

**U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY**

Digital geologic map database of the Payette National Forest and vicinity, Idaho

by

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Open-File Report 98-219B

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1999

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Introduction

The geology of the Payette National Forest and vicinity, Idaho (Fig. 1), was mapped and compiled by Karen Lund between 1992 and 1996. The geologic data for the digital map are from original mapping as well as compilation by Lund of numerous sources of published and unpublished geologic maps that are cited in the section 'Bibliography of Geologic Map Sources.' The geology was compiled onto 1:100,000-scale topographic base maps for input into a geographic information system (GIS). The digital geologic map database can be queried in many ways to produce a variety of geologic maps. Digital base map data files are not included: they may be obtained from a variety of commercial and government sources. This database is not meant to be used or displayed at any scale larger than 1:100,000 (e.g., 1:62,500 or 1:24,000).

This open-file report describes the geologic units and the methods used to convert the geologic map data into a digital format and documents the file structures. We wish to thank Gregory N. Green of the U.S. Geological Survey for reviewing the digital GIS files.

Data Sources, Processing, and Accuracy

Clear film positives of the 1:100,000-scale geologic map compilation were electronically scanned to create raster digital images, converted to vector, polygon and point GIS layers, and minimally attributed by a contractor (Optronics Specialty Co., Inc., Northridge, CA). The USGS also provided the contractor with the linework for the Snake River which had been converted from digital line graph (DLG) format files (U.S. Geological Survey, 1993) to Arc/Info GIS so as to delineate discrete geologic unit boundaries along the western margin of the map area. The initial products were remitted to the U.S. Geological Survey in an Arc/Info EXPORT format in scanner units and with latitude and longitude registration ties digitized from the original film positives. These tie points were used to convert (or transform) the digital files to calculated latitude-longitude points for a Universal Transverse Mercator (zone 11, with a -5,000,000 m y-offset or false northing) map projection. The RMS error¹ resulting from the file transformation was moderate (about 20 meters, see Appendix A). The digital files were then augmented with an interim geologic map data model (or data base), further attributed and edited, and then plotted and compared to the original film positive of the geologic map to check for digitizing and attributing errors. All processing by the U.S. Geological Survey was done in Arc/Info version 7.1.1 installed on a Sun Ultra workstation.

The overall accuracy (with respect to the location of lines and points) of the digital geologic map (Figs. 2 and 3) is probably no better than +/- 20 meters.

¹ The root mean square error (RMS error) describes the deviation between the tie locations in the input file and those in the output file. It is an indication of the quality of the derived transformation and is a measure of the quality of the original scanned materials. The transformation report of errors for each tie point is given in Appendix A.

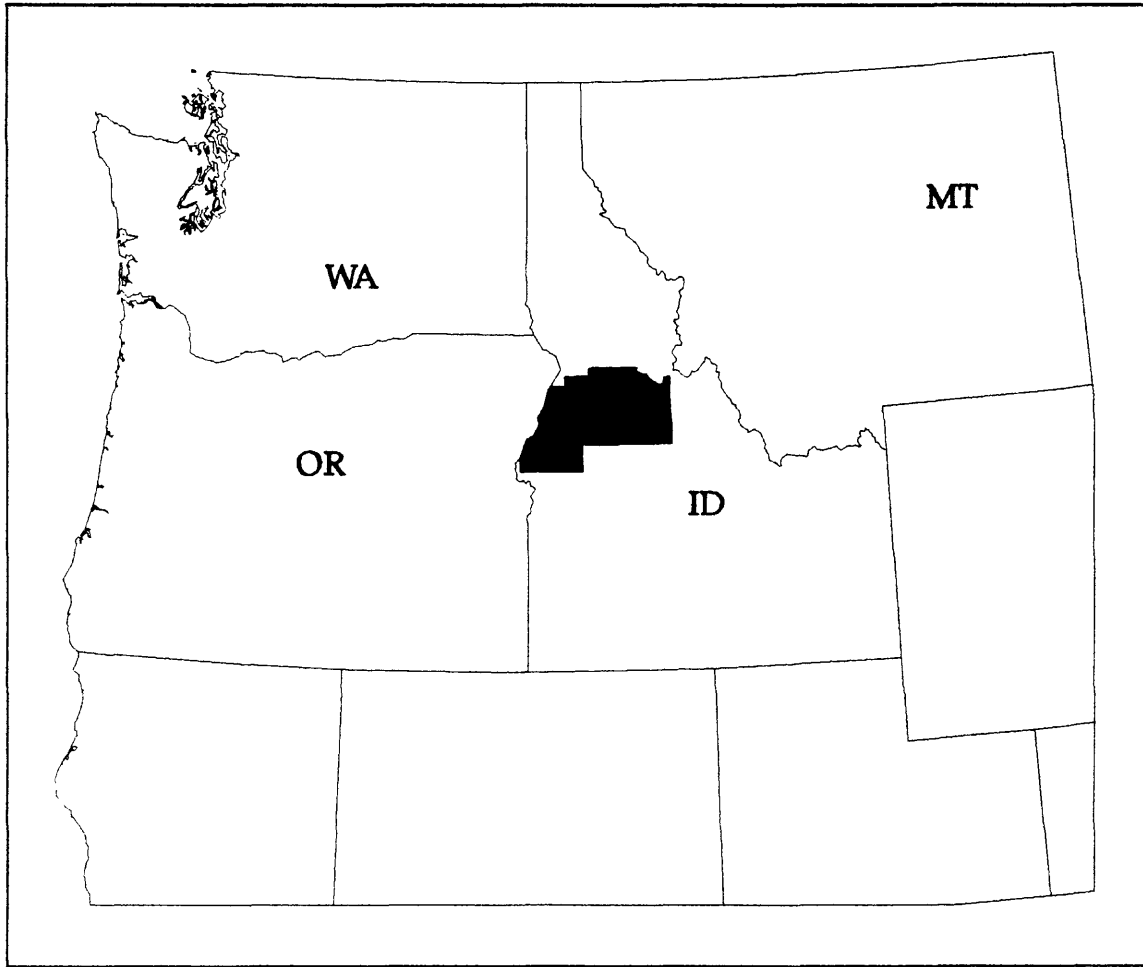


Figure 1. Index map showing the geographic extent of the Payette National Forest and vicinity. Idaho (black fill) with respect to the Pacific Northwest.

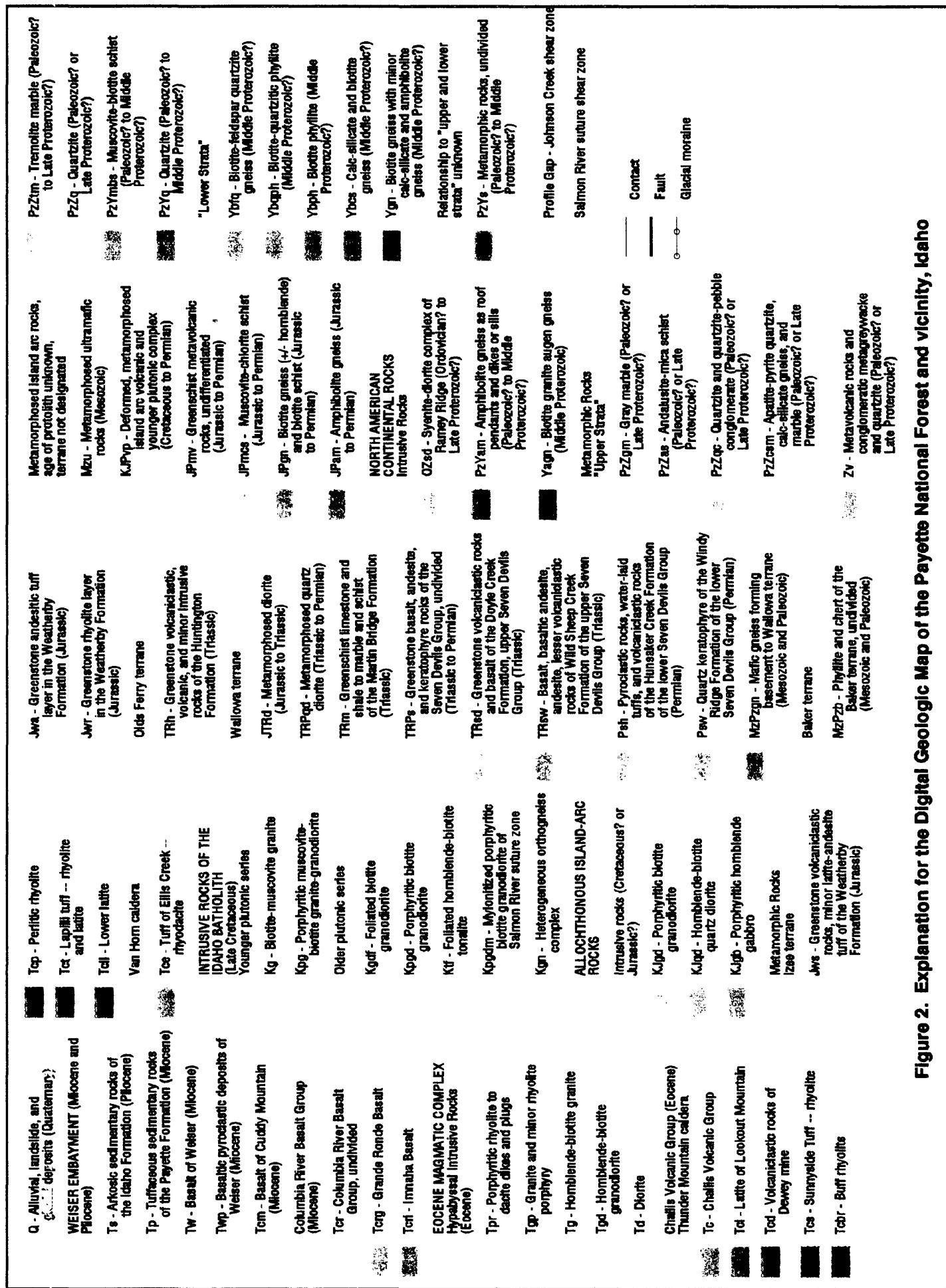
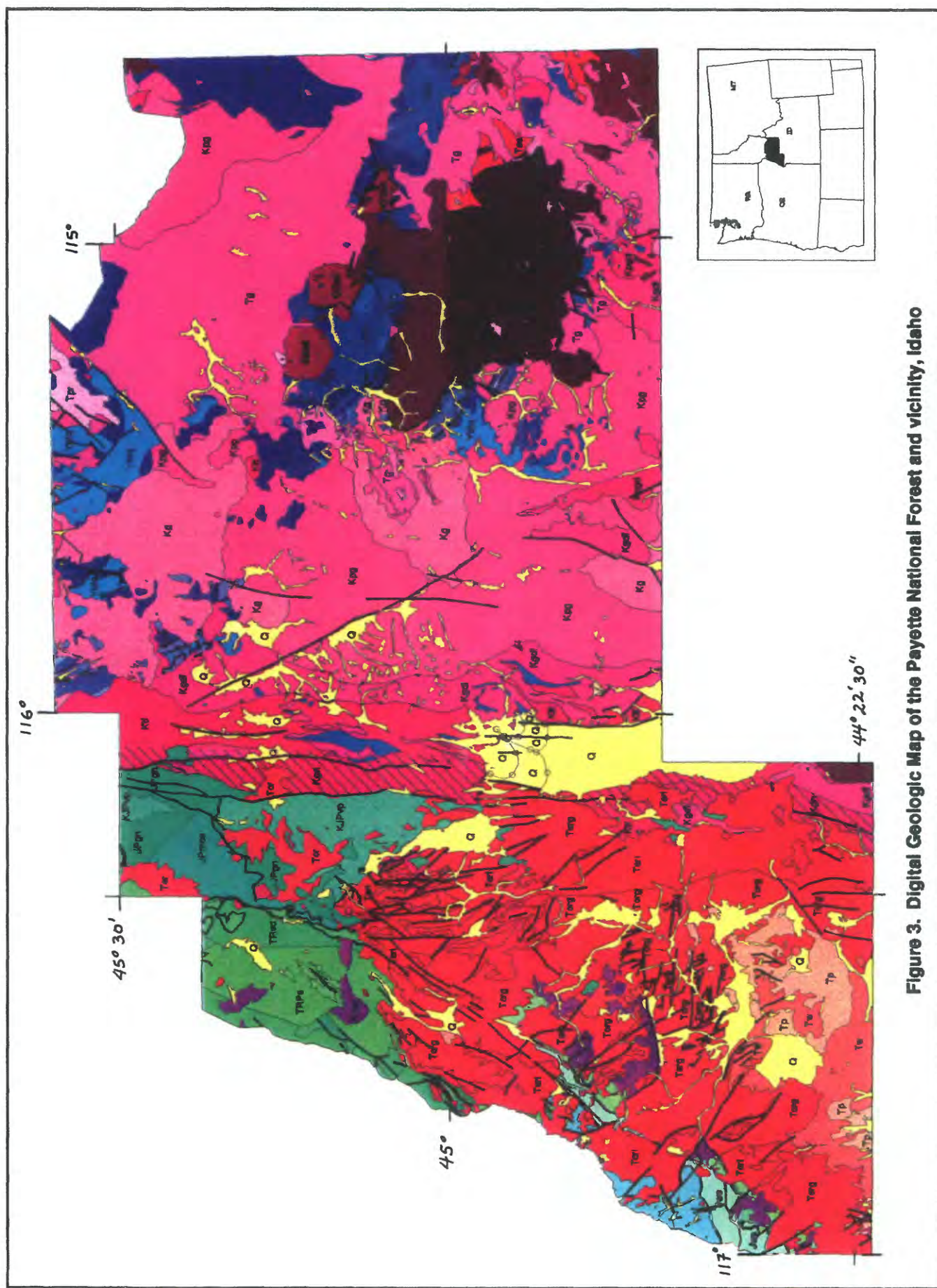


