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 numerically herbivores, but it also supports a diverse invertivore community and is dominated in biomass by planktivores. The quiet, relatively protected bay receives circulation and resulting plankton loads during parts of the tidal period, supporting large yellowtail snapper and schools of creole wrasse. Jacks and mackerels are commonly seen circling anchovies and other small bait fish. At other times, when the current is less favorable, planktivores are limited to small pomacentrids. Herbivore biomass is evenly split between the common parrotfish species and Acanthurids. Schools of mixed blue tang and surgeonfish are observed grazing the reef commonly. The most numerous piscivore observed at Savana is the coney. These are numerous near the bedrock periphery of the site along the island shoreline. One small yellowmouth grouper (11-20 cm) was observed on a belt transect in 2012, the first seen on a nearshore site. Otherwise no large snappers and groupers have been seen in the bay. The area is highly fished with fish traps.

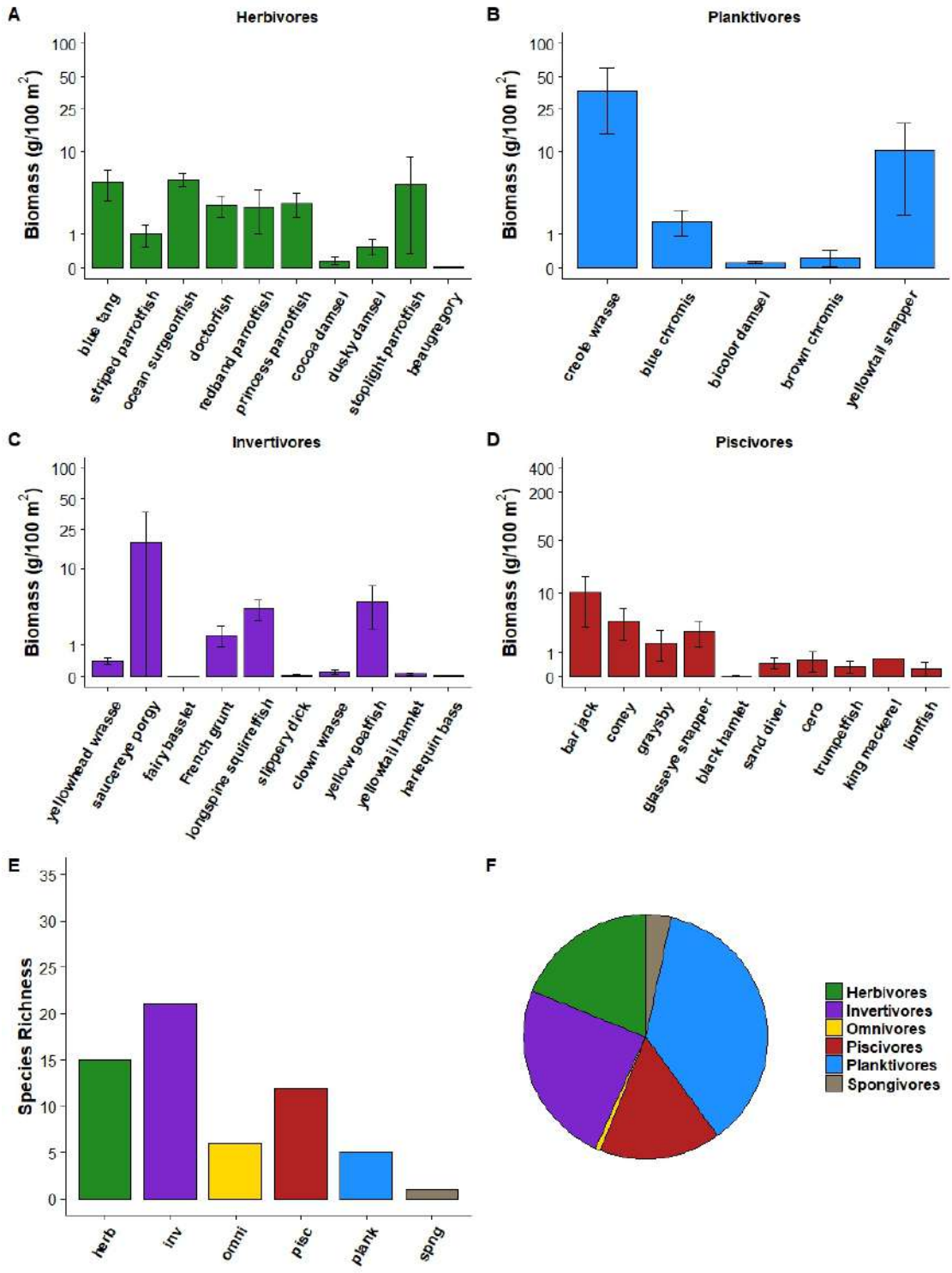
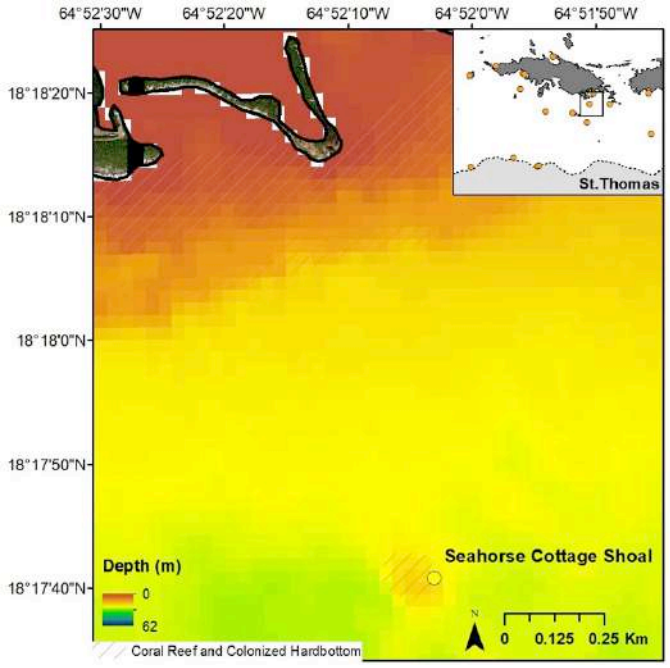


