

CRUISE INSTRUCTIONS: NOAA SHIP NANCY FOSTER

Cruise Title: **Seafloor characterization and inventory of deepwater fish resources of the Buck Island Reef National Monument (BIRNM), St. Croix and the mid-shelf reef (MSR) of the Virgin Islands National Coral Reef Monument (VINCRM)**

Cruise Number NF-04-06-VI

Period of Cruise: DEP: 2/17/04 San Juan, PR and Transit to Frederiksted, St. Croix
ARR: 2/18/04 Arrive Frederiksted, St. Croix, USVI
DEP: 2/22/04 St. John, USVI
ARR: 3/3/04 Disembark at Cruz Bay St. John, USVI

Area of Operation: Buck Island National Monument, St. Croix and Virgin Islands Coral Reef National Monument, St. Thomas and St. John

1.0 Scientific Objectives:

Primary:

- A) Conduct swath bathymetry and acoustical backscatter at three high priority mapping locations.
- B) Conduct towed video transects and exploratory surveys – side-scan, drop camera, and towed operated vehicle (TOV: Minibat)

Secondary:

- A) To utilize multiple methodologies to conduct an inventory of deep water (>70ft) fishes and associated habitats.

2.0 Schedule of Operations:

2.1 Daily Schedule:

19 February (Thursday):

Survey: Survey team installs remaining survey gear, does a gear shake-down of multibeam unit, and mission briefing. Christine Addison (NCCOS) gives demo to CCMA on use of Mini-bat, sidescan, and drop-cameras.

Biology: (0800-1600) Load, provision, and training.

20 February (Friday):

Survey: Survey team installs remaining survey gear, does a gear shake-down of multibeam unit, and mission briefing. Christine Addison (NCCOS) gives demo to CCMA on use of Mini-bat, sidescan, and drop-cameras.

Biology: (0800-1600) Load, provision, and training.

All: Science party stays on board vessel at Fredriksted, St. Croix the evening for early start 2/21.

21 February (Saturday):

MB Survey: (0800-1200) Steam to Buck Island. Conduct Shallow water MB survey of Buck Island.
(1600-2000) Conduct Shallow water MB survey of Buck Island.

Biology: (0800-1600) SeaArk takes four scientists out, paired into two teams; each team will do one fish/habitat census no deeper than 110 ft on 32% NITROX. Two other teams will do the same but will dive from either two RHIBs or a RHIB and the NANCY FOSTER. After a surface interval of at least 4.5 hrs the same dive teams will conduct an additional census each, as before, however, the depth is not to exceed 90 ft.

TOV: (1200-1600) Minibat towed video off the NANCY FOSTER.

22 February (Sunday):

MB Survey: (2400-0700) Complete MB survey of Buck Island.

Biology: (0800-1800) Same as prior days except 1) Christine Addison needs to be dropped in Christiansted in the AM and 2) after the last dive four members of the team will return to the NANCY FOSTER to collect their gear and depart for Christiansted.

TOV: (1200-1600) Minibat towed video off the NANCY FOSTER.

Steam: (1800-2400) Steam to St. John (Region B).

23 February (Monday):

MB Survey: (2400-0800) Shallow water MB survey of MSR.

All: (0800-1600) Steam to Cruz Bay, St. John. New members of the science party board the vessel in Cruz Bay, St. John in the evening. Additionally, we will be loading 10 fish traps and bait on board. MSR mission leg coordination.

MB Survey: (1600-2400) Shallow water MB survey of MSR.

24 February (Tuesday):

MB Survey: (2400-0800) Shallow water MB survey of MSR.

(1600-2400) Shallow water MB survey of MSR.

Biology: (0800-1600) The SeaArk and either two RHIBs or one RHIB and the NANCY FOSTER will each take a scientific diving team out to a specified location. Each team will do one fish/habitat census at a depth not to exceed 110 ft on 32% NITROX. Following this, the NANCY FOSTER will deploy 10 fish traps at specified locations around the mid-shelf reef. After a surface interval of at least 4.5 hrs the same dive teams will conduct an additional census each, as before, however, this time the depth is not to exceed 100 ft.

TOV: (1000-1400) Minibat towed video off the NANCY FOSTER.

25 February (Wednesday) – 2 March (Monday):

MB Survey: (2400-0800) Shallow water MB survey of MSR.

(1600-2400) Shallow water MB survey of MSR.

Biology: (0800-1600) The dive operations are the same as on the prior day; however, in between the first and second dive, the RV Foster will collect and redeploy the 10 traps at their specified locations around the mid-shelf reef.

TOV: (1000-1400) Minibat towed video off the NANCY FOSTER.

3 March (Tuesday):

MB Survey: (2400-0800) Shallow water MB survey of MSR.

All: (0800-1400) demobilization of gear from the NANCY FOSTER at Cruz Bay, St. John.

2.2 Watches:

Vessel operations will typically be a ~ 24 hour workday. A “give and take” operation cycle will be instituted during these workdays via consultation between the Chief Scientist and Commanding Officer in order to balance crew complement with demands of day-night operations. One crew member will be required on deck to work the winch for Minibat and drop cameras.

In Science Party, the Field Party Chief is responsible for organization of operations and data, respectively; Chief Diver is responsible for dive record keeping and developing dive profiles for presentation to the Chief Scientist who will clear them with the Commanding Officer or a designee.

3.0 Site Locations:

(See Table 1 & 2 at end of text)

3.1 Map of Operations:

(See Figure 1 - 4 at end of text)

4.0 Description of Operations:

Multibeam Survey: The NANCY FOSTER will be outfitted with an aluminum pole-mount suitable for stabilizing and supporting the MB transducer array. Triton Elics International has been contracted to conduct pre-installation, installation, and system calibration of the entire MB system. This work will be completed before the NANCY FOSTER leaves Charleston February 4, 2003. NOAA’s Office Coastal Survey will be providing two certified multibeam operators. CCMA will have additional persons onboard to assist the MB operators. MB will primarily be conducted during two eight hour shifts from 1600 to 0800. CCMA will be conducting multibeam surveys at 200% coverage in three areas.

CTD casts will be conducted every 4 hours of Multibeam operation to properly calibrate the instrument to ambient sound velocity conditions. Those areas in decreasing order of priority are as follows: Area A within BIRNM, Area B east-end of the MSR in the VIRNM, and Area C west-end of the MSR in the VIRNM (time permitting). See Figures 3 and 4.

Study Site	Area	Depth range	Total Line Length	Estimated Duration (hrs)	Location
Area A	13.71 nmi ²	20 - 400 m	47.6 LNM	14	Buck Island
Area B	35.52 nmi ²	1 – 57 m	613.3 LNM	191	MSR East
Area C	4.95 nmi ²	10 – 57 m	386.3 LNM	121	MSR West

Video mapping: At each of the two survey regions, we will locate and conduct mapping using a towed video sled and potentially a mini-bat TOV housing a camera and sonar system along areas of high topographic relief. The configuration of the instrument will be based upon set-up by CCFHR

colleagues on the previous leg in Puerto Rico.

Biology:

All divers will be certified at least at the NOAA Scientific Diver level or will have presented their current dive physical information, dive certification card, and letters of reciprocity to the Chief Diver by February 2nd. The SeaArk, RHIBs and potentially the NANCY FOSTER will be utilized to transport divers to specific dive locations. Additionally, the NANCY FOSTER will be used to deploy and collect fish traps and temporarily house fish in containers (provided by CCMA) on board while they are being sized and weighed.

Dive operations:

The latitude and longitude of all dive sites will be selected ahead of time and stored in 3 separate Garmin GPS units (one per boat). Each boat will navigate to the dive site using the GPS. For the St. John portion of the mission we will only dive on hard bottom habitat. This can mean swimming a little ways once the diver has entered the water or even aborting a dive if the correct habitat can not be found within a reasonable amount of time to still complete the survey and come to the surface within allowable dive time. For St. Croix we will dive wherever the pre-selected lat/long is providing the depth does not exceed the recommended maximum. One member of each dive team will be conducting a belt-transect to survey fish populations while the other will be conducting a point-count to survey both fish and collect some coarse information on the corresponding habitat. The point count diver will dive with a buoy that will float at the surface and is attached to a reel. The cord attached to the buoy will be played out leaving ample slack so that the buoy stays at the surface. This can then be tied off to some structure or else the tape anchor. The transect and point count methodologies are described in detail below:

Belt Transect Fish Census:

The belt transect diver obtains a random compass heading prior to entering the water and records the compass bearing (0-360°) on the data sheet. The diver attaches a tape measure to the substrate and allows it to roll out as progress is made along the chosen compass heading for a distance of 25m. However, for dives in St. Croix and for dives in high relief areas at St. John the diver will follow an isobath or even swim towards shallower waters so as to still maintain a single compass heading but not dive deeper than the allowable depth. The transect should take 15 minutes regardless of habitat type or number of animals present. This allows more mobile animals the opportunity to swim through the transect, and standardizes the samples collected to allow for comparisons. As the tape rolls out at a relatively constant speed, the diver records all fish species to the lowest taxonomic level possible that come within 2m of either side of the transect. Each survey is 100m² in area (25m length X 4m width). To decrease the total time spent writing, four letter codes are used that consist of the first two letters of the genus name followed by the first two letters of the species name. In the rare case that two species have the same four-letter code, letters are added to the species name until a difference occurs. If the fish can only be identified to the family or genus level then this is all that is recorded. If not even the family can be identified then no entry is necessary. The number of individuals per species is tallied in 5cm size class increments up to 35cm using visual estimation of fork length. If an individual is greater than 35cm, then an estimate of the actual length is recorded. Although the habitat should not be altered in any manner by lifting or

moving structure, the observer should record fish seen in holes, under ledges and in the water column. To identify, enumerate, or locate new individuals a diver may move off the centerline of the transect as long as they stay within the 4m transect width and do not look back along area already covered. The diver is allowed to look forward toward the end of the transect for the distance left along the transect (i.e. if the diver is at meter 15, he can look 10 meters distant, but if he is at meter 23, he can only look 2 meters ahead).