Figure 2. Explanation for the Digital Geologic Map of the Payette National Forest and vicinity, Idaho



GIS Documentation

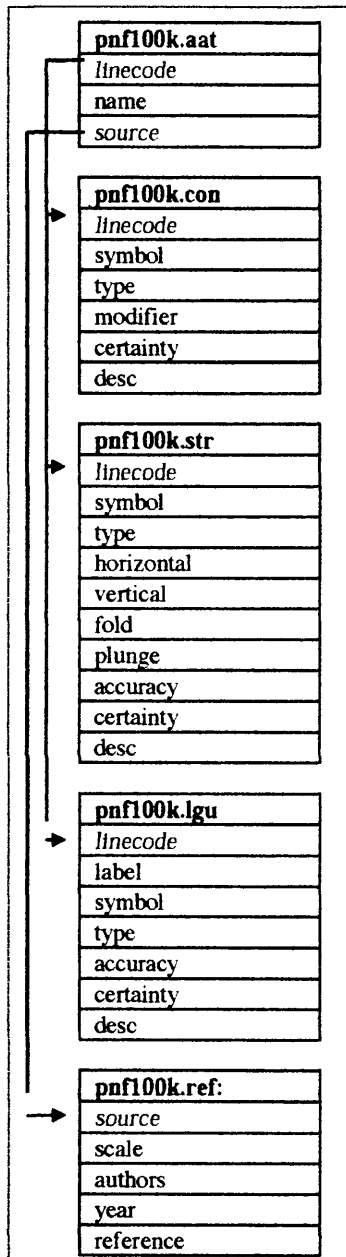
The digital geologic map database of the Payette National Forest and vicinity includes a geologic linework arc attribute table, PNF100K.AAT, that relates to the PNF100K.CON, PNF100K.STR, PNF100K.LGU and PNF100K.REF files; a rock unit polygon attribute table, PNF100K.PAT, that relates to the PNF100K.RU and PNF100K.REF files; a shear zone polygon attribute table, PNFSHEAR.PAT, that relates to the PNFSHEAR.ZON and PNFSHEAR.REF files; and two geologic map symbol point attribute tables, PNFPNT1.PAT and PNFPNT2.PAT, that relate to the PNFPNT*.SYM and PNFPNT*.REF files (see Fig. 4). These data files are described below.

Linear Features

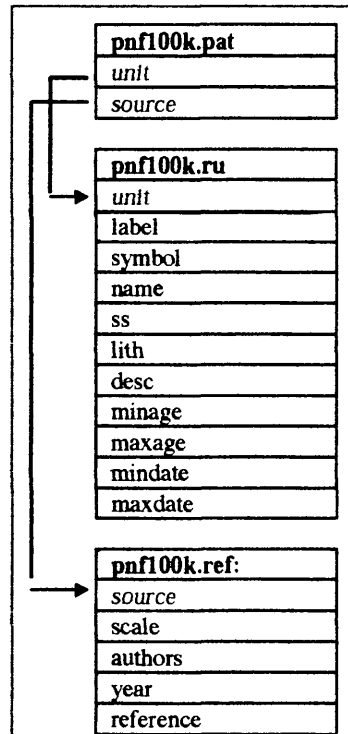
Descriptions of the items identifying linear features such as contacts, boundaries (e.g., lines of latitude and longitude) and structures in the arc (or line) attribute table, PNF100K.AAT, are as follows:

PNF100K.AAT			
ITEM NAME	ITEM TYPE	ITEM WIDTH	ATTRIBUTE DESCRIPTION
linecode	integer	3	Numeric code used to identify type of linear feature. Linecodes < 100 are used for contacts and boundaries which are described in the PNF100K.CON file. Linecodes > 100 and < 600 represent structural features which are described in the PNF100K.STR file. Linecodes > 800 represent linear geologic units (e.g., dikes and glacial moraines) which are described in the PNF100K.LGU file.
name	character	30	Name given to structural feature. No faults were named in the original source map, thus this item does not contain any names.
source	integer	4	Numeric code used to identify the data source for the linear feature. Complete references for the sources are listed in the PNF100K.REF file.

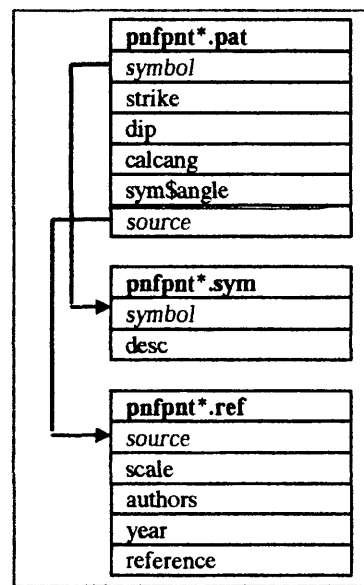
Geologic linework arc attribute table
and related files:



Rock unit polygon attribute
table and related files:



Point attribute table and related files:



Shear zone polygon attribute
table and related files:

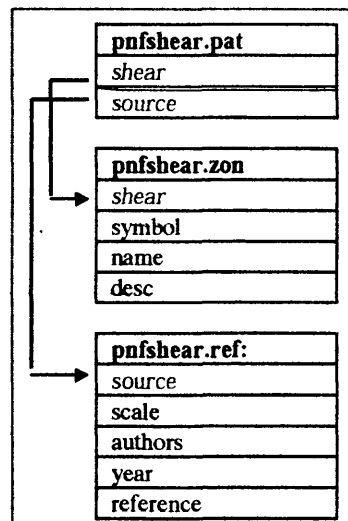


Figure 4: Relationships between feature attribute tables and look-up tables.

Attribute descriptions for items in the contact (and boundary) look-up table, PNF100K.CON (for use with the PLOTTER.LIN lineset), are as follows:

PNF100K.CON			
ITEM NAME	ITEM TYPE	ITEM WIDTH	ATTRIBUTE DESCRIPTION
linecode	integer	3	Numeric code (a value < 100) used to identify type of contact or boundary. (This item also occurs in PNF100K.AAT.)
symbol	integer	3	Line symbol number used by Arc/Info to plot arc (line). (Symbol numbers refer to the PLOTTER.LIN lineset .)
type	character	10	Major type of line, e.g., contact, shoreline, lines of latitude and longitude used for neatlines.
modifier	character	20	Line type modifier, i.e., approximate, concealed, gradational. No entry implies 'known.'
certainty	character	15	Degree of certainty of contact or boundary, i.e., inferred, uncertain. No entry implies 'certain.'
desc	character	100	Written description or explanation of contact or boundary.

Attribute descriptions for items in the structure look-up table, PNF100K.STR [for use with the GEOLOGY.LIN lineset (Fitzgibbon and Wentworth, 1991)], are as follows:

PNF100K.STR			
ITEM NAME	ITEM TYPE	ITEM WIDTH	ATTRIBUTE DESCRIPTION
linecode	integer	3	Numeric code (a value > 100 and < 600) used to identify type of structural feature. (This item also occurs in PNF100K.AAT.)
symbol	integer	3	Line symbol number used by Arc/Info to plot arc (line). Symbol numbers refer to the GEOLOGY.LIN lineset (Fitzgibbon and Wentworth, 1991).
type	character	10	Major type of structure, i.e., fault, fracture, fold, other.
horizontal	character	20	Type of horizontal fault movement, e.g., left-lateral, right-lateral. No entry implies 'unknown.'
vertical	character	20	Type of vertical fault movement, e.g., normal. No entry implies 'unknown.'
fold	character	15	Type of fold, e.g., anticline, syncline.
plunge	character	15	Type of plunge on fold, i.e., horizontal, plunging, plunging in, plunging out.
accuracy	character	15	Line type modifier indicating degree of accuracy, i.e., approximately located, concealed, gradational.. No entry implies 'known.'
certainty	character	15	Degree of certainty of contact or boundary, i.e., inferred, uncertain. No entry implies 'certain.'
desc	character	100	Written description or explanation of structural feature.