Figure 154. The Savana Island fish community as (A-D) average biomass per trophic group with the most common species shown in order on the x-axis, (E) species richness, and (F) relative community composition by total biomass. Note that biomass is a log scale.

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

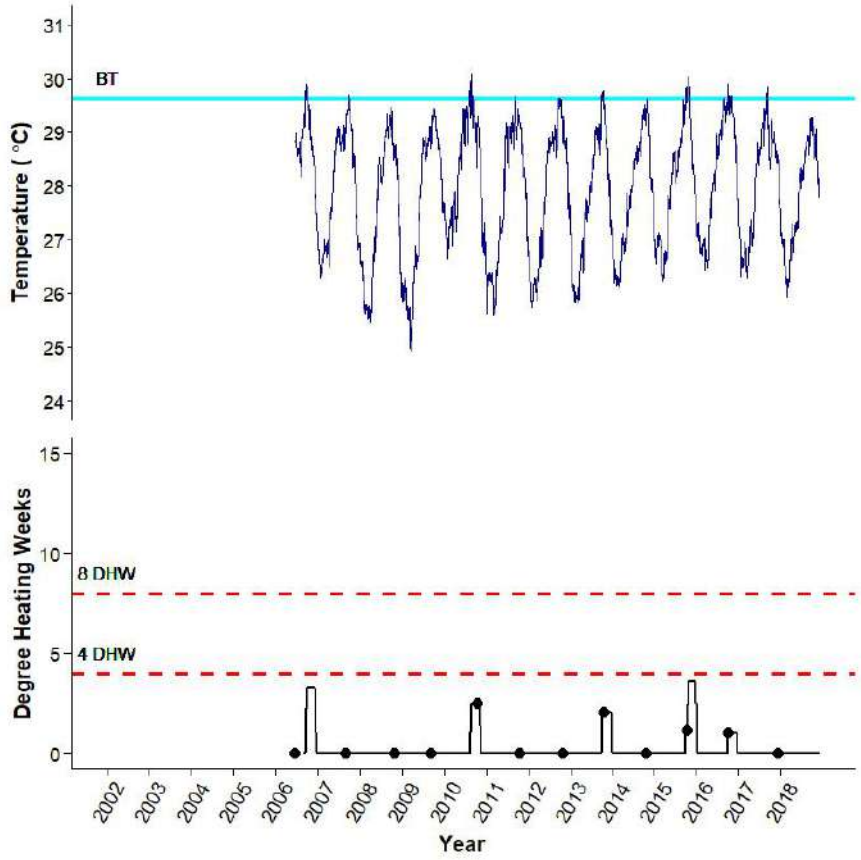


Figure 156. Seahorse benthic temperature record (21 m depth).

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.

