



Digital Geologic Map of the Coeur d'Alene 1:100,000 Quadrangle, Idaho and Montana

Digital compilation by Steven R. Munts¹

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Digital database, version 1.0

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

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Introduction

Between 1961 and 1969, Alan Griggs and others conducted fieldwork to prepare a geologic map of the Spokane 1:250,000 map (Griggs, 1973). Their field observations were posted on paper copies of 15-minute quadrangle maps. In 1999, the USGS contracted with the Idaho Geological Survey to prepare a digital version of the Coeur d'Alene 1:100,000 quadrangle. To facilitate this work, the USGS obtained the field maps prepared by Griggs and others from the USGS Field Records Library in Denver, Colorado. The Idaho Geological Survey (IGS) digitized these maps and used them in their mapping program. The mapping focused on field checks to resolve problems in poorly known areas and in areas of disagreement between adjoining maps. The IGS is currently in the process of preparing a final digital spatial database for the Coeur d'Alene 1:100,000 quadrangle. However, there was immediate need for a digital version of the geologic map of the Coeur d'Alene 1:100,000 quadrangle and the data from the field sheets along with several other sources were assembled to produce this interim product.

This interim product is the digital geologic map of the Coeur d'Alene 1:100,000 quadrangle, Idaho and Montana. It was compiled from the preliminary digital files prepared by the Idaho Geological, and supplemented by data from Griggs (1973) and from digital databases by Bookstrom and others (1999) and Derkey and others (1996). The resulting digital geologic map (GIS) database can be queried in many ways to produce a variety of geologic maps. Digital base map data files (topography, roads, towns, rivers and lakes, etc.) 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). The digital geologic map graphics and plot files (cda100k.gra/.hp and cda-map.pdf) that are provided in the digital package are representations of the digital database.

The map area is located in north Idaho (Fig. 1). This open-file report describes the geologic map units, the methods used to convert the geologic map data into a digital format, the ArcInfo GIS file structures and relationships, and explains how to download the digital files from the U.S. Geological Survey public access World Wide Web site on the Internet.

Manuscript reviews by Pamela D. Derkey, Thomas P. Frost, and Michael L. Zientek are greatly appreciated. I wish to thank Michael L. Zientek for the map unit descriptions and review of the digital files.

Description of Map Units

Unit descriptions were not included with the field sheets obtained from the USGS Field Records Library. These units' descriptions were modified from information published by Griggs (1973), Weis (1968), Weissenborn and Weis (1976), and Joseph (1990).

Qal Alluvial silt, sand, and gravel along stream valleys; silt and peat in filled ponds and lakes.

Qgy Younger glacial deposits - Glaciofluvial deposits of sand and gravel. Includes morainal till around the southwest end of Pend Oreille Lake.

Qls Landslide deposits - Areas of slump along valley walls.

Qgo Older glacial deposits - Glaciofluvial and glaciolacustrine deposits of silt, sand, and gravel, usually stratified and well sorted; includes some kame deposits and morainal material along margins of Spokane Valley and Rathdrum Prairie and in their tributary valleys.

Qp Palouse Formation-Loess deposits of tan to brown silt and fine sand, includes a number of overlapping soil zones of differing ages, some of which have well-developed clay and caliche layers; mantles the basalt plateau and the lower, gentler slopes of hills and ridges of pre-Tertiary rock that protrude above the top surface of the basalt flows and border the flows on the eastern side.

QTg Older gravel deposits -Poorly consolidated gravel, sand, and silt capping terraces and some flat ridge crests or other gently sloping surfaces. Accumulation of some deposits began after outpouring of basalt flows of the Columbia River Group, which dammed stream drainages; some result from blocking of drainage to west by glacial material in Pleistocene time. Deposits all of local origin.

Tcr Columbia River Basalt Group and Latah Formation - Flows of dense, dark, tholeiitic basalt, usually from 50 to 150 feet thick, and all essentially flat lying. Pillow-palagonite tuff complexes are present. The interlayered or underlying lacustrine beds of the Latah Formation are included with the basalt and not shown separately are. The Latah Formation consists of poorly-indurated siltstone, claystone, sandstone, and minor conglomerate that are tan to gray in color, thin bedded, and in part laminated.

TKg Granitic rocks - Plutons to batholithic complexes that predominantly consist of felsic igneous rocks of quartz monzonitic to granodioritic composition, but including differentiates ranging in composition from diorite to alaskite. Most of rocks are medium- to coarse grained and in large part porphyritic, but also include some sill-like bodies of fine-grained quartz monzonite intruded into the high-grade metamorphic rocks. Some, such as the small pluton south of Wolf Lodge Bay on Coeur d'Alene Lake, have apophyses and dikes of porphyries associated with them.

Cl Lakeview Limestone - Light- to dark-gray, thin- to thick-bedded, blocky limestone; includes blocky gray dolomite unit in upper part; contains some silty to sandy layers and zones. Metamorphosed to marble or hornfels adjacent to granitic intrusives.

Crg Rennie Shale and Gold Creek Quartzite – Rennie Shale - a fissile olive colored fossiliferous shale, about 100 feet thick; exposed only infrequently and generally poorly so. This units lies conformably between the Gold Creek Quartzite and the overlying Lakeview Limestone and is here mapped with the Gold Creek Quartzite. Gold Creek Quartzite –

White- to pinkish- vitreous, coarse-grained quartzite. Some pebble conglomerate is always present at base. The quartzites are usually thick-bedded and commonly crossbedded; the unit is about 500 feet thick.

Metamorphosed sedimentary rock of the Belt Supergroup

Yl Libby Formation - Dominantly medium-gray to olive-colored siltite or laminated siltite and argillite. Very thinly laminated dark argillite makes up the lowest part of section. The unit also contains rare chert laminae. Mud-chip breccia and ripple marks are common structural features; mud cracks are rare. It characteristically weathers in a blocky habit. Maximum thickness of eroded remnants is approximately 2,000 feet.

Ysp Striped Peak Formation – This formation consists of four distinct sub-units: 1) a basal mixed siltite, argillite, and quartzite member of red and green color overlain successively by 2) a tan dolomitic member, 3) a very thinly laminated dark-gray argillite-siltite member, and capped by 4) a dark-red arkosic quartzite unit (Harrison and Jobin, 1963). The combined thickness of the unit is nearly 2,000 feet and is about equally divided among the four sub-units. Basal unit thickens and overlying units wedge out southward. Mud cracks, ripple marks, and mud-chip breccia are found in red to green-colored rocks; salt casts and channeling are much less common structures. Several stromatolite layers occur in this unit. Micaceous sheen on bedding surfaces is characteristic at most outcrops. The transition into the overlying Libby Formation, and into the underlying upper part of Wallace Formation occurs through fairly narrow zones.

Ywu Upper part of Wallace Formation - Very thinly bedded dark-gray argillite or thinly laminated dark-gray argillite and light-gray siltite; a few beds or thin zones of lighter colored siltite are scattered through unit. A carbonate-bearing zone several hundred feet thick occurs near the center or toward the top of the map unit and appears to persist throughout area. It consists of greenish-gray to gray to dark-gray interbedded to interlaminated dolomitic argillite to siltite with some gray dolomite to dolomitic limestone beds, similar to basal unit of the lower part of Wallace. At some places dark-gray argillite, also contains carbonates. At most exposures, rocks are noticeably fissile, and fairly regularly bedded. Thickness is approximately 2,500 to 3,000 feet. The lower contact is gradational.