Attribute descriptions for items in the linear geologic units (e.g., dikes, glacial moraines and rock units that can only be mapped as linear features at a scale of 1:100,000) look-up table, PNF100K.LGU, [for use with the GEOLOGY.LIN lineset (Fitzgibbon and Wentworth, 1991)], are as follows:

PNF100K.LGU			
ITEM NAME	ITEM TYPE	ITEM WIDTH	ATTRIBUTE DESCRIPTION
linecode	integer	3	Numeric code (a value > 800) used to identify type of linear geologic unit. (This item also occurs in PNF100K.AAT.)
label	character	10	Map label used in the map proper to identify rock unit.
symbol	integer	3	Line symbol number used by Arc/Info to plot linear geologic unit. Symbol numbers refer to GEOLOGY.LIN lineset (Fitzgibbon and Wentworth, 1991).
type	character	10	Major type of linear geologic unit, e.g., dike, glacial moraine or formation.
accuracy	character	15	Line type modifier indicating degree of accuracy, i.e., approximate, concealed, gradational. No entry implies 'known.'
certainty	character	15	Degree of line type certainty, i.e., inferred, uncertain. No entry implies 'certain.'
desc	character	100	Written description or explanation of linear geologic unit.

Areal Features

Descriptions of the items identifying geologic units in the polygon attribute table, PNF100K.PAT, are as follows:

PNF100K.PAT			
ITEM NAME	ITEM TYPE	ITEM WIDTH	ATTRIBUTE DESCRIPTION
unit	integer	4	Numeric code used to identify the rock unit which is described in the PNF100K.RU look-up table. (This item also occurs in PNF100K.RU.)
source	integer	4	Numeric code used to identify the data source for the rock unit. Complete references for the sources are listed in the PNF100K.REF file.

Attribute descriptions for items in the lithology (rock unit) look-up table, PNF100K.RU (for use with the CALCOMP1.SHG shadeset), are as follows:

PNF100K.RU			
ITEM NAME	ITEM TYPE	ITEM WIDTH	ATTRIBUTE DESCRIPTION
unit	integer	4	Numeric code used to identify rock unit. (This item also occurs in PNF100K.PAT.)
label	character	10	Rock unit label (abbreviation) used to label unit on map.
symbol	integer	3	Shadeset symbol number used by Arc/Info to plot a filled/shaded polygon. (The symbol numbers used in this file refer to the CALCOMP1.SHG shadeset .)
name	character	7	The prefix portion of the geologic unit label that does not include subscripts. (If no subscripts are used in the label, then the 'name' entry is the same as the 'label' entry.)
ss	character	3	The suffix portion of the geologic unit label that includes subscripts.
lith	character	20	Major type of lithostratigraphic unit, i.e., unconsolidated sediments, sedimentary rocks, metasedimentary rocks, intrusive rocks, extrusive rocks, metamorphic rocks, water, ice.
desc	character	100	Formal or informal unit name
minage	character	7	Minimum stratigraphic age of lithologic unit, i.e., CRET, TERT, PCY.
maxage	character	7	Maximum stratigraphic age of lithologic unit
mindate	integer	4	Minimum radiometric age (in millions of years) if determined.
maxdate	integer	4	Maximum radiometric age (in millions of years) if determined.

Descriptions of the items identifying shear zones in the polygon attribute table, PNFSHEAR.PAT are as follows:

PNFSHEAR.PAT			
ITEM NAME	ITEM TYPE	ITEM WIDTH	ATTRIBUTE DESCRIPTION
shear	integer	4	Numeric code used to identify the shear zone which is described in the PNFSHEAR.ZON look-up table. (This item also occurs in the PNFSHEAR.ZON file.)
source	integer	4	Numeric code used to identify the data source for the rock unit. Complete references for the sources are listed in the PNFSHEAR.REF file.

Attribute descriptions for items in the shear zone look-up table, PNFSHEAR.ZON (for use with the CARTO.SHD shadeset), are as follows:

PNFSHEAR.ZON			
ITEM NAME	ITEM TYPE	ITEM WIDTH	ATTRIBUTE DESCRIPTION
shear	integer	4	Numeric code used to identify the shear zone. (This item also occurs in the PNFSHEAR.PAT file.)
symbol	integer	3	Shadeset symbol number used by Arc/Info CARTO.SHD shadeset file to plot a filled/shaded polygon.
name	character	25	Shear zone name
desc	character	200	Description of shear zone

Point Features

Descriptions of the items identifying geologic map symbols are given in the point attribute tables, PNFPNT1.PAT (which contains scanned points) and PNFPNT2.PAT (which contains digitized points), which are defined as follows:

PNFPNT1.PAT / PNFPNT2.PAT			
ITEM NAME	ITEM TYPE	ITEM WIDTH	ATTRIBUTE DESCRIPTION
pttype	character	32	Type of point symbol, e.g., strike and dip of inclined bedding, strike and dip of inclined cleavage, geochemical sample location. (This item also occurs in the PNFPNT*.SYM files.)
symbol	integer	3	Marker symbol number used by Arc/Info to identify type of geologic map symbol. Symbol numbers refer to the GEOLOGY.MRK markerset (Fitzgibbon and Wentworth, 1991).
strike	integer	3	Strike of bedding, metamorphic foliation or cleavage. Strike is an azimuthal angle (measured in degrees from 0 to 360 in a clockwise direction from North).
dip	integer	3	Dip of bedding, metamorphic foliation or cleavage. This value is an angle measured (in degrees from 0 to 90) down from the horizontal; thus a horizontal dip is 0 degrees and a vertical dip is 90 degrees.
calcang	integer	4	An interim value used to calculate sym\$angle. It turned out that the various structural map symbols in the GEOLOGY.MRK markerset had to be rotated by different amounts to achieve their proper map orientation. For the strike and dip symbols, calcang = strike - 270; for the lineation symbol, calcang = strike - 180 (however, lineation symbols were not used in this quadrangle map).
sym\$angle	integer	4	The angle used to complete the mathematical rotation of the structural map symbol to its proper orientation on the map. This value is the \$angle pseudoitem value for the point.
source	integer	4	Numeric code used to identify the data source for the geologic map symbol. Complete references for the sources are listed in the PNFPNT1.REF and PNFPNT2.REF files.

Attribute descriptions for items in the geologic map symbols look-up tables, PNFNT1.SYM / PNFNT2.SYM (both for use with the GEOLOGY.MRK markerset), are as follows:

PNFPNT*.SYM			
ITEM NAME	ITEM TYPE	ITEM WIDTH	ATTRIBUTE DESCRIPTION
pttype	character	32	Type of point symbol, e.g., strike and dip of inclined bedding, strike and dip of inclined cleavage. (This item also occurs in the PNFNT*.PAT files.)
symbol	integer	3	Marker symbol number used by Arc/Info to identify type of geologic map symbol. Symbol numbers refer to the GEOLOGY.MRK markerset (Fitzgibbon and Wentworth, 1991).
desc	character	250	Written description or explanation of map symbol.

Source Attributes

Descriptive source or reference information for the PNF100K, PNFNT* and PNFSHEAR coverages is stored in the PNF100K.REF, PNFNT*.REF files and PNFSHEAR.REF files respectively. Attribute descriptions for items in the PNF100K.REF, PNFNT*.REF, and PNFSHEAR.REF data source files are as follows:

PNF100K.REF / PNFNT*.REF / PNFSHEAR.REF			
ITEM NAME	ITEM TYPE	ITEM WIDTH	ATTRIBUTE DESCRIPTION
source	integer	4	Numeric code used to identify the data source. (This item also occurs in the PNF100K.AAT, PNF100K.PAT, PNFSHEAR.PAT and PNFNT*.PAT files.)
scale	integer	10	Scale of source map. (This value is the denominator of the proportional fraction that identifies the scale of the map that was digitized or scanned to produce the digital map.)
authors	character	100	Author(s) or compiler(s) of source map entered as last name, first name or initial, and middle initial.
year	integer	4	Source (map) publication date
reference	character	250	Remainder of reference in USGS reference format.

Obtaining Digital Data

The complete digital version of the geologic map is available in Arc/Info EXPORT format with associated data files. These data and map images are maintained in a Universal Transverse Mercator (UTM) map projection:

Projection:	UTM
Zone:	11
Y-offset (false northing):	-5,000,000 meters
Units:	meters

The digital geologic map GIS of the Payette National Forest and vicinity is available as Arc/Info EXPORT-format files (pnf100k.e00, pnfplt1.e00, pnfplt2.e00 and pnfshar.e00), as Arc/Info graphics files (baker.gra, bighorn.gra, brogan.gra, challis.gra, elk.gra, mcall.gra, pistol.gra, riggs.gra, warren.gra and weiser.gra) for each of the 1:100,000-scale quadrangles making up the map area (Elk City, Riggs, Warren, Bighorn Crags, Baker, McCall, Pistol Creek, Challis, Brogan, and Weiser), and as HPGL2 plot files (baker.hp, bighorn.hp, brogan.hp, challis.hp, elk.hp, mcall.hp, pistol.hp, riggs.hp, warren.hp and weiser.hp) for each of the 1:100,000-scale quadrangles making up the map area, as well as the associated data files (snakeul1.e00, forestul1.e00, *.key, geology.lin, calcomp1.shd, geology.mrk) and Arc/Info macro language programs (*.aml) which were used to plot the ten map plates at a scale of 1:100,000.

To obtain copies of the digital data, do one of the following:

1. Download the digital files from the USGS public access World Wide Web site on the Internet: URL = <http://greenwood.cr.usgs.gov/>

or

2. Anonymous FTP from greenwood.cr.usgs.gov, in the directory
pub/open-file-reports/ofr-98-0219-b/

The Internet sites contain the digital geologic map of the Payette National Forest both as an Arc/Info interchange-format files (*.e00) and as an HPGL2 plot files (*.hp), as well as the associated data files and Arc/Info macro programs which are used to plot the map at a scale of 1:100,000.

To manipulate this data in a geographic information system (GIS), you must have a GIS that is capable of reading Arc/Info interchange-format files (files with a .E00 file extension).

Obtaining Paper Maps

Paper copies of the digital geologic map plates (for a total of ten 1:100,000-scale quadrangles covered by the forest) are not available from the USGS. However, with access to a large-format color plotter that can interpret HPGL2 (Hewlett-Packard Graphics Language), 1:100,000-scale paper copies of the maps can be made, as follows:

1. Download the plot files for the maps, *.hp, from the USGS public access World Wide Web site on the Internet using the

URL = <http://greenwood.cr.usgs.gov/>

or

2. Anonymous FTP the plot files, *.hp, from: **[greenwood.cr.usgs.gov](http://greenwood.cr.usgs.gov/pub/open-file-reports/ofr-98-0219-b/)**, in the directory:
[pub/open-file-reports/ofr-98-0219-b/](http://greenwood.cr.usgs.gov/pub/open-file-reports/ofr-98-0219-b/)

and run the UNIX 'lpr -P<plotter_name> <filename>.hp' command for the HPGL2 files listed below by 1:100,000-scale quadrangle name:

Quad name	HPGL2 file name	Digital plate no.
Baker	baker.hp	Plate 5
Bighorn Crags	bighorn.hp	Plate 4
Brogan	brogan.hp	Plate 9
Challis	challis.hp	Plate 8
Elk City	elk.hp	Plate 1
McCall	mccall.hp	Plate 6
Pistol Creek	pistol.hp	Plate 7
Riggins	riggins.hp	Plate 2
Warren	warren.hp	Plate 3
Weiser	weiser.hp	Plate 10

The finished plots are about 29 inches by 44 inches.

