The
Midnight Pass
SOCIETY, INC. "MIDNIGHT PASS – PASS IT ON!"

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A FIELD STUDY OF RED DRIFT ALGAE (GRACILARIA) & BAY BOTTOM COMPOSITION IN LITTLE SARASOTA BAY, FLORIDA

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SYNOPSIS

On February 4, 1990, the Midnight Pass Society conducted a field trip to selected sites around Little Sarasota Bay in Sarasota County, Florida. The objective was to observe the vegetation extant at each location and to determine the composition of the Bay bottom. Of the three types of seagrasses that had been widely evident in Little Sarasota Bay, only Cuban Shoal Weed was found. It was generally quite sparse and appeared to be in a stressed condition. Red Drift Algae was found throughout the Bay, often in significant accumulations. Where large accumulations of Gracilaria were found, other types of vegetation were almost entirely absent. a review of the bottom samples taken disclosed the accumulation of organic sediments in Little Sarasota Bay. The organic sediments found were most severe around the Bird Islands, with progressively lesser accumulations the farther away the sampling site was from the Midnight Pass/Bird Islands area.

It would appear that the changed conditions in Little Sarasota Bay since, and due to the closing of Midnight Pass, have resulted in:

* The loss of nearly all seagrass bed acreage, with the remaining grass (Cuban Shoal Weed) both sparse and stressed.
* Significant accumulations of Red Drift Algae in numerous locations throughout Little Sarasota Bay.
* The accumulation of significant amounts of organic sediment on the bottom of Little Sarasota Bay in the "greater Midnight Pass" area.

INTRODUCTION

Embayments with poor circulation tend to allow nutrients to accumulate and enrich their waters. In these waters, deemed to be of "poor" quality, you will often find accumulations of algae. The Gladiola fields of Manatee County. The northern portion of Lemon Bay. Little Sarasota Bay. The waters in all three areas are considered poor; macroalgae accumulates here far more than in other areas. In two of these areas, "Man" has played a key role in exacerbating the situation.

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INTRODUCTION (CONT'D.)

The gladiola fields are irrigated with nutrient-enriched sewage effluent. The nutrients flow to an area of the bay with historically poor water circulation. We're dumping in more nutrients than the natural system can absorb.

In Little Sarasota Bay just the opposite is true. The natural flushing system had been up to the task of absorbing at least a major portion of our pollutants. Then, in 1983, "Man" shut down the natural flushing mechanism, greatly reducing tidal circulation. what's now dumped into the Bay (naturally or otherwise) can no longer get out.

Projects aimed at mapping the Little Sarasota Bay seagrass beds have previously reported that more than 12% of the embayment was covered with macroalgae. However, these studies were formulated in large measure through aerial photo interpretations. It's very hard to differentiate seagrass from alga on such photos. In addition, these studies are somewhat dated.

Accordingly, on February 4, 1990, the Midnight Pass Society conducted its own review of the vegetation to be found in Little Sarasota Bay. Numerous sampling sites were selected on the Key and mainland sides of the Bay. Three member-volunteers began the project at 9:15AM on a rising tide and completed the field work at 12:15PM. Fewer mainland sites were sampled due to the onset of inclement weather.

STUDY AREA

Member observations indicate that the adverse impact of Pass closure extends from the Point Crisp area south to the Blackburn Point bridge. Accordingly, we sampled a total of fourteen sites within this area. We'd intended to sample more sites than this but foul weather cut short our field work. We were able to get good north to south sample distribution and had ample time to make our observations. See Exhibit #1 for the location of the sampling sites.

OBJECTIVE

To define and describe the bottom of Little Sarasota Bay at each of the sampling locations as to type and extent of vegetative coverage and the composition of material found on the embayment floor.

PROTOCOL

Several sites were selected between Point Crisp and Blackburn Point to provide a definitive picture of the Bay bottom. The sampling sites were close enough to capture any spatial trends. Field work began at Point Crisp and progressed south on the Key side of the Bay. Travelling between sampling locations we continuously observed bottom conditions. See dotted line on Exhibit #1 for direction of travel. Seagrass plants were noted and selected as sampling sites, whenever found. At each site we performed the following procedures: marked the

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PROTOCOL (CONT'D.)

site on the field map; described the location; determined water depth; visually inspected the bottom and recorded observations; took a sample of the bottom vegetation, noted its description and preserved; using a Waechter stick took a water sample at least one foot below the surface; visually observed water clarity and recorded; described bottom composition and, where appropriate, took and preserved a sample; recorded visual observations of area in general and within 50 yards of sampling site; preserved samples in refrigerator. On February 5, 1990, reviewed vegetation samples with Dr. John B. Morrill; transferred water and bottom samples to Dr. Morrill for necessary lab work.