Point-count Fish Census: Bohnsack-Bannerot (1986):

The point-count diver records all fish species seen within a vertical cylinder of radius 7.5m that extends from the substrate to the surface of the water. This survey is conducted at a 45 degree angle from the transect diver so as to keep the divers within visual contact. The diver must ensure that the bottom of his/her cylinder is no deeper than the allowable depth. While staying at the center point of the cylinder the point-count diver slowly rotates in a circle. All species seen within the cylinder during a 5 minute period are recorded using the 4 letter codes described above. After the 5 minutes are up, the diver records the number and size (in 5cm size class increments) of individuals seen for each species identified. This is done during one full rotation per species in order from the bottom of the list to the top. Only schools of fishes unlikely to remain in the cylinder past the first 5 minutes are enumerated and measured during the initial time period. In the instance where species observed in the initial period are no longer seen in the area the count and measurement are done by memory.

Modified habitat composition census for MSR:

The point count diver will take a picture of his/her slate with the site number written in large letters on top of it. The diver will then take a couple of panoramic shots of the habitat during each dive. He/she will then collect the following information.

1. *Dive logistics* – name of the diver, station ID, date, and the start time of the survey.
2. *Habitat structure* – the dive site is categorized based on the hierarchical classification used to produce the benthic habitat maps.
3. *Depth* – minimum and maximum depth of the survey area, to provide an estimate of bottom slope.
4. *Rugosity (low, medium, or high)* - based on the height of the tallest hardbottom structure.
5. *Abiotic footprint* – an estimate of % cover (within 10%) of hardbottom, sand, and rubble in the 15-m cylinder. The sum of % cover in the abiotic footprint must total 100%.
6. *Biotic footprint* – an estimate of the % cover (within 10%) and min/max height (within 10cm) of live coral, gorgonians, sponges, macro algae, and uncolonized substrate in the 15-m cylinder. The sum of % cover (including uncolonized substrate) in the biotic footprint must total 100%.

All dives will be conducted with 32% NITROX. In St. Croix the first dive of the day will be at depths not exceeding 110 ft. The second dive will take place after a surface interval of at least 4.5 hrs at a depth not to exceed 90 ft. In St. John the first dive of the day will also be at depths not exceeding 110 ft with a surface interval again of at least 4.5 hrs. The second dive will take place at a depth not to exceed 100 ft. (There is added caution built into the St. Croix portion of the diving

activities as divers will be conducting censuses along a slope) Bottom time in all cases is anticipated to last approximately 20 minutes and NO MORE than 25 min. All divers should have dive computers capable of computing different NITROX mixes and all divers must ensure that they HAVE AT LEAST 25 minutes worth of diving time at the scheduled depth of their second dive prior to getting in the water. In the case of two dive teams being deployed from the same boat one dive team will begin and end their dive at which point the boat will then transit to the next station and the second dive team will complete their dive.

Fish trap surveys:

Approximately 10 fish traps will be baited and deployed around the mid-shelf reef south of St. John. The locations will be chosen ahead of time and will be stored in a Garmin GPS unit. These locations will be chosen so as to minimize the chance that the traps are set on hardbottom where they could potentially cause damage to reef areas. Between the first and second dives each day time will be allotted for the NANCY FOSTER to haul and set each trap. Traps will be hauled to the surface slowly (0.5 to 1 meter/second) to reduce the effects of barotrauma. Once fish are brought to the surface, they will be measured, weighed, and their swim bladders will be vented. They will then be placed in a holding tank aboard the vessel for observation prior to release. Venting will be done using a sterile, low-gauge, hypodermic needle (e.g. 1.2 x 38 mm). It is inserted at a 45° angle under a scale below the lateral line near the tip of the pectoral fin or just beneath the pectoral fin itself. An assortment of needle sizes will be used to accommodate a wide range of fishes. Fish will be stored in large Rubbermaid containers with air pumps to oxygenate the water. Researchers on board have previously conducted a trapping and tagging study in the Gulf of Mexico in which fish were vented and held for periods of time ranging from 5 to 30 minutes in recirculating tanks on deck. In situ observations of tagged fish showed high survival rates.

SPECIAL CONSIDERATIONS:

- 1) Use of the SeaArk and RHIBs are requested.
- 2) Support for dive operations is requested. Specifically, a boat driver for the SeaArk and each RHIB that is launched.
- 3) Room available to haul traps, as well as to store and measure fishes.
- 4) Support for the ships NITROX system.
- 5) Storage space for the fish traps and bait is requested.

5.0 Requirements and Equipment:

5.1 Vessel Provided:

- 1) Rigid vessels (Inflatable/RHIBs and SeaArk) for dive operations.
- 2) Boat drivers for vessels.
- 3) Space for traps, and fish holding containers.
- 4) Air compressor and NITROX system for SCUBA tank and bank filling.
- 5) Emergency oxygen for dive operations with sufficient capacity for 3 h breathing for two divers.
- 6) Hand held radios for communication between launches, NANCY FOSTER, and deck.

- 7) CTD.
- 8) Saltwater line on deck for fish-holding tanks.

5.2 Program Provided:

Equipment	Leg
1) NITROX SCUBA tanks (CCFHR).	STC/STJ
2) Dive weights (CCMA).	STC/STJ
3) 1 laptop computer with bathymetric files ready to add new diving or trapping sites as needed (CCMA).	STC
4) Permits for conducting activities in the National Park Service and territory waters (CCMA/NPS).	STC
5) Diving gear for each diver including dive weights (all agencies).	STC/STJ
6) 10 Fish traps (NPS) (1m x 1m x 30cm, ~40lbs).	STJ
7) Bait for fish traps (NPS).	STJ
8) Ropes and buoys for traps (NPS).	STJ
9) 2 fiberglass fish holding tanks (CCMA)(26x26x32 in).	STC
10) Hypodermic needles and rubbing alcohol for deflating swim bladders (CCMA).	STC
11) Gloves for handling fish (CCMA).	STC
12) Air pumps for aerating water while fish are being held (CCMA).	STC
13) 4 Garmin GPS units (CCMA).	STC
14) Data keeping supplies (data sheets, clip boards, rubber bands, pencils) (CCMA).	STC
15) Dive buoys (NPS/CCMA).	STC
16) 4 underwater cameras (NPS/CCMA).	STC
17) Tapes and anchors for the tapes (NPS/CCMA).	STC
18) Depth pingers for launches (CCMA).	STC
19) 2 O ₂ analyzers (CCMA).	STC
20) Fish measuring board (CCMA).	STC
21) Scales for weighing fish (CCMA).	STC
22) Sport Scan sidescan units, and misc sonar systems and associated mounting devices (possibly launch deployed) (CCFHR).	Charleston
23) Drift camera and cables (CCMA).	STC
24) Underwater video + camera equipment + tow bodies (MiniBat and drop camera sled) (CCFHR).	STC
25) 3 USB 250GB Maxtor 5000XT harddrives (CCMA).	STC
26) Five high end laptops and two flat screen monitors. One computer for the helmsman and one for multibeam operator (CCMA).	STC
27) HYPACK, CARIS, MapInfo, ISIS, Velocity (OCS).	STC/STJ
28) Reson 8101 ER MB system, OCTANS Gyro compass and motion sensor, and DGPS (OCS).	Charleston

6.0 Scientific Personnel:

6.1 Chief Scientist Authority:

The Chief Scientist has the authority to revise or alter the technical portions of the instructions provided that, after consultation with the Commanding Officer, it is ascertained that the proposed changes will not: 1) jeopardize the safety of the personnel on the ship, 2) exceed the time allotted for

the project, 3) result in undue additional expense, or 4) alter the general intent of the Project Instruction.

6.2 Chief Scientist:

Chief Scientist: Mark Monaco

Mapping: Tim Battista

Biology: John Christensen

6.3 Scientific Personnel List:

Male:	Transect Diver	Point-Count/Habitat Diver	MiniBat	Multibeam	Legs
Mark Monaco	X				STC/STJ
Tim Battista			X	X	STC/STJ
Ken Buja			X	X	STC/STJ
John Christensen	X		X		STC/STJ
Matt Kendall		X			STC/STJ
Chris Caldwell	X				STC/STJ
Russell Callender			X		STJ
Alan Friedlander		X			STC/STJ
Andy Bruckner		X			STC
Rob Waara	X				STJ
Jeff Miller		X			STJ
Jason Vasques			X	X	STC/STJ
Sean Rooney				X	STC/STJ
Grant Froelich				X	STC/STJ
Harold Orlinsky				X	STC
Jay Lazar				X	STJ

Female	Transect Diver	Point-Count/Habitat Diver	MiniBat	Multibeam	Legs
Ruth Kelly		X			STJ
Christine Addison			X		STC
Kim Woody	X				STC

*See attached individual daily schedules Tables

TASK TEAMS

St. Croix dive teams: (Caldow – Dive master)

- 1) **Monaco** & Bruckner
- 2) **Christensen** & Friedlander
- 3) **Kendall** & Woody

St. John dive teams: (Caldow – Dive master)

- 1) **Monaco** & Miller

- 2) **Christensen & Kelty**
- 3) **Friedlander & Waara**

MINIBAT

- 1) **Christensen & Buja**
- 2) **Battista & Callender**

MULTIBEAM

- 1) **Rooney & Battista**
- 2) **Froelich & Buja**

*Person in **bold** is field party chief – responsible for prepping rest of team*

Identification: All scientific personnel planning to board the ship should have in their possession at the time of boarding, a proper photo identification card (agency ID, drivers license, etc.).

All dive personnel should have in their possession at the time of boarding open water and NITROX certification cards. Copies of dive physical & letters of reciprocity for non-NOAA divers should be presented to John Christensen by February 2nd.

6.4 History Reports:

Upon acceptance of this proposal, and receipt by the Chief Scientist of the forms, the Chief Scientist will forward completed copies of the NOAA Health Services Questionnaire for all embarking scientific personnel to the Commanding Officer for review at least 7 days in advance of the cruise.

