MACHINE-READABLE FILES DEVELOPED FOR THE HIGH PLAINS REGIONAL AQUIFER-SYSTEM

ANALYSIS IN PARTS OF COLORADO, KANSAS, NEBRASKA, NEW MEXICO, OKLAHOMA,

SOUTH DAKOTA, TEXAS, AND WYOMING

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UNITED STATES DEPARTMENT OF THE INTERIOR

DONALD PAUL HODEL, Secretary

GEOLOGICAL SURVEY

Dallas L. Peck, Director

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ABSTRACT

This report describes the machine-readable files developed for the High Plains Regional Aquifer-System Analysis project that are stored on two magnetic tapes and are available from the U.S. Geological Survey. The first tape contains computer programs that were used to prepare, store, retrieve, organize, and preserve the areal interpretive data collected by the project staff. The second tape contains 134 data files that can be divided into five general classes: (1) Aquifer-geometry data, (2) aquifer and water characteristics, (3) water levels, (4) climatological data, and (5) land- and water-use data.

INTRODUCTION

The machine-readable files described in this report were assembled as part of the High Plains Regional Aquifer-System Analysis (RASA) project and include computer programs and geohydrologic data. The computer programs were used to manage the data which in turn were used to generate various reports (see "Selected References"), hydrologic analyses, and aquifer simulations. This report provides a description of the characteristics and contents of two magnetic tapes--the computer software tape and the data tape.

The computer software tape consists of 29 files of programs and supporting files that were used to prepare, store, retrieve, organize, and preserve the data collected and compiled by the High Plains RASA project. Each computer program was placed in a separate file; the supporting files were combined into related groups. These programs are described and documented in two reports (Luckey and Ferrigno, 1982; Ferrigno, 1986).

The data tape consists of 134 files that can be divided into five general classes: (1) Aquifer-geometry data, (2) aquifer and water characteristics, (3) water levels, (4) climatological data, and (5) land- and water-use data. A description of these classes of data can be found in the report by Luckey and Ferrigno (1982). These data were stored in a data base that was managed using a commercial data-base management system (DBMS) called System 2000[1].

The magnetic tapes are stored at the U.S. Geological Survey's National Computer Center, Reston, Va.; additional information and copies of individual files or tapes may be obtained from: Office of the Chief Hydrologist, Water Resources Division, U.S. Geological Survey, Mail Stop 409, National Center, 12201 Sunrise Valley Drive, Reston, VA 22092.

PHYSICAL CHARACTERISTICS OF THE MAGNETIC TAPES

The physical characteristics of the magnetic tapes were chosen to make the tapes compatible with a wide variety of computer systems. For example, the density and block-size values are small so that the tapes can be read using a minicomputer or a microcomputer.

The magnetic tapes have the following physical characteristics:

Tracks:	9
Density:	1600 BPI (bits per inch)
Labels:	None
Record Length (Fixed):	80 bytes
Block Size:	2,000 bytes
Code:	ASCII.

The magnetic tapes were generated on an Amdahl 470V/7 computer located at the U.S. Geological Survey's National Computer Center in Reston, Va. Each computer program, supporting file, or data file was initially stored as a sequential file or member of a partitioned-data set on a disk-storage device. The files were copied to a magnetic tape using an IBM utility program called IEBGENER.

DATA-BASE PROGRAMS AND SUPPORTING FILES

The machine-readable files that are stored on magnetic-tape number 220452 can be divided into four categories: (1) Source code for computer programs, (2) IBM Job Control Language (JCL) for executing the programs, (3) files containing variable declarations used by some of the computer programs, and (4) miscellaneous information. Listed in table 1 are the files in the order in which they were stored on the magnetic tape.

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[1]The use of brand names in this report is for identification purposes only and does not constitute endorsement by the U.S. Geological Survey.

The computer programs (files 1 through 23 in table 1) can be divided into three categories: (1) Data-preparation programs, (2) programs that interact with the data base and the DBMS, and (3) data-application programs. These programs were written in either Fortran IV or PL/1. A detailed description of the programs can be found in two reports published by the High Plains RASA project (Luckey and Ferrigno, 1982; Ferrigno, 1986).

