NF-06-10-OE

Descriptive Report to Accompany Hydrographic Survey NF-06-10-OE

Southeast of Charleston, SC August 19-29, 2006 NOAA Ship NANCY FOSTER Project Ocean Explorer George Sedberry, PhD. Chief Scientist, SCDNR Dan Boles, Project Manager

A. Area Surveyed

This hydrographic survey was performed over several sub locations in the vicinity of Charleston, SC to provide data relevant to Ocean Explorer's ground fish survey of the region. Over designated features, 100% multibeam coverage was acquired using the International Hydrographic Organization (IHO) Order 1 specifications to determine vessel speed and sonar settings. Approximately eight hundred fifty-eight nautical miles of survey lines were executed during the survey, totaling 81.07 square nautical miles of bathymetric data. Sound speed profiles were acquired to allow proper correction for local variations in sound speed. Because the sonar applies sound speed real time, that is, while acquiring data, no additional corrections were made for sound speed variation. Furthermore, after a careful quality check, described below, it was determined that there is little to no sound speed bias contained in the data.

Multibeam mileage (NM)	858.00
Coverage (square NM)	81.07

B. DATA ACQUISITION AND PROCESSING

B.1

The survey was completed exclusively aboard the NOAA Ship NANCY FOSTER (R352), using her Kongsberg-Simrad EM1002 multibeam sonar. The EM1002 is a beam steered system, which incorporates realtime surface sound speed from a SeaBird MicroTSG SBE 45, as well as sound speed profiles obtained with a SeaBird 19 and 911, while acquiring data. This allows the sonar to effectively direct its beams and the user to control swath width. For this survey, the multibeam swath was set to maximize coverage at the depth of each survey area. Typically, this is 60° to port and starboard for a total of 120°swath width, which will cover an area approximately 3x water depth. For example, in 50m depth at 120°, the swath will cover 150m, reaching 75m in either direction. However, in deeper water, swath width was reduced to minimize attenuation and outer beam error due to sound speed variability. An Applanix POS/MV was used to correct for dynamic vessel attitude. All data was acquired by Dan Boles and Dr. Sedberry. Table 1 below lists all hardware and personnel pertinent to survey NF-06-10-OE.

B.2

All bathymetric data were processed using CARIS 6.0 software. A careful analysis in subset editor allowed any erroneous soundings to be silenced manually, leaving corrected data for the creation of the BASE surface, which is a color coded display of bathymetric data generated by CARIS HIPS. Seven BASE surfaces were created, separating the survey into relatively distinct areas as well as managing file size to facilitate data transfer. Figure 1 below shows each area displayed over charts 11480 and 11520.

C. Tides

Using a .pdf tide zone display, included in the tide file accompanying this report, a zoned tide file (.zdf) was created manually to correct for the affects of tides on the data. The .zdf is based on the Charleston permanent tide station, id 8665530, and is meant to even out any vertical displacement in the data. Because the .zdf and corresponding tide file were not sent by NOAA's Center for Operational Oceanographic Products and Services (CO-OPS), the data do not meet hydrographic charting standards and should only be used for scientific purposes. However, the data can be re-corrected at any time should CO-OPS provide the proper files.

D. Conclusion

Survey Project NF-06-10-OE, having been thoroughly cleaned in CARIS HIPS/SIPS, has yielded good data that will be useful in planning future surveys. There are trace amounts of sea state bias in the data, such as small roll bias in the shoaler areas, and the tide corrections that were

created by project manager Dan Boles to smooth out vertical offsets in the soundings have left some tidal error, albeit negligible.



Figure 1. Survey areas of NF_06-10-OE

Acquisition and Processing Personnel	George Sedberry, PhD
	Dan Boles, Project Manager
Equipment	Kongsberg-Simrad EM1002
	Merlin acquisition software for Unix
	SeaBird SBE19, SBE911, SBE45
	CARIS HIPS/SIPS 6.0
	HYPACK Navigational Software
	Applanix POS/MV
	Trimble GPS

 Table 1 Inventory of Survey Personnel and Equipment