Paper copies of a customized geologic map can also be created by obtaining the digital data files as described above and then creating a custom plot file in a GIS.

References Cited

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Appendix A - Listing of registration tics and errors

Four Arc/Info files were remitted to the USGS from the contractor. Each of the four files had to be transformed to a UTM (zone 11, yshift = -5,000,000m) map projection. The errors for each latitude and longitude tic is given below.

1. Arc/Info transformation report for tics in the line and polygon coverage for the western portion of the Payette National Forest and vicinity, Idaho

The report identifies a root mean square (RMS) error of 19.357 meters for this Arc/Info coverage.

Arc: > transform wpay-geol2 wpaygeo6 affine <l
Transforming coordinates for coverage wpay-geol2

Scale (X,Y) = (2538.651,2540.020) Skew (degrees) = (0.001)
Rotation (degrees) = (0.632) Translation = (479397.390,32242.688)
RMS Error (input,output) = (0.008,19.357)

Affine $X = Ax + By + C$
 $Y = Dx + Ey + F$

A = 2538.496 B = -27.973 C = 479397.390
D = 28.018 E = 2539.866 F = 32242.688

tic id	input x output x	input y output y	x error	y error
3229	3.674	-46.868		
	490041.281	-86684.359	-7.665	-8.274
3204	3.745	-41.403		
	490062.500	-72799.945	0.307	-10.764
3179	3.818	-35.936		
	490083.750	-58915.215	10.842	-8.058
3154	3.890	-30.468		
	490105.063	-45030.184	19.921	-3.716
3231	11.521	-46.953		
	509958.719	-86684.359	-2.112	-5.279
3232	15.450	-46.991		
	519917.438	-86661.563	13.638	-12.938
3206	11.574	-41.485		
	509937.500	-72799.945	1.855	0.118
3181	11.615	-36.021		
	509916.250	-58915.215	-25.659	-5.991
3207	15.497	-41.523		
	519875.031	-72777.148	22.598	-8.077

3182	15.525	-36.057		
	519832.500	-58892.422	-16.569	-8.849
3233	19.370	-47.016		
	529876.125	-86623.578	7.509	-6.103
3234	23.291	-47.043		
	539834.875	-86570.398	1.965	-17.586
3208	19.402	-41.549		
	529812.500	-72739.156	-0.569	-3.698
3183	19.437	-36.081		
	529748.750	-58854.430	-0.842	-0.321
3209	23.316	-41.568		
	539750.063	-72685.969	-1.115	4.652
3184	23.341	-36.104		
	539665.000	-58801.238	-7.496	-0.882
3156	11.666	-30.555		
	509894.938	-45030.184	-27.709	-6.554
3131	11.724	-25.083		
	509873.594	-31144.842	-13.439	7.379
3157	15.570	-30.586		
	519789.906	-45007.387	-13.356	2.035
3132	15.614	-25.118		
	519747.188	-31122.043	-10.170	5.473
3081	11.837	-14.154		
	509830.750	-3373.232	9.521	-0.490
3056	11.888	-8.687		
	509809.281	10513.035	7.511	-0.970
3082	15.709	-14.186		
	519661.531	-3350.434	10.557	2.926
3057	15.760	-8.711		
	519618.531	10535.832	29.892	23.751
3158	19.471	-30.614		
	529684.875	-44969.391	-3.484	3.201
3133	19.502	-25.150		
	529620.813	-31084.047	-14.852	-4.654
3159	23.370	-30.630		
	539579.813	-44916.199	-0.295	18.259
3134	23.390	-25.163		
	539494.375	-31030.852	-17.390	18.255
3083	19.581	-14.207		
	529492.250	-3312.437	7.773	20.769
3058	19.611	-8.746		
	529427.813	10573.828	-4.178	4.448
3084	23.454	-14.235		
	539323.000	-3259.241	11.349	3.468
3059	23.476	-8.769		

	539237.063	10627.023	0.645	0.110
3032	15.805	-3.245		
	519575.469	24422.406	33.843	22.483
3033	19.653	-3.287		
	529363.188	24460.402	16.283	-15.627
3034	23.495	-3.296		
	539150.875	24513.596	-20.481	15.705
3235	27.217	-47.052		
	549793.625	-86502.023	10.088	0.828
3236	31.145	-47.050		
	559752.313	-86418.445	21.771	32.509
3237	35.066	-47.065		
	569711.063	-86319.672	17.172	4.813
3210	27.229	-41.581		
	549687.563	-72617.586	-6.636	12.974
3211	31.146	-41.583		
	559625.063	-72534.008	0.708	33.850
3185	27.244	-36.118		
	549581.313	-58732.848	-14.715	3.468
3186	31.156	-36.129		
	559497.563	-58649.262	0.061	2.129
3212	35.064	-41.605		
	569562.625	-72435.227	7.390	-11.493
3187	35.065	-36.139		
	569413.813	-58550.473	7.763	-13.038
3160	27.264	-30.648		
	549474.750	-44847.805	-10.501	12.482
3135	27.282	-25.186		
	549368.000	-30962.457	-11.131	0.636
3161	31.164	-30.662		
	559369.750	-44764.211	-4.123	3.521
3136	31.175	-25.202		
	559241.625	-30878.861	-1.995	-14.269
3162	35.063	-30.672		
	569264.688	-44665.418	-0.792	-12.210
3137	35.060	-25.201		
	569115.250	-30780.064	-12.613	-2.325
3085	27.312	-14.256		
	549153.813	-3190.845	-26.128	-9.215
3086	31.200	-14.266		
	558984.563	-3107.248	13.240	-10.467
3060	27.332	-8.784		
	549046.313	10695.418	-21.457	2.669
3061	31.195	-8.797		
	558855.563	10779.014	-23.428	-4.789

3087	35.082	-14.266		
	568815.313	-3008.450	37.052	0.059
3062	35.077	-8.800		
	568664.875	10877.809	21.977	-3.926
3036	31.209	-3.335		
	558726.375	24665.578	-12.767	-20.208
3037	35.065	-3.344		
	568514.063	24764.369	-9.563	-32.198

2. Arc/Info transformation report for tics in the point coverage for the western portion of the Payette National Forest and vicinity, Idaho

The report identifies a root mean square (RMS) error of 19.424 meters for this Arc/Info coverage.

Arc: |> transform wpaysym1 wpaysym2 affine <|
Transforming coordinates for coverage wpaysym1

Scale (X,Y) = (2540.027,2538.590) Skew (degrees) = (-0.003)
Rotation (degrees) = (-89.368) Translation = (479397.826,32240.742)
RMS Error (input,output) = (0.008,19.424)

Affine $X = Ax + By + C$

$Y = Dx + Ey + F$

A = 28.006 B = 2538.434 C = 479397.826

D = -2539.872 E = 28.110 F = 32240.742

tic id	input x output x	input y output y	x error	y error
3031	3.215 509787.719	11.940 24399.611	7.865	10.185
3032	3.245 519575.469	15.805 24422.406	33.400	21.966
3056	8.687 509809.281	11.888 10513.035	7.491	-1.878
3057	8.711 519618.531	15.760 10535.832	29.632	23.198
3081	14.154 509830.750	11.837 -3373.232	9.685	-1.435
3082	14.186 519661.531	15.709 -3350.434	10.481	2.336
3129	24.995 490126.406	3.943 -31144.842	-18.726	12.934
3131	25.083 509873.594	11.724 -31144.842	-12.907	6.359
3132	25.118 519747.188	15.614 -31122.043	-9.880	4.809
3033	3.287 529363.188	19.653 24460.402	15.602	-15.792
3058	8.746 529427.813	19.611 10573.828	-4.677	4.247
3034	3.296	23.495		

	539150.875	24513.596	-21.402	15.893
3035	3.326	27.364		
	548938.625	24581.986	13.183	-18.675
3059	8.769	23.476		
	539237.063	10627.023	-0.095	0.264
3060	8.784	27.332		
	549046.313	10695.418	-22.437	3.177
3036	3.335	31.209		
	558726.375	24665.578	-14.168	-19.314
3037	3.344	35.065		
	568514.063	24764.369	-11.205	-30.950
3061	8.797	31.195		
	558855.563	10779.014	-24.648	-3.927
3062	8.800	35.077		
	568664.875	10877.809	20.514	-2.709
3083	14.207	19.581		
	529492.250	-3312.437	7.456	20.534
3084	14.235	23.454		
	539323.000	-3259.241	10.792	3.588
3085	14.256	27.312		
	549153.813	-3190.845	-26.926	-8.742
3133	25.150	19.502		
	529620.813	-31084.047	-14.803	-4.962
3134	25.163	23.390		
	539494.375	-31030.852	-17.584	18.304
3135	25.186	27.282		
	549368.000	-30962.457	-11.567	1.042
3086	14.266	31.200		
	558984.563	-3107.248	12.200	-9.638
3087	14.266	35.082		
	568815.313	-3008.450	35.770	1.244
3136	25.202	31.175		
	559241.625	-30878.861	-2.672	-13.506
3137	25.201	35.060		
	569115.250	-30780.064	-13.533	-1.207
3154	30.468	3.890		
	490105.063	-45030.184	21.119	-5.486
3179	35.936	3.818		
	490083.750	-58915.215	12.225	-9.867
3156	30.555	11.666		
	509894.938	-45030.184	-26.993	-7.612
3157	30.586	15.570		
	519789.906	-45007.387	-12.883	1.336
3181	36.021	11.615		
	509916.250	-58915.215	-24.760	-7.086

