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

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## MIDNIGHT PASS POSITION PAPER

RESEARCH COMMITTEE
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**CLAM POPULATION IN LITTLE SARASOTA BAY**

### SYNOPSIS

The closing of Midnight Pass altered the embayment environment to such an extent that the filter-feeding clams that had historically inhabited the area could no longer survive. A 1988 Society field project determined that all such clams in the Pass vicinity had perished. The "clam kill" occurred either during the heavy rains of 1987 or, quite possibly, before then...but subsequent to the closing of Midnight Pass.

Field research. In August, 1988, the Midnight Pass Society conducted a field study to determine how much damage had been done to the clam population since, and due to, the closing of Midnight Pass. Prior to closure the area was known for its extensive, highly productive clam beds. The results of this Society field work were contained in a September, 1988 paper entitled:

A STUDY OF THE EFFECTS OF THE CLOSURE OF MIDNIGHT PASS ON THE CLAM POPULATION OF LITTLE SARASOTA BAY.

The changed environment in Little Sarasota Bay since the closing of Midnight Pass has been difficult to assess from a "test tube" approach to the issue. The degree of water quality degradation attributable to Pass closure was in proportion to the ever increasing constriction of tidal flow through the inlet. Constriction and the onset of water quality degradation commenced sometime in the early 1970's. Assessment of the problem is compounded by the dearth of "pre-closure" data. However, the fate of the clam population in the Pass area is a potent biological indicator of the hostile environment created with the closing of the Pass. Accordingly, the paper referred to above is attached to and made a part of this position paper.

Several of the changes to the Bay had an adverse impact on the clam population. With the "doorway" closed, zooplankton... a food source... could not enter the Bay in the same abundance. The fresh water running from the mainland during the rainy season was trapped in the embayment; Bay water salinity dropped below the clam's level of tolerance for too long a period of time. The absence of Pass tidal flow resulted in insufficient water circulation; too little food was brought to the feeding siphons of the clams. The Venus Sun Ray clams could not

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tolerate a bay bottom no longer kept clean and sandy through the flushing action of Midnight Pass. Extremely low dissolved oxygen levels during the rainy season associated with the trapped runoff may well have been below the tolerance level of the clams.

All of the clams in and around the Jim Neville Marine Preserve have perished. They just weren't able to survive the environment made hostile to them through closing the Pass. For the complete set of conclusions to be drawn from this field work, please refer to page four of the attached research paper.

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September, 1988

## A STUDY OF THE EFFECTS OF THE CLOSURE OF MIDNIGHT PASS ON THE CLAM POPULATION OF LITTLE SARASOTA BAY.

By James P. Herbert,
Executive Director

### INTRODUCTION

Midnight pass was closed in late 1983 by two Gulf-front homeowners when its northerly migration threatened their property. Their five less-than-adequate attempts to relocate the Pass proved fruitless. Little Sarasota Bay, which had been directly connected to the Gulf of Mexico by Midnight Pass, has since suffered a significant reduction in water circulation. In fact, the greater part of this embayment has been identified as a "null zone" with respect to water movement.

Little Sarasota Bay has been denied the multiple benefits of regular tidal exchange through Midnight Pass which it historically enjoyed. The Bay waters are no longer flushed and cleansed through Midnight Pass. Pollutants running off the mainland along with storm-waters are trapped there and left to accumulate. This fragile, estuarine environment has been drastically altered; the delicate ratio between fresh and salty waters has been thrown way out of balance.

Midnight Pass Society members have witnessed a steady diminution in bay water quality since the Pass was closed, a decline that appears to have recently accelerated. Noxious odors, excessive algae blooms, fish kills and dead seagrasses have become increasingly common. These are certain indicators that the Little Sarasota Bay ecosystem has been heavily stressed.

Society studies have noted very low salinity levels throughout the Bay...and also that they don't rebound after heavy rains as they would if Midnight Pass were open and flowing. Water turbidity has become so severe within the Bay that our secchi dish readings are in inches rather than in feet. Another Society monitoring program of Little Sarasota Bay revealed that coliform and total bacteria readings are alarmingly high.

