

16:01:08	27.221	80.036	99.9	32.7
16:01:08	27.221	80.036	99.3	32.5
16:01:12	27.221	80.036	100.3	32.2
16:01:16	27.221	80.036	101.9	32.1
16:01:20	27.221	80.036	102.2	32.2
16:01:25	27.222	80.036	99.6	32.2
CENTER REEFMAKER UNIT				
16:08:12	27.221	80.037	98.6	33.2
16:08:16	27.221	80.037	98.3	33
16:08:20	27.221	80.037	97.3	33
16:08:24	27.221	80.037	100.6	33
16:08:28	27.221	80.037	100.9	33
16:08:32	27.221	80.037	101.2	32.8
16:08:36	27.221	80.037	105.8	32.8
16:08:40	27.221	80.037	99.6	33
16:08:44	27.221	80.037	100.6	33.2
16:08:48	27.221	80.036	101.2	33.3
16:08:52	27.221	80.036	105.8	33.1
16:08:56	27.221	80.036	102.9	33.1
16:09:00	27.221	80.036	100.9	33.1
16:09:04	27.221	80.036	103.2	33.2
16:09:08	27.221	80.036	102.6	33.1
Note: All information obtained using a Hummingbird 1197c/997c, depths are relative to NAD83 Horizontal Datum				

5.8 SIROTKIN DIAMOND PATCH - SOUTH

- Location: Sirotkin Reef
- Materials: 5 Reefmaker “Florida Special” units (steel and concrete)
- Maximum Depth: 100 feet
- Reef High Point: 90 feet
- Year Created: 2005
- Monitoring Date: 09/05/2012
- Total Cost: \$3,975 (FWC 89% & Martin County 11%)

5.8.1 History of the Sirotkin Diamond Patch - South

Through a grant from the FWC, Martin County deployed five (5) Reefmaker “Florida Special” artificial reef units adjacent to existing reef materials in the Donaldson and Sirotkin reef sites, as well as four (4) stand-alone sites. Fifteen (15) of these units were deployed within the Sirotkin Reef site on May 21, 2005 in three groups of five units (North, Central, and South). Charts showing the location of the South Reefmaker Diamond Patch within the Sirotkin site and the placement of the individual units at the reef location are shown in Figure 24 and Figure 25, respectively.

