U.S. DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

The Digital Geologic Map of Wyoming in ARC/INFO Format

by

Gregory N. Green[1] and Patricia H. Drouillard[1]

Open-File Report 94-0425

[1]Denver, Colorado

1994

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The database can be downloaded via 'anonymous ftp' from a USGS system named greenwood.cr.usgs.gov (136.177.48.5). The files are located in a directory named /pub/open-file-reports/ofr-94-0425.

The database manager is: Gregory N. Green
(303) 236-5390
ggreen@greenwood.cr.usgs.gov
U.S. Geological Survey
Box 25046, Mail Stop 905
Denver, CO 80225

This geologic map was prepared as part of a study of digital methods and techniques as applied to complex geologic maps. The geologic map was digitized from the original scribe sheets used to prepare the published Geologic Map of Wyoming (Love and Christiansen, 1985). Consequently, the digital version is at 1:500,000 scale using the Lambert Conformal Conic map projection parameters of the State base map. Stable base contact prints of the scribe sheets were scanned on a Tektronix 4991 digital scanner. The scanner automatically converts the scanned image to an ASCII vector format. These vectors were transferred to a VAX minicomputer, where they were then loaded into ARC/INFO. Each vector and polygon was given attributes derived from the original 1985 geologic map.

This database was developed on a MicroVAX computer system using VMS 5.4-3 and ARC/INFO 5.0.2 software. The lineset and shadeset files are coded for a Calcomp electrostatic plotter.

The database was reviewed at the University of Wyoming, Wyoming Water Resources Center. The review was cross-checked at the USGS in Denver.

The authors wish to thank Dave Love and Ann Coe Christiansen for providing access to the original Geologic Map of Wyoming scribe sheets and negatives. For the digital review, we also thank Pat Stamile of the USGS and Chris Arneson and Laisan Serebryakov of the University of Wyoming Water Resources Center.

Directory contents:

000READ.ME	Text file that contains this Open-File 94-0425- document.
LOAD.AML	ARC/INFO commands to create the data bases.
WYOMING.AML	ARCPLOT commands that create a plot file of the geologic map from the data bases.
LAMBERT.PRJ	A file of the projection parameters used.
CCALIN.E00	ARC/INFO lineset CCA.LIN, the palette of line types for an electrostatic plotter.
DOTSHD.E00	ARC/INFO shadeset patterns, a palette of patterns.
CCASHD.E00	ARC/INFO shadeset file A, the palette of colors for an electrostatic plotter.
FNT003.E00	ARC/INFO geologic symbols font file.
TWO.AML	ARCPLOT commands that create a plot file of sheet two of the geologic map explanation.
THREE.AML	ARCPLOT commands that create a plot file of sheet three of the geologic map explanation.
FOUR.AML	ARCPLOT commands that create a plot file of sheet four of the geologic map explanation.
TWO.E00	Sheet two of the geologic map explanation.
THREE.E00	Sheet three of the geologic map explanation.
FOUR.E00	Sheet four of the geologic map explanation.
TWO00.ASC through TWO18.ASC	Text files for sheet two of the explanation.
THREE00.ASC through THREE60.ASC	Text files for sheet three of the explanation.
FOUR00.ASC through FOUR06.ASC	Text files for sheet four of the explanation.
CONTACT.E00	Contacts and faults file for the Geologic Map of Wyoming.
DECO.E00	Decorations file for the Geologic Map of Wyoming.
DIKES.E00	Dikes file for the Geologic Map of Wyoming.
BORDER.E00	The title and scale bar of the Geologic Map of Wyoming.

In order use this database, ARC/INFO software and hardware and FTP transfer software to copy the database to the ARC/INFO platform are required. To install the database, run LOAD.AML.

WATER, ROADS, CONTOURS, AND TOWNS:

Published geologic maps are prepared using a USGS topographic base map that contains the hydrology, hypsography, and political features. Because this digital version of the Geologic Map of Wyoming started with the original geologic scribe sheets, these features were not present. Only those water bodies that were required to close polygons were added by hand. The digital hydrology is not complete or as accurate as the original USGS 1:500,000 topographic base. A few water bodies were added for visual effect. No roads, contours, or towns were present on the geologic scribe sheets and none were added to this digital version.

LINESETS, SHADESETS, AND FONTS:

The plot program WYOMING.AML uses two linesets, CARTO.LIN and CCA.LIN. As the WYOMING.AML runs, black lines are produced from the INFO item BW which calls the ARC/INFO CARTO.LIN line set; to generate color lines the INFO item CCA calls the electrostatic 1024 color line set file, included as lineset CCALIN.E00.