Dr. Morrill ran salinity tests on all water samples obtained. He resuspended the bottom samples in sedimentation cones and photographed them.

OBSERVATIONS BY SAMPLING SITE

SITE #1. Just north of Point Crisp on Key side. Salinity 30.0 °/°°. Water depth 48" to 62". Samples-- water and vegetation only. Clear water noted with heavy masses of Red Drift Algae (RDA). The bottom was firm and sandy. No seagrasses noted in area. Morrill review noted one form of Gracilaria; one baby Sea Cucumber. Note that Marine Patrol stopped to investigate our activity.

SITE #2. Approximately 200 yards south of Point Crisp, Key side. Salinity 30.0 °/°°. Water depth 18" to 24". Samples-- water, vegetation and bottom. Water clear. Firm, sandy bottom with random, scattered oyster shell (none live noted). RDA caught on shell... observer cut self collecting sample. Patches of RDA and another, slimy form. Very sparse Cuban Shoal Weed (CSW) intermixed with RDA. No seagrass beds. Morrill review noted a different, bushy form of Gracilaria (RDA) and several small species of red and green alga. In bottom sample found a number of Pillbugs-- Isopods... some attached to oyster shell. Also, a moss animal-- a Bugula (Bryozoan). Bottom sample defined as shell gravel, coarse sand.

SITE #3. Approximately ½ mile farther south... just above Neville home, Key side. Salinity 30.0 °/°°. Water depth 12" to 24". Samples-water, vegetation, bottom. water was clear. Bottom was sandy and firm. very sparse CSW observed. No RDA found in area. Morrill review confirmed CSW blades. Bottom defined as shell gravel, coarse sand.

SITE #4. A third of a mile farther south, just above the dock of Mr. & Mrs. A. Harris. Salinity 30.0 °/°°. Water depth 25". Samples-- water, vegetation, bottom. Water was clear. Very sparse CSW intermixed with small amounts of RDA. More CSW noted closer to shore, but still quite sparse. Patches of RDA. Morrill reviewed a large, bushy form of alga, a few CSW blades. Bottom sample described as muddy sand which included a number of small snails.

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OBSERVATIONS BY SAMPLING SITE (CONT'D.)

SITE #5. South of marker 48, due east of Midnight Pass Marina, just north of northern channel to Midnight Pass. Salinity 30.5 °/°°. Water depth 22". Samples-- water, vegetation, bottom. Water not as clear as previous. Bottom was quite soft and dark. Brought up some healthy looking blades of CSW mixed with a slimy growth. Noted intermittent beds of CSW all covered with heavy growths... and RDA was intermixed. RDA patches also in area. Morrill review described CSW blades as healthy. Very fine sugar sand and silt. Sample taken included RDA and brown alga-- Ectocarpus.

SITE #5A. Stopped for gas at Midnight Pass Marina. No samples taken. Just south of marina docks noted a large stand of RDA in 12"-24" of water. Blanketed entire area with no other growth evident.

SITE #6. Above the Bird Islands, 100 yards south of northern channel. Site of seagrass study and other Society trips. No samples taken. Very soft bottom getting softer as we walk toward Bird Islands. Medium CSW in stressed condition with patches of RDA. RDA gets much thicker as we approach island...bad smell walking through. Came to immense patches of RDA... at least 2 feet thick. Water very murky. Clam shells found in bottom... no live clams.

SITE #7. Off the northeast corner of the Bird Islands, close to shore. Salinity 31.5 °/°°. Water depth 20" to 25". Samples-- water, vegetation, bottom. Heavy RDA in area, especially last 15 yards to shore. Soft, mucky bottom. Water clear. Morrill review found bottom to be comprised of silt and clay. Unusual algae in sample. the RDA was of the free, slender, tumbleweed type.