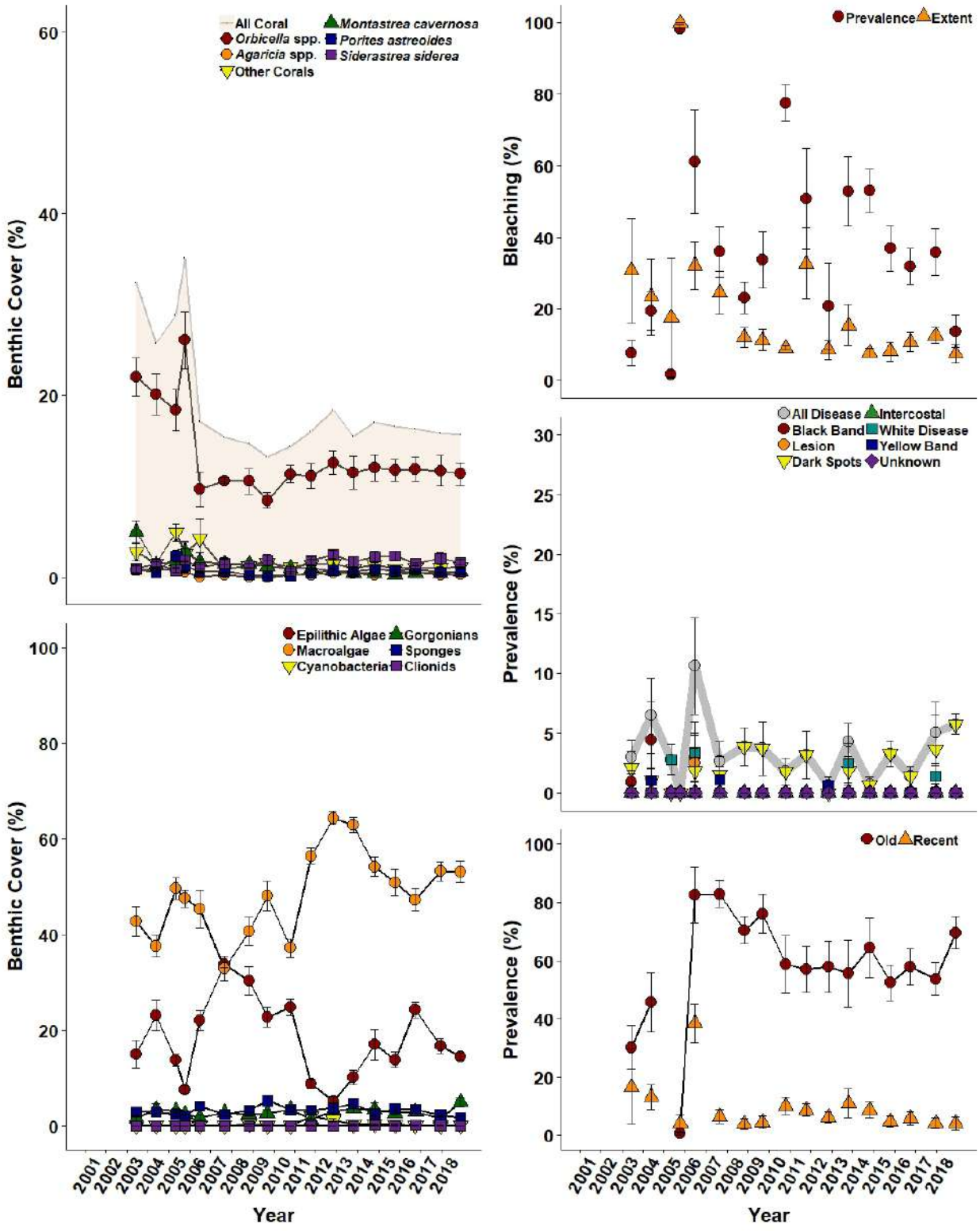


Figure 157. Seahorse Cottage Shoal benthic cover and coral health through time (mean ± SE).

Fish Community. Seahorse Cottage Shoal supports a large variety of reef fish and hosts aggregations of gray snapper and lane snapper during the summer months. The trophic guilds on the offshore reef are split relatively evenly between herbivores and invertivores, with piscivores nearly as high in biomass during some years. This reflects the heterogeneity of reef substrate and the availability of unconsolidated sand and rhodolith habitat surrounding the reef. The orientation on the circular offshore reef determines the number and species of fish observed. On the western edge of the reef, schools of snapper and porgies can be found. Mutton snapper and queen triggerfish are also relatively common on this edge of the reef. The top of the low spur and groove reef on the other hand holds mainly glasseye snapper, wrasses and parrotfish. Adult stoplight and redband parrotfish dominate herbivore biomass while glasseye snapper and graysby dominate the benthic piscivore trophic guild. Jacks and mackerels are common on the site. Seahorse Cottage Shoal is well known to fishermen and is heavily fished. Traps on the reef are common during surveys. Except for one sub-adult goliath grouper observed there in 2012, large groupers have never been seen on the reef. 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.

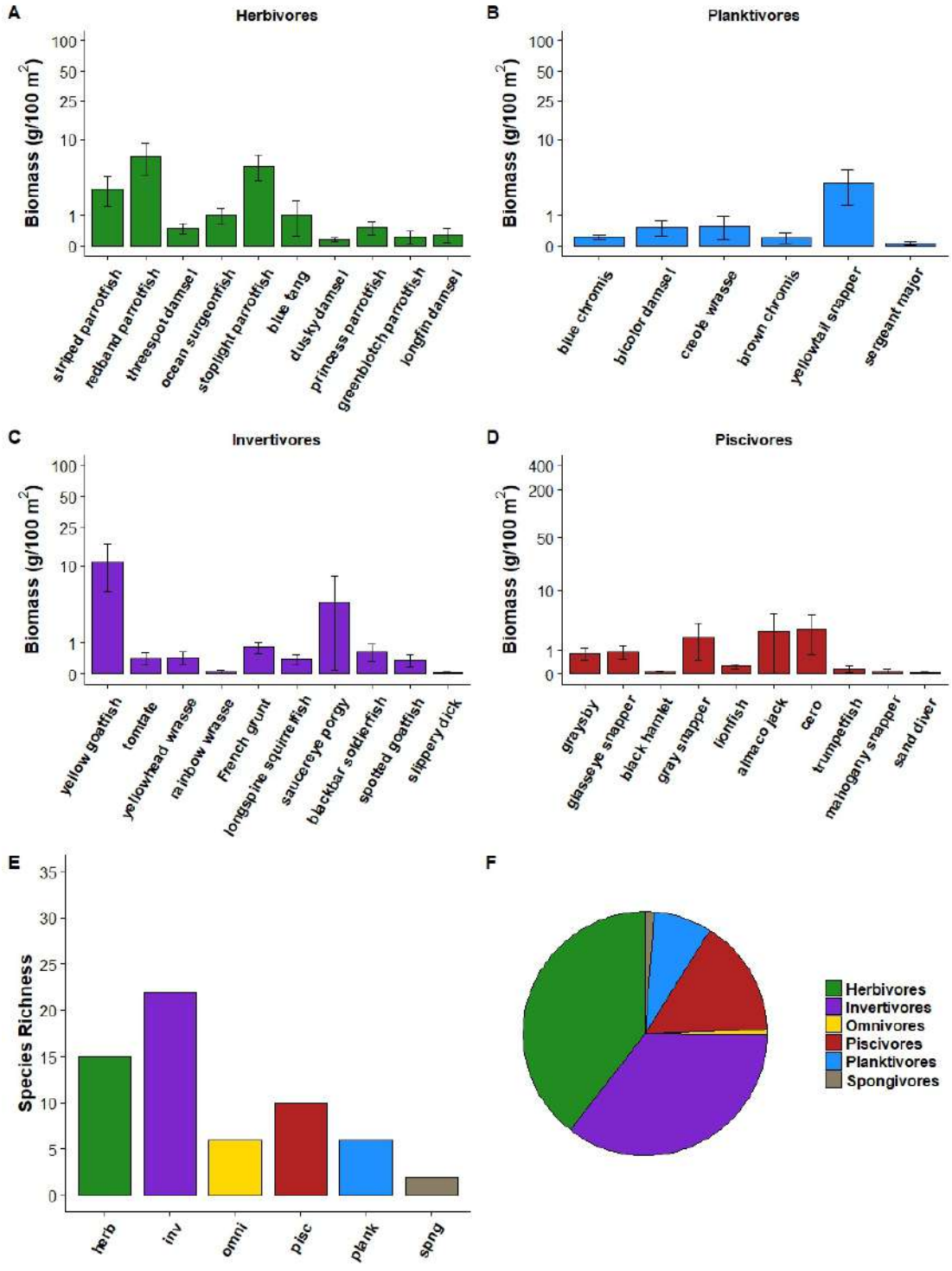
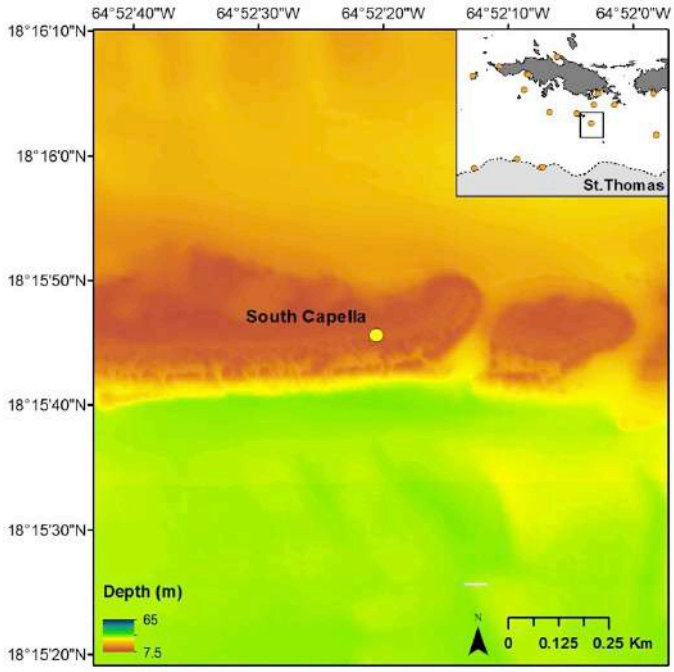