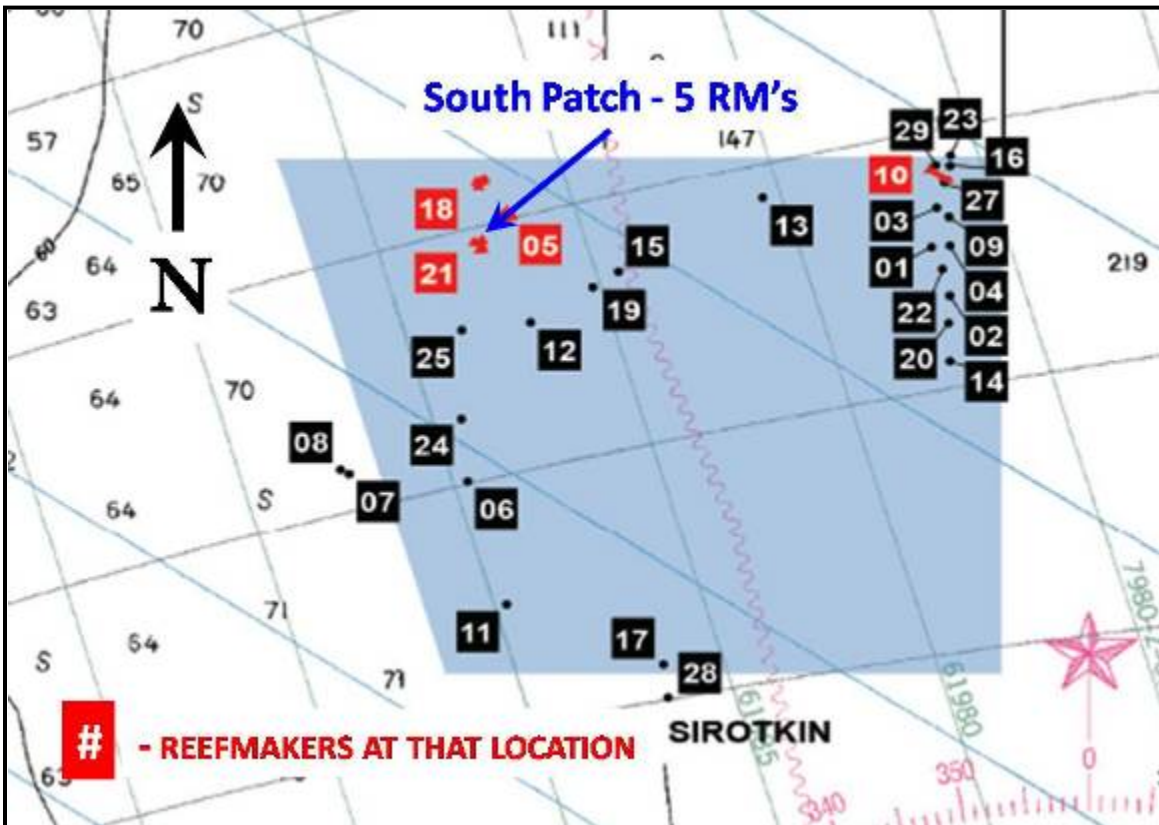


Figure 24. Chart of the Sirotkin site showing the Diamond Patch – South location.

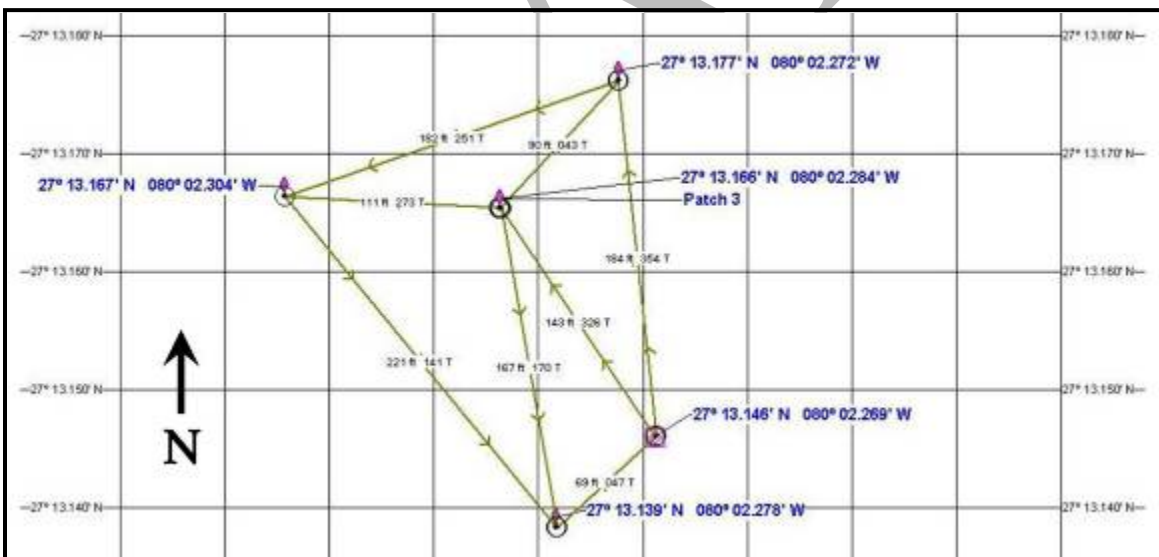


Figure 25. Chart view of the Sirotkin Diamond Patch - South unit locations.

The placement pattern shown in Figure 25 is roughly diamond-shaped, with one central unit surrounded by the remaining four, spaced approximately 100 feet apart. Color coded zip ties were attached to the top of each unit during deployment to simplify identification of individual units during monitoring.

5.8.2 Fathometer Survey Summary

A fathometer survey of the Sirotkin Diamond Patch – South artificial reef site was conducted to obtain depth information in the vicinity of the reef site and a depth profile image of the individual Reefmaker units. The map in Figure 26 shows the relative location of the Reefmaker units at the Sirotkin Diamond Patch – South reef site, which is identified by the blue dots and the dive flag symbol, and the path of the survey vessel (yellow line). The area had an average depth of 94.5 ft, minimum depth of 90 ft and a maximum depth of 102 ft. During the course of the survey, attempts were made to locate each Reefmaker unit within the patch using the Hummingbird depth profiler, however, the individual Reefmaker units have a small profile in comparison to the larger debris piles or sunken vessel artificial reef sites, and were difficult to locate given their size and the water depth.