SITE #6 ADDENDUM. A large three pound sample of Bay bottom was taken for Dr. Morrill because of the special nature of the bottom generally found around the Bird Islands. It is very thick, clumpy material with a strong odor often and quite dark... almost black. It appears to be a clay. Morrill's review confirmed the base was clay... apparently the fines from the spoil dumped on the Bird Islands during the ICW dredging of 1962-1963.

SITE #8. West of ICW marker 45, fifteen yards from shore. Shallow area. Samples-- vegetation and bottom. Water sample missed. Extremely soft bottom. Walking from last site sank nearly to knees in muck in one spot. Water all of a sudden very turbid with no obvious reason evident... and too far from ICW influence. Many RDA patches. Very sparse, very small patches of CSW... stunted blades. Morrill review confirmed.

SITE #9. West of ICW marker 41, on the south side of the southern channel to Midnight Pass. Mr. Waechter recalls large beds of Manatee or Turtle grass in area in the early 1980's. Salinity 32.0 °/°°. Water depth 18" to 22". Samples-- water, vegetation, bottom. Small amounts of CSW (blades looked healthy- but pulled from black muck). Some RDA in area. No grass beds of any kind. Morrill review of bottom sample was fine sugar sand with silt and mud.

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SITE #10. Approximately ½ mile south of Midnight Pass site, close-in to Casey Key. Salinity 32.0 °/°°. Water depth 3' and less. samples-- water, vegetation, bottom. Water quite turbid. Bottom very soft. Some CSW growing in patches-- no real beds noted. Some RDA, but only in small clumps. Morrill review found the CSW samples to be healthy. The RDA was in small pieces.

SITE #11. Continued south about ½ mile + to a point below ICW marker #38. Salinity 32.5 °/°°. Water depth 15" to 24". Water now is back to very clear. Bottom is quite hard, firm. Found a couple of oysters-live. Small amounts of RDA. No CSW or other vegetation. Samples-- water, vegetation, bottom. This became our southernmost sampling site as the weather turned against us. Morrill review noted typical RDA, no seagrass. One Ectocarpus specimen. Bottom was shell gravel, coarse sand.

SITE #12. On our northern, mainland run we stopped above Spanish Point near ICW marker #42 at The Oaks... 150 yards from shore and 30 yards south of a small island. Salinity 32.0 °/°°. Water depth 24" to 30". Samples-- water and vegetation only. Found very large patches of RDA. Morrill review confirmed as Gracilaria.

SITE #13. Just south of Point Crisp on eastern shore near Coral Cove canal (just above Mr. & Mrs. Herbert home). Salinity 30.0 °/°°. Water depth of 48" to 66". water and vegetation samples taken. Too deep for bottom sample. Huge stands of RDA all along bottom in very thick masses. More RDA here than any other site. RDA pulled up for sample was of different types and colors. No grass found in any of our vegetation samples. Morrill review confirmed vegetation as algae in different degrees of health.

FIELD OBSERVATION SUMMARY

Red Drift Algae was found throughout the Bay--- sometimes in huge, thick masses, sometimes in loose clumps tumbling along the bottom. In a couple of instances small plants were found growing attached to the bottom. The only seagrass noted was Cuban Shoal Weed. All CSW found (except at sites 5 and 6) was very sparse and the vast majority of the plants seemed in poor condition. The patches of CSW found at sites 5 and 6 were of medium density... but in patches rather than beds. All of these plants were covered with heavy epiphytic growths that seemed to be affecting their health.

Where heavy accumulations of RDA were found no other vegetation was noted. It appeared that the RDA had displaced stands of seagrass at these locations. This is the case at site #13 where there had been large seagrass beds. However, the loss of Manatee/Turtle grass at Site #9 did not seem to be caused by RDA. A more likely cause of the die-off are the low salinity regimes common in the Bay since the closure of Midnight Pass.

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FIELD OBSERVATIONS SUMMARY (CONT'D.)

In no instance did the field team note the existence of a seagrass bed as is found in other embayments... near new Pass, for example. Anecdotal and early mapping projects indicated that seagrass beds once thrived in Little Sarasota Bay.

The bay bottom at our northern and southern sites was clean and sandy. The water was clear. There was little soft sediment. But the closer we sampled near Midnight Pass the softer the bottom became. Walking these areas created large, opaque plumes. Around the bird Islands this black sediment is very thick... but the composition of the material underneath is different, too. It is more a type of "gunky" clay than any form of sand.