Ywl Lower part of Wallace Formation – This map units contains two distinguishable members, which were not differentiated on map. The upper unit consists predominantly of alternating black argillite and light-gray to greenish-gray siltite or quartzite; the latter is usually carbonate bearing. Interspersed in the sequence are layers or zones of rock like that in the Wallace units above and below. The lower unit, green to greenish-gray or gray, usually carbonate -bearing, interbedded or interlaminated argillite and siltite, contains many bluish-gray dolomite and dolomitic limestone beds. Blocky weathering molar-tooth structure, and rusty-tan-weathering are characteristic. Mud cracks (nondesiccate in origin) and ripple marks are common; fine-textured cross bedding is evident on etched surfaces of some siltite and quartzite beds. Irregularity in bedding and

minor folds are characteristic. Thickness is estimated to vary from 5,000 to 7,000 feet; the thinnest section is in and around the Coeur d'Alene district.

Ysr St. Regis Formation - Dark-red, purplish-red, green, or greenish-gray, interbedded or interlaminated, usually very thin- to thin-bedded argillite and siltite. The unit contains some quartzite beds in its basal part and becomes more argillitic toward top. Some carbonate-bearing beds are found in the upper part. Mud cracks, mud-chip breccia, and ripple marks are very common. It is gradational into units above and below. The unit weathers into platy or flaggy fragments.

Yr Revett Formation -Blocky, white to light-gray, thick-bedded, fine- to medium-grained, vitreous quartzite that is somewhat feldspathic. Gray to greenish-gray, thin- to thick-bedded siltite with partings and interbeds of argillite are common in upper and lower parts of the unit; siltite may be dominant rock type over zones tens of feet thick. Cross bedding in vitreous quartzite is common, and a rusty speckling due to weathering of small round carbonate segregations is characteristic in some vitreous beds. The thickness ranges from 2,000 to 3,000 feet. The map unit is transitional over hundreds of feet into units above and below.

Yrb Revett and Burke Formations, undivided – Units are lumped together where individual identity questionable in areas west of south end of Coeur d'Alene Lake.

Yb Burke Formation - Light- to medium-gray to greenish-gray, thin- to thick-bedded siltite with partings and interbeds of argillite. Some light-gray to white quartzite occurs in scattered beds and zones. At some places, mostly peripheral to Coeur d'Alene mining district and in the lower middle part of section, rocks are reddish-purple to lavender in color. Ripple marks are common in places; some cross bedding is present. At many exposures, the rocks have a faded weathered rind that contrasts with darker fresh rock. Fine magnetite octahedral pepper many of siltite beds. It is transitional into formations above and below. The thickness ranges from 2,800 to 4,500 feet; at most places, it is between 3,000 and 3,500 feet.

Yp Prichard Formation undivided – The formation was mapped as a single unit in western part of Coeur d'Alene district near Kellogg. The upper transitional zone and argillitic rocks have not been mapped separately from the predominantly siltite to quartzite below in the western part of the Coeur d'Alene district.

Ypu Upper part of Prichard Formation - Dark- to medium- gray, very thin-bedded argillite commonly interlaminated with light-gray siltite and also containing some siltite beds. This sequence grades upward into an interbedded and interzoned argillite, siltite, and quartzite sequence 500 to 1,000+ feet thick, which forms the transition zone into siltitic and quartzitic units above. Argillite is rust-stained on weathered surfaces; occasional ripple marks are present in the upper part. Total thickness ranges from 2,500 to 3,500 feet.

Ypl Lower part of Prichard Formation -Predominantly medium- to light-gray, thin- and regularly bedded siltite, laminated in part; some argillite is present in laminae and beds. Some beds or zones of gray to white quartzite of lenticular habit are present. Disseminated pyrrhotite concentrated within certain laminae is characteristic, and its weathering results in a persistent rusty-red rind on fracture surfaces. Thickness is over 7,500 feet; the base of the unit is not exposed.

Other Precambrian rock units

Yqd Quartz diorite - Dark-green, fine- to coarse- grained, hornblende-plagioclase- (quartz-biotite) diabasic-textured rocks intruded as sills into Prichard Formation. The sills can be as much as 1,000 feet thick; only the larger bodies are shown on the map.

pCbgh Hauser Lake Gneiss - Rusty-weathering, medium-grained, thinly-layered biotite-orthoclase-plagioclase-quartz gneiss and schist that contains minor quartzite. These rocks are foliated and may show lineated, mylonitic fabrics. Sillimanite is common and widespread. Muscovite-biotite schist layers are less than 1 m thick and quartz-feldspar layers are more than 1 m thick. The gneiss is locally intruded by mafic igneous rocks that now are small bodies of garnet-bearing amphibolite. Abundant felsic dikes and irregular crosscutting bodies with wide range of textures and compositions are present. Griggs (1973) thought the Prichard Formation (Belt Supergroup) was the protolith for the gneiss.

pCmu Metamorphic rocks, undivided – Tan to light-gray, coarse-grained quartz-feldspar-mica gneiss; tan, pink, gray, brown, medium to fine-grained micaceous and sillimanitic schist; gray, prominently layered gneiss and schist, and quartzite. Individual layers in prominently layered gneiss and schist are generally less than 6 inches thick and include quartzite, feldspathic quartzite, micaceous quartz-feldspar gneiss, granitic rock, amphibolite, and schist. Finer-grained sillimanitic facies rocks generally have less well-developed schistosity and are commonly intricately folded and contorted on all scales. Intricate folding and contortion on larger-scale is widespread in coarser-grained rocks. Granitic and pegmatitic lenses, pods, and irregular crosscutting bodies are locally abundant. Amphibolite layers and small, irregular amphibolite bodies present in several places. Griggs (1973) thought the Prichard Formation (Belt Supergroup) was the protolith for the gneiss.

pCmuq Quartzite - Medium to coarse-grained, in part vitreous, but mostly micaceous; in zones to hundreds of feet thick with some interlayered, more micaceous rock. Shown separately only in the more highly metamorphosed rocks.

Data Sources, Processing, and Accuracy

The Idaho Geological Survey (IGS) digitized original paper copy field maps prepared by Allan B. Griggs, between 1961 and 1969, for the Athol, Coeur d'Alene, Kellogg, Kingston, Lakeview, Lane, and Spirit Lake 15-minute quadrangles. The preliminary

digital files for each quadrangle (not including point data) were given to the U.S. Geological Survey (USGS) in 1999. Robert J. Miller (USGS) first merged the files for each quadrangle into single topological ArcInfo datasets and then edge matched the individual quadrangle files together to create a single dataset containing all of the IGS-provided digital geologic data (contacts, faults, and map units). Steven R. Munts (contractor) digitized geology from Griggs (1973) to fill in the northeastern part of the quadrangle not covered by Griggs' unpublished field maps. Digital geology (the contact between Quaternary sediments and older bedrock) from Bookstrom and others (1999) and digital geology from Derkey and others (1996) was inserted to complete the compilation. Munts also adjusted the Qal unit contacts to fit 1:100,000 topography. The digital files were then augmented with an interim geologic map data model (data base), further attributed and edited, and then plotted and compared to the original field geologic maps to check for digitizing and attributing errors. All processing by the U.S. Geological Survey was done in Arc/Info versions 7.2.1 and 8 installed on a Sun Ultra workstation.

The overall accuracy (with respect to the location of lines and points) of the digital geologic map ([see Figs. 2 and 3 for page-size versions](#)) is probably no better than +/- 13 meters. This digital 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).