To produce polygons three shadesets are used. Color polygons are produced from the INFO item CCA which calls the electrostatic 1024 color shadeset file, included as shadeset CCASHD.E00. To generate polygon patterns the INFO items DOT and PLT call the shadeset file DOT, included as DOTSHD.E00 and the shadeset file PLOTTER.E00. PLOTTER.SHD is the default ARC/INFO shade set.

The text font for the four special geologic symbols is included as font FNT003.FNT. The ASCII code for @ has been redefined to the symbol for Triassic, the ASCII code for & has been redefined to the symbol for Pennsylvanian, the ASCII code for _ has been redefined to the symbol for Cambrian, and the ASCII code for ! has been redefined to the symbol for Proterozoic and Late Archean.

CONTACTS, DECORATIONS, DIKES, BORDER, and EXPLANATION coverages:

The Digital Wyoming Geologic Map is made of four spatial datasets. The map coverages are (1) contacts and faults, (2) decorations,(3) dikes, and (4) the border-title. The attributed vector portion of the contact coverage is CONTACT.AAT. The attributed closed polygons of the contact coverage is CONTACT.PAT. DECO.AAT is an attributed vector graphic overlay of the decoration coverage. This dataset contains the teeth of thrust faults, shear zones, bars and balls, impact structure, diatremes, and ARC/INFO annotation. The polygon portion of the decoration coverage, DECO.PAT, is an attributed closed polygon graphic overlay. In order to fill the teeth and the balls with black paint, these had to be topologically structured. DIKES.AAT is the attributed vector file of the single line outcrops. Dikes at a scale of 1:500,000 are best represented by a thin single line and consequently have no area. The DIKES.PAT file is present but blank. The BORDER coverage is the scale bars with ARC/INFO annotation.

The Explanation sheets replicate the original explanations and references, within the limits of ARC/INFO.

CODING SCHEME FOR ATTRIBUTES:

ITEM	FEATURE
P1	Shorthand attribute
NAME	Name
BW	Line pattern from CARTO.LIN
CCA	Line pattern from CCA.LIN or shade color from CCA.SHD
DOT	Shade pattern from DOT.SHD
PLT	Shade pattern from PLOTTER.SHD
MAJOR1	DLG-3 (Optional) style MAJOR1 attribute
MINOR1	DLG-3 (Optional) style MINOR1 attribute

Line Types and Attributes

P1	CCA	BW	MAJOR1	MINOR1	Name
1	1	0	500	401	contact
2	0	0	500	402	nonprinting contact
3	4	0	500	403	fault
4	0	106	500	404	dotted fault
5	4	0	500	405	thrust fault
6	0	106	500	406	dotted thrust fault
7	4	0	500	407	thrust fault w/younger normal fault
8	0	106	500	408	dotted thrust fault w/younger normal fault
9	4	0	500	409	fault ? - based on source maps
10	1	0	500	410	base of Shannon Sandstone Member
11	135	0	50	200	shoreline
12	135	0	50	103	edge of ice
13	0	127	91	56	State Boundary
20	386	0	501	420	Ti intrusive
21	449	0	501	421	Yd intrusive
22	449	0	501	422	YX intrusive
23	223	0	501	423	XM intrusive
24	331	0	501	424	~W intrusive
30	2	0	502	430	diatreme
31	212	0	502	431	impact structure
32	1	0	502	432	ball outline
33	1	0	502	433	tooth outline
34	1	0	502	434	bar
35	1	0	502	435	shear zone
40	212	0	503	440	anticline axis
41	212	0	503	441	anticline arrow
42	345	0	503	442	boundary region

