Project NF-04-06 (USVI Benthic Habitat Mapping- 2004)
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Text in red was added by CCMA.

Data Processing and QA/QC Procedures

The contractor received all raw data and edited multibeam data from the ACOTR on Maxtor hard drive 1. The contractor was provided Caris HIPS/SIPS version 5.4 for data processing. After installing the software, the contractor accessed Caris support on the web to download Hot fixes 1-14. The Hot fixes ensured the latest software updates were included for processing. The contractor periodically reviewed Caris support to keep up with pertinent updates.

SWMB data were processed using the CARIS Hydrographic Information Processing System (HIPS/SIPS) software for Windows, version 5.4. The XTF data was converted to HDCS data using CARIS HIPS and SIPS Conversion Wizard. The following parameters were used during data conversion in CARIS: the Navigation Correctors were Geographic, Ship Navigation came from the Sensor, Bathymetry Gyro came from the Ship, soundings with a data quality flag of 0 were rejected, Side Scan Navigation came from the Sensor, Side Scan Gyro came from the Ship, the data was 16 bit, and 16 bit sensor data was preserved.

Navigation data was reviewed on a line-by-line basis for both time and horizontal consistency using CARIS navigation editor. Positions that exceeded the expected horizontal offsets for speed (.5 knots) and time (.2 seconds) were manually edited or interpolated for short periods between data points.

Heave, pitch, roll and heading were reviewed on a line-by-line basis using Caris HIPS Attitude Editor. Fliers or gaps in positioning and attitude data were rejected and interpolated for small periods in time and outright rejected for larger periods in time in which the characteristic of the curve was ambiguous.

After review and cleaning of position and attitude data were merged with sound velocity, tide **specify tide file type (prelim, observed, smooth) and (tidal zoning prelim, final),** and vessel offset, to compute the corrected depth and position of each sounding. Sound velocity correctors were applied with option for previous in time being selected.

The most effective approach to processing the SWMB data utilizes the Caris Subset Editor. Subset editing allows the contractor to compare adjacent lines for systematic errors. Although systematic errors were not observed, errors do exist in the data. Refraction appears to be present by noting the “cupping” and “frowning” of soundings in the across-track view. To verify the proper sound velocity profiles were applied, a thorough investigation of every cast was taken. Efforts were made to compare the times recorded in the Trip Log to the times recorded in the Acquisition Log and then to the

actual timestamps in the digital sound velocity file. Once the timestamps were verified to be in the UTC time format, the sound velocity correction routine was reapplied to all data followed by the remerging of all the data to apply the corrections. A second source of error originates from the heave data. There is an obvious artifact when viewing overlapping data in the along-track perspective through the subset editor. This artifact varies with sea state, meaning that it is more noticeable at times when seas were large. The final comment regarding processing pertains to the vessel offsets. The contractor recommends that the value associated with the sonar roll bias be reviewed.

During subset processing the Contractor observed limits to the size of the subsets. The across-track distance viewed at any one time did not exceed 500 meters. The number of pings viewed at any one time did not exceed 80. These were the absolute largest values observed. The majority of the data processed was viewed and edited with smaller sections than stated above. Due to the nature of the data quality and the required methods to edit artifacts above a mean surface, occasional fliers exist. The magnitude of the fliers varies due to the extremely diverse bottom conditions.

To ensure complete processing of the given dataset, the contractor employed two tools provided in the Caris HIPS/SIPS platform. The creation of base surfaces enabled the contractor to ensure that the largest sources of error were removed. The base surface routine provided shoal biased, deep biased, average depth and standard deviation surfaces. Each of these surfaces allowed the contractor to investigate specific anomalies in the dataset. Once the edits were made to the processed data, the base surface was recomputed to evaluate the changes made. The final tool for quality assurance is the contouring routine in the Caris Field Sheet Editor. Contours were developed to verify that the surface editing is complete.

To process the backscatter data, each line was evaluated for bottom tracking and was slant range corrected. Mosaics were created with the New Mosaic Routine using shine-thru as the preferred method of compilation. A 100-meter limit was placed on each line included in the mosaic.

The images derived for the deliverables were created using the export routine. Specifically, exporting from base surface to image and mosaic to image were the commands used. The average depth surface was used in the creation of the 24-bit color by depth images, and the two hill-shaded images offset by 90 degrees. The export to ASCII command was used to provide the five-meter position and depth files for additional modeling.