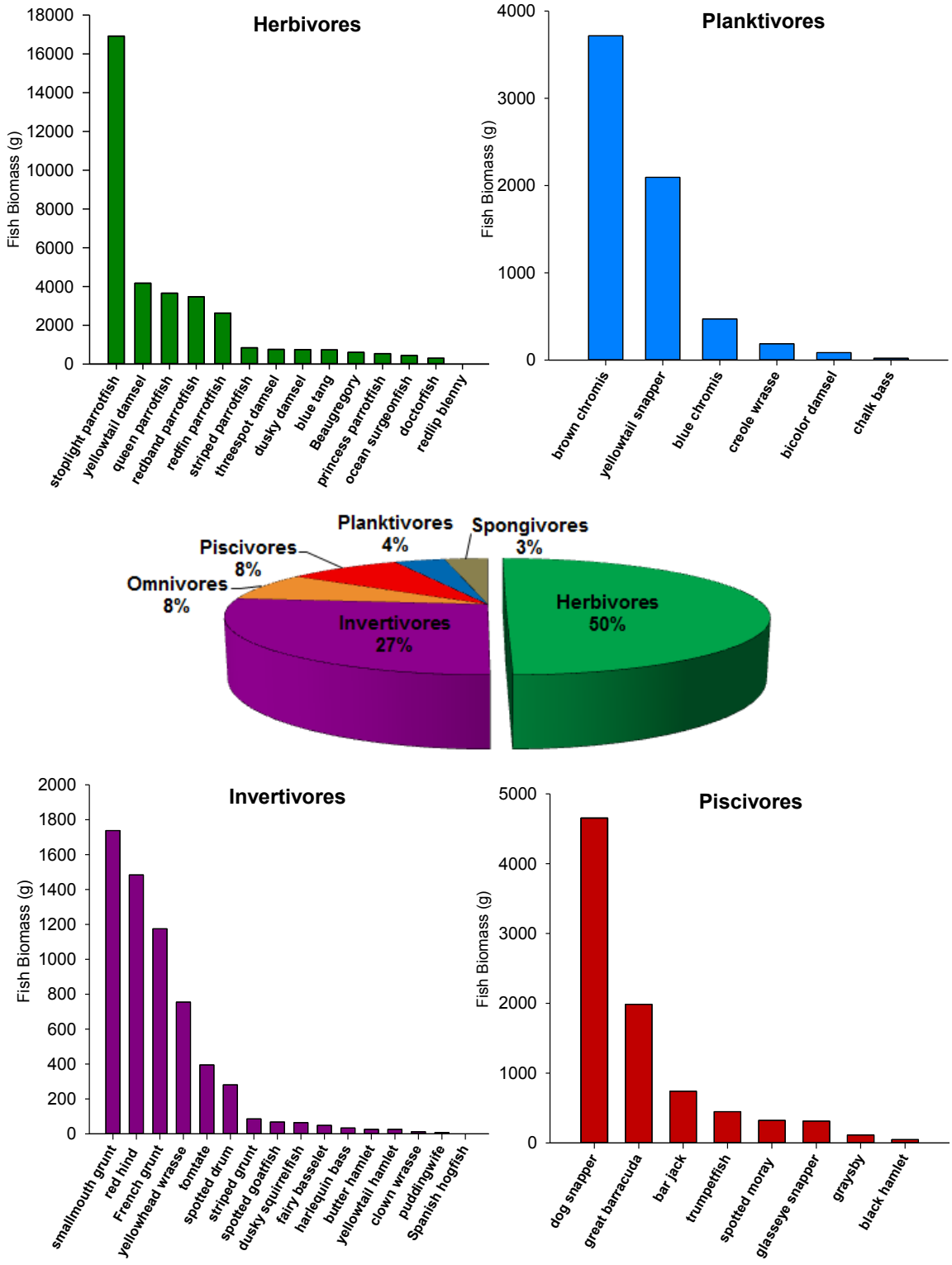


Figure 171. The South Water fish community by absolute and relative biomass.

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