Files 1 through 5 on magnetic-tape number 220452 contain the data-preparation programs. All of these programs were written in Fortran IV. These programs were part of an automated procedure that was used to generate some of the data for the High Plains RASA project. The source materials for the data usually were geohydrologic maps. The output from the last data-preparation program (file 5 in table 1) consists of data sets in the format needed for loading into the data base.

Files 6 through 16 on magnetic-tape number 220452 contain the programs that interact with the data base and the DBMS. These programs were linked to System 2000 (the DBMS) by means of subroutines provided by the developers of System 2000. The Edit and Retrieval Programs (files 6, 9, and 10 in table 1) were written in Fortran IV. All other programs in this group (files 7, 8, and 11 through 16 in table 1) were written in PL/1. The programs in files 6 through 16 perform functions such as loading, retrieving, and updating data stored in the data base.

Files 17 through 23 on magnetic-tape number 220452 contain the programs that use data retrieved from the data base. All of these programs were written in PL/1. Among other functions, these programs can be used for mathematical manipulations and graphical display of data. The Graphics Program uses two computer programs produced by Calcomp Computer Products, Inc.

Files 24 through 26 on magnetic-tape number 220452 contain the procedures, written in IBM JCL, to execute the computer programs. These procedures were written to be used on the Amdahl 470V/7 computer in Reston, Va., and make reference to files that are stored on a 3350-type disk-storage device. File 24 contains the procedures for executing the data-preparation programs. File 25 contains the procedures for executing the programs that access the data base and the DBMS. File 26 contains the procedures for executing the data-application programs. Files 27 and 28 on magnetic-tape number 220452 contain the variable declarations needed to link the programs in files 6 through 16 with the System 2000 DBMS.

File 29 on magnetic-tape number 220452 contains the following miscellaneous information: (1) A list of parameter names, (2) the data-base definition in the form required by System 2000, (3) the list of error messages used by the Edit and Retrieval Programs, and (4) several short files containing information needed by the IBM procedures for the programs that access the data base and the DBMS. Most of the information in this file would be needed only if the data were to be stored in a data base managed by the System 2000 DBMS.

Table 1.--*Data-base programs and supporting files*

File number	Contents and documentation
1	Digitizer Data-Conversion Program; documented in Luckey and Ferrigno (1982, p. 33).
2	First Data-Gridding Program; documented in Luckey and Ferrigno (1982, p. 37).
3	Second Data-Gridding Program; documented in Luckey and Ferrigno (1982, p. 40).
4	Boundary-Matrix Generation Program; documented in Luckey and Ferrigno (1982, p. 43).
5	Excess Data-Elimination Program; documented in Luckey and Ferrigno (1982, p. 45).
6	Edit Program; documented in Luckey and Ferrigno (1982, p. 48).
7	Load Program; documented in Luckey and Ferrigno (1982, p. 54).
8	Load Program subroutines.
9	Retrieval Program; documented in Luckey and Ferrigno (1982, p. 61).
10	Retrieval Program subroutines.
11	Instant-Update Program; documented in Luckey and Ferrigno (1982, p. 66).
12	Instant-Update Program subroutines.
13	Move Program; documented in Luckey and Ferrigno (1982, p. 77).
14	Statistics Program; documented in Luckey and Ferrigno (1982, p. 80).
15	General-Update Program; similar program documented in Ferrigno (1986, p. 45).
16	Reload Program; similar program documented in Ferrigno (1986, p. 65).
17	Data-Transformation Program; documented in Luckey and Ferrigno (1982, p. 83).

Table 1.--*Data-base programs and supporting files*--Continued

File number	Contents and documentation
18	Data-Transformation Program subroutines.
19	Interpolation Program; documented in Luckey and Ferrigno (1982, p. 83).
20	Data-Manipulation Program; documented in Luckey and Ferrigno (1982, p. 93).
21	Data-Manipulation Program--version 2; similar program documented in Ferrigno (1986, p. 77).
22	Graphics Program; documented in Luckey and Ferrigno (1982, p. 97).
23	Graphics Program subroutines and supporting programs.
24	IBM procedures for data-preparation programs; documented in Luckey and Ferrigno (1982).
25	IBM procedures for programs that access the data base and the data-base management system; documented in Luckey and Ferrigno (1982).
26	IBM procedures for data-application programs; documented in Luckey and Ferrigno (1982).
27	Variable declarations for Fortran programs that access the data base and the data-base management system; discussed in this report on page 3.
28	Variable declarations for PL/1 programs that access the data base and the data-base management system; discussed in this report on page 3.
29	Miscellanea; discussed in this report on page 3.