Polygon Types and Attributes

P1	CCA	DOT	PLT	MAJOR1	MINOR1	NAME
1	16	0	0	520	1	Qa
2	24	7	0	520	2	Qt
3	25	0	0	520	3	Qg
4	25	71	0	520	4	Qls
5	19	0	0	520	5	Qs
6	4	0	0	520	6	Ql
7	31	7	0	520	7	Qu
8	61	0	0	520	8	Qb
9	93	0	0	520	9	Qr
10	61	0	0	520	10	Qi
11	31	55	0	520	11	QTg
12	31	55	0	520	12	QTc
13	31	55	0	520	13	QTb
14	50	0	0	520	14	Tsl
15	50	55	0	520	15	Tte
16	50	0	0	520	16	Tr
17	142	0	0	520	17	Thr
18	139	0	0	520	18	Tii
19	312	0	0	520	19	Thl
20	312	0	0	520	20	Tsi
21	93	0	0	520	21	Tcc
22	50	55	0	520	22	Tcd
23	75	0	0	520	23	Tc
24	283	0	0	520	24	Tcv
25	75	0	0	520	25	Tml
26	300	0	0	520	26	Tbf
27	50	0	0	520	27	Tm
28	50	55	0	520	28	Tmu
29	75	0	0	520	29	Tu
30	75	0	0	520	30	Tmo
31	64	0	0	520	31	Tf
32	303	0	0	520	32	Tcs
33	47	55	0	520	33	Tgrw
34	47	71	0	520	34	Twd
35	47	0	0	520	35	Tw
36	35	0	0	520	36	TKe
37	64	0	0	520	37	Twr
38	358	0	0	520	38	Ti
39	124	0	0	520	39	Twi
40	127	0	0	520	40	Ttl
41	171	0	0	520	41	Tt
42	107	0	0	520	42	Ta
43	102	7	0	520	43	Tts
44	102	0	0	520	44	Ts
45	171	0	0	520	45	Ttp
46	82	0	0	520	46	Twp
47	107	0	0	520	47	Thp
48	82	71	0	520	48	Taw
49	82	0	33	520	49	Teml
50	98	0	0	520	50	Tv
51	47	0	0	520	51	Twdr
52	70	0	0	520	52	Tta
53	47	0	0	520	53	Twl
54	98	0	0	520	54	Tcr
55	303	0	0	520	55	Tfu
56	303	0	0	520	56	Tdb
57	35	0	0	520	57	TKp

58	64	71	0	520	58	Tbi
59	64	0	0	520	59	Toe
60	98	0	0	520	60	Tip
61	59	55	0	520	61	Twa
62	59	55	0	520	62	Twb
63	59	55	0	520	63	Tb
64	98	0	0	520	64	Tcg
65	98	0	0	520	65	Tgc
66	91	0	0	520	66	Tgl
67	312	0	33	520	67	Tgw
68	91	0	33	520	68	Tgwt
69	200	0	33	520	69	Tgt
70	300	0	0	520	70	Tglu
71	312	0	0	520	71	Twg
72	45	0	0	520	72	Twc
73	79	0	0	520	73	Twn
74	47	0	0	520	74	Twm
75	79	0	0	520	75	Twlc
76	45	55	0	520	76	Tbw
77	45	71	0	520	77	Tbs
78	45	7	0	520	78	Tp
79	303	71	0	520	79	Tep
80	303	0	0	520	80	Th
81	60	7	0	520	81	Twru
82	358	0	0	520	82	Tid
83	124	0	0	520	83	Tai
84	82	0	45	520	84	Twim
85	82	0	0	520	85	Tim
86	303	0	0	520	86	Tco
87	303	0	0	520	87	Tha
88	35	0	0	520	88	TKu
89	35	0	0	520	89	TKf
90	60	0	0	520	90	Twrb
91	64	0	0	520	91	Twrc
92	358	0	0	520	92	Tie
93	47	71	0	520	93	Twmo
94	47	55	0	520	94	Twk
95	45	0	45	520	95	Tftr
96	303	0	45	520	96	Tftl
97	303	0	0	520	97	Tfl
98	303	0	9	520	98	Tflt
99	45	0	9	520	99	Tft
100	387	0	0	520	100	Ki
101	755	0	0	520	101	Kav
102	755	0	0	520	102	Kbb
103	761	0	0	520	103	Kh
104	768	0	0	520	104	Kf
105	736	0	0	520	105	Kss
106	736	0	0	520	106	Kws
107	736	0	0	520	107	Ka
108	745	0	0	520	108	Kbr
109	800	0	0	520	109	Kg
110	727	0	0	520	110	Jst
111	964	0	0	520	111	J@n
112	755	0	0	520	112	J@nd
114	456	0	0	520	114	Pp
115	558	0	0	520	115	P&Ma
116	558	0	0	520	116	P&M
117	10	0	0	520	117	Mm
118	442	0	0	520	118	MD