Before Midnight Pass was closed, Little Sarasota Bay was known to have extensive and highly productive beds of clams. These filter feeders obviously found this area a nearly ideal habitat. But the closing of the Pass has resulted in a gross alteration of this special, unique environment. During frequent field trips to the Midnight Pass locale, many Society members reported finding a number of dead clams.

The Midnight Pass Society decided to undertake a study to determine just how much damage had been done to this form of marine life which had once been so prevalent in Little Sarasota Bay. Our approach was to select an area known for its clam beds and to subject

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INTRODUCTION (Continued)

it to close on-site inspection. The field work was performed by Society member-volunteers. Site selection, field procedures, field direction and data analysis were all under the capable supervision of Dr. John B. Morrill. Dr. Morrill is a noted Marine Biologist with "hands-on" extensive knowledge of the Midnight Pass/Little Sarasota Bay area.

STUDY AREA

Little Sarasota Bay is located on the west coast of Florida in Sarasota County. Midnight Pass directly connected the Bay to the Gulf of Mexico. The Pass separated the barrier islands of Casey Key (to the south) from Siesta Key. The Bird Islands, which represent the historical flood tidal delta of Midnight Pass, are situated just east of the previous Pass situs. The area immediately around the Bird Islands has been designated the Jim Neville Marine Preserve. See Figure #1.

Based upon our regular physical reconnaissance of Little Sarasota Bay and the segment thereof around Midnight Pass, we selected as our study area the tidal and subtidal region just southeast of the Bird Islands/Jim Neville Marine Preserve and north of what is known as the southern channel to Midnight Pass. See Figure #1.

CLAM SEARCH

On August 20, 1988 at 1200 hours, twelve members of the Midnight Pass Society assembled at the study area. Starting at a random spot, a 300 foot base line was laid out east to west and demarcated with yellow ribbon strung along bamboo poles placed in the Bay bottom. From this base line we identified six south-to-north transects each 400 feet in length spaced 50 feet apart from one another.

Six teams of two people each walked a one foot swath along their assigned 400 foot transect. Their mission was to collect every whole hard shell (Quahog) clam found in the upper six inches of sediment. Only whole clams were collected. Single or broken clam shells were discarded as they might not represent clams from the study area. The total area covered was 2400 square feet (400 foot transect X 1 foot swath = 400 square feet per transect X 6 transects = 2400 square feet).

The field work was completed by 1530 hours. Every clam found was dead. Not one live clam was discovered by the twelve volunteers during the 3½ hours of this project.

During the field work the whole dead clams were placed in croaker bags at the head stake for each transect. At the conclusion of the physical search for clams, the clams for each transect were counted. A total of 644 dead Quahog clams were discovered in the study area. Table #1 shows the results of the clam search including the number of dead clams and the mean low water depth by transect.

DEAD CLAM ESTIMATES

Using a ground-truth survey and aerial photographs, we calculate that there were a total of 90 acres of formerly live, healthy, productive Quahog clam beds in the shallow waters in and around the Bird Islands/Jim Neville Marine Preserve. The shallow area referred to is bounded by the Intracoastal Waterway to the east, the northern edge of the southern

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DEAD CLAM ESTIMATES (Continued)

channel to Midnight Pass and the southern-eastern edge of the northern channel to Midnight Pass.

From this data we can extrapolate the total number of Quahog clams killed in the Midnight Pass area. The remains of 644 Quahog clams were found in the study area, and this area is representative of the entire locale. This would yield an estimated 11,700 dead Quahogs per acre. The death toll for all 90 acres in and around the Jim Neville Marine Preserve computes to a staggering 1,053,000 Quahog clams...all dead! How ironic; how tragic; how unnecessary.

Other Society field trips to the area before and since the "Clam Search" failed to turn up a single live clam of any type. Additional evidence that the clams are gone can be found in the absence of the Left-Handed Whelk and the Horse Conch that feed on clams. They were found in the area on a regular basis when live clams were there. Now that the clams are dead it would appear they've moved on.