DATA-BASE PARAMETERS

Listed in table 2 are the contents of magnetic-tape number 220451. This magnetic tape contains a sequential version of the data originally stored in the data base.

The second column of table 2 contains the study unit. The study unit identifies the geographic area that is covered by the parameter. The study unit has three possible values: (1) HIPLAINS indicates that the data cover the entire High Plains aquifer; (2) NEBRASKA indicates that the data cover Chase, Dundy, and Perkins Counties in Nebraska; and (3) TEXAS indicates that the data cover Castro and Parmer Counties in Texas.

The fourth column of table 2 is the density at which the data were stored in the data base. The possible values are 1 through 4. A density of 1 indicates one value for each 3-degree latitude-longitude block that was partially or completely within the area defined by the study unit. A density of 2 indicates one value for each 1-degree latitude-longitude block that was partially or completely within the area defined by the study unit. A density of 3 indicates one value for each 10-minute latitude-longitude block that was partially or completely within the area defined by the study unit. The most detailed data were stored at density 4. A density of 4 indicates one value for each 1-minute latitude-longitude block that was partially or completely within the area defined by the study unit. A further discussion of the density concept can be found in Luckey and Ferrigno (1982).

Table 2.--*Data-base parameters*

[MSL = mean sea level; Mg/L = milligrams per liter; URNRD = Upper Republican Natural Resources District;
HPUWCD = High Plains Underground Water Conservation District]
Gal/day/ft = gallons per day per foot;

File number	Study unit	Parameter name	Density	Number of points	Units of measurement	Description
1	HIPLAINS	ANNUAL LAKE EVAPORATION	2	77	Inches	Data from U.S. Department of Commerce (1977, p. 63).
2	HIPLAINS	ANNUAL NORMAL PRECIPITATION	2	77	Inches	Data from U.S. Department of Commerce (1977, p. 43).
3	HIPLAINS	BASE OF AQUIFER - ALTITUDE	4	166,639	Feet	Altitude above MSL; from Weeks and Gutentag (1981).
4	HIPLAINS	BASE OF AQUIFER - GEOLOGY	3	2,001	Coded	Codes explained in file remarks records; data from Weeks and Gutentag (1981).
5	HIPLAINS	BOUNDARY	4	518,400	Coded	Codes explained in file remarks records.
6	HIPLAINS	CROP REQUIREMENT - ALFALFA	2	77	Inches	Irrigation demand for normal climatic year; from Heimes and Luckey (1982, table 3).
7	HIPLAINS	CROP REQUIREMENT - CORN	2	77	Inches	Do.
8	HIPLAINS	CROP REQUIREMENT - COTTON	2	77	Inches	Do.
9	HIPLAINS	CROP REQUIREMENT - DRY BEANS	2	77	Inches	Do.
10	HIPLAINS	CROP REQUIREMENT - SORGHUM	2	77	Inches	Do.
11	HIPLAINS	CROP REQUIREMENT - SOYBEANS	2	77	Inches	Do.
12	HIPLAINS	CROP REQUIREMENT - SUGAR BEETS	2	77	Inches	Do.
13	HIPLAINS	CROP REQUIREMENT - WHEAT	2	77	Inches	Do.

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Table 2.—Data-base parameters--Continued

