

DVDP AT THE FLORIDA STATE UNIVERSITY: CORE STORAGE AND SAMPLE DISTRIBUTION

Dennis S. CASSIDY

*Antarctic Research Facility, Department of Geology, Florida State University,
Tallahassee, Florida 32306, U.S.A.*

Abstract: Cores recovered by the Japan–New Zealand–United States Dry Valley Drilling Project (DVDP) in Antarctica are stored at the Florida State University's Antarctic Research Facility. More than 1100 m of DVDP drill core are stored at -23°C , from which 3471 samples have been distributed to authorized investigators worldwide. All cores remain in excellent condition, and further research interest in them is invited.

1. Introduction

The purpose of this article is to introduce the role of the Antarctic Research Facility at the Florida State University (FSU) within that of the Dry Valley Drilling Project (DVDP), and to provide a summary account of the status of the DVDP core collection curated at the Facility, including conditions of storage, sampling methods, and sample distribution totals.

The apparent anomaly of DVDP core storage being located in the state of Florida can be attributed to the wealth of unused, refrigerated storage space available within the Antarctic Marine Geology Research Facility and Core Library at FSU. A curatorial and research activity, the Facility was established by the National Science Foundation as a U.S. depository and research center for geological materials collected in the Southern Ocean. Since 1962, the permanent staff of the Facility have maintained the marine geology shipboard coring program aboard the research vessels, USNS ELTANIN and ARA ISLAS ORCADAS. In addition to the DVDP materials, the Facility presently houses more than 11000 m of ELTANIN/ISLAS ORCADAS marine sediment cores, as well as a variety of core and dredge sediments collected in both polar regions under the auspices of the U.S. National Science Foundation.

In December, 1972, Dr. James H. ZUMBERGE, Chairman of the U.S. Academy of Sciences Committee on Polar Research, appointed Dr. Sayed Z. EL-SAYED to the task of performing an on-site inspection of the Facility in order to evaluate its capabilities necessary to the handling, storage, and sample distribution of DVDP core specimens. The result of this visit was that the Facility was designated the domestic repository for DVDP sedimentary materials.

In retrospect, this arrangement has proven highly satisfactory, and represents

a unique, cooperative effort in that the Facility functions as a satellite sample distribution and storage center for DVDP materials under the direction and guidance of the U.S. project coordinator, Prof. Lyle D. MCGINNIS at the Northern Illinois University.

2. Core Storage

DVDP core storage at FSU totals more than 1100 m of P, H, N, and B drill core packaged in 408 core boxes. This includes all core from the 15 drill sites, except for cores from DVDP holes 1, 2 and 3, and basement core below 10.52 m from hole 6; these are stored at the Northern Illinois University. From U.S. ports of entry, the cores were shipped to the Facility by refrigerated truck transportation at temperatures below -15°C . Upon receipt, they were immediately placed in a low temperature storage vault maintained at a constant temperature of -23°C .

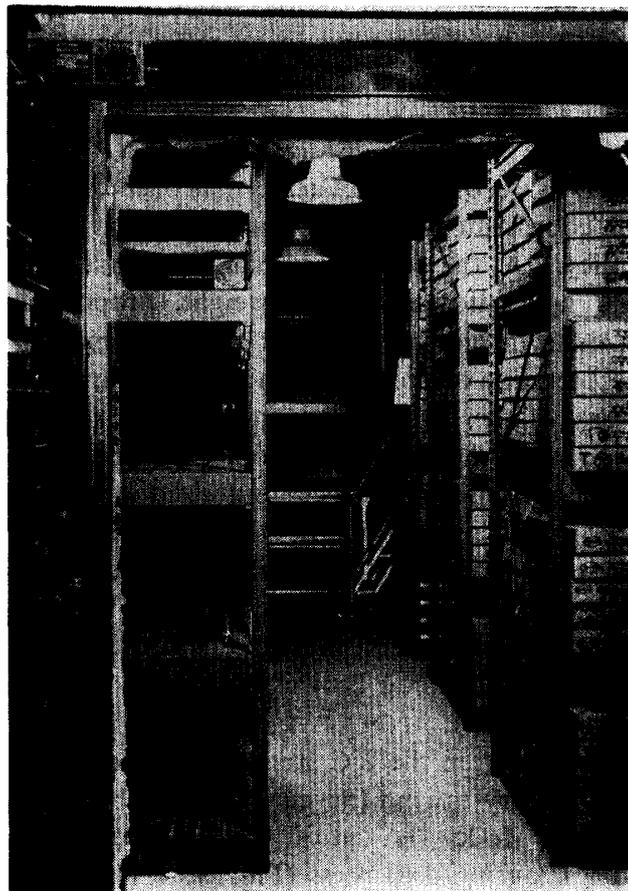


Fig. 1. Dry Valley Drilling Project cores stored at -23°C . Rack units are modular and can be reassembled as necessary without the use of connective hardware.