7.0 Miscellaneous Activities:

None known at this time.

7.1 Bridge Activities:

It is requested that a copy of the ship's *Deck Log - Weather Observation Sheet NOAA 77-13d* for and digital SCS data for the entire cruise be provided to the Chief Scientist upon departure of the science party or transmitted within 2 weeks thereafter.

8.0 Modification of Cruise Instructions:

Additional operations and ancillary projects, not covered under the main project, may be performed on a “not to interfere” basis. The Chief Scientist is responsible for determining the priority of the additional work, provided that any changes are discussed with the Commanding Officer and do not constitute a risk to the safety of the ship or personnel and do not significantly change the schedule for this cruise. If the requirements for the additional work place significantly different requirements on the ship, amendments to the Cruise Instructions must be prepared and approved.

9.0 Ancillary Tasks:

Ship's personnel conduct ancillary tasks. Instructions for ancillary tasks routinely assigned to Marine Operations Center ships are contained in *Marine Operations Center Directive 1803.00, Ancillary Tasks for NOAA Vessels*.

10.0 Hazardous Materials:

An inventory list and a *Material Safety Data Sheet* for each hazardous material will accompany hazardous material brought on board NANCY FOSTER by scientific parties. This information should be provided to the Commanding Officer. On departure from the ship, scientific parties will provide an inventory of hazardous material to the Commanding Officer showing that all hazardous material brought on board have been properly used up or removed in suitable waste containers. Anticipated hazardous materials (due to their flammable nature) include:

- 1) emergency oxygen (portable kit with 2 bottles)
- 2) three, 2.5-Oz. Butane refill canisters for cable repair, kept in toolbox.

The *Material Safety Data Sheet* is normally available from the manufacturer of the hazardous product. Procedures followed for use of chemicals will be those outlined in the *Chemical Hygiene Plan for Chemical Labs* aboard NOAA ships. The Science Party will provide a small spill containment kit appropriate for these chemicals.

11.0 Navigation:

Navigation for sampling surveys and dive station location will often be by Differential GPS. Science Lab will use independent DGPS that is compatible with program software - communication on navigation will be maintained. Small boat ops will be directed both by NANCY FOSTER and program DGPS. Station operations will be recorded in DGPS. For the rest of the cruise, navigation will be by the best method available.

12.0 Communications:

A progress report on operations prepared by the Chief Scientist may be relayed to the program office. Sometimes it is necessary for the Chief Scientist to communicate with another vessel, aircraft, or shore facility. Through various modes of communication, the ship is able to maintain contact with the Marine Operations Center on an as needed basis. These methods will be made available to the Chief Scientist upon request, in order to conduct official business. Due to a new directive from Marine Operations Center, the ship must charge the science party for all calls made on the cell or sky-cell telephone. INMARSAT, Sky Cell and cellular communication costs shall be reimbursed to the ship for telephone calls made by all scientific personnel. Currently, Sky Cell and cellular telephone services are about \$0.89 per minute and INMARSAT Mini-M is around \$1.68 per minute for voice. These charges will be assessed against the program after NANCY FOSTER receives the bill. There is generally a three-month delay receiving the bill for review. The Chief Scientist will be required to keep a log of all calls made by the science party. The program will also provide a cell phone to be kept on the bridge.

13.0 Disposition of Data:

The Chief Scientist is responsible for the disposition of data.

14.0 Reports:

The requirement for a formal cruise report by the Chief Scientist is left to the discretion of the

CCMA Center Director. A Ship Operations Evaluation Form is to be completed by the Chief Scientist(s) and forwarded to:

Office of Marine and Aviation Operations
Program Services and Outsourcing Division
SSMC3, Room 12872
1315 East-West Highway
Silver Spring, MD 20910-3282

15.0 Cruise Instruction Approvals:

The Marine Operations Center and NANCY FOSTER will acknowledge receipt of these instructions.

Figure 1. St. Croix diving locations.

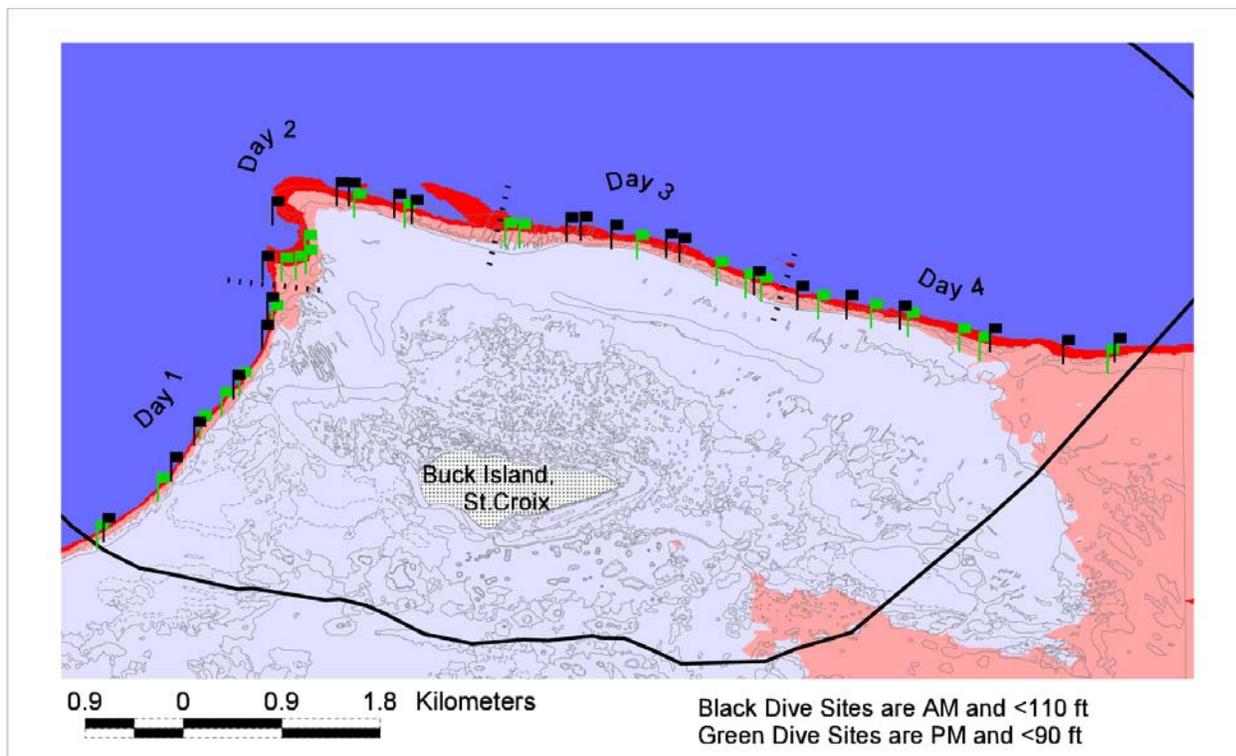


Figure 2. St. John diving and trapping locations.

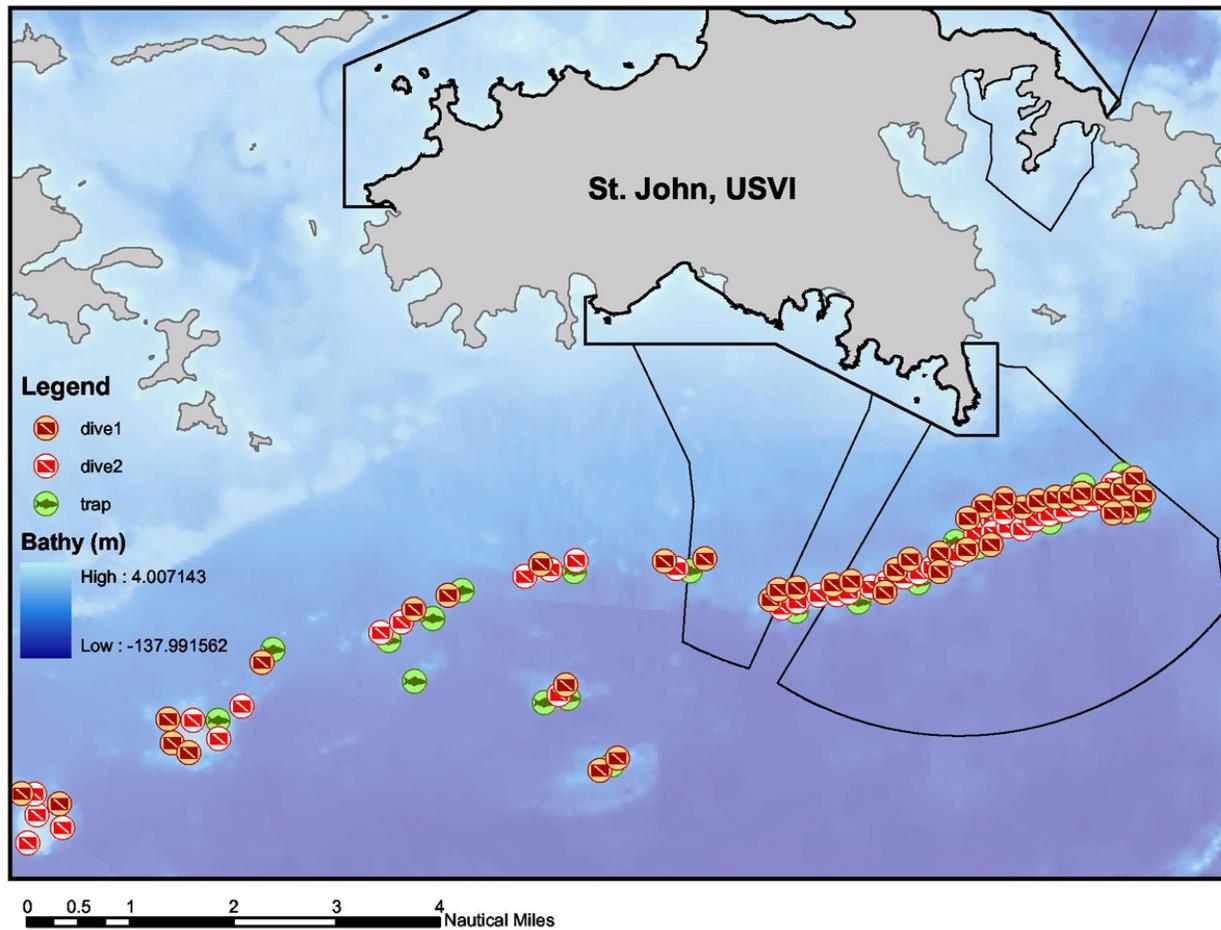


Table 1. Coordinates for St. Croix diving locations (Depth – meters).