The 1,053,000 dead clams refers only to Quahog clams in the Midnight Pass area. Other types of clams used to live there as well. It appears that they're all dead, too. The Venus Sun-Ray clam was abundant here in beds far more densely populated than the Quahog clam. We estimate there had been between 10 and 20 acres of Venus Sun-Ray beds. The very rare and beautiful Angel Wing clam used to live here as well...we located three areas of habitat. We estimate there were between 1 and 4 acres of Angel Wings here...but now all gone. During our field work we found two of them...both dead.

The above only covers the Midnight Pass area. Many other sites in Little Sarasota Bay wer known to be abundant with clams. With one possible exception, it would appear they've all died. While we didn't find any, we would expect there may be a few live clams "hanging in there" along the edges of the Intracoastal Waterway where a modicum of circulation still exists.

WHAT CAUSED THE CLAM KILL

To understand what caused this tragedy, we must first recall what Little Sarasota Bay was like when Midnight Pass was open and flowing. Salinity, while below Gulf levels, was relatively high. And while salinity levels would decline after heavy rainfalls, they'd quickly rebound. Dissolved oxygen levels were high and relatively stable. There was an abundance of zooplankton and phytoplankton at the base of the food web. Regular tidal exchange provided circulating currents which transported the plankton, flushed and cleanse the waters of the Bay and kept the bay bottom relatively clean and sandy. The forces of Nature were in balance one with another.

While the Pass was open and flowing, the Bay was alive and vibrant with all manner of marine plant and animal life that required these prevailing conditions. Among those to adopt this area as their home were the filter-feeding clams. Others...shrimp, various fishes and even sea mammals (Manatees and Porpoise)...were "just passing through". The area was a highly productive estuarine environment.

When Midnight Pass was closed, this habitat was drastically altered. The doorway was blocked preventing migratory movement of the "critters of the sea". Zooplankton (food) from the Gulf could not reach the Bay...nor could the larval forms of fish that needed the Bay as a nursery. Without circulation, a null zone of nearly no water movement was formed.

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## WHAT CAUSED THE CLAM KILL

Stormwater runoff-carried pollutants and nutrients brought into the Bay were trapped there Salinities and dissolved oxygen levels began extreme fluctuations. Fine organic particulate matter from the Bay as well as the mainland settled to the bottom creating a carpet of sedimentation. The forces of Nature are now out of balance. And the food web of Little Sarasota Bay which had been primarily marine-based, has been reduced to one that is essentially dominated by the decay and detritus of upland stormwater runoff.

Many species of marine life just moved away to a more suitable environment. But the filter-feeding clams are sedentary creatures that just couldn't pack their bags. They had no choice but to stay in the altered environment. While clams can withstand pretty low levels of dissolved oxygen they just can't tolerate low salinity levels for any length of time. They also rely on the presence of enough plankton as a food source and sufficient water circulation to move the plankton to where they are. No plankton plus no current equals no clams. It was probably a combination of low salinity and no food that "did in" the millions of clams that once lived in Little Sarasota Bay.

## WILL THE CLAMS COME BACK?

Since the environment created in Little Sarasota Bay is incompatible with their needs, the clams will not return unless and until the water conditions are returned to what they were They would require regular tidal exchange between the Bay and the Gulf which would mean the restoration and maintenance of Midnight Pass. Once the Pass was reopened there is every reason to expect that the clam beds would naturally return. Alternatively, a management program could be implemented to restock the area, speeding up the process.

## CONCLUSIONS

1. More than a million Quahog clams were killed in and around the Jim Neville Marine Preserve plus untold numbers of other types of clams. Considering all the clam beds in Little Sarasota Bay it is expected that millions of clams died.
2. Little Sarasota Bay was changed from a cleansed, flushed embayment with diverse and abundant marine plant and animal life to a body of water typified by wide zones of no water movement, widely fluctuating salinity and dissolved oxygen levels, an accumulation of sediments and pollutants and a food web based on detritus.
3. The death of the clams can be directly traced to the closing of Midnight Pass and the resultant alteration of this habitat.
4. The fate of the clams is indicative of the heavy stresses placed upon the other marine plant and animal life that used to live here.
5. The clams and the other marine life that required the prevailing conditions of a flushed bay are unlikely to return while the environment is left in its altered state.
6. If Midnight Pass is restored and maintained the previous environment will have also been restored. There is every reason to believe the filter-feeding clams would once again inhabit Little Sarasota Bay.
7. The restoration of Midnight Pass is an essential first step in making a commitment to our bay environment. Once this first step is taken additional steps should be taken to clean up the filth we are dumping into the bays.