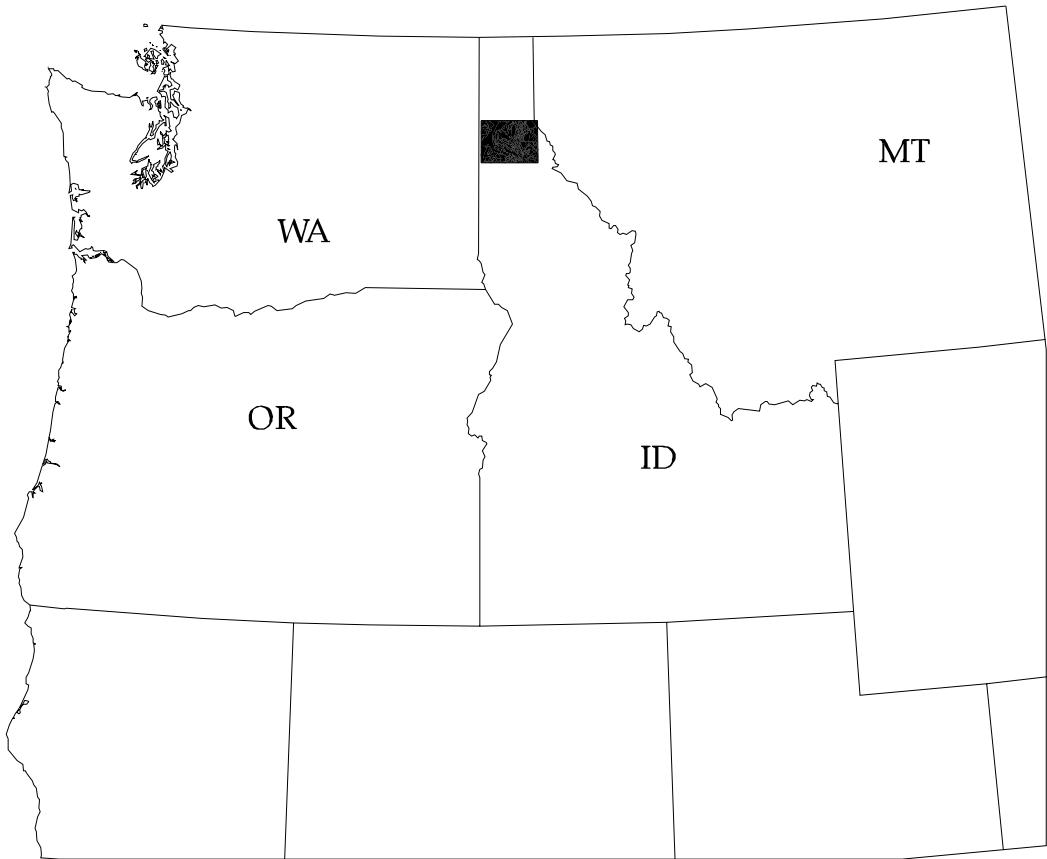


Figure 1. Index map showing the geographic extent of the mapped area (black fill) and the Coeur d'Alene quadrangle with respect to the Pacific Northwest.

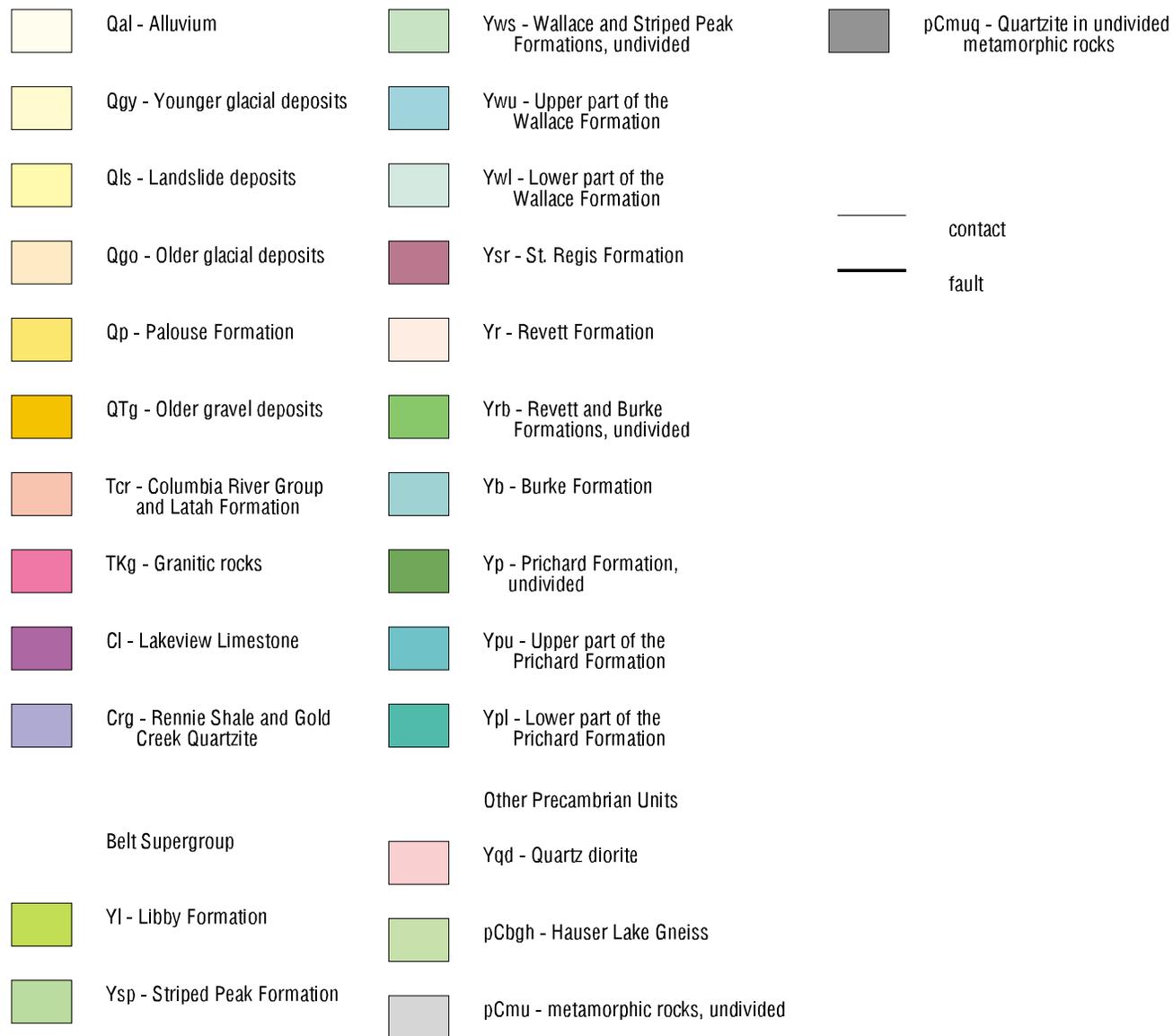


Figure 2. Explanation for the Simplified Digital Geologic Map of the Coeur d'Alene 1:100,000 quadrangle, Idaho and Montana