Figure 158. The Seahorse Cottage Shoal fish community as (A-D) average biomass per trophic group with the most common species shown in order on the x-axis, (E) species richness, and (F) relative community composition by total biomass. Note that biomass is a log scale.

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 2016 but not actively trapping. The reef was also highly affected by the 2005 coral bleaching event, suggesting a susceptibility to rising sea surface temperatures.

Figure 159. South Capella. (top) Location. (right) The reef with a derelict Antillean fish trap in Transect #1.

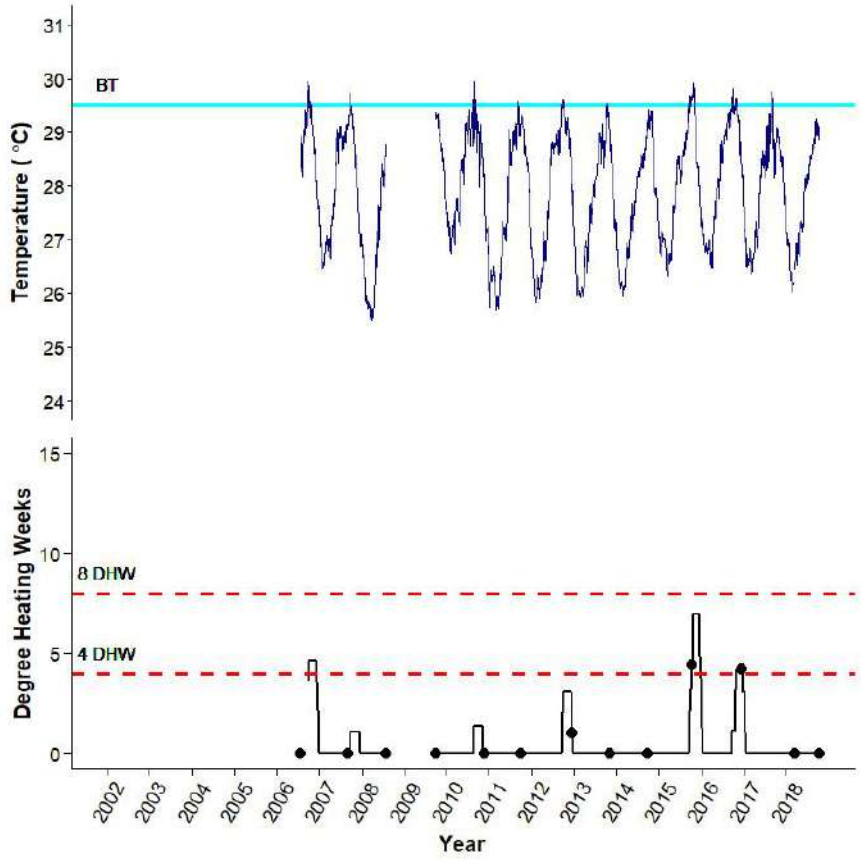


Figure 160. South Capella benthic temperature record (24 m depth).