This vault is located within a larger refrigerated storage room (2°C), and comprises 40 of the 510 square meters of refrigerated storage space available at the Facility. The 408 core boxes are arranged (Fig. 1) on modular, bulk storage rack units with a total shelf capacity of about 700 core boxes. A duplicate, backup refrigeration unit has been installed to provide continuous service in the event of failure of the main unit.

DVDP core was received in three shipments following the termination of the last three drilling seasons. Cores from DVDP sites 4–9 were received during May, 1974; cores from sites 10–13 were received during March, 1975, and cores from sites 14 and 15 during May, 1976.

Essentially, the cores remain in excellent condition for further sampling, since frozen storage has preserved the structural integrity of the ice-cemented sediments. In some lithologies, a loosely-consolidated, friable outer rind has developed due to the migration of ice out of the core by sublimation. In these cases, it is difficult to prevent some sediment loss in handling and sampling due to crumbling of the rind. Also, certain geochemical studies of interstitial water may no longer be feasible due to moisture loss.

3. Sampling

All sampling of DVDP core at the Facility has been carried out with the direct approval of the U.S. coordinator of the project according to the terms of the official DVDP sampling policy. At the time of sampling, information concerning the hole and box number, sample interval, sample weight, proportion of core diameter sampled, and other data, including comments as may be necessitated, for example, by problems of interpretation are recorded on a sample inventory form. Prepared in triplicate, one copy of the form is forwarded to the investigator receiving the samples, another is forwarded to the DVDP office at the Northern Illinois University, at which institution is maintained a computerized inventory of all DVDP samples, and the third copy remains in the DVDP file at FSU. Additional inventory control is provided by the placement of sample identification cards at the point of sampling within each core box, and by the recording of sample intervals and their locations, keyed to the investigator, on individually printed sets of core box photos which appear in Dry Valley Drilling Project Bulletin Nos. 3, 5 and 7, prepared at the Northern Illinois University.

All sampling is done within the 2°C storage room, and is effected by chiseling and handsawing (rarely), dry sawing (no cutting fluid) by circular, diamond blade utilizing a Felker Di-Met Model 41A cut-off saw, or by diamond core-drilling using a 38 cm, floor model, Clausing drill press (Fig. 2). The latter method makes use of a pre-cooled drill bit using compressed air as a drilling “fluid”, and was developed by Dr. Don ELSTON of the U.S. Geological Survey to obtain oriented sample “plugs”