File number	Study unit	Parameter name	Density	Number of points	Units of measurement	Description
14	HIPLAINS	DISSOLVED SOLIDS	3	2,001	Mg/L	Concentration in ground water; from Krothe and others (1982).
15	HIPLAINS	DRYLAND - 1978 - LANDSAT	4	174,871	Percent	Percent of area in dryland crops determined from Landsat imagery; see Thelin and Heimes (1986).
16	HIPLAINS	HYDRAULIC CONDUCTIVITY	3	1,781	Feet/day	See Gutentag and others (1984, fig. 10).
17	HIPLAINS	IRRIGATED LAND - 1949 - CENSUS	3	1,781	Acres	Data from U.S. Department of Commerce (1949-78); see Gutentag and others (1984, figs. 18-20).
18	HIPLAINS	IRRIGATED LAND - 1954 - CENSUS	3	1,781	Acres	Do.
19	HIPLAINS	IRRIGATED LAND - 1959 - CENSUS	3	1,781	Acres	Do.
20	HIPLAINS	IRRIGATED LAND - 1964 - CENSUS	3	1,781	Acres	Do.
21	HIPLAINS	IRRIGATED LAND - 1969 - CENSUS	3	1,781	Acres	Do.
22	HIPLAINS	IRRIGATED LAND - 1974 - CENSUS	3	1,781	Acres	Do.
23	HIPLAINS	IRRIGATED LAND - 1978 - CENSUS	3	1,781	Acres	Do.
24	HIPLAINS	IRRIGATED LAND - 1978 -LANDSAT	4	174,871	Percent	Percent of area irrigated determined from Landsat imagery; see Thelin and Heimes (1986).
25	HIPLAINS	IRRIGATED LAND - 1980 -LANDSAT	4	168,623	Percent	Do.
26	HIPLAINS	IRRIGATION DEMAND - 1949	3	1,781	Inches	Composite irrigation demand for all crops; from Heimes and Luckey (1982, table 4).
27	HIPLAINS	IRRIGATION DEMAND - 1954	3	1,781	Inches	Do.

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Table 2.--Data-base parameters--Continued

File number	Study unit	Parameter name	Density	Number of points	Units of measurement	Description
28	HIPLAINS	IRRIGATION DEMAND - 1959	3	1,781	Inches	Composite irrigation demand for all crops; from Heimes and Luckey (1982, table 4).
29	HIPLAINS	IRRIGATION DEMAND - 1964	3	1,781	Inches	Do.
30	HIPLAINS	IRRIGATION DEMAND - 1969	3	1,781	Inches	Do.
31	HIPLAINS	IRRIGATION DEMAND - 1974	3	1,781	Inches	Do.
32	HIPLAINS	LAND SURFACE	3	1,781	Feet	Altitude above MSL; see file remarks records.
33	HIPLAINS	RANGELAND - 1978 - LANDSAT	4	174,871	Percent	Percent of area in rangeland determined from Landsat imagery; see Thelin and Heimes (1986).
34	HIPLAINS	S.W. IRR. LAND - 1959 - CENSUS	3	1,781	Acres	Area irrigated by surface water; from U.S. Department of Commerce (1949-78).
35	HIPLAINS	SODIUM CONCENTRATION	3	2,001	Mg/L	Concentration in ground water; from Krothe and others (1982).
36	HIPLAINS	SOIL TYPE	3	1,781	Coded	Codes explained in file remarks records; see Gutentag and others (1984, fig. 14).
37	HIPLAINS	SPECIFIC YIELD	3	1,781	Percent	Estimated from drillers' logs; see Gutentag and others (1984, fig. 11).
38	HIPLAINS	WATER TABLE - PRED	4	166,639	Feet	Altitude above MSL, predevelopment; see Gutentag and others (1984, fig. 12).

Table 2.--Data-base parameters--Continued

File number	Study unit	Parameter name	Density	Number of points	Units of measurement	Description
39	HIPLAINS	WATER TABLE - 1960	4	166,639	Feet	Altitude above MSL; see file remarks records.
40	HIPLAINS	WATER TABLE - 1965	4	166,639	Feet	Do.
41	HIPLAINS	WATER TABLE - 1970	4	166,639	Feet	Do.
42	HIPLAINS	WATER TABLE - 1975	4	166,639	Feet	Do.
43	HIPLAINS	WATER TABLE - 1978	3	1,781	Feet	Altitude above MSL; see Gutentag and Weeks (1980).
44	HIPLAINS	WATER TABLE - 1980	4	166,639	Feet	Altitude above MSL; see Gutentag and others (1984, fig. 8).
45	NEBRASKA	IRR. LAND-1978-NRD	4	2,691	Acres	Irrigated acreage reported by URNRD.
46	NEBRASKA	IRR. LAND-1979-NRD	4	2,691	Acres	Do.
47	NEBRASKA	IRR. LAND-1980-NRD	4	2,691	Acres	Do.
48	NEBRASKA	IRR. LAND-1981-NRD	4	2,691	Acres	Do.
49	NEBRASKA	IRR. LAND-1982-NRD	4	2,691	Acres	Do.
50	NEBRASKA	IRR. LAND-1983-NRD	4	2,691	Acres	Do.
51	NEBRASKA	IRR. LAND-1984-NRD	4	2,691	Acres	Do.
52	NEBRASKA	BOUNDARY	4	7,200	Coded	Zero, outside study area; one, inside study area.