Physical Characteristics.

Current. Currents were directly measured at South Capella and this data will be included in a future report. 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.).

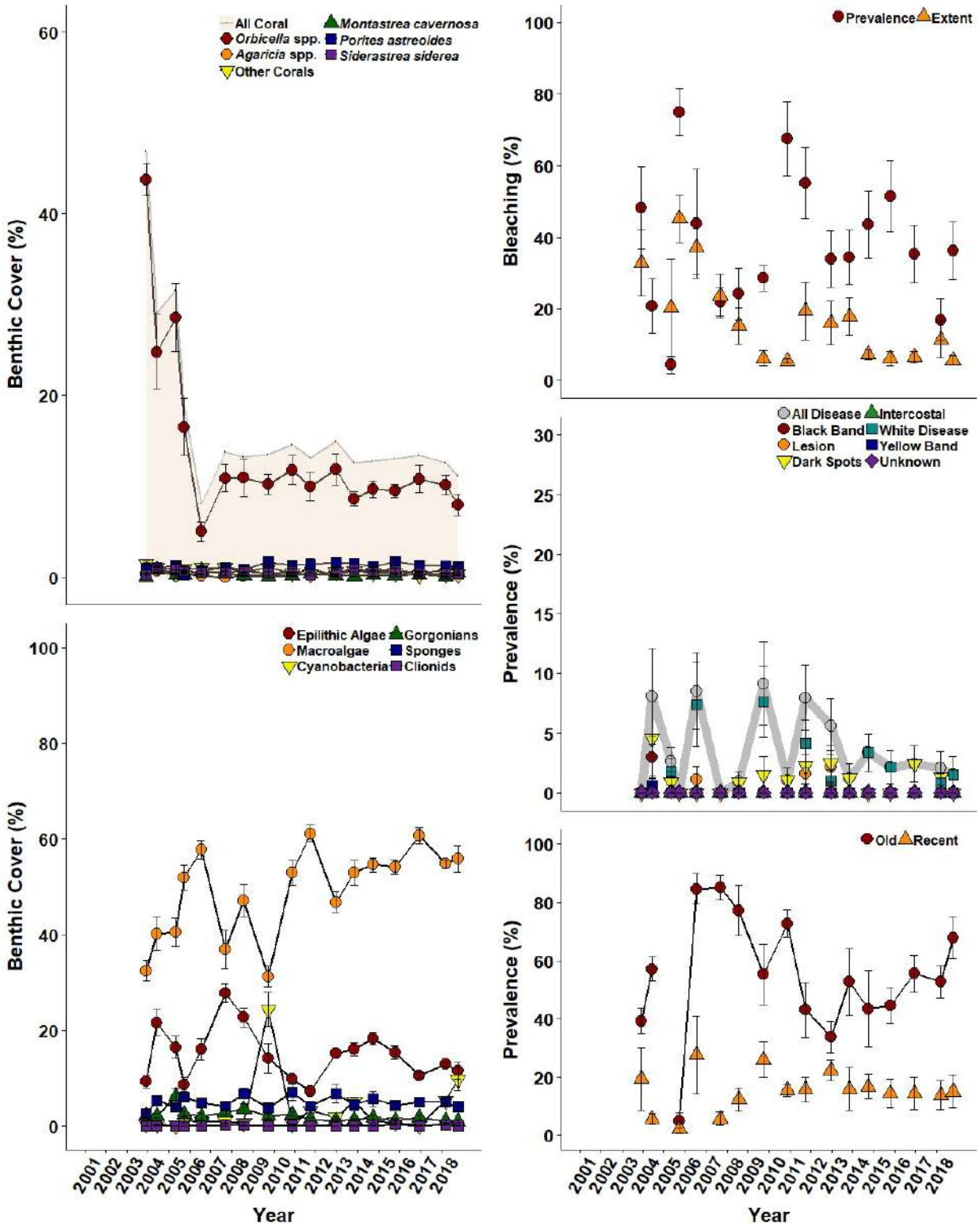


Figure 161. South Capella benthic cover and coral health through time (mean ± SE).

Fish Community. South Capella is characterized by a diverse fish community that is fairly well split between trophic levels. Schools of schoolmaster snapper are observed regularly and usually dominate the piscivore biomass, however these schools may be small spawning aggregations 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 and variety of invertivores. Grunts and goatfish comprise most of the invertivore biomass. Planktivores include the yellowtail snapper, as well as creole wrasse and black durgeon, generally seen on shelf edge reefs. Benthic herbivores are dominated in biomass by striped parrotfish with redband, stoplight and queen parrotfish also common. The South Capella reef is a highly fished area and traps are commonly seen during our survey events. The rich, complex reef is noticeably bare of large snappers and groupers. The serranid group is represented only by the graysby and small hamlets, with an occasional red hind observed. Nassau grouper have never been observed at this site. Conversely, red lionfish continue to occur more commonly at the South Capella reef than any other offshore site.