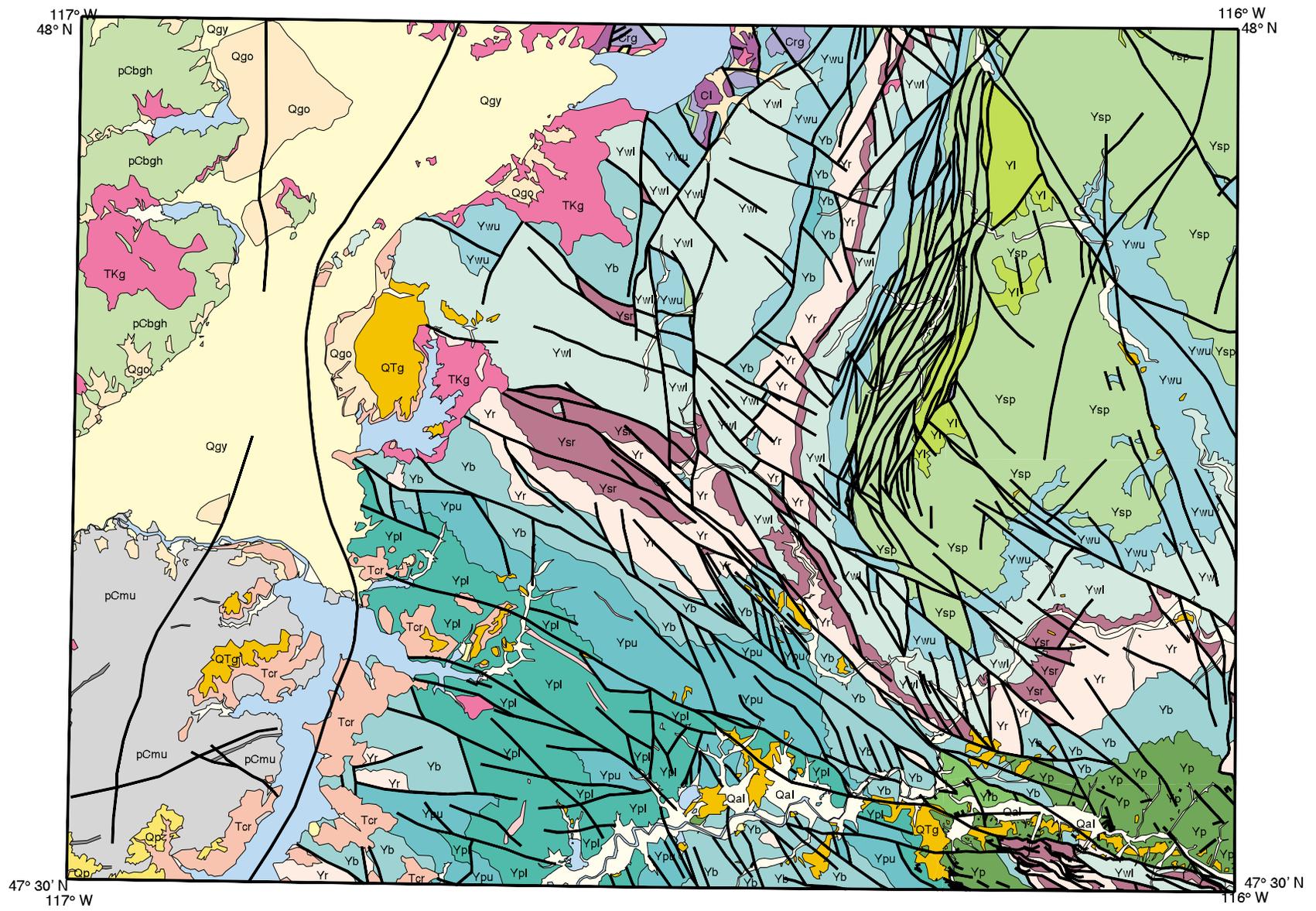


Figure 3. Simplified Digital Geologic Map of the Coeur d'Alene 1:100,000 quadrangle, Idaho and Montana

GIS Documentation

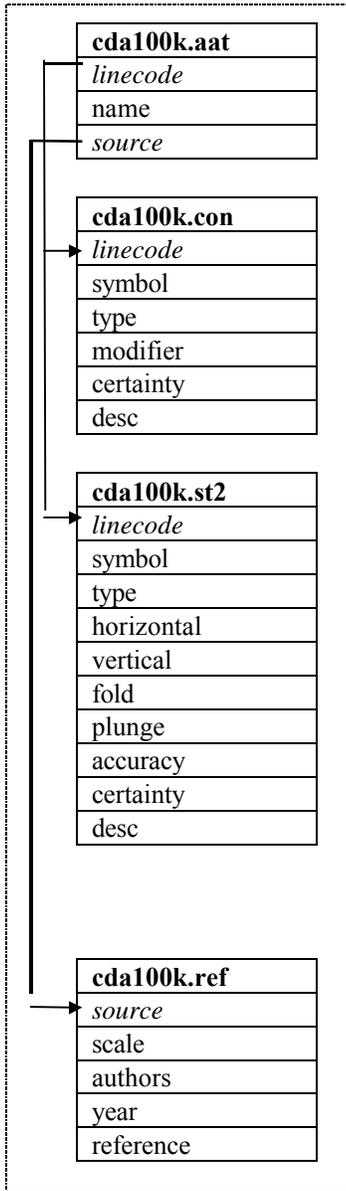
The digital geologic map of the Coeur d'Alene 1:100,000 quadrangle includes a geologic linework arc attribute table, CDA100K.AAT, that relates to the CDA100K.CON, CDA100K.ST2 and CDA100K.REF files; a rock unit polygon attribute table, CDA100K.PAT, that relates to the CDA100K.RU and CDA100K.REF files; and a geologic map symbol point attribute table, CDA100KP.PAT, that relates to the CDA100KP.SYM and CDA100KP.REF files (see Fig. 4). These data files are described below.

Linear Features

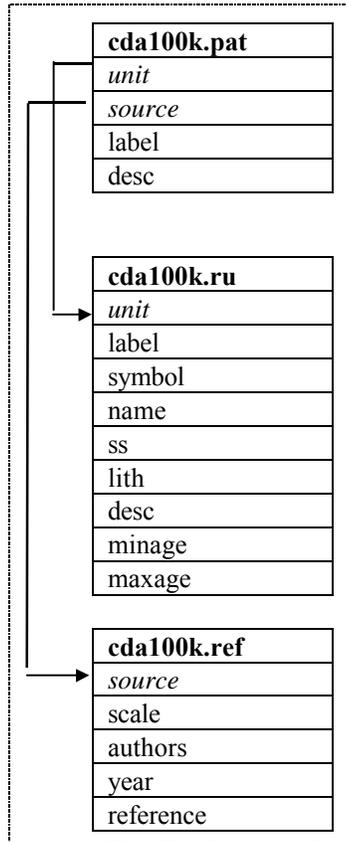
Descriptions of the items identifying linear features such as contacts, boundaries (e.g., lines of latitude and longitude, state boundaries) and structures in the arc (or line) attribute table, CDA100K.AAT, are as follows:

CDA100K.AAT			
ITEM NAME	ITEM TYPE	ITEM LENGTH	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 CDA100K.CON file. Linecodes > 100 and < 600 represent structural features which are described in the CDA100K.ST2 file.
name	character	30	Name given to structural feature.
source	integer	4	Numeric code used to identify the data source for the linear feature. Complete references for the sources are listed in the CDA100K.REF file.

Arc attribute table and related look-up tables:



Polygon attribute table and related look-up tables:



Point attribute table and related look-up tables:

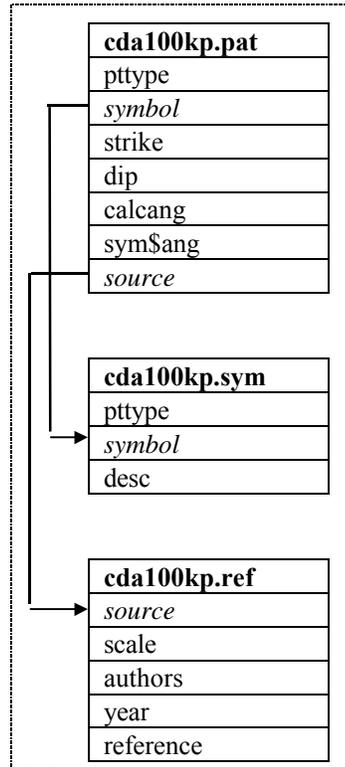


Figure 4: Relationships between feature attribute tables and look-up tables.