Table 2.--Data-base parameters--Continued

File number	Study unit	Parameter name	Density	Number of points	Units of measurement	Description
53	NEBRASKA	DRYLAND-1974-LANDSAT-SUMMER	4	2,676	Percent	Percent of area in dryland crops determined from Landsat imagery.
54	NEBRASKA	DRYLAND-1976-LANDSAT-SUMMER	4	2,608	Percent	Do.
55	NEBRASKA	DRYLAND-1978-LANDSAT-SUMMER	4	2,643	Percent	Do.
56	NEBRASKA	DRYLAND-1980-LANDSAT-SUMMER	4	2,691	Percent	Do.
57	NEBRASKA	DRYLAND-1983-LANDSAT-SUMMER	4	2,684	Percent	Do.
58	NEBRASKA	IRR. LAND-1974-LANDSAT-SUMMER	4	2,691	Percent	Percent of area irrigated determined from Landsat imagery.
59	NEBRASKA	IRR. LAND-1976-LANDSAT-SUMMER	4	2,691	Percent	Do.
60	NEBRASKA	IRR. LAND-1978-LANDSAT-SUMMER	4	2,691	Percent	Do.
61	NEBRASKA	IRR. LAND-1980-LANDSAT-SUMMER	4	2,691	Percent	Do.
62	NEBRASKA	IRR. LAND-1982-LANDSAT-SUMMER	4	2,690	Percent	Do.
63	NEBRASKA	IRR. LAND-1983-LANDSAT-SUMMER	4	2,691	Percent	Do.
64	NEBRASKA	IRR. LAND-1984-LANDSAT-SUMMER	4	2,691	Percent	Do.
65	NEBRASKA	NON-IRRLND-1984-LANDSAT-SUMMER	4	2,691	Percent	Percent of area not irrigated determined from Landsat imagery.
66	NEBRASKA	PUMPAGE - 1978 - ESTIMATED	4	2,691	Acre-feet	Estimated from URNRD and Landsat data.
67	NEBRASKA	PUMPAGE - 1979 - ESTIMATED	4	2,691	Acre-feet	Do.

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Table 2.--Data-base parameters--Continued

File number	Study unit	Parameter name	Density	Number of points	Units of measurement	Description
68	NEBRASKA	PUMPAGE - 1980 - NRD	4	2,691	Acre-feet	Determined from URNRD records.
69	NEBRASKA	PUMPAGE - 1981 - NRD	4	2,691	Acre-feet	Do.
70	NEBRASKA	PUMPAGE - 1982 - NRD	4	2,691	Acre-feet	Do.
71	NEBRASKA	PUMPAGE - 1983 - NRD	4	2,691	Acre-feet	Do.
72	NEBRASKA	PUMPAGE - 1984 - NRD	4	2,691	Acre-feet	Do.
73	NEBRASKA	RANGELAND-1974-LANDSAT-SUMMER	4	2,676	Percent	Percent of area in rangeland determined from Landsat imagery.
74	NEBRASKA	RANGELAND-1976-LANDSAT-SUMMER	4	2,608	Percent	Do.
75	NEBRASKA	RANGELAND-1978-LANDSAT-SUMMER	4	2,643	Percent	Do.
76	NEBRASKA	RANGELAND-1980-LANDSAT-SUMMER	4	2,691	Percent	Do.
77	NEBRASKA	RANGELAND-1983-LANDSAT-SUMMER	4	2,684	Percent	Do.
78	NEBRASKA	SOILS TYPE	4	2,691	Coded	Codes explained in file remarks records; see U.S. Department of Agriculture and others (1978).
79	NEBRASKA	SPECIFIC YIELD	4	2,691	Percent	Estimated from drillers' logs.
80	NEBRASKA	WATER-LEVEL CHANGE, 1975-83	4	2,691	Feet	Water-level change, spring 1975 to spring 1984, from observation wells.
81	TEXAS	ALTITUDE OF WATER TABLE - 1980	4	182	Feet	Altitude above MSL; from observation wells.
82	TEXAS	ALTITUDE: WATER TABLE - 1975	4	129	Feet	Altitude above MSL; from observation wells.