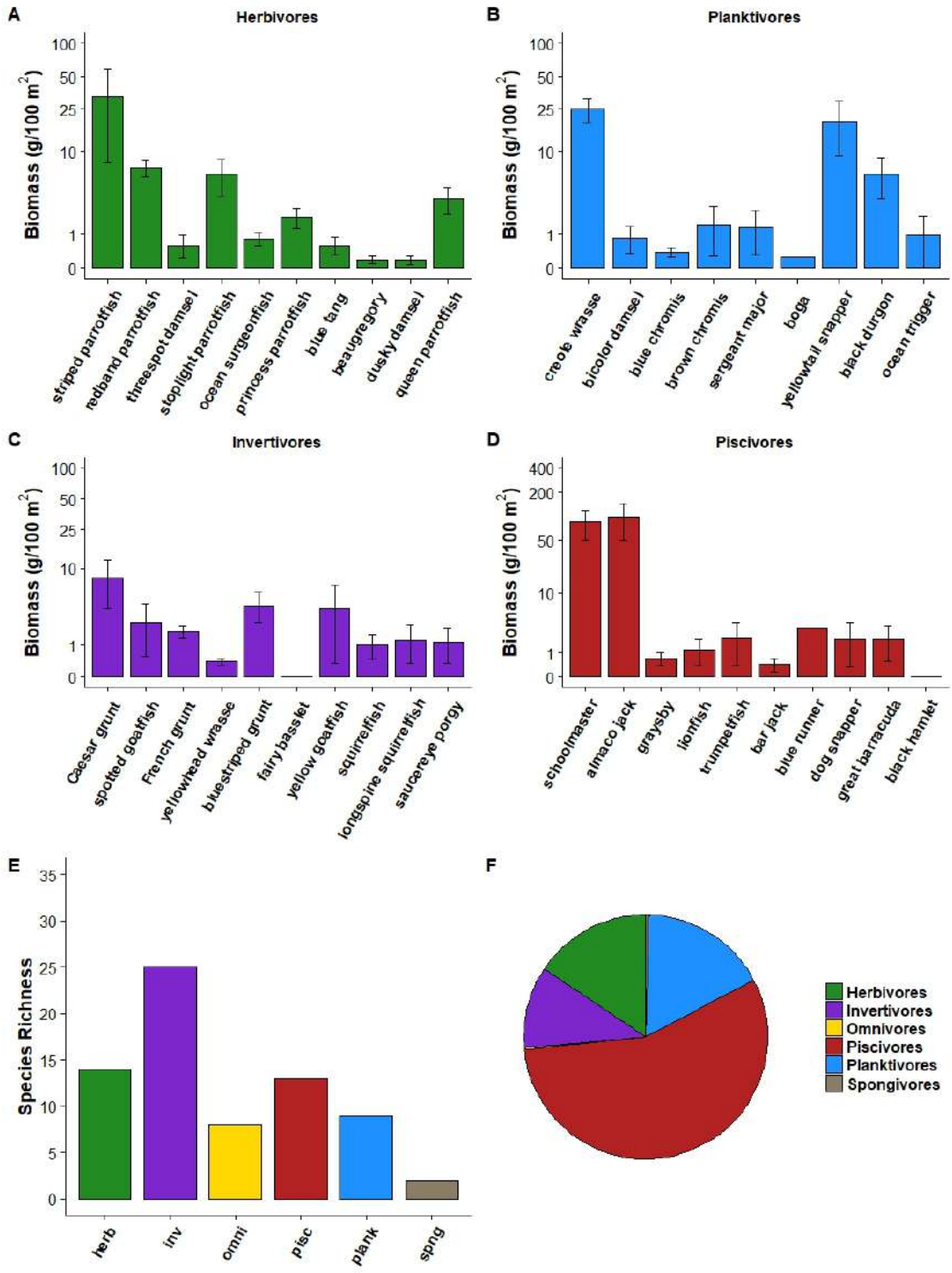
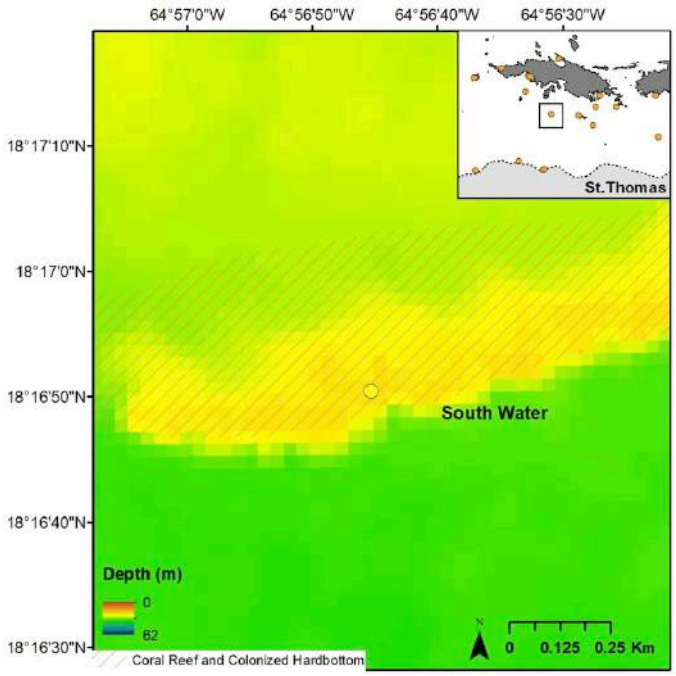


Figure 162. The South Capella fish community as (A-D) average biomass per trophic group with the most common species shown in order on the x-axis, (E) species richness, and (F) relative community composition by total biomass. Note that biomass is a log scale.