Attribute descriptions for items in the contact (and boundary) look-table, CDA100K.CON [for use with the CARTO.LIN and GEOL_SFO.LIN linesets], are as follows:

CDA100K.CON			
ITEM NAME	ITEM TYPE	ITEM LENGTH	ATTRIBUTE DESCRIPTION
linecode	integer	3	Numeric code (a value < 100) used to identify type of contact or boundary. (This item also occurs in CDA100K.AAT.)
symbol	integer	3	Line symbol number used by Arc/Info to plot lines. Symbol numbers refer to the CARTO.LIN lineset for linecodes gt 42 and lt 100 and to the GEOL_SFO.LIN lineset for linecodes gt 0 and lt 43.
type	character	10	Major type of line, e.g., contact, state boundaries, 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, CDA100K.ST2 [for use with the GEOL_SFO.LIN lineset], are as follows:

CDA100K.ST2			
ITEM NAME	ITEM TYPE	ITEM LENGTH	ATTRIBUTE DESCRIPTION
linecode	integer	3	Numeric code (a value > 100 and < 600) used to identify type of structural feature. (This item also occurs in CDA100K.AAT.)
symbol	integer	3	Line symbol number used by Arc/Info to plot arc (line). Symbol numbers refer to the GEOL_SFO.LIN lineset .
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.

Areal Features

Descriptions of the items identifying geologic units in the polygon attribute table, CDA100K.PAT, are as follows:

CDA100K.PAT			
ITEM NAME	ITEM TYPE	ITEM LENGTH	ATTRIBUTE DESCRIPTION
unit	integer	4	Numeric code used to identify the rock unit which is described in the CDA100K.RU look-up table. (This item also occurs in CDA100K.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 CDA100K.REF file.
label	character	10	Rock unit label (abbreviation) used to label unit on map.
desc	character	250	Formal or informal unit name.

Attribute descriptions for items in the lithology (rock unit) look-table, CDA100K.RU (for use with the CALCOMP1.SHD shadeset), are as follows:

CDA100K.RU			
ITEM NAME	ITEM TYPE	ITEM LENGTH	ATTRIBUTE DESCRIPTION
unit	integer	4	Numeric code used to identify rock unit. (This item also occurs in CDA100K.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.SHD shadeset .
name	character	7	The prefix portion of the rock unit label that does not include subscripts. (If subscripting is not used in the original unit 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	250	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

Point Features

Descriptions of the items identifying geologic map symbols are given in the point attribute table, CDA100KP.PAT, which is defined as follows:

CDA100KP.PAT			
ITEM NAME	ITEM TYPE	ITEM LENGTH	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 CDA100KP.SYM file.)
symbol	integer	3	Marker symbol number used by Arc/Info to identify type of geologic map symbol. Symbol numbers refer to the GEOSCAMP2.MRK markerset (Matti and others, 1997). (This item also occurs in the CDA100KP.SYM file.)
strike	integer	3	Strike of bedding, 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, 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. The various structural map symbols in the GEOSCAMP2.MRK markerset (Matti and others, 1997) had to be rotated by different amounts to achieve their proper map orientation. For the strike and dip symbols, calcang = strike – 270.
sym\$ang	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 structural map symbol. Complete references for the sources are listed in the CDA100KP.REF file.

Attribute descriptions for items in the geologic map symbols look-up table, CDA100KP.SYM, [for use with the GEOSCAMP2.MRK markerset (Matti and others, 1997)], are as follows:

CDA100KP.SYM			
ITEM NAME	ITEM TYPE	ITEM LENGTH	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 CDA100KP.PAT file.)
symbol	integer	3	Marker symbol number used by Arc/Info to identify type of structural map symbol. Symbol numbers refer to the GEOSCAMP2.MRK markerset (Matti and others, 1997).
desc	character	250	Written description or explanation of map symbol.

Source Attributes

Descriptive source or reference information for the CDA100K and CDA100KP ArcInfo datasets is stored in the CDA100K.REF and CDA100KP.REF files, respectively. Attribute descriptions for items in the CDA100K.REF and CDA100KP.REF data source files are as follows:

CDA100K.REF / CDA100KP.REF			
ITEM NAME	ITEM TYPE	ITEM LENGTH	ATTRIBUTE DESCRIPTION
source	integer	4	Numeric code used to identify the data source. (This item also occurs in the CDA100K.AAT, CDA100K.PAT, and CDA100KP.PAT files.)
scale	integer	8	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	200	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 interchange 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

To obtain copies of the digital data:

Download the digital files from the USGS public access World Wide Web site on the Internet: **URL = <http://pubs.usgs.gov/of/2000/0135/>**

The Internet site contains the digital geologic map of the Coeur d'Alene 1:100,000 quadrangle both in ArcInfo exchange-format files (cda100k.e00 and cda100kp.e00) and as a HPGL2 plot file (cda100k.hp) of the map area, 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.

Obtaining Paper Maps

Paper copies of the digital geologic map are not available from the USGS. However, with access to the Internet and access to a large-format color plotter that can interpret either HPGL2 (Hewlett-Packard Graphics Language), or PDF (portable document format) files, a 1:100,000-scale paper copy of the map can be made, as follows:

Download the digital version of the map, **cda100k.hp** or **cda100k.pdf**, from the USGS public access World Wide Web site on the Internet using the **URL = <http://pubs.usgs.gov/of/2000/0135/>**

This file can be plotted by any large-format color plotter that can interpret HPGL2 or PDF files. The finished plot is about 30 inches by 42 inches.

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

References Cited

- Bookstrom, A.A., Box, S.E., Jackson, B.L., Brandt, T.R., Derkey, P.D., and Munts, S.R., 1999, Digital map of surficial geology, wetlands, deepwater habitats, Coeur d'Alene River valley, Idaho: U.S. Geological Survey Open-File Report 99-548, 121 p. and 13 digital plates.
- Derkey, P.D., Johnson, B.R., and Carver, Michael, 1996, Digital geologic map of the Coeur d'Alene district, Idaho and Montana: U.S. Geological Survey Open-File Report 96-299, 6 p. and one digital plate.
- Griggs, A.B., 1973, Geologic map of the Spokane quadrangle, Washington, Idaho, and Montana: U.S. Geological Survey Miscellaneous Geologic Investigations Series Map I-768, 1:250,000
- Harrison, J.E. and Jobin, D.A., 1963, Geology of the Clark Fork quadrangle, Idaho-Montana: U.S. Geological Survey Bulletin 1141-K, 38 p.
- Joseph, N. L., 1990, Geologic map of the Spokane 1:100,000 Quadrangle, Washington – Idaho: Washington Division of Geology and Earth Resources Open-File Report 90-17, 29 p., 1 sheet.
- Matti, J.C., Miller, F.K., Powell, R.E., Kennedy, S.A., Bunyapanasarn, T.P., Koukladas, C., Hauser, R.M., and Cossette, P.M., 1997, Geologic-point attributes for digital geologic-map data bases produced by the Southern California Areal Mapping Project (SCAMP): U.S. Geological Survey Open-File Report 97-859, 7 p.
- Weis, P. L., 1968, Geologic map of the Greenacres quadrangle, Washington and Idaho: U.S. Geological Survey Geologic Quadrangle Map GQ-734, 4 p., 1 pl., scale 1:62,500.
- Weissenborn, A. E. and Weis, P. L., 1976, Geologic map of the Mount Spokane quadrangle, Spokane County, Washington and Kootenai and Bonner Counties, Idaho: U.S. Geological Survey Geologic Quadrangle Map GQ-1336, 1 sheet, scale 1:62,500.