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Table 2.--Data-base parameters--Continued

File number	Study unit	Parameter name	Density	Number of points	Units of measurement	Description
83	TEXAS	APPLICATION RATES-1980	4	49	Inches/acre	Composite application for all crops.
84	TEXAS	BOUNDARY	4	7,200	Coded	Zero, outside study area; one, inside study area.
85	TEXAS	IRR. LAND-1974-LANDSAT-SPRING	4	1,638	Percent	Percent of area irrigated determined from Landsat imagery.
86	TEXAS	IRR. LAND-1974-LANDSAT-SUMMER	4	1,638	Percent	Do.
87	TEXAS	IRR. LAND-1976-LANDSAT-SPRING	4	1,638	Percent	Do.
88	TEXAS	IRR. LAND-1976-LANDSAT-SUMMER	4	1,638	Percent	Do.
89	TEXAS	IRR. LAND-1978-LANDSAT-SPRING	4	1,638	Percent	Do.
90	TEXAS	IRR. LAND-1978-LANDSAT-SUMMER	4	1,638	Percent	Do.
91	TEXAS	IRR. LAND-1980-LANDSAT-SPRING	4	1,638	Percent	Do.
92	TEXAS	IRR. LAND-1980-LANDSAT-SUMMER	4	1,638	Percent	Do.
93	TEXAS	IRR. LAND-1982-LANDSAT-SPRING	4	1,638	Percent	Do.
94	TEXAS	IRR. LAND-1982-LANDSAT-SUMMER	4	1,638	Percent	Do.
95	TEXAS	IRR. LAND-1983-LANDSAT-SPRING	4	1,637	Percent	Do.
96	TEXAS	IRR. LAND-1983-LANDSAT-SUMMER	4	1,638	Percent	Do.

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Table 2.--*Data-base parameters*--Continued

File number	Study unit	Parameter name	Density	Number of points	Units of measurement	Description
97	TEXAS	NON-IRRLND-1974-LANDSAT-SPRING	4	1,638	Percent	Percent of area not irrigated determined from Landsat imagery.
98	TEXAS	NON-IRRLND-1974-LANDSAT-SUMMER	4	1,638	Percent	Do.
99	TEXAS	NON-IRRLND-1976-LANDSAT-SPRING	4	1,638	Percent	Do.
100	TEXAS	NON-IRRLND-1976-LANDSAT-SUMMER	4	1,638	Percent	Do.
101	TEXAS	NON-IRRLND-1978-LANDSAT-SPRING	4	1,638	Percent	Do.
102	TEXAS	NON-IRRLND-1978-LANDSAT-SUMMER	4	1,638	Percent	Do.
103	TEXAS	NON-IRRLND-1980-LANDSAT-SPRING	4	1,638	Percent	Do.
104	TEXAS	NON-IRRLND-1980-LANDSAT-SUMMER	4	1,638	Percent	Do.
105	TEXAS	NON-IRRLND-1982-LANDSAT-SPRING	4	1,638	Percent	Do.
106	TEXAS	NON-IRRLND-1982-LANDSAT-SUMMER	4	1,638	Percent	Do..
107	TEXAS	NON-IRRLND-1983-LANDSAT-SPRING	4	1,637	Percent	Do.
108	TEXAS	NON-IRRLND-1983-LANDSAT-SUMMER	4	1,638	Percent	Do.
109	TEXAS	PRECIPITATION-1975	4	3	Inches	Climatological data (National Climatic Data Center, 1975-83).
110	TEXAS	PRECIPITATION-1976	4	3	Inches	Do.
111	TEXAS	PRECIPITATION-1977	4	3	Inches	Do.

