

Miguel Bay, Florida:  
Inventory of Boats, Depths and Signs;  
and a Waterway Restriction Analysis

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This report presents boat, depth, channel, and signage information for the Miguel Bay trafficshed, located in Manatee County, Florida. Florida Sea Grant conducted three separate on-the-water surveys in order to obtain: 1) tide-corrected depths of waterway access channels (8/28/00); 2) the location and characteristics of boats, moorings, and related facilities (4/18/00); and 3) the location and characteristics of signs (8/29/00). For details on the methodology used during the surveys and the subsequent analysis, the reader is directed to the report: "Regional Waterway Management System for North Manatee County" (Swett et al., 2000)

A total of 164 moorings were surveyed in Miguel Bay, all of which belong to single-family residences. Mooring types are reported as wet slip (45), trailer (37), hoist (32), beached/blocked (20), ramp (19), float/ramp (5), davits (3), mooring (1), anchorage (1), and none (1). There were 102 boats berthed in Miguel Bay and the characteristics collected for each boat include: facility, mooring type, length, age, make and model, draft (including draft adjustment capability), and the date the boat was surveyed.

Boat types are reported in Table 1 as open utility (bass boat, skiff, john boat, pontoon boat), recreational fishing, sail, power cabin/trawler, speed, kayak/row/canoe, personal watercraft, and other (10 market fish and 1 houseboat). The majority (65.7 percent) of boats are either open utility (35.3 percent) or recreational fishing (30.4 percent), followed by kayak/row/canoe (12.7 percent), other (10.8 percent), personal watercraft (3.9 percent). There are relatively few sailboats (2.9 percent), power cabin/traulers (2.0 percent), or speed boats (2.0 percent).

The level of accessibility was determined for each boat. Boat access refers to the difference between a boat's draft and the depth of the shallowest downstream channel segment, at MLLW, that the boat must pass to gain access to open water. Four levels of restrictions are denoted: somewhat restricted, 0.0 ft or 0.5 ft deeper; restricted, 1.0 ft or 1.5 ft deeper; severely restricted, 2.0 ft or 2.5 ft deeper; and blocked, 3.0 ft or more deeper. Three-fourths (77) of the boats in Miguel Bay experience some degree of restriction (Table 2). Forty-two percent (32 vessels) are somewhat restricted, or only experience problems within 0.5 ft of MLLW; 35 boats (45.5 percent) are restricted by 1.0 ft – 1.5 ft; 10 boats (13.0 percent) are severely restricted; and none are blocked (there are no shoals  $\geq$  3.0 ft in Miguel Bay waterways).

The boats in Miguel Bay may be grouped into three draft categories (Table 3): shallow (0.5 to 1. ft); medium (2.0 to 3.5 ft); and deeper draft (4.0 ft and greater). Sixty-two percent of the boats (48) have shallow drafts and 37.7 percent (29) have medium drafts. None of the boats in Miguel Bay have deeper drafts. Some boats – those propelled by outboards and in-boards with out-drives – are capable of varying their draft by raising or lowering the outboard unit of the propulsion system. The accessibility analysis of these boats included two

options: (a) normal running conditions, with the lower unit fully extended; and (b) shallow water running, with the lower unit raised, for temporary shoal operation. Eighty-three percent (64) of the restricted boats (77) have the ability to raise their lower inboard-outboard units (Table 4). Two-thirds of these are concentrated at the lower end of the restriction levels, meaning that raising the lower unit by 0.5 – 1.0 ft would effectively eliminate, or substantially reduce, the restriction problem.

A total of 459 soundings were used to construct the approximately 5 statute miles of waterways in Miguel Bay. The waterways were then analyzed to determine the location and extent of restrictions (shoals) that impede boat traffic. Boat traffic is restricted in approximately 31.7 percent (1.6 mi.) of Miguel Bay waterways (Table 5). Nearly sixty percent of the restricted channels (0.95 mi.) only impede transit by shoals less than or equal to 0.5 feet, and twenty-eight percent (0.45 mi.) restrict traffic by shoals equal to 1.0 or 1.5 feet. The remaining twelve percent (0.19 mi.) restrict traffic by shoals equal to 2.0 feet or 2.5 feet.

Using the methodology discussed in Swett et al., estimates of dredging requirements for Miguel Bay were calculated for two scenarios (Table 6):

- i) Normal (MLLW = 0 ft datum) Depth Clearance; and
- ii) Additional Depth Clearance, which requires a 1 ft clearance between the lowest point of the boat and the channel bottom. Dredging amounts are in cubic yards and assume an average channel width of 20 ft.

A comparison of the results between Normal (approximately 4,636 yd<sup>3</sup>) and Additional (approximately 10,841 yd<sup>3</sup>) Depth Clearance shows that over two times the amount of spoil would need to be removed, overall, to achieve the additional depth clearance in Miguel Bay (Table 6). The projected dredge to achieve Normal Clearance Dredge requirement in Miguel Bay exceeds that of any other trafficsheds in Manatee County (see Table 11 in Swett et al., 2000). The projected dredge requirements for Additional Depth (1 ft.) Clearance is second only to Bimini Bay/Key Royale (see Table 12 in Swett et al., 2000).