Station_ID	Longitude	Latitude	Depth
STC shallow1	-64 38.6082	17 47.6472	-23.33
STC shallow2	-64 34.8660	17 47.9214	-23.60
STC shallow3	-64 34.2342	17 47.8590	-23.84
STC shallow4	-64 38.9232	17 47.2236	-23.86
STC shallow5	-64 39.2250	17 46.9902	-23.90
STC shallow6	-64 38.3622	17 48.0774	-24.08
STC shallow7	-64 35.9448	17 48.2124	-24.40
STC shallow8	-64 35.2212	17 48.0390	-24.40
STC shallow9	-64 38.1930	17 48.3492	-24.42
STC shallow10	-64 38.5206	17 47.7456	-24.55
STC shallow11	-64 35.4030	17 48.0816	-24.55
STC shallow12	-64 37.7046	17 48.5784	-24.60
STC shallow13	-64 36.1632	17 48.2916	-24.60
STC shallow14	-64 36.0222	17 48.2298	-24.64
STC shallow15	-64 35.6622	17 48.1266	-24.78
STC shallow16	-64 38.7150	17 47.5314	-24.80
STC shallow17	-64 38.1972	17 48.4242	-24.84
STC shallow18	-64 37.9530	17 48.6258	-25.02
STC shallow19	-64 37.2078	17 48.4842	-25.02
STC shallow20	-64 37.1376	17 48.4782	-25.04
STC shallow21	-64 36.5592	17 48.4242	-25.14
STC shallow22	-64 38.2440	17 48.3198	-25.16
STC shallow23	-64 38.3130	17 48.3108	-25.32
STC shallow24	-64 34.9662	17 47.9622	-25.41
STC deep1	-64 38.7450	17 47.5014	-28.22
STC deep2	-64 35.7648	17 48.1716	-28.45
STC deep3	-64 35.2596	17 48.0732	-28.46
STC deep4	-64 36.4140	17 48.4284	-28.76
STC deep5	-64 35.9790	17 48.2448	-28.76
STC deep6	-64 36.3492	17 48.4074	-29.17
STC deep7	-64 38.4072	17 48.3198	-29.22
STC deep8	-64 37.6686	17 48.5958	-29.32
STC deep9	-64 39.1926	17 47.0262	-29.40
STC deep10	-64 35.5230	17 48.1266	-29.44
STC deep11	-64 38.8584	17 47.3262	-29.45
STC deep12	-64 37.7562	17 48.6276	-29.54
STC deep13	-64 38.4090	17 47.9790	-29.56
STC deep14	-64 34.4526	17 47.9040	-29.70
STC deep15	-64 36.6834	17 48.4716	-29.79
STC deep16	-64 34.2000	17 47.9130	-29.91
STC deep17	-64 34.8144	17 47.9622	-30.26
STC deep18	-64 38.3580	17 48.5892	-30.27
STC deep19	-64 38.3832	17 48.1164	-30.37
STC deep20	-64 38.0406	17 48.6858	-30.39
STC deep21	-64 36.9060	17 48.5100	-30.39
STC deep22	-64 38.5506	17 47.7306	-30.58
STC deep23	-64 37.9788	17 48.6834	-30.70
STC deep24	-64 36.8352	17 48.5142	-31.16

Table 2. Coordinates for St. John diving and trapping locations (Depth – meters).

Station_ID	Longtiude	Latitude	Depth
stj_deep1	-64 50.91017	18 14.21580	-31.13
stj_deep2	-64 51.27311	18 14.31948	-31.43
stj_deep3	-64 49.85892	18 15.04218	-31.87
stj_deep4	-64 49.81512	18 14.80727	-30.52
stj_deep5	-64 49.65390	18 14.71368	-31.02
stj_deep6	-64 48.94302	18 15.58812	-31.17
stj_deep7	-64 47.47349	18 16.10598	-30.63
stj_deep8	-64 47.14391	18 16.24050	-30.51
stj_deep9	-64 46.00398	18 15.37290	-31.33
stj_deep10	-64 45.67104	18 14.54225	-31.75
stj_deep11	-64 45.49955	18 14.65998	-31.15
stj_deep12	-64 46.24272	18 16.54313	-31.28
stj_deep13	-64 45.04554	18 16.57002	-31.51
stj_deep14	-64 44.65212	18 16.59360	-31.50
stj_deep15	-64 44.01318	18 16.20012	-31.05
stj_deep16	-64 43.41462	18 16.34135	-30.95
stj_deep17	-64 43.93763	18 16.29491	-31.78
stj_deep18	-64 43.75925	18 16.31273	-30.77
stj_deep19	-64 43.23612	18 16.37814	-31.59
stj_deep20	-64 42.80214	18 16.49106	-32.41
stj_deep21	-64 42.66539	18 16.59216	-30.53
stj_deep22	-64 42.38003	18 16.64562	-30.97
stj_deep23	-64 42.38003	18 16.47323	-31.09
stj_deep24	-64 42.11250	18 16.68132	-30.92
stj_deep25	-64 41.57153	18 17.09154	-31.56
stj_deep26	-64 41.42886	18 17.15693	-30.94
stj_deep27	-64 41.25642	18 17.19258	-30.71
stj_deep28	-64 41.12568	18 17.19258	-31.03
stj_deep29	-64 41.00081	18 17.22827	-31.24
stj_deep30	-64 40.78086	18 17.22227	-30.88
stj_deep31	-64 40.60841	18 17.26986	-30.44
stj_deep32	-64 40.48955	18 17.37690	-31.86
stj_deep33	-64 40.40634	18 17.20446	-31.54
stj_deep34	-64 40.57278	18 17.04990	-30.94
stj_deep35	-64 40.69763	18 17.03802	-31.52
stj_deep36	-64 41.74985	18 17.17475	-31.53
stj_deep37	-64 41.95200	18 17.10341	-30.88
stj_deep38	-64 42.10655	18 16.98450	-30.96
stj_deep39	-64 41.88065	18 16.72890	-31.16
stj_deep40	-64 42.90912	18 16.27109	-31.20
stj_shallow1	-64 51.12876	18 14.11458	-17.63
stj_shallow2	-64 50.87873	18 13.98954	-26.35
stj_shallow3	-64 49.61586	18 15.02736	-27.97
stj_shallow4	-64 49.36577	18 14.85227	-26.16
stj_shallow5	-64 49.14072	18 15.16488	-27.62
stj_shallow6	-64 47.79029	18 15.87762	-26.08
stj_shallow7	-64 47.59026	18 15.97763	-25.54
stj_shallow8	-64 46.06482	18 15.27744	-27.17
stj_shallow9	-64 45.90222	18 16.57782	-26.04
stj_shallow10	-64 44.92698	18 16.50282	-27.84
stj_shallow11	-64 46.1523	18 16.49027	-25.77
stj_shallow12	-64 51.15378	18 14.31468	-26.03
stj_shallow13	-64 51.21630	18 13.83954	-17.47
stj_shallow14	-64 43.90931	18 16.11384	-24.07
stj_shallow15	-64 43.75421	18 16.17348	-25.98
stj_shallow16	-64 43.55148	18 16.23906	-27.49
stj_shallow17	-64 43.37250	18 16.24506	-26.22
stj_shallow18	-64 43.25921	18 16.26888	-25.77
stj_shallow19	-64 43.03854	18 16.32258	-23.91
stj_shallow20	-64 42.88943	18 16.36434	-26.57
stj_shallow21	-64 42.72246	18 16.41798	-25.83
stj_shallow22	-64 42.57929	18 16.45974	-27.39
stj_shallow23	-64 42.44808	18 16.51344	-29.32
stj_shallow24	-64 42.29897	18 16.60290	-28.57
stj_shallow25	-64 42.19163	18 16.63866	-28.98
stj_shallow26	-64 42.03059	18 16.84146	-27.35
stj_shallow27	-64 41.86362	18 16.96668	-22.93
stj_shallow28	-64 41.86362	18 16.84740	-23.27
stj_shallow29	-64 41.71451	18 16.90703	-23.29
stj_shallow30	-64 41.75027	18 17.03826	-26.99
stj_shallow31	-64 41.57735	18 16.88316	-26.97
stj_shallow32	-64 41.46402	18 16.97268	-25.16
stj_shallow33	-64 41.31491	18 17.02631	-27.15
stj_shallow34	-64 41.16582	18 17.06214	-29.05
stj_shallow35	-64 41.02866	18 17.11578	-29.19
stj_shallow36	-64 40.89744	18 17.16948	-28.31
stj_shallow37	-64 40.74234	18 17.14560	-28.36
stj_shallow38	-64 40.56342	18 17.13366	-29.42
stj_shallow39	-64 40.69464	18 17.32451	-20.77
stj_shallow40	-64 46.39632	18 16.42398	-26.54
stj_traps1	-64 49.36902	18 15.03114	-36.00
stj_traps2	-64 48.83897	18 15.71412	-30.30
stj_traps3	-64 47.71331	18 15.80159	-31.97
stj_traps4	-64 47.29253	18 16.01466	-32.36
stj_traps5	-64 47.46743	18 15.40812	-32.44
stj_traps6	-64 45.98111	18 15.23874	-33.16
stj_traps7	-64 45.55493	18 14.59944	-32.93
stj_traps8	-64 46.21062	18 15.20052	-33.26
stj_traps9	-64 45.92099	18 16.46820	-29.82
stj_traps10	-64 44.79539	18 16.47918	-32.37
stj_traps11	-64 47.00843	18 16.28790	-33.05
stj_traps12	-64 43.76807	18 16.08569	-33.25
stj_traps13	-64 43.16153	18 16.17317	-34.04
stj_traps14	-64 42.58781	18 16.36439	-33.96
stj_traps15	-64 42.00857	18 16.70868	-31.95
stj_traps16	-64 42.22169	18 16.76328	-33.51
stj_traps17	-64 40.98131	18 17.30424	-32.66
stj_traps18	-64 40.60428	18 17.40810	-33.48
stj_traps19	-64 40.45128	18 17.06928	-32.58
stj_traps20	-64 41.30915	18 16.94910	-30.25