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ACKNOWLEDGEMENTS

1. On behalf of the Midnight Pass Society, the writer sincerely thanks the member-volunteers who gave so freely of their time and efforts in getting out there and doing the field work. It took real commitment to wade through all that back-bay muck looking for clam remains while suffering cuts and sunburn. The twelve brave souls were as follows:

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| Chuck Crawford | Stan Lowe |
| Marlene B. Harris | John Morrill |
| Al Harris | Dorothy Powell |
| Art Kenyon | Jack Petrecca |
| Tam Kenyon | Janet Petrecca |
| Faye "Shu-Shu" LaRoche | Bob Waechter |

2. Figure #1 was modified from an exhibit in a Bland & Davis article appearing in the Spring, 1988 edition of the Journal of Coastal Research.

3. The writer would like to give special acknowledgement to the efforts and assistance of Dr. John B. Morrill, Professor of Biology at New College, the University of South Florida. Dr. Morrill helped us formulate our approach, select the site and prepare for the field work. He then guided our volunteers through the sometimes difficult and messy field work. Dr. Morrill then provided advice, counsel and guidance as to analysis of all the data obtained. The writer would like to thank him for all of his time, efforts, knowledge...and patience.

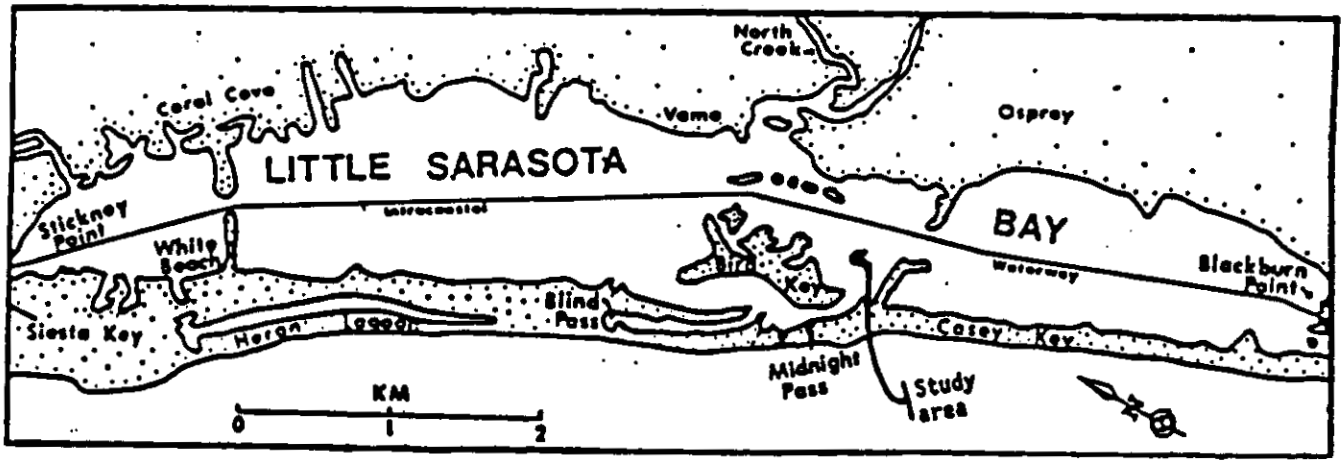
James P. Hachet

Table #1.

RESULTS OF CLAM SEARCH

| TRANSECT NUMBER | NUMBER OF DEAD CLAMS | DEPTH, MEAN LOW WATER |
|---|---|---|
| 1 | 48 | 1-2 feet |
| 2 | 132 | 0-1 feet |
| 3 | 45 | 1-3 feet |
| 4 | 108 | 0-1 feet |
| 5 | 139 | 0-1 feet |
| 6 | 172 | 0-1 feet |
| | 644 | TOTAL NUMBER OF DEAD CLAMS IN 2400 SQUARE FEET |

Figure #1.




Map depicting the Midnight Pass site, the Bird Islands and the clam search study area.