1. EXPLANATORY NOTES[1]

Shipboard Scientific Party[2]

INTRODUCTION

Leg 102, the second leg of the Ocean Drilling Program (ODP) and the first geophysics leg, was conducted in two parts. For the first segment, the *JOIDES Resolution* left Miami, Florida, on 19 March 1985, went to Deep Sea Drilling Project (DSDP) Site 418 to conduct borehole geophysical experiments in Hole 418A, and then proceeded to Norfolk, Virginia, arriving on 11 April. The ship then left Norfolk on the second part of the leg on 16 April and transited to the Azores, arriving at Ponta Delgada on 25 April 1985. No drilling was conducted during the transit, but underway geophysical data were collected, and a test was made of a new drill-pipe sonar tool on the Mid-Atlantic Ridge. The underway geophysical data for both parts of the leg are presented here, but details of the sonar experiment may be obtained from the Ocean Drilling Program offices in College Station, Texas.

Standard procedures for drilling operations and logging methods have been regularly amended and upgraded since 1968 by DSDP and ODP. In this chapter, we have assembled information that will help the reader understand the basis for our preliminary conclusions and help the interested investigator select data for further studies. This information pertains only to shipboard operations and analyses described in the site report in Part A, or *Initial Reports* part, of the Leg 102 *Proceedings of the Ocean Drilling Program*. Methods used by various investigators for further shore-based analysis of Leg 102 data will be presented in the individual scientific contributions published in Part B of the volume.

AUTHORSHIP OF SITE REPORT

Authorship of the site report (Chapter 3) is shared among the entire shipboard scientific party, although the two co-chief scientists and the staff scientist edited and rewrote part of the material prepared by other individuals. The site chapter is organized as follows (authorship in parentheses):

Site Summary (Salisbury, Scott)
Background and Objectives (Salisbury, Scott)
Operations (Salisbury, Foss)
Seismic-Line Interpretation (Auroux, Stephen)
Conventional Logging Results (Broglia)
Multichannel Sonic Logging Results (Moos)
Borehole Seismic Experiment Results (Stephen, Hoskins)
Three-Axis Borehole Magnetometer Measurement Results (Bosum)
Magnetic-Susceptibility Logging Results (Scott)
Temperature-Measurement Results (Becker, Fisher)
Borehole-Water Studies (Gieskes)
Summary and Conclusions (Salisbury, Scott)

SURVEY DATA

The instrumentation on board during Leg 102 included two precision echo-sounders, seismic-reflection profilers, and a Magnavox MX702A satellite navigation system.

A short survey using a precision echo-sounder was made on the *JOIDES Resolution* before dropping the beacon. Bathymetric data were obtained with a 3.5-kHz echo-sounder using Raytheon recorders. The depths were read on the basis of an assumed 1463-m/s sound velocity. The water depth (in meters) at each site was corrected using the Matthews (1939) tables, after adjusting for the depth of the hull transducer (6 m below sea level). Depths referred to the rig floor are assumed to be 10 m above the water line.

The standard seismic sources used aboard the *JOIDES Resolution* during Leg 102 were two 80-in.^{3} water guns. The seismic data were processed using a super-micro 561 Masscomp computer. A 15-in.-wide Printonix high-resolution graphic printer (160 dots/in.) and a 22-in.-wide Versatec plotter (200 dots/ in.) were available to plot the data. The raw data were recorded on tape, using an SEG-Y format and a density of 1600 bpi. Real-time seismic data were also displayed in analog format on two EDO 550 dry-paper recorders before processing but after passing through an amplifier and two band-pass filters. All geophysical survey data collected during Leg 102 are presented in the "Geophysical Profiling" chapter.

SHIPBOARD SCIENTIFIC PROCEDURES

Interstitial Waters

Borehole waters were analyzed for pH, alkalinity, salinity, chlorinity, calcium, magnesium, sulfate, ammonia, nitrate, dissolved iron, and silica during Leg 102. IAPSO standard seawater is the primary standard for water analyses aboard ship. Alkalinity and pH were determined using a Metrohm titrator with a Brinkmann combination pH electrode. The pH value of the sample was calibrated with 4.01, 6.86, and 7.41 buffer standards; readings were taken in millivolts and then converted to pH. The pH measurements were made immediately before the alkalinity measurements. The 5–10-mL interstitial-water sample, after being tested for pH, was titrated with 0.1 NHCl, using a potentiometric titration (Gieskes, 1973).

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[1] Salisbury, M. H., Scott, J. H., Auroux, C. A., et al., *Proc., Init. Repts. (Pt. A), ODP*, 102.

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Salinity was determined using a Goldberg optical refractometer that measures the total dissolved solids. Sayles et al. (1970) found that this salinity agreed well with their measured ion sums.

Chlorinity was determined by titrating a 0.1-mL sample (diluted with 5 mL of deionized water) with silver nitrate. The Mohr titration uses potassium chromate as an indicator.

Calcium was determined by complexometric titration of a 0.5-mL sample with EGTA, using GHA as an indicator. To enhance the determination of the endpoint, the calcium-GHA complex was extracted into a layer of butanol (Gieskes, 1973). No correction was made for the strontium, which is also included in the result.

Magnesium was determined by EDTA titration for total alkaline earths (Gieskes, 1973). Subsequent subtraction of the calcium value (which also includes strontium) yielded the magnesium concentration in the water sample.

Calcium, magnesium, and sulfate values were also determined by ion-exchange chromatography.

Ammonia, nitrate, silica, and dissolved iron were determined using colorimetric analysis.

OBTAINING SAMPLES

Potential investigators wishing to obtain samples should refer to the ODP-NSF Sample Distribution Policy. Sample-request forms may be obtained from the Curator, Ocean Drilling Program, 1000 Discovery Drive, College Station, Texas 77840. Requests must be as specific as possible; include site, hole, core, section, interval within a section, and volume of sample required.

REFERENCES

Gieskes, J. M., 1973. Interstitial water studies, Leg 15. Alkalinity, pH, Mg, Ca, Si, PO_4 and NH_4. *In* Heezen, B. C., McGregor, I. G., et al., *Init. Repts. DSDP*, 20: Washington (U.S. Govt. Printing Office), 813–829.

Matthews, D. J., 1939. Table of velocity of sound in pore water and in seawater: London (Admiralty, Hydrographic Dept.).

Sayles, F. L., Manheim, F. T., and Chan, K. M., 1970. Interstitial water studies on small core samples, Leg 4. *In* Bader, R. G., Gerard, R. D., et al., *Init. Repts. DSDP*, 4: Washington (U.S. Govt. Printing Office), 401–414.