Station_ID	Longtiude	Latitude	Depth
stj_traps21	-64 50.91017	18 14.21580	-31.13
stj_traps22	-64 51.27311	18 14.31948	-31.43
stj_traps23	-64 49.85892	18 15.04218	-31.87
stj_traps24	-64 49.81512	18 14.80727	-30.52
stj_traps25	-64 49.65390	18 14.71368	-31.02
stj_traps26	-64 48.94302	18 15.58812	-31.17
stj_traps27	-64 47.47350	18 16.10598	-30.63
stj_traps28	-64 47.14391	18 16.24050	-30.51
stj_traps29	-64 46.00398	18 15.37290	-31.33
stj_traps30	-64 45.67104	18 14.54225	-31.75
stj_traps31	-64 45.49955	18 14.65998	-31.15
stj_traps32	-64 46.24272	18 16.54313	-31.28
stj_traps33	-64 45.04554	18 16.57002	-31.51
stj_traps34	-64 44.65212	18 16.59360	-31.50
stj_traps35	-64 44.01318	18 16.20012	-31.05
stj_traps36	-64 43.41462	18 16.34135	-30.95
stj_traps37	-64 43.93763	18 16.29491	-31.78
stj_traps38	-64 43.75925	18 16.31273	-30.77
stj_traps39	-64 43.23612	18 16.37814	-31.59
stj_traps40	-64 42.80214	18 16.49106	-32.41
stj_traps41	-64 42.66540	18 16.59216	-30.53
stj_traps42	-64 42.38003	18 16.64562	-30.97
stj_traps43	-64 42.38003	18 16.47323	-31.09
stj_traps44	-64 42.11250	18 16.68132	-30.92
stj_traps45	-64 41.57153	18 17.09154	-31.56
stj_traps46	-64 41.42886	18 17.15693	-30.94
stj_traps47	-64 41.25642	18 17.19258	-30.71
stj_traps48	-64 41.12568	18 17.19258	-31.03
stj_traps49	-64 41.00081	18 17.22827	-31.24
stj_traps50	-64 40.78086	18 17.22227	-30.88
stj_traps51	-64 40.60841	18 17.26986	-30.44
stj_traps52	-64 40.48955	18 17.37690	-31.86
stj_traps53	-64 40.40634	18 17.20446	-31.54
stj_traps54	-64 40.57278	18 17.04990	-30.94
stj_traps55	-64 40.69763	18 17.03802	-31.52
stj_traps56	-64 41.74985	18 17.17475	-31.53
stj_traps57	-64 41.95200	18 17.10341	-30.88
stj_traps58	-64 42.10655	18 16.98450	-30.96
stj_traps59	-64 41.88065	18 16.72890	-31.16
stj_traps60	-64 42.90912	18 16.27110	-31.20

Station_ID	Longtiude	Latitude	Depth
stj_traps61	-64 40.93061	18 16.87416	-41.14
stj_traps62	-64 40.21080	18 17.03712	-39.30
stj_traps63	-64 41.52822	18 16.71114	-41.71
stj_traps64	-64 41.27016	18 16.94202	-35.52
stj_traps65	-64 42.57402	18 16.33086	-38.32
stj_traps66	-64 42.31595	18 16.30368	-40.01
stj_traps67	-64 43.14444	18 16.14072	-39.88
stj_traps68	-64 43.03578	18 16.42595	-31.16
stj_traps69	-64 43.42962	18 16.16790	-28.25
stj_traps70	-64 43.60620	18 16.09997	-37.10
stj_traps71	-64 43.86426	18 16.01850	-33.90
stj_traps72	-64 44.16306	18 16.09997	-29.78
stj_traps73	-64 43.40250	18 16.03206	-37.69
stj_traps74	-64 44.06795	18 15.89628	-42.38
stj_traps75	-64 44.61126	18 16.19508	-40.30
stj_traps76	-64 44.85570	18 16.41234	-35.27
stj_traps77	-64 45.37182	18 16.49382	-38.20
stj_traps78	-64 45.73854	18 16.57536	-34.39
stj_traps79	-64 46.10526	18 16.45308	-25.44
stj_traps80	-64 46.62132	18 16.46670	-35.50
stj_traps81	-64 46.34970	18 16.37160	-29.49
stj_traps82	-64 47.20535	18 16.09997	-38.42
stj_traps83	-64 47.53133	18 15.92340	-34.70
stj_traps84	-64 47.80296	18 15.80117	-31.91
stj_traps85	-64 47.81652	18 16.00488	-35.05
stj_traps86	-64 47.44980	18 15.42090	-28.98
stj_traps87	-64 47.30040	18 15.52955	-32.84
stj_traps88	-64 48.12888	18 15.77400	-31.38
stj_traps89	-64 50.81808	18 14.04912	-30.06
stj_traps90	-64 51.23910	18 14.19852	-26.43
stj_traps91	-64 50.91311	18 14.44302	-37.56
stj_traps92	-64 49.29690	18 15.09491	-37.14
stj_traps93	-64 49.29690	18 14.70108	-37.87
stj_traps94	-64 46.51265	18 14.14422	-49.22
stj_traps95	-64 46.17312	18 14.17140	-45.02
stj_traps96	-64 45.65706	18 14.21213	-38.79
stj_traps97	-64 45.30390	18 14.29361	-41.09
stj_traps98	-64 45.22242	18 14.57886	-37.70
stj_traps99	-64 45.82001	18 14.72820	-38.12
stj_traps100	-64 46.21391	18 15.16284	-37.50

Figure 3. Survey area A for multibeam, sidescan and mini-bat work around St. Croix.