LABORATORY OBSERVATIONS

Not much can be made of the limited salinity data. However, the salinity levels were lower at the northern sampling sites (above the Bird Islands) suggesting slightly less Gulf influence in that region.

The resuspended bottom samples were revealing. The stations farthest from the Midnight Pass/Bird Islands area were typified as shell gravel with fine and coarse sand and little organic sediments. The closer the collection station was to the Pass site, the larger the accumulations of organic sediment. High in nutrients, when stirred up these sediments cause turbidity. See Exhibit #2.

The sampling sites around the Bird Islands captured heavy, thick clay material. This likely came from the dredged spoil placed on the Islands during the dredging of the ICW. More than 200,000 cubic yards of material was placed here... none of it diked.

In resuspending the bottom samples it was noted that some took many days for the water to clarify... three were still cloudy a week later! The samples farthest from the Pass site clarified the fastest. Those three samples suggested the presence of ultra-light colloidal-like material that might remain in the water column.

CONCLUSIONS

1. There are significant accumulations of Red Drift Algae (Gracilaria) in Little Sarasota Bay.
2. Where large masses of RDA are found, rooted forms of vegetation are absent, suggesting that the RDA displaces them.
3. The seagrass noted during our field work was limited to Cuban Shoal Weed. The grassy areas were found to be very sparse. In those few places where the CSW was of medium density, it was both patchy and stressed by large amounts of epiphytic growth.
4. In no instance did we find what could be termed a seagrass bed.
5. Organic sediments of sizeable proportions have been accumulating in Little Sarasota Bay. the accumulations are greatest in the null zone around the Bird Islands.

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CONCLUSIONS (CONT'D.)

6. The un-diked spoil from the dredging of the ICW is still in evidence around the Bird Islands and continues to have an adverse affect on the natural topography, native vegetation and benthic community.

ACKNOWLEDGEMENTS

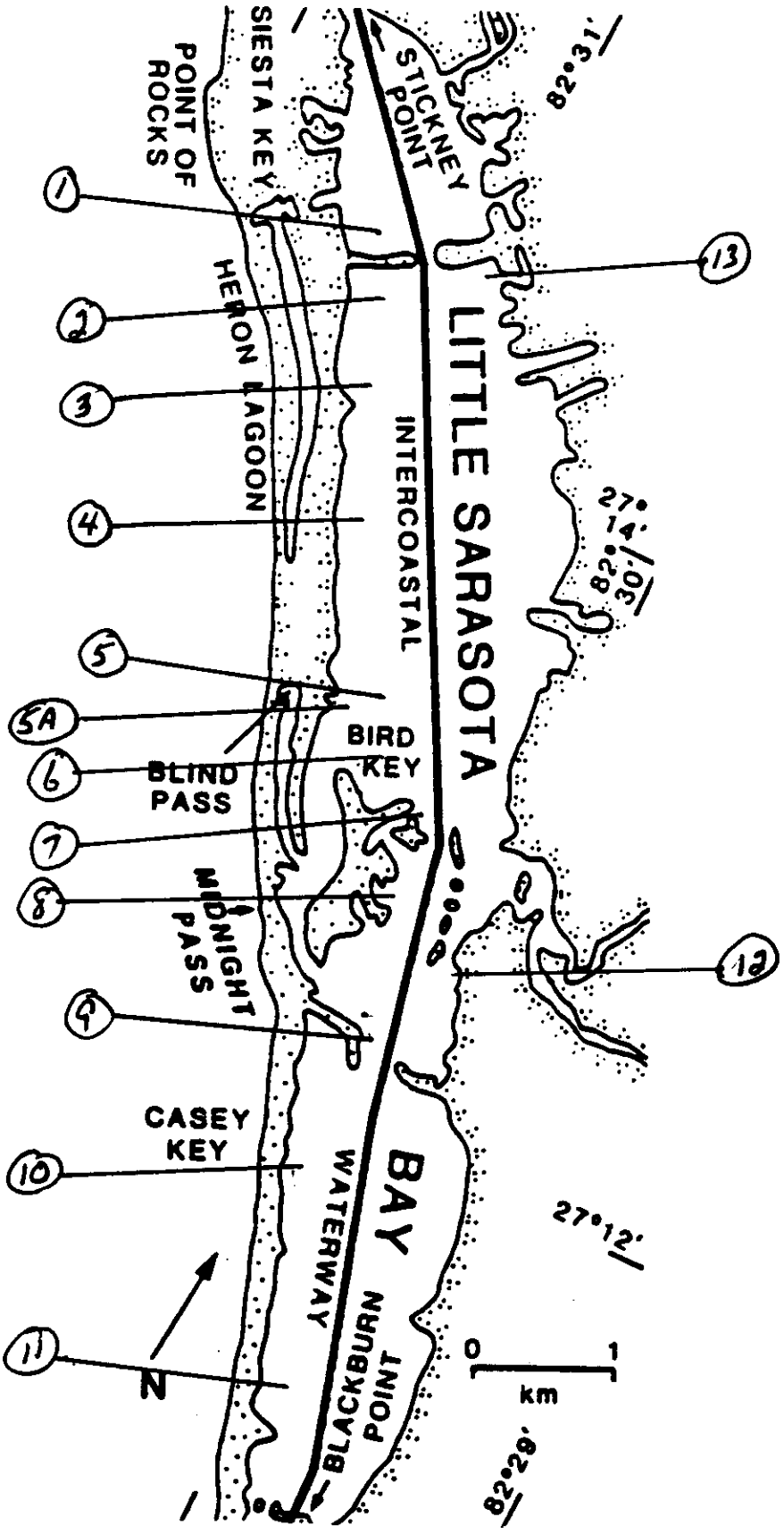
*** As ever, we owe our Midnight Pass Society members for their dedication and commitment to the local environment. Besides the writer, two members gave up their Sunday morning to conduct this field work. Thanks to Bob Waechter for supplying the boat. Thanks to Kent Brunson for supplying the fuel.