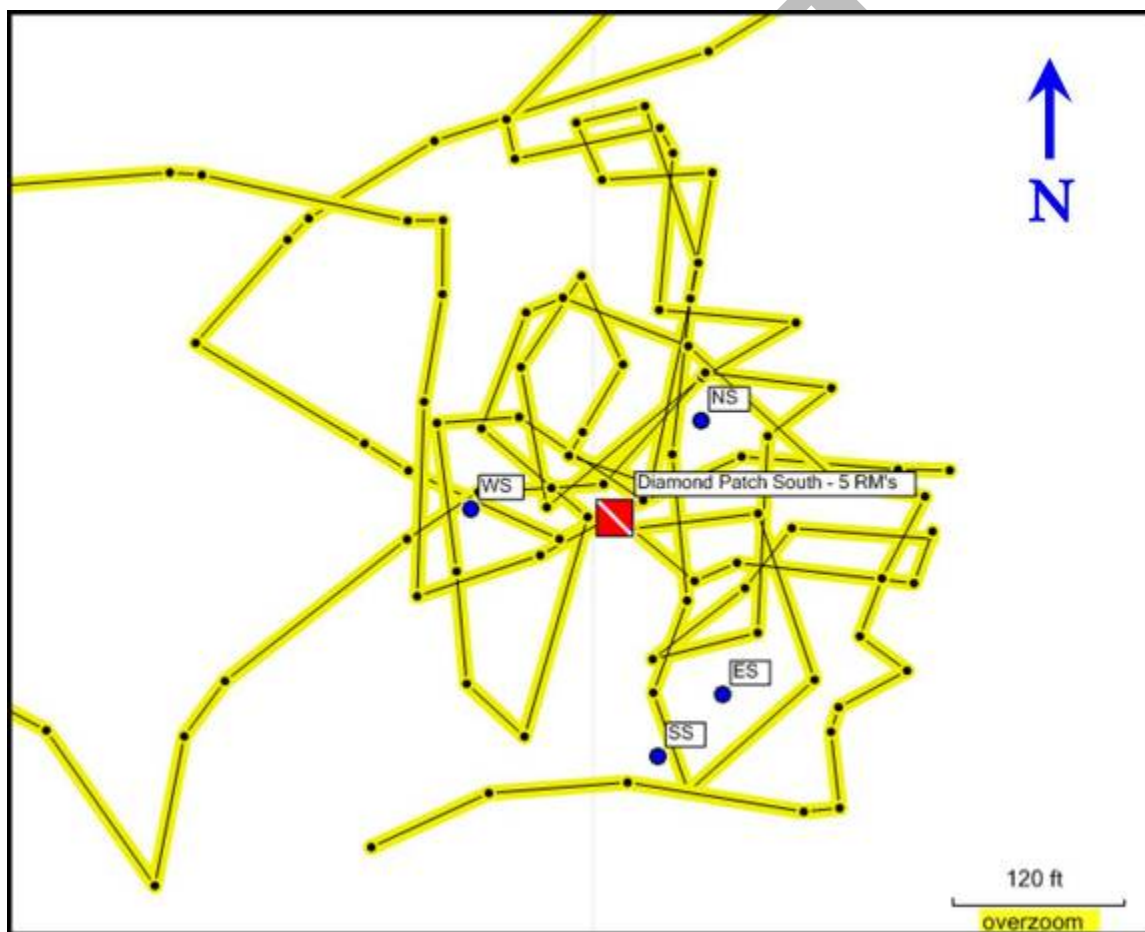


Figure 26. Garmin GPS track of the Sirotkin Diamond Patch - South Fathometer Survey.

All units, with the exception of the center Reefmaker unit, were documented on the screen during the survey; however, rough sea conditions and strong currents hindered the survey efforts. Due to the triangular profile of the units, the wide bases have a greater target signature and are more distinguishable in the depth profile. The screen-shot images in Figure 27 were captured during the survey as the Reefmaker units appeared on the depth profile. The depth profile images show the individual units on the bottom with associated latitude/longitude, time, course over ground, temperature and depth information.