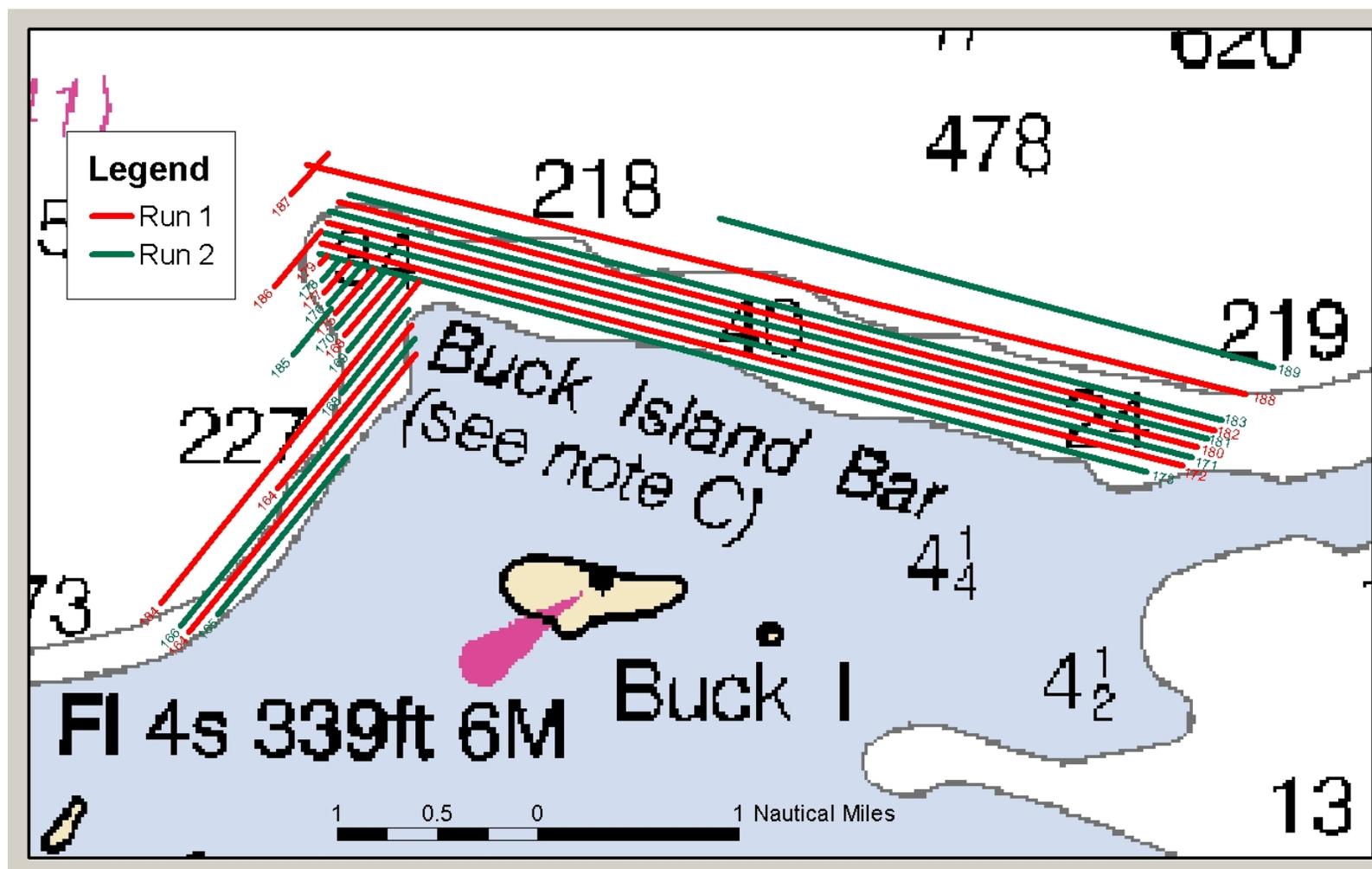
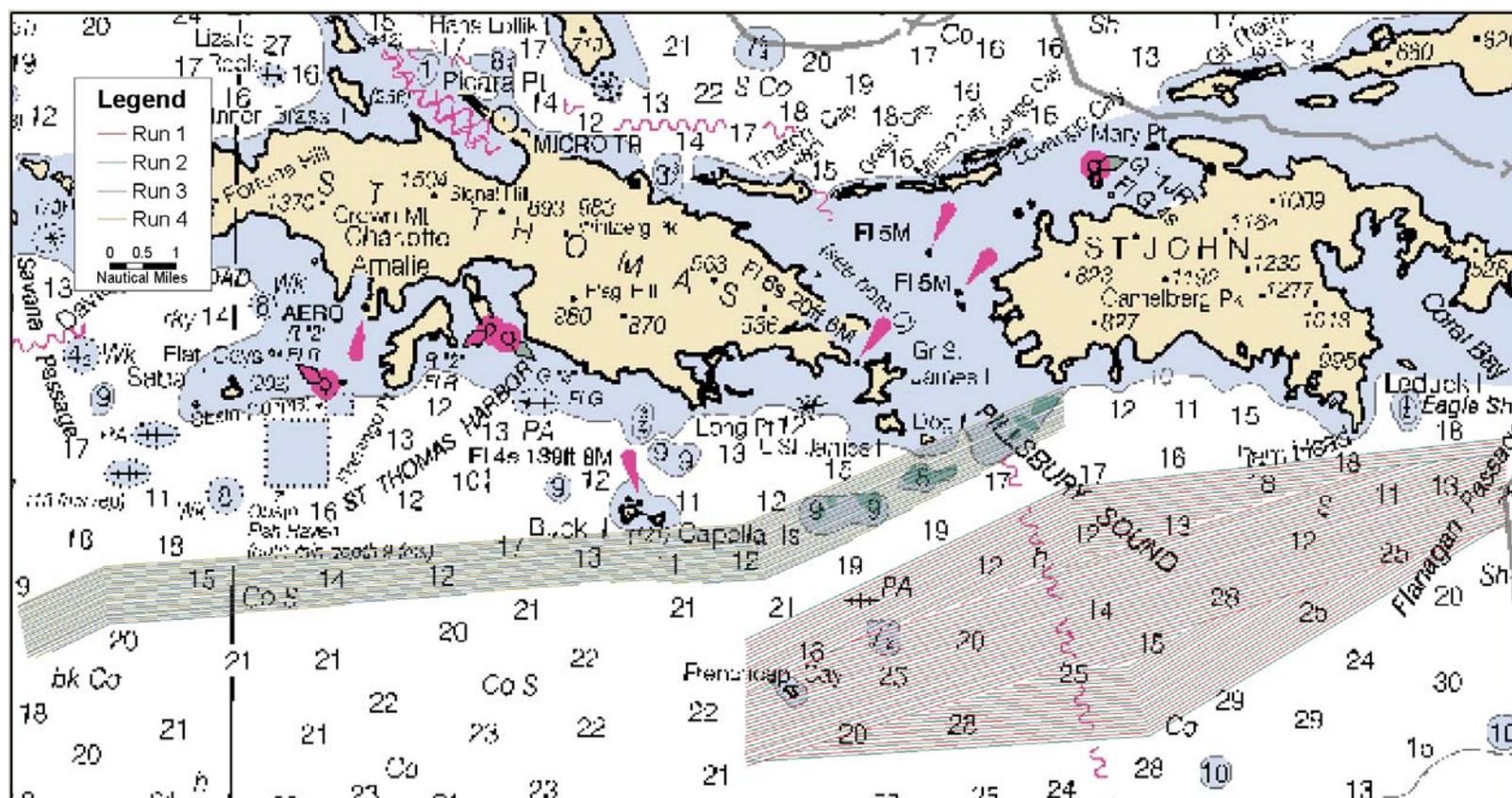


Figure 4. Survey areas B and C for multibeam, sidescan and mini-bat work around St. John & St. Thomas.



**Table 3. Personnel Schedule – Monaco
Mark Monaco**

DAY	DATE	LOCATION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Thu	2.19	STX	LOAD/PROVISION/TRAINING																							
Fri	2.20	STX	LOAD/PROVISION/TRAINING																							
Sat	2.21	STX	OFF DUTY								Dive1 Bruckner	on call, waiting on Buck						Dive2 Bruckner	OFF DUTY							
Sun	2.22	STX	OFF DUTY								Dive1 Bruckner	on call, waiting on Buck						Dive2 Bruckner	OFF DUTY				TRANSIT TO STJ			
Mon	2.23	STJ	OFF DUTY								LOAD GEAR; MISSION LEG COORDINATION								OFF DUTY							
Tue	2.24	STJ	OFF DUTY								Dive1 Miller	on call	on call	on call	on call	on call	Dive2 Miller	Trap Set	OFF DUTY							
Wed	2.25	STJ	on call								Dive1 Miller	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Miller	Trap Set	OFF DUTY							
Thu	2.26	STJ	OFF DUTY								Dive1 Miller	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Miller	Trap Set	OFF DUTY							
Fri	2.27	STJ	on call								Dive1 Miller	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Miller	Trap Set	OFF DUTY							
Sat	2.28	STJ	OFF DUTY								Dive1 Miller	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Miller	Trap Set	OFF DUTY							
Sun	2.29	STJ	on call								Dive1 Miller	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Miller	Trap Set	OFF DUTY							
Mon	3.1	STJ	OFF DUTY								Dive1 Miller	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Miller	Trap Set	OFF DUTY							
Tue	3.2	STJ	on call								Dive1 Miller	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Miller	Trap Set	OFF DUTY							
Wed	3.3	STJ	OFF DUTY								DEMOBILIZATION CRUZ BAY ST. JOHN								OFF DUTY							

Table 4. Personnel Schedule – Battista
Tim Battista

DAY	DATE	LOCATION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
Thu	2.19	STX	LOAD/PROVISION/TRAINING																								
Fri	2.20	STX	LOAD/PROVISION/TRAINING																								
Sat	2.21	STX	OFF DUTY								Steam Buck	Multibeam Buck: All				Minibat: All				Multibeam Buck: All		OFF DUTY					
Sun	2.22	STX	Multibeam Buck: Rooney							OFF DUTY					Minibat: Buja				OFF DUTY		TRANSIT TO STJ						
Mon	2.23	STJ	Multibeam MSR East: Rooney								LOAD GEAR St John; MISSION LEG COORDINATION								OFF DUTY								
Tue	2.24	STJ	Multibeam MSR East: Rooney								OFF DUTY		Minibat: Callender		OFF DUTY												
Wed	2.25	STJ	Multibeam MSR East: Rooney								OFF DUTY		Minibat: Callender		OFF DUTY												
Thu	2.26	STJ	Multibeam MSR East: Rooney								OFF DUTY		Minibat: Callender		OFF DUTY												
Fri	2.27	STJ	Multibeam MSR East: Rooney								OFF DUTY		Minibat: Callender		OFF DUTY												
Sat	2.28	STJ	Multibeam MSR East: Rooney								OFF DUTY		Minibat: Callender		OFF DUTY												
Sun	2.29	STJ	Multibeam MSR East: Rooney								OFF DUTY		Minibat: Callender		OFF DUTY												
Mon	3.1	STJ	Multibeam MSR East: Rooney								OFF DUTY		Minibat: Callender		OFF DUTY												
Tue	3.2	STJ	Multibeam MSR East: Rooney								OFF DUTY		Minibat: Callender		OFF DUTY												
Wed	3.3	STJ	Multibeam MSR East: Rooney								DEMOBILIZATION CRUZ BAY ST. JOHN								OFF DUTY								

**Table 5. Personnel Schedule – Buja
Ken Buja**

DAY	DATE	LOCATION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
Thu	2.19	STX	LOAD/PROVISION/TRAINING																								
Fri	2.20	STX	LOAD/PROVISION/TRAINING																								
Sat	2.21	STX	OFF DUTY								Steam Buck	Multibeam Buck: All				Minibat: All				Multibeam Buck: All		Multibeam Buck: Froelich		OFF DUTY			
Sun	2.22	STX	OFF DUTY											Minibat:Battista				OFF DUTY		TRANSIT TO STJ							
Mon	2.23	STJ	OFF DUTY								LOAD GEAR St John; MISSION LEG COORDINATION								Multibeam MSR East: Buja								
Tue	2.24	STJ	OFF DUTY											Minibat: Christensen		OFF DUTY		Multibeam MSR East: Buja									
Wed	2.25	STJ	OFF DUTY											Minibat: Christensen		OFF DUTY		Multibeam MSR East: Buja									
Thu	2.26	STJ	OFF DUTY											Minibat: Christensen		OFF DUTY		Multibeam MSR East: Buja									
Fri	2.27	STJ	OFF DUTY											Minibat: Christensen		OFF DUTY		Multibeam MSR East: Buja									
Sat	2.28	STJ	OFF DUTY											Minibat: Christensen		OFF DUTY		Multibeam MSR East: Buja									
Sun	2.29	STJ	OFF DUTY											Minibat: Christensen		OFF DUTY		Multibeam MSR East: Buja									
Mon	3.1	STJ	OFF DUTY											Minibat: Christensen		OFF DUTY		Multibeam MSR East: Buja									
Tue	3.2	STJ	OFF DUTY								OFF DUTY				Minibat: Christensen		OFF DUTY		Multibeam MSR East: Buja								
Wed	3.3	STJ	OFF DUTY								DEMOBILIZATION CRUZ BAY ST. JOHN								OFF DUTY								