3182	36.057	15.525		
	519832.500	-58892.422	-15.912	-9.585
3204	41.403	3.745		
	490062.500	-72799.945	1.875	-12.612
3206	41.485	11.574		
	509937.500	-72799.945	2.937	-1.012
3207	41.523	15.497		
	519875.031	-72777.148	23.436	-8.849
3229	46.868	3.674		
	490041.281	-86684.359	-5.912	-10.160
3231	46.953	11.521		
	509958.719	-86684.359	-0.846	-6.447
3232	46.991	15.450		
	519917.438	-86661.563	14.660	-13.746
3158	30.614	19.471		
	529684.875	-44969.391	-3.253	2.859
3183	36.081	19.437		
	529748.750	-58854.430	-0.429	-0.698
3159	30.630	23.370		
	539579.813	-44916.199	-0.307	18.274
3160	30.648	27.264		
	549474.750	-44847.805	-10.755	12.854
3184	36.104	23.341		
	539665.000	-58801.238	-7.326	-0.902
3185	36.118	27.244		
	549581.313	-58732.848	-14.788	3.806
3208	41.549	19.402		
	529812.500	-72739.156	0.027	-4.111
3209	41.568	23.316		
	539750.063	-72685.969	-0.762	4.597
3210	41.581	27.229		
	549687.563	-72617.586	-6.527	13.278
3161	30.662	31.164		
	559369.750	-44764.211	-4.620	4.250
3162	30.672	35.063		
	569264.688	-44665.418	-1.531	-11.123
3186	36.129	31.156		
	559497.563	-58649.262	-0.255	2.825
3187	36.139	35.065		
	569413.813	-58550.473	7.203	-11.984
3211	41.583	31.146		
	559625.063	-72534.008	0.572	34.513
3212	41.605	35.064		
	569562.625	-72435.227	7.010	-10.471
3233	47.016	19.370		

	529876.125	-86623.578	8.287	-6.552
3234	47.043	23.291		
	539834.875	-86570.398	2.499	-17.676
3235	47.052	27.217		
	549793.625	-86502.023	10.378	1.099
3236	47.050	31.145		
	559752.313	-86418.445	21.816	33.139
3237	47.065	35.066		
	569711.063	-86319.672	16.972	5.803

3. Arc/Info transformation report for tics in the line and polygon coverage for the eastern portion of the Payette National Forest and vicinity, Idaho

The report identifies a root mean square (RMS) error of 20.027 meters for this Arc/Info coverage.

Arc: |> transform epay-geol5 epaygeo6 affine <|
Transforming coordinates for coverage epay-geol5

Scale (X,Y) = (2538.271,2540.051) Skew (degrees) = (0.005)
Rotation (degrees) = (1.059) Translation = (542588.508,-60562.204)
RMS Error (input,output) = (0.008,20.027)

Affine $X = Ax + By + C$

$Y = Dx + Ey + F$

A = 2537.837 B = -46.725 C = 542588.508
D = 46.901 E = 2539.622 F = -60562.204

tic id	input x output x	input y output y	x error	y error
3161	6.727 559369.750	6.092 -44764.211	6.235	-9.863
3160	2.822 549474.750	6.142 -44847.805	-11.378	16.056
3162	10.628 569264.688	6.059 -44665.418	13.661	-10.736
3136	6.774 559241.625	11.558 -30878.861	-1.699	-12.485
3135	2.886 549368.000	11.599 -30962.457	2.355	-6.716
3137	10.672 569115.250	11.523 -30780.064	18.017	-17.873
3085	3.004 549153.813	22.533 -3190.845	4.382	-6.162
3086	6.872 558984.563	22.492 -3107.248	-7.916	-12.265
3087	10.748 568815.313	22.460 -3008.450	0.942	-10.158
3164	18.424 589054.625	6.017 -44422.227	9.667	4.207
3165	22.320 598949.563	6.004 -44277.828	3.799	9.165
3166	26.218	5.994		

	608844.563	-44118.223	0.127	8.525
3167	30.119	5.996		
	618739.563	-43943.406	6.417	22.624
3139	18.446	11.488		
	588862.438	-30536.865	2.683	15.913
3089	18.494	22.425		
	588476.813	-2765.247	-1.311	22.151
3140	22.334	11.470		
	598736.063	-30392.459	-2.759	6.774
3141	26.223	11.462		
	608609.688	-30232.848	-7.647	9.930
3142	30.115	11.466		
	618483.313	-30058.027	-4.358	27.194
3090	22.372	22.407		
	598307.563	-2620.839	10.786	14.144
3091	26.246	22.401		
	608138.313	-2461.226	12.256	20.865
3092	30.119	22.394		
	617969.063	-2286.404	9.685	8.573
3060	3.054	28.002		
	549046.313	10695.418	-16.563	-0.910
3061	6.901	27.955		
	558855.563	10779.014	-59.765	-22.411
3062	10.786	27.930		
	568664.875	10877.809	-8.844	-2.519
3035	3.114	33.464		
	548938.625	24581.986	-10.494	-12.185
3036	6.968	33.424		
	558726.375	24665.578	-15.957	-16.665
3037	10.826	33.395		
	568514.063	24764.369	-11.634	-7.255
3064	18.522	27.890		
	588283.375	11121.007	8.542	16.358
3039	18.544	33.356		
	588089.500	25007.559	1.692	11.825
3065	22.388	27.871		
	598092.625	11265.412	11.978	3.047
3066	26.256	27.861		
	607901.875	11425.021	18.746	1.624
3067	30.122	27.852		
	617711.125	11599.839	20.564	-16.243
3040	22.398	33.344		
	597877.188	25151.957	-3.110	16.287
3041	26.259	33.334		
	607664.875	25311.561	6.864	13.745

3042	30.116	33.335		
	617452.563	25486.371	6.763	23.323
3170	41.817	6.007		
	648424.563	-43327.711	7.196	-18.698
3168	34.020	5.980		
	628634.563	-43753.387	12.265	-26.294
3169	37.918	5.995		
	638529.500	-43548.156	8.633	-10.252
3171	45.713	6.034		
	658319.563	-43092.051	-0.556	-1.483
3172	49.609	6.052		
	668214.563	-42841.176	-8.990	-23.542
3143	34.005	11.452		
	628356.938	-29868.000	-4.300	-14.608
3144	37.907	11.465		
	638230.563	-29662.762	23.279	-4.450
3145	41.794	11.475		
	648104.188	-29442.309	13.910	-17.251
3093	33.987	22.392		
	627799.813	-2096.374	-4.410	-3.674
3094	37.861	22.405		
	637630.563	-1891.133	-2.618	5.973
3095	41.741	22.427		
	647461.313	-1670.679	10.391	22.895
3146	45.673	11.507		
	657977.813	-29206.643	-17.194	9.129
3147	49.564	11.528		
	667851.438	-28955.758	-15.745	-6.212
3096	45.614	22.437		
	657292.063	-1435.010	10.199	-6.886
3097	49.485	22.461		
	667122.750	-1184.124	1.129	-16.028
3173	53.509	6.097		
	678109.563	-42575.082	-8.571	5.506
3174	57.404	6.142		
	688004.625	-42293.766	-21.889	21.914
3148	53.453	11.569		
	677725.063	-28689.654	-22.449	15.715
3149	57.346	11.611		
	687598.750	-28408.330	-17.106	23.329
3098	53.363	22.492		
	676953.500	-918.018	9.745	-20.199
3099	57.230	22.531		
	686784.250	-636.690	-9.299	-21.627
3068	33.979	27.864		

	627520.313	11789.865	0.128	4.810
3069	37.850	27.873		
	637329.563	11995.102	14.358	4.822
3070	41.713	27.886		
	647138.813	12215.550	7.013	-0.945
3043	33.969	33.332		
	627240.250	25676.389	-0.316	6.429
3044	37.828	33.342		
	637027.938	25881.615	5.212	7.035
3045	41.685	33.358		
	646815.625	26102.055	5.124	8.731
3071	45.578	27.904		
	656948.000	12451.214	6.484	-9.510
3072	49.448	27.934		
	666757.250	12702.094	17.675	-2.590
3046	45.541	33.377		
	656603.250	26337.709	2.098	-0.162
3047	49.406	33.403		
	666390.938	26588.578	20.647	-3.906
3073	53.286	27.959		
	676566.438	12968.193	-53.889	-26.312
3074	57.169	28.010		
	686375.688	13249.514	-9.638	4.512
3048	53.259	33.436		
	676178.563	26854.666	10.304	-2.956
3049	57.112	33.473		
	685966.188	27135.975	-1.546	-11.100

4. Arc/Info transformation report for tics in the point coverage for the eastern portion of the Payette National Forest and vicinity, Idaho

The report identifies a root mean square (RMS) error of 20.027 meters for this Arc/Info coverage.

Arc: > transform epaysym1 epaysym2 affine <|
Transforming coordinates for coverage epaysym1

Scale (X,Y) = (2538.271,2540.051) Skew (degrees) = (0.005)
Rotation (degrees) = (1.059) Translation = (542588.508,-60562.204)
RMS Error (input,output) = (0.008,20.027)

Affine $X = Ax + By + C$

$Y = Dx + Ey + F$

A = 2537.837 B = -46.725 C = 542588.508
D = 46.901 E = 2539.622 F = -60562.204

tic id	input x output x	input y output y	x error	y error
3161	6.727	6.092		
	559369.750	-44764.211	6.235	-9.863
3160	2.822	6.142		
	549474.750	-44847.805	-11.378	16.056
3162	10.628	6.059		
	569264.688	-44665.418	13.661	-10.736
3135	2.886	11.599		
	549368.000	-30962.457	2.355	-6.716
3136	6.774	11.558		
	559241.625	-30878.861	-1.699	-12.485
3137	10.672	11.523		
	569115.250	-30780.064	18.017	-17.873
3085	3.004	22.533		
	549153.813	-3190.845	4.382	-6.162
3086	6.872	22.492		
	558984.563	-3107.248	-7.916	-12.265
3087	10.748	22.460		
	568815.313	-3008.450	0.942	-10.158
3164	18.424	6.017		
	589054.625	-44422.227	9.667	4.207
3165	22.320	6.004		
	598949.563	-44277.828	3.799	9.165
3166	26.218	5.994		

	608844.563	-44118.223	0.127	8.525
3167	30.119	5.996		
	618739.563	-43943.406	6.417	22.624
3139	18.446	11.488		
	588862.438	-30536.865	2.683	15.913
3089	18.494	22.425		
	588476.813	-2765.247	-1.311	22.151
3140	22.334	11.470		
	598736.063	-30392.459	-2.759	6.774
3141	26.223	11.462		
	608609.688	-30232.848	-7.647	9.930
3142	30.115	11.466		
	618483.313	-30058.027	-4.358	27.194
3090	22.372	22.407		
	598307.563	-2620.839	10.786	14.144
3091	26.246	22.401		
	608138.313	-2461.226	12.256	20.865
3092	30.119	22.394		
	617969.063	-2286.404	9.685	8.573
3060	3.054	28.002		
	549046.313	10695.418	-16.563	-0.910
3061	6.901	27.955		
	558855.563	10779.014	-59.765	-22.411
3062	10.786	27.930		
	568664.875	10877.809	-8.844	-2.519
3035	3.114	33.464		
	548938.625	24581.986	-10.494	-12.185
3036	6.968	33.424		
	558726.375	24665.578	-15.957	-16.665
3037	10.826	33.395		
	568514.063	24764.369	-11.634	-7.255
3064	18.522	27.890		
	588283.375	11121.007	8.542	16.358
3039	18.544	33.356		
	588089.500	25007.559	1.692	11.825
3065	22.388	27.871		
	598092.625	11265.412	11.978	3.047
3066	26.256	27.861		
	607901.875	11425.021	18.746	1.624
3067	30.122	27.852		
	617711.125	11599.839	20.564	-16.243
3040	22.398	33.344		
	597877.188	25151.957	-3.110	16.287
3041	26.259	33.334		
	607664.875	25311.561	6.864	13.745