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

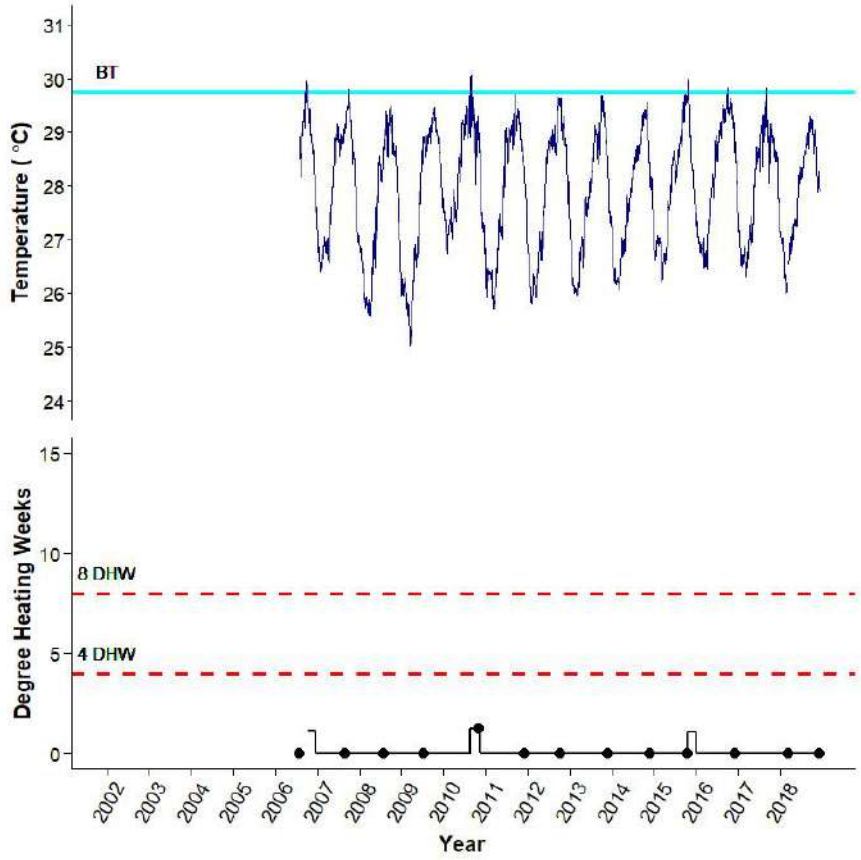


Figure 164. South Water benthic temperature record (24 m depth).

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.

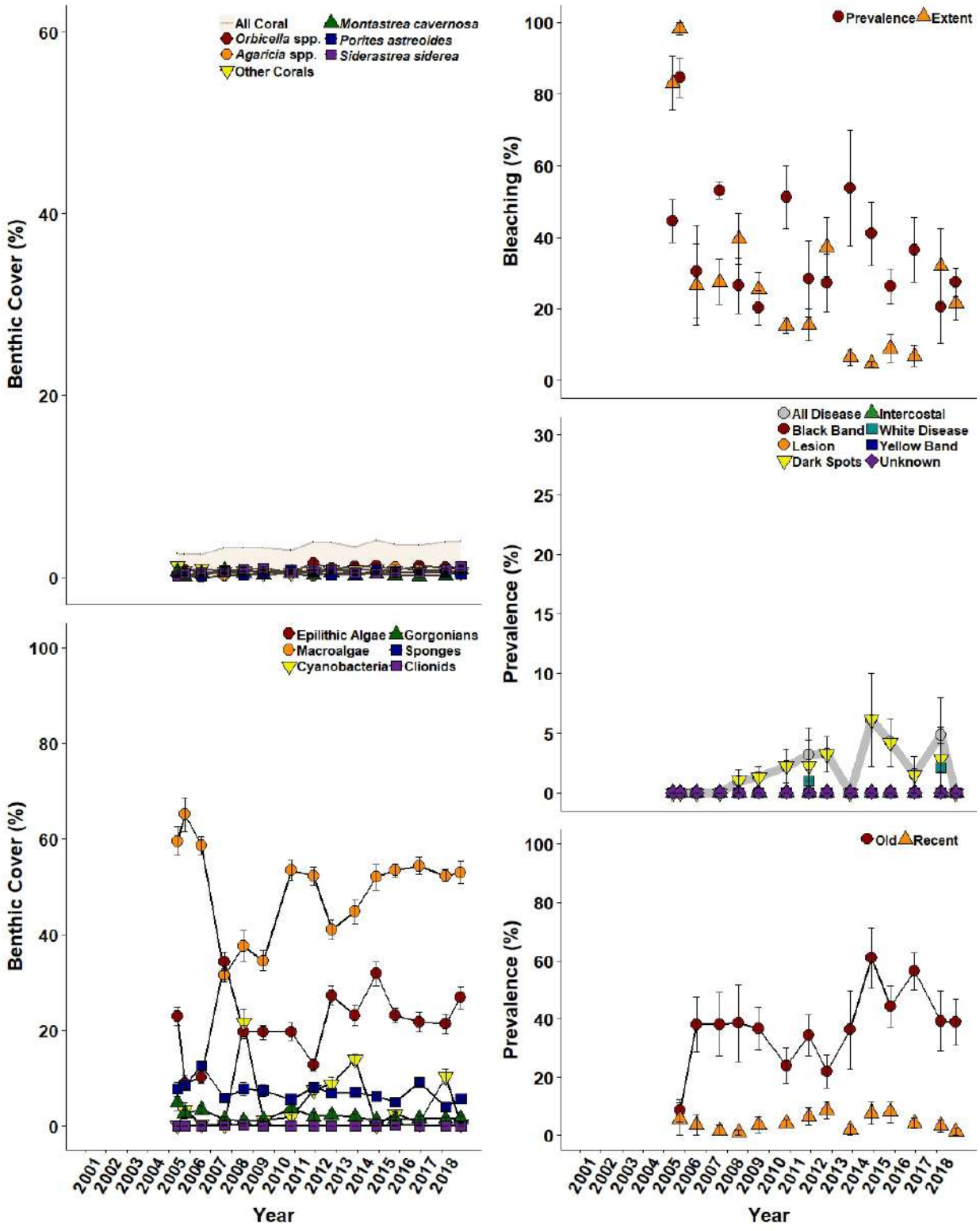


Figure 165. South Water benthic cover and coral health through time (mean ± SE).