Table 2.--*Data-base parameters*--Continued

File number	Study unit	Parameter name	Density	Number of points	Units of measurement	Description
112	TEXAS	PRECIPITATION-1978	4	3	Inches	Climatological data (National Climatic Data Center, 1975-83).
113	TEXAS	PRECIPITATION-1979	4	3	Inches	Do.
114	TEXAS	PRECIPITATION-1980	4	3	Inches	Do.
115	TEXAS	PRECIPITATION-1981	4	2	Inches	Do.
116	TEXAS	PRECIPITATION-1982	4	2	Inches	Do.
117	TEXAS	PRECIPITATION-1983	4	2	Inches	Do.
118	TEXAS	SAND THICKNESS	4	818	Feet	Estimated from drillers' logs.
119	TEXAS	SATURATED THICKNESS - 1980	4	792	Feet	Do.
120	TEXAS	SPECIFIC YIELD - 1980	4	822	Percent	Do.
121	TEXAS	TRANSMISSIVITY:1980	4	806	Gal/day/ft	Do.
122	TEXAS	WATER LEVEL 9 YEAR PERIOD	4	114	Feet	Water-level change, spring 1975 to spring 1984, from observation wells.
123	TEXAS	WATER LEVEL 5 YEAR PERIOD	4	118	Feet	Water-level change, spring 1975 to spring 1980, from observation wells.
124	TEXAS	WATER TABLE ALTITUDE:1984	4	174	Feet	Altitude above MSL; from observation wells.
125	TEXAS	WATER-LEVEL CHANGE, 1974	4	1,638	Feet	From unpublished map provided by HPUWCD No. 1.

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Table 2.--*Data-base parameters*--Continued

File number	Study unit	Parameter name	Density	Number of points	Units of measurement	Description
126	TEXAS	WATER-LEVEL CHANGE, 1975	4	1,638	Feet	From unpublished map provided by HPUWCD No. 1.
127	TEXAS	WATER-LEVEL CHANGE, 1976	4	1,638	Feet	Do.
128	TEXAS	WATER-LEVEL CHANGE, 1977	4	1,638	Feet	Do.
129	TEXAS	WATER-LEVEL CHANGE, 1978	4	1,638	Feet	Do.
130	TEXAS	WATER-LEVEL CHANGE, 1979	4	1,638	Feet	Do.
131	TEXAS	WATER-LEVEL CHANGE, 1980	4	1,638	Feet	Do.
132	TEXAS	WATER-LEVEL CHANGE, 1981	4	1,638	Feet	Do.
133	TEXAS	WATER-LEVEL CHANGE, 1982	4	1,638	Feet	Do.
134	TEXAS	WATER-LEVEL CHANGE, 1983	4	1,638	Feet	Do.

All of the data files were produced using the Retrieval Program (Luckey and Ferrigno, 1982, p. 61). A description of the records in the data files can be found in Luckey and Ferrigno (1982). The formats of these records are as follows:

001*: First master record

Columns	FORTRAN format	Content
01-04	A4	001*
05-10	6X	Blank
11-40	7A4,A2	Project name
41-49	I9	Reserved value A (Unused)
50-60	F11.3	Reserved value B (Unused)
61-70	2A4,A2	Reserved value C (Unused)
71-72	2X	Blank
73-80	I8	Sequence number, nondecreasing

002*: Second master record

Columns	FORTRAN format	Content
01-04	A4	002*
05-10	6X	Blank
11-18	2A4	Study unit
19-48	7A4,A2	Parameter name
49	I1	Density (see page 6)
50-52	I3	Scale factor (value x 10^{scale})
53-62	2A4,A2	Units of measurement - description
63-72	10X	Blank
73-80	I8	Sequence number, nondecreasing

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003*: Third master record

Columns	FORTRAN format	Content
01-04	A4	003*
05-10	6X	Blank
11-25	15X	Blank
26-30	I5	Minimum
31-35	I5	Maximum
36-40	I5	Average
41-47	I7	Number of values
48-55	F8.2	Standard deviation
56-62	7X	Blank
63-67	I5	Missing-value indicator (value used to flag missing data)
68-72	5X	Blank
73-80	I8	Sequence number, nondecreasing

050*: Remarks records

Columns	FORTRAN format	Content
01-04	A4	050*
05-10	6X	Blank
11-16	A4,A2	Date of remark (MMDDYY)
17-18	2X	Blank
19-21	I3	Remark sequence number
22	I1	Remark record number 1 = First record of set 2 = Second record of set 3 = Third record of set 4 = Fourth record of set 5 = Fifth record of set
23-72	12A4,A2	Text of remark
73-80	I8	Sequence number, nondecreasing

Note: The 050* records must come in sets of five.