3042	30.116	33.335		
	617452.563	25486.371	6.763	23.323
3170	41.817	6.007		
	648424.563	-43327.711	7.196	-18.698
3168	34.020	5.980		
	628634.563	-43753.387	12.265	-26.294
3169	37.918	5.995		
	638529.500	-43548.156	8.633	-10.252
3171	45.713	6.034		
	658319.563	-43092.051	-0.556	-1.483
3172	49.609	6.052		
	668214.563	-42841.176	-8.990	-23.542
3145	41.794	11.475		
	648104.188	-29442.309	13.910	-17.251
3143	34.005	11.452		
	628356.938	-29868.000	-4.300	-14.608
3144	37.907	11.465		
	638230.563	-29662.762	23.279	-4.450
3093	33.987	22.392		
	627799.813	-2096.374	-4.410	-3.674
3094	37.861	22.405		
	637630.563	-1891.133	-2.618	5.973
3095	41.741	22.427		
	647461.313	-1670.679	10.391	22.895
3146	45.673	11.507		
	657977.813	-29206.643	-17.194	9.129
3147	49.564	11.528		
	667851.438	-28955.758	-15.745	-6.212
3096	45.614	22.437		
	657292.063	-1435.010	10.199	-6.886
3097	49.485	22.461		
	667122.750	-1184.124	1.129	-16.028
3173	53.509	6.097		
	678109.563	-42575.082	-8.571	5.506
3174	57.404	6.142		
	688004.625	-42293.766	-21.889	21.914
3148	53.453	11.569		
	677725.063	-28689.654	-22.449	15.715
3149	57.346	11.611		
	687598.750	-28408.330	-17.106	23.329
3098	53.363	22.492		
	676953.500	-918.018	9.745	-20.199
3099	57.230	22.531		
	686784.250	-636.690	-9.299	-21.627
3068	33.979	27.864		

	627520.313	11789.865	0.128	4.810
3069	37.850	27.873		
	637329.563	11995.102	14.358	4.822
3070	41.713	27.886		
	647138.813	12215.550	7.013	-0.945
3043	33.969	33.332		
	627240.250	25676.389	-0.316	6.429
3044	37.828	33.342		
	637027.938	25881.615	5.212	7.035
3045	41.685	33.358		
	646815.625	26102.055	5.124	8.731
3071	45.578	27.904		
	656948.000	12451.214	6.484	-9.510
3072	49.448	27.934		
	666757.250	12702.094	17.675	-2.590
3046	45.541	33.377		
	656603.250	26337.709	2.098	-0.162
3047	49.406	33.403		
	666390.938	26588.578	20.647	-3.906
3073	53.286	27.959		
	676566.438	12968.193	-53.889	-26.312
3074	57.169	28.010		
	686375.688	13249.514	-9.638	4.512
3048	53.259	33.436		
	676178.563	26854.666	10.304	-2.956
3049	57.112	33.473		
	685966.188	27135.975	-1.546	-11.100

Appendix B - List of digital files in the Payette National Forest and vicinity GIS

- Use the '00import.aml' to IMPORT all of the *.E00 files for use in Arc/Info.
- Use the Arc/Info 'DRAW' command to plot the *.GRA files to your screen. (Make sure the display is set with the Arc/Info 'DISPLAY' command.)
- Use the Arc/Info 'HPGL2' command to create HPGL2 files from the *.GRA files.
- Use the UNIX 'lpr -P<plotter_name> <filename>.hp' command to send the *.HP files to a large-format color plotter that can interpret Hewlett-Packard Graphics Language.
- To re-create the *.GRA files, open the ArcPlot module, enter 'display 1040', enter a new filename for the graphics file, enter '&run pnf100k' and select the desired quadrangle name from the pop-up menu (and enter 'quit' to exit the ArcPlot module).

Primary Arc/Info EXPORT-format files (pnf*.e00) for the digital geology:

- pnf100k.e00
- pnfpnt1.e00
- pnfpnt2.e00
- pnfshear.e00

Arc/Info graphics (*.gra) and HPGL2 map plot (*.hp) files for the geologic map plates:

- baker.gra / .hp
- bighorn.gra / .hp
- brogan.gra / .hp
- challis.gra / .hp
- elk.gra / .hp
- mccall.gra / .hp
- pistol.gra / .hp
- riggins.gra / .hp
- warren.gra / .hp
- weiser.gra / .hp

Additional Arc/Info EXPORT-format files (*.e00) necessary to re-create the geologic map plates:

- calcomp1.shd.e00 - shadeset
- fnt038.e00 - font 38
- fnt040.e00 - font 40
- geology.mrk.e00 - markerset

- forestu11¹.e00 - exterior boundary of the Payette National Forest
- snakeu11.e00 - eastern margin of the Snake River (which was used for part of the western boundary of the map area)
- bakclip1².e00, bakclip3³.e00, bakclip4⁴.e00
- bakeru11.e00
- bigclip1.e00, bigclip3.e00, bigclip4.e00
- bighornu11.e00
- broclip1.e00, broclip3.e00, broclip4.e00
- broganu11.e00
- chaclip1.e00, chaclip3.e00, chaclip4.e00
- challisu11.e00
- elkclip1.e00, elkclip3.e00, elkclip4.e00
- elku11.e00

¹ an 'u11' suffix indicates UTM, zone 11 map projection with yshift = -5,000,000 meters.

² A 'clip1' suffix indicates a clip of the geology coverage (pnf100k) for the quadrangle.

³ A 'clip3' suffix indicates a clip of the pnfpnt1 coverage of points for the quadrangle.

⁴ A 'clip4' suffix indicates a clip of the pnfpnt2 coverage of points for the quadrangle.

- mcccclip1, mcccclip2¹, mcccclip3, mcccclip4
- mccallu11.e00
- pisclip1.e00, pisclip2.e00, pisclip3.e00, pisclip4
- pistolu11.e00
- rigclip1.e00, rigclip2.e00, rigclip3.e00, rigclip4
- rigginu11.e00
- warclip1.e00, warclip2.e00, warclip3.e00, warclip4.e00
- warrenu11.e00
- weiclip1.e00, weiclip2.e00, weiclip3.e00, weiclip4.e00
- weiseru11.e00
- geo.prj - a text file used to identify real-world (geographic) coordinates - for use in adding latitude and longitude notation around the margins of the map quadrangle
- u11.prj - a text file to identify UTM, zone 11 map projection - for use in adding latitude and longitude notation around the margins of the map quadrangle
- paycrd.txt - text file listing map credits on the map plates
- payref.txt - text file listing map references on the map plates

AML, graphics, key, lineset, and text files necessary to re-create the geologic map plates:

- scale2a.aml - plots scale bar on plates
- pnf100k.aml - master geologic map AML for plotting each of 10 quads.
- index_pnf.gra - index map graphic displayed on map plates (showing location of the mapped area with respect to the Pacific Northwest).
- pay_line.key - lineset symbol values and descriptive text for lines on the map plates
- pay_pol.key - shadeset symbol values and descriptive text for geologic map units on the map plates
- pay_shr.key - shadeset symbol values and descriptive text for shear zone patterns on the map plates
- pay_sym.key - markerset symbol values and descriptive text for map symbols (markers) on the map plates
- geology.lin - lineset

¹ A 'clip2' suffix indicates a clip of the shear zone coverage (pnfshear) for the quadrangle.

Appendix C - Arc/Info Macro Language program (pnf100k.aml) used to plot out geologic maps by quadrangle

```

/* pnf100k.aml, 3/16/99, pderkey

/* This Arc/Info Macro Language (AML) program
will plot each of the ten geologic map quadrangle
plates covering the Payette National Forest and
vicinity.

/* To run this AML:
/* 1. Type 'ap' at the 'Arc:' prompt to enter the
ArcPlot module,
/* 2. Type 'display 1040' at the 'Arcplot:' prompt to
create a GRA file,
/* 3. Enter a quadrangle name (or a filename of your
own choosing) at the 'Enter ARC/INFO Graphics
filename :' prompt for the GRA to be created,
/* 4. Type '&run pnf100k' at the 'Arc:' prompt to
start the program,
/* 5. Select the 1:100k quad that you wish to plot
from the popup window
/* 6. At the 'Arc:' prompt, enter 'draw <quadname>' -
- there is no need to use the GRA extension.
/* 7. Run the Arc/Info HPGL2 command to convert
the GRA file to an HPGL2 file, i.e., hpgl2 baker
baker.hp # 1.0 opaque # 0 # # # cal.dat
/* 8. Execute the UNIX 'lpr' command to print the
1:100,000-scale geologic map plot on your plotter, i.e.,
lpr -Ppicasso baker.hp

clear
clearselect

&s title1 'Digital Geologic Map Database of the
Payette National Forest and vicinity:'
&s title2 ''
&s platen0 ''
&s plateto ''
&s angle ''

/* select item to plot
&terminal 9999
&s mapquad [getchoice BAKER BIGHORN
BROGAN CHALLIS ELK MCCALL PISTOL
RIGGINS WARREN WEISER]
&select %mapquad%
&when BAKER
&do
&s quad bakeru11
&s geoclip bakclip1
&s shrclip bakclip2
&s pnt1clip bakclip3
&s pnt2clip bakclip4

&s title2 'Baker 1:100,000-scale quadrangle, Oregon
and Idaho'
&s platen0 = 'Plate 5'
&s plateto = 'of 10'
&s angle 0
&end
&when BIGHORN
&do
&s quad bighornu11
&s geoclip bigclip1
&s shrclip bigclip2
&s pnt1clip bigclip3
&s pnt2clip bigclip4
&s title2 'Bighorn Crag 1:100,000-scale
quadrangle, Idaho'
&s platen0 = 'Plate 4'
&s plateto = 'of 10'
&s angle -1.5
&end
&when BROGAN
&do
&s quad broganu11
&s geoclip broclip1
&s shrclip broclip2
&s pnt1clip broclip3
&s pnt2clip broclip4
&s title2 'Brogan 1:100,000-scale quadrangle,
Oregon and Idaho'
&s platen0 = 'Plate 9'
&s plateto = 'of 10'
&s angle 0
&end
&when CHALLIS
&do
&s quad challisu11
&s geoclip chaclip1
&s shrclip chaclip2
&s pnt1clip chaclip3
&s pnt2clip chaclip4
&s title2 'Challis 1:100,000-scale quadrangle, Idaho'
&s platen0 = 'Plate 8'
&s plateto = 'of 10'
&s angle -1.5
&end
&when ELK
&do
&s quad elku11
&s geoclip elkclip1
&s shrclip elkclip2
&s pnt1clip elkclip3
&s pnt2clip elkclip4