**Table 6. Personnel Schedule – Christensen
John Christensen**

DAY	DATE	LOCATION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
Thu	2.19	STX	LOAD/PROVISION/TRAINING																										
Fri	2.20	STX	LOAD/PROVISION/TRAINING																										
Sat	2.21	STX	OFF DUTY								Dive1 Mayor	on call, waiting on Buck						Dive2 Mayor	OFF DUTY										
Sun	2.22	STX	OFF DUTY								Dive1 Mayor	on call, waiting on Buck						Dive2 Mayor	OFF DUTY		website development		OFF DUTY						
Mon	2.23	STJ	OFF DUTY								LOAD GEAR; MISSION LEG COORDINATION								OFF DUTY										
Tue	2.24	STJ	on call								Dive1 Kelly	minibat: Callender						Dive2 Kelly	Trap Set	OFF DUTY		website development		OFF DUTY					
Wed	2.25	STJ	OFF DUTY								Dive1 Kelly	Trap Retrieval	Trap Workup	minibat: Callender						Dive2 Kelly	Trap Set	OFF DUTY							
Thu	2.26	STJ	on call								Dive1 Kelly	Trap Retrieval	Trap Workup	minibat: Callender						Dive2 Kelly	Trap Set	OFF DUTY		website development		OFF DUTY			
Fri	2.27	STJ	OFF DUTY								Dive1 Kelly	Trap Retrieval	Trap Workup	minibat: Callender						Dive2 Kelly	Trap Set	OFF DUTY							
Sat	2.28	STJ	on call								Dive1 Kelly	Trap Retrieval	Trap Workup	minibat: Callender						Dive2 Kelly	Trap Set	OFF DUTY		website development		OFF DUTY			
Sun	2.29	STJ	OFF DUTY								Dive1 Kelly	Trap Retrieval	Trap Workup	minibat: Callender						Dive2 Kelly	Trap Set	OFF DUTY							
Mon	3.1	STJ	on call								Dive1 Kelly	Trap Retrieval	Trap Workup	minibat: Callender						Dive2 Kelly	Trap Set	OFF DUTY		website development		OFF DUTY			
Tue	3.2	STJ	OFF DUTY								Dive1 Kelly	Trap Retrieval	Trap Workup	minibat: Callender						Dive2 Kelly	Trap Set	OFF DUTY							
Wed	3.3	STJ	on call								DEMOBILIZATION CRUZ BAY ST. JOHN								OFF DUTY										

**Table 7. Personnel Schedule – Kendall
Matt Kendall**

DAY	DATE	LOCATION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Thu	2.19	STX	LOAD/PROVISION/TRAINING																							
Fri	2.20	STX																								
Sat	2.21	STX	OFF DUTY								Dive1 Woody	on call, waiting on Buck						Dive2 Woody	OFF DUTY							
Sun	2.22	STX	OFF DUTY								Dive1 Woody	on call, waiting on Buck						Dive2 Woody	OFF DUTY; LIGHTERED TO STX FOR REMAINDER OF TRIP							
Mon	2.23	STJ	NOT PRESENT																							
Tue	2.24	STJ																								
Wed	2.25	STJ																								
Thu	2.26	STJ																								
Fri	2.27	STJ																								
Sat	2.28	STJ																								
Sun	2.29	STJ																								
Mon	3.1	STJ																								
Tue	3.2	STJ																								
Wed	3.3	STJ																								

Table 8. Personnel Schedule – Caldwell
Chris Caldwell

DAY	DATE	LOCATION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Thu	2.19	STX	LOAD/PROVISION/TRAINING																							
Fri	2.20	STX	LOAD/PROVISION/TRAINING																							
Sat	2.21	STX	OFF DUTY								Dive1 Friedlander	on call, waiting on Buck						Dive2 Friedlander	OFF DUTY							
Sun	2.22	STX	OFF DUTY								Dive1 Friedlander	on call, waiting on Buck						Dive2 Friedlander	OFF DUTY; LIGHTERED TO STX FOR REMAINDER OF TRIP							
Mon	2.23	STJ	NOT PRESENT																							
Tue	2.24	STJ																								
Wed	2.25	STJ																								
Thu	2.26	STJ																								
Fri	2.27	STJ																								
Sat	2.28	STJ																								
Sun	2.29	STJ																								
Mon	3.1	STJ																								
Tue	3.2	STJ																								
Wed	3.3	STJ																								

**Table 9. Personnel Schedule – Callender
Russell Callender**

DAY	DATE	LOCATION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
Thu	2.19	STX	NOT PRESENT																												
Fri	2.20	STX																													
Sat	2.21	STX																													
Sun	2.22	STX																													
Mon	2.23	STJ	LOAD GEAR; MISSION LEG COORDINATION										OFF DUTY																		
Tue	2.24	STJ	OFF DUTY								minibat prepare	minibat: Christensen					minibat breakdown	Trap Set	Minibat Assessment	OFF DUTY											
Wed	2.25	STJ	OFF DUTY								minibat prepare	Trap Retrieval	Trap Workup	minibat: Christensen					minibat breakdown	Trap Set	Minibat Assessment	OFF DUTY									
Thu	2.26	STJ	OFF DUTY								minibat prepare	Trap Retrieval	Trap Workup	minibat: Christensen					minibat breakdown	Trap Set	Minibat Assessment	OFF DUTY									
Fri	2.27	STJ	OFF DUTY								minibat prepare	Trap Retrieval	Trap Workup	minibat: Christensen					minibat breakdown	Trap Set	Minibat Assessment	OFF DUTY									
Sat	2.28	STJ	OFF DUTY								minibat prepare	Trap Retrieval	Trap Workup	minibat: Christensen					minibat breakdown	Trap Set	Minibat Assessment	OFF DUTY									
Sun	2.29	STJ	OFF DUTY								minibat prepare	Trap Retrieval	Trap Workup	minibat: Christensen					minibat breakdown	Trap Set	Minibat Assessment	OFF DUTY									
Mon	3.1	STJ	OFF DUTY								minibat prepare	Trap Retrieval	Trap Workup	minibat: Christensen					minibat breakdown	Trap Set	Minibat Assessment	OFF DUTY									
Tue	3.2	STJ	OFF DUTY								minibat prepare	Trap Retrieval	Trap Workup	minibat: Christensen					minibat breakdown	Trap Set	Minibat Assessment	OFF DUTY									
Wed	3.3	STJ	OFF DUTY								DEMOBILIZATION CRUZ BAY ST. JOHN							OFF DUTY													

**Table 10. Personnel Schedule – Friedlander
Alan Friedlander**

DAY	DATE	LOCATION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Thu	2.19	STX	LOAD/PROVISION/TRAINING																							
Fri	2.20	STX																								
Sat	2.21	STX	OFF DUTY								Dive1 Caldow	on call, waiting on Buck						Dive2 Caldow	OFF DUTY							
Sun	2.22	STX	OFF DUTY								Dive1 Caldow	on call, waiting on Buck						Dive2 Caldow	OFF DUTY							
Mon	2.23	STJ	TRANSIT TO STJ								LOAD GEAR; MISSION LEG COORDINATION								OFF DUTY							
Tue	2.24	STJ	OFF DUTY								Dive1 Waara	on call	on call	on call	on call	on call	Dive2 Waara	Trap Set	on call							
Wed	2.25	STJ	OFF DUTY								Dive1 Waara	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Waara	Trap Set	OFF DUTY							
Thu	2.26	STJ	OFF DUTY								Dive1 Waara	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Waara	Trap Set	on call							
Fri	2.27	STJ	OFF DUTY								Dive1 Waara	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Waara	Trap Set	OFF DUTY							
Sat	2.28	STJ	OFF DUTY								Dive1 Waara	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Waara	Trap Set	on call							
Sun	2.29	STJ	OFF DUTY								Dive1 Waara	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Waara	Trap Set	OFF DUTY							
Mon	3.1	STJ	OFF DUTY								Dive1 Waara	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Waara	Trap Set	on call							
Tue	3.2	STJ	OFF DUTY								Dive1 Waara	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Waara	Trap Set	OFF DUTY							
Wed	3.3	STJ	OFF DUTY								DEMOBILIZATION CRUZ BAY ST. JOHN								OFF DUTY							

**Table 11. Personnel Schedule – Bruckner
Andy Bruckner**

DAY	DATE	LOCATION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Thu	2.19	STX	LOAD/PROVISION/TRAINING																							
Fri	2.20	STX	LOAD/PROVISION/TRAINING																							
Sat	2.21	STX	OFF DUTY								Dive1 Monaco	on call, waiting on Buck						Dive2 Monaco	OFF DUTY							
Sun	2.22	STX	OFF DUTY								Dive1 Monaco	on call, waiting on Buck						Dive2 Monaco	OFF DUTY; LIGHTERED TO STX FOR REMAINDER OF TRIP							
Mon	2.23	STJ	NOT PRESENT																							
Tue	2.24	STJ																								
Wed	2.25	STJ																								
Thu	2.26	STJ																								
Fri	2.27	STJ																								
Sat	2.28	STJ																								
Sun	2.29	STJ																								
Mon	3.1	STJ																								
Tue	3.2	STJ																								
Wed	3.3	STJ																								

**Table 12. Personnel Schedule – Mayor
Phillipe Mayor**

DAY	DATE	LOCATION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Thu	2.19	STX	LOAD/PROVISION/TRAINING																							
Fri	2.20	STX																								
Sat	2.21	STX	OFF DUTY							Dive1 Christensen	on call, waiting on Buck					Dive2 Christensen	OFF DUTY									
Sun	2.22	STX	OFF DUTY							Dive1 Christensen	on call, waiting on Buck					Dive2 Christensen	OFF DUTY; LIGHTERED TO STX FOR REAMINDER OF TRIP									
Mon	2.23	STJ	NOT PRESENT																							
Tue	2.24	STJ																								
Wed	2.25	STJ																								
Thu	2.26	STJ																								
Fri	2.27	STJ																								
Sat	2.28	STJ																								
Sun	2.29	STJ																								
Mon	3.1	STJ																								
Tue	3.2	STJ																								
Wed	3.3	STJ																								