*** Exhibit #1, showing sampling site locations, was modified from a map appearing in Coastal sediments '87.

*** Dr. John B. Morrill provided his advice and guidance in planning this field study, in selecting the collection stations and in establishing the protocol under which these observations were made and samples taken. Dr. Morrill then performed the lab procedures described herein. He was instrumental in analyzing the data obtained and in formulating the conclusions to be drawn therefrom. Dr. Morrill's assistance, leadership, guidance and counsel is beyond value. We can only say.... thank you!

EXHIBIT #1

MIDNIGHT PASS SOCIETY
RED DRIFT ALGAE FIELD STUDY-- FEBRUARY 4, 1990
LOCATOR MAP OF SAMPLING SITES



Note: Map modifierd from Coastal Sediments '87 article by Davis et al.

MIDNIGHT PASS SOCIETY FIELD STUDY

FEBRUARY 4, 1990

SEDIMENT CONE SEDIMENT ANALYSIS

RED DRIFT ALGAE PAPER--- EXHIBIT #2

COLLECTION STATION	PERCENT OF TOTAL SEDIMENT - APPROXIMATE VALUES			
	COARSE SAND/ SHELL GRAVEL	FINE SUGAR SAND	BLACK ORGANIC RICH FINES	CREAMY CLAY
2	29 %	57 %	9 %	5 %
3	56 %	28 %	14 %	2 %
5	-0-	64 %	32 %	4 %
8	5 %	43 %	48 %	4 %
9	3 %	56 %	29 %	12 %
11	67 %	28 %	3 %	2 %

*** NOTES ON SEDIMENT ANALYSIS ***

A. Samples were taken on February 4th, resuspended on February 5th and all measurements and calculations were made seven days after initial settling...on February 12, 1990.

B. Settling procedures were not in accordance with standard analytical procedures. Field samples were mixed with 800ML of sea water and poured into sedimentation cones with stirring.

C. The values cited are only approximations.

D. The settling process resulted in fines trapped in coarse sands and fine sands strata.

E. The black organic rich fines strata was a mixture of organic matter and fine sugar sands.

F. After seven days in a non-stirred condition, the water in the samples from collection stations 5, 8 and 9 were still turbid. Looking down, the top of sediment sample was not visible in a water column of 15 CM. Ultra fine, ultra light colloidal-like material remained suspended in the water column.

G. For the exact location of the collection stations, see Exhibit # 1.