```

```

    &s title2 'Elk City 1:100,000-scale quadrangle,
Idaho'
    &s plateno = 'Plate 1'
    &s plateto = 'of 10'
    &s angle -1.0
    &end
&when MCCALL
    &do
    &s quad mccallu11
    &s geoclip mcccclip1
    &s shrclip mcccclip2
    &s pnt1clip mcccclip3
    &s pnt2clip mcccclip4
    &s title2 'McCall 1:100,000-scale quadrangle, Idaho
and Oregon'
    &s plateno = 'Plate 6'
    &s plateto = 'of 10'
    &s angle -0.5
    &end
&when PISTOL
    &do
    &s quad pistolu11
    &s geoclip pisclip1
    &s shrclip pisclip2
    &s pnt1clip pisclip3
    &s pnt2clip pisclip4
    &s title2 'Pistol Creek 1:100,000-scale quadrangle,
Idaho'
    &s plateno = 'Plate 7'
    &s plateto = 'of 10'
    &s angle -1.0
    &end
&when RIGGINS
    &do
    &s quad rigginsu11
    &s geoclip rigclip1
    &s shrclip rigclip2
    &s pnt1clip rigclip3
    &s pnt2clip rigclip4
    &s title2 'Riggins 1:100,000-scale quadrangle, Idaho
and Oregon'
    &s plateno = 'Plate 2'
    &s plateto = 'of 10'
    &s angle -0.5
    &end
&when WARREN
    &do
    &s quad warrenu11
    &s geoclip warclip1
    &s shrclip warclip2
    &s pnt1clip warclip3
    &s pnt2clip warclip4
    &s title2 'Warren 1:100,000-scale quadrangle, Idaho'
    &s plateno = 'Plate 3'
    &s plateto = 'of 10'
    &s angle -1.0

```

```

    &end
&when WEISER
    &do
    &s quad weiseru11
    &s geoclip weiclip1
    &s shrclip weiclip2
    &s pnt1clip weiclip3
    &s pnt2clip weiclip4
    &s title2 'Weiser 1:100,000-scale quadrangle, Idaho
and Oregon'
    &s plateno = 'Plate 10'
    &s plateto = 'of 10'
    &s angle -0.5
    &end
&end

pagesize 46 30
pageunits inches
mapunits meters
mape %quad%
mapscale 100000
mapposition ll 0.0 2.5
mapangle %angle%
maplimits 0.0 2.5 34 27

&s cover1 pnf100k
&s cover2 pnfshear
&s pntcover1 pnf1pnt1
&s pntcover2 pnf1pnt2
&s key1 pay_pol.key
&s key2 pay_line.key
&s key3 pay_sym.key
&s key4 pay_shr.key
&s refs payref.txt
&s credits paycrd.txt

/* Draw outside box
linesymbol 9
linecolor 1
box .5 .5 43 29

textquality proportional
textfont 94021
linedelete all
lineset plotter
lineset carto

/* cut marks
markerset plotter
markersymbol 1
markersize 0.1
marker 0 0
marker 0 29.5
marker 43.5 0
marker 43.5 29.5
markerset water

```

```

&label shadepolys
/* plot geology
shadedelete all
shadeset calcomp1
polygonshade %geoclip% unit %cover1%.ru
shadedelete all

&label linework
res %geoclip% arcs linecode lt 100 and linecode ge 40
arclines %geoclip% linecode %cover1%.con
asel %geoclip% arcs
linedelete all
lineset geology.lin
res %geoclip% arcs linecode lt 40 and linecode gt 0
arclines %geoclip% linecode %cover1%.con
asel %geoclip% arcs
res %geoclip% arcs linecode lt 800 and linecode gt 100
arclines %geoclip% linecode %cover1%.str
asel %geoclip% arcs
res %geoclip% arcs linecode gt 800
arclines %geoclip% linecode %cover1%.lgu
asel %geoclip% arcs

&label geolabels
/* plot geologic map unit label text
res %geoclip% poly area gt 300000
textsize 0.10
labeltext %geoclip% unit %cover1%.ru cc
asel %geoclip% poly

&label points
/* plot all points
markerdelete all
markerset geology.mrk
pointmarkers %pnt1clip% symbol
pointmarkers %pnt2clip% symbol
/* plot annotation for all points
textset font.txt
/* annotext cover1 subclass # {level...level}
annotext %pnt1clip% dip # 1 2
annotext %pnt2clip% dip # 1 2

&label PNF_GIS
/* plot outermost boundary of the Payette National
Forest
linedelete all
lineset carto
/* Remove the comment (!*) on the next line for the
boundary to plot.
/* arclines forestu11 123

&label titles
textfont 93715
textquality kern
textsize 0.5

```

```

move 1.5 27.5
text 'U.S. DEPARTMENT OF THE INTERIOR'
move 1.5 26.9
text 'U.S. GEOLOGICAL SURVEY'
move 42.5 27.5
text 'Open-File Report 98-219B' lr
move 42.5 26.9
text [quote [unquote %plateno%] [unquote
%plateto%]] lr
textfont 93711
textsize 0.5
move 16.2 2.80
text %title1% lc
move 16.2 2.25
text %title2% lc
textsize 0.4
move 16.2 1.65
text 'by Karen Lund, Pamela D. Derkey, Theodore R.
Brandt and Jon R. Oblad ' lc
move 16.2 1.0
text '1999' lc

/* draw map boundary box
linedelete all
lineset plotter
linesymbol 5
arcs %quad%

/* plot shade key for geologic map units
/* geologic units
shadedelete all
shadeset calcomp1
textfont 93711
textsize 0.20
move 33.5 25.8
text 'Geologic Map Units, Payette National Forest'
textsize 0.12
textquality proportional
textfont 94021
linesymbol 1
keyarea 33.5 5.0 45 25.5
keybox 0.6 0.35
keyseparation 0.2 0.2
keyshade %key1% nobox

/* plot shade key for shear zone overprint
shadedelete all
shadeset carto
keyshade %key4% nobox

/* plot line key
textfont 93711
textsize 0.20
move 39.95 13.7
text 'Explanation'
textsize 0.12

```

```

textquality proportional
textfont 94021
linedelete all
lineset geology.lin
keyarea 39.95 3.7 43 13.5
keybox 0.6 0.0
keyline %key2% nobox

/* plot marker key
markerdelete all
markerset geology.mrk
keymarker %key3% nobox
shadedelete all
shadeset calcomp1

/* plot references
textfont 93711
textsize 0.20
textcolor 1
move 36.5 3.20
text 'References'
move 36.5 3.0
textsize 0.12
textquality proportional
textfont 94021
textfile %refs%

&label credits
/* plot credits
textfont 93713
textquality proportional
textsize 0.12
move 29.7 3.85
textfile %credits%

&label proj
/* plot projection
textfont 94021
textsize 0.12
move 1.9 3.85
text 'map projection: UTM, zone 11'
/* plot scale bar
linedelete all
lineset plotter
textfont 94021
textsize 0.12
&r scale2a 4.5 2.5 other 100000

&label index-map
plot index_pnf.gra box 33.5 1.5 35.5 3.5
textfont 93713
textquality proportional
textsize 0.12
move 33.5 1.35
text 'Index map showing Payette National Forest'

```

```

&label lat-long
/* plot neat line labels (latitude and longitude) and
shear zone patterns
&if %mapquad% = 'BAKER' &then
&do
mape %quad%
/* plot shear zones
shadedelete all
shadeset carto
polygonshade %cover2% shear %cover2%.zon
linecolor 1
mapprojection geo.prj u11.prj
neatline -118 44.5 -117 45.0 geo.prj
&end
&if %mapquad% = 'BIGHORN' &then
&do
mape %quad%
/* plot shear zones
shadedelete all
shadeset carto
polygonshade %cover2% shear %cover2%.zon
linecolor 1
mapprojection geo.prj u11.prj
neatline -115 45.0 -114 45.5 geo.prj
&end
&if %mapquad% = 'BROGAN' &then
&do
mape %quad%
/* plot shear zones
shadedelete all
shadeset carto
polygonshade %cover2% shear %cover2%.zon
linecolor 1
mapprojection geo.prj u11.prj
neatline -118 44.0 -117 44.5 geo.prj
&end
&if %mapquad% = 'CHALLIS' &then
&do
mape %quad%
/* plot shear zones
shadedelete all
shadeset carto
polygonshade %cover2% shear %cover2%.zon
linecolor 1
mapprojection geo.prj u11.prj
neatline -115 44.5 -114 45.0 geo.prj
&end
&if %mapquad% = 'ELK' &then
&do
mape %quad%
/* plot shear zones
shadedelete all
shadeset carto
polygonshade %cover2% shear %cover2%.zon
linecolor 1
mapprojection geo.prj u11.prj

```

```

neatline -116 45.5 -115 46.0 geo.prj
&end
&if %mapquad% = 'MCCALL' &then
&do
mape %quad%
/* plot shear zones
shadedelete all
shadeset carto
polygonshade %shrclip% shear %cover2%.zon
linecolor 1
mapprojection geo.prj u11.prj
neatline -117 44.5 -116 45.0 geo.prj
&end
&if %mapquad% = 'PISTOL' &then
&do
mape %quad%
/* plot shear zones
shadedelete all
shadeset carto
polygonshade %shrclip% shear %cover2%.zon
linecolor 1
mapprojection geo.prj u11.prj
neatline -116 44.5 -115 45.0 geo.prj
&end
&if %mapquad% = 'RIGGINS' &then
&do
mape %quad%
/* plot shear zones
shadedelete all
shadeset carto
polygonshade %shrclip% shear %cover2%.zon
linecolor 1
mapprojection geo.prj u11.prj
neatline -117 45.0 -116 45.5 geo.prj
&end
&if %mapquad% = 'WARREN' &then
&do
mape %quad%
/* plot shear zones
shadedelete all
shadeset carto
polygonshade %shrclip% shear %cover2%.zon
linecolor 1
mapprojection geo.prj u11.prj
neatline -116 45.0 -115 45.5 geo.prj
&end
&if %mapquad% = 'WEISER' &then
&do
mape %quad%
/* plot shear zones
shadedelete all
shadeset carto
polygonshade %shrclip% shear %cover2%.zon
linecolor 1
mapprojection geo.prj u11.prj
neatline -117 44.0 -116 44.5 geo.prj

```

```

&end
neatlinehatch 0.125 0.125 0.2 0 geo.prj
textset font.txt
textsymbol 1
textsize 10 pt
textstyle typeset
textoffset -0.35 0.15
neatlinelabels 0.125 top all geo.prj dms '%1%!pat1857;
%2%!pat1727; %3%!pat1728'
textoffset -0.75 0.0
neatlinelabels 0.125 left all geo.prj dms
'%1%!pat1857; %2%!pat1727; %3%!pat1728'
textoffset -0.35 -0.25

&label done
quit
display 9999 3
&return

```

Appendix D - Metadata (pnf100k.met)

Identification_Information:

Citation:

Citation_Information:

Originator: Karen Lund

Originator: Pamela D. Derkey

Originator: Theodore R. Brandt

Originator: Jon R. Oblad

Publication_Date: 1999

Title:

Digital geologic map database of the Payette National Forest and vicinity, Idaho

Edition: version 1.0

Geospatial_Data_Presentation_Form: map

Series_Information:

Series_Name: Open-File Report 98-219B

Issue_Identification:

pnf100k.e00, pnfpnt1.e00, pnfpnt2.e00,
pnfshear.e00

Publication_Information:

Publication_Place: Spokane WA

Publisher: U.S. Geological Survey

Online_Linkage: URL = <http://greenwood.cr.usgs.gov/>

Online_Linkage:

anonymous FTP from greenwood.cr.usgs.gov in the subdirectory
pub/open-file-reports/ofr-98-0219-b/

Description:

Abstract:

The geology of the Payette National Forest and vicinity, Idaho was mapped and compiled by Karen Lund between 1992 and 1996. The geology was compiled onto 1:100,000-scale topographic base maps for input into a geographic information system (GIS). The digital geologic map database can be queried in many ways to produce a variety of geologic maps.