**Table 13. Personnel Schedule – Waara
Rob Waara**

DAY	DATE	LOCATION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Thu	2.19	STX	NOT PRESENT																							
Fri	2.20	STX																								
Sat	2.21	STX																								
Sun	2.22	STX																								
Mon	2.23	STJ	LOAD GEAR; TRIP COORDINATION										OFF DUTY													
Tue	2.24	STJ	OFF DUTY					Dive1 Friedlander	on call	on call	on call	on call	on call	Dive2 Friedlander	Trap Set	OFF DUTY										
Wed	2.25	STJ	OFF DUTY					Dive1 Friedlander	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Friedlander	Trap Set	on call	Minibat Assessment	OFF DUTY								
Thu	2.26	STJ	OFF DUTY					Dive1 Friedlander	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Friedlander	Trap Set	on call	Minibat Assessment	OFF DUTY								
Fri	2.27	STJ	OFF DUTY					Dive1 Friedlander	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Friedlander	Trap Set	on call	Minibat Assessment	OFF DUTY								
Sat	2.28	STJ	OFF DUTY					Dive1 Friedlander	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Friedlander	Trap Set	on call	Minibat Assessment	OFF DUTY								
Sun	2.29	STJ	OFF DUTY					Dive1 Friedlander	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Friedlander	Trap Set	on call	Minibat Assessment	OFF DUTY								
Mon	3.1	STJ	OFF DUTY					Dive1 Friedlander	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Friedlander	Trap Set	on call	Minibat Assessment	OFF DUTY								
Tue	3.2	STJ	OFF DUTY					Dive1 Friedlander	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Friedlander	Trap Set	on call	Minibat Assessment	OFF DUTY								
Wed	3.3	STJ	OFF DUTY					DEMOBILIZATION CRUZ BAY ST. JOHN							OFF DUTY											

**Table 14. Personnel Schedule – Miller
Jeff Miller**

DAY	DATE	LOCATION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Thu	2.19	STX	NOT PRESENT																							
Fri	2.20	STX																								
Sat	2.21	STX																								
Sun	2.22	STX																								
Mon	2.23	STJ	LOAD GEAR; TRIP COORDINATION										OFF DUTY													
Tue	2.24	STJ	OFF DUTY					Dive1 Monaco	on call	on call	on call	on call	on call	Dive2 Monaco	Trap Set	OFF DUTY										
Wed	2.25	STJ	OFF DUTY					Dive1 Monaco	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Monaco	Trap Set	on call	Minibat Assessment	OFF DUTY								
Thu	2.26	STJ	OFF DUTY					Dive1 Monaco	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Monaco	Trap Set	on call	Minibat Assessment	OFF DUTY								
Fri	2.27	STJ	OFF DUTY					Dive1 Monaco	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Monaco	Trap Set	on call	Minibat Assessment	OFF DUTY								
Sat	2.28	STJ	OFF DUTY					Dive1 Monaco	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Monaco	Trap Set	on call	Minibat Assessment	OFF DUTY								
Sun	2.29	STJ	OFF DUTY					Dive1 Monaco	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Monaco	Trap Set	on call	Minibat Assessment	OFF DUTY								
Mon	3.1	STJ	OFF DUTY					Dive1 Monaco	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Monaco	Trap Set	on call	Minibat Assessment	OFF DUTY								
Tue	3.2	STJ	OFF DUTY					Dive1 Monaco	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Monaco	Trap Set	on call	Minibat Assessment	OFF DUTY								
Wed	3.3	STJ	OFF DUTY					DEMOBILIZATION CRUZ BAY ST. JOHN							OFF DUTY											

**Table 15. Personnel Schedule – Rooney
Sean Rooney**

DAY	DATE	LOCATION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
Thu	2.19	STX	LOAD/PROVISION/TRAINING																									
Fri	2.20	STX	LOAD/PROVISION/TRAINING																									
Sat	2.21	STX	OFF DUTY								Steam Buck	Multibeam Buck: All				OFF DUTY				Multibeam Buck: All	OFF DUTY							
Sun	2.22	STX	Multibeam Buck: Battista							OFF DUTY										TRANSIT TO STJ								
Mon	2.23	STJ	Multibeam MSR East: Battista								OFF DUTY																	
Tue	2.24	STJ	Multibeam MSR East: Battista								OFF DUTY																	
Wed	2.25	STJ	Multibeam MSR East: Battista								OFF DUTY																	
Thu	2.26	STJ	Multibeam MSR East: Battista								OFF DUTY																	
Fri	2.27	STJ	Multibeam MSR East: Battista								OFF DUTY																	
Sat	2.28	STJ	Multibeam MSR East: Battista								OFF DUTY																	
Sun	2.29	STJ	Multibeam MSR East: Battista								OFF DUTY																	
Mon	3.1	STJ	Multibeam MSR East: Battista								OFF DUTY																	
Tue	3.2	STJ	Multibeam MSR East: Battista								OFF DUTY																	
Wed	3.3	STJ	Multibeam MSR East: Battista								OFF DUTY																	

**Table 16. Personnel Schedule – Froelich
Grant Froelich**

DAY	DATE	LOCATION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
Thu	2.19	STX	LOAD/PROVISION/TRAINING																								
Fri	2.20	STX	LOAD/PROVISION/TRAINING																								
Sat	2.21	STX	OFF DUTY								Steam Buck	Multibeam Buck: All				OFF DUTY				Multibeam Buck: All		Multibeam Buck: Buja		OFF DUTY			
Sun	2.22	STX	OFF DUTY																	TRANSIT TO STJ							
Mon	2.23	STJ	OFF DUTY															Multibeam MSR East: Buja									
Tue	2.24	STJ	OFF DUTY															Multibeam MSR East: Buja									
Wed	2.25	STJ	OFF DUTY															Multibeam MSR East: Buja									
Thu	2.26	STJ	OFF DUTY															Multibeam MSR East: Buja									
Fri	2.27	STJ	OFF DUTY															Multibeam MSR East: Buja									
Sat	2.28	STJ	OFF DUTY															Multibeam MSR East: Buja									
Sun	2.29	STJ	OFF DUTY															Multibeam MSR East: Buja									
Mon	3.1	STJ	OFF DUTY															Multibeam MSR East: Buja									
Tue	3.2	STJ	OFF DUTY															Multibeam MSR East: Buja									
Wed	3.3	STJ	OFF DUTY																								

**Table 17. Personnel Schedule – Kelty
Ruth Kelty**

DAY	DATE	LOCATION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23							
Thu	2.19	STX	NOT PRESENT																														
Fri	2.20	STX																															
Sat	2.21	STX																															
Sun	2.22	STX																															
Mon	2.23	STJ	LOAD GEAR; TRIP COORDINATION										OFF DUTY																				
Tue	2.24	STJ	OFF DUTY								Dive1 Christensen	on call	on call	on call	on call	on call	Dive2 Christensen	Trap Set	OFF DUTY														
Wed	2.25	STJ	OFF DUTY								Dive1 Christensen	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Christensen	Trap Set	on call	Minibat Assessment	on call					OFF DUTY							
Thu	2.26	STJ	OFF DUTY								Dive1 Christensen	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Christensen	Trap Set	on call	Minibat Assessment	OFF DUTY												
Fri	2.27	STJ	OFF DUTY								Dive1 Christensen	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Christensen	Trap Set	on call	Minibat Assessment	on call					OFF DUTY							
Sat	2.28	STJ	OFF DUTY								Dive1 Christensen	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Christensen	Trap Set	on call	Minibat Assessment	OFF DUTY					OFF DUTY							
Sun	2.29	STJ	OFF DUTY								Dive1 Christensen	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Christensen	Trap Set	on call	Minibat Assessment	on call					OFF DUTY							
Mon	3.1	STJ	OFF DUTY								Dive1 Christensen	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Christensen	Trap Set	on call	Minibat Assessment	OFF DUTY					OFF DUTY							
Tue	3.2	STJ	OFF DUTY								Dive1 Christensen	Trap Retrieval	Trap Workup	on call	on call	on call	Dive2 Christensen	Trap Set	on call	Minibat Assessment	on call					OFF DUTY							
Wed	3.3	STJ	OFF DUTY								DEMOBILIZATION CRUZ BAY ST. JOHN								OFF DUTY														

Table 19. Personnel Schedule – Addison
Christine Addison

DAY	DATE	LOCATION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
Thu	2.19	STX	LOAD/PROVISION/TRAINING																													
Fri	2.20	STX																														
Sat	2.21	STX	OFF DUTY							Steam Buck	OFF DUTY				Minibat: All				OFF DUTY													
Sun	2.22	STX	OFF DUTY							NOT PRESENT																						
Mon	2.23	STJ																														
Tue	2.24	STJ																														
Wed	2.25	STJ																														
Thu	2.26	STJ																														
Fri	2.27	STJ																														
Sat	2.28	STJ																														
Sun	2.29	STJ																														
Mon	3.1	STJ																														
Tue	3.2	STJ																														
Wed	3.3	STJ																														

**Table 19. Personnel Schedule – Woody
Kim Woody**

DAY	DATE	LOCATION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Thu	2.19	STX	LOAD/PROVISION/TRAINING																							
Fri	2.20	STX																								
Sat	2.21	STX	OFF DUTY								Dive1 Kendall	on call, waiting on Buck						Dive2 Kendall	OFF DUTY							
Sun	2.22	STX	OFF DUTY								Dive1 Kendall	on call, waiting on Buck						Dive2 Kendall	OFF DUTY; LIGHTERED TO STX FOR REMAINDER OF TRIP							
Mon	2.23	STJ	NOT PRESENT																							
Tue	2.24	STJ																								
Wed	2.25	STJ																								
Thu	2.26	STJ																								
Fri	2.27	STJ																								
Sat	2.28	STJ																								
Sun	2.29	STJ																								
Mon	3.1	STJ																								
Tue	3.2	STJ																								
Wed	3.3	STJ																								

Submitted by:

Dr. Russell Callender
Center Director,
Center for Coastal Monitoring
and Assessment

Date_____

Dr. Mark E. Monaco
Biogeographic Team,
Center for Coastal Monitoring
and Assessment

Date_____

Approved by:

Rear Admiral Nicholas Prah, NOAA
Director, Marine Operations Center

Date_____