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100*: Three-degree block record

Columns	FORTRAN format	Content
01-04	A4	100*
05-10	6X	Blank
11-16	I6	Latitude (DDMMSS)
17	1X	Blank
18-24	I7	Longitude (DDDMMSS)
25	1X	Blank
26-30	I5	Minimum
31-35	I5	Maximum
36-40	I5	Average
41-45	I5	Number of values
46-53	F8.2	Standard deviation
54-72	19X	Blank
73-80	I8	Sequence number, nondecreasing

200*: One-degree block record

Columns	FORTRAN format	Content
01-04	A4	200*
05-10	6X	Blank
11-16	I6	Latitude (DDMMSS)
17	1X	Blank
18-24	I7	Longitude (DDDMMSS)
25	1X	Blank
26-30	I5	Minimum
31-35	I5	Maximum
36-40	I5	Average
41-45	I5	Number of values
46-53	F8.2	Standard deviation
54-72	19X	Blank
73-80	I8	Sequence number, nondecreasing

350*: Ten-minute block record--10-minute data

Columns	FORTRAN format	Content
01-04	A4	350*
05-10	6X	Blank
11-16	I6	Latitude (DDMMSS)
17	1X	Blank
18-24	I7	Longitude (DDDMMSS)
25	1X	Blank
26-30	I5	Minimum
31-35	I5	Maximum
36-40	I5	Average
41-45	I5	Number of values
46-53	F8.2	Standard deviation
54-72	19X	Blank
73-80	I8	Sequence number, nondecreasing

300*: Ten-minute block record--1-minute data

Columns	FORTRAN format	Content
01-04	A4	300*
05-10	6X	Blank
11-16	I6	Latitude (DDMMSS)
17	1X	Blank
18-24	I7	Longitude (DDDMMSS)
25	1X	Blank
26-30	I5	Minimum
31-35	I5	Maximum
36-40	I5	Average
41-45	I5	Number of values
46-53	F8.2	Standard deviation
54-72	19X	Blank
73-80	I8	Sequence number, nondecreasing

Note: This record must be followed by exactly ten 401*-410* records.

401*-410*: One-minute block records

Columns	FORTRAN format	Content
01-04	A4	4xx*; xx=(01,02,...,10)
05-10	6X	Blank
11-60	10I5	Components 401-500; see note below
61-72	12X	Blank
73-80	I8	Sequence number, nondecreasing

Note: The components, 401 through 500, are entered at 10 components per record such that the records simulate a 10-by-10 matrix geographically overlaying the 10-minute latitude-longitude block:

Record	Components
401*	401-410
402*	411-420
403*	421-430
404*	431-440
405*	441-450
406*	451-460
407*	461-470
408*	471-480
409*	481-490
410*	491-500

Component 401 represents the northwestern most 1-minute block of the 10-minute block, component 410 represents the northeastern most 1-minute block, component 491 represents the southwestern most 1-minute block, and component 500 represents the southeastern most 1-minute block of the 10-minute block.

Each data file begins with the master records 001*, 002*, and 003*. These records may be followed by remarks records consisting of sets of five 050* records. These records will be followed by the appropriate combination of the 100*, 200*, 350*, 300*, and 401*-410* records. The final record contains only a 999*. The actual combination of records depends on the data density.

SUMMARY

Machine-readable files were assembled as part of the High Plains RASA project and are stored on two magnetic tapes that are available from the U.S. Geological Survey. The first magnetic tape (number 220452) contains computer programs that were used to prepare, store, retrieve, organize, and preserve aerial interpretive data collected for the project. The second magnetic tape (number 220451) contains 134 data files that can be divided into five general classes: (1) Aquifer-geometry data, (2) aquifer and water characteristics, (3) water levels, (4) climatological data, and (5) land- and water-use data.

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