Appendix A - List of digital files in the Coeur d'Alene GIS

- Use the 'importfile.aml' to IMPORT all of the *.E00 files for use in ArcInfo.
- Use the ArcInfo 'DRAW' command to plot the *.GRA file to your screen. (Make sure the display is set with the ArcInfo 'DISPLAY' command.)
- Use the ArcInfo 'HPGL2' command to create a HPGL2 file from the *.GRA file.
- Use the UNIX 'lpr -P<plotter_name> cda100k.hp' command to send the cda100k.hp file to a large-format color plotter that can interpret Hewlett-Packard Graphics Language.
- To re-create the *.GRA file, open the ArcPlot module, enter 'display 1040', enter a new filename for the graphics file, enter '&run cda100k'.

Primary ArcInfo exchange-format (*.e00) and metadata (*.met) files for the digital geology:

- cda100k.e00 – line and poly GIS
- cda100kp.e00 – point GIS
- cda100k.met - metadata

Arc/Info graphics (*.gra), HPGL2 map plot (*.hp), and portable document format (*.pdf) files for the geologic map sheet:

- cda100k.gra /.hp
- cda-map.pdf

Additional ArcInfo exchange -format files (*.e00) necessary to re-create the geologic map sheet:

- calcomp1.shd.e00 - shadeset
- cdabu11.e00 - exterior boundary of the Coeur d'Alene quadrangle
- fnt037.e00 – font 37
- fnt038.e00 – font 38
- fnt040.e00 – font 40
- geoscamp2.mrk.e00 - markerset
- hypsog.e00 - hypsography

AML, graphics, key, symbolset (*.lin), and text files (*.dat, *.prj, *.txt) necessary to re-create the geologic map sheet:

- cda100k.aml – program that creates a graphics file of the geologic map of the Coeur d'Alene quadrangle
- importfile.aml – program to import ArcInfo exchange-format (*.e00) files

- scale2a.aml – program to plot scale bar
- cdasourc.gra –map of data sources and 15-minute quadrangle outlines graphic file
- indexcda.gra - index map graphic file
- usgslogo.gra – USGS visual identity
- cda_line.key - lineset symbol values and descriptive text for lines on the map sheet
- cda_poly.key - shadeset symbol values and descriptive text for geologic map units on the map sheet
- cda_sym.key - markerset symbol values and descriptive text for map symbols (markers) on the map sheet
- geology.lin – lineset
- geol_sfo.lin – lineset
- cal.dat – plotter calibration data file
- 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
- cdacrd.txt - text file listing map credits
- cdaref.txt - text file listing map references

Appendix B - ArcInfo Macro Language program (cda100k.aml) used to plot the geologic map of the Coeur d'Alene quadrangle

```

/* cda100k.aml, 11/28/00, SRM

/* This Arc/Info Macro Language (AML)
program will plot the geologic map plate for the
Coeur d'Alene quadrangle at 1:100,000 scale.

/* 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 filename of your own choosing
(such as cda100k) at the 'Enter ARC/INFO
Graphics filename :' prompt for the GRA to be
created,
/* 4. Type '&run cda100k' at the 'ArcPlot:'
prompt to start the program,
/* 5. Run the Arc/Info HPGL2 command to
convert the GRA file to an HPGL2 file, i.e.,
hpgl2 cda100k cda100k.hp # 1.0 opaque # 0 # #
# cal.dat
/* 6. Execute the UNIX 'lpr' command to
print the 1:100,000-scale geologic map plot on
your plotter, i.e., lpr -Ppicasso cda100k.hp
/* *****

&set key1 cda_poly.key
&set key2 cda_line.key
&set key4 cda_sym.key
/* where cda_sym.key uses geoscamp2.mrk
symbols
&s credits cdacrd.txt
&s refs cdaref.txt
&s disclaimer cdadisc.txt

/* where 'cover' contains contacts, structures and
dikes;
/* 'pntcover' contains structural symbols for
bedding and foliations;
/* and 'quad' is the quadrangle boundary.

mape %quad%

/*draw outside box
linesymbol 9
linecolor 1
box 0.5 0.5 40.0 28.5

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
marker 40.5 0
marker 40.5 29

&label shadepolys
/* color polygons for geologic rock units
shadedelete all
shadeset calcomp1
mapangle -0.3
polygonshade %cover% unit %cover%.ru

&goto contacts
/* remove the above line of code if contour lines
are to be added
/* to the map.

clear
clearselect

pagesize 40.5 29.0
pageunits inches
mapunits meters
mapscale 100000

maplimits 0.25 2.4 32 27

&set quad cdabu11
&set cover cda100k
&sv logo = usgslogo.gra

/* hypsog is hypsography coverage
&set cover11 hypsog
&set pntcover cda100kp
/* where cda100kp uses symbols from
geoscamp2.mrk

```

```

&label hypso
/* (contours)
linedelete all
lineset color.lin
linecolor 14
asel %cover11% arcs
arcs %cover11%
linedelete all

&label contacts
/* plot contacts
linedelete all
lineset geol_sfo.lin
asel %cover% arcs
res %cover% arcs linecode gt 0 and linecode lt
42
arclines %cover% linecode %cover%.con
/*arcs %cover%
asel %cover% arcs

&label structures
/* plot structures with line patterns
linedelete all
lineset geol_sfo.lin
asel %cover% arcs
res %cover% arcs linecode gt 100 and linecode
lt 800
arclines %cover% linecode %cover%.st2
asel %cover% arcs

&label mapquad
/* plot quadrangle boundary
linedelete all
lineset plotter
linesymbol 5
arcs %quad%

&label geolabels
textsize 0.10
res %cover% poly area gt 300000
labeltext %cover% unit %cover%.ru cc
asel %cover% poly
/*label Qls unit
resel %cover% poly unit = 759
labeltext %cover% unit %cover%.ru cc
asel %cover% poly

&label points
/* plot points for map symbols
markerdelete all
markerset geoscamp2.mrk
pointmarkers %pntcover% symbol

&label anno
/* plot annotation for all points
textset font.txt
/* annotext cover subclass # {level...level}
annotext %pntcover% dip # 1 2

&label titles
plot %logo% box 1.7 26.9 4.7 27.9
textfont 93715
textquality kern
textsize 0.35
move 4.8 27.55
text 'U.S. DEPARTMENT OF THE INTERIOR'
move 4.8 27.05
text 'U.S. GEOLOGICAL SURVEY'
move 39.3 27.55
text 'Open-File Report 00-135' lr
move 39.3 27.05
text 'Database, version 1.0, (Sheet 1)' lr
move 17.85 27.55
text 'Prepared in cooperation with the Idaho
Geological Survey'

textfont 93711
textsize 0.4
move 16.65 2.75
text 'Digital Geologic Map of the Coeur d'Alene
1:100,000 Quadrangle, Idaho and Montana' lc
textsize 0.3
move 16.9 2.1
text 'Digital compilation by Steven R. Munts' lc

move 17 1.45
text '2000' lc

&label explan
/* plot explanation - geologic units
shadedelete all
shadeset calcomp1
textfont 93711
textsize 0.20
move 33.25 25.7
text 'Explanation'
textsize 0.12
textquality proportional
textfont 94021
/*keyarea 33.25 17.5 41.4 25.45
Keyarea 33.25 18.9 41.4 25.45
/*keybox 0.6 0.35
keybox 0.5 0.25
keyseparation 0.2 0.2
keyshade %key1%

&label linekey
/* plot explanation - line key