119	435	0	0	520	119	Sl
120	44	0	0	520	120	O_
121	723	0	0	520	121	Klc
122	755	0	0	520	122	Ket
123	761	0	0	520	123	Kc
124	768	0	33	520	124	Kft
125	800	0	0	520	125	KJk
126	680	0	0	520	126	@cd
127	140	0	0	520	127	DO
128	723	0	0	520	128	Kl
129	723	0	9	520	129	Klm
130	723	0	0	520	130	Kha
131	718	0	0	520	131	Kfh
132	718	0	9	520	132	Kfl
133	718	0	9	520	133	Kfb
134	718	0	9	520	134	Km
135	718	0	9	520	135	Kml
136	712	0	0	520	136	Kle
137	717	0	45	520	137	Kmv
138	755	55	0	520	138	Kso
139	755	0	0	520	139	Ksb
140	717	55	0	520	140	Kb
142	931	0	0	520	142	Kcf
143	761	0	0	520	143	Ks
144	772	0	0	520	144	Kn
147	736	0	0	520	147	Kmt
148	800	0	0	520	148	KJ
149	800	0	45	520	149	KJs
150	800	0	45	520	150	KJg
151	755	0	0	520	151	K@
152	727	7	0	520	152	Js
153	727	0	0	520	153	Jsg
154	755	0	0	520	154	J@
155	755	0	0	520	155	J@gn
156	755	0	0	520	156	J@gc
157	680	0	0	520	157	@ad
158	378	0	0	520	158	Ob
159	680	0	0	520	159	@c
161	788	0	0	520	161	@Pcg
162	788	0	0	520	162	@Pg
163	378	0	49	520	163	MzPz
164	378	0	0	520	164	P&c
165	378	0	0	520	165	PM
166	448	0	0	520	166	MDO
167	143	0	0	520	167	MO
168	444	0	0	520	168	Pzr
170	263	0	0	520	170	_r
171	717	0	0	520	171	Kp
172	723	0	0	520	172	Kmb
173	717	0	45	520	173	Kal
174	717	0	0	520	174	Ke
175	717	0	9	520	175	Kr
176	717	55	0	520	176	Kbl
177	761	0	0	520	177	Kba
178	761	0	0	520	178	Ksn
179	768	0	45	520	179	Knt
181	788	0	45	520	181	@Pjs
182	456	0	0	520	182	Pfs
183	378	0	0	520	183	P&cf
184	830	0	45	520	184	Knc

185	830	0	45	520	185	Kcl
186	830	0	0	520	186	Kgb
187	736	0	45	520	187	Kgbm
188	736	0	0	520	188	Kmr
189	745	0	0	520	189	Kns
190	788	0	45	520	190	@Ps
191	456	0	0	520	191	Pmo
192	558	0	0	520	192	P&h
193	558	0	0	520	193	P&m
194	143	0	0	520	194	MDe
195	143	0	0	520	195	MDg
196	32	0	0	520	196	Xsv
197	41	0	0	520	197	Xlc
198	32	7	0	520	198	Xdl
199	377	0	0	520	199	Wgn
200	395	0	0	520	200	WVsv
201	395	7	0	520	201	Ws
202	311	0	0	520	202	Wmu
203	683	0	0	520	203	Ugn
204	683	7	0	520	204	Ugn +
205	107	7	0	520	205	Ys
206	311	0	0	520	206	Yls
207	155	7	0	520	207	Yla
208	0	0	0	520	208	Yd
209	0	0	0	520	209	YX
210	70	7	0	520	210	Xgy
211	381	0	0	520	211	Xqd
212	385	0	0	520	212	Xm
213	373	0	0	520	213	Xgo
214	963	0	0	520	214	!W
215	420	0	0	520	215	Wp
216	420	7	0	520	216	Wg
217	380	0	0	520	217	Wgd
218	420	0	0	520	218	Wqm
219	95	0	0	520	219	WVg
220	0	0	0	520	220	shear
298	0	0	0	50	103	ICE
299	680	0	0	50	101	H2O
300	0	0	0	520	300	blank
301	353	0	0	520	301	pink
302	47	0	0	520	302	tan
303	800	0	0	520	303	green
304	2	0	0	520	304	black
330	0	0	0	520	330	pipe
332	2	0	0	520	332	ball
333	2	0	0	520	333	tooth

Reference cited:

Love, J.D., and Christiansen, A.C., 1985, Geologic Map of Wyoming: U.S. Geological Survey Special Geologic Map, scale 1:500,000.