Purpose:

This dataset was developed to provide geologic map GIS of the Payette National Forest for use in future spatial analysis by a variety of users.

This database is not meant to be used or displayed at any scale larger than 1:100,000 (e.g., 1:62,500 or 1:24,000).

Supplemental_Information:

This GIS consists of four major Arc/Info GIS datasets: one line and polygon file (pnf100k) containing geologic contacts and structures (lines) and geologic map rock units (polygons), two point files (pnfpnt1 and pnfpnt2) containing structural data, and one polygon file (pnfshear) containing shear zone polygons.

Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 1998

Currentness_Reference: publication date

Status:

Progress: Completed in 1999 for Open-File Report publication.

Maintenance_and_Update_Frequency:

Plan to update with a new geologic map data model,
perhaps later in 1999.

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -117.125

East_Bounding_Coordinate: -114.5

North_Bounding_Coordinate: 45.625

South_Bounding_Coordinate: 44.375

Keywords:

Theme:

Theme_Keyword_Thesaurus: none

Theme_Keyword: geology

Place:

Place_Keyword_Thesaurus: none

Place_Keyword: USA

Place_Keyword: Idaho

Place_Keyword: Pacific Northwest

Place_Keyword: Payette National Forest

Place_Keyword: Adams County

Place_Keyword: Gem County

Place_Keyword: Idaho County

Place_Keyword: Valley County

Place_Keyword: Washington County

Access_Constraints: None.

Use_Constraints:

This GIS is not meant to be used or displayed at any scale larger
than 1:100,000 (e.g., 1:62,500 or 1:24,000).

Any hardcopies utilizing these data sets shall clearly indicate
their source. If the licensee has modified the data in any way
they are obligated to describe the types of modifications they
have performed on the hardcopy map. Licensee specifically agrees
not to misrepresent these data sets, nor to imply that changes they
made were approved by the U.S. Geological Survey.

Point_of_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Karen Lund

Contact_Organization: U.S. Geological Survey

Contact_Position: geologist

Contact_Address:

Address_Type: mailing and physical address

Address: P.O. Box 25046, M.S. 905

City: Denver

State_or_Province: CO

Postal_Code: 80225

Country: USA
Contact_Voice_Telephone: (303) 236-5600
Contact_Electronic_Mail_Address: klund@usgs.gov

Data_Set_Credit:

Karen Lund (USGS) mapped and compiled the geology onto stable-base material;

Optronics Specialty Co., Inc. scanned the geologic map and provided minimally attributed Arc/Info interchange-format files to the USGS;

Pamela D. Derkey (USGS) imported the files, transformed them to UTM zone 11 (with a y-shift) and attached and attributed an interim geologic map data model;

Jon R. Oblad (Eastern Washington University) annotated the point data for output at a scale of 1:100,000.

Native_Data_Set_Environment:

SunOS, 5.5.1, sun4u UNIX

ARC/INFO version 7.1.1

Data_Quality_Information:

Attribute_Accuracy:

Attribute_Accuracy_Report:

Attribute accuracy was verified by manual comparison of the source with hard-copy printouts and plots.

Logical_Consistency_Report: Polygon and chain-node topology present.

Completeness_Report:

Geologic map units were both compiled from a variety of maps (with map scales ranging from 1:24,000 to 1:250,000 and 1 inch equals 10 miles) and mapped in the field at a scale of 1:24,000.

This data was compiled at a scale of 1:100,000. Some small units and those obscured by dense forest cover may not be included in this dataset.

Positional_Accuracy:

Horizontal_Positional_Accuracy:

Horizontal_Positional_Accuracy_Report:

The RMS error resulting from the four file transformations ranged from 19 to 20 meters, thus the overall accuracy of the digital geologic map is no better than +/- 20 meters.

It was tested by visual comparison of the source with hard-copy plots.

Lineage:

Source_Information:

Source_Citation:

Citation_Information:

Originator: Karen Lund

Originator: Pamela D. Derkey

Originator: Theodore R. Brandt

Originator: Jon R. Oblad

Publication_Date: 1999

Title:

Digital geologic map database of the Payette National Forest and vicinity, Idaho

Geospatial_Data_Presentation_Form: map

Series_Information:

Series_Name: Open-File Report 98-219B

Publication_Information:

Publication_Place: Spokane WA
Publisher: U.S. Geological Survey
Source_Scale_Denominator: 100000
Type_of_Source_Media: stable-base material: two clear film positives
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 1999
Source_Currentness_Reference:
Source_Citation_Abbreviation: Lund and others (1998)
Source_Contribution:
Karen Lund mapped and compiled the geology of the Payette National Forest and vicinity, Idaho between 1992 and 1996. The other three authors were responsible for creating the digital product.

Process_Step:

Process_Description:

Clear film positives of the 1:100,000-scale geologic map compilation were electronically scanned to create raster images, converted to vector, polygon and point GIS layers, and minimally attributed by a contractor (Optronics Specialty Co., Inc., Northridge, CA). The USGS also provided the contractor with the linework for the Snake River which had been converted from digital line graph (DLG) format files (US Geological Survey, 1993) to Arc/Info GIS so as to delineate discrete geologic unit boundaries along the western margin of the map area. The initial products were remitted to the USGS in an Arc/Info EXPORT format in scanner units and with latitude and longitude registration tics digitized from the original film positives. These tic points were used to convert (or transform) the digital files to calculated latitude-longitude points for a Universal Transverse Mercator (zone 11, with a -5,000,000 meter y-offset or false northing) map projection. The digital files were then augmented with an interim geologic map data model (or data base), further attributed and edited, and then plotted and compared to the original film positives of the geologic map to check for digitizing and attributing errors.

Process_Date: 1997 - 1998

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Vector

Point_and_Vector_Object_Information:

SDTS_Terms_Description:

SDTS_Point_and_Vector_Object_Type: Point

Point_and_Vector_Object_Count: 1794

SDTS_Point_and_Vector_Object_Type: String

Point_and_Vector_Object_Count: 6010

SDTS_Point_and_Vector_Object_Type: GT-polygon composed of chains

Point_and_Vector_Object_Count: 1795

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Grid_Coordinate_System:

Grid_Coordinate_System_Name: Universal Transverse Mercator

Universal_Transverse_Mercator:

UTM_Zone_Number: 11

Transverse_Mercator:

Scale_Factor_at_Central_Meridian: 1:100,000

Longitude_of_Central_Meridian: implied
Latitude_of_Projection_Origin: implied
False_Easting: implied
False_Northing: -5,000,000 meters
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: coordinate pair
Coordinate_Representation:
Abscissa_Resolution: not determined
Ordinate_Resolution: not determined
Planar_Distance_Units: METERS
Geodetic_Model:
Horizontal_Datum_Name: Unknown
Ellipsoid_Name: Clarke 1866
Semi-major_Axis: 6378206.4
Denominator_of_Flattening_Ratio: 294.98

Entity_and_Attribute_Information:

Overview_Description:

Entity_and_Attribute_Overview:

The 'Digital geologic map database of the Payette National Forest and vicinity, Idaho' Open-File Report 98-219B text contains a detailed description of each attribute code and a reference to the associated map symbols on the map source materials. The GIS includes a geologic linework arc attribute table, pnf100k.aat, that relates to the pnf100k.con (contact look-up table), pnf100k.str (structure look-up table), pnf100k.lgu (linear geologic unit look-up table) and pnf100k.ref (descriptive source or reference data) files; a rock unit polygon attribute table, pnf100k.pat, that relates to the pnf100k.ru (rock unit look-up table) and pnf100k.ref (descriptive source or reference files); a shear zone polygon attribute table, pnfshear.pat, that relates to the pnfshear.zon (shear zone look-up table) and pnfshear.ref (descriptive source or reference data) files; and two geologic map symbol point attribute tables, pnf100k.pnt1.pat and pnf100k.pnt2.pat, that relate to the pnf100k.pnt*.sym (structural point data look-up tables) and pnf100k.pnt*.ref (descriptive source or reference data) files.

Entity_and_Attribute_Detail_Citation:

Please see the Open-File Report text for a complete description of entities and attributes.

Distribution_Information:

Distributor:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: U.S. Geological Survey Information Services

Contact_Address:

Address_Type: mailing and physical address

Address: Open-File Reports, Box 25286

City: Denver

State_or_Province: CO

Postal_Code: 80225

Country: USA

Contact_Voice_Telephone: 1-303-202-4200

Contact_Facsimile_Telephone: 1-303-202-4693

Distribution_Liability:

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The USGS makes no guarantee or warranty concerning the accuracy of

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This digital geologic map GIS of the Payette National Forest and vicinity, Idaho is not meant to be used or displayed at any scale larger than 1:100,000 (e.g., 1:62,500 or 1:24,000).

Metadata_Reference_Information:

Metadata_Date: 19990316

Metadata_Review_Date:

Metadata_Future_Review_Date:

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: U.S. Geological Survey

Contact_Person: Pamela D. Derkey

Contact_Position: geologist

Contact_Address:

Address_Type: mailing and physical

Address: 904 W. Riverside Ave., Rm. 202

City: Spokane

State_or_Province: WA

Postal_Code: 99201

Country: USA

Contact_Voice_Telephone: (509) 368-3114

Contact_Facsimile_Telephone: (509) 368-3199

Contact_Electronic_Mail_Address: pderkey@usgs.gov

Metadata_Standard_Name:

FGDC Content Standards for Digital Geospatial

Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Access_Constraints: none

Metadata_Use_Constraints:

This GIS is not meant to be used or displayed at any scale larger than 1:100,000 (e.g., 1:62,500 or 1:24,000).