```

```

linedelete all
lineset geol_sfo.lin
keyarea 33.20 11.2 41.4 18.7
keybox 0.8 0.0
keyline %key2% nobox
linedelete all

&label strikedip
/*plot explanation - symbol key
textsize 0.12
textquality proportional
textfont 94021
markerdelete all
markerset geoscamp2.mrk
keyarea 33.20 10 42.4 14.5
keybox 0.8 0.0
keymarker %key4% nobox
markerdelete all
textsize 0.10
textquality proportional
move 33.6 14.0
text '10'

/* plots combined topo index and source map
&label topindex
plot cdasourc.gra box 33.2 9.4 39.4 13.9
textfont 93713
textquality proportional
textsize 0.12
move 33.4 9.3
text 'Index map showing geology data sources
and 15-minute quadrangle names within the'
move 35.6 9.1
text 'Coeur d"Alene 1:100,000 quadrangle.' lc

&label index-map
plot indexcda.gra box 34.77 7.2 36.8 8.67
textfont 93713
textquality proportional
textsize 0.12
move 35.6 7
text 'Index map showing Coeur d"Alene
1:100,000 quadrangle' lc

&label refs
/* plot references
textfont 93711
textsize 0.20
textcolor 1
move 33.55 6.4
text 'References'
move 33.85 6.3
textsize 0.12

textquality proportional
textfont 94021
textfile %refs%

&label disclaimer
textfont 93713
textquality proportional
textsize 0.12
move 34.12 3.6
textfile %disclaimer%

&label scalebar
/* plot scale bars
linedelete all
lineset plotter
textfont 94021
textsize 0.12
&r scale2a 3 2.5 other 100000

&label credits
/*plot credits
textfont 94021
textquality proportional
textsize 0.12
move 28.85 3.6
textfile %credits%
move 28.85 2.45
text 'Database approved for publication Oct.
5, 2000'

&label proj
/*plot map projection notes
textfont 94021
textquality proportional
textsize 0.12
move 1.75 3.7
text 'Map Projection: UTM, zone 11, NAD27'

&label lat-long
/* plot neat line labels (latitude and longitude)
mape %quad%
linecolor 1
mapprojection geo.prj u11.prj
neatline -117 47.5 -116 48 geo.prj
neatlinehatch 0.125 0.125 0.2 0 geo.prj
textset font.txt
textsymbol 1
textsize 8 pt
textstyle typeset
textoffset -0.30 0.15
neatlinelabels 0.125 top all geo.prj dms
'%1%!pat1857; %2%!pat1727; %3%!pat1728'
textoffset -0.65 -0.042

```

```
neatlinelabels 0.125 left all geo.prj dms  
'%1%!pat1857; %2%!pat1727; %3%!pat1728'  
textoffset 0.15 -0.042  
neatlinelabels 0.125 right all geo.prj dms  
'%1%!pat1857; %2%!pat1727; %3%!pat1728'
```

```
&label done  
quit  
display 9999 3  
draw cda100k
```

```
&return
```

Appendix C - Metadata file (cda100k.met) for the Coeur d'Alene GIS

Identification_Information:

Citation:

Citation_Information:

Originator: Steven R. Munts

Publication_Date: 2000

Title: Digital geologic map of the Coeur d'Alene 1:100,000 quadrangle, Idaho and Montana

Edition: Version 1.0

Geospatial_Data_Presentation_Form: map

Series_Information:

Series_Name: Open-File Report

Issue_Identification: OF00-135

Publication_Information:

Publication_Place: Menlo Park, CA

Publisher: U. S. Geological Survey

Online_Linkage: URL = <http://geopubs.wr.usgs.gov/open-file/of00-135/>

Description:

Abstract:

The digital geologic map of the Coeur d'Alene 1:100,000 quadrangle was compiled from preliminary digital datasets [Athol, Coeur d'Alene, Kellogg, Kingston, Lakeview, Lane, and Spirit Lake 15-minute quadrangles] prepared by the Idaho Geological Survey from A. B. Griggs (unpublished field maps), supplemented by Griggs (1973) and by digital data from Bookstrom and others (1999) and Derkey and others (1996). The digital geologic map database can be queried in many ways to produce a variety of derivative geologic maps.

Purpose:

This dataset was developed to provide geologic map GIS of the Coeur d'Alene 1:100,000 quadrangle for use in future spatial analysis by a variety of users. These data can be printed in a variety of ways to display various geologic features or used for digital analysis and modeling. 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 two major Arc/Info datasets: one line and polygon file (cda100k) containing geologic contacts and structures (lines) and geologic map rock units (polygons), and one point file (cda100kp) containing structural data.

Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 2000

Currentness_Reference: Publication date

Status:

Progress: complete

Maintenance_and_Update_Frequency:

No USGS updates planned; however, the Idaho Geological Survey plans to update the geologic map content within the next few years.

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -117.00

East_Bounding_Coordinate: -116.00

North_Bounding_Coordinate: 48.00

South_Bounding_Coordinate: 47.50

Keywords:

Theme:

Theme_Keyword_Thesaurus: none

Theme_Keyword: geology

Place:

Place_Keyword_Thesaurus: none

Place_Keyword: Idaho

Place_Keyword: Athol

Place_Keyword: Coeur d'Alene

Place_Keyword: Kellogg

Place_Keyword: Kingston

Place_Keyword: Lakeview

Place_Keyword: Lane

Place_Keyword: Spirit Lake

Place_Keyword: Spokane

Place_Keyword: Bonner County

Place_Keyword: Kootenai County

Place_Keyword: Shoshone County

Place_Keyword: Pacific Northwest

Place_Keyword: USA

Access_Constraints: none

Use_Constraints:

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

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

Point_of_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Pamela D. Derkey

Contact_Organization: U.S. Geological Survey

Contact_Position: geologist

Contact_Address:

Address_Type: mailing and physical address

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

City: Spokane

State_or_Province: WA

Postal_Code: 99201

Country: USA

Contact_Voice_Telephone: 1-509-368-3114

Contact_Facsimile_Telephone: 1-509-368-3199

Contact_Electronic_Mail_Address: pderkey@usgs.gov

Data_Set_Credit:

Between 1961 and 1969, Alan Griggs and others conducted field work to prepare a geologic map of the Spokane 1:250,000 map (Griggs, 1973). Their field observations were posted on paper copies of 15-minute quadrangle maps. In 1999, the USGS contracted with the Idaho Geological Survey to prepare a digital version of the Coeur d'Alene 1:100,000 quadrangle. To facilitate this work, the USGS obtained the field maps prepared by Griggs and others from the USGS Field Records Library in Denver, Colorado. The Idaho Geological Survey digitized these maps and used them in their mapping program. The mapping focused on field checks to resolve problems in poorly known areas and in areas of disagreement between adjoining maps. The IGS is currently in the process of preparing a final digital spatial database for the Coeur d'Alene 1:100,000 quadrangle. However, there was an immediate need for a digital version of the geologic map of the Coeur d'Alene 1:100,000 quadrangle and the data from the field sheets along with several other sources was assembled to produce this interim product. Other data sources include Bookstrom and others (1999) and Derkey and others (1996).

Pamela D. Derkey and Robert J. Miller (both of the USGS) provided technical assistance with the geologic systems data model, metadata, digital documentation, and map projections; Michael L. Zientek (USGS) provided map unit descriptions, Steven R. Munts (contractor) digitized new linework, edited digital files, combined existing data sets, built look-up tables, and prepared the composite data set.