Fish Community. South Water Island is a hard bottom reef crossed by sand channels that supports primarily invertivores and herbivores. Fish biomass is lower on this site than most other offshore and mesophotic sites of St. Thomas. The invertivore biomass is dominated by queen triggerfish, long-spine squirrelfish and grunts. Mutton snapper are occasional off the southern edge of the reef. Stoplight and redband parrotfish dominate the herbivore biomass, and many juvenile and sub-adults of these species as well as striped and princess parrotfish occur across the site. Piscivores generally make up a very small percentage of the biomass on the South Water Island site; small mackerels and jacks are commonly observed, driving up average biomass, but the guild is primarily composed of graysby, coney and medium sized snappers that school along the reef edge. The site lies several miles from the shelf edge, and planktivores are in general limited to yellowtail snapper and small chromis. South Water Island is highly fished and traps are commonly seen during our survey events. Lobsters are common on this low-lying reef, hiding in the hard bottom ledges that extend across the site lining the sand channels. With the exception of mutton snapper, the reef is bare of large snappers and groupers.

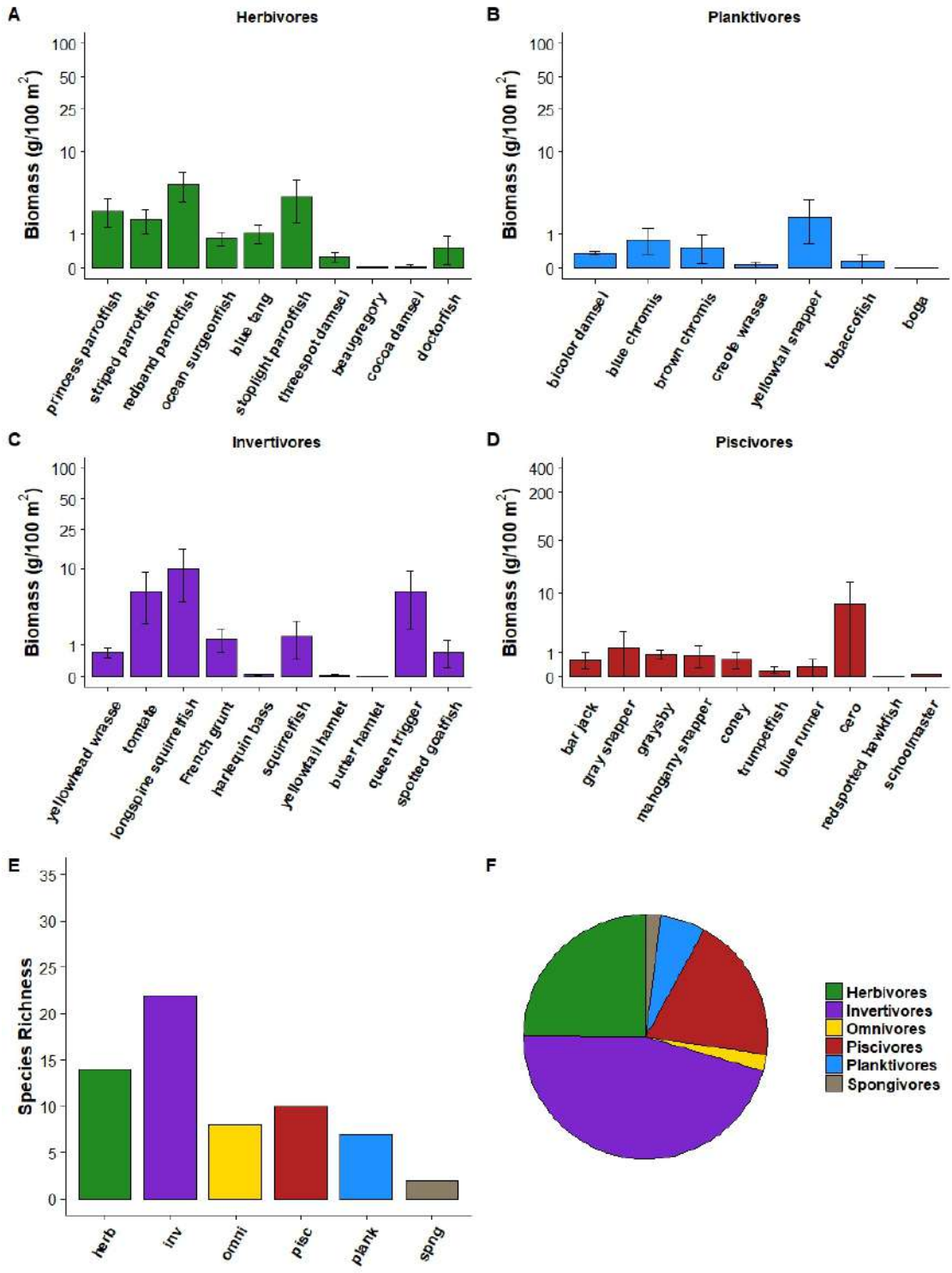


Figure 166. The South Water fish community as (A-D) average biomass per trophic group with the most common species shown in order on the x-axis, (E) species richness, and (F) relative community composition by total biomass. Note that biomass is a log scale.

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