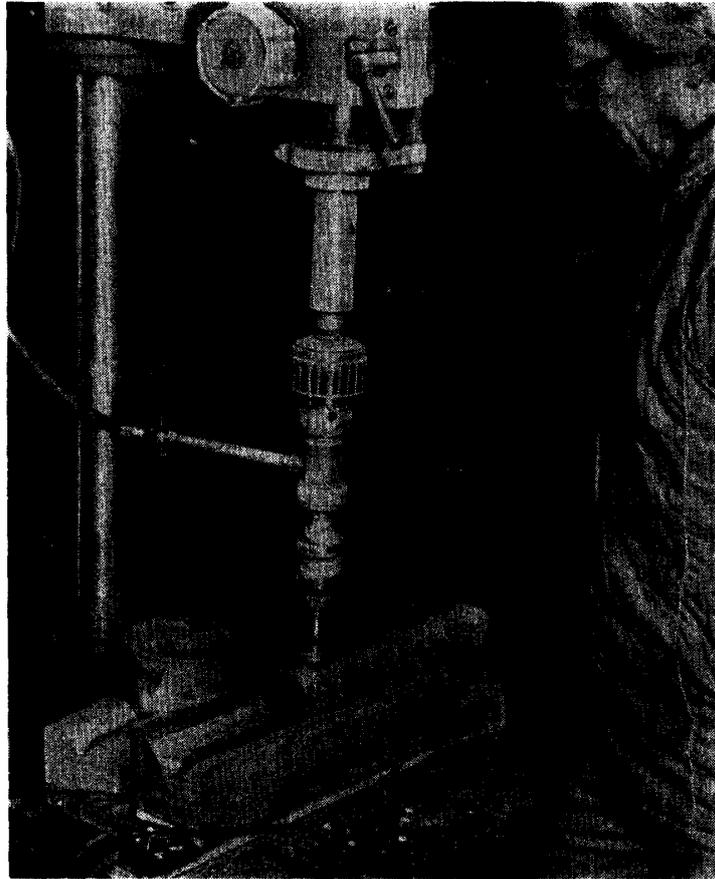


Fig. 2. Frozen Dry Valley Drilling Project core segment being dry-drilled for paleomagnetic sample plug by Don ELSTON, U.S. Geological Survey.

for paleomagnetic studies of DVDP cores.

4. Sample Distribution

Initial sampling and inspection of the DVDP materials at FSU began in August, 1974 with a contingent of seven visiting investigators coordinated by Dr. Peter N. WEBB. A second DVDP core sampling and inspection session was hosted by the Facility on 7, 8 and 9 July, 1975, involving twelve specialists in polar studies, and coordinated jointly by Lyle D. MCGINNIS and Mort D. TURNER. For purposes of both sampling and core inspection, a total of 24 scientists have been received by the Facility. An additional six investigators have received samples on the basis of letter requests as have many of those who journeyed to the Facility.

A total of 3471 samples have been distributed from the DVDP collection at FSU over a four year period. This total does not include samples removed from the cores prior to their arrival at the Facility, nor the redistribution of sample portions

SAMPLE RECIPIENT ¹	TOTAL NUMBER OF SAMPLES RECEIVED BY RECIPIENT PER HOLE NUMBER ² :															SAMPLE TOTALS PER RECIPIENT
	4	4A	5	5A	6	7	8	9	10	11	12	13	14	15		
BARRETT							7	2	1	18					53	81
BRADY		89													65	154
CAMERON							42	35								77
CLARIDGE									60							60
DECKER									36	74	35		11			156
ELSTON							104	18	147	363	147					779
HENDY							10			9	25					44
JONES	12	17	2			2	2					8	22	18	83	
LING	2	11					24	3	37	139	29			21	266	
MANDRA	2	11					20	3	37	139	29				241	
Mc COLLUM	2	11					25	3	37	139	29				246	
Mc GINNIS	1	3	2		3	1	29	2	36	65	33	8	7	10	200	
PORTER							33		5	35					73	
STUIVER							50	15	20	150	84				319	
TORII													36		36	
TREVES														78	78	
WEBB	5	13				7	99	17	59	268	67	5	22		562	
WRENN											16				16	
SAMPLE TOTALS PER HOLE NUMBER	24	155	4	0	3	10	445	98	475	1399	494	21	98	245	3,471	

¹NOTE: ALTHOUGH OTHER INVESTIGATORS ARE INVOLVED IN RESEARCH USING THESE SAMPLES, ONLY THE INDIVIDUALS TO WHOM SAMPLES HAVE BEEN OFFICIALLY ASSIGNED ARE LISTED.

²HOLE 4, 4A: LAKE VANDA HOLE 7: LAKE FRYKELL HOLE 10: NEW HARBOR HOLE 13: DON JUAN POND
HOLE 5, 5A: DON JUAN POND HOLE 8: NEW HARBOR HOLE 11: COMMONWEALTH GLACIER HOLE 14: NORTH FORK BASIN
HOLE 6: LAKE VIDA HOLE 9: NEW HARBOR HOLE 12: LAKE LEON HOLE 15: Mc MURDO SOUND

Fig. 3. Sample distribution from DVDP core stored at FSU.

by investigators to whom samples were distributed. Fig. 3 summarizes the sample distribution total according to the number of samples received per hole by investigators to whom the samples were assigned, and the number of samples distributed from each hole.

Further information concerning the DVDP cores at FSU and other aspects of the operation of the Antarctic Research Facility and its programs can be obtained by writing to the Curator of the Facility, as well as by reference to those articles appearing in the selected bibliography accompanying this report.

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