Native_Data_Set_Environment:

SunOS, 5.7, sun4u UNIX

ARC/INFO version 7.2.1

Data_Quality_Information:Attribute_Accuracy:Attribute_Accuracy_Report:

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

Logical_Consistency_Report:

Polygon and chain-node topology present.

Segments making up the outer and inner boundaries of a polygon tie end-to-end to completely enclose the area. Line segments are a set of sequentially numbered coordinate pairs. No duplicate features exist nor duplicate points in a data string. Intersecting lines are separated into individual line segments at the point of intersection. Point data are represented by two sets of coordinate

pairs, each with the same coordinate values. All nodes are represented by a single coordinate pair which indicates the beginning or end of a line segment. The neatline was generated by mathematically generating the four sides of the quadrangle, densifying the lines of latitude and projecting the file to UTM zone 11 (with a y-shift).

Completeness_Report:

All geologic units were compiled from previously existing maps ranging in scale from 1:24,000 to 1:250,000.

Positional_Accuracy:

Horizontal_Positional_Accuracy:

Horizontal_Positional_Accuracy_Report:

The horizontal position accuracy for the digital data is no better than 13 meters based on the digitizing RMS error.

Lineage:

Source_Information:

Source_Citation:

Citation_Information:

Originator: Griggs, A.B.

Publication_Date: 1973

Title: Geologic map of the Spokane quadrangle, Washington, Idaho, and Montana

Geospatial_Data_Presentation_Form: map

Series_Information:

Series_Name: Miscellaneous Geologic Investigations

Issue_Identification: Map I-768

Publication_Information:

Publication_Place: Denver, CO

Publisher: U.S. Geological Survey

Source_Scale_Denominator: 250000

Type_of_Source_Media: paper map

Source_Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 1973

Source_Currentness_Reference: publication date

Source_Citation_Abbreviation: Griggs (1973)

Source_Contribution:

Geology was digitized from the northeast part of this map source.

Map units used in OF00-135 were described in Griggs (1973).

Source_Information:

Source_Citation:

Citation_Information:

Originator: Griggs, A. B.

Publication_Date: not published

Title:

Unpublished geologic maps of the Athol, Coeur d'Alene, Kellogg, Kingston, Lakeview, Lane, and Spirit Lake 15-minute quadrangles, Idaho.

Geospatial_Data_Presentation_Form: map

Publication_Information:

Publication_Place: Denver, CO
 Publisher: U.S. Geological Survey Field Records Library
 Source_Scale_Denominator: 62500
 Type_of_Source_Media: paper maps
 Source_Time_Period_of_Content:
 Time_Period_Information:
 Single_Date/Time:
 Calendar_Date: 1961-1969
 Source_Currentness_Reference: date of field mapping
 Source_Citation_Abbreviation: Griggs, unpublished field notes
 Source_Contribution:
 These seven field maps were digitized by the Idaho Geological Survey and used in the map compilation.

Source_Information:

Source_Citation:
 Citation_Information:
 Originator: Bookstrom, A. A.
 Originator: Box, S. E.
 Originator: Jackson, B. L.
 Originator: Brandt, T. R.
 Originator: Derkey, P. D.
 Originator: Munts, S. R.
 Publication_Date: 1999
 Title:
 Digital map of surficial geology, wetlands, deepwater habitats, Coeur d'Alene River valley, Idaho
 Geospatial_Data_Presentation_Form: map
 Series_Information:
 Series_Name: Open-File Report
 Issue_Identification: OFR 99-548
 Publication_Information:
 Publication_Place: Denver, CO
 Publisher: U.S. Geological Survey
 Source_Scale_Denominator: 24000
 Type_of_Source_Media: CD-ROM
 Source_Time_Period_of_Content:
 Time_Period_Information:
 Single_Date/Time:
 Calendar_Date: 1999
 Source_Currentness_Reference: publication date
 Source_Citation_Abbreviation: Bookstrom and others, 1999
 Source_Contribution:
 This source provided contacts between the surficial units with the bedrock units in the lower Coeur d'Alene River area.

Source_Information:

Source_Citation:
 Citation_Information:
 Originator: Derkey, P.D., Johnson, B.R., and Carver, Michael
 Publication_Date: 1996
 Title: Digital geologic map of the Coeur d'Alene district, Idaho and Montana
 Geospatial_Data_Presentation_Form: map

Series_Information:

Series_Name: Open-File Report
 Issue_Identification: OFR 96-299

Publication_Information:

Publication_Place: Menlo Park, CA
 Publisher: U.S. Geological Survey

Source_Scale_Denominator: 24000

Type_of_Source_Media: digital files

Source_Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 1996

Source_Currentness_Reference: publication date

Source_Citation_Abbreviation: Derkey and others, 1996

Source_Contribution:

This source provided digital geology for the southeast part of the Coeur d'Alene 1:100,000 quadrangle.

Process_Step:

Process_Description:

Preliminary digital geologic map information for seven 15 minute quadrangles obtained from the Idaho Geological Survey were compiled electronically into a single topologically correct coverage by R. J. Miller (USGS) using ARC/INFO ver. 7.2.1 on a Sun Unix system.

S. R. Munts digitized the northeast corner part of Griggs's (1973) map plate on an Altek digitizing tablet (RMS input error = 0.002 [13 meters]) and incorporated the data into the Coeur d'Alene GIS.

S. R. Munts projected the Coeur d'Alene GIS to UTM zone 11 (meters) and attributed it with an interim geologic data model.

Digital data from Bookstrom and others (1999) was generalized and inserted into the Coeur d'Alene GIS to replace Griggs' unpublished field map data.

Digital data from Derkey and others (1996) was inserted into the southeast part of the Coeur d'Alene 1:100,000 quadrangle.

Process_Date: 1999 - 2000

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: 1689

SDTS_Point_and_Vector_Object_Type: String

Point_and_Vector_Object_Count: 5637

SDTS_Point_and_Vector_Object_Type: GT-polygon composed of chains

Point_and_Vector_Object_Count: 1690

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: implied

Longitude_of_Central_Meridian: implied

Latitude_of_Projection_Origin: implied

False_Easting: 0.000

False_Northing: -5,000,000 meters

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: coordinate pair

Coordinate_Representation:

Abscissa_Resolution: 0.000000028834

Ordinate_Resolution: 0.000000028834

Planar_Distance_Units: Meters

Geodetic_Model:

Horizontal_Datum_Name: North American Datum of 1927

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 of the Coeur d'Alene 1:100,000 quadrangle, Idaho and Montana' Open-File Report 00-135 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, cda100k.aat, that relates to the cda100k.con (contact look-up table), cda100k.st2 (structure look-up table), and the cda100k.ref (source reference look-up table) files; a rock unit polygon attribute table, cda100k.pat, that relates to the cda100k.ru (rock unit look-up table) and cda100k.ref (source reference look-up table) files; and a geologic map symbol point attribute table, cda100kp.pat, that relates to the cda100kp.sym (structural point data look-up tables) and cda100kp.ref (source reference look-up table) files.

Entity_and_Attribute_Detail_Citation:

A detailed description of the items in the Coeur d'Alene 100k GIS are given in the text of the Open-File Report 00-135 available in Adobe Acrobat PDF format on the World Wide Web at <http://geopubs.wr.usgs.gov/open-file/of00-135/>

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This digital geologic map GIS of the Coeur d'Alene 1:100,000 quadrangle, 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: 20001130

Metadata_Contact:

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Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata

Metadata_Standard_Version: EGDC-STD-001-1998

Metadata_Access_Constraints: none

Metadata_Use_Constraints: none