There are 50 boating-related signs in Miguel Bay: navigation guide (42), Other (1 abandoned piling; 2 buoys), speed regulation (2), resource protection (2), and hazard warning (1). All signs in the water and along the waterfront, visible to the boater, are included in this inventory. Signage information includes site (47 on-the-water and 3 on docks), type (3 buoys and 47 pilings), message, status (48 non-permitted, 1 permitted, and 1 unknown), and condition (49 ok and 1 damaged).

Three 1:2400-scale map atlases accompany this report, each of which contains 4 pages. The three atlases are: 1) Bathymetry – soundings (459) corrected to MLLW and presented to a 0.5-ft accuracy; 2) Channel Depths/Boat Drafts/Signage – soundings (459) presented in 6 depths categories ( $\leq 1$ , 1.5 or 2.0, 2.5 or 3.0, 3.5 or 4.0, 4.5 or 5.0,  $\geq 5$  ft); Boat Draft (102 vessels) presented in

6 draft categories (same units as depths); Signs (50) presented in 5 categories: navigation guide, hazard warning, speed regulation, resource protection, and other; 3) Analysis – channel restrictions, defined as the difference between a channel segment depth and the maximum draft of vessels located up-channel portrayed in 1 non-restriction and 5 restriction classes (0.0 ft, 0.5 ft, 1.5 ft, 2.0 ft,  $\geq 2.5$  ft); and boat restrictions (102 boats) defined as the difference between boat draft and the controlling center-line depth, portrayed in 6 restriction classes (same units as Channel Restrictions).

An ArcView (ESRI, Inc.) Map Atlas application, on a CD-ROM, accompanies this report. The Map Atlas application enables additional copies of pages within the three 1:2400-scale atlases to be printed. The GIS data sets (Atlas index, Boats, Moorings, Depths, Channels, and Signage), digital imagery, and metadata, are provided on a CD-ROM. The Map Atlas CD-ROM and the data CD-ROM contain instructions in their use.

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Swett, Robert, Gustavo A. Antonini, and Sharon Schulte. 2000. Regional Waterway Management System for North Manatee Florida. TD-2. Gainesville, FL: Florida Sea Grant.

Table 1. Counts of Boat Types in Miguel Bay

Boat Type	Boats	Percent
Recreational Fishing	31	30.4
Open Utility	36	35.3
Sail	3	2.9
Power Cabin/Trawler	2	2.0
Speed	2	2.0
Kayak/Row/Canoe	13	12.7
Personal Water Craft	4	3.9
Other	11	10.8
<b>Total:</b>	<b>102</b>	<b>100.0</b>

Table excludes 4 derelict vessels tallied in survey

Table 2. Boat Access Levels for Miguel Bay

Restriction Level	Boats	Column Percent
<b>All Boats</b>	102	100.0
<b>Unrestricted Boats</b>	25	24.5
<b>Restricted Boats</b>	77	75.5
<b>Somewhat Restricted</b>	32	41.6
<b>Restricted</b>	35	45.5
<b>Severely Restricted</b>	10	13.0
<b>Blocked</b>	0	0.0

Boat access levels refer to the difference between a boat's draft and the depth (MLLW) of the shallowest, downstream channel segment

Somewhat Restricted: 0.0 feet or 0.5 feet deeper.  
 Restricted: 1.0 feet or 1.5 feet deeper.  
 Severely Restricted: 2.0 feet or 2.5 feet deeper.  
 Blocked: 3.0 feet or more deeper.

Table 3. Number of Restricted Boats by Boat Draft Category

Draft Category	Boats	Column Percent
Shallow	48	62.3
Medium	29	37.7
Deeper	0	0.0
<b>Total</b>	<b>77</b>	<b>100.0</b>

Shallow: 0.5 to 1.5 feet

Medium: 2.0 to 3.5 feet

Deeper: 4.0 feet and greater

Table 4. Variable Draft Capability of Restricted Boats in Miguel Bay

Restriction Level	Boats	Variable Draft		Percent Boats Variable Draft
		No	Yes	
Somewhat Restricted	32	9	23	72
Restricted	35	2	33	94
Severely Restricted	10	2	8	80
Blocked				
<b>Total Restricted Boats</b>	<b>77</b>	<b>13</b>	<b>64</b>	<b>83</b>
<b>Percent of Column Total</b>	<b>100</b>	<b>17</b>	<b>83</b>	

Table 5. Channel Restrictions within Miguel Bay

Restriction Level	Length (feet)	Column Percent
All Channels	26450	100.0
Unrestricted Channels	18075	68.3
Restricted Channels	8376	31.7
Somewhat Restricted	5019	59.9
Restricted	2358	28.1
Severely Restricted	999	11.9
Blocked		

Somewhat Restricted: 0.0 feet or 0.5 feet shallower.  
 Restricted: 1.0 feet or 1.5 feet shallower.  
 Severely Restricted: 2.0 feet or 2.5 feet shallower.  
 Blocked: 3.0 feet or more shallower.

Table 6. Projected Dredge Requirements for Restricted Channels in Miguel Bay

	Somewhat Restricted	Restricted	Severely Restricted	Blocked	Total
Normal Depth Clearance (cu. yds.)	1,087	2,070	1,480	-	4,636
Additional Depth (1-ft) Clearance (cu. yds.)	4,805	3,817	2,219	-	10,841