

FILE 1:

## SUMMARY OF SPECMAP ARCHIVE NO. 1

This archive, prepared as part of the NSF-funded SPECMAP Project, contains climatic time series of the past 400,000 years, as well as basic downcore and core-top data from which these time series are derived. Downcore records include (1) quantitative data on planktonic species and assemblages which reflect conditions in the surface waters of the Atlantic Ocean; (2) estimates of sea-surface temperature derived from these faunal data; and (3) measurements of O-18, C-13 difference (planktic and benthic), and Cd/Ca. The age model used to transform each downcore record into a time series by correlation of its O-18 record with the published O-18 chronology of Imbrie et al. (1984) is given. Time series with uniformly spaced samples may be calculated by linear interpolation.

The O-18 chronologies of Imbrie et al. (1984) and Martinson et al. (1987) are given for reference, as well as orbital time series taken from the work of Berger (1978a,b).

Also archived are N. G. Kipp's Atlantic core-top foraminiferal data and SST equations FA20 and UW7 derived from them by procedures described in Kipp (1976). FA20 is used to derive SST estimates for cores V25-21, V30-49, V25-59, V25-56, V30-40, RC24-16, V22-174, and RC12-294. Equation UW7, designed for upwelling areas in the southeast Atlantic is used to estimate temperature variations in RC13-228. SST estimates for other cores are based on equations and data referenced on Table 1 in the printed memorandum which accompanies this archive.

Data and models archived here are the basis for the paleoclimatic time series analyzed in "Oceanic Response to Orbital Forcing in the Late Quaternary: Observational and Experimental Strategies", by J. Imbrie, A. McIntyre, and A. C. Mix. This paper is scheduled for publication in 1989 in 'Climate and Geosciences, A Challenge for Science and Society in the 21st Century', A. Berger, S. H. Schneider, and J.-C. Duplessy, eds., D. Reidel Publishing Company. Table 2 gives the parameters of time series analyzed in this paper.

Parts of this archive are referenced in "Surface water response of the equatorial Atlantic Ocean to orbital forcing" by McIntyre et al., 1989, *Paleoceanography*, v. 4, p. 19-55.

Many of the data and models in this archive have been generated as part of the SPECMAP project. Other data sources are listed in Table 1 in the printed memo which accompanies this archive. These include unpublished data of T. J. Crowley, J. D. Hays, N. G. Kipp, A. McIntyre, A. C. Mix, W. F. Ruddiman, and N. J. Shackleton.

This archive was compiled at Brown University by A. Duffy and J. Imbrie with the assistance of A. C. Mix and A. McIntyre. Financial support came from NSF SPECMAP grants: ATM-8319372 (Brown University), ATM-8318850 (Columbia University) and ATM83-19371-03 (Oregon State University).

Archive submitted March 6, 1989

This tape contains 101 files. The 16 files of the first group contain oxygen isotope data for 13 cores and three stacked records. File 14 contains Cd/Ca data in addition to O-18. The files are as follows:

- file 2: O-18 data for core RC12-294
- file 3: O-18 data for core RC13-228
- file 4: O-18 data for core RC24-16
- file 5: O-18 data for core V12-122
- file 6: O-18 data for core V22-174
- file 7: O-18 data for core V25-21
- file 8: O-18 data for core V25-56
- file 9: O-18 data for core V25-59
- file 10: O-18 data for core V30-40
- file 11: O-18 data for core V30-97
- file 12: O-18 data for core V30-49
- file 13: O-18 data for core RC11-120
- file 14: O-18 and Cd/Ca data for core AII107
- file 15: Stacked benthic O-18 record vs depth in reference core V19-29 (graphic correlation depth stack)
- file 16: Stacked planktic O-18 record vs depth in reference core V28-238 (graphic correlation depth stack)
- file 17: SPECMAP STACK, i.e., SPECMAP time scale developed by Imbrie et al., 1984 based on normalized planktonic records (normalized O-18 vs time). This chronology is the basic control for the age models developed in Imbrie et al., 1989 and McIntyre et al., 1989.

The 19 files of the next group give the depth-age relationship for 17 cores and two stacked records. The files are as follows:

- file 18: Age model for core AII107
- file 19: Age model for core K708-1
- file 20: Age model for core K708-7
- file 21: Age model for core RC12-294
- file 22: Age model for core RC13-228
- file 23: Age model for core RC24-16
- file 24: Age model for core V12-122
- file 25: Age model for core V19-30
- file 26: Age model for core V22-174
- file 27: Age model for core V25-21
- file 28: Age model for core V25-56
- file 29: Age model for core V25-59
- file 30: Age model for core V27-116
- file 31: Age model for core V30-40
- file 32: Age model for core V30-49
- file 33: Age model for core V30-97
- file 34: Age model for core RC11-120
- file 35: Age model for graphic correlation benthic O-18 stack (Martinson et al., 1987)
- file 36: Age model for graphic correlation planktic O-18 stack in Prell et al., 1986. The age model here is the Imbrie et al., 1984 age model for V28-238.