The following maps were used for clarification:

DeWitt, E.H., Redden, J.A., Buscher, D.P., and Wilson, A.B., 1989, Geologic map of the Black Hills area, South Dakota and Wyoming: U.S. Geological Survey Miscellaneous Investigations Series Map I-1910, scale 1:250,000.

Dover, J.H., and M'Gonigle, J.W., 1993, Geologic map of the Evanston 30'x60' quadrangle, Uinta and Sweetwater Counties, Wyoming: U.S. Geological Survey Miscellaneous Investigations Series Map I-2168, scale 1:100,000.

Love, J.D., and Christiansen, A.C., 1983, Preliminary geologic map of Wyoming: U.S. Geological Survey Open-File Report OF-83-802, scale 1:500,000.

Love, J.D., Christiansen, A.C., Brown, T.M., and Earl, J.L., 1979, Preliminary geologic map of the Thermopolis 1°x2° quadrangle, central Wyoming: U.S. Geological Survey Open-File Report OF-79-962, scale 1:250,000.

Love, J.D., Christiansen, A.C., and Earl, J.L., 1978, Preliminary geologic map of the Sheridan 1°x2° quadrangle, northern Wyoming: U.S. Geological Survey Open-File Report OF-78-456, scale 1:250,000.

Love, J.D., Christiansen, A.C., Earl, J.L., and Jones, R.W., 1978, Preliminary geologic map of the Arminto 1°x2° quadrangle, central Wyoming: U.S. Geological Survey Open-File Report OF-78-1089, scale 1:250,000.

Love, J.D., Christiansen, A.C., Earl, J.L., and Jones, R.W., 1979, Preliminary geologic map of the Casper 1°x2° quadrangle, central Wyoming: U.S. Geological Survey Open-File Report OF-79-961, scale 1:250,000.

Love, J.D., Christiansen, A.C., and Jones, R.W., 1979, Preliminary geologic map of the Lander 1°x2° quadrangle, central Wyoming: U.S. Geological Survey Open-File Report OF-79-1301, scale 1:250,000.

Love, J.D., Christiansen, A.C., and McGrew, L.W., 1978, Preliminary geologic map of the Gillette 1°x2° quadrangle, northeastern Wyoming and western South Dakota: U.S. Geological Survey Open-File Report OF-78-343, scale 1:250,000.

Love, J.D., Christiansen, A.C., and McGrew, L.W., 1987, Geologic map of the Newcastle 1°x2° quadrangle, northeastern Wyoming and western South Dakota: Geological Survey of Wyoming Map MS-25I, scale 1:250,000.

Love, J.D., Christiansen, A.C., McGrew, L.W., and King, J.K., 1990, Geologic map of the Gillette 1°x2° quadrangle, northeastern Wyoming and western South Dakota: Geological Survey of Wyoming Map MS-25G, scale 1:250,000.

M'Gonigle, J.W., and Dover, J.H., 1992, Geologic map of the Kemmerer 30'x60' quadrangle, Uinta and Sweetwater Counties, Wyoming: U.S. Geological Survey Miscellaneous Investigations Series Map I-2079, scale 1:100,000.

Oriel, S.S., and Pratt, L.B., 1980, Geologic map of the Preston 1°x2° quadrangle, southeastern Idaho and western Wyoming: U.S. Geological Survey Miscellaneous Investigations Series Map I-1127, scale 1:250,000.

Pierce, W.G., 1978, Geologic map of the Cody 1°x2° quadrangle, northwestern Wyoming: U.S. Geological Survey Miscellaneous Field Studies Map MF-963, scale 1:250,000.

U.S. Geological Survey, 1972, Geologic map of the Yellowstone National Park: U.S. Geological Survey Miscellaneous Investigations Series Map I-711, scale 1:250,000.

In addition, J.D. Love made the following unpublished mapping available:

Love, J.D., and Christiansen, A.C., unpublished, Preliminary geologic map of the Cheyenne 1°x2° quadrangle, scale 1:250,000.

Love, J.D., and Christiansen, A.C., unpublished, Preliminary geologic map of the Driggs 1°x2° quadrangle, scale 1:250,000.

Love, J.D., and Christiansen, A.C., unpublished, Preliminary geologic map of the Rawlins 1°x2° quadrangle, scale 1:250,000.

Love, J.D., Christiansen, A.C., Cassandra, K.S., and Roehler, H.W., unpublished, Preliminary geologic map of the Rock Springs 1°x2° quadrangle, scale 1:250,000.