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Seismic-reflection and echo-sounder data from R/V FARNELLA cruise
FRNL85-4 in the Puerto Rico and U.S. Virgin Islands
Exclusive Economic Zone

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Between November 4th and December 3rd, 1985, the U.S. Geological Survey in cooperation with Great Britain's Institute of Oceanographic Sciences collected over 9,500 line kilometers of seismic-reflection and echo-sounder profile data in the Exclusive Economic Zone of Puerto Rico and the U.S. Virgin Islands (Fig. 1). North of the islands, the survey covers parts of the Greater Antilles Outer Ridge and the Puerto Rico Trench; south of the islands, it covers parts of the Muertos Trough and the Venezuelan Basin. Data were also collected on the insular slopes north and south of the islands in water depths greater than about 500 meters (m).

The work was conducted aboard the research vessel FARNELLA on cruise FRNL85-4. Line spacing was about 37 km in the deep areas (ie., north of about 19°N and south of about 17.5°N) and as close as 10 km in the shallower areas near the islands (i.e., between about 17.5°N and 19°N). GLORIA long-range sidescan-sonar data were collected simultaneously with the seismic-reflection data and are discussed elsewhere (EEZ-SCAN 85 Scientific Staff, 1987). Magnetic data and digitized bathymetric data are also available from all of the FRNL85-4 tracklines shown in Figure 1

(Scanlon, 1986).

Navigational control was maintained by an integrated navigation system using mainly transit satellites, gyro compass, and doppler speed log. Global Positioning System (GPS) fixes were also used during the few hours each day when at least three GPS satellites were within range.

The seismic-reflection data were collected using a single 80- or 160-in³ airgun as the seismic source and a two-channel hydrophone receiver with 48 elements in each of two active sections. The airgun was fired every 15 seconds using air compressed to 1500 pounds per square inch. The signals from the two channels were summed together and recorded on flatbed paper recorders at 5- and 10-second sweeps. The signal was filtered between 20 and 200 Hz. Data quality is good and has a maximum subbottom penetration of about 1 second.

Echo-sounder data were collected using both 3.5 and 10 kHz systems simultaneously along all tracklines (Fig. 1). The 3.5 kHz data were recorded on a flatbed paper recorder at a 2-second sweep. The 10kHz data were recorded on a wet-paper recorder at a 1-second sweep. Data quality varies from poor to excellent, the lowest quality data being from the steepest parts of the insular slopes.

The original seismic records may be examined at the U.S. Geological Survey, Woods Hole, MA 02543. Microfilm copies of these data can be purchased only from the National Geophysical Data Center, 325 Broadway, Boulder, CO 80303, telephone (303) 497-6345.

REFERENCES

EEZ-SCAN 85 Scientific Staff, 1987, Atlas of the U.S. Exclusive Economic Zone, Eastern Caribbean: U.S. Geological Survey Miscellaneous Investigations Series, I-1864B, 58 p., scale 1:500,000.

Scanlon, K.M., 1986, Magnetic and Bathymetric Data from R/V FARNELLA Cruise FRNL 85-4 in the Puerto Rico and U.S. Virgin Islands EEZ, U.S. Geological Survey Open-File Report 86-399, 2 p.

Figure 1 Map showing the research vessel FARNELLA's tracklines (fine lines) within the U.S. Exclusive Economic Zone boundary (heavy line) of Puerto Rico and the U.S. Virgin Islands along which the seismic-reflection and echo-sounder data were collected.