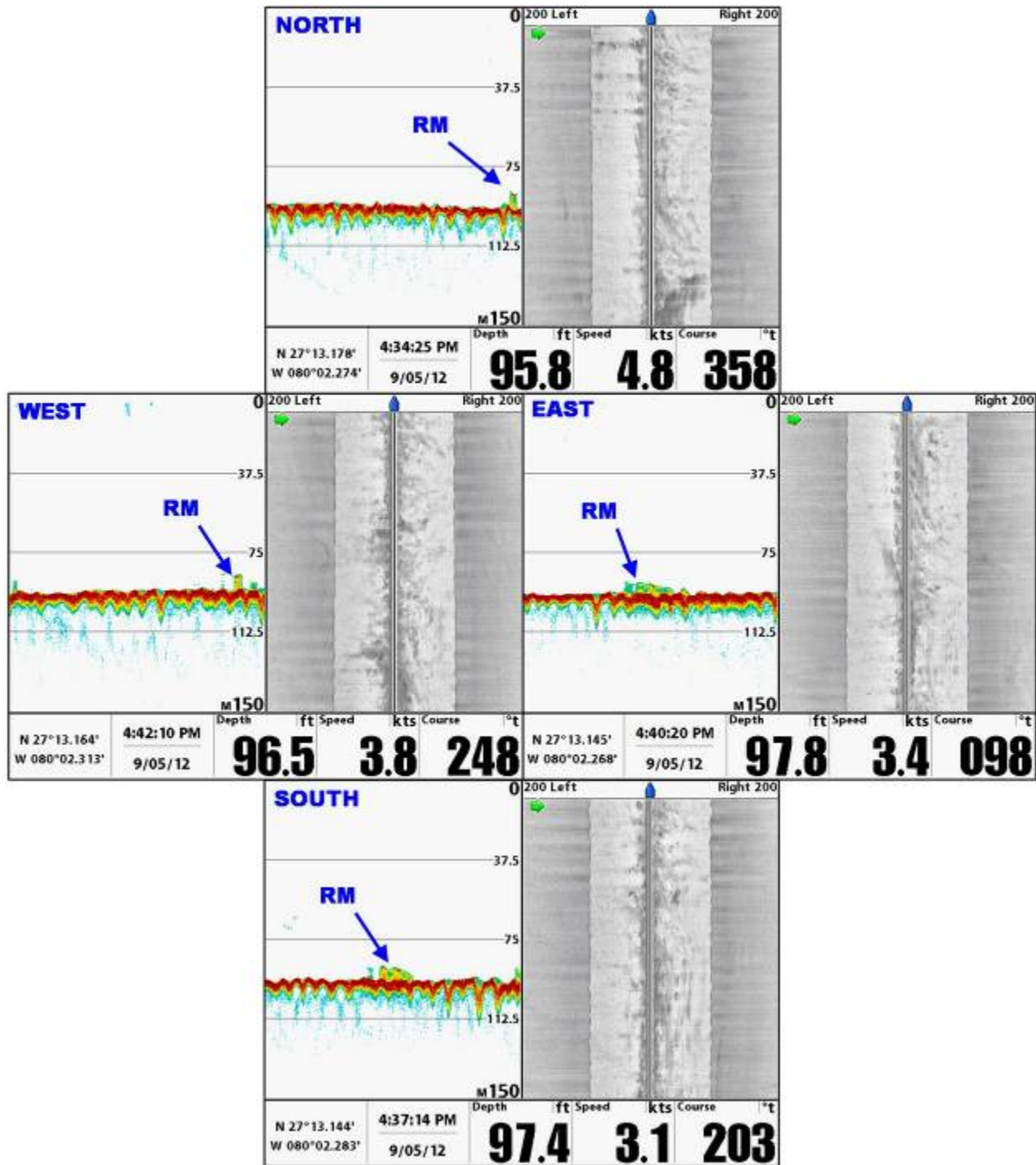


Figure 27. Hummingbird depth profile/sidescan images of the Sirotkin Diamond Patch - South.

The timestamp for each image was used as a point of reference to display the Hummingbird data for each Reefmaker unit as the survey vessel passed over the units and they appeared on the depth profile. Results from the fathometer survey (when each unit was observed) are shown below in Table 24. All depth data obtained during the fathometer survey of the Sirotkin Diamond Patch – South is included in the Appendix.

Table 24. Sirotkin Diamond Patch - South Artificial Reef Fathometer Survey Results.