The next 15 files contain sea surface temperature estimates vs depth in core. The files are as follows:

- file 37: SST estimates for core K708-1
- file 38: SST estimates for core K708-7
- file 39: SST estimates for core RC12-294
- file 40: SST estimates for core RC13-228
- file 41: SST estimates for core RC24-16

file 42: SST estimates for core V12-122  
file 43: SST estimates for core V22-174  
file 44: SST estimates for core V25-21  
file 45: SST estimates for core V25-56  
file 46: SST estimates for core V25-59  
file 47: SST estimates for core V27-116  
file 48: SST estimates for core V30-40  
file 49: SST estimates for core V30-49  
file 50: SST estimates for core V30-97  
file 51: SST estimates for core RC11-120 (Radiolaria)

Files 52 - 66 of the next group contain SST estimates interpolated at evenly spaced time intervals. File 67 contains Cd/Ca data from core All107 at evenly spaced times. The files are as follows:

file 52: SST vs time for core K708-1  
file 53: SST vs time for core K708-7  
file 54: SST vs time for core RC12-294  
file 55: SST vs time for core RC13-228  
file 56: SST vs time for core RC24-16  
file 57: SST vs time for core V12-122  
file 58: SST vs time for core V22-174  
file 59: SST vs time for core V25-21  
file 60: SST vs time for core V25-56  
file 61: SST vs time for core V25-59  
file 62: SST vs time for core V27-116  
file 63: SST vs time for core V30-40  
file 64: SST vs time for core V30-49  
file 65: SST vs time for core V30-97  
file 66: SST vs time for core RC11-120  
file 67: Cd/Ca vs time for core All107

Files 68,69 contain delta del 13-C data for the Curry-Crowley stack and for V19-30 respectively. In both files, the data is given at evenly spaced time intervals.

File 70 is a memo describing the format used by CLIMAP in its files of census counts of foraminifera. Files 71,72 contain the counts from the core top samples used in deriving two paleoecological equations. Files 73 - 80 give species abundances vs depth for eight cores. The files are as follows:

file 70: Memo on CLIMAP format  
file 71: core top data used in deriving equation FA20  
file 72: core top data used in deriving equation UW7 for upwelling areas.  
file 73: Planktic foram counts for core RC24-16  
file 74: Planktic foram counts for core V25-59  
file 75: Planktic foram counts for core V30-40  
file 76: Planktic foram counts for core V30-49  
file 77: Planktic foram counts for core RC12-294  
file 78: Planktic foram counts for core RC13-228  
file 79: Planktic foram counts for core V12-122  
file 80: Planktic foram counts for core V22-174

Files 81-94 contain estimated varimax factor loadings (b-hat matrices) for 14 cores. The product of b-hat matrix and equation vector gives estimated sea surface temperature vector. Except for core V12-122 and those in upwelling areas, the FA20 equation was used for most cores. For V12-122, FA3 was used. The files are as follows:

file 81: B-hat matrix for core K708-1  
file 82: B-hat matrix for core K708-7  
file 83: B-hat matrix for core RC12-294  
file 84: B-hat matrix for core RC13-228  
file 85: B-hat matrix for core RC24-16  
file 86: B-hat matrix for core V12-122  
file 87: B-hat matrix for core V22-174  
file 88: B-hat matrix for core V25-21  
file 89: B-hat matrix for core V25-56  
file 90: B-hat matrix for core V25-59  
file 91: B-hat matrix for core V27-116  
file 92: B-hat matrix for core V30-97  
file 93: B-hat matrix for core V30-49  
file 94: B-hat matrix for core V30-40

Files 95 - 97 contain paleoecological equations relating sea surface temperature and varimax factor loadings. The equations come in sets of two, one for the cold season and one for the warm. The files are as follows:

file 95: The paleoecological equations for upwelling areas, UW7  
file 96: The paleoecological equations FA20 based on Atlantic core top data.  
file 97: FA3, an earlier version of equation FA20 used in estimating SSTs for V12-122

Files 98-100 contain the factor score matrices (transposed) obtained from factor analysis of core top data. These matrices describe the composition of the varimax assemblages in terms of the faunal species. The product of the normalized data matrix and this matrix gives the b-hat matrix. The files are as follows:

file 98: F-matrix used in deriving UW7  
file 99: F-matrix used in deriving FA20  
file 100: F-matrix used in deriving FA3

file 101: This file contains orbital information.  
It gives ETP, the sum of normalized eccentricity, obliquity, and (negative) precession index in column 2, long term variations in eccentricity, obliquity, and precession index in columns 3,4,and 5, and eccentricity with its 413ky component notched out in column 6. Column 1 gives time (ka).