Time	Latitude	Longitude	Depth	Water Temp
	(DD)	(DD)	(ft)	(°C)
NORTH REEMAKER UNIT				
16:34:01	27.22	80.038	95.0	33.1
16:34:06	27.22	80.038	95.0	33
16:34:10	27.219	80.038	96.0	33.1
16:34:14	27.219	80.038	96.0	33.2
16:34:18	27.22	80.038	97.3	33
16:34:22	27.22	80.038	99.9	33.1
16:34:26	27.22	80.038	95.7	33.2
16:34:30	27.22	80.038	95.7	33
16:34:34	27.22	80.038	95.7	32.8
16:34:38	27.22	80.038	95.7	33.2
16:34:42	27.22	80.038	96.6	33.2
16:34:46	27.22	80.038	96.6	33
16:34:50	27.22	80.038	97.0	33
16:34:54	27.22	80.038	94.7	33
16:34:58	27.22	80.038	96.3	33
EAST REEFMAKER UNIT				
16:39:30	27.219	80.037	98.0	33
16: 39:33	27.219	80.038	98.0	33
16: 39:37	27.219	80.038	96.6	33
16: 39:41	27.219	80.038	96.0	33
16: 39:45	27.219	80.038	95.7	32.8
16: 39:49	27.219	80.038	96.3	32.6
16: 39:53	27.219	80.038	97.6	32.6
16: 39:57	27.219	80.038	96.3	32.8
16:40:01	27.219	80.038	97.6	33
16:40:06	27.219	80.038	96.3	32.8
16:40:10	27.219	80.038	96.0	33
16:40:14	27.219	80.038	97.6	32.8
16:40:18	27.219	80.038	95.0	32.8
16:40:22	27.219	80.038	97.6	33
16:40:26	27.219	80.038	96.3	33.3
SOUTH REEFMAKER UNIT				
16:36:21	27.22	80.038	95.7	32.6
16:36:25	27.22	80.038	96.6	32.6
16:36:29	27.22	80.038	95.7	33
16:36:33	27.219	80.038	96.3	32.8
16:36:37	27.219	80.038	97.0	32.7
16:36:41	27.219	80.038	98.0	32.6
16:36:45	27.219	80.038	97.3	32.5
16:36:49	27.219	80.038	97.3	32.5
16:36:53	27.219	80.038	97.0	32.4

16:36:57	27.219	80.038	96.6	32.5
16:37:01	27.219	80.038	98.3	32.4
16:37:05	27.219	80.038	97.3	32.8
16:37:09	27.219	80.038	95.7	33
16:37:13	27.219	80.038	98.0	33.2
16:37:18	27.219	80.038	96.6	33
WEST REEFMAKER UNIT				
16:41:38	27.22	80.038	95.7	32.5
16:41:42	27.22	80.038	96.3	32.5
16:41:46	27.22	80.038	95.7	32.6
16:41:50	27.22	80.038	95.7	32.6
16:41:54	27.219	80.038	93.7	32.6
16:41:58	27.219	80.038	94.7	32.7
16:42:02	27.219	80.038	95.3	32.6
16:42:06	27.219	80.038	94.4	32.6
16:42:10	27.219	80.039	93.7	32.7
16:42:14	27.219	80.039	93.4	32.7
16:42:18	27.219	80.039	91.7	32.5
16:42:22	27.219	80.039	94.4	32.7
16:42:26	27.219	80.039	95.3	32.6
16:42:30	27.219	80.039	91.7	32.7
16:42:34	27.219	80.039	92.7	32.6
Note: All information obtained using a Hummingbird 1197c/997c, depths are relative to NAD83 Horizontal Datum				

5.9 GLASRUD - "BIG AL" REEF

- Location: Sirotkin Reef
- Materials: "Big Al" Tugboat (Steel)
- Maximum Depth: 191 feet
- Reef High Point: 162 feet
- Year Created: 2010
- Monitoring Date: 9/05/2012
- Total Cost: \$40,000 (MCAC)

5.9.1 History of the Glasrud Artificial Reef

On Wednesday February 24th 2010, the 69-foot steel tug boat "Big Al" was deployed offshore as an estimated 100 spectators aboard 20 boats watched, photographed and took video of the sinking. The tug sank quickly after it was properly positioned in line with other artificial reefs created. During the deployment the crews on the support vessels had to contend with current, wind and the edge of the severe midday squall. The tug reached bottom in 187 feet of water near the Wickstrom, a 168 foot long steel freighter deployed in January 2003. Figure 28 shows a chart with the location of the Glasrud Reef.